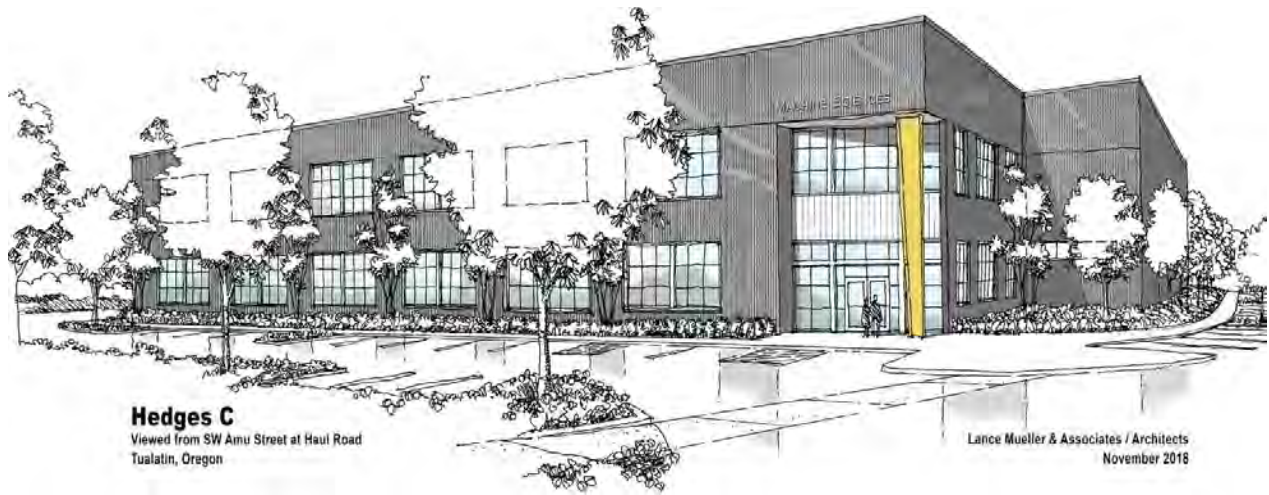


LANCE MUELLER & ASSOCIATES



ARCHITECTS • AIA

## Architectural Review Submittal



**Hedges C**

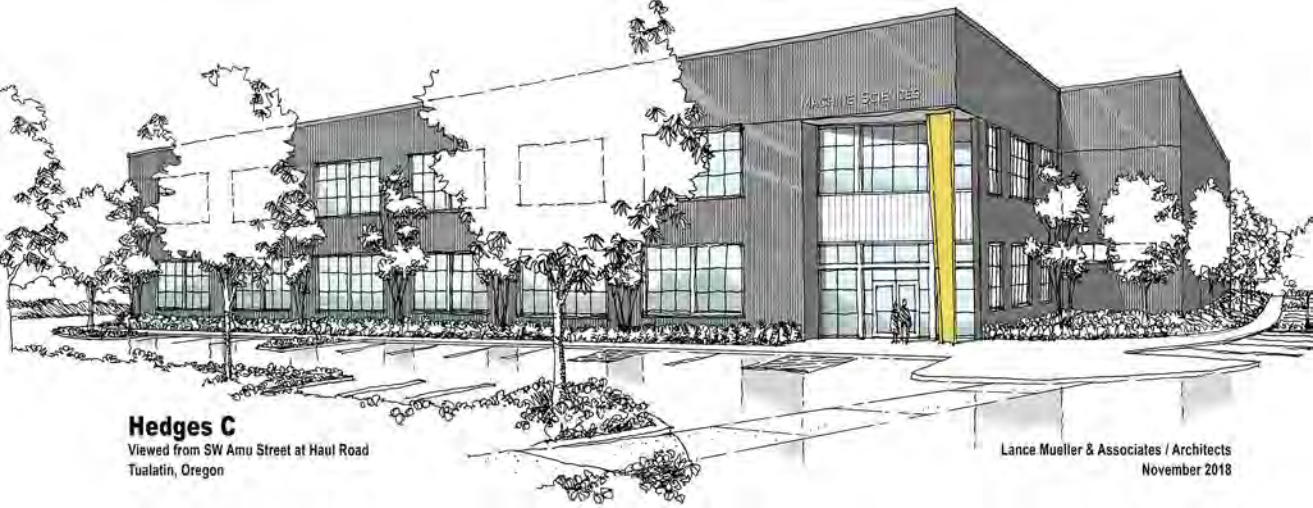
Viewed from SW Amu Street at Haul Road  
Tualatin, Oregon

Lance Mueller & Associates / Architects  
November 2016

### Hedges C

SW 115th Avenue (or SW Amu St.) at Haul Road  
Tualatin, OR 97062

December 2018



## Hedges C

Viewed from SW Amu Street at Haul Road  
Tualatin, Oregon

Lance Mueller & Associates / Architects  
November 2018

## Hedges C

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### Table of Contents - For AR Submittal

Item 1	<b>Application</b> Application Form & Application Fact Sheet AR Intake Checklist (with applicant comments in red) Plan Requirements – AR Intake Checklist
Item 2 (Deferred)	<b>Signed Affidavit of Sign Posting</b> Installation is after AR submittal is accepted & identification number is provided.
Item 3 (NA)	<b>Wetland Delineation Report</b> – Not Available. Existing Conservation Easement locations are identified on the topo/survey. It is the owner's intention to hire Clean Water Services to improve the landscaping and habitat of our existing Conservation Easement areas.
Item 4	<b>Clean Water Service (CWS) Service Provider Letter (SPL)</b>
Item 5	<b>Traffic Analysis Report</b> – 5 copies (1 copy per binder & 2 loose copies)
Item 6	<b>Neighborhood Meeting Materials</b> a. Report for Neighborhood Meeting is that <u>Owner and City Planner attended, but no neighbors attended.</u> b. Narrative addressing Design Guidelines c. Mailing Affidavit, Sign Posting Certificate, letter, GIS Buffer Map, Regular and CIO Mailing list, labels.
Item 7	<b>Vicinity Plan</b> – 8.5 x 11
Item 8	<b>Legal Description</b> as it appears on deed – one copy.
Item 9	<b>Mixed Solid Waste Recyclables Plan</b> – see sheet A-1. a. Letter from franchise hauler reviewing the facility. (Note – no tenant identified yet.)
Item 10	<b>Recent Title Report</b> – no older than 30 days.
Item 11	<b>Assessors Maps &amp; Mailing Labels</b> of property owners within 1,000' – 1 paper copy per binder & 1 set of labels)
Item 12	<b>Signs</b> – acknowledge that a separate application is required for signs.
Item 13	<b>Plan Drawing Index:</b> We include 3 sets each in sizes 8.5x11, 11x17, & 24x36 (24x36 is not in binder): A1.1 Site Plan & Notes A1.2 Site Details A1.3 Site Lighting Plan & Schedule A2.1 1st Floor Plan A3.1 Building Elevations C2.0 Site Grading Plan C2.1 Grading Details C3.0 Site Utility Plan C3.1 Detention Facility C3.6 Utility Details EC3.0 Erosion & Sediment Control Plan EC4.0 Erosion & Sediment Control Details EC4.1 Erosion & Sediment Control Details L-1 Landscape Plan & Plant Legend L-2 Landscape Details and Specs 1 of 1 Topographic Survey (Note - Tree Preservation Plan – Not required as no existing trees.)

#### Attachments:

**Geotechnical Report** (3 Sets)  
**Prelim Stormwater Report** (3 Sets)  
**Exterior Lighting Fixture Schedule / Cut Sheets**  
**Fire Flow** – deferred hydraulic modeling will be ordered when AR submittal accepted.  
**Completed City Fact Sheet / AR Intake Checklist** (Note, we have placed in Checklist in Item 1.)  
**Acoustic Engineer Report** – NA (This shell bldg. has no occupancy or rooftop mechanical.) RR  
**Crossing Information** – NA (No railroad in immediate area.)

**Digital Copy** of all above documents.

## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### **Item 1**

#### **Application**

Application Form & Application Fact Sheet  
AR Intake Checklist (with applicant comments in red)  
Plan Requirements – AR Intake Checklist



**CITY OF TUALATIN**  
**Community Development Department-Planning Division**  
**Land Use Application—Type II**

**PROPOSAL NAME** HEDGES C

**PROPOSAL SUMMARY** (Brief description)  
A NEW 1-STORY 73,000 SF BUILDING "SHELL", WHICH REQUIRES A T.I. PERMIT TO BE OCCUPIED.

**PROPERTY INFORMATION**

Location (address if available): SW 115<sup>th</sup> AVE. (OR SW AMY ST.) AT HAVIL ROAD,  
 Tax Map & Lot #(s): 2S127BA00600 Planning District: \_\_\_\_\_  
 Total site size: 197,709 SF  Developed  Undeveloped

**APPLICANT/CONTACT INFORMATION**

Applicant or Primary Contact Name: MAC MARTIN AT HEDGES C LLC  
 Mailing Address: P.O. BOX 15523  
 City/State: SEATTLE, WA Zip: 98115  
 Phone: 206-339-6676 Email: \_\_\_\_\_  
 Applicant's Signature: [Signature] Date: 12/10/2018

I hereby acknowledge that I have read this application and understand the requirements for approving and denying the application, that the information provided is correct, that I am the owner or authorized agent of the owner, and that plans submitted are in compliance with the City of Tualatin Development (TDC) and Municipal (TMC) Codes.

**PROPERTY OWNER/DEED HOLDER INFORMATION** (Attach list if more than one)

Name: HEDGES C LLC  
 Mailing Address: (SAME AS APPLICANT)  
 City/State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Email: \_\_\_\_\_  
 Property Owner Signature: [Signature] Date: 12/10/2018

Power of attorney or letter of authorization required if application not signed by the property owner/deed holder.

**LAND USE APPLICATION TYPE**

- Architectural Review (AR)
- Historic Landmark (HIST)
- Interpretation (INT)
- Minor Variance (MVAR)
- Tree Removal (TCP)
- Other \_\_\_\_\_

FOR STAFF USE ONLY	
Case No.:	_____
Date Received:	_____
By:	_____
Fee Amount \$:	_____
Received by:	_____

GENERAL INFORMATION	
Site Address:	NONE
Assessor's Map and Tax Lot #:	2S127BA00600
Planning District:	MG
Parcel Size:	197,709 SF
Property Owner:	HEDGES C LLC
Applicant:	HEDGES C LLC (MAC MARTIN)
Proposed Use:	MANUFACTURING & OFFICE

ARCHITECTURAL REVIEW DETAILS	
Residential	<input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industrial
Number of parking spaces:	171
Square footage of building(s):	72,970
Square footage of landscaping:	
Square footage of paving:	
Proposed density (for residential):	NA

**For City Personnel to complete:**

Staff contact person:

CITY OF TUALATIN FACT SHEET

**General**

Proposed use: <b>MANUFACTURING, OFFICE, STORAGE</b>	
Site area: <b>(197,709 SF) 4.5</b> acres	Building footprint: <b>59,351</b> sq. ft.
Development area: <b>(SAME)</b> acres	Paved area: <b>55,567 + 9,485 SIDEWALK</b> sq. ft.
Sq. ft.	Development area coverage: <b>63.3%</b> %

**Parking**

Spaces required (see TDC 73.400) (example: warehouse @ 0.3/1000 GFA) <b>Manuf. @ 1.6 /1000 GFA = 95.70 (59,813 SF)</b> <b>Off. @ 2.7 /1000 GFA = 30.48 (11,288 SF)</b> _____ @ _____ /1000 GFA = _____ Total parking required: <b>126</b> spaces ADA accessible = <b>6</b> Van pool = <b>5</b> Compact = (max. 35% allowed) <b>44</b> = Loading berths = <b>3</b>	Spaces provided: Total parking provided: <b>171</b> spaces Standard = <b>150</b> ADA accessible = <b>6</b> Van pool = <b>5</b> Compact = <b>10</b> Loading berths = <b>5</b>
--	--

**Bicycles**

Covered spaces required: <b>12</b>	Covered spaces provided: <b>12 (+ 3 UNCOVERED)</b>
------------------------------------	--

**Landscaping**

Landscaping required: <b>20</b> % of dvpt. area <b>39,542</b> Square feet	Landscaping provided: <b>36.5</b> % of dvpt. area <b>72,164</b> Square feet
Landscaped parking island area required: <b>25 SF X 171 = 4,275 SF</b> %	Landscaped parking island area provided: <b>4,926 SF</b> %

**Trash and recycling facility**

Minimum standard method: _____ square feet	Other method: _____ square feet
--	---------------------------------

**For commercial/industrial projects only**

Total building area: <b>71,100</b> sq. ft.	2 <sup>nd</sup> floor: <b>0</b> sq. ft.
Main floor: <b>59,315</b> sq. ft.	3 <sup>rd</sup> floor: <b>0</b> sq. ft.
Mezzanine: <b>11,785</b> sq. ft.	4 <sup>th</sup> floor: <b>0</b> sq. ft.

**For residential projects only (NA)**

Number of buildings: _____	Total sq. ft. of buildings: _____ sq. ft.
Building stories: _____	

# Architectural Review (AR) Intake Check List

Project Name: HEDGES C

AR-\_\_\_ - \_\_\_ Date Received: \_\_\_\_\_ Submittal # \_\_\_\_\_

- Project name or title that matches CRW scoping/pre-application meeting name. (Names should be somewhat descriptive of the project i.e. ABC Company New Building).
- Include page numbers, a Table of Contents, and staple documents or put documents in a binder. Do not use binder clips or paper clips.
- Plans should have page numbers and an Index to Sheets that matches page numbers. All symbols, line types, and textures must have a legend. Please direct to page of legend on each sheet. Plans should be stapled down the length of the left side.
- Application shall contain the names, addresses, e-mails, and telephone numbers of:  

<input checked="" type="checkbox"/> Property Owner(s)	<input checked="" type="checkbox"/> Applicant	<input type="checkbox"/> Project Planner (??)	ON ARCHITECTURAL DRAWING A-1.
<input checked="" type="checkbox"/> Architect	<input checked="" type="checkbox"/> Engineer	<input checked="" type="checkbox"/> Landscape Architect	
- Signatures from Property Owner(s) and the Applicant- along with printed name and date. ON APP
- Street Address(s), Tax Lot Number(s), and current tax map(s). NA 2
- Clean Water Services (CWS) Service Provider Letter (SPL) indicating a "Stormwater Connection Permit Authorization Letter" will likely be issued or Pre-Screen signed by CWS with appropriate box checked to indicate that it serves as an SPL.
- Wetland delineations and floodplain, if applicable SEE TOPO/SURVEY FOR CONSERVATION EXMT.
- NA Fill/Removal Permit Issued by the Oregon Division of State Lands (DSL) and the U.S. Army Corps of Engineers, if applicable
- Application Fee (must be paid at time of first submittal). A61255.
- Hydraulic Modeling worksheet and fee (must be paid at time of first submittal). A61255
- 3 plan sets of the following plans:
  - Existing Conditions Plan TOPO/SURVEY 1 of 1
  - Site Plan A1.1
  - Grading Plan C2.0
  - Landscape Plan L-1
  - Elevations including specifications as to type, color, and texture of exterior surfaces of proposed structures (scale of 1/16": 1', 1/8":1', 1/4":1', 1/2". 1", 3/4".1") A3.1
  - NA Tree Preservation Plan (NO TREES EXISTING)



# Architectural Review (AR) Intake Check List

Project Name: HEDGES C

AR-\_\_\_\_-\_\_\_\_ Date Received: \_\_\_\_\_ Submittal # \_\_\_\_\_

- All plan sets shall be collated, stapled and folded and shall include a north arrow, scale and legend corresponding to symbols on the plans.
- Scale for Existing Conditions, Site Plan, Grading, Landscape and Tree Preservation shall be 1":10', 1":20', 1":30', for larger developments 1":40' or 1":50'. Adjust the scale accordingly on ledger (11x17) and letter (8.5x11) size copies.
- 3 sets of 8 1/2" x11", 11"x17", 24"x36"
- Attachment 1 to this check list contains detailed plan requirements for each of the above

Public Utility Facility Plan (Per Tualatin Development Code Ch. 74) including the following information:

C3.0

- show the location type, size, and grade of all existing and proposed utility facilities such as: sanitary and storm sewers, water lines, fire hydrants, streets and sidewalks, and water quality facilities.
- Water quality, detention, and conveyance calculations and plans. (Soils report will also be required if soils type used for drainage calculations).
- Traffic study information as required by the City Engineer- 4 copies **ITEM 5 ON TABLE OF CONTENTS**
- Other utility facilities as required by the City Engineers such as a fire flow test
- All plan sets shall be collated, stapled and folded and shall include a north arrow, scale and legend corresponding to symbols on the plans.
- Scale shall be 1":10', 1":20', 1":30', for larger developments 1":40' or 1":50'. Adjust the scale accordingly on ledger (11x17) and letter (8.5x11) size copies.
- 3 sets of 8 1/2" x11", 11"x17", 24"x36"
- Attachment 1 to this check list contains detailed plan requirements.

NA

Developments in the Central Design District shall provide the Neighborhood Meeting notes and evidence of the notice posting required in TDC 31.071(5) and shall provide narratives statements considering each of the Design Guidelines in TDC 73.610 Narrative, (TDC Fig. 73-4 maps this district)

Completed City fact sheet on the project

Recent Title Report (no older than 30 days)

A letter from the franchise solid waste and recycling hauler reviewing the proposed solid waste and recyclables method and facility signed and dated by a designee of the hauler. Attach a site plan and elevations of trash enclosures signed and dated by the hauler, if applicable.

NA

Acoustical engineer report as required by the Community Development Director

(NOT OCCUPIED UNTIL T.I. WORK)

## Architectural Review (AR) Intake Check List

Project Name: HEDGES C

AR-\_\_\_\_-\_\_\_\_ Date Received: \_\_\_\_\_ Submittal # \_\_\_\_\_

Neighborhood Meeting information including the following:

- o Mailing affidavit and
- o Sign Posting certification on current City forms;
- o attendance log and notes;
- o copy of Neighborhood Meeting invitation;
- o GIS buffer map and mailing list including CIO contacts and mailing labels.
- o Neighborhood Meeting must have occurred no more than 180 days from date of first submittal.
- o Pursuant to TDC 31.063

*JONES*  Indication of a railroad (RR) at-grade crossing that provides sole access to the subject property, if applicable.

Land Use application notification information including:

- o Provide a list of mailing list recipients pursuant to TDC 31.064(1)
- o Post a sign pursuant to TDC 31.064(2)
- o Sign and dated posting certification with given case file number on current City Form.

Narrative containing responses to the applicable criteria in the Tualatin Development and Municipal Code.

Evidence of completed pre-application and scoping meeting with dates (no older than 180 days from date of 1<sup>st</sup> submittal).

Pre-Printed labels of mailing list (size 5160)

Adobe PDF(s) of application materials (direct conversions, not scans) on a CD or USB flash drive.

Lighting Plan with "scattered" photometrics, light specs, and a legend. All photometric measurements must be shown covering all subject site property lines and the entire subject site. All light specs must show lights that are full cut off. Photometric measurement labels must be large enough to read.

*A1.3 IS LIGHTING PLAN & ATTACHMENTS HAS THE EXTERIOR LIGHTING FIXTURE CUT OFFS.*

Application Re-Submittals:

*OK*  Revisions to application must include date of resubmission on all new and revised materials. Provide a response letter addressing each incomplete item and on what page the missing information can be found. Please submit 3 copies of an entire new packet, not just the revised and new materials, in paper and electronic format. Please organize the new and revised materials and put them in the appropriate places in the application.

## Architectural Review (AR) Intake Check List

Project Name: HEDGES C

AR-\_\_\_\_-\_\_\_\_ Date Received: \_\_\_\_\_ Submittal # \_\_\_\_\_

Please provide 3 full paper copies of every piece of the application for completeness review. During every completeness review staff will retain at least one paper copy of the submission for the record. Additional copies may be slip sheeted for resubmission at the staff member's discretion.

After the application is deemed complete, the project planner will request the appropriate number of complete application paper copies.

Revised date December 22, 2016

M:/Planning Web Forms/AR Intake checklist

**Architectural Review (AR) Intake Check List  
PLAN REQUIREMENTS**

Project Name: HEDGES C

AR- \_\_\_\_\_ - \_\_\_\_\_ Date Received \_\_\_\_\_ Submittal # \_\_\_\_\_

**PROPOSED SITE PLAN AND EXISTING CONDITIONS PLAN:**

- ✓ A1.1 • North arrow and scale of drawing (Scale 1":10', 1":20', 1":30', for larger developments 1":40' or 1":50'). Adjust the scale accordingly on ledger (11 x 17) and letter (8.5 x 11) size copies.
- ✓ A1.1 • Site Data to include Planning District designation, square footage of site, square footage of development area, square footage of landscaping, square footage of parking lot landscaping, square footage of pavement, number of parking spaces (standard, subcompact and disability), square footage of building (gross and perimeter). Information must contain existing and proposed square footage of parking spaces. Identify landscape credits available and building setback reduction.
- ✓ A1.1 ✓ C2.0 ✓ EC3.0 ✓ L-1 ✓ TOPO/SURVEY • Correct lot area and lot line dimensions of the site. Correct location of Natural Resource Protection Overlay District, including greenways, wetland natural areas and open space natural areas, and 25' vegetated corridors adjacent to a sensitive area. Also show delineated wetland boundary, top of bank and centerline for rivers and creeks. Indicate if wetlands or greenways are proposed to be dedicated.
- ✓ A1.1 • Location of buildings and main building entrance, dimensions and square footage of existing and proposed development, including setback distances to property lines and setback distances between buildings. Include location of bicycle parking and covered bicycle parking.
- ✓ A1.1 • Location of accessways, walkways and on-site bikeways.
- ✓ • Fronting street(s), right-of-way lines, driveways, sidewalks, curbs, paths, railroad right-of-way, bicycle paths, pedestrian paths, transit stop locations and easements (include dimensions).
- ✓ • Parking circulation and loading areas (dimensions of spaces) and type of surface. Show entrances, exits, direction of traffic flow, maneuvering areas and setbacks. Indicate location of subcompact spaces, vanpool and car pool parking and type of curbing. Identify disability stall locations and stall dimensions.
- ✓ A1.1 • Location of fences, walls, trash enclosures, recycling areas, electric transformer pads, rooftop mechanical equipment and exterior light fixtures.
- (NONE) • Outdoor storage areas and future development areas, if applicable.
- ✓ • Include all property lines and easements based on survey or other recorded county documents.
- ✓ • Include all proposed building envelopes.

**GRADING PLAN: C2.0**

- ✓ • North arrow and scale of drawing (scale 1":10', 1":20', 1":30').
- ✓ • Correct lot area and lot line dimensions of the site. Correct location of Natural Resource Protection Overlay District, including greenways, delineated wetland boundary, wetland natural areas and open space natural areas, and CWS vegetated corridors adjacent to a sensitive area. Also show top of bank and centerline for rivers and creeks. Indicate if wetlands or greenways are proposed to be dedicated.

## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

**Item 2 (Deferred)    Signed Affidavit of Sign Posting**

Installation is after AR submittal is accepted & identification number is provided.

## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### **Item 3 (NA)**

**Wetland Delineation Report** – Not Available. Existing Conservation Easement locations are identified on the topo/survey. It is the owner's intention to hire Clean Water Services to improve the landscaping and habitat of our existing Conservation Easement areas.

## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

**Item 4**

**Clean Water Service** (CWS) Service Provider Letter (SPL)

## Sensitive Area Pre-Screening Site Assessment

1. **Jurisdiction:** Tualatin

2. **Property Information** (example 1S234AB01400)

Tax lot ID(s): 2S127BA00600

Site Address: Not assigned

City, State, Zip: Tualatin, Oregon, 97062

Nearest Cross Street: Tualatin Sherwood Road

3. **Owner Information**

Name: Jack Martin

Company: Martin Real Estate Development

Address: 3955 South Tail Drive

City, State, Zip: Jackson, Wyoming, 83001

Phone/Fax: \_\_\_\_\_

E-Mail: \_\_\_\_\_

4. **Development Activity** (check *all* that apply)

- Addition to Single Family Residence (rooms, deck, garage)
- Lot Line Adjustment       Minor Land Partition
- Residential Condominium       Commercial Condominium
- Residential Subdivision       Commercial Subdivision
- Single Lot Commercial       Multi Lot Commercial

Other Shell building and associate site work

5. **Applicant Information**

Name: Jennifer Kimura

Company: VLMK Engineering + Design

Address: 3933 SW Kelly Ave

City, State, Zip: Portland, OR, 97220

Phone/Fax: 5032224453

E-Mail: jenniferk@vlmk.com

6. **Will the project involve any off-site work?**     Yes     No     Unknown

Location and description of off-site work \_\_\_\_\_

7. **Additional comments or information that may be needed to understand your project** \_\_\_\_\_

Proposed construction of a 70,470 sf (approximate) shell bldg and site work

This application does NOT replace Grading and Erosion Control Permits, Connection Permits, Building Permits, Site Development Permits, DEQ 1200-C Permit or other permits as issued by the Department of Environmental Quality, Department of State Lands and/or Department of the Army COE. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.

By signing this form, the Owner or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site. I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Print/Type Name Jennifer Kimura      Print/Type Title Permit Coordinator

**ONLINE SUBMITTAL**

Date 7/30/2018

### FOR DISTRICT USE ONLY

- Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.
- Based on review of the submitted materials and best available information Sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 17-05, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, State, and federal law.
- Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider letter as required by Resolution and Order 07-20, Section 3.02.1. All required permits and approvals must be obtained and completed under applicable local, state and federal law.
- This Service Provider Letter is not valid unless \_\_\_\_\_ CWS approved site plan(s) are attached.

The proposed activity does not meet the definition of development or **the lot was platted after 9/9/95 ORS 92.040(2).** NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED.      SEE FRANKLIN BUSINESS PARK NO.4 PLAT

Reviewed by Chuck Keshallan      Date 7/30/18



## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### **Table of Contents** - For AR Submittal

**Item 5**                    **Traffic Analysis Report** – 5 copies (1 copy per binder & 2 loose copies)

December 6, 2018

Project #: 23574

Mac Martin  
Martin Development  
P.O. Box 15523  
Seattle, WA 98115***RE: Hedges C Development Trip Debiting Letter***

Dear Mr. Martin:

Martin Development proposes to construct a 72,970 square foot manufacturing building for the Hedges C development within Franklin Business Park in Tualatin, Oregon. This letter provides trip generation estimates for the new building, documents trips consumed by site development to date, and compares the total trip generation of the proposed and constructed uses with the previously approved and vested overall site trip generation. As documented herein, the proposed Hedges C development generates a volume of trips that is consistent with the previously analyzed full build-out of Franklin Business Park, and vested trips will remain for other future site development assuming Hedges C is approved and constructed. As such, no additional traffic impact analysis is needed.

**BACKGROUND**

Kittelison & Associates, Inc. (Kittelison), prepared a traffic study for the site in October 1997 assuming development of up to 350,000 square feet (sf) of light industrial space or up to 450,000 sf of light industrial space for the full business park. The study concluded that either scenario could be accommodated. Kittelison subsequently prepared an updated traffic study in 1999 that assumed a development scenario consisting of 90,000 sf of retail space, 360,000 sf of office space, and 450,000 sf of light industrial space and again demonstrated that the transportation system could accommodate the development.

Most recently, Kittelison prepared a 2014 trip debiting letter for the site. That letter assumed the development of 101,300 sf of light industrial space (constructed), 101,400 sf of warehousing space (constructed), 64,808 sf of manufacturing space (then proposed), and 6,535 sf of retail space (then proposed). The 2014 trip debiting letter is attached for reference.

Since preparation of the 2014 trip debiting letter, the 101,400 sf warehousing building was constructed along with 30,000 sf of office space and 34,808 sf of additional warehousing space (the latter two uses constructed within the previously proposed 64,808 sf building).

Martin Development now proposes to construct the Hedges C development, which consists of a 72,970 sf manufacturing building.

## TRIP GENERATION

Weekday daily, weekday a.m. peak hour, and weekday p.m. peak hour vehicle trip generation estimates were calculated from empirical observations (at other similar developments) for the existing and proposed uses. For consistency with previous analyses, these observations were obtained from *Trip Generation Manual, 9<sup>th</sup> Edition*, published by the Institute of Transportation Engineers (ITE). Trip generation estimates for the existing and proposed uses are summarized in Table 1.

**Table 1 Trip Generation Estimates**

Land Use	ITE Code	Size (sf)	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
				Total	In	Out	Total	In	Out
<b>Existing (Constructed) Uses</b>									
Light Industrial	110	101,300	710	93	82	11	98	12	86
Warehousing	150	136,208	485	41	32	9	44	11	33
Office	710	30,000	331	47	41	6	45	8	37
Subtotal Trips			1,526	181	155	26	187	31	156
<b>Proposed Uses</b>									
Manufacturing	140	72,790	278	53	41	12	53	19	34
<b>Existing + Proposed Uses</b>									
<b>Total Trips</b>			1,804	234	196	38	240	50	190

## TRIP ACCOUNTING

The 1999 traffic study documents that there are 1,328 weekday p.m. peak hour trips associated with the Franklin Business Park vesting. Table 2 provides a trip summary of the existing and proposed uses.


**Table 2 Trip Debiting Summary**


Use	Number of PM Peak Hour Trips	PM Peak Hour Vested Trips Remaining
1999 Traffic Study Vesting	1,328	1,328
Uses constructed to date	(187)	1,141
Proposed Hedges C	(53)	1,088

After accounting for the existing uses and the proposed Hedges C development, 1,088 weekday PM peak hour trips remain vested for future development of the site.

If any additional information is needed regarding this evaluation, please call us at (503) 535-7433.

Sincerely,  
KITTELSON & ASSOCIATES, INC.

  
Kelly Blume, PE  
Associate Engineer

  
Chris Brehmer, PE  
Senior Principal Engineer



## Hedges C

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### Item 6

#### Neighborhood Meeting Materials

- a. Report for Neighborhood Meeting is that Owner and City Planner attended, but no neighbors attended.
- b. Narrative addressing Design Guidelines
- c. Mailing Affidavit, Sign Posting Certificate, letter, GIS Buffer Map, Regular and CIO Mailing list, labels.

# Meeting Minutes

Notes from the Hedges C Neighborhood Meeting on November 26<sup>th</sup>, 2018

**RE: Hedges C, located at SW Amu St & SW 115<sup>th</sup> St.**

There were four people who attended the meeting (see sign in sheet).

Mac Martin presented the site plan, elevations and building layout as well as a 3D rendering on the front of the building. The meeting lasted approximately 20 minutes and had very few comments, with no opposition to the project.

Comments from the meeting:

- Fred asked about when the anticipated completion date was for the building
  - o Mac responded I should be done in September 2019, or at least that is the goal
- Gary and Renee asked about how many employees machine sciences has
  - o Mac responded that they have about 90 employees now and that they work 3 shifts 6 days a week.
- Gary also asked about parking and what color the building would be
  - o Mac responded that we have approximately 170 parking spaces and that we are planning for a medium-dark grey with silver window mullions



**CERTIFICATION OF SIGN POSTING**

<p><b>NOTICE</b></p> <p><b>NEIGHBORHOOD / DEVELOPER MEETING</b></p> <p>___/___/2010 __:__.m.</p> <p>SW _____</p> <p>503-___-___</p>
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In addition to the requirements of [TDC 31.064\(2\)](#), the 18" x 24" sign must display the meeting date, time, and address as well as a contact phone number. The block around the word "NOTICE" must remain **orange** composed of the **RGB color values Red 254, Green 127, and Blue 0**. Staff has a Microsoft PowerPoint 2007 template of this sign design available through the Planning Division homepage at: <https://www.tualatinoregon.gov/planning/land-use-application-sign-templates>

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As the applicant for the HEDGES C project, I hereby certify that on this day, 11/2/2018 sign(s) was/were posted on the subject property in accordance with the requirements of the Tualatin Development Code and the Community Development Division.

Applicant's Name: MAC MARTIN

Applicant's Signature: *Mac Martin*  
(Please Print)

Date: 11/29/2018



### AFFIDAVIT OF MAILING NOTICE

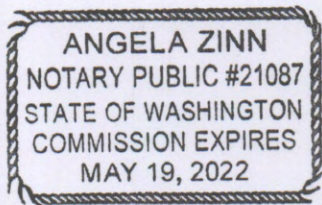
STATE OF OREGON            )  
  ) SS  
COUNTY OF WASHINGTON )

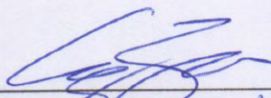
I, MACKENZIE MARTIN being first duly sworn, depose and say:

That on the 9TH day of NOVEMBER, 2018, I served upon the persons shown on Exhibit "A" (Mailing Area List), attached hereto and by this reference incorporated herein, a copy of the Notice of Neighborhood/Developer Meeting marked Exhibit "B," attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that the addresses shown on said Exhibit "A" are their regular addresses as determined from the books and records of the Washington County and/or Clackamas County Departments of Assessment and Taxation Tax Rolls, and that said envelopes were placed in the United States Mail with postage fully prepared thereon.

  
\_\_\_\_\_  
Signature

SUBSCRIBED AND SWORN to before me this 28<sup>th</sup> day of November, 2018.



  
\_\_\_\_\_  
Notary Public for Oregon Washington  
My commission expires: 5/19/2022

RE: HEDGES C NEIGHBORHOOD MEETING.

## EXHIBIT A

HEDGES C Neighbor Meeting Mailing list from escrow:

Edward Wager  
12075 SW Tual-Sherwood Rd  
Tualatin, OR 97062

Washington County  
169 N First Ave #42  
Hillsboro, OR 97124

Tualatin, City Of  
18880 SW Martinazzi Ave  
Tualatin, OR 97062

Norstar Business Center  
PO Box 1696  
Beaverton, OR 97075

Myslony LLC  
11555 SW Myslony St  
Tualatin, OR 97062

Myslony LLC  
11555 SW Myslony St  
Tualatin, OR 97062

Pnwp LLC  
6600 SW 105th Ave, Ste 175  
Beaverton, OR 97008

Cui Properties LLC  
20050 SW 112th Ave  
Tualatin, OR 97062

Tualatin, City Of  
18880 SW Martinazzi Ave  
Tualatin, OR 97062

Franklin Business Park  
Owners Of Lots 1-4  
,

Tualatin Energy LLC  
15786 SW Upper Boones Ferry Rd  
Lake Oswego, OR 97035

Kms Petroleum LLC  
8404 SE 134th Dr  
Portland, OR 97236

Amu Properties LLC  
20049 SW 112th Ave  
Tualatin, OR 97062

Albina Pipe Bending Co Inc  
12080 SW Myslony St  
Tualatin, OR 97062

Ofiplex Or LLC  
2220 Meridian Blvd  
Minden, NV 89423

Ofiplex Or LLC  
2220 Meridian Blvd  
Minden, NV 89423

Gary Walgraeve  
11345 SW Herman Rd  
Tualatin, OR 97062

Pnwp LLC #5  
6600 SW 105th Ave #175  
Beaverton, OR 97008

Pnwp LLC #5  
6600 SW 105th Ave #175  
Beaverton, OR 97008

Tualatin, City Of  
18880 SW Martinazzi Ave  
Tualatin, OR 97062

Tualatin Energy LLC  
15786 SW Upper Boones Ferry Rd  
Lake Oswego, OR 97035

Bennett Living Trust  
10550 S Kelland Ct  
Oregon City, OR 97045

Hedges A, An LLC  
PO Box 15523  
Seattle, WA 98115

Hedges B, An LLC  
PO Box 15523  
Seattle, WA 98115

Hedges B, An LLC  
PO Box 15523  
Seattle, WA 98115

Edward Wager  
8331 SE Carnation St  
Milwaukie, OR 97267

Albina Pipe Bending Co Inc  
12080 SW Myslony St  
Tualatin, OR 97062

118th Avenue LLC  
19695 SW 118th Ave  
Tualatin, OR 97062

Columbia Oregon Myslony  
Ste #1750 120 N Lasalle St  
Chicago, IL 60602

Tualatin Energy LLC  
15786 SW Upper Boones Ferry Rd  
Lake Oswego, OR 97035

## EXHIBIT A

HEDGES C Neighbor Meeting Mailing list from escrow:

D Hedges  
PO Box 15523  
Seattle, WA 98115

D Hedges  
PO Box 15523  
Seattle, WA 98115

Pacific Realty Associates Lp  
15350 SW Sequoia Pkwy #300  
Portland, OR 97224

Tualatin Yards LLC  
19100 SW 51st Ave  
Tualatin, OR 97062

Tualatin Yards LLC  
19100 SW 51st Ave  
Tualatin, OR 97062

Whs Realty Holdings LLC  
5366 Westfield Ct  
Lake Oswego, OR 97035

Marine Lumber Company  
11800 SW Myslony St  
Tualatin, OR 97062

Gary Walgraeve  
11345 SW Herman Rd  
Tualatin, OR 97062

Franklin Business Park LLC  
1202 NW 17th Ave Ste B  
Portland, OR 97209

Edward Wager  
8331 SE Carnation St  
Milwaukie, OR 97267

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Ronald Hutchens  
7900 S Three Gait Ln  
Canby, OR 97013

# "EXHIBIT B"

## NOTICE

### NEIGHBORHOOD / DEVELOPER MEETING

November 7<sup>th</sup>, 2018

Hedges C LLC  
PO Box 15523  
Seattle WA 98115

**RE: Hedges C, located at SW Amu St & SW 115<sup>th</sup> St.**

Dear Property Owner:

You are cordially invited to attend a meeting on **11/26/2018 @ 6:00PM @ 20049 SW 112th Ave. Tualatin OR 97062** (Co-Operations Office Building). This meeting shall be held to discuss a proposed project located at SW Amu St & SW 115<sup>th</sup> St. The proposal is to build a new 73,000 SF FLEX manufacturing building for a high-tech machining company. The building will have a 60,500 SF building pad, with 12,500 SF of second floor mezzanine for the operations/offices of the company.

This is an informational meeting to share the development proposal with interested neighbors. You will have the opportunity to review preliminary plans and identify topics of interest or consideration. Feel free to contact me with any questions or commentary.

Regards,



Mac Martin  
Martin Development  
206.399.6676  
[MartinDevelopment@outlook.com](mailto:MartinDevelopment@outlook.com)

cc: [lsanford@tualatin.gov](mailto:lsanford@tualatin.gov) ; Tualatin Community Development Department

**Hedges C**

December 2018

SW 115<sup>th</sup> Avenue (or SW Amu Street) at Haul Road  
Tualatin, OR

**Architectural Review Narrative:**

We are pleased to submit this project for AR review. The proposed Hedges C is a new one-story building “shell” with mezzanine for a local company, Machine Sciences Corporation. Located on improved land in Franklin Industrial Park, Hedges C gets its name from the adjacent Hedges Creek. The “C” designates it as the third contiguous industrial building by the ownership team in Franklin Business Park. Hedges A & B are the adjacent previous buildings in stained precast concrete walls and steel structure. The other contiguous building built by this ownership is Industry Restaurant on Tualatin-Sherwood Road and SW 112<sup>th</sup> Avenue. This is a much smaller and more intimate building that is a popular restaurant.

Hedges C uses include office, light manufacturing, and storage, which all meet current MG (General Manufacturing) zoning. The building is a steel structure with ribbed metal skin, and will include extensive natural light from skylights and windows. The west and south portions of the site remain as designated natural areas (conservation and storm drainage channel easements). Parking and access surround the building, and parking ratios are appropriate for the uses. The service area is placed behind the building where it is screened from public streets, and it is separated from surrounding buildings to the south and west by natural areas. Interior tenant improvements are required for the buildings to be occupied, but the exterior will be complete with utilities, parking, sidewalks, exterior lighting, and landscaping finished and ready for move-in. The preference is a single high-tech tenant, but there is a secondary entry on the west side to serve another tenant for flexible leasing options over time.

