CITY OF EUREKA
DEVELOPMENT SERVICES DEPARTMENT
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NOTICE OF PLANNING COMMISSION PUBLIC HEARING

COUNCIL CHAMBER, EUREKA CITY HALL, 531 "K" STREET, EUREKA, CALIFORNIA

NOTICE IS HEREBY GIVEN that on **Monday, December 10, 2018 at 5:30 p.m.**, or as soon thereafter as the matter can be heard, the Planning Commission will hold a public hearing to consider the **Carrington Vigo Street Commercial Development Project** located at **2616 Broadway, APNs 007-121-005 and -007**.

The project applicant, the Carrington Company, submitted an application on October 4, 2018, proposing development of restaurant uses in two (2) proposed commercial buildings on approximately 3.19 acres. Two restaurants will have drive-through facilities.

The project is located in the Coastal zone, within the CS (Service Commercial) zone district and GSC (General Service Commercial) land use designation, and restaurants are a conditionally permitted use in the zone. A Use Permit (C-18-0010) and Design Review (AA-18-0019) are required for the restaurant uses, and a Coastal Development Permit (CDP-18-0012) is required for the restaurant uses and a lot line adjustment. The Lot Line Adjustment (LLA-18-0004) is being processed separately.

NOTICE IS FURTHER GIVEN that in accordance with the California Environmental Quality Act (CEQA), an Initial Study was prepared and a Mitigated Negative Declaration posted for review (SCH #2018102055). The Mitigated Negative Declaration concludes that with mitigation, no substantial adverse environmental impact will result from the proposed project, and adoption of a Mitigation Monitoring and Reporting Program, findings of fact, and a Mitigated Negative Declaration is proposed.

How to Comment: All interested persons are invited to comment on the project at the scheduled public hearing. Any person desiring to provide written comments on the project do so prior to or at the public hearing. Written comments may be mailed or delivered to the Development Services Department, Third Floor, 531 K Street, Eureka. Accommodations for handicapped access to City meetings must be requested of the City Clerk, 441-4175, five working days in advance of the meeting. Appeals to the City Council of the Planning Commission's action on the project may be made within 10 calendar days of the action by filing a written Notice of Appeal, along with the filing fees as set by the City Council, with the City Clerk. The City's final action is appealable to the California Coastal Commission. If you challenge the nature of the proposed action in court, you may be limited to raising only those issues that you or someone else raised at the public hearing described in this notice or written correspondence delivered to the public entity conducting the hearing at or prior to the public hearing. The project file is available for review at, and questions may be directed to, the Development Services Division, Third Floor, City Hall, (707) 441-4160 or e-mail: *planning@ci.eureka.ca.gov*

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EUREKA CITY PLANNING COMMISSION

STAFF REPORT

December 10, 2018

Project Title: Carrington Vigo Street Commercial Development

Project Applicant: **Carrington Company**

Case Nos.: C-18-0010; CDP-18-0012; AA-18-0019; ED-18-0006

Location: 2616 Broadway; APNs: 007-121-005 and -007

Zoning/General Plan Designation: CS (Service Commercial)/GSC (General Service Commercial)

Project Description: The applicant is proposing to develop two (2) commercial buildings on approximately 3.19 acres on the southwest corner of Broadway (Highway 101) and Vigo Streets. The two (2) existing parcels will be reconfigured through a Lot Line Adjustment. The western parcel will be developed with a multi-tenant, 8,400 square foot commercial building. The multi-tenant building will include four separate lease spaces; one or more of which will be used as a restaurant and the southern lease space will include a drive-through. The resultant eastern parcel will be developed with an approximately 3,867 square foot drive-through restaurant.

The project is located in the Coastal zone, and the CS zone district where restaurants are a conditionally permitted use. A Use Permit, Design Review, and a Coastal Development Permit are required for the development. An Initial Study/Draft Mitigated Negative Declaration has been prepared and circulated for public comment. A Lot Line Adjustment is being processed separately (LLA-18-0004).

Staff Contact Person: Kristen M. Goetz, Senior Planner, City of Eureka, Development Services Department, Community Development Division; 531 "K" Street, Eureka, CA 95501-1165; phone: (707) 441-4160, fax: (707) 441-4202, email: planning@ci.eureka.ca.gov.

Staff Recommendation:

1. Hold a public hearing;
2. Approve the proposed project by adopting the following resolutions;
3. Adopt a Resolution of the Planning Commission adopting findings of fact, a Mitigation Monitoring and Reporting Program, and a Mitigated Negative Declaration; and

4. Adopt a Resolution of the Planning Commission approving the Use Permit and Design Review to allow restaurant uses at the Carrington Vigo Street Commercial Development; and
5. Adopt a Resolution of the Planning Commission approving the Coastal Development Permit for the restaurant uses and the Lot Line Adjustment at the Carrington Vigo Street Commercial Development.

Suggested Motion:
"I move the Planning Commission adopt a Resolution of the Planning Commission adopting Findings of Fact, a Mitigation Monitoring and Reporting Program, and a Mitigated Negative Declaration; and

Adopt a Resolution of the Planning Commission approving the Use Permit and Design Review for restaurant uses; and

Adopt a Resolution of the Planning Commission approving the Coastal Development Permit for the restaurant uses and the Lot Line Adjustment at the Carrington Vigo Street Commercial Development."

Environmental: The proposed development is a "project" as defined by the California Environmental Quality Act (CEQA) and is subject to the provisions of the Act. An Initial Study was prepared and a Mitigated Negative Declaration posted for review (SCH #2018102055). The Mitigated Negative Declaration concludes that with mitigation, no substantial adverse environmental impact will result from the proposed project (Attachment 1).

The City submitted the draft IS/MND to the State Clearinghouse for a 30-day comment period which ended November 20, 2018. A notice of the 30-day local comment period, and a Notice of Intent to Adopt a Negative Declaration were published in the Times-Standard; the local comment period ended on November 23, 2018. The City received three (3) comments on the IS/MND.

Prior to approving a project, CEQA requires the Planning Commission consider the proposed MND, together with any comments received during the public review process, and then adopt the MND if the Commission finds, on the basis of the whole record before it, including the Initial Study and any comments received, there is no substantial evidence the project will have a significant effect on the environment and the MND reflects the City's independent judgment and analysis.

The City received comments in response to the proposed Mitigated Negative Declaration from three (3) agencies, and one (1) advocacy group. The submitted comments and the response to comments are contained in Attachment 2, along with an Errata containing minor corrections and clarifications to the IS/MND

The California Environmental Quality Act requires the adoption of feasible mitigation measures to reduce the severity and magnitude of potentially significant environmental impacts associate with project development, and Staff recommends the Planning Commissions adopt the Mitigation Monitoring and Reporting Program, findings of fact included in the Resolution, and the Mitigated Negative Declaration.

Background: Carrington Company is proposing to redevelop approximately 3.19 acres of an existing commercial parcel. The project site is comprised of two separate parcels, APNs 007-121-005 and 007-121-007, which are located on the southwest corner of Highway 101 (Broadway) and Vigo Street. The address is 2616 Broadway.

The west side of Broadway in the vicinity of the project is developed with a range of commercial and visitor serving uses, including motels, restaurants, and retail and service stores. The property is bound on the south side by the commercial lots of Discount Cigarettes (0.17 acres), Mr. Fish Seafood (0.7 acres), and Gold Rush Coffee (0.5 acres) and on the north side by Vigo Street and other existing commercial developments. The eastern boundary is Broadway (State Highway 101). The western property boundary abuts the Maurer Freshwater Marsh, which is largely riparian vegetation and adjacent to the City of Eureka's Palco Marsh. Both marshes together are considered to be a large Environmentally Sensitive Habitat Area (ESHA).

The easterly parcel (referred to as Site 1) contains a vacant two-story commercial structure, and the westerly parcel (Site 2) is vacant. The building and property was formerly used as a truck stop/terminal with both paved and graveled parking areas.

Redevelopment proposed for the project includes the demolition of the existing structure, reconfiguration of the parcels through a Lot Line Adjustment, construction of a drive-through restaurant on Site 1, construction of a four-tenant commercial structure containing a mix of restaurant and retail uses, with one drive-through on Site 2, associated parking areas, low impact development features, landscaping, utilities, and stormwater infrastructure.

The project parcels are zoned Service Commercial (CS) and have a land use designation of General Service Commercial (GSC). Retail uses are principally permitted in the CS zone district, however, in the Coastal CS zone, restaurants are a conditionally permitted use, and a Use Permit is required for the proposed restaurant uses. Because the project is located in the Coastal Zone and a use permit is required, pursuant to the City's Local Coastal Program, a Coastal Development Permit is also required.

Use Permit

Eureka Municipal Code §10-5.29133. provides that "*Restaurants and soda fountains, including drive-in establishments*" are a conditionally permitted use. The definition of a "*Drive-in*" is "*An establishment serving food or beverages to customers who remain in or leave and return to their cars for consumption*." Over time, Staff has made the determination that a "drive-in" and "drive-through" are a similar use, and in fact, the definition has been updated in the inland portion of the Municipal Code to include drive-throughs. Therefore, the proposed restaurant with a drive-through is a conditionally permitted use.

One restaurant with a drive-through is proposed to be located on Site 1. The south tenant space in the four-tenant structure on Site 2 also contains a drive-through. Restaurant

uses could be located in any or all of the three remaining tenant spaces on Site 2, although one restaurant and two retail spaces is the likely make-up of the tenancy.

Applicable Regulations:

In order to give the district use regulations flexibility, in certain zoning districts conditional uses may be permitted subject to the granting of a use permit. Because of their unusual characteristics, conditional uses require special consideration so that they are located properly with respect to the objectives of the Zoning Regulations and with respect to their effects on surrounding properties. In order to achieve these purposes, the Planning Commission is empowered to grant an application for a use permit and to impose reasonable conditions provided, pursuant to Eureka Municipal Code Chapter 5, Article 24, Section 10-5.2407, the Planning Commission can make the following findings:

(a) *That the proposed location of the conditional use is in accord with the objectives of this chapter and the purposes of the district in which the site is located; and*

(b) *That the proposed location of the conditional use and the conditions under which it would be operated or maintained will not be detrimental to the public health, safety, or welfare or materially injurious to properties or improvements in the vicinity; and,*

(c) *That the proposed conditional use will comply with each of the applicable provisions of this chapter; and*

(d) *That the proposed conditional use, if located in the coastal zone, is consistent with the certified Local Coastal Program and is consistent with the intent of the zoning district.*

1. Objectives and Purpose

Pursuant to Eureka Municipal Code (EMC) § 10-5.102, the zoning regulations are adopted by the City Council in accordance with the City Charter to protect the public health, safety, peace, comfort, convenience, prosperity, and general welfare. More specifically, the chapter is adopted in order to achieve the following objectives:

(a) To provide a precise guide for the physical development of the City in such a manner as to achieve progressively the arrangement of land uses depicted in the General Plan adopted by the Council. *The project site has a zone and general plan designation of Service Commercial (CS). The purpose of the CS zone, in addition to the objectives prescribed in § 10-5.102, is to achieve the following purposes: (1) To provide appropriately located areas for retail stores, offices, service establishments, amusement establishments, and wholesale businesses offering commodities and services required by residents of the city and its surrounding market area; (2) To provide opportunities for retail stores, offices, service establishments, amusement establishments, and wholesale businesses to concentrate for the convenience of the public and in a mutually beneficial relationship to each other; (3) To provide space for community facilities and institutions that appropriately may be located in commercial areas; (4) To provide adequate space to meet the needs of modern commercial development, including off-street parking and truck loading areas; (5) To minimize traffic congestion and to avoid the overloading of utilities by preventing the construction of buildings of excessive size in*

relation to the amount of land around them; (6) To protect commercial properties from fire, explosion, noxious fumes, and other hazards; (7) To provide appropriately located areas for commercial uses having features that are incompatible with the purposes of the other commercial districts; (8) To permit additional development in mixed commercial areas containing both retail stores and commercial services; and (9) To allow a wider choice of location for certain industrial uses that do not have an adverse impact on commercial services. Because the zone classification and the general plan designation are consistent with each other, and because the proposed restaurants are consistent with the purposes listed above, granting the conditional use permit will facilitate and achieve the arrangement of land uses depicted in the general plan.

(b) To foster a harmonious, convenient, workable relationship among land uses. *The proposed development is located in the midst of an established commercial/visitor-serving corridor that exists on the west side of Broadway; as such it will not divide the established community and granting the conditional use permit will foster a harmonious, convenient, workable relationship among land uses.*

(c) To promote the stability of existing land uses that conform with the General Plan and to protect them from inharmonious influences and harmful intrusions. *Because the Broadway corridor is already developed with similar mixed uses and restaurants as proposed for the project site, the project will facilitate and promote stability of land uses consistent with the general plan.*

(d) To ensure that public and private lands ultimately are used for the purposes which are most appropriate and most beneficial from the standpoint of the city as a whole. *The construction of restaurants on the project site will serve not only the greater Eureka area, but will also cater to tourist traffic, which is a benefit to the city as a whole. In addition, the site and existing building have been vacant for over 20 years, which has led to blight and an attractive nuisance. The proposed project, if approved, would eliminate the blight, would create over 100 jobs, and would lead to new construction, all of which are beneficial to the City as a whole.*

(e) To prevent excessive population densities and overcrowding of the land with structures. *The granting of the conditional use permit will not result in increased population densities, and will not cause an overcrowding of land with structures.*

(f) To promote a safe, effective traffic circulation system. *A traffic study was completed for the mixed use project, including the restaurants. The conclusion of the traffic study is that, with mitigation, the development will not result in adverse traffic impacts.*

(g) To foster the provision of adequate off-street parking and off-street truck loading facilities. *The project site plan shows the locations available*

for off-street parking and loading facilities; the project will provide more than the required number of off-street parking spaces.

(h) To facilitate the appropriate location of community facilities and institutions. *No community facilities or institutions exist or are proposed. The site and existing building have been vacant for over 20 years; by this point in time, something would have been proposed or implemented at the site if any need for a community facility/institution was needed at the site.*

(i) To promote commercial and industrial activities in order to strengthen the city's tax base. *Granting the conditional use permit will facilitate the development of restaurants; which will in turn result in sales tax that will strengthen the city's tax base.*

(j) To protect and enhance real property values. *The completion of the Carrington Vigo Street Commercial development has the potential to greatly enhance property values in the vicinity of the development; therefore, granting the conditional use permit which will facilitate the construction of restaurants will protect and enhance real property values. Due to the construction that would result from the approval of the project, the site's property tax value will increase significantly.*

(k) To safeguard and enhance the appearance of the city. *The project is subject to Design Review, which will review the project design and architecture to assure that the appearance is harmonious with the surrounding properties. Approval of the project would also eliminate a long-vacant blighted building and would lead to the construction of new, modern buildings, substantial landscaping, and five new active businesses.*

Based on the discussion herein, Staff has determined that the required finding can be made that the project is in accord with the objectives and purposes of the Zoning Regulations, CS zone district, and specific purposes of the CS district.

2. Public health, safety, or welfare:
As required by law, an Initial Study/Proposed Mitigated Negative Declaration (IS/MND) was prepared and circulated that analyzed the proposed project for potential adverse environmental impacts. The conclusion of the IS/MND is that with specified mitigation, the project will not result in any adverse environmental impacts. The mitigation measures recommended in the IS/MND have been incorporated into Conditions of Approval in the Resolution. Based on the conclusions of the IS/MND and the discussion in this staff report, Staff believes that the project, as conditioned and mitigated, will not result in any adverse impacts to the public health, safety or welfare.

3. Use complies with applicable provisions:
The applicable provisions include the development standards specified in the Eureka Municipal Code for yards, building height, size, and bulk, off-street parking and loading, landscaping, etc. The CS zone district does not require yard setbacks, although the project maintains a 54 to 73 foot setback from the wetland located on the west side of Site 2. The structures proposed on Sites 1 and 2 will be setback more than 20 feet from Vigo Street.

The Site 1 restaurant is proposed to have an 11 foot drive-thru lane that will be located between the structure and both Vigo Street and Broadway. The site will also be landscaped.

Parking for restaurants is calculated at one off-street parking space per 200 square feet of gross floor area. The Site 1 drive-through restaurant will have approximately 3,867 square feet of floor area, which would require 19 off-street parking spaces. A total of 43 off-street parking spaces are proposed on Site 1. The Site 2 structure will be approximately 8,400 square feet, with two outdoor patio seating areas that total 950 square feet. In the unlikely event all four tenant spaces were occupied by restaurant uses, a total of 47 off-street spaces would be required. A total of 73 off-street spaces are proposed on Site 2. Parking for retail uses is calculated at one off-street parking space for every 300 square feet of floor area. Therefore, if all four tenant spaces on Site 2 were occupied by retail uses, a total of 31 off-street parking spaces would be required.

The site plan shows a total of 116 proposed off-street spaces. Therefore, based on the submitted site plan, the proposed project will comply with the applicable provisions in that all off-street parking can be developed, and the height, bulk and location of the buildings are in compliance with the standards for the CS zone.

As discussed in this staff report and as described and analyzed in the initial study, Staff finds that the proposed project does comply with the applicable provisions of the Code.

4. Use is consistent with Local Coastal Program:
The project site is located in the CS zoning district and within the coastal zone; a Coastal Development Permit for the construction of the proposed restaurants on Site 1 and Site 2 is required and discussed below. Within the City of Eureka, the LCP is within the scope of the Eureka General Plan. As such, compliance with the General Plan and its policies is the functional equivalent of compliance with the LCP.

The proposed project will allow for new businesses to locate and invest in the City, which will contribute to the local economy, and therefore shows compliance with General Plan Policy 1.B.9 which states that, "The City shall encourage economic investment in buildings ranging from modest signage improvements and new paint, to major façade improvements, remodels, and new buildings." The proposed project will meet all applicable development standards required by the Code and will therefore comply with General Plan Policy 1.L.2 which states that, "The City shall promote high quality design, visual attractiveness, proper location, adequate sites, sufficient off-street parking, and a convenient circulation system for commercially-designated areas of the city." As the applicant has submitted a design that complies with the development standards stipulated in the Code and that is consistent with applicable policies of the LCP, Staff believes that this finding can be made.

Design Review

<u>Site Plan and Architectural Review:</u>
The applicant is proposing to demolish the existing truck stop/terminal structure and construct a restaurant with drive-through on Site 1 and a four-tenant structure with one

restaurant with a drive-through, and up to three restaurants and/or retail tenants on Site 2.

The exterior of the structure on Site 1 will be composed of stucco in "Bone China" color with a "Safety Red" stucco band, custom red awnings with palm trees, and terracotta tile roof.

The exterior of the structure on Site 2 will include a "Beige" color, smooth-finish and a semi-smooth "Sage Green" Exterior Insulation and Finish Systems (EIFS) with "Beige" cornice molding and stone veneer and cap. Sheet 3.7 in Attachment 3 provides examples of the exterior materials and colors.

Although there are no landscaping requirements in the Coastal CS zone, the project proposes a total of 40,037 square feet of landscaping, with 14,346 square feet of developed landscape area, along with 25,691 square feet of landscaping in the wetland buffer zone.

The Planning Commission should determine whether the proposed structures, parking lot, and landscaping will be inharmonious with the surroundings or will have an adverse effect on the value of property or improvements in the vicinity. The ugly, the inharmonious, the monotonous, and the hazardous shall be barred, but originality in architecture, site planning, and landscape and graphic design shall not be suppressed. Review shall include exterior design, materials, textures, and colors but shall not consider elements of the design that do not affect exterior appearance.

<u>Sign Permit:</u>
The signage for Site 1 is included in this Design Review application. Design review approval of the signage for Site 2 will be completed at a later time, and is not a part of this application. Design review approval for signage on Site 2 will not require an additional use permit or Coastal Development Permit.

Pursuant to EMC § 10-5.1704, the CS zone district allows 3 square feet of signage for every foot of street frontage on each site. Together, Site 1 and Site 2 have approximately 735.71 feet of frontage, which can allow up to 2,207.13 square feet of signage. The maximum signage allowance will be shared across Site 1 and Site 2.

Site 1 signage included in this review proposes four (4) illuminated "In-n-Out" wall signs at 65.8 square feet each, or 263.2 square feet total, and one (1) double-faced, illuminated freestanding sign with 240 square feet total of sign area (120 sf per sign face). The freestanding sign will be located on Broadway at the Broadway entrance to Site 1 and will be 30 feet in height. The total sign area proposed for Site 1 is 503.2 square feet.

The Planning Commission must determine whether the Site 1 signs as proposed:

(a) Comply with the regulations for On-Premise and Off-Premise signs contained in § 10-5.1704. *At 503.2 sf, the total area proposed for all signs does not exceed the 2,207.13 square foot total sign area allowed for the site.*

(b) Are desirable for the applicant's enjoyment of substantial trade and property rights, and whether the signs constitute needless repetition,

redundancy or proliferation of signage. *The project proposes one wall sign for each side of the building and one freestanding sign.*

(c) Are consistent with the purposes and scope of the sign Ordinance as set forth in § 10-5.1701. *The purposes and scope of the sign ordinance include (A) Provide each sign user an opportunity for effective identification by limiting the number and area of signs permitted on all sites; (B) Maintain and enhance the quality of the city's appearance by avoiding clutter and by implementing design review; (C) Enable users of goods and services to identify establishments offering services to meet their needs; (D) Regulate the number and size of signs according to standards consistent with the types of establishments in each zoning district; (E) Protect residential districts adjoining non-residential districts from adverse impacts of excessive numbers or sizes of signs; (F) Apply on a city-wide basis subject to other more restrictive regulations which may be applicable in the Design Review and Scenic Coastal Areas. The signage for Site 1 as proposed complies with the development standards for wall and freestanding signs in the CS zone district.*

(d) Constitute a detriment to public health, safety and welfare. *The signs are internally illuminated, and as such should not be a distraction to the driving public, or to the residential and hotel uses east of Broadway on the bluff. Engineered plans will be required for building permit issuance, and sign inspections in the field will be completed.*

(e) Obscures from view or unduly detracts from existing adjacent signs through the location and design of the proposed signs. *The proposed wall signs will not obscure or detract from any adjacent signs. The Discount Cigarette store has a sign on the roof of the structure, and Mr. Fish has a freestanding sign adjacent to Broadway. Provided the freestanding sign is located at least ½ its height (15 feet) from the interior property line that will exist at the Broadway entrance as required by the Municipal Code, the freestanding sign will not obscure or distract from any adjacent signs.*

(f) Will have a significant adverse effect on the character of any residential district within 100 feet (excluding highway or road right-or-way). *Because the residential and hotel uses are located across and above Broadway on a bluff, and the height of the structures containing the wall signs, and the height of the freestanding sign are 30 feet or less, there should be no impact on the uses across Broadway.*

Based on the Site Plan, Architectural, and Sign Permit discussion above, Staff believes the necessary findings, as mentioned above, can be made to approve the Design Review and Sign Permit.

Use Permit and Design Review Summary:
Based on the discussion above, and the information and analysis in the IS/MND, Staff recommends the Planning Commission adopt the Mitigated Negative Declaration (SCH# 2018102055), the Mitigation Monitoring and Reporting Program, and the Findings of Fact, and conditionally approve the Use Permit and Design Review.

Coastal Development Permit

The Local Coastal Program is the foundational policy document for areas of the City located in the coastal zone. It establishes farsighted policy that forms the basis for and defines the framework by which the City's physical and economic resources in the coastal zone are to be developed, managed and utilized. The Local Coastal Program is divided into two components: the first component is the *Land Use Plan*, which is the General Plan specific to land in the coastal zone. It outlines the existing conditions, permitted uses, and policies needed to achieve the goals of the Coastal Act and includes the general plan map. The second component of the Local Coastal Program is the *Implementation Plan*, which includes zoning regulations and the zoning map for land in the coastal zone, as well as specific coastal zone ordinances necessary to implement the policies of the Land Use Plan. A discussion of how the project complies with these two components follows:

Land Use Plan
Below are goals and policies of the Land Use Plan portion of the adopted and certified LCP, each followed by a brief discussion how the project conforms to that goal or policy.

Goal 1.A To establish and maintain a land use pattern and mix of development in the Eureka area that protects residential neighborhoods, promotes economic choices and expansion, facilitates logical and cost-effective service extensions, and protects valuable natural and ecological resources. *The proposed project would add commercial and restaurant uses to the existing mix of commercial and restaurant uses located along the west side of Broadway in the vicinity of the project site. The new development will provide greater shopping and dining opportunities for the residents and visitors to the area thus promoting economic choices and expansion.*

The closest residential uses are located across Broadway on top of the bluff. As discussed in the IS/MND and supplemental information, the project will not impact the use or enjoyment of the existing residential neighborhood. Therefore, the project 'protects' the residential neighborhoods.

No service extensions are required.

The project site is adjacent to the Mauer Marsh, which is a valuable and productive natural resource. However, as discussed in the IS/MND, the project will not adversely affect the Mauer Marsh or any other natural or ecological resources.

Policy 1.A.1 The City shall encourage infilling of vacant urban land and reuse of underutilized urban land within the Planning Area as its first priority of accommodating demand for growth. *Project Site 1 currently includes a vacant, and long-underutilized commercial structure; Site 2 is currently vacant. The project will be infill development that includes the demolition of the former truck stop building and the construction of approximately 12,300 square feet of commercial retail and visitor serving uses, including restaurants.*

Policy 1.A.4 To promote the public safety, health, and welfare, and to protect private and public property, to assure the long-term productivity and economic vitality of coastal resources, and to conserve and restore the natural environment, the City shall protect the ecological balance of the coastal zone and prevent its deterioration and destruction. *The project would not result in any deterioration or destruction of coastal resources. A traffic study was completed for the mixed use project, including the restaurants. The conclusion of the traffic study is that, with mitigation, the development will not result in adverse traffic impacts. The elimination of a vacant building coupled with the construction of new buildings and the establishment of four new businesses will substantially contribute to long-term productivity and economic vitality. Also, as discussed in the IS/MND, the recommended mitigation measures will adequately protect the adjacent Maurer Marsh from adverse impacts resulting from the project.*

Policy 1.L.1 The City shall discourage new commercial development within the city that will adversely affect the economic vitality of the Core Area. The City shall also encourage Humboldt County to discourage such development in adjacent unincorporated areas. *The project would result in the construction of about 12,300 square feet of commercial and restaurant uses in the existing commercial corridor along Broadway. The project is relatively minor considering the size and volume of other existing businesses along the existing commercial corridor. There are currently no restaurants with drive-throughs in the core area. Therefore, there is no expectation that the proposed project would affect the economic vitality of the core area.*

Policy 1.L.2 The City shall promote high quality design, visual attractiveness, proper location, adequate sites, sufficient off-street parking, and a convenient circulation system for commercially-designated areas of the city. *The plans and elevations submitted by the applicant show that care has been given to the design and hardscape for the project to assure a high quality design and visual attractiveness. As discussed in the IS/MND, including the Traffic Study prepared for the project, the project is appropriately located, provides all required off-street parking, and has an appropriate circulation system. Therefore, the project complies with Policy 1.L.2. In addition, the project as submitted, includes high quality design and significant landscaping. The project is subject to Design Review, which will review the project design and architecture to assure that the appearance is harmonious with the surrounding properties. Approval of the project would also eliminate a long-vacant blighted building and would lead to the construction of new, modern buildings, substantial landscaping, and five new active businesses. Regarding the convenience of the circulation system, a traffic study was completed for the mixed use project, including the restaurants. The conclusion of the traffic study is that, with mitigation, the development will not result in adverse traffic impacts.*

Policy 1.L.3 The City shall discourage isolated and sprawling commercial activities along major roads and instead reinforce the vitality of the Core Area and existing community and neighborhood shopping areas. *The proposed project would be located within an existing commercial corridor, will consist of infill development, and will not be isolated or sprawling.*

Policy 1.L.10 The City shall work with property owners in deteriorated and deteriorating commercial areas to either rehabilitate their properties or convert them to productive uses that are consistent with this General Plan. *The subject property is deteriorated. Approval of the project would return the property to a productive use, with uses that are consistent with the general plan.*

Policy 3.A.14 The City shall require all new or intensified development projects to provide sufficient off-street parking supply so as to conserve the existing on-street supply, particularly in the commercial, medical services commercial, industrial, and higher density residential areas, except in the Core Area as specified under Goal 3.H in this document. In cases where off-street parking is required, the City will encourage joint-use parking arrangements. *The project would require the construction of about 66 off-street parking spaces where the site plan shows 116 spaces. Therefore, the project would provide an excess of all required off-street parking.*

Policy 4.D.6 The City shall improve the quality of runoff from urban and suburban development through use of appropriate and feasible mitigation measures including, but not limited to, artificial wetlands, grassy swales, infiltration/sedimentation basins, riparian setbacks, oil/grit separators, and other best management practices (BMPs). *The project proposes the installation of bio-retention basins outside of the greater than 50 foot wetland buffer area, and in the landscaped areas adjacent to Vigo Street. Oil/water separators will be installed as required to reduce potential contaminants in surface runoff.*

Policy 5.B.5 For new development between the first public road and the sea, the City shall require the dedication of a vertical access easement to the mean high tide line unless:

a. Another more suitable public access corridor is available within 500 feet of the site; or

b. Access at the site would be inconsistent with other General Plan coastal policies, including existing, expanded, or new coastal-dependent industry, agricultural operations, or the protection of environmentally sensitive habitat areas; or,

c. Access at the site is inconsistent with public safety, environmental protection, or military security needs.

The project site is more than 1,000 feet from the mean high tide line of Humboldt Bay; however, the project site does back-up to Maurer Marsh which is a valuable coastal resource. The project site is located on Vigo Street which provides public access into the Maurer Marsh and Palco Marsh areas. Therefore, adequate and more suitable access to coastal resources is available from Vigo Street and is not required across the subject property.

Policy 5.B.6 For new development between the first public road and the sea, the City shall require a lateral access easement along the shoreline unless:

a. Lateral access at the site would be inconsistent with other General Plan coastal policies, including existing expanded, or new coastal dependent

industry, agricultural operations, or the protection of environmentally sensitive habitat areas; or,

b. Access is inconsistent with public safety or military security needs.

The subject property is greater than 1,000 feet from Humboldt Bay, therefore lateral access is not possible.

Policy Goal 6.A To protect and enhance the natural qualities of the Eureka area's aquatic resources and to preserve the area's valuable marine, wetland, and riparian habitat. *The existing Maurer Marsh that is adjacent to the proposed development is understood to be an Environmentally Sensitive Habitat Area (ESHA). The IS/MND and biological study, as well as the Coastal Development Permit application and IS/MND response to comments, confirm that the project will not adversely impact the adjacent ESHA. The justification for a buffer of less than 100' is discussed in the Biological Resources Study dated April 27, 2018, prepared for the project by GHD and included as Appendix C in the IS/MND, Attachment 1.*

Policy 6.A.7 Within the Coastal Zone, the City shall ensure that environmentally sensitive habitat areas are protected against any significant disruption of habitat values, and that only uses dependent on such resources shall be allowed within such areas. The City shall require that development in areas adjacent to environmentally sensitive habitat areas be sited and designed to prevent impacts which would significantly degrade such areas, and be compatible with the continuance of such habitat areas. *The IS/MND and biological study, as well as the Coastal Development Permit application and IS/MND response to comments, confirm that the project will not adversely impact the adjacent ESHA. The justification for a buffer of less than 100' is discussed in the Biological Resources Study dated April 27, 2018, prepared for the project by GHD and included as Appendix C in the IS/MND, Attachment 1.*

To avoid any impacts to ESHA/wetlands, any and all exterior lighting will be located and shielded such that no light or glare extends beyond the property line. In addition, the illuminated portion of the light fixture or lens shall not extend below or beyond the canister or light shield.

Policy 6.A.8 Within the Coastal Zone, prior to approval of a development, the City shall require that all development on lots or parcels designated NR (Natural Resources) on the Land Use Diagram or within 250 feet of such designation, or development potentially affecting an environmentally sensitive habitat area, shall be found to be in conformity with the applicable habitat protection policies of the General Plan. All development plans, drainage plans, and grading plans submitted as part of an application shall show the precise location of the habitat(s) potentially affected by the proposed project and the manner in which they will be protected, enhanced or restored. *The adjacent ESHA is designated NR. The Biological Resources Study dated April 27, 2018, prepared for the project by GHD and included as Appendix C in the IS/MND, Attachment 1, as well as the Coastal Development Permit application and*

IS/MND response to comments, confirms that the project will not adversely impact the NR designated property.

Policy 6.A.19 The City shall require establishment of a buffer for permitted development adjacent to all environmentally sensitive areas. The minimum width of a buffer shall be 100 feet, unless the applicant for the development demonstrates on the basis of site specific information, the type and size of the proposed development, and/or proposed mitigation (such as planting of vegetation) that will achieve the purpose(s) of the buffer, that a smaller buffer will protect the resources of the habitat area. As necessary to protect the environmentally sensitive area, the City may require a buffer greater than 100 feet. The Buffer shall be measured horizontally from the edge of the environmental sensitive area nearest the proposed development to the edge of the development nearest to the environmentally sensitive area. Maps and supplemental information submitted as part of the application shall be used to specifically define these boundaries. *The Biological Resources Study dated April 27, 2018, prepared for the project by GHD and included as Appendix C in the IS/MND, Attachment 1, as well as the Coastal Development Permit application and IS/MND response to comments, confirms that the project will not adversely impact the adjacent ESHA. The justification for a buffer reduction to less than 100' is discussed also discussed in the Biological Resources Study in the Initial Study.*

Policy 6.A.20 To protect urban wetlands against physical intrusion, the City shall require that wetland buffer areas incorporate attractively designed and strategically located barriers and informational signs. *The project proposes the installation of a 6-foot tall fence adjoining the reduced wetland buffer at the west side of the property and curving around to and parallel with the south property line as shown on project site plan. A condition of approval has been added to install informational signs.*

Policy 6.E.4 The City shall submit development proposals to the North Coast Unified Air Quality Management District for review and comment in compliance with CEQA prior to consideration by the Planning Commission and /or City Council. *The NCUAQMD was sent a project referral as well as a copy of the initial study and mitigated negative declaration from the City for their review and comment. No comments were received from NCUAQMD.*

Wetland Buffer:
The City of Eureka's adopted Local Coastal Program (LCP) requires that Environmentally Sensitive Habitat Areas (ESHA), including wetlands, be protected. Specifically, LCP Policy 6.A.19 states:

"The City shall require establishment of a buffer for permitted development adjacent to all environmentally sensitive areas. The minimum width of a buffer shall be 100 feet, unless the applicant for the development demonstrates on the basis of site specific information, the type and size of the proposed development, and/or proposed mitigation (such as planting of vegetation) that will achieve the purpose(s) of the buffer, that a smaller buffer will protect the resources of the habitat area. As necessary to protect the

environmentally sensitive area, the City may require a buffer greater than 100 feet. The Buffer shall be measured horizontally from the edge of the environmental sensitive area nearest the proposed development to the edge of the development nearest to the environmentally sensitive area. Maps and supplemental information submitted as part of the application shall be used to specifically define these boundaries."

A buffer area provides essential open space between the proposed development and adjacent ESHA. The existence of the open space ensures that the type and scale of development proposed will not significantly degrade the habitat area. A buffer area is not itself a part of the environmentally sensitive habitat area, but a "buffer" or "screen" that protects the habitat area from potential adverse environmental impacts caused by the development. The buffer area is measured from the landward edge of the wetland (riparian woodlands are considered wetland habitats under the LCP) to the "development."

The project is located entirely within the Coastal Zone. A wetland delineation was prepared for the project by GHD in 2018, and the extent of wetland-type vegetation (based on one parameter) was mapped in accordance with the California Coastal Commission, as well as the extent of wetlands having wetland-type vegetation, hydric soils, and wetland hydrology (based on three-parameters) per the U.S. Army Corps of Engineers (USACE). The wetland delineation effort began with reviewing available wetland mapping. This included reviewing existing wetland information from the USFWS National Wetlands Inventory online mapper.

GHD mapped the areas of 1-parameter and 3-parameter wetlands and the wetland delineation identified the types of wetlands that are present and their locations. The delineation procedure was completed pursuant to the USACE 1987 Manual, *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coastal Regions* (Version 2.0). Following the initial review, a field survey was conducted on April 10, 2018 to map and document wetland and water features.

The parameters used to identify a wetland are characteristics of the soil, hydrology, and vegetation. To define a wetland, the USACE requires that all three parameters show wetland attributes. The Coastal Commission defines a wetland based on the presence of any one parameter. The wetland delineation determined that an area with wetland vegetation, hydric soils, and wetland hydrology is present along the western portion of APN 007-121-007 and the far southwestern corner of APN 007-121-005. In addition to the three-parameter wetland, a one-parameter wetland was identified encompassing the general area of the three-parameter wetland and sporadically extending farther west than the three-parameter wetland. The one-parameter wetland includes willow species (*Salix spp.*) that are growing in upland (upland soils and hydrology) conditions. If these areas were impacted by the project, the impact would be significant. However, as proposed, the project will be setback from any wetland areas by at least 50 feet and within that buffer area between the wetlands and the project, native vegetation will be installed to enhance the buffer and ensure no impacts to these wetlands will occur.

A thorough analysis regarding the adequacy of the 54-73 foot buffer was conducted prior to including it in all site plans. Seven characteristics were used to determine if a smaller

(less than 100 feet) buffer size between proposed development and an ESHA would be consistent with the LCP. These characteristics include: the biological significance of adjacent lands, sensitivity of species to disturbance, erosion susceptibility, natural topography, cultural features, lot configuration and location of existing development, and type and scale of development proposed. These event characteristics were analyzed in the Coastal Development Permit application and further analyzed in the IS/MND response to comments. The existing ESHA immediately adjacent to the project, would not be directly impacted by the project because no work is anticipated to be done within the ESHA boundaries. The site is also bordered by other commercial uses along Broadway and the site has been previously developed.

Although the existing structure at 2616 Broadway is located 50 feet or greater away from the ESHA, during the previous use of the site as a truck stop/terminal, trucks and trailers and other vehicles parked immediately adjacent to the ESHA. Therefore, as stated in the biological report in the IS/MND, the proposed 54-73-foot buffer would be sufficient to protect the ESHA from the project.

The project was referred to agencies and departments that might have interest in or jurisdiction over the project. Those referrals included the California Coastal Commission, and local Commission Staff provided comments and made recommendations for the inclusion of two conditions:

The first recommended condition is language protecting on-site wetlands from future development improvements (other than resource-dependent development such as restoration activities, which are permissive in wetlands), and insuring that no future development encroaches into the wetland buffer without an amendment to this CDP or additional CDP review.

The second recommended condition is based on Land Use Plan policy 6.A.20 and Implementation Plan section 10-5.2942.16. Barriers, that "...wetland buffer areas shall incorporate attractively designed and strategically located barriers and informational signs."

Both recommendations from the Coastal Commission have been added as Conditions of Approval.

No other agencies provided comments related to the Coastal Development permit.

Implementation Plan

The Implementation Plan includes the Coastal Zoning Regulations, the Zoning Map and specific Coastal Zone Ordinances that implement the policies of the LUP. In addition to specifying the regulations pertaining to specific zoning districts, the Coastal Zoning Regulations, Section 10-5.2940 et. seq. (Section 156.050 et. seq.), specify Development Standards that apply to all development in the Coastal Zone. The standards include those for public access, environmental resources, natural hazards, visual resources, public works, and development.

The property has a Zoning designation of Service Commercial (CS). The CS District is included in the zoning regulations to achieve the following purposes:

(1) To provide appropriately located areas for retail stores, offices, service establishments, amusement establishments, and wholesale businesses offering commodities and services required by residents of the city and its surrounding market area;

(2) To provide opportunities for retail stores, offices, service establishments, amusement establishments, and wholesale businesses to concentrate for the convenience of the public and in a mutually beneficial relationship to each other;

(3) To provide space for community facilities and institutions that appropriately may be located in commercial areas;

(4) To provide adequate space to meet the needs of modern commercial development, including off-street parking and truck loading areas;

(5) To minimize traffic congestion and to avoid the overloading of utilities by preventing the construction of buildings of excessive size in relation to the amount of land around them;

(6) To protect commercial properties from fire, explosion, noxious fumes, and other hazards;

(7) To provide appropriately located areas for commercial uses having features that are incompatible with the purposes of the other commercial districts;

(8) To permit additional development in mixed commercial areas containing both retail stores and commercial services; and

(9) To allow a wider choice of location for certain industrial uses that do not have an adverse impact on commercial services.

The Coastal Zone regulations control, among other things, the uses allowed within each zoning district. The CS zone district specifically permits "Restaurants and soda fountains, including drive-in establishments" as a conditionally permitted use. The definition of a "*Drive-in*" is "*An establishment serving food or beverages to customers who remain in or leave and return to their cars for consumption*." Over time, Staff has made the determination that a "drive-in" and "drive-through" are a similar use, and in fact, the definition has been updated in the inland portion of the Municipal Code to include drive-throughs. Therefore, the proposed restaurants, including the two with drive-throughs are conditionally permitted uses. The project proposed on Site 1 and Site 2 meets all development standards. Therefore, as discussed, the project as proposed is consistent with the CS Zoning Designation and the Coastal Zone Development Standards of the Implementation Plan.

<u>Coastal Development Permit Summary:</u>
In order to approve the Coastal Development Permit, the Planning Commission must find that the project is in conformance with the adopted and certified Local Coastal

Program. Based on the discussion above and the information and analysis in the Initial Study, Staff believes that such a finding can be made. Therefore, Staff recommends that the Planning Commission conditionally approve the Coastal Development Permit.

Lot Line Adjustment:
A lot line adjustment is required for the project. Lot line adjustments are deemed "development" under the Coastal Act and, therefore, require approval of a Coastal Development permit.

The Eureka Municipal Code gives authority for action on the lot line adjustment to the Director of Development Services. Therefore, following an action by the Planning Commission to approve the Coastal Development permit, the Director of Development Services will take action to approve the lot line adjustment.

The following adjustment is proposed:

Parcel	Existing Lot Area	Proposed Lot Area
007-121-005 (Site 1)	121,735 sf	47,103 sf
007-121-007 (Site 2)	14,689 sf	74,632 sf

As discussed in depth in the Coastal Development Permit section above, the development proposed as a result of the lot line adjustment does not conflict with and is supported by goals and policies contained within the City of Eureka's adopted and certified Land Use Plan, as well as the development standards in Eureka's Implementation Plan. The lot line adjustment will not impact the existing ESHA/wetland, impede access to the coast from the west end of Vigo Street through Palco and Maurer Marsh, and allow redevelopment of a long-vacant, underutilized, and blighted site. Therefore, the finding can be made that the lot line adjustment, as proposed, can be approved.

Staff Recommendation:
1. Hold a public hearing;
2. Approve the proposed project by adopting the following resolutions;
3. Adopt a Resolution of the Planning Commission adopting findings of fact, a Mitigation Monitoring and Reporting Program, and a Mitigated Negative Declaration; and
4. Adopt a Resolution of the Planning Commission approving the Use Permit and Design Review to allow restaurant uses at the Carrington Vigo Street Commercial Development; and
5. Adopt a Resolution of the Planning Commission approving the Coastal Development Permit for the restaurant uses and the Lot Line Adjustment at the Carrington Vigo Street Commercial Development.

Suggested Motion:
"I move the Planning Commission adopt a Resolution of the Planning Commission adopting Findings of Fact, a Mitigation Monitoring and Reporting Program, and a Mitigated Negative Declaration; and

Adopt a Resolution of the Planning approving the Use Permit and Design Review for restaurant uses; and

Adopt a Resolution of the Planning Commission approving the Coastal Development Permit for the restaurant uses and the Lot Line Adjustment at the Carrington Vigo Street Commercial Development."

Attachments:

Attachment 1	Initial Study/Proposed MND
Attachment 2	CEQA Comments and Reponses (includes four attachments)
Attachment 3	Project Plans
Attachment 4	Planning Commission CEQA Resolution w/Mitigation Monitoring and Reporting Program
Attachment 5	Planning Commission Use Permit and Design Review Resolution
Attachment 6	Planning Commission Coastal Development Permit Resolution

City of Eureka
2616 Broadway Redevelopment Project

DRAFT Initial Study/Proposed Mitigated Negative Declaration

October 19, 2018

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Initial Study/Proposed Mitigated Negative Declaration

City of Eureka
2616 Broadway Redevelopment Project

Prepared for:

City of Eureka

Community Development Division

Development Services Department

531 K Street

Eureka, California 95501

Prepared by:

GHD Inc.

718 Third Street

Eureka, California 95501

October 19, 2018

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Figure 3-Conceptual Grading Plan
Figure 4-Conceptual Landscape Plan
Appendix B CalEEMod Analysis
Appendix C Wetland Delineation and Biological Resources Report
Appendix D Historic Building Survey Report
Appendix E Limited Hazardous Materials Assessment Survey Report
Appendix F Geotechnical Survey (2004)
Appendix G Geotechnical Investigation Report (2018)
Appendix H Traffic Impact Study

Acronyms and Abbreviations

AB	Assembly Bill
ADA	Americans with Disabilities Act
APE	Area of Potential Effect
APN	Assessor Parcel Number
BAAQMD	Bay Area Air Quality Management District
BA/EFHA	Biological Assessment/Essential Fish Habitat Assessment
BMPs	Best Management Practices
CalEEMod	California Emissions Estimator Model
CalEMA	California Emergency Management Agency
CalEPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CDP	Coastal Development Permit
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CH_4	Methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO_2	Carbon dioxide
dB	Decibel
dBA	A-Weighted Sound Level
DTSC	Department of Toxic Substances Control
EPA	Environmental Protection Agency
ESHA	Environmentally Sensitive Habitat Area
FEMA	Federal Emergency Management Agency

GHG(s)	Greenhouse Gas(es)
GIS	Geographic Information System
HCAOG	Humboldt County Association of Governments
HWMA	Humboldt Waste Management Authority
ISMND	Initial Study and Mitigated Negative Declaration
Lmax	Maximum Instantaneous Noise Level
LRA	Local Responsibility Area
LUST	Leaking Underground Storage Tank
$MTCO_2e$	Metric tons carbon dioxide equivalent
N_2O	Nitrous oxide
NCRWQCB	North Coast Regional Water Quality Control Board
NCUAQMD	North Coast Unified Air Quality Management District
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
PM_{10}	Particulate matter less than 10 micrometers in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micrometers in diameter
PPV	Peak Particle Velocity
PRC	Public Resources Code
SDC	Seismic Design Category
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1. Project Information

Project Title	2616 Broadway Redevelopment Project
Lead Agency Name & Address	City of Eureka Community Development Division Development Services Department 531 K Street Eureka, California 95501
Contact Person	Kristen M. Goetz, Senior Planner Phone: (707) 441-4166 Email: kgoetz@ci.eureka.ca.gov
Project Applicant	The Carrington Company 707 H Street Eureka, California 95501 Contact: Gabe Hagemann, Managing Director Phone: (707) 444-7717 Email: gabe@thecarro.com
Project Location	Located at the southwest corner of Broadway (Highway 101) and Vigo Street (2616 Broadway) in the City of Eureka, California (see Section 1.3 of this ISMND)
Project Assessor's Parcel Numbers (APN)	007-121-005 and 007-121-007 (APN 007-121-006 [to the southeast] is not proposed for redevelopment)
General Plan Land Use Designation	General Service Commercial (GSC)
Zoning	Service Commercial (CS)
Project Description Summary	The Project would demolish the existing vacant commercial building in order to construct two commercial buildings and site improvements, including parking areas, utilities, low impact development site features, landscaping, and stormwater infrastructure.
Surrounding Land Uses and Setting Summary	The Project site is located within the City of Eureka, Humboldt County. The Project site is bordered by Vigo Street and a stretch of US 101 delineated as Broadway. Surrounding land uses are generally commercial with some residential uses located on top of the bluff across Broadway to the east. The western property boundary is generally adjacent to the Maurer Freshwater Marsh and the Palco Marsh.
Comment Period	October 20 – November 19, 2018 Comments can be submitted: 1. Via e-mail to kgoetz@ci.eureka.ca.gov; or 2. In hard-copy form to the City of Eureka, Development Services Department, 531 K Street, Eureka, CA 95501

1.1 Introduction

The 2616 Broadway Redevelopment Project (Project) would redevelop approximately 3.19 acres of an existing commercial parcel, designated as Assessor's Parcel Numbers (APNs) 007-121-005 and 007-121-007 (Project site), located at 2616 Broadway in the City of Eureka, Humboldt County, California. The Project site consists of a vacant two-story commercial structure (former truck stop) with associated paved and gravel parking areas. The project vicinity is shown on Figure 1 –Vicinity Map (Figure 1, Appendix A).

The Project site is currently owned by The Carrington Company (Carrington, Owner). Carrington is proposing to redevelop the Project site, including the demolition of the existing structure, construction of a drive-through restaurant, construction of a four-tenant commercial retail structure, associated parking areas, low impact development site features, landscaping, utilities, and stormwater infrastructure. The Project site was evaluated in 2004 and 2005 by a former property owner for an unrelated commercial redevelopment project. The previously-proposed redevelopment project was never implemented.

The Project is subject to the environmental review requirements of the California Environmental Quality Act (CEQA). The City of Eureka is the CEQA Lead Agency and has developed this Initial Study/Proposed Mitigated Negative Declaration for the following purposes:

- To identify feasible opportunities to avoid, substantially reduce, or mitigate environmental impacts;
- To disclose the results of the City's analysis of potential environmental impacts from the Project and the supporting information for approving the Project; and
- To inform the CEQA Lead Agency, responsible agencies, trustee agencies, and the public regarding the potential environmental impacts of the Project.

This Initial Study has been prepared to satisfy the requirements of CEQA (Public Resources Code [PRC], Div. 13, Sec 21000-21177) and the CEQA Guidelines (California Code of Regulations, Title 14, Sec 15000-15387). Based on the findings of the draft Initial Study, the City proposes to adopt a Mitigated Negative Declaration of environmental impact for the Project. A Mitigated Negative Declaration is appropriate when significant environmental impacts can be avoided by adopting specified mitigation measures.

The public review period for the Initial Study and proposed Mitigated Negative Declaration (ISMND) is October 20 through November 19, 2018. Comments regarding the correctness, completeness, or adequacy of the ISMND are invited. Comments received by the end of the public review period will be considered before adoption. Comments on the draft ISMND can be submitted via e-mail to kgoetz@ci.eureka.ca.gov, or mailed in hardcopy form to:

City of Eureka
Community Development Division
Development Services Department
531 K Street
Eureka, California 95501

Comments must be received by 5:00 pm on November 19, 2018.

The final ISMND document will be produced in track-changes mode to show the changes made in response to the comments received as necessary. Copies of the comments will be provided in Appendix A of the final document. Adoption of the final ISMND by the City of Eureka is anticipated in December 2018.

1.2 Project Location

The Project is located in the City of Eureka (the City), in Humboldt County, California. The Project site vicinity is shown on Figure 1 (Appendix A). The City of Eureka is on the Pacific Coast, 270 miles north of San Francisco and 95 miles south of the Oregon border.

The project is located on a developed lot in a commercial district of the City. The Project site is designated as APN 007-121-005 and 007-121-007. The Project site street address is 2616 Broadway. Broadway is also designated as US Highway 101. The Project site is situated at the southwest quadrant of the intersection of Broadway (US 101) and Vigo Street.

1.3 Existing Conditions

The Project site consists of a vacant two-story commercial structure (former truck stop) with associated paved and gravel parking areas. The Project site is located within the California Coastal Zone (Coastal Zone). Through the City of Eureka's adopted and certified Local Coastal Program (LCP), the City has primary permitting authority over the Project site, and the City's action is appealable to the California Coastal Commission.

2. Project Description

The 2016 Broadway Redevelopment Project (Project) would demolish the existing commercial building, construct two new commercial buildings, pave a portion of the gravel lot, repave existing paved areas, construct stormwater infrastructure and utility improvements, and install lighting. The project components are described in more detail below.

The impact analysis included in this document is based on the preliminary concept and design shown in Figure 2 located in Appendix A. As the design and engineering phase's progress, small changes and variations in design within the Project boundary are anticipated. The impacts associated with the final design would be comparable or less severe to what is analyzed in this document.

2.1 Project Funding

The project will be privately funded (owner financed).

2.2 Site Preparation

2.2.1 Demolition of the Existing Building

The Project site currently includes an approximately 9,000 square foot wooden two-story commercial building located at the center of the Project site parcel. The structure is vacant, attracting transient trespassers, and is in disrepair. The Project would demolish this building to remove all above-ground evidence of the structure to three-feet below ground surface, as well as the existing concrete and fence. The structure would be demolished using one or more crawler excavator(s) and other appropriate equipment. Open excavations and trenches would be backfilled with clean, compacted fill. The site would then be graded in conformance with the site grading plan. The conceptual grading plan is shown in Figure 3 in Appendix A.

2.2.2 Site Clearing and Grading

The existing gravel lot would be cleared of all vegetation and debris, and graded level prior to paving

2.3 Proposed New Construction

2.3.1 Commercial Buildings

The Project would construct two commercial buildings as shown on Figure 2 (Appendix A). One of the buildings would be located along the northeastern portion of the Project site, close to the Broadway street frontage at the intersection of Vigo Street and Broadway. This building would consist of approximately 3,867 square feet of enclosed space, along with approximately 1,000 square feet of outdoor area that would be utilized for seating and a trash enclosure. A drive-through use would also be constructed around the eastern and northern sides of the building. This building would most likely be used as a fast-food restaurant.

The second building would be an 8,400 square foot structure that would be divided into four different retail spaces, which would then be rented out to appropriate tenants. The two retail spaces on either end of the building would each be 2,500 square feet (Tenant A and Tenant D). A second drive-through may also be constructed for use by Tenant A at the southern portion of the building. The two middle retail spaces would each be 1,700 square feet (Tenant B and Tenant C). A second trash

enclosure would also be included in the southwestern portion of the site. Tenant A and Tenant D would also have 375 square feet and 575 square feet respectively, of outdoor seating. This building would potentially support fast-casual restaurant and/or retail uses.

2.3.2 Site Lighting

Lighting infrastructure will be installed at the exterior of the buildings and throughout the parking area in association with this project. Lighting improvements to the site will comply with City of Eureka and Americans with Disabilities Act requirements.

New luminaires will be mounted on poles approximately 16 feet above the ground. Luminaries will be downcast and fixtures will be equipped with hoods (i.e., luminaries will be shielded) to mitigate potential excess light beyond the Project site. A total of 14 standing lights would be installed within the Project site.

Lighting at the western side of the multi-tenant retail building will be minimized to mitigate light encroachment into the wooded marsh areas to the west. All the outside light fixtures would be cut-off fixtures and would be located, mounted, aimed, and shielded so that direct light is not cast onto adjacent properties or the adjacent vegetated areas.

2.3.3 Parking

The City of Eureka requires off-street parking facilities for new uses and major alterations and enlargements of existing uses. Per Sec. 10-5.1501 et seq. of the City's Municipal Code, the construction of a restaurant requires one off-street parking space for every 200 square feet of gross floor area and development of a retail use requires one space for every 300 square feet of gross floor area. If the most intensive parking ratio is applied to all of the structures on the site, a total of 71 off-street parking spaces would be required. The Project site would include approximately 123 parking spaces, seven ADA spaces and one electric vehicle (EV) space. The planned parking layout would provide more parking than what is required by current City standards.

2.3.4 Access

Access to the site is via both Broadway and Vigo Street. One access point along Broadway would allow for vehicles traveling southbound along Broadway to enter and exit the site from the southeastern side. Two access points would be provided from Vigo Street. The first Vigo Street access would be located immediately west of the northeast building. The second Vigo Street access would be located west of the first Vigo Street access point, providing access to the rear of the westerly multi-tenant building. The project site would have adequate emergency access and circulation per the City of Eureka's Fire Department Standards. The project includes restriping eastbound Vigo Street to include a dedicated left turn lane and a dedicated right turn lane (i.e., left and right out). The Project proposes to maintain full access for vehicles entering and exiting the Project site.

2.3.5 Landscaping

Landscaping would be placed along the perimeter of the site, as well as within the developed parking lot. The Project would result in the installation of 38,062 square feet of landscaped area, consisting of 29.956 square feet of landscaping within the developed area and 8,106 square feet of landscaping within the buffer area (non-irrigated). The landscaping would consist of a variety of plantings including native trees, shrubs, ground cover, and mulch. The landscaping conceptual plan is depicted on Figure 4 (Appendix A).

2.3.6 Utility and Sidewalk Improvements

The Project would include the extension of utilities to the proposed buildings. Additionally, the Project would improve the exiting sidewalks and curbs along the frontage of the site. These improvements may include resurfacing, curb extensions, and landscaping.

2.3.7 Signage

The Project would install three signs along the perimeter of the site. A monument sign would be located on the corner of Broadway and Vigo Street. Another monument sign would be located further west on Vigo Street, at the edge of the landscaped median bordering the street and on the west side of the first access point along Vigo Street. The third sign would be a freestanding sign and be located along the frontage of the property. The monument signs would be constructed out of cement and all signs would be sized in conformance with applicable code requirements.

2.4 Construction

2.4.1 Proposed Construction Schedule

Building demolition is anticipated to begin in January 2019 and would likely be completed by February 2019. Site redevelopment and construction work is anticipated to begin in July 2019 and is expected to be complete by December 2019. If project work commences after May 2019, project completion may be delayed until May 2020 (contingency completion date).

Construction of the Project is expected to begin in summer and require approximately six months to complete (123 working days). Site preparation would occur during the non-bird nesting season, between August 15th and March 31st. Anticipated daytime work hours are 7:00 a.m. to 7:00 p.m., Monday through Friday, with occasional work on Saturdays as necessitated. Construction on Sunday or legal holidays is not currently anticipated except for emergencies or with prior approval from the City of Eureka.

2.4.2 Construction Staging, Activities, and Equipment

Construction staging areas would occur within a portion of the Project site boundary, within paved or graveled areas. Construction would primarily include demolition of the existing building, excavation and grading, paving, construction of the new buildings, utility extensions, stormwater improvements, landscaping, and parking lot striping. All construction activities would be accompanied by both temporary and permanent erosion and sediment control best management practices (BMPs).

Equipment required for site preparation and construction would include: tracked excavators, backhoes, graders, bulldozers, dump trucks, rollers, paving machines, cranes, water trucks, drill rigs, pile drivers and pick-up trucks.

Construction access to and from the Project site would include Broadway (US 101) and Vigo Street. It is anticipated that temporary utility extensions, such as electric power or water, would be required for construction. Electric power would be provided to the Project site during construction via a temporary electric panel installed in coordination with Pacific Gas & Electric Company. To supply water for construction purposes, the contractor would install a city water meter at an existing appropriate water source, likely an adjacent fire hydrant. Drinking water would be supplied to the Project site during construction in containers from appropriate vendors.

The Project site would be fenced on all sides during construction. The contractor will establish temporary lighting onsite to be used, as needed, for construction purposes and/or security.

Lighting, if needed, will be designed and shielded to direct illumination downward onto the site, away from the ESHA area on the west side of the property, and will avoid glare and spillage to adjacent properties. Lighting will consist of minimal wattage necessary to provide safety and security at the Project site.

Onsite security presence during non-working hours may be instituted on an as needed basis, depending on site conditions and the status of the job.

2.4.3 Construction Access and Hauling Traffic

The anticipated haul truck routes to the Project area include US 101 from the north and south. The number of construction-related vehicles traveling to and from the Project area would vary on a daily basis. It is anticipated that up to 50 haul truck round trips would occur on a peak day. In addition, it is anticipated that construction crew trips would require up to eight round trips per day. Therefore, for the purposes of analysis, on any one day during construction, up to 58 vehicle round trips could occur.

2.4.4 Construction Recycling

The Project contractor would be required to develop and implement a waste reduction and recycling plan that would include measures to divert construction waste from landfills by using recycling, reuse, salvage, and other diversion programs. Materials that could not be reused or composted at local facilities would be disposed of at regional landfills.

2.5 Operations and Maintenance

The property owner and retail tenants would be responsible for general maintenance of the site, structures and associated infrastructure. Maintenance actives would generally be performed by the property owner and/or tenants on an as needed basis, as warranted by the site conditions.

2.5.1 Setbacks

The City of Eureka's adopted Local Coastal Program (LCP) requires that Environmentally Sensitive Habitat Areas (ESHA), including wetlands, be protected from development through implementing buffer areas. A buffer area provides essential open space between the proposed development and adjacent ESHA. The City LCP states that a minimum buffer width of 100 feet be maintained, unless other site specific information states that a smaller buffer will protect the ESHA.

A buffer area, enhanced with native plantings, is proposed in association with the Project. The proposed buffer will provide appropriate setback and protection for the adjacent ESHA, as defined in the Wetland Delineation and Biological Survey Report produced for the Project (GHD 2018) (Appendix C). The Project plans to offset development from delineated onsite wetlands by equal to, or greater than 50 feet and will include improvement of the wetland buffer area by planting the buffer with native vegetation which will enhance the buffer. All other setbacks would be consistent with the zoning designation of the parcels.

2.5.2 Site Drainage

The project proposes installation of new structures and stormwater management site features. The project includes Low Impact Development (LID), including LID design features, raingardens and stormwater management infrastructure that will improve the existing drainage pattern of the Project site.

2.6 Environmental Protection Actions Incorporated into the Project

The following actions are included as part of the Project to reduce or avoid potential adverse effects that could result from construction or operation of the Project. Additional mitigation measures are presented in the following analysis sections in Chapter 3, Environmental Analysis. Environmental protection actions and mitigation measures, together, will be included in a Mitigation Monitoring Program at the time that the Project is considered for approval.

2.6.1 Environmental Protection Action 1 – Air Quality Construction Control Measures

The following air quality emission construction measures would be included in the construction specifications for the Project:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas and unpaved access roads) shall be watered as necessary during dusty conditions.
2. All haul trucks transporting soil, sand, or other loose material on- or off-site shall be covered or should maintain at least two feet of freeboard.
3. During construction, the contractor will designate an area of the Project site for equipment and vehicle cleaning in proximity to the temporary water source. The contractor will establish a temporary drive-off road consisting of cobbles, which will mitigate bulk soil and mud accumulation on adjacent roads. Visible mud or dirt tracked-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping shall be prohibited.
4. All vehicle speeds on unpaved areas shall be limited to 15 miles per hour.
5. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
6. All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
7. A publicly visible sign shall be posted with the telephone number and person to contact at the City regarding dust complaints. This person shall respond and take corrective action within 48 hours. The North Coast Unified Air Quality Management District phone number shall also be visible to ensure compliance with applicable regulations.

2.6.2 Environmental Protection Action 2 – Implement Geotechnical Design Recommendations

As part of the Project design process, the property owner would engage a California-registered Geotechnical Engineer to conduct a design-level geotechnical study for the Project. The property owner will design the Project to comply with the site-specific recommendations made in the Project's geotechnical report. This will include design in accordance with the seismic and foundation design criteria, as well as site preparation and grading recommendations included in the report. The geotechnical recommendations will be incorporated into the final plans and specifications for the Project, and will be implemented during construction.

2.6.3 Environmental Protection Action 3 - Construction Materials Storage and Equipment Staging

Contractor equipment associated with the Project construction would be staged, when not in use, at a designated location (staging/lay-down area) at the Project site. Best management practices would be implemented in association with the staging/lay-down area to mitigate the potential for sediment delivery to adjacent areas and stormwater inlets. The following BMPs will be implemented by the contractor in association with the Project:

1. Minimize erosion and prevent the transport of sediment to sensitive areas.
2. Minimize disturbance of existing vegetation to that necessary to complete the work.
3. Activities such a vehicle washing are to be carried out at an off-site facility wherein the water is discharged into a sanitary sewer.
4. The contractor shall make adequate preparations, including training and equipment, to contain spills of oil or other hazardous materials.
5. The contractor shall provide covered waste receptacles for common solid wastes at convenient locations on the job site and provide regular collection of wastes.
6. The contractor shall provide sanitary facilities of sufficient number and size to accommodate construction crews and ensure adequate anchorage of such facilities to prevent them from being overturned.
7. All hazardous material containers will be placed in secondary containment(s) when not in use.
8. Vehicle maintenance will be performed off-site whenever practical.
9. Vehicle refueling will be performed on land at least 50 feet away from bay, drainage channels and/or stormwater systems, whenever practicable. Refueling shall be performed with adequate spill-mitigation and containment protocols to protect the marine environment.
10. Contractor must ensure that the construction site is prepared prior to the onset of any storm.
11. These BMPs may not cover all the situations that arise during construction due to unanticipated field conditions. Variations may be needed to BMPs in the field subject to the approval, or at the direction of the property owner.
12. It will be the responsibility of the contractor to fix any deficiencies indicated by the property owner or regulatory agencies to prevent erosion and/or control sediment.

2.7 Required Permits and/or Approvals

It is anticipated that the following environmental permits and documentation will be filed with the appropriate regulatory agencies in association with the Project:

- City of Eureka:
  - Coastal Development Permit
  - Conditional Use Permit
  - Building Permit
  - Grading Permit
  - Encroachment Permit

    - Demolition Permit
- North Coast Unified Air Quality Management District – National Emissions Standard for Hazardous Air Pollutants demolition notification

2.8 Technical Studies

The following technical studies have been completed, are currently under preparation and will be completed in the near future, for this Project, or were previously completed for an earlier proposed project on the same site.

- Wetland Delineation and Biological Resources Report (GHD, April 2018)
- Limited Hazardous Materials Assessment Survey Report (GHD, April 2018)
- Geotechnical Investigation (GHD, August 2018)
- Site-Specific Geotechnical Report (Bush Geotechnical Consultants, October 2004)
- Preliminary Design, Landscaping, Utility, and Grading Plans (GHD, September 2018)
- Historic Building Survey Report (Creative Home Construction, August 2018)
- Transportation Impact Study – Under Preparation (GHD, October 2018 [Draft])

3. Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☒ Hazards & Hazardous Materials	☐ Recreation
☐ Agricultural & Forestry Resources	☐ Hydrology/Water Quality	☒ Transportation/Traffic
☐ Air Quality	☐ Land Use/Planning	☐ Tribal Cultural Resources
☒ Biological Resources	☐ Mineral Resources	☐ Utilities/Service Systems
☒ Cultural Resources	☐ Noise	☒ Mandatory Findings of Significance
☐ Geology/Soils	☐ Population/Housing	
☐ Greenhouse Gas Emissions	☐ Public Services	

DETERMINATION

(To be completed by the Lead Agency) On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there would not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect: (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect: (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

_____ _____

Kristen M. Goetz, Senior Planner Date
City of Eureka

4. Environmental Analysis

The CEQA Guidelines Appendix G have been used to analyze potential project impacts throughout this ISMND. Significance thresholds have also been included where applicable to fine-tune the analysis to specific local regulations. Significance thresholds are not included for resource categories found to have no impact.

4.1 Aesthetics

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?			✓	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?			✓	
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			✓	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			✓	

a) Have a substantial adverse effect on a scenic vista? (Less than Significant)

The City has designated view corridors as views of the waterfront, inner harbor, and landmark buildings from public streets and other public spaces (City of Eureka 1999). Additionally, the Project site is located within the Coastal Zone and adjacent to the Maurer-Palco Marsh. The Maurer-Palco Marsh is designated as an ESHA and therefore is worthy of protection. However, because the Project site and the adjacent properties are already developed, the demolition, redevelopment, construction activities and operation of the proposed Project would not impede any views that are not already affected by the existing development. Therefore, the Project would not have a substantial effect on a scenic vista. The Project would result in a less than significant impact.

b) Substantially damage scenic resources within a state scenic highway? (Less than Significant)

Based on California Scenic Highway Mapping System, no officially designated state scenic highways are adjacent to or within view of the Project (Caltrans 2011). However, the entire length of US 101 in Humboldt County has been identified by the State Scenic Highway Mapping System as eligible for

state listing. The project is visible from US 101, or as delineated on local maps as Broadway; but, due to the fact that US 101 is not an officially designated state scenic highway and the Project would be redeveloping the site with uses similar to what currently exists, the Project would not substantially damage scenic resources within a state scenic highway. A less than significant impact would occur.

c) Have an adverse effect on visual character or quality? (Less than Significant)

The Project is located within a commercial area in the City of Eureka. The Project site currently exists as commercial uses and would be replaced with commercial uses. During the construction phase, the Project has the potential to impact the existing visual character, due to the presence of construction equipment and proposed construction activities. This impact would be short-term lasting less than one year (approximately six months) and would not permanently impact the visual quality of the area. Once constructed, the commercial buildings would be consistent with the aesthetic quality of the area. No displeasing components are planned for implementation that would result in an adverse impact to the visual quality of the area. The Project would have a less than significant impact regarding impacts to visual character or quality.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? (Less than Significant)

The Project would install lighting on the building facades, along the proposed drive through, and within the parking lot. While this would be a new source of nighttime lighting, the lights, as described in Section 2.0 Project Description, would be cut-off fixtures that are downcast. Within the vicinity of the Project site there are street lights and the constant traffic along Broadway. With the light and glare from the existing outdoor lighting and vehicle headlights, it is not anticipated that installation of lighting on the proposed commercial properties would substantially affect day or nighttime views in the area. Adherence to the lighting design features described in the Project description would ensure that impacts resulting from project-related light sources remain less than significant.

4.2 Agriculture and Forest Resources

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				✓
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				✓
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				✓
d) Result in the loss of forest land or conversion of forest land to non-forest use?				✓
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				✓

a, b, c, d, e) Convert farmland or forest land or conflict with existing zoning for agricultural use or a Williamson Act contract? (No Impact)

According to the California Department of Conservation (CDOC) Important Farmland Mapping Program, the Project site is not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (CDOC 2016). There is no land in agricultural production, land zoned for agricultural use, land designated for agriculture use (General Plan Land Use), or land under Williamson Act contract within the Project site (CDOC 2016). Additionally, the Project would not encroach upon or affect timber harvesting. No rezoning or conversion of forest land, timberland, or land zoned Timberland Production would result. No impact would occur to this resource category as a result of the Project.

4.3 Air Quality

	Potentially Significant Impact	Less-Than-Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?				✓
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			✓	
c) Result in a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			✓	
d) Expose sensitive receptors to substantial pollutant concentrations?			✓	
e) Create objectionable odors affecting a substantial number of people?			✓	

a) Conflict with or obstruct implementation of the applicable air quality plan? (No Impact)

This impact relates to consistency with an adopted attainment plan. The North Coast Unified Air Quality Management District (NCUAQMD) is responsible for monitoring and enforcing local, state, and federal air quality standards. The U.S. Environmental Protection Agency (EPA) sets the National Ambient Air Quality Standards for the following six 'criteria' air pollutants: ozone, particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide, carbon monoxide, lead, and sulfur dioxide. The California Air Resources Board (CARB) administers the California Ambient Air Quality Standards, which include the six criteria pollutants listed above as well as visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

Humboldt County is designated 'attainment' for all National Ambient Air Quality Standards. With regard to the California Ambient Air Quality Standards, Humboldt County is designated attainment for all pollutants except PM_{10}. Humboldt County is designated as "non-attainment" for the state's PM_{10} standard.

PM_{10} refers to inhalable particulate matter with an aerodynamic diameter of less than 10 microns. PM_{10} includes emission of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM_{10} emissions include unpaved road dust, smoke from wood stoves, construction dust, open burning of vegetation, and airborne salts and other particulate matter naturally generated by ocean surf. Therefore, any use or activity that generates airborne particulate matter may be of concern to the NCUAQMD. The proposed project would create PM_{10} emissions in part through vehicles coming and going to the Project site and the construction activity associated with the Project.

To address non-attainment for PM_{10}, the NCUAQMD adopted a Particulate Matter Attainment Plan in 1995. This plan presents available information about the nature and causes of PM_{10} standard exceedances and identifies cost-effective control measures to reduce PM_{10} emissions to levels necessary to meet California Ambient Air Quality Standards. However, the NCUAQMD states that the plan, "should be used cautiously as it is not a document that is required in order for the District to come into attainment for the state standard." (NCUAQMD 2018) Therefore, compliance with applicable NCUAQMD PM_{10} rules is applied as the threshold of significance for the purposes of analysis. NCUAQMD Rule 104 Section D, Fugitive Dust Emissions, is applicable to the Project.

Pursuant to Rule 104 Section D, the handling, transporting, or open storage of materials in such a manner, which allows or may allow unnecessary amounts of particulate matter to become airborne, shall not be permitted. Reasonable precautions shall be taken to prevent particulate matter from becoming airborne, including, but not limited to: 1) covering open bodied trucks when used for transporting materials likely to give rise to airborne dust; and 2) the use of water during the grading of roads or the clearing of land. The Project enhances compliance with Rule 104 as noted in Section 2.6.1 under air quality construction control measures by incorporating additional qualitative control measures recommended by other air districts, including the Bay Area Air Quality Management District (BAAQMD). Therefore, the Project complies with applicable rules, and would not conflict with or obstruct implementation of the applicable air quality plan with regard to construction and operation.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? (Less than Significant)

This impact is related to localized criteria pollutant impacts. Potential localized impacts would be exceedances of State or federal standards for PM_{10}. Localized PM_{10} is of concern during construction because of the potential to emit fugitive dust during earth-disturbing activities.

Construction activities would include demolition, excavation, asphalt paving, building construction, and sidewalk construction along the edges of the Project site. Generally, the most substantial air pollutant emissions would be dust (PM_{10} and $PM_{2.5}$) generated from demolition, grading, and excavation. If uncontrolled, these emissions could lead to both health and nuisance impacts. Construction activities would also temporarily create emissions of equipment exhaust and other air contaminants. The potential impacts from equipment exhaust are assessed separately in Section 4.3 c), below.

The NCUAQMD does not have formally adopted thresholds of significance for fugitive, dust-related particulate matter emissions. However, multiple air districts have determined that application of common dust control measures reduces a project's potential to generate a construction-period fugitive dust impact to less than significant. For the purposes of analysis, this document uses the following qualitative approach to determining significance for fugitive dust emissions from project construction. If all appropriate fugitive dust control measures commonly recommended are implemented, then fugitive dust emissions during construction are not considered significant.

The measures commonly identified to control construction-generated dust are incorporated into the Project. These controls are consistent with NCUAQMD Rule 104 Section D, Fugitive Dust Emission and provide supplemental, additional control of fugitive dust emissions beyond that which would occur with Rule 104 Section D compliance alone. Therefore, the Project would result in a less than significant impact for construction-period PM_{10} generation, and would not violate or substantially contribute to an existing or projected air quality violation.

Following construction, the Project would not include any stationary sources of air emissions. Localized high levels of CO, referred to as CO hotspots, are associated with traffic congestion and idling or slow-moving vehicles. The NCUAQMD does not have formally adopted guidance for assessing a project's potential to substantially contribute to an existing or projected CO hotspot. For the purposes of analysis, this document uses the BAAQMD approach to asses CO impacts from project operations. The BAAQMD recommends a screening analysis to determine if a project has the potential to contribute to a CO hotspot, which the BAAQMD identifies as increasing traffic volumes at nearby intersections to more than 44,000 vehicles per hour, or more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., in a tunnel or parking garage). Comparatively, traffic volumes identified in the Project's September 2018 Traffic Impact Study indicate that the busiest project-affected intersection (Broadway and W. Henderson Street) is projected to have 4,605 vehicles during the PM peak hour period in the Year 2038 Plus Project scenario. The intersection volume of the busiest project-affected intersection under the cumulative growth scenario is substantially lower than the BAAQMD's screening criteria. Therefore, the Project would not generate traffic levels that would create or substantially contribute to a CO hotspot. The impact related to CO from traffic congestion would be less than significant. Therefore, project-generated operational emissions would not violate or contribute substantially to an existing or projected air quality violation. The project's impact would be less than significant.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment? (Less than Significant)

This impact is related to regional criteria pollutant impacts. As identified in Section 4.3 a), above, Humboldt County is designated nonattainment of the State's PM_{10} standard. The County is designated attainment for all other state and federal standards.

For construction emissions, the NCUAQMD has indicated that emissions are not considered regionally significant for projects whose construction would be of relatively short duration, lasting less than one year. For project construction lasting more than one year or that involves above average construction intensity in volume of equipment or area disturbed, construction emissions may be compared to the stationary source thresholds. The project's construction is anticipated to require approximately 6 months to complete. Therefore, the Project's construction duration does not exceed the NCUAQMD's unofficial screening guidance of one year. However, emissions modeling was conducted for project construction, as detailed below.

The NCUAQMD does not have established CEQA significance criteria to determine the significance of impacts that would result from projects such as the proposed project; however, the NCUAQMD does have criteria pollutant significance thresholds for new or modified stationary source projects proposed within the NCUAQMD's jurisdiction. NCUAQMD has indicated that it is appropriate for lead agencies to compare proposed construction emissions that last more than one year to its stationary source significance thresholds, which are:

- Nitrogen oxides – 40 tons per year
- Reactive organic gases – 40 tons per year

- PM10 – 15 tons per year
- Carbon monoxide – 100 tons per year.

If an individual project's emission of a particular criteria pollutant is within the thresholds outlined above, the Project's effects concerning that pollutant are considered to be less than significant.

The California Emissions Estimator Model (CalEEMod) version 2016.3.2 was used to estimate air pollutant emissions from project construction (Appendix B). Project construction is anticipated to begin in early 2019 with construction complete in less than one year. CalEEMod default construction equipment activity was used to estimate construction-generated emissions.

NCUAQMD Rule 104 Section D requires reasonable precautions to prevent particulate matter from becoming airborne. Environmental Protection Action 1 includes enhanced compliance with the Rule 104 Section D requirement, as well as incorporation of BAAQMD's Basic Construction Measures. These measures are accounted for in CalEEMod as "mitigation" because the model categorizes the measures as "mitigation," even though they are technically not mitigation. The emissions modeling included watering the construction site two times per day and limiting vehicle speeds on unpaved areas to 15 miles per hour or less.

Table 4.3-1 summarizes construction-related emissions (without mitigation or environmental protection actions). As shown in the table, the Project's construction emissions would not exceed the NCUAQMD's stationary sources emission thresholds. Therefore, the Project's construction emissions are considered to have a less than significant impact.

Table 4.3-1 Construction Regional Pollutant Emissions

Parameter	Emissions (tons per year)			
	ROG	NO_X	CO	PM_{10}
Project Construction 2019	0.20	0.64	0.49	0.04
NCUAQMD Stationary Source Thresholds	40	40	100	15
Significant Impact?	No	No	No	No

Operational emissions were estimated using CalEEMod, the land use types and amounts identified in Section 2.0, and the trip generation rates identified by the Project's traffic engineer. The operational land uses and trip generation rates are shown below in Table 4.3-2. As stated in the Project description, the Project would remove an existing land use. As such, the net increase in trip generation resulting from the Project was used to calculate operational emissions. Annual operational emissions estimates are shown in Table 4.3-3. As shown in the table, the Project's operational emissions would not exceed the NCUAQMD's stationary sources emission thresholds. Therefore, the Project's operational emissions are considered to have a less than significant impact.

Table 4.3-2 Net Trip Generation

Land Use	Size (ksf)	Daily		CalEEMod Input	
		Trip Generation Rate	Total Trips	Trip Generation Rate	Total Trips
Restaurant with Drive Thru	6.27	470.95	2,951	108.34	678.94

Restaurant without Drive Thru	6.00	346.23	2,077	79.65	477.88
Existing Truck Stop (to be removed)	-8.50	455.53	-3,872	0.00	0.00
Net Increase	**-**	**-**	**1,157**	**-**	**1,157**

Notes:
- Ksf = thousands of square feet
- - = Not applicable

Table 4.3-3 Operational Regional Pollutant Emissions

Emissions Source	Emissions (tons per year)			
	ROG	NO_X	CO	PM_{10}
Area	0.06	0.00	0.00	0.00
Energy	0.01	0.07	0.06	0.01
Mobile	0.55	2.41	4.96	0.53
Total Project Operations	0.62	2.48	5.02	0.53
NCUAQMD Stationary Source Thresholds	40	40	100	15
Significant Impact?	No	No	No	No

d) Expose sensitive receptors to substantial pollutant concentrations? (Less than Significant)

Activities occurring near sensitive receptors should receive a higher level of preventative planning. Sensitive receptors include school-aged children (schools, daycare, playgrounds), the elderly (retirement community, nursing homes), the infirm (medical facilities/offices), and those who exercise outdoors regularly (public and private exercise facilities, parks). There are no schools in close proximity to the Project site. The closest residences are approximately 150 feet or more from the Project site and located approximately 50 feet above (elevation) the Project site.

The BAAQMD's Basic Construction Measures included in the Project description minimize idling times for trucks and equipment to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]), and ensures construction equipment is maintained in accordance with manufacturer's specifications.

Furthermore, project construction would be temporary, lasting less than one year. Therefore, Project construction activities are not expected to occur for a substantial amount of time. Due to the relatively short length of the construction period, the distance from the majority of construction activities, and the implementation of fugitive dust control measures, the Project would not result in the exposure of sensitive receptors to substantial pollutant concentrations. Therefore, the construction-related impact would be less than significant.

Following construction, the Project is not anticipated to emit a substantial amount of air emissions or new mobile source emissions that would result in substantial long-term operational emissions of

criteria air pollutants. Therefore, Project operation would not expose nearby sensitive receptors to substantial levels of pollutants. The operation-related impact would be less than significant.

e) Create objectionable odors affecting a substantial number of people? (Less than Significant)

The Project would not create odors that could reasonably be considered objectionable by the general public because no aspect of project construction is anticipated to create objectionable odors except for limited exhaust fumes from gas powered equipment. Following construction, implementation of the Project would not result in any major sources of odor. The impact would be less than significant.

4.4 Biological Resources

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		✓		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?			✓	
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			✓	
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				✓
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				✓
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				✓

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? (Less than Significant with Mitigation)

An evaluation of the existing biological setting on and near the Project site was conducted to determine the potential for any special-status vegetation communities, plants, or animal species to occur. A Wetland Delineation and Biological Resources Report was prepared for the Project (GHD 2018a) (Appendix C). Information on special-status plant species was compiled through a review of the literature and database searches. The following sources were reviewed to determine which special-status natural communities, plant and wildlife species have been documented in the vicinity of the Project alignment:

- California Natural Diversity Database records (CNDDB)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants
- Lists of special-status species and natural communities that may occur in the Project area as provided by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW)

In April 2018 a wetland delineation and wildlife survey was completed on the Project site. The results of both were combined into one report included as Appendix C.

Special-status Plants

The Project site is generally developed with a portion of the site being a gravel lot. The available habitat for special-status plant species occurring at the site is located within the boundary of the mapped Palustrine Forested wetland along the western border of the site. As construction activities are not planned within the wetland no effect on special-status plant species is anticipated to result from Project implementation. Given the disturbed, treeless, and partially paved Project site, there is no potential for special-status plant species to occur and none were identified during the site visits. No impact to federally endangered or threatened plant species would occur.

Special-status Wildlife Species

A total of 27 avian species were observed in or flying over the Project site. An active Black-capped Chickadee (A CDFW watch list species) nest (Cavity) was also detected during the site visit. Habitat in the Project area is fair to good quality for nesting birds along the western side of the site, particularly in the case of cavity nesting species. No other wildlife were detected during the survey with the exception of several treefrogs, which have no special regulatory status. The Migratory Bird Treaty Act makes it unlawful to “take” (kill, harm, harass, shoot, etc.) any migratory bird listed in 50CFR10, including nests, eggs, and young. If birds were to nest in or near the Project area during construction activities, the impact would be significant.

Furthermore, according to historical records consulted in the literature search, the Project area could be used for foraging and roosting for Long-eared Myotis (*Myotis Evotis*), Great Egret (*Ardea alba*), Great Blue Heron (*Ardea Herodias*), Snowy Egret (*Egretta thula*), and Black-crowned Night Heron (*Nycticorax nycticorax*), and Northern Red-legged Frog (*Rana aurora*). These species are discussed in more detail below:

***Long-eared Myotis* (*Myotis Evotis*)**

This species forms small nursery colonies in buildings, crevices, snags, and behind bark. Most young are born from May through July, with juveniles capable of independent flight by early August. They could potentially use the Project area, particularly the abandoned building on the Project site, which is not secured against birds and small mammals for roosting. If bats were to roost in or near the

Project area during construction activities, the impact would be significant. Implementation of Mitigation Measure BIO-1 would reduce the impact to less than significant.

Mitigation Measure BIO-1: Prevent Disturbance of Roosting Bats

Prior to construction, the Applicant shall have a Bat Habitat Assessment conducted prior to Project implementation. The Habitat Assessment shall be completed by a qualified biologist (e.g., a biologist holding a California Department of Fish and Wildlife collection permit and a Memorandum of Understanding with the CDFW allowing the biologist to handle and collect bats). The Habitat Assessment shall evaluate the existing building for suitable entry points and roost features, and shall provide focused daytime surveys for day-roosting bats. If a special-status bat species is found, or if suspected day roosts for special-status bats are identified, then the Habitat Assessment shall identify suitable performance measures for avoiding impacts to roosts, which may include, but would not be limited to:

- Consultation with the CDFW to determine appropriate measures for protecting bats with young if present, and for implementing measures to exclude non-breeding bat colonies during the building demolition process.

If no bats are present during the day, the structure planned for removal may be partially blocked with appropriate mesh or netting to prevent subsequent occupation. If bats are present during the day, additional exclusion and eviction efforts would be required based on specific recommendations of a qualified bat biologist in consultation with the CDFW.

***Great Egret* (*Ardea alba*)**

Great Egrets are year-round residents in western California, with breeders concentrated in the Klamath and Warner basin in Siskiyou and Modoc Counties, along the coast in Humboldt County, the San Francisco Bay area, Monterey County, the Salton Sea, and the Central Valley. In terms of habitat, they favor wetlands, estuaries, lakes, rivers, ponds, swamps, streams, marshes, and tidal flats. Great Egrets utilize a variety of substrates for nesting including trees, woody vegetation, artificial nest platforms, or ground on islands, or directly adjacent to water. Nest platforms are typically constructed of locally available sticks and greenery. Great Egrets nest communally with conspecifics or in mixed-species colonies. They are opportunistic foragers, wading in shallow water to feed on fish, amphibians, and invertebrates. They also hunt on shore for reptiles, birds, and small mammals. Based on available data, the presence of any established colonies at the site is unlikely. However, the species has a moderate potential to be present and forage within the Project area. If this species were to occur within the vicinity of the Project site during construction, a significant impact could occur. Implementation of Mitigation Measure BIO-2 would ensure that impacts to special-status birds are less than significant.

Mitigation Measure BIO-2: Protect Nesting Birds

- If construction occurs outside the bird nesting season (March 15 to August 15), no further mitigation is necessary. If construction occurs between March 15 and August 15, the client shall have a qualified wildlife biologist conduct preconstruction surveys within the vicinity of the impact area, to check for nesting activity of native birds and to evaluate the site for special-status bird species. The biologist shall conduct a minimum of one pre-construction survey within the seven-day period prior to construction activities. If construction work lapses for seven days or longer during the nesting season, a qualified biologist shall conduct a supplemental avian survey before project work is reinitiated.

- If an active nest is found, the biologist will determine the extent of an appropriate construction-free buffer zone to be established around the nest and/or operational restrictions in consultation with the California Department of Fish and Wildlife (CDFW). Buffer zones will be delineated with flagging and maintained until the nests have fledged or nesting activity has ceased. Buffer sizes would take into account factors such as (1) highway and other ambient noise levels, (2) distance from the nest to the highway and distance from the nest to the active construction area, (3) noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity; (4) distance and amount of vegetation or other screening between the construction site and the nest; and (5) sensitivity of individual nesting species and behaviors of the nesting birds. Buffers will be established based on the factors above and in consultation with the CDFW.

Great Blue Heron (Ardea Herodias)

Great Blue Herons are year-round residents in the majority of coastal and central California. Notable exceptions include the Sierras and the very southeastern desert regions of the state. Great Blue Herons are extremely adaptable to a variety of habitats including most saltwater and freshwater bodies, agricultural land, swamps, and wetlands, as well as near commercial and residential areas such as golf courses. Nesting habitat includes trees, bushes, artificial structures, or the ground adjacent to a water body. Nest platforms are typically constructed out of locally available sticks and lined with material such as grass, moss, and reeds. Great Blue Herons are colonial nesters. They are opportunistic foragers, wading in shallow water to feed on fish, amphibians, and invertebrates. They also hunt on shore for reptiles, birds, and small mammals. Additionally, they are known to scavenge carrion. The parcel does contain potential foraging habitat for Great Blue Herons. Based on available data, the presence of any established colonies at the site is unlikely. However, based on historical records and available habitat, the species has a moderate potential to be present and forage within the Project area. If this species were to occur within the vicinity of the Project site during construction, a significant impact could occur. Implementation of Mitigation Measure BIO-2 would ensure that impacts to special-status birds are less than significant.

Snowy Egret (Egretta thula)

Snowy Egrets were hunted to the brink of extinction by the plume trade at the end of the 19th and beginning of the 20th century. However, many populations rebounded after the Migratory Bird Treaty Act was passed in 1918. Year-round populations of Snowy Egrets are found around Humboldt Bay, the San Francisco Bay area, the Central Valley, and the Salton Sea. Wintering populations are also present along much of the rest of the California coast. Snowy Egrets prefer Broad-leaved Deciduous and estuarine areas, marshes, wet meadows, inland lakes, and river courses. Snowy Egrets construct stick nest platforms in a variety of tree and shrub species including: willows, holly, birch, and wax myrtle. Nests are lined with reeds, grasses, and moss. Snowy Egrets are colonial nesters, with colonies comprised of both conspecifics and allospecifics. Snowy Egrets hunt in shallow water and on shore, frequently making use of their distinctly yellow feet to attract and capture prey items. Prey includes fish, amphibians, snakes, lizards, crustaceans, insects, and worms. The parcel does contain potential foraging habitat for Snowy Egrets. Based on available data, the presence of any established colonies at the site is unlikely. However, based on historical records and available habitat, the species has a moderate potential to be present and forage within the Project area. If this species were to occur within the vicinity of the Project site during construction, a significant impact could

occur. Implementation of Mitigation Measure BIO-2 would ensure that impacts to special-status birds are less than significant.

Black-crowned Night Heron (Nycticorax nycticorax)

Black-crowned Night Herons are year-round residents in much of California, with notable exceptions in the Sierras, Central Valley, and the arid southeast portion of the state. These herons can be found in a wide variety of habitats adjacent to water bodies including urban, wetland, partially forested, and agricultural landscapes. Black-crowned Night Herons are colonial nesters, building platform stick nests in trees, reeds, cattails, bushes, or on the ground. As opportunistic feeders, Black-crowned Night Herons eat fish, insects, mammals, birds, carrion, trash, clams, crayfish, turtles, and many other food items. Based on available data, the presence of any established colonies at the site is unlikely. However, based on historical records and available habitat, the species has a moderate potential to be present and forage within the Project area. If this species were to occur within the vicinity of the Project site during construction, a significant impact could occur. Implementation of Mitigation Measure BIO-2 would ensure that impacts to special-status birds are less than significant.

Northern Red-legged Frog (Rana aurora)

Northern Red-legged Frogs occur along the west coast of North America from British Columbia to California. Northern Red-legged Frogs are typically found near water sources; however, they can range widely and inhabit damp places far from water. Northern Red-legged Frogs reproduce in water from January to February in Humboldt County, with some breeding occurring as late as March. Preferred egg laying locations are in “vegetated shallows with little water flow in permanent wetlands and temporary pools”. Northern Red-legged frogs are relatively common in and near-coastal portions of Humboldt County and historical records have documented the species near the Project area. This being the case, Northern Red-legged Frogs have a moderate chance of occurring at the Project site. If construction activities would negatively affect Northern Red-legged frogs the impact could be significant. Implementation of the following mitigation measure would ensure that impacts to Northern Red-Legged Frogs would be less than significant.

Mitigation Measure BIO-3: Protect Northern Red-Legged Frog

- No more than one week prior to commencement of ground disturbance within 50 feet of suitable northern red-legged frog habitat, a qualified wildlife biologist shall perform a preconstruction survey for the northern red-legged frog and shall relocate any specimens that occur within the work -impact zone to nearby suitable habitat.
- In the event that a northern-red legged frog is observed in an active construction zone, the contractor shall halt construction activities in the area where observed and the frog(s) shall be moved to a safe location in similar habitat outside of the construction zone.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? (No Impact)

Riparian areas are those vegetated areas adjacent to rivers, streams and lakes with specific overstory and/or understory plant species that meet the definition of riparian by the CDFW. The entire Project site is within the Coastal Zone, which is subject to the California Coastal Act of 1976. Section 30107.5 of the Coastal Act defines an ESHA as any area in which plant or animal life or their habitats are

either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

The western boundary of the Project site is located adjacent to an ESHA, the Maurer-Palco Marsh, however the Project would implement erosion and sediment control best management practices (BMPs), as described in the Project Description. The Project would disturb over one acre of land, and therefore, be required to implement a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP would ensure that no sediment or pollutants enter the ESHA as a result of the construction activities. Additionally, the Project would implement a 50 foot buffer between the proposed development and the ESHA, ensuring that implementation of the Project would avoid all riparian and sensitive natural communities. No impact would occur.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? (Less than Significant)

A wetlands delineation was prepared for the Project (GHD 2018a). The Project area is entirely within the Coastal Zone; therefore, the extent of wetland-type vegetation (based on one parameter) was mapped in accordance with the California Coastal Commission as well as the extent of wetlands having wetland-type vegetation, hydric soils, and wetland hydrology (based on three-parameters) per the U.S. Army Corps of Engineers (USACE). The wetland delineation effort began with reviewing available wetland mapping within the Project area. This included reviewing existing wetland information from the USFWS National Wetlands Inventory online mapper.

Field mapping was completed with a Trimble global positioning system (GPS) receiver connecting to a Trimble GPSb unit running ArcPad geographic information system (GIS) software that was used by the team to map areas of 1-parameter and 3-parameter wetlands. The wetland delineation identified the types of wetlands that are present within the Project site and their locations.

The wetland delineation procedure was completed pursuant to the USACE 1987 Manual, *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coastal Regions* (Version 2.0). Following the initial review, a field survey was conducted on April 10, 2018 to map and document wetland and water features within the Project site.

The parameters used to identify a wetland are characteristics of the soil, hydrology, and vegetation. To define a wetland, the USACE requires that all three parameters show wetland attributes. The Coastal Commission defines a wetland based on the presence of any one parameter. The wetland delineation determined that an area with wetland vegetation, hydric soils, and wetland hydrology is present along the western portion of APN 007-121-007 and the far southwestern corner of APN 007-121-005. In addition to the three-parameter wetland, a one-parameter wetland was identified encompassing the general area of the three-parameter wetland and sporadically extending farther west than the three-parameter wetland. The one-parameter wetland includes willow species (*Salix spp*.) that are growing in upland (upland soils and hydrology) conditions. If the Project impacted these areas the impact would be significant. However, as described in the Project Description, the Project would be setback from any wetland areas by at least 50 feet and within that buffer area between the wetlands and the Project boundary native vegetation will be installed to enhance the buffer and ensure no impacts to these wetlands would occur.

A thorough analysis regarding the adequacy of the 50 foot buffer was conducted prior to including it in all site plans. Seven characteristics are used to determine if a smaller (less than 100 feet) buffer size between proposed development and an ESHA would be consistent with the LCP. These

characteristics include: the biological significance of adjacent lands, sensitivity of species to disturbance, erosion susceptibility, natural topography, cultural features, lot configuration and location of existing development, and type and scale of development proposed. The ESHA, although in the immediate vicinity of the site, would not be directly impacted by the Project as no work is anticipated to be done within its boundaries. Several species could utilize the habitat for foraging, but it is unlikely to significantly impact species especially after the above-listed mitigation measures are included in project implementation. The site is also bordered by other commercial uses along Broadway and the site has been previously developed. The Project would require minimal grading, implement a SWPPP, and all other requirements included in the NPDES permit, as well as install native vegetative plantings between the site and the ESHA to ensure erosion is minimal. No topographic features, such as hills or bluffs, exist within the confines of the site that would inhibit development. Additionally, cultural features like roads or dikes could be placed between an ESHA and development for protection, however, Broadway is developed on both sides and no alternative site is suitable for the Project. The existing development is located 50 feet or greater away from the ESHA. Finally, the type and scale of the development would be consistent with the existing uses in the vicinity of the Project. Therefore, as stated in the biological report, a 50 foot buffer would be sufficient to protect the ESHA from the proposed Project. A less than significant impact would occur

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? (No Impact)

Wildlife movement corridors are areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Natural features such as canyon drainages, ridgelines, or areas with vegetative cover provide wildlife corridors. Wildlife movement corridors are important because they provide access to mates, food, and water; allow the dispersal of individuals away from high population density areas, and facilitate the exchange of genetic traits between populations.

The project does not include any features that would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The Project would not preclude wildlife mobility, breeding, or reproduction. No impact has been identified.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? (No Impact)

The City of Eureka General Plan includes several policies to protect biological resources. The policies focus on protecting and enhancing the natural qualities of the Eureka area's aquatic resources and preserving the area's valuable marine, wetland, and riparian habitat (policies 6.A.1, 6.A.3, 6.A.6, 6.A.7, 6.A.8, 6.A.13, 6.A.14, and 6.A.19). The Project would not conflict with applicable City of Eureka General Plan policies protecting biological resources, as necessary buffers, bioswales, and various sedimentation and erosion BMPs would be implemented to ensure the natural resources of Eureka are protected. No impact would occur.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? (No Impact)

Currently there are no adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans that include the Project area. No impact would occur.

4.5 Cultural Resources

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historic property that qualifies as a historical resource as defined in §15064.5?				✓
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		✓		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			✓	
d) Disturb any human remains, including those interred outside of formal cemeteries?		✓		

a) Cause a substantial adverse change in the significance of a historic property that qualifies as a historical resource as defined in §15064.5? (No Impact)

The CEQA Guidelines define a historical resource as: (1) a resource listed in the California Register of Historical Resources; (2) a resource included in a local register of historical resources, as defined in the California PRC Section 5020.1(k), or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

The Project would include the demolition of one existing commercial structure. A review of available records concluded that the wooden structure was constructed more than 50 years ago, which makes it potentially eligible as a historic resource. While greater than 50 years old, the building was previously used as a truck terminal and does not represent the history of Eureka and is not significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. The structure was evaluated by a historic preservation consultant, Creative Home Construction, in July of 2018. The results of the historic building evaluation are described in the building survey report dated August 31, 2018 (Creative Home Construction 2018) (Appendix D).

As concluded in the building survey, the existing structure does not possess historical significance and the demolition of the structure would not impact a historical resource. No other potential historical

resources are located within the Project site that would be affected by Project implementation. No impact would occur.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? (Less than Significant with Mitigation)

The records search at the North West Information Center (NWIC) on June 11, 2018 indicates the Project site has a moderate to high probability of finding sites or other cultural evidence in the Project area. It was determined that two Wiyot villages existed in the Project vicinity, however, the specific locations of these villages are unknown. The Project site is underlain by four feet of fill, which makes it unlikely that any cultural resources are located within the first layer of soil (fill). However some of the required utility trenches may need to excavate slightly deeper than the fill into native soil. If unknown archaeological resources were found at the site, the Project would result in a significant impact.

Mitigation Measure CR-1: Protect Archaeological Resources during Construction Activities.

If cultural resources are encountered during any construction, the applicant and its construction contractor shall cease all work in the immediate area and within a 50 foot buffer of the discovery location. A qualified archaeologist as well as the Tribal Historic Preservation Officers for the Bear River Band of Rohnerville Rancheria, Blue Lake Rancheria, and Wiyot Tribe are to be contacted to evaluate the discovery and, in consultation with the applicant and lead agency, development of a treatment plan in any instance where significant impacts cannot be avoided shall be completed to the satisfaction of the Tribal Historic Preservation Officers prior to the resumption of construction activities at the location. Prehistoric materials may include obsidian or chert flakes, tools, locally darkened midden soils, groundstone artifacts, shellfish or faunal remains, and human burials. Violations of the conditions relating to ground disturbing activities shall be subject to penalties as allowed under current laws and codes.

Implementation of Mitigation Measure CR-1 would reduce this impact to a less-than-significant level for both construction and operation because a plan to address discovery of unanticipated buried cultural resources and to preserve and/or record those resources consistent with appropriate laws and requirements would be implemented.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (Less than Significant with Mitigation Incorporated)

Paleontological resources are the remains or traces of prehistoric animals and plants. Paleontological resources, which include fossil remains and geologic sites with fossil-bearing strata are non-renewable and scarce and are a sensitive resource afforded protection under environmental legislation in California. Under California PRC Section 5097.5, unauthorized disturbance or removal of a fossil locality or remains on public land is a misdemeanor. State law also requires reasonable mitigation of adverse environmental impacts that result from development of public land and affect paleontological resources (PRC Section 30244).

The Project site is built completely on artificial fill and below, bay mud, therefore, it is unlikely that paleontological resources would be found onsite. However, if the Project encounters unknown paleontological resources a significant impact would occur.

Mitigation Measure CR-2: Protection of Paleontological Resources

In the event that fossils are encountered during construction (i.e., bones, teeth, or unusually abundant and well-preserved invertebrates or plants), construction activities shall be diverted away from the discovery within 50 feet of the find, and a professional paleontologist shall be notified to document the discovery as needed, to evaluate the potential resource, and to assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the material, if it is determined that the find cannot be avoided. The paleontologist shall make recommendations for any necessary treatment that is consistent with currently accepted scientific practices. Any fossils collected from the area shall then be deposited in an accredited and permanent scientific institution where they will be properly curated and preserved.

Implementation of Mitigation Measure CR-2 would reduce this impact to a less-than-significant level for both construction and operation because a plan to address discovery of unanticipated buried cultural resources and to preserve and/or record those resources consistent with appropriate laws and requirements would be implemented.

d) Disturb any human remains, including those interred outside of formal cemeteries? (Less than Significant with Mitigation)

Based on the records search, the Project site has a moderate to high probability of finding sites or other evidence of human internments. It is unlikely that undiscovered human remains are present within the construction areas given that the majority of the Project area has been disturbed by previous development. However, the possibility of encountering human remains during construction cannot be completely discounted; therefore, the impact related to the potential disturbance or damage of previously undiscovered human remains, if present, is considered potentially significant.

Mitigation Measure CR-3: Protect Human Remains if Encountered during Construction

If human remains are found by the applicant or construction contractor during grading or other construction activities, California Health and Safety Code 7050.5 requires the applicant or its construction contractor call the County Coroner immediately at 707-445-7242. If the Coroner determines the remains to be Native American, the Native American Heritage Commission shall then be contacted by the Coroner to determine appropriate treatment of the remains pursuant to PRC 5097.98. Violators shall be prosecuted in accordance with PRC Section 5097.99.

Violations of the conditions relating to ground disturbing activities shall be subject to penalties as allowed under current laws and codes.

Mitigation Measure CR-3 would reduce the impact of construction activities on potentially unknown human remains to a less-than-significant level by addressing discovery of unanticipated remains, associated grave goods, or items of cultural patrimony consistent with appropriate laws and requirements. Operational impacts on human remains are not anticipated.

4.6 Geology and Soils

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			✓	
ii) Strong seismic ground shaking?			✓	
iii) Seismic related ground failure, including liquefaction?			✓	
iv) Landslides?			✓	
b) Result in substantial soil erosion or the loss of topsoil?			✓	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on, or off, site landslide, lateral spreading, subsidence, liquefaction or collapse?			✓	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			✓	
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				✓

a.i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. (Less than Significant)

The Alquist-Priolo Act (Public Resources Code Sections 2621–2630) was passed in 1972 to mitigate the hazard of surface faulting to structures designed for human occupancy. The purpose of the Act is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Project site is not located within an active Alquist-Priolo fault mapped by the California Geological Survey (California Department of Conservation 2015). The closest Alquist-Priolo fault zone is located approximately 2.8 miles east of the Project site. Therefore, fault rupture is not anticipated to occur at the Project site. Impacts are less than significant.

a.ii) Strong seismic ground shaking? (Less than Significant)

Strong seismic shaking is a regional hazard that could cause major damage to the Project area. The extent of ground-shaking during an earthquake is controlled by the earthquake magnitude and intensity, distance to the epicenter, and the geologic conditions in the area.

Humboldt County is in an active earthquake area. There are numerous subsurface geologic structures capable of generating strong ground motion at the Project site. Of the active and potentially active regional structures, the Cascadia subduction zone and the Little Salmon fault zone are of the greatest concern (Busch Geotechnical Consultants 2004). Based on mapping, the Cascadia subduction zone lies approximately 34 miles west of the site. The Little Salmon fault is located approximately four miles southwest of the site (Busch Geotechnical Consultants 2004). Therefore, the Project could potentially be exposed to strong seismic ground shaking in the event of an earthquake. This could result in a potentially significant impact. However, as described in Environmental Protection Action 2.6.2 (Implement Geotechnical Design Recommendations), in Section 2.6, the Project is to be designed and constructed in conformance with site-specific geotechnical recommendations contained in the geotechnical report prepared for the Project. A geotechnical report was prepared for the Project site by GHD which provides site-specific information on the subsurface geotechnical conditions which will affect the proposed development (GHD 2018). The Project geotechnical report is provided in Appendix G. Adherence to the recommendations in the geotechnical report during construction and operation would result in a less than significant impact.

a.iii) Seismic related liquefaction? (Less than Significant)

Liquefaction is the transformation of saturated, loose, fine-grained sediment to a fluid-like state because of earthquake shaking or other rapid loading. Liquefaction is known to occur in loose or moderately saturated granular soils with poor drainage.

The Project is within an area of artificial fill over bay muds and may be subject to some degree of ground liquefaction during strong seismic shaking. The Project site has been mapped as an area with a “high” liquefaction potential. The most likely liquefaction –induced ground failure at the site, is the loss of bearing capacity. If a seismic event occurred in the vicinity of the Project site, liquefaction may cause a significant impact. Implementation of Environmental Protection Action 2.6.2 (Implement Geotechnical Design Recommendations) would ensure impacts from seismic induced liquefaction were less than significant.

a.iv) Landslides? (Less than Significant)

The Project area does not have the potential for landslides as it is located on relatively flat land. No Project components would present a landslide hazard, and all constructed features would comply with the latest version of the California Building Code (CBC), including the requirements of the Seismic Design Category (SDC) zones. Adherence to the CBC during construction and operation would result in a less than significant impact with regard to landslides.

b) Result in substantial soil erosion or the loss of topsoil? (Less than Significant)

Construction activities, including cut, fill, removal of vegetation, and operation of heavy equipment would disturb soil and, therefore, have the potential to cause erosion. These activities would be performed in compliance with the BMPs prescribed in the National Pollutant Discharge Elimination Standards (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ) (Construction General Permit). BMPs may include: silt fences, straw bales and wattles, soil stabilization controls, site watering for controlling dust, settling tanks and dewatering bags. In areas immediately adjacent to wetlands and the Maurer-Palco Marsh, BMPs would be implemented to prevent erosion and sedimentation from construction. Protection measures include a stormwater pollution prevention plan (SWPPP) which would be required prior to any construction ground disturbing activities since the Project would disturb more than one acre of ground. Therefore, with adherence to existing codes and regulations and the SWPPP, no substantial soil erosion or loss of topsoil would result from the Project and a less than significant impact is expected to occur.

Following construction, the Project would not result in soil erosion or loss of topsoil, as permanent LID features (bioswales) would be installed and no additional ground disturbance post-construction is anticipated. Therefore, no operational impact would occur.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on, or off, site landslide, lateral spreading, subsidence, liquefaction or collapse? (Less than Significant with Mitigation)

The proposed Project is located in an area prone to subsidence and is located within an area designated as having a “high” liquefaction potential. Reference Section 4.6 a) iii, above for a discussion on liquefaction. The soil within the Project site consists of artificial fill and bay mud. The existing surficial fill soils beneath the existing asphalt are typically medium dense to dense sands or stiff to very stiff silts and clays. Although the Project site is mapped as “Relatively Stable” on the Humboldt County GIS Portal, the potential for liquefaction and subsidence still exists. Implementation of Environmental Protection Action 2.6.2, would ensure impacts are less-than-significant.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? (Less than Significant)

Expansive soils are generally high in certain clay types and are prone to large volume changes that are directly related to changes in water content. Soils within the Project site consist of artificial fill and bay mud with the existing surficial fill soils beneath the existing asphalt characterized as medium dense to dense sands or stiff to very stiff silts and clays. These soils have the potential for expansion, however adherence to the recommendations in the geotechnical reports (Environmental Protection Action 2.6.2- Implement Geotechnical Design Recommendations) would reduce this impact to a less-than-significant impact.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? (No Impact)

The Project would not involve the use of septic tanks or other alternative wastewater disposal systems. Therefore, no impact would occur.

4.7 Greenhouse Gas Emissions

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			✓	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			✓	

a, b) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment, or conflict with an applicable plan, policy, or regulation? (Less than Significant)

This section discusses greenhouse gas emissions and consistency with the State's adopted Scoping plan. Greenhouse gasses are also a contributor to climate change and sea level rise. To provide additional context to this document, this section also discusses sea level rise resulting from global climate change for informational purposes only.

Climate change refers to changes in the Earth's weather patterns, including the rise in the Earth's temperature due to an increase in heat-trapping greenhouse gases (GHG) in the atmosphere. Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of GHGs that contribute to global warming or global climate change have a broader, global impact. Global climate change is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the Earth's atmosphere. The principal GHGs contributing to global warming are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and fluorinated compounds. These gases allow visible and ultraviolet light from the sun to pass through the atmosphere, but they prevent heat from escaping back out into space. GHG emissions can be reduced to some degree by improved coordination of land use and transportation planning at the city, county and subregional level, and other measures to reduce automobile use. Energy conservation measures also can contribute to reductions in GHG emissions.

Federal Guidance

On February 18, 2010, the Council on Environmental Quality (CEQ) provided a draft guidance memorandum for public consideration and comment on the ways in which federal agencies can improve their consideration of the effects of greenhouse gas emissions and climate change in evaluations of proposals for federal actions under the National Environmental Policy Act (NEPA) (CEQ 2010). The CEQ updated that draft in 2014, and provided a final guidance on August 2, 2016 (CEQ 2016).

The CEQ's 2010 draft guidance proposed to advise federal agencies to consider, in scoping their NEPA analyses, whether analysis of the direct and indirect greenhouse gas emissions from their proposed actions may provide meaningful information to decision makers and the public. Specifically,

if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide equivalent ($MTCO_2e$) emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 $MTCO_2e$, CEQ encouraged federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ did not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of greenhouse gas emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of greenhouse gases. The CEQ removed the direct emissions criteria from the 2016 final guidance, which contains no numeric recommendations. For comparison, the EPA's Greenhouse Gas Reporting Program requires mandatory reporting for 'large' industrial sources of GHG to report GHG data, and defines large industrial sources as those that emit more than 25,000 $MTCO_2e$ per year.

State Guidance

In 2006, the Governor of California signed Assembly Bill 32 (AB 32), committing the State of California to reducing GHG emissions to 1990 levels by 2020. The statute requires CARB to track emissions through mandatory reporting, determine the 1990 emission levels, set annual emissions limits that would result in meeting the 2020 target, and design and implement regulations and other feasible and cost effective measures to ensure that statewide GHG emissions would be reduced to 1990 levels by 2020. Senate Bill 32 (SB 32), passed in 2016, extended the goals of AB 32 and codifies the GHG reduction target of 40 percent below 1990 levels by year 2030. The companion bill to SB 32, AB 197 provides additional direction to CARB for developing the Updated Scoping Plan.

The 2017 Climate Change Scoping Plan released by the CARB provides strategies for meeting the mid-term 2030 GHG reduction target set by SB 32. The 2017 Climate Change Scoping Plan also identifies how the State can substantially advance toward the 2050 GHG reduction target of Executive Order S-3-05, which consists of reducing GHG emissions to 80 percent below 1990 levels.

Regional Guidance

The City of Eureka is in the process of developing, but does not currently have, a Climate Action Plan. The NCUAQMD does not have rules, regulations, or thresholds of significance for non-stationary GHG emissions. In 2011, the NCUAQMD adopted Rule 111 - Federal Permitting Requirements for Sources of Greenhouse Gases to establish a threshold above which New Source Review and federal Title V permitting applies and to establish federally enforceable limits on potential to emit GHGs for stationary sources. These are considered requirements for stationary sources, and should not be used as a threshold of significance for non-stationary source projects. For reference, Rule 111 Section D(1)(a) and D(1)(b) have applicability thresholds of 75,000 $MTCO_2e$ per year and 100,000 $MTCO_2e$ per year.

Other Air District Guidance

The BAAQMD publishes CEQA Guidelines to assist local jurisdictions and lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality. These CEQA Guidelines were updated in June 2010 to include new thresholds of significance (2010 Thresholds) adopted by the BAAQMD Governing Board. The BAAQMD's Guidelines were further updated in May 2017 to address the California Supreme Court's 2015 opinion in California Building Industry Association vs. Bay Area Air Quality Management District, 62 Cal.4th 369.

The BAAQMD's adopted thresholds of significance contain the following operational GHG thresholds:

- Compliance with a Qualified GHG Reduction Strategy; or

- 1,100 MTCO2e per year; or
- 4.6 MTCO2e per service population (residents plus employees) per year.

The BAAQMD Guidelines do not provide construction thresholds of significance for GHG emissions.

Threshold of Significance Applied

The 2017 Scoping Plan is the applicable plan adopted for the purpose of reducing emissions of greenhouse gas. As the City of Eureka has not adopted their own GHG thresholds, the City, as Lead Agency for the Project, has elected to apply the BAAQMD's threshold of 1,100 $MTCO_2e$ per year for this Project to evaluate the significance of the Project's generation of greenhouse gases. In order to assess the potential impact of construction-generated emissions, the construction GHG emissions are annualized over an assumed 30-year project lifespan and added to operational emissions.

Construction and Operational Impact

Project construction activities would result in a temporary increase in GHG emissions, including exhaust emissions from on-road trucks, worker commute vehicles, and off-road heavy-duty equipment. Construction would require clearing, earthmoving, and delivery equipment, as used for similar projects, and which have been accounted for in the State's emission inventory and reduction strategy for both on and off-road vehicles. Construction emissions were estimated using CalEEMod version 2016.3.2, and are estimated to be approximately 78 $MTCO_2e$ from all construction activities over the two-year construction period. The project's construction emissions equal 2.6 $MTCO_2e$ per year when annualized over the assumed 30-year lifespan of the Project.

Operational greenhouse gas emissions were estimated using CalEEMod version 2016.3.2. The project is estimated to generate approximately 959 $MTCO_2e$ during operations. Total project emissions (operations plus annualized construction) would be approximately 962 $MTCO_2e$ per year, which is less than the emission threshold of 1,100 MT CO_2e. Therefore, the Project would generate a less than significant impact.

The project is also evaluated for consistency with the 2017 Scoping Plan. The recommended actions in the 2017 Scoping Plan are broad policy and regulatory initiatives that are being implemented at the State level, regional planning level, or land use decisions made at the local level, and are not directly implemented by individual projects such as this Project. Therefore the Project would not conflict with the 2017 Scoping Plan, and would result in no impact.

4.8 Hazards and Hazardous Materials

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			✓	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		✓		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				✓
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				✓
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			✓	
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				✓
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			✓	
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			✓	

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? (Less than Significant)

Construction activities would involve the use of hazardous materials, such as fuels, lubricants, paints and solvents. These materials are commonly used during construction, are not acutely hazardous and would be used in small quantities. Regular transport of such materials to and from the Project site during construction could result in an incremental increase in the potential for accidents. However, numerous laws and regulations ensure the safe transportation, use, storage and disposal of hazardous materials. For example, California Department of Transportation (Caltrans) and the California Highway Patrol regulate the transportation of hazardous materials and wastes, including container types and packaging requirements, as well as licensing and training for truck operators, chemical handlers, and hazardous waste haulers. Any hazardous materials used in construction of the Project would be transported, used, and stored in accordance with state and federal regulation regarding hazardous materials. Impacts would be temporary and less than significant.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?(Less than Significant with Mitigation Incorporated)

A previous asbestos survey was conducted at the Project site by Winzler & Kelly in 2006. In April 2018, another hazardous building material survey was performed at the proposed Project site (Appendix E). Both surveys focused on the existing commercial building proposed for demolition. If asbestos- or lead-containing materials are present they must be handled according to applicable federal, state, and local requirements to protect against the inadvertent release of asbestos fibers or lead dust into the air. The results of the surveys concluded that there were asbestos containing materials in the samples taken from the building. Therefore, demolition of the building could expose people and workers within the vicinity to asbestos. A significant impact would occur. Additionally, the surface coatings of the building that were sampled were found to contain lead. Lead is another hazardous material that could impact the workers or residents in the vicinity of the site. If lead was to be released a significant impact could occur.

Mitigation Measure HAZ-1: Assess and Manage Hazardous Materials

The property owner shall follow all regulations and laws concerning asbestos and lead-related work. The property owner shall provide written notification to the NCUAQMD at least 10 business days prior to the commencement of demolition activities. The property owner shall also provide written notification to the nearest California Occupational Safety and Health Administration (Cal/OSHA) District Enforcement Office with jurisdiction over the Project site at least 24 hours prior to the start of hazardous material work. The demolition and removal of asbestos-containing building materials shall be subject to applicable Cal/OSHA regulations, including 8 CCR 1529, 5203 341.6-341.14, and the California Health and Safety Code. If lead-based paint is identified, then federal and State construction worker health and safety regulations shall be followed during demolition activities. If loose or peeling lead-based paint is identified, it shall be removed by a qualified lead abatement contractor and disposed of in accordance with existing hazardous waste regulations.

Implementation of Mitigation Measure HAZ-1, and adherence to existing and future hazardous materials and waste regulations would result in a less than significant impact. Following construction, operation of the Project would not result in the release of hazardous materials. No operational impact would occur.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? (No Impact)

There are no existing or proposed schools within 0.25 mile of the Project site. The nearest school facility, Zoe Barnum High School, is approximately 0.6 mile east of the Project site. Therefore, no impacts related to emissions or handling of materials within one-quarter mile of an existing or proposed school would occur.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? (No Impact)

The provisions in Government Code Section 65962.5 are commonly referred to as the "Cortese List." A search of the Cortese List was completed to determine if any known hazardous waste sites have been recorded on or adjacent to the Project site. The Project site, formerly Al's Truck Stop, was previously identified as a hazardous site due to a leaking underground storage tank (LUST). The necessary corrective actions were conducted to rectify the LUST. In 2005, a letter stating that no further action was needed on-site was issued by the Humboldt County Department of Health. Additionally, there were a few leaking underground storage tank (LUST) sites near the Project site; however, all of them have a cleanup status of closed. The closest LUST site with an open status is the Fred C. Deo site located along West Hawthorne Street in Eureka, which is approximately 2,000 feet north of the Project site. Therefore, the proposed Project would not be located on a Cortese List site and would not create a significant hazard to the public or environment. No impact would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? (Less than Significant)

Samoa Field Airport is located approximately 1.4 miles west of the Project site. However, implementation of the Project would not result in an unusually high structure that could obstruct air traffic or result in any other conflicting use. The redevelopment of the Project site would not impact airport use, airport operations, or aircraft safety. The Project would also not result in an airport-related safety hazard for people residing or working in the Project area. There are no other public airports/airstrips within two miles of the Project. Therefore, no potential safety hazards associated with public airports would occur.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? (No Impact)

No private airstrips exist within the vicinity of the Project site. Therefore, the Project would not result in a safety hazard for people residing or working in the Project area. No impact would occur.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? (Less than Significant)

The Project site is located entirely within the Tsunami Inundation Area according to the Tsunami Inundation Map for Emergency Planning for the Eureka and Arcata South quadrangles (CalEMA et al. 2009). The Pacific Tsunami Warning Center in Ewa Beach, Hawaii, is staffed full-time by scientists, who quickly collect and analyze incoming tsunami data and decide whether to issue a tsunami warning. In the event of a tsunami warning, the Humboldt County Office of Emergency Services employees are trained in disaster preparedness including broadcasting an emergency tsunami

warning (and sirens) and giving direction to the public on the actions they should take in the event of a potential tsunami in Humboldt Bay. The Project is not anticipated to interfere with the existing tsunami emergency response plans. The site would provide adequate emergency access and circulation consistent with the City's Fire Department standards. Therefore, the Project would have a less than significant impact.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? (Less than Significant)

According to Humboldt County's Fire Hazard Severity Zones Map, the Project site is located within an area designated as having a moderate fire hazard (County of Humboldt 2008). All construction activities would be required to comply with all applicable fire protection and prevention regulations specified in the California Fire Code, Hazardous Materials Transportation regulations, and Cal/OSHA regulations. During operation, hazardous and flammable materials would be properly segregated and stored on-site consistent with all relevant federal, state, and local regulations. Additionally, all vegetation would be maintained to limit fire risk. As mentioned in impact (g) above, the Project would also provide adequate emergency access to the site. Therefore, the Project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. A less than significant impact would occur.

4.9 Hydrology and Water Quality

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?			✓	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			✓	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?			✓	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?			✓	
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			✓	
f) Otherwise substantially degrade water quality?			✓	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				✓
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?			✓	
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				✓
j) Inundation by seiche, tsunami, or mudflow?			✓	

a) Violate any water quality standards or waste discharge requirements? (Less than Significant)

The Project's excavation, grading and other earthwork activities are limited to the Project footprint. However, due to the Project's proximity to the Bay and the Maurer-Palco Marsh, construction activities have the potential to affect water quality. Construction activities necessary to construct the proposed Project would be conducted in accordance with the State Water Resources Control Board's General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2009-0009-DWQ). The Construction General Permit requires the development of a SWPPP by a certified Qualified SWPPP Developer, if a Project would disturb more than one acre of land. Construction of the Project would disturb more than one acre of land and has the potential to degrade water quality as a result of erosion caused by earthmoving activities during construction or the accidental release of hazardous construction chemicals. Exposed soil from stockpiles, excavated areas, and other areas where ground cover would be removed could be transported elsewhere by wind or water. If not properly managed, this could increase sediment loads in receiving water bodies, thereby adversely affecting water quality. As discussed in the Project Description, a SWPPP would be developed as part of the Project. The SWPPP would identify the best management practices necessary to prevent adverse impact to water quality including violation of water quality standards and waste discharge requirements. The treatment provided by the storm water management measures would reduce the potential for degradation of water quality in surface waters to a less-than-significant level. Additionally, the Project would direct drainage towards the LID areas and through the buffer area prior to release to receiving water bodies, including the Maurer-Palco Marsh. This would ensure that runoff was filtered prior to release. Implementation of BMPs and erosion control measures would reduce potential water quality impacts during Project construction activities to a less-than-significant level by requiring measures to control erosion and sedimentation of the ESHA and other water bodies. As a result, the potential impact on water quality during construction and operation would be less than significant. No water quality standards or waste discharge requirements would be violated.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? (Less than Significant)

The majority of the Project site is already developed with impermeable surfaces and construction of the Project would not require the use of the local groundwater supply. Some water would be used for dust suppression, however the Project would draw from the City's water supply. During operation, it is not anticipated that the commercial buildings or landscaping would require the use of groundwater. Redevelopment of the site would result in an additional 21,871 square feet of impermeable surfaces. Although additional impervious surfaces would be installed onsite, runoff would be directed to the areas landscaped with bioswales and native vegetation, to ensure groundwater recharge could still occur. The Project would have a less-than-significant impact on the groundwater supply or groundwater recharge.

c, d) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner , which would result in substantial erosion or siltation or flooding on- or off- site? (Less than Significant)

The Project would not result in a substantial change to drainage patterns, would not alter the course of a stream or river, would not substantially increase surface runoff, or create substantial additional sources of polluted runoff. The addition of 21,871 square feet of impervious materials is not anticipated to have a significant effect on the drainage pattern. The Project would also include the installation of bioswales around the perimeter of the site adjacent to the Maurer-Palco Marsh to ensure no sedimentation is released into the ESHA.

Furthermore, to ensure that there are no potentially significant runoff impacts that could result in minor erosion, completion of a SWPPP to the satisfaction of the RWQCB is required because the Project includes more than one acre of ground disturbance. The preparation of a SWPPP and adherence to the RWQCB's requirements for the preparation of a SWPPP would result in a less than significant impact on stormwater-related siltation and erosion on- or off-site, or flooding on- or off-site.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? (Less than Significant)

The Project would result in approximately 21,871 square feet of additional impervious material, however this addition is not anticipated to result in a substantial amount of runoff, which would exceed the capacity of the existing stormwater drainage system.

Furthermore, as the Project would disturb greater than one acre of soil, the City would be required to obtain coverage under the Construction General permit, which would require the development and implementation of a SWPPP as part of the Project. The SWPPP would incorporate BMPs as appropriate. No debris, soil, silt, sand, slash, sawdust, rubbish, cement or concrete washings, oil or petroleum products, or other organic or earthen material from construction operations would be allowed to enter or be placed where it may become entrained in any flowing or standing water, or the adjacent ESHA. The proposed LID features would act as a way to improve water quality by filtering out pollutants prior to release into the environment. It is not anticipated that the Project would result in the provision of additional sources of polluted runoff. A less than significant impact would occur.

f) Otherwise substantially degrade water quality? (No Impact)

The Project would not substantially degrade water quality other than as previously discussed. No impact would occur.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? (No Impact)

The Project does not include the construction of new homes and would not indirectly induce housing growth as it would not extend infrastructure into new areas and would not increase the overall capacity of the local water/wastewater systems. Therefore, this evaluation criterion is not applicable to the Project. No impact would occur.

h) Place structures within a 100-year flood hazard area or expose people or structures to a significant risk of loss, injury or death involving flooding,? (Less than Significant)

The Federal Emergency Management Agency (FEMA) issues Flood Insurance Rate Maps identifying land areas that are subject to flooding. According to FEMA data, portions of the western extent of the Project site, specifically the majority of APN 007-121-007, is located within a 100-year flood zone (Zone [AE]). The area of the Project site designated as Zone (AE) is primarily set aside as a wetland buffer where no development is to occur. The majority of the Project site is located within Zone X, which is an area of minimal flood hazard (FEMA 2017). Structures associated with the Project are to be constructed within Zone X. It is not anticipated that the Project would expose people or structures to a significant risk of loss, injury or death as a result of flooding. The impact is less than significant.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? (No Impact)

The Project is not located within a dam inundation zone. No impact would occur.

j) Inundation by seiche, tsunami, or mudflow? (Less than Significant)

Due to the known seismic activity in the Pacific Rim, a tsunami could impact Humboldt Bay. It is expected that the impact of a tsunami on Humboldt Bay would primarily occur along the north and south spits and the King Salmon and Fields Landing areas, which are located directly across from the opening to Humboldt Bay. Humboldt State University has conducted a number of studies on the impacts to Humboldt Bay resulting from tsunami inundation. These studies indicate that, although a wave from 12 to 20 feet high could threaten the southern end of the north spit, including the U.S. Coast Guard base, Fairhaven and parts of Samoa, the largest tsunamis occurring on Humboldt Bay, including those dating back as early as 1700 A.D., did not entirely inundate the north spit. The last recorded tsunami of any observable height to occur in Humboldt Bay was in 1964 as a result of the Gulf of Alaska earthquake. It had a recorded maximum height of 12 feet on the inside of the north spit and breached a 10-foot seawall at the Eureka Boat Basin. The Bay was filled with logs and debris and nine changes in tidal height were reported over the night causing high current velocities within the Bay. Fourteen-knot currents were reported in the channel opposite the Coast Guard Stations (Lander et al. 1993).

Inundation is only one of the hazards posed by a tsunami. The extremely high velocity caused by rapid changes in water elevation is capable of causing significant erosion and damage to structures, especially when the water is laden with debris. High velocity water can cause damage even when the water height is not significantly high.

The National Oceanographic and Atmospheric Administration (NOAA) published a tsunami inundation model of the Humboldt Bay region which mathematically computed the expected inundation levels caused by a magnitude 8.4 earthquake on the Cascadia Subduction Zone (Bernard and others 1994). In the model, the north and south spit bear the brunt of the impact. Both spits are overrun and the waves travel across Humboldt Bay flooding Woodley and Indian Islands.

Configuration of the coastline, shape of the ocean floor, and character of the advancing waves play an important role in the destruction wrought by tsunamis along any coast, whether near the generating area or thousands of kilometers from it. The United States has collaborated with other countries around the Pacific to build and maintain a warning system that detects earthquake, sea surface levels, and ocean-bottom movements of water. The Pacific Tsunami Warning Center in Ewa Beach, Hawaii, is staffed full-time by scientists, who quickly collect and analyze incoming data and

decide whether to issue a tsunami warning. In the event of a tsunami warning, the County of Humboldt Office of Emergency Services employees are trained in disaster preparedness including broadcasting an emergency tsunami warning and giving direction to the public on the actions they should take in the event of a potential tsunami in Humboldt Bay.

The Project site is located within the Tsunami Inundation Area as mapped by the California Emergency Management Agency, California Geological Survey and University of Southern California (CalEMA 2009). Because mitigation for the potential tsunami inundation hazard already exists along the Bay in the form of tsunami hazard warning signs and a countywide tsunami early warning system, the tsunami risk is anticipated to be less than significant. The Project is therefore not expected to expose people to significant risk, loss, injury or death from tsunami inundation.

4.10 Land Use and Planning

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?				✓
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			✓	
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				✓

a) Physically divide an established community? (No Impact)

The Project would involve the redevelopment of an existing commercial lot that is located with an already developed area. As such, the Project would not result in a new division of a community, but would replace in-kind the commercial use. No impact would occur.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? (Less than Significant)

Applicable land use plans covering the Project site include the City of Eureka General Plan, Municipal Code, and the Local Coastal Program. The Project site is zoned Service Commercial and designated as General Service Commercial. Per the zoning ordinance, permitted uses include retail stores and conditional uses include restaurant including drive-in (drive-through). Allowable uses per the General Plan include retail stores, service establishments, amusement establishments, wholesale businesses, restaurants, and soda fountains (not including drive-in establishments), and offices. Drive-in (drive-through) restaurants are also allowed as a conditional use. The Project Applicant is applying for a Conditional Use Permit from the City to ensure the proposed drive-through facilities in each structure are consistent with the applicable land use plans. The four-unit commercial building proposed at the rear of the site would also house three commercial uses, however the exact nature of these uses would be determined at a later date. It is assumed that the commercial uses would be either a retail use or restaurant and would therefore, be consistent with the applicable land use and zoning regulations.

The Municipal Code also includes development standards that would apply to the Project. These standards specifically include yard setbacks, parking, and height limitations. The Project would comply with these standards. The Municipal Code and the Local Coastal Program also include resource protection policies for any project occurring within close proximity to a coastal resource

area. The proposed Project is adjacent to the Maurer-Palco Marsh, which is considered an ESHA. The Project would not encroach into this area and the Project would implement LID areas to protect this area from the proposed development.

The Project is also located within the Coastal Development Zone, which makes the site subject to applicable coastal zone policies and regulations of the Coastal Act. The Project would require a Coastal Development Permit (CDP) from the City. A CDP application package is being prepared concurrently with this ISMND.

Applicable policies adopted for the purpose of avoiding or mitigating environmental effects can be found throughout the City Local Coastal Program (LCP) and General Plan. A review of the LCP and General Plan elements, and the policies and standards within, did not identify any inconsistencies with the proposed Project.

The Project would not introduce new land uses or land use designations or zoning; therefore, no conflict with applicable land use plans, policies, or regulation(s) would occur. The impact would be less than significant.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan? (No Impact)

Currently there are no adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plans that cover the Project area. No impact would occur.

4.11 Mineral Resources

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				✓
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				✓

a, b) Result in the loss of availability of a known mineral resource that would be of value to the region or delineated by a General Plan, Specific Plan or other land use plan? (Less than Significant)

No mineral resources and no mineral resource extraction currently occurs within or near the Project site. The Project would not affect the availability of a known mineral resource that would be of value to the region, nor would the Project result in the loss of availability of a locally important mineral resource recovery sire, delineated on a specific, general plan, or other land use plan. No impact would occur.

4.12 Noise

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			✓	
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?			✓	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			✓	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			✓	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				✓
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				✓

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? (Less than Significant)

The Noise Section of the City's General Plan does not include set hours for construction or any specific measures to be included in the construction phase to minimize noise from construction equipment such as mufflers. Additionally, the City of Eureka does not currently have an adopted noise ordinance. Therefore, no impact regarding a violation of a specific noise standard during the construction phase would occur.

The City's General Plan does include noise thresholds for non-transportation related noise, which states that the maximum allowable noise at the property line of lands designated for noise-sensitive uses cannot exceed 65 dB (nighttime, 10:00 p.m. to 7:00 a.m.) to 70 dB (daytime, 7:00 a .m. to 10:00 p.m.).. The proposed Project is located approximately 150 feet west of existing residences, separated by Broadway (Highway 101). The noise generated from the Project, which would be limited to traffic, commercial/retail activity noise, and occasional landscaping and maintenance would be buffered by the existing ambient noise generated by traffic along Broadway (Highway 101). These activities alone are not anticipated to exceed the General Plan thresholds, nor are they anticipated to increase noise levels to an unacceptable level at the residential uses. Therefore, this incremental increase in noise would not expose persons to noise levels in excess of applicable standards and would not represent a substantial increase in noise. The impact would be less than significant.

b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels? (Less than Significant)

The construction of a project may generate vibration when heavy equipment or impact tools (e.g. jackhammers) are used. Construction activities that could generate ground borne vibration would include grading, compacting, paving, and demolition of the existing building on-site.

To avoid the potential for structural damage, Caltrans recommends a vibration limit of 0.5 inches per second (in/sec) Peak Particle Velocity (PPV) for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound, but where structural damage is a major concern, and a conservative limit of 0.08 in/sec PPV for very old buildings, or buildings that are documented to be structurally weakened. Therefore, conservatively, groundborne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in a significant vibration impact. No known very old buildings or buildings that are documented to be structurally weakened adjoin the Project site.

Table 4.12-1 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. High-power or vibratory tools and rolling stock equipment (tracked vehicles, compactors, etc.), may generate substantial vibration in the immediate vicinity. Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

Table 4.12-1 Typical Vibration Levels for Construction Equipment

Equipment	PPV at 25 ft. (in/sec)	Approximate PPV at 25 ft. (VdB)
Clam Shovel Drop	0.202	94
Vibratory Roller	0.210	94
Hoe Ram	0.089	87

Table 4.12-1 Typical Vibration Levels for Construction Equipment		
Equipment	**PPV at 25 ft. (in/sec)**	**Approximate PPV at 25 ft. (VdB)**
Large Bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Notes:

- PPV = Peak Particle Velocity
- VdB = Vibration decibels, vibration unit of measurement
- Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.

Project related activities would not involve the use of explosives or other intensive construction techniques that could generate significant ground borne vibration or noise. Vibration impacts to residences are anticipated to be minor, as the closest residences are approximately 150 feet, or more, from the Project site across Broadway. None of the above-listed equipment would exceed the established threshold 25 feet away from Project activities. Minor vibration in association with construction equipment used during the construction phase would be generated only on a short-term basis and such vibrations not anticipated to exceed the established threshold. Therefore, ground borne vibrations and noise during construction would have a less than significant impact.

Following construction, operation of the Project would not result in substantial sources of groundborne vibration or groundborne noise. Project operation would not generate vibration, therefore, no operational impact would occur.

c) Substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? (Less than Significant)

The Project would redevelop an existing commercial site and replace it with other commercial uses. These uses would include two drive-through restaurants and other retail stores, which may increase the operational traffic that would frequent the Project site. However, the trips would not be expected to increase the ambient noise levels perceptibly above existing conditions. The Project does not involve any operational feature that would cause any permanent increase to noise levels. The Project would, therefore, not result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project. The impact is less than significant.

d) Substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? (Less than Significant)

The duration of exposure at any given noise-sensitive receptor is a consideration in determining an impact's significance. For example, this analysis generally assumes that temporary construction noise that occurs during the day for a relatively short period of time would not be significant. This analysis assumes that most residents of average sensitivity that live in urban environments are accustomed to a certain amount of construction activity from time to time to maintain existing infrastructure. Therefore, for the purposes of this analysis, temporary exposure to construction noise

during the daytime is not considered to result in a substantial temporary increase in ambient noise levels if it is for a duration of one year or less. The Project would be constructed within six months and therefore would result in a less than significant impact regarding a temporary or periodic increase in ambient noise level.

e, f) Exposure of people residing or working near a private or public airport to excessive noise levels? (No Impact)

The Project site is located approximately 1.4 miles east of Samoa Field, a City-owned public airport; however, Project construction and operation would include only ground-based travel, and because the Project is not growth inducing, it would not affect air traffic patterns or levels. Additionally, given the nature of the Project, it would not introduce new permanent residents to the area. Employees for the proposed commercial uses are anticipated to be part-time and would draw from the local work force supply. Therefore, there would be no impact from exposing people to excessive noise levels attributable to airport operations and flights.

4.13 Population and Housing

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				✓
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				✓
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				✓

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? (No Impact)

The proposed commercial development would demolish one existing commercial building and construct two new commercial buildings. The Project does not include the construction of new homes in the area. The Project would not indirectly induce population growth because it would not necessitate new housing in the area. The Project would provide new employment opportunities, however it is assumed that future employees would be hired from the labor force within the City of Eureka. It would not result in the extension of utilities or roads or other infrastructure into outlying areas and would not directly or indirectly lead to the development of new sites that would induce population growth. In addition, implementation of the Project would not result in a direct or indirect increase in employment opportunities that could lead to an increase in the local population. Therefore, no impact to population growth would occur.

b, c) Displace substantial numbers of existing housing or people, necessitating the construction of replacement housing elsewhere? (No Impact)

The Project would demolish an existing, vacant, commercial building. No homes or people would be displaced as a result of Project construction or operation. Therefore, no impact would occur.

4.14 Public Services

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire Protection?			✓	
Police protection?			✓	
Schools?				✓
Parks?				✓
Other public facilities?				✓

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for public services? (Less than Significant)

The Project would be redeveloping an existing commercial site. Except in an emergency the Project would not require any additional demand on fire or police services. It is anticipated that the current fire and police services would be sufficient to protect the Project site during construction and operation. Additionally, the Project does not contain any growth-inducing components, which would impact schools, parks, or other public facilities. No impact to school, park, or other public facilities would occur.

4.15 Recreation

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				✓
b) Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?				✓

a, b) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated, or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment? (No Impact)

The Project would not increase the population of the surrounding community, so the use of existing neighborhood and regional parks or other recreational facilities would not change as a result of the Project. The Project would not result in the physical deterioration of public recreational facilities, and would not require construction of parks and recreational facilities. No impact would occur.

4.16 Transportation/Traffic

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?		✓		
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				✓
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?		✓		
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			✓	
e) Result in inadequate emergency access?			✓	
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?			✓	

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? (Less than Significant with Mitigation Incorporated)

The General Plan states that new or improved streets shall be designed in accordance with City standards and that new structures adjacent to expressways, arterial streets, and collector streets conform to sight distance requirements defined in Caltrans' Highway Design Manual. The southern half of Vigo Street along the north side of the Project would be improved, including repaving and restriping, in accordance with City standards. All sight distance requirements would be consistent with Caltrans standards and the Project would provide ample off-street parking, far exceeding the minimum number of parking spaces required per the City's municipal code.

The City of Eureka's General Plan includes policies related to transportation, including the establishment of acceptable Level of Service (LOS) thresholds. The General Plan states that the LOS shall be maintained on all roadway segments at LOS C or better, except for any portion of Broadway (US 101), where LOS D shall be acceptable.

The Project Transportation Impact Study (TIS) evaluates existing and future traffic operations, analyzing existing and future conditions both with and without the proposed Project, at five intersections within the Project vicinity. Once completed, the Project has the potential to result in a degradation of the LOS at three intersections, as defined in the Project TIS (GHD 2018c). The LOS at the intersections of Broadway and W. Hawthorne Street, Broadway and Vigo Street, and Broadway and W. Henderson Street would experience LOS degradation under existing and/or future (Year 2038) conditions. The Project TIS is included in Appendix H.

For the intersection of Broadway and W. Hawthorne Street, the proposed Project reduces the weekday Mid-Day peak hour LOS to E and the PM peak hour LOS to F under the existing plus project scenario. Caltrans plans to signalize this intersection within the next year (construction programmed for 2019). With the completion of the signal at this intersection, the intersection will perform at an acceptable LOS (LOS B) with the proposed Project, mitigating the potentially significant impact at the W. Hawthorne Street and Broadway intersection to a less than significant level. As the W. Hawthorne signalization project is funded and programmed by Caltrans, and signalization improves the LOS at this intersection to an acceptable level, no Project mitigation is required at this intersection.

For the intersection of Broadway and Vigo Street, the proposed Project reduces the weekday Mid-Day and the PM peak hour LOS to F under existing plus project conditions. The Broadway and Vigo intersection LOS is projected to be remain F for the Mid-Day and the PM peak hour for future (Year 2038) plus project conditions. Without mitigation, the proposed project would potentially create a significant impact at the Vigo Street and Broadway intersection in the weekday Mid-Day and PM peak hour by reducing the LOS to unacceptable operations under existing plus project and future plus project conditions.

Improvements to the Vigo Street and Broadway intersection are needed to restore the intersection to acceptable LOS for the weekday Mid-Day and PM peak hour. Mitigation Measure TRA-1 (Construct a Traffic Signal at Vigo Street and Broadway) addresses the

need for intersection improvements and proposes to construct at three-way traffic signal at the intersection of Vigo Street and Broadway.

For the intersection of W. Henderson Street and Broadway, the proposed project creates a potentially significant impact in the weekday Mid-Day peak hour by causing an intersection operating at acceptable to unacceptable LOS between the Year 2038 No Project and Year 2038 Plus Project conditions. Mitigation Measure TRA-2 (Convert Segment of W. Henderson Street to a One-way Westbound Street) addresses the potentially significant LOS degradation at W. Henderson and Broadway by restriping W. Henderson Street between Fairfield Street and Broadway to become a one-way westbound street. With implementation of TRA-2, the potentially significant impact at the W. Henderson Street and Broadway intersection is reduced to less than significant.

No specific measures of effectiveness have been identified in adopted plans that apply to temporary construction traffic and activity. For example, LOS standards are intended to regulate long-term impacts from operation of future projects, as opposed to temporary impacts from construction. However, during construction the normal functionality of US 101 may be altered due to the additional vehicle trips by construction workers, supply trucks, and haul trucks traveling to and from the Project site. No road closures or detours are anticipated to be required during this phase. Therefore, LOS of the roadways is not anticipated to be affected during construction. No conflict with applicable plans would result during construction.

Mitigation Measure TRA-1: Construct a Traffic Signal at Vigo Street and Broadway

Mitigation Measure TRA-1 proposes to construct a three-leg traffic signal at the intersection of Vigo Street and Broadway, including associated road striping and pedestrian improvements. The three-leg traffic signal proposed by TRA-1 would allow protected turn movements from Vigo Street on to northbound and southbound Broadway, as well as protected turns from Broadway onto Vigo Street. Upgrades to the pedestrian crossing at Vigo Street associated with TRA-1 would include pedestrian curb ramps, marked crossing and pedestrian barricades for other legs of intersection.

With implementation of TRA-1, the LOS at Vigo Street and Broadway is projected to be LOS D for the Mid-Day and PM peak hour, under the existing plus project conditions. For future conditions (Year 2038), implementation of TRA-1 is projected to result in LOS C operations for both the Mid-Day and PM peak hours. After mitigation, the resultant existing plus project LOS (LOS D) and future (Year 2038) plus project LOS (LOS C) is consistent with the target LOS (LOS D) for Broadway (US 101) roadway segments. With implementation of TRA-1, the potentially significant impact at the Vigo Street and Broadway intersection is reduced to less than significant.

Mitigation Measure TRA-2: Convert Segment of W. Henderson to a One-way Westbound Street

Mitigation Measure TRA-2 proposes to convert W. Henderson Street to a one-way westbound street between Fairfield Street and Broadway Street. In association with the conversion of W. Henderson, TRA-2 includes the following improvements to deter potential eastbound traffic from entering the one-way westbound lanes at W. Henderson Street: 1) restripe southbound Broadway Street left turns to U-turns only, 2) restrict northbound Broadway Street right turn, 3) restrict eastbound W. Henderson through

movement at westerly driveway, and 4) removes existing traffic signal phases which allow eastbound turns/movements on W. Henderson Street.

With implementation of TRA-2, the LOS at W. Henderson Street and Broadway under future conditions (Year 2038) is projected to be LOS C for the Mid-Day and LOS D for the PM peak hour. After mitigation, the resultant LOS (LOS C [Mid-Day] and LOS D [PM]) is consistent with the target LOS (LOS D) for Broadway (US 101) roadway segments. With implementation of TRA-2, the potentially significant impact at the W. Henderson Street and Broadway intersection is reduced to less than significant.

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways? (No Impact)

No congestion management plan or program exists for the Project area. Therefore, the Project would have no impact related to conflicting with an applicable congestion management plan or program.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? (No Impact)

The Project does not contain any feature or characteristic that would result in a change in air traffic patterns nor would any features be of sufficient height to affect air traffic. No impact would occur.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? (Less than Significant)

The Project would construct a new commercial development composed of two restaurants with drive-throughs and several additional commercial spaces. The proposed Project would not alter the existing alignment of the roadway that could result in a hazardous design feature, nor is it introducing a new incompatible use.

e) Result in inadequate emergency access? (Less than Significant)

The Project would implement a commercial use on a previously developed site. Currently the Project site has three adequate emergency access points. During construction, the Project would utilize a portion of the Project footprint for staging, however this would not impede emergency vehicle access in any way. The presence of additional vehicles on the roadway may slightly slow emergency response times, however this is not anticipated to substantially affect emergency access. The Project would have a less than significant impact regarding emergency access.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities? (Less than Significant)

The Project is subject to Humboldt County Association of Government's Humboldt Regional Bike Plan. The Regional Bike Plan includes goals and policies focused on improving the availability and safety of bicycle paths. Although no bike lanes are proposed adjacent to the Project site in the current Bike Plan, implementation of the Project would not eliminate the possibility for improving existing bike lanes along US 101, nor would it

restrict efforts to improve the safety of bicycle or pedestrian facilities. The Project would not conflict with the Humboldt Regional Bike Plan.

Sidewalk improvements are planned along Vigo Street and Broadway in association with this project. Pedestrian facility improvements planned in association with the Project would be designed and constructed in accordance with Caltrans, City, and Americans with Disabilities Act standards.

4.17 Tribal Cultural Resources

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or			✓	
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?			✓	

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a, b) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe? (Less than Significant with Mitigation)

CEQA requires lead agencies to determine if a proposed project would have a significant effect on tribal cultural resources. The CEQA Guidelines define tribal cultural resources as: (1) a site, feature,

place, cultural landscape, sacred place, or object with cultural value to a California Native American Tribe that is listed or eligible for listing on the California Register of Historical Resources, or on a local register of historical resources as defined in PRC Section 5020.1(k); or (2) a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant according to the historical register criteria in PRC Section 5024.1(c), and considering the significance of the resource to a California Native American tribe.

At their request, Tribes shall be afforded the opportunity to review and provide comments to the City early in project review and planning (screening) about known or potential Tribal cultural resources located in project areas within their respective tribal geographical area of concern. The City initiated AB 52 consultation with Bear River Band of the Rohnerville Rancheria, Blue Lake Rancheria and the Wiyot Tribe at Table Bluff Reservation via an email notification with a Project Description and vicinity map on June 29, 2018; however no written responce from any Tribe was received by the City by the end of the 30-day response period on July 30, 2018.

According to the North West Information Center (NWIC) Archaeological Survey Report prepared for the Project (NWIC 2017), there is a moderate to high possibility that the Project Area of Potential Effect (APE) contains undiscovered prehistoric artifacts or archaeological deposits. Although formal consultation was offered by the City for the proposed Project, correspondence with local Native American Tribes did not result in any expressed concerns regarding Tribal cultural resources. Therefore, the impact is less than significant.

4.18 Utilities and Service Systems

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				✓
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✓
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			✓	
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			✓	
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				✓
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			✓	
g) Comply with federal, state, and local statutes and regulations related to solid waste?			✓	

a, b, e) Exceed wastewater treatment requirements of the RWQCB, or require the construction of new water or wastewater treatment facilities, or have adequate wastewater capacity? (Less than Significant)

The City of Eureka's Elk River Wastewater Treatment Plant provides wastewater services for the City of Eureka. No wastewater would be generated as a result of Project construction. During operation, the Project may generate a small quantity of wastewater resulting from restrooms in the commercial

facilities, however, according to the Elk River Wastewater Treatment Plan 2015 Annual Report, the wastewater treatment plant has a permitted capacity of 8.6 million gallons per day (MGD) under dry weather treatment conditions and has an average flow rate of 4.75 MGD. As the Project is anticipated to generate minimal wastewater, the treatment plant would have adequate capacity to serve the Project and would not cause an exceedance of wastewater treatment requirements. No new wastewater treatment facilities would be required to be built (City of Eureka 2015). Similarly, the Project would require a portion of the local water supply for operation, however demand would be minimal in comparison to a residential development. It is not anticipated that new water facilities would be required to be built. A less than significant impact would occur.

c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? (Less than Significant)

As discussed in Hydrology and Water Quality, above, the Project site is relatively flat and would not result in significant changes to drainage patterns associated with the proposed Project. The addition of 21,871 square feet of impermeable material may result in a slight increase in runoff, however the installation of the LID features would reduce the amount of runoff directed to the storm drains. Therefore, the existing stormwater drainage facilities would be sufficient to accommodate the proposed Project. A less than significant impact would result.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? (Less than Significant)

The Project would require relatively small quantities of water during the construction phase (e.g. for dust control and concrete/asphalt applications) and water for landscaping, until the new vegetation is established. Once completed the Project would demand water from the local supply. Water is purchased from the Humboldt Bay Municipal Water District and is piped from its original source, subsurface wells on the Mad River near Blue Lake, to Eureka's 20 million gallon storage reservoir. The capacity of the Humboldt Bay Municipal Waste District (HBMWD) system is approximately 75 MGD and the current demand is approximately 9 MGD and is projected to be 20 MGD in 2020 (HBMWD 2015). As the Project's water demands are not anticipated to be substantial, they could be met by existing entitlements and resources. Therefore, the Project would not result in the need for the construction of new water facilities, or the expansion of existing facilities. A less than significant impact would occur.

f, g) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs, and comply with federal, state, and local statutes and regulations related to solid waste? (Less than Significant)

The solid waste provider in the Project area is the Humboldt Waste Management Authority (HWMA). The Project is not expected to generate a significant increase of services for solid waste disposal needs. Construction solid waste would include the one-time temporary generation of demolition and construction waste associated with the proposed Project. Recyclable construction materials (e.g. scrap metal, wood, concrete, glass) could be shipped to local businesses for reuse, with non-recyclable materials sent to the HWMA transfer station in Eureka.

The Project would include waste receptacles and spaces for recycling bins. The City of Eureka has a franchise agreements for waste collection in the Project area. Solid waste collected as a part of the Project would be taken to the Hawthorne Street Transfer Station of the HWMA. HWMA would then truck solid waste produced in the City to State licensed landfills located in Anderson, California

(Anderson Landfill) or Eagle Point, Oregon (Dry Creek Road Landfill) in compliance with local, state, and federal regulations pertaining to solid waste disposal. These facilities have a remaining capacity of about 8 million tons and 50 million tons respectively (Humboldt Local Agency Formation Commission 2015). Therefore, the landfills would have sufficient capacity to serve the Project's solid waste disposal needs. A less than significant impact is anticipated.

4.19 Mandatory Findings of Significance

	Potentially Significant Impact	Less-than-Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		✓		
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			✓	
c) Does the project have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly?			✓	

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? (Less than Significant with Mitigation)

As evaluated in this ISMND, the Project would not substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory.

Mitigation measures are listed herein to reduce impacts related to biological resources, cultural resources, and hazards and hazardous materials (related to releases that may impact biological resources). With implementation of the required mitigation measures, impacts would be less than significant.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? (Less than Significant)

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

As discussed in Section 4.10 Land Use and Planning, the Project is consistent with the goals and policies of the City of Eureka General Plan. The Project's impacts would not add appreciably to any existing or foreseeable future significant cumulative impact, such as visual quality, cultural resources, biological, traffic impacts, or air quality degradation. Incremental impacts, if any, would be negligible. Any applicable cumulative impacts to which this Project would contribute would be mitigated to a less-than-significant level.

Because the proposed project would not result in significant impacts after mitigation, and because the proposed project is a redevelopment of an existing commercial property for continued commercial use, the proposed project would not contribute to any significant cumulative impacts which may occur in the area in the future. Therefore, the impact would be less than significant.

c) Does the project have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly? (Less than Significant)

The Project has been planned and designed to avoid significant environmental impacts. As discussed in the analysis throughout Section 4 of this ISMND, the Project would not have environmental effects that would cause substantial adverse direct or indirect effects on human beings. The impact is less than significant.

5. References

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6. Report Preparers

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David Caisse, Civil Engineer

Chryss Meier, Environmental Scientist

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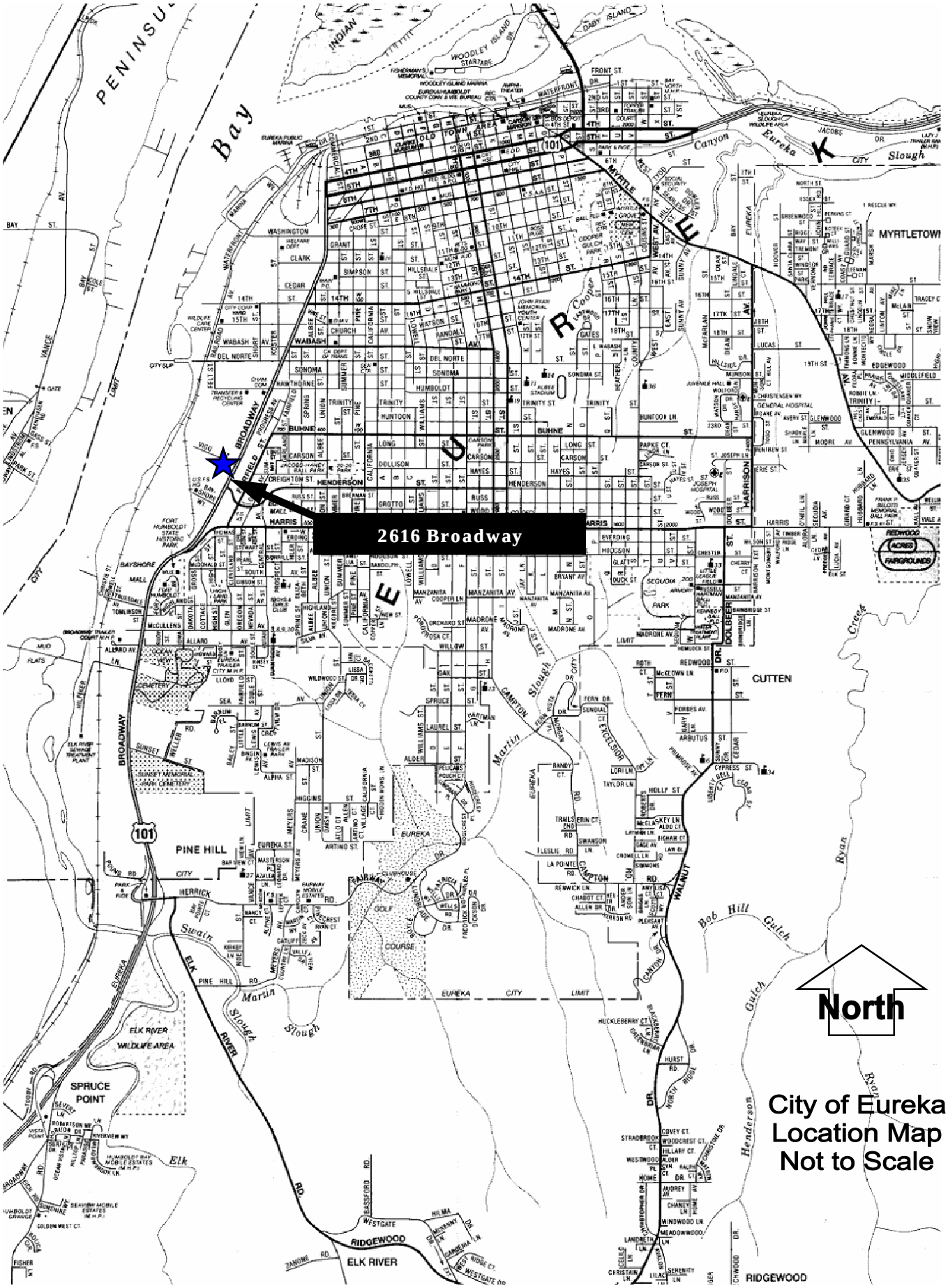
Appendix A Figures


2616 Broadway
North
City of Eureka
Location Map
Not to Scale
PENINSULA
Bay
BROADWAY
EUREKA
PINE HILL
SPRUCE POINT
ELK RIVER
RIDGEWOOD
CUTTEN
MYRTLETOWN
Martin Slough
Swain Slough
Ryan Creek
Bob Hill Gulch
Henderson Gulch
Eureka Slough
Cooper Gulch
Elk River
Elk River Wildlife Area
Eureka Canyon
Indian Island
Woodley Island
Daby Island
Fort Humboldt State Historic Park
Sequoia Park
Redwood Acres Fairgrounds
Eureka Public Marina
Woodley Island Marina
Eureka City Limit
101

2616 BROADWAY - EUREKA, CA REDEVELOPMENT

DESIGN REVIEW

MBA
ARCHITECTURE +
INTERIOR DESIGN

DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET	1.0

INDEX

COVER	1.0
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INOB EXTERIOR ELEVATIONS	2.1
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BLDG-B EXTERIOR ELEVATION (WEST)	3.3
BLDG-B EXTERIOR ELEVATION (SOUTH)	3.4
BLDG-B ACCESSORY STRUCTURES	3.5
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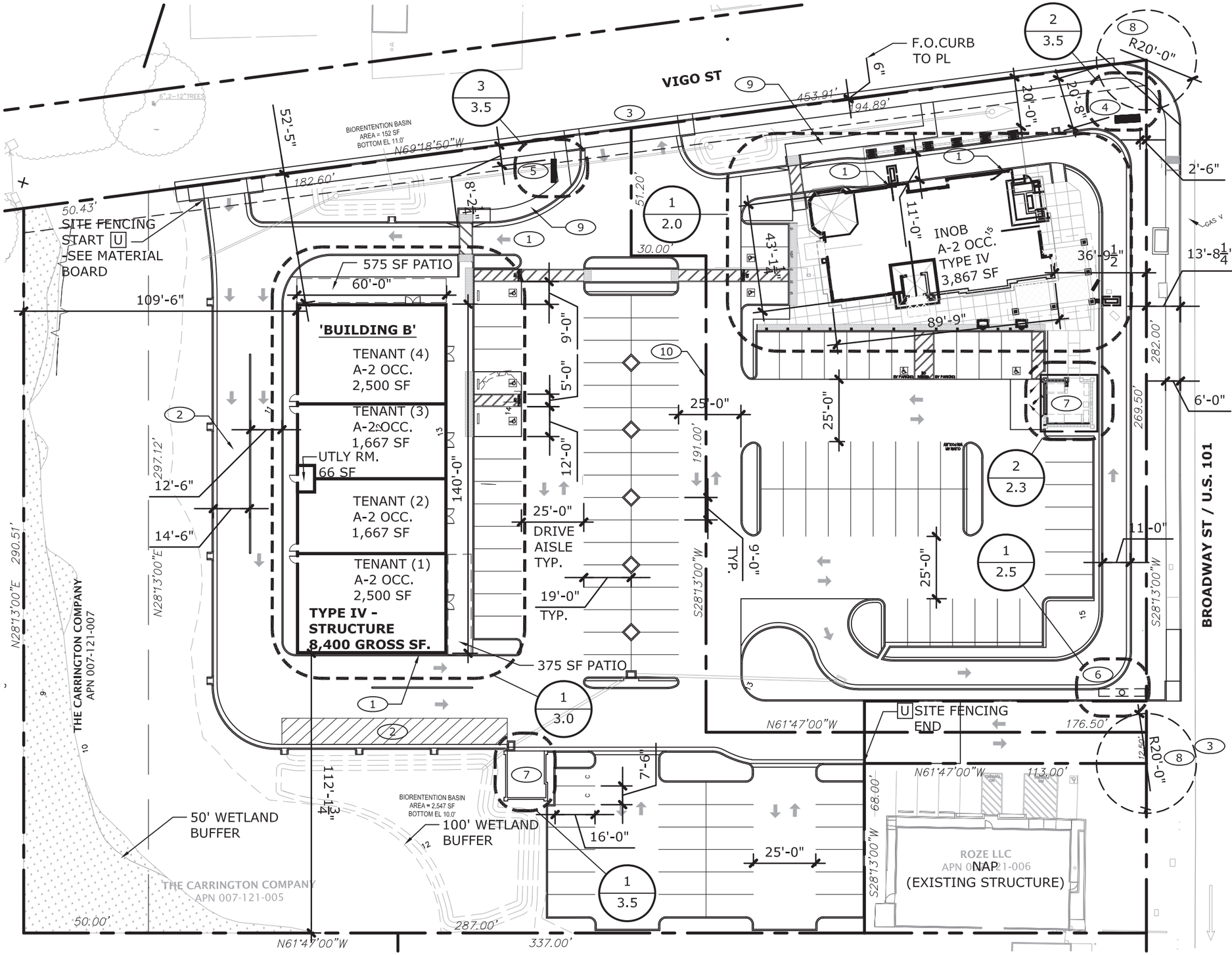
MATERIAL BOARD	3.7



1 SITE PLAN

SCALE: 1"=40"

0" 1" 2"
0' 10' 20' 40'-0" 80'-0"
NORTH

SHEET NOTES:

(THIS SHEET ONLY)

1. DRIVE-THRU WINDOW
2. LOADING ZONE/ONE WAY ACCESS DRIVE
3. SITE ENTRY
4. MONUMENT SIGN 1 (MAJOR)
5. MONUMENT SIGN 2 (MINOR)
6. INOB PYLON SIGN
7. TRASH ENCLOSURE
8. INTERSECTION VIEW TRIANGLE
9. ADA PATH OF TRAVEL - OFF SITE
10. NEW PROPERTY LINE - SEE CIVIL DWG'S

SITE INFORMATION

RESTAURANT COMBINED: 8,400 SF	
RESTAURANT STAND ALONE: 3,867 SF (1 SP : 200 SF) 12,267 SF/ 200 PARKING REQUIRED: (§ 155.117 SCHEDULE OF OFF-STREET PARKING SPACE REQUIREMENTS)	62 TOTAL SPACES
TOTAL OFF-STREET PARKING PROVIDED: STANDARD (9'-0" x 19'-0")	120 TOTAL SPACES
ADA SPACES:	5
COMPACT SPACES: (7'-6" x 16'-0")	2
EV SPACES:	2
ON-STREET PARKING PROVIDED:	TBD

SITE SIGNAGE

ALLOWABLE SIGNAGE: STREET FRONTAGE LENGTH X 3.	
BROADWAY FRONTAGE	282 FEET
VIGO FRONTAGE	454 FEET
AREA CALCULATION- STREET FRONTAGE COMBINED: (736') x 3	2208 SF
MONUMENT SIGN (MAJOR) - 6 PANELS @ 23sf EA. 2 SIDED	276 SF
MONUMENT SIGN (MINOR) - 5 PANELS @ 7.5sf EA. 1 SIDED	37.5 SF
MULTI-TENANT BUILDING SIGNAGE COMBINED:	884 SF
INOB BULDING SIGNAGE + PYLON SIGN	740 SF
SITE SIGNAGE ALLOWABLE:	2208 SF
PROPOSED SITE SIGNAGE COMBINED:	1937.5 SF

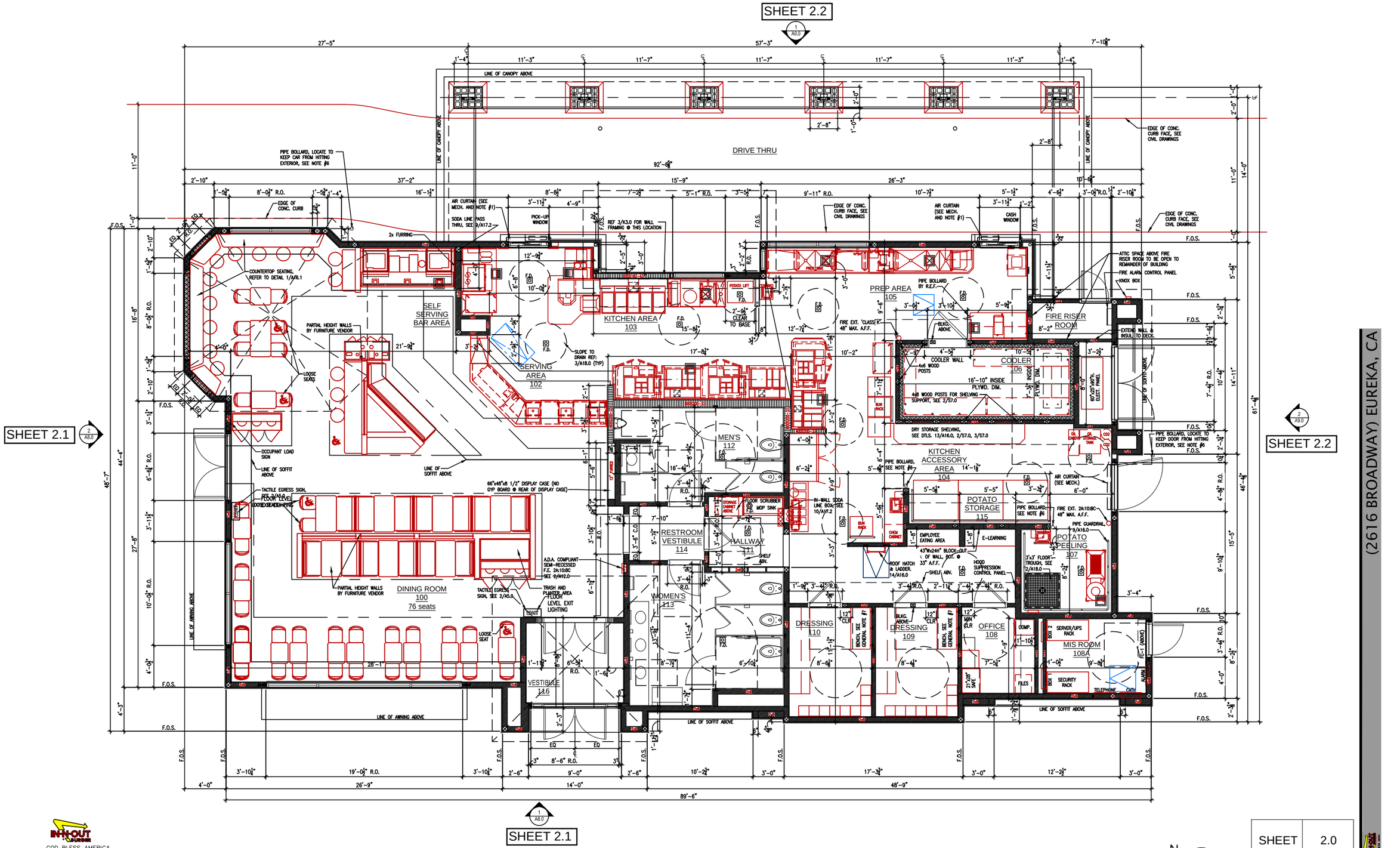
MBA
ARCHITECTURE + INTERIOR DESIGN

DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET 1.2



IN-N-OUT BURGER

GOD BLESS AMERICA

13502 HAMBURGER LANE
BALDWIN PARK, CA 91706

FLOOR PLAN

SHEET OF 1

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EUREKA, CA

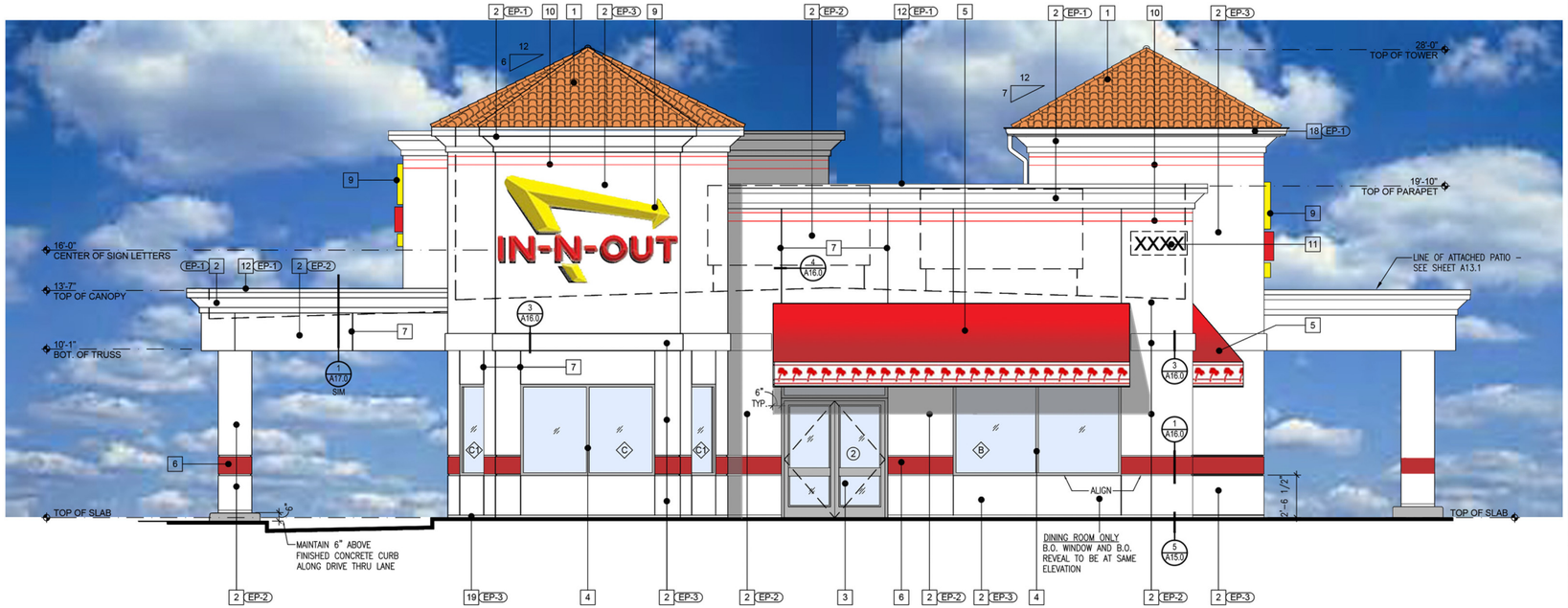
2616 BROADWAY

SCALE: 1/8"=1'-0"

N

SHEET	2.0

07-05-18



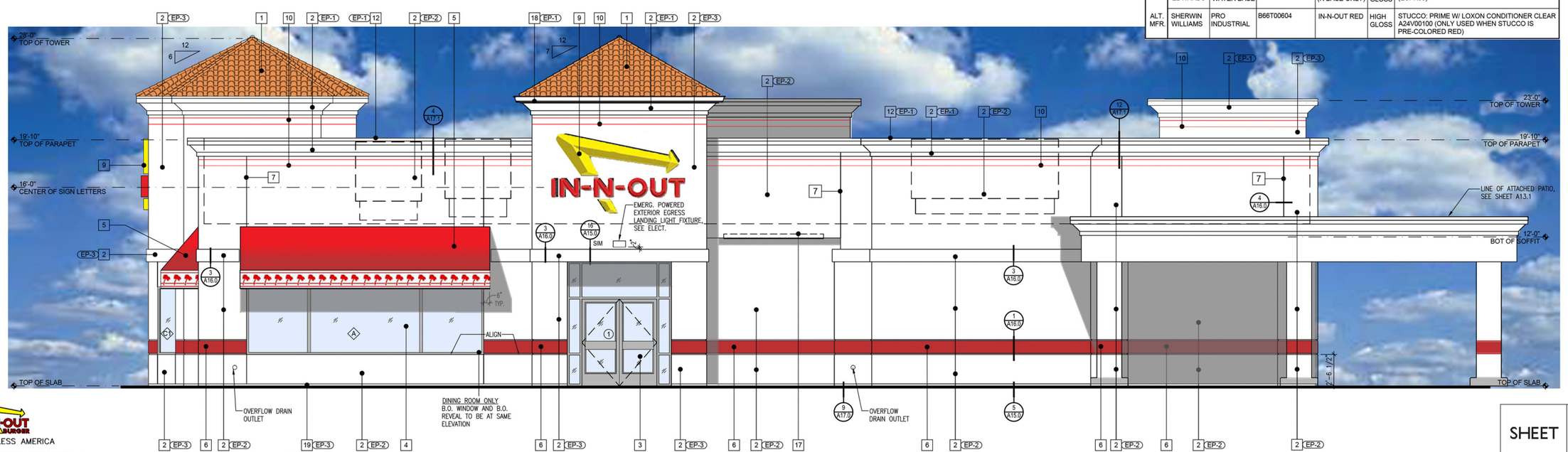
2 A8.0 WEST ELEVATION
SCALE: 1/8" = 1'-0"

KEY NOTES

1	TILE ROOF: EAGLE ROOFING PRODUCTS, CAPISTRANO STYLE 3125 TERRACOTTA. PROVIDE BIRD STOP AND PAINT TO MATCH TILE.
2	STUCCO: MEDIUM SAND FLOAT TEXTURE FINISH.
3	ALUMINUM STOREFRONT DOORS: CLEAR ANODIZED ALUMINUM.
4	ALUMINUM WINDOWS: CLEAR ANODIZED ALUMINUM.
5	AWNINGS: PVC COATED WICK-RESISTANT ERADICABLE POLYESTER AWNINGS WITH CUSTOM PALM TREE ERADICATED TO WHITE COLOR BY COOLEY BRITE CUSTOM RED 79-L1124A, FLAME RETARDANT PER UL-48, UL-94, NFPA 701. PROVIDE FLUORESCENT BACKLIGHTING. SEE: 5/A16.0 & 6/A16.0.
6	STUCCO BAND: PAINT (EP-4). INTEGRAL COLOR CEMENT PLASTER TO MATCH PAINT (EP-4). 1" ALUMINUM REVEAL TOP AND BOTTOM (DO NOT PAINT REVEALS). SEE DETAILS 1/A16.0 & 13/A17.0
7	1/4" WIDE METAL PENN SCREED: SEE DETAIL 4/A16.0. ALIGN CONTROL JOINTS ON DRIVE-THRU CANOPY FASCIA WITH CONTROL JOINTS ON BOTTOM OF SOFFIT.
8	SLOPED ALUMINUM WINDOWS: U.S. ALUMINUM S-010. GLASS JOINTS TO HAVE POLISHED EDGES WITH SILICONE JOINTS. PAINT WOOD FRAME "EP-4".
9	IN-N-OUT BURGER ILLUMINATED LOGO SIGN: UNDER SEPARATE PERMIT.
10	L.E.D. DOUBLE BAND LIGHTING: UNDER SEPARATE PERMIT.
11	BUILDING ADDRESS NUMBERS TO BE 12" HIGH, 4" MIN. W/ MIN. STROKE WIDTH OF 0.5 INCH PER FIRE DEPARTMENT AND CITY JURISDICTION ADDRESS DISPLAY REQUIREMENTS: 1. ADDRESS SHALL BE DISPLAYED & VISIBLE FROM BOTH STREET DIRECTIONS OF APPROACHING VEHICLES. 2. PERMANENT NUMBERS AND LETTERS SHALL BE MADE OF DURABLE AND CLEARLY VISIBLE MATERIAL SUCH AS WOOD, METAL, CERAMIC, PLASTIC AND VINYL. (PAINTED OR GLUED ON NUMBERS ARE NOT ACCEPTABLE MATERIALS). 3. NUMBERS SHALL BE OF COLORS CONTRASTING WITH BACKGROUND TO WHICH THEY ARE ATTACHED. 4. NUMBERS SHALL BE A MINIMUM PROPORTION RATIO OF 6:1 (HEIGHT TO WIDTH). 5. NUMBERS CANNOT BE SPELLED.
12	PRIMER: GALV-ALUM PREMIUM, NON FERROUS METAL PRIMER (GA 01). FINISH COAT: RUSTOLEUM SIERRA BEYOND BY DUNN EDWARDS. COLOR TO MATCH STUCCO.
13	HOLLOW METAL DOOR: SEE SHEET A11.0 (PAINT WITH SHERWIN WILLIAMS - WATERBASE ACROLON 100 URETHANE PART A B65-720 / PART -B B65V720 - TINT TO MATCH PAINT COLOR NOTED).
14	5'-0" HIGH STUB OUT FOR Co2 LINE
15	4" MIN. HIGH WHITE LETTERING "RISER ROOM" ON RED BACKGROUND SIGN. MOUNT ON RISER ROOM DOOR
16	RECESSED KNOX BOX AT 5'-0" HIGH TO THE RIGHT OF FIRE RISER ROOM. SEE DETAIL 10/A17.0
17	RECESSED 8' FLUORESCENT LIGHT FIXTURE IN SOFFIT. SEE DETAIL 9/A17.1
18	GUTTER AND DOWNSPOUT. REFER TO DETAIL 8/A17.2
19	TEXTURE EXPOSED FOUNDATION WALL BELOW STUCCO WEEP SCREED AND PAINT TO MATCH WALL.

EXTERIOR PAINT SCHEDULE

NO.	MFR.	MODEL	COLOR #	COLOR NAME	FINISH	REMARKS
EP-1	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	B66W00611	IN-N-OUT BONE CHINA	HIGH GLOSS	STUCCO: PRIME W/ LOXON CONCRETE & EXT LATEX PRIMER WHITE - A24W08300. GALV METAL: PRIME W/ GALVITE HS ACRYLIC COATING - B50WZ0030, OFF WHITE
EP-2	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	A84W01151	IN-N-OUT BONE CHINA	HIGH GLOSS	SEE REMARKS FOR EP-1 ALT MFR.
EP-3	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	A84W01151	IN-N-OUT BONE CHINA	HIGH GLOSS	SEE REMARKS FOR EP-1 ALT MFR.
EP-4	DUNN EDWARDS	SYN-LUSTRO WATER BASE	W10-221	SAFETY RED (R BASE ONLY)	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	PRO INDUSTRIAL	B66T00604	IN-N-OUT RED	HIGH GLOSS	STUCCO: PRIME W/ LOXON CONDITIONER CLEAR A24V00100 (ONLY USED WHEN STUCCO IS PRE-COLORED RED)



1 A8.0 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

GOD BLESS AMERICA

13502 HAMBURGER LANE
BALDWIN PARK, CA 91706

ELEVATION-1

SHEET OF 1

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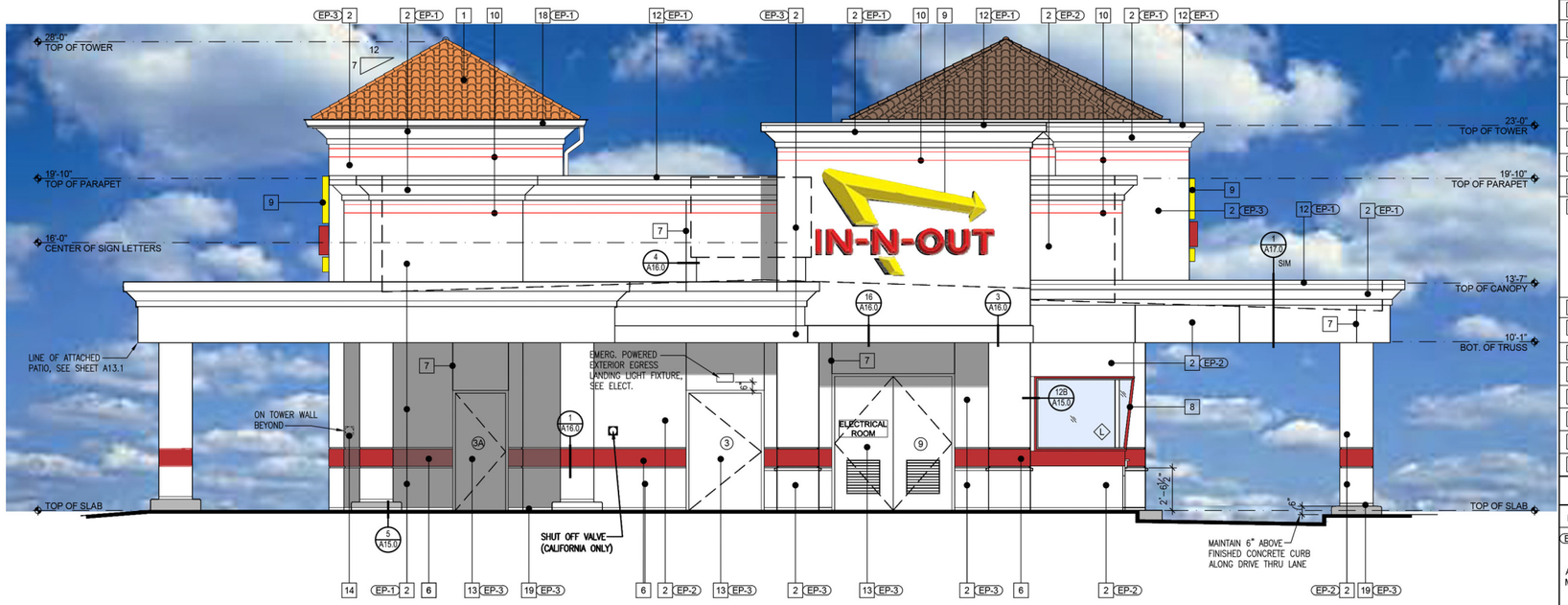
EUREKA, CA

2616 BROADWAY

(2616 BROADWAY) EUREKA, CA

SHEET 2.1

07-05-18



2 / A9.0 EAST ELEVATION
SCALE: 1/8" = 1'-0"

KEY NOTES

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9	IN-N-OUT BURGER ILLUMINATED LOGO SIGN: UNDER SEPARATE PERMIT.
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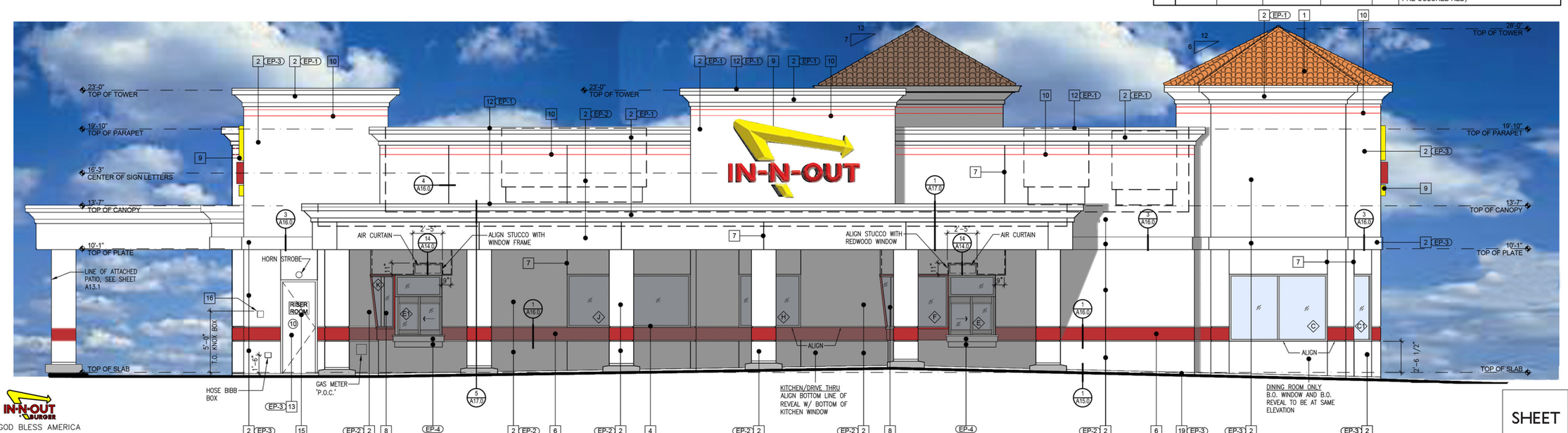
19	TEXTURE EXPOSED FOUNDATION WALL BELOW STUCCO WEEP SCREED AND PAINT TO MATCH WALL.

EXTERIOR PAINT SCHEDULE

NO.	MFR.	MODEL	COLOR #	COLOR NAME	FINISH	REMARKS
EP-1	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	B66W00611	IN-N-OUT BONE CHINA	HIGH GLOSS	STUCCO: PRIME W/ LOXON CONCRETE & EXT LATEX PRIMER WHITE - A24W08300. GALV METAL: PRIME W/ GALVITE HS ACRYLIC COATING - B50WZ0030, OFF WHITE
EP-2	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	A84W01151	IN-N-OUT BONE CHINA	HIGH GLOSS	SEE REMARKS FOR EP-1 ALT MFR.
EP-3	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	A84W01151	IN-N-OUT BONE CHINA	HIGH GLOSS	SEE REMARKS FOR EP-1 ALT MFR.
EP-4	DUNN EDWARDS	SYN-LUSTRO WATER BASE	W10-221	SAFETY RED (R BASE ONLY)	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	PRO INDUSTRIAL	B66T00604	IN-N-OUT RED	HIGH GLOSS	STUCCO: PRIME W/ LOXON CONDITIONER CLEAR A24V00100 (ONLY USED WHEN STUCCO IS PRE-COLORED RED)



1 / A9.0 NORTH ELEVATION
SCALE: 1/8" = 1'-0"

(2616 BROADWAY) EUREKA, CA

IN-N-OUT BURGER
GOD BLESS AMERICA
13502 HAMBURGER LANE
BALDWIN PARK, CA 91706

ELEVATION-2
SHEET OF 1

EUREKA, CA
2616 BROADWAY

SHEET 2.2

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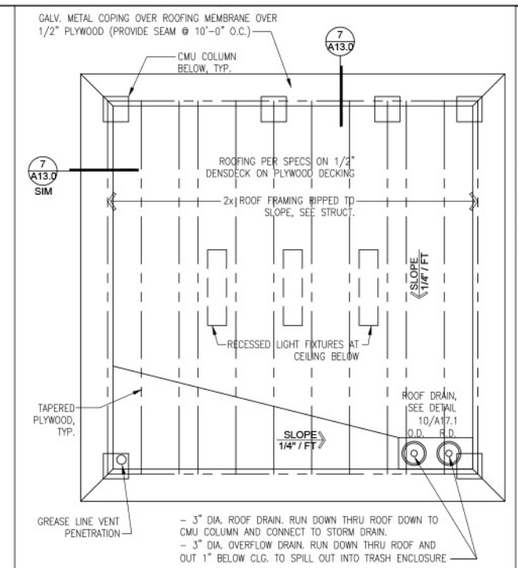
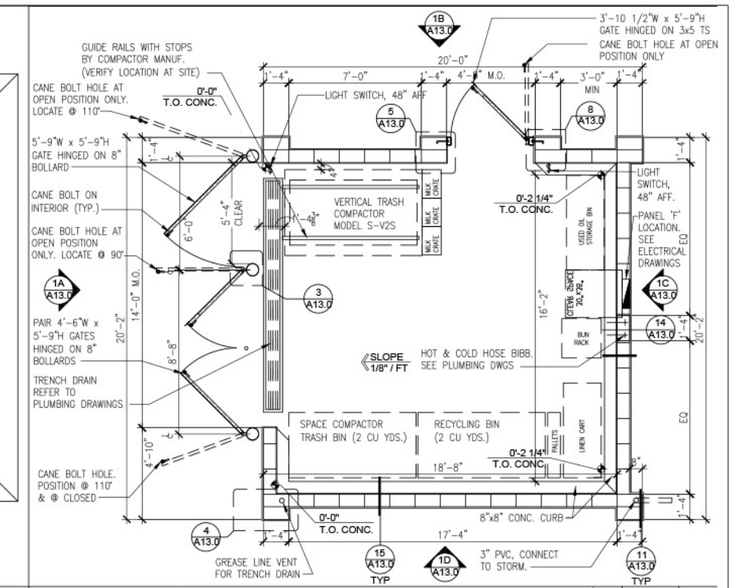
07-05-18



ROOF PLAN — SCALE 1/8" = 1'-0" — 6



FLOOR PLAN — SCALE 1/8" = 1'-0" — 2

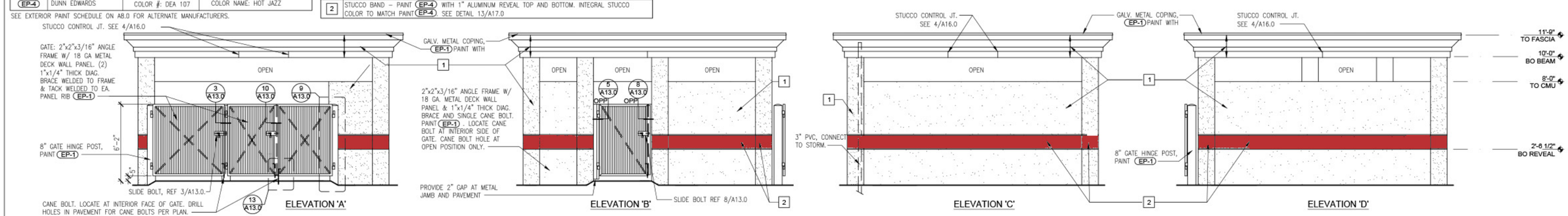
EXTERIOR PAINT KEY NOTES

EP-1	DUNN EDWARDS	COLOR #: DEW 339	COLOR NAME: BONE CHINA
EP-4	DUNN EDWARDS	COLOR #: DEA 107	COLOR NAME: HOT JAZZ

SEE EXTERIOR PAINT SCHEDULE ON A8.0 FOR ALTERNATE MANUFACTURERS.

FINISH KEY NOTES

1	STUCCO – MEDIUM SAND FLOAT TEXTURE FINISH. PAINT EP-1
2	STUCCO BAND – PAINT EP-4 WITH 1" ALUMINUM REVEAL TOP AND BOTTOM. INTEGRAL STUCCO COLOR TO MATCH PAINT EP-4. SEE DETAIL 13/A17.0



ELEVATIONS — SCALE 1/8" = 1'-0" — 1

(2616 BROADWAY) EUREKA, CA

IN-N-OUT BURGER
GOD BLESS AMERICA
13502 HAMBURGER LANE
BALDWIN PARK, CA 91706

TRASH ENCLOSURE

SHEET OF 1

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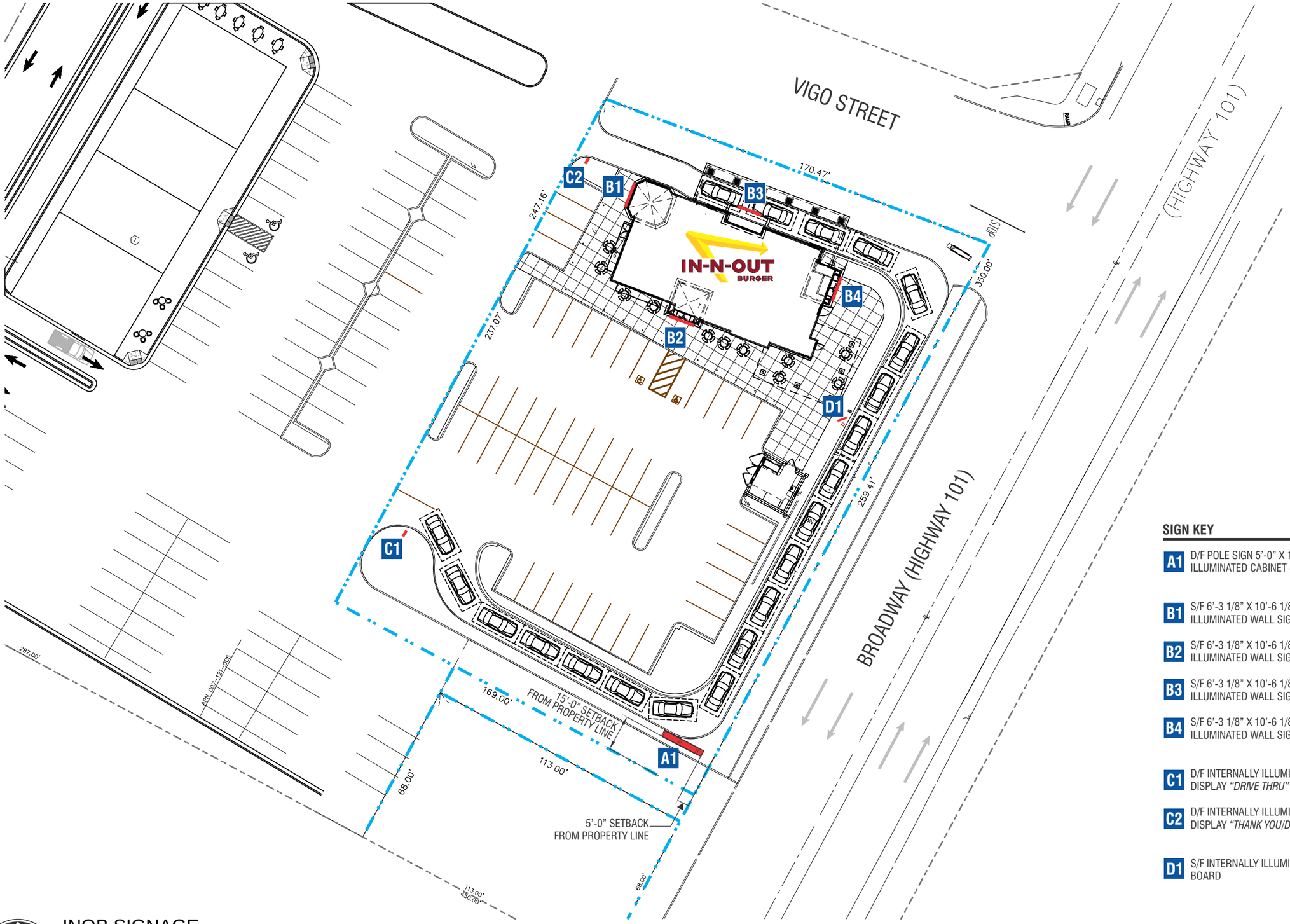
EUREKA, CA
2616 BROADWAY

SHEET 2.3

07-05-18



SIGN KEY

- **A1** D/F POLE SIGN 5'-0" X 15'-0" INTERNALLY ILLUMINATED CABINET @ 30'-0" OAH
- **B1** S/F 6'-3 1/8" X 10'-6 1/8" INTERNALLY ILLUMINATED WALL SIGN
- **B2** S/F 6'-3 1/8" X 10'-6 1/8" INTERNALLY ILLUMINATED WALL SIGN
- **B3** S/F 6'-3 1/8" X 10'-6 1/8" INTERNALLY ILLUMINATED WALL SIGN
- **B4** S/F 6'-3 1/8" X 10'-6 1/8" INTERNALLY ILLUMINATED WALL SIGN
- **C1** D/F INTERNALLY ILLUMINATED DIRECTIONAL DISPLAY *"DRIVE THRU"*
- **C2** D/F INTERNALLY ILLUMINATED DIRECTIONAL DISPLAY *"THANK YOU/DO NOT ENTER"*
- **D1** S/F INTERNALLY ILLUMINATED MENU BOARD

NORTH

INOB SIGNAGE
SITE PLAN (FOR SIGNAGE REFERENCE ONLY)

SCALE: 1" = 40'-0"

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
SITE PLAN & SIGN KEY

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

CUSTOMER APPROVAL

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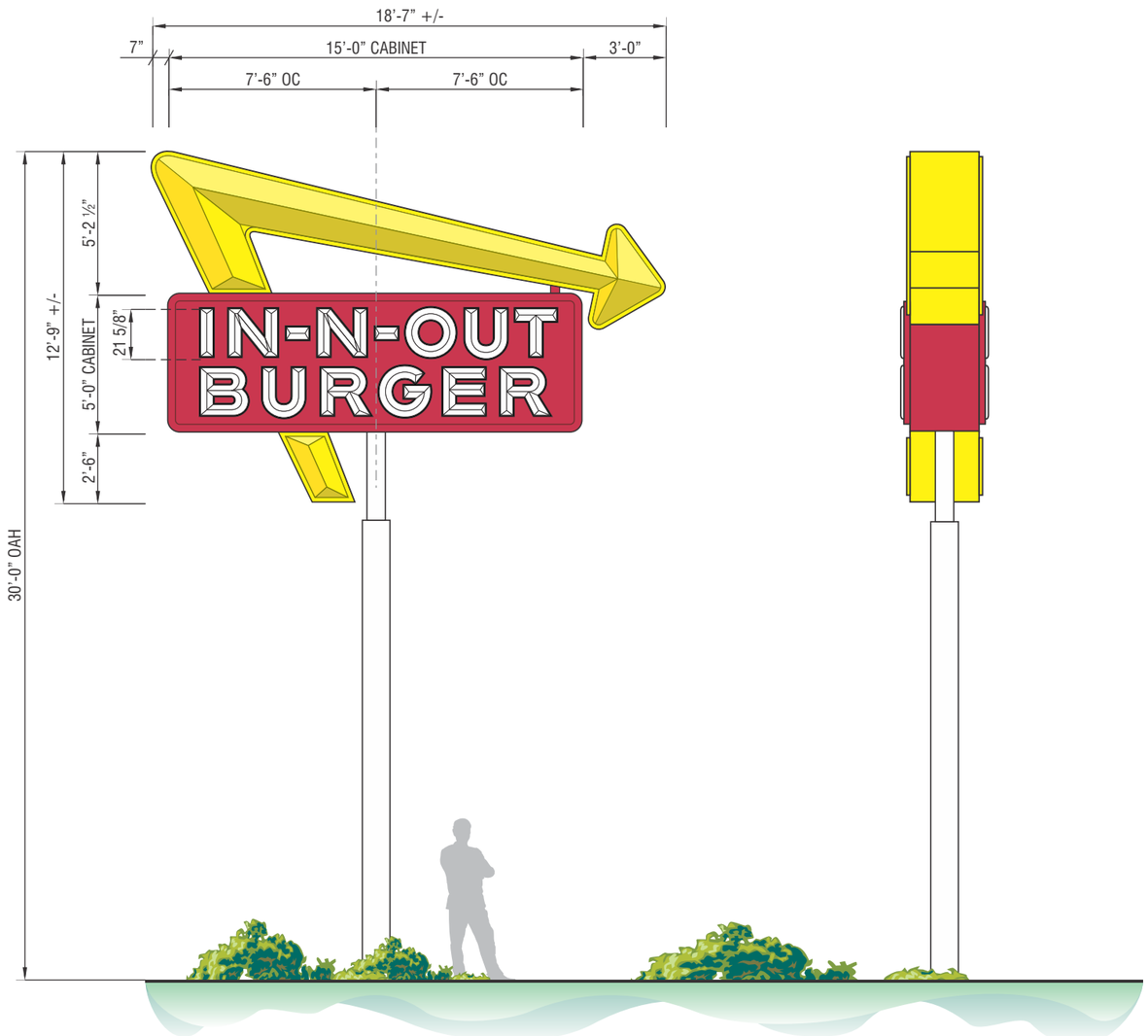
DWG#	PROJECT #
16-1065	319874
REVISION NO. 4	WO#

REVISIONS

1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

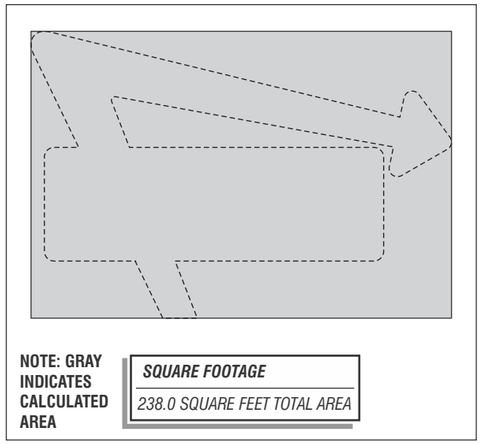
KEY NO.

SHEET 2.4



ELEVATION VIEW

END VIEW



NOTE: GRAY INDICATES CALCULATED AREA

SQUARE FOOTAGE
238.0 SQUARE FEET TOTAL AREA

SIGN SPECIFICATIONS:

D/F INTERNALLY ILLUMINATED MONUMENT SIGN W/ ALUMINUM CABINET & ARROW W/ FORMED FACES. COLORS ARE PER BELOW:

ARROW: FABRICATED CHANNEL WITH RETURNS PAINTED TO MATCH PMS YELLOW "C" W/ GLOSS FINISH. FORMED YELLOW #2037 ACRYLIC PLASTIC FACES WITH 1" YELLOW TRIMCAP EDGES. HO TRIPHOSPHORUS LAMP ILLUMINATION.

CABINET: FABRICATED CABINET & RETAINERS PAINTED TO INO RED W/ GLOSS FINISH. FORMED RED #211-1 ACRYLIC PLASTIC FACES W/ WHITE LETTERS. HO TRIPHOSPHORUS LAMP ILLUMINATION.

POLE: STANDARD PIPE AS REQ'D/ PAINT TO MATCH DUNN EDWARDS 'BONE CHINA WHITE'.

D/F INTERNALLY ILLUMINATED 5'-0" X 15'-0" PYLON SIGN @ 30'-0" OAH

SCALE: 3/16" = 1'-0"

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
GROUND SIGN

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

CUSTOMER APPROVAL

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DWG# 16-1065	PROJECT # 319874
REVISION NO. 4	WO#

REVISIONS

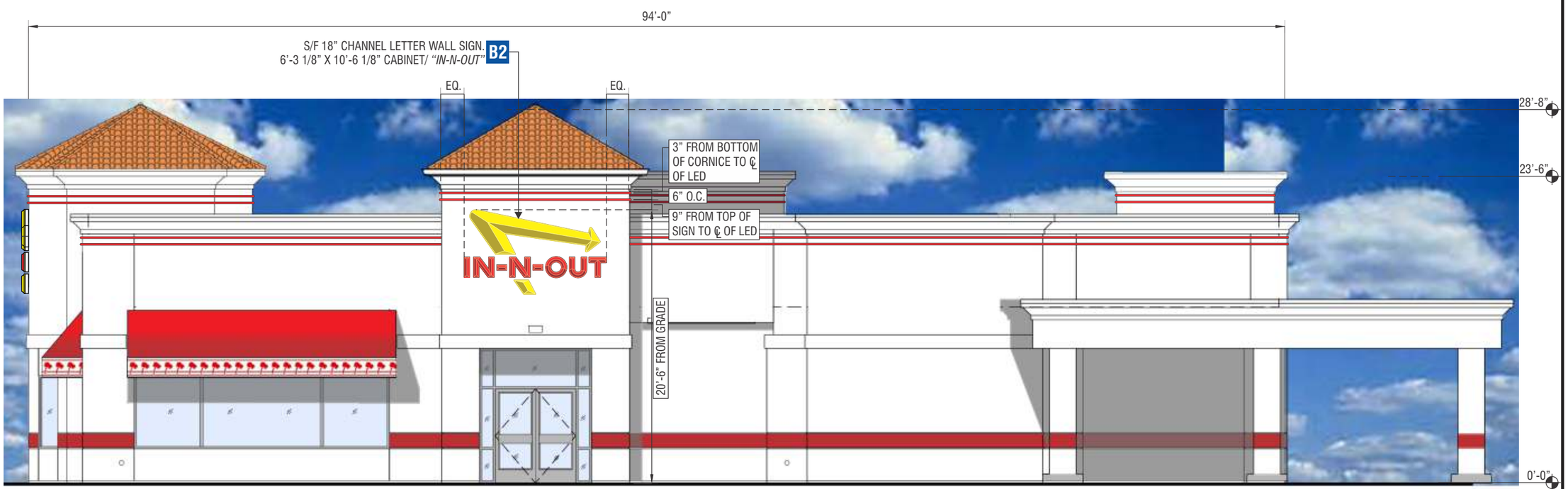
1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
A1

SHEET	2.5

WEST / FRONT ELEVATION

SCALE: 1/8" = 1'-0"



SOUTH / RIGHT ELEVATION

SCALE: 1/8" = 1'-0"

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
ELEVATIONS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

CUSTOMER APPROVAL

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DWG#	PROJECT #
16-1065	319874
REVISION NO. 4	WO#

REVISIONS

1	12/5/16	JM	7		
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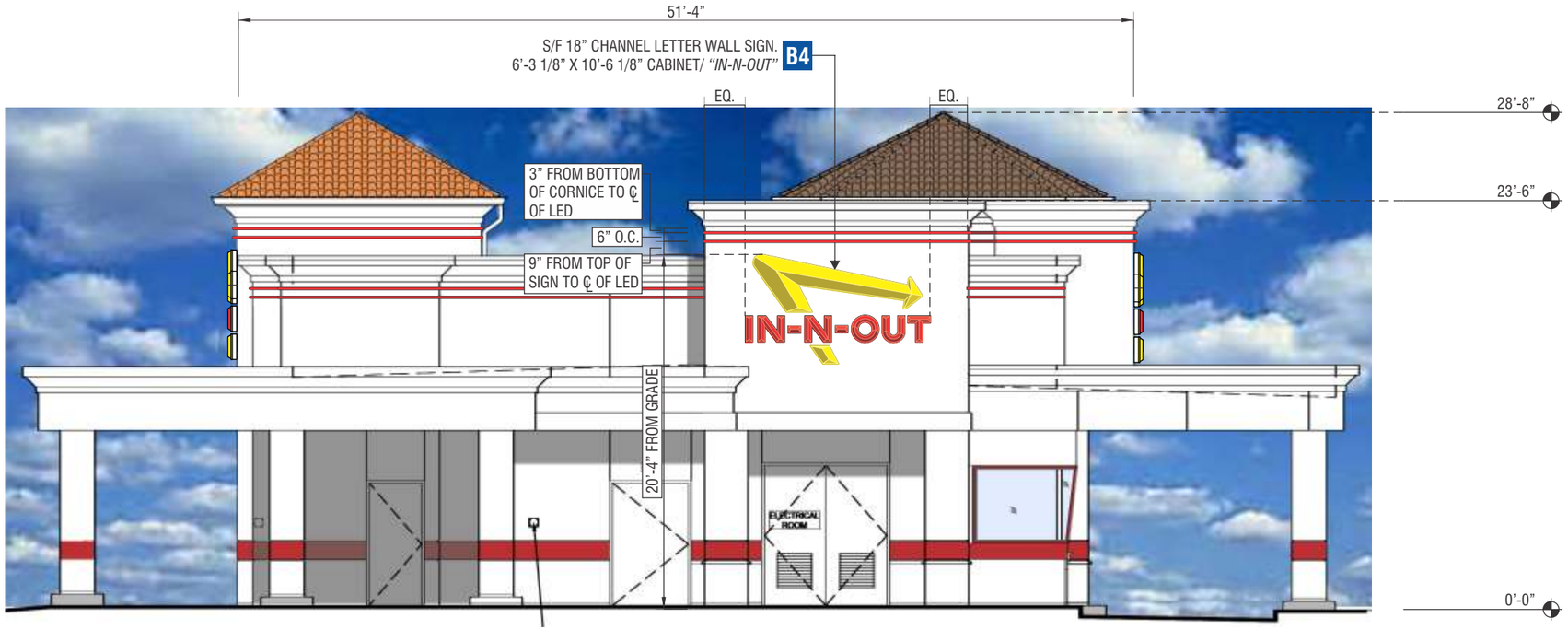
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

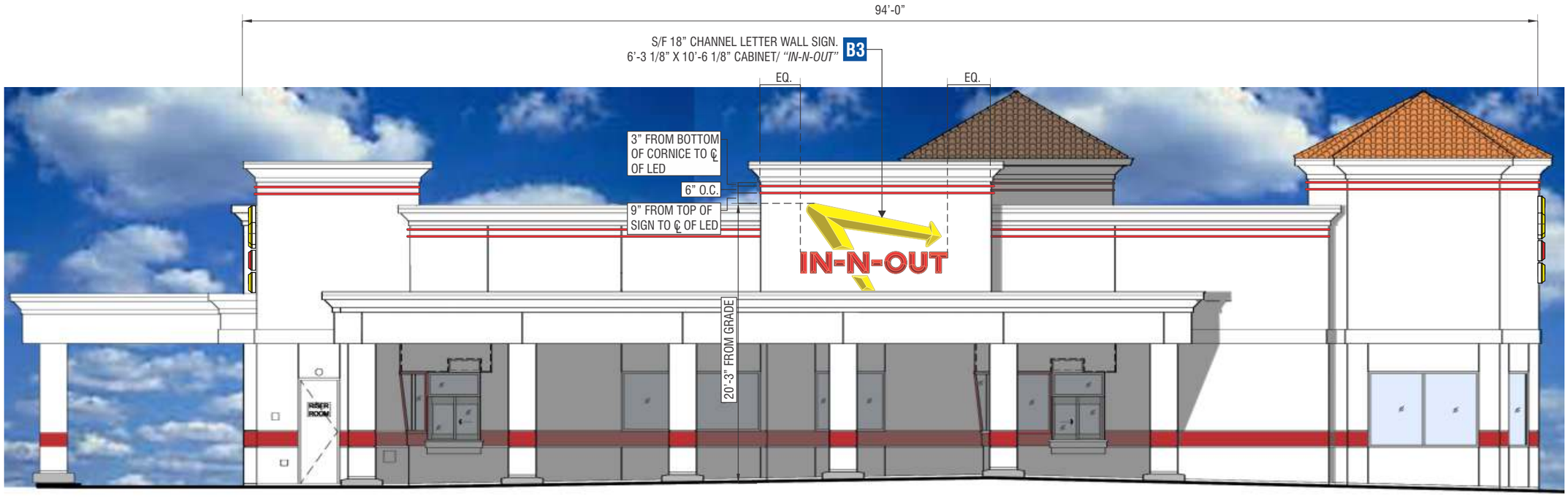
KEY NO.
B1 B2

SHEET	2.6



EAST / REAR ELEVATION

SCALE: 1/8" = 1'-0"



NORTH / LEFT ELEVATION

SCALE: 1/8" = 1'-0"

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
ELEVATIONS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 | SCALE NOTED

CUSTOMER APPROVAL

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DWG#	PROJECT #
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REVISION NO. 4	WO#

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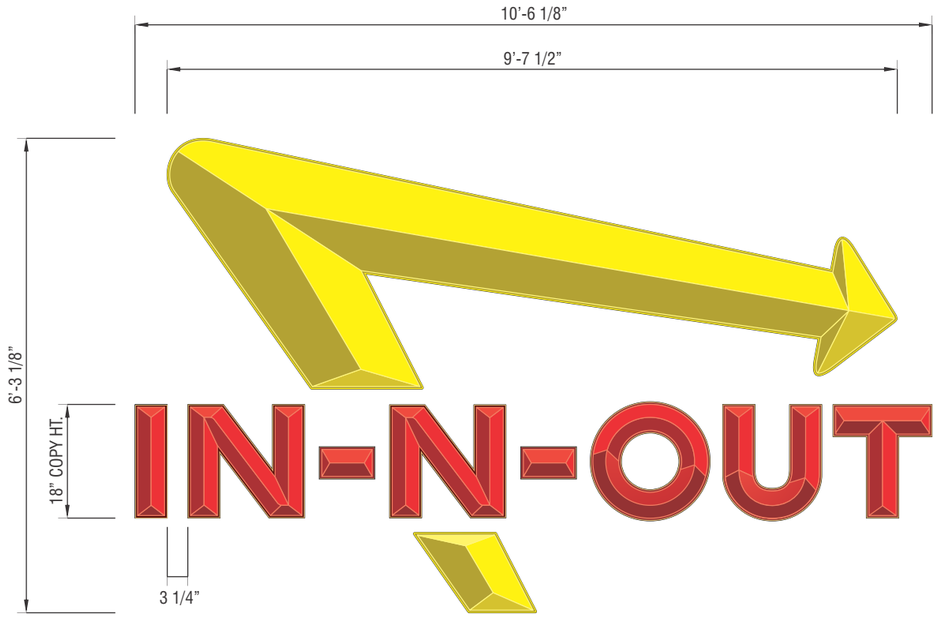
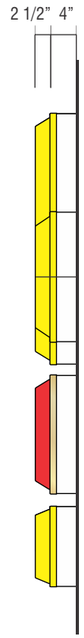
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
B3 B4

SHEET	2.7

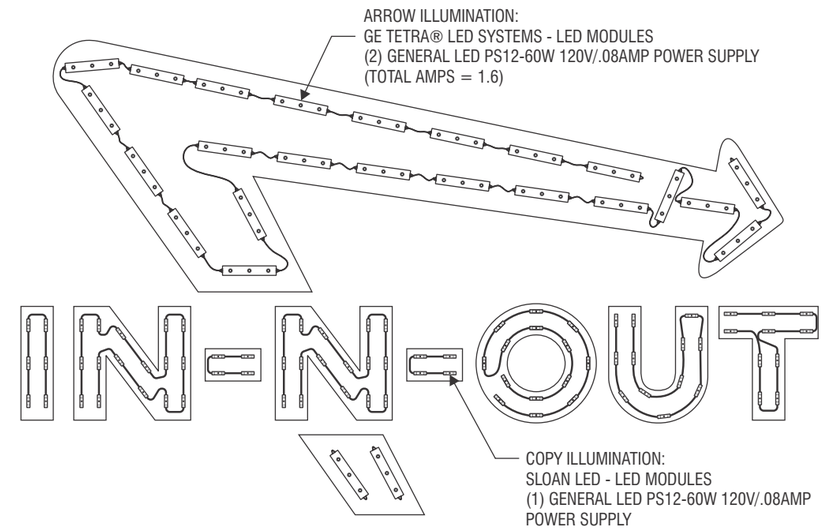


ELEVATION VIEW



SIDE VIEW

NOTES:
ALL LIGHTING COMPONENTS TO BE U.L. LISTED WITH DISCONNECT SWITCH @ POWER SUPPLY LOCATION (REMOTE). SIGNS PROVIDED WITH 3-WIRE 14 GAUGE JACK CABLE.



LIGHTING COMPONENT DETAIL

S/F 6' X 10' ILLUMINATED WALL SIGN

SCALE: 1/2" = 1'-0"

SIGN SPECIFICATIONS:

S/F INTERNALLY ILLUMINATED ALUMINUM CHANNEL LETTER SIGN DISPLAY WITH FORMED COPY & ARROW. COLORS/ MATERIAL PER BELOW:

ARROW:
FABRICATED CHANNEL WITH RETURNS PAINTED TO MATCH "BONE CHINA" SP 514 BY DUNN EDWARDS W/ SATIN FINISH. FORMED YELLOW #2037 ACRYLIC FACES. LED ILLUMINATION (SEE ABOVE).

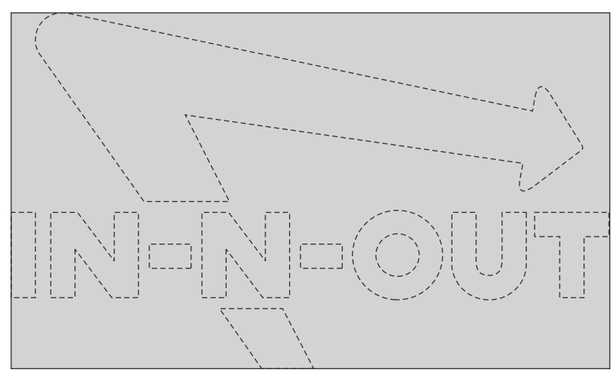
COPY:
FABRICATED CHANNEL WITH RETURNS PAINTED TO MATCH "BONE CHINA" SP 514 BY DUNN EDWARDS W/ SATIN FINISH. FORMED RED #211-1 ACRYLIC FACES WITH 1" GOLD TRIMCAP. RED LED ILLUMINATION (SEE ABOVE).

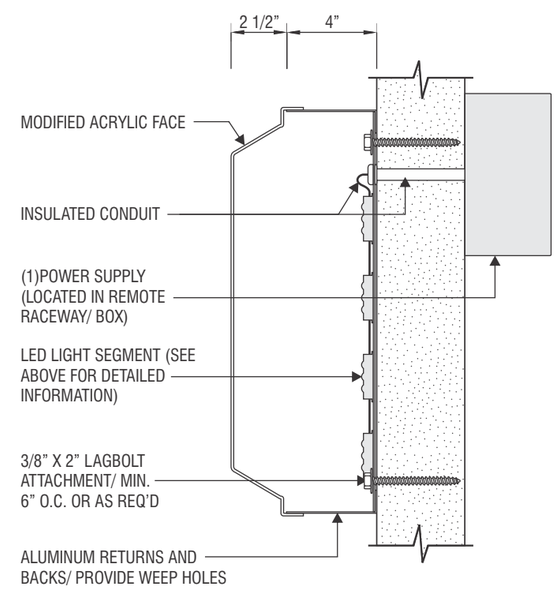
CHANNEL LETTERS TO BE 4" DEEP/ ALL SIGNS TO BE INSTALLED ONTO BUILDING AS REQUIRED.

SQUARE FOOTAGE CALCULATIONS:

TOTAL SIGN AREA: 65.8 S.F.

NOTE: GRAY INDICATES CALCULATED AREA





SECTION DETAIL (NOT TO SCALE)

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
WALL SIGNS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16
SCALE NOTED

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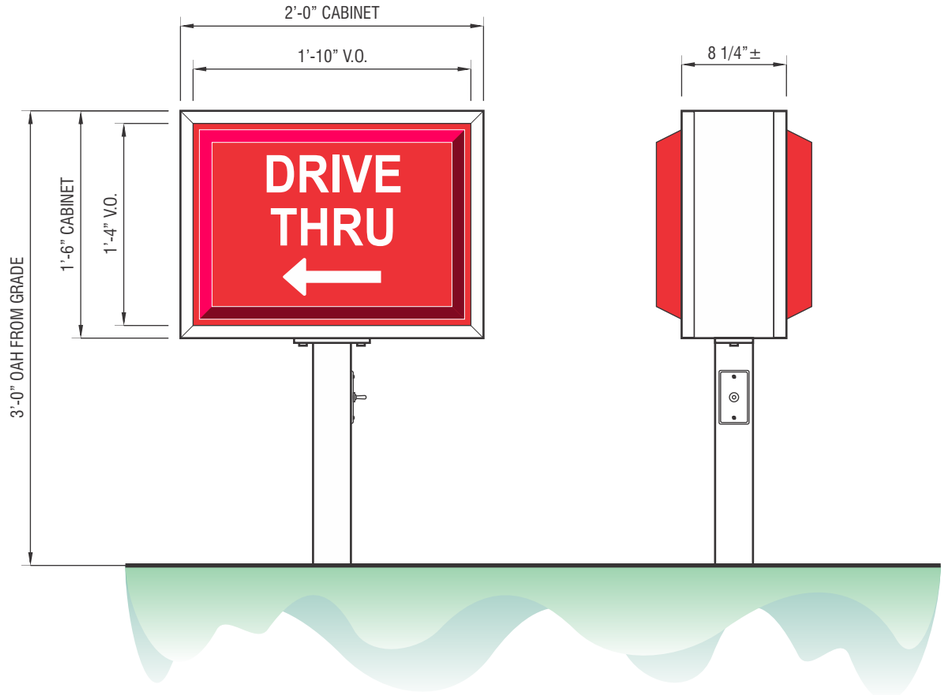
DWG#	PROJECT #
16-1065	319874
REVISION NO. 4	WO#

REVISIONS

1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
B1 B2 B3 B4

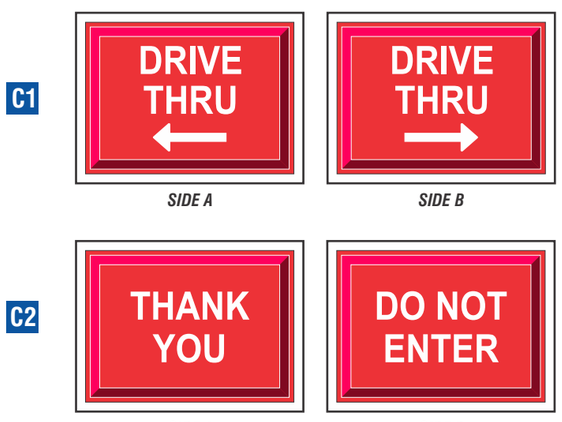
SHEET 2.8



ELEVATION VIEW *SIDE VIEW*

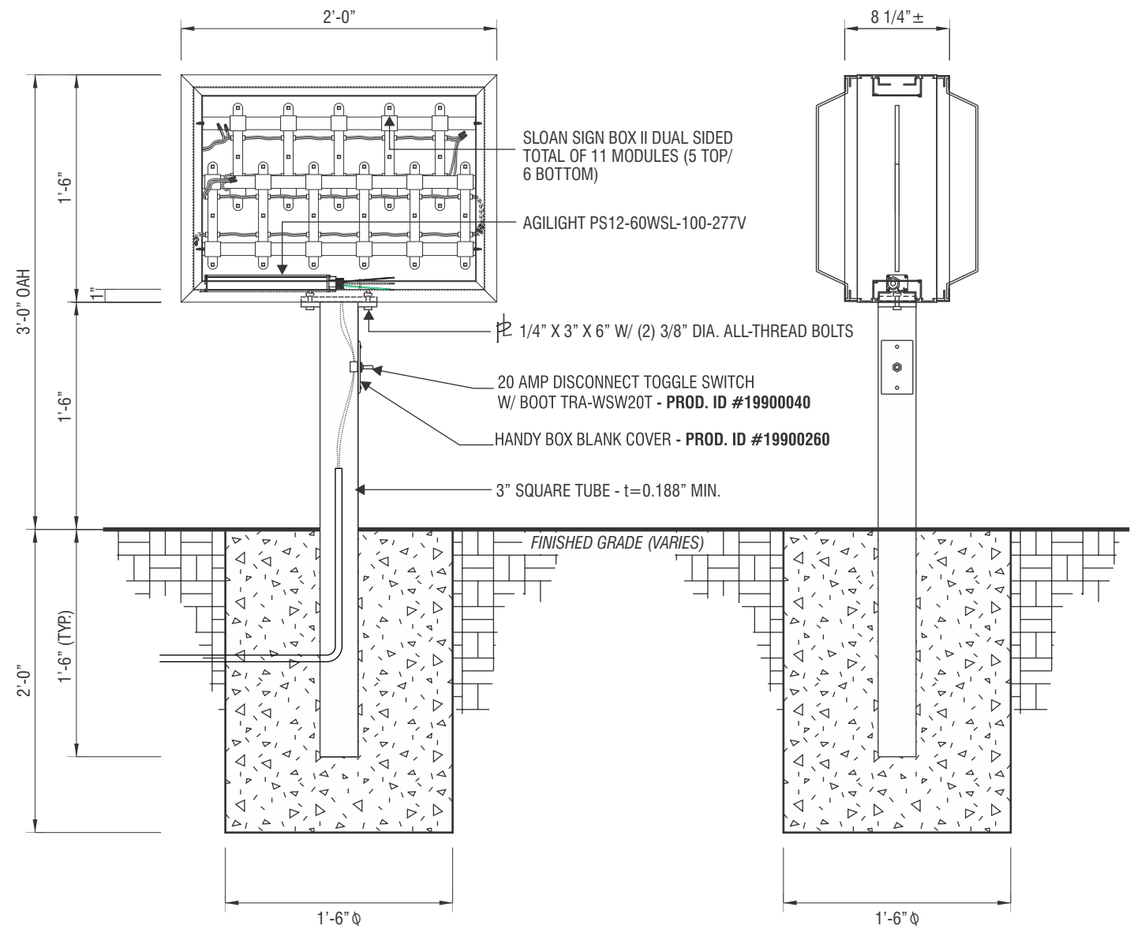
D/F INTERNALLY ILLUMINATED DIRECTIONAL SIGNS

SCALE: 1" = 1'-0"



SIDE A *SIDE B*

SIDE A *SIDE B*



ELEVATION VIEW *SIDE VIEW*

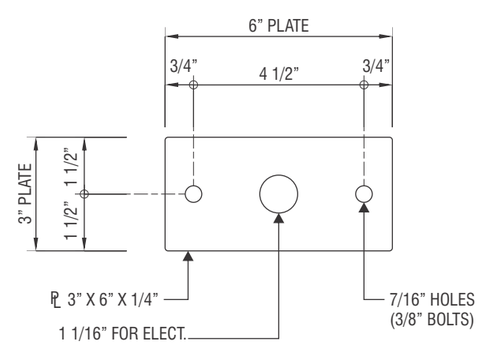


PLATE DETAIL

SCALE: 3" = 1'-0"

SIGN SPECIFICATIONS:

D/F INTERNALLY ILLUMINATED ALUMINUM DIRECTIONAL CABINET W/ FORMED FACES & ARROW. SIGN CABINET, RETAINERS PAINTED TO MATCH "BONE CHINA" SP 514 BY DUNN EDWARDS W/ SATIN FINISH. FORMED ACRYLIC PLASTIC FACES TO HAVE SECOND-SURFACE PAINTED GRAPHICS. BACKGROUND COLOR TO BE PAINTED INO 443 RED (25% CLEAR). LETTER COLOR TO BE PAINTED WHITE. SIGN CABINETS TO BE ILLUMINATED W/ SLOAN LED SIGN BOX II .

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
DIRECTIONALS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

CUSTOMER APPROVAL

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DWG# 16-1065	PROJECT # 319874
REVISION NO. 4	WO#

REVISIONS

1	12/5/16	JM	7		
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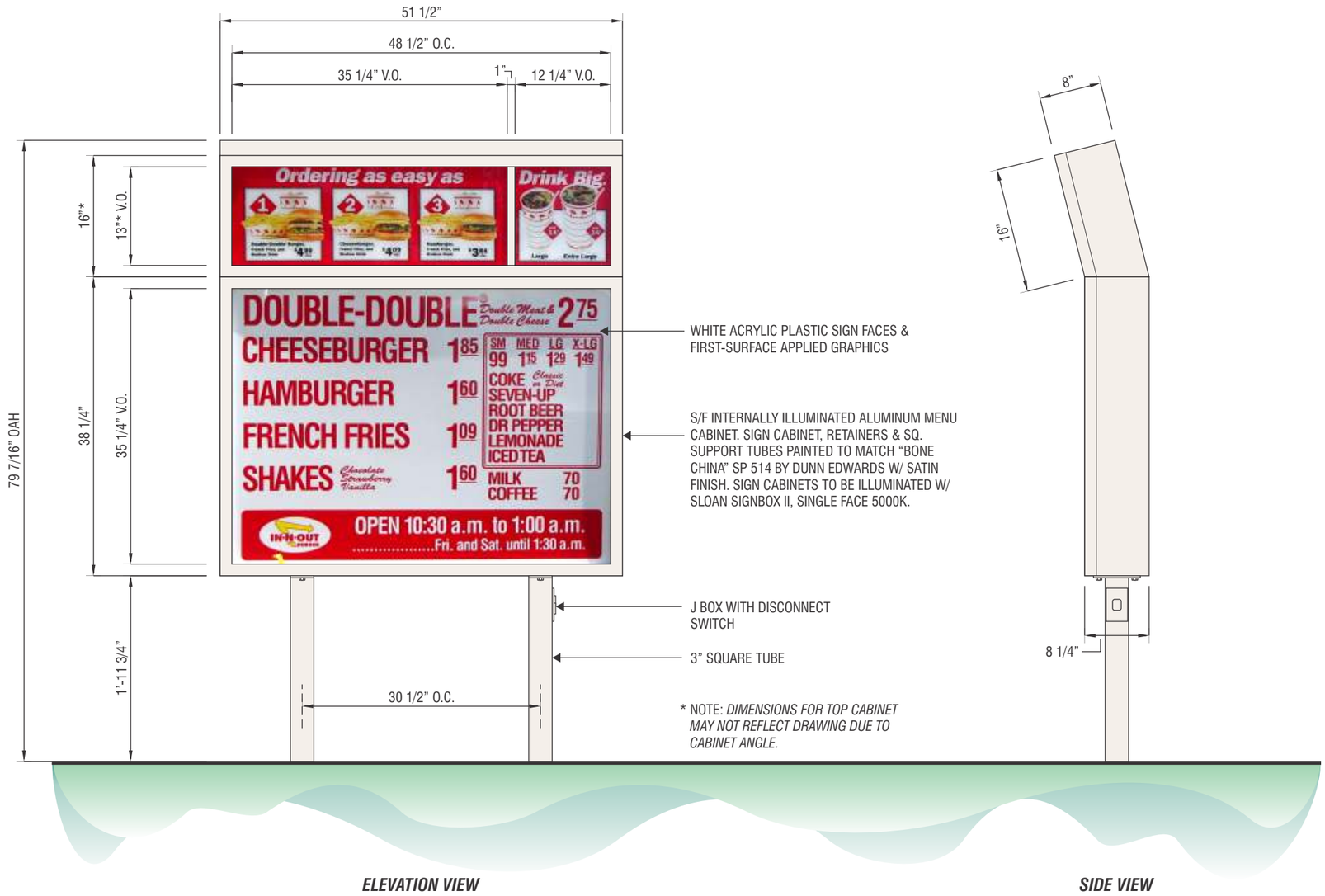
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
C1 C2

SHEET	2.9



S/F INTERNALLY ILLUMINATED MENU BOARD

SCALE: 3/4" = 1'-0"

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
MENU BOARD

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

CUSTOMER APPROVAL

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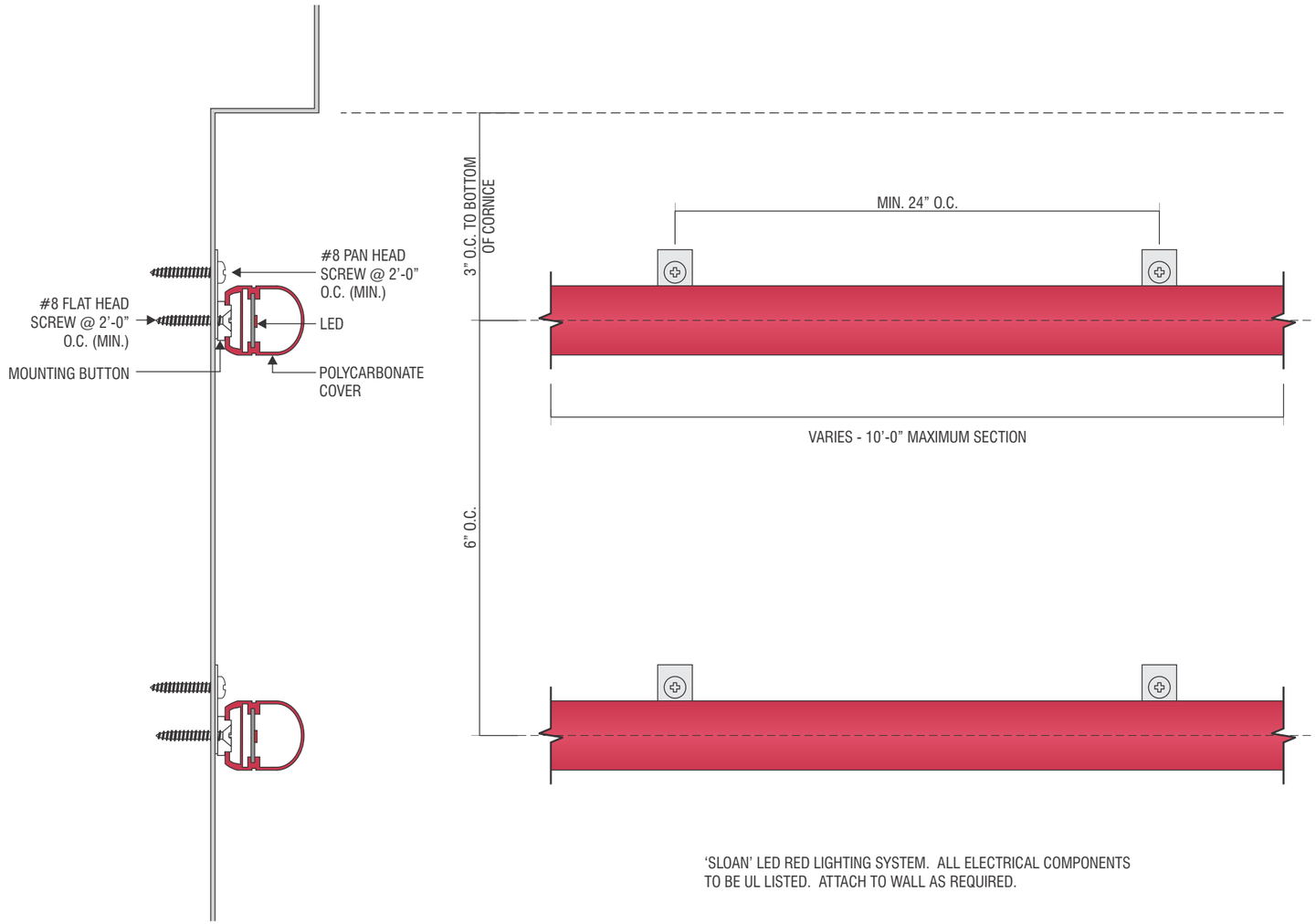
DWG# 16-1065	PROJECT # 319874
REVISION NO. 4	WO#

REVISIONS

1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
D1

SHEET	2.10



'SLOAN' LED RED LIGHTING SYSTEM. ALL ELECTRICAL COMPONENTS TO BE UL LISTED. ATTACH TO WALL AS REQUIRED.

LED BORDER

HALF SIZE

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
BORDER LED DETAIL

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

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DWG# 16-1065	PROJECT # 319874
REVISION NO. 4	WO#

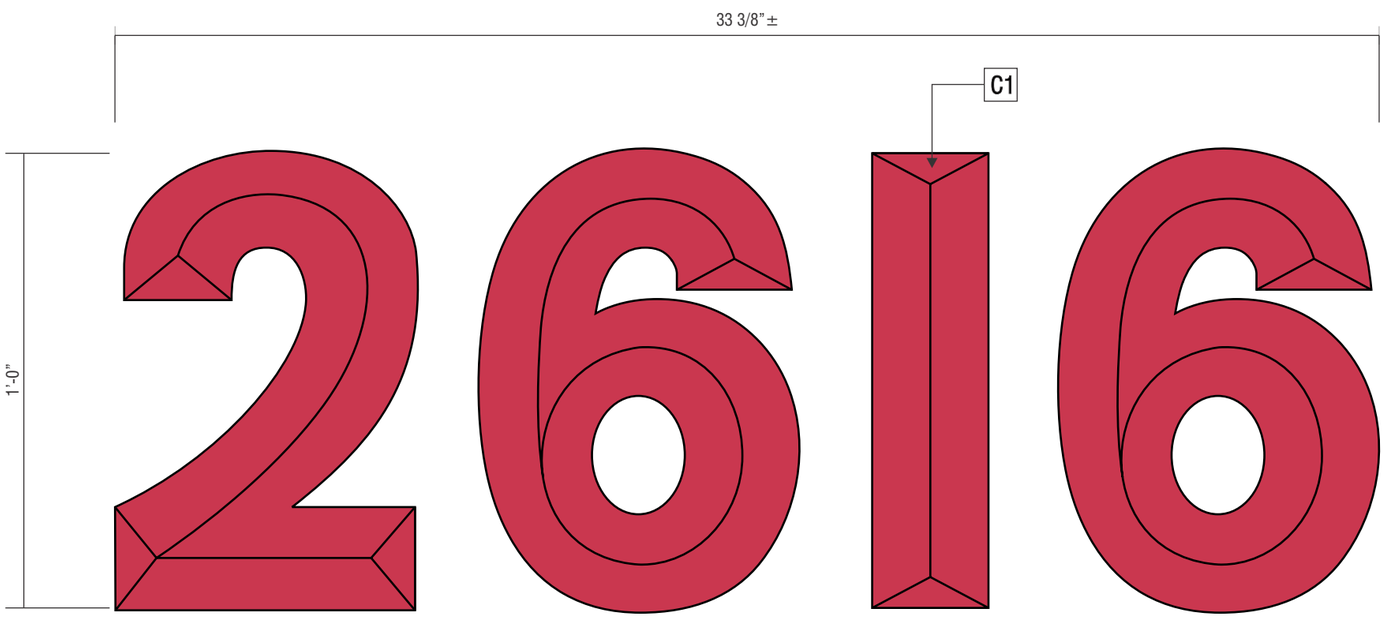
REVISIONS

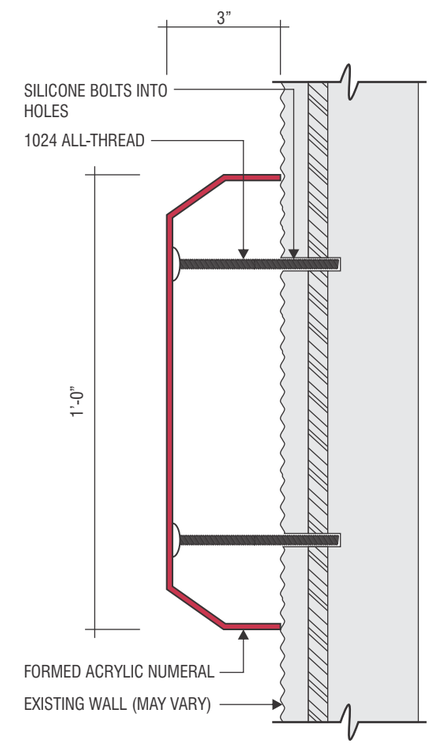
1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.

SHEET	2.11

COLOR SPECIFICATIONS	
C1	RED ACRYLIC #211-1





NON-ILLUMINATED 12" ADDRESS NUMERALS

SCALE: 3" = 1'-0"

CNP SIGNS & GRAPHICS
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San Diego, CA 92120
Tel: 619.283.2191
Fax: 619.283.9503
Web: www.cnpsigns.com

CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
NON-ILLUMINATED ADDRESS NUMERALS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16
SCALE NOTED

CUSTOMER APPROVAL

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DWG#	PROJECT #
16-1065	319874
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4	6/28/18	TT	10		
5			11		
6			12		

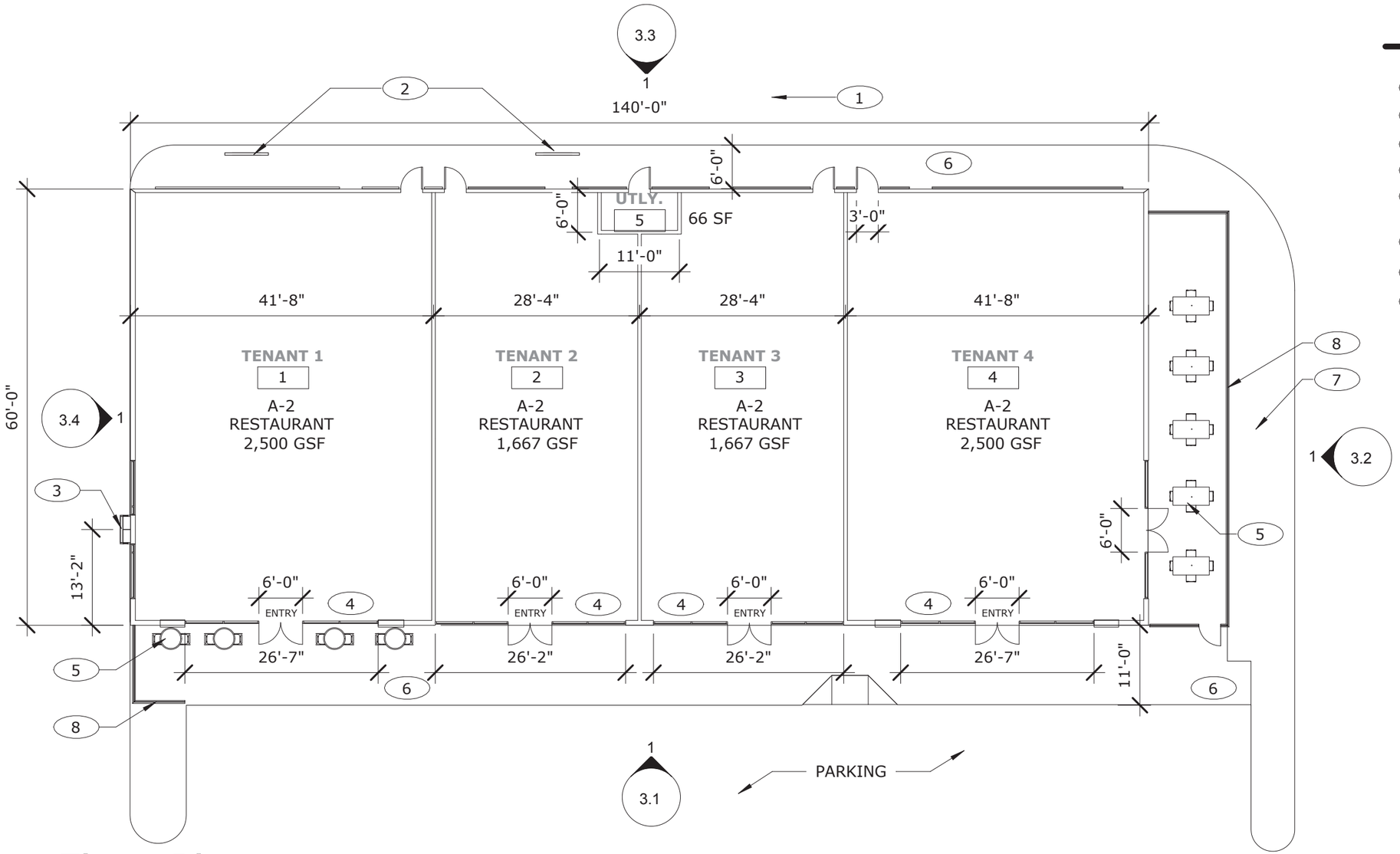
KEY NO.

