



City of Tualatin

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"NECESSARY PARTIES"
MARKED BELOW

NOTICE OF APPLICATION SUBMITTAL

- ANNEXATION
- CONDITIONAL USE PERMIT
- PLAN TEXT AMENDMENT
- ARCHITECTURAL REVIEW
- PLAN MAP AMENDMENT
- OTHER:

CASE/FILE: AR18-0002 (Community Development Dept.: Planning Division)

PROPOSAL	The applicant proposes to construct a 32,200 square foot warehouse building expansion on the east side of the existing API International building, creating a structure totaling 99,995 square feet. Twenty-six additional parking stalls would be added to the north side of the site. A vegetated corridor will be established in a small area of in the northwest corner of the site to Clean Water Services standards.
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PROPERTY	Name of Application	API INTERNATIONAL EXPANSION				
	<input type="checkbox"/> n/a	Street Address	12505 SW Herman Road			
		Tax Map and Lot No(s).	2S1 21DD 00100			
		Planning District	General Manufacturing (MG)	Overlays <input type="checkbox"/>	NRPO <input type="checkbox"/>	Flood Plain <input checked="" type="checkbox"/>
		Previous Applications	AR 86-12; AR 91-21	Additional Applications: N/A		CIO COMMERCIAL

DATES	Receipt of application	04/30/18	Deemed Complete	10/26/2018	CONTACT	Name: Tabitha Boschetti
	Notice of application submittal			10/31/2018		Title: Assistant Planner
	Project Status / Development Review meeting			02/28/2018		E-mail: TBOSCHETTI@tualatin.gov
	Comments due for staff report			11/14/2018		Phone: 503-691-3029
	Public meeting: <input type="checkbox"/> ARB <input type="checkbox"/> TPC <input checked="" type="checkbox"/> n/a					Notes: You may view the application materials through this City web page: www.tualatinoregon.gov/projects
	City Council (CC)			<input checked="" type="checkbox"/> n/a		

City Staff

- City Manager
- Building Official
- Chief of Police
- City Attorney
- City Engineer
- Community Development Director
- Community Services Director
- Economic Development liaison
- Engineering Associate*
- Finance Director
- GIS technician(s)
- IS Manager
- Operations Director*
- Parks and Recreation Coordinator
- Planning Manager
- Street/Sewer Supervisor
- Water Supervisor

Neighboring Cities

- Durham
- King City Planning Commission
- Lake Oswego
- Rivergrove PC
- Sherwood Planning Dept.
- Tigard Community Development Dept.
- Wilsonville Planning Division

Counties

- Clackamas County Dept. of Transportation and Development
- Washington County Dept. of Land Use and Transportation (ARs)
- Washington County Long Range Planning (LRP) (Annexations)

Regional Government

- Metro

School Districts

- Lake Oswego School Dist. 7J
- Sherwood SD 88J
- Tigard-Tualatin SD 23J (TTSD)
- West Linn-Wilsonville SD 3J

State Agencies

- Oregon Dept. of Aviation
- Oregon Dept. of Environmental Quality (DEQ)
- Oregon Dept. of Land Conservation and Development (DLCD) (via proprietary notice)
- Oregon Dept. of State Lands: Wetlands Program
- Oregon Dept. of Transportation (ODOT) Region 1
- ODOT Maintenance Dist. 2A

- ODOT Rail Division
- OR Dept. of Revenue

Utilities

- Republic Services
- Clean Water Services (CWS)
- Comcast [cable]*
- Frontier Communications [phone]
- Northwest Natural [gas]
- Portland General Electric (PGE)
- TriMet
- Tualatin Valley Fire & Rescue (TVF&R)
- United States Postal Service (USPS) (Washington; 18850 SW Teton Ave.)
- USPS (Clackamas)
- Washington County Consolidated Communications Agency (WCCCA)

Additional Parties

- Tualatin Citizen Involvement Organization (CIO)

***Paper Copies**

- 1.032: Burden of Proof
- 31.071 Architectural Review Procedure
- 31.074 Architectural Review Application Review Process
- 31.077 Quasi-Judicial Evidentiary Hearing Procedures
- Metro Code 3.09.045 Annexation Review Criteria
- 32.030 Criteria for Review of Conditional Uses
- 33.020 Conditions for Granting a Variance that is not a Sign or a Wireless Communication Facility
- 33.022 Criteria for Granting a Sign Variance
- 33.024 Criteria for Granting a Minor Variance
- 33.025 Criteria for Granting a Variance
- 34.200 Tree Cutting on Private Property without Architectural Review, Subdivision or Partition Approval, or Tree Removal Permit Prohibited
- 34.210 Application for Architectural Review, Subdivision or Partition Review, or Permit
- 34.230 Criteria (tree removal)
- 35.060 Conditions for Granting Reinstatement of Nonconforming Use
- 36.160 Subdivision Plan Approval
- 36.230 Review Process (partitioning)
- 36.330 Review Process (property line adjustment)
- 37.030 Criteria for Review (IMP)
- 40.030 Conditional Uses Permitted (RL)
- 40.060 Lot Size for Conditional Uses (RL)
- 40.080 Setback Requirements for Conditional Uses (RL)
- 41.030 Conditional Uses Permitted (RML)
- 41.050 Lot Size for Conditional Uses (RML)
- 41.070 Setback Requirements for Conditional Uses (RML)
- 42.030 Conditional Uses Permitted (RMH)
- 42.050 Lot Size for Conditional Uses (RMH)
- 42.070 Setback Requirements for Conditional Uses (RMH)
- 43.030 Conditional Uses Permitted (RH)
- 43.060 Lot Size for Conditional Uses (RH)
- 43.090 Setback Requirements for Conditional Uses (RH)
- 44.030 Conditional Uses Permitted (RH-HR)
- 44.050 Lot Size for Conditional Uses (RH-HR)
- 44.070 Setback Requirements for Conditional Uses (RH-HR)
- 49.030 Conditional Uses (IN)
- 49.040 Lot Size for Permitted and Conditional Uses (IN)
- 49.060 Setback Requirements for Conditional Uses (IN)
- 50.020 Permitted Uses (CO)
- 50.030 Central Urban Renewal Plan – Additional Permitted Uses and Conditional Uses (CO)
- 50.040 Conditional Uses (CO)
- 52.030 Conditional Uses (CR)
- 53.050 Conditional Uses (CC)
- 53.055 Central Urban Renewal Area – Conditional Uses (CC)
- 54.030 Conditional Uses (CG)
- 56.030 Conditional Uses (MC)
- 56.045 Lot Size for Conditional Uses (MC)
- 57.030 Conditional Uses (MUCOD)
- 60.040 Conditional Uses (ML)
- 60.041 Restrictions on Conditional Uses (ML)
- 61.030 Conditional Uses (MG)
- 61.031 Restrictions on Conditional Uses (MG)
- 62.030 Conditional Uses (MP)
- 62.031 Restrictions on Conditional Uses (MP)
- 64.030 Conditional Uses (MBP)
- 64.050 Lot Size for Permitted and Conditional Uses (MBP)
- 64.065 Setback Requirements for Conditional Uses (MBP)
- 68.030 Criteria for Designation of a Landmark
- 68.060 Demolition Criteria
- 68.070 Relocation Criteria
- 68.100 Alteration and New Construction Criteria
- 68.110 Alteration and New Construction Approval Process
- 73.130 Standards
- 73.160 Standards
- 73.190 Standards – Single-Family and Multi-Family Uses
- 73.220 Standards
- 73.227 Standards
- 73.230 Landscaping Standards
- 73.300 Landscape Standards – Multi-Family Uses
- 73.310 Landscape Standards – Commercial, Industrial, Public and Semi-Public Uses
- 73.320 Off-Street Parking Lot Landscaping Standards
- 73.470 Standards
- 73.500 Standards

API Building Expansion

Narrative Architectural Review Application

Prepared for:
City of Tualatin
18880 SW Martinazzi Avenue
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Prepared by:
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June 2017
17098.11

API Building Expansion

Summary

PROJECT DESCRIPTION

This project proposes an addition of 32,964 SF of warehousing space to the existing building.

SITE DESCRIPTION

The property is located at the NW corner of SW Herman Rd. and SW 125th Ct. within the City of Tualatin, OR. The parcel (Tax ID No. 2S121DD00100) is approximately 4.83 acres in size and is zoned MG-General Manufacturing.

APPLICABLE STANDARDS

The following narrative addresses the compliance of this project with all applicable codes and standards of the Tualatin Development Code (TDC) and the Tualatin Municipal Code (TMC).

TUALATIN MUNICIPAL CODE:

Title 03: Utilities and Water Quality

Title 04: Building

TUALATIN DEVELOPMENT CODE:

Chapter 61 - General Manufacturing Planning District

61.020 Permitted Uses

61.050 Lot Size

61.060 Setback Requirements

61.080 Structure Height

Chapter 70 - Flood Plain District

70.110 Development Permit Required

70.120 Application for Development Permit

70.170 General Standards

70.180 Specific Standards

Chapter 73 - Community Design Standards

73.140 Site Planning - Commercial, Industrial, Public and Semi-Public Uses.

73.160 Standards

73.200 Structural Design - Commercial, Industrial, Public and Semi-Public Uses.

73.220 Standards

73.225 Mixed Solid Waste and Source Separated Recyclables Storage Areas for New or Expanded Multi-Unit Residential, including Townhouses, Commercial, Industrial, Public and Semi-public Development.

73.226 Objectives

73.227 Standards

73.240 -Landscape General Provisions

73.250 Tree Preservation

73.260 Tree and Planting Specifications

73.270 Grading

73.280 Irrigation System Required

- 73.290 Re-vegetation in un-landscaped areas
- 73.310 Landscape Standards - Commercial, Industrial, public and Semi-Public Uses.
- 73.340 Off-street Parking Lot and Loading Area Landscaping - Commercial, Industrial, Public and Semi-Public Uses and Residential and Mixed Use Residential Uses within the Central Design District.
- 73.360 Off Street Parking Lot Islands - Commercial, Industrial, Public and Semi-Public Uses.
- 73.370 Off-Street Parking and Loading
- 73.380 Off-Street Parking Lots
- 73.390 Off-Street Loading Facilities
- 73.400 Access
- 73.410 Street Tree Plan

Chapter 74 - Public Improvements Required

- 74.120 Public Improvements
- 74.130 Private Improvements
- 74.140 Construction Timing
- 74.210 Minimum Street Right-of-Way Widths
- 74.310 Greenway, Natural Area, Bike and Pedestrian Path Dedications and Easements.
- 74.320 Slope Easements
- 74.330 Utility Easements
- 74.350 Tracts
- 74.420 Street Improvements
- 74.430 Streets, Modifications of Requirements in Case of Unusual Conditions
- 74.440 Streets, Traffic Study Required
- 74.450 Bikeway and Pedestrian Paths
- 74.470 Street Lights
- 74.610 Water Service
- 74.620 Sanitary Sewer Service
- 74.630 Storm Drainage System
- 74.640 Grading
- 74.650 Water Quality, Storm Water Detention and Erosion Control
- 74.670 Existing Structures
- 74.700 Removal, Destruction or Injury of Trees
- 74.720 Protection of Trees During Construction
- 74.725 Maintenance Responsibilities

ATTACHMENTS

- Exhibit 'A' - Flood Plain Memorandum
- Exhibit 'B' SW Herman Road ROW conditions

CODE CITATION and ANALYSIS Tualatin Municipal Code

Title 03: Utilities and Water Quality

Chapter 03-02: Sewer Regulations; Rates

TMC 3-2-160 Construction Standards

All sewer line construction and installation of services and equipment shall be in conformance with the City of Tualatin Public Works Construction Code. In addition, whenever a property owner extends a sewer line, the extension shall be carried to the opposite property line or to such other point as determined by the Public Works Director.

RESPONSE: The sanitary sewer for the building expansion will be provided via the existing service, no new public connections are proposed.

Chapter 03-03: Water Service

TMC 3-3-040 Separate Services Required.

Except as authorized by the City Engineer, a separate service and meter to supply regular water service or fire protection services shall be required for each building, residential unit of structure served. For the purposes of this section, trailer parks and multi-family residences of more than four dwelling units shall constitute a single unit unless the City Engineer determines that separate services are required.

RESPONSE: Domestic and irrigation water services for the building expansion will be provided via existing service. No new public connections or meters are proposed.

TMC 3-3-110 Construction Standards.

All water line construction and installation of services and equipment shall be in conformance with the City of Tualatin Public Works Construction Code. In addition, whenever a property owner extends a water line, which upon completion, is intended to be dedicated to the City as part of the public water system, said extension shall be carried to the opposite property line or to such other point as determined by the City Engineer. Water line size shall be determined by the City Engineer in accordance with the City's Development Code or implementing ordinances and the Public Works Construction Code.

RESPONSE: The domestic, irrigation and fire water services are currently in place and no public work construction is required.

TMC 3-3-120 Backflow Prevention Devices and Cross Connections.

The owner of property to which City water is furnished for human consumption shall install in accordance with City standards an appropriate backflow prevention device on the premises where any of the following circumstances exist:

Except as otherwise provided in this subsection, all irrigation systems shall be installed with a double check valve assembly. Irrigation system backflow prevention device assemblies installed before the effective date of this ordinance, which were approved at the time they were installed but are not on the current list of approved device assemblies maintained by the Oregon State Health Division, shall be permitted to remain in service provided they are properly maintained, are commensurate with the degree of hazard, are tested at least annually, and perform satisfactorily. When devices of this type are moved, or require more than minimum maintenance, they shall be replaced by device assemblies which are on the Health Division list of approved device assemblies.

RESPONSE: Domestic and irrigation water services for the building will be provided via existing service. No new meters or back flow devices are proposed.

TMC 3-3-130 Control Valves.

The customer shall install a suitable valve, as close to the meter location as practical, the operation of which will control the entire water supply from the service. The operation by the customer of the curb stop in the meter box is prohibited.

RESPONSE: The project will use existing services and the existing valve.

Chapter 03-05: Soil Erosion, Surface Water Management, Water Quality Facilities and Building and Sewers.

TMC 3-5-050 Erosion Control Permits

Except as noted in subsection 3 of this section, no person shall cause any change to improved or unimproved real property that causes, will cause, or is likely to cause a temporary or permanent increase in the rate of soil erosion from the site without first obtaining a permit from the City and paying prescribed fee.

RESPONSE: This construction of this building expansion will not cause any increase of soil erosion from the site.

TMC 3-5-060 Permit Process

Applications for an Erosion Control Permit.

Application for an Erosion Control Permit shall include an Erosion Control Plan which contains methods and interim facilities to be constructed or used concurrently and to be operated during construction to control erosion. The plan shall include either:

(a) A site specific plan outlining the protection techniques to control soil erosion and sediment transport from the site to less than one ton per acre per year as calculated using the Soil Conservation Service Universal Soil Loss Equation or other equivalent method approved by the City Engineer, or

(b) Techniques and methods contained and prescribed in the Soil Erosion Control Matrix and Methods, outlined in TMC 3-5.190 or the Erosion Control Plans - Technical Guidance Handbook, City of Portland and Unified Sewerage Agency, January, 1991.

Site Plan. A site specific plan, pre-pared by an Oregon registered professional engineer, shall be required when the site meets any of the following criteria:

- (a) greater than five acres;
- (b) greater than one acre and has slopes greater than 20 percent;
- (c) contains or is within 100 feet of a City-identified wetland or a waterway identified on FEMA floodplain maps; or
- (d) greater than one acre and contains highly erodible soils.

RESPONSE: An Erosion Control plan, prepared by a registered professional engineer, and compliant with the requirements described in this section, is included in this submittal package.

TMC 3-5-200 Downstream Protection Requirement.

Each new development is responsible for mitigating the impacts of that development upon the public storm water quantity system. The development may satisfy this requirement through the use of any of the following techniques, subject to the limitations and requirements in TMC 3-5-210: Construction of permanent on-site stormwater quantity detention facilities designed in accordance with this title.

RESPONSE: The project proposes on site detention using large diameter piping with outflow limited by an orifice installed within a control manhole. Sizing is detailed in the submitted drainage analysis. A down stream analysis was prepared and is described within the Stormwater Report included in this application.

TMC 3-5-210 Review of Downstream System.

For new development other than the construction of a single family house or duplex, plans shall document review by the design engineer of the downstream capacity of any existing storm drainage facilities impacted by the proposed development. That review shall extend downstream to a point where the impacts to the water surface elevation from the development will be insignificant, or to a point where the conveyance system has adequate capacity, as determined by the City Engineer. To determine the point at which the downstream impacts are insignificant or the drainage system has adequate capacity, the design engineer shall submit an analysis using the following guidelines:

- (1) evaluate the downstream drainage system for at least ¼ mile;
- (2) evaluate the downstream drainage system to a point at which the runoff from the development in a build out condition is less than 10 percent of the total runoff of the basin in its current development status. Developments in the basin that have been approved may be considered in place and their conditions of approval to exist if the work has started on those projects;
- (3) evaluate the downstream drainage system throughout the following range of storms: 2, 5, 10, and 25 year;
- (4) The City Engineer may modify items 1, 2, 3 to require additional information to determine the impacts of the development or to delete the provision of unnecessary information.

RESPONSE: The down stream drainage system for the area was evaluated as required and is discussed in the Stormwater Report included with this submittal.

TMC 3-5-250 Floodplain Design Standards.

(1) Balanced Cut and Fill Standard.

All fill placed in a floodplain shall be balanced with an equal amount of removal of soil material. No net fill in any floodplain is allowed with two exceptions:

- (a) When an engineering study has been conducted and approved by the City showing that the increase in water surface elevation resulting from the fill will not cause or contribute to significant damage from flooding to existing buildings or dwellings on properties upstream and downstream;

RESPONSE: Please refer to the attached Exhibit 'A', Flood Plain Memorandum prepared by the project Oregon Registered Professional Civil Engineer.

(2) Excavation Restricted.

Large areas may not be excavated in order to gain a small amount of fill in a floodplain. Excavation areas shall not exceed the fill areas by more than 50 percent of the square footage, unless approved by the City.

RESPONSE:

TMC 3-5-280 Placement of Water Quality Facilities.

Title III specifies that certain properties shall install water quality facilities for the purpose of removing phosphorous. No such water quality facilities shall be constructed within the defined area of existing or created wetlands unless a mitigation action, approved by the City, is constructed to replace the area used for the water quality facility.

RESPONSE: The site's proposed water quality facility is not located in wetlands or associated buffers.

TMC 3-5-290 Purpose of Title.

TMC 3-5-300 Application of Title.

Title III of this Chapter shall apply to all activities which create new or additional impervious surfaces, except as provided in TMC 3-5.310.

RESPONSE: The site's proposed water quality facility is designed in conformance to Clean Water Services Resolution and Order 07-20.

TMC 3-5-330 Permit Required.

Except as provided in TMC 3-5-310, no person shall cause any change to improved or unimproved real property that will, or is likely to, increase the rate or quantity of run-off or pollution from the site without first obtaining a permit from the City and following the conditions of the permit.

RESPONSE: The applicant is required to obtain a permit from the City of Tualatin to install an approved runoff flow control and treatment facility on the subject site.

TMC 3-5-340 Facilities Required

For new development, subject to the exemptions of TMC 3-5-310, no permit for construction, or land development, or plat or site plan shall be approved unless the conditions of the plat, plan or permit approval require permanent stormwater quality control facilities in accordance with this Title III.

RESPONSE: Due to the existing conditions within the Herman Road right-of-way, neither a sidewalk or a stormwater quality control facility will not be constructed. Instead a fee in lieu of provision is requested.

TMC 3-5-345 Inspection Reports.

The property owner or person in control of the property shall submit inspection reports annually to the City for the purpose of ensuring maintenance activities occur according to the operation and maintenance plan submitted for an approved permit or architectural review.

RESPONSE: The Stormwater Report, included in this submittal, includes a maintenance and operation section outlining the compliance with Clean Water Services Resolution and Order 07-20.

TMC 3-5-350 Phosphorous Removal Standard.

The stormwater quality control facilities shall be designed to remove 65 percent of the phosphorous from the runoff from 100 percent of the newly constructed impervious surfaces. Impervious surfaces shall include pavement, buildings, public and private roadways, and all other surfaces with similar runoff characteristics.

TMC 3-5-360 Design Storm.

The stormwater quality control facilities shall be designed to meet the removal efficiency of TMC 3-5-350 for a mean summertime storm event totaling 0.36 inches of precipitation falling in four hours with an average return period of 96 hours.

TMC 3-5-370 Design Requirements.

The removal efficiency in TDC Chapter 35 specifies only the design requirements and are not intended as a basis for performance evaluation or compliance determination of the stormwater quality control facility installed or constructed pursuant to this Title III.

RESPONSE: The proposed water quality facility is specified and sized to meet these standards. Please refer to the Stormwater Report included in this application.

TMC 3-5-390 Facility Permit Approval

A stormwater quality control facility permit shall be approved only if the following are met:

- (1) The plat, site plan, or permit application includes plans and a certification prepared by an Oregon registered, professional engineer that the proposed stormwater quality control facilities have been designed in accordance with criteria expected to achieve removal efficiencies for total phosphorous required by this Title III. Clean Water Services Design and Construction Standards shall be used in preparing the plan for the water quality facility; and
- (2) The plat, site plan, or permit application shall be consistent with the areas used to determine the removal required in TMC 3-5-350; and
- (3) A financial assurance, or equivalent security acceptable to the City, is provided by the applicant which assures that the stormwater quality control facilities are constructed according to the plans established in the plat, site plan, or permit approval. The financial assurance may be combined with our financial assurance requirements imposed by the City; and
- (4) A stormwater facility agreement identifies who will be responsible for assuring the long term compliance with the operation and maintenance plan.

RESPONSE: Due to the existing conditions within the Herman Road right-of-way, a stormwater quality control facilities will not be provided. Instead a fee in lieu of provision is requested.

Title 04: Buildings

TMC 4-1-010 Standards Applicable to Building.

- (1) The City adopts the following specialty codes, rules, and standards;
 - (a) The Oregon Structural Specialty Code, 2014 edition;
 - (b) The Oregon Mechanical Specialty Code, 2014 edition;
 - (c) The Oregon Plumbing Specialty Code, 2014 edition;
 - (i) The Oregon Energy Efficiency Specialty Code, 2014 edition;
 - (j) The Oregon Fire Code, 2014 edition.
- (2) The provisions in subsection (1) apply to all building and related activities conducted within the City and are in addition to all other applicable provisions of the Tualatin Municipal Code and the Tualatin Development Code.

RESPONSE: This building expansion has been designed per all applicable codes as listed above.

TMC 4-1-030 Grading

A person seeking a grading permit must submit a soil report with the permit application. The soils report submitted must be signed and sealed by an Oregon-certified soils engineer and comply with Appendix J of the Oregon Structural Specialty Code, 2014 edition. No grading activities may occur unless and until a person receives a grading permit and complies with this section.

RESPONSE: A signed and sealed Geotechnical report will be submitted to the City of Tualatin as required.

Chapter 04-02: Fire Hydrant Locations and Rates of Flow

TMC 4-2-010 Hydrants and Water Supply for Fire Protection

Every application for a building permit and accompanying plans shall be submitted to the Building Division for review of water used for fire protection, the approximate location and size of hydrants to be connected, and the provisions for access and egress for firefighting equipment. If upon such review it is determined that the fire protection facilities are not required or that they are adequately provided for in the plans, the Fire and Life Safety Reviewer shall recommend approval to the City Building Official.

If adequate provisions for such facilities are not made, the Fire and Life Safety Reviewer shall either recommend against approval of the plans or indicate to the applicant in writing where the plans are deficient or recommend approval of plans subject to conditions.

RESPONSE: The submitted site utility plans shows private on site hydrants and existing public hydrants in the vicinity of the building. The submitted fire flow calculations conform to the requirements of Tualatin Valley Fire and Rescue. The submitted site plan and accompanying letter from TVF&R show compliance to their requirements for apparatus maneuvering.

TUALATIN DEVELOPMENT CODE

CHAPTER 61 - General Manufacturing Planning District

Section 61.020 Permitted Uses.

RESPONSE: This project proposes the expansion of an existing, approved use. (Manufacturing/warehousing and freight movement).

Section 61.050 Lot Size.

RESPONSE: No changes to the existing lot size are proposed.

Section 61.060 Setback Requirements.

(1) Front yard. The minimum setback is 30 feet.

RESPONSE: See (4) Corner lot yards below.

(2) Side yard. The minimum setback is 0 to 50 feet, as determined through the Architectural Review process. When the side yard is adjacent to a property line or across the street from a residential or Manufacturing Park (MP) District, a side yard setback of 50 feet is required.

(3) Rear yard. The minimum setback is 0 to 50 feet, as determined through the Architectural Review process. When the rear yard is adjacent to a property line or across the street from a residential or Manufacturing Park (MP) District, a rear yard setback of 50 feet is required.

RESPONSE: This project is not adjacent to residentially zoned or used areas. The proposed building expansion is separated from an interior property line (side/rear) by the existing building and is setback 137-feet from an interior property line (side/rear).

(4) Corner lot yards. The minimum set-back is the maximum setback prescribed for each yard for a sufficient distance from the street intersections and driveways to provide adequate sight distance for vehicular and pedestrian traffic at intersections and driveways, as determined through the Architectural Review process.

RESPONSE: The project is located on a corner lot. The proposed building expansion is setback 125-feet from SW Herman Rd. and 20-feet from SW 125th Ct. Due to the substantial depth of the setback from SW Herman, adequate sight distances from the intersection of SW Herman Road and SW 125th Court. As proposes, the setback off of SW Herman Rd. is more than four times that required. This fact, and the resulting sight distance from the intersection made a 20-foot setback from SW 125th Ct. a reasonable and appropriate setback.

(5) The minimum parking and circulation area setback is 5 feet, except when a yard is adjacent to public streets or Residential or Manufacturing Park District, the minimum setback is 10 feet. No setback is required from lot lines within ingress and egress areas shared by abutting properties in accordance with TDC 73.400(2).

RESPONSE: The reconfigured parking, loading and circulation area is setback 20-feet from SW 125th Ct and 10-feet from the northern interior property line.

(8) No fence shall be constructed within 10 feet of a public right-of-way.

RESPONSE: There is no fencing proposed within 10-feet of a right-of-way.

Section 61.080 Structure Height.

(1) Except as provided in TDC 61.080(2) - (4), no structure shall exceed a height of 60 feet and flagpoles which display the flag of the United States of America either alone or with the State of Oregon flag shall not exceed 100 feet above grade provided that the setbacks are not less than a distance equal to the flagpole height.

RESPONSE: The proposed building expansion will not exceed 30-feet in height.

(3) Height Adjacent to a Residential District.

RESPONSE: This property is not adjacent to a residential district or use.

CHAPTER 70 - Flood Plain District

70.110 Development Permit Required

A development permit shall be obtained before construction or development begins within any area of special flood hazard established by TDC 70.050. The permit shall be for all structures, including manufactured homes, as set forth in the "Definitions," and for all other development, including fill and other activities, also as set forth in the "Definitions."

RESPONSE: A Development permit will be obtained prior to the start of any construction or on-site grading.

70.120 Application for Development Permit

Application for a development permit shall be made on forms furnished by the City Engineer and may include, but not be limited to, plans in duplicate, drawn to scale, showing the nature, location, dimensions and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; and the location of the foregoing. Specifically, the following information is required:

- (1) Elevation, in relation to mean sea level, of the lowest floor (including basement) of all structures;
- (2) Elevation, in relation to mean sea level, to which any structure has been flood proofed;
- (3) Certification by a registered professional engineer or architect that the flood proofing methods for any nonresidential structure meet the flood proofing criteria in TDC 70.180; and

(4) Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

RESPONSE: A Grading Plan, Utility Plan and Stormwater Report are all included in this submittal. These items address the existence of a single, existing catch basin with an elevation below the 500 year flood plain. This catch basin is located within the parking lot and beneath the proposed building expansion area. The catch basin and associated piping will be disconnected from the existing storm system. New piping will be provided to collect, detain and treat run off from the roof of the building expansion and all reconfigured impervious parking, loading and maneuvering areas.

The building is not displacing 100 year flood plain detention.

There is also an area of the site at the NE corner which is within the 100 year flood plain, however this building expansion will not impact this area in any way.

These plans have been prepared by a certified professional engineer.

70.170 General Standards

In all areas of special flood hazards, the following standards are required:

(5) Review of Building Permits. Where elevation data is not available either through the Flood Insurance Study or from another authoritative source (TDC 70.140(2)), applications for buildings permits shall be reviewed to assure that proposed construction will be reasonably safe from flooding. The test of reasonableness is a local judgment and includes use of historical data, high water marks, photographs of past flooding, etc., where available. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates.

RESPONSE: The finished floor elevation for the proposed expansion (136.93) is not within the 500-year flood plain. Please refer to the attached Flood Plain Memo for further clarification.

Section 70.180 Specific Standards.

In all areas of special flood hazards where base flood elevation data has been provided as set forth in TDC 70.050, "BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD," or TDC 70.140(2), "USE OF OTHER BASE FLOOD DATA," the following provisions are required:

(2) Nonresidential Construction.

New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated at least one foot above the base flood elevation; or, together with attendant utility and sanitary facilities, shall:

(a) Be floodproofed so that below the base flood level the structure is watertight, with walls substantially impermeable to the passage of water.

(b) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy.

(c) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and review of the structural design, specifications and plans. Such certification shall be provided to the official as set forth in TDC 70.140(3)(b).

(d) Elevated structures that are not floodproofed, but that have fully enclosed areas below the lowest floor that are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

(i) A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.

(ii) The bottom of all openings shall be no higher than one foot above grade.

(iii) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of flood waters.

(e) Applicants flood proofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the flood proofed level (e.g. a building constructed to the base flood level will be rated as one foot below that level).

RESPONSE: The finished floor elevation for the proposed expansion (136.93) is well above the 500-year flood plain elevation (+/- four feet above)

CHAPTER 73 - Community Design Standards

Section 73.140 Site Planning - Commercial, Industrial, Public and Semi-Public Uses.

Section 73.160 Standards.

The following standards are minimum requirements for commercial, industrial, public and semi-public development, and it is expected that development proposals shall meet or exceed these minimum requirements.

(1) Pedestrian and Bicycle Circulation.

(b) For Industrial Uses:

(i) a walkway shall be provided from the main building entrance to sidewalks in the public right-of-way and other on-site buildings and accessways. The walkway shall be a minimum of 5 feet wide and constructed of concrete, asphalt, or a pervious surface such as pavers or grasscrete, but not gravel or woody material, and be ADA compliant, if applicable.

(ii) Walkways through parking areas, drive aisles and loading areas shall have a different appearance than the adjacent paved vehicular areas.

(iii) Accessways shall be provided as a connection between the development's walkway and bikeway circulation system and an adjacent bike lane;

(iv) Accessways may be gated for security purposes;

(c) Curb ramps shall be provided wherever a walkway or accessway crosses a curb.

(d) Accessways shall be a minimum of 8 feet wide and constructed in accordance with the Public Works Construction Code if they are public accessways, and if they are private access-ways they shall be constructed of asphalt, concrete or a pervious surface such as pervious asphalt or concrete, pavers or grasscrete, but not gravel or woody material, and be ADA compliant, if applicable.

(g) Accessways shall be constructed, owned and maintained by the property owner.

RESPONSE: As proposed, the building expansion will have two entrances. The primary entrance will be on the north side of the building adjacent to the loading docks. An emergency entrance is located on the south side.

Pedestrian and bicycle connections are provided as required, to the existing primary entrance to the facility. These will remain and be maintained by the property owner.
Section 73.200 Structure Design - Commercial, Industrial, Public and Semi-Public Uses.
Section 73.220 Standards

Purpose. The purpose of commercial, industrial, public and semi-public building design objectives and standards is to implement the purpose and objectives of TDC 73.020(2) and are intended to promote functional, safe, innovative and attractive buildings which are compatible with the surrounding environment. This concerns the building form including the articulation of walls and roof design, materials, colors, placement of elements such as windows, doors, mechanical equipment and identification features.

RESPONSE: This building expansion has been designed to blend with the development style established by the existing building as well as meet the current standards of the code.

The building expansion frontage along SW 125th Ct, is articulated to add visual interest. The associated parking and truck loading is located to the rear of the building, with a small office area and entrance at the NE corner of the expansion.
Section 73.225 Mixed Solid Waste and Source Separated Recyclables Storage Areas for New or Expanded Multi-Unit Residential, Including Townhouses, Commercial, Industrial, Public and Semi-Public Development
Section 73.226 Objectives.

All new or expanded multi-family, including townhouses, commercial, industrial, public and semi-public projects should strive to meet the following objectives to the maximum extent practicable. Architects and developers should consider these elements in designing new projects.

Mixed solid waste and source separated recyclable storage areas shall be designed to the maximum extent practicable, to:

- (1) Screen elements such as garbage and recycling containers from view.
- (2) Ensure storage areas are centrally located and easy to use.
- (3) Meet dimensional and access requirements for haulers.
- (4) Designed to mitigate the visual impacts of storage areas.
- (5) Provide adequate storage for mixed solid waste and source separated recyclables.
- (6) Improve the efficiency of collection of mixed solid waste and source separated recyclables.

RESPONSE: This project intends to continue using the existing designated trash area which is located on the north side of the building.

Section 73.227 Standards.

The following standards are minimum requirements for mixed solid waste and source separated recyclables storage areas. To provide for flexibility in designing functional storage areas, this section provides four different methods to meet the objectives of providing adequate storage for mixed solid waste and source separated recyclables and improving the efficiency of collection. An applicant shall choose and implement one of the following four methods to demonstrate compliance: 1) minimum standards; 2) waste

assessment; 3) comprehensive recycling plan; or 4) franchised hauler review, as more fully described in subsections (2), (3), (4) and (5) of this section.

(5) Franchised Hauler Review Method.

The franchised hauler review method provides for a coordinated review of the proposed site plan by the franchised hauler serving the subject property. This method can be used when there are unique conditions associated with the site, use, or waste stream that make compliance with any of the three other methods impracticable. The objective of this method is to match a specific hauler program (types of equipment, frequency of collection, etc.) to the unique characteristic(s) of the site or development. The applicant shall coordinate with the franchised hauler to develop a plan for storage and collection of mixed solid waste and source separated recyclables to be generated. A narrative describing how the proposed site meets one or more unique conditions, plus site plan and architectural drawings showing the size and location of storage area(s) required to accommodate anticipated volumes shall be submitted for Architectural Review.

Additionally, a letter from the franchised hauler shall be submitted with the application that describes the level of service to be provided by the hauler, including any special equipment and collection frequency, which will keep the storage area from exceeding its capacity. For purposes of this subsection the following constitute unique conditions:

RESPONSE: This currently existing hauler service will be used.

(6) Location, Design and Access Standards for Storage Areas. The following location, design and access standards are applicable for storage areas:

(a) Location Standards

RESPONSE: The existing trash/recycling area is located outside of the building, in the parking lot, in the NW corner of the site. The area accommodates both recycling and solid waste, is easily accessible from the back of the building, will be well lighted by proposed parking lot lighting and does not interrupt proposed pedestrian or vehicular access ways. Additionally, this area is not visible from SW 125th Court right-of-way. This location has been previously approved by the service provider for trash and recycling hauling.

(b) Design Standards

RESPONSE: This building expansion does not propose alterations to the existing trash and recycling area.

(c) Access Standards

RESPONSE: The trash/recycling area will be accessible during all hours. The collection vehicle will not need to back into a public right-of-way to access the trash/recycling containers.

Section 73.240 Landscaping General Provisions.

(1) The following standards are minimum requirements.

(3) The minimum area requirement for landscaping for uses in CO, CR, CC, CG, ML and MG Planning Districts shall be fifteen (15) percent of the total land area to be developed, except within the Core Area Parking District, where the minimum area requirement for landscaping shall be 10 percent.

RESPONSE: A minimum of 15% landscape area is required. 21.8% landscape area is provided.

(9) Yards adjacent to public streets shall be planted to lawn or live groundcover and trees and shrubs and be perpetually maintained in a manner providing a park-like character to the property as approved through the Architectural Review process.

RESPONSE: The existing front yard landscape area, adjacent to SW Herman Road is landscaped with a combination of lawn, groundcover, mature shrubs and trees to present a lush, green setting for both the existing building as well as the expansion. Lawn is proposed around several mature existing trees along the east facade of the building expansion abutting SW 125th Court.

(10) Yards not adjacent to public streets shall be planted with trees, shrubs, grass or other live groundcover, and maintained consistent with a landscape plan indicating areas of future expansion, as approved through the Architectural Review process.

RESPONSE: The landscape areas to the north and west will retain existing plant materials.

(11) Any required landscaped area shall be designed, constructed, installed, and maintained so that within three years the ground shall be covered by living grass or other plant materials. (The foliage crown of trees shall not be used to meet this requirement.) A maximum of 10% of the landscaped area may be covered with un-vegetated areas of bark chips, rock or stone. Disturbed soils are encouraged to be amended to an original or higher level of porosity to regain infiltration and stormwater storage capacity.

RESPONSE: All landscape areas have been designed and will be installed and maintained to achieve living plant coverage within three years. Planting area soils will be amended to promote maximum health and growth of the plant materials.

Section 73.250 Tree Preservation.

(1) Trees and other plant materials to be retained shall be identified on the landscape plan and grading plan.

(2) During the construction process:

(a) The owner or the owner's agents shall provide above and below ground protection for existing trees and plant materials identified to remain.

(b) Trees and plant materials identified for preservation shall be protected by chain link or other sturdy fencing placed around the tree at the drip line.

(c) If it is necessary to fence within the drip line, such fencing shall be specified by a qualified arborist as defined in TDC 31.060.

(d) Neither top soil storage nor construction material storage shall be located within the drip line of trees designated to be preserved.

(e) Where site conditions make necessary a grading, building, paving, trenching, boring, digging, or other similar encroachment upon a preserved tree's drip-line area, such grading, paving, trenching, boring, digging, or similar encroachment shall only be permitted under the direction of a qualified arborist. Such direction must assure that the health needs of trees within the preserved area can be met.

(f) Tree root ends shall not remain exposed.

(3) Landscaping under preserved trees shall be compatible with the retention and health of said tree.

(4) When it is necessary for a preserved tree to be removed in accordance with TDC 34.210 the landscaped area surrounding the tree or trees shall be maintained and replanted with trees that relate to the present landscape plan, or if there is no landscape

plan, then trees that are complementary with existing, nearby landscape materials. Native trees are encouraged

(5) Pruning for retained deciduous shade trees shall be in accordance with National Arborist Association "Pruning Standards For Shade Trees," revised 1979.

(6) Except for impervious surface areas, one hundred percent (100%) of the area preserved under any tree or group of trees retained in the landscape plan (as approved through the Architectural Review process) shall apply directly to the percentage of landscaping required for a development.

RESPONSE: This project necessitates the removal of 7 trees which are located within the building expansion footprint. The existing trees to remain will be protected and pruned as detailed in the Arborist Report included with this submittal.

Section 73.260 Tree and Plant Specifications.

(1) The following specifications are minimum standards for trees and plants:

(a) Deciduous Trees:

Deciduous shade and ornamental trees shall be a minimum one and one-half inch (1 1/2") caliper measured six inches (6") above ground, balled and burlapped. Bare root trees will be acceptable to plant during their dormant season. Trees shall be characteristically shaped specimens.

RESPONSE: All proposed deciduous trees are 1.5-inch in caliper.

(b) Coniferous Trees.

Coniferous trees shall be a minimum five feet (5') in height above ground, balled and burlapped. Bare root trees will be acceptable to plant during their dormant season. Trees shall be well branched and characteristically shaped specimens.

RESPONSE: No conifers are proposed.

(c) Evergreen and Deciduous Shrubs.

Evergreen and deciduous shrubs shall be at least one (1) to five (5) gallon size. Shrubs shall be characteristically branched. Side of shrub with best foliage shall be oriented to public view.

RESPONSE: All proposed shrubs are specified as 1-gallon or larger in size.

(d) Groundcovers.

Groundcovers shall be fully rooted and shall be well branched or leafed. English ivy (*Hedera helix*) is considered a high maintenance material which is detrimental to other landscape materials and buildings and is therefore prohibited.

RESPONSE: The proposed ground cover is specified in 4-inch pots. English Ivy is not proposed.

(e) Lawns.

Lawns shall consist of grasses, including sod, or seeds of acceptable mix within the local landscape industry. Lawns shall be 100 percent coverage and weed free.

RESPONSE: Seeding for the lawn area are specified to comply with all provider's instructions and recommendations for lawn seeding.

(2) Landscaping shall be installed in accordance with the provisions of Sunset New Western Garden Book (latest edition), Lane Publishing Company, Menlo Park, California or the American Nurserymen Association Standards (latest edition).

(3) The following guidelines are suggested to ensure the longevity and continued vigor of plant materials:

(a) Select and site permanent landscape materials in such a manner as to produce a hardy and drought-resistant landscaped area.

(b) Consider soil type and depth, spacing, exposure to sun and wind, slope and contours of the site, building walls and overhangs, and compatibility with existing native vegetation preserved on the site or in the vicinity.

RESPONSE: All proposed landscape materials will be chosen, installed and maintained per current industry standards.

(4) All trees and plant materials shall be healthy, disease-free, damage-free, well-branched stock, characteristic of the species.

(5) All plant growth in landscaped areas of developments shall be controlled by pruning, trimming or otherwise so that:

(a) It will not interfere with designated pedestrian or vehicular access; and

(b) It will not constitute a traffic hazard because of reduced visibility.

RESPONSE: Branching, size, and structure of the proposed plant materials have been specified as desired and in conformance with this code section. Maintenance of the plant materials will also comply with this code section requirements regarding access and visibility.

Section 73.270 Grading.

(1) After completion of site grading, top-soil is to be restored to exposed cut and fill areas to provide a suitable base for seeding and planting.

(2) All planting areas shall be graded to provide positive drainage.

(3) Neither soil, water, plant materials nor mulching materials shall be allowed to wash across roadways or walkways.

(4) Impervious surface drainage shall be directed away from pedestrian walkways, dwelling units, buildings, outdoor private and shared areas and landscape areas except where the landscape area is a water quality facility.

RESPONSE: Grading which reduces runoff and provides surface drainage flow away from the building and sidewalks is proposed. All landscape top soil will be restored and amended.

Section 73.280 Irrigation System Required.

Except for townhouse lots, landscaped areas shall be irrigated with an automatic underground or drip irrigation system.

RESPONSE: This project proposes the expansion and reconfiguration of the existing underground irrigation system. The resulting system will fully cover the new and existing landscape areas. This work will be done on a Design Build basis.

Section 73.290 Re-vegetation in Un-landscaped Areas.

The purpose of this section is to ensure erosion protection, and in appropriate areas to encourage soil amendment, for those areas not included within the landscape percentage requirements so native plants will be established, and trees will not be lost.

(1) Where vegetation has been removed or damaged in areas not affected by the landscaping requirements and that are not to be occupied by structures or other improvements, vegetation shall be replanted.

(2) Plant materials shall be watered at intervals sufficient to ensure survival and growth for a minimum of two growing seasons.

(3) The use of native plant materials is encouraged to reduce irrigation and maintenance demands.

(4) Disturbed soils should be amended to an original or higher level of porosity to regain infiltration and stormwater storage capacity.

RESPONSE: All disturbed areas will be amended, landscaped, mulched and provided with irrigation.

Section 73.310 Landscape Standards - Commercial, Industrial, Public and Semi-Public Uses.

(1) A minimum 5-foot-wide landscaped area must be located along all building perimeters which are viewable by the general public from parking lots or the public right-of-way, excluding loading areas, bicycle parking areas and pedestrian egress/ingress locations. Pedestrian amenities such as landscaped plazas and arcades may be substituted for this requirement. This requirement shall not apply where the distance along a wall between two vehicle or pedestrian access openings (such as entry doors, garage doors, carports and pedestrian corridors) is less than 8 feet.

RESPONSE: The existing landscape around the existing building perimeter is to remain and currently satisfies this requirement.

(3) All areas not occupied by buildings, parking spaces, driveways, drive aisles, pedestrian areas or undisturbed natural areas shall be landscaped.

RESPONSE: All pervious areas will be landscaped. Landscape (in excess of 5-foot) is provided along both sides of the building expansion where visible to the public.

Section 73.340 Off-Street Parking Lot and Loading Area Landscaping - Commercial, Industrial, Public and Semi-Public Uses, and Residential and Mixed Use Residential Uses within the Central Design District.

(1) A clear zone shall be provided for the driver at ends of on-site drive aisles and at driveway entrances, vertically between a maximum of 30 inches and a minimum of 8 feet as measured from the ground level, except for parking structures and underground parking where this provision shall not apply.

RESPONSE: Landscape clear vision triangles have been considered at the proposed driveway access off of SW 125th Ct.

(2) Perimeter site landscaping of at least 5 feet in width shall be provided in all off-street parking and vehicular circulation areas (including loading areas).

(a) The landscape area shall contain:

(i) Deciduous trees an average of not more than 30 feet on center.

The trees shall meet the requirements of TDC 73.360(7).

(ii) Plantings which reach a mature height of 30 inches in three years which provide screening of vehicular headlights year round.

(iii) Shrubs or ground cover, planted so as to achieve 90 percent coverage within three years.

(iv) Native trees and shrubs are encouraged.

(b) Where off-street parking areas on separate lots are adjacent to one another and are connected by vehicular access, the landscaped strips required in subsection (2) of this section are not required.

RESPONSE: This project proposes a building expansion with loading docks and a total of 26 new/relocated, parking places. Twenty-one spaces have been added across the rear (north) of the property. Three landscape islands are also added in this area. Five proposed parking spaces abut 125th Ct. These areas are buffered by

existing, mature landscaping that will be retained. Please refer to the Landscape Plan included in this submittal package.

Section 73.360 Off-Street Parking Lot Landscape Islands - Commercial, Industrial, Public, and Semi-Public Uses.

(1) A minimum of 25 square feet per parking stall shall be improved with landscape island areas. They may be lower than the surrounding parking surface to allow them to receive stormwater run-off and function as water quality facilities as well as parking lot landscaping. They shall be protected from vehicles by curbs, but the curbs may have spaces to allow drainage into the islands. They shall be dispersed throughout the parking area [see TDC 73.380(3)]. They shall be planted with groundcover or shrubs that will completely cover the island area within 3 years. They shall be planted with deciduous shade trees when needed to meet the parking lot shade tree requirements. Native plant materials are encouraged. Landscape square footage requirements shall not apply to parking structures and underground parking.

RESPONSE: The project proposes 26 new/relocated parking stalls, which results in a requirement of 650 SF of landscape island landscape area. (25 SF x 26 stalls = 650 SF). As proposed, the project proposes a total of approximately 1,211 SF of landscape within the parking lot area.

Each new island is planted with deciduous shade trees and groundcovers.

(2) Landscaped island areas with deciduous parking lot shade trees shall be a minimum of 5 feet in width (from inside of curb to curb).

RESPONSE: As proposed, the landscape islands within the parking lot area are a minimum of 5-feet in width.

(3) A minimum of one deciduous shade tree shall be provided for every four (4) parking spaces to lessen the adverse impacts of glare, reduce heat from paved surfaces, and to emphasize circulation patterns. Required shade trees shall be uniformly distributed throughout the parking lot (see TDC 73.380(3)), except that within the Central Design District landscape islands and shade trees may be placed to frame views of the Tualatin Commons water feature or identified architectural focal elements. The trees shall meet the requirements of TDC 73.360(7). Parking lot shade tree requirements shall not apply to parking structures and underground parking.

RESPONSE: This project proposes a total of 26 new/relocated parking spaces, which requires 7 deciduous shade trees be distributed throughout the parking lot. This requirement has been met, as shown on the Landscape Plan included in this application package.

(4) Landscape islands shall be utilized at aisle ends to protect parked vehicles from moving vehicles and emphasize vehicular circulation patterns. Landscape island location requirements shall not apply to parking structures and under-ground parking.

RESPONSE: Landscape islands are provided at the ends of each row of parking spaces, as required.

(5) Required plant material in landscape islands shall achieve 90 percent coverage within three years. Native shrubs and trees are encouraged.

RERSPONSE: The plant materials specified with in the landscape islands have been spaced and sized to achieve 90% coverage within three years.

(6)(a) Except as in (b) below, site access from the public street shall be defined with a landscape area not less than 5 feet in width on each side and extend 25 feet back from the

property line for commercial, public, and semi-public development with 12 or more parking spaces and extend 30 feet back from the property line for industrial development, except for parking structures and under-ground parking which shall be determined through the Architectural Review process.

RESPONSE: The proposed driveway off of SW 125th Ct. is defined on both sides with a 5' x 25' landscape strip planted with shrubs and groundcovers..

(7) Deciduous shade trees shall meet the following criteria:

- (a) Reach a mature height of 30 feet or more;
- (b) Cast moderate to dense shade in summer;
- (c) Long lived, i.e., over 60 years;
- (d) Do well in an urban environment:
 - (i) Pollution tolerant.
 - (ii) Tolerant of direct and reflected heat.
- (e) Require little maintenance:
 - (i) Mechanically strong.
 - (ii) Insect- and disease-resistant.
 - (iii) Require little pruning.
- (f) Be resistant to drought conditions;
- (g) Be barren of fruit production.

RESPONSE: The following tree species are proposed in the new parking area:

Fraxinus pennsylvanica 'Patmore'/Patmore Ash

Fraxinus pennsylvanica 'Summit'/Summit Ash

Gleditsia tricanthos inermis 'Trueshade'/Thornless Honey Locust

Section 73.370 Off-Street Parking and Loading.

(1) General Provisions.

(a) At the time of establishment of a new structure or use, or change in use, or change in use of an existing structure, within any planning district of the City, off-street parking spaces, off-street vanpool and carpool parking spaces for commercial, institutional and industrial uses, off-street bicycle parking, and off-street loading berths shall be as provided in this and following sections, unless greater requirements are otherwise established by the conditional use permit or the Architectural Review process, based upon clear findings that a greater number of spaces are necessary at that location for protection of public health, safety and welfare or that a lesser number of vehicle parking spaces will be sufficient to carry out the objectives of this section.

(c) Except where otherwise specified, the floor area measured shall be the gross floor area of the building primary to the function of the particular use of the property other than space devoted to off-street parking or loading.

(j) Required parking spaces shall be available for the parking of operable passenger automobiles of residents, customers, patrons and employees and shall not be used for storage of vehicles or materials or for the parking of trucks used in conducting the business.

RESPONSE: Vehicular parking is proposed on-site, reflective of the building expansion square footage, and considering parking displaced by the expansion.

(n) Bicycle parking facilities shall include long-term parking that consists of covered, secure stationary racks, lockable enclosures, or rooms (indoor or outdoor) in which the bicycle is stored and short-term parking provided by secure stationary racks

(covered or not covered), which accommodate a bicyclist's lock securing the frame and both wheels. The Community Development Director, their designee, or the Architectural Review Board may approve a form of bicycle parking not specified in these provisions but that meets the needs of long-term and/or short-term parking pursuant to Section 73.370.

(o) Each bicycle parking space shall be at least 6 feet long and 2 feet wide, and overhead clearance in covered areas shall be at least 7 feet, unless a lower height is approved through the Architectural Review process.

(p) A 5-foot-wide bicycle maneuvering area shall be provided beside or between each row of bicycle parking. It shall be constructed of concrete, asphalt or a pervious surface such as pavers or grasscrete, but not gravel or woody material, and be maintained.

(q) Access to bicycle parking shall be provided by an area at least 3 feet in width. It shall be constructed of concrete, asphalt or a pervious surface such as pavers or grasscrete, but not gravel or woody material, and be maintained.

(r) Required bicycle parking shall be located in convenient, secure, and well-lighted locations approved through the Architectural Review process. Lighting, which may be provided, shall be deflected to not shine or create glare into street rights-of-way or fish and wildlife habitat areas.

(s) Long-term bicycle parking facilities may be provided inside a building in suitable secure and accessible locations.

(u) Bicycle parking areas and facilities shall be identified with appropriate signing as specified in the Manual on Uniform Traffic Control Devices (MUTCD) (latest edition). At a minimum, bicycle parking signs shall be located at the main entrance and at the location of the bicycle parking facilities.

RESPONSE: Three bicycle parking spaces are provided adjacent to the main entrance of the existing building. All three will be long term spaces (covered) and meet all of the additional applicable code standards, including lighting, paving and dimensions.

(x) Required vanpool and carpool parking shall meet the 9-foot parking stall standards in Figure 73-1 and be identified with appropriate signage.

RESPONSE: The two vanpool/carpool spaces will be signed as required.

(2) Off-Street Parking Provisions.

(a) The following are the minimum and maximum requirements for off-street motor vehicle parking in the City,

USE	MINIMUM MOTOR VEHICLE PARKING REQUIREMENT	MAXIMUM MOTOR VEHICLE PARKING REQUIREMENT	BICYCLE PARKING REQUIREMENT	PERCENTAGE OF BICYCLE PARKING TO BE COVERED
Industrial				
(i) Manufacturing	1.60 spaces per 1,000 sq. ft.	None	2, or 0.10 spaces per	First 5 spaces or 30%,

	of gross floor area		1,000 gross sq. ft., whichever is greater	whichever is greater
(ii) Warehousing	0.30 spaces per 1,000 sq. ft. of gross floor area	Zone A: 0.4 spaces per 1,000 sq. ft. gross floor area Zone B: 0.5 spaces per 1,000 sq. ft. gross floor area	2, or 0.10 spaces per 1,000 gross sq. ft., whichever is greater	First 5 spaces or 30%, whichever is greater
(iii) Wholesale establishment	3.00 spaces per 1,000 sq. ft. of gross floor area	None	2, or 0.50 spaces per 1,000 gross sq. ft., whichever is greater	First 5 spaces or 30%, whichever is greater

RESPONSE: The proposed building expansion is 32,964 GSF of Warehouse. As such, 10 vehicular spaces are required. $(32,964/1000 = 32.96 \times 0.30 = 9.9 \text{ spaces})$ As stated previously, 26 parking spaces are proposed, however, approximately 14 (not striped) existing parking spaces were displaced by the building expansion foot print. Therefore, 12 new parking spaces are proposed to accommodate the building expansion SF and 14 spaces to replaced existing spaces to be removed. Bicycle parking for 3 bikes is proposed adjacent to the primary entrance to the existing building.

(3) Off-Street Vanpool and Carpool Parking Provisions.

The minimum number of off-street Vanpool and Carpool parking for commercial, institutional and industrial uses is as follows:

Number of Required Parking Spaces	Number of Vanpool or Carpool Spaces
0 to 10	1
10 to 25	2
26 and greater	1 for each 25 spaces

RESPONSE: Because the building expansion requires 10 new parking spaces, two Vanpool/Carpool spaces are required. These spaces are located abutting the northern property line.

Section 73.380 Off-Street Parking Lots.

A parking lot, whether an accessory or principal use, intended for the parking of automobiles or trucks, shall comply with the following:

(1) Off-street parking lot design shall comply with the dimensional standards set forth in Figure 73-1 of this section, except for parking structures and underground parking where stall length and width requirements for a standard size stall shall be reduced by .5 feet and vehicular access at the entrance if gated shall be a minimum of 18 feet in width.

RESPONSE: All proposed standard parking lot spaces are 9-feet x 16-feet.

(3) Off-street parking stalls shall not exceed eight continuous spaces in a row without a landscape separation, except for parking structures and underground parking. For parking lots within the Central Design District that are designed to frame views of the central water feature or identified architectural focal elements as provided in TDC 73.350(3), this requirement shall not apply and the location of parking lot landscape islands shall be determined through the Architectural Review process.

RESPONSE: As proposed, the parking lot has a maximum of 8 continuous parking spaces.

(4) Parking lot drive aisles shall be constructed of asphalt or concrete, including pervious concrete. Parking stalls shall be constructed of asphalt or concrete, or a pervious surface such as pavers or grasscrete, but not gravel or woody material. Drive aisles and parking stalls shall be maintained adequately for all-weather use and drained to avoid water flow across sidewalks. Parking lot landscaping shall be provided pursuant to the requirements of TDC 73.350 and TDC 73.360. Walkways in parking lots shall be provided pursuant to TDC 73.160.

RESPONSE: The parking lot is paved. Parking lot landscape has been provided as required and discussed above. Pedestrian crosswalks through vehicular maneuvering areas of the parking lot will be striped.

(6) Artificial lighting, which may be provided, shall be deflected to not shine or create glare in a residential planning district, an adjacent dwelling, street right-of-way in such a manner as to impair the use of such way or a Natural Resource Protection Overlay District, Other Natural Areas identified in Figure 3-4 of the Parks and Recreation Master Plan, or a Clean Water Services Vegetated Corridor.

RESPONSE: A Lighting Plan, compliant with these standards has been prepared and submitted with the application package.

(7) Groups of more than 4 parking spaces shall be so located and served by driveways that their use will require no backing movements or other maneuvering within a street right-of-way other than an alley.

RESPONSE: The parking lot has been configured to eliminate the need for any backing into or maneuvering within a public right-of-way.

(8) Service drives to off-street parking areas shall be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress, and maximum safety of pedestrians and vehicular traffic on the site.

RESPONSE: No service specific use driveways are proposed. Service vehicles will use the driveway off of SW 125th Court, which comply with the requirements of this code section.

(9) Parking bumpers or wheel stops or curbing shall be provided to prevent cars from encroaching on the street right-of-way, adjacent landscaped areas, or adjacent pedestrian walkways.

RESPONSE: The proposed parking spaces and adjacent landscape areas have been sized and designed to accommodate bumper overhang.

(10) Disability parking spaces and accessibility shall be provided in accordance with applicable federal and state requirements.

RESPONSE: None of the proposed parking spaces in the rear parking lot are designated handicap. However, an associated project currently under construction, is providing 4 new ADA spaces.

Section 73.390 Off-Street Loading Facilities.

(1) The minimum number of off-street loading berths for commercial, industrial, public and semi-public uses is as follows:

Square Feet of Floor Area	Number of Berths
Less than 5,000	0
5,000 - 25,000	1
25,000 - 60,000	2
60,000 and over	3

RESPONSE: The proposed building is 32,946 SF in size, which requires two loading spaces. The project proposes a total of seven loading docks across the east side/rear of the building.

(2) Loading berths shall conform to the following minimum size specifications.

(b) Industrial uses - 12' x 60'

(c) Berths shall have an unobstructed height of 14'

(d) Loading berths shall not use the public right-of-way as part of the required off-street loading area.

RESPONSE: The proposed loading docks are 15' X 50', with unobstructed height in excess of 14-feet. Furthermore, the loading dock area is located behind the building, not abutting a right-of-way.

(3) Required loading areas shall be screened from public view from public streets and adjacent properties by means of sight-obscuring landscaping, walls or other means, as approved through the Architectural Review process.

RESPONSE: The proposed loading dock area is screened from SW 125th Ct. by parking lot area and a dense landscape buffer.

(6) The off-street loading facilities shall in all cases be on the same lot or parcel as the structure they are intended to serve. In no case shall the required off-street loading spaces be part of the area used to satisfy the off-street parking requirements.

RESPONSE: The required parking for this project has been provided on site.
Section 73.400 Access.

(6) Except as provided in TDC 53.100, all ingress and egress shall connect directly with public streets. [Ord. 882-92, § 24,12/14/92]

RESPONSE: The access and egress to this site is via SW 125th Court.

(8) To afford safe pedestrian access and egress for properties within the City, a sidewalk shall be constructed along all street frontage, prior to use or occupancy of the building or structure proposed for said property. The sidewalks required by this section shall be constructed to City standards, except in the case of streets with inadequate right-of-way width or where the final street design and grade have not been established, in which case the sidewalks shall be constructed to a design and in a manner approved by the City Engineer. Sidewalks approved by the City Engineer may include temporary sidewalks and sidewalks constructed on private property; provided, however, that such sidewalks shall provide continuity with sidewalks of adjoining commercial developments existing or proposed. When a sidewalk is to adjoin a future street improvement, the sidewalk construction shall include construction of the curb and gutter section to grades and alignment established by the City Engineer.

RESPONSE: A sidewalk currently exists along the SW 125th Ct. frontage, with a pedestrian connection proposed between the right-of-way and the north side of the building expansion entrance and parking area.

(12) Minimum Access Requirements for Industrial Uses.

Ingress and egress for industrial uses shall not be less than the following:

Required Parking Spaces	Minimum Number Required	Minimum Pavement Width	Minimum Pavement Walkways, Etc.
1-250	1	36 feet for first 50' from ROW, 24' thereafter	No curbs or walkway required

RESPONSE: This project requires a minimum of one access/egress driveway that is a minimum of 36-feet in width for the first 50-feet from right-of-way. This project proposes redevelopment of the existing northern-most driveway. As proposed, the pavement width is 36-feet, for the first 50-feet from the SW 125th Court right-of-way, into the site.

(15) Distance between Driveways and Intersections.

Except for single-family dwellings, the minimum distance between driveways and intersections shall be as provided below. Distances listed shall be measured from the stop bar at the intersection.

(a) At the intersection of collector or arterial streets, driveways shall be located a minimum of 150 feet from the intersection.

(b) At the intersection of two local streets, driveways shall be located a minimum of 30 feet from the intersection.

RESPONSE: SW Herman is an arterial road. The project currently has two existing driveways off of SW 125th Ct. Both will be retained, and the northern-most driveway will be rebuilt to provide access to the building expansion area. This

driveway access is approximately 410-feet from the intersection of SW Herman Road and SW 125th Ct.

(16) Vision Clearance Area.

(b) Collector Streets - A vision clearance area for all collector/arterial street intersections, collector/arterial street and local street intersections, and collector/arterial street and railroad intersections shall be that triangular area formed by the right-of-way lines along such lots and a straight line joining the right-of-way lines at points which are 25 feet from the intersection point of the right-of-way lines, as measured along such lines. Where a driveway intersects with a collector/arterial street, the distance measured along the driveway line for the triangular area shall be 10 feet (see Figure 73-2 for illustration).

(c) Vertical Height Restriction - Except for items associated with utilities or publicly owned structures such as poles and signs and existing street trees, no vehicular parking, hedge, planting, fence, wall structure, or temporary or permanent physical obstruction shall be permitted between 30 inches and 8 feet above the established height of the curb in the clear vision area (see Figure 73-2 for illustration).

RESPONSE: The project currently has two existing driveways. Both will be retained and the northern-most driveway will be rebuilt to provide access to the building expansion. Vision clearance for both driveways, comply with the required distances and vertical height restrictions. Specifically, the traffic report notes that the site access sight distance at the existing northern most driveway off of SW 125th Ct. is 270-feet to the north and 410-feet to the south, both exceed the minimum requirement.

Section 73.410 Street Tree Plan.

A person who desires to plant a street tree shall comply with TDC 74.765, which comprises the street tree plan.

RESPONSE: No new street trees are proposed or required at this time.

CHAPTER 74: Public Improvement Requirements

Section 74.120 Public Improvements.

RESPONSE: Any public improvements completed as a result of the AR process shall be installed at expense of applicant.

Section 74.130 Private Improvements.

RESPONSE: Noted; all private improvements to be installed at expense of the applicant.

Section 74.140 Construction Timing.

RESPONSE: All improvements will be completed prior to issuance of Certificate of Occupancy.

Section 74.210 Minimum Street Right-of-Way Widths.

The width of streets in feet shall not be less than the width required to accommodate a street improvement needed to mitigate the impact of a proposed development. In cases where a street is required to be improved according to the standards of the TDC, the width of the right-of-way shall not be less than the minimums indicated in TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G.

(2) For development applications other than subdivisions and partitions, wherever existing or future streets adjacent to property proposed for development are of inadequate right-of-way width, the additional right-of-way necessary to comply with TDC Chapter 74, Public Improvement Requirements, Figures 74-2A through 74-2G of the Tualatin Community Plan shall be dedicated to the City for use by the public prior to issuance of any building permit for the proposed development. This right-of-way dedication shall be for the full width of the property abutting the roadway and, if required by the City Engineer, additional dedications shall be provided for slope and utility easements if deemed necessary.

RESPONSE: This project proposes a dedication to the SW Herman Road right-of-way to achieve the required 62.5' width for future improvements.

Section 74.310 Greenway, Natural Area, Bike, and Pedestrian Path Dedications and Easements.

(1) Areas dedicated to the City for Greenway or Natural Area purposes or easements or dedications for bike and pedestrian facilities during the development application process shall be surveyed, staked and marked with a City approved boundary marker prior to acceptance by the City.

(3) For all other development applications, Greenway, Natural Area, bike, and pedestrian path dedications and easements shall be submitted to the City Engineer; building permits shall not be issued for the development prior to acceptance of the dedication or easement by the City.

RESPONSE: The dedicated right-of-way on SW Herman will be available for future improvements

Section 74.320 Slope Easements

(1) The applicant shall obtain and convey to the City any slope easements determined by the City Engineer to be necessary adjacent to the proposed development site to support the street improvements in the public right-of-way or accessway or utility improvements required to be constructed by the applicant.

(3) For all other development applications, a slope easement dedication shall be submitted to the City Engineer; building permits shall not be issued for the development prior to acceptance of the easement by the City.

RESPONSE: A slope easement for future construction of improvement will be granted, as needed and upon request.

Section 74.330 Utility Easements

Section 74.350 Tracts

RESPONSE: No utility easements or tracts are needed or proposed with this project.

Section 74.420 Street Improvements.

When an applicant proposes to develop land adjacent to an existing or proposed street, including land which has been excluded under TDC 74.220, the applicant should be responsible for the improvements to the adjacent existing or proposed street that will bring the improvement of the street into conformance with the Transportation Plan (TDC Chapter 11), TDC 74.425 (Street Design Standards), and the City's Public Works Construction Code, subject to the following provisions:

(1) For any development proposed within the City, roadway facilities within the right-of-way described in TDC 74.210 shall be improved to standards as set out in the Public Works Construction Code.

RESPONSE: No improvements or dedications are required for the SW 125th Ct. right-of-way. A dedication to SW Herman is being made, with a fee in lieu of request for required improvements.

(2) The required improvements may include the rebuilding or the reconstruction of any existing facilities located within the right-of-way adjacent to the proposed development to bring the facilities into compliance with the Public Works Construction Code.

(3) The required improvements may include the construction or rebuilding of off-site improvements which are identified to mitigate the impact of the development.

(4) Where development abuts an existing street, the improvement required shall apply only to that portion of the street right-of-way located between the property line of the parcel proposed for development and the centerline of the right-of-way, plus any additional pavement beyond the centerline deemed necessary by the City Engineer to ensure a smooth transition between a new improvement and the existing roadway (half-street improvement). Additional right-of-way and street improvements and off-site right-of-way and street improvements may be required by the City to mitigate the impact of the development. The new pavement shall connect to the existing pavement at the ends of the section being improved by tapering in accordance with the Public Works Construction Code.

RESPONSE: This project proposes the reconstruction of one of the existing driveways. This driveway will be brought up to applicable code standards as discussed within this narrative document.

No improvements or dedications are required for SW 125th Court.

At this time, the construction of the required improvements (sidewalk, water quality) within the SW Herman Road right-of-way is infeasible for the following reasons:

- **there is no sidewalk to tie into on the southwest side of the property**
- **there is an existing roadside ditch that would have to be filled and a new ditch inlet constructed**
- **there are several healthy mature trees that would have to be removed**
- **several existing trees would be negatively impacted by the required area of disturbance.**
- **the existing grades within the dedicated right-of-way make achievement of a ADA cross slope on the sidewalk impossible.**
- **there is an electrical vault that would have to be relocated.**
- **there are 2 power poles that would have to be relocated.**

For these reasons a fee in lieu of request is made for all required improvements within the SW Herman Road right-of-way. Please refer to Exhibit 'B' for graphic representation.

Section 74.430 Modifications of Requirements in Cases of Unusual Conditions.

(1) When, in the opinion of the City Engineer, the construction of street improvements in accordance with TDC 74.420 would result in the creation of a hazard, or would be impractical, or would be detrimental to the City, the City Engineer may modify the scope of the required improvement to eliminate such hazardous, impractical, or detrimental

results. Examples of conditions requiring modifications to improvement requirements include but are not limited to horizontal alignment, vertical alignment, significant stands of trees, fish and wildlife habitat areas, the amount of traffic generated by the proposed development, timing of the development or other conditions creating hazards for pedestrian, bicycle or motor vehicle traffic. The City Engineer may determine that, although an improvement may be impractical at the time of development, it will be necessary at some future date. In such cases, a written agreement guaranteeing future performance by the applicant in installing the required improvements must be signed by the applicant and approved by the City.

(2) When the City Engineer determines that modification of the street improvement requirements in TDC 74.420 is warranted pursuant to subsection (1) of this section, the City Engineer shall prepare written findings of modification. The City Engineer shall forward a copy of said findings and description of modification to the applicant, or his authorized agent, as part of the Utility Facilities Review for the proposed development, as provided by TDC 31.072. The decision of the City Engineer may be appealed to the City Council in accordance with TDC 31.076 and 31.077.

(3) To accommodate bicyclists on streets prior to those streets being upgraded to the full standards, an interim standard may be implemented by the City. These interim standards include reduction in motor vehicle lane width to 10 feet [the minimum specified in AASHTO's A Policy on Geo-metric Design of Highways and Streets (1990)], a reduction of bike lane width to 4-feet (as measured from the longitudinal gutter joint to the centerline of the bike lane stripe), and a paint-stripped separation 2 to 4 feet wide in lieu of a center turn lane. Where available roadway width does not provide for these minimums, the roadway can be signed for shared use by bicycle and motor vehicle travel. When width constraints occur at an intersection, bike lanes should terminate 50 feet from the intersection with appropriate signing.