The Hedges C lot was initially designed to have a 2-story concrete building as a westward expansion of the Hedges A & B development (AR-14-08 submittal). The owners quickly abandoned Hedges C as a concrete building because of high cost of pilings required to support a heavy building. Hedges C returns on this AR submittal as a lighter weight building. This proposal is now a single story building with a mezzanine located where soil bearing is better. It is now a lighter steel structure with ribbed metal skin, more suited to the available soil bearing capacities.

The new Hedges C responds to the AR-14-08 Conditions of Approval AR-1 through 9 individually as follows:

#### AR-1

- a. To meet the requirement of 73.160(1)(a)(iii), walkways through parking areas, drive aisles, and loading areas shall be visibly raised and of a different appearance than the adjacent paved vehicular areas. **Acknowledge. We provide the same concrete walkway treatment used at Hedges A & B for consistency, see our Site Plan, sheet A-1.**
- b. To meet the requirement of 73.160(1)(b)(i), a concrete or asphalt paved pedestrian walkway shall be provided from the main building entrance to sidewalks in the public right-of-way and other on-site buildings and access ways. The walkway shall be a minimum of 5 feet in width. **ADA compliant walkways are provided, see our Site Plan, sheet P-1.**
- c. The applicant shall construct a walkway between Flex B and SW 115th Avenue no later than before issuance of certificate of occupancy (CO). **Hedges C provides a walkway to SW 115th, and will do so prior to CO.**
- d. To meet the requirement of 73.160(1)(b)(iii), accessways shall be provided as a connection between the development's walkway and bikeway circulation system and an adjacent bike lane. **Not applicable, as we don't see a bike lane on our portion of SW 115th. Bikes have access to our adjacent lightly traveled roadways.**
- e. To meet the requirement of 73.160(1)(d), accessways shall be a minimum of 8 feet wide. **The public accessway on our public street, SW 115th exists, and we connect to it with private walkways.**
- f. To meet the requirement of 73.150(12), provide safe pathways for pedestrians to move from parking areas to building entrances. **ADA compliant walkways are provided; see our Site Plan, sheet A-1.**



Hedges A is a 2015 adjacent example of the development team's nearby projects, showing the high quality of the work in concept and execution. This includes 12" stained precast concrete wall, substantial recessed windows for natural light and façade relief, quality lighting fixtures, substantial landscaping, and concrete drive entries and pedestrian paths. Lower soil bearing led the team to choose a lighter steel structure with metal skin for Hedges C, but the quality remains in a different material and aesthetic. Landscaping will be similar on Hedges C.



**Hedges C as viewed on 12/6/16 from the roof of Hedges B. It shows the site after Early Grading Permit # EC1218-1373 work is complete. This prepared the site for winter weather and for 2019 construction with a new building permit.**

- g.* To meet the requirement of 73.160(1)(c), curb ramps shall be provided wherever a walkway or accessway crosses a curb. **ADA compliant curb ramps are provided, see our Site Plan, sheet A-1.**
- h.* To meet the requirement of 73.160(3)(d), provide an identification system which clearly locates buildings and their entries for patrons and emergency services. **We accomplish this as our main entry is clearly identified to guests by the architecture. The building address is placed on the building elevation per fire code. Signage by separate permit will define the address and tenant.**
- i.* To meet the requirement of 73.160(4)(a), on and above grade electrical and mechanical equipment such as transformers, heat pumps and air conditioners shall be screened with sight obscuring fences, walls or landscaping. **Acknowledge. This was successfully accomplished by the applicant's team on the three buildings built under AR-14-08, and will be done here also. Not all the utilities are defined as yet, so this requires follow through.**
- j.* To meet the requirement of 73.227(2)(a)(v), commercial, industrial, public and semi-public developments shall provide a minimum storage area of 10 square feet plus: office - 4 square feet/1000 square feet gross leasable area (GLA); Retail - 10 square feet/1000 square feet GLA; and wholesale/Warehouse/Manufacturing - 6 square feet/1000 square feet GLA. **Solid waste and recyclables enclosure meets the standard; see our Site Plan, sheet A-1.**
- k.* To meet the requirement of 73.227(6)(b)(iii), exterior storage areas shall be enclosed by a sight obscuring fence or wall at least 6 feet in height. In multi-family, commercial, public and semi-public developments evergreen plants shall be placed around the enclosure walls, excluding the gate or entrance openings. Gate openings for haulers shall be a minimum of 10 feet wide and shall be capable of being secured in a closed and open position. A separate pedestrian access shall also be provided in multi-family, commercial, public and semi-public developments. **Not applicable because no exterior storage areas are proposed.**
- l.* To meet the requirement of, 73.310(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. **We exceed the standard, see site plan A-1.**

- m.** To meet the requirement of 73.320(1), in addition to the goals stated in TDC 73.110 and 73.140, the goals of the off-street parking lot standards are to create shaded areas in parking lots, to reduce glare and heat buildup, provide visual relief within paved parking areas, emphasize circulation patterns, reduce the total number of spaces, reduce the impervious surface area and stormwater runoff and enhance the visual environment. The design of the off-street parking area shall be the responsibility of the developer and should consider visibility of signage, traffic circulation, comfortable pedestrian access, and aesthetics. **Accomplished, see site plan A-1.**
- n.** To meet the requirement of 73.360(6)(a), 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. **Not applicable, because we have no access off of a public ROW, our access is off the private and existing Haul Road. We do meet the intent of the landscape portion of this standard with our access nearest SW 115<sup>th</sup>.**
- o.** To meet the requirement of 34.230, the Community Development Director shall consider the following criteria when approving, approving with conditions, or denying a request to cut trees. The Community Development Director may approve a request to cut a tree when the applicant can satisfactorily demonstrate that any of the following criteria are met: **Not applicable, because there are no existing trees.**
- p.** To meet the requirement of 73.250, **Not applicable, because there are no existing trees in the construction area. My visual search on Google Earth suggests there are no trees in the natural areas of our site either, where no construction is allowed.**
- q.** To meet the requirements of 73.370(2)(a), Commercial (i) Retail shops (under 100,000 sq. ft. gross floor area), required bicycle parking is 0.50 spaces per 1,000 sq ft of gross floor area, of which 50% shall be covered; (iv) General office, required bicycle parking is 2, or 0.50 spaces per 1,000 gross square feet, whichever is greater, of which the first 10 spaces or 40%, whichever is greater, shall be covered; Industrial (i&ii) Manufacturing & Warehousing, required bicycle parking is 2, or 0.1 spaces per 1000 gross square feet, whichever is greater, of which the first 5 spaces or 30%, whichever is greater, shall be covered. **Accomplished, see our bike parking calculations on our sheet P-1.**
- r.** To meet the requirement of 73.370(1)(n), bicycle parking facilities shall either be lockable enclosures in which the bicycle is stored, or secure stationary racks, which accommodate a bicyclist's lock securing the frame and both wheels; (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, and (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. **Our bike storage concept is a few bikes can be locked on an exterior rack near the lobby, and the balance are locked inside in a designated room near a shower by later TI. See our Site Plan, sheet A-1.**
- s.** To meet the requirement of 73.370(3), the minimum number of off-street Vanpool and Carpool parking for commercial, institutional, and industrial uses is, for 26 and greater spaces, 1 for each 25 spaces. **Accomplished, see our Site Plan, sheet A-1.**
- t.** To meet the requirement of 73.370(1)(x), required vanpool and carpool parking shall meet the 9-foot parking stall standards in Figure 73-1 and be identified with appropriate signage. **Accomplished, see our Site Plan, sheet P-1.**
- u.** To meet the requirement of 73.160(3)(c), locate, orient and select on-site lighting to facilitate surveillance of on-site activities from the public right-of-way without shining into public rights-of-way or fish and wildlife habitat areas. **Accomplished, see our Lighting Plan.**
- v.** To meet the requirement of 73.380(6), artificial lighting, which may be provided, shall be so deflected as not to shine or create glare in any residential planning district or on any adjacent dwelling, or any street right-of-way in such a manner as to impair the use of such way. **Not applicable as there are no residential areas close to our site. We have glare control devices on our light fixtures for the record.**
- w.** To meet the requirement of 73.400(9), ingress and egress for industrial uses shall not be less than 36 feet for the first 50 feet from the right-of-way, and 24 feet thereafter (Applies to industrial uses with less than 250 required parking spaces). **Our access drives are off the private Haul Road. The existing Haul Road is 27' wide where it connects to the SW 115<sup>th</sup> ROW. This was discussed at the Scoping Meeting, and the**



**City's opinion was this standard did not apply to private roads.**

AR-2 To meet the requirement of 61.050, prior to building permit issuance the applicant shall obtain a Property Line Adjustment (PLA) through the Engineering Division. **Not applicable as no PLA is required or proposed.**

AR-3 To meet the requirement of 69.045, Building Permit issuance and Final Occupancy sign-off for office, retail and service uses shall follow or be concurrent with Building Permit issuance and Final Occupancy sign-off for industrial uses.

**Acknowledge.**

AR-4 To meet the requirement of 73.100(2), all building exterior improvements approved through the Architectural Review Process shall be continually maintained including necessary painting and repair so as to remain substantially similar to original approval through the Architectural Review Process, unless subsequently altered with Community Development Director approval, as a condition of approval. **Acknowledge.**

AR-5 To meet the requirement of 73.100(1), all landscaping approved through architectural review (AR) shall be continually maintained, including necessary watering, weeding, pruning and replacement, in a manner substantially similar to that originally approved by the AR decision, unless subsequently altered through AR. **Acknowledge.**

AR-6 To meet the requirement of 73.290(1), where natural vegetation has been removed or damaged through grading in areas not affected by the landscaping requirements and that are not to be occupied by structures or other improvements, such areas shall be replanted. **Acknowledge.**

AR-7 This development is required to comply with the noise standards of 63.051(1). **Acknowledge.**

AR-8 Any signage proposed for the site shall be submitted separately for sign permits. **Acknowledge, signing permits will require tenant input.**

AR-9 The applicant shall comply with the incorporated Public Facilities Recommendation (PFR) from the Engineering Division. **Acknowledge.**

**Section 7.040 Manufacturing Planning District Objectives.**

**(3) General Manufacturing Planning District (MG).**

(a) Suitable for light manufacturing uses and also for a wide range of heavier manufacturing and processing activities. Such areas could be expected to be more unsightly and to have more adverse environmental effects. **Acknowledge, this seems to describe our anticipated uses. We anticipate no retail and there is no rail service here.**

(b) The following uses within the Light Manufacturing District shall comply with the following size limits established by Metro. Retail sale, retail service and professional service uses shall be no greater than 5,000 square feet of sales or service area per outlet, or not greater than 20,000 square feet of sales or service area for multiple outlets in a single building or in multiple buildings that are part of the same development project, with the following exceptions. **We do not anticipate any of these uses.**

(i) Application of the Industrial Business Park Overlay District (TDC Chapter 69). **Yes, we are not in this overlay.**

(ii) The retail sale of products manufactured, assembled, packaged or wholesaled on the site is allowed provided the retail sale area, including the showroom area, is no more than 5% of the gross floor area of the building not to exceed 1,500 square feet. **Acknowledge, no retail is proposed.**

(iii) Within the Special Commercial Setback from arterial streets (TDC 60.035) the retail sale of home improvement materials and supplies is allowed provided it is not greater than 60,000 square feet of gross floor area per building or business and subject to the Special Commercial Setback from arterial streets as generally illustrated in Map 9-5 and specifically set forth in TDC 60.035. **Not applicable, we are not in this overlay.**

(c) The purpose of this district is to provide sites for manufacturing uses that are more compatible with adjacent commercial and residential uses and would serve to buffer heavy manufacturing uses. **Acknowledge.**

(d) In accordance with the Industrial Business Park Overlay District, TDC Chapter 69, selected office and retail uses are allowed to provide services to businesses and employees. The purpose is also to allow certain commercial service uses in the Commercial Services Overlay shown in the specific areas illustrated on Map 9-5 and selected commercial uses subject to distance restrictions from residential areas and subject to the Special Commercial Setback from arterial streets as generally illustrated in Map 9-5 and specifically set forth in TDC 60.035. **Not applicable, we are not in this overlay.**

**TDC Chapter 61: General Manufacturing Planning District (MG)**

**Section 61.010 Purpose** The purpose of this district is to provide areas of the City that are suitable for light industrial uses and also for a wide range of heavier manufacturing and processing activities. These uses are expected to be more unsightly and have more adverse environmental effects than the uses allowed in the Light Manufacturing Planning District. Railroad access and screened outdoor storage will be allowed in this district, conforming to defined architectural, landscape, and environmental design standards. The heaviest industrial uses that are environmentally adverse or pose a hazard to life and

safety shall be prohibited. The purpose is also to allow the retail sale of products manufactured, assembled, packaged or wholesaled on the site provided the retail sale area, including the showroom area, is no more than 5% of the gross floor area of the building not to exceed 1,500 square feet. Also suitable for the retail sale of building and home improvement materials and supplies provided it is not greater than 60,000 square feet of gross floor area per building or business and subject to the Special Commercial Setback from arterial streets as generally illustrated in Map 9-5 and specifically set forth in TDC 61.035. In accordance with the Industrial Business Park Overlay District, TDC Chapter 69, and TDC 60.037-60.038 selected small-scale mixed uses that are supportive of and secondary to industrial uses are allowed to provide services to businesses and employees. The purpose is also to allow certain commercial service uses in the Commercial Services Overlay shown in the specific areas illustrated on Map 9-5 and allow selected commercial uses subject to distance restrictions from residential areas and subject to the Special Commercial Setback from arterial streets as generally illustrated in Map 9-5 and specifically set forth in TDC 61.035 **Our listed anticipated uses for this building “shell” comply with the purpose of this zone, and they would also comply if in Light Manufacturing (ML). We propose no outside storage and are not on a railroad spur. Commercial services uses are not anticipated, and for the record we are outside Map 9-5.**

**Section 61.050 Lot Size.** Except for lots for public utility facilities, natural gas pumping stations and a wireless communication facility which shall be established through the Subdivision, Partition or Lot Line Adjustment process, the following requirements shall apply:

- (1) The minimum lot area shall be 20,000 square feet. **We comply.**
- (2) The minimum average lot width shall be 100 feet. **We comply.**
- (3) The minimum lot width at the street shall be 100 feet. **We comply.**

**Section 61.060 Setback Requirements.**

(1) Front yard. The minimum setback is 30 feet. When the front yard is across the street from a residential or Manufacturing Park (MP) district, a front yard setback of 50 feet is required. When a fish and wildlife habitat area is placed in a Tract and dedicated to the City at the City’s option, dedicated in a manner approved by the City to a non-profit conservation organization or is retained in private ownership by the developer, the minimum setback is 10 – 30 feet, as determined in the Architectural Review process, with the exception of front yards across the street from a residential or MP District, provided the buildings are located farther away from fish and wildlife habitat areas. **Our setbacks are much greater than the 30’ minimum.**

(2) Side yard. The minimum setback is 0 to 50 feet, as determined in 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. **Our setbacks are much greater than the 50’ minimum.**

(3) Rear yard. The minimum setback is 0 to 50 feet, as determined in 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. **Our setbacks are much greater than the 50’ minimum.**

(4) Corner lot yards. The minimum setback 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 in the Architectural Review process. **Acknowledge, we meet the standard.**

(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. **We are generous with landscaping and exceed the setback in all areas.**

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

**Section 60.090 Structure Height.**

(1) Except as provided in TDC 60.090(2), (3) or (4), no structure shall exceed a height of 50 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 one and one-half times the flagpole height. **Acknowledge, our drawings easily meet the building standard, and no flagpole is proposed.**

(2) The maximum permitted structure height provided in TDC 60.090(1) may be increased to no more than 85 feet, provided that all yards adjacent to the structure are not less than a distance equal to one and one-half times the height of the structure. **Not required.**

**TDC Chapter 73: Community Design Standards We think Hedges C is built to a Section 73.050 Criteria and Standards.**

(1) In exercising or performing his or her powers, duties, or functions, the Community Development Director shall determine whether there is compliance with the following:

(a) The proposed site development, including the site plan, architecture, landscaping, parking and graphic design, is in conformance with the standards of this and other applicable City ordinances insofar as the location, height, and appearance of the proposed development are involved; **Acknowledge this overall requirement, and we believe that we meet code.**

(b) The proposed design of the development is compatible with the design of other developments in the general vicinity; and **A unifying characteristic all of the nearby buildings is their walls are of tilt-up concrete construction of varying quality and aesthetic success. The proponent's existing Hedges A and B stand out from their neighbors in quality of design and materials in our opinion. Hedges C is compatible in use and scale with the nearby buildings. Where it differs is in using a lighter steel building construction system because the underlying soils do not support heavier construction systems. We think Hedges C is designed to a high standard with quality materials, and will add interest and visual vitality to the business park because it of different materials.**

(c) The location, design, size, color and materials of the exterior of all structures are compatible with the proposed development and appropriate to the design character of other developments in the vicinity. **See our response above on (1) (b).**

(2) In making his or her determination of compliance with the above requirements, the Community Development Director shall be guided by the objectives and standards set forth in this chapter. If the architectural review plan includes utility facilities or public utility facilities, then the City Engineer shall determine whether those aspects of the proposed plan comply with applicable standards. **Acknowledge.**

(4) As part of Architectural Review, the property owner may apply for approval to remove trees, in addition to those exemptions allowed in TDC 34.200(3), by submitting information concerning proposed tree removal, pursuant to TDC 34.210(1). The granting or denial of a tree removal permit shall be based on the criteria in TDC 34.230. **There are no existing trees.**

(5) Conflicting Standards. In addition to the MUCOD requirements, the requirements in TDC Chapter 73 (Community Design Standards) and other applicable Chapters apply. If TDC Chapters 57, 73 and other applicable Chapters, conflict or are different, they shall be resolved in accordance with TDC 57.200(2). [Ord. 637-84, §5, 6/11/84; Ord. 725-87, §2, 6/22/87; Ord. 743-88, §33, 3/28/88; Ord. 862-92, §51, 3/23/1992; Ord. 864-92, §14, 4/13/82; Ord. 963-96, §5, 6/24/96; Ord. 1025-99, §32, 7/26/99; Ord. 1062.00, §22, 12/11/00; Ord. 1062-00, 1/3/01; Ord. 1227-07 §12, 2/12/07] **Acknowledge.**

**Section 73.150 Design Standard Objectives** All 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. In the case of conflicts between objectives, the proposal shall provide a desirable balance between the objectives. Site elements shall be placed and designed, to the maximum extent practicable, to:

(1) Provide convenient walkways and crosswalks which separate pedestrians from vehicles and link primary building entries to parking areas, other on-site buildings and the public right-of-way. **Accomplished, see site plan.**

(4) Break up parking areas with landscaping (trees, shrubs and walkways) and buildings to lessen the overall impact of large paved areas. **Accomplished, see landscape plan.**

(5) Utilize landscaping in parking areas to direct and control vehicular movement patterns, screen headlights from adjacent properties and streets, and lessen the visual dominance of pavement coverage. **Accomplished, see landscape plan.**

(6) Provide vehicular connections to adjoining sites. **Accomplished, we maintain the existing private Haul Road with connection to the property to the west, see site plan.**

(7) Emphasize entry drives into commercial complexes and industrial park developments with special design features, such as landscaped medians, water features and sculptures. **Our entry drive is the existing private Haul Road connection to Amu Street and upgrades include improved pedestrian connections and much improved landscaping.**

(8) Locate, within parking lots, pedestrian amenities and/or landscaping in areas which are not used for vehicle maneuvering and parking. **Accomplished. See A-1 Site Plan sidewalks and the landscape plan.**

(9) Encourage outdoor seating areas which provide shade during summer and sun during winter, trash receptacles and other features for pedestrian use. Plantings with a variety of textures and color are encouraged. (10) Create opportunities for, or areas of, visual and aesthetic interest for occupants and visitors to the site. **We provide two**

pedestrian plazas at our building entries planned to receive these features in final design. We also provide a pocket park at the south edge of our site that will include a basketball court and other amenities to be determined.

(11) Conserve, protect and restore fish and wildlife habitat areas, and maintain or create visual and physical corridors to adjacent fish and wildlife habitat areas. **Native landscape is proposed, including enhancements in the no-build natural areas, to provide a natural setting that improves wildlife habitat.**

(12) Provide safe pathways for pedestrians to move from parking areas to building entrances. **Accomplished, see site plan.**

(13) Design the location of buildings and the orientation of building entrances for commercial, public and semi-public uses such as churches, schools and hospitals to provide adequate pedestrian circulation between buildings and to provide preferential access for pedestrians to existing or planned transit stops and transit stations. **Accomplished, see A-1 Site Plan.**

(17) Provide preferential parking for carpool and vanpools to encourage employees to participate in carpools and vanpools. **Design intent for meeting the code requirement is noted on out A-1 Site Plan, but tenant input required for finalizing for building permit. The important thing is we have ample parking well distributed.**

(18) Screen elements such as mechanical and electrical equipment, above ground sewer or water pump stations, pressure reading stations and water reservoirs from view. **We are providing Electrical and Sprinkler Riser room space so much of this equipment is inside the buildings. M and E on-site equipment will be screened by landscaping. There is no roof mounted HVAC equipment in this "shell" beyond roof ventilation, and HVAC equipment is ground mounted in landscaping in the rear service areas.**

**Section 73.160 Design 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.

(a) For commercial, public and semi-public uses:

(i) a walkway shall be provided between the main entrance to the building and any abutting public right-of-way of an arterial or collector street where a transit stop is designated or provided. The walkway shall be a minimum of 6 feet wide and shall be 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; **Accomplished, including ADA compliance - see A-1 Site Plan.**

(iii) walkways through parking areas, drive aisles, and loading areas shall be visibly raised and of a different appearance than the adjacent paved vehicular areas; **Accomplished, see A-1 Site Plan.**

(v) fences or gates which prevent pedestrian and bike access shall not be allowed at the entrance to or exit from any accessway. **No fencing is planned.**

(vii) Outdoor Recreation Access Routes shall be provided between the development's walkway and bikeway circulation system and parks, bikeways and greenways where a bike or pedestrian path is designated.

**Accomplished, see A-1 Site Plan.**

(5) The Federal Americans with Disabilities Act (ADA) applies to development in the City of Tualatin. Although TDC, Chapter 73 does not include the Oregon Structural Specialty Code's (OSSC) accessibility standards as requirements to be reviewed during the Architectural Review process, compliance with the OSSC is a requirement at the Building Permit step. It is strongly recommended all materials submitted for Architectural Review show compliance with the OSSC. **ADA access is anticipated in this design, see A-1 Site Plan.**

**Section 73.210 Objectives.** All 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. In the Central Design District, the Design Guidelines of TDC 73.610 shall be considered. In case of conflicts between objectives, the proposal shall provide a desirable balance between the objectives. Buildings shall be designed, to the maximum extent practicable, to:

(1) Minimize disruption of natural site features such as topography, trees and water features. **The buildable portion of the lot slopes about 2% from the SE to NW, allowing the building to be central with vehicle circulation surrounding. The natural feature is Hedges Creek at the south west lot lines, which we hope to enhance with landscaping using Clean Water Services.**

(2) Provide a composition of building elements which is cohesive and responds to use needs, site context, land form, a sense of place and identity, safety, accessibility and climatic factors. Utilize functional building elements such as

arcades, awnings, entries, windows, doors, lighting, reveals, accent features and roof forms, whenever possible, to accomplish these objectives. **We believe we have accomplished these objectives in our design with a distinctive sense of place enhanced by a limited palette of ribbed metal siding, generous glass, and strong shed roof form.**

(3) Where possible, locate loading and service areas so that impacts upon surrounding areas are minimized. In industrial development loading docks should be oriented inward to face other buildings or other loading docks. Our service dock is inward and well screened by the buildings from public ROW. **Our service area is placed in the rear where is screened by the building from the ROW, and otherwise screened from public view by natural areas.**

(4) Enhance energy efficiency in commercial and industrial development through the use of landscape and architectural elements such as arcades, sunscreens, lattice, trellises, roof overhangs and window orientation. **Our building is insulated code with generous natural light, including skylights..**

(5) Locate and design entries and loading/service areas in consideration of climatic conditions such as prevailing winds, sun and driving rains. **All service doors have generous canopies for functional and aesthetic reasons.**

(6) Give consideration to organization, design and placement of windows as viewed on each elevation having windows. Surveillance over parking areas from the inside, as well as visual surveillance from the outside in, should be considered in window placement. **For building security the tenant is restricting windows in the manufacturing areas at eye level. Generally surveillance is by security cameras as TI.**

(7) Select building materials which contribute to the project's identity, form and function, as well as to the surrounding environment. **Our limited palette is concrete steel and glass, and the image on the first page of this narrative is the general aesthetic we propose. It is well received by our high-tech tenants as well as their employees.**

(8) Select colors in consideration of lighting conditions and the context under which the structure is viewed, the ability of the material to absorb, reflect or transmit light and the color's functional role (e.g., to identify and attract business, aesthetic reasons, image-building). **We propose a darker neutral color in our building walls accented by our clear glass in clear anodized window framing, a timeless choice.**

(9) Where possible, locate windows and provide lighting in a manner which enables tenants, employees and police to watch over pedestrian, parking and loading areas. **For building security the tenant is restricting windows in the manufacturing areas at eye level. Generally surveillance is by security cameras as TI.**

(10) Where practicable locate windows and provide lighting in a manner which enables surveillance of interior activity from the public right-of-way or other public areas. **Accomplished, see drawings.**

**Section 73.220 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) Safety and Security.

(a) Locate, orient and select on-site lighting to facilitate surveillance of on-site activities from the public right-of-way or other public areas without shining into public rights-of-way or fish and wildlife habitat areas. **We propose conventional LED lighting fixtures with glare cut-off features limiting the light at ROWs, and the Lighting Plan shows good lighting distribution in the pavement areas.**

(b) Provide an identification system which clearly identifies and locates buildings and their entries. **Signage is as TI, but the architectural language makes entries a natural focal point in this design.**

(c) Shrubs in parking areas shall not exceed 30 inches in height, and tree canopies must not extend below 8 feet measured from grade, except for parking structures and underground parking where this provision shall not apply.

**Acknowledge.**

**Section 73.225 Mixed Solid Waste and Source Separated Recyclables** 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:

(v) Commercial, industrial, public and semi-public developments shall provide a minimum storage area of 10 square feet plus: Office - 4 square feet/1000 square feet gross leasable area (GLA); Retail - 10 square feet/1000 square feet GLA; Wholesale/ Warehouse/ Manufacturing - 6 square feet/1000 square feet GLA; Educational and institutional - 4 square feet/1000 square feet GLA; and other - 4 square feet/1000 square feet GLA. **Our solid waste/recyclable storage area is shown in the rear service areas on our site plan and is thoughtfully placed to be functional and not visible to the public. Our calculations on the A-1 Site Plan showing we meet the requirement.**

## LANDSCAPING

### **Section 73.240 Landscaping General Provisions.**

(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. When a dedication is granted in accordance with the planning district provisions on the subject property for a fish and wildlife habitat area, the minimum area requirement for landscaping may be reduced by 2.5 percent from the minimum area requirement as determined through the AR process. **We significantly exceed the 15% minimum landscaping area requirement, see site plan notes.**

(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.). **Acknowledge.**

(13) Landscape plans for required landscaped areas that include fences should carefully integrate any fencing into the plan to guide wild animals toward animal crossings under, over, or around transportation corridors. **No fencing proposed.**

**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. **Acknowledge. Our proposal fully landscapes the buildable portion of our lot, which is currently in natural grass only.**

**Ownership's intention is to contract with Clean Water Services to landscape the no-build natural areas.**

(2) Plant materials shall be watered at intervals sufficient to ensure survival and growth for a minimum of two growing seasons. **Acknowledge. Ownership is proven to maintain their landscaping well on the adjacent three buildings.**

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

(4) Disturbed soils should be amended to an original or higher level of porosity to regain infiltration and stormwater storage capacity. [Ord. 1224-06 §27, 11/13/06] **Acknowledge.**

**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. **We exceed the minimum on all building sides.**

(2) Areas exclusively for pedestrian use that are developed with pavers, bricks, etc., and contain pedestrian amenities, such as benches, tables with umbrellas, children's play areas, shade trees, canopies, etc., may be included as part of the site landscape area requirement. **We have not included our plazas with pedestrian amenities as landscape area.**

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

**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. **Accomplished, see landscape plan.**

(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). **The project exceeds landscaping minimums at the owner's request, and will present itself as a densely landscaped from public roads.**

**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 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. **Accomplished, see landscape plan.**
- (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). **Accomplished, see site plan.**
- (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). **Accomplished, see landscape plan.**
- (4) Landscape islands shall be utilized at aisle ends to protect parked vehicles from moving vehicles and emphasize vehicular circulation patterns. **Accomplished, see landscape plan.**
- (5) Required plant material in landscape islands shall achieve 90 percent coverage within three years. Native shrubs and trees are encouraged. **Acknowledge. Ownership is personally involved in plant selection at the nurseries on his projects, and he exceeds code minimum size in most selections.**
- (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. **Acknowledge. Our access drives are off the existing private Haul Road, where this requirement does not apply.**

#### **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. In case of conflicts between guidelines or objectives in TDC Chapter 73, the proposal shall provide a balance. **Off-street vanpool and carpool parking spaces are shown on our A-1 Site Plan with supporting code calculations.**

(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.

##### **Acknowledge.**

(h) When several uses occupy a single structure, the total requirements for off-street parking may be the sum of the requirements of the several uses computed separately or be computed in accordance with TDC 73.370(1)(m), Joint Use Parking. **Acknowledge, see our project statistics on A-1 Site Plan.**

(ii) The total number of parking spaces meets the standards for the sum of the number of spaces which would be separately required for each use. **Acknowledge, see our project statistics on the A-1 Site Plan.**

(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. **Accomplished, see A-1 Site Plan, which clarifies there are exterior racks near the main entry and interior bike storage.**

(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. **Accomplished, see site plan.**

(s) Long-term bicycle parking facilities may be provided inside a building in suitable secure and accessible locations. **Our proposal includes interior long-term secure bike storage near showers, and three short-term uncovered bike racks near the lobby. Bike calculations are on A1.1 Site Plan. The interior secure storage is being coordinated with the tenant's TI Architect, and will be part of the TI permit.**

(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.

**Accomplished, see site plan.**

(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. **Accomplished, see site plan.**

(v) Required bicycle parking spaces shall be provided at no cost to the bicyclist, or with only a nominal charge for key deposits, etc. This shall not preclude the operation of private for-profit bicycle parking businesses. **Acknowledge there is no cost for bike parking. Ownership would like to advise Planning that in his experience, bike riders using his buildings tend towards expensive bikes that they choose to store inside near their desks.**

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

**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.

**Accomplished, see A-1 Site Plan.**

(2) Parking stalls for sub-compact vehicles shall not exceed 35 percent of the total parking stalls required by TDC 73.370(2). Stalls in excess of the number required by TDC 73.370(2) can be sub-compact stalls. **Acknowledge, see A-1 Site Plan.**

(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. **Acknowledge this rigid requirement, see A-1 Site Plan.**

(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. **Acknowledge.**

(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.

**Accomplished, see A-1 Site Plan.**

(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. **Accomplished, see site plan.**

(11) On-site drive aisles without parking spaces, which provide access to parking areas with regular spaces or with a mix of regular and sub-compact spaces, shall have a minimum width of 22 feet for two-way traffic and 12 feet for one-way traffic. **Accomplished, see A-1 Site Plan.**

**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**

5,000 - 25,000 1

25,000 - 60,000 2

60,000 and over 3 **We provide three (3) - 12' x 60' dock-high loading berths per code. We also provide on-grade van service doors. For aesthetics we infill our van service doors openings with glass/aluminum doors.**

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

(a) Commercial, public and semi-public uses of 5,000 to 25,000 square feet shall be 12' x 25' and uses greater than 25,000 shall be 12' x 35'.

(b) Industrial uses - 12' x 60' **We provide three (3) - 12' x 60' dock-high loading berths per code.**

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

(d) Loading berths shall not use the public right-of-way as part of the required off-street loading area. **Accomplished, the service area is well screened by buildings in the rear area away from Public ROWs.**

(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. **Accomplished, we are screened from the public roads by buildings, including the neighbors building. We are screened from adjacent occupied properties by natural areas.**

(4) Required loading facilities shall be installed prior to final building inspection and shall be permanently maintained as a condition of use. **Agreed.**

(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. **Accomplished.**

#### **Section 73.400 Access.**

(1) The provision and maintenance of vehicular and pedestrian ingress and egress from private property to the public streets as stipulated in this Code are continuing requirements for the use of any structure or parcel of real property in the City of Tualatin. Access management and spacing standards are provided in this section of the TDC and TDC Chapter 75. No building or other permit shall be issued until scale plans are presented that show how the ingress and egress requirement is to be fulfilled. If the owner or occupant of a lot or building changes the use to which the lot or building is put, thereby increasing ingress and egress requirements, it shall be unlawful and a violation of this code to begin or maintain such altered use until the required increase in ingress and egress is provided. **Acknowledge.**

(2) Owners of two or more uses, structures, or parcels of land may agree to utilize jointly the same ingress and egress when the combined ingress and egress of both uses, structures, or parcels of land satisfies their combined requirements as designated in this code; provided that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases or contracts to establish joint use. Copies of said deeds, easements, leases or contracts shall be placed on permanent file with the City Recorder. **Acknowledge.**

(3) Joint and Cross Access.

(a) Adjacent commercial uses may be required to provide cross access drive and pedestrian access to allow circulation between sites. **Acknowledge.**

(14) Maximum Driveway Widths and Other Requirements.

(a) Unless otherwise provided in this chapter, maximum driveway widths shall not exceed 40 feet.

**Accomplished.**

(b) Except for townhouse lots, no driveways shall be constructed within 5 feet of an adjacent property line, except when two adjacent property owners elect to provide joint access to their respective properties, as provided by Subsection (2). **We meet this requirement.**

(c) There shall be a minimum distance of 40 feet between any two adjacent driveways on a single property unless a lesser distance is approved by the City Engineer. **We meet this requirement.**

(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.

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

(16) Vision Clearance Area.

(a) Local Streets - A vision clearance area for all local street intersections, local street and driveway intersections, and local street or driveway 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 10 feet from the intersection point of the right-of-way lines, as measured along such lines (see Figure 73-2 for illustration). **Acknowledge.**

(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). **Acknowledge.**

(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). **Acknowledge.**

**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. **Acknowledge, see landscape plan. Note, street trees and sidewalk exist at Hedges C's SW 115<sup>th</sup> Avenue's frontage, which was part of earlier ROW improvements.**

**Section 74.765 Street Tree Species and Planting Locations.** All trees, plants or shrubs planted in the right-of-way of the City shall conform in species and location and in accordance with the street tree plan in Schedule A. **Acknowledge, see landscape plan.**



The west side of Hedges B as seen from the Hedges C lot. Hedges B is nearing completion and will be occupied by Perlo Construction. Landscaping is just being installed. The stained precast concrete is seen in the evening yellowing sun 12/6/18.

End of Narrative

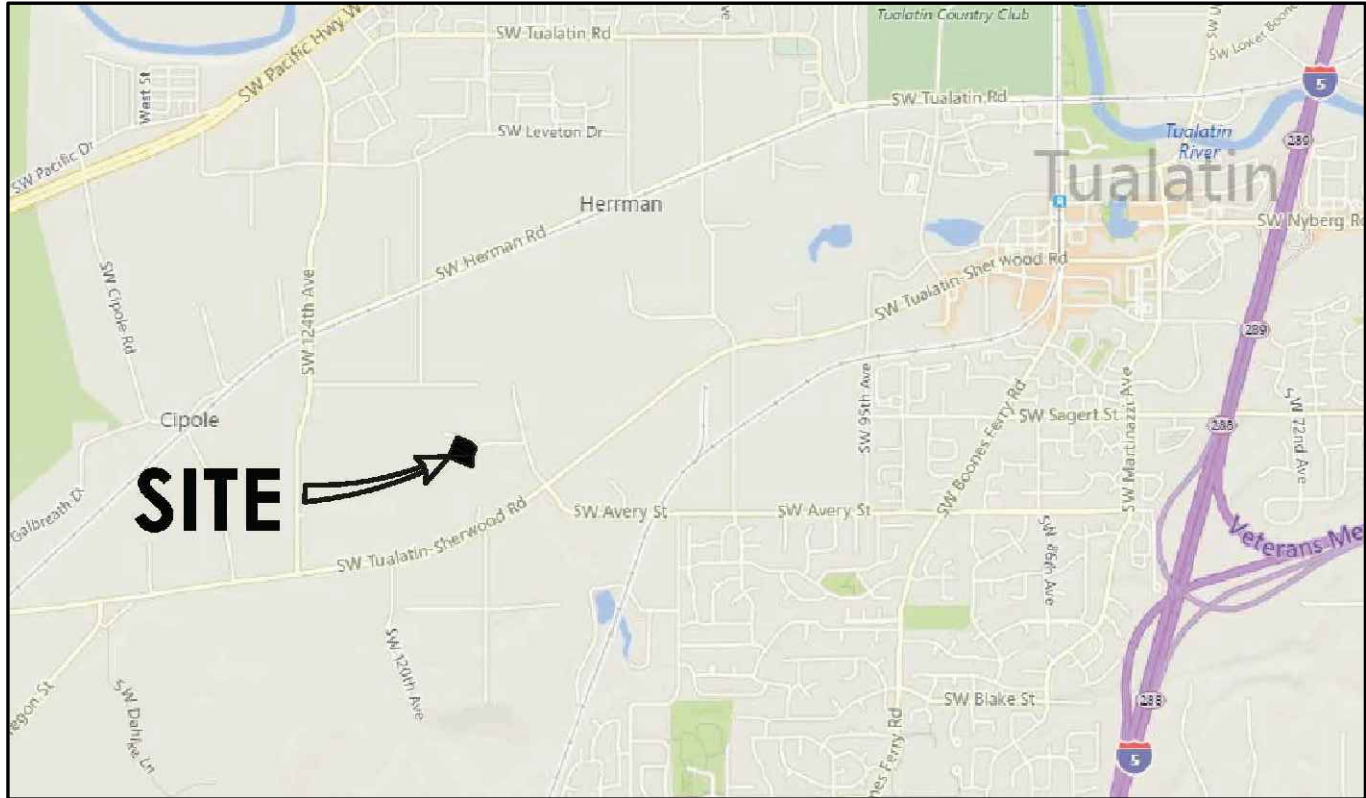
## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

**Item 7**

**Vicinity Plan – 8.5 x 11**

# VICINITY MAP



## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

**Item 8**

**Legal Description** as it appears on deed – one copy.

**Hedges C** SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

Legal Description as it appears on deed:

EXHIBIT "A"

LEGAL DESCRIPTION

All that certain real property in the County of Washington, State of Oregon,  
described as follows:

Lot 8, FRANKLIN BUSINESS PARK NO. 4, in the City of Tualatin, County of  
Washington and State of Oregon, a subdivision recorded February 8, 2008,  
Recording No. 2008-010869.

TOGETHER WITH AND SUBJECT TO access rights over and across private road  
(known as Hedges Creek Drive) as described in Declaration of Access Easement  
recorded July 6, 2011, Recording No. 2011-047430.

Tax Lot ID 2S127BA00600

## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### **Item 9**

**Mixed Solid Waste Recyclables Plan** – see sheet A-1.

- b. Letter from franchise hauler reviewing the facility. (Note – no tenant identified yet.)



10295 Southwest Ridder Road Wilsonville, OR 97070  
o 503.570.0626 f 503.582.9307 republicservices.com

January 28, 2019

Bob Wells  
Lance Mueller & Associates / Architects

Re: Hedges C  
SW 115<sup>th</sup> Ave.  
Tualatin, OR

Dear Mr. Wells,

Thank you, for sending us the final site plans for this proposed construction in Tualatin.