SHEET	2.12

SHEET NOTES

(THIS SHEET ONLY)

1. DRIVE AISLE / DRIVE-THRU
2. DRIVE-THRU ORDER MENU
3. DRIVE-THRU WINDOW
4. STOREFRONT WINDOWS
5. PATIO FURNITURE WITH UMBRELLAS (FUTURE TENANT PROVIDED)
6. SIDEWALK
7. PLANTING - SEE LANDSCAPE PLAN
8. OUTDOOR SEATING - BLACK IRON RAILING



1 Floor Plan

1/16" = 1'-0"

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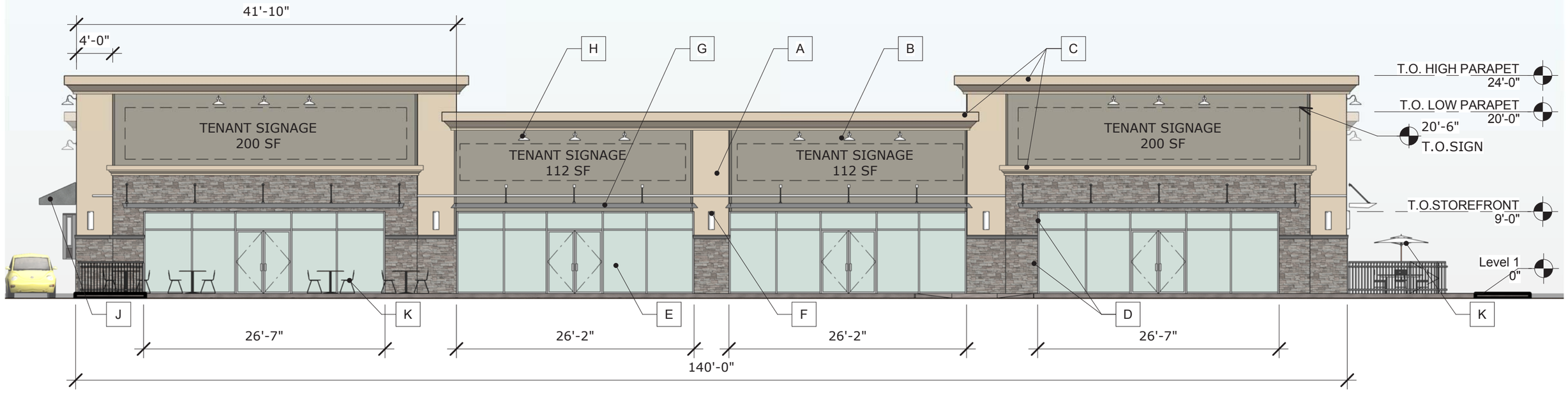
ARCHITECTURE +
INTERIOR DESIGN

DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET	3.0



1 EAST EXTERIOR ELEVATION

3/32" = 1'-0"

EXTERIOR FINISHES AND TREATMENTS

A	EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
B	EIFS SYSTEM - SAGE GREEN SEMI-SMOOTH TEXTURE FINISH
C	BEIGE EIFS CORNICE MOLDING
D	STONE VENEER AND CAP
E	CLEAR GLAZING / ALUMINUM FINISH STOREFRONT MULLIONS
F	VETICAL SCONCE - BRUSHED ALUMINUM FINISH
G	METAL TRELLIS AWNING - BRUSHED ALUMINUM
H	GOOSE NECK WALL SCONCE (LIGHTING) - BRUSHED ALUMINUM
J	COVERED CANVASED AWNING (DRIVE-THRU) - GRAY FINISH
K	OUTDOOR PATIO FURNITURE (FUTURE TENANT)
L	REAR ACCESS METAL DOORS - DARK GRAY FINISH
M	DRIVE-THRU WINDOW
N	DRIVE-THRU MENU BOARDS

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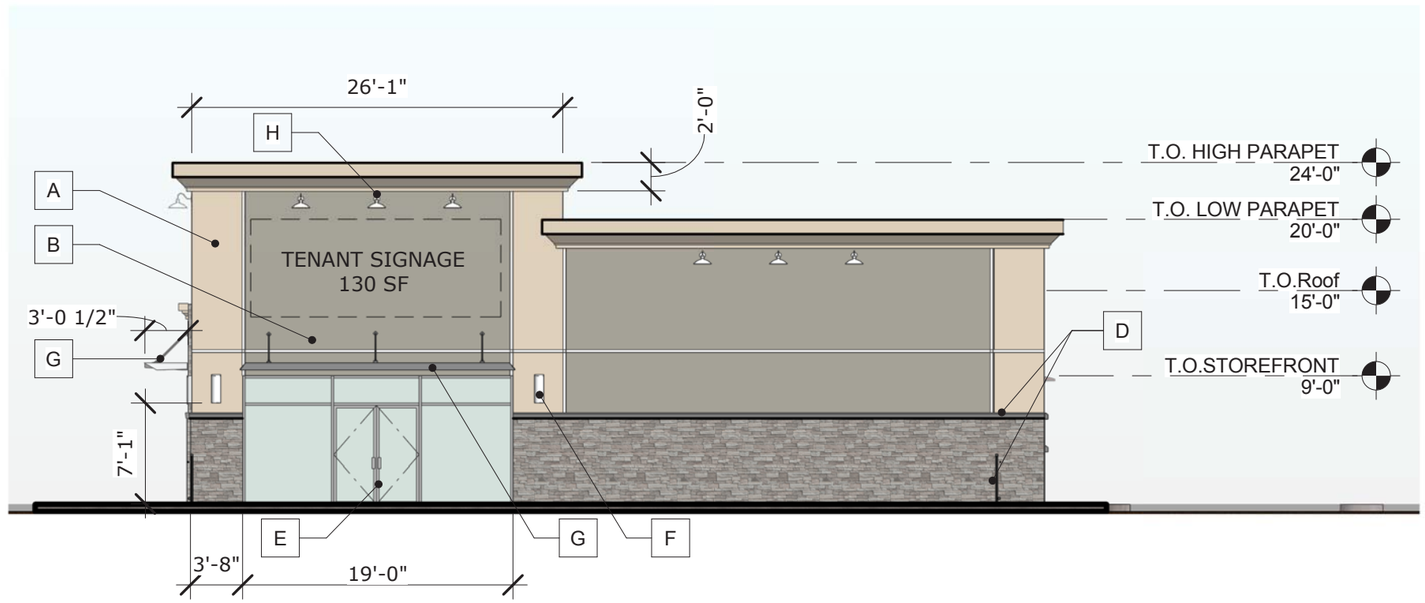
SHEET 3.1



1 NORTH EXTERIOR ELEVATION
3/32" = 1'-0"

EXTERIOR FINISHES AND TREATMENTS

- A EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
- B EIFS SYSTEM - SAGE GREEN SEMI-SMOOTH TEXTURE FINISH
- C BEIGE EIFS CORNICE MOLDING
- D STONE VENEER AND CAP
- E CLEAR GLAZING / ALUMINUM FINISH STOREFRONT MULLIONS
- F VETICAL SCONCE - BRUSHED ALUMINUM FINISH
- G METAL TRELLIS AWNING - BRUSHED ALUMINUM
- H GOOSE NECK WALL SCONCE (LIGHTING) - BRUSHED ALUMINUM
- J COVERED CANVASED AWNING (DRIVE-THRU) - GRAY FINISH
- K OUTDOOR PATIO FURNITURE (FUTURE TENANT)
- L REAR ACCESS METAL DOORS - DARK GRAY FINISH
- M DRIVE-THRU WINDOW
- N DRIVE-THRU MENU BOARDS

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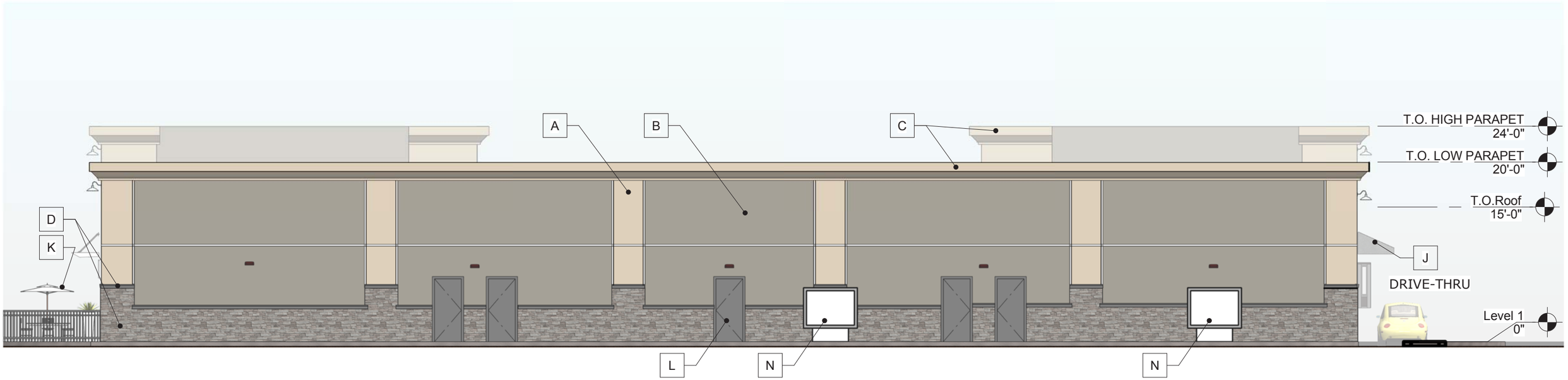
2616 BROADWAY REDEVELOPMENT
2616 BROADWAY EUREKA, CA

SHEET 3.2



1 WEST ELEVATION

3/32" = 1'-0"

EXTERIOR FINISHES AND TREATMENTS

A	EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
B	EIFS SYSTEM - SAGE GREEN SEMI-SMOOTH TEXTURE FINISH
C	BEIGE EIFS CORNICE MOLDING
D	STONE VENEER AND CAP
E	CLEAR GLAZING / ALUMINUM FINISH STOREFRONT MULLIONS
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M	DRIVE-THRU WINDOW
N	DRIVE-THRU MENU BOARDS

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DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET 3.3

1 SOUTH EXTERIOR ELEVATION
3/32" = 1'-0"

EXTERIOR FINISHES AND TREATMENTS

- A EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
- B EIFS SYSTEM - SAGE GREEN SEMI-SMOOTH TEXTURE FINISH
- C BEIGE EIFS CORNICE MOLDING
- D STONE VENEER AND CAP
- E CLEAR GLAZING / ALUMINUM FINISH STOREFRONT MULLIONS
- F VETICAL SCONCE - BRUSHED ALUMINUM FINISH
- G METAL TRELLIS AWNING - BRUSHED ALUMINUM
- H GOOSE NECK WALL SCONCE (LIGHTING) - BRUSHED ALUMINUM
- J COVERED CANVASED AWNING (DRIVE-THRU) - GRAY FINISH
- K OUTDOOR PATIO FURNITURE (FUTURE TENANT)
- L REAR ACCESS METAL DOORS - DARK GRAY FINISH
- M DRIVE-THRU WINDOW
- N DRIVE-THRU MENU BOARDS

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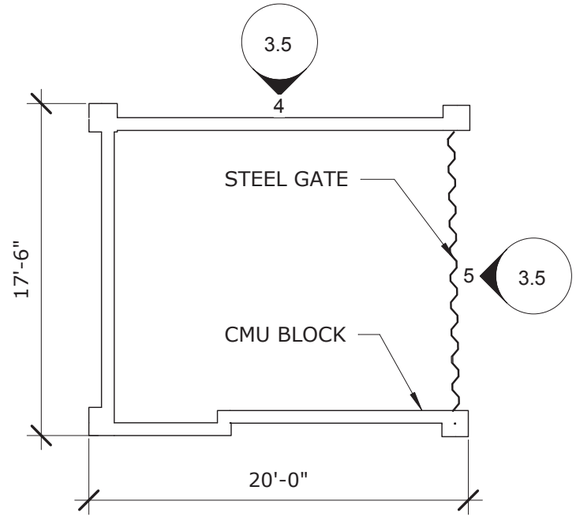
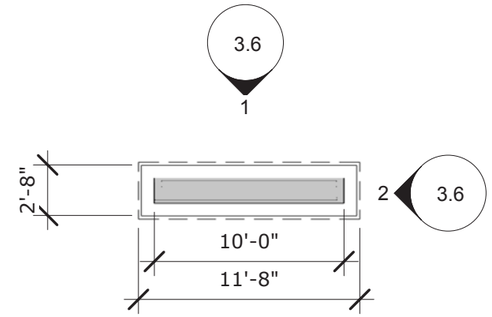
DESIGN REVIEW PACKAGE
2616 BROADWAY REDEVELOPMENT
2616 BROADWAY EUREKA, CA

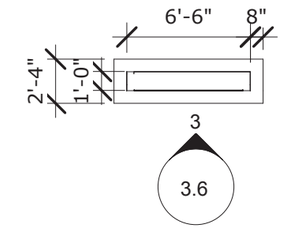
SHEET 3.4



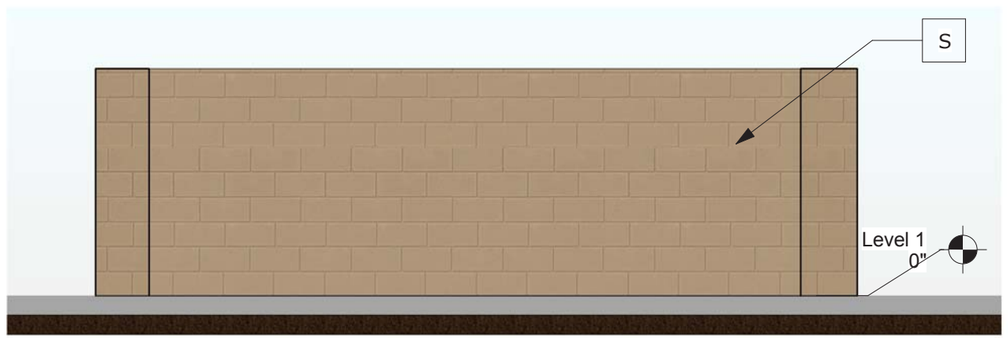
1 TRASH ENCLOSURE
1/8" = 1'-0"



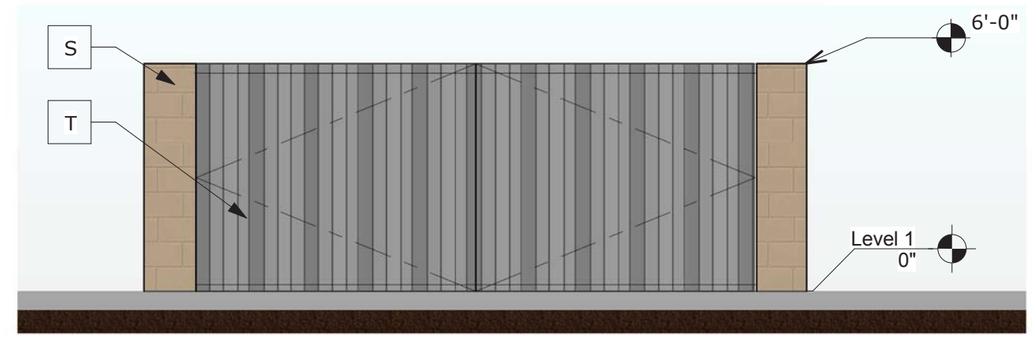
2 MONUMENT SIGN (MAJOR)
1/8" = 1'-0"



3 MONUMENT SIGN (MINOR)
1/8" = 1'-0"



4 TRASH ENCLOSURE ELEVATION 1
1/4" = 1'-0"



5 TRASH ENCLOSURE ELEVATION 2
1/4" = 1'-0"

EXTERIOR FINISHES AND TREATMENTS

S	TAN/BEIGE - SPLIT FACE CMU BLOCK AND CAP
T	CORRUGATED STEEL GATE - POWDER COAT GRAY FINISH

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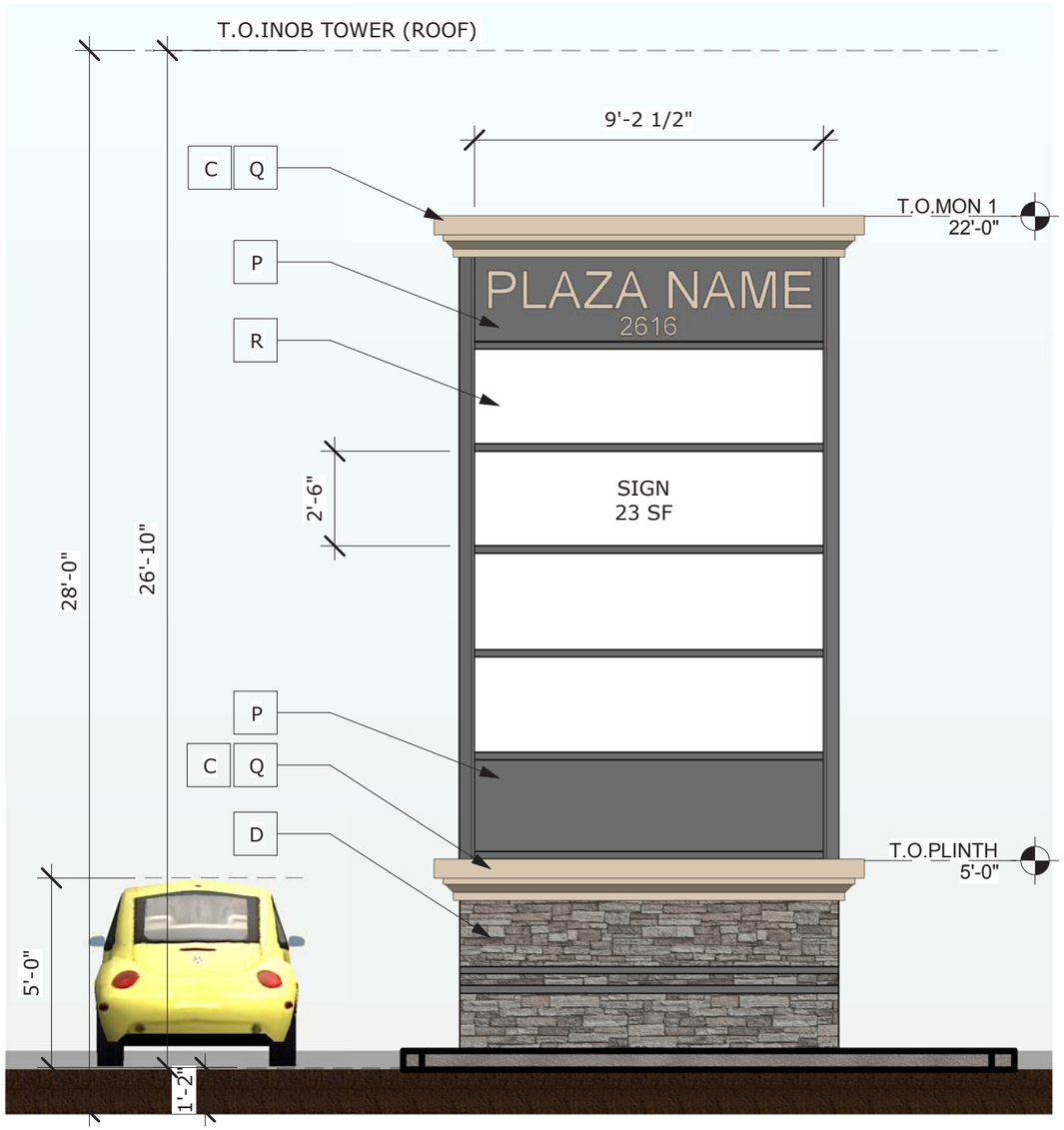
DESIGN REVIEW PACKAGE
2616 BROADWAY REDEVELOPMENT
2616 BROADWAY EUREKA, CA

SHEET	3.5

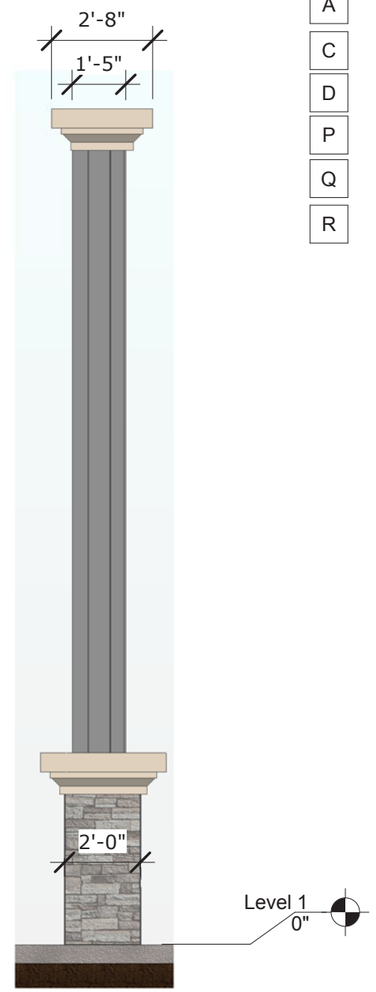
EXTERIOR FINISHES AND TREATMENTS

A	EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
C	BEIGE EIFS CORNICE MOLDING
D	STONE VENEER AND CAP
P	SHEET METAL - DARK GRAY PAINTED FINISH
Q	SHEET METAL CAP - PAINTED BEIGE
R	ILLUMINATED PANELS



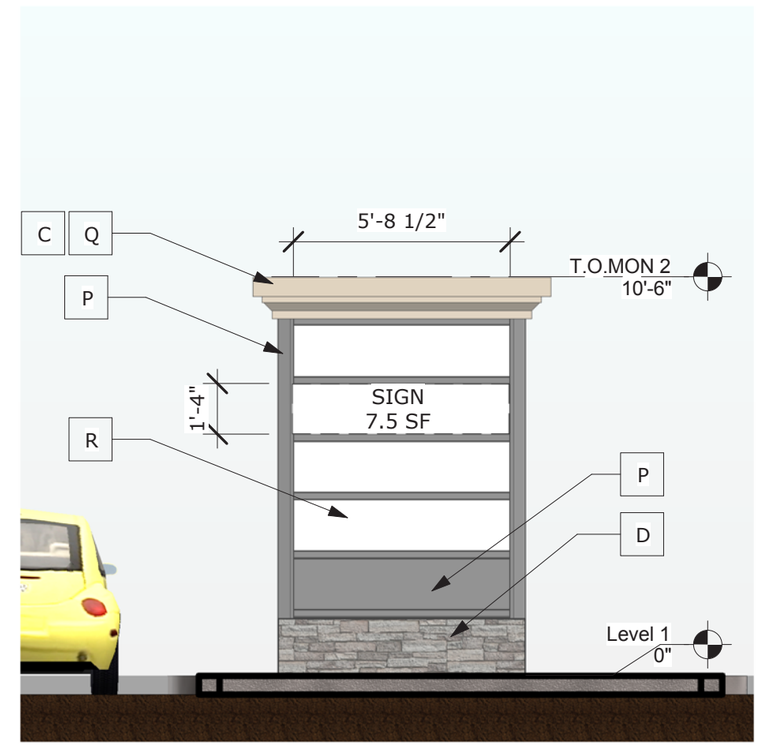
1 MONUMENT SIGN (MAJOR)

1/4" = 1'-0"



2 MONUMENT SIGN 1A

1/4" = 1'-0"



3 MONUMENT SIGN (MINOR)

1/4" = 1'-0"

MONUMENT SIGN (MAJOR) DIMENSIONS: 11'-8" (W) x 22'-0" (H) x 2'-8"(D)

DIMENSIONS PENDING STRUCTURAL REVIEW

MONUMENT SIGN (MINOR) DIMENSIONS: 7'-10" (W) x 10'-6" (H) x 2'-4"(D)

DIMENSIONS PENDING STRUCTURAL REVIEW

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DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

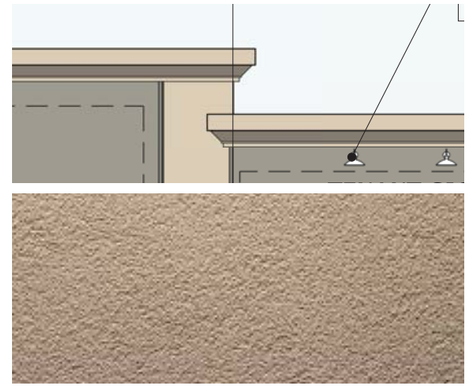
2616 BROADWAY EUREKA, CA

SHEET	3.6

A EIFS - BEIGE - SEMI SMOOTH TEXTURE FINISH

B EIFS - SAGE GREEN -SEMI SMOOTH TEXTURE FINISH

C IFS CORNICE MOLDING - BEIGE



D TONE VENEER AND CAP

E CLEAR GLAZING/ ALUMINUM FINISH STOREFRONT

F VERTICAL SCONCE - BRUSHED ALUMINUM FINISH

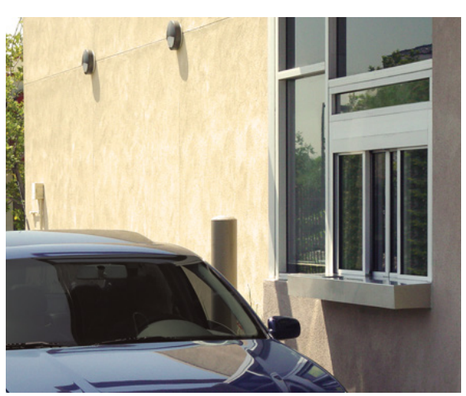
G METAL TRELLIS AWNING - BRUSHED ALUMINUM

H GOOSE NECK WALL SCONCE - BRUSHED ALUMINUM

J CANVASED AWNING (DRIVE-THRU) - GRAY FINISH

K PATIO FURNITURE (COLOR TBD) FUTURE TENANT

M DRIVE-THRU WINDOW



N DRIVE-THRU MENU BOARDS (FUTURE TENANT)

S SPLIT FACED CMU BLOCK - TAN/BEIGE COLOR

T CORRUGATED STEEL GATE - POWDER COAT GRAY

T SLATTED CHAIN LINK FENCE

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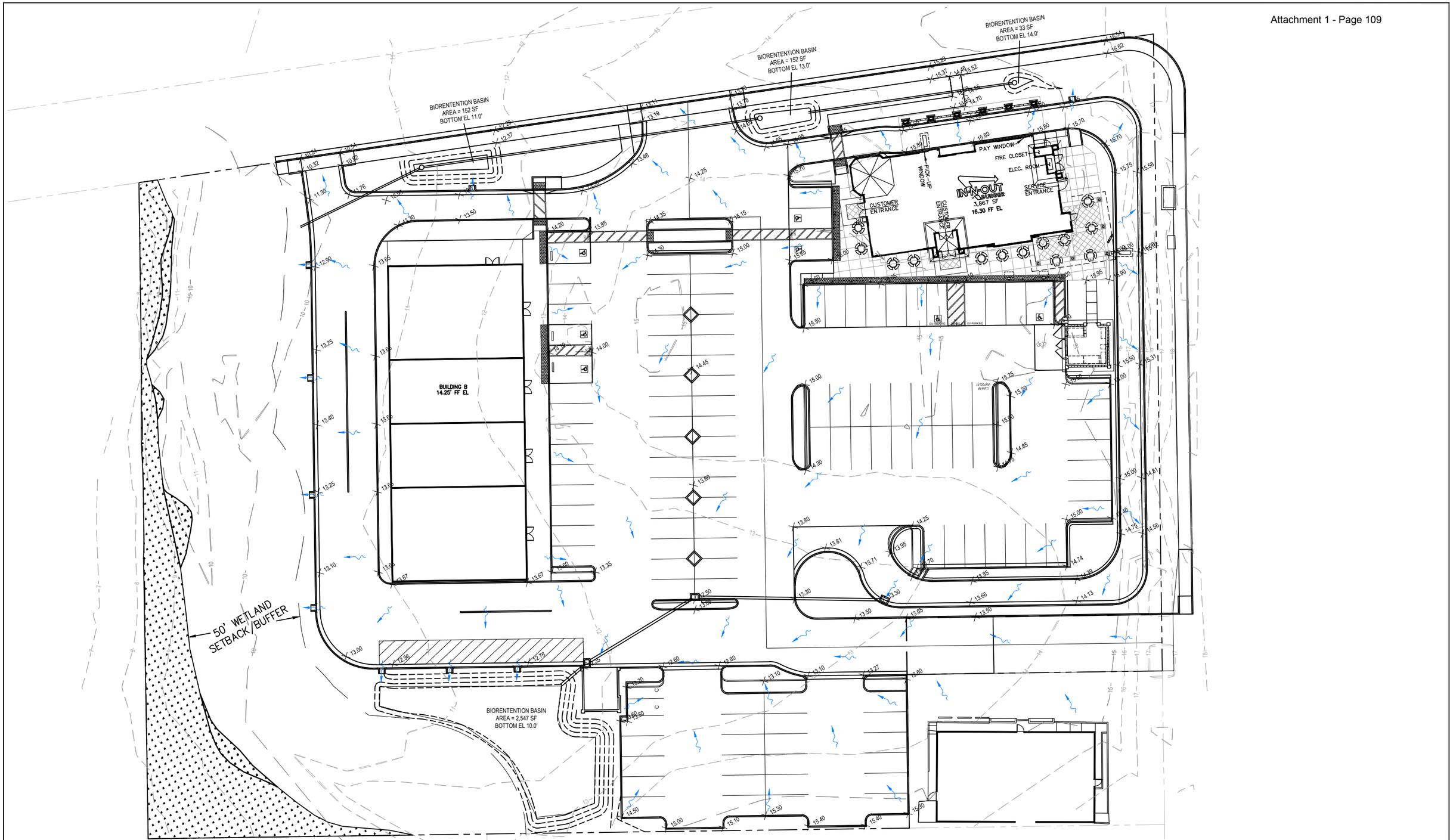
DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET 3.7



DESIGN STUDY

NOT FOR CONSTRUCTION

N

0 10' 20' 40'

Bar is one inch on original size sheet

0 1"

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REGISTERED PROFESSIONAL ENGINEER DAVID F. CAISSE No. C80962 CIVIL STATE OF CALIFORNIA

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Drawn	G.ZIRKEL	Designer	D.CAISSE
Drafting Check	D.CAISSE	Design Check	D.CAISSE
Project Manager	D.CAISSE	Date	9/5/2018
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Client THE CARRINGTON COMPANY

Project BROADWAY EUREKA REDEVELOPMENT

Title PRELIMINARY GRADING PLAN

Project No. 11153741

Original Size ANSI D

Sheet No. C-100

Sheet 1 of TBD

Plot Date: 5 September 2018 - 10:41 AM Plotted By: Gavin Zirkel Filename: G:\111\11153741 Carrington-Broadway Eureka Redevelopment\06-CAD\Sheets\11153741-INOB_Grading Plan.dwg

PLANT_SCHEDULE

TREES	BOTANICAL NAME / COMMON NAME	CONT SZ	WUCOLS	QTY
	Acer circinatum / Vine Maple LOW WATER USE EXPECTED IN COASTAL EUREKA	8` TRUNK HT	M	8
	Acer negundo / Box Elder A. NEGUNDO CALIFORNICA PREFERRED. LOW WATER USE EXPECTED IN COASTAL EUREKA	8` TRUNK HT	M	9
	Alnus rubra / Red Alder LOW WATER USE EXPECTED IN COASTAL EUREKA	15 gal	H	5
	Lyonothamnus floribundus asplenifolius / Fernleaf Catalina Ironwood	8` TRUNK HT	L	5
	Washingtonia robusta / Mexican Fan Palm PALM TREES INSTALLED TO CROSS.	FIELD DUG 20` TRUNK HT	L	2

SHRUBS	BOTANICAL NAME / COMMON NAME	SIZE	WUCOLS	QTY
	Agave x `Blue Glow` / Blue Glow Agave	5 gal	L	12
	Arctostaphylos uva-ursi `Point Reyes` / Kinnikinnick	1 gal	L	14
	Berberis thunbergii `Atropurpurea Nana` / Dwarf Redleaf Japanses Barberry	5 gal	M	35
	Callistemon citrinus `Little John` / Dwarf Bottle Brush	5 gal	L	19
	Carpenteria californica `Elizabeth` / Bush Anemone LOW WATER USE EXPECTED IN EUREKA	5 gal	M	20
	Ceanothus griseus horizontalis `Yankee Point` / California Lilac	5 gal	L	10
	Coprosma kirkii `Variegata` / Creeping Mirror Plant	1 gal	L	73
	Cornus sericea `Kelseyi` / Kelseyi Dogwood	15 gal	H	4
	Deschampsia cespitosa / Tufted Hair Grass	1 gal	L	221
	Juniperus communis var. australis `Pt. St. George` / Pt. St. George Dwarf Juniper	1 gal	L	3
	Lantana camara `Monine` TM / Monine Lantana	5 gal	L	8
	Leymus condensatus `Canyon Prince` / Native Blue Rye	5 gal	L	41
	Phormium tenax `Maori Maiden/Sunrise` / Tricolor New Zealand Flax	5 gal	L	44
	Polystichum munitum / Western Sword Fern LOW WATER USE EXPECTED IN COASTAL EUREKA	5 gal	M	16
	Russelia equisetiformis / Firecracker Plant	1 gal	M	5
	Trachelospermum jasminoides / Chinese Star Jasmine Pruned to hedge form - 2` H	5 gal	M	59
	Yucca gloriosa `Variegata` / Variegated Spanish Dagger	1 gal	L	8

GROUND COVERS	BOTANICAL NAME / COMMON NAME	CONT	WUCOLS	SPACING/AREA
	Fragaria chiloensis / Beach Strawberry LOW WATER USE EXPECTED IN COASTAL EUREKA	flat	M	18" o.c./1406 SF
	Juncus patens / California Gray Rush	flat	L	15" o.c./4722 SF
	Senecio mandraliscae / Blue Finger	flat	L	24" o.c./870 SF

MAXIMUM APPLIED WATER ALLOWANCE (MAWA)

ET_O	27.4	IN/YR
OVERHEAD LANDSCAPE AREA	0	FT^2
DRIP LANDSCAPE AREA	40037	FT^2
SPECIAL LANDSCAPE AREA	0	FT^2
TOTAL LANDSCAPE AREA	40037	FT^2

LANDSCAPE CALCULATIONS

DEVELOPED AREA LANDSCAPE	14,346 SF
BUFFER ZONE	25,691 SF
TOTAL LANDSCAPE AREA	40,037 SF 0.92 ACRE

MAWA CALCULATION INCORPORATING EFFECTIVE PRECIPITATION

TOTAL ANNUAL PRECIPITATION	40	IN/YR
EFFECTIVE PRECIPITATION (EPPT)	10	EPPT

$[(ET_O\text{-}EPPT) \times (0.62)] \times [(0.45 \times LA) + ((1.0\text{-}0.45) \times SLA)]$

194,364	GALLONS	
25,983	CF	
0.60	AC FT	
	MILLIONS OF	
0.19	GALLONS	

HYDROZONE	SYSTEM TYPE	PLANT WATER USE TYPE	PLANT FACTOR (PF)	HYDROZONE AREA (HA) WITHOUT SLA (FT^2)	IRRIGATION EFFICIENCY (IE)	$(PF \times HA/(FT^2))/IE$
1. LOW ZONE	DRIP	LOW	0.2	18750	0.81	4630
2. MOD ZONE	DRIP	MOD	0.5	21287	0.81	13140
3 HIGH ZONE	DRIP	HIGH	0.8	0	0.81	0
				40037		
					SUBTOTAL	17770
		SLA	1	0		0
					SUM	17770

ETWU WITH PRECIPITATION:
(ETO-EPPT) X 0.62 X [((PF X HA/IE) + SLA]

COMPLIES

191,700	GALLONS	
25,627	CF	
0.59	AC FT	
	MILLIONS OF	
0.19	GALLONS	

N

0 10' 20' 40'

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0 1"

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Drawn		Designer	
Drafting Check		Design Check	
Project Manager	D.CAISSE	Date	8/28/2018
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Client **THE CARRINGTON COMPANY**
Project **BROADWAY EUREKA REDEVELOPMENT**
Title **CONCEPTUAL LANDSCAPE PLAN**
REV. JULY 23, 2018

Project No. **11153741**
Original Size **ANSI D**
Sheet No.
Sheet of **TBD**

Appendix B CalEEMod Analysis

tblProjectCharacteristics

ProjectNa	LocationS	EMFAC_II	WindSpee	Precipitati	ClimateZo	Urbanizati	Operationa	UtilityCom	CO2Intens	CH4Intens	N2OIntens	TotalPopu	TotalLotAc	UsingHist	ConstructionPhaseStartDate
2616 Broa	C	HUM	2.2	103	1	Urban	2020	Pacific Ga	401	0.029	0.006	0	0.28	0	2019/01/14

tblPollutants

PollutantS	PollutantF	PollutantName
1	Reactive C	ROG
1	Nitrogen O	NOX
1	Carbon Mo	CO
1	Sulfur Dio	SO2
1	Particulate	PM10
1	Particulate	PM2_5
1	Fugitive PI	PM10_FUG
1	Fugitive PI	PM25_FUG
1	Biogenic C	CO2_BIO
1	Non-Bioge	CO2_NBIO
1	Carbon Di	CO2
1	Methane (	CH4
1	Nitrous Ox	N2O
1	CO2 Equiv	CO2E

tblLandUse

LandUseT	LandUseS	LandUseU	LandUseS	LotAcreag	LandUseS	Population	BuildingSp	GreenSpa	RecSwimmingArea	AllowEdit
Recreatior	Fast Food	6	1000sqft	0.14	6000	0	6000	0	0	
Recreatior	Fast Food	6.27	1000sqft	0.14	6267	0	6267	0	0	

tblConstructionPhase

PhaseNum	PhaseNam	PhaseTyp	PhaseStar	PhaseEnd	NumDaysV	NumDays	PhaseDescription
1	Demolition	Demolition	2019/01/1	2019/01/2	5	10	
2	Site Prepa	Site Prepa	2019/01/2	2019/01/2	5	1	
3	Grading	Grading	2019/01/2	2019/01/3	5	2	
4	Building C	Building C	2019/01/3	2019/06/1	5	100	
5	Paving	Paving	2019/06/2	2019/06/2	5	5	
6	Architectur	Architectur	2019/06/2	2019/07/0	5	5	

tblOffRoadEquipment

PhaseNam	OffRoadEc	OffRoadEc	UsageHou	HorsePow	LoadFactor
Demolition	Concrete/I	1	8	81	0.73
Demolition	Rubber Tir	1	1	247	0.4
Demolition	Tractors/L	2	6	97	0.37
Site Prepa	Graders	1	8	187	0.41
Site Prepa	Tractors/L	1	8	97	0.37
Grading	Concrete/I	1	8	81	0.73
Grading	Rubber Tir	1	1	247	0.4
Grading	Tractors/L	2	6	97	0.37
Building C	Cranes	1	4	231	0.29
Building C	Forklifts	2	6	89	0.2
Building C	Tractors/L	2	8	97	0.37
Paving	Cement ar	4	6	9	0.56
Paving	Pavers	1	7	130	0.42
Paving	Rollers	1	7	80	0.38
Paving	Tractors/L	1	7	97	0.37
Architectur	Air Compre	1	6	78	0.48

tblTripsAndVMT

PhaseNam	WorkerTrip	VendorTrip	HaulingTrip	WorkerTrip	VendorTrip	HaulingTrip	WorkerVeh	VendorVeh	HaulingVehicleClass
Demolition	10	0	41	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Site Prepa	5	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Grading	10	0	250	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Building C	5	2	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Paving	18	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT
Architectur	1	0	0	10.8	7.3	20	LD_Mix	HDT_Mix	HHDT

tblOnRoadDust

PhaseNam	WorkerPer	VendorPer	HaulingPe	RoadSiltLc	MaterialSil	MaterialMc	AverageVe	MeanVehicleSpeed
Demolition	100	100	100	0.1	8.5	0.5	2.4	40
Site Prepa	100	100	100	0.1	8.5	0.5	2.4	40
Grading	100	100	100	0.1	8.5	0.5	2.4	40
Building C	100	100	100	0.1	8.5	0.5	2.4	40
Paving	100	100	100	0.1	8.5	0.5	2.4	40
Architectur	100	100	100	0.1	8.5	0.5	2.4	40

tblDemolition

PhaseNam	Demolition	DemolitionUnit	Amount
Demolition	Building S(		9000

tblGrading

PhaseNam	MaterialIm	MaterialEx	GradingSi:	ImportExp	MeanVehi	AcresOfGr	MaterialMc	MaterialMc	MaterialSiltContent
Site Prepa	0	0		0	7.1	0.5	7.9	12	6.9
Grading	2000	500	Cubic Yarc	1	7.1	0	7.9	12	6.9

tblArchitecturalCoating

PhaseNam	Architectur	Architectur	EF_Reside	ConstArea	EF_Reside	ConstArea	EF_Nonre	ConstArea	EF_Nonre	ConstArea	EF_Parkin	ConstArea_Parking
Architectur	1900/01/0	3000/12/3	250	0	250	0	250	18401	250	6134	250	0

tblPaving

ParkingLotAcreage

tblVehicleTrips

VehicleTri	VehicleTri	WD_TR	ST_TR	SU_TR	HW_TL	HS_TL	HO_TL	CC_TL	CW_TL	CNW_TL	PR_TP	DV_TP	PB_TP	HW_TTP	HS_TTP	HO_TTP	CC_TTP	CW_TTP	CNW_TTP
Fast Food	1000sqft	79.65	79.65	79.65	0	0	0	7.3	9.5	7.3	51	37	12	0	0	0	79.5	1.5	19
Fast Food	1000sqft	108.34	108.34	108.34	0	0	0	7.3	9.5	7.3	29	21	50	0	0	0	78.8	2.2	19

tblVehicleEF

Season	EmissionT	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
A	CH4_IDLE	0	0	0	0	0.004794	0.002854	0.022379	0.658915	0.015166	0	0	1.017569	0
A	CH4_RUN	0.00929	0.048901	0.016969	0.028405	0.040317	0.013182	0.017998	0.009358	0.016257	0.120086	0.411191	0.011804	0.149923
A	CH4_STR	0.014066	0.058638	0.025177	0.048366	0.025449	0.007911	0.119788	0.311753	0.055077	0.083743	0.194333	0.107625	0.071319
A	CO_IDLE)	0	0	0	0	0.134467	0.10784	0.598014	3.162868	0.317338	0	0	4.107251	0
A	CO_RUNE	0.93408	4.493683	1.637673	2.427249	2.283983	1.029992	1.063145	0.833884	0.984027	4.790667	25.21704	0.680104	11.92201
A	CO_STRE	2.823173	11.39532	4.989404	8.458353	3.530818	1.11347	12.2777	4.485275	9.725752	14.57672	10.70706	4.771675	15.65185
A	CO2_NBI(	0	0	0	0	9.921955	16.0281	157.0918	5012.09	154.3581	0	0	1384.004	0
A	CO2_NBI(	272.9002	347.4518	388.9385	512.9396	676.1448	709.7236	1231.518	1643.125	1316.782	2072.398	163.4424	1210.873	1247.227
A	CO2_NBI(	62.69586	78.63398	89.79406	116.5242	21.1541	14.2548	55.46282	9.081855	63.82761	133.7786	50.34356	22.15511	65.08745
A	NOX_IDLE	0	0	0	0	0.127398	0.158901	1.23503	24.1775	0.900577	0	0	15.35063	0
A	NOX_RUN	0.115416	0.586985	0.274211	0.470023	4.083672	2.614076	3.351458	5.198666	2.425433	7.967088	1.259719	6.331114	3.289645
A	NOX_STR	0.19646	0.617556	0.489724	0.850856	1.027298	0.458382	12.46375	20.12422	5.115657	13.96978	0.337359	17.59045	1.938798
A	PM10_IDL	0	0	0	0	0.00144	0.001711	0.010204	0.055667	0.0004	0	0	0.017817	0
A	PM10_PM	0.03675	0.03675	0.03675	0.03675	0.07644	0.08918	0.13034	0.059327	0.13034	0.536037	0.01176	0.7448	0.13034
A	PM10_PM	0.008	0.008	0.008	0.008	0.010689	0.011248	0.012	0.03452	0.012	0.012	0.004	0.01144	0.01291
A	PM10_RU	0.002277	0.005302	0.002029	0.002347	0.037914	0.030398	0.064149	0.032362	0.010377	0.142682	0.001996	0.035512	0.050119
A	PM10_STI	0.00259	0.006266	0.002778	0.003468	0.001054	0.000288	0.001498	0.000166	0.000678	0.000764	0.005402	0.000236	0.002935
A	PM25_IDL	0	0	0	0	0.001378	0.001637	0.009763	0.053259	0.000383	0	0	0.017047	0
A	PM25_PM	0.01575	0.01575	0.01575	0.01575	0.03276	0.03822	0.05586	0.025426	0.05586	0.22973	0.00504	0.3192	0.05586
A	PM25_PM	0.002	0.002	0.002	0.002	0.002672	0.002812	0.003	0.00863	0.003	0.003	0.001	0.00286	0.003228
A	PM25_RU	0.002111	0.004893	0.001867	0.002169	0.036221	0.029068	0.061367	0.030962	0.009919	0.136489	0.001884	0.03397	0.047817
A	PM25_STI	0.002381	0.005766	0.002555	0.003193	0.00097	0.000265	0.001377	0.000153	0.000623	0.000703	0.005132	0.000217	0.002721
A	ROG_DIU	0.039178	0.175138	0.064504	0.084866	0.002028	0.000561	0.001468	0.000156	0.001325	0.003212	0.683367	0.001487	1.380408
A	ROG_HTS	0.181702	0.681764	0.273489	0.363074	0.123544	0.032985	0.095016	0.012536	0.03139	0.075694	1.033982	0.021325	0.175145
A	ROG_IDLE	0	0	0	0	0.016635	0.013145	0.057713	0.885247	0.048614	0	0	0.510515	0
A	ROG_RES	0.033715	0.136869	0.056683	0.075411	0.000983	0.000292	0.000728	0.000082	0.000595	0.001813	0.413592	0.000605	0.476568
A	ROG_RUN	0.023844	0.123971	0.042366	0.077482	0.259719	0.172611	0.183533	0.154792	0.102084	0.496176	2.62633	0.133253	0.465988
A	ROG_RUN	0.057668	0.533511	0.189687	0.279491	0.545168	0.106114	0.077561	0.002059	0.064311	0.014306	1.249243	0.014155	0.060889
A	ROG_STR	0.189717	0.790958	0.339561	0.652575	0.343234	0.10669	0.782629	0.262358	0.62512	1.129374	2.657754	0.254073	0.964119
A	SO2_IDLE	0	0	0	0	0.000098	0.000155	0.001511	0.047818	0.001484	0	0	0.013324	0
A	SO2_RUN	0.002738	0.003544	0.00391	0.005157	0.006602	0.006857	0.011816	0.015683	0.01272	0.019532	0.002119	0.0116	0.012545
A	SO2_STR	0.000676	0.00099	0.000986	0.001317	0.000278	0.000163	0.000772	0.00017	0.00081	0.001602	0.000758	0.000304	0.000927
A	TOG_DIUI	0.039178	0.175138	0.064504	0.084866	0.002028	0.000561	0.001468	0.000156	0.001325	0.003212	0.683367	0.001487	1.380408
A	TOG_HTS	0.181702	0.681764	0.273489	0.363074	0.123544	0.032985	0.095016	0.012536	0.03139	0.075694	1.033982	0.021325	0.175145
A	TOG_IDLE	0	0	0	0	0.022544	0.016977	0.073022	1.007786	0.064766	0	0	0.71968	0
A	TOG_RES	0.033715	0.136869	0.056683	0.075411	0.000983	0.000292	0.000728	0.000082	0.000595	0.001813	0.413592	0.000605	0.476568
A	TOG_RUN	0.034465	0.179636	0.061659	0.109933	0.320974	0.201138	0.217435	0.178164	0.126543	0.657989	3.125091	0.156735	0.641255
A	TOG_RUN	0.057668	0.533511	0.189687	0.279491	0.545168	0.106114	0.077561	0.002059	0.064311	0.014306	1.249243	0.014155	0.060889
A	TOG_STR	0.207704	0.865907	0.371762	0.714308	0.375783	0.116812	0.85688	0.287249	0.684427	1.236523	2.888311	0.278178	1.054243
S	CH4_IDLE	0	0	0	0	0.004794	0.002854	0.020423	0.62271	0.015105	0	0	1.016365	0
S	CH4_RUN	0.009324	0.048512	0.017042	0.028521	0.041134	0.013328	0.018251	0.009412	0.016522	0.120983	0.395133	0.01193	0.154727
S	CH4_STR	0.01278	0.052716	0.022877	0.043934	0.024374	0.007596	0.114349	0.29656	0.053231	0.07784	0.17023	0.10197	0.068199
S	CO_IDLE)	0	0	0	0	0.134467	0.10784	0.396223	2.315296	0.293885	0	0	3.915518	0
S	CO_RUNE	0.924657	4.409302	1.619515	2.385175	2.31361	1.035307	1.075486	0.837961	0.997974	4.827891	23.32236	0.686676	12.04759
S	CO_STRE	2.498051	9.98057	4.410442	7.48661	3.316816	1.051136	11.47574	4.170864	9.290535	12.81942	9.675995	4.333765	14.78979
S	CO2_NBI(	0	0	0	0	9.921955	16.0281	166.8598	5303.591	162.5989	0	0	1459.738	0
S	CO2_NBI(	272.7388	347.2661	388.7163	512.6539	676.1448	709.7236	1231.518	1643.125	1316.782	2072.398	163.4424	1210.873	1247.227
S	CO2_NBI(	62.69586	78.63398	89.79406	116.5242	21.1541	14.2548	55.46282	9.081855	63.82761	133.7786	50.34356	22.15511	65.08745
S	NOX_IDLE	0	0	0	0	0.127398	0.158901	1.274807	24.93712	0.929466	0	0	15.84323	0
S	NOX_RUN	0.106907	0.541481	0.253095	0.434181	4.02696	2.582413	3.312643	5.143379	2.39261	7.857758	1.190423	6.256742	3.18438
S	NOX_STR	0.182633	0.574582	0.455324	0.791205	0.977344	0.436546	12.38002	20.0972	5.027272	13.87726	0.318049	17.57644	1.842432
S	PM10_IDL	0	0	0	0	0.00144	0.001711	0.008602	0.048292	0.000337	0	0	0.01502	0
S	PM10_PM	0.03675	0.03675	0.03675	0.03675	0.07644	0.08918	0.13034	0.059327	0.13034	0.536037	0.01176	0.7448	0.13034
S	PM10_PM	0.008	0.008	0.008	0.008	0.010689	0.011248	0.012	0.03452	0.012	0.012	0.004	0.01144	0.01291
S	PM10_RU	0.002277	0.005302	0.002029	0.002347	0.037914	0.030398	0.064149	0.032362	0.010377	0.142682	0.001996	0.035512	0.050119
S	PM10_STI	0.00259	0.006266	0.002778	0.003468	0.001054	0.000288	0.001498	0.000166	0.000678	0.000764	0.005402	0.000236	0.002935
S	PM25_IDL	0	0	0	0	0.001378	0.001637	0.00823	0.046203	0.000323	0	0	0.01437	0
S	PM25_PM	0.01575	0.01575	0.01575	0.01575	0.03276	0.03822	0.05586	0.025426	0.05586	0.22973	0.00504	0.3192	0.05586
S	PM25_PM	0.002	0.002	0.002	0.002	0.002672	0.002812	0.003	0.00863	0.003	0.003	0.001	0.00286	0.003228
S	PM25_RU	0.002111	0.004893	0.001867	0.002169	0.036221	0.029068	0.061367	0.030962	0.009919	0.136489	0.001884	0.03397	0.047817
S	PM25_STI	0.002381	0.005766	0.002555	0.003193	0.00097	0.000265	0.001377	0.000153	0.000623	0.000703	0.005132	0.000217	0.002721
S	ROG_DIU	0.072396	0.329246	0.118827	0.156021	0.003768	0.001024	0.002753	0.000289	0.002345	0.005822	1.352028	0.002707	2.694756
S	ROG_HTS	0.176745	0.648045	0.265621	0.352798	0.113308	0.030921	0.08827	0.011739	0.030982	0.074325	0.935209	0.020542	0.15029
S	ROG_IDLE	0	0	0	0	0.016635	0.013145	0.053589	0.836607	0.047506	0	0	0.505979	0
S	ROG_RES	0.038951	0.158588	0.065457	0.087082	0.001119	0.00033	0.000835	0.000094	0.000616	0.002079	0.486812	0.000629	0.513984
S	ROG_RUN	0.023911	0.12281	0.04252	0.077251	0.261702	0.172972	0.184161	0.154924	0.102739	0.498395	2.50154	0.133566	0.47354
S	ROG_RUN	0.051781	0.45641	0.162336	0.239476	0.507577	0.098393	0.071914	0.001913	0.060255	0.011803	1.127393	0.011421	0.058169
S	ROG_STR	0.172365	0.711061	0.308539	0.592764	0.328736	0.102436	0.74709	0.249573	0.60417	1.049757	2.327942	0.240723	0.921857
S	SO2_IDLE	0	0	0	0	0.000098	0.000155	0.001602	0.050599	0.001563	0	0	0.014047	0
S	SO2_RUN	0.002736	0.00354	0.003907	0.005154	0.006603	0.006857	0.011816	0.015683	0.01272	0.019533	0.002085	0.0116	0.012548
S	SO2_STR	0.000671	0.000965	0.000976	0.0013	0.000274	0.000162	0.000758	0.000164	0.000803	0.001571	0.000731	0.000297	0.000912
S	TOG_DIUI	0.072396	0.329246	0.118827	0.156021	0.003768	0.001024	0.002753	0.000289	0.002345	0.005822	1.352028	0.002707	2.694756
S	TOG_HTS	0.176745	0.648045	0.265621	0.352798	0.113308	0.030921	0.08827	0.011739	0.030982	0.074325	0.935209	0.020542	0.15029
S	TOG_IDLE	0	0	0	0	0.022544	0.016977	0.067649	0.952413	0.063505	0	0	0.714516	0
S	TOG_RES	0.038951	0.158588	0.065457	0.087082	0.001119	0.00033	0.000835	0.000094	0.000616	0.002079	0.486812	0.000629	0.513984
S	TOG_RUN	0.034571	0.178027	0.061896	0.109824	0.323886	0.201665	0.218351	0.178357	0.1275	0.661227	2.980389	0.157191	0.654182

S	TOG_RUN	0.051781	0.45641	0.162336	0.239476	0.507577	0.098393	0.071914	0.001913	0.060255	0.011803	1.127393	0.011421	0.058169
S	TOG_STR	0.188708	0.778446	0.3378	0.648847	0.359911	0.112155	0.81797	0.273251	0.661491	1.149351	2.529987	0.263562	1.008078
W	CH4_IDLE	0	0	0	0	0.004794	0.002854	0.023527	0.708911	0.015251	0	0	1.019231	0
W	CH4_RUN	0.009224	0.049299	0.016842	0.028196	0.039383	0.013015	0.017691	0.009292	0.015938	0.119022	0.430764	0.011655	0.144134
W	CH4_STR	0.015804	0.06651	0.02828	0.054345	0.026762	0.008298	0.126365	0.330524	0.057707	0.091384	0.226306	0.119543	0.076452
W	CO_IDLEX	0	0	0	0	0.134467	0.10784	0.752248	4.333324	0.349726	0	0	4.372025	0
W	CO_RUNE	0.9406	4.585248	1.652456	2.467489	2.249538	1.023794	1.048118	0.828868	0.967132	4.746481	27.53374	0.672291	11.77519
W	CO_STRE	3.239645	13.18584	5.729605	9.698969	3.808546	1.1952	13.29093	4.890513	10.45451	16.95539	12.11909	5.748424	17.24241
W	CO2_NBIC	0	0	0	0	9.921955	16.0281	144.6362	4609.54	142.978	0	0	1279.419	0
W	CO2_NBIC	271.8441	346.2361	387.4846	511.0704	676.1448	709.7236	1231.518	1643.125	1316.782	2072.398	163.4424	1210.873	1247.227
W	CO2_NBIC	62.69586	78.63398	89.79406	116.5242	21.1541	14.2548	55.46282	9.081855	63.82761	133.7786	50.34356	22.15511	65.08745
W	NOX_IDLE	0	0	0	0	0.127398	0.158901	1.180197	23.1285	0.860684	0	0	14.67037	0
W	NOX_RUN	0.128559	0.657281	0.306744	0.525315	4.213769	2.689971	3.456765	5.347527	2.508911	8.226574	1.378606	6.520185	3.4972
W	NOX_STR	0.211865	0.665597	0.528062	0.917363	1.084106	0.48321	12.55892	20.15494	5.217311	14.07833	0.35956	17.60972	2.049621
W	PM10_IDL	0	0	0	0	0.00144	0.001711	0.012417	0.065853	0.000487	0	0	0.02168	0
W	PM10_PM	0.03675	0.03675	0.03675	0.03675	0.07644	0.08918	0.13034	0.059327	0.13034	0.536037	0.01176	0.7448	0.13034
W	PM10_PM	0.008	0.008	0.008	0.008	0.010689	0.011248	0.012	0.03452	0.012	0.012	0.004	0.01144	0.01291
W	PM10_RU	0.002277	0.005302	0.002029	0.002347	0.037914	0.030398	0.064149	0.032362	0.010377	0.142682	0.001996	0.035512	0.050119
W	PM10_STI	0.00259	0.006266	0.002778	0.003468	0.001054	0.000288	0.001498	0.000166	0.000678	0.000764	0.005402	0.000236	0.002935
W	PM25_IDL	0	0	0	0	0.001378	0.001637	0.01188	0.063004	0.000466	0	0	0.020742	0
W	PM25_PM	0.01575	0.01575	0.01575	0.01575	0.03276	0.03822	0.05586	0.025426	0.05586	0.22973	0.00504	0.3192	0.05586
W	PM25_PM	0.002	0.002	0.002	0.002	0.002672	0.002812	0.003	0.00863	0.003	0.003	0.001	0.00286	0.003228
W	PM25_RU	0.002111	0.004893	0.001867	0.002169	0.036221	0.029068	0.061367	0.030962	0.009919	0.136489	0.001884	0.03397	0.047817
W	PM25_STI	0.002381	0.005766	0.002555	0.003193	0.00097	0.000265	0.001377	0.000153	0.000623	0.000703	0.005132	0.000217	0.002721
W	ROG_DIU	0.012911	0.051259	0.021765	0.029007	0.000603	0.000185	0.000418	0.000047	0.000554	0.001276	0.128668	0.000553	0.366799
W	ROG_HTS	0.191536	0.74557	0.289064	0.383296	0.142371	0.036856	0.107231	0.013977	0.032168	0.078826	1.217903	0.022288	0.216253
W	ROG_IDLI	0	0	0	0	0.016635	0.013145	0.061546	0.952417	0.050144	0	0	0.516779	0
W	ROG_RES	0.012066	0.047882	0.02034	0.02711	0.00037	0.000113	0.000255	0.000029	0.000268	0.000835	0.119062	0.000268	0.176457
W	ROG_RUN	0.023703	0.125199	0.042084	0.077586	0.257456	0.172199	0.182776	0.154627	0.101294	0.493542	2.778141	0.132885	0.457051
W	ROG_RUN	0.066049	0.643269	0.22863	0.336463	0.598696	0.117109	0.0856	0.002266	0.070088	0.017871	1.422717	0.018049	0.064763
W	ROG_STR	0.213161	0.897153	0.381419	0.733268	0.360946	0.111904	0.825597	0.278156	0.654979	1.232415	3.095237	0.282208	1.033573
W	SO2_IDLE	0	0	0	0	0.000098	0.000155	0.001393	0.043977	0.001376	0	0	0.012326	0
W	SO2_RUN	0.002727	0.003533	0.003895	0.005139	0.006602	0.006857	0.011816	0.015683	0.01272	0.019532	0.002161	0.0116	0.012543
W	SO2_STR	0.000684	0.001022	0.000999	0.00134	0.000283	0.000165	0.00079	0.000177	0.000823	0.001642	0.000794	0.000321	0.000954
W	TOG_DIUI	0.012911	0.051259	0.021765	0.029007	0.000603	0.000185	0.000418	0.000047	0.000554	0.001276	0.128668	0.000553	0.366799
W	TOG_HTS	0.191536	0.74557	0.289064	0.383296	0.142371	0.036856	0.107231	0.013977	0.032168	0.078826	1.217903	0.022288	0.216253
W	TOG_IDLE	0	0	0	0	0.022544	0.016977	0.077724	1.084254	0.066508	0	0	0.72681	0
W	TOG_RES	0.012066	0.047882	0.02034	0.02711	0.00037	0.000113	0.000255	0.000029	0.000268	0.000835	0.119062	0.000268	0.176457
W	TOG_RUN	0.03425	0.18132	0.061234	0.109812	0.317652	0.200537	0.21633	0.177924	0.125392	0.654146	3.301169	0.156197	0.625845
W	TOG_RUN	0.066049	0.643269	0.22863	0.336463	0.598696	0.117109	0.0856	0.002266	0.070088	0.017871	1.422717	0.018049	0.064763
W	TOG_STR	0.233371	0.982156	0.417588	0.802625	0.395174	0.122521	0.903925	0.304545	0.71712	1.349339	3.36362	0.308982	1.130154

tblRoadDust

RoadPerce	RoadSiltLo	MaterialSil	MaterialMo	MobileAve	MeanVehic	CARB_PM_VMT
100	0.1	4.3	0.5	2.4	40	0

tblWoodstoves

Woodstove	NumberCo	NumberCa	NumberNo	NumberPe	Woodstove	WoodstoveWoodMass

tblFireplaces

Fireplaces	NumberW	NumberGa	NumberPr	NumberNo	FireplaceH	FireplaceD	FireplaceWoodMass

tblConsumerProducts

ROG_EF	ROG_EF_	ROG_EF_PesticidesFertilizers
2.14E-05	3.54E-07	5.15E-08

tblAreaCoating

Area_EF_I	Area_Resi	Area_EF_I	Area_Resi	Area_EF_I	Area_Nonı	Area_EF_I	Area_Nonı	Reapplicat	Area_EF_I	Area_Parking
250	0	250	0	250	18401	250	6134	10	250	0

tblLandscapeEquipment

NumberSn	NumberSummerDays
0	180

tblEnergyUse

EnergyUse	T24E	NT24E	LightingEle	T24NG	NT24NG
Fast Food	4	15.83	4.74	27.65	88.55
Fast Food	4	15.83	4.74	27.65	88.55

tblWater

WaterLanc	WaterLanc	IndoorWat	OutdoorW	ElectricityI	ElectricityI	ElectricityI	ElectricityI	SepticTan	AerobicPe	Anaerobic:	AnaDigest	AnaDigestCogen	CombDigestGasPercent
Fast Food	1000sqft	1821202	116247	2117	111	1272	1911	10.33	87.46	2.21	100	0	
Fast Food	1000sqft	1903156	121478.1	2117	111	1272	1911	10.33	87.46	2.21	100	0	

tblSolidWaste

SolidWast	SolidWast	SolidWast	LandfillNo	LandfillCa	LandfillCaptureGasEnergyRecovery
Fast Food	1000sqft	69.11	6	94	0
Fast Food	1000sqft	72.22	6	94	0

tblLandUseChange

Vegetation	Vegetation	AcresBegi	AcresEnd	CO2peracre

tblSequestration

BroadSpec	NumberOf	CO2perTree

tblConstEquipMitigation

ConstMitig	FuelType	Tier	NumberOf	TotalNumb	DPF	OxidationCatalyst
Air Compre	Diesel	No Change	0	1	No Change	0
Cement ar	Diesel	No Change	0	4	No Change	0
Concrete/I	Diesel	No Change	0	2	No Change	0
Cranes	Diesel	No Change	0	1	No Change	0
Forklifts	Diesel	No Change	0	2	No Change	0
Graders	Diesel	No Change	0	1	No Change	0
Pavers	Diesel	No Change	0	1	No Change	0
Rollers	Diesel	No Change	0	1	No Change	0
Rubber Tir	Diesel	No Change	0	2	No Change	0
Tractors/L	Diesel	No Change	0	8	No Change	0

tblConstDustMitigation

SoilStabili	SoilStabili	SoilStabili	ReplaceGr	ReplaceGr	ReplaceGr	WaterExp	WaterExp	WaterExp	WaterExp	WaterUnp	WaterUnp	WaterUnp	WaterUnp	CleanPavedRoadPercentReduction
0	0	0	0	0	0	1	2	55	55	0	1	0	15	0

tblLandUseMitigation

ProjectSel	IncreaseD	IncreaseD	IncreaseD	ImproveW	ImproveW	ImproveDi	ImproveDi	IncreaseT	IncreaseTi	IntegrateB	IntegrateB	ImprovePe	ImprovePe	ProvideTra	ProvideTra	ImplementL	LimitParki	LimitParki	UnbundleP	UnbundleP	OnStreetM	OnStreetM	ProvideBF	ProvideBF	ExpandTra	ExpandTra	IncreaseT	IncreaseT	IncreaseTransitFrequencyHeadwaysPercentReduction

tblCommuteMitigation

Implemen	Implement	Implement	TransitSub	TransitSub	TransitSub	Implement	Implement	Workplace	Workplace	Workplace	Encourage	Encourage	Encourage	Encourage	MarketCo	MarketCo	Employee	Employee	Employee	ProvideRi	ProvideRi	Implemen	ImplementSchoolBusProgramPercentFamilyUsing
0			0			0		0			0				0		0		2	0		0	

tblAreaMitigation

Landscape	Landscape	Landscape	Landscape	Landscape	Landscape	UseLowVO	UseLowVO	UseLowVO	UseLowVO	UseLowVO	UseLowVO	UseLowVO	UseLowVO	UseLowVO	HearthOnl	NoHearth	UseLowVO	UseLowVO	UseLowVO	OCPaint	ParkingValue
0		0		0		0	250	0	250	0	250	0	250	0	0	0	0	0	250		

tblEnergyMitigation

ExceedTitl ExceedTitl InstallHigh InstallHigh OnSiteRer KwhGener KwhGener PercentOfl PercentOfElectricityUseGenerated

tblApplianceMitigation

Appliance	PercentImprovement
ClothWasher	30
DishWasher	15
Fan	50
Refrigerator	15

tblWaterMitigation

ApplyWate	ApplyWate	ApplyWate	UseReclai	PercentOu	PercentInc	UseGreyW	PercentOu	PercentInc	InstallLowl	PercentRe	InstallLowl	PercentRe	InstallLowl	PercentRe	InstallLowl	PercentRe	TurfReduc	TurfReduc	TurfReduc	UseWaterI	UseWaterI	WaterEffic	MAWA	ETWU
0			0			0			0	32	0	18	0	20	0	20	0			0	6.1	0		

tblWasteMitigation

InstituteRe InstituteRecyclingAndCompostingServicesWastePercentReduction

tblOperationalOffRoadEquipment

OperOffRc	OperOffRc	OperHours	OperDaysI	OperHorse	OperLoadF	OperFuelType

tblFleetMix

FleetMixLa	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Fast Food	0.469869	0.051968	0.208218	0.140414	0.048762	0.007865	0.014833	0.04469	0.003169	0.001708	0.005951	0.001528	0.001026
Fast Food	0.469869	0.051968	0.208218	0.140414	0.048762	0.007865	0.014833	0.04469	0.003169	0.001708	0.005951	0.001528	0.001026

tblStationaryGeneratorsPumpsUse

Generator	NumberOf Generator	HorsePow	Load_Fact	HoursPerD	HoursPerY	GeneratorsPumpsEquipmentDescription

tblStationaryBoilersUse

BoilerEqui	NumberOf	BoilerFuel	BoilerRatir	DailyHeatI	AnnualHea	BoilerEquipmentDescription

tblStationaryUserDefined

UserDefin	UserDefin	TOG_lb_d	TOG_tpy	ROG_lb_d	ROG_tpy	CO_lb_day	CO_tpy	NOX_lb_d	NOX_tpy	SO2_lb_d	SO2_tpy	PM10_lb_	PM10_tpy	PM2_5_lb	PM2_5_tp	CO2_lb_d	CO2_tpy	CH4_lb_d	CH4_tpy

tblStationaryGeneratorsPumpsEF

Generator	TOG_EF	TOG_EF_	ROG_EF	ROG_EF_	CO_EF	CO_EF_U	NOX_EF	NOX_EF_	SO2_EF	SO2_EF_I	PM10_EF	PM10_EF	PM2_5_EI	PM2_5_EI	CO2_EF	CO2_EF_I	CH4_EF	CH4_EF_UOM

tblStationaryBoilersEF

BoilerEqui	TOG_EF	TOG_EF_	ROG_EF	ROG_EF_	CO_EF	CO_EF_U	NOX_EF	NOX_EF_	SO2_EF	SO2_EF_I	PM10_EF	PM10_EF	PM2_5_EI	PM2_5_EI	CO2_EF	CO2_EF_	CH4_EF	CH4_EF_UOM

tblRemarks

SubModul	PhaseNam	Season	Remarks
1			PG&E Adjusted to 401.00 as 5 yr avg 2012-2016 Climate Registry CRIS Report
3			total of 12.267ksf
4			Default Construction phase and durations
5	Architectural Coating		
5	Building Construction		
5	Demolition		Default Equip and Activity
5	Grading		
5	Paving		
5	Site Preparation		
6			Default Const Trip Gen
8			9,000sf Bldg Demo
9			appx 500cy export, 2,000 cy import
12			Adj to net increase. Rest w/o drive thru to 79.65, Rest w/Drive thru to 108.34.
20			
25			Air Quality Control Measures -Construction

Appendix C Wetland Delineation and Biological Resources Report

Wetland Delineation and Biological Survey Report

The Carrington Company

2616 Broadway, Eureka, California

April 27, 2018

Revision 0

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

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1. Introduction

On behalf of The Carrington Company (TCC), GHD Inc. (GHD) has prepared this wetland delineation and biological resources report, including accompanying appendices, in association with the proposed redevelopment of the commercial property located at 2616 Broadway in Eureka, California. The project site and vicinity is depicted on Figure 1 located in Appendix A. The wetland delineation as conducted on April 10, 2018 and the wildlife survey fieldwork was completed on April 13, 2018. Work completed at the project site by GHD was conducted at the request of TCC. The delineation and wildlife survey were conducted within the Project Study Boundary (PSB), which included the parcels identified by Assessor Parcel Numbers (APNs) 007-121-005-000 and 007-121-007-000, as shown on Figure 1 and Figure 2 located in Appendix A.

The extent of wetland-type vegetation, hydric soils, and wetland hydrology (based on three-parameter approach) were evaluated per the United States Army Corps of Engineers (USACE) protocol and wetland definition. The parcel is located in the Coastal Zone within the city of Eureka's Local Coastal Program (LCP) jurisdiction therefore the extent of wetland-type vegetation (based on one-parameter) was also mapped in accordance with the California Coastal Commission (CCC) wetland definition.

The wetland delineation determined that an area with wetland vegetation, hydric soils, and wetland hydrology is present along the western portion of APN 007-121-007-000 and the far south western corner of APN 007-121-005-000. In addition to the three-parameter wetland, a one-parameter wetland was identified and mapped encompassing the general area of the three-parameter wetland and sporadically extending farther west than the three-parameter wetland. The one-parameter wetland includes willow species (*Salix* spp.) that are growing in upland conditions (no hydric soils and no wetland hydrology was observed). Figures presenting the results of this investigation are provided in Appendix A. Data sheets documenting conditions observed during the investigation are included in Appendix B.

Based on project scoping database research, no state or federally listed threatened or endangered wildlife or plant species are likely to occur in the project area. Several non-listed state special status species have the potential to be present at the project site; however, species observed at the project site during the wildlife survey were generally common, with the exception of the Black-capped Chickadee. A table summarizing the species database research is included in Appendix C.

This report was prepared in association with the environmental documentation process, permitting, and construction planning process associated with the proposed redevelopment project. This report is subject to, and must be read in conjunction with, the limitations set out in Section 6 and the assumptions and qualifications contained throughout the report.

1.1 Project location

The project site consists of the TCC property located at 2616 Broadway in Eureka, in Humboldt County, California and represented by APNs 007-121-005-000 and 007-121-007-000. The project site is situated at the southwest quadrant of the intersection of Vigo Street and Broadway. The project site currently consists of a vacant two-story wood-framed commercial structure (former truck stop), and paved parking areas to the east, south, and north. The western portion of the parcel consists of a gravel staging area/parking lot. The project site's western and southwestern property

boundary is bordered by vegetated Broad-leaved Deciduous areas, including the Palco Marsh and Maurer Marsh.

1.2 Purpose of this Report

This report has been prepared by GHD for TCC and may only be used and relied on by TCC for the purpose agreed between GHD and the TCC as set out in the original scope and contract for work effort reported herein. GHD Inc. is not liable for any action arising out of the reliance of any third party on the information contained within this report. GHD otherwise disclaims responsibility to any person other than TCC arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

2. Methodology

2.1 Wetland delineation approach

The wetland delineation was performed on April 10, 2018. The wetland delineation was conducted by a wetland delineation team consisting of a GHD botanist and soil scientist. Prior to conducting a site visit, information on wetlands and potential jurisdictional waters was reviewed using the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory online application *Wetlands Mapper* (USFWS 2018).

The wetland delineation followed USACE criteria from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region* (USACE 2010). The current standard forms provided by the USACE (2010) were used for botany/soils/hydrology data collection.

Vegetation and soil data were collected at transects across the upland/wetland boundary with two plots (upland/wetland) per transect. The naming convention used on data sheets to designate plots associated with a transect was “–U” for upland or “–W” for or wetland. Intermediate points were mapped without collection of data, as appropriate, based on wetland vegetation and hydrological indicators.

The parameters used to identify a wetland are: characteristics of the soil, hydrology, and vegetation. To define a wetland, the USACE requires that all three-parameters show wetland attributes (USACE 1987; USACE 2010). Wetlands having all three indicators are defined as three-parameter or USACE wetlands. The CCC defines a wetland based on the presence of any one-parameter (wetland vegetation, soil, or hydrology), per Title 14 California Code of Regulations (CCR) Section 13577.

2.2 Botanical methodology

Vegetation data collection consisted of listing the dominant species in the herbaceous, shrub, and tree layer within a standard sized plot depending on layer. The species listed for each plot were classified as to whether or not they were wetland or upland indicators, using the standard reference for plant wetlands indicators: *State of California 2016 Wetland Plant List* (Lichvar et al. 2016). Plants were classified based on the probability that they would be found in wetlands (USACE 1987; USACE 2010), as follows:

1. Obligate (OBL) plants that are predominantly found in wetlands

2. Facultative/Wet plants (FACW) occurring in 67% to 99% of wetlands
3. Facultative (FAC) occurring in 34% to 66% of wetlands
4. Facultative/Up (FACU) occurring in 1% to 33% of wetlands
5. Uplands (UP) occurring in less than 1% in wetlands.

Plants not listed in the manual were considered to be in the upland category (Lichvar et al. 2016).

2.3 Soils methodology

For this survey, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual (*USACE 2010) procedures were combined with the Natural Resources Conservation Service's (NRCS) definition of hydric soils presented in Field Indicators of Hydric Soils in the United States (USDA/NRCS 2016). Soil pits were dug to an approximate depth of 18-inches. Data on soil color, texture and redoximorphic features were collected. Any observed mottling (iron concentrations) was noted, and care was taken to distinguish chromas of 1 and 2 indicative of organic vegetative matter and iron-depleted soil within 12-inches of the soil surface (USACE 2010; USDA/NRCS 2016).

Colors were described for the entire depth of the test pit and colors were determined on moist natural soil aggregate (ped) surfaces, which had not been crushed, using the Munsell Color Chart (COLOR, M. 2000). Soils with low chromas were verified as being hydric or upland with Field Indicators of Hydric Soils in the United States (USACE 2010; USDA/NRCS 2016).).

2.4 Hydrology methodology

The wetland delineation was conducted within the wet-weather season. Direct evidence of ground water (soil saturation, standing water, etc.) was present in the three-parameter wetland plots during the delineation. Primary wetland hydrologic indicators were observed, including: high water table, saturation, and presence of reduced iron. Secondary wetland hydrologic indicators were observed, including passing the FAC-Neutral Test and drainage patterns.

2.5 Wetland determination

The wetland boundary was evaluated using the USACE three-parameter methodology and the CCC one-parameter methodology. For the USACE methodology, the wetland determination was made with an emphasis on hydrology, redoximorphic soil features (hydric soils), and the dominance of wetland vegetation. All wetland plots exhibited a predominance of facultative (FAC) or wetter vegetation.

Two of the three upland plots exhibited a mix of wetland and upland plant species including the invasive species Himalayan blackberry (*Rubus armeniacus*). Vegetation results are further discussed in Section 3. Upland and wetland plots were completed on either side of the wetland/upland boundary. The distance to the wetland/upland boundary from wetland and upland plots was recorded on each respective datasheet and the wetland/upland boundary was recorded with a Global Positioning System (GPS) device. The wetland/upland boundary was determined and mapped, based on the locations of the upland and wetland plots within each transect and intermediate points.

The horizontal location of each transect point (including intermediate points) along the delineated wetland/upland boundary was collected with a Trimble GPS receiver with sub-meter accuracy,

connected to a Trimble GPS unit running ArcPad Geographic Information System (GIS) software. The GPS points were post-processed and connected using ArcGIS for map preparation.

3. Results of Wetland Delineation

As the project site falls entirely within the Coastal Zone within the city of Eureka's Local Coastal Program (LCP) jurisdiction, areas with wetland vegetation (FAC or wetter) that did not meet requirements for wetland hydrology or hydric soils were mapped and differentiated from three-parameter wetlands. The type of three-parameter wetland that was delineated within the PSB was Palustrine Forested Wetland (Broad-leaved Deciduous) using nomenclature adapted from Classification of Wetlands and Deepwater Habitats of the United States (Cowardin), by the Federal Geographic Data Committee (2013).

One-parameter wetlands meeting CCC requirements based on wetland (FAC or wetter) vegetation were mapped based on the presence of willow species (*Salix* spp.), primarily Pacific willow (*Salix lasiandra* var. *lasiandra*) growing in uplands (areas lacking hydric soils or hydrology). The results of the wetland delineation are graphically represented on Figure 2 in Appendix A.

The Palustrine Forested Wetland (Broad-leaved Deciduous) contained an overstory composed predominantly of willow species (FACW), with an occasional red alder (*Alnus rubra*), (FAC). The dominant species in the shrub layer was Himalayan blackberry (FAC). Dominant herbaceous species in the interior of the wetland was nutsedge (*Cyperus eragrostis*). Another invasive species, English ivy (*Hedera helix*), a FACU species, was sporadically dominant in the herbaceous layer. The area has experienced substantial anthropogenic disturbance, including extensive refuse accumulation, particularly near the wetland/upland boundary. In many locations, the wetland boundary was close to or associated with an earthen berm, comprised of pre-existing legally placed fill material, which separated the gravel parking area from the vegetated Broad-leaved Deciduous area.

The identification of upland vegetation was complicated by the predominance of Himalyan blackberry, an invasive species. This FAC species was the dominant shrub in each upland plot, causing two of the three upland plots to qualify as having wetland vegetation according to the dominance test. These plots lacked hydric soil or hydrology, and vegetation was growing on historic fill material. Dominant herbaceous vegetation in upland plots consisted of ripgut brome (*Bromus diandrus*) or sweet vernal grass (*Anthoxanthum odoratum*). Ripgut brome is not listed in the Wetland Plant List and thus assumed to be UPL for delineation purposes (Lichvar et al. 2016) and sweet vernal grass is a FACU species. Wetland data sheets are included in Appendix B.

Soil texture in the delineated three-parameter wetlands was variable and included silty clay loam, silty clay, and sandy loam. Wetland soils exhibited redoximorphic features typically found in hydric soils including low chromas with redoximorphic (iron concentrations) at or above 10-inches from the soil surface. Representative wetland (hydric) soils had matrix color within 12 inch ranges of 10YR 3/1, and 2.5Y 3/2, with iron concentrations of 2.5 YR 4/3. Documented low Chroma values of one and two are indicative of organic (vegetative) matter at surface. The common hydric soil indicator observed was F6 Redox Dark Surface.

Due to the presence of historic fill material, upland soils exhibited a range of textures from gravelly, to silty loam, to loam to silt or sand. Representative matrix colors included: 7.5/YR 2.5/1, 7.5YR 3/1, 10YR 3/1, and 10YR 3/2 with no redoximorphic features observed. Documented low Chroma values

of one and two are indicative of organic (vegetative) matter at surface. Giving these findings, the upland soils did not meet field indicators for hydric soils.

The wetland delineation was performed on April 10, 2018 during the 2017-2018 wet weather season. According to data from the National Weather Service automated rain gage in Eureka (Eureka WFO [EKA01]), as of April 12, 2018 Eureka had received 33-inches of rain since the beginning of the water year (October 1, 2017). This is 96% of average annual rainfall for this period (National Weather Service 2018). Water was observed within 12" of the soil surface in each wetland test pit, thus meeting the "high water table" primary indicator for hydrology. Saturation and presence of reduced iron were other primary indicators observed. Secondary indicators of hydrology included a pass on the FAC neutral test at two of the three wetland test pits.

4. Biological Scoping and Wildlife Survey

Biological resource database research and a reconnaissance level survey for special status wildlife species was conducted by GHD at the project site in April 2018. With the exception of the western corner of APN 007-121-005 which includes a piece of the Palustrine Forested Wetland, the majority of the project site is developed with no quality plant or wildlife habitat present. The Palustrine Forested Wetland occurring on the western side of the project site, primarily within APN 007-121-007, contains habitat for some special status plant and wildlife species. The reconnaissance level wildlife survey results are described in the following sections.

Prior to visiting the site for the general wildlife survey, GHD scientists reviewed current information available through the USFWS online species lists, the California Natural Diversity Database (CNDDB), and the California Native Plant Society (CNPS) rare plant database. This scoping, along with observations made during the wetland delineation and the wildlife survey, was used to assess whether or not the project is likely to have potential impacts to special status species and habitats. The results of scoping are provided in Appendix C.

4.1 Biological Resources Database Findings

Based on project scoping database research, no state or federally listed threatened or endangered wildlife or plant species are likely to occur in the project area; however, several non-listed state special status species may be present. While non-listed species are not included under the state or federal Endangered Species Acts, such species may be regulated or monitored via other laws or programs. Special status native plants are regulated by the California Department of Fish and Wildlife (CDFW).

4.1.1 Special Status Plants

Special status plant species include not only those listed as endangered, threatened, or rare at the state or federal level, but also those species meeting criteria for listing under the California Environmental Quality Act (CEQA), including plants on Lists 1A, 1B, and 2 of the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California. List 3 and List 4 species are not included in the scoping table (Appendix C). List 3 plant species are those for which more information is needed, and List 4 species are species with limited distribution.

Protocol level surveys for special status plants were not performed at the site. However, a GHD Botanist performed the wetland delineation on April 10, 2018 and did not observe any special status plant species. The available habitat for special status plant species occurring at this site is located

within the boundary of the mapped Palustrine Forested Wetland. As construction activities are not planned within the wetland, no effect on special status plant species is anticipated as a result of the project. A scoping list for special status plants is included in Appendix C. No federally endangered or threatened plant species are likely to occur in the project area (Appendix C).

4.1.2 Mammals

Historical records, the primary literature, and available habitat were considered to determine special status mammal species that could occur at the project site. Based on this information, no federally or state listed mammal species are likely to use the project site for roosting, breeding, or foraging habitat. However, special status bat species could potentially use the project area, particularly the abandoned building on the project site, which is not secured against birds and small mammals. This includes species such as the Long-eared Myotis (*Myotis evotis*; Western Bat Working Group – Medium Priority) which forms small nursery colonies in buildings, crevices, snags, and behind bark. Most young are born from May through July, with juveniles capable of independent flight by early August.

4.1.3 Birds

Historical records around the project site indicate that the area serves as moderate foraging habitat for several special status bird species (CDFW Special Animals List). These species are protected by the Federal Migratory Bird Treaty Act and described in further detail below.

Great Egret (Ardea alba) – Moderate Potential

Great Egrets are year-round residents in western California, with breeders concentrated in the Klamath and Warner basin in Siskiyou and Modoc Counties, along the coast in Humboldt County, the San Francisco Bay area, Monterey County, the Salton Sea, and the Central Valley. In term of habitat, they favor wetlands, estuaries, lakes, rivers, ponds, swamps, streams, marshes, and tidal flats. Great Egrets utilize a variety of substrates for nesting including trees, woody vegetation, artificial nest platforms, or even the ground over water, on islands, or directly adjacent to water. Nest platforms are typically constructed of locally available sticks and greenery. Great Egrets nest communally with conspecifics or in mixed-species colonies. They are opportunistic foragers, wading in shallow water to feed on fish, amphibians, and invertebrates. They also hunt on shore for reptiles, birds, and small mammals (Mccrimmon Jr. et al. 2011). Based on available data, the presence of any established colonies at the site is unlikely. However, based on historical records and available habitat, the species has a moderate potential to be present and forage within the project area.

Great Blue Heron (Ardea herodias) – Moderate Potential

Great Blue Herons are year-round residents in the majority of coastal and central California. Notable exceptions include the Sierras and the very southeastern desert regions of the state. Great Blue Herons are extremely adaptable to a variety of habitats including most saltwater and freshwater bodies, agricultural land, swamps, wetlands, as well as commercial and residential areas such as golf courses. Nesting habitat includes trees, bushes, artificial structures, or the ground adjacent to a water body. Nest platforms are typically constructed out of locally available sticks and lined with material such as grass, moss, and reeds. Great Blue Herons are colonial nesters. They are opportunistic foragers, wading in shallow water to feed on fish, amphibians, and invertebrates. They also hunt on shore for reptiles, birds, and small mammals. Additionally, they are known to scavenge carrion (Vennesland and Butler 2011). The parcel does contain potential foraging habitat for Great Blue Herons. Based on available data, the presence of any established colonies at the

site is unlikely. However, based on historical records and available habitat, the species has a moderate potential to be present and forage within the project area.

Snowy Egret (Egretta thula) – Moderate Potential

Snowy Egrets were hunted to the brink of extinction by the plume trade at the end of the 19th and beginning of the 20th century. However, many populations rebounded after the Migratory Bird Treaty Act was passed in 1918. Year-round populations of Snowy Egrets are found around Humboldt Bay, the San Francisco Bay area, the Central Valley, and the Salton Sea. Wintering populations are also present along much of the rest of the California coast. Snowy Egrets prefer Broad-leaved Deciduous and estuarine areas, marshes, wet meadows, inland lakes, and river courses. Snowy Egrets construct stick nest platforms in a variety of tree and shrub species including: willows, holly, birch, and wax myrtle. Nests are lined with reeds, grasses, and moss. Snowy Egrets are colonial nesters, with colonies comprised of both conspecifics and allospecifics. Snowy Egrets hunt in shallow water and on shore, frequently making use of their distinctly yellow feet to attract and capture prey items. Prey includes fish, amphibians, snakes, lizards, crustaceans, insects, and worms (Parsons and Master 2000). The parcel does contain potential foraging habitat for Snowy Egrets. Based on available data, the presence of any established colonies at the site is unlikely. However, based on historical records and available habitat, the species has a moderate potential to be present and forage within the project area.

Black-crowned Night Heron (Nycticorax nycticorax) – Moderate Potential

Black-crowned Night Herons are year-round residents in much of California, with notable exceptions in the Sierras, Central Valley, and the arid southeast portion of the state. These herons can be found in a wide variety of habitats adjacent to water bodies including urban, wetland, partially forested, and agricultural landscapes. Black-crowned Night Herons are colonial nesters, building platform stick nests in trees, reeds, cattails, bushes, or on the ground. As opportunistic feeders, Black-crowned Night Herons eat fish, insects, mammals, birds, carrion, trash, clams, crayfish, turtles, and many other food items (Hothem et al. 2010). Based on available data, the presence of any established colonies at the site is unlikely. However, based on historical records and available habitat, the species has a moderate potential to be present and forage within the project area.

4.1.4 Fish

Some aquatic habitat is present on the project site in the form of wetlands. However, no flowing freshwater streams or creeks, estuarine habitat, or bay habitat is present. This being the case, no fish species will occur at the project site. There is a small trash-filled creek adjacent to the project site (passes through Palco Marsh) that may seasonally contain small fish.

4.1.5 Insects

Historical records, the primary literature, and available habitat were considered to determine whether special status insect species that could occur at the project site. Based on this information, no special status insect species are likely to use the project site for breeding or foraging habitat.

4.1.6 Reptiles and Amphibians

Based on the available coastal Broad-leaved Deciduous habitat at the project site, Northern Red-legged Frogs could potentially move through the site during certain times of the year and have a moderate likelihood to occur at the project site.

Northern Red-legged Frog (Rana aurora), CDFW Species of Special Concern – Moderate Potential

Northern Red-legged Frogs occur along the west coast of North America from British Columbia to California. Northern Red-legged Frogs are typically found near water sources; however, they can range widely and inhabit damp places far from water (California Herps 2017). Northern Red-legged Frogs reproduce in water from January to February in Humboldt County, with some breeding occurring as late as March. Preferred egg laying locations are in “vegetated shallows with little water flow in permanent wetlands and temporary pools” (California Herps 2017). Northern Red-legged Frogs are relatively common in and near-coastal portions of Humboldt County and historical records have documented the species near the project area (AmphibiaWeb 2017). This being the case, Northern Red-legged Frogs have a moderate chance of occurring at the project site.

4.2 Wildlife Survey Methodology

A reconnaissance level survey for special status wildlife species was conducted by GHD at the project site on April 13, 2018. The survey was conducted by Genevieve Rozhon, a GHD Wildlife Biologist. The area within the proposed project construction limits and vegetated areas directly adjoining the project site was surveyed for active nesting bird species. This included the project site and accessible areas within 500-feet of the project area. To the degree feasible, inaccessible areas within 500-feet of the project area were surveyed with binoculars.

The survey was completed within the first three hours after sunrise to coincide with the period of high bird activity. This was also a suitable time to survey for Northern Red-legged Frogs. Weather on the survey day was overcast without any precipitation, high winds, or other conditions that could negatively impact bird or other wildlife activities. The wildlife survey occurred prior to the scheduled start of construction activities at the site.

The survey methods were intended to identify confirmed or probable avian nesting activity and Northern Red-legged Frog activity. The nest survey protocol followed the methodology outlined by Ralph et al. 1993. Where the habitat allowed the surveyor to walk without risk of damaging nests and surrounding vegetation, the survey included a physical search of the area. This included inspecting the ground, shrubs, and trees for the presence of active nests (cup nests, stick nests, mud nests, and cavities) and any songbird or raptor species within them. Additionally, the bark of vegetation and the ground layer under vegetation were inspected for evidence of songbird and raptor species, such as feathers, pellets, or whitewash. Where the habitat was dense or otherwise impenetrable/inaccessible, observations were made from fixed locations.

A list of all avian species heard or observed on site was completed after the surveys (Table 2). Each detected species was also associated with a code representing the highest breeding evidence observed during the day (Table 1). High-powered binoculars were used during the survey (10x42 magnification).

In addition, all standing bodies of water including seasonal wetlands, ponds, and drainage ditches were inspected for Northern Red-legged Frogs. Close attention was paid to damp ground and Broad-leaved Deciduous vegetation. A list of all amphibian and reptile species heard or observed on site was completed after the survey and results are tabulated in Table 3.

4.3 Wildlife Survey Results

All of the bird species detected during the survey were common species that do not have special federal or state regulatory status (with the exception of Black-capped Chickadees, a CDFW watch

list species). An active Black-capped Chickadee nest (cavity) was detected during the survey in a red alder. One adult bird was bringing insect prey to the nest (likely to incubating female as no chicks were heard and it is slightly early for chicks). Significant courtship and “pre-nesting” activities were observed in the project area (indicative of possible future nesting activity in the Broad-leaved Deciduous area on the west edge of the site). Habitat in this Broad-leaved Deciduous area was of fair to good quality for nesting birds, particularly in the case of cavity nesting species, since many dead snags (riddled with woodpecker-drilled cavities) were present. A total of 27 avian species were observed in or flying over the project site (see Table 2). No other wildlife were detected during the survey with the exception of several treefrogs (*Pseudacris sp.)*, which have no special regulatory status.

This survey represented an initial site visit to gauge nesting bird and wildlife conditions in the project area. A subsequent full nesting bird survey is recommended no more than seven days prior to the start of construction, (if construction occurs between March 15 to August 15 in northern California). In addition, prior to removal of the building onsite, a bat survey is recommended to ensure that no potential maternity roosts are disturbed.

Table 1. List of Breeding Codes, Associated Bird Behavior, and Breeding Status

(The highest ranking code was recorded for each species during the survey)

Breeding Rank	Breeding Code	Description	Breeding Status
1	N	Active nest	Breeding
2	M	Carrying nesting material	Breeding
3	F	Carrying food or fecal sac	Breeding
4	D	Distraction display/feigning	Breeding
5	L	Local young fed by parents	Breeding
6	Y	Local young incapable of sustained flight	Breeding
7	C	Copulation or courtship observed	Breeding
8	T	Territorial behavior	Unconfirmed
9	S	Territorial song or drumming heard	Unconfirmed
10	E	Encountered in study area	Unconfirmed
11	O	Encountered flying over the study area	Unconfirmed

Table 2. List of Avian Species Detected During Survey and Associated Highest Breeding Status

Alpha Code	Common Name	Latin Name	Highest Breeding Status	Breeding Code
EUST	European Starling	*Sturnus vulgaris*	Encountered in study area	E
BARS	Barn Swallow	*Hirundo rustica*	Encountered in study area	E
AMRO	American Robin	*Turdus migratorius*	Territorial song or drumming heard	S
OCWA	Orange-crowned Warbler	*Oreothlypis celata*	Territorial song or drumming heard	S
SOSP	Song Sparrow	*Melospiza melodia*	Territorial behavior	T
RCKI	Ruby-crowned Kinglet	*Regulus calendula*	Territorial song or drumming heard	S
ANHU	Anna's Hummingbird	*Calypte anna*	Territorial behavior	T
DOWO	Downy Woodpecker	*Picoides pubescens*	Encountered in study area	E
WCSP	White-crowned Sparrow	*Zonotrichia leucophrys*	Territorial song or drumming heard	S
TRES	Tree Swallow	*Tachycineta bicolor*	Encountered in study area	E
BLPH	Black Phoebe	*Sayornis nigricans*	Territorial song or drumming heard	S
NOFL	Northern Flicker	*Colaptes auratus*	Encountered in study area	E
WEGU	Western Gull	*Larus occidentalis*	Encountered flying over the study area	O
AMCR	American Crow	*Corvus brachyrhynchos*	Encountered in study area	E
LEGO	Lesser Goldfinch	*Spinus psaltria*	Encountered in study area	E
WREN	Wrentit	*Chamaea fasciata*	Territorial song or drumming heard	S

Table 2. List of Avian Species Detected During Survey and Associated Highest Breeding Status

Alpha Code	Common Name	Latin Name	Highest Breeding Status	Breeding Code
BCCH	Black-capped Chickadee	*Poecile atricapillus*	Active nest	N
MALL	Mallard	*Anas platyrhynchos*	Copulation or courtship observed	C
MAWR	Marsh Wren	*Cistothorus palustris*	Territorial behavior	T
HOSP	House Sparrow	*Passer domesticus*	Encountered in study area	E
RSHA	Red-shouldered Hawk	*Buteo lineatus*	Encountered flying over the study area	O
YRWA	Yellow-rumped Warbler (Audubon's)	*Setophaga coronata*	Encountered in study area	E
GWTE	Green-winged Teal	*Anas carolinensis*	Copulation or courtship observed	C
FOSP	Fox Sparrow	*Passerella iliaca*	Encountered in study area	E
PEFA	Peregrine Falcon	*Falco peregrinus*	Copulation or courtship observed	C
DCCO	Double-crested Cormorant	*Phalacrocorax auritus*	Encountered flying over the study area	O
CORA	Common Raven	*Corvus corax*	Encountered in study area	E

Table 3. List of Amphibian and Reptile Species Detected During the Survey Period

Common Name	Latin Name	Notes
Treefrog	*Pseudacris sp.*	Encountered in study area

5. Recommendations

It is recommended that a buffer area be established at the project site that separates the delineated wetland from the proposed project boundary. A wetland buffer of at least 50 feet, extending outward from the edge of the one-parameter wetland boundary, would protect the wetland habitat from potential development project impacts. It is recommended that the wetland buffer be enhanced by removing existing refuse and imported aggregate from the gravel parking area within the buffer area, planting native vegetation, and creating topographic contours that align with existing wetland features. It is recommended that areas of gravel removal be replanted and/or reseeded with native herbaceous species.

If construction occurs between March 15 and August 15, a qualified biologist should conduct a pre-construction bat survey and nesting bird survey at the project site, to evaluate the building for the presence of bat maternity colonies and to check for nesting activity of native birds. The biologist shall conduct a minimum of one pre-construction survey within the seven day period prior to construction and ground-disturbing activities. If construction lapses for seven days or longer during the breeding season, a qualified biologist shall conduct a supplemental wildlife pre-construction survey before project work is reinitiated.

If sensitive bat species/maternity colonies are detected in the building structure, CDFW will be consulted regarding appropriate avoidance/minimization measures. If avian active nests are detected within the construction footprint or within 500-feet of construction activities, the biologist shall flag a buffer around each nest. Construction activities shall avoid nest sites until the biologist determines that the young have fledged or nesting activity has ceased. If nests are documented outside of the construction (disturbance) footprint, but within 500-feet of the construction area, buffers will be implemented as needed. In general, the buffer size for common species would be determined on a case-by-case basis in consultation with the CDFW. The buffer size for sensitive species would be 300-feet and the buffer size for raptors would be 500-feet, if deemed appropriate in coordination with the CDFW.

Buffer sizes will take into account factors such as (1) noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity; (2) distance and amount of vegetation or other screening between the construction site and the nest; and (3) sensitivity of individual nesting species and behaviors of the nesting birds. The survey results will be reported to the CDFW prior to the commencement of construction activities.

6. Special Terms and Conditions

6.1 Scope and Limitations

This report does not authorize any individuals to develop, fill, or alter the wetlands delineated. Verification of the delineation by jurisdictional agencies is necessary prior to the use of this report for planning and development purposes. A USACE agency stamped delineation map and jurisdictional approval letter is required to signify confirmation of delineation results. In situations where a field investigation determines that no jurisdictional wetlands occur, jurisdictional concurrence with these findings is recommended.

To achieve the delineation objectives stated in this report, conclusions of the delineation were based on the information available during the period of the investigation, which took place on April 10, 2018. The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed by the date of preparation of the report. Site conditions may change after the date of this report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change, unless contracted to do so.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points. Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

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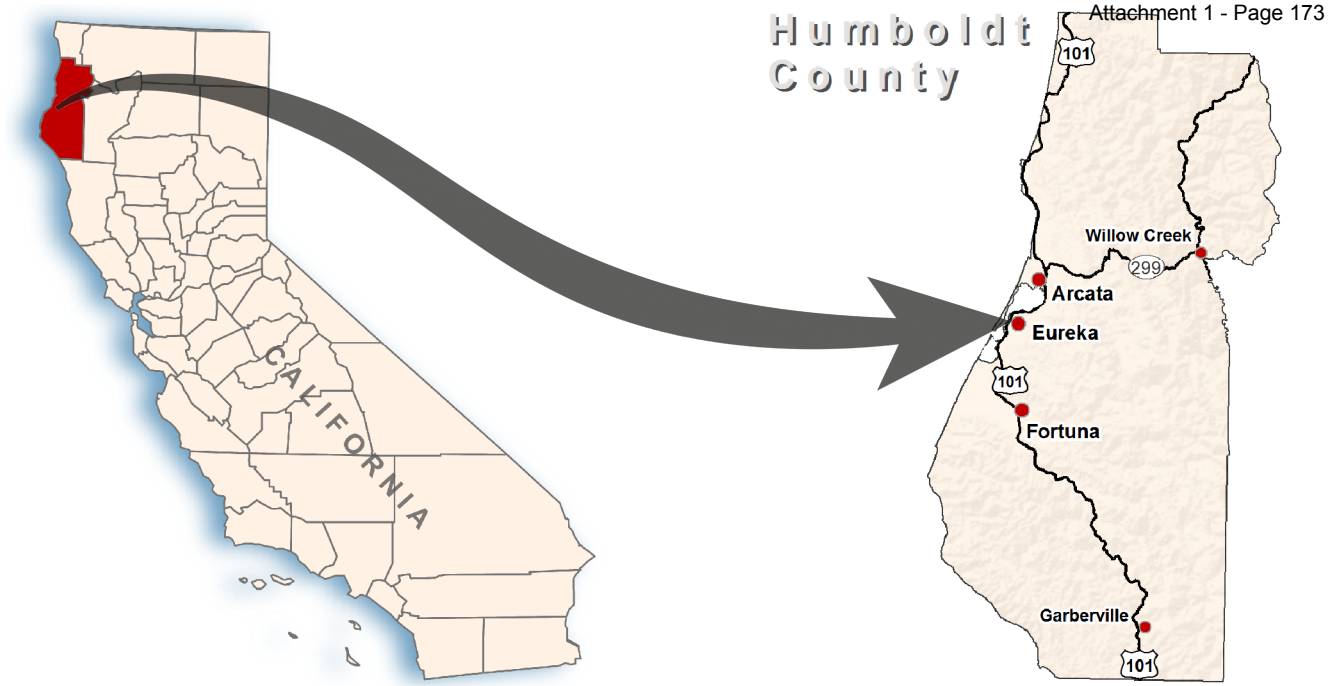
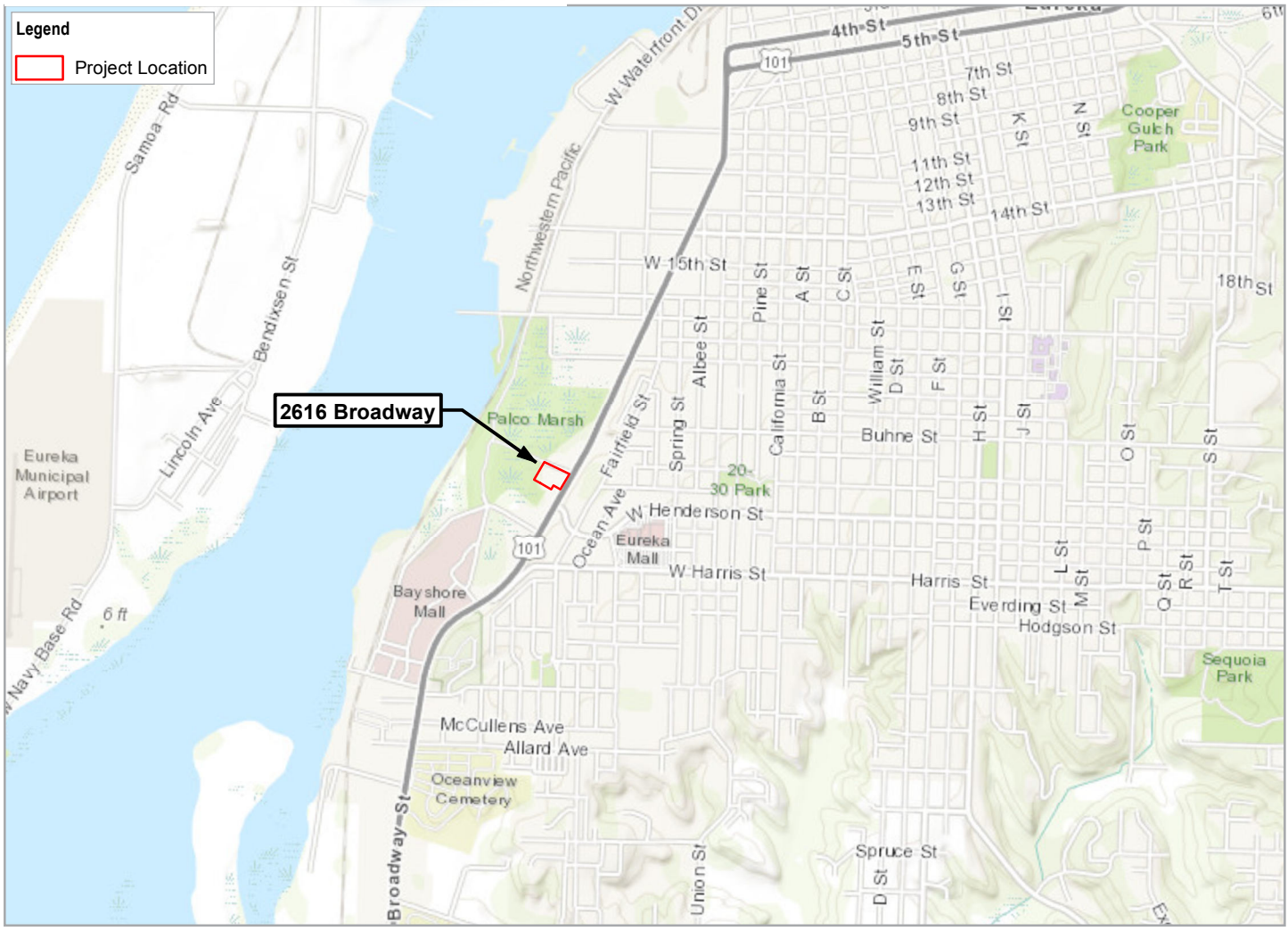
Appendices

Appendix A – Figures





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The Carrington Company
2616 Broadway Redevelopment Project

Project No. **11153741**
Revision No. **-**
Date **4/13/2018**

Vicinity Map

FIGURE 1

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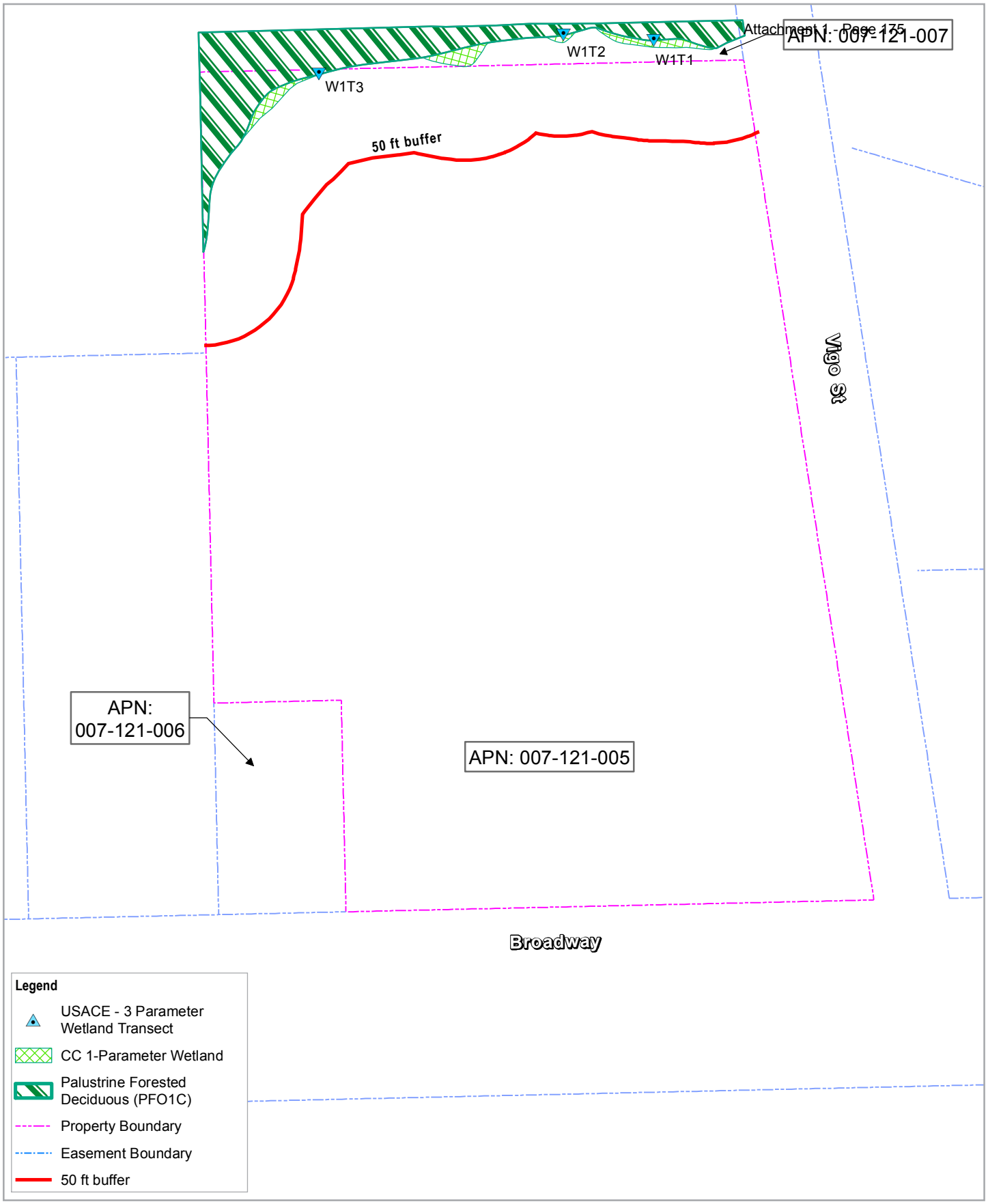
Print date: 13 Apr 2018 - 10:29

Data source: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community. Created by: gldavidson

Appendix B – Data Sheets



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Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

The Carrington Company
2616 Broadway Redevelopment Project

Wetland Delineation

Project No. **11153741.03**
Revision No. **D**
Date **09/05/2018**

FIGURE 2

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Data Source: . Created by: jclark2

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Carrington Property City/County: Eureka Sampling Date: 4/10/18
Applicant/Owner: TCC State: CA Sampling Point: WLT 1-W
Investigator(s): A.L., M.T. Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____
Hydric Soil Present?	Yes X	No _____
Wetland Hydrology Present?	Yes X	No _____

Is the Sampled Area within a Wetland? Yes X No _____

Remarks

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 7 m)	Absolute % Cover	Dominant Species?	Indicator Status
1 Salix lasiandra var. lasiandra	35%	X	FACW
2			
3			
4			
	35% = Total Cover		
Sapling/Shrub Stratum (Plot size 3 m)			
1 Rubus armeniacus	20%	X	FAC
2			
3			
4			
5			
	20% = Total Cover		
Herb Stratum (Plot size 2 m)			
1 Cyperus eragrostis	50%	X	FACW
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
	50% = Total Cover		
Woody Vine Stratum (Plot size _____)			
1			
2			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 100 (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of		Multiply by
OBL species	_____	x 1 = _____
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
__ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ 5 - Wetland Non-Vascular Plants[1]
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: Wetland pit is 2' from a large area of ponded water with duckweed on water surface. Wetland pit is 5' from where we mapped wetland boundary.

SOIL

Sampling Point: W1T1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0" - 4"	10YR 3/1	90	2.5Y 4/3	10	C	M	SILT + CLAY LOAM	
4" - 9"	10YR 3/1	85	2.5Y 4/3	15			SILTY CLAY LOAM	
9" - 12"	2.5Y 3/1	90	2.5Y 4/3	10			SILTY CLAY	
12" - 16"	2.5Y 2.5/1	80	2.5Y 4/4	20			SILTY CLAY	W/ FINE GRAVEL 5%

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: NONE

Depth (inches): NONE

Hydric Soil Present? Yes ✓ No ___

Remarks:

- F6 CONDITIONS / INDICATORS MET. - PRESENCE OF REDOX (HYDRIC SOILS).
- SOILS REACTED TO ALPHA-ALPHA DI TEST.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ✓ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ✓ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 12"-10" FINAL.

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 12"

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

PIT WAS DUG TO 16", HYDROLOGY OF WATER TABLE INFLUENCED PIT DEPTH. HOLE RECHARGED WITH 4" H_2O. (10"-12")

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Carrington City/County: Eureka Sampling Date: 4/10/18
Applicant/Owner: TCC State: CA Sampling Point: WITI-4
Investigator(s): A.L., M.T. Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): Convex Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil X, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks: Upland test pit is 18" from mapped boundary. Soil has evidence of fill material.

VEGETATION – Use scientific names of plants.

Invasiveness of FAC plant himalayan blackberry complicates. Growing on fill material.

Tree Stratum (Plot size: 7 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiandra var. lasiandra	35	X	FACW
2.			
3.			
4.			
	____ = Total Cover		

Sapling/Shrub Stratum (Plot size: 3 m)			
1. Rubus armeniacus	20	X	FAC
2.			
3.			
4.			
5.			
	____ = Total Cover		

Herb Stratum (Plot size: ~4 m)			
1. Bromus diandrus	45%	X	NL
2. Anthoxanthum odoratum	5		FACU
3. Poa annua	5		FAC
4. Geranium molle	2		NL
5. Lythrum hyssopifolia	2%		OBL
6.			
7.			
8.			
9.			
10.			
11.			
	65 = Total Cover	32.5 / 13	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Upland test pit is ~1/2 way down upland berm, anthropogenically created, dug in fill. Herbaceous plot contains ~35% bare ground as pit dug in open area of berm. Herbaceous plot based at 4m radius to capture veg due to the bare ground.

SOIL

Sampling Point: WITA-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4"	7.5Y 2/1	100	Ø	Ø	C	M		GRAVEL W/ FIBERGLASS & RUBBISH.
4"-12"	7.5Y 3/1	100						MED GRAVEL INCREASE IN RUBBISH
12"-16"	7.5Y 3/2	100						MOD GRAVEL W/ FINE SEDIMENT..

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: GRAVEL / SIZE INCREASES

Depth (inches): 12" - 16"

Hydric Soil Present? Yes ___ No ✓

Remarks:

INCREASE IN GRAVEL SIZE & QUANTITY OF RUBBISH (TRASH, Fiberglass, CERAMIC TILE) at GREATER DEPTHS. NO HYDRIC SOIL OBSERVED, INCREASE IN SOIL FINE PARTICLES AT 12"-16"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

NO WETLAND HYDROLOGY INDICATORS - PRIMARY MET.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Carrington City/County: Eureka Sampling Date: 4/10/18
Applicant/Owner: TCC State: CA Sampling Point: W1T2-W
Investigator(s): A.L., M.T. Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	Is the Sampled Area within a Wetland? Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 7m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiandra var. lasiandra	15	X	FACW
2.			
3.			
4.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3m)			
1. Rubus armeniacus	40	X	FAC
2. Rubus spectabilis	10		FAC
3.			
4.			
5.			
	50 = Total Cover		
Herb Stratum (Plot size: 3 m)			
1. Bromus diandrus	20	X	NL (UPL)
2. Epilobium ciliatum	5		FACW
3. Mentha pulegium	2		OBL
4. Anthoxanthum odoratum	2		FACU
5. Plantago lanceolata	2		FACU
6.			
7.			
8.			
9.			
10.			
11.			
	31 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: Herbaceous cover ~ 40% total in plot due to dense Rubus armeniacus and disturbed open ground. Water level at 9" in test pit. Ground Wetland test pit is 3' from Mapped [illegible]

SOIL

Sampling Point: W1T2W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0"-4"	10 YR 3/1	95%	2.5Y 4/3	5	C	M	Silty-Loam w/ organic matter	
4"-12"	10 YR 3/1	90	2.5Y 4/3	10	C	M	Silty-Loam w/ some clay	
12"-16"	10 YR 3/3	90	2.5Y 4/3	10	C	M	Loamy-clay..	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: NO

Depth (inches): NO

Hydric Soil Present? Yes ✓ No ___

Remarks: Hydric soil observed, pit conditions passed AA-DI test..

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 9"-16"

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water observed btwn 9"-16" below surface
Met hydrology indications w/ hydrology indications..
- Recharge from 9"-16" in depth

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Carrington City/County: Eureka Sampling Date: 4/10/18

Applicant/Owner: TCC State: CA Sampling Point: WIT2-4

Investigator(s): A.L., M.T. Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Presence of invasive Rubus armeniacus complicates vegetation here. Test pit is at the top of man-made berm. Plants not growing as hydrophytes.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
	____ = Total Cover		

Sapling/Shrub Stratum (Plot size 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1 Rubus armeniacus	20	X	FAC
2			
3			
4			
5			
	20 = Total Cover		

Herb Stratum (Plot size 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1 Bromus diandrus	15	X	NL
2 Festuca bromoides	3		FAC
3 Raphanus sativus	3		NL
4 Dactylis glomerata	2		FACU
5 Galium aparine	3		FACU
6			
7			
8			
9			
10			
11			
	26 = Total Cover		

Woody Vine Stratum (Plot size ____)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
	____ = Total Cover		

% Bare Ground in Herb Stratum: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals ____ (A)	____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Larger herbaceous plot to account for sparse herbaceous layer due to blackberry cover and canes. Upland test pit 1' from mapped boundary.

SOIL

Sampling Point: W1T2U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0'-2'	10YR 3/1	100	Ø	Ø	C	M	Silty Loam w/ gravel & rubble	
2'-14'	10YR 3/2	100	Ø	Ø	C	M	Loamy w/ increase in gravel.	
14-16'	10YR 3/4	100	Ø	Ø	C	M	Sandy w/ med. rocks	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: NO

Depth (inches): NO

Hydric Soil Present? Yes ___ No ✓

Remarks:

NO HYDRIC SOILS OBSERVED & NO SOIL INDICATORS MET?

NO REACTION TO AA-DI TEST

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 16"

Wetland Hydrology Present? Yes ___ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SOIL SATURATION OBSERVED AT 16", NO PRIMARY OR SECONDARY HYDROLOGY FIELD INDICATORS OBSERVED --

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Carrington City/County: Eureka Sampling Date: 011 7-W
Applicant/Owner: TCC State: CA Sampling Point:
Investigator(s): A.L., M.T. Section, Township, Range:
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%):
Subregion (LRR): Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Depth to ground water in pit is 12".
Wetland test pit is 2' to mapped wetland boundary.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiandra var. lasiandra	10	X	FACW
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3 m)			
1. Rubus armeniacus	35	X	FAC
2.			
3.			
4.			
5.			
	35 = Total Cover		
Herb Stratum (Plot size: 3 m)			
1. Hedera helix	40%	X	FACU
2. Hedera helix			
3. Anthoxanthum odoratum			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Herbaceous layer is sparse due partially to Rubus armeniacus canes and long Salix growing parallel and low to ground or touching ground.

SOIL

Sampling Point: 15 3W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0"-9"	10YR 3/1	90	2.5Y 4/3	10	C	M	SANDY-SILTY LOAM	
9"-16"	2.5Y 3/2	80	2.5Y 4/3	20	C	M	SANDY LOAM W/ SM 2% SM GRAVEL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: NO

Depth (inches): NO

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDRIC SOIL PRESENT, SOIL REACTED TO AA-DJ TEST.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ☑ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 12"

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 9"

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND HYDROLOGY FEATURES OBSERVED W/ SATURATION & WATER TABLE.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Carrington City/County: Eureka Sampling Date: WIT3-U
Applicant/Owner: TCC State: CA Sampling Point: _____
Investigator(s): A.L., M.T. Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks: Upland test pit is 2' from mapped wetland boundary.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 3 m)			
1. Rubus armeniacus	5%	X	FAC
2.			
3.			
4.			
5.			
	5% = Total Cover		
Herb Stratum (Plot size: 2 m)			
1. Poa pratensis	15		FAC
2. Anthoxanthum odoratum	25	X	FACU
3. [redacted]			
4. Vicia sativa	5		UPL
5. Bromus diandrus	35	X	NL
6. Hedera helix	10		FACU
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		45/18
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
Total Number of Dominant Species Across All Strata: _____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 = _____
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals:	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: W1T3U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0'-6"	10YR 3/2	100	Ø	Ø	C	M	Fill w/ Silt.	
6-16"	10YR 3/3	100	Ø	Ø	1	1	Fill / Silt / MED SIZE GRAVEL..	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: NA

Depth (inches): NA

Hydric Soil Present? Yes ___ No ✓

Remarks:

NO EVIDENCE OF HYDRIC SOILS, NO REACTION TO AA-DI TEST, VISUAL ASSESSMENT IS DOMINATE FILL MATERIAL W/ RUBBISH..

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 16"

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SATURATION IN FILL EVIDENT AT 16", NO WATER TABLE INTRUSION..

Appendix C – Scoping Table

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Abronia umbellata var. breviflora	pink sand-verbena	Dicots	None	None	G4G5T2	S1	1B.1	BLM_S-Sensitive	Coastal dunes	Coastal dunes and coastal strand.	Foredunes and interdunes with sparse cover. A. umbellata var. breviflora is usually the plant closest to the ocean. 0-25 m.	**No potential**. Project area does not include coastal dunes.
Acipenser medirostris	Green Sturgeon	Fish	Threatened	None	G3	S1S2		AFS_VU-Vulnerable | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened | NMFS_SC-Species of Concern	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters	These are the most marine species of sturgeon. Abundance increases northward of Point Conception. Spawns in the Sacramento, Klamath, & Trinity Rivers.	Spawns at temps between 8-14 C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	**No potential**. No riverine or bay habitat present at project site.

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Anodonta californiensis	California Floater	Mollusks	None	None	G3Q	S2?		USFS_S-Sensitive	Aquatic	Freshwater lakes and slow-moving streams and rivers. Taxonomy under review by specialists.	Generally in shallow water.	**No potential**. No freshwater stream or riverine habitat present at project site although creek on adjacent Palco Marsh property. Last documented record for the county was in the Elk River

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Aplodontia rufa humboldtiana	Humboldt Mountain Beaver	Mammals	None	None	G5TNR	SNR			Coastal scrub | Redwood | Riparian forest	Coast Range in southwestern Del Norte County and northwestern Humboldt County.	Variety of coastal habitats, including coastal scrub, riparian forests, typically with open canopy and thickly vegetated understory.	**No potential**. Last documented record of this species was from 1917 in southern Eureka (no records near project area). Coastal scrub/riparian woodland near site is highly degraded and would be considered sub-par for the species.
Ardea alba	Great Egret	Birds	None	None	G5	S4		CDF_S-Sensitive | IUCN_LC-Least Concern	Brackish marsh | Estuary | Freshwater marsh | Marsh & swamp | Riparian forest | Wetland	Colonial nester in large trees.	Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	**Moderate potential**. The species is known to forage and roost around Humboldt Bay and suitable roost or nesting trees may be present adjacent to the project area.

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Ardea herodias	Great Blue Heron	Birds	None	None	G5	S4		CDF_S-Sensitive | IUCN_LC-Least Concern	Brackish marsh | Estuary | Freshwater marsh | Marsh & swamp | Riparian forest | Wetland	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes.	Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	**Moderate potential**. The species is known to forage and roost around Humboldt Bay and suitable roost or nesting trees may be present adjacent to the project area.
Astragalus pycnostachyus var. pycnostachyus	coastal marsh milk-vetch	Dicots	None	None	G2T2	S2	1B.2	BLM_S-Sensitive | SB_SBBG-Santa Barbara Botanic Garden	Coastal dunes | Coastal scrub | Marsh & swamp | Wetland	Coastal dunes,marshes and swamps, coastal scrub.	Mesic sites in dunes or along streams or coastal salt marshes. 0-155 m.	**Low potential**. No coastal salt marsh is present. Habitat present is freshwater forested wetland.

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Bombus caliginosus	Obscure Bumble Bee	Insects	None	None	G4?	S1S2		IUCN_VU-Vulnerable		Coastal areas from Santa Barabara county to north to Washington state.	Food plant genera include Baccharis, Cirsium, Lupinus, Lotus, Grindelia and Phacelia.	**Low potential**. The project site falls within the species current range (according to ICUN Redlist). In addition, the project site is within the coastal fog belt. However, vegetation at the site does not include dune nectar plants that the species requires for foraging habitat.

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Bombus occidentalis	Western Bumble Bee	Insects	None	None	G2G3	S1		USFS_S-Sensitive | XERCES_IM-Imperiled		Once common & widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease.		**Low potential.** Although the project site falls within the species pre-2002 range (according to ICUN Redlist), the range has contracted significantly in the last decade and now only includes the intermountain west and cascade regions of the US.

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Brachyramphus marmoratus	Marbled Murrelet	Threatened	Endangered	G3G4	S1		CDF_S-Sensitive | IUCN_EN-Endangered | NABCI_RWL-Red Watch List	Lower montane coniferous forest | Oldgrowth | Redwood	Feeds near-shore; nests inland along coast from Eureka to Oregon border & from Half Moon Bay to Santa Cruz.	Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.	**Low.** It is possible that the species may fly over the project site on the way to foraging habitat (Humboldt Bay/the Pacific). However there is no breeding or foraging habitat present directly on or adjacent to the project site.	**Low potential**. Marbled Murrelets may fly over the project site on their way to foraging habitat (Humboldt Bay). However, there is no foraging or nesting habitat present for this species at the project site.
Bryoria spiralifera	twisted horsehair lichen	Lichens	None	None	G3	S1S2	1B.1		North coast coniferous forest	North coast coniferous forest.	Usually on conifers. 0-30 m.	**No potential.** North coast coniferous forest is not present.
Carex arcta	northern clustered sedge	Monocots	None	None	G5	S1	2B.2		Bog & fen | North coast coniferous forest | Wetland	Bogs and fens, north coast coniferous forest.	Mesic sites. 60-1405 m.	**Low potential.** Project area is freshwater forested wetland but not in coniferous forest.

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Carex lyngbyei	Lyngbye's sedge	Monocots	None	None	G5	S3	2B.2		Marsh & swamp | Wetland	Marshes and swamps (brackish or freshwater).	0-200 m.	**Moderate potential.** Freshwater wetland present.
Carex praticola	northern meadow sedge	Monocots	None	None	G5	S2	2B.2		Meadow & seep | Wetland	Meadows and seeps.	Moist to wet meadows. 15-3200 m.	**No potential.** No meadow habitat occurs at project site.
Castilleja ambigua var. humboldtiensis	Humboldt Bay owl's-clover	Dicots	None	None	G4T2	S2	1B.2	BLM_S-Sensitive	Marsh & swamp | Salt marsh | Wetland	Marshes and swamps.	In coastal saltmarsh with Spartina, Distichlis, Salicornia, Jaumea. 0-20 m.	**No potential.** Project area conatins freshwater wetland and no salt marsh.
Castilleja litoralis	Oregon coast paintbrush	Dicots	None	None	G3	S3	2B.2		Coastal bluff scrub | Coastal dunes | Coastal scrub	Coastal bluff scrub, coastal dunes, coastal scrub.	Sandy sites. 5-255 m.	**No potential.** No coastal bluff scrub or coastal dunes were present at site.

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Charadrius nivosus nivosus	Western Snowy Plover	Birds	Threatened	None	G3T3	S2S3		CDFW_SSC-Species of Special Concern | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern	Great Basin standing waters | Sand shore | Wetland	Sandy beaches, salt pond levees & shores of large alkali lakes.	Needs sandy, gravelly or friable soils for nesting.	**Low potential**. Western Snowy Plover may fly over the project site on their way to foraging habitat (beaches or riverine gravel bars). However, there is no foraging or nesting habitat present for this species at the project site.

Appendix C: Combined list of California Department of Fish and Wildlife California Natural Diversity Data Base, California Native Plant Society Inventory, and US Fish and Wildlife Service Scoping for Eureka Quad. The Carringotn Property, Eureka, CA

Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Charadrius montanus	Mountain Plover	Birds	None	None	G3	S2S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern	Chenopod scrub | Valley & foothill grassland	Short grasslands, freshly plowed fields, newly sprouting grain fields, & sometimes sod farms.	Short vegetation, bare ground, and flat topography. Prefers grazed areas and areas with burrowing rodents.	**Low potential**. Mountain Plover may fly over the project site on their way to foraging habitat (agricultural land around Humboldt Bay). However, there is no foraging or nesting habitat present for this species at the project site.
Chelonia mydas	Green Sea Turtle	Reptiles	Threatened	None	G3	S1		IUCN_EN-Endangered	Marine bay	Marine.	Completely herbivorous; needs adquate supply of seagrasses and algae.	**No potential**. No marine bay habitat present at the project site.

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Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Chloropyron maritimum ssp. palustre	Point Reyes salty bird's-beak	Dicots	None	None	G4?T2	S2	1B.2	BLM_S-Sensitive	Marsh & swamp | Salt marsh | Wetland	Coastal salt marsh.	Usually in coastal salt marsh with Salicornia, Distichlis, Jaumea, Spartina, etc. 0-115 m.	**No potential.** Project area conatins freshwater wetland and no salt marsh.
Cicindela hirticollis gravida	Sandy Beach Tiger Beetle	Insects	None	None	G5T2	S2			Coastal dunes	Inhabits areas adjacent to non-brackish water along the coast of California from San Francisco Bay to northern Mexico.	Clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affected by wave action.	**No potential**. Last historical record from Humboldt County was in the early 1900s. The species is believed to be extirpated from the area with known extant populations only in Marin, San Luis Obispo, Ventura, Santa Barbara, and San Diego counties in California.

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Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Circus cyaneus	Northern Harrier	Birds	None	None	G5	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Coastal scrub | Great Basin grassland | Marsh & swamp | Riparian scrub | Valley & foothill grassland | Wetland	Coastal salt & freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas.	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	**Low potential.** Numerous records of the species adjacent to the project site. However, no open grassy expanses or open coastal scrubland necessary for foraging/nesting at the project site.
Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo	Birds	Threatened	Endangered	G5T2T3	S1		BLM_S-Sensitive NABCI_RWL-Red Watch List USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	Riparian forest	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, w/ lower story of blackberry, nettles, or wild grape.	**Low potential**. No suitable nesting habitat (large willow/cottonwood thickets) existing on or directly adjacent to the project site. No country records from this particular area.

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Collinsia corymbosa	round-headed Chinese-houses	Dicots	None	None	G1	S1	1B.2		Coastal dunes	Coastal dunes.	0-30 m.	**No potential.** Coastal dunes are not present at project site.
Egretta thula	Snowy Egret	Birds	None	None	G5	S4		IUCN_LC-Least Concern	Marsh & swamp | Meadow & seep | Riparian forest | Riparian woodland | Wetland	Colonial nester, with nest sites situated in protected beds of dense tules.	Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	**Moderate potential**. The species is known to forage and roost around Humboldt Bay and suitable roost or nesting trees may be present adjacent to the project area.
Elanus leucurus	White-tailed Kite	Birds	None	None	G5	S3S4		BLM_S-Sensitive | CDFW_FP-Fully Protected | IUCN_LC-Least Concern	Cismontane woodland | Marsh & swamp | Riparian woodland | Valley & foothill grassland | Wetland	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	**Low potential.** Numerous records of the species adjacent to the project site. However, the site is too overgrown and lacks grassy expanses needed for nesting and foraging habitat.

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Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Emys marmorata	Western Pond Turtle	Reptiles	None	None	G3G4	S3		BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFS_S-Sensitive	Aquatic | Artificial flowing waters | Klamath/North coast flowing waters | Klamath/North coast standing waters | Marsh & swamp | Sacramento/San Joaquin flowing waters | Sacramento/San Joaquin standing waters | South coast flowing waters | South coast standing waters | Wetland	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	**Low potential.** Small seasonal wetlands on the project site and a creek at the adjacent Palco Marsh would serve as very low quality habitat.

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Scientific Name	Common Name	Taxon	FedList	CalList	GRank	SRank	Rare Plant Rank (CRPR)	Other Status	Habitats	General Habitat	Micro Habitat	Liklihood of Occurrence
Entosphenus tridentatus	Pacific Lamprey	Fish	None	None	G4	S4		AFS_VU-Vulnerable | BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters | South coast flowing waters	Found in Pacific Coast streams north of San Luis Obispo County, however regular runs in Santa Clara River. Size of runs is declining.	Swift-current gravel-bottomed areas for spawning with water temps between 12-18 C. Ammocoetes need soft sand or mud.	**No potential.** No stream or riverine habitat present on the site (other than potential small seasonal wetlands). Trash-filled stream on adjacent Palco Marsh property.
Erethizon dorsatum	North American Porcupine	Mammals	None	None	G5	S3		IUCN_LC-Least Concern	Broadleaved upland forest | Cismontane woodland | Closed-cone coniferous forest | Lower montane coniferous forest | North coast coniferous forest | Upper montane coniferous forest	Forested habitats in the Sierra Nevada, Cascade, and Coast ranges, with scattered observations from forested areas in the Transverse Ranges.	Wide variety of coniferous and mixed woodland habitat.	**Low potential**. Last documented record of this species was from the 1990s in Manila (no records near project area). Coastal scrub/riparian woodland near site is highly degraded and would be considered sub-par for the

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Erysimum menziesii	Menzies' wallflower	Dicots	Endangered	Endangered	G1	S1	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Coastal dunes	Coastal dunes.	Localized on dunes and coastal strand. 1-25 m.	**No potential.** Coastal dunes are not present at project site.
Erythronium revolutum	coast fawn lily	Monocots	None	None	G4G5	S3	2B.2		Bog & fen | Broadleaved upland forest | North coast coniferous forest | Wetland	Bogs and fens, broadleafed upland forest, north coast coniferous forest.	Mesic sites; streambanks. 60-1405 m.	**No potential**. Site does not contain broadleafed upland or north coast coniferous forest.
Eucyclogobius newberryi	Tidewater Goby	Fish	Endangered	None	G3	S3		AFS_EN-Endangered | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters | South coast flowing waters	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	**No potential.** No brackish water/lagoon habitat falls within the project area.
Gilia capitata ssp. pacifica	Pacific gilia	Dicots	None	None	G5T3	S2	1B.2		Chaparral | Coastal bluff scrub | Coastal prairie | Valley & foothill grassland	Coastal bluff scrub, chaparral, coastal prairie, valley and foothill grassland.	5-1345 m.	**No potential.** Project site does not contain coastal bluff scrub, chaparral, coastal prairie or grasslands.

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Gilia millefoliata	dark-eyed gilia	Dicots	None	None	G2	S2	1B.2	BLM_S-Sensitive	Coastal dunes	Coastal dunes.	1-60 m.	**No potential.** Coastal dunes are not present.
Hesperevax sparsiflora var. brevifolia	short-leaved evax	Dicots	None	None	G4T3	S2	1B.2	BLM_S-Sensitive	Coastal bluff scrub | Coastal dunes | Coastal prairie	Coastal bluff scrub, coastal dunes, coastal prairie.	Sandy bluffs and flats. 0-215 m.	**No potential.** Coastal bluff scrub, coastal dunes, coastal prairie are not present.
Lasthenia californica ssp. macrantha	perennial goldfields	Dicots	None	None	G3T2	S2	1B.2		Coastal bluff scrub | Coastal dunes | Coastal scrub	Coastal bluff scrub, coastal dunes, coastal scrub.	5-185 m.	**No potential.** Coastal bluff scrub, coastal dunes, coastal scrub are not present.
Lathyrus japonicus	seaside pea	Dicots	None	None	G5	S2	2B.1		Coastal dunes	Coastal dunes.	3-65 m.	**No potential.** Coastal dunes are not present.
Lathyrus palustris	marsh pea	Dicots	None	None	G5	S2	2B.2		Bog & fen | Coastal prairie | Coastal scrub | Lower montane coniferous forest | Marsh & swamp | North coast coniferous forest | Wetland	Bogs & fens, lower montane coniferous forest, marshes and swamps, north coast coniferous forest, coastal prairie, coastal scrub.	Moist coastal areas. 2-140 m.	**Low potential.** Freshwater wetland is present with some marshy areas.

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Layia carnosa	beach layia	Dicots	Endangered	Endangered	G2	S2	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden	Coastal dunes | Coastal scrub	Coastal dunes, coastal scrub.	On sparsely vegetated, semi-stabilized dunes, usually behind foredunes. 0-30 m.	**No potential.** Coastal dunes, coastal scrub are not present.
Lilium occidentale	western lily	Monocots	Endangered	Endangered	G1	S1	1B.1	SB_BerrySB-Berry Seed Bank	Bog & fen | Coastal bluff scrub | Coastal prairie | Coastal scrub | Freshwater marsh | Marsh & swamp | North coast coniferous forest | Wetland	Coastal scrub, freshwater marsh, bogs and fens, coastal bluff scrub, coastal prairie, north coast coniferous forest, marshes and swamps.	Well-drained, old beach washes overlain with wind-blown alluvium and organic topsoil; usually near margins of Sitka spruce. 3-110 m.	**Low potential.** Freshwater wetland is present but specific habitats of this species are not present.
Monotropa uniflora	ghost-pipe	Dicots	None	None	G5	S2	2B.2		Broadleaved upland forest | North coast coniferous forest	Broadleafed upland forest, north coast coniferous forest.	Often under redwoods or western hemlock. 15-855 m.	**No potential.** Broadleafed upland or north coast coniferous forest is not present.
Montia howellii	Howell's montia	Dicots	None	None	G3G4	S2	2B.2		Meadow & seep | North coast coniferous forest | Vernal pool | Wetland	Meadows and seeps, north coast coniferous forest, vernal pools.	Vernally wet sites; often on compacted soil. 10-1185 m.	**Low potential.** Compacted soils are present that are seasonally wet.

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Nycticorax nycticorax	Black-crowned Night Heron	Birds	None	None	G5	S4		IUCN_LC-Least Concern	Marsh & swamp | Riparian forest | Riparian woodland | Wetland	Colonial nester, usually in trees, occasionally in tule patches.	Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.	**Moderate potential**. The species is known to forage and roost around Humboldt Bay and suitable roost or nesting trees may be present adjacent to the project area.
Oenothera wolfii	Wolf's evening-primrose	Dicots	None	None	G2	S1	1B.1	BLM_S-Sensitive | SB_BerrySB-Berry Seed Bank	Coastal bluff scrub | Coastal dunes | Coastal prairie	Coastal bluff scrub, coastal dunes, coastal prairie, lower montane coniferous forest.	Sandy substrates; usually mesic sites. 0-125 m.	**No potential.** Project site does not contain coastal bluff scrub, coastal dunes, or coastal prairie.
Oncorhynchus clarkii clarkii	Coast Cutthroat Trout	Fish	None	None	G4T4	S3		AFS_VU-Vulnerable | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	Aquatic | Klamath/North coast flowing waters	Small coastal streams from the Eel River to the Oregon border.	Small, low gradient coastal streams and estuaries. Needs shaded streams with water temperatures <18C, and small gravel for spawning.	**No potential.** No rivers or streams fall within the project area. Trash-filled stream on adjacent Palco Marsh property.

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Oncorhynchus kisutch pop. 2	Coho Salmon - southern Oregon / northern California ESU	Fish	Threatened	Threatened	G4T2Q	S2?		AFS_TH-Threatened	Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters	Federal listing refers to populations between Cape Blanco, Oregon and Punta Gorda, Humboldt County, California.	State listing refers to populations between the Oregon border and Punta Gorda, California.	**No potential.** No rivers, streams, or bay habitat fall within the project area. Trash-filled stream on adjacent Palco Marsh property.
Oncorhynchus mykiss irideus pop. 16	Steelhead - northern California DPS	Fish	Threatened	None	G5T2T3Q	S2S3		AFS_TH-Threatened	Aquatic | Sacramento/San Joaquin flowing waters	Coastal basins from Redwood Creek south to the Gualala River, inclusive. Does not include summer-run steelhead.		**No potential.** No rivers, streams, or bay habitat fall within the project area. Trash-filled stream on adjacent Palco Marsh property.

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Pandion haliaetus	Osprey	Birds	None	None	G5	S4		CDF_S-Sensitive | CDFW_WL-Watch List | IUCN_LC-Least Concern	Riparian forest	Ocean shore, bays, freshwater lakes, and larger streams.	Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	**Low potential.** It is possible that the species may fly over the project site on the way to foraging habitat (Humboldt Bay/the Pacific). However there is no breeding or foraging habitat present directly on or adjacent to the project site.
Phoebastria albatrus	Short-tailed Albatross	Birds	Endangered	None	G1	S1		CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable NABCI_RWL-Red Watch List	Offshore Japanese Islands | Northern Pacific Ocean | Sea of Okhotsk	Islands with bare ground/grass surrounded by cliffs	Nests consist of large scoops lined with grass in open, grassy areas. Forages at upwellings in the ocean.	**No potential**. Species is extremely rare along the west coast of the U.S. (non-breeding season only). Only breeds on offshore islands in Japan and recently Midway atoll.

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Rallus obsoletus obsoletus	California Ridgway's Rail	Birds	Endangered	Endangered	G5T1	S1		CDFW_FP-Fully Protected | NABCI_RWL-Red Watch List	Brackish marsh | Marsh & swamp | Salt marsh | Wetland	Salt water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay.	Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.	**No potential**. The last Ridgway's Rail breeding population documented in Humboldt County was in 1932 at the mouth of the Mad River. No records of the species have been documented since then. The species was extirpated from this area most likely as the result of tidal marsh habitat

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Rana aurora	Northern Red-legged Frog	Amphibians	None	None	G4	S3		CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Klamath/North coast flowing waters | Riparian forest | Riparian woodland	Humid forests, woodlands, grasslands, and streamsides in northwestern California, usually near dense riparian cover.	Generally near permanent water, but can be found far from water, in damp woods and meadows, during non-breeding season.	**Moderate potential**. No lower montane coniferous forest, rocky creek/stream, or riparian habitat on or directly adjacent to project site. However, seasonal wetlands may be present.
Riparia riparia	Bank Swallow	Birds	None	Threatened	G5	S2		BLM_S-Sensitive | IUCN_LC-Least Concern	Riparian scrub | Riparian woodland	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	**Low potential**. Project area may serve as a foraging site, but no nesting habitat present.

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Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	Dicots	None	None	G5T2	S2	1B.2	BLM_S-Sensitive	Coastal bluff scrub | Coastal prairie | North coast coniferous forest	Coastal bluff scrub, coastal prairie, north coast coniferous forest.	Open coastal forest; roadcuts. 5-1255 m.	**No potential.** Coastal bluff scrub, coastal prairie, north coast coniferous forest are not present.
Sidalcea oregana ssp. eximia	coast checkerbloom	Dicots	None	None	G5T1	S1	1B.2	BLM_S-Sensitive	Lower montane coniferous forest | Meadow & seep | North coast coniferous forest | Wetland	Meadows and seeps, north coast coniferous forest, lower montane coniferous forest.	Near meadows, in gravelly soil. 5-1805 m.	**No potential.** North coast coniferous forest or lower montane conifeous forest are not present. Meadows are not present.
Spergularia canadensis var. occidentalis	western sand-spurrey	Dicots	None	None	G5T4	S1	2B.1		Marsh & swamp | Wetland	Marshes and swamps (coastal salt marshes).	0-3 m.	**No potential.** Freshwater wetland is present but coastal salt marsh is not.

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Spirinchus thaleichthys	Longfin Smelt	Fish	Candidate	Threatened	G5	S1		CDFW_SSC-Species of Special Concern	Aquatic | Estuary	Euryhaline, nektonic & anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column.	Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.	**No potential**. No estuarine or bay habitat present at project site.
Strix occidentalis caurina	Northern Spotted Owl	Birds	Threatened	Threatened	G3T3	S2S3		CDF_S-Sensitive |CDFW_SSC-Species of Special Concern |IUCN_NT-Near Threatened |NABCI_RWL-Yellow Watch List	Oldgrowth to mixed conifer forests with a multi-species canopy, moderate to high canopy closure, large conifers with decadence features such broken tops, cavities, or snags	Late seccessional redwood, douglas-fir forests in California, Oregon, and Washington	Nests in large, continuous patches of old growth redwood or doug fir-dominated forests	**No potential**. No suitable nesting or foraging habitat (complex coniferous forest) exists on or directly adjacent to the project site.

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Thaleichthys pacificus	Eulachon	Fish	Threatened	None	G5	S3			Aquatic | Klamath/North coast flowing waters	Found in Klamath River, Mad River, Redwood Creek, and in small numbers in Smith River and Humboldt Bay tributaries.	Spawn in lower reaches of coastal rivers with moderate water velocities and bottom of pea-sized gravel, sand, and woody debris.	**No potential**. No riverine, creek, or bay habitat present at project site.
Viola palustris	alpine marsh violet	Dicots	None	None	G5	S1S2	2B.2		Bog & fen | Coastal scrub | Wetland	Coastal scrub, bogs and fens.	Swampy, shrubby places in coastal scrub or coastal bogs. 0-150 m.	**Moderate potential.** Freshwater wetland and wetland riparian habitat is present.
Habitats												
Northern Coastal Salt Marsh	Northern Coastal Salt Marsh	Marsh	None	None	G3	S3.2			Marsh & swamp | Wetland			**Not present**. Freshwater forested wetland was present.

Potential to Occur:

No Potential: Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Low Potential. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

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Appendix D Historic Building Survey Report

Creative Home Construction
3683 Dolbeer St.
Eureka, CA 95503

Bill Hole, *owner* *PHONE* - (707) 834-1898
CA. General Contractor – Lic. # 499207
Building Consultant –sustainable structures, building analysis
Historic Preservation Consultant/Trainer *EMAIL* - billhole55@reninet.com

August 12, 2018

Project Scope – Building Survey of 2616 Broadway, Eureka CA

Purpose - The purpose of this report is to analyze the historicity of the existing building located on Project Location ahead of the proposed redevelopment of the property, which includes the demolition of the building. This building and property is not considered historically significant by the City of Eureka, it is not listed on the Local Register of Historic Places, and therefore proposed work does not fall under the purview of the City's Historic Preservation Commission. Because of the age of the building, it was determined to undertake this study.

Conclusion – It seems logical that though the building meets one criterion for determining historic significance (older than 50 years from construction), it doesn't visually demonstrate an underlying significance based construction techniques, materials, or architectural design unique to the region.

Research Findings - The proposed project is located in the City of Eureka, Humboldt County, California. The project is to be located on an already developed lot in a service commercial zone of Eureka. The site is located at the southwest intersection of Broadway Boulevard and Vigo Streets. Vigo Street first appeared in the 1955 Sanborn Fire Insurance Map as a recognized street. Before that it was a street that connected a bay-shore lumber mill "Eureka and Crossarm Lumber" to Broadway Blvd.

It may be considered a timestamp in history about the original timber industry that founded Humboldt County, but by the time this building was constructed the timber industry was waning. Constructed in 1948 as a "Garage and Services Building" (reference 5 and photo attachment), it has occupied varied businesses over time that include: Tony Gosselin International Harvester Tractor Sales and Service, been occupied by Eureka Truck Terminal and Gas Station, Truck Terminal Café, Janney's Truck Repair, Al's Eureka Truck Terminal, M&C Truck and Auto Repair, Johnsons Auto & Truck Repair & Electric, U-Haul Co. Independent Dealer Truck renting and leasing. The site sold fuels; gasoline, diesel, propane and maintained a 70-foot truck scale.

Abandoned of original uses for long enough that it currently suffers from severe deferred maintenance and has demonstrated no economically viable business use for nearly 15 years (7).

While suffering from negligence and deferred maintenance, its location within the bay-shore region has become a site of blight in many ways, Eureka's' homeless/transient population use, the repeated police presence to address building vandalism, and general security issues related to an unused building struck with no current purpose.

In 2004, a CEQA structured report was completed for the City of Eureka (1), as the site falls under California Coastal Commission Permit Jurisdiction. As then, todays' project involves the demolition of the one existing commercial structure. Research provided in the 2004 G.P.D. Project Report concluded it was constructed circa 1962 and determined at the time it was not of historical significance.

Today's research concludes that the building was constructed around 1948, as confirmed by City of Eureka building permit records and historic photographs (3, 5). Though the building is older than 50 years, it doesn't combine other significant attributes that earn a story of "historic significance", such as the importance of a property to the history, architecture, archeology, engineering, or culture of a community, a State, or the nation.

Determination in 2004 that building demolition would not result in an adverse change in the significance of a historical resource seems a fair conclusion still today.

Merle Shuster historic aerial photos archived at Humboldt State University's Humboldt Room are a good source of historic photographs. Photo numbered 2001.01.1190, dated 10/26/48, labeled "Eureka and Crossarm Lumber", and photos numbered 2001.01.1879 and 2001.01.1866, both dated 5/19/50, and 2001.01.2338, and 2001.01.2332, dated 12/14/58, demonstrate evidence of this building.

Additions to the exterior facades have been noted since the historic photographs. These include:
1. A circa 1972 eyebrow shed roof overhang on the east elevation (5).
2. Two separate and different time-span (earliest -1952) (5), square shaped rooms added to the north elevation. These appear to be enclosed loading docks based on the sliding door rails noted above openings. The earlier of the two has had side-mount hinges replace the overhead track.
3. The roof windows above the interior bays have been removed and covered with plywood.

Current Building Survey

Physical examination of the building was completed on July 25th, 2018. Previously utilized for a truck/auto maintenance and repair facility, it is mostly a full-width open expanse of interior space. There were originally five tall sixteen-foot wide rollup doors, on both the north and south elevations, for driving trucks into the bays. One bay has a seventy-foot long 3-1/2 foot wide sunken pit for mechanics to access the pit underneath of trucks for servicing. Basically the entire shop area is an open slab floor with perimeter walls attached to a low concrete foundation. The west wall and sections above the bay doors are solid flat-framed walls, common of commercial firewalls seen throughout Eureka.

Because of the wide doors, the wall structure of the north and south predominant elevations are framed with steel H-beam posts to support full spanning steel trusses. The trusses were hot riveted in fabrication, which would have been near the tail end of an era of this style of roof truss. Physical access to study the elevated trusses was not available at the time of this survey and it is likely that these were custom fabricated for this building. Clearly, if we were to identify historic fabric, the trusses would be the main features. If deconstruction of the building occurs, certainly recycling the wood and steel for reuse or salvage would be viable.

The eastern section of the building is traditional wood framed and unused other than minor storage and displays a need to be fully rehabilitated of mechanical, electrical, plumbing, and insulation systems. Evidence confirms what historic analysis of past businesses and uses provides.

Summary - This property is not considered a significant historic resource in the City of Eureka. Yet, because of its approximate 70-year age, this study was developed to address potential concerns of disturbing an historic resource. Based on evidence herein, it seems unlikely. The property has been utilized for commercial businesses during its life and for the last fifteen years has succumbed into a state of disrepair and blight (7).

The proposed future project will rearrange the use of the land and has a positive potential to develop a property with different business uses than historically, which may hopefully provide the economics for the property reuse to succeed well into the future. This will likely also remove the state of blight that this property has become within the City. Recycling building materials and maintaining sensitivity to surrounding bay watershed land seems logical.

References:

1) Gateway Pacific Development Project, June 2004 - Winzler & Kelly, #04-1022-01033
2) The Secretary of Interior's Standards for Rehabilitation
3) Shuster aerial photographs, Humboldt Room archives, Humboldt State University
4) The Legacy of the Log Boom Humboldt County Logging from 1945 to 1955, Paul G. Wilson
5) City of Eureka Building Permit Records
6) Polk City Directories
7) City of Eureka files "Notice of Inclusion on the City of Eureka Vacant and/or Boarded Buildings List"

ca. 1948 Gosselin company photograph

1948 Merle Shuster photo

1958 Merle Shuster photo

Appendix E Limited Hazardous Materials Assessment Survey Report

Limited Hazardous Materials Assessment Survey Report

The Carrington Company

Former Truck Stop Structure
2616 Broadway Eureka, California 95501
Structure Demolition Project
Eureka, California

April 20, 2018

GHD | 718 3rd Street | Eureka, California | 95501

Project Number 11153741| Phase 05 | Report Version: Rev. 0

Executive Summary

On April 13, 2018, GHD Inc. (GHD) coordinated a limited hazardous material survey at The Carrington Company (TCC) Former Truck Stop Structure (project site) located at 2616 Broadway in Eureka, California. The project site hazardous materials assessment included three components, collectively defined as “the survey”: a review of historical sampling data collected by Winzler & Kelly (now GHD) in 2006, a limited asbestos bulk sampling survey and a representative lead bulk sampling survey. This report supplements the 2006 survey reports produced by Winzler & Kelly and shall be read in conjunction with the findings, assumptions and conclusions contained in the 2006 Winzler & Kelly reports appended to this document in Appendix H.

The 2018 survey included the interior and exterior of the project site and was conducted in association with the planned project site demolition project on behalf of TCC. The survey included assessment of potentially hazardous materials located at the project site, specifically suspect asbestos materials and lead paint representative of those to be impacted by the project construction scope as defined by TCC.

As described in Table 4.1 Asbestos Laboratory Data and Quantification Summary located in Section 4, numerous building materials sampled for this survey were reported by the analyzing laboratory to contain asbestos. Asbestos material is subject to governmental regulations, including Title 8 California Code of Regulations Section 1529 (8 CCR 1529) as summarized in Appendix E.

As summarized in Table 5.1 Lead Laboratory Data Summary located in Section 5, several surface coatings were reported to contain lead. Surface coatings containing lead are subject to applicable governmental regulations, including 8 CCR 1532.1 as summarized in Appendix F.

The project site structure(s) and location of samples collected for the survey are generally depicted on Figure 1 – Project Site Sample Location Map (Figure 1) located in Appendix A. Photographs of the project site generally depicting the asbestos materials identified at the project site are located in Appendix B. The laboratory analytical reports produced for this survey are located in Appendix C (asbestos) and Appendix D (lead). This report is subject to, and must be read in conjunction with the limitations, assumptions, and qualifications contained throughout the report.

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Limited Hazardous Materials Assessment Survey Report
The Carrington Company
Former Truck Stop Structure

Report Rev. 0

GHD Project Number: 11153741 Phase 05

Submitted to:

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April 20, 2018

1. Introduction

GHD Inc. (GHD) is pleased to provide The Carrington Company (TCC) with the following Limited Hazardous Materials Assessment Survey Report (herein “report”) detailing the findings of the limited hazardous materials assessment survey conducted on April 13, 2018 (herein “the survey”) at the Former Truck Stop Structure (project site) facility located in Eureka, California (herein “project site”). The 2018 survey described by this report was performed at the request of, and on behalf of TCC. The following subsections provide pertinent contextual information regarding the survey, project, and project site. This report supplements previous asbestos survey data collected at the project site in 2006 by Winzler & Kelly (now GHD) and should be read in combination with the 2006 reports appended to this report.

The 2018 project site asbestos hazardous materials assessment included three components, collectively defined as “the survey”: a review of historical sampling data collected by Winzler & Kelly (now GHD) in 2006, a limited asbestos bulk sampling survey and a representative lead bulk sampling survey conducted on April 13, 2018. The 2018 survey was conducted by GHD under contract with TCC to identify asbestos and lead at the project site and to update, as necessary, the findings of the 2006 Winzler & Kelly surveys. The following subsections provide pertinent contextual information regarding the survey.

1.1 Client

The survey was conducted by GHD under contract with the facility owner (TCC), thus TCC shall herein be defined as the client for this report. The project-specific client information is as follows:

The Carrington Company

707 H Street

Eureka, California 95501

Client Representative: Gabe Hagemann, Vice President/Managing Director

1.2 Survey Location

The areas of the project site surveyed by GHD on April 13, 2018 are herein be defined as the project site. The project site is located at the following street address:

The Carrington Company

Former Truck Stop Structure

2616 Broadway (US101)

Eureka, California 95501

The existing conditions encountered at the project site are described in Section 2.

1.3 Purpose of the Report

GHD performed the survey to evaluate specific areas and building materials within the project site for the presence of asbestos and lead. The purpose of this Limited Hazardous Materials Assessment Survey Report (herein "the report") is to transmit to TCC the findings and conclusions resultant from the project site survey performed on April 13, 2018. This report supplements the 2006 survey reports produced by Winzler & Kelly and shall be read in conjunction with the findings, assumptions and conclusions contained in the 2006 Winzler & Kelly reports appended to this document (Appendix H). The services undertaken by GHD in connection with preparing the report were limited as defined herein and are subject to the scope limitations set out in the report and associated contracting documents.

1.4 Survey Description

The survey consisted of three components: a review of historical sampling data collected by Winzler & Kelly (now GHD) in 2006, bulk sampling of suspect asbestos materials and limited bulk sampling of suspect lead materials. The survey was conducted to assist the client with compliance with United States Environmental Protection Agency (USEPA) and California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) regulations governing asbestos and lead, as applicable to the project and project site. Section 1.6 provides a general summary of the regulatory context governing the survey.

For this survey, the following number of bulk samples were collected from the project site and submitted under chain of custody to AmeriSci Laboratories (AmeriSci) for analysis via the referenced methodology:

1. 23 total bulk material samples were analyzed for asbestos content via polarized light microscopy (PLM) methodology following USEPA method 600/R-93-116
2. Three (3) bulk paint samples were analyzed for lead content via flame atomic absorption spectrometry (AAS) methodology following USEPA method 3050B/7420

See Figure 1 – Project Site Sample Location Map (Figure 1) located in Appendix A (Figures) for the approximate location of bulk samples collected at the project site. Photographs of the project site generally depicting the homogeneous areas of asbestos and/or lead material identified during this survey are located in Appendix B (Photographs). The laboratory analytical reports and chain of custody documentation associated with this survey describe all of the materials sampled at the project site and are located in Appendix C (Asbestos Analytical Data) and Appendix D (Lead Analytical Data).

1.4.1 Survey Scope and Limitations

The survey scope of work associated with this report was limited to the project site areas shown on Figure 1 and the suspect hazardous materials described herein. The survey was limited to the following safely accessible areas of the project site:

1. Interior areas, including the floors, walls, ceilings, and exposed HVAC
2. Exterior areas, including exterior perimeter walls

The Former Truck Stop Building (Building) is a two-story wood-framed building built on a concrete slab foundation. The Building was previously surveyed for asbestos by Winzler & Kelly (now GHD) on March 30 and April 7, 2006. The findings of the 2006 survey were previously reported in the following document:

- *Asbestos Proposed Building Demolition Survey, 2616 Broadway Eureka, California* (Winzler & Kelly, April 2006)
- The 2006 Winzler & Kelly report is included in Appendix H

Areas not surveyed by GHD (areas not in scope and/or not specifically defined in this report) are excluded from the definition of the project site. The areas and materials excluded from the scope of this limited survey included the following (areas and/or components not surveyed):

1. Exterior areas, including: patios, walkways, porticos, parking areas, soil and/or naturally-occurring aggregate
2. Pressurized and/or potentially energized systems, including: wiring, mechanical units and machinery
3. Materials not to be disturbed during the project, located outside the project scope, or associated with components to be removed intact
4. Suspect materials located within permit-required confined spaces, crawlspaces, plenums, or other confined spaces, including material located underground
5. Suspect materials that could not be sampled without damaging the integrity of the building element, or would have caused significant damage, including materials encased in concrete

1.5 Survey and Reporting Assumptions

The content of this report is based on assumptions made by GHD as described in this report and associated contracting documents. It is GHD's understanding that this report is solely to be used by TCC specifically in connection with the project and project site, and this stated purpose was a significant factor in determining the survey scope and level of service provided for in the contracting documents. Should the project or report purpose change, this report immediately ceases to be valid and use of it by TCC, or any other party without GHD's prior review and written authorization, shall be at the user's sole risk.

The report's findings are based on conditions that existed on the date(s) of GHD's site visit(s) and should not be relied upon to precisely represent conditions at any other time. Conclusions about site conditions under no circumstances comprise a warranty that conditions in all areas within the site are of the same quality as those sampled. Recognize, too, that contamination might exist in forms not indicated by the limited assessment GHD conducted at the project site.

Samples of soil or naturally-occurring materials were not collected for this survey. Based on California Department of Conservation Division of Mines and Geology data[1], rock and/or soils

[1] State of California Department of Conservation Division of Mines and Geology, *A General Location guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos,* (August 2000). accessed via: http://www.capcoa.org/Docs/noa/%5B28%5D%20USGS%20Location%20Guide%20Report%202000-19.pdf

associated with Naturally Occurring Asbestos (NOA) are not known to be present in proximity to the project site. Regulations governing NOA, including those enforced by the California Air Resources Board (CARB), may apply to the project subject to the site-specific occurrence and/or disturbance of NOA.

The survey performed at the project site is additionally governed by the following assumptions that further define GHD's scope of work for the survey:

1. The survey included sampling throughout the building interior and exterior perimeter of project site and did not include ancillary structures such as signs, fencing or parking areas.

1.6 Survey Regulatory Setting

This section provides a regulatory context for the survey and generally summarizes the hazardous materials regulatory setting applicable to the project site. Further information is provided in Appendix E (Asbestos Regulatory Summary) and Appendix F (Lead Regulatory Summary).

The USEPA enforces asbestos regulations authorized under the Clean Air Act and specifies work practices to be followed at all facilities to lessen air pollution resultant from asbestos. To mitigate airborne asbestos fiber release, a survey must be conducted at a facility prior to renovation and/or demolition work to identify and sample suspect asbestos materials[2] in compliance with the USEPA's National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations, per Title 40 Code of Federal Regulations (CFR) Section 61, Subpart A and Subpart M. The project-specific NESHAP requirements are outlined in Section 6. Materials reported to contain greater than one percent (1%) asbestos by weight are regulated by the USEPA as either Asbestos Containing Material (ACM) or Regulated Asbestos Containing Material (RACM) based each material's distinctive physical characteristics. Material containing less than 1% asbestos is not subject to USEPA asbestos regulations.

Asbestos is a known carcinogen, thus worker exposure to asbestos is regulated by Cal/OSHA. Employee protection protocols per Title 8 California Code of Regulations (CCR) Sections 1529 (8 CCR 1529) apply to disturbance of material containing asbestos in any detectable concentration. Per Cal/OSHA, material containing greater than 1% asbestos is defined as Asbestos Containing Material (ACM), while Asbestos Containing Construction Material (ACCM) refers to material containing greater than 0.1% asbestos. Cal/OSHA requires that specific types of suspect asbestos materials located in buildings constructed no later than 1980 must be presumed to contain asbestos, unless sampled and proven to be otherwise. Presumed Asbestos Containing Material (PACM) includes thermal system insulation[3] (TSI) and surfacing materials[4]. Work conducted by an

[2] Suspect asbestos material includes, but is not limited to, the following materials: mastics, caulking, base cove, Thermal System Insulation applied to pipes, boilers, or other components to prevent heat loss or gain; Surfacing Materials, including spray or troweled-on surface coatings and acoustic/decorative textures; cementitious products, including cement paneling/piping; roofing products, including associated mastics, felts, or coatings; resilient flooring; gaskets and lagging; drywall; joint compound; plasters; vibration cloths, or expansion joints.

[3] Thermal system insulation (TSI) is defined by 8 CCR 1529 as ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.

[4] Surfacing material is defined by 8 CCR 1529 as material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

employee impacting ACM or ACCM is regulated by Cal/OSHA according to the specific material(s) to be disturbed and the size of the job. Materials reported to be nondetect via laboratory analysis are not subject to regulation by Cal/OSHA as ACM or ACCM.

The USEPA and Cal/OSHA regulate exposure to materials containing lead. Paint, glazing and other coating materials containing lead in a concentration above 90 parts per million (ppm) are defined by the United States Consumer Product Safety Commission (CPSC) as Lead Containing Paint (LCP). Coatings reported to contain lead above 5,000 ppm, or 1.0 milligram per square centimeter (mg/cm^2), are defined as Lead Based Paint (LBP). Work impacting LCP, LBP and/or presumed lead material triggers compliance with applicable regulations, including 8 CCR 1532.1. Additionally, work at the project site impacting LBP must comply with USEPA and California Department of Public Health (CDPH) lead regulations, including: the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. Section 6901 et seq.), 40 CFR Part 745, Subpart E; and 17 CCR Division 1, Chapter 8.

2. Project Site Existing Conditions

This report includes the following information about the specific structure(s) and building features surveyed in association with this survey, which shall further define the project site:

1. Approximate locations of general site features and bulk samples collected by GHD are shown on Figure 1 (Appendix A). The extent and distribution of sample points noted on Figure 1 shall define the survey boundary.
2. Photographs generally depicting the project site and some sampled materials are provided in Appendix B.
3. Descriptions of the specific building materials sampled at the project site are listed in the data tables located in Sections 4 and 5, as well as in the sample documentation located in Appendix C and Appendix D.

3. Survey Methodology

The following protocol generally describes the sampling methodology for the project site survey. Copies of the professional certifications for key project personnel, including survey field staff, are included in Section 7. The following list summarizes the sampling procedures utilized:

1. Suspect ACM and lead-containing surface coatings were visually identified at the project site. Suspect ACM was categorized into homogeneous materials (note: homogeneous material is defined as being uniform in texture, color, and date of application).
2. A sampling scheme was developed based upon the location and quantity of the identified homogeneous materials. Representative suspect ACM was identified and selected for sampling in general accordance with NESHAP sampling guidelines.
3. Bulk samples were collected using appropriate sampling tools. Samples were placed in leak-tight containers and labeled with a unique numerical identifier (sample number). Multiple samples were taken of some suspect ACM found to be distributed throughout the project site.

4. The general location of each bulk sample was noted on a project site plan-view diagram.
5. Friability, the susceptibility of the dry material to be crumbled, pulverized or reduced to a powder using hand pressure, was determined for each sampled suspect ACM.
6. The sample number, collection location and a description of the physical attributes of each bulk sample were recorded on a Chain of Custody form. The custody form accompanied the sample set(s) to the analyzing laboratory.
7. Decontamination of sampling tools was employed to prevent the spread of secondary contamination to subsequent bulk samples.
8. Bulk samples were submitted under chain of custody via overnight shipment to AmeriSci Laboratories (AmeriSci) for analysis of asbestos content via PLM analysis following USEPA method 600/R-93-116, and/or analysis of lead content via Atomic Absorption Spectrometry (AAS) via USEPA Method 3050B/7000B. Copies of the AmeriSci accreditations and certifications are located in Appendix G.

4. Findings for Asbestos

Numerous materials collected as part of the 2006 and 2018 asbestos sampling surveys were reported by the analyzing laboratory to contain asbestos fibers. The materials sampled at the project site and reported to contain asbestos are described in Table 4.1 Asbestos Laboratory Data and Quantification Summary (Table 4.1). Table 4.1 lists the physical description, approximate location, estimated quantity, applicable regulatory definitions and reported asbestos concentration for the identified asbestos materials. Materials that are homogeneous to (i.e., alike and may be represented by) those listed in Table 4.1 shall be assumed to contain an equal amount of asbestos.

Quantity estimates for the asbestos materials identified at the project site are provided in Table 4.1. The quantities include the total observed distribution of each material cumulatively estimated for the project site and do not define any partial quantities potentially disturbed during work impacting only discrete location(s) or partial amount(s) of material. The actual quantity of asbestos to be impacted in association with the project is undefined, as the precise amount of asbestos disturbance is dependent on emergent project needs and unknown contractor means, methods and scope.

Materials sampled for the survey were reported to contain greater than 1% asbestos, thus the applicable USEPA asbestos material category and anticipated waste designation are listed in Table 4.1. Work practices and prohibitions mandated by Cal/OSHA per 8 CCR 1529 shall govern work impacting all asbestos materials listed in Table 4.1. The applicable Cal/OSHA work class and Cal/OSHA asbestos material category for each ACM and ACCM is noted in Table 4.1.

The asbestos PLM analytical data associated with the survey is located in Appendix C. Materials that were not reported to contain asbestos fibers above the laboratory detection limit are noted on the PLM analytical reports as nondetect (ND), or no asbestos detected (NAD). Materials not reported to contain asbestos (noted in Appendix C as ND or NAD) are not listed in Table 4.1.

Table 4.1 Asbestos Laboratory Data and Quantification Summary

Former Truck Stop Structure, Eureka, California

Sample Number(s)	Material Description	Material Location	Asbestos %/Type	Estimated Quantity[1]	Asbestos Material Category[2]	Cal/OSHA Work Class[3]	Projected Waste Designation[2]
11153741-14	HVAC Tape (beige)	Interior – Main Office – 1st Floor Ceiling at duct	65% Chrysotile	60 SF	Category II	Class II	Non-Hazardous Asbestos Waste
11153741-18	Seam Caulking (black)	Exterior – SE Awning at center	4% Chrysotile	100 SF	Category II	Class II	Non-Hazardous Asbestos Waste
11153741-20, 21, 22, 23	Joint Compound (white)	Interior – 1st Floor – Walls and Ceilings – NW Stockroom, Repair Bays, Restrooms	≤0.3% Chrysotile[4, 5]	1,300 SF	ACCM (Not ACM or RACM)	Unclassified (Recommend Class II work)	Non-Hazardous Asbestos Waste
1022-14,37 (2006)	Blackjack (black)	Front Entrance – Roof overhang – Under shingles throughout	3% – 7% Chrysotile	200 LF	Category I	Class II	Non-Hazardous Asbestos Waste
1022-17,18 (2006)	Joint Compound (white)	1st Floor – North bathroom at wall	Homogeneous with Samples Containing ≤0.3% Chrysotile	Included With 1,300 SF Quantity Above	ACCM (Not ACM or RACM)	Unclassified (Recommend Class II work)	Non-Hazardous Asbestos Waste
1022-19 (2006)	Joint Compound (white)	1st Floor – NE room at wall	Homogeneous with Samples Containing ≤0.3% Chrysotile	Included With 1,300 SF Quantity Above	ACCM (Not ACM or RACM)	Unclassified (Recommend Class II work)	Non-Hazardous Asbestos Waste
1022-21,24 (2006)	Mastic (black) associated with Flooring Compound (white)	1st Floor – Main room at Floor locations	2% – 5% Chrysotile	40 SF	Category I	Class II	Non-Hazardous Asbestos Waste

Table 4.1 Asbestos Laboratory Data and Quantification Summary
Former Truck Stop Structure, Eureka, California

Sample Number(s)	Material Description	Material Location	Asbestos %/Type	Estimated Quantity[1]	Asbestos Material Category[2]	Cal/OSHA Work Class[3]	Projected Waste Designation[2]
1022-26,27 (2006)	Cementitious wall board (grey)	1st Floor – SE bathroom at wall	30% Chrysotile	370 SF	Category II	Class II	Non-Hazardous Asbestos Waste
1022-28 (2006)	Transite (white/grey) Flue	2nd Floor – eight inch (8”) heater flue	20% Chrysotile, 15% Crocidolite	30 SF	Category II	Class II	Non-Hazardous Asbestos Waste
1022-31 (2006)	Joint Compound (white)	1st Floor – 2nd SE bathroom at wall	Homogeneous with Samples Containing ≤0.3% Chrysotile	Included With 1,300 SF Quantity Above	ACCM (Not ACM or RACM)	Unclassified (Recommend Class II work)	Non-Hazardous Asbestos Waste

Acronyms:

- ACM = Asbestos Containing Material (>1% asbestos)
- ACCM = Asbestos Containing Construction Material (>0.25% asbestos)
- Cal/OSHA = California Department of Industrial Relations, Division of Occupational Safety and Health
- LF = Linear feet
- RACM = Regulated Asbestos Containing Material
- RCRA = Resource Conservation and Recovery Act
- SF = Square feet
- USEPA = United States Environmental Protection Agency
- VFT = Vinyl Floor Tile
- < = Symbol meaning “less than”
- > = Symbol meaning “greater than”

Table 4.1 Asbestos Laboratory Data and Quantification Summary
Former Truck Stop Structure, Eureka, California

Sample Number(s)	Material Description	Material Location	Asbestos %/Type	Estimated Quantity[1]	Asbestos Material Category[2]	Cal/OSHA Work Class[3]	Projected Waste Designation[2]

Annotations:

- (2006) = Indicates a sample collected during the 2006 Winzler & Kelly survey. The 2006 survey report is located in Appendix H.
- [1] = The quantities in Table 4.1 are estimates of the total (cumulative) amount of each homogeneous ACM, ACCM and/or presumed ACM at the project site. These quantities are estimates only and the actual amount of material to be removed should be verified by the contractor prior to bid.
- [2] = USEPA Category I and II nonfriable ACM that remains nonfriable during impaction shall be characterized as non-hazardous asbestos-containing waste. RACM shall be characterized as a California hazardous waste. The waste designation denoted herein assumes that nonfriable material will not become friable due to contractor removal practices. If nonfriable ACM is rendered friable (e.g., via the use of mechanical removal means), then such material shall be reclassified as RACM and disposed of as hazardous waste in California (non-RCRA hazardous waste). Nonfriable ACM that is associated with a fire-damaged facility is defined as RACM (non-RCRA hazardous waste), per USEPA guidance.
- [3] = Cal/OSHA work classes differentiate asbestos removal operations into four classes, each with specific regulatory protocols. Class I through IV operations describe work impacting material containing greater than 1% asbestos. Unclassified work includes tasks impacting material containing less than 1% asbestos. Unclassified work does not meet the definition of Class I through IV work, but is still subject to some Cal/OSHA requirements, including applicable sections of 8 CCR 1529. It is recommended that unclassified work be conducted per Class II asbestos work protocols.
- [4] = Material analyzed by Point Count 400 methodology.
- [5] = Material contains less than 1% asbestos, thus is not regulated by USEPA as ACM or RACM; however, material containing greater than 0.1% asbestos is regulated by Cal/OSHA as ACCM.

Notes:

- Work impacting material homogeneous (alike) to that noted in Table 4.1 shall be understood to impact asbestos.
- See Appendix E for further information on the asbestos regulatory environment, including USEPA material categories and Cal/OSHA work classes.

5. Findings for Lead

The suspect lead-containing surface coatings collected at the project site for the survey are described in Table 5.1 Lead Laboratory Data Summary (Table 5.1) located on page 11. As noted in Table 5.1, surface coatings collected from the project site were reported by AmeriSci to contain detectable quantities of lead. Table 5.1 provides the physical description, the approximate location, material substrate, reported lead content, and regulatory definition for each of the sampled surface coatings.

Work impacting known or presumed lead material, including those noted in Table 5.1, triggers compliance with applicable regulations, including 8 CCR 1532.1. In addition to Cal/OSHA protocols, work at the project site impacting known or presumed lead material is governed by applicable USEPA and CDPH regulations, including: 40 Code of Federal Regulations (CFR) Part 745, Subpart E; and 17 CCR Division 1, Chapter 8. Based on the age of the structure(s) and the data collected at the project site, unsampled surface coatings to be impacted in association with the project should be presumed to contain lead above LBP levels, unless appropriately tested and determined to be nondetect for lead.

The regulatory requirements governing lead are generally based on the specific concentration of lead reported in a given material. The laboratory-reported lead content for the sampled materials is above 90 parts per million (ppm), thus the materials meet the CPSC definition of LCP. Additionally, materials reported to contain lead at a concentration above 5,000 ppm, or 1.0 milligram per square centimeter (mg/cm^2), meet the CDPH and Cal/OSHA definition of LBP.

The lead AAS analytical data resultant from the survey is located in Appendix D. The lead regulatory requirements for the project are further summarized in Appendix F.

Table 5.1 Lead Laboratory Data Summary
Former Truck Stop Structure, Eureka, California

Sample Number	Sample Description	Substrate	Color	Sample Location	Lead Content (% by weight unless noted)	Triggers Compliance with Cal/OSHA 1532.1	Classified as Lead Based Paint
11153741-PB-1	Paint	Wood	Light Grey	Interior – Repair Bays – Wood Walls at SW corner	0.29% (2,900 ppm)	1532.1 applies	Not LBP (contains lead)
11153741-PB-2	Paint	Wood	White	Exterior – Center North Window Sill at center	2.2% (22,000 ppm)	1532.1 applies	LBP
11153741-PB-3	Paint	Metal	Red/Grey	Interior – Repair Bays – I Beam – North Wall at NW corner	7.7% (77,000 ppm)	1532.1 applies	LBP

Acronyms:

- Cal/OSHA = California Department of Industrial Relations, Division of Occupational Safety and Health
- CDPH = California Department of Public Health
- LBP = Lead Based Paint = Paint containing lead in a concentration of greater than or equal to 5,000 ppm, 1.0 mg/cm^2, or 0.5 percent by weight
- LCP = Lead Containing Paint = Paint containing lead in a concentration of greater than 90 ppm, or 0.009% by weight
- mg/cm^2 = milligrams per square centimeter (laboratory units of measurement reporting weight of lead per area)
- ppm = Parts per million (laboratory units of measurement reporting lead concentration)
- USEPA = United States Environmental Protection Agency

Notes:

- Notation “1532.1 Applies” signifies that the amount of lead in the sample triggers compliance with applicable regulations, including 8 CCR 1532.1.
- Notation “Not LBP” signifies that lead was not reported in a concentration above 5,000 ppm, or 0.5 percent by weight
- Parts per million (ppm) is equivalent to milligrams per kilogram (mg/kg)
- See Appendix F for further information on the lead regulatory environment.

6. Regulatory Jurisdiction and Notification

The limited asbestos survey was conducted to assist the client with compliance with the USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP) asbestos requirements in association with the project site roof replacement project. The USEPA local authority with responsibility for administering the NESHAP regulations within the project site jurisdiction is the North Coast Unified Air Quality Management District (NCUAQMD). Contact information for the NCUAQMD is provided below:

North Coast Unified Air Quality Management District

707 L Street

Eureka, CA 95501

Phone: (707) 443-3093

Work meeting the NESHAP definition of a demolition and/or work impacting RACM in quantities above specific size thresholds necessitates the submittal of a NESHAP Notification form and associated fee to the NCUAQMD. The NCUAQMD RACM quantity thresholds necessitating NESHAP notification are greater than, or equal to the following:

1. 160 square feet, 260 linear feet (for pipe insulation), or 35 cubic feet (for debris or waste)

The NESHAP regulations stipulate that the project owner shall notify the NCUAQMD at least 10 business days prior to the commencement of a renovation project, or commencement of work that impacts RACM in excess of the above-noted quantities. A NESHAP notification is required by the NCUAQMD if a project includes one or more of the following element(s):

1. The impaction of RACM in excess of the above-noted NCUAQMD NESHAP notification RACM thresholds
2. Work that meets the NESHAP definition of a demolition project, which is defined as the unweighting or removal of any structural members

   i) Note: a NESHAP notification is required for all demolition projects and is not dependent on the presence or absence of asbestos (ACM or RACM)

In addition to the NESHAP regulations enforced by the NCUAQMD, work at the project site shall be conducted in accordance with applicable employee protection regulations enforced by Cal/OSHA, including 8 CCR 1529, 5203 341.6-341.14 and the California Health and Safety Code.

As required by 8 CCR 1529(r) and 5203, written notification must be made to the nearest Cal/OSHA District Enforcement Office with jurisdiction over the project site for Asbestos-Related Work. For planned work exposing employees to lead, a Lead-Work Pre-Job Notification is required per 8 CCR 1532.1(p). Cal/OSHA notification shall be made at least 24 hours prior to the start of hazardous material-related work and is required if the planned project scope includes the one or both of the following elements:

1. The impaction of ACM, ACCM and/or LBP in excess of 100 square feet

The following table, Table 7.1 Pre-Work Regulatory Notifications (Table 7.1), summarizes the Cal/OSHA and NCUAQMD notifications anticipated in association with the project.

Table 6.1 Pre-Work Regulatory Notifications

Agency	Notification Type	Anticipated Notification Requirement		Submittal Timeline
NCUAQMD	NESHAP Renovation/ Renovation Notification	Notification:	☒ Required [1] ☐ Not anticipated [2]	>10 Business Days Prior to Work Start
Cal/OSHA	Temporary Worksite Notification	Notification:	☒ Required [3] ☐ Not anticipated [4]	≥24 Hours Prior to Work Start

Notes:

- NCUAQMD = Local USEPA-delegated authority with jurisdiction over the project site
- Cal/OSHA = California Department of Industrial Relations, Division of Occupational Safety and Health
- NESHAP = National Emissions Standards for Hazardous Air Pollutants
- USEPA = United States Environmental Protection Agency
- [1] = Assumption: Removal/unweighting of structural members (demolition work) and/or disturbance of RACM in excess of NCUAQMD NESHAP thresholds **is** expected to occur during this project
- [2] = Assumption: Removal/unweighting of structural members (demolition work) and/or disturbance of RACM in excess of NCUAQMD NESHAP thresholds **is not** expected to occur during this project
- [3] = Assumption: asbestos and/or lead-related work in excess of 100 square feet **is** expected to occur
- [4] = Assumption: asbestos and/or lead-related work in excess of 100 square feet **is not** expected to occur
- ≥ = Signifying “greater than, or equal to”

Further discussion of USEPA and Cal/OSHA regulations applicable to the project site is provided in Appendix E (Asbestos Regulatory Summary) and Appendix F (Lead Regulatory Summary).

7. Key Project Personnel

The survey was conducted by appropriately trained and certified personnel. Key project personnel included Cal/OSHA Certified Asbestos Consultant (CAC), Certified Site Surveillance Technician (CSST), and/or California Department of Public Health (CDPH) certified personnel. Copies of the certifications for staff performing survey and reporting work are included in this section in Figure 8.1 Key Project Personnel Certifications (Figure 8.1).

Figure 8.1 Key Project Personnel Certifications

8. Conclusion

As described in Section 4, materials sampled for this survey were reported by the analyzing laboratory to contain asbestos. The asbestos material identified in Table 4.1 located in Section 4 is subject to applicable asbestos regulations, including those summarized in Appendix E.

GHD recommends that asbestos materials be appropriately removed by a licensed abatement contractor prior to the commencement of any renovation work at the project site. Asbestos surfacing materials and TSI shall be impacted in accordance Cal/OSHA Class I work protocols within sealed, negatively-pressurized containments. GHD recommends that interior Class II work impacting ACM or ACCM (other than TSI and surfacing material) be performed within sealed, negative-pressure containments. Exterior work impacting ACM or ACCM (other than TSI and surfacing material) should be performed using, at minimum, Class II work protocols. Demolition work, as defined by NESHAP, will require removal of RACM from the facility prior to demolition.

If suspect ACM is discovered at the project site, beyond the material listed in Table 4.1, then such material shall be assumed to contain asbestos in a concentration of greater than 1% until appropriately sampled, analyzed and determined to be otherwise. If suspect asbestos material is discovered during site work, then work in that area shall stop, the material wetted, and access to the area restricted until an appropriate asbestos characterization of the material can be made.

Work at the project site is understood to meet the Cal/OSHA definition of construction work (8 CCR 1532.1[a]) and includes the impaction of known or presumed lead material. As noted in Table 5.1 located in Section 5, one or more of the sampled surface coatings were reported to contain lead.

Suspect lead material (e.g., paint, ceramic glazing, flashing, vent piping, weather coatings, varnishes, etc.) not identified in this report should be assumed to contain lead, unless appropriately sampled, analyzed and determined not to contain lead. Material reported or presumed to contain lead is subject to applicable regulations, including those summarized in Appendix F.

Agency notifications, as noted in Section 6 and summarized in Table 6.1, must be submitted to the NCUAQMD and Cal/OSHA by the contractor or the client prior to the commencement of any renovation or demolition work at the project site. The findings in this report are based on information obtained from sampling at specific sample points as noted on Figure 1 (Appendix A) and described by the sample documentation appended to the laboratory analytical reports. Site conditions at other parts of the project site may be different from the conditions found at the specific sample points. This report should not be used to evaluate the potential disturbance of suspect hazardous materials in association with area(s), site feature(s), and/or projects beyond the scope of the survey.

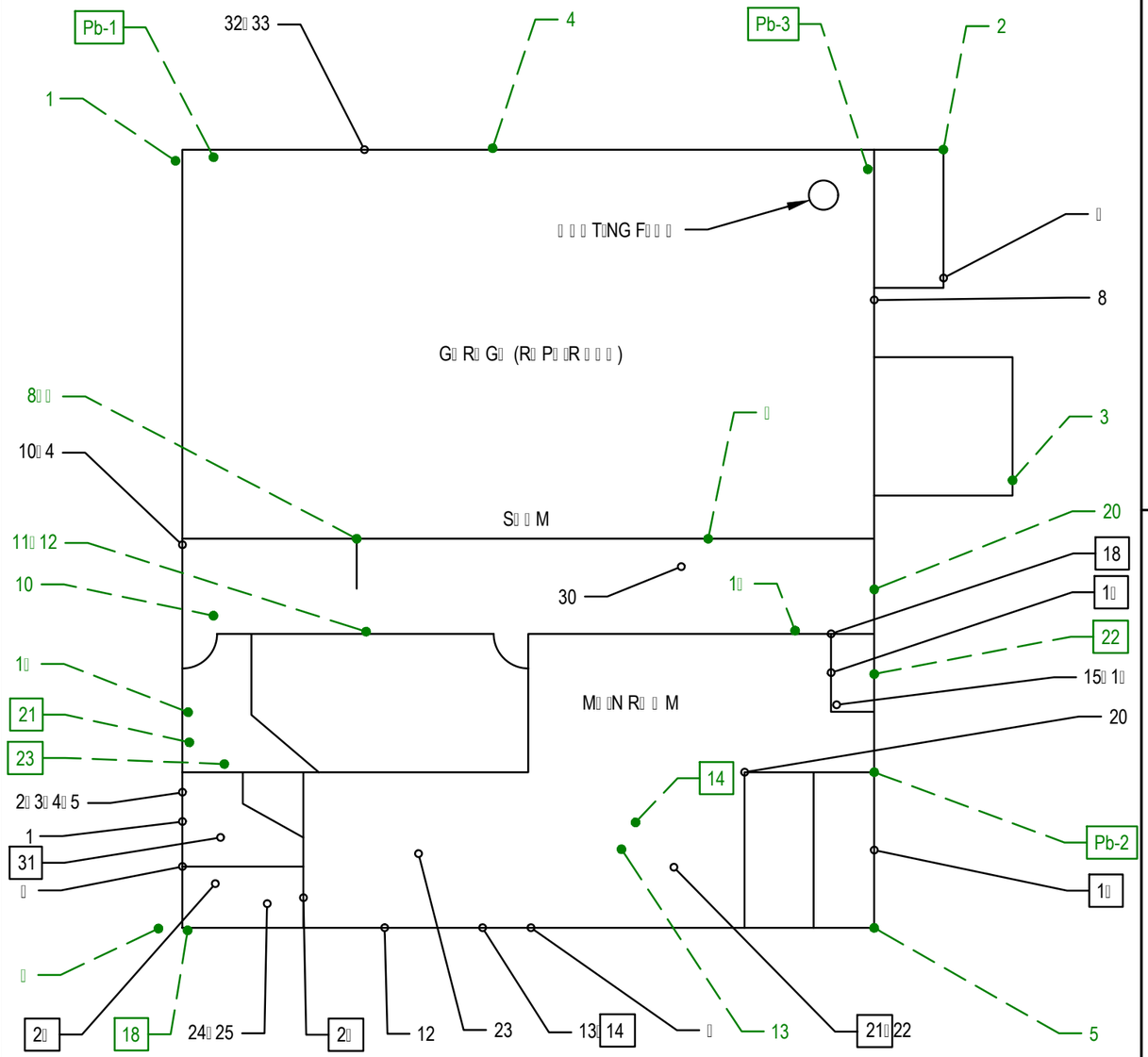
GHD has endeavored to conduct the services identified herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions as this project. No other representation, express or implied, is included or intended in this document. This report is an instrument of service of GHD. The scope of service GHD implemented was based, in part, on rules and regulations that GHD understood to be current or expected at the time GHD developed its proposal. Changes in regulations, interpretations, and/or enforcement policies may occur at any time and such changes could affect the extent of remediation required.

It is recommended that this report be provided to contractors and/or personnel who conduct work at the project site. It is recommended that the client maintain copies of this report for as long as the known hazardous materials remain at the project site, plus an additional period of 30 years.

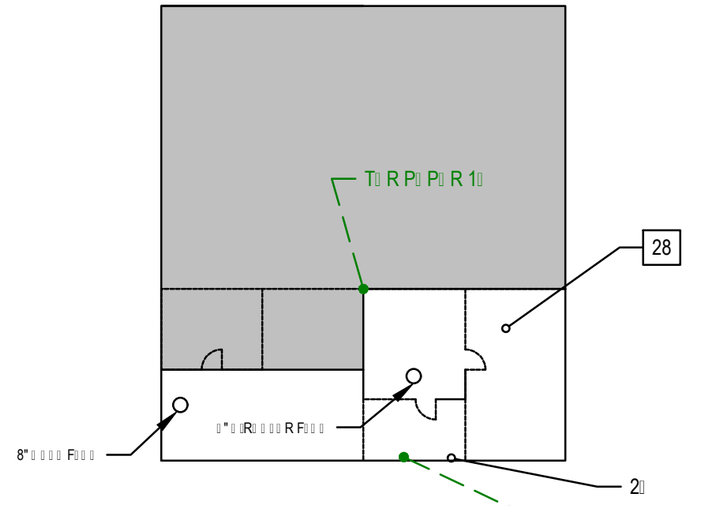
Appendices

Appendix A Figures

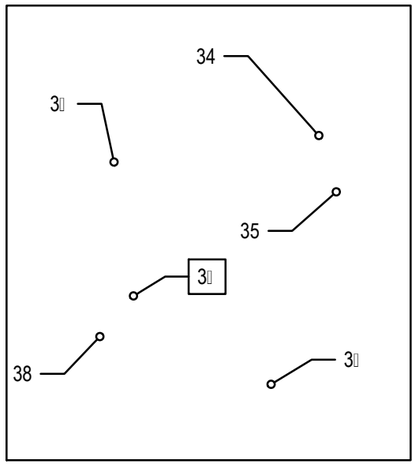
Figure(s) Depicting Bulk Sample Locations for The Carrington Company Former Truck Stop Structure



1ST F R



2ND F R



R F

SHEET GENERAL NOTES

1. DRAWING IS NOT TO SCALE.
2. ALL LOCATIONS ARE APPROXIMATE.
3. THIS SHEET TRANSMITS GHD SAMPLE LOCATIONS ONLY. NOT TO BE USED FOR CONSTRUCTION WORK.

LEGEND

- GHD SAMPLE 11153741.05-# = LOCATION OF BULK SAMPLE COLLECTED FOR ASBESTOS ANALYSIS
- SAMPLE DETERMINED TO CONTAIN ASBESTOS
- Pb- GHD SAMPLE 11153741.05-# = LOCATION OF BULK SAMPLE COLLECTED FOR LEAD ANALYSIS
- Pb- SAMPLE DETERMINED TO CONTAIN LEAD
- MARCH/APRIL 2006 WINZLER & KELLY ASBESTOS SAMPLE LOCATION
- MARCH/APRIL 2006 WINZLER & KELLY ASBESTOS SAMPLE DETERMINED TO CONTAIN ASBESTOS

N

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No.	Issue	Drawn	Approved	Date

Bar is one inch on original sheet
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Project Manager	S.HARRIS	Date	4/1 /2018
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Client THE CARRINGTON COMPANY
Project CARRINGTON BROADWAY EUREKA REDEVELOPMENT
Title FIGURE 1 SAMPLE LOCATION MAP
Project No. 11153741.05
Original Size ANSI D
Sheet No. 23
Sheet 1 of 1

Plot Date: 20 pril 2018 - :30 M Plotted : Gain in irel Filename: \\ghd\nfg\ dfs\ Sys urea\Project\111\11153741 arrington-roadway urea Redevelopment\0 - \ DrFigure\111153741-Carrington-roadway Figure1 Sample ocationMap.dwg

Appendix B Photographs

Photographs Depicting The Carrington Company Former Truck Stop Structure

Site Photographs

The photographs presented in this section generally depict the project site, including some of the materials sampled for the TCC project site survey and reported to contain hazardous constituents.

Photograph 1 – Project site – Exterior at roof and flashing – Mastic (Blackjack) and caulking at roof penetrations, flashing, and at seams (awning flashing location indicated by white arrow) reported to contain asbestos.

Photograph 2 – Project site – Throughout interior at drywall walls and ceilings – Joint compound (white) reported to contain asbestos. Joint Compound throughout the project site (typical, indicated by white arrow) should be assumed to contain asbestos.

Photograph 3 – project site – Throughout interior under flooring – Mastic (black) at flooring reported to contain asbestos. Mastic throughout the project site (typical, indicated by white arrow) should be assumed to contain asbestos.

Photograph 4 – Project site – Interior throughout on ducting – HVAC duct seam tape (beige) (typical, indicated by white arrow) reported to contain asbestos.

Appendix C Asbestos Analytical Data

PLM Laboratory Analytical Reports and Associated Chain of Custody Documentation for The Carrington Company Former Truck Stop Structure

Please Reply To:

AmeriSci Los Angeles
24416 S. Main Street, Ste 308
Carson, California 90745
TEL: (310) 834-4868 • FAX: (310) 834-4772

FACSIMILE TELECOPY TRANSMISSION

To: Scott Harris
GHD
Fax #:
Email: scott.harris@ghd.com

From: Lateef MacIntosh
AmeriSci Job #: 918041365
Subject: PLM 3 day Results
Client Project: 11153741.05; Carrington; Eureka - 2616 Broadway Development

Date: Thursday, April 19, 2018
Time: 10:10:42
Comments:

Number of Pages: 10
(including cover sheet)

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PLM Bulk Asbestos Report

GHD
Attn: Scott Harris
718 3rd Street

Eureka, CA 95501

Date Received 04/16/18
Date Examined 04/17/18

AmeriSci Job # 918041365
P.O. #
Page 1 **of** 7

RE: 11153741.05; Carrington; Eureka - 2616 Broadway Development

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
11153741-1	918041365-01.1	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Stem Wall (Grey) & Paint (White) / Exterior - Building At SW Corner			
Analyst Description: Beige/Grey, Heterogeneous, Non-Fibrous, Cementitious, Concrete			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
11153741-1	918041365-01.2	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Stem Wall (Grey) & Paint (White) / Exterior - Building At SW Corner			
Analyst Description: White, Homogeneous, Non-Fibrous, Paint			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
11153741-2	918041365-02.1	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Stem Wall (Grey) & Paint (White) / Exterior - Building At NW Corner			
Analyst Description: Beige/Grey, Homogeneous, Non-Fibrous, Cementitious, Concrete			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
11153741-2	918041365-02.2	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Stem Wall (Grey) & Paint (White) / Exterior - Building At NW Corner			
Analyst Description: Off-White/Blue, Homogeneous, Non-Fibrous, Paint			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
11153741-3	918041365-03.1	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Stucco (Cream) & Mortar (Grey) / Exterior - North Wall At Pop-Up			
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Stucco-Base Coat			
Asbestos Types:			
Other Material: Non-fibrous 100 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

11153741.05; Carrington; Eureka - 2616 Broadway Development

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
11153741-3	918041365-03.2	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Stucco (Cream) & Mortar (Grey) / Exterior - North Wall At Pop-Up			
Analyst Description: Cream, Homogeneous, Non-Fibrous, Stucco-Top Coat			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
Comment: Mortar not found			
11153741-4	918041365-04.1	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Stucco (Cream) & Mortar (Grey) / Exterior - West Wall - Center At Base			
Analyst Description: Grey, Homogeneous, Non-Fibrous, Cementitious, Stucco-Base Coat			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
11153741-4	918041365-04.2	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Stucco (Cream) & Mortar (Grey) / Exterior - West Wall - Center At Base			
Analyst Description: Cream, Homogeneous, Non-Fibrous, Stucco-Top Coat			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
Comment: Mortar not found			
11153741-5	918041365-05.1	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Curb (Grey) & Paint (Red) / Exterior - Curb At NE Corner			
Analyst Description: Beige/Grey, Homogeneous, Non-Fibrous, Cementitious, Concrete			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
11153741-5	918041365-05.2	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Curb (Grey) & Paint (Red) / Exterior - Curb At NE Corner			
Analyst Description: Red, Homogeneous, Non-Fibrous, Paint			
Asbestos Types:			
Other Material: Non-fibrous 100 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

11153741.05; Carrington; Eureka - 2616 Broadway Development

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
11153741-6	918041365-06	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Curb (Grey) / Exterior - Curb At SE Corner			
Analyst Description: Beige/Grey, Homogeneous, Non-Fibrous, Cementitious, Concrete			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
11153741-7	918041365-07.1	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete (Grey) & Expansion Joint (Black) / Interior - Repair Bays - Center At Floor			
Analyst Description: Beige/Grey, Homogeneous, Non-Fibrous, Cementitious, Concrete			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
11153741-7	918041365-07.2	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete (Grey) & Expansion Joint (Black) / Interior - Repair Bays - Center At Floor			
Analyst Description: Black, Homogeneous, Fibrous, Expansion Joint			
Asbestos Types:			
Other Material: Cellulose 15 %, Non-fibrous 85 %			
11153741-8	918041365-08	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Expansion Joint (Black) / Interior - Repair Bays - East - East Seam At Floor			
Analyst Description: Black, Homogeneous, Fibrous, Expansion Joint			
Asbestos Types:			
Other Material: Cellulose 20 %, Non-fibrous 80 %			
11153741-9	918041365-09	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Floor (Grey) / Interior - Repair Bays - East - East Seam At Floor			
Analyst Description: Beige/Grey, Homogeneous, Non-Fibrous, Cementitious, Concrete			
Asbestos Types:			
Other Material: Non-fibrous 100 %			
11153741-10	918041365-10.1	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: Concrete Floor (Grey) & Surface coating (Red) / Interior - Repairs Bays - East - NE corner At Restroom Floor			
Analyst Description: Beige/Grey, Homogeneous, Non-Fibrous, Concrete			
Asbestos Types:			
Other Material: Non-fibrous 100 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

11153741.05; Carrington; Eureka - 2616 Broadway Development

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
11153741-10	918041365-10.2	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18

Location: Concrete Floor (Grey) & Surface coating (Red) / Interior - Repairs Bays - East - NE corner At Restroom Floor

Analyst Description: Red, Homogeneous, Non-Fibrous, Coating
Asbestos Types:
Other Material: Non-fibrous 100 %

11153741-11	918041365-11.1	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18

Location: Fiberglass (Pink) & Paper Back (Beige, Silver) / Interior - Repair Bays - East Wall At Center

Analyst Description: Pink, Homogeneous, Fibrous, Insulation
Asbestos Types:
Other Material: Fibrous glass 80 %, Non-fibrous 20 %

11153741-11	918041365-11.2	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18

Location: Fiberglass (Pink) & Paper Back (Beige, Silver) / Interior - Repair Bays - East Wall At Center

Analyst Description: Silver, Homogeneous, Fibrous, Paper Backing
Asbestos Types:
Other Material: Cellulose 70 %, Non-fibrous 30 %

11153741-12	918041365-12.1	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18

Location: Fiberglass (Pink) & Paper Backing (Beige, Silver) / Interior - Repair Bays - East Wall At NE Corner

Analyst Description: Pink, Homogeneous, Fibrous, Insulation
Asbestos Types:
Other Material: Fibrous glass 80 %, Non-fibrous 20 %

11153741-12	918041365-12.2	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18

Location: Fiberglass (Pink) & Paper Backing (Beige, Silver) / Interior - Repair Bays - East Wall At NE Corner

Analyst Description: Silver, Homogeneous, Fibrous, Paper Backing
Asbestos Types:
Other Material: Cellulose 70 %, Non-fibrous 30 %

11153741-13	918041365-13	*No*	NAD (by CVES) by Lateef MacIntosh on 04/17/18

Location: Floor Leveling Compound (White) / Interior - Main Office - Floor At Seam

Analyst Description: Off-White, Homogeneous, Non-Fibrous, Leveling Compound
Asbestos Types:
Other Material: Non-fibrous 100 %

See Reporting notes on last page

PLM Bulk Asbestos Report

11153741.05; Carrington; Eureka - 2616 Broadway Development

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
11153741-14	918041365-14	***Yes***	65 % (by CVES) by Lateef MacIntosh on 04/17/18
Location: HVAC Tape (Beige) / Interior - Main Office - 1st Floor Ceiling At Duct			
Analyst Description: Off-White, Homogeneous, Fibrous, Tape **Asbestos Types:** Chrysotile 65.0 % **Other Material:** Non-fibrous 35 %			
11153741-15	918041365-15	***No***	NAD (by CVES) by Lateef MacIntosh on 04/17/18
Location: HVAC Tape (Beige) / Interior - Main Office - 2nd Floor - Center West Fan Room At Duct			
Analyst Description: Off-White, Homogeneous, Fibrous, Tape **Asbestos Types:** **Other Material:** Cellulose 75 %, Non-fibrous 25 %			
11153741-16	918041365-16	***No***	NAD (by CVES) by Lateef MacIntosh on 04/19/18
Location: Vapor Barrier (Black) / Interior - 2nd Floor - East Wall At Center At Penetration (Behind Siding)			
Analyst Description: Black, Homogeneous, Fibrous, Vapor Barrier **Asbestos Types:** **Other Material:** Cellulose 65 %, Non-fibrous 35 %			
11153741-17	918041365-17	***No***	NAD (by CVES) by Lateef MacIntosh on 04/19/18
Location: Electrical Fuse Panel Heatshield (Black) / Interior - Repair Bays - East Wall At NE Corner			
Analyst Description: Black, Homogeneous, Non-Fibrous, Panel **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
11153741-18	918041365-18	***Yes***	4 % (by CVES) by Lateef MacIntosh on 04/19/18
Location: Seam Caulking (Black) / Exterior - SE Awning At Center			
Analyst Description: Black/Blue, Homogeneous, Non-Fibrous, Caulking **Asbestos Types:** Chrysotile 4.0 % **Other Material:** Non-fibrous 96 %			
11153741-19	918041365-19	***No***	NAD [1] (by CVES) by Lateef MacIntosh on 04/19/18
Location: Window Putty (Grey) & Paint (White) / Interior - Repair Bays - South Wall At Bathroom			
Analyst Description: Off-White, Heterogeneous, Non-Fibrous, Window Putty/Paint **Asbestos Types:** **Other Material:** Non-fibrous 100 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

11153741.05; Carrington; Eureka - 2616 Broadway Development

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
11153741-20	918041365-20.1	***Yes***	2 %
Location: Drywall (White) & Joint Compound (White) / Interior - NW Stockroom - North Wall At Entrance			(by CVES) by Lateef MacIntosh on 04/19/18
Analyst Description: Off-White, Homogeneous, Non-Fibrous, Joint Compound **Asbestos Types:** Chrysotile 2.0 % **Other Material:** Non-fibrous 98 %			
11153741-20	918041365-20.2	***No***	NAD
Location: Drywall (White) & Joint Compound (White) / Interior - NW Stockroom - North Wall At Entrance			(by CVES) by Lateef MacIntosh on 04/19/18
Analyst Description: White/Brown, Homogeneous, Fibrous, Drywall **Asbestos Types:** **Other Material:** Cellulose 5 %, Non-fibrous 95 %			
11153741-21	918041365-21.1	***Yes***	2 %
Location: Drywall (White) & Joint Compound (White) / Interior - Repair Bays - West Wall At Center			(by CVES) by Lateef MacIntosh on 04/19/18
Analyst Description: Off-White, Homogeneous, Non-Fibrous, Joint Compound **Asbestos Types:** Chrysotile 2.0 % **Other Material:** Non-fibrous 98 %			
11153741-21	918041365-21.2	***No***	NAD
Location: Drywall (White) & Joint Compound (White) / Interior - Repair Bays - West Wall At Center			(by CVES) by Lateef MacIntosh on 04/19/18
Analyst Description: White/Brown, Homogeneous, Fibrous, Drywall **Asbestos Types:** **Other Material:** Cellulose 5 %, Non-fibrous 95 %			
11153741-22	918041365-22	***Yes***	2 %
Location: Joint Compound (White) / Interior - Repair Bays - NE Bathroom At East Wall			(by CVES) by Lateef MacIntosh on 04/19/18
Analyst Description: Off-White, Homogeneous, Non-Fibrous, Joint Compound **Asbestos Types:** Chrysotile 2.0 % **Other Material:** Non-fibrous 98 %			
11153741-23	918041365-23	***Yes***	2 %
Location: Joint Compound (White) / Interior - Repair Bays - SE Bathroom At East Wall			(by CVES) by Lateef MacIntosh on 04/19/18
Analyst Description: Off-White, Homogeneous, Non-Fibrous, Joint Compound **Asbestos Types:** Chrysotile 2.0 % **Other Material:** Non-fibrous 98 %			

See Reporting notes on last page

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Carson, California 90745
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FACSIMILE TELECOPY TRANSMISSION

To: Scott Harris
GHD
Fax #:
Email: scott.harris@ghd.com,Matthew.Tolley@ghd.com

From: John A. Lopez
AmeriSci Job #: 918041471
Subject: PLM 400 point count 24 hour Resul
Client Project: 11153741.05; Carrington; Eureka - 2616 Broadway Development

Date: Friday, April 20, 2018
Time: 13:26:42
Comments:

Number of Pages: 4 (including cover sheet)

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PLM Bulk Asbestos Report

GHD
Attn: Scott Harris
718 3rd Street

Eureka, CA 95501

Date Received 04/19/18
Date Examined 04/20/18

AmeriSci Job # 918041471
P.O. #
Page 1 **of** 1

RE: 11153741.05; Carrington; Eureka - 2616 Broadway Development

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
11153741-20	918041471-01	***Yes***	0.3 % pc [1]

Location: Drywall (White) & Joint Compound (White) / Interior - NW Stockroom - North Wall At Entrance

(by 400 pt ct)
by John A. Lopez
on 04/20/18

Analyst Description: Off-White, Homogeneous, Non-Fibrous, Joint Compound
Asbestos Types: Chrysotile 0.3 %
Other Material: Non-Asbestos/Inert 28.3 %
Comment: Heat Sensitive (organic): 15.3%; Acid Soluble (inorganic): 56.1%; Inert (Non-asbestos): 28.3%

11153741-23	918041471-02	***No***	NAD [2]

Location: Joint Compound (White) / Interior - Repair Bays - SE Bathroom At East Wall

(by 400 pt ct)
by John A. Lopez
on 04/20/18

Analyst Description: Off-White, Homogeneous, Non-Fibrous, Joint Compound
Asbestos Types:
Other Material: Non-Asbestos/Inert 36.3 %
Comment: Heat Sensitive (organic): 49.5%; Acid Soluble (inorganic): 14.1%; Inert (Non-asbestos): 36.3%

Reporting Notes:

(1) EPA 400 Point Count Analysis performed on Inert Residue remaining after 480C heat and HCl acid treatments

(2) EPA 400 Point Count Analysis performed on Inert Residue remaining after 480C heat and HCl acid treatments

Analyzed By: John A. Lopez; Date Analyzed: 4/20/2018 4-20-18

*NAD = no asbestos detected; Detection Limit <1%; Reporting Limits: CVES = 1%, 400 Pt Ct = 0.25%, 1000 Pt Ct = 0.1%; NA = not analyzed; NA/PS = not analyzed / positive stop; NVA = No Visible Asbestos; PLM (polarized light microscopy) Bulk Asbestos Analysis by EPA 600/R-93/116, including requirements for EPA 600/M4-82-020 per 40 CFR 763 (NVLAP Lab #200346-0, CA ELAP lab #2322); Note: PLM is not consistently reliable in detecting asbestos in floor coverings and similar NOB materials. TEM is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos-containing in New York State (also see EPA Advisory for floor tile, FR 59, 146, 38970, 8/1/94). NIST Accreditation requirements mandate that this report must not be reproduced except in full with the approval of the laboratory. This PLM report relates ONLY to the items tested.

Reviewed By:

718 3rd Street	Contact Name:	Scott Harris	Sample Date:	4/13/2018
Eureka, California	Contact Email:	scott.harris@ghd.com	Client:	CARRINGTON
Ph: (707) 443-8326	Analysis Method:	PLM (Asbestos) - please provide result for each layer where multiple materials exist	Site:	Eureka - 2616 Broadway Development
Fax: (707) 444-8330	Turnaround Time:	72 Hour	Project #:	11153741.05

BULK SAMPLE COLLECTION CHAIN OF CUSTODY

Sample Number	Sample Description	Location	USEPA Material Type	Friability
11153741-1	Concrete Stem Wall (grey) + Paint (white)	Exterior - Building at SW corner	MISC	NF
11153741-2	Concrete Stem Wall (grey) + Paint (white)	Exterior - Building at NW corner	MISC	NF
11153741-3	Stucco (cream) + Mortar (grey)	Exterior - North Wall at Pop-Up	MISC	NF
11153741-4	Stucco (cream) + Mortar (grey)	Exterior - West Wall - Center at Base	MISC	NF
11153741-5	Concrete Curb (grey) + Paint (red)	Exterior - Curb at NE Corner	MISC	NF
11153741-6	Concrete Curb (grey)	Exterior - Curb at SE Corner	MISC	NF
11153741-7	Concrete (grey) + Expansion Joint (black)	Interior - Repair Bays - Center at Floor	MISC	NF
11153741-8	Concrete Expansion Joint (black)	Interior - Repair Bays - East - East Seam at Floor	MISC	NF
11153741-9	Concrete Floor (grey)	Interior - Repair Bays - East - East Seam at Floor	MISC	NF
11153741-10	Concrete Floor (grey) + Surface Coating (red)	Interior - Repair Bays - East - NE Corner at Restroom Floor	MISC	NF
11153741-11	Fiberglass (pink) + Paper Back (beige, silver)	Interior - Repair Bays - East Wall at Center	TSI	F
11153741-12	Fiberglass (pink) + Paper Back (beige, silver)	Interior - Repair Bays - East Wall at NE Corner	TSI	F
11153741-13	Floor Leveling Compound (white)	Interior - Main Office - Floor at Seam	MISC	NF

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Date/time: 4/13/18 @ 1530
Relinquished by:
Date/time:

Received by: [signature]
Date/time: 4/16/18 @ 1020
Received by:
Date/time:

718 3rd Street Eureka, California Ph: (707) 443-8326 Fax: (707) 444-8330	Contact Name:	Scott Harris	Sample Date:	4/13/2018
	Contact Email:	scott.harris@ghd.com	Client:	CARRINGTON
	Analysis Method:	PLM (Asbestos) - please provide result for each layer where multiple materials exist	Site:	Eureka - 2616 Broadway Development
	Turnaround Time:	72 Hour	Project #:	11153741.05

BULK SAMPLE COLLECTION CHAIN OF CUSTODY

Sample Number	Sample Description	Location	USEPA Material Type	Friability
11153741-14	HVAC Tape (beige)	Interior - Main Office - 1st Floor Ceiling at Duct	MISC	F
11153741-15	HVAC Tape (beige)	Interior - Main Office - 2nd Floor - Center West Fan Room at Duct	MISC	F
11153741-16	Vapor Barrier (black)	Interior - 2nd Floor - East Wall at Center at Penetration (Behind Siding)	MISC	NF
11153741-17	Electrical Fuse Panel Heatshield (black)	Interior - Repair Bays - East Wall at NE Corner	MISC	NF
11153741-18	Seam Caulking (black)	Exterior - SE Awning at Center	MISC	NF
11153741-19	Window Putty (grey) + Paint (white)	Interior - Repair Bays - South Wall at Bathroom	MISC	NF
11153741-20	Drywall (white) + Joint Compound (white)	Interior - NW Stockroom - North Wall at Entrance	MISC	F
11153741-21	Drywall (white) + Joint Compound (white)	Interior - Repair Bays - West Wall at Center	MISC	F
11153741-22	Joint Compound (white)	Interior - Repair Bays - NE Bathroom at East Wall	SM	F
11153741-23	Joint Compound (white)	Interior - Repair Bays - SE Bathroom at East Wall	SM	F

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Date/time: 4/13/18 @ 1530
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Date/time:

Received by:
Date/time: 4/16/18 @ 1020
Received by:
Date/time:

Appendix D Lead Analytical Data

AAS Laboratory Analytical Reports and Associated Chain of Custody Documentation for The Carrington Company Former Truck Stop Structure

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FACSIMILE TELECOPY TRANSMISSION

To: Scott Harris
GHD
Fax #:
Email: scott.harris@ghd.com

From:
AmeriSci Job #: 418041192
Subject: Lead (paint) 3 day Results
Client Project: 11153741.05; Carrington; Eureka - 2616 Broadway

Date: Wednesday, April 18, 2018
Time: 11:47:31
Comments:

Number of Pages: 03
(including cover sheet)

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AmeriSci Job #: 418041192

Date Received: 04/16/18
Date Analyzed: 04/18/18

Lead Analysis Results

Paint

EPA Method 3050B/7000B

GHD

Eureka, CA

Job Site: 11153741.05; Carrington; Eureka - 2616 Broadway

AmeriSci # 418041192	Client Number	Sample Location	% Lead (w/w)	Lead Content (mg/kg = ppm)
01	11153741-1-PB	Paint (Light Grey) / Interior - Repair Bays - Wood Wall - SW Corner On Wood S	0.29	2,900
02	11153741-2-PB	Paint (White) / Exterior - Center North Window Sill At Center / Wood	2.2	22,000
03	11153741-3-PB	Paint (Red/Grey) / Interior - Repair Bays - I Beam - North Wall At NW Corner /	7.7	77,000

AmeriSci Reporting Limit is 0.01%, or 100mg/kg prior to any dilutions due to high analyte concentrations or matrix interferences. AmeriSci does not correct sample results by the blank value. All analytical batch data met quality control criteria unless otherwise noted. CA ELAP No. 2322.

Reviewed by: _____

Analyzed by: _____
Minh Phung, Chemist

ELAP No: CA 2322

GHD	718 3rd Street	Contact Name:	Scott Harris	Sample Date:	4/13/2018
	Eureka, California	Contact Email:	scott.harris@ghd.com	Client:	CARRINGTON
	Ph: (707) 443-8326	Analysis Method:	Pb (Lead) via AAS - please provide result for each layer separately where multiple materials exist	Site: Eureka: 2616 Broadway Development	Eureka - 2616 Broadway
	Fax: (707) 444-8330	Turnaround Time:	72 Hour	Project #:	11153741.05

BULK SAMPLE COLLECTION CHAIN OF CUSTODY

Sample Number	Sample Description	Location	Substrate	% Peeling
11153741-1-PB	Paint (light grey)	Interior - Repair Bays - Wood Wall - SW corner on Wood Structural Membrane	Wood	15
11153741-2-PB	Paint (white)	Exterior - Center North Window Sill at Center	Wood	15
11153741-3-PB	Paint (red/grey)	Interior - Repair Bays - I Beam - North Wall at NW Corner	Metal	<5

Relinquished by: Matthew J Taylor
Date/time: 4/13/18 @ 1530.
Relinquished by:
Date/time:

Received by: K.V
Date/time: 4/14/18 @ 1020
Received by:
Date/time:

Appendix E Asbestos Regulatory Summary

General Informational Summary of Governmental Rules and Regulations Concerning Asbestos

Appendix E Regulatory Overview for Asbestos

This appendix section provides a summary of governmental regulations applicable to asbestos in construction work and is applicable to the impaction of the asbestos building materials present at the project site.

E1.1 Asbestos Regulations

E1.1.1 Code of Federal Regulations

The following is a summary list of United States governmental regulations concerning asbestos:

1. 29 Code of Federal Regulations (CFR) 1926.1101, Asbestos (including all mandatory appendices)
2. 40 CFR 61, Subpart A and Subpart M USEPA NESHAP
3. 40 CFR Parts 261, 265, and 268, Hazardous Waste Management
4. 40 CFR Part 763, Asbestos Emergency Hazard Emergency Response Act (AHERA)
5. 49 CFR Parts 172, 173, 178, 179, Hazardous Material Transportation

E1.1.2 California Code of Regulations

The following is a summary list of State of California governmental regulations concerning asbestos:

1. 8 CCR Division 1, Chapter 4, Construction Safety Orders
2. 8 CCR Article 2.5, Registration of Asbestos Work, Sections 341.6–341.14
3. 8 CCR Section 1529, Asbestos
4. 8 CCR Section 5144, Respiratory Protection
5. 22 CCR Division 4.5, Environmental Health Standards for Management of Hazardous Waste
6. California Environmental Protection Agency (Cal/EPA), California Air Resource Board (CARB), Final Regulation Order, Section 93105, Asbestos Airborne Toxic Control Measures for Construction, Grading, Quarrying, and Surface Mining Operations

E1.1.3 Definitions

1. For the purpose of this report, the following definitions will apply to the discussion of hazardous materials contained herein.
2. Abatement – Hazardous materials related construction undertaken for the purpose of eliminating or reducing existing recognized hazardous materials related hazards as adapted from 29 Code of Federal Regulations (CFR), Part 1903 Inspections, Citation and Proposed Penalties, Standard 1903.19 Abatement Verification (29 CFR 1903.19), Subsection (b)(1).
3. Asbestos Containing Material (ACM) – A material determined to contain greater than one percent (1%) asbestos by weight as defined by the Title 8 California Code of Regulations (CCR), Subchapter 4, Construction Safety Orders, Article 4. Dusts, Fumes, Mists, Vapors, and Gases, Section 1529 (8 CCR 1529), Subsection (b).

4. Asbestos Containing Construction Material (ACCM) – A construction material determined to contain detectable levels of asbestos fibers in concentrations of greater than 0.1 percent asbestos by weight as defined by Chapter 3.2 of the California Occupational Safety and Health Regulations, Subchapter 2, Regulations of the Division of Occupational Safety and Health, Article 2.5. Registration--Asbestos- Related Work, Section 341.6(c).
5. Containment – Protective physical barriers and associated means and methods used to contain airborne contaminant dust within the abatement work area and prevent contamination of surfaces and grounds below and adjacent to areas where a hazardous material is being disturbed.
6. Hazardous Material – Substance with properties that can cause injury or illness to humans or adversely impact living organisms in the environment under certain conditions. Hazardous materials include both organic and inorganic chemicals and chemical compounds. Includes any substance on the list of hazardous substances prepared by the Director, California Department of Industrial Relations, pursuant to Labor Code Section 6382 and also known as the Director's List. For the project, hazardous materials include, but are not limited to: asbestos and lead.
7. Hazardous Waste – Waste material that is listed or meets the criteria for hazardous waste as set forth in CCR, Title 22, Division 4.5 and Article 9. at minimum, with regard to asbestos, the following shall be considered to be hazardous wastes with respect to this section:

i) Nonfriable Asbestos Containing Material (Category I and II) rendered friable during renovation or renovation

ii) Regulated Asbestos Containing Material

E1.4 Nonfriable Asbestos Containing Material

Friability is a qualitative measure of a material's affinity for producing airborne asbestos fibers (dust). A material that, when dry, can be crumbled, pulverized or reduced to powder using hand pressure is classified as friable according to USEPA regulations. Nonfriable materials are those that do not meet the above-definition of friable.

Nonfriable materials are classified by the USEPA into the following categories:

1. Category I Nonfriable – Any asbestos containing gasket, packing, resilient floor covering, or asphalt roofing product that contains greater than 1% asbestos as determined by PLM, that, when dry cannot be crumbled, pulverized, or reduced to a powder using hand pressure.
2. Category II Nonfriable – Any material, excluding Category I nonfriable ACM, that contains greater than 1% asbestos as determined by PLM, that, when dry cannot be crumbled, pulverized, or reduced to a powder using hand pressure.

Category I Nonfriable ACM may be left in place during renovation work. Certain Category II Nonfriable ACM may be left in place during renovation or renovation; however, Category II ACM that may become friable (e.g., damaged, brittle and/or cementitious materials) must be removed prior to renovation or renovation. Category I ACM and some Category II ACM may be left in situ

during renovation; however Cal/OSHA will regulate such renovation activities as Class II work, as defined herein.

Note: Cal/OSHA employee protection protocols, including those summarized herein, apply to any disturbance of asbestos material, regardless of the USEPA material category (Category I, Category II, RACM), concentration of asbestos, or quantity of material. As such worker protection protocols per 8 CCR 1529 apply to work disturbing any asbestos.

If a nonfriable material is impacted with mechanical means (power tools, abrasive mechanical means, etc.) such material shall no longer be classified as nonfriable and shall instead be classified as RACM. A nonfriable material that has been significantly damaged may also be classified as friable, if the damaged material can be reduced to powder or crumbled using hand pressure.

E1.5 Regulated Asbestos Containing Material

A material is regulated by the USEPA as RACM if it conforms to one or more of the following:

1. It is a friable ACM
2. It is a Category I or II ACM that has become friable
3. It is a Category I ACM that will be subject to mechanical impaction
4. It is a Category II ACM that has a high probability of becoming friable during the course of renovation or renovation activities that are expected to impact the material

While the USEPA does not regulate material determined by PLM laboratory analysis using point count 400 methodology to contain less than 1% asbestos, some Cal/OSHA regulations apply to material determined to contain any detectable amount of asbestos.

Pursuant to NESHAP regulations, nonfriable materials are not classified as RACM if removed essentially intact using hand methods and not made “friable” during removal. The use of mechanical means to remove or impact nonfriable ACM will render that material friable, thus mechanically-impacted materials shall be considered RACM and subject to handling and disposal requirements governing RACM.

Asbestos containing material that meets the USEPA definition of RACM, if present in quantities greater than the Yolo Solano Air Quality Management District (NCUAQMD) quantity thresholds noted in Section 6, must be removed from the project site prior to renovation. Additionally, Category I and Category II ACM that is associated with a fire-damaged structure must be classified as RACM, per USEPA regulation. Materials identified in this report as USEPA RACM will require disposal as a non-Resource Conservation and Recovery Act (RCRA) California hazardous asbestos waste, if disposed of in California.

Abatement of RACM that is Thermal System Insulation (TSI) or surfacing material requires Class I abatement methods as defined by the Occupational Safety and Health Administration (OSHA) and Cal/OSHA. RACM that is not TSI or surfacing material requires Class II abatement methods as defined by OSHA and Cal/OSHA. Class I and Class II abatement methods are described below.

E1.6 Cal/OSHA Work Classes

Cal/OSHA regulates material containing asbestos at any detectable level, thus worker protection, material handling, material labelling, and material disposal protocols per California Code of Regulations (CCR), Title 8, Section 1529 (8 CCR 1529) apply to impaction of any material determined to contain asbestos above the laboratory detection limit. Impaction of material determined to contain asbestos in concentrations of less than 1% by weight (ACCM and <0.1%) is categorized by Cal/OSHA as unclassified work.

Cal/OSHA regulates worker exposure to airborne asbestos by instituting work practice, notification, training, and personal protective equipment requirements for employers and employees. In an effort to mitigate worker exposure to airborne asbestos fibers, Cal/OSHA mandates specific material containerization and work practices when workers impact materials containing asbestos at any detectable level. Cal/OSHA categorizes asbestos related work into four work classes as described below and defined in 8 CCR 1529.

E1.6.1 Class I Work

Class I asbestos work consists of activities involving the removal of asbestos-containing TSI, asbestos-containing surfacing material, or PACM. TSI includes pipe, pipe fitting, duct, boiler, and flue asbestos-containing insulation. Surfacing material includes sprayed-on or troweled-on asbestos-containing fire proofing, acoustical plaster or decorative plaster. PACM is TSI or surfacing material installed prior to 1981. PACM is presumed to contain asbestos and must be handled according to Class I work protocols unless sampled and determined by PLM analysis to contain no detectable asbestos fibers. Class I abatement work is subject to OSHA and Cal/OSHA regulations. Class I work must be conducted within a regulated negative-pressure containment equipped with a three-stage decontamination chamber that includes an operable shower. Class I work must be performed by properly trained and protected workers using appropriate means and methods as described by 8 CCR 1529.

E1.6.2 Class II Work

Class II asbestos work means activities involving the impaction and removal of ACM, which is not TSI or surfacing material, and results in more than one bag of waste materials. This includes but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics. Class II work must be conducted within a regulated area containment and must be performed by properly trained and protected workers using appropriate means and methods as described by 8 CCR 1529.

E1.6.3 Class III Work

Class III asbestos work means activities involving the repair and maintenance operations, where ACM, including TSI, surfacing ACM and/or PACM, is likely to be disturbed. Class III asbestos removal operations are limited to work that generates no more waste than that which can fit into one 60 inch by 60-inch (60” x 60”) waste bag. Class III work must be conducted within a regulated area containment by properly trained and protected workers using appropriate means and methods described by 8 CCR 1529.

E1.6.4 Class IV Work

Class IV asbestos work means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities. Class IV work must be conducted by properly trained and protected workers using appropriate means and methods described by 8 CCR 1529.

E1.7 Asbestos Containing Construction Material

Materials reported by laboratory analysis to contain detectable concentrations of asbestos fibers of less than 1% by weight are not regulated by the USEPA as ACM or RACM and are not governed by NESHAP regulations. While not regulated by the USEPA, materials containing less than 1% asbestos by weight are regulated by Cal/OSHA as ACCM and are subject to Cal/OSHA employee protection, waste labeling, and handling protocols. Employees impacting materials containing detectable levels of asbestos fibers, but in concentrations less than 1% asbestos by weight, must adhere to work practices and methods of compliance as mandated by Cal/OSHA and described in 8 CCR 1529.

E1.8 Exposure Limits for Asbestos

Employers must monitor the air their workers are breathing to determine the airborne concentration of asbestos fibers present in the work environment during the various shifts and while performing various tasks. Phase contract microscopy (PCM) sampling cassettes and low-volume air pumps are worn by employees during their work shift, typically for a period of eight hours. The PCM cassettes are analyzed by a laboratory and an exposure is determined, measured in asbestos fibers per cubic centimeter of air (fibers/cc), extrapolated across the eight-hour work shift. The eight-hour exposure is known as a time-weighted average (TWA).

The exposure limits noted in Table E1.8 Cal/OSHA Airborne Exposure Limits for Asbestos (Table E1.8) must be adhered to for employee protection to establish appropriate protective measures and controls when impacting material containing asbestos.

Table E1.8 Cal/OSHA Airborne Exposure Limits for Asbestos

Air Contaminant	Excursion Limit (Short Term Exposure Limit)	Permissible Exposure Limit (PEL) (8 hr TWA)
Asbestos	1.0 fibers/cc over 30 minutes	0.1 fibers/cc over an 8 hour TWA

Notes:

- Permissible Exposure Limit (PEL): Employer must ensure no employee is exposed above this level based on an 8 hour TWA. When employee expose levels meet or exceed the PEL, administrative, engineering and work practice controls must be implemented. Respiratory protection and other protective measures are required pending feasible engineering controls. Other training, monitoring, and medical surveillance requirements apply for exposure levels exceeding PEL.
- Short Term Exposure Limit (STEL): Short term exposure is measured over 30 minutes during periods of maximum expected exposure operations and is also known as the Excursion Limit

The Contractor should conduct representative breathing zone personal air monitoring of its employees, including a minimum of 25 percent of the crew, once each shift and repeated daily or until a negative exposure assessment (NEA), as derived in accordance with 8 CCR 1529 (f)(2)(C), can be established. A NEA is documented proof that a given activity will not expose employees to asbestos in concentrations above the PELs noted in Table E1.8. A NEA may be established by maintaining initial air monitoring from the beginning of a project that is representative of work employees will be performing during the entire project showing exposure below the PEL or Short Term Exposure Limit (STEL).

Workers should wear personal air sampling devices for the full duration of their shift (eight hours). At least one sample should be collected representing each position/job classification in each work area of the project site. If exposures are determined to be above the PEL or STEL, appropriate worker protections should be instituted per 8 CCR 1529. Exposure monitoring should document the source of asbestos emissions.

Until an employee exposure assessment is completed and it has been determined and documented that the employee is not exposed above the PEL, the Contractor should treat the employee as if the employee were exposed above the PEL and should implement employee protective measures per 8 CCR 1529. Monitoring should be conducted by an individual experienced and knowledgeable about the methods of air monitoring in compliance with applicable regulatory standards.

E2.1 Requirements for Asbestos Impaction

E2.1.1 Asbestos Administrative Controls

Employers must establish a written hazard communication (HAZCOM) training program and train their employees to the hazards to which they are exposed. A HAZCOM program should be implemented for employees who will impact asbestos. If exposure monitoring shows worker airborne exposure to asbestos above the PEL, or above the excursion limit, then additional training and worker certification is necessary.

Supervisors who oversee asbestos work shall have completed 40 hours of USEPA Asbestos Hazard Emergency Response Act (AHERA)-accredited supervisor training. Employees interacting with asbestos must have a level of training appropriate for the class of asbestos work, ranging from two hours (HAZCOM) to 32 hours (AHERA-accredited Worker). At no time should suspected or known asbestos material be drilled, cut, sanded, scraped, or otherwise disturbed by untrained personnel.

Asbestos disturbance and/or removal operations must be conducted by a Cal/OSHA-registered and State-licensed asbestos removal contractor. Contractor registration with Cal/OSHA is required if greater than 100 square feet of ACM, RACM, or ACCM are disturbed by a contractor within a one-year period of time. Employers whose employees disturb asbestos must file a written Report of Use of Regulated Carcinogens (Report of Use) form with Cal/OSHA. A Report of Use form must be filed with Cal/OSHA by employers whose workers disturb material containing greater than 0.1 percent asbestos. Disturbance of asbestos and/or abatement operations should be supervised by a Competent Person, as defined by 8 CCR 1529, who is trained, knowledgeable and qualified in the techniques of asbestos abatement.

One or more of the following specialty certifications for asbestos is/are required by the California Contractors' State License Board (CSLB) for contractors who disturb greater than 100 square feet of asbestos in a year (some exceptions for specific materials apply):

1. C-22 – Asbestos abatement

E2.1.2 Work Practice Controls

Asbestos abatement should be performed by persons trained, qualified, licensed, and equipped to perform asbestos abatement. Employees must never be exposed to airborne asbestos above the PEL, thus specific administrative controls, work practice controls and personal protective equipment (PPE) protocols must be implemented by the employer. Whole-body coverings (including hood and foot-coverings), gloves, and HEPA cartridge-equipped respirators are the standard PPE utilized for asbestos work in most circumstances. The remainder of this section consists of a brief summary of selected work practices required when impacting materials containing asbestos.

A regulated area is required to be established using signage and/or barrier tape around a work area where asbestos is to be impacted if there is a "reasonable possibility" that airborne concentrations of asbestos will exceed the PEL (8 CCR 1529). A regulated area is also required for all Class I, II and III work. Regulated areas shall be demarcated "in a manner that minimized the number of persons within the area and protects persons outside the area from exposure to airborne asbestos" (8 CCR 1529). Access to regulated areas shall be limited to properly trained and protected workers.

The use of wet methods (water) to mitigate emissions of airborne dust is required whenever material containing asbestos is disturbed. The goal of using wet methods is to achieve no visible emissions of asbestos-related dust.

Vacuum cleaners equipped with High Efficiency Particulate Filters (HEPA) must be used by employees impacting material containing asbestos in detectable quantities and must also be used to address associated dust and debris. Material containing asbestos in detectable quantities may not be impacted by non-HEPA-equipped sanders, grinders, saws, or other abrasive power tools. Material containing asbestos (including associated dust and debris) may not be addressed using compressed air, dry sweeping, or dry shoveling.

Material containing asbestos in detectable quantities must be "promptly" containerized in leak tight containers. Prompt clean-up generally is understood to mean that material should not be left un-containerized (unpackaged or outside of a sealable disposal container or waste bin) after any work stoppage such as scheduled breaks and the end of any work shift. Waste containers containing ACM or RACM must be labeled in accordance with Cal/OSHA labeling requirements. Waste containers of RACM must be additionally labeled in accordance with USEPA labeling requirements.

E2.2 Asbestos Work Notifications

Notifications are required by regulatory agencies prior to conducting certain types of work which may impact hazardous materials. Pre-work notifications are required for the project by the local USEPA NESHAP delegated authority (air district) and Cal/OSHA office with jurisdiction over the project site as noted in Table 6.1 located in Section 6.

E2.2.1 Cal/OSHA Temporary Worksite Notification

For project activities which will involve asbestos-related work in excess of 100 square or linear feet, written notification must be made to Cal/OSHA. Such written notification to Cal/OSHA must be submitted to the nearest Cal/OSHA office exercising regulatory authority over the project at least 24 hours prior to the start of asbestos-related work. In addition, certain unexpected events related to asbestos work, such as employees exposed over the PEL without a respirator, must be reported to Cal/OSHA within 15 days of the incident.

E2.2.1 NESHAP Renovation or Renovation Notification

The USEPA NESHAP regulations are authorized by Section 112 of the Clean Air Act (published in 40 Code of Federal Regulations Parts 61 and 63) and specify work practices for asbestos to be followed during renovations and renovations of all structures meeting the NESHAP definition of a facility. The NESHAP regulations require the owner of the facility, or the facility operator, to notify a USEPA delegated authority at least 10 business days prior to the planned commencement of abatement, renovation, and/or renovation work triggering notification. The USEPA authority administering the NESHAP regulations for the project site is the NCUAQMD.

A Renovation Notification must be supplied to the NCUAQMD 10 business days before any work meeting one or more of the following criteria:

1. Impaction or removal of RACM in quantities greater than the notification thresholds noted in Section 6
2. Facility renovation, including unweighting or removal of any load-bearing structure
3. Intentional burning for fire training purposes

E2.3 Asbestos Disposal Requirements

Category I and Category II nonfriable ACM should be disposed of as asbestos-containing waste in California. Friable ACM (RACM), including nonfriable material that has become or will be rendered friable, should be disposed of in California as non-Resource Conservation and Recovery Act (non-RCRA) hazardous waste. Impacting nonfriable ACM with mechanical means will render such material friable and reclassify the material as RACM.

If point count laboratory analysis (Point Count 400) shows that a given material contains less than 1% asbestos, then such material is not considered a hazardous waste by USEPA, or the California Department of Toxic Substances Control (DTSC). Asbestos material containing less than 1% asbestos is not subject to Cal/OSHA asbestos waste labeling requirements. Waste materials containing less than 1% asbestos may generally be disposed of as construction debris in many California landfills and at many municipal transfer stations; however, the acceptance criteria of each facility may differ. The waste acceptor should be contacted, and their individual acceptance-criteria abided by, prior to waste transport and disposal.

Appendix F Lead Regulatory Summary

General Informational Summary of Governmental Rules and Regulations for Lead (Pb)

Appendix F Regulatory Overview for Lead

Work at the project site is understood to meet the Cal/OSHA definition of construction work (8 CCR 1532.1[a]) and includes the planned impaction of known lead containing surface coatings, thus, is subject to regulation by governmental agencies and standards, including those noted in this section.

F1.1 Lead Regulations

F1.1.1 Code of Federal Regulations (CFR)

1. 29 CFR 1926, Construction Standards
2. 40 CFR Parts 261, 265, and 268, Hazardous Waste Management
3. 40 CFR Part 745, Lead: Identification of Dangerous Levels of Lead
4. 40 CFR Part 745, Subpart E Lead Renovation, Repair and Painting Program
5. 49 CFR Parts 172, 173, 178, 179, Hazardous Material Transportation

F1.1.2 California Code of Regulations (CCR)

1. 8 CCR Division 1, Chapter 4, Construction Safety Orders
2. 8 CCR 1532.1, Lead in Construction
3. 8 CCR 1537, Welding, Cutting, and Heating of Coated Metals
4. 8 CCR 1531, Respiratory Protection
5. 17 CCR Division 1, Chapter 8, Accreditation/Certification, and Work Practices in Lead–Related Construction
6. 22 CCR Division 4.5, Environmental Health Standards for Management of Hazardous Waste

F1.2 Lead Based Paint

The USEPA, CDPH and Cal/OSHA define Lead Based Paint (LBP) as a surface coating containing lead in a concentration of equal to or greater than 0.5 percent by weight, 5,000 milligrams per kilogram (mg/kg), 5,000 ppm, or 1.0 milligram per square centimeter (mg/cm^2). In addition, Cal/OSHA regulates worker impaction of paint containing any detectable quantity of lead, thus such work triggers compliance with applicable regulations, including 8 CCR 1532.1.

The United States Consumer Product Safety Commission defines lead containing paint (LCP) as a surface coating containing lead in a concentration of equal to or greater than 0.009 percent by weight or 90 ppm (90 mg/kg).

F1.3 Trigger Tasks and Lead Impaction Activities

Specific construction tasks, known as Trigger Tasks, when performed on material(s) known to contain detectable quantities of lead, should be understood to expose employees above the lead PEL and thus necessitate specific employee protection measures per 8 CCR 1532.1. A Trigger Task or Activity is defined herein as a construction operation, process or task specifically identified by the Cal/OSHA lead standard (8 CCR 1532.1) as a potential lead exposure hazard requiring

certain protective measures to be implemented prior to obtaining the results of an initial exposure assessment.

Performing a Trigger Task should be understood to expose employees above the Permissible Exposure Limit (PEL) and should thus necessitate employee protection measures, including the following: wearing of respirators and protective clothing, action level training (at a minimum) and initial employee biological medical monitoring (blood tests), until personal air sampling proves otherwise. Untrained and/or unprotected workers should not perform trigger tasks. Specific trigger tasks and their expected resultant airborne exposure levels are described below.

F1.3.1 Trigger Task I

The following trigger task I activities are expected to create airborne lead concentrations of 50 to 500 micrograms per cubic meter of air (µg/m^3):

1. Manual renovation
2. Paint preparation (scraping and sanding)
3. Using heat guns
4. Using HEPA-filtered equipment
5. Debris clean-up

F1.3.2 Trigger Task II

The following trigger task II activities are expected to create airborne lead concentrations of 500 to 2,500 µg/m^3:

1. Lead mortar work
2. Lead burning
3. Rivet busting
4. Use of non-HEPA-filtered equipment
5. Dry abrasive blast debris clean-up or containment movement

F1.3.3 Trigger Task III

The following trigger task II activities are expected to create airborne lead concentrations of greater than 2,500 µg/m^3:

1. Welding
2. Abrasive blasting
3. Torch cutting/burning

F1.4 Competent Person Designation

The Contractor shall designate, in writing, one or more individuals as Competent Persons(s) when tasking individuals to perform work at the project site that may impact lead containing surface coatings. Written designation shall certify that each designated Competent Person has the

appropriate training and knowledge required of a Competent Person under Article 6 of the construction Safety Orders, Title 8, California Code of Regulations.

F1.5 Personal Air Monitoring

The Contractor should conduct worker breathing zone exposure monitoring (also known as personal air monitoring) to determine the airborne concentration of lead present within the work environment as required by Cal/OSHA per 8 CCR 1532.1. Air monitoring of Contractor personnel performing lead impaction work is required by Cal/OSHA and is the obligation of the Contractor. The Contractor is responsible for providing daily Cal/OSHA compliance monitoring as per 8 CCR 1532.1 (Lead). The Contractor shall monitor workers for lead exposure.

Air monitoring should continue for each task for the duration of the project, unless a negative exposure assessment is achieved. The exposure limits noted in F1.5 Cal/OSHA Exposure Limits for Lead (Table F1.5) must be adhered to for employee protection to establish appropriate protective measures and controls when impacting material containing lead.

Table F1.5 Cal/OSHA Airborne Exposure Limits for Lead

Air Contaminant	Action Level (AL) (8-hr TWA)	Permissible Exposure Limit (PEL) (8-hr TWA)
Lead	30 µg/m^3	50 µg/m^3

Notes:

- µg/m^3 = Micrograms per cubic meter of air
- 8-hr TWA = Eight-hour time-weighted average
- Action Limit (AL): When employee exposure levels exceed the AL, specific administrative, engineering and work practice controls must be implemented.
- Permissible Exposure Limit (PEL): Employer must ensure no employee is exposed above this level based on an 8 hour TWA. When employee exposure levels exceed the PEL, all applicable administrative, engineering and work practice controls must be implemented. Respiratory protection and other protective measures are required pending feasible engineering controls. Other training, monitoring, and medical surveillance requirements apply for exposure levels exceeding PEL.

Correspondingly to the asbestos air monitoring requirements described in Appendix E, the Contractor should conduct representative (25% of crew) breathing zone personal air monitoring of its employees once each shift and repeated daily or until a NEA showing airborne lead exposure below the PEL or Action Level (AL), as derived in accordance with and 8 CCR 1532.1 (d) can be established. Monitoring should be conducted by an individual experienced and knowledgeable about the methods of air monitoring and in accordance with 8 CCR 1532.1. If exposures are determined to be above the action level, appropriate worker protections should be instituted per 8 CCR 1532.1. Exposure monitoring should document the source of lead emissions.

Until an employee exposure assessment is completed and it has been determined and documented that the employee is not exposed above the PEL, the Contractor should treat the employee as if the employee were exposed above the PEL and should implement employee protective measures per 8 CCR 1532.1, if any Trigger Tasks are to be performed.

F1.6 Personnel Training

Individuals engaged in lead-related construction work activities should attend lead hazard training appropriate to their assignments. All training for other lead–related construction activities should be in accordance with the worker training provisions in the Cal/OSHA and CDPH lead regulations.

Employees, including crew leaders, supervisors, and any other Contractor personnel or agents who may be exposed to airborne concentrations of lead must have received at a minimum: lead awareness training (HAZCOM) as required by Cal/OSHA 8 CCR 1532.1. If air monitoring demonstrates an exposure above the AL or PEL for lead, the Contractor should maintain documentation that employees receiving this exposure level have received Action Level training if exposed above Action Level. The Contractor should maintain documentation affirming that employees have appropriate CDPH lead worker certification if exposed above PEL while working at a public building.

F1.6.1 Hazard Communication Training

All workers should receive lead hazard communication (HAZCOM) training prior to the commencement of work that may disturb painted surfaces known or presumed to contain lead at the project site. Such training should be documented and such documentation retained onsite for review. Training should include, but may not be limited to, the locations and presence of lead containing material at the project site, the potential hazards of lead exposure, the purpose and meaning of warning signage, the isolation (using signage and barrier tape) of identified lead debris, the required procedures and training necessary to impact lead containing material and prohibited practices regarding lead containing material at the project site, the content of 8 CCR 1532.1, the specific nature of operations which could expose employees to lead above the action level, the proper use of respirators, the purpose and a description of the medical surveillance program, the content of the Contractor Lead Compliance Plan, and the proper use/restrictions on chelating agents.

F1.6.2 Action Level Training

The Action Level (AL) is an established airborne contaminate level that when met or exceeded, certain protective health and safety measures are triggered per 8 CCR 1532.1 (I) (2). For lead, the AL is an exposure of 30 micrograms per cubic meter of air ($\mu g/m^3$) of airborne lead as an 8-hour TWA. The Contractor should provide training for all workers who may be exposed to lead in excess of the AL or PEL in accordance with Title 8 CCR 1532.1, Subsection (I), Parts (1) and (2) Awareness Training. Contractor should maintain documentation that employees receiving this exposure level have received Action Level training if exposed above Action Level.

The Contractor should itself establish, or have site personnel attend, an Action Level Training program. Such a training program should assure that each employee is trained in the following:

1. The content of 8 CCR 1532.1 and its appendices.
2. The specific nature of the operations which could result in exposure to lead above the action levels.
3. The purpose, proper selection, fitting, use, and limitations of respirators.

4. The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant).
5. The engineering controls and work practices associated with the employee's job assignment including training of employees.
6. The contents of any compliance plan and the location of regulated areas in effect.
7. Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used except under the direction of a licensed physician.
8. The employee's right of access to records under CCR Section 3204.

F1.7 Medical Surveillance Compliance

Use only workers trained and medically qualified for the assigned lead work and respirator usage for trigger tasks or other work known or reasonably expected to generate airborne exposures to lead in excess of the Action Level (AL) or PEL.

Contractor employees shown to be exposed above the AL, PEL, and/or engaged in Trigger Tasks in the absence of a NEA, must be medically-qualified to do so and have the appropriate medical examinations as specified in 8 CCR 1532.1. Medically-qualified should mean that the worker who performs trigger tasks, or other lead-related construction tasks likely to exceed the AL or PEL, has received, at minimum, lead biological monitoring and medical evaluation for use of respiratory protection in accordance with 8 CCR 1532.1(j).

Medical requirement for lead-related construction work compliance should include:

1. Documentation of medical surveillance examination by a licensed medical physician prior to commencement of onsite Lead–Related Construction “trigger task” work. Documentation should include baseline blood lead levels. The baseline blood lead should have been within 30 days in advance of starting work.
2. Documentation from physician that all employees or agents who may be exposed to airborne lead in excess of background levels have received medical examination to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects in accordance with 8 CCR 153. Medical exams should have been performed not more than 12 months prior to the completion of Contractor work at the project site. Biological monitoring records documenting employee blood lead level test results should be kept for 30 years. The Contractor must be aware of and provide information to the examining physician about unusual conditions in the workplace environment (e.g., high temperatures, humidity, chemical contaminants) that may impact on the employee's ability to perform work activities.
3. Documentation that each employee required to wear respirators has passed a respirator fit test within the past 12 months and has been assigned an individual respirator based on the fit test.

4. Methods, procedures and plan for monitoring employee airborne lead exposure as required by Cal/OSHA during lead component removal, clean-up and surface preparation activities. Methods and procedures, at a minimum, should comply with requirements outlined in 8 CCR 1532.1 Lead. Include Name, address and certification information for laboratory to be used for air sample analysis.

F1.8 Requirements for Lead Impaction

Surface coatings (paint) applied to interior and exterior surfaces at the project site have been reported and/or are assumed to contain lead. Employers whose employees perform impaction of surface coatings at the project site should monitor their employees for airborne lead exposure and institute necessary employee protection precautions per the Cal/OSHA lead standard (8 CCR 1532.1) when conducting work at the project site.

As required by 8 CCR 1532.1, employees performing work at the project site, including foreman, supervisor, and any other company personnel or agents who may be exposed to any airborne concentrations of lead, should receive training which includes, at a minimum, Lead Awareness training, also known as lead HAZCOM training.

If air monitoring demonstrates an employee exposure to lead above 30 micrograms per cubic meter of air (µg/m^3), a threshold known as the Cal/OSHA Action Level, or 50 µg/m^3, a threshold known as the PEL, the employer must maintain documentation that employees receiving such exposure(s) have received Action Level training (if exposed above the Action Level or PEL) and have appropriate CDPH certification. It should be noted that CDPH certification is applicable if employees are exposed above the PEL in a building generally accessible to the public as defined by 17 CCR, Division 1, Chapter 8, Article 1.

Employee protection measures are mandated by Cal/OSHA when workers impact lead and the scope and magnitude of these measures are generally dependent on the amount of lead present in the air. At a minimum, work impacting lead must include the following protocols:

1. Establishment of a regulated work area (posting of warning signage)
2. Establishment of hygiene controls (hand washing facilities)
3. Use of wet methods (water) to mitigate airborne dust generation
4. Use of HEPA filter-equipped vacuums and tools
5. Use of PPE, including respirators, as appropriate

F2.1 Lead Waste Disposal

F2.1.2 Waste Segregation and Characterization

The Resource Conservation and Recovery Act (RCRA) gave the USEPA authority to regulate the waste status of demolition and renovation debris, including lead-containing materials. Specific notification and testing requirements are required to be addressed prior to transporting, treating, storing, or disposing of hazardous wastes. Lead containing wastes are considered hazardous waste under RCRA if Toxicity Characteristic Leaching Procedure (TCLP) results exceed five milligrams per liter (mg/l). The USEPA exempts from most RCRA requirements those generators whose

combined hazardous waste generation is less than 100 kilograms per month. Site owner or contractor should provide for secure onsite temporary storage for known or suspect hazardous LBP paint chip, dust/debris, and cleanup related waste.

Suspect hazardous waste streams and waste categories listed below should be considered lead hazardous waste until proven otherwise through testing. Suspect hazardous waste should be segregated by the Client or site owner based on potential for exhibiting hazardous waste characteristics. Lead related wastes, at a minimum, are to be segregated into the below listed categories:

1. Category I: Paint removed by chemical stripping, mechanical removal or abrasive media, paint chips, vacuum bags, used cleaning materials. These materials are typically hazardous wastes and should be assumed hazardous unless proven nonhazardous via approved laboratory analysis.
2. Category II: Plastic sheeting and tape, disposable clothing, and equipment. These materials should be non-hazardous if properly cleaned and decontaminated. However, these items are to be considered hazardous wastes subject to testing.
3. Category III: Work dust and debris from lead painted finishes and structures undergoing work are to be considered hazardous waste subject to testing.

Composite representative samples should be taken of each waste stream category generated. Samples from a given waste stream category may be composited into one sample for analysis. The site owner and contractor should ensure a sufficient number of representative samples are taken from each category of segregated waste. Waste streams should be tested using the lead testing analytical thresholds for determination of hazardous waste characterization as shown on the following tables, Table F2.1 and Table F2.2.

Table F2.1 Cal/EPA Testing Protocol for Lead

Lead Content Analytical Method	Hazardous Waste Threshold	Waste Characterization
Total Threshold Limit Concentration (TTLC)	≤50 ppm	Non-Hazardous Waste
Total Threshold Limit Concentration (TTLC)	>50 ppm - ≤1,000 ppm	Run STLC
Total Threshold Limit Concentration (TTLC)	>1,000 ppm	California Hazardous Waste, Run TCLP
Soluble Threshold Limit Concentration (STLC)	≤5 mg/L	Non-Hazardous Waste
Soluble Threshold Limit Concentration (STLC)	>5 mg/L	California Hazardous Waste, Run TCLP

Notes:
- > = greater than
- ≤ = less than or equal to
- mg/L = milligrams per liter, laboratory unit of measurement for soluble analytes
- ppm = parts per million, laboratory unit of measurement

Any waste greater than or equal to 1,000 ppm lead using the TTLC analysis method should be considered a lead hazardous waste. If the TTLC result for a waste stream is less than 50 ppm lead, then the waste stream is non-hazardous and no further testing is required for the sampled waste stream unless the waste changes in character or composition.

Table F2.2 USEPA Testing Protocol for Lead

Lead Content Analytical Method	Hazardous Waste Threshold	Waste Characterization
Toxicity Characteristic Leaching Procedure (TCLP)	>5 mg/L	RCRA Hazardous Waste
Toxicity Characteristic Leaching Procedure (TCLP)	≤5 mg/L	Non-RCRA Hazardous Waste

Notes:

- > = greater than
- ≤ = less than or equal to
- mg/L = milligrams per liter, laboratory unit of measurement for soluble analytes
- RCRA = Resource Conservation and Recovery Act

Based on the above testing protocols, any representative waste stream having a soluble lead concentration greater than or equal to five (5) ppm lead as determined by STLC or TCLP analyses or any waste greater than or equal to 1,000 ppm lead using the TTLC analysis method should be considered a lead hazardous waste.

Each category of suspect hazardous waste should be tested and characterized according to requirements of the selected permitted waste disposal site. If other hazardous constituents are known or suspected to be present, the testing should also include those substances or conditions.

The waste should be packaged, stored, handled, transported and disposed of for each category of waste generated based on the testing results and regulatory protocol. All testing should be performed by a laboratory that complies with and is certified under the Environmental Laboratory Accreditation Program (ELAP) established by the CDPH.

Appendix G Laboratory Certifications

Accreditations and Certifications for Laboratories Providing Analytical Data for the Project

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200346-0

AmeriSci Los Angeles

Carson, CA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2018-01-01 through 2018-12-31

Effective Dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Voluntary Laboratory Accreditation Program

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

AmeriSci Los Angeles
DBA: AmeriSci Los Angeles
24416 South Main Street, Suite 308
Carson, CA 90745
Mr. Glenn F. Massey
Phone: 310-834-4868 Fax: 310-834-4772
Email: gmassey@amerisci.com
http://www.amerisci.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 200346-0

Bulk Asbestos Analysis

Code	Description
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	Description
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

Effective 2018-01-01 through 2018-12-31

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

AmeriSci Los Angeles

24416 South Main Street

Carson, CA 90745

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2322**

Expiration Date: **9/30/2018**

Effective Date: **10/1/2016**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE

ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

CERTIFICATE OF ENVIRONMENTAL ACCREDITATION

Is hereby granted to

Enthalpy Analytical LLC, dba Curtis & Tompkins, Ltd.

2323 Fifth Street

Berkeley, CA 94710

Scope of the certificate is limited to the
"Fields of Testing"
which accompany this Certificate.

Continued accredited status depends on successful completion of on-site inspection, proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No.: **2896**

Expiration Date: **1/31/2019**

Effective Date: **2/1/2017**

Sacramento, California
subject to forfeiture or revocation

Christine Sotelo, Chief
Environmental Laboratory Accreditation Program

CALIFORNIA STATE
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

Enthalpy Analytical LLC, dba Curtis & Tompkins, Ltd.

2323 Fifth Street
Berkeley, CA 94710
Phone: (510) 486-0900

Certificate No. **2896**
Expiration Date **1/31/2019**

Field of Testing: 102 - Inorganic Chemistry of Drinking Water

102.045	001	Perchlorate	EPA 314.0

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.112	001	Boron	EPA 200.7
108.112	002	Calcium	EPA 200.7
108.112	004	Magnesium	EPA 200.7
108.112	005	Potassium	EPA 200.7
108.112	007	Sodium	EPA 200.7
108.113	002	Calcium	EPA 200.8
108.113	003	Magnesium	EPA 200.8
108.113	004	Potassium	EPA 200.8
108.113	006	Sodium	EPA 200.8
108.120	001	Bromide	EPA 300.0
108.120	002	Chloride	EPA 300.0
108.120	003	Fluoride	EPA 300.0
108.120	008	Sulfate	EPA 300.0
108.120	012	Nitrate (as N)	EPA 300.0
108.120	014	Nitrite (as N)	EPA 300.0
108.360	001	Phenols, Total	EPA 420.1
108.381	001	Oil and Grease	EPA 1664A
108.390	001	Turbidity	SM2130B-2001
108.410	001	Alkalinity	SM2320B-1997
108.420	001	Hardness (calculation)	SM2340B-1997
108.430	001	Conductivity	SM2510B-1997
108.440	001	Residue, Total	SM2540B-1997
108.441	001	Residue, Filterable TDS	SM2540C-1997
108.442	001	Residue, Non-filterable TSS	SM2540D-1997
108.465	001	Chlorine, Total Residual	SM4500-Cl G-2000
108.472	001	Cyanide, Total	SM4500-CN E-1999
108.490	001	Hydrogen Ion (pH)	SM4500-H+ B-2000
108.501	002	Kjeldahl Nitrogen, Total (as N)	SM4500-NH3 C-1997
108.502	002	Ammonia (as N)	SM4500-NH3 B,D-1997
108.540	001	Phosphate, Ortho (as P)	SM4500-P E-1999
108.541	001	Phosphorus, Total	SM4500-P E-1999
108.552	001	Silica, Dissolved	SM4500-SiO2 C-1997
108.584	001	Sulfide (as S)	SM4500-S= D-2000
108.592	001	Biochemical Oxygen Demand	SM5210B-2001
108.595	001	Chemical Oxygen Demand	SM5220D-1997
108.597	001	Organic Carbon-Total (TOC)	SM5310C-2000

As of 2/9/2018 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

Enthalpy Analytical LLC, dba Curtis & Tompkins, Ltd.

Certificate No. 2896
Expiration Date: 1/31/2019

108.605	001	Surfactants	SM5540C-2000

Field of Testing: 109 - Toxic Chemical Elements of Wastewater

109.010	001	Aluminum	EPA 200.7
109.010	002	Antimony	EPA 200.7
109.010	003	Arsenic	EPA 200.7
109.010	004	Barium	EPA 200.7
109.010	005	Beryllium	EPA 200.7
109.010	006	Boron	EPA 200.7
109.010	007	Cadmium	EPA 200.7
109.010	009	Chromium	EPA 200.7
109.010	010	Cobalt	EPA 200.7
109.010	011	Copper	EPA 200.7
109.010	012	Iron	EPA 200.7
109.010	013	Lead	EPA 200.7
109.010	015	Manganese	EPA 200.7
109.010	016	Molybdenum	EPA 200.7
109.010	017	Nickel	EPA 200.7
109.010	019	Selenium	EPA 200.7
109.010	021	Silver	EPA 200.7
109.010	023	Thallium	EPA 200.7
109.010	024	Tin	EPA 200.7
109.010	025	Titanium	EPA 200.7
109.010	026	Vanadium	EPA 200.7
109.010	027	Zinc	EPA 200.7
109.020	001	Aluminum	EPA 200.8
109.020	002	Antimony	EPA 200.8
109.020	003	Arsenic	EPA 200.8
109.020	004	Barium	EPA 200.8
109.020	005	Beryllium	EPA 200.8
109.020	006	Cadmium	EPA 200.8
109.020	007	Chromium	EPA 200.8
109.020	008	Cobalt	EPA 200.8
109.020	009	Copper	EPA 200.8
109.020	010	Lead	EPA 200.8
109.020	011	Manganese	EPA 200.8
109.020	012	Molybdenum	EPA 200.8
109.020	013	Nickel	EPA 200.8
109.020	014	Selenium	EPA 200.8
109.020	015	Silver	EPA 200.8
109.020	016	Thallium	EPA 200.8
109.020	017	Vanadium	EPA 200.8
109.020	018	Zinc	EPA 200.8
109.190	001	Mercury	EPA 245.1

Field of Testing: 110 - Volatile Organic Chemistry of Wastewater

110.040	000	Purgeable Organic Compounds	EPA 624

Field of Testing: 111 - Semi-volatile Organic Chemistry of Wastewater

Enthalpy Analytical LLC, dba Curtis & Tompkins, Ltd.

Certificate No. 2896
Expiration Date: 1/31/2019

111.100	000	Base/Neutral & Acid Organics	EPA 625	
111.170	000	Organochlorine Pesticides and PCBs	EPA 608	

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010B	
114.010	002	Arsenic	EPA 6010B	
114.010	003	Barium	EPA 6010B	
114.010	004	Beryllium	EPA 6010B	
114.010	005	Cadmium	EPA 6010B	
114.010	006	Chromium	EPA 6010B	
114.010	007	Cobalt	EPA 6010B	
114.010	008	Copper	EPA 6010B	
114.010	009	Lead	EPA 6010B	
114.010	010	Molybdenum	EPA 6010B	
114.010	011	Nickel	EPA 6010B	
114.010	012	Selenium	EPA 6010B	
114.010	013	Silver	EPA 6010B	
114.010	014	Thallium	EPA 6010B	
114.010	015	Vanadium	EPA 6010B	
114.010	016	Zinc	EPA 6010B	
114.020	001	Antimony	EPA 6020	
114.020	002	Arsenic	EPA 6020	
114.020	003	Barium	EPA 6020	
114.020	004	Beryllium	EPA 6020	
114.020	005	Cadmium	EPA 6020	
114.020	006	Chromium	EPA 6020	
114.020	007	Cobalt	EPA 6020	
114.020	008	Copper	EPA 6020	
114.020	009	Lead	EPA 6020	
114.020	010	Molybdenum	EPA 6020	
114.020	011	Nickel	EPA 6020	
114.020	012	Selenium	EPA 6020	
114.020	013	Silver	EPA 6020	
114.020	014	Thallium	EPA 6020	
114.020	015	Vanadium	EPA 6020	
114.020	016	Zinc	EPA 6020	
114.103	001	Chromium (VI)	EPA 7196A	
114.106	001	Chromium (VI)	EPA 7199	
114.140	001	Mercury	EPA 7470A	
114.141	001	Mercury	EPA 7471A	
114.222	001	Cyanide	EPA 9014	

Field of Testing: 115 - Extraction Test of Hazardous Waste

115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311	
115.030	001	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II	
115.040	001	Synthetic Precipitation Leaching Procedure (SPLP)	EPA 1312	

Field of Testing: 116 - Volatile Organic Chemistry of Hazardous Waste

116.030	001	Gasoline-range Organics	EPA 8015B	Interim

As of 2/9/2018 , this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

Enthalpy Analytical LLC, dba Curtis & Tompkins, Ltd.