RESPONSE: The project requests a modified cross section for SW Herman Road. At this time, the construction of the sidewalk within the SW Herman Road right-of-way is infeasible for several reasons outlined above. Please refer to Exhibit 'B'. Section 74.440 Streets, Traffic Study Required.

(1) The City Engineer may require a traffic study to be provided by the applicant and furnished to the City as part of the development approval process as provided by this Code, when the City Engineer determines that such a study is necessary in connection with a proposed development project in order to:

(a) Assure that the existing or proposed transportation facilities in the vicinity of the proposed development are capable of accommodating the amount of traffic that is expected to be generated by the proposed development, and/or

(b) Assure that the internal traffic circulation of the proposed development will not result in conflicts between on-site parking movements and/or on-site loading movements and/or on-site traffic movements, or impact traffic on the adjacent streets.

(2) The required traffic study shall be completed prior to the approval of the development application.

(3) The traffic study shall include, at a minimum:

(a) an analysis of the existing situation, including the level of service on adjacent and impacted facilities.

(b) an analysis of any existing safety deficiencies.

- (c) proposed trip generation and distribution for the proposed development.
 - (d) projected levels of service on adjacent and impacted facilities.
 - (e) recommendation of necessary improvements to ensure an acceptable level of service for roadways and a level of service of at least D and E for signalized and unsignalized intersections respectively, after the future traffic impacts are considered.
 - (f) The City Engineer will determine which facilities are impacted and need to be included in the study.
 - (g) The study shall be conducted by a registered engineer.
- (4) The applicant shall implement all or a portion of the improvements called for in the traffic study as determined by the City Engineer.

Response: A traffic study prepared by SABA, C.E.S. has been completed and is included in this submittal application.

Per this report, the site has about 530 feet of frontage on the west side of SW 125th Court, with two separate driveways about 110 and 410 feet from the SW Herman Road / SW 125th Ct. T-intersection. Both driveways will remain. The northern-most driveway will remain per this project proposal. There are no access drives along SW Herman Road.

The report makes several recommendations, (page 16 of the report) all of which have been incorporated into the design of the project.

Section 74.450 Bikeways and Pedestrian Paths.

- (1) Where proposed development abuts or contains an existing or proposed bikeway, pedestrian path, or multi-use path, as set forth in TDC Chapter 11, Transportation Figure 11-4, the City may require that a bikeway, pedestrian path, or multi-use path be constructed, and an easement or dedication provided to the City.
- (2) Where required, bikeways and pedestrian paths shall be provided as follows:
 - (a) Bike and pedestrian paths shall be constructed and surfaced in accordance with the Public Works Construction Code.
 - (b) The applicant shall install the striping and signing of the bike lanes and shared roadway facilities, where designated.

Response: No bikeways or pedestrian paths will be constructed with this project. A fee in lieu of arrangement is requested for the sidewalk along the SW Herman Road frontage, for reasons discussed in this narrative document.

Section 74.470 Street Lights

- (1) Street light poles and luminaries shall be installed in accordance with the Public Works Construction Code.
- (2) The applicant shall submit a street lighting plan for all interior and exterior streets on the proposed development site prior to issuance of a Public Works Permit.

RESPONSE: No new street lighting is proposed at this time.

Section 74.610 Water Service.

Section 74.620 Sanitary Sewer Service.

Section 74.630 Storm Drainage System.

RESPONSE: No public improvement to the water, Sanitary Sewer or Storm Drainage system is proposed. No public services will be extended to adjacent properties.

Section 74.650 Water Quality, Storm Water Detention and Erosion Control.

The applicant shall comply with the water quality, storm water detention and erosion control requirements in the Surface Water Management Ordinance. If required:

(2) On all other development applications, prior to issuance of any building permit, the applicant shall arrange to construct a permanent on-site water quality facility and storm water detention facility and submit a design and calculations indicating that the requirements of the Surface Water Management Ordinance will be met and obtain a Stormwater Connection Permit from Clean Water Services.

(3) For on-site private and regional non-residential public facilities, the applicant shall submit a stormwater facility agreement, which will include an operation and maintenance plan provided by the City, for the water quality facility for the City's review and approval. The applicant shall submit an erosion control plan prior to issuance of a Public Works Permit. No construction or disturbing of the site shall occur until the erosion control plan is approved by the City and the required measures are in place and approved by the City

RESPONSE: As proposed, this building expansion project complies with all applicable codes and standards in compliance with Clean Water Services Resolution and Order 07-20.

Specifically, flow control will meet existing rates and the proposed filter cartridges are approved by CWS for private development.

Section 74.670 Existing Structures.

(1) Any existing structures requested to be retained by the applicant on a proposed development site shall be connected to all available City utilities at the expense of the applicant.

(2) The applicant shall convert any existing overhead utilities serving existing structures to underground utilities, at the expense of the applicant.

RESPONSE: As this is an expansion of an existing development, all structures are to be retained. Utility expansions to serve the proposed building expansion will be placed underground.

Section 74.700 Removal, Destruction or Injury of Trees.

RESPONSE: No trees shall be removed without a permit.

Section 74.720 Protection of Trees During Construction.

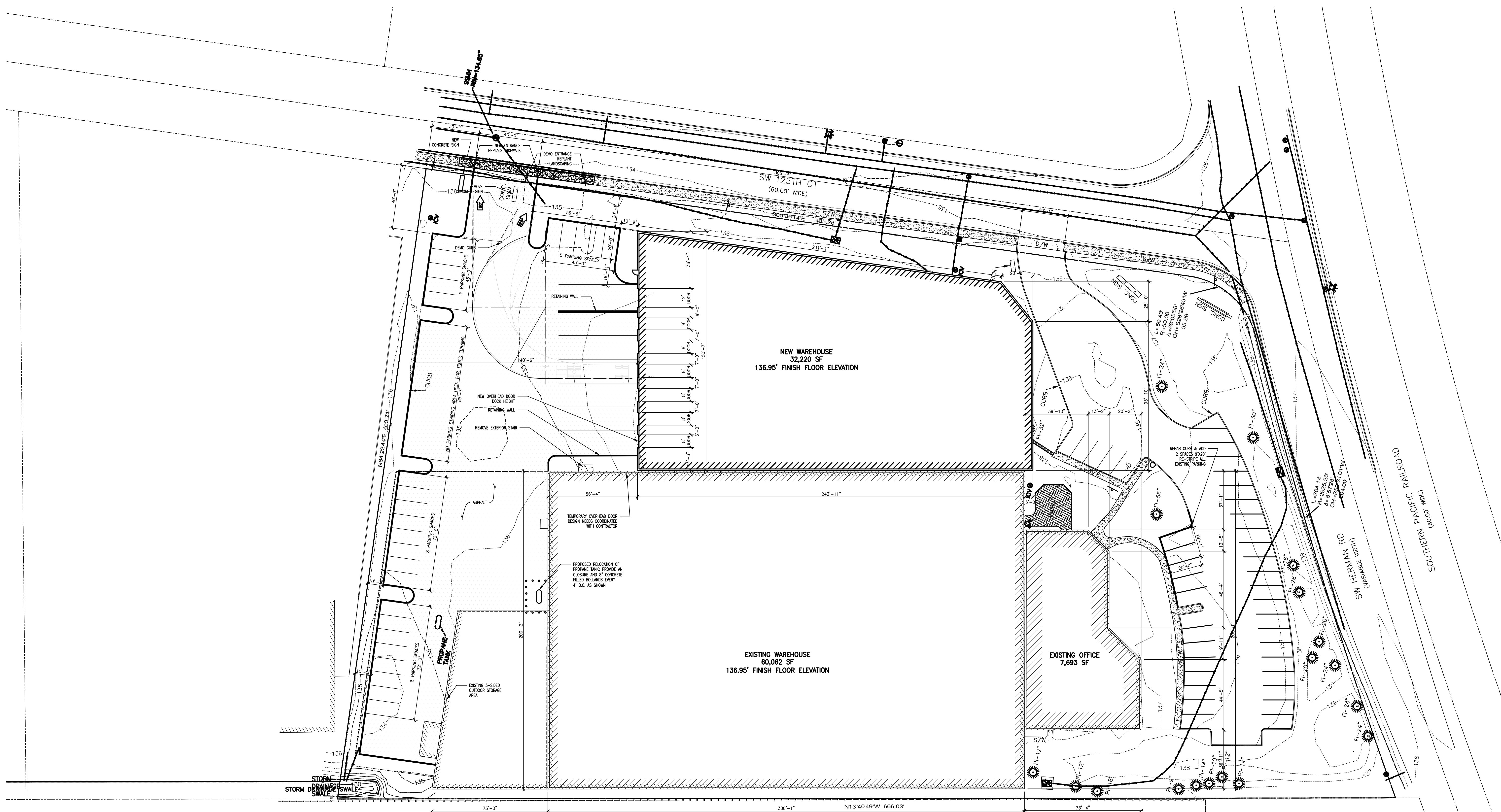
(1) During the erection, repair, alteration or removal of a building or structure, it is unlawful for the person in charge of such erection, repair, alteration or removal to leave a tree in or upon a public right-of-way in the vicinity of the building or structure without a good and sufficient guard or protectors to prevent injury to the tree arising out of or by reason of such erection, repair, alteration or removal.

(2) Excavations and driveways shall not be placed within six feet of a tree in or upon a public right-of-way without written permission from the City Engineer. During excavation or construction, the person shall guard the tree within six feet and all building material or other debris shall be kept at least four feet from any tree. [Ord. 963-96, § 9, 6/24/96]

RESPONSE: Trees designated to be retained (shown on Landscape plan) shall be protected during construction as required by the Arborist Report and specified on the Landscape Plans.

Section 74.725 Maintenance Responsibilities.

RESPONSE: All required maintenance shall be done by the owner as dictated by this section.



LEGEND

	DRIVE-IN OVERHEAD DOOR
	DOCK-HIGH OVERHEAD DOOR
	EDGE OF ASPHALT PAVING & INTEGRAL CONCRETE CURB
	4" CONCRETE SIDEWALK

KEYNOTES

1 X

SITE INFORMATION

SITE AREA:	210,561.8 SF
PARKING AREA:	31,558.50 SF
LANDSCAPE AREA:	50,892.22 SF

BUILDING AREAS	
EXISTING WAREHOUSE AREA:	60,062 SF
MANUFACTURING AREA:	10,000 SF (*AREA WITHIN EXISTING WAREHOUSE)
EXISTING OFFICE AREA:	7,693 SF

NEW ADDITION AREA:	32,200 SF
NEW SHIPPING OFFICE AREA:	600 SF (*AREA WITHIN NEW ADDITION)

TOTAL BUILDING AREA:	99,955 SF
----------------------	-----------

PARKING TOTAL:	65 SPACES=	64.17: 65 SPACES
OFFICE:	2.7 SPACES PER 1,000 SF (8,700 SF)=	23.5 SPACES
MANUFACTURING:	1.6 SPACES PER 1,000 SF (10,000 SF)=	16 SPACES
STORAGE:	.3 SPACES PER 1,000 SF (82,262)=	24.7 SPACES

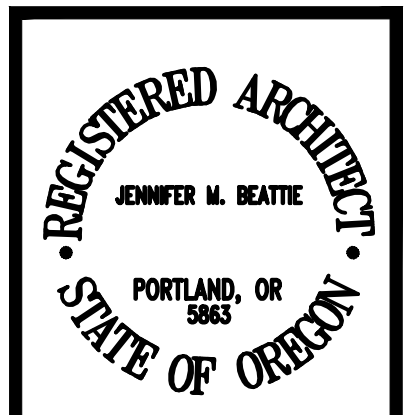
GENERAL NOTES

PLAN NORTH NORTH

1 A0.1

SITE PLAN

SCALE: 1"=30'



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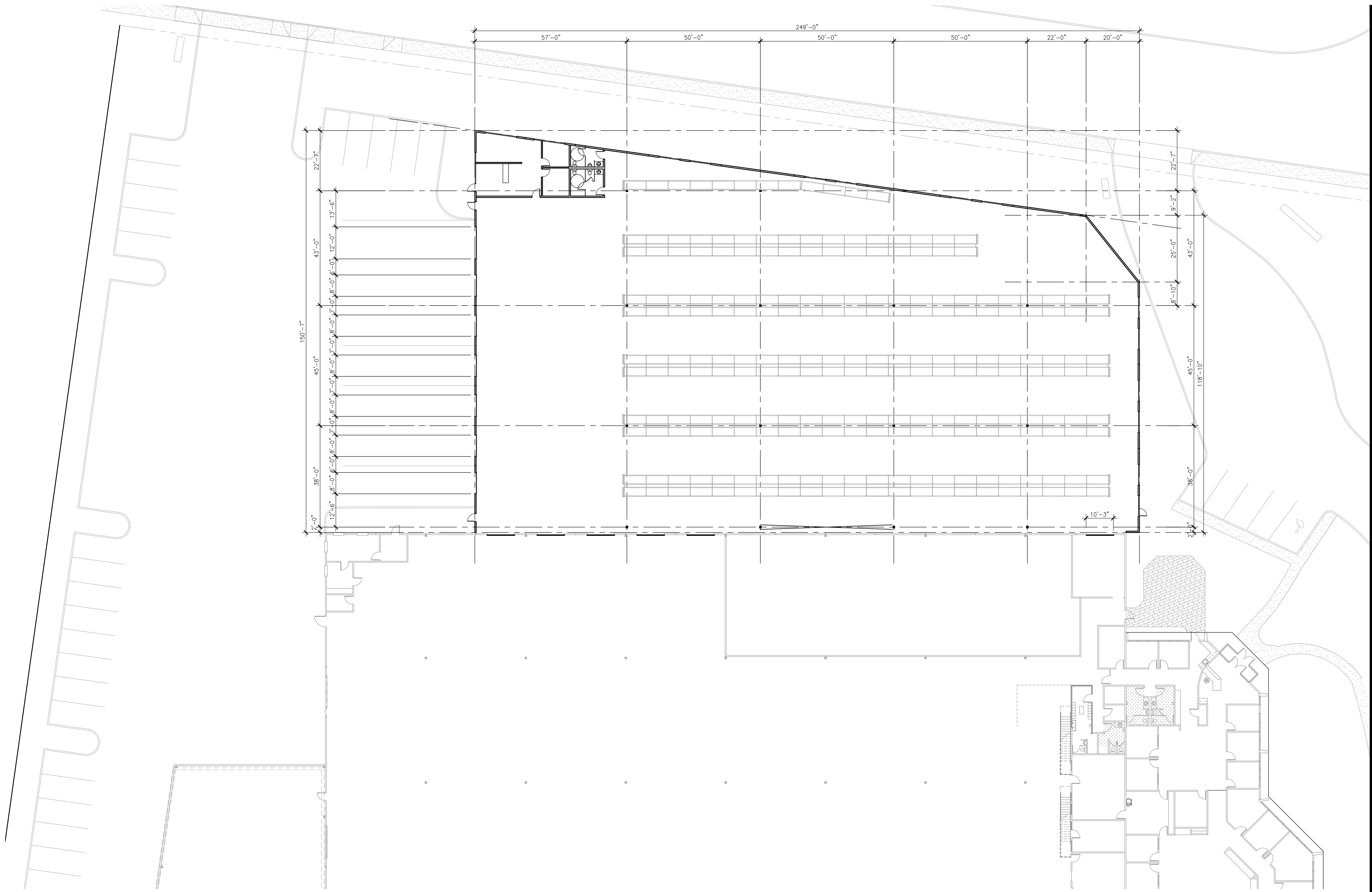
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 170220.01



1 FIRST FLOOR PLAN
 1/16" = 1'-0"



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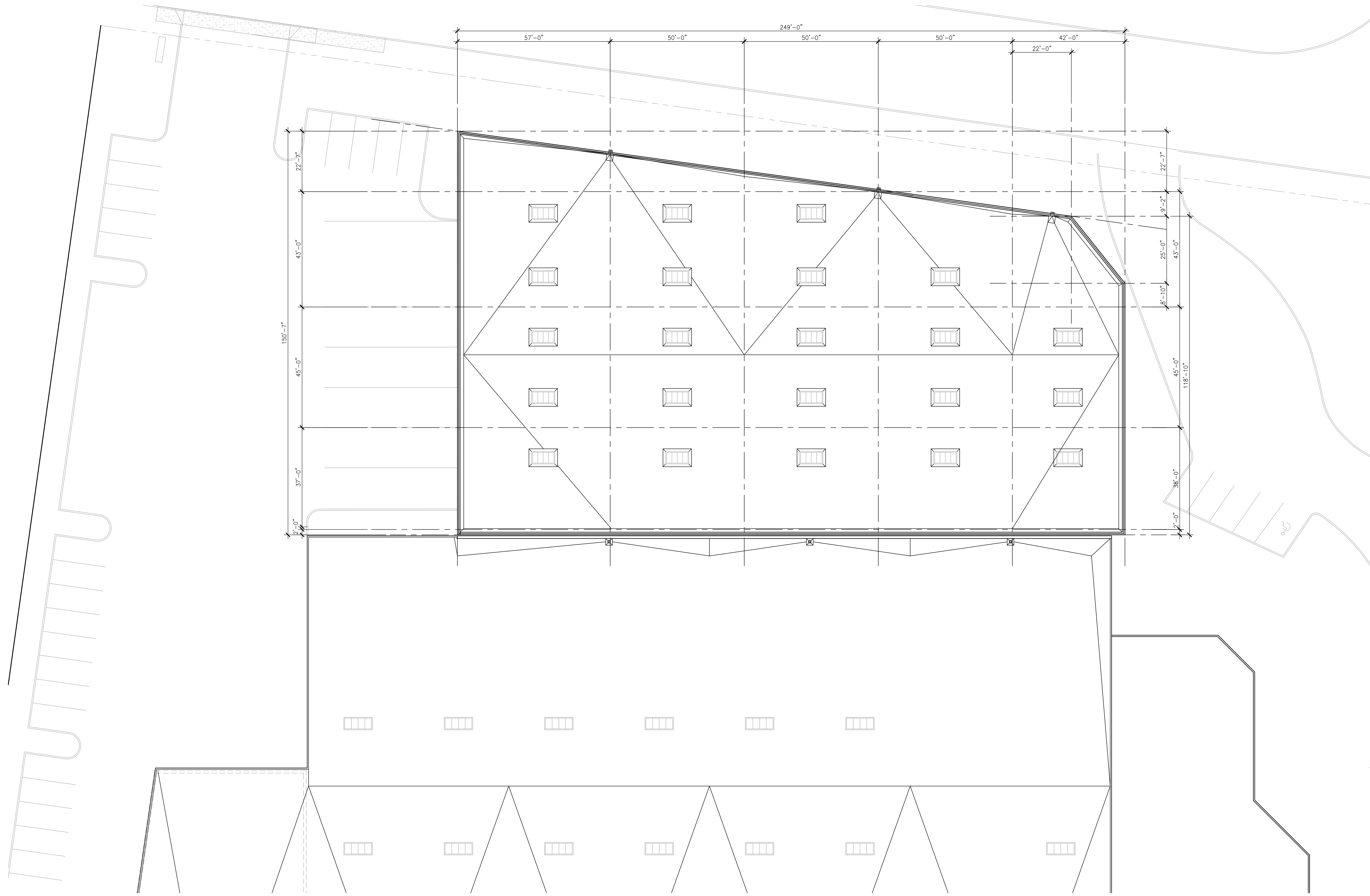
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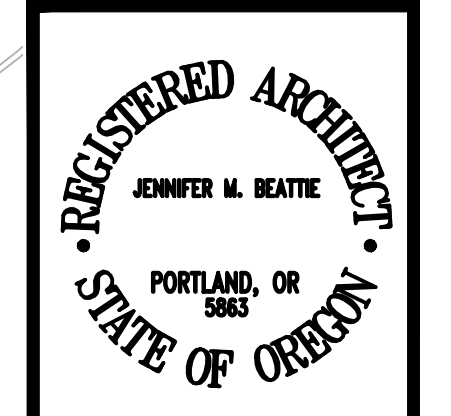
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FLOOR PLAN
A11
 CIDA JOB NUMBER:
 170220.01

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1 ROOF PLAN
 1/16" = 1'-0"



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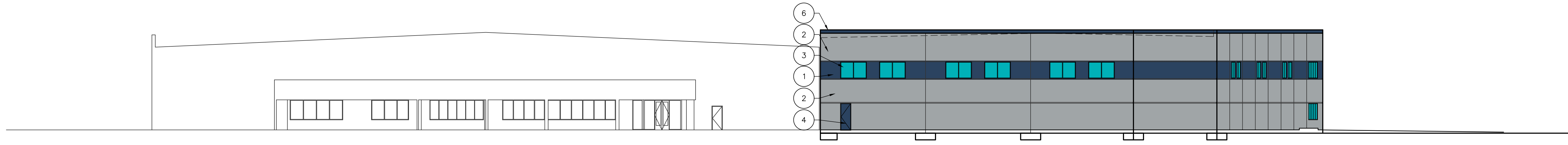
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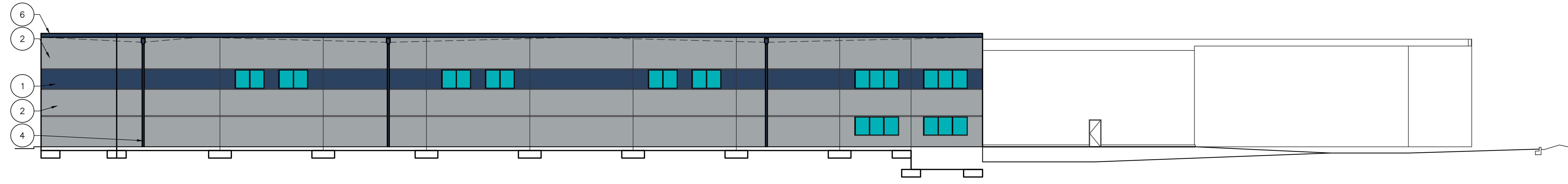
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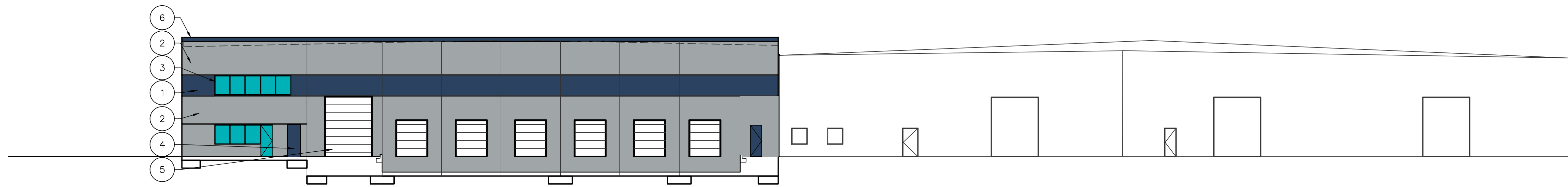
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1 SOUTH ELEVATION
 1/16" = 1'-0"



2 EAST ELEVATION
 1/16" = 1'-0"



3 NORTH ELEVATION
 1/16" = 1'-0"

- 1 PAINTED CONCRETE - SW 9176 DRESS BLUES
- 2 PAINTED CONCRETE - SW 7073 NETWORK GRAY
- 3 STOREFRONT - BLACK POWDER COATED FRAME
 - A. SHGC = 0.29
 - B. SHADE COEFFICIENT = 0.34
 - C. VISIBLE LIGHT = 44%
 - D. WINTER U VALUE = 0.35
 - E. SUMMER U VALUE = 0.27
- 4 MAN DOOR - NO GLAZING PAINTED DRESS BLUE
- 5 DOCK DOOR - PRE FINISHED WHITE
- 6 METAL COPING - PRE FINISHED METAL SW 9176 DRESS BLUE
- 7 METAL DOWNSPOUT - PRE FINISHED METAL SW 9176 DRESS BLUES



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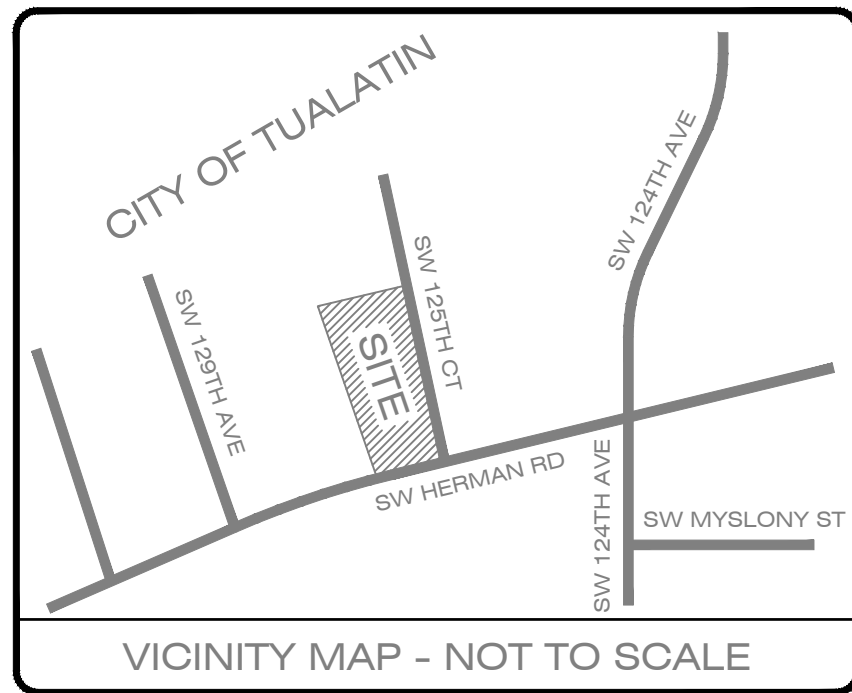
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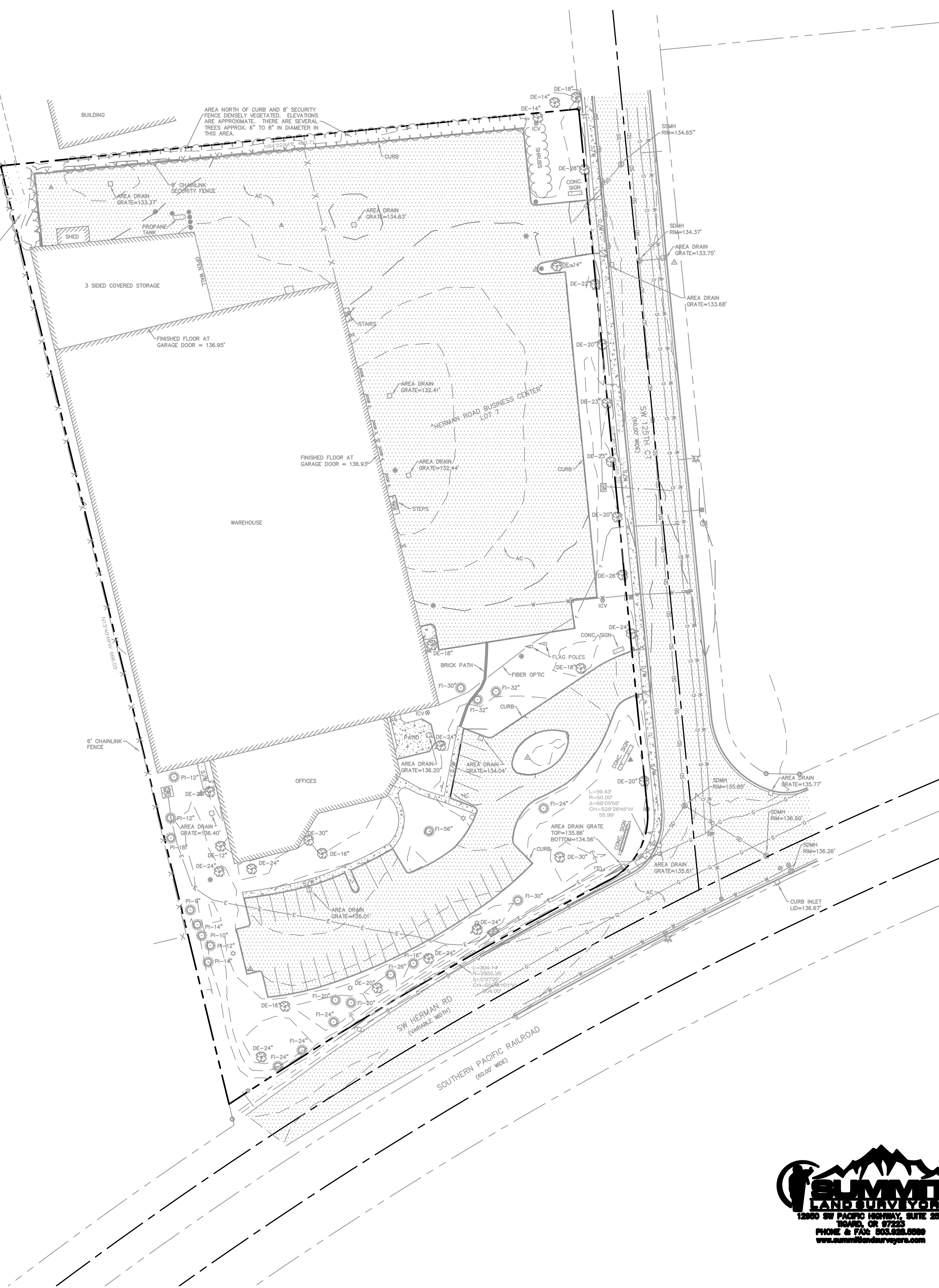
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SHEET
 ELEVATION
A2.1
 CIDA JOB NUMBER:
 170220.01

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UNABLE TO MAP AREA WEST OF PARKING CURB. DENSELY VEGETATED. ALSO A LARGE FALLEN TREE. THERE IS A SWALE IN THIS AREA AND MAY BE A STORM OUTLET STRUCTURE. BUT UNABLE TO GAIN ACCESS TO VERIFY.

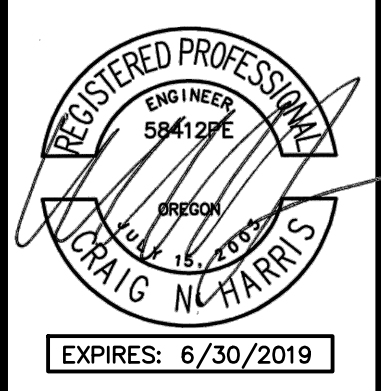
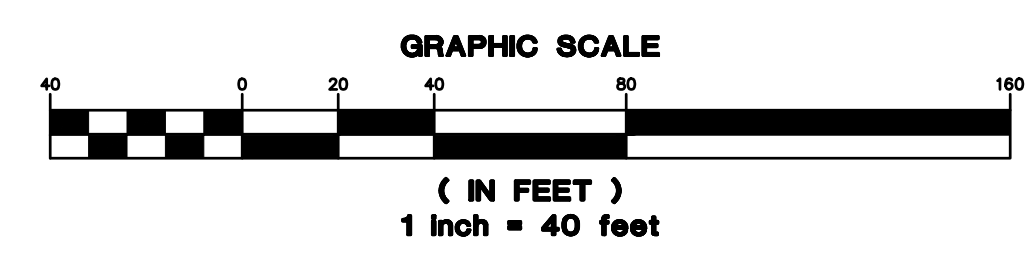
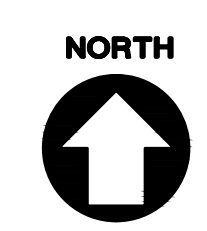


SHEET NOTES

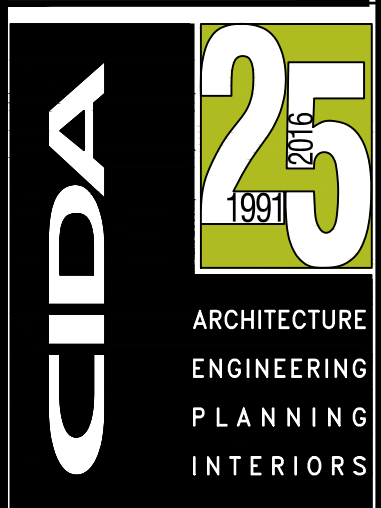
- BENCHMARK INFORMATION. WASHINGTON COUNTY BENCHMARK NO. 102. A BRASS DISK SET IN CONCRETE FILLED WITH STEEL AT THE NORTHWEST CORNER OF THE INTERSECTION OF SW CIPOLE ROAD AND THE SOUTHERN PACIFIC RAIL ROAD CROSSING (P# 789.5). ELEVATION 157.296'
- SOURCE INFORMATION FROM PLANS AND MARKINGS HAVE BEEN COMBINED WITH OBSERVED ABOVE GROUND EVIDENCE OF UTILITIES TO DEVELOP A VIEW OF THE UNDERGROUND UTILITIES AS THEY APPEAR HEREON. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. IN ADDITION, IN SOME JURISDICTIONS, 811 OR OTHER SIMILAR UTILITY LOCATE REQUESTS FROM SURVEYORS MAY BE IGNORED OR RESULT IN AN INCOMPLETE RESPONSE. IF WE SUSPECT THIS HAS OCCURRED, WE WILL NOTE HEREON HOW THIS AFFECTED OUR ASSESSMENT OF THE LOCATION OF THE UTILITIES. IF ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION AND/OR A PRIVATE UTILITY LOCATE REQUEST MAY BE NECESSARY.
- MANHOLES SHOWN HEREON ARE TO CENTER OF MANHOLE LID, NOT CENTER OF STRUCTURE.
- A TITLE REPORT WAS NOT PROVIDED. EASEMENTS OR OTHER ISSUES OF TITLE MAY EXIST WHICH ARE NOT DEPICTED HEREON.

LEGENDS

CONCRETE WALL	
FLOW LINE	
FENCE	
MINOR CONTOUR	
MAJOR CONTOUR	
GUTTER LINE	
SANITARY SEWER LINE	
STORM DRAIN LINE	
GAS LINE	
WATER LINE	
COMMUNICATIONS LINE	
ELECTRIC LINE	
FIRE DEPARTMENT CONNECTION	
FIRE HYDRANT	
WATER METER/SERVICE	
DOWN SPOUT	
STORM DRAIN MANHOLE	
CATCH BASIN/AREA DRAIN	
SANITARY SEWER MANHOLE	
UTILITY CLEAN OUT	
UTILITY VALVE	
UTILITY POLE	
UTILITY GUY WIRE	
LIGHT POLE	
GROUND LIGHT (LANDSCAPE)	
ELECTRIC PEDESTAL	
ELECTRIC VAULT	
TELEPHONE MANHOLE	
COMMUNICATION PEDESTAL	
SIGN POST	
MAILBOX	
BOLLARD	
HANDICAP PARKING	
DECIDUOUS TREE	
EVERGREEN TREE	



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EXISTING CONDITIONS

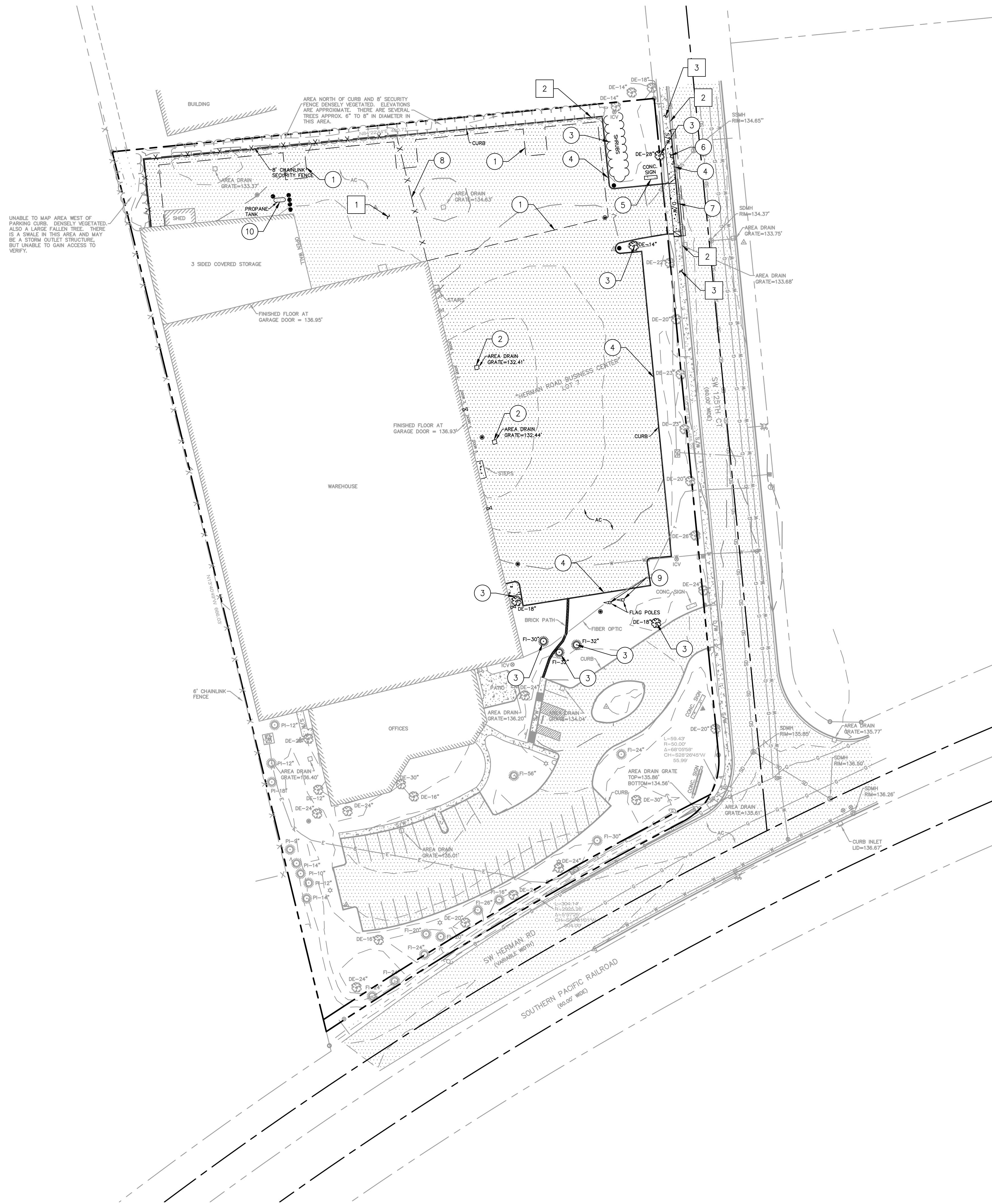
DATE: 04/16/18
DRAWN: NJD
CHECKED: NWS

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JOB NUMBER:
A17116.11



SHEET NOTES

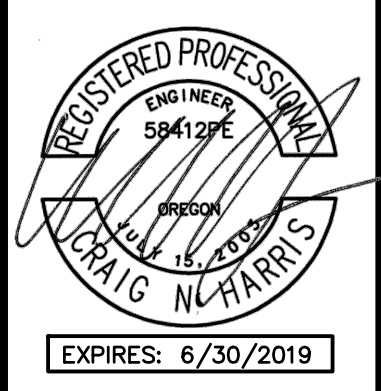
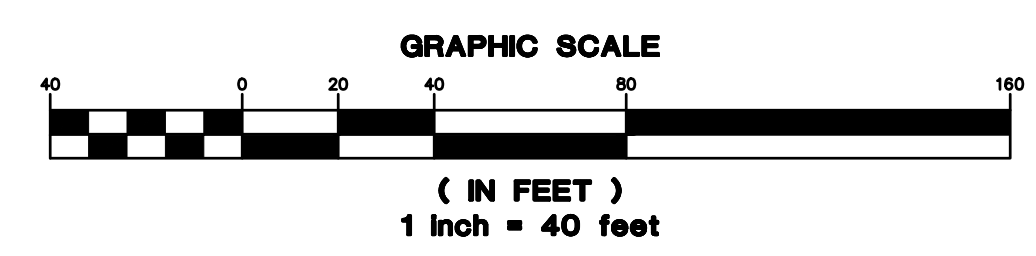
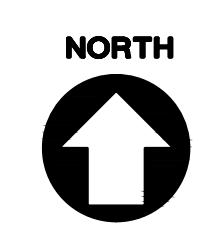
1. CONTRACTOR MAY STAGE WITHIN LIMITS OF DEMOLITION.
2. REMOVE ALL SITE COMPONENTS AND RECYCLE COMPONENTS AS REQUIRED IN THE SPECIFICATIONS.
3. ALL TRADE LICENSES AND PERMITS NECESSARY FOR THE PROCUREMENT AND COMPLETION OF THE WORK SHALL BE SECURED BY THE CONTRACTOR PRIOR TO COMMENCING DEMOLITION.
4. THE CONTRACTOR SHALL PRESERVE AND PROTECT FROM DAMAGE ALL EXISTING RIGHT-OF-WAY SURVEY MONUMENTATION DURING DEMOLITION. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND PAYING FOR THE REPLACEMENT BY A LICENSED SURVEYOR OF ANY DAMAGED OR REMOVED MONUMENTS.
5. PROTECT ALL ITEMS ON ADJACENT PROPERTIES AND IN THE RIGHT OF WAY INCLUDING BUT NOT LIMITED TO SIGNAL EQUIPMENT, PARKING METERS, SIDEWALKS, STREET TREES, STREET LIGHTS, CURBS, PAVEMENT AND SIGNS. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ANY DAMAGED ITEMS TO ORIGINAL CONDITION.
6. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, AND OTHER FACILITIES IMMEDIATELY ADJACENT TO EXCAVATIONS FROM DAMAGES CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT AND OTHER HAZARDS.
7. SAWCUT STRAIGHT LINES IN SIDEWALK, AS NECESSARY.
8. CONTRACTOR IS RESPONSIBLE TO CONTROL DUST AND MUD DURING THE DEMOLITION PERIOD, AND DURING TRANSPORTATION OF DEMOLITION DEBRIS. ALL STREET SURFACES OUTSIDE THE CONSTRUCTION ZONE MUST BE KEPT CLEAN.
9. PROTECT ALL EXISTING UTILITY STRUCTURES AND UNDERGROUND MAINS TO REMAIN.
10. PROTECT ALL EXISTING VEGETATION TO REMAIN.

(X) DEMOLITION NOTES

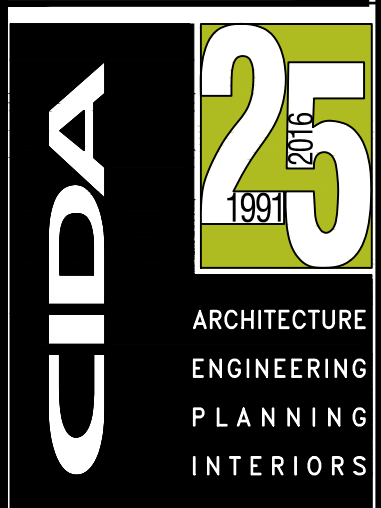
- 1 SAWCUT AND REMOVE ASPHALT
- 2 REMOVE CATCH BASIN
- 3 REMOVE TREE
- 4 REMOVE CURB
- 5 REMOVE SIGN
- 6 REMOVE SIDEWALK
- 7 REMOVE DRIVEWAY
- 8 REMOVE FENCE
- 9 REMOVE FLAG POLES
- 10 REMOVE PROPANE TANK TO BE RELOCATED TO PROPOSED AREA

(X) PROTECTION NOTES

- 1 PROTECT ASPHALT
- 2 PROTECT CURB
- 3 PROTECT SIDEWALK



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DEMOLITION PLAN

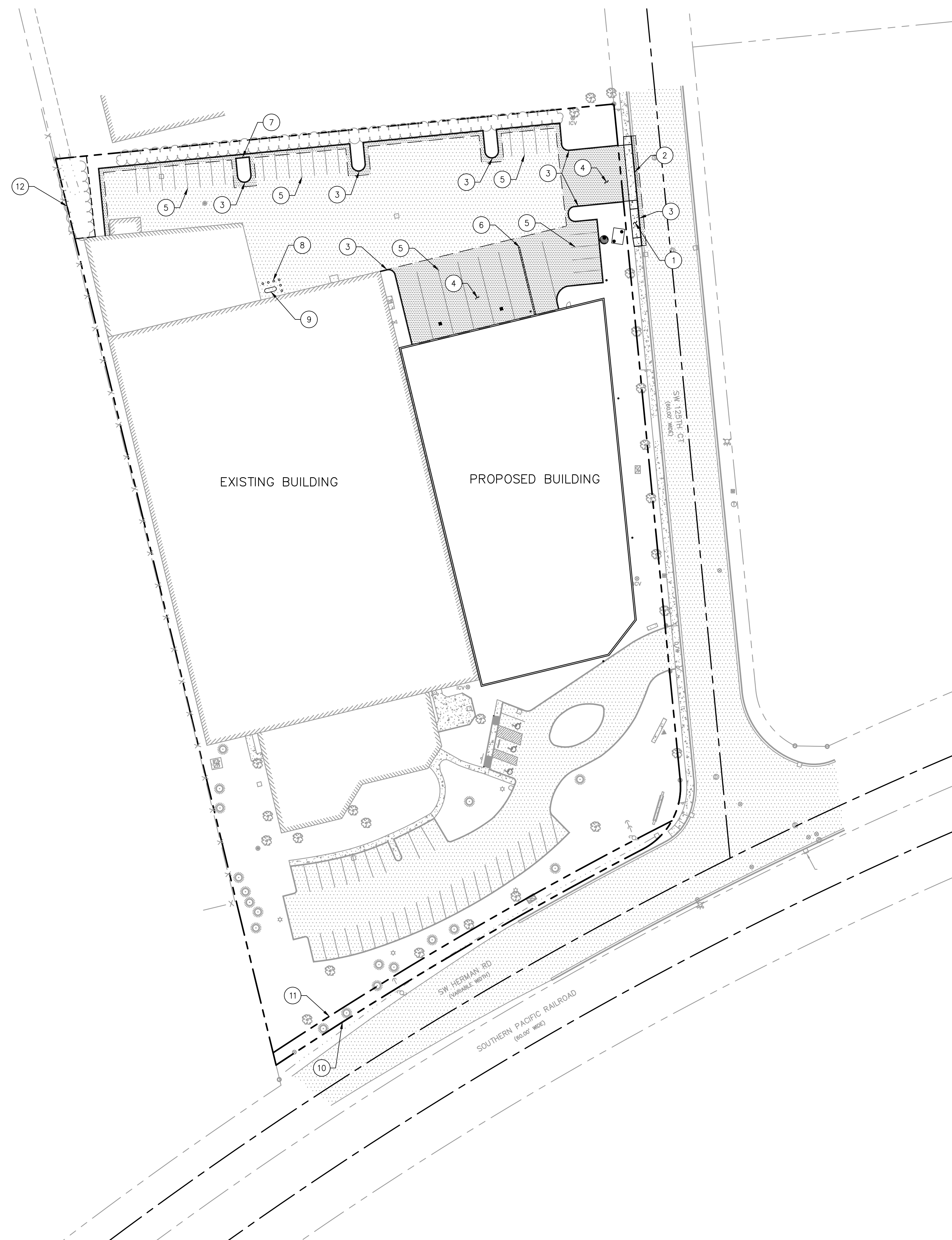
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SHEET NOTES

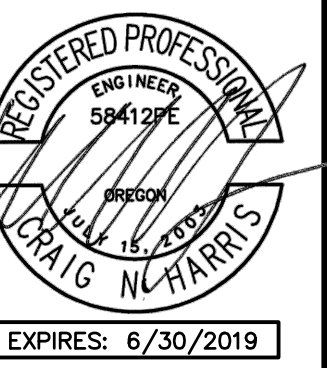
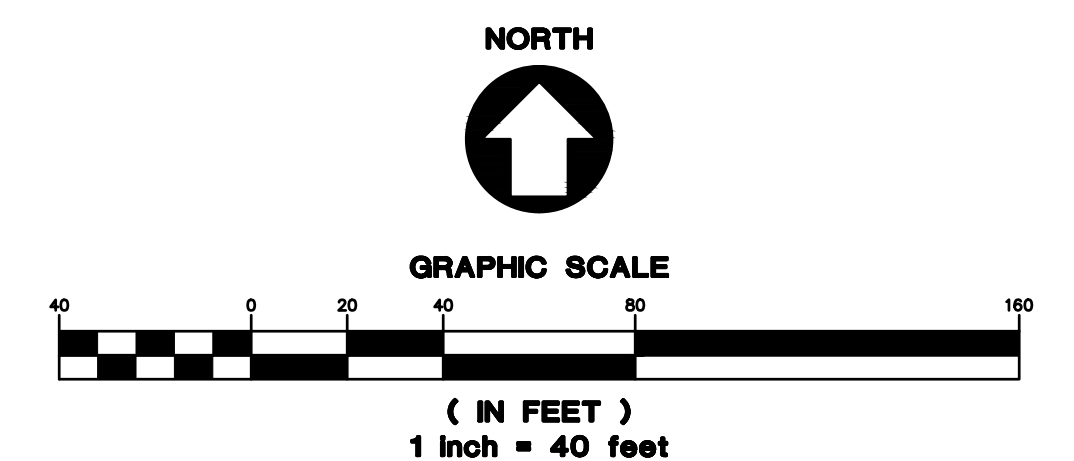
1. SEE ARCHITECTURAL PLANS FOR ADDITIONAL SITE INFORMATION.
2. THE CONTRACTOR SHALL HAVE A FULL SET OF THE CURRENT APPROVED CONSTRUCTION DOCUMENTS INCLUDING ADDENDA ON THE PROJECT SITE AT ALL TIMES.
3. THE CONTRACTOR SHALL KEEP THE ENGINEER AND JURISDICTION INFORMED OF CONSTRUCTION PROGRESS TO FACILITATE SITE OBSERVATIONS AT REQUIRED INTERVALS. 24-HOUR NOTICE IS REQUIRED.

LEGENDS

- PROPERTY LINE
- PROPOSED CURB
- CONCRETE SIDEWALK SURFACING
- ASPHALT SURFACING

(X) CONSTRUCTION NOTES

1. INSTALL SIDEWALK PER DETAIL 2/C4.0
2. INSTALL DRIVEWAY PER CITY OF TUALATIN DETAIL 441/C4.0
3. INSTALL CURB PER DETAIL 1/C4.0
4. INSTALL ASPHALT 3/C4.0
5. INSTALL STRIPING
6. INSTALL WALL
7. INSTALL 12" CURB FLOW THROUGH
8. INSTALL PIPE BOLLARD PER DETAIL 5/C4.0
9. RELOCATE EXISTING PROPANE TANK
10. EXISTING RIGHT-OF-WAY
11. PROPOSED RIGHT-OF-WAY
12. AREA OF "FLOOD PLAIN" ON-SITE



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SITE PLAN

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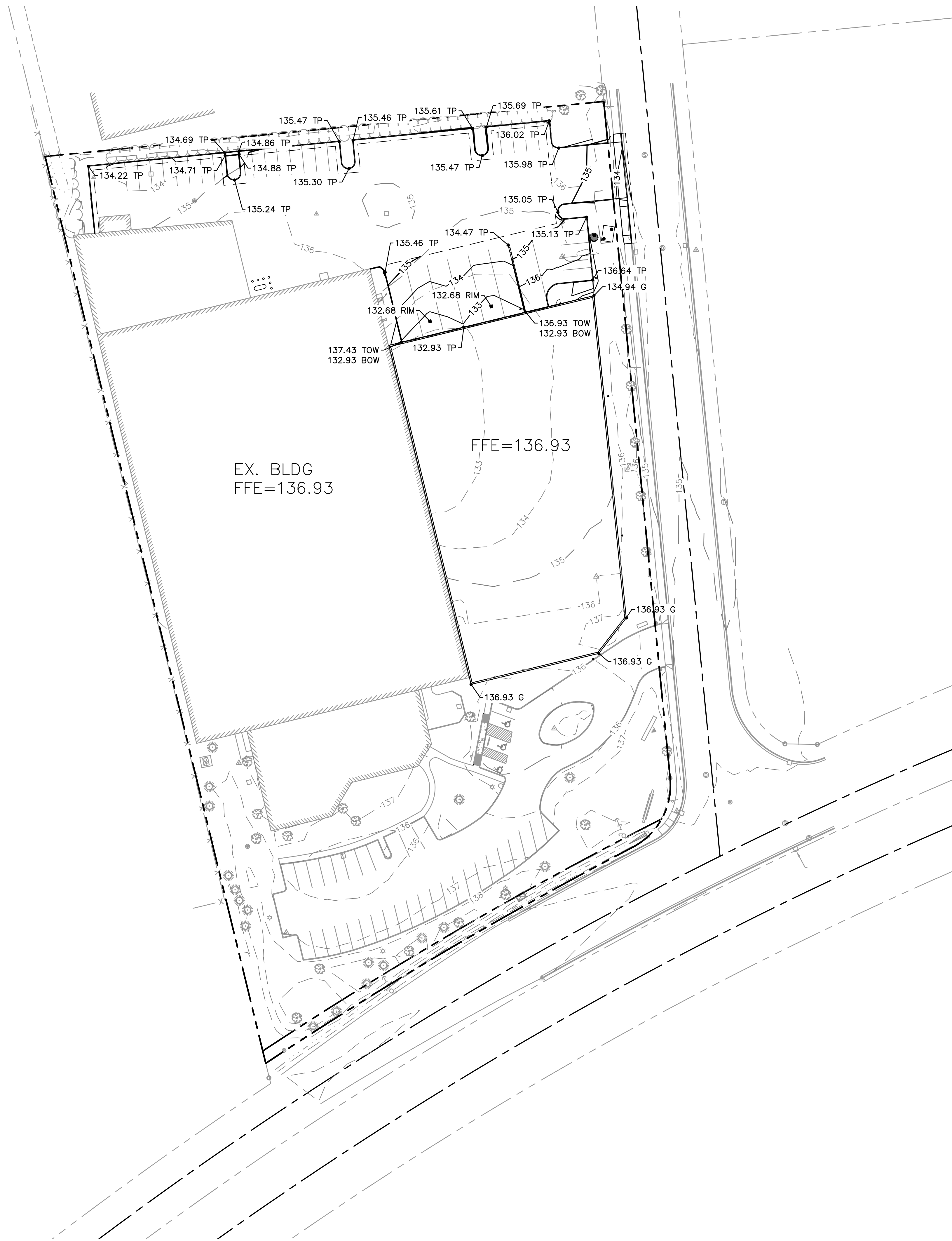
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JOB NUMBER:
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SHEET NOTES

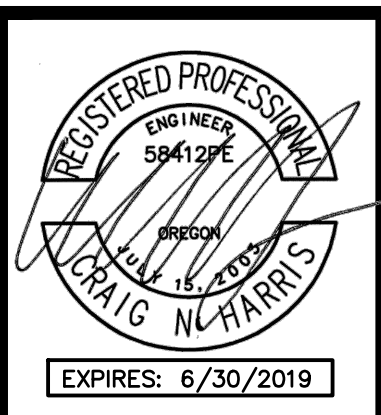
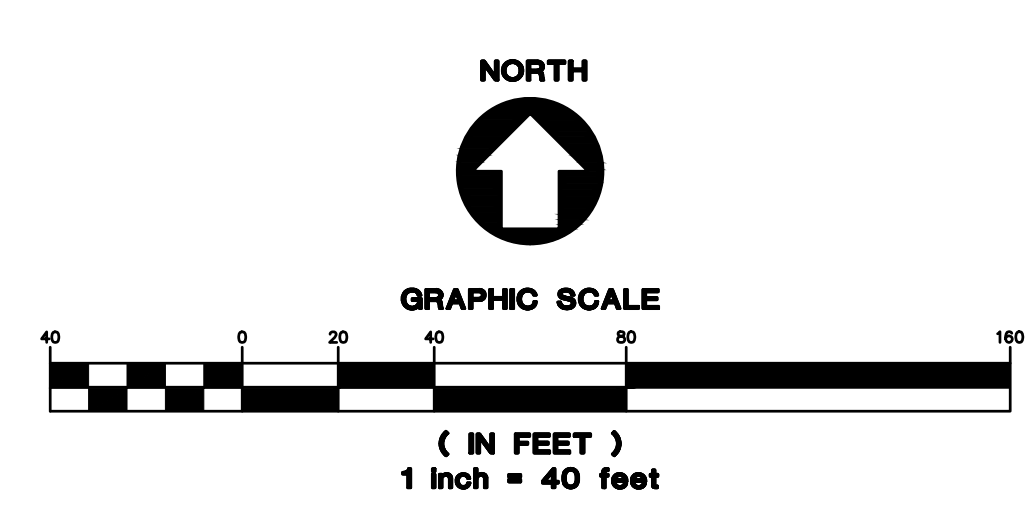
1. CURB HEIGHTS ARE 6" UNLESS NOTED OTHERWISE.
2. LANDINGS ON ACCESSIBLE ROUTES SHALL NOT EXCEED 2% IN ANY DIRECTION.
3. ALL ACCESSIBLE ROUTES SHALL COMPLY WITH CURRENT ADA ACCESSIBILITY GUIDELINES FOR BUILDING AND FACILITIES (ADAAG).
4. ALL WALKWAYS FROM ACCESSIBLE UNITS ARE DESIGNED TO NOT REQUIRE HANDRAILS. THEREFORE, RAMP WITH SLOPES STEEPER THAN 5.0% AND LESS THAN 8.33% SHALL NOT EXCEED 0.5' RISE OR 6.0' LENGTH.
5. FINISH GRADES ARE TO BE BROUGHT TO WITHIN 0.08 FT IN 10 FT OF THE GRADES SHOWN AT SUBGRADE AND TO WITHIN 0.03 FT IN 10 FT AT FINISH GRADE. CONTRACTOR TO ALLOW FOR PLACEMENT OF REQUIRED TOPSOIL IN ROUGH GRADING.
6. GRADING ELEVATIONS AS SHOWN ON SITE AND LANDSCAPE PLANS ARE FINISHED GRADE WHICH INCLUDES SUBGRADE SOIL, TOPSOIL, SOIL AMENDMENTS, ROCKERY AND RUNOFF PROTECTION CONTRACTOR IS RESPONSIBLE TO COORDINATE GRADING WITH BOTH EXCAVATOR AND LANDSCAPE CONTRACTOR.

GRADING LABEL LEGEND

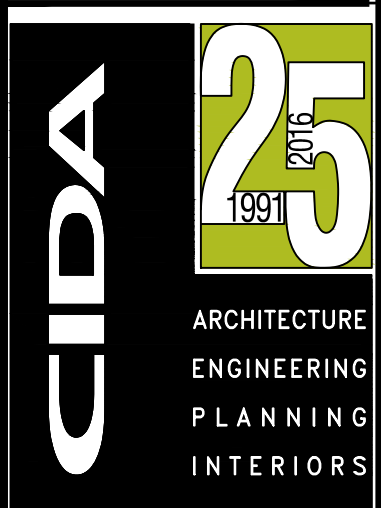
CALLOUT	DESCRIPTION
XX.XX	SPOT ELEVATION
XX	DESCRIPTION LISTED BELOW.
BOW	BOTTOM OF WALL
FFE	FINISHED FLOOR ELEVATION
G	GROUND
TOW	TOP OF WALL
TP	TOP OF PAVEMENT

LEGEND

EXISTING CONTOUR MINOR	--- 102 ---
EXISTING CONTOUR MAJOR	--- 100 ---
PROPOSED CONTOUR MINOR	--- 102 ---
PROPOSED CONTOUR MAJOR	--- 100 ---



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GRADING PLAN

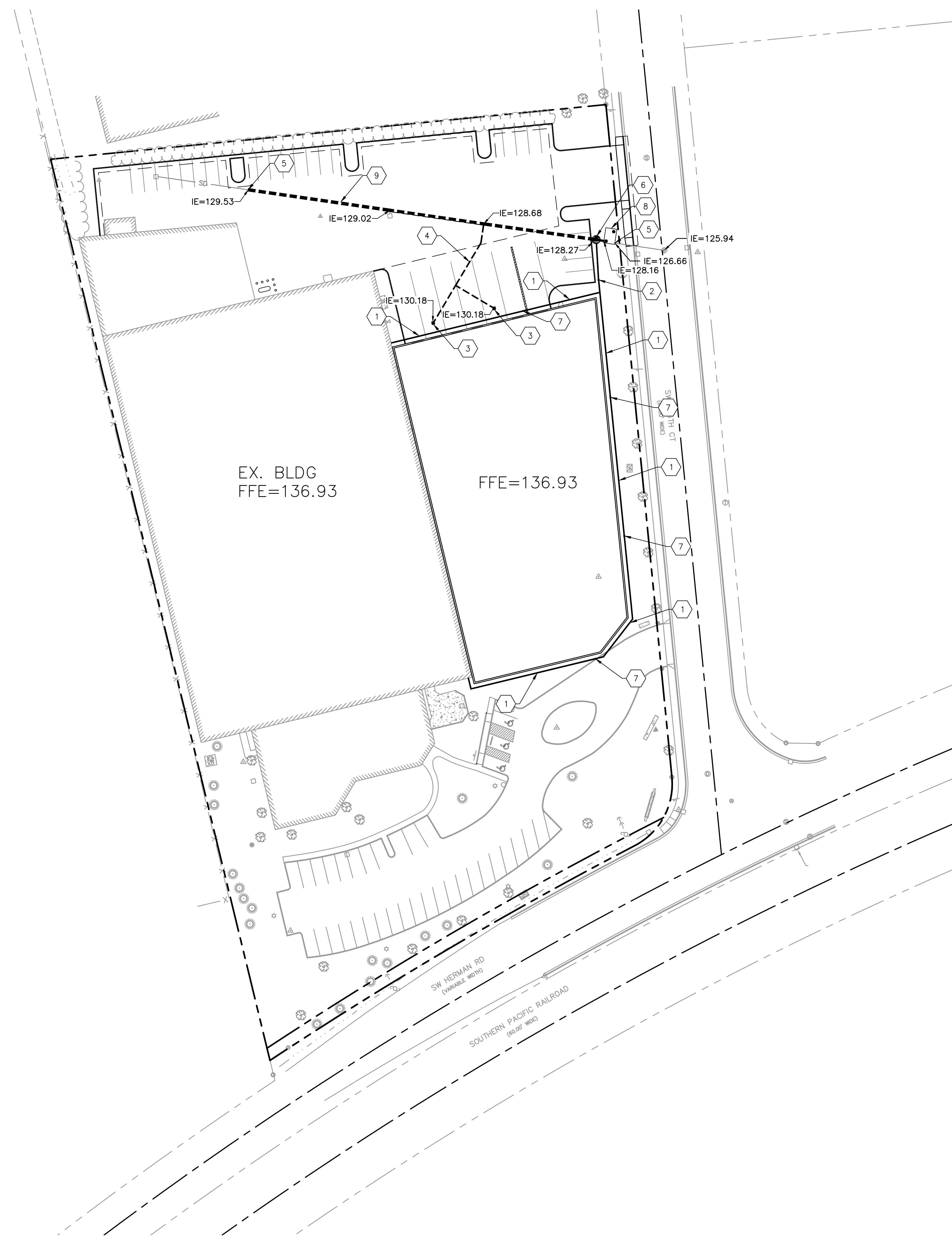
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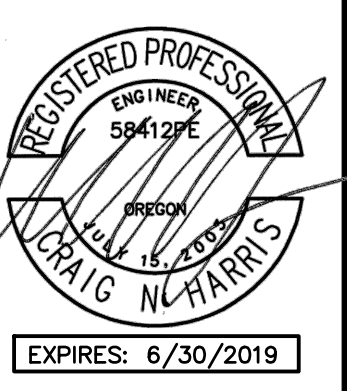
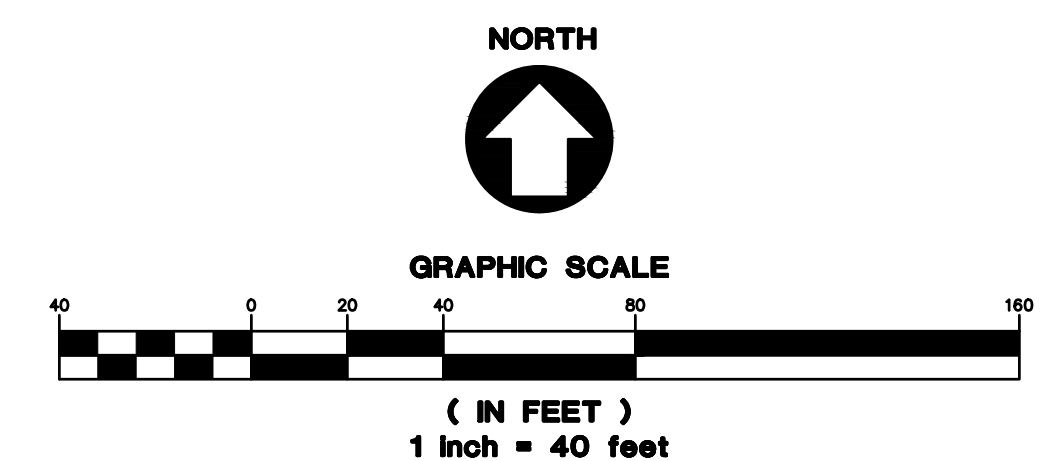


SHEET NOTES

1. PIPE BEDDING AND BACKFILL UTILITIES SHALL BE DONE PER DETAIL 7/C4.0.
2. INSTALL THRUST BLOCKS ON FIRE AND WATER LINES PER DETAIL 2/C4.1.
3. THIS PLAN IS GENERALLY DIAGRAMMATIC. IT DOES NOT SHOW EVERY JOINT, BEND, FITTING, OR ACCESSORY REQUIRED FOR CONSTRUCTION.
4. CLEAN OUTS SHALL BE INSTALLED IN CONFORMANCE WITH UPC CHAPTER SEVEN, SECTION 707 AND SECTION 719. NOT ALL REQUIRED CLEAN OUTS ARE SHOWN.
5. DOMESTIC WATER AND FIRE LINES AND ACCESSORIES BETWEEN THE WATER METER AND THE BUILDING SHALL BE INSTALLED BY A LICENSED PLUMBER EMPLOYED BY A LICENSED PLUMBING CONTRACTOR.
6. UTILITIES WITHIN FIVE FEET OF A BUILDING SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR INTERIOR USE AS DESCRIBED IN THE CURRENT EDITION OF THE UPC.
7. INLETS AND OUTLETS TO ON-SITE MANHOLES SHALL HAVE FLEXIBLE CONNECTION NO CLOSER THAN 12" AND NO FARTHER THAN 36" FROM THE MANHOLE.
8. CONTRACTOR TO VERIFY EXISTING INVERTS PRIOR TO ORDERING MATERIALS. CONTACT ENGINEER OF RECORD IF DISCREPANCIES OCCUR.

(X) STORM NOTES

1. INSTALL FOUNDATION DRAIN PER DETAIL 6/C4.0
2. INSTALL BACKWATER VALVE, PRODUCT BY CLEAN CHECK
3. INSTALL CATCH BASIN PER DETAIL 3/C4.1
4. 6" PIPE AT 2% MIN
5. TIE TO EXISTING STORM PIPE
6. INSTALL 60" FLOW CONTROL MANHOLE PER DETAIL 4/C4.1
7. INSTALL CLEANOUT PER DETAIL 1/C4.1
8. INSTALL 8'x11' PEAK DIVERSION FILTER VAULT PER CONTECH DETAIL ON C4.1
9. 250 LF - 21" DETENTION PIPE @ 0.5%.