My Company: Republic Services of Clackamas and Washington Counties has the franchise agreement to service this area with the City of Tualatin. We will provide complete commercial waste removal and recycling services as needed on a weekly basis for this location.

The design plans & location of the trash and recycle enclosure positioned at the Southwest corner of the property will allow access for our trucks.

Thanks Bob for your help and concerns for our services prior to this project being developed.

Sincerely,

A handwritten signature in black ink, appearing to read "Kelly Herrod", written over a light blue horizontal line.

Kelly Herrod  
Operations Supervisor  
Republic Services Inc.



**Architectural Review Note:** The following is email correspondence to date regarding trash/recycle enclosure approval from the franchise vendor. Drawings submitted are the A1.1 Site Plan and A1.2 trash/recycle enclosure details. Access and location were given approval 12/10/18, which is highlighted below in "yellow". Full approval letter is pending Republic Services review.

**From:** Bob Wells <[BWells@lmueller.com](mailto:BWells@lmueller.com)>  
**Sent:** Friday, December 14, 2018 10:46 AM  
**To:** Olivares, John <[JOlivares@republicservices.com](mailto:JOlivares@republicservices.com)>  
**Subject:** Hedges C: franchise hauler approval letter (Tualatin)

John, thank you for the quick response. Attached for approval is details of the trash/recycle enclosure itself, plus the site plan previously submitted.

**Bob Wells** | Associate | **Lance Mueller & Associates / Architects** | 130 Lakeside, #250 Seattle, WA 98122  
P 206-325-2553 x120 | F 206-328-0554 | C **206-915-2442**

**From:** Olivares, John [<mailto:JOlivares@republicservices.com>]  
**Sent:** Monday, December 10, 2018 10:37 AM  
**To:** Bob Wells  
**Subject:** FW: Hedges C: franchise hauler approval letter (Tualatin)

Bob,

The access looks fine (easily accessible for our truck to be able to drive straight up to the enclosure) but we will need design plans for the actual enclosure which we will need to review prior to drafting an approval letter. I have attached our minimum specs for FL enclosure as a guide.

Thank you.

**John Olivares**  
Operations Manager  
Wilsonville / Tualatin  
Lake Oswego / Clackamas & Washington Counties

10295 SW Ridder Rd. Wilsonville OR 97070  
e [jolivares@republicservices.com](mailto:jolivares@republicservices.com)  
c 503-826-7139  
w [www.RepublicServices.com](http://www.RepublicServices.com)



We'll handle it from here.™

**From:** Bob Wells <[BWells@lmueller.com](mailto:BWells@lmueller.com)>  
**Sent:** Friday, December 7, 2018 11:46 AM  
**To:** Olivares, John <[JOlivares@republicservices.com](mailto:JOlivares@republicservices.com)>  
**Cc:** 'macmartinis@gmail.com' <[macmartinis@gmail.com](mailto:macmartinis@gmail.com)>  
**Subject:** Hedges C: franchise hauler approval letter (Tualatin)

Note that ([BWells@lmueller.com](mailto:BWells@lmueller.com)) is an external email. Forward unfamiliar emails to [infosec.phishing@republicservices.com](mailto:infosec.phishing@republicservices.com)

Hello John Olivares,

We are submitting for Architectural Review to Tualatin Planning for entitlement approval as a first step to submitting for building permit. One of the many requirements is an approval letter from you, as the franchise trash hauler, for our trash/recycle enclosure concept. The tenant will be Machine Solutions Corporation in Wilsonville, and we plan to begin construction in 2019.

Attached is our site plan for review, and I've added some red-marks to clarify your access. You can see for this location your access is excellent. Trash/recycle enclosure size is code minimum as a place marker, and after further discussions with the tenant it is likely the recycle area will grow to the south. You will get to review this again at building permit submittal.

Trash/recycle enclosure 8' high walls are concrete and doors are galvanized steel, as this is a first class manufacturing building.

A quick approval letter would be appreciated. Thank you,

**Bob Wells** | Associate | **Lance Mueller & Associates / Architects** | 130 Lakeside, #250 Seattle, WA 98122  
|  
P 206-325-2553 x120 | F 206-328-0554 | C 206-915-2442

John Olivares  
**Republic Services**  
10295 SW Ridder Rd.  
Wilsonville OR 97070  
503-826-7139

## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

**Item 10**

**Recent Title Report** – no older than 30 days.



25 NW 23rd Place Suite 1 / Commercial Dept  
Portland, OR 97210  
Phone (503) 219-9088 Fax (503) 477-6476

WFG National Title Insurance Company  
Trevor Cheyne  
25 NW 23rd Place Suite 1 / Commercial Dept  
Portland, OR 97210

Date Prepared: October 24, 2018

## PRELIMINARY TITLE REPORT

Order Number: **18-226823**  
Escrow Officer: Trevor Cheyne  
Phone: (503) 444-7047  
Fax: (503) 296-5869  
Email: [tcheyne@wfgnationaltitle.com](mailto:tcheyne@wfgnationaltitle.com)

**Borrower(s): Hedges C, An LLC**

**Property: 0 SW Amu Street, Tualatin, OR 97062**

**The following items have been amended:  
Change buyers name**

**WFG National Title Insurance Company**, is prepared to issue a title insurance policy, as of the effective date and in the form and amount shown on Schedule A, subject to the conditions, stipulations and exclusions from coverage appearing in the policy form and subject to the exceptions shown on Schedule B. This Report (and any Amendments) is preliminary to and issued solely for the purpose of facilitating the issuance of a policy of title insurance at the time the real estate transaction in question is closed and no liability is assumed in the Report. The Report shall become null and void unless a policy is issued and the full premium paid.

This report is for the exclusive use of the person to whom it is addressed. Title insurance is conditioned on recordation of satisfactory instruments that establish the interests of the parties to be insured; until such recordation, the Company may cancel or revise this report for any reason.

## SCHEDULE A

1. The effective date of this preliminary title report is **8:00 A.M.** on **17th day of October, 2018**
2. The policies and endorsements to be insured and the related charges are:

<u>Policy/Endorsement Description</u>	<u>Liability</u>	<u>Charge</u>
<b>ALTA 2006 Ext. Loan Policy</b>	<b>\$8,900,000.00</b>	<b>\$13,950.00</b>
Short Term Rate		\$13,950.00

**Proposed Insured: Wells Fargo N.A., its successors and/or assigns**

**Government Service Fee: \$25.00**

This is a preliminary billing only, a consolidated statement of charges, credits and advances, if any, in connection with this order will be provided at closing.

3. Title to the land described herein is vested in:  
**Hedges C, An LLC, an Oregon limited liability company**

4. The estate or interest in land is:

**Fee Simple**

5. The land referred to in this report is described as follows:

**SEE ATTACHED EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF**

**EXHIBIT "A"**  
**LEGAL DESCRIPTION**

Lot 8, FRANKLIN BUSINESS PARK NO. 4, in the City of Tualatin, County of Washington and State of Oregon, a subdivision recorded February 8, 2008, Recording No. 2008-010869.

TOGETHER WITH AND SUBJECT TO access rights over and across private road (known as Hedges Creek Drive) as described in Declaration of Access Easement recorded July 6, 2011, Recording No. 2011-047430.

## SCHEDULE B

### GENERAL EXCEPTIONS

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the public records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
4. Any encroachment (of existing improvements located on the subject land onto adjoining land or of existing improvements located on adjoining land onto the subject land), encumbrance, violation, variation, or adverse circumstance affecting the title that would be disclosed by an accurate and complete land survey of the subject land.
5. Any lien, or right to a lien, for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the public records.

### SPECIAL EXCEPTIONS

6. Any adverse claim or defect in the title based upon the assertion that some portion of said land has been removed from or brought within the boundaries of the premises by a avulsive movement of Hedges Creek or has been formed by a process of accretion or reliction or has been created by artificial means or has accreted to such portion so created.
7. Government rights to connect with flood control and propagation of anadromous fish and public rights of fishing and recreational navigation in and to the water, bed and shoreline of the Hedges Creek.
8. Easement, including the terms and provisions thereof:

For	:	Storm Drain Channel
Granted to	:	the City of Tualatin, its successors in interest and assigns
Recorded	:	February 9, 2000
Recording No(s)	:	<a href="#">2000-010208</a>
Affects	:	Said Storm Drain channel is delineated on the plat of Franklin Business Park No. 4
9. Covenants, Conditions and Restrictions, including the terms and provisions thereof, as shown on the recorded plat of [Franklin Business Park](#).
10. Easement as shown on the plat of [Franklin Business Park](#)

For	:	Conservation purposes
Affects	:	25 foot strips shown on the plat

Also delineated on the Plat of Franklin Business Park No. 4.

11. Covenants, Conditions, Restrictions and Easements, including the terms and provisions thereof, in Declaration of Franklin Business Park:
- Recorded : November 10, 2004  
Recording No(s) : [2004-129475](#)
- Easements rights over the common areas for the benefit of the Association and the Owners of Franklin Business Park, for access, ingress and egress over all the common areas disclosed in above Declaration, subject to terms therein.
- As amended by First Amendment:
- Recorded : August 5, 2005  
Recording No(s) : [2005-093498](#)
- As amended by Second Amendment:
- Recorded : July 8, 2011  
Recording No(s) : [2011-047427](#)
- Said Second Amendment was
- Re-Recorded : July 15, 2011  
Recording No(s) : [2011-049589](#)
- Assignment of Declarant Rights:
- Assignor : Franklin Business Park LLC, an Oregon limited liability company  
Assignee : Franklin Business Park Owners Association, an Oregon nonprofit corporation
- Recorded : April 17, 2018  
Recording No(s) : [2018-026472](#)
12. Said Covenants, Conditions and Restrictions set forth above contain, amount other things, levies and assessments of Franklin Business Park Owners Association.
13. Easement, including the terms and provisions thereof:
- For : Public Utility Access  
Granted to : the City of Tualatin, its successors in interest and assigns
- Recorded : December 16, 2005  
Recording No(s) : [2005-158560](#)  
Affects : along the North lot line (being within the private street known as Hedges Creek Drive)
14. Covenants, Conditions and Restrictions, including the terms and provisions thereof, as shown on the recorded Plat of [Franklin Business Park No. 4](#).
15. Easement and Maintenance Agreement, including the terms and provisions thereof, in Declaration of Access Easement
- For : Ingress and egress for vehicular and pedestrian traffic on Hedges Creek Drive
- And : Lot 7, Franklin Business Park No. 3, Lot 8, Franklin Business Park No. 4, and the portion of Lot 4, Franklin Business Park (now known as Franklin Business Park No. 6)
- Recorded : July 6, 2011  
Recording No(s) : [2011-047430](#)  
Affects : The North part and appurtenant rights.
16. City liens, if any, of the City of Tualatin.

NOTE: We are unable to find these parcels on Conduit System.



17. Unpaid Taxes for 2018 -2019:
- |                 |   |   |
|-----------------|---|---|
| Levied Amount   | : | \$17,783.65, plus interest and fees, if any |
| Property ID No. | : | <a href="#">R2159667</a>                    |
| Levy Code       | : | 088.15                                      |
| Map Tax Lot No. | : | 2S127BA 00600                               |
18. The requirement that a copy of the Operating Agreement of Hedges C, An LLC, an Oregon limited liability company be submitted to us for examination. Any conveyance or encumbrance by said Company should be executed in accordance with the Operating Agreement of said Company.
19. This Commitment is subject to approval by personnel of WFG National Title Insurance Company and any additional limitations, requirements or exceptions made by WFG National Title Insurance Company.
20. Any unrecorded leases or rights of tenants in possession.
21. Statutory liens for labor or materials, including liens for contributions due to the State of Oregon for unemployment compensation and for workmen's compensation, which have now gained or hereafter may gain priority over the lien of the insured mortgage where no notice of such liens appear of record.
22. An accurate survey of these premises showing boundary lines, and location of improvements and easements, should be furnished for our review prior to our writing an ALTA Extended Policy. Exception may be taken to such matters as may be shown thereby.

LINKS FOR ADDITIONAL SUPPORTING DOCUMENTS:

- [Assessor's Map](#)
- [Taxes](#)
- [Vested deed](#)
- [Plat Map Franklin Business Park No. 4](#)
- [Easement 2011-047430](#)
- [Colored easements on Franklin Business Park](#)
- [Colored easements on Franklin Business Park No. 4](#)

**END OF EXCEPTIONS**

NOTE: We find NO judgments or Federal Tax Liens against the name(s) of Hedges C, An LLC.

NOTE: In no event shall WFG National Title Insurance Company have any liability for the tax assessor's imposition of any additional assessments for omitted taxes unless such taxes have been added to the tax roll and constitute liens on the property as of the date of closing. Otherwise, such omitted taxes shall be the sole responsibility of the vestee(s), herein.

NOTE: No search has been made for Financing Statements filed in the office of the Secretary of State. Exception may be taken to such matters as may be shown thereby. No liability is assumed if a Financing Statement is filed in the office of the County Recorder covering timber, crops, fixtures or contracts on the premises wherein the lands are described other than by metes and bounds or under the rectangular survey system or by recorded lot and block.

NOTE: The Oregon Corporation Commission disclosed that [Hedges C, An LLC](#), is an active Oregon limited liability company:

Filed	:	January 24, 2018
Member	:	Mac Martin
Manager	:	John Martin
Registered Agent	:	M65 LLC

NOTE: The following is incorporated herein for information purposes only and is not part of the exception from coverage (Schedule B-II of the prelim and Schedule B of the policy):The following instrument(s), affecting said

property, is (are) the last instrument(s) conveying subject property filed for record within 24 months of the effective date of this preliminary title report:

Warranty Deed

Grantee(s): Hedges C, An LLC  
Grantor(s): Franklin Business Park LLC, an Oregon limited liability company  
Recorded Date: January 29, 2018  
Recording No: (instrument) 2018-006915, of Official Records  
COMMENTS: [2018-006915](#)

NOTE: The following applicable recording fees will be charged by the county:

Multnomah County-First Page	\$82.00
Washington County-First Page	\$81.00
Clackamas County-First Page	\$93.00
Each Additional Page	\$ 5.00
Non-standard Document Fee	\$20.00
E-recording Fee	\$ 3.00

**Washington County Ordinance No. 193, recorded May 13, 1977 in Washington County, Oregon imposes a tax of \$1.00 per \$1,000.00 or fraction thereof on the transfer of real property located within Washington County.**

NOTE: IMPORTANT INFORMATION REGARDING PROPERTY TAX PAYMENTS

Fiscal Year:	July 1 <sup>st</sup> through June 30 <sup>th</sup>
Taxes become a lien on real property, but are not yet payable.	July 1 <sup>st</sup>
Taxes become certified and payable (approximately on this date)	October 15 <sup>th</sup>
First one third payment of taxes are due	November 15 <sup>th</sup>
Second one third payment of taxes are due	February 15 <sup>th</sup>
Final payment of taxes are due	May 15 <sup>th</sup>

Discounts: If two thirds are paid by November 15<sup>th</sup>, a 2% discount will apply.  
If the full amount of the taxes are paid by November 15<sup>th</sup>, a 3% discount will apply.

Interest: Interest accrues as of the 15<sup>th</sup> of each month based on any amount that is unpaid by the due date. No interest is charged if the minimum amount is paid according to the above mentioned payment schedule.

**NOTE: THE FOLLOWING NOTICE IS REQUIRED BY STATE LAW: YOU WILL BE REVIEWING, APPROVING AND SIGNING IMPORTANT DOCUMENTS AT CLOSING. LEGAL CONSEQUENCES FOLLOW FROM THE SELECTION AND USE OF THESE DOCUMENTS. YOU MAY CONSULT AN ATTORNEY ABOUT THESE DOCUMENTS. YOU SHOULD CONSULT AN ATTORNEY IF YOU HAVE QUESTIONS OR CONCERNS ABOUT THE TRANSACTION OR ABOUT THESE DOCUMENTS. IF YOU WISH TO REVIEW TRANSACTION DOCUMENTS THAT YOU HAVE NOT SEEN, CONTACT THE ESCROW AGENT.**

**End of Report**

**Your Escrow Officer**

Trevor Cheyne  
WFG National Title Insurance Company  
25 NW 23rd Place Suite 1 / Commercial Dept  
Portland, OR 97210  
Phone: (503) 444-7047  
Fax: (503) 296-5869  
Email: [tcheyne@wfgnationaltitle.com](mailto:tcheyne@wfgnationaltitle.com)



WFG National Title Insurance Company is prepared to issue, as of the date specified in the attached Preliminary Title Report (the Report), a policy or policies of title insurance as listed in the Report and describing the land and the estate or interest set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as a General or Specific Exception or not excluded from coverage pursuant to the printed Exclusions and Conditions of the policy form(s).

The printed General Exceptions and Exclusions from the coverage of the policy or policies are listed in Exhibit One to the Report. In addition, the forms of the policy or policies to be issued may contain certain contract clauses, including an arbitration clause, which could affect the party's rights. Copies of the policy forms should be read. They are available from the office which issued the Report.

The Report (and any amendments) is preliminary to and issued solely for the purpose of facilitating the issuance of a policy of title insurance at the time the real estate transaction in question is closed and no liability is assumed in the Report.

The policy(s) of title insurance to be issued will be policy(s) of WFG National Title Insurance Company.

**Please read the Specific Exceptions shown in the Report and the General Exceptions and Exclusions listed in Exhibit One carefully. The list of Specific and General Exceptions and Exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy to be issued and should be read and carefully considered.**

**It is important to note that the Report is not an abstract of title, a written representation as to the complete condition of the title of the property in question, and may not list all liens, defects and encumbrances affecting title to the land.**

The Report is for the exclusive use of the parties to this transaction, and the Company does not have any liability to any third parties or any liability under the terms of the policy(s) to be issued until the full premium is paid. Until all necessary documents are recorded in the public record, the Company reserves the right to amend the Report.

Countersigned

**Exhibit One**  
**2006 American Land Title Association Loan Policy 6-17-06**  
**EXCLUSIONS FROM COVERAGE**

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
  - (i) the occupancy, use, or enjoyment of the Land;
  - (ii) the character, dimensions, or location of any improvement erected on the Land;
  - (iii) the subdivision of land; or
  - (iv) environmental protection;or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
  - (a) created, suffered, assumed, or agreed to by the Insured Claimant;
  - (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
  - (c) resulting in no loss or damage to the Insured Claimant;
  - (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
  - (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
  - (a) a fraudulent conveyance or fraudulent transfer, or
  - (b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

**THE ABOVE POLICY FORM MAY BE ISSUED TO AFFORD EITHER Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:**

**SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE**

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the public records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
4. Any encroachment (of existing improvements located on the subject land onto adjoining land or of existing improvements located on adjoining land onto the subject land), encumbrance, violation, variation, or adverse circumstance affecting the title that would be disclosed by an accurate and complete land survey of the subject land.
5. Any lien, or right to a lien, for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the public records.

**2006 AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY 6-17-06**  
**EXCLUSIONS FROM COVERAGE**

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
  - (i) the occupancy, use, or enjoyment of the Land;
  - (ii) the character, dimensions, or location of any improvement erected on the Land;
  - (iii) the subdivision of land; or
  - (iv) environmental protection;or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
  - (a) created, suffered, assumed, or agreed to by the Insured Claimant;
  - (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
  - (c) resulting in no loss or damage to the Insured Claimant;
  - (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
  - (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
  - (a) a fraudulent conveyance or fraudulent transfer; or
  - (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

**SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE**

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, not shown by the public records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
4. Any encroachment (of existing improvements located on the subject land onto adjoining land or of existing improvements located on adjoining land onto the subject land), encumbrance, violation, variation, or adverse circumstance affecting the title that would be disclosed by an accurate and complete land survey of the subject land.

Any lien, or right to a lien, for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the public records.



## ABOUT YOUR PRIVACY

At WFG, we believe it is important to protect the privacy and confidences of our customers. This notice is intended to explain how we collect, use, and protect any information that we may collect. It will explain the choices you may make about the use of that information.

### What Information Do We Collect About You?

We collect certain types of information about you. This may consist of:

- Your name, address, and telephone number.
- Your email address.
- Your social security or government ID numbers.
- Your financial information.

We collect this information from:

- The application or other forms you fill out with us.
- The correspondence you and others direct to us.
- Our transactions with you.
- Others involved in your transaction, including the real estate agent or lender.

In some cases, we collect information from third parties. For instance, we may receive real estate information from local assessor's offices.

### How Do We Use This Information?

We use the information we collect to respond to your requests. **WE DO NOT SHARE** your information with other companies.

### How Can You "Opt Out?"

We do not share your information so there is no need to opt out.

### The information We Collect About You On Our Website

When you enter our website, we automatically collect and store certain information. This consists of:

- Your IP Address
- (Internet Protocol Address) and domain name.
- The type of browser and operating system you use.
- The time of your visit.
- The pages of our site you visit.

If you register with us or fill out an on online survey, we will collect additional personal information, such as your name, telephone number, email address and mailing address.

### Cookie Usage

In order to provide you with customized service, we make use of "cookies." Cookies are essentially files that help us identify your computer and respond to it. You may disable cookies on your own computer, but you may not be able to download online documents unless cookies are enabled.

## **How We Use Information**

The information we collect concerning:

- Your browser
- The time and date of your visit
- The web pages or services you accessed

is used for administrative and technical purposes. For instance, we may use it to count the number of visitors to our site and determine the most popular pages. We may also use it to review types of technology you are using, determine which link brought you here, assess how our advertisements on other sites are working, and to help with maintenance.

We use information contained in your emails only for the purpose of responding to those emails. If we ask you to fill out any forms or surveys, we will use the information we receive only for the specific purposes indicated in those forms or surveys.

## **Your Right to See and Correct Information**

If you wish to see the information collected about you, please contact your settlement agent.

## **Children's Policy**

We do not knowingly collect information from children under the age of 18. We delete any information that we discover has been provided by children.

## **Security**

### **--Generally**

We make every effort to protect the integrity of your information. Any personal information you enter into online forms or surveys will be encrypted to ensure it remains private. We limit the right of access to your information to employees that need to use the information to respond to or process your request or transaction. We also take industry standard (IPSEC) measures to protect our sites from malicious intrusions or hacking.

### **--Phishing and Pretexting**

As you know, consumers are increasingly targeted by unscrupulous persons attempting to acquire sensitive personal or financial information, by impersonating legitimate businesses. We will never send you an unsolicited email or other communication requesting your private information. If you receive a communication directing you to enter your personal information, please disregard the instruction and contact us immediately at [Compliance@wfgnationaltitle.com](mailto:Compliance@wfgnationaltitle.com).

## **Oregon Residents**

We may not disclose personal or privileged information about you unless we provide you with a disclosure authorization form that is executed by you or your representative and otherwise complies with certain statutory requirements. Any such authorization is not valid for more than 24 months and may be revoked by you at any time, subject to the rights of anyone who relied on the authorization prior to your notice of revocation.

In addition, if your personal or privileged information was collected or received by us in connection with a title insurance transaction, we cannot disclose such information if the disclosure authorization form that you executed is more than one year old or if the requested disclosure is for a purpose other than a purpose expressly permitted by statute.

You have the right at any time to request in writing access to recorded personal information about you that is reasonably described by you and reasonably available to us. Within 30 days of the date of our receipt of any such written request from you, we will inform you of the nature and substance of any such information, permit you to see and copy that information or obtain a copy by mail, disclose the identity, if recorded, of the persons to whom we have disclosed such information during the previous two years, and provide you with a summary of the procedures by which you may request that such information be corrected, amended or deleted.

## **Do Not Track**

Because there is not an industry-standard process or defined criteria to permit a user to opt out of tracking their internet access (Do Not Track or DNT), we do not currently respond to the various DNT signals.

## **How to Contact Us**

If you have any questions about our privacy policy, please contact WFG:

- By email: [Compliance@wfgnationaltitle.com](mailto:Compliance@wfgnationaltitle.com)
- By telephone: 800-385-1590
- By fax: 503-974-9596
- By mail: 12909 SW 68<sup>th</sup> Pkwy, Suite 350, Portland, OR 97223
- In person: 12909 SW 68<sup>th</sup> Pkwy, Suite 350, Portland, OR 97223

### **WFG FAMILY**

WILLISTON FINANCIAL GROUP LLC  
WFG NATIONAL TITLE INSURANCE COMPANY  
WFG LENDER SERVICES, LLC  
WFGLS TITLE AGENCY OF UTAH, LLC  
WFG NATIONAL TITLE COMPANY OF WASHINGTON, LLC  
WFG NATIONAL TITLE COMPANY OF CALIFORNIA  
WFG NATIONAL TITLE COMPANY OF TEXAS, LLC D/B/A WFG NATIONAL TITLE COMPANY  
UNIVERSAL TITLE PARTNERS, LLC  
VALUTRUST SOLUTIONS, LLC  
WILLISTON ENTERPRISE SOLUTIONS & TECHNOLOGY, LLC  
WFG NATIONAL TITLE COMPANY OF CLARK COUNTY, WA, LLC D/B/A WFG NATIONAL TITLE  
INLAND PROFESSIONAL TITLE LLC D/B/A WFG NATIONAL TITLE COMPANY OF EASTERN WA  
WFG NATIONAL TITLE COMPANY OF COLORADO



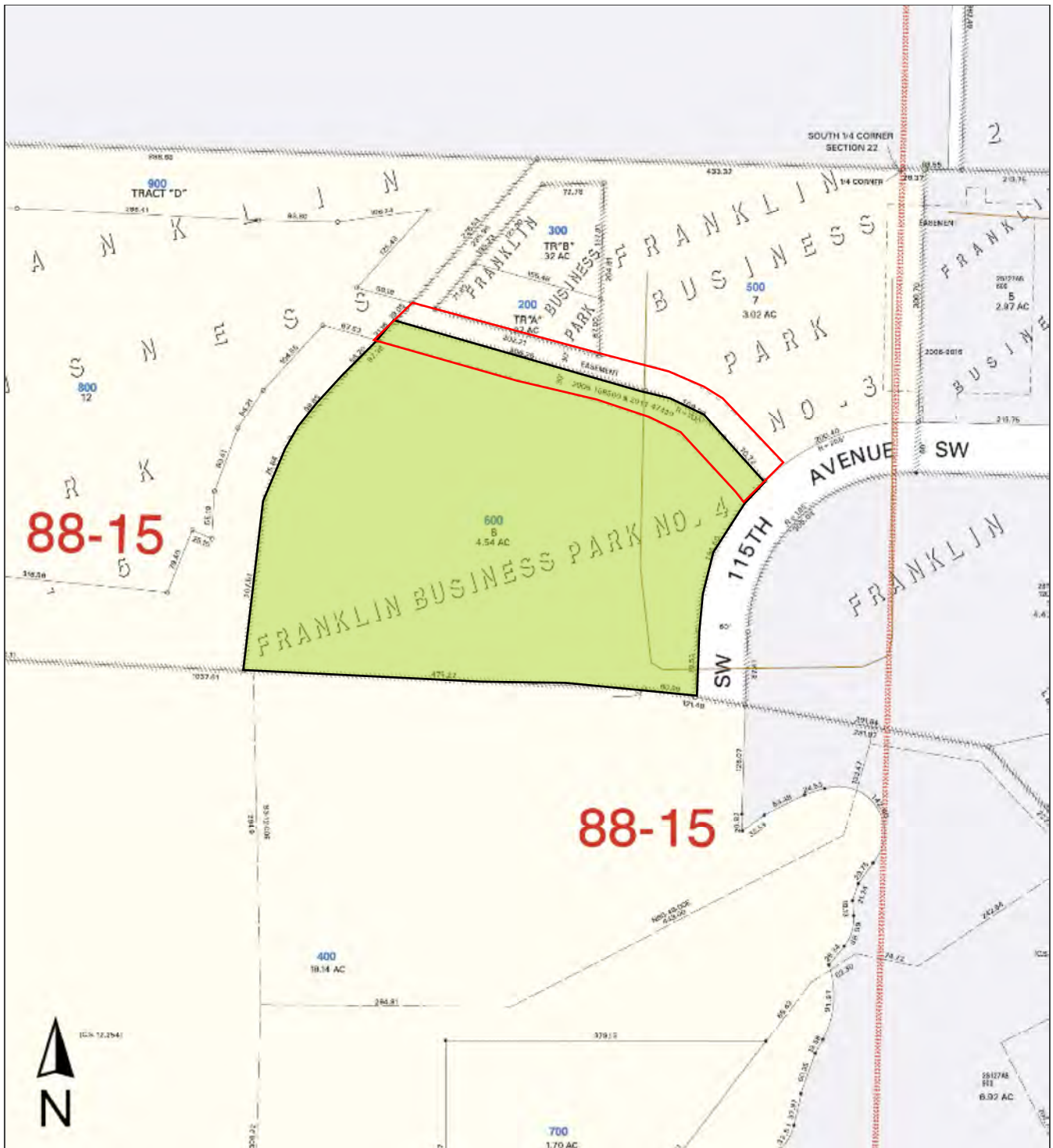
## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### **Item 11**

**Assessors Maps & Mailing Labels** of property owners within 1,000' – 1 paper copy per binder & 1 set of labels)





88-15

88-15



ParcelID: R2159667 2S127BA-00600

Tualatin, OR 97062

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, and is not a survey of the land depicted. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the company does not insure dimensions, distances, location of easements, acreage or other matters shown thereon.

## EXHIBIT A

### HEDGES C Neighbor Meeting Mailing list from escrow:

Edward Wager  
12075 SW Tual-Sherwood Rd  
Tualatin, OR 97062

Washington County  
169 N First Ave #42  
Hillsboro, OR 97124

Tualatin, City Of  
18880 SW Martinazzi Ave  
Tualatin, OR 97062

Norstar Business Center  
PO Box 1696  
Beaverton, OR 97075

Myslony LLC  
11555 SW Myslony St  
Tualatin, OR 97062

Myslony LLC  
11555 SW Myslony St  
Tualatin, OR 97062

Pnwp LLC  
6600 SW 105th Ave, Ste 175  
Beaverton, OR 97008

Cui Properties LLC  
20050 SW 112th Ave  
Tualatin, OR 97062

Tualatin, City Of  
18880 SW Martinazzi Ave  
Tualatin, OR 97062

Franklin Business Park  
Owners Of Lots 1-4  
,

Tualatin Energy LLC  
15786 SW Upper Boones Ferry Rd  
Lake Oswego, OR 97035

Kms Petroleum LLC  
8404 SE 134th Dr  
Portland, OR 97236

Amu Properties LLC  
20049 SW 112th Ave  
Tualatin, OR 97062

Albina Pipe Bending Co Inc  
12080 SW Myslony St  
Tualatin, OR 97062

Ofiplex Or LLC  
2220 Meridian Blvd  
Minden, NV 89423

Ofiplex Or LLC  
2220 Meridian Blvd  
Minden, NV 89423

Gary Walgraeve  
11345 SW Herman Rd  
Tualatin, OR 97062

Pnwp LLC #5  
6600 SW 105th Ave #175  
Beaverton, OR 97008

Pnwp LLC #5  
6600 SW 105th Ave #175  
Beaverton, OR 97008

Tualatin, City Of  
18880 SW Martinazzi Ave  
Tualatin, OR 97062

Tualatin Energy LLC  
15786 SW Upper Boones Ferry Rd  
Lake Oswego, OR 97035

Bennett Living Trust  
10550 S Kelland Ct  
Oregon City, OR 97045

Hedges A, An LLC  
PO Box 15523  
Seattle, WA 98115

Hedges B, An LLC  
PO Box 15523  
Seattle, WA 98115

Hedges B, An LLC  
PO Box 15523  
Seattle, WA 98115

Edward Wager  
8331 SE Carnation St  
Milwaukie, OR 97267

Albina Pipe Bending Co Inc  
12080 SW Myslony St  
Tualatin, OR 97062

118th Avenue LLC  
19695 SW 118th Ave  
Tualatin, OR 97062

Columbia Oregon Myslony  
Ste #1750 120 N Lasalle St  
Chicago, IL 60602

Tualatin Energy LLC  
15786 SW Upper Boones Ferry Rd  
Lake Oswego, OR 97035

## EXHIBIT A

HEDGES C Neighbor Meeting Mailing list from escrow:

D Hedges  
PO Box 15523  
Seattle, WA 98115

D Hedges  
PO Box 15523  
Seattle, WA 98115

Pacific Realty Associates Lp  
15350 SW Sequoia Pkwy #300  
Portland, OR 97224

Tualatin Yards LLC  
19100 SW 51st Ave  
Tualatin, OR 97062

Tualatin Yards LLC  
19100 SW 51st Ave  
Tualatin, OR 97062

Whs Realty Holdings LLC  
5366 Westfield Ct  
Lake Oswego, OR 97035

Marine Lumber Company  
11800 SW Myslony St  
Tualatin, OR 97062

Gary Walgraeve  
11345 SW Herman Rd  
Tualatin, OR 97062

Franklin Business Park LLC  
1202 NW 17th Ave Ste B  
Portland, OR 97209

Edward Wager  
8331 SE Carnation St  
Milwaukie, OR 97267

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Powin Pacific Properties LLC  
PO Box 483  
Tualatin, OR 97062

Ronald Hutchens  
7900 S Three Gait Ln  
Canby, OR 97013

## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### **Item 12**

**Signs** – acknowledge that a separate application is required for signs.

## ARCHITECTURAL REVIEW CERTIFICATION OF SIGN POSTING



The applicant shall provide and post a sign pursuant to Tualatin Development Code (TDC) 31.064(2). Additionally, the 18" x 24" sign must contain the application number, and the block around the word "NOTICE" must remain primary yellow composed of the RGB color values Red 255, Green 255, and Blue 0. Additionally, the potential applicant must provide a flier (or flyer) box on or near the sign and fill the box with brochures reiterating the meeting info and summarizing info about the potential project, including mention of anticipated land use application(s). Staff has a Microsoft PowerPoint 2007 template of this sign design available through the Planning Division homepage at < [www.tualatinoregon.gov/planning/land-use-application-sign-templates](http://www.tualatinoregon.gov/planning/land-use-application-sign-templates)>.

NOTE: For larger projects, the Community Development Department may require the posting of additional signs in conspicuous locations.

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As the applicant for the Hedges C  
project, I hereby certify that on this day, January 18th, 2019 sign(s) was/were posted on the subject property in accordance with the requirements of the Tualatin Development Code and the Community Development Department - Planning Division.

Applicant's Name: Mac Martin  
(PLEASE PRINT)

Applicant's Signature: 

Date: 1/18/19



## NOTICE

### ARCHITECTURAL REVIEW AR-18-0008

For more information call  
503-691-3026 or visit  
[www.tualatinoregon.gov](http://www.tualatinoregon.gov).



## Hedges C

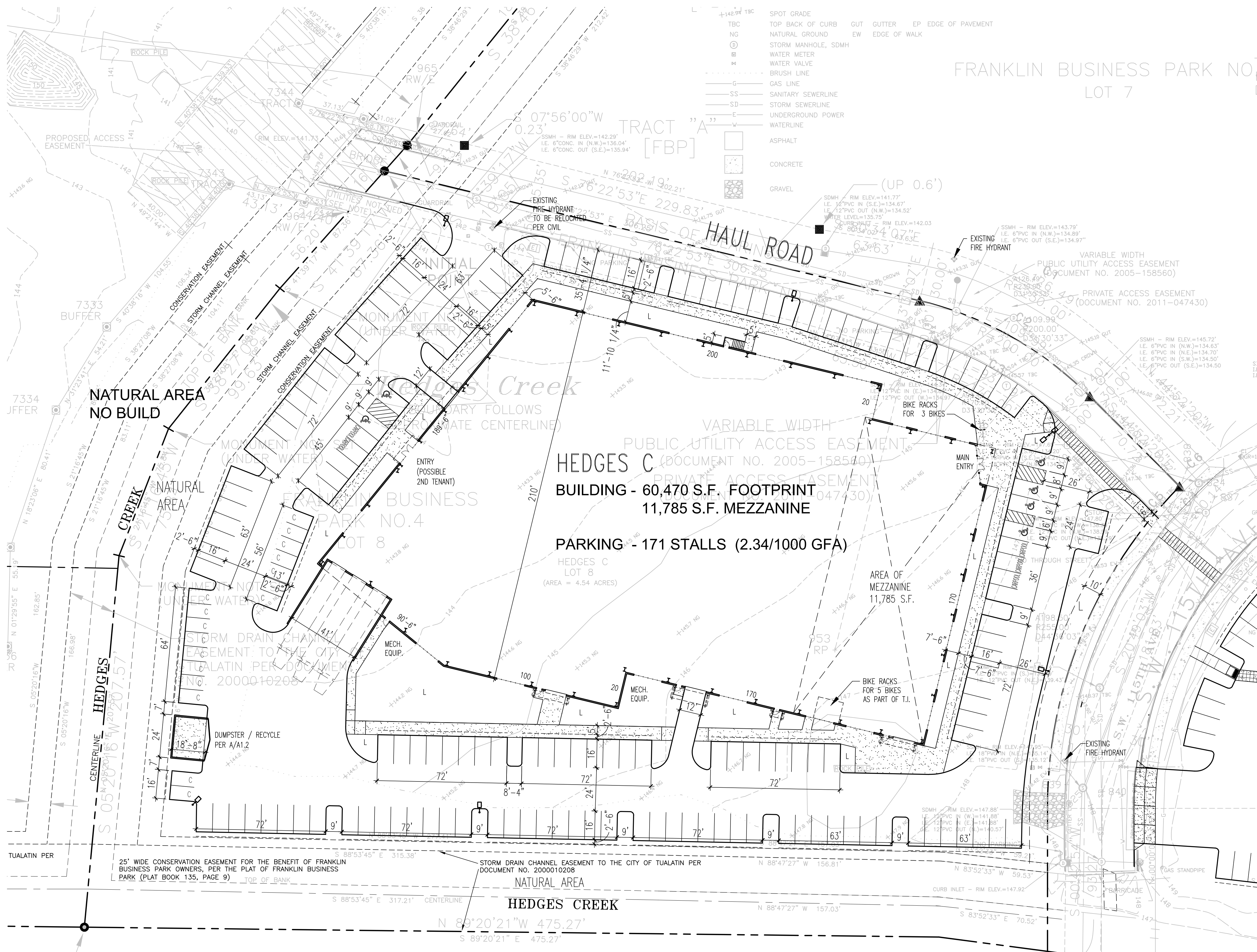
SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### Item 13

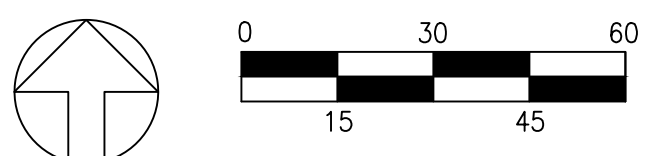
**Plan Drawing Index:** We include 3 sets each in sizes 8.5x11, 11x17, & 24x36 (24x36 is not in binder):

- A1.1 Site Plan & Notes
- A1.2 Site Details
- A1.3 Site Lighting Plan & Schedule
- A2.1 1st Floor Plan
- A3.1 Building Elevations
- C2.0 Site Grading Plan
- C2.1 Grading Details
- C3.0 Site Utility Plan
- C3.1 Detention Facility
- C3.6 Utility Details
- EC3.0 Erosion & Sediment Control Plan
- EC4.0 Erosion & Sediment Control Details
- EC4.1 Erosion & Sediment Control Details
- L-1 Landscape Plan & Plant Legend
- L-2 Landscape Details and Specs
- 1 of 1 Topographic Survey

(Note - Tree Preservation Plan – Not required as no existing trees.)