Certificate No. 2896
Expiration Date: 1/31/2019

116.040	041	Methyl tert-butyl Ether (MTBE)	EPA 8021B	Interim
116.040	062	BTEX	EPA 8021B	Interim
116.080	000	Volatile Organic Compounds	EPA 8260B	Interim

Field of Testing: 117 - Semi-volatile Organic Chemistry of Hazardous Waste

117.010	001	Diesel-range Total Petroleum Hydrocarbons	EPA 8015B	Interim
117.110	000	Extractable Organics	EPA 8270C	Interim
117.140	000	Polynuclear Aromatic Hydrocarbons	EPA 8310	Interim
117.170	000	Nitroaromatics and Nitramines	EPA 8330	Interim
117.210	000	Organochlorine Pesticides	EPA 8081A	Interim
117.220	000	PCBs	EPA 8082	Interim

Field of Testing: 120 - Physical Properties of Hazardous Waste

120.010	001	Ignitability	EPA 1010	
120.080	001	Corrosivity - pH Determination	EPA 9045C	

Appendix H 2006 Winzler & Kelly Asbestos Report

Winzler & Kelly Asbestos Survey Report for Pacific Properties Group Proposed Building Demolition at 2616 Broadway Eureka, California

04-1022-01.11037

ASBESTOS SURVEY
PACIFIC PROPERTIES GROUP
PROPOSED BUILDING DEMOLITION
2616 BROADWAY
EUREKA, CALIFORNIA

April 2006

Prepared for:
Mr. Kent Hallen
Pacific Properties Group
775 Entler Avenue, Suite 3
Chico, California 95928

Prepared by:
Winzler & Kelly Consulting Engineers
633 Third Street
Eureka, California 95501
(707) 443-8326

ASBESTOS SURVEY
PACIFIC PROPERTIES GROUP
PROPOSED BUILDING DEMOLITION
EUREKA, CALIFORNIA

Project No. 04-1022-01.11037

Prepared for:
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ASBESTOS SURVEY
PACIFIC PROPERTIES GROUP
PROPOSED BUILDING DEMOLITION
2616 BROADWAY
EUREKA, CALIFORNIA

I. PURPOSE

This limited survey was conducted in order to identify the presence of asbestos in the building materials of the above-referenced building for a proposed demolition to NESHAP requirements.

II. EXECUTIVE SUMMARY

On March 30, and April 7, 2006, Winzler & Kelly Consulting Engineers (Winzler & Kelly) conducted surveys and sampling for asbestos at the above-referenced site. The site included the building located at 2616 Broadway (southwest corner of Vigo Street and Broadway), consisting of the ground level customer service area, bathrooms and mechanics garage, the second floor storage areas, and the roof. See Figures 1 through 3, Appendix A for sampling locations.

A summary of asbestos containing materials (ACM) identified during this survey is listed in Table 1. Asbestos sample data is summarized in Table 2, Appendix B. The Laboratory Reports and Chain of Custody forms for asbestos are included in Appendix C.

Asbestos Survey

During the asbestos surveys, 39 bulk samples were collected for analysis for asbestos. By laboratory analysis, various materials in the buildings were determined to be "asbestos containing materials" (ACM).

TABLE 1
ASBESTOS CONTAINING MATERIALS (ACM)
Vigo Street Proposed Demolition

Building/ Floor	Room # or Name	MATERIAL	ACM or PACM	QUANTITY Square Feet=SF Linear Feet =LF	Comments
1st floor	N bathroom wall and ceiling	Joint compound on drywall	ACM	274 SF	
	NE room	Joint compound on drywall	ACM	321 SF	
	Main room floor	Black mastic on white floating compound	ACM	20 SF	

Building/ Floor	Room # or Name	MATERIAL	ACM or PACM	QUANTITY Square Feet=SF Linear Feet =LF	Comments
	SE bathroom floor	Green 12”x12” VFT with white streaks and black mastic	ACM	51 SF	Only the mastic contained asbestos. The mastic is attached to the underside of the VFT
	SE Bathroom wall	Grey cementitious wall board	ACM	145 SF	
	SE bathroom ceiling	Joint compound on drywall	ACM	33 SF	
	SE 2nd bathroom ceiling	Joint compound on drywall	ACM	173 SF	
	SE 2nd bathroom wall	Grey cementitious wall board	ACM	268 SF	
	Main garage, NW corner	8” circular heater flue	ACM	25 LF	
2nd Floor	Open area by ladder	8” circular heater flue	ACM	12 LF	
	Middle room	6” circular heater flue	ACM	7 LF	
	South room	8” oval heater flue	ACM	9 LF	
Exterior, East Side	Entrance overhang	1.5” bead of Black Jack	ACM	80 LF	
Roof	Strip separating the black and grey rolled roofing	12” strip of Black Jack	ACM	80 SF	

III. ASBESTOS - SURVEY METHODOLOGY

Each suspect asbestos-containing material (ACM) identified was bulk sampled in general accordance with sampling guidelines established by the Environmental Protection Agency and 29 CFR 1926.1101. The following summarizes the sampling procedures utilized. The samples were submitted to RJ Lee Group, Inc., an accredited laboratory, under chain-of-custody, for identification of asbestos content.

- The general location of each ACM was tabulated and marked on a corresponding map.

- These materials were then categorized into homogeneous materials. A homogeneous material is defined as being uniform in texture, color, and date of application.

- A sampling scheme was developed based upon the location and quantity of the various homogeneous materials. Sample numbers were recorded on data sheets and each sample was categorized as a miscellaneous material (MM), surfacing material (SM), or thermal system insulation (TSI). Further, the condition of the sample material was classified into AHERA damage categories in addition to assessing friability. The classifications are as follows:

  Not damaged (ND) - no damage.
  Damaged (DG) - loss of cohesion or adhesion properties wherein <25% of the damage is localized, or <10% of the damage occurs in the overall area.
  Significantly Damaged (SD) - loss of cohesion or adhesion properties wherein >25% of the damage is localized, or >10% of the damage occurs in the overall area.
  Friable - can easily be crumbled when dry.
  Non-Friable - not easily crumbled when dry.
  Potential for Significant Damage - Applies to friable ACBM that is in a regularly occupied area, wherein a reasonable likelihood exists that the material or its covering will become significantly damaged, deteriorated, or delaminated due to factors including, but not limited to, accessibility, vibration, or air erosion.

- Bulk samples were collected by a Winzler & Kelly Cal /OSHA Certified Asbestos Consultant (CAC) using appropriate sampling tools and leak-tight containers.

- Decontamination of bulk sampling tools was used to prevent the spread of secondary contamination to subsequent bulk samples.

- Each bulk sample was individually numbered and recorded on a Bulk Sample Log and sent to RJ Lee Group, Inc.

- The samples were analyzed by Polarized Light Microscopy (PLM) following National Institute of Occupational Safety and Health (NIOSH) Method 9002.

- Table 2, Appendix B summarizes the sample number, sample description, sample location, and the concentration of asbestos, if any, and the quantities of asbestos containing materials.

V. SUMMARY OF REGULATIONS

Asbestos:
Note that several definitions apply to materials containing asbestos.

Asbestos Containing Materials (ACM) contain >1% asbestos. Regulated ACM (RACM) is defined under NESHAP as being ACM which is “friable”, or “non-friable” ACM which will be rendered friable by renovation and/or demolition activities.

Asbestos Containing Construction Materials (ACCM) contain >0.1% asbestos, and the disturbance of these materials are subject to Cal/OSHA regulations for the protection of workers.

There are six regulations that either require or imply that an asbestos inspection must be performed prior to work that will disturb ACM (disrupt the matrix, crumble, pulverize or generate visible debris). The first is the NESHAP regulation which requires an inspection prior to a demolition or a renovation project over the notification amounts. The second is the OSHA Asbestos Standard for the construction Industry which requires TSI, surfacing, and flooring to be treated as ACM if they are present in buildings constructed before 1981. The third stems from the Cal/OSHA Illness Injury Protection Program (IIPP) requirements for hazard determination and inspection. The fourth is the California Asbestos Notification Act. The fifth is the Hazard Substances Removal Contract requirements in California, while the sixth is California Labor Code 6501.9 which indicates the building owner must determine if asbestos containing construction material (ACCM) is present prior to contracted work.

According to the National Emission Standard for Hazardous Air Pollutants (NESHAP), ACM (>1% asbestos) must be removed prior to demolition or renovation if the material is considered to be a Regulated Asbestos Containing Material (RACM), and if it will be disturbed (made friable). RACM is generally defined as all “friable” ACM and “non-friable” ACM, which, by definition, contain >1% asbestos, that will become friable during renovation. The North Coast Unified Air Quality District must be notified for all demolitions and must be notified for any renovations that disturb RACM (friable asbestos, or non friable asbestos that will become friable) above the notification amounts. The EPA notification amounts are 160 square feet and 260 linear feet.

Building owners must notify employees and contractors working inside a building that the building contains asbestos. A Report of Use form must be filed with CAL-OSHA when a carcinogen is disturbed during renovation or demolition.

Building owners also have responsibilities to provide a safe work environment and must notify employees and contractors working inside a building known to contain asbestos. Two of these specific laws are the Asbestos Notification Act (California Health and Safety Code, Section 25915 et. seq.) and Proposition 65. Asbestos regulations are complicated and are subject to change. The intent of the following information is to advise you of some of the regulations that may affect you, but is not intended to be an all-encompassing discussion of asbestos regulations.

The California Business and Professions Code, Section 7058.5 et. al. seq. requires asbestos abatement contractors to be certified with the Contractor State Licensing Board (in addition to being registered annually with CAL-OSHA). They must be certified if, at one job site, at one time, they ever engage in asbestos-related work involving 100 square feet or more of asbestos containing construction materials (ACCM, >0.1% asbestos). There are exceptions to this certification process for roofing and flooring materials. Work practices for asbestos removal are regulated by CAL-OSHA. In addition, a Report of Use form must be filed with CAL-OSHA by the abatement contractor when a carcinogen (asbestos) is disturbed.

Building owners have responsibilities to provide a safe work environment and must notify employees and contractors working inside a building known to contain asbestos. Two of these specific laws are the Asbestos Notification Act (California Health and Safety Code, Section 25915 et. seq.) and Proposition 65. Prop 65 requires the posting of warning signage.
The Asbestos Notification Act applies to building owners, professional property managers of and tenants in non-residential buildings built before 1979 who know of ACCM in their buildings. They must provide a specific written notification to employees and contractors in the building. Results of inspections, sampling, etc. must be shared, warning signs posted, and various other actions taken. This notification must be done each year. In addition, a supplemental notification must be done within 90 days of a change in the material or the receipt of additional sampling results. A copy of this notice must be given to every co-owner or tenant. Tenants who receive this notice are required to notify their employees.

Under Section 25359.7 of the Health and Safety Code, owners of real estate property who know of or have reasonable cause to believe that ACM is present must disclose that prior to sale.

The Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), regulates chemicals in California that cause cancer or reproductive toxicity. The list of chemicals involved is published in Division 2 of Title 22, beginning with Section 12000

Proposition 65 involves the public notification and warning required by the regulation. There is controversy on how to appropriately comply. In general, unless the ACM in a building is damaged and thus the owner believes it is contaminating air in the building, the owner does not have to specifically post the Proposition 65 warning sign (just for the asbestos). On the other hand, these warning signs should be displayed whenever and wherever asbestos work is being done. Many building owners routinely add the Proposition 65 warning as part of their compliance with the Asbestos Notification Act (see Sections 25249.5 & 25249.6 of the Health & Safety Code).

In addition to the above-mentioned regulations, the following regulations will most likely apply:

- ✓ Section 25914.1-3 Health and Safety Code
- ✓ Section 25359.7 Health and Safety Code
- ✓ Section 19827.5 Health and Safety Code
- ✓ 29 CFR 1910.1001
- ✓ 29 CFR 1926.1101
- ✓ 40 CFR Part 61, Subpart M (NESHAP)
- ✓ 8 CCR Article 4, 1529
- ✓ 8 CCR Article 110, 5208
- ✓ Labor Code Section 9000 et. seq.
- ✓ Labor Code section 6501.9
- ✓ 8 CCR Article 2.5. Section 341.6 et. seq.
- ✓ 8 CCR Article 2.5, Section 341.9
- ✓ Asbestos Hazard Emergency Response Act (AHERA)

Asbestos regulations are complicated and are subject to change. The intent of the above information is to advise you of some of the regulations that may affect you, but is not intended to be an all-encompassing discussion of asbestos regulations.

The sole purpose of this investigation and of this report is to assess the site with respect to asbestos material as defined by Winzler & Kelly's scope of work. Winzler & Kelly is not responsible for locating asbestos containing building material in inaccessible areas such as behind walls, above hard ceilings, beneath flooring or underground. The passage of time, manifestation of latent conditions, or occurrence of future events may require further exploration at the site, analysis of data, and reevaluation of the findings, observations, conclusions, and recommendations expressed in the report. This report has been prepared on behalf of and for the exclusive use of Pacific Properties Group, and is subject to and issued in connection with the agreement and the provisions thereof.

TABLE 2
ASBESTOS SURVEY DATA
PACIFIC PROPERTIES GROUP
PROPOSED BUILDING DEMOLITION

Note: Some samples include analysis of multiple layers

Sample Number	Sample Description	Location	Asbestos % Type*	Friable vs. Non-Friable	Comments
1022-1	Blue paint	Exterior, South side	ND	Friable	
1022-2	Red paint	Exterior, South side	ND	Friable	
1022-3	White paint	Exterior, South side	ND	Friable	
1022-4	White stucco topcoat	Exterior, South side	ND	Non-Friable	
1022-5	Grey mortar	Exterior, South side	ND	Non-Friable	
1022-6	White window putty	Exterior, South side	ND	Non-Friable	
1022-7	White window putty	Exterior, South side	ND	Non-Friable	
1022-8	White stucco skim coat w/ grey mortar	Exterior, North side	ND	Non-Friable	
1022-9	Grey concrete	Exterior, North side	ND	Non-Friable	
1022-10	White stucco topcoat	Exterior, South side	ND	Non-Friable	
1022-11	Grey mortar	Exterior, South side	ND	Non-Friable	
1022-12	Black felt	Front Entrance, roof overhang, under shingles	ND	Non-Friable	
1022-13	Black felt	Front Entrance, roof overhang, under shingles	ND	Non-Friable	
1022-14	**Black Jack**	**Front Entrance, roof overhang, under shingles**	**3% CH**	**Non-Friable**	**Under and next to wood shake roofing**
1022-15	Tan & white linoleum w/ backing	1st floor, North bathroom, floor	ND	Friable	
“”	Yellow mastic	“”	ND	Friable	
1022-16	Tan & white linoleum w/ backing	1st floor, North bathroom, floor	ND	Friable	

ND = Non-Detect for asbestos
* Asbestos types: AM=Amosite; AC=Actinolite; AN=Anthophyllite; CH=Chrysotile; CR=Crocidolite; TR=Tremolite

TABLE 2
ASBESTOS SURVEY DATA
PACIFIC PROPERTIES GROUP
PROPOSED BUILDING DEMOLITION

Note: Some samples include analysis of multiple layers

Sample Number	Sample Description	Location	Asbestos % Type*	Friable vs. Non-Friable	Comments
1022-17	White sheetrock	1st floor, North bathroom, wall	ND	Non-Friable	
“”	**Joint compound**	**“”**	**3% CH**	**Non-Friable**	
1022-18	White sheetrock	1st floor, North bathroom wall	ND	Non-Friable	
“”	**Joint compound**	**“”**	**3% CH**	**Non-Friable**	
1022-19	White sheetrock	1st floor, NE room	ND	Non-Friable	
“”	**Joint compound**	**“”**	**3% CH**	**Non-Friable**	
1022-20	Brown baseboard mastic	1st floor, main room, wall	ND	Non-Friable	
1022-21	White flooring compound	1st floor, main room, floor	ND	Non-Friable	
“”	**Black mastic**	**“”**	**2% CH**	**Non-Friable**	
1022-22	Grey concrete	1st floor, main room, floor	ND	Non-Friable	
1022-23	Brown 4’x8’ ceiling panels	1st floor, main room, ceiling	ND	Friable	
1022-24	Green 12”x12” VFT w/ white streaks	1st floor, SE bathroom, floor	ND	Non-Friable	
“"	**Black mastic**	**“”**	**5% CH**	**Non-Friable**	
1022-25	Green 12”x12” VFT w/ white streaks	1st floor, SE bathroom, floor	ND	Non-Friable	
“”	**Black mastic**	**“”**	**5% CH**	Non-Friable	
1022-26	**Grey cementitious wall board**	**1st floor, SE bathroom, wall**	**30% CH**	**Non-Friable**	
1022-27	**Grey cementitious wall board**	**1st floor, SE bathroom, wall**	**30% CH**	**Non-Friable**	

ND = Non-Detect for asbestos
* Asbestos types: AM=Amosite; AC=Actinolite; AN=Anthophyllite; CH=Chrysotile; CR=Crocidolite; TR=Tremolite

TABLE 2
ASBESTOS SURVEY DATA
PACIFIC PROPERTIES GROUP
PROPOSED BUILDING DEMOLITION

Note: Some samples include analysis of multiple layers

Sample Number	Sample Description	Location	Asbestos % Type*	Friable vs. Non-Friable	Comments
1022-28	**White transite**	**2nd floor, 8" heater flue**	**20% CH 15% CR**	**Non-Friable**	
1022-29	Black tar paper	2nd floor, inner wall	ND	Non-Friable	
1022-30	Tan concrete	1st floor, garage, floor	ND	Non-Friable	
1022-31	White sheetrock	1st floor, 2nd SE bathroom	ND	Non-Friable	
""	**Joint compound**	**""**	**2% CH**	**Non-Friable**	
1022-32	Off white window putty	1st floor, West wall	ND	Non-Friable	
1022-33	Off white window putty	1st floor, West wall	ND	Non-Friable	
1022-34	Black rolled roof and tar	Roof, North side	ND	Non-Friable	
1022-35	Black rolled roof and tar	Roof, North side	ND	Non-Friable	
1022-36	Black rolled roof and tar	Roof, South side	ND	Non-Friable	
1022-37	**Black Jack**	**Roof, between grey and black rolled roof /tar**	**7% CH**	**Non-Friable**	
1022-38	Grey rolled roof and tar	Roof, East side	ND	Non-Friable	
1022-39	Grey rolled roof and tar	Roof, East side	ND	Non-Friable	

ND = Non-Detect for asbestos
* Asbestos types: AM=Amosite; AC=Actinolite; AN=Anthophyllite; CH=Chrysotile; CR=Crocidolite; TR=Tremolite

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Appendix F Geotechnical Study (2004)

October 1, 2004

BUSCH GEOTECHNICAL CONSULTANTS

Randy Cook
Cook Realty and Investment
P. O. B. 6015
Eureka, CA 95501

Site-Specific Geotechnical Report, Proposed Commercial Development, 2616 Broadway, Eureka, California

EXECUTIVE SUMMARY

Subsurface investigations at the proposed development site using cone penetrometer testing (CPT) revealed that weak, geologically young (latest Holocene), low density bay muds underlie the two western proposed retail stores. Competent mid to late Pleistocene sands and gravels (Hookton Formation sediments) underlie the eastern proposed retail store. The entire site is covered with a veneer of fill that, from east to west, ranges from a few inches to ~5 feet thick. Along the western edge of the property, the bay muds extend to a depth of ~30 ft below the existing surface. The muds rest on a buried west-sloping surface eroded into the Hookton Formation. Because of an ongoing toxic investigation and the presence of known hydrocarbon contaminates at the site, the owner's preferred development plan is to minimize excavations. The owner proposes to support the two western retail stores on a deep foundation system consisting of driven piles extending through the bay muds and any underlying potentially liquefiable sands into the Hookton Formation. The eastern retail store is situated east of the bay muds so is located entirely over mostly medium dense Hookton Formation sediments. Most likely, that store can rest on a conventional foundation system by following standard soils engineering precautions.

P.O. BOX 222 • ARCATA, CA 95518-0222 • 707-822-7300 • FAX 707-822-9911
Geotechnical and Geologic Studies for Land Development and Resource Management
Please visit our website at buschgeotech.com

In light of the owner's desire to utilize a deep foundation system that extends through all potentially liquefiable material, we did not do a quantitative evaluation of the liquefaction potential of the site. Instead, we made a qualitative assessment utilizing the CPT logs in light of laboratory data and quantitative calculations from nearby sites with an identical geologic setting. Our analysis indicates that the bay muds and minor interbedded coarse and silt and sand lenses respectively have a MODERATE and HIGH liquefaction potential and the Hookton Fm. sediments have a LOW liquefaction potential. We believe the overall liquefaction-induced ground failure potential at the site is LOW, but that the long-term differential settlement potential of areas underlain by bay muds is HIGH. Bearing foundations within the Hookton Formation deposits will reduce the risk of damage due to differential settlements to LOW to NEGLIGIBLE.

INTRODUCTION

Contract information and Purpose of the Report

We are providing this report under the terms of BGC contract #04-048 dated August 4, 2004. **The purpose of the report is to characterize the engineering geology of the site, present site-specific foundation soils information and geotechnical recommendations to support the design and construction of three retail stores, and provide an analysis of the geohazards at the site.**

The report explains our scope of work and methods; presents an abbreviated discussion of the tectonic setting, site geology, and regional seismic hazard; discusses site-specific foundation soils characteristics, hazards, and risks at the proposed development site; provides our database (Cone Penetrometer Testing logs and references); and presents geotechnical recommendations. In addition to text, the report contains three figures: a site location map (Figure 1); a survey-controlled site map that shows the locations our CPT exploration holes, the existing buildings, the proposed buildings, and the expected depth to foundation bearing soils within the building areas (Figure 2); and a regional tectonic map showing faults and folds in Humboldt County (Figure 3).

Figure 1. Nested maps of the site showing its location in Humboldt County. Base map is a portion of the U.S.G.S. 7.5' Eureka quadrangle map. Various scales.

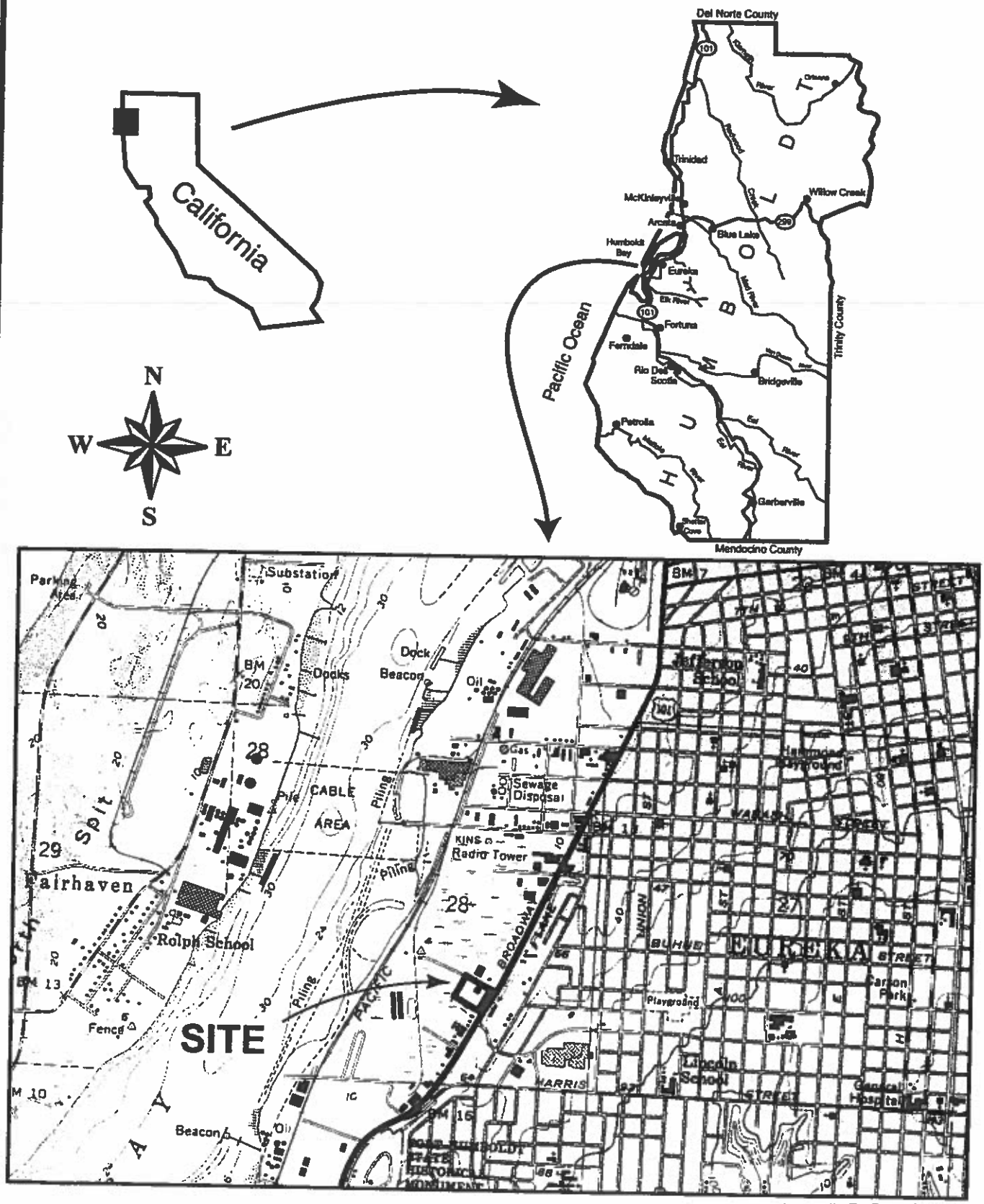
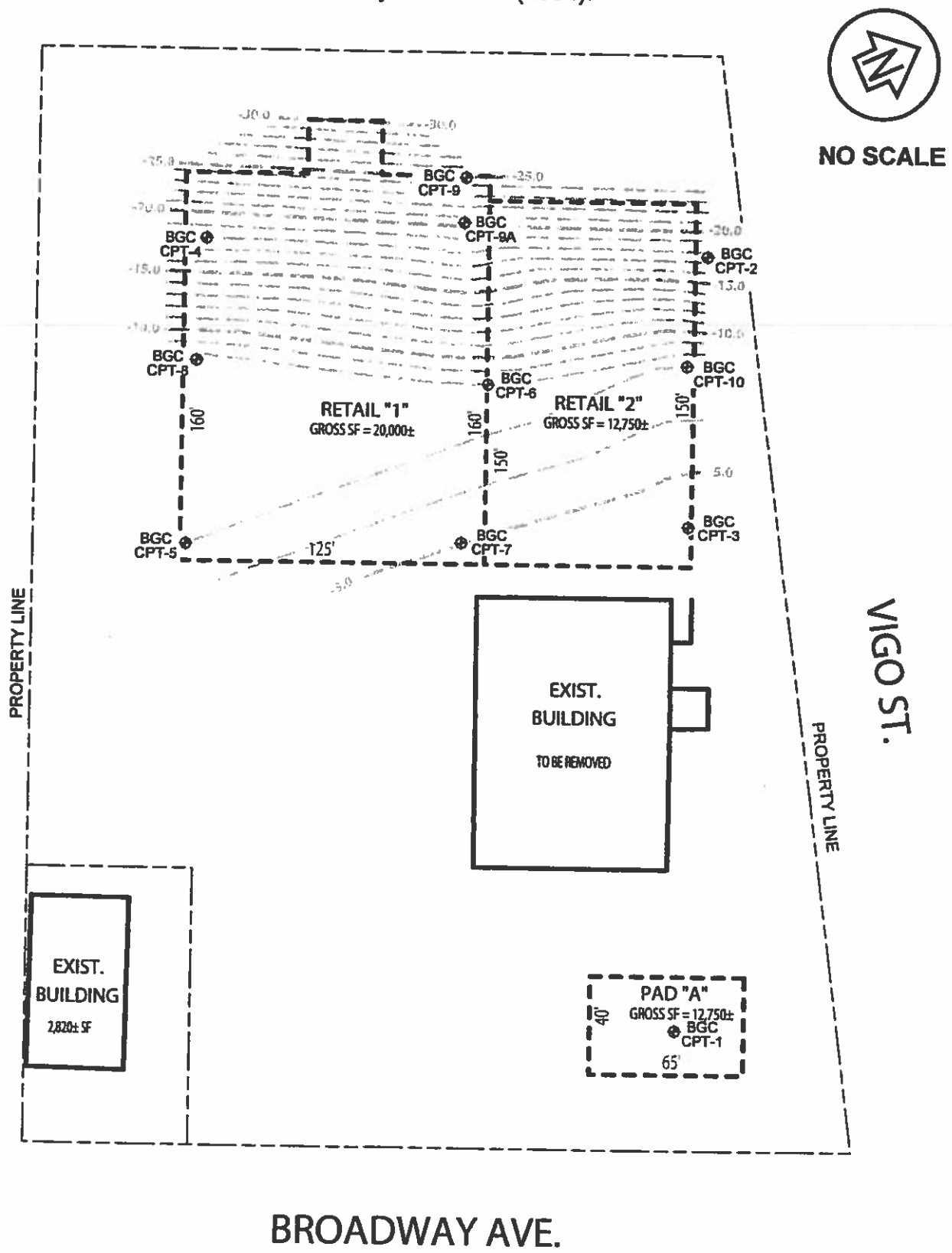


Figure 2. Map showing the location of CPT holes, existing buildings, property lines, purposed retail stores, and the approximate depth to the bottom of the "bay mud" sediments. Base map provided by PACLAND (2004).



Site Description

The "site" is a ~3-acre trapezoidal parcel located at 2616 Broadway on the southwestern corner of the intersection of Broadway (U.S. Highway 101) and Vigo Street in Eureka, California. This area is in section 28, T5N, R1W, HBM, of the USGS Eureka 7.5-minute quadrangle map (see Figure 1).

The proposal is to remove the existing retail store (Johnson's Auto Repair and U-Haul Dealer [formerly Al's Truck Stop]) located near the center of the property and construct two large retail stores near the back (western) edge of the property and one small retail store near the front (northeastern) corner of the property (see Figure 2). Because of an ongoing toxics investigation and the known presence of hydrocarbon contaminates at the site, the preferred development plan is to minimize excavations of the site soils (Cook, personal communication, 2004). The plan is to support the western two proposed retail stores on piers driven to refusal. Because of favorable subsurface conditions in the eastern part of the site, the eastern store does not require a deep foundation system.

When we did our work the site contained numerous vehicles, trailers, and construction equipment. Our placement of the CPT holes was in part dictated by access considerations.

Scope-of-Work and Investigation Methods

Our scope of work for the project included:

- Discussing the project with the owners and their agents;
- Reviewing pertinent professional literature and maps;
- Inspecting the geomorphology of the site and vicinity;
- Determining the general stratigraphy of the site using cone penetrometer testing (CPT) techniques (ASTM D 3441);
- Summarizing regional geologic and site-specific hazards and risks;
- Providing this engineering geology report; and
- Providing verbal updates and consultation during our work.

In addition to providing site-specific soils information, the report presents the pertinent information required by the 1997 edition of the Uniform Building Code (ICBO, 1997) (see **RECOMMENDATIONS**).

Due to the ongoing environmental investigations at the site and the known presence of contamination within the soil (Clearwater, 1998; Blue Rock, 2004), excavating the site with a backhoe or hand auger to collect soil samples was excluded from our scope of work.

We use standard practices and professional standards of care for all of our studies. We also follow the recommendations provided by Southern California Earthquake Center (SCEC) for the implementation of CDMG Special Publication 117 (CDMG, 1997; SCEC, 2002).

On August 16, 2004, BGC Staff Engineering Geologist Bryan Dussell met with owner Randall Cook to locate the corners of the proposed retail stores and identify sites for cone penetrometer testing (CPT). Later that day, a CPT rig subcontracted from Gregg Drilling and Testing of Martinez, CA, arrived to begin testing. The testing continued for the rest of the day and into the next. Bryan remained on site to supervise the testing for the entire period. BGC Principal Bob Busch visited the site several times during the testing process to review the preliminary results.

Cone penetrometer logs are prepared at drilling using standard computer programs that compare tip resistance (Qc) to sleeve friction (Fs) in light of the dynamic pore water pressure (Ut). Derived data include: the ratio between Fs and Qc (Rf); equivalent SPT blow counts (N_{60}); normalized equivalent SPT blow counts ($N1_{60}$); normalized blow counts corrected for clean sand equivalent ($N1_{60cs}$); undrained shear strength (Su); CRR (cyclic resistance ratio); Dr (relative density); peak secant friction angle (ϕ'); OCR (over consolidation ratio); and SBT (soil behavior type) (per Robertson, 1990). The contained CPT logs do not present all of these data streams. The calculation of equivalent $N1_{60}$ values is based on Robertson et al. (1983). Appendix IA1 presents the CPT logs, a methods report, data tables, references to methods, and explanatory figures, all provided by Gregg Drilling and Testing. See Robertson (1998) for an overview. Appendix IB is the Unified Soils Classification System (USCS) terminology.

All text, figures, and logs record depths in feet below the existing ground surface.

On August 25, Bryan returned to the site with Staff Geologist Beau Whitney to survey the locations of the CPT holes. They used a Nikon NPL-352 total station with an internal data recorder to survey the probe locations and selected fixed points that are shown on the project base map that was provided to us by the developer (e.g., building corners and groundwater monitoring wells). In the office we superimposed our data onto the base map (PACLAND, 2004) to generate our Figure 2.

ENGINEERING GEOLOGY

Encapsulation of the Regional Tectonic Setting

The site is located within the onland portion of the Cascadia subduction zone (Csz) fold and thrust belt, a tectonically active area that extends offshore from British Columbia south to Humboldt County where it comes onshore (see Figure 3). Numerous youthful thrust faults, uplifted marine terraces, and folds (anticlines and synclines) attest to the rapid shallow crustal deformation that is occurring in the area.

The axis of the Eureka anticline trends northwest, passing roughly through the center of Eureka, north of the site. Terraces on the northeastern side of Eureka dip gently to the northeast whereas the terraces on the southwestern side of town dip gently to the southwest. As mapped by Carver and Burke (1992), this site is <2 km southwest of the axis of the anticline. Therefore, the Pleistocene sediments beneath the site have a shallow dip to the southwest.

Faults

Numerous structures are capable of generating strong ground motion at the site (see Figure 3). Of the active and potentially active regional structures, the Cascadia subduction zone (Csz) and the Little Salmon fault zone (LSf) are of greatest concern.

Work by geoscientists has demonstrated that great (M_w 8.0 to 9.0) earthquakes have occurred in the coastal Pacific Northwest in the recent past, and that the potential for similar earthquakes to occur is HIGH within the next 200 years. These

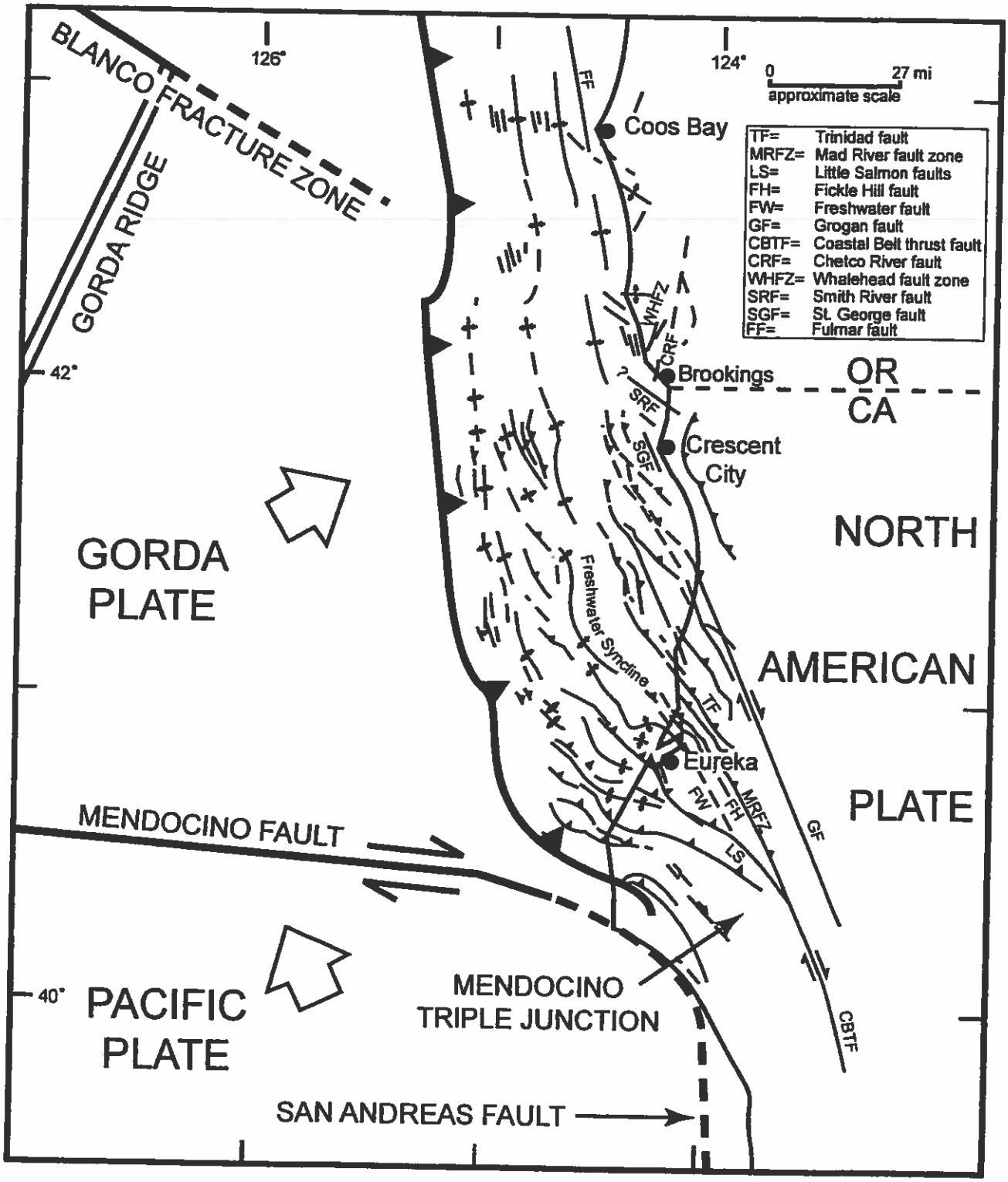
earthquakes occur along the dipping interface between the oceanic Gorda plate and the continental North America plate. Plate tectonic processes are causing the Gorda plate to subduct (dive down) beneath the North America plate, so it underlies North America, beginning at the base of the continental slope, which is offshore. This tectonic interface, which is called the Cascadia subduction zone or Csz, last ruptured on January 26, 1700 (Satake et al., 1996). Based on mapping by McLaughlin et al. (2000), the trace (the map position of the intersection of the fault plane with the ground surface) of the megathrust of the Csz lies about 54 km (34 mi) west of the site. The fault passes beneath the site at about 10 km (6.5 mi) in depth (assuming a 11° dip on the fault plane, per Toppozada et al., 1995).

Two recent works respectively suggest that the recurrence interval of great Csz earthquakes is 480-535 yrs and 570-590 yrs (Kelsey et al., 2002; Witter et al., 2003). Previously it was cited as ~300 to 500+ years (Clarke and Carver, 1992). A Csz event would cause a regional catastrophe in the Pacific Northwest. In 1995, the probability of such an event was thought to be ~10% to 20% within the next 50 years (Geomatrix, 1995). Considering the new recurrence interval data, the probability is likely to be on the low end of the range.

Petersen et al. (1996) indicate that each year the probability is 1 chance in 475 (or 10% in 50 years) that a peak horizontal ground acceleration of about 0.76 g will occur in the site vicinity. That is, this acceleration is the predicted acceleration from the design basis earthquake (DBE). The spectral acceleration (5% damped) for the 0.2 sec and 0.3 sec period of the DBE is likely to approach 2 g (estimate, 1.77 and 1.72 g, respectively), and for a 1.0-second period, 0.69 g (based on a Zip Code of 95502; USGS, 2004).

The LSf is a Type A fault (CDMG, 1998) capable of generating a maximum moment magnitude of M_{max} = 7.0 M_w (Petersen et al., 1996). It passes north of Fortuna, through South Eureka, and out to sea. At its closest, the trace is about 6.5 km (4 mi) southwest of the site (based on mapping by McLaughlin et al., 2000). Assuming a 30° dip of the fault plane to the northeast, the site is located about 3.5 km (2.3 mi) above the fault plane. This location falls within the "shaded zone" of the onshore trace of the LSf in CDMG, 1998 (plate A-5), the companion publication to the Uniform Building Code (UBC) (ICBO, 1997).

Figure 3. Tectonic Map of Northern California and Southern Oregon showing plate geometry and regionally significant Quaternary faults (modified from USGS, 1992, Oregon Department of Geology and Mineral Industries1986, and Kelsey et al 1998). Hollow arrows indicate plate motion relative to a fixed North American plate.



Design Acceleration

As explained previously, the project design acceleration is the horizontal rock acceleration with a 10% probability of being exceeded in a 50-year period. This PGA (probable ground acceleration) is 0.76 (Peterson et al., 1996, 1999). The evaluation of the potential for amplification to occur due to subsurface conditions was out of our scope of work, as was determining a seismic spectra. However, it seems certain that amplification is likely in the western part of the site because of the presence of deep, soft, bay muds (discussion follows).

Geomorphic and Geologic Setting

The site is located over a transitional point between a low-gradient (<5%), westward sloping toeslope and a tidal marsh that borders the eastern edge of Humboldt Bay (the "PALCO Marsh"). Through the years, development in the site vicinity has resulted in partial filling of the landward edge of the marsh. The two western proposed retail stores will be built over reclaimed marshland. Immediately east of the site, bordering the eastern side of Broadway (U.S. Highway 101), a precipitous (>100%) bluff rises above the site. The bluff exposes middle to late Pleistocene Hookton Formation sediments (Ristau, 1979; McLaughlin et al., 2000). The Hookton Formation is a weakly lithified alluvial deposit primarily composed of poorly consolidated, well sorted, fine and medium sands and gravelly sands. This formation underlies the site at variable depth, deepening to the west. It is the target foundation-bearing material for all of the proposed retail stores.

The site setting has formed during the past ~10,000 years in response to the rise of sea level following the end of the last Ice Age. As sea level rose, erosion progressed eastward. Waves ate into the uplifted Hookton Formation sediments, creating an abrasion platform (eroded surface) that dips gently to the west. Continued sea level rise buried the abrasion platform beneath interbeds of sandy to gravelly alluvium. Then fine-grained sands deposited on a low-energy beach or in a dune field covered the alluvium. Continued sea level rise and the formation of Humboldt Bay allowed silts and bay muds to be deposited to the base of the coastal bluff. The construction of U.S. 101 steepened the bluff face, and infilling reclaimed the landward edge of the marsh (BGC, 1989; 1990; 1991a; 1991b).

Sediment Types, Characteristics, and Distribution

Due to the location of the site and the industrial history of the area, much of the site vicinity has been modified. It is apparent that large volumes of soil have been moved throughout the area to facilitate the development of Eureka.

Although CPT data provide extensive information on the physical properties of the site soils, to fully understand the sedimentology and stratigraphy (soil layer pattern) of a site, it is necessary to physically observe the various soil units. Soil characteristics such as color, mineralogy, texture, grain roundness, cementation history, and weathering profile, plus unit traits such as geometry, typically are important factors to consider when evaluating a site. Because it was inadvisable to use a backhoe, drill rig, or CPT sampler to directly observe the subsoils (due to the presence of contaminants), we have described the site based exclusively on the CPT results and our general understanding of the geologic history of the site vicinity.

In 1990 and 1991 we investigated two sites in a similar geomorphic setting less than a block north of Vigo Street (BGC, 1990; 1991a; 1991b). For those studies, we used a drill rig and a backhoe to investigate and visually describe the subsoil. We also collected representative soil samples for laboratory analysis. From the surface down, the stratigraphy of those sites consisted of variable amounts of fill over ~5 ft of loose, poorly graded sand (USCS, SP) typical of a low-energy beach or dune setting. The loose sand was underlain by ~15 ft of loose to medium dense interbedded sands and gravels that rested directly on top of an abrasion platform cut into the Hookton Formation. The interbedded sands and gravels were consistent with a high energy fluvial or nearshore environment such as a beach or river channel. In that study, we concluded that the loose sands above the abrasion platform and ~5 feet of the weathered Hookton Formation sediments below the platform respectively had a HIGH to MODERATE liquefaction potential. Below that, in the unweathered Hookton Formation sediments, liquefaction was unlikely (a discussion of liquefaction follows). A narrow strip of marsh sediments was present only along the western edge of those sites, and development was not proposed on those sediments.

The bay marsh sediments around Humboldt Bay are primarily slightly clayey, slightly sandy (fine) silts (USCS, ML), with thin lenses and laminae of other sediments including poorly graded, loose, fine sands (SP) and silty fine sands (SM), clayey silts

(ML-CL), silty clays (CL), organic silts (OH), and peat layers (PT). Some of the bay muds are characterized as "sensitive fines" on the SBT (Soil Behavior Type) column of the CPT logs (others are characterized as silty clays, clayey silts, silts, and sandy silts). Prior studies around Humboldt Bay indicate that loose sandy lenses within the marsh sediments have a HIGH liquefaction potential (BGC, 1994; 1996; 2000).

At this site, the CPT logs (excluding CPT-1 and CPT-3) record a consistent stratigraphy. To simplify and generalize, from the surface down, the logs show a medium dense to dense (N_160 values >30), medium to coarse grained soils overlying soft to medium stiff (N_160 values 5-<20), fine grained soils that in turn overlie another medium dense to dense (N_160 values >30) coarse grained soil. **This stratigraphy undoubtedly represents a dense fill overlying soft bay muds overlying medium dense Hookton Formation sediments.** Without direct observation of the soil units, we can not preclude the possibility that the uppermost sands and gravels immediately below the bay muds are part of the high-energy fluvial deposits found above the abrasion platform to the north (BGC, 1990; 1991a; 1991b), in which case, the Hookton Formation sediments are located at a greater, unknown depth below the site. **Regardless of the mode of genesis of the sediments immediately underlying the bay muds, all load-bearing foundation elements for the two proposed retail stores in the western part of the property must extend through the soft bay muds and bear within the underlying competent sands and gravel (REC 7).**

The logs for CPT-1 and CPT-3 are different in that they record no soft, fine grained sediments. Either bay muds were never deposits at these locations or the muds were stripped from the locations and were replaced with fill. At the nearby sites we studied north of this site (ibid.), the part of the parcels adjacent to Broadway had been partially stripped. The resultant "cut" surface subsequently was covered with a thin veneer of fill.

According to the draft environmental report for the site (Clearwater, 1998), the fill materials thicken from ~6 inches along Broadway to ~5 feet west of the existing building. Although we did not collect samples of the fill soils for this study (due to the ongoing environmental investigation), similar bay edge sites in the Eureka area are underlain by poor quality fills (e.g., sawdust, redwood bark, construction debris, etc.). At location CPT-9, the probe tip broke off on a large piece of concrete at a depth of 4.4 ft. **In conclusion, large pieces of concrete and other hard debris are likely present in the fills on the property.**

Liquefaction and Seismogenic Ground Failure Potential

Liquefaction is the temporary partial or total loss of shear strength of saturated cohesionless soil in response to cyclic shear stress. The loss of strength is caused by an increase in pore water pressures due to the cyclic shear. Although vibrations can trigger liquefaction, earthquake shaking is the typical triggering force. Saturated, geologically young (late Holocene), poorly consolidated, cohesionless, fine-grained sediments are particularly susceptible to liquefaction (CEE, 1985). As mapped by Toppozada et al. (1995), the site is in an area with a "high" liquefaction potential.

Typically, on sites such as this, we use a semi-empirical approach to address the liquefaction potential of the subsoils. The results of the analysis determine which (if any) of the subsoils are likely to liquefy during a magnitude 7.5 earthquake or larger. The project engineers then use the data to develop foundation designs. However, at this site, because the project developer already has decided to use a deep foundation system (piles driven into the Hookton Formation sediments), determining the liquefaction and liquefaction-induced ground failure potentials of the site becomes unnecessary. In California, Pleistocene deposits (such as the Hookton Formation) have not been known to liquefy in modern times (Youd, 1994; Dwyer and Borchardt, 1994). This conclusion is supported by the results of several nearby studies (e.g., BGC, 1990; 1991a; 1991b; 2000).

Based on our interpretation of the CPT logs and the results of quantitative liquefaction potential studies completed for nearby sites (ibid.), **the liquefaction potential of the sands and coarse silts in the bay mud sequence is MODERATE to HIGH and of the target foundation-bearing sands, silty sands, and gravelly sands of the unweathered Hookton Formation is LOW.** The liquefiable soils are located mainly in the western half of the property, beneath the two large retail stores.

The most likely type of liquefaction-induced ground failure at the site is the loss of bearing capacity (cyclic softening liquefaction). Lateral spreading (strain softening liquefaction) is unlikely because there is little relief in the area.

A reduction of the end-bearing capacity and skin-friction component of the total pile bearing capacity could occur during seismic shaking of long duration and strong intensity if the piles terminate in sediments with a normalized blow count below about 25. Also, substantial drag-down forces could be generated by densifying sediments.

Overview of Geologic Hazards and Risks

We identified six geologic hazards at this site. The hazard and associated risks are discussed below:

1. Seismic shaking;
2. Settlement (including differential settlement);
3. Coseismic settlement;
4. Fault rupture;
5. Liquefaction-induced ground failure; and
6. Tsunami and seiche flooding.

1. Because the site is located within a tectonically active region with multiple seismic sources, the risk is HIGH that a strong earthquake with damaging accelerations will occur within the next 50 years. See **Design Basis Accelerations**, preceding.

2. The time-dependent settlement of cohesionless soils is a natural, on-going process. The magnitude of this type of settlement depends upon the initial relative density of the soil and upon the occurrence of events such as seismic and cultural (highway, railway, machinery) vibrations, repetitive loads, groundwater table fluctuations, wetting and drying cycles, and the breakdown of the constituent grains by chemical and physical weathering.

Theoretically, settlement of about 1% (CEE, 1985) to 6% (in sands; Boirum and Gifford, 1986) of the total thickness of Holocene (bay fill) sediments is possible due to the densification of the loose materials. Using 30 feet as the estimated maximum thickness of the bay mud sequence and the overlying poor quality fill soils combined, up to about 22 inches of settlement due solely to densification is possible along the western edge of the development site <u>over the long term</u>. In contrast, less than a half-inch of settlement (if any) is possible along the eastern edge of the site.

3. Coseismic settlement is the instantaneous subsidence of the land in response to an earthquake. During past Cascadia subduction zone events, large areas of Washington, Oregon, and northern California have subsided instantaneously, causing inundation of low-lying coastal areas (Atwater, 1987; Darienzo, 1991; Grant and McLaren, 1987; Vick, 1988; Valentine, 1992). If a Csz event were to occur in the Humboldt Bay region, the site vicinity could experience coseismic subsidence of up to

about 2 m (>6 ft) (based on Vick, 1988; Valentine, 1992). One immediate consequence would be flooding due to the relative rise of sea level.

In conclusion, in addition to the 1%-6% settlement of the Holocene sediments (bay mud and poor quality fill soils) possible due to densification (see item 2), up to about an additional 5 feet of settlement is possible due to the crustal down-warping that is likely to accompany the next Cascadia subduction zone event. The total settlement in the western part of the site thus could be about 7 feet. The risk of coseismic settlement of this magnitude is roughly the same as the risk of a Csz event. Currently this is estimated as about 10-20% over the next 50 years.

4. There are no lineaments or known faults that align directly with the site, therefore, the risk of fault rupture is NEGLIGIBLE.

5. As addressed previously, any saturated loose cohesionless sediments present within the bay muds, on top of the abrasion platform, and within the weathering profile in the Hookton Formation soils have a MODERATE to HIGH liquefaction potential. The unweathered Hookton Formation sediments have a LOW liquefaction potential.

During a liquefaction event, the loss of bearing capacity is the type of failure most likely to occur. A flow failure or lateral spread is unlikely because of the absence of relief in the area.

6. A tsunami is a seismically generated sea wave. Humboldt Bay has not been affected significantly by a tsunami during historical times, but geologic studies in and by the bay have identified buried sand deposits interpretable as deposits left by paleo-tsunamis (Vick, 1988; Valentine, 1992; Leroy, 1999; Patton, 2004). On the other hand, Crescent City has experienced at least six tsunamis in the last 42 years (1946, 1952, 1957, 1960, 1964, and 1992; Kilbourne and Mualchin, 1981; Oppenheimer et al., 1993). There, the greatest tsunami rise, about 13 feet, was associated with the Good Friday 1964 Alaskan earthquake. Humboldt Bay experienced about a 1.0-m rise during two of these events (1946, 1964).

Although Kilbourne et al. (1980) suggest that locally generated (near source) tsunamis present less of a hazard to the Humboldt Bay area than distant source tsunamis, increased recognition of the seismic capability of the Cascadia subduction zone (Heaton and Kanamori, 1984; Clarke and Carver, 1992) suggests this may not

be true. Empirical data from other subduction zones (Heaton and Hartzell, 1986) suggests that a 8.5 M Csz earthquake along the northern California coast could generate a near-source tsunami with a run- up of over 10 m (33 ft) in low-lying coastal areas. Evidence for paleo-tsunami run-up heights of 6+ meters (20 ft) already has been discovered in mid coastal Oregon (Gallaway et al., 1992). The 25 April 1992 M7.0 Cape Mendocino earthquake, interpreted as a Csz earthquake (Oppenheimer et al., 1993), generated a tsunami that arrived at Humboldt Bay within 40 minutes of the earthquake, with a height of about 3 ft (Gonzales and Bernard, 1992). Other things held equal, a larger magnitude earthquake could be expected to generate a larger tsunami, especially if that earthquake were to trigger a large undersea landslide.

Because we do not know the limits and heights of any levees that may be present in this part of Eureka, the risk of inundation by a distant source tsunami, and by a near-source tsunami generated by a causative mechanism other than rupture of the Csz, is UNCERTAIN. The risk of inundation by a near-source tsunami generated by a Csz event is HIGH, regardless of the presence and heights of possible levees. The risk of a Csz event presumably is <10% over the next 50 years.

Summary of Conclusions

In summary, the target foundation-bearing soil unit, the Pleistocene Hookton Formation, is primarily composed of medium dense to dense sands, gravelly sands, and gravels. $N1_{60}$ values, as determined from CPT probe data, typically exceed 30 and range to ~ 70. These competent bearing soils are present beneath the bay mud sequence, any other alluvial, dune, or beach sediments the muds rest on, and a zone of weathered Hookton Fm. soils.

Using a design basis acceleration of 0.76 g and a project design life of 50 years, the risk is LOW that the bearing sands and gravels will liquefy and cause either a substantial loss of bearing capacity or another type of liquefaction-induced mode of ground failure of the site. The risk is MODERATE to HIGH that the shaking will cause the liquefaction or partial liquefaction of sands and coarse silts within the uppermost weathered Hookton Formation sediments and any overlying sandy soils. Liquefaction is likely to result in the loss of bearing capacity in near-surface soils. Our foundation and paving recommendations address this issue.

RECOMMENDATIONS

Discussion

Because the two western stores will be built over a westward-thickening sequence of soft bay muds capped by poor quality fill soils, and the eastern retail store will be built over competent soils covered with a thin veneer of fill, we present our recommendations in three sets. The first set, titled "General Recommendations," applies to all three stores. The next two sets, titled "Retail Stores 1 and 2" and "Pad A" address those stores directly. For convenience, the recommendation numbering sequence continues through the different groups (that is, we do not start each group with "REC 1"). Many of our recommendations regarding design parameters for the deep piles stems from a recent investigation that we completed for a proposed large retail building in a similar setting (BGC, 2000). For that report, we collected numerous samples of the bay muds and underlying Hookton Formation soils for laboratory analysis (tests included particle size analysis, direct shear, and Atterberg limits tests).

General Recommendations

REC 1. The site is located in UBC Seismic Zone 4. Per UBC, 1997, Table 16-I (or the equivalent table in a more recent UBC edition), use a Seismic Zone Factor **Z = 0.4**.

REC 2. In the "Faults" section of this report we calculated that the site is ~ 6.5 km from the trace of the Little Salmon fault, and that the fault plane passes below the site at a depth of ~3.5 km. Although these data are accurate based on the current model of the transition between the onshore and offshore segments of the Little Salmon fault, the State has mapped a shaded "near-source zone" for the fault. This near-source zone takes into consideration the same variables we used, but assumes a site is "0" km from the fault when the fault passes beneath the site at 10 km or less depth. The shaded near-source zone also includes an additional : d by the State (CDMG, 1998), the site is within the shaded n that it is located within 2 km of a Type A fault. The Litt e the controlling fault for the site. Use the following s:

These are values for S_E type NOT S_D

Acceleration, **Na = 1.5** (Table 16-S),
Velocity, **Nv = 2.0** (Table 16-T),
Seismic coefficients, $\mathbf{C_a = 0.36N_a}$ and $\mathbf{C_v = 0.96N_v}$ (Tables 16-Q and 16-R).

REC 3. The CPT data indicate that the soil profile varies dramatically across the site. The west [illegible] of the site is underlain by up to ~30 ft of soft "bay muds" that have $N1_{60}$ valu[illegible] astern half is underlain by Hookton Fm. sediments with $N1_{60}$ valu[illegible] e UBC Table 16 addresses average soil properties within the [illegible] e site and the retail stores over the bay mud will be supporte[illegible] the Hookton Fm. sediments, design for Soil Profile Type S_D. ← NOT CONSISTENT

REC 4. [illegible] r load-bearing applications requiring fills. Our standard, "boiler pl[illegible] n is: "Use only a controlled density flowable fill (CDFF) (for example, "2- or 3-bag sand slurry," [not 1-bag slurry]) or an engineered fill for structural (load-bearing) applications. An engineered fill is a well-graded nonplastic or low plasticity granular material compacted to specifications. If it will have a free face, it should have about 35% binder (silt + clay) by volume. Otherwise, it can be free draining. It should contain no organics, no trash, and no clasts over 6" in diameter (3" is preferable).

At this site, <u>where the fill will rest on Hookton sediments</u>, the liquid limit of the binder should be <35, its plasticity index, <16, as determined by plasticity testing, and the fill should be compacted to 90% (or greater) of its maximum dry density (MDD) as determined by "modified proctor curve" lab testing (ASTM 1557) and verified by field compaction testing (ASTM 1556 or 2922). Ideally, the engineered fill should rest on undisturbed subsoils, <u>not</u> topsoils or existing uncontrolled fill. However, at this site it may be not be cost effective to remove the unsuitable soils in preparation for the placement of fill soils due to existing soil contamination and disposal issues. <u>Where the structural fill will rest on existing predominately nonorganic fills or "bay muds</u>," the fill can be compacted to an estimated 80% of its MDD, but a risk of settlement will remain. Suitable engineered fills include "river run" sand and gravel and crushed aggregate baserock."

NOTE: Structural fills placed above bay deposits in excess of a few feet thick probably will be damaged during a strong earthquake.

REC 5. If utilities trenches cannot be kept entirely within a new capping fill to be placed per **REC 6**, excavate utility trenches through all organic cultural fills to

underlying nonorganic fills, bay muds, or Hookton Fm. soils. Replace these undesirable materials as necessary to design grade of the utilities with structural backfill per **REC 4**, lay the utilities, and complete backfilling with structural fill.

REC 6. For areas to be paved. Because the existing fill soils at the site are unlikely to be removed because of potential contaminates, we recommend adding a capping layer of free-draining granular fill to the site to raise the grade. Prepare a subgrade by stripping the existing asphaltic and concrete pavement from driveways and parking areas and removing the existing foundations and other cultural debris, as possible. Fill any shallow excavations with a free-draining granular fill compacted to 90% or better of its MDD (per **REC 4**). Roll the surface with a steam roller or vibratory roller to smooth it. Place either an appropriate geofabric or a biaxial geogrid (such as the BX1200 product manufactured by Tensar®) on the surface (Contech, undated). (Geogrid is the preferred alternative.) Cover the geogrid with a clean granular fill compacted to 90% of its MDD (per **REC 4**).

The intent of this recommendation is twofold. First, adding fill to raise the grade will minimize the chance that workers digging new foundations and utilities trenches will have to dig into potentially contaminated soils. Second, it will reduce the risk that the driveways, walks, and parking areas will be damaged by differential settlements due to the consolidation of unsuitable materials in the subsurface.

Retail Stores 1 and 2

(We paraphrased many of the following recommendations from a report we prepared for a similar "bay mud over Hookton Fm." site (BGC, 2000). We indicate each of these recommendations with an asterisk (*) preceding the specific sentence. The engineering recommendations in the report were prepared and signed by an engineer registered in California. We stress that we are engineering geologists, not engineers, and that we present these recommendations to provide information for preliminary engineering design work only. Final design specifics should be based on recommendations provided by an engineer registered in California, as modified by in situ pile driving and pile load tests.)

REC 7. Support the structures on a pile foundation driven to "refusal" in the competent Hookton Fm. sediments underlying the existing fill soils, bay muds, and weathered Hookton Fm. soils. Wooden, concrete, or galvanized steel piles are acceptable. We define "refusal" as "10 or more final blows of 1/4- to 3/16-inch advancement per final blow."

*To calculate the skin friction component of total bearing capacity (if necessary), use a vertical skin friction value of 800 psf for the competent Hookton Fm. sediments. We define the "top of the competent Hookton sediments" as "the first (shallowest) soil below the bay mud unit with a normalized blow count ($N1_{60}$ value) or equivalent normalized blow count of 25 or greater." *Design may assume tip bearing capacity as one-fifth of the total. *Use a factor of safety of 3 or greater.

REC 8. *Conduct pile load tests to determine individual and/or group pile capacity and to calibrate or modify the recommended design parameters if necessary. *Pile dynamic analysis methods that take into account characteristics of the hammer, driving cap, pile, and soil can be used to relate actual dynamic pile behavior to ultimate static pile resistance. *Discount the frictional resistance of the bay muds.

REC 9. *Determine the required minimum design pile embedment depths based on calculated pile bearing capacities and design loads. *However, drive test piles to refusal (per REC 7), or as directed otherwise by the project engineer, and modify the actual pile depths as appropriate.

REC 10. *Design the pile foundation for down-drag loading due to the consolidation of the bay muds. *Use a vertical down-drag skin friction value of 250 psf for the bay muds (and the surficial fill soils).

REC 11. *For the competent Hookton sediments, the resistance to lateral loads may be provided by passive pressure equivalent to a fluid weighing 450 pcf. *The passive pressure may be assumed to act over two times the pile width. *Where design indicates pile passive pressure resistance is insufficient, resultant lateral footing reactions may be transferred to the soil using "A. B. Chance Co." helical pier tension tieback anchors. *The tieback anchors must be embedded in, and gain support from, the competent Hookton sediments. *If tiebacks are required, design the tiebacks in accordance with A. B. Chance literature guidelines using the soil information presented herein. *Refer to ICBO Evaluation Report 5110 for allowable helical pier foundation system loads. Useful A. B. Chance literature includes ABC, 2001 and ABC, 2004 (see References Cited).

REC 12. If concrete slabs are used, they must gain support from the pile and grade beam foundation system. Due to the consolidation potential of the bay muds, reinforced concrete slabs must be designed to span between grade beams. See **RECs 4, 5,** and **6** for instructions for preparing the ground beneath the slabs. Place a capillary break and moisture barrier (6-mil polyethylene membrane) beneath the slabs.

Pad A

REC 13. Rest load-bearing foundations on suitable soils or a structural fill resting on suitable soils. "Suitable" soils are competent undisturbed Hookton Fm. subsoils, and "unsuitable soils" are topsoils, disturbed soils, or uncontrolled fill soils.

For this particular area, we recommend that you remove all of the existing concrete and pavement, then dig foundation excavations to the suitable soils. If excavations deeper than the engineer's design are necessary because of deep unsuitable soils, backfill the over-excavated footing trenches to the base of footing grade with a compacted granular fill or a flowable fill (per **REC 4**). If no exceptionally deep disturbed areas are present within the building footprint, suitable soils are likely to be present within ~3 ft of the existing asphalt surface.

To rest the footings on a structural fill, remove the unsuitable soils for the width of the foundation plus two feet (one foot on each side of the foundation) and fill the excavation with an engineered fill or a flowable fill. By "fill the excavation" we mean "fill the excavation to design base of footing grade."

CAUTION: Failure to rest the foundation on competent subsoils will lead to cracking and settlements over time.

NOTE: If existing soil contamination precludes removing existing unsuitable fills and soils, <u>either</u> assume the UNCERTAIN level of risk of settlement and structural distress over time and build on the existing fills, <u>or</u> design a grade beam style foundation and structural slab supported by A. B. Chance helical anchors. Assume the anchors will bear in "Class 5" soils (ABC, 1990) and use Chance literature to determine allowable anchor capacities. (see ABC, 2001, 2004).

CAUTIONS, LIMITATIONS, CLOSURE, and AUTHENTICATION

CAUTION: This report does not address protocols for dealing with the known contaminates at the site. We recommend that a qualified person (per STP, 2004) licensed by the State of California review the final construction plans and provide the appropriate safety and materials disposal guidance, including onsite monitoring, if necessary.

Because the project is a low-risk development rather than a high-risk one, we did not evaluate and describe the site conditions as thoroughly as we would have for a school, hospital, or multistory structure, for example. Nevertheless, we have a high degree of confidence that we understand the site, that our conclusions are accurate, and that our recommendations are appropriate for the project.

Because the site is a geologically young deposit with a high groundwater table, and because it is located in a region in which strong earthquakes are common and a great (M>8) one is possible, a regional catastrophe might occur. Such an event probably would adversely affect structures on the site, regardless of the engineering design precautions taken. That is, an UNCERTAIN level of residual risk of damage due to a catastrophe will remain. Stated yet another way, the report provides recommendations that, if followed, will lower—but not eliminate—levels of risk associated with identified site-specific geologic and soils hazards.

We are available to provide additional geotechnical information and support. If there are questions, please call. Randy, thank you again for hiring us.

Respectfully submitted,

Busch Geotechnical Consultants

Bryan Dussell
Project Geologist

R. E. Busch, Jr., Ph.D.
C.E.G. #1448

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D:REB:c:\MSW\Cook8.SE.doc
Cc:
Attachments: **REFERENCES CITED**
LIST OF APPENDICES
Appendices IA1, IB

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IB. Unified Soils Classification System end

GREGG DRILLING AND TESTING, INC.
GREGG IN SITU, INC.
ENVIRONMENTAL AND GEOTECHNICAL INVESTIGATION SERVICES

September 2, 2004

Busch Geotechnical
Attn: Bob Busch
905 Sixth Street
Arcata, California 95221

Subject: CPT Site Investigation
Cook Broadway Project
Eureka, California
GREGG Project Number: 04-272ma

Dear Mr. Busch:

The following report presents the results of GREGG IN SITU's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	x
2	Pore Pressure Dissipation Tests	(PPD)	x
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	Resistivity Cone Penetration Tests	(RCPTU)	☐
5	UVIF Cone Penetration Tests	(UVIFCPTU)	☐
6	Groundwater Sampling	(GWS)	☐
7	Soil Sampling	(SS)	☐
8	Vapor Sampling	(VS)	☐
9	Vane Shear Testing	(VST)	☐
10	SPT Energy Calibration	(SPTE)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (562) 427-6899.

Sincerely,
GREGG IN SITU, Inc.

Mary Walden
Operations Manager

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Copies of ASTM Standards are available through www.astm.org

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APPENDIX CPT

Cone Penetration Testing Procedure (CPT)

Gregg In Situ, Inc. carries out all Cone Penetration Tests (CPT) using an integrated electronic cone system, *Figure CPT*. The soundings were conducted using a 20 ton capacity cone with a tip area of 15 cm^2 and a friction sleeve area of 225 cm^2. The cone is designed with an equal end area friction sleeve and a tip end area ratio of 0.85.

The cone takes measurements of cone bearing (q_c), sleeve friction (f_s) and dynamic pore water pressure (u_2) at 5-cm intervals during penetration to provide a nearly continuous hydrogeologic log. CPT data reduction and interpretation is performed in real time facilitating on-site decision making. The above mentioned parameters are stored on disk for further analysis and reference. All CPT soundings are performed in accordance with revised (2002) ASTM standards (D 5778-95).

The cone also contains a porous filter element located directly behind the cone tip (u_2), *Figure CPT*. It consists of porous plastic and is 5.0mm thick. The filter element is used to obtain dynamic pore pressure as the cone is advanced as well as Pore Pressure Dissipation Tests (PPDT's) during appropriate pauses in penetration. It should be noted that prior to penetration, the element is fully saturated with silicon oil under vacuum pressure to ensure accurate and fast dissipation.

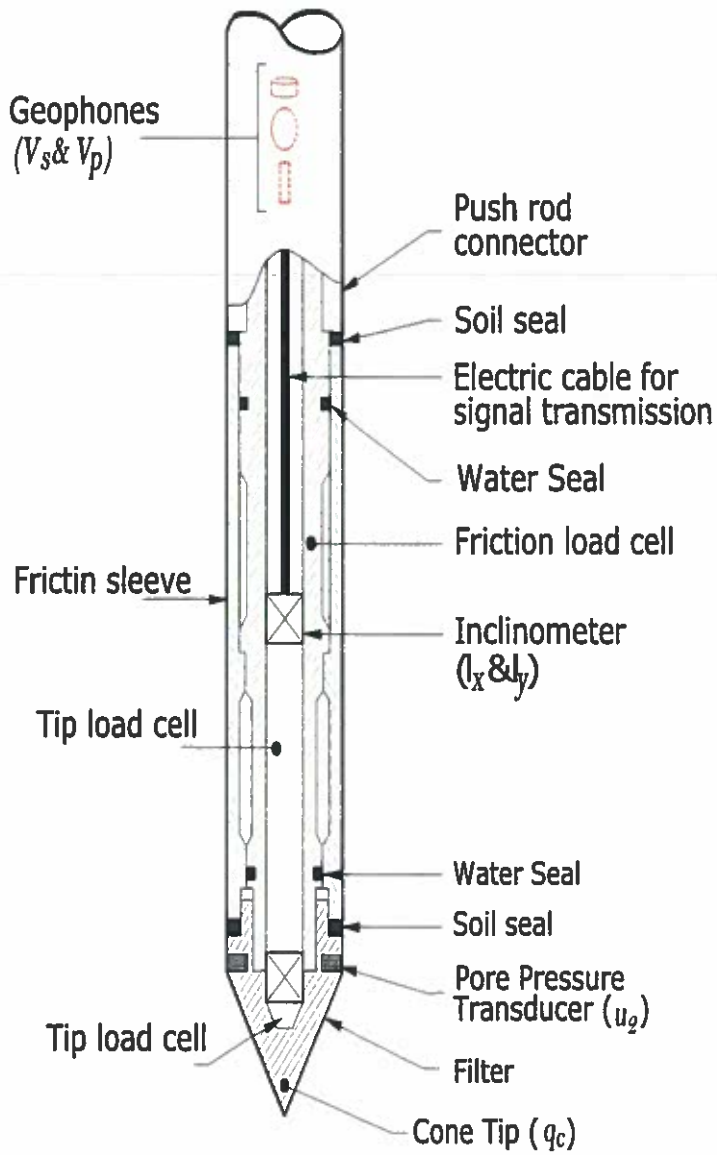


Figure CPT

When the soundings are complete, the test holes are grouted using a Gregg In Situ support rig. The grouting procedure consists of pushing a hollow CPT rod with a "knock out" plug to the termination depth of the test hole. Grout is then pumped under pressure as the tremie pipe is pulled from the hole. Disruption or further contamination to the site is therefore minimized.

Cone Penetration Test Data & Interpretation

Soil behavior type and stratigraphic interpretation is based on relationships between cone bearing (q_c), sleeve friction (f_s), and pore water pressure (u_2). The friction ratio (R_f) is a calculated parameter defined by $100f_s/q_c$ and is used to infer soil behavior type. Generally:

Cohesive soils (clays)

- High friction ratio (R_f) due to small cone bearing (q_c)
- Generate large excess pore water pressures (u_2)

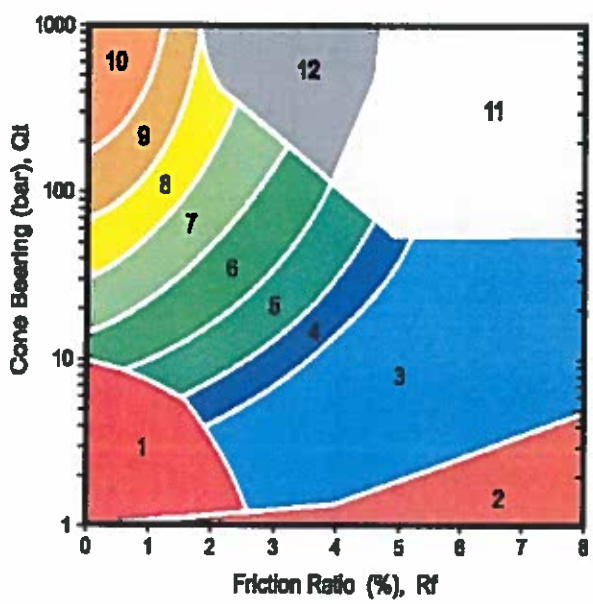
Cohesionless soils (sands)

- Low friction ratio (R_f) due to large cone bearing (q_c)
- Generate very little excess pore water pressures (u_2)

A complete set of baseline readings are taken prior to and at the completion of each sounding to determine temperature shifts and any zero load offsets. Corrections for temperature shifts and zero load offsets can be extremely important, especially when the recorded loads are relatively small. In sandy soils, however, these corrections are generally negligible.

The cone penetration test data collected from your site is presented in graphical form in Appendix CPT. The data includes CPT logs of measured soil parameters, computer calculations of interpreted soil behavior types (SBT), and additional geotechnical parameters. A summary of locations and depths is available in Table 1. Note that all penetration depths referenced in the data are with respect to the existing ground surface.

Soil interpretation for this project was conducted using recent correlations developed by Robertson et al, 1990, *Figure SBT*. Note that it is not always possible to clearly identify a soil type based solely on q_c, f_s, and u_2. In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the soil behavior type.



ZONE	Qt/N	SBT
1	2	Sensitive, fine greained
2	1	Organic materials
3	1	Clay
4	1.5	Silty clay to clay
5	2	Clayey silt to silty clay
6	2.5	Sandy silt to clayey silt
7	3	Silty sand to sandy silt
8	4	Sand to silty sand
9	5	Sand
10	6	Gravely sand to sand
11	1	Very stiff fine grained*
12	2	Sand to clayey sand*

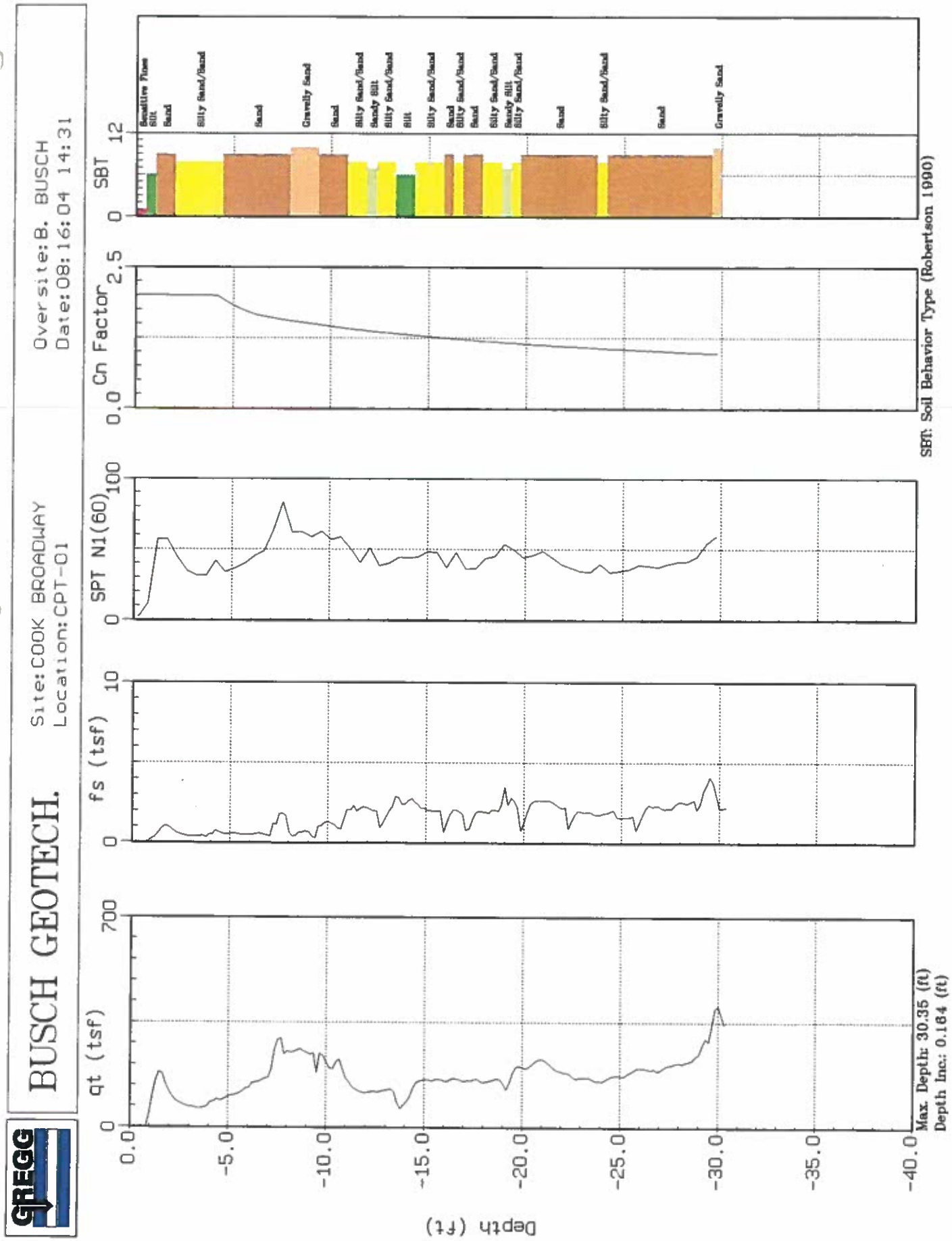
*over consolidated or cemented

Figure SBT

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (Feet)	Depths of Groundwater Samples	Depths of Soil Samples	Depth of Pore Pressure Dissipation Tests
CPT-01	8/16	30	-	-	20.01
CPT-02	8/16	40	-	-	17.06
CPT-03	8/16	30	-	-	12.30
CPT-04	8/16	35	-	-	19.19
CPT-05	8/16	20	-	-	-
CPT-06	8/16	20	-	-	-
CPT-07	8/17	25	-	-	-
CPT-08	8/17	32	-	-	-
CPT-09	8/17	5	-	-	-
CPT-09A	8/17	40	-	-	-
CPT-10	8/17	27	-	-	-

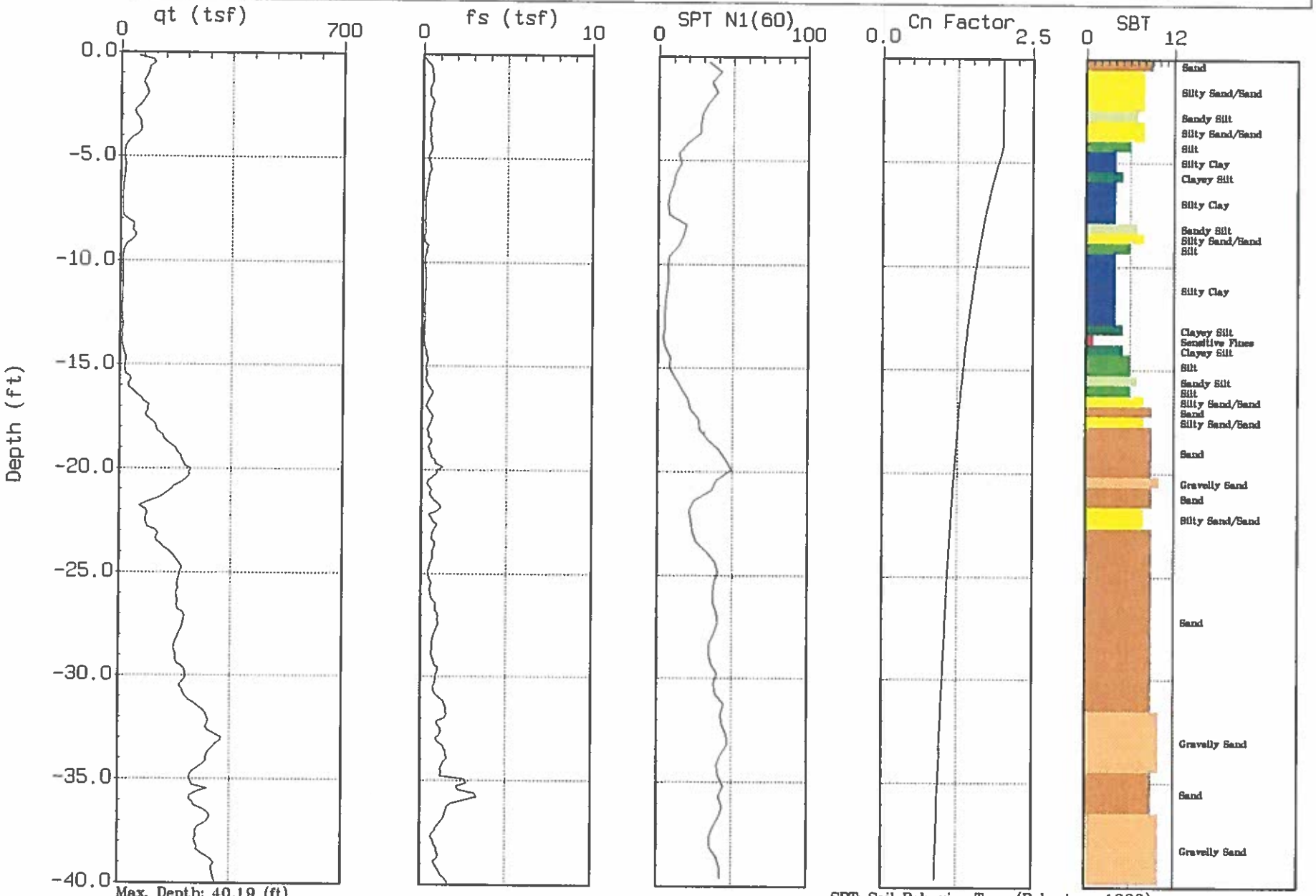

GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-01
Oversite: B. BUSCH
Date: 08:16:04 14:31
qt (tsf)
fs (tsf)
SPT N1(60)
Cn Factor
SBT
Sensitive Fine Grained
Silt
Sand
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Silty Sand/Sand
Sandy Silt
Silty Sand/Sand
Silt
Silty Sand/Sand
Sand
Silty Sand/Sand
Sand
Silty Sand/Sand
Sandy Silt
Silty Sand/Sand
Sand
Silty Sand/Sand
Sand
Gravelly Sand
Depth (ft)
Max. Depth: 30.35 (ft)
Depth Inc.: 0.184 (ft)
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-02

Oversite: B. BUSCH
Date: 08:16:04 15:27



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

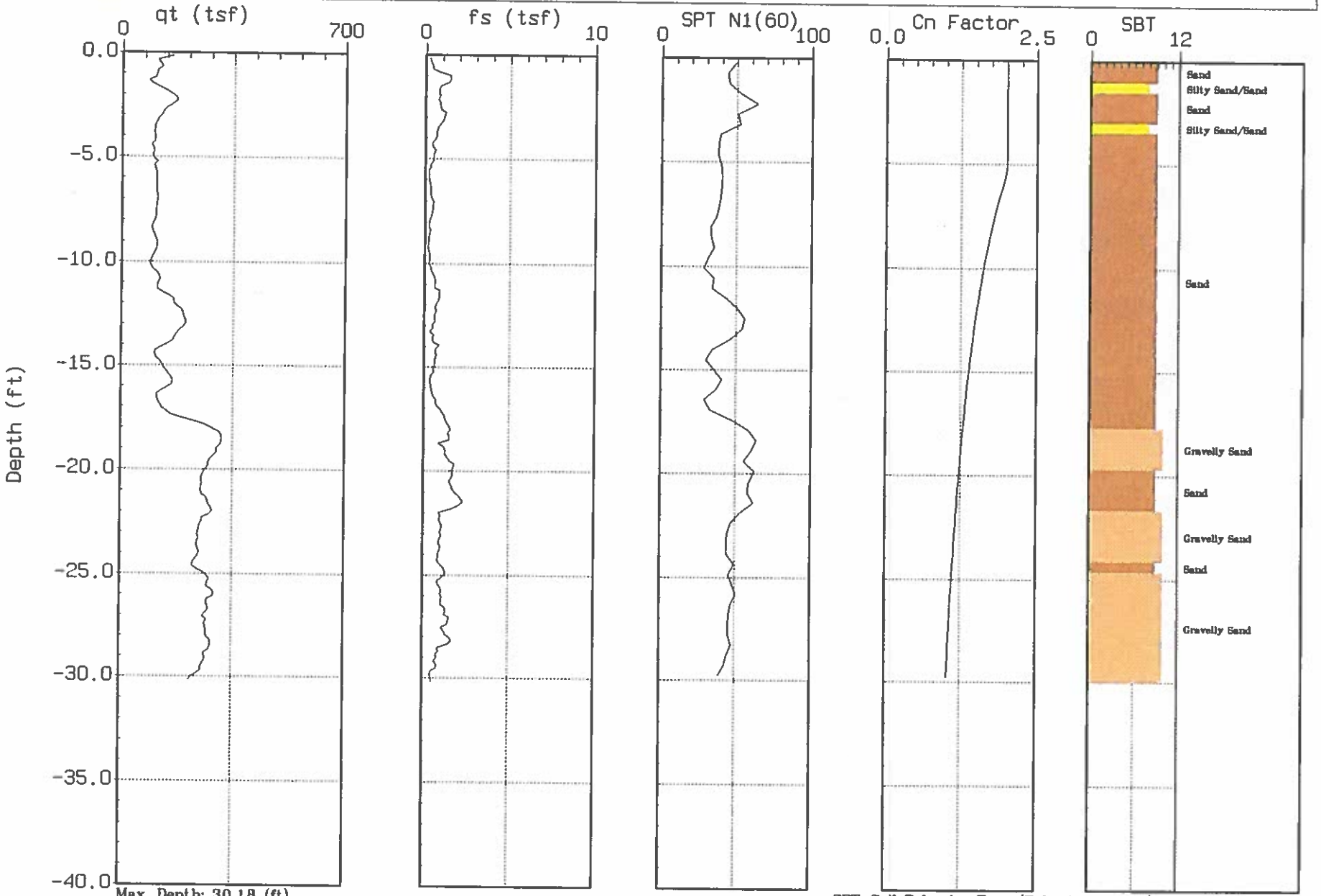
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

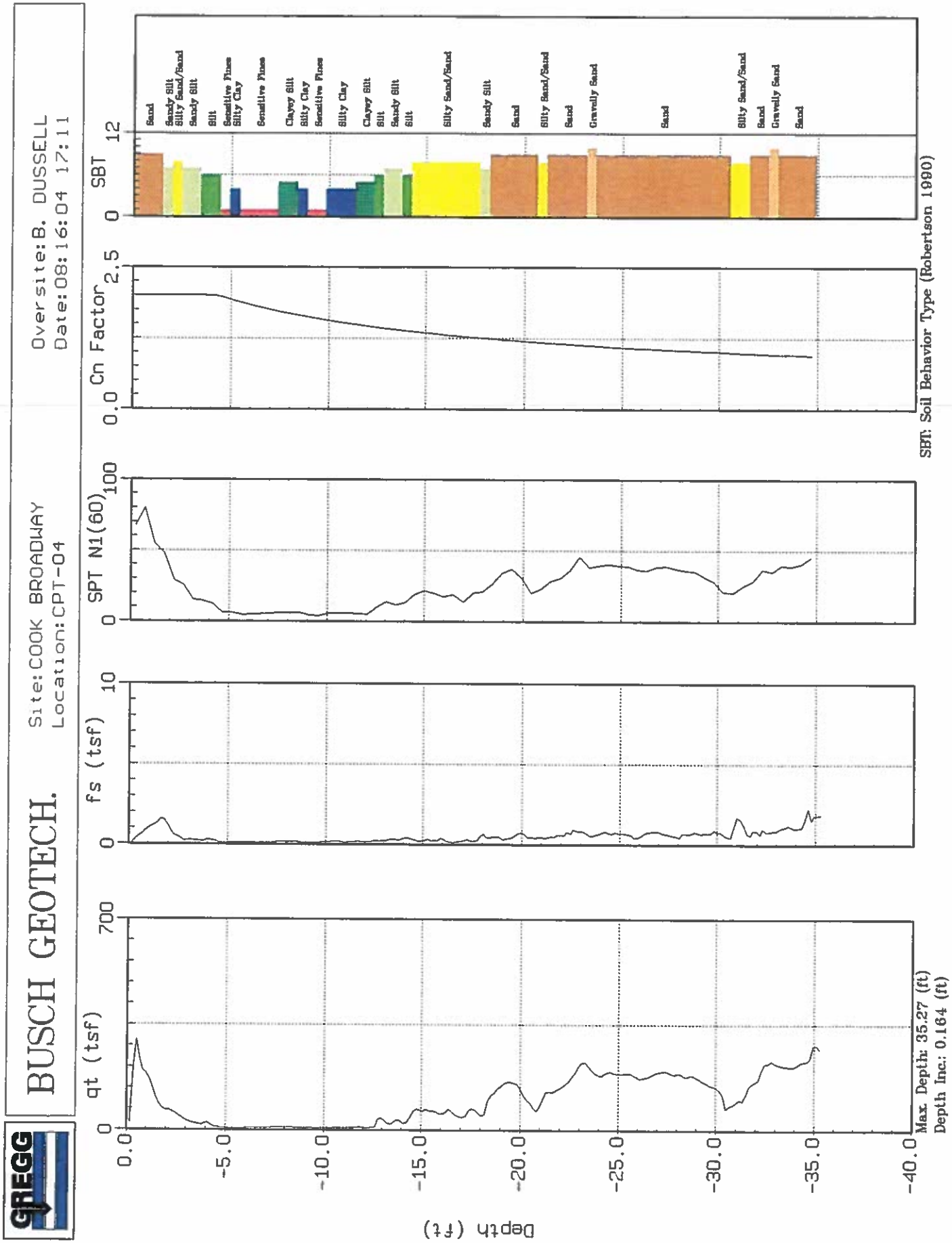
Site: COOK BROADWAY
Location: CPT-03

Oversite: B. BUSCH
Date: 08:16:04 16:08



Max. Depth: 30.18 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

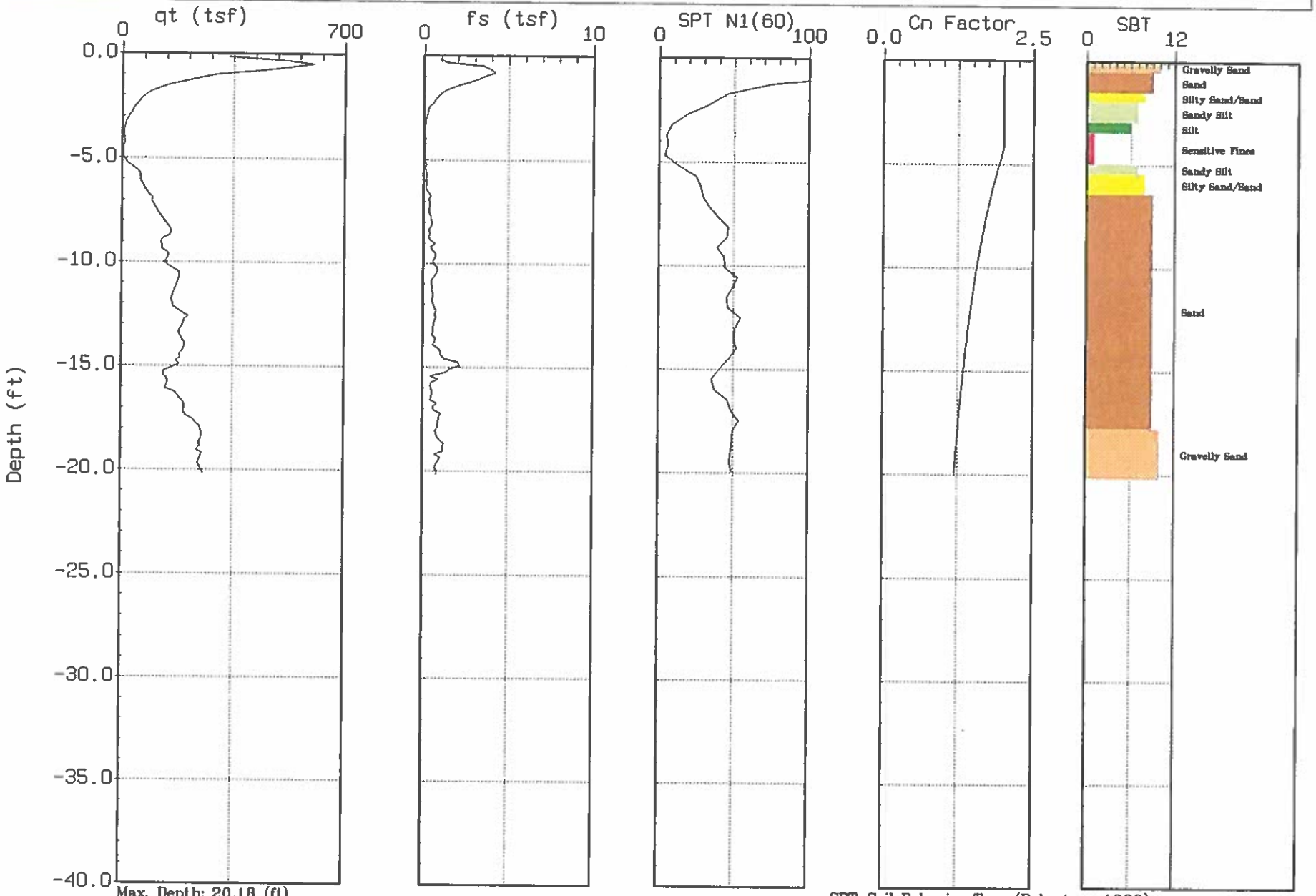

GREGG
BUSCH GEOTECH.
Site:COOK BROADWAY
Location:CPT-04
Oversite:B. DUSSELL
Date:08:16:04 17:11
qt (tsf)
0
700
fs (tsf)
0
10
SPT N1(60)
0
100
Cn Factor
0.0
2.5
SBT
0
12
Sand
Sandy Silt
Silty Sand/Sand
Sandy Silt
Silt
Sensitive Fine
Silty Clay
Sensitive Fine
Clayey Silt
Silty Clay
Sensitive Fine
Silty Clay
Clayey Silt
Silt
Sandy Silt
Silt
Silty Sand/Sand
Sandy Silt
Sand
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Silty Sand/Sand
Sand
Gravelly Sand
Sand
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
Depth (ft)
Max. Depth: 35.27 (ft)
Depth Inc.: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-05

Oversite: B. DUSSELL
Date: 08:16:04 17:52



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

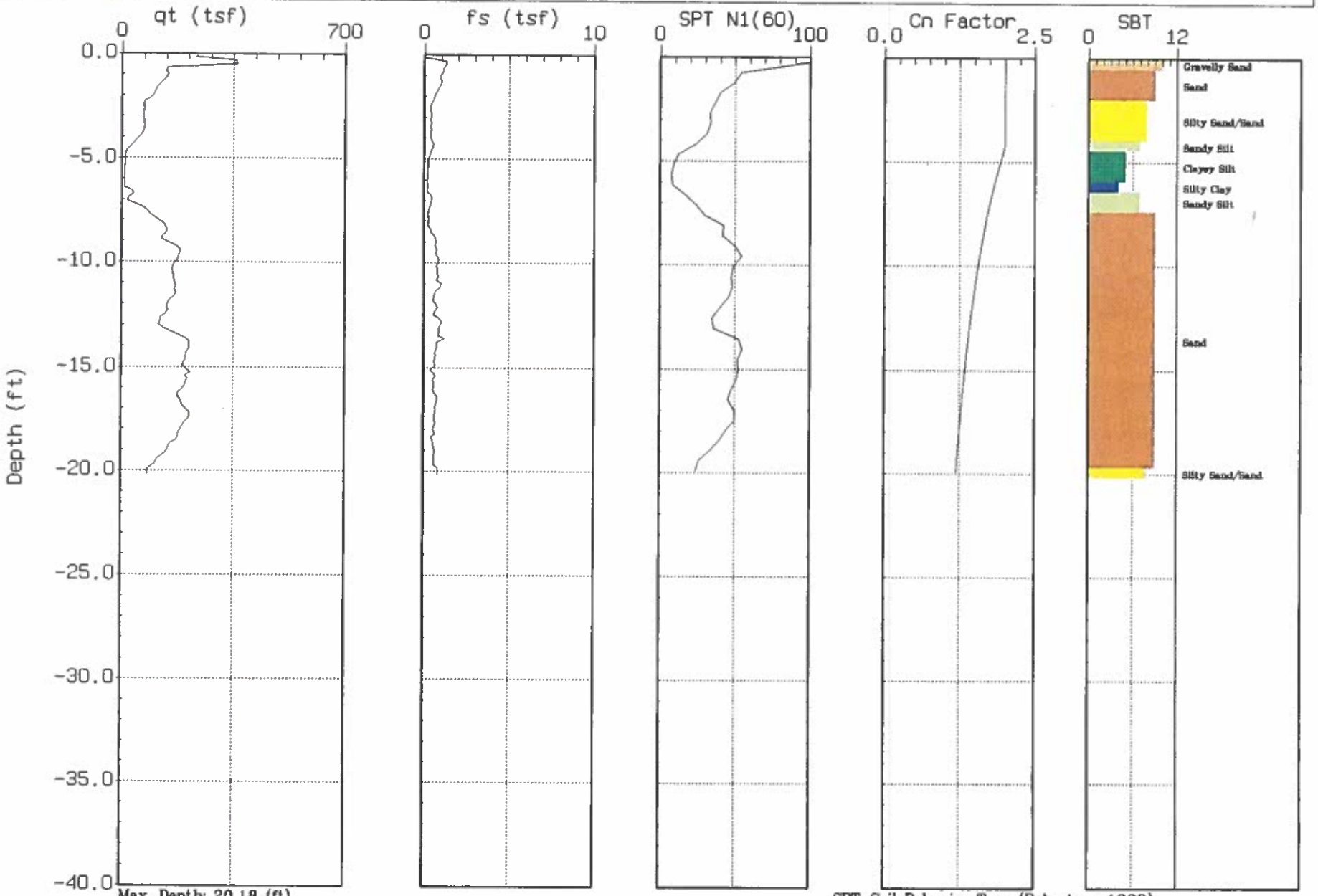
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

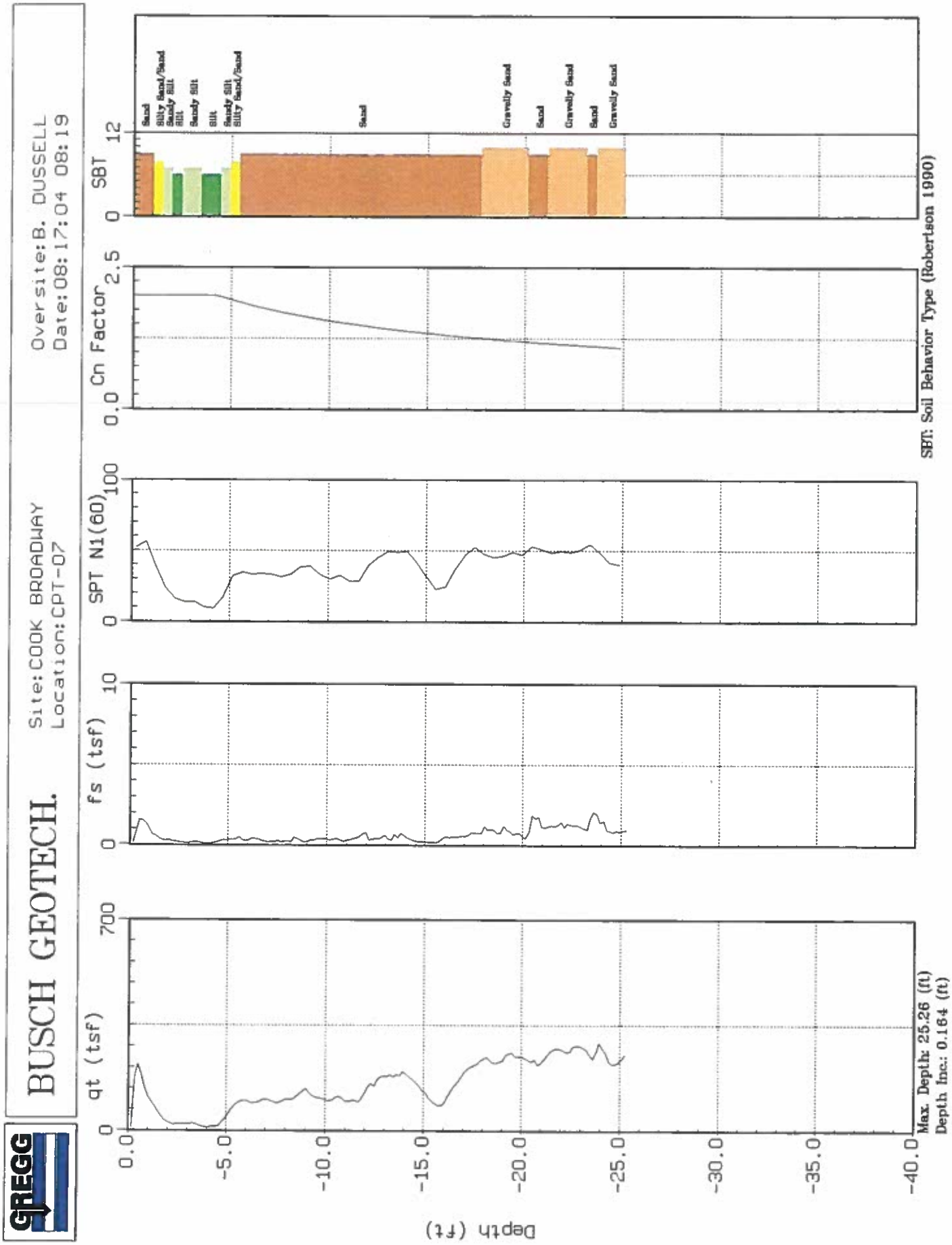
Site: COOK BROADWAY
Location: CPT-06

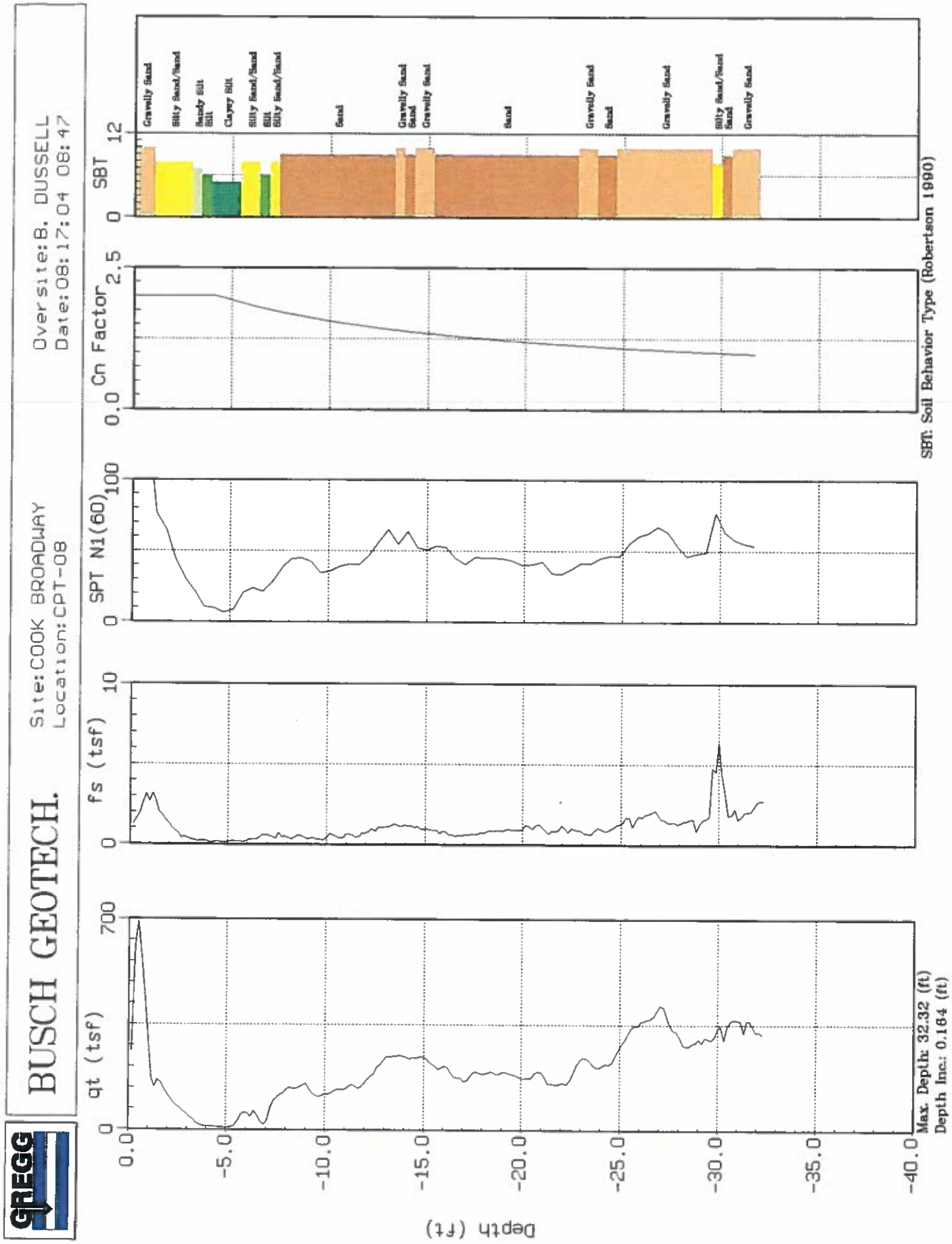
Oversite: B. DUSSELL
Date: 08:16:04 18:18



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

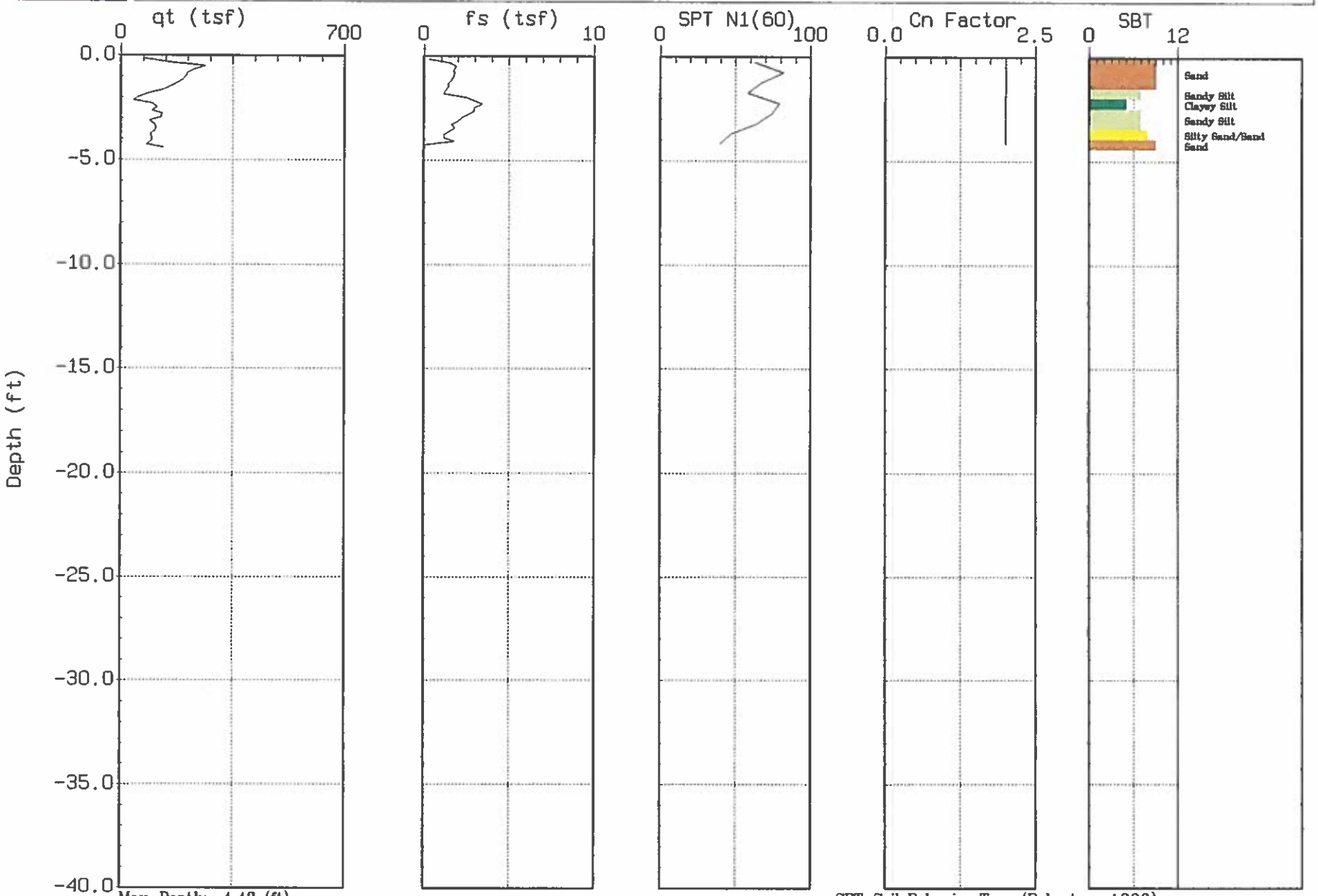

GREGG
BUSCH GEOTECH.
Site:COOK BROADWAY
Location:CPT-07
Oversite:B. DUSSELL
Date:08:17:04 08:19
qt (tsf)
0
700
fs (tsf)
0
10
SPT N1(60)
0
100
Cn Factor
0.0
2.5
SBT
0
12
Sand
Silty Sand/Sand
Sandy Silt
Silt
Sandy Silt
Silt
Sandy Silt
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
Depth (ft)
Max. Depth: 25.26 (ft)
Depth Inc.: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-08
Oversite: B. DUSSELL
Date: 08:17:04 08:47
qt (tsf)
0
700
fs (tsf)
0
10
SPT N1(60)
0
100
Cn Factor
0.0
2.5
SBT
0
12
Gravelly Sand
Silty Sand/Sand
Sandy Silt
Silt
Clayey Silt
Silty Sand/Sand
Silt
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
Silty Sand/Sand
Sand
Gravelly Sand
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
Depth (ft)
Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)

BUSCH GEOTECH.

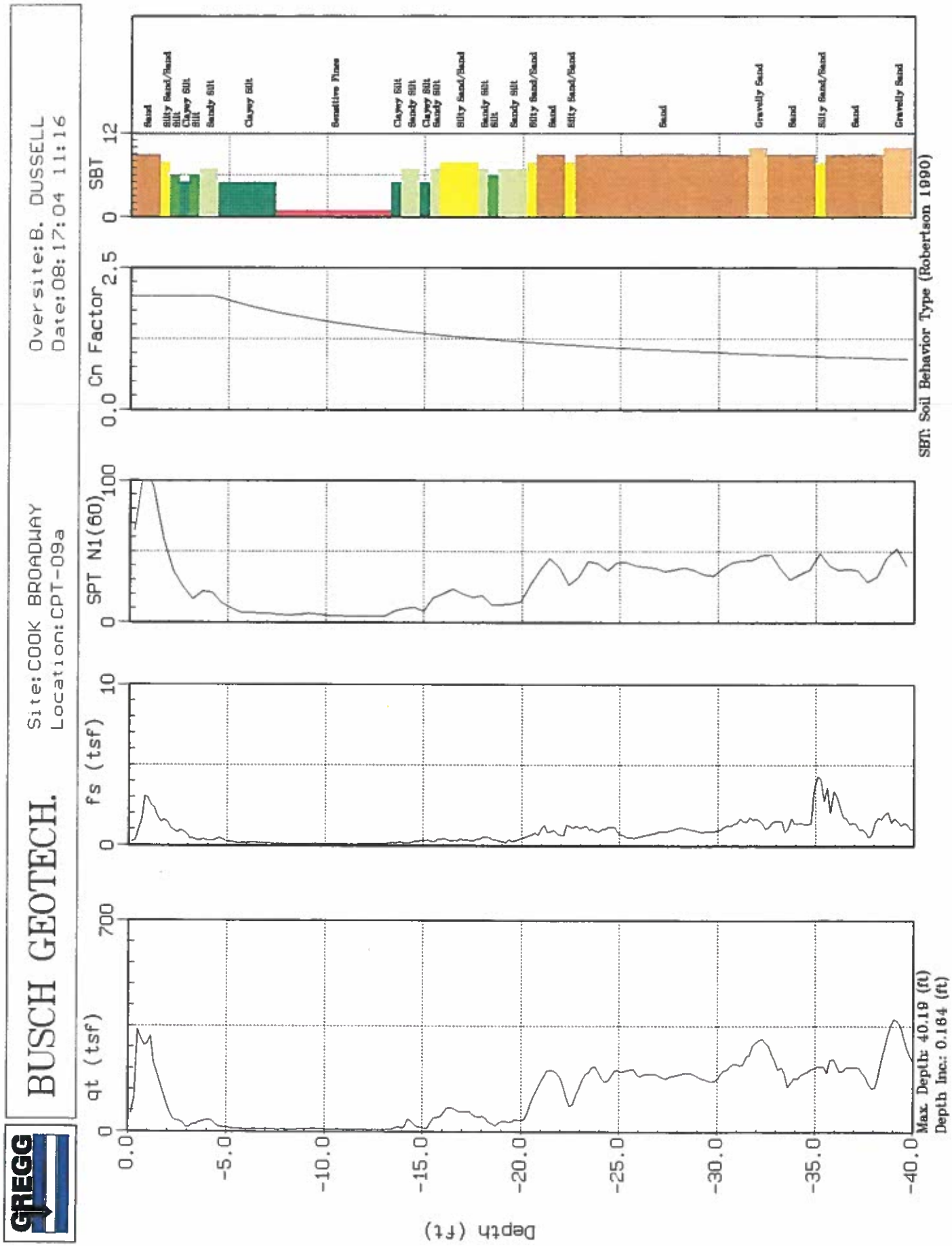
Site: COOK BROADWAY
Location: CPT-09

Oversite: B. DUSSELL
Date: 08:17:04 09:17



Max. Depth: 4.43 (ft)
Depth Inc.: 0.164 (ft)

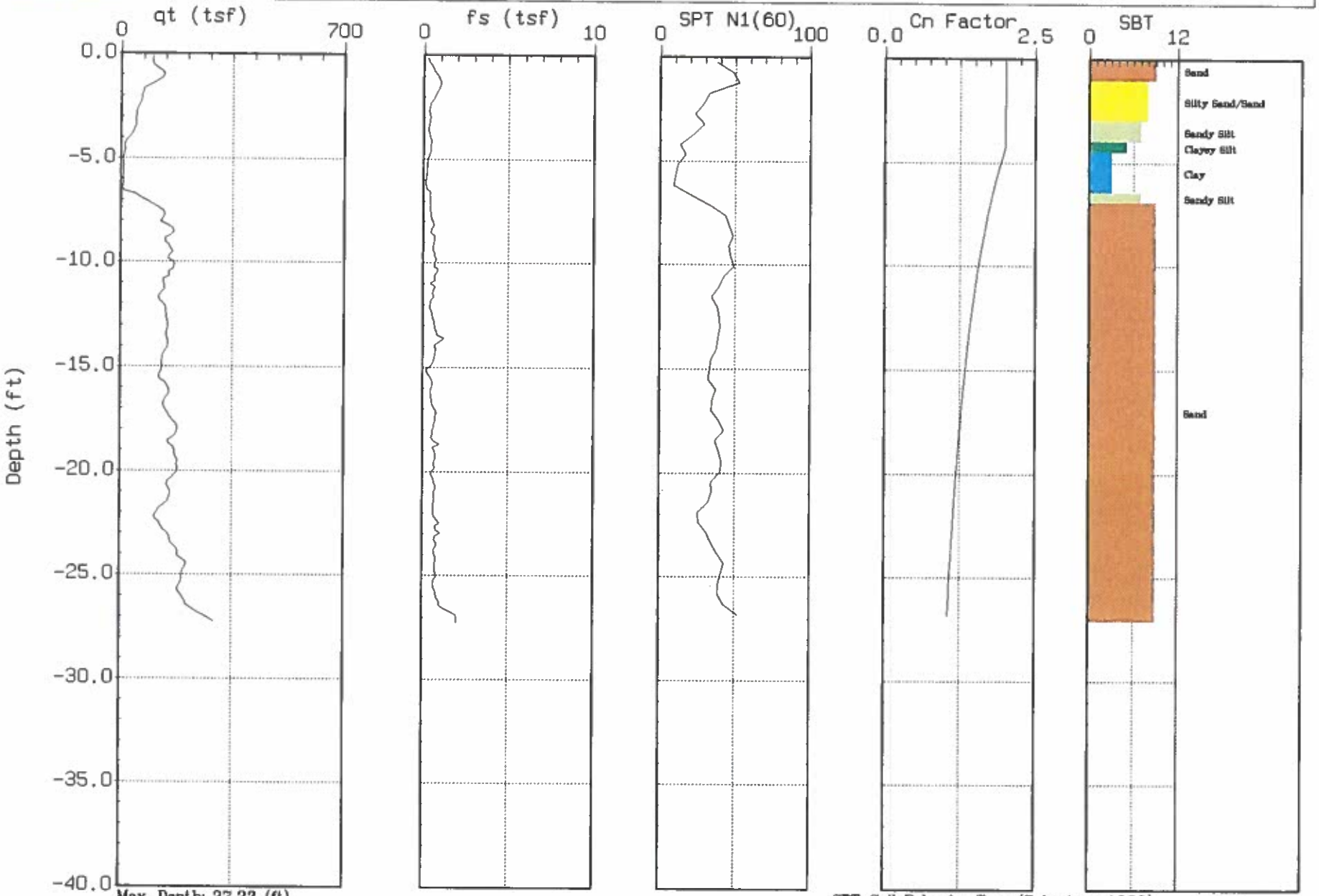
SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-09a
Oversite: B. DUSSELL
Date: 08:17:04 11:16
qt (tsf)
700
0
fs (tsf)
10
0
SPT N1(60)
100
0
Cn Factor
2.5
0.0
SBT
12
0
Sand
Silty Sand/Sand
Silt
Clayey Silt
Silt
Sandy Silt
Clayey Silt
Sensitive Fine
Clayey Silt
Sandy Silt
Clayey Silt
Sandy Silt
Silty Sand/Sand
Sandy Silt
Silt
Sandy Silt
Silty Sand/Sand
Sand
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Silty Sand/Sand
Sand
Gravelly Sand
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
Depth (ft)
Max. Depth: 40.19 (ft)
Depth Inc.: 0.184 (ft)
SBT: Soil Behavior Type (Robertson 1990)

BUSCH GEOTECH.

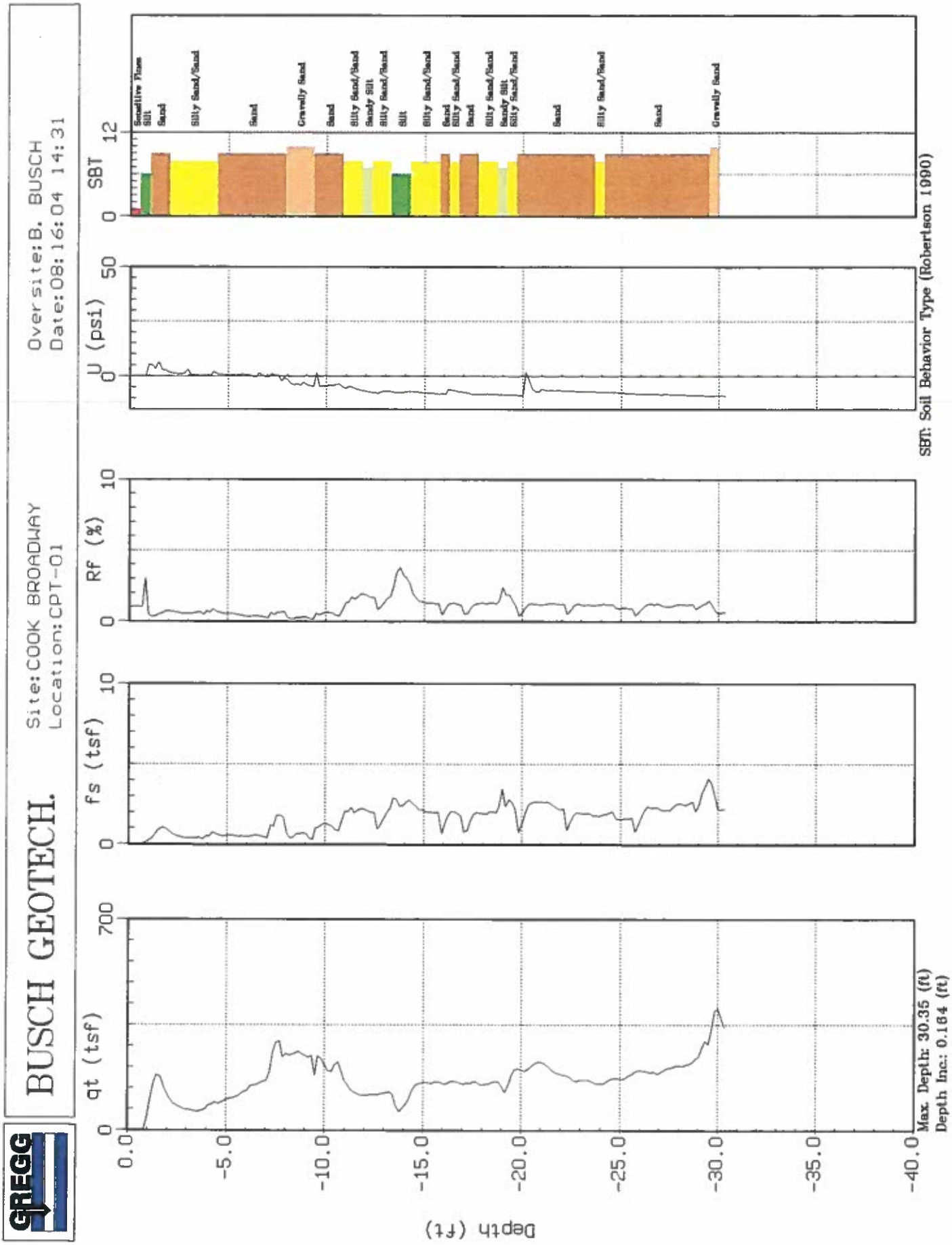
Site: COOK BROADWAY
Location: CPT-10

Oversite: B. DUSSELL
Date: 08:17:04 11:48



Max. Depth: 27.23 (ft)
Depth Inc.: 0.164 (ft)

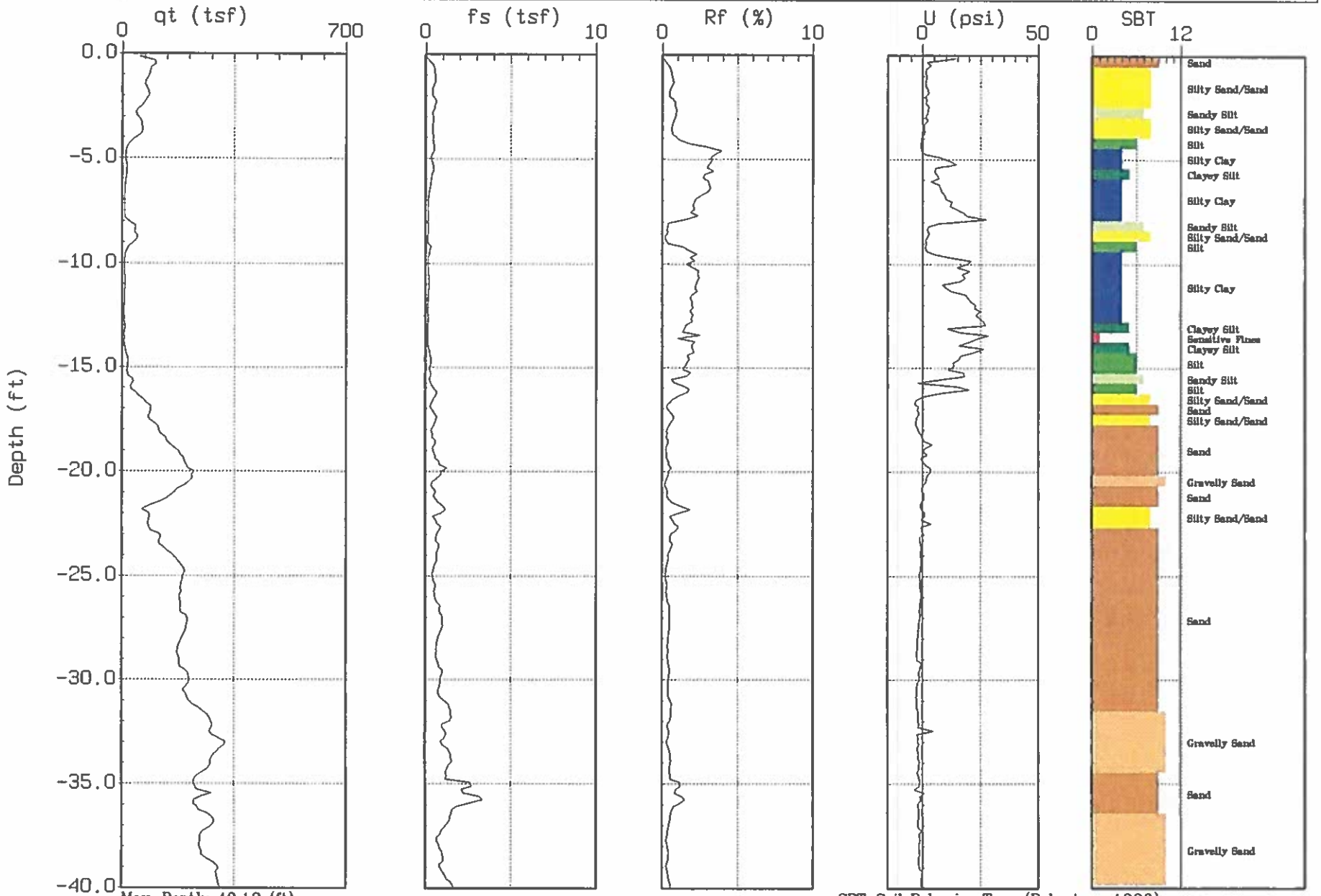
SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-01
Oversite: B. BUSCH
Date: 08:16:04 14:31
qt (tsf)
0
700
fs (tsf)
0
10
Rf (%)
0
10
U (psi)
0
50
SBT
0
12
Sensitive Fine Silt
Sand
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Silty Sand/Sand
Sandy Silt
Silty Sand/Sand
Silt
Silty Sand/Sand
Sand
Silty Sand/Sand
Sand
Silty Sand/Sand
Sandy Silt
Silty Sand/Sand
Sand
Silty Sand/Sand
Sand
Gravelly Sand
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
Depth (ft)
Max. Depth: 30.35 (ft)
Depth Inc.: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)

BUSCH GEOTECH.

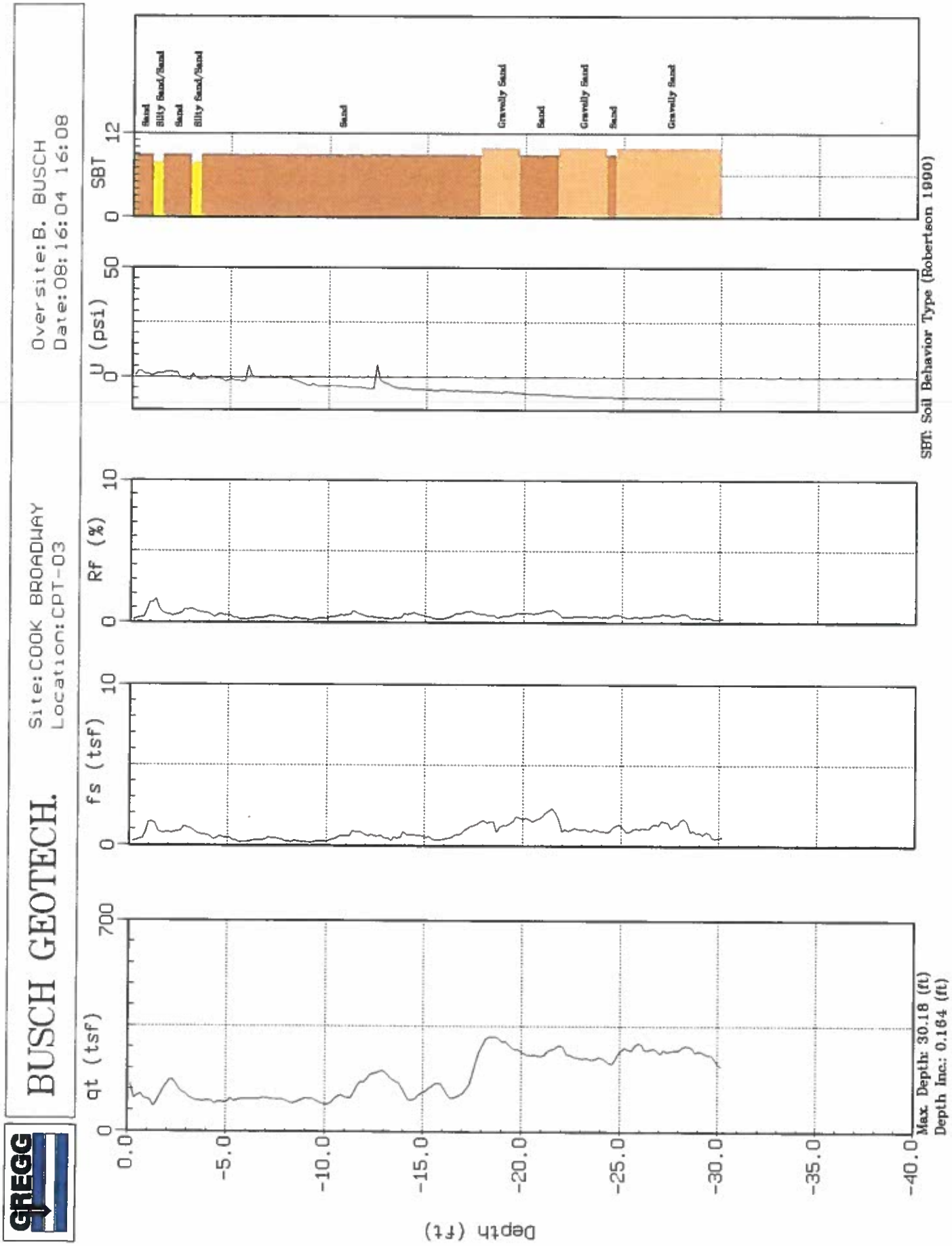
Site: COOK BROADWAY
Location: CPT-02

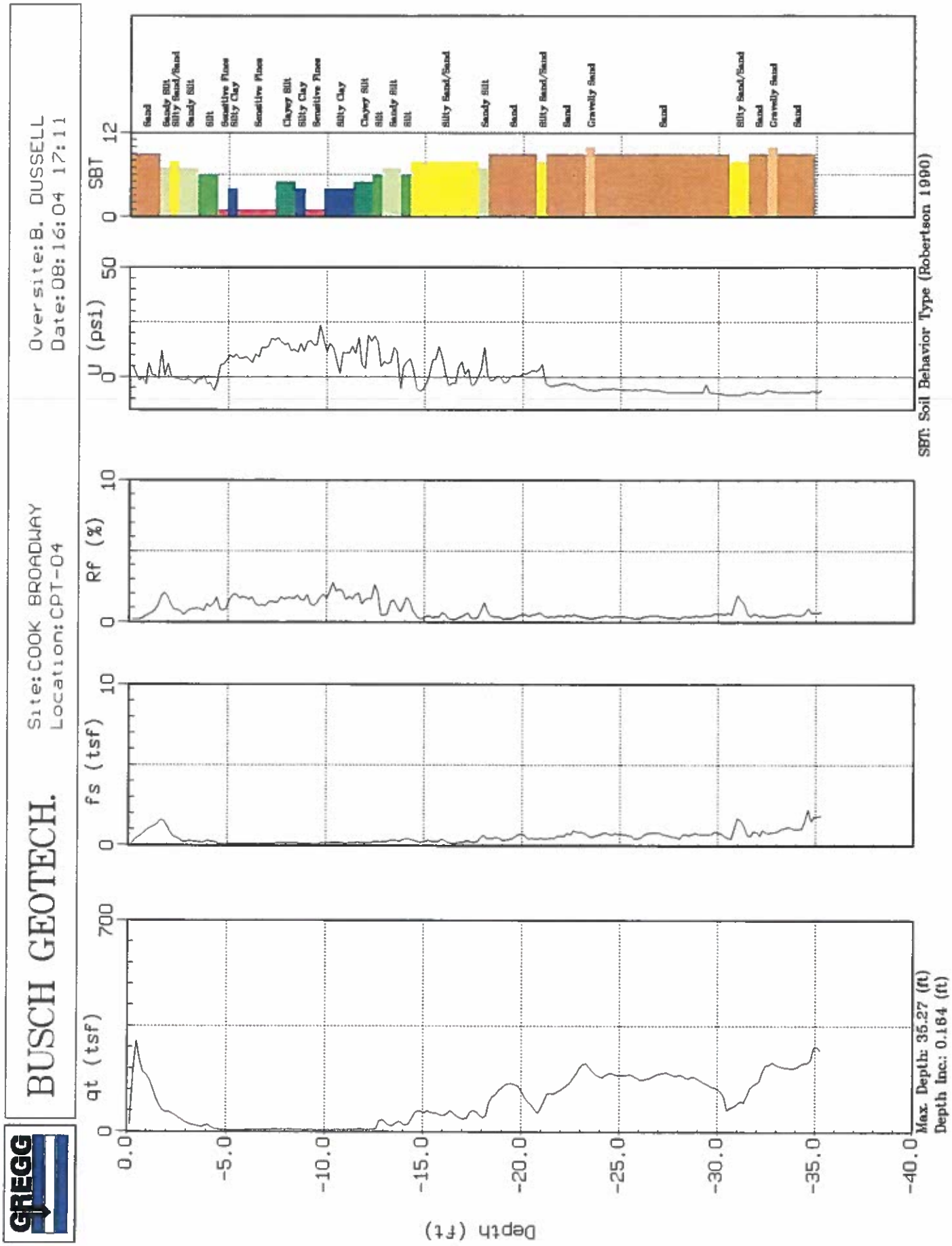
Oversite: B. BUSCH
Date: 08:16:04 15:27



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH.
Site:COOK BROADWAY
Location:CPT-03
Oversite:B. BUSCH
Date:08:16:04 16:08
qt (tsf)
fs (tsf)
RF (%)
U (psi)
SBT
Sand
Silty Sand/Sand
Sand
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
SBT: Soil Behavior Type (Robertson 1990)
Max. Depth: 30.18 (ft)
Depth Inc.: 0.164 (ft)
Depth (ft)

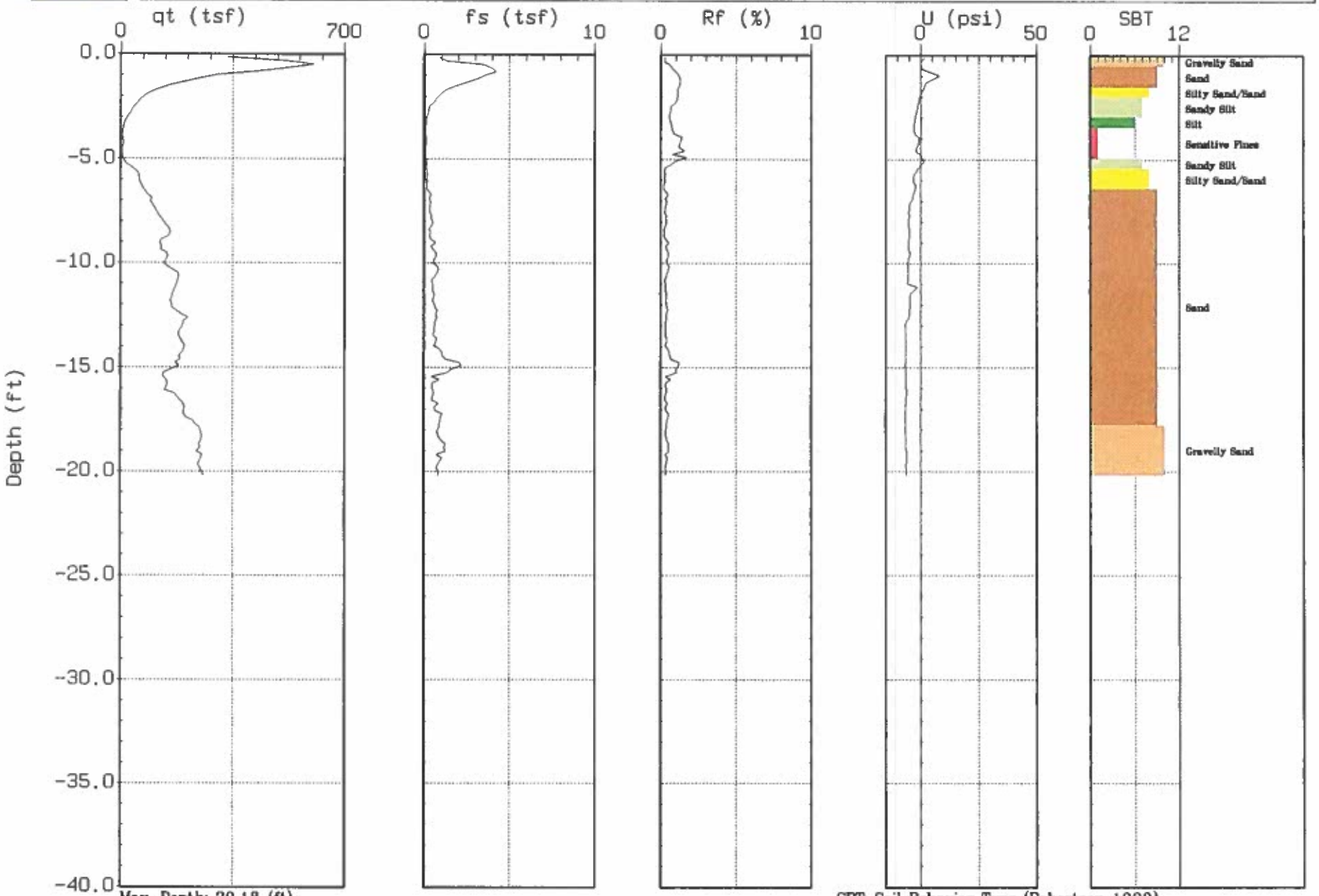

GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-04
Oversite: B. DUSSELL
Date: 08:16:04 17:11
qt (tsf)
fs (tsf)
Rf (%)
U (psi)
SBT
Depth (ft)
Max. Depth: 35.27 (ft)
Depth Inc.: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

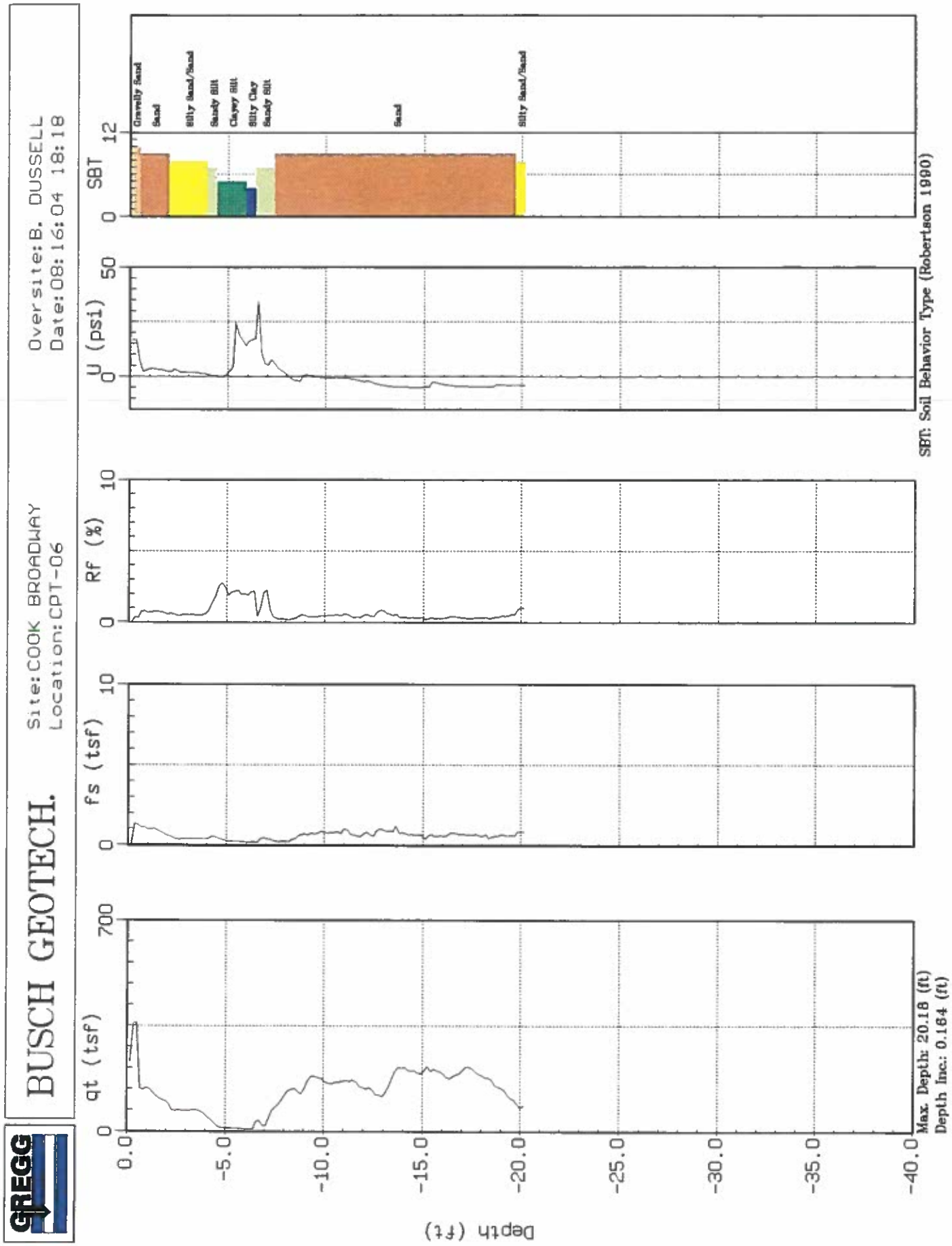
Site: COOK BROADWAY
Location: CPT-05

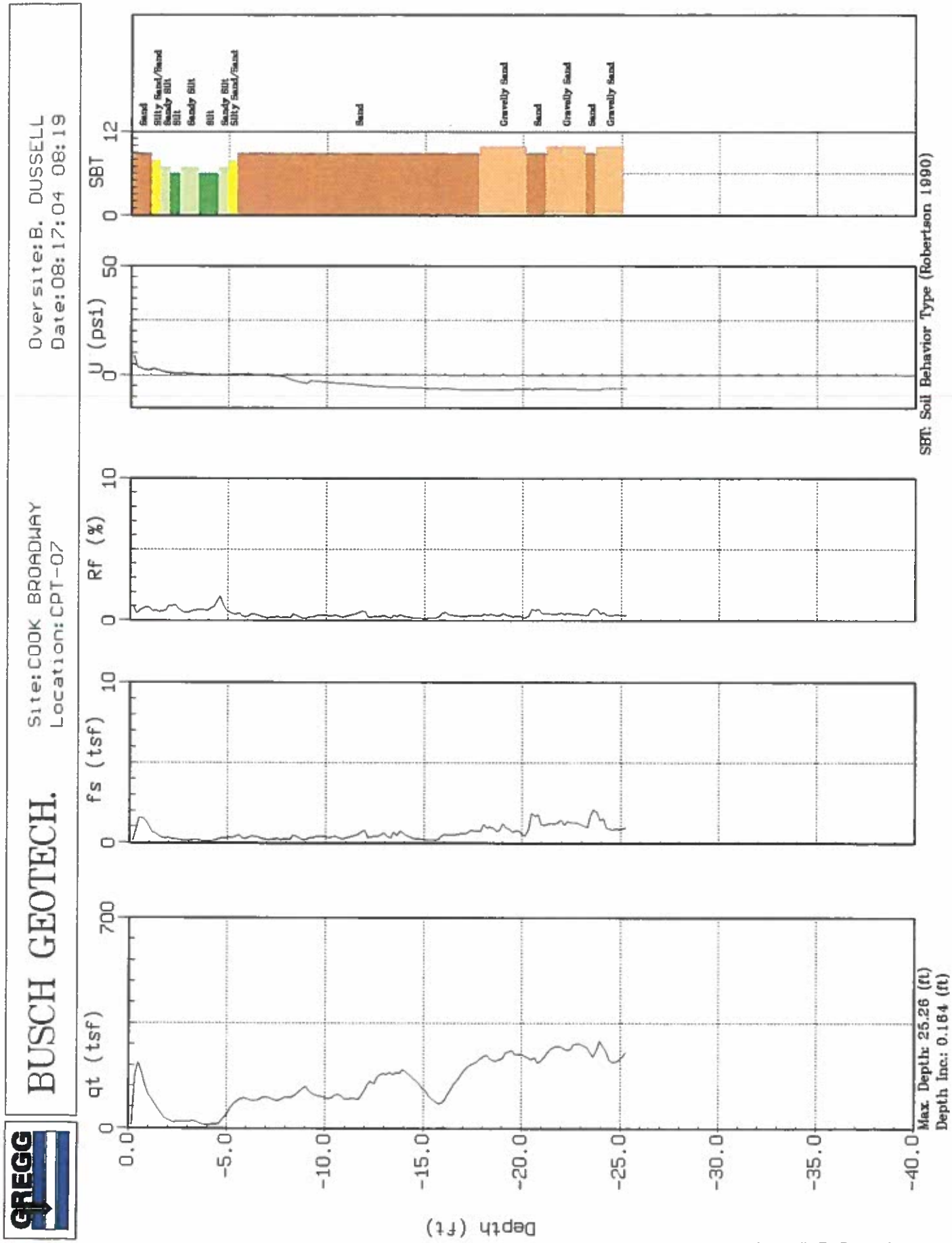
Oversite: B. DUSSELL
Date: 08:16:04 17:52



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH.
Site:COOK BROADWAY
Location:CPT-06
Oversite:B. DUSSELL
Date:08:16:04 18:18
qt (tsf)
fs (tsf)
Rf (%)
U (psi)
SBT
Gravelly Sand
Sand
Silty Sand/Sand
Sandy Silt
Clayey Silt
Silty Clay
Sandy Silt
Sand
Silty Sand/Sand
SBT: Soil Behavior Type (Robertson 1990)
Depth (ft)
Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

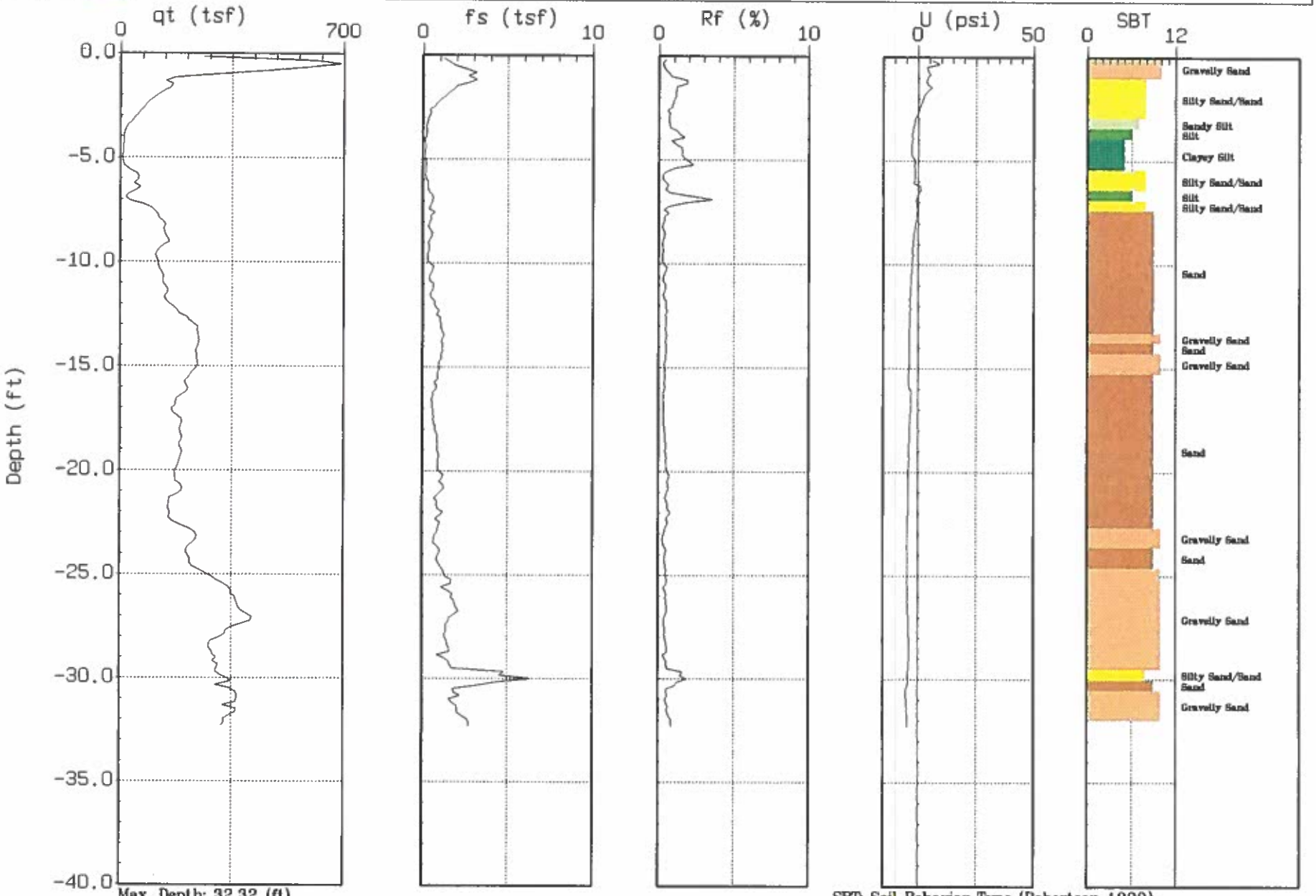

GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-07
Oversite: B. DUSSELL
Date: 08:17:04 08:19
qt (tsf)
0
700
fs (tsf)
0
10
Rf (%)
0
10
U (psi)
0
50
SBT
0
12
Sand
Silty Sand/Sand
Sandy Silt
Silt
Sandy Silt
Silt
Sandy Silt
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
Depth (ft)
Max. Depth: 25.26 (ft)
Depth Inc: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-08

Oversite: B. DUSSELL
Date: 08:17:04 08:47



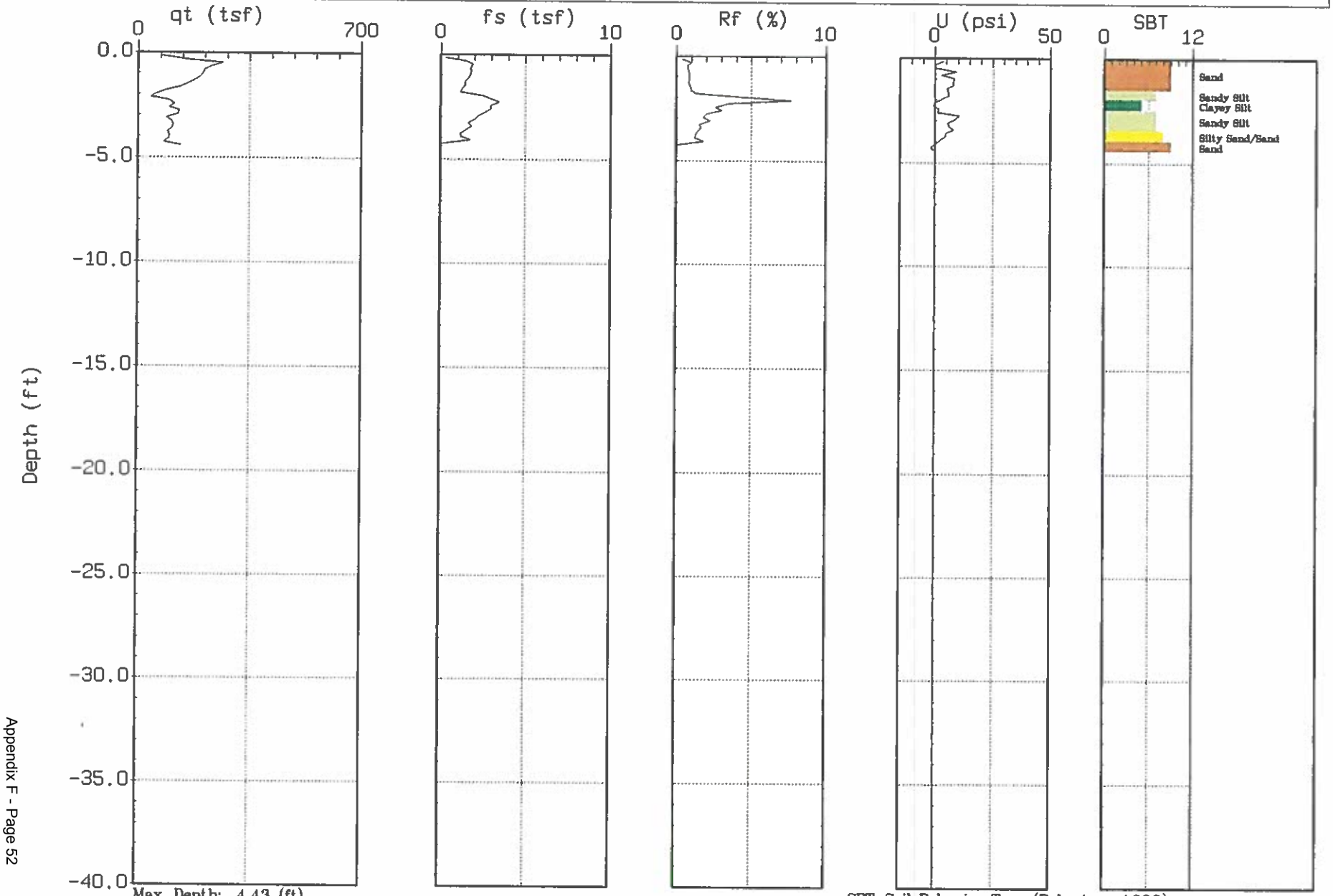
Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)

BUSCH GEOTECH.

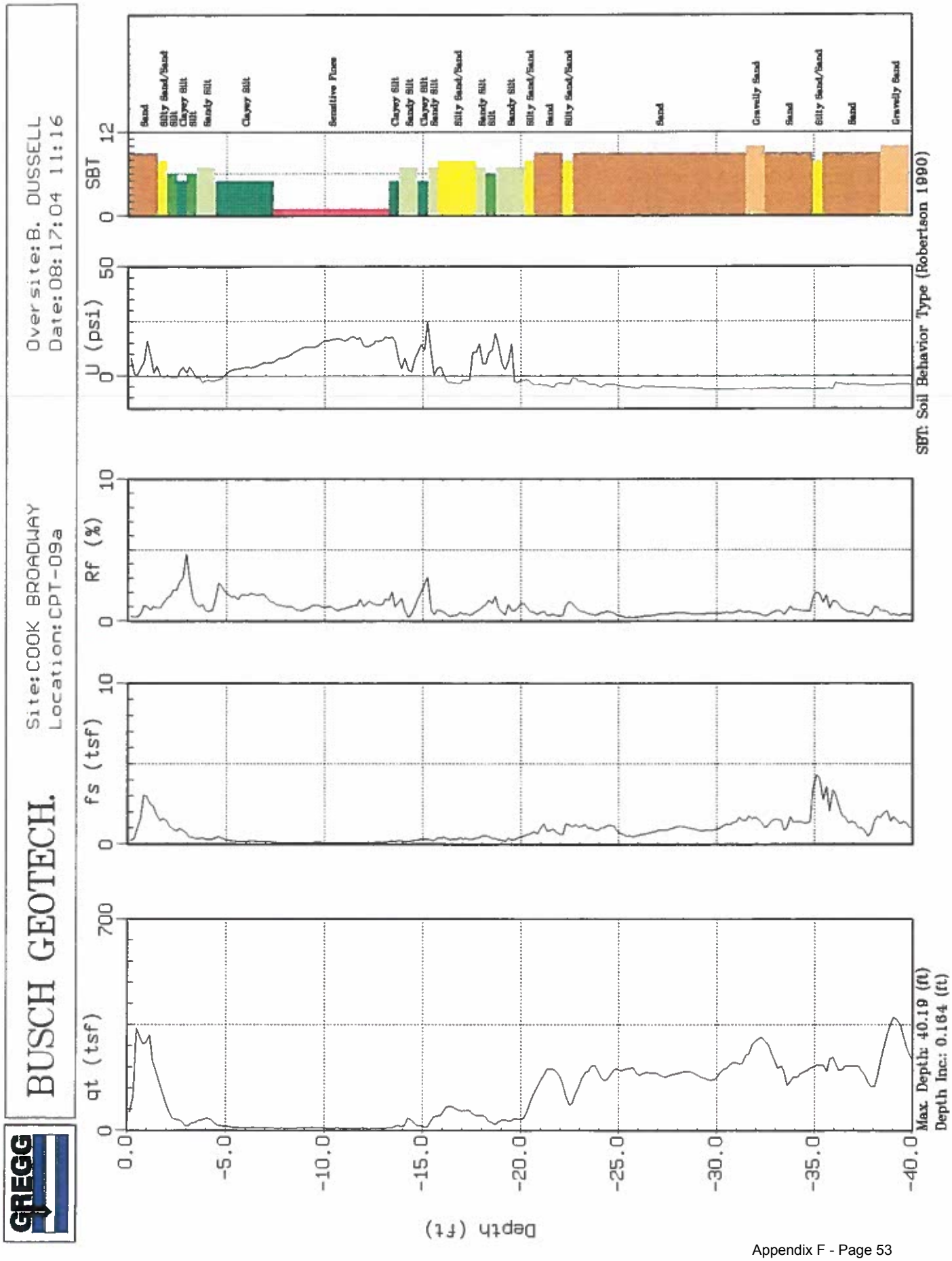
Site: COOK BROADWAY
Location: CPT-09

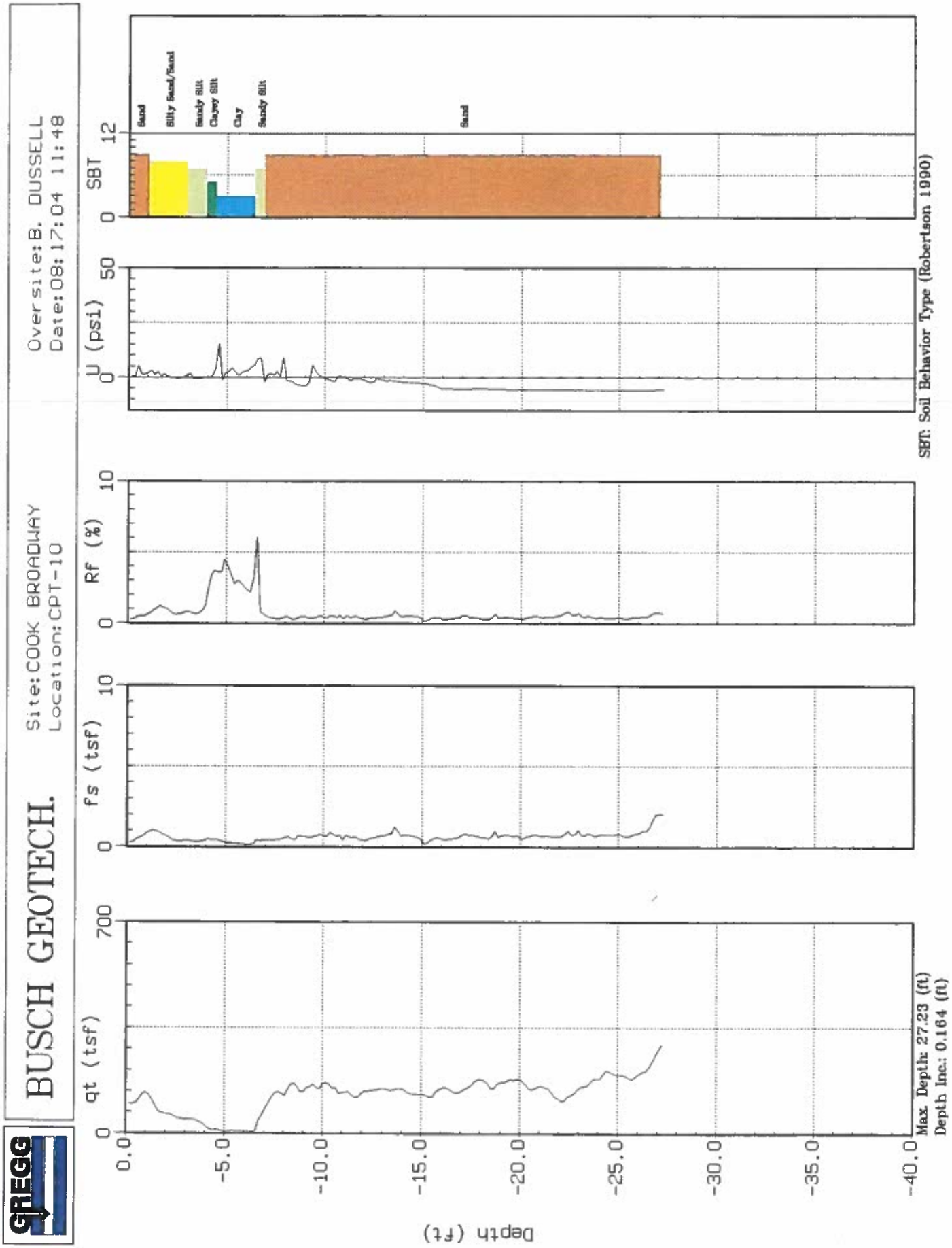
Oversite: B. DUSSELL
Date: 08:17:04 09:17

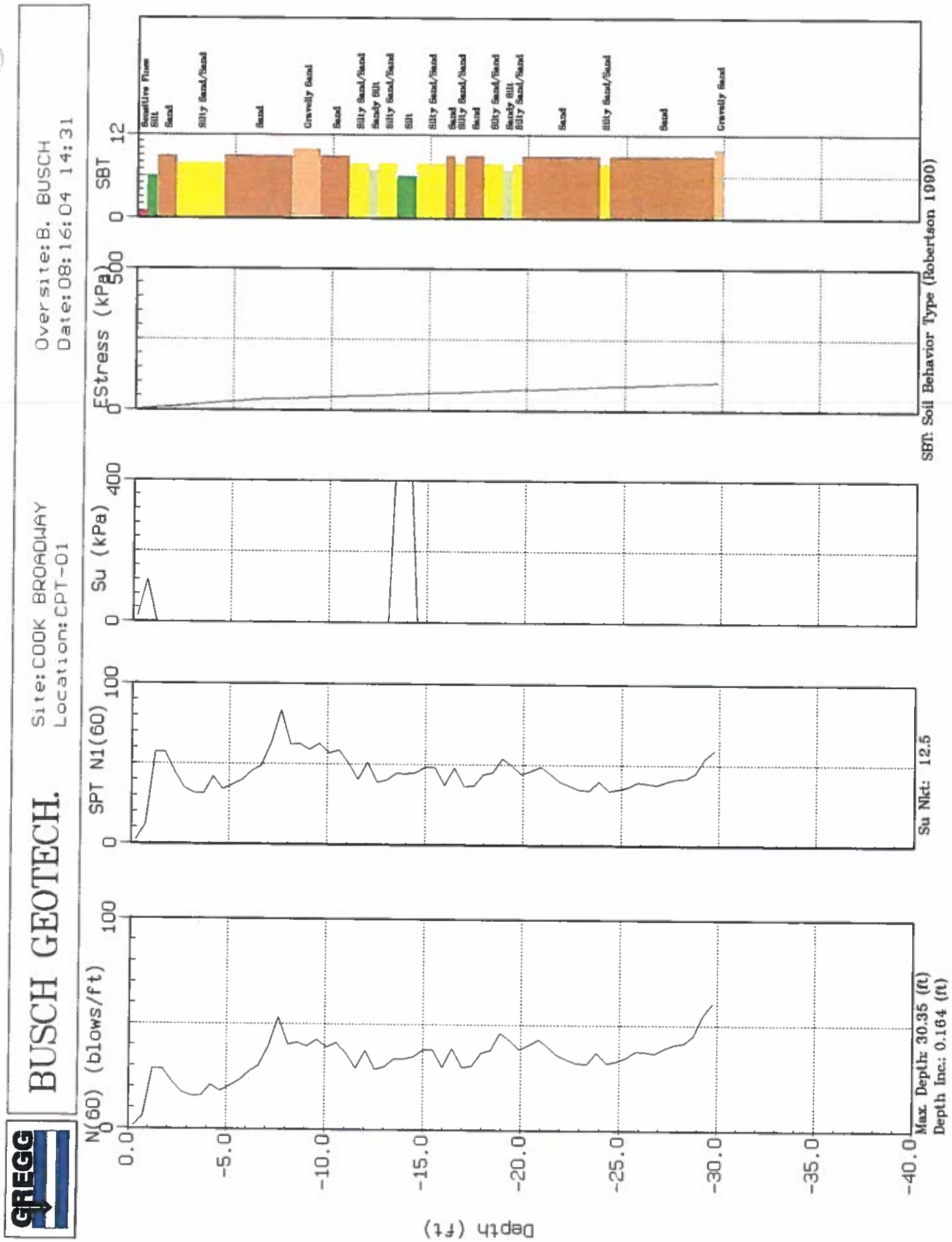


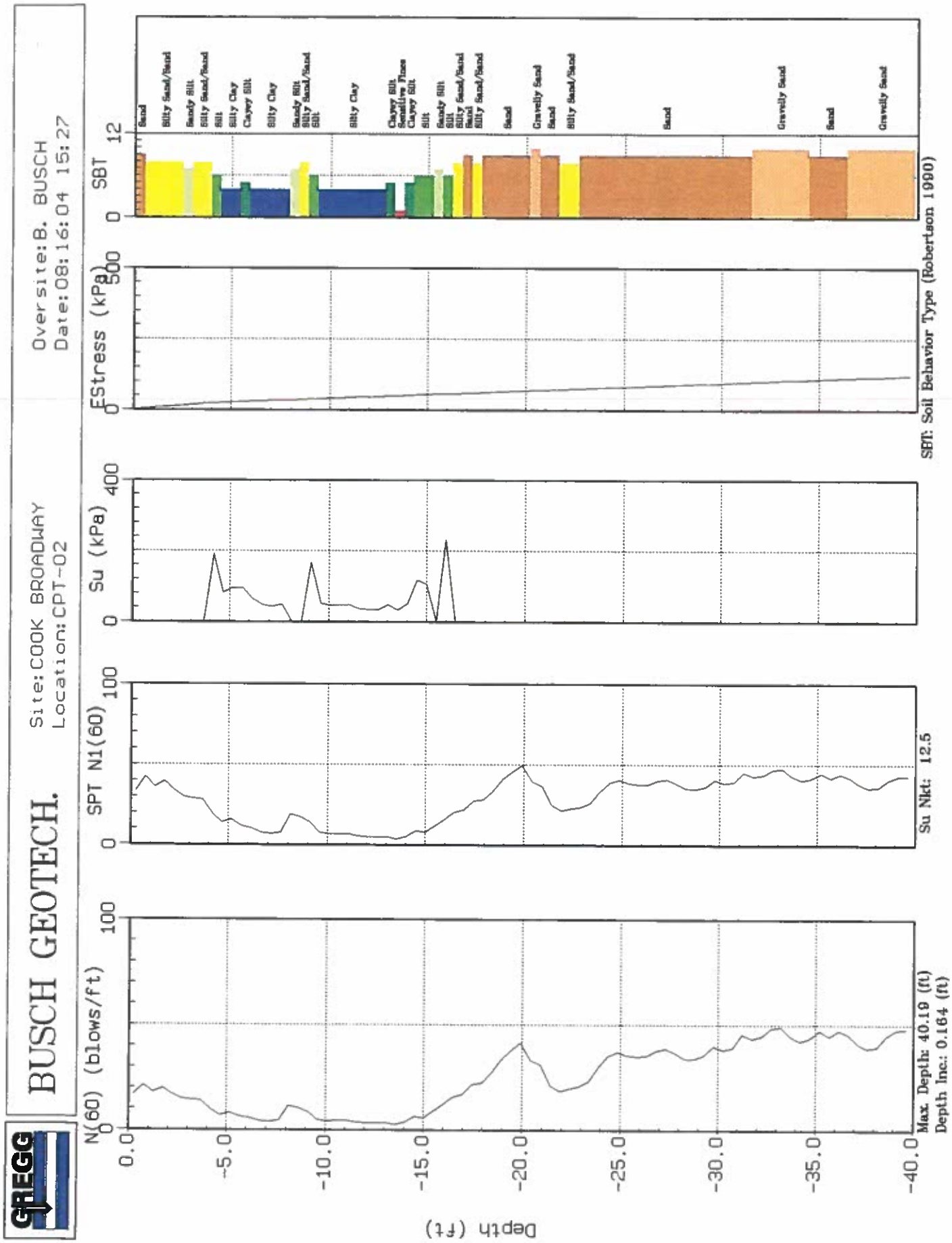
Max. Depth: 4.43 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-09a
Oversite: B. DUSSELL
Date: 08:17:04 11:16
qt (tsf)
fs (tsf)
Rf (%)
U (psi)
SBT
Sand
Silty Sand/Sand
Silt
Clayey Silt
Silt
Sandy Silt
Clayey Silt
Sensitive Fine
Clayey Silt
Sandy Silt
Clayey Silt
Sandy Silt
Silty Sand/Sand
Sandy Silt
Silt
Sandy Silt
Silty Sand/Sand
Sand
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Silty Sand/Sand
Sand
Gravelly Sand
Depth (ft)
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
Max. Depth: 40.19 (ft)
Depth Inc: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-10
Oversite: B. DUSSELL
Date: 08: 17: 04 11: 48
qt (tsf)
0
700
fs (tsf)
0
10
Rf (%)
0
10
U (psi)
0
50
SBT
0
12
Sand
Silty Sand/Sand
Sandy Silt
Clayey Silt
Clay
Sandy Silt
Sand
SBT: Soil Behavior Type (Robertson 1990)
Max. Depth: 27.23 (ft)
Depth Inc.: 0.164 (ft)
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
Depth (ft)


GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-01
Oversite: B. BUSCH
Date: 08:16:04 14:31
N(60) (blows/ft)
SPT N1(60)
Su (kPa)
EStress (kPa)
SBT
Depth (ft)
Max. Depth: 30.35 (ft)
Depth Inc.: 0.164 (ft)
Su Nkt: 12.5
SBT: Soil Behavior Type (Robertson 1990)

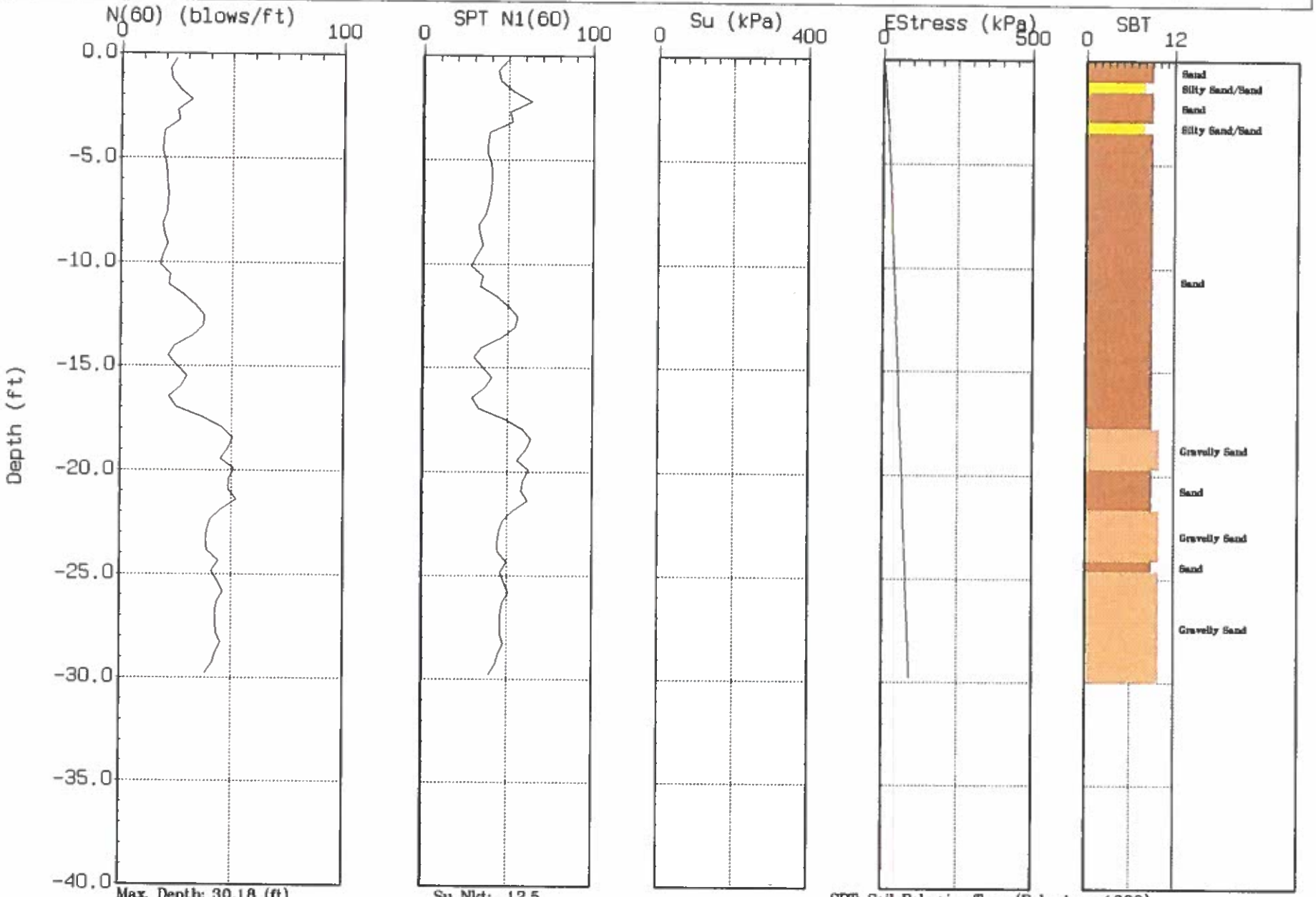

GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-02
Oversite: B. BUSCH
Date: 08:16:04 15:27
N(60) (blows/ft)
SPT N1(60)
Su (kPa)
EStress (kPa)
SBT
Depth (ft)
Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)
Su Nkt: 12.5
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-03

Oversite: B. BUSCH
Date: 08:16:04 16:08



Max. Depth: 30.18 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

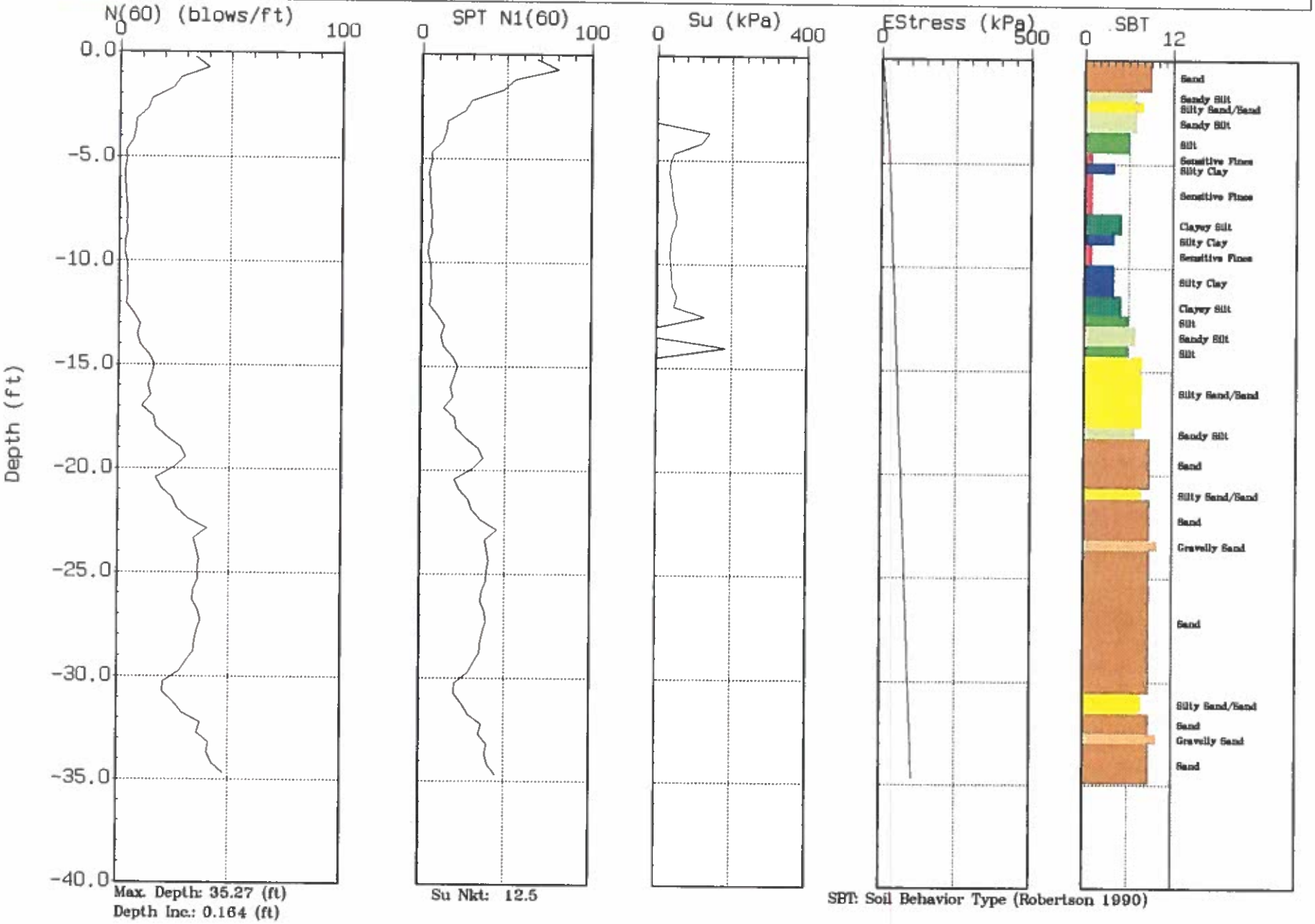
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-04

Oversite: B. DUSSELL
Date: 08:16:04 17:11



Max. Depth: 35.27 (ft)
Depth Inc.: 0.164 (ft)

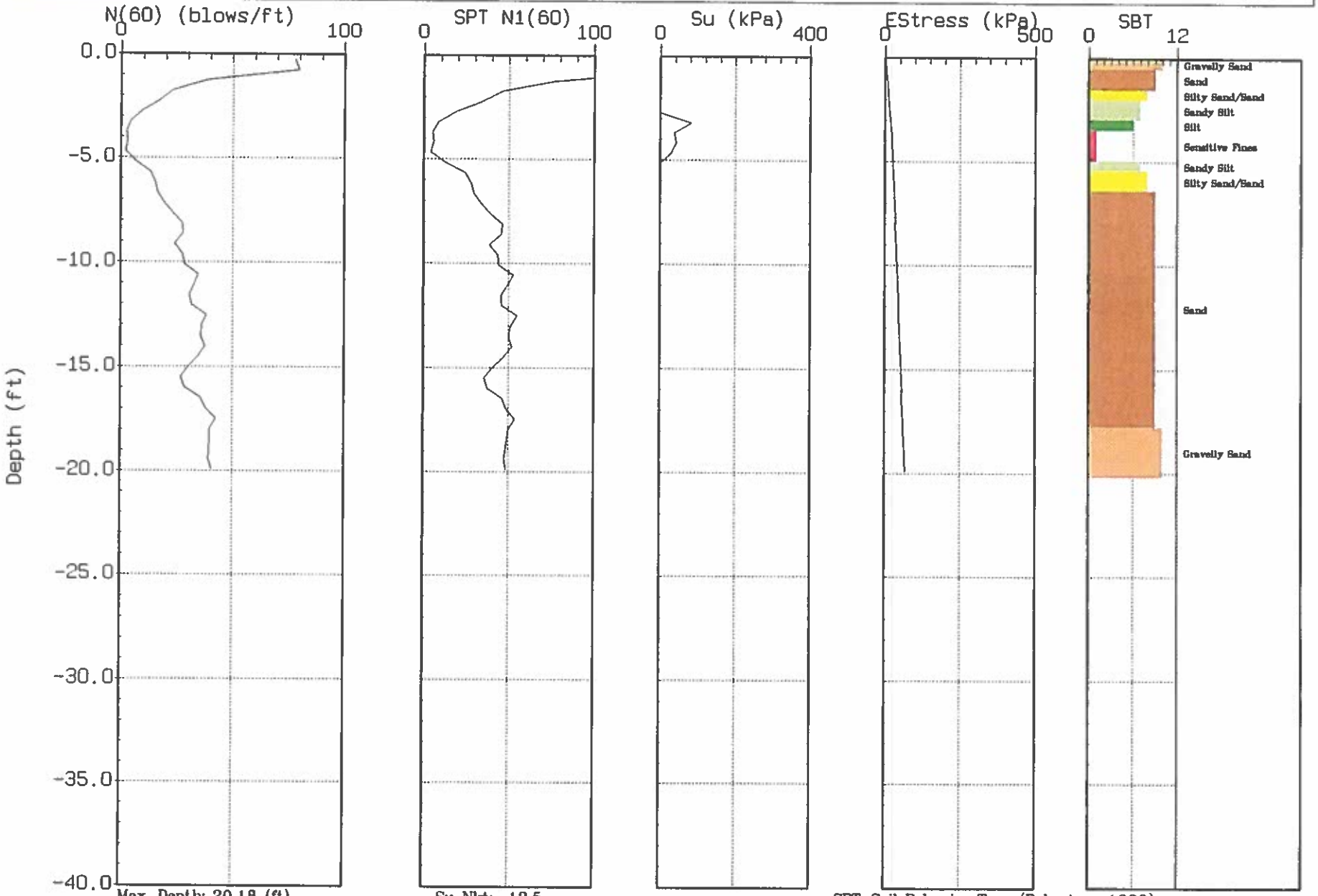
Su Nkt: 12.5

SBT: Soil Behavior Type (Robertson 1990)

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-05

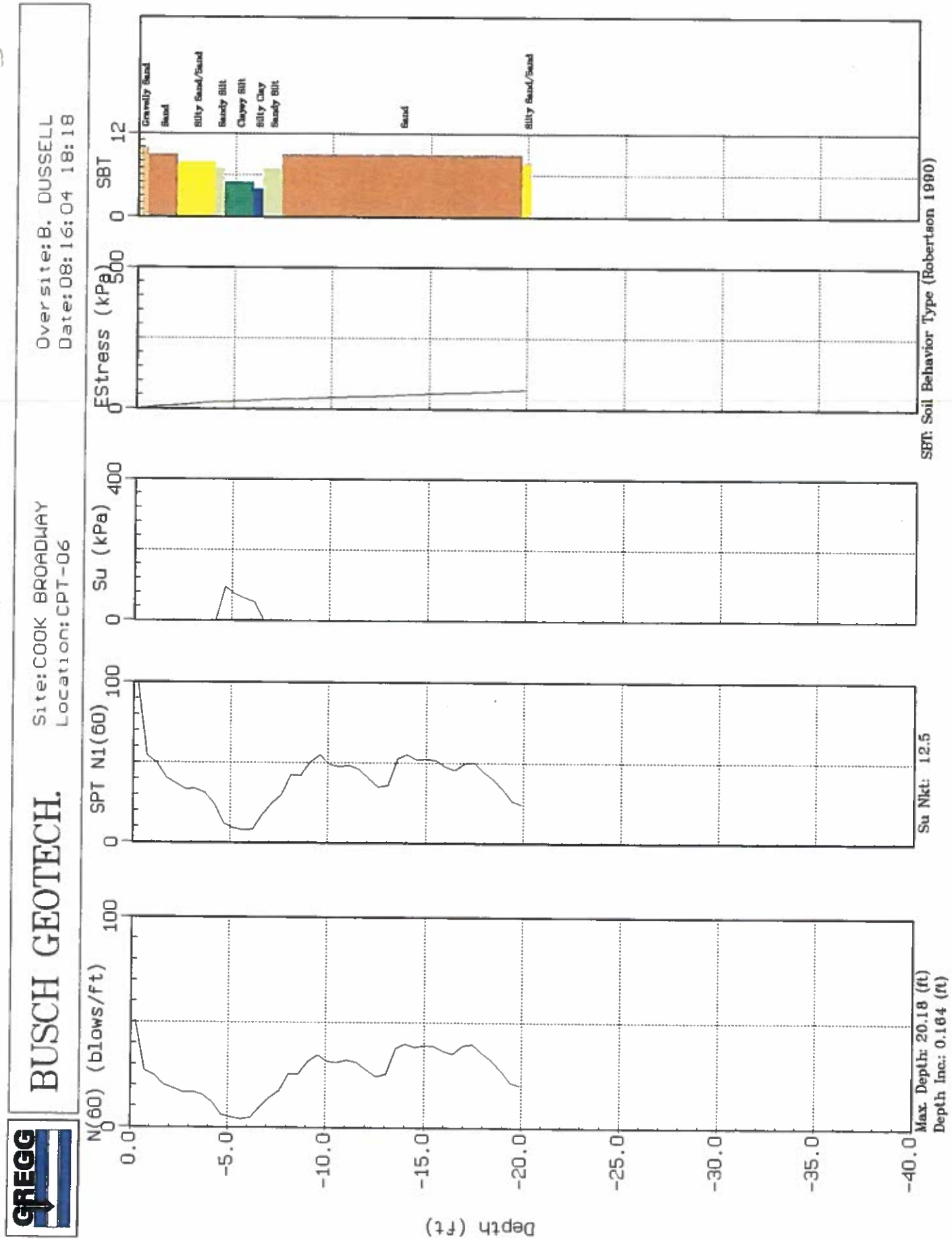
Oversite: B. DUSSELL
Date: 08:16:04 17:52

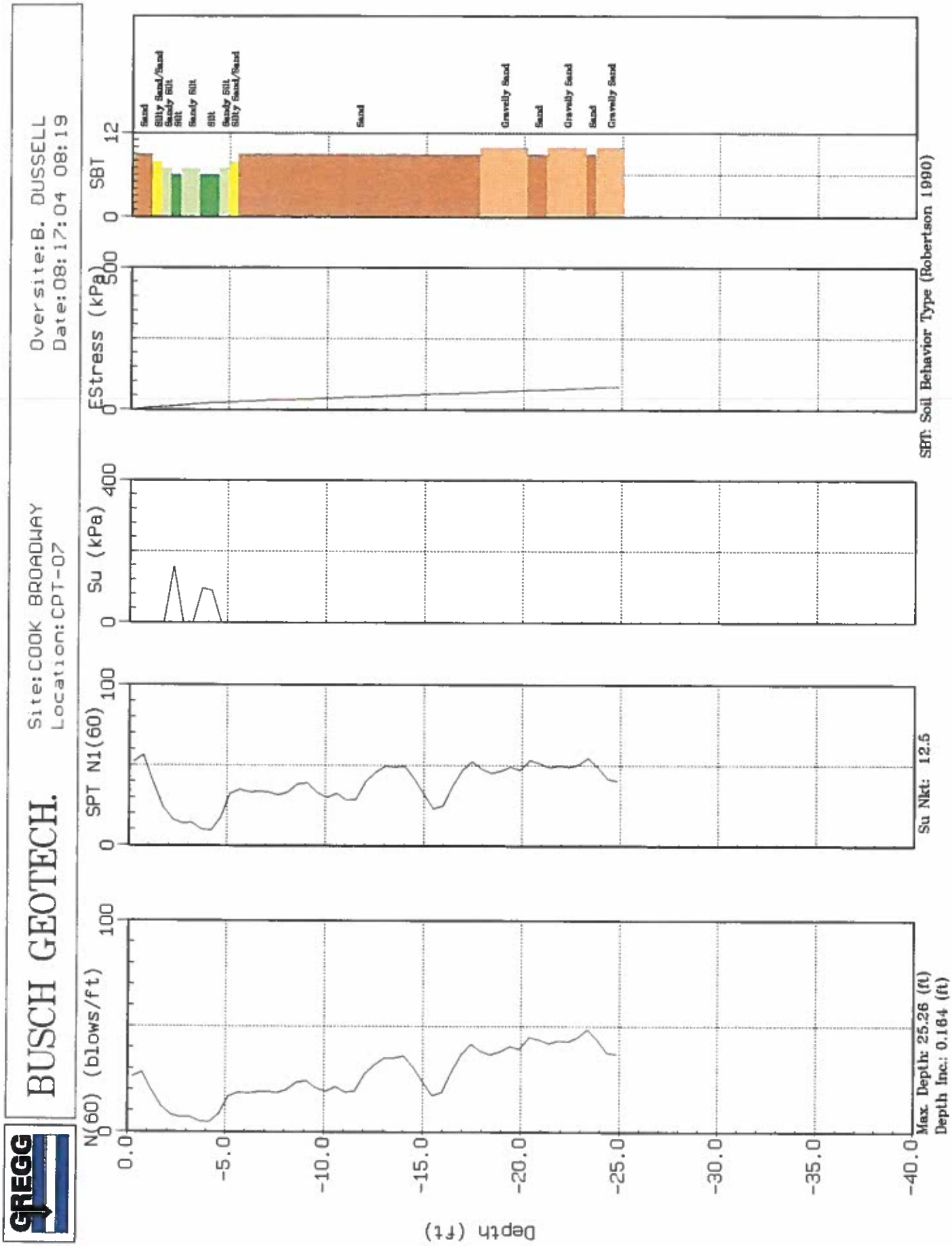


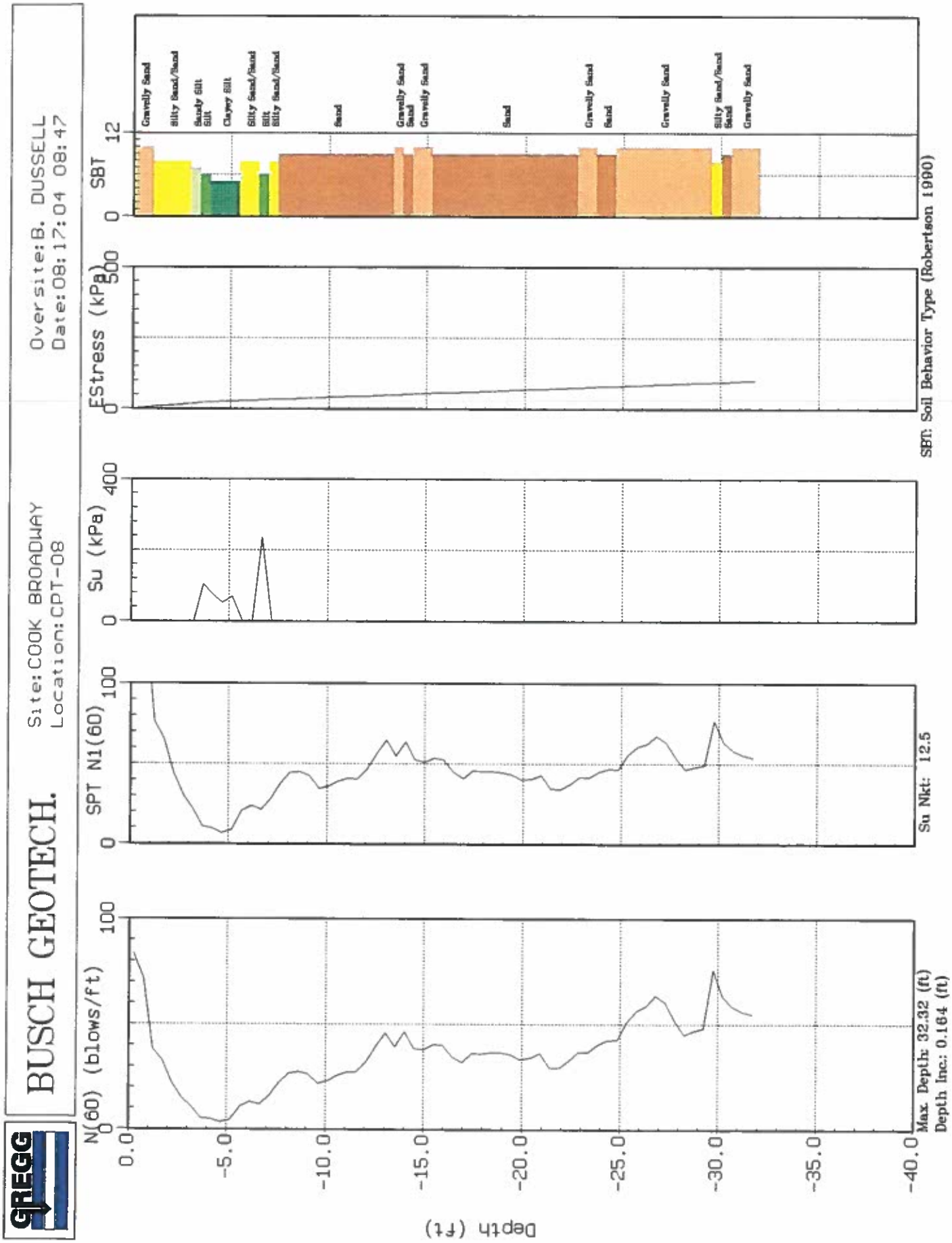
Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH
Site:COOK BROADWAY
Location:CPT-06
Oversite:B. DUSSELL
Date:08:16:04 18:18
N(60) (blows/ft)
SPT N1(60)
Su (kPa)
EStress (kPa)
SBT
Gravelly Sand
Sand
Silty Sand/Sand
Sandy Silt
Clayey Silt
Silty Clay
Sandy Silt
Sand
Silty Sand/Sand
Su Nkt: 12.5
SBT: Soil Behavior Type (Robertson 1990)
Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)
Depth (ft)

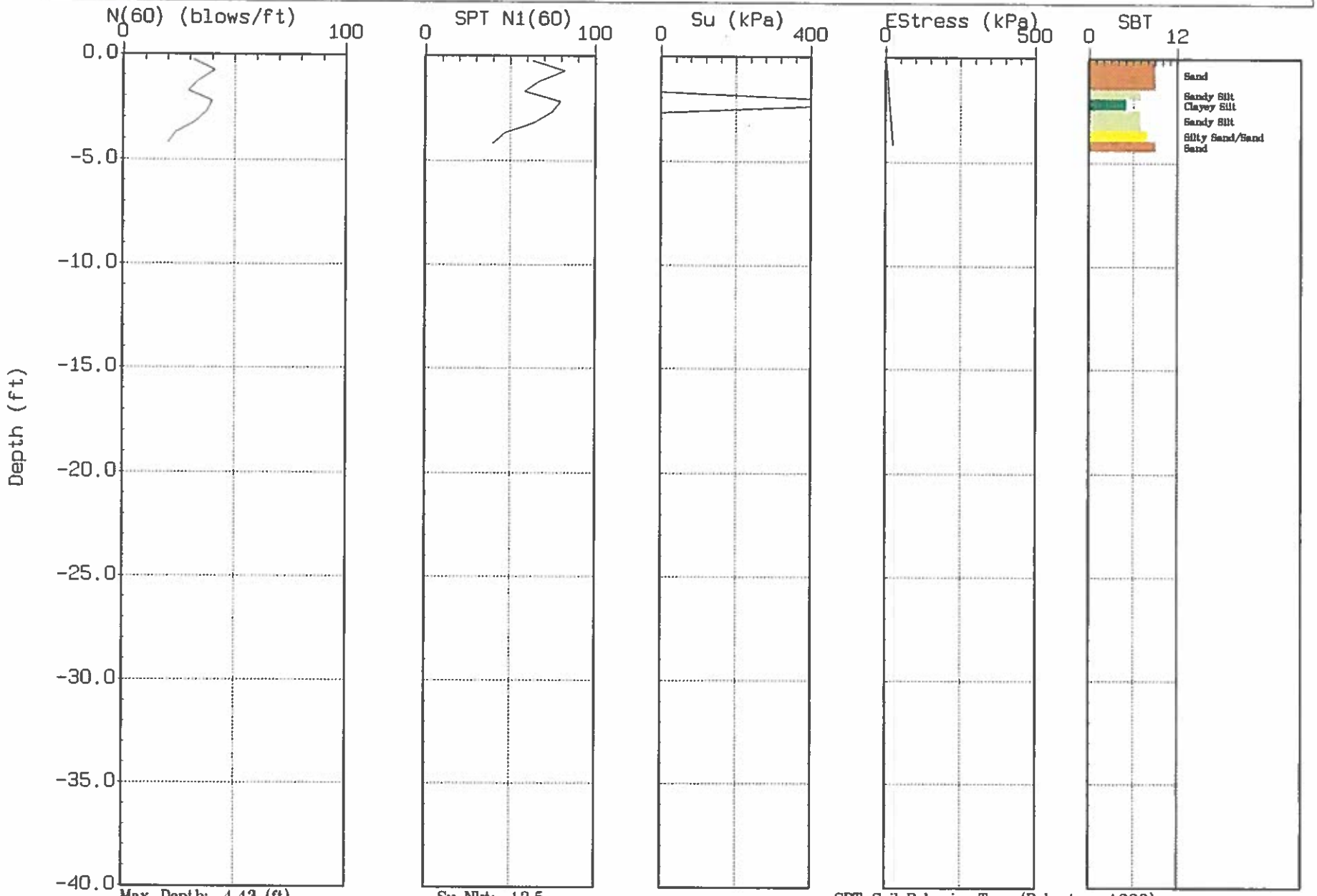

GREGG
BUSCH GEOTECH.
Site:COOK BROADWAY
Location:CPT-07
Oversite:B. DUSSELL
Date:08:17:04 08:19
N(60) (blows/ft)
SPT N1(60)
Su (kPa)
EStress (kPa)
SBT
Sand
Silty Sand/Sand
Sandy Silt
Silt
Gravelly Sand
Depth (ft)
Max. Depth: 25.26 (ft)
Depth Inc.: 0.164 (ft)
Su Nkt: 12.5
SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-08
Oversite: B. DUSSELL
Date: 08:17:04 08:47
N(60) (blows/ft)
SPT N1(60)
Su (kPa)
EStress (kPa)
SBT
Gravelly Sand
Silty Sand/Sand
Sandy Silt
Silt
Clayey Silt
Silty Sand/Sand
Silt
Silty Sand/Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
Sand
Gravelly Sand
Silty Sand/Sand
Sand
Gravelly Sand
Depth (ft)
Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)
Su Nkt: 12.5
SBT: Soil Behavior Type (Robertson 1990)

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-09

Oversite: B. DUSSELL
Date: 08:17:04 09:17



Max. Depth: 4.43 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

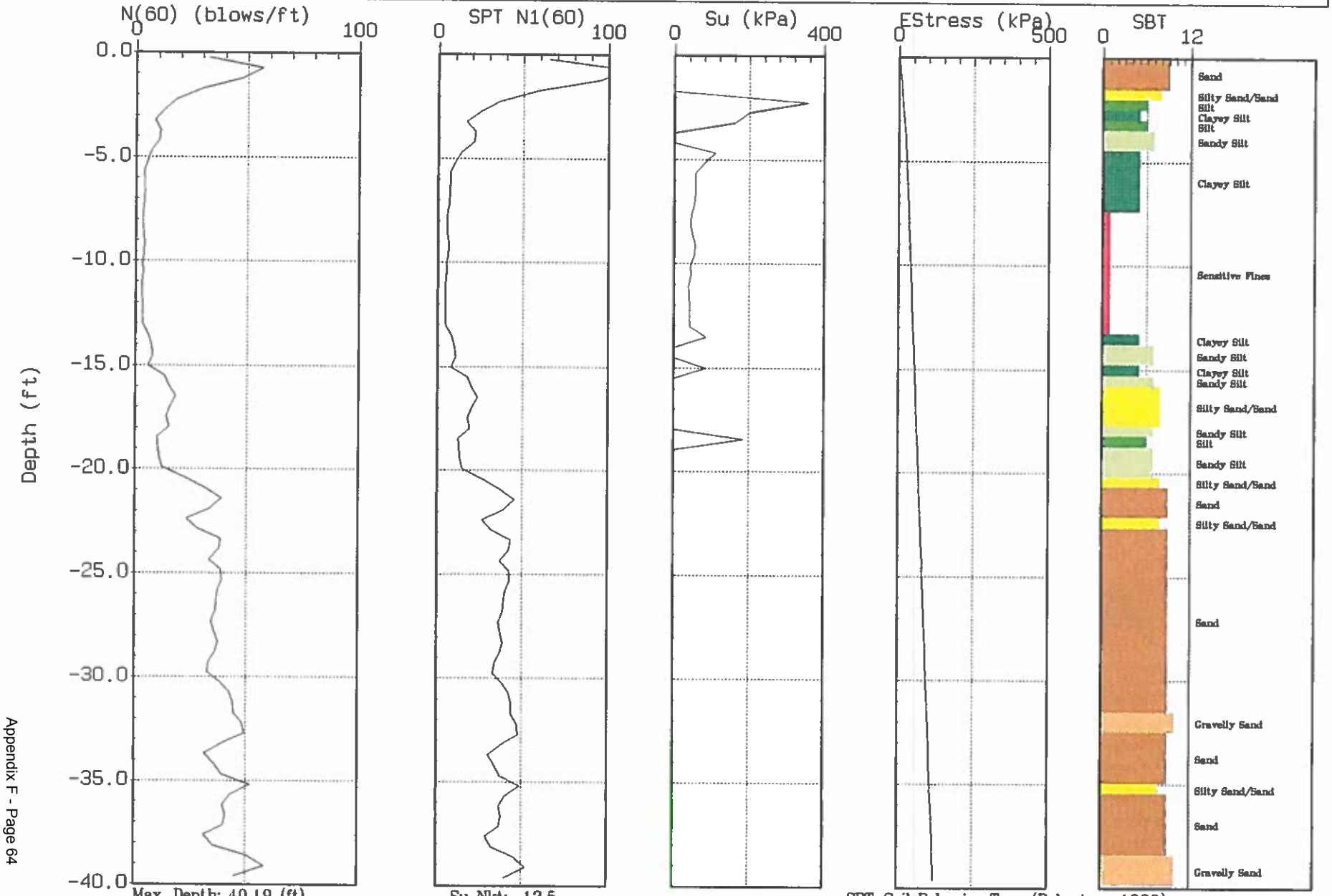
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-09a

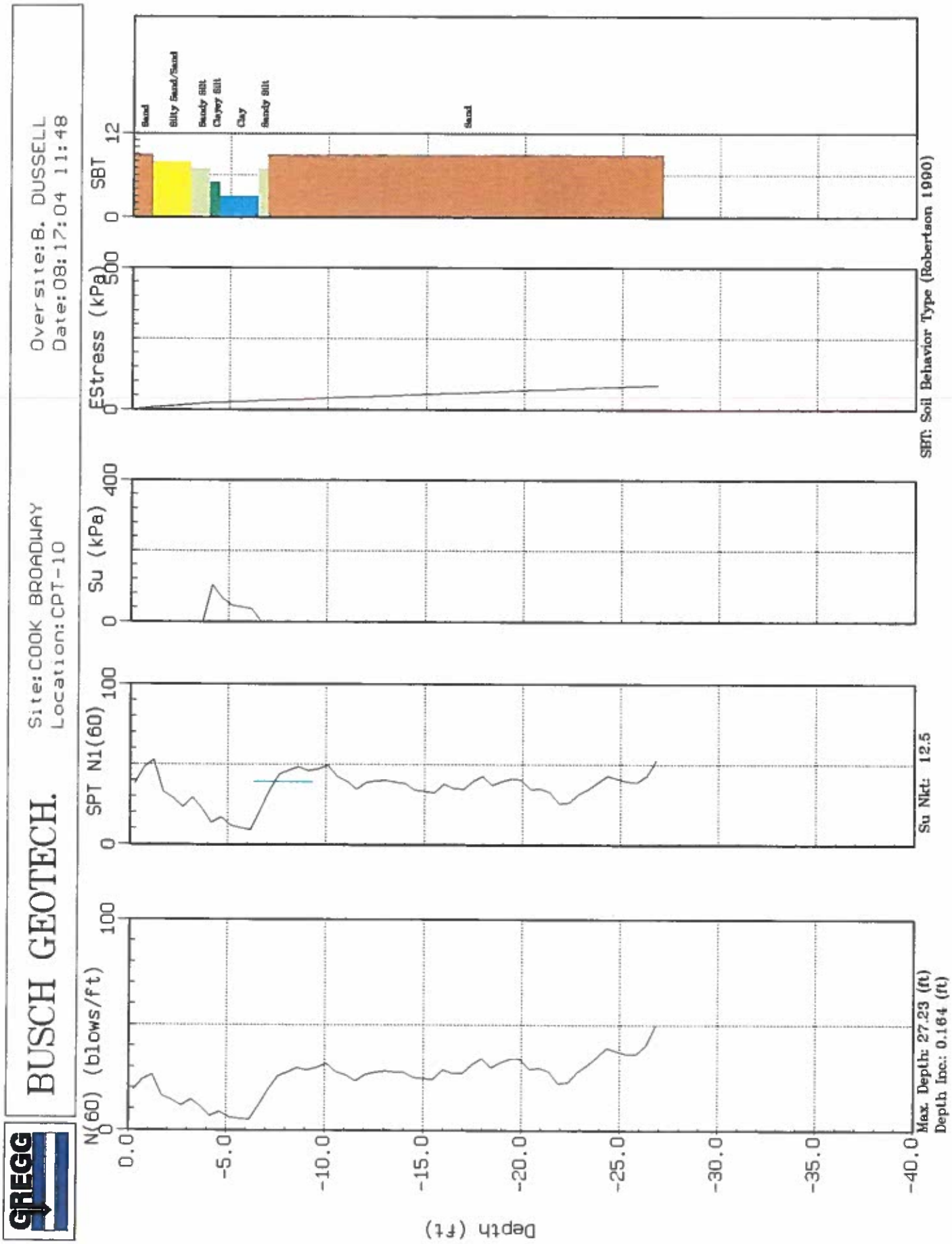
Oversite: B. DUSSELL
Date: 08:17:04 11:16



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

SBT: Soil Behavior Type (Robertson 1990)


GREGG
BUSCH GEOTECH.
Site: COOK BROADWAY
Location: CPT-10
Oversite: B. DUSSELL
Date: 08:17:04 11:48
N(60) (blows/ft)
SPT N1(60)
Su (kPa)
EStress (kPa)
SBT
Sand
Silty Sand/Sand
Sandy Silt
Clayey Silt
Clay
Sandy Silt
Sand
Depth (ft)
Max. Depth: 27.23 (ft)
Depth Inc: 0.164 (ft)
Su Nkt: 12.5
SBT: Soil Behavior Type (Robertson 1990)

APPENDIX PPDT

Pore Pressure Dissipation Tests (PPDT)

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals measured hydrostatic water pressures and determined the approximate depth of the ground water table. A PPDT is conducted when the cone is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (u) with time is measured behind the tip of the cone and recorded by a computer system.

Pore pressure dissipation data can be interpreted to provide estimates of:

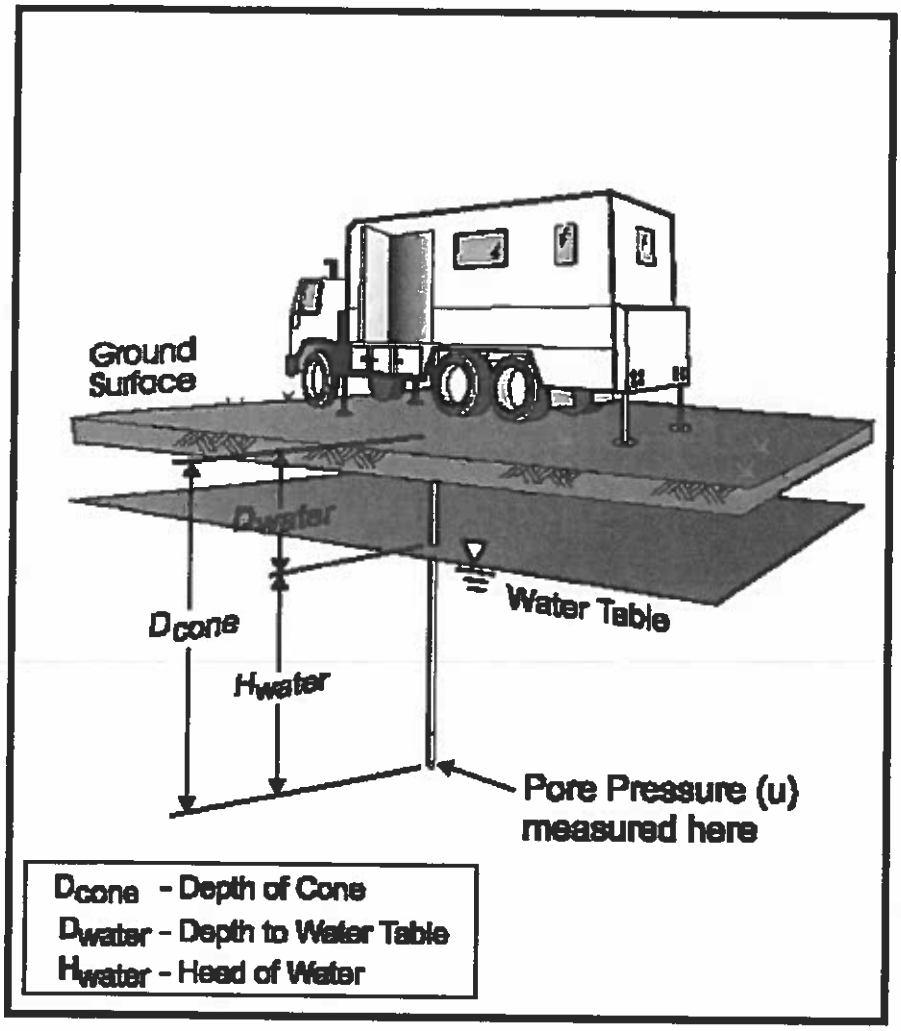
- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation (c_h)
- In situ horizontal coefficient of permability (k_h)

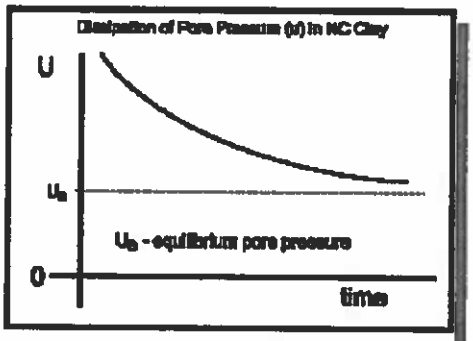
In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until such time as there is no variation in pore pressure with time (refer to Figure PPD). This time is commonly referred to as t_{100}, the point at which 100% of the excess pore pressure has dissipated.

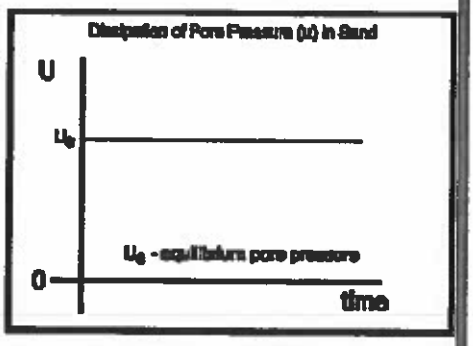
Interpretation of either c_h and k_h from dissipation results can be most easily achieved using either of two analytical approaches: cavity-expansion theory or the strain-path approach. Comparisons of the available solutions and results from field studies suggest that the cavity-expansion method of Torstensson (1977) and the strain-path approaches of Levadous (1980) and Teh (1987) all provide similar predications of consolidation parameters from CPTU dissipation data (Gillespie 1981; Kabir and Lutenegger 1990; Robertson et al. (1991). Robertson et al. (1991) have shown that these methods, although developed for normally consolidated soils, can be equally applied to overconsolidated soils. Furthermore, comparisons of field and laboratory data indicate that the trends in the measured (laboratory) and predicated (CPTU) data are consistent provided the micro fabric and nature of the soils being tested are taken into consideration. (Danziger 1990; Robertson et al. 1991).

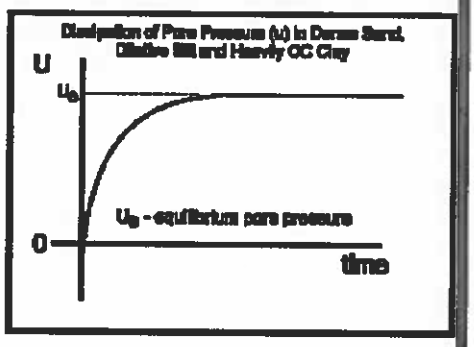
A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1991.

A summary of the pore pressure dissipation tests is summarized in Table 1.
Pore pressure dissipation data is presented in graphical form in Appendix PPDT.