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UTILITY PLAN

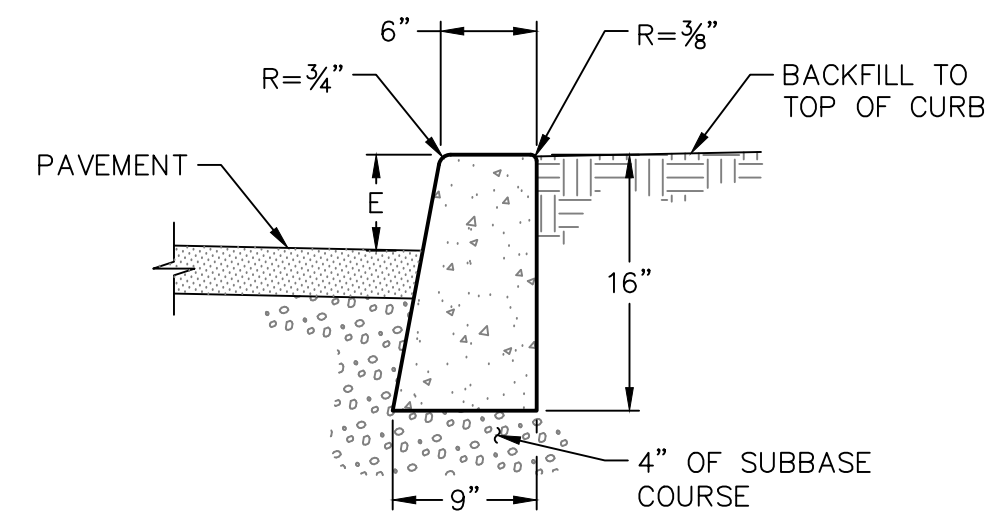
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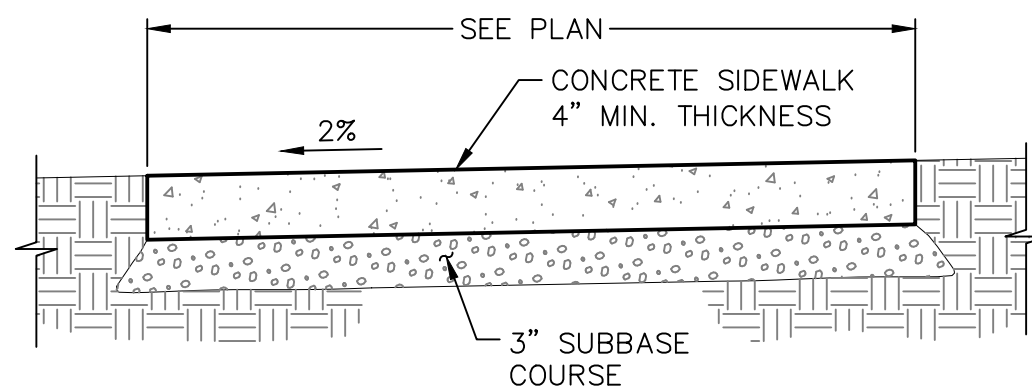
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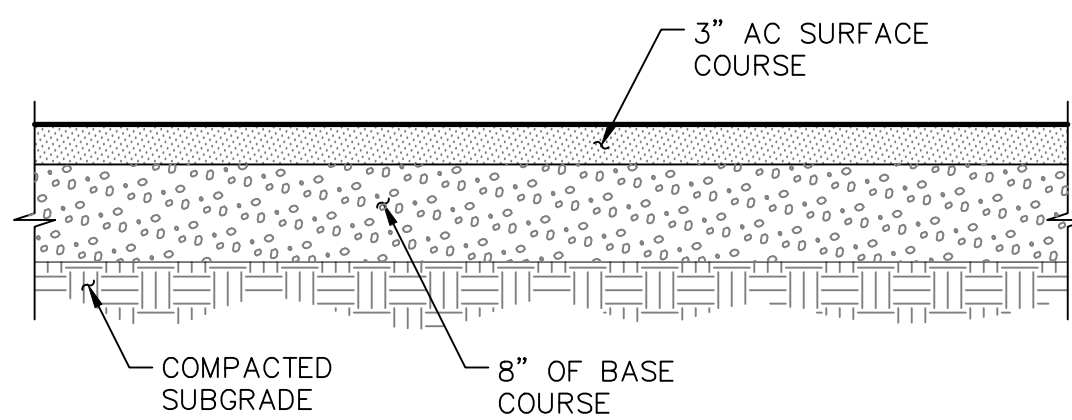
- NOTES:**
- CURB EXPOSURE 'E' = 6", TYP. VARY AS SHOWN ON PLANS OR AS DIRECTED.
 - CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
 - TOPS OF ALL CURBS SHALL SLOPE TOWARD THE ROADWAY AT 2% UNLESS OTHERWISE SHOWN OR AS DIRECTED.
 - DIMENSIONS ARE NOMINAL AND MAY VARY TO CONFORM WITH CURB MACHINE AS APPROVED BY THE ENGINEER.

1 CONCRETE CURB - STANDARD
SCALE: NTS

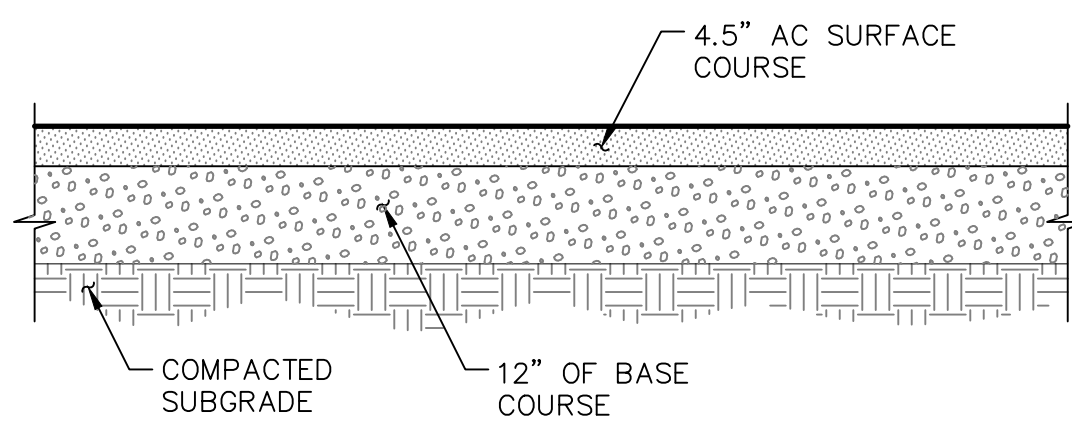


- NOTES:**
- CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX SPACING, AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY, UNLESS NOTED OTHERWISE.

2 CONCRETE SIDEWALK
SCALE: NTS

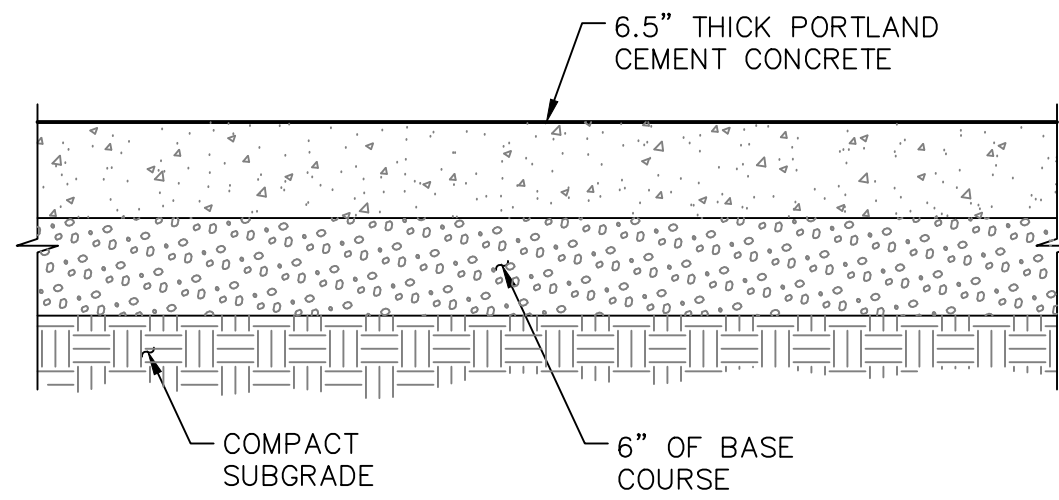


CARS:



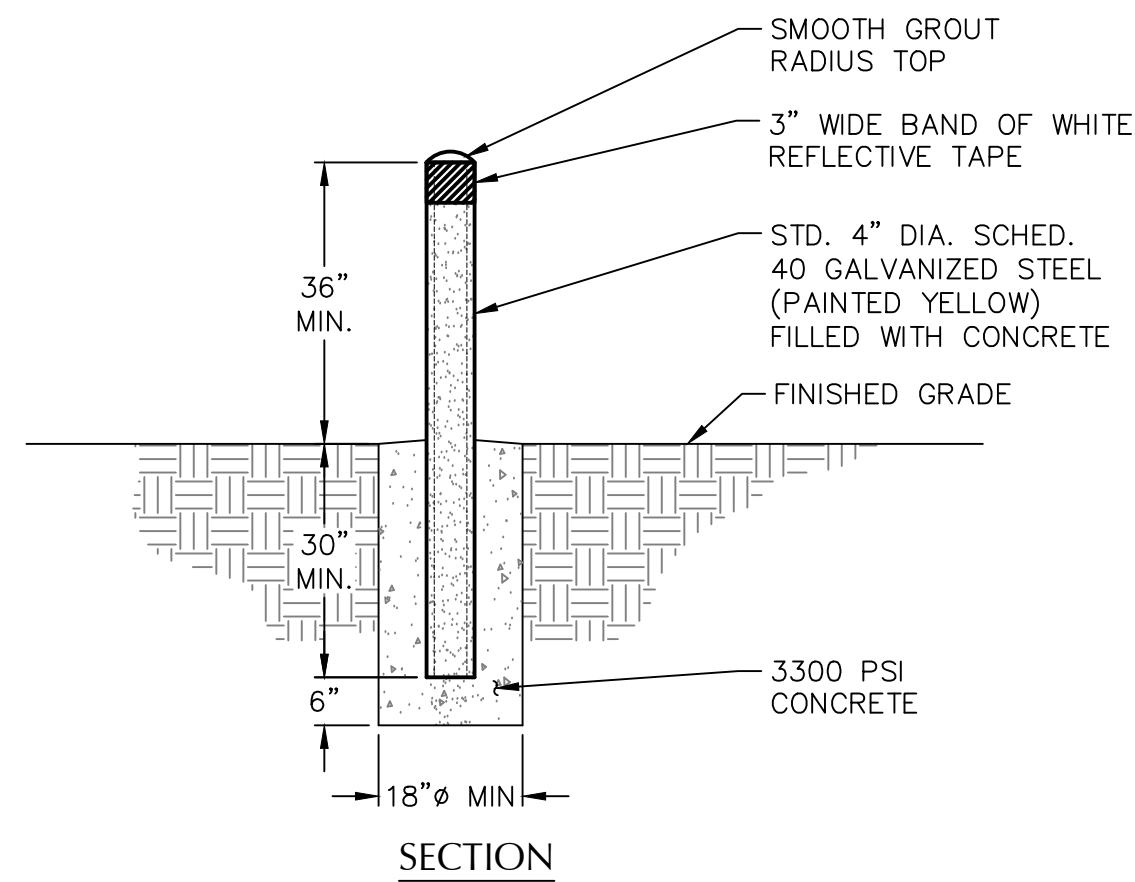
TRUCKS:

3 ASPHALT PAVEMENT SECTION
SCALE: NTS

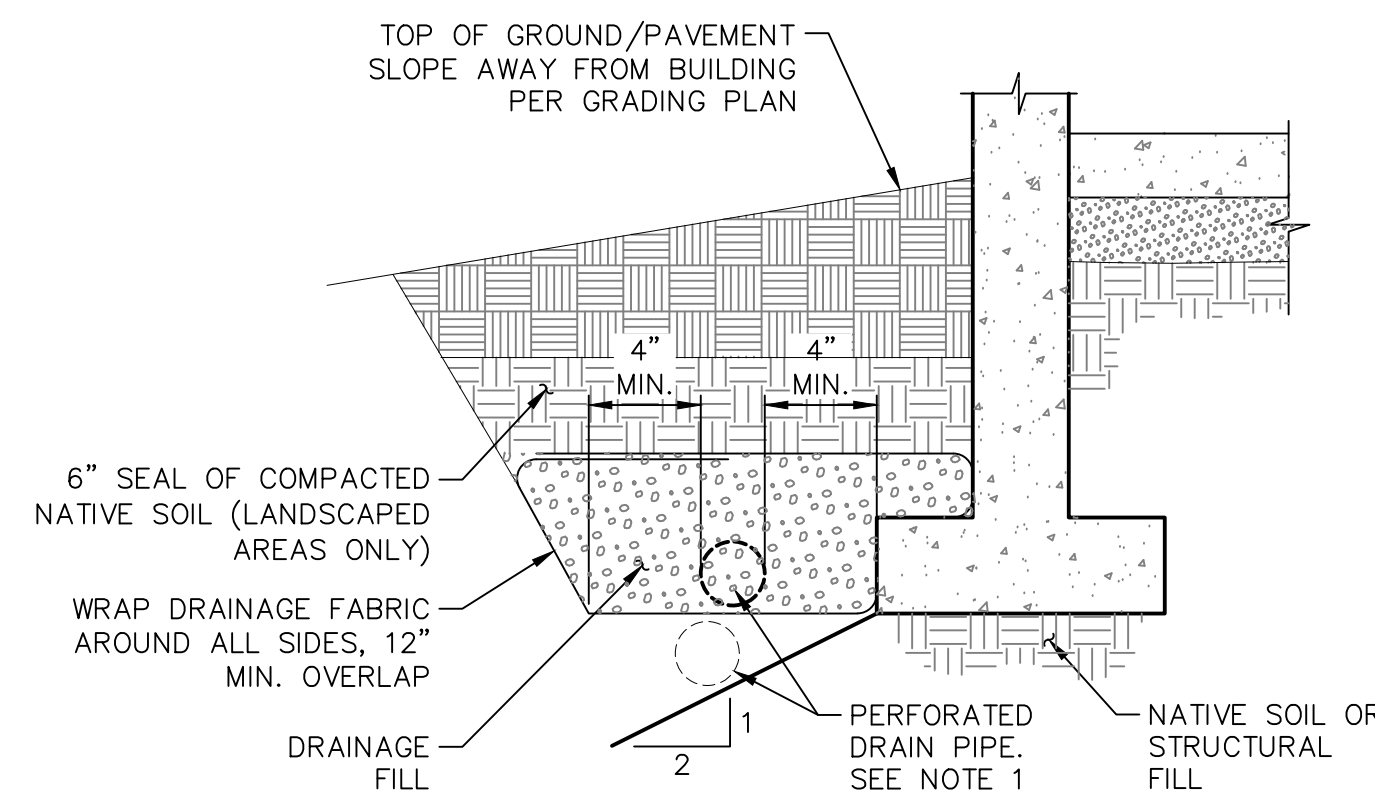


- NOTES:**
- CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX. SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
 - PROVIDE MEDIUM TO COARSE BROOM FINISH.

4 CONCRETE PAVEMENT SECTION
SCALE: NTS

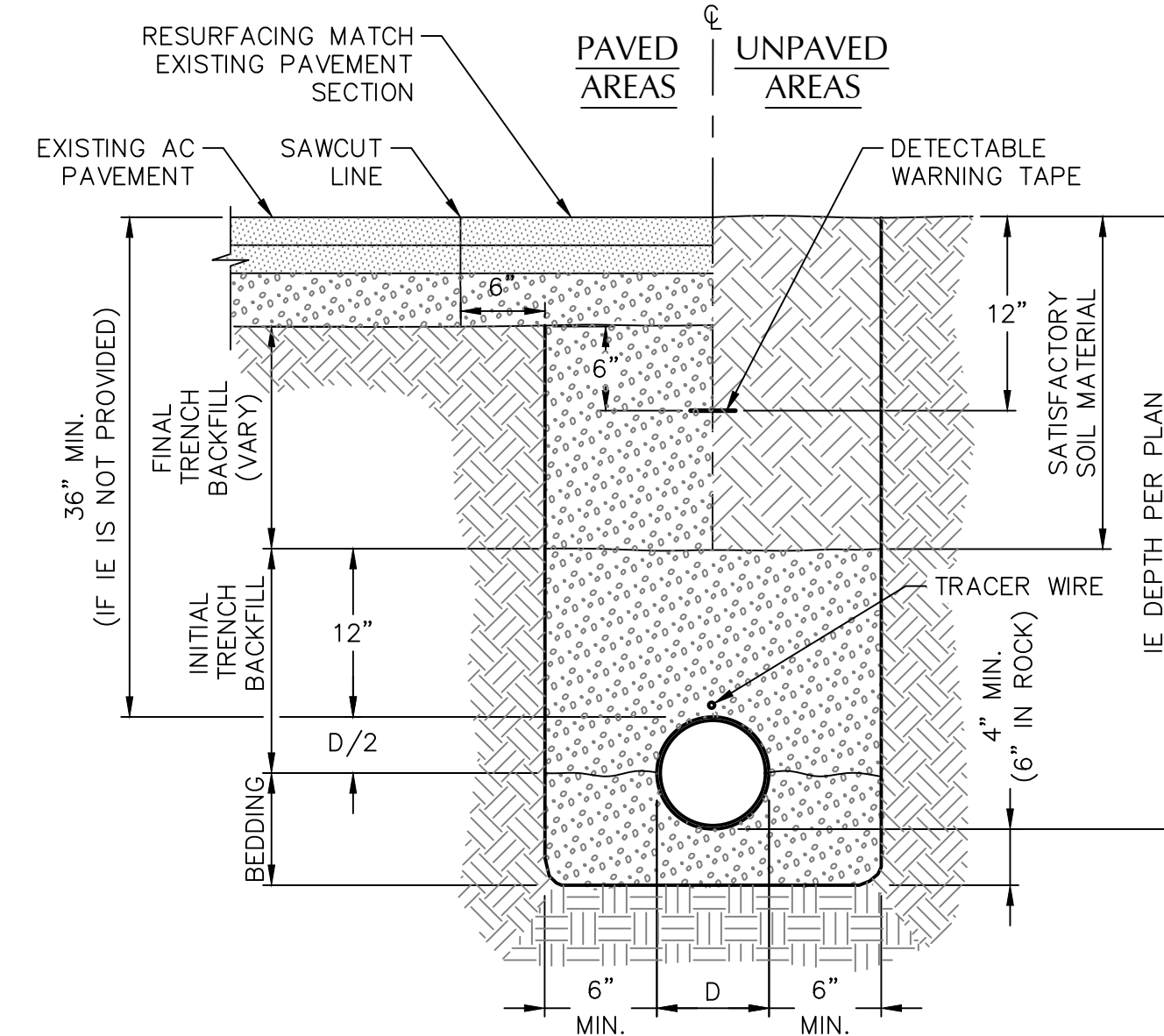


5 PIPE BOLLARD (4" DIA)
SCALE: NTS

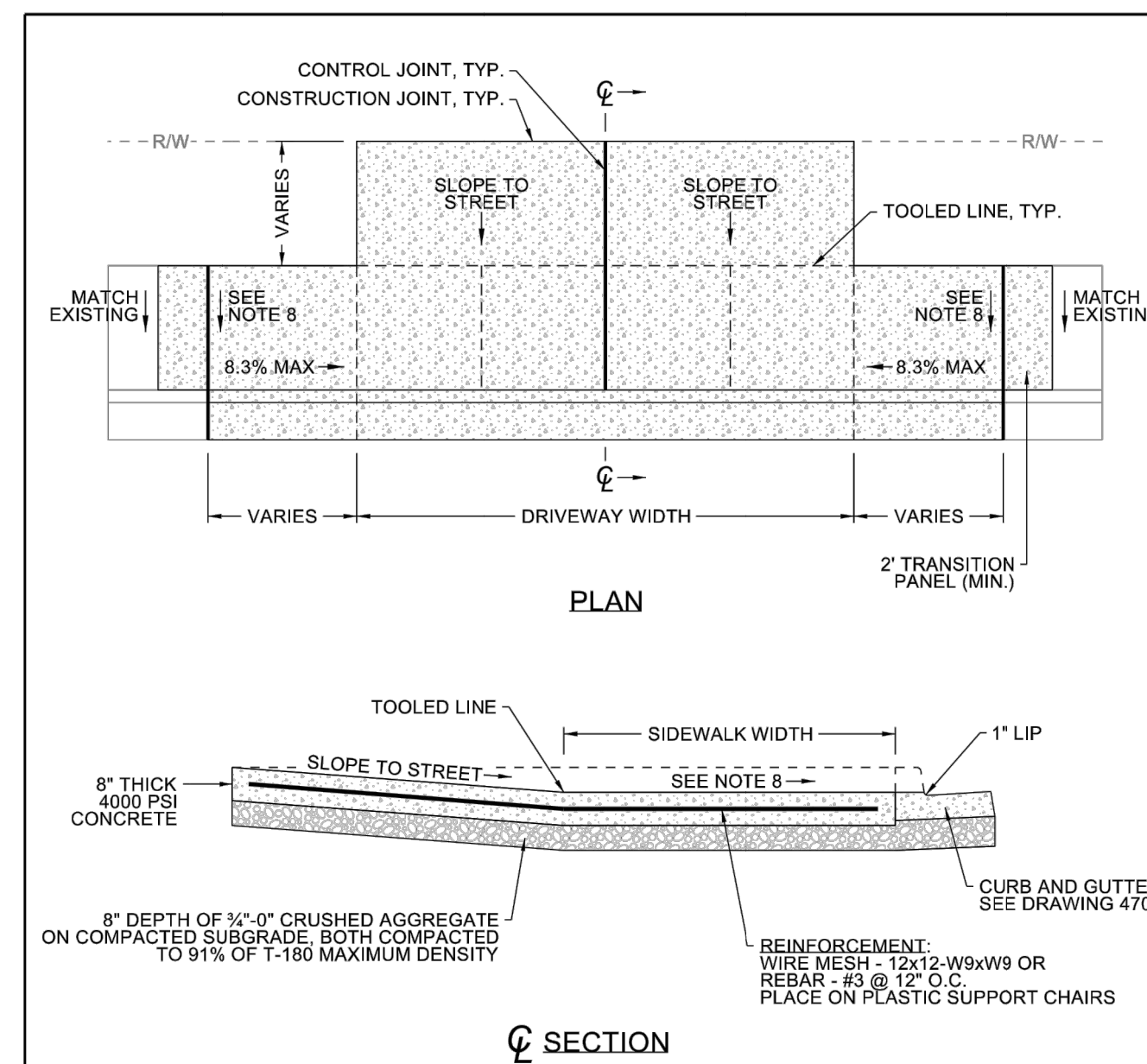


- NOTES:**
- LAY PERFORATED DRAIN PIPE ON MIN. 0.5% GRADIENT, WIDENING EXCAVATION AS REQUIRED. MAINTAIN PIPE ABOVE 2:1 SLOPE AS SHOWN.
 - CONNECT TO FOUNDATION DRAIN STUBOUT SHOWN ON PLANS.

6 PERIMETER FOUNDATION DRAIN
SCALE: NTS

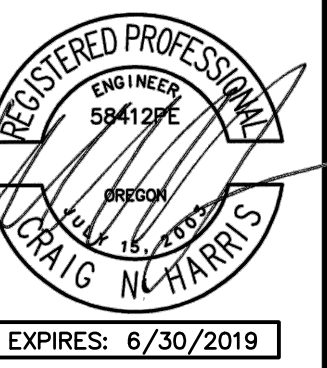


7 TYPICAL PIPE BEDDING AND BACKFILL
SCALE: NTS



- NOTES:**
- CONTROL JOINTS SHALL BE WEAKENED PLANE TYPE FORMED TO A DEPTH 2-3/4" WITH TOOLED EDGES (1/4" R EDGE, 3" FLAT) EXCEPT IN CURB AND GUTTER (1/4" R EDGE ONLY). NO MESH ACROSS CONTROL JOINTS.
 - TOOLED LINES ARE FOR COMESTIC PURPOSES ONLY. 1/4" R EDGE, 3" FLAT.
 - FOR LOCATION AND WIDTH OF DRIVEWAYS, MEET THE REQUIREMENTS OF THE TUALATIN DEVELOPMENT CODE.
 - FINISH CONCRETE APPROACH RAMP WITH BRUSH FINISH TRANSVERSE TO CENTERLINE.
 - POUR APPROACH SLAB AND RAMPS (BOTH 8" THICK) MONOLITHIC WITH CURB AND GUTTER IF SO DIRECTED BY ENGINEER.
 - BEFORE OPENING TO TRAFFIC, ATTAIN 4,000 PSI COMPRESSIVE STRENGTH.
 - REMOVE THE CURB AND GUTTER IN ITS ENTIRETY AND POUR BACK AS A MONOLITHIC POUR IF AN EXISTING CURB AND GUTTER IS MODIFIED AS PART OF A DRIVEWAY APPROACH.
 - SIDEWALK CROSS SLOPE TO BE MAX 1.5% DESIGN SLOPE (2.0% MAX FINISHED SURFACE SLOPE).

CITY OF TUALATIN, OR		COMMERCIAL DRIVEWAY APPROACH CURBSIDE SIDEWALK	
REVISED: 04/07/2017	EFFECTIVE: 04/24/2017	SCALE:	DRAWING NO: 441
		DRAFTED BY: M. PALMER	APPROVED BY: J. FUCHS



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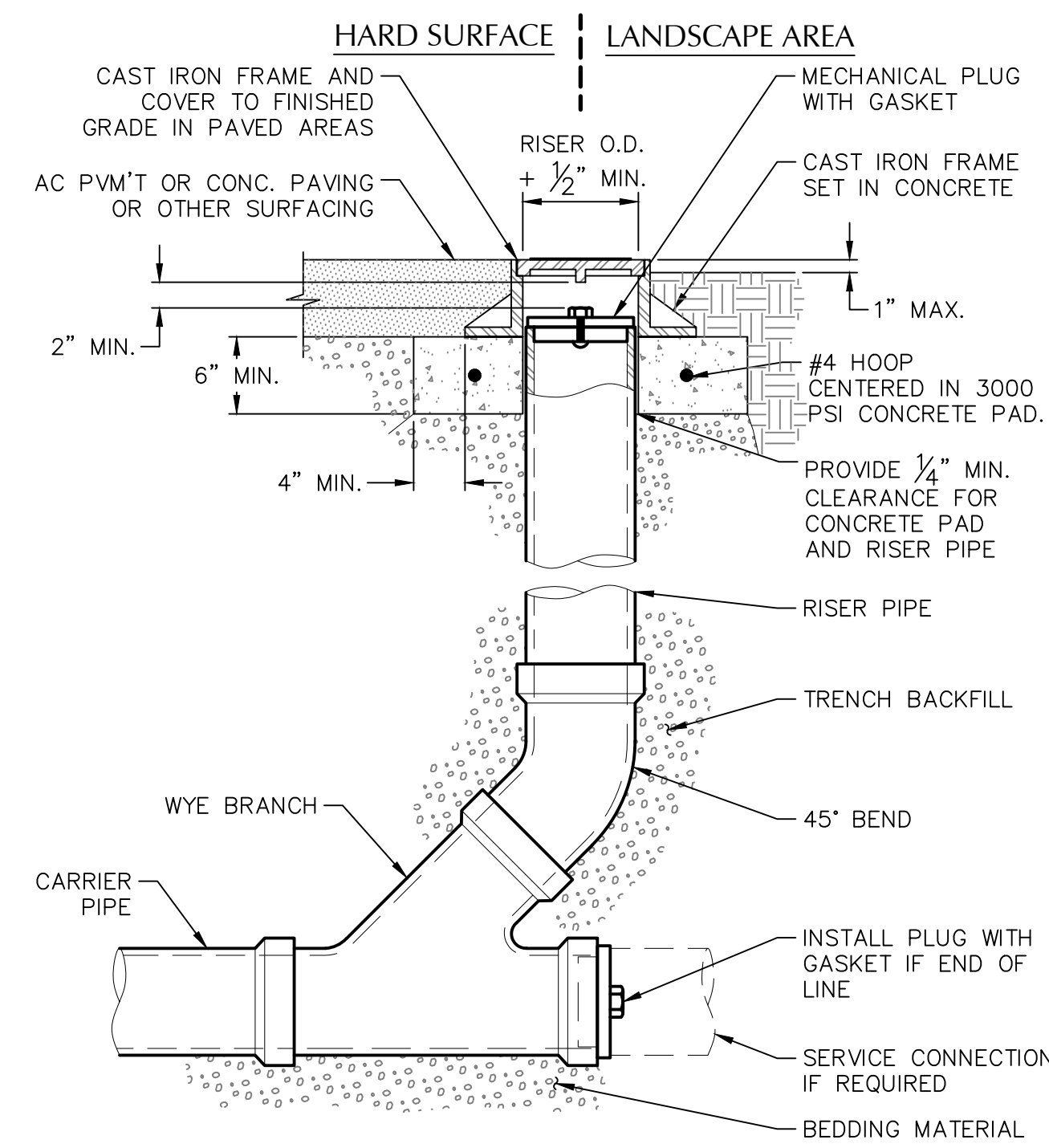
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SHEET
C4.0

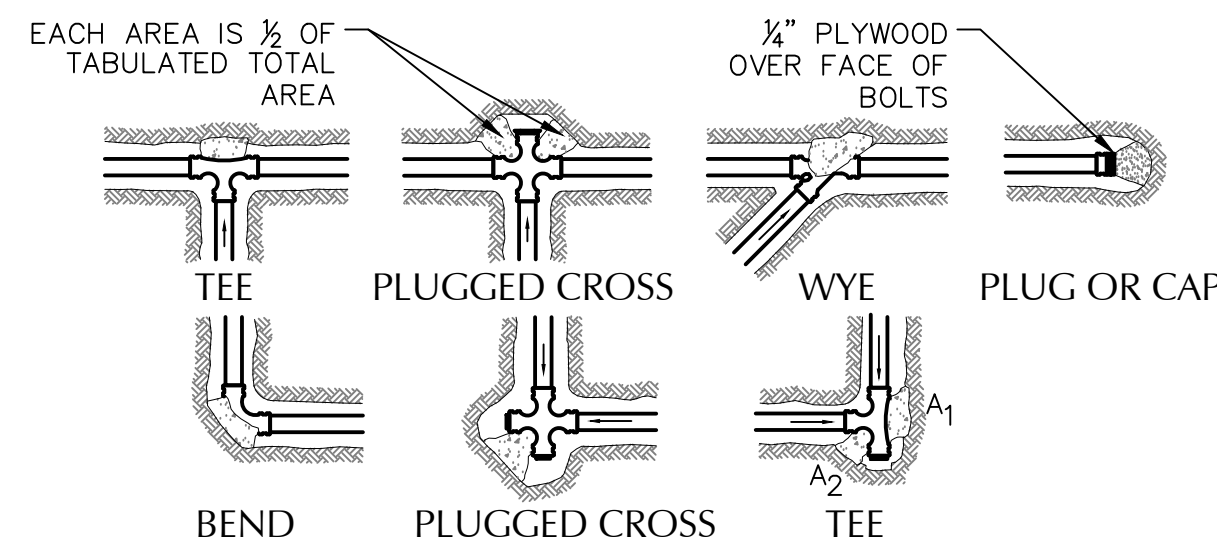
JOB NUMBER:
A17116.11



- NOTES:
1. CAST IRON FRAME AND COVER SHALL MEET H-20 LOAD REQUIREMENT.
 2. FOR CARRIER PIPE SIZE 6"Ø AND LESS, PROVIDE RISER PIPE SIZE TO MATCH CARRIER PIPE.
 3. FOR CARRIER PIPE SIZE 8"Ø AND LARGER, RISER PIPE SHALL BE 6"Ø.
 4. RISER PIPE MATERIAL TO MATCH CARRIER PIPE MATERIAL.

1 STANDARD CLEANOUT (COTG)

SCALE: NTS



1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
3. THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLAN; e.g. (15) INDICATES 15 SQUARE FEET BEARING AREA REQUIRED.
4. IF NOT SHOWN ON PLANS REQUIRED BEARING AREAS AT FITTING SHALL BE AS INDICATED BELOW, ADJUST IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS (ES) STATED IN THE SPECIAL SPECIFICATIONS.
5. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL.

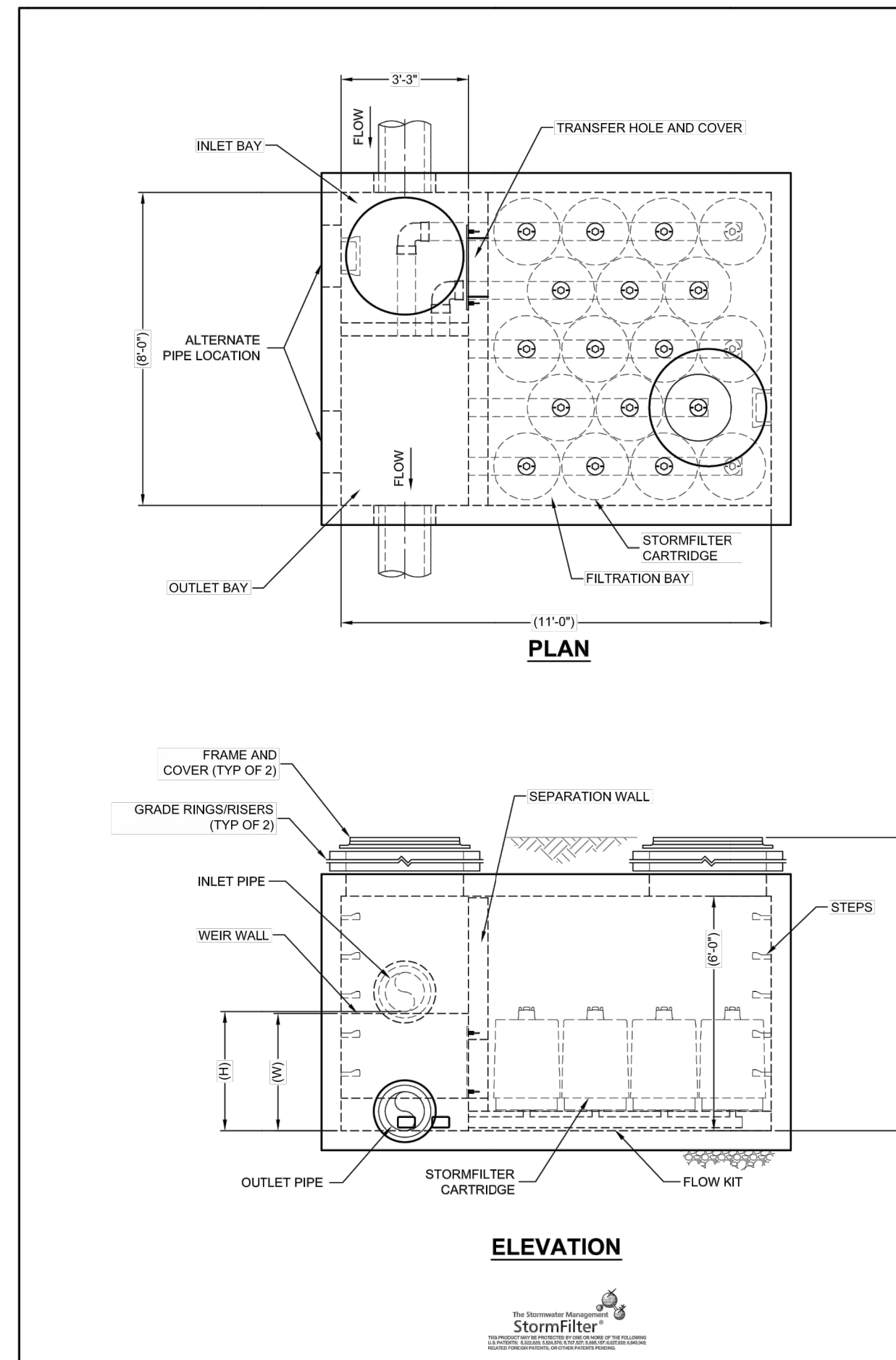
BEARING AREA OF THRUST BLOCK IN SQUARE FOOT

FITTING SIZE	TEE, WYE, PLUG, OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22½° BEND	11¼° BEND
			A1	A2			
4	1.0	1.4	1.9	1.4	1.0		
6	2.1	3.0	4.3	3.0	1.6	1.0	
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.4	1.2

NOTE: ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 p.s.i. AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 p.s.i.. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURE AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION: BEARING AREA = (TEST PRESSURE/150)X(2000/ SOIL BEARING STRESS)X(TABLE VALUE).

2 THRUST BLOCK

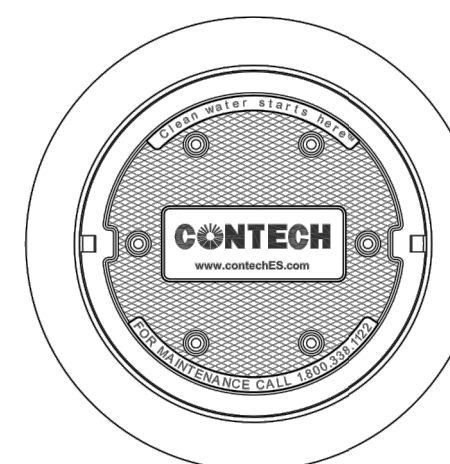
SCALE: NTS



STORMFILTER DESIGN TABLE

• THE 8' x 11' PEAK DIVERSION STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA
 • SPECIFIC FLOW RATE: PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD
 • THE PEAK DIVERSION STORMFILTER IS AVAILABLE IN A LEFT INLET (AS SHOWN) OR RIGHT INLET CONFIGURATION.
 • ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS OTHERWISE NOTED.

CARTRIDGE HEIGHT	27"	18"	LOW DROP
SYSTEM HYDRAULIC DROP (H - REGD. MIN.)	3.05'	2.3'	1.8'
HEIGHT OF WEIR (W)	2.20'	2.20'	2.20'
TREATMENT BY MEDIA SURFACE AREA	2 gpm/ft ²	2 gpm/ft ²	2 gpm/ft ²
CARTRIDGE FLOW RATE (gpm)	22.5	11.25	10



FRAME AND COVER (DIAMETER VARIES) N.T.S.

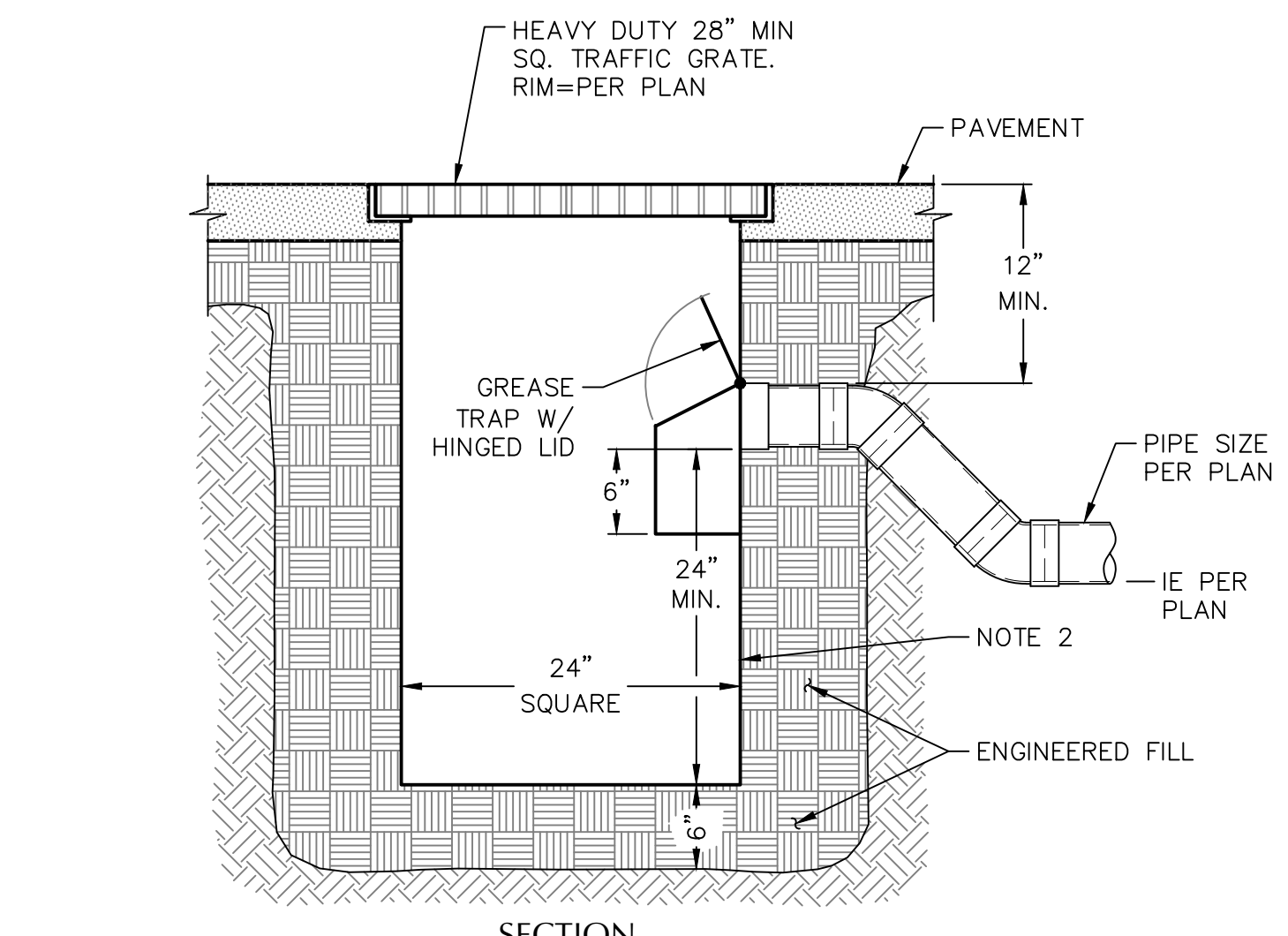
PERFORMANCE SPECIFICATION
 FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON-ACTUATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 37 SECONDS. SPECIFIC FLOW RATE SHALL BE 2 GPM/SF (MAXIMUM). SPECIFIC FLOW RATE IS THE MEASURE OF THE FLOW (GPM) DIVIDED BY THE MEDIA SURFACE CONTACT AREA (SF). MEDIA VOLUMETRIC FLOW RATE SHALL BE 6 GPM/SF OF MEDIA (MAXIMUM).

- GENERAL NOTES:**
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
 2. DIMENSIONS MARKED WITH (I) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
 3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE. www.contechES.com
 4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
 5. STRUCTURE SHALL MEET AASHTO H2020 LOAD RATING, ASSUMING EARTH COVER OF 7' ± AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M208 AND BE CAST WITH THE CONTECH LOGO.

- INSTALLATION NOTES:**
- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
 - B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE (LIFTING CLUTCHES PROVIDED).
 - C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL SECTIONS AND ASSEMBLE STRUCTURE.
 - D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
 - E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
 - F. CONTRACTOR TO REMOVE THE TRANSFER HOLE COVER WHEN THE SYSTEM IS BROUGHT ONLINE.

CONTECH ENGINEERED SOLUTIONS LLC
 www.contechES.com
 9025 Centre Pointe Dr., Suite 400, West Chester, OH 45389
 800-338-1122 513-645-7000 513-645-7893 FAX

THE STORMWATER MANAGEMENT STORMFILTER 8' x 11' PEAK DIVERSION STORMFILTER STANDARD DETAIL



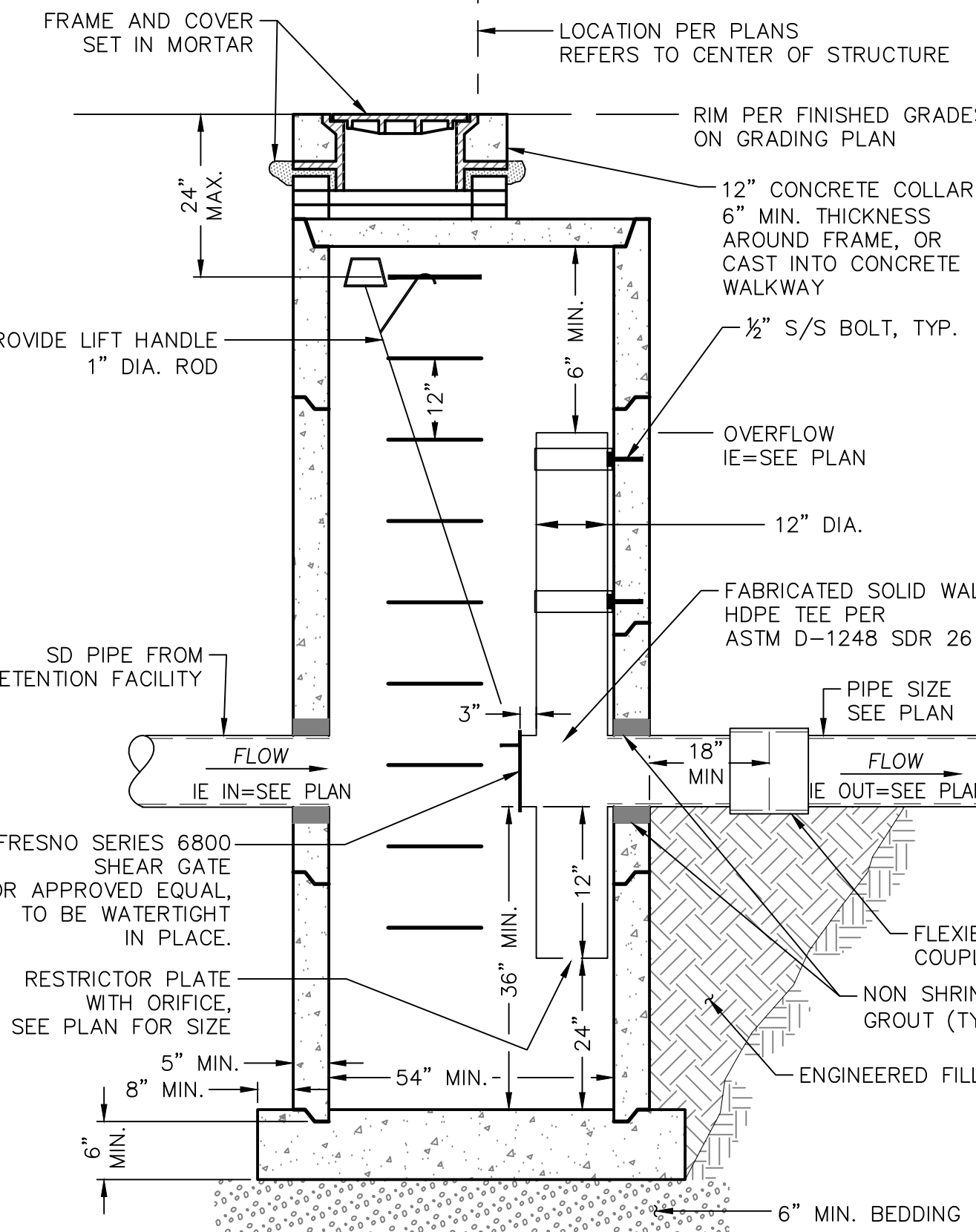
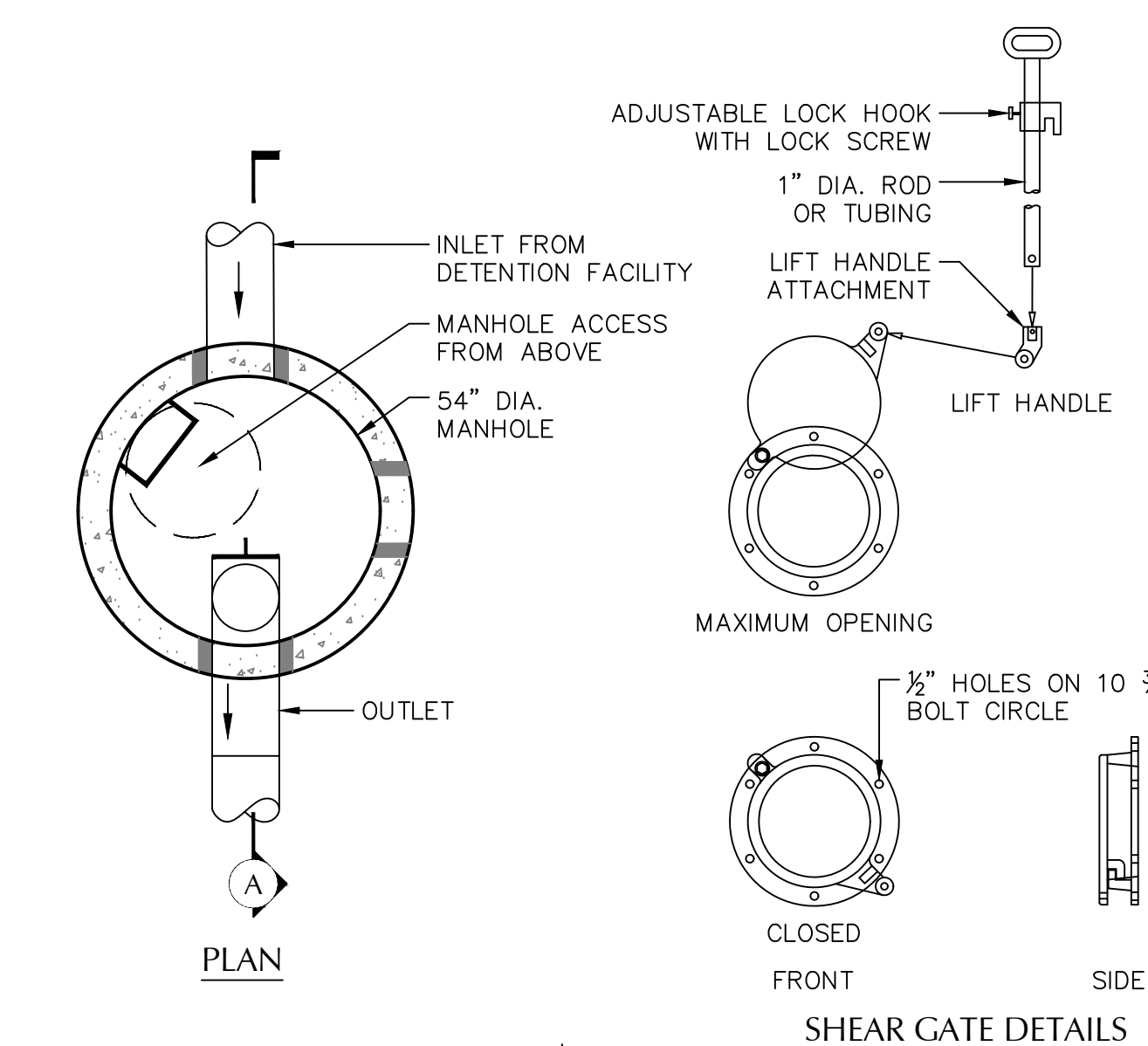
- NOTES:
1. CONTRACTOR TO WIDEN EXCAVATION AS REQUIRED TO OBTAIN COMPACTION WITH CONTRACTORS COMPACTION EQUIPMENT.
 2. 1/4" STEEL PLATE, BITUMINOUS COATED. AS MANUFACTURED BY GIBSON STEEL BASINS OR APPROVED EQUAL.

3 TRAPPED CATCH BASIN

SCALE: NTS

CONTROL ORIFICE @ ELEVATIONS

FLOW CONTROL MANHOLE	ORIFICE #1	ORIFICE #2	EMERGENCY OVERFLOW
FCMH-01	Ø7.9" ORIFICE	11"Wx2"H NOTCH ORIFICE	12" OPEN PIPE

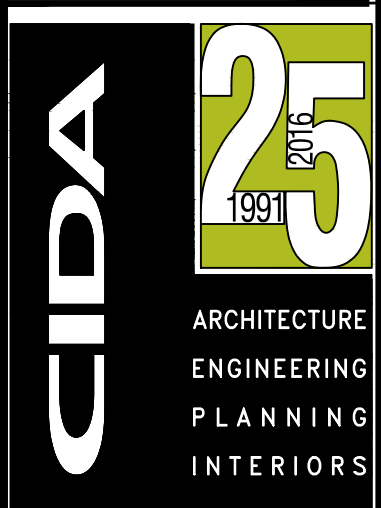


4 FLOW CONTROL MANHOLE

SCALE: NTS PER WSDOT STD PLAN B-10.40-00



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 12505 SW HERMAN ROAD
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DETAILS

DATE: 04/16/18
 DRAWN: NJD
 CHECKED: NWS

REVISIONS:

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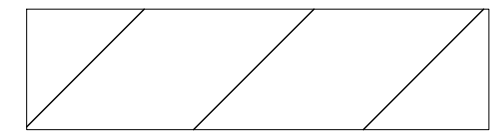
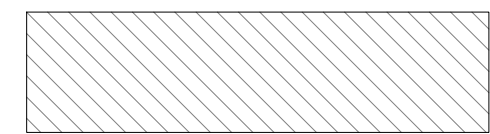
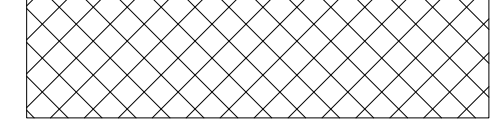
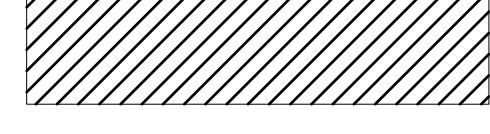
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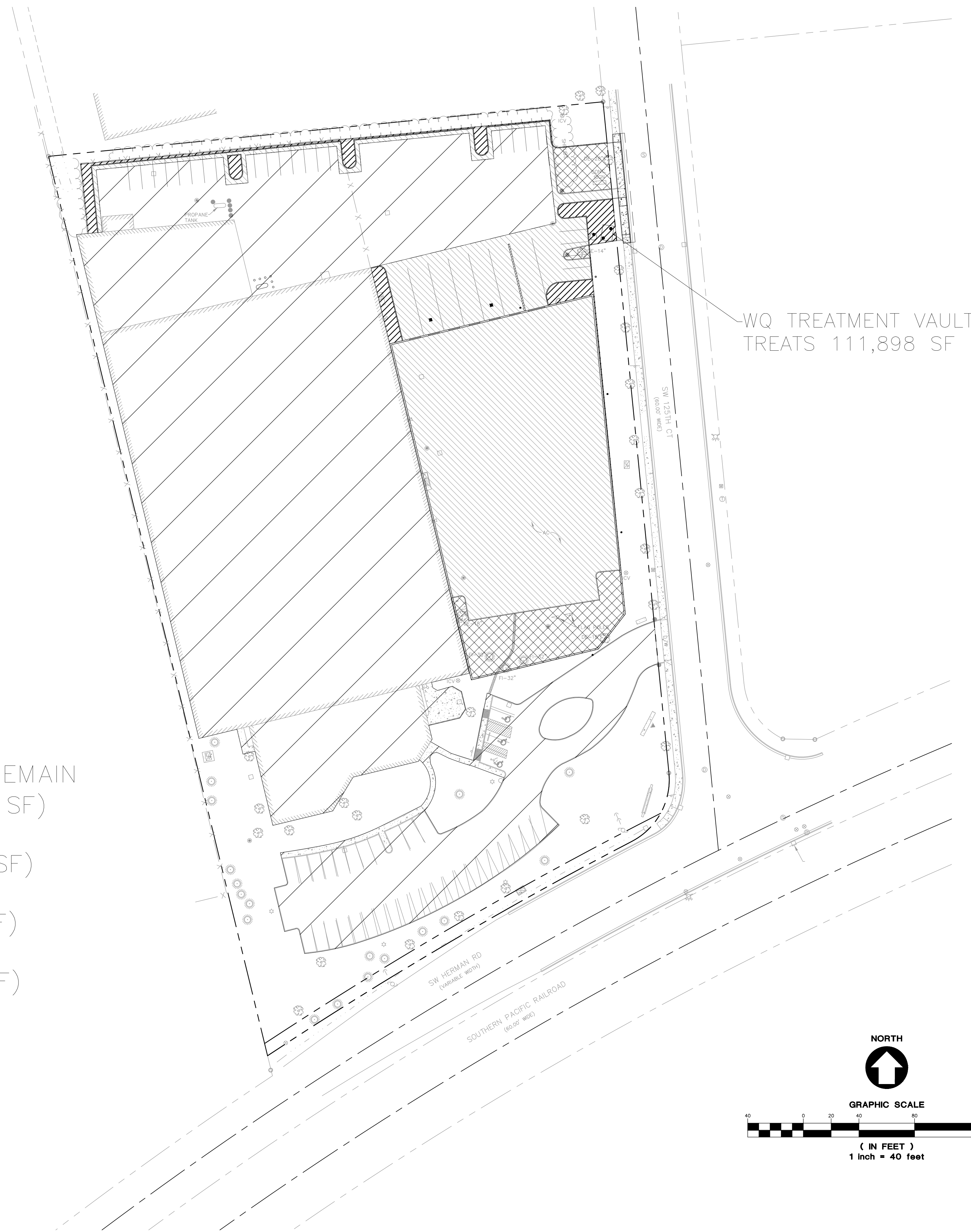
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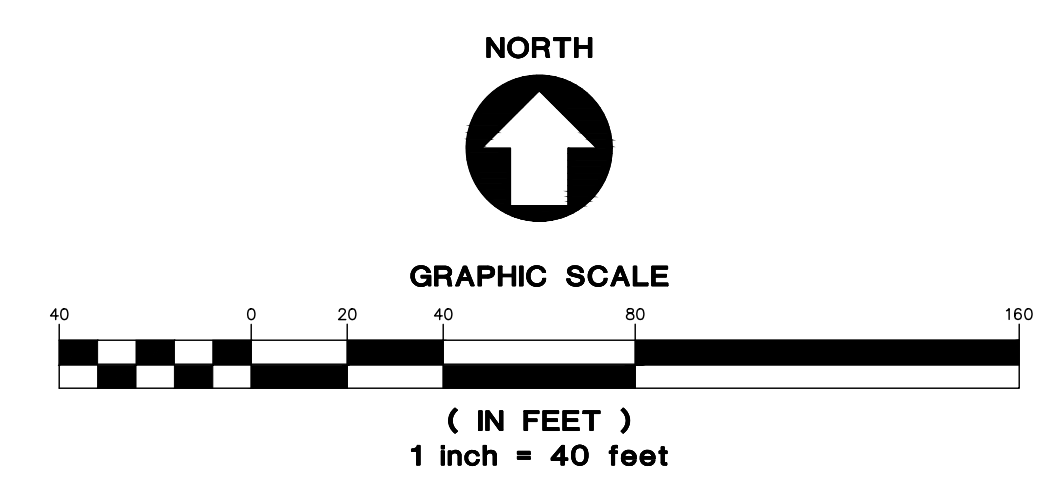
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 A17116.11

IMPERVIOUS AREAS

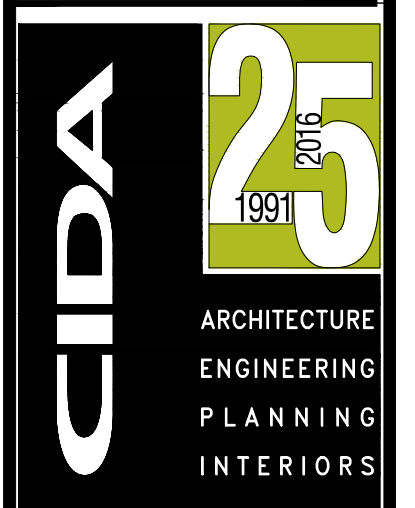
-  EXISTING TO REMAIN
(118,377 SF)
-  MODIFIED
(38,231 SF)
-  NEW
(6,193 SF)
-  REMOVE
(2,996 SF)



WQ TREATMENT VAULT
TREATS 111,898 SF



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IMPERVIOUS AREAS

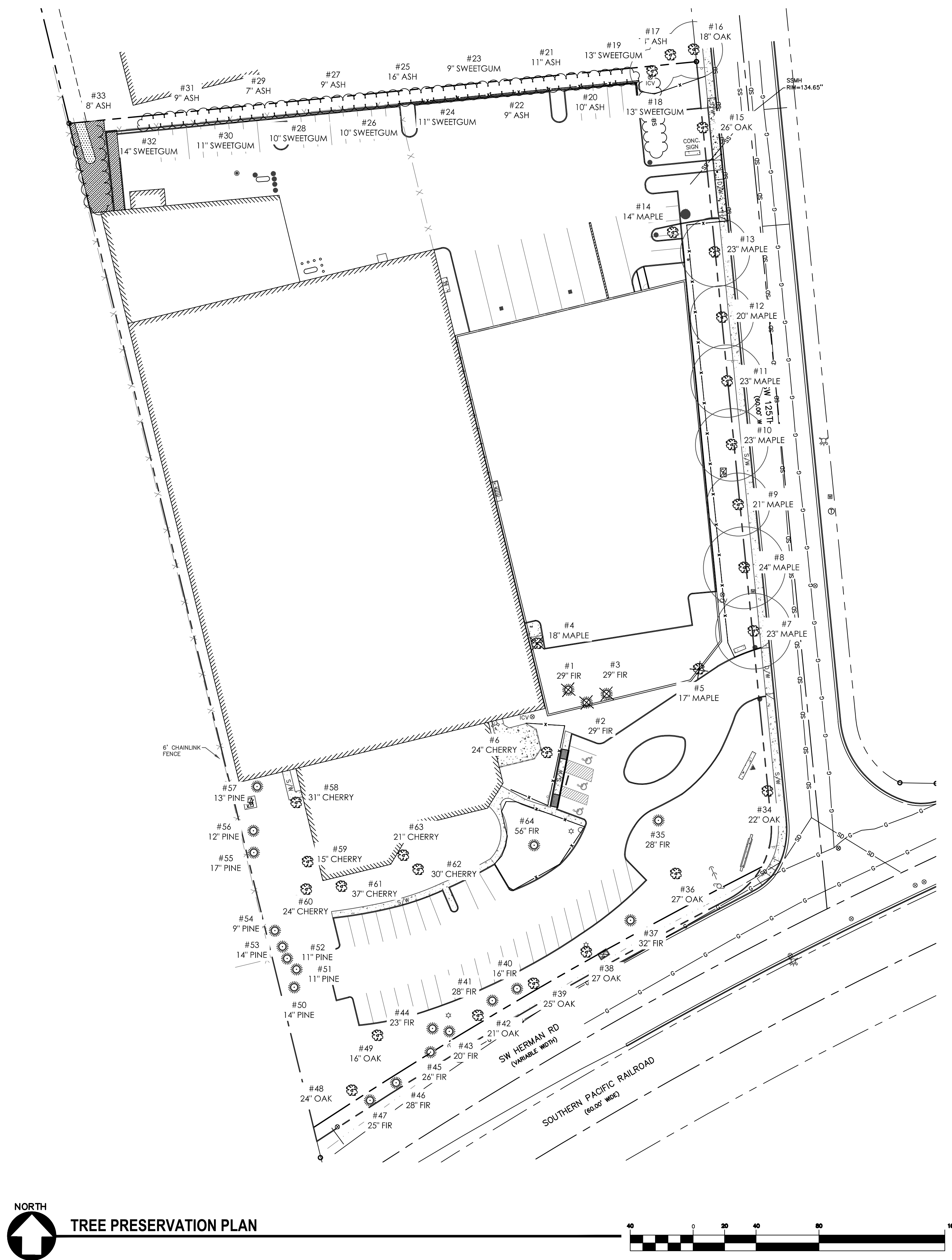
DATE: 04/16/18
DRAWN: NJD
CHECKED: NWS

REVISIONS:

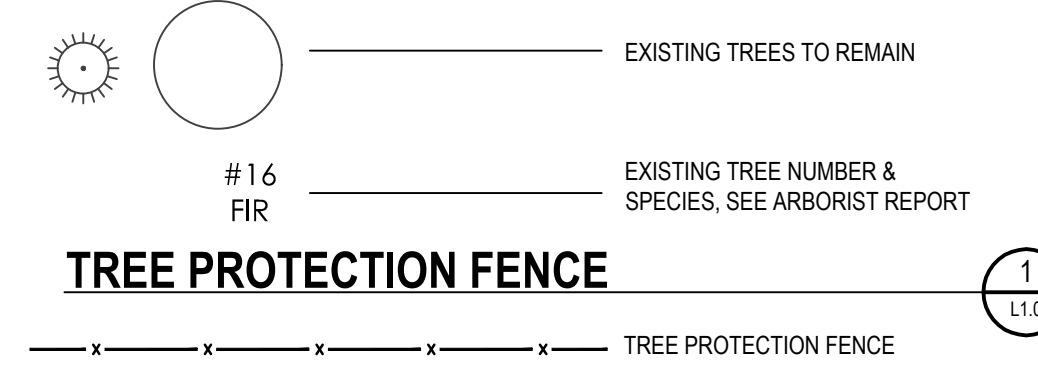
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SHEET

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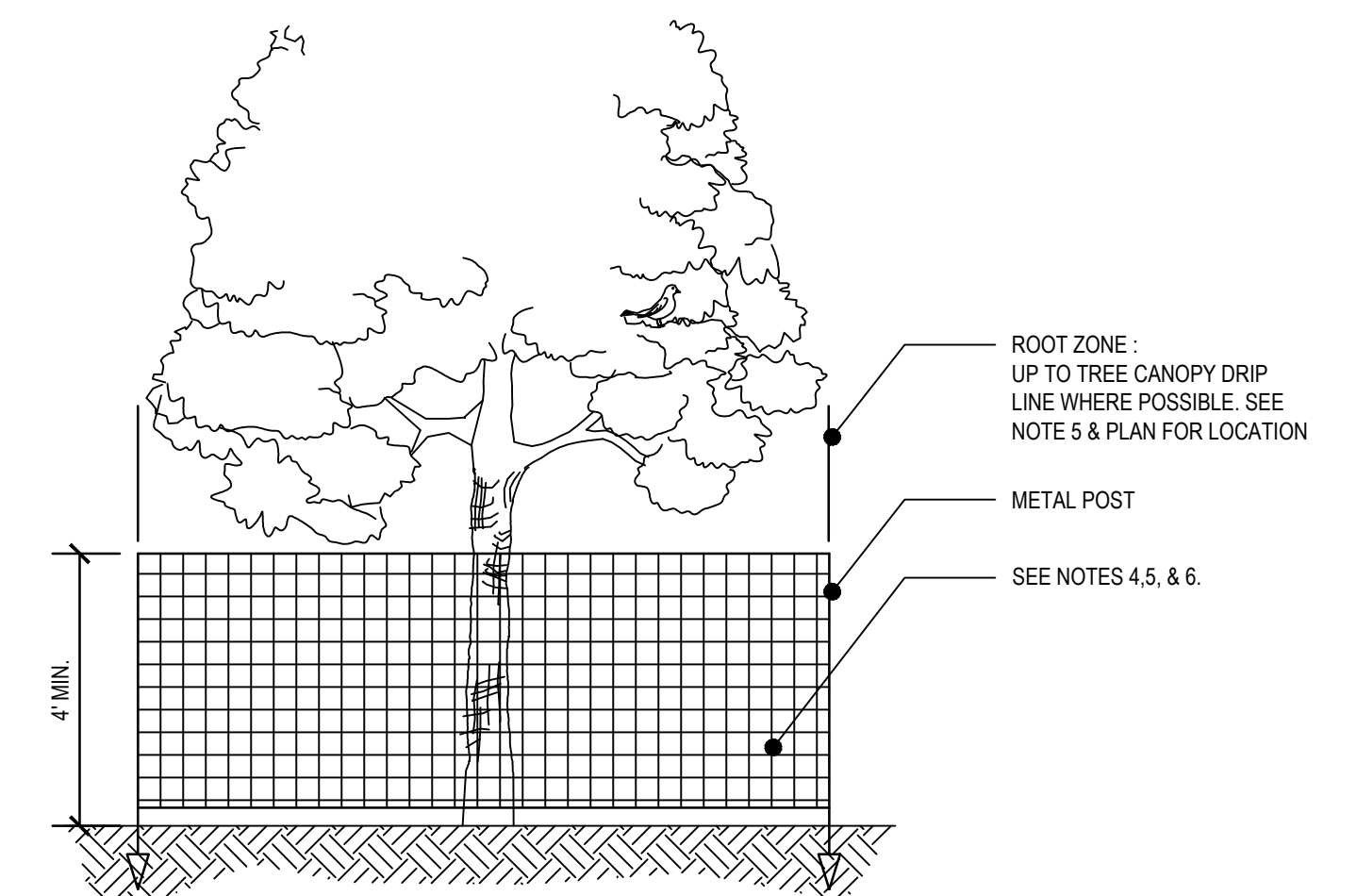


LEGEND

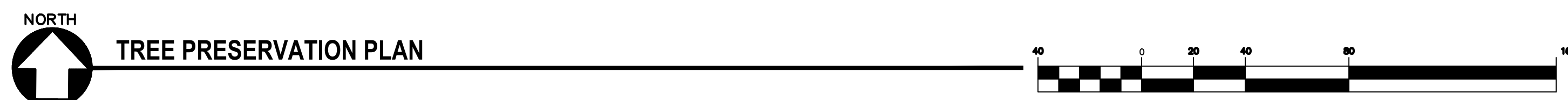


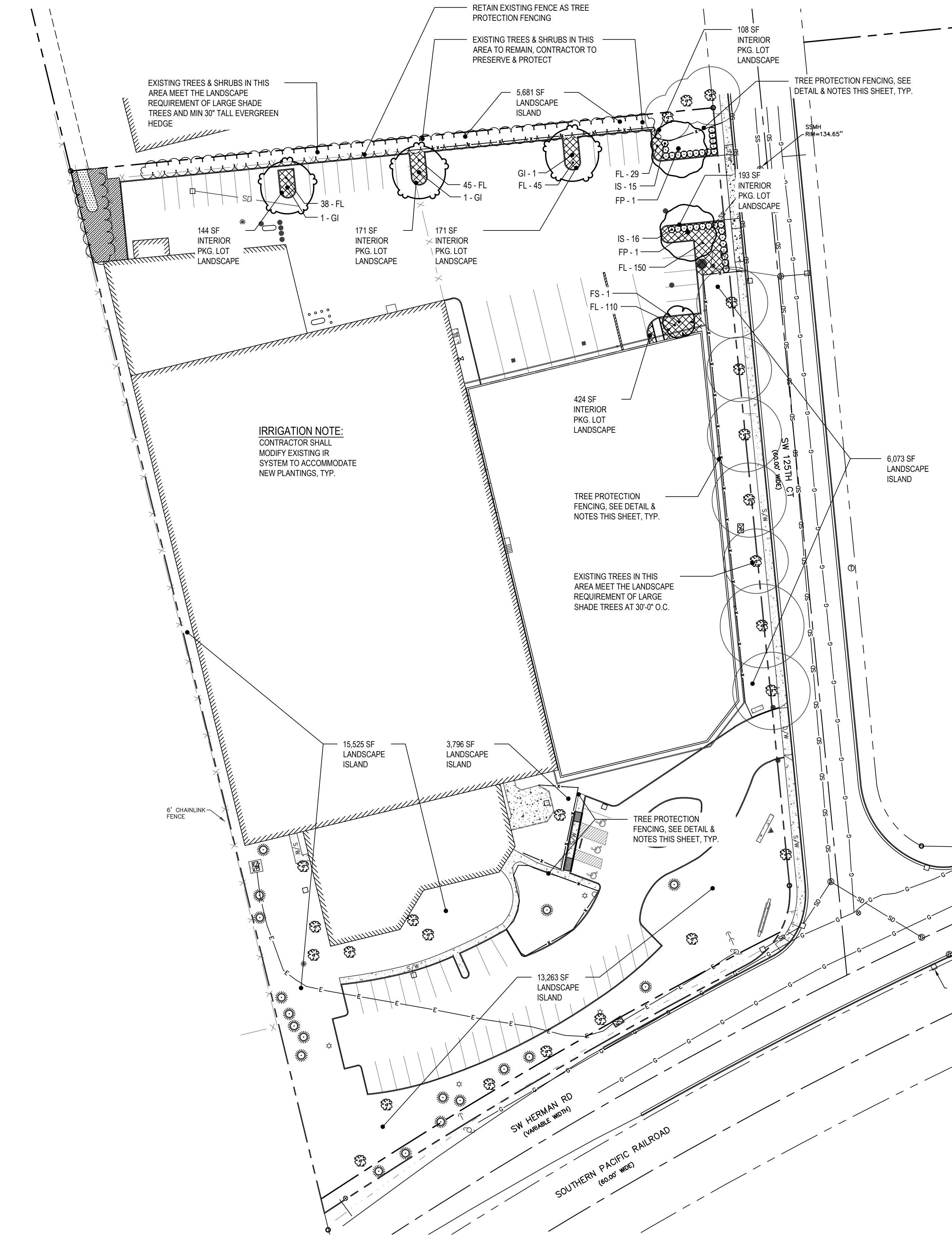
TREE PROTECTION NOTES:

- BEFORE WORK IS STARTED, INSTALL TREE PROTECTION FENCING. CONTACT THE PROJECT ARBORIST FOR ASSISTANCE.
- REFER TO SECTION 34 200 TREE REMOVAL, 34.270 TREE PROTECTION DURING CONSTRUCTION & 73.250 TREE PRESERVATION OF THE TUALATIN CITY CODE.
- NO ENCROACHMENT OF ANY KIND IS ALLOWED WITHIN THE TREE PROTECTION FENCE ZONE DURING CONSTRUCTION.
- INSTALL FENCE ON TREE SIDE OF EXISTING CURB FOR ALL TREES TO BE PRESERVED. ROOT PROTECTION ZONE IS AN AREA AROUND A TREE THAT IS BASED ON THE DIAMETER OF THE TREE CANOPY AND BETWEEN EXISTING CURB AND PROPOSED SIDEWALK.
- FENCING SHALL BE 4-FOOT HIGH ORANGE CONSTRUCTION FENCE WITH METAL POSTS AND BE SECURED TO THE GROUND WITH 6-FOOT METAL POSTS. AVOID DRIVING POSTS OR STAKES INTO MAJOR ROOTS.
- FENCE SHALL BE INSTALLED PRIOR TO LAND CLEARING, FILLING OR ANY LAND ALTERATION AND SHALL REMAIN IN PLACE UNTIL AFTER CONSTRUCTION IS COMPLETE.
- NO EXCAVATION OR COMPACTION OF EARTH OR OTHER POTENTIALLY DAMAGING ACTIVITIES ALLOWED WITHIN THE PROTECTION FENCING.
- WORK WITHIN PROTECTION FENCE SHALL BE DONE MANUALLY. NO STOCKPILING OF MATERIALS, VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MACHINERY SHALL BE ALLOWED WITHIN THE LIMITS OF THE FENCING.
- WITHIN CLEARING/GRADING LIMITS OR AT THE EDGE OF THE CLEARING/GRADING LIMITS, TREE PROTECTION MAY BE INSTALLED AROUND GROUPS OF TREES.
- DURING WORK, ANY ROOTS GREATER THAN TWO INCHES FOUND DURING EXCAVATION SHALL BE CLEANLY CUT. MULTIPLE ROOT PRUNING EVENTS FOR SINGLE TREES SHALL BE MANAGED & MONITORED BY THE PROJECT ARCHITECT.
- AFTER CONSTRUCTION IS COMPLETE, PROJECT ARCHITECT SHALL VERIFY TREE PROTECTION FENCING CAN BE REMOVED.