**SITE PLAN**  
SCALE: 1" = 30'



**PROPERTY DESCRIPTION:**

LOT 8, "FRANKLIN BUSINESS PARK" NO. 4  
 STATE ID # - 25127BA00600  
 PROPERTY ID # - R2159667  
 N.E. 1/4 SECTION 27, TOWNSHIP 2 SOUTH,  
 RANGE 1 WEST, WILLAMETTE MERIDIAN,  
 CITY OF TUALATIN, WASHINGTON COUNTY, OREGON

**OSSC CODE ANALYSIS:**

2014 OREGON STRUCTURAL SPECIALTY CODE  
 OCCUPANCY GROUPS: F-2, B, S-2  
 GENERAL BUILDING HEIGHTS & AREAS:  
 TYPE OF CONSTRUCTION - TYPE II-B SPRINKLERED  
 ALLOWABLE BUILDING HEIGHT - 55'  
 PROPOSED BUILDING HEIGHT - 43'-3"  
 MEZZANINE AREA - 11,785 S.F. (19.87% OF GFA)  
 ALLOWABLE AREA:  
 TABULAR BUILDING AREA PER STORY - 23,000 (F-2 & B)  
 FRONTAGE INCREASE =  $[1030/1030 - 0.25] 30/30 = 75$   
 AUTOMATIC SPRINKLER SYSTEM INCREASE = 3 (ONE STORY BUILDING)  
 ALLOWABLE BUILDING AREA =  $\{23,000 \times 0.75\} + \{23,000 \times 3\} = 109,250$  S.F.  
 PROPOSED BUILDING AREA - 60,470 S.F.

**Architectural Review:** Hedges C is a new one-story building "shell" intended for a light industrial tenant with a mezzanine intended for mostly office use. A certificate of occupancy required a permit for TI work, and the projects mixed uses include office, light manufacturing, and warehouse. The building will be a metal building with ribbed metal skin and steel structure with slab-on-grade floor construction. It will include generous natural light from glass and skylights.

**Project Statistics and Notes:**  
 ZONING DISTRICT: GENERAL MANUFACTURING (MG)  
 INDUSTRIAL BUSINESS PARK OVERLAY

**STATISTICS:**

BUILDING AREAS:	Bldg. Gross Area	Bldg. Gross Floor area	Bldg. Gross Leasable Area
1 <sup>st</sup> Floor	60,470sf	59,315sf	60,006sf
Mezzanine	11,785	11,785	11,465
<b>Total</b>	<b>72,255</b>	<b>71,100sf</b>	<b>71,471sf</b>

**MIXED USE PERCENTAGE (SECTION 69.065):** (use gross floor area)  
 Manufacturing: 59,813sf (84.12%)  
 Office: 11,288sf (15.88%)

**SITE:** 197,709 SF  
 COVERAGE: 30.6%

**PARKING:**  
 REQUIRED: (use gross floor area)  
 Manufacturing: 59,813 x 1.6/1,000 = 95.70  
 Commercial Office: 11,288 x 2.7/1,000 = 30.48  
 Total Required = 126  
 PROVIDED: 171 Stalls (2.34/1,000SF)

REQUIRED VAN POOL: 126 req'd / 25 = 5.04  
 PROVIDED VAN POOL: 5

**BIKE PARKING:** (use gross floor area)  
 REQUIRED:  
 Manufacturing: 71,100 x 0.1/1,000 = 7.11  
 Total Required = 8 (5 covered)  
 PROVIDED: 8 (5 Interior & 3 uncovered exterior)

**TRASH ENCLOSURE AREA CALCULATIONS:** (use gross leasable floor area)  
 REQUIRED:  
 Basic Minimum: 10sf  
 Industrial: 71,471sf x 6/1,000 = 429sf  
 Office: (not used - less than 20%)  
 Total Required = 439sf  
 PROVIDED: 448 (24' x 18.66')

**LANDSCAPE CALCULATIONS:**  
 REQUIRED: 20% (or 39,542sf)  
 PROVIDED: 36.5% (or 72,164sf)

**Parking Island Area:**  
 REQUIRED: 25sf x 171 = 4,275sf  
 PROVIDED: 4,926sf

**Project Team:**

**Owner / Developer:**  
 Hedges C & D LLC  
 PO Box 15523  
 Seattle, WA 98115  
 Contact: Mac Martin  
 Phone: (206) 399-6676

**Tenant:**  
 Machine Sciences Corporation  
 10165 SW Commerce Circle, Suite G  
 Wilsonville OR 97070  
 Phone: (503) 682-9980

**Shell Architect:**  
 Lance Mueller & Associates / Architects  
 130 Lakeside Ave. S, Suite 250  
 Seattle, WA 98122  
 Contact: Bob Wells  
 Phone: (206) 325-2553 x 120  
 Phone: (503) 222-4453

**Engineer/Civil & Foundation Structural:**  
 VLMK Engineering + Design  
 3933 SW Kelly Avenue  
 Portland, OR 97239  
 Contact: Trent Nagle  
 Phone: (503) 222-4453

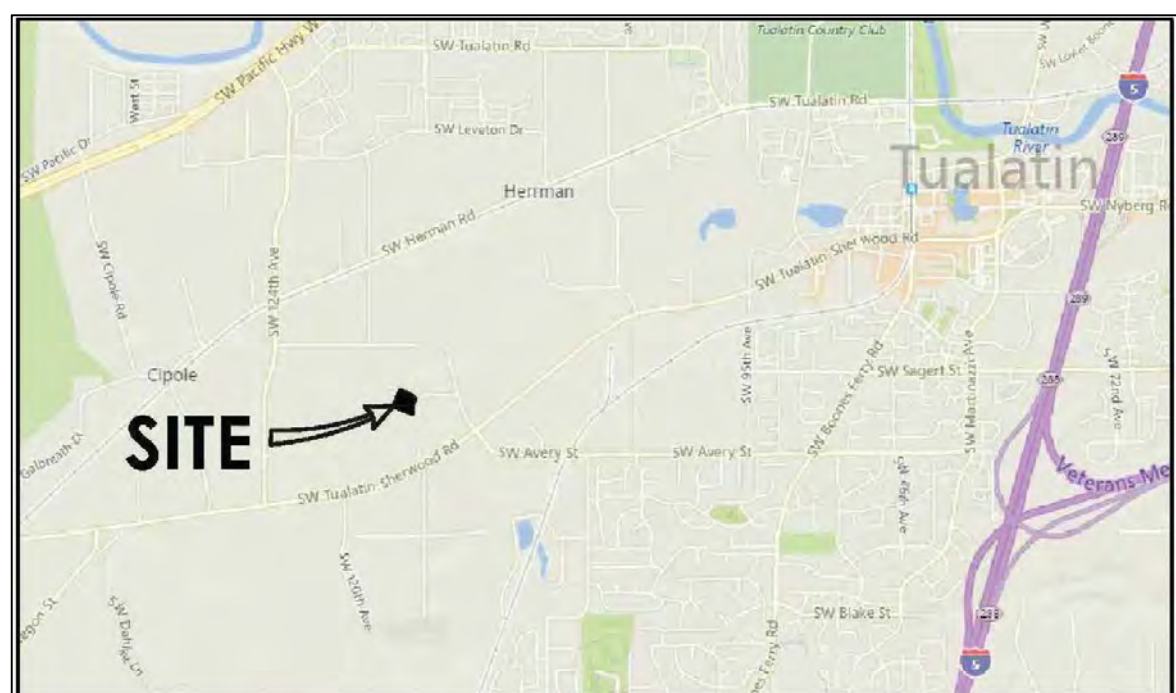
**Landscape Architect:**  
 Otten Landscape Architects  
 3933 SW Kelly Ave. Suite B  
 Portland, OR 97239  
 Contact: Janet Otten  
 Phone: (503) 972-0311

**Geotechnical Engineer:**  
 GeoEngineers  
 1200 NW Naito Parkway, Suite 180  
 Portland, OR 97209  
 Contact: Greg Landau  
 Phone: (503) 624-9274

**Jurisdiction:** City of Tualatin  
 PO Box 363  
 18876 SW Martinazzi Ave.  
 Tualatin, OR 97062

**DRAWING INDEX:**

- A1.1 SITE PLAN AND NOTES
- A1.2 SITE DETAILS
- A1.3 SITE LIGHTING PLAN AND SCHEDULE
- A2.1 FLOOR PLAN
- A3.1 EXTERIOR ELEVATIONS
- C2.0 SITE GRADING PLAN
- C2.1 GRADING DETAILS
- C3.0 SITE UTILITY PLAN
- C3.1 DETENTION FACILITY
- C3.6 UTILITY DETAILS
- EC3.0 EROSION & SEDIMENT CONTROL PLAN
- EC4.0 EROSION & SEDIMENT CONTROL DETAILS
- EC4.1 EROSION & SEDIMENT CONTROL DETAILS
- L-1 LANDSCAPE PLAN AND LEGEND
- L-2 LANDSCAPE DETAILS AND SPECS
- 1 of 1 TOPOGRAPHIC SURVEY



**SITE PLAN & NOTES**

**HEDGES C**  
 SW 115th AVE AND HAUL ROAD  
 TUALATIN, OREGON

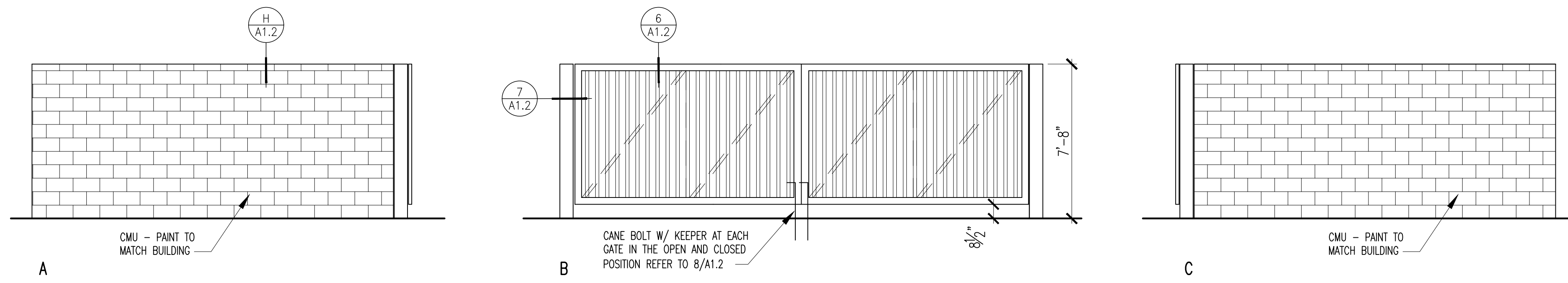
**REGISTERED ARCHITECT**  
 LANCE MUELLER & ASSOCIATES  
 130 LAKESIDE • SUITE 250 • SEATTLE, WA 98122 • (206) 325-2553

**ARCHITECT**  
 LANCE MUELLER & ASSOCIATES  
 130 LAKESIDE • SUITE 250 • SEATTLE, WA 98122 • (206) 325-2553

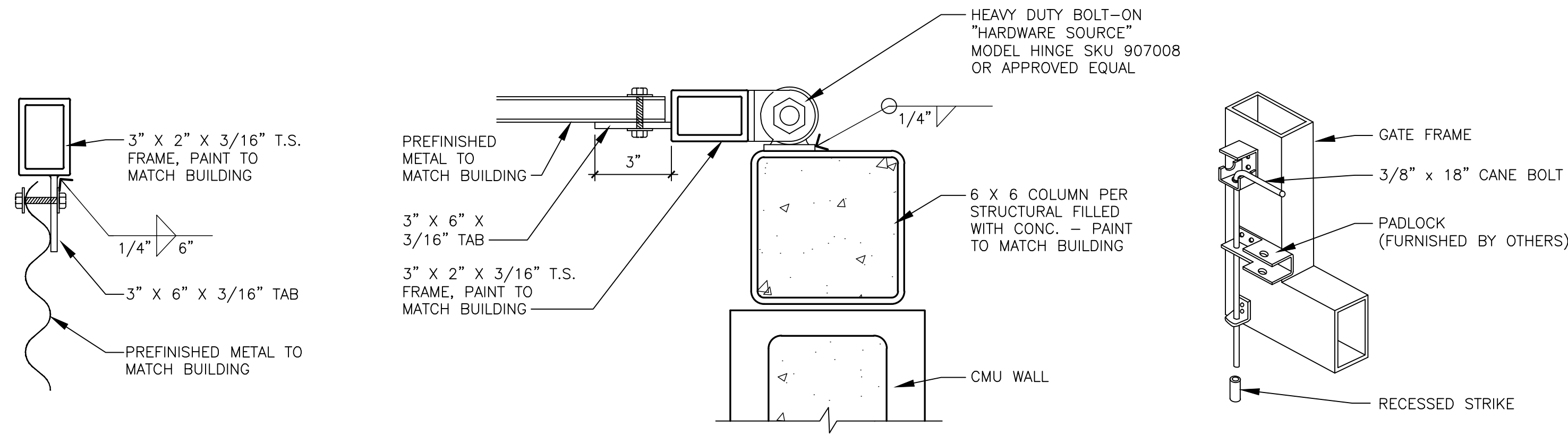
sheet **A1.1**

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						11-26-18	date
							revision
							no.
							date





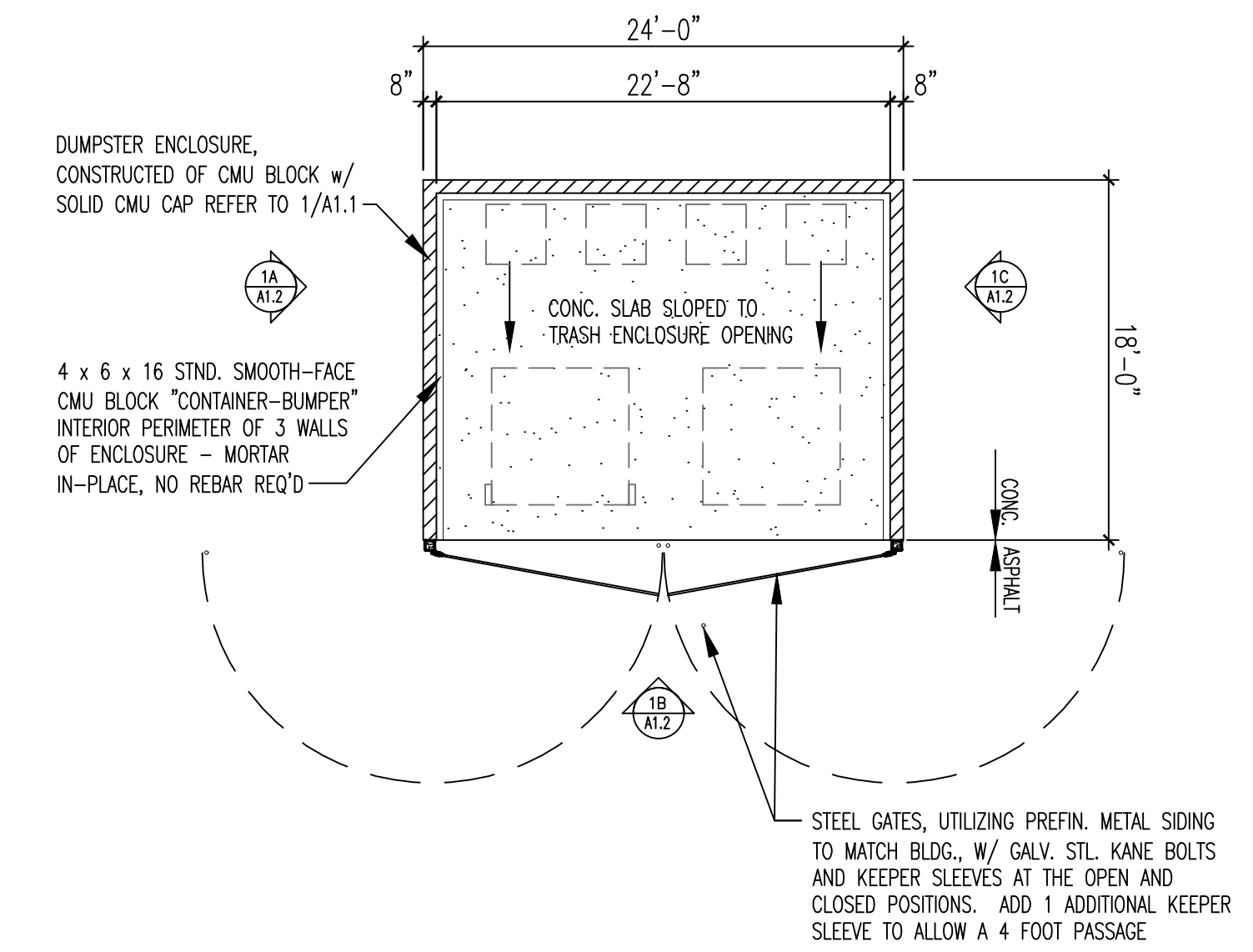
**1 DUMPSTER ELEVATION**  
SCALE: 1/4" = 1'-0"



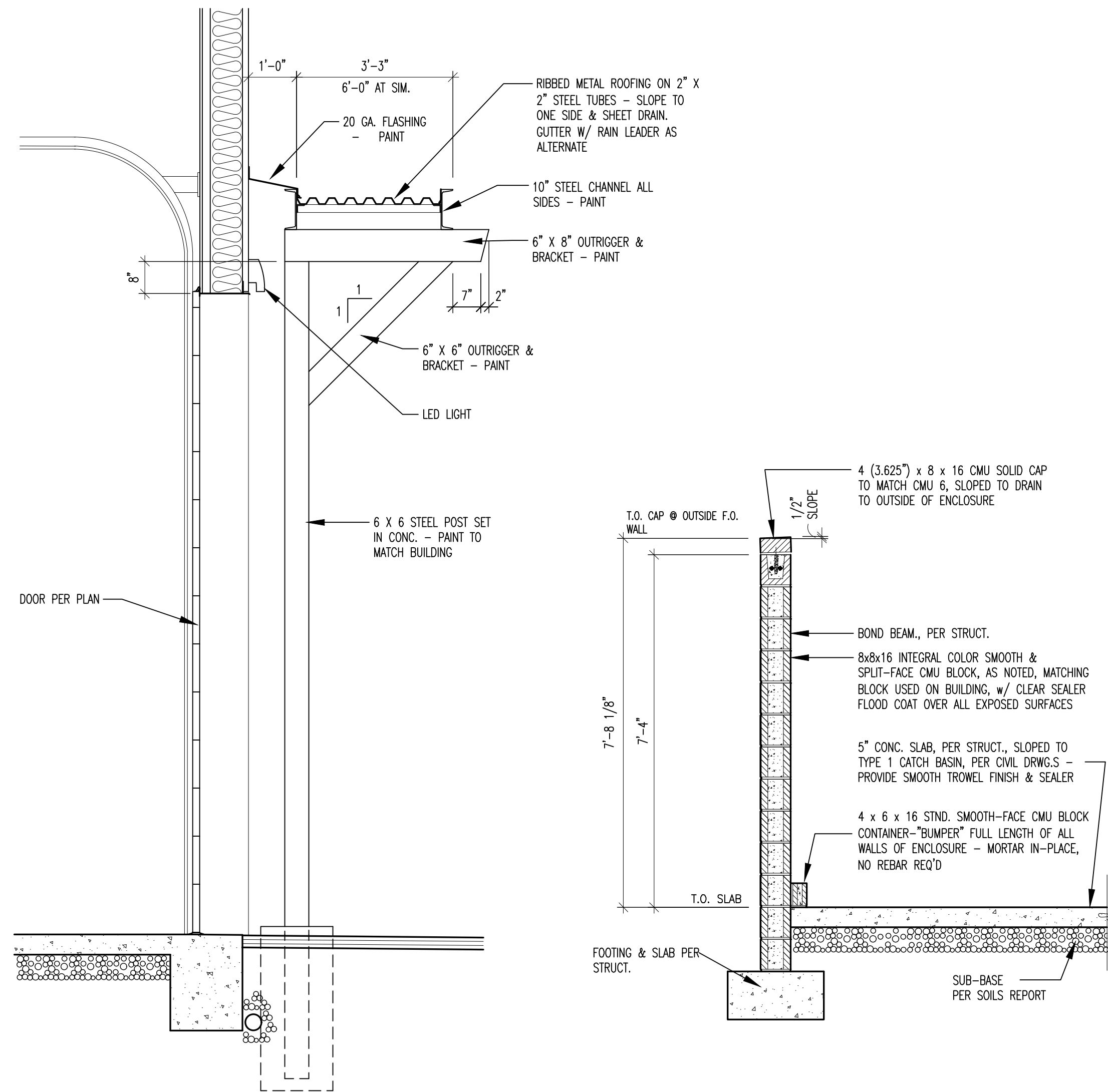
**6 DETAIL**  
SCALE: 3" = 1'-0"

**7 DETAIL**  
SCALE: 3" = 1'-0"

**8 DETAIL**  
SCALE: 3" = 1'-0"



**A ENLARGED DUMPSTER PLAN**  
SCALE: 1/4" = 1'-0"



**G FREE STANDING CANOPY SECTION**  
SCALE: 1/2" = 1'-0"

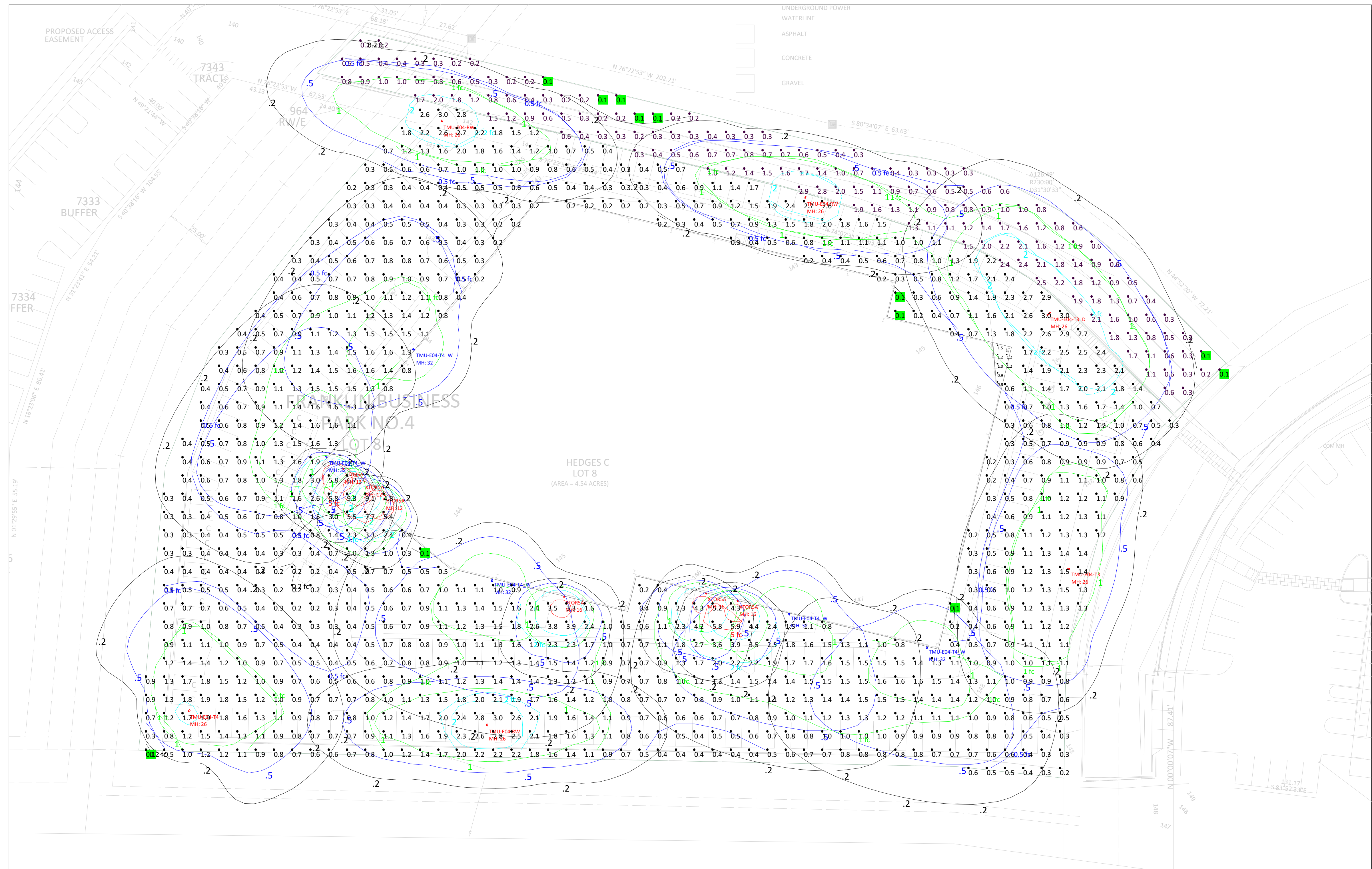
**H DUMPSTER SECTION**  
SCALE: 1/2" = 1'-0"

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						AR SUBMITTAL	revision
							no.
							date

**HEDGES C**  
SW 115th AVE AND HAUL ROAD  
TUALATIN, OREGON

**LANCE MUELLER & ASSOCIATES**  
ARCHITECTS  
130 LAKESIDE • SUITE 250 • SEATTLE, WA 98122 • (206) 325-2553

SITE DETAILS  
sheet  
**A1.2**

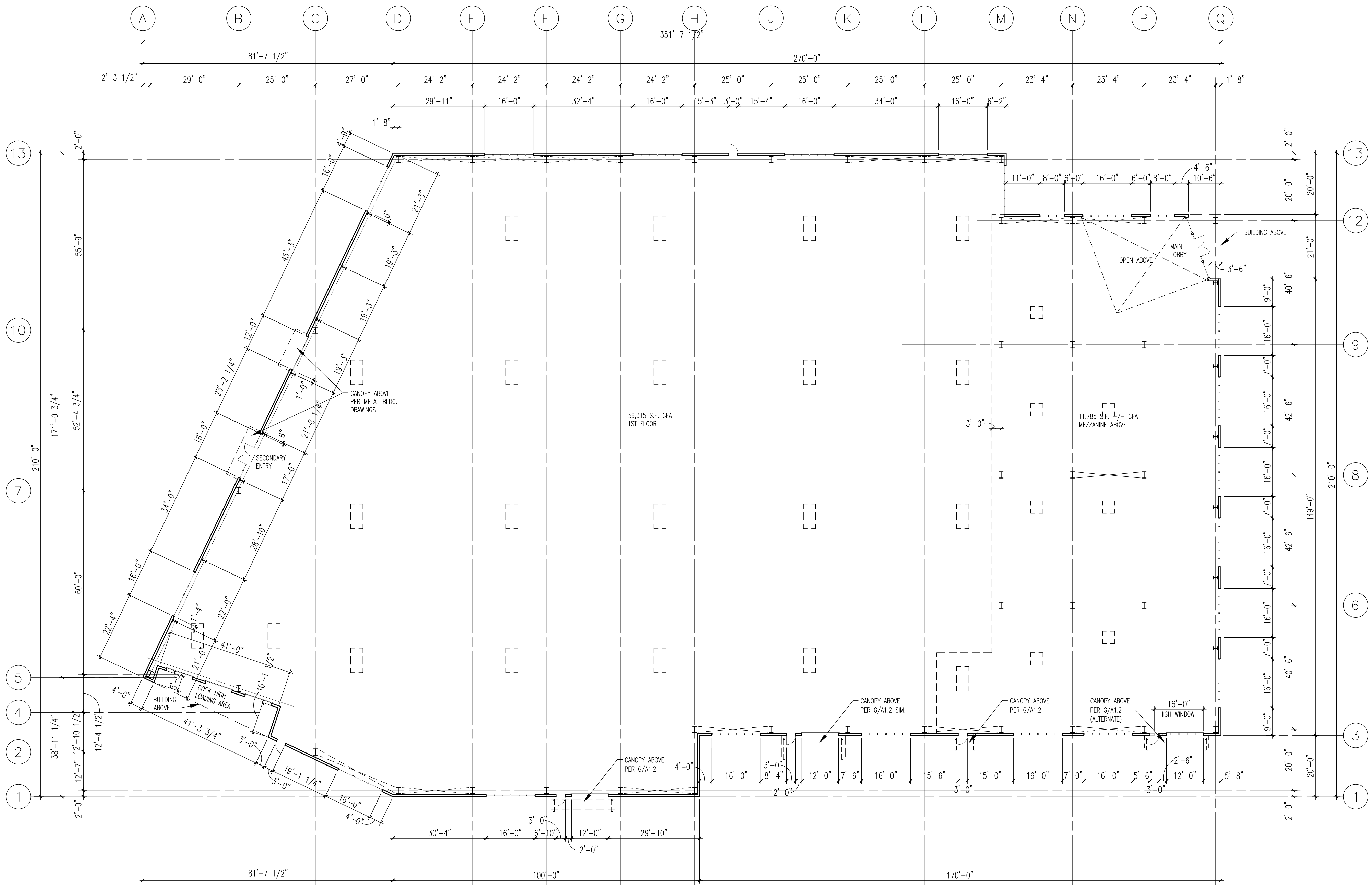


Scale: 1 inch= 30 Ft.

### ENTRY WITH DUAL HEAD POLE AT SITE CORNER

Isoline Legend		Standard Luminaire Schedule									
Footcandle (fc)		Symbol	Qty	Label	Manufacturer	Part # Description	Lum. Watts	Lum. Lumens	LLF	Arm	Filename
0.2	0.2	[Symbol]	3	TMU-E04-RW	EATON - STREETWORKS (FORMER COOPER LIGHTING)	TMU-E04-LED-E-U-RW	97.2	12496	0.900	0.66725	TMU-E04-LED-E-U-RW.ies
0.5	0.5	[Symbol]	1	TMU-E04-T3	EATON - STREETWORKS (FORMER COOPER LIGHTING)	TMU-E04-LED-E-U-T3	97.2	12336	0.900	0.66725	TMU-E04-LED-E-U-T3.ies
1	1	[Symbol]	1	TMU-E04-T3_D	EATON - STREETWORKS (FORMER COOPER LIGHTING)	TMU-E04-LED-E-U-T3 DUAL	97.2	12336	0.900	0.66725	TMU-E04-LED-E-U-T3.ies
2	2	[Symbol]	1	TMU-E04-T4	EATON - STREETWORKS (FORMER COOPER LIGHTING)	TMU-E04-LED-E-U-T4	97.2	12088	0.900	0.66725	TMU-E04-LED-E-U-T4.ies
5	5	[Symbol]	5	TMU-E04-T4_W	EATON - STREETWORKS (FORMER COOPER LIGHTING)	TMU-E04-LED-E-U-T4-WM	97.2	12088	0.900	0.66725	TMU-E04-LED-E-U-T4.ies
5	5	[Symbol]	6	XTORSA	EATON - LUMARK (FORMER COOPER LIGHTING)	XTORSA	50.1	4282	0.900	0	XTORSA.ies

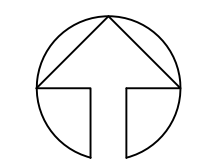
NOTES:  
 1. LIGHT LOSS FACTOR APPLIED, INITIAL VALUES WILL BE HIGHER  
 2. FIXTURE HEIGHT: NOTED  
 3. POLE HEIGHT: 20'  
 4. STANDARD REFLECTANCE USED: 20% GROUND EQUAL TO ASPHALT  
 5. CALCULATION POINTS LOCATED ON GROUND



- LEGEND**
- 4' x 8' SKYLIGHT
  - 4' x 4' SKYLIGHT

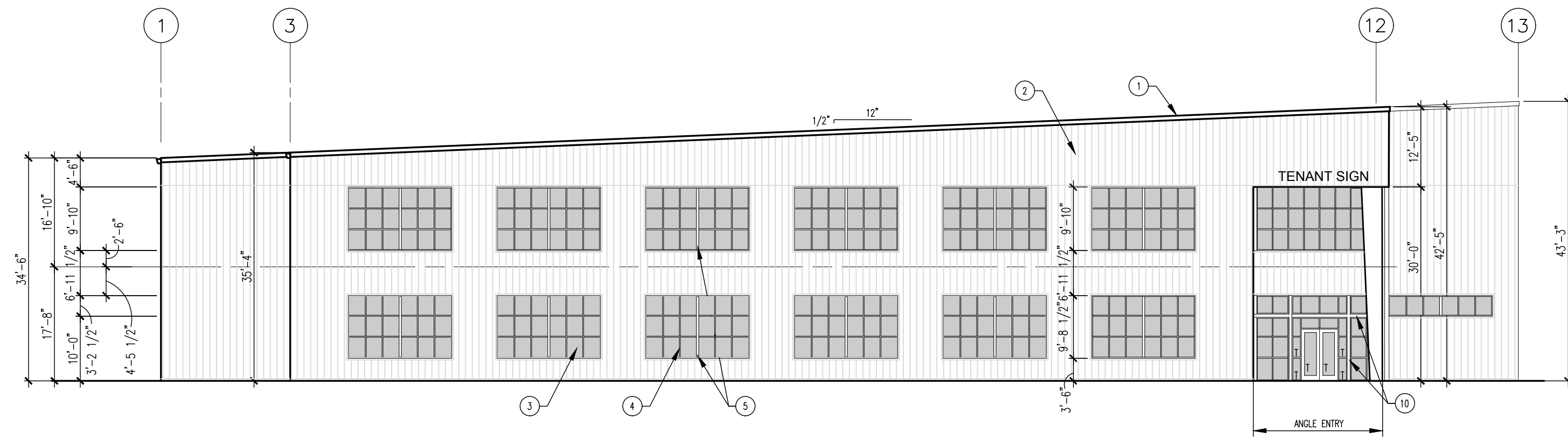
**FLOOR PLAN**

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



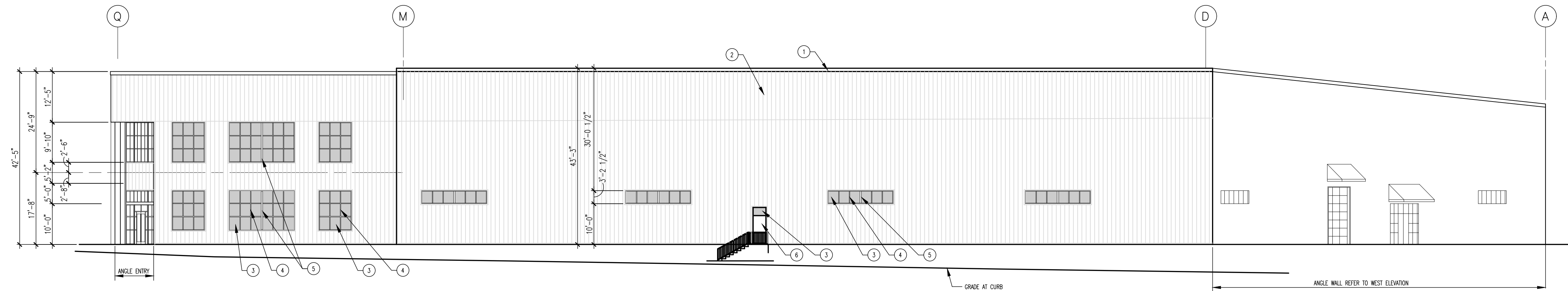
P:\dwg\18001\18001 - hedges c\18001-01x-r10.dwg  
 2/14/2018

	<b>HEDGES C</b> SW 115th AVE AND HAUL ROAD TUALATIN, OREGON	<b>FLOOR PLAN</b> sheet <b>A2.1</b>
	<b>LANDSCAPE MUELLER &amp; ASSOCIATES</b> ARCHITECTS 130 LAKESIDE • SUITE 250 • SEATTLE, WA 98122 • (206) 325-2553	<b>REGISTERED ARCHITECT</b> LANDSCAPE ARCHITECT STATE OF OREGON NO. 1491
	18-001 job no. EM drawn BW checked 12-12-18 date no. revision date	12-12-18 AR SUBMITTAL NEIGHBORHOOD MEETING 11-26-18 no. revision date



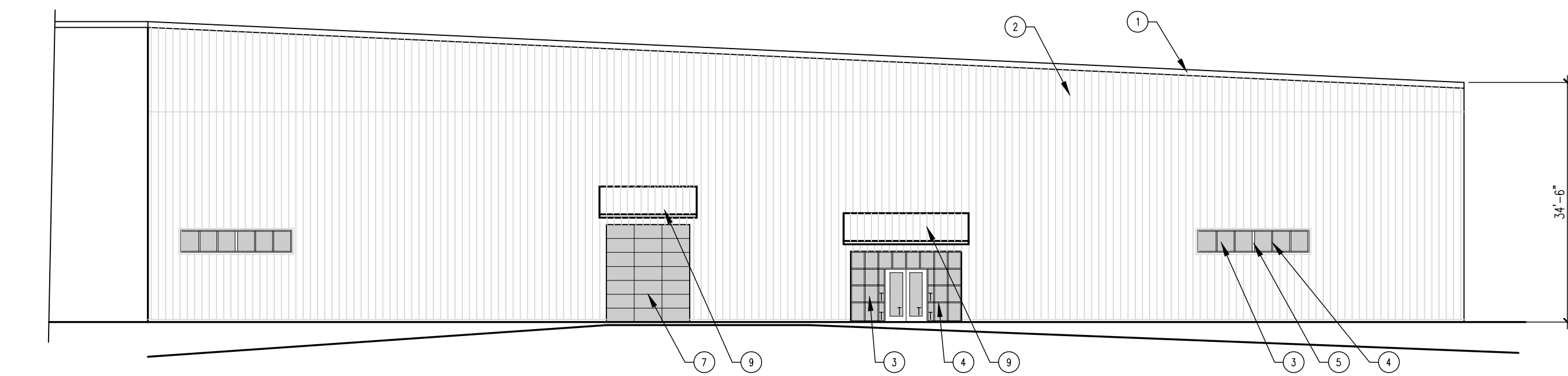
**EAST ELEVATION**

SCALE: 3/32" = 1'-0"



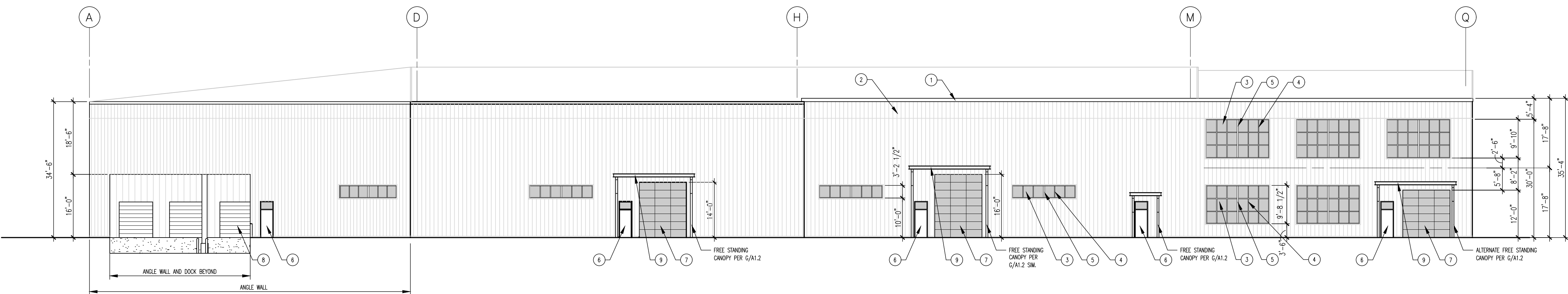
**NORTH ELEVATION**

SCALE: 3/32" = 1'-0"



**WEST ELEVATION**

SCALE: 3/32" = 1'-0"



**SOUTH ELEVATION**

SCALE: 3/32" = 1'-0"

**EXTERIOR MATERIALS & FINISHES:**

MARK:	ITEM:	DESCRIPTION:	REMARKS:
1.	COPING	GALVANIZED METAL PAINT	COLOR: MATCH WALL PANEL
2.	METAL WALL PANELS	AEP SPAN HR-36 PANELS INSTALLED WITH RIBS VERTICAL	COLOR: AEP SPAN - VINTAGE (PREMIUM DARK GRAY - METALLIC FINISH)
3.	GLASS	1" CLEAR INSULATED (PPG SOLARBAN 60, OR APPROVED)	GLASS TINT COLOR: CLEAR
4.	STOREFRONT:	NOMINAL 2" X 4" ALUMINUM, CENTER SET, CLEAR ANODIZED	COLOR: CLEAR ANODIZED
5.	STOREFRONT:	DOUBLE WIDE VERTICAL WINDOW MULLION (AT CENTER)	COLOR: CLEAR ANODIZED
6.	HOLLOW METAL DOORS	SOLID CORE HM WITH METAL FRAMES	COLOR: MATCH WALL PANEL
7.	ON-GRADE SERVICE DOORS	ALUMINUM RAIL/S TILE & GLASS SECTIONAL UPWARD ACTING DOORS (RAYNOR AV200, OR APPROVED)	COLOR: CLEAR ANODIZED, INSULATED LOW-E CLEAR GLASS
8.	TRUCK DOCK DOORS	HOLLOW METAL SECTIONAL UPWARD ACTING DOORS, PAINT	COLOR: MATCH WALL PANEL
9.	CANOPIES	STEEL FRAME, PAINTED	COLOR: MATCH WALL PANEL
10.	STEEL TUBES	STEEL, PAINTED	COLOR: MATCH CLEAR ANODIZED

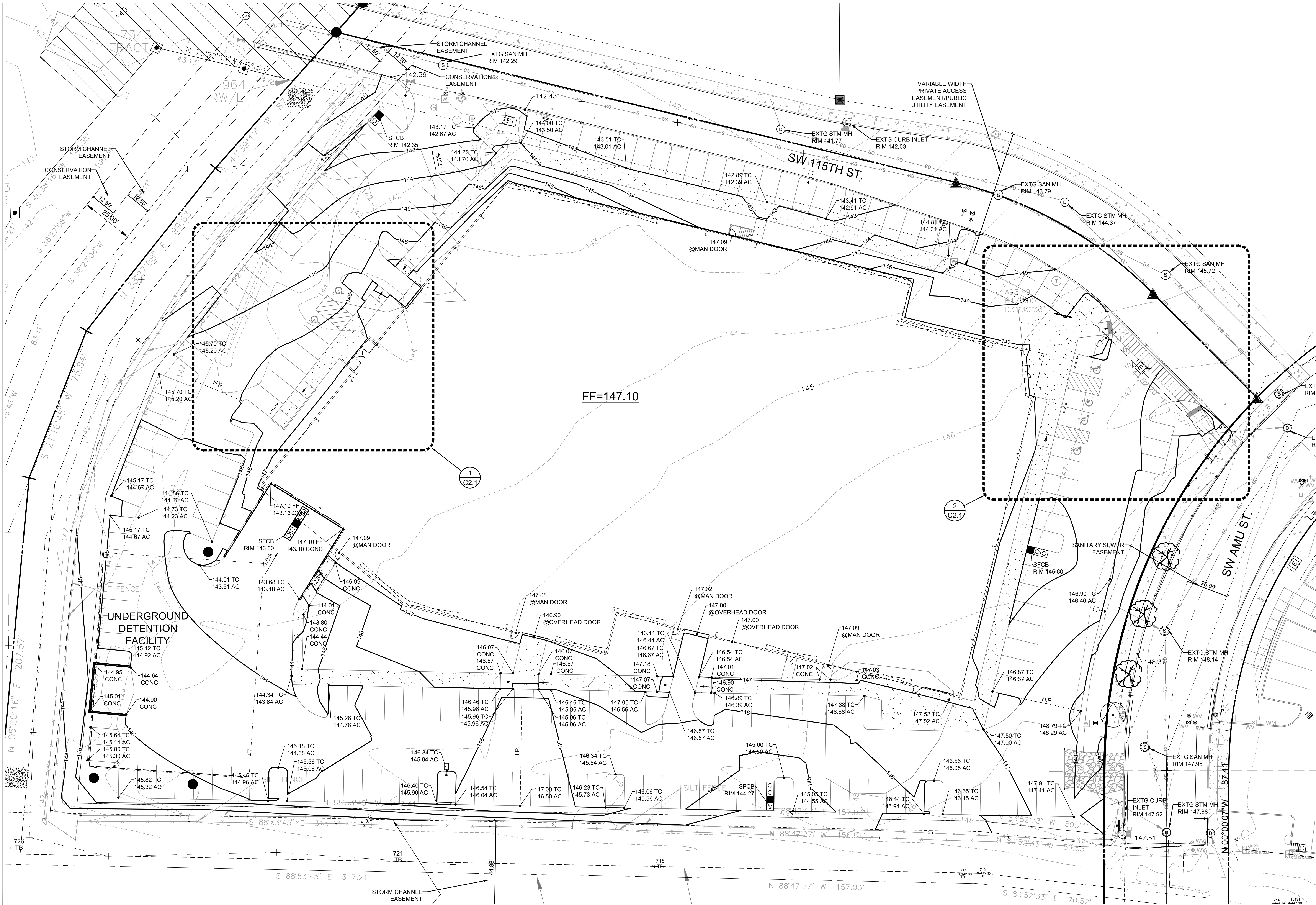
18-001  
job no.  
EM  
drawn  
12-12-18  
date  
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NEIGHBORHOOD MEETING  
revision  
no.