Water Table Calculation

$$D_{water} = D_{cone} - H_{water}$$

where $H_{water} = U_e$ (depth units)

Useful Conversion Factors:

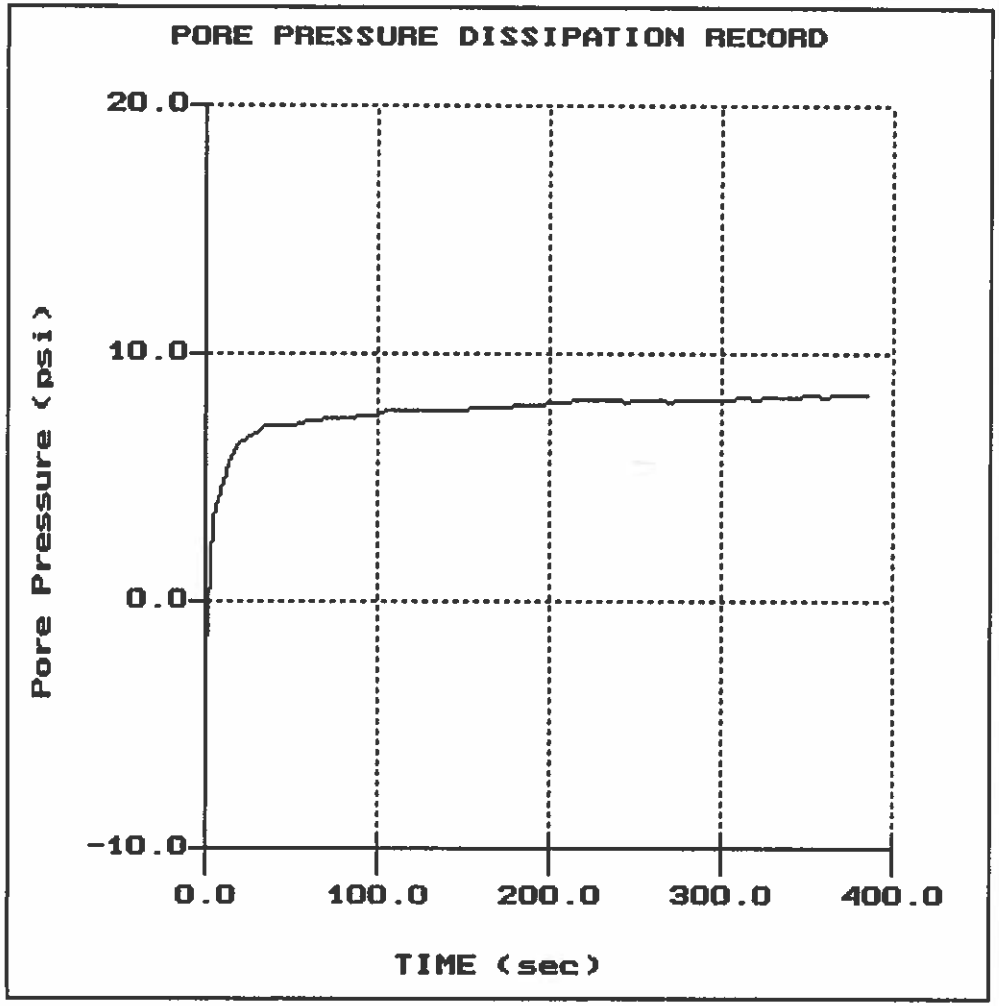
1psi = 0.704m = 2.31 feet (water)
1tsf = 0.958 bar = 13.9 psi
1m = 3.28 feet

Figure PPD

BUSCH GEOTECH

Site: COOK BROADWAY
Location: CPT-04

Oversite: B. DUSSELL
Date:08:16:04 17:11

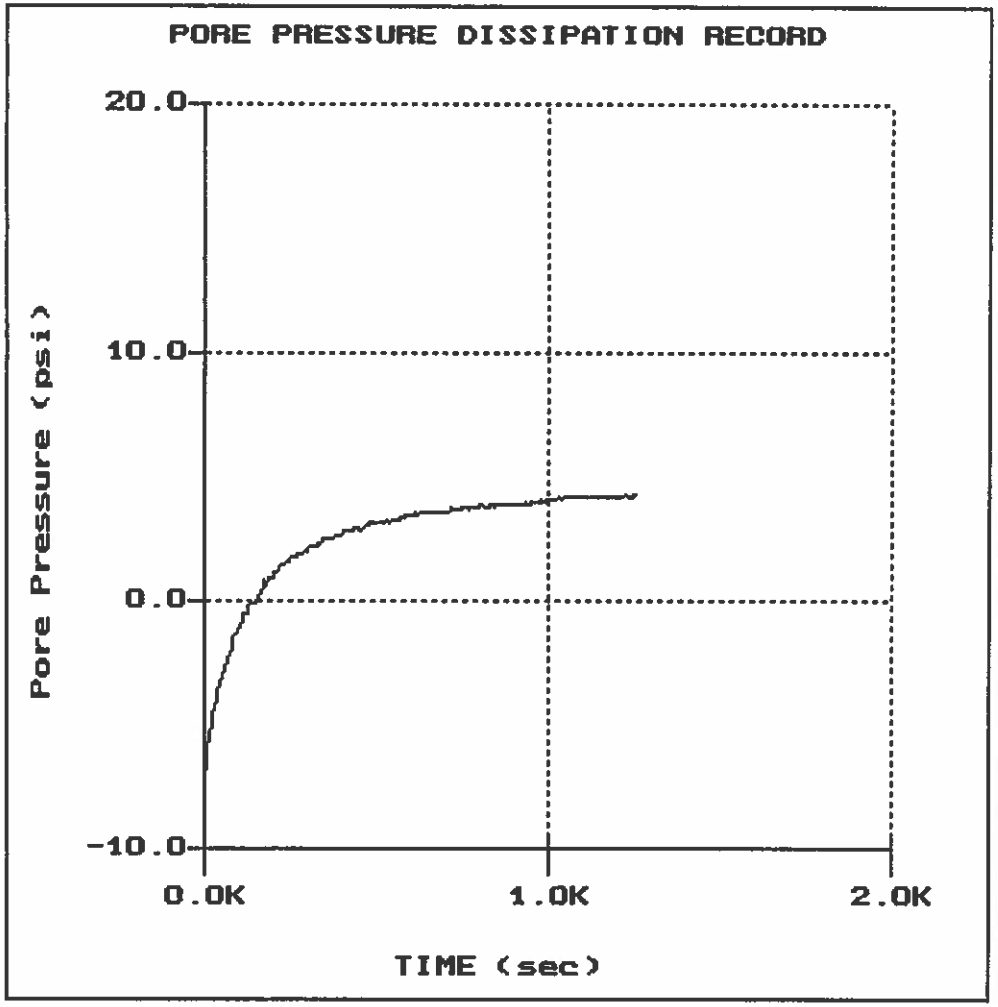


File: 272C04.PPC
Depth (m): 5.85
(ft): 19.19
Duration : 385.0s
U-min: -2.38 0.0s
U-max: 8.36 380.0s

BUSCH GEOTECH

Site: COOK BROADWAY
Location: CPT-03

Oversite: B. BUSCH
Date:08:16:04 16:08

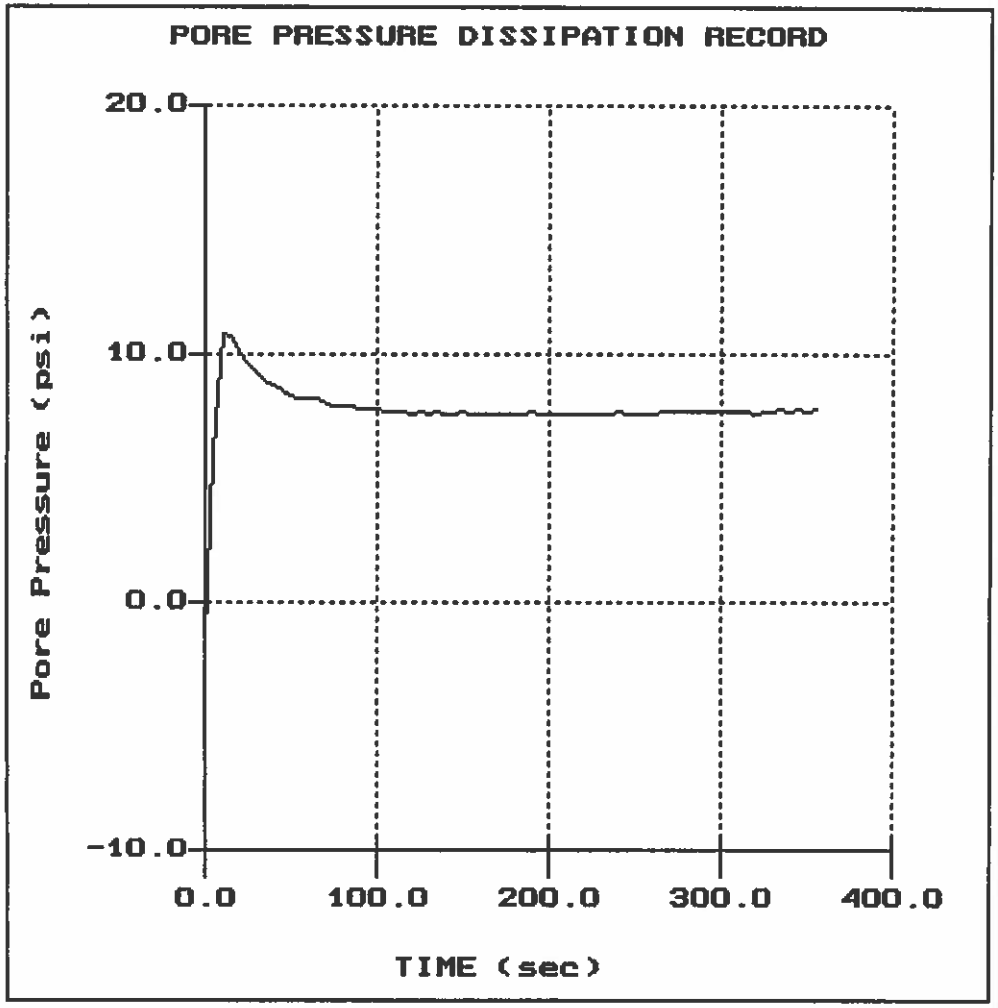


File: 272C03.PPC
Depth (m): 3.75
(ft): 12.30
Duration : 1255.0s
U-min: -6.77 5.0s
U-max: 4.27 1245.0s

BUSCH GEOTECH

Site: COOK BROADWAY
Location: CPT-02

Oversite: B. BUSCH
Date:08:16:04 15:27

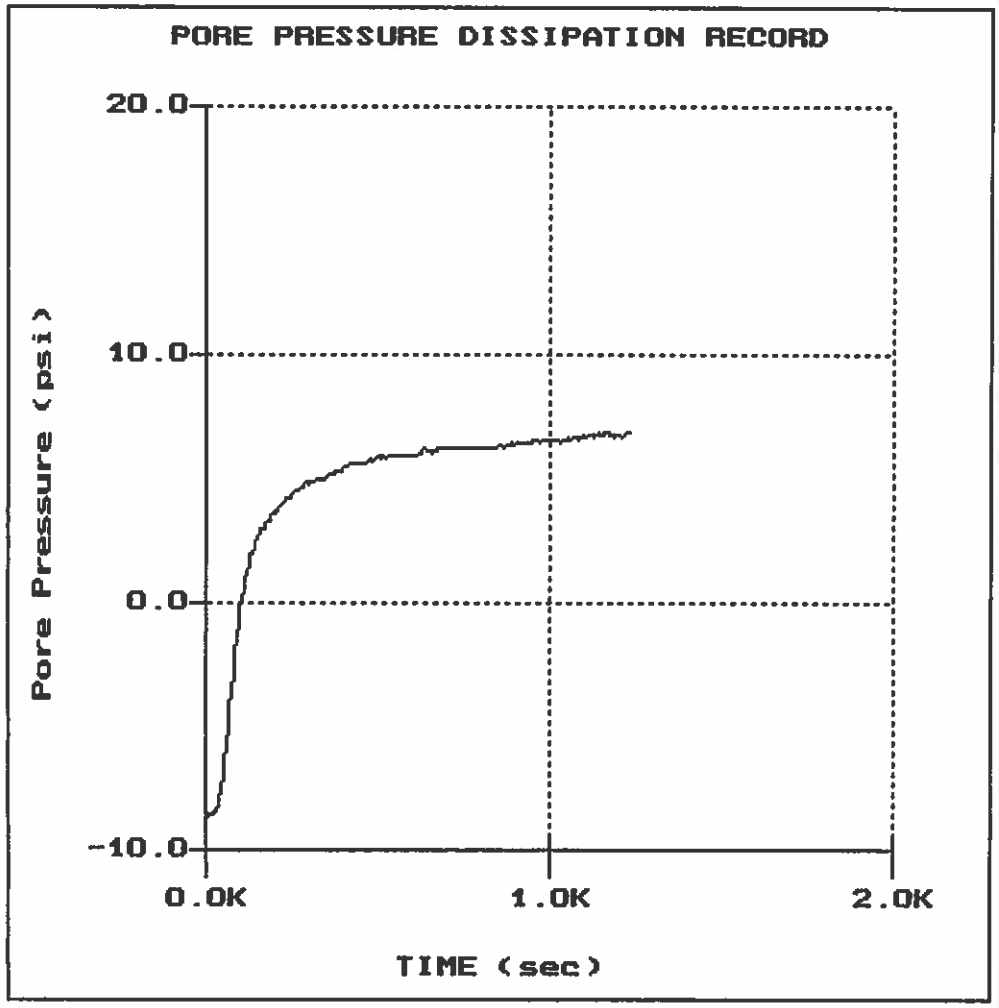


File: 272C02.PPC
Depth (m): 5.20
(ft): 17.06
Duration : 355.0s
U-min: -1.81 0.0s
U-max: 10.84 10.0s

BUSCH GEOTECH

Site: COOK BROADWAY
Location: CPT-01

Oversite: B. BUSCH
Date:08:16:04 14:31



File: 272C01.PPC
Depth (m): 6.10
(ft): 20.01
Duration : 1230.0s
U-min: -8.73 0.0s
U-max: 6.90 1225.0s

Gregg In Situ, Inc. Page: 1a
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-4935
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-01
Engineer: B. BUSCH
CPT Date: 04/16/08
CPT Time: 14:31
CPT File: 272C01.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.83 (ft): 6.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.25	2.0	0.02	1.00	0.1	1	79.6	0.01	0.01	0.00	2.00	1.0	1.9	0.16	0.00
0.74	15.4	0.09	0.61	4.2	6	114.6	0.03	0.03	0.00	2.00	5.9	11.8	1.23	0.00
1.23	148.6	0.56	0.38	11.2	9	124.1	0.06	0.06	0.00	2.00	28.5	56.9	UnDef	0.00
1.72	148.7	0.97	0.65	5.5	9	124.1	0.09	0.09	0.00	2.00	28.5	57.0	UnDef	0.00
2.21	92.1	0.59	0.64	2.8	8	120.9	0.12	0.12	0.00	2.00	22.1	44.1	UnDef	0.00
2.71	72.7	0.39	0.54	3.9	8	120.9	0.15	0.15	0.00	2.00	17.4	34.8	UnDef	0.33
3.20	65.6	0.36	0.56	1.0	8	120.9	0.18	0.18	0.00	2.00	15.7	31.4	UnDef	0.26
3.61	63.2	0.36	0.56	0.9	8	120.9	0.21	0.21	0.00	2.00	15.1	30.3	UnDef	0.25
4.02	79.0	0.57	0.72	1.9	8	120.9	0.23	0.23	0.00	2.00	18.9	37.8	UnDef	0.40
4.51	92.1	0.56	0.61	1.7	8	120.9	0.26	0.26	0.00	1.95	22.0	43.0	UnDef	0.00
5.00	102.9	0.53	0.52	1.3	9	124.1	0.29	0.29	0.00	1.85	19.7	36.4	UnDef	0.00
5.50	114.3	0.49	0.43	1.3	9	124.1	0.32	0.32	0.00	1.76	21.9	38.5	UnDef	0.00
5.99	135.9	0.47	0.34	0.6	9	124.1	0.35	0.35	0.00	1.68	26.0	43.8	UnDef	0.00
6.56	155.0	0.51	0.33	0.6	9	124.1	0.39	0.37	0.02	1.64	29.7	48.7	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-4935
CPT File: 272C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	206.4	0.89	0.43	0.8	9	124.1	0.43	0.39	0.04	1.60	39.5	63.4	UnDef	0.00
7.63	277.3	1.74	0.63	-1.8	9	124.1	0.46	0.40	0.05	1.57	53.1	83.5	UnDef	0.00
8.12	252.1	0.46	0.18	-7.2	10	127.3	0.49	0.42	0.07	1.54	40.2	62.1	UnDef	0.00
8.61	257.6	0.65	0.25	-8.1	10	127.3	0.52	0.44	0.08	1.51	41.1	62.2	UnDef	0.00
9.10	246.6	0.43	0.18	-10.3	10	127.3	0.55	0.45	0.10	1.49	39.4	58.5	UnDef	0.00
9.60	222.4	1.09	0.49	-6.2	9	124.1	0.58	0.47	0.11	1.46	42.6	62.3	UnDef	0.00
10.09	204.3	1.21	0.59	-10.3	9	124.1	0.61	0.48	0.13	1.44	39.1	56.3	UnDef	0.00
10.58	214.5	1.06	0.49	-9.6	9	124.1	0.64	0.50	0.14	1.42	41.1	58.2	UnDef	0.00
11.07	150.8	2.11	1.40	-11.9	8	120.9	0.67	0.51	0.16	1.40	36.1	50.4	UnDef	0.00
11.56	121.6	2.11	1.73	-14.2	7	117.8	0.70	0.53	0.17	1.38	38.8	53.5	UnDef	0.00
12.06	116.9	2.08	1.78	-16.4	7	117.8	0.73	0.54	0.19	1.36	37.3	50.8	UnDef	0.00
12.55	119.1	1.36	1.14	-17.5	8	120.9	0.76	0.55	0.20	1.34	28.5	38.3	UnDef	0.00
13.04	125.4	1.93	1.54	-15.9	8	120.9	0.79	0.57	0.22	1.33	30.0	39.8	UnDef	0.00
13.53	87.7	2.68	3.05	-17.1	6	114.6	0.82	0.58	0.24	1.31	33.6	44.0	6.95	0.00
14.03	88.1	2.59	2.94	-16.5	6	114.6	0.85	0.60	0.25	1.30	33.7	43.7	6.98	0.00
14.52	144.9	2.36	1.63	-16.7	8	120.9	0.88	0.61	0.27	1.28	34.7	44.5	UnDef	0.00
15.01	158.6	2.04	1.29	-17.6	8	120.9	0.90	0.62	0.28	1.27	38.0	48.1	UnDef	0.00
15.50	159.1	1.97	1.24	-18.3	8	120.9	0.93	0.64	0.30	1.25	38.1	47.7	UnDef	0.00
15.99	155.4	1.21	0.78	-17.0	9	124.1	0.96	0.65	0.31	1.24	29.8	36.8	UnDef	0.00
16.49	161.7	1.99	1.23	-15.4	8	120.9	0.99	0.67	0.33	1.22	38.7	47.4	UnDef	0.00
16.98	155.7	1.13	0.73	-17.1	9	124.1	1.03	0.68	0.34	1.21	29.8	36.1	UnDef	0.00
17.47	158.9	1.75	1.10	-19.0	8	120.9	1.06	0.70	0.36	1.20	38.0	45.6	UnDef	0.00
17.96	152.5	1.89	1.24	-19.0	8	120.9	1.08	0.71	0.37	1.19	36.5	43.3	UnDef	0.00
18.45	159.2	2.01	1.26	-19.4	8	120.9	1.11	0.73	0.39	1.17	38.1	44.7	UnDef	0.00
18.95	144.0	2.73	1.90	-19.5	7	117.8	1.14	0.74	0.40	1.16	46.0	53.5	UnDef	0.00
19.44	178.9	2.53	1.41	-19.7	8	120.9	1.17	0.75	0.42	1.15	42.8	49.3	UnDef	0.00
19.93	200.5	1.29	0.64	-12.1	9	124.1	1.20	0.77	0.43	1.14	38.4	43.8	UnDef	0.00
20.42	211.3	2.55	1.21	-11.1	8	120.9	1.23	0.78	0.45	1.13	50.6	57.2	UnDef	0.00
20.92	225.9	2.63	1.17	-15.0	9	124.1	1.26	0.80	0.47	1.12	43.3	48.4	UnDef	0.00
21.41	206.4	2.52	1.22	-15.0	8	120.9	1.29	0.81	0.48	1.11	49.4	54.8	UnDef	0.00
21.90	186.0	2.21	1.19	-15.0	8	120.9	1.32	0.83	0.50	1.10	44.5	49.0	UnDef	0.00
22.39	174.9	1.34	0.77	-15.4	9	124.1	1.35	0.84	0.51	1.09	33.5	36.5	UnDef	0.00
22.88	165.6	1.92	1.16	-16.1	8	120.9	1.38	0.86	0.53	1.08	39.7	42.8	UnDef	0.00
23.38	164.6	1.85	1.13	-16.3	8	120.9	1.41	0.87	0.54	1.07	39.4	42.2	UnDef	0.00
23.87	154.4	1.78	1.15	-16.8	8	120.9	1.44	0.89	0.56	1.06	37.0	39.3	UnDef	0.00
24.36	165.7	1.94	1.17	-17.1	8	120.9	1.47	0.90	0.57	1.05	39.7	41.8	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-4935
CPT File: 272C01.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
24.85	171.6	1.57	0.92	-17.5	9	124.1	1.50	0.91	0.59	1.05	32.9	34.4	UnDef	0.00
25.34	179.9	1.61	0.89	-17.9	9	124.1	1.53	0.93	0.60	1.04	34.5	35.7	UnDef	0.00
25.84	196.8	1.25	0.63	-18.4	9	124.1	1.56	0.95	0.62	1.03	37.7	38.8	UnDef	0.00
26.33	194.9	2.25	1.15	-18.7	9	124.1	1.60	0.96	0.63	1.02	37.3	38.1	UnDef	0.00
26.82	191.3	2.25	1.18	-19.0	8	120.9	1.63	0.98	0.65	1.01	45.8	46.4	UnDef	0.00
27.31	203.9	2.13	1.04	-19.1	9	124.1	1.66	0.99	0.67	1.01	39.1	39.3	UnDef	0.00
27.80	213.6	2.47	1.15	-19.4	9	124.1	1.69	1.01	0.68	1.00	40.9	40.8	UnDef	0.00
28.30	216.8	2.50	1.15	-19.7	9	124.1	1.72	1.02	0.70	0.99	41.5	41.1	UnDef	0.00
28.79	235.6	2.39	1.01	-20.0	9	124.1	1.75	1.04	0.71	0.98	45.1	44.4	UnDef	0.00
29.28	285.5	3.66	1.28	-20.6	9	124.1	1.78	1.05	0.73	0.98	54.7	53.4	UnDef	0.00
29.77	378.7	2.96	0.78	-20.4	9	124.1	1.81	1.07	0.74	0.97	72.5	70.3	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e

Page: 1b

Run No: 04-0902-1112-4935
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-01
Engineer: B. BUSCH
CPT Date: 04/16/08
CPT Time: 14:31
CPT File: 272C01.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.83 (ft): 6.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	1.0E-07	0.00	203.9	1.00	3.8	0.1	3.9	5.8	UnDef	UnDef	10.0	UnDef	0.0	1.9
0.74	5.0E-05	0.01	455.3	0.61	29.4	0.0	29.4	0.3	48	61.6	10.0	-0.28	0.0	11.8
1.23	5.0E-02	0.00	1000.0	0.38	284.5	0.0	284.5	0.0	50	95.0	1.0	-0.31	0.0	56.9
1.72	5.0E-02	0.00	1000.0	0.65	284.8	0.0	284.8	0.0	50	95.0	1.0	-0.36	0.0	57.0
2.21	5.0E-03	0.00	743.4	0.64	176.4	0.0	176.4	0.0	50	94.2	1.0	-0.33	0.0	44.1
2.71	5.0E-03	0.00	472.3	0.54	139.2	0.0	139.2	0.0	48	84.4	1.0	-0.27	0.0	34.8
3.20	5.0E-03	0.00	357.0	0.56	125.7	0.0	125.7	0.7	48	78.9	1.0	-0.25	0.0	31.4
3.61	5.0E-03	0.00	302.8	0.56	121.1	0.0	121.1	1.4	46	76.0	1.0	-0.24	0.0	30.3
4.02	5.0E-03	0.00	338.4	0.73	151.4	0.0	151.4	1.9	48	80.8	1.0	-0.27	0.0	37.8
4.51	5.0E-03	0.00	349.6	0.61	175.8	0.0	175.8	1.1	48	83.4	1.0	-0.26	0.0	43.0
5.00	5.0E-02	0.00	350.3	0.52	186.0	0.0	186.0	0.6	48	85.1	1.0	-0.24	0.0	36.4
5.50	5.0E-02	0.00	352.6	0.43	196.8	0.0	196.8	0.0	48	86.7	1.0	-0.23	0.0	38.5
5.99	5.0E-02	0.00	383.0	0.35	223.5	0.0	223.5	0.0	48	90.3	1.0	-0.21	0.0	43.8
6.56	5.0E-02	0.00	415.7	0.33	248.8	0.0	248.8	0.0	48	93.4	1.0	-0.22	0.0	48.7

Gregg In Situ, Inc.
Run No: 04-0902-1112-4935
CPT File: 272C01.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
7.14	5.0E-02	0.00	528.7	0.43	323.7	0.0	323.7	0.0	48	95.0	1.0	-0.26	0.0	63.4
7.63	5.0E-02	0.00	683.8	0.63	426.5	0.0	426.5	0.0	50	95.0	1.0	-0.32	0.0	83.5
8.12	5.0E+00	0.00	598.6	0.18	380.5	0.0	380.5	0.0	50	95.0	1.0	-0.20	0.0	62.1
8.61	5.0E+00	0.00	589.1	0.25	381.6	0.0	381.6	0.0	50	95.0	1.0	-0.23	0.0	62.2
9.10	5.0E+00	0.00	544.1	0.18	358.9	0.0	358.9	0.0	50	95.0	1.0	-0.19	0.0	58.5
9.60	5.0E-02	0.00	474.0	0.49	318.1	0.0	318.1	0.0	48	95.0	1.0	-0.26	0.0	62.3
10.09	5.0E-02	0.00	421.6	0.59	287.6	0.0	287.6	0.4	48	95.0	1.0	-0.27	0.0	56.3
10.58	5.0E-02	0.00	429.3	0.50	297.4	0.0	297.4	0.0	48	95.0	1.0	-0.26	0.0	58.2
11.07	5.0E-03	0.00	292.6	1.41	206.0	6.0	212.0	6.1	46	88.0	1.0	-0.33	0.9	51.3
11.56	5.0E-04	-0.01	229.4	1.74	163.9	19.0	182.9	8.9	46	81.4	1.0	-0.33	3.7	57.2
12.06	5.0E-04	-0.01	214.9	1.79	155.6	21.2	176.8	9.5	46	79.9	1.0	-0.33	4.1	54.9
12.55	5.0E-03	-0.01	213.3	1.15	156.5	6.2	162.6	6.4	46	80.1	1.0	-0.27	0.9	39.2
13.04	5.0E-03	-0.01	219.0	1.55	162.7	15.6	178.3	8.3	46	81.2	1.0	-0.31	2.3	42.1
13.53	5.0E-05	-0.01	149.1	3.08	112.5	54.3	166.7	17.2	44	70.6	10.0	-0.39	11.3	55.3
14.03	5.0E-05	-0.01	146.5	2.97	111.7	52.4	164.1	17.0	44	70.5	10.0	-0.38	10.9	54.6
14.52	5.0E-03	-0.01	236.4	1.64	181.7	17.1	198.8	8.2	46	84.4	1.0	-0.33	2.5	47.0
15.01	5.0E-03	-0.01	253.0	1.29	196.6	6.7	203.3	6.2	46	86.6	1.0	-0.30	1.0	49.1
15.50	5.0E-03	-0.01	248.0	1.25	195.0	5.9	200.9	6.1	46	86.4	1.0	-0.30	0.9	48.6
15.99	5.0E-02	-0.01	236.6	0.78	188.2	0.0	188.2	3.8	46	85.4	1.0	-0.25	0.0	36.8
16.49	5.0E-03	-0.01	240.7	1.24	193.7	6.5	200.2	6.2	46	86.2	1.0	-0.29	1.0	48.4
16.98	5.0E-02	-0.01	226.8	0.73	184.5	0.0	184.5	3.6	46	84.8	1.0	-0.23	0.0	36.1
17.47	5.0E-03	-0.01	226.4	1.11	186.2	4.3	190.6	5.9	46	85.1	1.0	-0.28	0.7	46.2
17.96	5.0E-03	-0.01	212.9	1.25	177.0	9.6	186.6	6.9	46	83.6	1.0	-0.28	1.4	44.7
18.45	5.0E-03	-0.01	217.8	1.27	182.9	10.0	192.8	6.9	46	84.6	1.0	-0.29	1.5	46.2
18.95	5.0E-04	-0.01	193.2	1.91	163.9	29.4	193.3	10.7	44	81.4	1.0	-0.33	5.6	59.1
19.44	5.0E-03	-0.01	235.7	1.42	201.6	12.9	214.5	7.2	46	87.4	1.0	-0.31	1.9	51.3
19.93	5.0E-02	0.00	259.3	0.65	223.8	0.0	223.8	2.5	46	90.4	1.0	-0.24	0.0	43.8
20.42	5.0E-03	0.00	268.1	1.21	233.6	3.4	237.0	5.5	46	91.6	1.0	-0.30	0.5	57.7
20.92	5.0E-02	0.00	281.4	1.17	247.4	0.7	248.1	5.1	46	93.2	1.0	-0.30	0.1	48.5
21.41	5.0E-03	0.00	252.3	1.23	224.0	5.7	229.8	5.9	46	90.4	1.0	-0.30	0.9	55.7
21.90	5.0E-03	-0.01	223.2	1.19	200.1	7.7	207.8	6.4	46	87.2	1.0	-0.28	1.2	50.1
22.39	5.0E-02	-0.01	206.1	0.77	186.5	0.0	186.5	4.4	46	85.1	1.0	-0.23	0.0	36.5
22.88	5.0E-03	-0.01	191.7	1.17	175.1	10.5	185.6	7.1	44	83.3	1.0	-0.27	1.6	44.4
23.38	5.0E-03	-0.01	187.3	1.14	172.6	10.1	182.7	7.1	44	82.9	1.0	-0.26	1.5	43.7
23.87	5.0E-03	-0.01	172.7	1.16	160.5	12.6	173.2	7.7	44	80.8	1.0	-0.26	1.9	41.2
24.36	5.0E-03	-0.01	182.5	1.18	171.0	12.2	183.1	7.5	44	82.6	1.0	-0.26	1.8	43.6

Gregg In Situ, Inc.
Run No: 04-0902-1112-4935
CPT File: 272C01.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(nl)60	(N1)60cs
24.85	5.0E-02	-0.01	185.9	0.92	175.5	4.2	179.8	5.9	44	83.4	1.0	-0.24	0.5	34.9
25.34	5.0E-02	-0.01	191.8	0.90	182.5	2.8	185.4	5.6	44	84.5	1.0	-0.24	0.3	36.1
25.84	5.0E-02	-0.01	206.5	0.64	198.0	0.0	198.0	3.5	46	86.9	1.0	-0.21	0.0	38.8
26.33	5.0E-02	-0.01	201.2	1.16	194.6	9.9	204.5	6.8	46	86.4	1.0	-0.27	1.2	39.3
26.82	5.0E-03	-0.01	194.5	1.19	189.6	11.4	201.0	7.1	44	85.6	1.0	-0.27	1.7	48.1
27.31	5.0E-02	-0.01	204.3	1.05	200.5	6.1	206.6	6.1	46	87.2	1.0	-0.26	0.7	40.0
27.80	5.0E-02	-0.01	210.8	1.16	208.5	9.0	217.5	6.5	46	88.3	1.0	-0.27	1.1	41.9
28.30	5.0E-02	-0.01	210.8	1.16	210.0	9.0	219.0	6.5	46	88.5	1.0	-0.27	1.1	42.2
28.79	5.0E-02	-0.01	225.8	1.02	226.6	2.4	228.9	5.4	46	90.7	1.0	-0.27	0.3	44.6
29.28	5.0E-02	0.00	270.0	1.29	272.6	6.6	279.2	5.9	46	95.0	1.0	-0.31	0.8	54.2
29.77	5.0E-02	0.00	353.6	0.78	359.0	0.0	359.0	2.1	48	95.0	1.0	-0.28	0.0	70.3

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e

Run No: 04-0902-1112-4996
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-02
Engineer: B. BUSCH
CPT Date: 04/16/08
CPT Time: 15:27
CPT File: 272C02.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.25	87.1	0.20	0.23	14.9	9	124.1	0.02	0.02	0.00	2.00	16.7	33.4	UnDef	0.00
0.74	87.6	0.50	0.58	3.4	8	120.9	0.05	0.05	0.00	2.00	21.0	42.0	UnDef	0.00
1.23	74.5	0.51	0.69	3.1	8	120.9	0.08	0.08	0.00	2.00	17.8	35.7	UnDef	0.35
1.72	81.9	0.38	0.46	4.7	8	120.9	0.10	0.10	0.00	2.00	19.6	39.2	UnDef	0.44
2.21	70.0	0.56	0.80	4.5	8	120.9	0.13	0.13	0.00	2.00	16.7	33.5	UnDef	0.30
2.71	46.2	0.42	0.90	4.0	7	117.8	0.16	0.16	0.00	2.00	14.7	29.5	UnDef	0.14
3.20	59.1	0.40	0.68	2.8	8	120.9	0.19	0.19	0.00	2.00	14.2	28.3	UnDef	0.22
3.61	62.2	0.39	0.62	1.7	8	120.9	0.22	0.22	0.00	2.00	14.9	29.8	UnDef	0.24
4.02	36.5	0.42	1.16	-1.4	7	117.8	0.24	0.24	0.00	2.00	11.6	23.3	UnDef	0.12
4.51	13.0	0.44	3.42	-0.3	4	114.6	0.27	0.26	0.02	1.98	8.3	16.4	1.02	0.13
5.00	10.9	0.35	3.18	26.5	4	114.6	0.30	0.27	0.03	1.93	7.0	13.5	0.85	0.13
5.50	13.5	0.41	3.04	13.2	4	114.6	0.33	0.28	0.05	1.89	8.6	16.3	1.06	0.12
5.99	10.2	0.30	2.92	13.3	4	114.6	0.36	0.29	0.06	1.85	6.5	12.0	0.79	0.14
6.56	6.7	0.19	2.79	20.5	4	114.6	0.39	0.31	0.08	1.80	4.3	7.7	0.51	0.10

Gregg In Situ, Inc.
Run No: 04-0902-1112-4996
CPT File: 272C02.COR

Page: 2a

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	5.9	0.12	2.10	30.1	4	114.6	0.42	0.32	0.10	1.76	3.8	6.6	0.44	0.09
7.63	6.7	0.13	1.91	49.1	4	114.6	0.45	0.34	0.11	1.72	4.3	7.3	0.50	0.10
8.12	35.3	0.12	0.34	8.7	7	117.8	0.48	0.35	0.13	1.69	11.3	19.1	UnDef	0.10
8.61	43.4	0.10	0.23	4.8	8	120.9	0.51	0.36	0.14	1.66	10.4	17.2	UnDef	0.11
9.10	22.2	0.21	0.96	3.3	6	114.6	0.54	0.38	0.16	1.63	8.5	13.9	1.74	0.09
9.60	7.2	0.15	2.10	29.0	4	114.6	0.56	0.39	0.17	1.60	4.6	7.3	0.53	0.10
10.09	6.5	0.13	1.94	41.6	4	114.6	0.59	0.40	0.19	1.58	4.2	6.6	0.48	0.09
10.58	6.7	0.16	2.35	39.4	4	114.6	0.62	0.42	0.21	1.55	4.3	6.6	0.48	0.09
11.07	6.7	0.15	2.23	24.2	4	114.6	0.65	0.43	0.22	1.53	4.3	6.6	0.49	0.09
11.56	5.4	0.10	1.92	44.9	4	114.6	0.68	0.44	0.24	1.51	3.4	5.2	0.38	0.09
12.06	5.1	0.10	1.91	53.6	4	114.6	0.71	0.45	0.25	1.48	3.2	4.8	0.35	0.08
12.55	5.1	0.10	1.96	56.5	4	114.6	0.73	0.47	0.27	1.46	3.3	4.8	0.35	0.08
13.04	6.8	0.10	1.47	41.0	5	114.6	0.76	0.48	0.28	1.44	3.3	4.7	0.48	0.09
13.53	5.0	0.09	1.72	54.8	4	114.6	0.79	0.49	0.30	1.42	3.2	4.6	0.34	0.08
14.03	7.4	0.15	2.02	48.9	5	114.6	0.82	0.51	0.31	1.41	3.6	5.0	0.53	0.09
14.52	16.1	0.27	1.68	34.5	6	114.6	0.85	0.52	0.33	1.39	6.2	8.6	1.22	0.11
15.01	14.7	0.23	1.56	32.4	6	114.6	0.88	0.53	0.34	1.37	5.6	7.7	1.11	0.11
15.50	27.6	0.24	0.87	17.9	7	117.8	0.90	0.54	0.36	1.36	8.8	11.9	UnDef	0.09
15.99	31.1	0.50	1.60	33.3	6	114.6	0.93	0.56	0.37	1.34	11.9	15.9	2.41	0.11
16.49	64.8	0.43	0.67	-4.8	8	120.9	0.96	0.57	0.39	1.32	15.5	20.5	UnDef	0.15
16.98	88.6	0.36	0.40	-4.6	8	120.9	0.99	0.59	0.41	1.31	21.2	27.7	UnDef	0.22
17.47	90.0	0.56	0.63	-6.8	8	120.9	1.02	0.60	0.42	1.29	21.5	27.8	UnDef	0.22
17.96	116.4	0.37	0.32	-4.0	9	124.1	1.05	0.61	0.44	1.28	22.3	28.4	UnDef	0.37
18.45	141.0	0.48	0.34	3.6	9	124.1	1.08	0.63	0.45	1.26	27.0	34.0	UnDef	0.00
18.95	173.8	0.44	0.25	2.4	9	124.1	1.11	0.65	0.47	1.25	33.3	41.4	UnDef	0.00
19.44	196.1	0.70	0.35	0.3	9	124.1	1.14	0.66	0.48	1.23	37.6	46.2	UnDef	0.00
19.93	215.7	1.00	0.46	6.8	9	124.1	1.17	0.68	0.50	1.22	41.3	50.3	UnDef	0.00
20.42	207.3	0.43	0.21	2.3	9	124.1	1.20	0.69	0.51	1.20	39.7	47.8	UnDef	0.00
20.92	161.5	0.48	0.30	0.0	9	124.1	1.23	0.71	0.53	1.19	30.9	36.8	UnDef	0.00
21.41	110.4	0.77	0.69	-1.2	8	120.9	1.26	0.72	0.54	1.18	26.4	31.1	UnDef	0.28
21.90	77.0	0.82	1.06	1.2	8	120.9	1.29	0.74	0.56	1.17	18.4	21.5	UnDef	0.19
22.39	82.2	0.69	0.84	1.9	8	120.9	1.32	0.75	0.57	1.16	19.7	22.7	UnDef	0.18
22.88	108.1	0.67	0.62	-1.1	9	124.1	1.35	0.76	0.59	1.14	20.7	23.7	UnDef	0.25
23.38	120.2	0.71	0.59	-2.2	9	124.1	1.38	0.78	0.60	1.13	23.0	26.1	UnDef	0.30
23.87	154.0	0.64	0.42	-2.1	9	124.1	1.42	0.79	0.62	1.12	29.5	33.1	UnDef	0.00
24.36	183.2	0.54	0.30	-1.7	9	124.1	1.45	0.81	0.64	1.11	35.1	39.0	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-4996
CPT File: 272C02.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
24.85	193.3	0.39	0.20	-2.9	9	124.1	1.48	0.83	0.65	1.10	37.0	40.8	UnDef	0.00
25.34	183.9	0.51	0.28	-2.4	9	124.1	1.51	0.84	0.67	1.09	35.2	38.4	UnDef	0.00
25.84	182.4	0.51	0.28	-1.7	9	124.1	1.54	0.86	0.68	1.08	34.9	37.8	UnDef	0.00
26.33	183.1	0.75	0.41	-2.7	9	124.1	1.57	0.87	0.70	1.07	35.1	37.6	UnDef	0.00
26.82	196.6	0.91	0.46	-2.6	9	124.1	1.60	0.89	0.71	1.06	37.6	40.0	UnDef	0.00
27.31	202.1	0.96	0.47	-3.8	9	124.1	1.63	0.90	0.73	1.05	38.7	40.8	UnDef	0.00
27.80	190.5	0.77	0.40	-4.5	9	124.1	1.66	0.92	0.74	1.04	36.5	38.1	UnDef	0.00
28.30	177.1	0.63	0.36	-5.3	9	124.1	1.69	0.93	0.76	1.04	33.9	35.2	UnDef	0.00
28.79	176.5	0.61	0.35	-5.7	9	124.1	1.72	0.95	0.77	1.03	33.8	34.8	UnDef	0.00
29.28	185.3	0.83	0.45	-2.2	9	124.1	1.75	0.96	0.79	1.02	35.5	36.2	UnDef	0.00
29.77	208.6	0.91	0.43	-3.8	9	124.1	1.78	0.98	0.80	1.01	40.0	40.4	UnDef	0.00
30.27	199.0	0.79	0.39	-5.5	9	124.1	1.81	0.99	0.82	1.00	38.1	38.3	UnDef	0.00
30.76	204.3	0.88	0.43	-6.0	9	124.1	1.84	1.01	0.84	1.00	39.1	39.0	UnDef	0.00
31.17	229.7	1.36	0.59	-5.8	9	124.1	1.87	1.02	0.85	0.99	44.0	43.6	UnDef	0.00
31.58	263.4	1.47	0.56	-4.7	9	124.1	1.89	1.03	0.86	0.98	50.4	49.7	UnDef	0.00
32.07	280.9	1.09	0.39	-4.4	10	127.3	1.92	1.05	0.88	0.98	44.8	43.8	UnDef	0.00
32.56	286.0	1.14	0.40	0.1	10	127.3	1.96	1.06	0.89	0.97	45.6	44.3	UnDef	0.00
33.05	317.0	1.04	0.33	-4.8	10	127.3	1.99	1.08	0.91	0.96	50.6	48.7	UnDef	0.00
33.55	288.2	1.44	0.50	-4.5	10	127.3	2.02	1.10	0.92	0.96	46.0	43.9	UnDef	0.00
34.04	273.5	1.38	0.50	-3.6	10	127.3	2.05	1.11	0.94	0.95	43.7	41.4	UnDef	0.00
34.53	236.4	1.17	0.49	-4.3	9	124.1	2.08	1.13	0.95	0.94	45.3	42.7	UnDef	0.00
35.02	228.5	2.46	1.08	-5.1	9	124.1	2.11	1.14	0.97	0.94	43.8	41.0	UnDef	0.00
35.51	250.9	2.90	1.15	-0.9	9	124.1	2.14	1.16	0.98	0.93	48.1	44.7	UnDef	0.00
36.01	232.7	1.93	0.83	-4.3	9	124.1	2.17	1.17	1.00	0.92	44.6	41.2	UnDef	0.00
36.50	279.0	1.43	0.51	-4.2	10	127.3	2.20	1.19	1.01	0.92	44.5	40.8	UnDef	0.00
36.99	270.7	1.07	0.40	-3.5	10	127.3	2.23	1.20	1.03	0.91	43.2	39.4	UnDef	0.00
37.48	244.8	0.71	0.29	-3.2	10	127.3	2.27	1.22	1.05	0.91	39.1	35.4	UnDef	0.00
37.98	244.8	0.84	0.34	-3.6	10	127.3	2.30	1.24	1.06	0.90	39.1	35.1	UnDef	0.00
38.47	264.1	0.99	0.38	-3.8	10	127.3	2.33	1.25	1.08	0.89	42.1	37.7	UnDef	0.00
38.96	297.3	0.87	0.29	-2.4	10	127.3	2.36	1.27	1.09	0.89	47.5	42.1	UnDef	0.00
39.45	298.5	1.24	0.42	-1.0	10	127.3	2.39	1.28	1.11	0.88	47.6	42.0	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e

Run No: 04-0902-1112-4996
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-02
Engineer: B. BUSCH
CPT Date: 04/16/08
CPT Time: 15:27
CPT File: 272C02.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E-02	0.01	1000.0	0.23	166.8	0.0	166.8	0.0	50	95.0	1.0	-0.26	0.0	33.4
0.74	5.0E-03	0.00	1000.0	0.58	167.8	0.0	167.8	0.0	50	95.0	1.0	-0.35	0.0	42.0
1.23	5.0E-03	0.00	989.9	0.69	142.7	0.0	142.7	0.0	50	95.0	1.0	-0.36	0.0	35.7
1.72	5.0E-03	0.00	779.6	0.46	156.9	0.0	156.9	0.0	50	93.2	1.0	-0.30	0.0	39.2
2.21	5.0E-03	0.00	518.3	0.80	134.0	0.0	134.0	1.0	48	85.1	1.0	-0.32	0.0	33.5
2.71	5.0E-04	0.00	280.6	0.91	88.5	0.0	88.5	3.7	46	70.4	1.0	-0.27	0.0	29.5
3.20	5.0E-03	0.00	304.8	0.69	113.3	0.0	113.3	2.1	46	75.1	1.0	-0.25	0.0	28.3
3.61	5.0E-03	0.00	283.8	0.62	119.1	0.0	119.1	2.0	46	74.8	1.0	-0.24	0.0	29.8
4.02	5.0E-04	0.00	149.6	1.17	69.8	7.7	77.5	8.7	44	58.1	1.0	-0.24	1.5	24.8
4.51	5.0E-07	0.00	49.8	3.49	24.9	54.4	79.3	30.7	UnDef	UnDef	6.0	UnDef	12.3	28.8
5.00	5.0E-07	0.07	39.7	3.26	20.7	61.4	82.1	33.0	UnDef	UnDef	6.0	UnDef	11.9	25.4
5.50	5.0E-07	0.03	47.0	3.11	25.0	49.7	74.8	29.9	UnDef	UnDef	6.0	UnDef	11.6	27.9
5.99	5.0E-07	0.04	33.5	3.02	18.4	68.8	87.3	34.6	UnDef	UnDef	6.0	UnDef	11.7	23.7
6.56	5.0E-07	0.09	20.6	2.96	11.9	47.5	59.4	42.7	UnDef	UnDef	6.0	UnDef	7.7	15.5

Gregg In Situ, Inc.
Run No: 04-0902-1112-4996
CPT File: 272C02.COR

Page: 2b

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
7.14	5.0E-07	0.15	16.9	2.26	10.1	40.5	50.7	42.6	UnDef	UnDef	6.0	UnDef	6.6	13.2
7.63	5.0E-07	0.23	18.5	2.04	11.2	44.9	56.2	39.6	UnDef	UnDef	6.0	UnDef	7.3	14.7
8.12	5.0E-04	0.00	99.6	0.35	58.4	0.0	58.4	5.0	42	51.9	1.0	-0.10	0.0	19.1
8.61	5.0E-03	0.00	117.9	0.23	70.4	0.0	70.4	3.1	42	57.2	1.0	-0.08	0.0	17.2
9.10	5.0E-05	0.00	57.5	0.99	35.4	14.2	49.6	15.7	40	37.5	10.0	-0.13	3.0	16.9
9.60	5.0E-07	0.11	16.9	2.28	11.2	44.9	56.1	42.7	UnDef	UnDef	6.0	UnDef	7.3	14.7
10.09	5.0E-07	0.19	14.8	2.14	10.1	40.3	50.4	44.5	UnDef	UnDef	6.0	UnDef	6.6	13.2
10.58	5.0E-07	0.17	14.6	2.59	10.1	40.6	50.7	47.5	UnDef	UnDef	6.0	UnDef	6.6	13.2
11.07	5.0E-07	0.09	14.2	2.47	10.1	40.3	50.3	47.4	UnDef	UnDef	6.0	UnDef	6.6	13.1
11.56	5.0E-07	0.25	10.7	2.20	7.9	31.7	39.7	51.9	UnDef	UnDef	3.0	UnDef	5.2	10.4
12.06	5.0E-07	0.33	9.6	2.22	7.4	29.4	36.8	54.5	UnDef	UnDef	3.0	UnDef	4.8	9.6
12.55	5.0E-07	0.34	9.4	2.29	7.3	29.3	36.7	55.5	UnDef	UnDef	3.0	UnDef	4.8	9.6
13.04	5.0E-06	0.16	12.6	1.66	9.6	38.5	48.2	44.4	UnDef	UnDef	6.0	UnDef	4.7	9.4
13.53	5.0E-07	0.33	8.6	2.04	7.0	28.2	35.2	55.8	UnDef	UnDef	3.0	UnDef	4.6	9.2
14.03	5.0E-06	0.18	13.1	2.27	10.2	41.0	51.2	47.8	UnDef	UnDef	6.0	UnDef	5.0	10.0
14.52	5.0E-05	0.05	29.4	1.78	21.9	43.5	65.4	29.9	36	30.0	6.0	-0.11	6.1	14.7
15.01	5.0E-05	0.05	26.1	1.66	19.8	45.3	65.1	31.1	36	30.0	6.0	-0.10	6.0	13.7
15.50	5.0E-04	0.01	49.0	0.90	36.6	16.9	53.4	16.8	38	38.4	1.0	-0.11	2.9	14.9
15.99	5.0E-05	0.02	54.0	1.65	40.7	30.0	70.7	20.9	40	41.5	10.0	-0.17	5.8	21.7
16.49	5.0E-03	-0.01	111.8	0.68	83.9	5.8	89.7	7.4	42	62.3	1.0	-0.16	0.9	21.4
16.98	5.0E-03	-0.01	149.6	0.41	113.3	0.0	113.3	3.4	44	70.9	1.0	-0.15	0.0	27.7
17.47	5.0E-03	-0.01	148.2	0.63	113.7	0.8	114.5	5.3	44	70.9	1.0	-0.18	0.1	27.9
17.96	5.0E-02	0.00	187.6	0.32	145.3	0.0	145.3	1.5	44	78.0	1.0	-0.15	0.0	28.4
18.45	5.0E-02	0.00	222.1	0.34	173.8	0.0	173.8	1.0	46	83.1	1.0	-0.17	0.0	34.0
18.95	5.0E-02	0.00	267.6	0.25	211.7	0.0	211.7	0.0	46	88.8	1.0	-0.16	0.0	41.4
19.44	5.0E-02	0.00	295.2	0.36	236.1	0.0	236.1	0.0	46	91.9	1.0	-0.19	0.0	46.2
19.93	5.0E-02	0.00	317.6	0.47	256.9	0.0	256.9	0.6	46	94.3	1.0	-0.22	0.0	50.3
20.42	5.0E-02	0.00	298.4	0.21	244.1	0.0	244.1	0.0	46	92.9	1.0	-0.15	0.0	47.8
20.92	5.0E-02	0.00	227.0	0.30	188.1	0.0	188.1	0.6	46	85.4	1.0	-0.16	0.0	36.8
21.41	5.0E-03	-0.01	151.4	0.70	127.2	2.2	129.4	5.6	44	74.2	1.0	-0.19	0.3	31.5
21.90	5.0E-03	-0.01	102.9	1.08	87.8	16.5	104.3	10.9	42	63.6	1.0	-0.20	2.4	23.9
22.39	5.0E-03	-0.01	108.0	0.85	93.0	11.1	104.1	9.0	42	65.2	1.0	-0.18	1.6	24.4
22.88	5.0E-02	-0.01	139.7	0.63	121.1	2.0	123.1	5.6	44	72.8	1.0	-0.18	0.2	23.9
23.38	5.0E-02	-0.01	152.4	0.59	133.2	0.0	133.2	4.8	44	75.5	1.0	-0.18	0.0	26.1
23.87	5.0E-02	0.00	192.0	0.42	169.0	0.0	169.0	2.2	44	82.3	1.0	-0.17	0.0	33.1
24.36	5.0E-02	0.00	224.4	0.30	199.2	0.0	199.2	0.6	46	87.0	1.0	-0.16	0.0	39.0

Gregg In Situ, Inc.
Run No: 04-0902-1112-4996
CPT File: 272C02.COR

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Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
24.85	5.0E-02	0.00	232.5	0.21	208.3	0.0	208.3	0.0	46	88.3	1.0	-0.13	0.0	40.8
25.34	5.0E-02	0.00	217.1	0.28	196.4	0.0	196.4	0.6	46	86.6	1.0	-0.15	0.0	38.4
25.84	5.0E-02	0.00	211.4	0.28	192.9	0.0	192.9	0.7	46	86.1	1.0	-0.15	0.0	37.8
26.33	5.0E-02	0.00	208.5	0.41	192.0	0.0	192.0	1.8	46	86.0	1.0	-0.18	0.0	37.6
26.82	5.0E-02	0.00	220.1	0.47	204.4	0.0	204.4	2.0	46	87.8	1.0	-0.19	0.0	40.0
27.31	5.0E-02	0.00	222.5	0.48	208.3	0.0	208.3	2.0	46	88.3	1.0	-0.19	0.0	40.8
27.80	5.0E-02	0.00	206.1	0.41	194.8	0.0	194.8	1.8	46	86.4	1.0	-0.17	0.0	38.1
28.30	5.0E-02	-0.01	188.4	0.36	179.6	0.0	179.6	1.8	44	84.1	1.0	-0.16	0.0	35.2
28.79	5.0E-02	-0.01	184.7	0.35	177.6	0.0	177.6	1.9	44	83.7	1.0	-0.15	0.0	34.8
29.28	5.0E-02	0.00	190.9	0.45	184.9	0.0	184.9	2.5	44	84.9	1.0	-0.18	0.0	36.2
29.77	5.0E-02	0.00	211.7	0.44	206.6	0.0	206.6	1.9	46	88.1	1.0	-0.18	0.0	40.4
30.27	5.0E-02	-0.01	198.8	0.40	195.5	0.0	195.5	1.9	46	86.5	1.0	-0.17	0.0	38.3
30.76	5.0E-02	-0.01	201.0	0.43	199.2	0.0	199.2	2.1	46	87.0	1.0	-0.18	0.0	39.0
31.17	5.0E-02	0.00	223.4	0.60	222.6	0.0	222.6	2.8	46	90.2	1.0	-0.21	0.0	43.6
31.58	5.0E-02	0.00	253.3	0.56	253.7	0.0	253.7	2.1	46	94.0	1.0	-0.22	0.0	49.7
32.07	5.0E+00	0.00	266.2	0.39	268.5	0.0	268.5	0.6	46	95.0	1.0	-0.19	0.0	43.8
32.56	5.0E+00	0.00	266.9	0.40	271.3	0.0	271.3	0.7	46	95.0	1.0	-0.20	0.0	44.3
33.05	5.0E+00	0.00	291.7	0.33	298.5	0.0	298.5	0.0	46	95.0	1.0	-0.19	0.0	48.7
33.55	5.0E+00	0.00	261.1	0.50	269.4	0.0	269.4	1.5	46	95.0	1.0	-0.21	0.0	43.9
34.04	5.0E+00	0.00	244.2	0.51	253.9	0.0	253.9	1.8	46	94.0	1.0	-0.21	0.0	41.4
34.53	5.0E-02	0.00	207.9	0.50	217.9	0.0	217.9	2.5	46	89.6	1.0	-0.19	0.0	42.7
35.02	5.0E-02	0.00	198.1	1.09	209.2	8.5	217.8	6.5	46	88.4	1.0	-0.26	1.0	42.0
35.51	5.0E-02	0.00	214.9	1.16	228.2	9.2	237.4	6.4	46	90.9	1.0	-0.28	1.1	45.8
36.01	5.0E-02	0.00	196.5	0.84	210.2	0.3	210.5	5.1	46	88.6	1.0	-0.23	0.0	41.2
36.50	5.0E+00	0.00	232.8	0.52	250.4	0.0	250.4	2.1	46	93.6	1.0	-0.21	0.0	40.8
36.99	5.0E+00	0.00	222.8	0.40	241.3	0.0	241.3	1.4	46	92.5	1.0	-0.18	0.0	39.4
37.48	5.0E+00	0.00	198.7	0.29	216.8	0.0	216.8	1.0	46	89.5	1.0	-0.14	0.0	35.4
37.98	5.0E+00	0.00	196.1	0.35	215.4	0.0	215.4	1.5	46	89.3	1.0	-0.16	0.0	35.1
38.47	5.0E+00	0.00	209.0	0.38	230.9	0.0	230.9	1.5	46	91.3	1.0	-0.17	0.0	37.7
38.96	5.0E+00	0.00	232.5	0.29	258.3	0.0	258.3	0.4	46	94.5	1.0	-0.16	0.0	42.1
39.45	5.0E+00	0.00	230.5	0.42	257.7	0.0	257.7	1.4	46	94.4	1.0	-0.19	0.0	42.0

Gregg In Situ, Inc. Page: 1a
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-5056
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-03
Engineer: B. BUSCH
CPT Date: 04/16/08
CPT Time: 16:08
CPT File: 272C03.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 0.91 (ft): 3.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.25	128.1	0.28	0.22	4.7	9	124.1	0.02	0.02	0.00	2.00	24.5	49.1	UnDef	0.00
0.74	114.1	0.88	0.77	2.6	8	120.9	0.05	0.05	0.00	2.00	27.3	54.6	UnDef	0.00
1.23	93.8	1.22	1.30	3.5	8	120.9	0.08	0.08	0.00	2.00	22.5	44.9	UnDef	0.00
1.72	136.6	0.77	0.57	5.5	9	124.1	0.11	0.11	0.00	2.00	26.2	52.3	UnDef	0.00
2.21	165.4	0.80	0.48	3.0	9	124.1	0.14	0.14	0.00	2.00	31.7	63.4	UnDef	0.00
2.71	132.0	1.05	0.79	-2.3	9	124.1	0.17	0.17	0.00	2.00	25.3	50.6	UnDef	0.00
3.20	108.6	0.89	0.82	-0.1	8	120.9	0.20	0.19	0.01	2.00	26.0	52.0	UnDef	0.00
3.61	101.3	0.66	0.65	-2.4	8	120.9	0.22	0.20	0.02	2.00	24.3	48.5	UnDef	0.00
4.02	102.1	0.50	0.49	-0.6	9	124.1	0.25	0.21	0.03	2.00	19.6	39.1	UnDef	0.00
4.51	96.3	0.48	0.50	-2.8	8	120.9	0.28	0.23	0.05	2.00	23.0	46.1	UnDef	0.00
5.00	101.5	0.41	0.41	-3.3	9	124.1	0.31	0.24	0.06	2.00	19.4	38.9	UnDef	0.00
5.50	103.9	0.22	0.22	-4.2	9	124.1	0.34	0.26	0.08	1.96	19.9	39.1	UnDef	0.00
5.99	107.9	0.23	0.21	4.8	9	124.1	0.37	0.27	0.09	1.91	20.7	39.5	UnDef	0.00
6.56	109.4	0.32	0.29	-1.3	9	124.1	0.40	0.29	0.11	1.85	21.0	38.8	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-5056
CPT File: 272C03.COR

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Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	108.6	0.45	0.41	-1.2	9	124.1	0.44	0.31	0.13	1.80	20.8	37.4	UnDef	0.00
7.63	106.5	0.32	0.30	-0.9	9	124.1	0.47	0.33	0.14	1.75	20.4	35.8	UnDef	0.00
8.12	96.7	0.23	0.23	-3.1	9	124.1	0.50	0.34	0.16	1.71	18.5	31.7	UnDef	0.00
8.61	101.3	0.22	0.22	-6.8	9	124.1	0.53	0.36	0.18	1.68	19.4	32.5	UnDef	0.00
9.10	109.2	0.17	0.15	-8.5	9	124.1	0.56	0.37	0.19	1.64	20.9	34.4	UnDef	0.00
9.60	98.0	0.24	0.25	-9.8	9	124.1	0.59	0.39	0.21	1.61	18.8	30.2	UnDef	0.42
10.09	91.4	0.30	0.33	-9.1	9	124.1	0.62	0.40	0.22	1.58	17.5	27.6	UnDef	0.34
10.58	115.2	0.53	0.46	-9.9	9	124.1	0.65	0.42	0.24	1.55	22.1	34.2	UnDef	0.00
11.07	112.7	0.66	0.59	-10.7	9	124.1	0.68	0.43	0.25	1.52	21.6	32.9	UnDef	0.00
11.56	147.8	0.83	0.56	-11.2	9	124.1	0.71	0.45	0.27	1.50	28.3	42.4	UnDef	0.00
12.06	175.0	0.63	0.36	-12.2	9	124.1	0.74	0.46	0.28	1.47	33.5	49.3	UnDef	0.00
12.55	195.8	0.58	0.30	1.3	9	124.1	0.78	0.48	0.30	1.45	37.5	54.3	UnDef	0.00
13.04	192.6	0.40	0.21	-8.5	9	124.1	0.81	0.49	0.31	1.43	36.9	52.6	UnDef	0.00
13.53	166.9	0.48	0.29	-11.6	9	124.1	0.84	0.51	0.33	1.40	32.0	44.9	UnDef	0.00
14.03	125.5	0.71	0.57	-12.4	9	124.1	0.87	0.52	0.34	1.38	24.0	33.2	UnDef	0.00
14.52	111.1	0.63	0.57	-12.9	9	124.1	0.90	0.54	0.36	1.36	21.3	29.0	UnDef	0.38
15.01	133.1	0.53	0.40	-13.6	9	124.1	0.93	0.55	0.37	1.34	25.5	34.3	UnDef	0.00
15.50	155.1	0.34	0.22	-14.1	9	124.1	0.96	0.57	0.39	1.33	29.7	39.4	UnDef	0.00
15.99	141.6	0.40	0.28	-14.1	9	124.1	0.99	0.58	0.41	1.31	27.1	35.5	UnDef	0.00
16.49	113.2	0.59	0.53	-14.5	9	124.1	1.02	0.60	0.42	1.29	21.7	28.0	UnDef	0.35
16.98	130.7	0.90	0.69	-15.0	9	124.1	1.05	0.61	0.44	1.28	25.0	32.0	UnDef	0.00
17.47	192.9	1.24	0.64	-15.3	9	124.1	1.08	0.63	0.45	1.26	36.9	46.6	UnDef	0.00
17.96	286.7	1.46	0.51	-15.7	10	127.3	1.11	0.64	0.47	1.25	45.8	57.0	UnDef	0.00
18.45	315.8	1.25	0.40	-16.0	10	127.3	1.14	0.66	0.48	1.23	50.4	62.0	UnDef	0.00
18.95	303.4	1.22	0.40	-15.7	10	127.3	1.17	0.68	0.50	1.22	48.4	58.9	UnDef	0.00
19.44	281.7	1.55	0.55	-16.5	10	127.3	1.21	0.69	0.51	1.20	45.0	54.1	UnDef	0.00
19.93	266.3	1.68	0.63	-17.4	9	124.1	1.24	0.71	0.53	1.19	51.0	60.6	UnDef	0.00
20.42	254.1	1.55	0.61	-18.1	9	124.1	1.27	0.72	0.54	1.18	48.7	57.2	UnDef	0.00
20.92	253.0	1.83	0.72	-18.2	9	124.1	1.30	0.74	0.56	1.16	48.5	56.4	UnDef	0.00
21.41	272.1	2.18	0.80	-18.8	9	124.1	1.33	0.75	0.57	1.15	52.1	60.1	UnDef	0.00
21.90	283.3	1.16	0.41	-19.4	10	127.3	1.36	0.77	0.59	1.14	45.2	51.6	UnDef	0.00
22.39	253.2	0.99	0.39	-20.1	10	127.3	1.39	0.78	0.61	1.13	40.4	45.6	UnDef	0.00
22.88	244.1	1.00	0.41	-20.4	10	127.3	1.42	0.80	0.62	1.12	39.0	43.5	UnDef	0.00
23.38	242.0	0.94	0.39	-21.0	10	127.3	1.45	0.82	0.64	1.11	38.6	42.7	UnDef	0.00
23.87	244.8	0.89	0.36	-21.1	10	127.3	1.48	0.83	0.65	1.10	39.1	42.8	UnDef	0.00
24.36	230.4	0.95	0.41	-21.3	9	124.1	1.52	0.85	0.67	1.09	44.1	47.9	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-5056
CPT File: 272C03.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
24.85	257.9	1.22	0.47	-21.6	10	127.3	1.55	0.86	0.68	1.08	41.2	44.3	UnDef	0.00
25.34	274.4	0.90	0.33	-21.8	10	127.3	1.58	0.88	0.70	1.07	43.8	46.7	UnDef	0.00
25.84	290.4	1.06	0.36	-21.8	10	127.3	1.61	0.90	0.71	1.06	46.3	49.0	UnDef	0.00
26.33	273.2	1.10	0.40	-21.8	10	127.3	1.64	0.91	0.73	1.05	43.6	45.7	UnDef	0.00
26.82	268.2	1.36	0.51	-21.9	10	127.3	1.67	0.93	0.74	1.04	42.8	44.4	UnDef	0.00
27.31	268.8	1.31	0.49	-21.8	10	127.3	1.70	0.94	0.76	1.03	42.9	44.2	UnDef	0.00
27.80	270.8	1.36	0.50	-21.8	10	127.3	1.73	0.96	0.77	1.02	43.2	44.1	UnDef	0.00
28.30	284.1	1.33	0.47	-21.9	10	127.3	1.77	0.98	0.79	1.01	45.3	45.9	UnDef	0.00
28.79	269.5	0.82	0.30	-21.8	10	127.3	1.80	0.99	0.81	1.00	43.0	43.2	UnDef	0.00
29.28	260.7	0.75	0.29	-22.0	10	127.3	1.83	1.01	0.82	1.00	41.6	41.5	UnDef	0.00
29.77	240.5	0.47	0.20	-22.1	10	127.3	1.86	1.02	0.84	0.99	38.4	37.9	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e

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Run No: 04-0902-1112-5056
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-03
Engineer: B. BUSCH
CPT Date: 04/16/08
CPT Time: 16:08
CPT File: 272C03.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 0.91 (ft): 3.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E-02	0.00	1000.0	0.22	245.3	0.0	245.3	0.0	50	95.0	1.0	-0.26	0.0	49.1
0.74	5.0E-03	0.00	1000.0	0.77	218.5	0.0	218.5	0.0	50	95.0	1.0	-0.38	0.0	54.6
1.23	5.0E-03	0.00	1000.0	1.30	179.6	0.0	179.6	1.7	50	95.0	1.0	-0.44	0.0	44.9
1.72	5.0E-02	0.00	1000.0	0.57	261.6	0.0	261.6	0.0	50	95.0	1.0	-0.34	0.0	52.3
2.21	5.0E-02	0.00	1000.0	0.48	316.8	0.0	316.8	0.0	50	95.0	1.0	-0.33	0.0	63.4
2.71	5.0E-02	0.00	792.3	0.80	252.8	0.0	252.8	0.0	50	95.0	1.0	-0.36	0.0	50.6
3.20	5.0E-03	0.00	569.4	0.82	208.0	0.0	208.0	0.8	50	92.8	1.0	-0.33	0.0	52.0
3.61	5.0E-03	0.00	499.5	0.65	194.0	0.0	194.0	0.3	48	89.9	1.0	-0.29	0.0	48.5
4.02	5.0E-02	0.00	474.5	0.49	195.6	0.0	195.6	0.0	48	89.3	1.0	-0.26	0.0	39.1
4.51	5.0E-03	0.00	418.2	0.50	184.4	0.0	184.4	0.0	48	86.7	1.0	-0.25	0.0	46.1
5.00	5.0E-02	0.00	414.0	0.41	194.3	0.0	194.3	0.0	48	87.3	1.0	-0.24	0.0	38.9
5.50	5.0E-02	0.00	399.2	0.22	199.0	0.0	199.0	0.0	48	87.1	1.0	-0.18	0.0	39.1
5.99	5.0E-02	0.00	391.6	0.21	201.6	0.0	201.6	0.0	48	87.4	1.0	-0.17	0.0	39.5
6.56	5.0E-02	0.00	372.8	0.29	198.0	0.0	198.0	0.0	48	86.9	1.0	-0.20	0.0	38.8

Gregg In Situ, Inc.
Run No: 04-0902-1112-5056
CPT File: 272C03.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
7.14	5.0E-02	0.00	348.9	0.41	190.9	0.0	190.9	0.0	48	85.8	1.0	-0.22	0.0	37.4
7.63	5.0E-02	0.00	325.9	0.31	182.7	0.0	182.7	0.0	48	84.6	1.0	-0.19	0.0	35.8
8.12	5.0E-02	0.00	282.6	0.24	162.2	0.0	162.2	0.0	46	81.1	1.0	-0.16	0.0	31.7
8.61	5.0E-02	0.00	283.4	0.22	166.3	0.0	166.3	0.0	46	81.9	1.0	-0.15	0.0	32.5
9.10	5.0E-02	0.00	293.0	0.15	175.5	0.0	175.5	0.0	46	83.4	1.0	-0.12	0.0	34.4
9.60	5.0E-02	-0.01	252.5	0.25	154.4	0.0	154.4	0.0	46	79.7	1.0	-0.15	0.0	30.2
10.09	5.0E-02	-0.01	226.3	0.33	141.2	0.0	141.2	0.8	46	77.2	1.0	-0.17	0.0	27.6
10.58	5.0E-02	0.00	275.0	0.46	174.6	0.0	174.6	1.0	46	83.3	1.0	-0.21	0.0	34.2
11.07	5.0E-02	-0.01	259.6	0.59	167.9	0.0	167.9	2.2	46	82.1	1.0	-0.23	0.0	32.9
11.56	5.0E-02	0.00	329.4	0.56	216.5	0.0	216.5	1.1	48	89.4	1.0	-0.24	0.0	42.4
12.06	5.0E-02	0.00	377.2	0.36	252.0	0.0	252.0	0.0	48	93.8	1.0	-0.22	0.0	49.3
12.55	5.0E-02	0.00	408.8	0.30	277.4	0.0	277.4	0.0	48	95.0	1.0	-0.21	0.0	54.3
13.04	5.0E-02	0.00	389.6	0.21	268.6	0.0	268.6	0.0	48	95.0	1.0	-0.17	0.0	52.6
13.53	5.0E-02	0.00	327.2	0.29	229.2	0.0	229.2	0.0	48	91.1	1.0	-0.19	0.0	44.9
14.03	5.0E-02	-0.01	238.4	0.57	169.8	0.0	169.8	2.4	46	82.5	1.0	-0.22	0.0	33.2
14.52	5.0E-02	-0.01	204.9	0.57	148.3	0.0	148.3	3.0	46	78.6	1.0	-0.20	0.0	29.0
15.01	5.0E-02	-0.01	239.0	0.40	175.1	0.0	175.1	1.2	46	83.3	1.0	-0.19	0.0	34.3
15.50	5.0E-02	-0.01	271.3	0.22	201.4	0.0	201.4	0.0	46	87.3	1.0	-0.15	0.0	39.4
15.99	5.0E-02	-0.01	241.0	0.28	181.4	0.0	181.4	0.2	46	84.3	1.0	-0.16	0.0	35.5
16.49	5.0E-02	-0.01	187.5	0.53	143.2	0.0	143.2	3.2	44	77.6	1.0	-0.19	0.0	28.0
16.98	5.0E-02	-0.01	211.3	0.69	163.3	0.0	163.3	3.7	46	81.3	1.0	-0.22	0.0	32.0
17.47	5.0E-02	0.00	305.0	0.65	238.0	0.0	238.0	1.9	46	92.1	1.0	-0.25	0.0	46.6
17.96	5.0E+00	0.00	443.2	0.51	349.6	0.0	349.6	0.0	48	95.0	1.0	-0.26	0.0	57.0
18.45	5.0E+00	0.00	476.5	0.40	380.3	0.0	380.3	0.0	48	95.0	1.0	-0.25	0.0	62.0
18.95	5.0E+00	0.00	447.0	0.40	361.1	0.0	361.1	0.0	48	95.0	1.0	-0.24	0.0	58.9
19.44	5.0E+00	0.00	405.3	0.55	331.4	0.0	331.4	0.3	48	95.0	1.0	-0.26	0.0	54.1
19.93	5.0E-02	0.00	374.5	0.63	309.8	0.0	309.8	1.0	48	95.0	1.0	-0.27	0.0	60.6
20.42	5.0E-02	0.00	349.7	0.61	292.4	0.0	292.4	1.2	48	95.0	1.0	-0.26	0.0	57.2
20.92	5.0E-02	0.00	341.0	0.73	288.2	0.0	288.2	1.9	48	95.0	1.0	-0.27	0.0	56.4
21.41	5.0E-02	0.00	359.5	0.80	306.8	0.0	306.8	2.1	48	95.0	1.0	-0.29	0.0	60.1
21.90	5.0E+00	0.00	366.7	0.41	316.2	0.0	316.2	0.0	48	95.0	1.0	-0.23	0.0	51.6
22.39	5.0E+00	0.00	320.9	0.39	279.7	0.0	279.7	0.0	46	95.0	1.0	-0.21	0.0	45.6
22.88	5.0E+00	-0.01	303.1	0.41	267.0	0.0	267.0	0.3	46	95.0	1.0	-0.21	0.0	43.5
23.38	5.0E+00	-0.01	294.5	0.39	262.0	0.0	262.0	0.3	46	94.9	1.0	-0.20	0.0	42.7
23.87	5.0E+00	-0.01	292.2	0.37	262.5	0.0	262.5	0.1	46	94.9	1.0	-0.20	0.0	42.8
24.36	5.0E-02	-0.01	269.8	0.42	244.8	0.0	244.8	0.8	46	92.9	1.0	-0.20	0.0	47.9

Gregg In Situ, Inc.
Run No: 04-0902-1112-5056
CPT File: 272C03.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(nl)60	(Nl)60cs
24.85	5.0E+00	-0.01	296.7	0.48	271.5	0.0	271.5	0.9	46	95.0	1.0	-0.22	0.0	44.3
25.34	5.0E+00	-0.01	310.1	0.33	286.3	0.0	286.3	0.0	46	95.0	1.0	-0.19	0.0	46.7
25.84	5.0E+00	0.00	322.4	0.37	300.2	0.0	300.2	0.0	48	95.0	1.0	-0.20	0.0	49.0
26.33	5.0E+00	-0.01	297.8	0.41	280.0	0.0	280.0	0.4	46	95.0	1.0	-0.21	0.0	45.7
26.82	5.0E+00	-0.01	287.2	0.51	272.4	0.0	272.4	1.2	46	95.0	1.0	-0.22	0.0	44.4
27.31	5.0E+00	-0.01	283.1	0.49	270.8	0.0	270.8	1.1	46	95.0	1.0	-0.22	0.0	44.2
27.80	5.0E+00	-0.01	280.4	0.51	270.5	0.0	270.5	1.3	46	95.0	1.0	-0.22	0.0	44.1
28.30	5.0E+00	-0.01	289.3	0.47	281.4	0.0	281.4	0.9	46	95.0	1.0	-0.22	0.0	45.9
28.79	5.0E+00	-0.01	270.0	0.31	264.9	0.0	264.9	0.0	46	95.0	1.0	-0.17	0.0	43.2
29.28	5.0E+00	-0.01	256.9	0.29	254.2	0.0	254.2	0.0	46	94.0	1.0	-0.16	0.0	41.5
29.77	5.0E+00	-0.01	233.1	0.20	232.6	0.0	232.6	0.0	46	91.5	1.0	-0.12	0.0	37.9

Gregg In Situ, Inc. Page: 1a
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-5117
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-04
Engineer: B. DUSSELL
CPT Date: 04/16/08
CPT Time: 17:11
CPT File: 272C04.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.25	176.0	0.26	0.15	4.5	9	124.1	0.02	0.02	0.00	2.00	33.7	67.4	UnDef	0.00
0.74	208.5	0.78	0.37	2.2	9	124.1	0.05	0.05	0.00	2.00	39.9	79.9	UnDef	0.00
1.23	143.1	1.19	0.83	0.7	9	124.1	0.08	0.08	0.00	2.00	27.4	54.8	UnDef	0.00
1.72	75.0	1.40	1.87	14.4	7	117.8	0.11	0.11	0.00	2.00	23.9	47.9	UnDef	0.00
2.21	60.3	0.61	1.01	-0.7	7	117.8	0.14	0.14	0.00	2.00	19.3	38.5	UnDef	0.22
2.71	39.3	0.26	0.65	-2.8	7	117.8	0.16	0.16	0.00	2.00	12.6	25.1	UnDef	0.12
3.20	23.5	0.22	0.92	-4.4	6	114.6	0.19	0.19	0.00	2.00	9.0	18.0	1.87	0.09
3.61	17.4	0.15	0.86	-0.6	6	114.6	0.22	0.22	0.00	2.00	6.7	13.4	1.38	0.09
4.02	19.2	0.23	1.18	-9.3	6	114.6	0.24	0.24	0.00	2.00	7.4	14.7	1.52	0.09
4.51	7.5	0.09	1.21	6.8	5	114.6	0.27	0.25	0.02	1.99	3.6	7.1	0.58	0.08
5.00	5.0	0.07	1.48	20.4	1	79.6	0.29	0.26	0.03	1.96	2.4	4.6	0.37	0.09
5.50	4.6	0.08	1.80	21.1	4	114.6	0.32	0.27	0.05	1.93	3.0	5.7	0.35	0.09
5.99	5.0	0.08	1.68	18.4	4	114.6	0.34	0.28	0.06	1.88	3.2	6.0	0.37	0.09
6.56	5.7	0.07	1.19	26.8	1	79.6	0.37	0.29	0.08	1.85	2.7	5.1	0.43	0.09

Gregg In Situ, Inc.
Run No: 04-0902-1112-5117
CPT File: 272C04.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	6.3	0.09	1.39	37.4	5	114.6	0.40	0.30	0.10	1.83	3.0	5.5	0.47	0.09
7.63	7.2	0.11	1.58	37.2	5	114.6	0.43	0.31	0.11	1.79	3.4	6.1	0.54	0.10
8.12	7.0	0.12	1.66	30.7	5	114.6	0.45	0.33	0.13	1.75	3.4	5.9	0.53	0.10
8.61	5.7	0.09	1.66	29.4	4	114.6	0.48	0.34	0.14	1.72	3.6	6.2	0.41	0.09
9.10	5.2	0.07	1.41	36.2	1	79.6	0.51	0.35	0.16	1.70	2.5	4.2	0.38	0.09
9.60	5.0	0.08	1.67	42.8	4	114.6	0.53	0.36	0.17	1.68	3.2	5.3	0.36	0.09
10.09	5.5	0.12	2.14	30.8	4	114.6	0.56	0.37	0.19	1.65	3.5	5.8	0.39	0.09
10.58	5.6	0.12	2.20	15.8	4	114.6	0.59	0.38	0.21	1.62	3.6	5.8	0.40	0.09
11.07	5.9	0.10	1.65	27.6	4	114.6	0.62	0.39	0.22	1.59	3.8	6.0	0.42	0.09
11.56	7.6	0.13	1.68	26.4	5	114.6	0.64	0.41	0.24	1.57	3.6	5.7	0.55	0.10
12.06	6.5	0.10	1.60	30.2	5	114.6	0.67	0.42	0.25	1.54	3.1	4.8	0.46	0.09
12.55	17.2	0.18	1.07	30.0	6	114.6	0.70	0.43	0.27	1.52	6.6	10.0	1.32	0.09
13.04	29.9	0.21	0.72	15.3	7	117.8	0.73	0.45	0.28	1.50	9.5	14.3	UnDef	0.10
13.53	25.7	0.26	1.03	15.2	6	114.6	0.76	0.46	0.30	1.48	9.9	14.5	2.00	0.09
14.03	24.7	0.34	1.38	15.3	6	114.6	0.78	0.47	0.31	1.46	9.5	13.8	1.91	0.10
14.52	57.1	0.23	0.41	-6.2	8	120.9	0.81	0.49	0.33	1.44	13.7	19.6	UnDef	0.13
15.01	66.5	0.23	0.34	-5.8	8	120.9	0.84	0.50	0.34	1.41	15.9	22.5	UnDef	0.15
15.50	61.9	0.20	0.32	23.0	8	120.9	0.87	0.51	0.36	1.39	14.8	20.7	UnDef	0.14
15.99	55.1	0.26	0.47	4.6	8	120.9	0.90	0.53	0.37	1.38	13.2	18.1	UnDef	0.12
16.49	60.3	0.11	0.18	-1.0	8	120.9	0.93	0.54	0.39	1.36	14.4	19.6	UnDef	0.13
16.98	44.0	0.21	0.49	9.0	8	120.9	0.96	0.56	0.41	1.34	10.5	14.1	UnDef	0.10
17.47	66.3	0.18	0.27	-5.5	8	120.9	0.99	0.57	0.42	1.32	15.9	21.0	UnDef	0.14
17.96	52.4	0.49	0.94	13.5	7	117.8	1.02	0.59	0.44	1.31	16.7	21.8	UnDef	0.13
18.45	112.0	0.43	0.39	-2.3	9	124.1	1.05	0.60	0.45	1.29	21.4	27.7	UnDef	0.34
18.95	145.8	0.35	0.24	-3.9	9	124.1	1.08	0.62	0.47	1.27	27.9	35.6	UnDef	0.00
19.44	158.7	0.44	0.28	0.5	9	124.1	1.11	0.63	0.48	1.26	30.4	38.3	UnDef	0.00
19.93	134.3	0.66	0.49	2.5	9	124.1	1.14	0.65	0.50	1.24	25.7	32.0	UnDef	0.00
20.42	88.4	0.41	0.46	6.0	8	120.9	1.17	0.66	0.51	1.23	21.2	26.1	UnDef	0.19
20.92	81.2	0.40	0.49	4.8	8	120.9	1.20	0.68	0.53	1.22	19.4	23.7	UnDef	0.17
21.41	126.8	0.43	0.34	-9.8	9	124.1	1.23	0.69	0.54	1.20	24.3	29.2	UnDef	0.39
21.90	138.1	0.56	0.40	-7.8	9	124.1	1.26	0.71	0.56	1.19	26.5	31.5	UnDef	0.00
22.39	163.7	0.78	0.48	-8.0	9	124.1	1.29	0.72	0.57	1.18	31.4	37.0	UnDef	0.00
22.88	209.5	0.79	0.38	-11.9	9	124.1	1.32	0.74	0.59	1.17	40.1	46.8	UnDef	0.00
23.38	213.7	0.56	0.26	-14.3	9	124.1	1.36	0.75	0.60	1.15	40.9	47.3	UnDef	0.00
23.87	184.6	0.65	0.35	-13.8	9	124.1	1.39	0.77	0.62	1.14	35.4	40.4	UnDef	0.00
24.36	191.1	0.72	0.37	-13.0	9	124.1	1.42	0.78	0.64	1.13	36.6	41.4	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-5117
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Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
24.85	188.2	0.70	0.37	-13.6	9	124.1	1.45	0.80	0.65	1.12	36.0	40.4	UnDef	0.00
25.34	188.4	0.61	0.32	-14.0	9	124.1	1.48	0.81	0.67	1.11	36.1	40.1	UnDef	0.00
25.84	178.3	0.43	0.24	-13.9	9	124.1	1.51	0.83	0.68	1.10	34.1	37.6	UnDef	0.00
26.33	175.5	0.71	0.40	-13.7	9	124.1	1.54	0.84	0.70	1.09	33.6	36.7	UnDef	0.00
26.82	188.9	0.78	0.41	-14.7	9	124.1	1.57	0.86	0.71	1.08	36.2	39.1	UnDef	0.00
27.31	194.8	0.61	0.32	-16.2	9	124.1	1.60	0.87	0.73	1.07	37.3	40.0	UnDef	0.00
27.80	186.6	0.47	0.25	-16.6	9	124.1	1.63	0.89	0.74	1.06	35.7	37.9	UnDef	0.00
28.30	181.1	0.64	0.36	-16.4	9	124.1	1.66	0.90	0.76	1.05	34.7	36.5	UnDef	0.00
28.79	179.2	0.71	0.40	-16.4	9	124.1	1.69	0.92	0.77	1.04	34.3	35.8	UnDef	0.00
29.28	162.2	0.67	0.41	-13.8	9	124.1	1.72	0.93	0.79	1.04	31.1	32.2	UnDef	0.00
29.77	145.9	0.77	0.53	-17.3	9	124.1	1.75	0.95	0.80	1.03	27.9	28.7	UnDef	0.37
30.27	107.9	0.60	0.55	-18.7	9	124.1	1.78	0.96	0.82	1.02	20.7	21.1	UnDef	0.21
30.76	85.1	1.05	1.23	-18.8	8	120.9	1.81	0.98	0.84	1.01	20.4	20.6	UnDef	0.20
31.17	98.8	1.36	1.38	-18.5	8	120.9	1.84	0.99	0.85	1.01	23.6	23.8	UnDef	0.26
31.58	138.0	0.67	0.49	-16.7	9	124.1	1.86	1.00	0.86	1.00	26.4	26.4	UnDef	0.31
32.07	176.1	0.80	0.45	-17.1	9	124.1	1.89	1.02	0.88	0.99	33.7	33.4	UnDef	0.00
32.56	224.4	0.78	0.35	-15.0	9	124.1	1.92	1.03	0.89	0.98	43.0	42.3	UnDef	0.00
33.05	219.2	0.92	0.42	-16.2	9	124.1	1.95	1.05	0.91	0.98	42.0	41.0	UnDef	0.00
33.55	211.7	1.10	0.52	-16.3	9	124.1	1.99	1.06	0.92	0.97	40.5	39.3	UnDef	0.00
34.04	217.4	1.01	0.46	-16.6	9	124.1	2.02	1.08	0.94	0.96	41.6	40.1	UnDef	0.00
34.53	231.4	1.72	0.74	-16.1	9	124.1	2.05	1.09	0.95	0.96	44.3	42.4	UnDef	0.00

Gregg In Situ, Inc. Page: 1b
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-5117
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-04
Engineer: B. DUSSELL
CPT Date: 04/16/08
CPT Time: 17:11
CPT File: 272C04.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E-02	0.00	1000.0	0.15	337.2	0.0	337.2	0.0	50	95.0	1.0	-0.23	0.0	67.4
0.74	5.0E-02	0.00	1000.0	0.37	399.3	0.0	399.3	0.0	50	95.0	1.0	-0.30	0.0	79.9
1.23	5.0E-02	0.00	1000.0	0.83	274.0	0.0	274.0	0.0	50	95.0	1.0	-0.38	0.0	54.8
1.72	5.0E-04	0.01	706.0	1.87	143.7	UnDef	UnDef	0.0	50	90.6	1.0	-0.46	UnDef	UnDef
2.21	5.0E-04	0.00	445.7	1.02	115.6	0.0	115.6	2.5	48	80.9	1.0	-0.33	0.0	38.5
2.71	5.0E-04	0.00	238.6	0.66	75.3	0.0	75.3	2.9	46	65.8	1.0	-0.23	0.0	25.1
3.20	5.0E-05	-0.01	121.1	0.93	45.1	4.9	50.0	8.7	42	48.8	10.0	-0.20	1.2	19.2
3.61	5.0E-05	0.00	79.7	0.87	33.4	7.2	40.6	11.7	42	38.5	10.0	-0.15	1.7	15.0
4.02	5.0E-05	-0.02	79.5	1.20	36.9	11.6	48.5	14.0	42	39.9	10.0	-0.18	2.6	17.3
4.51	5.0E-06	0.03	28.7	1.25	14.3	19.6	33.9	26.6	UnDef	UnDef	6.0	UnDef	4.0	11.2
5.00	1.0E-07	0.13	17.9	1.58	9.5	37.9	47.4	36.9	UnDef	UnDef	6.0	UnDef	4.6	9.3
5.50	5.0E-07	0.14	16.1	1.93	8.7	35.0	43.7	41.5	UnDef	UnDef	6.0	UnDef	5.7	11.4
5.99	5.0E-07	0.11	16.5	1.80	9.2	36.7	45.9	40.1	UnDef	UnDef	6.0	UnDef	6.0	12.0
6.56	1.0E-07	0.14	18.3	1.27	10.3	36.0	46.3	34.1	UnDef	UnDef	6.0	UnDef	4.8	9.8

Gregg In Situ, Inc.
Run No: 04-0902-1112-5117
CPT File: 272C04.COR

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Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
7.14	5.0E-06	0.18	19.5	1.48	11.2	42.3	53.5	34.6	UnDef	UnDef	6.0	UnDef	5.4	10.8
7.63	5.0E-06	0.16	21.6	1.68	12.6	45.5	58.1	34.4	UnDef	UnDef	6.0	UnDef	5.9	12.1
8.12	5.0E-06	0.13	20.2	1.77	12.1	48.3	60.4	36.1	UnDef	UnDef	6.0	UnDef	5.9	11.8
8.61	5.0E-07	0.15	15.3	1.81	9.5	38.0	47.5	41.7	UnDef	UnDef	6.0	UnDef	6.2	12.4
9.10	1.0E-07	0.21	13.6	1.56	8.7	34.6	43.3	42.2	UnDef	UnDef	6.0	UnDef	4.2	8.5
9.60	5.0E-07	0.26	12.5	1.87	8.2	32.7	40.9	46.1	UnDef	UnDef	6.0	UnDef	5.3	10.7
10.09	5.0E-07	0.16	13.3	2.38	8.8	35.3	44.1	48.2	UnDef	UnDef	6.0	UnDef	5.8	11.5
10.58	5.0E-07	0.06	13.2	2.45	8.9	35.7	44.6	48.8	UnDef	UnDef	6.0	UnDef	5.8	11.6
11.07	5.0E-07	0.12	13.4	1.84	9.2	36.7	45.8	44.6	UnDef	UnDef	6.0	UnDef	6.0	12.0
11.56	5.0E-06	0.08	17.0	1.83	11.6	46.5	58.1	39.7	UnDef	UnDef	6.0	UnDef	5.7	11.4
12.06	5.0E-06	0.12	13.8	1.79	9.8	39.0	48.8	43.5	UnDef	UnDef	6.0	UnDef	4.8	9.6
12.55	5.0E-05	0.04	38.1	1.12	25.6	20.4	45.9	21.6	38	30.0	6.0	-0.10	3.8	13.8
13.04	5.0E-04	0.01	65.4	0.73	43.8	10.7	54.5	12.4	40	43.6	1.0	-0.12	2.0	16.3
13.53	5.0E-05	0.01	54.4	1.06	37.2	17.2	54.4	16.9	40	38.9	10.0	-0.13	3.6	18.1
14.03	5.0E-05	0.01	50.7	1.42	35.2	24.2	59.4	20.2	38	37.3	10.0	-0.15	4.7	18.5
14.52	5.0E-03	-0.01	116.0	0.42	80.2	0.0	80.2	5.0	42	61.0	1.0	-0.13	0.0	19.6
15.01	5.0E-03	-0.01	131.3	0.35	92.0	0.0	92.0	3.6	44	64.9	1.0	-0.12	0.0	22.5
15.50	5.0E-03	0.01	118.6	0.33	84.4	0.0	84.4	4.0	42	62.4	1.0	-0.11	0.0	20.7
15.99	5.0E-03	0.00	102.5	0.47	74.1	0.0	74.1	5.0	42	58.7	1.0	-0.13	0.0	18.1
16.49	5.0E-03	-0.01	109.4	0.19	80.1	0.0	80.1	3.0	42	60.9	1.0	-0.05	0.0	19.6
16.98	5.0E-03	0.00	77.1	0.50	57.6	0.0	57.6	5.0	40	51.5	1.0	-0.10	0.0	14.1
17.47	5.0E-03	-0.01	114.2	0.28	85.8	0.0	85.8	3.7	42	62.9	1.0	-0.09	0.0	21.0
17.96	5.0E-04	0.00	87.7	0.96	67.0	14.0	81.0	11.5	42	55.8	1.0	-0.17	2.7	24.5
18.45	5.0E-02	0.00	184.7	0.39	141.4	0.0	141.4	2.2	44	77.2	1.0	-0.16	0.0	27.7
18.95	5.0E-02	0.00	235.2	0.24	181.9	0.0	181.9	0.0	46	84.4	1.0	-0.14	0.0	35.6
19.44	5.0E-02	0.00	249.9	0.28	195.6	0.0	195.6	0.0	46	86.5	1.0	-0.16	0.0	38.3
19.93	5.0E-02	0.00	206.1	0.49	163.5	0.0	163.5	2.5	46	81.4	1.0	-0.19	0.0	32.0
20.42	5.0E-03	0.00	132.1	0.47	106.5	0.0	106.5	4.6	44	69.1	1.0	-0.15	0.0	26.1
20.92	5.0E-03	0.00	118.5	0.50	96.7	1.6	98.3	5.6	42	66.3	1.0	-0.14	0.2	23.9
21.41	5.0E-02	-0.01	182.0	0.35	149.4	0.0	149.4	1.9	44	78.8	1.0	-0.15	0.0	29.2
21.90	5.0E-02	-0.01	194.1	0.41	161.0	0.0	161.0	2.1	44	80.9	1.0	-0.17	0.0	31.5
22.39	5.0E-02	-0.01	225.5	0.48	188.8	0.0	188.8	2.0	46	85.5	1.0	-0.20	0.0	37.0
22.88	5.0E-02	0.00	283.0	0.38	239.0	0.0	239.0	0.4	46	92.3	1.0	-0.20	0.0	46.8
23.38	5.0E-02	0.00	282.9	0.26	241.4	0.0	241.4	0.0	46	92.5	1.0	-0.16	0.0	47.3
23.87	5.0E-02	-0.01	239.2	0.35	206.4	0.0	206.4	0.8	46	88.0	1.0	-0.18	0.0	40.4
24.36	5.0E-02	-0.01	242.9	0.38	211.6	0.0	211.6	0.9	46	88.8	1.0	-0.18	0.0	41.4

Gregg In Situ, Inc.
Run No: 04-0902-1112-5117
CPT File: 272C04.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
24.85	5.0E-02	-0.01	234.6	0.37	206.4	0.0	206.4	1.0	46	88.0	1.0	-0.18	0.0	40.4
25.34	5.0E-02	-0.01	230.5	0.33	204.8	0.0	204.8	0.7	46	87.8	1.0	-0.16	0.0	40.1
25.84	5.0E-02	-0.01	213.9	0.24	191.9	0.0	191.9	0.3	46	86.0	1.0	-0.13	0.0	37.6
26.33	5.0E-02	-0.01	206.7	0.41	187.2	0.0	187.2	1.8	46	85.3	1.0	-0.17	0.0	36.7
26.82	5.0E-02	-0.01	218.6	0.42	199.7	0.0	199.7	1.6	46	87.1	1.0	-0.18	0.0	39.1
27.31	5.0E-02	-0.01	221.6	0.32	204.2	0.0	204.2	0.8	46	87.7	1.0	-0.16	0.0	40.0
27.80	5.0E-02	-0.01	208.5	0.26	193.8	0.0	193.8	0.5	46	86.2	1.0	-0.14	0.0	37.9
28.30	5.0E-02	-0.01	198.9	0.36	186.6	0.0	186.6	1.6	46	85.2	1.0	-0.16	0.0	36.5
28.79	5.0E-02	-0.01	193.5	0.40	183.1	0.0	183.1	2.0	44	84.6	1.0	-0.17	0.0	35.8
29.28	5.0E-02	-0.01	172.1	0.42	164.4	0.0	164.4	2.7	44	81.5	1.0	-0.16	0.0	32.2
29.77	5.0E-02	-0.01	152.1	0.54	146.7	0.0	146.7	4.4	44	78.3	1.0	-0.17	0.0	28.7
30.27	5.0E-02	-0.01	110.2	0.56	107.6	4.9	112.5	6.6	42	69.4	1.0	-0.15	0.6	21.7
30.76	5.0E-03	-0.02	85.2	1.26	84.2	25.6	109.8	13.7	42	62.4	1.0	-0.20	3.5	24.1
31.17	5.0E-03	-0.01	97.9	1.40	97.2	27.8	124.9	13.3	42	66.4	1.0	-0.22	3.8	27.6
31.58	5.0E-02	-0.01	135.9	0.50	134.9	0.0	134.9	4.7	44	75.9	1.0	-0.15	0.0	26.4
32.07	5.0E-02	-0.01	171.2	0.46	170.8	0.0	170.8	3.1	44	82.6	1.0	-0.17	0.0	33.4
32.56	5.0E-02	-0.01	215.5	0.35	216.1	0.0	216.1	1.2	46	89.4	1.0	-0.16	0.0	42.3
33.05	5.0E-02	-0.01	207.4	0.42	209.6	0.0	209.6	1.9	46	88.5	1.0	-0.18	0.0	41.0
33.55	5.0E-02	-0.01	197.3	0.52	200.9	0.0	200.9	2.9	46	87.3	1.0	-0.19	0.0	39.3
34.04	5.0E-02	-0.01	199.8	0.47	204.9	0.0	204.9	2.4	46	87.8	1.0	-0.18	0.0	40.1
34.53	5.0E-02	-0.01	209.8	0.75	216.6	0.0	216.6	4.1	46	89.4	1.0	-0.23	0.0	42.4

Gregg In Situ, Inc. Page: 1a

Interpretation Output - Release 1.00.19e

Run No: 04-0902-1112-5172
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-05
Engineer: B. DUSSELL
CPT Date: 04/16/08
CPT Time: 17:52
CPT File: 272C05.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.25	486.5	1.87	0.39	0.9	10	127.3	0.02	0.02	0.00	2.00	77.7	155.3	UnDef	0.00
0.74	415.8	3.90	0.94	9.7	9	124.1	0.05	0.05	0.00	2.00	79.6	159.3	UnDef	0.00
1.23	200.8	2.51	1.25	6.7	8	120.9	0.08	0.08	0.00	2.00	48.1	96.1	UnDef	0.00
1.72	95.5	1.04	1.09	0.5	8	120.9	0.11	0.11	0.00	2.00	22.9	45.8	UnDef	0.00
2.21	53.0	0.48	0.91	-2.5	7	117.8	0.14	0.14	0.00	2.00	16.9	33.8	UnDef	0.18
2.71	29.0	0.17	0.60	-4.7	7	117.8	0.16	0.16	0.00	2.00	9.2	18.5	UnDef	0.10
3.20	10.9	0.07	0.64	-6.5	6	114.6	0.19	0.19	0.00	2.00	4.2	8.4	0.86	0.00
3.61	4.9	0.04	0.81	-6.3	1	79.6	0.21	0.21	0.00	2.00	2.4	4.7	0.38	0.00
4.02	5.7	0.07	1.30	-2.0	5	114.6	0.23	0.23	0.00	2.00	2.7	5.4	0.43	0.08
4.51	4.3	0.05	1.17	-2.9	1	79.6	0.26	0.24	0.02	2.00	2.1	4.1	0.32	0.09
5.00	10.3	0.09	0.88	1.4	6	114.6	0.28	0.25	0.03	2.00	3.9	7.9	0.80	0.08
5.50	46.5	0.12	0.26	-4.8	8	120.9	0.31	0.26	0.05	1.94	11.1	21.6	UnDef	0.14
5.99	59.7	0.13	0.22	-6.7	8	120.9	0.34	0.28	0.06	1.89	14.3	27.0	UnDef	0.21
6.56	81.6	0.26	0.32	-6.9	8	120.9	0.38	0.30	0.08	1.84	19.5	35.9	UnDef	0.37

Gregg In Situ, Inc.
Run No: 04-0902-1112-5172
CPT File: 272C05.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	100.7	0.32	0.32	-11.2	9	124.1	0.41	0.31	0.10	1.79	19.3	34.5	UnDef	0.00
7.63	120.4	0.37	0.31	-11.9	9	124.1	0.44	0.33	0.11	1.75	23.1	40.3	UnDef	0.00
8.12	143.9	0.39	0.27	-11.8	9	124.1	0.47	0.34	0.13	1.71	27.6	47.0	UnDef	0.00
8.61	144.8	0.33	0.23	-11.8	9	124.1	0.50	0.36	0.14	1.67	27.7	46.3	UnDef	0.00
9.10	125.1	0.52	0.41	-12.1	9	124.1	0.53	0.37	0.16	1.64	24.0	39.2	UnDef	0.00
9.60	143.6	0.64	0.45	-11.5	9	124.1	0.56	0.39	0.17	1.60	27.5	44.1	UnDef	0.00
10.09	147.3	0.70	0.48	-12.9	9	124.1	0.59	0.40	0.19	1.57	28.2	44.4	UnDef	0.00
10.58	179.8	0.59	0.33	-12.8	9	124.1	0.62	0.42	0.21	1.54	34.4	53.2	UnDef	0.00
11.07	170.8	0.48	0.28	-8.1	9	124.1	0.66	0.43	0.22	1.52	32.7	49.6	UnDef	0.00
11.56	159.4	0.53	0.33	-10.7	9	124.1	0.69	0.45	0.24	1.49	30.5	45.5	UnDef	0.00
12.06	164.6	0.65	0.39	-11.1	9	124.1	0.72	0.46	0.25	1.47	31.5	46.2	UnDef	0.00
12.55	199.2	0.67	0.34	-12.6	9	124.1	0.75	0.48	0.27	1.44	38.1	55.1	UnDef	0.00
13.04	188.1	0.57	0.30	-15.4	9	124.1	0.78	0.50	0.28	1.42	36.0	51.2	UnDef	0.00
13.53	187.1	0.63	0.34	-15.2	9	124.1	0.81	0.51	0.30	1.40	35.8	50.2	UnDef	0.00
14.03	196.3	0.81	0.41	-15.1	9	124.1	0.84	0.53	0.31	1.38	37.6	51.9	UnDef	0.00
14.52	179.8	1.44	0.80	-15.1	9	124.1	0.87	0.54	0.33	1.36	34.4	46.8	UnDef	0.00
15.01	157.4	1.68	1.07	-15.3	8	120.9	0.90	0.56	0.34	1.34	37.7	50.6	UnDef	0.00
15.50	139.8	0.59	0.42	-15.0	9	124.1	0.93	0.57	0.36	1.32	26.8	35.5	UnDef	0.00
15.99	149.1	0.49	0.33	-14.4	9	124.1	0.96	0.59	0.37	1.31	28.6	37.3	UnDef	0.00
16.49	185.9	0.57	0.31	-14.9	9	124.1	0.99	0.60	0.39	1.29	35.6	45.9	UnDef	0.00
16.98	198.1	0.75	0.38	-15.3	9	124.1	1.02	0.62	0.41	1.27	37.9	48.4	UnDef	0.00
17.47	222.0	0.91	0.41	-15.6	9	124.1	1.05	0.63	0.42	1.26	42.5	53.5	UnDef	0.00
17.96	250.2	0.80	0.32	-15.4	10	127.3	1.08	0.65	0.44	1.24	39.9	49.7	UnDef	0.00
18.45	249.5	1.05	0.42	-15.3	10	127.3	1.11	0.66	0.45	1.23	39.8	48.9	UnDef	0.00
18.95	247.9	1.02	0.41	-14.7	10	127.3	1.15	0.68	0.47	1.21	39.6	48.0	UnDef	0.00
19.44	246.1	0.91	0.37	-14.5	10	127.3	1.18	0.69	0.48	1.20	39.3	47.1	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e

Run No: 04-0902-1112-5172
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-05
Engineer: B. DUSSELL
CPT Date: 04/16/08
CPT Time: 17:52
CPT File: 272C05.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E+00	0.00	1000.0	0.39	931.8	0.0	931.8	0.0	50	95.0	1.0	-0.31	0.0	155.3
0.74	5.0E-02	0.00	1000.0	0.94	796.3	0.0	796.3	0.2	50	95.0	1.0	-0.40	0.0	159.3
1.23	5.0E-03	0.00	1000.0	1.25	384.5	0.0	384.5	1.5	50	95.0	1.0	-0.43	0.0	96.1
1.72	5.0E-03	0.00	896.1	1.09	183.0	0.0	183.0	1.1	50	95.0	1.0	-0.41	0.0	45.8
2.21	5.0E-04	0.00	389.0	0.91	101.5	0.0	101.5	2.4	48	77.1	1.0	-0.31	0.0	33.8
2.71	5.0E-04	-0.01	174.7	0.60	55.5	0.0	55.5	4.1	44	57.0	1.0	-0.19	0.0	18.5
3.20	5.0E-05	-0.02	55.5	0.65	20.9	5.9	26.9	13.3	40	30.0	10.0	-0.10	1.3	9.7
3.61	1.0E-07	-0.04	22.0	0.85	9.4	13.7	23.1	27.2	UnDef	UnDef	6.0	UnDef	2.8	7.5
4.02	5.0E-06	-0.01	23.1	1.36	10.8	24.0	34.8	30.8	UnDef	UnDef	6.0	UnDef	4.1	9.5
4.51	1.0E-07	-0.03	16.6	1.24	8.2	32.8	41.1	35.6	UnDef	UnDef	6.0	UnDef	4.1	8.2
5.00	5.0E-05	0.00	39.8	0.90	19.7	12.2	31.8	19.3	38	30.0	6.0	-0.09	2.5	10.3
5.50	5.0E-03	0.00	174.5	0.26	88.4	0.0	88.4	1.3	44	63.8	1.0	-0.12	0.0	21.6
5.99	5.0E-03	0.00	212.6	0.22	110.5	0.0	110.5	0.1	46	70.1	1.0	-0.12	0.0	27.0
6.56	5.0E-03	0.00	274.6	0.32	146.8	0.0	146.8	0.0	46	78.3	1.0	-0.18	0.0	35.9

Gregg In Situ, Inc.
Run No: 04-0902-1112-5172
CPT File: 272C05.COR

Page: 2b

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
7.14	5.0E-02	0.00	320.2	0.32	176.1	0.0	176.1	0.0	46	83.5	1.0	-0.19	0.0	34.5
7.63	5.0E-02	0.00	365.5	0.31	205.7	0.0	205.7	0.0	48	88.0	1.0	-0.20	0.0	40.3
8.12	5.0E-02	0.00	417.6	0.27	240.3	0.0	240.3	0.0	48	92.4	1.0	-0.20	0.0	47.0
8.61	5.0E-02	0.00	402.4	0.23	236.7	0.0	236.7	0.0	48	92.0	1.0	-0.18	0.0	46.3
9.10	5.0E-02	0.00	333.1	0.42	200.2	0.0	200.2	0.1	48	87.2	1.0	-0.22	0.0	39.2
9.60	5.0E-02	0.00	367.7	0.45	225.3	0.0	225.3	0.0	48	90.6	1.0	-0.23	0.0	44.1
10.09	5.0E-02	0.00	363.0	0.48	226.8	0.0	226.8	0.2	48	90.7	1.0	-0.24	0.0	44.4
10.58	5.0E-02	0.00	427.3	0.33	271.8	0.0	271.8	0.0	48	95.0	1.0	-0.22	0.0	53.2
11.07	5.0E-02	0.00	391.6	0.28	253.6	0.0	253.6	0.0	48	93.9	1.0	-0.20	0.0	49.6
11.56	5.0E-02	0.00	353.0	0.33	232.6	0.0	232.6	0.0	48	91.5	1.0	-0.20	0.0	45.5
12.06	5.0E-02	0.00	352.6	0.40	236.3	0.0	236.3	0.0	48	91.9	1.0	-0.22	0.0	46.2
12.55	5.0E-02	0.00	413.3	0.34	281.3	0.0	281.3	0.0	48	95.0	1.0	-0.22	0.0	55.1
13.04	5.0E-02	0.00	378.2	0.31	261.6	0.0	261.6	0.0	48	94.8	1.0	-0.20	0.0	51.2
13.53	5.0E-02	0.00	365.1	0.34	256.3	0.0	256.3	0.0	48	94.3	1.0	-0.21	0.0	50.2
14.03	5.0E-02	0.00	371.9	0.41	265.0	0.0	265.0	0.0	48	95.0	1.0	-0.23	0.0	51.9
14.52	5.0E-02	0.00	330.9	0.80	239.3	0.0	239.3	2.5	48	92.3	1.0	-0.28	0.0	46.8
15.01	5.0E-03	-0.01	281.7	1.07	206.7	0.0	206.7	4.6	46	88.1	1.0	-0.29	0.0	50.6
15.50	5.0E-02	-0.01	243.4	0.42	181.1	0.0	181.1	1.2	46	84.3	1.0	-0.19	0.0	35.5
15.99	5.0E-02	-0.01	253.0	0.33	190.7	0.0	190.7	0.4	46	85.8	1.0	-0.18	0.0	37.3
16.49	5.0E-02	0.00	307.8	0.31	234.7	0.0	234.7	0.0	46	91.7	1.0	-0.19	0.0	45.9
16.98	5.0E-02	0.00	320.0	0.38	247.1	0.0	247.1	0.0	46	93.2	1.0	-0.21	0.0	48.4
17.47	5.0E-02	0.00	350.1	0.41	273.4	0.0	273.4	0.0	48	95.0	1.0	-0.22	0.0	53.5
17.96	5.0E+00	0.00	385.2	0.32	304.4	0.0	304.4	0.0	48	95.0	1.0	-0.21	0.0	49.7
18.45	5.0E+00	0.00	374.9	0.42	300.0	0.0	300.0	0.0	48	95.0	1.0	-0.23	0.0	48.9
18.95	5.0E+00	0.00	363.6	0.41	294.5	0.0	294.5	0.0	48	95.0	1.0	-0.23	0.0	48.0
19.44	5.0E+00	0.00	352.7	0.37	289.0	0.0	289.0	0.0	48	95.0	1.0	-0.21	0.0	47.1

Gregg In Situ, Inc. Page: 1a
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-5226
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-06
Engineer: B. DUSSELL
CPT Date: 04/16/08
CPT Time: 18:18
CPT File: 272C06.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.25	316.5	0.86	0.27	31.2	10	127.3	0.02	0.02	0.00	2.00	50.5	101.0	UnDef	0.00
0.74	141.6	1.05	0.74	6.5	9	124.1	0.05	0.05	0.00	2.00	27.1	54.2	UnDef	0.00
1.23	129.1	0.96	0.74	7.6	9	124.1	0.08	0.08	0.00	2.00	24.7	49.5	UnDef	0.00
1.72	104.5	0.68	0.66	5.8	8	120.9	0.11	0.11	0.00	2.00	25.0	50.0	UnDef	0.00
2.21	76.5	0.44	0.57	5.8	8	120.9	0.14	0.14	0.00	2.00	18.3	36.6	UnDef	0.37
2.71	69.1	0.36	0.52	4.2	8	120.9	0.17	0.17	0.00	2.00	16.6	33.1	UnDef	0.30
3.20	69.5	0.36	0.52	3.9	8	120.9	0.20	0.20	0.00	2.00	16.6	33.3	UnDef	0.30
3.61	68.0	0.36	0.53	3.0	8	120.9	0.22	0.22	0.00	2.00	16.3	32.5	UnDef	0.29
4.02	47.7	0.42	0.88	1.2	7	117.8	0.25	0.25	0.00	2.00	15.2	30.5	UnDef	0.15
4.51	18.2	0.40	2.22	0.1	5	114.6	0.27	0.26	0.02	1.97	8.7	17.1	1.43	0.10
5.00	10.3	0.22	2.17	5.7	5	114.6	0.30	0.27	0.03	1.92	4.9	9.5	0.80	0.10
5.50	8.9	0.19	2.13	45.2	5	114.6	0.33	0.28	0.05	1.88	4.3	8.0	0.69	0.10
5.99	7.3	0.15	2.01	35.9	4	114.6	0.36	0.30	0.06	1.84	4.7	8.6	0.56	0.11
6.56	24.2	0.27	1.12	39.0	6	114.6	0.39	0.31	0.08	1.79	9.3	16.6	1.91	0.10

Gregg In Situ, Inc.
Run No: 04-0902-1112-5226
CPT File: 272C06.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	43.8	0.34	0.78	14.4	7	117.8	0.43	0.33	0.10	1.75	14.0	24.5	UnDef	0.13
7.63	91.1	0.21	0.23	6.7	9	124.1	0.45	0.34	0.11	1.71	17.4	29.8	UnDef	0.41
8.12	132.4	0.26	0.19	-1.4	9	124.1	0.49	0.36	0.13	1.67	25.4	42.4	UnDef	0.00
8.61	132.9	0.54	0.40	-2.8	9	124.1	0.52	0.37	0.14	1.64	25.5	41.8	UnDef	0.00
9.10	162.5	0.67	0.41	1.2	9	124.1	0.55	0.39	0.16	1.61	31.1	50.0	UnDef	0.00
9.60	180.7	0.75	0.42	-0.8	9	124.1	0.58	0.40	0.17	1.58	34.6	54.6	UnDef	0.00
10.09	163.8	0.76	0.46	-1.6	9	124.1	0.61	0.42	0.19	1.55	31.4	48.6	UnDef	0.00
10.58	162.2	0.78	0.48	-1.5	9	124.1	0.64	0.43	0.21	1.52	31.1	47.2	UnDef	0.00
11.07	167.3	0.89	0.53	-2.2	9	124.1	0.67	0.45	0.22	1.49	32.0	47.9	UnDef	0.00
11.56	161.9	0.55	0.34	-4.3	9	124.1	0.70	0.46	0.24	1.47	31.0	45.6	UnDef	0.00
12.06	143.5	0.70	0.49	-5.5	9	124.1	0.73	0.48	0.25	1.45	27.5	39.7	UnDef	0.00
12.55	126.5	0.79	0.63	-8.2	9	124.1	0.76	0.49	0.27	1.42	24.2	34.5	UnDef	0.00
13.04	132.4	0.89	0.67	-10.3	9	124.1	0.79	0.51	0.28	1.40	25.4	35.6	UnDef	0.00
13.53	196.5	0.90	0.46	-10.9	9	124.1	0.82	0.52	0.30	1.38	37.6	52.0	UnDef	0.00
14.03	208.7	0.70	0.33	-11.3	9	124.1	0.85	0.54	0.31	1.36	40.0	54.4	UnDef	0.00
14.52	199.2	0.62	0.31	-11.7	9	124.1	0.88	0.55	0.33	1.34	38.2	51.3	UnDef	0.00
15.01	203.6	0.51	0.25	-11.3	9	124.1	0.91	0.57	0.34	1.33	39.0	51.7	UnDef	0.00
15.50	202.7	0.57	0.28	-6.5	9	124.1	0.94	0.58	0.36	1.31	38.8	50.8	UnDef	0.00
15.99	189.9	0.56	0.30	-8.8	9	124.1	0.97	0.60	0.37	1.29	36.4	47.0	UnDef	0.00
16.49	183.2	0.75	0.41	-10.1	9	124.1	1.00	0.61	0.39	1.28	35.1	44.8	UnDef	0.00
16.98	203.3	0.64	0.32	-10.5	9	124.1	1.04	0.63	0.41	1.26	38.9	49.1	UnDef	0.00
17.47	206.9	0.63	0.30	-11.0	9	124.1	1.07	0.65	0.42	1.25	39.6	49.3	UnDef	0.00
17.96	185.2	0.59	0.32	-11.1	9	124.1	1.10	0.66	0.44	1.23	35.5	43.7	UnDef	0.00
18.45	167.4	0.49	0.30	-10.3	9	124.1	1.13	0.68	0.45	1.22	32.1	39.0	UnDef	0.00
18.95	142.5	0.60	0.42	-9.0	9	124.1	1.16	0.69	0.47	1.20	27.3	32.9	UnDef	0.00
19.44	112.2	0.58	0.52	-9.5	9	124.1	1.19	0.71	0.48	1.19	21.5	25.6	UnDef	0.29

Gregg In Situ, Inc. Page: 1b

Interpretation Output - Release 1.00.19e

Run No: 04-0902-1112-5226
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-06
Engineer: B. DUSSELL
CPT Date: 04/16/08
CPT Time: 18:18
CPT File: 272C06.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E+00	0.00	1000.0	0.27	606.3	0.0	606.3	0.0	50	95.0	1.0	-0.28	0.0	101.0
0.74	5.0E-02	0.00	1000.0	0.74	271.2	0.0	271.2	0.0	50	95.0	1.0	-0.37	0.0	54.2
1.23	5.0E-02	0.00	1000.0	0.74	247.4	0.0	247.4	0.0	50	95.0	1.0	-0.37	0.0	49.5
1.72	5.0E-03	0.00	973.0	0.66	200.1	0.0	200.1	0.0	50	95.0	1.0	-0.36	0.0	50.0
2.21	5.0E-03	0.00	557.0	0.57	146.5	0.0	146.5	0.0	50	87.4	1.0	-0.29	0.0	36.6
2.71	5.0E-03	0.00	413.5	0.52	132.4	0.0	132.4	0.1	48	81.7	1.0	-0.26	0.0	33.1
3.20	5.0E-03	0.00	352.7	0.52	133.2	0.0	133.2	0.6	48	79.5	1.0	-0.24	0.0	33.3
3.61	5.0E-03	0.00	306.0	0.53	130.2	0.0	130.2	1.1	46	77.2	1.0	-0.23	0.0	32.5
4.02	5.0E-04	0.00	193.5	0.89	91.4	1.1	92.4	5.4	44	65.6	1.0	-0.24	0.2	30.7
4.51	5.0E-06	0.00	69.4	2.25	34.9	26.6	61.5	21.2	UnDef	UnDef	10.0	UnDef	6.4	23.5
5.00	5.0E-06	0.01	37.0	2.23	19.4	35.3	54.7	29.2	UnDef	UnDef	6.0	UnDef	6.4	15.9
5.50	5.0E-06	0.16	30.3	2.21	16.4	42.7	59.1	32.0	UnDef	UnDef	6.0	UnDef	6.6	14.7
5.99	5.0E-07	0.15	23.4	2.12	13.1	52.5	65.6	35.8	UnDef	UnDef	6.0	UnDef	8.6	17.1
6.56	5.0E-05	0.05	76.5	1.14	42.5	13.3	55.8	13.9	40	42.7	10.0	-0.17	2.9	19.5

Gregg In Situ, Inc.
Run No: 04-0902-1112-5226
CPT File: 272C06.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(nl)60	(N1)60cs
7.14	5.0E-04	0.01	132.6	0.79	75.0	4.4	79.4	7.1	44	59.0	1.0	-0.19	0.9	25.3
7.63	5.0E-02	0.00	265.2	0.24	152.5	0.0	152.5	0.0	46	79.4	1.0	-0.15	0.0	29.8
8.12	5.0E-02	0.00	369.6	0.20	216.8	0.0	216.8	0.0	48	89.5	1.0	-0.16	0.0	42.4
8.61	5.0E-02	0.00	356.0	0.41	213.3	0.0	213.3	0.0	48	89.0	1.0	-0.22	0.0	41.8
9.10	5.0E-02	0.00	418.4	0.41	255.6	0.0	255.6	0.0	48	94.2	1.0	-0.24	0.0	50.0
9.60	5.0E-02	0.00	447.7	0.42	278.8	0.0	278.8	0.0	48	95.0	1.0	-0.24	0.0	54.6
10.09	5.0E-02	0.00	390.8	0.46	248.1	0.0	248.1	0.0	48	93.3	1.0	-0.24	0.0	48.6
10.58	5.0E-02	0.00	373.4	0.48	241.3	0.0	241.3	0.1	48	92.5	1.0	-0.24	0.0	47.2
11.07	5.0E-02	0.00	372.1	0.53	244.7	0.0	244.7	0.5	48	92.9	1.0	-0.25	0.0	47.9
11.56	5.0E-02	0.00	348.1	0.34	232.8	0.0	232.8	0.0	48	91.5	1.0	-0.21	0.0	45.6
12.06	5.0E-02	0.00	298.5	0.49	203.0	0.0	203.0	0.9	46	87.6	1.0	-0.22	0.0	39.7
12.55	5.0E-02	0.00	254.9	0.63	176.3	0.0	176.3	2.5	46	83.5	1.0	-0.23	0.0	34.5
13.04	5.0E-02	0.00	258.7	0.67	181.6	0.0	181.6	2.7	46	84.4	1.0	-0.24	0.0	35.6
13.53	5.0E-02	0.00	373.6	0.46	265.7	0.0	265.7	0.0	48	95.0	1.0	-0.24	0.0	52.0
14.03	5.0E-02	0.00	385.6	0.34	278.2	0.0	278.2	0.0	48	95.0	1.0	-0.21	0.0	54.4
14.52	5.0E-02	0.00	357.9	0.31	261.9	0.0	261.9	0.0	48	94.9	1.0	-0.20	0.0	51.3
15.01	5.0E-02	0.00	356.0	0.25	264.0	0.0	264.0	0.0	48	95.0	1.0	-0.18	0.0	51.7
15.50	5.0E-02	0.00	345.2	0.28	259.5	0.0	259.5	0.0	48	94.6	1.0	-0.19	0.0	50.8
15.99	5.0E-02	0.00	315.0	0.30	239.9	0.0	239.9	0.0	46	92.4	1.0	-0.18	0.0	47.0
16.49	5.0E-02	0.00	296.4	0.41	228.7	0.0	228.7	0.4	46	91.0	1.0	-0.21	0.0	44.8
16.98	5.0E-02	0.00	321.1	0.32	250.7	0.0	250.7	0.0	46	93.6	1.0	-0.19	0.0	49.1
17.47	5.0E-02	0.00	319.0	0.31	252.1	0.0	252.1	0.0	46	93.8	1.0	-0.19	0.0	49.3
17.96	5.0E-02	0.00	278.8	0.32	223.0	0.0	223.0	0.0	46	90.3	1.0	-0.18	0.0	43.7
18.45	5.0E-02	0.00	246.2	0.30	199.4	0.0	199.4	0.2	46	87.1	1.0	-0.16	0.0	39.0
18.95	5.0E-02	-0.01	204.7	0.42	167.8	0.0	167.8	2.0	46	82.1	1.0	-0.18	0.0	32.9
19.44	5.0E-02	-0.01	157.3	0.52	130.7	0.0	130.7	4.1	44	74.9	1.0	-0.17	0.0	25.6

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e

Run No: 04-0902-1112-5287
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-07
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 08:19
CPT File: 272C07.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.25	135.9	0.84	0.62	12.1	9	124.1	0.02	0.02	0.00	2.00	26.0	52.1	UnDef	0.00
0.74	146.6	1.28	0.88	5.6	9	124.1	0.05	0.05	0.00	2.00	28.1	56.1	UnDef	0.00
1.23	81.4	0.53	0.65	5.8	8	120.9	0.08	0.08	0.00	2.00	19.5	39.0	UnDef	0.43
1.72	36.9	0.28	0.76	3.1	7	117.8	0.11	0.11	0.00	2.00	11.8	23.6	UnDef	0.11
2.21	20.6	0.20	0.99	1.9	6	114.6	0.13	0.13	0.00	2.00	7.9	15.8	1.64	0.09
2.71	21.2	0.12	0.58	2.0	7	117.8	0.16	0.16	0.00	2.00	6.8	13.5	UnDef	0.09
3.20	21.5	0.15	0.70	0.9	6	114.6	0.19	0.19	0.00	2.00	8.2	16.5	1.70	0.09
3.61	13.8	0.11	0.76	0.8	6	114.6	0.21	0.21	0.00	2.00	5.3	10.6	1.09	0.08
4.02	11.3	0.09	0.83	-0.1	6	114.6	0.24	0.24	0.00	2.00	4.3	8.6	0.88	0.08
4.51	18.0	0.23	1.30	0.1	6	114.6	0.27	0.25	0.02	2.00	6.9	13.8	1.42	0.09
5.00	54.9	0.31	0.56	0.5	8	120.9	0.30	0.26	0.03	1.95	13.1	25.6	UnDef	0.19
5.50	91.5	0.38	0.42	1.2	8	120.9	0.33	0.28	0.05	1.90	21.9	41.5	UnDef	0.00
5.99	97.4	0.33	0.34	0.7	9	124.1	0.36	0.29	0.06	1.85	18.7	34.5	UnDef	0.00
6.56	96.7	0.31	0.32	-0.1	9	124.1	0.39	0.31	0.08	1.79	18.5	33.2	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-5287
CPT File: 272C07.COR

Page: 2a

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	99.5	0.19	0.19	-0.9	9	124.1	0.43	0.33	0.10	1.74	19.1	33.3	UnDef	0.00
7.63	95.5	0.21	0.22	-1.6	9	124.1	0.46	0.34	0.11	1.71	18.3	31.2	UnDef	0.46
8.12	103.7	0.30	0.29	-5.0	9	124.1	0.49	0.36	0.13	1.67	19.9	33.1	UnDef	0.00
8.61	121.9	0.26	0.22	-7.6	9	124.1	0.52	0.37	0.14	1.64	23.3	38.2	UnDef	0.00
9.10	126.1	0.27	0.21	-7.1	9	124.1	0.55	0.39	0.16	1.60	24.2	38.7	UnDef	0.00
9.60	108.1	0.38	0.36	-7.1	9	124.1	0.58	0.40	0.17	1.57	20.7	32.6	UnDef	0.00
10.09	100.6	0.33	0.33	-8.1	9	124.1	0.61	0.42	0.19	1.54	19.3	29.7	UnDef	0.41
10.58	110.7	0.31	0.28	-9.0	9	124.1	0.64	0.43	0.21	1.52	21.2	32.2	UnDef	0.00
11.07	98.0	0.33	0.34	-9.7	9	124.1	0.67	0.45	0.22	1.49	18.8	28.0	UnDef	0.35
11.56	100.5	0.54	0.54	-10.5	8	120.9	0.70	0.46	0.24	1.47	24.1	35.3	UnDef	0.36
12.06	141.9	0.47	0.33	-11.5	9	124.1	0.73	0.48	0.25	1.44	27.2	39.2	UnDef	0.00
12.55	164.6	0.42	0.25	-12.2	9	124.1	0.76	0.49	0.27	1.42	31.5	44.8	UnDef	0.00
13.04	182.3	0.42	0.23	-12.7	9	124.1	0.79	0.51	0.28	1.40	34.9	48.9	UnDef	0.00
13.53	182.6	0.61	0.34	-12.8	9	124.1	0.82	0.53	0.30	1.38	35.0	48.3	UnDef	0.00
14.03	187.5	0.45	0.24	-13.3	9	124.1	0.85	0.54	0.31	1.36	35.9	48.9	UnDef	0.00
14.52	159.6	0.24	0.15	-13.6	9	124.1	0.88	0.56	0.33	1.34	30.6	41.0	UnDef	0.00
15.01	123.2	0.17	0.14	-14.1	9	124.1	0.91	0.57	0.34	1.32	23.6	31.2	UnDef	0.46
15.50	89.6	0.18	0.20	-14.4	9	124.1	0.94	0.59	0.36	1.31	17.2	22.4	UnDef	0.22
15.99	98.2	0.47	0.48	-14.3	9	124.1	0.98	0.60	0.37	1.29	18.8	24.3	UnDef	0.26
16.49	148.5	0.50	0.34	-14.9	9	124.1	1.01	0.62	0.39	1.27	28.5	36.2	UnDef	0.00
16.98	191.8	0.58	0.30	-15.1	9	124.1	1.04	0.63	0.41	1.26	36.7	46.2	UnDef	0.00
17.47	216.8	0.75	0.35	-15.6	9	124.1	1.07	0.65	0.42	1.24	41.5	51.6	UnDef	0.00
17.96	239.0	0.93	0.39	-15.6	10	127.3	1.10	0.66	0.44	1.23	38.2	46.9	UnDef	0.00
18.45	228.6	0.88	0.38	-15.6	9	124.1	1.13	0.68	0.45	1.21	43.8	53.2	UnDef	0.00
18.95	238.3	0.97	0.41	-15.3	10	127.3	1.16	0.69	0.47	1.20	38.0	45.7	UnDef	0.00
19.44	254.0	0.75	0.29	-15.0	10	127.3	1.19	0.71	0.48	1.19	40.5	48.1	UnDef	0.00
19.93	245.4	0.56	0.23	-15.0	10	127.3	1.22	0.73	0.50	1.17	39.2	46.0	UnDef	0.00
20.42	233.6	1.45	0.62	-14.9	9	124.1	1.25	0.74	0.51	1.16	44.7	52.0	UnDef	0.00
20.92	227.4	1.32	0.58	-14.4	9	124.1	1.28	0.76	0.53	1.15	43.5	50.1	UnDef	0.00
21.41	262.2	1.19	0.45	-14.6	10	127.3	1.31	0.77	0.54	1.14	41.9	47.7	UnDef	0.00
21.90	271.1	1.25	0.46	-14.8	10	127.3	1.35	0.79	0.56	1.13	43.3	48.8	UnDef	0.00
22.39	268.0	1.28	0.48	-14.9	10	127.3	1.38	0.80	0.57	1.12	42.8	47.7	UnDef	0.00
22.88	280.3	1.13	0.40	-15.0	10	127.3	1.41	0.82	0.59	1.10	44.7	49.4	UnDef	0.00
23.38	254.0	1.58	0.62	-15.1	9	124.1	1.44	0.83	0.60	1.09	48.7	53.3	UnDef	0.00
23.87	274.7	1.59	0.58	-14.8	9	124.1	1.47	0.85	0.62	1.08	52.6	57.1	UnDef	0.00
24.36	236.1	0.86	0.36	-14.4	10	127.3	1.50	0.87	0.64	1.07	37.7	40.5	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-5287
CPT File: 272C07.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
24.85	230.0	0.87	0.38	-14.4	9	124.1	1.53	0.88	0.65	1.07	44.1	46.9	UnDef	0.00

Gregg In Situ, Inc.

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Interpretation Output - Release 1.00.19e

Run No: 04-0902-1112-5287
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-07
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 08:19
CPT File: 272C07.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E-02	0.00	1000.0	0.62	260.3	0.0	260.3	0.0	50	95.0	1.0	-0.35	0.0	52.1
0.74	5.0E-02	0.00	1000.0	0.88	280.7	0.0	280.7	0.0	50	95.0	1.0	-0.39	0.0	56.1
1.23	5.0E-03	0.00	1000.0	0.65	156.0	0.0	156.0	0.0	50	95.0	1.0	-0.36	0.0	39.0
1.72	5.0E-04	0.00	349.3	0.76	70.7	0.0	70.7	2.0	48	70.3	1.0	-0.28	0.0	23.6
2.21	5.0E-05	0.00	153.0	0.99	39.5	2.8	42.3	7.5	44	50.2	10.0	-0.23	0.7	16.5
2.71	5.0E-04	0.00	129.6	0.59	40.6	0.8	41.5	5.7	44	48.3	1.0	-0.16	0.2	13.7
3.20	5.0E-05	0.00	111.4	0.71	41.2	3.2	44.3	7.7	42	46.3	10.0	-0.17	0.8	17.2
3.61	5.0E-05	0.00	63.3	0.77	26.4	7.2	33.7	13.0	40	31.9	10.0	-0.12	1.6	12.2
4.02	5.0E-05	0.00	46.4	0.85	21.6	10.1	31.7	17.0	38	30.0	6.0	-0.10	2.2	10.8
4.51	5.0E-05	0.00	70.9	1.32	34.5	14.1	48.6	15.9	40	37.4	10.0	-0.18	3.1	16.9
5.00	5.0E-03	0.00	206.8	0.56	104.5	0.0	104.5	3.0	46	68.5	1.0	-0.20	0.0	25.6
5.50	5.0E-03	0.00	327.6	0.42	169.7	0.0	169.7	0.2	48	82.4	1.0	-0.22	0.0	41.5
5.99	5.0E-02	0.00	331.2	0.34	176.1	0.0	176.1	0.0	48	83.5	1.0	-0.20	0.0	34.5
6.56	5.0E-02	0.00	309.9	0.32	169.8	0.0	169.8	0.0	46	82.4	1.0	-0.19	0.0	33.2

Gregg In Situ, Inc.
Run No: 04-0902-1112-5287
CPT File: 272C07.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
7.14	5.0E-02	0.00	301.7	0.19	170.0	0.0	170.0	0.0	46	82.5	1.0	-0.14	0.0	33.3
7.63	5.0E-02	0.00	276.5	0.23	159.4	0.0	159.4	0.0	46	80.6	1.0	-0.15	0.0	31.2
8.12	5.0E-02	0.00	287.5	0.29	169.3	0.0	169.3	0.0	46	82.4	1.0	-0.17	0.0	33.1
8.61	5.0E-02	0.00	324.4	0.22	195.0	0.0	195.0	0.0	48	86.4	1.0	-0.16	0.0	38.2
9.10	5.0E-02	0.00	322.5	0.21	197.8	0.0	197.8	0.0	48	86.8	1.0	-0.16	0.0	38.7
9.60	5.0E-02	0.00	265.9	0.36	166.3	0.0	166.3	0.4	46	81.9	1.0	-0.19	0.0	32.6
10.09	5.0E-02	0.00	238.3	0.33	152.0	0.0	152.0	0.6	46	79.3	1.0	-0.17	0.0	29.7
10.58	5.0E-02	0.00	253.2	0.28	164.3	0.0	164.3	0.0	46	81.5	1.0	-0.16	0.0	32.2
11.07	5.0E-02	-0.01	216.4	0.34	143.0	0.0	143.0	1.1	46	77.5	1.0	-0.16	0.0	28.0
11.56	5.0E-03	-0.01	214.8	0.55	144.3	0.0	144.3	2.7	46	77.8	1.0	-0.20	0.0	35.3
12.06	5.0E-02	0.00	294.3	0.33	200.5	0.0	200.5	0.0	46	87.2	1.0	-0.19	0.0	39.2
12.55	5.0E-02	0.00	331.1	0.25	229.0	0.0	229.0	0.0	48	91.0	1.0	-0.18	0.0	44.8
13.04	5.0E-02	0.00	356.0	0.23	249.8	0.0	249.8	0.0	48	93.5	1.0	-0.17	0.0	48.9
13.53	5.0E-02	0.00	346.3	0.34	246.7	0.0	246.7	0.0	48	93.2	1.0	-0.20	0.0	48.3
14.03	5.0E-02	0.00	345.5	0.24	249.6	0.0	249.6	0.0	48	93.5	1.0	-0.18	0.0	48.9
14.52	5.0E-02	0.00	285.8	0.15	209.6	0.0	209.6	0.0	46	88.5	1.0	-0.12	0.0	41.0
15.01	5.0E-02	-0.01	214.4	0.14	159.6	0.0	159.6	0.0	46	80.7	1.0	-0.09	0.0	31.2
15.50	5.0E-02	-0.01	151.3	0.20	114.5	0.0	114.5	1.5	44	71.2	1.0	-0.09	0.0	22.4
15.99	5.0E-02	-0.01	161.8	0.48	123.9	0.0	123.9	3.6	44	73.4	1.0	-0.17	0.0	24.3
16.49	5.0E-02	-0.01	239.5	0.34	185.2	0.0	185.2	0.6	46	84.9	1.0	-0.17	0.0	36.2
16.98	5.0E-02	0.00	302.2	0.30	236.2	0.0	236.2	0.0	46	91.9	1.0	-0.18	0.0	46.2
17.47	5.0E-02	0.00	333.7	0.35	263.9	0.0	263.9	0.0	48	95.0	1.0	-0.20	0.0	51.6
17.96	5.0E+00	0.00	359.4	0.39	287.5	0.0	287.5	0.0	48	95.0	1.0	-0.22	0.0	46.9
18.45	5.0E-02	0.00	335.8	0.38	271.8	0.0	271.8	0.0	48	95.0	1.0	-0.21	0.0	53.2
18.95	5.0E+00	0.00	342.1	0.41	280.1	0.0	280.1	0.0	48	95.0	1.0	-0.22	0.0	45.7
19.44	5.0E+00	0.00	356.5	0.29	295.2	0.0	295.2	0.0	48	95.0	1.0	-0.19	0.0	48.1
19.93	5.0E+00	0.00	336.7	0.23	282.0	0.0	282.0	0.0	48	95.0	1.0	-0.17	0.0	46.0
20.42	5.0E-02	0.00	313.7	0.62	265.6	0.0	265.6	1.6	46	95.0	1.0	-0.25	0.0	52.0
20.92	5.0E-02	0.00	299.1	0.58	255.9	0.0	255.9	1.5	46	94.2	1.0	-0.24	0.0	50.1
21.41	5.0E+00	0.00	338.2	0.46	292.2	0.0	292.2	0.3	48	95.0	1.0	-0.23	0.0	47.7
21.90	5.0E+00	0.00	342.6	0.46	299.0	0.0	299.0	0.3	48	95.0	1.0	-0.23	0.0	48.8
22.39	5.0E+00	0.00	331.9	0.48	292.7	0.0	292.7	0.5	48	95.0	1.0	-0.23	0.0	47.7
22.88	5.0E+00	0.00	340.4	0.40	303.1	0.0	303.1	0.0	48	95.0	1.0	-0.22	0.0	49.4
23.38	5.0E-02	0.00	302.6	0.63	272.1	0.0	272.1	1.7	46	95.0	1.0	-0.25	0.0	53.3
23.87	5.0E-02	0.00	321.4	0.58	291.6	0.0	291.6	1.2	48	95.0	1.0	-0.24	0.0	57.1
24.36	5.0E+00	0.00	271.0	0.36	248.3	0.0	248.3	0.4	46	93.3	1.0	-0.19	0.0	40.5

Gregg In Situ, Inc.
Run No: 04-0902-1112-5287
CPT File: 272C07.COR

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Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(nl)60	(Nl)60cs
24.85	5.0E-02	0.00	259.3	0.38	239.8	0.0	239.8	0.7	46	92.3	1.0	-0.19	0.0	46.9

Gregg In Situ, Inc. Page: 1a
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-5336
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-08
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 08:47
CPT File: 272C08.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.25	522.7	1.55	0.30	14.4	10	127.3	0.02	0.02	0.00	2.00	83.4	166.8	UnDef	0.00
0.74	450.9	2.79	0.62	10.3	10	127.3	0.05	0.05	0.00	2.00	72.0	143.9	UnDef	0.00
1.23	159.5	2.60	1.63	10.1	8	120.9	0.08	0.08	0.00	2.00	38.2	76.4	UnDef	0.00
1.72	135.9	1.51	1.11	6.8	8	120.9	0.11	0.11	0.00	2.00	32.5	65.1	UnDef	0.00
2.21	91.7	0.86	0.93	2.6	8	120.9	0.14	0.14	0.00	2.00	22.0	43.9	UnDef	0.00
2.71	63.1	0.40	0.64	-1.0	8	120.9	0.17	0.17	0.00	2.00	15.1	30.2	UnDef	0.24
3.20	33.5	0.23	0.69	-4.2	7	117.8	0.20	0.20	0.00	2.00	10.7	21.4	UnDef	0.10
3.61	15.4	0.20	1.27	-6.0	6	114.6	0.22	0.22	0.00	2.00	5.9	11.8	1.21	0.09
4.02	10.5	0.13	1.21	-6.1	5	114.6	0.24	0.24	0.00	2.00	5.0	10.0	0.82	0.08
4.51	7.7	0.12	1.52	-6.8	5	114.6	0.27	0.26	0.02	1.98	3.7	7.3	0.59	0.09
5.00	6.8	0.14	2.00	-3.8	4	114.6	0.30	0.27	0.03	1.93	4.4	8.4	0.52	0.10
5.50	30.6	0.13	0.43	-3.1	7	117.8	0.33	0.28	0.05	1.88	9.8	18.4	UnDef	0.10
5.99	52.4	0.22	0.43	-1.9	8	120.9	0.36	0.30	0.06	1.84	12.5	23.1	UnDef	0.16
6.56	38.9	0.44	1.13	0.0	7	117.8	0.39	0.31	0.08	1.79	12.4	22.2	UnDef	0.12

Gregg In Situ, Inc.
Run No: 04-0902-1112-5336
CPT File: 272C08.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	67.1	0.42	0.63	-1.2	8	120.9	0.43	0.33	0.10	1.75	16.1	28.0	UnDef	0.22
7.63	115.5	0.53	0.46	-1.8	9	124.1	0.46	0.34	0.11	1.71	22.1	37.8	UnDef	0.00
8.12	138.1	0.35	0.26	-3.3	9	124.1	0.49	0.36	0.13	1.67	26.5	44.2	UnDef	0.00
8.61	142.9	0.48	0.34	-4.8	9	124.1	0.52	0.37	0.14	1.64	27.4	44.8	UnDef	0.00
9.10	137.4	0.33	0.24	-5.7	9	124.1	0.55	0.39	0.16	1.60	26.3	42.2	UnDef	0.00
9.60	113.2	0.26	0.23	-5.6	9	124.1	0.58	0.40	0.17	1.57	21.7	34.1	UnDef	0.00
10.09	120.0	0.52	0.43	-6.3	9	124.1	0.61	0.42	0.19	1.54	23.0	35.5	UnDef	0.00
10.58	132.8	0.40	0.30	-6.9	9	124.1	0.64	0.43	0.21	1.52	25.4	38.6	UnDef	0.00
11.07	141.3	0.58	0.41	-7.4	9	124.1	0.67	0.45	0.22	1.49	27.1	40.4	UnDef	0.00
11.56	142.4	0.52	0.37	-8.0	9	124.1	0.70	0.46	0.24	1.47	27.3	40.0	UnDef	0.00
12.06	165.8	0.80	0.48	-8.2	9	124.1	0.73	0.48	0.25	1.44	31.8	45.9	UnDef	0.00
12.55	203.5	0.95	0.46	-8.4	9	124.1	0.76	0.49	0.27	1.42	39.0	55.4	UnDef	0.00
13.04	238.5	1.08	0.45	-8.7	9	124.1	0.79	0.51	0.28	1.40	45.7	64.0	UnDef	0.00
13.53	245.6	1.16	0.47	-8.7	9	124.1	0.82	0.53	0.30	1.38	47.0	64.9	UnDef	0.00
14.03	241.2	1.15	0.48	-8.8	9	124.1	0.85	0.54	0.31	1.36	46.2	62.9	UnDef	0.00
14.52	240.9	1.02	0.42	-8.9	10	127.3	0.88	0.56	0.33	1.34	38.4	51.6	UnDef	0.00
15.01	236.4	0.92	0.39	-9.0	10	127.3	0.92	0.57	0.34	1.32	37.7	49.9	UnDef	0.00
15.50	210.6	0.80	0.38	-9.2	9	124.1	0.95	0.59	0.36	1.30	40.3	52.6	UnDef	0.00
15.99	209.1	0.72	0.34	-7.8	9	124.1	0.98	0.60	0.37	1.29	40.0	51.6	UnDef	0.00
16.49	180.6	0.54	0.30	-7.3	9	124.1	1.01	0.62	0.39	1.27	34.6	44.0	UnDef	0.00
16.98	165.9	0.56	0.34	-7.7	9	124.1	1.04	0.63	0.41	1.26	31.8	39.9	UnDef	0.00
17.47	188.3	0.61	0.32	-8.3	9	124.1	1.07	0.65	0.42	1.24	36.1	44.8	UnDef	0.00
17.96	188.0	0.75	0.40	-8.6	9	124.1	1.10	0.66	0.44	1.23	36.0	44.2	UnDef	0.00
18.45	190.8	0.84	0.44	-9.0	9	124.1	1.13	0.68	0.45	1.21	36.5	44.4	UnDef	0.00
18.95	190.4	0.86	0.45	-9.1	9	124.1	1.16	0.69	0.47	1.20	36.5	43.8	UnDef	0.00
19.44	185.6	0.90	0.48	-9.3	9	124.1	1.19	0.71	0.48	1.19	35.6	42.2	UnDef	0.00
19.93	173.5	1.01	0.58	-9.6	9	124.1	1.22	0.72	0.50	1.18	33.2	39.0	UnDef	0.00
20.42	178.2	1.08	0.61	-9.7	9	124.1	1.25	0.74	0.51	1.16	34.1	39.7	UnDef	0.00
20.92	188.9	1.05	0.56	-9.8	9	124.1	1.28	0.75	0.53	1.15	36.2	41.7	UnDef	0.00
21.41	153.5	0.78	0.51	-9.8	9	124.1	1.31	0.77	0.54	1.14	29.4	33.5	UnDef	0.00
21.90	153.4	1.01	0.66	-9.9	9	124.1	1.34	0.78	0.56	1.13	29.4	33.2	UnDef	0.00
22.39	170.0	0.89	0.52	-10.4	9	124.1	1.37	0.80	0.57	1.12	32.6	36.4	UnDef	0.00
22.88	230.5	0.80	0.35	-10.6	10	127.3	1.41	0.82	0.59	1.11	36.8	40.7	UnDef	0.00
23.38	229.8	0.69	0.30	-10.7	10	127.3	1.44	0.83	0.60	1.10	36.7	40.2	UnDef	0.00
23.87	210.1	0.94	0.45	-10.7	9	124.1	1.47	0.85	0.62	1.09	40.2	43.7	UnDef	0.00
24.36	221.1	0.93	0.42	-10.7	9	124.1	1.50	0.86	0.64	1.08	42.3	45.6	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-5336
CPT File: 272C08.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
24.85	266.5	1.28	0.48	-10.6	10	127.3	1.53	0.88	0.65	1.07	42.5	45.4	UnDef	0.00
25.34	320.4	1.47	0.46	-10.5	10	127.3	1.56	0.89	0.67	1.06	51.1	54.1	UnDef	0.00
25.84	352.5	1.63	0.46	-10.4	10	127.3	1.59	0.91	0.68	1.05	56.3	59.0	UnDef	0.00
26.33	367.7	1.91	0.52	-10.4	10	127.3	1.62	0.93	0.70	1.04	58.7	61.0	UnDef	0.00
26.82	398.6	1.84	0.46	-9.9	10	127.3	1.65	0.94	0.71	1.03	63.6	65.6	UnDef	0.00
27.31	379.9	1.41	0.37	-9.5	10	127.3	1.69	0.96	0.73	1.02	60.6	62.0	UnDef	0.00
27.80	323.8	1.32	0.41	-9.1	10	127.3	1.72	0.97	0.74	1.01	51.7	52.4	UnDef	0.00
28.30	281.9	1.48	0.52	-9.0	10	127.3	1.75	0.99	0.76	1.01	45.0	45.2	UnDef	0.00
28.79	294.0	1.24	0.42	-9.0	10	127.3	1.78	1.01	0.77	1.00	46.9	46.8	UnDef	0.00
29.28	301.7	1.63	0.54	-9.7	10	127.3	1.81	1.02	0.79	0.99	48.2	47.7	UnDef	0.00
29.77	317.0	5.22	1.65	-10.1	8	120.9	1.84	1.04	0.80	0.98	75.9	74.5	UnDef	0.00
30.27	330.5	3.14	0.95	-10.8	9	124.1	1.87	1.05	0.82	0.98	63.3	61.7	UnDef	0.00
30.76	365.8	1.86	0.51	-11.9	10	127.3	1.90	1.07	0.84	0.97	58.4	56.5	UnDef	0.00
31.17	343.5	1.88	0.55	-11.3	10	127.3	1.93	1.08	0.85	0.96	54.8	52.7	UnDef	0.00
31.58	356.7	2.13	0.60	-10.9	10	127.3	1.95	1.09	0.86	0.96	56.9	54.4	UnDef	0.00

Gregg In Situ, Inc. Page: 1b
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-5336
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-08
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 08:47
CPT File: 272C08.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E+00	0.00	1000.0	0.30	1001.1	0.0	1001.1	0.0	50	95.0	1.0	-0.28	0.0	166.8
0.74	5.0E+00	0.00	1000.0	0.62	863.7	0.0	863.7	0.0	50	95.0	1.0	-0.35	0.0	143.9
1.23	5.0E-03	0.00	1000.0	1.63	305.4	UnDef	UnDef	0.0	50	95.0	1.0	-0.47	UnDef	UnDef
1.72	5.0E-03	0.00	1000.0	1.11	260.3	0.0	260.3	0.9	50	95.0	1.0	-0.42	0.0	65.1
2.21	5.0E-03	0.00	668.4	0.93	175.7	0.0	175.7	1.0	50	92.7	1.0	-0.36	0.0	43.9
2.71	5.0E-03	0.00	377.5	0.64	120.9	0.0	120.9	1.0	48	79.1	1.0	-0.27	0.0	30.2
3.20	5.0E-04	0.00	169.9	0.69	64.2	0.0	64.2	4.9	44	58.7	1.0	-0.20	0.0	21.4
3.61	5.0E-05	-0.01	69.0	1.29	29.5	12.2	41.7	16.0	40	34.7	10.0	-0.18	2.6	14.4
4.02	5.0E-06	-0.02	42.1	1.24	20.0	15.4	35.5	21.3	UnDef	UnDef	6.0	UnDef	3.7	13.8
4.51	5.0E-06	-0.03	29.0	1.58	14.7	25.7	40.5	28.8	UnDef	UnDef	6.0	UnDef	4.8	12.1
5.00	5.0E-07	-0.02	24.3	2.10	12.9	51.6	64.5	35.0	UnDef	UnDef	6.0	UnDef	8.4	16.9
5.50	5.0E-04	0.00	107.3	0.43	56.3	0.0	56.3	5.0	42	50.8	1.0	-0.12	0.0	18.4
5.99	5.0E-03	0.00	175.9	0.43	94.3	0.0	94.3	2.7	44	65.6	1.0	-0.16	0.0	23.1
6.56	5.0E-04	0.00	123.3	1.15	68.1	10.3	78.4	9.9	42	56.3	1.0	-0.22	2.0	24.2

Gregg In Situ, Inc.
Run No: 04-0902-1112-5336
CPT File: 272C08.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
7.14	5.0E-03	0.00	202.9	0.64	114.5	0.0	114.5	3.6	46	71.2	1.0	-0.21	0.0	28.0
7.63	5.0E-02	0.00	335.3	0.46	193.0	0.0	193.0	0.3	48	86.1	1.0	-0.23	0.0	37.8
8.12	5.0E-02	0.00	384.1	0.26	225.8	0.0	225.8	0.0	48	90.6	1.0	-0.19	0.0	44.2
8.61	5.0E-02	0.00	381.1	0.34	228.8	0.0	228.8	0.0	48	91.0	1.0	-0.21	0.0	44.8
9.10	5.0E-02	0.00	352.0	0.24	215.6	0.0	215.6	0.0	48	89.3	1.0	-0.18	0.0	42.2
9.60	5.0E-02	0.00	278.8	0.23	174.3	0.0	174.3	0.0	46	83.2	1.0	-0.15	0.0	34.1
10.09	5.0E-02	0.00	285.0	0.44	181.4	0.0	181.4	0.7	46	84.4	1.0	-0.21	0.0	35.5
10.58	5.0E-02	0.00	304.3	0.30	197.2	0.0	197.2	0.0	46	86.7	1.0	-0.18	0.0	38.6
11.07	5.0E-02	0.00	312.9	0.41	206.3	0.0	206.3	0.2	46	88.0	1.0	-0.21	0.0	40.4
11.56	5.0E-02	0.00	304.9	0.37	204.4	0.0	204.4	0.0	46	87.8	1.0	-0.20	0.0	40.0
12.06	5.0E-02	0.00	344.1	0.48	234.3	0.0	234.3	0.4	48	91.7	1.0	-0.23	0.0	45.9
12.55	5.0E-02	0.00	409.6	0.47	283.1	0.0	283.1	0.0	48	95.0	1.0	-0.25	0.0	55.4
13.04	5.0E-02	0.00	466.0	0.46	326.8	0.0	326.8	0.0	48	95.0	1.0	-0.26	0.0	64.0
13.53	5.0E-02	0.00	465.9	0.47	331.6	0.0	331.6	0.0	48	95.0	1.0	-0.26	0.0	64.9
14.03	5.0E-02	0.00	444.8	0.48	321.1	0.0	321.1	0.0	48	95.0	1.0	-0.26	0.0	62.9
14.52	5.0E+00	0.00	431.6	0.42	316.1	0.0	316.1	0.0	48	95.0	1.0	-0.24	0.0	51.6
15.01	5.0E+00	0.00	411.6	0.39	305.8	0.0	305.8	0.0	48	95.0	1.0	-0.23	0.0	49.9
15.50	5.0E-02	0.00	356.9	0.38	268.9	0.0	268.9	0.0	48	95.0	1.0	-0.22	0.0	52.6
15.99	5.0E-02	0.00	345.2	0.35	263.5	0.0	263.5	0.0	48	95.0	1.0	-0.21	0.0	51.6
16.49	5.0E-02	0.00	290.6	0.30	224.8	0.0	224.8	0.0	46	90.5	1.0	-0.18	0.0	44.0
16.98	5.0E-02	0.00	260.4	0.34	204.1	0.0	204.1	0.4	46	87.7	1.0	-0.18	0.0	39.9
17.47	5.0E-02	0.00	288.8	0.33	228.9	0.0	228.9	0.0	46	91.0	1.0	-0.18	0.0	44.8
17.96	5.0E-02	0.00	281.7	0.40	225.9	0.0	225.9	0.5	46	90.6	1.0	-0.20	0.0	44.2
18.45	5.0E-02	0.00	279.5	0.44	226.6	0.0	226.6	0.8	46	90.7	1.0	-0.21	0.0	44.4
18.95	5.0E-02	0.00	272.8	0.46	223.7	0.0	223.7	1.0	46	90.4	1.0	-0.21	0.0	43.8
19.44	5.0E-02	0.00	260.2	0.49	215.8	0.0	215.8	1.4	46	89.3	1.0	-0.21	0.0	42.2
19.93	5.0E-02	0.00	237.9	0.59	199.5	0.0	199.5	2.5	46	87.1	1.0	-0.22	0.0	39.0
20.42	5.0E-02	0.00	239.3	0.61	202.8	0.0	202.8	2.6	46	87.5	1.0	-0.22	0.0	39.7
20.92	5.0E-02	0.00	248.6	0.56	212.8	0.0	212.8	2.1	46	88.9	1.0	-0.22	0.0	41.7
21.41	5.0E-02	-0.01	197.7	0.51	171.2	0.0	171.2	2.8	46	82.7	1.0	-0.19	0.0	33.5
21.90	5.0E-02	-0.01	193.7	0.66	169.4	0.0	169.4	4.0	44	82.4	1.0	-0.21	0.0	33.2
22.39	5.0E-02	-0.01	210.8	0.53	186.0	0.0	186.0	2.6	46	85.1	1.0	-0.20	0.0	36.4
22.88	5.0E+00	0.00	280.9	0.35	249.8	0.0	249.8	0.2	46	93.5	1.0	-0.19	0.0	40.7
23.38	5.0E+00	0.00	274.7	0.30	246.6	0.0	246.6	0.0	46	93.2	1.0	-0.17	0.0	40.2
23.87	5.0E-02	0.00	246.3	0.45	223.4	0.0	223.4	1.4	46	90.3	1.0	-0.20	0.0	43.7
24.36	5.0E-02	0.00	254.6	0.42	233.0	0.0	233.0	1.0	46	91.5	1.0	-0.20	0.0	45.6

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Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
7.14	5.0E-02	0.00	311.6	0.39	173.8	0.0	173.8	0.1	46	83.1	1.0	-0.21	0.0	34.0
7.63	5.0E-02	0.00	395.5	0.33	225.6	0.0	225.6	0.0	48	90.6	1.0	-0.21	0.0	44.2
8.12	5.0E-02	0.00	406.5	0.38	237.0	0.0	237.0	0.0	48	92.0	1.0	-0.23	0.0	46.4
8.61	5.0E-02	0.00	417.9	0.37	248.8	0.0	248.8	0.0	48	93.4	1.0	-0.23	0.0	48.7
9.10	5.0E-02	0.00	387.4	0.39	235.4	0.0	235.4	0.0	48	91.8	1.0	-0.23	0.0	46.1
9.60	5.0E-02	0.00	388.8	0.45	240.9	0.0	240.9	0.0	48	92.5	1.0	-0.24	0.0	47.2
10.09	5.0E-02	0.00	399.0	0.44	251.9	0.0	251.9	0.0	48	93.8	1.0	-0.24	0.0	49.3
10.58	5.0E-02	0.00	335.4	0.48	215.8	0.0	215.8	0.5	48	89.3	1.0	-0.23	0.0	42.2
11.07	5.0E-02	0.00	306.3	0.42	200.6	0.0	200.6	0.3	46	87.2	1.0	-0.21	0.0	39.3
11.56	5.0E-02	0.00	264.0	0.43	176.0	0.0	176.0	1.0	46	83.5	1.0	-0.20	0.0	34.4
12.06	5.0E-02	0.00	289.5	0.30	196.1	0.0	196.1	0.0	46	86.6	1.0	-0.18	0.0	38.4
12.55	5.0E-02	0.00	292.1	0.39	201.0	0.0	201.0	0.3	46	87.3	1.0	-0.20	0.0	39.3
13.04	5.0E-02	0.00	290.0	0.48	202.7	0.0	202.7	0.9	46	87.5	1.0	-0.22	0.0	39.7
13.53	5.0E-02	0.00	277.4	0.69	196.8	0.0	196.8	2.5	46	86.7	1.0	-0.25	0.0	38.5
14.03	5.0E-02	0.00	267.0	0.48	192.2	0.0	192.2	1.3	46	86.0	1.0	-0.21	0.0	37.6
14.52	5.0E-02	0.00	235.7	0.48	172.2	0.0	172.2	1.8	46	82.9	1.0	-0.20	0.0	33.7
15.01	5.0E-02	0.00	225.9	0.22	167.4	0.0	167.4	0.0	46	82.0	1.0	-0.13	0.0	32.8
15.50	5.0E-02	-0.01	216.8	0.37	162.8	0.0	162.8	1.3	46	81.2	1.0	-0.17	0.0	31.9
15.99	5.0E-02	-0.01	250.4	0.31	190.3	0.0	190.3	0.3	46	85.7	1.0	-0.17	0.0	37.3
16.49	5.0E-02	-0.01	229.1	0.35	176.4	0.0	176.4	0.9	46	83.6	1.0	-0.17	0.0	34.5
16.98	5.0E-02	-0.01	223.8	0.50	174.5	0.0	174.5	2.2	46	83.2	1.0	-0.20	0.0	34.2
17.47	5.0E-02	0.00	251.9	0.42	198.7	0.0	198.7	1.1	46	87.0	1.0	-0.20	0.0	38.9
17.96	5.0E-02	0.00	269.3	0.33	214.8	0.0	214.8	0.1	46	89.2	1.0	-0.18	0.0	42.0
18.45	5.0E-02	-0.01	230.0	0.45	185.8	0.0	185.8	1.7	46	85.0	1.0	-0.19	0.0	36.4
18.95	5.0E-02	-0.01	243.2	0.40	198.6	0.0	198.6	1.0	46	86.9	1.0	-0.19	0.0	38.9
19.44	5.0E-02	-0.01	250.6	0.38	206.8	0.0	206.8	0.8	46	88.1	1.0	-0.19	0.0	40.5
19.93	5.0E-02	-0.01	244.6	0.32	204.0	0.0	204.0	0.4	46	87.7	1.0	-0.17	0.0	39.9
20.42	5.0E-02	-0.01	204.9	0.44	173.0	0.0	173.0	2.1	46	83.0	1.0	-0.18	0.0	33.9
20.92	5.0E-02	-0.01	205.0	0.44	174.9	0.0	174.9	2.1	46	83.3	1.0	-0.18	0.0	34.2
21.41	5.0E-02	-0.01	189.7	0.44	163.6	0.0	163.6	2.5	44	81.4	1.0	-0.17	0.0	32.0
21.90	5.0E-02	-0.01	146.5	0.55	127.9	0.0	127.9	4.7	44	74.3	1.0	-0.17	0.0	25.0
22.39	5.0E-02	-0.01	148.3	0.71	130.7	2.8	133.6	5.8	44	75.0	1.0	-0.19	0.3	25.9
22.88	5.0E-02	-0.01	176.5	0.59	156.8	0.0	156.8	4.0	44	80.2	1.0	-0.19	0.0	30.7
23.38	5.0E-02	-0.01	193.2	0.48	173.1	0.0	173.1	2.6	44	83.0	1.0	-0.18	0.0	33.9
23.87	5.0E-02	-0.01	213.8	0.39	193.1	0.0	193.1	1.5	46	86.1	1.0	-0.17	0.0	37.8
24.36	5.0E-02	-0.01	236.8	0.36	215.6	0.0	215.6	0.9	46	89.3	1.0	-0.18	0.0	42.2

Gregg In Situ, Inc.
Run No: 04-0902-1112-5512
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Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
24.85	5.0E-02	-0.01	224.4	0.39	206.3	0.0	206.3	1.3	46	88.0	1.0	-0.18	0.0	40.4
25.34	5.0E-02	-0.01	212.2	0.34	196.8	0.0	196.8	1.2	46	86.7	1.0	-0.16	0.0	38.5
25.84	5.0E-02	-0.01	208.4	0.42	195.0	0.0	195.0	1.9	46	86.4	1.0	-0.18	0.0	38.2
26.33	5.0E-02	-0.01	228.6	0.50	215.6	0.0	215.6	2.1	46	89.3	1.0	-0.20	0.0	42.2
26.82	5.0E-02	0.00	276.3	0.74	262.3	0.0	262.3	2.8	46	94.9	1.0	-0.25	0.0	51.3

Gregg In Situ

Environmental and Geotechnical Site Investigation Contractors

Gregg In Situ CPT Interpretations as of January 7, 1999 (Release 1.00.19)

Gregg In Situ's interpretation routine should be considered a calculator of current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (typically 0.25m). Note that Qt is the recorded tip value, Qc, corrected for pore pressure effects. Since all Gregg In Situ cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, Fs, are not required.

The tip correction is: $Qt = Qc + (1-a) \bullet Ud$

where: *Qt* is the corrected tip load
Qc is the recorded tip load
Ud is the recorded dynamic pore pressure
a is the Net Area Ratio for the cone (typically 0.85 for Gregg In Situ cones)

Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). The stress calculations use unit weights assigned to the Soil Behavior Type zones or from a user defined unit weight profile.

Details regarding the interpretation methods for all of the interpreted parameters is given in table 1. The appropriate references referred to in table 1 are listed in table 2.

The estimated Soil Behavior Type is based on the charts developed by Robertson and Campanella shown in figure 1.

Table 1 CPT Interpretation Methods

Interpreted Parameter	Description	Equation	Ref
Depth	mid layer depth		
AvgQt	Averaged corrected tip (Qt)	$AvgQt = \frac{1}{n}\sum_{i=1}^{n} Qt_i$	
AvgFs	Averaged sleeve friction (Fs)	$AvgFs = \frac{1}{n}\sum_{i=1}^{n} Fs_i$	
AvgRf	Averaged friction ratio (Rf)	$AvgRf = 100\% \bullet \frac{AvgFs}{AvgQt}$	
AvgUd	Averaged dynamic pore pressure (Ud)	$AvgUd = \frac{1}{n}\sum_{i=1}^{n} Ud_i$	
SBT	Soil Behavior Type as defined by Robertson and Campanella		1

CPT Interpretations

U.Wt.	Unit Weight of soil determined from: 1) uniform value or 2) value assigned to each SBT zone 3) user supplied unit weight profile		
TStress	Total vertical overburden stress at mid layer depth	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ where γ is layer unit weight h_i is layer thickness	
EStress	Effective vertical overburden stress at mid layer depth	$EStress = TStress - Ueq$	
Ueq	Equilibrium pore pressure determined from: 1) hydrostatic from water table depth 2) user supplied profile		
Cn	SPT N_{60} overburden correction factor	$Cn=(\sigma_v')^{-0.5}$ where σ_v' is in tsf $0.5 < C_n < 2.0$	
N_{60}	SPT N value at 60% energy calculated from Qt/N ratios assigned to each SBT zone		3
$(N1)_{60}$	SPT N_{60} value corrected for overburden pressure	$N1_{60} = Cn \bullet N_{60}$	3
$\Delta(N1)_{60}$	Equivalent Clean Sand Correction to $(N1)_{60}$	$\Delta(N1)_{60} = \frac{K_{SPT}}{1-K_{SPT}} \bullet (N1)_{60}$ Where: K_{SPT} is defined as: 0.0 for FC < 5% 0.0167 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	7
$(N1)_{60cs}$	Equivalent Clean Sand $(N1)_{60}$	$(N1)_{60cs} = (N1)_{60} + \Delta(N1)_{60}$	7
Su	Undrained shear strength - Nkt is use selectable	$Su = \frac{Qt - \sigma_v}{N_{kt}}$	2
k	Coefficient of permeability (assigned to each SBT zone)		6
Bq	Pore pressure parameter	$Bq = \frac{\Delta u}{Qt - \sigma_v}$	2
Qtn	Normalized Qt for Soil Behavior Type classification as defined by Robertson, 1990	$Qtn = \frac{Qt - \sigma_v}{\sigma'_v}$	4
Rfn	Normalized Rf for Soil Behavior Type classification as defined by Robertson, 1990	$Rfn = 100\% \bullet \frac{f_s}{Qt - \sigma_v}$	4
SBTn	Normalized Soil Behavior Type (slightly modified from that published by Robertson, 1990. This version includes all the soil zones of the original non-normalized SBT chart - see figure 1)		4
Qc1	Normalized Qt for seismic analysis	$qc1 = qc \bullet (Pa/\sigma_v')^{0.5}$ where: Pa = atm. pressure	5
Qc1N	Dimensionless Normalized Qt1	qc1N = qc1 / Pa where: Pa = atm. pressure	

GREGG

CPT Interpretations

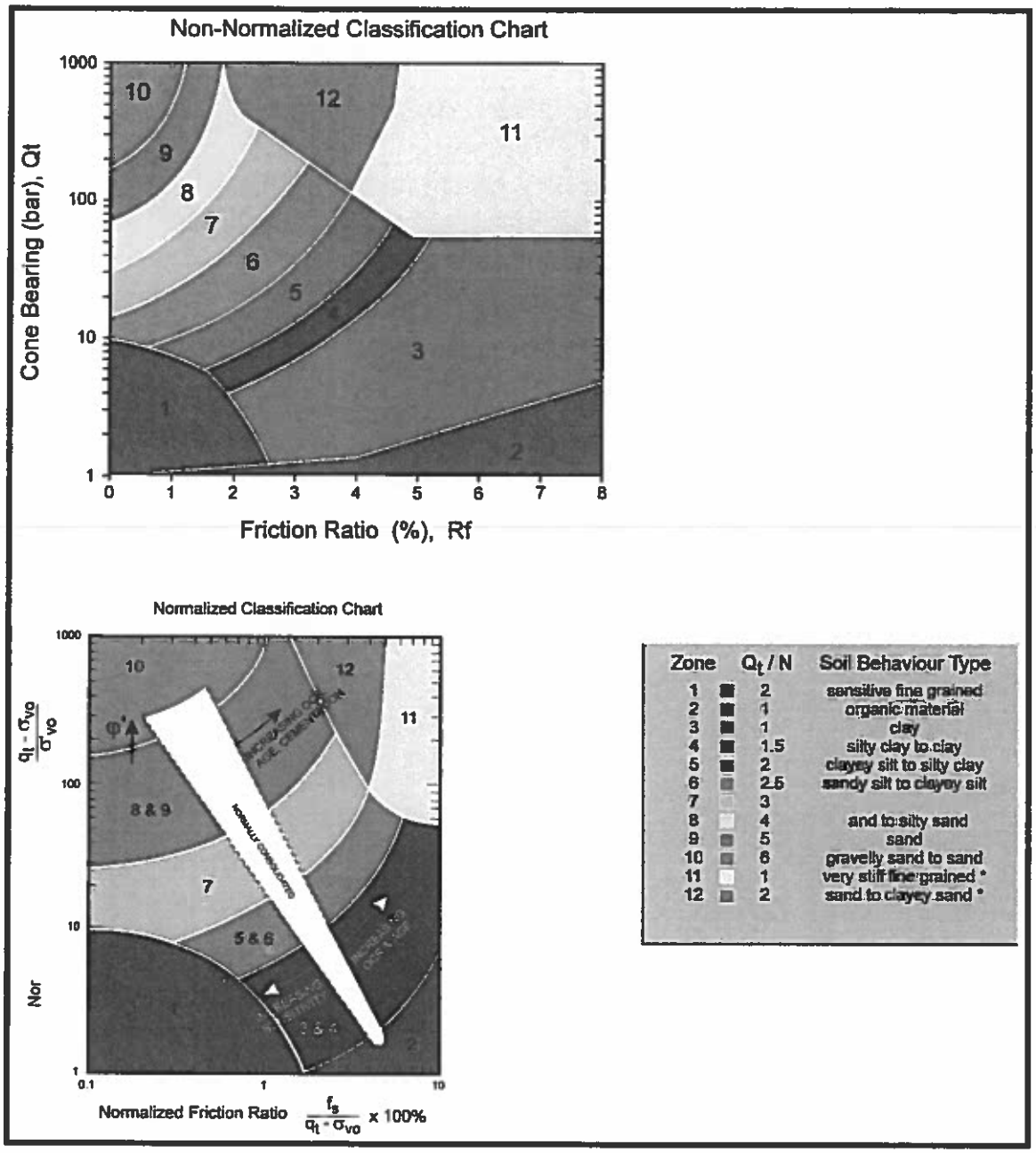

Figure 1 Non-Normalized and Normalized Soil Behavior Type Classification Charts

CPT Interpretations

ΔQc1N1	Equivalent clean sand correction	$\Delta qc1N = \frac{K_{CPT}}{1-K_{CPT}} \bullet qc1N$ Where: K_{CPT} is defined as: 0.0 for FC < 5% 0.0267 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	5
Qc1Ncs	Clean Sand equivalent Qc1N	*qc1Ncs = qc1N + Δqc1N*	5
Ic	Soil index for estimating grain characteristics	$Ic = [(3.47 - \log Q)^2 + (\log F + 1.22)^2]^{0.5}$	5
FC	Fines content (%)	$FC=1.75(Ic^{3.25}) - 3.7$ *FC=100 for Ic > 3.5* *FC=0 for Ic < 1.26* *FC = 5% if 1.64 < Ic < 2.6 AND Rfn<0.5*	8
PHI	Friction Angle	Campanella and Robertson Durunoglu and Mitchel Janbu	1
Dr	Relative Density	Ticino Sand Hokksund Sand Schmertmann 1976 Jamiolkowski - All Sands	1
OCR	Over Consolidation Ratio		1
State Parameter			9
CRR	Cyclic Resistance Ratio		7

GREGG

Gregg In Situ, Inc.
Run No: 04-0902-1112-5336
CPT File: 272C08.COR

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
24.85	5.0E+00	0.00	301.8	0.48	278.4	0.0	278.4	0.8	46	95.0	1.0	-0.22	0.0	45.4
25.34	5.0E+00	0.00	356.6	0.46	331.6	0.0	331.6	0.1	48	95.0	1.0	-0.23	0.0	54.1
25.84	5.0E+00	0.00	385.7	0.46	361.7	0.0	361.7	0.0	48	95.0	1.0	-0.24	0.0	59.0
26.33	5.0E+00	0.00	395.4	0.52	373.9	0.0	373.9	0.2	48	95.0	1.0	-0.25	0.0	61.0
26.82	5.0E+00	0.00	421.4	0.46	401.9	0.0	401.9	0.0	48	95.0	1.0	-0.25	0.0	65.6
27.31	5.0E+00	0.00	394.9	0.37	379.9	0.0	379.9	0.0	48	95.0	1.0	-0.22	0.0	62.0
27.80	5.0E+00	0.00	330.8	0.41	321.1	0.0	321.1	0.0	48	95.0	1.0	-0.22	0.0	52.4
28.30	5.0E+00	0.00	283.1	0.53	277.3	0.0	277.3	1.4	46	95.0	1.0	-0.22	0.0	45.2
28.79	5.0E+00	0.00	290.6	0.42	286.9	0.0	286.9	0.6	46	95.0	1.0	-0.21	0.0	46.8
29.28	5.0E+00	0.00	293.6	0.54	292.1	0.0	292.1	1.3	46	95.0	1.0	-0.23	0.0	47.7
29.77	5.0E-03	0.00	304.0	1.66	304.6	17.1	321.7	7.0	46	95.0	1.0	-0.35	2.6	77.1
30.27	5.0E-02	0.00	312.5	0.96	315.4	0.0	315.4	3.5	46	95.0	1.0	-0.29	0.0	61.7
30.76	5.0E+00	0.00	341.0	0.51	346.5	0.0	346.5	0.6	48	95.0	1.0	-0.24	0.0	56.5
31.17	5.0E+00	0.00	316.1	0.55	323.4	0.0	323.4	1.1	46	95.0	1.0	-0.24	0.0	52.7
31.58	5.0E+00	0.00	324.4	0.60	333.8	0.0	333.8	1.3	48	95.0	1.0	-0.25	0.0	54.4

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-5397
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-09
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 09:17
CPT File: 272C09.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.25	164.3	1.23	0.75	3.2	9	124.1	0.02	0.02	0.00	2.00	31.5	62.9	UnDef	0.00
0.74	214.0	1.75	0.82	15.6	9	124.1	0.05	0.05	0.00	2.00	41.0	82.0	UnDef	0.00
1.23	175.8	1.48	0.84	16.1	9	124.1	0.08	0.08	0.00	2.00	33.7	67.3	UnDef	0.00
1.72	91.3	1.61	1.77	11.3	7	117.8	0.11	0.11	0.00	2.00	29.1	58.3	UnDef	0.00
2.21	82.8	3.10	3.74	0.8	5	114.6	0.13	0.13	0.00	2.00	39.6	79.3	6.61	0.00
2.71	116.5	2.58	2.21	15.5	7	117.8	0.16	0.16	0.00	2.00	37.2	74.4	UnDef	0.00
3.20	100.6	1.79	1.78	14.8	7	117.8	0.19	0.19	0.00	2.00	32.1	64.2	UnDef	0.00
3.61	98.7	1.32	1.34	10.4	8	120.9	0.22	0.22	0.00	2.00	23.6	47.3	UnDef	0.00
4.02	91.0	0.98	1.08	0.9	8	120.9	0.24	0.24	0.00	2.00	21.8	43.6	UnDef	0.00

Gregg In Situ, Inc. Page: 1b

Interpretation Output - Release 1.00.19e

Run No: 04-0902-1112-5397
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-09
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 09:17
CPT File: 272C09.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E-02	0.00	1000.0	0.75	314.7	0.0	314.7	0.0	50	95.0	1.0	-0.37	0.0	62.9
0.74	5.0E-02	0.00	1000.0	0.82	409.9	0.0	409.9	0.0	50	95.0	1.0	-0.38	0.0	82.0
1.23	5.0E-02	0.00	1000.0	0.84	336.7	0.0	336.7	0.0	50	95.0	1.0	-0.39	0.0	67.3
1.72	5.0E-04	0.00	859.4	1.77	174.9	UnDef	UnDef	0.0	50	95.0	1.0	-0.47	UnDef	UnDef
2.21	5.0E-06	0.00	613.7	3.75	158.6	UnDef	UnDef	0.0	UnDef	UnDef	10.0	UnDef	UnDef	UnDef
2.71	5.0E-04	0.00	712.4	2.22	223.1	UnDef	UnDef	0.0	50	95.0	1.0	-0.50	UnDef	UnDef
3.20	5.0E-04	0.00	522.2	1.78	192.7	1.3	194.0	5.3	48	90.5	1.0	-0.42	0.3	64.5
3.61	5.0E-03	0.00	454.6	1.34	189.1	0.0	189.1	3.9	48	88.2	1.0	-0.37	0.0	47.3
4.02	5.0E-03	0.00	376.9	1.08	174.4	0.0	174.4	3.4	48	84.4	1.0	-0.32	0.0	43.6

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e

Run No: 04-0902-1112-5452
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-09a
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 11:16
CPT File: 272C09A.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.25	169.9	0.48	0.28	7.6	9	124.1	0.02	0.02	0.00	2.00	32.5	65.1	UnDef	0.00
0.74	295.8	2.52	0.85	20.4	9	124.1	0.05	0.05	0.00	2.00	56.7	113.3	UnDef	0.00
1.23	247.7	2.20	0.89	11.5	9	124.1	0.08	0.08	0.00	2.00	47.4	94.9	UnDef	0.00
1.72	123.4	1.47	1.19	-0.2	8	120.9	0.11	0.11	0.00	2.00	29.6	59.1	UnDef	0.00
2.21	46.6	0.93	1.99	-1.4	6	114.6	0.14	0.14	0.00	2.00	17.9	35.7	3.72	0.16
2.71	25.9	0.83	3.20	6.1	5	114.6	0.16	0.16	0.00	2.00	12.4	24.8	2.06	0.00
3.20	21.3	0.37	1.75	3.8	6	114.6	0.19	0.19	0.00	2.00	8.2	16.3	1.69	0.09
3.61	32.2	0.34	1.06	-4.3	7	117.8	0.22	0.22	0.00	2.00	10.3	20.6	UnDef	0.11
4.02	36.9	0.26	0.71	-5.0	7	117.8	0.24	0.24	0.00	2.00	11.8	23.6	UnDef	0.11
4.51	18.1	0.38	2.08	-3.7	6	114.6	0.27	0.25	0.02	1.99	7.0	13.8	1.43	0.10
5.00	12.1	0.23	1.88	4.0	5	114.6	0.30	0.27	0.03	1.94	5.8	11.3	0.95	0.09
5.50	8.0	0.13	1.67	7.7	5	114.6	0.32	0.28	0.05	1.90	3.8	7.3	0.61	0.09
5.99	7.5	0.14	1.83	9.1	5	114.6	0.35	0.29	0.06	1.85	3.6	6.6	0.57	0.10
6.56	7.8	0.14	1.84	11.5	5	114.6	0.39	0.31	0.08	1.81	3.7	6.7	0.59	0.10

Gregg In Situ, Inc.
Run No: 04-0902-1112-5452
CPT File: 272C09A.COR

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Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	7.4	0.11	1.45	14.2	5	114.6	0.42	0.32	0.10	1.77	3.5	6.2	0.56	0.09
7.63	6.4	0.07	1.10	18.4	5	114.6	0.45	0.33	0.11	1.73	3.1	5.3	0.48	0.09
8.12	6.0	0.06	1.00	21.9	1	79.6	0.47	0.34	0.13	1.71	2.9	4.9	0.45	0.09
8.61	6.7	0.05	0.75	27.9	1	79.6	0.49	0.35	0.14	1.70	3.2	5.5	0.50	0.08
9.10	7.8	0.07	0.94	30.7	5	114.6	0.51	0.35	0.16	1.68	3.7	6.3	0.58	0.09
9.60	7.5	0.08	1.08	32.5	5	114.6	0.54	0.37	0.17	1.65	3.6	5.9	0.55	0.09
10.09	6.2	0.06	0.96	37.3	1	79.6	0.57	0.38	0.19	1.63	3.0	4.9	0.45	0.09
10.58	6.4	0.05	0.78	39.0	1	79.6	0.59	0.38	0.21	1.62	3.1	5.0	0.47	0.09
11.07	5.6	0.05	0.90	38.6	1	79.6	0.61	0.38	0.22	1.61	2.7	4.3	0.40	0.09
11.56	5.7	0.07	1.22	40.3	1	79.6	0.63	0.39	0.24	1.60	2.8	4.4	0.41	0.09
12.06	6.0	0.07	1.17	31.2	5	114.6	0.65	0.40	0.25	1.59	2.9	4.5	0.43	0.09
12.55	6.1	0.07	1.16	35.7	5	114.6	0.68	0.41	0.27	1.56	2.9	4.5	0.43	0.09
13.04	6.3	0.09	1.38	39.3	5	114.6	0.71	0.42	0.28	1.54	3.0	4.6	0.45	0.09
13.53	11.8	0.16	1.36	31.6	5	114.6	0.73	0.44	0.30	1.51	5.7	8.6	0.89	0.09
14.03	21.9	0.12	0.57	11.0	7	117.8	0.76	0.45	0.31	1.49	7.0	10.4	UnDef	0.09
14.52	23.8	0.21	0.87	16.1	6	114.6	0.79	0.46	0.33	1.47	9.1	13.4	1.84	0.09
15.01	11.7	0.29	2.45	38.8	5	114.6	0.82	0.48	0.34	1.45	5.6	8.1	0.87	0.13
15.50	40.8	0.26	0.64	10.9	7	117.8	0.85	0.49	0.36	1.43	13.0	18.7	UnDef	0.11
15.99	63.3	0.36	0.57	1.5	8	120.9	0.88	0.50	0.37	1.41	15.1	21.4	UnDef	0.15
16.49	75.5	0.27	0.35	-7.4	8	120.9	0.91	0.52	0.39	1.39	18.1	25.1	UnDef	0.18
16.98	64.8	0.33	0.52	-5.7	8	120.9	0.94	0.53	0.41	1.37	15.5	21.3	UnDef	0.14
17.47	57.5	0.29	0.50	15.3	8	120.9	0.97	0.55	0.42	1.35	13.8	18.7	UnDef	0.13
17.96	47.0	0.45	0.97	19.8	7	117.8	1.00	0.56	0.44	1.34	15.0	20.1	UnDef	0.12
18.45	25.3	0.37	1.46	32.3	6	114.6	1.02	0.57	0.45	1.32	9.7	12.8	1.94	0.10
18.95	31.8	0.20	0.62	17.5	7	117.8	1.05	0.59	0.47	1.31	10.1	13.3	UnDef	0.09
19.44	33.7	0.28	0.83	14.3	7	117.8	1.08	0.60	0.48	1.29	10.8	13.9	UnDef	0.10
19.93	37.6	0.42	1.12	-5.2	7	117.8	1.11	0.61	0.50	1.28	12.0	15.3	UnDef	0.11
20.42	94.6	0.66	0.70	-6.6	8	120.9	1.14	0.63	0.51	1.26	22.6	28.6	UnDef	0.24
20.92	163.6	0.94	0.58	-9.2	9	124.1	1.17	0.64	0.53	1.25	31.3	39.1	UnDef	0.00
21.41	202.8	0.85	0.42	-11.0	9	124.1	1.20	0.66	0.54	1.23	38.8	47.9	UnDef	0.00
21.90	175.4	0.63	0.36	-7.8	9	124.1	1.23	0.67	0.56	1.22	33.6	41.0	UnDef	0.00
22.39	96.6	1.16	1.20	-6.4	8	120.9	1.26	0.69	0.57	1.21	23.1	27.9	UnDef	0.28
22.88	147.1	1.12	0.76	-4.5	9	124.1	1.29	0.70	0.59	1.19	28.2	33.6	UnDef	0.00
23.38	200.6	1.05	0.52	-7.9	9	124.1	1.32	0.72	0.60	1.18	38.4	45.4	UnDef	0.00
23.87	197.0	0.91	0.46	-10.2	9	124.1	1.35	0.73	0.62	1.17	37.7	44.1	UnDef	0.00
24.36	173.9	1.09	0.63	-9.2	9	124.1	1.38	0.75	0.64	1.16	33.3	38.5	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-5452
CPT File: 272C09A.COR

Page: 3a

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
24.85	201.8	0.86	0.43	-9.8	9	124.1	1.41	0.76	0.65	1.15	38.6	44.3	UnDef	0.00
25.34	203.6	0.51	0.25	-11.7	9	124.1	1.44	0.78	0.67	1.13	39.0	44.2	UnDef	0.00
25.84	194.2	0.48	0.25	-12.8	9	124.1	1.47	0.79	0.68	1.12	37.2	41.8	UnDef	0.00
26.33	190.8	0.63	0.33	-10.8	9	124.1	1.51	0.81	0.70	1.11	36.6	40.7	UnDef	0.00
26.82	190.0	0.79	0.42	-11.5	9	124.1	1.54	0.82	0.71	1.10	36.4	40.1	UnDef	0.00
27.31	179.5	0.86	0.48	-11.9	9	124.1	1.57	0.84	0.73	1.09	34.4	37.6	UnDef	0.00
27.80	187.0	1.03	0.55	-12.2	9	124.1	1.60	0.85	0.74	1.08	35.8	38.8	UnDef	0.00
28.30	195.1	1.05	0.54	-12.7	9	124.1	1.63	0.87	0.76	1.07	37.4	40.1	UnDef	0.00
28.79	188.4	0.91	0.48	-13.2	9	124.1	1.66	0.88	0.77	1.06	36.1	38.4	UnDef	0.00
29.28	173.8	0.84	0.48	-13.8	9	124.1	1.69	0.90	0.79	1.05	33.3	35.1	UnDef	0.00
29.77	169.9	0.88	0.52	-13.8	9	124.1	1.72	0.91	0.80	1.05	32.5	34.0	UnDef	0.00
30.27	199.9	1.12	0.56	-14.0	9	124.1	1.75	0.93	0.82	1.04	38.3	39.7	UnDef	0.00
30.76	222.4	1.31	0.59	-14.1	9	124.1	1.78	0.94	0.84	1.03	42.6	43.8	UnDef	0.00
31.17	221.4	1.55	0.70	-14.1	9	124.1	1.81	0.96	0.85	1.02	42.4	43.3	UnDef	0.00
31.58	263.4	1.59	0.60	-13.8	9	124.1	1.83	0.97	0.86	1.02	50.5	51.2	UnDef	0.00
32.07	303.2	1.50	0.50	-13.6	10	127.3	1.86	0.99	0.88	1.01	48.4	48.7	UnDef	0.00
32.56	278.7	1.20	0.43	-13.4	10	127.3	1.89	1.00	0.89	1.00	44.5	44.5	UnDef	0.00
33.05	217.8	1.51	0.69	-13.2	9	124.1	1.92	1.02	0.91	0.99	41.7	41.4	UnDef	0.00
33.55	169.0	1.18	0.70	-13.1	9	124.1	1.95	1.03	0.92	0.98	32.4	31.9	UnDef	0.00
34.04	181.4	1.37	0.76	-13.4	9	124.1	1.99	1.05	0.94	0.98	34.7	34.0	UnDef	0.00
34.53	200.2	1.33	0.67	-13.8	9	124.1	2.02	1.06	0.95	0.97	38.4	37.2	UnDef	0.00
35.02	214.5	3.97	1.85	-13.7	8	120.9	2.05	1.08	0.97	0.96	51.4	49.5	UnDef	0.00
35.51	216.4	2.78	1.28	-13.6	8	120.9	2.08	1.09	0.98	0.96	51.8	49.6	UnDef	0.00
36.01	220.4	2.94	1.33	-9.9	8	120.9	2.11	1.11	1.00	0.95	52.8	50.2	UnDef	0.00
36.50	209.5	1.57	0.75	-8.9	9	124.1	2.14	1.12	1.01	0.94	40.1	37.9	UnDef	0.00
36.99	213.8	1.23	0.58	-9.2	9	124.1	2.17	1.14	1.03	0.94	41.0	38.4	UnDef	0.00
37.48	180.6	0.78	0.43	-9.9	9	124.1	2.20	1.15	1.05	0.93	34.6	32.2	UnDef	0.00
37.98	157.6	1.28	0.81	-10.2	9	124.1	2.23	1.17	1.06	0.93	30.2	27.9	UnDef	0.41
38.47	275.2	1.88	0.68	-10.0	9	124.1	2.26	1.18	1.08	0.92	52.7	48.5	UnDef	0.00
38.96	365.9	1.53	0.42	-9.7	10	127.3	2.29	1.20	1.09	0.91	58.4	53.4	UnDef	0.00
39.45	314.2	1.32	0.42	-9.3	10	127.3	2.32	1.21	1.11	0.91	50.2	45.5	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e

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Run No: 04-0902-1112-5452
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-09a
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 11:16
CPT File: 272C09A.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E-02	0.00	1000.0	0.28	325.5	0.0	325.5	0.0	50	95.0	1.0	-0.28	0.0	65.1
0.74	5.0E-02	0.00	1000.0	0.85	566.6	0.0	566.6	0.0	50	95.0	1.0	-0.39	0.0	113.3
1.23	5.0E-02	0.00	1000.0	0.89	474.4	0.0	474.4	0.0	50	95.0	1.0	-0.39	0.0	94.9
1.72	5.0E-03	0.00	1000.0	1.19	236.4	0.0	236.4	1.3	50	95.0	1.0	-0.43	0.0	59.1
2.21	5.0E-05	0.00	343.1	1.99	89.3	7.1	96.4	7.8	48	73.4	10.0	-0.40	1.7	37.5
2.71	5.0E-06	0.01	157.1	3.22	49.6	UnDef	UnDef	0.0	UnDef	UnDef	10.0	UnDef	UnDef	UnDef
3.20	5.0E-05	0.01	110.2	1.77	40.9	13.5	54.3	14.3	42	46.0	10.0	-0.26	3.0	19.3
3.61	5.0E-04	0.00	148.4	1.07	61.7	5.6	67.3	8.1	44	56.2	1.0	-0.23	1.1	21.7
4.02	5.0E-04	0.00	153.4	0.71	70.7	1.2	71.9	5.6	44	58.6	1.0	-0.20	0.2	23.8
4.51	5.0E-05	-0.01	70.8	2.11	34.8	24.0	58.8	20.3	40	37.5	10.0	-0.23	4.7	18.6
5.00	5.0E-06	0.01	44.5	1.92	23.0	26.1	49.1	24.9	UnDef	UnDef	6.0	UnDef	5.6	16.9
5.50	5.0E-06	0.03	27.6	1.74	14.9	32.4	47.3	30.7	UnDef	UnDef	6.0	UnDef	5.5	12.7
5.99	5.0E-06	0.03	24.5	1.92	13.6	45.3	58.8	33.8	UnDef	UnDef	6.0	UnDef	6.2	12.8
6.56	5.0E-06	0.04	24.1	1.94	13.7	48.4	62.1	34.2	UnDef	UnDef	6.0	UnDef	6.4	13.1

Gregg In Situ, Inc.
Run No: 04-0902-1112-5452
CPT File: 272C09A.COR

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Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
7.14	5.0E-06	0.05	21.7	1.53	12.8	38.8	51.6	33.2	UnDef	UnDef	6.0	UnDef	5.6	11.8
7.63	5.0E-06	0.08	17.8	1.18	10.8	36.2	47.0	33.8	UnDef	UnDef	6.0	UnDef	4.9	10.2
8.12	1.0E-07	0.10	16.3	1.08	10.1	37.7	47.8	34.5	UnDef	UnDef	6.0	UnDef	4.8	9.8
8.61	1.0E-07	0.12	18.0	0.81	11.2	22.5	33.7	30.0	UnDef	UnDef	6.0	UnDef	3.9	9.4
9.10	5.0E-06	0.11	20.5	1.01	12.8	25.3	38.1	29.9	UnDef	UnDef	6.0	UnDef	4.4	10.7
9.60	5.0E-06	0.12	18.8	1.16	12.0	34.1	46.2	32.7	UnDef	UnDef	6.0	UnDef	5.1	11.0
10.09	1.0E-07	0.17	15.1	1.06	10.0	39.9	49.8	35.7	UnDef	UnDef	6.0	UnDef	4.9	9.8
10.58	1.0E-07	0.17	15.3	0.86	10.2	31.9	42.1	33.4	UnDef	UnDef	6.0	UnDef	4.5	9.5
11.07	1.0E-07	0.20	12.9	1.01	8.8	35.1	43.9	38.3	UnDef	UnDef	6.0	UnDef	4.3	8.6
11.56	1.0E-07	0.20	13.2	1.37	9.0	36.1	45.1	41.2	UnDef	UnDef	6.0	UnDef	4.4	8.8
12.06	5.0E-06	0.14	13.4	1.32	9.3	37.2	46.4	40.3	UnDef	UnDef	6.0	UnDef	4.5	9.1
12.55	5.0E-06	0.16	13.1	1.30	9.3	37.1	46.3	40.7	UnDef	UnDef	6.0	UnDef	4.5	9.1
13.04	5.0E-06	0.17	13.2	1.55	9.5	37.9	47.4	42.6	UnDef	UnDef	6.0	UnDef	4.6	9.3
13.53	5.0E-06	0.06	25.5	1.44	17.5	34.9	52.4	29.9	UnDef	UnDef	6.0	UnDef	6.1	14.7
14.03	5.0E-04	0.00	47.0	0.59	31.9	10.7	42.6	14.4	38	34.5	1.0	-0.07	1.9	12.3
14.52	5.0E-05	0.01	49.8	0.90	34.3	15.4	49.7	16.6	38	36.6	6.0	-0.11	3.2	16.7
15.01	5.0E-06	0.08	23.0	2.63	16.6	66.6	83.2	39.0	UnDef	UnDef	6.0	UnDef	8.1	16.3
15.50	5.0E-04	0.00	81.9	0.65	57.2	8.1	65.3	9.7	42	51.2	1.0	-0.13	1.6	20.2
15.99	5.0E-03	-0.01	124.2	0.57	87.3	2.2	89.5	5.9	42	63.4	1.0	-0.16	0.3	21.7
16.49	5.0E-03	-0.01	144.3	0.36	102.7	0.0	102.7	3.2	44	68.1	1.0	-0.13	0.0	25.1
16.98	5.0E-03	-0.01	120.2	0.52	87.0	1.7	88.6	5.7	42	63.3	1.0	-0.15	0.3	21.5
17.47	5.0E-03	0.00	103.7	0.51	76.2	3.3	79.6	6.6	42	59.5	1.0	-0.13	0.5	19.2
17.96	5.0E-04	0.00	82.3	0.99	61.5	14.7	76.2	12.2	42	53.4	1.0	-0.17	2.8	22.8
18.45	5.0E-05	0.02	42.3	1.52	32.7	30.5	63.2	23.1	38	35.2	6.0	-0.14	5.5	18.3
18.95	5.0E-04	0.00	52.4	0.64	40.6	12.4	53.0	13.8	40	41.5	1.0	-0.09	2.3	15.5
19.44	5.0E-04	0.00	54.4	0.86	42.6	16.2	58.8	15.3	40	42.8	1.0	-0.12	2.9	16.8
19.93	5.0E-04	-0.02	59.5	1.15	47.0	21.0	68.1	16.6	40	45.6	1.0	-0.15	3.7	19.0
20.42	5.0E-03	-0.01	149.0	0.70	116.9	2.4	119.3	5.7	44	71.7	1.0	-0.19	0.4	29.0
20.92	5.0E-02	-0.01	253.0	0.58	199.8	0.0	199.8	2.2	46	87.1	1.0	-0.22	0.0	39.1
21.41	5.0E-02	0.00	306.8	0.42	244.9	0.0	244.9	0.4	46	92.9	1.0	-0.21	0.0	47.9
21.90	5.0E-02	0.00	259.0	0.36	209.3	0.0	209.3	0.6	46	88.4	1.0	-0.18	0.0	41.0
22.39	5.0E-03	-0.01	138.8	1.22	114.1	15.6	129.7	9.5	44	71.1	1.0	-0.24	2.3	30.2
22.88	5.0E-02	0.00	207.7	0.77	171.8	0.0	171.8	4.3	46	82.8	1.0	-0.23	0.0	33.6
23.38	5.0E-02	0.00	277.9	0.52	231.9	0.0	231.9	1.4	46	91.4	1.0	-0.22	0.0	45.4
23.87	5.0E-02	0.00	267.2	0.46	225.3	0.0	225.3	1.2	46	90.6	1.0	-0.21	0.0	44.1
24.36	5.0E-02	-0.01	230.7	0.63	196.8	0.0	196.8	2.9	46	86.7	1.0	-0.22	0.0	38.5

Gregg In Situ, Inc.
Run No: 04-0902-1112-5452
CPT File: 272C09A.COR

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Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	QclN	DeltaQclN	QclNcs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(nl)60	(NI)60cs
24.85	5.0E-02	0.00	262.7	0.43	226.1	0.0	226.1	1.0	46	90.7	1.0	-0.20	0.0	44.3
25.34	5.0E-02	-0.01	259.9	0.25	225.9	0.0	225.9	0.0	46	90.6	1.0	-0.15	0.0	44.2
25.84	5.0E-02	-0.01	243.0	0.25	213.4	0.0	213.4	0.0	46	89.0	1.0	-0.15	0.0	41.8
26.33	5.0E-02	-0.01	234.3	0.33	207.8	0.0	207.8	0.7	46	88.2	1.0	-0.17	0.0	40.7
26.82	5.0E-02	-0.01	228.9	0.42	204.9	0.0	204.9	1.4	46	87.8	1.0	-0.19	0.0	40.1
27.31	5.0E-02	-0.01	212.2	0.48	191.9	0.0	191.9	2.2	46	86.0	1.0	-0.19	0.0	37.6
27.80	5.0E-02	-0.01	217.2	0.55	198.1	0.0	198.1	2.7	46	86.9	1.0	-0.21	0.0	38.8
28.30	5.0E-02	-0.01	222.6	0.54	204.8	0.0	204.8	2.5	46	87.8	1.0	-0.21	0.0	40.1
28.79	5.0E-02	-0.01	211.2	0.49	196.1	0.0	196.1	2.3	46	86.6	1.0	-0.19	0.0	38.4
29.28	5.0E-02	-0.01	191.3	0.49	179.3	0.0	179.3	2.8	44	84.0	1.0	-0.18	0.0	35.1
29.77	5.0E-02	-0.01	183.9	0.52	173.9	0.0	173.9	3.2	44	83.1	1.0	-0.19	0.0	34.0
30.27	5.0E-02	-0.01	213.2	0.56	202.9	0.0	202.9	2.8	46	87.6	1.0	-0.21	0.0	39.7
30.76	5.0E-02	-0.01	233.5	0.59	223.9	0.0	223.9	2.6	46	90.4	1.0	-0.22	0.0	43.8
31.17	5.0E-02	-0.01	229.3	0.71	221.4	0.0	221.4	3.4	46	90.1	1.0	-0.23	0.0	43.3
31.58	5.0E-02	0.00	269.6	0.61	261.7	0.0	261.7	2.1	46	94.9	1.0	-0.23	0.0	51.2
32.07	5.0E+00	0.00	305.7	0.50	298.8	0.0	298.8	0.9	46	95.0	1.0	-0.23	0.0	48.7
32.56	5.0E+00	0.00	276.4	0.43	272.5	0.0	272.5	0.8	46	95.0	1.0	-0.21	0.0	44.5
33.05	5.0E-02	-0.01	212.2	0.70	211.3	0.0	211.3	3.7	46	88.7	1.0	-0.22	0.0	41.4
33.55	5.0E-02	-0.01	161.8	0.71	162.7	1.2	163.9	5.3	44	81.2	1.0	-0.20	0.1	32.0
34.04	5.0E-02	-0.01	171.3	0.76	173.4	1.5	175.0	5.3	44	83.1	1.0	-0.21	0.2	34.1
34.53	5.0E-02	-0.01	186.5	0.67	190.1	0.0	190.1	4.2	44	85.7	1.0	-0.21	0.0	37.2
35.02	5.0E-03	-0.01	197.2	1.87	202.2	33.8	236.0	10.4	46	87.5	1.0	-0.33	4.9	54.3
35.51	5.0E-03	-0.01	196.3	1.30	202.7	15.5	218.2	7.7	46	87.5	1.0	-0.28	2.3	51.9
36.01	5.0E-03	-0.01	197.4	1.35	205.1	17.1	222.2	7.9	46	87.9	1.0	-0.28	2.5	52.7
36.50	5.0E-02	-0.01	184.9	0.76	193.6	0.0	193.6	4.8	44	86.2	1.0	-0.22	0.0	37.9
36.99	5.0E-02	-0.01	186.3	0.58	196.3	0.0	196.3	3.6	44	86.6	1.0	-0.20	0.0	38.4
37.48	5.0E-02	-0.01	154.9	0.44	164.7	0.0	164.7	3.5	44	81.6	1.0	-0.16	0.0	32.2
37.98	5.0E-02	-0.01	133.2	0.83	142.8	9.4	152.2	7.3	44	77.5	1.0	-0.20	1.1	29.1
38.47	5.0E-02	-0.01	230.9	0.69	247.7	0.0	247.7	3.3	46	93.3	1.0	-0.23	0.0	48.5
38.96	5.0E+00	0.00	303.7	0.42	327.2	0.0	327.2	0.4	46	95.0	1.0	-0.21	0.0	53.4
39.45	5.0E+00	0.00	257.1	0.42	279.2	0.0	279.2	1.0	46	95.0	1.0	-0.20	0.0	45.5

Gregg In Situ, Inc. Page: 1a
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-5512
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-10
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 11:48
CPT File: 272C10.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
0.25	98.8	0.33	0.34	4.5	9	124.1	0.02	0.02	0.00	2.00	18.9	37.8	UnDef	0.00
0.74	125.5	0.66	0.53	3.3	9	124.1	0.05	0.05	0.00	2.00	24.0	48.1	UnDef	0.00
1.23	109.7	0.96	0.87	4.9	8	120.9	0.08	0.08	0.00	2.00	26.3	52.5	UnDef	0.00
1.72	68.1	0.76	1.11	1.8	8	120.9	0.11	0.11	0.00	2.00	16.3	32.6	UnDef	0.29
2.21	59.8	0.42	0.70	-0.7	8	120.9	0.14	0.14	0.00	2.00	14.3	28.7	UnDef	0.22
2.71	48.2	0.34	0.71	0.5	7	117.8	0.16	0.16	0.00	2.00	15.4	30.8	UnDef	0.15
3.20	45.6	0.32	0.70	0.3	7	117.8	0.19	0.19	0.00	2.00	14.6	29.1	UnDef	0.14
3.61	38.0	0.30	0.78	-1.1	7	117.8	0.22	0.22	0.00	2.00	12.1	24.3	UnDef	0.12
4.02	19.7	0.41	2.07	0.3	6	114.6	0.24	0.24	0.00	2.00	7.6	15.1	1.56	0.10
4.51	10.5	0.38	3.64	13.1	3	111.4	0.27	0.25	0.02	1.99	10.0	19.9	0.81	0.17
5.00	6.1	0.24	3.94	6.4	3	111.4	0.30	0.27	0.03	1.94	5.8	11.3	0.46	0.10
5.50	6.1	0.17	2.86	4.2	3	111.4	0.32	0.28	0.05	1.90	5.8	11.0	0.46	0.10
5.99	5.3	0.12	2.35	7.8	4	114.6	0.35	0.29	0.06	1.86	3.4	6.2	0.39	0.09
6.56	29.0	0.32	1.10	11.9	7	117.8	0.39	0.31	0.08	1.81	9.3	16.8	UnDef	0.10

Gregg In Situ, Inc.
Run No: 04-0902-1112-5512
CPT File: 272C10.COR

Page: 2a

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
7.14	100.8	0.39	0.38	2.9	9	124.1	0.42	0.32	0.10	1.76	19.3	34.0	UnDef	0.00
7.63	133.9	0.43	0.32	9.1	9	124.1	0.45	0.34	0.11	1.72	25.6	44.2	UnDef	0.00
8.12	143.8	0.54	0.38	-4.2	9	124.1	0.48	0.35	0.13	1.68	27.5	46.4	UnDef	0.00
8.61	154.2	0.57	0.37	-8.3	9	124.1	0.51	0.37	0.14	1.65	29.5	48.7	UnDef	0.00
9.10	148.9	0.58	0.39	-0.4	9	124.1	0.54	0.38	0.16	1.62	28.5	46.1	UnDef	0.00
9.60	155.4	0.69	0.45	2.8	9	124.1	0.57	0.40	0.17	1.58	29.8	47.2	UnDef	0.00
10.09	165.5	0.72	0.43	-2.4	9	124.1	0.60	0.41	0.19	1.56	31.7	49.3	UnDef	0.00
10.58	144.3	0.70	0.48	-1.0	9	124.1	0.63	0.43	0.21	1.53	27.6	42.2	UnDef	0.00
11.07	136.6	0.56	0.41	-1.7	9	124.1	0.66	0.44	0.22	1.50	26.2	39.3	UnDef	0.00
11.56	121.8	0.52	0.43	-1.5	9	124.1	0.70	0.46	0.24	1.48	23.3	34.4	UnDef	0.00
12.06	137.9	0.41	0.30	-4.2	9	124.1	0.73	0.47	0.25	1.45	26.4	38.4	UnDef	0.00
12.55	143.7	0.56	0.39	-3.0	9	124.1	0.76	0.49	0.27	1.43	27.5	39.3	UnDef	0.00
13.04	147.1	0.70	0.47	-3.4	9	124.1	0.79	0.50	0.28	1.41	28.2	39.7	UnDef	0.00
13.53	144.9	0.99	0.68	-4.2	9	124.1	0.82	0.52	0.30	1.39	27.8	38.5	UnDef	0.00
14.03	143.6	0.69	0.48	-5.3	9	124.1	0.85	0.53	0.31	1.37	27.5	37.6	UnDef	0.00
14.52	130.5	0.63	0.48	-5.7	9	124.1	0.88	0.55	0.33	1.35	25.0	33.7	UnDef	0.00
15.01	128.6	0.28	0.22	-6.8	9	124.1	0.91	0.57	0.34	1.33	24.6	32.8	UnDef	0.00
15.50	126.7	0.47	0.37	-9.1	9	124.1	0.94	0.58	0.36	1.31	24.3	31.9	UnDef	0.00
15.99	150.1	0.46	0.31	-12.0	9	124.1	0.97	0.60	0.37	1.30	28.7	37.3	UnDef	0.00
16.49	140.9	0.49	0.35	-12.4	9	124.1	1.00	0.61	0.39	1.28	27.0	34.5	UnDef	0.00
16.98	141.1	0.71	0.50	-12.5	9	124.1	1.03	0.63	0.41	1.26	27.0	34.2	UnDef	0.00
17.47	162.5	0.68	0.42	-12.2	9	124.1	1.06	0.64	0.42	1.25	31.1	38.9	UnDef	0.00
17.96	177.8	0.57	0.32	-12.0	9	124.1	1.09	0.66	0.44	1.23	34.1	42.0	UnDef	0.00
18.45	155.6	0.70	0.45	-12.5	9	124.1	1.12	0.67	0.45	1.22	29.8	36.4	UnDef	0.00
18.95	168.1	0.66	0.39	-12.6	9	124.1	1.15	0.69	0.47	1.21	32.2	38.9	UnDef	0.00
19.44	177.0	0.67	0.38	-12.7	9	124.1	1.18	0.70	0.48	1.19	33.9	40.5	UnDef	0.00
19.93	176.5	0.55	0.31	-13.1	9	124.1	1.21	0.72	0.50	1.18	33.8	39.9	UnDef	0.00
20.42	151.3	0.65	0.43	-13.4	9	124.1	1.24	0.73	0.51	1.17	29.0	33.9	UnDef	0.00
20.92	154.5	0.67	0.44	-13.4	9	124.1	1.28	0.75	0.53	1.16	29.6	34.2	UnDef	0.00
21.41	145.9	0.64	0.44	-13.4	9	124.1	1.31	0.76	0.54	1.15	28.0	32.0	UnDef	0.00
21.90	115.3	0.62	0.54	-13.5	9	124.1	1.34	0.78	0.56	1.13	22.1	25.0	UnDef	0.27
22.39	118.9	0.83	0.70	-13.3	9	124.1	1.37	0.79	0.57	1.12	22.8	25.6	UnDef	0.30
22.88	144.0	0.85	0.59	-13.4	9	124.1	1.40	0.81	0.59	1.11	27.6	30.7	UnDef	0.44
23.38	160.5	0.76	0.47	-13.5	9	124.1	1.43	0.82	0.60	1.10	30.7	33.9	UnDef	0.00
23.87	180.7	0.71	0.39	-13.5	9	124.1	1.46	0.84	0.62	1.09	34.6	37.8	UnDef	0.00
24.36	203.6	0.74	0.36	-13.5	9	124.1	1.49	0.85	0.64	1.08	39.0	42.2	UnDef	0.00

Gregg In Situ, Inc.
Run No: 04-0902-1112-5512
CPT File: 272C10.COR

Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60 (blows/ft)	Su (tsf)	CRR
24.85	196.5	0.76	0.39	-13.5	9	124.1	1.52	0.87	0.65	1.07	37.6	40.4	UnDef	0.00
25.34	189.1	0.64	0.34	-13.4	9	124.1	1.55	0.88	0.67	1.06	36.2	38.5	UnDef	0.00
25.84	188.9	0.80	0.42	-13.4	9	124.1	1.58	0.90	0.68	1.05	36.2	38.2	UnDef	0.00
26.33	210.6	1.05	0.50	-13.4	9	124.1	1.61	0.91	0.70	1.05	40.3	42.2	UnDef	0.00
26.82	258.4	1.90	0.73	-13.1	9	124.1	1.64	0.93	0.71	1.04	49.5	51.3	UnDef	0.00

Gregg In Situ, Inc.
Interpretation Output - Release 1.00.19e
Run No: 04-0902-1112-5512
Job No: 04-272MA
Client: BUSCH GEOTECH.
Project: CPT SITE INVESTIGATION
Site: COOK BROADWAY
Location: CPT-10
Engineer: B. DUSSELL
CPT Date: 04/17/08
CPT Time: 11:48
CPT File: 272C10.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 1.22 (ft): 4.0
Su Nkt used: 12.50
Averaging Increment (m): 0.15
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

Depth (ft)	k (cm/s)	Bq	Qtn	Rfn	Qc1N	DeltaQc1N	Qc1Ncs	Fc (%)	Phi (Deg)	Dr (%)	OCR	State Param	Del(n1)60	(N1)60cs
0.25	5.0E-02	0.00	1000.0	0.34	189.2	0.0	189.2	0.0	50	95.0	1.0	-0.30	0.0	37.8
0.74	5.0E-02	0.00	1000.0	0.53	240.5	0.0	240.5	0.0	50	95.0	1.0	-0.34	0.0	48.1
1.23	5.0E-03	0.00	1000.0	0.87	210.1	0.0	210.1	0.0	50	95.0	1.0	-0.39	0.0	52.5
1.72	5.0E-03	0.00	643.6	1.11	130.5	0.0	130.5	1.9	50	87.9	1.0	-0.38	0.0	32.6
2.21	5.0E-03	0.00	440.6	0.71	114.6	0.0	114.6	0.9	48	80.6	1.0	-0.29	0.0	28.7
2.71	5.0E-04	0.00	291.3	0.71	92.3	0.0	92.3	2.4	46	71.6	1.0	-0.25	0.0	30.8
3.20	5.0E-04	0.00	234.3	0.71	87.4	0.0	87.4	3.3	46	67.7	1.0	-0.23	0.0	29.1
3.61	5.0E-04	0.00	173.4	0.78	72.8	0.8	73.6	5.4	44	60.8	1.0	-0.22	0.2	24.4
4.02	5.0E-05	0.00	80.8	2.09	37.8	22.1	59.8	18.8	42	40.5	10.0	-0.25	4.5	19.6
4.51	5.0E-08	0.04	40.2	3.74	20.0	77.6	97.6	34.8	UnDef	UnDef	6.0	UnDef	19.7	39.5
5.00	5.0E-08	0.03	21.9	4.14	11.6	46.3	57.9	46.8	UnDef	UnDef	6.0	UnDef	11.3	22.7
5.50	5.0E-08	0.01	20.7	3.03	11.3	45.1	56.3	42.9	UnDef	UnDef	6.0	UnDef	11.0	22.1
5.99	5.0E-07	0.04	16.9	2.52	9.5	38.2	47.7	44.1	UnDef	UnDef	6.0	UnDef	6.2	12.5
6.56	5.0E-04	0.01	93.7	1.11	51.4	11.7	63.0	11.9	42	48.2	1.0	-0.19	2.2	18.9

Table 2 References

No.	Reference
1	Robertson, P.K. and Campanella, R.G., 1986, "Guidelines for Use, Interpretation and Application of the CPT and CPTU", UBC, Soil Mechanics Series No. 105, Civil Eng. Dept., Vancouver, B.C., Canada
2	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
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4	Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27.
5	Robertson, P.K. and Fear, C.E., 1995, "Liquefaction of Sands and its Evaluation", Keynote Lecture, First International Conference on Earthquake Geotechnical Engineering, Tokyo, Japan.
6	Gregg In Situ Internal Report
7	Robertson, P.K. and Wride, C.E., 1997, "Cyclic Liquefaction and its Evaluation Based on SPT a NCEER Workshop Paper, January 22, 1997
8	Wride, C.E. and Robertson, P.K., 1997, "Phase II Data Review Report (Massey and Kidd Sites, River Delta)", Volume 1 - Data Report (June 1997), University of Alberta.
9	Plewes, H.D., Davies, M.P. and Jefferies, M.G., 1992, "CPT Based Screening Procedure for E Liquefaction Susceptibility", 45th Canadian Geotechnical Conference, Toronto, Ontar October 1992.

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Appendix G Geotechnical Investiagion Report (2018)

Geotechnical Investigation

2616 Broadway Redevelopment Project
Eureka, California

The Carrington Company

11153741 | July 2018

July 24, 2018

Gabe Hagemann
Managing Director
The Carrington Company
627 H Street
Eureka, CA 95501

Dear Mr. Hagemann,

RE: Geotechnical Investigation, 2616 Broadway Redevelopment Project, Eureka, California

GHD is pleased to present the attached report containing the results of our geotechnical investigation for the proposed 2616 Broadway Redevelopment Project in Eureka, California. It is our understanding that the proposed one-story multi-tenant retail space will have an area of approximately 8,000 square feet and will include parking areas, utilities, low impact development site features, landscaping, and storm drain infrastructure. The existing vacant commercial building will be demolished.

The accompanying report presents our findings, conclusions, and recommendations developed from our geotechnical investigation. Contained in the report are geotechnical design criteria and recommendations for design and construction of the proposed improvements. The results of the subsurface exploration and laboratory testing programs, which form the basis of our recommendations, are also included in the report. On the basis of our investigation, the site is suitable, from a geotechnical perspective, to receive the planned improvements provided the recommendations presented in the report are incorporated into the design and construction of the project.

If you have any questions regarding the information contained in this report, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,

GHD

Anthony Quintrall, P.E.
Senior Project Engineer

Christopher D. Trumbull, P.E., G.E., D.GE
Senior Geotechnical Engineer

GHD | 4080 Plaza Goldorado Circle Suite B Cameron Park CA 95682 USA

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Appendix C Laboratory Test Results
Appendix D Previous Explorations by Others

Distribution

To: The Carrington Company

Gabe Hagemann

Managing Director

627 H Street

Eureka, CA 95501

From: GHD

Christopher Trumbull, P.E., G.E., D.GE

Anthony Quintrall, P.E.

4080 Plaza Goldorado Circle, Suite B

Cameron Park, CA 95682

1. Introduction

This report presents the findings, conclusions, and recommendations developed from a geotechnical engineering investigation for the 2616 Broadway Redevelopment Project. The investigation was conducted in accordance with Additional Services Agreement Number 1 to the Professional Services Agreement between GHD Inc. (GHD) and The Carrington Company dated June 13, 2018.

1.1 Project Description

The project site is located southwest of the intersection of Broadway Street and Vigo Street, Eureka, California as shown on Figure A-1, Vicinity Map. The proposed one-story multi-tenant retail space will have an area of approximately 8,000 square feet and will include parking areas, utilities, low impact development (LID) site features, landscaping, and storm drain infrastructure. The existing two-story wood-framed vacant commercial building will be demolished. The assumed traffic index (TI) for the parking area improvements range from 5 to 7.

1.2 Purpose and Scope of Work

The purpose of this study was to evaluate the suitability of the project site, from a geotechnical perspective, for the proposed improvements. The main objectives of the investigation were to characterize the subsurface materials, perform engineering analyses, develop geotechnical recommendations and criteria, and document our findings, conclusions, and recommendations in this report.

The scope of the geotechnical investigation included the following tasks:

- A review of published geologic and geotechnical material pertaining to the site vicinity
- A field exploration program consisting of four exploratory borings drilled to a maximum depth of approximately 51 feet below ground surface (bgs) within the site to characterize the subsurface conditions
- Laboratory testing on select soil samples collected from the borings
- Engineering analyses to develop geotechnical design criteria and recommendations for the proposed project
- Preparation of this report

2. Field Exploration and Laboratory Testing

2.1 Field Exploration

Four borings were drilled on June 26, 2018 at the approximate locations shown on Figure A-2, Exploration Map. The borings were located in the field based on estimated distances from survey stakes placed prior to the investigation for the proposed building corners in combination with aerial

imagery. The borings were drilled to a maximum depth of approximately 51 feet bgs under the supervision of GHD technical personnel utilizing a truck-mounted CME-55 drill rig equipped with a combination of 6-inch solid flight auger and mud rotary drilling methods. The drill rig was also equipped with an automatic hammer with a weight of 140 pounds and a drop of 30 inches. Boring B-4 was terminated below the existing asphalt pavement due to a shallow layer of concrete.

The number of blows required for each 6-inch increment of drive were recorded and the cumulative blow count for the 12 inches of drive (following the first 6 inches of “seating” drive), or fraction thereof where resistance was encountered, is presented in the logs of borings. The blow counts presented in the logs are uncorrected and shown as they were recorded in the field. Both the samples and drill cuttings were visually classified in the field based on the Unified Soil Classification System (USCS) in general accordance with ASTM D2488.

The standardized N_{60} value is also presented and is calculated based on field blow counts and coefficients for hammer energy correction to normalize the automatic hammer blow count to the energy of the original SPT rope and cathead hammer (approximately 60%), borehole diameter to normalize the blow count for the diameter of the borehole, sampler type to account for the type of sampler and the presence of liners, and rod length to normalize the blow count to a standard length of 33 feet.

Subsurface conditions encountered are summarized in Section 3.3. Logs of borings were prepared based on the field logging, visual examination of the soil samples in the laboratory, and the results of laboratory testing in general accordance with ASTM D2487. The soil boring key and the logs of boring are presented in Appendix B.

2.2 Laboratory Testing

Laboratory testing was conducted on select soil samples recovered during the site investigation. Tests conducted include the following:

- Standard Test Method for Particle-Size Analysis of Soils (ASTM D422)
- Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No. 200) Sieve in Soils by Washing (ASTM D1140)
- Standard Test Methods for One-Dimensional Consolidation Properties of Soil Using Incremental Loading (ASTM D2435)
- Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)
- Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (ASTM D4318)
- Standard Test Method for Measurement of Oxidation-Reduction of Soil (ASTM G100)
- Method for Determining the Resistance “R” Value of Treated and Untreated Bases, Subbases, and Basement Soils by the Stabilometer (CTM 301)
- Method of Testing Soils and Waters for Sulfate Content (CTM 417)
- Method of Testing Soils and Waters for Chloride Content (CTM 422)

- Method for Determining Field and Laboratory Resistivity and pH Measurements for Soils and Water (CTM 643)

Laboratory test results are presented in Appendix C.

2.3 Percolation Testing

GHD performed feasibility-level percolation test in Boring B-3 at a depth of approximately 3 feet bgs. The hole was allowed to soak for approximately 30 minutes prior to running the percolation tests. After the initial soaking, readings were taken every 10 minutes for a period of 30 minutes; the rate of drop was recorded on field percolation logs also included in Appendix B. The result of the percolation testing are discussed in Section 4.5.

2.4 Previous Explorations by Others

Busch Geotechnical Consultants performed 11 cone penetration tests (CPTs) in and around the project site between August 16 and August 17, 2004 to a maximum depth of approximately 40 feet bgs. Pore pressure dissipation tests were performed in four of the CPTs. Krazan & Associates, Inc. performed six borings to the west of the project site for future commercial development to a maximum depth of approximately 50 feet on March 29, 2018. Locations of the previous CPTs and borings are shown on Figure A-2. CPT logs, the results of dissipation testing, borings logs, and relevant laboratory data are included in Appendix D.

3. Geologic and Subsurface Conditions

3.1 Site Conditions

At the time of the exploration, the relatively flat site was surrounded by chain link fencing on the north, east, and south sides and mature trees on the west side. The site included a two-story wood-framed structure with a paved parking lot on the eastern portion of the parcel. The proposed development area was covered with gravel and sand. Four survey stakes were placed to demarcate the corners of a previously proposed building layout, which were used for determining boring locations for the current investigation. Vigo Street was just north of the project site and Broadway Street (also called Redwood Highway) was located to the east. The western side of the project site was marshland, and commercial buildings were located to the south.

3.2 General Geology and Faulting

The site is located in the Coast Ranges geomorphic province and is mapped as Pliocene to Holocene sediments consisting of unconsolidated and semi-consolidated alluvium and terrace deposits that are mostly non-marine but may include marine deposits near the coast (Jennings 1977, updated 2010). The site is underlain by Pleistocene Hookton Formation alluvial deposits of clay, silt, sand, gravel, and boulders deposited in stream beds and floodplains from the Cascadia Mountain Range (McLaughlin et al, 2000 and Busch, 2004).

The site is within the Cascadia Subduction Zone, an active thrust fault which separates the Juan de Fuca and North America plates. The nearest active (Holocene epoch) fault system is the Little Salmon Fault zone, located approximately 4 miles south-southwest of the project site.

3.3 Subsurface Conditions

The results of the field exploration and laboratory analysis indicate the subsurface materials generally consisted of sand and gravel surfacing underlain by fill consisting of very loose to loose clayey sand up to approximately 4 to 6½ feet bgs. The fill was underlain by a layer of compressible soil (consisting of sandy clay and clay) to a depth of approximately 6½ to 7 feet bgs. The thickness of the compressible layer varied based on the previous explorations by others from 0 near the eastern side of the site to up to 9 feet on the west side. The compressible layer was underlain by medium dense to very dense clayey gravel with sand, gravel with sand, sand with silt, and gravel with silt to the maximum depth explored of 51 feet bgs.

Contours were prepared based on the combination of previous explorations and the current boring data to approximate the thickness of the compressible soils throughout the site. These contours are shown on Figure A-2. The thickness of the compressible layer varies from approximately 1 to 5 feet across the building pad footprint.

Groundwater was encountered between 4 and 5 feet bgs in the current borings. Previous explorations by Busch Geotechnical Consultants encountered groundwater between 4 and 6 feet bgs and by Krazan between 4 and 8 feet bgs. Note that the depth of groundwater could vary over time due to seasonal changes and other factors such as changes to site drainage.

4. Conclusions

On the basis of this investigation, the site is suitable, from a geotechnical perspective, to receive the planned improvements provided the recommendations presented in the report are incorporated into the design and construction of the project.

4.1 Compressible Soils

Compressible soil was encountered between 4 and 6 feet bgs in the current borings. The thickness of the compressible soil layer varied across the site, from 0 at the eastern side of the site up to 10 feet along the western side and from 1 to 5 feet thick below the proposed building footprint. Approximate contours of the compressible soil thickness are shown on Figure A-2. As shown, the thickness of the compressible soils within the limits of the proposed improvements ranges from 0 to 1 foot. Consolidation of the compressible layer is estimated to be up to 1 inch within the building footprint.

Compressible fill was encountered to a depth up to 5 feet bgs below the proposed building footprint. The fill varies in consistency, is weak, and potentially compressible.

4.2 Groundwater

Groundwater was encountered as shallow as 4 feet bgs. If underground utilities or other improvements are planned below these depths groundwater might be encountered and dewatering or working in the wet may be necessary.

4.3 Ground Shaking

The project is located (40.784 latitude, -124.184 longitude) in an area generally characterized as having high seismicity; strong ground shaking should be expected during seismic events. Using the United States Geological Survey (USGS) Seismic Design Maps website considering the site location, ASCE 7-10 provisions, and Type D soils (very stiff soil), the Peak Ground Acceleration (PGA) is 1.31 g for the maximum credible earthquake (MCE). The site is not in an Alquist Priolo Earthquake Fault Zone.

4.4 Corrosion

A soils corrosivity analysis was performed to assist in estimating and mitigating the deterioration of buried ferrous metals and concrete. Corrosion testing was performed on one sample obtained from Boring B-2, and the results are summarized in the table below. Detailed laboratory test results are included in Appendix C.

Table 4.1 Soil Corrosion Results

Sample No.	Resistivity (ohm-cm)	pH	Redox Potential (mV)	Sulfides	Sulfates (ppm)	Chlorides (ppm)	Points
B2-3	3,480	5.75	(+) 299	Negative	46.3	5.9	2

4.4.1 Corrosion Potential for Ferrous Pipes

To evaluate the potential for external corrosion potential on ductile iron pipe from soil, the 10-point system in C105/A21.5 (ANSI/AWWA 1999) was used, which resulted in 2 points for the sample analyzed. The long life of historical unprotected pipe in soil with less than 10 points indicates a noncorrosive environment (AWWA 2005).

4.4.2 Corrosion Potential for Reinforced Concrete

According to ACI 318, a sulfate concentration less than 1,000 parts per million is considered “not applicable.” Reinforced concrete exposed to elevated levels of water soluble chlorides should be designed to minimize potential intrusion of chloride ions to the reinforcing steel per ACI 318; this is not anticipated to be an issue for the current project.

The provided corrosion test results are only an indicator of potential soil corrosivity for the sample tested at the selected depth interval. It is possible that corrosion potential can vary by sample location and depth. Based on the results of the tested samples, the soil may be generally characterized as noncorrosive. Corrosion engineering was not included in the current scope of services; therefore, a detailed analysis of the corrosion test results is not included in this report. A

qualified corrosion engineer should be retained to review the test results and design any mitigation that may be required.

4.5 Liquefaction

Liquefaction occurs when excess pore pressures are generated in loose, saturated, generally cohesionless soil (sand, gravel, and some silts) during earthquake shaking, causing the soil to experience a partial to complete loss of shear strength. Such a loss of shear strength can result in settlement and/or horizontal movement (lateral spreading) of the soil mass. Based on the soils encountered in the field and the depth to groundwater, the probability of liquefaction for the project is estimated to be moderate to high.

Liquefaction analyses were performed utilizing the LiqSVs software, version 1.2.1.1. The Idriss and Boulanger 2014 method was used to analyze blow count data from Borings B-1 and B-2. Analysis was performed for the maximum credible earthquake, which has an approximate return period of 2,475 years. The PGA of 1.31 was used in combination with a magnitude 7.67 earthquake based on the U.S. Geologic Society unified hazard map website.

Liquefiable soils were found between 6 and 8 feet bgs on Boring B-1 and at approximately 5 feet on Boring B-2. The estimated total magnitude of liquefaction-induced settlement was 1½ and 1 inches, respectively, with a maximum differential settlement of approximately ½ inch. Lateral spreading is unlikely due to the level nature of the site.

4.6 Infiltration Rates

The results of the percolation tests indicate similar permeability rates across the site. Considering the field percolation test results, the Porchet method, correlated values, and the variability of materials encountered across the site, preliminary infiltration values and relevant soil characteristics are presented in Table 4.2.

Table 4.2 Preliminary Infiltration Values

Parameter	B-3
USCS Classification	SP-SM
Passing No. 4 Sieve (%)	100
Passing No. 200 Sieve (%)	10
Field Percolation Rate (in/hr)	8
Calculated Infiltration Rate (in/hr)	0.56 - 0.83
Preliminary Design Infiltration Rate (in/hr)	0.5

The infiltration values were based on the field and laboratory data obtained at the boring locations at a depth of approximately 3 feet. If the location and depth of the LID features changes, the subsurface materials may change and the actual infiltration rates may vary.

5. Recommendations

5.1 Site Preparation and Earthwork

5.1.1 Existing Fill Removal

To provide foundation support, the existing fill material below the building pad (and at least 5 feet beyond) should be removed to at least 4 feet bgs. Once the existing fill material is removed, the bottom of the excavation should be scarified and compacted in accordance with the Earthwork recommendations below. If the bottom of the excavation is unstable, stabilization measures, such a placement of a biaxial geogrid, may be necessary. After the bottom of excavation is prepared, the excavation should be backfilled with engineered fill in accordance with Section 5.1.3 below. GHD Geotechnical staff should be present during construction to confirm the materials encountered in the excavation, its stability, and any necessary stabilization measures.

5.1.2 Site Preparation

Site preparation should include the stripping of surface vegetation, including the root zone, in open field areas. The existing aggregate surfacing should be removed, as should any shallow utilities or pipes. Voids or depressions created by the removal of buried objects should be cleaned of all loose soil and debris and backfilled with engineered fill, placed and compacted as described below.

5.1.3 Earthwork

5.1.3.1 General Subgrade Preparation

To provide uniform support for the proposed improvements, the subgrade in all areas to receive structural improvements, including engineered fill and foundations, should be scarified to a depth of at least 8 inches, moisture conditioned as necessary, and compacted as engineered fill. Any soft or loose subgrade should be excavated to firm, native material and replaced with engineered fill.

Fill materials should be excavated to a depth of 4 feet bgs at the location of any proposed foundation. The excavation should be backfilled with engineered fill as described below. Upon completion of subgrade preparation, engineered fill should be placed as described below.

5.1.3.2 Engineered Fill

Engineered fill should consist of a homogenous mixture of soil and rock free of vegetation, organic material, rubbish, and/or rubble. Highly plastic or organic soils should not be used for engineered fill but may be placed in landscape areas. It is anticipated that most of the soil generated from onsite excavations will be suitable for use as engineered fill.

Imported materials to be used as engineered fill should meet the specifications listed in the table below. GHD should be provided test results and observe and approve import fill submittal in writing prior to the material being brought on site.

Table 5.1 Import Fill Specifications

R-Value	Atterberg Limits (ASTM D4318)	Particle Size (ASTM C136 or D422)
50	LL < 40 PI < 20	100% passing the 6-inch sieve minimum of 85% passing the 2½ inch sieve maximum of 30% passing the #200 sieve

5.1.3.3 Compaction

Engineered fill should be moisture conditioned as necessary, placed in horizontal loose lifts not exceeding 8 inches in thickness, and compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D1557 for fills less than 5 feet in thickness. For fills thicker than 5 feet, fill should be compacted to 95 percent of the maximum dry density as determined by ASTM D1557. Placement of fill material should be verified by a GHD representative on a continuous basis. Nuclear density testing should be performed at a frequency of one per 5,000 cubic yards.

5.1.3.4 Trench Bedding and Backfill

Trench backfill should meet the engineered fill specifications detailed in Table 5.1. Trench backfill should be placed in lifts not exceeding 12 inches in thickness and compacted to 95 percent of ASTM D1557 by mechanical means only (no jetting). Pipe bedding should conform to the pipe manufacturer's or Civil Engineer's recommendations. Trench backfill should be tested every lift at a frequency of 300 linear feet.

5.1.4 Temporary Slopes

Temporary slopes and shoring should conform to OSHA standards. Shored excavations should be constructed from the top down in cuts not exceeding 5 vertical feet in depth. Excavation of subsequent cuts should not be performed until shoring of the adjacent upper cut has been completed. Protection of workers and adjacent structures, shoring design, and the stability of all temporary slopes should be contractually established as solely the responsibility of the contractor.

5.2 Shallow Foundations

5.2.1 Bearing Capacity

Provided the building pad area is prepared in accordance with Section 5.1, the proposed structure may be supported on strip or spread footings with a minimum depth of 18 inches bgs and founded on engineered fill. The foundation should be designed using allowable bearing capacities of 1,000 pounds per square foot (psf) for dead loads and 1,500 psf for dead plus live loads. The allowable bearing capacity can be increased by one-third for all loads including wind and seismic. The total settlement is anticipated to be less than 1 inch, with differential settlement of ½ inch over 50 feet.

GHD geotechnical staff should observe the foundations excavations prior to placing reinforcing steel or concrete to verify that the structures are founded on the appropriate materials.

5.2.2 Passive Resistance

Passive earth resistance or passive earth pressure is the amount of resistance provided by the soil in response to a movement of a structure resulting in a compressive force upon the soil. A passive earth pressure of 400 pounds per cubic foot (pcf) should be used if the upper foot of soils is ignored. A friction coefficient of 0.4 is recommended. If the structure is poured against neatly excavated soil without the use of forms, both the friction coefficient and the passive resistance may be used in design. Passive earth pressures provided herein assume that the zone of interest is above the groundwater table and on a relatively level surface.

5.3 Seismic Design

The seismic design criteria for the site listed in the table below were developed in accordance with ASCE 7-10 based on the subsurface information obtained from the geotechnical investigation and the USGS Seismic Design Maps website.

Table 5.2 Seismic Design Criteria

Parameter	Recommended Value	Reference (ASCE 7-10)
Site Class	D	Table 20.3-1
Mapped MCE spectral response at short period (S_S)	3.106 g	Figure 22-1
Mapped MCE spectral response at 1 sec period (S_1)	1.230 g	Figure 22-2
Site coefficient (F_a)	1.0	Table 11.4-1
Site coefficient (F_v)	1.5	Table 11.4-2
MCE spectral response acceleration for short period (S_{MS})	3.106 g	Equation 11.4-1
MCE spectral response acceleration for 1 sec period (S_{M1})	1.845 g	Equation 11.4-2
Design Spectral Acceleration for short period (S_{DS})	2.071 g	Equation 11.4-3
Design Spectral Acceleration for 1 sec period (S_{D1})	1.230 g	Equation 11.4-4
Mapped Peak Ground Acceleration	1.306 g	Figure 22-7
Site coefficient (F_{PGA})	1.0	Table 11.8-1

5.4 Interior Slabs-on-Grade

Interior slabs-on-grade can be supported on subgrade soils prepared as recommended in the Earthwork section above. Slab-on-grade floor systems should be designed by the Structural Engineer based upon anticipated floor loads. Slab-on-grade can be designed using CBC minimum requirements; however, experience has shown that such designs may result in unacceptable performance regarding structural integrity, durability, wear resistance, aesthetics, and impacts to floor coverings. These shortcomings are most often associated with the following:

- Concrete cracking and attendant differential vertical and horizontal movement of slab sections and
- Migration of moisture up through slabs resulting in damage to floor coverings and/or development of mold.

To address these performance issues, the design and construction elements for slab-on-grade construction recommended by the Portland Cement Association in its manual Design and Control of Concrete Mixtures 15th Edition (Portland Cement Association 2011) may be incorporated as considered appropriate by the Structural Engineer and the Client. A low water to cement ratio is advantageous for slab-on-grade performance.

Interior slabs should be underlain by at least 4 inches of ¾-inch clean crushed rock to provide a capillary break to potential under-slab moisture.

Where moisture sensitive floor coverings are to be installed, the flooring manufacturer should be contacted for its recommended moisture and vapor protection measures. Other moisture-proofing measures such as concrete admixtures or sealants may be necessary, depending on the level of protection required. In general, the quality and thickness of the concrete slab are primary factors in reducing moisture and moisture vapor transmission. Transmission of moisture vapor up through the slab should be designed by the architect or by a moisture vapor expert; however an ASTM E174 Type A vapor retarder should be placed over the rock where vapor transmission is undesirable, such as in areas where flooring will be placed on the slab-on-grade. The effectiveness of the plastic in reducing water vapor transmission is highly dependent on the quality of workmanship to maintain the integrity of the plastic throughout the construction process. A 2-inch-thick layer of clean sand is commonly placed over the vapor retarder to provide puncture protection and aid in slab curing utilizing a wet cure curing method and with a water to cement ratio of 0.43 to reduce the water and, therefore, the vapor released during curing. The sand should be uniformly lightly damp (not wet) when the concrete is placed.

5.5 Flexible Pavement

5.5.1 Flexible Pavement

R-Value testing was performed on a bulk sample collected from Boring B-3, the test results indicate an R-Value of 58. Due to variations in near-surface soil, an R-value of 50 was used for design. Analyses were completed for TIs of 5, 6, and 7 based on the anticipated vehicle loading. Recommendations for a two-part pavement section for each TI value are presented in the table below.

Table 5.3 Hot Mix Asphalt Pavement Section Recommendations

Traffic Index	Asphalt Thickness (in)	Aggregate Base Thickness (in)
5	3	6
6	3	6
7	3	7

5.5.2 Rigid Pavement

The analytical procedure used in the design of rigid vehicular concrete pavements was the method published by the American Concrete Pavement Association. The corresponding modulus of subgrade reaction of 200 pounds per cubic inch was assigned to represent a compacted, onsite subgrade underlain by 6 inches of aggregate base. The flexural strength (modulus of rupture) for

concrete was assumed to be 550 pounds per square inch (psi), which would require a 28-day compressive strength of at least 3,700 psi. Traffic was assumed to be less than 40 medium-weight trucks (bus, food delivery, garbage) on average per day for 20 years.

Based on this analysis, a rigid pavement section of 5.5 inches of concrete for a 20-year pavement life is recommended. If a concrete with a flexural strength of at least 650 psi (a 28-day compressive strength of at least 5,000 psi) is used, the concrete thickness may be reduced to 5 inches. Reinforcing steel is not necessary for geotechnical reasons; however, #4 dowels should be placed at a maximum spacing of 18 inches at cold joints. In addition, the concrete should be scored at least one-third the slab thickness every 10 feet on center each way.

5.6 Surface Drainage and Erosion Control

Drainage around foundations and structures should be constructed in such a way that soils near the structures do not become saturated. In general, all construction surfaces should be graded to drain to prevent water from ponding. Unpaved surfaces adjacent to foundations or pavements should be graded no flatter than 2 percent.

Erosion control measures should be implemented for exposed surfaces potentially subject to soil erosion. Best Management Practices to reduce erosion and transport of soil particles or turbid water into the drainage course flowing from the construction site must be employed. All conditions of existing water quality regulatory agency permits must be adhered to.

5.7 Plan Review and Construction Observation

GHD geotechnical staff should review the project plans and specifications during the construction document phase to evaluate if they are consistent with the recommendations presented in this Report. The conclusions and recommendations contained herein are contingent upon GHD being retained to provide intermittent observation and appropriate field and laboratory testing during site preparation to evaluate if the subsurface conditions are as anticipated. If the subsurface conditions are observed to be different from those described in this report, GHD should be notified immediately so that the changed conditions can be evaluated and our recommendations revised, if appropriate. The recommendations in this report are contingent upon prompt notification and review of changed conditions.

6. References

American Concrete Institute. 2014. “ACI 318-14 Building Code Requirements for Structural Concrete and Commentary.”

American Society of Civil Engineers. 2010. “ASCE Standard ASCE/SEI 7-10, Minimum Design Loads for Buildings and Other Structures.”

AWWA. Bonds et al. 2005. “Corrosion and Corrosion Control of Iron Pipe, AWWA Journal 97.6.”

Busch Geotechnical Consultants. 2004. “Site-Specific Geotechnical Report, Proposed Commercial Development, 2616 Broadway, Eureka, California.” October 1.

Jennings, C.W., Strand, R.G., and Rogers, T.H. 1977, updated 2010. “Geologic map of California: California Division of Mines and Geology, scale 1:750,000.”

Krazan & Associates, Inc. 2018. “Draft Geotechnical Engineering Investigation, Proposed In-N-Out Burger Restaurant, 2616 Broadway, Eureka, California.” April 19.

McLaughlin, R.J., Ellen, S.D., Blake, M.C., Jayko, A.S., Irwin, W.P., Aalto, K.R., Carver, G.A., Clarke, S.H., Barnes, J.B., Cecil, J.D., and Cyr, K.A., 2000, Geology of the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 X 60 minute quadrangles and adjacent offshore area, northern California, with digital database: U.S. Geological Survey, Miscellaneous Field Studies Map MF-2336, scale 1:100,000.

Portland Cement Association. 2011. “Design and Control of Concrete Mixtures.”

U.S. Geologic Survey. Visited July 24, 2018. Unified Hazard Tool Website https://earthquake.usgs.gov/hazards/interactive/

U.S. Geologic Survey. Visited July 03, 2018. U.S. Seismic Design Maps, Version for 2010 NEHRP Provisions. http://earthquake.usgs.gov/designmaps/us/application.php

7. Limitations

This Geotechnical Investigation (“Report”):

- Has been prepared by GHD for The Carrington Company (TCC) under the professional supervision of those senior partners and/or senior staff whose seals and signatures appear herein
- May only be used and relied on by TCC, which is responsible to ensure that all relevant parties to the project, including designers, contractors, subcontractors, etc., are made aware of this report in its entirety
- Must not be copied to, used by, or relied on by any person other than TCC without the prior written consent of GHD
- May only be used for the purpose of engineering design of the proposed Restroom building at the project site described in this report (and must not be used for any other purpose)

GHD and its servants, employees and officers otherwise expressly disclaim responsibility to any person other than TCC arising from or in connection with this Report.

To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the Report are excluded unless they are expressly stated to apply in this Report.

The services undertaken by GHD in connection with preparing this Report:

- In regard to site exploration and testing:
  - Site exploration and testing characterizes subsurface conditions only at the locations where the explorations or tests are performed; actual subsurface conditions between

explorations may be different than those described in this report. Variations of subsurface conditions from those analyzed or characterized in this report are not uncommon and may become evident during construction. In addition, changes in the condition of the site can occur over time as a result of either natural processes (such as earthquakes, flooding, or changes in ground water levels) or human activity (such as construction adjacent to the site, dumping of fill, or excavating). If changes to the site's surface or subsurface conditions occur since the performance of the field work described in this report, or if differing subsurface conditions are encountered, we should be contacted immediately to evaluate the differing conditions to assess if the opinions, conclusions, and recommendations provided in this report are still applicable or should be amended.

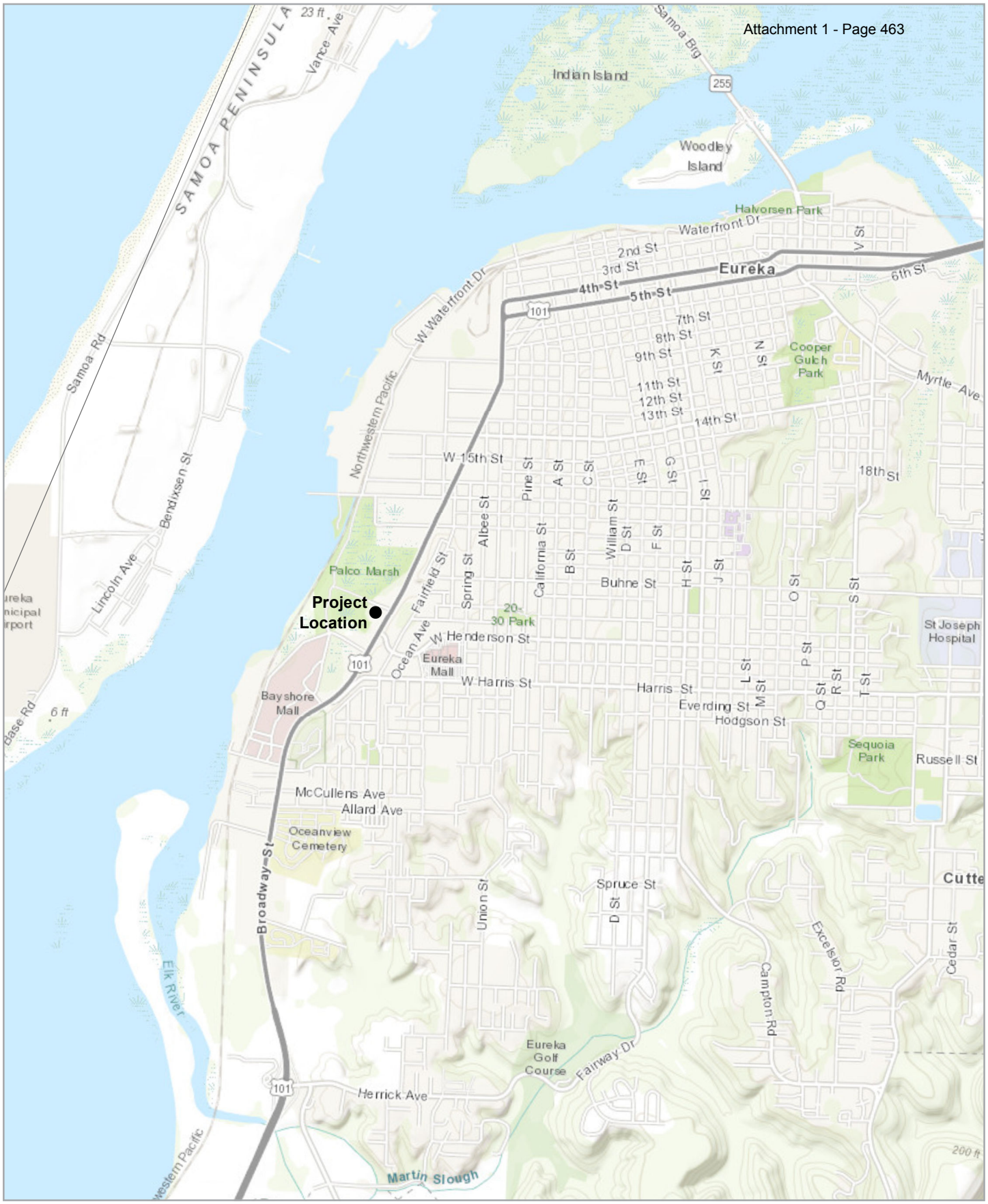
- In regard to limitations:
  - Our scope of services was limited to the proposed work described in this report, and did not address other items or areas.
  - The geotechnical investigation upon which this report is based was conducted for the proposed structures at the project site described in this report. The conclusions and recommendations contained in this report are not valid for other structures and/or project sites. If the proposed project is modified or relocated, or if the subsurface conditions found during construction differ from those described in this report, GHD should be provided the opportunity to review the new information or changed conditions to determine if our conclusions and recommendations need revision.
- Did not include evaluation or investigation of the presence or absence of wetlands
- Did not include a landslide evaluation
- Did not include a fault investigation
- Did not include a hazardous material investigation

GHD expressly disclaims responsibility for any error in, or omission from, this Report arising from or in connection with any of the Assumptions being incorrect. There is no warranty, either expressed or implied. GHD accepts no liability regarding completeness or accuracy of the information presented and/or provided to us, or any conclusions and decisions which may be made by the client or others regarding the subject site/project. Verification of our conclusions and recommendations is subject to our review of the project plans and specifications, and our observations of construction.

Subject to the paragraphs in this section of the Report, the interpretations of data, findings, conclusions, recommendations and professional opinions in this Report are based on the information reviewed, site conditions encountered, and samples collected during our field exploration and were developed in accordance with generally accepted geotechnical engineering principles and practices and as prescribed by the client. This Report is considered valid for the proposed project for a period of two years from the report date provided that the site conditions and development plans remain unchanged. With the passage of time, changes in the conditions of a property can occur due to natural processes or the works of man on this or adjacent properties. Legislation or the broadening of knowledge may result in changes in applicable standards. Depending on the magnitude of any changes, GHD may require that additional studies (at additional cost) be performed and that an updated report be issued. Additional studies may disclose

information which may significantly modify the findings of this report. GHD will retain untested samples collected during our field investigation for a period not to exceed 60 days unless other arrangements are made with the client. After a period of two years from the report date, GHD expressly disclaims responsibility for any error in, or omission from, this Report arising from or in connection with those opinions, conclusions and any recommendations.

Appendix A
Figures



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Miles

Map Projection: Lambert Conformal Conic
Horizontal Datum: NAD 1983 2011
Grid: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US

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The Carrington Company
2616 Broadway Redevelopment Project
Eureka, California

Project No. **11153741**
Revision No. **0**
Date **07/9/2018**

Vicinity Map

Figure A-1

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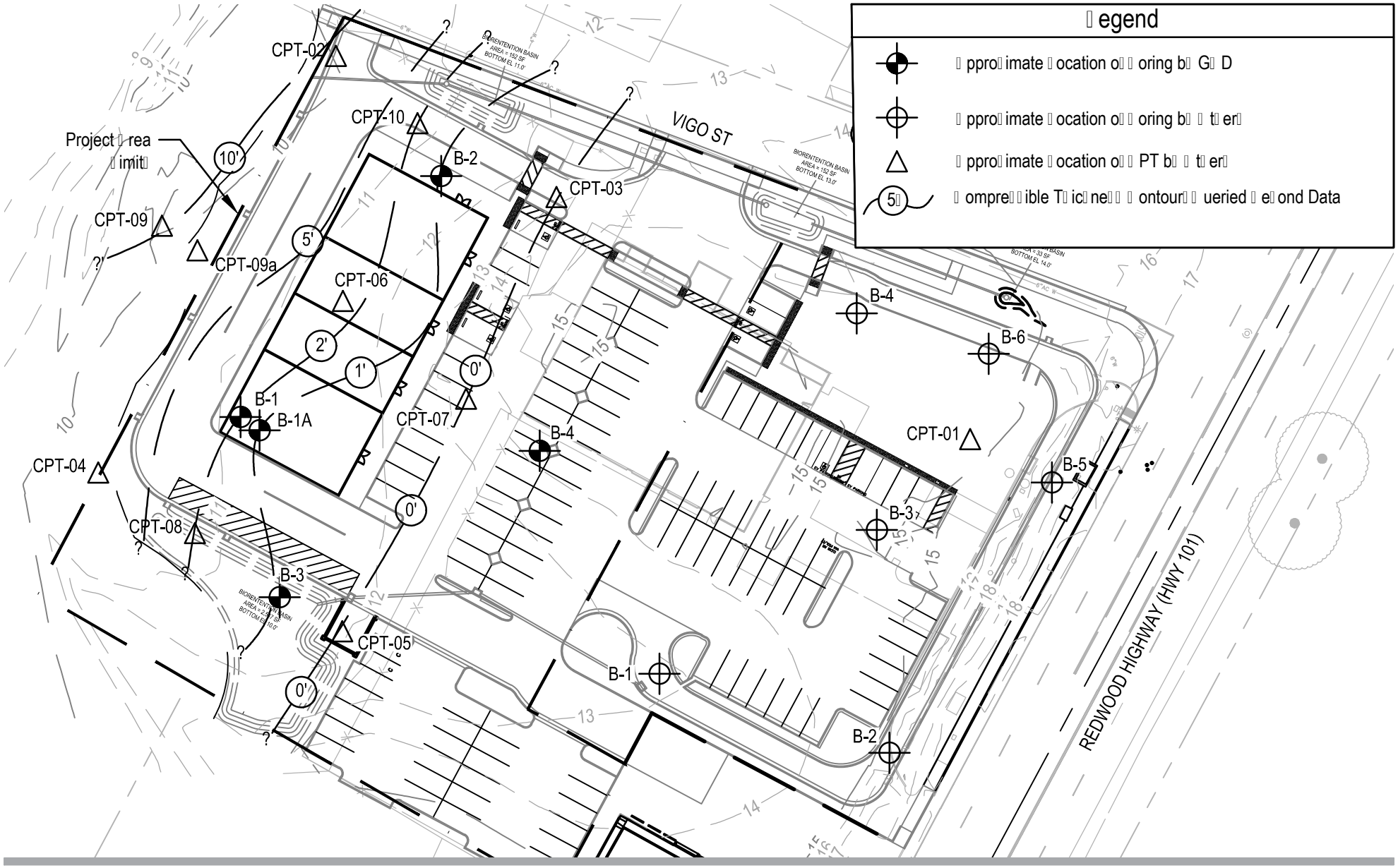
Print date: 23 Jul 2018 - 13:46

Data source: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community. Created by: dmebrahtom



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The Carrington Company
2616 Broadway Redevelopment Project
Eureka, California

GHD

Exploration Map

Project No. 11153741
Report No.
Date 07/24/2018

Figure A-2

Filename: \\ghdnet\ghd\US\Ureka\Projects\111\11153141 Carrington-Broadway Ureka Redevelopment\04-Technical Work\0 - Geotechnical Survey\D\Figure\11153141-INI Utility Plan Geo Map.dwg
Plot Date: 24 July 2018 - 5:01 PM

Source:

Appendix B
Logs of Borings

EMPIRICAL CORRELATIONS WITH STANDARD PENETRATION RESISTANCE N VALUES*

	N60 * (Blows/ft)	Consistency	Unconfined Compressive Strength (tons/sq ft)
FINE GRAINED SOIL	0 - 2	Very Soft	<0.25
	3 - 4	Soft	0.25 - 0.50
	5 - 8	Medium Stiff	0.50 - 1.00
	9 - 15	Stiff	1.00 - 2.00
	16 - 30	Very Stiff	2.00 - 4.00
	>30	Hard	>4.00

	N60 * (Blows/ft)	Relative Density
COARSE GRAINED SOIL	0 - 4	Very Loose
	5 - 10	Loose
	11 - 30	Medium Dense
	31 - 50	Dense
	>50	Very Dense

*ASTM D 1586; number of blows of 140 pound hammer falling 30 inches to drive a 2-inch-O.D., 1.4-inch-I.D. sampler one foot.

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

MAJOR DIVISIONS			SYMBOLS	DESCRIPTIONS
COARSE GRAINED SOIL MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOIL MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS LITTLE OR NO FINES	GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES APPRECIABLE AMOUNT OF FINES	GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOIL MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS LITTLE OR NO FINES	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES APPRECIABLE AMOUNT OF FINES	SM	SILTY SANDS, SAND - SILT MIXTURES
			SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOIL MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOIL			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

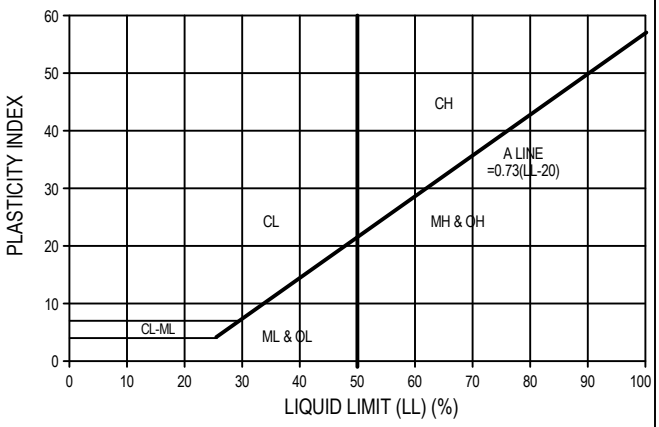
PARTICLE SIZE IDENTIFICATION

BOULDERS	>12 in
COBBLES	3 - 12 in
GRAVEL: COARSE	3/4 - 3 in
GRAVEL: FINE	No.4 - 3/4 in
SAND: COARSE	No.10 - No.4
SAND: MEDIUM	No.40 - No.10
SAND: FINE	No.200 - No.40
SILT	0.002 mm - No.200
CLAY	<0.002 mm

WELL GRADED - HAVING WIDE RANGE OF GRAIN SIZES AND APPRECIABLE AMOUNTS OF ALL INTERMEDIATE PARTICLE SIZES

POORLY GRADED - PREDOMINATELY ONE GRAIN SIZE, OR HAVING A RANGE OF SIZES WITH SOME INTERMEDIATE SIZES MISSING

PLASTICITY CHART



SAMPLE SYMBOLS

- SPT (1.375 I.D.)
- California (2.0-inch I.D.)
- California Modified (2.5-inch I.D.)
- No Recovery
- Shelby Tube
- Auger Sample

WELL SYMBOLS

- Cement Grout
- Bentonite
- Filter Sand
- Screen in filter sand
- Slough
- RX (Bedrock)

WATER LEVEL SYMBOLS

- Water level at time of drilling.
- Water level measured at a specified time after drilling and sampling or well completion.

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Soil descriptions and stratum lines are interpretive, and actual changes may be gradual. Field descriptions may have been modified to reflect results of laboratory tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations.
3. Abbreviations:

CD = TX-CD	NR = No Recovery
CN = Consolidation	PR = Permeability
CR = Corrosivity	RV = R-Value
CU = TX-CU	TC = Cyclic Triaxial
DS = Direct Shear	UC = Unconfined Compression
EI = Expansion Index	UU = TX-UU (quick)
MDD = Maximum Density	ATD = At Time of Drilling

Start Date: **6/26/18**			Total Depth Drilled (ft bgs): **50.5**
Drilling Method: **6-inch Solid Flight Auger & Mud rotary**		Drilling Contractor: **Taber Drilling**	Arbitrary Ground Surface Elevation (ft MSL): **12**
Drill Rig: **CME- 55**		Hammer Type/ Efficiency: **Automatic Trip/ 79%**	Hammer Weight / Drop: **140# / 30"**
Logged By: **Dave Mebrahtom**	Reviewed By: **T. Quintrall**	Borehole Backfill: **Grout**	Groundwater Depth (ft): **4ft ATD**

Remarks: **Switch to mud rotary at 4 feet bgs.**

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Type	Sample/Run No.	Blows/6"	N_{60}	Water Content (%)	Dry Density (pcf)	% Passing No. 4 Sieve	% Passing No. 200 Sieve	Liquid Limit	Plasticity Index
		6" Aggregate Surfacing											
11		Grayish brown Clayey SAND (SC), fine-grained, trace gravel (coarse, rounded), trace cementation, loose, moist (fill).											
	1												
10				MC	B1-1	3	5	23	93		19		
	2				B1-1A	3 4							
9		Very loose.											
	3			SPT	B1-2	1 1 1	2						
8													
	4	ATD											
7		No gravel.											
	5												
6				MC	B1-3 B1-3A B1-3B	2 2 6	6	48	71			26	8
	6												
5		Dark gray CLAY (CL), medium plasticity, wet.											
	7	Grayish brown SAND with CLAY (SP-SC), fine-grained, trace organics, trace gravel (fine, rounded), medium dense, wet.		SPT	B1-4	2 1 8	11						
4													
	8												
3													
	9	Grayish brown Silty GRAVEL (GM), fine, angular to subangular, trace sand (fine-grained), medium dense, wet.											
2													
	10												
1		Grayish brown SAND with CLAY (SP-SC), fine-grained, trace gravel (coarse, rounded), medium dense, wet.											
	11			MC	B1-5 B1-5A	9 17 17	28	18	109	96	10		
0													
	12												
-1													
	13												
-2													
	14												
-3													
	15	Dense.											
-4				SPT	B1-6	10 13 14	38						
	16												
-5													
	17												
-6													
	18												
-7													
	19												
-8													

GHD

The Carrington Company
2616 Broadway Redevelopment Project
Eureka, California

Project No. 11153741
Revision No. 0
Date 7/24/2018

Log of Boring

B-1

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Type	Sample/Run No.	Blows/6"	N_{60}	Water Content (%)	Dry Density (pcf)	% Passing No. 4 Sieve	% Passing No. 200 Sieve	Liquid Limit	Plasticity Index
-9		Grayish brown SAND with CLAY (SP-SC), fine-grained, trace gravel (coarse, rounded), medium dense, wet.											
	21	Trace gravel (fine), very dense,/		MC	B1-7 B1-7A	17 26 29	54	21	106		10		
-10													
	22												
-11													
	23												
-12													
	24												
-13													
	25	Dense.											
-14				SPT	B1-8	11 14 17	49						
	26												
-15													
	27												
-16													
	28												
-17													
	29												
-18													
	30	Very dense.											
-19				MC	B1-9 B1-9A	23 32 33	64						
	31												
-20													
	32												
-21													
	33												
-22													
	34												
-23													
	35												
-24				SPT	B1-10	14 18 23	68						
	36												
-25													
	37												
-26													
	38												
-27													
	39												
-28													
	40	Grayish brown GRAVEL with SILT (GW-GM), fine, rounded, trace sand (fine-grained), very dense, wet.											
-29				MC	B1-11 B1-11A	32 50/4"	50+						
	41												
-30													
	42												
-31													
	43	Grayish brown SAND with SILT (SP-SM), fine-grained, very dense, wet.											

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Type	Sample/Run No.	Blows/6"	N_{60}	Water Content (%)	Dry Density (pcf)	% Passing No. 4 Sieve	% Passing No. 200 Sieve	Liquid Limit	Plasticity Index
	44	Grayish brown SAND with SILT (SP-SM), fine-grained, very dense, wet.											
-33													
	45												
-34				SPT	B1-12	18 26 28	90						
	46												
-35													
	47												
-36													
	48												
-37													
	49												
-38													
	50												
-39				MC	B1-13	50/6"	50+						
		Boring terminated at 50.5 feet bgs.											
	51												
-40													
	52												
-41													
	53												
-42													
	54												
-43													
	55												
-44													
	56												
-45													
	57												
-46													
	58												
-47													
	59												
-48													
	60												
-49													
	61												
-50													
	62												
-51													
	63												
-52													
	64												
-53													
	65												
-54													
	66												
-55													
	67												

The Carrington Company
2616 Broadway Redevelopment Project
Eureka, California

Project No. 11153741
Revision No. 0
Date 7/24/2018

Log of Boring

B-1

Start Date: **6/26/18**			Total Depth Drilled (ft bgs): **7.3**
Drilling Method: **6-inch Solid Flight Auger & Mud rotary**		Drilling Contractor: **Taber Drilling**	Arbitrary Ground Surface Elevation (ft MSL): **12**
Drill Rig: **CME- 55**		Hammer Type/ Efficiency: **Automatic Trip/ 79%**	Hammer Weight / Drop: **140# / 30"**
Logged By: **Dave Mebrahtom**	Reviewed By: **T. Quintrall**	Borehole Backfill: **Cuttings**	Groundwater Depth (ft): **4ft ATD**

Remarks:

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Type	Sample/Run No.	Blows/6"	N_{60}	Other Tests
		6" Aggregate Surfacing						
11		Grayish brown Clayey SAND (SC), fine-grained, trace gravel (coarse, rounded), trace cementation, loose, moist (fill).						
	1							
10								
	2							
9								
	3							
8				ST				
	4	ATD						
7		No trace of gravel.						
	5							
6								
	6	Dark gray CLAY (CL), medium plasticity, wet.		ST				CN
5		Grayish brown SAND with Clay (SP-SC), fine-grained, wet.						
	7							
4		Boring terminated at 7.3 feet bgs.						
	8							
3								
	9							
2								
	10							
1								
	11							
0								
	12							
-1								
	13							
-2								
	14							
-3								
	15							
-4								
	16							
-5								
	17							
-6								
	18							
-7								
	19							
-8								

Start Date: **6/26/18**			Total Depth Drilled (ft bgs): **50.9**
Drilling Method: **6-inch Solid Flight Auger & Mud rotary**		Drilling Contractor: **Taber Drilling**	Arbitrary Ground Surface Elevation (ft MSL): **11**
Drill Rig: **CME- 55**		Hammer Type/ Efficiency: **Automatic Trip/ 79%**	Hammer Weight / Drop: **140# / 30"**
Logged By: **Dave Mebrahtom**	Reviewed By: **T. Quintrall**	Borehole Backfill: **Grout**	Groundwater Depth (ft): **5ft ATD**

Remarks: **Switch to mud rotary at 10 feet bgs.**

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Type	Sample/Run No.	Blows/6"	N_{60}	Recovery (in)	% Passing No. 4 Sieve	% Passing No. 200 Sieve	Other Tests
		6" Aggregate Surfacing									
		Light brown brown SAND (SP), fine-grained, medium dense, moist (fill).									
10	1										
9	2			MC	B1-1 B1-1A	7 8 8	12				
		Dark grayish SAND with CLAY (SP-SC), fine-grained, loose, moist (fill).									
8	3			SPT	B2-2	2 3 4	9				
7	4										
6	5	Wet.		MC	B2-3 B2-3A	3 4 3	5				
		Grayish brown Sandy CLAY (CL), low plasticity, trace organics, wet.									
5	6	Dark brown CLAY (CH), high plasticity, trace organics, wet.		ST	B2-4			16			CN
4	7	Dark grayish brown Clayey GRAVEL with Sand (GC), fine, rounded, fine-grained, medium dense, wet.									
3	8										
2	9										
1	10										
0	11			MC	B2-5 B2-5A	7 12 15	22		62	29	
		Grayish black and white GRAVEL with Sand (GP), fine, rounded, fine-grained, medium dense, wet.									
-1	12										
-2	13										
-3	14										
		Light brown SAND with Clay (SP-SC), fine-grained, trace gravel (fine, rounded), medium dense, wet.									
-4	15										
-5	16			SPT	B2-6	4 10 11	30				
-6	17										
-7	18										
-8	19										

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Type	Sample/Run No.	Blows/6"	N_{60}	Recovery (in)	% Passing No. 4 Sieve	% Passing No. 200 Sieve	Other Tests
		Light brown SAND with Clay (SP-SC), fine-grained, trace gravel (fine, rounded), medium dense, wet.									
		Dense.		MC	B2-7 B2-7A	11 19 19	38			7	
-10	21										
-11	22										
-12	23										
-13	24										
-14	25										
-15	26			SPT	B2-8	7 14 17	49				
-16	27										
-17	28										
-18	29										
-19	30	Very dense.									
-20	31			MC	B2-9 B2-9A	27 50/5"	50+				
-21	32										
-22	33										
-23	34										
-24	35	Increased gravel (white and brown).									
-25	36			SPT	B2-10	4 13 19	53				
-26	37										
-27	38										
-28	39										
-29	40										
-30	41	White, black and brown GRAVEL with Silt (GP-GM), fine, rounded, trace sand (fine-grained), very dense, wet.		MC	B2-11 B2-11A	14 43 50/4"	50+				
-31	42										
-32	43										

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Type	Sample/Run No.	Blows/6"	N_{60}	Recovery (in)	% Passing No. 4 Sieve	% Passing No. 200 Sieve	Other Tests
-33	44	White, black and brown GRAVEL with Silt (GP-GM), fine, rounded, trace sand (fine-grained), very dense, wet.									
-34	45	Brown, whilte and Gray GRAVEL (GP), fine, rounded, trace sand (fine-grained), trace silt, medium dense, wet.		SPT	B2-12	3 5 9	23				
-35	46										
-36	47										
-37	48										
-38	49	Grayish brown Silty SAND (SM), fine-grained, trace gravel (fine, rounded), trace cobble, very dense, wet.									
-39	50			MC	B2-13A	38 50/5"	50+				
-40	51	Boring terminated at 50.9 feet bgs.									
-41	52										
-42	53										
-43	54										
-44	55										
-45	56										
-46	57										
-47	58										
-48	59										
-49	60										
-50	61										
-51	62										
-52	63										
-53	64										
-54	65										
-55	66										
-56	67										

The Carrington Company
2616 Broadway Redevelopment Project
Eureka, California

Project No. 11153741
Revision No. 0
Date 7/24/2018

Log of Boring

B-2

Start Date: **6/26/18**			Total Depth Drilled (ft bgs): **5.0**
Drilling Method: **6 inch Solid Flight Auger**		Drilling Contractor: **Taber Drilling**	Arbitrary Ground Surface Elevation (ft MSL): **12**
Drill Rig: **CME- 55**		Hammer Type/ Efficiency: **Automatic Trip/ 79%**	Hammer Weight / Drop: **140# / 30"**
Logged By: **Dave Mebrahtom**	Reviewed By: **T. Quintrall**	Borehole Backfill: **Cuttings**	Groundwater Depth (ft): **5ft ATD**

Remarks:

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Type	Sample/Run No.	Blows/6"	N_{60}	Other Tests
11		Gravel and Sand (fill).						
	1	Light brown GRAVEL with Silt and Sand (GP-GM), fine to coarse, rounded to subangular, fine-grained, moist.						
10		Olive brown Clayey SAND with Gravel (SC), fine-grained, moist.		BK	Bulk			RV
	2							
9								
	3							
8								
	4	Dark brown CLAY (CH), high plasticity, trace organic matter, wet.						
7								
	5	ATD Boring terminated at 5 feet bgs.						
6								
	6							
5								
	7							
4								
	8							
3								
	9							
2								
	10							
1								
	11							
0								
	12							
-1								
	13							
-2								
	14							
-3								
	15							
-4								
	16							
-5								
	17							
-6								
	18							
-7								
	19							
-8								

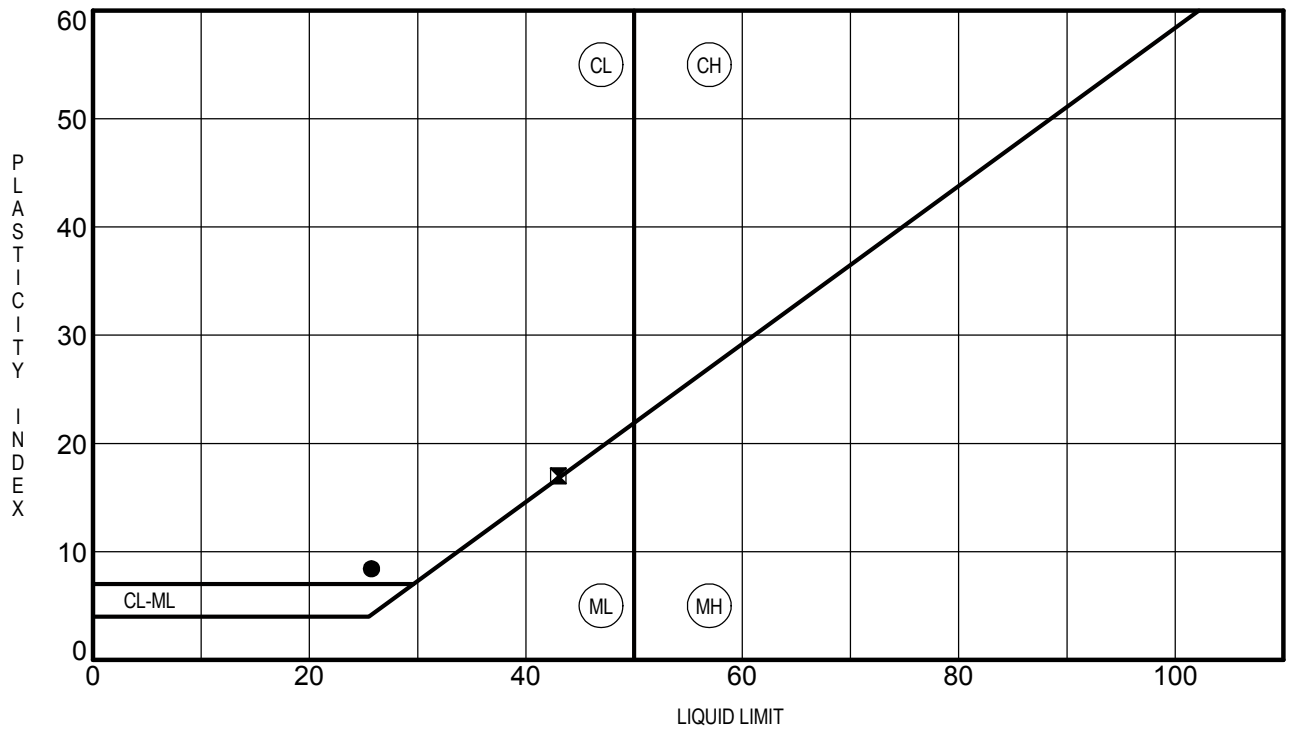
Start Date: **6/26/18**			Total Depth Drilled (ft bgs): **0.5**
Drilling Method: **6 inch Solid Flight Auger**		Drilling Contractor: **Taber Drilling**	Arbitrary Ground Surface Elevation (ft MSL): **14**
Drill Rig: **CME- 55**		Hammer Type/ Efficiency: **Automatic Trip/ 79%**	Hammer Weight / Drop: **140# / 30"**
Logged By: **Dave Mebrahtom**	Reviewed By: **T. Quintrall**	Borehole Backfill: **Cuttings**	Groundwater Depth (ft): **Not Encountered ATD**

Remarks:

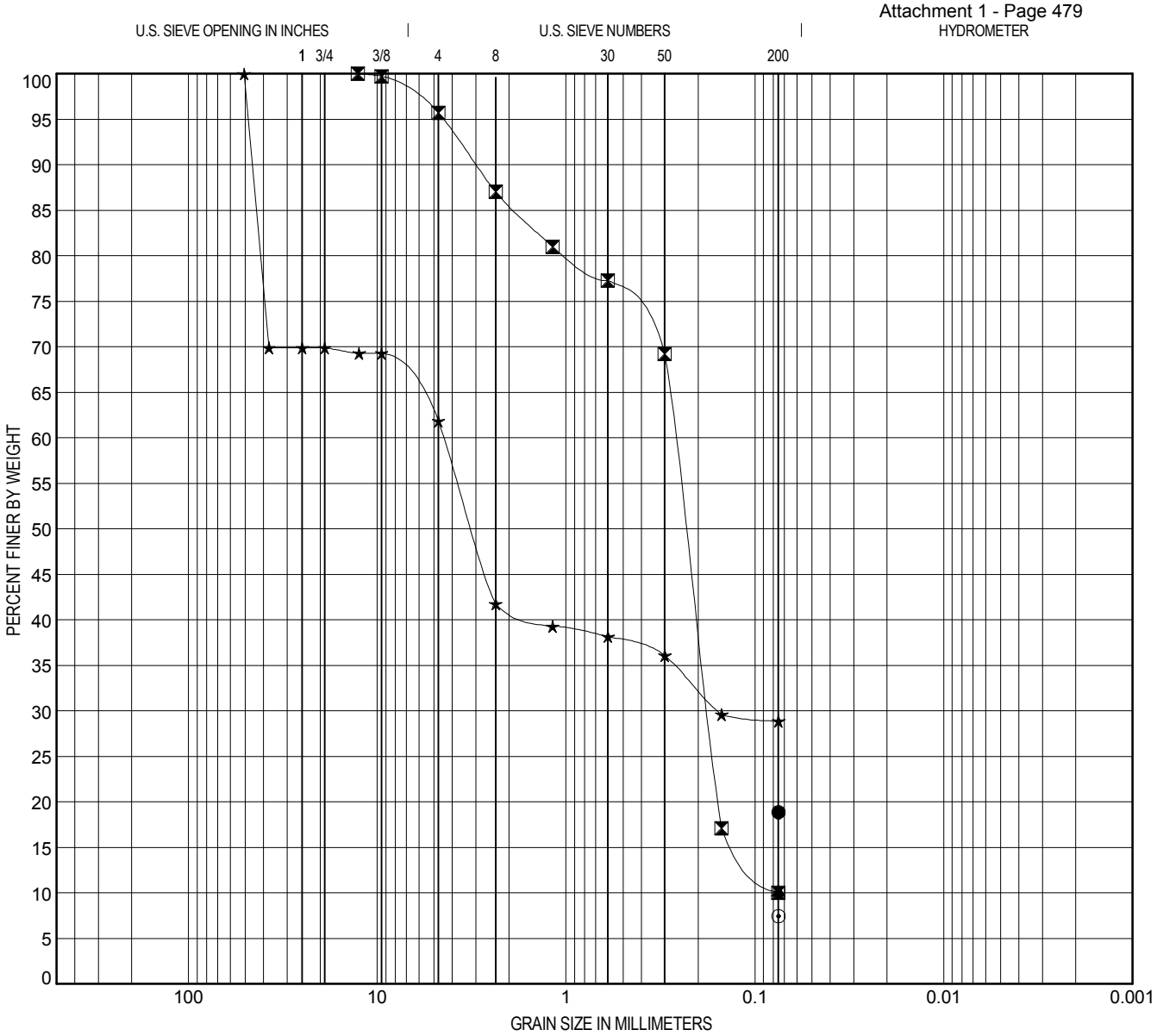
Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Type	Sample/Run No.	Blows/6"	N_{60}
		5" Asphalt.					
		Boring teminated at 0.5 feet bgs due to auger refusal.					
13	1						
12	2						
11	3						
10	4						
9	5						
8	6						
7	7						
6	8						
5	9						
4	10						
3	11						
2	12						
1	13						
0	14						
-1	15						
-2	16						
-3	17						
-4	18						
-5	19						

Appendix C
Laboratory Test Results

Boring ID	Depth (ft)	Description	Water Content (%)	Dry Density (pcf)	Maximum Size (mm)	%<#200 Sieve	Liquid Limit	Plastic Limit	Plasticity Index	Other Tests
B-1	2.0	SC, Grayish brown clayey sand	23.1	92.6	0.075	19				
B-1	5.5	SC, Grayish brown clayey sand	48.2	70.6						
B-1	6.0	SC, Grayish brown clayey sand					26	17	9	
B-1	11.5	SP-SC, Gray brown poorly graded sand with clay	18.3	108.6	12.7	10				
B-1	21.0	SP-SC, Gray brown sand with clay trace gravel	21.5	105.9	0.075	10				
B-1A	4.8	CL, Dark gray lean clay					43	26	17	CN
B-2	6.1	CH, Dark brown clay								CN
B-2	10.5	GC, Dark grayinsh brown clayey gravel with sand			50.8	29				
B-2	20.5	SP-SC, Grayish brown sand with clay			0.075	7				
B-3	0.0	SP-SM, Dark grayish brown SAND with Silt								RV



	Specimen Identification		LL	PL	PI	Fines	Classification
●	B-1	**6.0'**	26	17	9		SC, Grayish brown clayey sand
⧓	B-1A	**4.8'**	43	26	17		CL, Dark gray lean clay

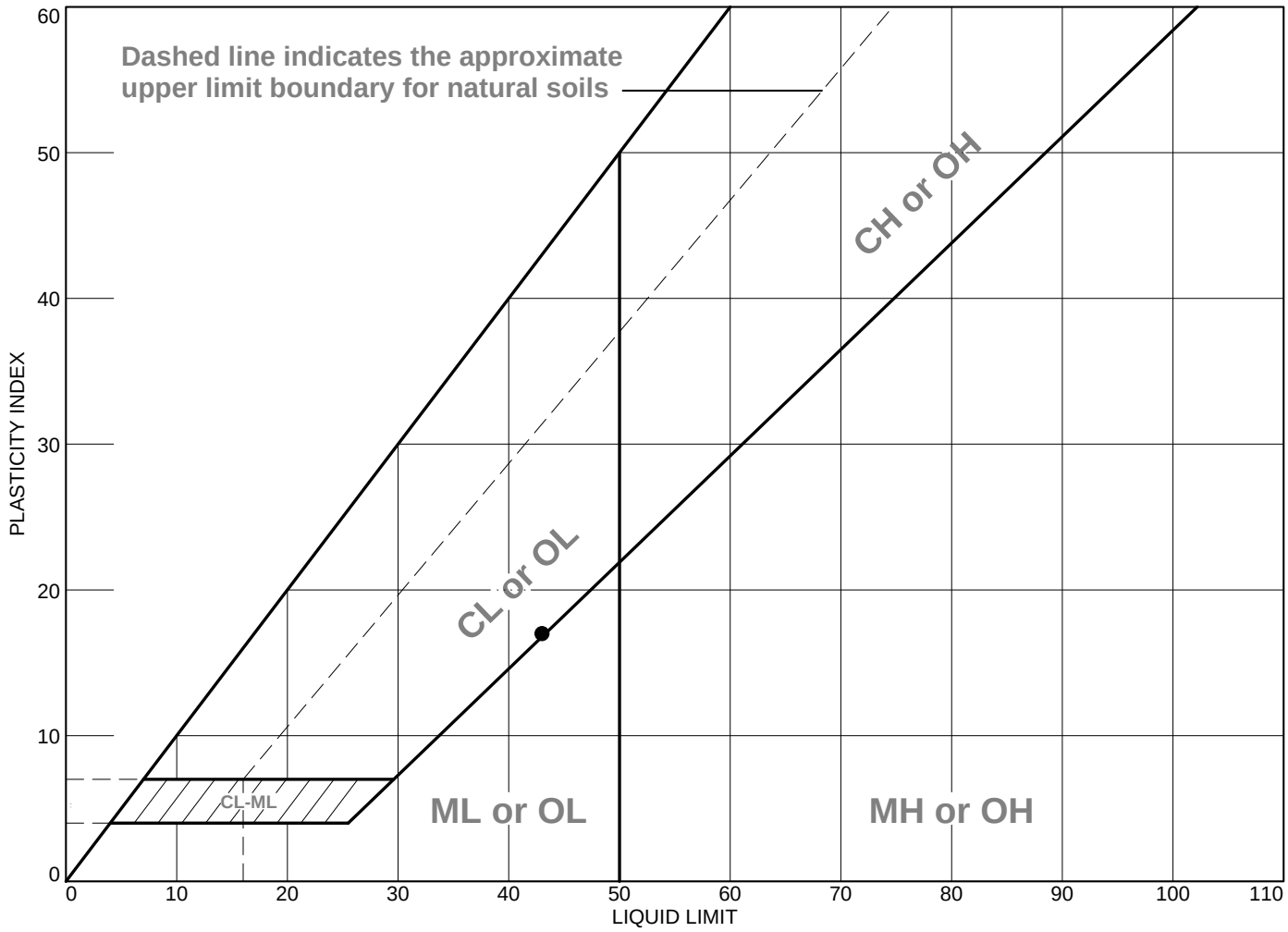


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	C_c	C_u
●	B-1	2.0	SC, Gray brown clayey sand					
⊠	B-1	11.5	SP-SC, Gray brown poorly graded sand with clay				1.59	3.54
▲	B-1	21.0	SC, Gray brown sand with clay trace gravel					
★	B-2	10.5	SC, Gray brown gravely sand with clay					
⊙	B-2	20.5	SP-SC/SW-SC, Gray brown gravely sand trace clay					

	Specimen Identification		D_{100}	D_{90}	D_{85}	D_{50}	D_{15}	D_{10}	%Gravel	%Sand	%Silt	%Clay
●	B-1	2.0	0.075						0.0	0.0	18.9	
⊠	B-1	11.5	12.7	2.993	1.865	0.232	0.122		4.2	85.8	10.0	
▲	B-1	21.0	0.075						0.0	0.0	10.3	
★	B-2	10.5	50.8	45.927	43.668	3.142			38.1	33.0	28.9	
⊙	B-2	20.5	0.075						0.0	0.0	7.5	

LIQUID AND PLASTIC LIMITS TEST REPORT



	Material Description	Sampled	Tested	Technician	LL	PL	PI	%<#40	USCS
●	Dark gray lean CLAY		7/20/18	MR	43	26	17		

Project No. S1515-05-12 **Client:** GHD Inc.

Project: GHD 2616 Broadway

○ **Sample Number:** B1-1A

GEOCON CONSULTANTS, INC.