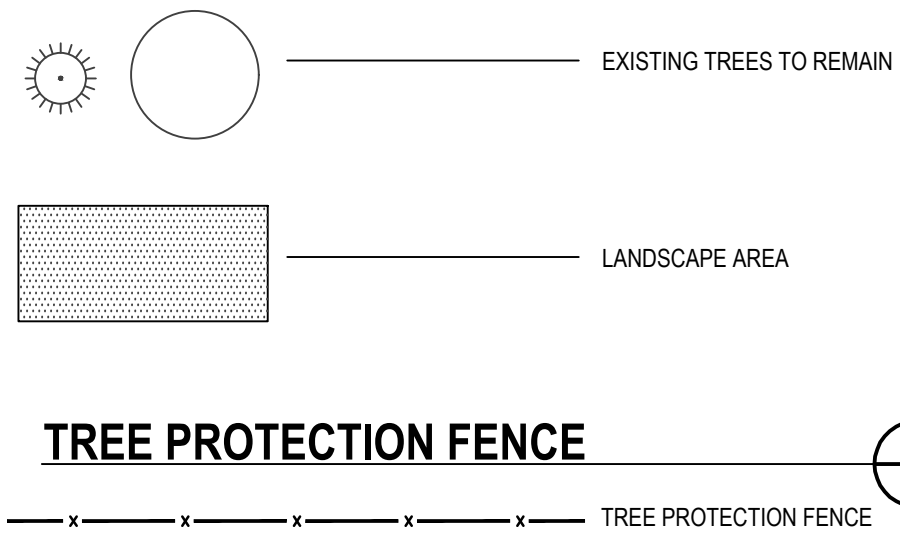


1 TREE PROTECTION FENCING DETAIL
N.T.S.





LEGEND



TREE PROTECTION FENCE

LANDSCAPE REQUIREMENTS

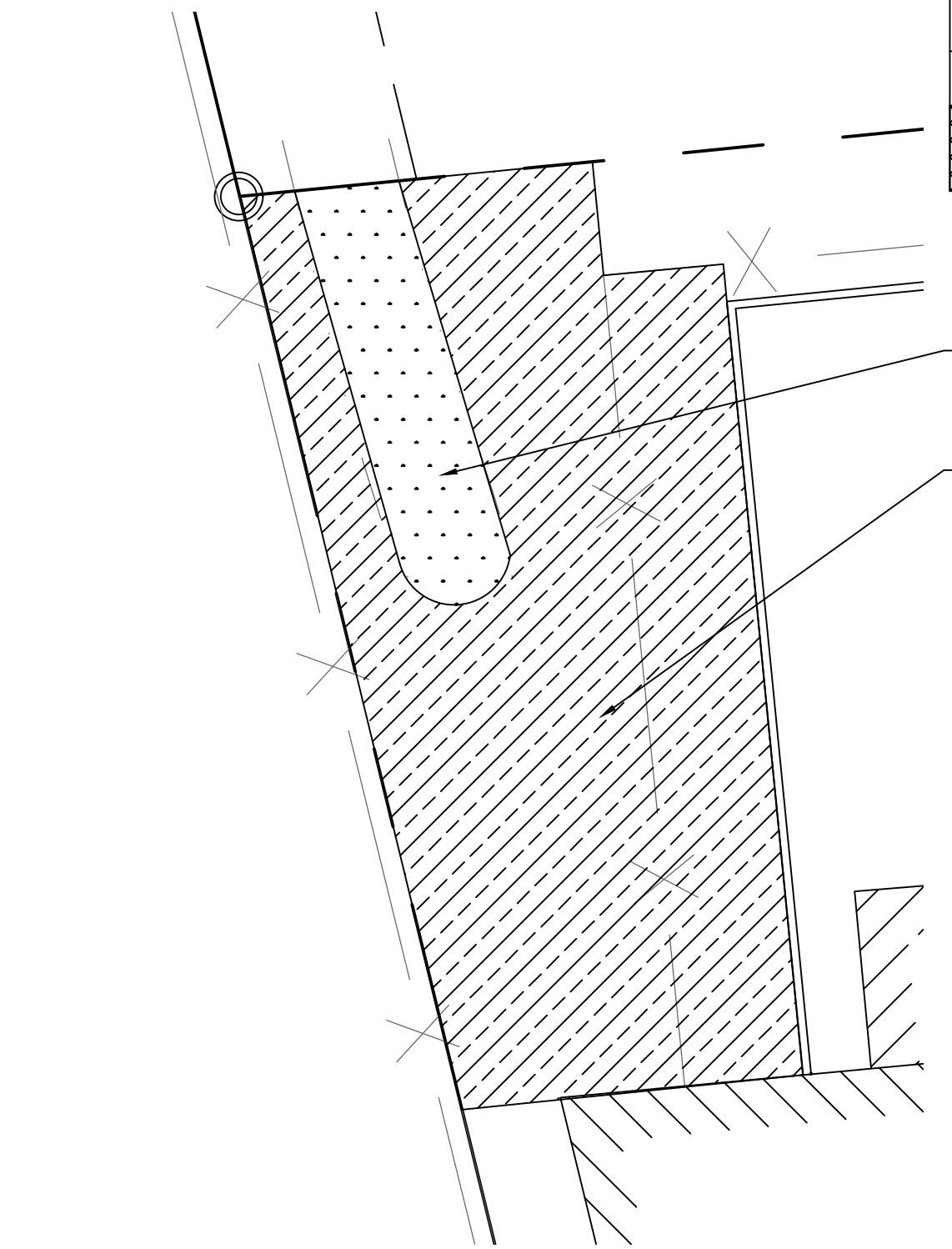
TOTAL SITE AREA	= 210,562 SF
LANDSCAPE AREA REQUIRED 15% OF SITE	= 31,584 SF
LANDSCAPE ARE PROPOSED 21.6% OF SITE	= 45,549 SF
PERIMETER PKG. LOT LANDSCAPING REQ.	= 5'-0" MIN LANDSCAPE STRIP
PERIMETER PKG. LOT LANDSCAPING PROPOSED	= 9'-6" LANDSCAPE STRIP
INTERIOR PKG. LOT ISLAND REQ = 25 SF PER PKG. STALL	= 25 x 26 STALL = 650 SF
INTERIOR PKG. LOT LANDSCAPE PROPOSED	= 1,211 SF
INTERIOR PKG. LOT TREES REQUIRED	= 6
INTERIOR PKG. LOT TREES PROPOSED	= 6

PLANTING NOTES

- ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT CITY OF TUALATIN STANDARDS AND THE OREGON STRUCTURAL SPECIALTY CODE.
- VERIFY ALL EXISTING CONDITIONS, INCLUDING LOCATION OF PROPERTY LINES, PRIOR TO BEGINNING ANY WORK. REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE IMMEDIATELY.
- DO NOT WILLFULLY PROCEED WITH CONSTRUCTION WHEN UNKNOWN OBSTRUCTIONS AND/OR DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. IMMEDIATELY NOTIFY OWNER'S REPRESENTATIVE OF UNKNOWN OBSTRUCTIONS AND/OR DIFFERENCES. PRIOR TO REMOVING ANY EXISTING FEATURES, REVIEW AND CONFIRM EXTENT OF DEMOLITION WITH OWNER'S REPRESENTATIVE.
- PROTECT EXISTING ITEMS TO REMAIN DURING CONSTRUCTION. ANY DAMAGE TO EXISTING ITEMS DESIGNATED TO REMAIN I.E. CURBS, WALKS, PLANT MATERIAL, LAWN OR FENCES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
- VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES, LINES, PIPES, VAULTS, OR BOXES PRIOR TO EXCAVATION. 2. MARK AND PROTECT ALL UTILITIES, SITE FEATURES AND VEGETATION TO REMAIN IN PLACE. ANY DAMAGE TO ANY KNOWN EXISTING UTILITY ELEMENTS SHALL BE REPAIRED PROPERLY AND IMMEDIATELY.
- REMOVE FROM THE SITE AND LEGALLY DISPOSE OF ALL DEBRIS AND EXCAVATED MATERIAL NOT REQUIRED FOR FILL. NO RUBBISH OR DEBRIS SHALL BE BURIED ON THE SITE.
- MAINTAIN ALL ROADWAYS AND PAVED PATHWAYS CLEAN AND FREE OF CONSTRUCTION MATERIALS AND DEBRIS, PROVIDING NECESSARY DUST CONTROL WHERE REQUIRED.
- COORDINATE AND SCHEDULE ALL WORK WITH THE OWNER'S REPRESENTATIVE.
- INSTALL EROSION CONTROL SYSTEMS IN ACCORDANCE WITH CITY OF TUALATIN STANDARDS PRIOR TO SITE WORK AND LANDSCAPE INSTALLATION.
- CONTRACTOR SHALL PROVIDE TOPSOIL, SOIL AMENDMENTS, AND EROSION CONTROL.
- CONTRACTOR SHALL SUBMIT CERTIFIED TOPSOIL ANALYSIS REPORT FOR OWNER'S APPROVAL PRIOR TO PLANT INSTALLATION.
- CONTRACTOR IS RESPONSIBLE FOR ANY AMENDMENTS TO SOIL PH FERTILITY AND/OR DRAINAGE CONDITIONS NECESSARY TO ENSURE PROPER GROWING CONDITIONS FOR PROPOSED PLANTINGS.
- CONTRACTOR SHALL FOLLOW PROVIDER'S INSTRUCTIONS AND RECOMMENDATIONS FOR SEEDING.
- ALL PLANTS SHALL BE INSTALLED ACCORDING TO AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1) AS WELL AS DETAIL DRAWINGS AND SPECIFICATIONS.
- ALL PLANTS SHALL BE IRRIGATED BY A FULLY AUTOMATED, PERMANENT IRRIGATION SYSTEM UNLESS OTHERWISE NOTED. CONTRACTOR SHALL MODIFY EXISTING IR SYSTEM TO ACCOMMODATE NEW PLANTINGS.
- CONTRACTOR SHALL RE-DESIGN THE IRRIGATION SYSTEM AND PROVIDE OWNER WITH SHOP DRAWINGS FOR APPROVAL. SEE SPECS.
- PRIOR TO FINAL ACCEPTANCE, CONTRACTOR SHALL PROVIDE OWNER WITH AS-BUILT PLANS OF THE INSTALLATION, COPIES OF ALL OPERATION MANUALS AND WARRANTY DOCUMENTS.
- ALL NEW PLANTS IN LANDSCAPE AREAS SHALL BE WARRANTED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

PLANT SCHEDULE

TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	
	FP	2	FRAXINUS PENNSYLVANICA 'PATMORE' WELL BRANCHED AND LIMBED TO 8'-0"	PATMORE' ASH	1.5" CAL.	
	FS	1	FRAXINUS PENNSYLVANICA 'SUMMIT' WELL BRANCHED AND LIMBED TO 8'-0"	SUMMIT ASH	1.5" CAL.	
	GI	3	GLEDITSIA TRIACANTHOS INERMIS 'TRUESHADE' WELL BRANCHED AND LIMBED TO 8'-0"	THORNLESS HONEY LOCUST	1.5" CAL.	
SHRUBS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	
	IS	31	ILEX GLABRA 'SHAMROCK' MAINTAIN HEIGHT AT 30"	INKBERRY	1 GAL.	
GROUND COVERS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
	FL	417	FRAGARIA CHILOENSIS 'LIPSTICK'	BEACH STRAWBERRY	4" POT	24" o.c.



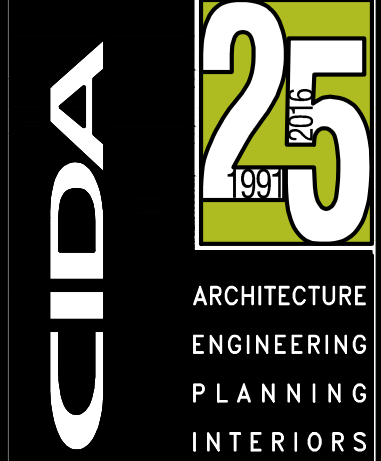
- EXISTING VEGETATION IN SWALE TO REMAIN. DO NOT DISTURB SWALE.
- VEGETATIVE CORRIDOR = 1,428 SF
- TREES REQUIRED = 14
- SHRUBS REQUIRED = 72
- PLANT THE FOLLOWING PLANTS & QUANTITIES AS PER DETAIL 11/L2.0
- TREES - 2 GAL QTY. = 7
- ACER CIRCINATUM / VINE MAPLE = 7
- RHAMNUS PURSHIANA/ CASCARA = 7
- SHRUBS - 1 GAL QTY. = 12
- CORNUS SERICEA / RED-OSIER DOGWOOD = 12
- PYSOCARPUS CAPITATUS / NINEBARK = 12
- HOLODISCUS DISCOLOR / OCEANSPRAY = 12
- SPIRAEA DOUGLASII / DOUGLAS SPIRAEA = 12
- SYMPHORICARPUS ALBUS / SNOWBERRY = 12
- ROSA PISOCARPA / CLUSTERED ROSE = 12



1 VEGETATIVE CORRIDOR PLANTING PLAN
SCALE: 1:10



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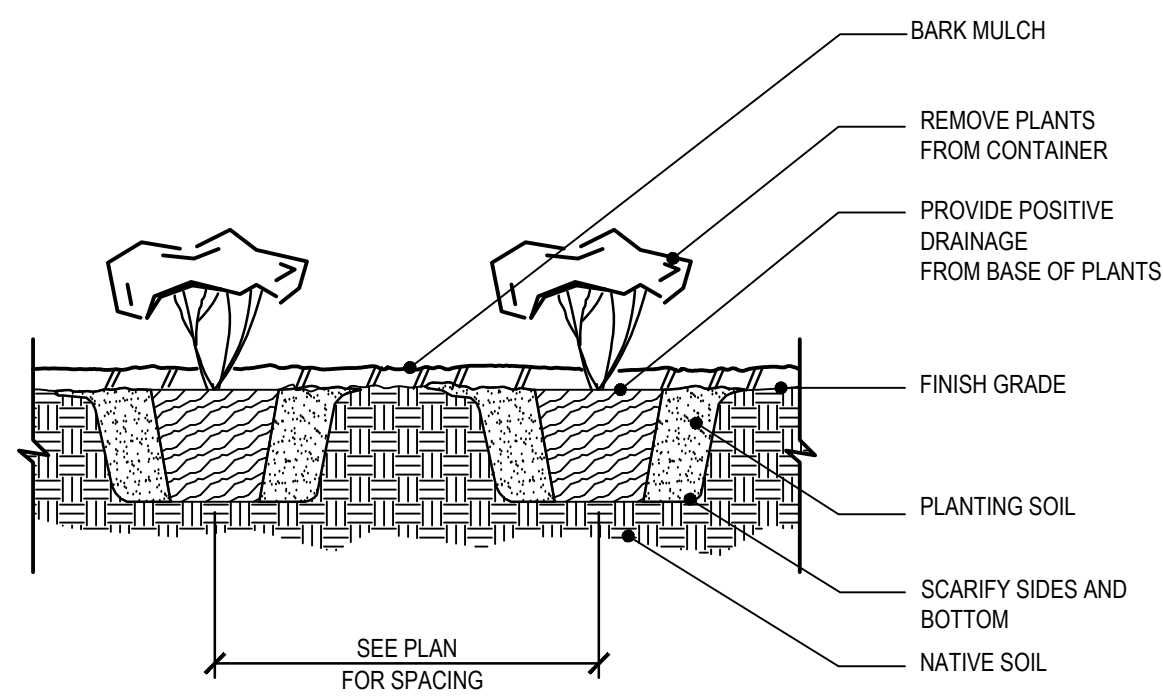
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DATE: 04/16/18
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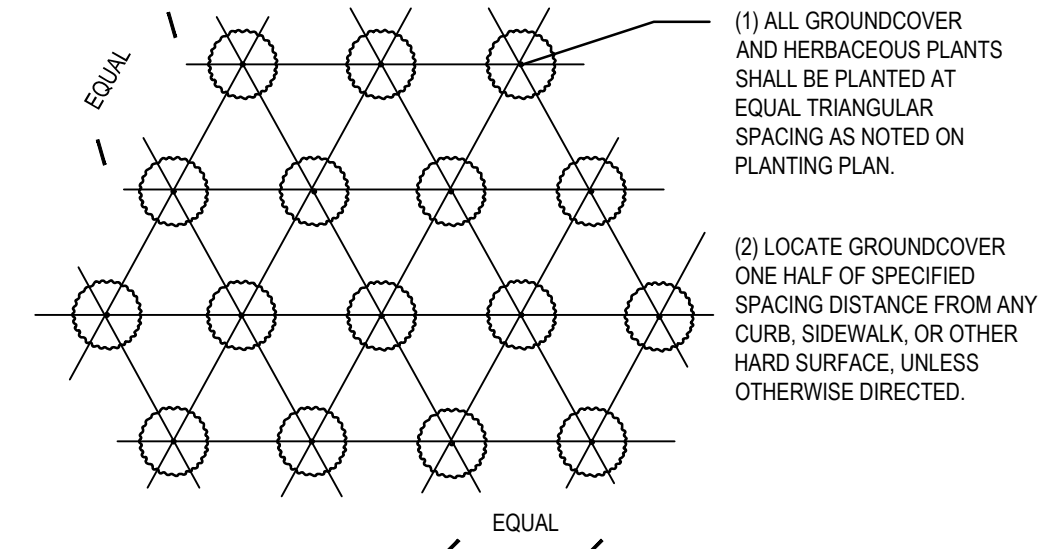
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SHEET
LANDSCAPE PLAN
L1.1

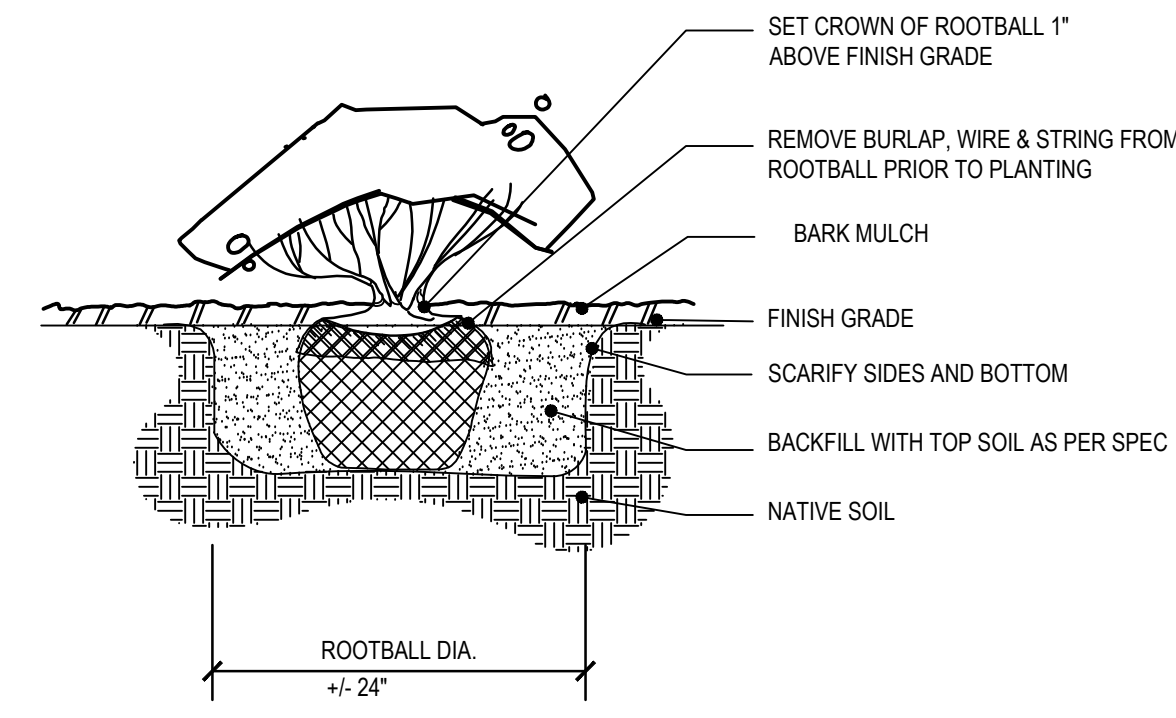
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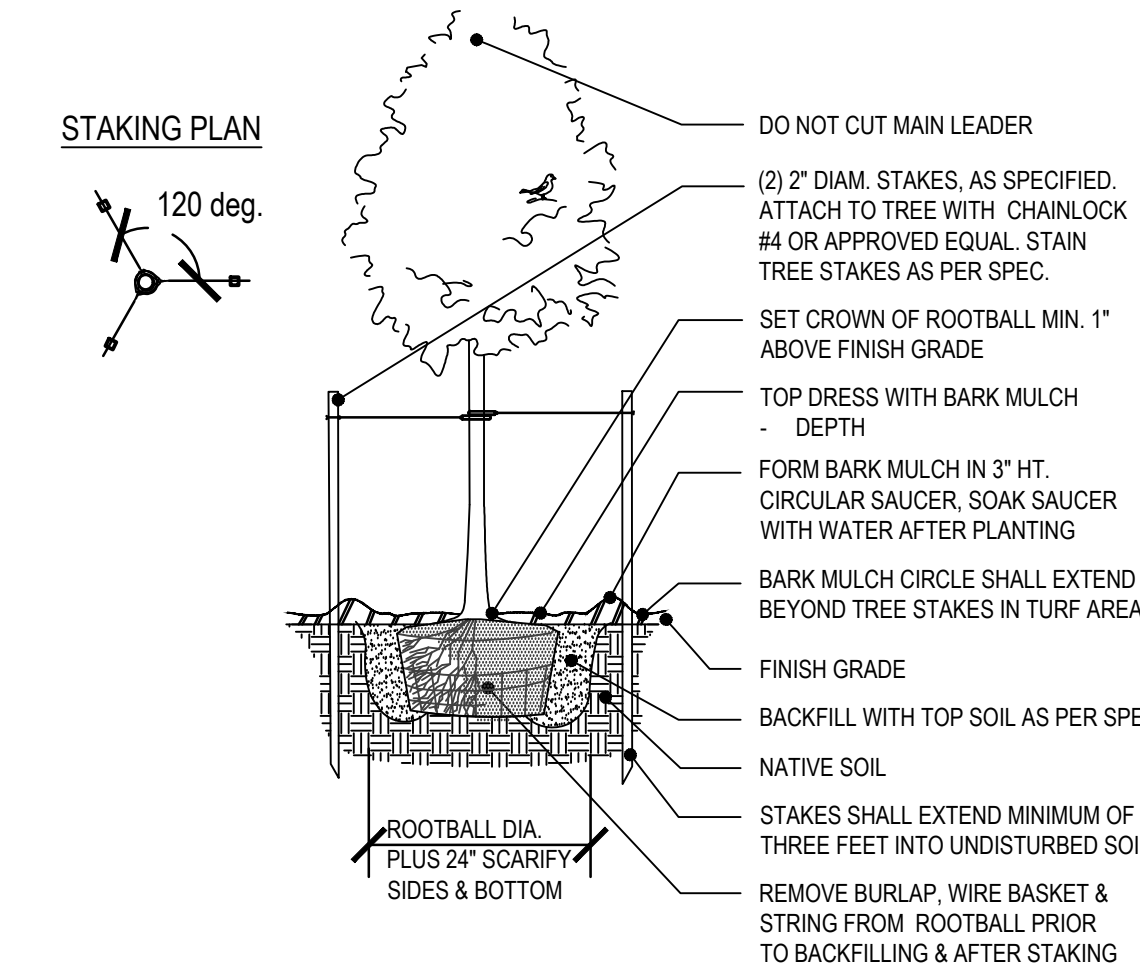
1 GROUNDCOVER & HERBACEOUS PLANT PLANTING DETAIL
L2.0 SCALE: NTS



2 GROUNDCOVER & HERBACEOUS PLANT PLANTING PLAN
L2.0 SCALE: NTS



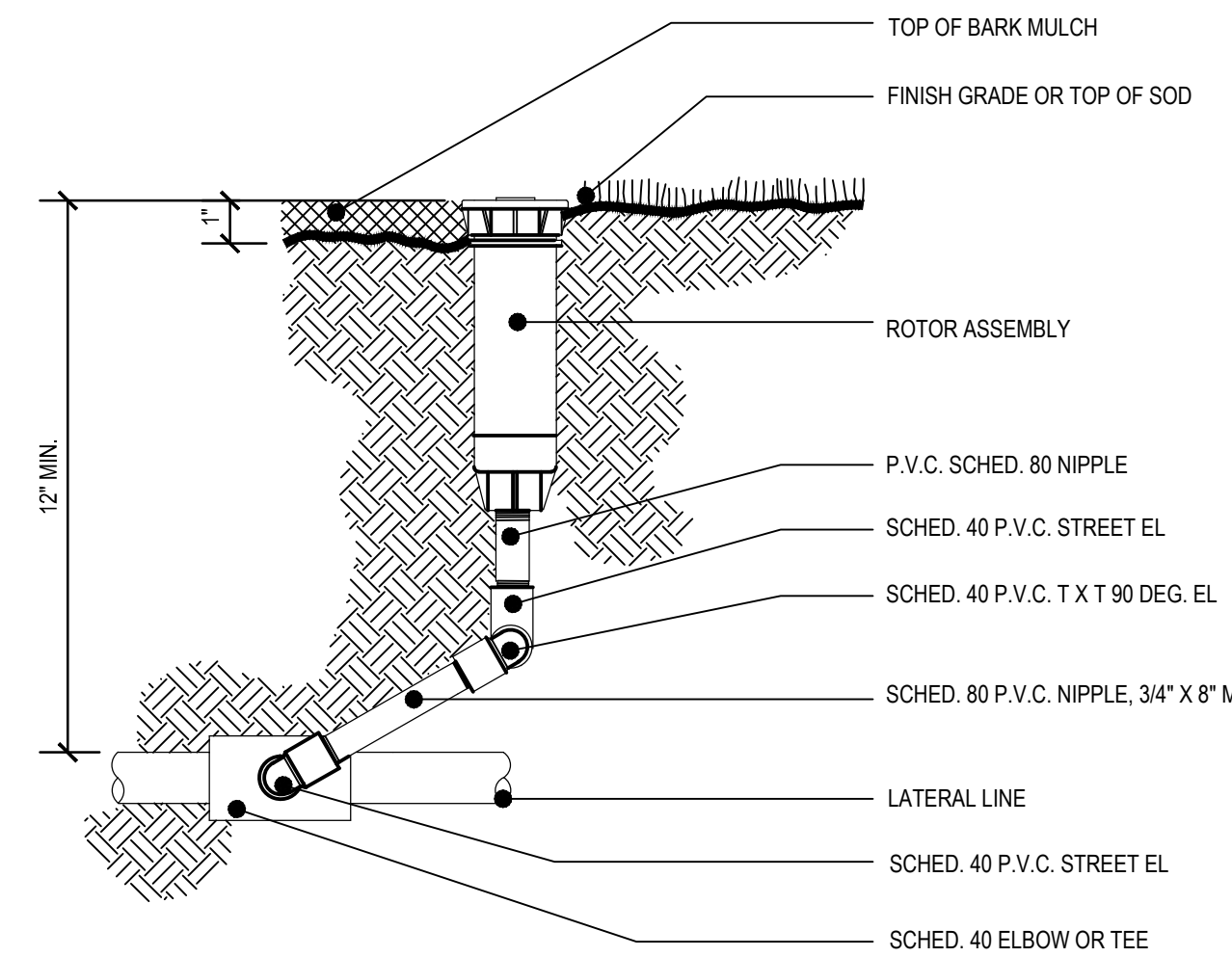
3 SHRUB PLANTING
L2.0 SCALE: NTS



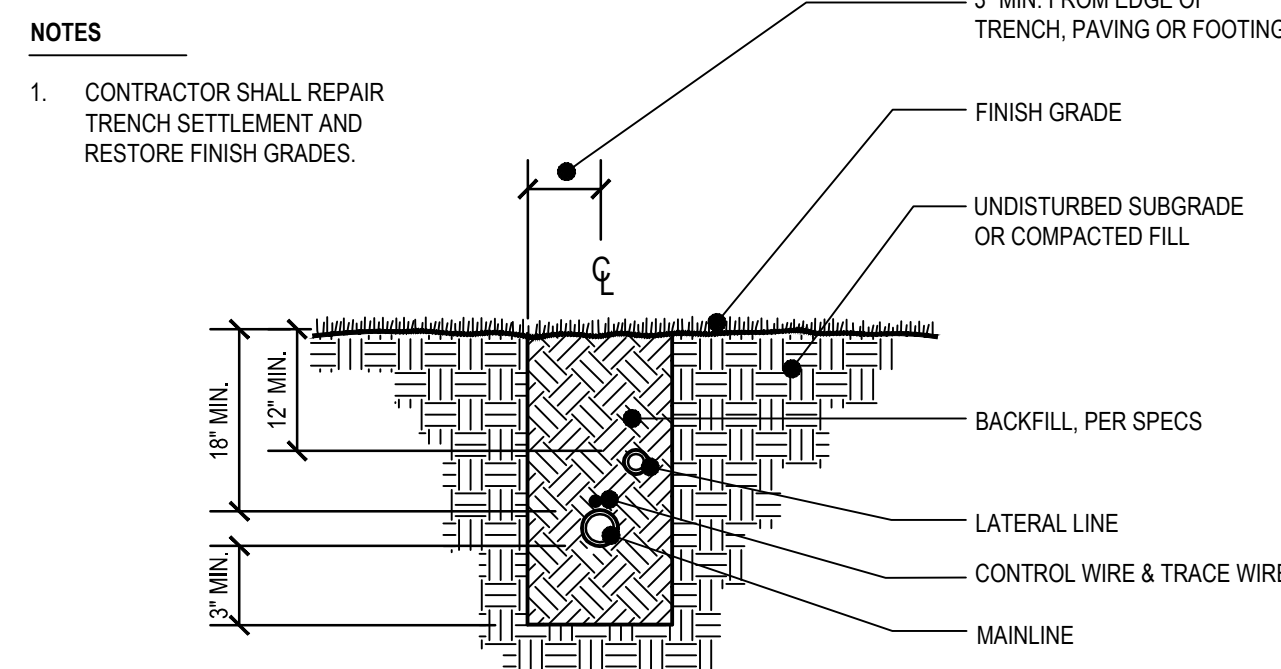
4 DECIDUOUS TREE PLANTING DETAIL
L2.0 SCALE: NTS

- NOTES**
1. PIPING SHALL NOT EXCEED 5 FEET PER SECOND VELOCITY.
 2. DEMANDS OF SYSTEM DESIGN SHALL NOT EXCEED PERFORMANCE CRITERIA OF WATER METER.
 3. SEE SPECIFICATIONS FOR ALL PERFORMANCE REQUIREMENTS

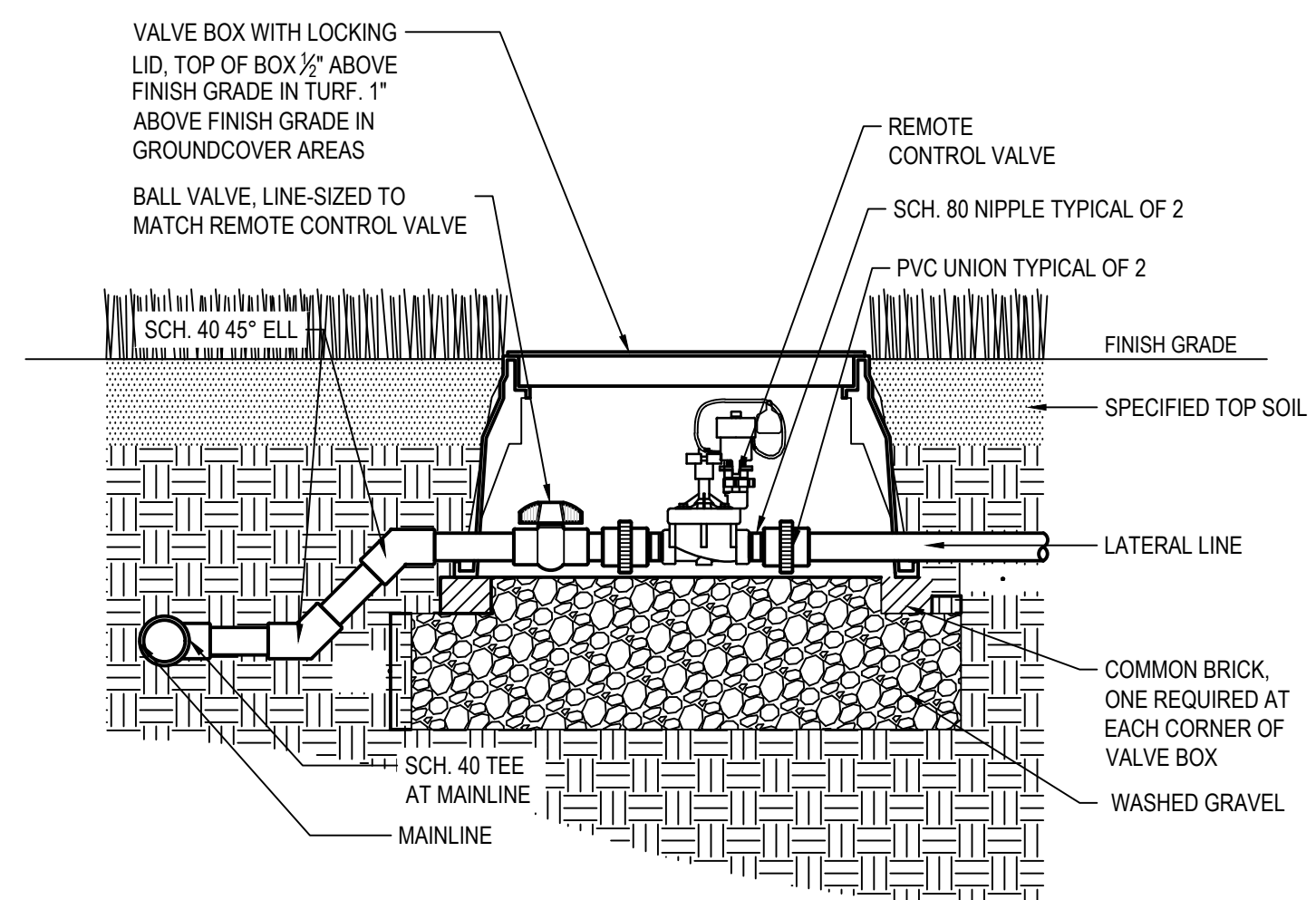
GPM	PIPE SIZE
0-9	3/4"
9-16	1"
16-26	1-1/4"
26-35	1-1/2"
35-55	2"



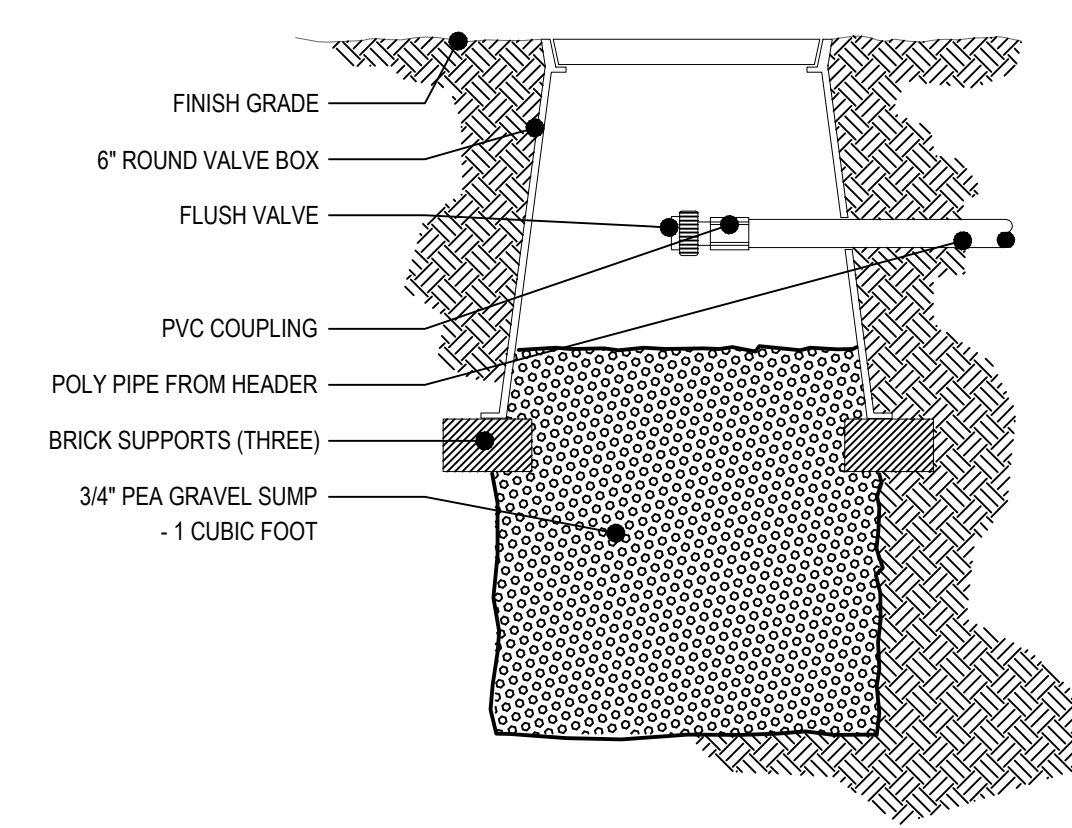
6 SPRAY HEAD ASSEMBLY W/ SWING JOINT
L2.0 SCALE: NTS



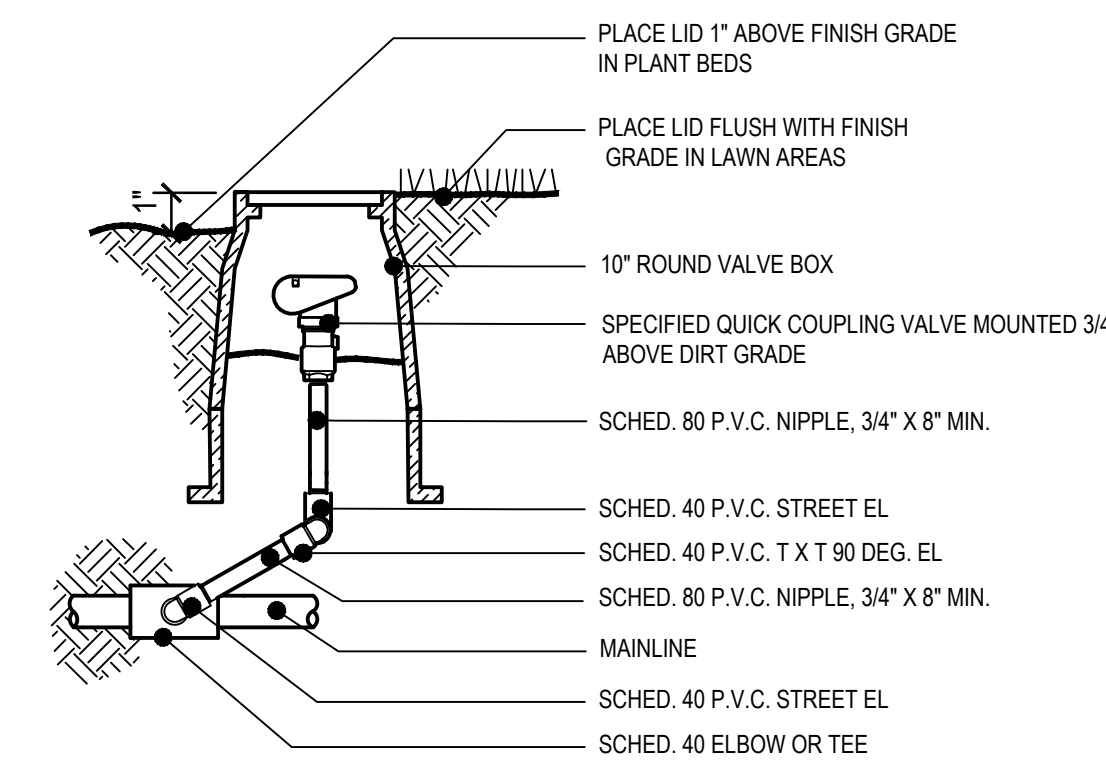
7 IR TRENCHING DETAIL
L2.0 SCALE: NTS



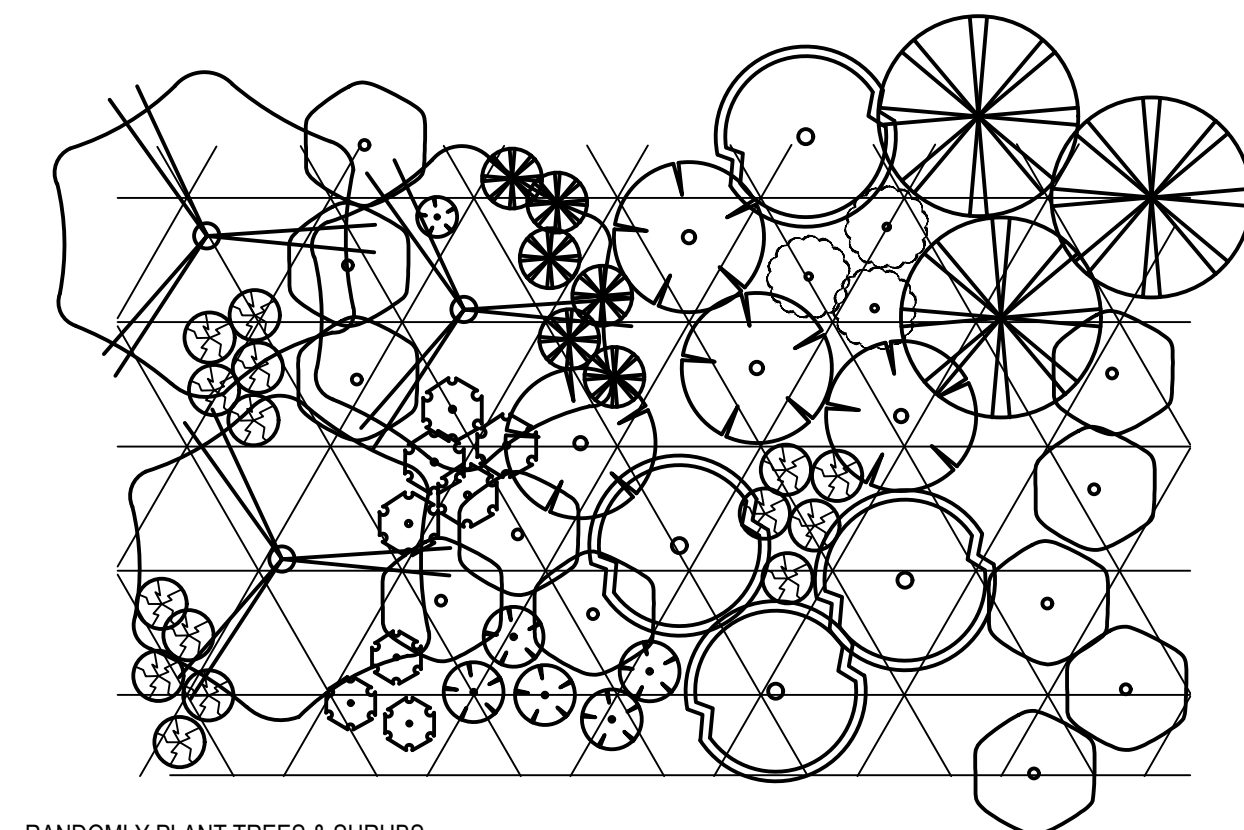
8 REMOTE CONTROL VALVE
L2.0 SCALE: NTS



9 FLUSH VALVE
L2.0 SCALE: NTS



10 QUICK COUPLER VALVE DETAIL
L2.0 SCALE: NTS



11 VEGETATIVE CORRIDOR PLANTING DETAIL
L1.1 N.T.S.

Landscape Construction Specifications

General

1. Municipal, County, State and Federal laws, regarding uses and regulations governing or relating to any portion of the work depicted on these plans are hereby incorporated into and made part of these specifications, and their provisions shall be carried out by the contractor.
2. The Contractor shall verify the locations of all existing utilities, structures, and services before commencing work. The location of utilities, structures, services shown on these plans are approximate only. Any discrepancies between these plans and the actual field conditions shall be reported to the Owner's representative.
3. The Contractor shall locate and protect all existing utilities, features and plants on and adjacent to the project site during construction. Contractor shall repair, at his own expense, all damage resulting from his operations or negligence.
4. The Contractor shall obtain all necessary valid licenses, permits, and insurance required to perform the work indicated herein before commencing work, and shall be responsible for coordinating work with all parties involved, including jurisdictional agencies.
5. The Contractor shall use all means necessary to protect the public at all times during the construction process.
6. In the event of conflict between pertinent codes, regulations, structural notes, and/or requirements, or the referenced standards of these Specifications, the provisions of the more stringent shall govern.
7. Weather Limitations: Soil work shall be performed only when the weather conditions do not detrimentally affect the quality of work.

Mandatory Site Inspection Schedule

1. Schedule for Mandatory site inspection procedures. The mandatory site inspections include but are not limited to the following:

Pre-Construction Site Meeting

Contractor shall be notified a minimum of 48 hours prior to meeting to review site conditions, proposed construction and construction schedule, and review construction specifications prior to commencement of construction operations.

Rough Grading Inspection

Contractor shall notify Owner's Representative a minimum 48 hours prior to request for inspection of rough soil grades. All rough grading operations shall be completed per specifications and prepared for inspection. No topsoil placement or backfilling in areas to be landscaped should occur until written approval by Owner's Representative has been issued.

Open Trench Irrigation Inspection

Contractor shall notify Owner's Representative 24 hours prior to inspection for written approval of irrigation trench depths, piping conditions, and pressure testing. (Refer to Irrigation Specification for inspection procedures)

Plant Material Inspection

Plant material quality and layout inspection and written approval shall occur with 24 hours notice to Owner's Representative prior to installation of any plant material. (Refer to Planting Specification for inspection procedures)

Final Landscape Areas and Irrigation Performance Inspection

Contractor shall notify Owner's Representative 48 hours prior to inspection for approval of landscape and irrigation work. Irrigation operations and coverage shall be inspected. Plant quality and layout shall be inspected. Written approval shall be issued upon inspection approval of specified construction. (Refer to relative specification sections)

Erosion Control

1. Provide and maintain positive drainage patterns throughout the construction process, and as directed by the Owner's Representative if weather or construction activity creates drainage conflicts detrimental to construction process or environmental conditions. Comply with jurisdictional requirements.
2. Maintain erosion measures throughout the landscaping process. Restore erosion control measures disturbed by landscaping operations. Remove only upon approval of Owner's Representative.

Invasive Weed Control Prior to Construction

1. Verify and identify conditions requiring eradication of invasive weeds and grasses prior to existing soil surface disturbance as directed by Owner's Representative. Stockpiled topsoil shall be treated to eradicate weeds prior to soil ripping and stockpiling. Weed eradication shall include herbicide and non-herbicide methods only administered by a currently licensed applicator. Eradication shall include and is not limited to elimination of the following invasive species from areas to be landscaped:

Cirsium arvense (Canadian Thistle) Lotus corniculatus (Bird's foot Trefoil)
Convolvulus spp. (Morning Glory) Lythrium salicaria (Purple Loosestrife)
Cytisus scoparius (Scotch Broom) Melilotus spp. (Sweet Clover)
Dipsacus sylvestris (Common Teasel) Myriophyllum spicatum (Eurasian Milfoil)
Equisetum spp. (Horsetail) Phalaris arundinaceae (Reed Canary Grass)
Festuca arundinaceae (Tall Fescue) Rubus discolor (Himalayan Blackberry)
Hedera helix (English Ivy) Solanum spp. (Nightshade)
Holcus canatus (Velvet Grass) Trifolium spp. (Clovers)
Lolium spp. (Rye Grasses)

Rough Grade Inspection

1. Conditions and quality of rough grade shall be inspected and approved by Owner's Representative prior to the commencement of specified work in areas to be landscaped. The contractor shall then be responsible for completion of activities specified herein, and defined on the plan.
2. In all plant bed areas the sub-grade shall be free of unsuitable material such as stumps, roots, rocks, concrete, asphalt, or metals, for a minimum depth of 24 inches, and in all lawn or seeded areas the sub-grade shall be free of unsuitable material for a minimum depth of 12 inches
3. The Owner's Representative, at their discretion, shall direct further rough grading or soil preparation if specified activities have not created a surface satisfactory for further work to commence. Compensation for additional surface work created by conditions unknown at the outset and as directed in writing by the Owner's Representative shall be negotiated at the time of the directive, and prior to the commencement of particular construction activities.

Finish Grading

1. Verify that rough grade in landscape areas is sufficiently below proposed final grade for planting beds and lawn areas to allow for placement of topsoil mix. Refer to grading plans for finish grade references. Verify that grades provide positive drainage at all landscape areas, and slope away from structures at a minimum of 2% slope. Final grades in all landscape areas shall be crowned at center to facilitate proposed drainage.

Installation Of Irrigation Sleeving

1. Sleeving conduit shall be installed at existing and proposed paved areas as per specifications, as directed by the Owner's Representative, or as irrigation installation requirements, prior to preparation for paving construction. Set piping to provide minimum covers of:
 - 18-inch for sleeving beneath walkways;
 - 24-inch for sleeving beneath vehicular traffic or structures.

Mark each end of sleeving with a 2 x 4 stake with 24" exposed, clearly marked 'SLEEVE LOCATION'. Contractor shall maintain staking identification and location throughout construction process. Protect all existing paving when installing sleeving. Restore all paving damaged by sleeve installation.
2. Size of sleeving conduit pipe shall be a minimum of two times the diameter of the bell end of the pipe that is to be fed into the sleeve.
3. Set sleeving in a compacted bed of material that will not damage the pipe during compaction of surface backfill material.

Design / Build Irrigation Specification

IRRIGATION SYSTEM IS EXISTING. Contractor shall identify and locate existing irrigation system. Contractor shall modify existing irrigation system following the below requirements. Contractor shall notify Landscape Architect if conditions exist that prevent modification of existing irrigation system. Verify system pressure prior to modify existing irrigation system.

1.1 DESIGN BUILD SUBMITTALS AND REQUIREMENTS

- A. Design Criteria: Submitted plan shall meet the following criteria and shall be approved for construction only upon verification that all required criteria have been met.
 1. Drawings submitted for design approval:
 - a. Must clearly illustrate irrigation heads, dripline, valve, controller and point of connection locations. Individual valves and controllers shall be numbered sequentially. The size and maximum flow through each valve and capacity of each controller shall be clearly noted.
 - b. Must clearly illustrate pipe sizes from all laterals and mainline pipe.
 - c. Drawings must be to a standard measurable engineering scale that is at a minimum of 1"=30'-0".
 - d. Drawings must be CAD generated.
 - e. Drawings must include a legend that describes all symbols and materials represented on the plan.
 - f. Drawings must clearly illustrate that the proposed irrigation system meets all performance criteria described by these specifications.
 - g. Must utilize graphics that clearly distinguish between lateral and mainline pipe and sleeves under pavement; dripline; manual or automatic control valves, isolation valves and drain valves; irrigation controllers and all other equipment located on the plan.
 - B. Irrigation system as designed and installed shall perform within the tolerances and specification of the specified manufacturers.
 - C. The system shall be fully adjustable to fine-tune the system performance for specific zones. Indicate water pressure and gallonage parameters at available water source on the required submittal.
 - D. Irrigation system shall be designed so that planting beds, sloped banks and lawn zones are on separate control valves to facilitate the different water requirements of each area.
 - E. System shall be designed to supply manufacturer's specified minimum operating pressure to furthest emitter from water meter. Water flow through piping shall not exceed a velocity of 5 feet per second.
 - F. System shall furnish components to allow operation within manufacturer's specified tolerances for optimum performance. Undersized components shall not be approved for installation.

5. Upon completion of the irrigation system installation and as a condition of it's acceptance, deliver to the Owner's representative the following "As-built" drawings; Three prints and one reproducible sepia of all changes to the irrigation system including a Controller Zone Reference chart. Instruct owner of system components operation, system winterization, and controller adjustment processes. Instruct owner of precipitation requirements and schedule of anticipated controller adjustments as landscape matures.
6. Protect existing buildings, walls, pavements, reference points, monuments, and markers on this site. Verify location of and protect all utilities. Protect adjacent property. Protect work and materials of other trades. Protect irrigation system materials before, during, and after installation. In the event of damage, repair or replace items as necessary to the approval of the Owner's representative and at no additional cost to the Owner. Use all means necessary to protect the public from injury at all times.
7. Provide warranty for all installed materials and work for one year beyond the date of final acceptance of the irrigation system installation.
8. Verify gallonage, pressure, size, and location of service water line. The Contractor shall guarantee an irrigation system that functions to manufacturer's specifications with the source volume and pressure afforded to site. Make arrangements for water shut-off during construction if necessary, notify owner 24 hours prior to suspension of water service.
9. Irrigation trenches shall be a depth to provide a minimum cover of 18 inches for sleeving beneath walkways; 18 inches for all pressurized main lines; 36 inches for sleeving beneath asphalt paving, and 12 inches for all lateral lines. Backfill with clean fill void of material injurious to system components. All sleeving under vehicular traffic to be Class 200 PVC, all other sleeving shall be class 200 PVC. Locate top of zone valves a minimum of 6" below finish grade.
10. Combine wire and piping where possible.
11. Contractor shall follow manufacturer's instructions for solvent welding of PVC pipe and fittings to achieve tight and inseparable joints. Utilize single wrap Teflon tape at all threaded joints.

12. Install all valves with fittings that facilitate maintenance removal and place valve boxes at location that are easily serviced but not in conspicuous locations. Locate in planting beds wherever possible, away from mower, edger, or de-thatcher operations.
13. Contractor shall install one manual drain valve at discharge side of each remote control valve and at all low points in mainline pipe so as to allow for complete drainage of all main lines. Mark with a painted sleeve cover and indicate locations on As-Built drawings.
14. Contractor shall provide backflow prevention as required per local and state codes, installed as per manufacturer's specifications.
15. Contractor shall install irrigation controller in accordance with manufacturer's specifications. Verify a 120 V.A.C. electrical source and a min. 1 1/2" conduit from controller location open to all electrical zone valves in field. Weatherproof any exterior wall penetrations.
16. Automatic Controller: Rainbird or Hunter capable of meeting Water Sense EPA Criteria or approved equal. Controller shall have ability for all zones to fully operate and meet both normal and specified low volume system requirements as specified herein, and as required by site conditions. Coordinate location in field with owner's representative.
17. Install all wire in accordance with manufacturer's specifications with a minimum of 18 inch looped inside valve box at each remote control valve and at the controller. All splices shall occur within valve boxes with water-proof connectors.
18. Contractor shall install all sprinkler heads with flexible risers, using flexible polyethylene pipe not to exceed 18 inches in length or PVC swing joints. Tee fittings shall extend horizontally from pipe.
19. Contractor shall thoroughly flush irrigation system after piping, risers, and valves are installed but prior to installing sprinkler heads. Thoroughly clean, adjust and balance the installed irrigation system. Adjust spray pattern of nozzles to minimize throw of water onto buildings, walls, roads and parking lots. Adjust controller for optimum performance and precipitation rates utilizing proper water conservation measures.

Topsoil Placement and Soil Preparation

1. Contractor shall submit certified topsoil analysis report for owner's approval prior to plant installation.
2. Contractor is responsible for any amendments to soil PH, fertility and/or drainage conditions necessary to ensure proper growing conditions for proposed planting.
3. Topsoil shall be friable soil from existing stockpiled material or imported, with added soil amendments as specified. It shall not be delivered while in a frozen or muddy condition. Protect from erosion at all times. Utilize existing stockpiled topsoil only under the direction of the Owner's Representative. Do not place topsoil in areas that have not been cleared of weeds listed herein. Topsoil shall meet the following requirements:
 - a. Free of roots and rocks larger than 1/2 inch,
 - b. Free of subsoil, debris, large weeds, foreign matter and any other material deleterious to plant material health.
 - c. Acidity range (pH) of 5.5 to 7.5.
 - d. Containing a minimum of 4 percent and a maximum of 25 percent inorganic matter with decaying matter of 25 percent content by volume or less.
 - e. Textural gradations shall be sand: 45-75%, silt: 15-35%, clay: 05-20%.
4. Commercial fertilizer shall be an organic base, complete fertilizer containing in available form by within a minimum of 10N 10P 5K - with 50 percent of the available nitrogen in slow-release formula, Webfoot Organic Delux, or approved equal.a
5. Compost shall be yard debris compost meeting industry and jurisdictional standards.
6. Contractor shall remove all debris, rocks one inch in diameter or larger, sticks, mortar, concrete, asphalt, paper, contaminated soil and any material harmful to plant life, in all planting areas.
7. Contractor shall rototill subgrade six (6) inches deep before placing topsoil. Specified imported topsoil shall be placed at a minimum depth of 12" in all planting areas. Do not place material during wet conditions. Do not work saturated soils in any manner. floated to a level, sloped or mounded grade between any existing or constructed point on the site, such as curbs, walls, walks, paving and the like. Final soil grades in planting beds shall be 2" below adjacent paving and curbs for mulch application.
8. Distribute following soil amendments to all landscape areas in even layers and power rototill or spade to a minimum depth of six (6) inches into topsoil, as follows;

Planting Beds:

 - a. Compost: Apply nine cubic yards per 1000 sq. ft.
 - b. Commercial Fertilizer: Apply 50 pounds per 1000 sq. ft.
9. Preparation of backfill planting soil mix shall be as follows:

Thoroughly blend and mix the following proportion of materials while in a moist condition:

 - Three cubic yards topsoil
 - 1 1/2 cubic yards compost
 - 1 1/2 cubic yards medium bark,
 - 10 pounds commercial fertilizer
 - Five pounds bonemeal
10. Keep project free from accumulation of debris, topsoil and other material. At completion of each area of work, remove debris, equipment and surplus materials. Any paved area or surfaces stained or soiled from landscaping materials shall be cleaned with a power sweeper using water under pressure. Building surfaces shall be washed with proper equipment and materials as approved by the Owner's representative.

Seeded Lawn and Fieldgrass Installation

1. Seeding operations shall occur only between March 15 and October 15.
2. Seeding is not permitted during cold weather (less than 32 degrees F), hot weather (greater than 80 degrees F), when soil temperature is less than 55 degrees F, when ground is saturated, or when wind velocity is greater than 10 mph.
3. Contractor shall float rough graded seedbed. Do not disturb natural drainage patterns. Remove rocks, clumps, or debris at surface. Lightly scarify surface.
4. Contractor shall apply 10 pounds commercial fertilizer per 1,000 square feet of surface area before spreading seed.
5. Lawn Seed: Contractor shall manually broadcast or hydro-seed eight pounds of Sunmark "Northwest Supreme Lawn Mix" grass seed per 1,000 square feet.
6. Fieldgrass Seed: Contractor shall manually broadcast or hydro-seed eight pounds of Sunmark "Diamond Green" grass seed per 1,000 square feet.
7. The Contractor shall protect and maintain the seeded area by fencing, watering, feeding, reseeding, mowing and repairing as necessary to establish a thick, uniform stand of grass acceptable to the Owner's representative. Contractor to maintain lawn for a minimum of 3 mowings.

Trees, Shrubs, & Groundcover Installation

1. Contractor shall guarantee materials and workmanship in general landscape areas for one year from date of conditional acceptance. Plant material shall be in accordance with American Standard for Nursery Stock (ANSI Z60.1) shall comply with State and Federal laws with respect to inspection for insect infestation and plant diseases and shall be free of insect pests and plant diseases.
2. Plant materials shall have a minimum of 6 inches of prepared soil under the root ball, and a minimum of 6 inches on each side of the root ball. Tree roots or root ball shall have a minimum of 12 inches of plant soil under the root ball and a minimum of 12 inches on each side of the root ball, or roots. Final grade should maintain root ball slightly above surrounding grade (not to exceed one inch) for bark mulch installation.
3. Root control barrier shall be installed in trenches, alongside hardscape structures and utility lines such as sidewalks, curbs, pavement, walls, and concrete located within 15 feet of new trees measured from the trunk. Root barrier is to be DeepRoot UB-24, or approved equal.
4. Mulch all planting beds after planting, final raking, grading and leveling of the planting beds with a layer of Hem/Fir medium screened bark mulch as specified on the plans.
5. Balled and burlapped trees, boxed trees or bare root trees shall be either guyed or staked as detailed on the plans.
6. Remove all dead or dying branches and criss-crossing branches from trees. Do not cut leader.
7. Keep project free from accumulation of debris, topsoil and other material. At completion of each area of work, remove debris, equipment and surplus material. All paved areas or surfaces stained or soiled from landscape material shall be cleaned with a water-pressure power sweeper. Building surfaces shall be washed with proper equipment and materials as approved by the Owner.
8. River Rock Mulch: River rock mulch shall be minimum 3/4" to maximum 1-1/2" diameter washed round river rock, uniform in size. All fines shall be screened from the aggregate within a one-quarter inch (1/4") tolerance. Color shall be white to light brown. Contractor shall provide the owner with samples of river rocks for approval prior to installation.

Maintenance

1. Contractor shall maintain general landscape areas for one year after accepted completion of project.
2. Maintenance shall include; all grade resettlement, weeding, policing and removal of plant material debris during maintenance period. Remove and replace dead plant material as needed at no cost to owner for maintenance period. Seasonal leaf fall removal is outside the scope of this maintenance specification.
3. Any unsatisfactory condition arising during this maintenance period shall be brought to the attention of the Owner's Representative immediately.



AAI alphan associates, inc.
ENGINEERING
4875 SW Griffith Drive | Suite 300 | Beaverton, OR | 97005
503.620.3030 | tel | 503.620.5539 fax | www.aaieing.com



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TEL : 503.226.1285
FAX : 503.226.1870
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API INTERNATIONAL
12505 SW HERMAN ROAD
TUALATIN OREGON

DATE: 04/16/18
DRAWN: TKL
CHECKED: TKL

REVISIONS:

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ENGINEERING INC.

SHEET
**LANDSCAPE
& IR SPECS**

L3.0

JOB NUMBER:
A17116.20

PRIVATE LIGHTING NOTES:
 PRIVATE LIGHTS POLES SHALL BE 25-FOOT TALL, BRONZE, STEEL POLE.

APPROVED STEEL POLE IS:
 COOPER COOPER SSS4M25SF41

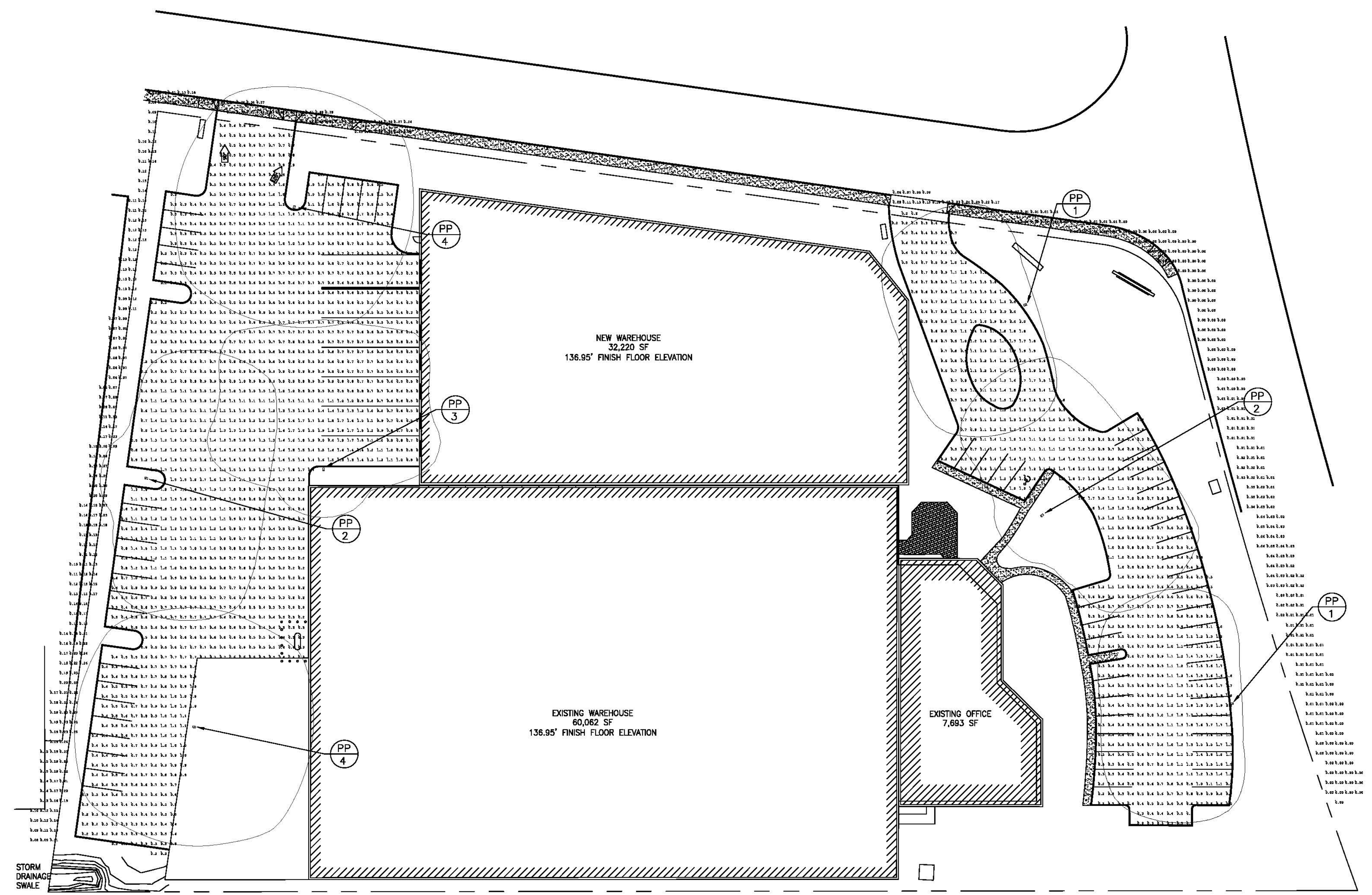
LUMINAIRE SHALL BE APPROVED, LED 96W, 240V, BRONZE "GLEON" LUMINAIRES.