REGISTERED ARCHITECT  
LANDE MUELLER & ASSOCIATES  
SEATTLE, WA 98101  
STATE OF OREGON

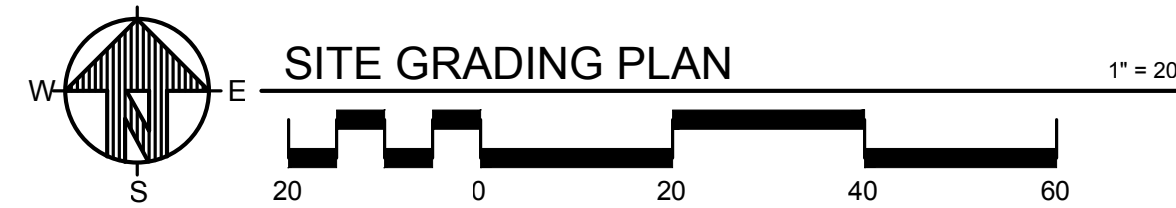
**HEDGES C**  
SW 115th AVE AND HAUL ROAD  
TUALATIN, OREGON

EXTERIOR ELEVATIONS  
LANDE MUELLER & ASSOCIATES  
ARCHITECTS  
130 LAKESIDE • SUITE 250 • SEATTLE, WA 98122 • (206) 325-2553

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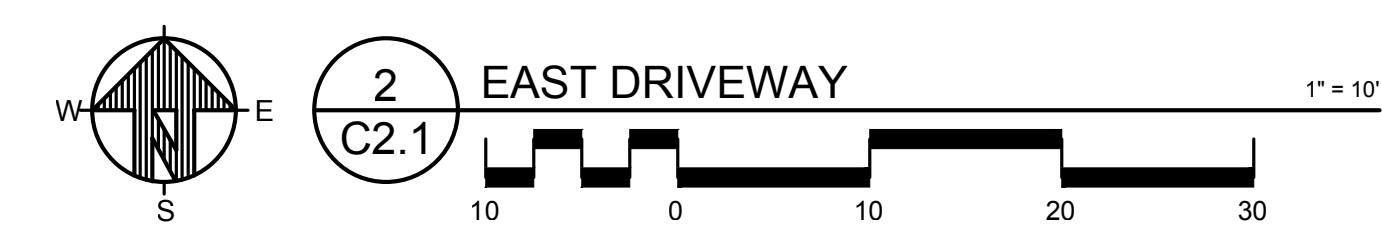
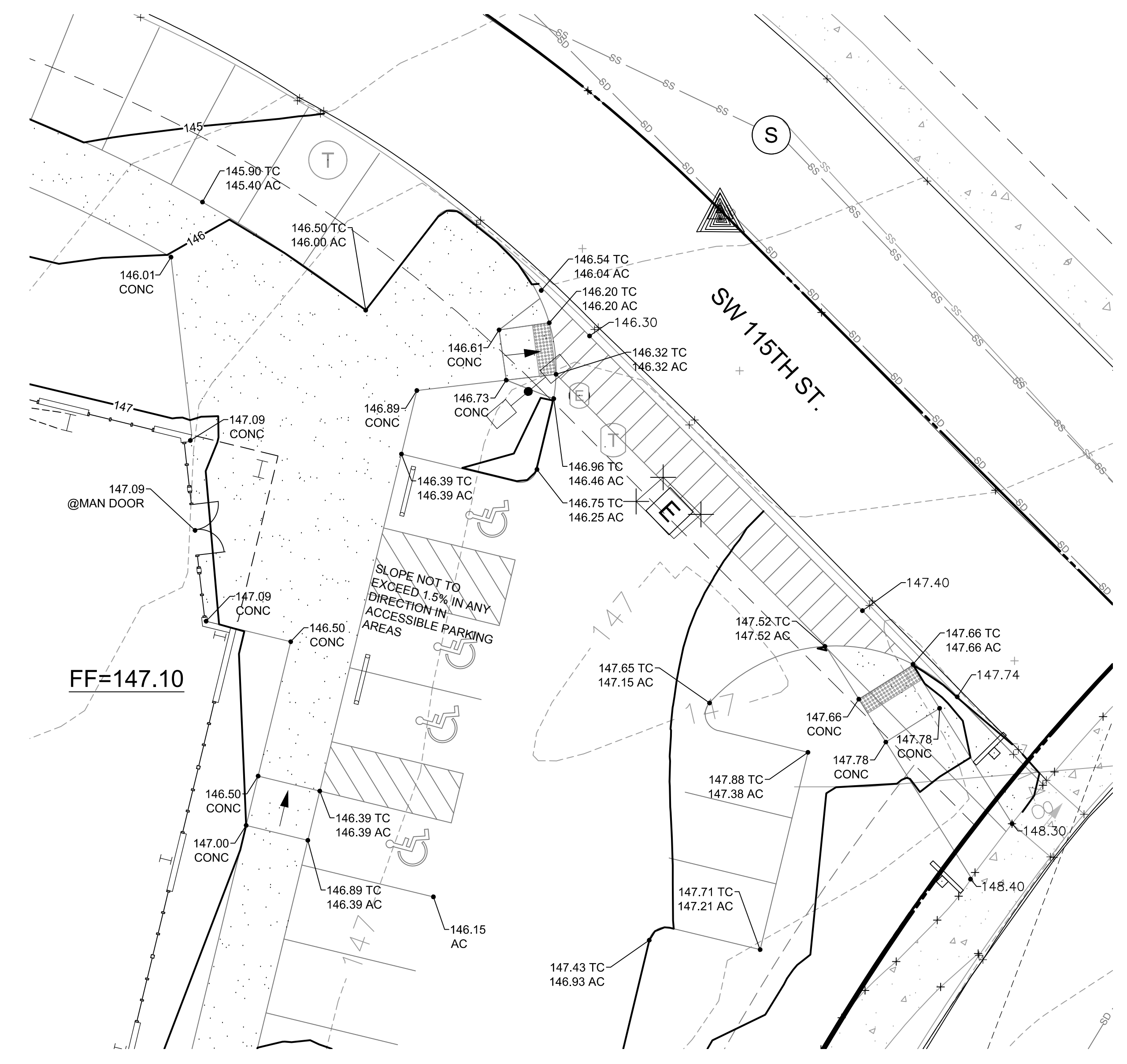
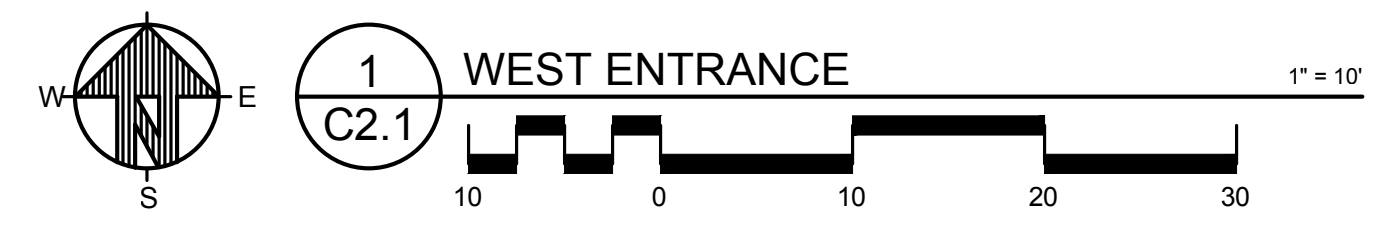
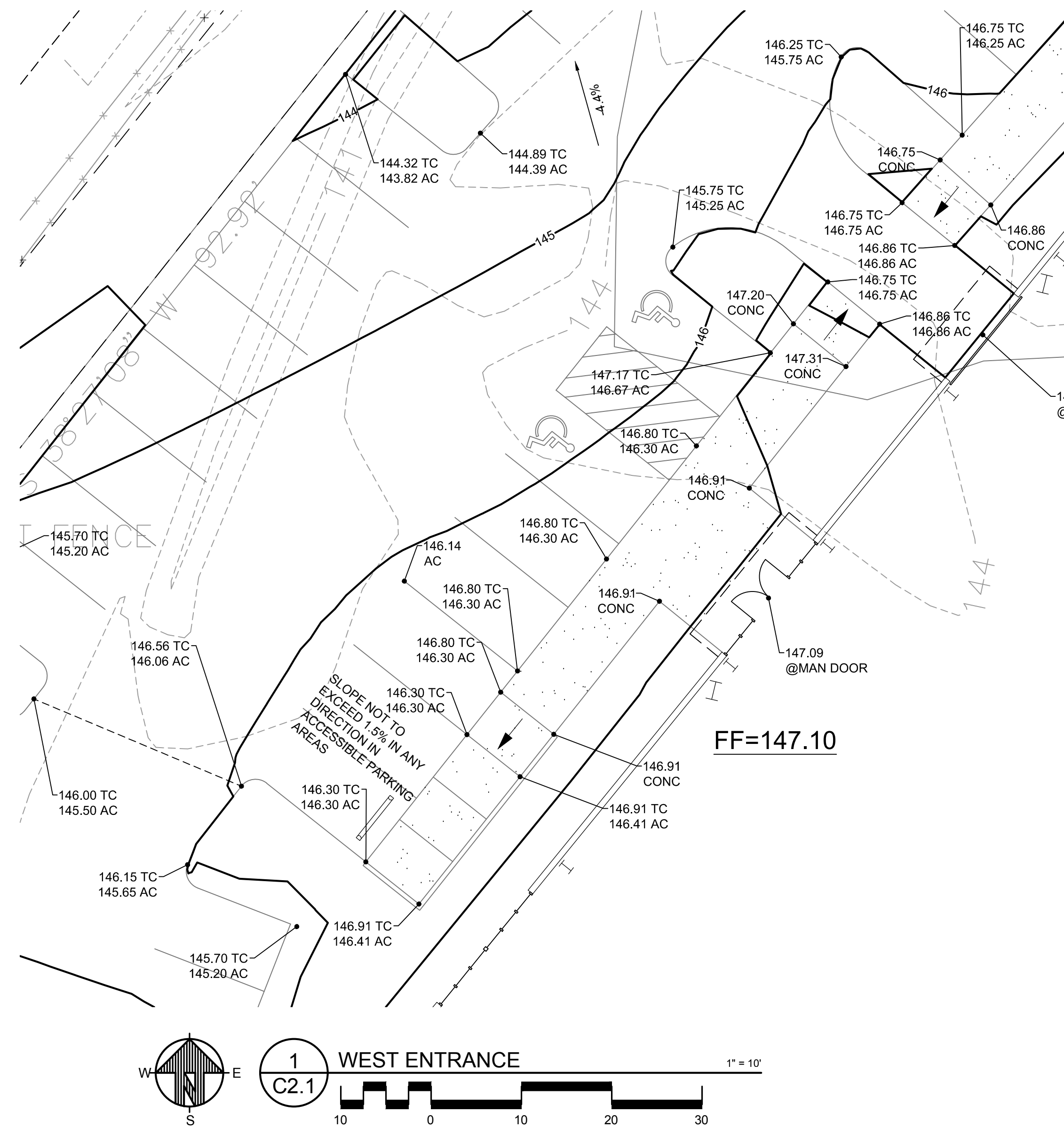
  

**SITE GRADING PLAN**  
LANCE MUELLER & ASSOCIATES  
ARCHITECTS  
130 LAKESIDE • SUITE 250 • SEATTLE, WA 98122 • (206) 389-9555

**VLMK ENGINEERING & DESIGN**  
1300 1st Ave, Suite 1000, Seattle, WA 98101 • (206) 461-1111

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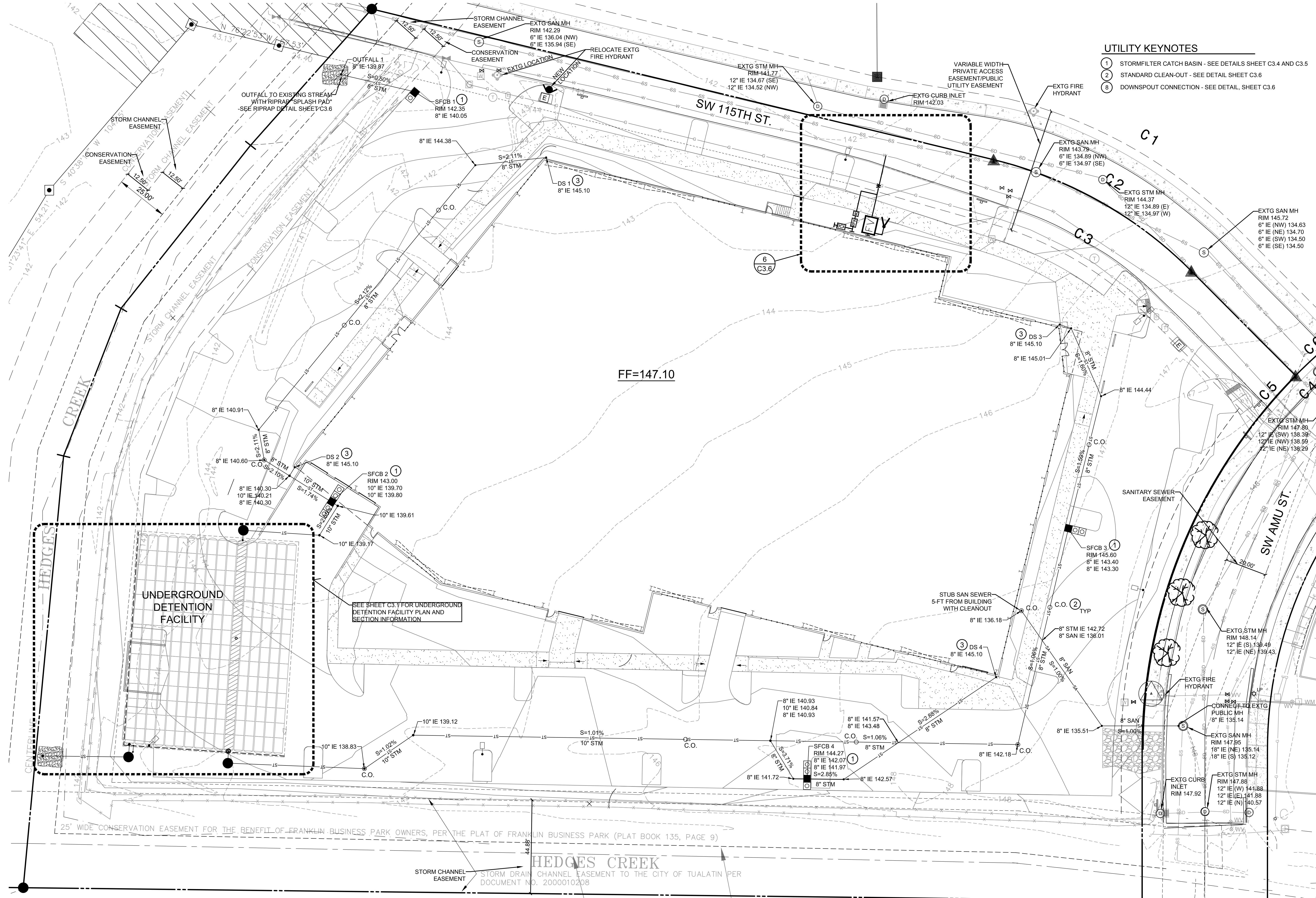
**HEDGES C**  
SW 15th ST. AND SW AMU ST.  
TUALATIN, OREGON



20180291	job no.	20180291	revision	date
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		JULY 2018		

**HEDGES C**  
 SW 115th ST. AND SW AMU ST.  
 TUALATIN, OREGON

**GRADING DETAILS**  
 LANCE MUELLER & ASSOCIATES  
 ARCHITECTS  
 130 LAKESIDE • SUITE 200 • SEATTLE, WA 98122 • (206) 285-9553  
**VLMK ENGINEERING & DESIGN**  
 2015 1st Ave. • Suite 100 • Tualatin, OR 97061 • (503) 261-1111



- UTILITY KEYNOTES**
- 1 STORMFILTER CATCH BASIN - SEE DETAILS SHEET C3.4 AND C3.5
  - 2 STANDARD CLEAN-OUT - SEE DETAIL SHEET C3.6
  - 3 DOWNSPOUT CONNECTION - SEE DETAIL SHEET C3.6

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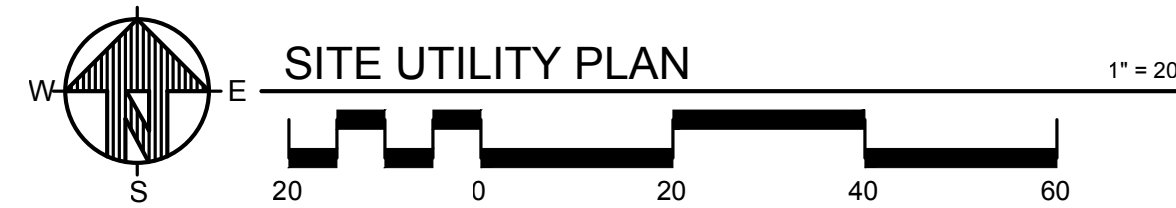
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**HEDGES C**  
 SW 115th ST. AND SW AMU ST.  
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**SITE UTILITY PLAN**  
 LANCE MULLER & ASSOCIATES  
 ARCHITECTS  
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**VLMK ENGINEERING & DESIGN**  
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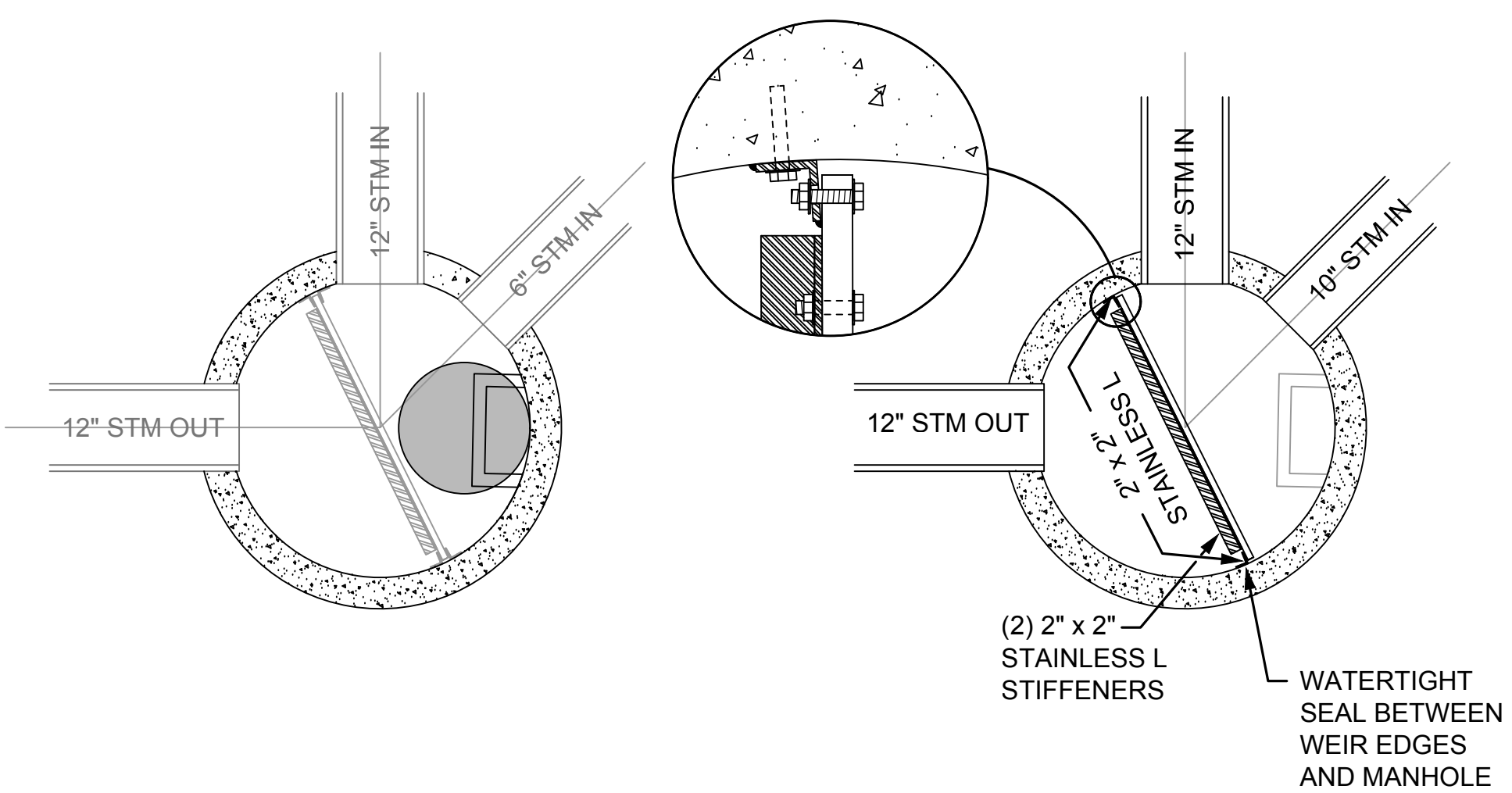
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**UNDERGROUND  
 DETENTION  
 FACILITY**

SEE SHEET C3.1 FOR UNDERGROUND  
 DETENTION FACILITY PLAN AND  
 SECTION INFORMATION

25' WIDE CONSERVATION EASEMENT FOR THE BENEFIT OF FRANKLIN BUSINESS PARK OWNERS, PER THE PLAT OF FRANKLIN BUSINESS PARK (PLAT BOOK 135, PAGE 9)

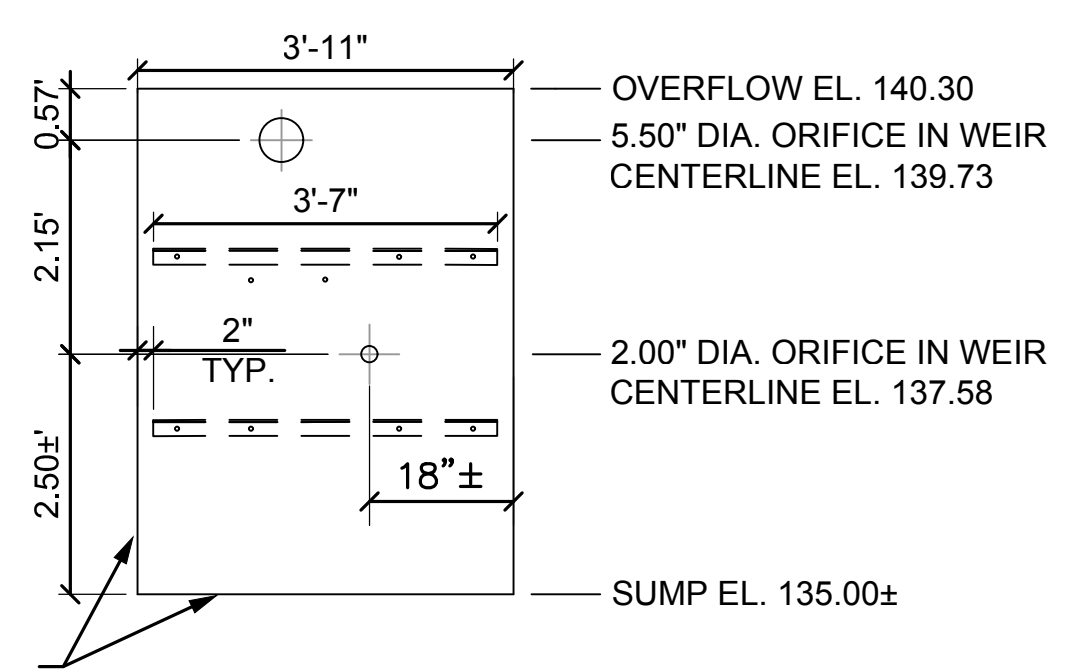
**HEDGES CREEK**  
 STORM DRAIN CHANNEL EASEMENT TO THE CITY OF TUALATIN PER  
 DOCUMENT NO. 2000010208



**PLAN VIEW OF CONTROL STRUCTURE**

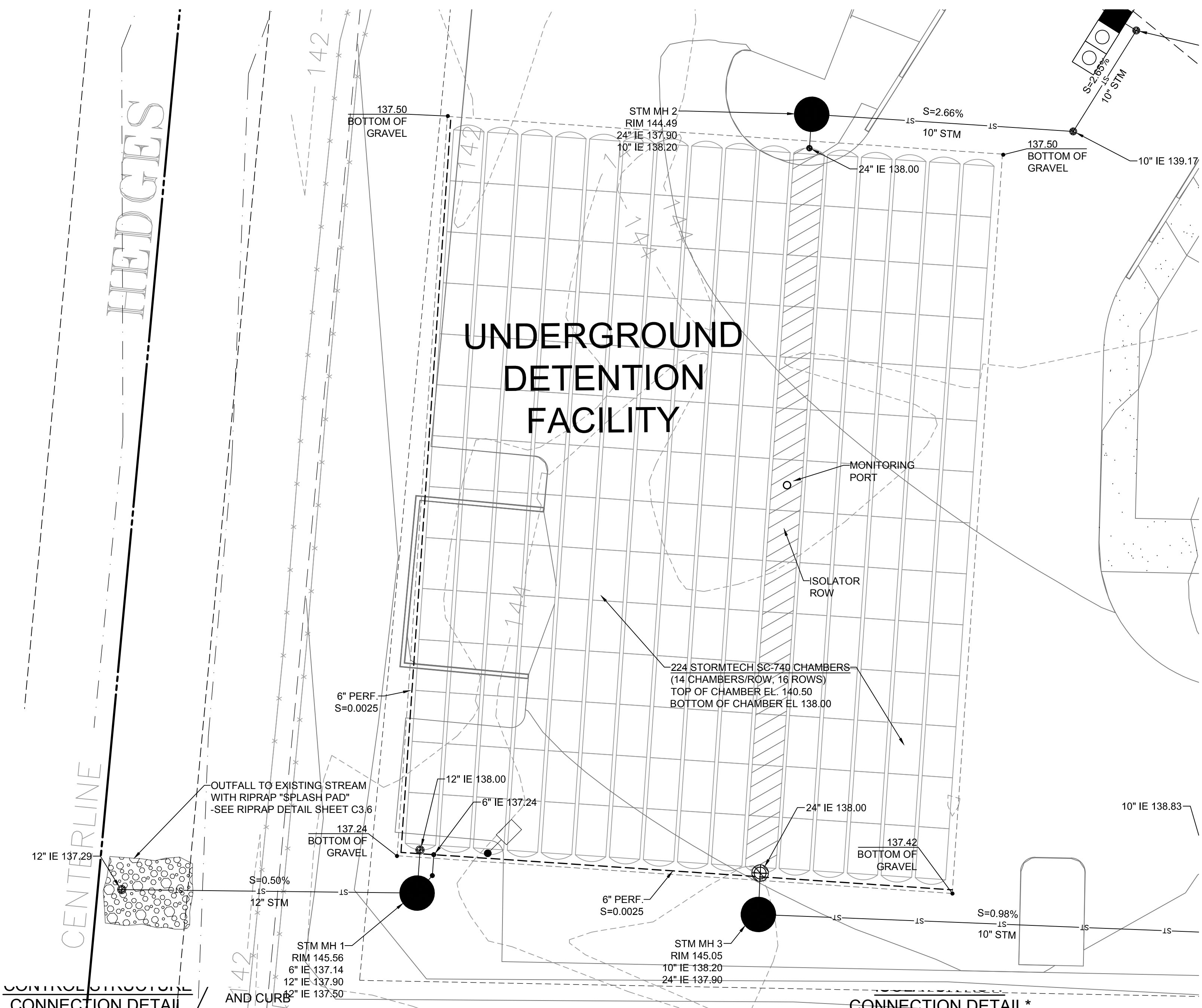
WEIR SHALL BE 1" SOLID WALL HDPE. ANCHOR WEIR TO 2" x 2" STAINLESS L EVERY 12" MAXIMUM WITH STAINLESS HARDWARE (OUTLET SIDE). CREATE WATER TIGHT SEAL ALONG ALL EDGES AFTER INSTALLATION.

INSTALL TWO 2" x 2" STAINLESS L STIFFENERS ON OUTLET SIDE OF WEIR (3'-7"), CENTERED AND ANCHORED TO WEIR, WITH STAINLESS HARDWARE AT 5 POINTS.

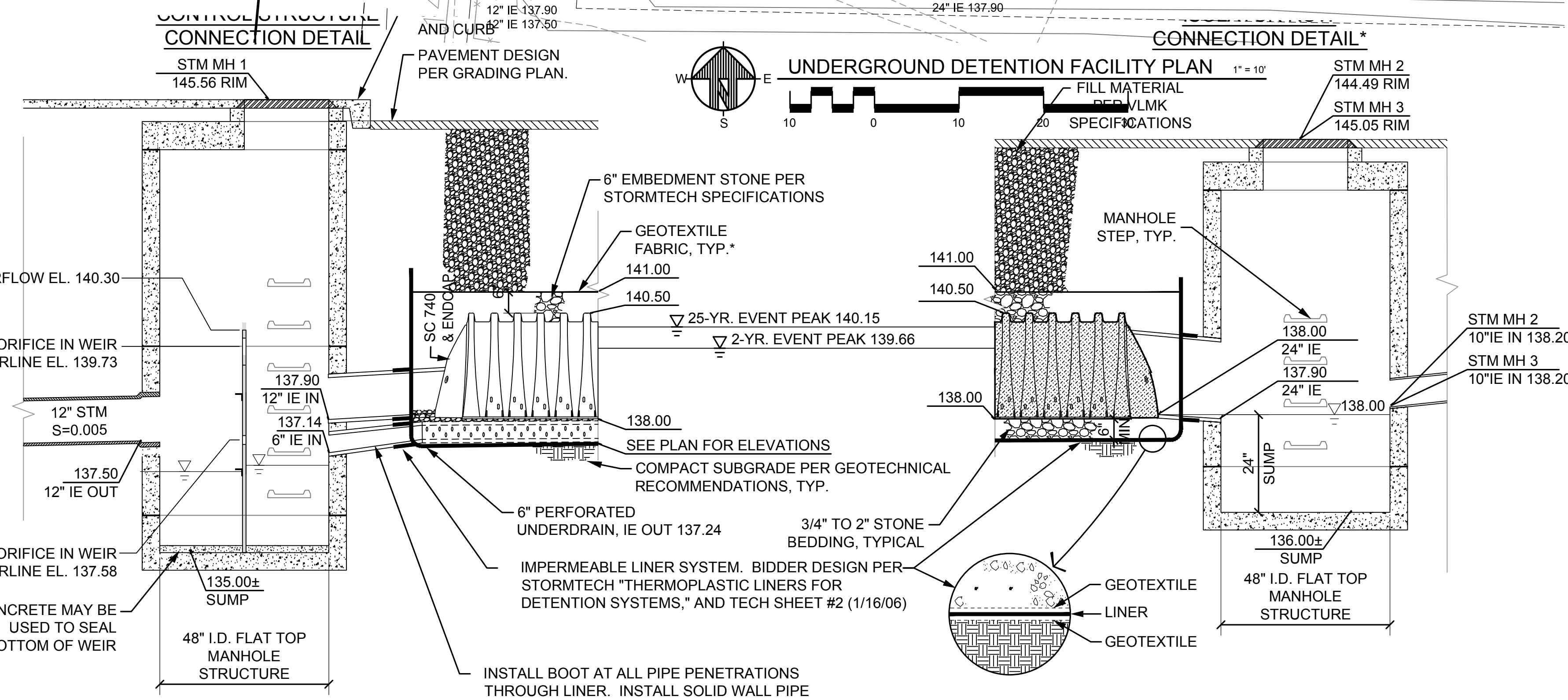


**WEIR DETAIL**

SEAL EDGES OF WEIR AT ALL POINTS OF CONTACT WITH MANHOLE WALLS



**UNDERGROUND DETENTION FACILITY**



**DETENTION FACILITY SECTION NOT TO SCALE**

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 SW 15th ST. AND SW AMU ST.  
 TUALATIN, OREGON