Checked by: MR

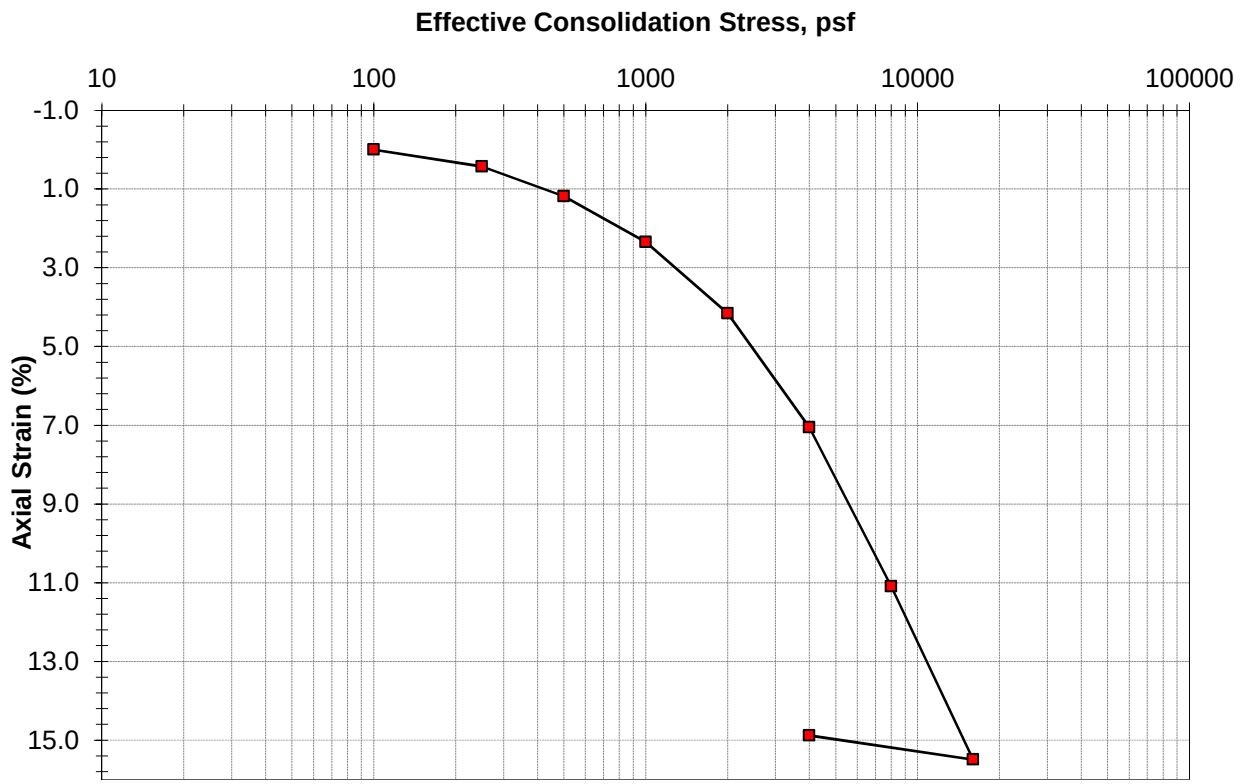
Title: Lab Manager

Figure

Tested By: MR **Checked By:** MR

CONSOLIDATION TEST - ASTM D2435
STRESS VERSUS STRAIN

Project Name	GHD 11153741
Geocon Project Number	S1515-05-12
Boring Number	B1
Sample Number	B1-B1A
Sample Description	Dark gray CLAY



Axial Load, psf	Void Ratio	Axial Strain, %
initial	1.146	0.00
100	1.146	0.00
250	1.137	0.43
500	1.121	1.19
1000	1.096	2.35
2000	1.057	4.16
4000	0.995	7.05
8000	0.908	11.09
16000	0.814	15.49
4000	0.827	14.88

Measurement	Initial	Final
Height (in.)	0.750	0.638
Moisture Content (%)	39.8	30.5
Dry Density (pcf)	78.6	92.3
Saturation (%)	94	100

Note:
Gs = 2.7 (assumed)

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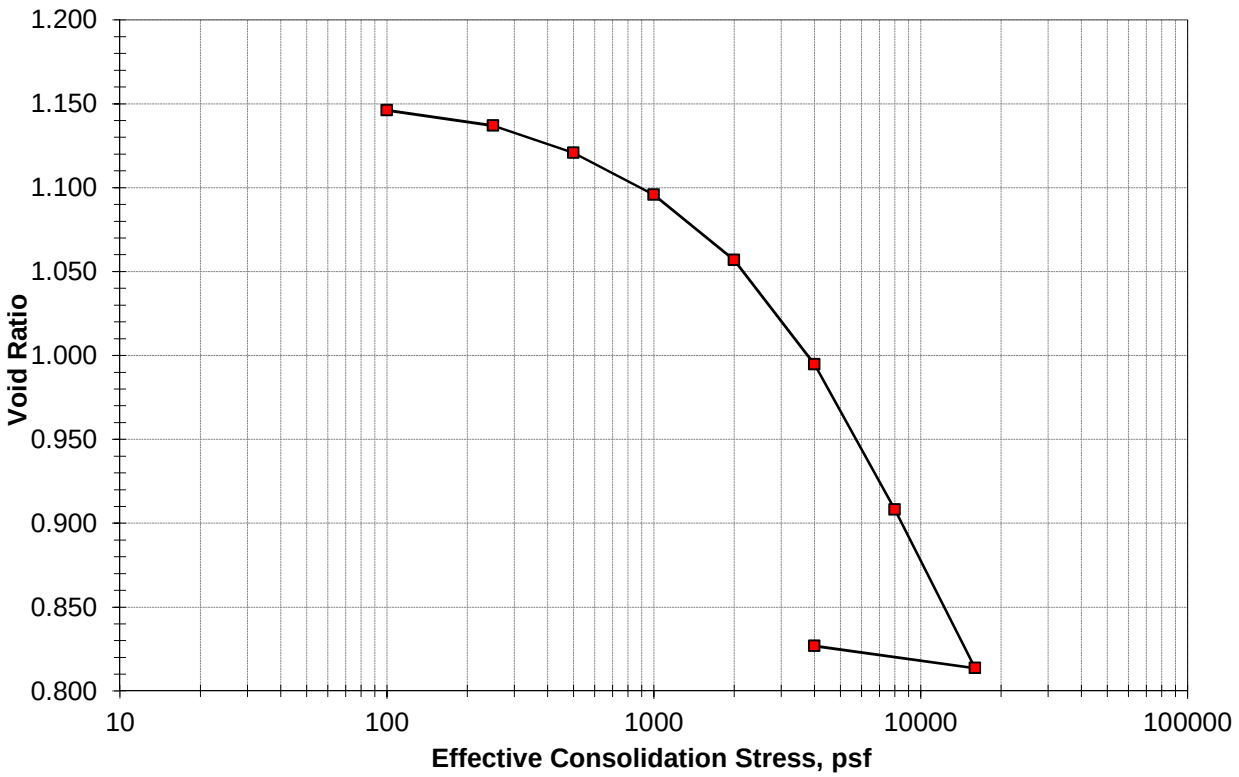
Page 1 of 3

CONSOLIDATION TEST - ASTM D2435
STRESS VERSUS VOID RATIO

Project Name	GHD 11153741
Geocon Project Number	S1515-05-12
Boring Number	B1
Sample Number	B1-B1A
Sample Description	Dark gray CLAY



Axial Load, psf	Void Ratio	Axial Strain, %
initial	1.146	0.00
100	1.146	0.00
250	1.137	0.43
500	1.121	1.19
1000	1.096	2.35
2000	1.057	4.16
4000	0.995	7.05
8000	0.908	11.09
16000	0.814	15.49
4000	0.827	14.88

Measurement	Initial	Final
Height (in.)	0.750	0.638
Moisture Content (%)	39.8	30.5
Dry Density (pcf)	78.6	92.3
Saturation (%)	94	100

Note:
Gs = 2.7 (assumed)

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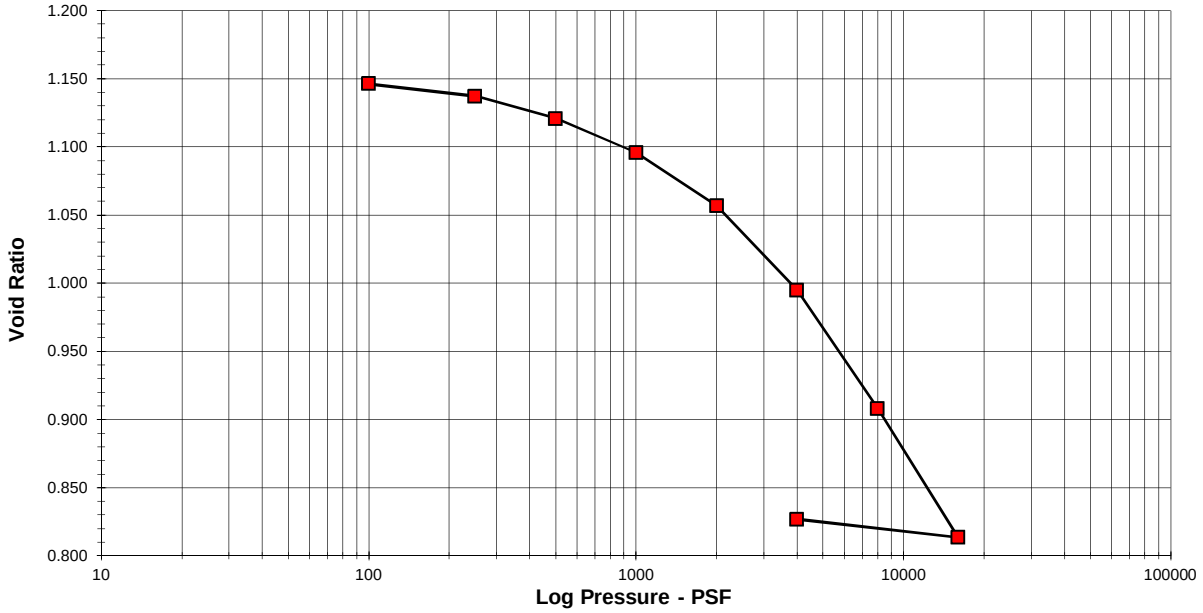
CONSOLIDATION TEST - ASTM D2435

Project Name: GHD 11153741
Project Number: S1515-05-12 Sample Number: B1 B1-B1A

CONSOLIDATION TEST RESULTS
JOB S1515-05-12, BORING B1, B1-B1A



Axial Load (psf)	Void Ratio	Axial Strain (%)	m_V, coef of vol Compres (in^2/lb)	c_C, Comp Index	50% Consolidation t_{50}, Time to Consol (min)	50% Consolidation C_V, Coeff of Consol (ft^2/yr)	90% Consolidation t_{90}, Time to Consol (min)	90% Consolidation C_V, Coeff of Consol (ft^2/yr)
initial	1.146	0.00						
100	1.146	0.00						
250	1.137	0.43						
500	1.121	1.19						
1000	1.096	2.35						
2000	1.057	4.16						
4000	0.995	7.05						
8000	0.908	11.09						
16000	0.814	15.49						
4000	0.827	14.88						

G_s = 2.7 (assumed)	COND AT START OF TEST	COND AT END OF TEST
HEIGHT (in.)	0.7500	0.6384
DRY DENSITY (pcf):	78.6	92.3
SATURATION (%)	93.8	99.9

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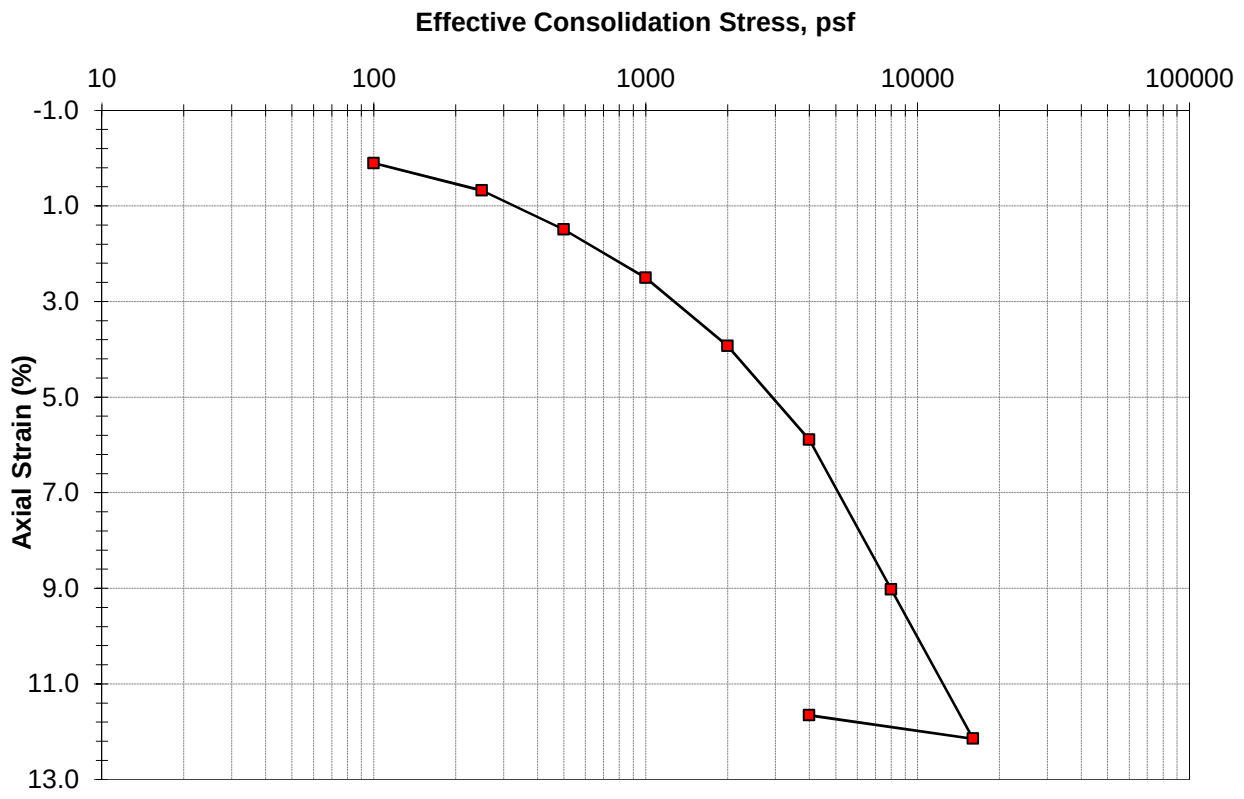
CONSOLIDATION TEST - ASTM D2435
STRESS VERSUS STRAIN

Project Name	GHD 11153741
Geocon Project Number	S1515-05-12
Boring Number	B2
Sample Number	B2-4 (5.5-8)
Sample Description	Dark Gray CLAY



Axial Load, psf	Void Ratio	Axial Strain, %
initial	0.945	0.00
100	0.943	0.11
250	0.932	0.68
500	0.916	1.49
1000	0.896	2.51
2000	0.869	3.93
4000	0.830	5.89
8000	0.769	9.03
16000	0.709	12.15
4000	0.718	11.65

Measurement	Initial	Final
Height (in.)	0.750	0.663
Moisture Content (%)	34.3	26.2
Dry Density (pcf)	87.6	99.2
Saturation (%)	99	100

Note:
Gs = 2.73 (assumed)

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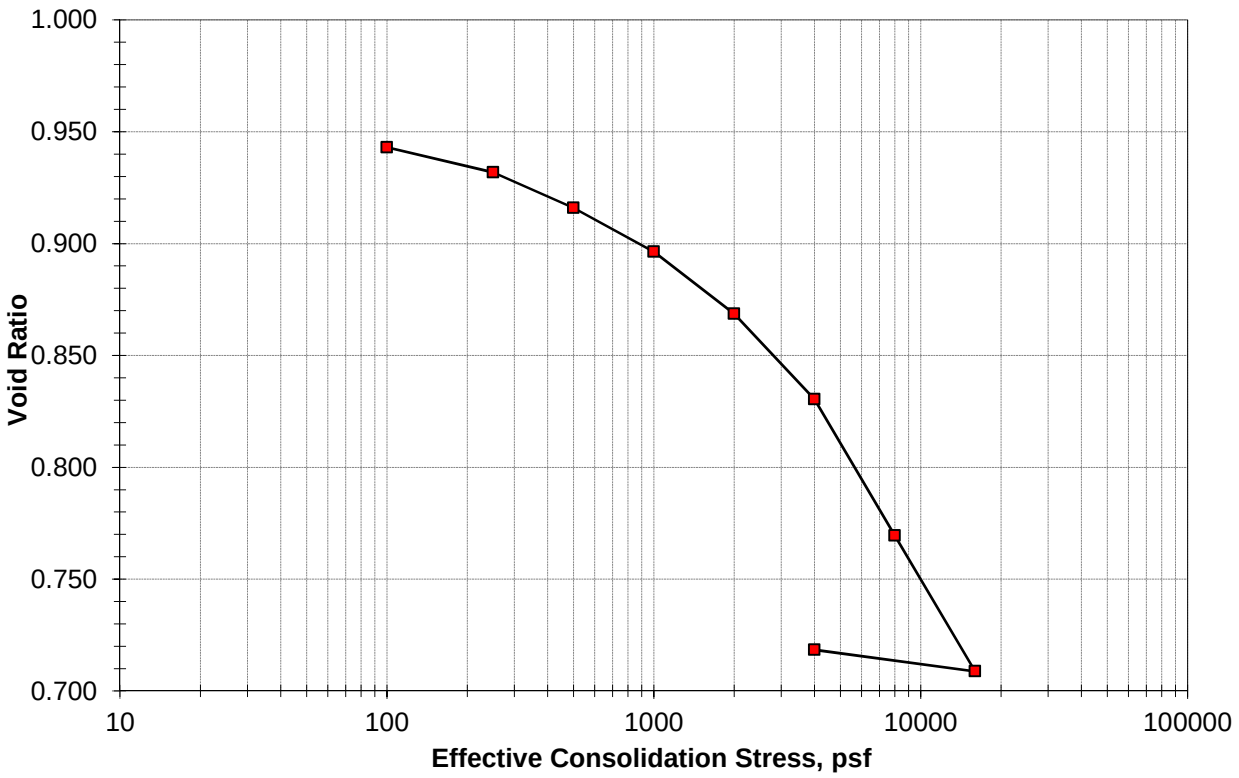
CONSOLIDATION TEST - ASTM D2435
STRESS VERSUS VOID RATIO

Project Name	GHD 11153741
Geocon Project Number	S1515-05-12
Boring Number	B2
Sample Number	B2-4 (5.5-8)
Sample Description	Dark Gray CLAY



Axial Load, psf	Void Ratio	Axial Strain, %
initial	0.945	0.00
100	0.943	0.11
250	0.932	0.68
500	0.916	1.49
1000	0.896	2.51
2000	0.869	3.93
4000	0.830	5.89
8000	0.769	9.03
16000	0.709	12.15
4000	0.718	11.65

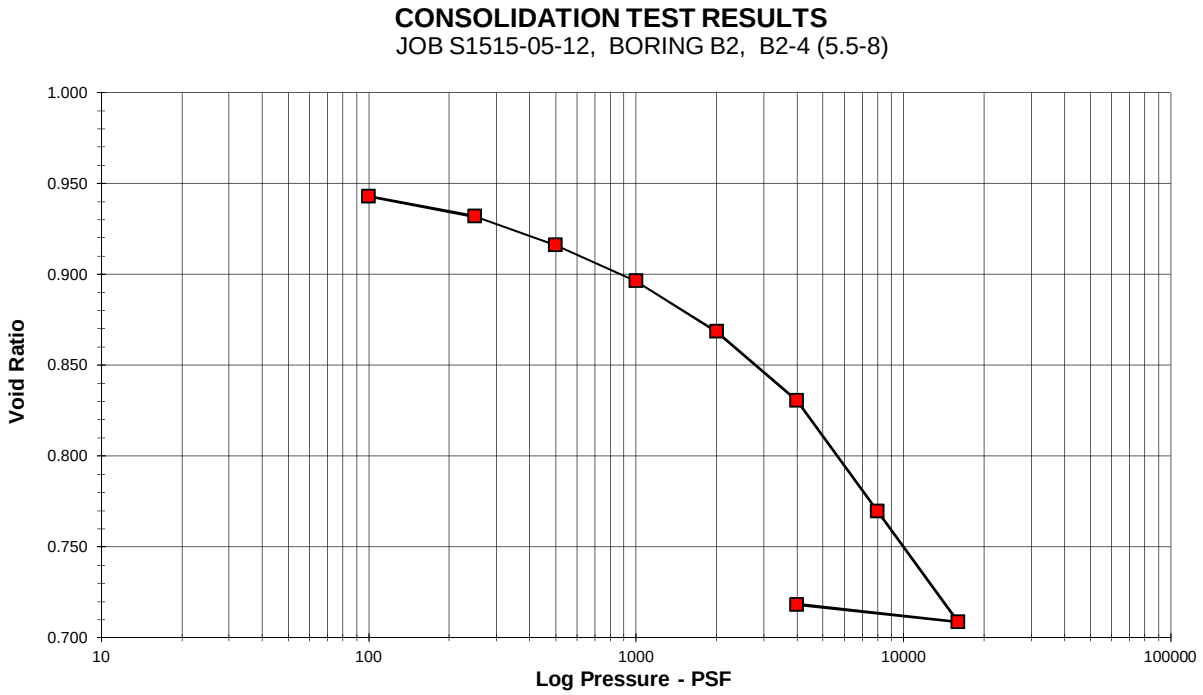
Measurement	Initial	Final
Height (in.)	0.750	0.663
Moisture Content (%)	34.3	26.2
Dry Density (pcf)	87.6	99.2
Saturation (%)	99	100

Note:
Gs = 2.73 (assumed)

GEOCON
CONSULTANTS, INC.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
tel. 916.852-9118 fax. 916.852.9132

CONSOLIDATION TEST - ASTM D2435

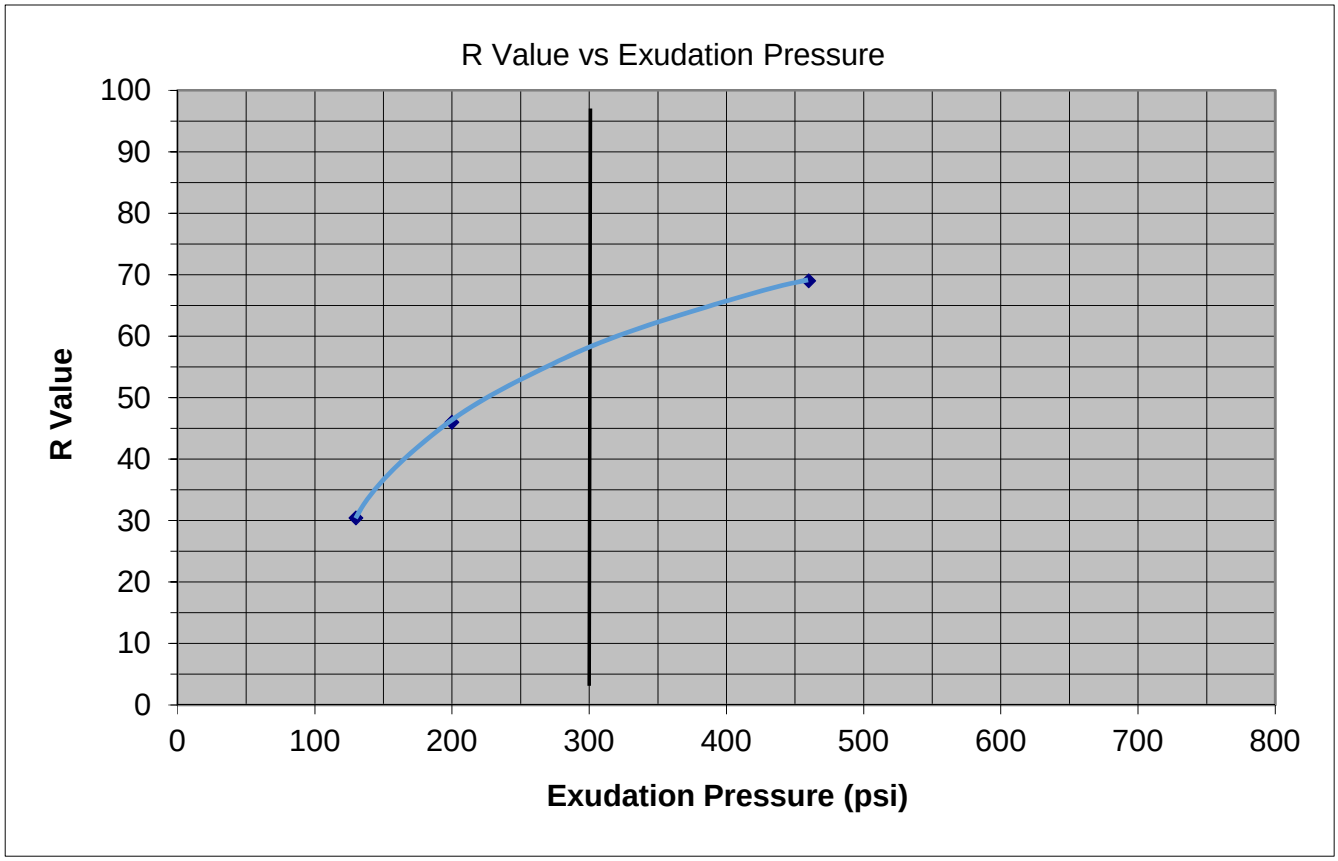
Project Name: GHD 11153741
Project Number: S1515-05-12 Sample Number: B2 B2-4 (5.5-8)



Axial Load (psf)	Void Ratio	Axial Strain (%)	m_V, coef of vol Compres (in^2/lb)	c_C, Comp Index	50% Consolidation t_{50}, Time to Consol (min)	50% Consolidation C_V, Coeff of Consol (ft^2/yr)	90% Consolidation t_{90}, Time to Consol (min)	90% Consolidation C_V, Coeff of Consol (ft^2/yr)
initial	0.945	0.00						
100	0.943	0.11						
250	0.932	0.68						
500	0.916	1.49						
1000	0.896	2.51						
2000	0.869	3.93						
4000	0.830	5.89						
8000	0.769	9.03						
16000	0.709	12.15						
4000	0.718	11.65						

G_s = 2.73 (assumed)	COND AT START OF TEST	COND AT END OF TEST
HEIGHT (in.)	0.7500	0.6626
MOISTURE CONTENT (%)	34.3	26.2
DRY DENSITY (pcf):	87.6	99.2
SATURATION (%)	99.1	99.8

GEOCON CONSULTANTS, INC.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
tel. 916.852-9118 fax. 916.852.9132



Sample ID & Description			
Boring Number	B3-Bulk		
Sample Depth (feet)	--		
Material Description	Olive Brown Clayey SAND with gravel		
Test Data			
Specimen	2099	2090	2091
Exudation Pressure (psi)	130	200	460
Expansion Dial (.0001")	0	3	18
Expansion Pressure (psf)	0.0	13.0	77.9
Resistance 'R' Value	30	46	69
Moisture at test (%)	10.6	9.2	7.9
Dry density at test (pcf)	125.9	123.5	124.7
R Value at 300 psi exudation pressure		**58**	
R Value by expansion pressure (TI=5.0)		**66**	
R Value by Equillibrium		**58**	

Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, California 95742
Telephone: (916) 852-9118
Fax: (916) 852-9132

Resistance "R" Value, ASTM D2844, CTM 301

Project: GHD 2616 Broadway Eureka
Location:
Number: S1515-05-12
Figure:

Sunland Analytical
11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 07/06/2018
Date Submitted 07/02/2018

To: Tony Quintrall
GHD
4080 Plaza Goldorado Cir. B
Cameron Park, CA 95682

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 11153741 Site ID : B2-3.
Thank you for your business.

* For future reference to this analysis please use SUN # 77424-161690.

EVALUATION FOR SOIL CORROSION

Soil pH	5.75		
Moisture	17.5 %		
Minimum Resistivity	3.48 ohm-cm (x1000)		
Chloride	5.9 ppm	00.00059	%
Sulfate	46.3 ppm	00.00463	%
Redox Potential	(+) 299 mv		
Sulfides	Presence - NEGATIVE		

METHODS
pH and Min.Resistivity CA DOT Test #643 Mod.(Sm.Cell)
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m
Redox Potential ASTM G-200m, Sulfides AWWA C105/A25.5

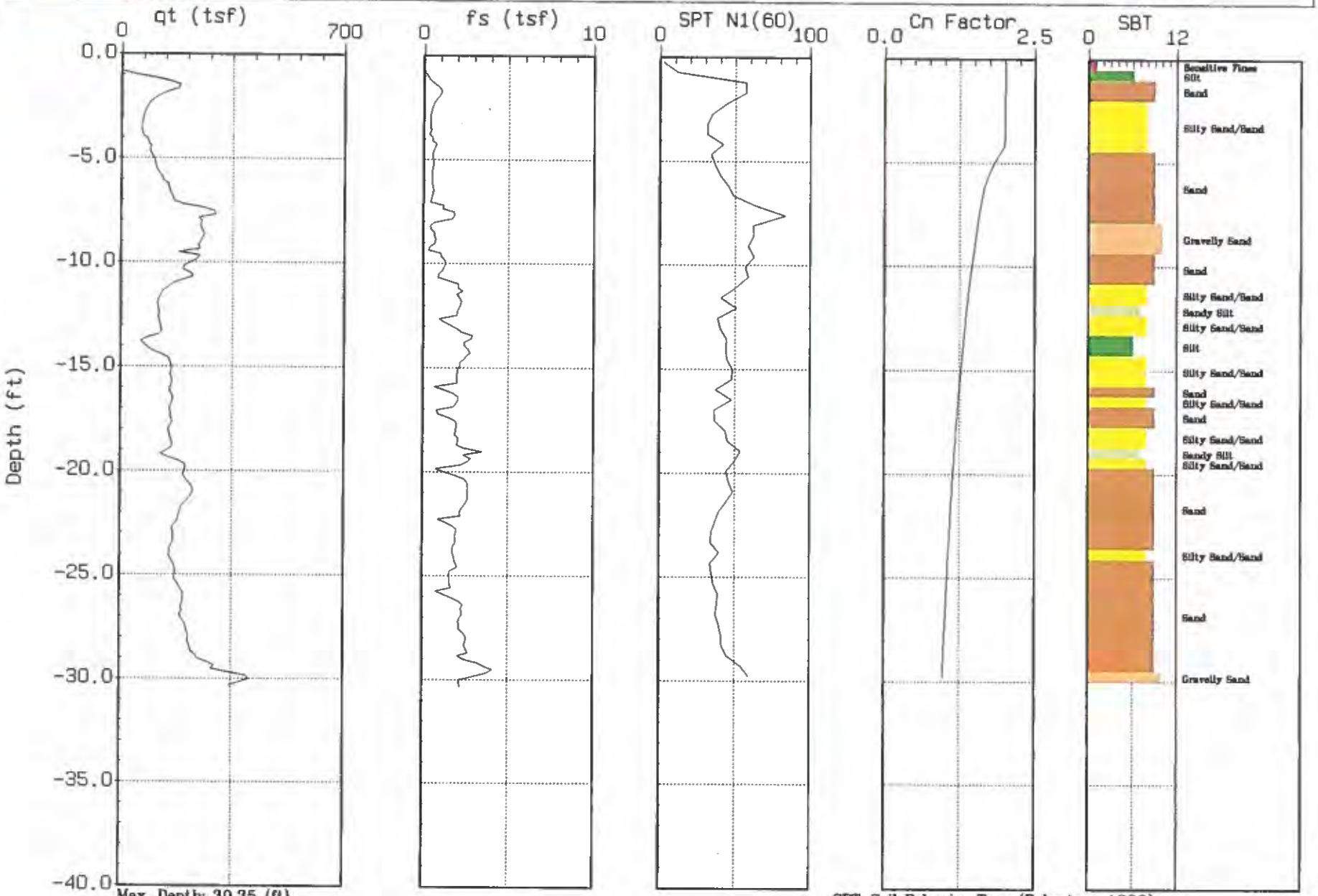
Appendix D
Previous Explorations by Others

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-01

Oversite: B. BUSCH
Date: 08:16:04 14:31



Max. Depth: 30.35 (ft)
Depth Inc.: 0.164 (ft)

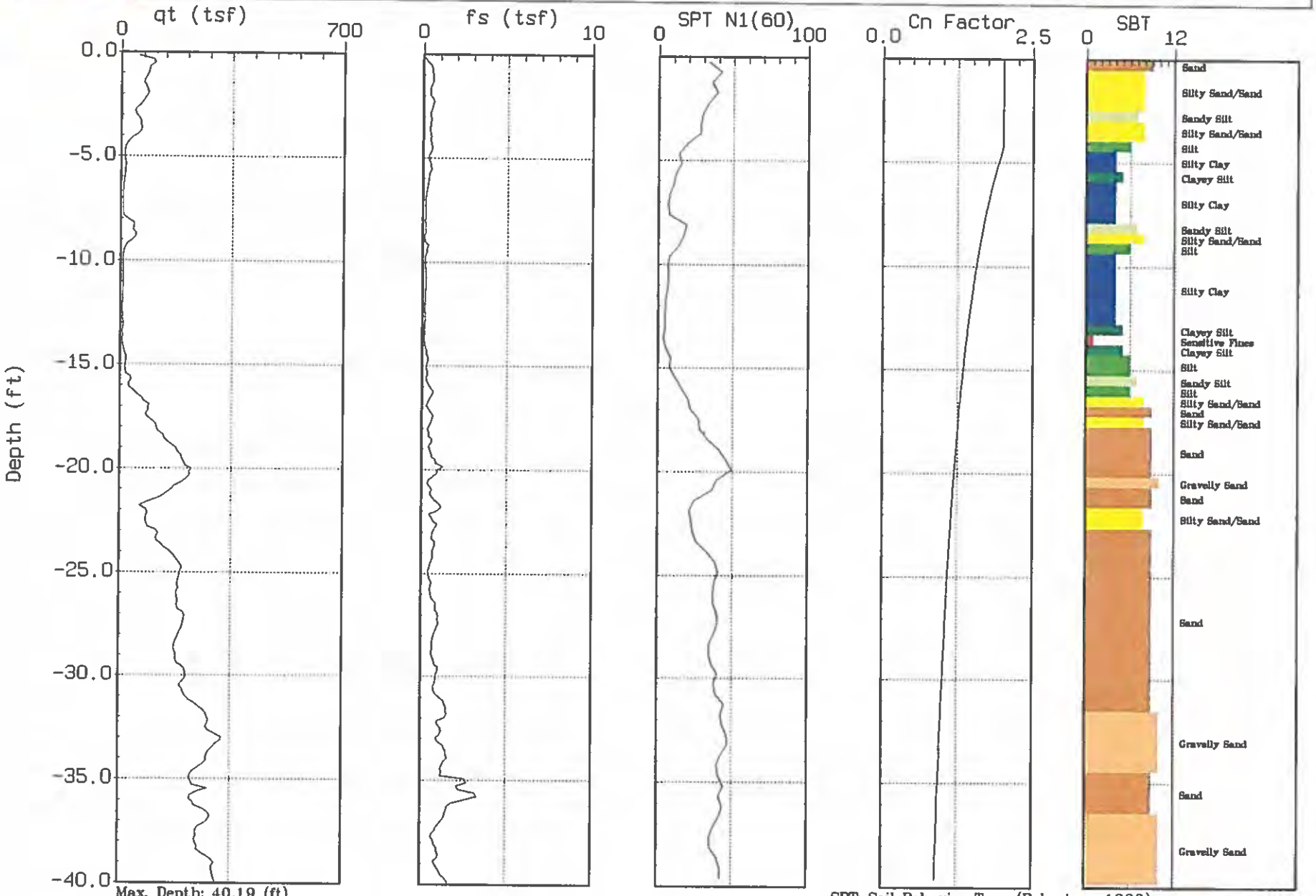
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-02

Oversite: B. BUSCH
Date: 08:16:04 15:27



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

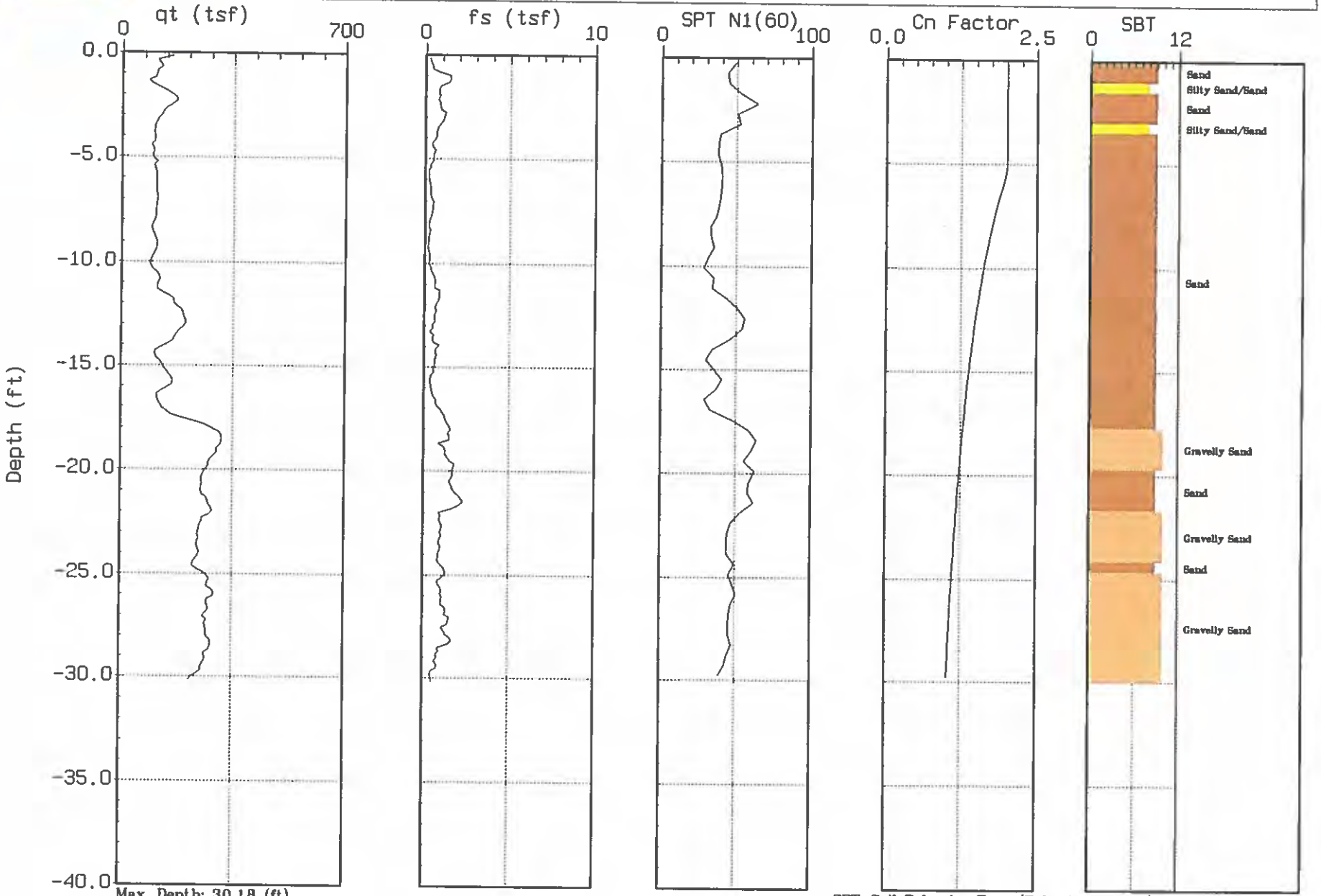
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-03

Oversite: B. BUSCH
Date: 08:16:04 16:08



Max. Depth: 30.18 (ft)
Depth Inc.: 0.164 (ft)

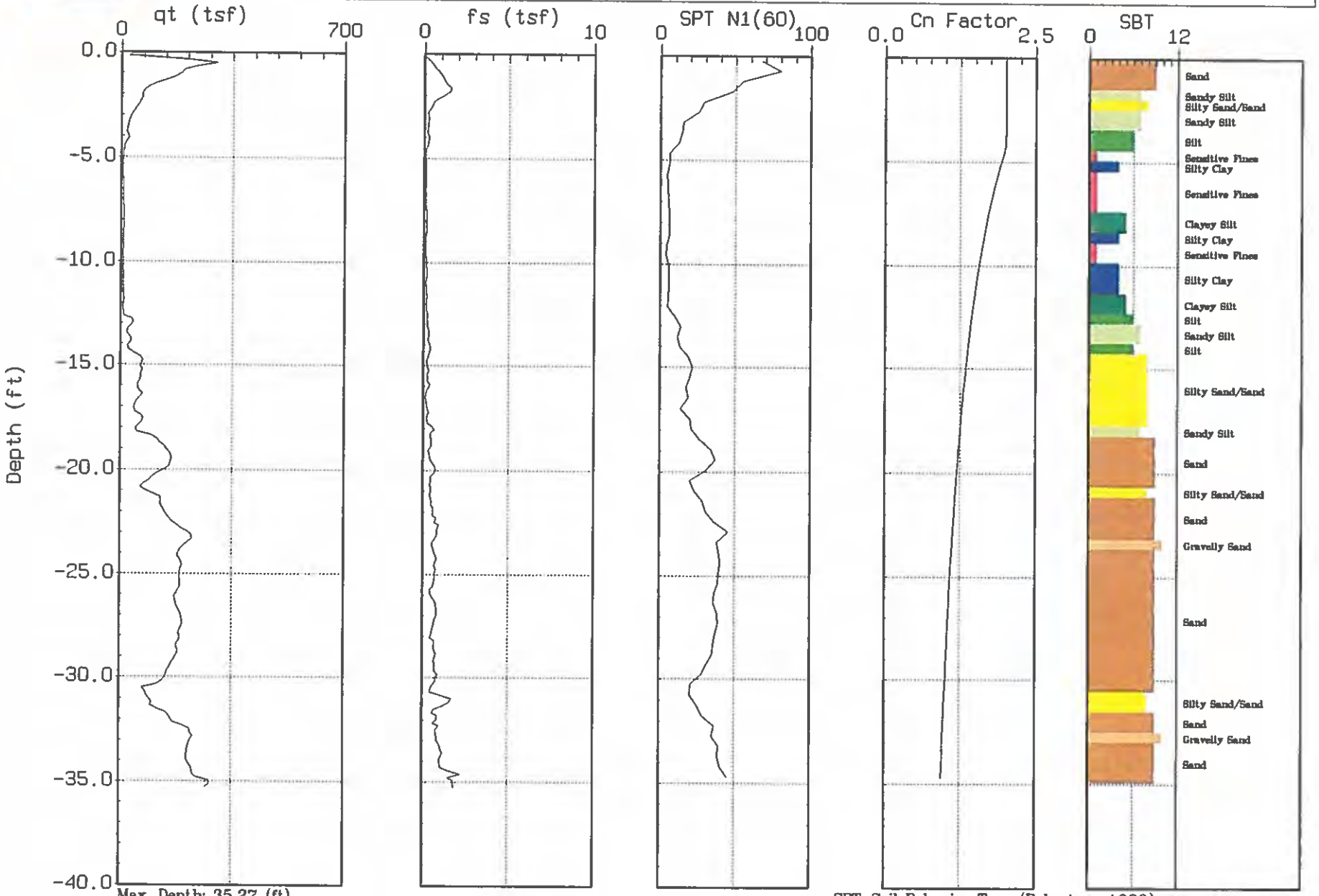
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-04

Oversite: B. DUSSELL
Date: 08:16:04 17:11



Max. Depth: 35.27 (ft)
Depth Inc.: 0.164 (ft)

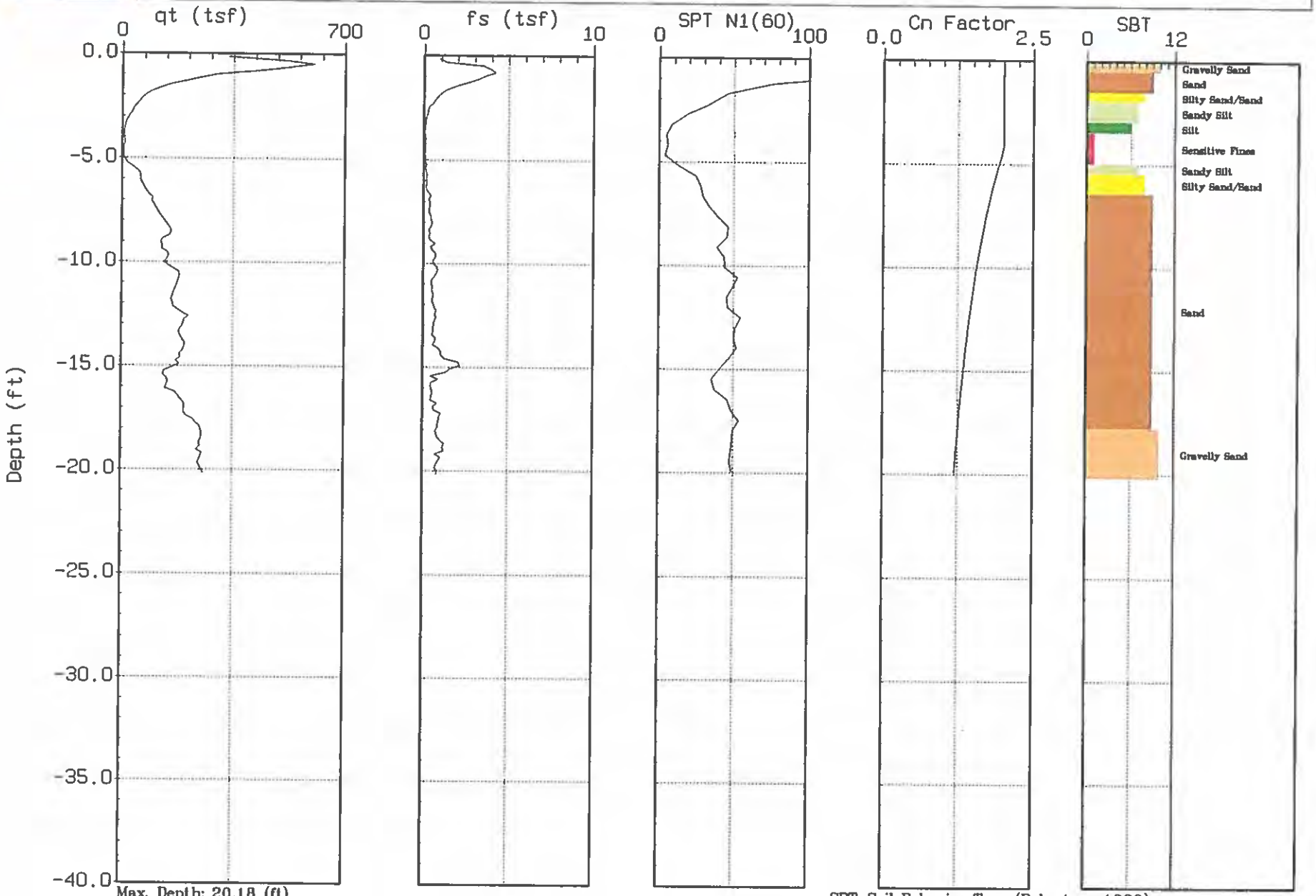
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-05

Oversite: B. DUSSELL
Date: 08:16:04 17:52



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

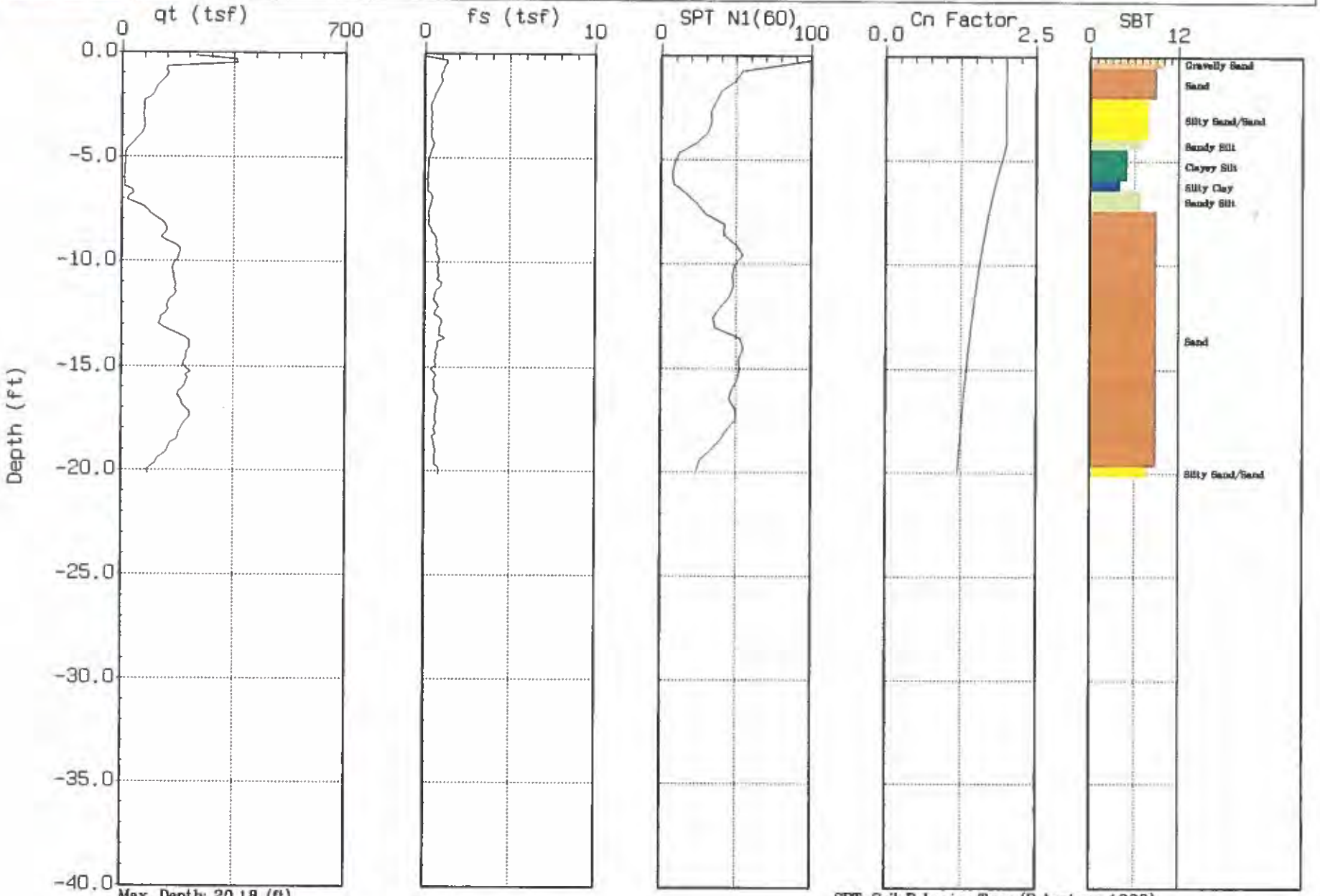
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-06

Oversite: B. DUSSELL
Date: 08:16:04 18:18



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

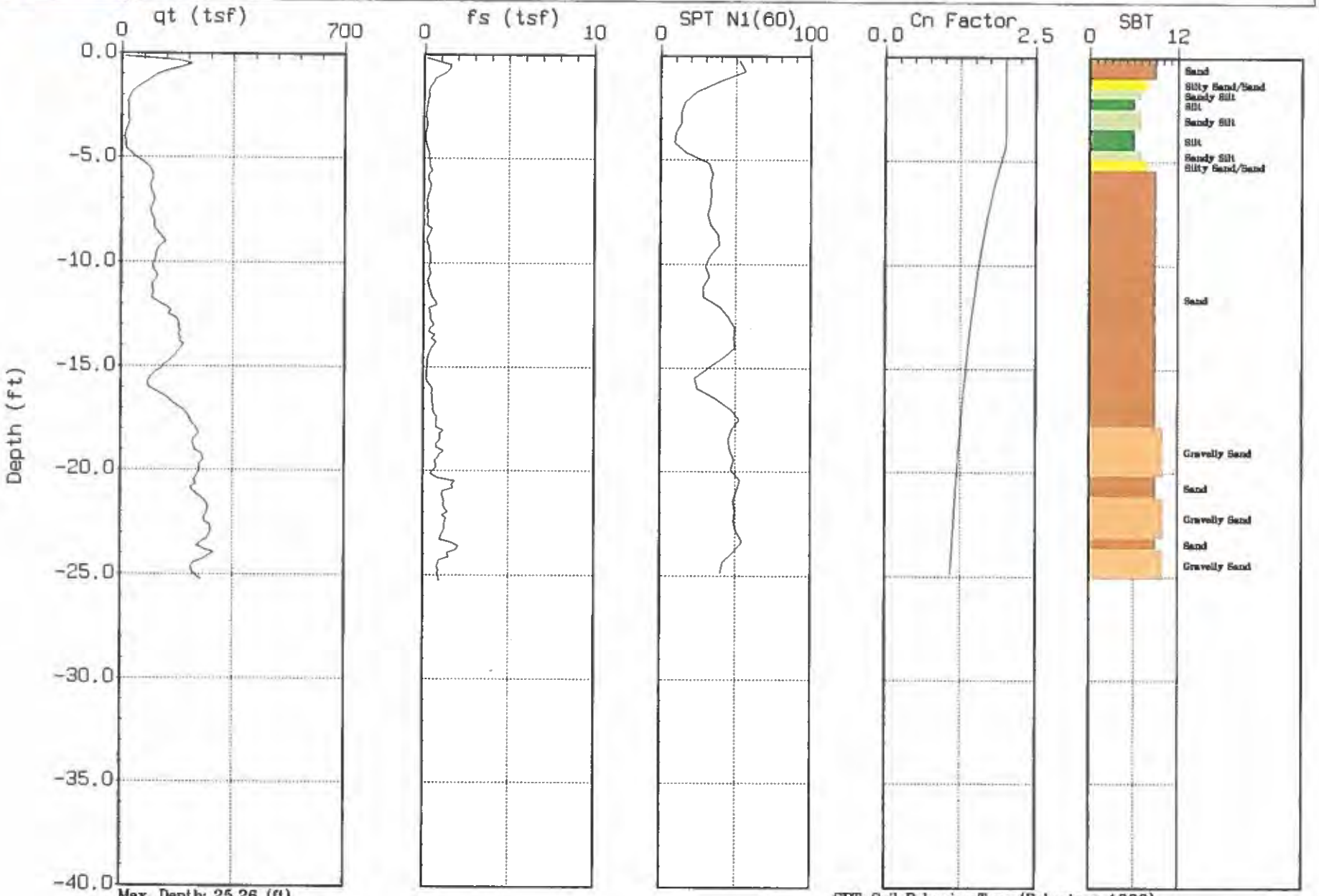
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-07

Oversite: B. DUSSELL
Date: 08:17:04 08:19



Max. Depth: 25.26 (ft)
Depth Inc.: 0.164 (ft)

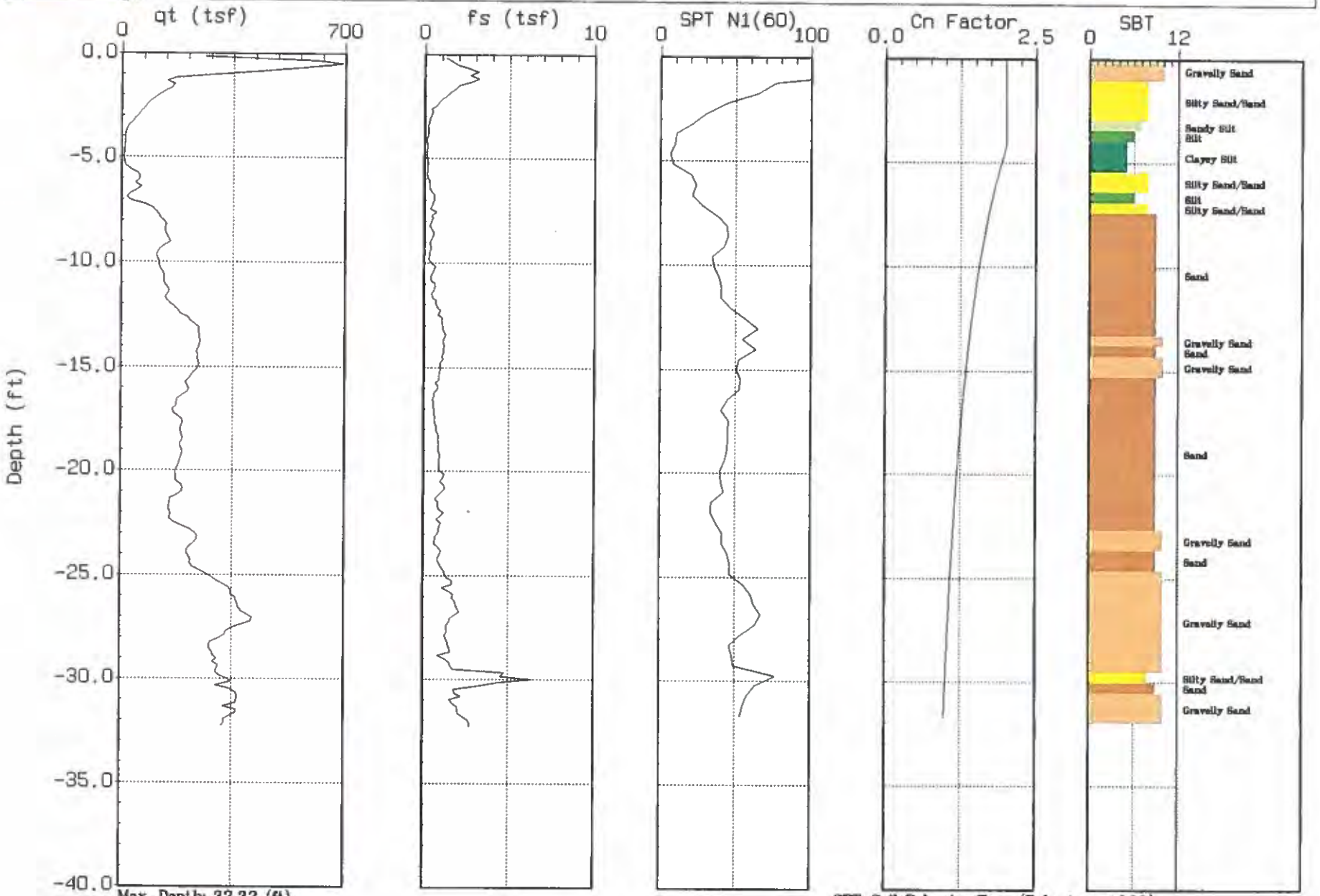
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-08

Oversite: B. DUSSELL
Date: 08:17:04 08:47



Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)

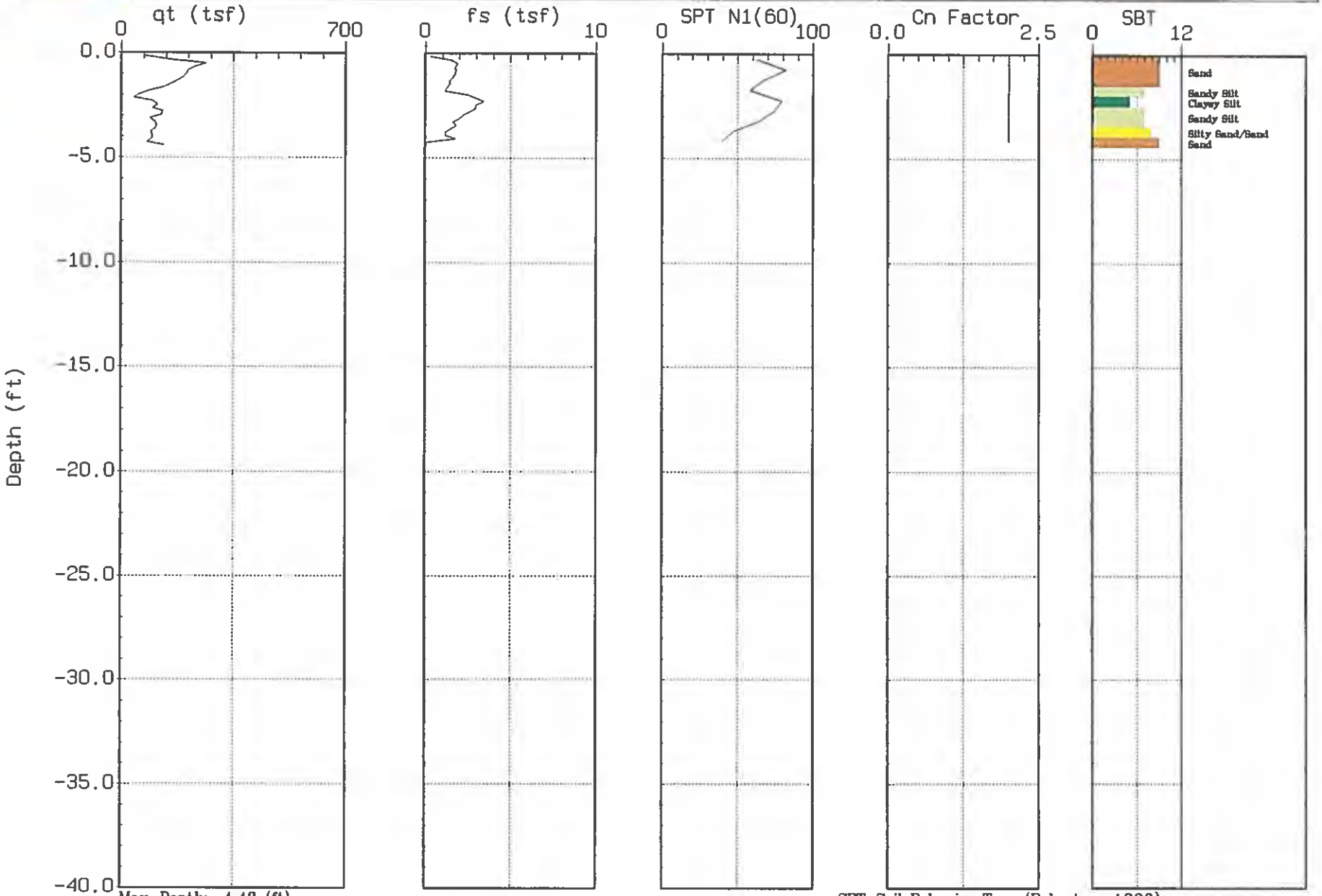
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-09

Oversite: B. DUSSELL
Date: 08:17:04 09:17



Max. Depth: 4.43 (ft)
Depth Inc.: 0.164 (ft)

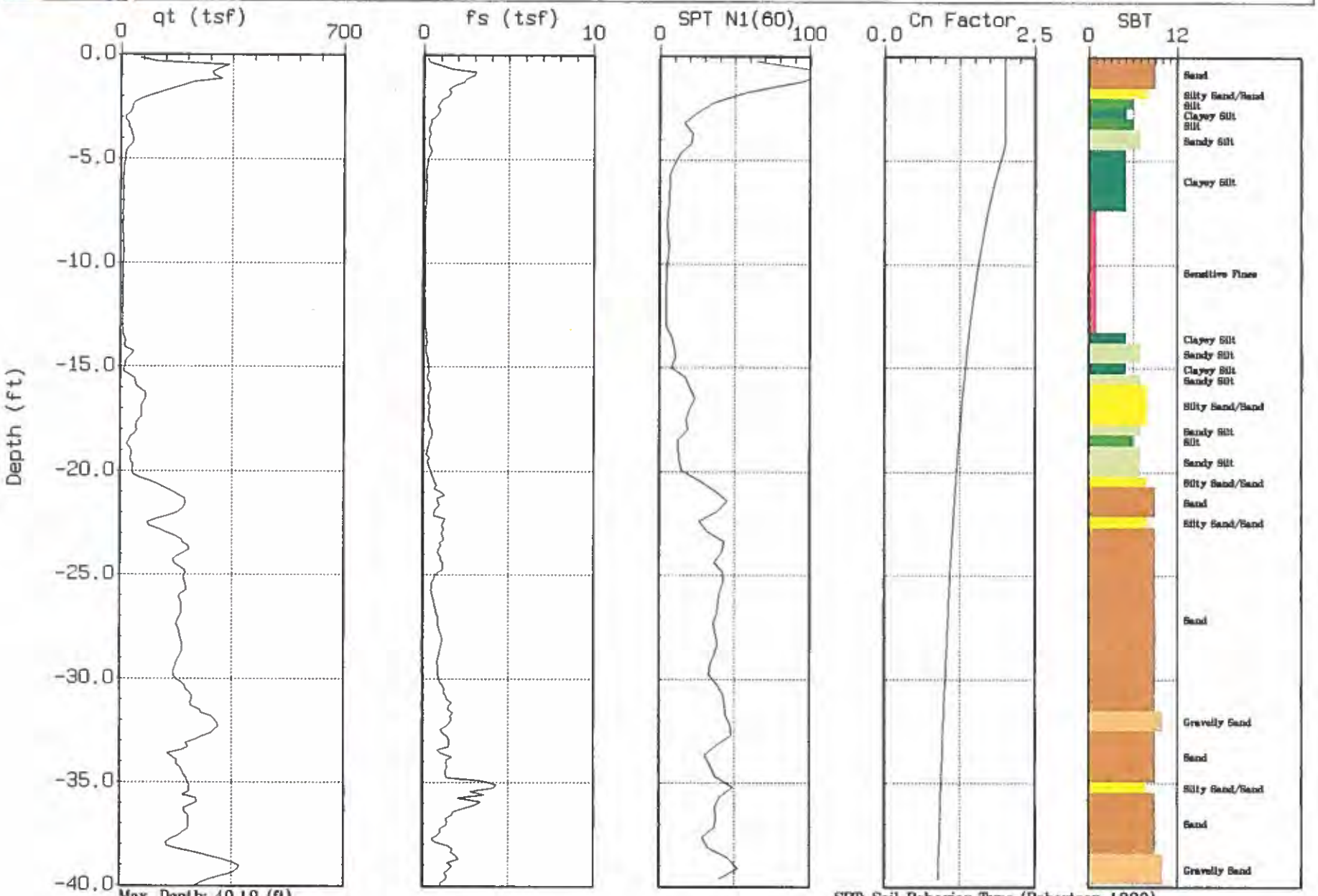
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-09a

Oversite: B. DUSSELL
Date: 08:17:04 11:16



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

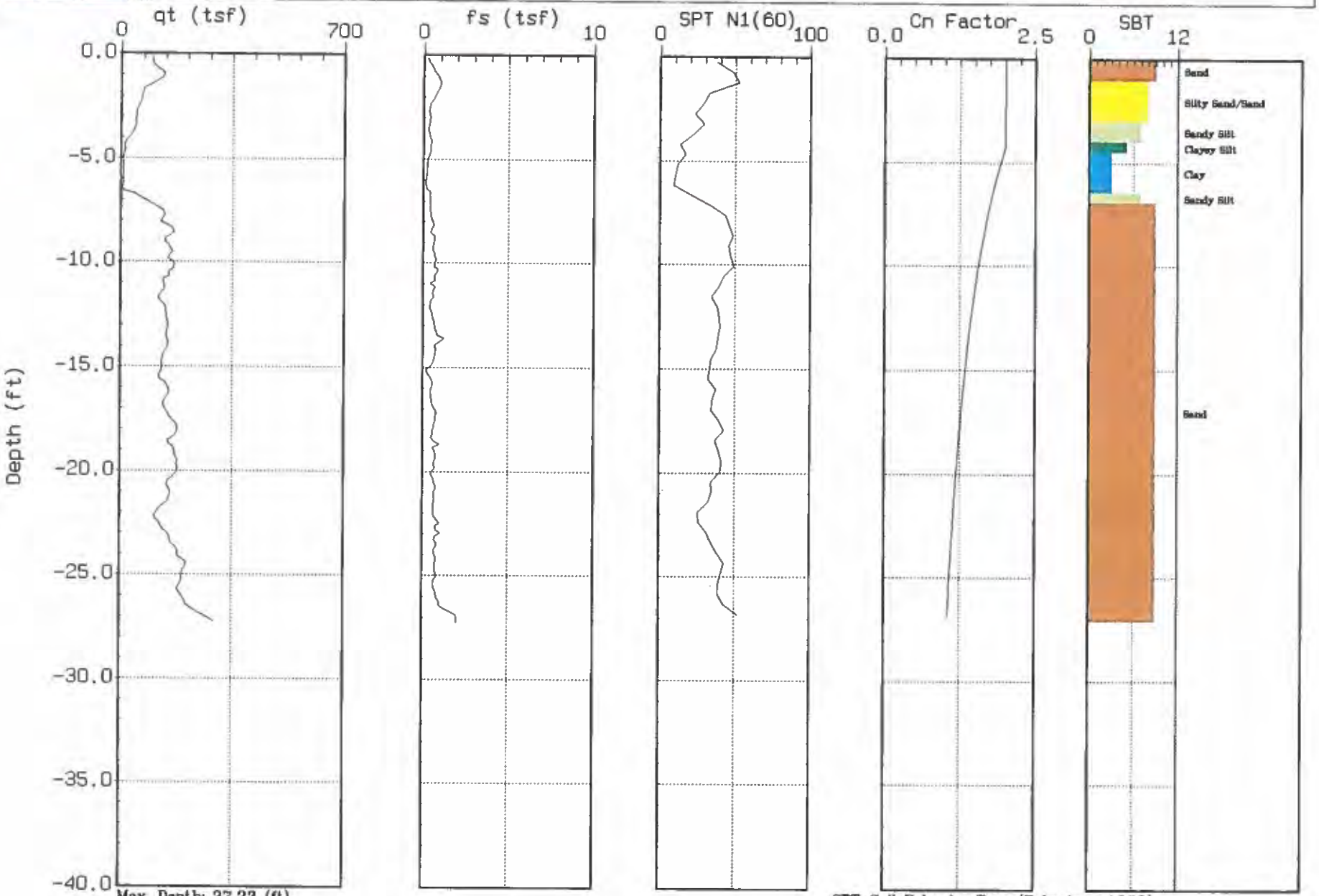
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-10

Oversite: B. DUSSELL
Date: 08:17:04 11:48



Max. Depth: 27.23 (ft)
Depth Inc.: 0.164 (ft)

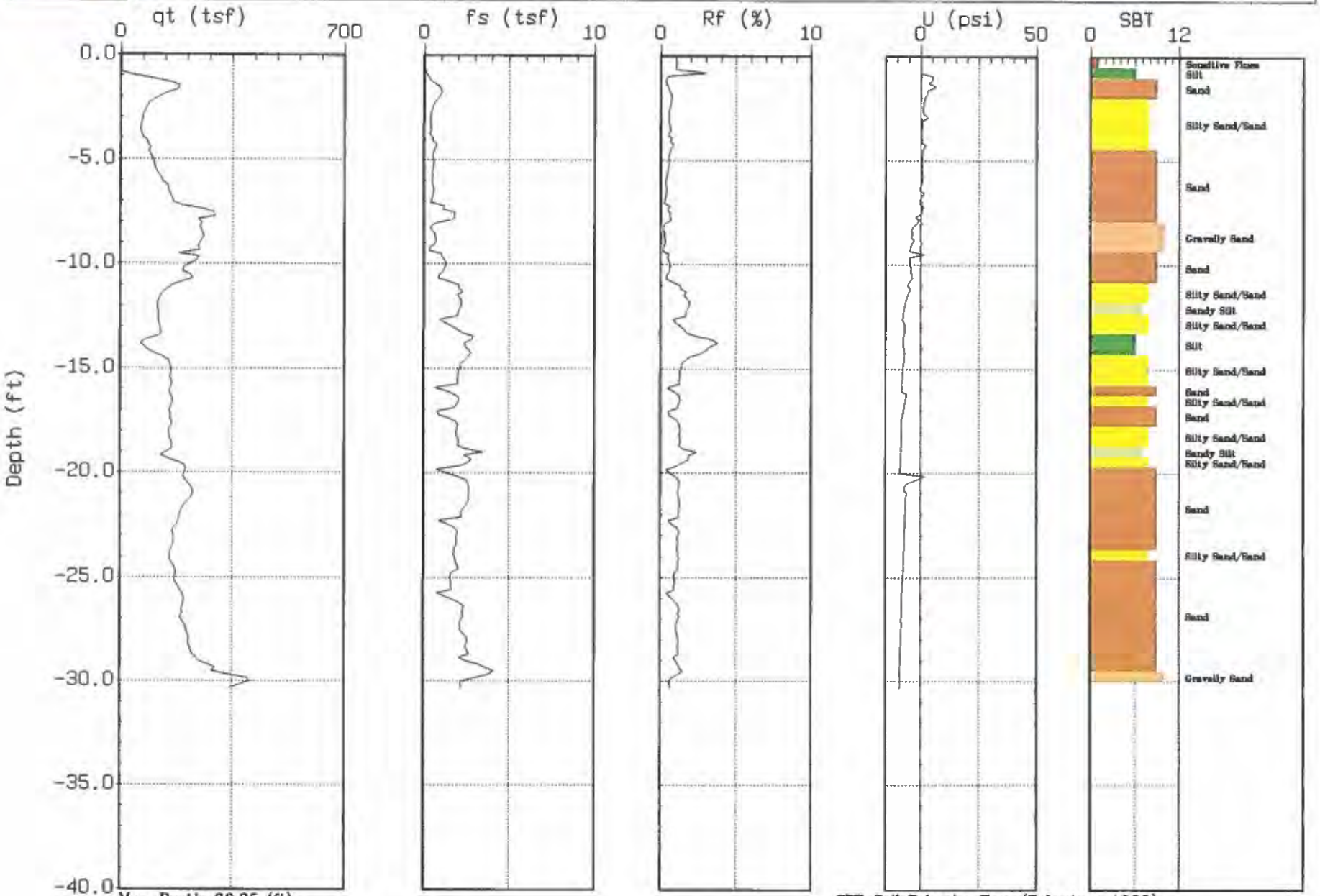
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-01

Oversite: B. BUSCH
Date: 08:16:04 14:31



Max. Depth: 30.35 (ft)
Depth Inc.: 0.164 (ft)

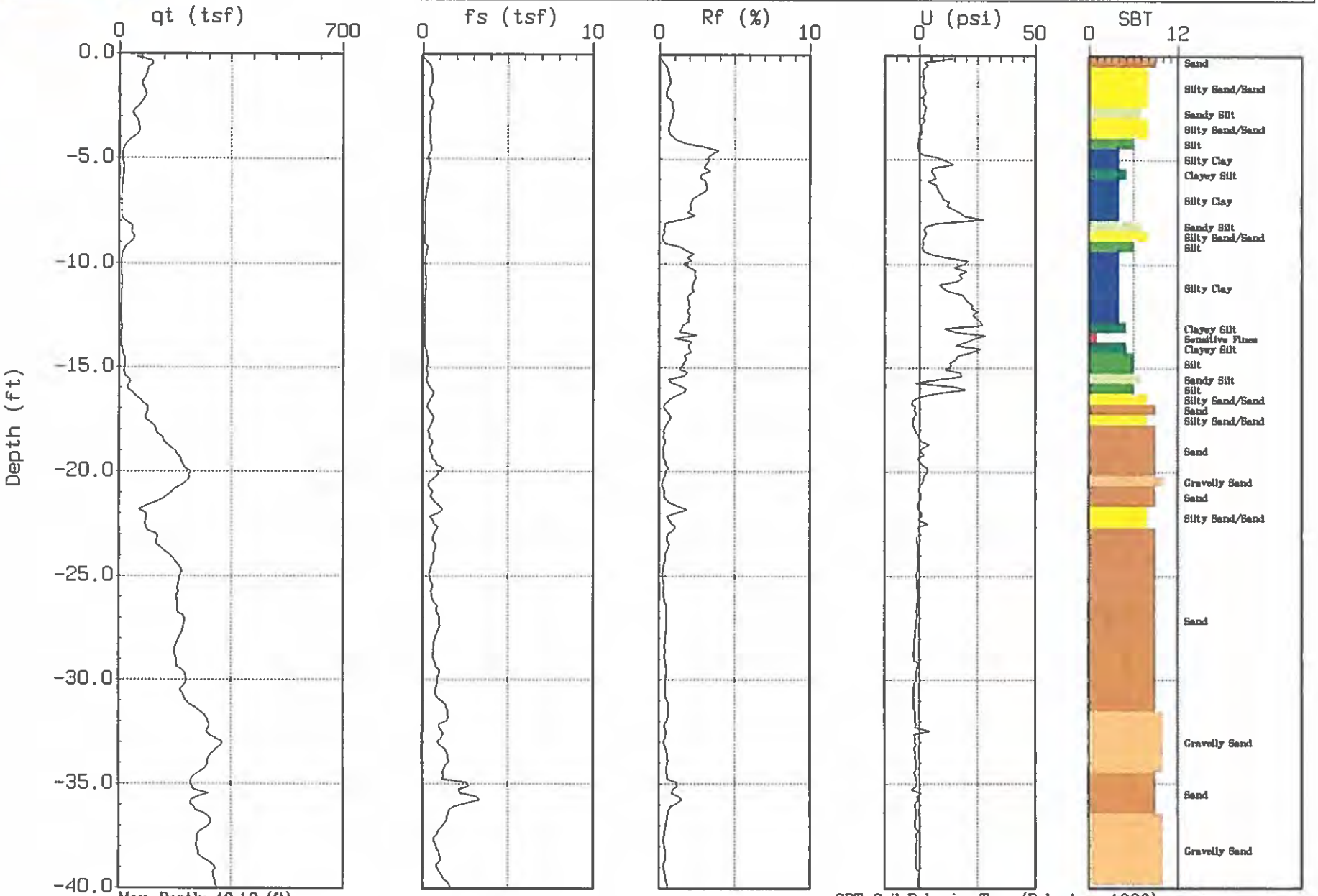
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-02

Oversite: B. BUSCH
Date: 08:16:04 15:27



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

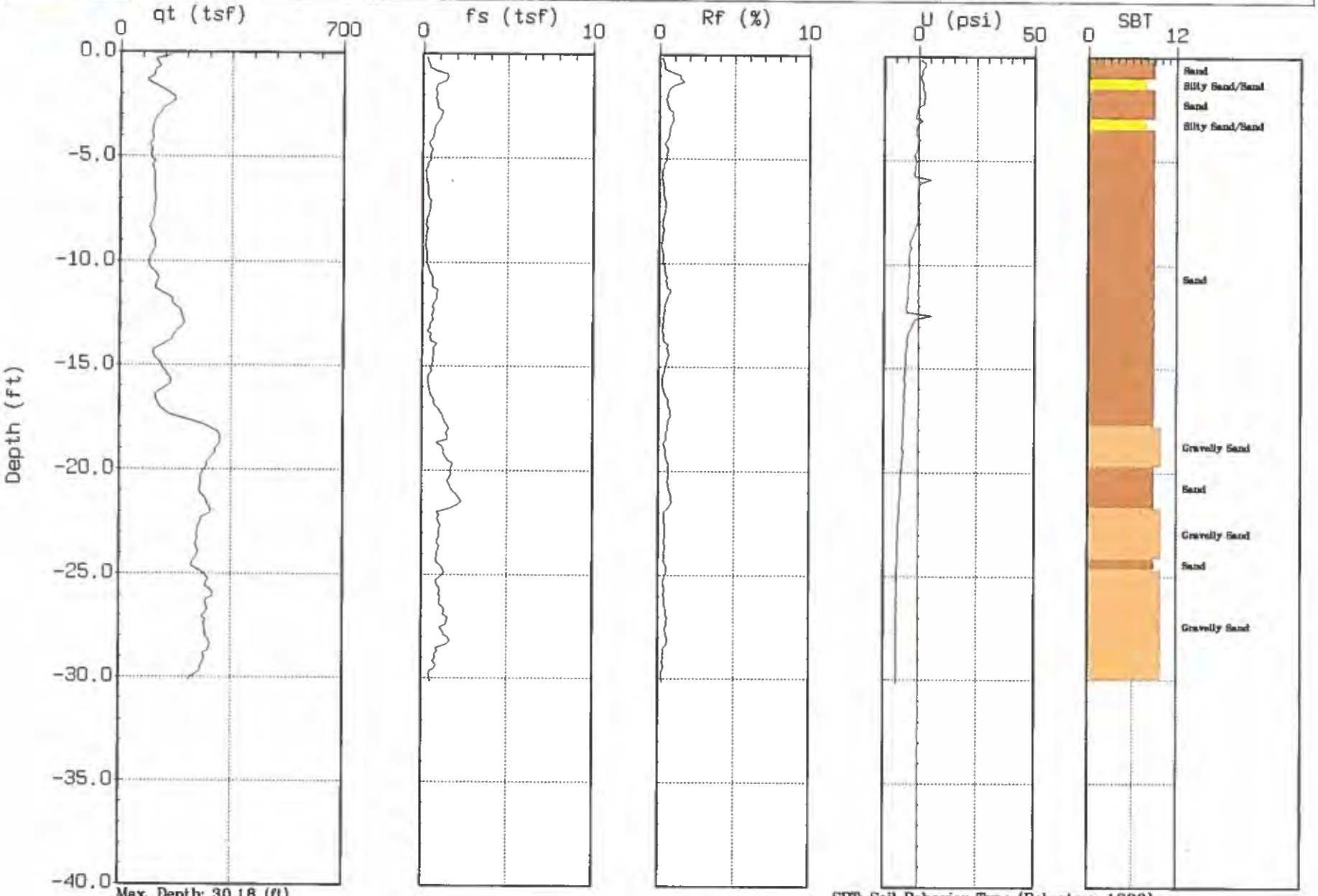
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-03

Oversite: B. BUSCH
Date: 08:16:04 16:08



Max. Depth: 30.18 (ft)
Depth Inc.: 0.164 (ft)

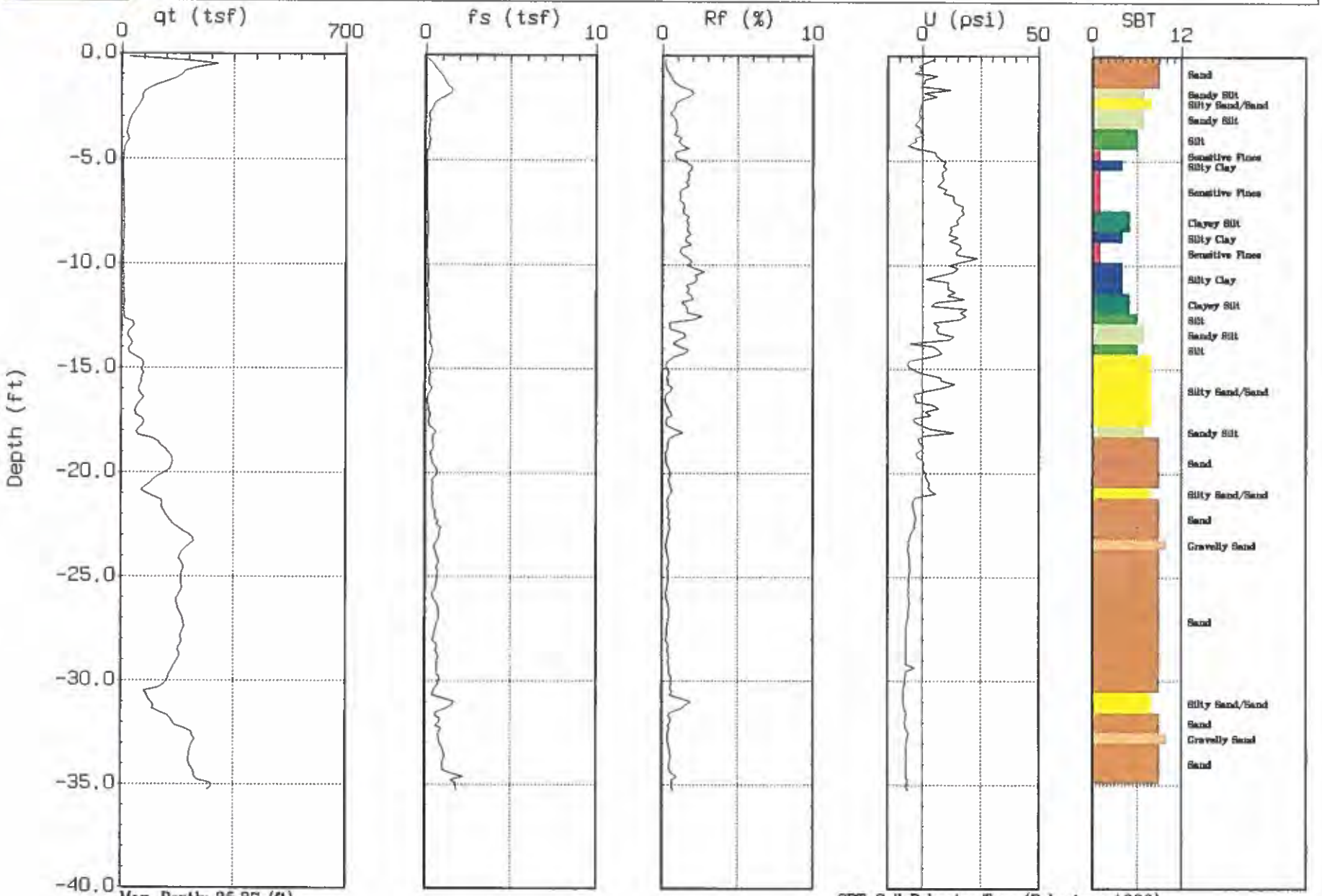
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-04

Oversite: B. DUSSELL
Date: 08:16:04 17:11



Max. Depth: 35.27 (ft)
Depth Inc.: 0.164 (ft)

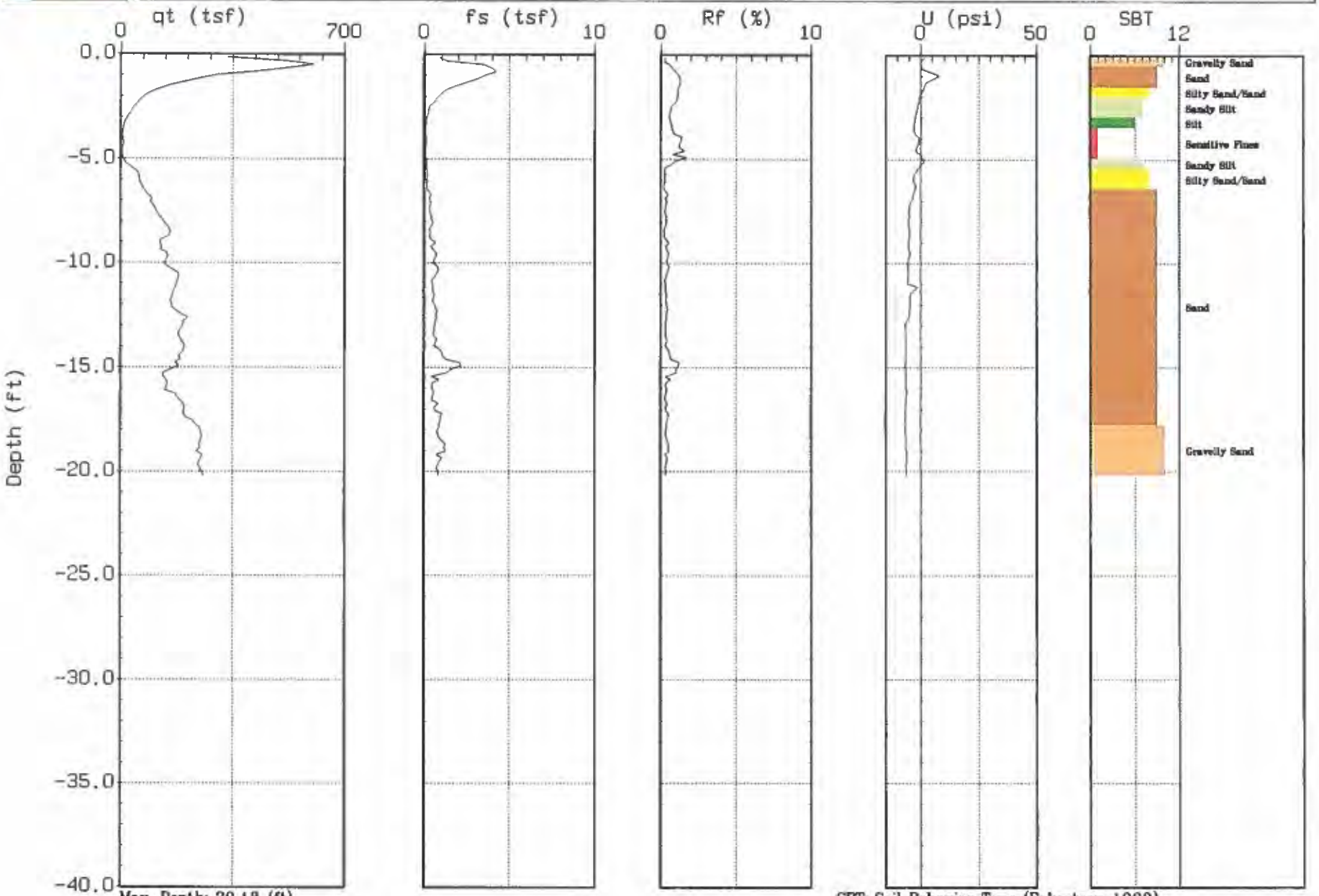
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-05

Oversite: B. DUSSELL
Date: 08:16:04 17:52



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

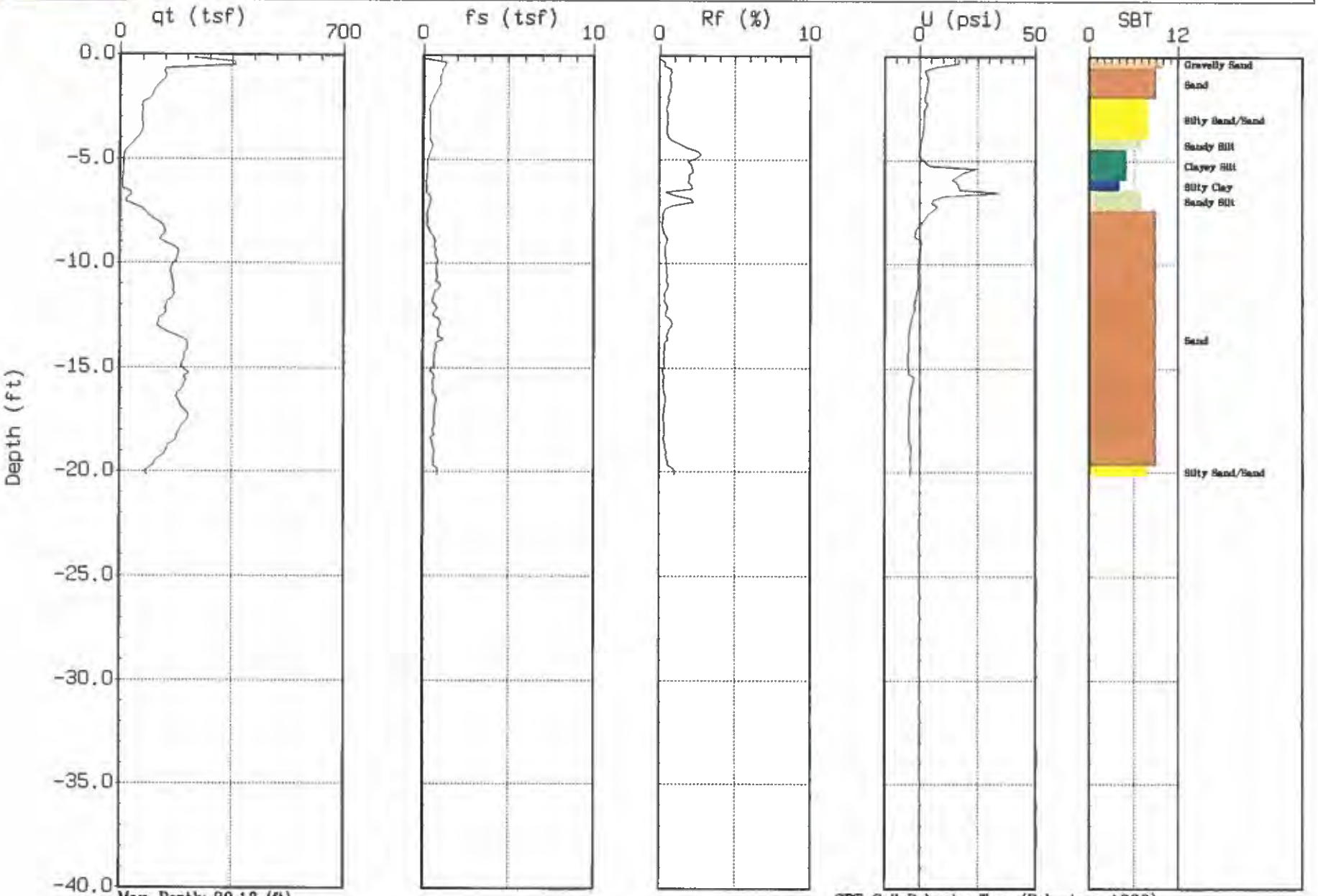
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-06

Oversite: B. DUSSELL
Date: 08:16:04 18:18



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

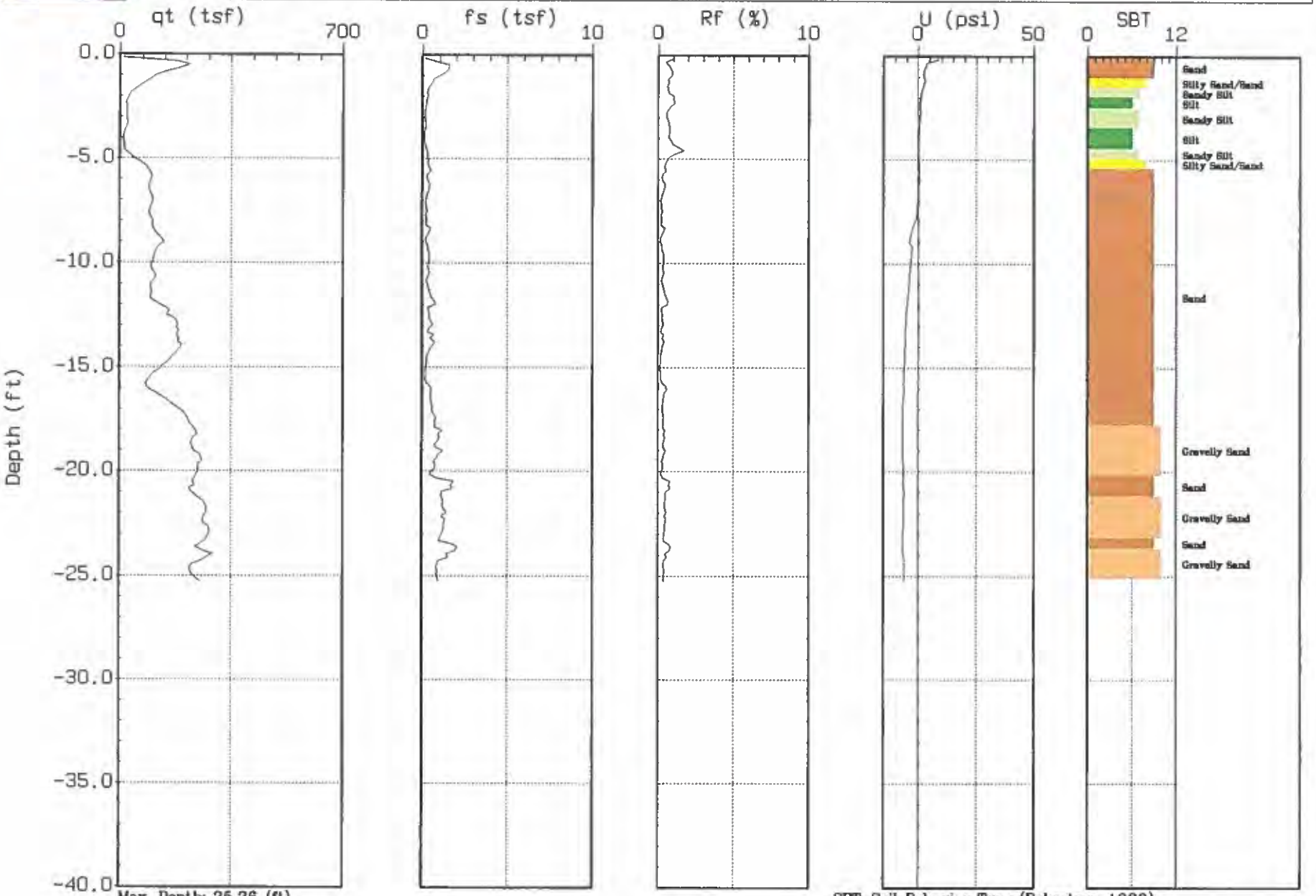
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-07

Oversite: B. DUSSELL
Date: 08:17:04 08:19



Max. Depth: 25.26 (ft)
Depth Inc.: 0.164 (ft)

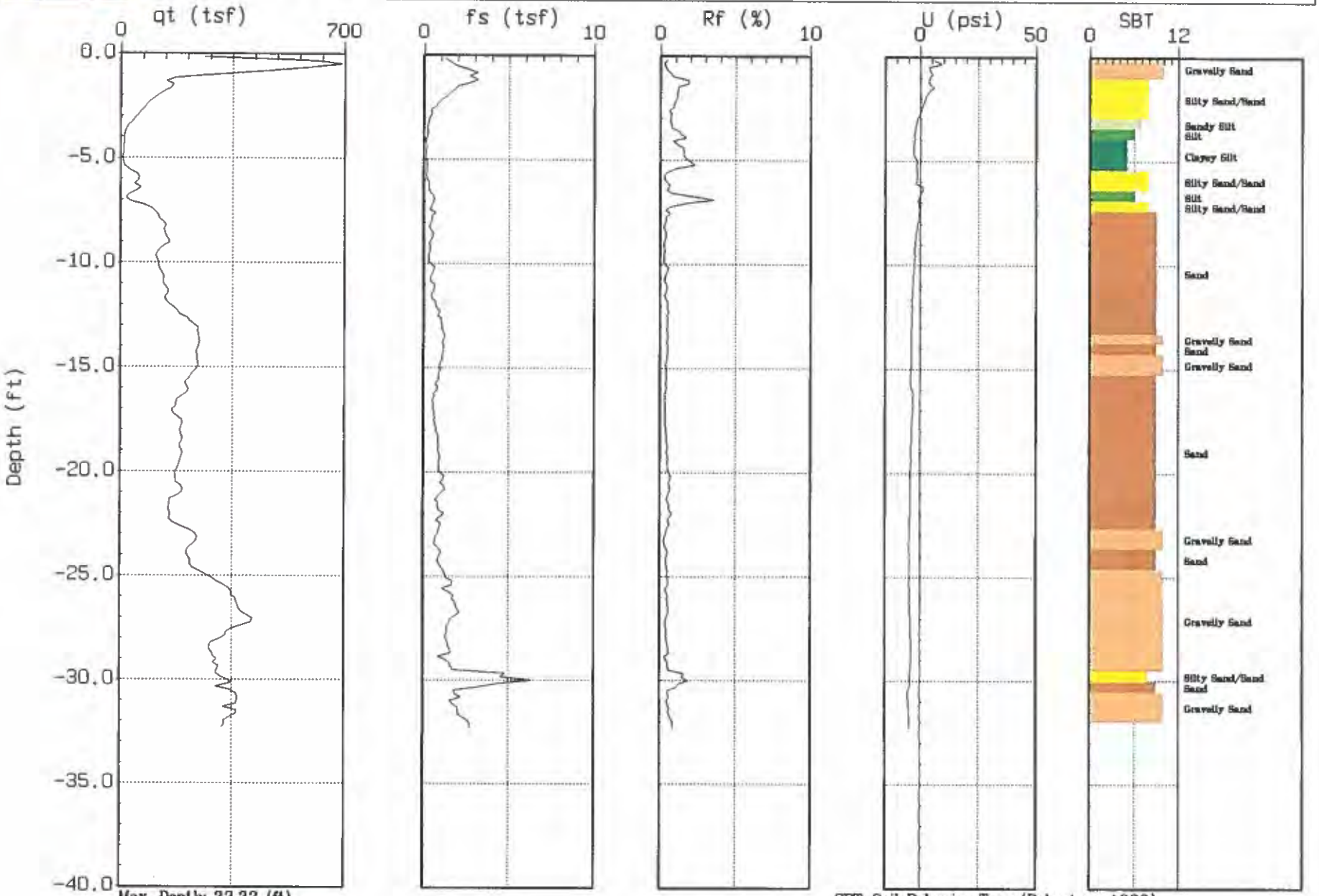
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-08

Oversite: B. DUSSELL
Date: 08:17:04 08:47



Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)

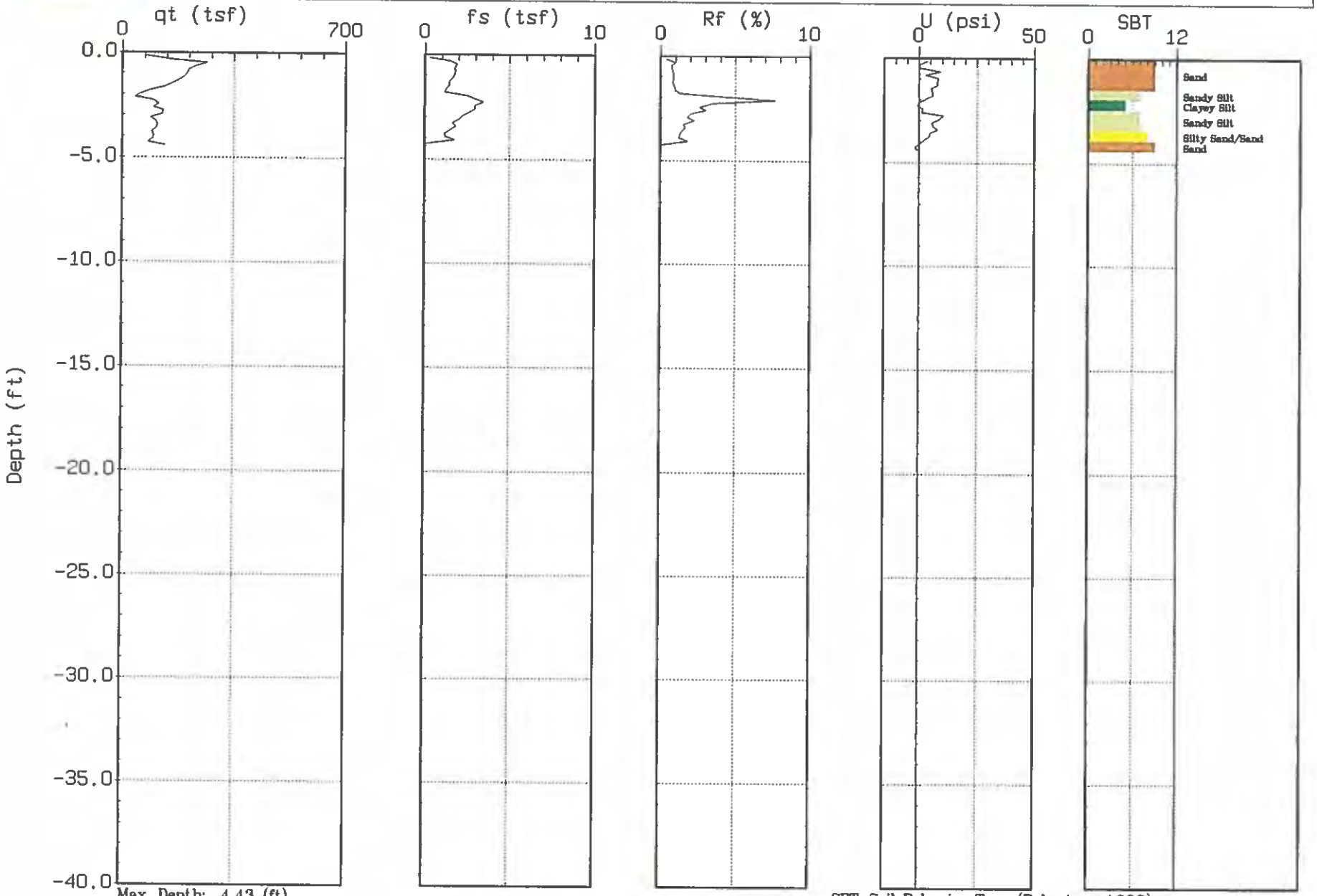
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-09

Oversite: B. DUSSELL
Date: 08:17:04 09:17



Max. Depth: 4.43 (ft)
Depth Inc.: 0.164 (ft)

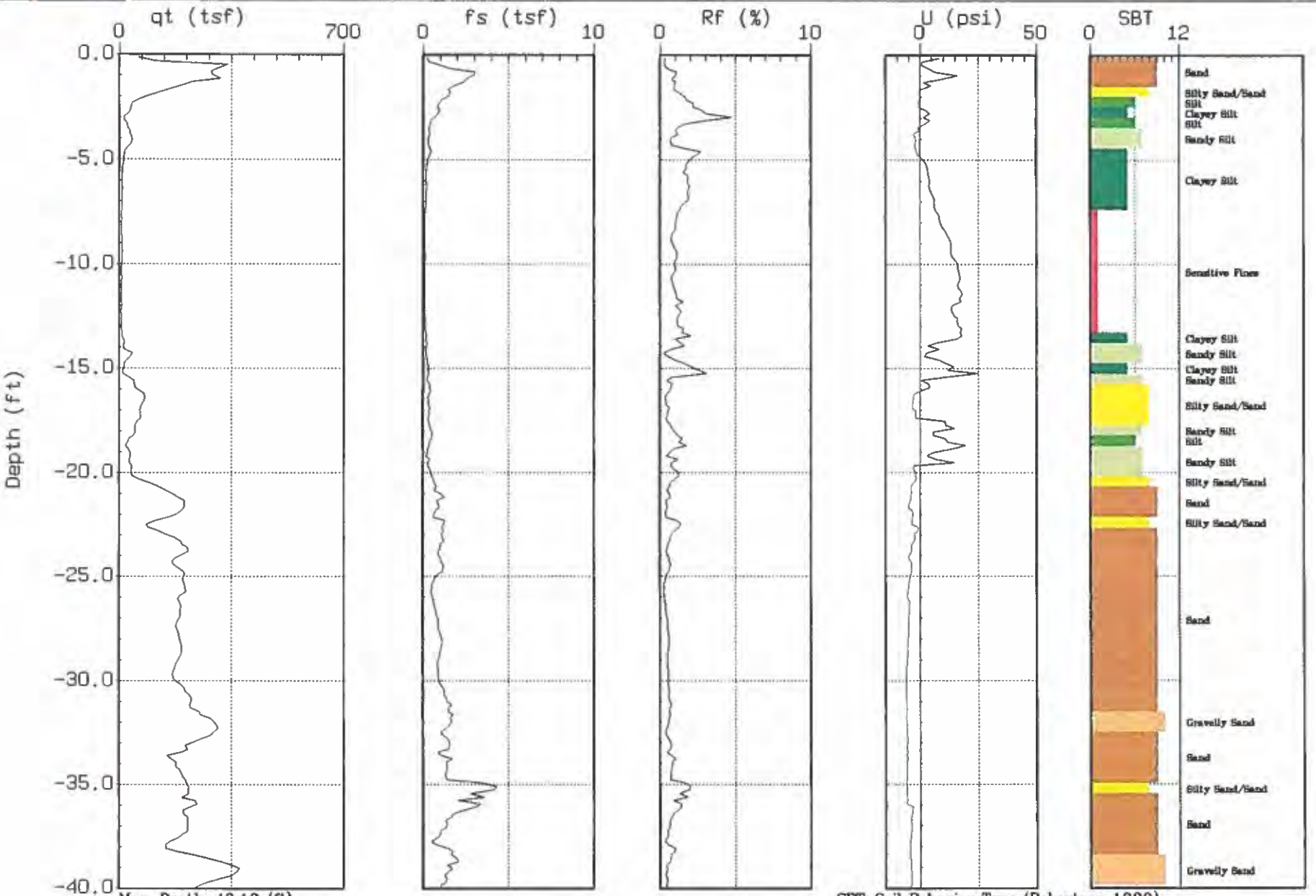
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-09a

Oversite: B. DUSSELL
Date: 08:17:04 11:16



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

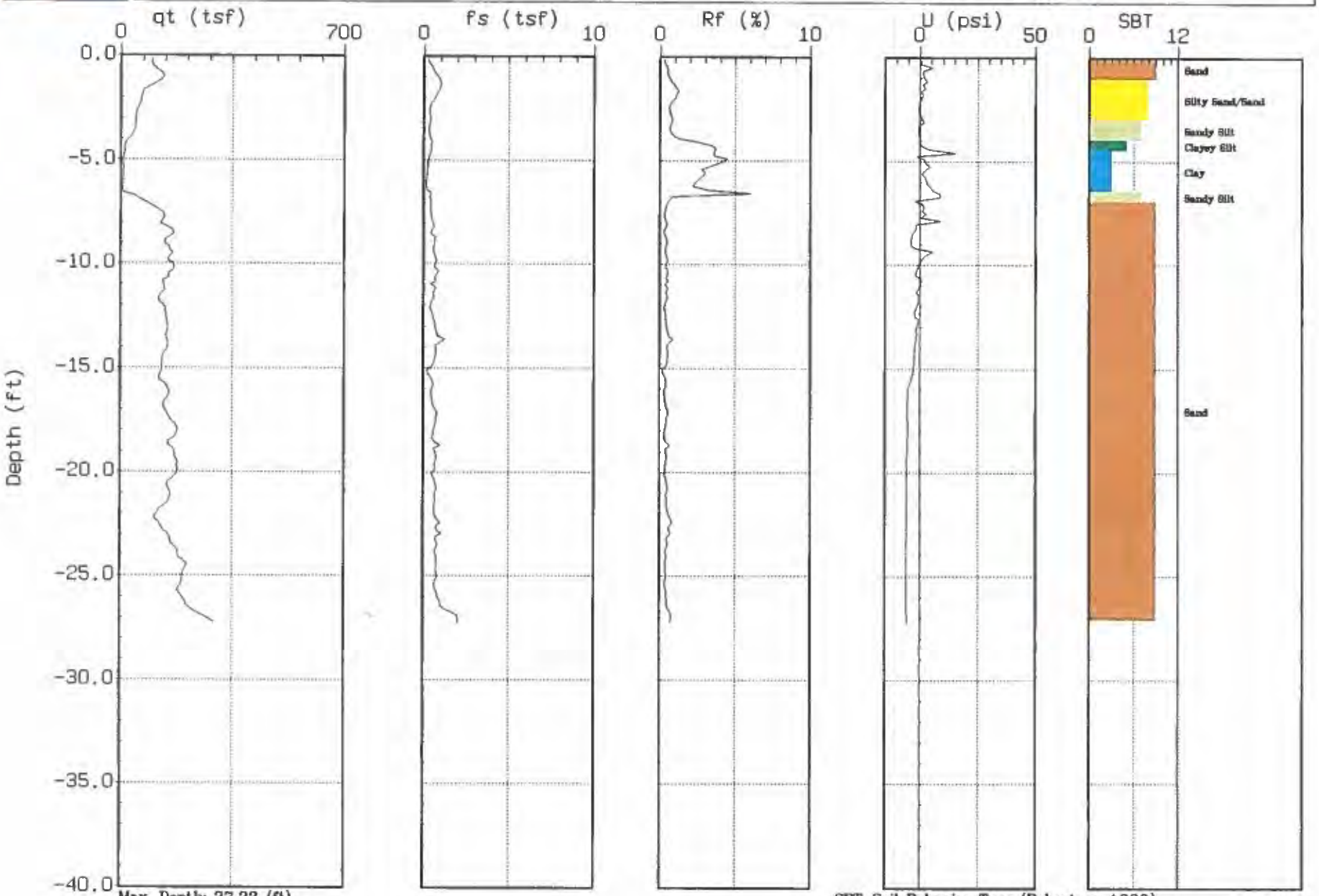
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-10

Oversite: B. DUSSELL
Date: 08:17:04 11:48



Max. Depth: 27.23 (ft)
Depth Inc.: 0.164 (ft)

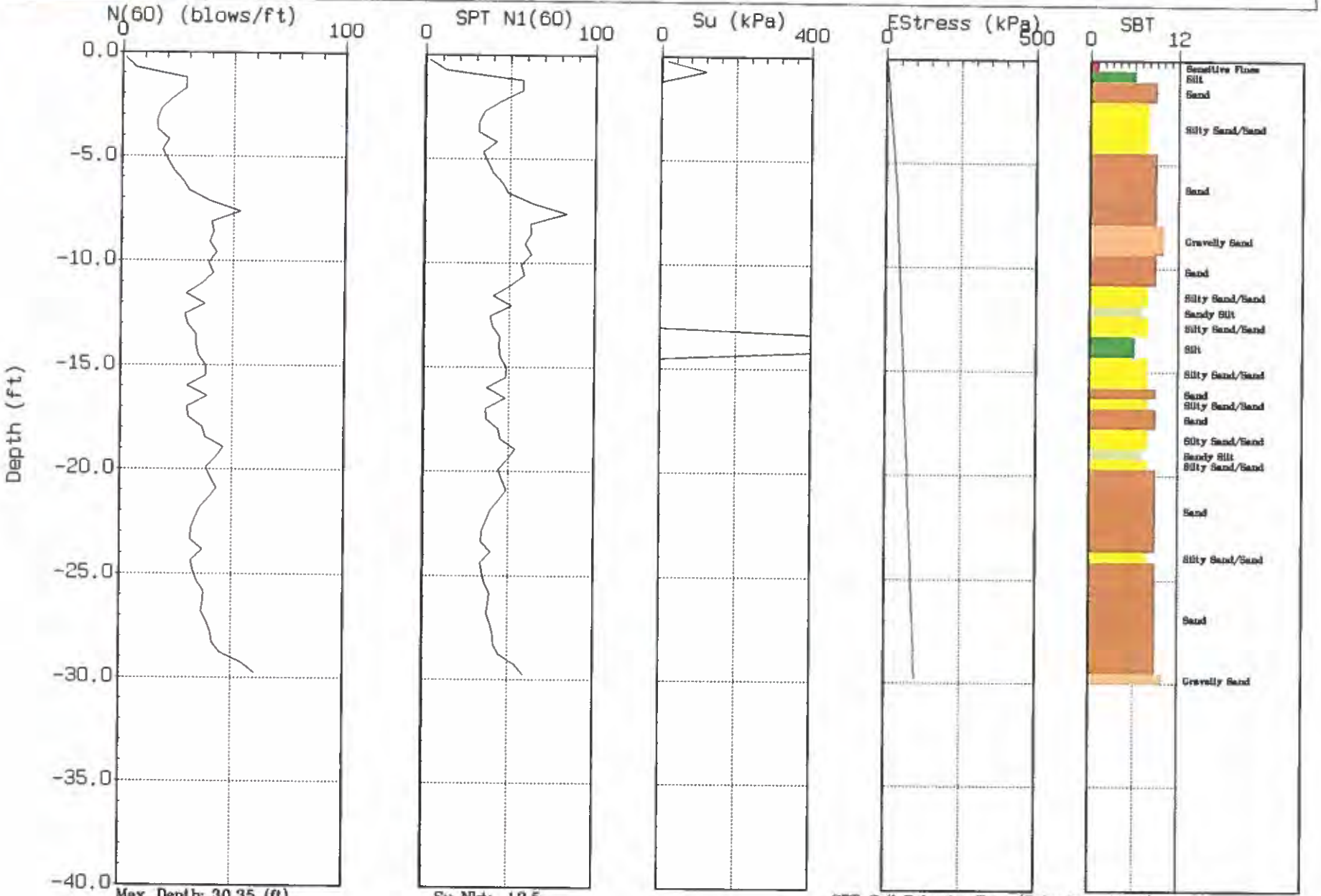
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-01

Oversite: B. BUSCH
Date: 08:16:04 14:31



Max. Depth: 30.35 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

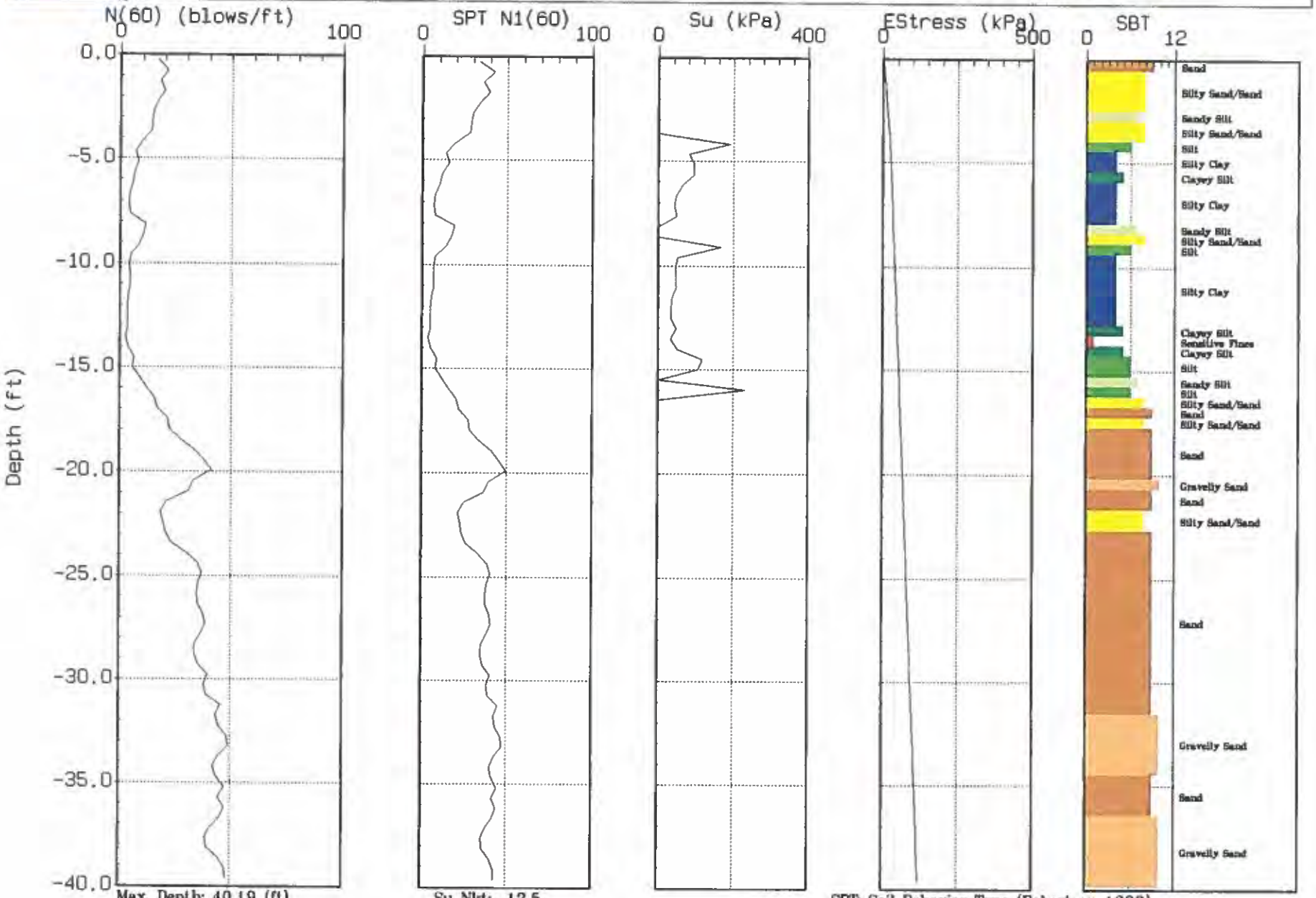
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-02

Oversite: B. BUSCH
Date: 08:16:04 15:27



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

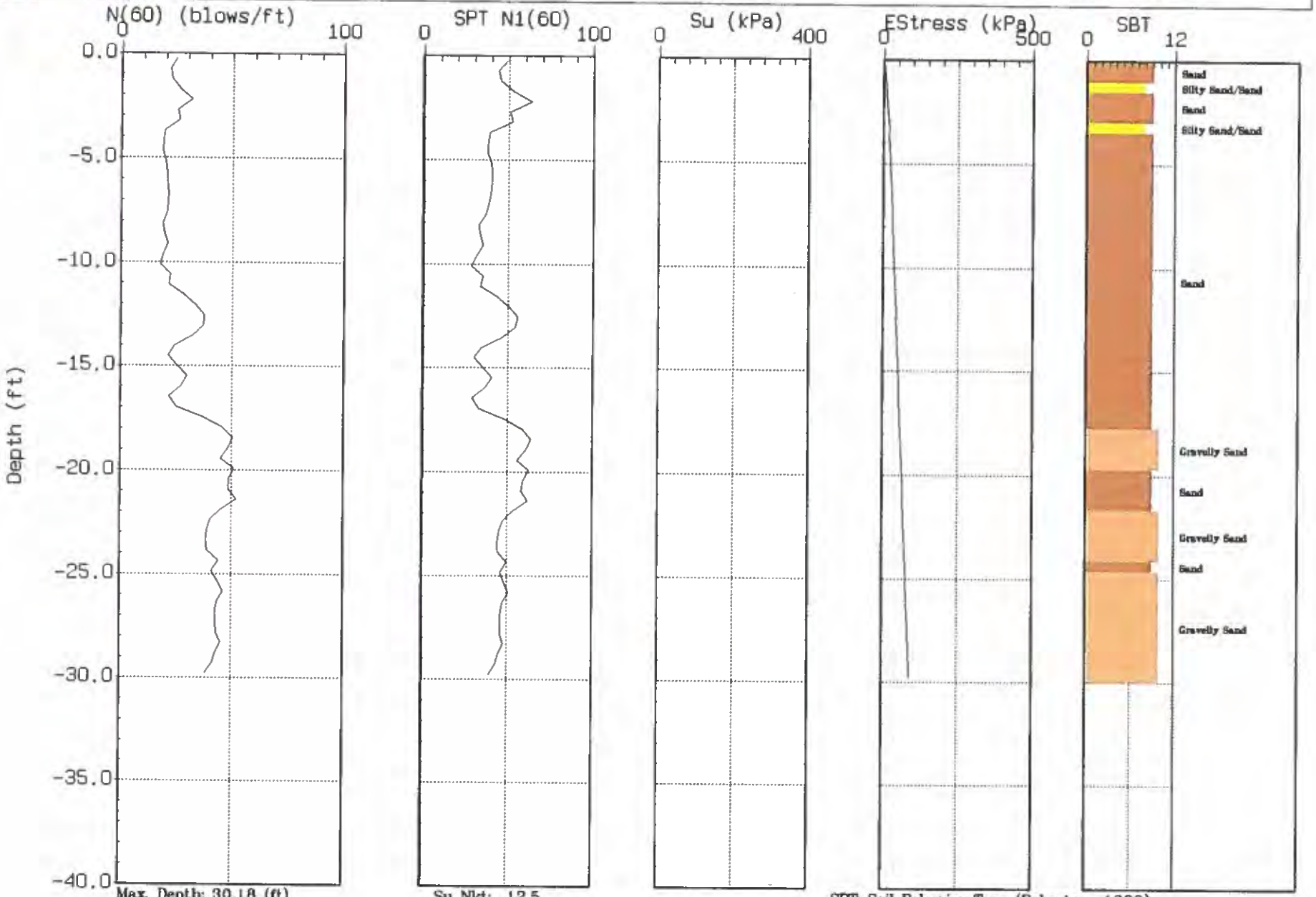
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-03

Oversite: B. BUSCH
Date: 08:16:04 16:08



Max. Depth: 30.18 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

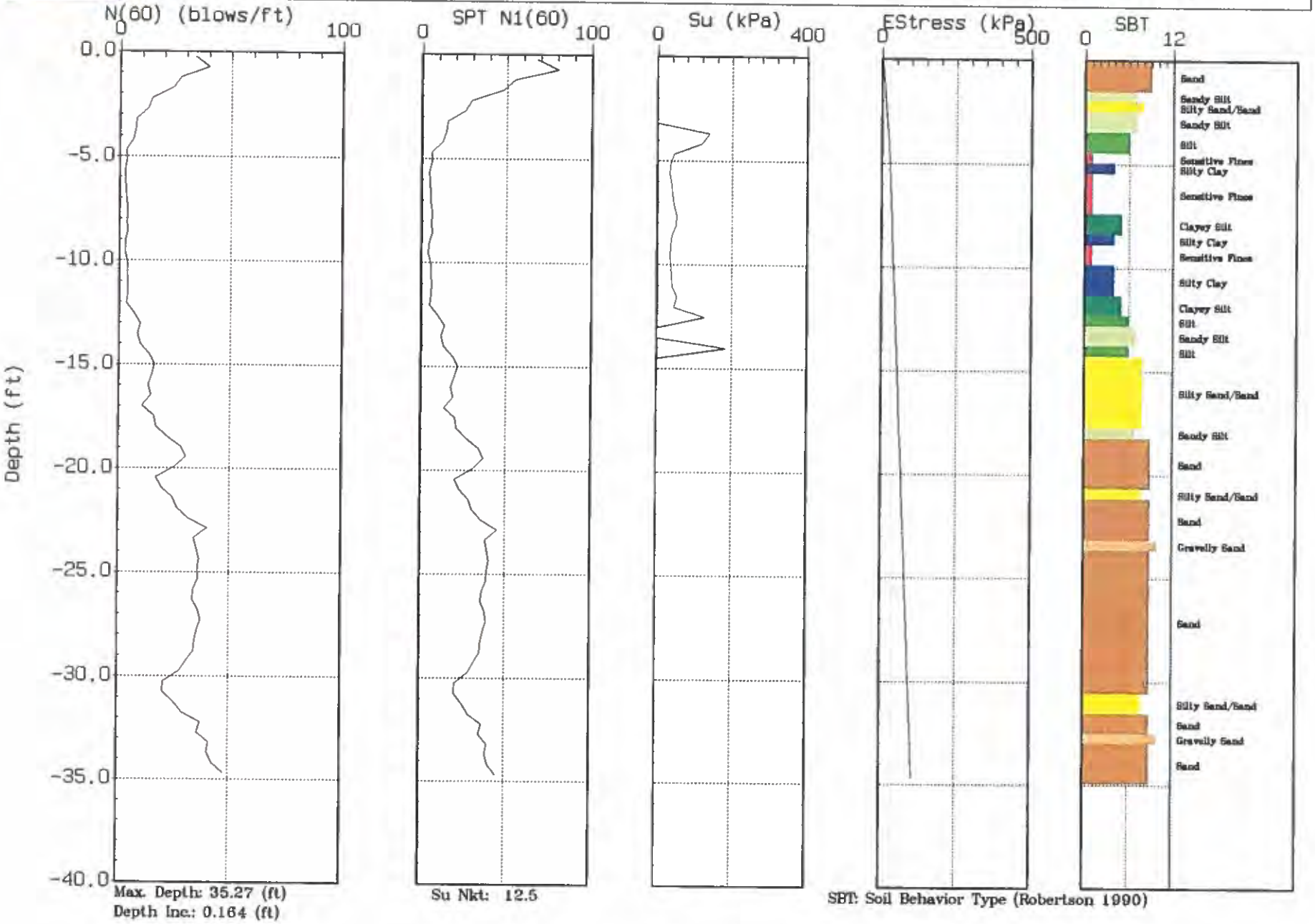
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-04

Oversite: B. DUSSELL
Date: 08:16:04 17:11



Max. Depth: 35.27 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

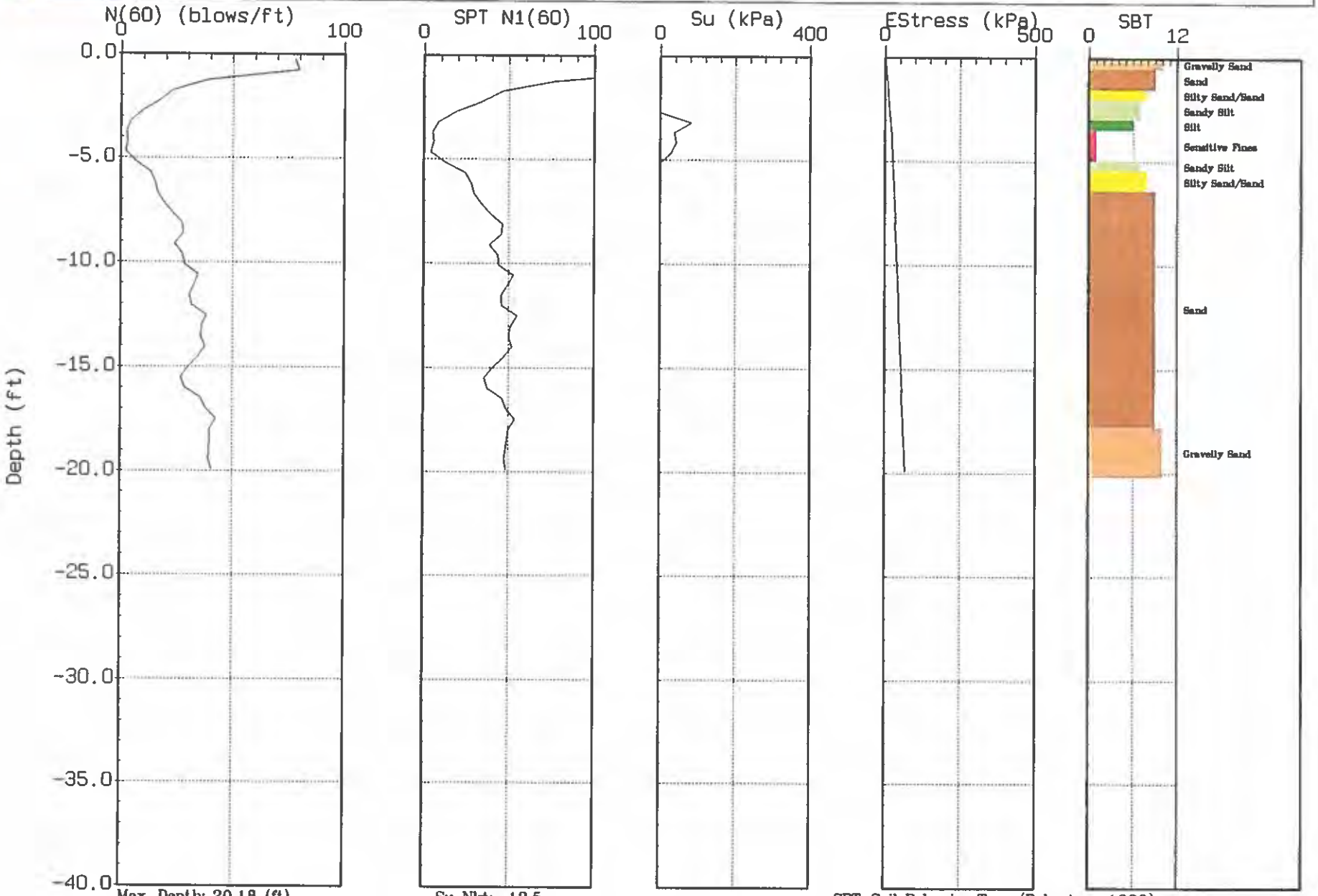
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-05

Oversite: B. DUSSELL
Date: 08:16:04 17:52



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

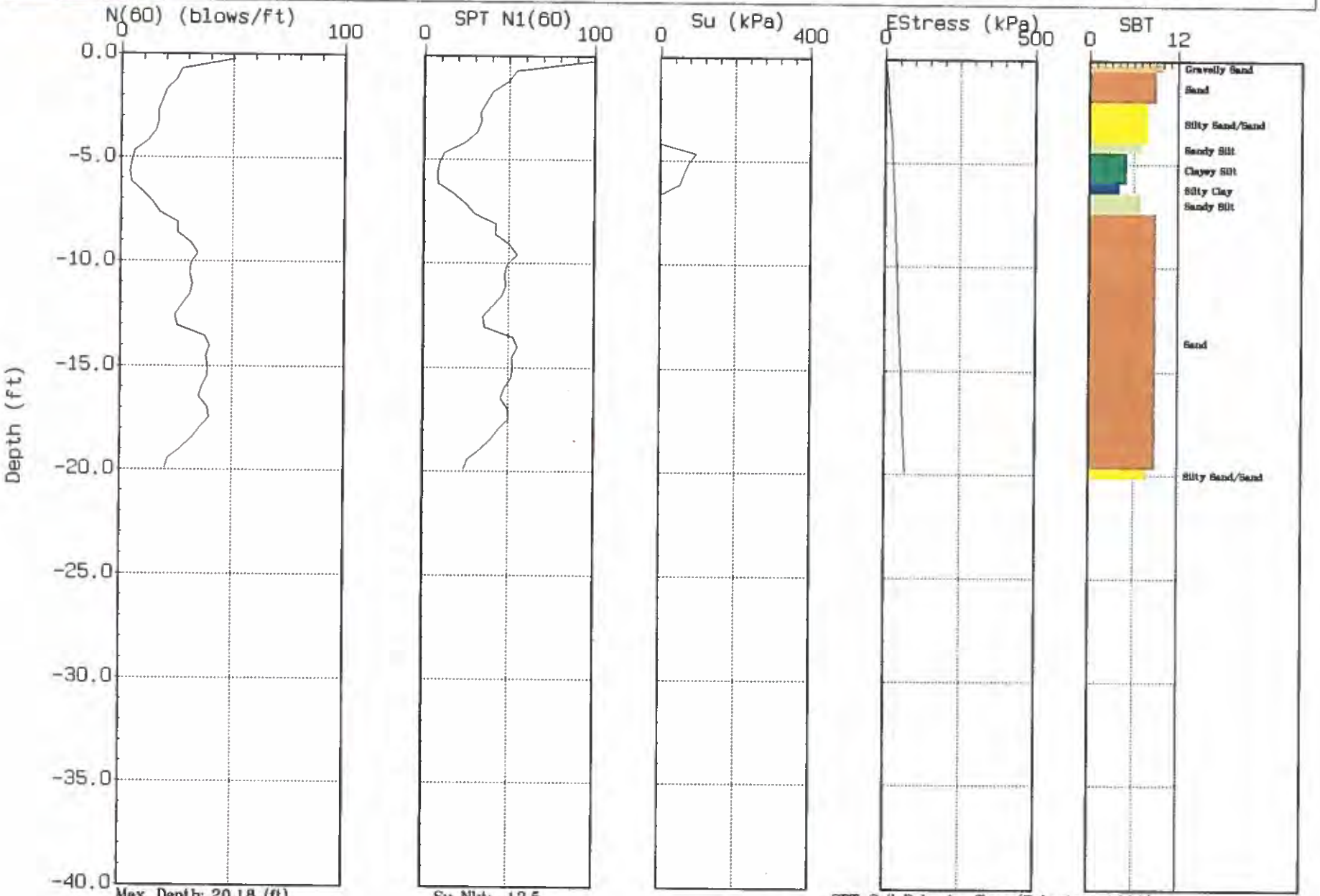
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-06

Oversite: B. DUSSELL
Date: 08:16:04 18:18



Max. Depth: 20.18 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

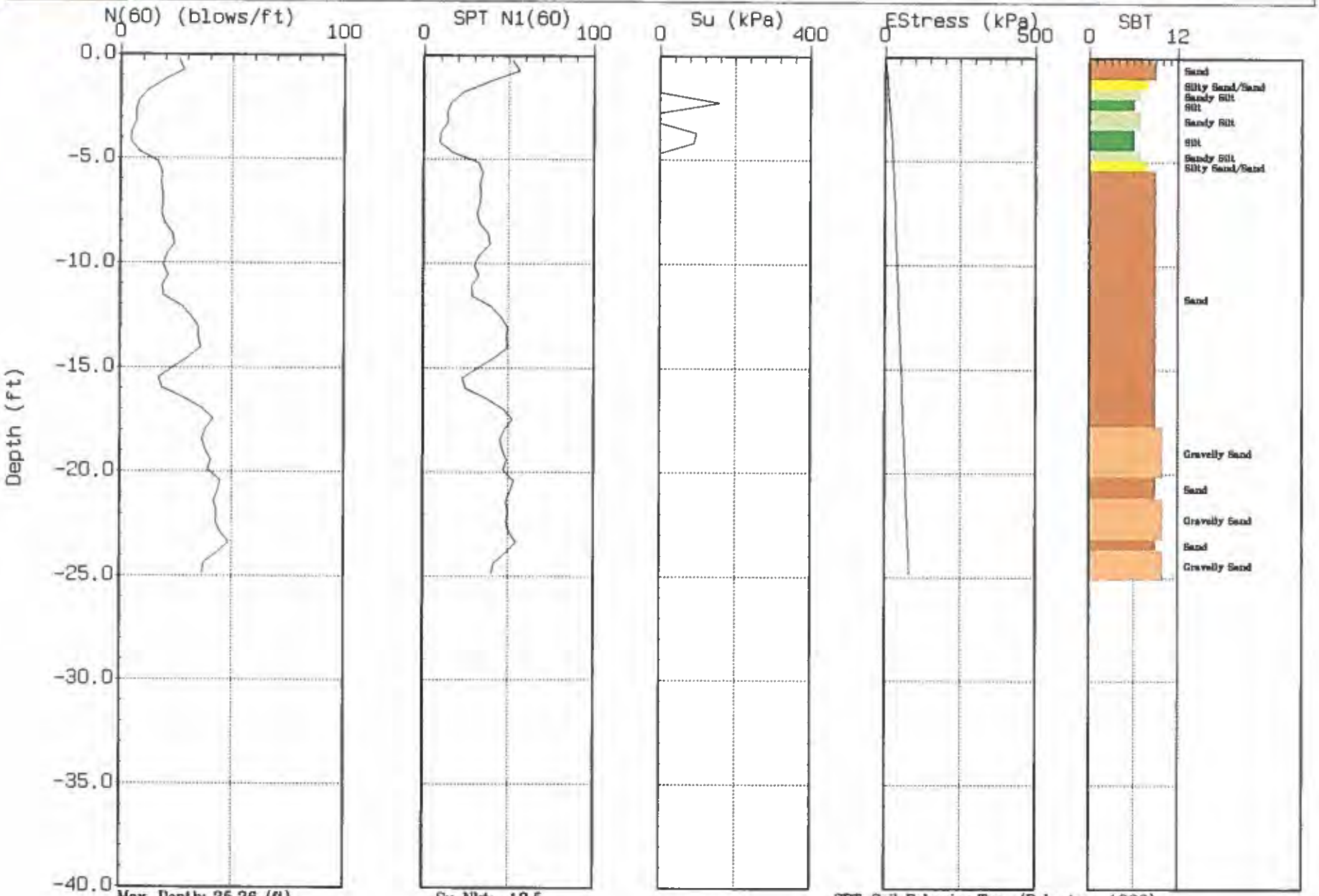
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-07

Oversite: B. DUSSELL
Date: 08:17:04 08:19



Max. Depth: 25.26 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

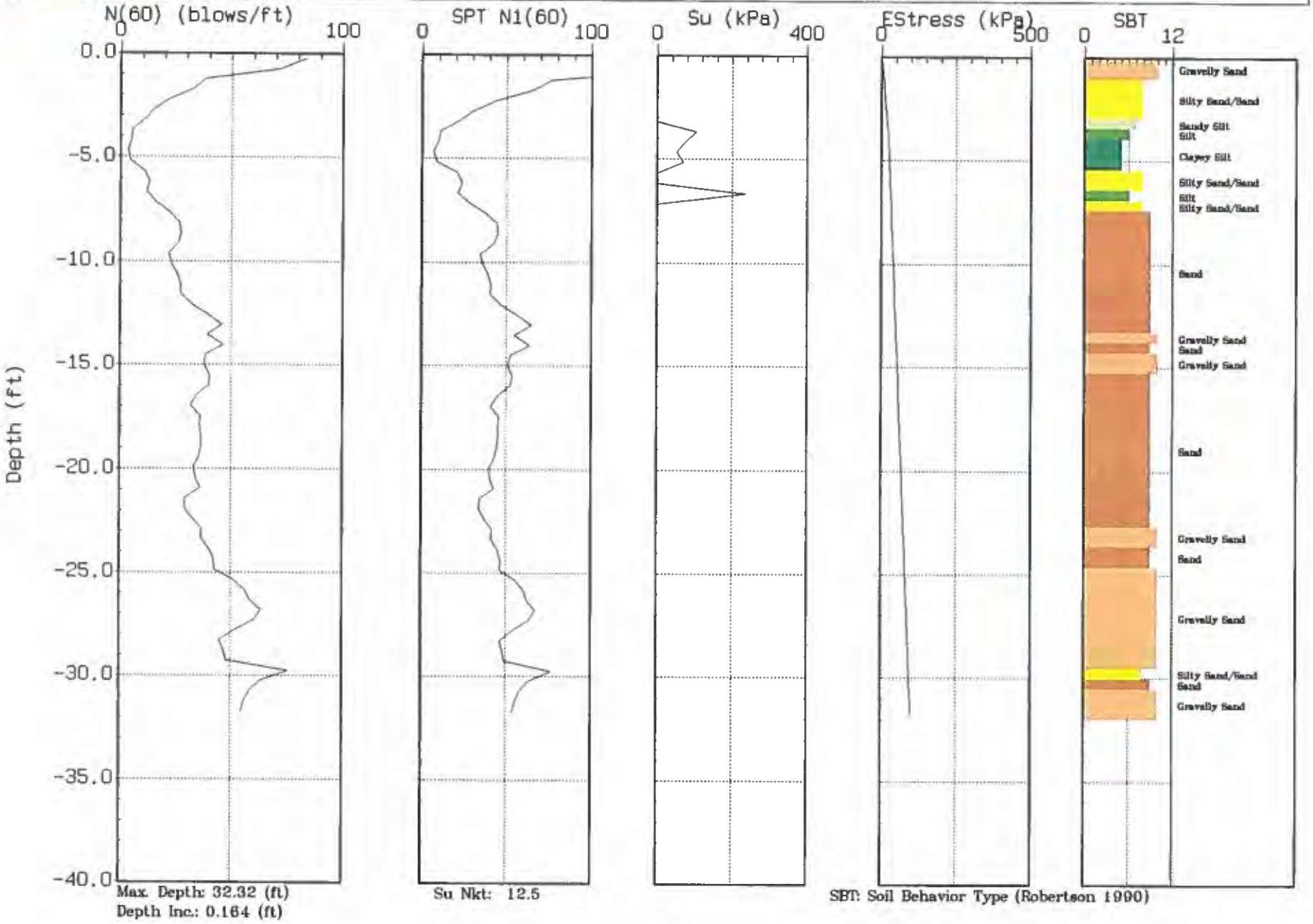
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-08

Oversite: B. DUSSELL
Date: 08:17:04 08:47



Max. Depth: 32.32 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

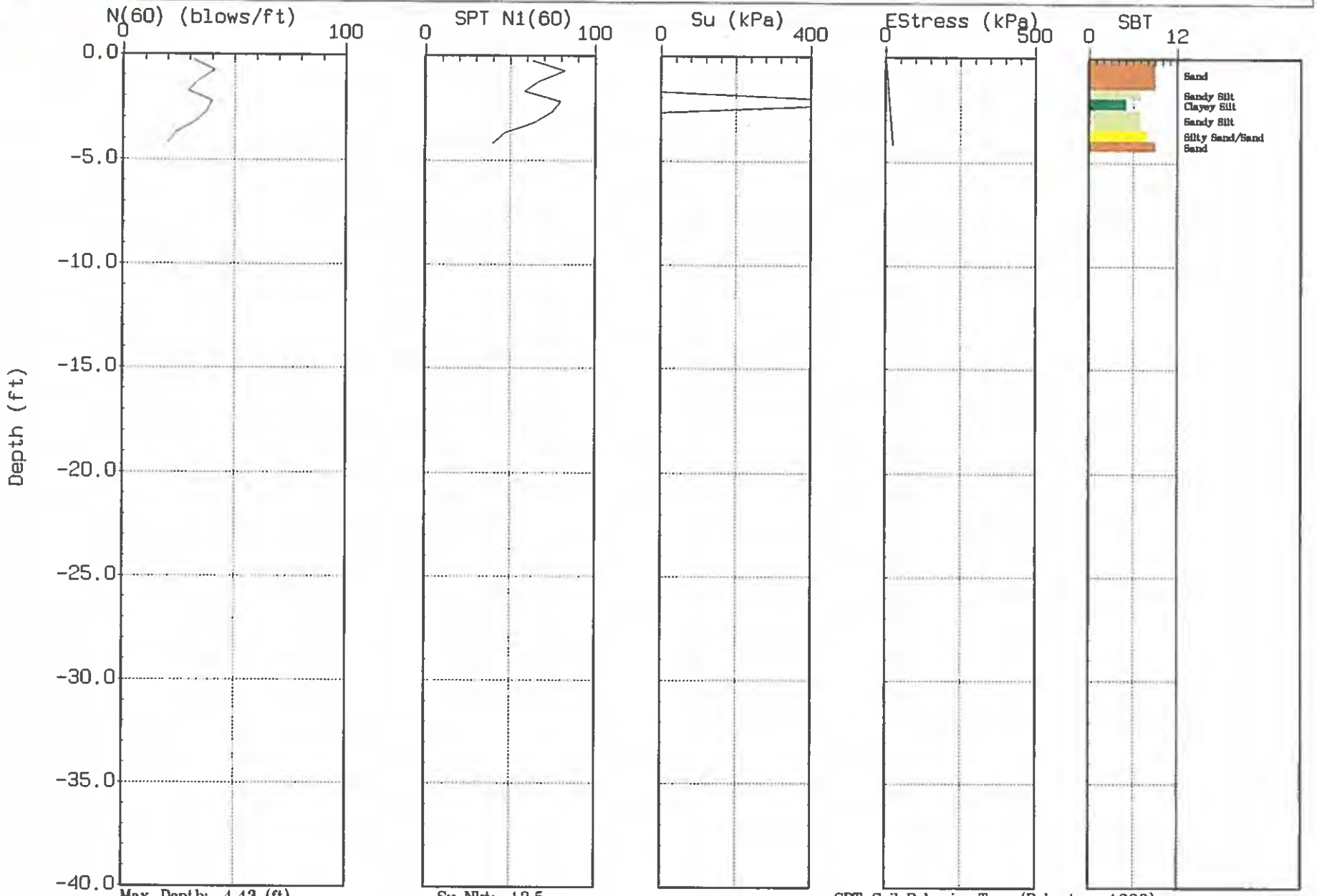
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-09

Oversite: B. DUSSELL
Date: 08:17:04 09:17



Max. Depth: 4.43 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

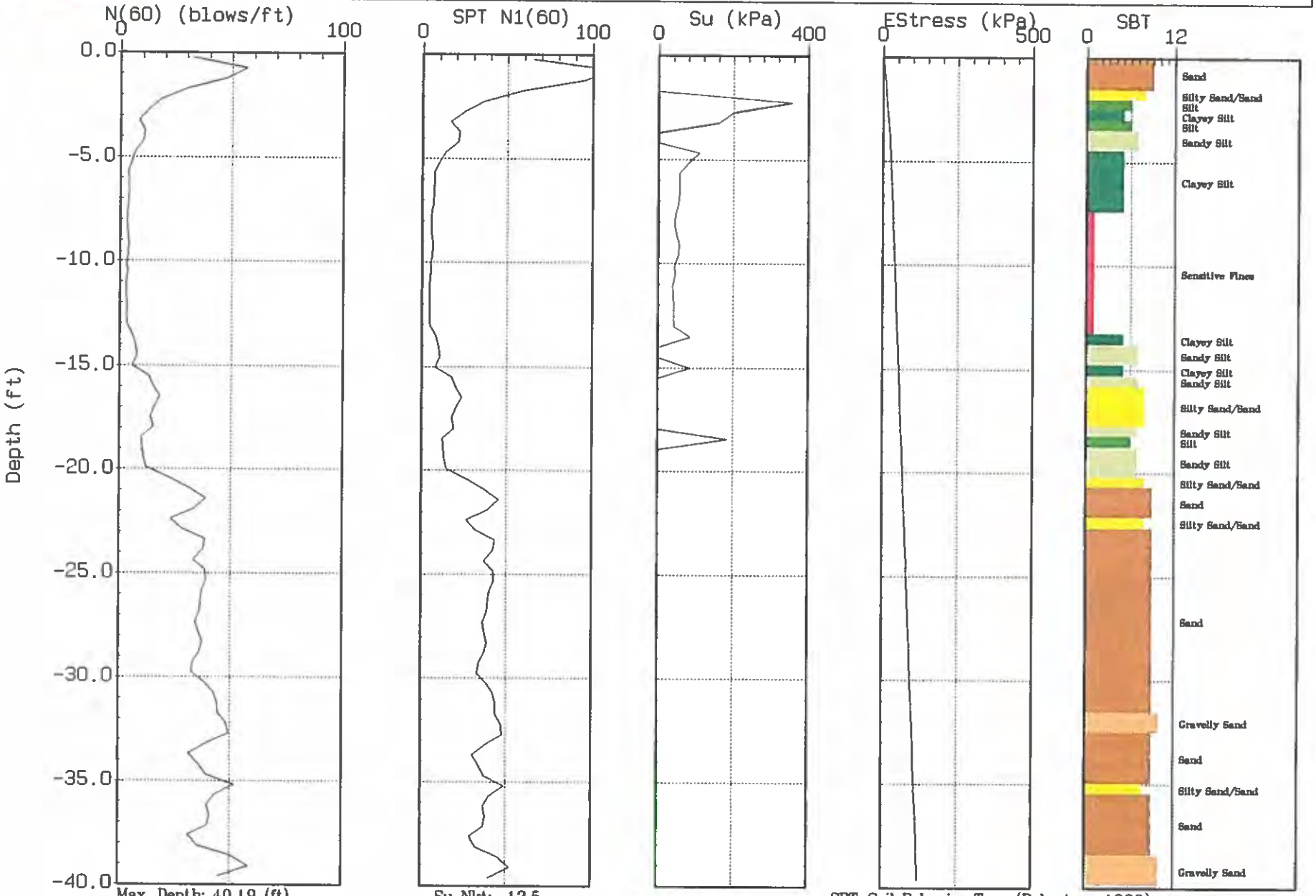
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-09a

Oversite: B. DUSSELL
Date: 08:17:04 11:16



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

Su Nkt: 12.5

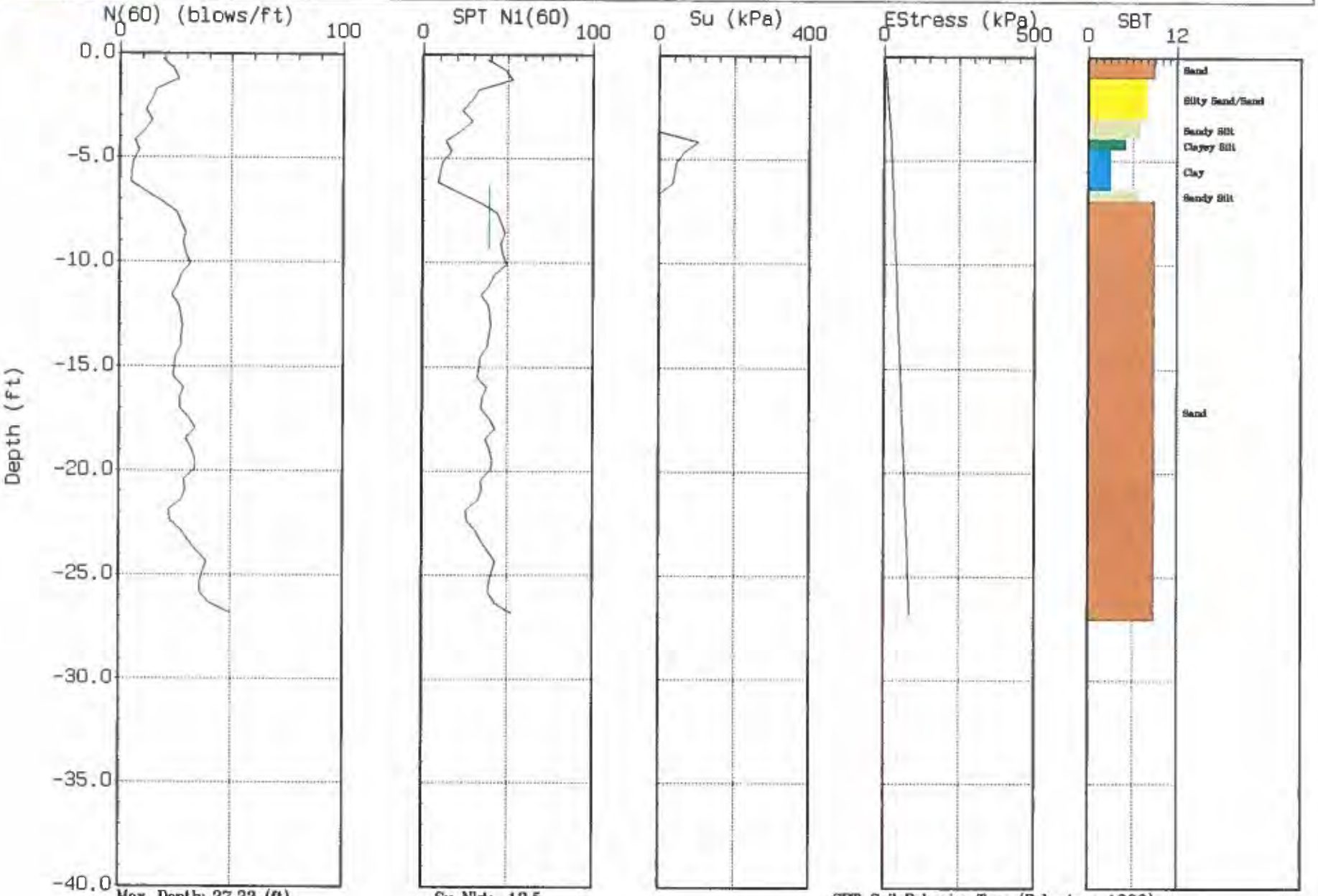
SBT: Soil Behavior Type (Robertson 1990)

GREGG

BUSCH GEOTECH.

Site: COOK BROADWAY
Location: CPT-10

Oversite: B. DUSSELL
Date: 08:17:04 11:48



Max. Depth: 27.23 (ft)
Depth Inc.: 0.164 (ft)

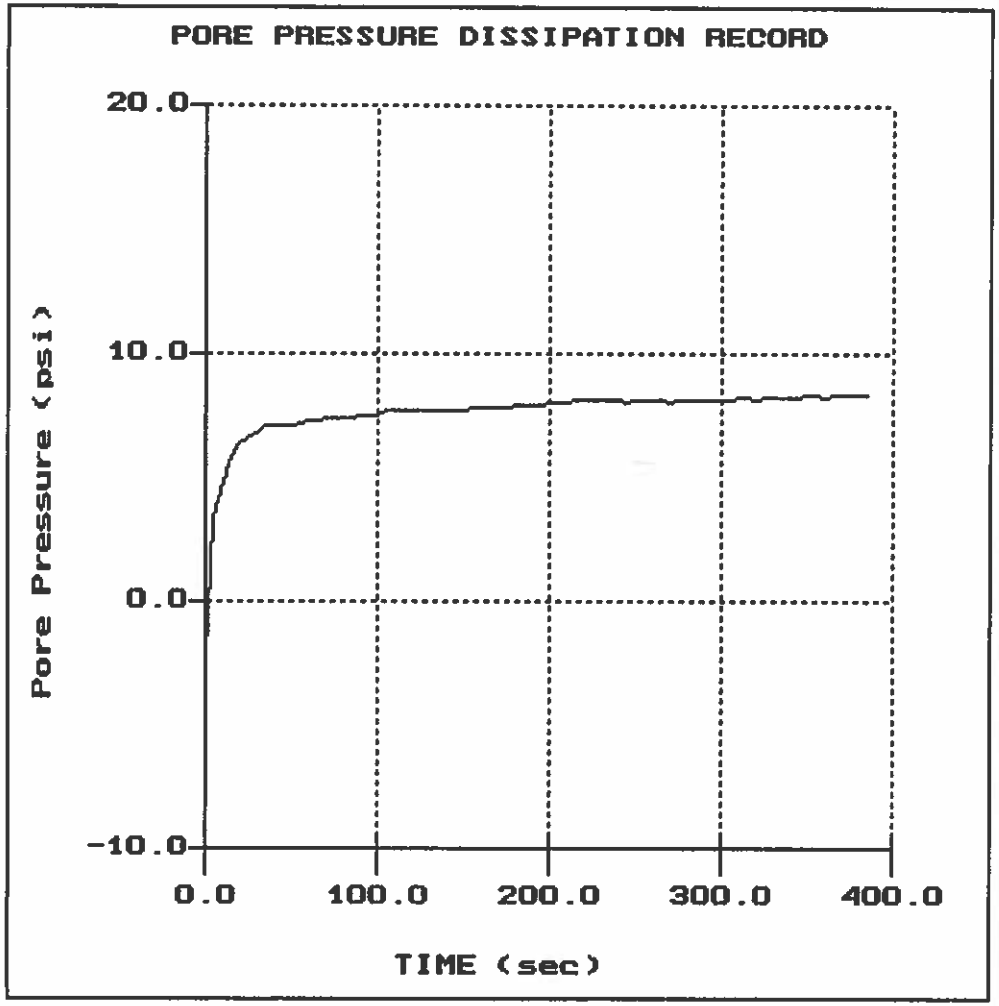
Su Nkt: 12.5

SBT: Soil Behavior Type (Robertson 1990)

BUSCH GEOTECH

Site: COOK BROADWAY
Location: CPT-04

Oversite: B. DUSSELL
Date:08:16:04 17:11

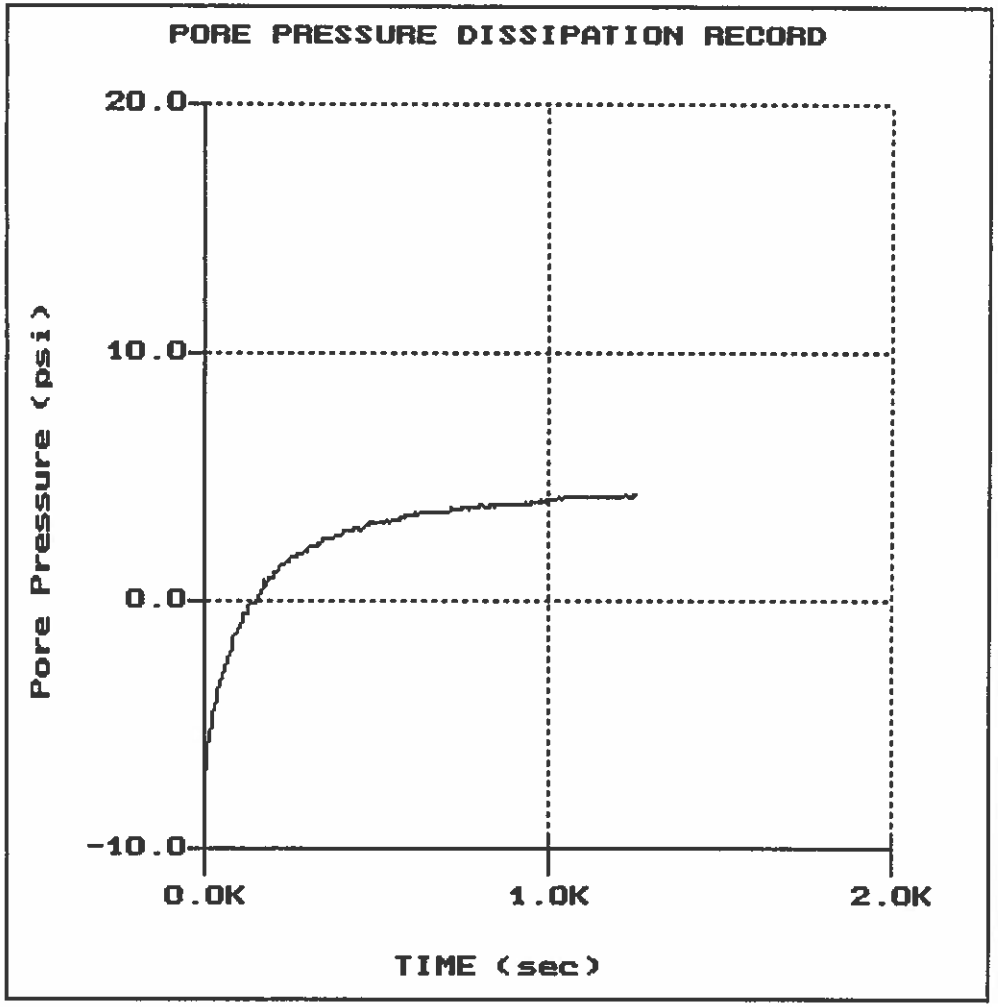


File: 272C04.PPC
Depth (m): 5.85
(ft): 19.19
Duration : 385.0s
U-min: -2.38 0.0s
U-max: 8.36 380.0s

BUSCH GEOTECH

Site: COOK BROADWAY
Location: CPT-03

Oversite: B. BUSCH
Date:08:16:04 16:08

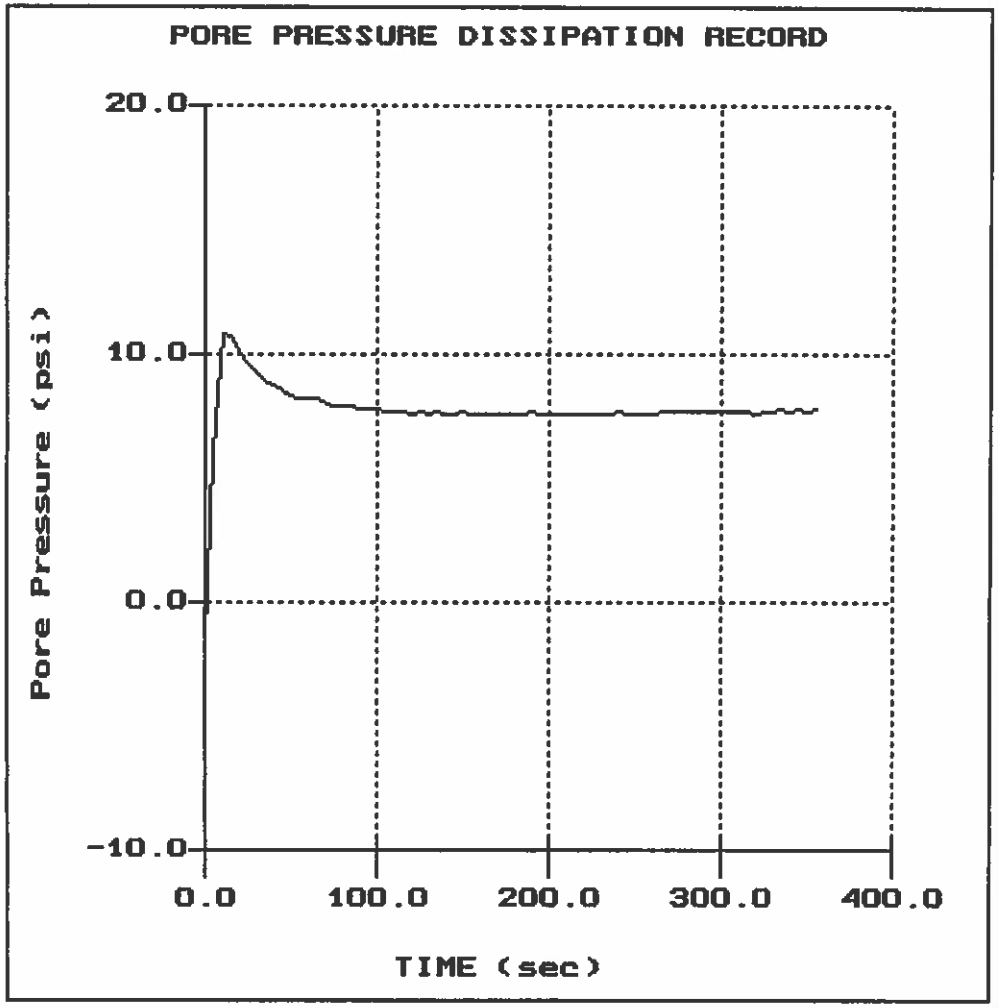


File: 272C03.PPC
Depth (m): 3.75
(ft): 12.30
Duration : 1255.0s
U-min: -6.77 5.0s
U-max: 4.27 1245.0s

BUSCH GEOTECH

Site: COOK BROADWAY
Location: CPT-02

Oversite: B. BUSCH
Date:08:16:04 15:27

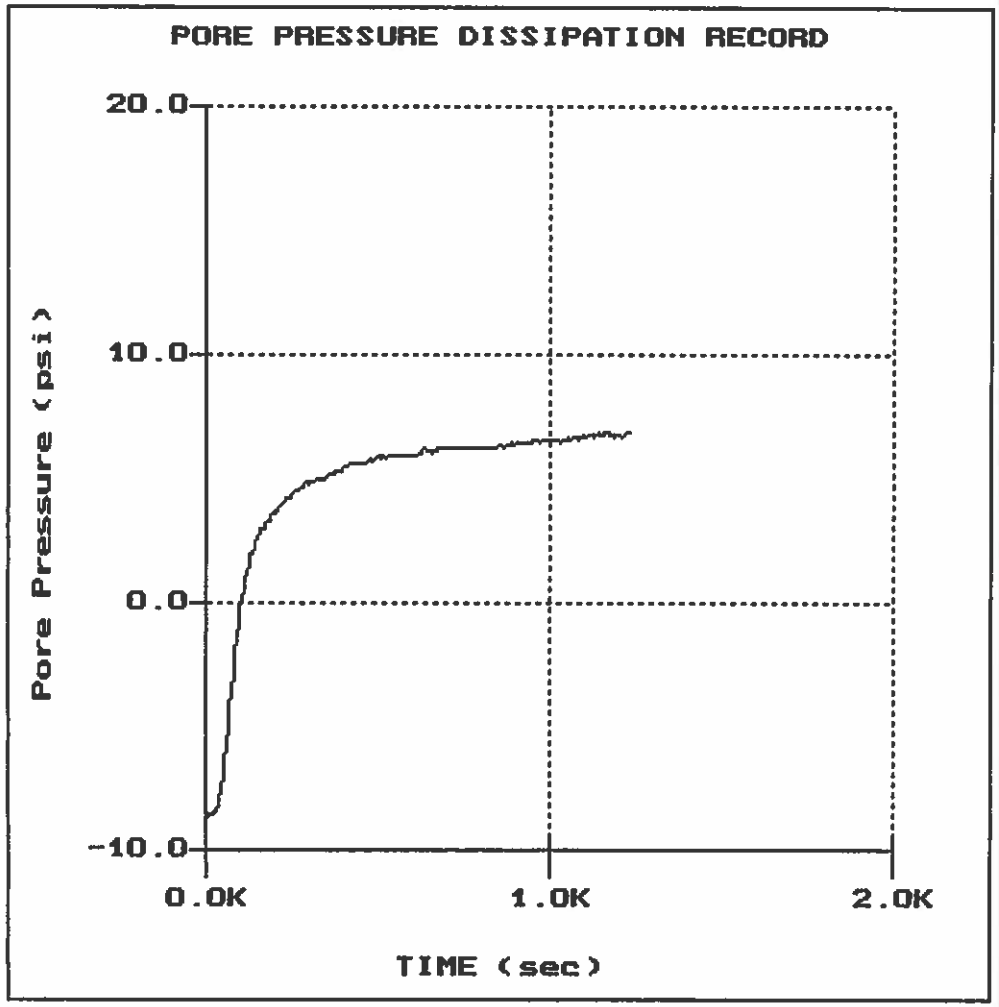


File: 272C02.PPC
Depth (m): 5.20
(ft): 17.06
Duration : 355.0s
U-min: -1.81 0.0s
U-max: 10.84 10.0s

BUSCH GEOTECH

Site: COOK BROADWAY
Location: CPT-01

Oversite: B. BUSCH
Date:08:16:04 14:31



File: 272C01.PPC
Depth (m): 6.10
(ft): 20.01
Duration : 1230.0s
U-min: -8.73 0.0s
U-max: 6.90 1225.0s

DRAFT

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

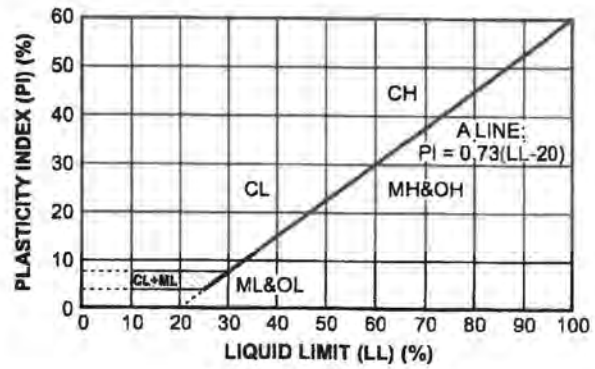
CONSISTENCY CLASSIFICATION

Description	Blows per Foot
Granular Soils	
Very Loose	< 5
Loose	5 – 15
Medium Dense	16 – 40
Dense	41 – 65
Very Dense	> 65
Cohesive Soils	
Very Soft	< 3
Soft	3 – 5
Firm	6 – 10
Stiff	11 – 20
Very Stiff	21 – 40
Hard	> 40

GRAIN SIZE CLASSIFICATION

Grain Type	*Standard Sieve Size*	*Grain Size in Millimeters*
Boulders	Above 12 inches	Above 305
Cobbles	12 to 13 inches	305 to 76.2
Gravel	3 inches to No. 4	76.2 to 4.76
Coarse-grained	3 to ¾ inches	76.2 to 19.1
Fine-grained	¾ inches to No. 4	19.1 to 4.76
Sand	No. 4 to No. 200	4.76 to 0.074
Coarse-grained	No. 4 to No. 10	4.76 to 2.00
Medium-grained	No. 10 to No. 40	2.00 to 0.042
Fine-grained	No. 40 to No. 200	0.042 to 0.074
Silt and Clay	Below No. 200	Below 0.074

PLASTICITY CHART



Log of Boring B1

Project: In-N-Out Burger

Project No: 032-17030

Client: In-N-Out Burger

Figure No.: A-1

Location: 2616 Broadway Street, Eureka, California

Logged By: R. Alexander

Depth to Water> **Initial:** 8 Feet **At Completion:** 8 Feet

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
0		Ground Surface						
		ASPHALTIC CONCRETE = 1¾ inches AGGREGATE BASE = 2½ inches						
2		***SILTY SAND/SAND (SM/SP)*** FILL, fine- to coarse-grained; gray, damp, drills easily	105.2	4.7		22		
4		***SILTY SAND (SM)*** Medium dense, fine- to coarse-grained with GRAVEL; gray, moist, drills easily	124.9	9.4		24		
6								
8		Saturated below 8 feet						
10								
12		***SANDY SILT (ML)*** Medium dense, fine- to medium-grained; brown, saturated, drills easily						
14								
16								
18								
20								

Drill Method: Solid Flight

Drill Date: 3-29-18

Drill Rig: CME 45B

Krazan and Associates

Hole Size: 4½ Inches

Driller: Brent Snyder

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B2

Project: In-N-Out Burger

Project No: 032-17030

Client: In-N-Out Burger

Figure No.: A-2

Location: 2616 Broadway Street, Eureka, California

Logged By: R. Alexander

Depth to Water> **Initial:** 4 Feet **At Completion:** 4 Feet

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
0		Ground Surface						
		ASPHALTIC CONCRETE = 2¼ inches AGGREGATE BASE = 3 inches						
		GRAVELLY SILTY SAND (SM) FILL, fine- to coarse-grained; brown, damp, drills easily	109.5	5.4		25		
2								
4		***GRAVELLY SILTY SAND (SM)*** Medium dense, fine- to coarse-grained; gray, saturated, drills easily	120.9	10.0		21		
6								
8		***SANDY CLAYEY SILT (ML)*** Medium dense, fine- to medium-grained; light brown, saturated, drills easily						
10				11.5		36		
		SILTY SAND (SM) Medium dense, fine- to coarse-grained with trace GRAVEL; light brown, saturated, drills easily						
12								
14								
16								
18								
20								

Drill Method: Solid Flight

Drill Date: 3-29-18

Drill Rig: CME 45B

Krazan and Associates

Hole Size: 4½ Inches

Driller: Brent Snyder

Elevation: 20 Feet

Sheet: 1 of 1

Log of Boring B3

Project: In-N-Out Burger

Project No: 032-17030

Client: In-N-Out Burger

Figure No.: A-3

Location: 2616 Broadway Street, Eureka, California

Logged By: R. Alexander

Depth to Water> **Initial:** 6 Feet **At Completion:** 6 Feet

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
		Ground Surface						
0		***GRAVELLY SILTY SAND (SM)*** FILL, fine- to coarse-grained; brown, damp, drills firmly						
2			119.4	5.0		50		
4		***GRAVELLY SILTY SAND (SM)*** Loose, fine- to coarse-grained; grayish-brown, damp, drills easily						
			127.9	6.2		15		
6		Saturated below 6 feet						
8		***SILTY SAND (SM)*** Medium dense, fine- to coarse-grained; gray, saturated, drills easily						
10			113.9	20.8		24		
12								
14								
		End of Borehole						
16								
18								
20								

Drill Method: Solid Flight

Drill Date: 3-29-18

Drill Rig: CME 45B

Krazan and Associates

Hole Size: 4½ Inches

Driller: Brent Snyder

Elevation: 15 Feet

Sheet: 1 of 1

Log of Boring B4

Project: In-N-Out Burger

Project No: 032-17030

Client: In-N-Out Burger

Figure No.: A-4

Location: 2616 Broadway Street, Eureka, California

Logged By: R. Alexander

Depth to Water> **Initial:** 6 Feet **At Completion:** 6 Feet

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
0		Ground Surface						
		ASPHALTIC CONCRETE = 3 inches AGGREGATE BASE = 2 inches						
2		***GRAVELLY SILTY SAND (SM)*** Loose, fine- to coarse-grained; brown, damp, drills easily	107.6	5.0		24		
4		***SILTY SAND (SM)*** Medium dense, fine- to medium-grained with interbeds of SAND; light brown, damp, drills easily						
6		Saturated below 6 feet				18		
8		***SILTY SAND/SAND (SM/SP)*** Medium dense, fine- to coarse-grained; grayish-brown, saturated, drills easily						
10				13.3		21		
12								
14		***SILTY SAND (SM)*** Dense, fine- to medium-grained; light brown, saturated, drills easily						
16			102.0	24.8		30		
18								
20								

Drill Method: Hollow Stem

Drill Date: 3-29-18

Drill Rig: CME 45B

Krazan and Associates

Hole Size: 6½ Inches

Driller: Brent Snyder

Elevation: 50 Feet

Log of Boring B4

Project: In-N-Out Burger
Project No: 032-17030
Client: In-N-Out Burger
Figure No.: A-4
Location: 2616 Broadway Street, Eureka, California
Logged By: R. Alexander
Depth to Water> **Initial:** 6 Feet **At Completion:** 6 Feet

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
			106.3	20.8		34		
22								
24		***SILTY SAND (SM)*** Dense, fine- to coarse-grained with fine GRAVEL; brown, saturated, drills firmly						
			110.1	14.3		29		
26								
28								
30								
			109.6	11.9		43		
32								
34		Very dense with interbeds of SILTY SAND/SAND and fine- to medium-grained below 33 feet						
			136.3	5.8		50+		
36								
38								
40								

Drill Method: Hollow Stem
Drill Date: 3-29-18
Drill Rig: CME 45B
Hole Size: 6½ Inches
Driller: Brent Snyder
Elevation: 50 Feet

Krazan and Associates

Log of Boring B4

Project: In-N-Out Burger
Project No: 032-17030
Client: In-N-Out Burger
Figure No.: A-4
Location: 2616 Broadway Street, Eureka, California
Logged By: R. Alexander
Depth to Water> **Initial:** 6 Feet **At Completion:** 6 Feet

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
			129.6	8.2		67		
42								
44								
			127.1	8.6		70		
46								
48								
50		End of Borehole						
52								
54								
56								
58								
60								

Drill Method: Hollow Stem
Drill Date: 3-29-18
Drill Rig: CME 45B
Krazan and Associates
Hole Size: 6½ Inches
Driller: Brent Snyder
Elevation: 50 Feet

Log of Boring B5

Project: In-N-Out Burger
Project No: 032-17030
Client: In-N-Out Burger
Figure No.: A-5
Location: 2616 Broadway Street, Eureka, California
Logged By: R. Alexander
Depth to Water> **Initial:** 6 Feet **At Completion:** 6 Feet

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
0		Ground Surface						
		ASPHALTIC CONCRETE = 3 inches AGGREGATE BASE = 1½ inches						
2		***SILTY SAND (SM)*** FILL, fine- to medium-grained; brown, moist, drills easily						
4		***SILTY SAND (SM)*** Medium dense, fine- to medium-grained; brown, moist, drills easily		15.5		22		
6		Saturated below 6 feet						
8		With trace GRAVEL below 8 feet	122.3	11.7		32		
10								
12								
14								
16		End of Borehole						
18								
20								

Drill Method: Solid Flight
Drill Date: 3-29-18
Drill Rig: CME 45B
Krazan and Associates
Hole Size: 4½ Inches
Driller: Brent Snyder
Elevation: 15 Feet
Sheet: 1 of 1

Log of Boring B6

Project: In-N-Out Burger

Project No: 032-17030

Client: In-N-Out Burger

Figure No.: A-6

Location: 2616 Broadway Street, Eureka, California

Logged By: R. Alexander

Depth to Water> **Initial:** 6½ Feet **At Completion:** 6½ Feet

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
0		Ground Surface						
		ASPHALTIC CONCRETE = 2 inches AGGREGATE BASE = 2 inches						
		GRAVELLY SILTY SAND (SM) FILL, fine- to medium-grained; brown, damp, drills easily	109.0	3.0		30		
2		***SAND (SP)*** Medium dense, fine- to medium-grained; light brown, damp, drills easily						
4		***SILTY SAND (SM)*** Medium dense, fine- to medium-grained; brown, damp, drills easily Saturated below 6½ feet		19.5		30		
6			111.3	19.0		28		
8								
10								
12								
14								
		End of Borehole						
16								
18								
20								

Drill Method: Solid Flight

Drill Date: 3-29-18

Drill Rig: CME 45B

Krazan and Associates

Hole Size: 4½ Inches

Driller: Brent Snyder

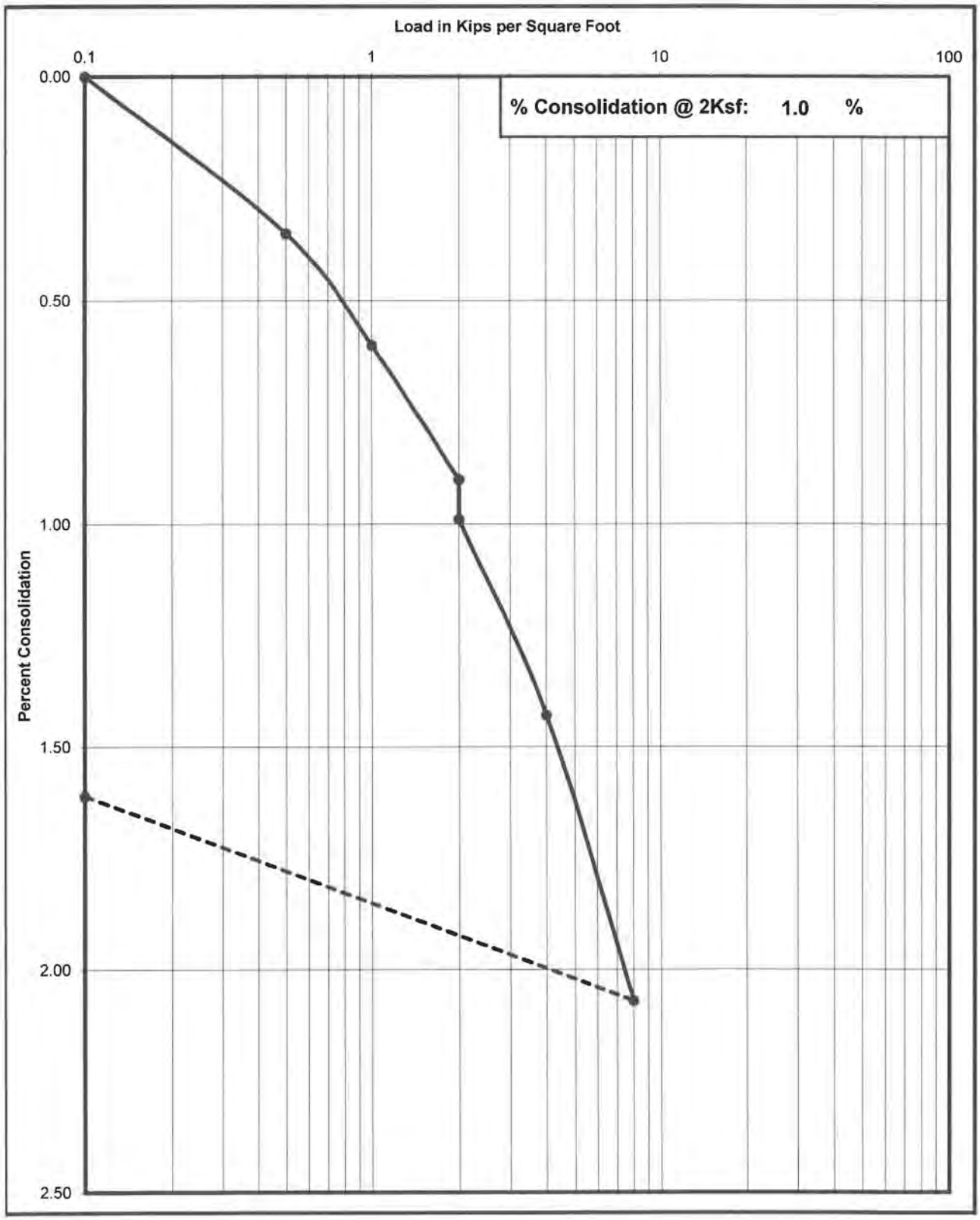
Elevation: 15 Feet

Sheet: 1 of 1

DRAFT

Consolidation Test

Project No	Boring No. & Depth	Date	Soil Classification
032-17030	B4 @ 2-3'	4/12/2018	SP



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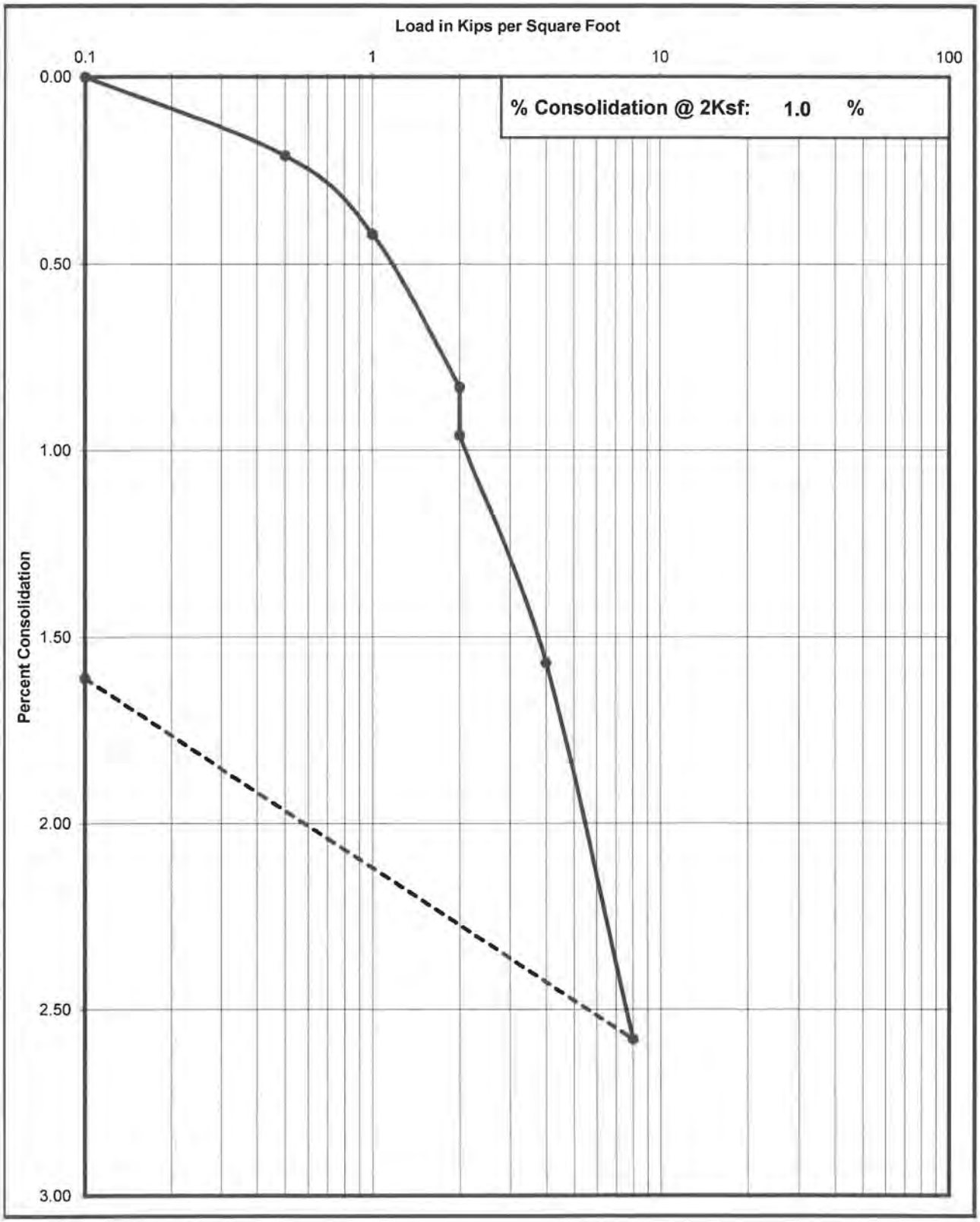
Consolidation Test

Project No	Boring No. & Depth	Date	Soil Classification
032-17030	B6 @ 2-3'	4/12/2018	SP



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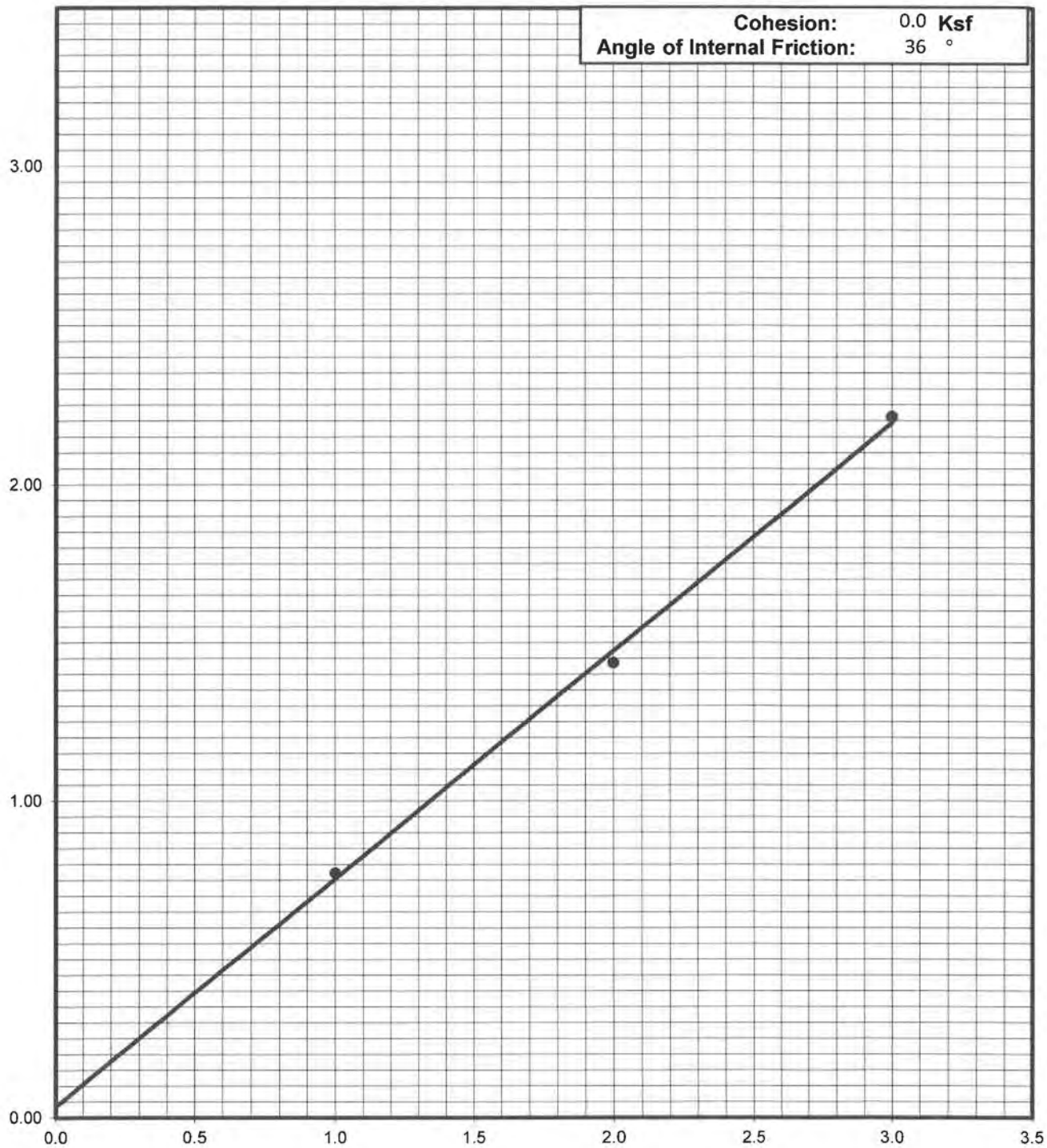
Shear Strength Diagram (Direct Shear)
ASTM D - 3080 / AASHTO T - 236

Project Number	Boring No. & Depth	Soil Type	Date
032-17030	B1 @ 2-3'	SP-SM	4/12/2018



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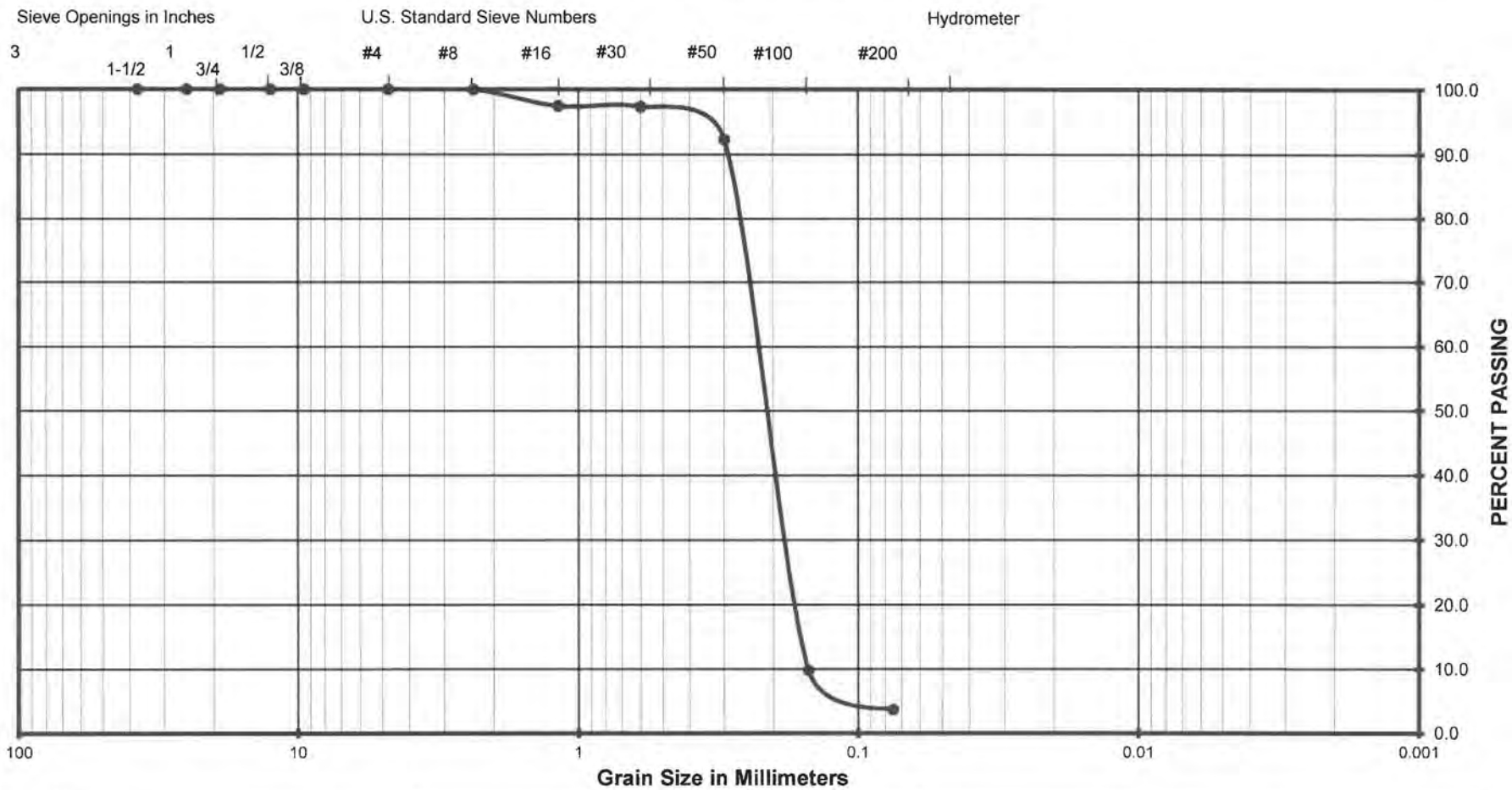
Grain Size Analysis



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	In-N-Out Burger
Project Number	032-17030
Soil Classification	SP
Sample Number	B4 @ 2-3'

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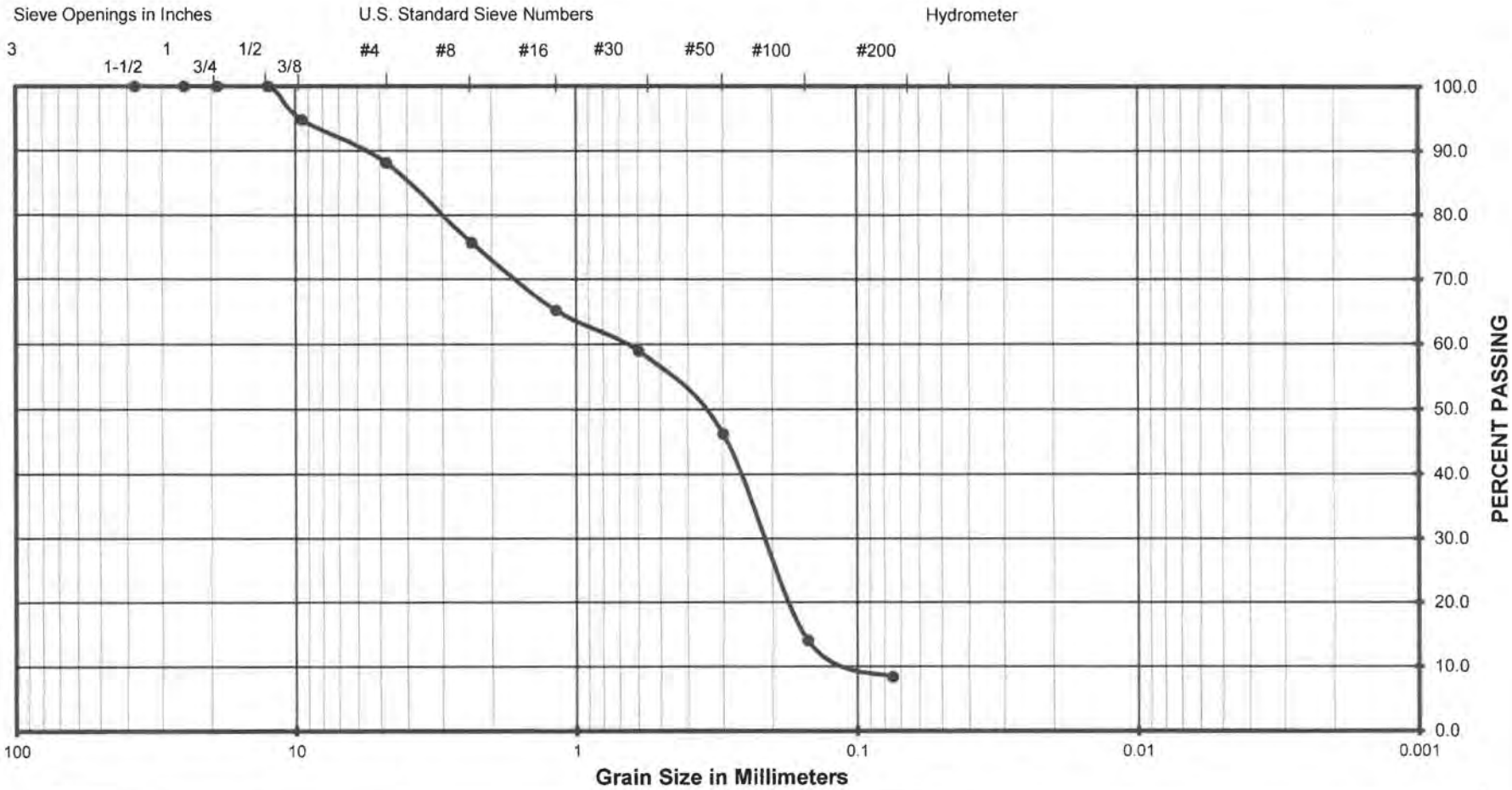
Grain Size Analysis



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	In-N-Out Burger
Project Number	032-17030
Soil Classification	SM-SP w/ grvl
Sample Number	B4 @ 10-11'

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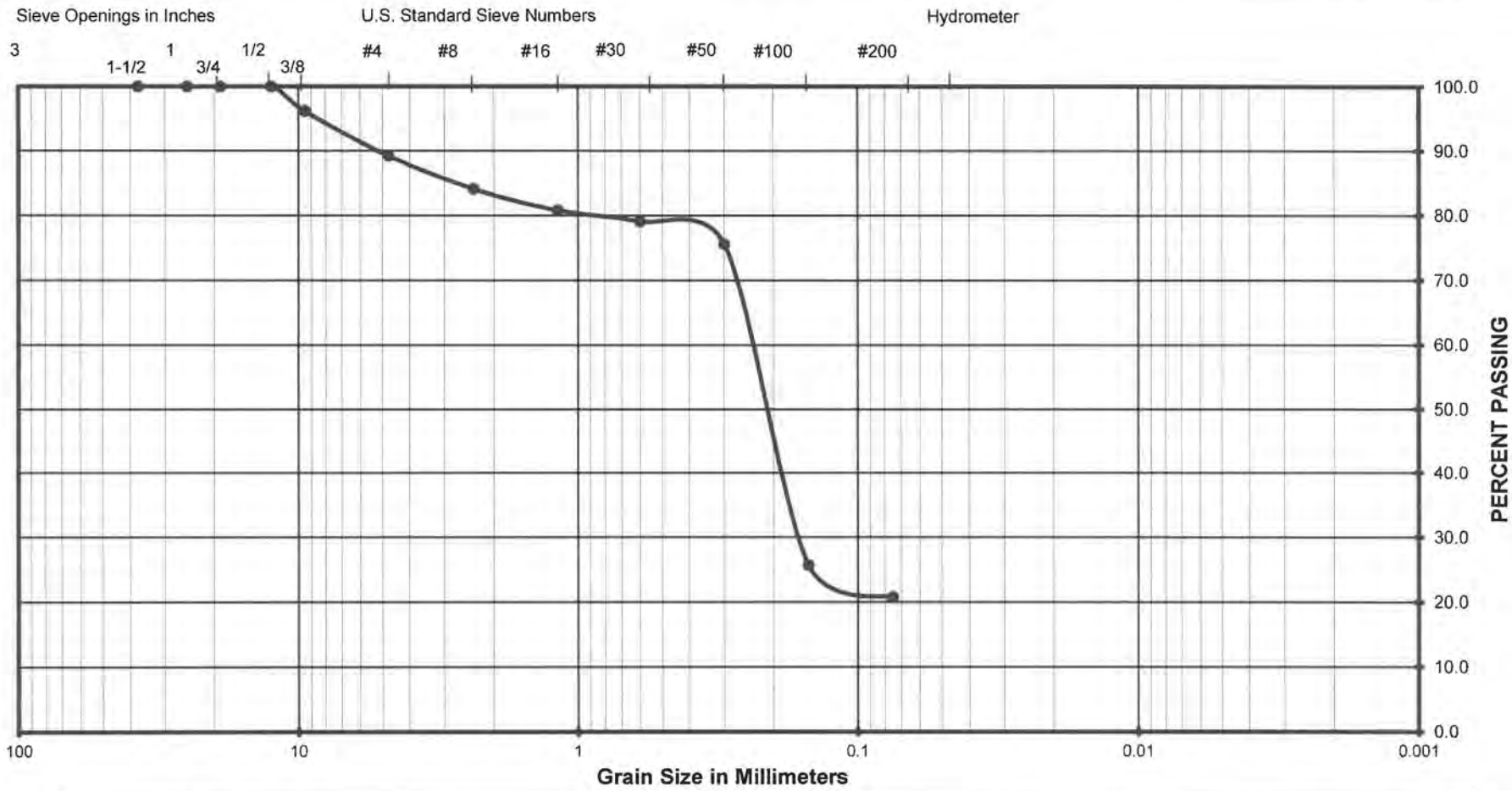
DRAFT

Grain Size Analysis



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	In-N-Out Burger
Project Number	032-17030
Soil Classification	SM w/ grvl
Sample Number	B4 @ 25-26'

DRAFT

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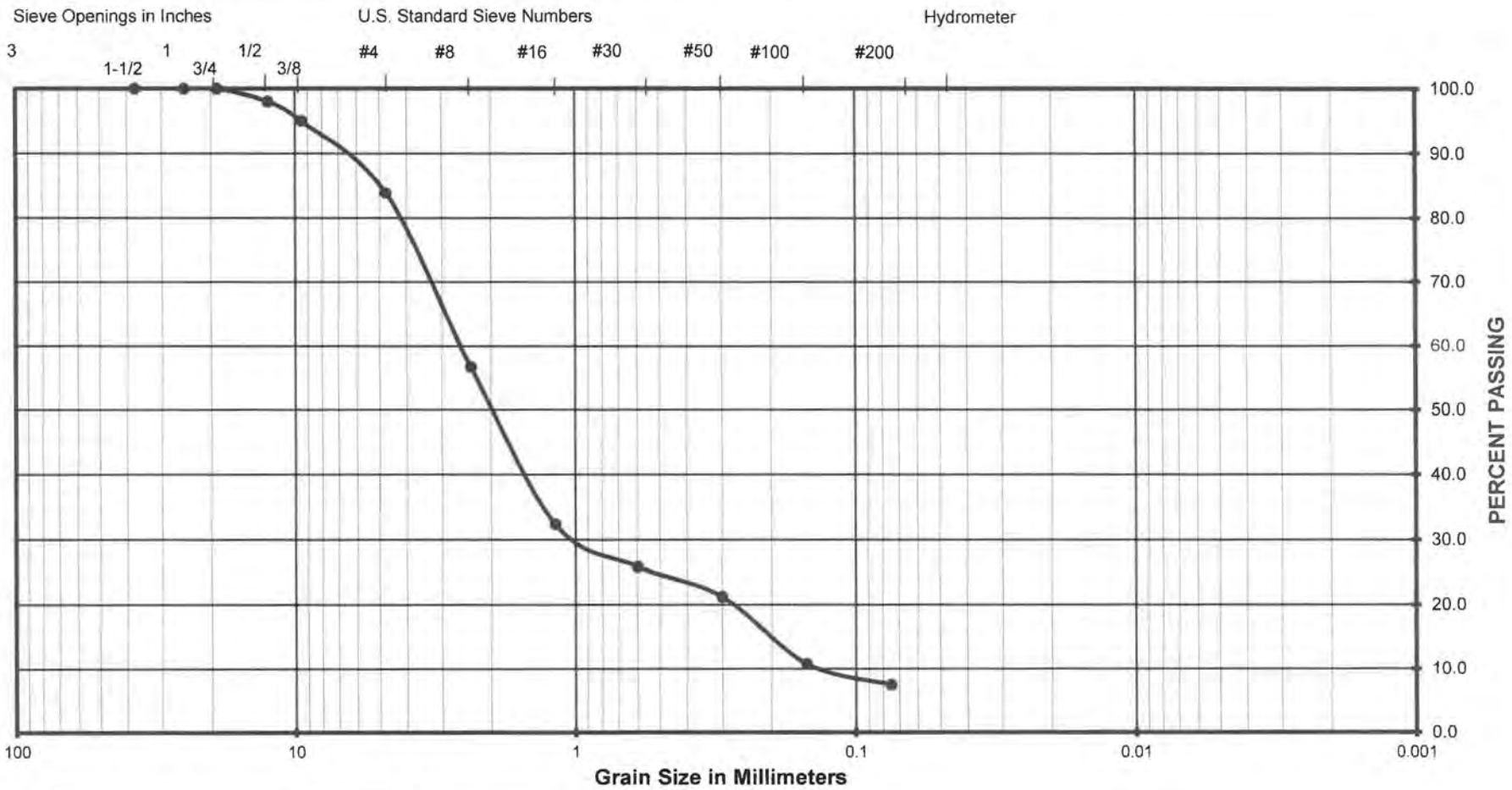
Grain Size Analysis



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	In-N-Out Burger
Project Number	032-17030
Soil Classification	SM-SP w/ grvl
Sample Number	B4 @ 35-36'

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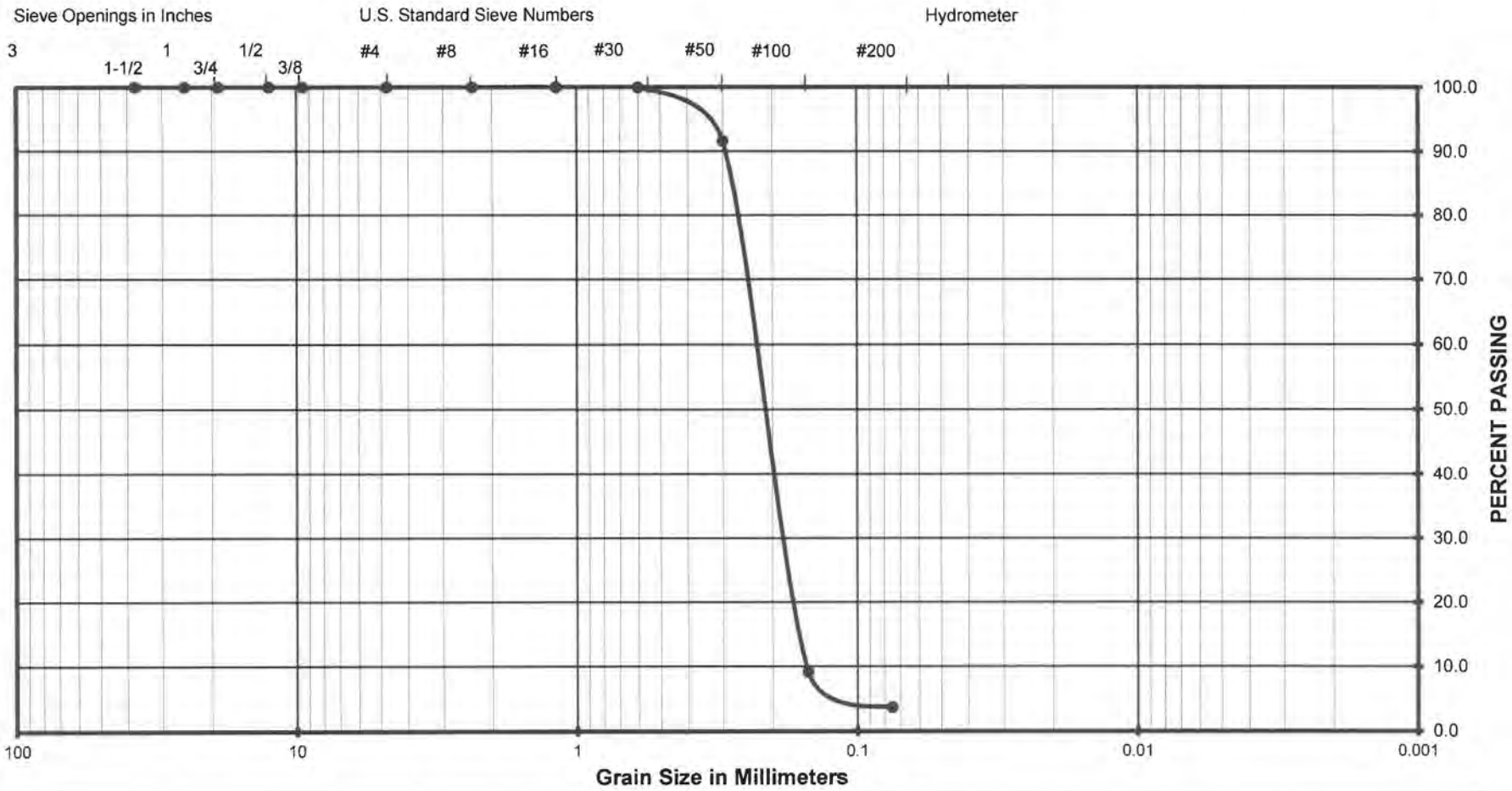
Grain Size Analysis



Gravel		Sand			Silt or Clay
Coarse	Fine	Coarse	Medium	Fine	

(Unified Soils Classification)

Project Name	In-N-Out Burger
Project Number	032-17030
Soil Classification	SP
Sample Number	B6 @ 2-3'

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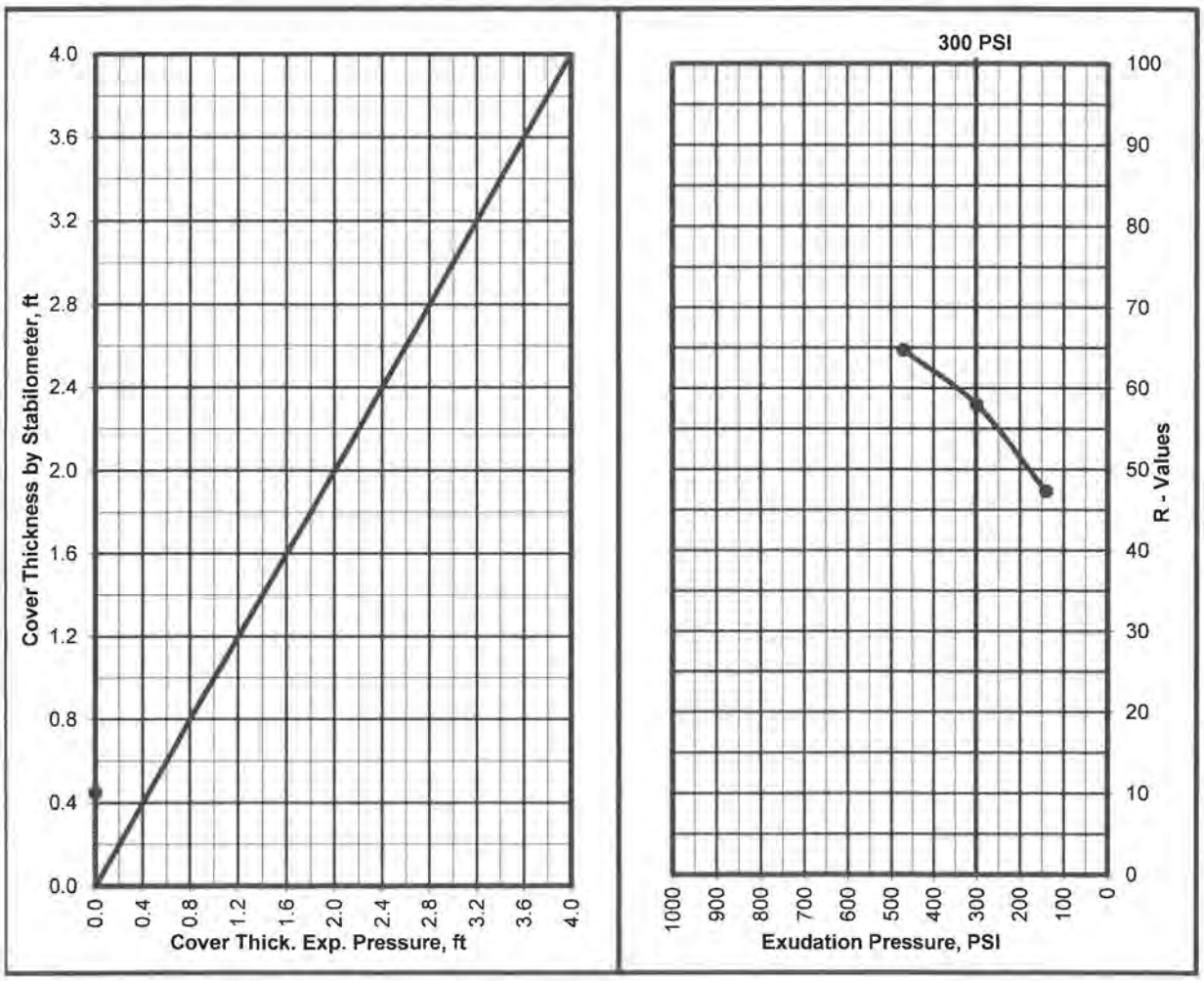
R - VALUE TEST
ASTM D - 2844 / CAL 301

Project Number	:	032-17030
Project Name	:	In-N-Out Burger
Date	:	4/11/2018
Sample Location/Curve Number	:	RV#2
Soil Classification	:	SM

TEST	A	B	C
Percent Moisture @ Compaction, %	11.8	11.2	12.3
Dry Density, lbm/cu.ft.	109.4	109.4	109.3
Exudation Pressure, psi	300	470	140
Expansion Pressure, (Dial Reading)	0	0	0
Expansion Pressure, psf	0	0	0
Resistance Value R	58	65	47

R Value at 300 PSI Exudation Pressure	**58**
R Value by Expansion Pressure (TI =): 5	**Expansion Pressure nil**



Krazan Testing Laboratory

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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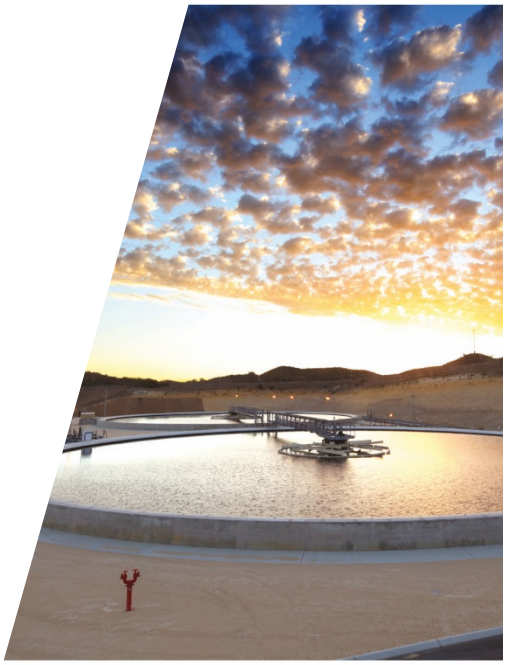
Appendix H Transportation Impact Study



Transportation Impact Study

2616 Broadway Street Redevelopment Project

The Carrington Company

11153741 | November 2018

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1. Introduction

GHD Inc. (GHD) has evaluated traffic conditions that could potentially be impacted by a project currently being proposed by the Carrington Company. The Carrington Company has retained GHD to perform a transportation impact study (TIS) for the proposed 2616 Broadway Street Redevelopment (project).

1.1 Project Description

The location of the project is 2616 Broadway Street in Eureka, Humboldt County, California. The proposed project would redevelop an existing 2.79 acre former truck stop site for commercial purposes, with approximately 6,400 square feet of fast food with drive thru, 2,500 square feet of fast casual restaurant, and 3,350 square feet of either strip mall retail or professional office uses. The proposed development would consist of for a total of approximately 12,250 square feet. Currently, the project site has a permitted food truck operation (fast casual), while the former truck stop business is vacant. The project includes demolition of the existing building, reconstruction of driveway access and egress from Broadway Street, also designated as United State Highway (US 101), and Vigo Street, parking for motor vehicles and bicycles, walkways, and landscaping. Figure 1, located on page 3, presents the project location and study area.

1.2 Scope of Study, Study Scenarios and Analysis Periods

This study was conducted with the intent of identifying the potential traffic impacts associated with the proposed project. The traffic impacts of the proposed project were evaluated using the standards and methodologies set forth by both the City of Eureka (City) and the California Department of Transportation District 1 (Caltrans). The City of Eureka has jurisdiction over growth and development and city streets in the project area adjacent to Broadway Street (US 101). Caltrans has jurisdiction over Broadway Street (US 101) in the project area. The TIS was performed and impacts evaluated in accordance with the standards and methodologies set forth in the *Guide for* the *Preparation of Traffic Impact Studies* (Caltrans, 2002). The traffic analysis is based on peak hour levels of service for signalized and unsignalized intersections. The traffic analysis includes an evaluation of peak hour signal warrants for unsignalized intersections and vehicle queueing for all intersections. Significant impacts, as defined in the CEQA guidelines, and thresholds of significance, as established by Caltrans and the City, were used to determine the level of significance of traffic impacts.

This TIS presents the transportation operations and impacts associated with the redevelopment of 2616 Broadway Street under the following scenarios:

- Existing conditions
- Existing Plus Project conditions
- Cumulative No Project conditions
- Cumulative Plus Project Conditions

Existing conditions quantify the current traffic operations at the study locations. Existing conditions are described in Section 3.

Existing Plus Project conditions refer to the analysis scenario in which traffic impacts associated with the proposed project are investigated in comparison to the *Existing* conditions scenario. Within this scenario, the project generated peak hour traffic volumes have been added to the *Existing* conditions volumes to obtain the Existing Plus Project volumes. Existing Plus Project conditions are described in Section 5.

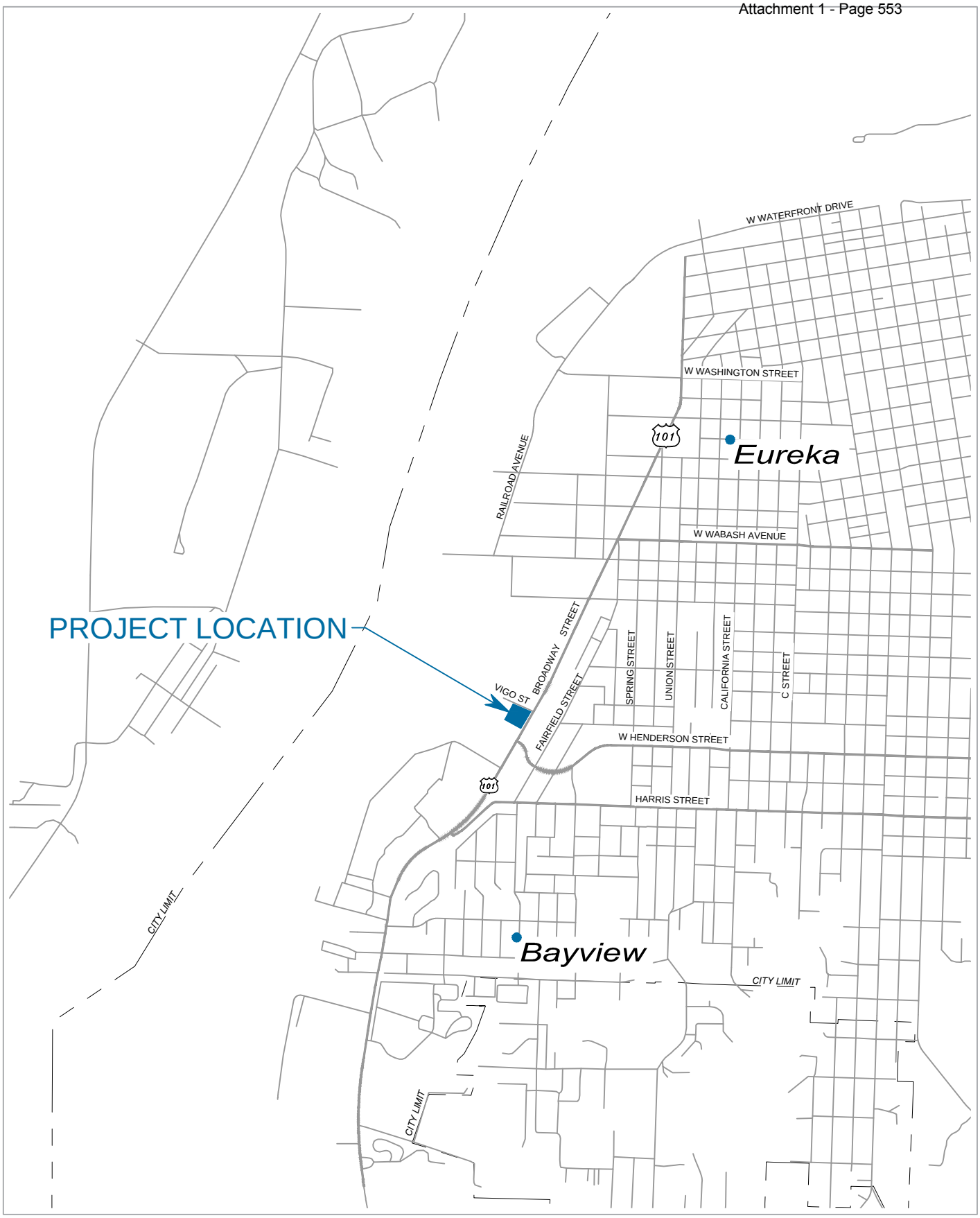
Cumulative (Year 2038) conditions refer to the analysis scenario in which traffic impacts associated with 20 years of development in the City of Eureka are investigated. Within this scenario, the projected growth has been added to the Existing conditions volumes to obtain the *Year 2038* volumes. Cumulative conditions are described in Section 6.

Cumulative (Year 2038) Plus Project conditions refer to the analysis scenario in which traffic impacts associated with the proposed project are investigated in comparison to the Cumulative conditions scenario. Within this scenario, the project generated peak hour traffic volumes have been added to the *Cumulative* conditions volumes to obtain the Cumulative Plus Project volumes. Cumulative Plus Project conditions are described in Section 7.

Each scenario is described in further detail and evaluated in subsequent sections of this report. Transportation improvements required to maintain acceptable vehicular access and safety at all locations are identified and documented under the Impacts and Mitigation section of this study.

In coordination with Caltrans, the Morning (AM) peak hour was not analyzed as the traffic volumes are less than what is experienced during the Mid-Day and Afternoon (PM) peak hour period. Therefore, the AM peak hour was not analyzed within this study.

The analysis performed within in this TIS provides a planning level analysis and is intended only for preliminary engineering level design. The “analysis level” describes the level of detail used when the methodology is applied. The “planning and preliminary engineering level” of analysis requires only the most fundamental types of information.



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GHD

The Carrington Company
2616 BROADWAY STREET REDEVELOPMENT

STUDY AREA MAP

Project No. **11153741**
Report No. **001**
Date **07.11.2018**

FIGURE 1

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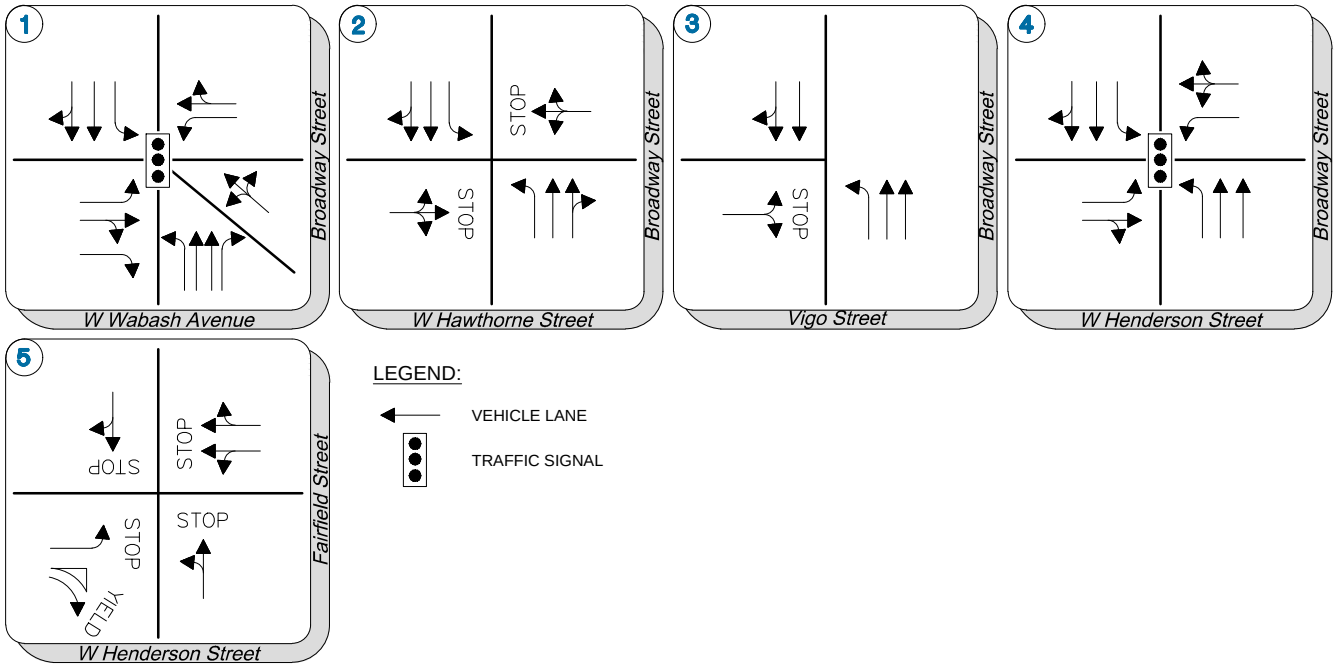
Source:

1.3 Study Intersections

The intersections analyzed within this study have been numbered for ease of reference throughout the report. All study intersection, except for the intersection of Fairfield Street & W Henderson Street, are within the jurisdiction of Caltrans. The following five intersections were identified by Caltrans and the City of Eureka for analysis:

1. Broadway Street & W Wabash Avenue
2. Broadway Street & W Hawthorne Street
3. Broadway Street & Vigo Street
4. Broadway Street & W Henderson Street
5. Fairfield Street & W Henderson Street

Figure 2 presents the existing intersection lane geometrics and traffic controls.



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The Carrington Company
2616 BROADWAY STREET REDEVELOPMENT

EXISTING LANE GEOMETRICS AND CONTROL

Project No. 11153741
Report No. 001
Date 07.11.2018

FIGURE 2

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Source:

2. Level of Service Methodologies and Guidelines

The following section presents a summary of the general level of service (LOS) methodologies and guidelines used in the analysis of intersections.

2.1 Data Requirements

The data requirements for the traffic impact analysis include:

- Existing intersection turning movement counts and vehicle classification counts
- Existing intersection geometry and configuration
- Existing signal timing and phasing

GHD's traffic data collection subconsultant, Counts Unlimited, Inc., collected existing intersection turning movement traffic volumes at all study locations on Wednesday, May 9, 2018 while schools were in session. Data collected by Counts Unlimited, Inc. was inclusive of bicycles and pedestrians. In addition, 24-hour roadway classification counts were also collected on Broadway Street (US 101) south of Henderson Street and north of Vigo Street. All traffic count data are included in Appendix B.

Per Caltrans guidance, the Morning (AM) peak hour was not analyzed as the traffic volumes are less than what is experienced during the Mid-Day peak hour. All intersections were analyzed during the weekday Mid-Day and PM peak hour period. The Mid-Day peak hour is defined as the highest continuous hour of peak traffic flow counted between 11:00 am and 1:00 pm, and the PM peak hour is defined as the highest continuous hour of peak traffic flow counted between 4:00 pm and 6:00 pm under typical weekday conditions.

Weekday Mid-Day and PM peak hour intersection turn movement traffic counts were collected at all study intersections. Schools in the area were in regular session and no known special events were occurring in the area at the time of the traffic counts. Counts were obtained in the absence of inclement weather. Figure 3, located on page 8, presents the existing weekday Mid-Day and PM peak hour volumes.

2.2 General LOS Methodologies

Intersection LOS was calculated for all control types (e.g. signalization, stop sign controlled) using the methods documented in the Transportation Research Board publications *Highway Capacity Manual (HCM) 2000 and 6th Edition*. LOS determinations are presented on a letter grade scale from "A" to "F", whereby LOS "A" represents "free-flow" conditions and LOS "F" represents over capacity conditions. LOS is a qualitative measure of traffic operating conditions, whereby a letter grade is assigned to an intersection representing progressively worsening traffic conditions.

2.2.1 Intersection LOS Methodologies

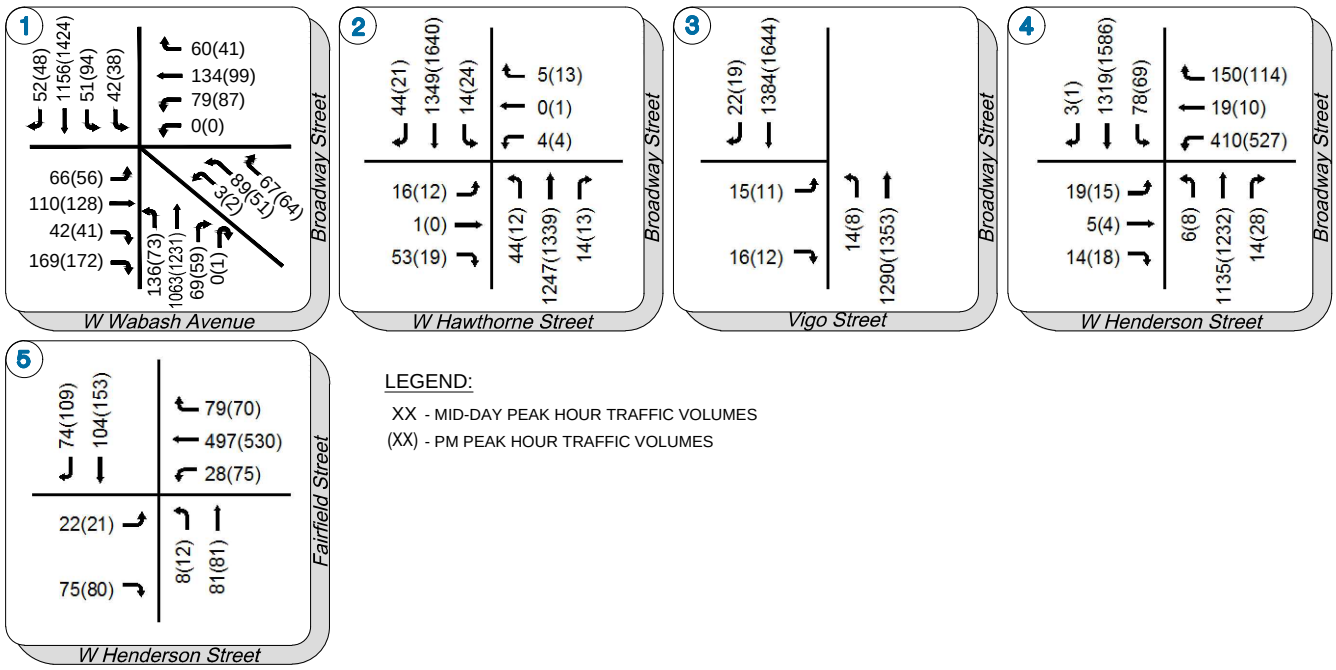
For signalized intersections, intersection delays and LOS are average values for all intersection movements. For two-way stop-controlled (TWSC) intersections, the intersection delays and LOS

are represented by the worst approach. Table 2.1 presents the delay-based LOS criteria for different types of intersection control.

Table 2.1 - Level of Service (LOS) Criteria for Intersections

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle (sec)		
				Signalized	Un signalized	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	<10.0	<10.0	<10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and <20.0	>10.0 and <15.0	>10.0 and <15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and <35.0	>15.0 and <25.0	>15.0 and <25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and <55.0	>25.0 and <35.0	>25.0 and <35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and <80.0	>35.0 and <50.0	>35.0 and <50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0	>50.0

References: 2000 Highway Capacity Manual
Note: Stopped delay/vehicle units are seconds (sec)



LEGEND:

XX - MID-DAY PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES

N

The Carrington Company
2616 BROADWAY STREET REDEVELOPMENT

EXISTING PEAK HOUR TRAFFIC VOLUMES

Project No. 11153741
Report No. 001
Date 07.11.2018

FIGURE 3

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Source:

2.3 Agency LOS Guidelines and Policies

2.3.1 City of Eureka LOS Guidelines

The City of Eureka's General Plan, Section 3: Transportation and Circulation Element, Policy 3.A.2 contains the following policy pertaining to LOS standards in the City:

> *The City shall endeavor to manage its street and highway system so as to maintain Level of Service C operation on all roadway segments, except for any portion of U.S. 101, where Level of Service D shall be acceptable.*

2.3.2 Caltrans LOS Guidelines

The Caltrans published *Guide for the Preparation of Traffic Impact Studies* (Caltrans, 2002) states the following:

> *"Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not be always feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS."*

Consistent with the agencies' policies, this study will consider LOS "C" as the standard acceptable threshold for all intersections in the jurisdiction of the City of Eureka and LOS "D" as the standard acceptable threshold for all intersections in the jurisdiction of Caltrans.

2.4 Intersection Operation Analysis Software

The Synchro 10 (Trafficware) software suite was used to implement the HCM 6 analysis methodologies, except at the signalized intersection of Broadway Street/W Wabash Avenue. This intersection is a non-standard five-legged signalized intersection which cannot be analyzed by implementing HCM 6 analysis through Synchro. Due to HCM 6 inability to analyze five-legged intersections, the study intersection of Broadway Street/W Wabash Avenue was analyzed with HCM 2000. SimTraffic 10 (Trafficware) software suite was used to develop 95th percentile queues for all study intersections.

2.5 Significance Threshold

The following thresholds of significance are used to determine if the proposed project causes a significant impact and requires mitigation:

Signalized Intersections

- The project causes an acceptable LOS to decline to an unacceptable LOS; or
- The project increases the overall average delay by more than five seconds per vehicle at an intersection having an unacceptable LOS without project traffic.

Two-Way Stop Intersections

- The project causes the worst-case approach's acceptable LOS to decline to an unacceptable LOS; or
- The project increases the average delay for the worst-case approach by more than five seconds per vehicle at an intersection that has an unacceptable LOS without the project.

2.6 Technical Analysis Parameters

This TIS provides evaluation of traffic operating conditions by incorporating appropriate technical parameters (e.g. heavy vehicle adjustment factors, peak hour factors, and signal lost-time factors) and reports the resulting intersection delays and LOS as estimated using HCM 6 or HCM 2000 based analysis methodologies. The following section describes all technical parameters incorporated into intersection analysis.

Table 2.2 presents the technical analysis parameters which were applied to study intersections during the analysis.

Table 2.2 – Intersection LOS: Technical Analysis Parameters

Technical Parameters[1, 2, 6]	Caltrans Intersections	City Intersections
Grade	Level at all Intersections	Level at all Intersections
% Trucks	From Counts	From Counts
PHF for Existing & Short Term	From Counts	From Counts
PHF for Future Conditions	0.92 or higher	0.92 or higher
Minimum Signal Cycle Length[3]	Optimized	-
Lost Time per Critical Signal Phase	Optimized	-
Left Turn Critical Volume[4]	1900 vehicles per hour	1900 vechicles per hour
Pedestrian calls per hour[5]	From Counts	From Counts

Notes:
1) Parameters apply to all study intersection unless specifically indicated otherwise
2) All parameters are same for existing as well as Year 2038 conditions
3) Will be optimized as appropriate for all relevant study intersections
4) a.k.a saturated flow rate
5) Applied to all approaches at signalized intersections
6) Computer software defaults will be used for all parameters not listed

2.7 Warrant Analysis

A supplemental traffic signal warrant analysis was completed for unsignalized intersections determined to be operating at an unacceptable LOS. The term "signal warrant" refers to the list of established criteria used by public agencies to quantitatively justify or ascertain the need for installation of a traffic signal at an unsignalized intersection. This study has employed the signal warrant criteria presented in the latest edition of the California Manual on Uniform Traffic Control Devices (MUTCD) for all unsignalized study intersection.

The California MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. Specifically, this study utilizes the peak hour volume-based Warrant 3, also referred to as the Peak Hour Volume Warrant, as one representative type of traffic

signal warrant analysis. It should be noted that the Peak Hour Volume Warrant was only applied when the intersection was found to be operating at an unacceptable LOS. Therefore, there may be instances when the unsignalized intersection operates at acceptable LOS conditions but still meets the Peak Hour Volume Warrant.

2.8 Vehicle Queuing

Vehicle queuing analysis was completed for all intersections to assess capacity of intersections to accommodate the number of vehicles expected to wait at the intersections before being able to pass through or turn. This analysis is important because if there is not enough storage between intersections, in left or right turn pockets, the overflow of vehicles can obstruct the operations of the roadway. SimTraffic 10 (Trafficware) was utilized to analyze and project 95th percentile queue lengths. All defaults values were used within the analysis unless stated in prior sections of this report.

In some cases, the 95th percentile queue will extend into and beyond upstream intersection(s). These cases have been noted in the analysis.

3. Existing Conditions

The Existing condition is the analysis scenario which describes the existing conditions at the study intersections during both the weekday Mid-Day and PM peak hours. Existing conditions establish the baseline traffic conditions. This section includes a discussion of transportation facilities in the project area, including roadway network, transit services and bicycle and pedestrian facilities.

3.1 Existing Roadway Network

Roadways that provide primary circulation in the vicinity of the proposed project are described below. Within the project study area, the road network includes regional routes, arterials and local streets.

Broadway Street (US 101) is a major north-south highway that traverses along costal California. US 101 serves as the principle inter-regional auto and truck travel route that connects Eureka to other portions of the North Coast and the San Francisco Bay Area to the south.

Within the project vicinity, US 101 provides major connection between and through several cities. US 101 represents a major recreational as well as commuter travel route. US 101 is generally a four-lane undivided highway cross-section through Eureka with a posted speed limit of 40 miles per hour (mph) but a posted 35 mph north of the project area.

Vigo Street is a local street that provides access to businesses with driveway access/egress. Vigo Street is currently a dead-end street and not intended for through traffic. The project proposes to include a driveway access/egress from Vigo Street.

West (W) Henderson Street is functionally classified a major arterial by the City of Eureka. Between the intersection of Broadway Street and W Henderson Street and Fairfield Street, two-way traffic is maintained on W Henderson Street. East of Fairfield Street, W Henderson Street is one-way, with

two travel lanes and a Class II bike lane in the westbound direction. W Henderson Street forms a one-way pair with W Harris Street for eastbound traffic. W Henderson Street and W Harris Street provide east-west access to commercial and residential areas, including the Eureka Mall and the Henderson Center shopping district.

Hawthorne Street is a two-lane local street, extending east-west, which provides access to residential areas within the City.

W Wabash Ave is a minor arterial that extends east-west and generally includes a lane in each direction with Class II bike lanes. W Wabash Avenue provides access to a commercial corridor, including businesses and residential.

3.2 Existing Transit Service

The Eureka Transit Service (ETS), a joint power authority within Humboldt Transit Authority (HTA), provides fixed route bus transit service within the City of Eureka. The ETS operations four weekday bus routes, two weekday and Saturday bus routes and one Saturday only bus route; for a total of five separate routes operating at various times and locations throughout the City. Of these routes, two pass through the project area. The following scheduled stops are within one-quarter mile from the project site:

- Forest Service – Red Route, Green Route and Rainbow Route
- Henderson & Central – Green Route
- Henderson & Spring – Green Route and Gold Route
- Harris & Central – Red Route, Green Route, Gold Route, and Rainbow Route

3.3 Existing Bicycle and Pedestrian Facilities

Bicycle facilities are classified into five categories per the Caltrans *Highway Design Manual* (Caltrans, 2018):

- Shared Roadway (No Bikeway Designation) – Most bicycle travel occurs on streets and highways without bikeway designations.
- Class I Bikeway (Bike Path) – A Class I facility is a multi-use trail for the exclusive use of bicycles and pedestrians, separate from the auto traveled way.
- Class II Bikeway (Bike Lane) – A Class II facility is an on-street bicycle lane, with painted markings and signs designating the lane's bicycle-only use. The bicycle lane is separated from vehicle and pedestrian traffic, but the route may be interrupted by vehicle turning movements at driveways, on-street parking or intersections.
- Class III Bikeway (Bike Route) – A Class III bicycle facility is a route for bicyclists in which the available traveled way is shared with vehicles. The facility is designated by signs or other markings and is usually provided when a Class I or Class II facility cannot be provided.

- Class IV Bikeways (Separate Bikeways) – A Class IV bikeway is a bikeway for the exclusive use of bicycles and includes a separation required between the separated bikeway and the through vehicular traffic.

There are no existing bikeway designations on Broadway Street fronting the project. There are wide shoulders in both directions that may be used by bicyclists. Within the project study limits, Class II bike lanes are present on portions of W Henderson Street and W Wabash Avenue.

Pedestrian facilities in the study area primarily consist of sidewalks and crosswalks at intersections. Discontinuous sidewalks are present on the project site frontage along the southbound side of Broadway Street and north toward W Wabash Avenue. Sidewalks are also present on the following streets:

- Broadway Street (both sides north of Vigo Street)
- W Henderson Street (one side between Broadway Street and Fairfield Street and both sides east of Fairfield Street)
- W Wabash Avenue (both sides)

3.4 Existing Site Access and Circulation

The project site is currently provided from Broadway Street and Vigo Street. Access to the project site from Broadway Street is by a full-access 60-foot driveway from Broadway Street adjacent to an operational retail establishment (Discount Cigarettes), that is not associated with the project. Access from Vigo Street is by a full access approximate 100-foot driveway. One building is present on the project site, generally located at the center of the site between the two driveways. Parking is available at the south, east, and north sides of the building. The gravel lot to the west of the buildings is not generally accessible to the public. Traffic circulation in and around the site is generally acceptable for the current users.

3.5 Existing Intersections Operations

Existing weekday Mid-Day and PM peak hour intersection traffic operations were quantified utilizing the existing traffic volumes and existing intersection lane geometrics and control types. Table 3.1 presents intersection operations for the Existing conditions.

Table 3.1 – Existing Intersection Operations

#	Intersection	Control Type[1,2]	Target LOS	Mid-Day Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	Broadway St & W Wabash Ave	Signal	D	36.5	D	-	36.3	D	-
2	**Broadway St & W Hawthorne St**	**TWSC**	**D**	27.3	D	-	**51.0**	**F**	**No**
3	**Broadway St & Vigo St**	**TWSC**	**D**	24.8	C	-	**36.2**	**E**	**No**
4	**Broadway St & W Henderson St**	**Signal**	**D**	32.5	C	-	**59.4**	**E**	**-**
5	Fairfield St & W Henderson St	AWSC	C	12.3	B	-	15.4	C	-

Notes:
1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC & Signal
3. Warrant = Based on California MUTCD Warrant 3

As presented in Table 3.1, three of the five study intersections listed below are currently found to operate below the threshold LOS:

- Intersection 2 – Broadway Street & W Hawthorne Street
- Intersection 3 – Broadway Street & Vigo Street
- Intersection 4 – Broadway Street & W Henderson Street

Intersections 1 and 5 are currently found to operate at or above the threshold LOS.

3.6 Existing Queues

Table 3.2, located on page 15, presents a summary of the Existing queue lengths for weekday Mid-Day and PM peak hour.

Table 3.2 – Existing 95th Percentile Queue Lengths

Int. #	Intersection/Approach	Control Type	Existing 95th Percentile Queue (ft)		Available Storage
			Mid-Day Peak Hour	PM Peak Hour	
1	***Broadway St & W Wabash Ave***				
	Eastbound Left	Signal	***144***	***144***	70
	Eastbound Thru/Right		289	373	-
	Eastbound Right		***211***	***224***	70
	Westbound Left		642	737	-
	Westbound Thru/Right		***340***	***374***	235
	Northbound Left		***341***	***260***	205
	Northbound Thru		541	661	850
	Northbound Right		***245***	***255***	165
	Southbound Left		***276***	***267***	155
	Southbound Thru		700	649	-
	Southbound Thru/Right		705	665	-
	Northw est Left/Right		182	177	-
2	***Broadway St & W Hawthorne St***				
	Eastbound Left/Thru/Right	TWSC	97	74	-
	Westbound Left/Thru/Right		26	52	-
	Northbound Left		41	12	-
	Northbound Thru/Right		10	49	-
	Southbound Left		12	24	-
	Southbound Thru/Right		16	47	850
3	***Broadway St & Vigo St***				
	Eastbound Left/Right	TWSC	56	48	-
	Northbound Left		34	26	440
	Northbound Thru		-	7	440
	Southbound Thru		-	8	-
	Southbound Thru/Right		-	11	-
4	***Broadway St & W Henderson St***				
	Eastbound Left	Signal	45	41	-
	Eastbound Thru/Right		60	56	-
	Westbound Left		185	255	420
	Westbound Left/Thru/Right		205	277	420
	Northbound Left		39	54	105
	Northbound Thru		317	350	-
	Northbound Thru/Right		288	316	-
	Southbound Left		136	114	190
	Southbound Thru		298	366	440
	Southbound Thru/Right		312	383	440
5	***Fairfield St & W Henderson St***				
	Eastbound Left	AWSC	45	46	-
	Eastbound Right		48	***55***	50
	Westbound Left/Thru		85	107	-
	Westbound Thru/Right		96	92	-
	Northbound Left/Thru		51	60	-
	Southbound Thru/Right		69	96	-

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control

*2. **Bold** text indicates queues that exceed available storage*

3. Queues are noted in feet (ft)

4. Available storage is noted in feet (ft)

Presently, the following 95th percentile queues extend into or beyond an adjacent upstream intersection:

- Intersection 1 Broadway and W Wabash Avenue
  - Eastbound thru-right and right turn lane queue extends into and past Koster Street
  - Westbound thru-right lane queue extends into and past Spring Street
  - Westbound left-turn lane queue extends into and past Spring Street and Albee Street
  - Northbound thru lane queue extends into Hawthorne Street (Intersection 2)
  - Southbound thru and thru-right lanes extend into and past W 15th street and W 14th Street

4. Project Trip Generation, Distribution and Assignment

This section discusses the methods and analysis conducted in selecting trip generation rates and assigning project trips to the existing roadway network. The magnitude of traffic produced by the proposed project and the location where that traffic would appear was estimated using the three-step process of trip generation, trip distribution, and trip assignment.

4.1 Project Description

For analysis purposes, the proposed project will be completed in a single phase. The term "project", as used in this report, refers to the development as follows:

- Location: +/- acres west of Broadway Street (US 101), south of Vigo Street
  - Land use quantities:
    - 6,400 square feet of Fast Food with Drive Thru
    - 2,500 square feet of Fast Casual Restaurant
    - 3,350 square feet of Strip Mall Retail or Professional Office
  - Existing site use:
    - The site is presently used for a permitted food truck, parking and seating. An estimated credit for the removal of this use was taken in the analysis.
- Access to the project will be via two proposed driveway
  - One full-access unsignalized driveway on Vigo Street
  - One right-in/right-out unsignalized driveway on Broadway Street (US 101)

4.2 Project Trip Generation

Project trip generation forecasts were derived using the *Institute of Transportation Engineers' Trip Generation Manual 10th Edition* (ITE 2017) (Trip Generation Manual) average rates and equations. Table 4.1 presents the proposed project's trip generation for weekday Mid-Day and PM peak hours.

Table 4.1 – Proposed Project Trip Generation

Land Use Category (ITE Code)	Unit[1]	Daily Trip Rate/Unit[2]	Mid-Day Peak Hour Trip Rate/Unit			PM Peak Hour Trip Rate/Unit		
			Total	In %	Out %	Total	In %	Out %
Fast Casual Restaurant (930)	ksf	315.17	43.79	50%	50%	14.13	50%	50%
Fast-Food with Drive-Thru (934)	ksf	470.95	51.36	51%	49%	32.66	52%	48%
Shopping Center (820)	ksf	11.89	3.00	62%	38%	3.81	48%	52%
Project Name	**Quantity (Units)**	**Daily Trips**	**Mid-Day Peak Hour Trips**			**PM Peak Hour Trips**		
			Total	**In**	**Out**	**Total**	**In**	**Out**
Fast Food - Casual	2.5	788	109	55	54	35	17	18
Fast Foods with Drive-Thru	6.4	3,014	329	168	161	209	109	100
Shopping Center	3.4	40	10	6	4	13	7	6
New Project Driveway Trips		**3,842**	**448**	**229**	**219**	**257**	**133**	**124**
Fast Casual Restaurant Pass-by: 43% Daily, Mid-Day, & PM		*-339*	*-47*	*-24*	*-23*	*-15*	*-7*	*-8*
Fast Food w/ Drive Thru Window Pass-by: 49% Daily & Mid-Day, 50% PM		*-1,477*	*-161*	*-82*	*-79*	*-104*	*-54*	*-50*
		-14	*-3*	*-2*	*-1*	*-4*	*-2*	*-2*
Net New Project Trips		**2,013**	**237**	**121**	**116**	**134**	**70**	**64**

Notes:
1. 1 ksf = 1,000 square feet DU = dwelling unit
2. Trip rates based on ITE Trip Generation Manual 10th edition fitted-curve equations or average rates
3. Pass-by rates based off the publication ITE Trip Generation Handbook, 3rd Edition

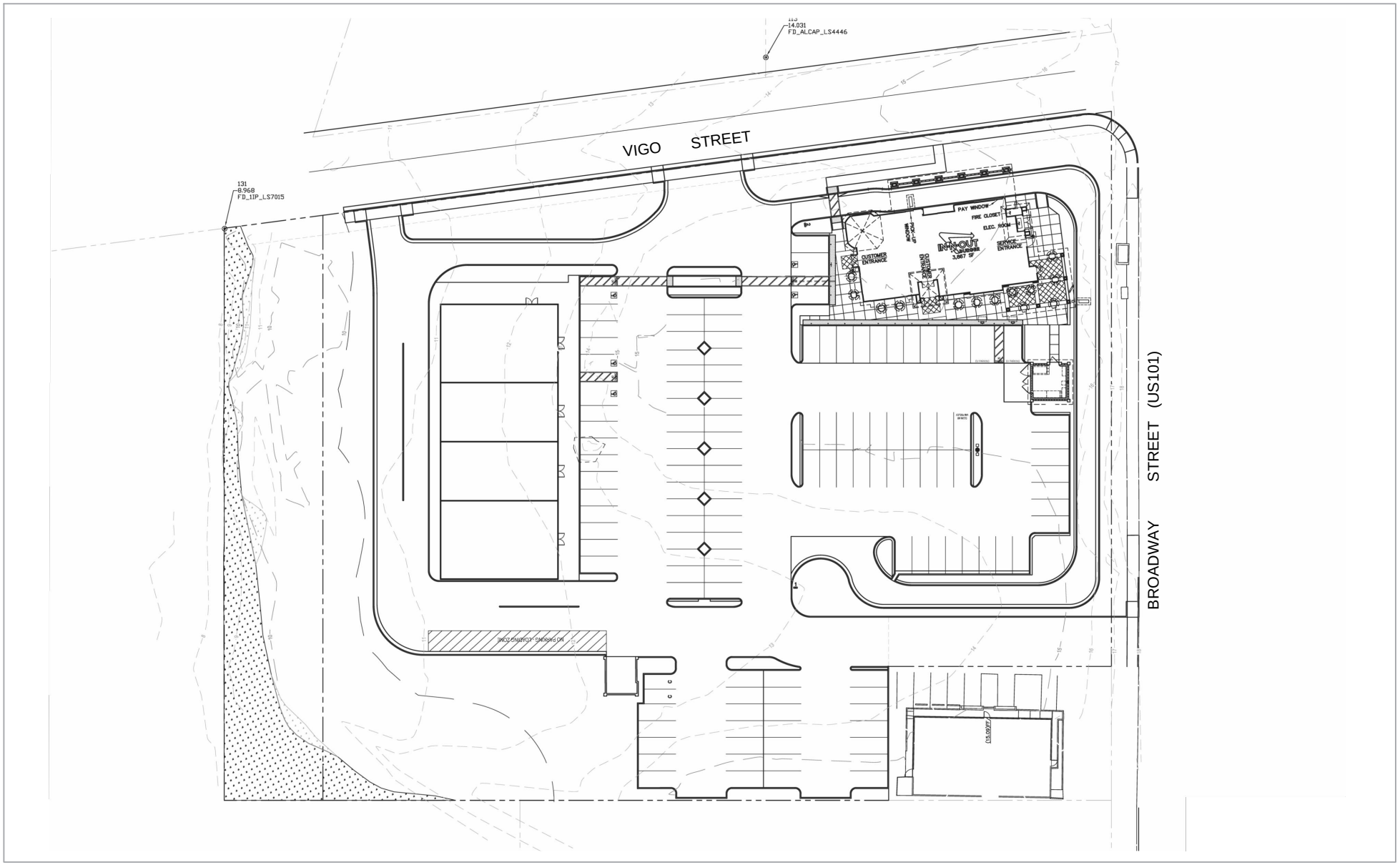
The trip generation for the project includes pass-by trips, which are a subset of trip generation that applies to commercial/retail/restaurant developments. Pass-By trips are vehicles already on the roadway network that the business hopes to attract into their site as the vehicles are driving by. The percentage of pass-by trips selected for the land uses within this project are within the ranges included in the ITE Trip Generation Manual.

As presented in Table 4.1, the proposed project is projected to generate 237 Mid-Day and 134 PM net new weekday peak hour trips.

4.3 Project Trip Distribution and Assignment

The project directional trip distribution and specific assignment of project-generated trips were established based on an understanding of existing and projected future traffic flows and travel patterns within the vicinity of the project site. Thus, approximately 55%of net new project trips will come from the north and 45% of net new project trips will come from the south. Pass-by trips are based on existing through traffic passing the intersection. These two volumes have been added together resulting in the final trip assignment that may show outbound traffic as approximately equal distribution to the north and south due to the increase of pass-by traffic from the north that then head south.

Figure 4, located on page 18, presents the detailed project site plan. Figure 5, located on page 19, presents the project trip distribution. Figure 6, located on page 20, presents the project trip assignment.