APPROVED LUMINAIRE IS:
 COOPER GLEON-AF-02-LED-E1-SL3-BZ-MA-7030-600-HSS
 COOPER GLEON-AF-02-LED-E1-T4W-BZ-MA-7030-600
 COOPER GLEON-AF-02-LED-E1-T4FT-BZ-MA-7030-600
 COOPER GLEON-AF-02-LED-E1-5WQ-BZ-MA-7030-600

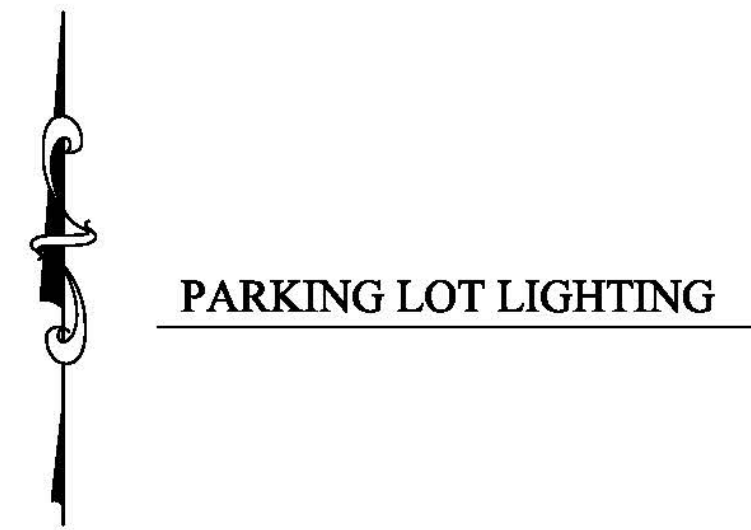
2. LIGHTING CONTRACTOR/INSTALLER IS SOLELY RESPONSIBLE FOR INSTALLATION OF CORRECT MATERIAL BASED ON CURRENT JURISDICTION SPECIFICATIONS AND STANDARDS. LIGHT POLE AND LUMINAIRE SUBMITTAL TO PROPER JURISDICTION RECOMMENDED.

LEGEND

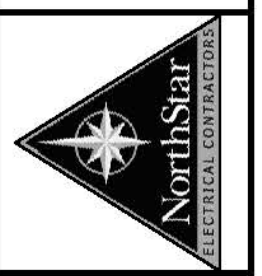
- PP 1 = INSTALL 96W LED SHOEBOX LUMINAIRE ON METAL POLE.
- PP 2 = INSTALL 96W LED SHOEBOX LUMINAIRE ON METAL POLE.
- PP 3 = INSTALL 96W LED SHOEBOX LUMINAIRE ON METAL POLE.
- PP 4 = INSTALL 96W LED SHOEBOX LUMINAIRE ON METAL POLE.



LIGHT LEVEL REQUIREMENTS			
LOCATION	TARGET	LIGHT LEVEL	UNIFORMITY
WEST PARKING LOT	TARGET	≥0.50 FC AVG	≤5:1 AVG:MIN
	ACHIEVED	0.76 FC AVG	3.80:1 AVG:MIN
EAST PARKING LOT	TARGET	≥0.50 FC AVG	≤5:1 AVG:MIN
	ACHIEVED	0.94 FC AVG	4.70:1 AVG:MIN
OFF-SITE	TARGET	<0.50 FC MAX	NA
	ACHIEVED	0.47 FC MAX	NA



NorthStar Electrical Contractors
 11055 S.W. Clay Street
 Sherwood, Oregon 97140
 Phone 503-612-0840
 Fax 503-612-0891
 Email adam.suminski@NorthStarElect.com



API EXPANSION
 TUALATIN, OR

REV DATE	NO.	REV DESCRIPTION

Title: SITE LIGHTING DESIGN
 Designed by: Adam Suminski
 Checked by: Jesse Culp
 Date: July 11, 2018

DWG. NO
EL1
 Project No.:

Service Provider Letter

CWS File Number
18-000889

This form and the attached conditions will serve as your Service Provider Letter in accordance with Clean Water Services Design and Construction Standards (R&O 17-5).

Jurisdiction: Tualatin Review Type: No Impact
 Site Address: 12505 SW Herman RD SPL Issue Date: July 20, 2018
 / Location: Tualatin, OR 97062 SPL Expiration Date: July 19, 2020

Applicant Information:		Owner Information:	
Name	<u>AAI ENGINEERING INC</u>	Name	<u>BEHBAHANY PROPERTIES LLC</u>
Company	<u>AAI ENGINEERING INC</u>	Company	<u>BEHBAHANY PROPERTIES LLC</u>
Address	<u>4875 SW GRIFFITH DR</u>	Address	<u>12505 SW HERMAN RD</u>
	<u>BEAVERTON OR 97005</u>		<u>TUALATIN OR 97062</u>
Phone/Fax	<u>(503) 620-3030</u>	Phone/Fax	<u></u>
E-mail:	<u>andisheha@aaieng.com</u>	E-mail:	<u></u>

Tax lot ID	Development Activity
<u>2S121DD00100</u>	<u>Commercial addition</u>
<u></u>	<u>Parking lot landscape medians and restriping.</u>
<u></u>	<u></u>
<u></u>	<u></u>

Pre-Development Site Conditions:	Post Development Site Conditions:
Sensitive Area Present: <input checked="" type="checkbox"/> On-Site <input checked="" type="checkbox"/> Off-Site	Sensitive Area Present: <input checked="" type="checkbox"/> On-Site <input checked="" type="checkbox"/> Off-Site
Vegetated Corridor Width: <u>variable: 5-30</u>	Vegetated Corridor Width: <u>variable: 5-30</u>
Vegetated Corridor Condition: <u>Degraded</u>	<u></u>

Enhancement of Remaining Vegetated Corridor Required: Square Footage to be enhanced: 1,428

Encroachments into Pre-Development Vegetated Corridor:

Type and location of Encroachment:	Square Footage:
<u>none</u>	<u>0</u>
<u></u>	<u></u>

Mitigation Requirements:

Type/Location	Sq. Ft./Ratio/Cost
<u>n/a</u>	<u>0</u>
<u></u>	<u></u>

Conditions Attached Development Figures Attached (2) Planting Plan Attached Geotech Report Required

This Service Provider Letter does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered on your property.

8-15-18

In order to comply with Clean Water Services water quality protection requirements the project must comply with the following conditions:

1. No structures, development, construction activities, gardens, lawns, application of chemicals, uncontained areas of hazardous materials as defined by Oregon Department of Environmental Quality, pet wastes, dumping of materials of any kind, or other activities shall be permitted within the sensitive area or Vegetated Corridor which may negatively impact water quality, except those allowed in R&O 17-5, Chapter 3.
2. Prior to any site clearing, grading or construction the Vegetated Corridor and water quality sensitive areas shall be surveyed, staked, and temporarily fenced per approved plan. During construction the Vegetated Corridor shall remain fenced and undisturbed except as allowed by R&O 17-5, Section 3.06.1 and per approved plans.
3. If there is any activity within the Sensitive Area, the applicant shall gain authorization for the project from the Oregon Department of State Lands (DSL) and US Army Corps of Engineers (USACE). The applicant shall provide Clean Water Services or its designee (appropriate city) with copies of all DSL and USACE project authorization permits.
4. An approved Oregon Department of Forestry Notification is required for one or more trees harvested for sale, trade, or barter, on any non-federal lands within the State of Oregon.
5. **Prior to ground disturbance an erosion control permit is required from the City.** Appropriate Best Management Practices (BMP's) for Erosion Control, in accordance with Clean Water Services' Erosion Prevention and Sediment Control Planning and Design Manual, shall be used prior to, during, and following earth disturbing activities.
6. **Prior to construction, a Stormwater Connection Permit from Clean Water Services or its designee is required pursuant to Ordinance 27, Section 4.B.**
7. Activities located within the 100-year floodplain shall comply with R&O 17-5, Section 5.10.
8. Removal of native, woody vegetation shall be limited to the greatest extent practicable.
9. If applicable, the water quality swale and detention pond shall be planted with Clean Water Services approved native species, and designed to blend into the natural surroundings.
10. **Should final development plans differ significantly from those submitted for review by Clean Water Services, the applicant shall provide updated drawings, and if necessary, obtain a revised Service Provider Letter.**

SPECIAL CONDITIONS

11. **For Vegetated Corridors up to 50 feet wide, the applicant shall enhance the entire Vegetated Corridor to meet or exceed good corridor condition as defined in R&O 17-5, Section 3.14.2, Table 3-3.**
12. Prior to any site clearing, grading or construction, the applicant shall provide Clean Water Services with a Vegetated Corridor enhancement/restoration plan. Enhancement/restoration of the Vegetated Corridor shall be provided in accordance with R&O 17-5, Appendix A, and shall include planting specifications for all Vegetated Corridor, including any cleared areas larger than 25 square feet in Vegetated Corridor rated ""good.""
13. Prior to installation of plant materials, all invasive vegetation within the Vegetated Corridor shall be removed per methods described in Clean Water Services' Integrated Vegetation and Animal Management Guidance, 2003. During removal of invasive vegetation care shall be taken to minimize impacts to existing native tree and shrub species.
14. Clean Water Services shall be notified 72 hours prior to the start and completion of enhancement/restoration activities. Enhancement/restoration activities shall comply with the guidelines provided in Planting Requirements (R&O 17-5, Appendix A).
15. Maintenance and monitoring requirements shall comply with R&O 17-5, Section 2.12.2. If at any time during the warranty period the landscaping falls below the 80% survival level, the owner shall reinstall all deficient planting at the next appropriate planting opportunity and the two year maintenance period shall begin again from the date of replanting.

16. Performance assurances for the Vegetated Corridor shall comply with R&O 17-5, Section 2.07.2, Table 2-1 and Section 2.11, Table 2-2.
17. **Clean Water Services shall require an easement over the Sensitive Area and Vegetated Corridor conveying storm and surface water management to Clean Water Services or the City that would prevent the owner of the Vegetated Corridor from activities and uses inconsistent with the purpose of the corridor and any easements therein.**

FINAL PLANS

18. Final construction plans shall include landscape plans. In the details section of the plans, a description of the methods for removal and control of exotic species, location, distribution, condition and size of plantings, existing plants and trees to be preserved, and installation methods for plant materials is required. Plantings shall be tagged for dormant season identification and shall remain on plant material after planting for monitoring purposes.
19. A Maintenance Plan shall be included on final plans including methods, responsible party contact information, and dates (minimum two times per year, by June 1 and September 30).
20. Final construction plans shall clearly depict the location and dimensions of the sensitive area and the Vegetated Corridor (indicating good, marginal, or degraded condition). Sensitive area boundaries shall be marked in the field.
21. Protection of the Vegetated Corridors and associated sensitive areas shall be provided by the installation of permanent fencing and signage between the development and the outer limits of the Vegetated Corridors. Fencing and signage details to be included on final construction plans.

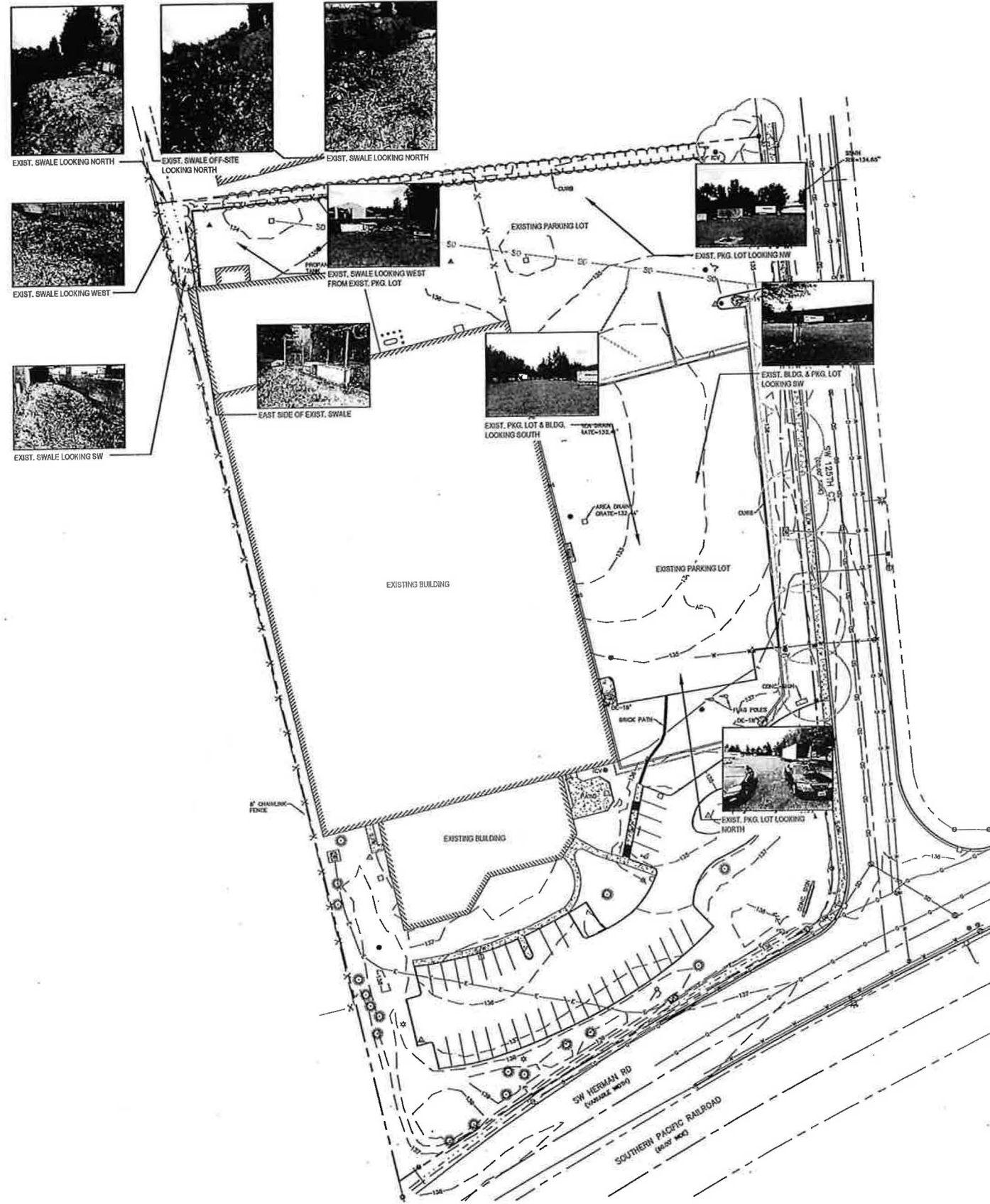
This Service Provider Letter is not valid unless CWS-approved site plan is attached.

Please call (503) 681-3639 with any questions.



Laurie Bunce
Environmental Plan Review

Attachments (4)



NORTH
 **LANDSCAPE PLAN**



CWS File Number 18-000889
 Approved
 Clean Water Services
 For environmental review
 By LB Date 7/26/18
 SPL Attachment 1 of 4



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ENGINEERING
 4872 SW Galloway Drive | Suite 300 | Beaverton, OR 97005
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 FAX: 503.226.1879
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API INTERNATIONAL
 12505 SW HERMAN ROAD
 TUALATIN OREGON

EXISTING CONDITIONS PLAN
 DATE: 04/16/18
 DRAWN: TKL
 CHECKED: TKL
 REVISIONS:

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SHEET
L0.0
 JOB NUMBER: A17116.20



SHEET NOTES

1. SEE ARCHITECTURAL PLANS FOR ADDITIONAL SITE INFORMATION.
2. THE CONTRACTOR SHALL HAVE A FULL SET OF THE CURRENT APPROVED CONSTRUCTION DOCUMENTS INCLUDING ADDENDA ON THE PROJECT SITE AT ALL TIMES.
3. THE CONTRACTOR SHALL KEEP THE ENGINEER AND JURISDICTION INFORMED OF CONSTRUCTION PROGRESS TO FACILITATE SITE OBSERVATIONS AT REQUIRED INTERVALS. 24-HOUR NOTICE IS REQUIRED.

LEGENDS

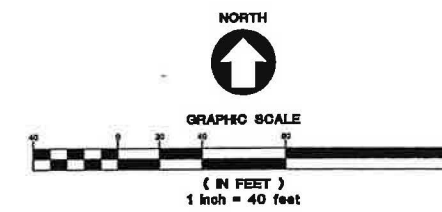
- PROPERTY LINE
- PROPOSED CURB
- CONCRETE SIDEWALK SURFACING
- ASPHALT SURFACING

(X) CONSTRUCTION NOTES

1. INSTALL SIDEWALK PER DETAIL 2/C4.0
2. INSTALL DRIVEWAY PER CITY OF TUALATIN DETAIL 441/C4.0
3. INSTALL CURB PER DETAIL 1/C4.0
4. INSTALL ASPHALT 3/C4.0
5. INSTALL STRIPING
6. INSTALL WALL
7. INSTALL 12" CURB FLOW THROUGH
8. INSTALL PIPE BOLLARD PER DETAIL 5/C4.0
9. RELOCATE EXISTING PROPANE TANK
10. EXISTING RIGHT-OF-WAY
11. PROPOSED RIGHT-OF-WAY
12. AREA OF "FLOOD PLAIN" ON-SITE

CWS File No. 18-000889
 Approved
 Clean Water Services
 For environmental review
 By LB Date 7/20/18

SPL Attachment 2 of 4



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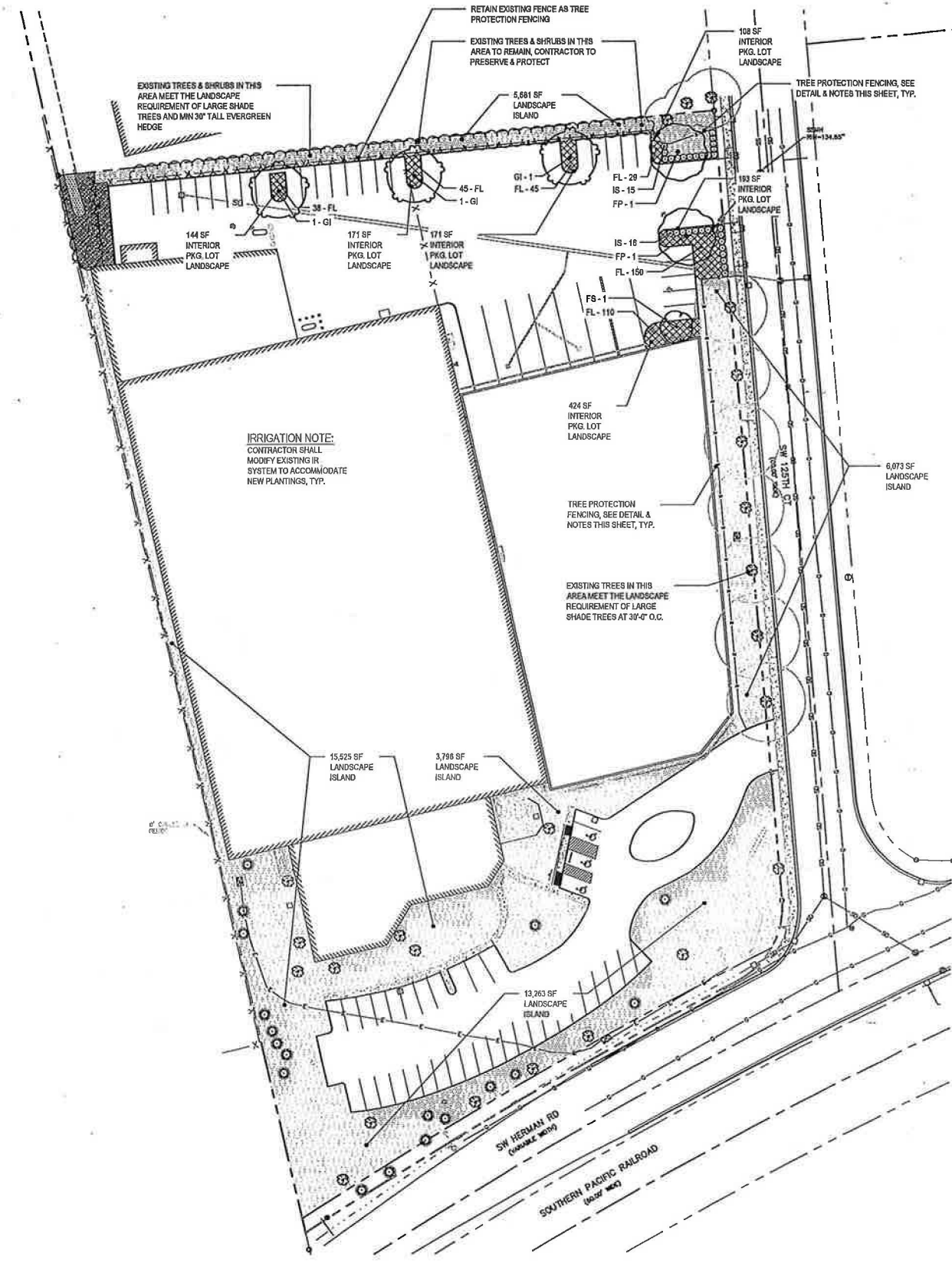
SITE PLAN

DATE: 04/16/18
 DRAWN: NJD
 CHECKED: NWS

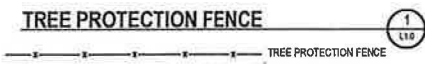
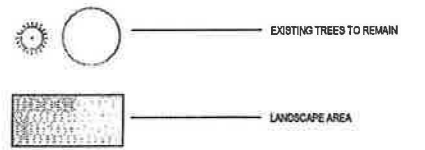
REVISIONS:
 SHEET

C1.0

JOB NUMBER:
 A17116.11



LEGEND



LANDSCAPE REQUIREMENTS

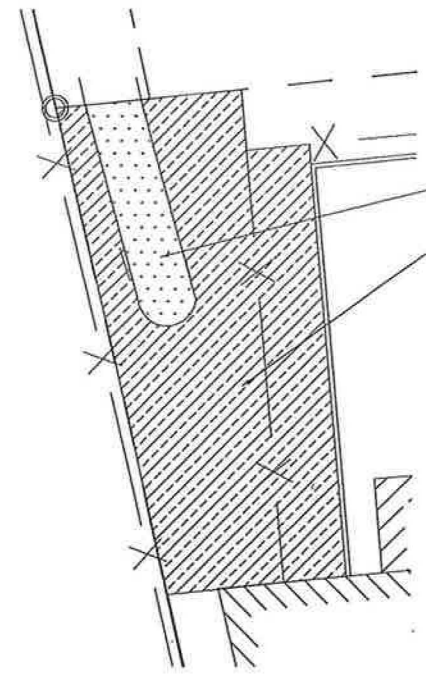
TOTAL SITE AREA	= 210,562 SF
LANDSCAPE AREA REQUIRED 15% OF SITE	= 31,584 SF
LANDSCAPE ARE PROPOSED 21.6% OF SITE	= 45,548 SF
PERIMETER PKG. LOT LANDSCAPING REQ.	= 5'-0" MIN LANDSCAPE STRIP
PERIMETER PKG. LOT LANDSCAPING PROPOSED	= 6'-6" LANDSCAPE STRIP
INTERIOR PKG. LOT ISLAND REQ = 25 SF PER PKG. STALL = 25 x 20 STALL	= 650 SF
INTERIOR PKG. LOT LANDSCAPE PROPOSED	= 1,211 SF
INTERIOR PKG. LOT TREES REQUIRED	= 6
INTERIOR PKG. LOT TREES PROPOSED	= 6

PLANTING NOTES

- ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT CITY OF TUALATIN STANDARDS AND THE OREGON STRUCTURAL SPECIALTY CODE.
- VERIFY ALL EXISTING CONDITIONS, INCLUDING LOCATION OF PROPERTY LINES, PRIOR TO BEGINNING ANY WORK. REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE IMMEDIATELY.
- DO NOT WILLFULLY PROCEED WITH CONSTRUCTION WHEN UNKNOWN OBSTRUCTIONS AND/OR DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. IMMEDIATELY NOTIFY OWNER'S REPRESENTATIVE OF UNKNOWN OBSTRUCTIONS AND/OR DIFFERENCES. PRIOR TO REMOVING ANY EXISTING FEATURES, REVIEW AND CONFIRM EXTENT OF DEMOLITION WITH OWNER'S REPRESENTATIVE.
- PROTECT EXISTING ITEMS TO REMAIN DURING CONSTRUCTION. ANY DAMAGE TO EXISTING ITEMS DESIGNATED TO REMAIN I.E. CURBS, WALKS, PLANT MATERIAL, LAWN OR FENCES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
- VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES, LINES, PIPES, VAULTS, OR BOXES PRIOR TO EXCAVATION. MARK AND PROTECT ALL UTILITIES, SITE FEATURES AND VEGETATION TO REMAIN IN PLACE. ANY DAMAGE TO ANY KNOWN EXISTING UTILITY ELEMENTS SHALL BE REPAIRED PROPERLY AND IMMEDIATELY.
- REMOVE FROM THE SITE AND LEGALLY DISPOSE OF ALL DEBRIS AND EXCAVATED MATERIAL NOT REQUIRED FOR FILL. NO RUBBISH OR DEBRIS SHALL BE BURIED ON THE SITE.
- MAINTAIN ALL ROADWAYS AND PAVED PATHWAYS CLEAN AND FREE OF CONSTRUCTION MATERIALS AND DEBRIS, PROVIDING NECESSARY DUST CONTROL WHERE REQUIRED.
- COORDINATE AND SCHEDULE ALL WORK WITH THE OWNER'S REPRESENTATIVE.
- INSTALL EROSION CONTROL SYSTEMS IN ACCORDANCE WITH CITY OF TUALATIN STANDARDS PRIOR TO SITE WORK AND LANDSCAPE INSTALLATION.
- CONTRACTOR SHALL PROVIDE TOPSOIL, SOIL AMENDMENTS, AND EROSION CONTROL.
- CONTRACTOR SHALL SUBMIT CERTIFIED TOPSOIL ANALYSIS REPORT FOR OWNER'S APPROVAL PRIOR TO PLANT INSTALLATION.
- CONTRACTOR IS RESPONSIBLE FOR ANY AMENDMENTS TO SOIL PH FERTILITY AND/OR DRAINAGE CONDITIONS NECESSARY TO ENSURE PROPER GROWING CONDITIONS FOR PROPOSED PLANTINGS.
- CONTRACTOR SHALL FOLLOW PROVIDER'S INSTRUCTIONS AND RECOMMENDATIONS FOR SEEDING.
- ALL PLANTS SHALL BE INSTALLED ACCORDING TO AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1) AS WELL AS DETAIL DRAWINGS AND SPECIFICATIONS.
- ALL PLANTS SHALL BE IRRIGATED BY A FULLY AUTOMATED, PERMANENT IRRIGATION SYSTEM UNLESS OTHERWISE NOTED. CONTRACTOR SHALL MODIFY EXISTING IR SYSTEM TO ACCOMMODATE NEW PLANTINGS.
- CONTRACTOR SHALL RE-DESIGN THE IRRIGATION SYSTEM AND PROVIDE OWNER WITH SHOP DRAWINGS FOR APPROVAL. SEE SPECS.
- PRIOR TO FINAL ACCEPTANCE, CONTRACTOR SHALL PROVIDE OWNER WITH AS-BUILT PLANS OF THE INSTALLATION, COPIES OF ALL OPERATION MANUALS AND WARRANTY DOCUMENTS.
- ALL NEW PLANTS IN LANDSCAPE AREAS SHALL BE WARRANTED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

PLANT SCHEDULE

TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	
	FP	2	FRAXINUS PENNSYLVANICA 'PATMORE' WELL BRANCHED AND LIMBED TO 6'-0"	'PATMORE' ASH	1.5" CAL.	
	FS	1	FRAXINUS PENNSYLVANICA 'SUMMIT' WELL BRANCHED AND LIMBED TO 6'-0"	SUMMIT ASH	1.5" CAL.	
	GI	3	GLEDTISIA TRIACANTHOS INERMIS 'TRUESHADE' WELL BRANCHED AND LIMBED TO 6'-0"	THORNLESS HONEY LOCUST	1.5" CAL.	
SHRUBS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	
	IS	31	ILEX GLABRA 'SHAMROCK' MAINTAIN HEIGHT AT 30"	INKBERRY	1 GAL.	
GROUND COVERS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
	FL	417	FRAGARIA CHILOENSIS 'LIPSTICK'	BEACH STRAWBERRY	4" POT	24" o.c.



1 VEGETATIVE CORRIDOR PLANTING PLAN
SCALE: 1:10

NORTH
LANDSCAPE PLAN



CWS File No. 18-000889
Approved
Clean Water Services
For environmental review
By LB Date 7/20/18

SPZ Attachment 3 of 4



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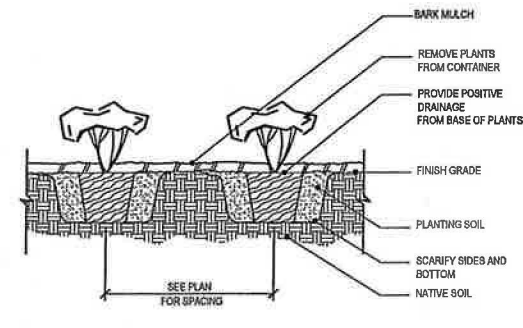
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FAX: 503.228.1870
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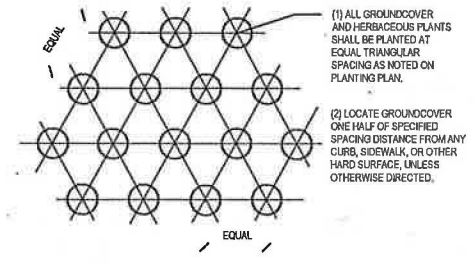
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DRAWN: TKL
CHECKED: TKL

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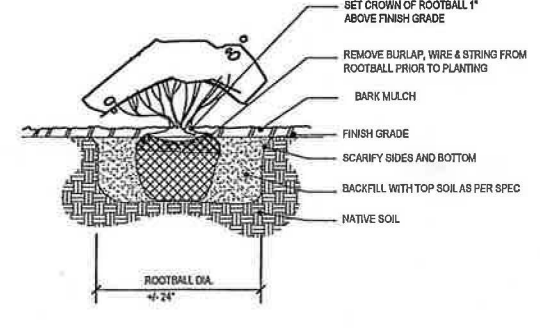
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SHEET
LANDSCAPE PLAN
L1.1
JOB NUMBER:
A17116.20



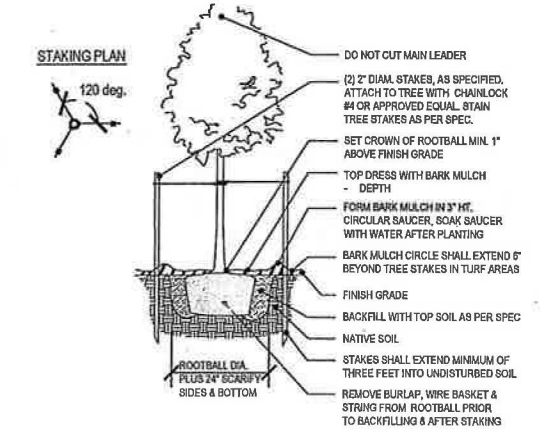
1 GROUNDCOVER & HERBACEOUS PLANT PLANTING DETAIL
L2.0 SCALE: NTS



2 GROUNDCOVER & HERBACEOUS PLANT PLANTING PLAN
L2.0 SCALE: NTS



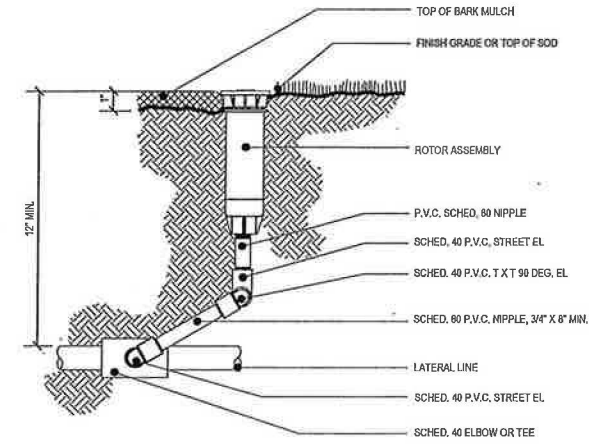
3 SHRUB PLANTING
L2.0 SCALE: NTS



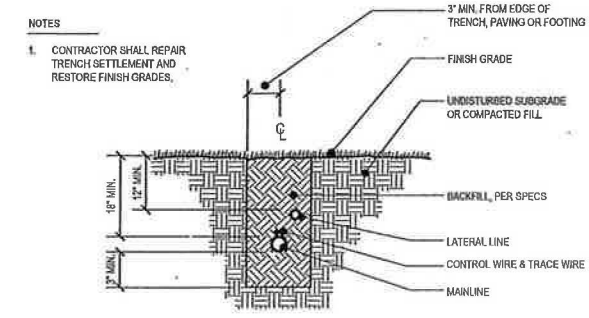
4 DECIDUOUS TREE PLANTING DETAIL
L2.0 SCALE: NTS

NOTES
1. PIPING SHALL NOT EXCEED 5 FEET PER SECOND VELOCITY.
2. DEMANDS OF SYSTEM DESIGN SHALL NOT EXCEED PERFORMANCE CRITERIA OF WATER METER.
3. SEE SPECIFICATIONS FOR ALL PERFORMANCE REQUIREMENTS.

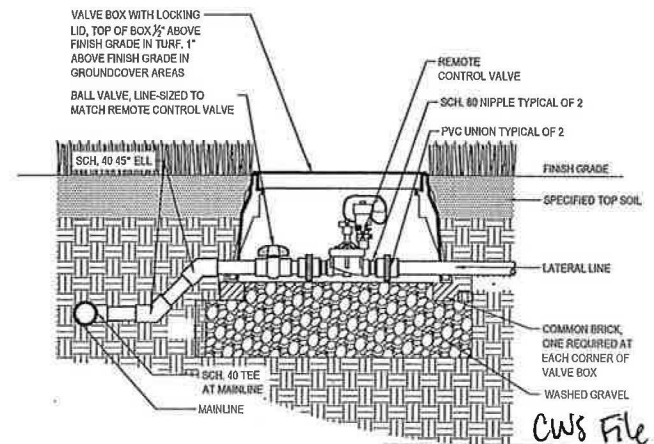
GPM	PIPE SIZE
0-9	3/4"
9-16	1"
16-26	1-1/4"
26-35	1-1/2"
35-55	2"



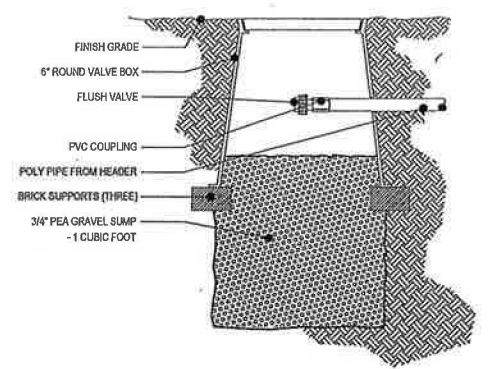
5 LATERAL PIPE SIZING SCHEDULE
L2.0 SCALE: NTS



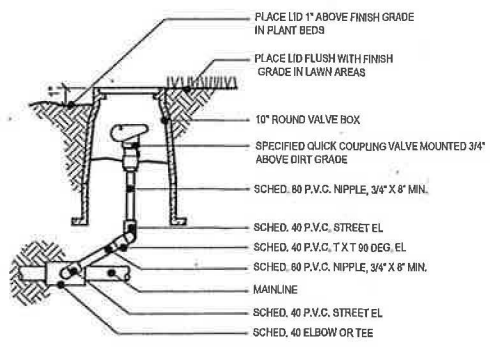
6 SPRAY HEAD ASSEMBLY W/ SWING JOINT
L2.0 SCALE: NTS



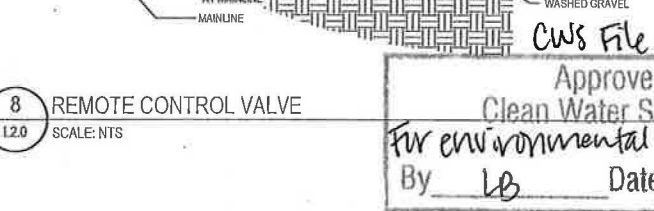
7 IR TRENCHING DETAIL
L2.0 SCALE: NTS



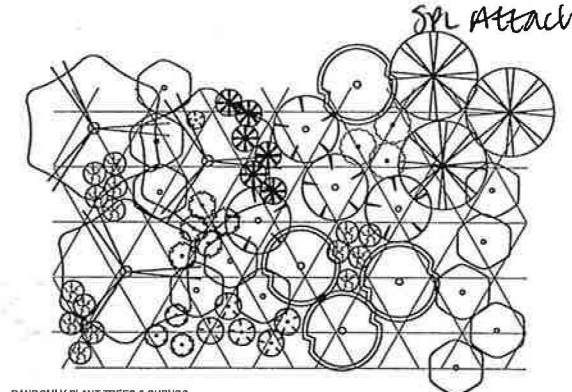
9 FLUSH VALVE
L2.0 SCALE: NTS



10 QUICK COUPLER VALVE DETAIL
L2.0 SCALE: NTS



8 REMOTE CONTROL VALVE
L2.0 SCALE: NTS



11 VEGETATIVE CORRIDOR PLANTING DETAIL
L1.1 N.T.S.

CWS File No. 18-000889
Approved
Clean Water Services
For environmental review
By LB Date 7/20/18
SPL Attachment 4 of 4



API Expansion

STORMWATER REPORT & CALCULATIONS

12505 SW Herman Rd
Tualatin, Oregon

Revised August 1, 2018

June 8, 2018

PROJECT NUMBER: A17116.11

AAI Engineering

4875 S.W. Griffith Drive

Suite 300

Beaverton, Oregon 97005

PH 503.620.3030 FX 503.620.5539

EMAIL: craigh@aaieng.com

API Expansion

TABLE OF CONTENTS

- I. Project Overview
- II. Water Quality Design
- III. Water Quantity Design
- IV. Conveyance Pipe Design and Layout
- V. Downstream Analysis
- VI. HydroCAD Calculations
- VII. Details
- VIII. Geotechnical Report
- IX. O&M

API Expansion

I. Project Overview

API Expansion

Project Overview

The API Expansion project is located at 12505 SW Herman Road, in Tualatin OR. The project site is 150,933SF with 75,416F of buildings and 56,387SF of AC and concrete. During construction we will be removing a large portion of AC and constructing the Building addition over this area. We will be disturbing about 71,000SF. Post construction we will ADD 3,178SF of impervious area to the site.

The existing and proposed building runoff will be collected by downspouts and the existing site parking has been graded to collect runoff in catch basins. The WQ facility has been designed base on the latest CWS manual. Grading in pervious areas is designed to limit erosion potential and match existing elevations at property lines.

Conveyance piping is sized to handle expected flows from the 25yr design storm as specified in CWS Design and Construction Standards Manual, April 2017 R&O 17-5.

Please see the attached calculations showing that the on-site stormwater system meets the said requirement.

API Expansion

II. Water Quality Design

API Expansion

Water Quality Design

The project is within the CWS jurisdiction for stormwater management. We will capture runoff from the existing and new impervious areas in Downspouts (Roofs) and Catchbasins (AC and Concrete). Due to site constraints, we are proposing the use of a Filtered Vault to provide water quality. Contech makes the product we are proposing and the vault has been sized per the calculations below and the peak flow volumes and treatment capacities listed below.

Facility	Type	Size	Area Treated	IA Treated (sf)	Discharge Point
Filtered Vault	(9) Cart	8'X11'	Asphalt/Roof	134,981SF	Existing drainage system in SW 125th Ct.

VLT1

$$\begin{aligned} \text{Water Quality Volume (WQV)} &= \frac{0.36in. \times Area}{12in./ft.} \\ &= \frac{0.36in. \times 134,981ft.^2}{12in./ft.} \end{aligned}$$

$$\text{Water Quality Volume} = 4,049.43ft^3$$

The Water Quality Flow is the average design flow anticipated from the water quality storm.

$$\begin{aligned} \text{Water Quality Flow (WQF)} &= \frac{WQV}{14,400sec.} \\ &= \frac{4,049.43ft.^3}{14,400sec.} \end{aligned}$$

$$\text{Water Quality Flow (WQF)} = 0.281 \frac{ft^3}{sec} = 0.281cfs$$

API Expansion

Determine required number of filter cartridges

$$\text{Number of Filters} \quad N_{\text{filter}} = Q_{\text{treat}} \times \left(\frac{449 \text{ gpm} / \text{cfs}}{Q_{\text{cart}} \text{ gpm} / \text{cartridge}} \right)$$

$$Q_{\text{treat}} = Q = 0.281 \text{ cfs}, Q_{\text{cart}} = 15 \text{ gpm} / \text{cartridge}$$

$$N_{\text{filter}} = 0.281 \text{ cfs} \times \left(\frac{449 \text{ gpm} / \text{cfs}}{15 \text{ gpm} / \text{cartridge}} \right)$$

Number of Filters

$$N_{\text{filter}} = 8.41 \text{ Cartridges}$$

Use (9)-Cartridge Filtered Vault to provide treatment.

API Expansion

III. Water Quantity Design

API Expansion

Water Quantity Design

Water Quantity (Detention)

The water quantity detention requirement is to detain the post-developed 2-year (Q=1.81cfs), 10-year (Q=2.58cfs) and 25-year (Q=2.95cfs) storm events and release it at the pre-developed 2-year (Q=1.78cfs), 10-year (Q=2.54cfs) and 25-year (Q=2.91cfs) discharge rates. The required detention volume, to contain the 25yr storm, is 463CF. By using 250LF of 21" diameter CMP, we will have an available detention volume of 601CF. The additional storage volume assures that the detention facility will not surcharge the on-site conveyance system and pond on the surface during large rain events.

Orifice Release

The stormwater runoff will be released from the detention pipes through a flow control riser located in a manhole. The flow control riser will have (2) orifices. The initial orifice is 7.9" Dia. This orifice will discharge the 2-year storm. The second orifice is a 2.0"Hx11.0"W slot, at an elevation of 1.17' above the 2-year orifice. This orifice will discharge 10-year and 25-year storm events. The emergency overflow elevation is 0.78' above the 10/25-year slot with an opening of 15". This will allow rain events larger than the 25-year storm to pass without causing a surcharging of the on-site conveyance system.

Please see attached HydroCAD calculations (Section VI) and Details (Section VII) to verify adequacy of water quantity design.

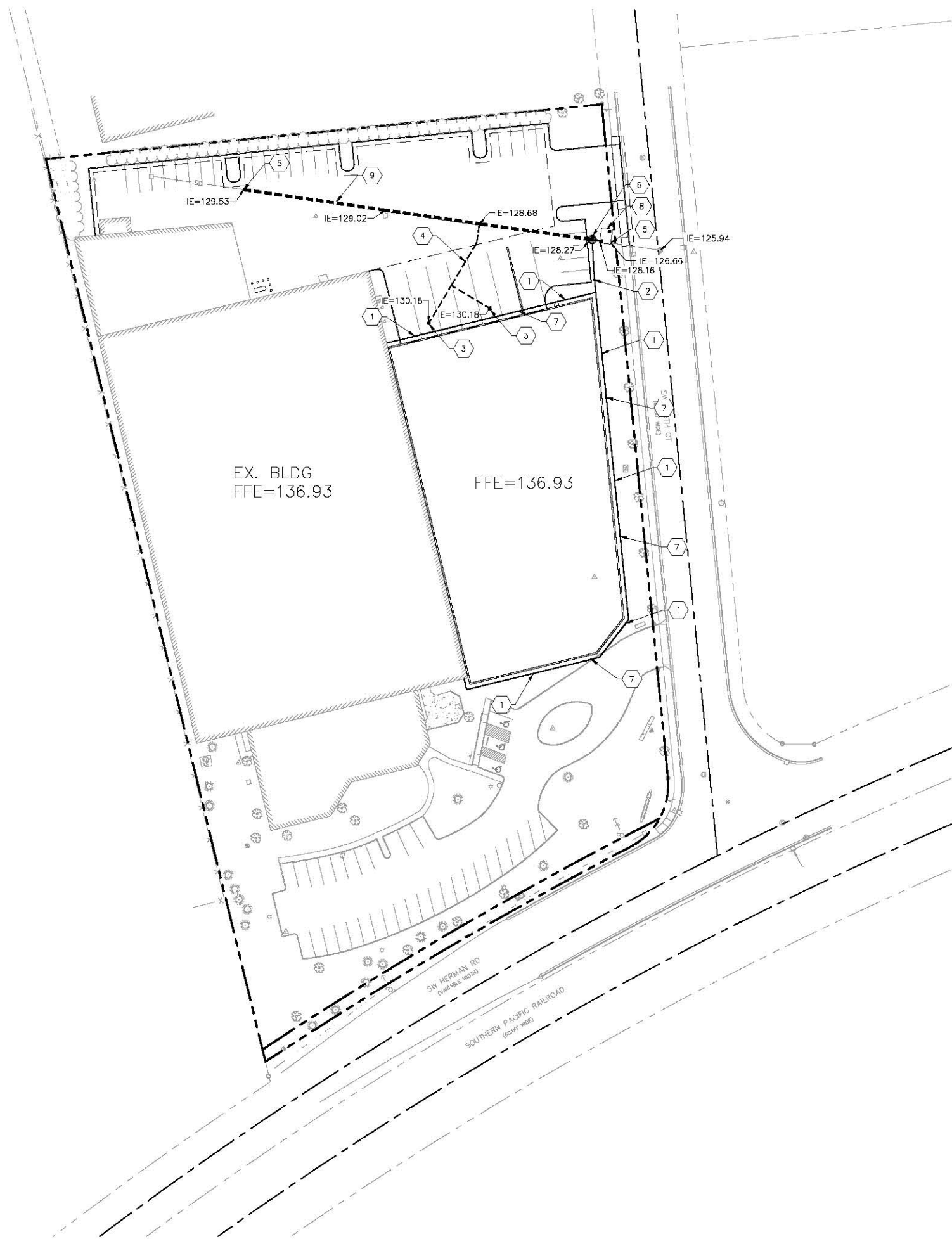
API Expansion

IV. Conveyance Pipe Design and Layout

A pipe layout and corresponding calculations will be provided once the building downspouts have been finalized.

Storm Conveyance Calculations

General		Connected Basin				Cumulative Basin					Piping																	
Upstream Structure	Downstream Structure	Design Storm (yr)	Impervious Area (sf)	Pervious Area (sf)	Total Area (sf)	Impervious Area (sf)	Pervious Area (sf)	Weighted Runoff Coefficient	Total Basin Area (sf)	Total Area (ac)	Time of Concentration (min)	I (in/hr)	Q (cfs)	% Full (Q/Q _{MAX})	Size (in)	Slope (%)	Design Pipe Velocity (ft/s)	Slope (ft/ft)	D (ft)	D/d	d (ft)	n	deg	A (cf)	P (ft)	R	Full Pipe Velocity (ft/s)	Max Allowable Q (cfs)
CB-1	79	25	3272	0	3272	3272	0	0.90	3272	0.08	5.00	2.50	0.17	14.25%	6	1.85%	6.19	0.0185	0.50	0.94	0.47	0.009	5.29	0.19	1.32	0.14	6.19	1.19
CB-2	79	25	12553	0	12553	12553	0	0.90	12553	0.29	5.00	2.50	0.65	54.68%	6	1.85%	6.19	0.0185	0.50	0.94	0.47	0.009	5.29	0.19	1.32	0.14	6.19	1.19
79	73	25		0	0	15825	0	0.90	15825	0.36	5.00	2.50	0.82	68.93%	6	1.85%	6.19	0.0185	0.50	0.94	0.47	0.009	5.29	0.19	1.32	0.14	6.19	1.19
EXCB-1	72	25	7336	0	7336	7336	0	0.90	7336	0.17	5.00	2.50	0.38	30.73%	6	2.00%	6.44	0.0200	0.50	0.94	0.47	0.01	5.29	0.19	1.32	0.14	6.44	1.23
72	84	25		0	0	7336	0	0.90	7336	0.17	5.00	2.50	0.38	2.18%	21	0.50%	7.42	0.0050	1.75	0.94	1.65	0.01	5.29	2.35	4.63	0.51	7.42	17.41
EXBC-2	84	25	11456	0	11456	11456	0	0.90	11456	0.26	5.00	2.50	0.59	47.99%	6	2.00%	6.44	0.0200	0.50	0.94	0.47	0.01	5.29	0.19	1.32	0.14	6.44	1.23
84	73	25		0	0	18792	0	0.90	18792	0.43	5.00	2.50	0.97	5.58%	21	0.50%	7.42	0.0050	1.75	0.94	1.65	0.01	5.29	2.35	4.63	0.51	7.42	17.41
73	FCMH-1	25		0	0	34617	0	0.90	34617	0.79	5.00	2.50	1.79	10.27%	21	0.50%	7.42	0.0050	1.75	0.94	1.65	0.01	5.29	2.35	4.63	0.51	7.42	17.41
DS	FCMH-1	25	32964	0	32964	32964	0	0.90	32964	0.76	5.00	2.50	1.70	64.12%	8	2.00%	7.80	0.0200	0.67	0.94	0.63	0.01	5.29	0.34	1.76	0.19	7.80	2.66
FCMH-1	WQV-1	25		0	0	67581	0	0.90	67581	1.55	5.00	2.50	3.49	89.18%	12	0.50%	5.11	0.0050	1.00	0.94	0.94	0.01	5.29	0.77	2.65	0.29	5.11	3.91

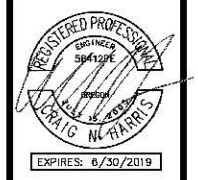
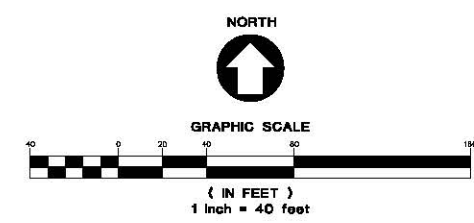


SHEET NOTES

1. PIPE BEDDING AND BACKFILL UTILITIES SHALL BE DONE PER DETAIL 7/C4.0.
2. INSTALL THRUST BLOCKS ON FIRE AND WATER LINES PER DETAIL 2/C4.1.
3. THIS PLAN IS GENERALLY DIAGRAMMATIC. IT DOES NOT SHOW EVERY JOINT, BEND, FITTING, OR ACCESSORY REQUIRED FOR CONSTRUCTION.
4. CLEAN OUTS SHALL BE INSTALLED IN CONFORMANCE WITH UPC CHAPTER SEVEN, SECTION 707 AND SECTION 719. NOT ALL REQUIRED CLEAN OUTS ARE SHOWN.
5. DOMESTIC WATER AND FIRE LINES AND ACCESSORIES BETWEEN THE WATER METER AND THE BUILDING SHALL BE INSTALLED BY A LICENSED PLUMBER EMPLOYED BY A LICENSED PLUMBING CONTRACTOR.
6. UTILITIES WITHIN FIVE FEET OF A BUILDING SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR INTERIOR USE AS DESCRIBED IN THE CURRENT EDITION OF THE UPC.
7. INLETS AND OUTLETS TO ON-SITE MANHOLES SHALL HAVE FLEXIBLE CONNECTION NO CLOSER THAN 12" AND NO FARTHER THAN 36" FROM THE MANHOLE.
8. CONTRACTOR TO VERIFY EXISTING INVERTS PRIOR TO ORDERING MATERIALS. CONTACT ENGINEER OF RECORD IF DISCREPANCIES OCCUR.

X STORM NOTES

1. INSTALL FOUNDATION DRAIN PER DETAIL 6/C4.0
2. INSTALL BACKWATER VALVE, PRODUCT BY CLEAN CHECK
3. INSTALL CATCH BASIN PER DETAIL 3/C4.1
4. 6" PIPE AT 2% MIN
5. TIE TO EXISTING STORM PIPE
6. INSTALL 60" FLOW CONTROL MANHOLE PER DETAIL 4/C4.1
7. INSTALL CLEANOUT PER DETAIL 1/C4.1
8. INSTALL 8'x11' PEAK DIVERSION FILTER VAULT PER CONTECH DETAIL ON C4.1
9. 250 LF - 21" DETENTION PIPE @ 0.5%



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API INTERNATIONAL
 12505 SW HERMAN ROAD
 TUALATIN OREGON

UTILITY PLAN

DATE: 04/16/18
 DRAWN: NJD
 CHECKED: NWS
 REVISIONS:

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SHEET
C3.0

JOB NUMBER:
 A17116.11

API Expansion

V. Downstream Analysis

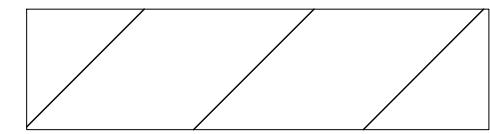
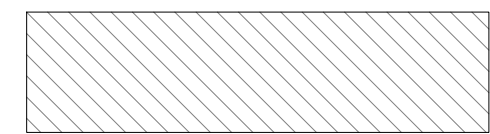
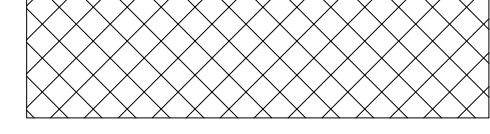
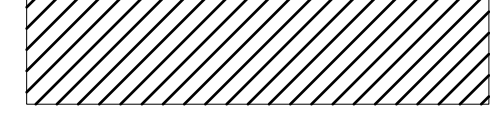
API Expansion

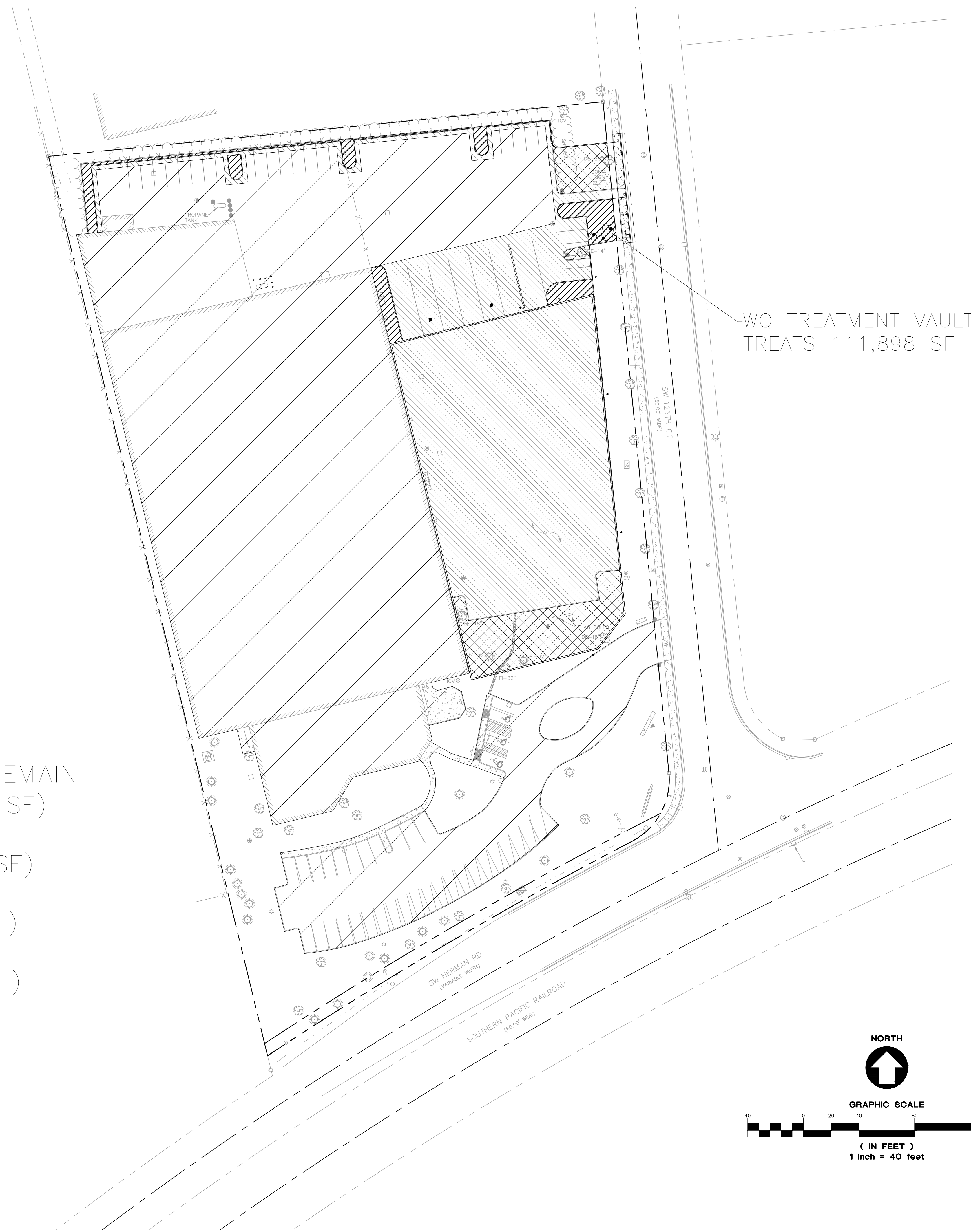
Downstream Analysis

We are providing a downstream analysis per Section 3-5-210, including use Manning's pipe capacity spreadsheet provided by the City of Tualatin. Runoff from our site enters an existing storm conveyance system in SW 125th Ct and flows generally north to a point that is just south of the cul-de-sac, approximately 320'. At this point the conveyance piping turns west and terminates approximately 475' further downstream at an outfall to wetland. There are no observed deficiencies in the downstream conveyance piping (Approx. 795') and we are not increasing the flow from our site. With no increase in flow from our site between pre-developed and post-developed conditions, and an adequate downstream system currently in place, it is not possible for our project to have an adverse effect on any downstream component of the storm system. See Manning's pipe capacity spreadsheet provided by the City of Tualatin attached.

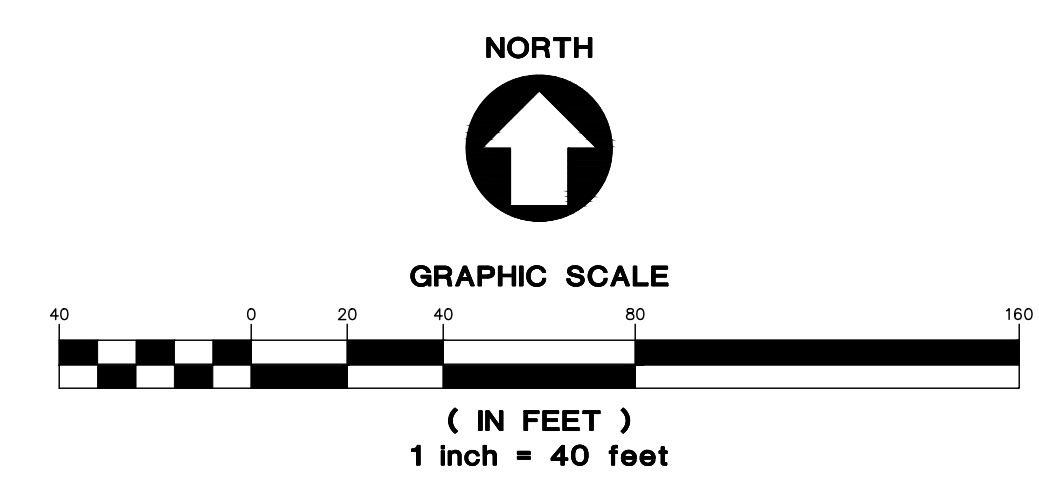
Project: API										Legend: % Pipe Capacity Used														
Project: Stormwater Conveyance Calculation Check										0-82				Acceptable										
Date: 8/1/2018										83 +				Upsize if City's										
Calc'd By: Craig Harris, PE										83 +				Awareness for Private										
Pipe Information and Calculations																								
Design Section	Q (Calc'd) "Q"	Pipe Dia. (inch) "D"	Pipe Dia. (ft) "D"	Manning's number "n"	Slope "S" %	Slope "S"	Area Full (Calc'd) "Af"	Wetted Perimeter (Calc'd) "Wp"	Hydraulic Radius (Calc'd) "Rf"	Velocity Full (Calc'd) "Vf"	Flow Rate Full (Calc'd) "Qf"	% Pipe Capacity Used (Calc'd) "Q/Qf"	Velocity @ Q/Qf (Calc'd) "V"	Acceptable or Redesign Necessary										
Before project																								
12" priv	2.9	12	1.00	0.013	1	0.0100	0.785	3.142	0.250	4.549	3.572	81.2%	3.69											
36" pub (upstream)	25.6	36	3.00	0.013	0.2635	0.0026	7.069	9.425	0.750	4.857	34.330	74.6%	3.62	*Slope of existing upstream pipe is assumed to match existing downstream slope										
36" pub (downstream)	28.5	36	3.00	0.013	0.2635	0.0026	7.069	9.425	0.750	4.857	34.330	83.0%	4.03	*Slope of existing downstream pipe is assumed as flat as possible such that 83% capacity is obtained. Pipe slope is likely closer to roadway slope of 0.4%.										
After project																								
12" priv	2.9	12	1.00	0.013	1	0.0100	0.785	3.142	0.250	4.549	3.572	81.2%	3.69											
36" pub (upstream)	25.6	36	3.00	0.013	0.2635	0.0026	7.069	9.425	0.750	4.857	34.330	74.6%	3.62											
36" pub (downstream)	28.5	36	3.00	0.013	0.2635	0.0026	7.069	9.425	0.750	4.857	34.330	83.0%	4.03	*Note that public pipes still experience flows at 83% capacity or less										
Show in square feet and acres:																								
<ul style="list-style-type: none"> Impervious areas: existing, modified (replaced: was existing and will remain, but had to go down to gravel or subgrade), new (was pervious), removed (now pervious), and new total Treatment provided: existing, new total 																								
This will help us with our new yearly reporting requirements to CWS.																								