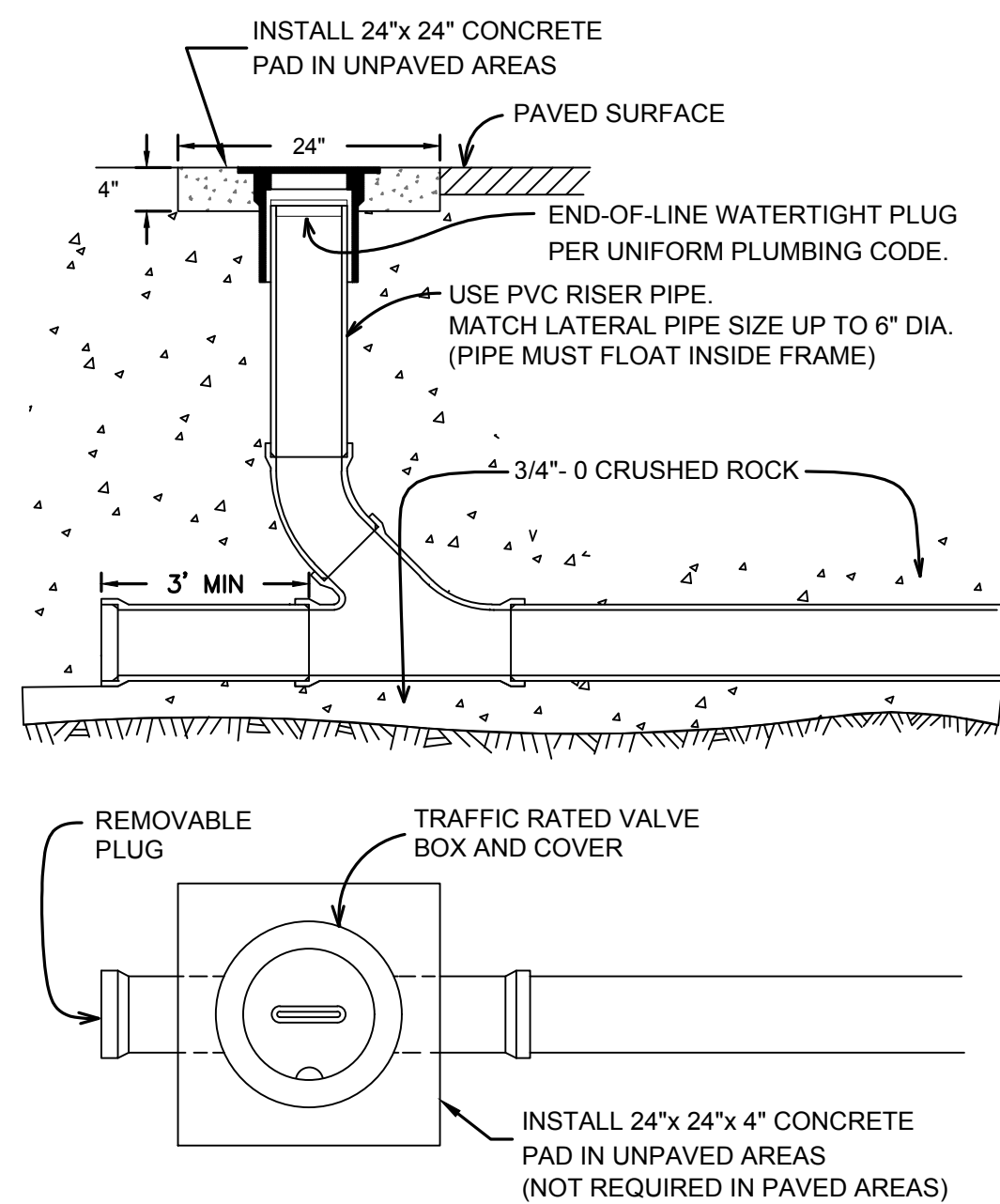
**DETENTION FACILITY**  
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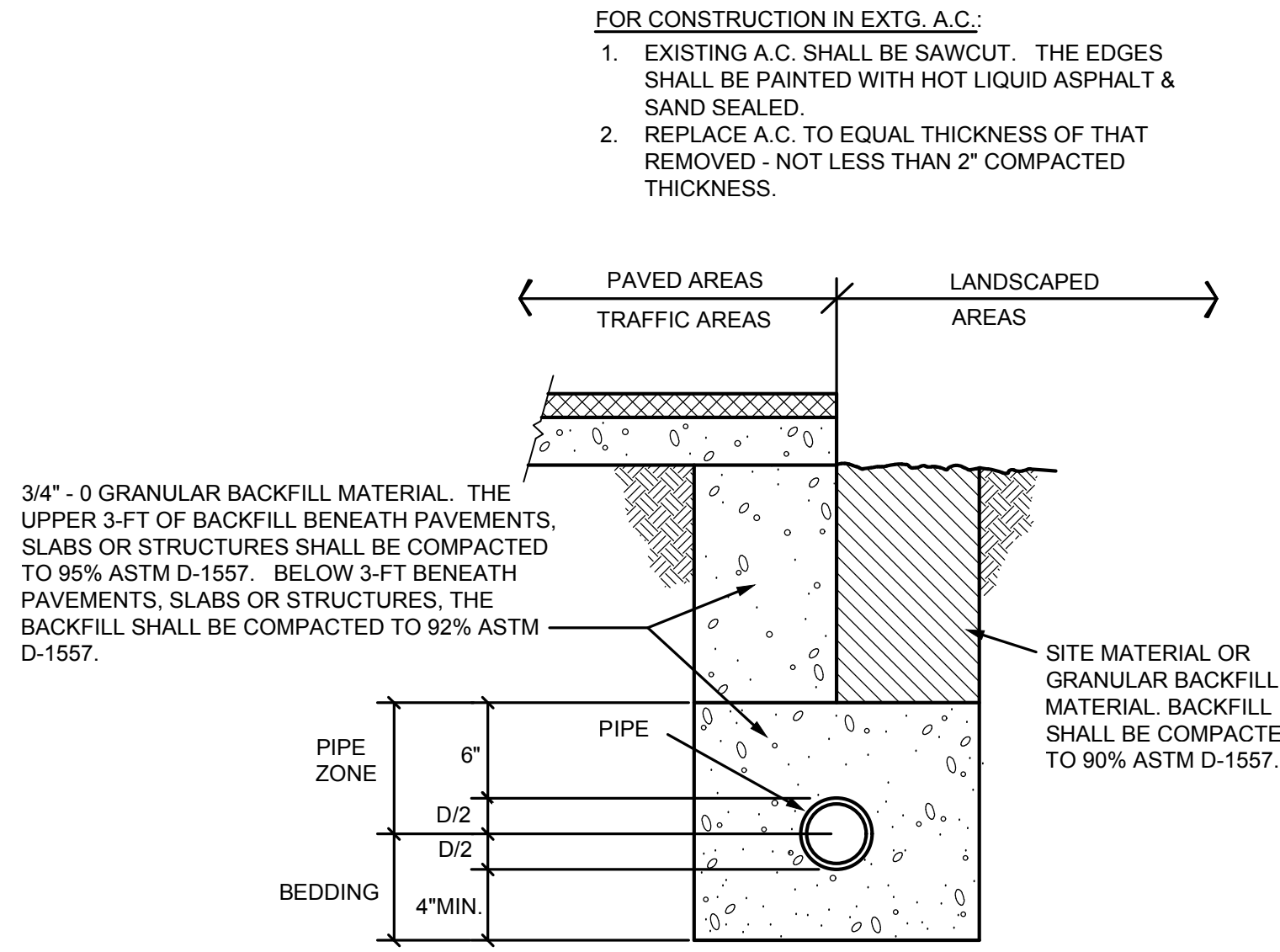
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					revision
					no.

sheet **C3.1**

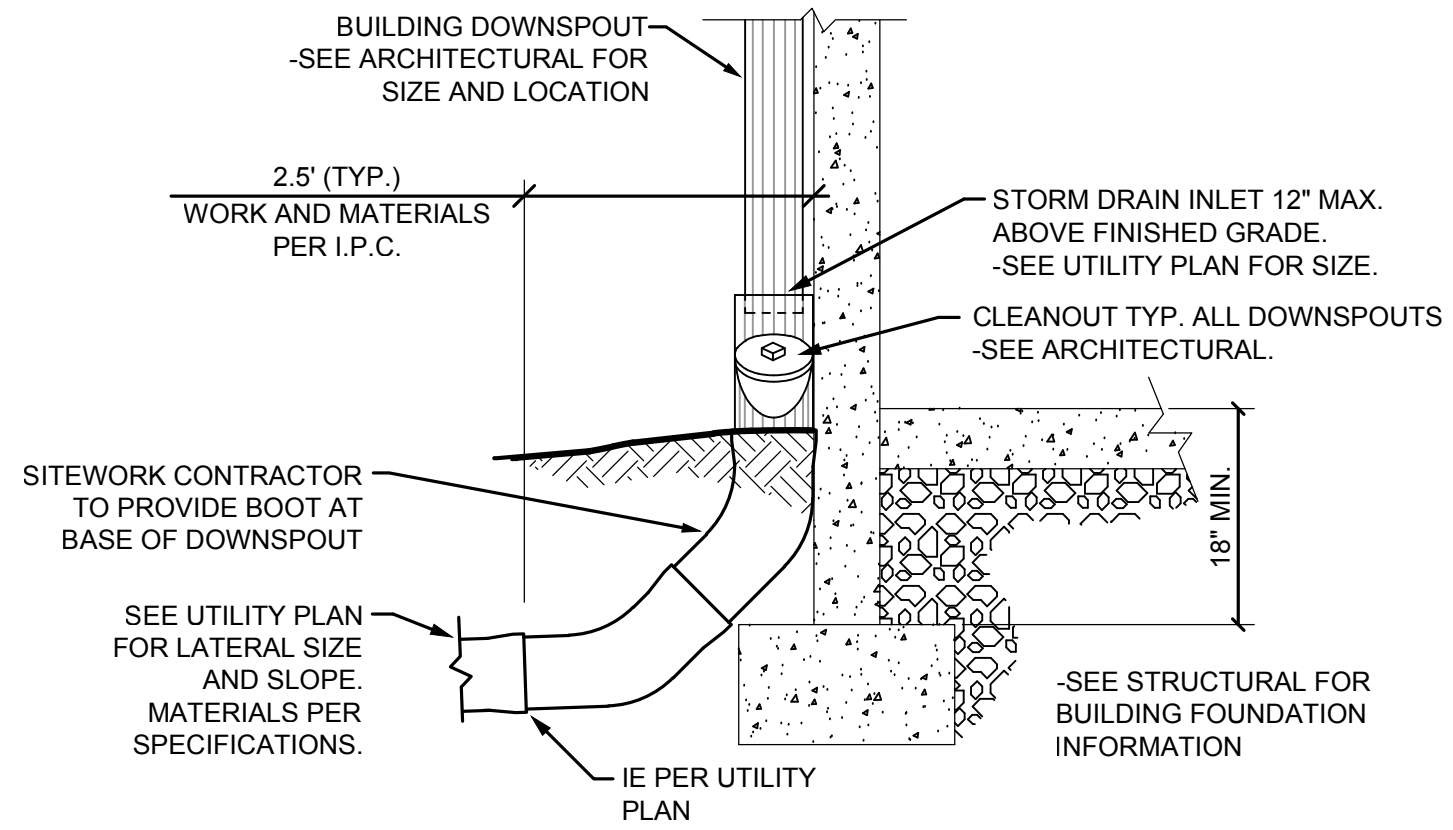




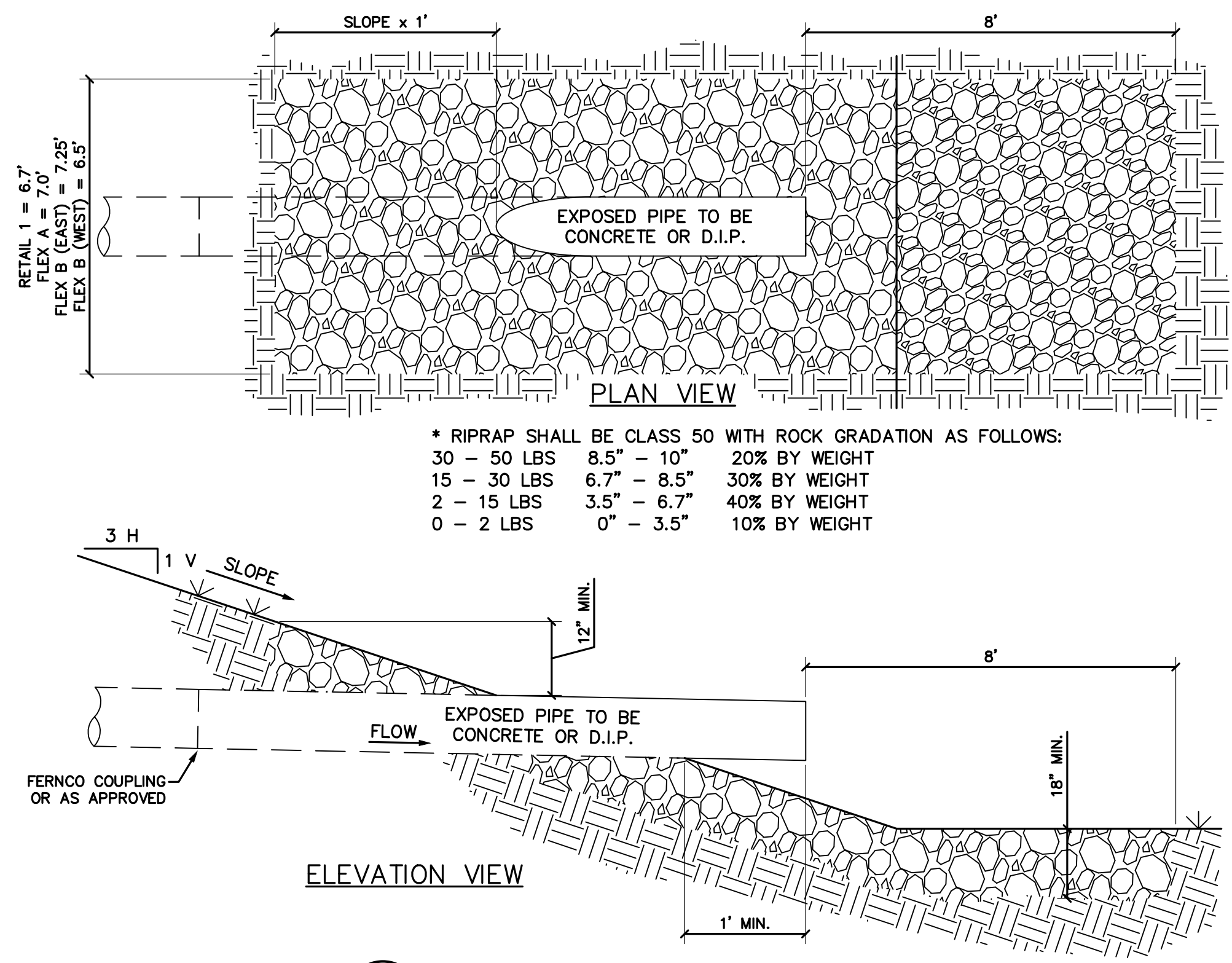
1 CLEAN OUT  
C3.6 N.T.S.



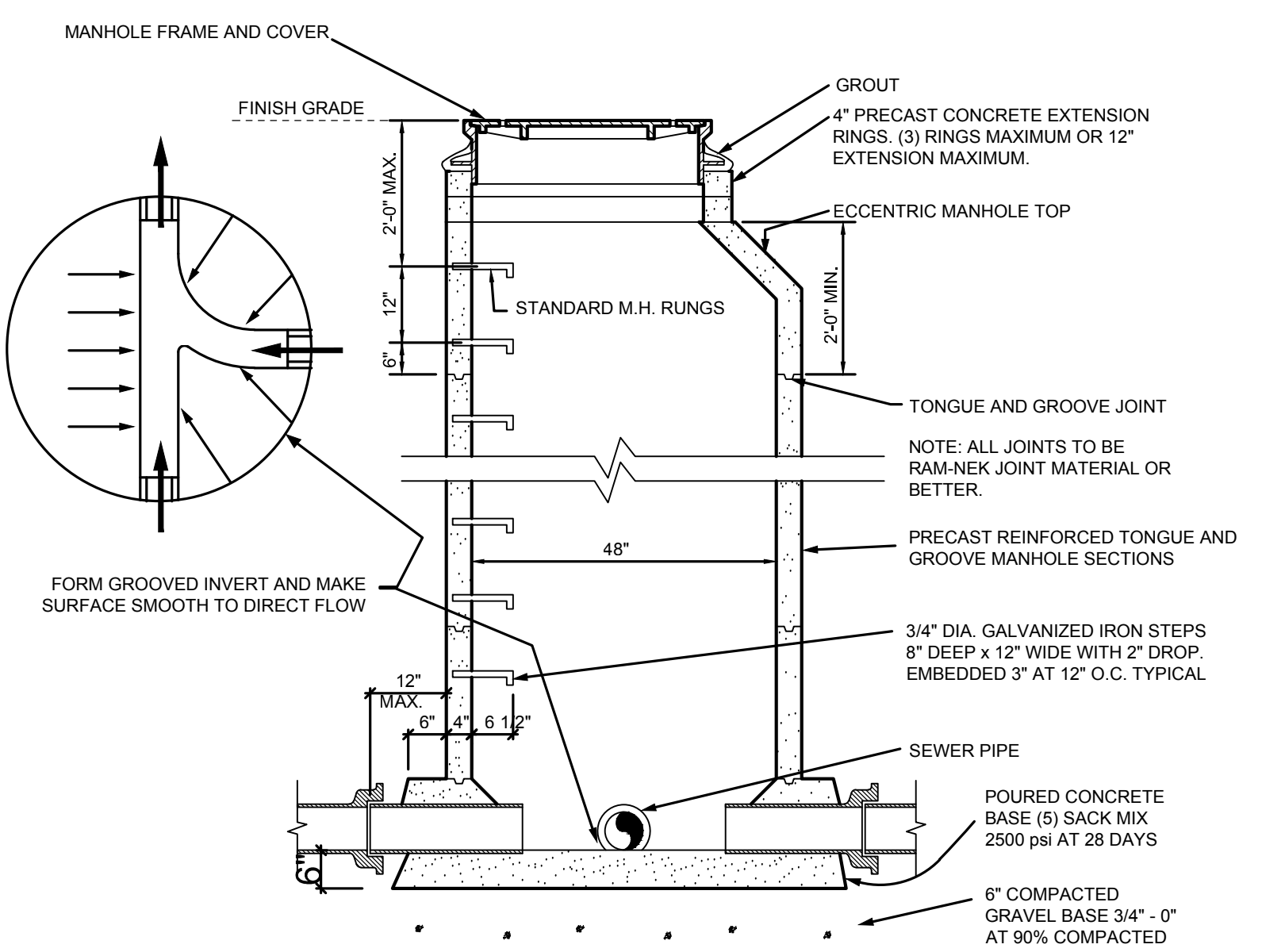
2 PIPE TRENCH EMBEDMENT SECTION  
C3.6 N.T.S.



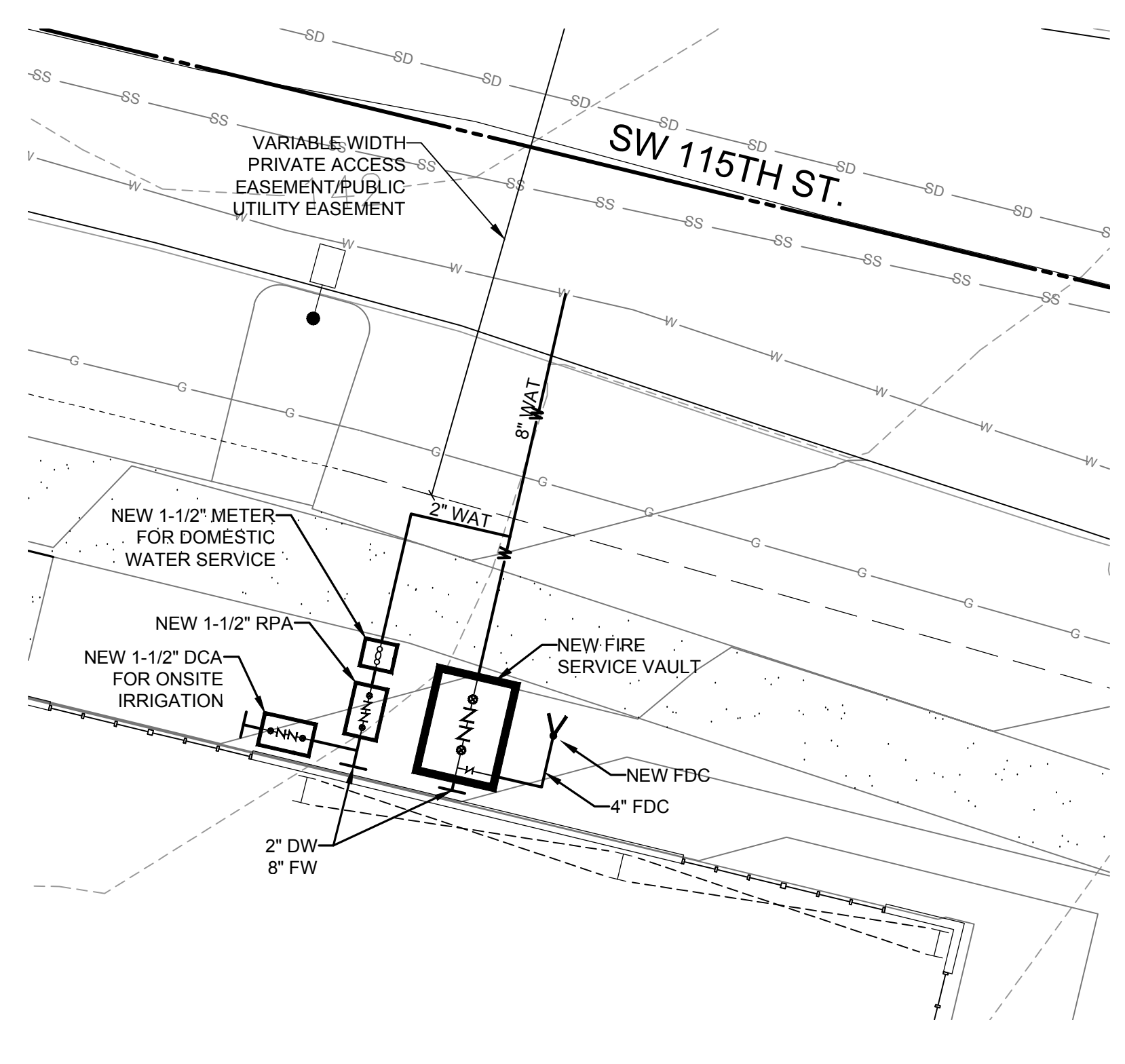
3 DOWNSPOUT CONNECTION DETAIL  
C3.6 N.T.S.



4 RIPRAP OUTFALL DETAIL  
C3.6 N.T.S.



5 STANDARD MANHOLE SECTION  
C3.6 N.T.S.



6 WATER CONNECTION DETAIL  
C3.6 1" = 10'

- FOR CONSTRUCTION IN EXTG. A.C.:
- EXISTING A.C. SHALL BE SAWCUT. THE EDGES SHALL BE PAINTED WITH HOT LIQUID ASPHALT & SAND SEALED.
  - REPLACE A.C. TO EQUAL THICKNESS OF THAT REMOVED - NOT LESS THAN 2" COMPACTED THICKNESS.

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TUALATIN, OREGON

**EROSION AND SEDIMENT CONTROL BMP IMPLEMENTATION:**

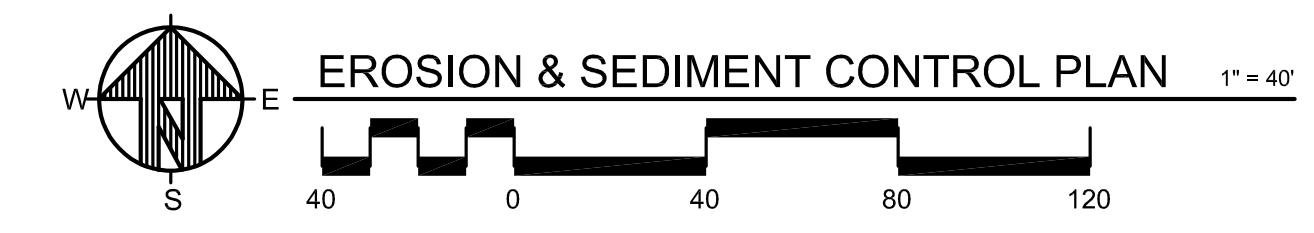
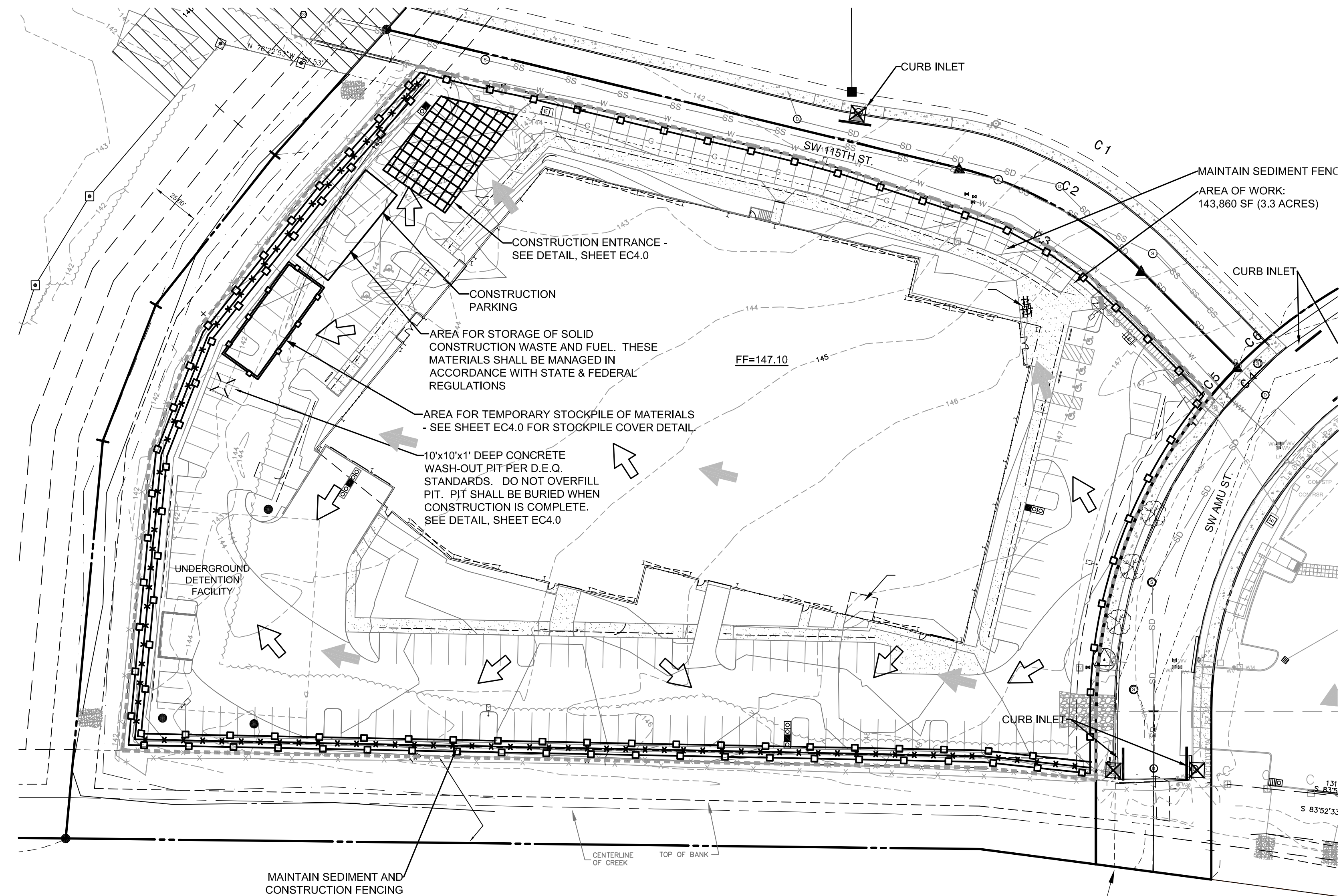
1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. "STOCK PILE AREA 1" SHALL BE MOVED TO "STOCK PILE AREA 2" FOLLOWING THE EXCAVATION CUT ACTIVITIES.
3. THE "STAGING, EQUIPMENT MAINTENANCE, FUELING, PORTA-POTTY, AND SOLID WASTE AREA 1" SHALL BE MOVED TO "STAGING, EQUIPMENT MAINTENANCE, FUELING, PORTA-POTTY, AND SOLID WASTE AREA 2" FOLLOWING EXCAVATION "CUT" ACTIVITIES.
4. ALL "SEDIMENT BARRIERS (TO BE INSTALLED AFTER GRADING)" SHALL BE INSTALLED IMMEDIATELY FOLLOWING ESTABLISHMENT OF FINISHED GRADE AS SHOWN ON THESE PLANS.
5. LONG TERM SLOPE STABILIZATION MEASURES "INCLUDING MATTING" SHALL BE IN PLACE OVER ALL EXPOSED SOILS BY OCTOBER 1.

6. THE STORM WATER FACILITY SHALL BE CONSTRUCTED AND LANDSCAPED PRIOR TO THE STORM WATER SYSTEM FUNCTIONING AND SITE PAVING.
7. INLET PROTECTION SHALL BE IN-PLACE IMMEDIATELY FOLLOWING PAVING ACTIVITIES.

**GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES:**

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, UNLESS OTHERWISE AUTHORIZED:
  - A. VEGETATED CORRIDOR AREAS REQUIRE NATIVE SEED MIXES. SEE RESTORATION PLAN FOR APPROPRIATE SEED MIX.
  - B. DWARF GRASS MIX (MIN. 100 LB./AC.)
    1. DWARF PERENNIAL RYEGRASS (80% BY WEIGHT)
    2. CREEPING RED FESCUE (20% BY WEIGHT)
  - C. STANDARD HEIGHT GRASS MIX (MIN. 100LB./AC.)
    1. ANNUAL RYEGRASS (40% BY WEIGHT)
    2. TURF-TYPE FESCUE (60% BY WEIGHT)
2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.
4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.
5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION, DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
13. AVOID PAVING IN WET WEATHER WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.
14. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.

THESE EROSION AND SEDIMENT CONTROL PLANS ASSUME "DRY WEATHER" CONSTRUCTION. "WET WEATHER" CONSTRUCTION MEASURES NEED TO BE APPLIED BETWEEN OCTOBER 1ST AND MAY 31ST.



**SURVEY LEGEND**

- |        |   |
|--------|---|
| AC     | = ASPHALTIC CONCRETE (PAVEMENT)   |
| CAM    | = CAMERA (TRAFFIC) POLE   |
| CB     | = CATCH BASIN   |
| CI     | = CURB INLET CATCH BASIN  |
| CMH    | = CURB INLET MANHOLE/CATCH BASIN  |
| CMP    | = CORRUGATED METAL PIPE   |
| COM    | = COMMUNICATIONS  |
| CONC   | = CONCRETE  |
| COSS   | = CLEANOUT (SANITARY SEWER)   |
| CSP    | = CONCRETE SEWER PIPE   |
| DI     | = DUCTILE IRON  |
| EB     | = ELECTRICAL BOX  |
| EV     | = ELECTRICAL VAULT  |
| EX     | = ELECTRICAL TRANSFORMER  |
| ELEV.  | = ELEVATION   |
| EM     | = ELECTRIC METER  |
| EXT    | = EXTRUDED  |
| FH     | = FIRE HYDRANT  |
| GP     | = GATE POST   |
| GV     | = NATURAL GAS VALVE   |
| I.E.   | = INVERT ELEVATION  |
| LP     | = LAMP POLE   |
| MH     | = MANHOLE   |
| NG     | = NATURAL GROUND  |
| O/H    | = OVERHEAD  |
| PP     | = POWER POLE  |
| PSP    | = PEDESTRIAN SIGNAL POLE  |
| PVC    | = POLYVINYL CHLORIDE (PIPE)   |
| R/SR   | = RISER   |
| SDMH   | = STORM DRAINAGE MANHOLE  |
| SSMH   | = SANITARY SEWER MANHOLE  |
| STP    | = STANDPIPE   |
| T.B.M. | = TEMPORARY BENCHMARK   |
| TRC    | = CONIFEROUS TREE WITH SIZE IN INCHES                                       |
| TRD    | = DECIDUOUS TREE WITH SIZE IN INCHES  |
| T/SB   | = TRAFFIC SIGNAL BOX  |
| TSP    | = TRAFFIC SIGNAL POLE   |
| VLT    | = VAULT   |
| WM     | = WATER METER   |
| WV     | = WATER VALVE   |
| 0636   | = TREE TAG NUMBER FROM ARBORIST'S REPORT (LOCATION VERIFIED IN THIS SURVEY) |
| C      | = COMMUNICATIONS LINE   |
| E      | = ELECTRIC LINE   |
| F      | = FENCE LINE  |
| G      | = NATURAL GAS LINE  |
| SS     | = SANITARY SEWER LINE   |
| SD     | = STORM SEWER LINE  |
| W      | = WATER LINE  |

**ESC PLAN LEGEND**

- |          |                                 |
|----------|---------------------------------|
| [Symbol] | = BIOFILTER BAG INLET BARRIER   |
| [Symbol] | = AREA DRAIN WITH INSERT BAG    |
| [Symbol] | = SEDIMENT FENCE                |
| [Symbol] | = CONSTRUCTION FENCE            |
| [Symbol] | = GRAVEL CONSTRUCTION ENTRANCE  |
| [Symbol] | = STRAW MULCH STABILIZATION     |
| [Symbol] | = PRE-DEV. DRAINAGE FLOW ARROW  |
| [Symbol] | = POST-DEV. DRAINAGE FLOW ARROW |
| [Symbol] | = CONCRETE TRUCK WASH OUT PIT   |
| [Symbol] | = LIMIT OF DISTURBED AREA       |

**SITE PLAN LEGEND**

- |          |                             |          |                              |
|----------|-----------------------------|----------|------------------------------|
| [Symbol] | = EXISTING CONTOUR LINE     | [Symbol] | = AREA DRAIN                 |
| [Symbol] | = NEW CONTOUR LINE          | [Symbol] | = MANHOLE                    |
| [Symbol] | = EXISTING SPOT ELEVATION   | [Symbol] | = UTILITY POLE               |
| [Symbol] | = NEW SPOT ELEVATION        | [Symbol] | = FIRE HYDRANT               |
| [Symbol] | = PROVIDE STAKE. SEE SPECS. | [Symbol] | = METER                      |
| EL       | = ELEVATION                 | [Symbol] | = UTILITY VAULT              |
| B.M.     | = BENCH MARK                | [Symbol] | = TRANSFORMER AND PAD        |
| TC       | = TOP OF CURB               | [Symbol] | = VALVE BOX COVER            |
| BC       | = BOTTOM OF CURB            | [Symbol] | = LIGHT POLE                 |
| MH       | = MANHOLE                   | [Symbol] | = WALL MOUNTED LIGHT         |
| CB       | = CATCH BASIN               | [Symbol] | = FIRE DEPARTMENT CONNECTION |
| AC       | = ASPHALT CONCRETE          |          |                              |
| AD       | = AREA DRAIN                |          |                              |
| H.P.     | = HIGH POINT                |          |                              |
| T.O.W.   | = TOP OF WALL               |          |                              |

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 07-20, SECTION 3.06.1 AND PER APPROVED PLANS.