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2616 BROADWAY STREET REDEVELOPMENT

PROJECT SITE PLAN

Project No. 11153741
Report No. 001
Date 07.11.2018

FIGURE 4

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Source:

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2616 BROADWAY STREET REDEVELOPMENT

TRIP DISTRIBUTION

Project No. 11153741
Report No. 001
Date 07.11.2018

FIGURE 5

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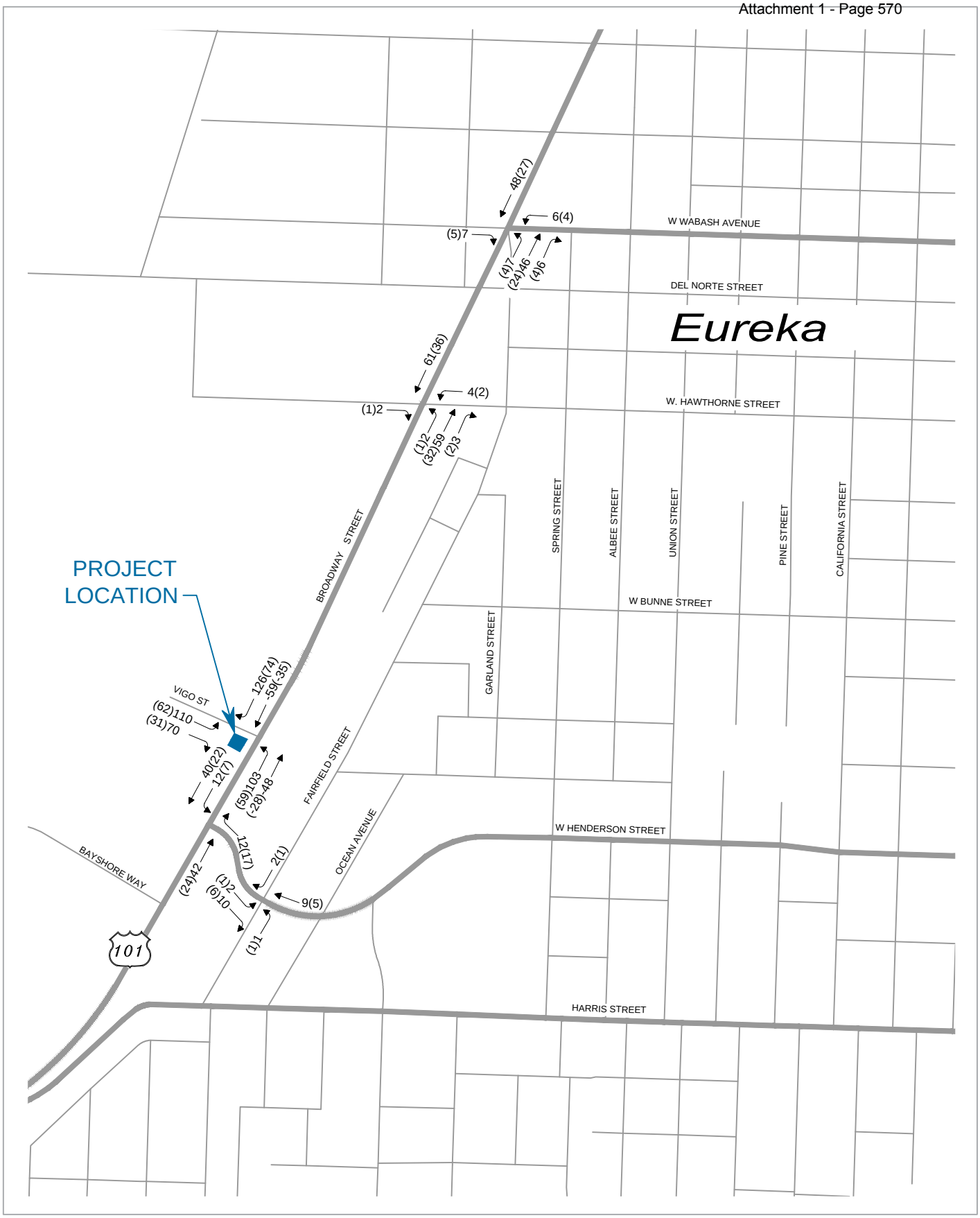

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The Carrington Company
2616 BROADWAY STREET REDEVELOPMENT

PROJECT TRIP ASSIGNMENT
PEAK HOUR TRAFFIC VOLUMES

Project No. **11153741**
Report No. **001**
Date **11.21.2018**

FIGURE 6

Filename: K:\PRJ\2502\T2502\T2502TG001.dwg Plot Date: 21 November 2018 - 8:26 AM

Source:

5. Existing Plus Project Conditions

The Existing Plus Project conditions is the analysis scenario in which traffic impacts associated with the proposed project are investigated in comparison to the Existing conditions.

5.1 Current Land Use

Currently, the proposed project site has a food cart pod that is present every day. The food cart pod would no longer be in operation once the proposed project is built. The trips associated with the food cart pod have been reduced from turning movements at the study intersections.

ITE code 926 (Food Cart Pod) only has data for PM peak hour. Therefore, the existing turning movement counts were compared between Mid-Day and PM peak hour. The Mid-Day peak hour turning movement count was approximately 34% higher than the PM peak hour. Therefore, the Mid-Day trip rate was assumed to be approximately 34% higher. This is similar to the description provided by ITE stating “Food pods typically serve lunch and dinner with lunchtime typically generating the highest volumes of the day.”

Table 5.1 presents the current project site use trip generation for weekday Mid-Day and PM peak hours.

Table 5.1 – Existing Trip Generation for Food Cart Pod

Land Use Category (ITE Code)	Unit[1]	Mid-Day Peak Hour Trip Rate/Unit			PM Peak Hour Trip Rate/Unit		
		Total	In %	Out %	Total	In %	Out %
Food Cart Pod (926)	Food Carts	4.13	50%	50%	3.08	50%	50%
Project Name	**Quantity (Units)**	**Mid-Day Peak Hour Trips**			**PM Peak Hour Trips**		
		Total	**In**	**Out**	**Total**	**In**	**Out**
Food Pod	1.0	4	2	2	3	1	2
New Project Driveway Trips		**4**	**2**	**2**	**3**	**1**	**2**
Net New Project Trips		**4**	**2**	**2**	**3**	**1**	**2**

Notes:
1. Trip rates based on ITE Trip Generation Manual 10th edition fitted-curve equations

As presented in Table 5.1, the current food cart pod generates approximately four Mid-Day and three PM peak hour trips. These trips will be assumed to not exist on the network as the attraction is no longer available. A reduction in turning movement counts based on current turning movement counts will be assumed.

5.2 Intersection Operations

Existing Plus Project weekday Mid-Day and PM peak hour intersection traffic operations were quantified by superimposing traffic generated by the proposed project onto Existing No Project conditions with the addition of a left turn lane at the intersection of Broadway Street & Vigo Street.

Figure 7, located on page 24, presents the Existing Plus Project intersection traffic volumes.

Table 5.2 presents a summary of the Existing Plus Project study intersection LOS conditions.

Table 5.2 – Existing Plus Project Intersection Level of Service

#	Intersection	Control Type[1,2]	Target LOS	Mid-Day Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	Broadway St & W Wabash Ave	Signal	D	38.3	D	-	37.3	D	-
2	**Broadway St & W Hawthorne St**	**TWSC**	**D**	**47.4**	**E**	**No**	**84.1**	**F**	**No**
3	**Broadway St & Vigo St**	**TWSC**	**D**	**149.1**	**F**	**Yes**	**165.9**	**F**	**Yes**
4	**Broadway St & W Henderson St**	**Signal**	**D**	34.6	C	-	**61.7**	**E**	**-**
5	Fairfield St & W Henderson St	AWSC	C	12.6	B	-	15.6	C	-

Notes:
1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC & Signal
3. Warrant = Based on California MUTCD Warrant 3

As presented in Table 5.2, three of the five study intersections, noted below, are projected to operate below the threshold LOS:

- Intersection 2 – Broadway Street & W Hawthorne Street
- Intersection 3 – Broadway Street & Vigo Street
  - With the striping of separate left-turn and right-turn lanes the overall approach LOS F is unacceptable. The left-turn volume contributes significantly to LOS degradation (238.9 seconds/LOS F during Mid-Day peak hour and 251.3 seconds/LOS F during PM peak hour) for the overall approach. The right-turn lane has acceptable LOSC (LOS C) for both Mid-Day and PM peak hours.
- Intersection 4 – Broadway Street & W Henderson Street

Intersections 1 and 5 are projected to operate at or above the threshold LOS.

5.3 Existing Plus Project Queues

Table 5.3 presents a summary of the Existing Plus Project queues for weekday Mid-Day and PM peak hour.

The following 95th percentile queues extend into or beyond an adjacent upstream intersection:

- Intersection 1 Broadway and W Wabash Avenue
  - Eastbound thru-right and right turn lane queue extends into and past Koster Street
  - Westbound thru-right lane queue extends into and past Spring Street
  - Westbound left-turn lane queue extends into and past Spring Street and Albee Street
  - Northbound thru lane queue extends into Hawthorne Street (Intersection 2)
  - Southbound thru and thru-right lanes extend into and past W 15th street and W 14th Street

Table 5.3 – Existing Plus Project 95th Percentile Queue Lengths

Int. #	Intersection/Approach	Control Type	Existing Plus Project 95th Percentile Queue (ft)		Available Storage
			Mid-Day Peak Hour	PM Peak Hour	
1	***Broadway St & W Wabash Ave***				
	Eastbound Left	Signal	***145***	***155***	70
	Eastbound Thru/Right		289	373	-
	Eastbound Right		***211***	***224***	70
	Westbound Left		642	737	-
	Westbound Thru/Right		***340***	***377***	235
	Northbound Left		***342***	***304***	205
	Northbound Thru		572	709	850
	Northbound Right		***245***	***289***	165
	Southbound Left		***276***	***273***	155
	Southbound Thru		1206	662	-
	Southbound Thru/Right		1208	667	-
	Northw est Left/Right		185	177	-
2	***Broadway St & W Hawthorne St***				
	Eastbound Left/Thru/Right	TWSC	144	74	-
	Westbound Left/Thru/Right		37	61	-
	Northbound Left		118	93	-
	Northbound Thru/Right		67	89	-
	Southbound Left		86	164	-
	Southbound Thru/Right		78	176	850
3	***Broadway St & Vigo St***				
	Eastbound Left	TWSC	464	141	-
	Eastbound Right		276	61	-
	Northbound Left		115	75	440
	Northbound Thru		16	21	440
	Southbound Thru		15	21	-
	Southbound Thru/Right		28	26	-
4	***Broadway St & W Henderson St***				
	Eastbound Left	Signal	49	46	-
	Eastbound Thru/Right		60	60	-
	Westbound Left		186	256	420
	Westbound Left/Thru/Right		207	277	420
	Northbound Left		57	75	105
	Northbound Thru		396	415	-
	Northbound Thru/Right		354	372	-
	Southbound Left		136	139	190
	Southbound Thru		298	366	440
	Southbound Thru/Right		312	383	440
5	***Fairfield St & W Henderson St***				
	Eastbound Left	AWSC	48	56	-
	Eastbound Right		***64***	***64***	50
	Westbound Left/Thru		85	107	-
	Westbound Thru/Right		96	92	-
	Northbound Left/Thru		53	60	-
	Southbound Thru/Right		76	105	-

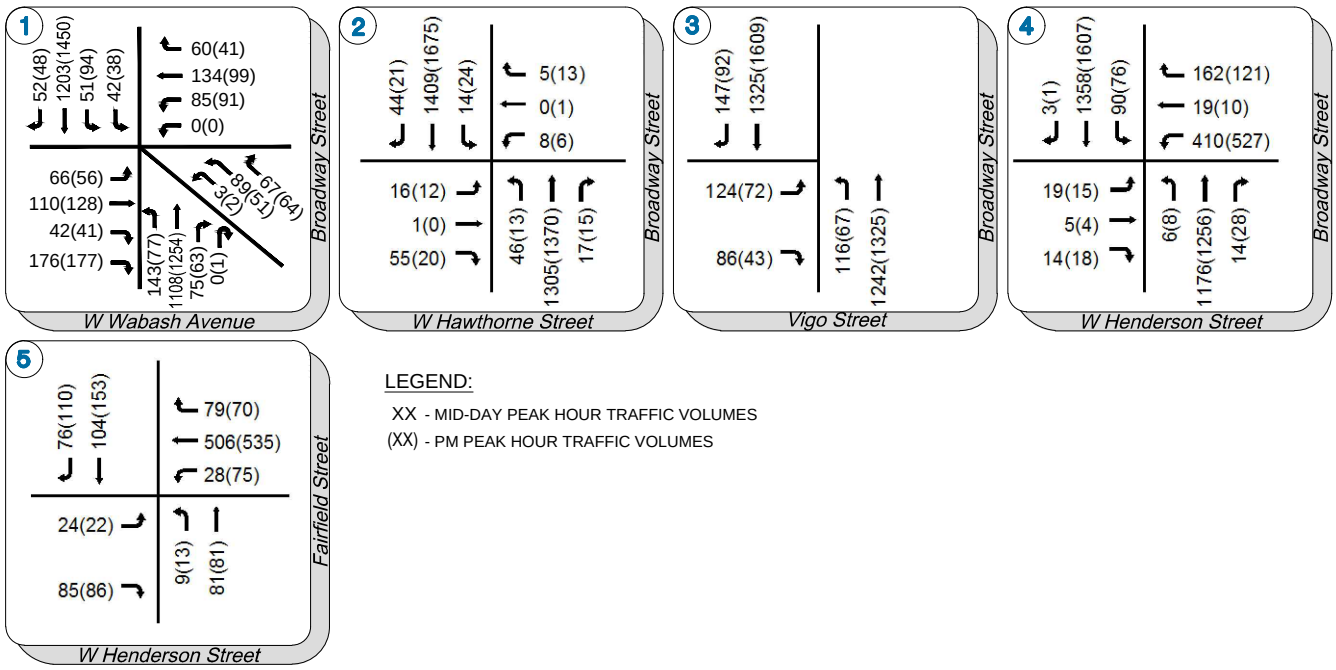
Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control

*2. **Bold** text indicates queues that exceed available storage*

3. Queues are noted in feet (ft)

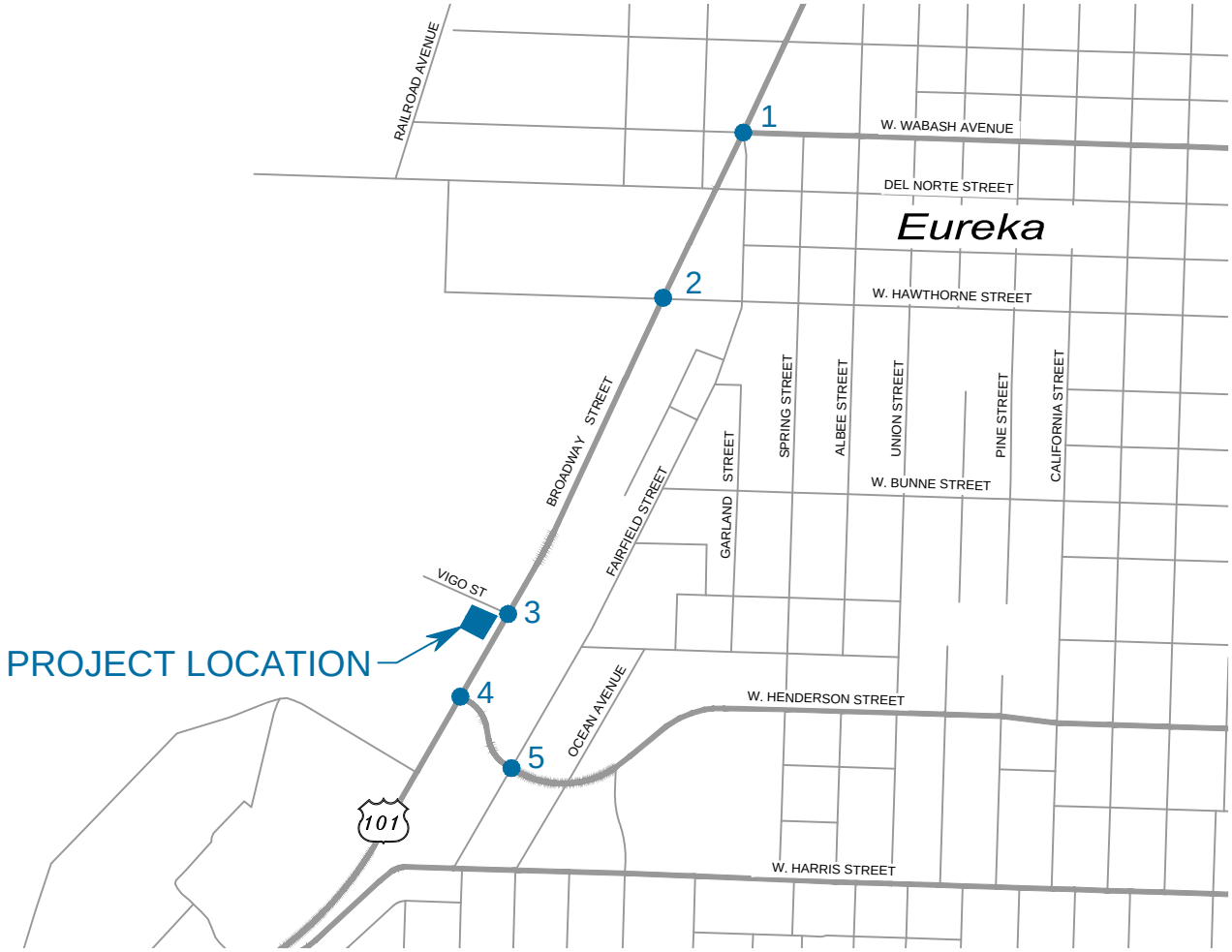
4. Available storage is noted in feet (ft)



LEGEND:

XX - MID-DAY PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



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The Carrington Company
2616 BROADWAY STREET REDEVELOPMENT

EXISTING PLUS PROJECT
PEAK HOUR TRAFFIC VOLUMES

Project No. 11153741
Report No. 001
Date 11.21.2018

FIGURE 7

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Source:

6. Cumulative (Year 2038) Conditions

The long-term future year traffic forecasts for this study have been developed using the 2014 Growth Factors memorandum prepared by Caltrans. The growth rate of 25% represents an expected 20 year straight line growth for the region. This growth rate is consistent with the 2017 US 101 Transportation Concept Report prepared by Caltrans.

The Cumulative "No Project" is alternatively referred to as Year 2038 No Project conditions where the proposed development remains undeveloped through Year 2038. It is assumed that the intersection of Broadway Street and Hawthorn Street is signalized, per Caltrans comments.

Figure 8, located on page 28 presents the Year 2038 No Project weekday Mid-Day and PM traffic volumes.

6.1 Year 2038 No Project Intersection Operations

Table 6.1 presents a summary of the Year 2038 No Project study intersection LOS conditions.

Table 6.1 - Year 2038 No Project Intersection Level of Service

#	Intersection	Control Type[1,2]	Target LOS	Mid-Day Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	Broadway St & W Wabash Ave	Signal	D	37.7	D	-	40.8	D	-
2	Broadway St & W Hawthorne St	Signal	D	33.3	C	-	32.5	C	-
3	**Broadway St & Vigo St**	**TWSC**	**D**	**42.6**	**E**	**No**	**69.3**	**F**	**No**
4	**Broadway St & W Henderson St**	**Signal**	**D**	51.8	D	-	**83.2**	**F**	**-**
5	**Fairfield St & W Henderson St**	**AWSC**	**C**	17.1	C	-	**26.1**	**D**	**Yes**

Notes:
1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC & Signal
3. Warrant = Based on California MUTCD Warrant 3

As presented in Table 6.1, three of the five study intersections, noted below, are projected to operate below the threshold LOS:

- Intersection 3 – Broadway Street & Vigo Street
- Intersection 4 – Broadway Street & W Henderson Street
- Intersection 5 – Fairfield Street & W Henderson Street

Intersections 1 and 2 are projected to operate at or above the threshold LOS.

6.2 Year 2038 No Project Queues

Table 6.2, located on page 26, presents a summary of the Year 2038 No Project queues for weekday Mid-Day and PM peak hour.

Table 6.2 – Year 2038 No Project 95th Percentile Queue Lengths

Int. #	Intersection/Approach	Control Type	Cumulative No Project 95th Percentile Queue (ft)		Available Storage
			Mid-Day Peak Hour	PM Peak Hour	
1	***Broadway St & W Wabash Ave***				
	Eastbound Left	Signal	***159***	***161***	70
	Eastbound Thru/Right		488	560	-
	Eastbound Right		***243***	***243***	70
	Westbound Left		1077	737	-
	Westbound Thru/Right		***403***	***374***	235
	Northbound Left		***449***	***470***	205
	Northbound Thru		***1027***	***1072***	850
	Northbound Right		***245***	***255***	165
	Southbound Left		***426***	***449***	155
	Southbound Thru		1221	1316	-
	Southbound Thru/Right		1190	1294	-
2	***Broadway St & W Hawthorne St***				
	Eastbound Left/Thru/Right	Signal	118	74	-
	Westbound Left/Thru/Right		136	123	-
	Northbound Left		193	147	-
	Northbound Thru		963	1855	-
	Northbound Thru/Right		965	1864	-
	Southbound Left		68	98	-
	Southbound Thru		456	515	850
	Southbound Thru/Right		480	533	850
3	***Broadway St & Vigo St***				
	Eastbound Left/Right	TWSC	67	109	-
	Northbound Left		45	50	440
	Northbound Thru		7	359	440
	Southbound Thru		17	280	-
	Southbound Thru/Right		27	297	-
4	***Broadway St & W Henderson St***				
	Eastbound Left	Signal	50	50	-
	Eastbound Thru/Right		69	88	-
	Westbound Left		326	***495***	420
	Westbound Left/Thru/Right		351	***498***	420
	Northbound Left		56	77	105
	Northbound Thru		571	730	-
	Northbound Thru/Right		512	694	-
	Southbound Left		***198***	***285***	190
	Southbound Thru		417	***538***	440
	Southbound Thru/Right		432	***543***	440
5	***Fairfield St & W Henderson St***				
	Eastbound Left	AWSC	58	70	-
	Eastbound Right		***69***	***76***	50
	Westbound Left/Thru		105	261	-
	Westbound Thru/Right		127	250	-
	Northbound Left/Thru		66	67	-
	Southbound Thru/Right		93	208	-

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control

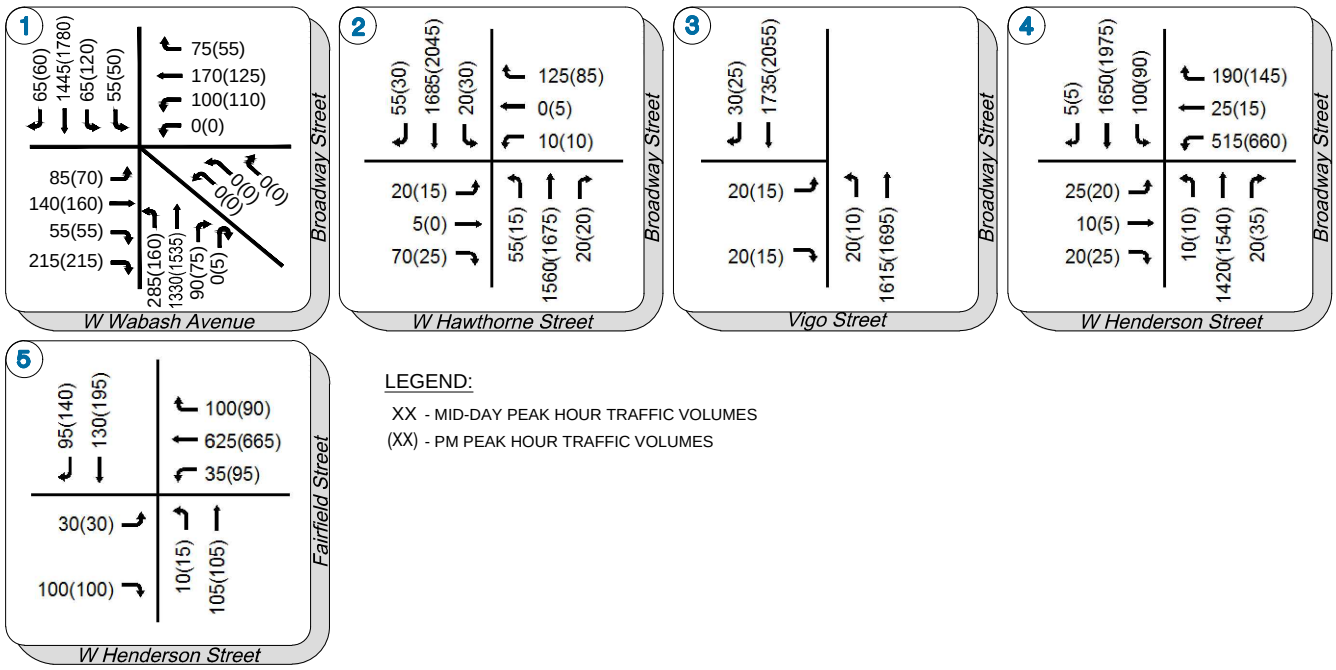
*2. **Bold** text indicates queues that exceed available storage*

3. Queues are noted in feet (ft)

4. Available storage is noted in feet (ft)

Due to limited storage available at the intersection of Broadway Street and W Wabash Avenue and heavy congestion, the projected 95th percentile queues for Year 2038 No Project may be more extensive than what is reported below and cannot be represented adequately. The following 95th percentile queues extend into or beyond an adjacent upstream intersection:

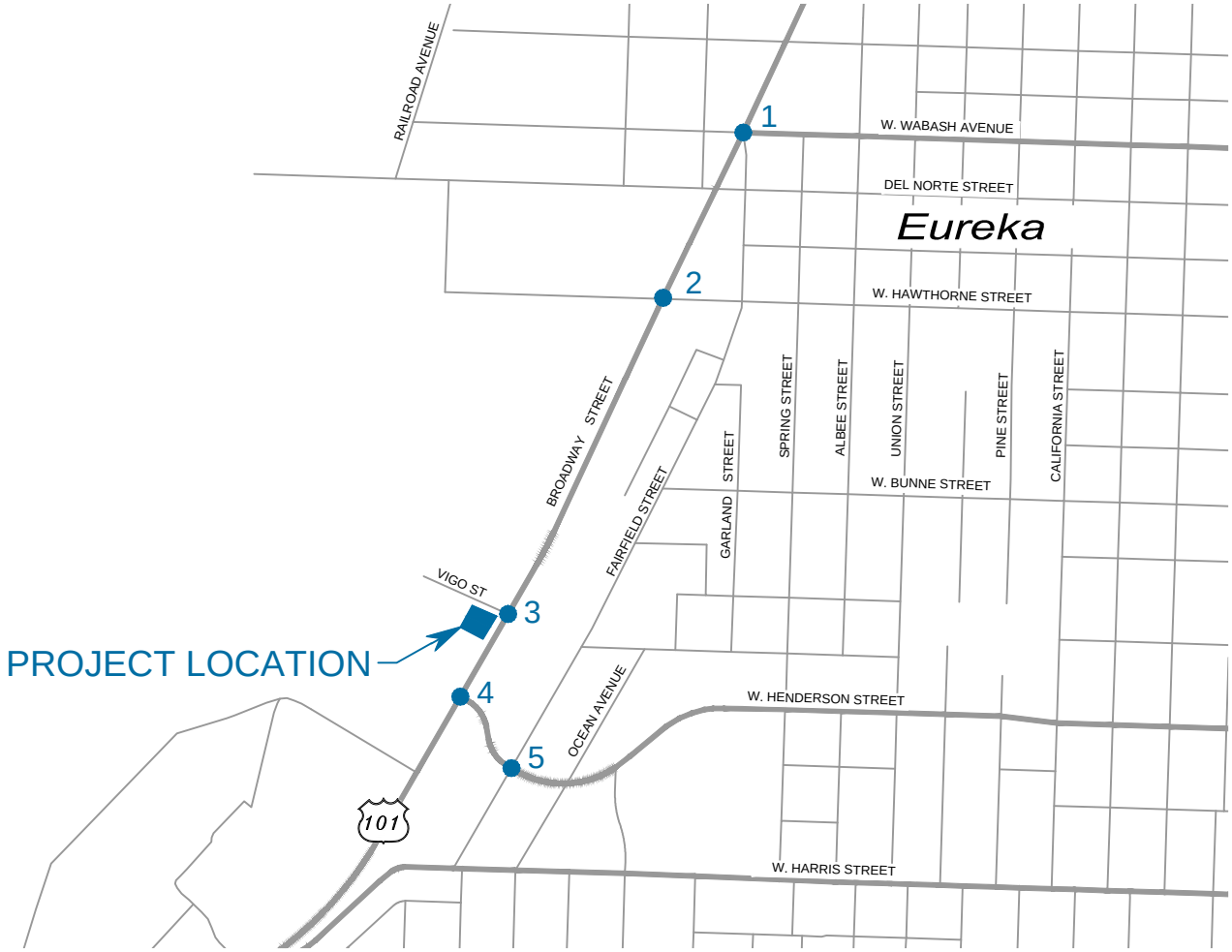
- Intersection 1 Broadway and W Wabash Avenue
    - Eastbound thru-right and right turn lane queue extends into and past Koster Street
    - Westbound thru-right lane queue extends into and past Spring Street
    - Westbound left-turn lane queue extends into and past Spring Street and Albee Street
    - Northbound thru lane queue extends into Hawthorne Street (Intersection 2)
    - Southbound thru and thru-right lanes extend into and past W 15th street and W 14th Street
- Intersection 2 Broadway and Hawthorne Street
    - Northbound thru and thru-right lane queues extend into Vigo Street during PM peak hour
- Intersection 4 Broadway and W Henderson Street
    - Westbound left and left-thru-right lane queues extend into and past Fairfield Street during PM peak hour
    - Southbound thru and thru-right lane queues extend into and past Vigo Street



LEGEND:

XX - MID-DAY PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



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The Carrington Company
2616 BROADWAY STREET REDEVELOPMENT

YEAR 2038 NO PROJECT
PEAK HOUR TRAFFIC VOLUMES

Project No. 11153741
Report No. 001
Date 11.21.2018

FIGURE 8

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Source:

7. Year 2038 Plus Project Conditions

The Year 2038 Plus Project conditions were simulated by superimposing traffic generated by full build-out of the proposed project onto Year 2038 No Project traffic volumes. Figure 10, located on page 34, presents the Year 2038 Plus Project peak hour traffic volumes.

Due to limited storage available at the intersection of Broadway Street/W Wabash Avenue and heavy congestion, the projected 95th percentile queues for Year 2038 Plus Project may be more extensive than what is reported below and cannot be represented adequately.

Figure 9, located on page 33 presents the Year 2038 Plus Project weekday Mid-Day and PM traffic volumes.

Year 2038 Plus Project Intersection Operations

Table 7.1 presents a summary of the Year 2038 Plus Project study intersection LOS conditions.

Table 7.1 - Year 2038 Plus Project Intersection Level of Service

#	Intersection	Control Type[1,2]	Target LOS	Mid-Day Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	Broadway St & W Wabash Ave	Signal	D	37.8	D	-	42.2	D	-
2	Broadway St & W Hawthorne St	Signal	D	39.5	D	-	35.4	D	-
3	**Broadway St & Vigo St**	**TWSC**	**D**	**505.3**	**F**	**Yes**	**519.0**	**F**	**Yes**
4	**Broadway St & W Henderson St**	**Signal**	**D**	**56.1**	**E**	**-**	**86.4**	**F**	**-**
5	**Fairfield St & W Henderson St**	**AWSC**	**C**	17.6	C	-	**26.8**	**D**	**Yes**

Notes:
1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC & Signal
3. Warrant = Based on California MUTCD Warrant 3

As presented in Table 7.1, three of the five study intersections, noted below, are projected to operate below the threshold LOS:

- Intersection 3 – Broadway Street & Vigo Street
  - With the striping of separate left-turn and right-turn lanes the overall approach LOS F is unacceptable. The left-turn volume contributes significantly to LOS degradation (greater than 300 seconds [LOS F] during Mid-Day peak hour and greater than 300 seconds [LOS F] during PM peak hour) for the overall approach. The right-turn lane is LOS D for both Mid-Day and PM peak hours.
- Intersection 4 – Broadway Street & W Henderson Street
- Intersection 5 – Fairfield Street & W Henderson Street

Intersections 1 and 2 are projected to operate at or above the threshold LOS.

7.1 Year 2038 Plus Project Queues

Table 7.2 presents a summary of the *Year 2038 Plus Project* queues for weekday Mid-Day and PM peak hour.

Table 7.2 – Year 2038 Plus Project 95th Percentile Queue Lengths

Int. #	Intersection/Approach	Control Type	Cumulative Plus Project 95th Percentile Queue (ft)		Available Storage
			Mid-Day Peak Hour	PM Peak Hour	
1	***Broadway St & W Wabash Ave***				
	Eastbound Left	Signal	***230***	***151***	70
	Eastbound Thru/Right		384	482	-
	Eastbound Right		***298***	***246***	70
	Westbound Left		642	737	-
	Westbound Thru/Right		***489***	***374***	235
	Northbound Left		***729***	***507***	205
	Northbound Thru		***997***	***1059***	850
	Northbound Right		***245***	***255***	165
	Southbound Left		***276***	***273***	155
	Southbound Thru		1455	1413	-
	Southbound/Right		1458	1413	-
2	***Broadway St & W Hawthorne St***				
	Eastbound Left/Thru/Right	Signal	97	74	-
	Westbound Left/Thru/Right		123	147	-
	Northbound Left		168	144	-
	Northbound Thru		1001	1649	-
	Northbound Thru/Right		998	1655	-
	Southbound Left		55	84	-
	Southbound Thru		380	342	850
	Southbound Thru/Right		399	367	850
3	***Broadway St & Vigo St***				
	Eastbound Left	TWSC	817	305	-
	Eastbound Right		666	84	-
	Northbound Left		138	165	440
	Northbound Thru		77	319	440
	Southbound Thru		15	165	-
	Southbound Thru/Right		26	183	-
4	***Broadway St & W Henderson St***				
	Eastbound Left	Signal	50	50	-
	Eastbound Thru/Right		70	84	-
	Westbound Left		342	***510***	420
	Westbound Left/Thru/Right		368	***508***	420
	Northbound Left		67	54	105
	Northbound Thru		642	760	-
	Northbound Thru/Right		564	723	-
	Southbound Left		***212***	***288***	190
	Southbound Thru		397	***506***	440
	Southbound Thru/Right		395	***509***	440
5	***Fairfield St & W Henderson St***				
	Eastbound Left	AWSC	57	66	-
	Eastbound Right		***71***	***80***	50
	Westbound Left/Thru		116	253	-
	Westbound Thru/Right		136	243	-
	Northbound Left/Thru		64	66	-
	Southbound Thru/Right		91	183	-

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control

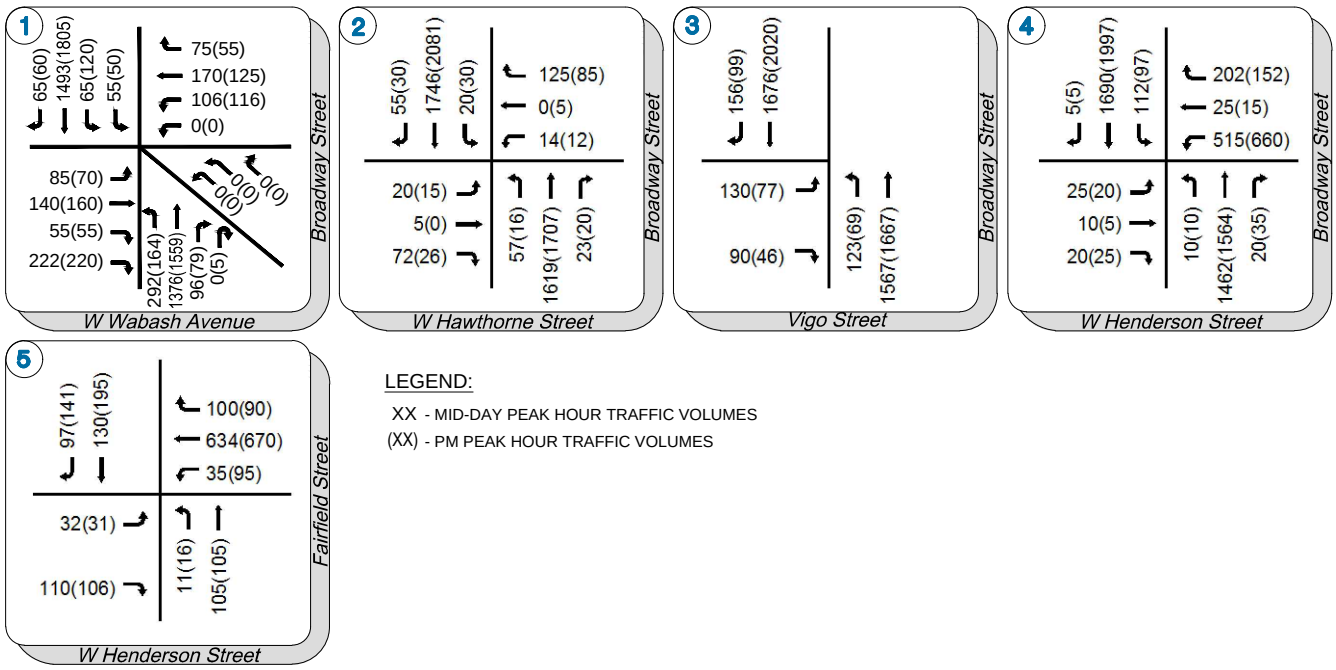
*2. **Bold** text indicates queues that exceed available storage*

3. Queues are noted in feet (ft)

4. Available storage is noted in feet (ft)

The following 95th percentile queues extend into or beyond an adjacent upstream intersection:

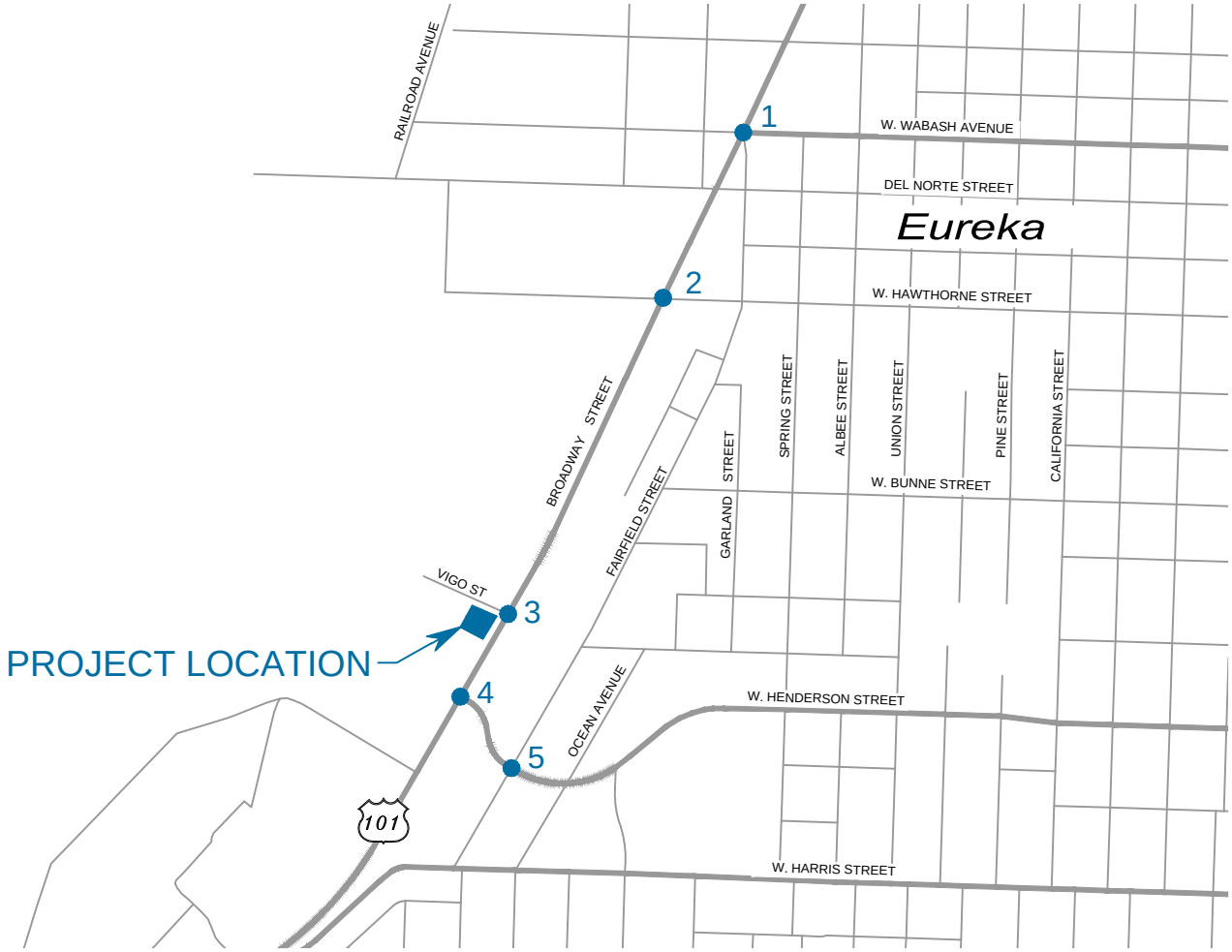
- Intersection 1 Broadway and W Wabash Avenue
  - Eastbound thru-right and right turn lane queue extends into and past Koster Street
  - Westbound thru-right lane queue extends into and past Spring Street
  - Westbound left-turn lane queue extends into and past Spring Street and Albee Street
  - Northbound thru lane queue extends into Hawthorne Street (Intersection 2)
  - Southbound thru and thru-right lanes extend into and past W 15th street and W 14th Street
- Intersection 2 Broadway and Hawthorne Street
  - Northbound thru and thru-right lane queues extend into Vigo Street during PM peak hour
- Intersection 4 Broadway and W Henderson Street
  - Westbound left and left-thru-right lane queues extend into and past Fairfield Street during PM peak hour
  - Southbound thru and thru-right lane queues extend into and past Vigo Street



LEGEND:

XX - MID-DAY PEAK HOUR TRAFFIC VOLUMES

(XX) - PM PEAK HOUR TRAFFIC VOLUMES



N

The Carrington Company
2616 BROADWAY STREET REDEVELOPMENT

YEAR 2038 PLUS PROJECT
PEAK HOUR TRAFFIC VOLUMES

Project No. 11153741
Report No. 001
Date 11.21.2018

FIGURE 9

Filename: K:\PRJ\2502\T2502\T2502TG001.dwg Plot Date: 21 November 2018 - 8:26 AM

Source:

8. Project Impacts and Proposed Improvements

This section presents recommended project-related mitigation measures at the study intersections developed based on the findings from the analyses presented herein. The mitigations are provided for both Existing conditions and Year 2038 conditions separately, so it may be possible that the same mitigations at one location are applicable to both conditions.

8.1 Impact Significance Criteria

The following thresholds of significance based on industry practice, but not established by the City of Eureka or Caltrans, are used to determine if the proposed project causes a significant impact and requires mitigation:

Intersections

- An intersection or roadway segment deteriorates from an acceptable LOS to unacceptable LOS E or worse, or
- Increases the delay by more than 5 seconds at an intersection found to be operating at an unacceptable LOS.

In the event of a significant impact, proposed mitigations to intersections, as described in section 8.3, should improve traffic operations from an unacceptable LOS to an acceptable LOS.

8.2 Existing Plus Project Impacts

Table 8.1 presents the intersections projected to operate at unacceptable LOS under Existing Plus Project conditions.

Table 8.1 -Existing Plus Project Significant Impacts

Mid-Day Peak Hour										
#	Intersection	Control Type[1]	Target LOS	Existing LOS[2]	Existing Plus Project LOS[2]	Existing Delay (D1)	Existing Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	Significant Impact?
2	Broadway St & W Hawthorne St	TWSC	D	D	E	27.3	47.4	20.1	No	Yes
3	Broadway St & Vigo St	TWSC	D	C	F	24.8	149.1	124.3	Yes	Yes

PM Peak Hour										
#	Intersection	Control Type[1]	Target LOS	Existing LOS[2]	Existing Plus Project LOS[2]	Existing Delay (D1)	Existing Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	Significant Impact?
2	Broadway St & W Hawthorne St	TWSC	D	F	F	51	84.1	33.1	No	Yes
3	Broadway St & Vigo St	TWSC	D	E	F	36.2	165.9	129.7	Yes	Yes
4	Broadway St & W Henderson St	Signal	D	E	E	59.4	61.7	2.3	-	No

Notes:
1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal
3. Warrant = Based on California MUTCD Warrant 3

8.3 Existing Plus Project Mitigations

The following improvements are proposed to provide acceptable operations at intersections where a project's significant impact is identified. Caltrans has completed an independent analysis of the project mitigations and has concluded that conversion of Intersection 4 – Broadway Street and W Henderson Street to one-way between Broadway Street and Fairfield Street would be necessary under existing plus project conditions to provide adequate northbound left-turn storage for Broadway Street onto Vigo Street.

8.3.1 Intersection 2 – Broadway Street & W Hawthorne Street

The proposed project creates a significant impact in the weekday Mid-Day peak hour by reducing the LOS to unacceptable operations and the PM peak hour by increasing the delay at an intersection operating unacceptable by more than five seconds between the Existing No Project and Existing Plus Projec*t* conditions. The following improvements are proposed to restore the intersection to acceptable LOS for the weekday Mid-Day and PM peak hour:

- Construct a traffic signal

Caltrans has plans to signalize this intersection within the next year (programmed for 2019). With the completion of the signal at this intersection, the intersection will perform at acceptable LOS and the project will no longer have a significant impact. If the signalization project is fully funded and programmed, no project mitigation is required.

8.3.2 Intersection 3 – Broadway Street & Vigo Street

The proposed project creates a significant impact in the weekday Mid-Day peak hour by reducing the LOS to unacceptable operations and the PM peak hour by increasing the delay at an intersection operating unacceptable by more than five seconds between the Existing No Project and Existing Plus Project conditions. The following improvements are proposed to restore the intersection to acceptable LOS for the weekday Mid-Day and PM peak hour:

- Construct a traffic signal
- Reconfigure eastbound approach to include two left turn pockets and one right turn lane

There is potential to coordinate a new traffic signal at Vigo Street with the existing traffic signal at W Henderson Street; however, in order to efficiently coordinate the two signals, the existing signal phase for the private driveway/driveways at W Henderson Street should be eliminated to convert W Henderson Street to three-leg intersection so that this intersection could have similar cycle lengths, phasing and timing with three-leg intersection of Vigo Street. In coordination with Caltrans, this proposal is found to be undesirable because it would remove the existing signal phase and restrict access to the private driveways.

8.3.3 Intersection 4 – Broadway Street & W Henderson Street

The proposed project creates a significant impact in the weekday Mid-Day peak hour by causing an intersection operating at acceptable to unacceptable LOS between the Year 2038 No Project and Year 2038 Plus Project conditions. The following improvements are proposed to restore the intersection to acceptable LOS for the weekday Mid-Day peak hour:

- Convert W Henderson Street to a one-way street between Fairfield Street and Broadway Street and reconfigure to two left-turn lanes and one through-right turn lane.
    - Remove southbound Broadway left-turn lane and convert to northbound left-turn lane for intersection of Vigo Street
    - Restrict northbound Broadway Street right turn
    - Restrict eastbound driveway thru movement

If W Henderson Street is converted to a one-way street, larger vehicles that are currently allowed to make southbound left turns onto W Henderson Street would take alternative routes and may divert to Harris Street, which is part of a one-way couplet with W Henderson Street. The intersection of Harris Street would need to be examined and/or reconfigured to accommodate larger vehicles (STAA or CA legal trucks). Additionally, other motor vehicles that currently use W Henderson Street would also be diverted to other routes. Based on input from Caltrans and the City of Eureka, it is likely that most vehicles would continue south to Harris Street, likely exceeding the capacity of the existing left-turn pocket of the existing volumes are combined. In coordination with Caltrans, it is recommended that the existing southbound left-turn pocket be extended on Broadway at Harris Street, when converting W Henderson Street to one-way.

8.4 Significance After Mitigation

Table 8.2 presents the mitigated LOS operations assuming the stated improvements are implemented.

Table 8.2 – Existing Plus Project Mitigated Intersection Level of Service

#	Intersection	Control Type[1,2]	Target LOS	Mid-Day Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
2	Broadway St & W Hawthorne St	Signal	D	11.6	B	13.5	B
3	Broadway St & Vigo St	TWSC	D	34.1	D	34.1	D

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

8.5 Year 2038 Plus Project Impacts

Table 8.3 presents the intersections projected to operate at unacceptable LOS under the Year 2038 Plus Project conditions.

Table 8.3 – Year 2038 Plus Project Significant Impacts

Mid-Day Peak Hour										
#	Intersection	Control Type[1]	Target LOS	Cumulative LOS[2]	Cumulative Plus Project LOS[2]	Cumulative Delay (D1)	Cumulative Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	Significant Impact?
3	Broadway St & Vigo St	TWSC	D	E	F	42.6	505.3	462.7	Yes	Yes
4	Broadway St & W Henderson St	Signal	D	D	E	51.8	56.1	4.3	-	Yes

PM Peak Hour										
#	Intersection	Control Type[1]	Target LOS	Cumulative LOS[2]	Cumulative Plus Project LOS[2]	Cumulative Delay (D1)	Cumulative Plus Project Delay (D2)	Delay Increase (D2-D1)	Signal Warrant Met?	Significant Impact?
3	Broadway St & Vigo St	TWSC	D	F	F	69.3	519	449.7	Yes	Yes
4	Broadway St & W Henderson St	Signal	D	F	F	83.2	86.4	3.2	-	No
5	Fairfield St & W Henderson St	AWSC	C	D	D	26.1	26.8	0.7	Yes	No

Notes:
1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal
3. Warrant = Based on California MUTCD Warrant 3

8.6 Year 2038 Plus Project Mitigations

The following improvements are proposed to provide acceptable operations at intersections where a project's significant impact is identified:

8.6.1 Intersection 3 – Broadway Street & Vigo Street

The proposed project creates a significant impact in the weekday Mid-Day and PM peak hour by increasing the delay at an intersection operating unacceptable by more than five seconds between the Year 2038 No Project and Year 2038 Plus Project conditions. The following improvements are proposed to restore the intersection to acceptable LOS for the weekday Mid-Day and PM peak hour:

- Construct a traffic signal
- Reconfigure eastbound approach to include two left turn pockets and one right turn lane

Caltrans provided separate analysis that a signal at Broadway Street and Vigo Street may begin to operate unacceptably in the southbound direction, pending the amount of traffic volume growth. Caltrans is recommending that southbound Broadway Street right-turns onto Vigo Street may require channelization to maintain acceptable operations.

There is potential to coordinate a new traffic signal at Vigo Street with the existing traffic signal at W Henderson Street; however, in order to efficiently coordinate the two signals, the existing signal phase for the private driveway/driveways at W Henderson Street should be eliminated to convert W Henderson Street to three-leg intersection so that this intersection could have similar cycle lengths, phasing and timing with three-leg intersection of Vigo Street. In coordination with Caltrans, this proposal is found to be undesirable because it would remove the existing signal phase and restrict access to the private driveways.

8.6.2 Intersection 4 – Broadway Street & W Henderson Street

The proposed project creates a significant impact in the weekday Mid-Day peak hour by causing an intersection operating at acceptable to unacceptable LOS between the Year 2038 No Project and Year 2038 Plus Project conditions. The following improvements are proposed to restore the intersection to acceptable LOS for the weekday Mid-Day peak hour:

- Convert W Henderson Street to a one-way street between Fairfield Street and Broadway Street and reconfigure to two left-turn lanes and one through-right turn lane.
    - Remove southbound Broadway left-turn lane and convert to northbound left-turn lane for intersection of Vigo Street
    - Restrict northbound Broadway Street right turn
    - Restrict eastbound driveway thru movement

If W Henderson Street is converted to a one-way street, larger vehicles that are currently allowed to make southbound left turns onto W Henderson Street would take alternative routes and may divert to Harris Street, which is part of a one-way couplet with W Henderson Street. The intersection of Harris Street would need to be examined and/or reconfigured to accommodate larger vehicles (STAA or CA legal trucks). Additionally, other motor vehicles that currently use W Henderson Street would also be diverted to other routes. Based on input from Caltrans and the City of Eureka, it is likely that most vehicles would continue south to Harris Street, likely exceeding the capacity of the existing left-turn pocket of the existing volumes are combined. In coordination with Caltrans, it is recommended that the existing southbound left-turn pocket be extended on Broadway at Harris Street, when converting W Henderson Street to one-way.

8.7 Significance After Mitigation

Table 8.4 presents the mitigated LOS operations assuming the stated improvements are implemented.

Table 8.4 – Year 2038 Plus Project Mitigated Intersection Level of Service

#	Intersection	Control Type[1,2]	Target LOS	Mid-Day Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
3	Broadway St & Vigo St	Signal	D	21.3	C	27.4	C
4	Broadway St & W Henderson St	Signal	D	21.0	C	54.1	D

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on average of all approaches for Signal

9. References

Caltrans (2002). *Guide for the Preparation of Traffic Impact Studies*. State of California, Department of Transportation, Sacramento, CA. December 2002.

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ITE (2017). *Trip Generation 10th Edition*. Institute of Transportation Engineers, Washington, D.C.

Caltrans (2018*). Highway Design Manual 6th Edition*. State of California, Department of Transportation, Publication Distribution Unit, Sacramento, CA

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Appendix

Appendix A – Intersection Turning Movement Counts

Appendix B – Synchro and SimTraffic Outputs

Appendix C – Signal Warrant Analysis Worksheets

Appendix D – 2014 Growth Factors Memorandum (February 3, 2014)

Appendix A
Intersection Turning Movement Counts

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Eureka
N/S: US-101 (Broadway Street)
E/W: Vigo Street
Weather: Clear

File Name : 01_ERK_101_Vigo MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
11:00 AM	309	3	312	5	252	257	2	1	3	572
11:15 AM	270	2	272	2	278	280	1	2	3	555
11:30 AM	334	5	339	4	305	309	0	1	1	649
11:45 AM	316	7	323	1	307	308	2	0	2	633
Total	1229	17	1246	12	1142	1154	5	4	9	2409
12:00 PM	321	4	325	3	322	325	0	6	6	656
12:15 PM	331	6	337	1	318	319	5	2	7	663
12:30 PM	373	6	379	4	314	318	5	3	8	705
12:45 PM	359	6	365	6	331	337	4	5	9	711
Total	1384	22	1406	14	1285	1299	14	16	30	2735
Grand Total	2613	39	2652	26	2427	2453	19	20	39	5144
Apprch %	98.5	1.5		1.1	98.9		48.7	51.3		
Total %	50.8	0.8	51.6	0.5	47.2	47.7	0.4	0.4	0.8	
Passenger Vehicles	2491	30	2521	24	2303	2327	18	17	35	4883
% Passenger Vehicles	95.3	76.9	95.1	92.3	94.9	94.9	94.7	85	89.7	94.9
Motorcycles	14	0	14	0	12	12	0	0	0	26
% Motorcycles	0.5	0	0.5	0	0.5	0.5	0	0	0	0.5
Heavy Trucks	108	9	117	2	112	114	1	3	4	235
% Heavy Trucks	4.1	23.1	4.4	7.7	4.6	4.6	5.3	15	10.3	4.6

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00 PM										
12:00 PM	321	4	325	3	322	325	0	**6**	6	656
12:15 PM	331	**6**	337	1	318	319	**5**	2	7	663
12:30 PM	**373**	6	**379**	4	314	318	5	3	8	705
12:45 PM	359	6	365	**6**	**331**	**337**	4	5	**9**	**711**
Total Volume	1384	22	1406	14	1285	1299	14	16	30	2735
% App. Total	98.4	1.6		1.1	98.9		46.7	53.3		
PHF	.928	.917	.927	.583	.971	.964	.700	.667	.833	.962

Counts Unlimited
PO Box 1178
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City of Eureka
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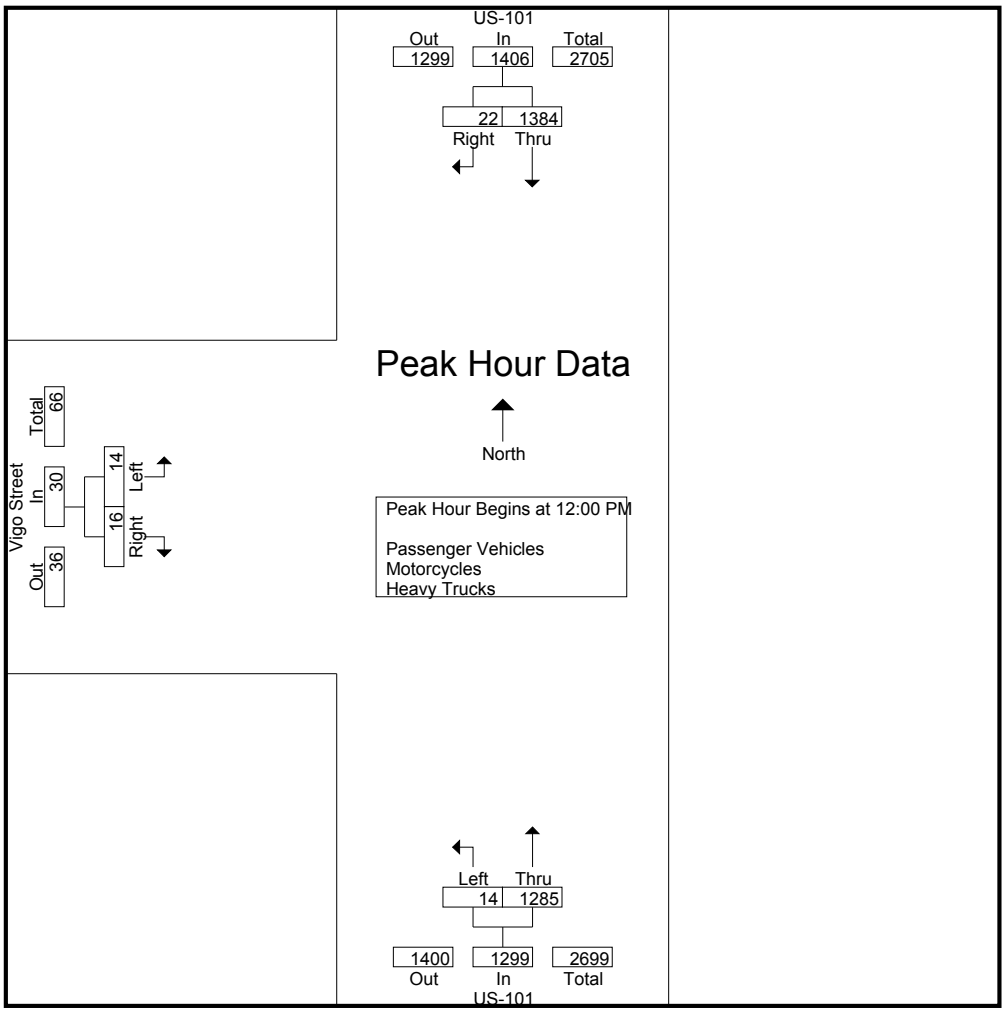
File Name : 01_ERK_101_Vigo MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM			12:00 PM			12:00 PM		
+0 mins.	321	4	325	3	322	325	0	**6**	6
+15 mins.	331	**6**	337	1	318	319	**5**	2	7
+30 mins.	**373**	6	**379**	4	314	318	5	3	8
+45 mins.	359	6	365	**6**	**331**	**337**	4	5	**9**
Total Volume	1384	22	1406	14	1285	1299	14	16	30
% App. Total	98.4	1.6		1.1	98.9		46.7	53.3	
PHF	.928	.917	.927	.583	.971	.964	.700	.667	.833

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E/W: Vigo Street
Weather: Clear

File Name : 01_ERK_101_Vigo MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles

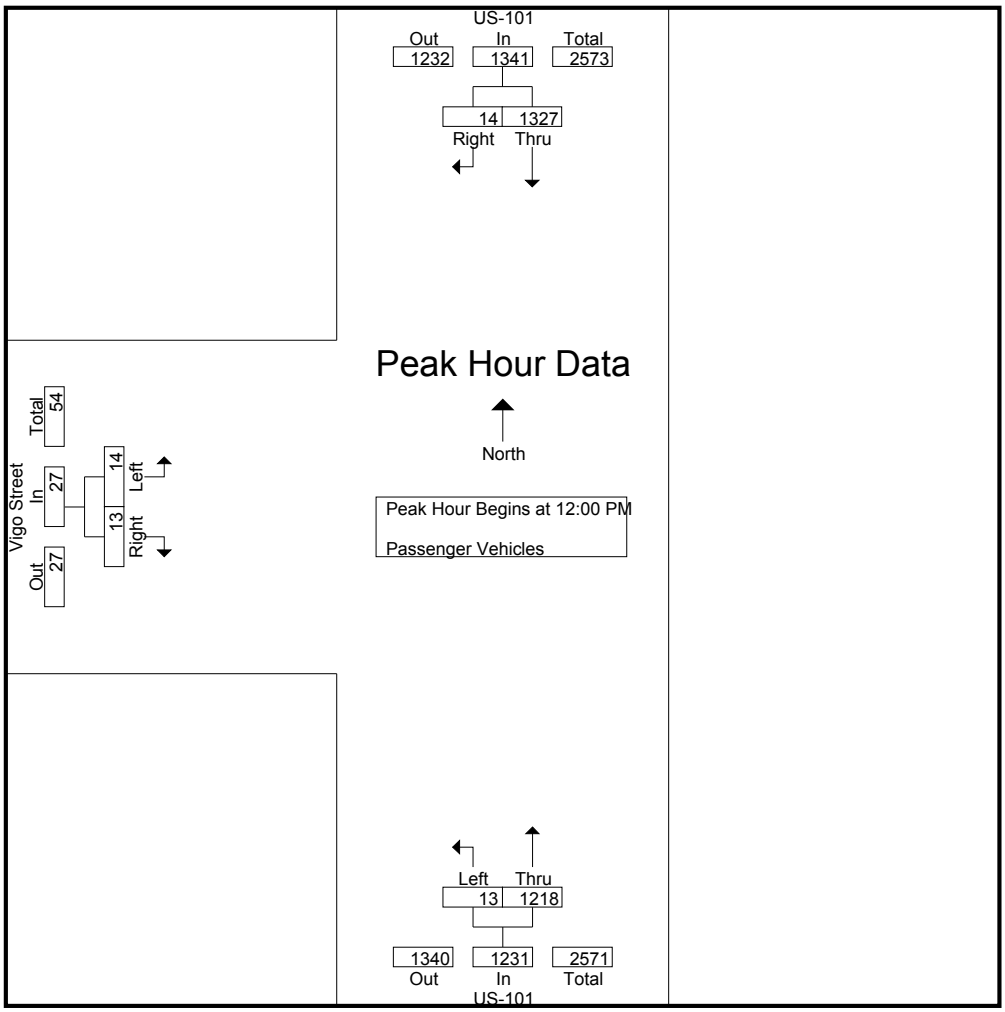
	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
11:00 AM	290	3	293	5	239	244	2	1	3	540
11:15 AM	249	2	251	2	264	266	1	2	3	520
11:30 AM	319	4	323	3	290	293	0	1	1	617
11:45 AM	306	7	313	1	292	293	1	0	1	607
Total	1164	16	1180	11	1085	1096	4	4	8	2284
12:00 PM	304	3	307	3	306	309	0	4	4	620
12:15 PM	312	1	313	1	306	307	5	2	7	627
12:30 PM	357	5	362	4	292	296	5	2	7	665
12:45 PM	354	5	359	5	314	319	4	5	9	687
Total	1327	14	1341	13	1218	1231	14	13	27	2599
Grand Total	2491	30	2521	24	2303	2327	18	17	35	4883
Apprch %	98.8	1.2		1	99		51.4	48.6		
Total %	51	0.6	51.6	0.5	47.2	47.7	0.4	0.3	0.7	

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00 PM										
12:00 PM	304	3	307	3	306	309	0	4	4	620
12:15 PM	312	1	313	1	306	307	**5**	2	7	627
12:30 PM	**357**	**5**	**362**	4	292	296	5	2	7	665
12:45 PM	354	5	359	**5**	**314**	**319**	4	**5**	**9**	**687**
Total Volume	1327	14	1341	13	1218	1231	14	13	27	2599
% App. Total	99	1		1.1	98.9		51.9	48.1		
PHF	.929	.700	.926	.650	.970	.965	.700	.650	.750	.946

Counts Unlimited
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Eureka
N/S: US-101 (Broadway Street)
E/W: Vigo Street
Weather: Clear

File Name : 01_ERK_101_Vigo MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM			12:00 PM			12:00 PM		
+0 mins.	304	3	307	3	306	309	0	4	4
+15 mins.	312	1	313	1	306	307	**5**	2	7
+30 mins.	**357**	**5**	**362**	4	292	296	5	2	7
+45 mins.	354	5	359	**5**	**314**	**319**	4	**5**	**9**
Total Volume	1327	14	1341	13	1218	1231	14	13	27
% App. Total	99	1		1.1	98.9		51.9	48.1	
PHF	.929	.700	.926	.650	.970	.965	.700	.650	.750

Counts Unlimited
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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Vigo Street
Weather: Clear

File Name : 01_ERK_101_Vigo MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Motorcycles

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
11:00 AM	0	0	0	0	1	1	0	0	0	1
11:15 AM	2	0	2	0	0	0	0	0	0	2
11:30 AM	7	0	7	0	5	5	0	0	0	12
11:45 AM	1	0	1	0	1	1	0	0	0	2
Total	10	0	10	0	7	7	0	0	0	17
12:00 PM	1	0	1	0	1	1	0	0	0	2
12:15 PM	3	0	3	0	0	0	0	0	0	3
12:30 PM	0	0	0	0	3	3	0	0	0	3
12:45 PM	0	0	0	0	1	1	0	0	0	1
Total	4	0	4	0	5	5	0	0	0	9
Grand Total	14	0	14	0	12	12	0	0	0	26
Apprch %	100	0		0	100		0	0		
Total %	53.8	0	53.8	0	46.2	46.2	0	0	0	

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00 PM										
12:00 PM	1	0	1	0	1	1	0	0	0	2
12:15 PM	**3**	0	**3**	0	0	0	0	0	0	**3**
12:30 PM	0	0	0	0	**3**	**3**	0	0	0	3
12:45 PM	0	0	0	0	1	1	0	0	0	1
Total Volume	4	0	4	0	5	5	0	0	0	9
% App. Total	100	0		0	100		0	0		
PHF	.333	.000	.333	.000	.417	.417	.000	.000	.000	.750

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Vigo Street
Weather: Clear

File Name : 01_ERK_101_Vigo MD
Site Code : 99918361
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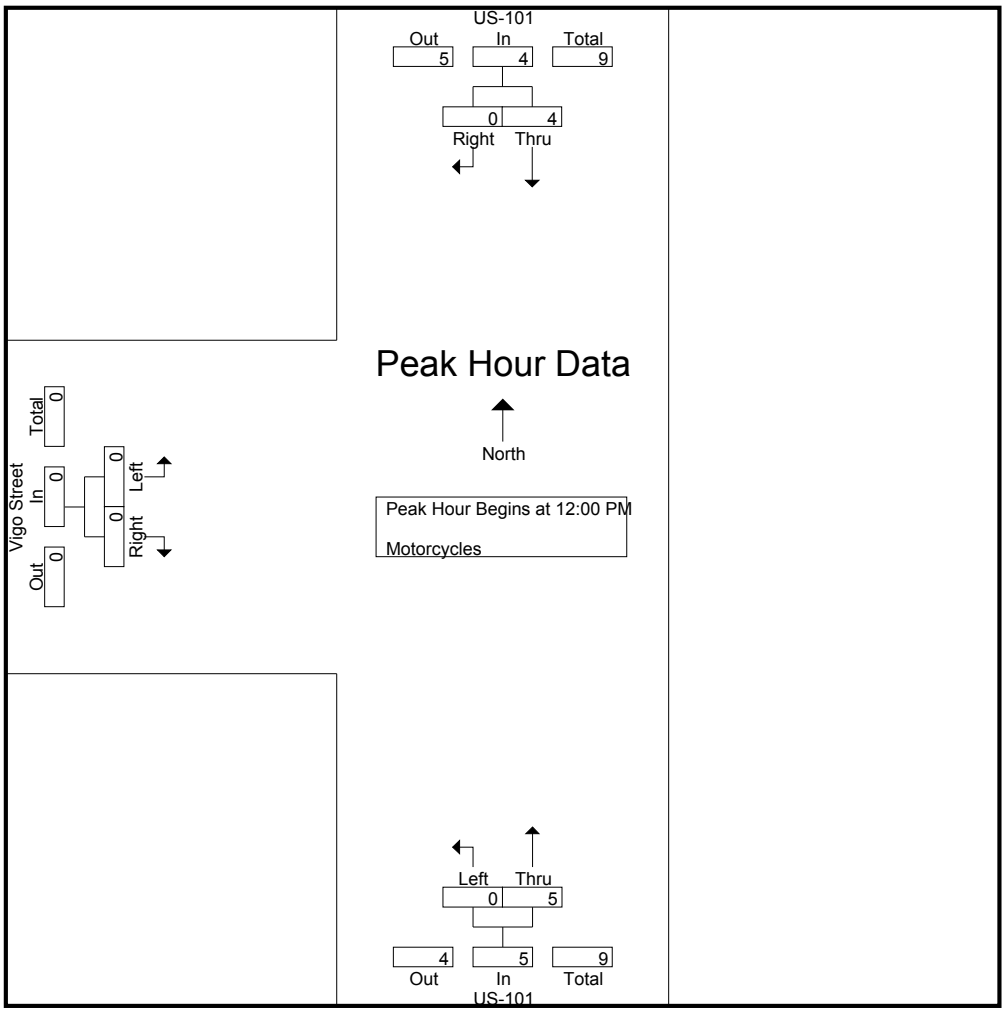

Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM			12:00 PM			12:00 PM		
+0 mins.	1	0	1	0	1	1	0	0	0
+15 mins.	**3**	0	**3**	0	0	0	0	0	0
+30 mins.	0	0	0	0	**3**	**3**	0	0	0
+45 mins.	0	0	0	0	1	1	0	0	0
Total Volume	4	0	4	0	5	5	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.333	.000	.333	.000	.417	.417	.000	.000	.000

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City of Eureka
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Groups Printed- Heavy Trucks

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
11:00 AM	19	0	19	0	12	12	0	0	0	31
11:15 AM	19	0	19	0	14	14	0	0	0	33
11:30 AM	8	1	9	1	10	11	0	0	0	20
11:45 AM	9	0	9	0	14	14	1	0	1	24
Total	55	1	56	1	50	51	1	0	1	108
12:00 PM	16	1	17	0	15	15	0	2	2	34
12:15 PM	16	5	21	0	12	12	0	0	0	33
12:30 PM	16	1	17	0	19	19	0	1	1	37
12:45 PM	5	1	6	1	16	17	0	0	0	23
Total	53	8	61	1	62	63	0	3	3	127
Grand Total	108	9	117	2	112	114	1	3	4	235
Apprch %	92.3	7.7		1.8	98.2		25	75		
Total %	46	3.8	49.8	0.9	47.7	48.5	0.4	1.3	1.7	

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00 PM										
12:00 PM	**16**	1	17	0	15	15	0	**2**	**2**	34
12:15 PM	16	**5**	**21**	0	12	12	0	0	0	33
12:30 PM	16	1	17	0	**19**	**19**	0	1	1	**37**
12:45 PM	5	1	6	**1**	16	17	0	0	0	23
Total Volume	53	8	61	1	62	63	0	3	3	127
% App. Total	86.9	13.1		1.6	98.4		0	100		
PHF	.828	.400	.726	.250	.816	.829	.000	.375	.375	.858

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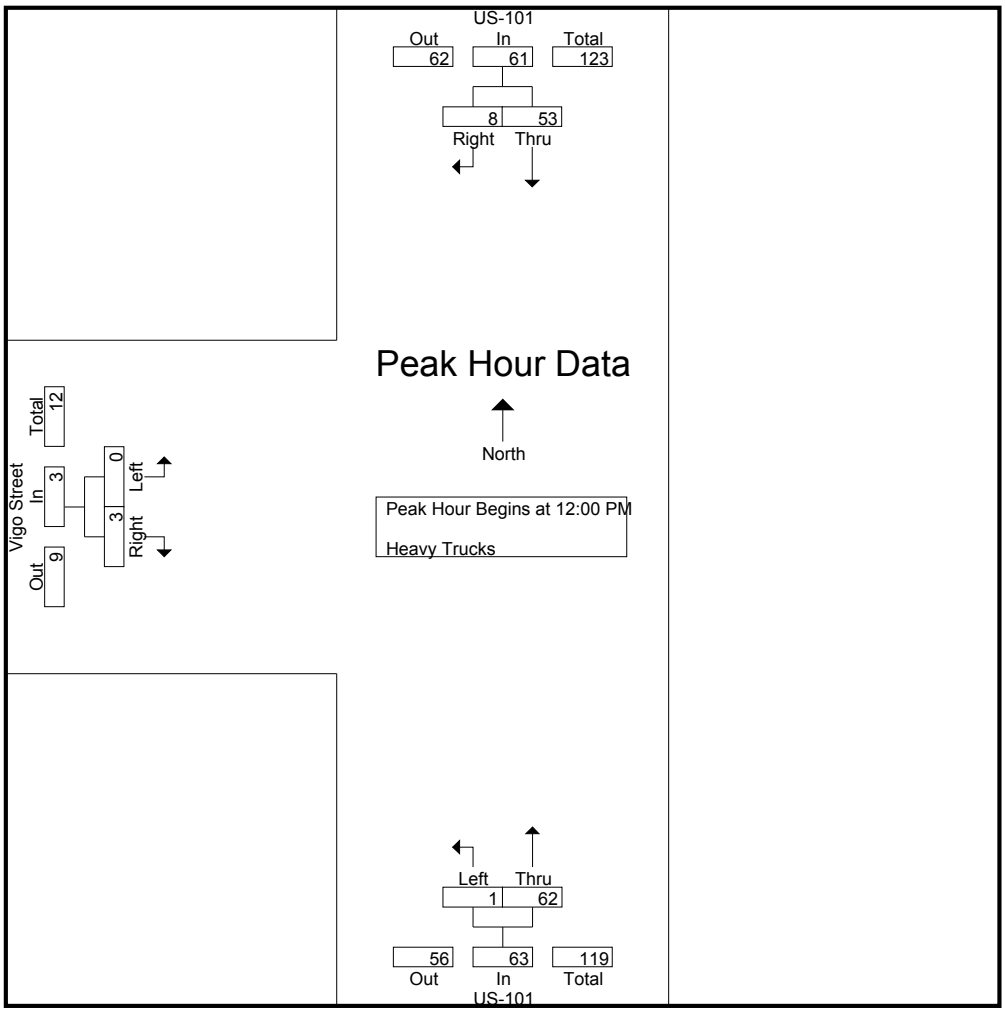

Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM			12:00 PM			12:00 PM		
+0 mins.	**16**	1	17	0	15	15	0	**2**	**2**
+15 mins.	16	**5**	**21**	0	12	12	0	0	0
+30 mins.	16	1	17	0	**19**	**19**	0	1	1
+45 mins.	5	1	6	**1**	16	17	0	0	0
Total Volume	53	8	61	1	62	63	0	3	3
% App. Total	86.9	13.1		1.6	98.4		0	100	
PHF	.828	.400	.726	.250	.816	.829	.000	.375	.375

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City of Eureka
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File Name : 01_ERK_101_Vigo PM
Site Code : 99918361
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Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	413	4	417	2	350	352	2	4	6	775
04:15 PM	360	3	363	2	335	337	2	0	2	702
04:30 PM	361	5	366	3	306	309	5	1	6	681
04:45 PM	394	7	401	2	303	305	3	4	7	713
Total	1528	19	1547	9	1294	1303	12	9	21	2871
05:00 PM	477	4	481	1	334	335	1	7	8	824
05:15 PM	393	1	394	1	286	287	1	0	1	682
05:30 PM	307	3	310	7	274	281	3	1	4	595
05:45 PM	324	3	327	2	280	282	1	2	3	612
Total	1501	11	1512	11	1174	1185	6	10	16	2713
Grand Total	3029	30	3059	20	2468	2488	18	19	37	5584
Apprch %	99	1		0.8	99.2		48.6	51.4		
Total %	54.2	0.5	54.8	0.4	44.2	44.6	0.3	0.3	0.7	
Passenger Vehicles	2940	30	2970	17	2338	2355	16	18	34	5359
% Passenger Vehicles	97.1	100	97.1	85	94.7	94.7	88.9	94.7	91.9	96
Motorcycles	21	0	21	0	15	15	1	0	1	37
% Motorcycles	0.7	0	0.7	0	0.6	0.6	5.6	0	2.7	0.7
Heavy Trucks	68	0	68	3	115	118	1	1	2	188
% Heavy Trucks	2.2	0	2.2	15	4.7	4.7	5.6	5.3	5.4	3.4

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	360	3	363	2	**335**	**337**	2	0	2	702
04:30 PM	361	5	366	**3**	306	309	**5**	1	6	681
04:45 PM	394	**7**	401	2	303	305	3	4	7	713
05:00 PM	**477**	4	**481**	1	334	335	1	**7**	**8**	**824**
Total Volume	1592	19	1611	8	1278	1286	11	12	23	2920
% App. Total	98.8	1.2		0.6	99.4		47.8	52.2		
PHF	.834	.679	.837	.667	.954	.954	.550	.429	.719	.886

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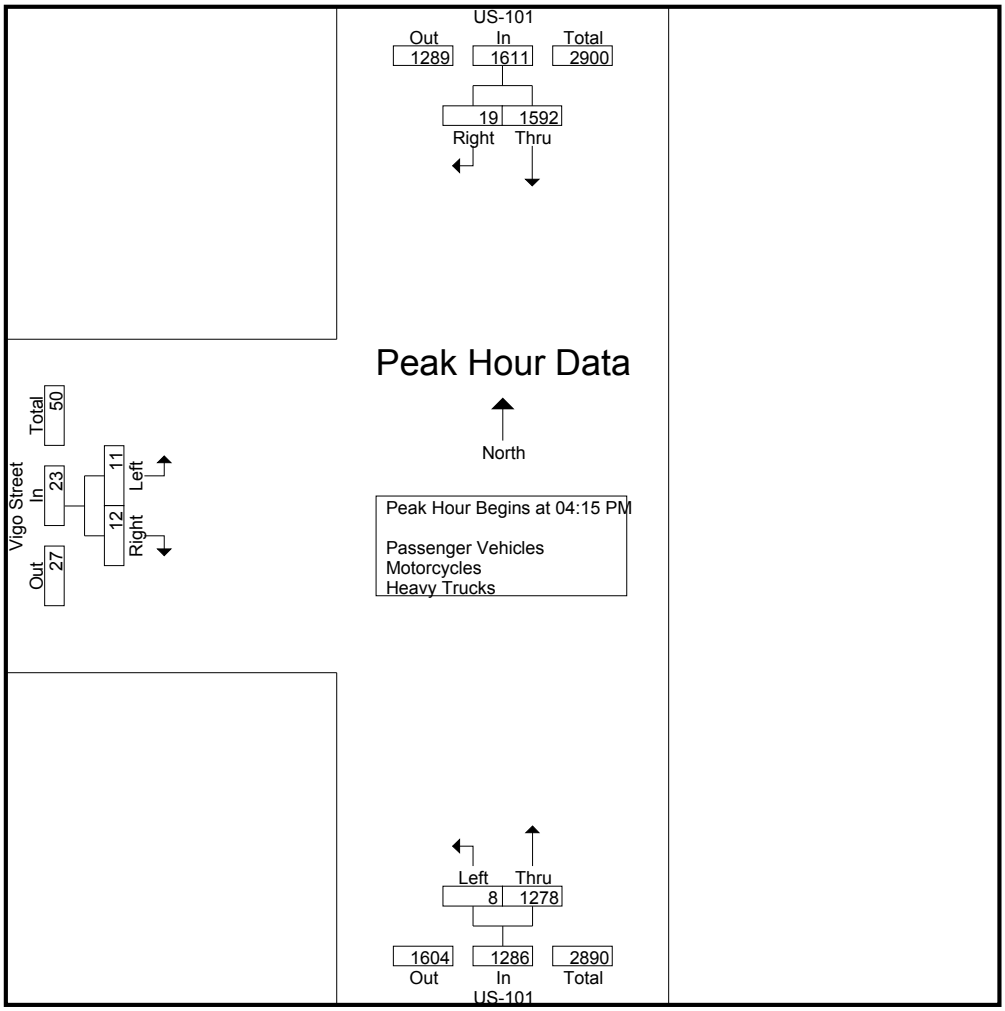

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:00 PM			04:15 PM		
+0 mins.	361	5	366	2	**350**	**352**	2	0	2
+15 mins.	394	**7**	401	2	335	337	**5**	1	6
+30 mins.	**477**	4	**481**	**3**	306	309	3	4	7
+45 mins.	393	1	394	2	303	305	1	**7**	**8**
Total Volume	1625	17	1642	9	1294	1303	11	12	23
% App. Total	99	1		0.7	99.3		47.8	52.2	
PHF	.852	.607	.853	.750	.924	.925	.550	.429	.719

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Groups Printed- Passenger Vehicles

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	406	4	410	1	314	315	2	4	6	731
04:15 PM	344	3	347	2	318	320	1	0	1	668
04:30 PM	348	5	353	3	295	298	5	1	6	657
04:45 PM	380	7	387	2	285	287	3	4	7	681
Total	1478	19	1497	8	1212	1220	11	9	20	2737
05:00 PM	464	4	468	1	317	318	1	7	8	794
05:15 PM	383	1	384	1	282	283	1	0	1	668
05:30 PM	299	3	302	5	257	262	2	1	3	567
05:45 PM	316	3	319	2	270	272	1	1	2	593
Total	1462	11	1473	9	1126	1135	5	9	14	2622
Grand Total	2940	30	2970	17	2338	2355	16	18	34	5359
Apprch %	99	1		0.7	99.3		47.1	52.9		
Total %	54.9	0.6	55.4	0.3	43.6	43.9	0.3	0.3	0.6	

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	344	3	347	2	**318**	**320**	1	0	1	668
04:30 PM	348	5	353	**3**	295	298	**5**	1	6	657
04:45 PM	380	**7**	387	2	285	287	3	4	7	681
05:00 PM	**464**	4	**468**	1	317	318	1	**7**	**8**	**794**
Total Volume	1536	19	1555	8	1215	1223	10	12	22	2800
% App. Total	98.8	1.2		0.7	99.3		45.5	54.5		
PHF	.828	.679	.831	.667	.955	.955	.500	.429	.688	.882

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File Name : 01_ERK_101_Vigo PM
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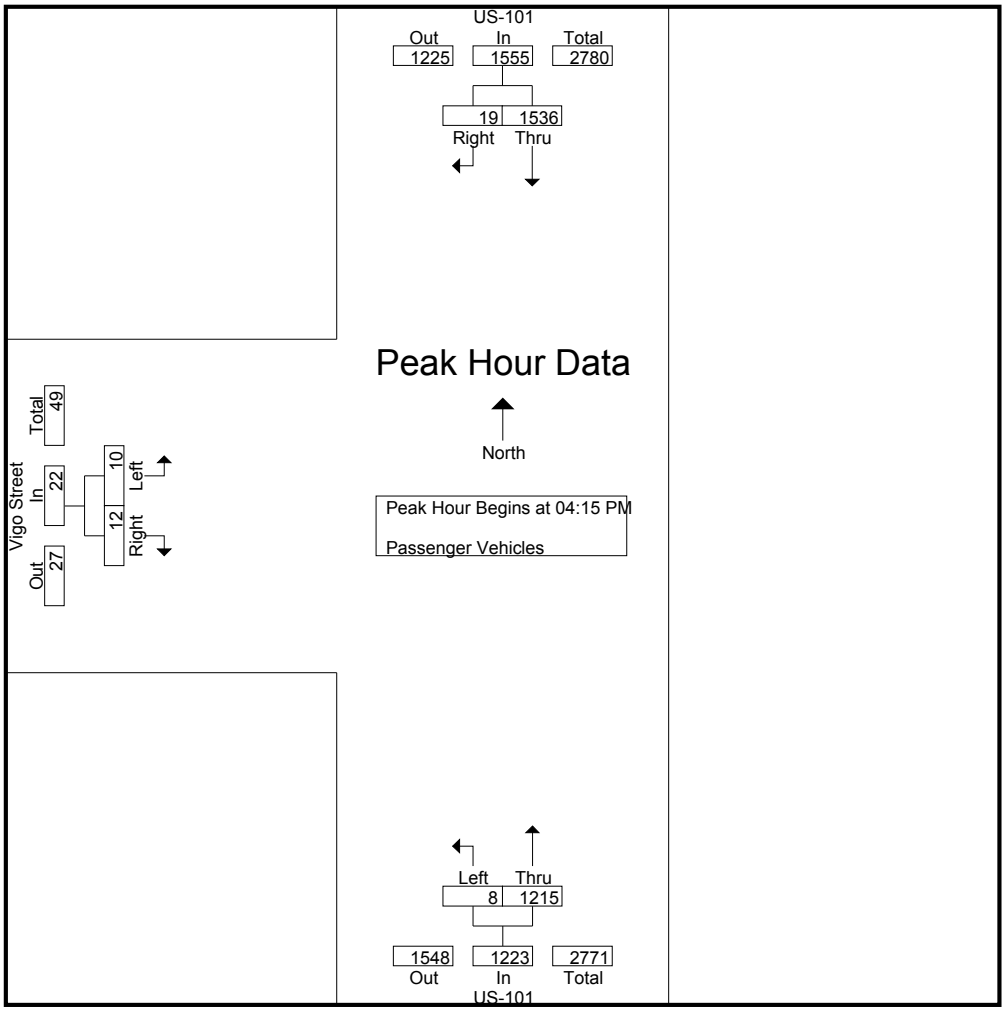

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	344	3	347	2	**318**	**320**	1	0	1
+15 mins.	348	5	353	**3**	295	298	**5**	1	6
+30 mins.	380	**7**	387	2	285	287	3	4	7
+45 mins.	**464**	4	**468**	1	317	318	1	**7**	**8**
Total Volume	1536	19	1555	8	1215	1223	10	12	22
% App. Total	98.8	1.2		0.7	99.3		45.5	54.5	
PHF	.828	.679	.831	.667	.955	.955	.500	.429	.688

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Groups Printed- Motorcycles

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	2	0	2	0	3	3	0	0	0	5
04:15 PM	2	0	2	0	1	1	1	0	1	4
04:30 PM	1	0	1	0	0	0	0	0	0	1
04:45 PM	3	0	3	0	7	7	0	0	0	10
Total	8	0	8	0	11	11	1	0	1	20
05:00 PM	3	0	3	0	1	1	0	0	0	4
05:15 PM	6	0	6	0	0	0	0	0	0	6
05:30 PM	2	0	2	0	2	2	0	0	0	4
05:45 PM	2	0	2	0	1	1	0	0	0	3
Total	13	0	13	0	4	4	0	0	0	17
Grand Total	21	0	21	0	15	15	1	0	1	37
Apprch %	100	0		0	100		100	0		
Total %	56.8	0	56.8	0	40.5	40.5	2.7	0	2.7	

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	2	0	2	0	1	1	**1**	0	**1**	4
04:30 PM	1	0	1	0	0	0	0	0	0	1
04:45 PM	**3**	0	**3**	0	**7**	**7**	0	0	0	**10**
05:00 PM	3	0	3	0	1	1	0	0	0	4
Total Volume	9	0	9	0	9	9	1	0	1	19
% App. Total	100	0		0	100		100	0		
PHF	.750	.000	.750	.000	.321	.321	.250	.000	.250	.475

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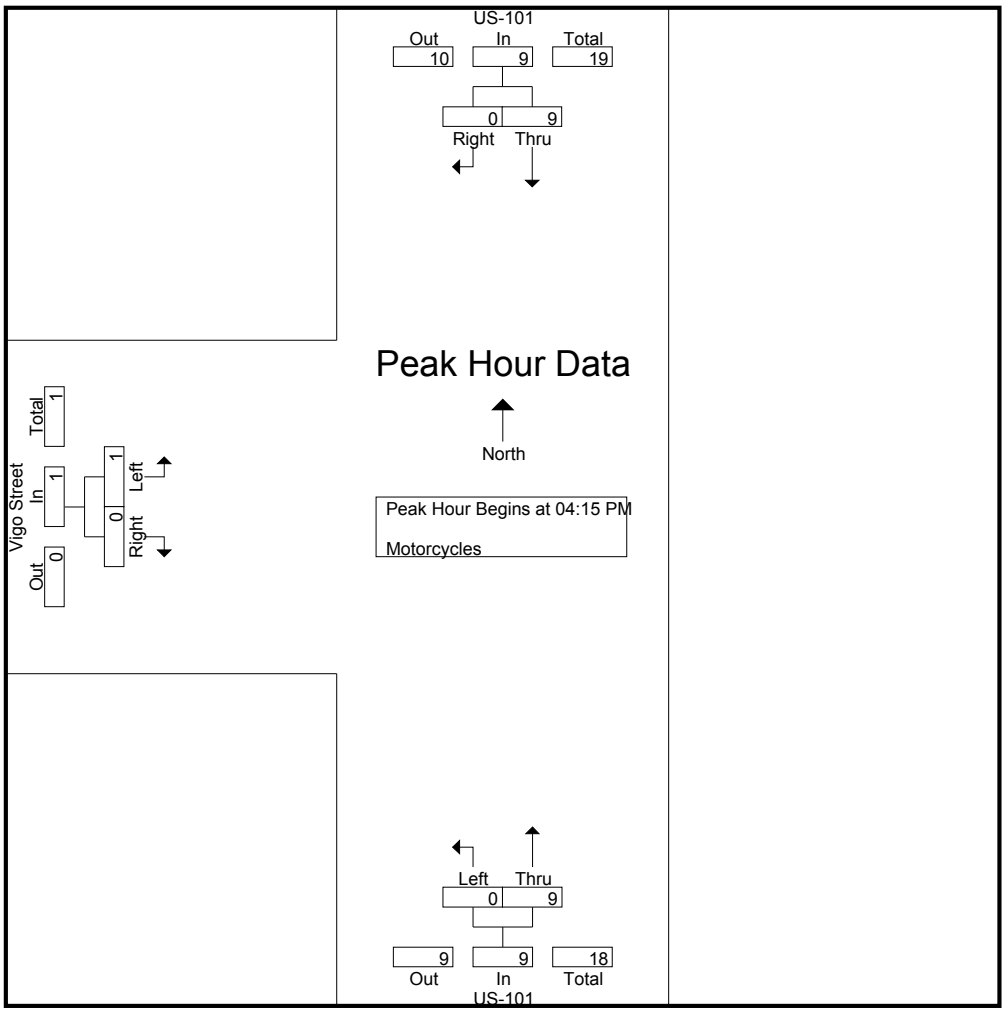

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	2	0	2	0	1	1	**1**	0	**1**
+15 mins.	1	0	1	0	0	0	0	0	0
+30 mins.	**3**	0	**3**	0	**7**	**7**	0	0	0
+45 mins.	3	0	3	0	1	1	0	0	0
Total Volume	9	0	9	0	9	9	1	0	1
% App. Total	100	0		0	100		100	0	
PHF	.750	.000	.750	.000	.321	.321	.250	.000	.250

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Groups Printed- Heavy Trucks

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	5	0	5	1	33	34	0	0	0	39
04:15 PM	14	0	14	0	16	16	0	0	0	30
04:30 PM	12	0	12	0	11	11	0	0	0	23
04:45 PM	11	0	11	0	11	11	0	0	0	22
Total	42	0	42	1	71	72	0	0	0	114
05:00 PM	10	0	10	0	16	16	0	0	0	26
05:15 PM	4	0	4	0	4	4	0	0	0	8
05:30 PM	6	0	6	2	15	17	1	0	1	24
05:45 PM	6	0	6	0	9	9	0	1	1	16
Total	26	0	26	2	44	46	1	1	2	74
Grand Total	68	0	68	3	115	118	1	1	2	188
Apprch %	100	0		2.5	97.5		50	50		
Total %	36.2	0	36.2	1.6	61.2	62.8	0.5	0.5	1.1	

	US-101 Southbound			US-101 Northbound			Vigo Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**14**	0	**14**	0	**16**	**16**	0	0	0	**30**
04:30 PM	12	0	12	0	11	11	0	0	0	23
04:45 PM	11	0	11	0	11	11	0	0	0	22
05:00 PM	10	0	10	0	16	16	0	0	0	26
Total Volume	47	0	47	0	54	54	0	0	0	101
% App. Total	100	0		0	100		0	0		
PHF	.839	.000	.839	.000	.844	.844	.000	.000	.000	.842

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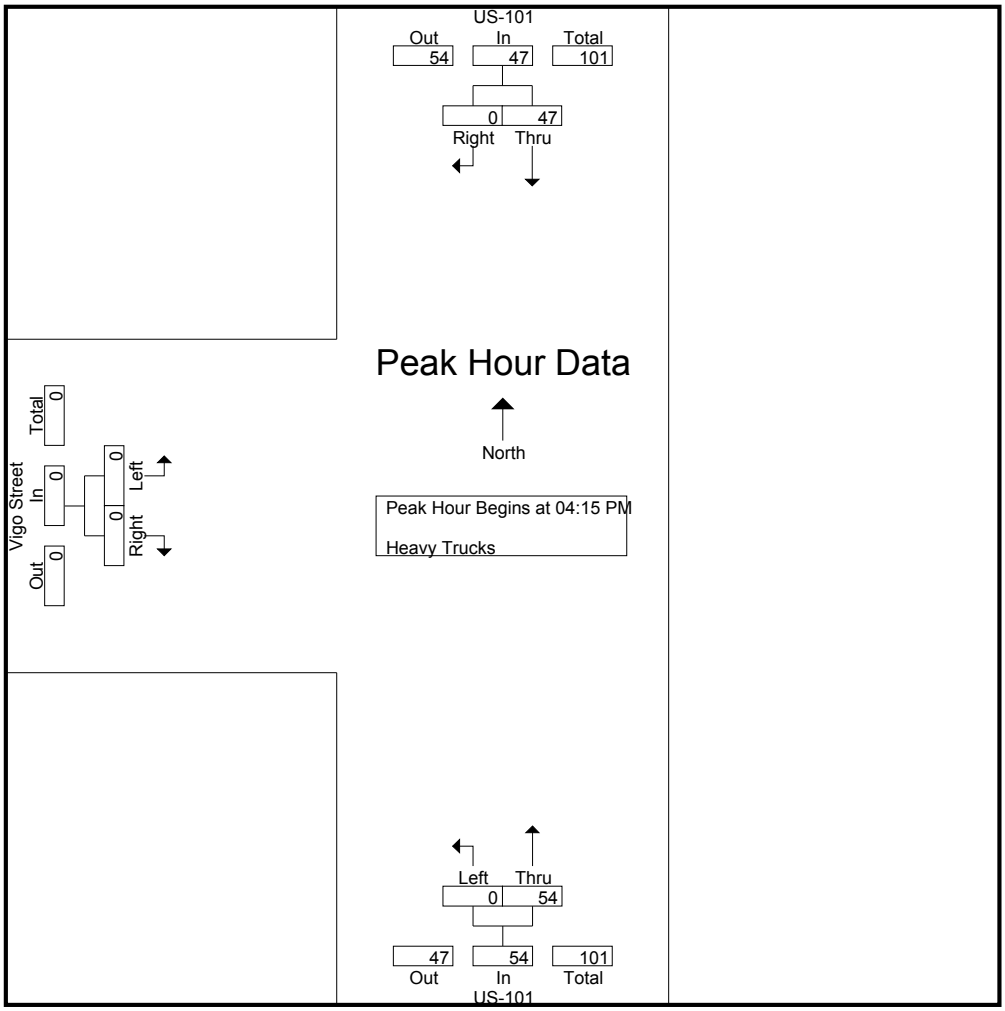

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	**14**	0	**14**	0	**16**	**16**	0	0	0
+15 mins.	12	0	12	0	11	11	0	0	0
+30 mins.	11	0	11	0	11	11	0	0	0
+45 mins.	10	0	10	0	16	16	0	0	0
Total Volume	47	0	47	0	54	54	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.839	.000	.839	.000	.844	.844	.000	.000	.000

Location: Eureka
N/S: US-101
E/W: Vigo Street

Date: 5/9/2018
Day: Wednesday

PEDESTRIANS

	North Leg US-101	East Leg Dead End	South Leg US-101	West Leg Vigo Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
11:00 AM	0	0	0	2	2
11:15 AM	0	0	0	5	5
11:30 AM	0	0	0	3	3
11:45 AM	0	0	0	4	4
12:00 PM	0	3	0	5	8
12:15 PM	0	0	0	2	2
12:30 PM	0	0	0	3	3
12:45 PM	0	0	0	2	2
TOTAL VOLUMES:	0	3	0	26	29

	North Leg US-101	East Leg Dead End	South Leg US-101	West Leg Vigo Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	2	0	7	9
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	5	5
4:45 PM	0	1	0	1	2
5:00 PM	0	0	0	6	6
5:15 PM	0	1	0	1	2
5:30 PM	0	0	0	2	2
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	4	0	22	26

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Location: Eureka
N/S: US-101
E/W: Vigo Street

Date: 5/9/2018
Day: Wednesday

BICYCLES

	Southbound US-101			Westbound Dead End			Northbound US-101			Eastbound Vigo Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	2
11:15 AM	0	1	0	0	0	0	0	0	0	1	0	0	2
11:30 AM	0	1	1	0	0	0	0	1	0	0	0	0	3
11:45 AM	0	0	1	0	0	0	0	4	0	0	0	0	5
12:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	1	0	1	0	1	3
12:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	5	2	0	0	0	0	8	0	2	0	1	18

	Southbound US-101			Westbound Dead End			Northbound US-101			Eastbound Vigo Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	2	0	0	0	0	0	1	0	0	0	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:45 PM	0	4	0	0	0	0	0	2	0	0	0	0	6
5:00 PM	0	2	0	0	0	0	0	1	0	0	0	0	3
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
TOTAL VOLUMES:	0	10	0	0	0	0	0	6	0	0	0	0	16

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Henderson Street
Weather: Clear

File Name : 02_ERK_101_Henderson MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	11	278	0	289	110	3	35	148	0	216	4	220	4	0	6	10	667
11:15 AM	17	269	0	286	86	5	40	131	1	231	1	233	4	3	1	8	658
11:30 AM	25	321	0	346	113	1	35	149	0	274	4	278	10	3	3	16	789
11:45 AM	11	289	0	300	93	3	41	137	1	248	2	251	7	1	5	13	701
Total	64	1157	0	1221	402	12	151	565	2	969	11	982	25	7	15	47	2815
12:00 PM	17	289	0	306	102	14	42	158	0	257	4	261	2	0	6	8	733
12:15 PM	13	302	1	316	90	2	33	125	0	300	4	304	4	2	2	8	753
12:30 PM	14	345	1	360	108	2	35	145	1	255	1	257	6	2	3	11	773
12:45 PM	30	312	0	342	101	1	36	138	5	296	5	306	6	1	3	10	796
Total	74	1248	2	1324	401	19	146	566	6	1108	14	1128	18	5	14	37	3055
Grand Total	138	2405	2	2545	803	31	297	1131	8	2077	25	2110	43	12	29	84	5870
Apprch %	5.4	94.5	0.1		71	2.7	26.3		0.4	98.4	1.2		51.2	14.3	34.5		
Total %	2.4	41	0	43.4	13.7	0.5	5.1	19.3	0.1	35.4	0.4	35.9	0.7	0.2	0.5	1.4	
Passenger Vehicles	133	2305	2	2440	791	31	292	1114	8	1982	24	2014	38	12	29	79	5647
% Passenger Vehicles	96.4	95.8	100	95.9	98.5	100	98.3	98.5	100	95.4	96	95.5	88.4	100	100	94	96.2
Motorcycles	1	12	0	13	1	0	0	1	0	5	0	5	4	0	0	4	23
% Motorcycles	0.7	0.5	0	0.5	0.1	0	0	0.1	0	0.2	0	0.2	9.3	0	0	4.8	0.4
Heavy Trucks	4	88	0	92	11	0	5	16	0	90	1	91	1	0	0	1	200
% Heavy Trucks	2.9	3.7	0	3.6	1.4	0	1.7	1.4	0	4.3	4	4.3	2.3	0	0	1.2	3.4

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	17	289	0	306	102	**14**	**42**	**158**	0	257	4	261	2	0	**6**	8	733
12:15 PM	13	302	**1**	316	90	2	33	125	0	**300**	4	304	4	**2**	2	8	753
12:30 PM	14	**345**	1	**360**	**108**	2	35	145	1	255	1	257	**6**	2	3	**11**	773
12:45 PM	**30**	312	0	342	101	1	36	138	**5**	296	**5**	**306**	6	1	3	10	**796**
Total Volume	74	1248	2	1324	401	19	146	566	6	1108	14	1128	18	5	14	37	3055
% App. Total	5.6	94.3	0.2		70.8	3.4	25.8		0.5	98.2	1.2		48.6	13.5	37.8		
PHF	.617	.904	.500	.919	.928	.339	.869	.896	.300	.923	.700	.922	.750	.625	.583	.841	.959

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City of Eureka
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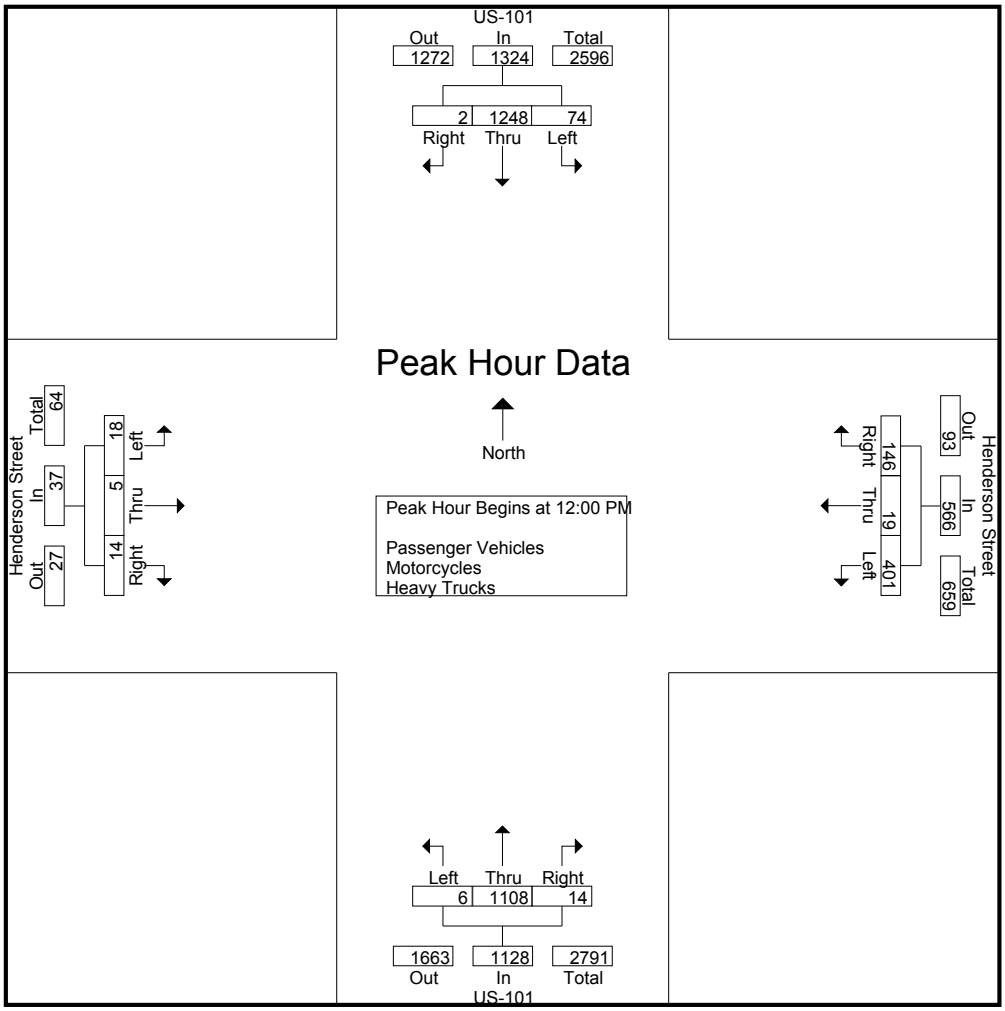
E/W: Henderson Street
Weather: Clear

File Name : 02_ERK_101_Henderson MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				11:15 AM				12:00 PM				11:00 AM			
+0 mins.	17	289	0	306	86	5	40	131	0	257	4	261	4	0	**6**	10
+15 mins.	13	302	**1**	316	**113**	1	35	149	0	**300**	4	304	4	**3**	1	8
+30 mins.	14	**345**	1	**360**	93	3	41	137	1	255	1	257	**10**	3	3	**16**
+45 mins.	**30**	312	0	342	102	**14**	**42**	**158**	**5**	296	**5**	**306**	7	1	5	13
Total Volume	74	1248	2	1324	394	23	158	575	6	1108	14	1128	25	7	15	47
% App. Total	5.6	94.3	0.2		68.5	4	27.5		0.5	98.2	1.2		53.2	14.9	31.9	
PHF	.617	.904	.500	.919	.872	.411	.940	.910	.300	.923	.700	.922	.625	.583	.625	.734

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Start Date : 5/9/2018
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Groups Printed- Passenger Vehicles

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	11	264	0	275	107	3	35	145	0	204	4	208	4	0	6	10	638
11:15 AM	17	250	0	267	85	5	40	130	1	219	0	220	4	3	1	8	625
11:30 AM	24	308	0	332	111	1	35	147	0	265	4	269	6	3	3	12	760
11:45 AM	11	281	0	292	92	3	39	134	1	239	2	242	7	1	5	13	681
Total	63	1103	0	1166	395	12	149	556	2	927	10	939	21	7	15	43	2704
12:00 PM	15	275	0	290	102	14	42	158	0	244	4	248	2	0	6	8	704
12:15 PM	12	287	1	300	89	2	32	123	0	289	4	293	4	2	2	8	724
12:30 PM	14	330	1	345	105	2	34	141	1	243	1	245	6	2	3	11	742
12:45 PM	29	310	0	339	100	1	35	136	5	279	5	289	5	1	3	9	773
Total	70	1202	2	1274	396	19	143	558	6	1055	14	1075	17	5	14	36	2943
Grand Total	133	2305	2	2440	791	31	292	1114	8	1982	24	2014	38	12	29	79	5647
Apprch %	5.5	94.5	0.1		71	2.8	26.2		0.4	98.4	1.2		48.1	15.2	36.7		
Total %	2.4	40.8	0	43.2	14	0.5	5.2	19.7	0.1	35.1	0.4	35.7	0.7	0.2	0.5	1.4	

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	15	275	0	290	102	**14**	**42**	**158**	0	244	4	248	2	0	**6**	8	704
12:15 PM	12	287	**1**	300	89	2	32	123	0	**289**	4	**293**	4	**2**	2	8	724
12:30 PM	14	**330**	1	**345**	**105**	2	34	141	1	243	1	245	**6**	2	3	**11**	742
12:45 PM	**29**	310	0	339	100	1	35	136	**5**	279	**5**	289	5	1	3	9	**773**
Total Volume	70	1202	2	1274	396	19	143	558	6	1055	14	1075	17	5	14	36	2943
% App. Total	5.5	94.3	0.2		71	3.4	25.6		0.6	98.1	1.3		47.2	13.9	38.9		
PHF	.603	.911	.500	.923	.943	.339	.851	.883	.300	.913	.700	.917	.708	.625	.583	.818	.952

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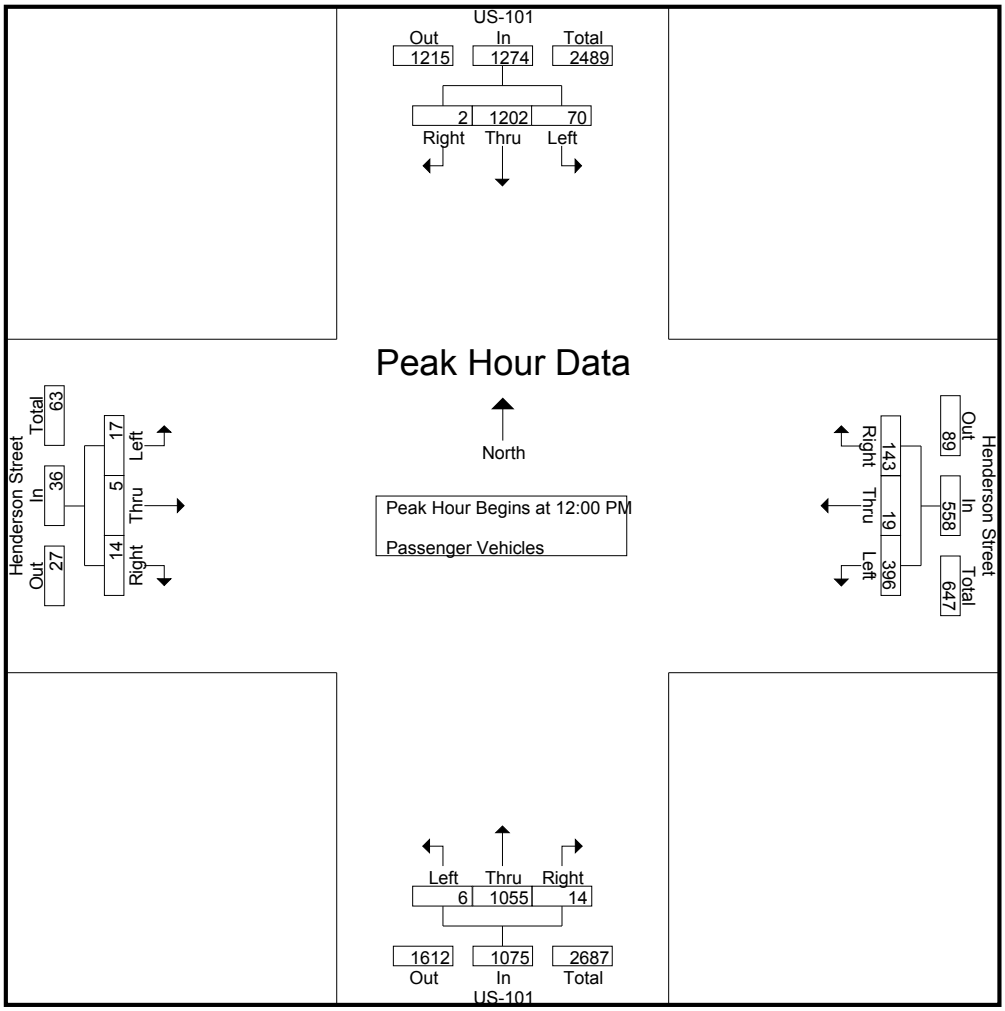

Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:00 PM				12:00 PM			
+0 mins.	15	275	0	290	102	**14**	**42**	**158**	0	244	4	248	2	0	**6**	8
+15 mins.	12	287	**1**	300	89	2	32	123	0	**289**	4	**293**	4	**2**	2	8
+30 mins.	14	**330**	1	**345**	**105**	2	34	141	1	243	1	245	**6**	2	3	**11**
+45 mins.	**29**	310	0	339	100	1	35	136	**5**	279	**5**	289	5	1	3	9
Total Volume	70	1202	2	1274	396	19	143	558	6	1055	14	1075	17	5	14	36
% App. Total	5.5	94.3	0.2		71	3.4	25.6		0.6	98.1	1.3		47.2	13.9	38.9	
PHF	.603	.911	.500	.923	.943	.339	.851	.883	.300	.913	.700	.917	.708	.625	.583	.818

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Groups Printed- Motorcycles

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
11:15 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
11:30 AM	0	7	0	7	0	0	0	0	0	1	0	1	4	0	0	4	12
11:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	10	0	10	0	0	0	0	0	3	0	3	4	0	0	4	17
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
12:45 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	2
Total	1	2	0	3	1	0	0	1	0	2	0	2	0	0	0	0	6
Grand Total	1	12	0	13	1	0	0	1	0	5	0	5	4	0	0	4	23
Apprch %	7.7	92.3	0		100	0	0		0	100	0		100	0	0		
Total %	4.3	52.2	0	56.5	4.3	0	0	4.3	0	21.7	0	21.7	17.4	0	0	17.4	

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	**1**	1	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	**2**
12:30 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	1
12:45 PM	0	0	0	0	**1**	0	0	**1**	0	1	0	1	0	0	0	0	2
Total Volume	1	2	0	3	1	0	0	1	0	2	0	2	0	0	0	0	6
% App. Total	33.3	66.7	0		100	0	0		0	100	0		0	0	0		
PHF	.250	.500	.000	.375	.250	.000	.000	.250	.000	.500	.000	.500	.000	.000	.000	.000	.750

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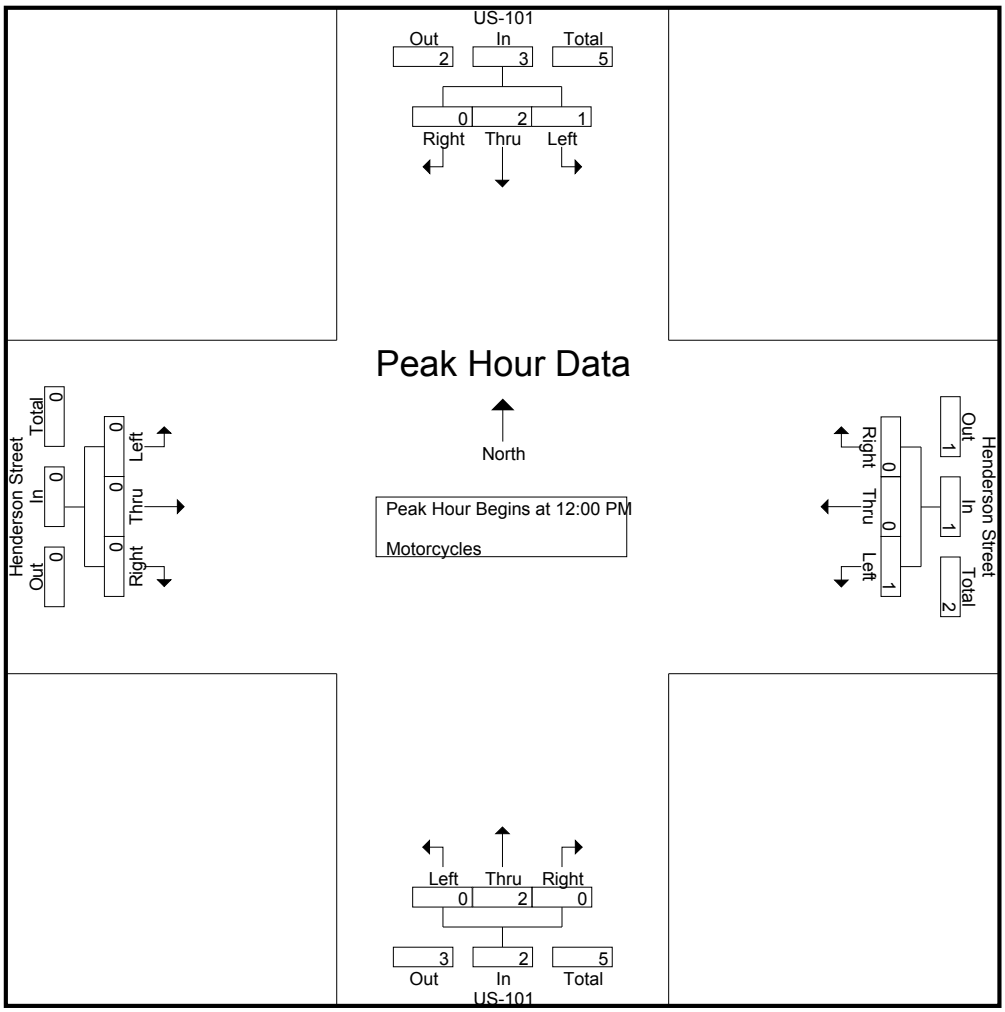

Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:00 PM				12:00 PM			
+0 mins.	0	**1**	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	**1**	1	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+45 mins.	0	0	0	0	**1**	0	0	**1**	0	1	0	1	0	0	0	0
Total Volume	1	2	0	3	1	0	0	1	0	2	0	2	0	0	0	0
% App. Total	33.3	66.7	0		100	0	0		0	100	0		0	0	0	
PHF	.250	.500	.000	.375	.250	.000	.000	.250	.000	.500	.000	.500	.000	.000	.000	.000

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Groups Printed- Heavy Trucks

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	0	14	0	14	3	0	0	3	0	11	0	11	0	0	0	0	28
11:15 AM	0	17	0	17	1	0	0	1	0	12	1	13	0	0	0	0	31
11:30 AM	1	6	0	7	2	0	0	2	0	8	0	8	0	0	0	0	17
11:45 AM	0	7	0	7	1	0	2	3	0	8	0	8	0	0	0	0	18
Total	1	44	0	45	7	0	2	9	0	39	1	40	0	0	0	0	94
12:00 PM	2	13	0	15	0	0	0	0	0	13	0	13	0	0	0	0	28
12:15 PM	0	14	0	14	1	0	1	2	0	11	0	11	0	0	0	0	27
12:30 PM	0	15	0	15	3	0	1	4	0	11	0	11	0	0	0	0	30
12:45 PM	1	2	0	3	0	0	1	1	0	16	0	16	1	0	0	1	21
Total	3	44	0	47	4	0	3	7	0	51	0	51	1	0	0	1	106
Grand Total	4	88	0	92	11	0	5	16	0	90	1	91	1	0	0	1	200
Apprch %	4.3	95.7	0		68.8	0	31.2		0	98.9	1.1		100	0	0		
Total %	2	44	0	46	5.5	0	2.5	8	0	45	0.5	45.5	0.5	0	0	0.5	

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	**2**	13	0	**15**	0	0	0	0	0	13	0	13	0	0	0	0	28
12:15 PM	0	14	0	14	1	0	**1**	2	0	11	0	11	0	0	0	0	27
12:30 PM	0	**15**	0	15	**3**	0	1	**4**	0	11	0	11	0	0	0	0	**30**
12:45 PM	1	2	0	3	0	0	1	1	0	**16**	0	**16**	**1**	0	0	**1**	21
Total Volume	3	44	0	47	4	0	3	7	0	51	0	51	1	0	0	1	106
% App. Total	6.4	93.6	0		57.1	0	42.9		0	100	0		100	0	0		
PHF	.375	.733	.000	.783	.333	.000	.750	.438	.000	.797	.000	.797	.250	.000	.000	.250	.883

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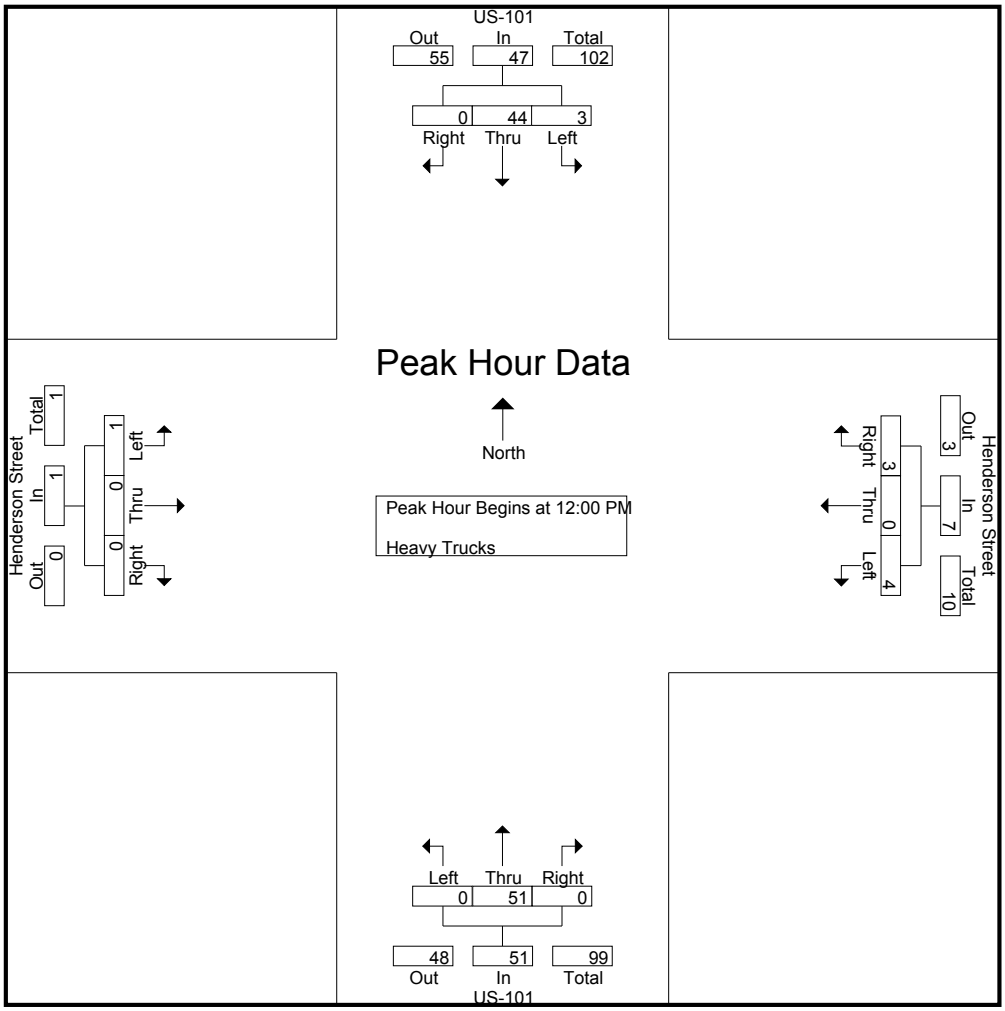

Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:00 PM				12:00 PM			
+0 mins.	**2**	13	0	**15**	0	0	0	0	0	13	0	13	0	0	0	0
+15 mins.	0	14	0	14	1	0	**1**	2	0	11	0	11	0	0	0	0
+30 mins.	0	**15**	0	15	**3**	0	1	**4**	0	11	0	11	0	0	0	0
+45 mins.	1	2	0	3	0	0	1	1	0	**16**	0	**16**	**1**	0	0	**1**
Total Volume	3	44	0	47	4	0	3	7	0	51	0	51	1	0	0	1
% App. Total	6.4	93.6	0		57.1	0	42.9		0	100	0		100	0	0	
PHF	.375	.733	.000	.783	.333	.000	.750	.438	.000	.797	.000	.797	.250	.000	.000	.250

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Henderson Street
Weather: Clear

File Name : 02_ERK_101_Henderson PM
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	26	384	0	410	110	2	30	142	3	315	10	328	9	0	4	13	893
04:15 PM	20	362	0	382	113	2	37	152	4	307	3	314	3	2	5	10	858
04:30 PM	16	330	0	346	117	3	39	159	2	257	9	268	4	1	2	7	780
04:45 PM	17	397	0	414	112	3	26	141	2	299	7	308	4	0	4	8	871
Total	79	1473	0	1552	452	10	132	594	11	1178	29	1218	20	3	15	38	3402
05:00 PM	21	446	0	467	134	2	27	163	3	285	6	294	5	0	8	13	937
05:15 PM	15	397	0	412	164	2	22	188	1	285	6	292	2	3	4	9	901
05:30 PM	15	302	0	317	106	5	39	150	2	244	2	248	2	7	6	15	730
05:45 PM	13	313	0	326	112	0	34	146	2	252	4	258	2	0	2	4	734
Total	64	1458	0	1522	516	9	122	647	8	1066	18	1092	11	10	20	41	3302
Grand Total	143	2931	0	3074	968	19	254	1241	19	2244	47	2310	31	13	35	79	6704
Apprch %	4.7	95.3	0		78	1.5	20.5		0.8	97.1	2		39.2	16.5	44.3		
Total %	2.1	43.7	0	45.9	14.4	0.3	3.8	18.5	0.3	33.5	0.7	34.5	0.5	0.2	0.5	1.2	
Passenger Vehicles	139	2820	0	2959	954	19	251	1224	19	2093	45	2157	30	13	34	77	6417
% Passenger Vehicles	97.2	96.2	0	96.3	98.6	100	98.8	98.6	100	93.3	95.7	93.4	96.8	100	97.1	97.5	95.7
Motorcycles	2	19	0	21	5	0	1	6	0	13	1	14	1	0	0	1	42
% Motorcycles	1.4	0.6	0	0.7	0.5	0	0.4	0.5	0	0.6	2.1	0.6	3.2	0	0	1.3	0.6
Heavy Trucks	2	92	0	94	9	0	2	11	0	138	1	139	0	0	1	1	245
% Heavy Trucks	1.4	3.1	0	3.1	0.9	0	0.8	0.9	0	6.1	2.1	6	0	0	2.9	1.3	3.7

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	16	330	0	346	117	**3**	**39**	159	2	257	**9**	268	4	1	2	7	780
04:45 PM	17	397	0	414	112	3	26	141	2	**299**	7	**308**	4	0	4	8	871
05:00 PM	**21**	**446**	0	**467**	134	2	27	163	**3**	285	6	294	**5**	0	**8**	**13**	**937**
05:15 PM	15	397	0	412	**164**	2	22	**188**	1	285	6	292	2	**3**	4	9	901
Total Volume	69	1570	0	1639	527	10	114	651	8	1126	28	1162	15	4	18	37	3489
% App. Total	4.2	95.8	0		81	1.5	17.5		0.7	96.9	2.4		40.5	10.8	48.6		
PHF	.821	.880	.000	.877	.803	.833	.731	.866	.667	.941	.778	.943	.750	.333	.563	.712	.931

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City of Eureka
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Weather: Clear

File Name : 02_ERK_101_Henderson PM
Site Code : 99918361
Start Date : 5/9/2018
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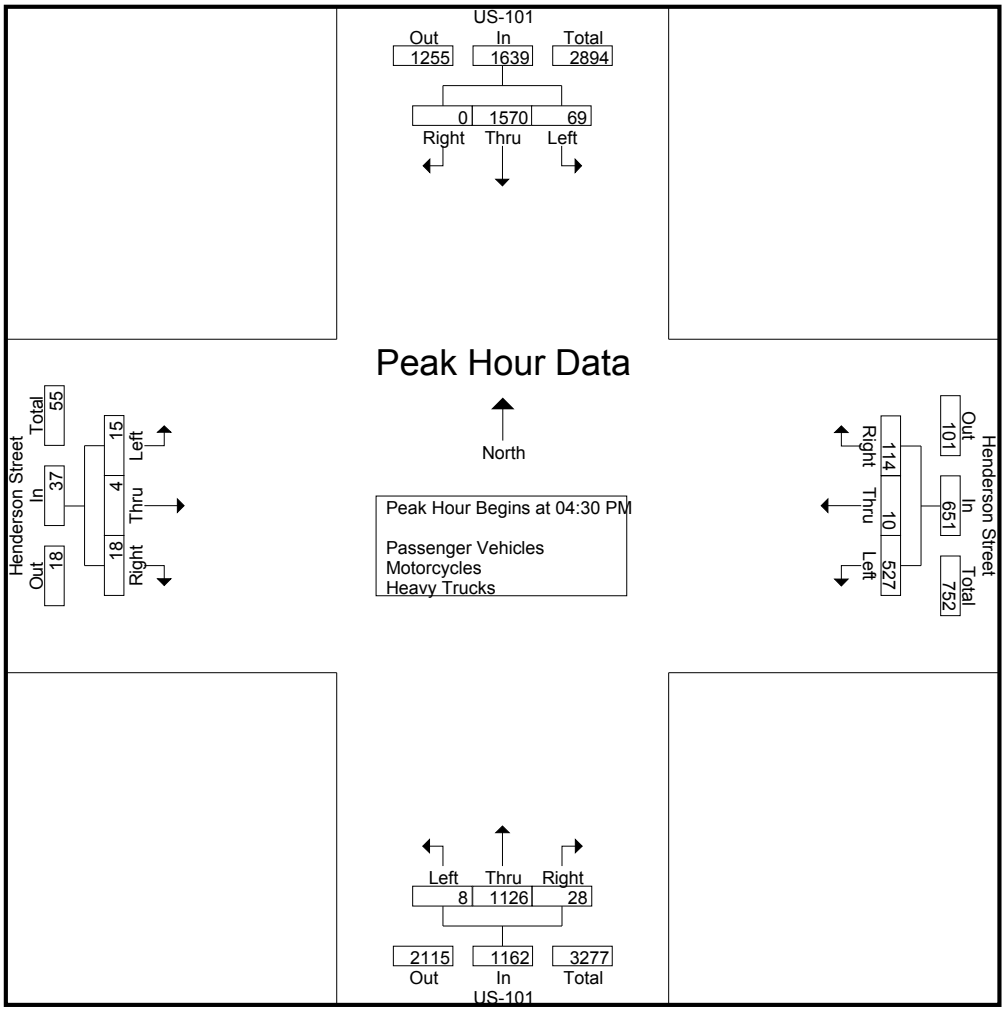

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:00 PM				04:45 PM			
+0 mins.	16	330	0	346	117	**3**	**39**	159	3	**315**	**10**	**328**	4	0	4	8
+15 mins.	17	397	0	414	112	3	26	141	**4**	307	3	314	**5**	0	**8**	13
+30 mins.	**21**	**446**	0	**467**	134	2	27	163	2	257	9	268	2	3	4	9
+45 mins.	15	397	0	412	**164**	2	22	**188**	2	299	7	308	2	**7**	6	**15**
Total Volume	69	1570	0	1639	527	10	114	651	11	1178	29	1218	13	10	22	45
% App. Total	4.2	95.8	0		81	1.5	17.5		0.9	96.7	2.4		28.9	22.2	48.9	
PHF	.821	.880	.000	.877	.803	.833	.731	.866	.688	.935	.725	.928	.650	.357	.688	.750

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Groups Printed- Passenger Vehicles

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	24	373	0	397	108	2	30	140	3	277	9	289	8	0	4	12	838
04:15 PM	20	339	0	359	112	2	37	151	4	285	3	292	3	2	5	10	812
04:30 PM	16	318	0	334	115	3	39	157	2	244	9	255	4	1	2	7	753
04:45 PM	16	382	0	398	111	3	26	140	2	276	6	284	4	0	3	7	829
Total	76	1412	0	1488	446	10	132	588	11	1082	27	1120	19	3	14	36	3232
05:00 PM	20	430	0	450	134	2	26	162	3	268	6	277	5	0	8	13	902
05:15 PM	15	385	0	400	162	2	22	186	1	279	6	286	2	3	4	9	881
05:30 PM	15	290	0	305	102	5	37	144	2	224	2	228	2	7	6	15	692
05:45 PM	13	303	0	316	110	0	34	144	2	240	4	246	2	0	2	4	710
Total	63	1408	0	1471	508	9	119	636	8	1011	18	1037	11	10	20	41	3185
Grand Total	139	2820	0	2959	954	19	251	1224	19	2093	45	2157	30	13	34	77	6417
Apprch %	4.7	95.3	0		77.9	1.6	20.5		0.9	97	2.1		39	16.9	44.2		
Total %	2.2	43.9	0	46.1	14.9	0.3	3.9	19.1	0.3	32.6	0.7	33.6	0.5	0.2	0.5	1.2	

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	16	318	0	334	115	**3**	**39**	157	2	244	**9**	255	4	1	2	7	753
04:45 PM	16	382	0	398	111	3	26	140	2	276	6	284	4	0	3	7	829
05:00 PM	**20**	**430**	0	**450**	134	2	26	162	**3**	268	6	277	**5**	0	**8**	**13**	**902**
05:15 PM	15	385	0	400	**162**	2	22	**186**	1	**279**	6	**286**	2	**3**	4	9	881
Total Volume	67	1515	0	1582	522	10	113	645	8	1067	27	1102	15	4	17	36	3365
% App. Total	4.2	95.8	0		80.9	1.6	17.5		0.7	96.8	2.5		41.7	11.1	47.2		
PHF	.838	.881	.000	.879	.806	.833	.724	.867	.667	.956	.750	.963	.750	.333	.531	.692	.933

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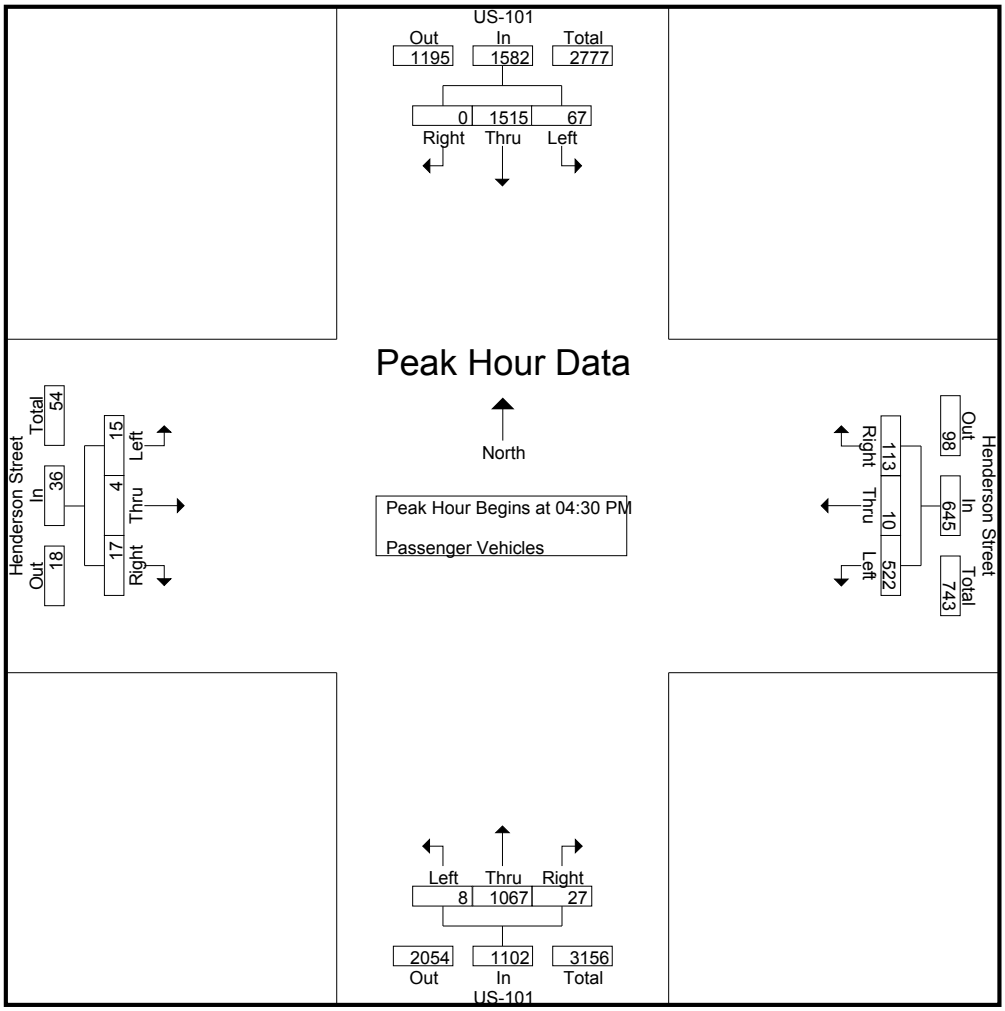

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	16	318	0	334	115	**3**	**39**	157	2	244	**9**	255	4	1	2	7
+15 mins.	16	382	0	398	111	3	26	140	2	276	6	284	4	0	3	7
+30 mins.	**20**	**430**	0	**450**	134	2	26	162	**3**	268	6	277	**5**	0	**8**	**13**
+45 mins.	15	385	0	400	**162**	2	22	**186**	1	**279**	6	**286**	2	**3**	4	9
Total Volume	67	1515	0	1582	522	10	113	645	8	1067	27	1102	15	4	17	36
% App. Total	4.2	95.8	0		80.9	1.6	17.5		0.7	96.8	2.5		41.7	11.1	47.2	
PHF	.838	.881	.000	.879	.806	.833	.724	.867	.667	.956	.750	.963	.750	.333	.531	.692

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Groups Printed- Motorcycles

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	1	0	2	1	0	0	1	0	1	0	1	1	0	0	1	5
04:15 PM	0	3	0	3	0	0	0	0	0	1	0	1	0	0	0	0	4
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	1	1	0	2	0	0	0	0	0	8	1	9	0	0	0	0	11
Total	2	6	0	8	1	0	0	1	0	10	1	11	1	0	0	1	21
05:00 PM	0	3	0	3	0	0	1	1	0	0	0	0	0	0	0	0	4
05:15 PM	0	5	0	5	1	0	0	1	0	0	0	0	0	0	0	0	6
05:30 PM	0	3	0	3	3	0	0	3	0	2	0	2	0	0	0	0	8
05:45 PM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
Total	0	13	0	13	4	0	1	5	0	3	0	3	0	0	0	0	21
Grand Total	2	19	0	21	5	0	1	6	0	13	1	14	1	0	0	1	42
Apprch %	9.5	90.5	0		83.3	0	16.7		0	92.9	7.1		100	0	0		
Total %	4.8	45.2	0	50	11.9	0	2.4	14.3	0	31	2.4	33.3	2.4	0	0	2.4	

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	**1**	1	0	2	0	0	0	0	0	**8**	**1**	**9**	0	0	0	0	**11**
05:00 PM	0	3	0	3	0	0	**1**	**1**	0	0	0	0	0	0	0	0	4
05:15 PM	0	**5**	0	**5**	**1**	0	0	1	0	0	0	0	0	0	0	0	6
Total Volume	1	10	0	11	1	0	1	2	0	8	1	9	0	0	0	0	22
% App. Total	9.1	90.9	0		50	0	50		0	88.9	11.1		0	0	0		
PHF	.250	.500	.000	.550	.250	.000	.250	.500	.000	.250	.250	.250	.000	.000	.000	.000	.500

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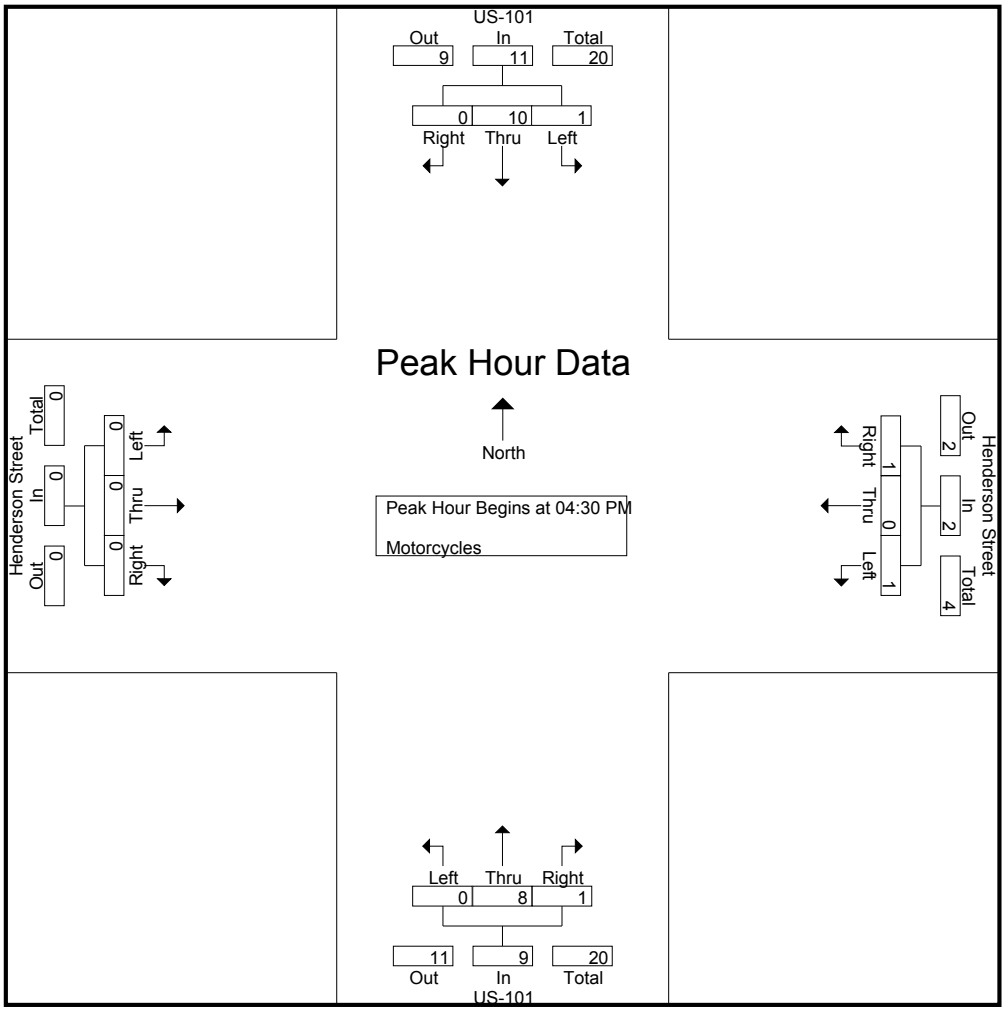

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	**1**	1	0	2	0	0	0	0	0	**8**	**1**	**9**	0	0	0	0
+30 mins.	0	3	0	3	0	0	**1**	**1**	0	0	0	0	0	0	0	0
+45 mins.	0	**5**	0	**5**	**1**	0	0	1	0	0	0	0	0	0	0	0
Total Volume	1	10	0	11	1	0	1	2	0	8	1	9	0	0	0	0
% App. Total	9.1	90.9	0		50	0	50		0	88.9	11.1		0	0	0	
PHF	.250	.500	.000	.550	.250	.000	.250	.500	.000	.250	.250	.250	.000	.000	.000	.000

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Groups Printed- Heavy Trucks

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	10	0	11	1	0	0	1	0	37	1	38	0	0	0	0	50
04:15 PM	0	20	0	20	1	0	0	1	0	21	0	21	0	0	0	0	42
04:30 PM	0	11	0	11	2	0	0	2	0	13	0	13	0	0	0	0	26
04:45 PM	0	14	0	14	1	0	0	1	0	15	0	15	0	0	1	1	31
Total	1	55	0	56	5	0	0	5	0	86	1	87	0	0	1	1	149
05:00 PM	1	13	0	14	0	0	0	0	0	17	0	17	0	0	0	0	31
05:15 PM	0	7	0	7	1	0	0	1	0	6	0	6	0	0	0	0	14
05:30 PM	0	9	0	9	1	0	2	3	0	18	0	18	0	0	0	0	30
05:45 PM	0	8	0	8	2	0	0	2	0	11	0	11	0	0	0	0	21
Total	1	37	0	38	4	0	2	6	0	52	0	52	0	0	0	0	96
Grand Total	2	92	0	94	9	0	2	11	0	138	1	139	0	0	1	1	245
Apprch %	2.1	97.9	0		81.8	0	18.2		0	99.3	0.7		0	0	100		
Total %	0.8	37.6	0	38.4	3.7	0	0.8	4.5	0	56.3	0.4	56.7	0	0	0.4	0.4	

	US-101 Southbound				Henderson Street Westbound				US-101 Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	11	0	11	**2**	0	0	**2**	0	13	0	13	0	0	0	0	26
04:45 PM	0	**14**	0	**14**	1	0	0	1	0	15	0	15	0	0	**1**	**1**	**31**
05:00 PM	**1**	13	0	14	0	0	0	0	0	**17**	0	**17**	0	0	0	0	31
05:15 PM	0	7	0	7	1	0	0	1	0	6	0	6	0	0	0	0	14
Total Volume	1	45	0	46	4	0	0	4	0	51	0	51	0	0	1	1	102
% App. Total	2.2	97.8	0		100	0	0		0	100	0		0	0	100		
PHF	.250	.804	.000	.821	.500	.000	.000	.500	.000	.750	.000	.750	.000	.000	.250	.250	.823

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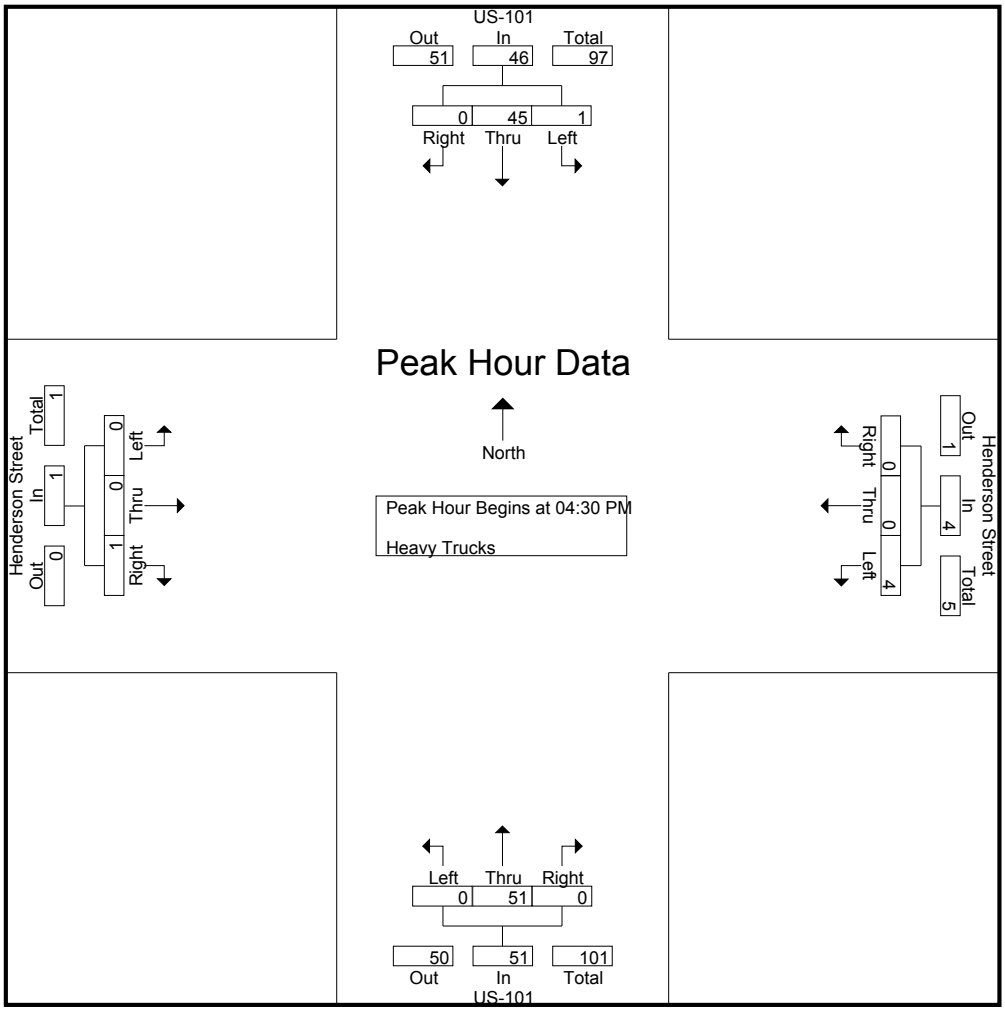

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	11	0	11	**2**	0	0	**2**	0	13	0	13	0	0	0	0
+15 mins.	0	**14**	0	**14**	1	0	0	1	0	15	0	15	0	0	**1**	**1**
+30 mins.	**1**	13	0	14	0	0	0	0	0	**17**	0	**17**	0	0	0	0
+45 mins.	0	7	0	7	1	0	0	1	0	6	0	6	0	0	0	0
Total Volume	1	45	0	46	4	0	0	4	0	51	0	51	0	0	1	1
% App. Total	2.2	97.8	0		100	0	0		0	100	0		0	0	100	
PHF	.250	.804	.000	.821	.500	.000	.000	.500	.000	.750	.000	.750	.000	.000	.250	.250

Location: Eureka
N/S: US-101
E/W: Henderson Street

Date: 5/9/2018
Day: Wednesday

PEDESTRIANS

	North Leg US-101	East Leg Henderson Street	South Leg US-101	West Leg Henderson Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
11:00 AM	0	0	0	0	0
11:15 AM	0	0	0	0	0
11:30 AM	2	0	0	0	2
11:45 AM	1	0	0	5	6
12:00 PM	4	0	0	6	10
12:15 PM	3	0	0	4	7
12:30 PM	1	1	0	2	4
12:45 PM	1	0	0	0	1
TOTAL VOLUMES:	12	1	0	17	30

	North Leg US-101	East Leg Henderson Street	South Leg US-101	West Leg Henderson Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	3	1	0	5	9
4:15 PM	5	1	0	2	8
4:30 PM	2	0	0	5	7
4:45 PM	0	1	0	2	3
5:00 PM	0	0	0	4	4
5:15 PM	1	1	0	1	3
5:30 PM	0	1	0	4	5
5:45 PM	0	0	0	1	1
TOTAL VOLUMES:	11	5	0	24	40

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Location: Eureka
N/S: US-101
E/W: Henderson Street

Date: 5/9/2018
Day: Wednesday

BICYCLES

	Southbound US-101			Westbound Henderson Street			Northbound US-101			Eastbound Henderson Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	2	0	0	0	0	0	1	0	0	0	0	3
12:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
12:30 PM	0	1	0	1	0	0	0	0	1	0	0	1	4
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	3	0	2	0	0	0	4	1	0	0	1	11

	Southbound US-101			Westbound Henderson Street			Northbound US-101			Eastbound Henderson Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	2	0	0	1	0	0	1	0	0	1	0	5
4:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:45 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
5:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
TOTAL VOLUMES:	0	7	0	0	2	0	0	6	0	0	1	0	16

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Hawthorne Street
Weather: Clear

File Name : 03_ERK_101_Hawthorne MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	3	285	9	297	0	1	2	3	8	244	1	253	3	0	20	23	576
11:15 AM	3	287	9	299	0	0	2	2	12	262	3	277	3	0	6	9	587
11:30 AM	2	320	6	328	2	0	1	3	5	291	2	298	0	1	8	9	638
11:45 AM	6	324	10	340	0	0	0	0	14	306	3	323	4	2	7	13	676
Total	14	1216	34	1264	2	1	5	8	39	1103	9	1151	10	3	41	54	2477
12:00 PM	4	317	11	332	0	0	0	0	10	316	4	330	3	0	17	20	682
12:15 PM	4	335	13	352	0	0	2	2	12	323	1	336	2	1	10	13	703
12:30 PM	1	371	12	384	3	0	3	6	10	290	6	306	7	0	14	21	717
12:45 PM	5	324	8	337	1	0	0	1	12	318	3	333	4	0	12	16	687
Total	14	1347	44	1405	4	0	5	9	44	1247	14	1305	16	1	53	70	2789
Grand Total	28	2563	78	2669	6	1	10	17	83	2350	23	2456	26	4	94	124	5266
Apprch %	1	96	2.9		35.3	5.9	58.8		3.4	95.7	0.9		21	3.2	75.8		
Total %	0.5	48.7	1.5	50.7	0.1	0	0.2	0.3	1.6	44.6	0.4	46.6	0.5	0.1	1.8	2.4	
Passenger Vehicles	28	2447	66	2541	5	1	10	16	75	2225	23	2323	26	4	85	115	4995
% Passenger Vehicles	100	95.5	84.6	95.2	83.3	100	100	94.1	90.4	94.7	100	94.6	100	100	90.4	92.7	94.9
Motorcycles	0	13	0	13	1	0	0	1	0	12	0	12	0	0	0	0	26
% Motorcycles	0	0.5	0	0.5	16.7	0	0	5.9	0	0.5	0	0.5	0	0	0	0	0.5
Heavy Trucks	0	103	12	115	0	0	0	0	8	113	0	121	0	0	9	9	245
% Heavy Trucks	0	4	15.4	4.3	0	0	0	0	9.6	4.8	0	4.9	0	0	9.6	7.3	4.7

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	4	317	11	332	0	0	0	0	10	316	4	330	3	0	**17**	20	682
12:15 PM	4	335	**13**	352	0	0	2	2	**12**	**323**	1	**336**	2	**1**	10	13	703
12:30 PM	1	**371**	12	**384**	**3**	0	**3**	**6**	10	290	**6**	306	**7**	0	14	**21**	**717**
12:45 PM	**5**	324	8	337	1	0	0	1	12	318	3	333	4	0	12	16	687
Total Volume	14	1347	44	1405	4	0	5	9	44	1247	14	1305	16	1	53	70	2789
% App. Total	1	95.9	3.1		44.4	0	55.6		3.4	95.6	1.1		22.9	1.4	75.7		
PHF	.700	.908	.846	.915	.333	.000	.417	.375	.917	.965	.583	.971	.571	.250	.779	.833	.972

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Hawthorne Street
Weather: Clear

File Name : 03_ERK_101_Hawthorne MD
Site Code : 99918361
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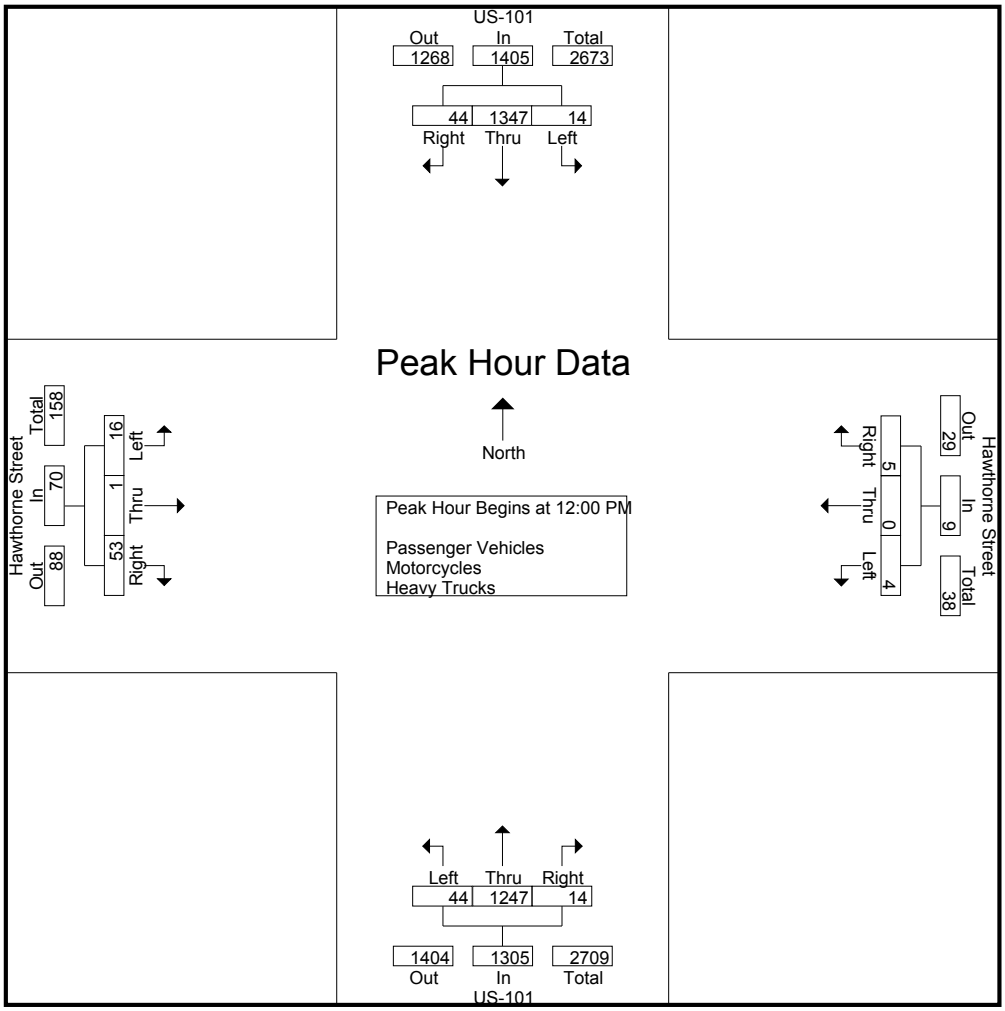

Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:45 AM				12:00 PM				12:00 PM				12:00 PM			
+0 mins.	**6**	324	10	340	0	0	0	0	10	316	4	330	3	0	**17**	20
+15 mins.	4	317	11	332	0	0	2	2	**12**	**323**	1	**336**	2	**1**	10	13
+30 mins.	4	335	**13**	352	**3**	0	**3**	**6**	10	290	**6**	306	**7**	0	14	**21**
+45 mins.	1	**371**	12	**384**	1	0	0	1	12	318	3	333	4	0	12	16
Total Volume	15	1347	46	1408	4	0	5	9	44	1247	14	1305	16	1	53	70
% App. Total	1.1	95.7	3.3		44.4	0	55.6		3.4	95.6	1.1		22.9	1.4	75.7	
PHF	.625	.908	.885	.917	.333	.000	.417	.375	.917	.965	.583	.971	.571	.250	.779	.833

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City of Eureka
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File Name : 03_ERK_101_Hawthorne MD
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Groups Printed- Passenger Vehicles

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	3	267	9	279	0	1	2	3	7	227	1	235	3	0	20	23	540
11:15 AM	3	266	7	276	0	0	2	2	12	249	3	264	3	0	6	9	551
11:30 AM	2	309	4	315	1	0	1	2	5	274	2	281	0	1	6	7	605
11:45 AM	6	310	8	324	0	0	0	0	12	292	3	307	4	2	7	13	644
Total	14	1152	28	1194	1	1	5	7	36	1042	9	1087	10	3	39	52	2340
12:00 PM	4	303	8	315	0	0	0	0	10	300	4	314	3	0	15	18	647
12:15 PM	4	314	13	331	0	0	2	2	11	311	1	323	2	1	10	13	669
12:30 PM	1	358	10	369	3	0	3	6	8	271	6	285	7	0	11	18	678
12:45 PM	5	320	7	332	1	0	0	1	10	301	3	314	4	0	10	14	661
Total	14	1295	38	1347	4	0	5	9	39	1183	14	1236	16	1	46	63	2655
Grand Total	28	2447	66	2541	5	1	10	16	75	2225	23	2323	26	4	85	115	4995
Apprch %	1.1	96.3	2.6		31.2	6.2	62.5		3.2	95.8	1		22.6	3.5	73.9		
Total %	0.6	49	1.3	50.9	0.1	0	0.2	0.3	1.5	44.5	0.5	46.5	0.5	0.1	1.7	2.3	

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	4	303	8	315	0	0	0	0	10	300	4	314	3	0	**15**	**18**	647
12:15 PM	4	314	**13**	331	0	0	2	2	**11**	**311**	1	**323**	2	**1**	10	13	669
12:30 PM	1	**358**	10	**369**	**3**	0	**3**	**6**	8	271	**6**	285	**7**	0	11	18	**678**
12:45 PM	**5**	320	7	332	1	0	0	1	10	301	3	314	4	0	10	14	661
Total Volume	14	1295	38	1347	4	0	5	9	39	1183	14	1236	16	1	46	63	2655
% App. Total	1	96.1	2.8		44.4	0	55.6		3.2	95.7	1.1		25.4	1.6	73		
PHF	.700	.904	.731	.913	.333	.000	.417	.375	.886	.951	.583	.957	.571	.250	.767	.875	.979

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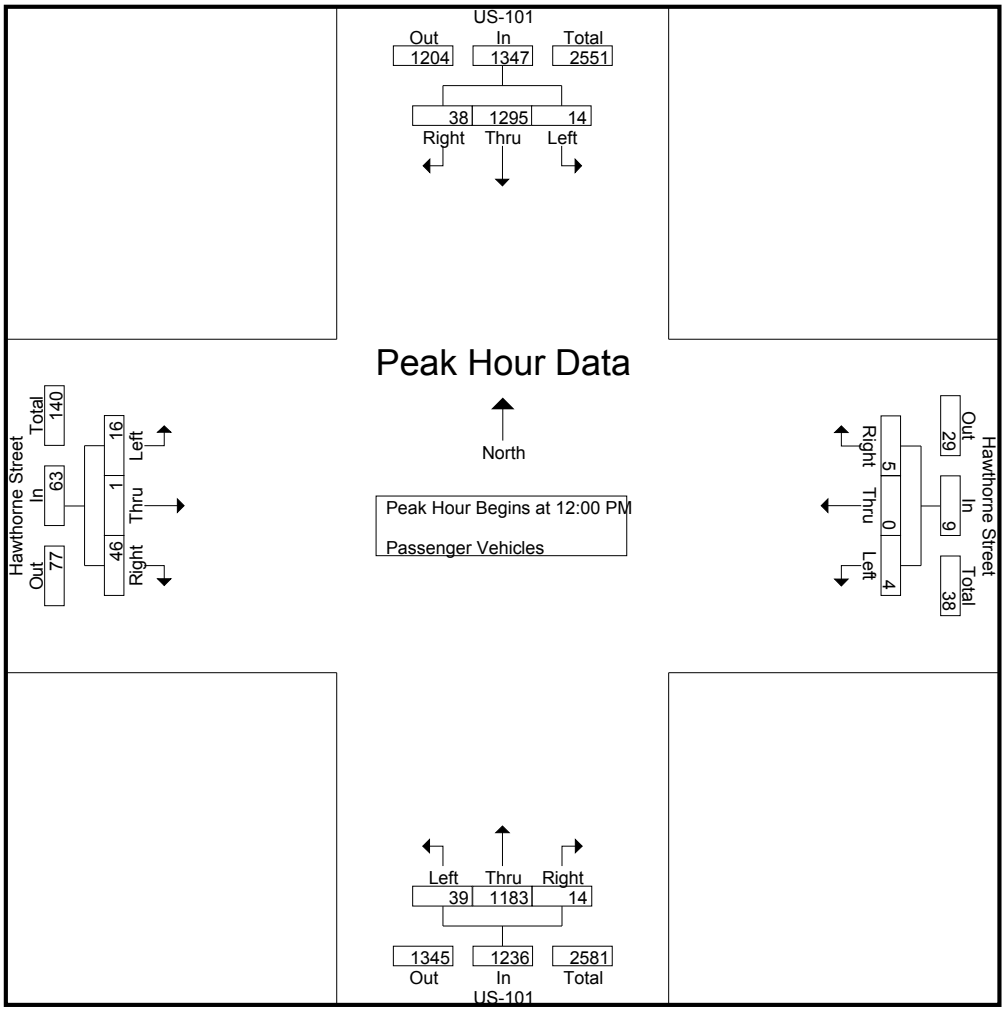

Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:00 PM				12:00 PM			
+0 mins.	4	303	8	315	0	0	0	0	10	300	4	314	3	0	**15**	**18**
+15 mins.	4	314	**13**	331	0	0	2	2	**11**	**311**	1	**323**	2	**1**	10	13
+30 mins.	1	**358**	10	**369**	**3**	0	**3**	**6**	8	271	**6**	285	**7**	0	11	18
+45 mins.	**5**	320	7	332	1	0	0	1	10	301	3	314	4	0	10	14
Total Volume	14	1295	38	1347	4	0	5	9	39	1183	14	1236	16	1	46	63
% App. Total	1	96.1	2.8		44.4	0	55.6		3.2	95.7	1.1		25.4	1.6	73	
PHF	.700	.904	.731	.913	.333	.000	.417	.375	.886	.951	.583	.957	.571	.250	.767	.875

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City of Eureka
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File Name : 03_ERK_101_Hawthorne MD
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Groups Printed- Motorcycles

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
11:15 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
11:30 AM	0	6	0	6	1	0	0	1	0	5	0	5	0	0	0	0	12
11:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	9	0	9	1	0	0	1	0	7	0	7	0	0	0	0	17
12:00 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
12:15 PM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
12:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
12:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	4	0	4	0	0	0	0	0	5	0	5	0	0	0	0	9
Grand Total	0	13	0	13	1	0	0	1	0	12	0	12	0	0	0	0	26
Apprch %	0	100	0		100	0	0		0	100	0		0	0	0		
Total %	0	50	0	50	3.8	0	0	3.8	0	46.2	0	46.2	0	0	0	0	

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
12:15 PM	0	**3**	0	**3**	0	0	0	0	0	0	0	0	0	0	0	0	**3**
12:30 PM	0	0	0	0	0	0	0	0	0	**3**	0	**3**	0	0	0	0	3
12:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	4	0	4	0	0	0	0	0	5	0	5	0	0	0	0	9
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.333	.000	.333	.000	.000	.000	.000	.000	.417	.000	.417	.000	.000	.000	.000	.750

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City of Eureka
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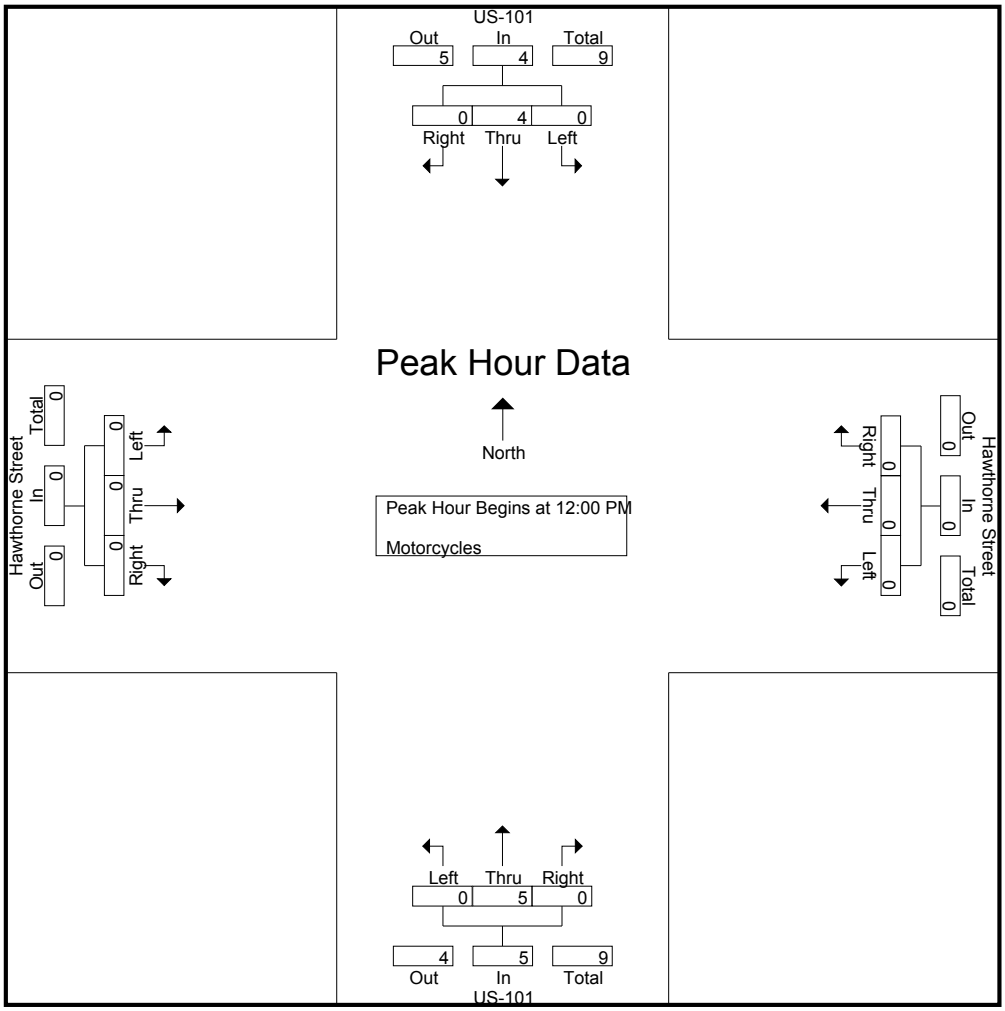

Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:00 PM				12:00 PM			
+0 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
+15 mins.	0	**3**	0	**3**	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	**3**	0	**3**	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	0	4	0	4	0	0	0	0	0	5	0	5	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.333	.000	.333	.000	.000	.000	.000	.000	.417	.000	.417	.000	.000	.000	.000

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City of Eureka
N/S: US-101 (Broadway Street)
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File Name : 03_ERK_101_Hawthorne MD
Site Code : 99918361
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Groups Printed- Heavy Trucks

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	0	18	0	18	0	0	0	0	1	16	0	17	0	0	0	0	35
11:15 AM	0	19	2	21	0	0	0	0	0	13	0	13	0	0	0	0	34
11:30 AM	0	5	2	7	0	0	0	0	0	12	0	12	0	0	2	2	21
11:45 AM	0	13	2	15	0	0	0	0	2	13	0	15	0	0	0	0	30
Total	0	55	6	61	0	0	0	0	3	54	0	57	0	0	2	2	120
12:00 PM	0	13	3	16	0	0	0	0	0	15	0	15	0	0	2	2	33
12:15 PM	0	18	0	18	0	0	0	0	1	12	0	13	0	0	0	0	31
12:30 PM	0	13	2	15	0	0	0	0	2	16	0	18	0	0	3	3	36
12:45 PM	0	4	1	5	0	0	0	0	2	16	0	18	0	0	2	2	25
Total	0	48	6	54	0	0	0	0	5	59	0	64	0	0	7	7	125
Grand Total	0	103	12	115	0	0	0	0	8	113	0	121	0	0	9	9	245
Apprch %	0	89.6	10.4		0	0	0		6.6	93.4	0		0	0	100		
Total %	0	42	4.9	46.9	0	0	0	0	3.3	46.1	0	49.4	0	0	3.7	3.7	

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	13	**3**	16	0	0	0	0	0	15	0	15	0	0	2	2	33
12:15 PM	0	**18**	0	**18**	0	0	0	0	1	12	0	13	0	0	0	0	31
12:30 PM	0	13	2	15	0	0	0	0	**2**	**16**	0	**18**	0	0	**3**	**3**	**36**
12:45 PM	0	4	1	5	0	0	0	0	2	16	0	18	0	0	2	2	25
Total Volume	0	48	6	54	0	0	0	0	5	59	0	64	0	0	7	7	125
% App. Total	0	88.9	11.1		0	0	0		7.8	92.2	0		0	0	100		
PHF	.000	.667	.500	.750	.000	.000	.000	.000	.625	.922	.000	.889	.000	.000	.583	.583	.868

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City of Eureka
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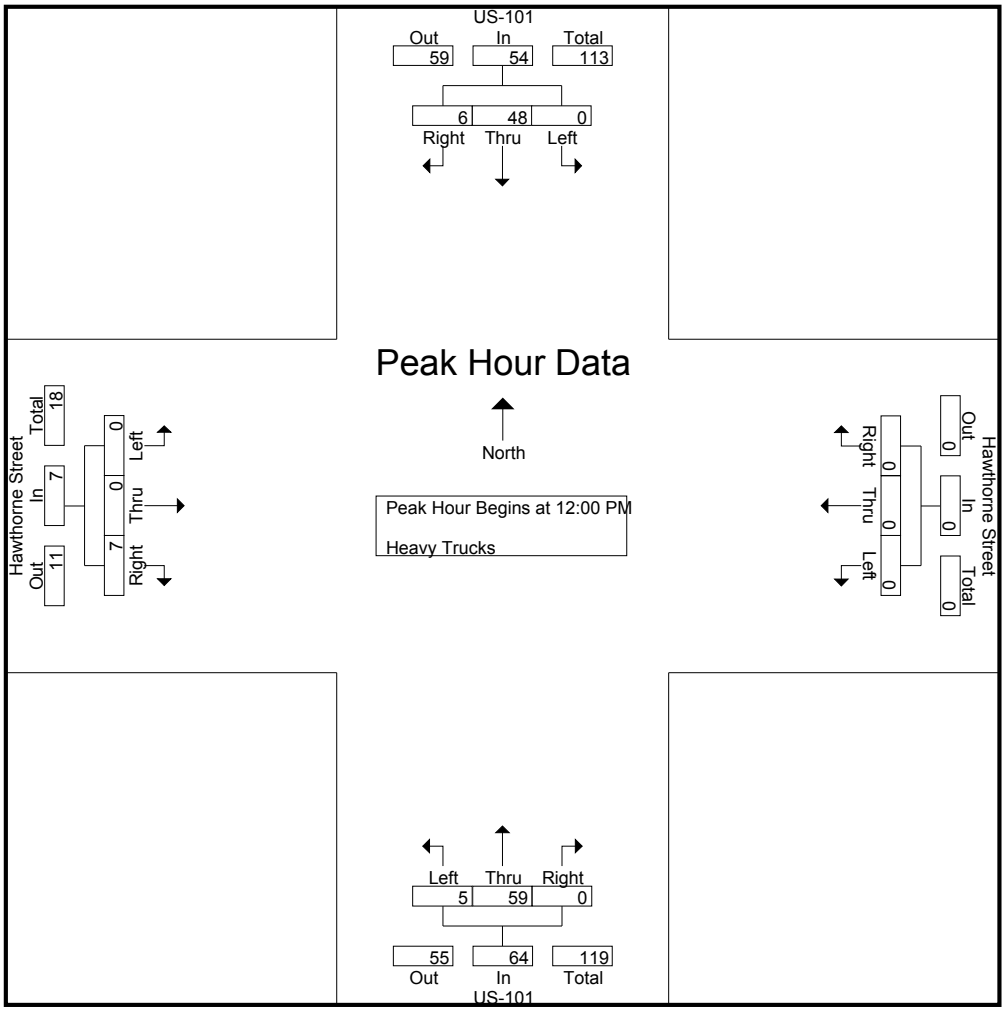

Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				12:00 PM				12:00 PM				12:00 PM			
+0 mins.	0	13	**3**	16	0	0	0	0	0	15	0	15	0	0	2	2
+15 mins.	0	**18**	0	**18**	0	0	0	0	1	12	0	13	0	0	0	0
+30 mins.	0	13	2	15	0	0	0	0	**2**	**16**	0	**18**	0	0	**3**	**3**
+45 mins.	0	4	1	5	0	0	0	0	2	16	0	18	0	0	2	2
Total Volume	0	48	6	54	0	0	0	0	5	59	0	64	0	0	7	7
% App. Total	0	88.9	11.1		0	0	0		7.8	92.2	0		0	0	100	
PHF	.000	.667	.500	.750	.000	.000	.000	.000	.625	.922	.000	.889	.000	.000	.583	.583

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Hawthorne Street
Weather: Clear

File Name : 03_ERK_101_Hawthorne PM
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	6	368	6	380	1	0	2	3	2	316	3	321	3	2	10	15	719
04:15 PM	3	380	12	395	1	1	4	6	8	355	1	364	7	0	4	11	776
04:30 PM	6	361	3	370	1	0	2	3	1	311	5	317	2	0	7	9	699
04:45 PM	3	400	4	407	0	0	2	2	3	334	3	340	3	0	2	5	754
Total	18	1509	25	1552	3	1	10	14	14	1316	12	1342	15	2	23	40	2948
05:00 PM	12	499	2	513	2	0	5	7	0	339	4	343	0	0	6	6	869
05:15 PM	7	329	1	337	1	0	1	2	2	238	4	244	0	0	4	4	587
05:30 PM	1	323	2	326	2	0	1	3	1	307	3	311	2	0	3	5	645
05:45 PM	2	330	0	332	1	0	2	3	1	274	6	281	0	0	4	4	620
Total	22	1481	5	1508	6	0	9	15	4	1158	17	1179	2	0	17	19	2721
Grand Total	40	2990	30	3060	9	1	19	29	18	2474	29	2521	17	2	40	59	5669
Apprch %	1.3	97.7	1		31	3.4	65.5		0.7	98.1	1.2		28.8	3.4	67.8		
Total %	0.7	52.7	0.5	54	0.2	0	0.3	0.5	0.3	43.6	0.5	44.5	0.3	0	0.7	1	
Passenger Vehicles	39	2883	28	2950	9	1	19	29	16	2320	29	2365	17	2	37	56	5400
% Passenger Vehicles	97.5	96.4	93.3	96.4	100	100	100	100	88.9	93.8	100	93.8	100	100	92.5	94.9	95.3
Motorcycles	1	20	0	21	0	0	0	0	0	17	0	17	0	0	0	0	38
% Motorcycles	2.5	0.7	0	0.7	0	0	0	0	0	0.7	0	0.7	0	0	0	0	0.7
Heavy Trucks	0	87	2	89	0	0	0	0	2	137	0	139	0	0	3	3	231
% Heavy Trucks	0	2.9	6.7	2.9	0	0	0	0	11.1	5.5	0	5.5	0	0	7.5	5.1	4.1

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	3	380	**12**	395	1	**1**	4	6	**8**	**355**	1	**364**	**7**	0	4	**11**	776
04:30 PM	6	361	3	370	1	0	2	3	1	311	**5**	317	2	0	**7**	9	699
04:45 PM	3	400	4	407	0	0	2	2	3	334	3	340	3	0	2	5	754
05:00 PM	**12**	**499**	2	**513**	**2**	0	**5**	**7**	0	339	4	343	0	0	6	6	**869**
Total Volume	24	1640	21	1685	4	1	13	18	12	1339	13	1364	12	0	19	31	3098
% App. Total	1.4	97.3	1.2		22.2	5.6	72.2		0.9	98.2	1		38.7	0	61.3		
PHF	.500	.822	.438	.821	.500	.250	.650	.643	.375	.943	.650	.937	.429	.000	.679	.705	.891

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City of Eureka
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File Name : 03_ERK_101_Hawthorne PM
Site Code : 99918361
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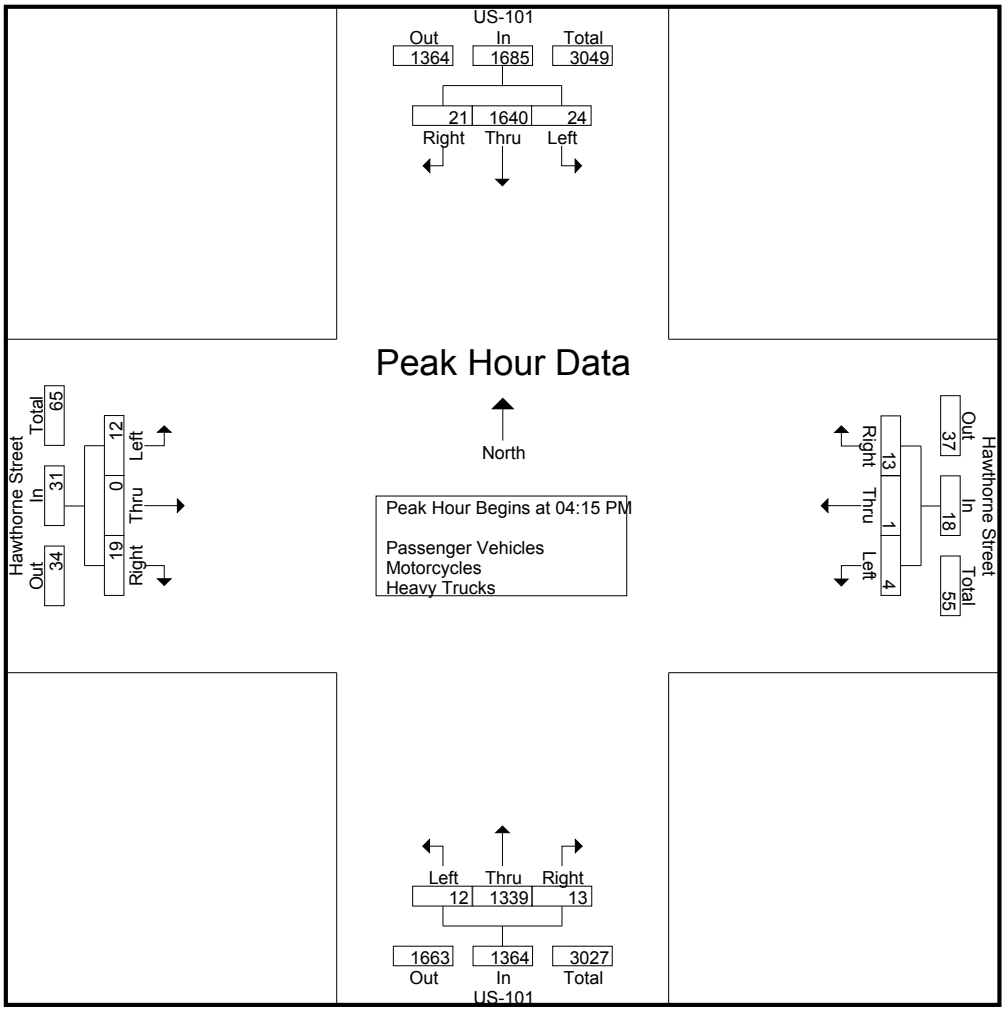

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:15 PM				04:00 PM			
+0 mins.	3	380	**12**	395	1	**1**	4	6	**8**	**355**	1	**364**	3	**2**	**10**	**15**
+15 mins.	6	361	3	370	1	0	2	3	1	311	**5**	317	**7**	0	4	11
+30 mins.	3	400	4	407	0	0	2	2	3	334	3	340	2	0	7	9
+45 mins.	**12**	**499**	2	**513**	**2**	0	**5**	**7**	0	339	4	343	3	0	2	5
Total Volume	24	1640	21	1685	4	1	13	18	12	1339	13	1364	15	2	23	40
% App. Total	1.4	97.3	1.2		22.2	5.6	72.2		0.9	98.2	1		37.5	5	57.5	
PHF	.500	.822	.438	.821	.500	.250	.650	.643	.375	.943	.650	.937	.536	.250	.575	.667

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Groups Printed- Passenger Vehicles

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	6	357	6	369	1	0	2	3	1	280	3	284	3	2	8	13	669
04:15 PM	3	358	11	372	1	1	4	6	7	331	1	339	7	0	4	11	728
04:30 PM	6	350	3	359	1	0	2	3	1	299	5	305	2	0	6	8	675
04:45 PM	3	384	4	391	0	0	2	2	3	310	3	316	3	0	2	5	714
Total	18	1449	24	1491	3	1	10	14	12	1220	12	1244	15	2	20	37	2786
05:00 PM	11	480	1	492	2	0	5	7	0	319	4	323	0	0	6	6	828
05:15 PM	7	321	1	329	1	0	1	2	2	233	4	239	0	0	4	4	574
05:30 PM	1	314	2	317	2	0	1	3	1	285	3	289	2	0	3	5	614
05:45 PM	2	319	0	321	1	0	2	3	1	263	6	270	0	0	4	4	598
Total	21	1434	4	1459	6	0	9	15	4	1100	17	1121	2	0	17	19	2614
Grand Total	39	2883	28	2950	9	1	19	29	16	2320	29	2365	17	2	37	56	5400
Apprch %	1.3	97.7	0.9		31	3.4	65.5		0.7	98.1	1.2		30.4	3.6	66.1		
Total %	0.7	53.4	0.5	54.6	0.2	0	0.4	0.5	0.3	43	0.5	43.8	0.3	0	0.7	1	

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	3	358	**11**	372	1	**1**	4	6	**7**	**331**	1	**339**	**7**	0	4	**11**	728
04:30 PM	6	350	3	359	1	0	2	3	1	299	**5**	305	2	0	**6**	8	675
04:45 PM	3	384	4	391	0	0	2	2	3	310	3	316	3	0	2	5	714
05:00 PM	**11**	**480**	1	**492**	**2**	0	**5**	**7**	0	319	4	323	0	0	6	6	**828**
Total Volume	23	1572	19	1614	4	1	13	18	11	1259	13	1283	12	0	18	30	2945
% App. Total	1.4	97.4	1.2		22.2	5.6	72.2		0.9	98.1	1		40	0	60		
PHF	.523	.819	.432	.820	.500	.250	.650	.643	.393	.951	.650	.946	.429	.000	.750	.682	.889

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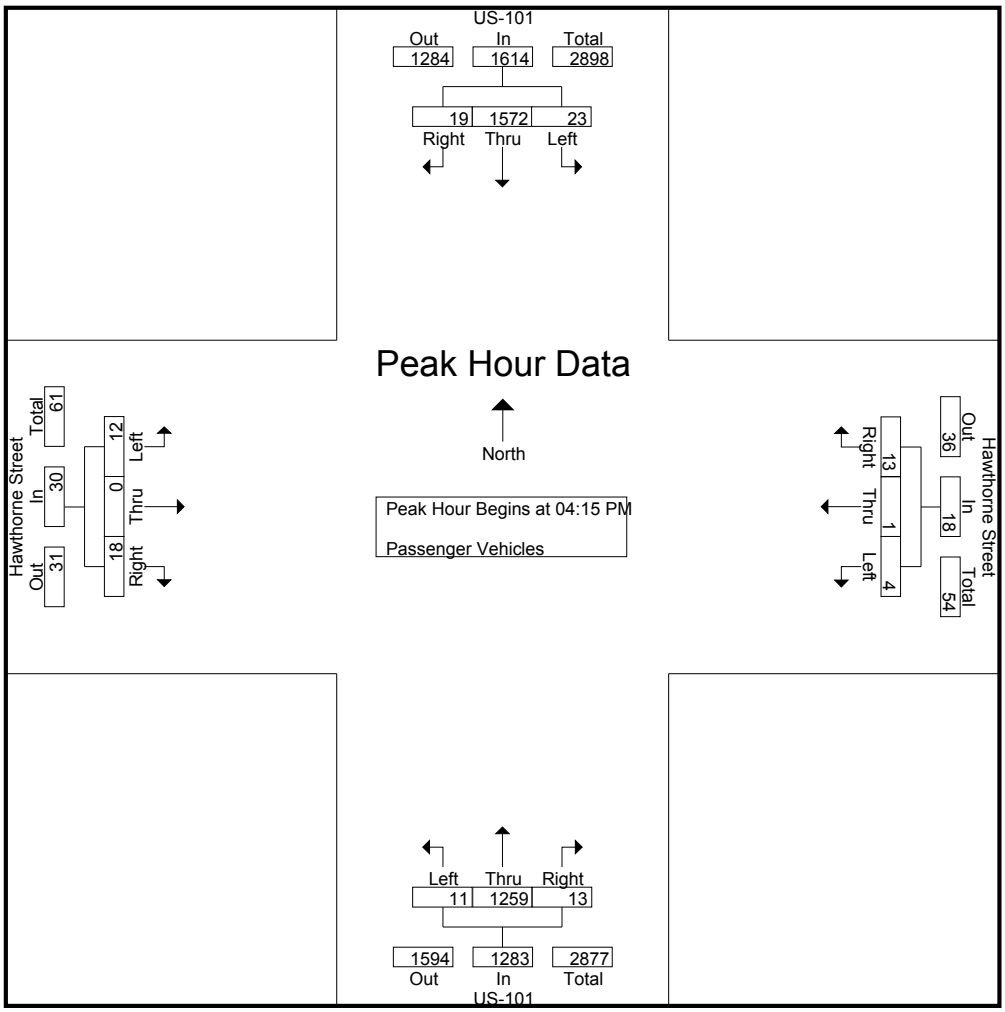

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:15 PM				04:15 PM			
+0 mins.	3	358	**11**	372	1	**1**	4	6	**7**	**331**	1	**339**	**7**	0	4	**11**
+15 mins.	6	350	3	359	1	0	2	3	1	299	**5**	305	2	0	**6**	8
+30 mins.	3	384	4	391	0	0	2	2	3	310	3	316	3	0	2	5
+45 mins.	**11**	**480**	1	**492**	**2**	0	**5**	**7**	0	319	4	323	0	0	6	6
Total Volume	23	1572	19	1614	4	1	13	18	11	1259	13	1283	12	0	18	30
% App. Total	1.4	97.4	1.2		22.2	5.6	72.2		0.9	98.1	1		40	0	60	
PHF	.523	.819	.432	.820	.500	.250	.650	.643	.393	.951	.650	.946	.429	.000	.750	.682

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Groups Printed- Motorcycles

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	2	0	2	0	0	0	0	0	3	0	3	0	0	0	0	5
04:15 PM	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	5	0	5	0	0	0	0	0	8	0	8	0	0	0	0	13
Total	0	10	0	10	0	0	0	0	0	13	0	13	0	0	0	0	23
05:00 PM	1	3	0	4	0	0	0	0	0	1	0	1	0	0	0	0	5
05:15 PM	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
05:30 PM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
05:45 PM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
Total	1	10	0	11	0	0	0	0	0	4	0	4	0	0	0	0	15
Grand Total	1	20	0	21	0	0	0	0	0	17	0	17	0	0	0	0	38
Apprch %	4.8	95.2	0		0	0	0		0	100	0		0	0	0		
Total %	2.6	52.6	0	55.3	0	0	0	0	0	44.7	0	44.7	0	0	0	0	

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	**5**	0	**5**	0	0	0	0	0	**8**	0	**8**	0	0	0	0	**13**
05:00 PM	**1**	3	0	4	0	0	0	0	0	1	0	1	0	0	0	0	5
Total Volume	1	11	0	12	0	0	0	0	0	11	0	11	0	0	0	0	23
% App. Total	8.3	91.7	0		0	0	0		0	100	0		0	0	0		
PHF	.250	.550	.000	.600	.000	.000	.000	.000	.000	.344	.000	.344	.000	.000	.000	.000	.442

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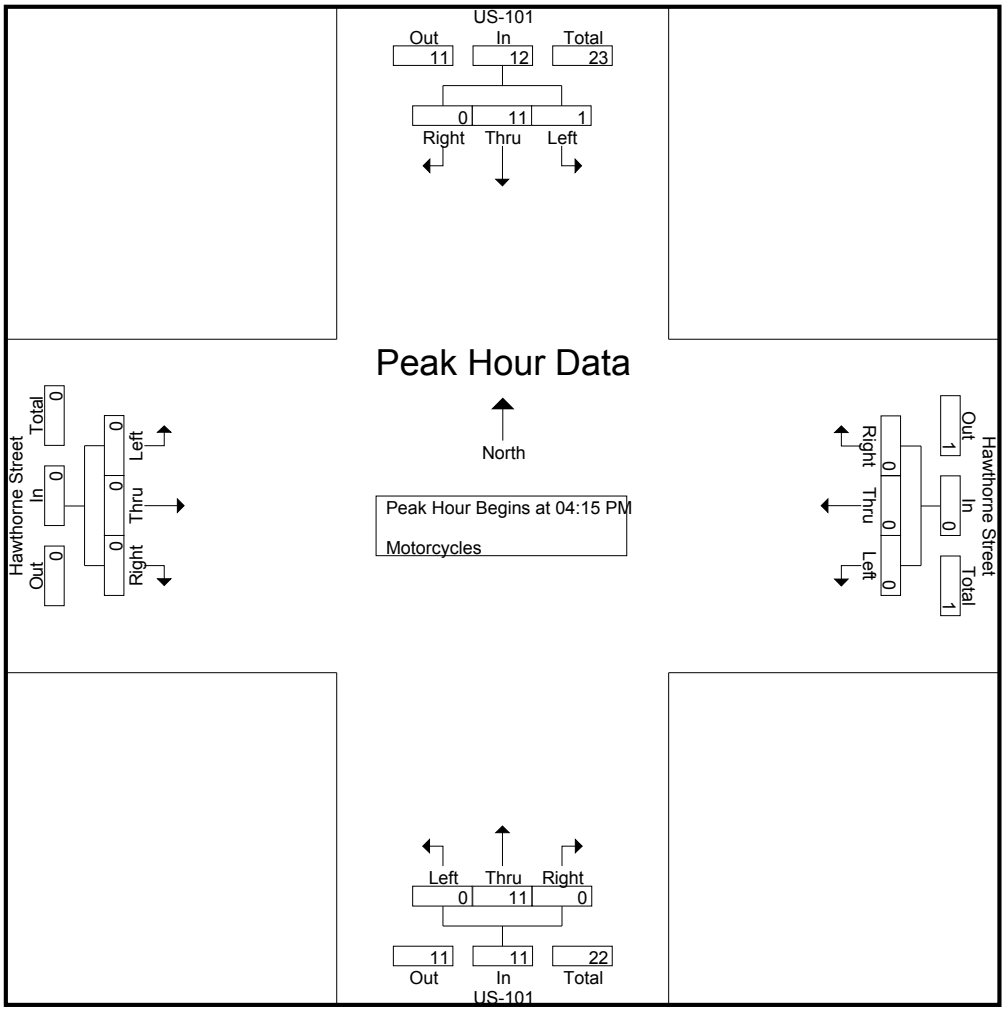

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:15 PM				04:15 PM			
+0 mins.	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0
+15 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	**5**	0	**5**	0	0	0	0	0	**8**	0	**8**	0	0	0	0
+45 mins.	**1**	3	0	4	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	1	11	0	12	0	0	0	0	0	11	0	11	0	0	0	0
% App. Total	8.3	91.7	0		0	0	0		0	100	0		0	0	0	
PHF	.250	.550	.000	.600	.000	.000	.000	.000	.000	.344	.000	.344	.000	.000	.000	.000

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City of Eureka
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Groups Printed- Heavy Trucks

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	9	0	9	0	0	0	0	1	33	0	34	0	0	2	2	45
04:15 PM	0	20	1	21	0	0	0	0	1	22	0	23	0	0	0	0	44
04:30 PM	0	10	0	10	0	0	0	0	0	12	0	12	0	0	1	1	23
04:45 PM	0	11	0	11	0	0	0	0	0	16	0	16	0	0	0	0	27
Total	0	50	1	51	0	0	0	0	2	83	0	85	0	0	3	3	139
05:00 PM	0	16	1	17	0	0	0	0	0	19	0	19	0	0	0	0	36
05:15 PM	0	4	0	4	0	0	0	0	0	5	0	5	0	0	0	0	9
05:30 PM	0	8	0	8	0	0	0	0	0	20	0	20	0	0	0	0	28
05:45 PM	0	9	0	9	0	0	0	0	0	10	0	10	0	0	0	0	19
Total	0	37	1	38	0	0	0	0	0	54	0	54	0	0	0	0	92
Grand Total	0	87	2	89	0	0	0	0	2	137	0	139	0	0	3	3	231
Apprch %	0	97.8	2.2		0	0	0		1.4	98.6	0		0	0	100		
Total %	0	37.7	0.9	38.5	0	0	0	0	0.9	59.3	0	60.2	0	0	1.3	1.3	

	US-101 Southbound				Hawthorne Street Westbound				US-101 Northbound				Hawthorne Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	**20**	**1**	**21**	0	0	0	0	**1**	**22**	0	**23**	0	0	0	0	**44**
04:30 PM	0	10	0	10	0	0	0	0	0	12	0	12	0	0	**1**	**1**	23
04:45 PM	0	11	0	11	0	0	0	0	0	16	0	16	0	0	0	0	27
05:00 PM	0	16	1	17	0	0	0	0	0	19	0	19	0	0	0	0	36
Total Volume	0	57	2	59	0	0	0	0	1	69	0	70	0	0	1	1	130
% App. Total	0	96.6	3.4		0	0	0		1.4	98.6	0		0	0	100		
PHF	.000	.713	.500	.702	.000	.000	.000	.000	.250	.784	.000	.761	.000	.000	.250	.250	.739

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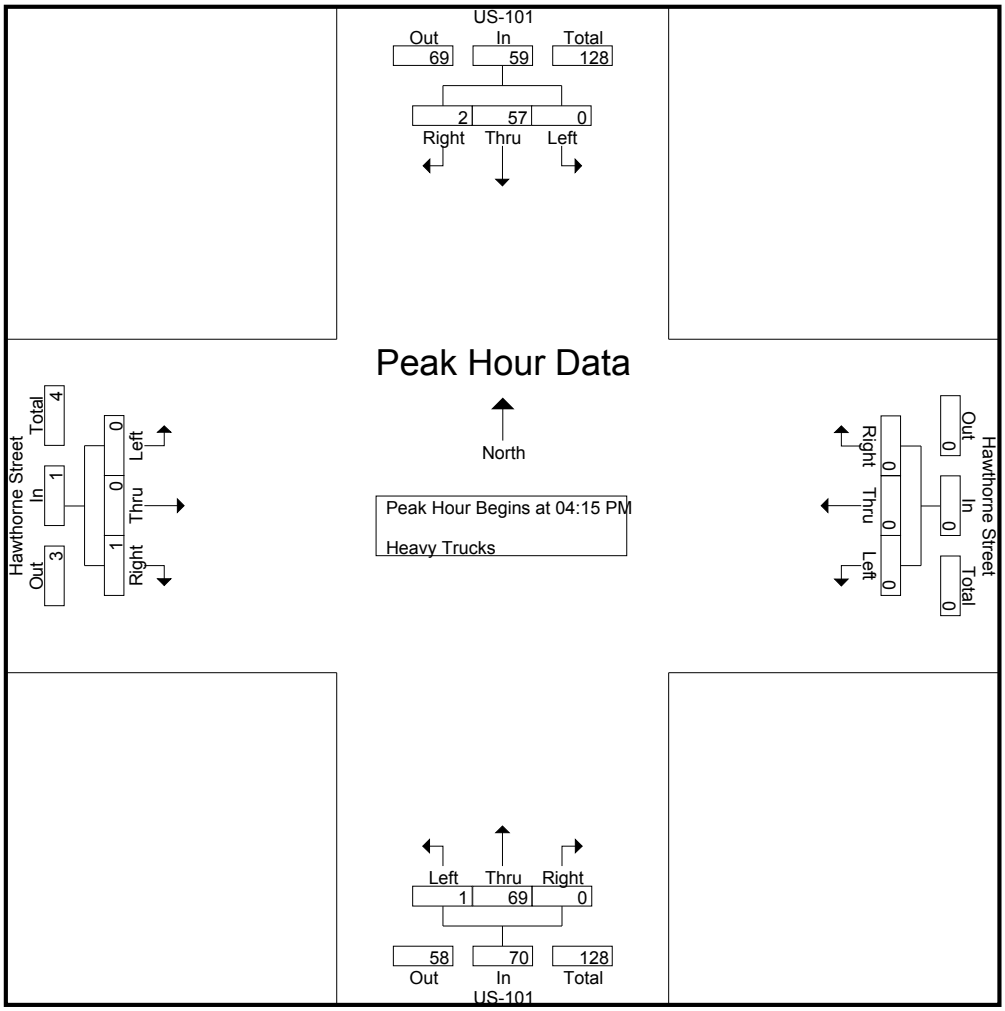

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:15 PM				04:15 PM			
+0 mins.	0	**20**	**1**	**21**	0	0	0	0	**1**	**22**	0	**23**	0	0	0	0
+15 mins.	0	10	0	10	0	0	0	0	0	12	0	12	0	0	**1**	**1**
+30 mins.	0	11	0	11	0	0	0	0	0	16	0	16	0	0	0	0
+45 mins.	0	16	1	17	0	0	0	0	0	19	0	19	0	0	0	0
Total Volume	0	57	2	59	0	0	0	0	1	69	0	70	0	0	1	1
% App. Total	0	96.6	3.4		0	0	0		1.4	98.6	0		0	0	100	
PHF	.000	.713	.500	.702	.000	.000	.000	.000	.250	.784	.000	.761	.000	.000	.250	.250

Location: Eureka
N/S: US-101
E/W: Hawthorne Street

Date: 5/9/2018
Day: Wednesday

PEDESTRIANS

	North Leg US-101	East Leg Hawthorne Street	South Leg US-101	West Leg Hawthorne Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
11:00 AM	0	0	0	3	3
11:15 AM	0	0	2	7	9
11:30 AM	0	1	1	2	4
11:45 AM	1	1	1	3	6
12:00 PM	0	3	1	1	5
12:15 PM	0	0	0	0	0
12:30 PM	0	0	0	3	3
12:45 PM	0	3	0	1	4
TOTAL VOLUMES:	1	8	5	20	34

	North Leg US-101	East Leg Hawthorne Street	South Leg US-101	West Leg Hawthorne Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	2	0	2	4
4:15 PM	0	0	0	2	2
4:30 PM	2	4	1	4	11
4:45 PM	1	1	0	7	9
5:00 PM	0	0	0	3	3
5:15 PM	0	1	0	2	3
5:30 PM	0	1	0	1	2
5:45 PM	0	2	1	2	5
TOTAL VOLUMES:	3	11	2	23	39

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Location: Eureka
N/S: US-101
E/W: Hawthorne Street

Date: 5/9/2018
Day: Wednesday

BICYCLES

	Southbound US-101			Westbound Hawthorne Street			Northbound US-101			Eastbound Hawthorne Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	0	1	0	0	0	0	0	2	0	0	0	0	3
11:15 AM	0	0	1	0	0	0	1	1	0	0	0	0	3
11:30 AM	0	1	0	0	0	0	0	0	0	1	0	0	2
11:45 AM	0	0	0	2	0	0	0	3	1	0	0	0	6
12:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	1	2	0	0	0	0	1	0	0	0	0	4
12:30 PM	0	1	0	0	0	0	0	0	0	1	0	0	2
12:45 PM	0	1	0	0	0	1	0	2	0	1	0	0	5
TOTAL VOLUMES:	0	5	4	2	0	1	1	9	1	3	0	0	26

	Southbound US-101			Westbound Hawthorne Street			Northbound US-101			Eastbound Hawthorne Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
4:15 PM	0	1	0	0	0	0	0	1	1	0	1	0	4
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
4:45 PM	0	2	0	0	0	0	0	5	0	0	0	0	7
5:00 PM	0	1	0	0	1	0	0	1	0	0	0	0	3
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	1	0	0	1	0	0	1	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
TOTAL VOLUMES:	0	6	0	0	2	0	0	10	2	0	1	0	21

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
11:00 AM	8	15	244	16	283	0	14	21	12	47	1	14	17	0	32	25	169	12	1	207	11	29	15	25	80	649
11:15 AM	9	12	200	15	236	0	13	25	14	52	2	11	15	0	28	21	193	14	1	229	18	23	4	40	85	630
11:30 AM	3	16	243	22	284	0	30	35	12	77	0	15	17	0	32	20	243	10	0	273	14	29	5	36	84	750
11:45 AM	7	17	246	16	286	0	31	34	16	81	1	21	18	0	40	25	216	18	0	259	10	28	12	33	83	749
Total	27	60	933	69	1089	0	88	115	54	257	4	61	67	0	132	91	821	54	2	968	53	109	36	134	332	2778
12:00 PM	9	15	244	11	279	0	20	44	15	79	0	19	21	0	40	35	225	9	0	269	22	32	13	31	98	765
12:15 PM	13	13	268	10	304	0	18	26	15	59	2	25	18	0	45	27	244	16	0	287	9	24	7	40	80	775
12:30 PM	9	12	291	15	327	0	12	24	14	50	0	20	15	0	35	28	212	19	0	259	13	25	14	44	96	767
12:45 PM	11	11	246	16	284	0	22	40	16	78	1	25	13	0	39	27	233	15	0	275	22	29	8	39	98	774
Total	42	51	1049	52	1194	0	72	134	60	266	3	89	67	0	159	117	914	59	0	1090	66	110	42	154	372	3081
Grand Total	69	111	1982	121	2283	0	160	249	114	523	7	150	134	0	291	208	1735	113	2	2058	119	219	78	288	704	5859
Apprch %	3	4.9	86.8	5.3		0	30.6	47.6	21.8		2.4	51.5	46	0		10.1	84.3	5.5	0.1		16.9	31.1	11.1	40.9		
Total %	1.2	1.9	33.8	2.1	39	0	2.7	4.2	1.9	8.9	0.1	2.6	2.3	0	5	3.6	29.6	1.9	0	35.1	2	3.7	1.3	4.9	12	
Passenger Vehicles	68	108	1877	118	2171	0	155	238	112	505	7	147	132	0	286	200	1642	110	2	1954	112	211	77	286	686	5602
% Passenger Vehicles	98.6	97.3	94.7	97.5	95.1	0	96.9	95.6	98.2	96.6	100	98	98.5	0	98.3	96.2	94.6	97.3	100	94.9	94.1	96.3	98.7	99.3	97.4	95.6
Motorcycles	0	1	11	0	12	0	0	0	0	0	0	0	0	0	0	1	7	1	0	9	0	0	0	0	0	21
% Motorcycles	0	0.9	0.6	0	0.5	0	0	0	0	0	0	0	0	0	0	0.5	0.4	0.9	0	0.4	0	0	0	0	0	0.4
Heavy Trucks	1	2	94	3	100	0	5	11	2	18	0	3	2	0	5	7	86	2	0	95	7	8	1	2	18	236
% Heavy Trucks	1.4	1.8	4.7	2.5	4.4	0	3.1	4.4	1.8	3.4	0	2	1.5	0	1.7	3.4	5	1.8	0	4.6	5.9	3.7	1.3	0.7	2.6	4

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 12:00 PM																										
12:00 PM	9	**15**	244	11	279	0	20	**44**	15	**79**	0	19	**21**	0	40	**35**	225	9	0	269	**22**	**32**	13	31	**98**	765
12:15 PM	**13**	13	268	10	304	0	18	26	15	59	**2**	**25**	18	0	**45**	27	**244**	16	0	**287**	9	24	7	40	80	**775**
12:30 PM	9	12	**291**	15	**327**	0	12	24	14	50	0	20	15	0	35	28	212	**19**	0	259	13	25	**14**	**44**	96	767
12:45 PM	11	11	246	**16**	284	0	**22**	40	**16**	78	1	25	13	0	39	27	233	15	0	275	22	29	8	39	98	774
Total Volume	42	51	1049	52	1194	0	72	134	60	266	3	89	67	0	159	117	914	59	0	1090	66	110	42	154	372	3081
% App. Total	3.5	4.3	87.9	4.4		0	27.1	50.4	22.6		1.9	56	42.1	0		10.7	83.9	5.4	0		17.7	29.6	11.3	41.4		
PHF	.808	.850	.901	.813	.913	.000	.818	.761	.938	.842	.375	.890	.798	.000	.883	.836	.936	.776	.000	.949	.750	.859	.750	.875	.949	.994

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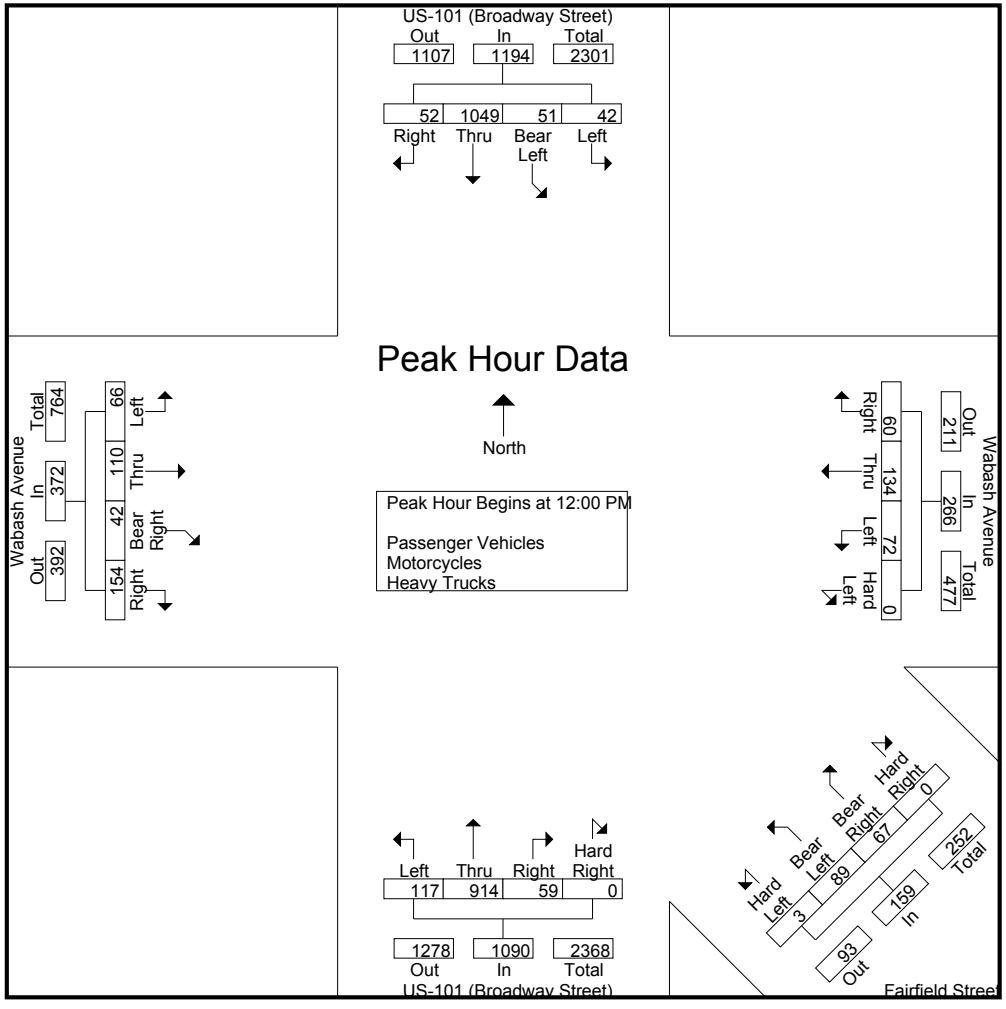
City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



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City of Eureka
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Site Code : 99918361
Start Date : 5/9/2018
Page No : 3

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	11:45 AM					11:30 AM					11:45 AM					12:00 PM					12:00 PM					
+0 mins.	7	**17**	246	**16**	286	0	30	35	12	77	1	21	18	0	40	**35**	225	9	0	269	**22**	**32**	13	31	**98**	
+15 mins.	9	15	244	11	279	0	**31**	34	**16**	**81**	0	19	**21**	0	40	27	**244**	16	0	**287**	9	24	7	40	80	
+30 mins.	**13**	13	268	10	304	0	20	**44**	15	79	**2**	**25**	18	0	**45**	28	212	**19**	0	259	13	25	**14**	**44**	96	
+45 mins.	9	12	**291**	15	**327**	0	18	26	15	59	0	20	15	0	35	27	233	15	0	275	22	29	8	39	98	
Total Volume	38	57	1049	52	1196	0	99	139	58	296	3	85	72	0	160	117	914	59	0	1090	66	110	42	154	372	
% App. Total	3.2	4.8	87.7	4.3		0	33.4	47	19.6		1.9	53.1	45	0		10.7	83.9	5.4	0		17.7	29.6	11.3	41.4		
PHF	.731	.838	.901	.813	.914	.000	.798	.790	.906	.914	.375	.850	.857	.000	.889	.836	.936	.776	.000	.949	.750	.859	.750	.875	.949	

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
11:00 AM	8	14	232	15	269	0	12	18	12	42	1	14	17	0	32	25	154	12	1	192	11	28	15	25	79	614
11:15 AM	8	12	184	15	219	0	11	25	14	50	2	11	15	0	28	19	186	14	1	220	16	21	4	39	80	597
11:30 AM	3	16	228	21	268	0	30	33	11	74	0	15	15	0	30	18	226	10	0	254	13	28	5	36	82	708
11:45 AM	7	17	234	16	274	0	31	32	15	78	1	21	18	0	40	25	208	18	0	251	9	27	12	33	81	724
Total	26	59	878	67	1030	0	84	108	52	244	4	61	65	0	130	87	774	54	2	917	49	104	36	133	322	2643
12:00 PM	9	14	230	10	263	0	19	42	15	76	0	18	21	0	39	34	214	9	0	257	21	31	13	30	95	730
12:15 PM	13	13	250	10	286	0	18	26	15	59	2	24	18	0	44	25	236	16	0	277	9	23	7	40	79	745
12:30 PM	9	11	279	15	314	0	12	24	14	50	0	20	15	0	35	28	198	18	0	244	13	25	13	44	95	738
12:45 PM	11	11	240	16	278	0	22	38	16	76	1	24	13	0	38	26	220	13	0	259	20	28	8	39	95	746
Total	42	49	999	51	1141	0	71	130	60	261	3	86	67	0	156	113	868	56	0	1037	63	107	41	153	364	2959
Grand Total	68	108	1877	118	2171	0	155	238	112	505	7	147	132	0	286	200	1642	110	2	1954	112	211	77	286	686	5602
Apprch %	3.1	5	86.5	5.4		0	30.7	47.1	22.2		2.4	51.4	46.2	0		10.2	84	5.6	0.1		16.3	30.8	11.2	41.7		
Total %	1.2	1.9	33.5	2.1	38.8	0	2.8	4.2	2	9	0.1	2.6	2.4	0	5.1	3.6	29.3	2	0	34.9	2	3.8	1.4	5.1	12.2	

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 12:00 PM																										
12:00 PM	9	**14**	230	10	263	0	19	**42**	15	**76**	0	18	**21**	0	39	**34**	214	9	0	257	**21**	**31**	**13**	30	**95**	730
12:15 PM	**13**	13	250	10	286	0	18	26	15	59	**2**	**24**	18	0	**44**	25	**236**	16	0	**277**	9	23	7	40	79	745
12:30 PM	9	11	**279**	15	**314**	0	12	24	14	50	0	20	15	0	35	28	198	**18**	0	244	13	25	13	**44**	95	738
12:45 PM	11	11	240	**16**	278	0	**22**	38	**16**	76	1	24	13	0	38	26	220	13	0	259	20	28	8	39	95	**746**
Total Volume	42	49	999	51	1141	0	71	130	60	261	3	86	67	0	156	113	868	56	0	1037	63	107	41	153	364	2959
% App. Total	3.7	4.3	87.6	4.5		0	27.2	49.8	23		1.9	55.1	42.9	0		10.9	83.7	5.4	0		17.3	29.4	11.3	42		
PHF	.808	.875	.895	.797	.908	.000	.807	.774	.938	.859	.375	.896	.798	.000	.886	.831	.919	.778	.000	.936	.750	.863	.788	.869	.958	.992

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City of Eureka
N/S: US-101 (Broadway Street)
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Weather: Clear

File Name : 04_ERK_101_Wabash MD
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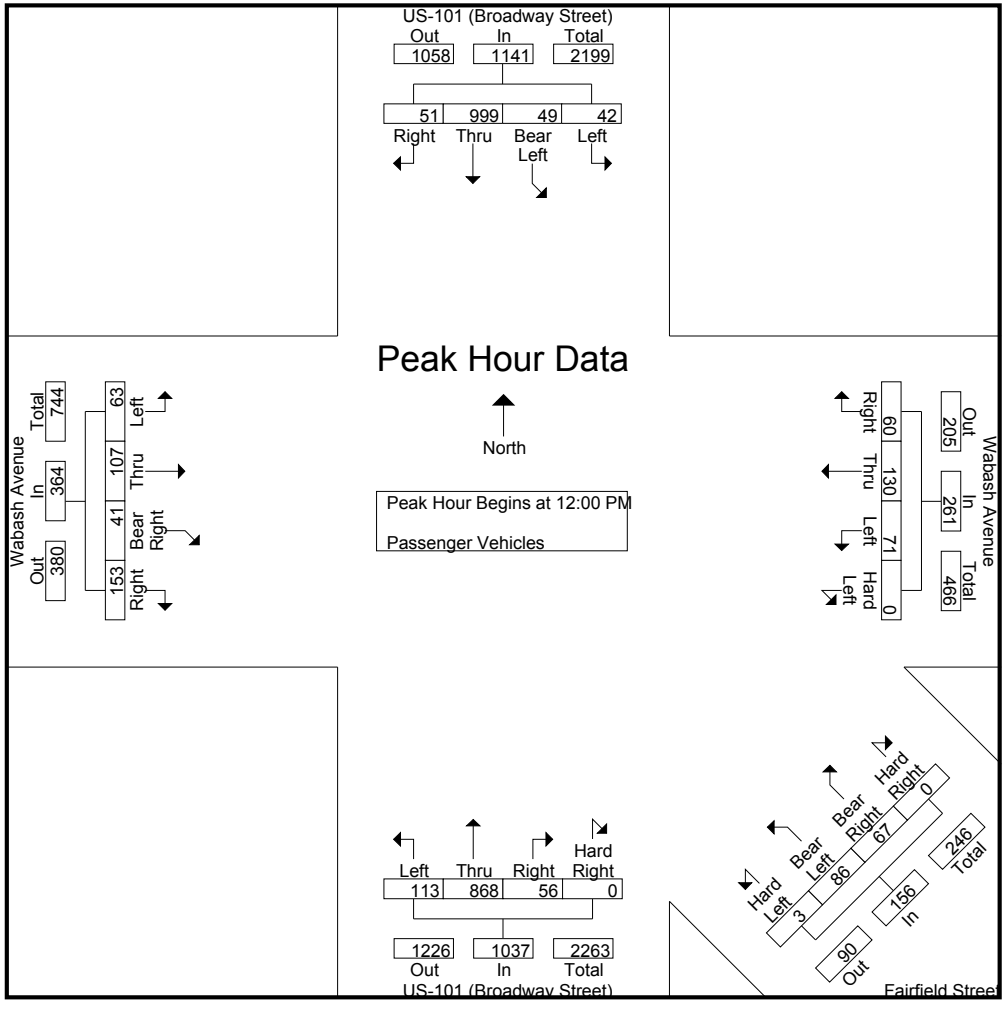

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City of Eureka
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	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	12:00 PM					12:00 PM					12:00 PM					12:00 PM					12:00 PM					
+0 mins.	9	**14**	230	10	263	0	19	**42**	15	**76**	0	18	**21**	0	39	**34**	214	9	0	257	**21**	**31**	**13**	30	**95**	
+15 mins.	**13**	13	250	10	286	0	18	26	15	59	**2**	**24**	18	0	**44**	25	**236**	16	0	**277**	9	23	7	40	79	
+30 mins.	9	11	**279**	15	**314**	0	12	24	14	50	0	20	15	0	35	28	198	**18**	0	244	13	25	13	**44**	95	
+45 mins.	11	11	240	**16**	278	0	**22**	38	**16**	76	1	24	13	0	38	26	220	13	0	259	20	28	8	39	95	
Total Volume	42	49	999	51	1141	0	71	130	60	261	3	86	67	0	156	113	868	56	0	1037	63	107	41	153	364	
% App. Total	3.7	4.3	87.6	4.5		0	27.2	49.8	23		1.9	55.1	42.9	0		10.9	83.7	5.4	0		17.3	29.4	11.3	42		
PHF	.808	.875	.895	.797	.908	.000	.807	.774	.938	.859	.375	.896	.798	.000	.886	.831	.919	.778	.000	.936	.750	.863	.788	.869	.958	

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Motorcycles

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
11:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:15 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11:30 AM	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	11
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	8	0	9	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	14
12:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
12:15 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	3
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	1	2	1	0	4	0	0	0	0	0	7
Grand Total	0	1	11	0	12	0	0	0	0	0	0	0	0	0	0	1	7	1	0	9	0	0	0	0	0	21
Apprch %	0	8.3	91.7	0		0	0	0	0		0	0	0	0		11.1	77.8	11.1	0		0	0	0	0		
Total %	0	4.8	52.4	0	57.1	0	0	0	0	0	0	0	0	0	0	4.8	33.3	4.8	0	42.9	0	0	0	0	0	

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 12:00 PM																										
12:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1	0	0	0	0	0	2
12:15 PM	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**1**	0	**3**	0	0	0	0	0	**3**
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	1	2	1	0	4	0	0	0	0	0	7
% App. Total	0	0	100	0		0	0	0	0		0	0	0	0		25	50	25	0		0	0	0	0		
PHF	.000	.000	.375	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250	.000	.333	.000	.000	.000	.000	.000	.583

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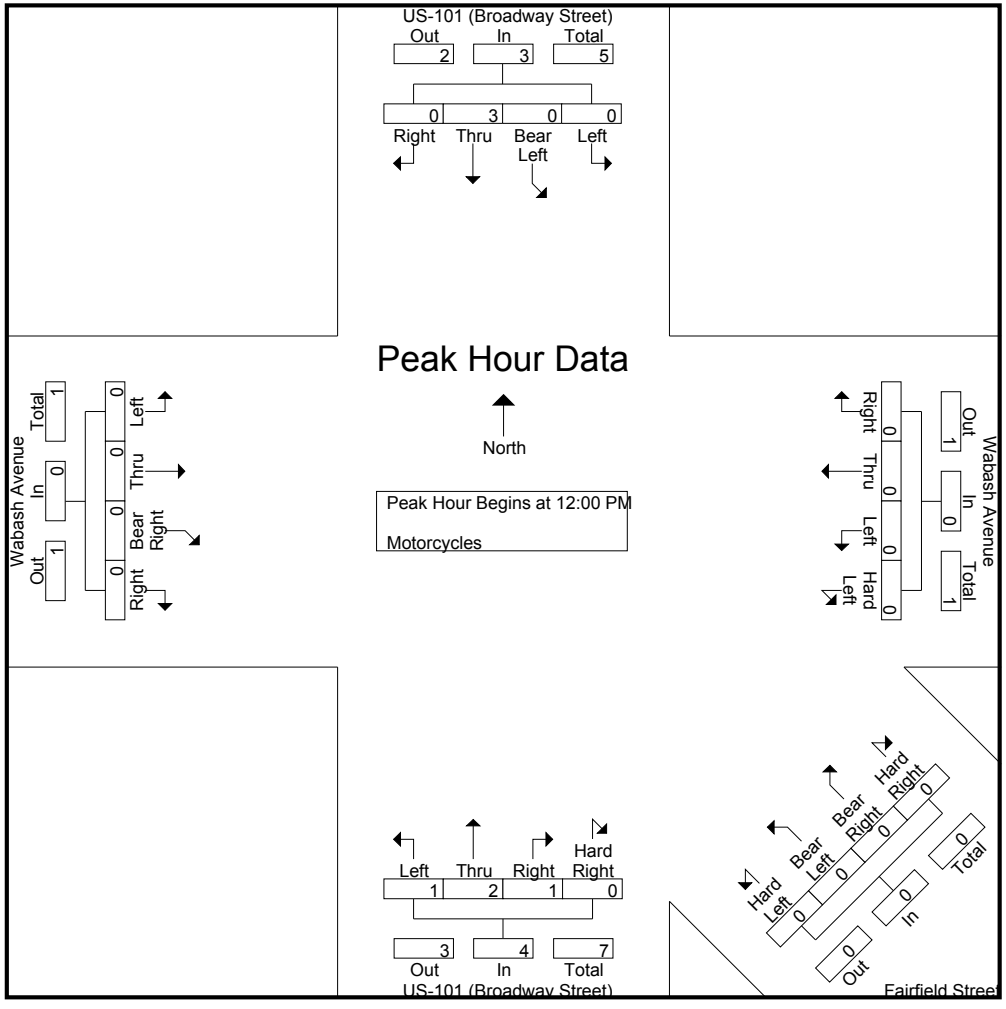
City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



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Start Date : 5/9/2018
Page No : 3

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	12:00 PM					12:00 PM					12:00 PM					12:00 PM					12:00 PM					
+0 mins.	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1	0	0	0	0	0	
+15 mins.	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**1**	0	**3**	0	0	0	0	0	
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	1	2	1	0	4	0	0	0	0	0	
% App. Total	0	0	100	0		0	0	0	0		0	0	0	0		25	50	25	0		0	0	0	0		
PHF	.000	.000	.375	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250	.000	.333	.000	.000	.000	.000	.000	

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Heavy Trucks

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
11:00 AM	0	0	12	1	13	0	2	3	0	5	0	0	0	0	0	0	15	0	0	15	0	1	0	0	1	34
11:15 AM	1	0	14	0	15	0	2	0	0	2	0	0	0	0	0	2	7	0	0	9	2	2	0	1	5	31
11:30 AM	0	0	9	1	10	0	0	2	1	3	0	0	2	0	2	2	12	0	0	14	1	1	0	0	2	31
11:45 AM	0	0	12	0	12	0	0	2	1	3	0	0	0	0	0	0	8	0	0	8	1	1	0	0	2	25
Total	1	0	47	2	50	0	4	7	2	13	0	0	2	0	2	4	42	0	0	46	4	5	0	1	10	121
12:00 PM	0	1	13	1	15	0	1	2	0	3	0	1	0	0	1	0	11	0	0	11	1	1	0	1	3	33
12:15 PM	0	0	16	0	16	0	0	0	0	0	0	1	0	0	1	2	8	0	0	10	0	1	0	0	1	28
12:30 PM	0	1	12	0	13	0	0	0	0	0	0	0	0	0	0	0	12	0	0	12	0	0	1	0	1	26
12:45 PM	0	0	6	0	6	0	0	2	0	2	0	1	0	0	1	1	13	2	0	16	2	1	0	0	3	28
Total	0	2	47	1	50	0	1	4	0	5	0	3	0	0	3	3	44	2	0	49	3	3	1	1	8	115
Grand Total	1	2	94	3	100	0	5	11	2	18	0	3	2	0	5	7	86	2	0	95	7	8	1	2	18	236
Apprch %	1	2	94	3		0	27.8	61.1	11.1		0	60	40	0		7.4	90.5	2.1	0		38.9	44.4	5.6	11.1		
Total %	0.4	0.8	39.8	1.3	42.4	0	2.1	4.7	0.8	7.6	0	1.3	0.8	0	2.1	3	36.4	0.8	0	40.3	3	3.4	0.4	0.8	7.6	

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 12:00 PM																										
12:00 PM	0	**1**	13	**1**	15	0	**1**	**2**	0	**3**	0	**1**	0	0	**1**	0	11	0	0	11	1	**1**	0	**1**	**3**	**33**
12:15 PM	0	0	**16**	0	**16**	0	0	0	0	0	0	1	0	0	1	**2**	8	0	0	10	0	1	0	0	1	28
12:30 PM	0	1	12	0	13	0	0	0	0	0	0	0	0	0	0	0	12	0	0	12	0	0	**1**	0	1	26
12:45 PM	0	0	6	0	6	0	0	2	0	2	0	1	0	0	1	1	**13**	**2**	0	**16**	**2**	1	0	0	3	28
Total Volume	0	2	47	1	50	0	1	4	0	5	0	3	0	0	3	3	44	2	0	49	3	3	1	1	8	115
% App. Total	0	4	94	2		0	20	80	0		0	100	0	0		6.1	89.8	4.1	0		37.5	37.5	12.5	12.5		
PHF	.000	.500	.734	.250	.781	.000	.250	.500	.000	.417	.000	.750	.000	.000	.750	.375	.846	.250	.000	.766	.375	.750	.250	.250	.667	.871

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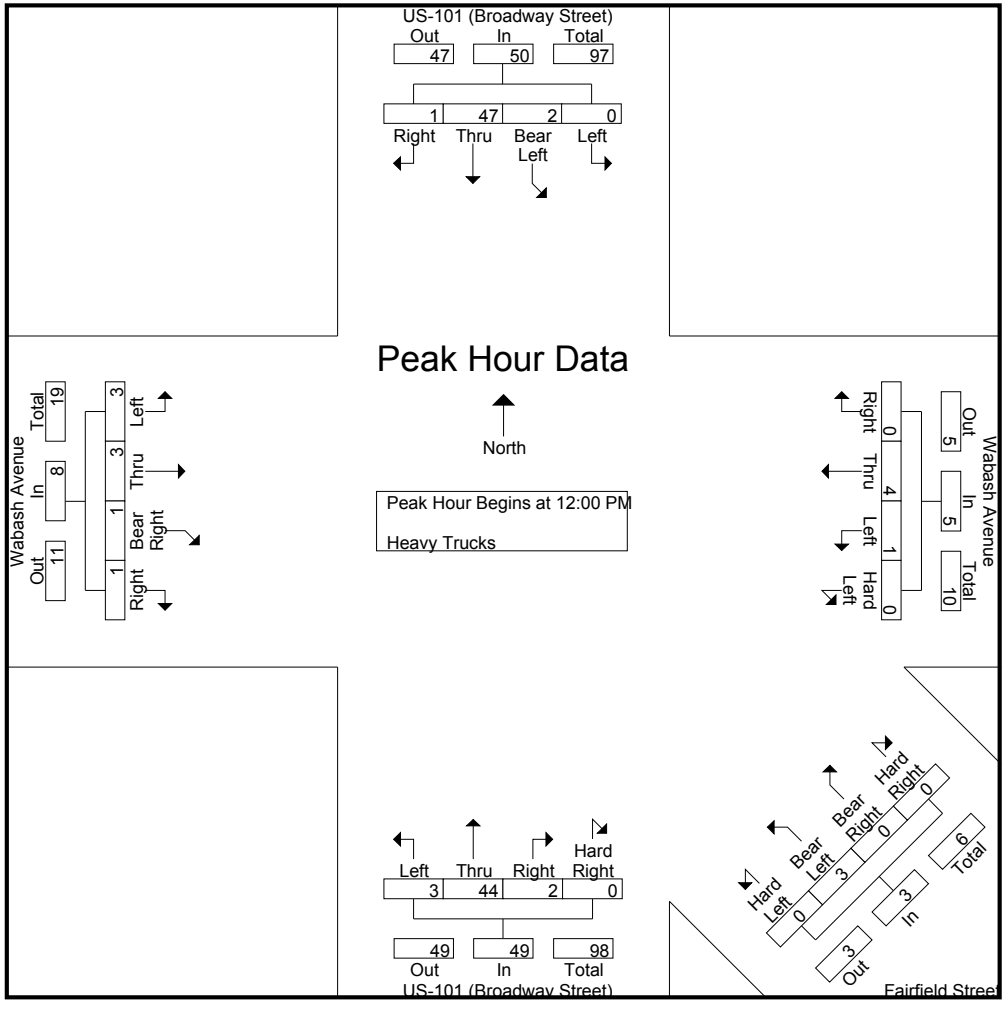
City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



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File Name : 04_ERK_101_Wabash MD
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Page No : 3

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	12:00 PM					12:00 PM					12:00 PM					12:00 PM					12:00 PM					
+0 mins.	0	**1**	13	**1**	15	0	**1**	**2**	0	**3**	0	**1**	0	0	**1**	0	11	0	0	11	1	**1**	0	**1**	**3**	
+15 mins.	0	0	**16**	0	**16**	0	0	0	0	0	0	1	0	0	1	**2**	8	0	0	10	0	1	0	0	1	
+30 mins.	0	1	12	0	13	0	0	0	0	0	0	0	0	0	0	0	12	0	0	12	0	0	**1**	0	1	
+45 mins.	0	0	6	0	6	0	0	2	0	2	0	1	0	0	1	1	**13**	**2**	0	**16**	**2**	1	0	0	3	
Total Volume	0	2	47	1	50	0	1	4	0	5	0	3	0	0	3	3	44	2	0	49	3	3	1	1	8	
% App. Total	0	4	94	2		0	20	80	0		0	100	0	0		6.1	89.8	4.1	0		37.5	37.5	12.5	12.5		
PHF	.000	.500	.734	.250	.781	.000	.250	.500	.000	.417	.000	.750	.000	.000	.750	.375	.846	.250	.000	.766	.375	.750	.250	.250	.667	

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Weather: Clear

File Name : 04_ERK_101_Wabash MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Bicycles

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
11:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
11:15 AM	0	0	0	1	1	0	0	2	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
11:30 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	2	1	3	0	0	3	0	3	0	0	0	2	2	0	3	0	0	3	0	0	0	0	0	11
12:00 PM	0	0	2	0	2	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12:15 PM	1	0	2	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	0	1	1	0	2	0	0	0	0	0	4
Total	1	0	4	0	5	0	1	3	0	4	0	0	0	1	1	0	2	1	0	3	1	0	0	0	1	14
Grand Total	1	0	6	1	8	0	1	6	0	7	0	0	0	3	3	0	5	1	0	6	1	0	0	0	1	25
Apprch %	12.5	0	75	12.5		0	14.3	85.7	0		0	0	0	100		0	83.3	16.7	0		100	0	0	0		
Total %	4	0	24	4	32	0	4	24	0	28	0	0	0	12	12	0	20	4	0	24	4	0	0	0	4	

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 12:00 PM																										
12:00 PM	0	0	**2**	0	2	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12:15 PM	**1**	0	2	0	**3**	0	**1**	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**1**	**5**
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	**1**	**1**	0	1	**1**	0	**2**	0	0	0	0	0	4
Total Volume	1	0	4	0	5	0	1	3	0	4	0	0	0	1	1	0	2	1	0	3	1	0	0	0	1	14
% App. Total	20	0	80	0		0	25	75	0		0	0	0	100		0	66.7	33.3	0		100	0	0	0		
PHF	.250	.000	.500	.000	.417	.000	.250	.375	.000	.500	.000	.000	.000	.250	.250	.000	.500	.250	.000	.375	.250	.000	.000	.000	.250	.700

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City of Eureka
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File Name : 04_ERK_101_Wabash MD
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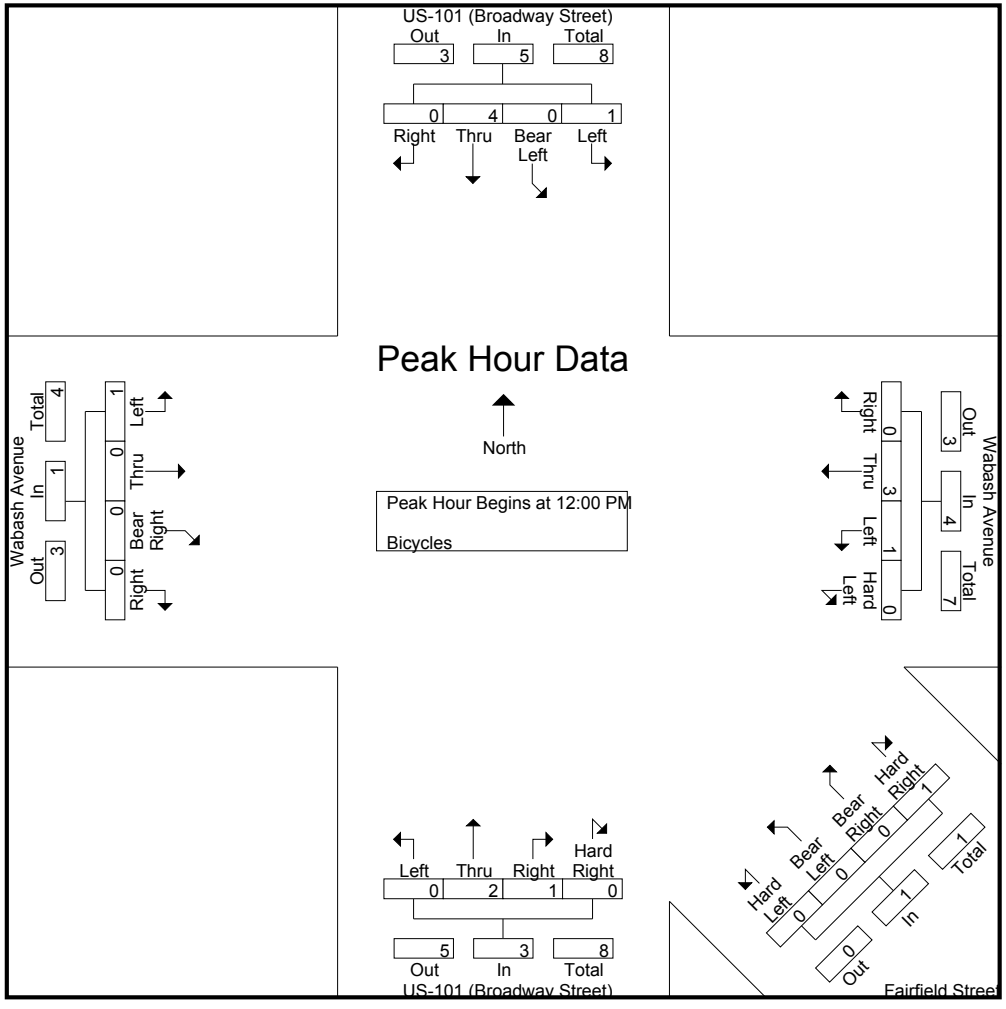

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	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	11:30 AM					11:15 AM					11:00 AM					11:00 AM					11:30 AM					
+0 mins.	0	0	1	0	1	0	0	**2**	0	**2**	0	0	0	0	0	0	**2**	0	0	**2**	0	0	0	0	0	
+15 mins.	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	
+30 mins.	0	0	**2**	0	2	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	
+45 mins.	**1**	0	2	0	**3**	0	0	2	0	2	0	0	0	1	1	0	0	0	0	0	**1**	0	0	0	**1**	
Total Volume	1	0	5	0	6	0	0	5	0	5	0	0	0	2	2	0	3	0	0	3	1	0	0	0	1	
% App. Total	16.7	0	83.3	0		0	0	100	0		0	0	0	100		0	100	0	0		100	0	0	0		
PHF	.250	.000	.625	.000	.500	.000	.000	.625	.000	.625	.000	.000	.000	.500	.500	.000	.375	.000	.000	.375	.250	.000	.000	.000	.250	

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City of Eureka
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E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash PM
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
04:00 PM	11	12	266	6	295	0	22	33	11	66	0	12	18	0	30	25	242	7	0	274	12	24	6	46	88	753
04:15 PM	10	18	259	11	298	0	23	25	9	57	1	9	20	0	30	24	276	18	0	318	17	24	9	38	88	791
04:30 PM	13	23	272	9	317	0	23	24	7	54	0	14	13	0	27	15	228	17	0	260	15	37	8	40	100	758
04:45 PM	11	27	301	16	355	0	22	26	14	62	1	11	17	0	29	21	255	14	1	291	16	24	6	35	81	818
Total	45	80	1098	42	1265	0	90	108	41	239	2	46	68	0	116	85	1001	56	1	1143	60	109	29	159	357	3120
05:00 PM	4	26	298	12	340	0	19	24	11	54	0	17	14	0	31	13	239	10	0	262	8	43	18	59	128	815
05:15 PM	5	18	302	10	335	0	21	16	8	45	0	17	12	1	30	22	230	16	0	268	19	25	15	48	107	785
05:30 PM	14	13	246	9	282	0	10	17	7	34	1	13	18	0	32	15	219	16	0	250	21	32	13	35	101	699
05:45 PM	11	22	264	15	312	0	22	17	9	48	1	6	13	0	20	18	245	15	0	278	8	17	8	25	58	716
Total	34	79	1110	46	1269	0	72	74	35	181	2	53	57	1	113	68	933	57	0	1058	56	117	54	167	394	3015
Grand Total	79	159	2208	88	2534	0	162	182	76	420	4	99	125	1	229	153	1934	113	1	2201	116	226	83	326	751	6135
Apprch %	3.1	6.3	87.1	3.5		0	38.6	43.3	18.1		1.7	43.2	54.6	0.4		7	87.9	5.1	0		15.4	30.1	11.1	43.4		
Total %	1.3	2.6	36	1.4	41.3	0	2.6	3	1.2	6.8	0.1	1.6	2	0	3.7	2.5	31.5	1.8	0	35.9	1.9	3.7	1.4	5.3	12.2	
Passenger Vehicles	79	159	2136	84	2458	0	158	174	75	407	4	99	124	1	228	152	1827	106	1	2086	110	222	82	321	735	5914
% Passenger Vehicles	100	100	96.7	95.5	97	0	97.5	95.6	98.7	96.9	100	100	99.2	100	99.6	99.3	94.5	93.8	100	94.8	94.8	98.2	98.8	98.5	97.9	96.4
Motorcycles	0	0	9	0	9	0	1	2	0	3	0	0	0	0	0	0	14	1	0	15	0	0	0	2	2	29
% Motorcycles	0	0	0.4	0	0.4	0	0.6	1.1	0	0.7	0	0	0	0	0	0	0.7	0.9	0	0.7	0	0	0	0.6	0.3	0.5
Heavy Trucks	0	0	63	4	67	0	3	6	1	10	0	0	1	0	1	1	93	6	0	100	6	4	1	3	14	192
% Heavy Trucks	0	0	2.9	4.5	2.6	0	1.9	3.3	1.3	2.4	0	0	0.8	0	0.4	0.7	4.8	5.3	0	4.5	5.2	1.8	1.2	0.9	1.9	3.1

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:15 PM																										
04:15 PM	10	18	259	11	298	0	**23**	25	9	57	**1**	9	**20**	0	30	**24**	**276**	**18**	0	**318**	**17**	24	9	38	88	791
04:30 PM	**13**	23	272	9	317	0	23	24	7	54	0	14	13	0	27	15	228	17	0	260	15	37	8	40	100	758
04:45 PM	11	**27**	**301**	**16**	**355**	0	22	**26**	**14**	**62**	1	11	17	0	29	21	255	14	**1**	291	16	24	6	35	81	**818**
05:00 PM	4	26	298	12	340	0	19	24	11	54	0	**17**	14	0	**31**	13	239	10	0	262	8	**43**	**18**	**59**	**128**	815
Total Volume	38	94	1130	48	1310	0	87	99	41	227	2	51	64	0	117	73	998	59	1	1131	56	128	41	172	397	3182
% App. Total	2.9	7.2	86.3	3.7		0	38.3	43.6	18.1		1.7	43.6	54.7	0		6.5	88.2	5.2	0.1		14.1	32.2	10.3	43.3		
PHF	.731	.870	.939	.750	.923	.000	.946	.952	.732	.915	.500	.750	.800	.000	.944	.760	.904	.819	.250	.889	.824	.744	.569	.729	.775	.972

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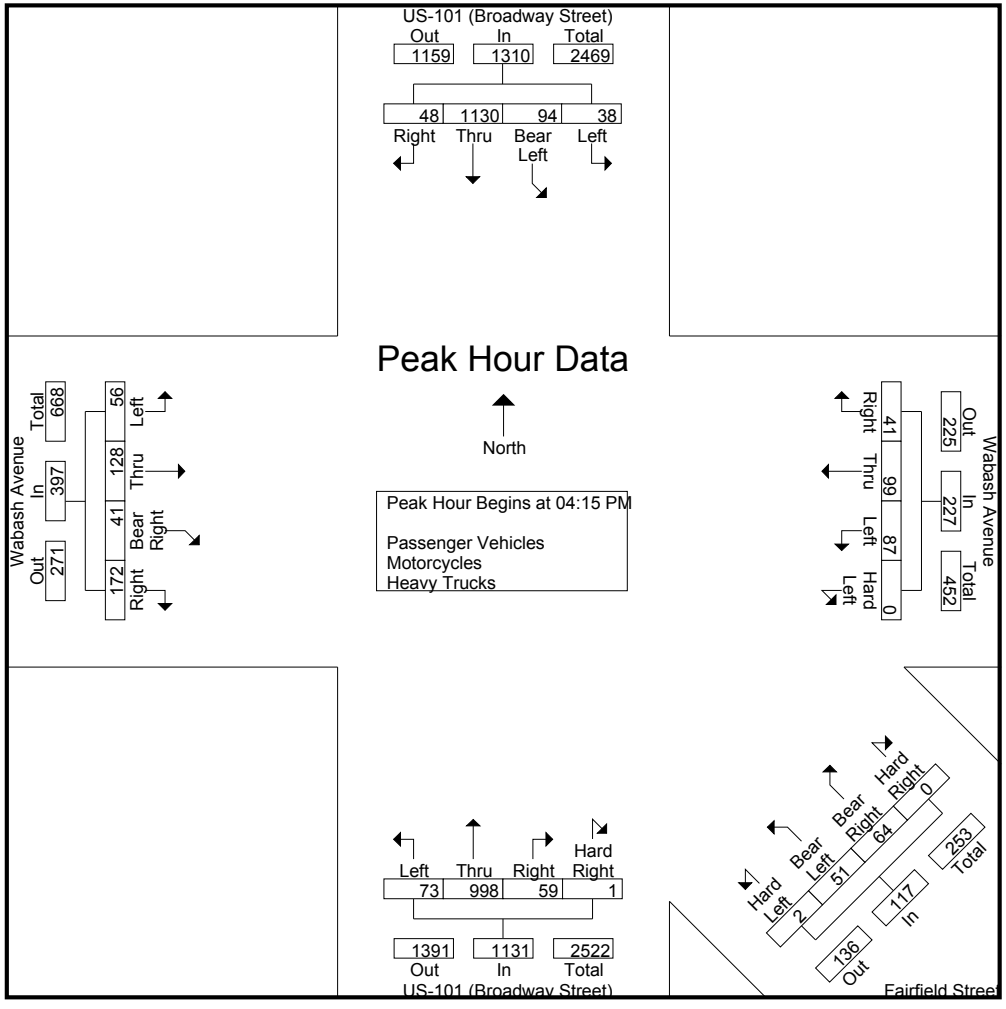
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash PM
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



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	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	04:30 PM					04:00 PM					04:45 PM					04:00 PM					04:45 PM					
+0 mins.	**13**	23	272	9	317	0	22	**33**	11	**66**	**1**	11	17	0	29	**25**	242	7	0	274	16	24	6	35	81	
+15 mins.	11	**27**	301	**16**	**355**	0	**23**	25	9	57	0	**17**	14	0	31	24	**276**	**18**	0	**318**	8	**43**	**18**	**59**	**128**	
+30 mins.	4	26	298	12	340	0	23	24	7	54	0	17	12	**1**	30	15	228	17	0	260	19	25	15	48	107	
+45 mins.	5	18	**302**	10	335	0	22	26	**14**	62	1	13	**18**	0	**32**	21	255	14	**1**	291	**21**	32	13	35	101	
Total Volume	33	94	1173	47	1347	0	90	108	41	239	2	58	61	1	122	85	1001	56	1	1143	64	124	52	177	417	
% App. Total	2.4	7	87.1	3.5		0	37.7	45.2	17.2		1.6	47.5	50	0.8		7.4	87.6	4.9	0.1		15.3	29.7	12.5	42.4		
PHF	.635	.870	.971	.734	.949	.000	.978	.818	.732	.905	.500	.853	.847	.250	.953	.850	.907	.778	.250	.899	.762	.721	.722	.750	.814	

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Site Code : 99918361
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Groups Printed- Passenger Vehicles

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
04:00 PM	11	12	256	6	285	0	21	29	11	61	0	12	18	0	30	24	218	6	0	248	11	23	6	45	85	709
04:15 PM	10	18	243	11	282	0	22	25	9	56	1	9	20	0	30	24	262	17	0	303	17	23	9	38	87	758
04:30 PM	13	23	265	9	310	0	23	24	7	54	0	14	13	0	27	15	217	15	0	247	12	35	8	40	95	733
04:45 PM	11	27	291	15	344	0	21	26	14	61	1	11	17	0	29	21	234	14	1	270	16	24	6	35	81	785
Total	45	80	1055	41	1221	0	87	104	41	232	2	46	68	0	116	84	931	52	1	1068	56	105	29	158	348	2985
05:00 PM	4	26	288	12	330	0	19	23	11	53	0	17	14	0	31	13	224	8	0	245	8	43	18	56	125	784
05:15 PM	5	18	297	9	329	0	20	14	8	42	0	17	12	1	30	22	226	16	0	264	18	25	14	47	104	769
05:30 PM	14	13	240	8	275	0	10	16	7	33	1	13	17	0	31	15	208	16	0	239	20	32	13	35	100	678
05:45 PM	11	22	256	14	303	0	22	17	8	47	1	6	13	0	20	18	238	14	0	270	8	17	8	25	58	698
Total	34	79	1081	43	1237	0	71	70	34	175	2	53	56	1	112	68	896	54	0	1018	54	117	53	163	387	2929
Grand Total	79	159	2136	84	2458	0	158	174	75	407	4	99	124	1	228	152	1827	106	1	2086	110	222	82	321	735	5914
Apprch %	3.2	6.5	86.9	3.4		0	38.8	42.8	18.4		1.8	43.4	54.4	0.4		7.3	87.6	5.1	0		15	30.2	11.2	43.7		
Total %	1.3	2.7	36.1	1.4	41.6	0	2.7	2.9	1.3	6.9	0.1	1.7	2.1	0	3.9	2.6	30.9	1.8	0	35.3	1.9	3.8	1.4	5.4	12.4	

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:15 PM																										
04:15 PM	10	18	243	11	282	0	22	25	9	56	**1**	9	**20**	0	30	**24**	**262**	**17**	0	**303**	**17**	23	9	38	87	758
04:30 PM	**13**	23	265	9	310	0	**23**	24	7	54	0	14	13	0	27	15	217	15	0	247	12	35	8	40	95	733
04:45 PM	11	**27**	**291**	**15**	**344**	0	21	**26**	**14**	**61**	1	11	17	0	29	21	234	14	**1**	270	16	24	6	35	81	**785**
05:00 PM	4	26	288	12	330	0	19	23	11	53	0	**17**	14	0	**31**	13	224	8	0	245	8	**43**	**18**	**56**	**125**	784
Total Volume	38	94	1087	47	1266	0	85	98	41	224	2	51	64	0	117	73	937	54	1	1065	53	125	41	169	388	3060
% App. Total	3	7.4	85.9	3.7		0	37.9	43.8	18.3		1.7	43.6	54.7	0		6.9	88	5.1	0.1		13.7	32.2	10.6	43.6		
PHF	.731	.870	.934	.783	.920	.000	.924	.942	.732	.918	.500	.750	.800	.000	.944	.760	.894	.794	.250	.879	.779	.727	.569	.754	.776	.975

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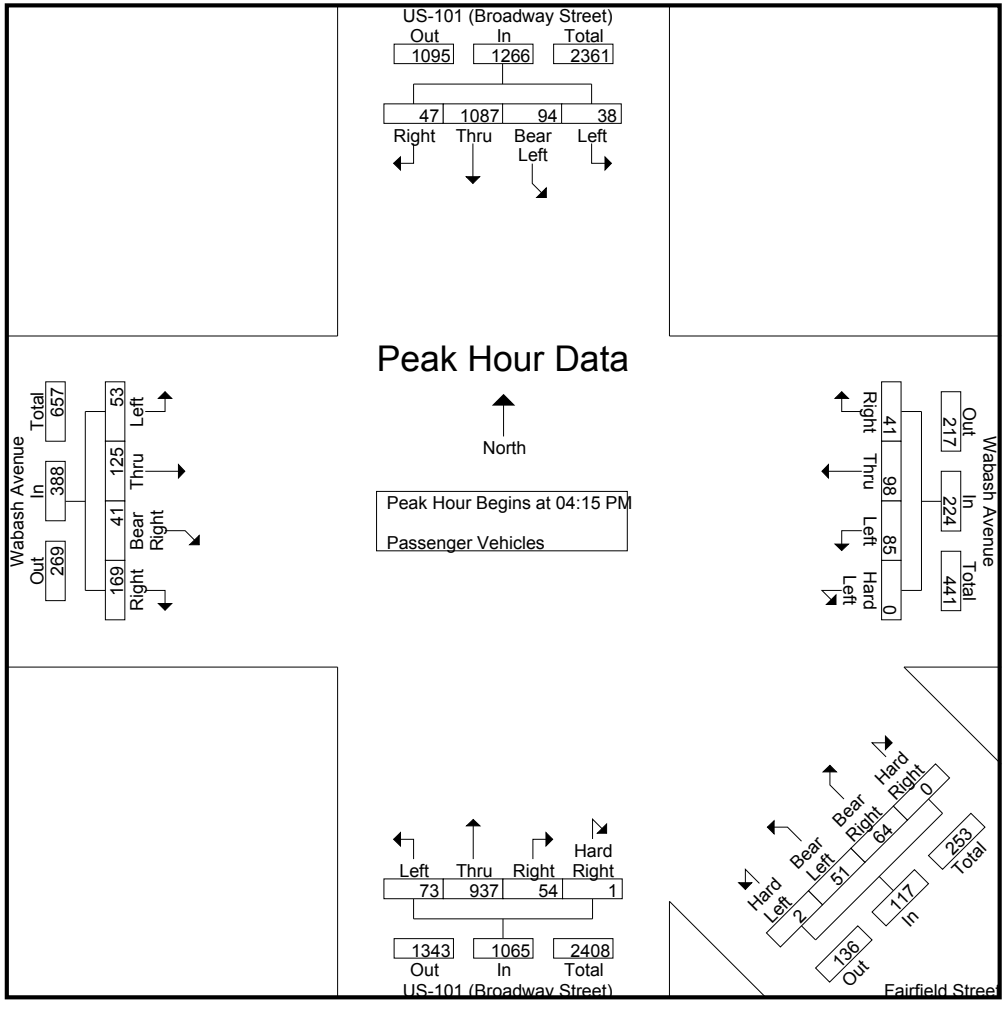