IMPERVIOUS AREAS

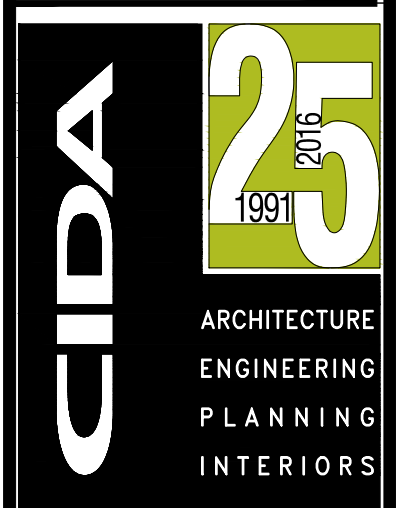
-  EXISTING TO REMAIN
(118,377 SF)
-  MODIFIED
(38,231 SF)
-  NEW
(6,193 SF)
-  REMOVE
(2,996 SF)



WQ TREATMENT VAULT
TREATS 111,898 SF



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IMPERVIOUS AREAS

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CHECKED: NWS

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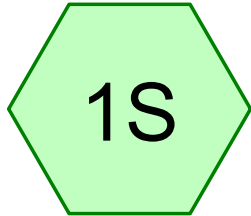
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SHEET

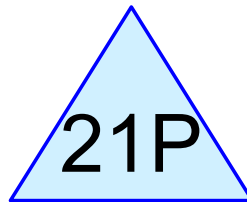
JOB NUMBER:
A17116.11

API Expansion

VI. HydroCAD Calculations

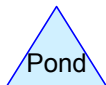
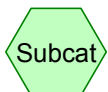


Existing Conditions



Developed Conditions

Chambers



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Existing Conditions Runoff Area=150,933 sf 87.33% Impervious Runoff Depth>2.06"
Tc=5.0 min CN=74/98 Runoff=1.78 cfs 0.594 af

Subcatchment22S: Developed Runoff Area=150,933 sf 89.43% Impervious Runoff Depth>2.09"
Tc=5.0 min CN=74/98 Runoff=1.81 cfs 0.604 af

Pond 21P: Chambers Peak Elev=1.17' Storage=174 cf Inflow=1.81 cfs 0.604 af
Outflow=1.77 cfs 0.604 af

Total Runoff Area = 6.930 ac Runoff Volume = 1.198 af Average Runoff Depth = 2.07"
11.62% Pervious = 0.805 ac 88.38% Impervious = 6.125 ac

Summary for Subcatchment 1S: Existing Conditions

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.78 cfs @ 7.91 hrs, Volume= 0.594 af, Depth> 2.06"

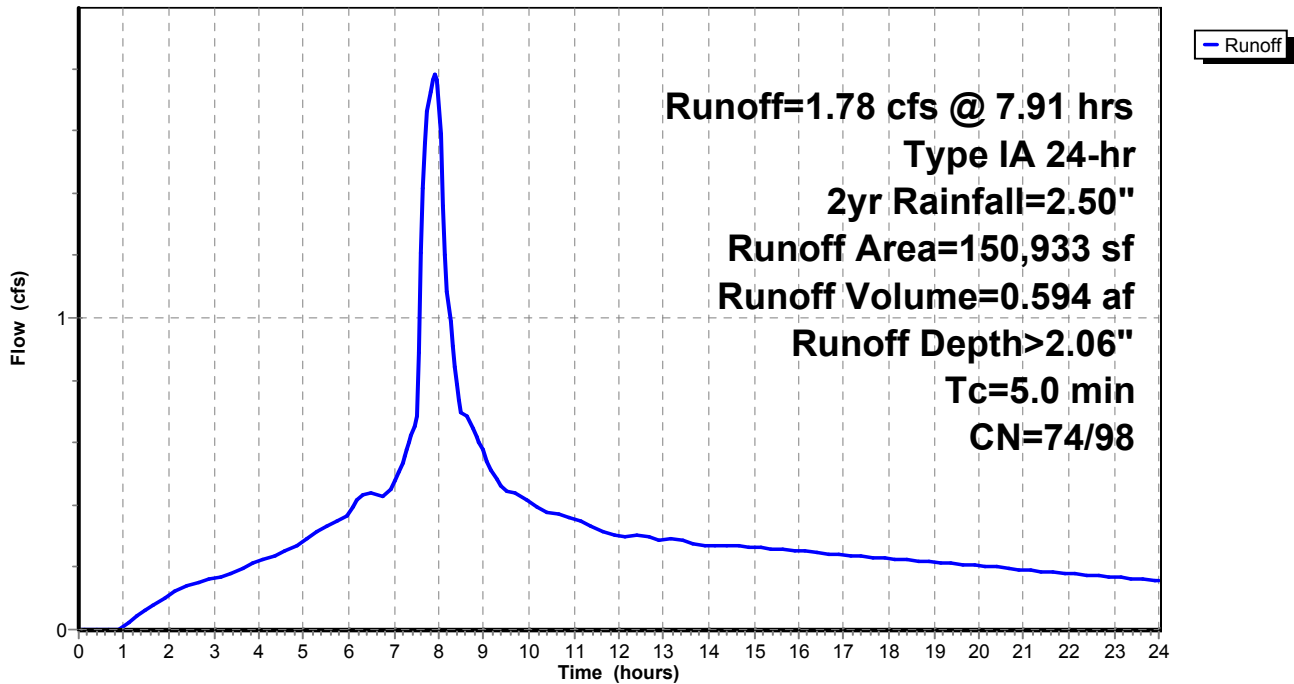
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 2yr Rainfall=2.50"

Area (sf)	CN	Description
19,130	74	>75% Grass cover, Good, HSG C
131,803	98	Paved parking, HSG D
150,933	95	Weighted Average
19,130	74	12.67% Pervious Area
131,803	98	87.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



Summary for Subcatchment 22S: Developed Conditions

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.81 cfs @ 7.91 hrs, Volume= 0.604 af, Depth> 2.09"

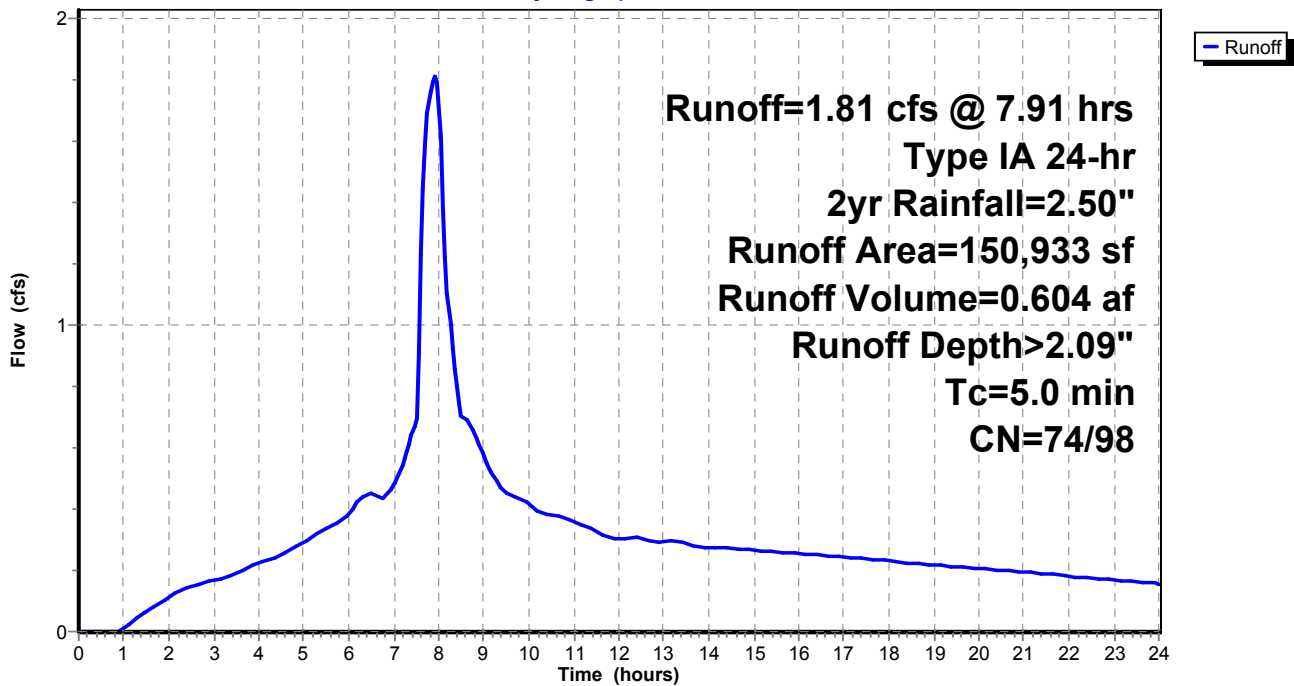
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 2yr Rainfall=2.50"

Area (sf)	CN	Description
134,981	98	Paved parking, HSG C
15,952	74	>75% Grass cover, Good, HSG C
150,933	95	Weighted Average
15,952	74	10.57% Pervious Area
134,981	98	89.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 22S: Developed Conditions

Hydrograph



Summary for Pond 21P: Chambers

Inflow Area = 3.465 ac, 89.43% Impervious, Inflow Depth > 2.09" for 2yr event
 Inflow = 1.81 cfs @ 7.91 hrs, Volume= 0.604 af
 Outflow = 1.77 cfs @ 7.99 hrs, Volume= 0.604 af, Atten= 2%, Lag= 5.0 min
 Primary = 1.77 cfs @ 7.99 hrs, Volume= 0.604 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 1.17' @ 7.99 hrs Surf.Area= 340 sf Storage= 174 cf

Plug-Flow detention time= 0.2 min calculated for 0.604 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (679.6 - 679.5)

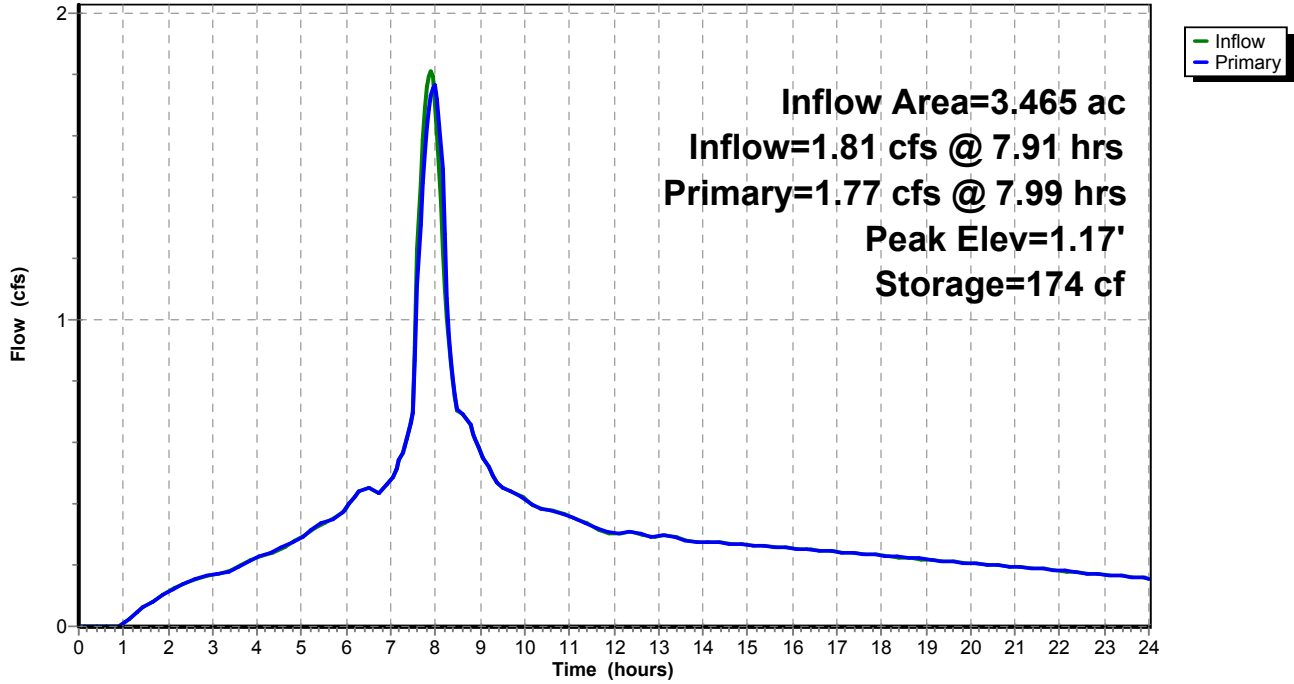
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	601 cf	21.0" Round Pipe Storage L= 250.0' S= 0.0050 'f'

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	7.9" Horiz. 2-yr C= 0.600
#2	Primary	1.17'	11.0" W x 2.0" H Vert. 10yr/25yr C= 0.600
#3	Primary	1.95'	12.0" Horiz. Emergency Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.77 cfs @ 7.99 hrs HW=1.16' (Free Discharge)
 1=2-yr (Orifice Controls 1.77 cfs @ 5.19 fps)
 2=10yr/25yr (Controls 0.00 cfs)
 3=Emergency Overflow (Controls 0.00 cfs)

Pond 21P: Chambers

Hydrograph



A17116.11.API

Prepared by Hewlett-Packard Company

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Type IA 24-hr 10yr Rainfall=3.45"

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Page 7

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Existing Conditions Runoff Area=150,933 sf 87.33% Impervious Runoff Depth>2.96"
Tc=5.0 min CN=74/98 Runoff=2.54 cfs 0.854 af

Subcatchment22S: Developed Runoff Area=150,933 sf 89.43% Impervious Runoff Depth>3.00"
Tc=5.0 min CN=74/98 Runoff=2.58 cfs 0.866 af

Pond 21P: Chambers Peak Elev=1.63' Storage=352 cf Inflow=2.58 cfs 0.866 af
Outflow=2.54 cfs 0.866 af

Total Runoff Area = 6.930 ac Runoff Volume = 1.720 af Average Runoff Depth = 2.98"
11.62% Pervious = 0.805 ac 88.38% Impervious = 6.125 ac

Summary for Subcatchment 1S: Existing Conditions

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.54 cfs @ 7.90 hrs, Volume= 0.854 af, Depth> 2.96"

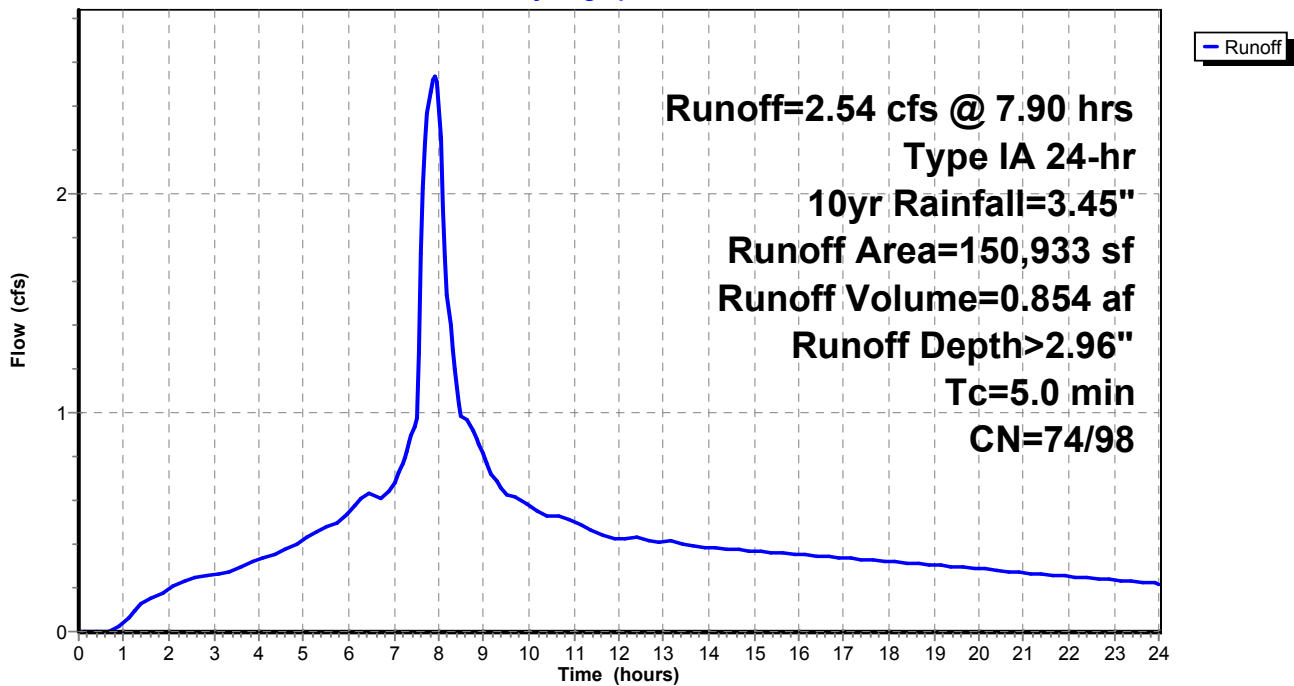
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 10yr Rainfall=3.45"

Area (sf)	CN	Description
19,130	74	>75% Grass cover, Good, HSG C
131,803	98	Paved parking, HSG D
150,933	95	Weighted Average
19,130	74	12.67% Pervious Area
131,803	98	87.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



Summary for Subcatchment 22S: Developed Conditions

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.58 cfs @ 7.90 hrs, Volume= 0.866 af, Depth> 3.00"

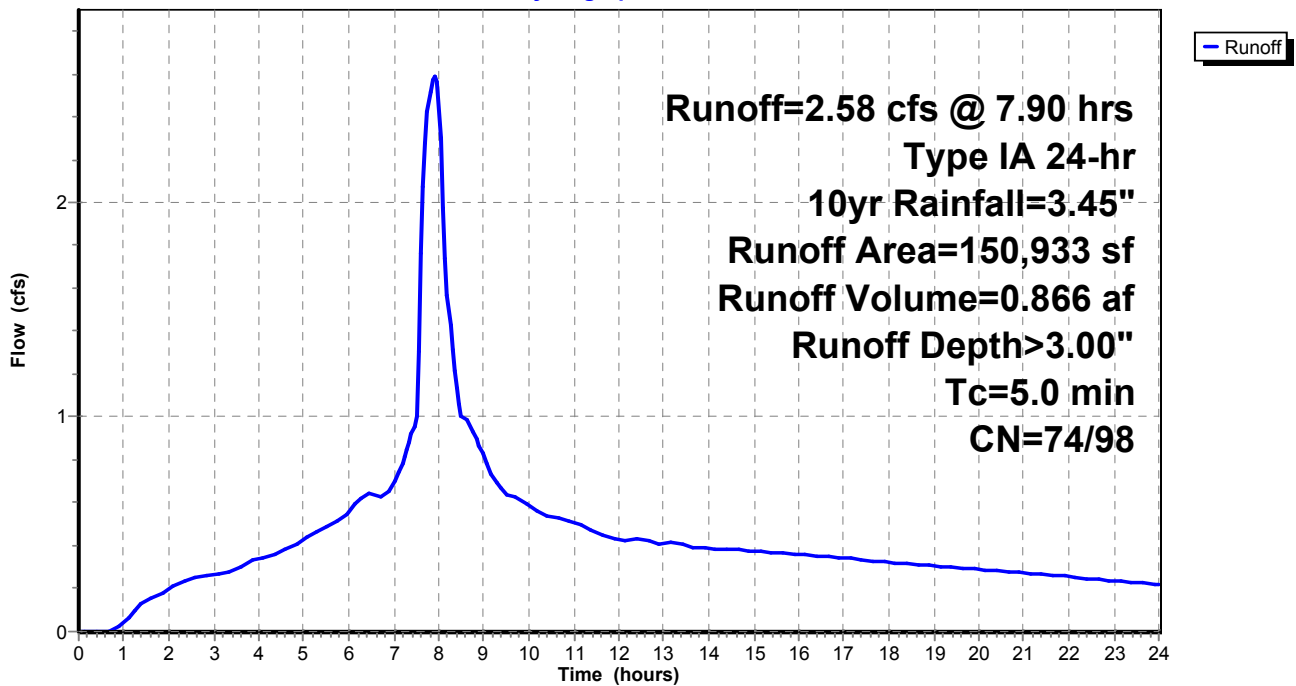
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 10yr Rainfall=3.45"

Area (sf)	CN	Description
134,981	98	Paved parking, HSG C
15,952	74	>75% Grass cover, Good, HSG C
150,933	95	Weighted Average
15,952	74	10.57% Pervious Area
134,981	98	89.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 22S: Developed Conditions

Hydrograph



Summary for Pond 21P: Chambers

Inflow Area = 3.465 ac, 89.43% Impervious, Inflow Depth > 3.00" for 10yr event
 Inflow = 2.58 cfs @ 7.90 hrs, Volume= 0.866 af
 Outflow = 2.54 cfs @ 7.98 hrs, Volume= 0.866 af, Atten= 1%, Lag= 4.6 min
 Primary = 2.54 cfs @ 7.98 hrs, Volume= 0.866 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 1.63' @ 7.98 hrs Surf.Area= 390 sf Storage= 352 cf

Plug-Flow detention time= 0.3 min calculated for 0.866 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (671.4 - 671.1)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	601 cf	21.0" Round Pipe Storage L= 250.0' S= 0.0050 'f'

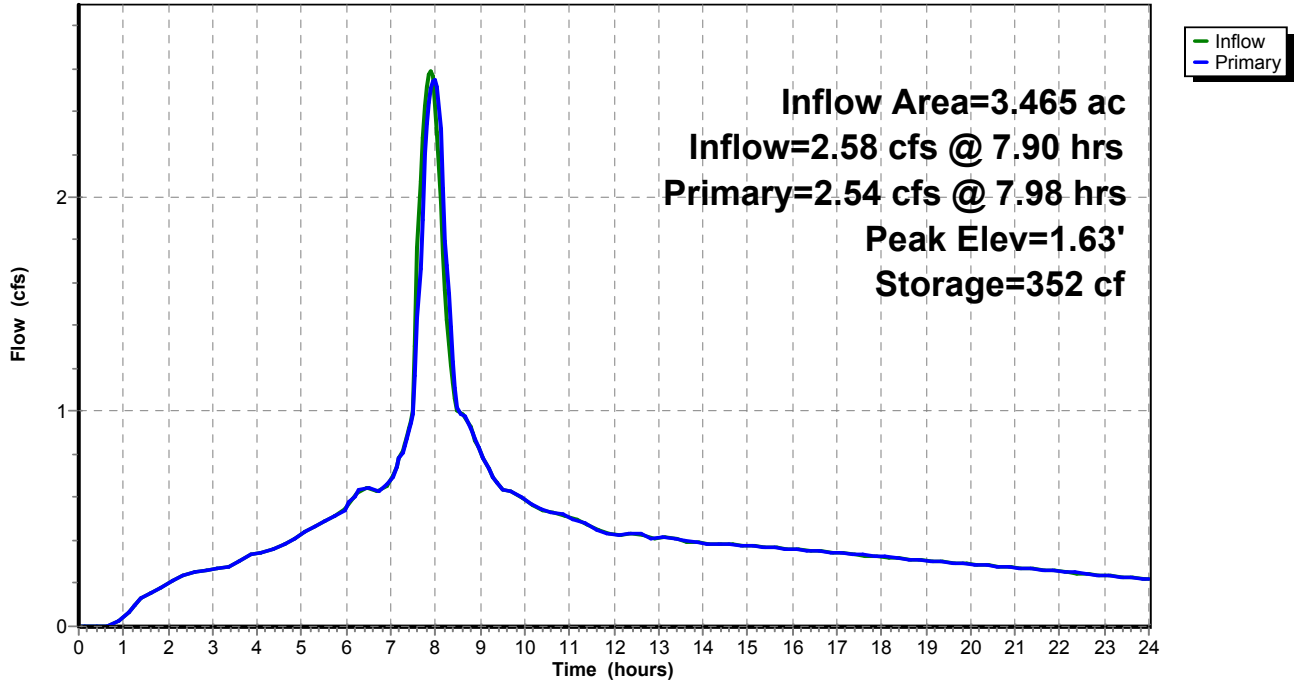
Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	7.9" Horiz. 2-yr C= 0.600
#2	Primary	1.17'	11.0" W x 2.0" H Vert. 10yr/25yr C= 0.600
#3	Primary	1.95'	12.0" Horiz. Emergency Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.54 cfs @ 7.98 hrs HW=1.63' (Free Discharge)

- 1=2-yr (Orifice Controls 2.09 cfs @ 6.14 fps)
- 2=10yr/25yr (Orifice Controls 0.45 cfs @ 2.93 fps)
- 3=Emergency Overflow (Controls 0.00 cfs)

Pond 21P: Chambers

Hydrograph



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Prepared by Hewlett-Packard Company

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Type IA 24-hr 25yr Rainfall=3.90"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SBUH method, Split Pervious/Imperv.

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Existing Conditions Runoff Area=150,933 sf 87.33% Impervious Runoff Depth>3.39"
Tc=5.0 min CN=74/98 Runoff=2.91 cfs 0.978 af

Subcatchment22S: Developed Runoff Area=150,933 sf 89.43% Impervious Runoff Depth>3.43"
Tc=5.0 min CN=74/98 Runoff=2.95 cfs 0.991 af

Pond 21P: Chambers Peak Elev=1.95' Storage=463 cf Inflow=2.95 cfs 0.991 af
Outflow=2.90 cfs 0.991 af

Total Runoff Area = 6.930 ac Runoff Volume = 1.970 af Average Runoff Depth = 3.41"
11.62% Pervious = 0.805 ac 88.38% Impervious = 6.125 ac

Summary for Subcatchment 1S: Existing Conditions

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.91 cfs @ 7.90 hrs, Volume= 0.978 af, Depth> 3.39"

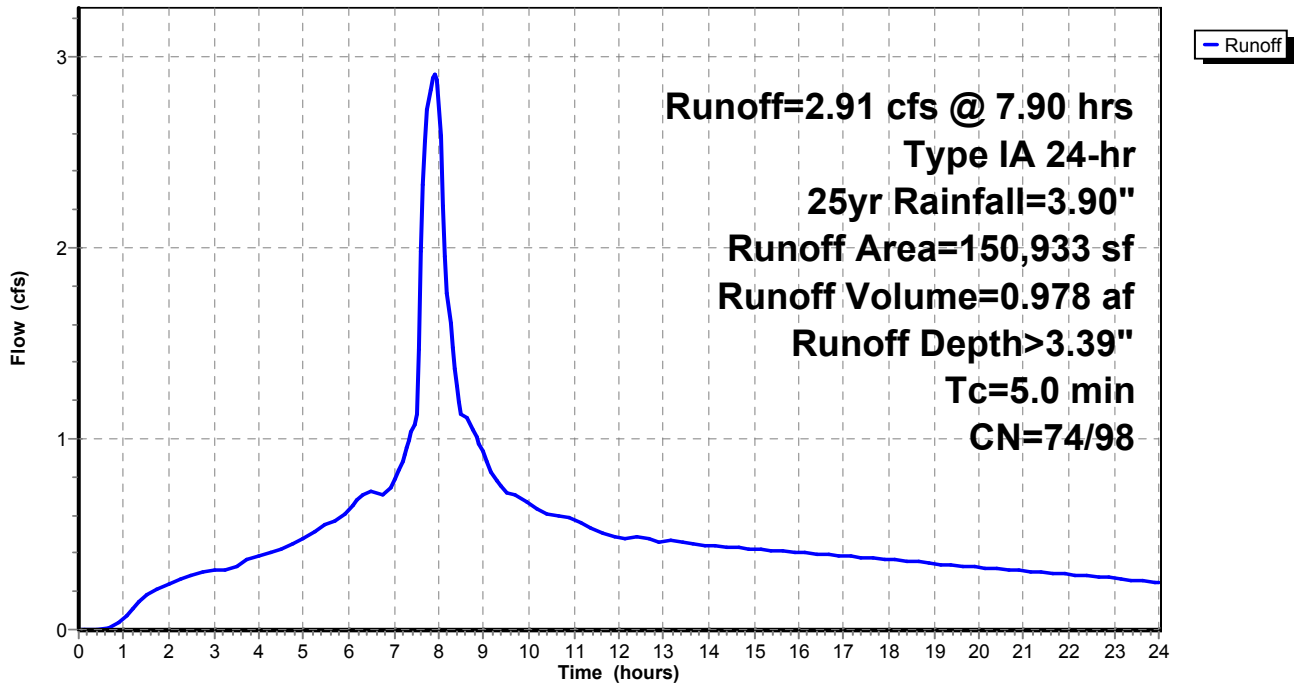
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 25yr Rainfall=3.90"

Area (sf)	CN	Description
19,130	74	>75% Grass cover, Good, HSG C
131,803	98	Paved parking, HSG D
150,933	95	Weighted Average
19,130	74	12.67% Pervious Area
131,803	98	87.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 1S: Existing Conditions

Hydrograph



Summary for Subcatchment 22S: Developed Conditions

[49] Hint: Tc<2dt may require smaller dt

Runoff = 2.95 cfs @ 7.90 hrs, Volume= 0.991 af, Depth> 3.43"

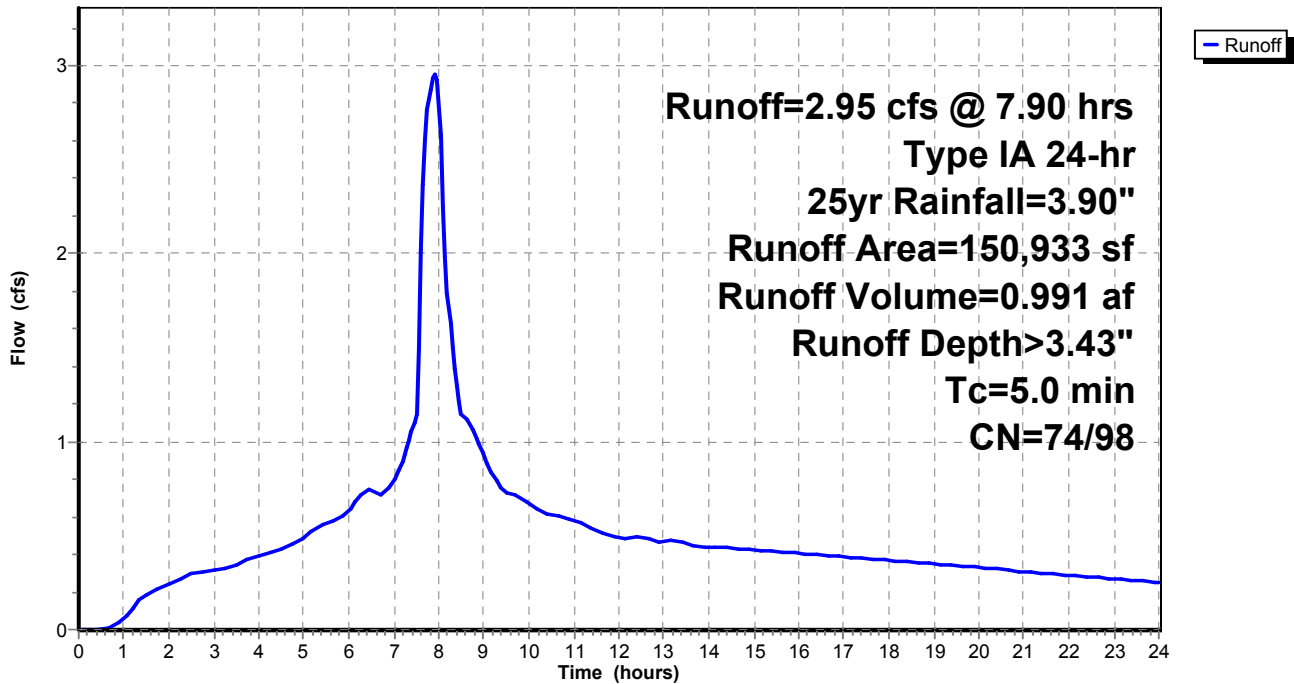
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 25yr Rainfall=3.90"

Area (sf)	CN	Description
134,981	98	Paved parking, HSG C
15,952	74	>75% Grass cover, Good, HSG C
150,933	95	Weighted Average
15,952	74	10.57% Pervious Area
134,981	98	89.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 22S: Developed Conditions

Hydrograph



Summary for Pond 21P: Chambers

Inflow Area = 3.465 ac, 89.43% Impervious, Inflow Depth > 3.43" for 25yr event
 Inflow = 2.95 cfs @ 7.90 hrs, Volume= 0.991 af
 Outflow = 2.90 cfs @ 7.98 hrs, Volume= 0.991 af, Atten= 2%, Lag= 4.8 min
 Primary = 2.90 cfs @ 7.98 hrs, Volume= 0.991 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 1.95' @ 7.98 hrs Surf.Area= 303 sf Storage= 463 cf

Plug-Flow detention time= 0.4 min calculated for 0.989 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (668.7 - 668.3)

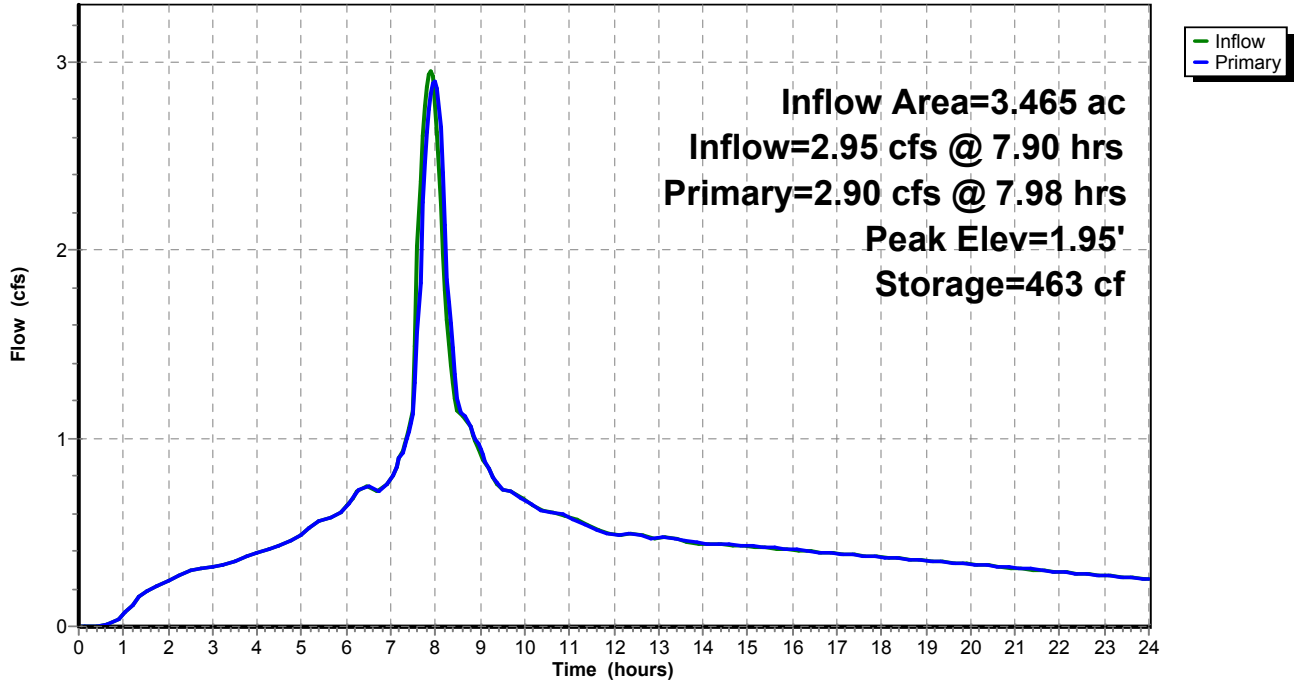
Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	601 cf	21.0" Round Pipe Storage L= 250.0' S= 0.0050 'f'

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	7.9" Horiz. 2-yr C= 0.600
#2	Primary	1.17'	11.0" W x 2.0" H Vert. 10yr/25yr C= 0.600
#3	Primary	1.95'	12.0" Horiz. Emergency Overflow C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.89 cfs @ 7.98 hrs HW=1.94' (Free Discharge)
 1=2-yr (Orifice Controls 2.28 cfs @ 6.70 fps)
 2=10yr/25yr (Orifice Controls 0.61 cfs @ 3.98 fps)
 3=Emergency Overflow (Controls 0.00 cfs)

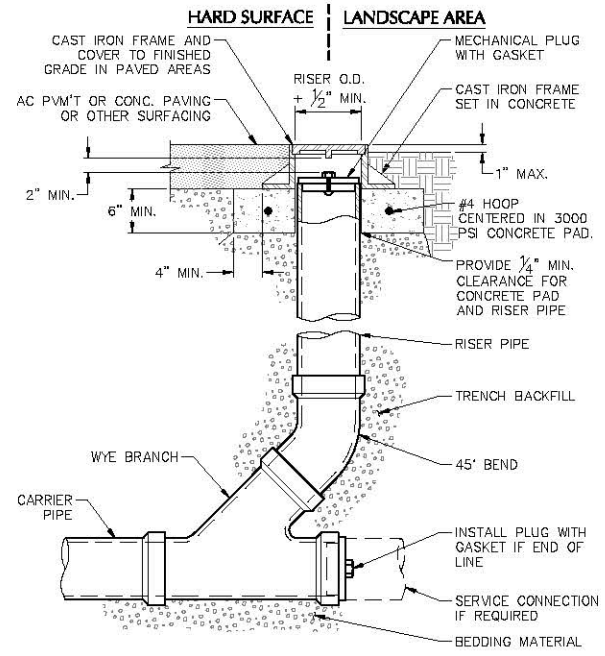
Pond 21P: Chambers

Hydrograph



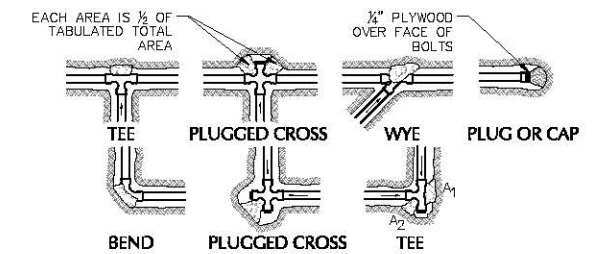
API Expansion

VII. Details



- NOTES:
- CAST IRON FRAME AND COVER SHALL MEET H-20 LOAD REQUIREMENT.
 - FOR CARRIER PIPE SIZE 6"Ø AND LESS, PROVIDE RISER PIPE SIZE TO MATCH CARRIER PIPE.
 - FOR CARRIER PIPE SIZE 8"Ø AND LARGER, RISER PIPE SHALL BE 6"Ø.
 - RISER PIPE MATERIAL TO MATCH CARRIER PIPE MATERIAL.

1 STANDARD CLEANOUT (COTG)
SCALE: NTS



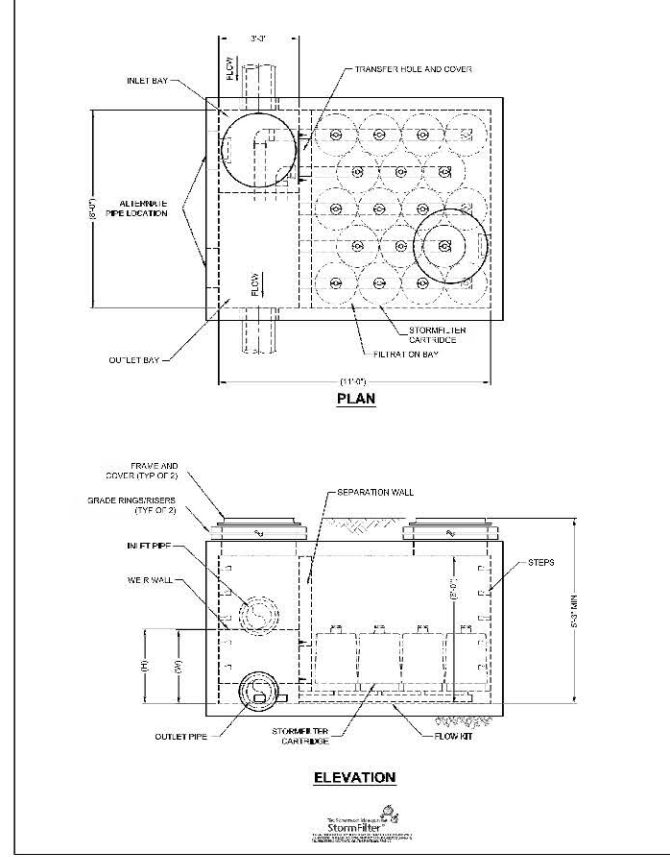
- CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
- KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
- THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCLOSED ON THE PLAN; e.g. (15) INDICATES 15 SQUARE FEET BEARING AREA REQUIRED.
- IF NOT SHOWN ON PLANS REQUIRED BEARING AREAS AT FITTING SHALL BE AS INDICATED BELOW, ADJUST IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS (ES) STATED IN THE SPECIAL SPECIFICATIONS.
- BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL.

BEARING AREA OF THRUST BLOCK IN SQUARE FOOT

FITTING SIZE	TEE, WYE, PLUG, OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22½° BEND	11¼° BEND
			A1	A2			
4	1.0	1.4	1.9	1.4	1.0		
6	2.1	3.0	4.3	3.0	1.6	1.0	
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.4	1.2

NOTE: ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 p.s.i. AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 p.s.i.. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURE AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION: BEARING AREA = (TEST PRESSURE/150)X(2000/ SOIL BEARING STRESS)X(TABLE VALUE).

2 THRUST BLOCK
SCALE: NTS



STORMFILTER DESIGN TABLE

• THE 8' x 11' PEAK DIVERSION STORMFILTER TREATMENT CAPACITY VARIED BY GARDEN SIDE DRAINAGE AND LOCAL APPROVED SPECIFIC FLOW RATE. PEAK DRAINAGE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD.
• THE PEAK DIVERSION STORMFILTER IS AVAILABLE IN A 11' x 11' FEET HAS SHOWN ON HOURLY BEBLE LOGS IN A JOURNAL.
• ALL PARTS AND MATERIAL ASSEMBLY PROVIDED BY CONTECH UNLESS OTHERWISE NOTED.

CARTRIDGE HEIGHT	32"	48"
SYSTEM FLOW RATE (GPM)	3.25	2.25
PEAK FLOW RATE (GPM)	2.00	1.50
TREATMENT BY MEDIA SURFACE AREA	2.00	1.50
CARTRIDGE FLOW RATE (GPM)	2.00	1.50

SITE SP DATA REQ

STRUCTURED WALLS	UNSTRUCTURED WALLS
MIN. FLOW RATE (GPM)	MIN. FLOW RATE (GPM)
MIN. FLOW RATE (GPM)	MIN. FLOW RATE (GPM)
MIN. FLOW RATE (GPM)	MIN. FLOW RATE (GPM)
MIN. FLOW RATE (GPM)	MIN. FLOW RATE (GPM)

PERFORMANCE SPECIFICATION

FILTER CARTRIDGES SHALL BE MEDIA-BLENDED, PASSIVE, SITION ACTIVATED, RADIAL FLOW AND SELF-CLEANING. 1. DEPTH SHALL BE 12" MIN. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 20 SECONDS. 2. SPECIFIC FLOW RATE SHALL BE 2 GPM/FT² (MAXIMUM). SPECIFIC FLOW RATE IS THE MEASURE OF THE FLOW RATE MEDIA SURFACE CONTACT AREA (FT²) MEDIA VOLUMETRIC FLOW RATE SHALL BE 5 GPM/FT² (MAXIMUM).

GENERAL NOTES:

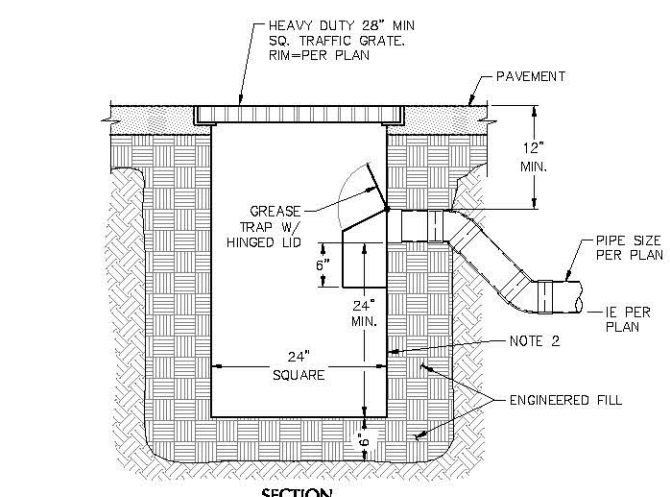
- CONTRACTOR TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH (L) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR INSTALLATION REQUIREMENTS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOU REPRESENTATIVE. WWW.CONTECH.COM
- STORMFILTER FACTORY QUALITY CONTROL SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE AFTER REQUIREMENTS OF PROJECT.
- STORMFILTER SHALL MEET ALL LOCAL AND NATIONAL REQUIREMENTS FOR ALL LOCAL JURISDICTIONS OR BELOW. THE OUTLET PIPE INVERT ELEVATION. SAMPLES OF RECORD TO CONFIRM ACTUAL GROUNDWATER CONDITIONS SHALL BE TAKEN TO 100% AND BE SEALS WITH THE CONTRACTOR.

INSTALLATION NOTES:

- ANY EXISTING EXISTING DEPTH, ANCHOR AND LOCATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDER SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO REMOVE EXISTING WITH REFERENCE TO SETTING AND REPAIR CAPACITY TO LIFT AND SET THE STRUCTURE. RIBSERS CLIP ONES PROVIDED.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL SECTIONS AND ASSEMBLY SHOWN.
- CONTRACTOR TO PROVIDE, INSTALL AND GROUT PIPES. WATCH OUTLET PIPE INVERT WITH OUTLET BAY FLOOR.
- CONTRACTOR TO TAKE APPROPRIATE MEASUREMENTS TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED DAMAGE.
- CONTRACTOR TO REMOVE THE TRANSFER HOLES COVER ON THE SYSTEM IS BROUGHT ONLINE.

CONTECH ENGINEERED SOLUTIONS LLC
4610 Graham Park Dr., Suite 300, West Chester, OH 45380
936.336.1877 936.445.2000 936.445.2000 FAX

THE STORMWATER MANAGEMENT & 8' x 11' PEAK DIVERSION STORMFILTER STANDARD DETAIL

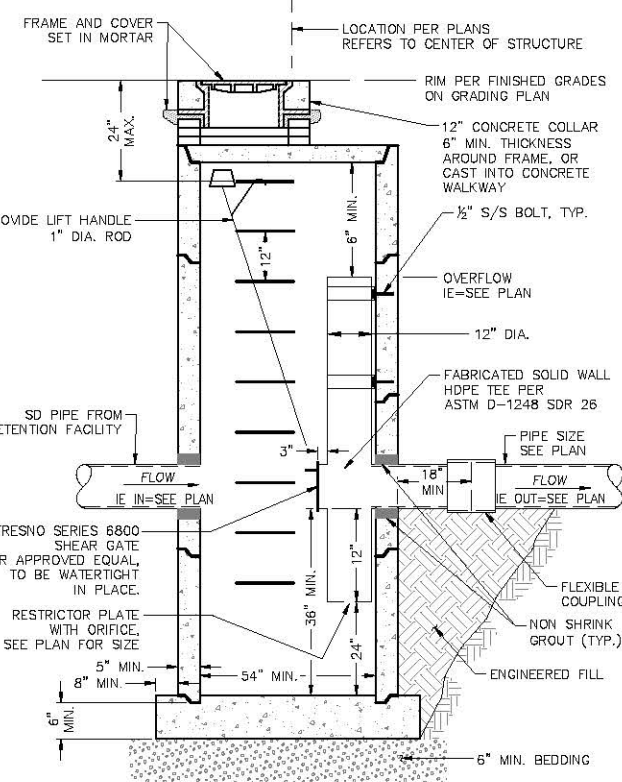
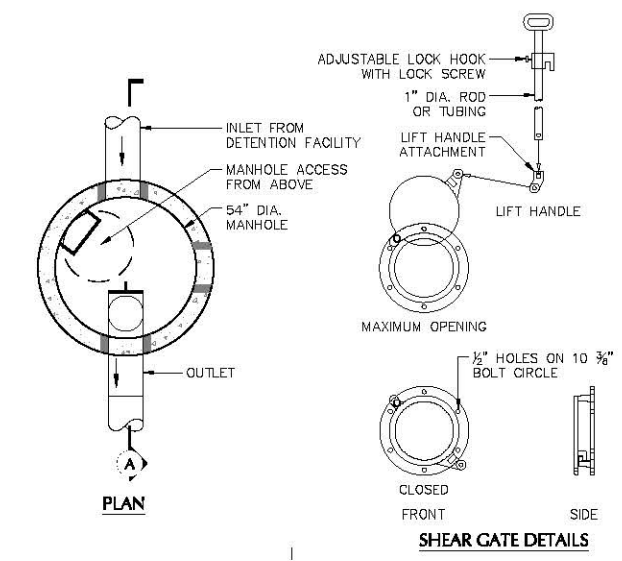


- NOTES:**
- CONTRACTOR TO WIDEN EXCAVATION AS REQUIRED TO OBTAIN COMPACTION WITH CONTRACTORS COMPACTION EQUIPMENT.
 - 1/4" STEEL PLATE, BITUMINOUS COATED, AS MANUFACTURED BY GIBSON STEEL BASINS OR APPROVED EQUAL.

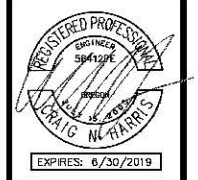
3 TRAPPED CATCH BASIN
SCALE: NTS

CONTROL ORIFICE @ ELEVATIONS

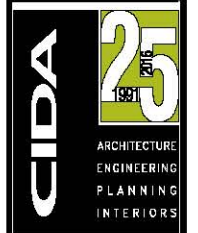
FLOW CONTROL MANHOLE	ORIFICE #1	ORIFICE #2	EMERGENCY OVERFLOW
FCMH-01	Ø7.9" ORIFICE @ 126.68'	11" X 2" H NOTCH ORIFICE @ 129.85'	12" OPEN PIPE @ 130.63'



4 FLOW CONTROL MANHOLE
SCALE: NTS PER WSDOT STD PLAN B-10.40-DD



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TEL: 503.226.1258
FAX: 503.226.1870
WWW.CIDATAINC.COM

API INTERNATIONAL
12505 SW HERMAN ROAD
TUALATIN OREGON

DETAILS

DATE: 04/16/18
DRAWN: NJD
CHECKED: NWS
REVISIONS:

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C4.1

JOB NUMBER: A17116.11

API Expansion

VIII. Geotechnical Report

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

**API Facility Expansion
Herman Road and SW 125th Court, Tualatin, Oregon**

**Geotech
Solutions Inc.**

January 29, 2018

GSI Project: aai-17-2-gi

January 29, 2018

aai-17-2-gi

API Properties
cyrus@apiint.com

Cc:
andisheha@aaieng.com; hamid@aaieng.com; craigh@aaieng.com

REPORT OF GEOTECHNICAL ENGINEERING SERVICES API Facility Expansion, 12505 SW Herman Rd, Tualatin, Oregon

As authorized, this report summarizes our geotechnical engineering services for the proposed project. Based on information you provided we understand that the site is to be expanded with a new building addition to the north of roughly 29,000 square feet and possible associated pavement and utilities. The purpose of our work is to investigate the soil conditions and provide geotechnical engineering for new building design for column loads up to 200 kips, wall loads up to 5 kips per foot, and slab loads up to 500 psf, as well as site infiltration rates and pavements. Our specific scope of work included the following:

- Provide principal-level geotechnical project management including client communications, management of field and subcontracted services, report writing, analyses, and invoicing.
- Review previous reports, geologic maps and vicinity geotechnical information as indicators of subsurface conditions.
- Complete a site reconnaissance to observe surface features relevant to geotechnical issues, such as topography, vegetation, presence and condition of springs, exposed soils and rock, and evidence of previous grading.
- Identify exploration locations and complete One-Call utility locates for public utilities and a private locate.
- Explore subsurface conditions by advancing two CPT probes to depths of up to 60 feet or refusal with pore pressure testing to evaluate ground water depths, as well as one hand auger in a landscaped area to a depth of up to 5 feet or refusal to evaluate near surface conditions.
- Complete infiltration testing in the hand auger and analyze ppd testing in the CPTs, and provide an infiltration rate and strata and backfill criteria to the civil engineer for their design, if feasible.
- Classify and sample materials encountered and maintain a detailed log of the explorations.
- Determine the moisture content of selected samples obtained from the explorations and complete soil classification testing as necessary.
- Provide recommendations for earthwork including site preparation, reuse of existing fill in place or stabilized or reinstalled, seasonal material usage, compaction criteria, utility trench backfill, and the need for subsurface drainage.
- Evaluate site liquefaction potential and estimate site deformations and provide qualitative means to address unsuitable deformations if needed.
- Provide recommendations for shallow foundations including suitable soils, stabilization, bearing pressures, sliding coefficient, and a seismic site class, as well as geotechnical parameters for deep foundation support for up to one pile type, if needed.

- Provide recommendations for slab support, including a subgrade modulus if needed, underslab rock thickness and materials, and the need for stabilization.
- Provide recommendations for pavements including subgrade preparation and stabilization, and base rock and asphalt concrete and portland cement concrete thicknesses.
- Provide a written report summarizing the results of our geotechnical evaluation.

SITE OBSERVATIONS AND CONDITIONS

Surface Conditions

The facility is located immediately north of SW Herman Road and west of SW 125th Court in Tualatin, Oregon. Expansion is proposed to the north and northeast over areas currently paved with asphalt concrete. The site is relatively flat, with landscape strips to the north and east. Light commercial and industrial uses are present abutting the site. The general site appearance from a recent aerial photo is shown on the attached **Site Plan**.

Subsurface Conditions

General – Subsurface conditions at the site were explored on January 15th and 18th, 2018 by excavating one hand auger to a depth of 3 feet and advancing two cone penetrometer probes to depths of 60 feet. Our approximate exploration locations are shown on the attached **Site Plan**. Specific subsurface conditions observed at each exploration are described in the attached **Hand Auger Logs** and **CPT Logs**.

In general, subsurface conditions in our explorations generally included asphalt concrete pavement and base rock in the CPT's, and mulch in the hand auger, underlain by soft silt fill with some clay and organics to depths of roughly 3.5 feet. This fill was soft with CPT tip resistance generally less than 10 tsf, and friction ratios of generally 2 to 4%, but 6-8% where more organic. Native silt with variable sand and clay was present under the fill, with tip resistance of generally 10-20 tsf and friction ratios of generally 1.5 to 4%. At depths of 7 to 10 feet the silt transitioned to sandy silt and sand with tip resistance ranging from generally 60-160 tsf, and friction ratios of 1-3%. At depths of 42-45 feet this material transitioned to silty soils with variable clay and tip resistance of generally 30-120 tsf and friction ratios of 3-6%.

Site soil conditions are consistent with mapped soil deposits.

Infiltration – Infiltration testing was completed in HA-1 at a depth of 3 feet using falling head, double ring configuration, cased hole testing. Raw results from testing indicated a rate of 0.5 in³/hr/in².

Groundwater – Pore pressure back calculation from the CPT's indicates ground water levels of roughly 7 to 9 feet below the ground surface. Perched ground water may exist shallower than that after winter or spring rainfall events.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our explorations, laboratory testing, and engineering analyses, it is our opinion that the site can be developed following the recommendations contained herein. Key geotechnical

issues include removal of soft fill from footing areas and soils sensitive to moisture/rainfall. Specific geotechnical recommendations are provided in the following sections.

Conventional grading could likely be achieved only in the dry season, typically late June through mid-September. Earthwork construction outside the dry season or dry conditions is feasible but will result in increased construction costs for stabilization of haul roads and working blankets, as well as protection of exposed silt soils. The near surface soils at the site consist of fine-grained silt which is easily disturbed when wet. If construction is planned for wet conditions, measures must be taken to minimize disturbance.

Site Preparation

General - Prior to earthwork construction, the site must be prepared by removing any existing structures, utilities, fill, pavement and topsoil from the building areas. Deeper topsoil stripping depths may be required in areas of loose organic soil typically associated with trees and shrubs or past farming activities. Root balls from trees and shrubs may extend several feet and grubbing operations can cause considerable subgrade disturbance. All disturbed material must be removed to undisturbed subgrade and backfilled with structural fill. In general, roots greater than one-inch in diameter must be removed as well as areas of concentrated smaller roots where organic content exceeds 2% by dry weight. In our explorations this depth average one foot.

Stabilization and Soft Areas – Soft areas are expected in the wet season. After site preparation we must be contacted to evaluate the exposed subgrade. This evaluation can be done by proof rolling in dry conditions or probing during wet conditions. Soft areas will require over-excavation and backfilling with well graded, angular crushed rock compacted as structural fill, overlying a separation geosynthetic such as a Propex Geotex 601 or equivalent. Where soft soils remain after excavation to depths of roughly 12-18 inches, geogrid may also be needed over the fabric such as a Propex Gridpro BXPI2-4 (or equivalent).

Working Blankets and Haul Roads – The site pavements could be used as haul roads for as long as practical, and some increased cracking and fatigue should be expected in heavily trafficked areas due to soft subgrade, and may require repair. Construction equipment must not operate directly on the soil as it is susceptible to disturbance and softening. Haul roads placed over a geosynthetic in a thickened advancing pad can be used to protect subgrades. We recommend that sound, angular, pit run or crushed basalt with no more than 6 percent passing a #200 sieve be used to construct haul roads and working blankets. Working blankets must be at least 12 inches thick, and haul roads at least 24 inches thick. These can typically be reduced to 10 and 16 inches, respectively, with the use of the preceding separation geosynthetic and geogrid. Some repair of working blankets and haul roads should be expected.

As an alternative to the methods described above, reuse of native soils may be possible by soil amendment using portland cement. Amendment requires an experienced contractor using specialty spreading and mixing equipment. Typically in these soils 5-6% cement in one or two mixing passes is used for an amendment depth of 12 inches (a soil weight of 100pcf is typically used for the quantity calculation). However, the materials used and quantities can vary based on moisture and organic contents, plasticity, and required amendment depth. Organic or clayey soils may require 7% cement or more, and soils with soft wet silt under the treated zone may require deeper treatment or use of only

grid and rock fill methods. That may be the case on this site in the wet season. Compaction and grading of amended soils must be completed within 4 hours of mixing, and the amended soil must be allowed to cure for 4 days prior to trafficking. Generally, 50 percent of mixed particles should pass a No. 4 sieve.

The permeability of amended soil is very low. The surface of amended soils in building and pavement areas must therefore be sloped at a minimum of 0.5 percent to prevent collection of surface water during construction. Amended soils must be removed from all landscape areas prior to planting.

The preceding rock and amendment thicknesses are the minimum recommended. Subgrade protection is the responsibility of the contractor and thicker sections may be required based on subgrade conditions during construction and type and frequency of construction equipment.

Earthwork

Fill – The on-site fine grained inorganic soils can be used for structural fill if properly moisture conditioned and free of deleterious materials. Use of the silt material will not be feasible during wet conditions. Even during dry summer conditions the on-site silt soils may require drying by scarification and frequent mixing in thin lifts. Once moisture contents are within 3 percent of optimum (typically 13-16% for these soils), the material must be compacted to at least 92 percent relative to ASTM D1557 (modified proctor) using a tamping foot type compactor. Fill must be placed in lifts no greater than 10 inches in loose thickness. In addition to meeting density specifications, fill will also need to pass a wheel roll using a loaded dump truck, water truck, or similar size equipment.

In wet conditions, fill must be imported granular soil with less than 6 percent fines, such as clean crushed or pit run rock. This material must also be compacted to 95 percent relative to ASTM D1557.

Trenches – Utility trenches may encounter ground water seepage and caving must be expected where seepage is present. Shoring of utility trenches will be required for depths greater than 4 feet and where groundwater seepage is present. We recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation.

Depending on the excavation depth and amount of groundwater seepage, dewatering may be necessary for construction of underground utilities. Flow rates for dewatering are likely to vary depending on location, soil type, and the season during which the excavation occurs. The dewatering systems, if necessary, must be capable of adapting to variable flows.

Pipe bedding must be installed in accordance with the pipe manufacturers' recommendations. If groundwater is present in the base of the utility trench excavation, we recommend overexcavating the trench by 12 to 18 inches and placing trench stabilization material in the base. Trench stabilization material must consist of well-graded, crushed rock or crushed gravel with a maximum particle size of 4 inches and be free of deleterious materials. The percent passing the U.S. Standard No. 200 Sieve must be less than 5 percent by weight when tested in accordance with ASTM C 117.

Trench backfill above the pipe zone must consist of well graded, angular crushed rock or sand fill with no more than 7 percent passing a #200 sieve. Trench backfill must be compacted to 92 percent relative

to ASTM D-1557, and construction of hard surfaces, such as sidewalks or pavement, must not occur within one week of backfilling.

Seismic Design

General - In accordance with the International Building Code (IBC) as adapted by State of Oregon Structural Specialty Code (SOSSC) and based on our explorations and experience in the site vicinity, the subject project is Class F, but for this low rise structure can be evaluated using the parameters associated with Site Class D.

Liquefaction - Liquefaction occurs in loose, saturated, granular soils. Strong shaking, such as that experienced during earthquakes, causes the densification and the subsequent settlement of these soils. Our CPT based analyses indicates that an overall liquefaction induced settlement on the site is roughly 3-4 inches, primarily from strain associated with sandy layers. This also likely applies to the existing building. However, in the top 20 feet only roughly 1 inch is expected, and this is the expected differential settlement. Given the settlement distribution, unsaturated surface soils, and the relatively flat local ground conditions, there is a low risk of liquefaction related structurally damaging deformations to the buildings. Sand boils and venting are possible, and could impact floor slabs and exterior surfacing.

Shallow Foundations

Soft silt fill was encountered in our explorations to depths of roughly 3.5 feet and must be removed from below foundations. Based on the provided information regarding building type and anticipated structural loads as previously stated, the proposed structure can be supported on shallow spread foundations bearing on at least 6 inches of crushed rock structural fill placed over the native medium stiff or stiffer silt. Footings must be embedded at least 18 inches below the lowest adjacent, exterior grade. Footings can be designed for an allowable net bearing pressure of 2,500 psf. The preceding bearing pressure can be increased to 5,000 psf for temporary wind and seismic loads.

Continuous footings must be no less than 18 inches wide, and pad footings must be no less than 24 inches wide. Resistance to lateral loads can be obtained by a passive equivalent fluid pressure of 350 pcf against suitable footings, ignoring the top 12 inches of embedment, and by a footing base friction coefficient of 0.38. Properly founded footings are expected to settle less than a total of 1 inch, with less than ½ inch differentially.

If footing construction is to occur in wet conditions, a few inches of crushed rock must be placed at the base of footings to reduce subgrade disturbance and softening during construction.

Slabs

Floor slab loads up to 250 psf are expected to induce less than one inch of settlement if based on the working pads described herein which includes a minimum of 12 inches of clean, angular crushed rock with no more than 5 percent passing a #200 sieve. For slab loads up to 500 psf the silt fill must be removed and replaced with structural fill. This material was encountered to depths of roughly 3.5 feet in our explorations. A separation geosynthetic such as a Propex Geotex 601 is required under the rock. Prior to slab rock placement the subgrade will need to be evaluated by us by probing or observing wheel rolling using a loaded dump truck or equivalent wheel load. Underslab rock must be compacted to 92 percent compaction relative to ASTM D1557, and must pass the wheel roll. In addition, any areas

contaminated with fines must be removed and replaced with clean rock. If the base rock is saturated or trapping water, this water must be removed prior to slab placement.

Some flooring manufacturers require specific slab moisture levels and/or vapor barriers to validate the warranties on their products. A properly installed and protected vapor flow retardant can reduce slab moistures. If moisture sensitive floor coverings or operations are planned, we recommend a vapor barrier be used. Typically a reinforced product or thicker product (such as a 15 mil STEGO wrap or equivalent) can be used. Experienced contractors using special concrete mix design and placement have been successful placing concrete directly over the vapor barrier which overlies the rock. This avoids the issue of water trapped in the rock between the slab and vapor barrier, which otherwise requires removal. In either case, slab moisture should be tested/monitored until it meets floor covering manufacturer's recommendations.

Infiltration

Design - Based on the results of our testing and analyses, infiltration rates in the silt are very low, and shallow seasonal seepage may preclude use of infiltration systems. If very shallow systems are used above seasonal seepage levels (expected to be at 3-4 feet in depth), we recommend using a design infiltration rate of 0.25 in³/hour per in² on the sides of infiltration systems. The base may also be used with upstream sedimentation protection. Embedment into suitable soils will require us to be called for observation during installation. It is prudent to have a down gradient surface overflow designed for infiltration systems where ground water levels may be perched and vary seasonally.

Confirmation Testing and Maintenance - Testing of infiltration systems is required to confirm the design infiltration rate as actual subsurface conditions and infiltration rates can vary widely. Flexibility for adaptation and expansion of infiltration systems must be incorporated into the design and construction, with contingencies included in the project budget and schedule. Infiltration systems need to be maintained free of debris and silt in order to function properly.

Drainage

General - We recommend installing perimeter foundation drains around all exterior foundations. The surface around building perimeters must be sloped to drain away from the buildings.

Foundation Drains - Foundation drains must consist of a two-foot wide zone of drain rock encompassing a 4-inch diameter perforated pipe, all enclosed with a non-woven filter fabric. The drain rock must have no more than 2 percent passing a #200 sieve and must extend to within one foot of the ground surface. The geosynthetic must be a Propex Geotex 601 or equivalent. One foot of low permeability soil (such as the on-site silt) must be placed over the fabric at the top of the drain to isolate the drain from surface runoff.

Pavement

Asphalt Concrete – At the time of this report we did not have specific information regarding the type and frequency of expected traffic. We therefore developed asphalt concrete pavement thicknesses for areas exposed to passenger vehicles only and areas exposed to up to five 3 to 5-axle trucks per day based on a 20-year design life. Traffic volumes can be revised if specific data is available.

Our pavement analyses is based on AASHTO methods and subgrade of structural fill or undisturbed medium stiff or better silt having a resilient modulus of 3,000 psi and prepared as recommended herein. We have also assumed that roadway construction will be completed during an extended period of dry weather. The results of our analyses based on these parameters are provided in the table below.

<u>Traffic</u>	<u>AC (inches)</u>	<u>CR (inches)</u>
Passenger Vehicle Only	3	8
Up to 5 Trucks/Day (52k 18k ESALs)	4.5	12

The thicknesses listed in the preceding table are the minimum acceptable for construction during an extended period of dry weather. Increased rock thicknesses will be required for construction during wet conditions. Crushed rock must conform to ODOT base rock standards and have less than 6 percent passing the #200 sieve. Asphalt concrete must be compacted to a minimum of 91 percent of a Rice Density.

Portland Cement Concrete - We developed PCC pavement thicknesses at the site for the assumed one-way traffic levels as shown in the table below. Each of these sections is based on AASHTO methods with no reduction for wander and a composite modulus of subgrade reaction of 180 pci (AASHTO Figure 3.3 with $M_r = 3,000$ psi and 6 inches crushed rock base). Other parameters include 4,000 psi compressive strength portland cement concrete (PCC), and plain jointed concrete *without* load transfer devices or tied concrete shoulders. PCC pavements over trench backfill should not be placed within one week of fill installation unless survey data indicates that settlement of the backfill is complete.

<u>Traffic</u>	<u>18k ESALS</u>	<u>PCC (inches)</u>	<u>CRB (inches)</u>
Up to 5 Trucks Per Day	52,000	6.5	6

Sidewalks should be supported on at least 4 inches of base rock placed over medium stiff or better undisturbed native silt subgrade or structural fill based on native soils.

Subgrade Preparation - The pavement subgrade must be prepared in accordance with the **Earthwork and Site Preparation** recommendations presented in this report. All pavement subgrades must pass a proof roll prior to paving. Soft areas must be repaired by over-excavating the areas and installing a stabilization geosynthetic. Well graded, angular crushed rock backfill compacted as structural fill must be used to bring the aforementioned areas to-grade. For stabilization geosynthetics we recommend a Propex Geotex 601 for separation overlying a suitable punched and drawn biaxial geogrid such as a Propex Gridpro BXPI2-4 (or equivalent).

LIMITATIONS AND OBSERVATION DURING CONSTRUCTION

We have prepared this report for use by API and the design and construction teams for this project only. The information herein could be used for bidding or estimating purposes but must not be construed as a warranty of subsurface conditions. We have made observations only at the aforementioned locations and only to the stated depths. These observations do not reflect soil types,

strata thicknesses, water levels or seepage that may exist between observations. We must be consulted to observe all foundation bearing surfaces, subgrade stabilization, proof rolling of slab and pavement subgrades, installation of structural fill, subsurface drainage, and cut and fill slopes. We must be consulted to review final design and specifications in order to see that our recommendations are suitably followed. If any changes are made to the anticipated locations, loads, configurations, or construction timing, our recommendations may not be applicable, and we must be consulted. The preceding recommendations must be considered preliminary, as actual soil conditions may vary. In order for our recommendations to be final, we must be retained to observe actual subsurface conditions encountered. Our observations will allow us to interpret actual conditions and adapt our recommendations if needed.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty, expressed or implied, is given.



We appreciate the opportunity to work with you on this project and look forward to our continued involvement. Please contact us if you have any questions.

Sincerely,

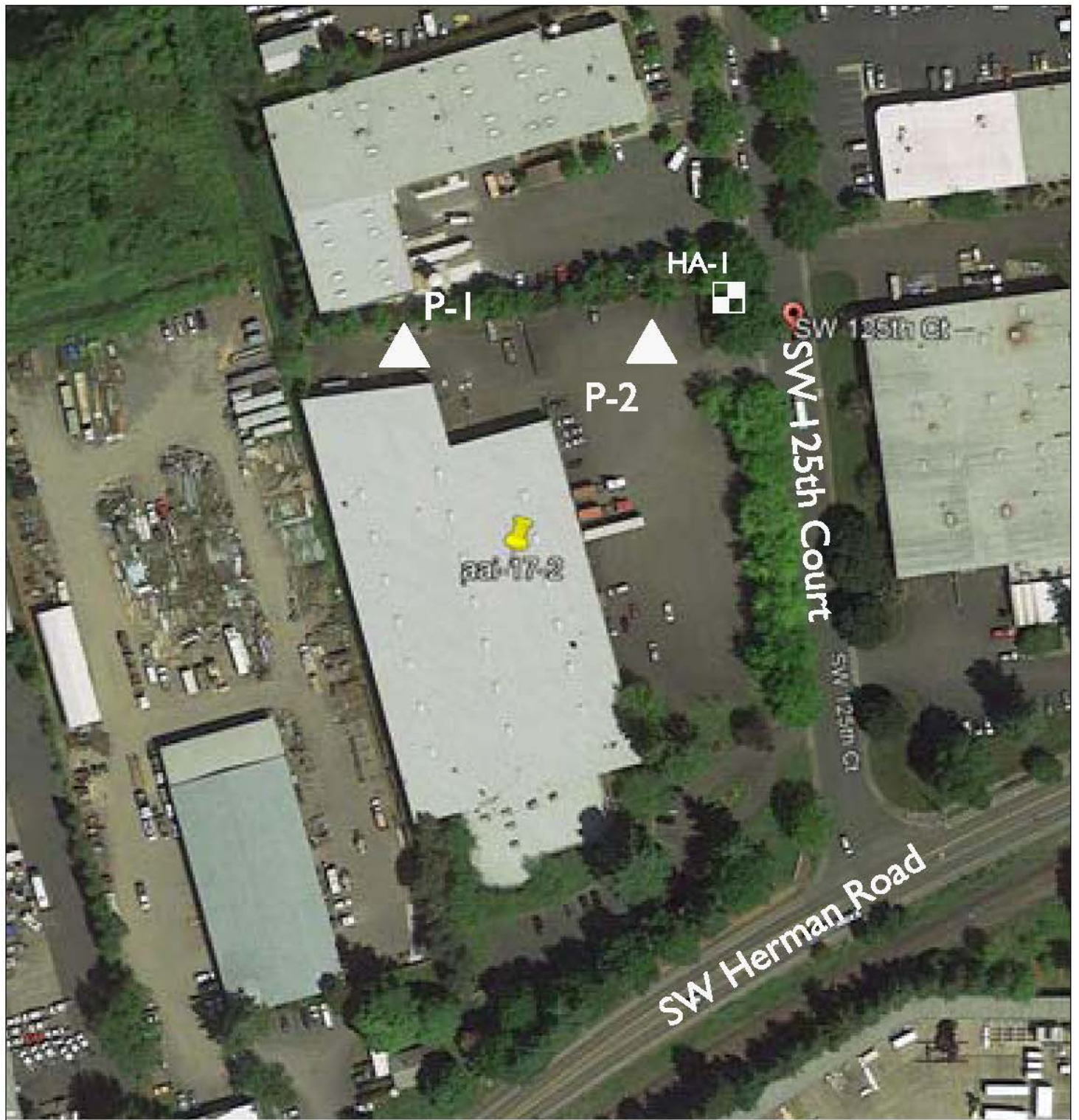
A handwritten signature in black ink, appearing to read 'Don Rondema', followed by a long horizontal line extending to the right.

Don Rondema, MS, PE, GE
Principal



Attachments –

Site Plan, Guidelines for Classification of Soil, Hand Auger Log, CPT Analyses and Logs, Moisture Contents



NOT TO SCALE

BASE PHOTO FROM GOOGLE EARTH 2017 AERIAL

Geotech
Solutions Inc.

SITE PLAN
aai-17-2-gj

GUIDELINES FOR CLASSIFICATION OF SOIL

Description of Relative Density for Granular Soil	
Relative Density	Standard Penetration Resistance (N-values) blows per foot
very loose	0 - 4
loose	4 - 10
medium dense	10 - 30
dense	30 - 50
very dense	over 50

Description of Consistency for Fine-Grained (Cohesive) Soils		
Consistency	Standard Penetration Resistance (N-values) blows per foot	Torvane Undrained Shear Strength, tsf
very soft	0 - 2	less than 0.125
soft	2 - 4	0.125 - 0.25
medium stiff	4 - 8	0.25 - 0.50
stiff	8 - 15	0.50 - 1.0
very stiff	15 - 30	1.0 - 2.0
hard	over 30	over 2.0

Grain-Size Classification	
Description	Size
Boulders	12 - 36 in.
Cobbles	3 - 12 in.
Gravel	1/4 - 3/4 in. (fine) 3/4 - 3 in. (coarse)
Sand	No. 200 - No. 40 Sieve (fine) No. 40 - No. 10 sieve (medium) No. 10 - No. 4 sieve (coarse)
Silt/Clay	Pass No. 200 sieve

Modifier for Subclassification	
Adjective	Percentage of Other Material In Total Sample
Clean/Occasional	0 - 2
Trace	2 - 10
Some	10 - 30
Sandy, Silty, Clayey, etc.	30 - 50

Test Pit # Depth (ft) Soil Description

Explorations completed on January 15, 2017 with a hand augur.

HA-1

Location: NE portion of site.