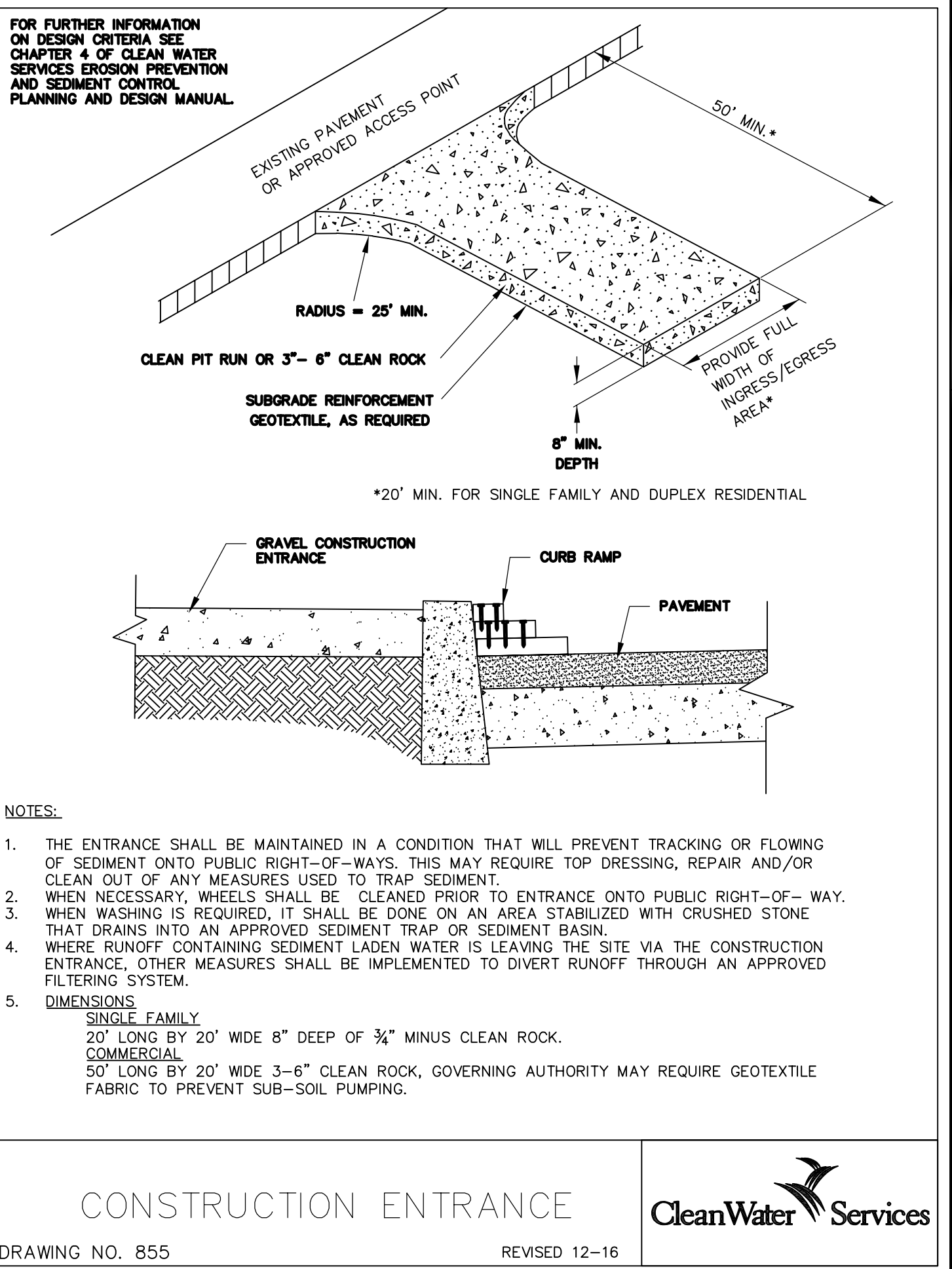
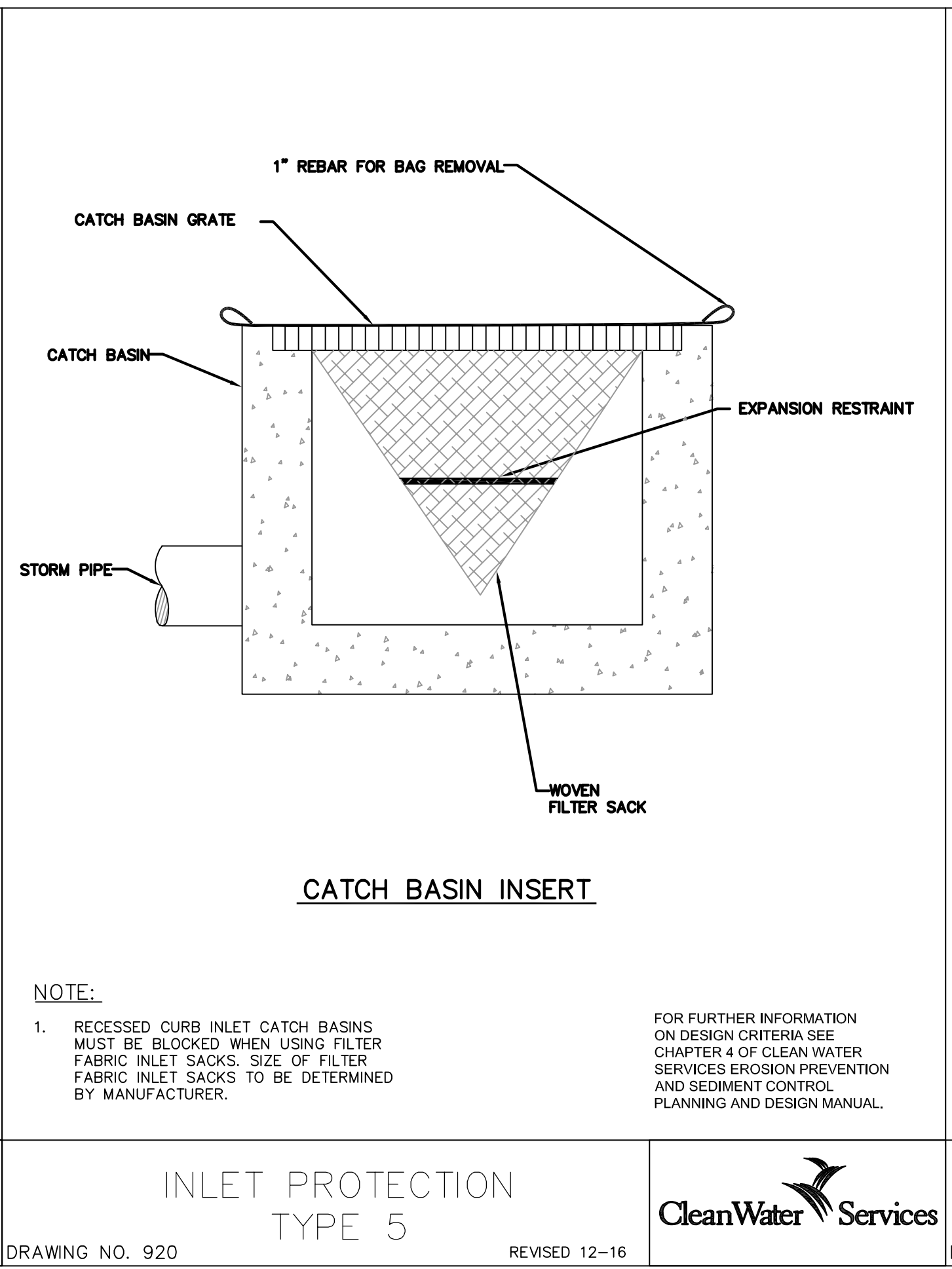
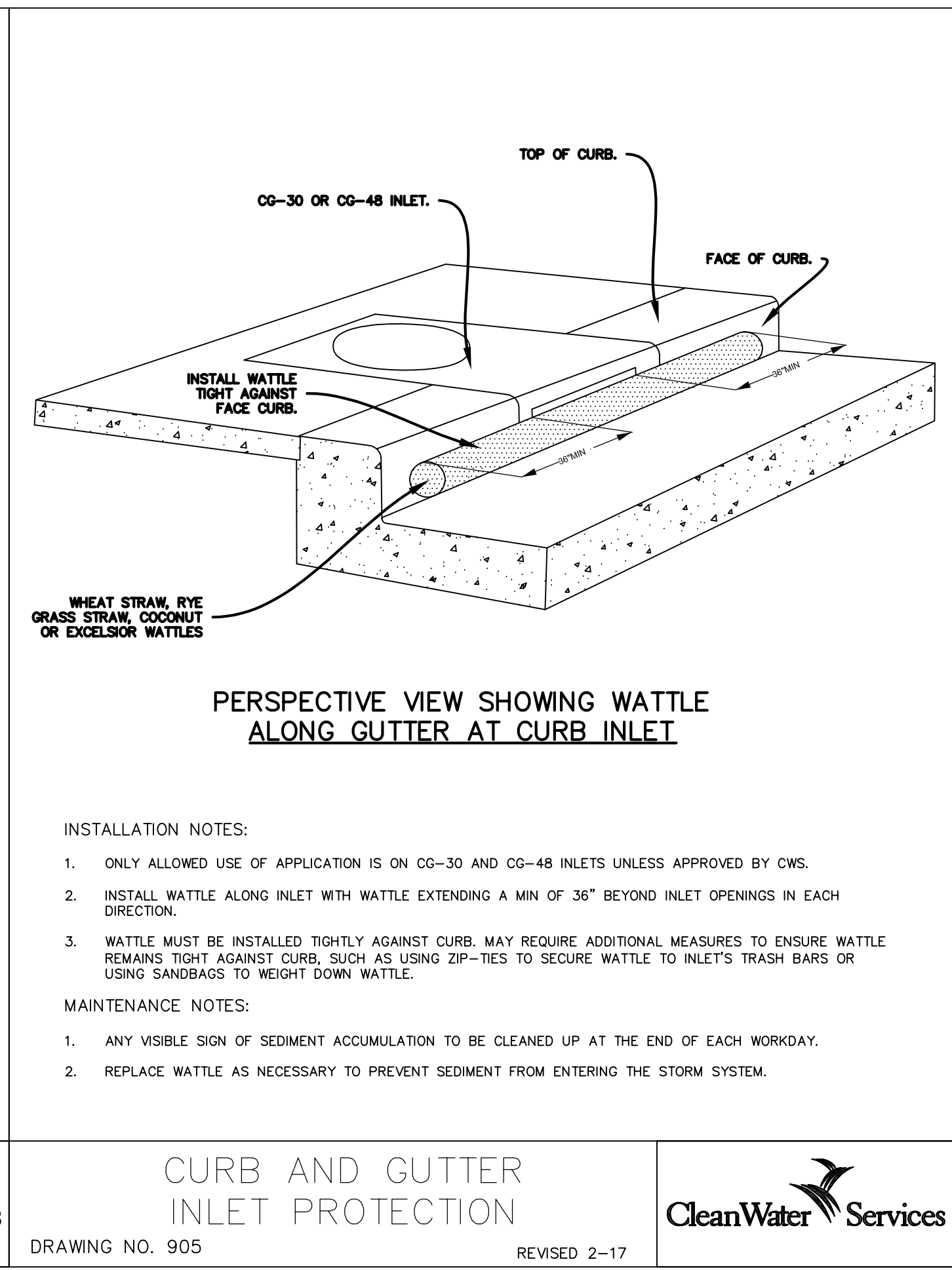
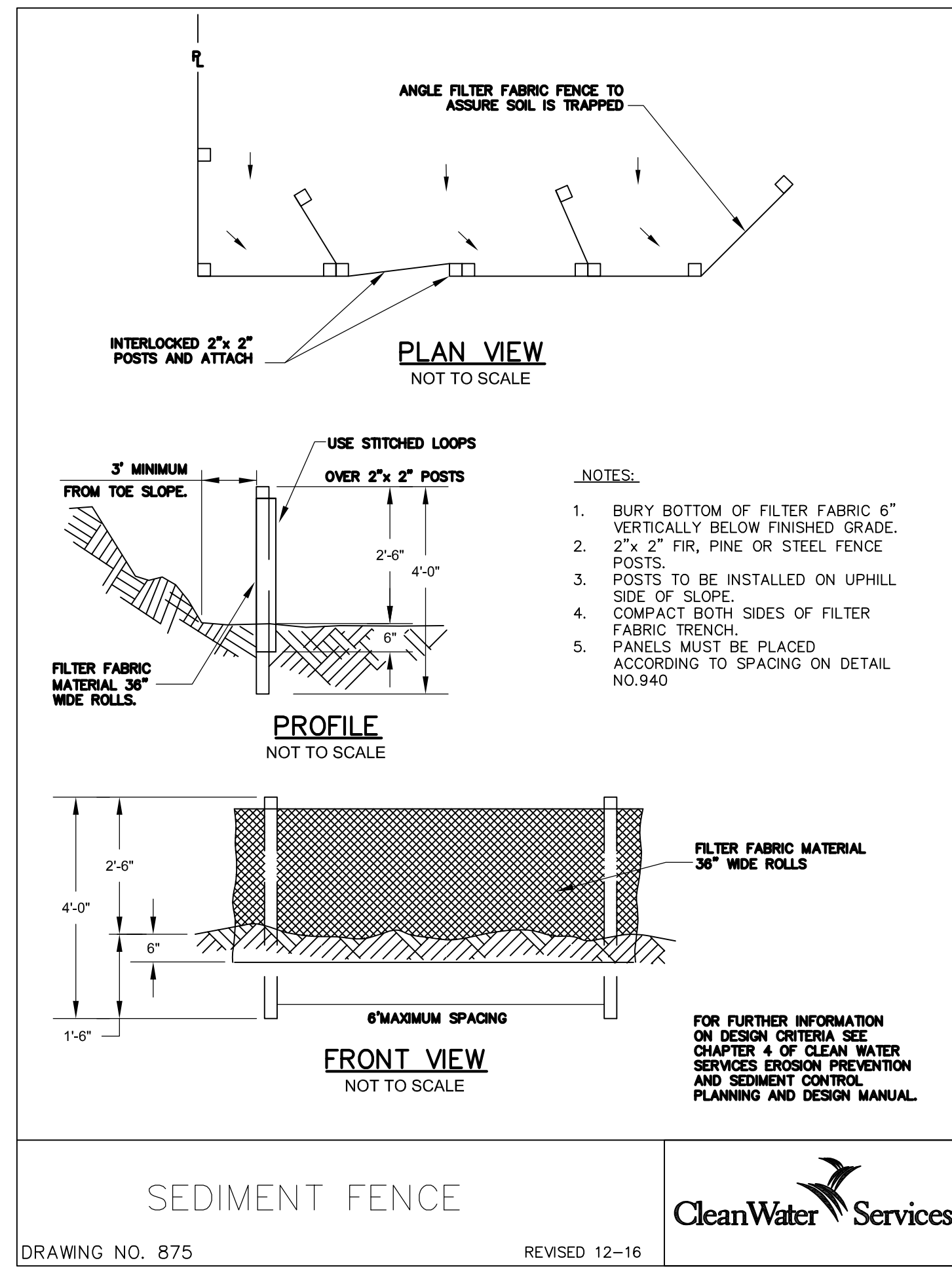
**NOTE:**  
ALL CHANGES/MODIFICATIONS TO THIS PLAN REQUIRE FILING OF AN "ACTION PLAN" PER THE DEQ 1200-C PERMIT FOR THIS PROJECT. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR FILING ANY ACTION PLANS.

**EROSION & SEDIMENT CONTROL PLAN**  
 LANGE MUELLER & ASSOCIATES  
 ARCHITECTS  
 120 LAUREL - SUITE 220 - BEVERLY HILLS, CA 91605 - (310) 225-2525  
**VLMK ENGINEERING + DESIGN**  
 3333 15th Avenue NE, Portland, Oregon 97217 - (503) 222-4241 - (503) 222-8283 - www.vlmk.com

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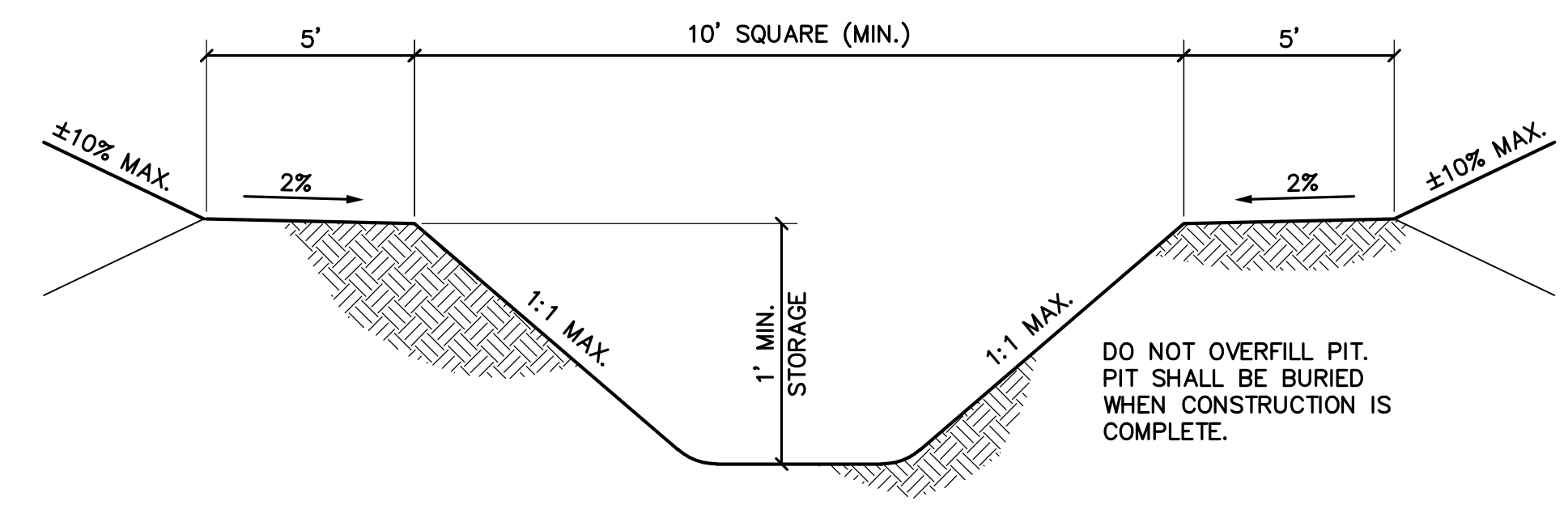


1 SEDIMENT FENCE  
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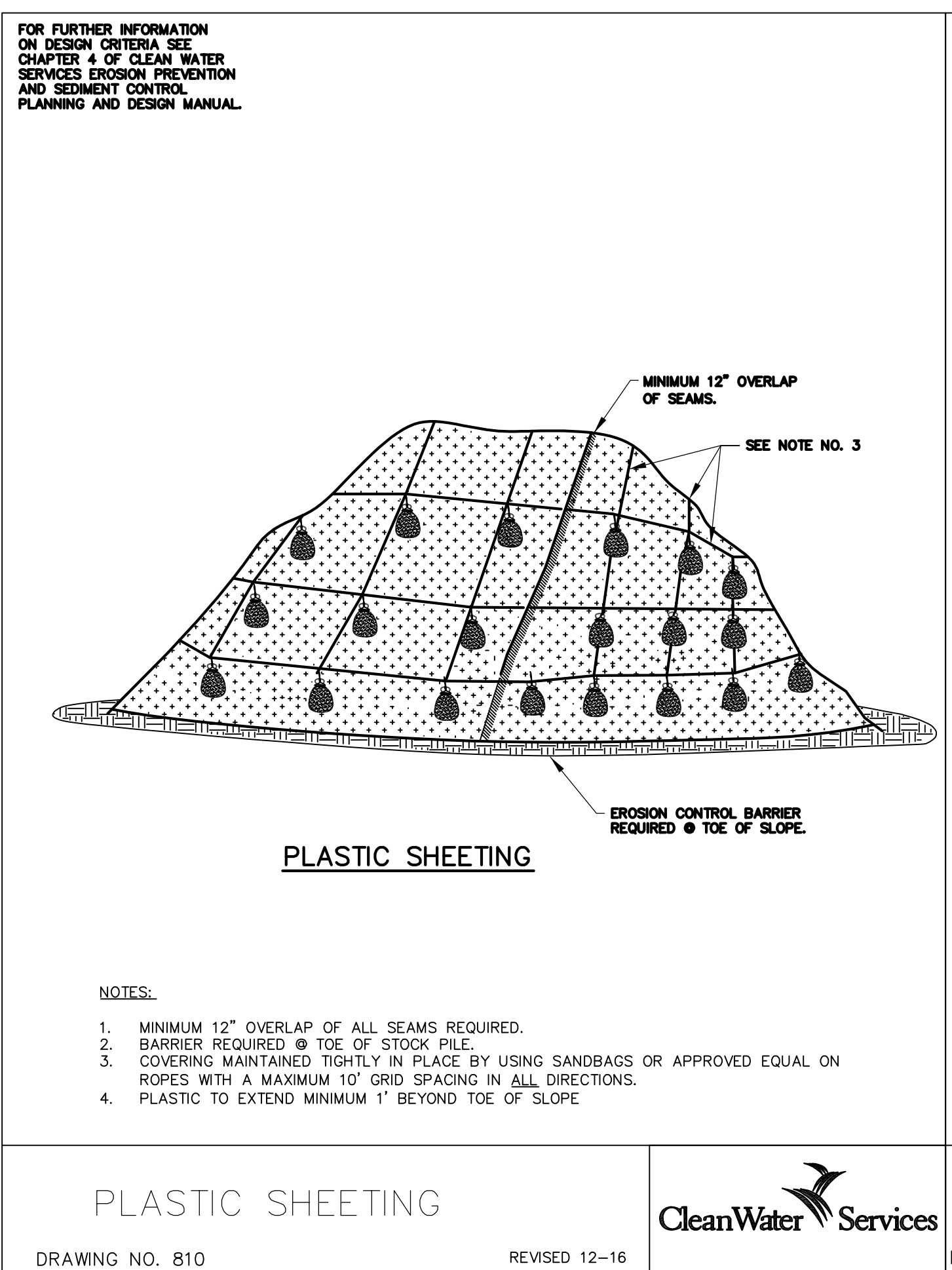
2 BIOFILTER BAG CURB INLET BARRIER  
EC4.0 N.T.S.

3 CATCH BASIN INSERT BAG  
EC4.0 N.T.S.

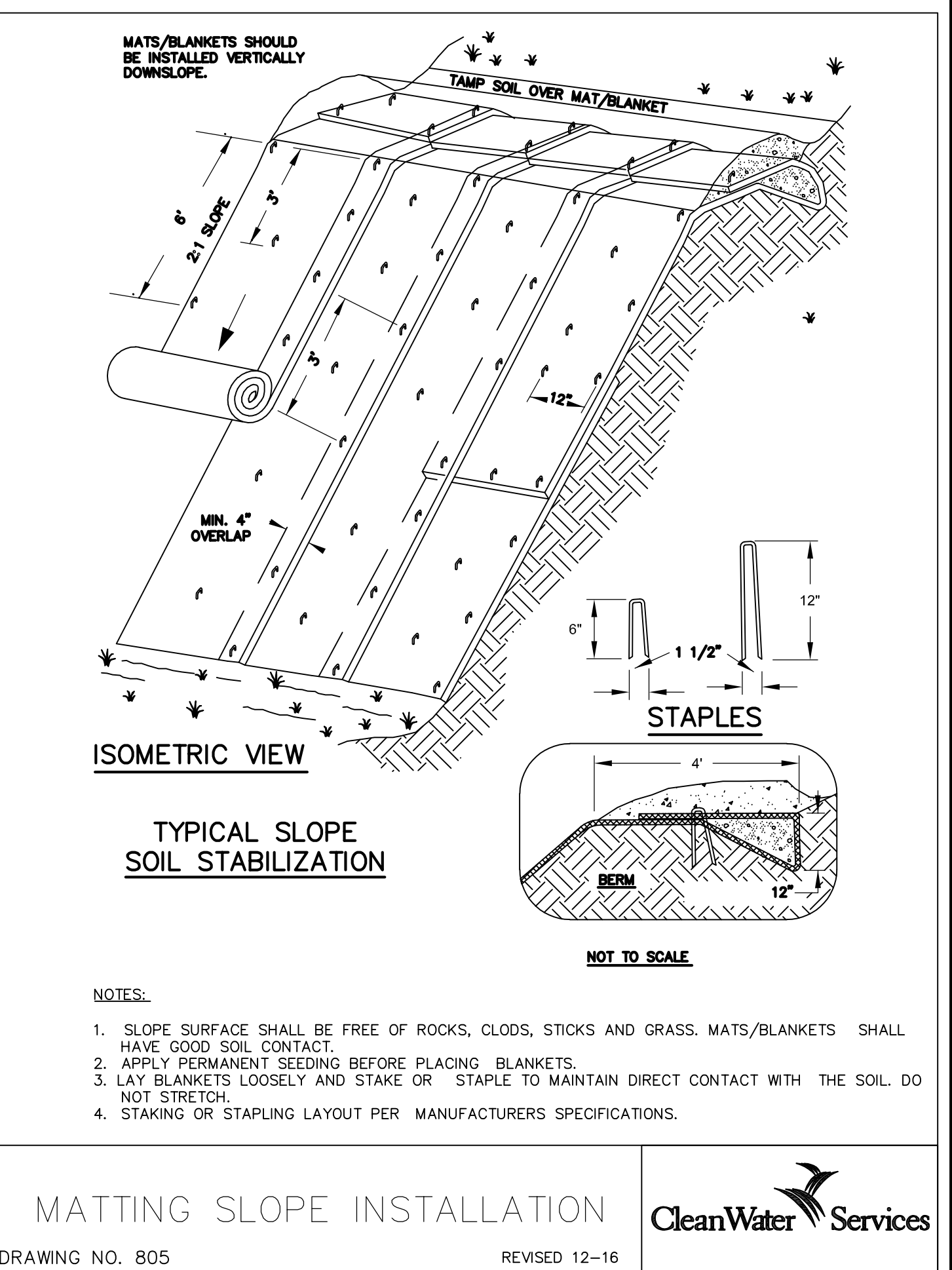
4 CONSTRUCTION ENTRANCE  
EC4.0 N.T.S.



7 CONCRETE WASH-OUT PIT  
EC4.0 N.T.S.



5 STOCKPILE COVER  
EC4.0 N.T.S.



6 MATTING AT SLOPE INSTALLATION  
EC4.0 N.T.S.

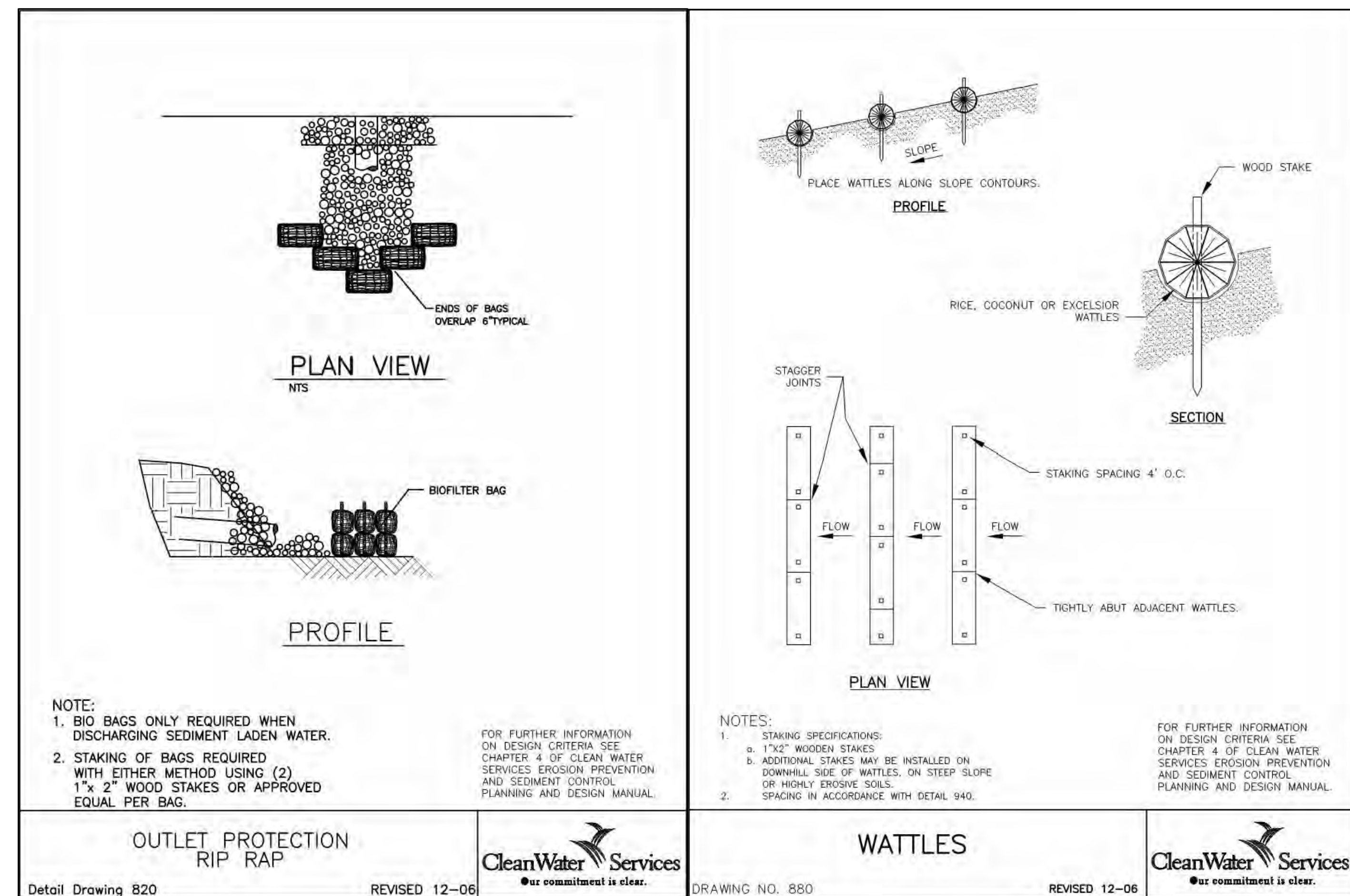
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**HEDGES C**  
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ARCHITECTS  
150 LAWRENCE - SUITE 225 - TUALATIN, OR 97146 - (503) 325-9255  
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3033 SW 48th Avenue, Portland, Oregon 97221 | (503) 224-4241 | (503) 224-4242 | www.vlmk.com

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**EC4.0**

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7  
EC4.0  
OUTLET RIP RAP PROTECTION  
N.T.S.

8  
EC4.0  
WATTLES  
N.T.S.

EROSION & SEDIMENT CONTROL DETAILS  
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ARCHITECTS  
150 W. LAUREL - SUITE 200 - TUALATIN, OR 97146  
TEL 503.224.4434 FAX 503.224.4435  
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3035 SW Avenue "Palmer" Clatsop County, Oregon 97131 TEL 503.224.4431 FAX 503.224.4435 WWW.VLMK.COM

**HEDGES C**  
SW 115th ST. AND SW AMU ST.  
TUALATIN, OREGON

20180291	job no.								
	drawn								
	checked								
JULY 2018	date								
	revision								

**GENERAL NOTES:**

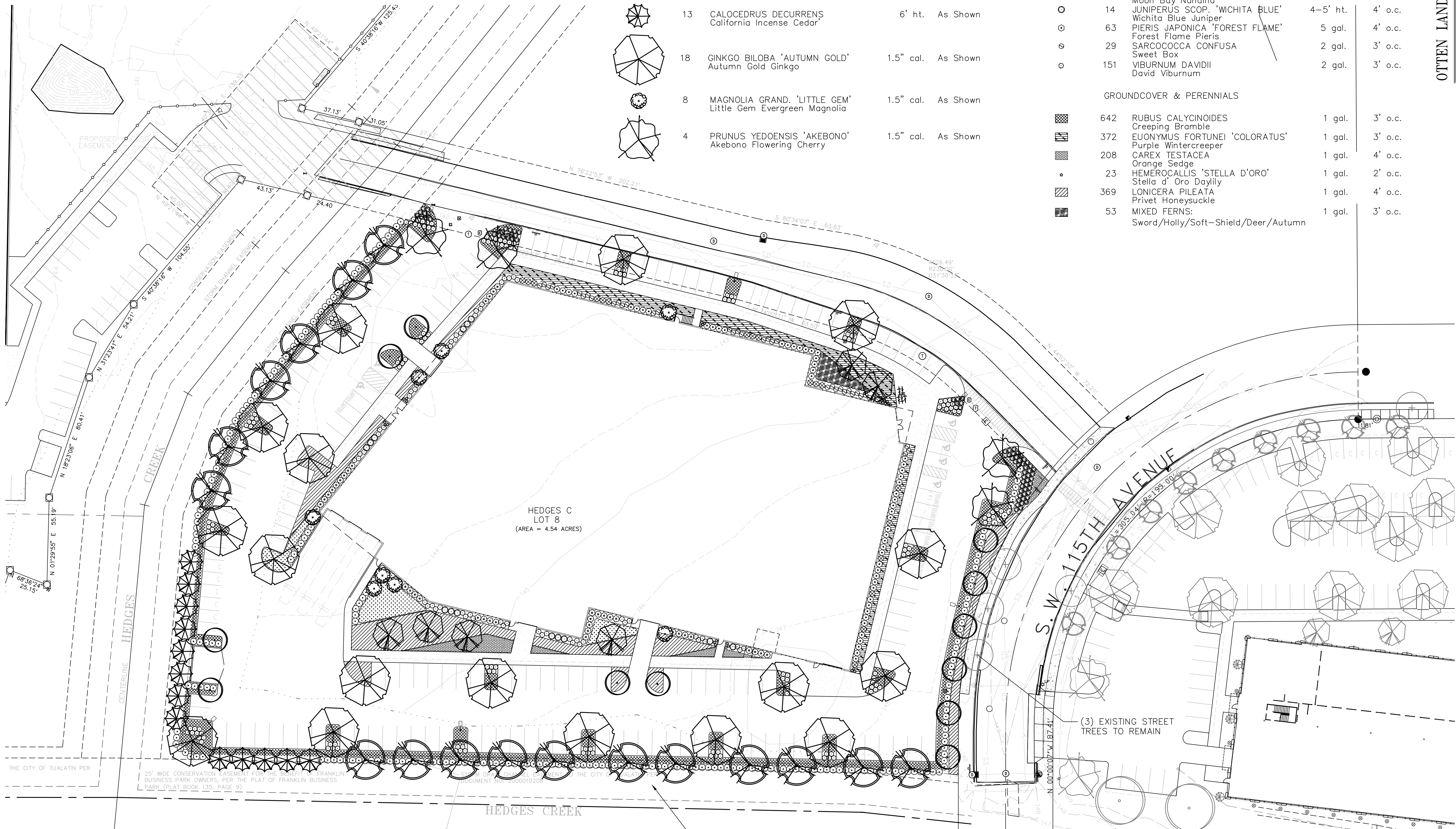
1. Contractor is to verify all plant quantities.
2. Adjust plantings in the field as necessary.
3. Project is to be irrigated by an automatic, underground system, which will provide full coverage for all plant material. System is to be design/ build by Landscape Contractor. Guarantee system for a minimum one year. Show drip systems as alternate bid only.
4. All plants are to be fully foliated, well branched and true to form.
5. Contractor is to notify Landscape Architect or Owner's Representative of any site changes or unforeseen conditions that may be detrimental to plant health, or cause future problems to any structural elements of the project.

**PLANT LEGEND: GENERAL LANDSCAPING**

SYMBOL	QTY.	LATIN NAME/ Common Name	SIZE	SPACING
TREES				
	6	ACER PALMATUM 'SANGO KAKU' Sango Kaku Japanese Maple	1.5" cal.	As Shown
	16	ACER TRUNC. x PLAT. 'KEITHSFORM' Norwegian Sunset Maple	1.5" cal.	As Shown
	12	CARPINUS BET. 'FRANS FONTAINE' Frans Fontaine Hornbeam	1.5" cal.	As Shown
	13	CALOCEDRUS DECURRENS California Incense Cedar	6' ht.	As Shown
	18	GINKGO BILOBA 'AUTUMN GOLD' Autumn Gold Ginkgo	1.5" cal.	As Shown
	8	MAGNOLIA GRAND. 'LITTLE GEM' Little Gem Evergreen Magnolia	1.5" cal.	As Shown
	4	PRUNUS YEDOENSIS 'AKEBONO' Akebono Flowering Cherry	1.5" cal.	As Shown

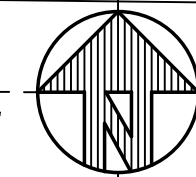
**PLANT LEGEND: GENERAL LANDSCAPING**

SYMBOL	QTY.	LATIN NAME/ Common Name	SIZE	SPACING
SHRUBS				
	18	CEPHALOTAXUS HARR. 'FASTIGIATA' Upright Japanese Plum Yew	4-5' ht.	4' o.c.
	39	CISTUS LADANIFER Crimson Spot Rockrose	5 gal.	4' o.c.
	372	CORNUS SERICEA 'KELSEY' Kelsey Dogwood	2 gal.	30" o.c.
	55	ABELIA GRAND. 'SUNSHINE DAYDREAM' Sunshine Daydream Abelia	5 gal.	3' o.c.
	246	LIGUSTRUM JAPONICUM 'TEXANUM' Waxleaf Privet	5 gal.	4' o.c.
	71	NANDINA DOMESTICA 'MOON BAY' Moon Bay Nandina	2 gal.	3' o.c.
	14	JUNIPERUS SCOP. 'WICHITA BLUE' Wichita Blue Juniper	4-5' ht.	4' o.c.
	63	PIERIS JAPONICA 'FOREST FLAME' Forest Flame Pieris	5 gal.	4' o.c.
	29	SARCOCOCCA CONFUSA Sweet Box	2 gal.	3' o.c.
	151	VIBURNUM DAVIDII David Viburnum	2 gal.	3' o.c.
GROUNDCOVER & PERENNIALS				
	642	RUBUS CALYCINOIDES Creeping Bramble	1 gal.	3' o.c.
	372	EUONYMUS FORTUNEI 'COLORATUS' Purple Wintercreeper	1 gal.	3' o.c.
	208	CAREX TESTACEA Orange Sedge	1 gal.	4' o.c.
	23	HEMEROCALLIS 'STELLA D'ORO' Stella d' Oro Daylily	1 gal.	2' o.c.
	369	LONICERA PILEATA Privet Honeysuckle	1 gal.	4' o.c.
	53	MIXED FERNS: Sword/Holly/Soft-Shield/Deer/Autumn	1 gal.	3' o.c.



**LANDSCAPE PLAN**

SCALE 1" = 30'-0"



OWNER INTENDS TO ENLIST CLEAN WATER SERVICES TO PROVIDE NATURAL RESOURCE AREA ENHANCEMENT

OTTEN LANDSCAPE ARCHITECTS Inc. OIO

3933 SW Kelly Avenue • Suite B • Portland, Oregon 97239-4393  
Phone (503) 972-0311 • Fax (503) 972-0314 • www.ottenla.com

REGISTERED LANDSCAPE ARCHITECT  
JANELL OTTEN  
OREGON  
EXP. 12/31/18

18-001 job no.	EH drawn	JLO checked	12-10-18 date
			no.
			revision
			date

**HEDGES C**  
SW 115th AVE AND HAUL ROAD  
TUALATIN, OREGON

LANDSCAPE PLAN  
LANE MUELLER & ASSOCIATES  
ARCHITECTS  
130 LAKESIDE • SUITE 250 • SEATTLE, WA 98122 • (206) 325-2553

sheet  
**1-1**

**OUTLINE SPECIFICATIONS PLANTING AND SEEDING:**

**GENERAL:** All plants shall conform to all applicable standards of the latest edition of the "American Association of Nurserymen Standards", A.N.S.I. Z60.1 - 1973. Meet or exceed the regulations and laws of Federal, State, and County regulations, regarding the inspection of plant materials, certified as free from hazardous insects, disease, and noxious weeds, and certified fit for sale in Oregon.

The apparent silence of the Specifications and Plans as to any detail, or the apparent omission from them of a detailed description concerning any point, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of first quality are to be used. All interpretations of these Specifications shall be made upon the basis above stated.

Landscape contractor shall perform a site visit prior to bidding to view existing conditions.

**PERFORMANCE QUALITY ASSURANCE:** Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary horticultural practices and who are completely familiar with the specified requirements and methods needed for the proper performance of the work of this section.

**NOTIFICATION:** Give Landscape Architect minimum of 2 days advance notice of times for inspections. Inspections at growing site does not preclude Landscape Architect's right of rejection of deficient materials at project site. Each plant failing to meet the above mentioned "Standards" or otherwise failing to meet the specified requirements as set forth shall be rejected and removed immediately from the premises by the Contractor and at his expense, and replaced with satisfactory plants or trees conforming to the specified requirements.

**SUBSTITUTIONS:** Only as approved by the Landscape Architect or the Owner's Representative.

**GUARANTEE AND REPLACEMENT:** All plant material shall be guaranteed from final acceptance for one full growing season or one year, whichever is longer. During this period the Contractor shall replace any plant material that is not in good condition and producing new growth (except that material damaged by severe weather conditions, due to Owner's negligence, normally unforeseen peculiarities of the planting site, or lost due to vandalism). Guarantee to replace, at no cost to Owner, unacceptable plant materials with plants of same variety, age, size and quality as plant originally specified. Conditions of guarantee on replacement plant shall be same as for original plant.

Landscape Contractor shall keep on site for Owner's Representative's inspection, all receipts for soil amendment and topsoil deliveries.

**PROTECTION** Protect existing roads, sidewalks, and curbs, landscaping, and other features remaining as final work. Verify location of underground utilities prior to doing work. Repair and make good any damage to service lines, existing features, etc. caused by landscaping installation.

**PLANT QUALITY ASSURANCE:** Deliver direct from nursery. Maintain and protect roots of plant material from drying or other possible injury. Store plants in shade and protect them from weather immediately upon delivery, if not to be planted within four hours.

Nursery stock shall be healthy, well branched and rooted, formed true to variety and species, full foliated, free of disease, injury, defects, insects, weeds, and weed roots. Trees shall have straight trunks, symmetrical tips, and have an intact single leader. Any trees with double leaders will be rejected upon inspection. All Plants: True to name, with one of each bundle or lot tagged with the common and botanical name and size of the plants in accordance with standards of practice of the American Association of Nurserymen, and shall conform to the Standardized Plant Names, 1942 Edition.

Container grown stock: Small container-grown plants, furnished in removable containers, shall be well rooted to ensure healthy growth. **Grow container plants in containers a minimum of one year** prior to delivery, with roots filling container but not root bound. Bare root stock: Roots well-branched and fibrous. Balled and burlapped (B&B): Ball shall be of natural size to ensure healthy growth. Ball shall be firm and the burlap sound. No loose or made ball will be acceptable.

**TOPSOIL AND FINAL GRADES:** Landscape Contractor is to verify with the General Contractor if the on site topsoil is or is not conducive to proper plant growth. Supply alternate bid for imported topsoil.

Landscape Contractor is to supply and place 12" of topsoil in planting beds and 6" in lawn areas. If topsoil stockpiled on site is not conducive to proper plant growth, the Landscape Contractor shall import the required amount. Landscape Contractor is to submit samples of the imported soil and/or soil amendments to the Landscape Architect. The topsoil shall be a sandy loam, free of all weeds and debris inimical to lawn or plant growth.

Landscaping shall include finished grades and even distribution of topsoil to meet planting requirements. Grades and slopes shall be as indicated. Planting bed grades shall be approximately 3" below adjacent walks, paving, finished grade lines, etc., to allow for bark application. Finish grading shall remove all depressions or low areas to provide positive drainage throughout the area.

**PLANTING SPECIFICATIONS:**

**HERBICIDES:** Prior to soil preparation, all areas showing any undesirable weed or grass growth shall be treated with Round-up in strict accordance with the manufacturer's instructions.

**SOIL PREPARATION:** Work all areas by rototilling to a minimum depth of 8". Remove all stones (over 1 1/2" size), sticks, mortar, large clumps of vegetation, roots, debris, or extraneous matter turned up in working. Soil shall be of a homogeneous fine texture. Level, smooth and lightly compact area to plus or minus .10 of required grades.

In groundcover areas add 2" of compost (or as approved) and till in to the top 6" of soil.

**PLANTING HOLE:** Lay out all plant locations and excavate all soils from planting holes to 2 1/2 times the root ball or root system width. Loosen soil inside bottom of plant hole. Dispose of any "subsoil" or debris from excavation. Check drainage of planting hole with water, and adjust any area showing drainage problems.

**SOIL MIX:** Prepare soil mix in each planting hole by mixing:  
2 part native topsoil (no subsoil)  
1 part compost (as approved)

Thoroughly mix in planting hole and add fertilizers at the following rates:

Small shrubs - 1/8 lb./ plant  
Shrubs - 1/3 to 1/2 lb./ plant  
Trees - 1/3 to 1 lb./ plant

**FERTILIZER:** For trees and shrubs use Commercial Fertilizer "A" Inorganic (5-4-3) with micro-nutrients and 50% slow releasing nitrogen. For initial application in fine seed lawn areas use Commercial Fertilizer "B" (8-16-8) with micro-nutrients and 50% slow-releasing nitrogen. For lawn maintenance use Commercial Fertilizer "C" (22-16-8) with micro-nutrients and 50% slow-releasing nitrogen. DO NOT apply fertilizer to Water Quality Swale.

**PLANTING TREES AND SHRUBS:** Plant upright and face to give best appearance or relationship to adjacent plants and structures. Place 6" minimum, lightly compacted layer of prepared planting soil under root system. Loosen and remove twine binding and burlap from top 1/2 of root balls. Cut off cleanly all broken or frayed roots, and spread roots out. Stagger Plants in rows. Backfill planting hole with soil mix while working each layer to eliminate voids.