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	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	04:15 PM					04:15 PM					04:15 PM					04:15 PM					04:15 PM					
+0 mins.	10	18	243	11	282	0	22	25	9	56	**1**	9	**20**	0	30	**24**	**262**	**17**	0	**303**	**17**	23	9	38	87	
+15 mins.	**13**	23	265	9	310	0	**23**	24	7	54	0	14	13	0	27	15	217	15	0	247	12	35	8	40	95	
+30 mins.	11	**27**	**291**	**15**	**344**	0	21	**26**	**14**	**61**	1	11	17	0	29	21	234	14	**1**	270	16	24	6	35	81	
+45 mins.	4	26	288	12	330	0	19	23	11	53	0	**17**	14	0	**31**	13	224	8	0	245	8	**43**	**18**	**56**	**125**	
Total Volume	38	94	1087	47	1266	0	85	98	41	224	2	51	64	0	117	73	937	54	1	1065	53	125	41	169	388	
% App. Total	3	7.4	85.9	3.7		0	37.9	43.8	18.3		1.7	43.6	54.7	0		6.9	88	5.1	0.1		13.7	32.2	10.6	43.6		
PHF	.731	.870	.934	.783	.920	.000	.924	.942	.732	.918	.500	.750	.800	.000	.944	.760	.894	.794	.250	.879	.779	.727	.569	.754	.776	

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Groups Printed- Motorcycles

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
04:00 PM	0	0	2	0	2	0	0	1	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
04:45 PM	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	11
Total	0	0	5	0	5	0	0	1	0	1	0	0	0	0	0	0	12	1	0	13	0	0	0	0	0	19
05:00 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	3
05:15 PM	0	0	3	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5
05:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	4	0	4	0	1	1	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	2	2	10
Grand Total	0	0	9	0	9	0	1	2	0	3	0	0	0	0	0	0	14	1	0	15	0	0	0	2	2	29
Apprch %	0	0	100	0		0	33.3	66.7	0		0	0	0	0		0	93.3	6.7	0		0	0	0	100		
Total %	0	0	31	0	31	0	3.4	6.9	0	10.3	0	0	0	0	0	0	48.3	3.4	0	51.7	0	0	0	6.9	6.9	

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:15 PM																										
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**	0	2	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
04:45 PM	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0	0	0	0	**8**	0	0	**8**	0	0	0	0	0	**11**
05:00 PM	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	1	0	0	1	0	0	0	**1**	**1**	3
Total Volume	0	0	3	0	3	0	0	1	0	1	0	0	0	0	0	0	11	1	0	12	0	0	0	1	1	17
% App. Total	0	0	100	0		0	0	100	0		0	0	0	0		0	91.7	8.3	0		0	0	0	100		
PHF	.000	.000	.250	.000	.250	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.344	.250	.000	.375	.000	.000	.000	.250	.250	.386

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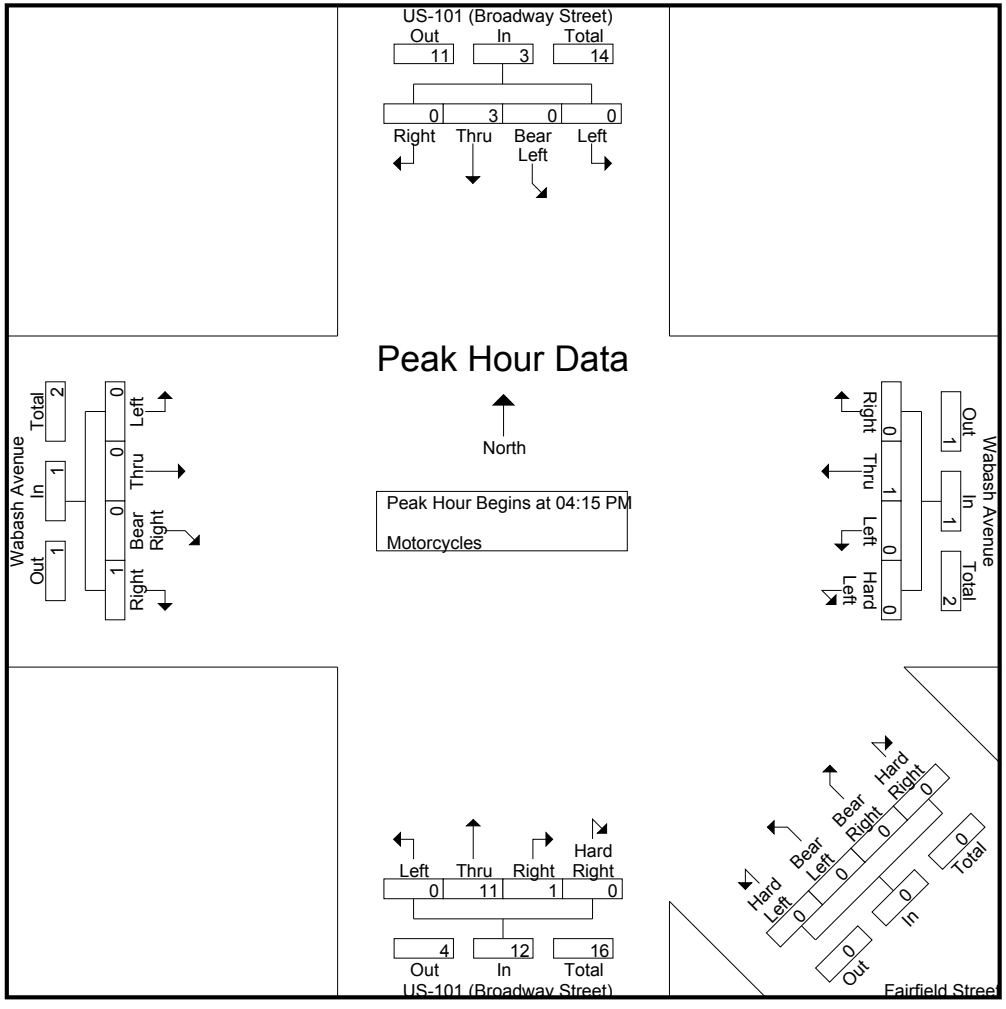

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	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	04:15 PM					04:15 PM					04:15 PM					04:15 PM					04:15 PM					
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**	0	2	0	0	0	0	0	
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	
+30 mins.	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0	0	0	0	**8**	0	0	**8**	0	0	0	0	0	
+45 mins.	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	1	0	0	1	0	0	0	**1**	**1**	
Total Volume	0	0	3	0	3	0	0	1	0	1	0	0	0	0	0	0	11	1	0	12	0	0	0	1	1	
% App. Total	0	0	100	0		0	0	100	0		0	0	0	0		0	91.7	8.3	0		0	0	0	100		
PHF	.000	.000	.250	.000	.250	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.344	.250	.000	.375	.000	.000	.000	.250	.250	

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Groups Printed- Heavy Trucks

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
04:00 PM	0	0	8	0	8	0	1	3	0	4	0	0	0	0	0	1	22	1	0	24	1	1	0	1	3	39
04:15 PM	0	0	16	0	16	0	1	0	0	1	0	0	0	0	0	0	13	0	0	13	0	1	0	0	1	31
04:30 PM	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	10	2	0	12	3	2	0	0	5	24
04:45 PM	0	0	7	1	8	0	1	0	0	1	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	22
Total	0	0	38	1	39	0	3	3	0	6	0	0	0	0	0	1	58	3	0	62	4	4	0	1	9	116
05:00 PM	0	0	10	0	10	0	0	0	0	0	0	0	0	0	0	0	14	2	0	16	0	0	0	2	2	28
05:15 PM	0	0	2	1	3	0	0	2	0	2	0	0	0	0	0	0	4	0	0	4	1	0	1	0	2	11
05:30 PM	0	0	5	1	6	0	0	1	0	1	0	0	1	0	1	0	10	0	0	10	1	0	0	0	1	19
05:45 PM	0	0	8	1	9	0	0	0	1	1	0	0	0	0	0	0	7	1	0	8	0	0	0	0	0	18
Total	0	0	25	3	28	0	0	3	1	4	0	0	1	0	1	0	35	3	0	38	2	0	1	2	5	76
Grand Total	0	0	63	4	67	0	3	6	1	10	0	0	1	0	1	1	93	6	0	100	6	4	1	3	14	192
Apprch %	0	0	94	6		0	30	60	10		0	0	100	0		1	93	6	0		42.9	28.6	7.1	21.4		
Total %	0	0	32.8	2.1	34.9	0	1.6	3.1	0.5	5.2	0	0	0.5	0	0.5	0.5	48.4	3.1	0	52.1	3.1	2.1	0.5	1.6	7.3	

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:15 PM																										
04:15 PM	0	0	**16**	0	**16**	0	**1**	0	0	**1**	0	0	0	0	0	0	13	0	0	13	0	1	0	0	1	**31**
04:30 PM	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	10	**2**	0	12	**3**	**2**	0	0	**5**	24
04:45 PM	0	0	7	**1**	8	0	1	0	0	1	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	22
05:00 PM	0	0	10	0	10	0	0	0	0	0	0	0	0	0	0	0	**14**	2	0	**16**	0	0	0	**2**	2	28
Total Volume	0	0	40	1	41	0	2	0	0	2	0	0	0	0	0	0	50	4	0	54	3	3	0	2	8	105
% App. Total	0	0	97.6	2.4		0	100	0	0		0	0	0	0		0	92.6	7.4	0		37.5	37.5	0	25		
PHF	.000	.000	.625	.250	.641	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.893	.500	.000	.844	.250	.375	.000	.250	.400	.847

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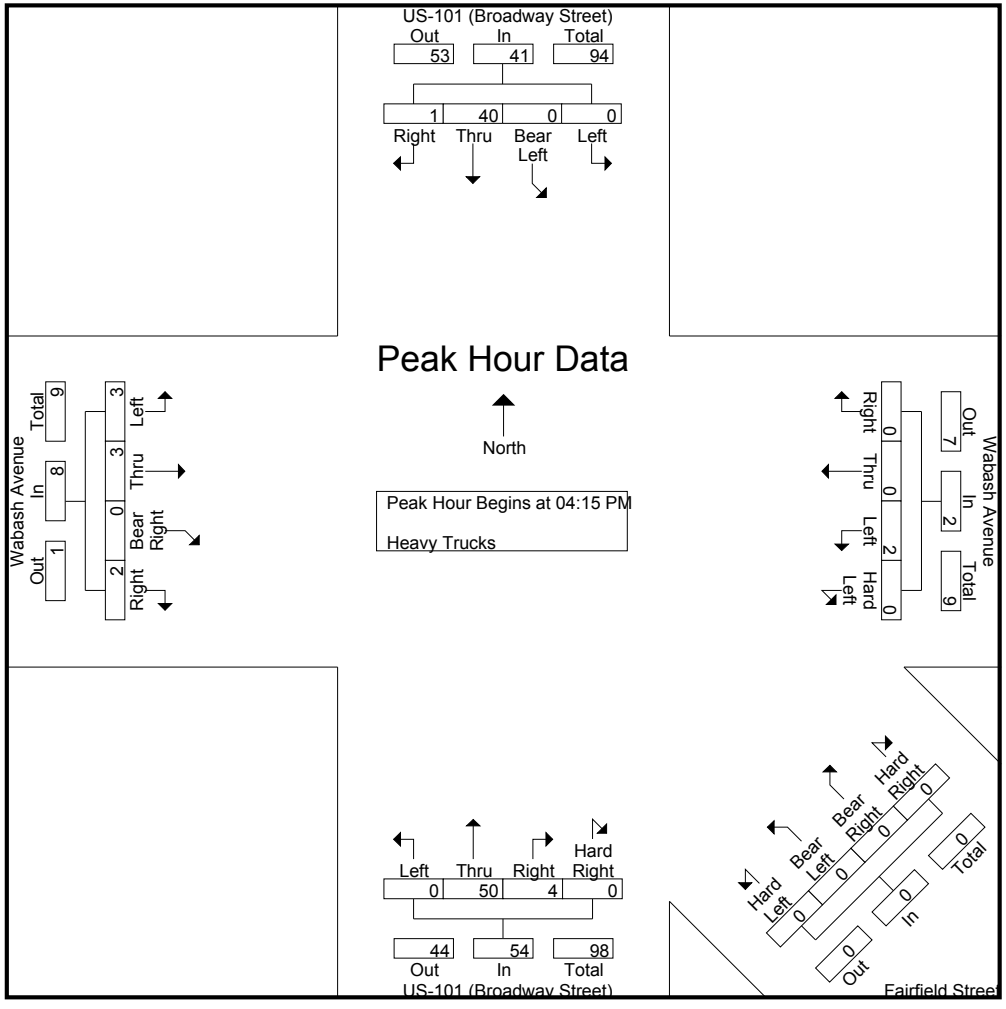
City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash PM
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



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City of Eureka
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	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	04:15 PM					04:15 PM					04:15 PM					04:15 PM					04:15 PM					
+0 mins.	0	0	**16**	0	**16**	0	**1**	0	0	**1**	0	0	0	0	0	0	13	0	0	13	0	1	0	0	1	
+15 mins.	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	10	**2**	0	12	**3**	**2**	0	0	**5**	
+30 mins.	0	0	7	**1**	8	0	1	0	0	1	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	
+45 mins.	0	0	10	0	10	0	0	0	0	0	0	0	0	0	0	0	**14**	2	0	**16**	0	0	0	**2**	2	
Total Volume	0	0	40	1	41	0	2	0	0	2	0	0	0	0	0	0	50	4	0	54	3	3	0	2	8	
% App. Total	0	0	97.6	2.4		0	100	0	0		0	0	0	0		0	92.6	7.4	0		37.5	37.5	0	25		
PHF	.000	.000	.625	.250	.641	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.893	.500	.000	.844	.250	.375	.000	.250	.400	

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City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash PM
Site Code : 99918361
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Page No : 1

Groups Printed- Bicycles

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
04:15 PM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
04:45 PM	0	0	3	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	4	1	5	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	9
05:00 PM	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	1	0	0	1	1	2	0	0	0	0	0	1	1	0	0	2	1	0	0	0	1	6
Grand Total	0	0	5	1	6	0	1	1	1	3	0	0	0	0	0	2	2	0	0	4	1	1	0	0	2	15
Apprch %	0	0	83.3	16.7		0	33.3	33.3	33.3		0	0	0	0		50	50	0	0		50	50	0	0		
Total %	0	0	33.3	6.7	40	0	6.7	6.7	6.7	20	0	0	0	0	0	13.3	13.3	0	0	26.7	6.7	6.7	0	0	13.3	

	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:45 PM																										
04:45 PM	0	0	**3**	**1**	**4**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
05:00 PM	0	0	1	0	1	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	**1**	0	1	0	0	0	0	0	**1**	0	0	0	**1**	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	**1**	0	0	0	**1**	2
Total Volume	0	0	4	1	5	0	0	1	1	2	0	0	0	0	0	1	1	0	0	2	1	0	0	0	1	10
% App. Total	0	0	80	20		0	0	50	50		0	0	0	0		50	50	0	0		100	0	0	0		
PHF	.000	.000	.333	.250	.313	.000	.000	.250	.250	.500	.000	.000	.000	.000	.000	.250	.250	.000	.000	.500	.250	.000	.000	.000	.250	.625

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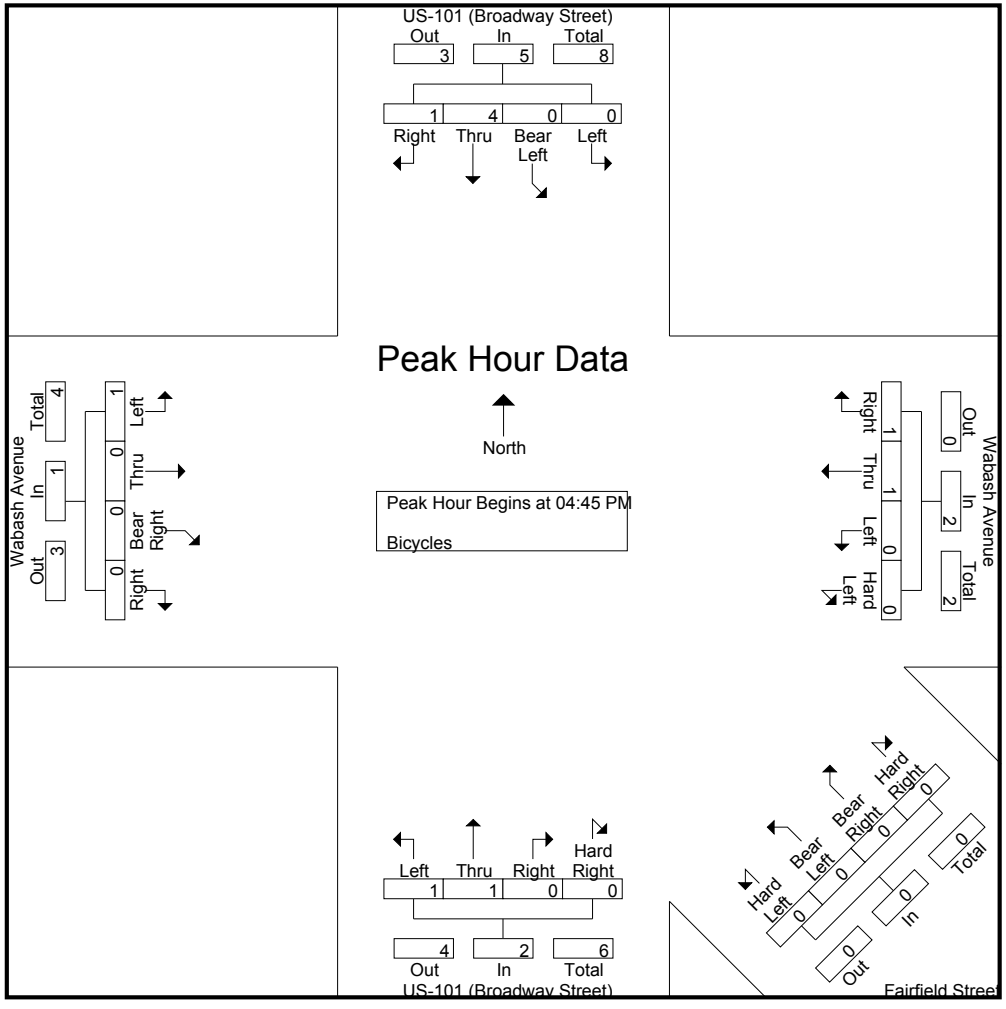
City of Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue / Fairfield Street
Weather: Clear

File Name : 04_ERK_101_Wabash PM
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



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Start Date : 5/9/2018
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	US-101 (Broadway Street) Southbound					Wabash Avenue Westbound					Fairfield Street Northwestbound					US-101 (Broadway Street) Northbound					Wabash Avenue Eastbound					
Start Time	Left	Bear Left	Thru	Right	App. Total	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Each Approach Begins at:																										
	04:15 PM					04:15 PM					04:00 PM					04:00 PM					04:00 PM					
+0 mins.	0	0	1	0	1	0	**1**	0	0	**1**	0	0	0	0	0	0	**1**	0	0	**1**	0	**1**	0	0	**1**	
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+30 mins.	0	0	**3**	**1**	**4**	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1	0	0	0	0	0	
+45 mins.	0	0	1	0	1	0	0	0	**1**	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	0	5	1	6	0	1	0	1	2	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	
% App. Total	0	0	83.3	16.7		0	50	0	50		0	0	0	0		50	50	0	0		0	100	0	0		
PHF	.000	.000	.417	.250	.375	.000	.250	.000	.250	.500	.000	.000	.000	.000	.000	.250	.250	.000	.000	.500	.000	.250	.000	.000	.250	

Location: Eureka
N/S: US-101 (Broadway Street)
E/W: Wabash Avenue

Date: 5/9/2018
Day: Wednesday

PEDESTRIANS

	North Leg US-101 (Broadway Street) Pedestrians	East Leg Wabash Avenue Pedestrians	South Leg US-101 (Broadway Street) Pedestrians	West Leg Wabash Avenue Pedestrians	West Leg Wabash Avenue Pedestrians	
11:00 AM	4	0	0	0	4	8
11:15 AM	2	2	1	0	3	8
11:30 AM	1	2	1	0	2	6
11:45 AM	4	3	1	0	5	13
12:00 PM	13	2	1	0	9	25
12:15 PM	6	4	4	0	2	16
12:30 PM	9	3	0	0	5	17
12:45 PM	8	1	1	0	2	12
TOTAL VOLUMES:	47	17	9	0	32	73

	North Leg US-101 (Broadway Street) Pedestrians	East Leg Wabash Avenue Pedestrians	South Leg US-101 (Broadway Street) Pedestrians	West Leg Wabash Avenue Pedestrians	West Leg Wabash Avenue Pedestrians	
4:00 PM	4	1	0	0	4	9
4:15 PM	5	2	0	0	0	7
4:30 PM	11	5	0	0	8	24
4:45 PM	7	3	0	0	3	13
5:00 PM	4	1	0	0	0	5
5:15 PM	7	1	0	0	5	13
5:30 PM	5	2	0	0	4	11
5:45 PM	2	3	0	0	2	7
TOTAL VOLUMES:	45	18	0	0	26	63

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City of Eureka
N/S: Fairfield Street
E/W: Henderson Street
Weather: Clear

File Name : 05_ERK_Fairfield_Henderson MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	0	20	19	39	6	134	19	159	4	12	0	16	4	0	10	14	228
11:15 AM	0	23	14	37	9	119	20	148	1	22	0	23	0	0	21	21	229
11:30 AM	0	21	24	45	5	125	15	145	3	15	0	18	7	0	19	26	234
11:45 AM	0	25	12	37	10	124	24	158	1	20	0	21	3	0	12	15	231
Total	0	89	69	158	30	502	78	610	9	69	0	78	14	0	62	76	922
12:00 PM	0	35	24	59	4	129	20	153	3	24	0	27	9	0	13	22	261
12:15 PM	0	23	16	39	6	111	21	138	4	14	0	18	4	0	18	22	217
12:30 PM	0	24	18	42	9	123	16	148	1	25	0	26	3	0	13	16	232
12:45 PM	0	25	20	45	12	111	19	142	3	22	0	25	6	0	21	27	239
Total	0	107	78	185	31	474	76	581	11	85	0	96	22	0	65	87	949
Grand Total	0	196	147	343	61	976	154	1191	20	154	0	174	36	0	127	163	1871
Apprch %	0	57.1	42.9		5.1	81.9	12.9		11.5	88.5	0		22.1	0	77.9		
Total %	0	10.5	7.9	18.3	3.3	52.2	8.2	63.7	1.1	8.2	0	9.3	1.9	0	6.8	8.7	
Passenger Vehicles	0	192	146	338	61	958	153	1172	20	153	0	173	35	0	122	157	1840
% Passenger Vehicles	0	98	99.3	98.5	100	98.2	99.4	98.4	100	99.4	0	99.4	97.2	0	96.1	96.3	98.3
Motorcycles	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1	3
% Motorcycles	0	0.5	0	0.3	0	0.1	0	0.1	0	0	0	0	0	0	0.8	0.6	0.2
Heavy Trucks	0	3	1	4	0	17	1	18	0	1	0	1	1	0	4	5	28
% Heavy Trucks	0	1.5	0.7	1.2	0	1.7	0.6	1.5	0	0.6	0	0.6	2.8	0	3.1	3.1	1.5

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:15 AM																	
11:15 AM	0	23	14	37	9	119	20	148	1	22	0	23	0	0	**21**	21	229
11:30 AM	0	21	**24**	45	5	125	15	145	**3**	15	0	18	7	0	19	**26**	234
11:45 AM	0	25	12	37	**10**	124	**24**	**158**	1	20	0	21	3	0	12	15	231
12:00 PM	0	**35**	24	**59**	4	**129**	20	153	3	**24**	0	**27**	**9**	0	13	22	**261**
Total Volume	0	104	74	178	28	497	79	604	8	81	0	89	19	0	65	84	955
% App. Total	0	58.4	41.6		4.6	82.3	13.1		9	91	0		22.6	0	77.4		
PHF	.000	.743	.771	.754	.700	.963	.823	.956	.667	.844	.000	.824	.528	.000	.774	.808	.915

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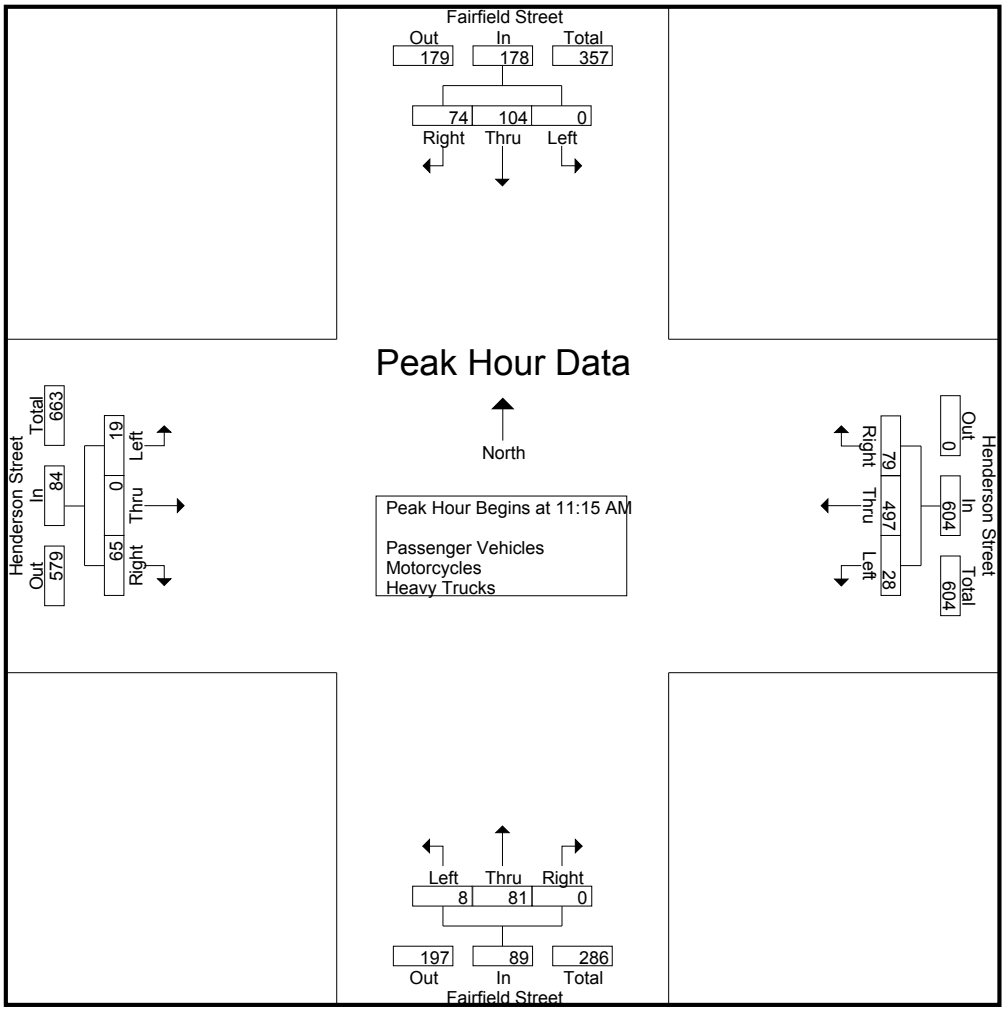
City of Eureka
N/S: Fairfield Street
E/W: Henderson Street
Weather: Clear

File Name : 05_ERK_Fairfield_Henderson MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:00 PM				11:00 AM				12:00 PM				12:00 PM			
+0 mins.	0	**35**	**24**	**59**	6	**134**	19	**159**	3	24	0	**27**	**9**	0	13	22
+15 mins.	0	23	16	39	9	119	20	148	**4**	14	0	18	4	0	18	22
+30 mins.	0	24	18	42	5	125	15	145	1	**25**	0	26	3	0	13	16
+45 mins.	0	25	20	45	**10**	124	**24**	158	3	22	0	25	6	0	**21**	**27**
Total Volume	0	107	78	185	30	502	78	610	11	85	0	96	22	0	65	87
% App. Total	0	57.8	42.2		4.9	82.3	12.8		11.5	88.5	0		25.3	0	74.7	
PHF	.000	.764	.813	.784	.750	.937	.813	.959	.688	.850	.000	.889	.611	.000	.774	.806

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City of Eureka
N/S: Fairfield Street
E/W: Henderson Street
Weather: Clear

File Name : 05_ERK_Fairfield_Henderson MD
Site Code : 99918361
Start Date : 5/9/2018
Page No : 1

Groups Printed- Passenger Vehicles

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	0	20	19	39	6	130	19	155	4	12	0	16	4	0	10	14	224
11:15 AM	0	23	14	37	9	118	20	147	1	22	0	23	0	0	20	20	227
11:30 AM	0	21	23	44	5	124	15	144	3	14	0	17	7	0	18	25	230
11:45 AM	0	24	12	36	10	121	24	155	1	20	0	21	3	0	12	15	227
Total	0	88	68	156	30	493	78	601	9	68	0	77	14	0	60	74	908
12:00 PM	0	34	24	58	4	129	20	153	3	24	0	27	9	0	12	21	259
12:15 PM	0	23	16	39	6	108	21	135	4	14	0	18	4	0	17	21	213
12:30 PM	0	23	18	41	9	119	16	144	1	25	0	26	3	0	13	16	227
12:45 PM	0	24	20	44	12	109	18	139	3	22	0	25	5	0	20	25	233
Total	0	104	78	182	31	465	75	571	11	85	0	96	21	0	62	83	932
Grand Total	0	192	146	338	61	958	153	1172	20	153	0	173	35	0	122	157	1840
Apprch %	0	56.8	43.2		5.2	81.7	13.1		11.6	88.4	0		22.3	0	77.7		
Total %	0	10.4	7.9	18.4	3.3	52.1	8.3	63.7	1.1	8.3	0	9.4	1.9	0	6.6	8.5	

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:15 AM to 12:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:15 AM																	
11:15 AM	0	23	14	37	9	118	20	147	1	22	0	23	0	0	**20**	20	227
11:30 AM	0	21	23	44	5	124	15	144	**3**	14	0	17	7	0	18	**25**	230
11:45 AM	0	24	12	36	**10**	121	**24**	**155**	1	20	0	21	3	0	12	15	227
12:00 PM	0	**34**	**24**	**58**	4	**129**	20	153	3	**24**	0	**27**	**9**	0	12	21	**259**
Total Volume	0	102	73	175	28	492	79	599	8	80	0	88	19	0	62	81	943
% App. Total	0	58.3	41.7		4.7	82.1	13.2		9.1	90.9	0		23.5	0	76.5		
PHF	.000	.750	.760	.754	.700	.953	.823	.966	.667	.833	.000	.815	.528	.000	.775	.810	.910

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City of Eureka
N/S: Fairfield Street
E/W: Henderson Street
Weather: Clear

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Site Code : 99918361
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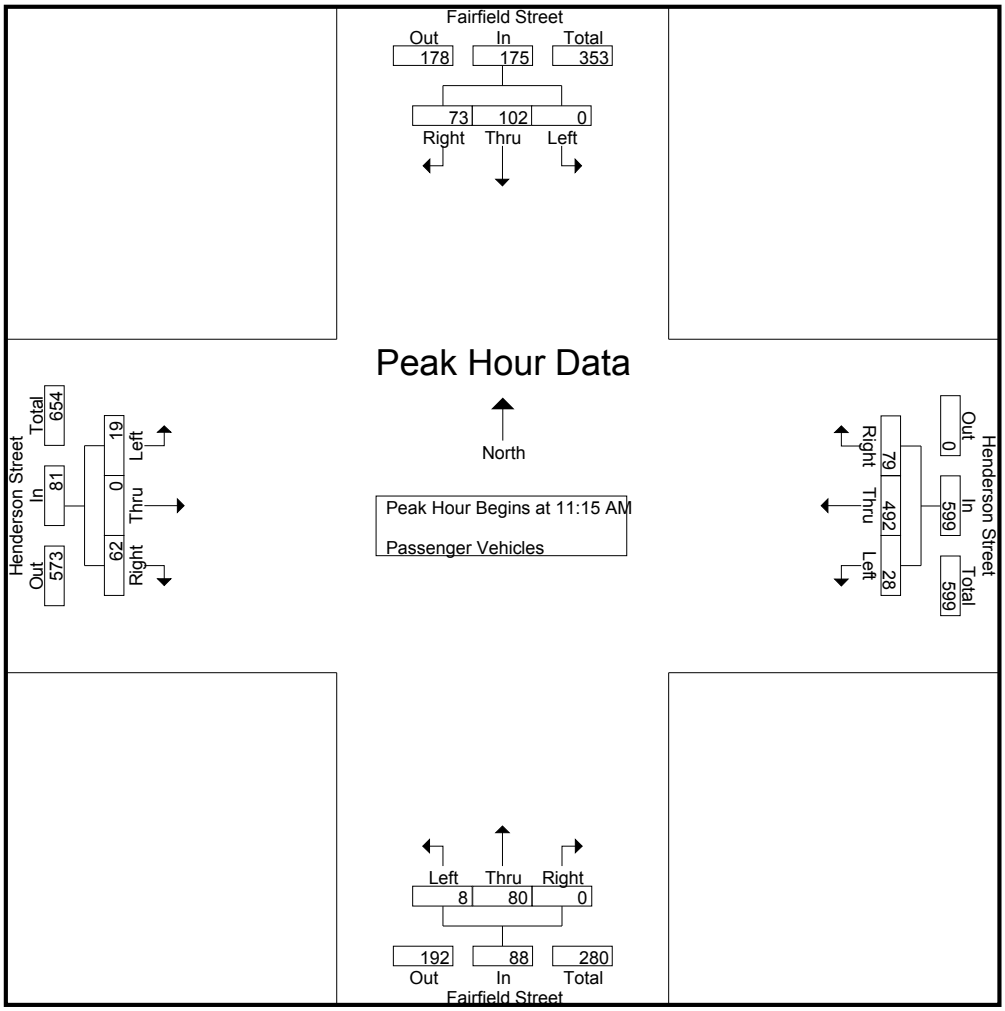

Peak Hour Analysis From 11:15 AM to 12:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:15 AM				11:15 AM				11:15 AM				11:15 AM			
+0 mins.	0	23	14	37	9	118	20	147	1	22	0	23	0	0	**20**	20
+15 mins.	0	21	23	44	5	124	15	144	**3**	14	0	17	7	0	18	**25**
+30 mins.	0	24	12	36	**10**	121	**24**	**155**	1	20	0	21	3	0	12	15
+45 mins.	0	**34**	**24**	**58**	4	**129**	20	153	3	**24**	0	**27**	**9**	0	12	21
Total Volume	0	102	73	175	28	492	79	599	8	80	0	88	19	0	62	81
% App. Total	0	58.3	41.7		4.7	82.1	13.2		9.1	90.9	0		23.5	0	76.5	
PHF	.000	.750	.760	.754	.700	.953	.823	.966	.667	.833	.000	.815	.528	.000	.775	.810

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Groups Printed- Motorcycles

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
12:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1	3
Grand Total	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	1	3
Apprch %	0	100	0		0	100	0		0	0	0		0	0	100		
Total %	0	33.3	0	33.3	0	33.3	0	33.3	0	0	0	0	0	0	33.3	33.3	

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:15 AM to 12:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:15 AM																	
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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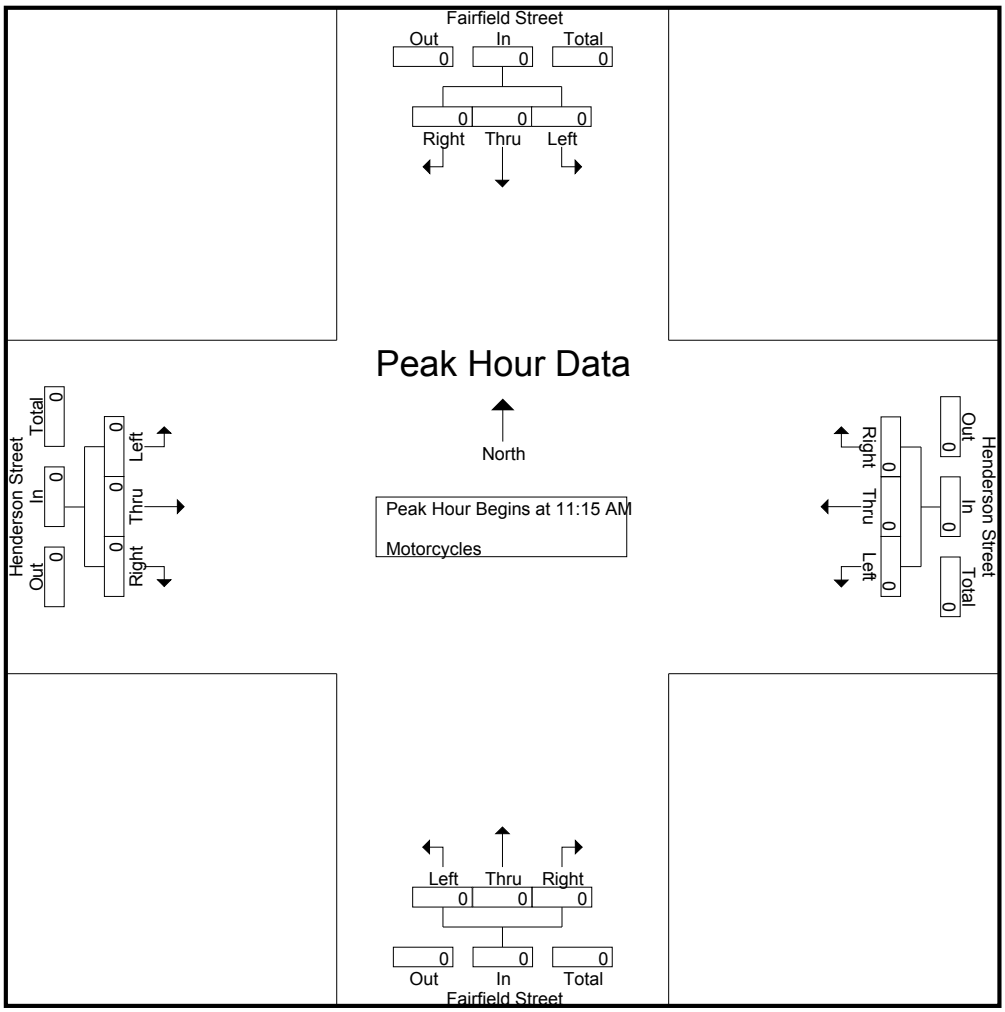

Peak Hour Analysis From 11:15 AM to 12:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:15 AM				11:15 AM				11:15 AM				11:15 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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Groups Printed- Heavy Trucks

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
11:00 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	4
11:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
11:30 AM	0	0	1	1	0	1	0	1	0	1	0	1	0	0	1	1	4
11:45 AM	0	1	0	1	0	3	0	3	0	0	0	0	0	0	0	0	4
Total	0	1	1	2	0	9	0	9	0	1	0	1	0	0	2	2	14
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
12:15 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3
12:30 PM	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	4
12:45 PM	0	1	0	1	0	1	1	2	0	0	0	0	1	0	1	2	5
Total	0	2	0	2	0	8	1	9	0	0	0	0	1	0	2	3	14
Grand Total	0	3	1	4	0	17	1	18	0	1	0	1	1	0	4	5	28
Apprch %	0	75	25		0	94.4	5.6		0	100	0		20	0	80		
Total %	0	10.7	3.6	14.3	0	60.7	3.6	64.3	0	3.6	0	3.6	3.6	0	14.3	17.9	

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 11:15 AM to 12:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:15 AM																	
11:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	**1**	**1**	2
11:30 AM	0	0	**1**	**1**	0	1	0	1	0	**1**	0	**1**	0	0	1	1	**4**
11:45 AM	0	**1**	0	1	0	**3**	0	**3**	0	0	0	0	0	0	0	0	4
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
Total Volume	0	2	1	3	0	5	0	5	0	1	0	1	0	0	3	3	12
% App. Total	0	66.7	33.3		0	100	0		0	100	0		0	0	100		
PHF	.000	.500	.250	.750	.000	.417	.000	.417	.000	.250	.000	.250	.000	.000	.750	.750	.750

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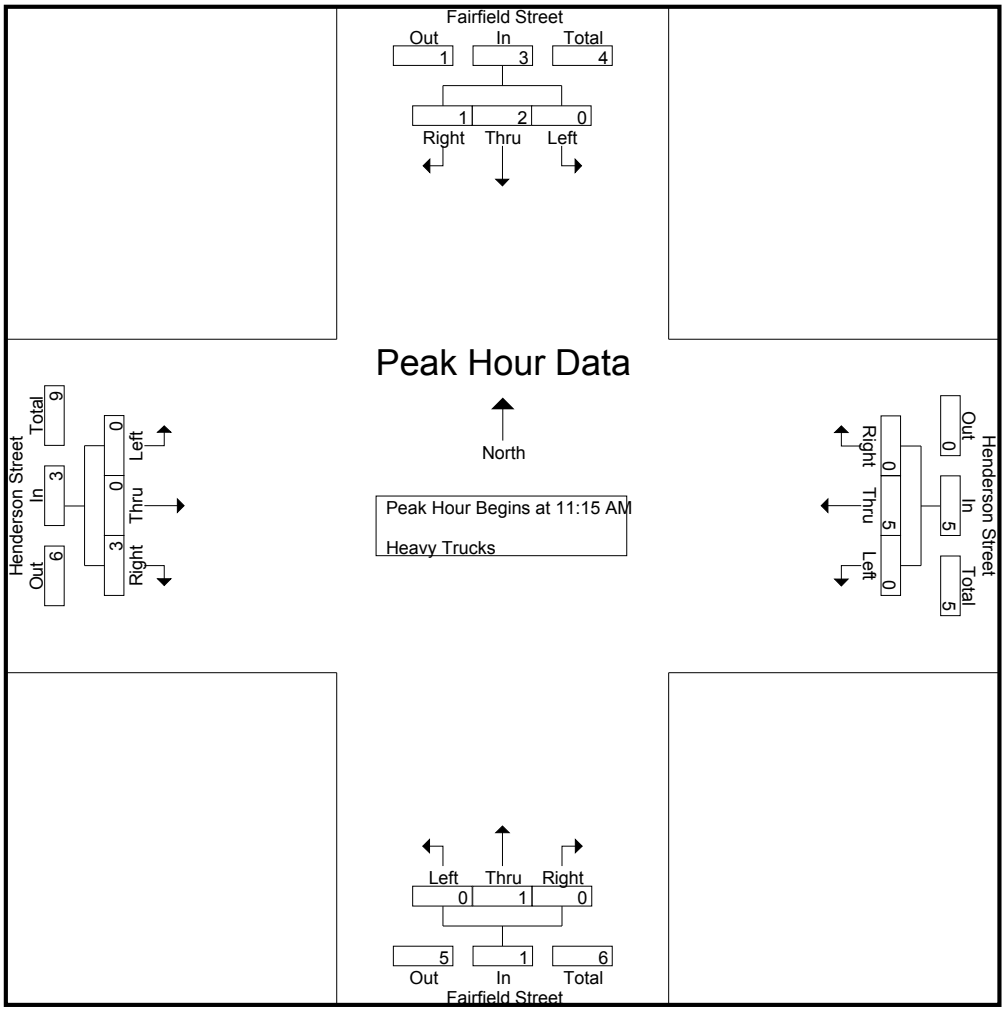

Peak Hour Analysis From 11:15 AM to 12:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:15 AM				11:15 AM				11:15 AM				11:15 AM			
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	**1**	**1**
+15 mins.	0	0	**1**	**1**	0	1	0	1	0	**1**	0	**1**	0	0	1	1
+30 mins.	0	**1**	0	1	0	**3**	0	**3**	0	0	0	0	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1
Total Volume	0	2	1	3	0	5	0	5	0	1	0	1	0	0	3	3
% App. Total	0	66.7	33.3		0	100	0		0	100	0		0	0	100	
PHF	.000	.500	.250	.750	.000	.417	.000	.417	.000	.250	.000	.250	.000	.000	.750	.750

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City of Eureka
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Groups Printed- Passenger Vehicles - Motorcycles - Heavy Trucks

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	25	22	47	12	118	10	140	5	20	0	25	5	0	28	33	245
04:15 PM	0	29	20	49	19	135	18	172	2	21	0	23	4	1	23	28	272
04:30 PM	0	41	38	79	12	124	20	156	4	29	0	33	8	0	20	28	296
04:45 PM	0	26	18	44	16	112	10	138	3	17	0	20	4	0	20	24	226
Total	0	121	98	219	59	489	58	606	14	87	0	101	21	1	91	113	1039
05:00 PM	0	41	27	68	19	131	19	169	3	18	0	21	5	0	21	26	284
05:15 PM	0	44	36	80	15	147	20	182	2	19	0	21	5	0	18	23	306
05:30 PM	0	42	25	67	25	130	21	176	3	27	0	30	7	0	20	27	300
05:45 PM	0	31	19	50	10	101	11	122	3	7	0	10	5	0	8	13	195
Total	0	158	107	265	69	509	71	649	11	71	0	82	22	0	67	89	1085
Grand Total	0	279	205	484	128	998	129	1255	25	158	0	183	43	1	158	202	2124
Apprch %	0	57.6	42.4		10.2	79.5	10.3		13.7	86.3	0		21.3	0.5	78.2		
Total %	0	13.1	9.7	22.8	6	47	6.1	59.1	1.2	7.4	0	8.6	2	0	7.4	9.5	
Passenger Vehicles	0	277	204	481	128	980	129	1237	25	156	0	181	43	1	154	198	2097
% Passenger Vehicles	0	99.3	99.5	99.4	100	98.2	100	98.6	100	98.7	0	98.9	100	100	97.5	98	98.7
Motorcycles	0	0	0	0	0	7	0	7	0	1	0	1	0	0	2	2	10
% Motorcycles	0	0	0	0	0	0.7	0	0.6	0	0.6	0	0.5	0	0	1.3	1	0.5
Heavy Trucks	0	2	1	3	0	11	0	11	0	1	0	1	0	0	2	2	17
% Heavy Trucks	0	0.7	0.5	0.6	0	1.1	0	0.9	0	0.6	0	0.5	0	0	1.3	1	0.8

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	26	18	44	16	112	10	138	**3**	17	0	20	4	0	20	24	226
05:00 PM	0	41	27	68	19	131	19	169	3	18	0	21	5	0	**21**	26	284
05:15 PM	0	**44**	**36**	**80**	15	**147**	20	**182**	2	19	0	21	5	0	18	23	**306**
05:30 PM	0	42	25	67	**25**	130	**21**	176	3	**27**	0	**30**	**7**	0	20	**27**	300
Total Volume	0	153	106	259	75	520	70	665	11	81	0	92	21	0	79	100	1116
% App. Total	0	59.1	40.9		11.3	78.2	10.5		12	88	0		21	0	79		
PHF	.000	.869	.736	.809	.750	.884	.833	.913	.917	.750	.000	.767	.750	.000	.940	.926	.912

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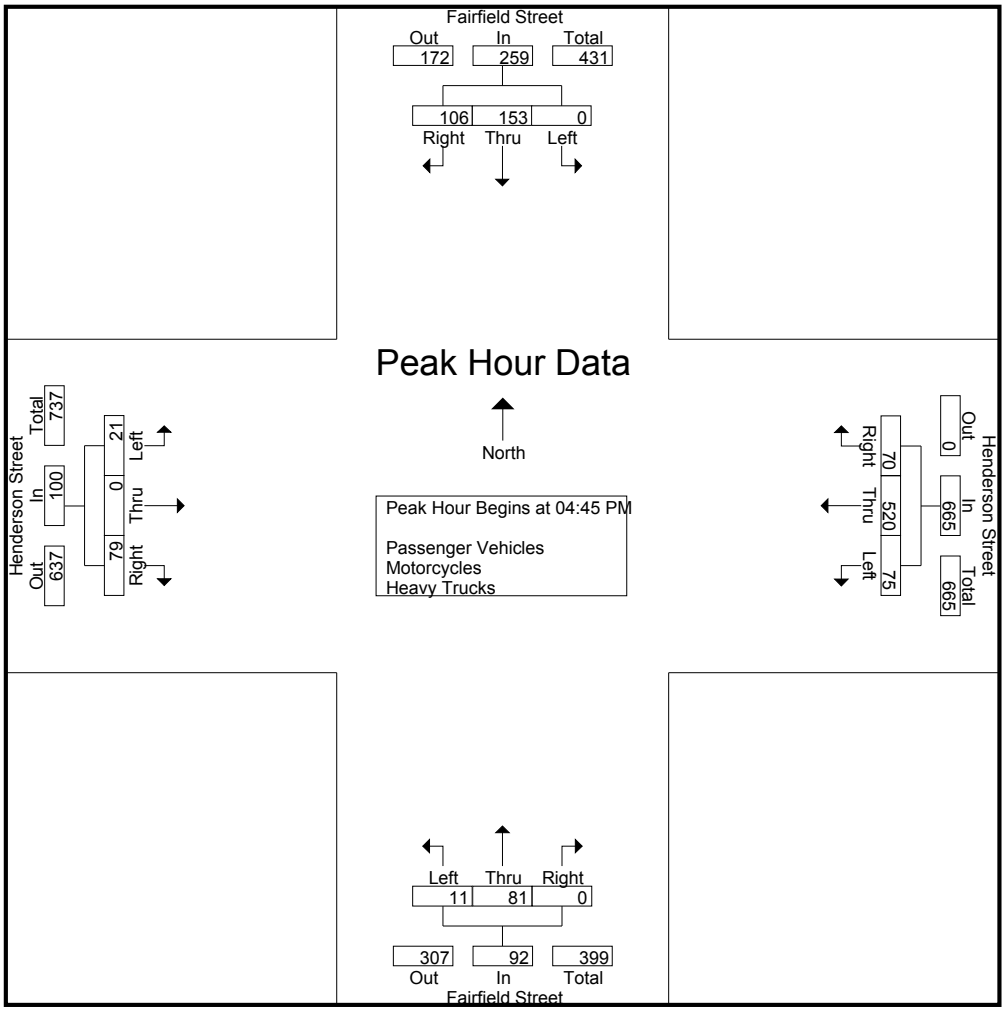

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:45 PM				04:00 PM				04:00 PM			
+0 mins.	0	41	**38**	79	16	112	10	138	**5**	20	0	25	5	0	**28**	**33**
+15 mins.	0	26	18	44	19	131	19	169	2	21	0	23	4	**1**	23	28
+30 mins.	0	41	27	68	15	**147**	20	**182**	4	**29**	0	**33**	**8**	0	20	28
+45 mins.	0	**44**	36	**80**	**25**	130	**21**	176	3	17	0	20	4	0	20	24
Total Volume	0	152	119	271	75	520	70	665	14	87	0	101	21	1	91	113
% App. Total	0	56.1	43.9		11.3	78.2	10.5		13.9	86.1	0		18.6	0.9	80.5	
PHF	.000	.864	.783	.847	.750	.884	.833	.913	.700	.750	.000	.765	.656	.250	.813	.856

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Groups Printed- Passenger Vehicles

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	25	21	46	12	117	10	139	5	20	0	25	5	0	26	31	241
04:15 PM	0	29	20	49	19	134	18	171	2	20	0	22	4	1	23	28	270
04:30 PM	0	41	38	79	12	122	20	154	4	29	0	33	8	0	20	28	294
04:45 PM	0	26	18	44	16	110	10	136	3	17	0	20	4	0	18	22	222
Total	0	121	97	218	59	483	58	600	14	86	0	100	21	1	87	109	1027
05:00 PM	0	40	27	67	19	130	19	168	3	17	0	20	5	0	21	26	281
05:15 PM	0	43	36	79	15	145	20	180	2	19	0	21	5	0	18	23	303
05:30 PM	0	42	25	67	25	123	21	169	3	27	0	30	7	0	20	27	293
05:45 PM	0	31	19	50	10	99	11	120	3	7	0	10	5	0	8	13	193
Total	0	156	107	263	69	497	71	637	11	70	0	81	22	0	67	89	1070
Grand Total	0	277	204	481	128	980	129	1237	25	156	0	181	43	1	154	198	2097
Apprch %	0	57.6	42.4		10.3	79.2	10.4		13.8	86.2	0		21.7	0.5	77.8		
Total %	0	13.2	9.7	22.9	6.1	46.7	6.2	59	1.2	7.4	0	8.6	2.1	0	7.3	9.4	

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	26	18	44	16	110	10	136	**3**	17	0	20	4	0	18	22	222
05:00 PM	0	40	27	67	19	130	19	168	3	17	0	20	5	0	**21**	26	281
05:15 PM	0	**43**	**36**	**79**	15	**145**	20	**180**	2	19	0	21	5	0	18	23	**303**
05:30 PM	0	42	25	67	**25**	123	**21**	169	3	**27**	0	**30**	**7**	0	20	**27**	293
Total Volume	0	151	106	257	75	508	70	653	11	80	0	91	21	0	77	98	1099
% App. Total	0	58.8	41.2		11.5	77.8	10.7		12.1	87.9	0		21.4	0	78.6		
PHF	.000	.878	.736	.813	.750	.876	.833	.907	.917	.741	.000	.758	.750	.000	.917	.907	.907

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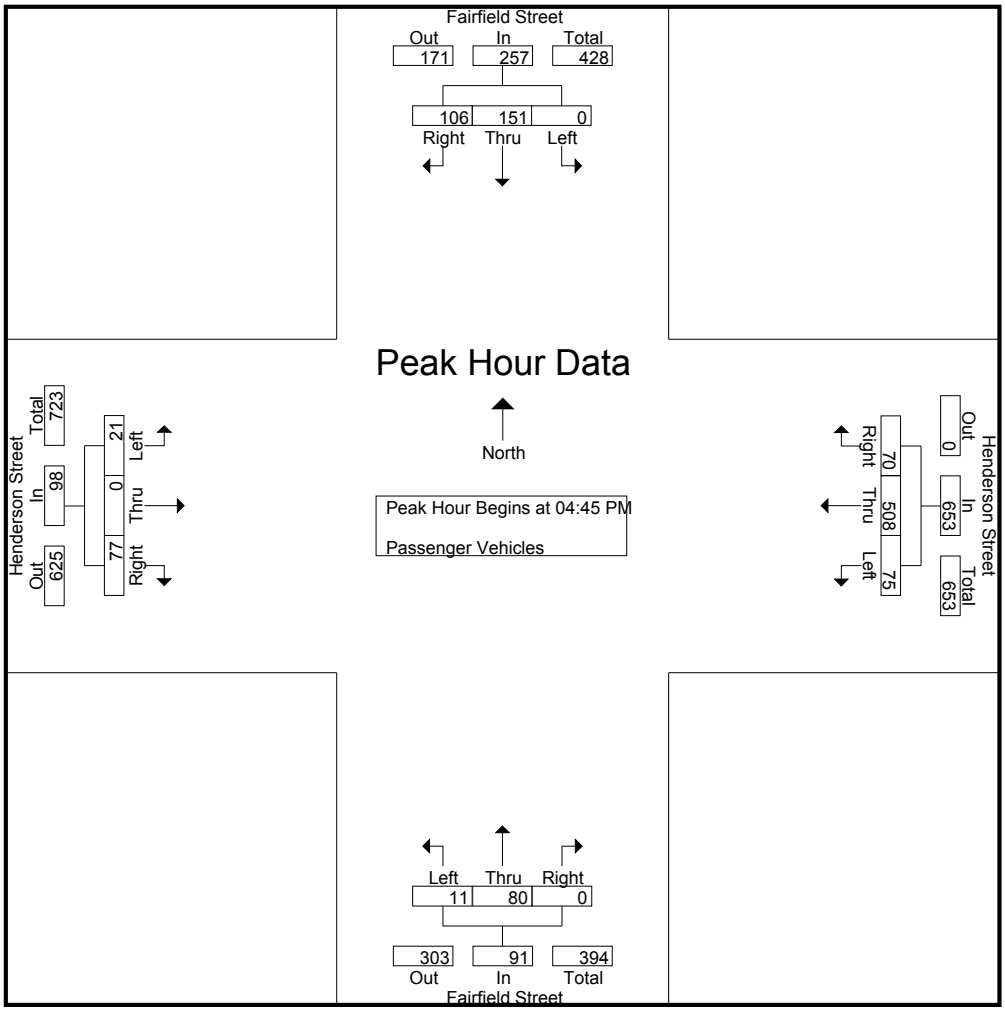
City of Eureka
N/S: Fairfield Street
E/W: Henderson Street
Weather: Clear

File Name : 05_ERK_Fairfield_Henderson PM
Site Code : 99918361
Start Date : 5/9/2018
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	26	18	44	16	110	10	136	**3**	17	0	20	4	0	18	22
+15 mins.	0	40	27	67	19	130	19	168	3	17	0	20	5	0	**21**	26
+30 mins.	0	**43**	**36**	**79**	15	**145**	20	**180**	2	19	0	21	5	0	18	23
+45 mins.	0	42	25	67	**25**	123	**21**	169	3	**27**	0	**30**	**7**	0	20	**27**
Total Volume	0	151	106	257	75	508	70	653	11	80	0	91	21	0	77	98
% App. Total	0	58.8	41.2		11.5	77.8	10.7		12.1	87.9	0		21.4	0	78.6	
PHF	.000	.878	.736	.813	.750	.876	.833	.907	.917	.741	.000	.758	.750	.000	.917	.907

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City of Eureka
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Weather: Clear

File Name : 05_ERK_Fairfield_Henderson PM
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Groups Printed- Motorcycles

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	2	3
05:00 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
05:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	6	0	6	0	1	0	1	0	0	0	0	7
Grand Total	0	0	0	0	0	7	0	7	0	1	0	1	0	0	2	2	10
Apprch %	0	0	0		0	100	0		0	100	0		0	0	100		
Total %	0	0	0	0	0	70	0	70	0	10	0	10	0	0	20	20	

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**	2
05:00 PM	0	0	0	0	0	1	0	1	0	**1**	0	**1**	0	0	0	0	2
05:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0	**3**
Total Volume	0	0	0	0	0	5	0	5	0	1	0	1	0	0	2	2	8
% App. Total	0	0	0		0	100	0		0	100	0		0	0	100		
PHF	.000	.000	.000	.000	.000	.417	.000	.417	.000	.250	.000	.250	.000	.000	.250	.250	.667

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City of Eureka
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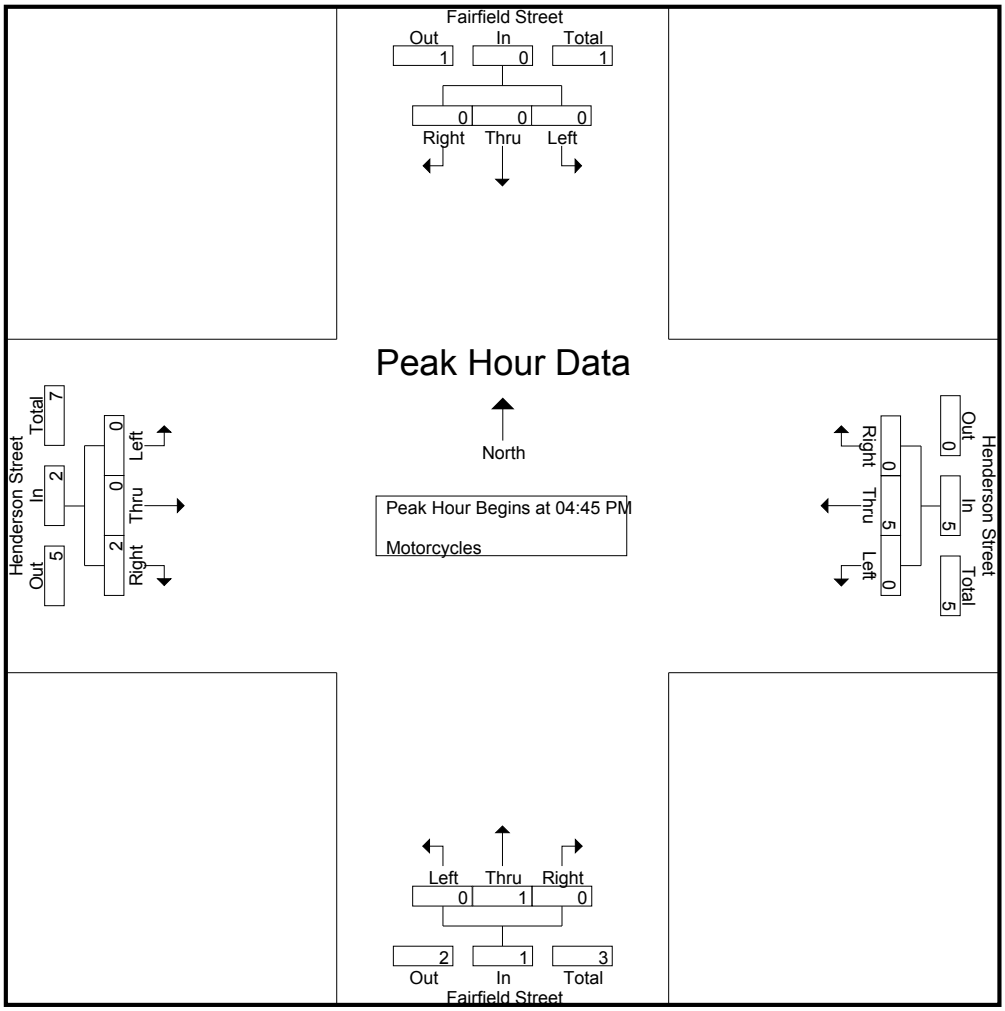

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**2**
+15 mins.	0	0	0	0	0	1	0	1	0	**1**	0	**1**	0	0	0	0
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	5	0	5	0	1	0	1	0	0	2	2
% App. Total	0	0	0		0	100	0		0	100	0		0	0	100	
PHF	.000	.000	.000	.000	.000	.417	.000	.417	.000	.250	.000	.250	.000	.000	.250	.250

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E/W: Henderson Street
Weather: Clear

File Name : 05_ERK_Fairfield_Henderson PM
Site Code : 99918361
Start Date : 5/9/2018
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Groups Printed- Heavy Trucks

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	2	3
04:15 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
04:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
Total	0	0	1	1	0	5	0	5	0	1	0	1	0	0	2	2	9
05:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	4
05:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	2	0	2	0	6	0	6	0	0	0	0	0	0	0	0	8
Grand Total	0	2	1	3	0	11	0	11	0	1	0	1	0	0	2	2	17
Apprch %	0	66.7	33.3		0	100	0		0	100	0		0	0	100		
Total %	0	11.8	5.9	17.6	0	64.7	0	64.7	0	5.9	0	5.9	0	0	11.8	11.8	

	Fairfield Street Southbound				Henderson Street Westbound				Fairfield Street Northbound				Henderson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
05:00 PM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	**4**	0	**4**	0	0	0	0	0	0	0	0	**4**
Total Volume	0	2	0	2	0	7	0	7	0	0	0	0	0	0	0	0	9
% App. Total	0	100	0		0	100	0		0	0	0		0	0	0		
PHF	.000	.500	.000	.500	.000	.438	.000	.438	.000	.000	.000	.000	.000	.000	.000	.000	.563

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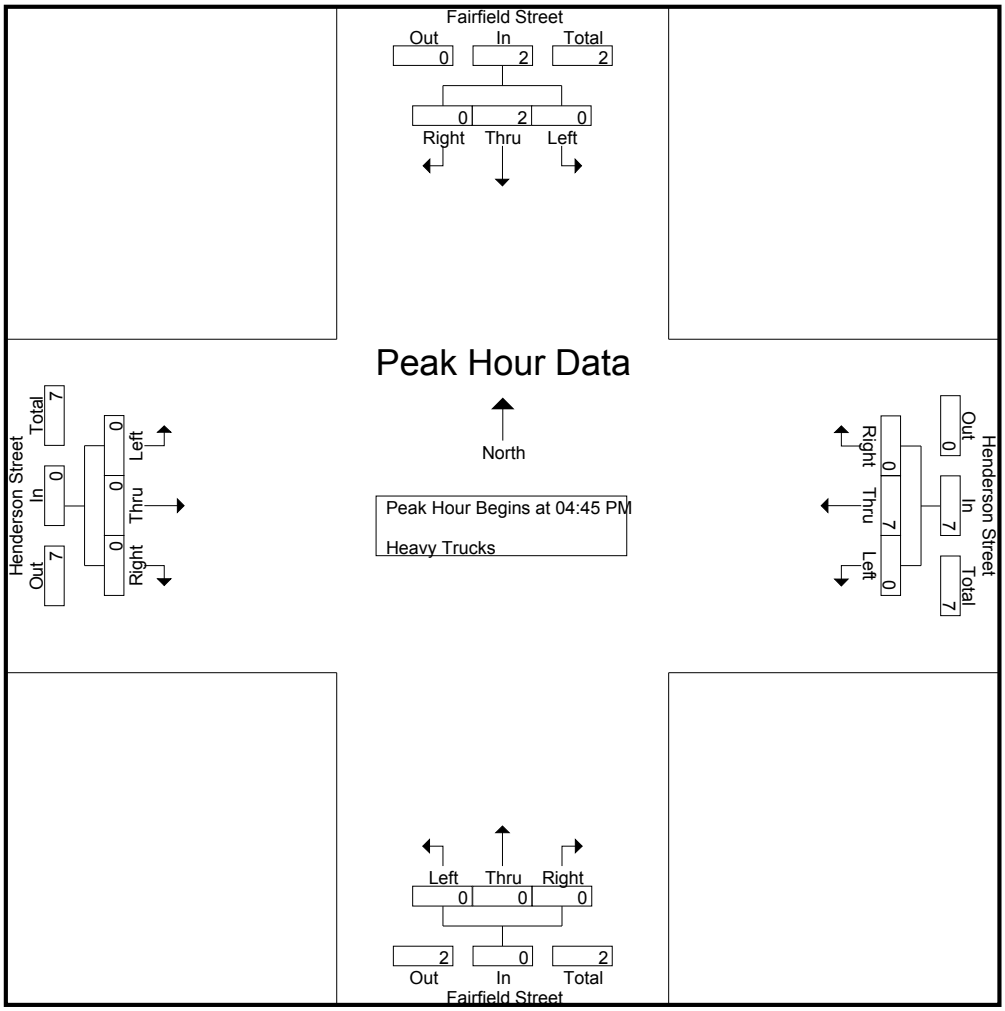

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0
+15 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	**4**	0	**4**	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	0	7	0	7	0	0	0	0	0	0	0	0
% App. Total	0	100	0		0	100	0		0	0	0		0	0	0	
PHF	.000	.500	.000	.500	.000	.438	.000	.438	.000	.000	.000	.000	.000	.000	.000	.000

Location: Eureka
N/S: Fairfield Street
E/W: Henderson Street

Date: 5/9/2018
Day: Wednesday

PEDESTRIANS

	North Leg Fairfield Street	East Leg Henderson Street	South Leg Fairfield Street	West Leg Henderson Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
11:00 AM	0	0	0	0	0
11:15 AM	0	1	2	0	3
11:30 AM	0	0	0	1	1
11:45 AM	0	0	1	0	1
12:00 PM	0	0	0	0	0
12:15 PM	1	0	1	0	2
12:30 PM	0	1	1	0	2
12:45 PM	0	0	0	1	1
TOTAL VOLUMES:	1	2	5	2	10

	North Leg Fairfield Street	East Leg Henderson Street	South Leg Fairfield Street	West Leg Henderson Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	0	1	0	1
4:15 PM	1	0	3	0	4
4:30 PM	0	1	1	4	6
4:45 PM	0	0	0	0	0
5:00 PM	0	0	1	1	2
5:15 PM	0	0	0	0	0
5:30 PM	2	0	1	0	3
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	3	1	7	5	16

Location: Eureka
N/S: Fairfield Street
E/W: Henderson Street

Date: 5/9/2018
Day: Wednesday

BICYCLES

	Southbound Fairfield Street			Westbound Henderson Street			Northbound Fairfield Street			Eastbound Henderson Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	2
12:15 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	2	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL VOLUMES:	3	1	0	0	1	0	0	1	0	0	0	0	6

	Southbound Fairfield Street			Westbound Henderson Street			Northbound Fairfield Street			Eastbound Henderson Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
4:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	2	0	0	3	0	0	1	0	0	0	0	6

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Appendix B
Synchro and SimTraffic Outputs

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Existing Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBL
Lane Configurations												
Traffic Volume (vph)	66	110	42	169	79	134	60	136	1063	69	42	51
Future Volume (vph)	66	110	42	169	79	134	60	136	1063	69	42	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		5.2
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00		1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	0.99		0.97	1.00	0.99		1.00	1.00	0.95		1.00
Flpb, ped/bikes	0.98	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Frt	1.00	0.95		0.85	1.00	0.95		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		1.00	0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1700	1630		1436	1729	1720		1736	3471	1474		1736
Flt Permitted	0.41	1.00		1.00	0.48	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)	741	1630		1436	865	1720		1736	3471	1474		1736
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	67	111	42	171	80	135	61	137	1074	70	42	52
RTOR Reduction (vph)	0	4	0	135	0	18	0	0	0	0	0	0
Lane Group Flow (vph)	67	166	0	19	80	178	0	137	1074	70	0	94
Confl. Peds. (#/hr)	36			6	6		36			18		
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA	Perm	Prot	Prot
Protected Phases		4				8		5	2		1	1
Permitted Phases	4			4	8					2		
Actuated Green, G (s)	10.8	10.8		10.8	10.8	10.8		8.4	38.9	38.9		5.6
Effective Green, g (s)	10.8	10.8		10.8	10.8	10.8		8.4	38.9	38.9		5.6
Actuated g/C Ratio	0.12	0.12		0.12	0.12	0.12		0.10	0.44	0.44		0.06
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		5.2
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	3.0	3.0		1.5
Lane Grp Cap (vph)	90	199		176	106	210		165	1532	650		110
v/s Ratio Prot		0.10				c0.10		c0.08	c0.31			0.05
v/s Ratio Perm	0.09			0.01	0.09					0.05		
v/c Ratio	0.74	0.83		0.11	0.75	0.85		0.83	0.70	0.11		0.85
Uniform Delay, d1	37.3	37.8		34.4	37.4	37.8		39.1	19.9	14.4		40.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2	26.7	24.2		0.2	24.8	25.2		27.3	1.5	0.1		42.5
Delay (s)	64.0	62.0		34.6	62.1	63.0		66.4	21.4	14.5		83.4
Level of Service	E	E		C	E	E		E	C	B		F
Approach Delay (s)		51.5				62.8			25.8			
Approach LOS		D				E			C			

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	88.1	Sum of lost time (s)	22.8
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Existing Conditions
Mid-Day Peak Hr

Movement	SBT	SBR	NWL2	NWL	NWR
Lane Configurations					
Traffic Volume (vph)	1156	52	3	89	67
Future Volume (vph)	1156	52	3	89	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	6.4			5.5	
Lane Util. Factor	0.95			1.00	
Frpb, ped/bikes	1.00			1.00	
Flpb, ped/bikes	1.00			1.00	
Frt	0.99			0.94	
Flt Protected	1.00			0.97	
Satd. Flow (prot)	3443			1674	
Flt Permitted	1.00			0.97	
Satd. Flow (perm)	3443			1674	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	1168	53	3	90	68
RTOR Reduction (vph)	4	0	0	0	0
Lane Group Flow (vph)	1217	0	0	161	0
Confl. Peds. (#/hr)		10			
Heavy Vehicles (%)	4%	4%	4%	4%	4%
Turn Type	NA		Prot	Prot	
Protected Phases	6		9	9	
Permitted Phases					
Actuated Green, G (s)	36.1			10.0	
Effective Green, g (s)	36.1			10.0	
Actuated g/C Ratio	0.41			0.11	
Clearance Time (s)	6.4			5.5	
Vehicle Extension (s)	3.0			1.5	
Lane Grp Cap (vph)	1410			190	
v/s Ratio Prot	c0.35			c0.10	
v/s Ratio Perm					
v/c Ratio	0.86			0.85	
Uniform Delay, d1	23.7			38.3	
Progression Factor	1.00			1.00	
Incremental Delay, d2	5.7			26.9	
Delay (s)	29.5			65.2	
Level of Service	C			E	
Approach Delay (s)	33.3			65.2	
Approach LOS	C			E	

Intersection Summary

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	1	53	4	0	5	44	1247	14	14	1349	44
Future Vol, veh/h	16	1	53	4	0	5	44	1247	14	14	1349	44
Conflicting Peds, #/hr	0	0	1	1	0	0	5	0	6	6	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	16	1	54	4	0	5	45	1272	14	14	1377	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2159	2815	717	2093	2830	649	1427	0	0	1292	0	0
Stage 1	1433	1433	-	1375	1375	-	-	-	-	-	-	-
Stage 2	726	1382	-	718	1455	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	26	17	365	29	16	405	458	-	-	517	-	-
Stage 1	137	193	-	149	206	-	-	-	-	-	-	-
Stage 2	375	204	-	379	188	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	23	15	363	22	14	403	456	-	-	514	-	-
Mov Cap-2 Maneuver	109	117	-	114	103	-	-	-	-	-	-	-
Stage 1	123	187	-	134	185	-	-	-	-	-	-	-
Stage 2	334	183	-	312	182	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.3	25	0.5	0.1
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	456	-	-	232	189	514	-	-
HCM Lane V/C Ratio	0.098	-	-	0.308	0.049	0.028	-	-
HCM Control Delay (s)	13.8	-	-	27.3	25	12.2	-	-
HCM Lane LOS	B	-	-	D	D	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.3	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	16	14	1290	1384	22
Future Vol, veh/h	15	16	14	1290	1384	22
Conflicting Peds, #/hr	0	0	12	0	0	12
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	15	16	14	1330	1427	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2144	737	1462	0	-	0
Stage 1	1451	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Critical Hdwy	6.9	7	4.2	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.55	3.35	2.25	-	-	-
Pot Cap-1 Maneuver	40	354	443	-	-	-
Stage 1	177	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	38	350	438	-	-	-
Mov Cap-2 Maneuver	151	-	-	-	-	-
Stage 1	169	-	-	-	-	-
Stage 2	445	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.8	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	438	-	214	-	-
HCM Lane V/C Ratio	0.033	-	0.149	-	-
HCM Control Delay (s)	13.5	-	24.8	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Existing Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	5	14	410	19	150	6	1135	14	78	1319	3
Future Volume (veh/h)	19	5	14	410	19	150	6	1135	14	78	1319	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	5	15	302	196	156	6	1182	15	81	1374	3
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	53	12	36	401	216	172	11	1388	18	104	1595	3
Arrive On Green	0.03	0.03	0.03	0.23	0.23	0.23	0.01	0.39	0.39	0.06	0.44	0.44
Sat Flow, veh/h	1767	404	1211	1767	951	757	1767	3564	45	1767	3609	8
Grp Volume(v), veh/h	20	0	20	302	0	352	6	585	612	81	671	706
Grp Sat Flow(s),veh/h/ln	1767	0	1614	1767	0	1708	1767	1763	1846	1767	1763	1854
Q Serve(g_s), s	0.8	0.0	0.9	12.2	0.0	15.3	0.3	23.1	23.1	3.4	26.2	26.2
Cycle Q Clear(g_c), s	0.8	0.0	0.9	12.2	0.0	15.3	0.3	23.1	23.1	3.4	26.2	26.2
Prop In Lane	1.00		0.75	1.00		0.44	1.00		0.02	1.00		0.00
Lane Grp Cap(c), veh/h	53	0	48	401	0	387	11	686	719	104	779	819
V/C Ratio(X)	0.38	0.00	0.41	0.75	0.00	0.91	0.54	0.85	0.85	0.78	0.86	0.86
Avail Cap(c_a), veh/h	227	0	207	401	0	387	273	776	813	273	779	819
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	0.0	36.3	27.5	0.0	28.7	37.8	21.3	21.3	35.4	19.2	19.2
Incr Delay (d2), s/veh	1.6	0.0	2.1	7.5	0.0	24.5	14.4	8.2	7.9	4.7	9.7	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.4	5.8	0.0	8.6	0.2	10.0	10.4	1.5	11.3	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	0.0	38.4	35.0	0.0	53.2	52.2	29.5	29.2	40.1	28.9	28.5
LnGrp LOS	D	A	D	D	A	D	D	C	C	D	C	C
Approach Vol, veh/h		40			654			1203			1458	
Approach Delay, s/veh		38.2			44.8			29.4			29.3	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	36.1		7.5	5.7	40.1		23.0
Change Period (Y+Rc), s	* 5.2	6.4		* 5.2	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 12	33.6		* 9.8	* 12	33.6		17.3
Max Q Clear Time (g_c+I1), s	5.4	25.1		2.9	2.3	28.2		17.3
Green Ext Time (p_c), s	0.0	4.6		0.0	0.0	3.7		0.0

Intersection Summary	
HCM 6th Ctrl Delay	32.5
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	0	75	28	497	79	8	81	0	0	104	74
Future Vol, veh/h	22	0	75	28	497	79	8	81	0	0	104	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	0	82	30	540	86	9	88	0	0	113	80
Number of Lanes	1	0	1	0	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.2	13.6	10.2	10.9
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	9%	100%	0%	10%	0%	0%
Vol Thru, %	91%	0%	0%	90%	76%	58%
Vol Right, %	0%	0%	100%	0%	24%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	89	22	75	277	328	178
LT Vol	8	22	0	28	0	0
Through Vol	81	0	0	249	249	104
RT Vol	0	0	75	0	79	74
Lane Flow Rate	97	24	82	301	356	193
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.161	0.045	0.125	0.467	0.531	0.298
Departure Headway (Hd)	5.997	6.736	5.516	5.59	5.368	5.544
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	598	532	650	646	673	648
Service Time	4.034	4.473	3.253	3.312	3.09	3.575
HCM Lane V/C Ratio	0.162	0.045	0.126	0.466	0.529	0.298
HCM Control Delay	10.2	9.8	9	13.1	14	10.9
HCM Lane LOS	B	A	A	B	B	B
HCM 95th-tile Q	0.6	0.1	0.4	2.5	3.1	1.2

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Existing Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Traffic Volume (vph)	56	128	41	172	87	99	41	73	1231	59	1	38
Future Volume (vph)	56	128	41	172	87	99	41	73	1231	59	1	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00		1.00	0.95	1.00		
Frpb, ped/bikes	1.00	0.99		0.95	1.00	0.99		1.00	1.00	0.98		
Flpb, ped/bikes	0.99	1.00		1.00	0.99	1.00		1.00	1.00	1.00		
Frt	1.00	0.95		0.85	1.00	0.96		1.00	1.00	0.85		
Flt Protected	0.95	1.00		1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1757	1662		1433	1753	1769		1770	3539	1549		
Flt Permitted	0.61	1.00		1.00	0.42	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	1132	1662		1433	773	1769		1770	3539	1549		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	58	132	42	177	90	102	42	75	1269	61	1	39
RTOR Reduction (vph)	0	4	0	138	0	16	0	0	0	35	0	0
Lane Group Flow (vph)	58	188	0	21	90	128	0	75	1269	27	0	0
Confl. Peds. (#/hr)	11			16	16		11					
Confl. Bikes (#/hr)							2			1	1	
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA	Perm		Prot
Protected Phases		4				8		5	2			1
Permitted Phases	4			4	8					2		
Actuated Green, G (s)	11.8	11.8		11.8	11.8	11.8		3.7	38.2	38.2		
Effective Green, g (s)	11.8	11.8		11.8	11.8	11.8		3.7	38.2	38.2		
Actuated g/C Ratio	0.13	0.13		0.13	0.13	0.13		0.04	0.43	0.43		
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	3.0	3.0		
Lane Grp Cap (vph)	151	222		191	103	236		74	1532	670		
v/s Ratio Prot		0.11				0.07		0.04	0.36			
v/s Ratio Perm	0.05			0.01	c0.12					0.02		
v/c Ratio	0.38	0.85		0.11	0.87	0.54		1.01	0.83	0.04		
Uniform Delay, d1	34.9	37.3		33.6	37.5	35.7		42.2	22.1	14.4		
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
Incremental Delay, d2	1.2	24.1		0.2	50.4	2.0		108.4	3.8	0.0		
Delay (s)	36.1	61.4		33.8	87.9	37.7		150.7	25.9	14.4		
Level of Service	D	E		C	F	D		F	C	B		
Approach Delay (s)		47.1				57.0			32.1			
Approach LOS		D				E			C			

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	88.2	Sum of lost time (s)	22.8
Intersection Capacity Utilization	94.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Existing Conditions
PM Peak Hour

Movement	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	94	1424	48	2	51	64
Future Volume (vph)	94	1424	48	2	51	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.4			5.5	
Lane Util. Factor	1.00	0.95			1.00	
Frpb, ped/bikes	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00	
Frt	1.00	1.00			0.93	
Flt Protected	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3519			1687	
Flt Permitted	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3519			1687	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	97	1468	49	2	53	66
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	136	1514	0	0	121	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)			5			
Turn Type	Prot	NA		Prot	Prot	
Protected Phases	1	6		9	9	
Permitted Phases						
Actuated Green, G (s)	7.8	42.3			7.6	
Effective Green, g (s)	7.8	42.3			7.6	
Actuated g/C Ratio	0.09	0.48			0.09	
Clearance Time (s)	5.2	6.4			5.5	
Vehicle Extension (s)	1.5	3.0			1.5	
Lane Grp Cap (vph)	156	1687			145	
v/s Ratio Prot	c0.08	c0.43			c0.07	
v/s Ratio Perm						
v/c Ratio	0.87	0.90			0.83	
Uniform Delay, d1	39.7	21.0			39.7	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	36.7	6.7			30.7	
Delay (s)	76.4	27.7			70.4	
Level of Service	E	C			E	
Approach Delay (s)		31.7			70.4	
Approach LOS		C			E	

Intersection Summary

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	19	4	1	13	12	1339	13	24	1640	21
Future Vol, veh/h	12	0	19	4	1	13	12	1339	13	24	1640	21
Conflicting Peds, #/hr	5	0	16	16	0	5	3	0	1	1	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	13	0	21	4	1	15	13	1504	15	27	1843	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2696	3458	953	2531	3463	766	1870	0	0	1520	0	0
Stage 1	1912	1912	-	1539	1539	-	-	-	-	-	-	-
Stage 2	784	1546	-	992	1924	-	-	-	-	-	-	-
Critical Hdwy	7.58	6.58	6.98	7.58	6.58	6.98	4.18	-	-	4.18	-	-
Critical Hdwy Stg 1	6.58	5.58	-	6.58	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.58	5.58	-	6.58	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.54	4.04	3.34	3.54	4.04	3.34	2.24	-	-	2.24	-	-
Pot Cap-1 Maneuver	~ 10	6	256	13	6	341	310	-	-	425	-	-
Stage 1	68	112	-	118	172	-	-	-	-	-	-	-
Stage 2	348	171	-	260	110	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 9	5	251	11	5	339	309	-	-	425	-	-
Mov Cap-2 Maneuver	60	76	-	92	73	-	-	-	-	-	-	-
Stage 1	65	104	-	113	165	-	-	-	-	-	-	-
Stage 2	315	164	-	219	103	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	51	26.4	0.2	0.2
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	309	-	-	112	188	425	-	-
HCM Lane V/C Ratio	0.044	-	-	0.311	0.108	0.063	-	-
HCM Control Delay (s)	17.2	-	-	51	26.4	14	-	-
HCM Lane LOS	C	-	-	F	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.4	0.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	12	8	1353	1644	19
Future Vol, veh/h	11	12	8	1353	1644	19
Conflicting Peds, #/hr	0	0	12	0	0	12
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	12	13	9	1520	1847	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2648	946	1880	0	-	0
Stage 1	1870	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	-	-
Pot Cap-1 Maneuver	18	261	311	-	-	-
Stage 1	106	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	17	258	307	-	-	-
Mov Cap-2 Maneuver	94	-	-	-	-	-
Stage 1	102	-	-	-	-	-
Stage 2	406	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	36.2	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	307	-	141	-	-
HCM Lane V/C Ratio	0.029	-	0.183	-	-
HCM Control Delay (s)	17.1	-	36.2	-	-
HCM Lane LOS	C	-	E	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Existing Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	4	18	527	10	114	8	1232	28	69	1586	1
Future Volume (veh/h)	15	4	18	527	10	114	8	1232	28	69	1586	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		1.00	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	16	4	19	350	314	123	9	1325	30	74	1705	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	51	8	36	384	275	108	16	1444	33	95	1643	1
Arrive On Green	0.03	0.03	0.03	0.22	0.22	0.22	0.01	0.41	0.41	0.05	0.46	0.46
Sat Flow, veh/h	1753	262	1243	1753	1258	493	1753	3494	79	1753	3587	2
Grp Volume(v), veh/h	16	0	23	350	0	437	9	663	692	74	831	875
Grp Sat Flow(s),veh/h/ln	1753	0	1505	1753	0	1750	1753	1749	1824	1753	1749	1840
Q Serve(g_s), s	0.7	0.0	1.2	15.4	0.0	17.3	0.4	28.3	28.4	3.3	36.2	36.2
Cycle Q Clear(g_c), s	0.7	0.0	1.2	15.4	0.0	17.3	0.4	28.3	28.4	3.3	36.2	36.2
Prop In Lane	1.00		0.83	1.00		0.28	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	51	0	44	384	0	383	16	723	754	95	801	843
V/C Ratio(X)	0.31	0.00	0.53	0.91	0.00	1.14	0.57	0.92	0.92	0.78	1.04	1.04
Avail Cap(c_a), veh/h	217	0	187	384	0	383	262	743	776	262	801	843
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	0.0	37.8	30.1	0.0	30.9	39.0	21.9	21.9	36.9	21.4	21.4
Incr Delay (d2), s/veh	1.3	0.0	3.6	25.3	0.0	90.0	11.2	16.0	15.6	5.2	41.9	41.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.5	8.9	0.0	16.6	0.2	13.4	13.9	1.5	22.0	23.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	0.0	41.4	55.4	0.0	120.9	50.2	37.9	37.6	42.1	63.3	62.5
LnGrp LOS	D	A	D	E	A	F	D	D	D	D	F	F
Approach Vol, veh/h		39			787			1364			1780	
Approach Delay, s/veh		40.4			91.7			37.8			62.0	
Approach LOS		D			F			D			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.5	39.1		7.5	5.9	42.6		23.0
Change Period (Y+Rc), s	* 5.2	6.4		* 5.2	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 12	33.6		* 9.8	* 12	33.6		17.3
Max Q Clear Time (g_c+I1), s	5.3	30.4		3.2	2.4	38.2		19.3
Green Ext Time (p_c), s	0.0	2.3		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	59.4
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	0	80	75	530	70	12	81	0	0	153	109
Future Vol, veh/h	21	0	80	75	530	70	12	81	0	0	153	109
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	0	88	82	582	77	13	89	0	0	168	120
Number of Lanes	1	0	1	0	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10	17.4	11	13.7
HCM LOS	A	C	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	13%	100%	0%	22%	0%	0%
Vol Thru, %	87%	0%	0%	78%	79%	58%
Vol Right, %	0%	0%	100%	0%	21%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	93	21	80	340	335	262
LT Vol	12	21	0	75	0	0
Through Vol	81	0	0	265	265	153
RT Vol	0	0	80	0	70	109
Lane Flow Rate	102	23	88	374	368	288
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.183	0.047	0.148	0.625	0.59	0.462
Departure Headway (Hd)	6.457	7.302	6.075	6.026	5.766	5.782
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	554	489	588	598	626	622
Service Time	4.517	5.065	3.837	3.765	3.505	3.828
HCM Lane V/C Ratio	0.184	0.047	0.15	0.625	0.588	0.463
HCM Control Delay	11	10.4	9.9	18.3	16.5	13.7
HCM Lane LOS	B	B	A	C	C	B
HCM 95th-tile Q	0.7	0.1	0.5	4.3	3.9	2.4

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Existing Plus Project Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBL
Lane Configurations												
Traffic Volume (vph)	66	110	42	176	85	134	60	143	1108	75	42	51
Future Volume (vph)	66	110	42	176	85	134	60	143	1108	75	42	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		5.2
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00		1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	0.99		0.97	1.00	0.99		1.00	1.00	0.95		1.00
Flpb, ped/bikes	0.98	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Frt	1.00	0.95		0.85	1.00	0.95		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		1.00	0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1699	1626		1436	1729	1720		1736	3471	1473		1736
Flt Permitted	0.41	1.00		1.00	0.46	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)	739	1626		1436	835	1720		1736	3471	1473		1736
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	67	111	42	178	86	135	61	144	1119	76	42	52
RTOR Reduction (vph)	0	5	0	138	0	18	0	0	0	0	0	0
Lane Group Flow (vph)	67	169	0	19	86	178	0	144	1119	76	0	94
Confl. Peds. (#/hr)	36			6	6		36			18		
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA	Perm	Prot	Prot
Protected Phases		4				8		5	2		1	1
Permitted Phases	4			4	8					2		
Actuated Green, G (s)	10.9	10.9		10.9	10.9	10.9		8.6	39.4	39.4		5.6
Effective Green, g (s)	10.9	10.9		10.9	10.9	10.9		8.6	39.4	39.4		5.6
Actuated g/C Ratio	0.12	0.12		0.12	0.12	0.12		0.10	0.44	0.44		0.06
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		5.2
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	3.0	3.0		1.5
Lane Grp Cap (vph)	90	199		176	102	211		168	1541	654		109
v/s Ratio Prot		c0.10				0.10		c0.08	c0.32			0.05
v/s Ratio Perm	0.09			0.01	0.10					0.05		
v/c Ratio	0.74	0.85		0.11	0.84	0.84		0.86	0.73	0.12		0.86
Uniform Delay, d1	37.6	38.1		34.6	38.1	38.1		39.4	20.2	14.4		41.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2	26.7	26.6		0.2	43.1	24.7		31.5	1.7	0.1		44.9
Delay (s)	64.2	64.7		34.8	81.2	62.7		70.9	22.0	14.5		86.0
Level of Service	E	E		C	F	E		E	C	B		F
Approach Delay (s)		52.8				68.3			26.8			
Approach LOS		D				E			C			

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	88.7	Sum of lost time (s)	22.8
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Existing Plus Project Conditions
Mid-Day Peak Hr

Movement	SBT	SBR	NWL2	NWL	NWR
Lane Configurations					
Traffic Volume (vph)	1203	52	3	89	67
Future Volume (vph)	1203	52	3	89	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	6.4			5.5	
Lane Util. Factor	0.95			1.00	
Frpb, ped/bikes	1.00			1.00	
Flpb, ped/bikes	1.00			1.00	
Frt	0.99			0.94	
Flt Protected	1.00			0.97	
Satd. Flow (prot)	3444			1674	
Flt Permitted	1.00			0.97	
Satd. Flow (perm)	3444			1674	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	1215	53	3	90	68
RTOR Reduction (vph)	4	0	0	0	0
Lane Group Flow (vph)	1264	0	0	161	0
Confl. Peds. (#/hr)		10			
Heavy Vehicles (%)	4%	4%	4%	4%	4%
Turn Type	NA		Prot	Prot	
Protected Phases	6		9	9	
Permitted Phases					
Actuated Green, G (s)	36.4			10.0	
Effective Green, g (s)	36.4			10.0	
Actuated g/C Ratio	0.41			0.11	
Clearance Time (s)	6.4			5.5	
Vehicle Extension (s)	3.0			1.5	
Lane Grp Cap (vph)	1413			188	
v/s Ratio Prot	c0.37			c0.10	
v/s Ratio Perm					
v/c Ratio	0.89			0.86	
Uniform Delay, d1	24.4			38.6	
Progression Factor	1.00			1.00	
Incremental Delay, d2	7.7			28.8	
Delay (s)	32.1			67.5	
Level of Service	C			E	
Approach Delay (s)	35.8			67.5	
Approach LOS	D			E	

Intersection Summary

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	1	55	8	0	5	46	1305	17	14	1409	44
Future Vol, veh/h	16	1	55	8	0	5	46	1305	17	14	1409	44
Conflicting Peds, #/hr	0	0	1	1	0	0	5	0	6	6	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	16	1	56	8	0	5	47	1332	17	14	1438	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2254	2943	748	2190	2957	681	1488	0	0	1355	0	0
Stage 1	1494	1494	-	1441	1441	-	-	-	-	-	-	-
Stage 2	760	1449	-	749	1516	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	22	14	348	24	14	386	433	-	-	488	-	-
Stage 1	125	180	-	135	191	-	-	-	-	-	-	-
Stage 2	358	189	-	363	175	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 12	6	346	11	6	384	431	-	-	485	-	-
Mov Cap-2 Maneuver	62	72	-	67	67	-	-	-	-	-	-	-
Stage 1	70	149	-	75	107	-	-	-	-	-	-	-
Stage 2	198	105	-	251	145	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	42.5	47.4	3.2	1.1
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	431	-	-	167	98	485	-	-
HCM Lane V/C Ratio	0.109	-	-	0.44	0.135	0.029	-	-
HCM Control Delay (s)	14.4	2.9	-	42.5	47.4	12.6	1	-
HCM Lane LOS	B	A	-	E	E	B	A	-
HCM 95th %tile Q(veh)	0.4	-	-	2	0.5	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	11

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	124	86	116	1242	1325	147
Future Vol, veh/h	124	86	116	1242	1325	147
Conflicting Peds, #/hr	0	0	12	0	0	12
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	128	89	120	1280	1366	152

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2334	771	1530	0	-	0
Stage 1	1454	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Critical Hdwy	6.9	7	4.2	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.55	3.35	2.25	-	-	-
Pot Cap-1 Maneuver	~ 30	336	417	-	-	-
Stage 1	176	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 21	332	412	-	-	-
Mov Cap-2 Maneuver	~ 104	-	-	-	-	-
Stage 1	~ 123	-	-	-	-	-
Stage 2	355	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	149.1	1.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	412	-	104	332	-	-
HCM Lane V/C Ratio	0.29	-	1.229	0.267	-	-
HCM Control Delay (s)	17.3	-	238.9	19.7	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	1.2	-	8.6	1.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Existing Plus Project Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	5	14	410	19	162	6	1176	14	90	1358	3
Future Volume (veh/h)	19	5	14	410	19	162	6	1176	14	90	1358	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	5	15	308	187	169	6	1225	15	94	1415	3
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	52	12	36	390	197	178	11	1404	17	120	1645	3
Arrive On Green	0.03	0.03	0.03	0.22	0.22	0.22	0.01	0.39	0.39	0.07	0.46	0.46
Sat Flow, veh/h	1767	403	1210	1767	892	806	1767	3566	44	1767	3609	8
Grp Volume(v), veh/h	20	0	20	308	0	356	6	606	634	94	691	727
Grp Sat Flow(s),veh/h/ln	1767	0	1614	1767	0	1699	1767	1763	1846	1767	1763	1854
Q Serve(g_s), s	0.9	0.0	1.0	12.9	0.0	16.2	0.3	24.8	24.8	4.1	27.5	27.5
Cycle Q Clear(g_c), s	0.9	0.0	1.0	12.9	0.0	16.2	0.3	24.8	24.8	4.1	27.5	27.5
Prop In Lane	1.00		0.75	1.00		0.47	1.00		0.02	1.00		0.00
Lane Grp Cap(c), veh/h	52	0	48	390	0	375	11	694	727	120	803	845
V/C Ratio(X)	0.38	0.00	0.42	0.79	0.00	0.95	0.54	0.87	0.87	0.78	0.86	0.86
Avail Cap(c_a), veh/h	221	0	202	390	0	375	266	756	792	266	803	845
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	0.0	37.3	28.8	0.0	30.1	38.8	21.9	21.9	35.9	19.1	19.1
Incr Delay (d2), s/veh	1.7	0.0	2.1	10.0	0.0	33.2	14.5	10.3	9.9	4.1	9.4	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.4	6.3	0.0	9.8	0.2	11.1	11.5	1.8	11.8	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	0.0	39.5	38.8	0.0	63.2	53.3	32.2	31.8	40.0	28.4	28.1
LnGrp LOS	D	A	D	D	A	E	D	C	C	D	C	C
Approach Vol, veh/h		40			664			1246			1512	
Approach Delay, s/veh		39.2			51.9			32.1			29.0	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.5	37.2		7.5	5.7	42.1		23.0
Change Period (Y+Rc), s	* 5.2	6.4		* 5.2	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 12	33.6		* 9.8	* 12	33.6		17.3
Max Q Clear Time (g_c+I1), s	6.1	26.8		3.0	2.3	29.5		18.2
Green Ext Time (p_c), s	0.0	4.0		0.0	0.0	2.9		0.0

Intersection Summary	
HCM 6th Ctrl Delay	34.6
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	0	85	28	506	79	9	81	0	0	104	76
Future Vol, veh/h	24	0	85	28	506	79	9	81	0	0	104	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	0	92	30	550	86	10	88	0	0	113	83
Number of Lanes	1	0	1	0	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.4	13.9	10.3	11.1
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	10%	100%	0%	10%	0%	0%
Vol Thru, %	90%	0%	0%	90%	76%	58%
Vol Right, %	0%	0%	100%	0%	24%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	24	85	281	332	180
LT Vol	9	24	0	28	0	0
Through Vol	81	0	0	253	253	104
RT Vol	0	0	85	0	79	76
Lane Flow Rate	98	26	92	305	361	196
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.165	0.049	0.143	0.477	0.542	0.304
Departure Headway (Hd)	6.064	6.774	5.553	5.625	5.406	5.597
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	591	529	645	641	668	642
Service Time	4.103	4.513	3.292	3.35	3.131	3.63
HCM Lane V/C Ratio	0.166	0.049	0.143	0.476	0.54	0.305
HCM Control Delay	10.3	9.9	9.2	13.4	14.4	11.1
HCM Lane LOS	B	A	A	B	B	B
HCM 95th-tile Q	0.6	0.2	0.5	2.6	3.3	1.3

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Existing Plus Project Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Traffic Volume (vph)	56	128	41	177	91	99	41	77	1254	63	1	38
Future Volume (vph)	56	128	41	177	91	99	41	77	1254	63	1	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00		1.00	0.95	1.00		
Frpb, ped/bikes	1.00	0.99		0.95	1.00	0.99		1.00	1.00	0.98		
Flpb, ped/bikes	0.99	1.00		1.00	0.99	1.00		1.00	1.00	1.00		
Frt	1.00	0.95		0.85	1.00	0.96		1.00	1.00	0.85		
Flt Protected	0.95	1.00		1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1757	1662		1434	1753	1769		1770	3539	1549		
Flt Permitted	0.61	1.00		1.00	0.42	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	1130	1662		1434	777	1769		1770	3539	1549		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	58	132	42	182	94	102	42	79	1293	65	1	39
RTOR Reduction (vph)	0	4	0	142	0	16	0	0	0	37	0	0
Lane Group Flow (vph)	58	188	0	22	94	128	0	79	1293	29	0	0
Confl. Peds. (#/hr)	11			16	16		11					
Confl. Bikes (#/hr)							2			1	1	
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA	Perm		Prot
Protected Phases		4				8		5	2			1
Permitted Phases	4			4	8					2		
Actuated Green, G (s)	12.1	12.1		12.1	12.1	12.1		4.8	38.7	38.7		
Effective Green, g (s)	12.1	12.1		12.1	12.1	12.1		4.8	38.7	38.7		
Actuated g/C Ratio	0.14	0.14		0.14	0.14	0.14		0.05	0.43	0.43		
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	3.0	3.0		
Lane Grp Cap (vph)	153	225		194	105	240		95	1538	673		
v/s Ratio Prot		0.11				0.07		0.04	0.37			
v/s Ratio Perm	0.05			0.02	c0.12					0.02		
v/c Ratio	0.38	0.83		0.11	0.90	0.53		0.83	0.84	0.04		
Uniform Delay, d1	35.0	37.5		33.7	37.8	35.8		41.7	22.4	14.5		
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
Incremental Delay, d2	1.1	22.2		0.2	55.4	1.8		41.8	4.3	0.0		
Delay (s)	36.2	59.6		33.9	93.2	37.6		83.5	26.7	14.5		
Level of Service	D	E		C	F	D		F	C	B		
Approach Delay (s)		46.2				59.5			29.3			
Approach LOS		D				E			C			

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	22.8
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Existing Plus Project Conditions
PM Peak Hour

Movement	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	94	1450	48	2	51	64
Future Volume (vph)	94	1450	48	2	51	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.4			5.5	
Lane Util. Factor	1.00	0.95			1.00	
Frpb, ped/bikes	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00	
Frt	1.00	1.00			0.93	
Flt Protected	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3520			1687	
Flt Permitted	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3520			1687	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	97	1495	49	2	53	66
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	136	1541	0	0	121	0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)			5			
Turn Type	Prot	NA		Prot	Prot	
Protected Phases	1	6		9	9	
Permitted Phases						
Actuated Green, G (s)	7.8	41.7			7.6	
Effective Green, g (s)	7.8	41.7			7.6	
Actuated g/C Ratio	0.09	0.47			0.09	
Clearance Time (s)	5.2	6.4			5.5	
Vehicle Extension (s)	1.5	3.0			1.5	
Lane Grp Cap (vph)	155	1649			144	
v/s Ratio Prot	c0.08	c0.44			c0.07	
v/s Ratio Perm						
v/c Ratio	0.88	0.93			0.84	
Uniform Delay, d1	40.1	22.4			40.1	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	37.8	10.3			32.3	
Delay (s)	77.9	32.6			72.4	
Level of Service	E	C			E	
Approach Delay (s)		36.3			72.4	
Approach LOS		D			E	

Intersection Summary

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	20	6	1	13	13	1370	15	24	1675	21
Future Vol, veh/h	12	0	20	6	1	13	13	1370	15	24	1675	21
Conflicting Peds, #/hr	5	0	16	16	0	5	3	0	1	1	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	13	0	22	7	1	15	15	1539	17	27	1882	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2756	3538	972	2590	3542	784	1909	0	0	1557	0	0
Stage 1	1951	1951	-	1579	1579	-	-	-	-	-	-	-
Stage 2	805	1587	-	1011	1963	-	-	-	-	-	-	-
Critical Hdwy	7.58	6.58	6.98	7.58	6.58	6.98	4.18	-	-	4.18	-	-
Critical Hdwy Stg 1	6.58	5.58	-	6.58	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.58	5.58	-	6.58	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.54	4.04	3.34	3.54	4.04	3.34	2.24	-	-	2.24	-	-
Pot Cap-1 Maneuver	~ 9	6	248	12	6	332	299	-	-	412	-	-
Stage 1	65	107	-	112	165	-	-	-	-	-	-	-
Stage 2	338	163	-	253	105	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 6	4	244	8	4	330	298	-	-	412	-	-
Mov Cap-2 Maneuver	37	56	-	62	62	-	-	-	-	-	-	-
Stage 1	40	107	-	70	103	-	-	-	-	-	-	-
Stage 2	198	101	-	226	105	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	84.1	38.1	3.4	0.2
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	298	-	-	79	131	412	-	-
HCM Lane V/C Ratio	0.049	-	-	0.455	0.172	0.065	-	-
HCM Control Delay (s)	17.7	3.3	-	84.1	38.1	14.3	0	-
HCM Lane LOS	C	A	-	F	E	B	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.9	0.6	0.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	43	67	1325	1609	92
Future Vol, veh/h	72	43	67	1325	1609	92
Conflicting Peds, #/hr	0	0	12	0	0	12
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	81	48	75	1489	1808	103

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2767	968	1923	0	-	0
Stage 1	1872	-	-	-	-	-
Stage 2	895	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	-	-
Pot Cap-1 Maneuver	~ 15	252	299	-	-	-
Stage 1	106	-	-	-	-	-
Stage 2	357	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 11	249	296	-	-	-
Mov Cap-2 Maneuver	~ 71	-	-	-	-	-
Stage 1	~ 78	-	-	-	-	-
Stage 2	353	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	165.9	1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	296	-	71	249	-	-
HCM Lane V/C Ratio	0.254	-	1.139	0.194	-	-
HCM Control Delay (s)	21.3	-	251.3	22.9	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	1	-	6.2	0.7	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Existing Plus Project Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	4	18	527	10	121	8	1256	28	76	1607	1
Future Volume (veh/h)	15	4	18	527	10	121	8	1256	28	76	1607	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		1.00	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	16	4	19	354	309	130	9	1351	30	82	1728	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	51	8	36	379	266	112	16	1446	32	105	1666	1
Arrive On Green	0.03	0.03	0.03	0.22	0.22	0.22	0.01	0.41	0.41	0.06	0.46	0.46
Sat Flow, veh/h	1753	261	1242	1753	1229	517	1753	3496	78	1753	3587	2
Grp Volume(v), veh/h	16	0	23	354	0	439	9	675	706	82	842	887
Grp Sat Flow(s),veh/h/ln	1753	0	1503	1753	0	1746	1753	1749	1825	1753	1749	1840
Q Serve(g_s), s	0.7	0.0	1.2	15.9	0.0	17.3	0.4	29.5	29.6	3.7	37.2	37.2
Cycle Q Clear(g_c), s	0.7	0.0	1.2	15.9	0.0	17.3	0.4	29.5	29.6	3.7	37.2	37.2
Prop In Lane	1.00		0.83	1.00		0.30	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	51	0	44	379	0	378	16	723	755	105	812	855
V/C Ratio(X)	0.31	0.00	0.53	0.93	0.00	1.16	0.57	0.93	0.94	0.78	1.04	1.04
Avail Cap(c_a), veh/h	215	0	184	379	0	378	259	734	766	259	812	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	0.0	38.3	30.8	0.0	31.3	39.5	22.4	22.4	37.1	21.4	21.4
Incr Delay (d2), s/veh	1.3	0.0	3.6	29.8	0.0	98.5	11.2	18.8	18.4	4.7	41.6	40.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.5	9.6	0.0	17.3	0.2	14.5	15.0	1.6	22.4	23.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	0.0	41.9	60.5	0.0	129.9	50.7	41.2	40.9	41.8	63.0	62.3
LnGrp LOS	D	A	D	E	A	F	D	D	D	D	F	F
Approach Vol, veh/h		39			793			1390			1811	
Approach Delay, s/veh		40.9			98.9			41.1			61.7	
Approach LOS		D			F			D			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.0	39.5		7.5	5.9	43.6		23.0
Change Period (Y+Rc), s	* 5.2	6.4		* 5.2	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 12	33.6		* 9.8	* 12	33.6		17.3
Max Q Clear Time (g_c+I1), s	5.7	31.6		3.2	2.4	39.2		19.3
Green Ext Time (p_c), s	0.0	1.5		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	61.7
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	15.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	0	86	75	535	70	13	81	0	0	153	110
Future Vol, veh/h	22	0	86	75	535	70	13	81	0	0	153	110
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	0	95	82	588	77	14	89	0	0	168	121
Number of Lanes	1	0	1	0	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10.1	17.8	11.1	13.9
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	14%	100%	0%	22%	0%	0%
Vol Thru, %	86%	0%	0%	78%	79%	58%
Vol Right, %	0%	0%	100%	0%	21%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	94	22	86	343	338	263
LT Vol	13	22	0	75	0	0
Through Vol	81	0	0	268	268	153
RT Vol	0	0	86	0	70	110
Lane Flow Rate	103	24	95	376	371	289
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.187	0.049	0.16	0.633	0.597	0.467
Departure Headway (Hd)	6.504	7.326	6.099	6.052	5.793	5.817
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	550	487	585	595	623	618
Service Time	4.564	5.096	3.868	3.796	3.537	3.865
HCM Lane V/C Ratio	0.187	0.049	0.162	0.632	0.596	0.468
HCM Control Delay	11.1	10.5	10	18.7	16.8	13.9
HCM Lane LOS	B	B	A	C	C	B
HCM 95th-tile Q	0.7	0.2	0.6	4.4	3.9	2.5

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Cumulative Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBL
Lane Configurations												
Traffic Volume (vph)	85	140	55	215	100	170	75	285	1330	90	55	65
Future Volume (vph)	85	140	55	215	100	170	75	285	1330	90	55	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		5.2
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00		1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	0.99		0.98	1.00	0.99		1.00	1.00	0.94		1.00
Flpb, ped/bikes	0.98	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Frt	1.00	0.95		0.85	1.00	0.95		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		1.00	0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1697	1630		1442	1729	1718		1736	3471	1461		1736
Flt Permitted	0.31	1.00		1.00	0.35	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)	553	1630		1442	644	1718		1736	3471	1461		1736
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	86	141	56	217	101	172	76	288	1343	91	56	66
RTOR Reduction (vph)	0	3	0	114	0	13	0	0	0	0	0	0
Lane Group Flow (vph)	86	216	0	81	101	235	0	288	1343	91	0	122
Confl. Peds. (#/hr)	36			6	6		36			18		
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA	Perm	Prot	Prot
Protected Phases		4				8		5	2		1	1
Permitted Phases	4			4	8					2		
Actuated Green, G (s)	18.6	18.6		18.6	18.6	18.6		20.7	63.9	63.9		11.3
Effective Green, g (s)	18.6	18.6		18.6	18.6	18.6		20.7	63.9	63.9		11.3
Actuated g/C Ratio	0.17	0.17		0.17	0.17	0.17		0.19	0.58	0.58		0.10
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		5.2
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	3.0	3.0		1.5
Lane Grp Cap (vph)	92	272		241	107	287		323	1996	840		176
v/s Ratio Prot		0.13				0.14		c0.17	0.39			0.07
v/s Ratio Perm	0.16			0.06	c0.16					0.06		
v/c Ratio	0.93	0.79		0.34	0.94	0.82		0.89	0.67	0.11		0.69
Uniform Delay, d1	45.7	44.4		40.8	45.7	44.6		44.1	16.4	10.7		48.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2	72.1	14.2		0.6	68.7	16.0		24.5	0.9	0.1		9.1
Delay (s)	117.7	58.6		41.4	114.5	60.6		68.6	17.3	10.7		57.4
Level of Service	F	E		D	F	E		E	B	B		E
Approach Delay (s)		62.0				76.2			25.5			
Approach LOS		E				E			C			

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	111.1	Sum of lost time (s)	17.3
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Cumulative Conditions
Mid-Day Peak Hr

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1445	65
Future Volume (vph)	1445	65
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.4	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3443	
Flt Permitted	1.00	
Satd. Flow (perm)	3443	
Peak-hour factor, PHF	0.99	0.99
Adj. Flow (vph)	1460	66
RTOR Reduction (vph)	3	0
Lane Group Flow (vph)	1523	0
Confl. Peds. (#/hr)		10
Heavy Vehicles (%)	4%	4%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	54.5	
Effective Green, g (s)	54.5	
Actuated g/C Ratio	0.49	
Clearance Time (s)	6.4	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1688	
v/s Ratio Prot	c0.44	
v/s Ratio Perm		
v/c Ratio	0.90	
Uniform Delay, d1	25.9	
Progression Factor	1.00	
Incremental Delay, d2	7.1	
Delay (s)	33.0	
Level of Service	C	
Approach Delay (s)	34.8	
Approach LOS	C	

Intersection Summary

HCM 6th Signalized Intersection Summary
2: US 101 (Broadway St) & W Hawthorne St

Cumulative Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	5	70	10	0	125	55	1560	20	20	1685	55
Future Volume (veh/h)	20	5	70	10	0	125	55	1560	20	20	1685	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	20	5	71	10	0	128	56	1592	20	20	1719	56
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	25	6	89	12	0	155	71	1929	24	30	1803	58
Arrive On Green	0.08	0.08	0.08	0.11	0.00	0.11	0.04	0.55	0.55	0.02	0.53	0.53
Sat Flow, veh/h	332	83	1177	111	0	1424	1739	3507	44	1739	3425	111
Grp Volume(v), veh/h	96	0	0	138	0	0	56	787	825	20	867	908
Grp Sat Flow(s),veh/h/ln	1592	0	0	1535	0	0	1739	1735	1817	1739	1735	1802
Q Serve(g_s), s	5.5	0.0	0.0	8.1	0.0	0.0	2.9	34.5	34.6	1.1	43.7	44.5
Cycle Q Clear(g_c), s	5.5	0.0	0.0	8.1	0.0	0.0	2.9	34.5	34.6	1.1	43.7	44.5
Prop In Lane	0.21		0.74	0.07		0.93	1.00		0.02	1.00		0.06
Lane Grp Cap(c), veh/h	120	0	0	167	0	0	71	954	999	30	913	948
V/C Ratio(X)	0.80	0.00	0.00	0.83	0.00	0.00	0.79	0.82	0.83	0.66	0.95	0.96
Avail Cap(c_a), veh/h	246	0	0	238	0	0	215	954	999	184	920	955
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	0.0	0.0	40.3	0.0	0.0	43.9	17.1	17.2	45.1	20.7	20.9
Incr Delay (d2), s/veh	4.6	0.0	0.0	10.5	0.0	0.0	7.0	6.0	5.8	8.8	18.5	19.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	3.5	0.0	0.0	1.4	13.4	14.0	0.5	20.0	21.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.7	0.0	0.0	50.8	0.0	0.0	50.9	23.1	23.0	53.9	39.2	40.5
LnGrp LOS	D	A	A	D	A	A	D	C	C	D	D	D
Approach Vol, veh/h		96			138			1668			1795	
Approach Delay, s/veh		46.7			50.8			24.0			40.0	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	57.2		12.7	9.0	55.0		15.7
Change Period (Y+Rc), s	* 5.2	6.4		* 5.7	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 9.8	50.6		* 14	* 11	49.0		14.3
Max Q Clear Time (g_c+I1), s	3.1	36.6		7.5	4.9	46.5		10.1
Green Ext Time (p_c), s	0.0	8.9		0.1	0.0	2.1		0.1

Intersection Summary	
HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	20	20	1615	1735	30
Future Vol, veh/h	20	20	20	1615	1735	30
Conflicting Peds, #/hr	0	0	12	0	0	12
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	21	21	21	1665	1789	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2692	922	1832	0	-	0
Stage 1	1817	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Critical Hdwy	6.9	7	4.2	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.55	3.35	2.25	-	-	-
Pot Cap-1 Maneuver	~ 17	267	317	-	-	-
Stage 1	111	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 16	264	313	-	-	-
Mov Cap-2 Maneuver	92	-	-	-	-	-
Stage 1	102	-	-	-	-	-
Stage 2	357	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.6	0.2	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	313	-	136	-	-
HCM Lane V/C Ratio	0.066	-	0.303	-	-
HCM Control Delay (s)	17.3	-	42.6	-	-
HCM Lane LOS	C	-	E	-	-
HCM 95th %tile Q(veh)	0.2	-	1.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Cumulative Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	10	20	515	25	190	10	1420	20	100	1650	5
Future Volume (veh/h)	25	10	20	515	25	190	10	1420	20	100	1650	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	26	10	21	380	244	198	10	1479	21	104	1719	5
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	16	34	419	224	181	17	1602	23	128	1851	5
Arrive On Green	0.03	0.03	0.03	0.24	0.24	0.24	0.01	0.45	0.45	0.07	0.51	0.51
Sat Flow, veh/h	1767	527	1106	1767	943	765	1767	3557	50	1767	3606	10
Grp Volume(v), veh/h	26	0	31	380	0	442	10	732	768	104	840	884
Grp Sat Flow(s),veh/h/ln	1767	0	1633	1767	0	1707	1767	1763	1845	1767	1763	1853
Q Serve(g_s), s	1.6	0.0	2.0	22.5	0.0	25.5	0.6	42.0	42.1	6.2	47.6	47.7
Cycle Q Clear(g_c), s	1.6	0.0	2.0	22.5	0.0	25.5	0.6	42.0	42.1	6.2	47.6	47.7
Prop In Lane	1.00		0.68	1.00		0.45	1.00		0.03	1.00		0.01
Lane Grp Cap(c), veh/h	54	0	50	419	0	405	17	794	831	128	905	951
V/C Ratio(X)	0.48	0.00	0.62	0.91	0.00	1.09	0.59	0.92	0.92	0.81	0.93	0.93
Avail Cap(c_a), veh/h	66	0	61	419	0	405	66	823	861	128	905	951
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.3	0.0	51.5	39.9	0.0	41.0	53.0	27.8	27.8	49.1	24.3	24.3
Incr Delay (d2), s/veh	2.5	0.0	5.7	22.8	0.0	71.6	11.5	15.4	15.1	29.3	15.5	15.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.9	12.3	0.0	18.6	0.3	19.8	20.7	3.7	21.9	22.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.7	0.0	57.2	62.6	0.0	112.6	64.5	43.2	42.9	78.4	39.8	39.3
LnGrp LOS	D	A	E	E	A	F	E	D	D	E	D	D
Approach Vol, veh/h		57			822			1510			1828	
Approach Delay, s/veh		55.6			89.5			43.2			41.8	
Approach LOS		E			F			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	54.8		8.5	6.2	61.6		31.2
Change Period (Y+Rc), s	* 5.2	6.4		* 5.2	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 7.8	50.2		* 4	* 4	54.0		25.5
Max Q Clear Time (g_c+I1), s	8.2	44.1		4.0	2.6	49.7		27.5
Green Ext Time (p_c), s	0.0	4.3		0.0	0.0	3.5		0.0

Intersection Summary			
HCM 6th Ctrl Delay			51.8
HCM 6th LOS			D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	17.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	0	100	35	625	100	10	105	0	0	130	95
Future Vol, veh/h	30	0	100	35	625	100	10	105	0	0	130	95
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	0	109	38	679	109	11	114	0	0	141	103
Number of Lanes	1	0	1	0	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10.4	20.3	11.6	13.2
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	9%	100%	0%	10%	0%	0%
Vol Thru, %	91%	0%	0%	90%	76%	58%
Vol Right, %	0%	0%	100%	0%	24%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	115	30	100	348	413	225
LT Vol	10	30	0	35	0	0
Through Vol	105	0	0	313	313	130
RT Vol	0	0	100	0	100	95
Lane Flow Rate	125	33	109	378	448	245
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.228	0.067	0.186	0.628	0.718	0.409
Departure Headway (Hd)	6.565	7.375	6.148	5.99	5.767	6.018
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	545	484	580	601	628	597
Service Time	4.631	5.147	3.919	3.738	3.515	4.072
HCM Lane V/C Ratio	0.229	0.068	0.188	0.629	0.713	0.41
HCM Control Delay	11.6	10.7	10.3	18.4	21.9	13.2
HCM Lane LOS	B	B	B	C	C	B
HCM 95th-tile Q	0.9	0.2	0.7	4.4	6	2

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Cumulative Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Traffic Volume (vph)	70	160	55	215	110	125	55	160	1535	75	5	50
Future Volume (vph)	70	160	55	215	110	125	55	160	1535	75	5	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00		1.00	0.95	1.00		
Frpb, ped/bikes	1.00	0.99		0.96	1.00	0.99		1.00	1.00	0.98		
Flpb, ped/bikes	0.99	1.00		1.00	0.99	1.00		1.00	1.00	1.00		
Frt	1.00	0.95		0.85	1.00	0.95		1.00	1.00	0.85		
Flt Protected	0.95	1.00		1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1755	1661		1442	1752	1763		1770	3539	1550		
Flt Permitted	0.45	1.00		1.00	0.26	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	837	1661		1442	486	1763		1770	3539	1550		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	72	165	57	222	113	129	57	165	1582	77	5	52
RTOR Reduction (vph)	0	3	0	105	0	13	0	0	0	32	0	0
Lane Group Flow (vph)	72	241	0	95	113	173	0	165	1582	50	0	0
Confl. Peds. (#/hr)	11			16	16		11					
Confl. Bikes (#/hr)							2			1	1	
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA	Perm		Prot
Protected Phases		4				8		5	2			1
Permitted Phases	4			4	8					2		
Actuated Green, G (s)	18.2	18.2		18.2	18.2	18.2		11.9	65.1	65.1		
Effective Green, g (s)	18.2	18.2		18.2	18.2	18.2		11.9	65.1	65.1		
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.16		0.10	0.57	0.57		
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	3.0	3.0		
Lane Grp Cap (vph)	133	265		230	77	281		185	2024	886		
v/s Ratio Prot		0.14				0.10		0.09	0.45			
v/s Ratio Perm	0.09			0.07	c0.23					0.03		
v/c Ratio	0.54	0.91		0.41	1.47	0.61		0.89	0.78	0.06		
Uniform Delay, d1	44.0	47.0		43.0	47.8	44.5		50.3	18.8	10.8		
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
Incremental Delay, d2	3.5	31.8		0.9	268.0	3.4		36.7	2.0	0.0		
Delay (s)	47.5	78.8		43.9	315.8	47.9		87.0	20.9	10.8		
Level of Service	D	E		D	F	D		F	C	B		
Approach Delay (s)		60.9				149.1			26.4			
Approach LOS		E				F			C			

Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	17.3
Intersection Capacity Utilization	102.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Cumulative Conditions
PM Peak Hour

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	120	1780	60
Future Volume (vph)	120	1780	60
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	5.2	6.4	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	1.00	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1770	3519	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1770	3519	
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	124	1835	62
RTOR Reduction (vph)	0	2	0
Lane Group Flow (vph)	176	1895	0
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			5
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	13.2	66.4	
Effective Green, g (s)	13.2	66.4	
Actuated g/C Ratio	0.12	0.58	
Clearance Time (s)	5.2	6.4	
Vehicle Extension (s)	1.5	3.0	
Lane Grp Cap (vph)	205	2053	
v/s Ratio Prot	c0.10	c0.54	
v/s Ratio Perm			
v/c Ratio	0.86	0.92	
Uniform Delay, d1	49.4	21.4	
Progression Factor	1.00	1.00	
Incremental Delay, d2	27.2	7.5	
Delay (s)	76.6	28.9	
Level of Service	E	C	
Approach Delay (s)		33.0	
Approach LOS		C	

Intersection Summary

HCM 6th Signalized Intersection Summary
2: US 101 (Broadway St) & W Hawthorne St

Cumulative Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	25	10	5	85	15	1675	20	30	2045	30
Future Volume (veh/h)	15	0	25	10	5	85	15	1675	20	30	2045	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	1.00		0.93	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	16	0	27	11	5	92	16	1821	22	33	2223	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	23	0	38	14	6	117	25	2243	27	41	2268	34
Arrive On Green	0.04	0.00	0.04	0.09	0.09	0.09	0.01	0.63	0.63	0.02	0.64	0.64
Sat Flow, veh/h	564	0	951	153	69	1276	1753	3538	43	1753	3526	52
Grp Volume(v), veh/h	43	0	0	108	0	0	16	898	945	33	1099	1157
Grp Sat Flow(s),veh/h/ln	1515	0	0	1498	0	0	1753	1749	1832	1753	1749	1830
Q Serve(g_s), s	3.1	0.0	0.0	7.7	0.0	0.0	1.0	42.2	42.6	2.0	65.9	67.0
Cycle Q Clear(g_c), s	3.1	0.0	0.0	7.7	0.0	0.0	1.0	42.2	42.6	2.0	65.9	67.0
Prop In Lane	0.37		0.63	0.10		0.85	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	61	0	0	138	0	0	25	1109	1161	41	1125	1177
V/C Ratio(X)	0.71	0.00	0.00	0.78	0.00	0.00	0.65	0.81	0.81	0.80	0.98	0.98
Avail Cap(c_a), veh/h	171	0	0	169	0	0	66	1116	1169	75	1126	1178
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.8	0.0	0.0	48.5	0.0	0.0	53.6	15.0	15.1	53.1	18.7	18.9
Incr Delay (d2), s/veh	5.5	0.0	0.0	14.0	0.0	0.0	10.1	4.6	4.5	12.5	21.4	22.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	3.4	0.0	0.0	0.5	15.8	16.6	1.0	28.8	30.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.3	0.0	0.0	62.5	0.0	0.0	63.6	19.6	19.6	65.6	40.1	41.0
LnGrp LOS	E	A	A	E	A	A	E	B	B	E	D	D
Approach Vol, veh/h		43			108			1859			2289	
Approach Delay, s/veh		57.3			62.5			20.0			40.9	
Approach LOS		E			E			B			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.8	75.6		10.1	6.7	76.6		15.7
Change Period (Y+Rc), s	* 5.2	6.4		* 5.7	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 4.3	69.7		* 12	* 4.1	70.3		12.3
Max Q Clear Time (g_c+I1), s	4.1	44.6		5.1	3.0	69.0		9.7
Green Ext Time (p_c), s	0.0	15.6		0.0	0.0	1.3		0.1

Intersection Summary	
HCM 6th Ctrl Delay	32.5
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	15	10	1695	2055	25
Future Vol, veh/h	15	15	10	1695	2055	25
Conflicting Peds, #/hr	0	0	12	0	0	12
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	16	16	11	1842	2234	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3203	1143	2273	0	-	0
Stage 1	2260	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	-	-
Pot Cap-1 Maneuver	~ 7	192	218	-	-	-
Stage 1	64	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 6	190	216	-	-	-
Mov Cap-2 Maneuver	56	-	-	-	-	-
Stage 1	60	-	-	-	-	-
Stage 2	333	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	69.3	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	216	-	87	-	-
HCM Lane V/C Ratio	0.05	-	0.375	-	-
HCM Control Delay (s)	22.5	-	69.3	-	-
HCM Lane LOS	C	-	F	-	-
HCM 95th %tile Q(veh)	0.2	-	1.5	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Cumulative Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	5	25	660	15	145	10	1540	35	90	1975	5
Future Volume (veh/h)	20	5	25	660	15	145	10	1540	35	90	1975	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.87	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	22	5	27	441	393	156	11	1656	38	97	2124	5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	47	6	32	439	314	125	17	1777	41	111	2011	5
Arrive On Green	0.03	0.03	0.03	0.25	0.25	0.25	0.01	0.51	0.51	0.06	0.56	0.56
Sat Flow, veh/h	1753	220	1189	1753	1253	497	1753	3493	80	1753	3579	8
Grp Volume(v), veh/h	22	0	32	441	0	549	11	827	867	97	1037	1092
Grp Sat Flow(s),veh/h/ln	1753	0	1409	1753	0	1750	1753	1749	1824	1753	1749	1839
Q Serve(g_s), s	1.8	0.0	3.4	37.3	0.0	37.3	0.9	65.7	66.3	8.2	83.7	83.7
Cycle Q Clear(g_c), s	1.8	0.0	3.4	37.3	0.0	37.3	0.9	65.7	66.3	8.2	83.7	83.7
Prop In Lane	1.00		0.84	1.00		0.28	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	47	0	38	439	0	438	17	889	928	111	983	1033
V/C Ratio(X)	0.47	0.00	0.85	1.00	0.00	1.25	0.64	0.93	0.93	0.88	1.06	1.06
Avail Cap(c_a), veh/h	47	0	38	439	0	438	47	913	953	111	983	1033
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.4	0.0	72.2	55.8	0.0	55.8	73.5	34.1	34.3	69.2	32.6	32.6
Incr Delay (d2), s/veh	2.7	0.0	84.2	44.1	0.0	131.5	13.7	15.4	15.6	48.0	44.6	44.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	2.1	21.9	0.0	32.4	0.5	30.5	32.1	5.1	45.3	47.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.1	0.0	156.4	99.9	0.0	187.3	87.1	49.5	49.8	117.2	77.2	76.8
LnGrp LOS	E	A	F	F	A	F	F	D	D	F	F	F
Approach Vol, veh/h		54			990			1705			2226	
Approach Delay, s/veh		122.9			148.4			49.9			78.8	
Approach LOS		F			F			D			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.6	82.2		9.2	6.7	90.1		43.0
Change Period (Y+Rc), s	* 5.2	6.4		* 5.2	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 9.4	77.8		* 4	* 4	83.7		37.3
Max Q Clear Time (g_c+I1), s	10.2	68.3		5.4	2.9	85.7		39.3
Green Ext Time (p_c), s	0.0	6.9		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	83.2
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	26.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	0	100	95	665	90	15	105	0	0	195	140
Future Vol, veh/h	30	0	100	95	665	90	15	105	0	0	195	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	0	109	103	723	98	16	114	0	0	212	152
Number of Lanes	1	0	1	0	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11.5	32.9	12.7	19.5
HCM LOS	B	D	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	12%	100%	0%	22%	0%	0%
Vol Thru, %	88%	0%	0%	78%	79%	58%
Vol Right, %	0%	0%	100%	0%	21%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	30	100	428	423	335
LT Vol	15	30	0	95	0	0
Through Vol	105	0	0	333	333	195
RT Vol	0	0	100	0	90	140
Lane Flow Rate	130	33	109	465	459	364
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.258	0.074	0.21	0.846	0.802	0.631
Departure Headway (Hd)	7.112	8.186	6.949	6.552	6.287	6.242
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	501	440	520	548	574	575
Service Time	5.211	5.886	4.649	4.334	4.068	4.312
HCM Lane V/C Ratio	0.259	0.075	0.21	0.849	0.8	0.633
HCM Control Delay	12.7	11.5	11.5	35.7	30	19.5
HCM Lane LOS	B	B	B	E	D	C
HCM 95th-tile Q	1	0.2	0.8	8.9	7.8	4.4

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & W Wabash Ave

Cumulative Plus Project Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBL
Lane Configurations												
Traffic Volume (vph)	85	140	55	222	106	170	75	292	1376	96	65	55
Future Volume (vph)	85	140	55	222	106	170	75	292	1376	96	65	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		6.4
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00		1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	0.99		0.98	1.00	0.98		1.00	1.00	0.94		1.00
Flpb, ped/bikes	0.98	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Frt	1.00	0.94		0.85	1.00	0.95		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		1.00	0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1696	1634		1441	1729	1717		1736	3471	1458		1752
Flt Permitted	0.28	1.00		1.00	0.32	1.00		0.95	1.00	1.00		0.19
Satd. Flow (perm)	507	1634		1441	581	1717		1736	3471	1458		357
Peak-hour factor, PHF	0.99	0.99	0.92	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.92
Adj. Flow (vph)	86	141	60	224	107	172	76	295	1390	97	66	60
RTOR Reduction (vph)	0	3	0	170	0	13	0	0	0	0	0	0
Lane Group Flow (vph)	86	220	0	32	107	235	0	295	1390	97	0	126
Confl. Peds. (#/hr)	36			6	6		36			18		
Heavy Vehicles (%)	4%	4%	2%	4%	4%	4%	4%	4%	4%	4%	4%	2%
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA	Perm	Prot	Perm
Protected Phases		4				8		5	2		1	
Permitted Phases	4			4	8					2		6
Actuated Green, G (s)	18.5	18.5		18.5	18.5	18.5		21.4	85.0	85.0		58.4
Effective Green, g (s)	18.5	18.5		18.5	18.5	18.5		21.4	85.0	85.0		58.4
Actuated g/C Ratio	0.16	0.16		0.16	0.16	0.16		0.19	0.74	0.74		0.51
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		6.4
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	3.0	3.0		3.0
Lane Grp Cap (vph)	81	261		230	92	274		321	2552	1072		180
v/s Ratio Prot		0.13				0.14		c0.17	0.40			
v/s Ratio Perm	0.17			0.02	c0.18					0.07		0.35
v/c Ratio	1.06	0.84		0.14	1.16	0.86		0.92	0.54	0.09		0.70
Uniform Delay, d1	48.5	47.1		41.7	48.5	47.3		46.2	6.8	4.3		21.9
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2	117.9	20.8		0.2	144.3	21.9		29.5	0.2	0.0		11.3
Delay (s)	166.4	67.9		41.9	192.9	69.2		75.7	7.0	4.4		33.2
Level of Service	F	E		D	F	E		E	A	A		C
Approach Delay (s)		74.2				106.4			18.2			
Approach LOS		E				F			B			

Intersection Summary			
HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	115.6	Sum of lost time (s)	17.3
Intersection Capacity Utilization	107.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & W Wabash Ave

Cumulative Plus Project Conditions
Mid-Day Peak Hr

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1493	65
Future Volume (vph)	1493	65
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.4	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	1.00	
Satd. Flow (prot)	3444	
Flt Permitted	1.00	
Satd. Flow (perm)	3444	
Peak-hour factor, PHF	0.99	0.99
Adj. Flow (vph)	1508	66
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	1572	0
Confl. Peds. (#/hr)		10
Heavy Vehicles (%)	4%	4%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	58.4	
Effective Green, g (s)	58.4	
Actuated g/C Ratio	0.51	
Clearance Time (s)	6.4	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	1739	
v/s Ratio Prot	c0.46	
v/s Ratio Perm		
v/c Ratio	0.90	
Uniform Delay, d1	26.0	
Progression Factor	1.00	
Incremental Delay, d2	7.0	
Delay (s)	33.1	
Level of Service	C	
Approach Delay (s)	33.1	
Approach LOS	C	

Intersection Summary

HCM 6th Signalized Intersection Summary
2: US 101 (Broadway St) & W Hawthorne St

Cumulative Plus Project Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	5	72	14	0	125	57	1619	23	20	1746	55
Future Volume (veh/h)	20	5	72	14	0	125	57	1619	23	20	1746	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	20	5	73	14	0	128	58	1652	23	20	1782	56
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	25	6	92	17	0	154	74	1921	27	30	1795	56
Arrive On Green	0.08	0.08	0.08	0.11	0.00	0.11	0.04	0.55	0.55	0.02	0.52	0.52
Sat Flow, veh/h	325	81	1185	152	0	1389	1739	3501	49	1739	3430	107
Grp Volume(v), veh/h	98	0	0	142	0	0	58	817	858	20	897	941
Grp Sat Flow(s),veh/h/ln	1591	0	0	1541	0	0	1739	1735	1816	1739	1735	1803
Q Serve(g_s), s	5.7	0.0	0.0	8.5	0.0	0.0	3.1	37.6	37.9	1.1	47.7	48.8
Cycle Q Clear(g_c), s	5.7	0.0	0.0	8.5	0.0	0.0	3.1	37.6	37.9	1.1	47.7	48.8
Prop In Lane	0.20		0.74	0.10		0.90	1.00		0.03	1.00		0.06
Lane Grp Cap(c), veh/h	124	0	0	171	0	0	74	951	996	30	908	944
V/C Ratio(X)	0.79	0.00	0.00	0.83	0.00	0.00	0.79	0.86	0.86	0.66	0.99	1.00
Avail Cap(c_a), veh/h	243	0	0	235	0	0	212	951	996	182	908	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	0.0	0.0	40.8	0.0	0.0	44.4	18.0	18.1	45.7	22.0	22.3
Incr Delay (d2), s/veh	4.3	0.0	0.0	12.1	0.0	0.0	6.7	8.0	7.8	8.9	26.8	28.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	3.7	0.0	0.0	1.4	15.1	15.8	0.5	23.6	25.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.7	0.0	0.0	52.9	0.0	0.0	51.1	26.0	25.9	54.6	48.8	50.9
LnGrp LOS	D	A	A	D	A	A	D	C	C	D	D	D
Approach Vol, veh/h		98			142			1733			1858	
Approach Delay, s/veh		46.7			52.9			26.8			49.9	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	57.8		13.0	9.2	55.4		16.1
Change Period (Y+Rc), s	* 5.2	6.4		* 5.7	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 9.8	50.6		* 14	* 11	49.0		14.3
Max Q Clear Time (g_c+I1), s	3.1	39.9		7.7	5.1	50.8		10.5
Green Ext Time (p_c), s	0.0	7.6		0.1	0.0	0.0		0.1

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	30.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	130	90	123	1567	1676	156
Future Vol, veh/h	130	90	123	1567	1676	156
Conflicting Peds, #/hr	0	0	12	0	0	12
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	134	93	127	1615	1728	161

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2883	957	1901	0	-	0
Stage 1	1821	-	-	-	-	-
Stage 2	1062	-	-	-	-	-
Critical Hdwy	6.9	7	4.2	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.55	3.35	2.25	-	-	-
Pot Cap-1 Maneuver	~ 12	252	298	-	-	-
Stage 1	~ 110	-	-	-	-	-
Stage 2	287	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 7	249	295	-	-	-
Mov Cap-2 Maneuver	~ 54	-	-	-	-	-
Stage 1	~ 62	-	-	-	-	-
Stage 2	284	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s$	505.3	1.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	295	-	54	249	-	-
HCM Lane V/C Ratio	0.43	-	2.482	0.373	-	-
HCM Control Delay (s)	26.1	-	$ 835.9	27.8	-	-
HCM Lane LOS	D	-	F	D	-	-
HCM 95th %tile Q(veh)	2.1	-	13.7	1.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Cumulative Plus Project Conditions
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	10	20	515	25	202	10	1462	20	112	1690	5
Future Volume (veh/h)	25	10	20	515	25	202	10	1462	20	112	1690	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	26	10	21	386	236	210	10	1523	21	117	1760	5
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	16	34	416	212	188	17	1618	22	127	1864	5
Arrive On Green	0.03	0.03	0.03	0.24	0.24	0.24	0.01	0.45	0.45	0.07	0.52	0.52
Sat Flow, veh/h	1767	527	1106	1767	900	801	1767	3559	49	1767	3606	10
Grp Volume(v), veh/h	26	0	31	386	0	446	10	754	790	117	860	905
Grp Sat Flow(s),veh/h/ln	1767	0	1633	1767	0	1700	1767	1763	1845	1767	1763	1853
Q Serve(g_s), s	1.6	0.0	2.0	23.2	0.0	25.5	0.6	44.1	44.3	7.1	49.9	50.0
Cycle Q Clear(g_c), s	1.6	0.0	2.0	23.2	0.0	25.5	0.6	44.1	44.3	7.1	49.9	50.0
Prop In Lane	1.00		0.68	1.00		0.47	1.00		0.03	1.00		0.01
Lane Grp Cap(c), veh/h	54	0	50	416	0	400	17	801	839	127	911	958
V/C Ratio(X)	0.48	0.00	0.62	0.93	0.00	1.11	0.59	0.94	0.94	0.92	0.94	0.94
Avail Cap(c_a), veh/h	65	0	60	416	0	400	65	816	855	127	911	958
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.7	0.0	51.9	40.6	0.0	41.4	53.5	28.2	28.2	50.0	24.7	24.7
Incr Delay (d2), s/veh	2.5	0.0	6.1	26.9	0.0	79.9	11.5	18.4	18.1	55.8	17.7	17.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.9	13.0	0.0	19.4	0.3	21.4	22.3	5.1	23.3	24.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	0.0	58.0	67.5	0.0	121.4	65.0	46.6	46.3	105.8	42.4	42.0
LnGrp LOS	D	A	E	E	A	F	E	D	D	F	D	D
Approach Vol, veh/h		57			832			1554			1882	
Approach Delay, s/veh		56.3			96.4			46.6			46.1	
Approach LOS		E			F			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	55.7		8.5	6.2	62.4		31.2
Change Period (Y+Rc), s	* 5.2	6.4		* 5.2	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 7.8	50.2		* 4	* 4	54.0		25.5
Max Q Clear Time (g_c+I1), s	9.1	46.3		4.0	2.6	52.0		27.5
Green Ext Time (p_c), s	0.0	3.0		0.0	0.0	1.8		0.0

Intersection Summary	
HCM 6th Ctrl Delay	56.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	17.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	0	110	35	634	100	11	105	0	0	130	97
Future Vol, veh/h	32	0	110	35	634	100	11	105	0	0	130	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	0	120	38	689	109	12	114	0	0	141	105
Number of Lanes	1	0	1	0	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	10.6	21.1	11.7	13.4
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	9%	100%	0%	10%	0%	0%
Vol Thru, %	91%	0%	0%	90%	76%	57%
Vol Right, %	0%	0%	100%	0%	24%	43%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	116	32	110	352	417	227
LT Vol	11	32	0	35	0	0
Through Vol	105	0	0	317	317	130
RT Vol	0	0	110	0	100	97
Lane Flow Rate	126	35	120	383	453	247
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.232	0.072	0.205	0.641	0.732	0.416
Departure Headway (Hd)	6.635	7.414	6.187	6.033	5.812	6.071
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	538	481	576	597	621	592
Service Time	4.703	5.191	3.963	3.783	3.562	4.128
HCM Lane V/C Ratio	0.234	0.073	0.208	0.642	0.729	0.417
HCM Control Delay	11.7	10.8	10.6	19	22.9	13.4
HCM Lane LOS	B	B	B	C	C	B
HCM 95th-tile Q	0.9	0.2	0.8	4.6	6.3	2

HCM Signalized Intersection Capacity Analysis
1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Cumulative Plus Project Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	NBR2	SBL2
Lane Configurations												
Traffic Volume (vph)	70	160	55	220	116	125	55	164	1559	79	5	50
Future Volume (vph)	70	160	55	220	116	125	55	164	1559	79	5	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		
Lane Util. Factor	1.00	0.95		0.95	1.00	1.00		1.00	0.95	1.00		
Frpb, ped/bikes	1.00	0.99		0.96	1.00	0.99		1.00	1.00	0.98		
Flpb, ped/bikes	0.99	1.00		1.00	0.99	1.00		1.00	1.00	1.00		
Frt	1.00	0.95		0.85	1.00	0.95		1.00	1.00	0.85		
Flt Protected	0.95	1.00		1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1756	1663		1449	1752	1763		1770	3539	1549		
Flt Permitted	0.50	1.00		1.00	0.34	1.00		0.95	1.00	1.00		
Satd. Flow (perm)	925	1663		1449	619	1763		1770	3539	1549		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	72	165	57	227	120	129	57	169	1607	81	5	52
RTOR Reduction (vph)	0	3	0	114	0	15	0	0	0	36	0	0
Lane Group Flow (vph)	72	242	0	90	120	171	0	169	1607	50	0	0
Confl. Peds. (#/hr)	11			16	16		11					
Confl. Bikes (#/hr)							2			1	1	
Turn Type	Perm	NA		Perm	Perm	NA		Prot	NA	Perm		Prot
Protected Phases		4				8		5	2			1
Permitted Phases	4			4	8					2		
Actuated Green, G (s)	20.9	20.9		20.9	20.9	20.9		11.4	58.9	58.9		
Effective Green, g (s)	20.9	20.9		20.9	20.9	20.9		11.4	58.9	58.9		
Actuated g/C Ratio	0.19	0.19		0.19	0.19	0.19		0.10	0.54	0.54		
Clearance Time (s)	5.7	5.7		5.7	5.7	5.7		5.2	6.4	6.4		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5		1.5	3.0	3.0		
Lane Grp Cap (vph)	175	315		275	117	334		183	1894	829		
v/s Ratio Prot		0.15				0.10		0.10	0.45			
v/s Ratio Perm	0.08			0.06	c0.19					0.03		
v/c Ratio	0.41	0.77		0.33	1.03	0.51		0.92	0.85	0.06		
Uniform Delay, d1	39.1	42.2		38.5	44.5	40.0		48.9	21.8	12.3		
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		
Incremental Delay, d2	1.1	10.2		0.5	90.2	1.0		44.4	3.8	0.0		
Delay (s)	40.3	52.5		39.0	134.8	41.0		93.3	25.5	12.3		
Level of Service	D	D		D	F	D		F	C	B		
Approach Delay (s)		45.5				77.8			31.0			
Approach LOS		D				E			C			

Intersection Summary			
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	103.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	120	1805	60
Future Volume (vph)	120	1805	60
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	5.2	6.4	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	1.00	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1770	3519	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1770	3519	
Peak-hour factor, PHF	0.97	0.97	0.97
Adj. Flow (vph)	124	1861	62
RTOR Reduction (vph)	0	2	0
Lane Group Flow (vph)	176	1921	0
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			5
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	12.9	60.4	
Effective Green, g (s)	12.9	60.4	
Actuated g/C Ratio	0.12	0.55	
Clearance Time (s)	5.2	6.4	
Vehicle Extension (s)	1.5	3.0	
Lane Grp Cap (vph)	207	1932	
v/s Ratio Prot	c0.10	c0.55	
v/s Ratio Perm			
v/c Ratio	0.85	0.99	
Uniform Delay, d1	47.6	24.6	
Progression Factor	1.00	1.00	
Incremental Delay, d2	26.0	19.0	
Delay (s)	73.6	43.6	
Level of Service	E	D	
Approach Delay (s)		46.1	
Approach LOS		D	

Intersection Summary

HCM 6th Signalized Intersection Summary
2: US 101 (Broadway St) & W Hawthorne St

Cumulative Plus Project Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	26	12	5	85	16	1707	20	30	2081	30
Future Volume (veh/h)	15	0	26	12	5	85	16	1707	20	30	2081	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	1.00		0.94	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	16	0	28	13	5	92	17	1855	22	33	2262	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	22	0	38	17	7	121	26	2248	27	41	2272	33
Arrive On Green	0.04	0.00	0.04	0.10	0.10	0.10	0.01	0.64	0.64	0.02	0.64	0.64
Sat Flow, veh/h	549	0	961	178	68	1259	1753	3539	42	1753	3527	51
Grp Volume(v), veh/h	44	0	0	110	0	0	17	915	962	33	1118	1177
Grp Sat Flow(s),veh/h/ln	1510	0	0	1505	0	0	1753	1749	1832	1753	1749	1830
Q Serve(g_s), s	3.2	0.0	0.0	8.0	0.0	0.0	1.1	44.9	45.3	2.1	70.7	71.9
Cycle Q Clear(g_c), s	3.2	0.0	0.0	8.0	0.0	0.0	1.1	44.9	45.3	2.1	70.7	71.9
Prop In Lane	0.36		0.64	0.12		0.84	1.00		0.02	1.00		0.03
Lane Grp Cap(c), veh/h	60	0	0	145	0	0	26	1111	1164	41	1126	1179
V/C Ratio(X)	0.73	0.00	0.00	0.76	0.00	0.00	0.66	0.82	0.83	0.80	0.99	1.00
Avail Cap(c_a), veh/h	193	0	0	192	0	0	185	1122	1175	185	1126	1179
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	0.0	0.0	49.4	0.0	0.0	55.0	15.6	15.7	54.5	19.7	19.9
Incr Delay (d2), s/veh	6.2	0.0	0.0	7.9	0.0	0.0	10.2	5.1	5.0	12.3	25.0	25.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	3.3	0.0	0.0	0.5	16.9	17.9	1.1	31.9	34.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	0.0	0.0	57.2	0.0	0.0	65.2	20.7	20.7	66.8	44.7	45.7
LnGrp LOS	E	A	A	E	A	A	E	C	C	E	D	D
Approach Vol, veh/h		44			110			1894			2328	
Approach Delay, s/veh		59.4			57.2			21.1			45.5	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.8	77.6		10.2	6.8	78.6		16.5
Change Period (Y+Rc), s	* 5.2	6.4		* 5.7	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 12	71.9		* 14	* 12	72.2		14.3
Max Q Clear Time (g_c+I1), s	4.1	47.3		5.2	3.1	73.9		10.0
Green Ext Time (p_c), s	0.0	15.7		0.0	0.0	0.0		0.1

Intersection Summary	
HCM 6th Ctrl Delay	35.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	16.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	77	46	69	1667	2020	99
Future Vol, veh/h	77	46	69	1667	2020	99
Conflicting Peds, #/hr	0	0	12	0	0	12
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	100	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	84	50	75	1812	2196	108

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3318	1164	2316	0	-	0
Stage 1	2262	-	-	-	-	-
Stage 2	1056	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	-	-
Pot Cap-1 Maneuver	~ 6	186	209	-	-	-
Stage 1	~ 64	-	-	-	-	-
Stage 2	294	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 4	184	207	-	-	-
Mov Cap-2 Maneuver	~ 37	-	-	-	-	-
Stage 1	~ 40	-	-	-	-	-
Stage 2	291	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 519	1.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	207	-	37	184	-	-
HCM Lane V/C Ratio	0.362	-	2.262	0.272	-	-
HCM Control Delay (s)	32	-	$ 810.1	31.7	-	-
HCM Lane LOS	D	-	F	D	-	-
HCM 95th %tile Q(veh)	1.6	-	9.2	1.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Cumulative Plus Project Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	5	25	660	15	152	10	1564	35	97	1997	5
Future Volume (veh/h)	20	5	25	660	15	152	10	1564	35	97	1997	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.87	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	22	5	27	444	388	163	11	1682	38	104	2147	5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	47	6	32	438	307	129	17	1780	40	110	2014	5
Arrive On Green	0.03	0.03	0.03	0.25	0.25	0.25	0.01	0.51	0.51	0.06	0.56	0.56
Sat Flow, veh/h	1753	220	1189	1753	1230	517	1753	3494	79	1753	3579	8
Grp Volume(v), veh/h	22	0	32	444	0	551	11	840	880	104	1048	1104
Grp Sat Flow(s),veh/h/ln	1753	0	1409	1753	0	1746	1753	1749	1824	1753	1749	1839
Q Serve(g_s), s	1.8	0.0	3.4	37.3	0.0	37.3	0.9	67.6	68.3	8.8	84.0	84.0
Cycle Q Clear(g_c), s	1.8	0.0	3.4	37.3	0.0	37.3	0.9	67.6	68.3	8.8	84.0	84.0
Prop In Lane	1.00		0.84	1.00		0.30	1.00		0.04	1.00		0.00
Lane Grp Cap(c), veh/h	47	0	38	438	0	436	17	891	930	110	984	1035
V/C Ratio(X)	0.47	0.00	0.85	1.01	0.00	1.26	0.64	0.94	0.95	0.94	1.07	1.07
Avail Cap(c_a), veh/h	47	0	38	438	0	436	47	912	951	110	984	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.6	0.0	72.3	56.0	0.0	56.0	73.6	34.5	34.7	69.6	32.6	32.6
Incr Delay (d2), s/veh	2.7	0.0	85.0	46.4	0.0	135.4	13.7	17.3	17.6	66.6	47.8	47.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	2.1	22.1	0.0	32.8	0.5	31.8	33.5	6.0	46.3	48.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.2	0.0	157.3	102.4	0.0	191.4	87.3	51.9	52.3	136.2	80.5	80.1
LnGrp LOS	E	A	F	F	A	F	F	D	D	F	F	F
Approach Vol, veh/h		54			995			1731			2256	
Approach Delay, s/veh		123.5			151.7			52.3			82.9	
Approach LOS		F			F			D			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.6	82.4		9.2	6.7	90.4		43.0
Change Period (Y+Rc), s	* 5.2	6.4		* 5.2	* 5.2	6.4		5.7
Max Green Setting (Gmax), s	* 9.4	77.8		* 4	* 4	83.7		37.3
Max Q Clear Time (g_c+I1), s	10.8	70.3		5.4	2.9	86.0		39.3
Green Ext Time (p_c), s	0.0	5.8		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	86.4
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	26.8
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	0	106	95	670	90	16	105	0	0	195	141
Future Vol, veh/h	31	0	106	95	670	90	16	105	0	0	195	141
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	0	115	103	728	98	17	114	0	0	212	153
Number of Lanes	1	0	1	0	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	11.7	34	12.9	19.8
HCM LOS	B	D	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	13%	100%	0%	22%	0%	0%
Vol Thru, %	87%	0%	0%	78%	79%	58%
Vol Right, %	0%	0%	100%	0%	21%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	121	31	106	430	425	336
LT Vol	16	31	0	95	0	0
Through Vol	105	0	0	335	335	195
RT Vol	0	0	106	0	90	141
Lane Flow Rate	132	34	115	467	462	365
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.265	0.077	0.223	0.855	0.811	0.636
Departure Headway (Hd)	7.259	8.213	6.976	6.583	6.319	6.273
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	498	438	517	547	568	573
Service Time	5.259	5.921	4.684	4.374	4.11	4.353
HCM Lane V/C Ratio	0.265	0.078	0.222	0.854	0.813	0.637
HCM Control Delay	12.9	11.6	11.7	37	31	19.8
HCM Lane LOS	B	B	B	E	D	C
HCM 95th-tile Q	1.1	0.2	0.8	9.1	8	4.5

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR>	>	<L	TR	L	T	T	R>	<L	T	TR
Maximum Queue (ft)	124	334	190	545	295	285	552	535	250	215	618	611
Average Queue (ft)	62	173	87	303	165	197	321	323	86	147	553	538
95th Queue (ft)	144	289	211	642	340	341	541	532	245	276	700	705
Link Distance (ft)		525		548			807	807			561	561
Upstream Blk Time (%)				27							50	44
Queuing Penalty (veh)				0							0	0
Storage Bay Dist (ft)	70		70		235	205			165	155		
Storage Blk Time (%)	6	48	1	40	9	33	18	32		1	62	
Queuing Penalty (veh)	20	72	3	77	7	177	24	22		8	57	

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	NW
Directions Served	<LR
Maximum Queue (ft)	176
Average Queue (ft)	126
95th Queue (ft)	182
Link Distance (ft)	127
Upstream Blk Time (%)	50
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: US 101 (Broadway St) & W Hawthorne St

Movement	EB	WB	NB	NB	NB	B18	B18	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	T	T	L	T	TR
Maximum Queue (ft)	131	30	65	4	3	11	10	20	36	31
Average Queue (ft)	44	7	13	0	0	0	0	3	1	1
95th Queue (ft)	97	26	41	2	2	8	8	12	17	16
Link Distance (ft)	541	352		1625	1625	107	107		807	807
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			100					100		
Storage Blk Time (%)									0	
Queuing Penalty (veh)									0	

Intersection: 3: US 101 (Broadway St) & Vigo St

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	64	44
Average Queue (ft)	26	9
95th Queue (ft)	56	34
Link Distance (ft)	323	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		75
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 4: US 101 (Broadway St) & W Henderson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	48	75	217	220	78	355	327	213	350	359
Average Queue (ft)	17	24	121	136	7	215	177	55	169	187
95th Queue (ft)	45	60	185	205	39	317	288	136	298	312
Link Distance (ft)		103	441	441		724	724		449	449
Upstream Blk Time (%)		0								
Queuing Penalty (veh)		0								
Storage Bay Dist (ft)	25				105			190		
Storage Blk Time (%)	17	11				31			5	
Queuing Penalty (veh)	3	2				2			4	

Intersection: 5: Fairfield St & W Henderson St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	R	LT	TR	LT	TR
Maximum Queue (ft)	59	66	107	124	65	82
Average Queue (ft)	16	12	55	60	30	44
95th Queue (ft)	45	48	85	96	51	69
Link Distance (ft)	441		276	276	352	203
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		50				
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	0	0				

Network Summary

Network wide Queuing Penalty: 480

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR>	>	<L	TR	L	T	T	R>	<L	T	TR
Maximum Queue (ft)	124	466	190	583	295	285	680	685	250	215	612	604
Average Queue (ft)	59	208	99	448	163	84	396	406	88	165	568	556
95th Queue (ft)	144	373	224	737	374	260	654	661	255	267	649	665
Link Distance (ft)		525		548			807	807			561	561
Upstream Blk Time (%)		0		63			0	1			56	47
Queuing Penalty (veh)		0		0			3	3			0	0
Storage Bay Dist (ft)	70		70		235	205			165	155		
Storage Blk Time (%)	1	54	2	75	3		38	47		20	52	
Queuing Penalty (veh)	4	77	6	105	2		28	28		142	69	

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	NW
Directions Served	<LR
Maximum Queue (ft)	153
Average Queue (ft)	103
95th Queue (ft)	177
Link Distance (ft)	127
Upstream Blk Time (%)	33
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: US 101 (Broadway St) & W Hawthorne St

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	94	72	20	83	95	39	77	86
Average Queue (ft)	29	16	3	7	8	7	9	8
95th Queue (ft)	74	52	12	44	49	24	41	47
Link Distance (ft)	541	352		1612	1612		807	807
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			100			100		
Storage Blk Time (%)				0			0	
Queuing Penalty (veh)				0			0	

Intersection: 3: US 101 (Broadway St) & Vigo St

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	TR
Maximum Queue (ft)	52	35	9	13	17
Average Queue (ft)	19	6	0	0	1
95th Queue (ft)	48	26	7	8	11
Link Distance (ft)	323		449	120	120
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		75			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: US 101 (Broadway St) & W Henderson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	54	68	306	333	115	383	362	177	399	398
Average Queue (ft)	13	21	162	170	9	239	202	50	213	230
95th Queue (ft)	41	56	255	277	54	350	316	114	366	383
Link Distance (ft)		110	441	441		724	724		449	449
Upstream Blk Time (%)		0							0	0
Queuing Penalty (veh)		0							0	0
Storage Bay Dist (ft)	25				105			190		
Storage Blk Time (%)	12	12				34			10	
Queuing Penalty (veh)	3	2				3			7	

Intersection: 5: Fairfield St & W Henderson St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	R	LT	TR	LT	TR
Maximum Queue (ft)	56	64	133	116	72	124
Average Queue (ft)	17	17	70	57	34	58
95th Queue (ft)	46	55	107	92	60	96
Link Distance (ft)	441		276	276	352	203
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		50				
Storage Blk Time (%)	0	1				
Queuing Penalty (veh)	0	0				

Network Summary

Network wide Queuing Penalty: 483

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR>	>	<L	TR	L	T	T	R>	<L	T	TR
Maximum Queue (ft)	124	341	190	495	295	285	618	634	250	215	1075	1072
Average Queue (ft)	66	164	72	222	151	207	323	329	88	146	954	937
95th Queue (ft)	145	281	192	507	296	342	563	572	240	276	1206	1208
Link Distance (ft)		525		549			807	807			1021	1021
Upstream Blk Time (%)				9							48	43
Queuing Penalty (veh)				0							0	0
Storage Bay Dist (ft)	70		70		235	205			165	155		
Storage Blk Time (%)	7	40	1	22	3	29	20	33		2	65	
Queuing Penalty (veh)	24	62	2	43	3	162	29	25		12	60	

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	NW
Directions Served	<LR
Maximum Queue (ft)	166
Average Queue (ft)	112
95th Queue (ft)	185
Link Distance (ft)	127
Upstream Blk Time (%)	43
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: US 101 (Broadway St) & W Hawthorne St

Movement	EB	WB	NB	NB	B18	B18	B18	SB	SB
Directions Served	LTR	LTR	LT	TR		T	T	LT	TR
Maximum Queue (ft)	193	52	144	111	33	76	42	143	145
Average Queue (ft)	59	12	40	12	1	9	3	20	14
95th Queue (ft)	144	37	118	67	13	44	24	86	78
Link Distance (ft)	541	352	1640	1640	92	92	92	807	807
Upstream Blk Time (%)						0	0		
Queuing Penalty (veh)						0	0		
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: US 101 (Broadway St) & Vigo St

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	453	183	137	72	21	32	53
Average Queue (ft)	201	70	63	4	1	2	5
95th Queue (ft)	464	276	115	36	16	15	28
Link Distance (ft)	614	614		437	437	92	92
Upstream Blk Time (%)	5	3					0
Queuing Penalty (veh)	0	0					0
Storage Bay Dist (ft)			75				
Storage Blk Time (%)			12	0			
Queuing Penalty (veh)			72	0			

Intersection: 4: US 101 (Broadway St) & W Henderson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	56	73	201	240	115	463	419	154	332	349
Average Queue (ft)	19	23	124	138	9	264	212	60	157	175
95th Queue (ft)	49	60	186	207	57	396	354	121	281	295
Link Distance (ft)		103	441	441		724	724		437	437
Upstream Blk Time (%)		0								
Queuing Penalty (veh)		0								
Storage Bay Dist (ft)	25				105			190		
Storage Blk Time (%)	18	9				38			4	
Queuing Penalty (veh)	3	2				2			4	

Intersection: 5: Fairfield St & W Henderson St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	R	LT	TR	LT	TR
Maximum Queue (ft)	62	73	93	110	70	86
Average Queue (ft)	18	20	54	58	31	46
95th Queue (ft)	48	64	81	95	53	76
Link Distance (ft)	441		276	276	352	203
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		50				
Storage Blk Time (%)	0	2				
Queuing Penalty (veh)	0	0				

Network Summary

Network wide Queuing Penalty: 505

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR>	>	<L	TR	L	T	T	R>	<L	T	TR
Maximum Queue (ft)	124	415	190	592	295	284	731	751	250	215	608	604
Average Queue (ft)	69	197	95	496	155	115	401	415	111	172	569	563
95th Queue (ft)	155	344	218	712	377	304	693	709	289	273	662	667
Link Distance (ft)		525		548			807	807			561	561
Upstream Blk Time (%)				68			1	1			63	53
Queuing Penalty (veh)				0			5	6			0	0
Storage Bay Dist (ft)	70		70		235	205			165	155		
Storage Blk Time (%)	2	55	3	87	3	0	37	45		29	49	
Queuing Penalty (veh)	8	79	9	122	3	1	28	29		209	65	

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	NW
Directions Served	<LR
Maximum Queue (ft)	154
Average Queue (ft)	95
95th Queue (ft)	174
Link Distance (ft)	127
Upstream Blk Time (%)	27
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: US 101 (Broadway St) & W Hawthorne St

Movement	EB	WB	NB	NB	B18	B18	B18	SB	SB
Directions Served	LTR	LTR	LT	TR		T	T	LT	TR
Maximum Queue (ft)	89	81	144	158	15	44	23	291	332
Average Queue (ft)	30	21	25	21	1	7	2	46	42
95th Queue (ft)	71	61	93	89	8	30	12	164	176
Link Distance (ft)	540	352	1652	1652	68	68	68	807	807
Upstream Blk Time (%)						0			
Queuing Penalty (veh)						0			
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 3: US 101 (Broadway St) & Vigo St

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	TR
Maximum Queue (ft)	174	68	86	46	28	38
Average Queue (ft)	67	28	40	2	4	4
95th Queue (ft)	141	61	75	21	21	26
Link Distance (ft)	603	603		449	68	68
Upstream Blk Time (%)					0	0
Queuing Penalty (veh)					0	1
Storage Bay Dist (ft)			75			
Storage Blk Time (%)			3	0		
Queuing Penalty (veh)			22	0		

Intersection: 4: US 101 (Broadway St) & W Henderson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	54	81	280	310	159	437	389	229	422	414
Average Queue (ft)	16	22	168	174	16	267	226	56	218	226
95th Queue (ft)	46	60	256	268	75	415	372	139	363	363
Link Distance (ft)		110	441	441		724	724		449	449
Upstream Blk Time (%)		0							0	0
Queuing Penalty (veh)		0							0	0
Storage Bay Dist (ft)	25				105			190		
Storage Blk Time (%)	14	11				38		0	10	
Queuing Penalty (veh)	3	2				3		0	7	

Intersection: 5: Fairfield St & W Henderson St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	R	LT	TR	LT	TR
Maximum Queue (ft)	91	74	127	108	61	144
Average Queue (ft)	18	21	69	56	31	62
95th Queue (ft)	56	64	106	90	52	105
Link Distance (ft)	441		276	276	352	203
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (ft)		50				
Storage Blk Time (%)	0	2				
Queuing Penalty (veh)	0	0				

Network Summary

Network wide Queuing Penalty: 604

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR>	>	L	TR	L	T	T	R>	<L	T	TR
Maximum Queue (ft)	124	520	190	889	295	405	842	888	250	355	1015	994
Average Queue (ft)	77	293	134	790	187	393	673	648	71	201	731	708
95th Queue (ft)	159	488	243	1077	403	449	983	1027	211	426	1221	1190
Link Distance (ft)		525		834			816	816			1102	1102
Upstream Blk Time (%)		2		84			10	4			10	8
Queuing Penalty (veh)		0		0			83	33			0	0
Storage Bay Dist (ft)	70		70		235	205			165	155		
Storage Blk Time (%)	8	59	4	89	12	86	11	23		4	50	
Queuing Penalty (veh)	33	113	14	218	12	570	32	21		31	60	

Intersection: 2: US 101 (Broadway St) & W Hawthorne St

Movement	EB	WB	NB	NB	NB	B18	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	T	L	T	TR
Maximum Queue (ft)	156	162	199	1044	1055	10	124	535	577
Average Queue (ft)	57	73	67	385	390	0	13	233	250
95th Queue (ft)	118	136	193	963	965	6	68	456	480
Link Distance (ft)	541	352		1567	1567	165		816	816
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			100				100		
Storage Blk Time (%)			0	33				17	
Queuing Penalty (veh)			3	18				3	

Intersection: 3: US 101 (Broadway St) & Vigo St

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	TR
Maximum Queue (ft)	82	57	9	34	56
Average Queue (ft)	31	15	0	1	3
95th Queue (ft)	67	45	7	17	27
Link Distance (ft)	628		448	165	165
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		75			
Storage Blk Time (%)		0			
Queuing Penalty (veh)		0			

Intersection: 4: US 101 (Broadway St) & W Henderson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	50	77	373	402	126	634	555	261	412	430
Average Queue (ft)	21	32	216	239	11	370	323	88	238	258
95th Queue (ft)	50	69	326	351	56	571	512	198	417	432
Link Distance (ft)		103	441	441		724	724		448	448
Upstream Blk Time (%)		0	0	0		0			0	0
Queuing Penalty (veh)		0	0	0		0			0	2
Storage Bay Dist (ft)	25				105			190		
Storage Blk Time (%)	23	20				42		1	11	
Queuing Penalty (veh)	7	5				4		7	11	

Intersection: 5: Fairfield St & W Henderson St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	R	LT	TR	LT	TR
Maximum Queue (ft)	83	73	135	158	83	129
Average Queue (ft)	22	25	69	78	38	55
95th Queue (ft)	58	69	105	127	66	93
Link Distance (ft)	441		276	276	352	203
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		50				
Storage Blk Time (%)	0	2				
Queuing Penalty (veh)	0	1				

Network Summary

Network wide Queuing Penalty: 1282

Queuing and Blocking Report
Cumulative Conditions

07/21/2018

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR>	>	<L	TR	L	T	T	R>	<L	T	TR
Maximum Queue (ft)	124	543	190	575	295	405	851	879	250	355	1146	1113
Average Queue (ft)	73	355	157	554	96	380	697	684	67	276	880	851
95th Queue (ft)	161	560	243	593	313	470	1035	1072	218	449	1316	1294
Link Distance (ft)		525		549			816	816			1111	1111
Upstream Blk Time (%)		5		97			17	8			17	13
Queuing Penalty (veh)		0		0			150	75			0	0
Storage Bay Dist (ft)	70		70		235	205			165	155		
Storage Blk Time (%)	2	71	11	100	1	92	14	24		24	44	
Queuing Penalty (veh)	9	126	44	180	1	706	23	19		214	74	

Intersection: 2: US 101 (Broadway St) & W Hawthorne St

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	102	159	199	1494	1514	156	657	670
Average Queue (ft)	32	65	34	748	757	24	216	230
95th Queue (ft)	74	123	147	1855	1864	98	515	533
Link Distance (ft)	541	352		1789	1789		816	816
Upstream Blk Time (%)				4	5			
Queuing Penalty (veh)				34	39			
Storage Bay Dist (ft)			100			100		
Storage Blk Time (%)				48		0	14	
Queuing Penalty (veh)				7		1	4	

Intersection: 3: US 101 (Broadway St) & Vigo St

Movement	EB	NB	NB	NB	SB	SB
Directions Served	LR	L	T	T	T	TR
Maximum Queue (ft)	119	83	314	313	397	407
Average Queue (ft)	48	11	82	82	86	93
95th Queue (ft)	109	50	359	357	280	297
Link Distance (ft)	648		449	449	1789	1789
Upstream Blk Time (%)			1	1		
Queuing Penalty (veh)			9	8		
Storage Bay Dist (ft)		75				
Storage Blk Time (%)			16			
Queuing Penalty (veh)			2			

Intersection: 4: US 101 (Broadway St) & W Henderson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	49	110	454	457	103	728	690	319	473	483
Average Queue (ft)	18	38	367	373	19	479	438	121	384	397
95th Queue (ft)	50	88	495	498	77	730	694	285	538	543
Link Distance (ft)		110	441	441		724	724		449	449
Upstream Blk Time (%)		2	7	9		9	8		5	6
Queuing Penalty (veh)		0	31	36		0	0		51	59
Storage Bay Dist (ft)	25				105			190		
Storage Blk Time (%)	27	33				42		0	24	
Queuing Penalty (veh)	8	7				4		1	22	

Intersection: 5: Fairfield St & W Henderson St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	R	LT	TR	LT	TR
Maximum Queue (ft)	96	74	231	217	84	192
Average Queue (ft)	24	30	135	117	39	106
95th Queue (ft)	70	76	261	250	67	208
Link Distance (ft)	441		276	276	352	203
Upstream Blk Time (%)			4	4		10
Queuing Penalty (veh)			0	0		0
Storage Bay Dist (ft)		50				
Storage Blk Time (%)	0	4				
Queuing Penalty (veh)	0	1				

Network Summary

Network wide Queuing Penalty: 1943

Intersection: 1: US 101 (Broadway St) & W Wabash Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR>	>	L	TR	L	T	T	R>	<L	T	TR
Maximum Queue (ft)	240	463	270	593	355	579	776	811	250	215	1176	1184
Average Queue (ft)	95	255	166	558	220	482	507	468	50	181	1024	1014
95th Queue (ft)	230	384	298	582	489	729	997	982	172	273	1455	1458
Link Distance (ft)		525		547			825	825			1176	1176
Upstream Blk Time (%)		0		94			6	3			48	45
Queuing Penalty (veh)		0		0			57	23			0	0
Storage Bay Dist (ft)	150		150		235	400			165	155		
Storage Blk Time (%)	0	40	1	100	12	58	1	10		49	43	
Queuing Penalty (veh)	1	79	4	244	13	402	4	10		362	52	

Intersection: 2: US 101 (Broadway St) & W Hawthorne St

Movement	EB	WB	NB	NB	NB	B18	B18	B18	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR		T	T	L	T	TR
Maximum Queue (ft)	127	145	199	1077	1072	31	60	46	74	455	472
Average Queue (ft)	50	72	57	334	334	1	5	4	10	190	208
95th Queue (ft)	96	123	168	1001	998	16	46	30	55	380	399
Link Distance (ft)	541	352		1582	1582	130	130	130		825	825
Upstream Blk Time (%)				1	1		0	0			
Queuing Penalty (veh)				8	8		1	0			
Storage Bay Dist (ft)			100						100		
Storage Blk Time (%)			0	25						14	
Queuing Penalty (veh)			2	14						3	

Intersection: 3: US 101 (Broadway St) & Vigo St

Movement	EB	EB	NB	NB	NB	SB	SB	B18
Directions Served	L	R	L	T	T	T	TR	T
Maximum Queue (ft)	626	583	158	240	95	35	53	6
Average Queue (ft)	477	219	73	18	5	1	5	0
95th Queue (ft)	817	666	138	123	77	15	26	4
Link Distance (ft)	657	657		460	460	130	130	1582
Upstream Blk Time (%)	26	19		0				
Queuing Penalty (veh)	0	0		0				
Storage Bay Dist (ft)			100					
Storage Blk Time (%)			8	0				
Queuing Penalty (veh)			60	0				

Intersection: 4: US 101 (Broadway St) & W Henderson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	50	79	348	381	97	725	617	264	416	416
Average Queue (ft)	21	32	222	241	14	429	371	93	229	241
95th Queue (ft)	50	70	342	368	67	642	564	212	397	395
Link Distance (ft)		103	442	442		724	724		460	460
Upstream Blk Time (%)		0	0	0		1	0		0	
Queuing Penalty (veh)		0	1	2		0	0		0	
Storage Bay Dist (ft)	25				105			190		
Storage Blk Time (%)	28	22				45		0	10	
Queuing Penalty (veh)	8	5				5		3	11	

Intersection: 5: Fairfield St & W Henderson St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	R	LT	TR	LT	TR
Maximum Queue (ft)	69	74	144	176	82	110
Average Queue (ft)	23	24	71	80	36	57
95th Queue (ft)	57	71	116	136	64	91
Link Distance (ft)	442		276	276	352	203
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		50				
Storage Blk Time (%)	0	2				
Queuing Penalty (veh)	1	1				

Network Summary

Network wide Queuing Penalty: 1385

Intersection: 1: US 101 (Broadway St) & Fairfield St & W Wabash Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR>	>	L	TR	L	T	T	R>	<L	T	TR
Maximum Queue (ft)	125	537	190	588	295	405	845	880	249	215	1270	1261
Average Queue (ft)	63	308	157	556	108	360	672	668	68	177	1206	1202
95th Queue (ft)	151	482	246	571	330	507	1041	1059	216	273	1413	1413
Link Distance (ft)		525		546			816	816			1214	1214
Upstream Blk Time (%)		1		99			16	8			59	50
Queuing Penalty (veh)		0		0			147	72			0	0
Storage Bay Dist (ft)	70		70		235	205			165	155		
Storage Blk Time (%)	2	66	7	99	2	82	19	30		13	46	
Queuing Penalty (veh)	9	119	29	179	2	635	32	25		113	79	

Intersection: 2: US 101 (Broadway St) & W Hawthorne St

Movement	EB	WB	NB	NB	NB	B18	B18	B18	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR		T	T	L	T	TR
Maximum Queue (ft)	95	179	199	1376	1369	121	185	195	154	382	408
Average Queue (ft)	30	72	32	648	656	17	43	42	20	147	162
95th Queue (ft)	68	147	144	1649	1655	114	190	183	84	342	367
Link Distance (ft)	541	352		1543	1543	190	190	190		816	816
Upstream Blk Time (%)		0		19	19	1	6	5			
Queuing Penalty (veh)		0		164	166	6	33	27			
Storage Bay Dist (ft)			100						100		
Storage Blk Time (%)				44						9	
Queuing Penalty (veh)				7						3	

Intersection: 3: US 101 (Broadway St) & Vigo St

Movement	EB	EB	NB	NB	NB	SB	SB	B18	B18
Directions Served	L	R	L	T	T	T	TR	T	T
Maximum Queue (ft)	294	114	165	291	274	251	248	274	66
Average Queue (ft)	149	37	68	73	69	46	56	11	3
95th Queue (ft)	305	84	165	317	319	165	183	189	32
Link Distance (ft)	640	640		438	438	190	190	1543	1543
Upstream Blk Time (%)				0	1	1	1		
Queuing Penalty (veh)				4	8	11	15		
Storage Bay Dist (ft)			100						
Storage Blk Time (%)			2	13					
Queuing Penalty (veh)			17	9					

Intersection: 4: US 101 (Broadway St) & W Henderson St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	50	102	455	456	103	752	745	320	459	464
Average Queue (ft)	19	35	372	377	14	519	473	130	363	374
95th Queue (ft)	50	84	510	508	53	760	723	288	506	509
Link Distance (ft)		110	441	441		724	724		438	438
Upstream Blk Time (%)		1	7	9		8	7		3	3
Queuing Penalty (veh)		0	31	36		0	0		28	33
Storage Bay Dist (ft)	25				105			190		
Storage Blk Time (%)	28	26				42		3	22	
Queuing Penalty (veh)	8	5				4		34	21	

Intersection: 5: Fairfield St & W Henderson St

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	R	LT	TR	LT	TR
Maximum Queue (ft)	89	74	273	251	87	214
Average Queue (ft)	27	33	128	112	38	95
95th Queue (ft)	66	80	253	243	66	183
Link Distance (ft)	441		276	276	352	203
Upstream Blk Time (%)			4	5		4
Queuing Penalty (veh)			0	0		0
Storage Bay Dist (ft)		50				
Storage Blk Time (%)	0	4				
Queuing Penalty (veh)	1	1				

Network Summary

Network wide Queuing Penalty: 2112

HCM 6th Signalized Intersection Summary
2: US 101 (Broadway St) & W Hawthorne St

Existing Plus Project Conditions - Mitigated
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	1	55	8	0	5	46	1305	17	14	1409	44
Future Volume (veh/h)	16	1	55	8	0	5	46	1305	17	14	1409	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	16	1	56	8	0	5	47	1332	17	14	1438	45
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	22	1	76	19	0	12	81	2024	26	30	1881	59
Arrive On Green	0.06	0.06	0.06	0.02	0.00	0.02	0.05	0.58	0.58	0.02	0.55	0.55
Sat Flow, veh/h	347	22	1216	1014	0	634	1739	3506	45	1739	3430	107
Grp Volume(v), veh/h	73	0	0	13	0	0	47	659	690	14	726	757
Grp Sat Flow(s),veh/h/ln	1585	0	0	1648	0	0	1739	1735	1816	1739	1735	1803
Q Serve(g_s), s	2.5	0.0	0.0	0.4	0.0	0.0	1.5	14.4	14.4	0.4	18.1	18.2
Cycle Q Clear(g_c), s	2.5	0.0	0.0	0.4	0.0	0.0	1.5	14.4	14.4	0.4	18.1	18.2
Prop In Lane	0.22		0.77	0.62		0.38	1.00		0.02	1.00		0.06
Lane Grp Cap(c), veh/h	100	0	0	31	0	0	81	1001	1048	30	951	988
V/C Ratio(X)	0.73	0.00	0.00	0.42	0.00	0.00	0.58	0.66	0.66	0.46	0.76	0.77
Avail Cap(c_a), veh/h	516	0	0	533	0	0	166	1273	1333	159	1267	1316
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	0.0	0.0	27.0	0.0	0.0	26.0	8.0	8.0	27.1	9.8	9.8
Incr Delay (d2), s/veh	9.9	0.0	0.0	8.8	0.0	0.0	6.5	0.8	0.8	10.5	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	0.2	0.0	0.0	0.7	3.6	3.8	0.3	5.1	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.5	0.0	0.0	35.8	0.0	0.0	32.5	8.9	8.8	37.5	11.7	11.7
LnGrp LOS	D	A	A	D	A	A	C	A	A	D	B	B
Approach Vol, veh/h		73			13			1396			1497	
Approach Delay, s/veh		35.5			35.8			9.6			12.0	
Approach LOS		D			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	36.6		8.0	7.1	35.0		5.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.1	40.8		18.1	5.3	40.6		18.0
Max Q Clear Time (g_c+I1), s	2.4	16.4		4.5	3.5	20.2		2.4
Green Ext Time (p_c), s	0.0	9.9		0.2	0.0	10.3		0.0

Intersection Summary		
HCM 6th Ctrl Delay		11.6
HCM 6th LOS		B

HCM 6th Signalized Intersection Summary
3: US 101 (Broadway St) & Vigo St

Existing Plus Project Conditions - Mitigated
Mid-Day Peak Hr

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	124	86	116	1242	1325	147
Future Volume (veh/h)	124	86	116	1242	1325	147
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	128	89	120	1280	1366	152
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	287	132	152	2609	1857	205
Arrive On Green	0.09	0.09	0.09	0.75	0.59	0.59
Sat Flow, veh/h	3374	1547	1739	3561	3229	347
Grp Volume(v), veh/h	128	89	120	1280	751	767
Grp Sat Flow(s),veh/h/ln	1687	1547	1739	1735	1735	1750
Q Serve(g_s), s	2.6	4.0	4.8	10.3	22.2	22.7
Cycle Q Clear(g_c), s	2.6	4.0	4.8	10.3	22.2	22.7
Prop In Lane	1.00	1.00	1.00			0.20
Lane Grp Cap(c), veh/h	287	132	152	2609	1026	1036
V/C Ratio(X)	0.45	0.68	0.79	0.49	0.73	0.74
Avail Cap(c_a), veh/h	701	321	361	2609	1026	1036
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	31.6	31.9	3.5	10.5	10.6
Incr Delay (d2), s/veh	0.4	2.2	3.4	0.7	4.6	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.5	2.0	1.8	7.6	7.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.4	33.9	35.3	4.1	15.1	15.4
LnGrp LOS	C	C	D	A	B	B
Approach Vol, veh/h	217			1400	1518	
Approach Delay, s/veh	32.4			6.8	15.2	
Approach LOS	C			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		60.0		11.3	11.4	48.6
Change Period (Y+Rc), s		6.4		* 5.2	* 5.2	6.4
Max Green Setting (Gmax), s		53.6		* 15	* 15	33.6
Max Q Clear Time (g_c+I1), s		12.3		6.0	6.8	24.7
Green Ext Time (p_c), s		12.0		0.2	0.0	6.0

Intersection Summary	
HCM 6th Ctrl Delay	12.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: US 101 (Broadway St) & W Hawthorne St

Existing Plus Project Conditions - Mitigated
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	20	6	1	13	13	1370	15	24	1675	21
Future Volume (veh/h)	12	0	20	6	1	13	13	1370	15	24	1675	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.90	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	13	0	22	7	1	15	15	1539	17	27	1882	24
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	36	0	62	26	4	57	31	2272	25	48	2304	29
Arrive On Green	0.06	0.00	0.06	0.06	0.06	0.06	0.02	0.64	0.64	0.03	0.65	0.65
Sat Flow, veh/h	568	0	961	461	66	988	1753	3542	39	1753	3535	45
Grp Volume(v), veh/h	35	0	0	23	0	0	15	759	797	27	929	977
Grp Sat Flow(s),veh/h/ln	1529	0	0	1516	0	0	1753	1749	1832	1753	1749	1831
Q Serve(g_s), s	1.9	0.0	0.0	1.2	0.0	0.0	0.7	23.6	23.7	1.3	33.9	34.3
Cycle Q Clear(g_c), s	1.9	0.0	0.0	1.2	0.0	0.0	0.7	23.6	23.7	1.3	33.9	34.3
Prop In Lane	0.37		0.63	0.30		0.65	1.00		0.02	1.00		0.02
Lane Grp Cap(c), veh/h	98	0	0	87	0	0	31	1122	1176	48	1140	1193
V/C Ratio(X)	0.36	0.00	0.00	0.26	0.00	0.00	0.49	0.68	0.68	0.56	0.82	0.82
Avail Cap(c_a), veh/h	322	0	0	319	0	0	108	1434	1502	108	1434	1501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	0.0	0.0	38.8	0.0	0.0	41.9	9.8	9.8	41.3	11.1	11.2
Incr Delay (d2), s/veh	2.2	0.0	0.0	1.6	0.0	0.0	11.5	0.9	0.8	9.6	3.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.5	0.0	0.0	0.4	7.3	7.7	0.7	10.8	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	0.0	0.0	40.4	0.0	0.0	53.4	10.6	10.6	50.9	14.1	14.2
LnGrp LOS	D	A	A	D	A	A	D	B	B	D	B	B
Approach Vol, veh/h		35			23			1571			1933	
Approach Delay, s/veh		40.7			40.4			11.0			14.7	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.9	59.7		10.0	6.0	60.5		9.4
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.3	70.5		18.1	5.3	70.5		18.1
Max Q Clear Time (g_c+I1), s	3.3	25.7		3.9	2.7	36.3		3.2
Green Ext Time (p_c), s	0.0	15.4		0.1	0.0	19.8		0.0

Intersection Summary		
HCM 6th Ctrl Delay		13.5
HCM 6th LOS		B

HCM 6th Signalized Intersection Summary
3: US 101 (Broadway St) & Vigo St

Existing Plus Project Conditions - Mitigated
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	72	43	67	1325	1609	92
Future Volume (veh/h)	72	43	67	1325	1609	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	81	48	75	1489	1808	103
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	189	87	96	2738	2190	123
Arrive On Green	0.06	0.06	0.05	0.78	0.65	0.65
Sat Flow, veh/h	3428	1572	1767	3618	3478	191
Grp Volume(v), veh/h	81	48	75	1489	932	979
Grp Sat Flow(s),veh/h/ln	1714	1572	1767	1763	1763	1814
Q Serve(g_s), s	1.6	2.1	2.9	11.3	27.3	28.6
Cycle Q Clear(g_c), s	1.6	2.1	2.9	11.3	27.3	28.6
Prop In Lane	1.00	1.00	1.00			0.11
Lane Grp Cap(c), veh/h	189	87	96	2738	1140	1173
V/C Ratio(X)	0.43	0.55	0.78	0.54	0.82	0.83
Avail Cap(c_a), veh/h	894	410	379	2738	1140	1173
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	31.8	32.2	3.0	9.1	9.3
Incr Delay (d2), s/veh	0.6	2.0	5.1	0.8	6.5	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	1.3	1.5	8.8	9.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.1	33.8	37.3	3.8	15.7	16.4
LnGrp LOS	C	C	D	A	B	B
Approach Vol, veh/h	129			1564	1911	
Approach Delay, s/veh	32.7			5.4	16.0	
Approach LOS	C			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		60.0		9.0	9.0	51.0
Change Period (Y+Rc), s		6.4		* 5.2	* 5.2	6.4
Max Green Setting (Gmax), s		53.6		* 18	* 15	33.6
Max Q Clear Time (g_c+I1), s		13.3		4.1	4.9	30.6
Green Ext Time (p_c), s		15.1		0.1	0.0	2.7

Intersection Summary	
HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: US 101 (Broadway St) & Vigo St

Cumulative Plus Project Conditions - Mitigated
Mid-Day Peak Hr

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	130	90	123	1567	1676	156
Future Volume (veh/h)	130	90	123	1567	1676	156
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	134	93	127	1615	1728	161
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	296	136	160	2601	1873	172
Arrive On Green	0.09	0.09	0.09	0.75	0.58	0.58
Sat Flow, veh/h	3374	1547	1739	3561	3294	293
Grp Volume(v), veh/h	134	93	127	1615	922	967
Grp Sat Flow(s),veh/h/ln	1687	1547	1739	1735	1735	1762
Q Serve(g_s), s	2.7	4.2	5.1	15.6	33.7	36.1
Cycle Q Clear(g_c), s	2.7	4.2	5.1	15.6	33.7	36.1
Prop In Lane	1.00	1.00	1.00			0.17
Lane Grp Cap(c), veh/h	296	136	160	2601	1015	1030
V/C Ratio(X)	0.45	0.68	0.79	0.62	0.91	0.94
Avail Cap(c_a), veh/h	699	320	360	2601	1015	1030
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	31.6	31.8	4.2	13.1	13.6
Incr Delay (d2), s/veh	0.4	2.3	3.3	1.1	13.4	16.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.6	2.2	2.9	13.4	15.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.4	33.9	35.1	5.3	26.5	30.2
LnGrp LOS	C	C	D	A	C	C
Approach Vol, veh/h	227			1742	1889	
Approach Delay, s/veh	32.4			7.5	28.4	
Approach LOS	C			A	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		60.0		11.5	11.8	48.2
Change Period (Y+Rc), s		6.4		* 5.2	* 5.2	6.4
Max Green Setting (Gmax), s		53.6		* 15	* 15	33.6
Max Q Clear Time (g_c+I1), s		17.6		6.2	7.1	38.1
Green Ext Time (p_c), s		16.5		0.2	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	19.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Cumulative Plus Project Conditions - Mitigated
Mid-Day Peak Hr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	25	0	20	515	25	202	10	1462	0	150	0	1802
Future Volume (veh/h)	25	0	20	515	25	202	10	1462	0	150	0	1802
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach		No			No			No				No
Adj Sat Flow, veh/h/ln	1856	0	1856	1856	1856	1856	1856	1856	0		0	1856
Adj Flow Rate, veh/h	26	0	21	536	26	210	10	1523	0		0	1877
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		0.96	0.96
Percent Heavy Veh, %	3	0	3	3	3	3	3	3	0		0	3
Cap, veh/h	0	0	0	707	36	290	17	2308	0		0	2110
Arrive On Green	0.00	0.00	0.00	0.21	0.21	0.21	0.01	0.65	0.00		0.00	0.59
Sat Flow, veh/h		0		3428	174	1406	1767	3618	0		0	3699
Grp Volume(v), veh/h		0.0		536	0	236	10	1523	0		0	917
Grp Sat Flow(s),veh/h/ln				1714	0	1580	1767	1763	0		0	1763
Q Serve(g_s), s				12.8	0.0	12.1	0.5	22.8	0.0		0.0	39.1
Cycle Q Clear(g_c), s				12.8	0.0	12.1	0.5	22.8	0.0		0.0	39.1
Prop In Lane				1.00		0.89	1.00		0.00		0.00	
Lane Grp Cap(c), veh/h				707	0	326	17	2308	0		0	1031
V/C Ratio(X)				0.76	0.00	0.72	0.57	0.66	0.00		0.00	0.89
Avail Cap(c_a), veh/h				1006	0	464	81	2308	0		0	1095
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00		0.00	1.00
Uniform Delay (d), s/veh				32.5	0.0	32.2	42.9	9.1	0.0		0.0	15.6
Incr Delay (d2), s/veh				1.7	0.0	2.5	10.5	0.7	0.0		0.0	8.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln				5.3	0.0	4.7	0.3	6.9	0.0		0.0	15.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				34.2	0.0	34.7	53.4	9.8	0.0		0.0	24.5
LnGrp LOS				C	A	C	D	A	A		A	C
Approach Vol, veh/h					772			1533				1882
Approach Delay, s/veh					34.3			10.1				24.3
Approach LOS					C			B				C

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		63.3			6.1	57.3		23.6				
Change Period (Y+Rc), s		6.4			* 5.2	6.4		5.7				
Max Green Setting (Gmax), s		50.2			* 4	54.0		25.5				
Max Q Clear Time (g_c+I1), s		24.8			2.5	41.2		14.8				
Green Ext Time (p_c), s		12.8			0.0	9.7		2.2				

Intersection Summary	
HCM 6th Ctrl Delay	21.0
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: US 101 (Broadway St) & W Henderson St

Cumulative Plus Project Conditions - Mitigated
Mid-Day Peak Hr

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	5
Future Volume (veh/h)	5
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	0.97
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1856
Adj Flow Rate, veh/h	5
Peak Hour Factor	0.96
Percent Heavy Veh, %	3
Cap, veh/h	6
Arrive On Green	0.59
Sat Flow, veh/h	10
Grp Volume(v), veh/h	965
Grp Sat Flow(s),veh/h/ln	1853
Q Serve(g_s), s	39.2
Cycle Q Clear(g_c), s	39.2
Prop In Lane	0.01
Lane Grp Cap(c), veh/h	1084
V/C Ratio(X)	0.89
Avail Cap(c_a), veh/h	1151
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	15.6
Incr Delay (d2), s/veh	8.5
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	16.0
Unsig. Movement Delay, s/veh	
LnGrp Delay(d),s/veh	24.2
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 6th Signalized Intersection Summary
3: US 101 (Broadway St) & Vigo St

Cumulative Plus Project Conditions - Mitigated
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	77	46	69	1667	2020	99
Future Volume (veh/h)	77	46	69	1667	2020	99
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	50	75	1812	2196	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	201	92	97	2728	2198	107
Arrive On Green	0.06	0.06	0.06	0.77	0.64	0.64
Sat Flow, veh/h	3428	1572	1767	3618	3508	166
Grp Volume(v), veh/h	84	50	75	1812	1122	1182
Grp Sat Flow(s),veh/h/ln	1714	1572	1767	1763	1763	1819
Q Serve(g_s), s	1.6	2.1	2.9	16.6	43.3	44.6
Cycle Q Clear(g_c), s	1.6	2.1	2.9	16.6	43.3	44.6
Prop In Lane	1.00	1.00	1.00			0.09
Lane Grp Cap(c), veh/h	201	92	97	2728	1135	1171
V/C Ratio(X)	0.42	0.54	0.77	0.66	0.99	1.01
Avail Cap(c_a), veh/h	732	336	378	2728	1135	1171
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	31.7	32.3	3.6	12.1	12.3
Incr Delay (d2), s/veh	1.4	4.8	12.1	1.3	24.3	28.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.0	1.5	2.4	18.5	20.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.8	36.5	44.4	4.9	36.4	40.9
LnGrp LOS	C	D	D	A	D	F
Approach Vol, veh/h	134			1887	2304	
Approach Delay, s/veh	34.2			6.5	38.7	
Approach LOS	C			A	D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		60.0		9.3	9.0	51.0
Change Period (Y+Rc), s		6.4		* 5.2	* 5.2	6.4
Max Green Setting (Gmax), s		53.6		* 15	* 15	33.6
Max Q Clear Time (g_c+I1), s		18.6		4.1	4.9	46.6
Green Ext Time (p_c), s		19.3		0.3	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis Cumulative Plus Project Conditions - Mitigated
4: US 101 (Broadway St) & W Henderson St

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	20	0	25	660	15	152	10	1564	0	77	0	2094
Future Volume (vph)	20	0	25	660	15	152	10	1564	0	77	0	2094
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2		4.2	4.7	4.7		4.2	5.4		4.5		5.4
Lane Util. Factor	1.00		1.00	0.97	1.00		1.00	0.95		1.00		0.95
Frpb, ped/bikes	1.00		0.85	1.00	0.99		1.00	1.00		1.00		1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00		1.00
Frt	1.00		0.85	1.00	0.86		1.00	1.00		1.00		1.00
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1736		1328	3367	1556		1736	3471		1770		3470
Flt Permitted	0.95		1.00	0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1736		1328	3367	1556		1736	3471		1770		3470
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93
Adj. Flow (vph)	22	0	27	710	16	163	11	1682	0	84	0	2252
RTOR Reduction (vph)	0	0	26	0	44	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	0	1	710	135	0	11	1682	0	84	0	2257
Confl. Peds. (#/hr)			12			2						
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	2%	4%	4%
Turn Type	Prot		Perm	Split	NA		Prot	NA		Prot		NA
Protected Phases	4			8	8		5	2		1		6
Permitted Phases			4									
Actuated Green, G (s)	3.9		3.9	30.6	30.6		1.9	83.8		10.0		92.2
Effective Green, g (s)	3.9		3.9	30.6	30.6		1.9	83.8		10.0		92.2
Actuated g/C Ratio	0.03		0.03	0.21	0.21		0.01	0.57		0.07		0.63
Clearance Time (s)	4.2		4.2	4.7	4.7		4.2	5.4		4.5		5.4
Vehicle Extension (s)	1.5		1.5	2.5	2.5		1.5	3.0		3.0		3.0
Lane Grp Cap (vph)	46		35	700	323		22	1977		120		2174
v/s Ratio Prot	c0.01			c0.21	0.09		0.01	0.48		c0.05		c0.65
v/s Ratio Perm			0.00									
v/c Ratio	0.48		0.02	1.01	0.42		0.50	0.85		0.70		1.04
Uniform Delay, d1	70.6		69.7	58.2	50.5		72.1	26.4		67.1		27.4
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	2.8		0.1	37.6	0.6		6.4	3.7		16.4		30.1
Delay (s)	73.4		69.8	95.9	51.1		78.5	30.2		83.4		57.5
Level of Service	E		E	F	D		E	C		F		E
Approach Delay (s)		71.4			86.9			30.5				58.4
Approach LOS		E			F			C				E

Intersection Summary			
HCM 2000 Control Delay	54.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	147.1	Sum of lost time (s)	18.8
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Cumulative Plus Project Conditions - Mitigated
4: US 101 (Broadway St) & W Henderson St

PM Peak Hour

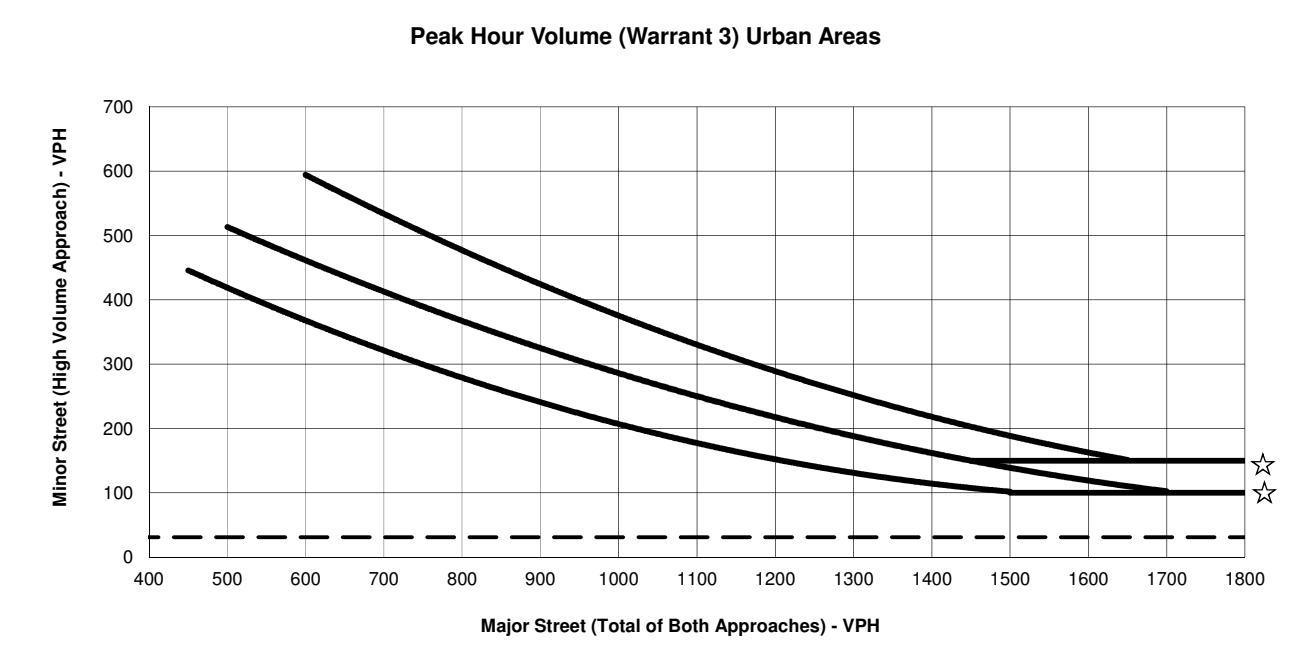
Movement	SBR
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Confl. Bikes (#/hr)	3
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Appendix C
Signal Warrant Analysis Worksheets

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

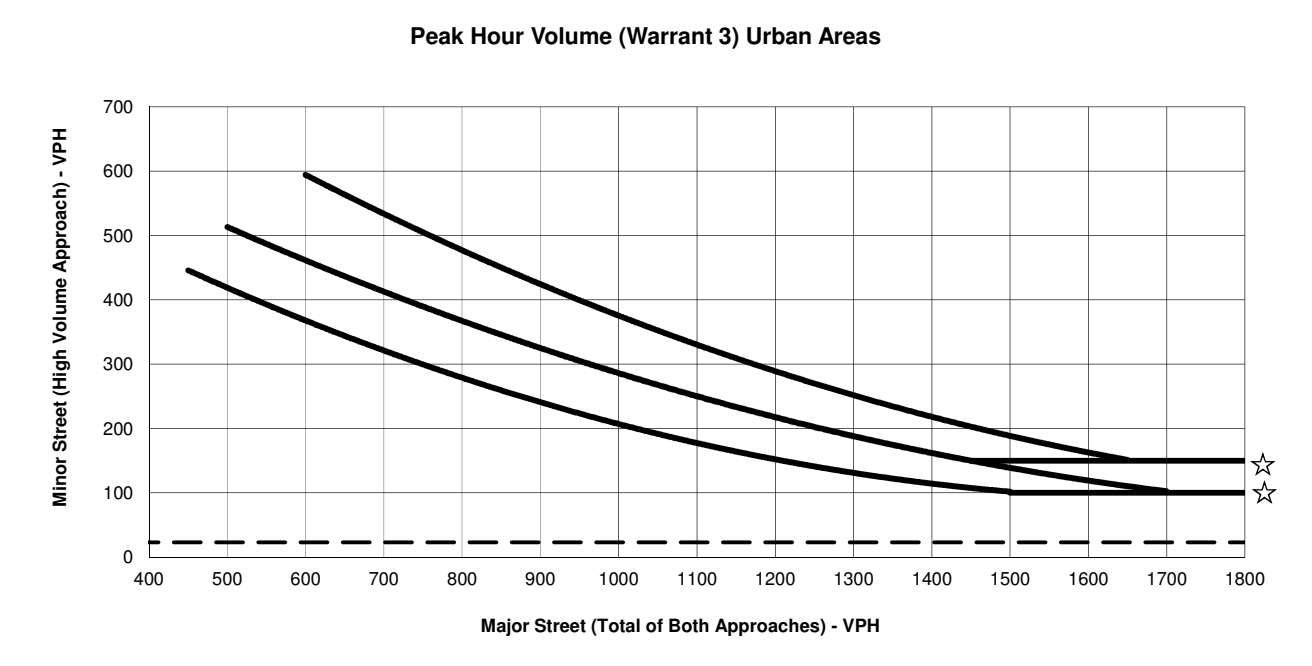
Existing PM

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Hawthorne Street	1

Major St. Volume:	3049
Minor St. Volume:	31
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

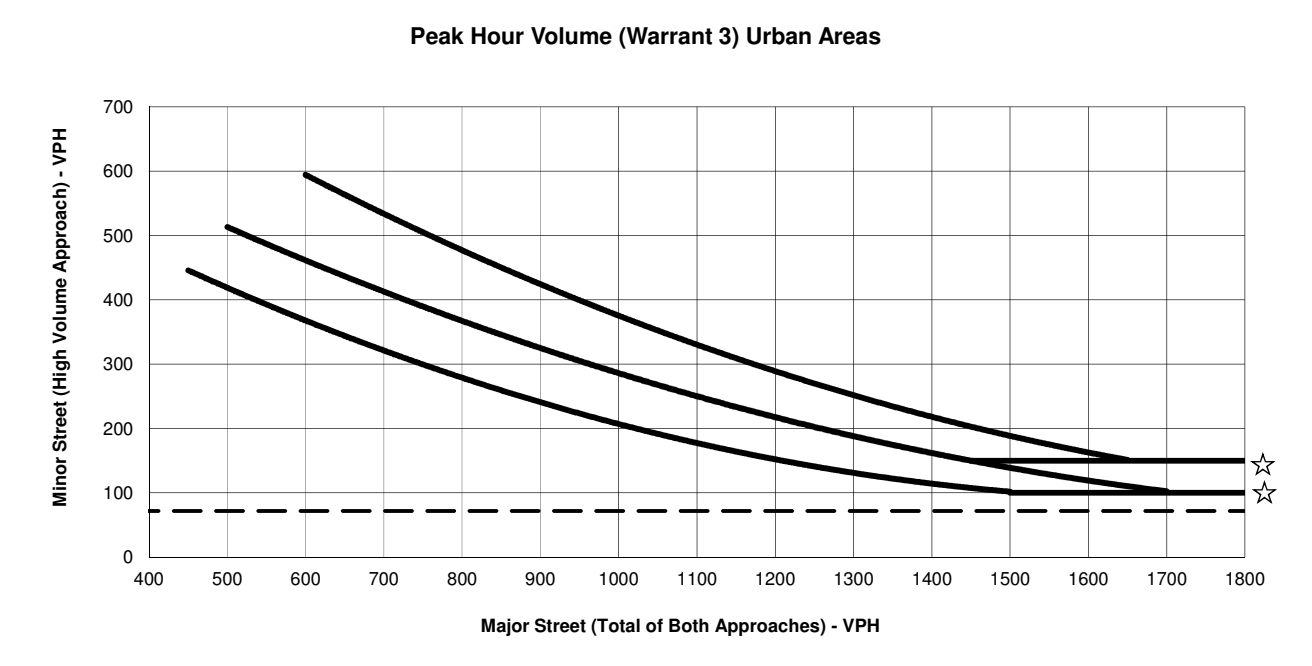
Existing PM

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Vigo Street	1

Major St. Volume:	3024
Minor St. Volume:	23
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

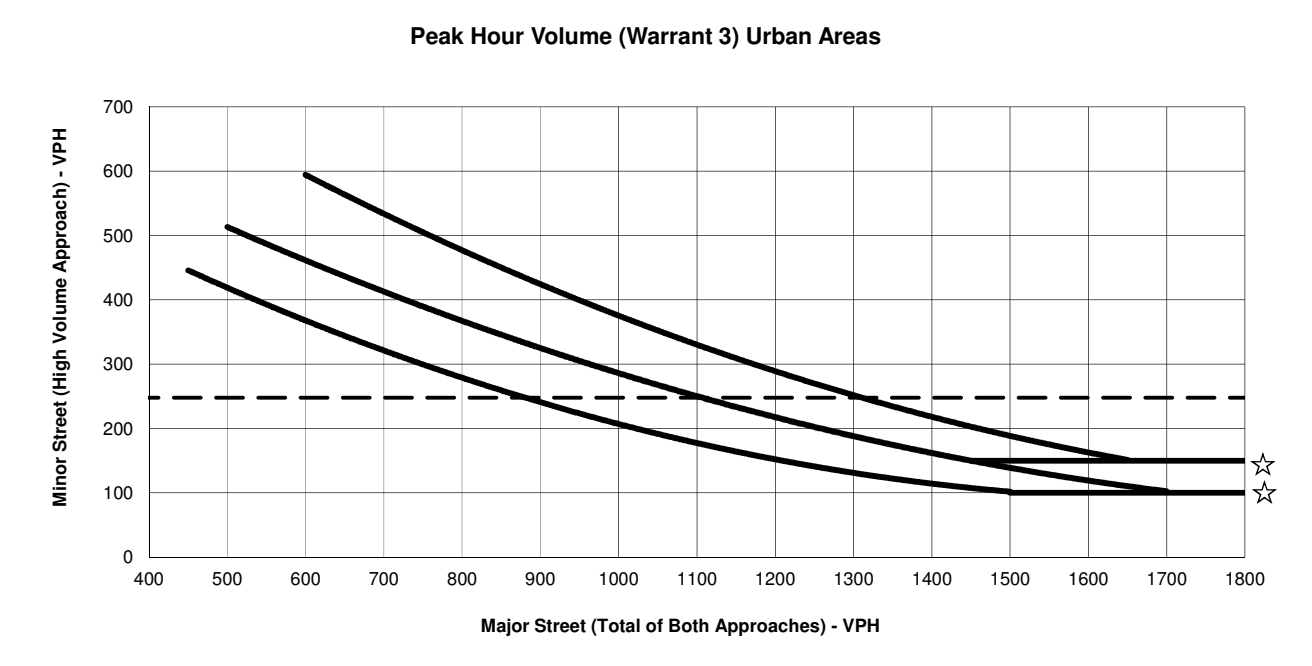
E+P Mid-Day

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Hawthorne Street	1

Major St. Volume:	2835
Minor St. Volume:	72
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

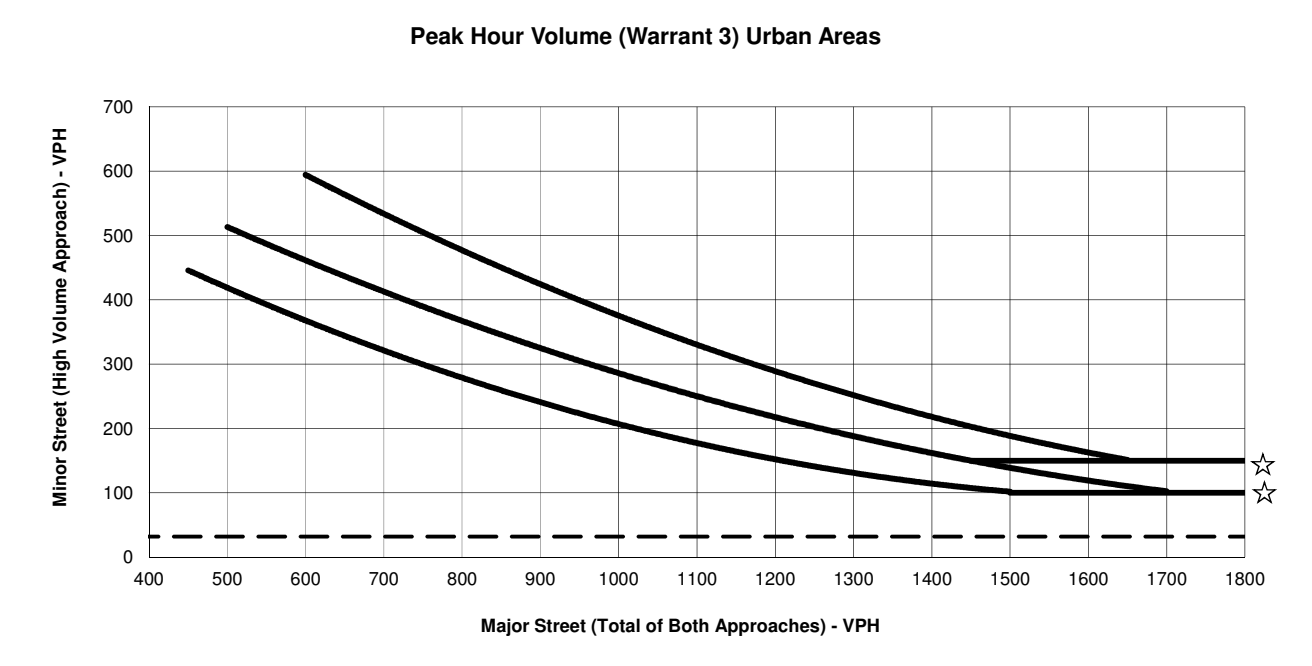
E+P Mid-Day

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Vigo Street	1

Major St. Volume:	2830
Minor St. Volume:	248
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

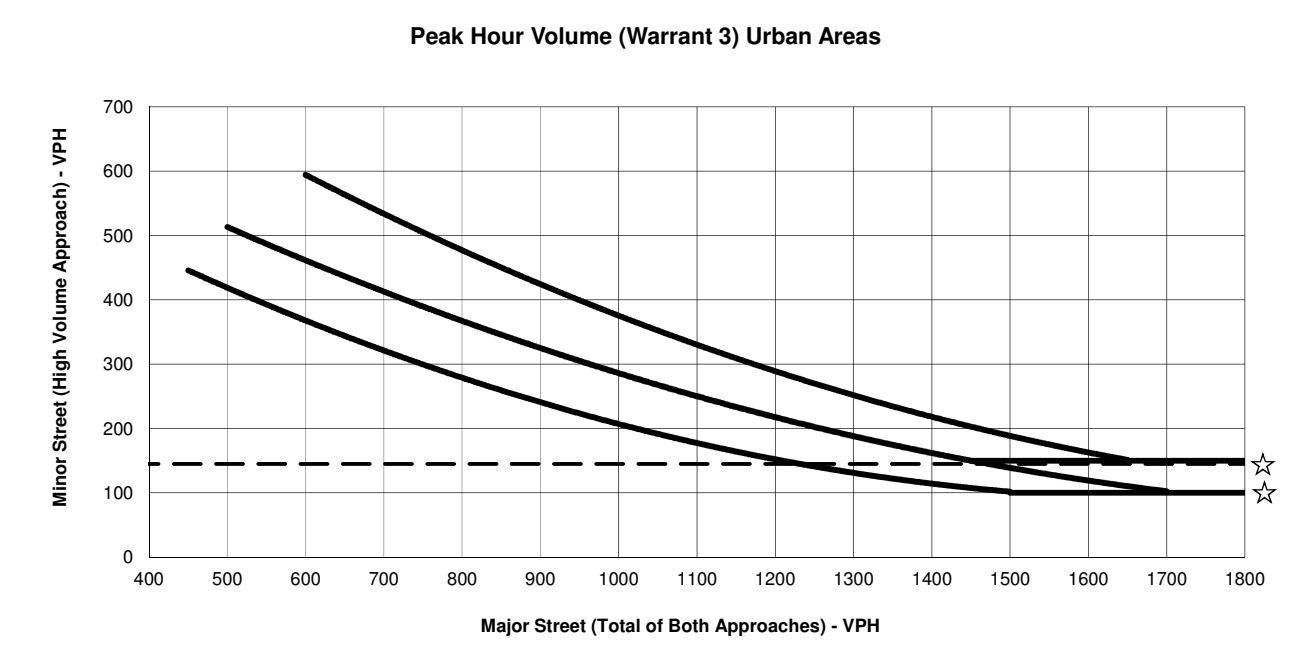
E+P PM

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Hawthorne Street	1

Major St. Volume:	3118
Minor St. Volume:	32
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

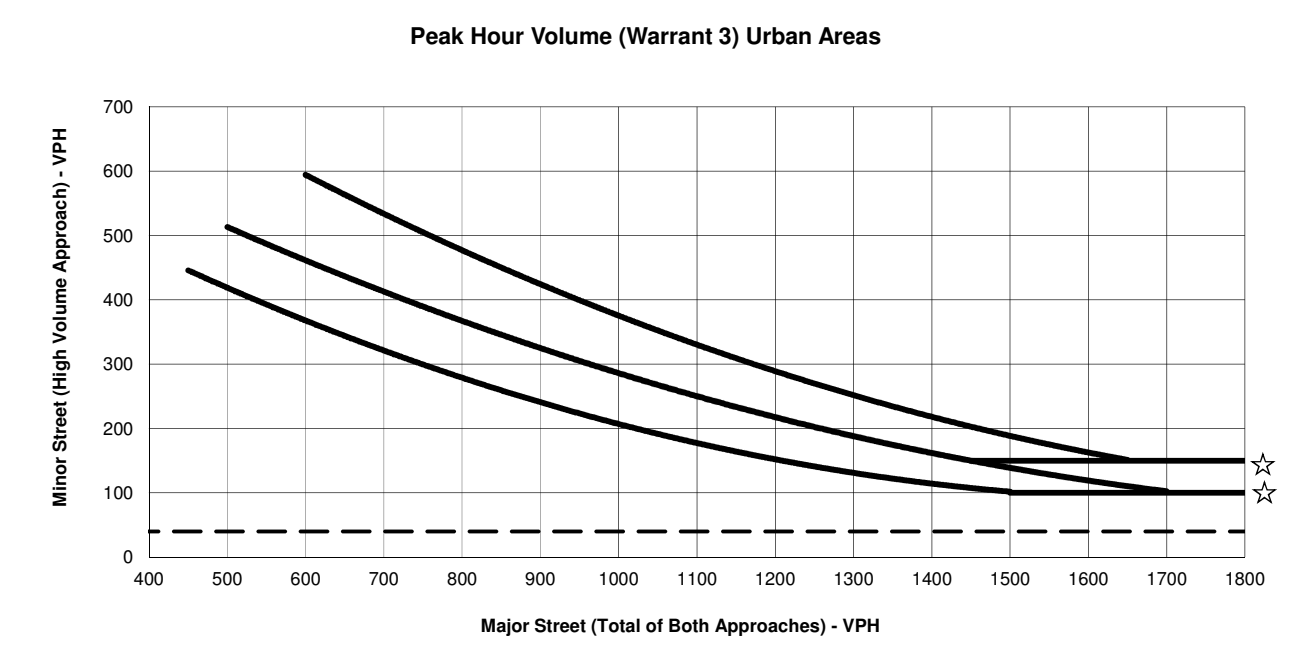
E+P PM

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Vigo Street	1

Major St. Volume:	3093
Minor St. Volume:	145
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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Cumulative Mid-Day

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Vigo Street	1

Major St. Volume:	3400
Minor St. Volume:	40
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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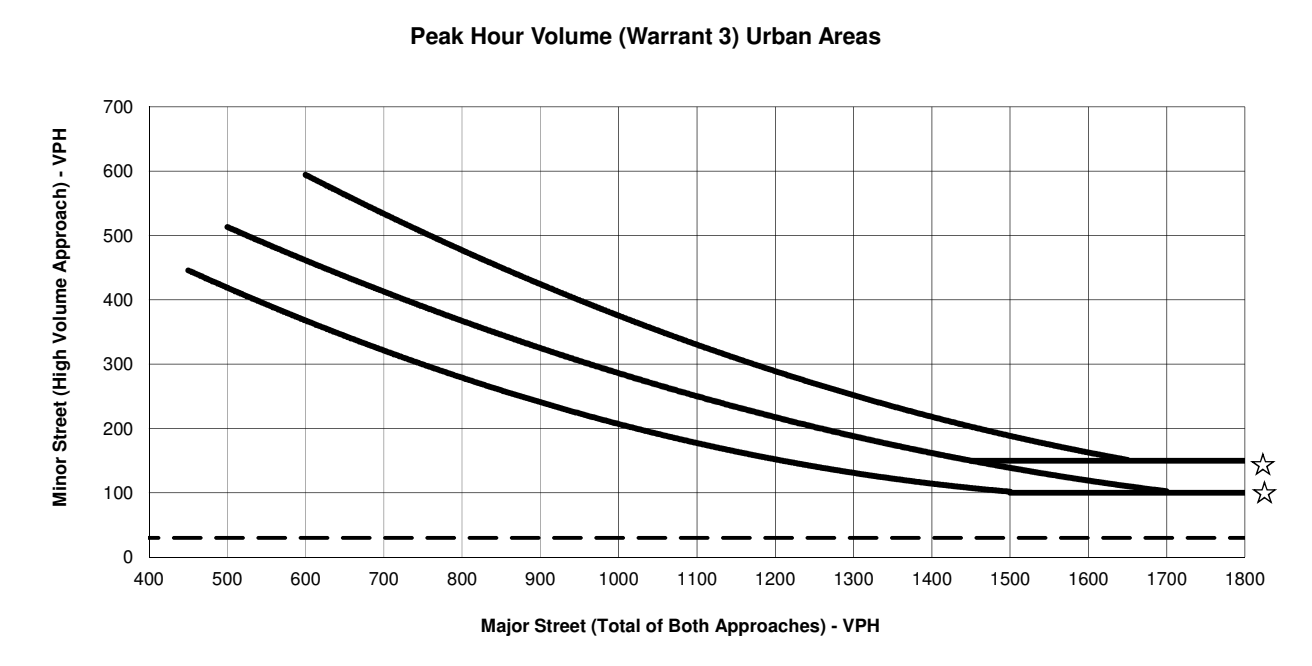

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Cumulative PM

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Vigo Street	1

Major St. Volume:	3785
Minor St. Volume:	30
Warrant Met?:	No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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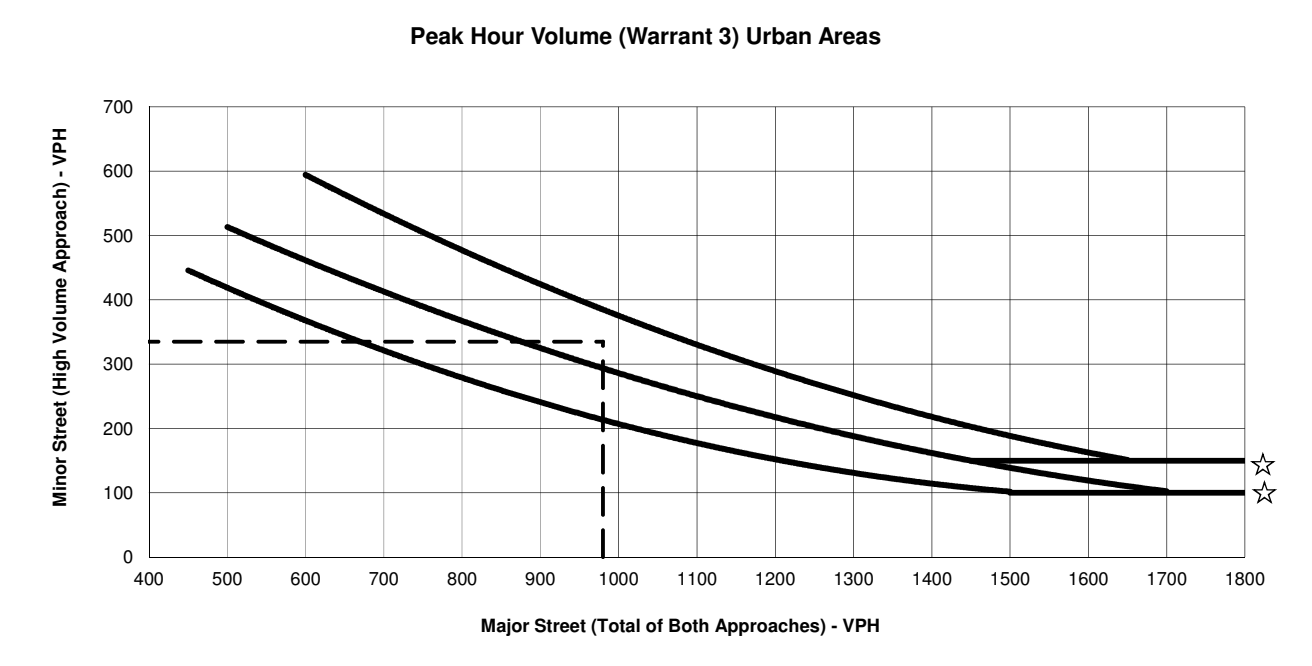

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Cumulative PM

		Number of Lanes
Major Approach	W Henderson St	2
Minor Approach	Fairfield St	1

Major St. Volume:	980
Minor St. Volume:	335
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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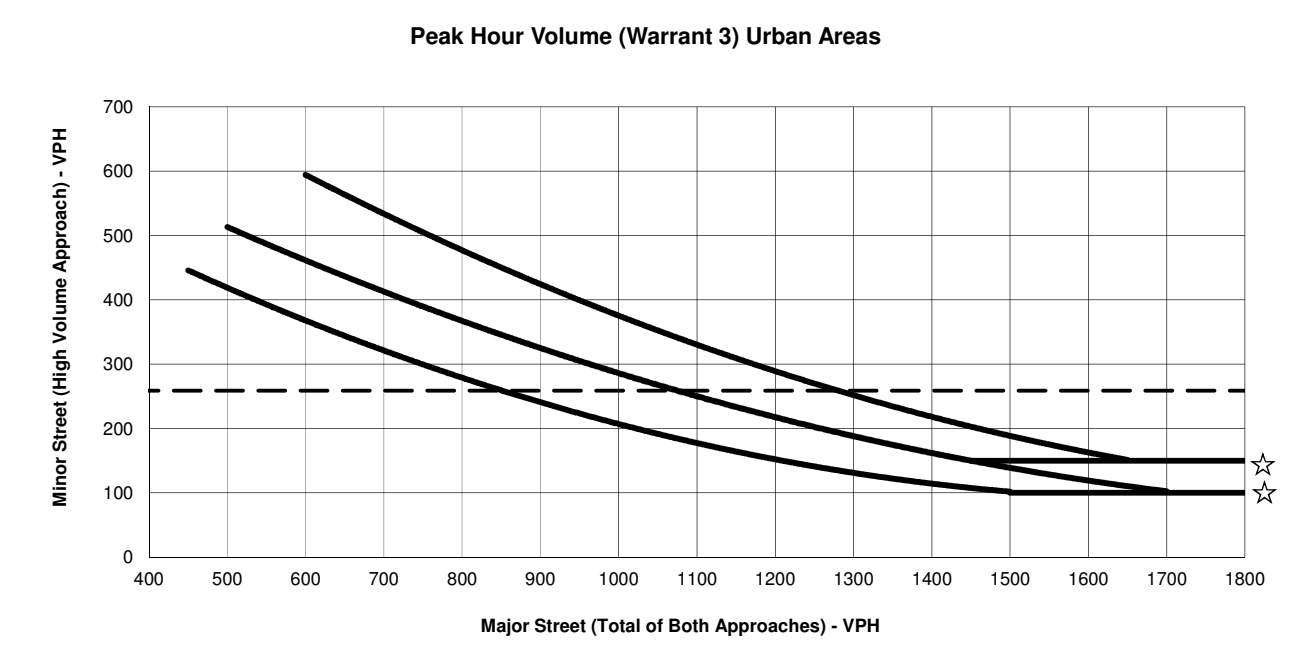

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C+P Mid-Day

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Vigo Street	1

Major St. Volume:	3522
Minor St. Volume:	259
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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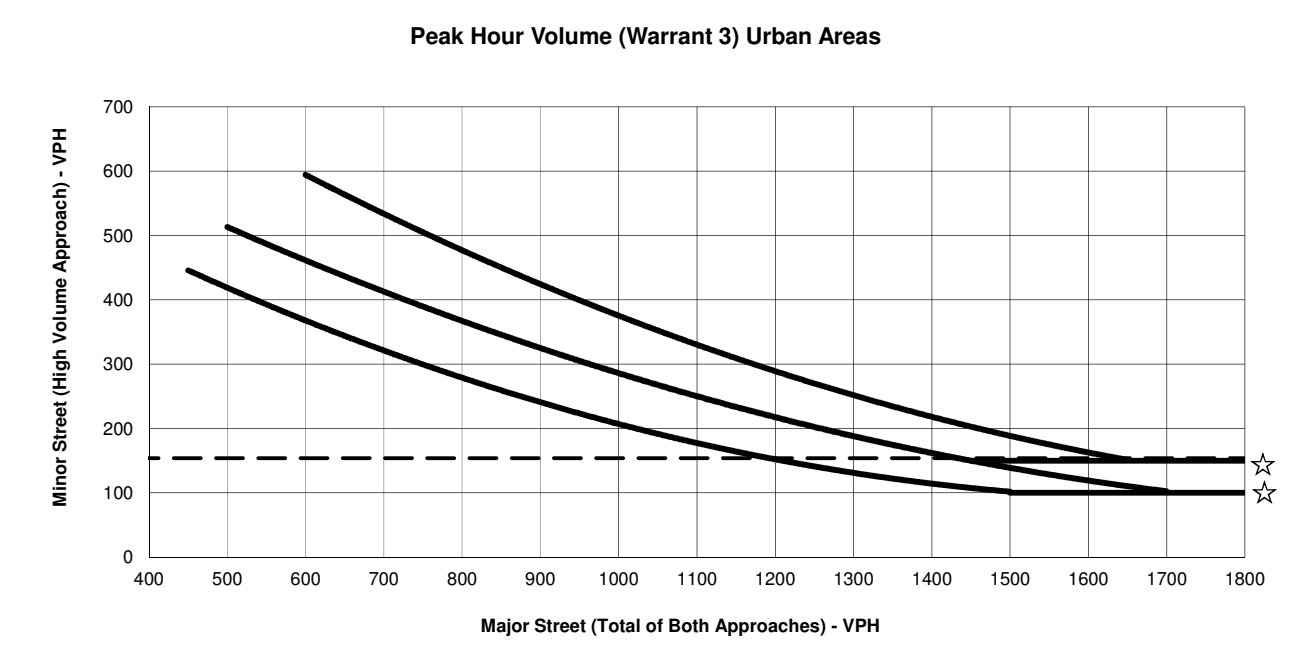

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C+P PM

		Number of Lanes
Major Approach	Broadway Street	2
Minor Approach	Vigo Street	1

Major St. Volume:	3855
Minor St. Volume:	154
Warrant Met?:	Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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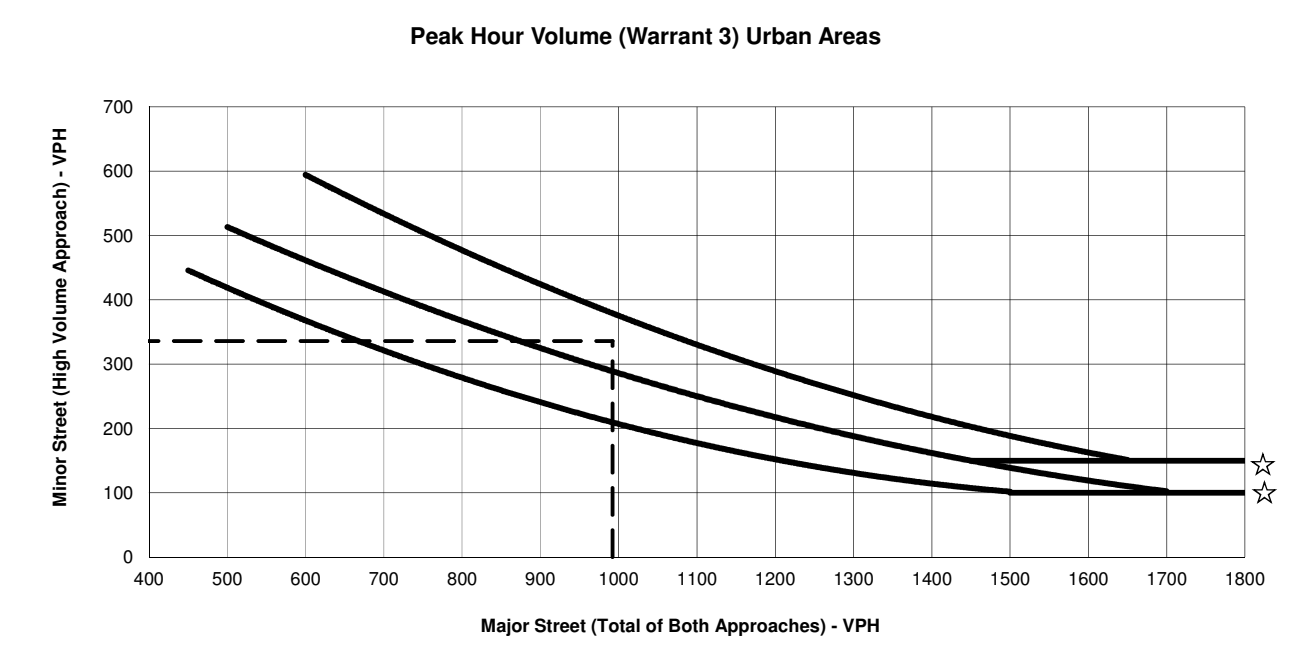

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C+P PM

		Number of Lanes
Major Approach	W Henderson St	2
Minor Approach	Fairfield St	1

Major St. Volume:	992
Minor St. Volume:	336
Warrant Met?:	Yes

Appendix D
Trip Rates Memorandum
(November 22, 2016)

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: CHARLIE FIELDER
JANA HOLLIFIELD
MATT BRADY
MARK SUCHANEK

Date: February 3, 2014

File: Growth Factors

From: BRAD METTAM
Deputy District Director,
Planning and Local Assistance

Subject: 2014 Growth Factors

Attached are the 2014 District 1 growth factor summary, the 2014 District Growth Factor Map, and a "Using D1 Growth Factors" tutorial.

Prior to 1984, Caltrans District 1 projected future traffic volumes based solely on historical growth. Future volumes were calculated using an annual percent increase that was derived from historical traffic volumes. We found that this method produced acceptable results in the short to mid-term, but due to compounding, long-range predictions (20 years or more) tended to be overestimated.

In 1984, in order to eliminate that long-range distortion noted above, we began calculating growth factors as a 20-year straight-line determinant. For example, a segment of highway with a growth factor of 1.4 is predicted to have a 40% increase in traffic over the next 20-years. Likewise, it is predicted to have a 20% increase over 10 years.

Historically, District staff has developed growth factors based on both projected travel trends and historical growth from two data sources—the "California Motor Vehicle Stock Travel and Fuel Forecast" (CMVSTAFF) and historical Average Vehicle Mile Traveled (AVMT) comparisons from "Traffic Volumes on the California State Highway System." Since CMVSTAFF was not available for the 2014 growth factor update, county growth factor targets were developed based on California Air Resources Board traffic growth projections and historic traffic growth data.

Our growth factors are applied over highway segments that were determined using observed conditions; these segments vary in length, but they are not longer than fifty miles. Traffic volumes over segments are based on a calculated weighted average of

volumes (Annual Average Daily Traffic) for the entire segment. While actual growth at the local level can vary considerably, we are looking at overall growth over the long-term. If more specific data or information are available for a particular location (actual counts, planned growth, etc.) it may be advisable to calculate a location-specific rate. However, for the purposes of facility design (20-year design-life) our generalized segment growth factors are appropriate. It should be noted that our growth factors forecast traffic growth only for the mainline (State Routes); local streets should be examined separately.

District planning staff reviews growth factors every two years, and typically revise them every two to four years. Growth factors were not updated for several years following 2006, since MVSTAFF data supported higher growth rates at a time when traffic counts were generally level or declining. The most recent MVSTAFF has been removed from the Division of Transportation Planning, Office of Transportation Forecasting and Analysis website, and they recommended using the use of the Air Resources Board EMFAC database as a substitute. Therefore, we based our 20-year District vehicle miles of travel target on ARB data. District staff would prefer to use county travel demand models to project traffic growth, or the MVSTAFF to develop growth factor targets, and we hope to do so in the future. However, neither of these data sources is currently supportable.

If you have any questions regarding the growth factors, please call Rex Jackman at (707) 445-6412 or Chris Dosch at (707) 441-4542.

Attachments:
2014 Growth Factor Summary
2014 Growth Factor Map
Using District 1 Growth Factors Tutorial

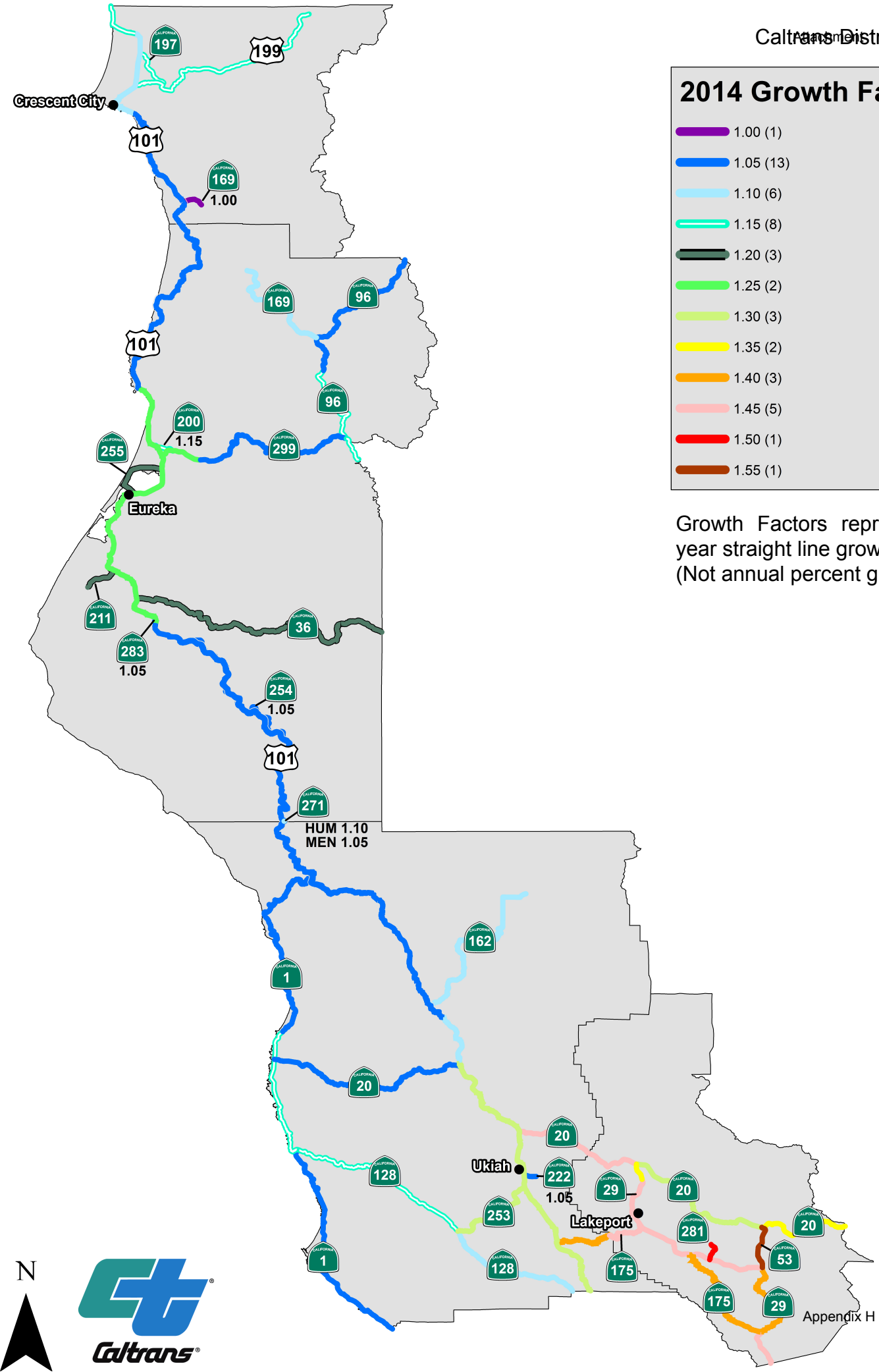
c: TROY ARSENEAU
DAVID MORGAN
JOHN CARSON
RALPH MARTINELLI
GARRY BANDUCCI
SANDRA ROSAS
STEVE HUGHES
SUSAN ZANCHI
ROYAL McCARTHY
REX JACKMAN

Caltrans District 1

2014 Growth Factor Map

- 1.00 (1)
- 1.05 (13)
- 1.10 (6)
- 1.15 (8)
- 1.20 (3)
- 1.25 (2)
- 1.30 (3)
- 1.35 (2)
- 1.40 (3)
- 1.45 (5)
- 1.50 (1)
- 1.55 (1)

Growth Factors represent a 20 year straight line growth pattern. (Not annual percent growth)



DISTRICT 1 - GROWTH FACTOR SUMMARY

20 YEAR GROWTH FACTORS

SEGMENT	2/2014 G.F.
MEN-1-0.00/40.27	1.05
MEN-1-40.27/64.86	1.15
MEN-1-64.86/105.57	1.05
MEN-20-0.00/33.16	1.05
MEN-20-33.22/44.11	1.45
LAK-20-0.00/8.34	1.45
LAK-20-8.34/31.62	1.30
LAK-20-31.62/46.48	1.35
LAK-29-0.00/5.81	1.45
LAK-29-5.81/20.31	1.40
LAK-29-20.31/48.40	1.45
LAK-29-48.40/52.54	1.35
HUM-36-0.00/45.68	1.20
LAK-53-0.00/7.45	1.55
HUM-96-0.00/16.00	1.15
HUM-96-16.00/44.98	1.05
MEN-101-0.10/47.27	1.30
MEN-101-47.27/55.90	1.10
MEN-101-55.90/104.15	1.05
HUM-101-0.00/51.84	1.05
HUM-101-51.84/100.71	1.25
HUM-101-100.71/137.14	1.05
DN-101-0.00/23.85	1.05
DN-101-23.85/39.98	1.10
DN-101-39.98/46.49	1.15
MEN-128-0.00/29.58	1.15
MEN-128-29.58/50.90	1.10
MEN-162-0.00/34.05	1.10
DN-169-0.0/3.52	1.00
HUM-169-13.20/33.84	1.10
MEN-175-0.00/9.85	1.40
LAK-175-0.00/8.19	1.45
LAK-175-8.25/28.04	1.40
DN-197-0.00/7.08	1.15
DN-199-0.51/36.41	1.15
HUM-200-0.00/2.68	1.15
HUM-211-73.20/79.16	1.20
MEN-222-0.00/2.15	1.05
MEN-253-0.00/17.18	1.30
HUM-254-0.00/46.53	1.05
HUM-255-0.0/8.80	1.20
MEN-271-0.0/22.72	1.05
HUM-271-0.00/0.31	1.10
LAK-281-14.00/17.00	1.50
HUM-283-0.00/0.36	1.05
HUM-299-0.00/5.93	1.25
HUM-299-5.93/38.83	1.05
HUM-299-38.83/43.04	1.15
DISTRICT GROWTH FACTOR (Weighted Average)	1.24

Using District 1 Growth Factors

- To project volumes **<u>20 years</u>** into the future, multiply the base year traffic volume by the growth factor (GF).

  Formula: (GF)*(Base Year Volume) = Projected Volume

  Example: The base year volume (2012) is 1500 AADT. The 20-year growth factor for that segment of highway is 1.3. What is the 2032 volume?

  (1.3)*(1500) = 1950 The projected 2032 traffic volume (AADT) for this segment is 1950.

- To project volumes **<u>Less than or greater than 20 years</u>** into the future, use the following formula:

  Formula: $[1 + \frac{(\mathrm{GF}-1)*(\#\text{ of years into future})}{20}] * (\text{starting volume}) = \text{Projected Volume}$

  Example: The Base year volume in 2012 is 700 AADT. The 20- year growth factor is 1.4.

  A) What is the volume in 27 years?

  $\left[1 + \left(\frac{(1.4-1)*(27)}{20}\right)\right] * (700) = 1078$ The projected volume in 2039 is 1078.

  B) What is the volume in 7 years?

  $\left[1 + \left(\frac{(1.4-1)*(7)}{20}\right)\right] * (700) = 798$ The projected volume in 2019 is 798.

2616 Broadway Redevelopment Project
Initial Study/Proposed Mitigated Negative Declaration Response to Comments and Errata

The 2616 Broadway Redevelopment Project (project) is subject to the requirements of the California Environmental Quality Act (CEQA). The City of Eureka (City) is the CEQA Lead Agency. An Initial Study/Proposed Mitigated Negative Declaration (IS/Proposed MND) was prepared for the project to satisfy the requirements of CEQA (Public Resources Code (PRC), Div. 13, Sec 21000-21177) and the CEQA Guidelines (California Code of Regulations, Title 14, Sec 15000-15387).

The IS/Proposed MND was circulated for greater than 30 days, from October 20, 2018 to November 23, 2018, to allow the public and agencies the opportunity to review and comment on the document. In accordance with the requirements of CEQA, the City provided a notice of intent to adopt a mitigated negative declaration to the public, responsible agencies, and the Humboldt County Clerk. The City published a notice in the Times Standard, a newspaper of general circulation in the area affected by the proposed project. A notice was also posted at the Humboldt County Clerk's office for a period of at least 30 days. The IS/Proposed MND was submitted to the State Clearinghouse for review by state agencies, and to responsible and trustee agencies with jurisdiction by law over resources affected by the project. The IS/Proposed MND was made available for public review at the City of Eureka Development Services Department in Eureka City Hall.

Comments on the IS/MND were received by the City during the 30-day comment period. Comments were received from the following entities during the 30-day comment period:

1. Comment Letter A – United States Army Corps of Engineers
2. Comment Letter B – Native American Heritage Commission
3. Comment Letter C – California Department of Transportation
4. Comment Letter D – Humboldt Baykeeper

The City has considered the comments received during the comment period, as required prior to adopting a mitigated negative declaration. While CEQA does not require Lead Agencies to respond to comments on an IS/Proposed MND received, the City has elected to respond to all comments received. Responses to the comments received are included herein.

The individual comments from the letters received by the City in response to the circulation of the IS/Proposed MND are responded to herein. The City's responses addressing each of the specific comments follow the individually numbered comments. The City responses are numbered sequentially to correspond to the numerated comments in the attached letters. The letters received by the City from commenting agencies and individuals are included herein as Attachments A to D.

The comments resulted in minor modifications to the text of the IS/Proposed MND to clarify project details and impacts. The comments did not result in a substantial revision of the mitigated negative declaration. No circumstances were identified that would require the recirculation of the mitigated negative declaration.

An errata has been developed to address the minor text modifications to the IS/Proposed MND. The errata is provided herein in Section 5.

1. Comment Letter A: United States Army Corps of Engineers

The City received a comment email (Comment Letter A) from Holly Costa with the United States Army Corps of Engineers (USACE) on October 23, 2018. The USACE letter is included herein as Attachment A.

1.1 Response to Comment A-1

The Project will avoid all adjacent wetlands completely and will not impact any USACE jurisdictional (three-parameter) wetlands. A wetland delineation was conducted at the Project site and the findings of that delineation compiled in the Wetland Delineation and Biological Resources Report included as Appendix C to the IS/Proposed MND. As noted in Section 2.5.1 of the IS/Proposed MND, the Project design includes a wetlands setback (buffer between the Project and the wetland boundaries) of 50 feet, or greater, from both the one-parameter and three-parameter wetlands.

2. Comment Letter B: Native American Heritage Commission

The City received a comment email (Comment Letter B) from Gayle Totton with the California Native American Heritage Commission (NAHC) on October 31, 2018. The individual comments from the NAHC letter have been numbered for reference. Responses to the numerated NAHC comments are provided below. The NAHC letter is included herein as Attachment B.

2.1.1 Response to Comment B-1

This is an introductory paragraph noting that the NAHC has completed a limited review of the IS/Proposed MND and introduces four specific comments (Comments B-2 through B-5, below). Comment noted.

2.1.2 Response to Comment B-2

The City appreciates the assistance of the NAHC in providing the reference for the best practices for consultation outreach. As recognized in Comment B-2, the City is in compliance with the State requirements for environmental consultation pursuant to AB-52. As described in Section 4.17 of the IS/MND, and as acknowledged by Comment B-2, the City initiated AB 52 consultation with Bear River Band of the Rohnerville Rancheria, Blue Lake Rancheria and the Wiyot Tribe at Table Bluff Reservation via an email notification with a Project Description and vicinity map on June 29, 2018. No written response from any Tribe was received by the City by the end of the 30-day response period on July 30, 2018. Contrary to the statement in Comment B-2, the City made systematic efforts to solicit consultation from the Tribes using the mutually-agreed upon protocols for such communication.

The City sent consultation requests to the above-named Tribes on two separate occasions. The first consultation communication from the City was provided on June 29, 2018 and the second on October 8, 2018. In addition to the City's requests for Tribal input, the City provided a copy of the IS/Proposed MND to each Tribe on October 19, 2018. No response from any Tribe was received by the close of the local IS/Proposed MND comment period on November 23, 2018. The City considers the efforts made to solicit consultation from the Tribes to be in good faith and in compliance with AB-52, as such efforts were made

using the appropriate and customary protocol for Tribal consultation communication mutually-accepted by the City and the Tribes.

2.1.3 Response to Comment B-3

Comment B-3 references a mitigation measure ("Arch 3") that is not included in the Project IS/Proposed MND. Mitigation Measure CR-3, included under Section 4.5 Cultural Resources in the IS/Proposed MND, includes reference to PRC 5097.98, but does not include specific reference to the "Most Likely Descendant timeline." Mitigation Measure CR-3 states that the NAHC shall be "contacted by the Coroner to determine appropriate treatment of the remains pursuant to PRC 5097.98."

As specified in PRC 5097.98, whenever the NAHC "receives notification of a discovery of Native American human remains from a county coroner pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code, it shall immediately notify those persons it believes to be most likely descended from the deceased Native American. The descendants may, with the permission of the owner of the land, or his or her authorized representative, inspect the site of the discovery of the Native American human remains and may recommend to the owner or the person responsible for the excavation work means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. The descendants shall complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site."

As Mitigation Measure CR-3 states that the NAHC will be contacted per PRC 5097.98, thereby incorporating the descendant inspection timeline by reference, the City believes that no update to Mitigation Measure CR-3 is necessary.

2.1.4 Response to Comment B-4

As described in Section 4.5(b) of the IS/Proposed MND, an archaeological records search was completed for the Project site by the Northwest Information Center (NWIC) on June 11, 2018. As the NWIC record search was prepared only four months prior to the public comment circulation of the IS/Proposed MND, the City understands the report to be current (not out of date) and acceptable for use. In addition to the NWIC record search reference in Section 4.5(b), the document is subsequently referenced in Section 4.17 of the IS/Proposed MND. The reference to the NWIC record search in Section 4.17 contains a citation error, incorrectly noting the record search date as 2017. The correct NWIC record search date is 2018, thus the reference in Section 4.17, page 4-52 of the IS/Proposed MND will be corrected to read "(NWIC 2018)." This correction is addressed in the errata located in Section 5.

2.1.5 Response to Comment B-5

As described in Response to Comment B-2, the City initiated AB 52 consultation with the Bear River Band of the Rohnerville Rancheria, Blue Lake Rancheria and the Wiyot Tribe at Table Bluff Reservation on June 29, 2018. The City subsequently sent consultation correspondence to each Tribe on October 8, 2018. In addition to the City's multiple requests for Tribal input, the City provided a copy of the IS/Proposed MND to each Tribe on October 19, 2018. As stated in Section 4.17 (page 4-52), although formal consultation was offered by the City for the proposed Project, correspondence with local Native American Tribes did not result in any expressed concerns regarding Tribal cultural resources.

The Project site consists of a developed commercial site, and has existed as such for approximately 90 years. As stated in the IS/Proposed MND Section 4.5(b), the Project site is currently topped by up to four feet of fill. Up to four feet of additional fill will be distributed over the existing fill over much of the Project site. As much of the Project work will be limited to within four feet the first layer of soil (fill), it is unlikely that any Tribal Cultural Resources are located within an area of potential impact.

The City made all reasonable efforts in good-faith to solicit consultation from the Tribes using the mutually-accepted protocol for Tribal consultation communication; however, no written response from any Tribe was received by the City by the end of the 30-day response period. Given that no information regarding the presence of Tribal cultural resources was provided to the City and the nature of the Project work is anticipated to result in minimal disturbance of native soil beneath the base layer of fill currently overlaying the commercial property, there is no reasonably foreseeable impact on Tribal cultural resources as a result of the Project. This information is also addressed in the errata located in Section 5.

3. Comment Letter C: California Department of Transportation

The City received a comment letter via email (Comment Letter C) from Jesse Robertson with the California Department of Transportation (Caltrans) on November 16, 2018. The Caltrans letter provided comments on both the IS/Proposed MND and the draft Transportation Impact Study (TIS) prepared for the project. The individual comments from the Caltrans letter have been numbered for reference. Responses to the numerated Caltrans comments are provided below. The below responses identify which comments have resulted in changes to the TIS. The Caltrans comment letter is included herein as Attachment C.

3.1 Response to Comment C-1

This is an introductory paragraph noting that Caltrans has completed a peer review of the TIS completed for the Project and determined that the Project would have “significant impacts to the transportation system if unmitigated.” No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.2 Response to Comment C-2

Comment C-2 is a summary of the unmitigated traffic delay impact at Vigo Street and Broadway (noted as “Impact #1”). Caltrans states that the projected delay for left-turning vehicles could “reasonably be expected” to result in higher collision rate for the Vigo/Broadway intersection.

The TIS identified this impact at Vigo/Broadway and recommended mitigation to address the delay. The TIS proposed installation of a traffic signal as mitigation to address the projected delay at Vigo/Broadway and modeled the projected reduction in delay.

With the installation of a traffic signal, the LOS at the Vigo/Broadway intersection is projected operate acceptably for the weekday Mid-day and PM peak hours. As this impact and associated mitigation is already addressed in the TIS, no further changes to the TIS or model are proposed.

3.3 Response to Comment C-3

Comment C-3 is a summary of the pre-project (existing) traffic queuing impact at Henderson Street and Broadway that contributes to delay at Vigo Street (noted as “Impact #2”). Caltrans states that the queues at southbound Henderson Street have been observed to extend through the Vigo Street intersection under current conditions and these queues can limit some or all of the movement in and out of the Project site.

The TIS identified the above-noted queueing impact in Section 7.1. With implementation of the proposed mitigation described in Section 8.6.1 of the TIS, turning movements will be performed more safely and efficiently and the Vigo/Broadway intersection will operate acceptably as noted in TIS Section 8.7 (Table 8.4). As this impact and associated mitigation are already addressed in the TIS, no changes to the TIS or model are proposed as a result of this comment.

3.4 Response to Comment C-4

Comment C-6 summarizes the first of four mitigation scenarios completed by Caltrans. Mitigation scenarios were studied at five-year intervals to determine how each scenario would function under future growth. The mitigation described by Comment C-4 would prohibit left-turns from eastbound Vigo to northbound Broadway, U-turns would be allowed at the Henderson and Broadway intersection and the intersection of Henderson and Broadway would continue to have four approach legs, but Henderson would be converted to one-way, westbound between Fairfield Street and Broadway. The TIS will be updated to remove the mitigation option noted in C-4, as this mitigation scenario is not preferred by Caltrans or the City. The TIS mitigation scenario proposed for the Project is noted in Comment C-5.

3.5 Response to Comment C-5

Comment C-5 summarizes the second of four mitigation scenarios Caltrans completed at five-year intervals to estimate how each scenario would function under future growth. The mitigation described by Comment C-5 would install an uncoordinated traffic signal at Vigo Street and Broadway and convert Henderson to one-way westbound, maintain four intersection approach legs.