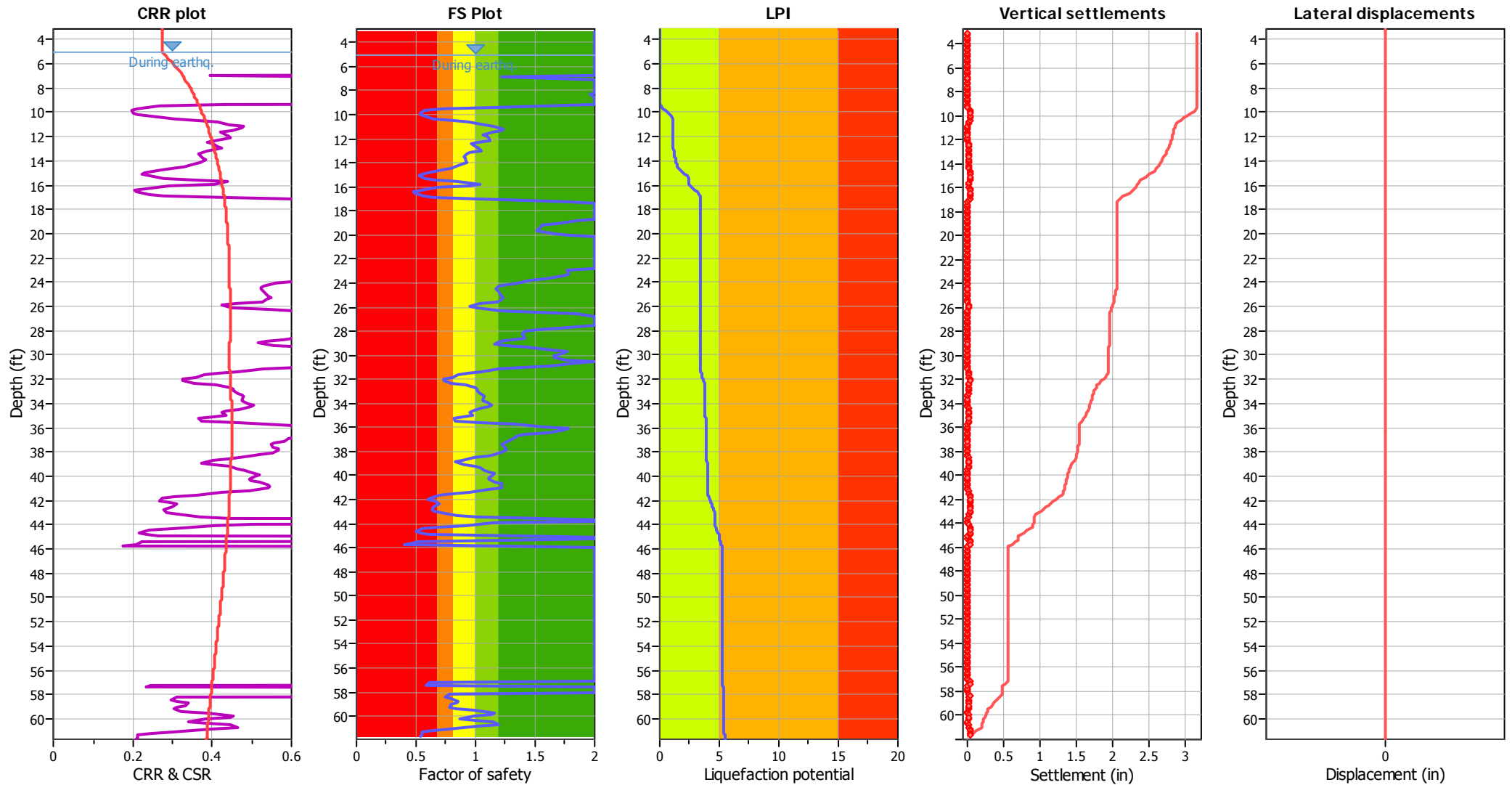
Surface conditions: Short grass,

0 – 1.5 Medium stiff, brown SILT, rooty, with trace sand; moist.

1.5 – 3 Medium stiff, brown/black SILT, with some roots; moist.

Exploration	Depth, ft	Moisture Content
HA-1	1.0	25%
HA-1	2.0	31%
HA-1	3.0	27%

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	8.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.29	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	5.00 ft	Fill height:	N/A	Limit depth:	N/A

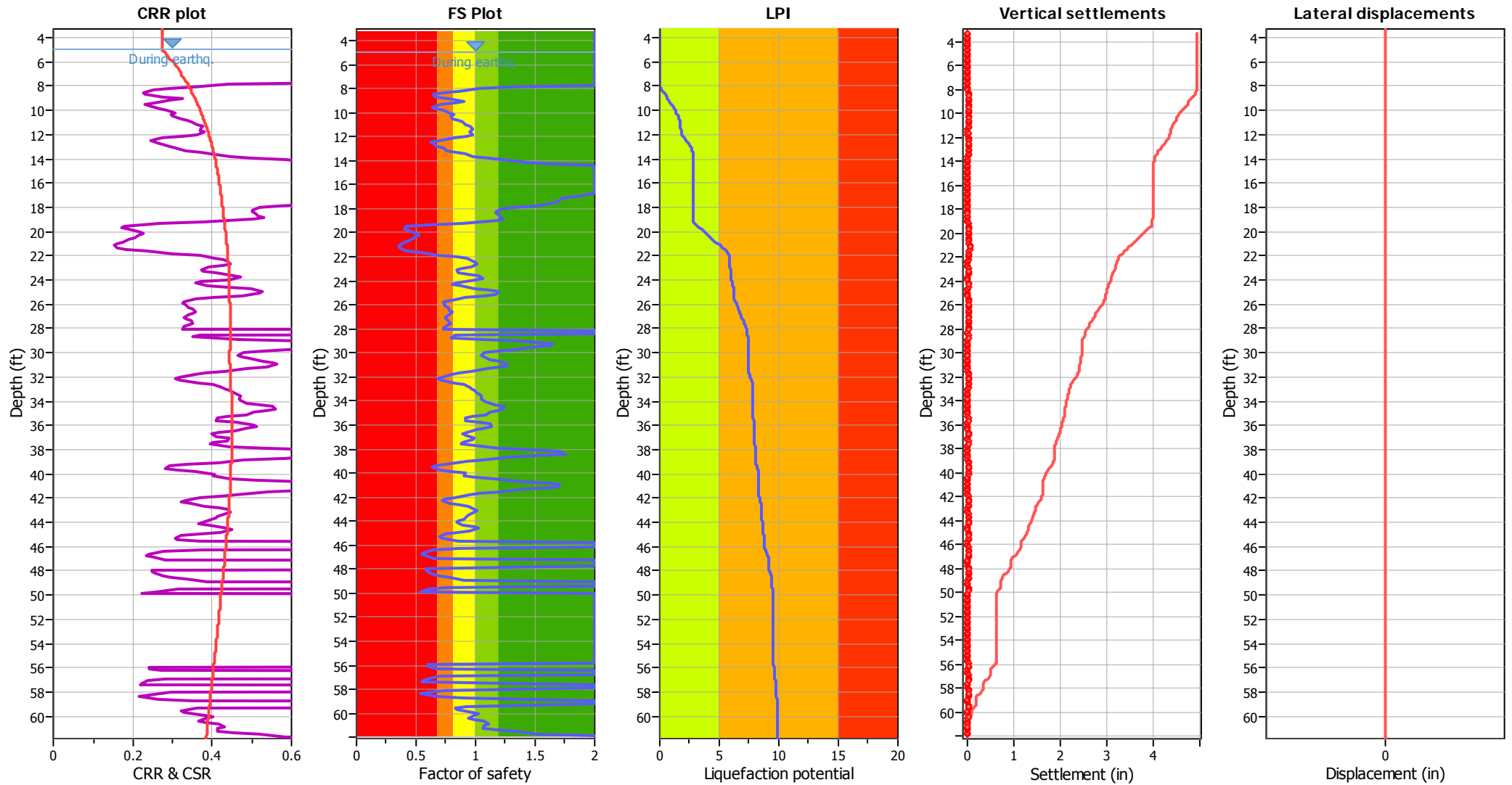
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	8.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.29	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	5.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

API Expansion

IX. O&M

API Expansion

STORMWATER OPERATIONS & MAINTENANCE PLAN

API Expansion

August 07, 2018

Prepared by:

Craig Harris

AAI Engineering

4875 SW Griffith Drive, Suite 300

Beaverton, OR 97005

Responsibility

The sumped catchbasins, conveyance piping, Flow Control Manhole and WQ Vault are to be maintained by the Property owner. These facilities have been designed for ease of maintenance outlined herein.

Responsible party contact info:

Primary:

TBD

Department of Environmental Quality - (503) 229-5696

Oregon Emergency Response System - (800) 452-0311

Description

The runoff from the proposed building addition and asphalt areas will be collected in new downspouts (Building) and catchbasins (AC). The existing buildings downspouts will be re-routed to the detention pipe. The runoff will be detained via a flow control manhole prior to the WQ Vault. After treatment, runoff will be conveyed to the existing storm drainage system located in SW 125th Ct.

API Expansion

Facilities Description Table

Facility Name	Type	Size (LF)	Area Treated	IA Treated (SF)	Discharge Point
21" Detention Pipe	CMP Pipe	250LF	N/A		Flow Control Manhole
Filtered Vault	(9) cart	NA	Asphalt/Roof	134,981	Existing storm system in SW 125th Ct.

Inspection/Maintenance Schedule

Each part of the system shall be inspected and maintained quarterly and within 48 hours after each major storm event. For this O&M Plan, a major storm event is defined as 1.0 inches of rain (or more) in 24 hours. All components of the storm system as described above must be inspected and maintained frequently or they cease to function effectively. The Facility owner shall keep a log, recording all inspection dates, observations, and maintenance activities. Receipts shall be saved when maintenance is performed and there is record of expense. The mechanical filter devices have a contracted maintenance schedule which is included at the end of this O&M and must be entered into with a qualified service technician.

The following items shall be inspected and maintained as stated:

Catchbasins, Conveyance Pipes, Flow Control manhole, WQ vault (Storm System):

- Sediment shall be removed biannually, more frequently if site produces a high volume of sediment.
- Debris shall be removed from inlets and outlets quarterly, or as necessary to maintain free flow of runoff.
- Quarterly inspections for clogging shall be preformed, or if "ponding" is observed in basins or at Catchbasin inlets.
- Grates shall be tamer proof.
- See manufacturer specific O&M for the filtered cartridges

API Expansion

Source Control

Source control measures prevent pollutants from mixing with stormwater. Typical non-structure control measures include raking and removing leaves, pavement sweeping, vacuum sweeping, and limited and controlled application of pesticides, herbicides and fertilizers.

- Source control measures shall be inspected and maintained quarterly.
- Signage shall be maintained.

Spill Prevention

Spill prevention measures shall be exercised when handling substances that can contaminate stormwater. Virtually all sites present dangers from spills. It is important to exercise caution when handling substances that can contaminate stormwater. Activities that pose the chance of hazardous material spills shall not take place near collection facilities.

- The proper authority and property owner shall be contacted immediately if a spill is observed.
- A spill kit shall be kept near spill-prone operations and refreshed annually.
- Employees shall be trained on spill control measures.
- Shut-off valves shall be tested quarterly.
- Release of pollutants shall be corrected within 12 hours.

Insects and Rodents

Insects and Rodents shall not be harbored in any part of the storm system.

- Pest control measures shall be taken when insects/rodents are found to be present. Standing water and food sources shall be prevented.
- Holes in the ground located in and around the swale shall be filled.
- Outfalls shall be inspected and cleaned regularly to ensure no rodent activity, which can clog or decrease the efficiency of the storm system.
- Pest control measures shall be taken when insects/rodents are found to be present. Standing water and food sources shall be prevented.

Access

Access shall be maintained for the Catchbasins, Flow Control Manhole and WQ Vault so operations and maintenance can be performed as regularly scheduled.

API Expansion

Stormwater Facility Monitoring Log

Drainage

- The swale shall drain within 48 hours. Time/Date, weather and site conditions when ponding occurs shall be recorded.

Pollution prevention

- All sites shall implement best management practices (BMP's), to prevent hazardous wastes, litter, or excessive oil and sediment from contaminating stormwater. Contact Spill Prevention & Citizen Response for immediate assistance with responding to spills. Record Time/Date, weather and site conditions if site activities are found to contaminate stormwater.

Vectors (mosquitoes and rodents)

- Stormwater facilities shall not harbor mosquito larvae or rodents that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the waters' surface. Note holes/burrows in and around the Basin and Access Road. Call Washington County Vector Control for immediate assistance with eradication of vectors. Record time/date, weather and site conditions when vector activity is observed.

Maintenance

- Record date, description and contractor (if applicable) for all structure repairs, landscape maintenance and facility cleanout activities.

Date: _____

Initials: _____

Work performed by: _____

Work performed: _____

Details: _____

API Expansion

Date: _____ Initials: _____

Work performed by: _____

Work performed: _____

Details: _____

Date: _____ Initials: _____

Work performed by: _____

Work performed: _____

Details: _____

Date: _____ Initials: _____

Work performed by: _____

Work performed: _____

Details: _____

Date: _____ Initials: _____

Work performed by: _____

Work performed: _____

Details: _____

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

**API Facility Expansion
Herman Road and SW 125th Court, Tualatin, Oregon**

**Geotech
Solutions Inc.**

January 29, 2018

GSI Project: aai-17-2-gi

January 29, 2018

aai-17-2-gi

API Properties
cyrus@apiint.com

Cc:
andisheha@aaieng.com; hamid@aaieng.com; craigh@aaieng.com

REPORT OF GEOTECHNICAL ENGINEERING SERVICES API Facility Expansion, 12505 SW Herman Rd, Tualatin, Oregon

As authorized, this report summarizes our geotechnical engineering services for the proposed project. Based on information you provided we understand that the site is to be expanded with a new building addition to the north of roughly 29,000 square feet and possible associated pavement and utilities. The purpose of our work is to investigate the soil conditions and provide geotechnical engineering for new building design for column loads up to 200 kips, wall loads up to 5 kips per foot, and slab loads up to 500 psf, as well as site infiltration rates and pavements. Our specific scope of work included the following:

- Provide principal-level geotechnical project management including client communications, management of field and subcontracted services, report writing, analyses, and invoicing.
- Review previous reports, geologic maps and vicinity geotechnical information as indicators of subsurface conditions.
- Complete a site reconnaissance to observe surface features relevant to geotechnical issues, such as topography, vegetation, presence and condition of springs, exposed soils and rock, and evidence of previous grading.
- Identify exploration locations and complete One-Call utility locates for public utilities and a private locate.
- Explore subsurface conditions by advancing two CPT probes to depths of up to 60 feet or refusal with pore pressure testing to evaluate ground water depths, as well as one hand auger in a landscaped area to a depth of up to 5 feet or refusal to evaluate near surface conditions.
- Complete infiltration testing in the hand auger and analyze ppd testing in the CPTs, and provide an infiltration rate and strata and backfill criteria to the civil engineer for their design, if feasible.
- Classify and sample materials encountered and maintain a detailed log of the explorations.
- Determine the moisture content of selected samples obtained from the explorations and complete soil classification testing as necessary.
- Provide recommendations for earthwork including site preparation, reuse of existing fill in place or stabilized or reinstalled, seasonal material usage, compaction criteria, utility trench backfill, and the need for subsurface drainage.
- Evaluate site liquefaction potential and estimate site deformations and provide qualitative means to address unsuitable deformations if needed.
- Provide recommendations for shallow foundations including suitable soils, stabilization, bearing pressures, sliding coefficient, and a seismic site class, as well as geotechnical parameters for deep foundation support for up to one pile type, if needed.

- Provide recommendations for slab support, including a subgrade modulus if needed, underslab rock thickness and materials, and the need for stabilization.
- Provide recommendations for pavements including subgrade preparation and stabilization, and base rock and asphalt concrete and portland cement concrete thicknesses.
- Provide a written report summarizing the results of our geotechnical evaluation.

SITE OBSERVATIONS AND CONDITIONS

Surface Conditions

The facility is located immediately north of SW Herman Road and west of SW 125th Court in Tualatin, Oregon. Expansion is proposed to the north and northeast over areas currently paved with asphalt concrete. The site is relatively flat, with landscape strips to the north and east. Light commercial and industrial uses are present abutting the site. The general site appearance from a recent aerial photo is shown on the attached **Site Plan**.

Subsurface Conditions

General – Subsurface conditions at the site were explored on January 15th and 18th, 2018 by excavating one hand auger to a depth of 3 feet and advancing two cone penetrometer probes to depths of 60 feet. Our approximate exploration locations are shown on the attached **Site Plan**. Specific subsurface conditions observed at each exploration are described in the attached **Hand Auger Logs** and **CPT Logs**.

In general, subsurface conditions in our explorations generally included asphalt concrete pavement and base rock in the CPT's, and mulch in the hand auger, underlain by soft silt fill with some clay and organics to depths of roughly 3.5 feet. This fill was soft with CPT tip resistance generally less than 10 tsf, and friction ratios of generally 2 to 4%, but 6-8% where more organic. Native silt with variable sand and clay was present under the fill, with tip resistance of generally 10-20 tsf and friction ratios of generally 1.5 to 4%. At depths of 7 to 10 feet the silt transitioned to sandy silt and sand with tip resistance ranging from generally 60-160 tsf, and friction ratios of 1-3%. At depths of 42-45 feet this material transitioned to silty soils with variable clay and tip resistance of generally 30-120 tsf and friction ratios of 3-6%.

Site soil conditions are consistent with mapped soil deposits.

Infiltration – Infiltration testing was completed in HA-1 at a depth of 3 feet using falling head, double ring configuration, cased hole testing. Raw results from testing indicated a rate of 0.5 in³/hr/in².

Groundwater – Pore pressure back calculation from the CPT's indicates ground water levels of roughly 7 to 9 feet below the ground surface. Perched ground water may exist shallower than that after winter or spring rainfall events.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our explorations, laboratory testing, and engineering analyses, it is our opinion that the site can be developed following the recommendations contained herein. Key geotechnical

issues include removal of soft fill from footing areas and soils sensitive to moisture/rainfall. Specific geotechnical recommendations are provided in the following sections.

Conventional grading could likely be achieved only in the dry season, typically late June through mid-September. Earthwork construction outside the dry season or dry conditions is feasible but will result in increased construction costs for stabilization of haul roads and working blankets, as well as protection of exposed silt soils. The near surface soils at the site consist of fine-grained silt which is easily disturbed when wet. If construction is planned for wet conditions, measures must be taken to minimize disturbance.

Site Preparation

General - Prior to earthwork construction, the site must be prepared by removing any existing structures, utilities, fill, pavement and topsoil from the building areas. Deeper topsoil stripping depths may be required in areas of loose organic soil typically associated with trees and shrubs or past farming activities. Root balls from trees and shrubs may extend several feet and grubbing operations can cause considerable subgrade disturbance. All disturbed material must be removed to undisturbed subgrade and backfilled with structural fill. In general, roots greater than one-inch in diameter must be removed as well as areas of concentrated smaller roots where organic content exceeds 2% by dry weight. In our explorations this depth average one foot.

Stabilization and Soft Areas – Soft areas are expected in the wet season. After site preparation we must be contacted to evaluate the exposed subgrade. This evaluation can be done by proof rolling in dry conditions or probing during wet conditions. Soft areas will require over-excavation and backfilling with well graded, angular crushed rock compacted as structural fill, overlying a separation geosynthetic such as a Propex Geotex 601 or equivalent. Where soft soils remain after excavation to depths of roughly 12-18 inches, geogrid may also be needed over the fabric such as a Propex Gridpro BXPI2-4 (or equivalent).

Working Blankets and Haul Roads – The site pavements could be used as haul roads for as long as practical, and some increased cracking and fatigue should be expected in heavily trafficked areas due to soft subgrade, and may require repair. Construction equipment must not operate directly on the soil as it is susceptible to disturbance and softening. Haul roads placed over a geosynthetic in a thickened advancing pad can be used to protect subgrades. We recommend that sound, angular, pit run or crushed basalt with no more than 6 percent passing a #200 sieve be used to construct haul roads and working blankets. Working blankets must be at least 12 inches thick, and haul roads at least 24 inches thick. These can typically be reduced to 10 and 16 inches, respectively, with the use of the preceding separation geosynthetic and geogrid. Some repair of working blankets and haul roads should be expected.

As an alternative to the methods described above, reuse of native soils may be possible by soil amendment using portland cement. Amendment requires an experienced contractor using specialty spreading and mixing equipment. Typically in these soils 5-6% cement in one or two mixing passes is used for an amendment depth of 12 inches (a soil weight of 100pcf is typically used for the quantity calculation). However, the materials used and quantities can vary based on moisture and organic contents, plasticity, and required amendment depth. Organic or clayey soils may require 7% cement or more, and soils with soft wet silt under the treated zone may require deeper treatment or use of only

grid and rock fill methods. That may be the case on this site in the wet season. Compaction and grading of amended soils must be completed within 4 hours of mixing, and the amended soil must be allowed to cure for 4 days prior to trafficking. Generally, 50 percent of mixed particles should pass a No. 4 sieve.

The permeability of amended soil is very low. The surface of amended soils in building and pavement areas must therefore be sloped at a minimum of 0.5 percent to prevent collection of surface water during construction. Amended soils must be removed from all landscape areas prior to planting.

The preceding rock and amendment thicknesses are the minimum recommended. Subgrade protection is the responsibility of the contractor and thicker sections may be required based on subgrade conditions during construction and type and frequency of construction equipment.

Earthwork

Fill – The on-site fine grained inorganic soils can be used for structural fill if properly moisture conditioned and free of deleterious materials. Use of the silt material will not be feasible during wet conditions. Even during dry summer conditions the on-site silt soils may require drying by scarification and frequent mixing in thin lifts. Once moisture contents are within 3 percent of optimum (typically 13-16% for these soils), the material must be compacted to at least 92 percent relative to ASTM D1557 (modified proctor) using a tamping foot type compactor. Fill must be placed in lifts no greater than 10 inches in loose thickness. In addition to meeting density specifications, fill will also need to pass a wheel roll using a loaded dump truck, water truck, or similar size equipment.

In wet conditions, fill must be imported granular soil with less than 6 percent fines, such as clean crushed or pit run rock. This material must also be compacted to 95 percent relative to ASTM D1557.

Trenches – Utility trenches may encounter ground water seepage and caving must be expected where seepage is present. Shoring of utility trenches will be required for depths greater than 4 feet and where groundwater seepage is present. We recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation.

Depending on the excavation depth and amount of groundwater seepage, dewatering may be necessary for construction of underground utilities. Flow rates for dewatering are likely to vary depending on location, soil type, and the season during which the excavation occurs. The dewatering systems, if necessary, must be capable of adapting to variable flows.

Pipe bedding must be installed in accordance with the pipe manufacturers' recommendations. If groundwater is present in the base of the utility trench excavation, we recommend overexcavating the trench by 12 to 18 inches and placing trench stabilization material in the base. Trench stabilization material must consist of well-graded, crushed rock or crushed gravel with a maximum particle size of 4 inches and be free of deleterious materials. The percent passing the U.S. Standard No. 200 Sieve must be less than 5 percent by weight when tested in accordance with ASTM C 117.

Trench backfill above the pipe zone must consist of well graded, angular crushed rock or sand fill with no more than 7 percent passing a #200 sieve. Trench backfill must be compacted to 92 percent relative

to ASTM D-1557, and construction of hard surfaces, such as sidewalks or pavement, must not occur within one week of backfilling.

Seismic Design

General - In accordance with the International Building Code (IBC) as adapted by State of Oregon Structural Specialty Code (SOSSC) and based on our explorations and experience in the site vicinity, the subject project is Class F, but for this low rise structure can be evaluated using the parameters associated with Site Class D.

Liquefaction - Liquefaction occurs in loose, saturated, granular soils. Strong shaking, such as that experienced during earthquakes, causes the densification and the subsequent settlement of these soils. Our CPT based analyses indicates that an overall liquefaction induced settlement on the site is roughly 3-4 inches, primarily from strain associated with sandy layers. This also likely applies to the existing building. However, in the top 20 feet only roughly 1 inch is expected, and this is the expected differential settlement. Given the settlement distribution, unsaturated surface soils, and the relatively flat local ground conditions, there is a low risk of liquefaction related structurally damaging deformations to the buildings. Sand boils and venting are possible, and could impact floor slabs and exterior surfacing.

Shallow Foundations

Soft silt fill was encountered in our explorations to depths of roughly 3.5 feet and must be removed from below foundations. Based on the provided information regarding building type and anticipated structural loads as previously stated, the proposed structure can be supported on shallow spread foundations bearing on at least 6 inches of crushed rock structural fill placed over the native medium stiff or stiffer silt. Footings must be embedded at least 18 inches below the lowest adjacent, exterior grade. Footings can be designed for an allowable net bearing pressure of 2,500 psf. The preceding bearing pressure can be increased to 5,000 psf for temporary wind and seismic loads.

Continuous footings must be no less than 18 inches wide, and pad footings must be no less than 24 inches wide. Resistance to lateral loads can be obtained by a passive equivalent fluid pressure of 350 pcf against suitable footings, ignoring the top 12 inches of embedment, and by a footing base friction coefficient of 0.38. Properly founded footings are expected to settle less than a total of 1 inch, with less than ½ inch differentially.

If footing construction is to occur in wet conditions, a few inches of crushed rock must be placed at the base of footings to reduce subgrade disturbance and softening during construction.

Slabs

Floor slab loads up to 250 psf are expected to induce less than one inch of settlement if based on the working pads described herein which includes a minimum of 12 inches of clean, angular crushed rock with no more than 5 percent passing a #200 sieve. For slab loads up to 500 psf the silt fill must be removed and replaced with structural fill. This material was encountered to depths of roughly 3.5 feet in our explorations. A separation geosynthetic such as a Propex Geotex 601 is required under the rock. Prior to slab rock placement the subgrade will need to be evaluated by us by probing or observing wheel rolling using a loaded dump truck or equivalent wheel load. Underslab rock must be compacted to 92 percent compaction relative to ASTM D1557, and must pass the wheel roll. In addition, any areas

contaminated with fines must be removed and replaced with clean rock. If the base rock is saturated or trapping water, this water must be removed prior to slab placement.

Some flooring manufacturers require specific slab moisture levels and/or vapor barriers to validate the warranties on their products. A properly installed and protected vapor flow retardant can reduce slab moistures. If moisture sensitive floor coverings or operations are planned, we recommend a vapor barrier be used. Typically a reinforced product or thicker product (such as a 15 mil STEGO wrap or equivalent) can be used. Experienced contractors using special concrete mix design and placement have been successful placing concrete directly over the vapor barrier which overlies the rock. This avoids the issue of water trapped in the rock between the slab and vapor barrier, which otherwise requires removal. In either case, slab moisture should be tested/monitored until it meets floor covering manufacturer's recommendations.

Infiltration

Design - Based on the results of our testing and analyses, infiltration rates in the silt are very low, and shallow seasonal seepage may preclude use of infiltration systems. If very shallow systems are used above seasonal seepage levels (expected to be at 3-4 feet in depth), we recommend using a design infiltration rate of 0.25 in³/hour per in² on the sides of infiltration systems. The base may also be used with upstream sedimentation protection. Embedment into suitable soils will require us to be called for observation during installation. It is prudent to have a down gradient surface overflow designed for infiltration systems where ground water levels may be perched and vary seasonally.

Confirmation Testing and Maintenance - Testing of infiltration systems is required to confirm the design infiltration rate as actual subsurface conditions and infiltration rates can vary widely. Flexibility for adaptation and expansion of infiltration systems must be incorporated into the design and construction, with contingencies included in the project budget and schedule. Infiltration systems need to be maintained free of debris and silt in order to function properly.

Drainage

General - We recommend installing perimeter foundation drains around all exterior foundations. The surface around building perimeters must be sloped to drain away from the buildings.

Foundation Drains - Foundation drains must consist of a two-foot wide zone of drain rock encompassing a 4-inch diameter perforated pipe, all enclosed with a non-woven filter fabric. The drain rock must have no more than 2 percent passing a #200 sieve and must extend to within one foot of the ground surface. The geosynthetic must be a Propex Geotex 601 or equivalent. One foot of low permeability soil (such as the on-site silt) must be placed over the fabric at the top of the drain to isolate the drain from surface runoff.

Pavement

Asphalt Concrete – At the time of this report we did not have specific information regarding the type and frequency of expected traffic. We therefore developed asphalt concrete pavement thicknesses for areas exposed to passenger vehicles only and areas exposed to up to five 3 to 5-axle trucks per day based on a 20-year design life. Traffic volumes can be revised if specific data is available.

Our pavement analyses is based on AASHTO methods and subgrade of structural fill or undisturbed medium stiff or better silt having a resilient modulus of 3,000 psi and prepared as recommended herein. We have also assumed that roadway construction will be completed during an extended period of dry weather. The results of our analyses based on these parameters are provided in the table below.

<u>Traffic</u>	<u>AC (inches)</u>	<u>CR (inches)</u>
Passenger Vehicle Only	3	8
Up to 5 Trucks/Day (52k 18k ESALs)	4.5	12

The thicknesses listed in the preceding table are the minimum acceptable for construction during an extended period of dry weather. Increased rock thicknesses will be required for construction during wet conditions. Crushed rock must conform to ODOT base rock standards and have less than 6 percent passing the #200 sieve. Asphalt concrete must be compacted to a minimum of 91 percent of a Rice Density.

Portland Cement Concrete - We developed PCC pavement thicknesses at the site for the assumed one-way traffic levels as shown in the table below. Each of these sections is based on AASHTO methods with no reduction for wander and a composite modulus of subgrade reaction of 180 pci (AASHTO Figure 3.3 with $M_r = 3,000$ psi and 6 inches crushed rock base). Other parameters include 4,000 psi compressive strength portland cement concrete (PCC), and plain jointed concrete *without* load transfer devices or tied concrete shoulders. PCC pavements over trench backfill should not be placed within one week of fill installation unless survey data indicates that settlement of the backfill is complete.

<u>Traffic</u>	<u>18k ESALS</u>	<u>PCC (inches)</u>	<u>CRB (inches)</u>
Up to 5 Trucks Per Day	52,000	6.5	6

Sidewalks should be supported on at least 4 inches of base rock placed over medium stiff or better undisturbed native silt subgrade or structural fill based on native soils.

Subgrade Preparation - The pavement subgrade must be prepared in accordance with the **Earthwork and Site Preparation** recommendations presented in this report. All pavement subgrades must pass a proof roll prior to paving. Soft areas must be repaired by over-excavating the areas and installing a stabilization geosynthetic. Well graded, angular crushed rock backfill compacted as structural fill must be used to bring the aforementioned areas to-grade. For stabilization geosynthetics we recommend a Propex Geotex 601 for separation overlying a suitable punched and drawn biaxial geogrid such as a Propex Gridpro BXPI2-4 (or equivalent).

LIMITATIONS AND OBSERVATION DURING CONSTRUCTION

We have prepared this report for use by API and the design and construction teams for this project only. The information herein could be used for bidding or estimating purposes but must not be construed as a warranty of subsurface conditions. We have made observations only at the aforementioned locations and only to the stated depths. These observations do not reflect soil types,

strata thicknesses, water levels or seepage that may exist between observations. We must be consulted to observe all foundation bearing surfaces, subgrade stabilization, proof rolling of slab and pavement subgrades, installation of structural fill, subsurface drainage, and cut and fill slopes. We must be consulted to review final design and specifications in order to see that our recommendations are suitably followed. If any changes are made to the anticipated locations, loads, configurations, or construction timing, our recommendations may not be applicable, and we must be consulted. The preceding recommendations must be considered preliminary, as actual soil conditions may vary. In order for our recommendations to be final, we must be retained to observe actual subsurface conditions encountered. Our observations will allow us to interpret actual conditions and adapt our recommendations if needed.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty, expressed or implied, is given.



We appreciate the opportunity to work with you on this project and look forward to our continued involvement. Please contact us if you have any questions.

Sincerely,

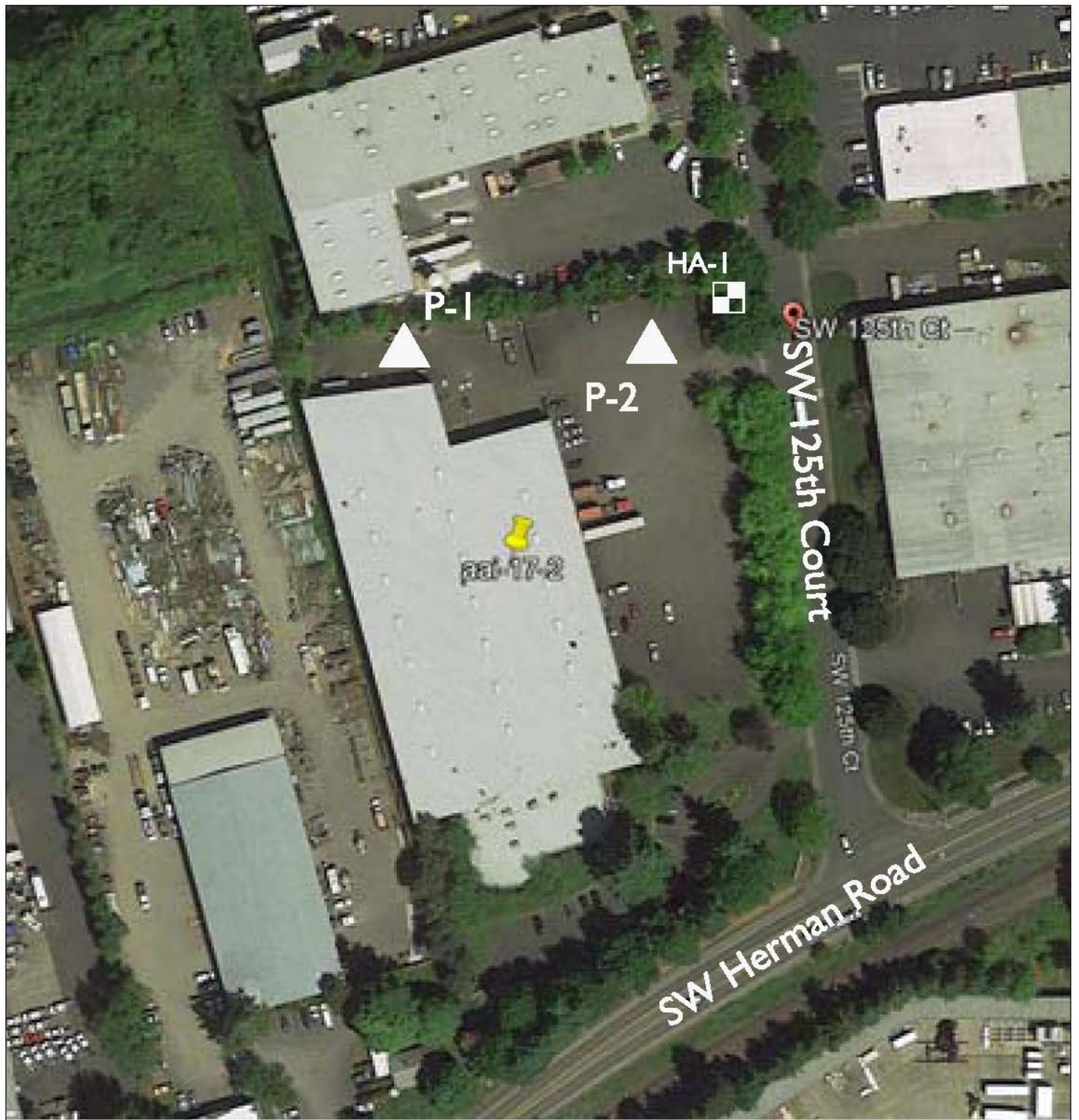
A handwritten signature in black ink, appearing to read 'Don Rondema', followed by a long horizontal line extending to the right.

Don Rondema, MS, PE, GE
Principal



Attachments –

Site Plan, Guidelines for Classification of Soil, Hand Auger Log, CPT Analyses and Logs, Moisture Contents



NOT TO SCALE

BASE PHOTO FROM GOOGLE EARTH 2017 AERIAL

Geotech
Solutions Inc.

SITE PLAN

aai-17-2-gj

GUIDELINES FOR CLASSIFICATION OF SOIL

Description of Relative Density for Granular Soil	
Relative Density	Standard Penetration Resistance (N-values) blows per foot
very loose	0 - 4
loose	4 - 10
medium dense	10 - 30
dense	30 - 50
very dense	over 50

Description of Consistency for Fine-Grained (Cohesive) Soils		
Consistency	Standard Penetration Resistance (N-values) blows per foot	Torvane Undrained Shear Strength, tsf
very soft	0 - 2	less than 0.125
soft	2 - 4	0.125 - 0.25
medium stiff	4 - 8	0.25 - 0.50
stiff	8 - 15	0.50 - 1.0
very stiff	15 - 30	1.0 - 2.0
hard	over 30	over 2.0

Grain-Size Classification	
Description	Size
Boulders	12 - 36 in.
Cobbles	3 - 12 in.
Gravel	1/4 - 3/4 in. (fine) 3/4 - 3 in. (coarse)
Sand	No. 200 - No. 40 Sieve (fine) No. 40 - No. 10 sieve (medium) No. 10 - No. 4 sieve (coarse)
Silt/Clay	Pass No. 200 sieve

Modifier for Subclassification	
Adjective	Percentage of Other Material In Total Sample
Clean/Occasional	0 - 2
Trace	2 - 10
Some	10 - 30
Sandy, Silty, Clayey, etc.	30 - 50

Test Pit # Depth (ft) Soil Description

Explorations completed on January 15, 2017 with a hand augur.

HA-1

Location: NE portion of site.

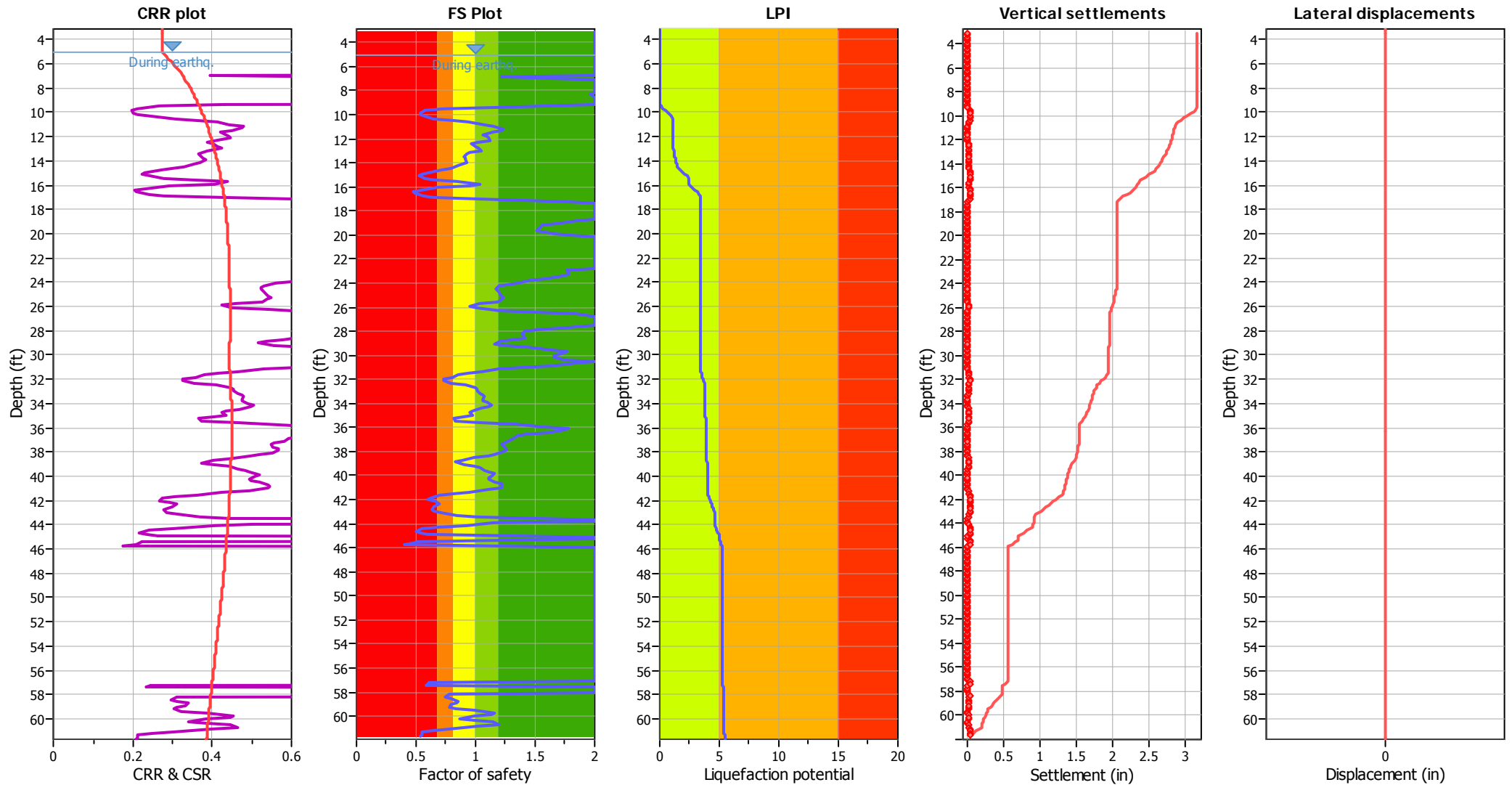
Surface conditions: Short grass,

0 – 1.5 Medium stiff, brown SILT, rooty, with trace sand; moist.

1.5 – 3 Medium stiff, brown/black SILT, with some roots; moist.

Exploration	Depth, ft	Moisture Content
HA-1	1.0	25%
HA-1	2.0	31%
HA-1	3.0	27%

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	8.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.29	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	5.00 ft	Fill height:	N/A	Limit depth:	N/A

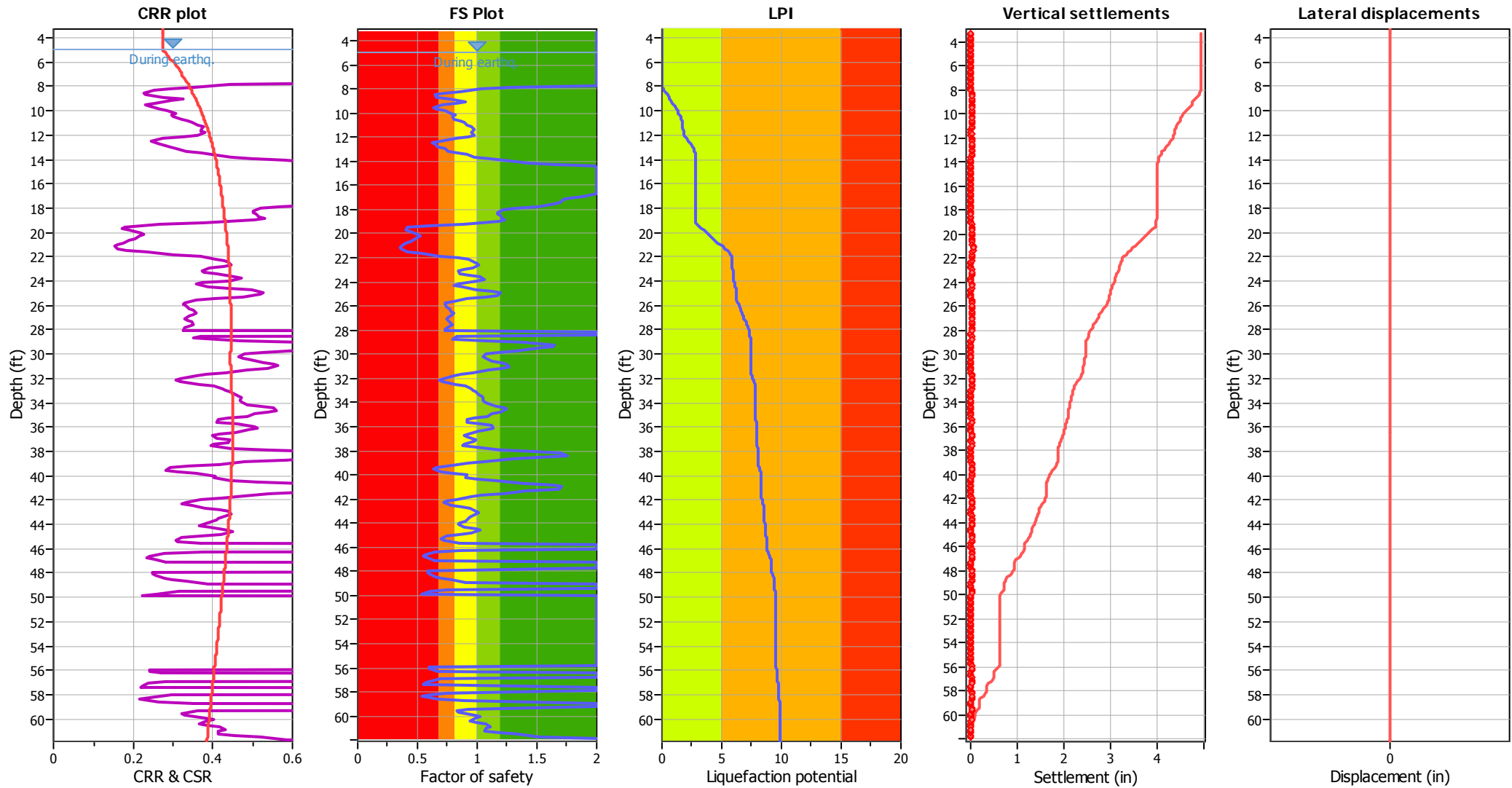
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (earthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	Yes
Earthquake magnitude M_w :	8.70	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.29	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	5.00 ft	Fill height:	N/A	Limit depth:	N/A

F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk



TERAGAN & ASSOCIATES, INC. ARBORICULTURAL CONSULTANTS

MEMORANDUM

DATE: October 10, 2018

TO: Cyrus Behbahany (Behbahany Properties)

FROM: Todd Prager, RCA #597, ISA Board Certified Master Arborist

RE: Tree Removal and Protection Plan for API International

Summary

This report includes tree removal and protection recommendations for construction of an addition at API International in Tualatin.

Background

Behbahany Properties is proposing to construct an addition to the existing building at API International at 12505 SW Herman Road in Tualatin. The proposed site plan with existing tree locations is provided in Attachment 1.

The purpose of this report is to:

1. Provide tree removal findings and recommendations based on the proposed site plan; and
2. Provide recommendations for adequately protecting the trees to be retained during construction.

Tree Assessment

On June 1, 2018, I completed the inventory of all trees over 8-inches in trunk diameter (DBH) at the project site. The complete inventory data is provided in the tree inventory spreadsheet in Attachment 2. The data collected for each tree includes the tree number, species (common and scientific names), DBH, tree health condition, tree structural condition, pertinent comments, and treatment (remove/retain). The tree numbers in the tree inventory in Attachment 2 correspond to the tree numbers on the proposed site plan in Attachment 1. The trees were also tagged with their corresponding numbers in the field.

Proposed Tree Removal

A typical minimum recommended tree protection zone encompasses a radius around a tree that is .5 feet per inch of trunk diameter. For example, a tree with a 24-inch trunk diameter would have a minimum protection radius of 12 feet. However, this standard may need to be adjusted on a case by case basis due to tree health, species characteristics, root distribution, whether the tree will be impacted on multiple sides, and other factors.

Attachment 1 shows the proposed construction impacts in relation to the trees. Trees 1 through 5, 14, and 15 are within the construction footprint and will be removed for construction purposes. Therefore, the removal of these trees meets the tree removal criteria in section 34.230.1(c) of the Tualatin Code because their removal is required "to construct proposed improvements".

Protection recommendations for the trees to be retained are provided in the next section of this report.

Tree Protection Recommendations

The following tree protection measures will be necessary to protect the trees during construction:

- *Tree Protection Fencing*: Erect six foot metal tree protection fencing in the locations shown in Attachment 1 to protect the trees from construction. Note that the existing fencing adjacent to trees 25 through 33 can be retained to protect these trees during construction.
- *Pruning of Trees 7 through 13*: Trees 7 through 13 shall be reduction and/or clearance pruned prior to construction in accordance with ANSI A300 pruning standards the minimum necessary to allow for construction of the proposed building. Reduction cuts shall be made to lateral branches that are at least one-third to one-half the sizes of the parent branches. All cuts shall be made just outside the branch collars.

Additional tree protection recommendations that are consistent with City of Tualatin standards are provided in Attachment 3.

Conclusion

Seven trees are recommended for removal with construction. The trees to be retained will be adequately protected during construction by adhering to the recommendations in this report. Any change to the tree protection plan should be completed by the project arborist to ensure that the trees to be retained are properly protected.

Please contact me if you have questions, concerns, or need any additional information.

Sincerely,

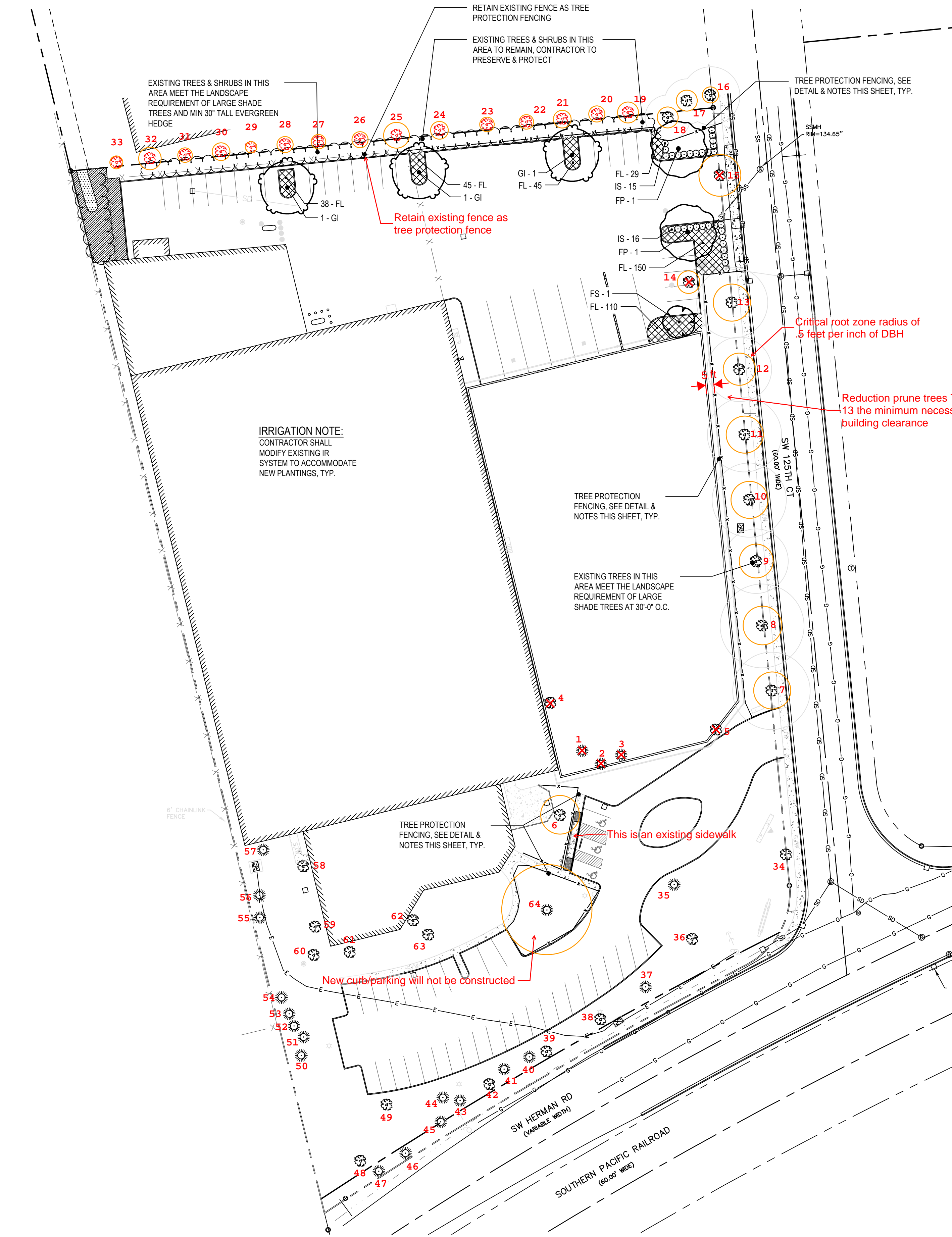


Todd Prager

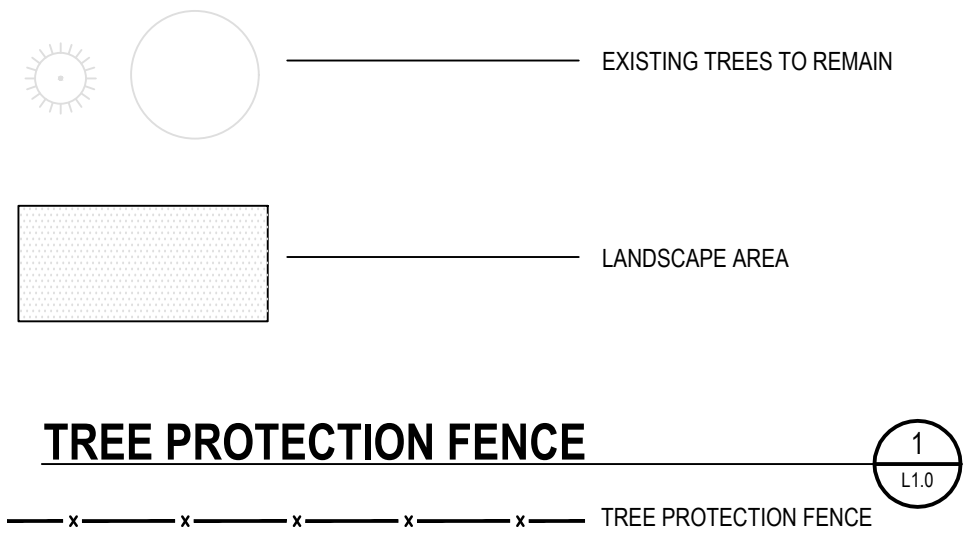
*ASCA Registered Consulting Arborist #597
ISA Board Certified Master Arborist, WE-6723B
ISA Qualified Tree Risk Assessor
AICP, American Planning Association*

Enclosures: Attachment 1 – Site Plan with Tree Removal and Protection
Attachment 2 – Tree Inventory
Attachment 3 – Tree Protection Recommendations
Attachment 4 – Assumptions and Limiting Conditions

Attachment 1



LEGEND



TREE PROTECTION FENCE

LANDSCAPE REQUIREMENTS

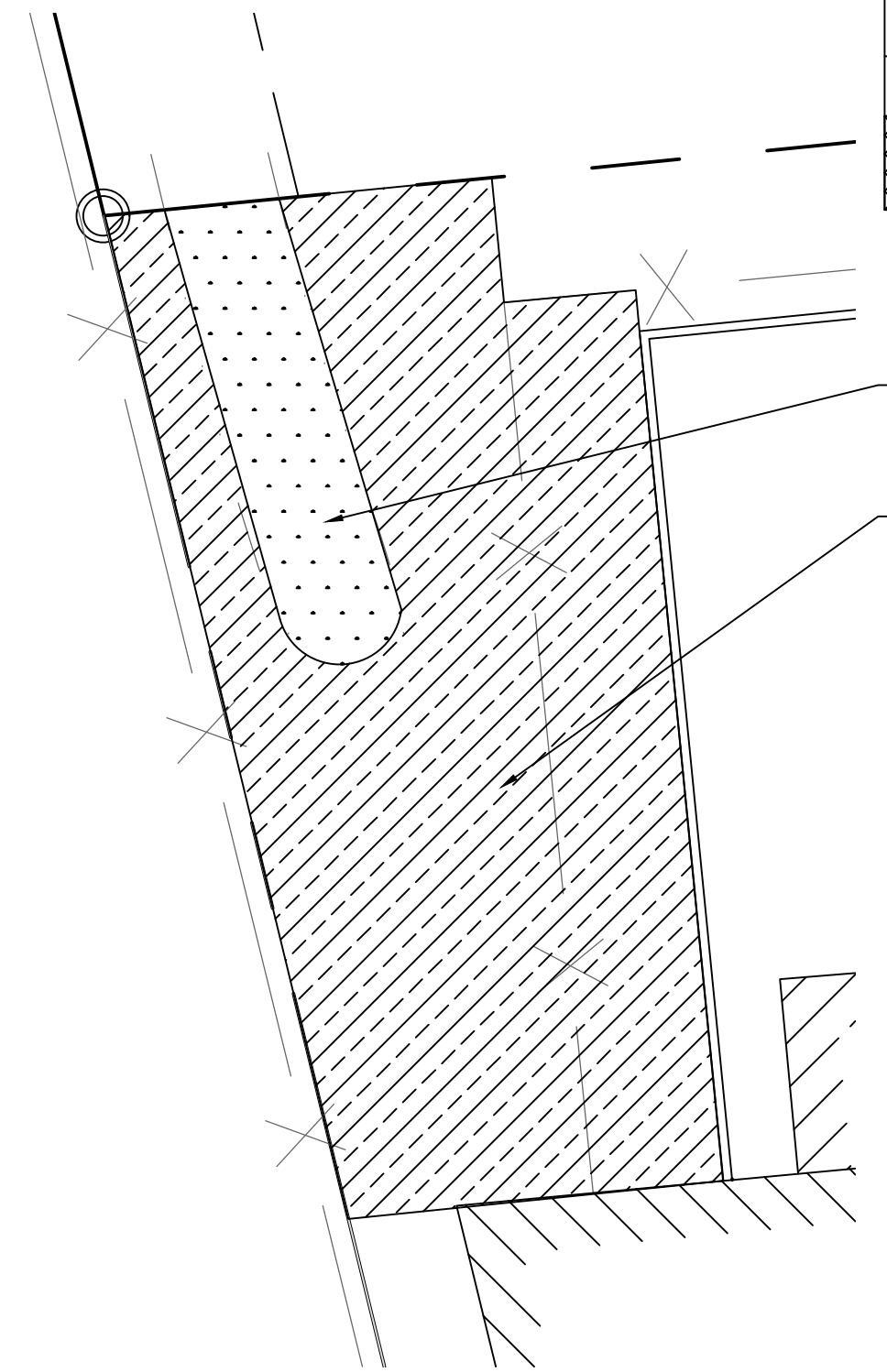
TOTAL SITE AREA	= 210,562 SF
LANDSCAPE AREA REQUIRED 15% OF SITE	= 31,584 SF
LANDSCAPE ARE PROPOSED 21.6% OF SITE	= 45,549 SF
PERIMETER PKG. LOT LANDSCAPING REQ.	= 5'-0" MIN LANDSCAPE STRIP
PERIMETER PKG. LOT LANDSCAPING PROPOSED	= 9'-6" LANDSCAPE STRIP
INTERIOR PKG. LOT ISLAND REQ = 25 SF	
PER PKG. STALL = 25 x 26 STALL	= 650 SF
INTERIOR PKG. LOT LANDSCAPE PROPOSED	= 1,211 SF
INTERIOR PKG. LOT TREES REQUIRED	= 6
INTERIOR PKG. LOT TREES PROPOSED	= 6

PLANTING NOTES

- ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT CITY OF TUALATIN STANDARDS AND THE OREGON STRUCTURAL SPECIALTY CODE.
- VERIFY ALL EXISTING CONDITIONS, INCLUDING LOCATION OF PROPERTY LINES, PRIOR TO BEGINNING ANY WORK. REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE IMMEDIATELY.
- DO NOT WILLFULLY PROCEED WITH CONSTRUCTION WHEN UNKNOWN OBSTRUCTIONS AND/OR DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. IMMEDIATELY NOTIFY OWNER'S REPRESENTATIVE OF UNKNOWN OBSTRUCTIONS AND/OR DIFFERENCES. PRIOR TO REMOVING ANY EXISTING FEATURES, REVIEW AND CONFIRM EXTENT OF DEMOLITION WITH OWNER'S REPRESENTATIVE.
- PROTECT EXISTING ITEMS TO REMAIN DURING CONSTRUCTION. ANY DAMAGE TO EXISTING ITEMS DESIGNATED TO REMAIN I.E. CURBS, WALKS, PLANT MATERIAL, LAWN OR FENCES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
- VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES, LINES, PIPES, VAULTS, OR BOXES PRIOR TO EXCAVATION. 2. MARK AND PROTECT ALL UTILITIES, SITE FEATURES AND VEGETATION TO REMAIN IN PLACE. ANY DAMAGE TO ANY KNOWN EXISTING UTILITY ELEMENTS SHALL BE REPAIRED PROPERLY AND IMMEDIATELY.
- REMOVE FROM THE SITE AND LEGALLY DISPOSE OF ALL DEBRIS AND EXCAVATED MATERIAL NOT REQUIRED FOR FILL. NO RUBBISH OR DEBRIS SHALL BE BURIED ON THE SITE.
- MAINTAIN ALL ROADWAYS AND PAVED PATHWAYS CLEAN AND FREE OF CONSTRUCTION MATERIALS AND DEBRIS, PROVIDING NECESSARY DUST CONTROL WHERE REQUIRED.
- COORDINATE AND SCHEDULE ALL WORK WITH THE OWNER'S REPRESENTATIVE.
- INSTALL EROSION CONTROL SYSTEMS IN ACCORDANCE WITH CITY OF TUALATIN STANDARDS PRIOR TO SITE WORK AND LANDSCAPE INSTALLATION.
- CONTRACTOR SHALL PROVIDE TOPSOIL, SOIL AMENDMENTS, AND EROSION CONTROL.
- CONTRACTOR SHALL SUBMIT CERTIFIED TOPSOIL ANALYSIS REPORT FOR OWNER'S APPROVAL PRIOR TO PLANT INSTALLATION.
- CONTRACTOR IS RESPONSIBLE FOR ANY AMENDMENTS TO SOIL PH FERTILITY AND/OR DRAINAGE CONDITIONS NECESSARY TO ENSURE PROPER GROWING CONDITIONS FOR PROPOSED PLANTINGS.
- CONTRACTOR SHALL FOLLOW PROVIDER'S INSTRUCTIONS AND RECOMMENDATIONS FOR SEEDING.
- ALL PLANTS SHALL BE INSTALLED ACCORDING TO AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1) AS WELL AS DETAIL DRAWINGS AND SPECIFICATIONS.
- ALL PLANTS SHALL BE IRRIGATED BY A FULLY AUTOMATED, PERMANENT IRRIGATION SYSTEM UNLESS OTHERWISE NOTED. CONTRACTOR SHALL MODIFY EXISTING IR SYSTEM TO ACCOMMODATE NEW PLANTINGS.
- CONTRACTOR SHALL RE-DESIGN THE IRRIGATION SYSTEM AND PROVIDE OWNER WITH SHOP DRAWINGS FOR APPROVAL. SEE SPECS.
- PRIOR TO FINAL ACCEPTANCE, CONTRACTOR SHALL PROVIDE OWNER WITH AS-BUILT PLANS OF THE INSTALLATION, COPIES OF ALL OPERATION MANUALS AND WARRANTY DOCUMENTS.
- ALL NEW PLANTS IN LANDSCAPE AREAS SHALL BE WARRANTED FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

PLANT SCHEDULE

TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	
	FP	2	FRAXINUS PENNSYLVANICA 'PATMORE' WELL BRANCHED AND LIMBED TO 8'-0"	PATMORE' ASH	1.5" CAL.	
	FS	1	FRAXINUS PENNSYLVANICA 'SUMMIT' WELL BRANCHED AND LIMBED TO 8'-0"	SUMMIT ASH	1.5" CAL.	
	GI	3	GLEDITSIA TRIACANTHOS INERMIS 'TRUESHADE' WELL BRANCHED AND LIMBED TO 8'-0"	THORNLESS HONEY LOCUST	1.5" CAL.	
SHRUBS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	
	IS	31	ILEX GLABRA 'SHAMROCK' MAINTAIN HEIGHT AT 30"	INKBERRY	1 GAL.	
GROUND COVERS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
	FL	417	FRAGARIA CHILOENSIS 'LIPSTICK'	BEACH STRAWBERRY	4" POT	24" o.c.

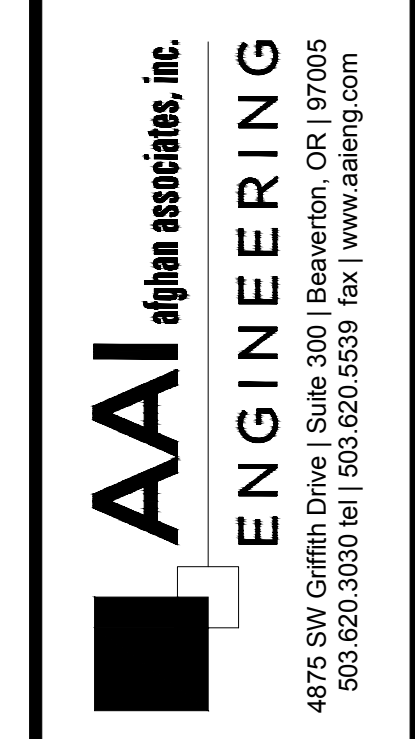


- EXISTING VEGETATION IN SWALE TO REMAIN, DO NOT DISTURB SWALE.
- VEGETATIVE CORRIDOR = 1,428 SF
- TREES REQUIRED = 14
- SHRUBS REQUIRED = 72
- PLANT THE FOLLOWING PLANTS & QUANTITIES AS PER DETAIL 11/L2.0
- TREES - 2 GAL QTY. = 7
- ACER CIRCINATUM / VINE MAPLE = 7
- RHAMNUS PURSHIANA/ CASCARA = 7
- SHRUBS - 1 GAL QTY. = 12
- CORNUS SERICEA / RED-OSIER DOGWOOD = 12
- PYSOCARPUS CAPITATUS / NINEBARK = 12
- HOLODISCUS DISCOLOR / OCEANSPRAY = 12
- SPIRAEA DOUGLASII / DOUGLAS SPIRAEA = 12
- SYMPHORICARPUS ALBUS / SNOWBERRY = 12
- ROSA PISOCARPA / CLUSTERED ROSE = 12



1 VEGETATIVE CORRIDOR PLANTING PLAN

SCALE: 1:10



5895 SW 72ND AVE SUITE 200
PORTLAND, OREGON 97224
TEL: 503.226.1285
FAX: 503.226.1670
WWW.CIDAINC.COM

API INTERNATIONAL
12505 SW HERMAN ROAD
TUALATIN OREGON

DATE: 04/16/18
DRAWN: TKL
CHECKED: TKL

REVISIONS:
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SHEET
LANDSCAPE
PLAN
L1.1

JOB NUMBER:
A17116.20

Attachment 2

TREE NO.	COMMON NAME	SCIENTIFIC NAME	DBH ¹	CONDITION ²	STRUCTURE ²	COMMENTS	TREATMENT
1	Douglas-fir	<i>Pseudotsuga menziesii</i>	29	good	fair	moderately one sided	remove
2	Douglas-fir	<i>Pseudotsuga menziesii</i>	29	good	fair	moderately one sided	remove
3	Douglas-fir	<i>Pseudotsuga menziesii</i>	29	fair	fair	moderately one sided	remove
4	red maple	<i>Acer rubrum</i>	18	good	fair	one sided	remove
5	red maple	<i>Acer rubrum</i>	17	fair	fair	multiple leaders	remove
6	flowering cherry	<i>Prunus serrulata</i>	24	good	good	29' crown radius	retain
7	red maple	<i>Acer rubrum</i>	23	good	fair	multiple leaders, 24' crown radius	retain
8	red maple	<i>Acer rubrum</i>	24	good	fair	multiple leaders, 38' crown radius	retain
9	red maple	<i>Acer rubrum</i>	21	good	fair	multiple leaders, 32' crown radius	retain
10	red maple	<i>Acer rubrum</i>	23	good	fair	multiple leaders, 31' crown radius	retain
11	red maple	<i>Acer rubrum</i>	23	good	fair	multiple leaders, 32' crown radius	retain
12	red maple	<i>Acer rubrum</i>	20	good	fair	multiple leaders, 23' crown radius	retain
13	red maple	<i>Acer rubrum</i>	23	good	fair	multiple leaders, 29' crown radius	retain
14	red maple	<i>Acer rubrum</i>	14	poor	fair	multiple leaders, thin crown with dieback	remove
15	red oak	<i>Quercus rubra</i>	26	good	fair	multiple leaders, 37' crown radius	remove
16	red oak	<i>Quercus rubra</i>	18	fair	fair	multiple leaders, moderately thin crown, 28' crown radius	retain
17	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	14	good	fair	multiple leaders, 21' crown radius	retain
18	sweetgum	<i>Liquidambar styraciflua</i>	13	good	fair	codominant at 8', 14' crown radius	retain
19	sweetgum	<i>Liquidambar styraciflua</i>	13	good	fair	multiple leaders, 20' crown radius, added to site plan in approximate location by arborist	retain
20	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	10	good	fair	multiple leaders, 13' crown radius, crown pruned high, added to site plan in approximate location by arborist	retain
21	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	11	good	fair	multiple leaders, 14' crown radius, crown pruned high, added to site plan in approximate location by arborist	retain
22	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	9	good	fair	multiple leaders, 12' crown radius, added to site plan in approximate location by arborist	retain

Attachment 2

TREE NO.	COMMON NAME	SCIENTIFIC NAME	DBH ¹	CONDITION ²	STRUCTURE ²	COMMENTS	TREATMENT
23	sweetgum	<i>Liquidambar styraciflua</i>	9	good	fair	multiple leaders, 10' crown radius, added to site plan in approximate location by arborist	retain
24	sweetgum	<i>Liquidambar styraciflua</i>	11	good	fair	multiple leaders, 15' crown radius, added to site plan in approximate location by arborist	retain
25	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	16	good	poor	multiple leaders, 13' crown radius, codominant stem at 4' with included bark and crack, added to site plan in approximate location by arborist	retain
26	sweetgum	<i>Liquidambar styraciflua</i>	10	good	fair	multiple leaders, 13' crown radius, added to site plan in approximate location by arborist	retain
27	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	9	good	fair	multiple leaders, 12' crown radius, added to site plan in approximate location by arborist	retain
28	sweetgum	<i>Liquidambar styraciflua</i>	10	good	fair	multiple leaders, 11' crown radius, added to site plan in approximate location by arborist	retain
29	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	7	fair	fair	multiple leaders, 7' crown radius, added to site plan in approximate location by arborist	retain
30	sweetgum	<i>Liquidambar styraciflua</i>	11	fair	fair	multiple leaders, 13' crown radius, undersized leaves, added to site plan in approximate location by arborist	retain
31	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	9	good	fair	multiple leaders, 11' crown radius, added to site plan in approximate location by arborist	retain
32	sweetgum	<i>Liquidambar styraciflua</i>	14	good	fair	multiple leaders, 10' crown radius, added to site plan in approximate location by arborist	retain
33	Raywood ash	<i>Fraxinus oxycarpa</i> 'Raywood'	8	fair	fair	multiple leaders, 6' crown radius, scars on lower trunk, moderately thin crown, added to site plan in approximate location by arborist	retain

Attachment 2

TREE NO.	COMMON NAME	SCIENTIFIC NAME	DBH ¹	CONDITION ²	STRUCTURE ²	COMMENTS	TREATMENT
34	red oak	<i>Quercus rubra</i>	22	poor	poor	multiple leaders, significant dieback and epicormic growth	retain
35	Douglas-fir	<i>Pseudotsuga menziesii</i>	28	good	good		retain
36	red oak	<i>Quercus rubra</i>	27	good	fair	side pruned for overhead utilities	retain
37	Douglas-fir	<i>Pseudotsuga menziesii</i>	32	good	fair	side pruned for overhead utilities	retain
38	red oak	<i>Quercus rubra</i>	27	good	fair	multiple leaders, side pruned for overhead utilities	retain
39	red oak	<i>Quercus rubra</i>	25	good	fair	multiple leaders, side pruned for overhead utilities	retain
40	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	good	fair	side pruned for overhead utilities	retain
41	Douglas-fir	<i>Pseudotsuga menziesii</i>	28	good	fair	side pruned for overhead utilities	retain
42	red oak	<i>Quercus rubra</i>	21	good	fair	multiple leaders, side pruned for overhead utilities	retain
43	Douglas-fir	<i>Pseudotsuga menziesii</i>	20	good	fair	side pruned for overhead utilities	retain
44	Douglas-fir	<i>Pseudotsuga menziesii</i>	23	good	fair	codominant at 25', moderately one sided	retain
45	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	good	fair	side pruned for overhead utilities	retain
46	Douglas-fir	<i>Pseudotsuga menziesii</i>	28	good	fair	side pruned for overhead utilities	retain
47	Douglas-fir	<i>Pseudotsuga menziesii</i>	25	good	fair	side pruned for overhead utilities	retain
48	red oak	<i>Quercus rubra</i>	24	good	fair	multiple leaders	retain
49	red oak	<i>Quercus rubra</i>	16	good	fair	multiple leaders	retain
50	Scots pine	<i>Pinus sylvestris</i>	14	fair	fair	multiple leaders, moderately one sided	retain
51	Scots pine	<i>Pinus sylvestris</i>	11	fair	fair	multiple leaders, moderately one sided	retain
52	Scots pine	<i>Pinus sylvestris</i>	11	fair	fair	multiple leaders, moderately one sided	retain
53	Scots pine	<i>Pinus sylvestris</i>	14	fair	fair	multiple leaders, moderately one sided	retain
54	Scots pine	<i>Pinus sylvestris</i>	9	fair	fair	multiple leaders, moderately one sided	retain
55	Scots pine	<i>Pinus sylvestris</i>	17	fair	fair	multiple leaders, moderately one sided	retain
56	Scots pine	<i>Pinus sylvestris</i>	12	fair	poor	multiple leaders, moderately one sided, lost top	retain

Attachment 3

Tree Protection Recommendations

The following recommendations will help to ensure that the trees to be retained are adequately protected:

Before Construction Begins

1. Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection.
 - a. Hold a tree protection meeting with all contractors to explain the goals of tree protection.
 - b. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Method as outlined in the current edition of the *Guide for Plant Appraisal* by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.
2. Fencing
 - a. Trees to remain on site will be protected by installation of tree protection fencing as shown in Attachment 1.
 - b. The fencing should be put in place before the ground is cleared in order to protect the trees and the soil around the trees from disturbances.
 - c. Fencing should be established by the project arborist based on the needs of the trees to be protected and to facilitate construction.
 - d. Fencing should consist of 6-foot high steel fencing on concrete blocks or 6-foot metal fencing secured to the ground with 8-foot metal posts to prevent it from being moved by contractors, sagging, or falling down.
 - e. Fencing should remain in the position that is established by the project arborist and not be moved without approval from the project arborist until final project approval.
3. Signage
 - a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

TREE PROTECTION ZONE

DO NOT REMOVE OR ADJUST THE LOCATION OF THIS
TREE PROTECTION FENCING
UNAUTHORIZED ENCROACHMENT MAY RESULT IN FINES

Please contact the project arborist if alterations to the location of the tree protection fencing are necessary.

Todd Prager, Project Arborist, Teragan & Associates, 971-295-4835

- b. Signage should be placed every 75-feet or less.

During Construction

1. Protection Guidelines Within the Tree Protection Zones:
 - a. No new buildings; grade change or cut and fill, during or after construction; new impervious surfaces; or utility or drainage field placement should be allowed within the tree protection zones.
 - b. No traffic should be allowed within the tree protection zones. This includes but is not limited to vehicle, heavy equipment, or even repeated foot traffic.
 - c. No storage of materials including but not limiting to soil, construction material, or waste from the site should be permitted within the tree protection zones. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
 - d. Construction trailers should not to be parked/placed within the tree protection zones.
 - e. No vehicles should be allowed to park within the tree protection zones.
 - f. No other activities should be allowed that will cause soil compaction within the tree protection zones.
2. The trees should be protected from any cutting, skinning or breaking of branches, trunks or woody roots.
3. The project arborist should be notified prior to the cutting of woody roots from trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out.
4. Trees that have woody roots cut should be provided supplemental water during the summer months.
5. Any necessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
6. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

After Construction

1. Carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones.
2. Carefully plant new plants within the tree protection zones. Avoid cutting the woody roots of trees that are retained.
3. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist.
4. Provide adequate drainage within the tree protection zones and do not alter soil hydrology significantly from existing conditions for the trees to be retained.
5. Provide for the ongoing inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants.
6. The retained trees may need to be fertilized if recommended by the project arborist.
7. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

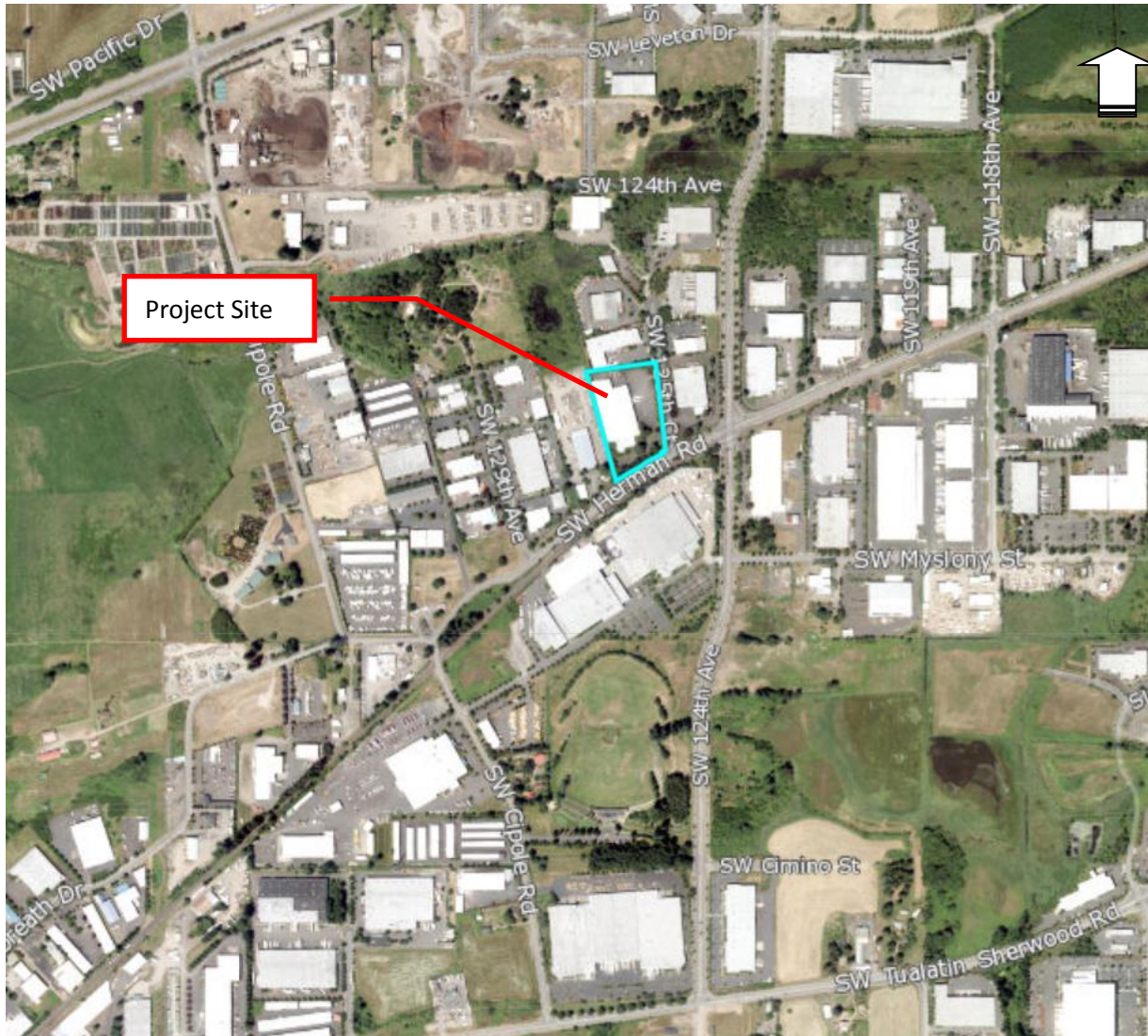
Attachment 4

Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. The site plans and construction information provided by Pacific NW Properties and their consultants was the basis of the information provided in this report.
2. It is assumed that this property is not in violation of any codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultant's role is only to make recommendations. Inaction on the part of those receiving the report is not the responsibility of the consultant.
7. The purpose of this report is to:
 - Provide tree removal findings and recommendations based on the proposed site plan; and
 - Provide recommendations for adequately protecting the trees to be retained during construction.

API Expansion – SW 125thCt. /SW Herman Rd.

Traffic/Access Study



Prepared for: Cyrus Behbahany
Behbahany Properties, LLC

Project Site: 12505 SW Herman Rd.
Tualatin, OR, 97062

Prepared by **SABA, C.E.S.**
5640 SW Murray Blvd. #20
Beaverton, OR 97005



EXP: June 2018

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Executive Summary

This traffic study is presented as part of the development application referred to as API Expansion at SW 125th Ct. and SW Herman Road in Tualatin, Oregon. The parcel (Tax ID No. 2S121DD00100) is approximately 4.83 acre in area and zoned as Industrial/Light Industrial (MG-General Manufacturing).

The proposed site plan will add up to 34,240 Square Feet of additional warehouse that will replace the existing under-utilized paved surface, on the east side of the parcel along SW 125th Avenue and adjacent to the existing 60,060 Square Feet warehouse (Herman Road Business Center).

This analysis will examine the traffic impacts of the proposed addition of about warehouse on the nearby study intersection of SW 125th Avenue and SW Herman Road.

Based on discussions with City of Tualatin staff and directions provided, the traffic analysis will address Trip Generation based on the worst-case scenario (Light Industrial) land use (ITE Code 110), and the traffic impacts at the intersection of SW 125th Avenue and SW Herman Road as well as site access driveways along SW 125th Avenue.

Existing Traffic Conditions

- The existing study intersection located at SW 125th Ct. and SW Herman Road operate at levels which meet 95% Queuing analysis, Volume to Capacity and Level of Service standards supported by City of Tualatin during both weekdays AM and PM peak hours.
- Based on the proposed addition, size, land use and placement of the proposed warehouse development no other intersections fall within the impact area of this development.
- No existing safety concerns were identified. In addition, all lane configurations, signing and striping, sight distance and traffic control devices are considered adequate and meet or exceed City's transportation standards.

Year 2018 Background Traffic Conditions

- The City of Tualatin has no proposed transportation system improvements within the impact area of the proposed development in the near future.
- Year 2018 background traffic conditions were evaluated. No in-process developments were identified by city staff.
- AM and PM peak turning movement counts were collected at the study intersection and site driveways which are used as the base count location for existing and future traffic impact analysis. (see Appendix B)

Proposed Development

- The proposed site plan will add up to 34,240 Square Feet of additional warehouse that currently is an under-utilized parking lot, on the east side of the parcel along SW 125th Ct. and adjacent to the existing warehouse on the west side of the site known as Herman Road Business Center.

Conclusions and Recommendations

Based on the findings of the transportation impact analysis documented in this report, the proposed warehouse expansion can be developed while maintaining acceptable levels of operation and safety on the adjacent roadway network, site accesses and the intersection of SW 125th Ct. and SW Herman Road.

- Up to 34,240 Square Feet of warehouse (Light Industrial) building will be added to the existing under-utilized paved surface on the east side of the existing building.
- Both existing driveways will remain in place and will be stop controlled.
- The intersection of SW 125th and SW Herman will remain stop controlled and a Stop Bar should be added aligned with the existing Stop sign to better define the stopping position for southbound traffic
- All landscaping along the site frontages of SW 125thCt. should be maintained to ensure adequate sight distance at both driveways accessing the site.

Vicinity Map

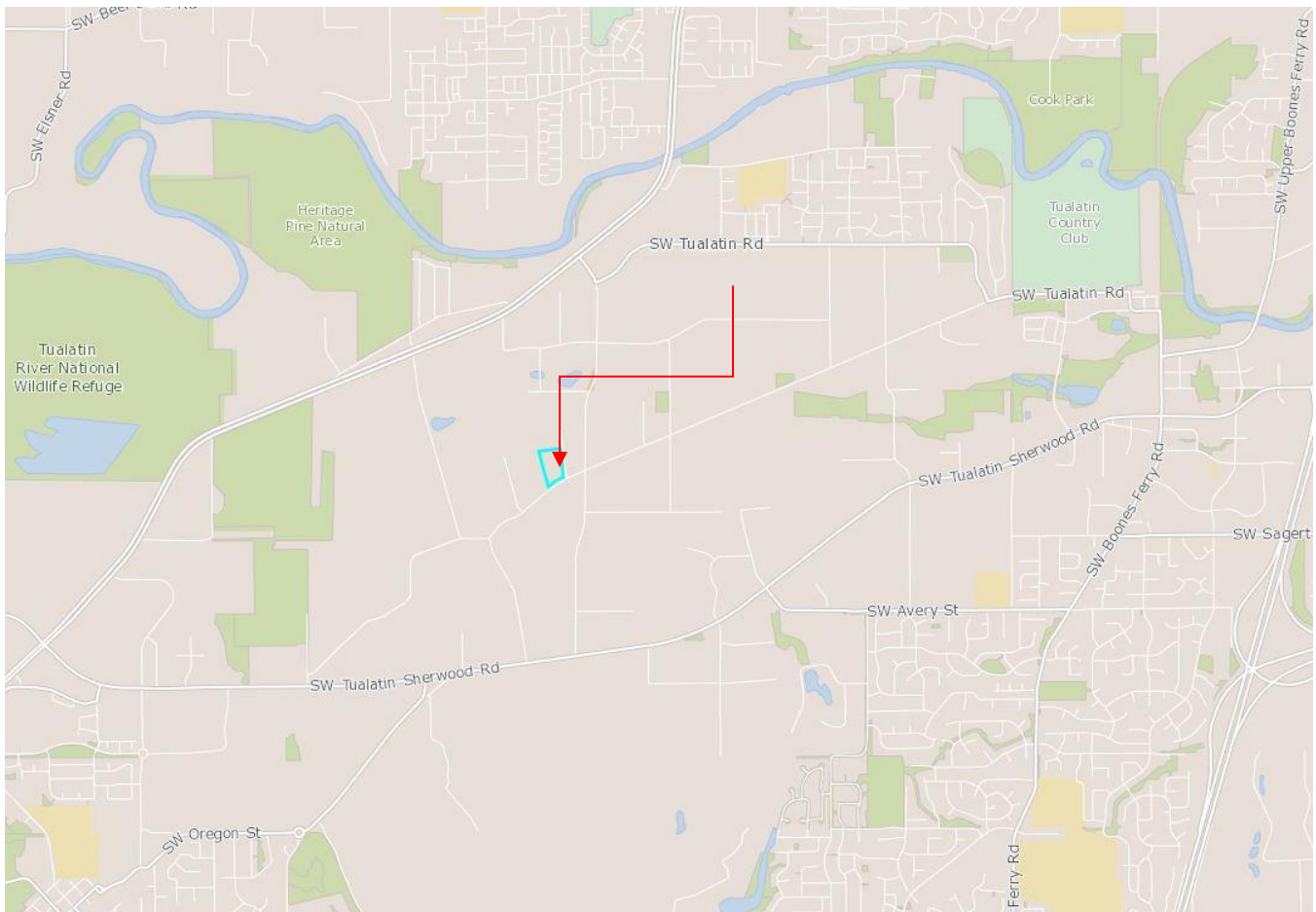


Figure 1- Vicinity Map

Introduction

The applicant plans to add an approximate 32,700 to 34,200 square feet of Light Industrial Warehouse on an existing site that is zoned appropriately for the intended use located on the northwest corner of SW 125th Ct. and SW Herman Road in the City of Tualatin (See Figure 2 Site Plan). The parcel is about 4.83 acres and is zoned MG (General Manufacturing) according to City of Tualatin's zoning map.

For the purposes of this traffic assessment, the worst-case scenario has been used to estimate the total future additional trips generated from this expansion.

Site Plan



Figure 2 – Site Plan

The site vicinity map (Figure 1) and the proposed site plan (Figure 2) illustrate the location of the proposed development as well as the access to SW 125th Ct. and SW Herman Road.

The purpose of this study is to assess the traffic impacts of the proposed development on the nearby street intersection and site accesses. The analysis will include level of service calculations and a queuing analysis. Detailed information on traffic counts, trip generation calculations, and level of service calculations is included in the appendices at the end of this report.

Location Description

The site (zoned MG – General Manufacturing) is located on the northwest corner of the SW 125th Ct. SW Herman Road intersection in the City of Tualatin. The existing site has an existing warehouse building (60,060 Square Feet) with two separate driveways that provide access to SW 125th Ct.

The site has about 530 feet of frontage along the west side of SW 125th Ct. with two existing driveways about 110 and 410 feet north of SW Herman Road. There are no access driveways along the approximate 335 feet of frontage of SW Herman Road. SW Herman Road curves southwesterly to the west. The fully improved signalized intersection of SW Herman Road and SW 124th Avenue is about 350 feet east of SW 125th Ct.

City of Tualatin Engineering Division staff requested a study of the existing stop controlled T-intersection of SW 125th Ct. and SW Herman Road as well as operational analysis of the existing driveways. SW 125th Ct. and SW Herman Road are both paved, built to City standards with sidewalks, curb and gutter

Site Access

Both site accesses will remain at existing locations as described above. Site accesses and proposed improvements are shown in Figure 2.

All intersections within the impact area of the development will be Stop controlled.

Existing Conditions

New AM and PM peak period traffic counts were obtained on Thursday April 5th, 2018 and results are used to assess the full impact of the proposed development on the existing roadway network serving the site. Figure 4 shows the summary of the results and Appendix B show the actual counts.

Site Trip Generation

Estimated average weekday and weekday AM and PM peak hour vehicle trips for the proposed site development are shown in Table 1 which was prepared using the standard reference Trip Generation, 10th Edition, published by the Institute of Transportation Engineers.

Land Use Type	ITE Code	Per 1000 S.F.	Trip Generation				Daily
			AM Peak		PM Peak		
			In	Out	In	Out	
Light Industrial	110	34	28	4	4	29	237

Table 1- Trip Generation

Trip Distribution and Existing Lane Configuration

The distribution of site generated trips and direction of anticipated trips are based on the current travel patterns and existing arterial traffic flow in the area as well as METRO regional travel patterns.

Estimated trip distribution is illustrated in Figure 3 which is then used as the basis for assigning trips in and out of the site during AM and PM peak periods. Based on intersection, field observation and existing land use in the area and vicinity 50% of the trips generated from the site are expected to travel east on SW Herman Road toward I-5 and 50% travel west on SW Herman Road toward 99W.



Figure 3 –Trip Distribution & Existing Lane Configuration

Figure 4 – Existing Volumes – AM(PM)

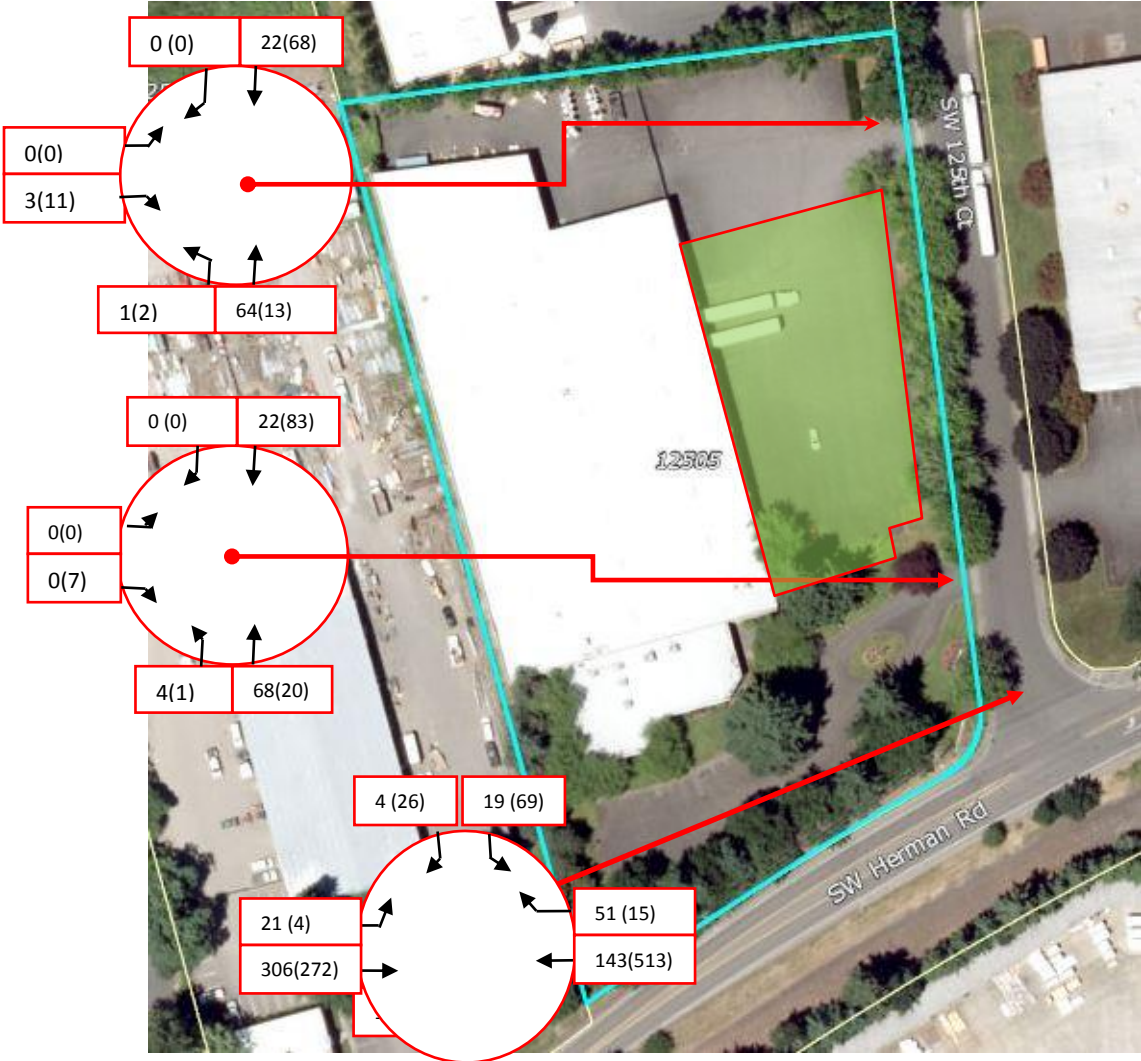
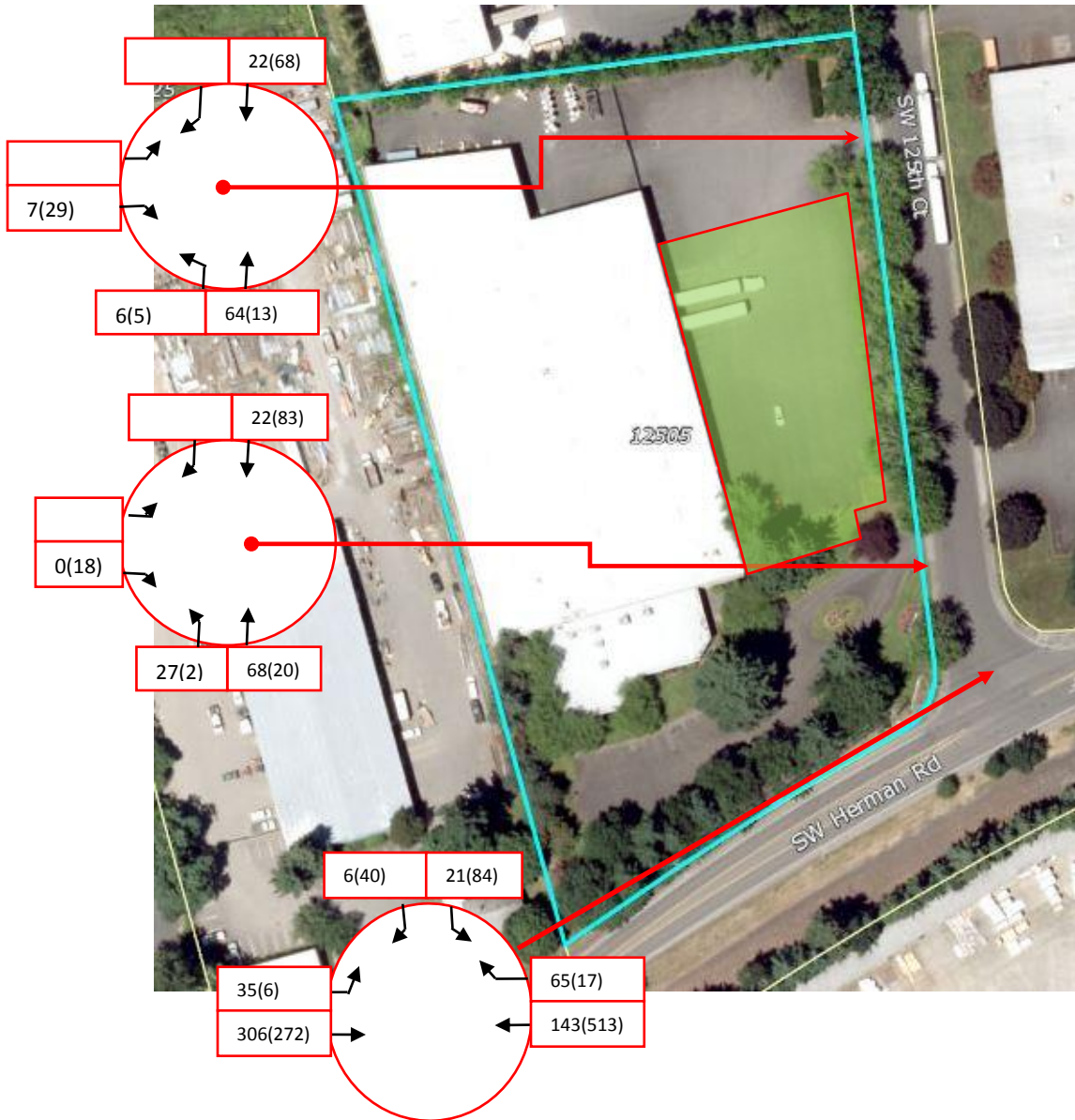


Figure 5 – Site Generated AM(PM)



Figure 6 - Existing Plus Site



Traffic Analysis

The traffic analysis is prepared considering the existing traffic conditions, proposed development and the total future occupancy for the entire site for driveway access points as well as the SW 125th Ct and SW Herman Road using Synchro 10 software.

Traffic Volumes

The year 2018 background traffic volumes for the weekday AM and PM peak hours are shown in Figure 4. The site generated respective peak periods traffic (Figure 5) were then added to the existing/background traffic to obtain the total anticipated traffic entering/exiting the study intersection and site (Figure 6).

A Level of Service analysis was done for the intersection of SW 125th Ct. and SW Herman Road and site's accesses. The results of the analysis are summarized in Table 2 and the worksheets are contained in Appendix C and D.

The SW 125th Ct. and SW Herman Road intersection reviewed does not meet left turn warrants for a dedicated left turn lane under present and present plus site scenarios.

Vehicle Queuing Analysis

Similarly, an analysis of vehicle queuing determined that adequate lane storage will be available on and off site for the forecasted AM and PM peak periods as part of the completion of the proposed development.

Capacity Analysis

To determine the level of service at the study intersections, a capacity analysis was conducted. The analysis was conducted according to the unsignalized intersection analysis methodologies in the 2000 *HIGHWAY CAPACITY MANUAL* (HCM) published by the Transportation Research Board. Level of service can range from A, which indicates little or no delay, to F, which indicates a significant amount of congestion and delay. Detailed level of service descriptions are included in the appendix to this report. The intersection of SW 125th Ct. and SW Herman Road currently operates with a Level of Service of A in the AM Peak and PM Peak hours.

As shown in Table 2, both study intersections currently operate acceptably during both peak hours and will continue to operate acceptably with the proposed development. No mitigations at the intersections are necessary or recommended with the development of this site.

Table 2 – Level of Service and Approach Delay

INTERSECTION UNSIGNALIZED	LOS 2018 – Existing Overall/Approach		LOS Existing + Site Overall/Approach	
	AM	PM	AM	PM
	<i>Control Delay/Approach Delay (Sec)</i>			
	<i>95% Queue Length (Veh) Overall/Approach</i>			
	<i>V/C</i>			
SW 125th Ct.& SW Herman Rd.	A/B	A/C	A/B	A/C
	<i>7.7/12.7</i>	<i>8.6/19.2</i>	<i>7.8/12.5</i>	<i>8.7/21.3</i>
	<i>0.05/0.15</i>	<i>0.01/1.21</i>	<i>0.09/0.17</i>	<i>0.02/1.80</i>
	<i>0.02/0.05</i>	<i>--/0.29</i>	<i>0.03/0.05</i>	<i>0.01/0.38</i>
SW 125 th and North Access (*)	A	A	A	A
SW 125 th and South Access (*)	A	A	A	A

(*) – Control Delay, 95% Queue, v/c for driveways deemed unnecessary.

Safety Analysis

Sight Distance

Sight distance evaluation and assessment were made at the existing driveways as well as the intersection of SW 125th Ct and SW Herman Road. The posted speed along SW 125th Ct. is 25 mph, and along SW Herman Road is 45 mph. Operating speed of both roadways were observed to be very close to the posted speed during site visits in April 2018.

The intersection and driveway sight distances were measured based on an eye height of 3.5 feet and an object height of 3.5 feet above the road; and assumed to be 10 feet from the near edge of pavement to the front of a stopped vehicle, (actual measurement is taken 15 feet from pavement edge).

Available sight distance exceeds the minimum requirement, and there is little or no concern about intersection sight distance in either direction. The applicant, however, must maintain the maximum attainable sight distance by trimming lower tree limbs, and avoid adding any structures, sign monuments and/or vegetation.

Table 3 – Site Access Sight Distance

Intersection	Sight Distance in Feet	
	North	South
North Access at SW 125 th Ct.	270 (*)	410
South Access at SW 125 th Ct.	300 +	110 (**)
	East	West
SW 125 th Ct. at SW Herman Road	400 +	600 +

(*) – With no cars parked or overgrown vegetation

(**) - Looking to Herman Road intersection (maximum distance)

Crash History

Five-year reported crash data was obtained and reviewed for the intersection of SW 125th Ct. and SW Herman Road using ODOT Crash Analysis and Reporting Unit records. One reported crash (Passenger car making a left turn from SW 125th Ct. to southbound to eastbound failed to yield the right of way to an eastbound passenger car in 2015). No other crashes were reported at this intersection or along SW 125th Ct.

Based on the character and geometry and level topography of the area, no sight obstruction or other physical restrictions were observed in the area.

Low speeds, low volumes along with good line of sight provides for excellent traffic operation at both driveways and the study intersection. Trucks are permitted to park only on the east side of SW 125th Ct. No line of sight obstruction is anticipated at the driveways which are located on the west side of the street. No adverse conditions were observed or identified at this intersection and/or access driveways and nearby streets.

Access Spacing

The south driveway is located on the west side of SW 125th Ct., approximately 110 feet north of SW Herman Road. There is an offset driveway on the east side of the SW 125th Ct. approximately 45 feet (center to center) to the north.

The north driveway is also located on the west side of the SW 125th Ct. approximately 430 feet north of SW Herman Road. There is an offset driveway on the east side of the SW 125th Ct. approximately 80 feet (center to center) to the north as well.

Low volumes and good line of sight provides for safe and efficient of both driveways.

The queue length from southbound traffic on SW 125th Ct. extended to the south driveway only once for a few seconds. No other adverse operation conditions were observed nor anticipated.

Site Circulation

The proposed site development will provide adequate safe and efficient site circulation accommodating pedestrian, vehicular traffic including passenger cars and trucks in and out of the site with sufficient turning movements, line of site and driveway widths.

As it is laid out now and in the future, all trucks must use the north driveway to load/unload at the existing and proposed warehouses.

Field observation revealed that the majority of employees use the south parking lot and driveway to arrive and leave. It is anticipated that this pattern of use to continue for both north and south parking lots.

Parking

With reconfiguration of the north and south parking lots, there will be at least a total of 69 parking spaces (32 spaces north parking lot, 37 spaces south parking lot including adequate number of designated accessible parking spaces). In addition, there will be a minimum of 7 additional truck loading/unloading docks on the north parking lot.

Pedestrian Safety

There are built to standards sidewalks on both sides of SW 125th Ct. along the primary frontage of the site. There is a standard sidewalk on the north side of Herman Road extending from SW 125th Ct. to SW 124th Avenue.

Transit

There is no transit service available in the area.

Conclusions and Recommendations

Based on the findings of the transportation impact analysis documented in this report, the proposed API Expansion can be developed while maintaining acceptable levels of operation and safety along the frontage, adjacent study intersection and on the surrounding transportation system. The following recommendations are made:

- Establish stop controls at private access driveways entering SW 125th Ct.
- Provide 20 feet NO PARKING on either side of the north driveway access.
- Provide 20 feet of No Parking on the north side of the south driveway, and restrict parking on south side of the south driveway up to SW Herman Road.
- Add a STOP BAR at the existing Stop sign at the intersection of SW 125th Ct and SW Herman Road.
- Maintain all landscaping along the site frontages of SW 125th Ct to ensure adequate sight distance at both driveways.

APPENDIX A –LEVEL OF SERVICE

The Highway Capacity Manual (HCM) defines LOS for signalized and unsignalized intersections as a function of the average vehicle control delay. LOS may be calculated per movement or per approach for any intersection configuration, but LOS for the intersection as a whole is only defined for signalized and all-way stop configurations.

When analyzing unsignalized intersections that are not all-way stop-controlled, each possible movement is considered individually.

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

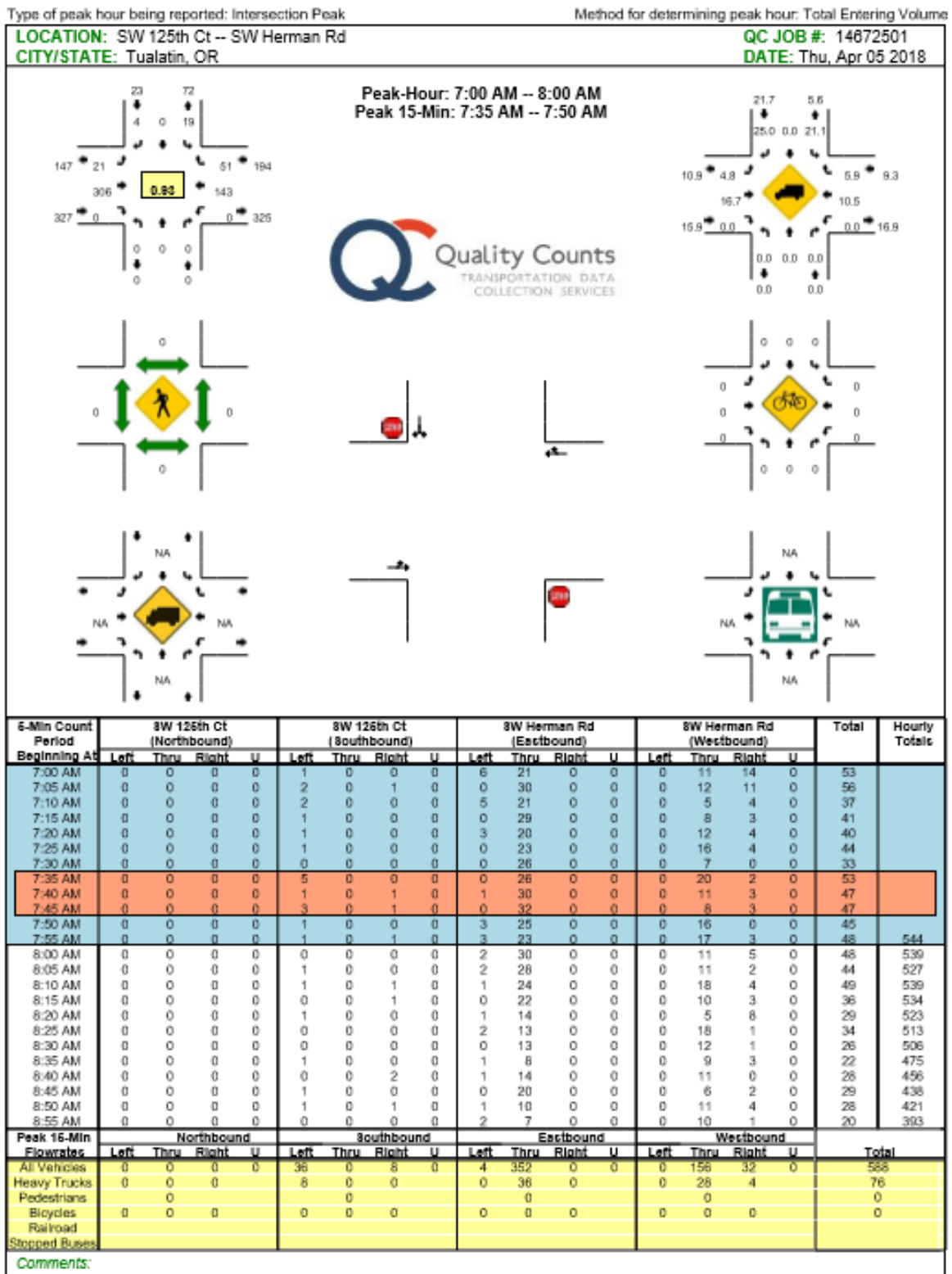
Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

**LEVEL OF SERVICE CRITERIA
FOR UNSIGNALIZED INTERSECTIONS**

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

APPENDIX B - TRAFFIC COUNTS

New AM and PM Peak Traffic counts were obtained on April 5th, 2018. Results of these counts were used to complete the traffic analysis.

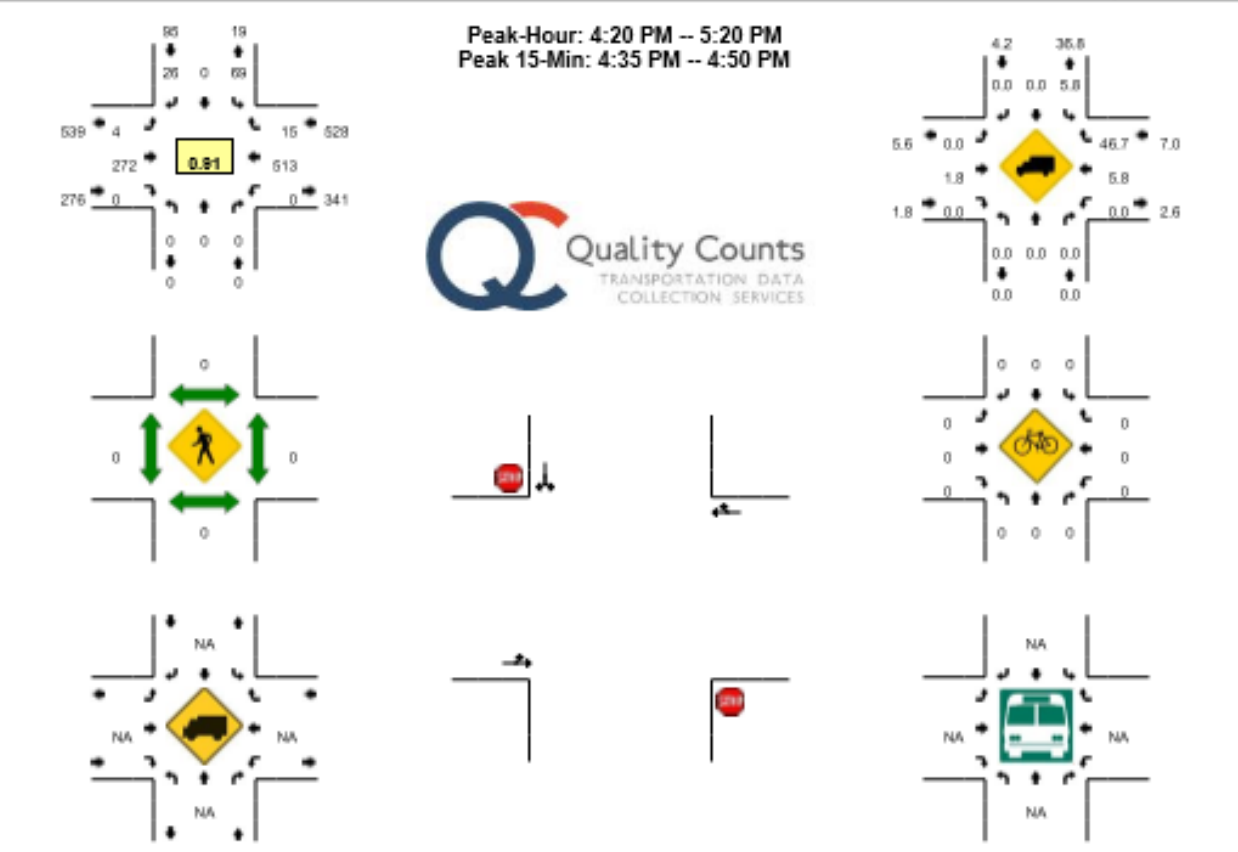


Report generated on 4/10/2018 10:15 AM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

LOCATION: SW 125th Ct -- SW Herman Rd
CITY/STATE: Tualatin, OR

QC JOB #: 14672502
DATE: Thu, Apr 05 2018



5-Min Count Period	SW 125th Ct (Northbound)				SW 125th Ct (Southbound)				SW Herman Rd (Eastbound)				SW Herman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	6	0	5	0	0	21	0	0	0	47	2	0	81	
4:05 PM	0	0	0	0	13	0	0	0	0	31	0	0	0	35	0	0	79	
4:10 PM	0	0	0	0	6	0	1	0	0	21	0	0	0	45	2	0	75	
4:15 PM	0	0	0	0	6	0	1	0	0	24	0	0	0	33	2	0	66	
4:20 PM	0	0	0	0	6	0	0	0	1	22	0	0	0	40	1	0	70	
4:25 PM	0	0	0	0	2	0	1	0	0	15	0	0	0	46	3	0	67	
4:30 PM	0	0	0	0	5	0	4	0	1	20	0	0	0	41	2	0	73	
4:35 PM	0	0	0	0	10	0	2	0	1	32	0	0	0	37	1	0	83	
4:40 PM	0	0	0	0	5	0	2	0	0	28	0	0	0	44	1	0	80	
4:45 PM	0	0	0	0	6	0	2	0	0	22	0	0	0	53	1	0	84	
4:50 PM	0	0	0	0	5	0	1	0	0	30	0	0	0	29	3	0	68	
4:55 PM	0	0	0	0	2	0	2	0	0	20	0	0	0	46	0	0	70	
5:00 PM	0	0	0	0	9	0	3	0	1	17	0	0	0	44	0	0	74	
5:05 PM	0	0	0	0	12	0	2	0	0	27	0	0	0	45	1	0	87	
5:10 PM	0	0	0	0	4	0	6	0	0	16	0	0	0	45	1	0	72	
5:15 PM	0	0	0	0	3	0	1	0	0	23	0	0	0	43	1	0	71	
5:20 PM	0	0	0	0	2	0	2	0	0	16	0	0	0	44	0	0	64	
5:25 PM	0	0	0	0	2	0	1	0	0	15	0	0	0	44	2	0	64	
5:30 PM	0	0	0	0	2	0	1	0	1	19	0	0	0	28	0	0	51	
5:35 PM	0	0	0	0	4	0	0	0	0	20	0	0	0	41	2	0	67	
5:40 PM	0	0	0	0	2	0	0	0	0	9	0	0	0	29	0	0	40	
5:45 PM	0	0	0	0	3	0	2	0	0	12	0	0	0	40	2	0	59	
5:50 PM	0	0	0	0	1	0	2	0	0	9	0	0	0	36	0	0	48	
5:55 PM	0	0	0	0	2	0	2	0	0	6	0	0	0	21	0	0	31	
Peak 15-Min	Northbound				Southbound				Eastbound				Westbound				Total	
Flowrates	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	84	0	24	0	4	328	0	0	0	536	12	0	968	
Heavy Trucks	0	0	0	0	4	0	0	0	0	4	0	0	0	12	8	0	28	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

APPENDIX C - TRAFFIC ANALYSIS

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	MGS			Intersection	SW Herman & SW 125th			
Agency/Co.	City of Tualatin Engineering			Jurisdiction	City of Tualatin			
Date Performed	May 2018			Analysis Year	2018			
Analysis Time Period	AM - Existing			Project ID				
East/West Street: SW Harmen Road				North/South Street: SW 125th Ave.				
Intersection Orientation: East-West				Study Period (hrs): 1.00				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	21	306	0	0	143	51		
Peak-Hour Factor, PHF	0.93	0.93	1.00	1.00	0.93	0.93		
Hourly Flow Rate, HFR	22	329	0	0	153	54		
Percent Heavy Vehicles	5	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT						TR	
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	19	0	4		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.93	1.00	0.93		
Hourly Flow Rate, HFR	0	0	0	20	0	4		
Percent Heavy Vehicles	0	0	0	21	0			
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	1	0		
Configuration							LTR	
Delay, Queue Length, and Level of Service								
Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (vph)	22						24	
C (m) (vph)	1346						494	
v/c	0.02						0.05	
95% queue length	0.05						0.15	
Control Delay	7.7						12.7	
LOS	A						B	
Approach Delay	--	--				12.7		
Approach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	MGS			Intersection	SW Herman & SW 125th			
Agency/Co.	City of Tualatin Engineering			Jurisdiction	City of Tualatin			
Date Performed	May 2018			Analysis Year	2018			
Analysis Time Period	PM - Existing			Project ID				
East/West Street: SW Harmen Road				North/South Street: SW 125th Ave.				
Intersection Orientation: East-West				Study Period (hrs): 1.00				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	4	272	0	0	513	15		
Peak-Hour Factor, PHF	0.91	0.91	1.00	1.00	0.91	0.91		
Hourly Flow Rate, HFR	4	298	0	0	563	16		
Percent Heavy Vehicles	0	-	-	0	-	-		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT						TR	
Upstream Signal	0			0				
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	69	0	26		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.91	1.00	0.91		
Hourly Flow Rate, HFR	0	0	0	75	0	28		
Percent Heavy Vehicles	0	0	0	0	0	6		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	1	0		
Configuration				LTR				
Delay, Queue Length, and Level of Service								
Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT					LTR		
v (vph)	4					103		
C (m) (vph)	1005					357		
v/c	0.00					0.29		
95% queue length	0.01					1.21		
Control Delay	8.6					19.2		
LOS	A					C		
Approach Delay	-					19.2		
Approach LOS	-					C		

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TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	MGS			Intersection	SW Herman & SW 125th			
Agency/Co.	City of Tualatin Engineering			Jurisdiction	City of Tualatin			
Date Performed	May 2018			Analysis Year	2018			
Analysis Time Period	AM - Existing Plus Site			Project ID				
East/West Street: SW Harmen Road				North/South Street: SW 125th Ave.				
Intersection Orientation: East-West				Study Period (hrs): 1.00				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	35	306	0	0	143	65		
Peak-Hour Factor, PHF	0.93	0.93	1.00	1.00	0.93	0.93		
Hourly Flow Rate, HFR	37	329	0	0	153	69		
Percent Heavy Vehicles	5	-	-	0	-	-		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	21	0	6		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.93	1.00	0.93		
Hourly Flow Rate, HFR	0	0	0	22	0	6		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	1	0		
Configuration					LTR			
Delay, Queue Length, and Level of Service								
Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (vph)	37						28	
C (m) (vph)	1329						511	
w/c	0.03						0.05	
95% queue length	0.09						0.17	
Control Delay	7.8						12.5	
LOS	A						B	
Approach Delay	-	-					12.5	
Approach LOS	-	-					B	

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TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	MGS			Intersection	SW Herman & SW 125th			
Agency/Co.	City of Tualatin Engineering			Jurisdiction	City of Tualatin			
Date Performed	May 2018			Analysis Year	2018			
Analysis Time Period				Project ID				
East/West Street: SW Harmen Road				North/South Street: SW 125th Ave.				
Intersection Orientation: East-West				Study Period (hrs): 1.00				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	6	272	0	0	513	17		
Peak-Hour Factor, PHF	0.91	0.91	1.00	1.00	0.91	0.91		
Hourly Flow Rate, HFR	6	298	0	0	563	18		
Percent Heavy Vehicles	5	-	-	0	-	-		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	84	0	40		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.91	1.00	0.91		
Hourly Flow Rate, HFR	0	0	0	92	0	43		
Percent Heavy Vehicles	0	0	0	6	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	1	0		
Configuration					LTR			
Delay, Queue Length, and Level of Service								
Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LTR	
v (vph)	6						135	
C (m) (vph)	978						356	
w/c	0.01						0.38	
95% queue length	0.02						1.80	
Control Delay	8.7						21.3	
LOS	A						C	
Approach Delay	--	--					21.3	
Approach LOS	--	--					C	

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MEMORANDUM

DATE: October 15, 2018
BY: Craig Harris, PE *CH*
SUBJECT: Flood Plain **Memo**
PROJECT: API Expansion - 12505 SW Herman Rd, Tualatin, OR
PROJECT NO.: A17116.11

This memorandum is to outline the Flood Plain as noted in a letter from the City of Tualatin dated August 30, 2018. Under Completeness Items: Engineering Criteria b. "Please discuss the flood plain onsite, that you are not affecting it, and that you will obtain a floodplain permit.". There are two distinct areas of the site that are noted as being with the elevation with "0.2% annual chance of flood hazard, areas of 1% annual chance of flooding with average depth less than a foot or with drainage areas of less than one square mile.". One of these areas is a man-made ditch that encroaches slightly on the most extreme northwest corner of the site. No work will be done within 100' of this ditch. The other is an enclosed depression bound to the west by the existing building and to the north, east and south by higher grades. This is a small enclosed depression (all grades surrounding it are well above the 500 year floodplain). It was graded with the original buildings construction to allow for 4' high truck delivery docks. This area will be under the proposed building addition. Since this depression is hydraulically isolated from the surrounding floodplain, and completely within our sites property, infilling this area to construct a building addition will have no effect on the surrounding properties or the storage volume of the larger drainage basin.

cc: File

EXHIBIT 'A'
4875 SW Griffith Drive | Suite 300 | Beaverton, OR | 97005

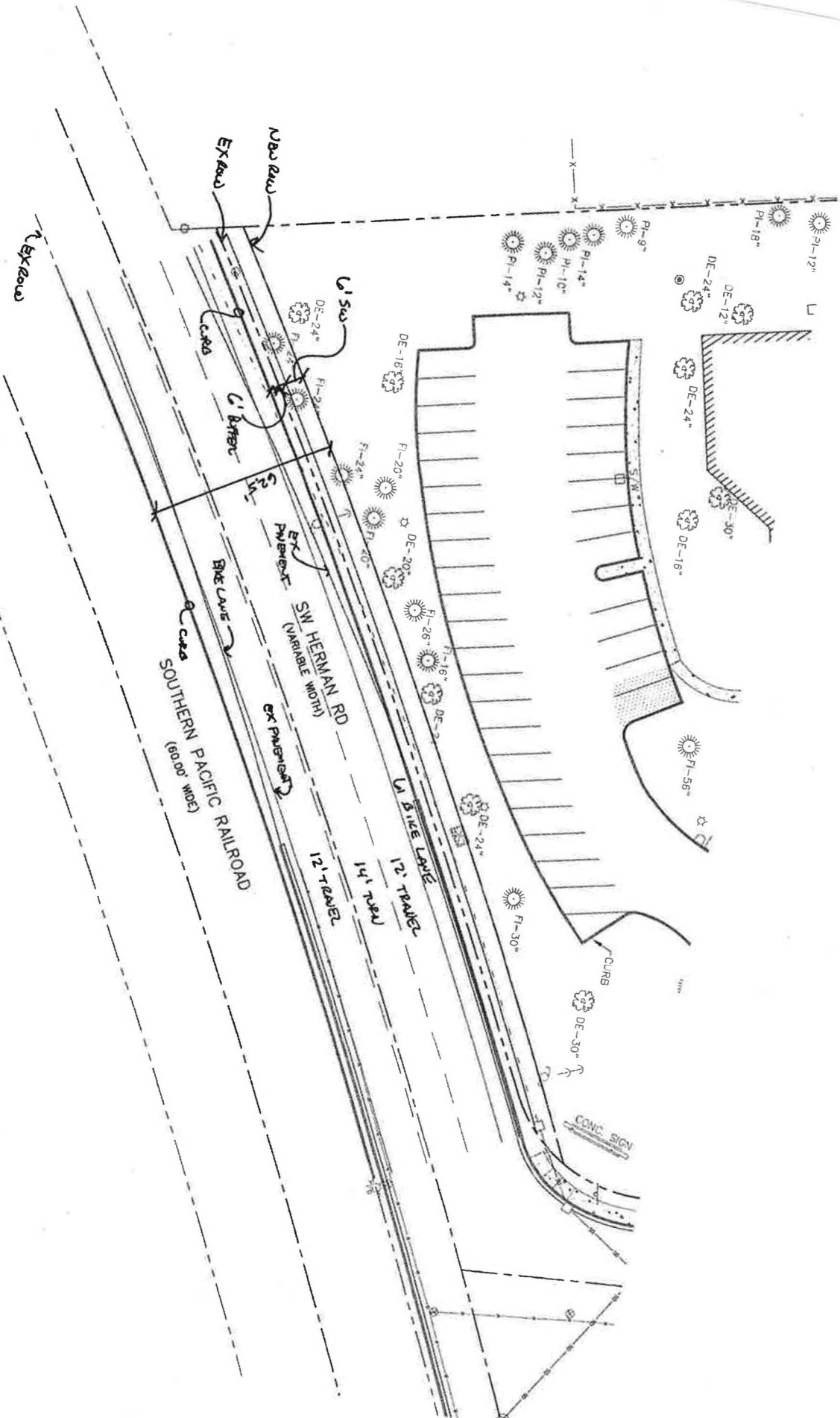


EXHIBIT 'B'
 SW HERMAN ROAD - R.O.W.
 1"=30'
 (11/10/72)

LETTER OF TRANSMITTAL

DATE: 10/24/18

PROJECT NAME: API EXPANSION

ATTENTION: TABITHA BOSCHETTI

TO: 18880 SW Martinazzi Ave
Tualatin, OR, 97062

ENCLOSED: Plans Copy of Letter
 Calculations Specifications
 Shop Drawings Other

NO. OF COPIES:	DESCRIPTION:
1	Title Report

For your approval For your review
 For your use As you requested

REMARKS: Title Report for API Expansion Project

COPY TO: File

SIGNED: Abdi Afghan

Delivered Via: Courier 90 min. 3 hr. Same day
 FedEx Priority Standard
 Mail
 To be picked up
 Delivered



121 SW Morrison St, Ste 500
(503)220-0015

OWNERSHIP AND ENCUMBRANCES REPORT WITH GENERAL INDEX LIENS
Informational Report of Ownership and Monetary and Non-Monetary Encumbrances

To ("Customer"): API International
12505 SW Herman Road
Tualatin, OR 97062

Customer Ref.: 12505 SW Herman Rd.
Order No.: 141800911T
Effective Date: October 18, 2018 at 08:00 AM
Charge:

The information contained in this report is furnished by Lawyers Title of Oregon, LLC (the "Company") as a real property information service based on the records and indices maintained by the Company for the county identified below. THIS IS NOT TITLE INSURANCE OR A PRELIMINARY TITLE REPORT FOR, OR COMMITMENT FOR, TITLE INSURANCE. No examination has been made of the title to the herein described property, other than as specifically set forth herein. Liability for any loss arising from errors and/or omissions is limited to the lesser of the charge or the actual loss, and the Company will have no greater liability by reason of this report. THIS REPORT IS SUBJECT TO THE LIMITATIONS OF LIABILITY STATED BELOW, WHICH LIMITATIONS OF LIABILITY ARE A PART OF THIS REPORT.

THIS REPORT INCLUDES MONETARY AND NON-MONETARY ENCUMBRANCES.

Part One - Ownership and Property Description

Owner. The apparent vested owner of property ("the Property") as of the Effective Date is:

Behbahany Properties, LLC, an Oregon limited liability company

Premises. The Property is:

(a) Street Address:

12505 SW Herman Road, Tualatin, OR 97062

(b) Legal Description:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

CITY OF TUALATIN
RECEIVED
OCT 24 2018
COMMUNITY DEVELOPMENT
PLANNING DIVISION

Part Two - Encumbrances

Encumbrances. As of the Effective Date, the Property appears subject to the following monetary and non-monetary encumbrances of record, not necessarily listed in order of priority, including liens specific to the subject property and general index liens (liens that are not property specific but affect any real property of the named person in the same county):

EXCEPTIONS

SPECIFIC ITEMS AND EXCEPTIONS:

1. Unpaid Property Taxes are as follows:
Fiscal Year: 2018-2019
Amount: \$65,700.69, plus interest, if any
Levy Code: 088.15
Account No.: R1422357
Map No.: 2S121DD-00100
2. City Liens, if any, in favor of the City of Tualatin.
3. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:
Granted to: Portland General Electric Company
Purpose: Underground distribution line
Recording Date: December 3, 1986
Recording No: 86056443
Affects: A 10 foot wide strip over Southerly portion of the subject property, as shown on map attached to said document
4. Covenants, conditions, restrictions and easements but omitting any covenants or restrictions, if any, including but not limited to those based upon race, color, religion, sex, sexual orientation, familial status, marital status, disability, handicap, national origin, ancestry, source of income, gender, gender identity, gender expression, medical condition or genetic information, as set forth in applicable state or federal laws, except to the extent that said covenant or restriction is permitted by applicable law, as set forth in the document
Recording Date: June 3, 1987
Recording No: 87028192
5. Liens and charges as set forth in the above mentioned declaration,
Payable to: Tigard Street Investment Co, a partnership
6. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:
Granted to: City of Tualatin
Purpose: Slope and public utility
Recording Date: May 8, 2002
Recording No: 2002-054173
Affects: Adjacent to SW Herman Road as described therein and as shown on map attached to said document
7. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:
Granted to: City of Tualatin
Purpose: Public utility
Recording Date: January 28, 2004
Recording No: 2004-008119
Affects: Southerly portion as described therein and as shown on map attached to said document

8. A deed of trust to secure an indebtedness in the amount shown below,
Amount: \$2,587,537.00
Dated: June 18, 2010
Trustor/Grantor: Behbahany Properties, LLC, an Oregon limited liability company
Trustee: Wells Fargo Financial National Bank
Beneficiary: Wells Fargo Bank, National Association
Loan No.: #0692699084 /20100615043
Recording Date: June 22, 2010
Recording No.: 2010-047209

An agreement to modify the terms and provisions of said deed of trust as therein provided
Executed by: Behbahany Properties, LLC, an Oregon limited liability company and Wells Fargo
Bank, National Association
Recording Date: January 16, 2015
Recording No: 2015-003313

9. Existing leases and tenancies, if any, and any interests that may appear upon examination of such leases.

Note: This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.

End of Reported Information

There will be additional charges for additional information or copies. For questions or additional requests, contact:

Tammera Bush
503-553-5677
Tammera.Bush@ltic.com

Lawyers Title of Oregon, LLC
121 SW Morrison St, Ste 500
Portland, OR 97204

EXHIBIT "A"
Legal Description

Lot 7, HERMAN ROAD BUSINESS CENTER, in the City of Tualatin, Washington County, Oregon.

LIMITATIONS OF LIABILITY

"CUSTOMER" REFERS TO THE RECIPIENT OF THIS REPORT.

CUSTOMER EXPRESSLY AGREES AND ACKNOWLEDGES THAT IT IS EXTREMELY DIFFICULT, IF NOT IMPOSSIBLE, TO DETERMINE THE EXTENT OF LOSS WHICH COULD ARISE FROM ERRORS OR OMISSIONS IN, OR THE COMPANY'S NEGLIGENCE IN PRODUCING, THE REQUESTED REPORT, HEREIN "THE REPORT." CUSTOMER RECOGNIZES THAT THE FEE CHARGED IS NOMINAL IN RELATION TO THE POTENTIAL LIABILITY WHICH COULD ARISE FROM SUCH ERRORS OR OMISSIONS OR NEGLIGENCE. THEREFORE, CUSTOMER UNDERSTANDS THAT THE COMPANY IS NOT WILLING TO PROCEED IN THE PREPARATION AND ISSUANCE OF THE REPORT UNLESS THE COMPANY'S LIABILITY IS STRICTLY LIMITED. CUSTOMER AGREES WITH THE PROPRIETY OF SUCH LIMITATION AND AGREES TO BE BOUND BY ITS TERMS

THE LIMITATIONS ARE AS FOLLOWS AND THE LIMITATIONS WILL SURVIVE THE CONTRACT:

ONLY MATTERS IDENTIFIED IN THIS REPORT AS THE SUBJECT OF THE REPORT ARE WITHIN ITS SCOPE. ALL OTHER MATTERS ARE OUTSIDE THE SCOPE OF THE REPORT.

CUSTOMER AGREES, AS PART OF THE CONSIDERATION FOR THE ISSUANCE OF THE REPORT AND TO THE FULLEST EXTENT PERMITTED BY LAW, TO LIMIT THE LIABILITY OF THE COMPANY, ITS LICENSORS, AGENTS, SUPPLIERS, RESELLERS, SERVICE PROVIDERS, CONTENT PROVIDERS AND ALL OTHER SUBSCRIBERS OR SUPPLIERS, SUBSIDIARIES, AFFILIATES, EMPLOYEES, AND SUBCONTRACTORS FOR ANY AND ALL CLAIMS, LIABILITIES, CAUSES OF ACTION, LOSSES, COSTS, DAMAGES AND EXPENSES OF ANY NATURE WHATSOEVER, INCLUDING ATTORNEY'S FEES, HOWEVER ALLEGED OR ARISING, INCLUDING BUT NOT LIMITED TO THOSE ARISING FROM BREACH OF CONTRACT, NEGLIGENCE, THE COMPANY'S OWN FAULT AND/OR NEGLIGENCE, ERRORS, OMISSIONS, STRICT LIABILITY, BREACH OF WARRANTY, EQUITY, THE COMMON LAW, STATUTE OR ANY OTHER THEORY OF RECOVERY, OR FROM ANY PERSON'S USE, MISUSE, OR INABILITY TO USE THE REPORT OR ANY OF THE MATERIALS CONTAINED THEREIN OR PRODUCED, **SO THAT THE TOTAL AGGREGATE LIABILITY OF THE COMPANY AND ITS AGENTS, SUBSIDIARIES, AFFILIATES, EMPLOYEES, AND SUBCONTRACTORS SHALL NOT IN ANY EVENT EXCEED THE COMPANY'S TOTAL FEE FOR THE REPORT.**

CUSTOMER AGREES THAT THE FOREGOING LIMITATION ON LIABILITY IS A TERM MATERIAL TO THE PRICE THE CUSTOMER IS PAYING, WHICH PRICE IS LOWER THAN WOULD OTHERWISE BE OFFERED TO THE CUSTOMER WITHOUT SAID TERM. CUSTOMER RECOGNIZES THAT THE COMPANY WOULD NOT ISSUE THE REPORT BUT FOR THIS CUSTOMER AGREEMENT, AS PART OF THE CONSIDERATION GIVEN FOR THE REPORT, TO THE FOREGOING LIMITATION OF LIABILITY AND THAT ANY SUCH LIABILITY IS CONDITIONED AND PREDICATED UPON THE FULL AND TIMELY PAYMENT OF THE COMPANY'S INVOICE FOR THE REPORT.

THE REPORT IS LIMITED IN SCOPE AND IS NOT AN ABSTRACT OF TITLE, TITLE OPINION, PRELIMINARY TITLE REPORT, TITLE REPORT, COMMITMENT TO ISSUE TITLE INSURANCE, OR A TITLE POLICY, AND SHOULD NOT BE RELIED UPON AS SUCH. THE REPORT DOES NOT PROVIDE OR OFFER ANY TITLE INSURANCE, LIABILITY COVERAGE OR ERRORS AND OMISSIONS COVERAGE. THE REPORT IS NOT TO BE RELIED UPON AS A REPRESENTATION OF THE STATUS OF TITLE TO THE PROPERTY. THE COMPANY MAKES NO REPRESENTATIONS AS TO THE REPORT'S ACCURACY, DISCLAIMS ANY WARRANTY AS TO THE REPORT, ASSUMES NO DUTIES TO CUSTOMER, DOES NOT INTEND FOR CUSTOMER TO RELY ON THE REPORT, AND ASSUMES NO LIABILITY FOR ANY LOSS OCCURRING BY REASON OF RELIANCE ON THE REPORT OR OTHERWISE.

IF CUSTOMER (A) HAS OR WILL HAVE AN INSURABLE INTEREST IN THE SUBJECT REAL PROPERTY, (B) DOES NOT WISH TO LIMIT LIABILITY AS STATED HEREIN AND (C) DESIRES THAT ADDITIONAL LIABILITY BE ASSUMED BY THE COMPANY, THEN CUSTOMER MAY REQUEST AND PURCHASE A POLICY OF TITLE INSURANCE, A BINDER, OR A COMMITMENT TO ISSUE A POLICY OF TITLE INSURANCE. NO ASSURANCE IS GIVEN AS TO THE INSURABILITY OF THE TITLE OR STATUS OF TITLE. CUSTOMER EXPRESSLY AGREES AND ACKNOWLEDGES IT HAS AN INDEPENDENT DUTY TO ENSURE AND/OR RESEARCH THE ACCURACY OF ANY INFORMATION OBTAINED FROM THE COMPANY OR ANY PRODUCT OR SERVICE PURCHASED.

NO THIRD PARTY IS PERMITTED TO USE OR RELY UPON THE INFORMATION SET FORTH IN THE REPORT, AND NO LIABILITY TO ANY THIRD PARTY IS UNDERTAKEN BY THE COMPANY.

CUSTOMER AGREES THAT, TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT WILL THE COMPANY, ITS LICENSORS, AGENTS, SUPPLIERS, RESELLERS, SERVICE PROVIDERS, CONTENT PROVIDERS, AND ALL OTHER SUBSCRIBERS OR SUPPLIERS, SUBSIDIARIES, AFFILIATES, EMPLOYEES AND SUBCONTRACTORS BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT, PUNITIVE, EXEMPLARY, OR SPECIAL DAMAGES, OR LOSS OF PROFITS, REVENUE, INCOME, SAVINGS, DATA, BUSINESS, OPPORTUNITY, OR GOODWILL, PAIN AND SUFFERING, EMOTIONAL DISTRESS, NON-OPERATION OR INCREASED EXPENSE OF OPERATION, BUSINESS INTERRUPTION OR DELAY, COST OF CAPITAL, OR COST OF REPLACEMENT PRODUCTS OR SERVICES, REGARDLESS OF WHETHER SUCH LIABILITY IS BASED ON BREACH OF CONTRACT, TORT, NEGLIGENCE, THE COMPANY'S OWN FAULT AND/OR NEGLIGENCE, STRICT LIABILITY, BREACH OF WARRANTIES, FAILURE OF ESSENTIAL PURPOSE, OR OTHERWISE AND WHETHER CAUSED BY NEGLIGENCE, ERRORS, OMISSIONS, STRICT LIABILITY, BREACH OF CONTRACT, BREACH OF WARRANTY, THE COMPANY'S OWN FAULT AND/OR NEGLIGENCE OR ANY OTHER CAUSE WHATSOEVER, AND EVEN IF THE COMPANY HAS BEEN ADVISED OF THE LIKELIHOOD OF SUCH DAMAGES OR KNEW OR SHOULD HAVE KNOWN OF THE POSSIBILITY FOR SUCH DAMAGES.

END OF THE LIMITATIONS OF LIABILITY