The mitigation noted in Comment C-5 is the same mitigation scenario that is proposed in the TIS to address impacts to the intersections on Broadway at Vigo Street and West Henderson Street. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.6 Response to Comment C-6

Comment C-6 summarizes the third of four mitigation scenarios Caltrans assessed at five-year intervals to evaluate functionality under future growth. The mitigation described by Comment C-6 would install a traffic signal at Vigo Street and Broadway that would be coordinated with the existing traffic signal at Henderson and Broadway. Henderson would be converted to one-way westbound between Fairfield Street and Broadway. The existing signal phase for the private driveway or driveways opposite Henderson would be eliminated in order to match timing for the three-legged signal phasing at Vigo Street. This mitigation scenario was not recommended in the TIS. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.7 Response to Comment C-7

Comment C-7 summarizes the fourth of four mitigation scenarios Caltrans to evaluate functionality under future growth. The mitigation described by Comment C-7 would install a traffic signal at Vigo Street and Broadway with Henderson remaining a two-way street between Fairfield Street and Broadway and a four-legged, uncoordinated signal at Henderson and Broadway. This mitigation scenario was not recommended in the TIS. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.8 Response to Comment C-8

Comment C-8 describes the proposed configuration of Vigo Street which serves as the basis for the mitigation scenarios described in Comments C-4 to C-7. Comment C-8 describes the proposed configuration of the Vigo Street to include: an eastbound approach to Broadway consisting of two left turn pockets and one right turn lane; a single lane for westbound traffic; and the prohibition of on-street parking along Vigo Street.

The TIS has been updated to account for the Vigo Street configuration proposed in Comment C-8. As noted in Section 8.3.2 of the final TIS, the proposed improvements to restore the Vigo/Broadway intersection to acceptable LOS have been updated to include two eastbound left turn pockets. The IS/Proposed MND Section 4.16(a), Mitigation Measure TRA-1 has been updated to include two left turn lanes along the eastbound Vigo Street approach. This information is addressed in the errata located in Section 5.

3.9 Response to Comment C-9

Comment C-9 describes Caltrans conclusions for the first mitigation alternative described under Comment C-4. The TIS will be updated to remove this mitigation as an option, as this scenario is not preferred by Caltrans or the City.

3.10 Response to Comments C-10 to C-15

Comments C-10 to C-15 describe the Caltrans conclusions for the second mitigation alternative described under Comment C-5. This mitigation scenario is preferred by Caltrans with the caveats that improvements built under this scenario may not provide acceptable traffic conditions under future conditions and that the City and Caltrans must work together to plan for future growth on Broadway for local, regional and interregional travel.

The TIS specifies in Section 8.7 that acceptable performance at Vigo/Broadway and West Henderson/Broadway is projected for cumulative plus project conditions with the proposed mitigation. The trip generation component of the TIS is additionally addressed under Comment C-27. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.11 Response to Comment C-16

Comment C-16 describes Caltrans conclusions for the third mitigation alternative described under Comment C-6. The TIS did not evaluate this mitigation as an option, as this mitigation scenario is not

preferred by Caltrans or the City. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.12 Response to Comment C-17

Comment C-17 describes Caltrans conclusions for the fourth mitigation alternative described under Comment C-7. The TIS did not evaluate this mitigation as an option, as this mitigation scenario is not preferred by Caltrans or the City. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.13 Response to Comment C-18

Queueing inside the site was evaluated by the Applicant and In-N-Out during the site design phase. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.14 Response to Comment C-19

Onsite queue was evaluated as noted in Response to Comment C-18. Queueing within the proposed In-N-Out drive-through is designed to accommodate up to 21 cars. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.15 Response to Comment C-20

Comment C-20 describes Caltrans' recommendation that the City adopt a method of issuing fines to businesses that have queues that extend offsite. Comment C-20 is outside the scope of the Proposed IS/MND. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.16 Response to Comment C-21

Comment C-21 describes potential options to mitigate drive-through queues extending beyond the drive-through lane. In-N-Out associate(s) is/are deployed to the drive-through queue with wireless ordering tablets once queue exceeds eight cars, in order to address queueing issues. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.17 Response to Comment C-22

Comment C-22 is an introductory paragraph noting that Caltrans has comments pertaining to the TIS and offers such information in support the encroachment permit application to install a signal on Broadway at Vigo Street. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.18 Response to Comment C-23

As noted in Comment C-23, the TIS utilized a peak hour factor of 0.92 and an ideal saturation flow rate of 1,900 vehicles per hour of green per lane. After factoring, the saturation flow rate utilized in the modeling is at or below the 1,750 vehicles per hour of green per lane utilized by Caltrans District 1.

As defined in Section 2.1 of the TIS, the traffic counts that informed the TIS were completed in May 2018 for one typical day, mid-week of a non-holiday week, to estimate existing traffic volumes and corresponding peak hour factors. Mainline peak hour factors calculated from the traffic counts were between 0.88 and 0.994. Due to day-to-day variability of peak hour factor, a suitable and conservative

estimate of 0.92 was utilized for all scenarios in cumulative conditions for all intersections less than 0.92 for this planning level analysis. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.19 Response to Comment C-24

Within the limitation of the modelling and the available data, the TIS queuing analysis based on the collected data and model output is adequate for a planning level study. Based on the TIS study area (i.e., the specific intersections studied for the TIS) defined in Section 1.3 of the TIS, the queues reported adequately represent the queues expected within the study area. At the recommendation of Caltrans in April 2018, the traffic data collection scope of the TIS was limited to five specific intersections to account for changing conductions due to signal installation at Hawthorne Street and Broadway and the ongoing effort by Caltrans to fine-tune traffic progression through the Broadway corridor.

The scope of the TIS study area was defined in collaboration with Caltrans prior to the commencement of the TIS data collection. While a corridor-wide study may well better represent queues, such a broad level of analysis is beyond the scope of the Project TIS. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.20 Response to Comment C-25

See Response to Comment C-19. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.21 Response to Comment C-26

Comment C-26 notes that the Project site is adjacent to the Pacific Coast Bike Route and recommends the provision of secure bicycle parking. The Applicant has agreed to work with the City to incorporate bicycle parking that is compatible with the site that is consistent with applicable municipal code. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.22 Response to Comment C-27

The trip generation presented in the TIS draft provided to Caltrans for internal review in July 2018 was updated in subsequent revisions based on Applicant modifications to the site plan and the up-to-date trip generation for the proposed project is presented. The trip generation values presented in Table 4.1 in the October 2018 draft of the TIS were derived using the Institute of Transportation Engineers (ITE) *Trip Generation Manual 10th Edition*, in accordance with industry standards. The ITE trip generation rates used for the TIS are the most current available and are based on developments similar to the proposed Project that have been established throughout the United States. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.23 Response to Comment C-28

Section 4.4 Roadway Improvements will be removed from the TIS. Striping on Vigo Street will be included in the mitigation recommended for the project.

3.24 Response to Comment C-29

Within the limitation of the modelling and the available data, we find the queuing analysis based on these factors are adequate. As noted in Response to Comment C-24, The TIS study area was agreed upon with Caltrans in April 2018 prior to the collection of traffic data in May 2018. Traffic data was collected as described in Section 2.1 of the TIS. The queues reported adequately represent the queues expected within the study area.

See Response to Comment C-23 and C-24 for additional information related to this comment. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.25 Response to Comment C-30

Comment C-30 refers to a mitigation that was proposed in the TIS that would have restricted left-turn movements out and in at Vigo Street. This mitigation was removed from the TIS as is not the mitigation scenario preferred by the City or Caltrans.

3.26 Response to Comment C-31

See Response to Comment C-30. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.27 Response to Comment C-32

See Response to Comment C-30. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.28 Response to Comment C-33

Comment C-33 refers to a mitigation that is not in the TIS. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.29 Response to Comment C-34

It is acknowledged that the southbound left turn pocket on Broadway at Harris Street should be extended to accommodate additional queuing. It is acknowledged that such improvements should be completed when the improvements to Henderson Street and Vigo Street are being constructed. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.30 Response to Comment C-35

As noted in Table 8.4 (Year 2038 Plus Project Mitigated Intersection Level of Service) located in Section 8.7 of the TIS, the intersection at Vigo Street and Broadway is projected to operate at LOS C for both Mid-day and PM peak hours under future conditions after mitigation. The southbound approach at Vigo Street is projected to operate at LOS C for Mid-day and LOS D for PM peak hours. Both peak hours are beneath the LOS threshold set forth by Caltrans.

Per Caltrans Guidelines, the intersection of Vigo and Broadway was analyzed in the TIS and found to operate at acceptable level of service based on the average delay for the entire intersection. As noted in the TIS appendix, the specific lane group LOS during the PM peak hour has been determined to be LOS F

due to the roadway capacity, not the delay. Lane group delay is determined to be LOS D for the southbound lanes. A southbound right turn pocket would not be required based on delay, however volume to capacity may prompt the addition of a southbound right turn pocket, at Caltrans discretion. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

3.31 Response to Comment C-36

Comment C-36 describes Caltrans acceptance of a traffic signal at Vigo Street and Broadway, in conjunction with modifications to Broadway at West Henderson Street and Harris Street, to adequately mitigate for traffic impacts in the near term.

Comment C-36 notes that Caltrans will issue the City an encroachment permit and may be willing to make improvements to Henderson and/or Harris to address deficiencies under existing conditions. Comment C-36 further requests that the City work cooperatively with Caltrans District 1 staff to plan and fund multi-model improvements to meet future travel demand within the Broadway corridor. No change to the IS/Proposed MND or TIS is proposed as a result of this comment.

4. Comment letter D: Humboldt Baykeeper

The City received a comment letter via email (Comment Letter D) from Jennifer Kalt, Director of Humboldt Baykeeper on November 23, 2018. The Humboldt Baykeeper letter provided comments on both the IS/Proposed MND and the Biological Report prepared for the project. The individual comments from the Humboldt Baykeeper letter have been numbered for reference. Responses to the numerated Baykeeper comments are provided below. The below responses identify which comments may result in changes to the IS/Proposed MND. The Humboldt Baykeeper comment letter is included herein as Attachment D.

4.1 Response to Comment D-1

This is an introductory paragraph noting that Humboldt Baykeeper has completed a review of the Draft IS/Proposed MND and is submitting comments. No change to the IS/Proposed MND is proposed as a result of this comment.

4.2 Response to Comment D-2

Comment D-2 summarizes Humboldt Baykeeper's mission statement and outlines the work that Humboldt Baykeeper does as a 501(c) 3 non-profit organization. No change to the IS/Proposed MND is proposed as a result of this comment.

4.3 Response to Comment D-3

Comment D-3 lists several of the components of the proposed Project. No change to the IS/Proposed MND is proposed as a result of this comment.

4.4 Response to Comment D-4

Comment D-4 affirms that Humboldt Baykeeper believes that there are “many positive aspects” of the Project, however Comment D-4 concludes with an assertion that the IS/Proposed MND fails to adequately assess and mitigate impacts to the adjacent Environmentally Sensitive Habitat Area (ESHA), as defined in the City’s Local Coastal Plan (LCP).

As identified in Sections 2.4.2, 2.5.1, 4.1, 4.4(b), and Appendix C of the IS/Proposed MND, the Maurer-Palco Marsh (marsh) is defined as an ESHA. As the marsh located westerly-adjacent to the Project site is acknowledged to be an ESHA, the marsh is afforded special consideration in the IS/Proposed MND. As described in Section 4.4 of the IS/Proposed MND, wetlands were delineated at the Project site in April 2018.

The findings of the wetland delineation were reported in the Wetland Delineation and Biological Survey Report (report) dated April 2018. The IS/Proposed MND incorporates the findings of the report, which is included with the IS/Proposed MND in Appendix C. The report identifies the marsh as an ESHA and delineates both three-parameter and one-parameter wetlands within the Project site. As stated in Section 5 of the report, a wetland setback (buffer) of at least 50 feet, expanding outward from the edge of the one-parameter wetland boundary (willow dripline) and three parameter wetlands, would adequately protect the ESHA from Project construction and operational impacts.

The City LCP requires that ESHA, including wetlands, be protected. As defined in Section 2.5.1 of the IS/Proposed MND and depicted in Figures 2, 3 and 4 (IS/Proposed MND Appendix A), an appropriate buffer has been incorporated into the Project design to protect the ESHA from potential Project impacts in accordance with the City’s adopted LCP requirements. The proposed wetland buffer was measured a minimum of 54 feet from the ESHA to the development, however its width is greater than 54 feet in numerous locations. The maximum width of the wetland buffer is 73 feet, and the average width of the buffer is approximately 57 feet and totals 20,360 square feet. The measurements do not include the 2,547 square-foot onsite LID bioretention area, which is adjacent to the wetland buffer. The proposed wetland buffer is consistent with the City’s LCP Policy 6.A.19, which states that “(t)he minimum width of a buffer shall be 100 feet, unless the applicant for the development demonstrates on the basis of site specific information, the type and size of the proposed development, and/or proposed mitigation (such as planting of vegetation) that will achieve the purpose(s) of the buffer, that a smaller buffer will protect the resources of the habitat area.”

The proposed greater than 50-foot wetland buffer, including the proposed improvements to the buffer, would achieve the ESHA protection potentially offered by a larger unimproved setback. The proposed buffer would protect the ESHA using numerous habitat enhancements incorporated into the buffer design, as well as many onsite low impact development (LID) design features and stormwater management and treatment, which are not part of the ESHA buffer.

The proposed buffer area will be enhanced by removing existing refuse and aggregate gravel fill, replacing the gravel fill with clean soil and native vegetation plantings. The buffer area would be landscaped with native trees, herbaceous plants and a mulch layer. An LID bioretention area, also a

proposed component adjacent to the buffer area, would also be landscaped with native trees and a biofiltering groundcover. There would be five red alders (*Alnus rubra*) used in the buffer zone. Red alders are relatively fast growing deciduous trees that reach heights up to 65-75'. There would also be seven box elders (*Acer negundo*) in the buffer area. Box elders are more drought tolerant, but also relatively fast growing deciduous trees that typically grow to heights ranging from 35-65 feet. Four smaller vine maples (*Acer circinatum*) are proposed for the LID area adjacent to the buffer zone. These trees are slower growing and attain heights ranging from 10-20 feet. California gray rush (*Juncus patens*), a two to three-foot high perennial, is proposed for the basin bottom within the LID area adjacent to the buffer zone.

The Project design includes a 2,547 square-foot onsite bioretention area, located outside of the buffer area, which will sequester and treat 100 percent of the stormwater which is projected to flow from the Project area. The onsite stormwater treatment LID features, including native plantings, raingardens, and three bioretention basins, will mitigate stormwater impacts associated with the Project, and improves onsite stormwater management.

In addition, onsite improvements will include a physical barrier to dissuade anthropogenic disturbance to the buffer area and adjacent ESHA. Project boundary fencing is proposed to be installed along the western extent of the Project site to limit access to the buffer area from the Project site, and deter pedestrian movement through the ESHA.

In accordance with the City LCP Coastal Development Permit (CDP) Supplemental Application Form Request for Reduced Buffer requirements, the following seven categories were analyzed to determine the site-specific suitability of the proposed buffer width: (1) Biological Significance of Adjacent Lands; (2) Sensitivity of Species to Disturbance; (3) Susceptibility of Parcel to Erosion; (4) Use of Natural Topographic Features to Locate Development; (5) Use of Existing Cultural Features to Locate Buffer Zones; (6) Lot Configuration and Location of Existing Development; and (7) Type and Scale of Development Proposed.

The site-specific applicability of the proposed wetland buffer width to each of the seven categories defined in the City LCP CDP is analyzed below.

1. *Biological Significance of Adjacent Lands*

The existing site is made up of 1.61 acres of impervious area which drains westerly towards the wetland and buffer area. There is currently no stormwater treatment or storage. Most of the area proposed for use as the buffer has been filled and compacted with native fill and covered baserock and is currently used as a parking and material storage area. Under current conditions, stormwater flows into the ESHA from the compacted surfaces of the Project site with limited infiltration, no retention and no treatment. Infiltration and retention, both proposed to be established via construction of bioretention basins in association with the Project, would serve to substantially reduce stormwater and/or potential pollutant entrance into the ESHA.

The existing ESHA is heavily impacted by vagrancy and associated anthropogenic degradation. Longstanding and sustained use of the existing heavily-trafficked pedestrian corridor through the Project

site (currently vacant) and along Vigo Street has resulted in extensive refuse accumulation and damage to plants and wildlife habitat. The quality of the ESHA in the vicinity of the Project site is degraded and polluted as a result of the site vacancy compounded by current pedestrian usage patterns, primarily accessing the encampment known as Devil's Playground located west of the ESHA and refuse. Implementation of the Project, including the associated down-casting site lighting and boundary fencing improvements, will discourage pedestrian traffic through the Project site, wetland buffer and the adjacent ESHA, thereby mitigating a significant source of existing anthropogenic degradation to the ESHA. In addition, Vigo Street will be upgraded to support the Project. During operation of the Project, the presence of vehicles and customers is expected to discourage existing pedestrian usage from encampments.

According to the description of Biological Significance of Adjacent Lands contained in the City LCP CDP, "a functional relationship may exist if species associated with such areas (ESHA) spend a significant portion of their life cycle on adjacent lands." The Wetland Delineation and Biological Survey Report prepared for the Project site states that Northern Red-legged Frog and a variety of birds could potentially move through the Project site during certain times of the year and have a moderate likelihood to occur at, or in areas adjacent to the Project site; however, as stated in Section 4 of the report, there is no quality plant or wildlife habitat present within the Project site outside of the area proposed for buffer enhancement. Due to the developed condition of the Project site, contiguity to US 101 and other commercial development, and the absence of suitable habitat, it is unlikely that ESHA species would spend a significant portion of their life cycle within the proposed development of the Project site.

Given the sustained degradation to the ESHA from stormwater and pedestrian impaction, combined with the lack of suitable habitat for ESHA species within the Project site, it is determined that a biologically significant functional relationship is not likely to exist between the Project site and the ESHA. Due to the absence of a significant functional relationship, a buffer of at least 54-73 feet extending from the far westerly edge of the wetland to the eastern edge of the proposed development is adequate to protect ESHA species from potential impacts associated with the proposed Project.

2. *Sensitivity of Species to Disturbance*

The proposed Project would improve the quality and quantity of habitat present within the Project site via development of a verdant wetland buffer. Additionally, the Project would result in enhancement of the quality of the habitat currently provided by the adjacent ESHA as described above.

The area proposed for the 54 to 73-foot buffer currently consists of compacted aggregate and is currently used as a parking and storage area. The Project would increase the total amount of habitat currently available for species within the Project site by removing the compacted aggregate and planting native vegetation within the proposed buffer area. The current conditions at the Project site provide no stormwater management function or valuable habitat. The proposed wetland buffer includes removal of the existing aggregate fill, decompacting and recontouring the area to match natural topography, and propagation of native trees and shrubs which will provide valuable habitat.

As detailed in Section 4 of the Wetland Delineation and Biological Report, there are no state or federally listed threatened or endangered wildlife or plant species that are likely to occur at the Project site,

however several non-listed state and special status species may be present in the marsh. There is a small refuse-impacted creek near the project site that may seasonally contain fish, which will have improved water quality by the Project and proposed wetland buffer due to the increased stormwater management implemented by the LID features. Amphibians such as Northern Red-legged Frogs may utilize the ESHA, which will be improved by the Project through the creation of the wetland buffer and thus expansion of habitat. Estuarine birds such as Great Egret and Great Blue Herons are likely to utilize the ESHA, however are not expected to be adversely affected by the proposed Project due to the improvements of the buffer proposed by the Project. Bat species could potentially use the Project area, particularly the abandoned building on the Project site, which is not secured against birds and small mammals.

As described in Section 4.4 of the IS/Proposed MND, Mitigation Measures Bio-1, Bio-2 and Bio-3 will protect roosting bats, nesting birds and Northern Red-legged Frogs from adverse short term construction impacts of the Project.

The Project will include site security improvements such as lighting (not to exceed the boundary of the Project site), a boundary fence, and roadway improvements. Although it is unknown how many people reside within the ESHA in the immediate vicinity of the Project site, it is expected that implementation of the Project including site security improvements, site improvements and improvements to Vigo Street will discourage transient use of the adjacent ESHA and discourage further refuse accumulation and plant and wildlife habitat destruction associated with transient usage. The proposed wetland buffer will improve the ESHA and wildlife habitat through improved stormwater management, native vegetation, and general attention to the area which will likely further reduce the amount of anthropogenic damage to the ESHA from the existing site usage.

The baseline condition of the ESHA immediately adjacent to the Project site is poor due to the presence of transient pedestrian traffic, human encampments and associated refuse. The current despoiled conditions within the ESHA indicate that the species currently utilizing the ESHA as habitat have the capacity to adapt to long-term human disturbance. Given that the Project will improve the quality of the ESHA habitat by mitigating current stormwater and human impacts, and increase the quantity of available habitat by establishing a buffer with native vegetation, the proposed 54 to 73-foot buffer width is adequate and appropriate.

3. Susceptibility of Parcel to Erosion

A site-specific geotechnical investigation of the Project site was conducted in August 2018. The findings of the geotechnical investigation are provided in the Geotechnical Investigation Report prepared for the Project site and included with the IS/Proposed MND in Appendix G. The geotechnical investigation determined that the site is relatively level with no major changes in grade anticipated as a result of Project development.

Current conditions at the Project site include extensive asphalt and concrete (eastern two-thirds of the site) and compacted aggregate fill (western one-third of the site). Existing refuse and aggregate fill will be removed from the proposed wetland buffer area. The buffer area will be decompacted and recontoured

using soil fill material to create topographic contours that align with existing wetland features in order to simulate natural drainage patterns.

The proposed Project increases the impervious area by approximately 32 percent (2.12 acres), however; stormwater runoff is expected to decrease by 36 percent (based on peak flows during a 2-year, 24-hour storm event). The Project will sequester and treat 100 percent of the stormwater with is projected to flow from the Project area. In addition to the reduced runoff rates (as a result of the basin's storage volume), the planting medium provides soil stabilization and pollutant removal and treatment before infiltrating back into the ground. See previous discussion of bioretention area.

The Project would comply with the requirements of the National Pollutant Discharge Elimination Standards (NPDES) General Permit for Storm Water Discharges. A Stormwater Pollution Prevention Plan (SWPP), including stormwater and runoff best management practices (BMP) would be established to ensure no substantial soil erosion or loss of topsoil would occur from Project implementation. It is not anticipated that any significant erosion would result from Project implementation or operation, thus the reduced buffer width is compatible with the site topography and erosion susceptibility.

4. Use of Natural Topographic Features to Locate Development

The project site gradually slopes downward from Broadway, also defined as United States Highway 101 (US 101), to an historic soil berm, approximately four feet in height (breached in several locations from current stormwater flow), located at the western edge of the Project site. The berm generally separates the ESHA from the developed portions of the Project site. No other hills or significant topographical features exist within the project site. The wetland buffer area will be recontoured with soil fill material to create minor topographic contours that align with existing wetland features. The topography of the buffer area would be enhanced in order to maximize the functionality of the buffer area, thus the proposed width of the buffer is consistent with the ESHA protection goals of this category.

5. Use of Existing Cultural Features to Locate Buffer Zones

The Project site consists of approximately 3.19 acres and is located east of US 101 on an existing developed commercially-zoned parcel. The ESHA is located immediately west of the Project site, separated by an earthen berm. Given the small size of the commercial parcel and the size of the proposed buffer area which includes the entire western Project site boundary, there is no other alternative site configuration for the Project development on the parcel. The Project will preserve the existing earthen berm within the proposed wetland buffer, as well as enhance the area within the buffer immediately east of the berm with native plantings. The existing earthen berm will be preserved within the proposed buffer area, thus the proposed width of the buffer is consistent with the ESHA protection goals of this category.

The Project proposes to construct two buildings: a fast-food restaurant and a four-tenant retail space. The fast-food restaurant building is anticipated to receive a high amount of use and is proposed to be located at the north-eastern portion of the property, adjacent to US 101. The four-tenant retail space is anticipated to be used less than the fast-food restaurant building and is proposed to be sited on the western portion of the property, between the ESHA and the fast-food restaurant anchor tenant building.

6. Lot Configuration and Location of Existing Development

The Project site is located within a developed area. The neighboring parcel to the north contains a structure located approximately 12 feet minimum from the adjacent ESHA. There is also development south of the Project site. US 101 exists to the east, which generates substantial noise. The Project site currently contains one structure which is slated for demolition. Two structures are proposed for construction spanning the majority of the property. The topography of the buffer area would be enhanced in order to maximize the functionality of the buffer area, thus the proposed width of the buffer is consistent with the ESHA protection goals of this category.

7. Type and Scale of Development Proposed

The Project is proposing a commercial development. Five tenants, including three restaurants, would occupy the proposed commercial spaces. No residential component is proposed in association with the Project, which could potentially result in humans and or domesticated animals disturbing the ESHA would be constructed as a part of the proposed Project. Land uses in the vicinity of the Project site are exclusively commercial, with the exception of the residential area located east of the Project site across US 101 on the bluff. Therefore, the proposed Project is consistent with the type and scale of development in the area.

No change to the IS/Proposed MND is proposed as a result of this comment.

4.5 Response to Comment D-5

Comment D-5 states the location of the Project in relation to the ESHA known as the Maurer-Palco Marsh. No change to the IS/Proposed MND is proposed as a result of this comment.

4.6 Response to Comment D-6

Comment D-6 states that the IS/Proposed MND recommends a wetland of at least 50 to 73 feet, extending outward from the edge of the one-parameter wetland boundary to protect the wetland habitat from potential development impacts. No change to the IS/Proposed MND is proposed as a result of this comment.

4.7 Response to Comment D-7

Comment D-7 relates the Humboldt Baykeeper's belief that the proposed wetland buffer is inconsistent with policies in the City's LCP and Land Use Policies. See Response to Comment D-4 for an explanation of how the proposed buffer protects the adjacent wetlands and how the Project is consistent with the policies in the City's LCP and Land Use Policies.

4.8 Response to Comment D-8

Comment D-8 states that the MND is inconsistent with the City's Land Use Plan (LUP) and Local Coastal Program (LCP) Policy 6.A.6, 6.A.7, 6.A.8 and 6.A.19. As noted in Response to comment D-4, a wetland buffer of at least 50 feet is proposed. The proposed buffer would be reinforced with habitat enhancements,

including: removal of compacted aggregate fill, propagation of native plants, improved stormwater infiltration capacity and topographical improvements to account for the reduction in size and additional protections to the ESHA. See Response to Comment D-4 for an explanation of how the City is consistent with Policies 6.A.6, 6.A.7 and 6.A.19.

The City's LUP Policy 6.A.8 states that the City shall require that all development on lots within 250 feet of parcels designated Natural Resources or development potentially affecting an ESHA shall be found to be in conformity with all applicable habitat protection policies of the General Plan. The City's General Plan was approved in September 2018 and includes the following policies on habitat protection:

> *NR-2.1: Development in Gulches and Greenways.*
>
> *Allow limited development within Eureka's gulches and greenways and permit private property owners adjacent to gulch and greenway areas to develop, provided sensitive species habitat, fish and wildlife corridors, and the hydrologic capacity of the resource are protected, and vegetation removal does not occur below the high water mark or in areas subject to flooding, consistent with local, State and federal regulations.*

The Project's proposed wetland buffer will provide improvements to the adjacent ESHA.

> *NR-2.5 Sensitive Species Habitat*
>
> *Require development in or adjacent to sensitive species habitats that may contain special-status species to be compatible with the long-term sustainability of the habitat, and (in discretionary projects) be conditioned to prevent significant habitat degradation or harm to rare, threatened, or endangered species.*

The proposed wetland buffer will improve long-term sustainability of the adjacent ESHA through the removal of aggregate fill, addition of native vegetation, and substantially improved stormwater management.

> *NR-2.6 Buffers*
>
> *Require the provision and maintenance of reasonably-sized buffers between sensitive habitat and adjacent urban uses to minimize disturbance of the resources, as appropriate. Buffers need not be larger than is recommended by a qualified professional ecologist (such as an ecologist, biologist, or wetland scientist).*

A Wetland Delineation and Biological Survey and Report was completed for the site and includes a wetland delineation, review of the biological characteristics of the Project site and the adjacent habitat and a scoping table to determine wildlife species' potential for occurrence within the Project site or adjacent to the Project site. The Report recommended a minimum 50 foot buffer between the Project and the adjacent ESHA.

The City's LUP Policy 6.A.8 also states that all development plans, grading plans, and drainage plans submitted as a part of an application show the precise location of the habitat(s) potentially affected by the

proposed project and the manner in which they will be protected, enhanced, or restored. Each site plan identifies the wetland buffer and appropriate protection and enhancement features per the specifics of the plan, such as LID locations or vegetation. The Project is consistent with the City's LUP Policy 6.A.8.

4.9 Response to Comment D-9

Comment D-9 asserts that the Project is not compatible with LCP ESHA protection and buffer policies. See Response to Comment D-4 and Response to Comment D-8 for explanations as to why the Project is compatible and consistent with LCP policies regarding ESHA protection and buffer policies.

4.10 Response to Comment D-10

Comment D-10 states that the Project should be resituated so as to minimize the impacts on ESHA. See Response to Comment D-4 for an explanation of the buffer attributes and how the proposed buffer will protect the adjacent ESHA.

4.11 Response to Comment D-11

Comment D-11 recognizes that the IS/Proposed MND recommends further biological surveys for nesting birds, red-legged frogs, bat habitat in the existing building slated for demolition, and proposes mitigation measures during demolition and construction. No change to the IS/Proposed MND is proposed as a result of this comment.

4.12 Response to Comment D-12

Comment D-12 states that the IS/Proposed MND fails to evaluate increased noise related to the operation of the Project once construction is complete. The comment is not clear if the "increased noise" is an alleged concern for humans or the environment. The City assumes this comment is related to noise to the environment.

According to the UK Arboricultural Association, a vegetative noise attenuation barrier should be formed "by an irregular structure comprising trees, shrubs, herb and litter layer" (Dobson, Martin and Ryan, Jo. Trees in Focus APN 6, Trees and Shrubs for Noise Control, January 2000.). It has been noted that berms, ground surface area, and leaf litter play a particularly important role in noise attenuation. Mature trees, with upward reaching canopies higher than humans, provide less buffering than these factors, or densely planted shrubs. The mulch in the wetland buffer, herbaceous plants in the adjacent LID area and trees throughout the wetland buffer and LID area are anticipated to attenuate a portion of the noise generated from operation of the Project.

Deciduous trees provide particular visual buffering for more distant views in spring, summer, and fall months of the year; depending on the density of branch structure, they may also provide some visual buffering in the winter months. Visual buffering at ground level, however, is best achieved through shrubs and other under-canopy plantings which conflict with other management goals including the maintenance of sightlines for public safety. The proposed planting plan includes deciduous red alder (*Alnus rubra*) and box elder (*Acer negundo*) trees in the proposed wetland buffer area.

According to Figure N-2: Noise Compatibility in the City's General Plan, commercial businesses that produce, or are in the vicinity of noise levels at 70 L_{dn} are "Normally Acceptable", and up to 78 L_{dn} are "Conditionally Acceptable" and up to 82 L_{dn} are "Normally Unacceptable". The measurement L_{dn} is a 24-hour day and night, A-weighted noise exposure level, which accounts for the greater sensitivity of most people to nighttime noise.

Table N-2 within the City's General Plan tabulates the traffic noise levels and distances to roadway contours. The roadway segment associated with the Project, Broadway (US 101), from Henderson Street to Wabash Avenue contains a value of 69 L_{dn} from 50 feet away, meaning that the ambient noise within the Project area nearly equates to the 70 L_{dn} noise limit that would be "normally acceptable" at the Project site. According to the City's General Plan, new noise-sensitive development that are exposed to existing or projected noise levels shall mitigate for the ambient noise by following the mitigation in Table N-4. Operation of the Project is expected to produce noise impacts which will increase the localized noise from the "normally acceptable" range to the "conditionally acceptable" range on Figure N-2.

In 2005, Winzler & Kelly (now GHD) conducted a noise study at the Project site in association with a previous development plan submitted for the site that was never completed. The noise study evaluated the sound originating from US 101 at various locations throughout the Project site and vicinity. The study compared the noise levels at three locations:

- Site 1: on the front sidewalk immediately adjacent to US 101;
- Site 2: at the edge of the ESHA in current Project site location (approximate location of existing berm), and
- Site 3: at the edge of the ESHA behind the building immediately north of the Project site.

The measurements were taken from 7:40-8:30 am in order to capture baseline noise data. These locations were selected to compare noise level data in areas with unobstructed lines of sight to US 101, and noise levels in areas where views of the roadway were blocked by buildings (Site 3). Specifically, the average noise levels at Site 1 on average measured 67.4 decibels (dBA), Site 2 measured on average 47.1 dBA, and Site 3 measured on average 42.5 dBA at 20 feet from the building, 45.2 dBA at 30 feet from the building, and 48.1 dBA at 40 feet from the building. The study observed that noise attenuation was significantly more pronounced (i.e., the level of noise was greatly reduced) for the measurements collected in areas behind buildings that were shielded from the source of the noise. The four tenant retail building is expected to shield and reduce noise levels, at varying intervals, to receptors behind it including the ESHA from noise generated by US 101.

As the Project proposes to construct a four-tenant building, oriented north-south, at the western portion of the Project site, shielding the ESHA from US 101 and the noise generated by operation of the Project development, it may reasonably be determined that noise levels within the ESHA and buffer area will not significantly increase and may be reduced to below background levels even with operational noise of the site as noise generated by US 101 is the predominant noise in the Project area.

4.13 Response to Comment D-13

Comment D-13 states that operation of a drive-through fast-food restaurant and regular activities associated with the proposed development will increase night-time noise levels.

The Project site is located along US 101 in a highly commercialized area. The existing conditions within the Project vicinity include significant existing noise impacts resultant from vehicular and pedestrian traffic and adjacent commercial operations. There are numerous businesses currently operating in the Project vicinity, including a 24-hour service fueling station, with an automated carwash facility, located approximately 425 feet south of the Project site.

The Project proposes to construct two buildings: a fast-food restaurant and a four-tenant retail space. The fast-food restaurant building is proposed to be located at the north-eastern portion of the property, adjacent to Broadway (US 101). The four-tenant retail space is proposed to be sited on the western portion of the property, between the ESHA and the fast-food restaurant anchor tenant building. It is expected that the fast-food anchor tenant will produce the majority of noise impacts during operational hours, which are expected to be 11:00 am to 12:00 am. This tenant is located close to US 101 (furthest building away from the ESHA). It is anticipated that US 101 will generate noise equal to or above that generated from the fast-food restaurant anchor tenant. The four-tenant retail space is expected to produce less noise during operational hours, than the fast-food anchor tenant building. The operational hours of the retail spaces are not expected to extend beyond 10:00 pm.

The placement of the buildings within the Project site are appropriate for noise mitigation to wildlife species in the adjacent ESHA due to placement of the fast-food anchor tenant is approximately 290-355 feet from the ESHA. The queuing lane for the fast-food restaurant anchor tenant terminates 215 feet from the ESHA. The operational noise impacts from the main Project parking area and anchor tenant will be mitigated by the western multi-tenant building and the proposed fencing separating Project from the buffer.

4.14 Response to Comment D-14

Comment D-14 relays that the biological information relied upon by the City in approving the Project does not demonstrate that a reduced wetland setback would protect the resources of the habitat area as required by LUP Policy 6.A.19. See Response to Comment D-4 for a discussion of how the proposed 50 to 73-foot wetland setback would protect the adjacent ESHA habitat.

4.15 Response to Comment D-15

Comment D-15 states that the biological information prepared for the Project discusses the increased disturbance associated with the operation of the project adjacent to the ESHA and generally concludes that the impacts would be less than significant. No change to the IS/Proposed MND is proposed as a result of this comment.

4.16 Response to Comment D-16

Comment D-16 states that the biological evaluation lacks site-specific information regarding impacts from increased disturbance associated with operation of the Project to birds, mammals or other species that utilize the ESHA.

The Project is designed to protect wildlife habitat, as well as preserve and enhance the important ecosystem functions of the ESHA during Project operation through implementation of the following Project components:

- Strategic placement of buildings (see Response to Comment D-13)
- Fencing along the western edge of the Project boundary to limit the public into the wetland buffer area
- Installation of permanent LID bioretention features which is anticipated to treat 100 percent of the stormwater which is projected to flow from the Project area. The native vegetation within the LID features will provide pollutant removal and treatment before infiltrating back into the ground.
- Removal of the existing aggregate fill and recontouring of the underlying earth within the proposed wetland buffer area
- Native plant propagation
- Installation of at least two wetland informational signs, one sign located on the northern property boundary at Vigo Street and the other sign located between the south property line and the trash enclosure on the westerly parcel facing the parking lot located east of the trash enclosure to further protect wildlife and their habitat per Coastal Development Permit (CDP-18-0012)
- The condition per Use Permit C-18-0010 that any and all exterior lighting will be located and shielded such that no light or glare extends beyond the property line or illuminated portion of the light fixture shall not extend below or beyond the canister or light shield

Collectively the voluntary and conditional Project components listed above will improve habitat and ESHA conditions during operation of the Project.

4.17 Response to Comment D-17

Comment D-17 states that there is no information regarding the current level of use of the ESHA by wildlife and how that level of use would be expected to change as a result of the Project. The Wetland Delineation and Biological Survey and Report includes results of a wildlife survey conducted at the Project site which intended to identify confirmed or probable avian nesting activity and Northern Red-legged Frog activity. The only amphibian detected during the survey period was a Treefrog (*Pseudacris sp*.). A variety of bird species were detected during the survey, all of which were common species that do not have special federal or state regulatory status with the exception of Black-capped Chickadees, a CDFW watch list species. A total of 27 avian species were observed in or flying over the Project site, see Table 2 in the Wetland Delineation and Biological Survey and Report for a list of detected avian species. The survey

represented an initial site visit to gauge nesting bird and wildlife conditions in the Project area. A subsequent full nesting bird survey is recommended no more than seven days prior to the start of construction (if construction occurs between March 15 to August 15 in northern California). In addition, prior to removal of the building onsite, a bat survey is recommended to ensure that no potential maternity roosts are disturbed. Mitigation Measures Bio-1, Bio-2, and Bio-3 capture the Wetland Delineation and Biological Survey and Report's recommendations for protections to bats, nesting birds and Northern Red-legged Frogs during construction of the Project. No change to the IS/Proposed MND is proposed as a result of this comment.

4.18 Response to Comment D-18

Comment D-18 states that the "record" does not demonstrate how the planting of vegetation along a reduced buffer width would achieve the purpose(s) of the buffer to effectively protect the resources of the habitat area as required by LUP Policy 6.A.19.

As stated in Response to Comment D-4, vegetation would be planted within the wetland buffer to mitigate for the reduced buffer size through the ecosystem benefits the vegetation would provide as compared to an absence of planted vegetation. Such benefits include: greater soil stabilization, increased habitat for song birds, bats, rodents and other small mammals, improved stormwater management, a visual buffer, increased opportunity for stormwater infiltration and thus less likelihood for pollutants to directly enter the Maurer-Palco Marsh.

4.19 Response to Comment D-19

Comment D-19 states that the Project's location offers the potential for the City to examine connecting the existing gravel road from Vigo Street to the Eureka Waterfront Trail. This is not part of the proposed Project. Comment noted. No change to the IS/Proposed MND is proposed as a result of this comment.

4.20 Response to Comment D-20

Comment D-20 implies that the Project should include bicycle parking within the Project because it would be appealing to many local residents. As noted in Response to Comment C-26, bicycle parking will incorporated into the project design.

4.21 Response to Comment D-21

Comment D-21 states that the Project includes several LID features to reduce pollution from stormwater runoff. Comment noted. No change to the IS/Proposed MND is proposed as a result of this comment.

4.22 Response to Comment D-22

Comment D-22 states that it would be beneficial to include interpretive signage to inform the public of the importance of protecting Humboldt Bay and coastal wetlands from stormwater runoff. Interpretive signage will be a required component of the Project per CDP condition of approval (CDP-18-0012) and as noted in Response to Comment D-16.

5. Errata

The following changes to the IS/Proposed MND are proposed. Where revisions to the text of the Initial Study/Proposed MND are called for, the page and paragraph are set forth, followed by the appropriate revision. Text added to the IS/Proposed MND is indicated with underlined (underlined) text. Deletions to text in the IS/Proposed MND are shown with double strikethrough (~~strikethrough~~) text.

5.1 IS/Proposed MND, Table index, Page vi

Table 4.12-1 Typical Vibration Levels for Construction Equipment .....~~Error! Bookmark not defined~~ 4-40

5.2 IS/Proposed MND, Section 1 (Project Information), Page 1-1

Comment Period October 20 – November ~~19~~ 23, 2018

5.3 IS/Proposed MND, Section 4.16 (Traffic), Page 4-48, Mitigation Measure TRA-1

Mitigation Measure TRA-1 proposes to construct a three-leg traffic signal at the intersection of Vigo Street and Broadway, including associated road striping and pedestrian improvements. The three-leg traffic signal proposed by TRA-1 would allow protected turn movements from Vigo Street on to northbound and southbound Broadway, as well as protected turns from Broadway onto Vigo Street. Upgrades to the pedestrian crossing at Vigo Street associated with TRA-1 would include pedestrian curb ramps, marked crossing and pedestrian barricades for other legs of intersection. The Vigo Street eastbound approach would be reconfigured in association with TRA-1 to include two left turn pockets and one right turn lane.

5.4 IS/Proposed MND, Section 4.17 (Tribal Cultural Resources), Page 4-52, middle and last paragraphs

At their request, Tribes shall be afforded the opportunity to review and provide comments to the City early in project review and planning (screening) about known or potential Tribal cultural resources located in project areas within their respective tribal geographical area of concern. The City initiated AB 52 consultation with Bear River Band of the Rohnerville Rancheria, Blue Lake Rancheria and the Wiyot Tribe at Table Bluff Reservation via an email notification with a Project Description and vicinity map on June 29, 2018~~; however no~~. No ~~responce~~ response from any Tribe was received by the City by the end of the 30-day response period on July 30, 2018. The City sent a second correspondence (project referral) to the above-named Tribes on October 8, 2018. The City additionally provided a copy of the IS/Proposed MND to the Tribes on October 19, 2018. No response from any Tribe was received by the end of the IS/Proposed MND public comment period on November 23, 2018.

According to the North West Information Center (NWIC) Archaeological ~~Survey Report~~ Record Search prepared for the Project (NWIC ~~2017~~ 2018), there is a moderate to high possibility that the Project Area of Potential Effect (APE) contains undiscovered prehistoric artifacts or archaeological deposits. Although formal consultation was offered by the City for the proposed Project, correspondence with local Native American Tribes did not result in any expressed concerns regarding Tribal cultural resources. The Project site consists of a developed commercial site, and has existed as such for approximately 90 years. The

Project site is currently topped by up to four feet of fill. Up to four feet of additional fill will be distributed over the existing fill over much of the Project site. As much of the Project site preparation and utility excavation work will be limited to within the top four feet of the existing layer of fill, it is unlikely that any Tribal Cultural Resources are located within an area of potential impact. Therefore, the impact is less than significant.

5.5 IS/Proposed MND, Section 5 (References), Page 5-1

Northwest Information Center (NWIC). 2018. Record search results for the proposed 2616 Broadway Redevelopment Project, Eureka, CA. June 11.

ATTACHMENT A

Comment Letter A from United States Army Corps of Engineers

Scott Harris

From: Gabe Hagemann <gabe@thecarrco.com>
Sent: Tuesday, October 23, 2018 11:04 AM
To: Scott Harris
Cc: Don Delgrande
Subject: FW: Project Referral: Carrington Vigo Street Commercial Development

FYI...

Gabe Hagemann
(707) 444-7717

-----Original Message-----
From: Kristen Goetz [mailto:kgoetz@ci.eureka.ca.gov]
Sent: Tuesday, October 23, 2018 10:44 AM
To: Gabe Hagemann
Subject: FW: Project Referral: Carrington Vigo Street Commercial Development

Hi Gabe: FYI below.

Kristen M. Goetz | Senior Planner
Community Development Division
Development Services Department
City of Eureka | 707-441-4166

-----Original Message-----
From: Costa, Holly N CIV USARMY CESPN (US) [mailto:Holly.N.Costa@usace.army.mil]
Sent: Tuesday, October 23, 2018 9:51 AM
To: Kristen Goetz <kgoetz@ci.eureka.ca.gov>
Subject: RE: Project Referral: Carrington Vigo Street Commercial Development

Hi Kristen,

Sorry for the late reply. It appears from the plan drawings that the applicant will avoid the adjacent wetlands, and if that is the case, then a Corps permit would not be required. I would encourage the applicant to make sure they have a current wetlands delineation before beginning construction just to be sure they avoid the wetlands completely. A-1

Thank you,
Holly

****

Holly Costa
U.S. Army Corps of Engineers
San Francisco District Regulatory Division North Branch Chief

1455 Market Street, 16th Floor
San Francisco, CA 94103
(415) 503-6780
(415) 503-6690 (fax)

https://urldefense.proofpoint.com/v2/url?u=http-3A__www.spn.usace.army.mil_Missions_Regulatory.aspx&d=DwIFAg&c=euGZstcaTDllvimEN8b7jXrwqOf-v5A_CdpgnVfiiMM&r=shEP1vEssczxImm2Q0U_4FghmT6nEAvYfKLlKyDu8Vs&m=_PCw-uwScV9OUw3R29DhwBlqgFnhPFCcG9RRNz_1iaY&s=usvem-wVaVcc5sV7pkgqGU6j3q7nNb6AY6Vc3EBgsnU&e=

-----Original Message-----
From: Kristen Goetz [mailto:kgoetz@ci.eureka.ca.gov]
Sent: Monday, October 8, 2018 9:57 AM
To: Kristen Goetz <kgoetz@ci.eureka.ca.gov>
Subject: [Non-DoD Source] Project Referral: Carrington Vigo Street Commercial Development

Hi all: Attached is a referral for a commercial development on the corner of Broadway (Highway 101) and Vigo Streets.

Please keep the same subject line and reply to me on or before Friday, October 19, 2018. If you have no comment you may ignore this email, or feel free to send a reply of "No Comment." Please contact me if you have questions or need additional information.

If you are not the appropriate person, or someone else in your agency should instead/also receive referrals, please provide their name and e-mail address to me and we'll update the referral e-mail list.

Thank you!

Kristen M. Goetz | Senior Planner

Community Development Division

Development Services Department

City of Eureka | 707-441-4166

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ATTACHMENT B

Comment Letter B from California Native American Heritage Commission

October 31, 2018

Kristen M. Goetz, Senior Planner
City of Eureka
531 K Street
Eureka, CA 95501

Also sent via e-mail: kgoetz@ci.eureka.ca.gov

Re: SCH# 2018102055, 2616 Broadway Redevelopment Project, City of Eureka; Humboldt County, California

Dear Ms. Goetz:

The Native American Heritage Commission (NAHC) has reviewed the Mitigated Negative Declaration (MND) prepared for the project referenced above. The review included the Introduction and Project Description; and the Environmental Analysis, section 4.5, Cultural Resources, and section 4.17, Tribal Cultural Resources prepared by GHD, Inc. for the City of Eureka. We have the following concerns: B-1

1. While consultation requirements under AB-52 have technically been met, a single e-mail for project notification does not represent a good faith effort to consult with the tribes. The NAHC recommends that consultation outreach to the tribes on the NAHC list is consistent with Best Practices. Please refer to: http://nahc.ca.gov/wp-content/uploads/2015/04/AB52TribalConsultationRequirementsAndBestPractices_Revised_3_9_16.pdf B-2
2. The Most Likely Descendant timeline in Mitigation Measure Arch 3, subsection (c) is inaccurate. Public Resources Code section 5097.98 specifically states "the descendants shall complete their inspection and make their recommendations or preferences within **48 hours after being allowed access to the site".** B-3
3. Cultural Resource assessments are incomplete and/or out of date. The only documented assessment for this project was a records search in 2017. B-4
4. There are no mitigation measures specifically addressing Tribal Cultural Resources separately and distinctly from Archaeological Resources. Mitigation measures must take Tribal Cultural Resources into consideration as required under AB-52, **with or without consultation** occurring. Mitigation language for archaeological resources is not always appropriate for measures specifically for handling Tribal Cultural Resources. Sample mitigation measures for Tribal Cultural Resources can be found in the CEQA guidelines at ," http://resources.ca.gov/ceqa/docs/ab52/Clean-final-AB-52-App-G-text-Submitted.pdf and http://opr.ca.gov/docs/Revised_AB_52_Technical_Advisory_March_2017.pdf B-5

Please contact me at gayle.totton@nahc.ca.gov or call (916) 373-3714 if you have any questions.

Sincerely,

Gayle Totton

Gayle Totton, B.S., M.A., Ph.D.
Associate Governmental Project Analyst

Attachment

cc: State Clearinghouse

ADDITIONAL INFORMATION

The California Environmental Quality Act (CEQA)[1], specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment.[2] If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared.[3] In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended in 2014 by Assembly Bill 52. (AB 52).[4] **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** AB 52 created a separate category for "tribal cultural resources"[5], that now includes "a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment.[6] Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.[7] Your project may also be subject to **Senate Bill 18 (SB 18)** (Burton, Chapter 905, Statutes of 2004), Government Code 65352.3, if it also involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space. **Both SB 18 and AB 52 have tribal consultation requirements**. Additionally, if your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966[8] may also apply.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

Agencies should be aware that AB 52 does not preclude agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52. For that reason, we urge you to continue to request Native American Tribal Consultation Lists and Sacred Lands File searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/. Additional information regarding AB 52 can be found online at http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf, entitled "Tribal Consultation Under AB 52: Requirements and Best Practices".

The NAHC recommends lead agencies consult with all California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources.

A brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments is also attached.

Pertinent Statutory Information:

Under AB 52:

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a **lead agency** shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice.

A **lead agency** shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project.[9] and **prior to the release of a negative declaration, mitigated negative declaration or environmental impact report**. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18).[10]

The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

a. Alternatives to the project.
b. Recommended mitigation measures.
c. Significant effects.[11]

1. The following topics are discretionary topics of consultation:

a. Type of environmental review necessary.
b. Significance of the tribal cultural resources.

[1] Pub. Resources Code § 21000 et seq.
[2] Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, § 15064.5 (b); CEQA Guidelines Section 15064.5 (b)
[3] Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd.(a)(1); CEQA Guidelines § 15064 (a)(1)
[4] Government Code 65352.3
[5] Pub. Resources Code § 21074
[6] Pub. Resources Code § 21084.2
[7] Pub. Resources Code § 21084.3 (a)
[8] 154 U.S.C. 300101, 36 C.F.R. § 800 et seq.
[9] Pub. Resources Code § 21080.3.1, subds. (d) and (e)
[10] Pub. Resources Code § 21080.3.1 (b)
[11] Pub. Resources Code § 21080.3.2 (a)

c. Significance of the project's impacts on tribal cultural resources.

If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. [12]

With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process **shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10.** Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public.[13]

If a project may have a significant impact on a tribal cultural resource, **the lead agency's environmental document shall discuss** both of the following:

a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource.[14]

Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached.[15]

Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 **shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program**, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable.[16]

If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, **the lead agency shall consider feasible mitigation** pursuant to Public Resources Code section 21084.3 (b).[17]

An environmental impact report **may not be certified**, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days.[18]

This process should be documented in the Tribal Cultural Resources section of your environmental document.

Under SB 18:

Government Code § 65352.3 (a) (1) requires consultation with Native Americans on general plan proposals for the purposes of "preserving or mitigating impacts to places, features, and objects described § 5097.9 and § 5091.993 of the Public Resources Code that are located within the city or county's jurisdiction. Government Code § 65560 (a), (b), and (c) provides for consultation with Native American tribes on the open-space element of a county or city general plan for the purposes of protecting places, features, and objects described in Sections 5097.9 and 5097.993 of the Public Resources Code.

- SB 18 applies to **local governments** and requires them to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf
- Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe**.[19]
- There is no Statutory Time Limit on Tribal Consultation under the law.

[12] Pub. Resources Code § 21080.3.2 (a)
[13] Pub. Resources Code § 21082.3 (c)(1)
[14] Pub. Resources Code § 21082.3 (b)
[15] Pub. Resources Code § 21080.3.2 (b)
[16] Pub. Resources Code § 21082.3 (a)
[17] Pub. Resources Code § 21082.3 (e)
[18] Pub. Resources Code § 21082.3 (d)
[19] (Gov. Code § 65352.3 (a)(2)).

- Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research,[20] the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction.[21]
- Conclusion Tribal Consultation: Consultation should be concluded at the point in which:
    - The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    - Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation.[22]

NAHC Recommendations for Cultural Resources Assessments:

- Contact the NAHC for:
    - A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
    - A Native American Tribal Contact List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.
        - The request form can be found at http://nahc.ca.gov/resources/forms/.
- Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    - If part or the entire APE has been previously surveyed for cultural resources.
    - If any known cultural resources have been already been recorded on or adjacent to the APE.
    - If the probability is low, moderate, or high that cultural resources are located in the APE.
    - If a survey is required to determine whether previously unrecorded cultural resources are present.
- If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    - The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    - The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

Examples of Mitigation Measures That May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

- Avoidance and preservation of the resources in place, including, but not limited to:
    - Planning and construction to avoid the resources and protect the cultural and natural context.
    - Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
- Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
    - Protecting the cultural character and integrity of the resource.
    - Protecting the traditional use of the resource.
    - Protecting the confidentiality of the resource.
- Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
- Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed.[23]
- Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.[24]

The lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

- Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources.[25] In areas of identified

[20] pursuant to Gov. Code section 65040.2,
[21] (Gov. Code § 65352.3 (b)).
[22] (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).
[23] (Civ. Code § 815.3 (c)).
[24] (Pub. Resources Code § 5097.991).
[25] per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)).

archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.

- Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
- Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

ATTACHMENT C

Comment Letter C from California Department of Transportation

DEPARTMENT OF TRANSPORTATION
DISTRICT 1, P.O. BOX 3700
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Making Conservation a California Way of Life.

November 16, 2018

1-HUM-101-76.76
2616 Broadway Redevelopment
SCH# 2018102055

Ms. Kristen Goetz, Senior Planner
Community Development Services
City of Eureka
531 K Street
Eureka, CA 95501

Dear Ms. Goetz:

Thank you for giving Caltrans the opportunity to review and comment on the Mitigated Negative Declaration (MND) for the proposed 2616 Broadway Redevelopment Project located at the intersection of Vigo Street and Broadway (US 101). District 1 Caltrans has completed a peer review of the Traffic Study that was prepared to assess the transportation impacts of the project. The Caltrans analysis included the development of an independent traffic simulation model using Synchro software. The results of our analysis lead us to conclude that the project would have significant impacts to the transportation system if unmitigated. C-1

Impact #1: We concur with MND's identified transportation impact at the intersection of Vigo Street and Broadway (U.S. Route 101), which is anticipated to lead to 13-minute delays for left-turning vehicles on eastbound Vigo Street destined for northbound Broadway as a result of the proposed project. This is an unacceptable amount of delay, which can reasonably be expected to result in an increase in the collision rate for the intersection. C-2

Impact #2: The intersection of Henderson Street at Broadway contributes to the delay at Vigo Street as a consequence of vehicles in queue in the southbound direction at the traffic signal for Henderson and Broadway. Queues at Henderson have been observed extending through the Vigo Street intersection under current conditions. The existing queues frequently limit all movement in and out of the project site and is considered to impact the access to and from the project site under current conditions without the projected increase in trips that would be attributed to the project. C-3

Our traffic simulation analysis evaluated traffic conditions under four mitigation scenarios at five-year intervals to determine how well each scenario would function under future growth in traffic volumes. The mitigation scenarios are described as follow: C-4

1. Install a center median island, designed to prohibit left-turns from eastbound (EB) Vigo to northbound (NB) Broadway. U-turns would be allowed at the Henderson and Broadway intersection. The intersection at Henderson would continue to have four entry or approach

legs but Henderson would be converted to one-way, westbound (WB) between Fairfield Street and Broadway. C-4

2. Install a traffic signal at Vigo Street and Broadway and convert Henderson to one-way westbound. The intersection at Henderson and Broadway would have four approach legs. C-5
3. A traffic signal installed at Vigo Street and Broadway, which would be coordinated with the existing traffic signal at Henderson and Broadway. Henderson would be converted to one-way westbound between Fairfield Street and Broadway. The existing signal phase for the private driveway or driveways opposite Henderson would be eliminated in order to match the timing for the three-legged signal phasing at Vigo Street. C-6
4. A traffic signal installed at Vigo Street and Broadway with Henderson remaining as a two-way street between Fairfield Street and Broadway and a four-legged, uncoordinated signal at Henderson and Broadway. C-7

In the above scenarios that include the installation of traffic signals at Vigo Street and Broadway, eastbound Vigo Street would have two dedicated left-turn lanes onto northbound Broadway and one dedicated right-turn lane onto southbound Broadway. One lane would be provided for westbound Vigo Street and all on-street parking on Vigo Street would be prohibited. Any excess right of way on Vigo Street should be reserved for bicycle lanes. C-8

Mitigation alternatives: Our conclusions from the results of the simulated traffic analysis related to the project's impacts and mitigation measures are as follow:

1. Scenario number one does not present a problem with respect to timing or delay, moving the number of vehicles through the intersection, according to our traffic model outputs. The District does not support this scenario due to right of way constraints and issues related to the necessary turning radius for larger-sized vehicles. With Henderson converted to one-way westbound as a part of this scenario, there is a greater potential for wrong-way movements with the left-turn pocket provided where left-turns are prohibited. C-9
2. Scenario number two was reported by GHD to operate at a Level of Service (LOS) C, based on the volume of traffic used in the October draft of the transportation analysis. Using the volumes from the July draft of the GHD transportation analysis, the same scenario would operate at a LOS D on "opening day" of the project. By the year 2028, the LOS drops using either traffic volume to either D or E, depending on which volumes are used. **This is the mitigation scenario is preferred by Caltrans** with the caveat that the improvements built under this scenario may not provide acceptable traffic conditions under future conditions. Traffic volumes will need to be monitored to ensure that Broadway meets mutually-defined performance standards under future conditions. We request that the City work cooperatively with Caltrans to plan for the future growth on Broadway for both local, regional, and interregional travel. C-10 C-11 C-12 C-13 C-14 C-15

3. Scenario number three, which involves signal coordination between the existing signal at Henderson and Broadway and the proposed signal at Vigo Street. This scenario appears to operate with an acceptable LOS, however we find this proposal to be undesirable because it would eliminate the existing signal phase for the eastbound leg of the Henderson Street signal and restrict access to other private driveways. C-16
4. Scenario number four results in the lowest LOS of the four scenarios studied. Henderson is projected to operate at LOS E on "opening day" and degrade to LOS F by 2028, or less than ten years after opening. This scenario does not operate at an acceptable performance level with project-generated traffic and any infrastructure investment should consider the design life. Considering the length of time needed to carefully study, design and construct the improvements, projects with a short design-life run the risk of being poor investments of public resources. C-17

We have not considered the potential impacts of spill-over queues the extend off-site as a result of poor on-site circulation or excessive delays for traveling through the drive-through aisle. We recommend that the City analyze or model the on-site queues and develop preventative measures to limit impacts off-site. The drive throughs should be designed to accommodate the number of trips that are projected to occur during peak periods without impacting off-site transportation, circulation and public access. We recommend that the City adopt a method for issuing fines any businesses with drive-throughs on site that have queues which extend off-site and obstruct traffic on public streets and/or obstruct access to other driveways. Drive-throughs may need to include multiple lanes for queuing and ordering, multiple windows for sales transactions and/or pick-up, and/or staff assigned to direct traffic and circulation on site to limit off-site queuing. C-18 C-19 C-20 C-21

Detailed Comments for the Transportation Impact Study (Transportation Analysis)
The following comments pertain to the District's analysis of the transportation analysis that was prepared for the project. This information is intended to support the City's encroachment permit application to install a signal on Broadway at Vigo Street. Encroachment permits issued to local government agencies are issued at no cost to the public agency. C-22

Section 2.6 Technical Analysis Parameters
Table 2.2 of the transportation analysis shows a peak hour factor of 0.92 and saturation flow rate of 1900, which is the default setting for many traffic modeling software platforms. District 1 uses a saturation flow rate 1750 and peak hour factors are calculated for each movement at intersections to reflect travel behavior more commonly observed in rural areas like the north coast. These values for quantifying lane utilization and traffic density can be determined based on traffic observation, however, it is our opinion that the use of these values may result in the under-estimation or under-reporting of foreseeable or actual traffic impacts. C-23

Section 2.8 Vehicle Queueing: C-24

The transportation analysis shows that the vehicle queue lengths for westbound Henderson at Broadway are half of maximum capacity. Field observations at this intersection show queueing is at capacity and extends up Henderson and beyond Fairfield. C-24 (cont.)

Driveway queueing in the parking lot was not evaluated. Any queue extending to Vigo and spilling onto Broadway would cause a significant impact to traffic on Broadway. Queueing inside the parking lot and through the drive-thru should be evaluated or modeled to show duration and queue length of vehicles. C-25

Section 3.3 Existing Bicycle and Pedestrian Facilities
This section of Broadway is the Pacific Coast Bike Route (Class III). Other bicycling routes in the area, including the Hikshari' Trail and the bike lane (Class II) on Harris and Henderson Streets suggest that the provision of secure bicycle parking be considered. C-26

Section 4.2 Project Trip Generation:
Table 4.1 in the latest TIS shows a reduction in trips compared to the July TIS. The Fast Food Casual restaurant and the addition of a Shopping Center resulted in an overall lower trip generation rate. This lower trip generation rate shows a better performance of Vigo and Broadway than reported in the July 2018 TIS. For this evaluation Caltrans used the trip generation volumes for analysis but still believes that the trips shown in the 2018 TIS are underestimating the actual trips generated. C-27

Section 4.4 Roadway Improvements
This improvement is different than what is described in Section 8.3 Existing Plus Project Mitigations and likely was not revised between the July draft and the October transportation analysis. Section 4.4 states that the proposed improvements include pavement markings for a left turn lane on the eastbound approach at Vigo and the intersection would remain stop controlled. For the purposes of clarity, this alternative does not provide sufficient gaps for westbound left turning vehicles at mid-day peak hour. Vehicles are significantly delayed and queueing backs up beyond capacity on Vigo. C-28

Section 5.3 Existing Plus Project Queues
Table 5.3 project queues are not representative of what is observed in the field. For example, Henderson westbound traffic frequently experiences queue lengths during mid-day that extend beyond the intersection of Fairfield and Henderson. Queues experienced on southbound Broadway at Henderson extend beyond Vigo St. A recent field review during mid-day observed southbound Broadway vehicle queues at Henderson extend over 700 feet or approximately 30 vehicles long in the number 2 lane. C-29

Section 8.3 Existing Plus Project Mitigations – Intersection 3 - Broadway Street & Vigo Street C-30

Alternative 1-Restriction of left turns eastbound Vigo Street (left & right in and right out only)

- *Convert W Henderson to one-way (couplet)*
  Changing the timing at Henderson and making it one-way slightly reduces the delay for northbound Broadway traffic with the removal of the turn movement, however the southbound traffic does not improve because there is no increase in "green time" allocated to this signal phase and thru traffic still waits for opposing left turns at Vigo and Henderson. C-30 (cont.)

  Additionally, larger vehicles are now restricted from making a southbound left turn onto Henderson and do not have an alternative route nearby. Harris Street is not designed for large trucks (STAA or CA legal) to make southbound left turn movements from Broadway. We expect that this intersection will need to be reconfigured to accommodate STAA and CA legal trucks as a result of converting Henderson to one-way. C-31

- *Restripe Broadway for southbound U-Turns*
  Based on the number of vehicles that would be forced to make U-Turns as a result of a left-turn prohibition for eastbound Vigo Street and the limited availability of public right of way to widen Broadway to provide a suitable turning radius, we do not support U-turns on Broadway. C-32

Alternative 2a-Signalization of Vigo and Broadway (Henderson Two-Way) / Existing Plus Project

This alternative would require a channelized left turn pocket for northbound vehicles to turn left onto Vigo. The left turn pocket for southbound Broadway to Henderson storage would conflict with the new left turn pocket onto Vigo. The southbound left turn pocket onto Henderson has enough storage for 7 vehicles (approximately 175 feet), Sim Traffic modeling results show that the 95% queue for this left turn pocket is at capacity for existing plus project volumes. A left turn pocket for northbound traffic turning onto Vigo would require the entire length of the road segment, from signal to signal. The storage requirements are for existing plus project traffic volumes and do not allow for increases in future traffic volumes. C-33

A modeled simulation of existing traffic volumes shows the southbound left turn onto Henderson will experience queueing beyond the capacity of the turn pocket. The northbound left onto Vigo also experiences queuing larger than the proposed turn pocket. These left turn pocket queues conflict with one another and essentially overlap.

Based on the above findings, the installation of a signal at Vigo and Broadway without mitigation or improvements to the Henderson and Harris Street intersections will result in significant unmitigated impacts to U.S. Route 101 (Broadway).

Alternative 2b-Signalization of Vigo and Broadway (Henderson One-Way) / Existing Plus Project

The reconfiguration of Henderson to a one-way is required to accommodate northbound left turn queues into Vigo. As discussed previously, if Henderson is converted to a one-way street, larger vehicles that are now restricted from making a southbound left turn onto Henderson will not have an alternative route to access Harris Street in the immediate vicinity. This intersection will either need to be reconfigured to accommodate STAA and CA legal trucks or have an alternate route identified. Additionally, vehicles that currently use Henderson to travel eastbound to Fairfield will be diverted to other routes. We expect that the majority of the vehicles diverted from traveling eastbound on Henderson will continue south to Harris, likely exceeding the capacity of the existing left turn pocket if the existing volumes are combined. We recommend extending the southbound left-turn pocket on Broadway at Harris Street when converting Henderson to one-way. C-34

Under the 20-year traffic projections, the signal at Vigo and Broadway begins to operate at an unacceptable level in the southbound direction. Southbound Broadway right-turns onto Vigo will require channelization to maintain acceptable operations within the 20-year horizon. C-35

The signal at Vigo Street and modifications to Broadway at Henderson and Harris appear to adequately to mitigate for traffic impacts in the near term, for which we are willing to issue the City an encroachment permit. Caltrans may be willing to make improvements to Henderson and or Harris to address deficiencies under existing conditions. However, in consideration of both the near-term and anticipated future transportation impacts to Broadway as a result of redevelopment at Vigo Street, we request that the City work cooperatively with Caltrans District staff to plan and fund multi-modal improvements to meet future travel demand within the Broadway corridor. C-36

Please contact me with questions or for further assistance regarding the above comments at: (707) 441-4693 or by email at: <jesse.robertson@dot.ca.gov>.

Sincerely,

JESSE ROBERTSON
Transportation Planning
District 1 Caltrans

c: State Clearinghouse
Scott Harris, GHD Consulting Engineers

ATTACHMENT D

Comment Letter D from Humboldt Baykeeper

Nov. 23, 2018

Ms. Kristen Goetz, Senior Planner
City of Eureka Development Services Department
531 K Street
Eureka, CA 95501
kgoetz@ci.eureka.ca.gov

Submitted via email

Re: Comments on the City of Eureka's 2616 Broadway Redevelopment Project Draft Initial Study/Proposed Mitigated Negative Declaration

Ms. Goetz,

On behalf of the Humboldt Baykeeper board, staff, and members, I submit these comments regarding the Draft Initial Study/Proposed Mitigated Negative Declaration for the City of Eureka's 2616 Broadway Redevelopment Project ("Project") located on APNs 007-121-005 and 007-121-007. D-1

Humboldt Baykeeper works to safeguard our coastal resources for the health, enjoyment, and economic strength of the Humboldt Bay community, and is a member of the California Coastkeeper Alliance and the international Waterkeeper Alliance. D-2

The Project would demolish the existing vacant commercial building in order to construct two commercial buildings and site improvements, including parking areas, utilities, low impact development site features, landscaping, and stormwater infrastructure. Although the Project has many positive aspects, notably Low Impact Development features to reduce pollution from stormwater runoff, the Proposed Mitigated Negative Declaration (MND) for the Project fails to adequately assess and mitigate impacts to Environmentally Sensitive Habitat Areas (ESHA) as defined in the City's Local Coastal Plan (LCP). The western boundary of the Project site is adjacent to an ESHA known as the Mauer-Palco Marsh, an area adjacent to Humboldt Bay, which comprise some of the most significant of the few remaining wetlands within the City of Eureka's Coastal Zone. D-3 D-4 D-5

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The MND recommends a wetland buffer of at least 50 feet, extending outward from the edge of the one-parameter wetland boundary to protect the wetland habitat from potential development project impacts (Appendix C, p. 14). Although removal of trash and gravel followed by native vegetation plantings are recommended within the 50-foot wetland buffer, the proposed buffer width is inconsistent with policies in the City's LCP and Land Use Policies (LUP) that protect wetlands, ESHA, Aquatic Resources, and Marine, Wetland, and Riparian Habitats. D-6 D-7

According to the MND,

> The City of Eureka General Plan includes several policies to protect biological resources. The policies focus on protecting and enhancing the natural qualities of the Eureka area's aquatic resources and preserving the area's valuable marine, wetland, and riparian habitat (policies 6.A.1, 6.A.3, 6.A.6, 6.A.7, 6.A.8, 6.A.13, 6.A.14, and 6.A.19). The Project would not conflict with applicable City of Eureka General Plan policies protecting biological resources, as necessary buffers, bioswales, and various sedimentation and erosion BMPs would be implemented to ensure the natural resources of Eureka are protected. No impact would occur. (p. 4-16).

In addition, the MND states that,

> The proposed Project is adjacent to the Maurer-Palco Marsh [sic], which is considered an ESHA. The Project would not encroach into this area and the Project would implement LID areas to protect this area from the proposed development.
>
> The Project is also located within the Coastal Development Zone, which makes the site subject to applicable coastal zone policies and regulations of the Coastal Act. The Project would require a Coastal Development Permit (CDP) from the City. A CDP application package is being prepared concurrently with this ISMND.
>
> Applicable policies adopted for the purpose of avoiding or mitigating environmental effects can be found throughout the City Local Coastal Program (LCP) and General Plan. A review of the LCP and General Plan elements, and the policies and standards within, did not identify any inconsistencies with the proposed Project.
>
> The Project would not introduce new land uses or land use designations or zoning; therefore, no conflict with applicable land use plans, policies, or regulation(s) would occur. The impact would be less than significant. (p. 4-37).

However, the MND is inconsistent with the following policies in the LCP and LUP regarding required setbacks (buffer) from Mauer-Palco Marsh, an environmentally sensitive habitat area. Because the proposed development would be located within 100 feet of ESHA, the project is not compatible with LCP ESHA protection and buffer policies. The project could and should be resituated so as to minimize the impacts on ESHA. D-8 D-9 D-10

LUP Aquatic Resources and Marine, Wetland, and Riparian Habitats Policy 6.A.6, in applicable part: D-10 (cont.)

> *The City declares the following to be environmentally sensitive habitat areas within the Coastal Zone: ...*
>
> *b. Wetlands and estuaries, including that portion of Humboldt Bay within the City's jurisdiction, riparian areas, and vegetated dunes ...*

LUP Aquatic Resources and Marine, Wetland, and Riparian Habitats Policy 6.A.7:

> *Within the Coastal Zone, the City shall ensure that environmentally sensitive habitat areas are protected against all significant disruption of habitat values, and only uses dependent on such resources be allowed within such areas. The City shall require that development in areas adjacent to environmentally sensitive habitat areas be sited and designed to prevent impacts which would significantly degrade such areas, and be compatible with the continuance of such habitat areas.*

LUP Aquatic Resources and Marine, Wetland, and Riparian Habitats Policy 6.A.8:

> *Within the Coastal Zone, prior to the approval of a development, the City shall require that all development on lots or parcels designated NR (Natural Resources) on the Land Use Diagram or within 250 feet of such designation, or development potentially affecting an environmentally sensitive habitat areas, shall be found to be in conformity with all applicable habitat protection policies of the General Plan. All development plans, drainage plans, and grading plans submitted as part of an application shall show the precise location of the habitat(s) potentially affected by the proposed project and the manner in which they will be protected, enhanced, or restored.*

LUP Aquatic Resources and Marine, Wetland, and Riparian Habitats Policy 6.A.19, in applicable part:

> *The City shall require the establishment of a buffer for permitted development adjacent to all environmentally sensitive habitat areas. The minimum width of a buffer shall be 100 feet, unless the applicant for the development demonstrates on the basis of site specific information, the type and size of the proposed development, and/or the proposed mitigation (such as planting of vegetation) that will achieve the purpose(s) of the buffer, that a smaller buffer will protect the resources of the habitat area...*

The MND recommends further biological surveys for nesting birds, red-legged frogs, bat habitat in the existing building slated for demolition, and proposes mitigation measures during demolition and construction (p. 4-12 and 4-14). However, the MND fails to evaluate increased noise related to the operation of the Project once construction is complete. Operation of a drive-through fast-food restaurant and D-11 D-12

other regular activities associated with the proposed development will increase night-time noise levels, which are not analyzed in the MND, nor are they addressed in the proposed reduced wetland setback. D-13

The biological information relied upon by the City in approving the project, does not demonstrate that a reduced wetland setback would protect the resources of the habitat area as required by LUP Policy 6.A.l9. The biological information prepared for the project discusses the increased disturbance associated with the operation of the project adjacent to the ESHA, and generally concludes that the impacts would be less than significant. However, the biological evaluation lacks site-specific information regarding impacts from increased disturbance associated with operation of the project to birds, mammals, or other species that utilize the ESHA. There is no information regarding the current level of use of the ESHA by wildlife and how that level of use would be expected to change as a result of the project. Furthermore, the information in the record does not demonstrate how the planting of vegetation along a reduced buffer width would achieve the purpose(s) of the buffer to effectively protect the resources of the habitat area as required by LUP Policy 6.A.19. D-14 D-15 D-16 D-17 D-18

Waterfront Trail Connectivity and Bicycle Parking

The Project's location on Vigo Street offers the potential for the City to examine connecting the existing gravel road from Vigo Street to the Eureka Waterfront Trail. Including additional bicycle parking within the Project would be appealing to many local residents. D-19 D-20

Interpretive Signage for Low-Impact Development Features

The Project includes several low-impact development features to reduce pollution from stormwater runoff. Including interpretive signage to inform the public of the importance of protecting Humboldt Bay and coastal wetlands from stormwater runoff would be beneficial. D-21 D-22

We appreciate the opportunity to comment on the proposed Project. Please keep us informed of public hearings and other future opportunities to provide input.

Sincerely,

__s/_____
Jennifer Kalt, Director
jkalt@humboldtbaykeeper.org

Cc: Cristin Kenyon, California Coastal Commission

2616 BROADWAY - EUREKA, CA REDEVELOPMENT

DESIGN REVIEW

MBA
ARCHITECTURE +
INTERIOR DESIGN

DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET	1.0

INDEX

COVER	1.0
INDEX	1.1
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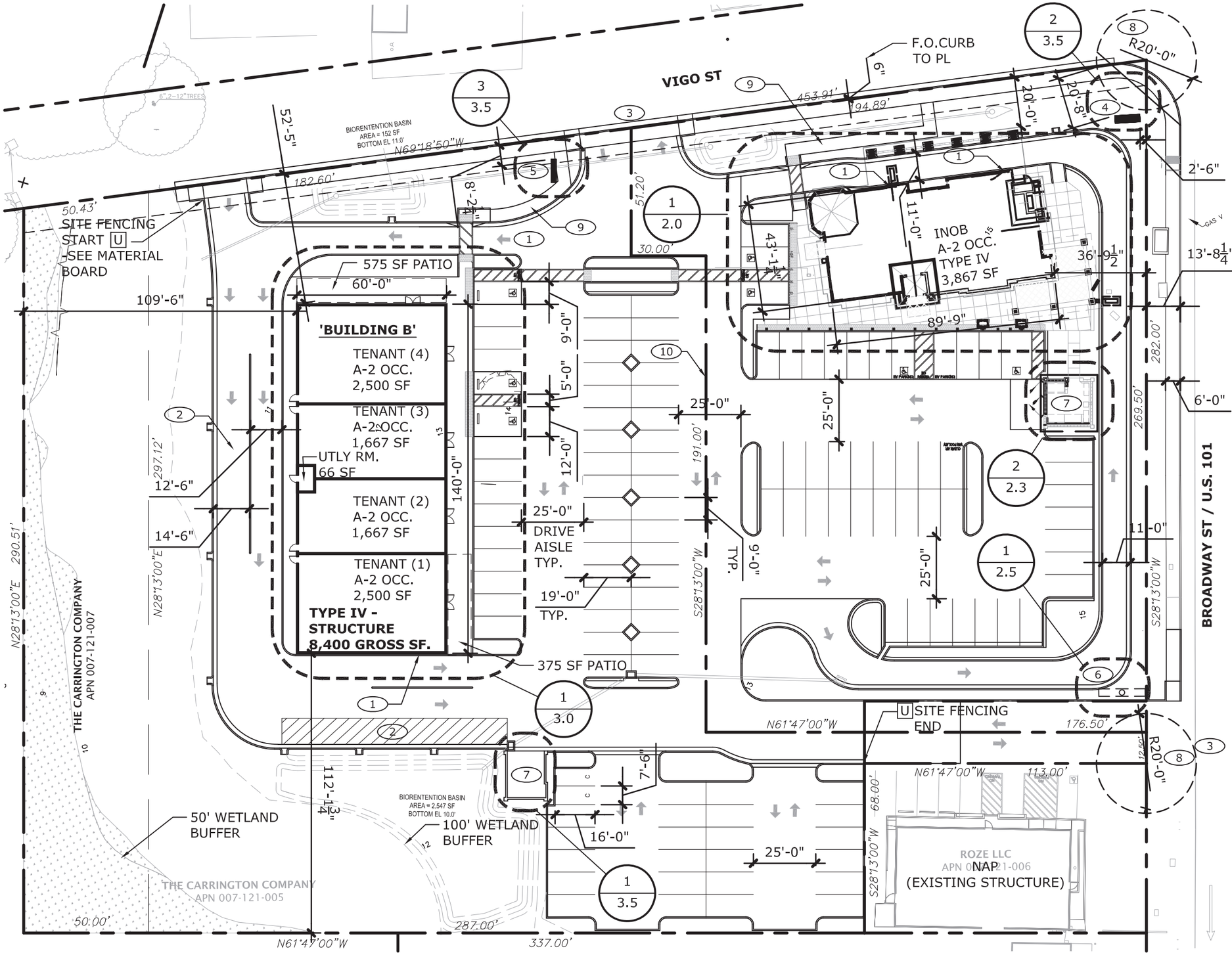
INOB FLOOR PLAN	2.0
INOB EXTERIOR ELEVATIONS	2.1
INOB EXTERIOR ELEVATIONS	2.2
INOB TRASH ENCLOSURE	2.3
INOB SIGNAGE PACKAGE	2.4 - 2.12
BUILDING B FLOOR PLAN	3.0
BLDG B - EXTERIOR ELEVATION (EAST)	3.1
BLDG-B EXTERIOR ELEVATION (NORTH)	3.2
BLDG-B EXTERIOR ELEVATION (WEST)	3.3
BLDG-B EXTERIOR ELEVATION (SOUTH)	3.4
BLDG-B ACCESSORY STRUCTURES	3.5
BLDG-B SIGN ELEVATIONS	3.6
MATERIAL BOARD	3.7



SHEET NOTES:

Attachment 3 - Page 3

(THIS SHEET ONLY)

1. DRIVE-THRU WINDOW
2. LOADING ZONE/ONE WAY ACCESS DRIVE
3. SITE ENTRY
4. MONUMENT SIGN 1 (MAJOR)
5. MONUMENT SIGN 2 (MINOR)
6. INOB PYLON SIGN
7. TRASH ENCLOSURE
8. INTERSECTION VIEW TRIANGLE
9. ADA PATH OF TRAVEL - OFF SITE
10. NEW PROPERTY LINE - SEE CIVIL DWG'S

SITE INFORMATION

RESTAURANT COMBINED: 8,400 SF	
RESTAURANT STAND ALONE: 3,867 SF (1 SP : 200 SF) 12,267 SF/ 200 PARKING REQUIRED: (§ 155.117 SCHEDULE OF OFF-STREET PARKING SPACE REQUIREMENTS)	62 TOTAL SPACES
TOTAL OFF-STREET PARKING PROVIDED: STANDARD (9'-0" x 19'-0")	120 TOTAL SPACES
ADA SPACES:	5
COMPACT SPACES: (7'-6" x 16'-0")	2
EV SPACES:	2
ON-STREET PARKING PROVIDED:	TBD

SITE SIGNAGE

ALLOWABLE SIGNAGE: STREET FRONTAGE LENGTH X 3.	
BROADWAY FRONTAGE	282 FEET
VIGO FRONTAGE	454 FEET
AREA CALCULATION- STREET FRONTAGE COMBINED: (736') x 3	2208 SF
MONUMENT SIGN (MAJOR) - 6 PANELS @ 23sf EA. 2 SIDED	276 SF
MONUMENT SIGN (MINOR) - 5 PANELS @ 7.5sf EA. 1 SIDED	37.5 SF
MULTI-TENANT BUILDING SIGNAGE COMBINED:	884 SF
INOB BULDING SIGNAGE + PYLON SIGN	740 SF
SITE SIGNAGE ALLOWABLE:	2208 SF
PROPOSED SITE SIGNAGE COMBINED:	1937.5 SF

1 SITE PLAN

SCALE: 1"=40"

0" 1" 2"
0' 10' 20' 40'-0" 80'-0"

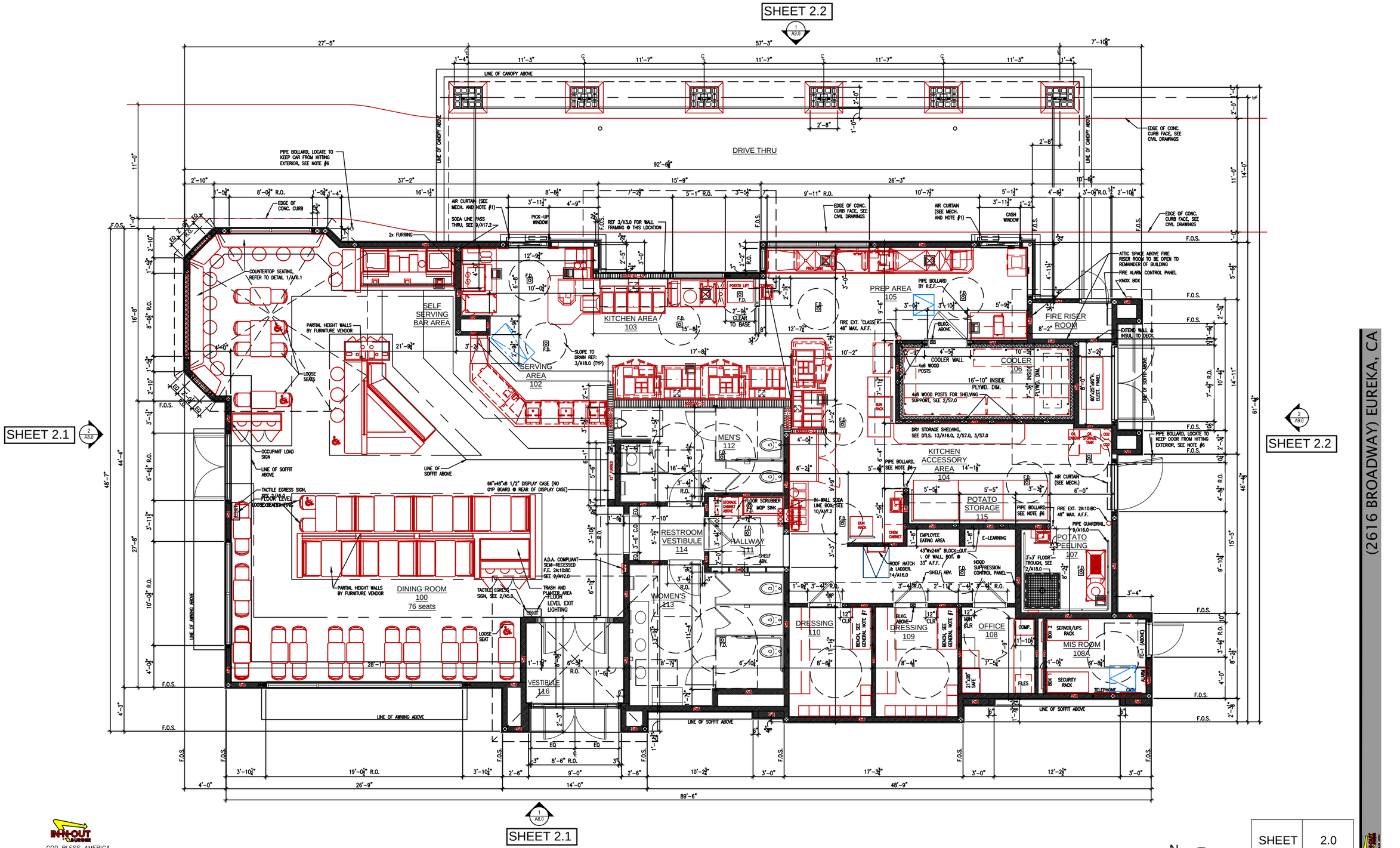
MBA
ARCHITECTURE + INTERIOR DESIGN

DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET	1.2



GOD BLESS AMERICA

13502 HAMBURGER LANE
BALDWIN PARK, CA 91706

FLOOR PLAN

SHEET OF 1

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EUREKA, CA

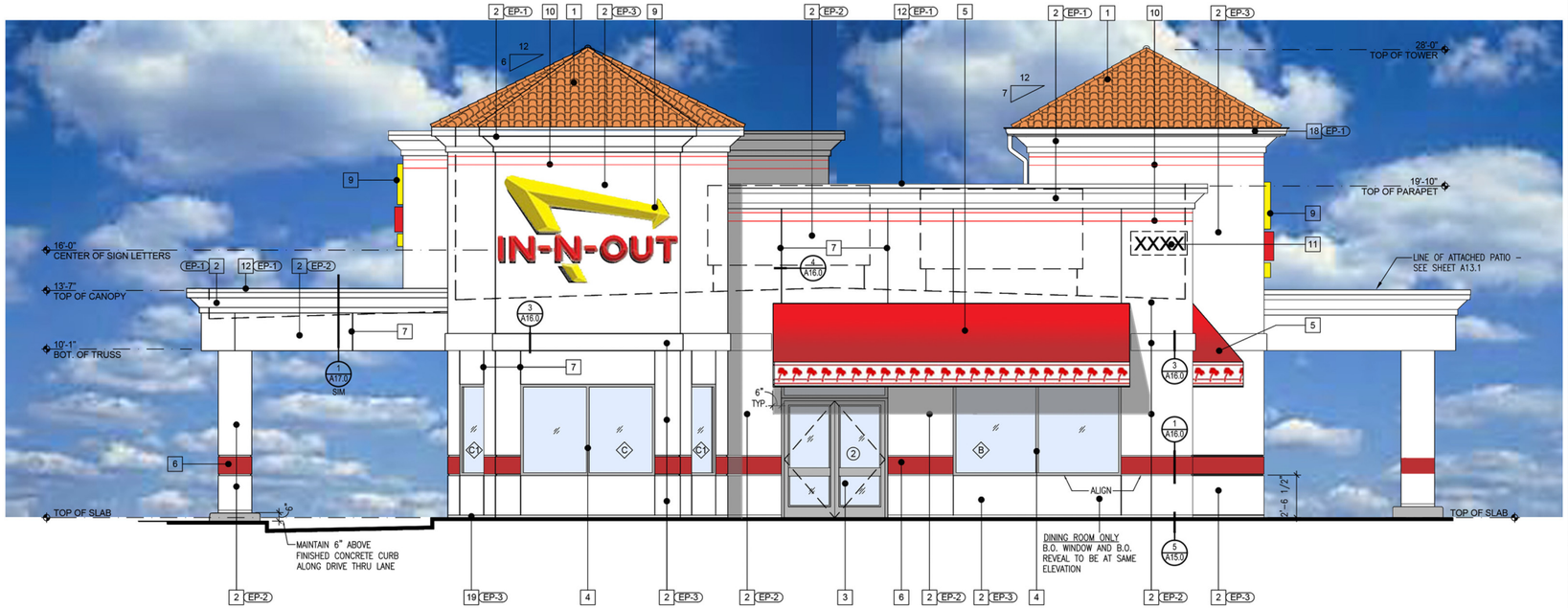
2616 BROADWAY

SCALE: 1/8"=1'-0"

N

SHEET	2.0

07-05-18



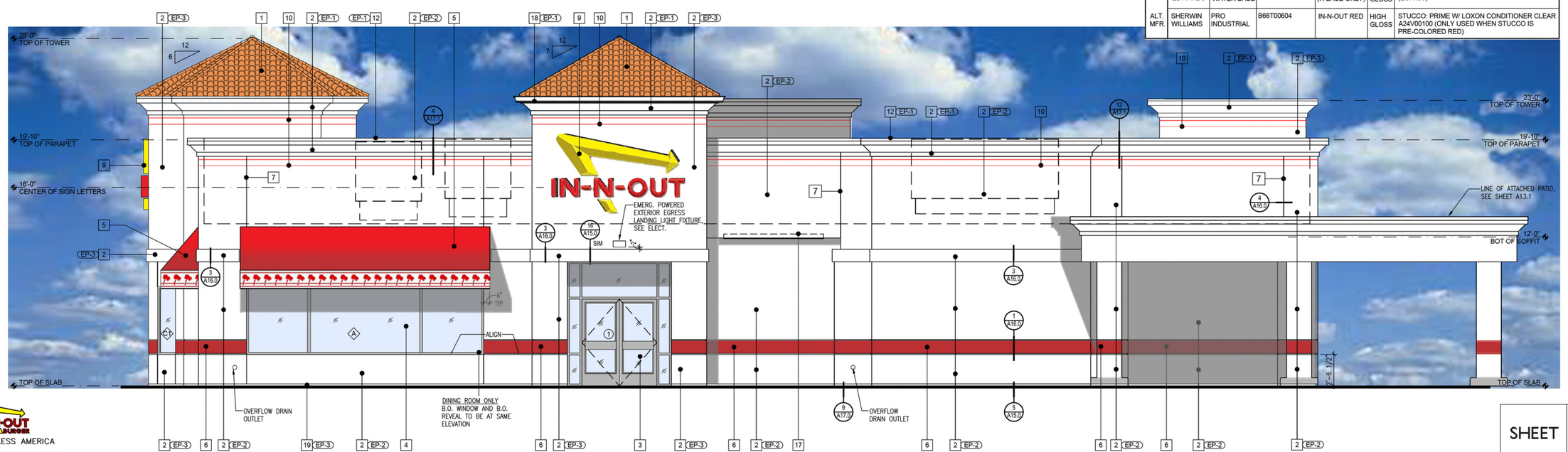
2 / A8.0 WEST ELEVATION
SCALE: 1/8" = 1'-0"

KEY NOTES

1	TILE ROOF: EAGLE ROOFING PRODUCTS, CAPISTRANO STYLE 3125 TERRACOTTA. PROVIDE BIRD STOP AND PAINT TO MATCH TILE.
2	STUCCO: MEDIUM SAND FLOAT TEXTURE FINISH.
3	ALUMINUM STOREFRONT DOORS: CLEAR ANODIZED ALUMINUM.
4	ALUMINUM WINDOWS: CLEAR ANODIZED ALUMINUM.
5	AWNINGS: PVC COATED WICK-RESISTANT ERADICABLE POLYESTER AWNINGS WITH CUSTOM PALM TREE ERADICATED TO WHITE COLOR BY COOLEY BRITE CUSTOM RED 79-L1124A, FLAME RETARDANT PER UL-48, UL-94, NFPA 701. PROVIDE FLUORESCENT BACKLIGHTING. SEE: 5/A16.0 & 6/A16.0.
6	STUCCO BAND: PAINT (EP-4). INTEGRAL COLOR CEMENT PLASTER TO MATCH PAINT (EP-4). 1" ALUMINUM REVEAL TOP AND BOTTOM (DO NOT PAINT REVEALS). SEE DETAILS 1/A16.0 & 13/A17.0
7	1/4" WIDE METAL PENN SCREED: SEE DETAIL 4/A16.0. ALIGN CONTROL JOINTS ON DRIVE-THRU CANOPY FASCIA WITH CONTROL JOINTS ON BOTTOM OF SOFFIT.
8	SLOPED ALUMINUM WINDOWS: U.S. ALUMINUM S-010. GLASS JOINTS TO HAVE POLISHED EDGES WITH SILICONE JOINTS. PAINT WOOD FRAME "EP-4".
9	IN-N-OUT BURGER ILLUMINATED LOGO SIGN: UNDER SEPARATE PERMIT.
10	L.E.D. DOUBLE BAND LIGHTING: UNDER SEPARATE PERMIT.
11	BUILDING ADDRESS NUMBERS TO BE 12" HIGH, 4" MIN. W/ MIN. STROKE WIDTH OF 0.5 INCH PER FIRE DEPARTMENT AND CITY JURISDICTION ADDRESS DISPLAY REQUIREMENTS: 1. ADDRESS SHALL BE DISPLAYED & VISIBLE FROM BOTH STREET DIRECTIONS OF APPROACHING VEHICLES. 2. PERMANENT NUMBERS AND LETTERS SHALL BE MADE OF DURABLE AND CLEARLY VISIBLE MATERIAL SUCH AS WOOD, METAL, CERAMIC, PLASTIC AND VINYL. (PAINTED OR GLUED ON NUMBERS ARE NOT ACCEPTABLE MATERIALS). 3. NUMBERS SHALL BE OF COLORS CONTRASTING WITH BACKGROUND TO WHICH THEY ARE ATTACHED. 4. NUMBERS SHALL BE A MINIMUM PROPORTION RATIO OF 6:1 (HEIGHT TO WIDTH). 5. NUMBERS CANNOT BE SPELLED.
12	PRIMER: GALV-ALUM PREMIUM, NON FERROUS METAL PRIMER (GA 01). FINISH COAT: RUSTOLEUM SIERRA BEYOND BY DUNN EDWARDS. COLOR TO MATCH STUCCO.
13	HOLLOW METAL DOOR: SEE SHEET A11.0 (PAINT WITH SHERWIN WILLIAMS - WATERBASE ACROLON 100 URETHANE PART A B65-720 / PART -B B65V720 - TINT TO MATCH PAINT COLOR NOTED).
14	5'-0" HIGH STUB OUT FOR Co2 LINE
15	4" MIN. HIGH WHITE LETTERING "RISER ROOM" ON RED BACKGROUND SIGN. MOUNT ON RISER ROOM DOOR
16	RECESSED KNOX BOX AT 5'-0" HIGH TO THE RIGHT OF FIRE RISER ROOM. SEE DETAIL 10/A17.0
17	RECESSED 8' FLUORESCENT LIGHT FIXTURE IN SOFFIT. SEE DETAIL 9/A17.1
18	GUTTER AND DOWNSPOUT. REFER TO DETAIL 8/A17.2
19	TEXTURE EXPOSED FOUNDATION WALL BELOW STUCCO WEEP SCREED AND PAINT TO MATCH WALL.

EXTERIOR PAINT SCHEDULE

NO.	MFR.	MODEL	COLOR #	COLOR NAME	FINISH	REMARKS
EP-1	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	B66W00611	IN-N-OUT BONE CHINA	HIGH GLOSS	STUCCO: PRIME W/ LOXON CONCRETE & EXT LATEX PRIMER WHITE - A24W08300. GALV METAL: PRIME W/ GALVITE HS ACRYLIC COATING - B50WZ0030, OFF WHITE
EP-2	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	A84W01151	IN-N-OUT BONE CHINA	HIGH GLOSS	SEE REMARKS FOR EP-1 ALT MFR.
EP-3	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	A84W01151	IN-N-OUT BONE CHINA	HIGH GLOSS	SEE REMARKS FOR EP-1 ALT MFR.
EP-4	DUNN EDWARDS	SYN-LUSTRO WATER BASE	W10-221	SAFETY RED (R BASE ONLY)	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	PRO INDUSTRIAL	B66T00604	IN-N-OUT RED	HIGH GLOSS	STUCCO: PRIME W/ LOXON CONDITIONER CLEAR A24V00100 (ONLY USED WHEN STUCCO IS PRE-COLORED RED)



1 / A8.0 SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

GOD BLESS AMERICA

13502 HAMBURGER LANE
BALDWIN PARK, CA 91706

ELEVATION-1

SHEET OF 1

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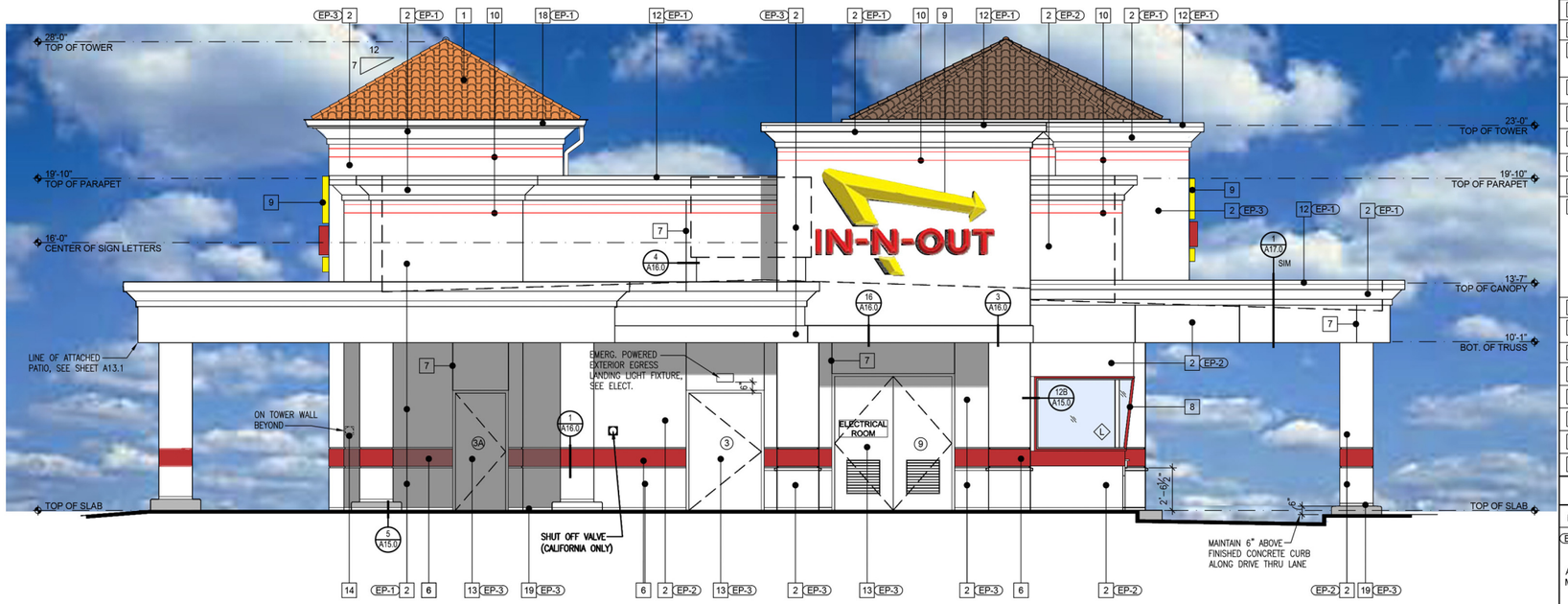
EUREKA, CA

2616 BROADWAY

(2616 BROADWAY) EUREKA, CA

SHEET 2.1

07-05-18



2 / A9.0 EAST ELEVATION
SCALE: 1/8" = 1'-0"

KEY NOTES

1	TILE ROOF: EAGLE ROOFING PRODUCTS, CAPISTRANO STYLE 3125 TERRACOTTA. PROVIDE BIRD STOP AND PAINT TO MATCH TILE.
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6	STUCCO BAND: PAINT (EP-4). INTEGRAL COLOR CEMENT PLASTER TO MATCH PAINT (EP-4). 1" ALUMINUM REVEAL TOP AND BOTTOM (DO NOT PAINT REVEALS). SEE DETAILS 1/A16.0 & 13/A17.0
7	1/4" WIDE METAL PENN SCREED: SEE DETAIL 4/A16.0. ALIGN CONTROL JOINTS ON DRIVE-THRU CANOPY FASCIA WITH CONTROL JOINTS ON BOTTOM OF SOFFIT.
8	SLOPED ALUMINUM WINDOWS: U.S. ALUMINUM S-010. GLASS JOINTS TO HAVE POLISHED EDGES WITH SILICONE JOINTS. PAINT WOOD FRAME "EP-4".
9	IN-N-OUT BURGER ILLUMINATED LOGO SIGN: UNDER SEPARATE PERMIT.
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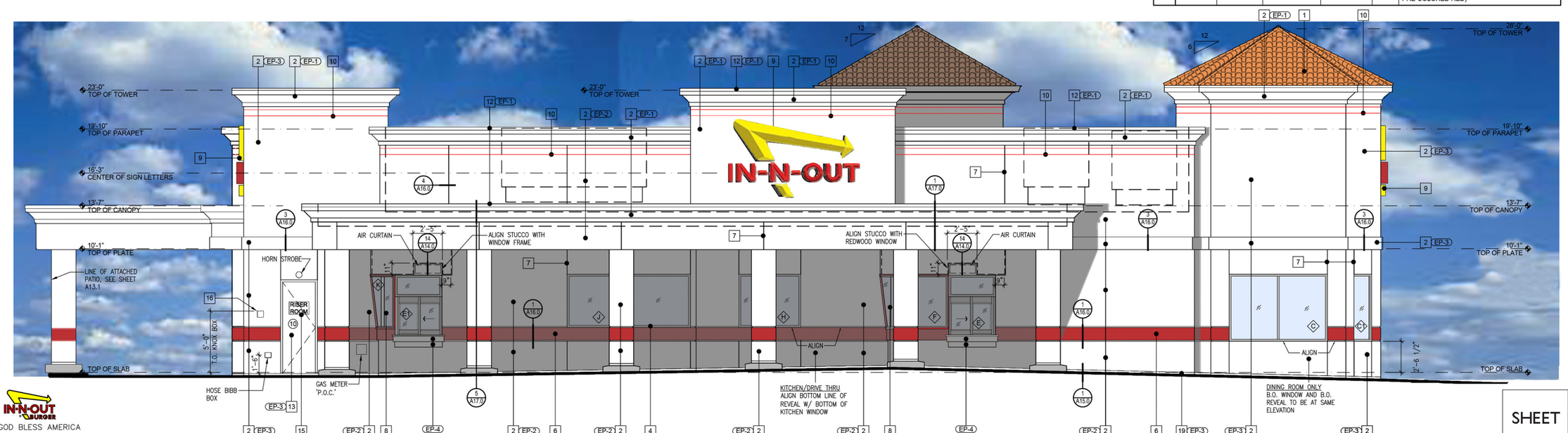
17	RECESSED 8' FLUORESCENT LIGHT FIXTURE IN SOFFIT. SEE DETAIL 9/A17.1
18	GUTTER AND DOWNSPOUT. REFER TO DETAIL 8/A17.2
19	TEXTURE EXPOSED FOUNDATION WALL BELOW STUCCO WEEP SCREED AND PAINT TO MATCH WALL.

EXTERIOR PAINT SCHEDULE

NO.	MFR.	MODEL	COLOR #	COLOR NAME	FINISH	REMARKS
EP-1	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	B66W00611	IN-N-OUT BONE CHINA	HIGH GLOSS	STUCCO: PRIME W/ LOXON CONCRETE & EXT LATEX PRIMER WHITE - A24W08300. GALV METAL: PRIME W/ GALVITE HS ACRYLIC COATING - B50WZ0030, OFF WHITE
EP-2	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	A84W01151	IN-N-OUT BONE CHINA	HIGH GLOSS	SEE REMARKS FOR EP-1 ALT MFR.
EP-3	DUNN EDWARDS	EVERSHIELD	EVSH 60 - SP 514	BONE CHINA	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	SUPER PAINT LATEX	A84W01151	IN-N-OUT BONE CHINA	HIGH GLOSS	SEE REMARKS FOR EP-1 ALT MFR.
EP-4	DUNN EDWARDS	SYN-LUSTRO WATER BASE	W10-221	SAFETY RED (R BASE ONLY)	HIGH GLOSS	PRIME W/ D.E. EFF-STOP PREMIUM PRIMER (ESPR00)
ALT. MFR.	SHERWIN WILLIAMS	PRO INDUSTRIAL	B66T00604	IN-N-OUT RED	HIGH GLOSS	STUCCO: PRIME W/ LOXON CONDITIONER CLEAR A24V00100 (ONLY USED WHEN STUCCO IS PRE-COLORED RED)



1 / A9.0 NORTH ELEVATION
SCALE: 1/8" = 1'-0"

GOD BLESS AMERICA

13502 HAMBURGER LANE
BALDWIN PARK, CA 91706

ELEVATION-2

SHEET OF 1

EUREKA, CA

2616 BROADWAY

(2616 BROADWAY) EUREKA, CA

SHEET 2.2

07-05-18

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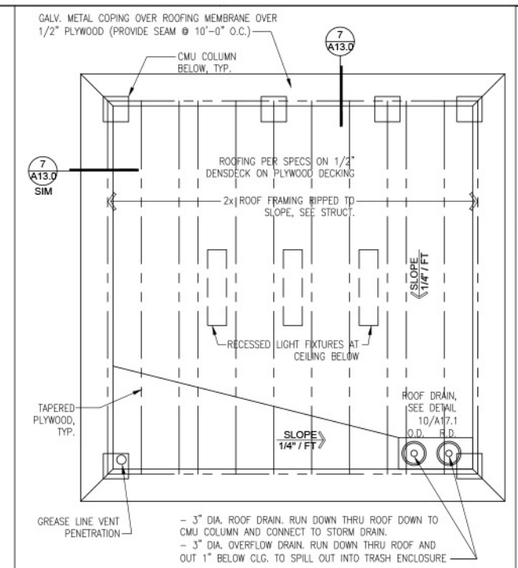
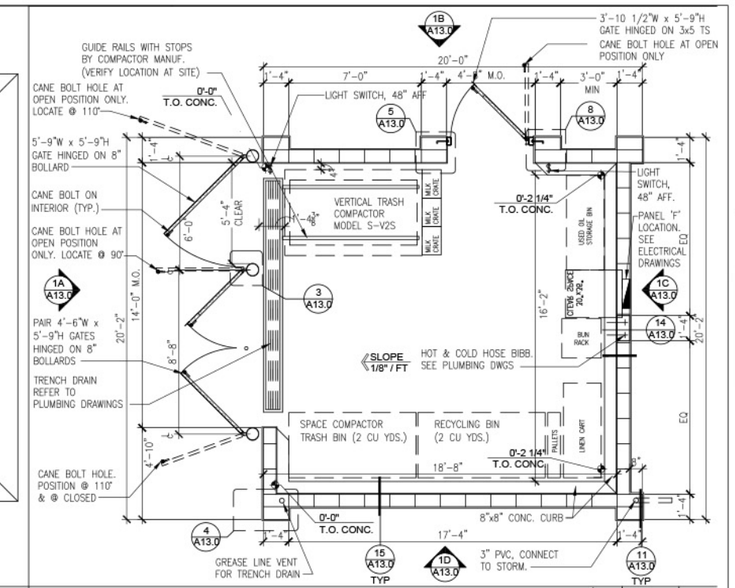


ROOF PLAN — SCALE 1/8" = 1'-0" — 6



FLOOR PLAN — SCALE 1/8" = 1'-0" — 2

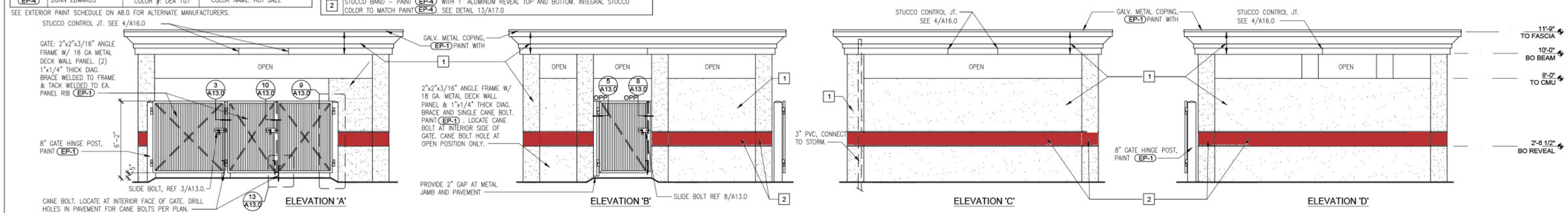
EXTERIOR PAINT KEY NOTES

EP-1	DUNN EDWARDS	COLOR #: DEW 339	COLOR NAME: BONE CHINA
EP-4	DUNN EDWARDS	COLOR #: DEA 107	COLOR NAME: HOT JAZZ

SEE EXTERIOR PAINT SCHEDULE ON A8.0 FOR ALTERNATE MANUFACTURERS.

FINISH KEY NOTES

1	STUCCO – MEDIUM SAND FLOAT TEXTURE FINISH. PAINT EP-1
2	STUCCO BAND – PAINT EP-4 WITH 1" ALUMINUM REVEAL TOP AND BOTTOM. INTEGRAL STUCCO COLOR TO MATCH PAINT EP-4. SEE DETAIL 13/A17.0



ELEVATIONS — SCALE 1/8" = 1'-0" — 1

(2616 BROADWAY) EUREKA, CA

IN-N-OUT BURGER
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13502 HAMBURGER LANE
BALDWIN PARK, CA 91706

TRASH ENCLOSURE

SHEET OF 1

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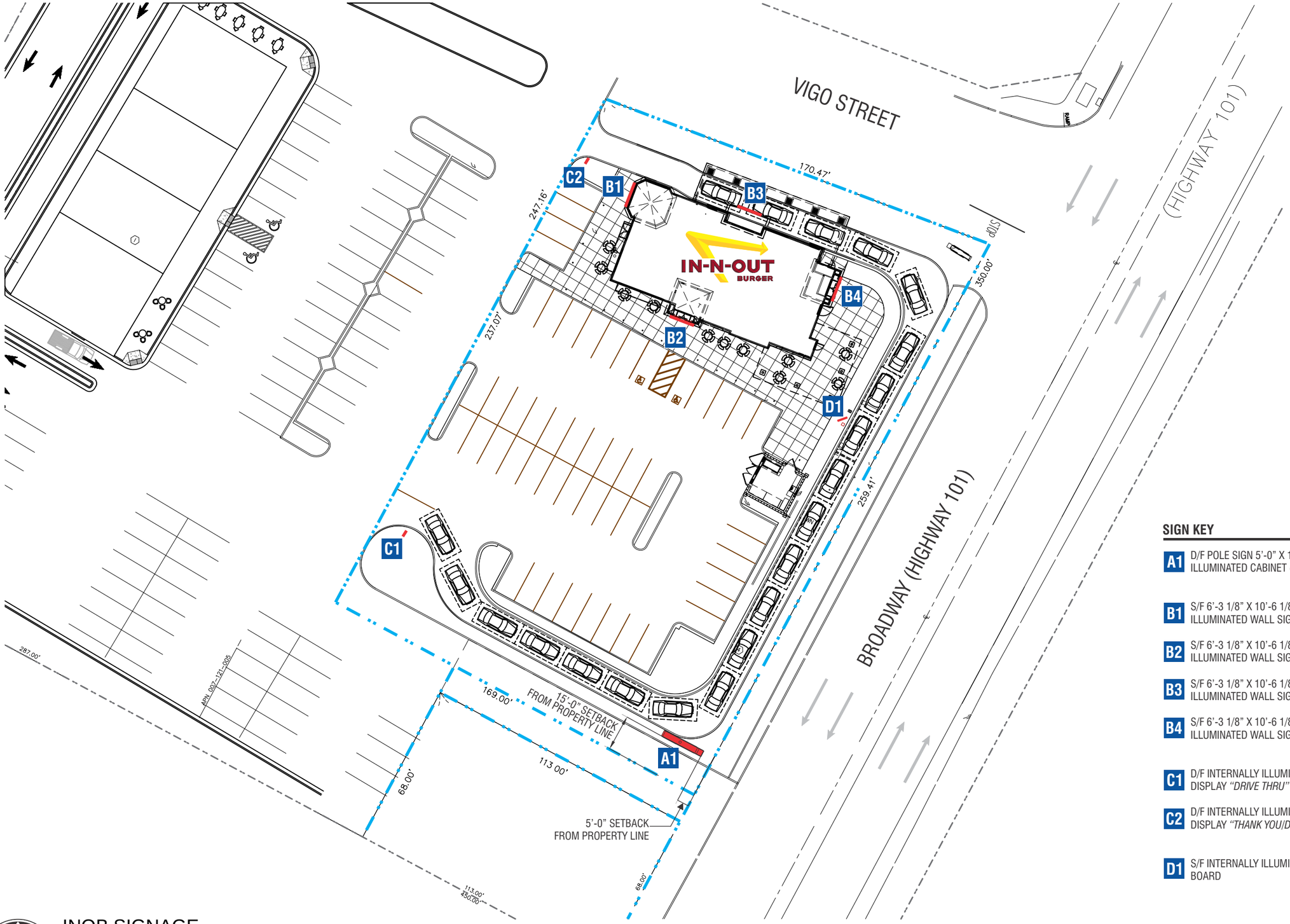
EUREKA, CA
2616 BROADWAY

SHEET 2.3

07-05-18



SIGN KEY

A1 D/F POLE SIGN 5'-0" X 15'-0" INTERNALLY ILLUMINATED CABINET @ 30'-0" OAH

B1 S/F 6'-3 1/8" X 10'-6 1/8" INTERNALLY ILLUMINATED WALL SIGN

B2 S/F 6'-3 1/8" X 10'-6 1/8" INTERNALLY ILLUMINATED WALL SIGN

B3 S/F 6'-3 1/8" X 10'-6 1/8" INTERNALLY ILLUMINATED WALL SIGN

B4 S/F 6'-3 1/8" X 10'-6 1/8" INTERNALLY ILLUMINATED WALL SIGN

C1 D/F INTERNALLY ILLUMINATED DIRECTIONAL DISPLAY *"DRIVE THRU"*

C2 D/F INTERNALLY ILLUMINATED DIRECTIONAL DISPLAY *"THANK YOU/DO NOT ENTER"*

D1 S/F INTERNALLY ILLUMINATED MENU BOARD

NORTH

INOB SIGNAGE

SITE PLAN (FOR SIGNAGE REFERENCE ONLY)

SCALE: 1" = 40'-0"

CNP SIGNS & GRAPHICS
4530 Mission Gorge Place
San Diego, CA 92120
Tel: 619.283.2191
Fax: 619.283.9503
Web: www.cnpsigns.com

CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
SITE PLAN & SIGN KEY

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

CUSTOMER APPROVAL

UNLESS SPECIFIED, THIS DRAWING IS NOT FOR PRODUCTION. *The information shown is for permitting and design intent only. Colors shown are representations of the indicated specifications, and may not be an exact match of the finished product.*

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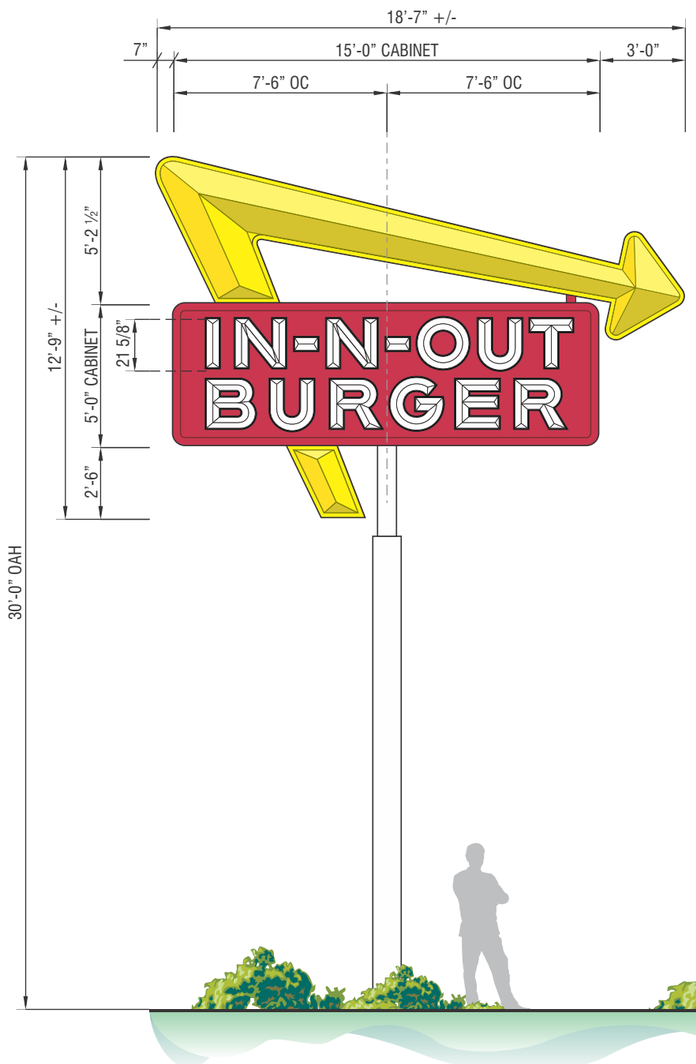
DWG#	PROJECT #
16-1065	319874
REVISION NO. 4	WO#

REVISIONS

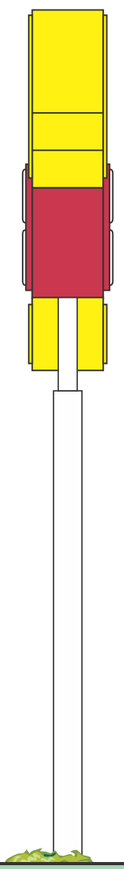
1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.

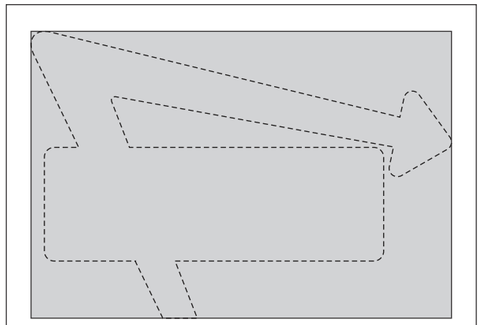
SHEET 2.4



ELEVATION VIEW



END VIEW



NOTE: GRAY INDICATES CALCULATED AREA

SQUARE FOOTAGE

238.0 SQUARE FEET TOTAL AREA

SIGN SPECIFICATIONS:

D/F INTERNALLY ILLUMINATED MONUMENT SIGN W/ ALUMINUM CABINET & ARROW W/ FORMED FACES. COLORS ARE PER BELOW:

ARROW: FABRICATED CHANNEL WITH RETURNS PAINTED TO MATCH PMS YELLOW "C" W/ GLOSS FINISH. FORMED YELLOW #2037 ACRYLIC PLASTIC FACES WITH 1" YELLOW TRIMCAP EDGES. HO TRIPHOSPHORUS LAMP ILLUMINATION.

CABINET: FABRICATED CABINET & RETAINERS PAINTED TO INO RED W/ GLOSS FINISH. FORMED RED #211-1 ACRYLIC PLASTIC FACES W/ WHITE LETTERS. HO TRIPHOSPHORUS LAMP ILLUMINATION.

POLE: STANDARD PIPE AS REQ'D/ PAINT TO MATCH DUNN EDWARDS 'BONE CHINA WHITE'.

D/F INTERNALLY ILLUMINATED 5'-0" X 15'-0" PYLON SIGN @ 30'-0" OAH

SCALE: 3/16" = 1'-0"

CNP SIGNS & GRAPHICS
4530 Mission Gorge Place
San Diego, CA 92120
Tel: 619.283.2191
Fax: 619.283.9503
Web: www.cnpsigns.com

CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
GROUND SIGN

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

CUSTOMER APPROVAL

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DWG# 16-1065	PROJECT # 319874
REVISION NO. 4	WO#

REVISIONS

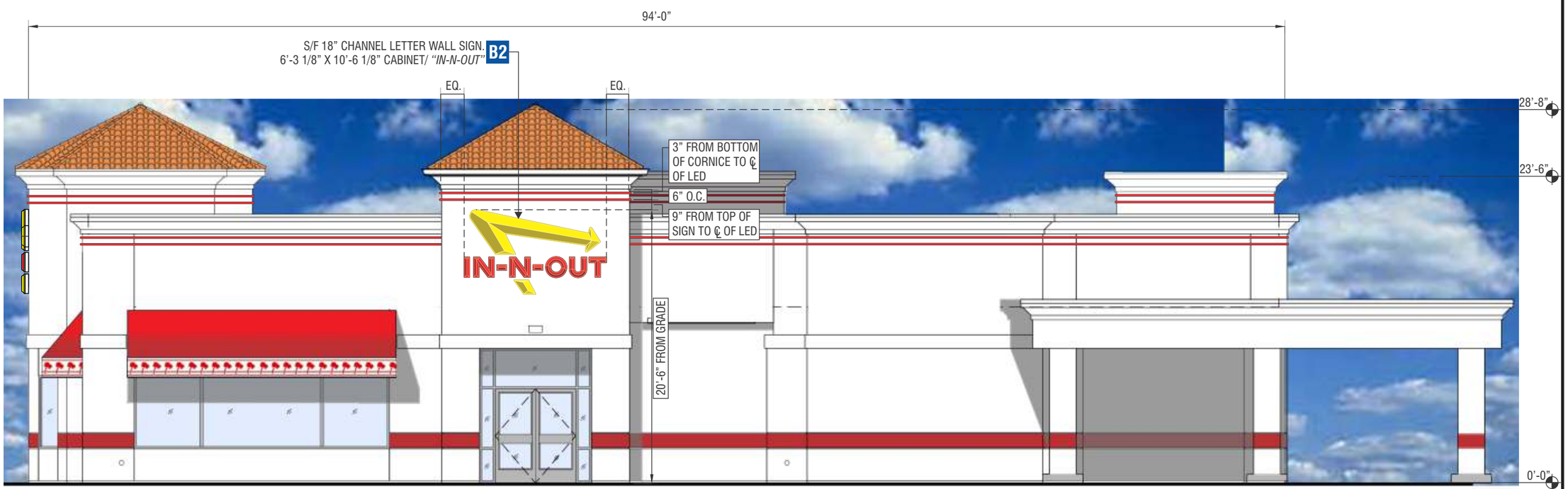
1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
A1

SHEET	2.5

WEST / FRONT ELEVATION

SCALE: 1/8" = 1'-0"



SOUTH / RIGHT ELEVATION

SCALE: 1/8" = 1'-0"

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
ELEVATIONS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

CUSTOMER APPROVAL

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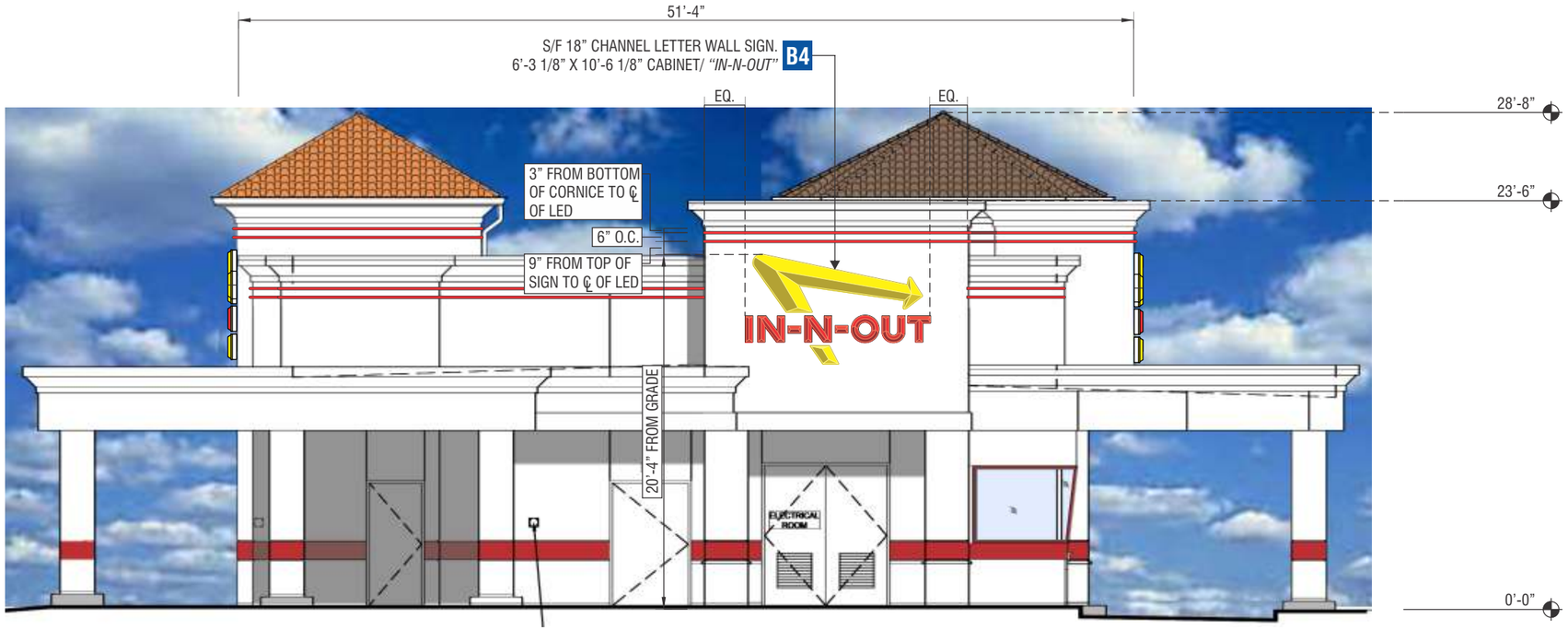
DWG#	PROJECT #
16-1065	319874
REVISION NO. 4	WO#

REVISIONS

1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

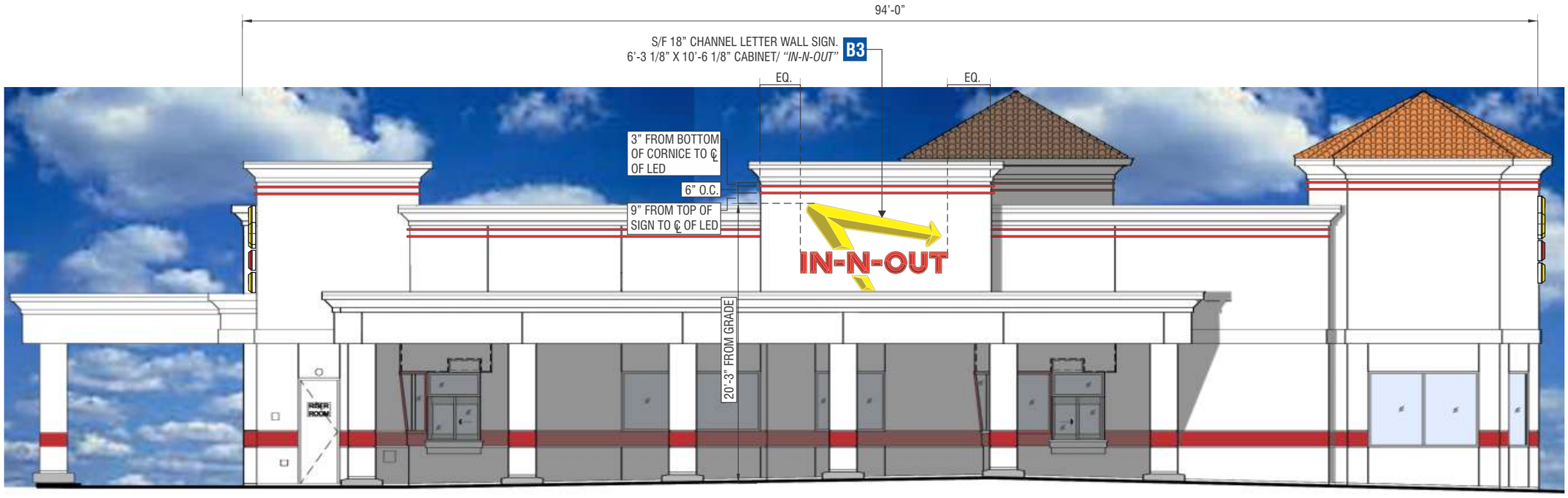
KEY NO.
B1 B2

SHEET	2.6



EAST / REAR ELEVATION

SCALE: 1/8" = 1'-0"



NORTH / LEFT ELEVATION

SCALE: 1/8" = 1'-0"

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
ELEVATIONS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16
SCALE NOTED

CUSTOMER APPROVAL

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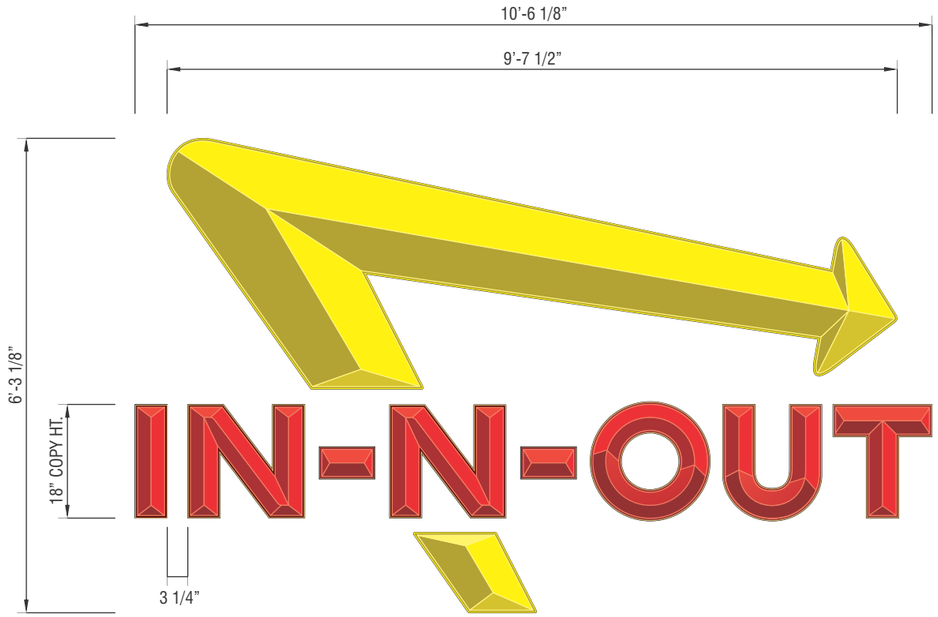
DWG#	PROJECT #
16-1065	319874
REVISION NO. 4	WO#

REVISIONS

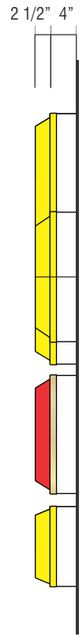
1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
B3 B4

SHEET 2.7

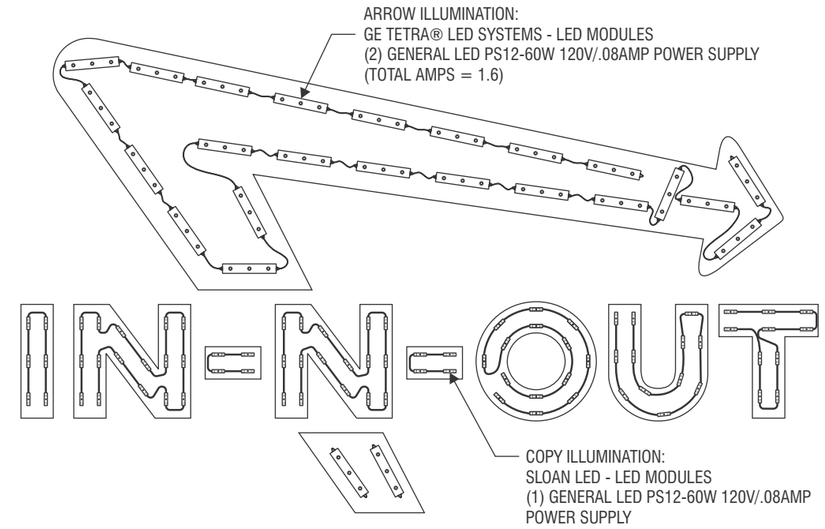


ELEVATION VIEW



SIDE VIEW

NOTES:
ALL LIGHTING COMPONENTS TO BE U.L. LISTED WITH DISCONNECT SWITCH @ POWER SUPPLY LOCATION (REMOTE). SIGNS PROVIDED WITH 3-WIRE 14 GAUGE JACK CABLE.



LIGHTING COMPONENT DETAIL

S/F 6' X 10' ILLUMINATED WALL SIGN

SCALE: 1/2" = 1'-0"

SIGN SPECIFICATIONS:

S/F INTERNALLY ILLUMINATED ALUMINUM CHANNEL LETTER SIGN DISPLAY WITH FORMED COPY & ARROW. COLORS/ MATERIAL PER BELOW:

ARROW:
FABRICATED CHANNEL WITH RETURNS PAINTED TO MATCH "BONE CHINA" SP 514 BY DUNN EDWARDS W/ SATIN FINISH. FORMED YELLOW #2037 ACRYLIC FACES. LED ILLUMINATION (SEE ABOVE).

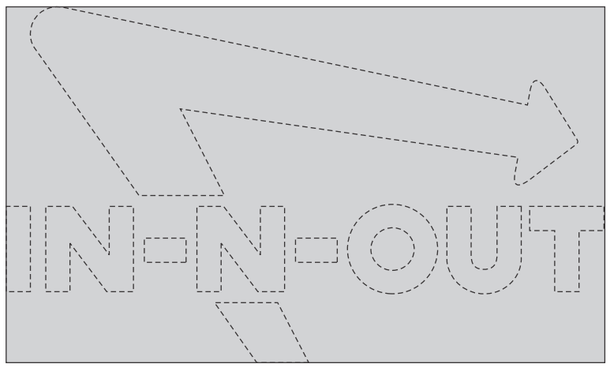
COPY:
FABRICATED CHANNEL WITH RETURNS PAINTED TO MATCH "BONE CHINA" SP 514 BY DUNN EDWARDS W/ SATIN FINISH. FORMED RED #211-1 ACRYLIC FACES WITH 1" GOLD TRIMCAP. RED LED ILLUMINATION (SEE ABOVE).

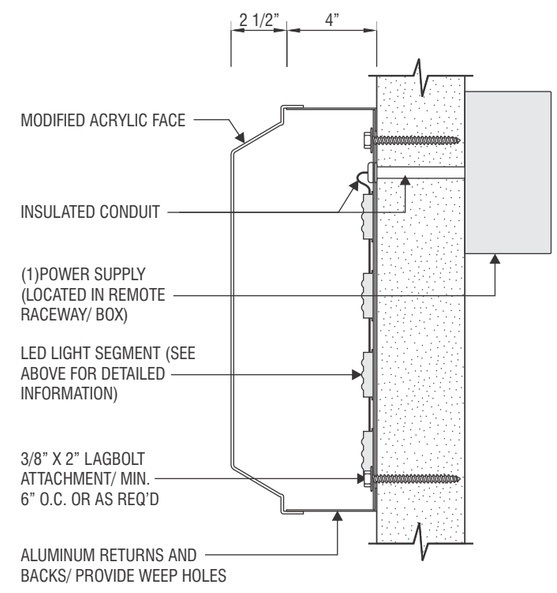
CHANNEL LETTERS TO BE 4" DEEP/ ALL SIGNS TO BE INSTALLED ONTO BUILDING AS REQUIRED.

SQUARE FOOTAGE CALCULATIONS:

TOTAL SIGN AREA: 65.8 S.F.

NOTE: GRAY INDICATES CALCULATED AREA





SECTION DETAIL (NOT TO SCALE)

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
WALL SIGNS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16
SCALE NOTED

CUSTOMER APPROVAL

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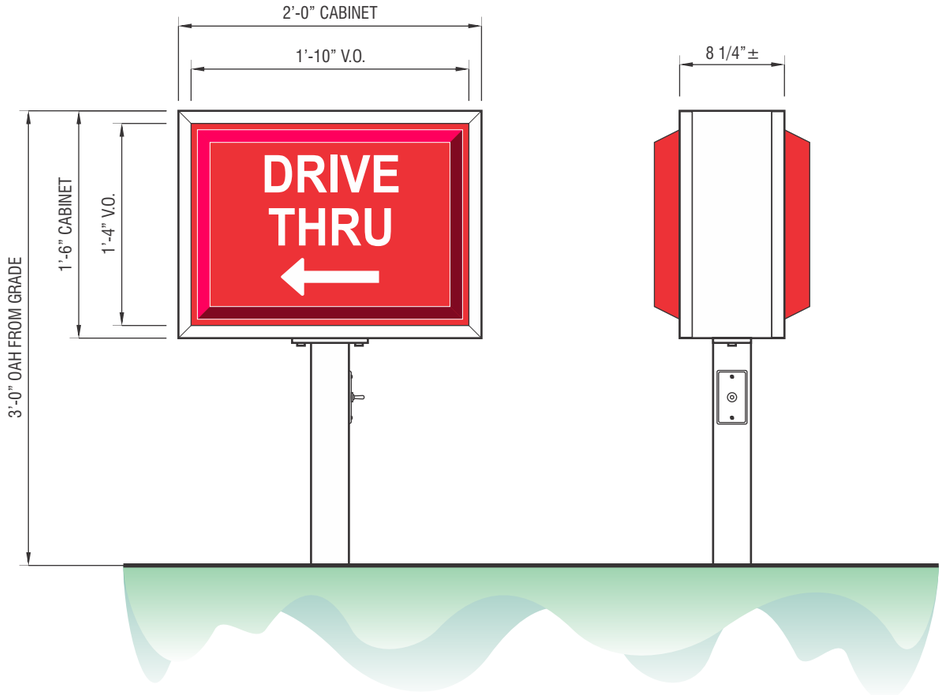
DWG#	PROJECT #
16-1065	319874
REVISION NO. 4	WO#

REVISIONS

1	12/5/16	JM	7		
2	12/15/16	JM	8		
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
B1 B2 B3 B4

SHEET	2.8

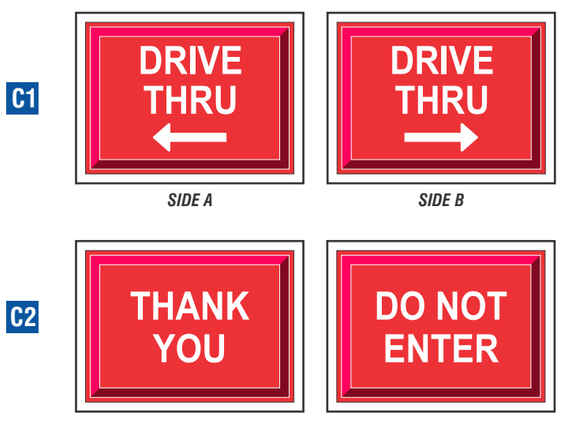


ELEVATION VIEW

SIDE VIEW

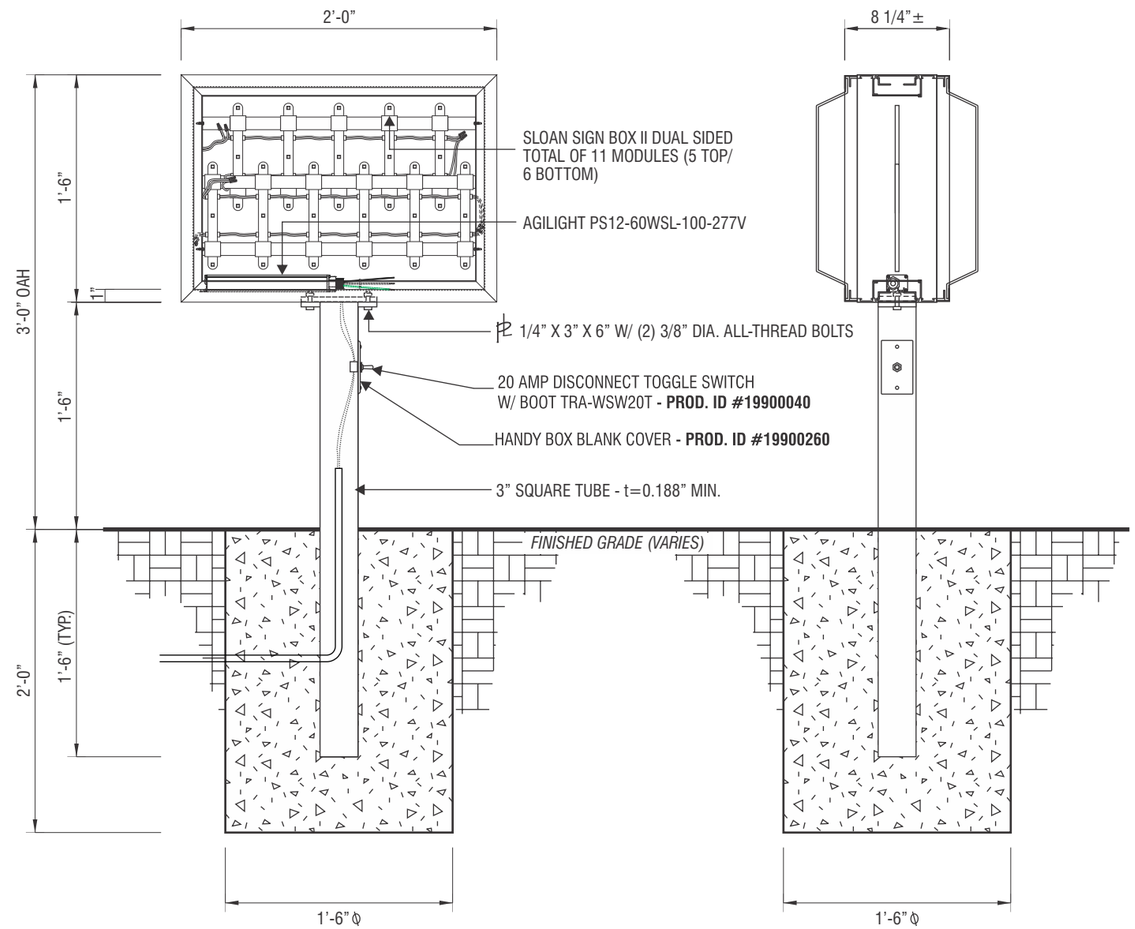
D/F INTERNALLY ILLUMINATED DIRECTIONAL SIGNS

SCALE: 1" = 1'-0"



SIDE A SIDE B

SIDE A SIDE B



ELEVATION VIEW

SIDE VIEW

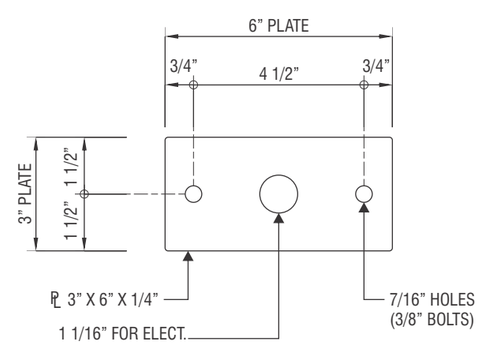


PLATE DETAIL

SCALE: 3" = 1'-0"

SIGN SPECIFICATIONS:

D/F INTERNALLY ILLUMINATED ALUMINUM DIRECTIONAL CABINET W/ FORMED FACES & ARROW. SIGN CABINET, RETAINERS PAINTED TO MATCH "BONE CHINA" SP 514 BY DUNN EDWARDS W/ SATIN FINISH. FORMED ACRYLIC PLASTIC FACES TO HAVE SECOND-SURFACE PAINTED GRAPHICS. BACKGROUND COLOR TO BE PAINTED INO 443 RED (25% CLEAR). LETTER COLOR TO BE PAINTED WHITE. SIGN CABINETS TO BE ILLUMINATED W/ SLOAN LED SIGN BOX II .

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
DIRECTIONALS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

CUSTOMER APPROVAL

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16-1065	319874
REVISION NO. 4	WO#

REVISIONS

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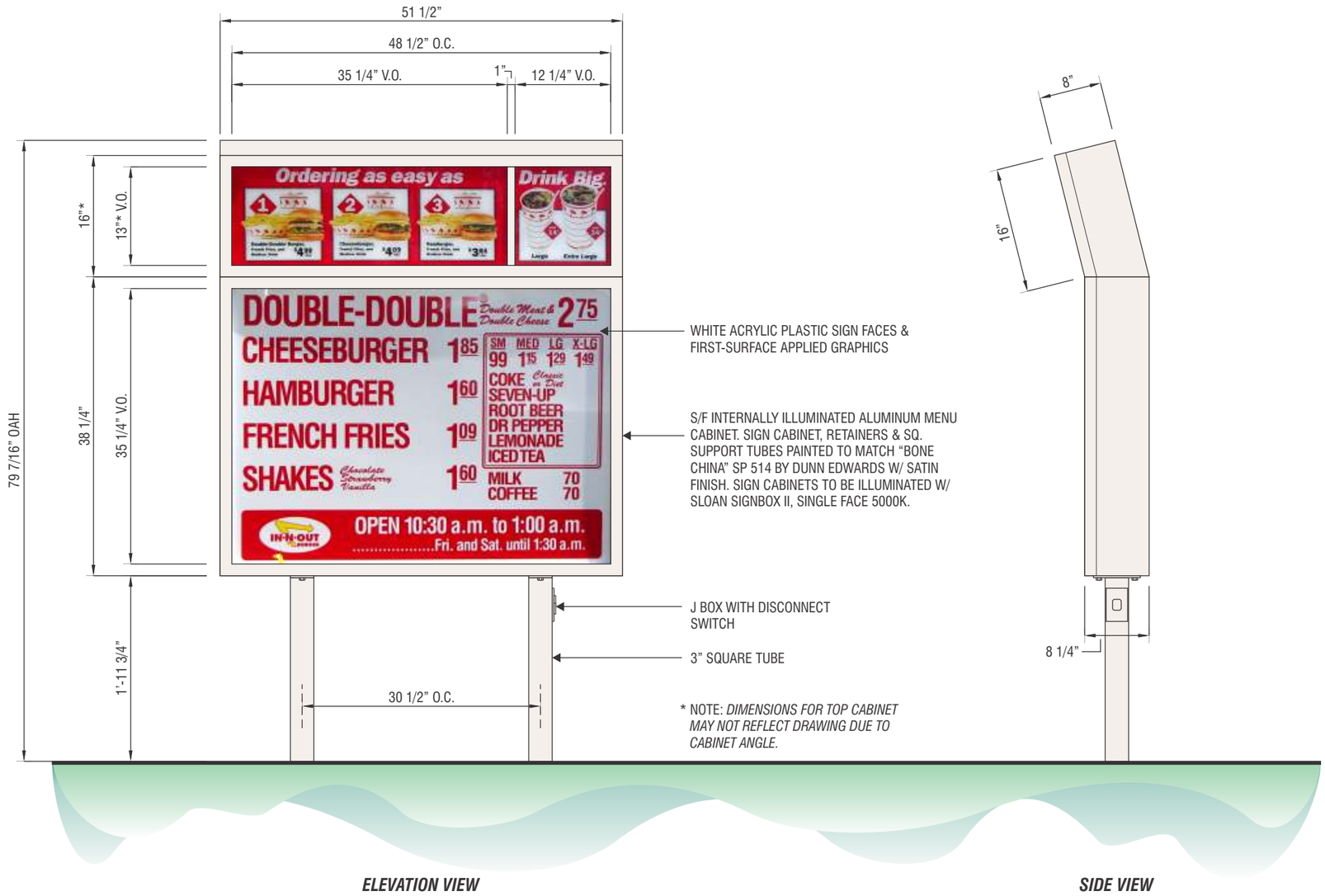
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
C1 C2

SHEET	2.9



S/F INTERNALLY ILLUMINATED MENU BOARD

SCALE: 3/4" = 1'-0"

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
MENU BOARD

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16
SCALE NOTED

CUSTOMER APPROVAL

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DWG# 16-1065	PROJECT # 319874
REVISION NO. 4	WO#

REVISIONS

1	12/5/16	JM	7		
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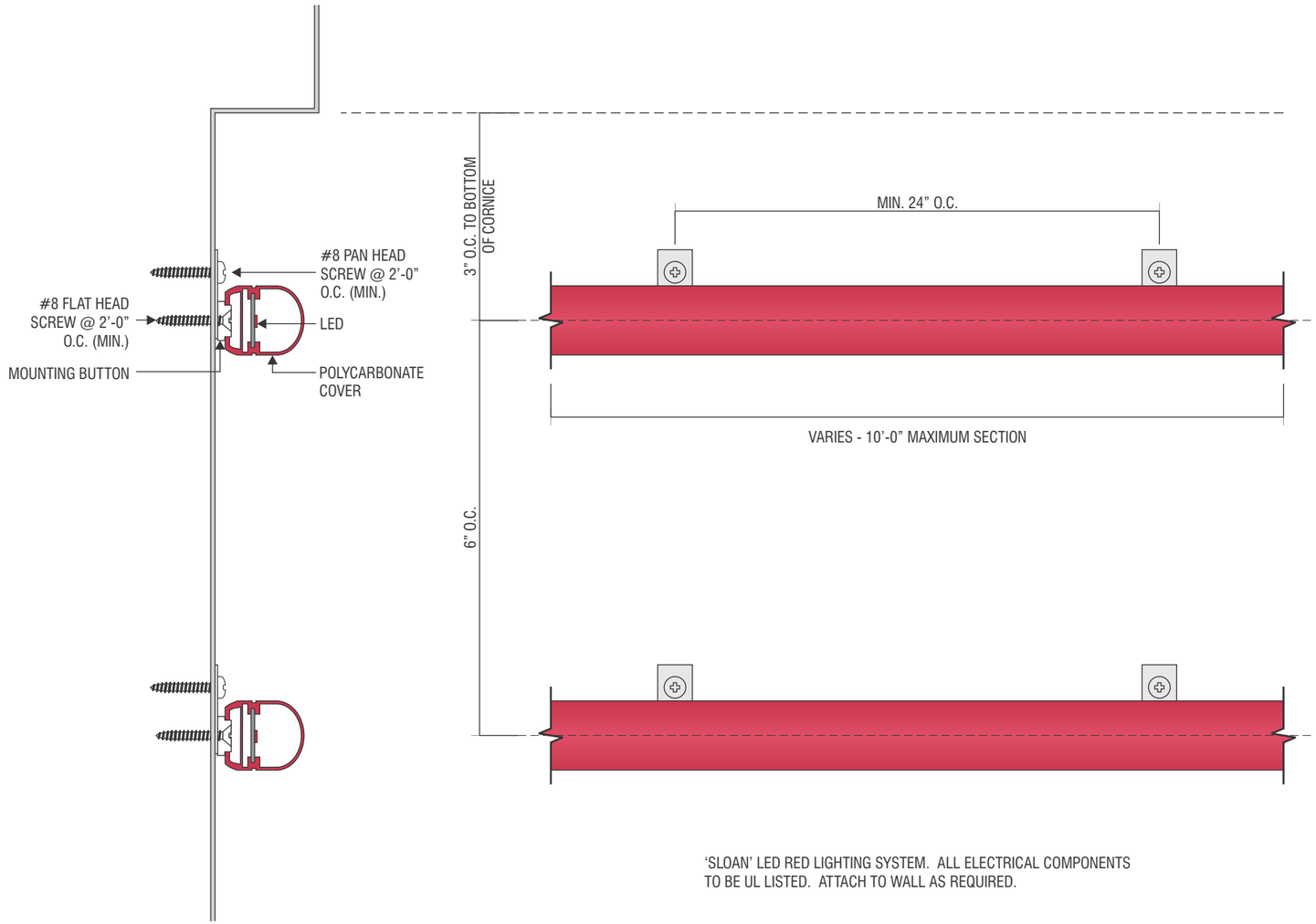
3	1/19/17	AW	9		
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.
D1

SHEET	2.10



'SLOAN' LED RED LIGHTING SYSTEM. ALL ELECTRICAL COMPONENTS TO BE UL LISTED. ATTACH TO WALL AS REQUIRED.

LED BORDER

HALF SIZE

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
BORDER LED DETAIL

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16 SCALE NOTED

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DWG# 16-1065	PROJECT # 319874
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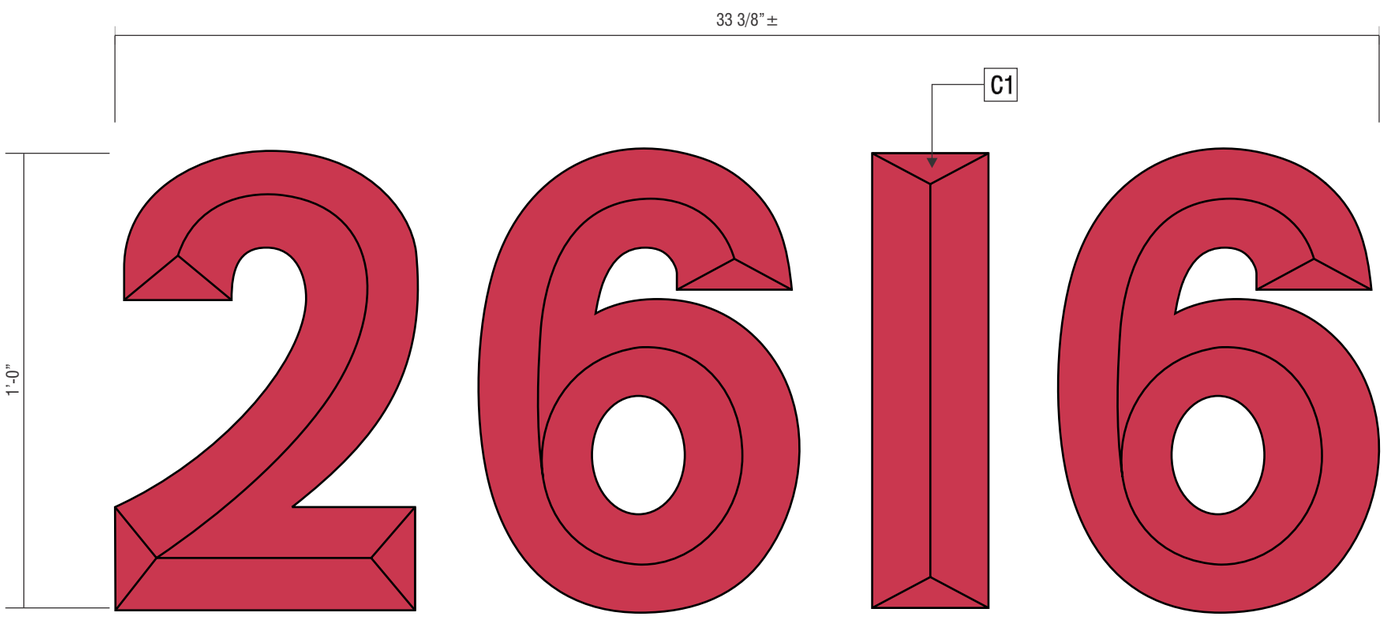
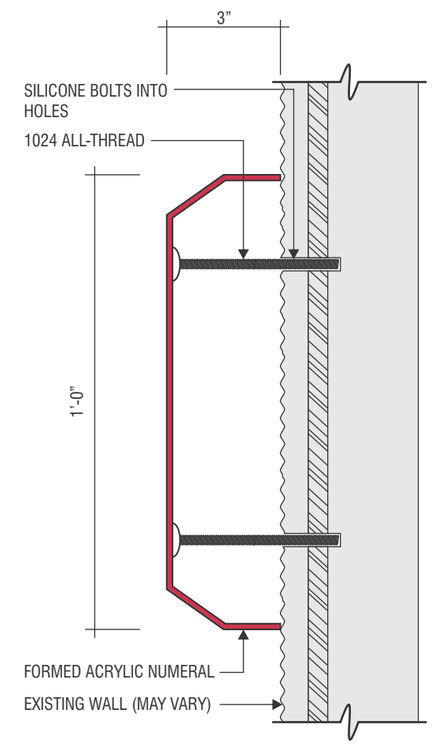
4	6/28/18	TT	10		
5			11		
6			12		

KEY NO.

SHEET 2.11

COLOR SPECIFICATIONS	
C1	RED ACRYLIC #211-1





NON-ILLUMINATED 12" ADDRESS NUMERALS

SCALE: 3" = 1'-0"

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CLIENT
IN-N-OUT BURGER

PROJECT
IN-N-OUT BURGER #XXX

LOCATION
2616 BROADWAY
EUREKA, CA

SHEET TITLE
NON-ILLUMINATED ADDRESS NUMERALS

ACCT. REP.
ANDREW DEL RIO

DESIGNER
JARED McCARTER

DATE 12/2/16
SCALE NOTED

CUSTOMER APPROVAL

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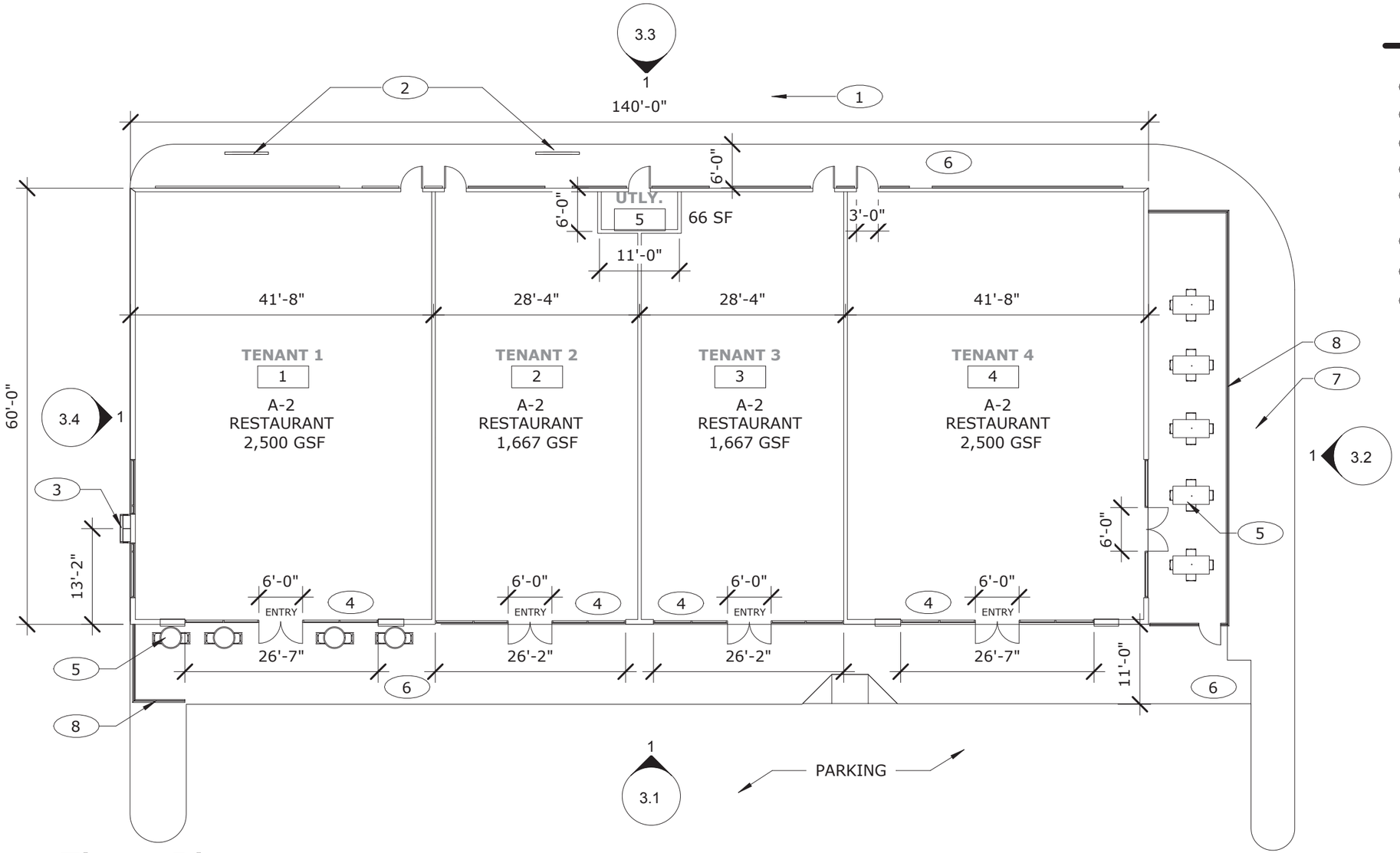
5			11		
6			12		

KEY NO.

SHEET	2.12



1 Floor Plan
1/16" = 1'-0"

SHEET NOTES

(THIS SHEET ONLY)

1. DRIVE AISLE / DRIVE-THRU
2. DRIVE-THRU ORDER MENU
3. DRIVE-THRU WINDOW
4. STOREFRONT WINDOWS
5. PATIO FURNITURE WITH UMBRELLAS (FUTURE TENANT PROVIDED)
6. SIDEWALK
7. PLANTING - SEE LANDSCAPE PLAN
8. OUTDOOR SEATING - BLACK IRON RAILING

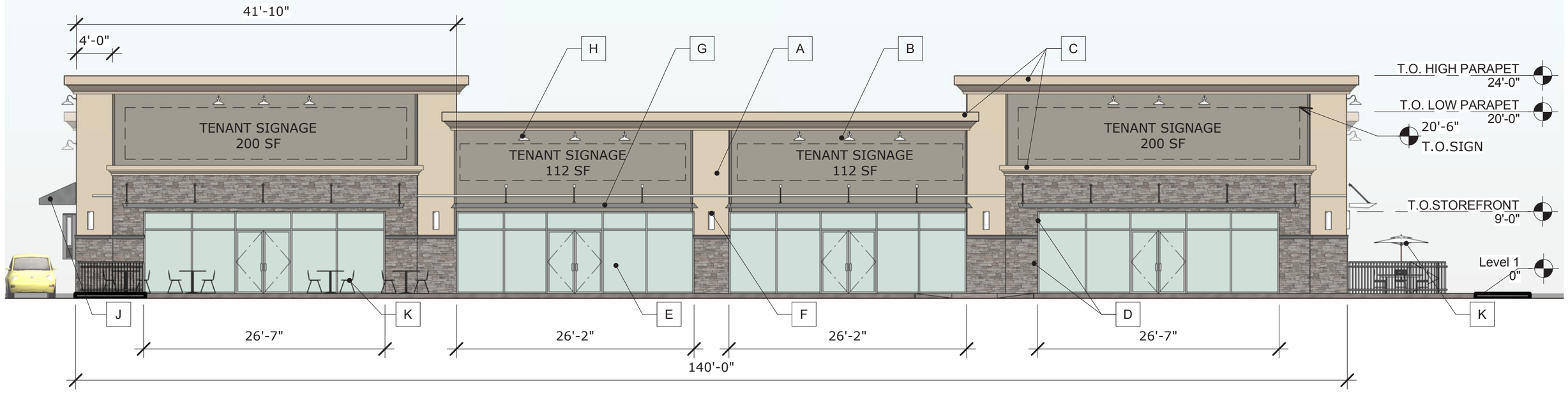
MBA
ARCHITECTURE +
INTERIOR DESIGN

DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET	3.0



1 EAST EXTERIOR ELEVATION

3/32" = 1'-0"

EXTERIOR FINISHES AND TREATMENTS

A	EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
B	EIFS SYSTEM - SAGE GREEN SEMI-SMOOTH TEXTURE FINISH
C	BEIGE EIFS CORNICE MOLDING
D	STONE VENEER AND CAP
E	CLEAR GLAZING / ALUMINUM FINISH STOREFRONT MULLIONS
F	VETICAL SCONCE - BRUSHED ALUMINUM FINISH
G	METAL TRELLIS AWNING - BRUSHED ALUMINUM
H	GOOSE NECK WALL SCONCE (LIGHTING) - BRUSHED ALUMINUM
J	COVERED CANVASED AWNING (DRIVE-THRU) - GRAY FINISH
K	OUTDOOR PATIO FURNITURE (FUTURE TENANT)
L	REAR ACCESS METAL DOORS - DARK GRAY FINISH
M	DRIVE-THRU WINDOW
N	DRIVE-THRU MENU BOARDS

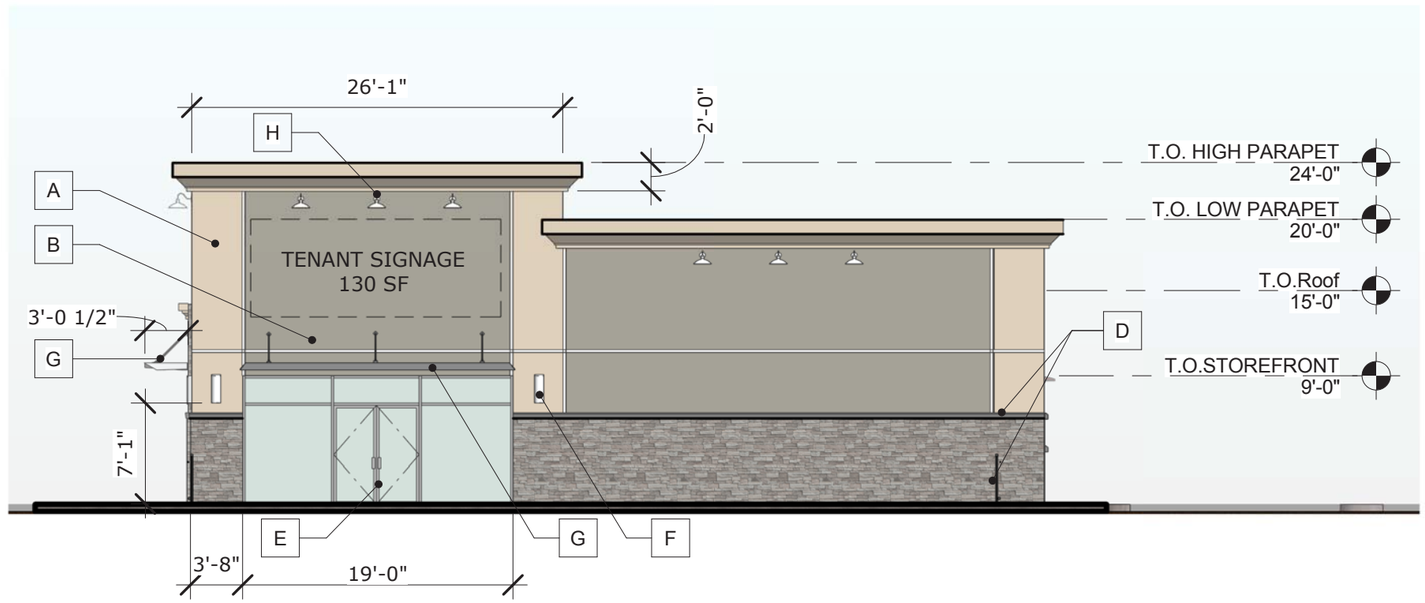
MBA
ARCHITECTURE +
INTERIOR DESIGN

DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET	3.1



1 NORTH EXTERIOR ELEVATION

3/32" = 1'-0"

EXTERIOR FINISHES AND TREATMENTS

A	EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
B	EIFS SYSTEM - SAGE GREEN SEMI-SMOOTH TEXTURE FINISH
C	BEIGE EIFS CORNICE MOLDING
D	STONE VENEER AND CAP
E	CLEAR GLAZING / ALUMINUM FINISH STOREFRONT MULLIONS
F	VETICAL SCONCE - BRUSHED ALUMINUM FINISH
G	METAL TRELLIS AWNING - BRUSHED ALUMINUM
H	GOOSE NECK WALL SCONCE (LIGHTING) - BRUSHED ALUMINUM
J	COVERED CANVASED AWNING (DRIVE-THRU) - GRAY FINISH
K	OUTDOOR PATIO FURNITURE (FUTURE TENANT)
L	REAR ACCESS METAL DOORS - DARK GRAY FINISH
M	DRIVE-THRU WINDOW
N	DRIVE-THRU MENU BOARDS

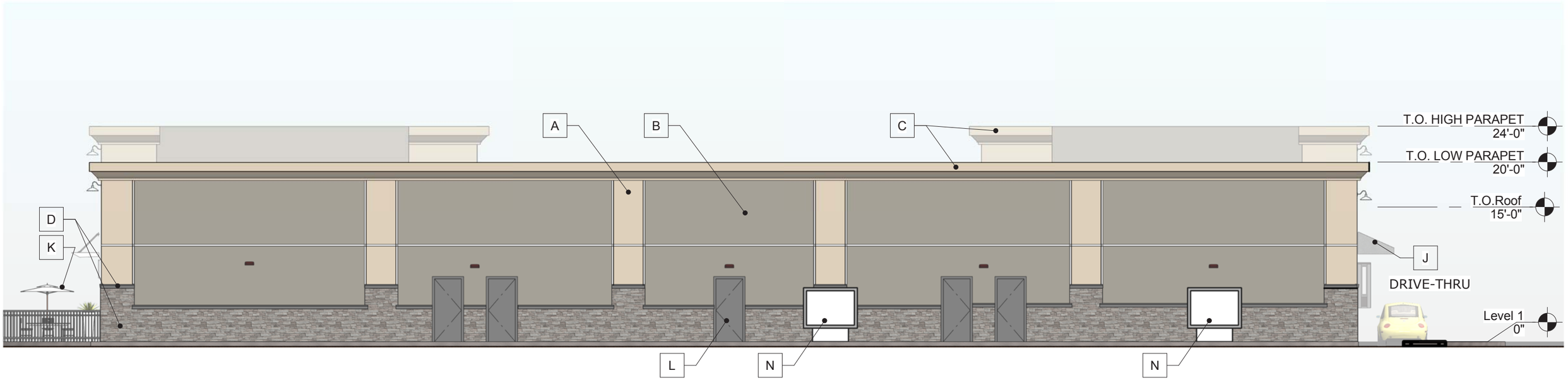
MBA
ARCHITECTURE +
INTERIOR DESIGN

DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

SHEET	3.2



1 WEST ELEVATION

3/32" = 1'-0"

EXTERIOR FINISHES AND TREATMENTS

A	EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
B	EIFS SYSTEM - SAGE GREEN SEMI-SMOOTH TEXTURE FINISH
C	BEIGE EIFS CORNICE MOLDING
D	STONE VENEER AND CAP
E	CLEAR GLAZING / ALUMINUM FINISH STOREFRONT MULLIONS
F	VETICAL SCONCE - BRUSHED ALUMINUM FINISH
G	METAL TRELLIS AWNING - BRUSHED ALUMINUM
H	GOOSE NECK WALL SCONCE (LIGHTING) - BRUSHED ALUMINUM
J	COVERED CANVASED AWNING (DRIVE-THRU) - GRAY FINISH
K	OUTDOOR PATIO FURNITURE (FUTURE TENANT)
L	REAR ACCESS METAL DOORS - DARK GRAY FINISH
M	DRIVE-THRU WINDOW
N	DRIVE-THRU MENU BOARDS

1 SOUTH EXTERIOR ELEVATION
3/32" = 1'-0"

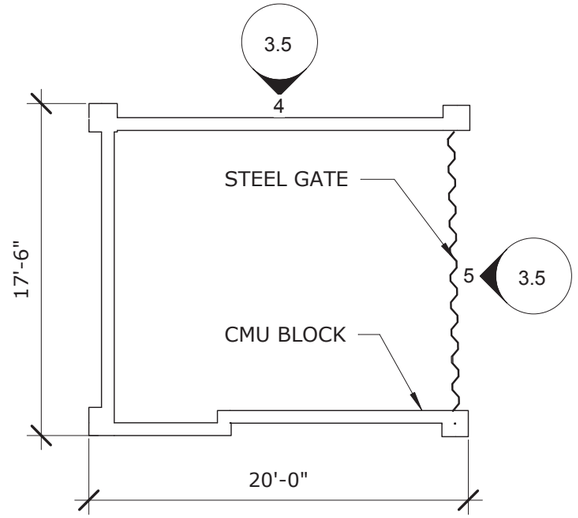
EXTERIOR FINISHES AND TREATMENTS

- A EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
- B EIFS SYSTEM - SAGE GREEN SEMI-SMOOTH TEXTURE FINISH
- C BEIGE EIFS CORNICE MOLDING
- D STONE VENEER AND CAP
- E CLEAR GLAZING / ALUMINUM FINISH STOREFRONT MULLIONS
- F VETICAL SCONCE - BRUSHED ALUMINUM FINISH
- G METAL TRELLIS AWNING - BRUSHED ALUMINUM
- H GOOSE NECK WALL SCONCE (LIGHTING) - BRUSHED ALUMINUM
- J COVERED CANVASED AWNING (DRIVE-THRU) - GRAY FINISH
- K OUTDOOR PATIO FURNITURE (FUTURE TENANT)
- L REAR ACCESS METAL DOORS - DARK GRAY FINISH
- M DRIVE-THRU WINDOW
- N DRIVE-THRU MENU BOARDS

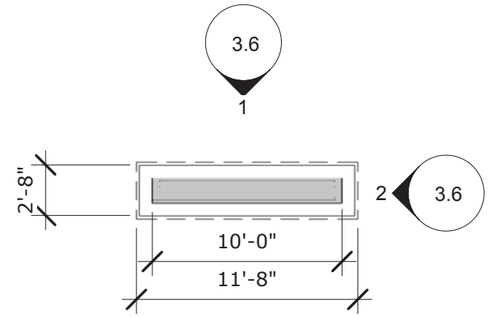
MBA
ARCHITECTURE +
INTERIOR DESIGN

DESIGN REVIEW PACKAGE
2616 BROADWAY REDEVELOPMENT
2616 BROADWAY EUREKA, CA

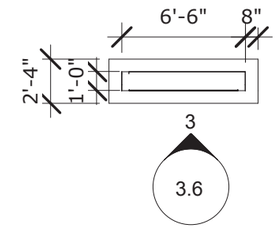
SHEET	3.4



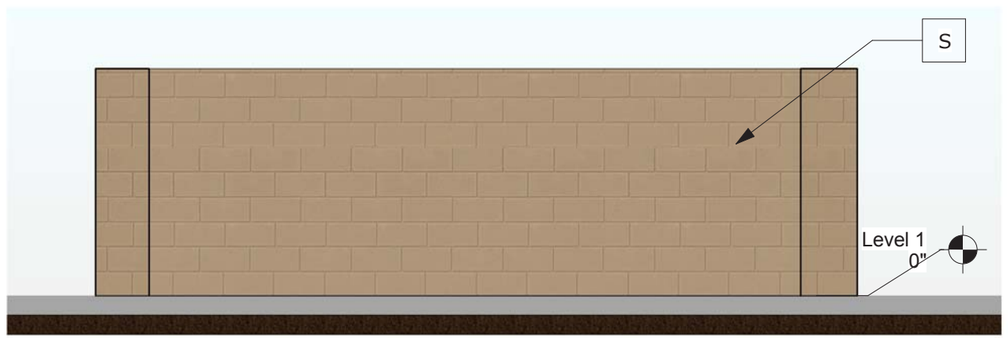
1 TRASH ENCLOSURE
1/8" = 1'-0"



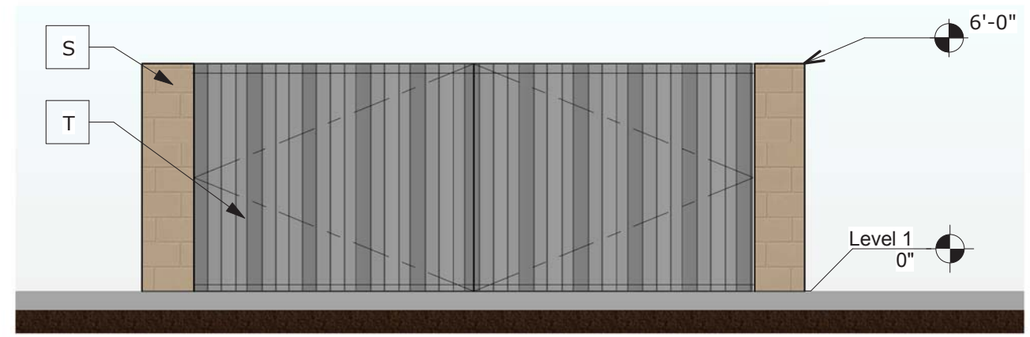
2 MONUMENT SIGN (MAJOR)
1/8" = 1'-0"



3 MONUMENT SIGN (MINOR)
1/8" = 1'-0"



4 TRASH ENCLOSURE ELEVATION 1
1/4" = 1'-0"



5 TRASH ENCLOSURE ELEVATION 2
1/4" = 1'-0"

EXTERIOR FINISHES AND TREATMENTS

S	TAN/BEIGE - SPLIT FACE CMU BLOCK AND CAP
T	CORRUGATED STEEL GATE - POWDER COAT GRAY FINISH

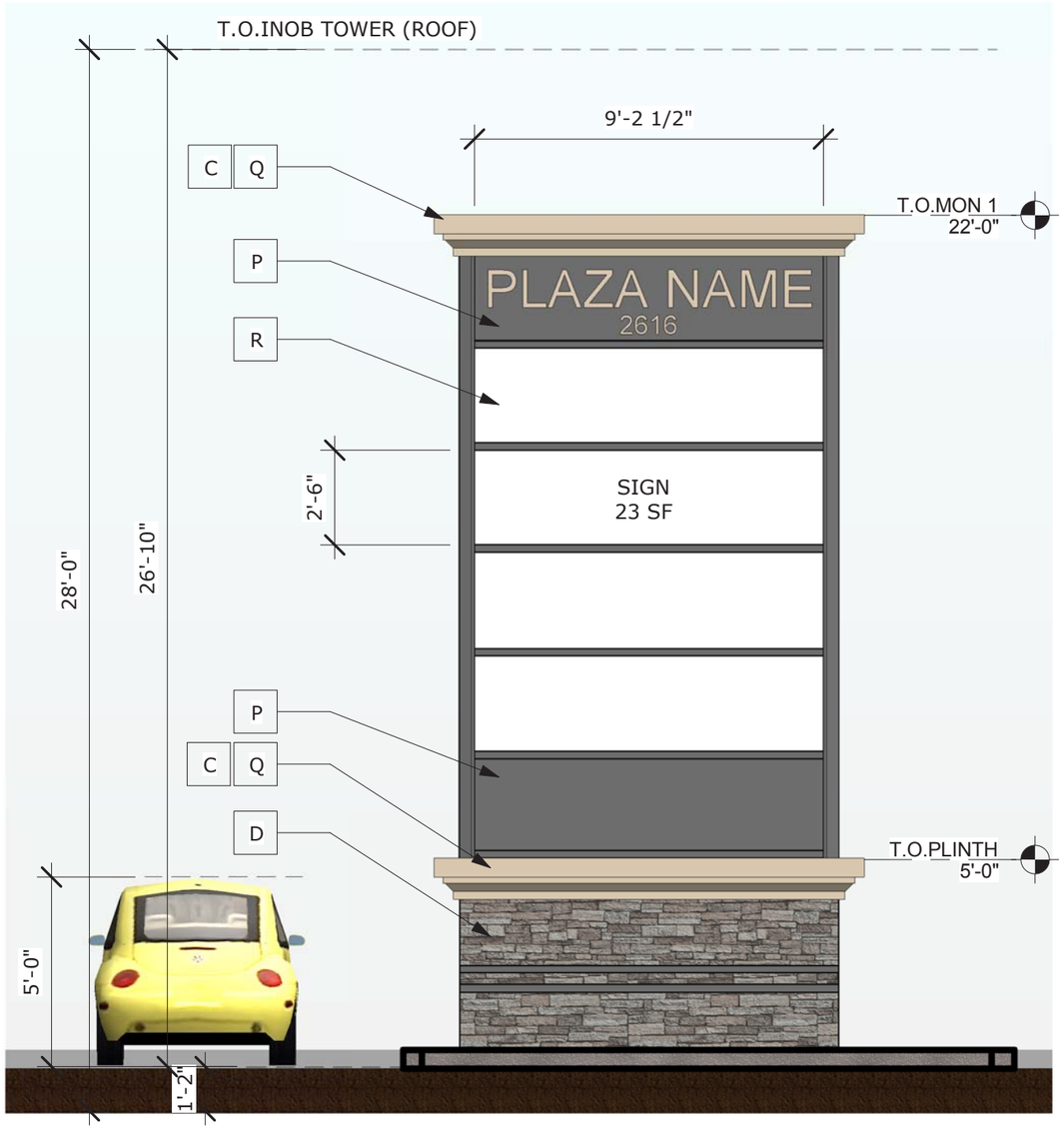
MBA
ARCHITECTURE + INTERIOR DESIGN

DESIGN REVIEW PACKAGE
2616 BROADWAY REDEVELOPMENT
2616 BROADWAY EUREKA, CA

SHEET	3.5

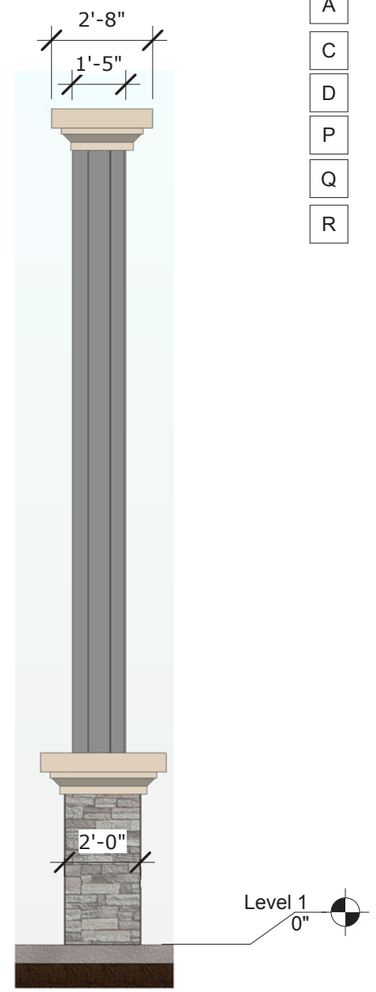
EXTERIOR FINISHES AND TREATMENTS

A	EIFS SYSTEM - BEIGE SEMI-SMOOTH TEXTURE FINISH
C	BEIGE EIFS CORNICE MOLDING
D	STONE VENEER AND CAP
P	SHEET METAL - DARK GRAY PAINTED FINISH
Q	SHEET METAL CAP - PAINTED BEIGE
R	ILLUMINATED PANELS



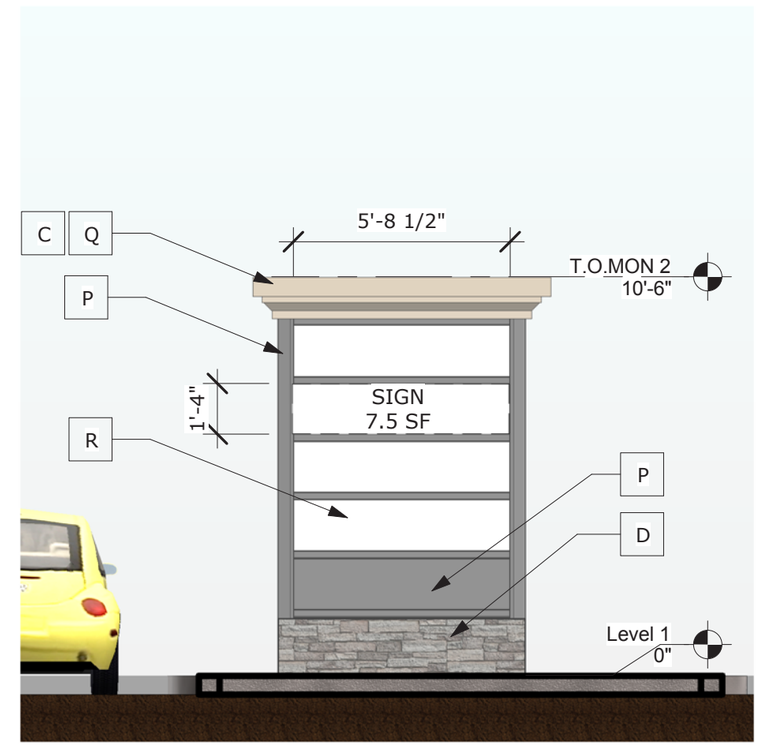
1 MONUMENT SIGN (MAJOR)

1/4" = 1'-0"



2 MONUMENT SIGN 1A

1/4" = 1'-0"



3 MONUMENT SIGN (MINOR)

1/4" = 1'-0"

MONUMENT SIGN (MAJOR) DIMENSIONS: 11'-8" (W) x 22'-0" (H) x 2'-8"(D)

DIMENSIONS PENDING STRUCTURAL REVIEW

MONUMENT SIGN (MINOR) DIMENSIONS: 7'-10" (W) x 10'-6" (H) x 2'-4"(D)

DIMENSIONS PENDING STRUCTURAL REVIEW

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DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

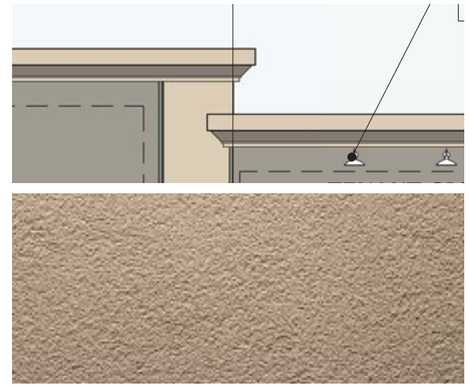
2616 BROADWAY EUREKA, CA

SHEET	3.6

A EIFS - BEIGE - SEMI SMOOTH TEXTURE FINISH

B EIFS - SAGE GREEN -SEMI SMOOTH TEXTURE FINISH

C IFS CORNICE MOLDING - BEIGE



D TONE VENEER AND CAP

E CLEAR GLAZING/ ALUMINUM FINISH STOREFRONT

F VERTICAL SCONCE - BRUSHED ALUMINUM FINISH

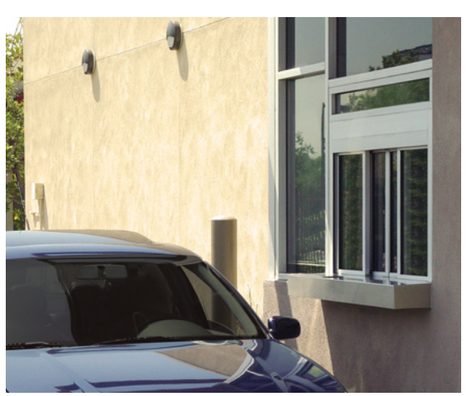
G METAL TRELLIS AWNING - BRUSHED ALUMINUM

H GOOSE NECK WALL SCONCE - BRUSHED ALUMINUM

J CANVASED AWNING (DRIVE-THRU) - GRAY FINISH

K PATIO FURNITURE (COLOR TBD) FUTURE TENANT

M DRIVE-THRU WINDOW



N DRIVE-THRU MENU BOARDS (FUTURE TENANT)

S SPLIT FACED CMU BLOCK - TAN/BEIGE COLOR

T CORRUGATED STEEL GATE - POWDER COAT GRAY

T SLATTED CHAIN LINK FENCE

MBA
ARCHITECTURE +
INTERIOR DESIGN

DESIGN REVIEW PACKAGE

2616 BROADWAY REDEVELOPMENT

2616 BROADWAY EUREKA, CA

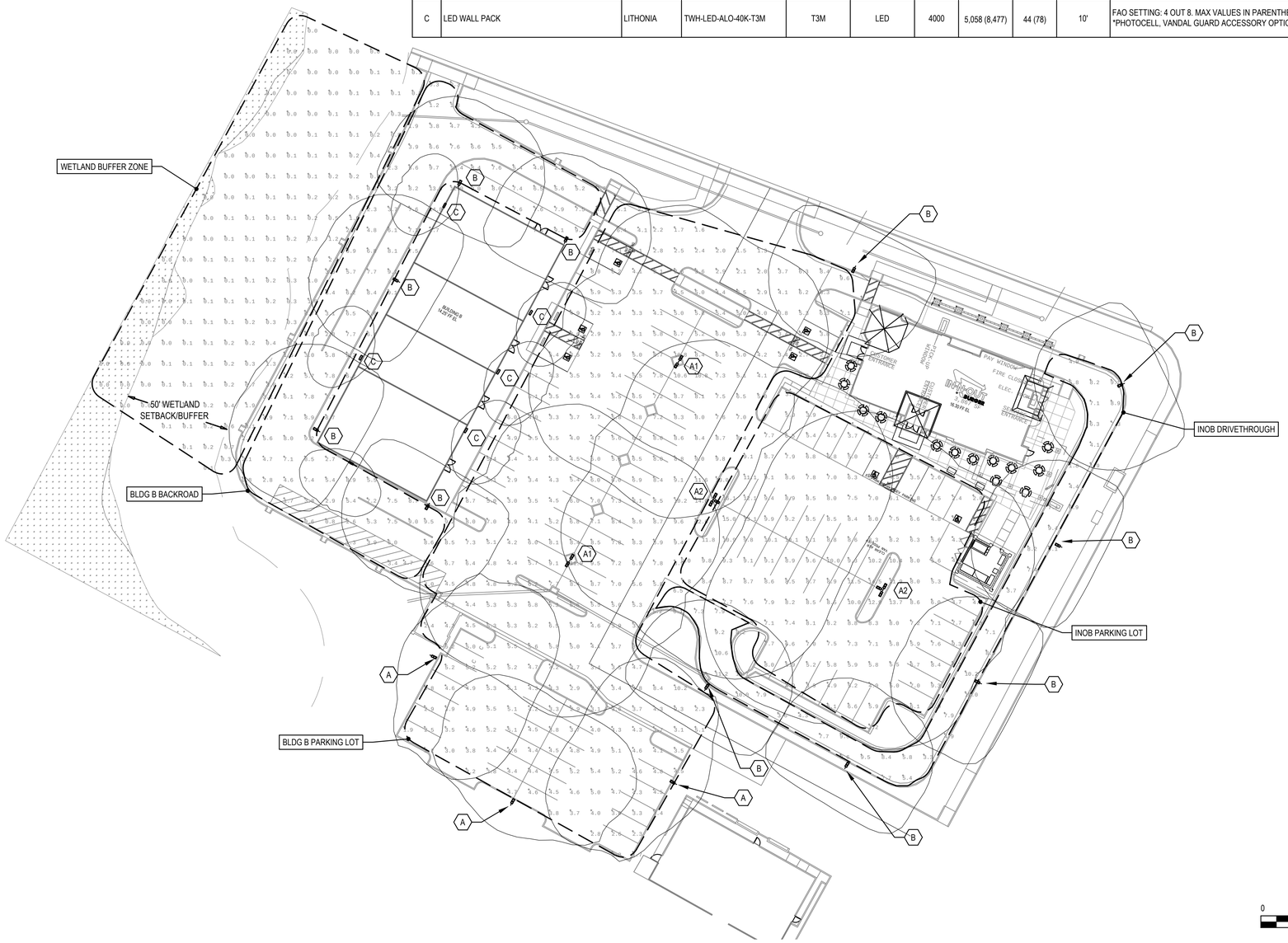
SHEET	3.7

CALCULATION SUMMARY

LABEL	CALC TYPE	UNITS	AVG	MAX	MIN
BLDG B BACKROAD	ILLUMINANCE	Fc	5.58	14.80	0.30
INOB DRIVETHROUGH	ILLUMINANCE	Fc	7.21	11.20	1.80
BLDG B PARKING LOT	ILLUMINANCE	Fc	5.33	14.00	1.30
INOB PARKING LOT	ILLUMINANCE	Fc	7.53	16.10	2.00
WETLAND BUFFER ZONE	ILLUMINANCE	Fc	0.24	3.10	N/A

LIGHTING FIXTURE SCHEDULE

TYPE MARK	DESCRIPTION	MANUFACTURER	MODEL	DISTRIBUTION TYPE	LAMP/SOCKET TYPE	COLOR TEMP (K)	LUMEN OUTPUT	FIXTURE WATTAGE	MOUNTING HEIGHT	NOTES
A	LED SINGLE FIXTURE W/ HOUSE SHIELD, FORWARD THROW	LITHONIA	DSX2-LED-P2-40K-TFTM-HS	TFTM	LED	4000	24,054	185	25'	TFTM - FORWARD THROW MEDIUM, HOUSE SHIELD
A1	LED DOUBLE FIXTURE BACK TO BACK	LITHONIA	DSX2-LED-P3-40K-TFTM	TFTM	LED	4000	(2) 28,255	(2) 217	25'	TFTM - FORWARD THROW MEDIUM, NO HOUSE SHIELD, (2) FIXTURES BACK TO BACK
A2	LED FIXTURES (3 AT 90 DEG.)	LITHONIA	DSX2-LED-P2-40K-TFTM	TFTM	LED	4000	(3) 24,054	(3) 185	25'	TFTM - FORWARD THROW MEDIUM, NO HOUSE SHIELD, (3) FIXTURES AT 90 DEG. ANGLES
B	LED SINGLE FIXTURE W/ HOUSE SHIELD, VERY SHORT	LITHONIA	DSX2-LED-P2-40K-T5S-HS	T5VS	LED	4000	25,037	185	25'	T5VS - TYPE V VERY SHORT, HOUSE SHIELD
C	LED WALL PACK	LITHONIA	TWH-LED-ALO-40K-T3M	T3M	LED	4000	5,058 (8,477)	44 (78)	10'	FAO SETTING: 4 OUT 8. MAX VALUES IN PARENTHESIS. *PHOTOCELL, VANDAL GUARD ACCESSORY OPTION



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0 30' 60'

PRELIMINARY

No.	Issue	Drawn	Approved	Date

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Drafting Check	Design Check
Project Manager	Date 08/29/2018
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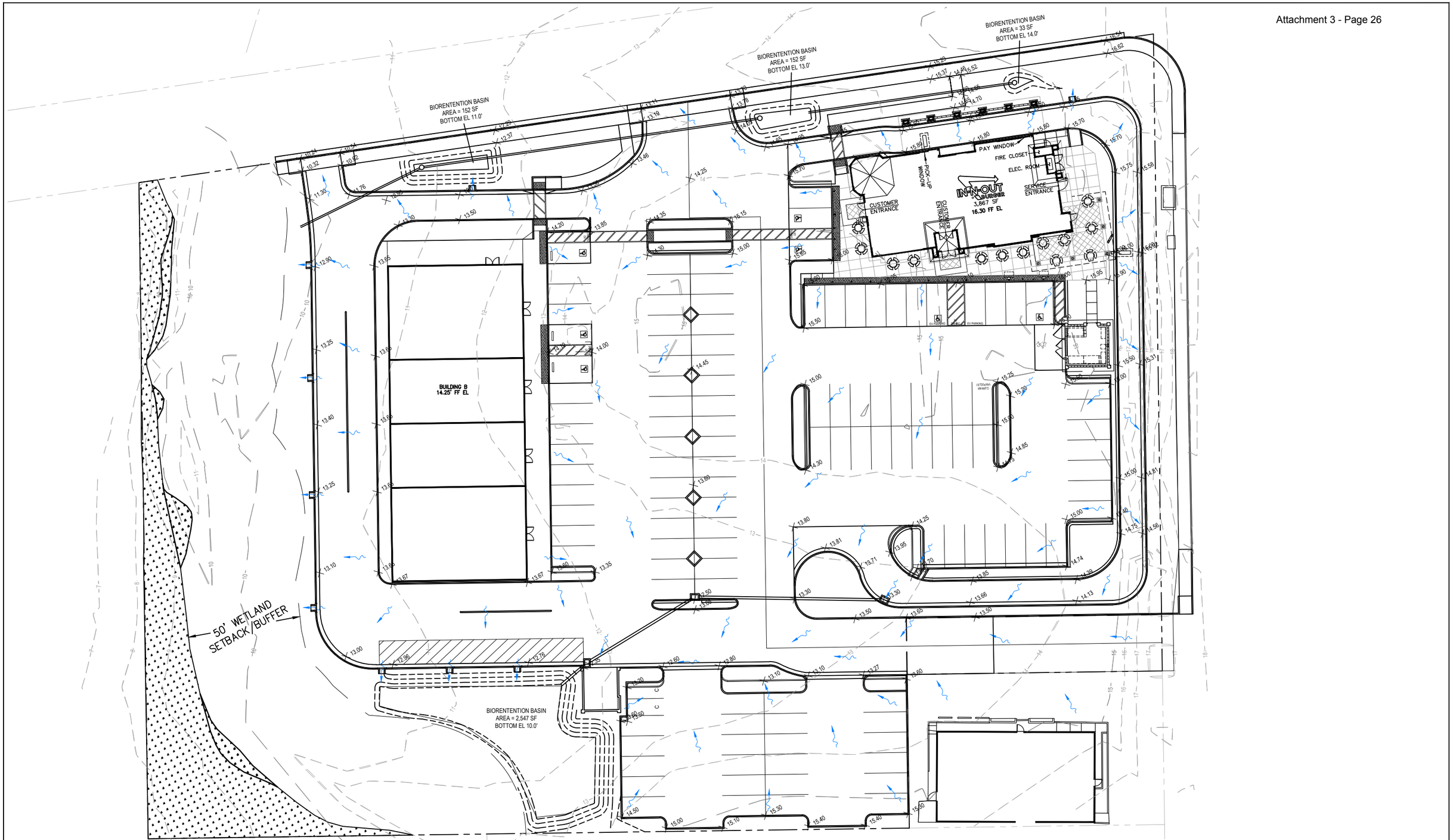
Client THE CARRINGTON COMPANY
Project CARRINGTON-BROADWAY EUREKA REDEVELOPMENT
Title PRELIMINARY PHOTOMETRICS
Project No.
Original Size ANSI D
Sheet No.
Sheet of



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Drafting Check	D.CAISSE	Design Check	D.CAISSE
Project Manager	D.CAISSE	Date	9/5/2018
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Client THE CARRINGTON COMPANY
Project BROADWAY EUREKA REDEVELOPMENT
Title PRELIMINARY GRADING PLAN

Project No. 11153741

Original Size ANSI D

Sheet No. C-100

Sheet 1 of TBD

PLANT_SCHEDULE

TREES	BOTANICAL NAME / COMMON NAME	CONT SZ	WUCOLS	QTY
	Acer circinatum / Vine Maple LOW WATER USE EXPECTED IN COASTAL EUREKA	8` TRUNK HT	M	8
	Acer negundo / Box Elder A. NEGUNDO CALIFORNICA PREFERRED. LOW WATER USE EXPECTED IN COASTAL EUREKA	8` TRUNK HT	M	9
	Alnus rubra / Red Alder LOW WATER USE EXPECTED IN COASTAL EUREKA	15 gal	H	5
	Lyonothamnus floribundus asplenifolius / Fernleaf Catalina Ironwood	8` TRUNK HT	L	5
	Washingtonia robusta / Mexican Fan Palm PALM TREES INSTALLED TO CROSS.	FIELD DUG 20` TRUNK HT	L	2

SHRUBS	BOTANICAL NAME / COMMON NAME	SIZE	WUCOLS	QTY
	Agave x `Blue Glow` / Blue Glow Agave	5 gal	L	12
	Arctostaphylos uva-ursi `Point Reyes` / Kinnikinnick	1 gal	L	14
	Berberis thunbergii `Atropurpurea Nana` / Dwarf Redleaf Japanses Barberry	5 gal	M	35
	Callistemon citrinus `Little John` / Dwarf Bottle Brush	5 gal	L	19
	Carpenteria californica `Elizabeth` / Bush Anemone LOW WATER USE EXPECTED IN EUREKA	5 gal	M	20
	Ceanothus griseus horizontalis `Yankee Point` / California Lilac	5 gal	L	10
	Coprosma kirkii `Variegata` / Creeping Mirror Plant	1 gal	L	73
	Cornus sericea `Kelseyi` / Kelseyi Dogwood	15 gal	H	4
	Deschampsia cespitosa / Tufted Hair Grass	1 gal	L	221
	Juniperus communis var. australis `Pt. St. George` / Pt. St. George Dwarf Juniper	1 gal	L	3
	Lantana camara `Monine` TM / Monine Lantana	5 gal	L	8
	Leymus condensatus `Canyon Prince` / Native Blue Rye	5 gal	L	41
	Phormium tenax `Maori Maiden/Sunrise` / Tricolor New Zealand Flax	5 gal	L	44
	Polystichum munitum / Western Sword Fern LOW WATER USE EXPECTED IN COASTAL EUREKA	5 gal	M	16
	Russelia equisetiformis / Firecracker Plant	1 gal	M	5
	Trachelospermum jasminoides / Chinese Star Jasmine Pruned to hedge form - 2` H	5 gal	M	59
	Yucca gloriosa `Variegata` / Variegated Spanish Dagger	1 gal	L	8

GROUND COVERS	BOTANICAL NAME / COMMON NAME	CONT	WUCOLS	SPACING/AREA
	Fragaria chiloensis / Beach Strawberry LOW WATER USE EXPECTED IN COASTAL EUREKA	flat	M	18" o.c./1406 SF
	Juncus patens / California Gray Rush	flat	L	15" o.c./4722 SF
	Senecio mandraliscae / Blue Finger	flat	L	24" o.c./870 SF

MAXIMUM APPLIED WATER ALLOWANCE (MAWA)

ET_O	27.4	IN/YR
OVERHEAD LANDSCAPE AREA	0	FT^2
DRIP LANDSCAPE AREA	40037	FT^2
SPECIAL LANDSCAPE AREA	0	FT^2
TOTAL LANDSCAPE AREA	40037	FT^2

LANDSCAPE CALCULATIONS

DEVELOPED AREA LANDSCAPE	14,346 SF
BUFFER ZONE	25,691 SF
TOTAL LANDSCAPE AREA	40,037 SF 0.92 ACRE

MAWA CALCULATION INCORPORATING EFFECTIVE PRECIPITATION

TOTAL ANNUAL PRECIPITATION	40	IN/YR
EFFECTIVE PRECIPITATION (EPPT)	10	EPPT

$[(ET_O\text{-}EPPT) \times (0.62)] \times [(0.45 \times LA) + ((1.0\text{-}0.45) \times SLA)]$

	194,364	GALLONS
	25,983	CF
	0.60	AC FT
		MILLIONS OF
	0.19	GALLONS

HYDROZONE	SYSTEM TYPE	PLANT WATER USE TYPE	PLANT FACTOR (PF)	HYDROZONE AREA (HA) WITHOUT SLA (FT^2)	IRRIGATION EFFICIENCY (IE)	$(PF \times HA/(FT^2))/IE$
1. LOW ZONE	DRIP	LOW	0.2	18750	0.81	4630
2. MOD ZONE	DRIP	MOD	0.5	21287	0.81	13140
3 HIGH ZONE	DRIP	HIGH	0.8	0	0.81	0
				40037		
					SUBTOTAL	17770
		SLA	1	0		0
					SUM	17770

ETWU WITH PRECIPITATION:
(ETO-EPPT) X 0.62 X [((PF X HA/IE) + SLA]

COMPLIES

191,700	GALLONS
25,627	CF
0.59	AC FT
	MILLIONS OF
0.19	GALLONS

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Project Manager	D.CAISSE	Date	8/28/2018
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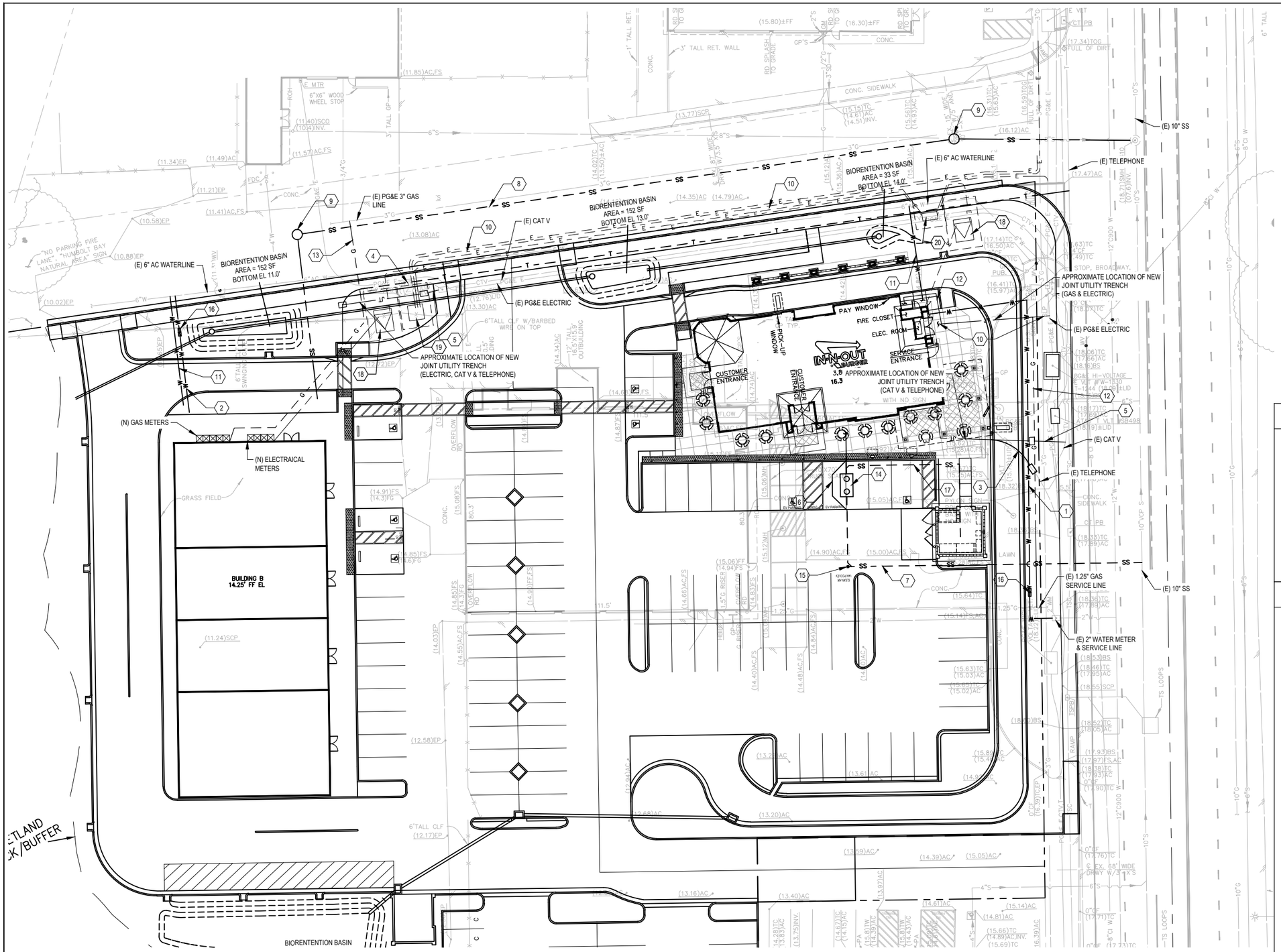
Client **THE CARRINGTON COMPANY**
Project **BROADWAY EUREKA REDEVELOPMENT**
Title **CONCEPTUAL LANDSCAPE PLAN**

Project No. **11153741** **REV. JULY 23, 2018**

Original Size **ANSI D** Sheet No. Sheet of **TBD**



SHEET GENERAL NOTES

1. LOCATION OF EX UTILITIES & STRUCTURES ARE FROM INFORMATION AVAILABLE AT TIME OF DESIGN. EXACT LOCATION AND COMPLETENESS ARE NOT GUARANTEED. CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICES ALERT (800) 227-2600 A MIN. OF TWO WORKING DAYS PRIOR TO ANY EXCAVATION AND POTHOLE FOR EXACT LOCATION.
2. CONTRACTOR TO POTHOLE PRIOR TO PURCHASING MATERIALS TO DETERMINE THE EXACT LOCATION AND DEPTH OF (E) UTILITIES. NOTIFY ENGINEER OF ANY CONFLICTS WITH PROPOSED IMPROVEMENTS.
3. COORDINATE WATER AND SEWER CONNECTIONS WITH PLUMBER.

KEYNOTES

1. 2" WATER SERVICE
2. X" WATER SERVICE
3. 4" TELEPHONE SERVICE
4. X" TELEPHONE SERVICE
5. CAT V SERVICE
6. 4" SANITARY SEWER SERVICE
7. 6" SANITARY SEWER SERVICE
8. X" SANITARY SEWER SERVICE
9. SANITARY SEWER MANHOLE
10. PG&E ELECTRIC SERVICE
11. 6" FIRE SERVICE
12. PG&E 1.25" GAS SERVICE
13. PG&E X" GAS SERVICE
14. X GALLON OIL AND GREASE INTERCEPTOR
15. TWO WAY LATERAL CLEANOUT
16. X" BACKFLOW PREVENTOR
17. SS CONNECTION TO TRASH ENCLOSURE
18. TRANSFORMER
19. INTERRUPTER
20. JUNCTION BOX

DESIGN STUDY
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Project Manager	D.CAISSE	Date	9/5/2018
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Client THE CARRINGTON COMPANY
Project BROADWAY EUREKA REDEVELOPMENT
Title PRELIMINARY UTILITY PLAN
Project No. 11153741
Original Size ANSI D
Sheet No. C-100
Sheet 1 of TBD

EUREKA CITY PLANNING COMMISSION
Resolution No. 2018-__

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF EUREKA ADOPTING FINDINGS OF FACT, A MITIGATION MONITORING AND REPORTING PROGRAM, AND A MITIGATED NEGATIVE DECLARATION TO ALLOW RESTAURANT USES AND A LOT LINE ADJUSTMENT AT 2616 BROADWAY, APNS 007-121-005 AND -007

WHEREAS, on October 4, 2018, the Carrington Company submitted applications to develop two (2) commercial buildings on approximately 3.19 acres on the southwest corner of Broadway (Highway 101) and Vigo Streets (referred to as the Carrington Vigo Street Commercial Development); and

WHEREAS, the project address is 2616 Broadway, and the parcel numbers are 007-121-005 and -007; and

WHEREAS, the project includes the demolition of the existing structure, reconfiguration of the parcels through a Lot Line Adjustment (LLA-18-0004), construction of an approximate 3,867 square foot drive-through restaurant on the eastern lot, construction of a four-tenant, approximately 8,400 square foot commercial structure containing a mix of restaurant and retail uses and outdoor patio areas, associated parking areas, low impact development features, landscaping, utilities, and stormwater infrastructure on the western lot; and

WHEREAS, one or more of the four separate lease spaces on the western parcel will be used as a restaurant and the southern lease space will include a drive-through; restaurant uses could be located in any or all of the three tenant spaces, although one restaurant and two retail spaces is the likely make-up of the tenancy; and

WHEREAS, the project parcels are zoned Service Commercial (CS), have a land use designation of General Service Commercial (GSC), and are located in the Coastal Zone; and

WHEREAS, Eureka Municipal Code §10-5.29133. provides that "*Restaurants and soda fountains, including drive-in establishments*" are a conditionally permitted use and the definition of a "*Drive-in*" is "*An establishment serving food or beverages to customers who remain in or leave and return to their cars for consumption*."; and

WHEREAS, as a conditionally permitted use in the Coastal CS zone, a Use Permit (C-18-0010) and Design Review (AA-18-0019) are required for the restaurant uses, and a Coastal Development Permit (CDP-18-0012) is required for the restaurant use and the Lot Line Adjustment; and

WHEREAS, the proposed development is a "project" as defined by the California Environmental Quality Act (CEQA) and is subject to the provisions of the Act; and

WHEREAS, an Initial Study/Draft Mitigated Negative Declaration (ED-18-0006) was prepared and circulated for local public comment and submitted to the State Clearinghouse (SCH #2018102055) for 30-day public comment period; and

WHEREAS, the City received comment letters from public agencies and the public regarding the Draft Mitigated Negative Declaration, and prepared a response to the comments; and

WHEREAS, the Mitigated Negative Declaration concluded that with mitigation, no substantial adverse environmental impact will result from the proposed project; and

WHEREAS, prior to approving a project, CEQA requires the Planning Commission consider the proposed MND, together with any comments received during the public review process; and

WHEREAS, adoption of this resolution along with adoption of resolutions approving the proposed project's Use Permit, Design Review, and Coastal Development Permit will constitute approval of the project.

NOW THEREFORE, BE IT RESOLVED by the Planning Commission of the City of Eureka that:

1. On the basis of the whole record including the initial study, the comments received, and the response to comments, there is no substantial evidence that the project will have any significant effects on the environment with implementations of the mitigation measures.

2. The mitigated negative declaration was prepared for this project pursuant to the provisions of CEQA and reflects the City of Eureka's independent judgment and analysis.

3. The project site is not within two nautical miles of a public airport or public use airport, and they determined that the project will not result in a safety hazard or noise problem for persons using the airport or for persons residing or working in the project area.

4. The documents and other material which constitute the record of proceedings upon which the Planning Commission's decision is based are maintained in the City of Eureka Development Services Department, 531 K Street, Eureka, CA.

4. The mitigation monitoring and reporting program attached hereto as "Attachment A" and incorporated herein by this reference, is adopted and are included as conditions of approval of the project.

5. The Errata attached hereto as "Attachment 2" and incorporated herein by this reference, is adopted.

PASSED, APPROVED AND ADOPTED by the Planning Commission of the City of Eureka in the County of Humboldt, State of California, on the 10th day of December, 2018 by the following vote:

AYES: COMMISSIONERS
NOES: COMMISSIONERS
ABSENT: COMMISSIONERS
ABSTAIN: COMMISSIONERS

_____
Jeff Ragan, Chair, Planning Commission

Attest:

Rob Holmlund, Executive Secretary

CEQA Resolution Attachment A

CEQA Mitigation Monitoring/ Reporting Program (MMRP)

This Mitigation Monitoring/Reporting Program (MMRP) has been prepared for the project described below in conformance with Section 21081.6 of the California Environmental Quality Act (CEQA) and Section 15097 of the CEQA Guidelines.

SCH #: 2018102055

PROJECT TITLE: Carrington Vigo Street Commercial Development (2616 Broadway Development Project)

PROJECT APPLICANT: Carrington Company **CASE NO**: ED-18-0006

PROJECT LOCATION: 2616 Broadway, Eureka, CA; APNs 007-121-005 and -007

ZONING AND GENERAL PLAN DESIGNATION: Service Commercial (CS) and General Service Commercial (GSC),

PROJECT DESCRIPTION: The Carrington Vigo Street Commercial Develoment (2016 Broadway Redevelopment Project) would demolish the existing structure, reconfigure the parcels through a Lot Line Adjustment, construct a drive-through restaurant on the easterly site, a four-tenant commercial structure containing a mix of restaurant and retail uses on the westerly site, associated parking areas, low impact development features, landscaping, utilities, and stormwater infrastructure.

LEAD AGENCY: City of Eureka, 531 "K" Street, Eureka, CA 95501-1165

CONTACT PERSON: Kristen M. Goetz, Senior Planner; *phone*: (707) 441-4166; *fax*: (707) 441-4202; *e-mail*: kgoetz@ci.eureka.ca.gov

INTRODUCTION: On December 10, 2018, with the actions by Planning Commission approving a Use Permit, Design Review, and a Coastal Development Permit, the above described project was approved by the Planning Commission of the City of Eureka; mitigation measures were made a condition of project approval. The purpose of this MMRP is to ensure that the mitigation measures adopted in connection with project approval are effectively implemented. This MMRP establishes the framework that the City of Eureka and others will use to implement the adopted migration measures and the monitoring and/or reporting of such implementation.

CEQA provides that the City of Eureka may choose whether the MMRP will monitor mitigation, report on mitigation, or both. "Reporting" generally consists of a written compliance review that is presented to the decision making body or authorized staff person. A report may be required at various stages during project implementation or upon completion of the mitigation measure. "Monitoring" is generally an ongoing or periodic

process of project oversight. There is often no clear distinction between monitoring and reporting and the program best suited to ensuring compliance in any given instance will usually involve elements of both. The choice of program may be guided by the following:

(1) Reporting is suited to projects which have readily measurable or quantitative mitigation measures or which already involve regular review. For example, a report may be required upon issuance of final occupancy to a project whose mitigation measures were confirmed by building inspection.

(2) Monitoring is suited to projects with complex mitigation measures, such as wetlands restoration or archeological protection, which may exceed the expertise of the City of Eureka to oversee; are expected to be implemented over a period of time; or, require careful implementation to assure compliance.

(3) Reporting and monitoring are suited to all but the most simple projects. Monitoring ensures that project compliance is checked on a regular basis during and, if necessary after, implementation. Reporting ensures that the City of Eureka is informed of compliance with mitigation requirements.

ENFORCEMENT: In accordance with CEQA, the primary responsibility for making a determination with respect to potential environmental effects rests with the City of Eureka rather than the monitor or preparer of the CEQA documents. As such, the City of Eureka is identified as the primary enforcement agency for this MMRP.

PROGRAM MODIFICATION: After adoption of this MMRP, minor changes to this MMRP are permitted but can only be made by the City of Eureka. The Director of Development Services, after consultation with affected Departments or Agencies, may make minor modifications to this MMRP. If, for any reason, any mitigation measure specified in this MMRP cannot be implemented due to factors beyond the control of the owner/developer and/or the City of Eureka, at a noticed public hearing before the Planning Commission of the City of Eureka, substitution of another mitigation measure may be approved. In no case shall deviations from this MMRP be permitted unless this MMRP continues to satisfy the requirements of Section 21081.6 of CEQA, as determined by the City of Eureka.

SUMMARY OF POTENTIAL PROJECT IMPACTS: Below is a table that summarizes the impact potential for each category of impact as identified and analyzed in the Initial Study.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
I Aesthetics			✓	
II Agricultural and Forest Resources				✓
III Air Quality			✓	
IV Biological Resources		✓		
V Cultural Resources		✓		
VI Geology and Soils			✓	
VII Greenhouse Gas Emissions			✓	
VIII Hazards and Hazardous Materials		✓		
IX Hydrology and Water Quality			✓	
X Land Use and Planning			✓	
XI Mineral Resources				✓

XII Noise			✓	
XIII Population and Housing				✓
XIV Public Services			✓	
XV Recreation				✓
XVI Transportation and Traffic		✓		
XVII Tribal Cultural Resources			✓	
XVIII Utilities and Service Systems			✓	
XIV Mandatory Findings of Significance		✓		

MMRP IMPLEMENTATION TABLE: To assure that this MMRP is effectively implemented the table on the following pages establishes the framework that the City of Eureka and others will use to implement the adopted migration measures and the monitoring and/or reporting of such implementation. The following abbreviations will be used in the MMRP table:

AQMD..... Air Quality Management District
BD..... City of Eureka Building Division
CDFW ..... California Department of Fish and Wildlife
DSD ..... Development Services Department
ENG ..... City of Eureka Engineering Division
OWN..... Carrington Company
PW ..... City of Eureka Public Works Department
RWQCB ..... Regional Water Quality Control Board

Mitigation Measure	Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
4.4 Biological Resources				
BIO-1 Prevent Disturbance of Roosting Bats Prior to construction, the Applicant shall have a Bat Habitat Assessment conducted prior to Project implementation. The Habitat Assessment shall be completed by a qualified biologist (e.g., a biologist holding a California Department of Fish and Wildlife collection permit and a Memorandum of Understanding with the CDFW allowing the biologist to handle and collect bats). The Habitat Assessment shall evaluate the existing building for suitable entry points and roost features, and shall provide focused daytime surveys for day-roosting bats. If a special-status bat species is found, or if suspected day roosts for special-status bats are identified, then the Habitat Assessment shall identify suitable performance measures for avoiding impacts to roosts, which may include, but would not be limited to:	OWN CONT DSD CDFW	Prior to construction by a biologist holding a CDFW collection permit and a Memorandum of Understanding with CDFW allowing the biologist to handle and collect bats	Once prior to construction	State CDFW standards

Mitigation Measure	Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
• Consultation with the CDFW to determine appropriate measures for protecting bats with young if present, and for implementing measures to exclude non-breeding bat colonies during the building demolition process. If no bats are present during the day, the structure planned for removal may be partially blocked with appropriate mesh or netting to prevent subsequent occupation. If bats are present during the day, additional exclusion and eviction efforts would be required based on specific recommendations of a qualified bat biologist in consultation with the CDFW.				

Mitigation Measure	Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
BIO-2 Protect Nesting Birds • If construction occurs outside the bird nesting season (March 15 to August 15), no further mitigation is necessary. If construction occurs between March 15 and August 15, the client shall have a qualified wildlife biologist conduct preconstruction surveys within the vicinity of the impact area, to check for nesting activity of native birds and to evaluate the site for special-status bird species. The biologist shall conduct a minimum of one pre-construction survey within the seven-day period prior to construction activities. If construction work lapses for seven days or longer during the nesting season, a qualified biologist shall conduct a supplemental avian survey before project work is reinitiated. • If an active nest is found, the biologist will determine the extent of an appropriate construction-free buffer zone to be established around the nest and/or operational restrictions in consultation with CDFW. Buffer zones will be delineated with flagging and	OWN CONT DSD CDFW	Pre-construction if construction occurs between March 15 and August 15	Throughout construction as needed. If construction work lapses for seven days or longer during the nesting season, a qualified biologist shall conduct a supplemental avian survey before project work is reinitiated	Federal and state standards

Mitigation Measure	Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
maintained until the nests have fledged or nesting activity has ceased. Buffer sizes would take into account factors such as (1) highway and other ambient noise levels, (2) distance from the nest to the highway and distance from the nest to the active construction area, (3) noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity; (4) distance and amount of vegetation or other screening between the construction site and the nest; and (5) sensitivity of individual nesting species and behaviors of the nesting birds. Buffers will be established based on the factors above and in consultation with CDFW.				

Mitigation Measure		Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
BIO-3	**Protect Northern Red-Legged Frog** • No more than one week prior to commencement of ground disturbance within 50 feet of suitable northern red-legged frog habitat, a qualified wildlife biologist shall perform a preconstruction survey for the northern red-legged frog and shall relocate any specimens that occur within the work -impact zone to nearby suitable habitat. • In the event that a northern-red legged frog is observed in an active construction zone, the contractor shall halt construction activities in the area where observed and the frog(s) shall be moved to a safe location in similar habitat outside of the construction zone.	OWN CONT DSD	Pre-construction	Once at pre-construction	Federal and State standards
4.5	**Cultural Resources**				
CR-1	**Protect Archaeological Resources during Construction Activities** If cultural resources are encountered during any construction, the applicant and its construction contractor shall cease all work in the immediate area and within a 50 foot	OWN CONT DSD BD	All grounding disturbing construction activates must be in compliance at all times.	Throughout subsurface construction activities	City of Eureka standards

Mitigation Measure	Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
buffer of the discovery location. A qualified archaeologist as well as the Tribal Historic Preservation Officers for the Bear River Band of Rohnerville Rancheria, Blue Lake Rancheria, and Wiyot Tribe are to be contacted to evaluate the discovery and, in consultation with the applicant and lead agency, development of a treatment plan in any instance where significant impacts cannot be avoided shall be completed to the satisfaction of the Tribal Historic Preservation Officers prior to the resumption of construction activities at the location. Prehistoric materials may include obsidian or chert flakes, tools, locally darkened midden soils, groundstone artifacts, shellfish or faunal remains, and human burials. Violations of the conditions relating to ground disturbing activities shall be subject to penalties as allowed under current laws and codes.				

Mitigation Measure		Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
CR-2	**Protection of Paleontological Resources** In the event that fossils are encountered during construction (i.e., bones, teeth, or unusually abundant and well-preserved invertebrates or plants), construction activities shall be diverted away from the discovery within 50 feet of the find, and a professional paleontologist shall be notified to document the discovery as needed, to evaluate the potential resource, and to assess the nature and importance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the material, if it is determined that the find cannot be avoided. The paleontologist shall make recommendations for any necessary treatment that is consistent with currently accepted scientific practices. Any fossils collected from the area shall then be deposited in an accredited and permanent scientific institution where they will be properly curated and preserved.	CONT OWN DSD BD	All grounding disturbing construction activates must be in compliance at all times.	Throughout subsurface construction activities	City of Eureka standards

Mitigation Measure	Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
CR-3 **Protect Human Remains if Encountered during Construction** If human remains are found by the applicant or construction contractor during grading or other construction activities, California Health and Safety Code 7050.5 requires the applicant or its construction contractor call the County Coroner immediately at 707-445-7242. If the Coroner determines the remains to be Native American, the Native American Heritage Commission shall then be contacted by the Coroner to determine appropriate treatment of the remains pursuant to PRC 5097.98. Violators shall be prosecuted in accordance with PRC Section 5097.99. Violations of the conditions relating to ground disturbing activities shall be subject to penalties as allowed under current laws and codes.	CONT OWN DSD BD	All grounding disturbing construction activates must be in compliance at all times.	Throughout subsurface construction activities	California Health and Safety Code 7050.5, Humboldt County standards, Public Resource Code (PRC) 5097.98, and PRC 5097.99

Mitigation Measure		Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
4.8	**Hazards and Hazardous Materials**				
HAZ-1	**Assess and Manage Hazardous Materials** The property owner shall follow all regulations and laws concerning asbestos and lead-related work. The property owner shall provide written notification to the NCUAQMD at least 10 business days prior to the commencement of demolition activities. The property owner shall also provide written notification to the nearest California Occupational Safety and Health Administration (Cal/OSHA) District Enforcement Office with jurisdiction over the Project site at least 24 hours prior to the start of hazardous material work. The demolition and removal of asbestos-containing building materials shall be subject to applicable Cal/OSHA regulations, including 8 CCR 1529, 5203 341.6-341.14, and the California Health and Safety Code. If lead-based paint is identified, then federal and State construction worker health and safety regulations shall be followed during demolition activities. If loose	OWN CONT AQMD DSD BD Cal/OSHA	At least 10 days prior to commencement of demolition activities	Throughout demolition as needed	Cal/OSHA regulations including but not limited to: 8 CCR 1529, 5203 341.6-341.14

Mitigation Measure		Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
	or peeling lead-based paint is identified, it shall be removed by a qualified lead abatement contractor and disposed of in accordance with existing hazardous waste regulations.				
4.16	**Transportation/Traffic**				
TRA-1	**Construct a Traffic Signal at Vigo Street and Broadway** Mitigation Measure TRA-1 proposes to construct a three-leg traffic signal at the intersection of Vigo Street and Broadway, including associated road striping and pedestrian improvements. The three-leg traffic signal proposed by TRA-1 would allow protected turn movements from Vigo Street on to northbound and southbound Broadway, as well as protected turns from Broadway onto Vigo Street. Upgrades to the pedestrian crossing at Vigo Street associated with TRA-1 would include pedestrian curb ramps, marked crossing and pedestrian barricades for other legs of intersection.	OWN CONT Caltrans ENG PW DSD BD	Operational before construction	N/A	City of Eureka and Caltrans standards

Mitigation Measure		Person/ Agency Responsible for Monitoring	Timing of Implementation/ Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
TRA-2	**Convert Segment of W. Henderson to a One-way Westbound Street** Mitigation Measure TRA-2 proposes to convert W. Henderson Street to a one-way westbound street between Fairfield Street and Broadway Street. In association with the conversion of W. Henderson, TRA-2 includes the following improvements to deter potential eastbound traffic from entering the one-way westbound lanes at W. Henderson Street: 1) restrict northbound Broadway Street right turn, 2) restrict eastbound W. Henderson through movement at westerly driveway, and 3) removes existing traffic signal phases which allow eastbound turns/movements on W. Henderson Street.	OWN CONT Caltrans ENG PW DSD BD	Operational before construction	N/A	City of Eureka and Caltrans standards

Environmental Protection Actions		Individual Responsible for Implementing and/or Reporting	Timing of Implementation/Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
EPA-1	Air Quality Construction Control Measures **The following air quality emission construction measures would be included in the construction specifications for the Project:** • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas and unpaved access roads) shall be watered, as necessary, during dusty conditions. • All haul trucks transporting soil, sand or other loose material on- or off-site shall be covered or should maintain at least two feet of freeboard. • During construction, the contractor will designate an area of the Project site for equipment and vehicle cleaning in proximity to the temporary water source. The contractor will establish a temporary drive-off road consisting of cobbles, which will mitigate bulk soil and mud accumulation on adjacent roads. Visible mud or dirt tracked-out onto adjacent	CONT OWN BD AQMD	At onset of construction	Through out construction as needed	AQMD

Environmental Protection Actions	Individual Responsible for Implementing and/or Reporting	Timing of Implementation/Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping shall be prohibited. • All vehicle speeds on unpaved areas shall be limited to 15 miles per hour. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • A publicly visible sign shall be posted with the telephone number and person to				

Environmental Protection Actions		Individual Responsible for Implementing and/or Reporting	Timing of Implementation/Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
	contact at the City regarding dust complaints. This person shall respond and take corrective action within 48 hours. The NCUAQMD phone number shall also be visible to ensure compliance with applicable regulations.				
EPA-2	**Implement Geotechnical Design Recommendations** As part of the Project design process, the property owner would engage a California-registered Geotechnical Engineer to conduct a design-level geotechnical study for the Project. The property owner will design the Project to comply with the site-specific recommendations made in the Project's geotechnical report. This will include design in accordance with the seismic and foundation design criteria, as well as site preparation and grading recommendations included in the report. The geotechnical recommendations will be incorporated into the final plans and	OWN BD	At onset of Project design	Through out construction	City of Eureka and state standards

Environmental Protection Actions		Individual Responsible for Implementing and/or Reporting	Timing of Implementation/Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
	specifications for the Project, and will be implemented during construction.				
EPA-3	**Construction Materials Storage and Equipment Staging** Contractor equipment associated with the Project construction would be staged, when not in use, at a designated location (staging/lay-down area) at the Project site. Best management practices would be implemented in association with the staging/lay-down area to mitigate the potential for sediment delivery to adjacent areas and stormwater inlets. The following BMPs will be implemented by the contractor in association with the Project: 1. Minimize erosion and prevent the transport of sediment to sensitive areas. 2. Minimize disturbance of existing vegetation to that necessary to complete the work.	CONT OWN	Pre-Construction	Throughout construction as needed	RWQCB

Environmental Protection Actions	Individual Responsible for Implementing and/or Reporting	Timing of Implementation/Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
3. Activities such a vehicle washing are to be carried out at an off-site facility wherein the water is discharged into a sanitary sewer. 4. The contractor shall make adequate preparations, including training and equipment, to contain spills of oil or other hazardous materials. 5. The contractor shall provide covered waste receptacles for common solid wastes at convenient locations on the job site and provide regular collection of wastes. 6. The contractor shall provide sanitary facilities of sufficient number and size to accommodate construction crews and ensure adequate anchorage of such facilities to prevent them from being overturned. 7. All hazardous material containers will be placed in secondary containment(s) when not in use. 8. Vehicle maintenance will be performed off-site whenever practical.				

Environmental Protection Actions	Individual Responsible for Implementing and/or Reporting	Timing of Implementation/Compliance	Frequency and/or Duration of Monitoring	Evidence of Compliance
9. Vehicle refueling will be performed on land at least 50 feet away from bay, drainage channels and/or stormwater systems, whenever practicable. Refueling shall be performed with adequate spill-mitigation and containment protocols to protect the marine environment. 10. Contractor must ensure that the construction site is prepared prior to the onset of any storm. 11. These BMPs may not cover all the situations that arise during construction due to unanticipated field conditions. Variations may be needed to BMPs in the field subject to the approval, or at the direction of the property owner. 12. It will be the responsibility of the contractor to fix any deficiencies indicated by the property owner or regulatory agencies to prevent erosion and/or control sediment.				

EUREKA CITY PLANNING COMMISSION
Resolution No. 2018-__

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF EUREKA APPROVING THE USE PERMIT AND DESIGN REVIEW TO ALLOW RESTAURANT USES AT 2616 BROADWAY, APNS 007-121-005 AND -007

WHEREAS, on October 4, 2018, the Carrington Company submitted applications to develop two (2) commercial buildings on approximately 3.19 acres on the southwest corner of Broadway (Highway 101) and Vigo Streets (referred to as the Carrington Vigo Street Commercial Development); and

WHEREAS, the site contains a vacant two-story commercial structure; and

WHEREAS, the building and property was formerly used as a truck stop/terminal with both paved and graveled parking areas; and

WHEREAS, the property is bound on the south side by the commercial lots of Discount Cigarettes (0.17 acres), Mr. Fish Seafood (0.7 acres), and Gold Rush Coffee (0.5 acres) and on the north side by Vigo Street and other existing commercial developments; and

WHEREAS, the west side of Broadway in the vicinity of the project is developed with a range of commercial and visitor serving uses, including motels, restaurants, and retail and service stores; and

WHEREAS, the project proposes the demolition of the existing structure, reconfiguration of the parcels through a Lot Line Adjustment (LLA-18-0004), construction of an approximate 3,867 square foot drive-through restaurant, construction of a four-tenant, approximately 8,400 square foot commercial structure containing a mix of restaurant and retail uses and outdoor patio areas, associated parking areas, low impact development features, landscaping, utilities, and stormwater infrastructure; and

WHEREAS, the project proposes one wall sign for each side of the building and one freestanding sign; and

WHEREAS, no utility service extensions are required for the project;

WHEREAS, one or more of the four separate lease spaces on the western parcel may be used as a restaurant and the southern lease space will include a drive-through; restaurant uses could be located in any or all of the three tenant spaces, although one restaurant and two retail spaces is the likely make-up of the tenancy; and

WHEREAS, the project parcels are zoned Service Commercial (CS), have a land use designation of General Service Commercial (GSC), and are located in the Coastal Zone; and

WHEREAS, Eureka Municipal Code §10-5.29133 provides that "*Restaurants and soda fountains, including drive-in establishments*" are a conditionally permitted use and the definition of a "*Drive-in*" is "*An establishment serving food or beverages to customers who remain in or leave and return to their cars for consumption*"; and

WHEREAS, as a conditionally permitted use in the Coastal CS zone, a Use Permit (C-18-0010) and Design Review (AA-18-0019) are required for the restaurant uses, and a Coastal Development Permit (CDP-18-0012) is required for the restaurant use and the Lot Line Adjustment; and

WHEREAS, the proposed development is a "project" as defined by the California Environmental Quality Act (CEQA) and is subject to the provisions of the Act; and

WHEREAS, an Initial Study/Draft Mitigated Negative Declaration (ED-18-0006) was prepared and circulated for local public comment and submitted to the State Clearinghouse (SCH #2018102055) for 30-day public comment periods; and

WHEREAS, the eastern boundary is Broadway (State Highway 101) and the western property boundary abuts the Maurer Freshwater Marsh, which is largely riparian vegetation and adjacent to the City of Eureka's Palco Marsh and both marshes together are considered to be a large Environmentally Sensitive Habitat Area (ESHA); and

WHEREAS, a traffic study was completed for the project, including the restaurants. The conclusion of the traffic study is that, with mitigation, the development will not result in adverse traffic impacts; and

WHEREAS, the IS/MND and biological study, as well as the Coastal Development Permit application and IS/MND response to comments, confirm that the project will not adversely impact the adjacent ESHA or wetlands; and

WHEREAS, the Mitigated Negative Declaration concluded that with mitigation, no substantial adverse environmental impact will result from the proposed project; and

WHEREAS, prior to approving a project, CEQA requires the Planning Commission consider the proposed MND, together with any comments received during the public review process; and

WHEREAS, a Mitigation Monitoring and Reporting program, findings of fact, and Mitigated Negative Declaration was adopted by the Planning Commission on December 10, 2018.

NOW THEREFORE, BE IT RESOLVED by the Planning Commission of the City of Eureka that:

1. The project is in accord with the objectives and purposes of the Zoning Regulations, CS zone district, and specific purposes of the CS district because:

a. Granting the conditional use permit will facilitate and achieve the arrangement of land uses depicted in the general plan.
b. The project will foster a harmonious, convenient, workable relationship among land uses.
c. The project will facilitate and promote stability of land uses consistent with the general plan.
d. Restaurants on the project site will serve the greater Eureka area and cater to tourist traffic, which is a benefit to the city as a whole.
e. Granting the use permit will not result in increased population densities, and will not cause an overcrowding of land with structures.
f. With mitigation, the development will not result in adverse traffic impacts.
g. The project provides more than the required number of off-street parking spaces, and provides off-street loading facilities.
h. No community facilities or institutions exist, are proposed, or are needed on the site.
i. Development of restaurants will result in sales tax that will strengthen the city's tax base.
j. Implementation of the project will greatly enhance property values in the vicinity of the development thereby protecting and enhancing real property values.
k. The signage as proposed complies with the development standards for wall and freestanding signs in the CS zone district.

2. The project consists of infill development.
3. With specified mitigation, the project will not result in any adverse environmental impacts and as conditioned and mitigated, will not result in any adverse impacts to the public health, safety or welfare.
4. The proposed project complies with the applicable provisions of the Code in compliance with the standards for the CS zone.
5. The project complies with General Plan Policy 1.B.9 which encourages economic investment in buildings including construction of new buildings, and General Plan Policy 1.L.2 which promotes high quality design, visual attractiveness, and proper location, and is therefore consistent with the applicable policies of the Local Coastal Program.
6. The proposed structures, parking lot, and landscaping are not inharmonious with the surroundings, will not have an adverse effect on the value of property or improvements in the vicinity, is not ugly, inharmonious, monotonous, or hazardous.
7. The signs are internally illuminated, and will not be a distraction to the driving public, or to the residential and hotel uses east of Broadway on the bluff.
8. The proposed wall signs will not obscure or detract from any adjacent signs.
9. The residential and hotel uses located across and above Broadway on the bluff will not be impacted by the signage at the site.
10. The project will not adversely affect the Mauer Marsh or any other natural or ecological resources.
11. The project will not adversely impact the adjacent ESHA or wetlands.

12. With mitigation, no substantial adverse environmental impact will result from the proposed project.
13. The proposed development is a "project" as defined by the California Environmental Quality Act (CEQA) and is subject to the provisions of the Act.
14. An Initial Study/Draft Mitigated Negative Declaration (ED-18-0006) was prepared and circulated for local public comment and submitted to the State Clearinghouse (SCH #2018102055) for 30-day public comment period.
15. The Mitigated Negative Declaration concluded that with mitigation, no substantial adverse environmental impact will result from the proposed project.
16. The Planning Commission considered the proposed MND, together with the comments received during the public review process and the response to comments.
17. A Mitigation Monitoring and Reporting program, findings of fact, and Mitigated Negative Declaration was adopted by the Planning Commission on December 10, 2018.
18. The Use Permit and Design Review of the Carrington Vigo Street Commercial Development is approved with the conditions noted below.

BE IT FURTHER RESOLVED by the Planning Commission of the City of Eureka that approval of the Use Permit is conditioned on the following terms and requirements:

1. The applicant and all contractors will comply with all applicable conditions of approval in CDP-18-0012 and the adopted Mitigation Measures to the satisfaction of the Development Services Department.
2. To the satisfaction of the Development Services Department, the freestanding sign located at the Broadway entrance to the site will be shown on the building plans and will be installed on the site at least ½ its height (15 feet) from the interior property line that will exist at the Broadway entrance following the approval of the Lot Line Adjustment as required by Eureka Municipal Code Sec 10-5.1704(B)(2).
3. To the satisfaction of the Development Services Department, the freestanding sign located at the Broadway entrance to the site will not project over the public right-of-way as required by Eureka Municipal Code Sec 10-5.1704(B)(3).
4. Additional advertising signage proposed on the site will obtain a sign permit or Design Review approval as required by the zoning code, to the satisfaction of the Development Services Department. The maximum signage allowance for the site will be shared across both parcels.
5. Any and all exterior lighting will be located and shielded such that no light or glare extends beyond the property line. In addition, the illuminated portion of the light fixture or lens shall not extend below or beyond the canister or light shield, to the satisfaction of the Development Services Department.

PASSED, APPROVED AND ADOPTED by the Planning Commission of the City of Eureka in the County of Humboldt, State of California, on the 10th day of December, 2018 by the following vote:

AYES: COMMISSIONERS
NOES: COMMISSIONERS
ABSENT: COMMISSIONERS

ABSTAIN: COMMISSIONERS

Jeff Ragan, Chair, Planning Commission

Attest:

Rob Holmlund, Executive Secretary

EUREKA CITY PLANNING COMMISSION
Resolution No. 2018-__

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF EUREKA APPROVING THE COASTAL DEVELOPMENT PERMIT TO ALLOW RESTAURANT USES AND A LOT LINE ADJUSTMENT AT 2616 BROADWAY, APNS 007-121-005 AND -007

WHEREAS, on October 4, 2018, the Carrington Company submitted applications to develop two (2) commercial buildings on approximately 3.19 acres on the southwest corner of Broadway (Highway 101) and Vigo Streets (referred to as the Carrington Vigo Street Commercial Development); and

WHEREAS, the site contains a vacant two-story commercial structure; and

WHEREAS, the building and property was formerly used as a truck stop/terminal with both paved and graveled parking areas; and

WHEREAS, the property is bound on the south side by the commercial lots of Discount Cigarettes (0.17 acres), Mr. Fish Seafood (0.7 acres), and Gold Rush Coffee (0.5 acres) and on the north side by Vigo Street and other existing commercial developments; and

WHEREAS, the west side of Broadway in the vicinity of the project is developed with a range of commercial and visitor serving uses, including motels, restaurants, and retail and service stores; and

WHEREAS, the project proposes the demolition of the existing structure, reconfiguration of the parcels through a Lot Line Adjustment (LLA-18-0004), construction of an approximate 3,867 square foot drive-through restaurant, construction of a four-tenant, approximately 8,400 square foot commercial structure containing a mix of restaurant and retail uses and outdoor patio areas, associated parking areas, low impact development features, landscaping, utilities, and stormwater infrastructure; and

WHEREAS, the project proposes one wall sign for each side of the building and one freestanding sign; and

WHEREAS, no utility service extensions are required for the project;

WHEREAS, one or more of the four separate lease spaces on the western parcel may be used as a restaurant and the southern lease space will include a drive-through; restaurant uses could be located in any or all of the three tenant spaces, although one restaurant and two retail spaces is the likely make-up of the tenancy; and

WHEREAS, the project parcels are zoned Service Commercial (CS), have a land use designation of General Service Commercial (GSC), and are located in the Coastal Zone; and

WHEREAS, Eureka Municipal Code §10-5.29133 provides that "*Restaurants and soda fountains, including drive-in establishments*" are a conditionally permitted use and the definition of a "*Drive-in*" is "*An establishment serving food or beverages to customers who remain in or leave and return to their cars for consumption*"; and

WHEREAS, as a conditionally permitted use in the Coastal CS zone, a Use Permit (C-18-0010) and Design Review (AA-18-0019) are required for the restaurant uses, and a Coastal Development Permit (CDP-18-0012) is required for the restaurant use and the Lot Line Adjustment; and

WHEREAS, the City of Eureka has permit jurisdiction for issuing the Coastal Development Permit with appeal jurisdiction to the State Coastal Commission; and

WHEREAS, the proposed development is a "project" as defined by the California Environmental Quality Act (CEQA) and is subject to the provisions of the Act; and

WHEREAS, an Initial Study/Draft Mitigated Negative Declaration (ED-18-0006) was prepared and circulated for local public comment and submitted to the State Clearinghouse (SCH #2018102055) for 30-day public comment periods; and

WHEREAS, the eastern boundary is Broadway (State Highway 101) and the western property boundary abuts the Maurer Freshwater Marsh, which is largely riparian vegetation and adjacent to the City of Eureka's Palco Marsh and both marshes together are considered to be a large Environmentally Sensitive Habitat Area (ESHA); and

WHEREAS, a traffic study was completed for the project, including the restaurants. The conclusion of the traffic study is that, with mitigation, the development will not result in adverse traffic impacts; and

WHEREAS, the IS/MND and biological study, as well as the Coastal Development Permit application and IS/MND response to comments, confirm that the project will not adversely impact the adjacent ESHA or wetlands; and

WHEREAS, the Mitigated Negative Declaration concluded that with mitigation, no substantial adverse environmental impact will result from the proposed project; and

WHEREAS, prior to approving a project, CEQA requires the Planning Commission consider the proposed MND, together with any comments received during the public review process; and

WHEREAS, a Mitigation Monitoring and Reporting program, findings of fact, and Mitigated Negative Declaration was adopted by the Planning Commission on December 10, 2018.

NOW THEREFORE, BE IT RESOLVED by the Planning Commission of the City of Eureka that:

1. A conditional use permit (C-18-0010) and Design Review (AA-18-0019) were approved with conditions by the Planning Commission on December 10, 2018.
2. The proposed project complies with the applicable provisions of the Code in compliance with the standards for the CS zone.
3. The project complies with General Plan Policy 1.B.9 which encourages economic investment in buildings including construction of new buildings, and General Plan Policy 1.L.2 which promotes high quality design, visual attractiveness, and proper location, and is therefore consistent with the applicable policies of the Local Coastal Program.
4. The proposed structures, parking lot, and landscaping are not inharmonious with the surroundings, will not have an adverse effect on the value of property or improvements in the vicinity, is not ugly, inharmonious, monotonous, or hazardous.
5. The signs are internally illuminated, and will not be a distraction to the driving public, or to the residential and hotel uses east of Broadway on the bluff.
6. The proposed wall signs will not obscure or detract from any adjacent signs.
7. The residential and hotel uses located across and above Broadway on the bluff will not be impacted by the signage at the site.
8. The project will establish and maintain a land use pattern and mix of development in the Eureka area that protects residential neighborhoods, promotes economic choices and expansion, facilitates logical and cost-effective service extensions, and protects valuable natural and ecological resources.
9. The project will not negatively affect public safety, health, or welfare.
10. The project will assure the long-term productivity and economic vitality of coastal resources.
11. The project consists of infilling of vacant urban land and reuse of underutilized urban land.
12. The project will not negatively affect the economic vitality of the core area.
13. Care has been given to the overall design and hardscape for the project to assure a high quality design and visual attractiveness.
14. The project is appropriately located, provides all required off-street parking, and has an appropriate circulation system.
15. With mitigation, the development will not result in adverse traffic impacts or unacceptable impacts to the city's overall circulation system.
16. The project will be located within an existing commercial corridor and will not be isolated or sprawling.
17. The subject property is deteriorated and approval of the project will return the property to a productive use, with uses that are consistent with the general plan.
18. The project will not adversely affect the Mauer Marsh or any other natural or ecological resources.
19. The project will not result in any deterioration or destruction of coastal resources. The adopted mitigation measures will adequately protect the adjacent Maurer Marsh from adverse impacts resulting from the project.
20. The project proposes the installation of bio-retention basins outside of the 50 foot wetland buffer area, and in the landscaped areas adjacent to Vigo Street. Oil/water

separators will be installed as required to reduce potential contaminants in surface runoff.

21. The project site is more than 1,000 feet from the mean high tide line of Humboldt Bay. The project site does back-up to Maurer Marsh which is a valuable coastal resource. The project site is located on Vigo Street which provides adequate and suitable public access to coastal resources and into the Maurer Marsh and Palco Marsh areas and public access through or along the site is not required The subject property is greater than 1,000 feet from Humboldt Bay and lateral public access is not possible.
22. The existing Maurer Marsh adjacent to the proposed development is designated NR and an Environmentally Sensitive Habitat Area (ESHA). The initial study and biological study confirm that the project will not adversely impact the adjacent ESHA. The justification for a buffer of less than 100' is discussed in the Biological Resources Study dated April 27, 2018, prepared for the project by GHD, in the Coastal Development Permit application, and in responses to comments on the Initial Study/Proposed Mitigated Negative Declaration for the project.
23. The project proposes the installation of a 6-foot tall fence adjoining the reduced wetland buffer at the west side of the property and curving around to and parallel with the south property line as shown on project site plan.
24. The NCUAQMD was sent a project referral as well as a copy of the initial study and mitigated negative declaration from the City for their review and comment and no comments were received from NCUAQMD.
25. A wetland delineation was prepared for the project by GHD in 2018, and the extent of wetland-type vegetation (based on one parameter) was mapped in accordance with the California Coastal Commission, as well as the extent of wetlands having wetland-type vegetation, hydric soils, and wetland hydrology (based on three-parameters) per the U.S. Army Corps of Engineers (USACE).
26. A field survey was conducted by GHD on April 10, 2018 to map and document wetland and water features.
27. The project will be setback from any wetland areas by at least 50 feet and within that buffer area between the wetlands and the project, native vegetation will be installed to enhance the buffer and ensure no impacts to these wetlands will occur.
28. A thorough analysis regarding the adequacy of the greater than 50 foot buffer was conducted prior to including it in all site plans using seven characteristics to determine if a smaller (less than 100 feet) buffer size between proposed development and an ESHA would be consistent with the LCP.
29. The existing ESHA immediately adjacent to the project, would not be directly impacted by the project because no work is anticipated to be done within the ESHA boundaries. The site is also bordered by other commercial uses along Broadway and the site has been previously developed.
30. Although the existing structure at 2616 Broadway is located 50 feet or greater away from the ESHA, during the previous use of the site as a truck stop/terminal, trucks and trailers and other vehicles parked immediately adjacent to the ESHA.
31. As stated in the biological report in the Initial Study, the proposed greater than 50-foot buffer is sufficient to protect the ESHA from the project, and a wetland buffer

reduction to 50 feet is approved (minimum 54 feet, maximum 73 feet, average 57 feet).

32. The project as proposed meets all development standards.
33. The project as proposed is consistent with the CS Zoning Designation and the Coastal Zone Development Standards of the Implementation Plan.
34. A lot line adjustment is required for the project.
35. Lot line adjustments are deemed "development" under the Coastal Act and, therefore, require approval of a Coastal Development permit.
36. Following action by the Planning Commission on the Coastal Development permit, the Director of Development Services will take action on the lot line adjustment.
37. The development proposed as a result of the lot line adjustment does not conflict with and is supported by goals and policies contained within the City of Eureka's adopted and certified Land Use Plan, as well as the development standards in Eureka's Implementation Plan.
38. The lot line adjustment will not impact the existing ESHA/wetland, impede access to the coast from the west end of Vigo Street through Palco and Maurer Marsh, and will allow redevelopment of a long-vacant, underutilized, and blighted site.

BE IT FURTHER RESOLVED by the Planning Commission of the City of Eureka that approval of the Coastal Development Permit is conditioned on the following terms and requirements:

1. The applicant and all contractors will comply with all applicable conditions of approval in C-18-0010 and the adopted Mitigation Measures to the satisfaction of the Development Services Department.
2. To the satisfaction of the Development Services Department, the on-site wetlands will be protected from future development improvements (other than resource-dependent development such as restoration activities, which are permissive in wetlands), and no future development will encroach into the wetland buffer without an amendment to Coastal Development Permit CDP-18-0012 and/or additional CDP review.
3. To the satisfaction of the Development Services Department, at least one wetland buffer informational sign will be placed along the north property line, adjacent to the wetland buffer, facing Vigo Street, and at least one sign will be located between the south property line and the trash enclosure on the westerly parcel, facing the parking lot located east of the trash enclosure.

PASSED, APPROVED AND ADOPTED by the Planning Commission of the City of Eureka in the County of Humboldt, State of California, on the 10th day of December, 2018 by the following vote:

AYES: COMMISSIONERS
NOES: COMMISSIONERS
ABSENT: COMMISSIONERS
ABSTAIN: COMMISSIONERS

Jeff Ragan, Chair, Planning Commission

Attest:

Rob Holmlund, Executive Secretary