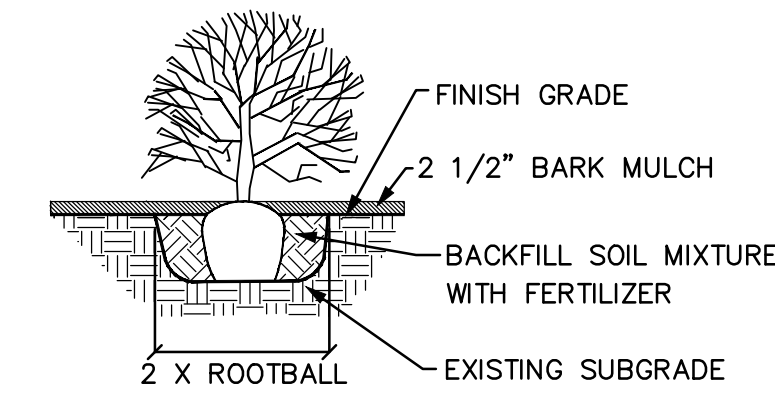
When approximately 2/3 full, water thoroughly, then allow water to soak away. Place remaining backfill and dish surface around plant to hold water. Final grade should keep root ball slightly above surrounding grade, not to exceed 1". Water again until no more water is absorbed. Initial watering by irrigation system is not allowed.

**STAKING OF TREES:** Stake or guy all trees. Stakes shall be 2" X 2" (nom.) quality tree stakes with point. They shall be of Douglas Fir, clear and sturdy. Stake to be minimum 2/3 the height of the tree, not to exceed 8'-0". Drive stake firmly 1'-6" below the planting hole. Tree ties for deciduous trees shall be "Chainlock" (or better). For Evergreen trees use "Gro-Strait" Tree Ties (or a reinforced rubber hose and guy wires) with guy wires of a minimum 2 strand twisted 12 ga. wire. Staking and guying shall be loose enough to allow movement of tree while holding tree upright.

**MULCHING OF PLANTINGS:** Mulch planting areas with dark, aged, medium grind fir or hemlock bark (aged at least 6 months) to a depth of 2" in ground cover areas and 2 1/2" in shrub beds. Apply evenly, not higher than grade of plant as it came from the nursery, and rake to a smooth finish. Water thoroughly, then hose down planting area with fine spray to wash leaves of plants.

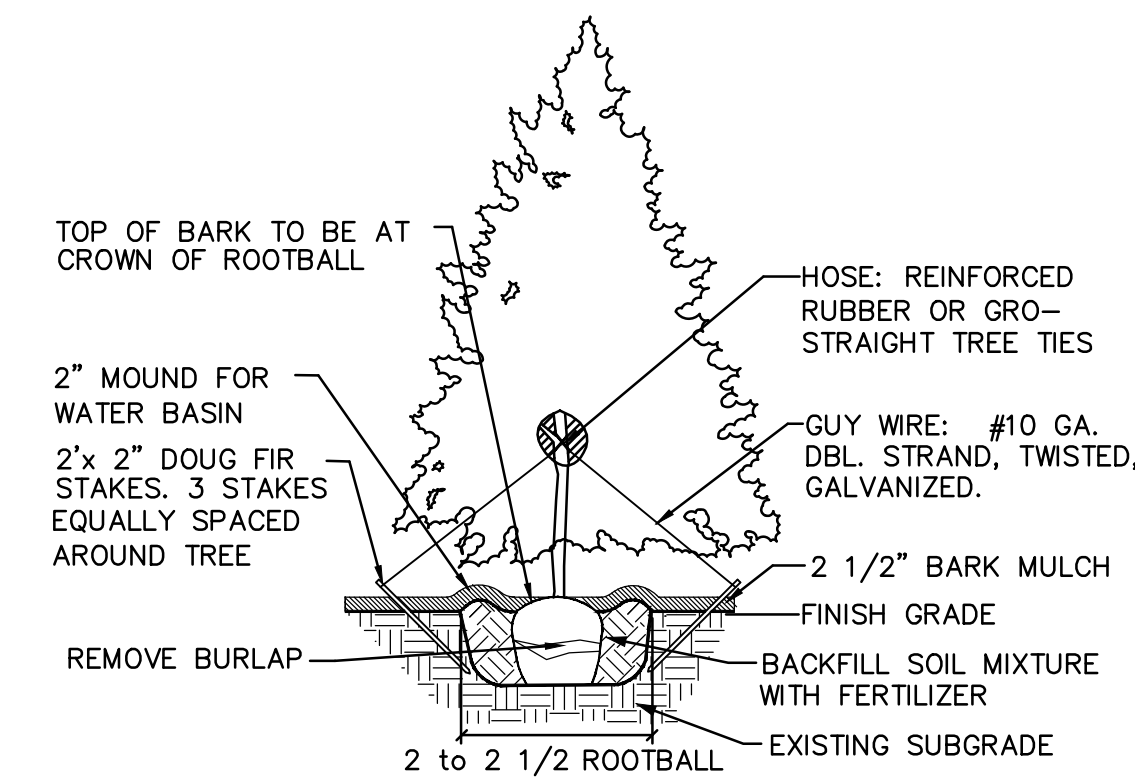
**GENERAL MAINTENANCE:** Protect and maintain work described in these specifications against all defects of materials and workmanship, through final acceptance. Replace plants not in normal healthy condition at the end of this period. Water, weed, cultivate, mulch, reset plants to proper grade or upright position, remove dead wood and do necessary standard maintenance operations. Irrigate when necessary to avoid drying out of plant materials, and to promote healthy growth.

**CLEAN-UP:** At completion of each division of work all extra material, supplies, equipment, etc., shall be removed from the site. All walks, paving, or other surfaces shall be swept clean, mulch areas shall have debris removed and any soil cleared from surface. All areas of the project shall be kept clean, orderly and complete.



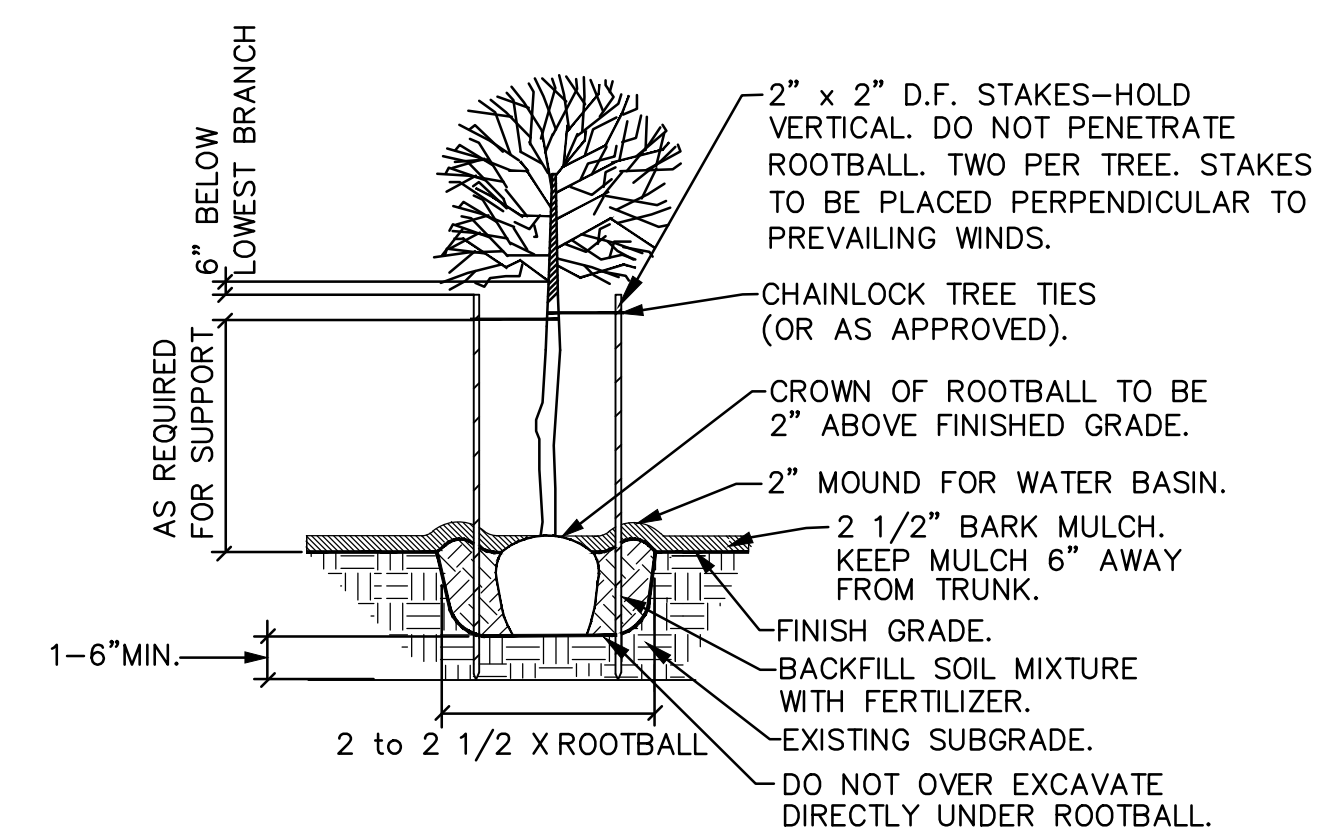
SHRUB PLANTING DETAIL

NOT TO SCALE



EVERGREEN TREE STAKING DETAIL

NOT TO SCALE



NOTE: ANY PROPOSED CHANGES TO OUR SPECIFICATION OR DETAIL SHOULD BE APPROVED BY THE LANDSCAPE ARCHITECT. LIKEWISE, IN ACCORDANCE WITH BEST PRACTICES OF LOCAL LANDSCAPE INSTALLATION, SHOULD THE LANDSCAPE CONTRACTOR FIND A PREFERRED ALTERNATE METHOD, THE LANDSCAPE ARCHITECT MAY BE SO ADVISED.

GENERAL DECIDUOUS TREE PLANTING DETAIL

NOT TO SCALE

18-001 job no.	EH drawn	JLO checked	12-10-18 date	no.	revision	date
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REGISTERED  
LANDSCAPE ARCHITECT  
JANET L. OTTEN  
OREGON  
EXP. 12/31/18  
TUALATIN, OREGON

HEDGES C  
SW 115th AVE AND HAUL ROAD  
TUALATIN, OREGON

LANDSCAPE SPECIFICATIONS & DETAILS

LANGE MUELLER & ASSOCIATES

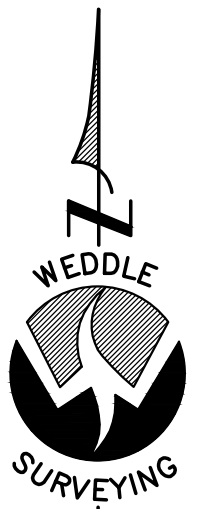
A R C H I T E C T S  
130 LAKESIDE • SUITE 250 • SEATTLE, WA 98122 • (206) 325-2553

sheet

L-2

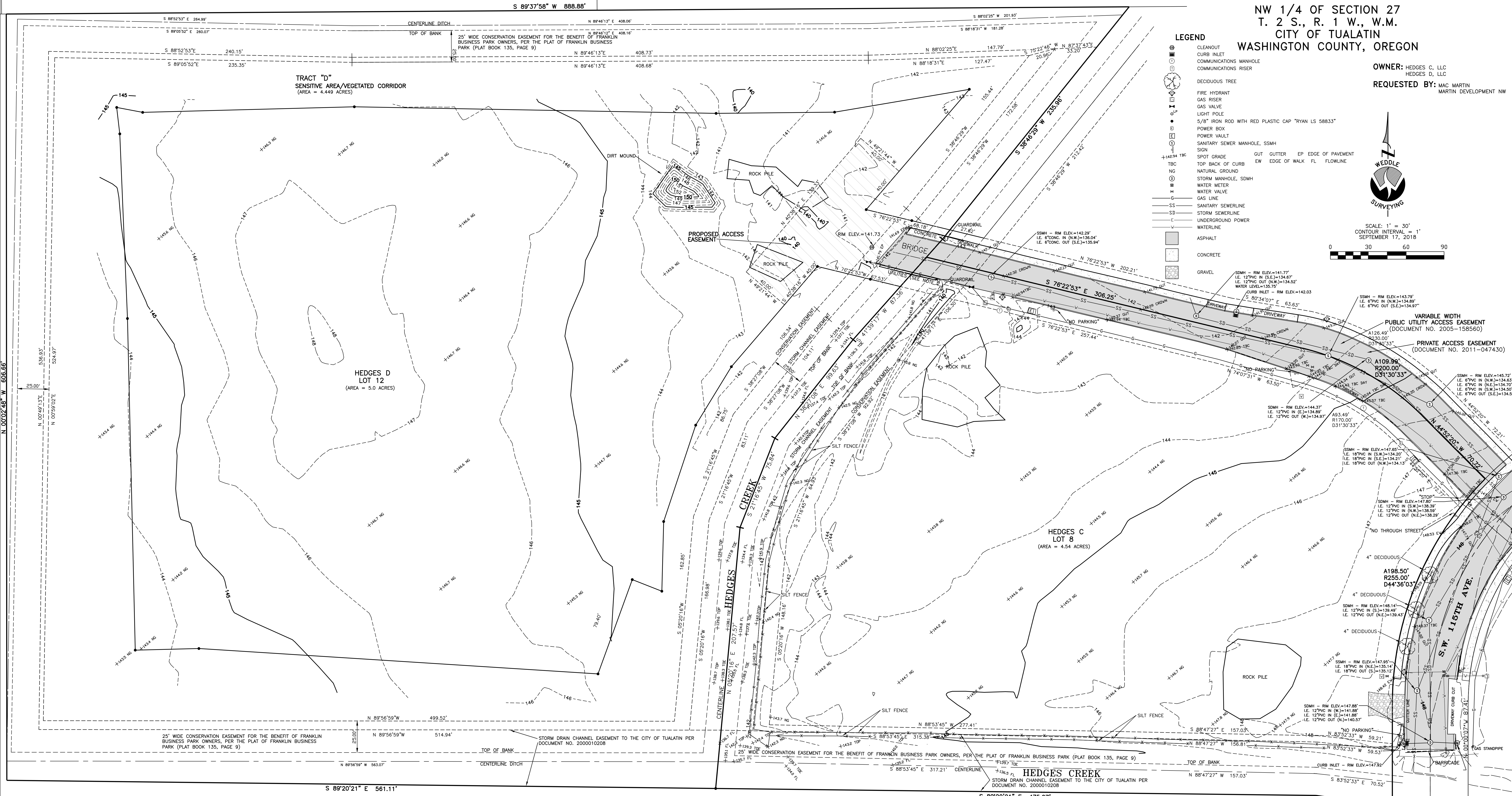
**TOPOGRAPHIC SURVEY**  
**HEDGES C AND D**  
 LOT 8, "FRANKLIN BUSINESS PARK" NO. 4 &  
 LOT 12, "FRANKLIN BUSINESS PARK" NO. 6  
 NW 1/4 OF SECTION 27  
 T. 2 S., R. 1 W., W.M.  
 CITY OF TUALATIN  
 WASHINGTON COUNTY, OREGON

OWNER: HEDGES C, LLC  
 HEDGES D, LLC  
 REQUESTED BY: MAC MARTIN  
 MARTIN DEVELOPMENT NW



SCALE: 1" = 30'  
 CONTOUR INTERVAL = 1'  
 SEPTEMBER 17, 2018

- LEGEND**
- CLEANOUT
  - CURB INLET
  - COMMUNICATIONS MANHOLE
  - COMMUNICATIONS RISER
  - DECIDUOUS TREE
  - FIRE HYDRANT
  - GAS RISER
  - GAS VALVE
  - LIGHT POLE
  - 5/8" IRON ROD WITH RED PLASTIC CAP "RYAN LIS 58833"
  - POWER BOX
  - POWER VAULT
  - SANITARY SEWER MANHOLE, SSMH
  - SIGN
  - SPOT GRADE
  - GUT GUTTER EP EDGE OF PAVEMENT
  - TBC TOP BACK OF CURB
  - NG NATURAL GROUND
  - SD STORM MANHOLE, SDMH
  - W WATER METER
  - W VALVE
  - G GAS LINE
  - SS SANITARY SEWERLINE
  - SD STORM SEWERLINE
  - U UNDERGROUND POWER
  - W WATERLINE
  - ASPHALT
  - CONCRETE
  - GRAVEL



**BASIS OF ELEVATIONS**  
 WEDDLE CONTROL POINTS WITH ELEVATIONS DERIVED FROM WASHINGTON COUNTY BENCHMARK NO. 89, A BRASS CAP IN MONUMENT BOX MARKING THE QUARTER CORNER BETWEEN SECTIONS 26 & 35, T.2S., R.1E., AT THE INTERSECTION OF IBACH ROAD AND BOONES FERRY ROAD.  
 ELEVATION = 276.48' (NGVD '29) (MONUMENT HAS BEEN DESTROYED. RELATIVE ELEVATIONS HAVE BEEN PERPETUATED.)

- SURVEYOR'S NOTES**
- UTILITIES SHOWN HEREON ARE PER ABOVE GROUND EVIDENCE AS BUILT MAPPING FROM THE CITY OF TUALATIN AND NORTHWEST NATURAL GAS AND UTILITY LOCATE SERVICE POINT. THE SURVEYOR MAKES NO GUARANTEE AS TO THE EXACT LOCATION, OR EXTENT OF UNDERGROUND UTILITIES. CALL 811 BEFORE DIGGING.
  - MULTIPLE UNMARKED UTILITIES CROSSING NEXT TO BRIDGE.
  - THE BASIS OF BEARINGS FOR THIS SURVEY IS THE PLAT OF "FRANKLIN BUSINESS PARK", WASHINGTON COUNTY PLAT RECORDS.
  - EASEMENTS ARE SHOWN PER THE PLAT OF FRANKLIN BUSINESS PARK NO. 4 AND 6.
  - NOT ALL SURVEY MONUMENTS ARE NOT SHOWN. REFER TO THE PLAT OF FRANKLIN BUSINESS PARK NO. 4 AND 6 FOR MONUMENT LOCATIONS.

- REVISIONS/UPDATES**
- 09/17/18 EXPANDED TOPOGRAPHY TO SOUTH AND WEST (TOWARD CREEK) OVER HEDGES 'C' SITE, DUE TO RECENT CLEARING, GRADING AND BRUSH REMOVAL.
  - 09/24/18 ADDED SPOT ELEVATIONS OF CREEK TO SOUTH AND WEST OF HEDGES 'C' SITE, DUE TO RECENT BRUSH REMOVAL.

REGISTERED PROFESSIONAL LAND SURVEYOR  
 OREGON (JULY 13, 2004)  
 ANTHONY B. RYAN  
 58833  
 RENEWAL: DECEMBER 31, 2018



## **Hedges C**

SW 115th Avenue (or SW Amu St.) at Haul Road, Tualatin, OR 97062

### **Attachments:**

**Geotechnical Report** (3 Sets)

**Exterior Lighting Fixture** Cut Sheets

**Fire Flow** – deferred hydraulic modeling will be ordered when AR submittal accepted.

**Completed City Fact Sheet / AR Intake Checklist** (Note, we have placed in Checklist in Item 1.)

**Acoustic Engineer Report** – NA (This shell bldg. has no occupancy or rooftop mechanical.) RR

**Crossing Information** – NA (No railroad in immediate area.)



**Due Diligence and Preliminary Geotechnical  
Engineering Services**

Hedges Buildings C & D  
Tualatin, Oregon

*for*  
**Martin Development**

September 6, 2018



**Due Diligence and Preliminary Geotechnical  
Engineering Services**

Hedges Buildings C & D  
Tualatin, Oregon

*for*

**Martin Development**

September 6, 2018



1200 NW Naito Parkway, Ste. 180  
Portland, Oregon 97209  
503.624.9274

# Due Diligence and Preliminary Geotechnical Engineering Services

## Hedges Buildings C & D Tualatin, Oregon

File No. 0821-014-02

September 6, 2018

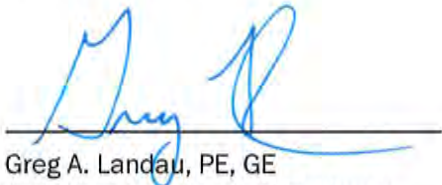
Prepared for:

Martin Development  
2351 Fairview Avenue E, Unit A  
Seattle, Washington 98102

Attention: Mac Martin

Prepared by:

GeoEngineers, Inc.  
1200 NW Naito Parkway  
Portland, Oregon, 97209  
503.624.9274



Greg A. Landau, PE, GE

Associate Geotechnical Engineer

GAL:cje



EXPIRES: 12.31.18

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## **INTRODUCTION**

This report presents the results of GeoEngineers' due diligence and preliminary geotechnical engineering services for the project located off SW Amu Street near the intersection with SW 115<sup>th</sup> Street in Tualatin, Oregon, as shown in the Vicinity Map, Figure 1. The project site consists of two parcels. The Building C parcel is bounded by SW 115<sup>th</sup> Street to the north, SW Amu Street to the east and riparian corridors associated with Hedges Creek to the south and west. The Building D parcel is located at the west end of SW 115<sup>th</sup> Street and is bounded by private properties, or undeveloped riparian wetlands, to the north, west, and south, and by the Hedges Creek channel on the east. The Building C and Building D sites are shown relative to surrounding physical features in the Site Plans, Figures 2 and 3, respectively.

The purpose of our geotechnical engineering services was to explore subsurface conditions at the site to provide preliminary recommendations regarding the suitable foundation support options for Hedges Building C and Hedges Building D. Our scope of services is summarized in our revised proposal to you dated January 19, 2018.

Based on preliminary information provided by the project team, we understand that the planned development will likely include commercial concrete tilt-up structures with parking provided at-grade. Geotechnical site conditions and development considerations are presented below.

## **FIELD EXPLORATIONS AND LABORATORY TESTING**

### **Field Explorations**

The subsurface conditions at the site were evaluated by drilling a total of seven geotechnical borings to depths ranging from 5½ to 81½ feet below ground surface (bgs). In addition, we reviewed logs of borings performed during explorations of the Building C site (Hart Crowser 2014) and the Building D site (GeoDesign, Inc. 1997). The approximate locations of the explorations, including those performed by others, are shown in Figures 2 and 3. The logs of the explorations are presented in Appendix A.

### **Laboratory Testing**

Soil samples were obtained during drilling and were taken to GeoEngineers' laboratory for further evaluation. Selected samples were tested to determine Atterberg limits, moisture-density, fines content, organic content and moisture content. A description of the laboratory testing and the test results are presented in Appendix A.

## **SITE CONDITIONS**

### **Surface Conditions**

The Building C site is roughly rectangular and is currently vacant and covered with field grass, although portions of the site were mantled with a gravel pavement. Concrete curbs, gutters, and sidewalks were constructed along the north and east sides of the site. Stockpiles of debris fill were observed in the northwest corner of the site, including basalt boulders, gravel, asphalt, and concrete. The site surface is flat to very gently undulating, with elevations across the site ranging from approximately 143 feet above mean sea level (MSL) to 144 feet MSL.

The Building D site is an approximately 5-acre parcel located west of the Hedges Creek canal. Similar drainage canals have been excavated along the north and much of the west side of the parcel. The site is currently vacant and is covered with rough field grass and small trees. A stockpile of aggregate is located in the northeast corner of the site. The site surface is flat to very gently undulating, with elevations across the site ranging from approximately 150 feet MSL to 153 feet MSL.

## **Subsurface Conditions**

### **General**

Both parcels within the project site are located within the Tualatin River valley, once dominated by the active floodplains and alluvial terraces of the Tualatin River and its tributaries such as Hedges Creek.

During agricultural development, and, later, urbanization of Tualatin-Sherwood metropolitan area these lowlands were altered, largely by channelization of the tributary streams as well as raising the grade of the original riparian lowlands by placing a variety of fill materials ranging from ditch channel spoil, silt, sand, gravel, and construction and demolition debris. The original topography of Hedges Creek as well as the surrounding agricultural areas were never documented or, if so, was not preserved, so the thickness, extent, and location of these fills are not well defined. The project site is mantled with these man-made fills.

Two types of soil were encountered underlying the site within the depth of exploration: fill, and alluvial sediments. The latter are further divided into Holocene-age alluvial silt, fine sand, and clay overlying Pleistocene-age silts and sand to gravel alluvium deposited by the catastrophic Missoula Floods. Conditions varied significantly between the parcels, however, so each site is described separately in the paragraphs below. Geologic cross sections are provided as Figures 4 to 6.

### **Building C**

We interpret the veneer of soft silt to medium dense and very dense silty gravel to be man-made fill. The thickness of the fill encountered in our borings on the Building C site ranged from 3½ feet of very dense silty gravel encountered in Boring B-1C to 7 feet of medium stiff silt encountered in boring B-2C. Borings completed by others encountered 2 feet of medium dense silty gravel fill along the north building footprint while another boring drilled to the southwest encountered 8½ feet of soft silt. In our opinion this layer of fill, ranging from 2 to 8½ feet thick, mantles the full extent of the site.

A variable thickness of very soft to medium stiff silt, elastic silt, sandy silt, and organic silt and very loose to loose silty fine sand was encountered below the fill to the depths explored ranging from 25 to 45 feet bgs. A layer of highly organic peat was encountered between approximately 13 to 18 feet bgs in B-4C in the northwest corner of the building. The soil types suggest that these materials are the native Hedges Creek alluvium, including highly organic backswamp or marsh deposits.

Medium stiff silt was encountered at approximately 27 feet bgs in B-4C which graded to medium dense sand and gravel and stiff silt below 40 feet bgs, and medium dense sand and gravel below 45 feet bgs in B-2C. Dense gravels were encountered at 42 feet bgs in B-1C, and are reported at 40 feet and 45 feet bgs, respectively in B-8 and B-1 drilled by others. These materials suggest that the young alluvial deposits are typically underlain by older, Missoula flood deposit sediments at those depths.

Our borings B-1C and B-2C encountered groundwater at 14 feet bgs in mid-February. Groundwater levels were not determined in boring B-4C due to the use of mud rotary methods. Groundwater was encountered at approximately 8 feet bgs in B-8 and 11 feet bgs in B-1, drilled by others in December 2013 (Hart Crowser 2014). Groundwater conditions are expected to fluctuate as a function of season, precipitation, and particularly in response to the level of the adjacent Hedges Creek.

## Building D

Records of site grading indicate that silty and sandy man-made fill was placed across the bulk of the Building D site in the late 1990s, raising the site grades between 8 and 19 feet. Our explorations indicate that the consistency of the fill soils varies significantly across the site, from 19 feet of stiff to very stiff silt and dense silty fine sand encountered in B-3D in the southeast and B-1D in the northeast to 8 feet of soft silt and very loose silty fine sand encountered in B-2D in the northwest.

A variable thickness of very soft to medium stiff silt, elastic silt, sandy silt, and organic silt and very loose to loose silty fine sand was encountered below the fill to depths ranging from 40 to 89 feet bgs. A layer of highly organic peat ranging between 5 and 15 feet thick was encountered underlying the full building footprint at depths between approximately 15 to 23 feet bgs. As with the similar soils encountered underlying the Building C site we interpret these materials as native Hedges Creek alluvium, including highly organic backswamp or marsh deposits.

The depth to stiffer and denser Missoula Flood deposits varied considerably across the building footprint. Medium dense gravels were reported at roughly 33 feet bgs in boring B-5 (GeoDesign 1997) and dense silty gravels were encountered at 40 feet bgs in B-2D, both located at or near the west end of the building footprint. Dense silty sand and gravel was encountered at 40 feet bgs in B-1D, and medium dense sand and gravel and soft to stiff to very stiff silt in B-3D located along the east footing line. However, the reported depth to dense sand in B-3 (GeoDesign 1997), drilled near the southwest-center of the building footprint, extends to approximately 89 feet bgs, suggesting the possibility of deep, soft silt and fine sand alluvium underlying this portion of the building.

Groundwater was encountered within ½ foot to 4 feet bgs in B-1D and B-2D, respectively. Groundwater was not determined in boring B-3D due to the use of mud rotary methods. Numerous vernal pools and ponds of rainwater and snowmelt were observed at the ground surface during our field exploration, indicating the presence of shallow groundwater perched in the fill soils. However, borings drilled at the original ground surface report groundwater levels equivalent to existing depths of 12 to 19 feet bgs, suggesting that this perched groundwater has been “mounded” by the man-made fill and is unlikely to fluctuate in response to the level of Hedges Creek.

## INFILTRATION TESTING

We conducted infiltration testing to assist in the evaluation of the site for design of proposed on-site infiltration systems. The presence of groundwater within several inches of the ground surface precluded testing on the Building D site. We conducted one infiltration test on the Building C site at a depth of approximately 6 feet bgs at the selected location of B-3C/IT-1.

The approximate test location is shown in Figure 2. Testing was conducted using the encased falling head method consistent with the procedures outlined in the Clean Water Services Low Impact Development Alternatives manual. A 6-inch diameter polyvinyl chloride (PVC) pipe was pushed 6 inches into the soil at the bottom of the drilled boring, and the test area was pre-soaked over a 4-hour period by repeated addition of water into the pipe when necessary.

After the saturation period, the pipe was filled with clean water to at least 12 inches above the soil in the bottom of the boring. The drop-in water level was measured over one hour. The second and third test iterations were terminated because we observed a consistent approximate 1/16th-inch drop in the water level during the 4-hour saturation period and the first 60-minute testing period. Field test results are summarized in Table 1 below.

**TABLE 1. INFILTRATION RESULTS**

Infiltration Test No.	Location	Depth (feet)	USCS Material Type	Field Measured Infiltration Rate <sup>1</sup> (inches/hour)
IT-1	B-3C, Building C (See Site Plan)	6'	ML	1/16th

Notes:

<sup>1</sup> Appropriate factors should be applied to the field measured infiltration rate, based on the design methodology and specific system used.

USCS = Unified Soil Classification System

The infiltration rates shown in Table 1 are field-measured infiltration rates. These represent a short-term measured rate, and factors of safety have not been applied for the type of infiltration system being considered, or for variability that may be present in the on-site soil. In our opinion, and consistent with the state of the practice, correction factors should be applied to this measured rate to reflect the small area of testing and the number of tests conducted.

## CONCLUSIONS AND RECOMMENDATIONS

### Summary

A summary of the primary geotechnical considerations is provided below. The summary is presented for introductory purposes only and should be used in conjunction with the complete recommendations presented in this report.

- Field-measured infiltration rates are very low. On-site stormwater infiltration is likely not feasible.
- Liquefaction-induced settlement is anticipated across the majority of the Building C site during the design level earthquake. We estimate approximately 4 to 8 inches of settlement during this event. Supporting the structures on aggregate piers, as recommended, will mitigate for this liquefaction-induced settlement.
- A 5 to 15-foot-thick layer of organic silt and peat was encountered under the full extent of the Building D site and the northeast corner of Building C. This organic material is highly compressible and will likely continue to settle with additional loading, although the majority of settlement under the weight of the existing fill has likely occurred.
- Due to the variable soil conditions across the site, different foundation support systems should be considered for Building C and Building D.
- We recommend Building C be supported on aggregate piers extending to a depth of approximately 35 to 40 feet bgs. Grouted aggregate piers should be used within areas with organic soils in the northwest corner of the building footprint. Depending on risk tolerance, the entire building footprint (and one row outside the footprint) could be supported on piers or only under footings (and one row on either side of the footings). The extent of organic soil in the northeast corner should be evaluated further with additional subsurface explorations.
- Building D can be supported on grouted aggregate piers under the building footings or the entire building footprint. An alternate solution could consist of augercast piles with grade beams. Both solutions would limit settlement to acceptable levels.



- A pre-load program may be feasible for Building D instead of ground improvement/piles. To be successful, sufficient settlement would need to be induced by the pre-load to reduce post-construction settlement to an acceptable level. A minimum 4 to 6-foot preload left in-place at least 6 months can be used for budgeting purposes.

Our specific geotechnical recommendations are presented in the following sections of this report.

## **Earthquake Engineering**

### **Liquefaction**

GeoEngineers evaluated the site for seismic hazards, including liquefaction, lateral spreading and earthquake-induced landsliding. Liquefaction refers to the condition when vibration or ground shaking, usually from earthquake forces, results in the development of excess pore pressures in saturated soils with subsequent loss of strength in the soil deposit affected. In general, soils that are susceptible to liquefaction include very loose to medium dense clean to silty sands and low plasticity silts. For liquefaction to occur, soils must be saturated. Liquefaction usually results in ground settlement and loss of bearing capacity, resulting in settlement of structures that are supported on foundations within or above the liquefied soils.

We evaluated the liquefaction potential of the site using the Simplified Procedure (Youd et al. 2001). The Simplified Procedure is based on comparing the cyclic resistance ratio (CRR) of a soil layer (the cyclic shear stress required to cause liquefaction) to the cyclic stress ratio (CSR) induced by an earthquake. The factor of safety against liquefaction is determined by dividing the CSR by the CRR. Liquefaction hazards, including settlement and related effects, can occur when the factor of safety against liquefaction is less than 1.0.

The liquefaction analyses are based on the 2012/2015 IBC (2 percent chance of exceedance in 50 years, or 2,475-year event) which corresponds to a peak ground acceleration (PGA) of 0.41g and a magnitude of 9.0. Based on our explorations, soils at the Building C site are potentially liquefiable. Without ground improvement, we estimate approximately 4 to 8 inches of liquefaction induced settlement during the design earthquake.

### **Lateral Spreading**

A body of soft, liquefiable soil located near a steep or vertical slope is typically subject to failure towards the unsupported (“free face”) slope during an earthquake. This “lateral spreading” is usually related to liquefaction of the underlying soils and flow-like movement towards the unsupported face and is typically more severe where the free face is high, steep, and the site soils more highly liquefiable.

We evaluated the lateral spreading potential of the site using the (Youd et al. 2002) Free Face procedure. Without ground improvement, we estimate up to several inches of lateral spread at the Building C site during the design seismic event.

### **Fault Surface Rupture**

The closest mapped fault to the site possibly capable of surface rupture is the northwest-to-southeast trending Canby-Molalla Fault with its inferred extension approximately 2.5 miles northeast of the site (Personius 2002). No faults are mapped as crossing the site, and the potential for site fault surface rupture is, therefore, very low.

## 2012/2015 IBC Seismic Design Information

For preliminary design purposes, we recommend using the following 2012/2015 IBC parameters for soil profile type, short period spectral response acceleration ( $S_s$ ), 1-second period spectral response acceleration ( $S_1$ ) and seismic coefficients ( $F_A$  and  $F_V$ ) for the project site.

**TABLE 2. SEISMIC DESIGN PARAMETERS**

2012/2015 IBC Parameter	Recommended Value
Soil Profile Type	D/F <sup>1</sup>
Short Period Spectral Response Acceleration, $S_s$ (percent g)	0.94
1-Second Period Spectral Response Acceleration, $S_1$ (percent g)	0.42
Seismic Coefficient, $F_A$	1.11
Seismic Coefficient, $F_V$	1.58

Note:

<sup>1</sup> In accordance with American Society of Civil Engineers (ASCE) 7-10, Site Class F soils vulnerable to potential failure or collapse under seismic loading, such as liquefiable soils, may be classified in accordance with Section 20.3, without regard for liquefaction, provided the structure under design has a fundamental period of vibration equal or less than 0.5 seconds.

## Preliminary Foundation Support Recommendations

### General

Due to the highly variable soil conditions between the Building C and Building D sites, we recommend different foundation support considerations for each building. For Building C, aggregate piers are likely the most cost-effective solution to limit liquefaction induced settlement to acceptable levels. For Building D, there are several foundation support options to consider depending on tolerance for risk, magnitude of acceptable settlement, and anticipated construction schedule. Specific foundation recommendations for each building site are provided separately below.

### Building C

#### Aggregate Piers

Aggregate piers are a common ground improvement method that we are familiar with and have used successfully in supporting structures in these conditions. Shallow spread footings supported on aggregate piers would provide high bearing capacity and reduced settlement by creating a stiff soil subgrade. Aggregate piers can also be designed to mitigate for liquefaction. Ground improvement methods can consist of the Rammed Aggregate Pier® (RAP) System constructed by GeoPier Foundation Company or Vibro Piers™ constructed by Hayward Baker.

Aggregate pier systems are typically designed and constructed by the specialty contractor to a performance specification. They should submit a ground improvement design that has been completed and stamped by a registered professional engineer with experience in such projects. We anticipate additional explorations will be required for a construction design in order to better identify the extent of organic soils under Building C. We recommend that GeoEngineers review the design on behalf of the Owner, although the specialty contractor will retain responsibility for the design and construction of the ground improvements to the specified performance criteria.

We anticipate that the aggregate piers would extend from footing subgrade to approximately 35 feet bgs. We anticipate aggregate piers will extend one row outside the building footprint. They should be designed to meet the final bearing capacity and settlement tolerances provided by the structural engineer. The specialty contractor would provide final design and in-house quality control for the piers. We recommend that GeoEngineers provide construction quality assurance for the owner during the construction process.

The bearing capacity of the aggregate pier-improved subgrade would be determined by the specialty contractor. We typically see a bearing capacity of approximately 4,000 to 6,000 psf in soil similar to those at the site that have been improved with aggregate piers.

Aggregate piers will mitigate for liquefaction induced settlement within the improvement zone. To reduce construction costs, ground improvement with aggregate piers can be considered just beneath foundation elements and one row on either side of foundation elements. Based on this approach, the slab would be designed to settle during the design earthquake and would likely need to be replaced following a large seismic event.

## **Building D**

### ***Grouted Aggregate Piers***

Similar to aggregate piers described above, grout injected aggregate piers are a suitable foundation solution for Building D. The inclusion of grout to the aggregate pier system provides additional structural rigidity within the pier element that extends through the soft compressible material. Aggregate piers would extend under the foundations and to a depth of approximately 45 feet bgs, although the grout improved zone would likely not extend the full depth.

### ***Augercast Piles***

Augercast piles are constructed using a continuous-flight, hollow-stem auger attached to a set of leads supported by a crane. The first step in the pile casting process consists of drilling the auger into the ground to the specified pile tip elevation. Grout is then pumped through the hollow-stem auger during steady withdrawal of the auger and replaces the soils removed. The final step is to install a steel reinforcing cage and typically a center bar into the column of fresh grout.

A potential advantage of augercast piles is that they are not a proprietary system. A potential disadvantage of augercast piles is that, given the layers of very soft silt and peat, and the required depth of the piles, it may be challenging to keep the drilled holes from caving or necking during pile installation. Necked and caved piles should be replaced, and replacement typically requires two piles to structurally replace and balance foundations at the rejected pile location. Another drawback of augercast piles in soft ground conditions, such as this site, is the unpredictable volume of grout. Grout volume calculations cannot be made on a neat-line basis because the grout will flow/expand under its own weight into the surrounding ground. We recommend cost estimates use a minimum 30 percent grout overrun, as well as scheduling contingencies, to allow adjacent piles to set before installing additional piles.

Settlement of soils surrounding piles can induce frictional downdrag loads that essentially reduce the allowable pile capacity. This typically occurs if there are heavy floor loads, large fill embankments, compressible soils, or if liquefaction-induced settlement occurs. We anticipate limited downdrag as a result of compression of organic soils under existing fill and building loads.

For budgeting purposes, we recommend that augercast piles extend to an average depth of approximately 60 feet bgs, including a minimum 10 feet penetration into dense sand/gravel. For planning purposes, we recommend the allowable axial and uplift capacities presented in Table 3 below.

**TABLE 3. AXIAL PILE CAPACITY – AUGERCAST PILES**

Pile Diameter (inches)	Minimum Embedment	Allowable Axial Capacity <sup>1</sup> (kips)	Allowable Uplift Capacity (kips)
14	10 feet into dense sand/gravel	80	30
18	10 feet into dense sand/gravel	100	40

Note:

<sup>1</sup> Allowable Downward Capacities include allowances (reduction) for downdrag.

Allowable pile capacities are provided for allowable stress design (ASD), and the allowable capacities are for combined dead plus long-term live loads and may be increased by one-third when considering design loads of short duration such as seismic forces. The allowable capacities are based on the strength of the supporting soils for the depths below the existing ground surface and include a factor of safety of 3 for end bearing and 2 for shaft friction. The capacities apply to single piles. If piles are spaced at least 3-pile diameters on center, as recommended, no reduction of the axial capacity for group action is needed. For constructability, we recommend that the piles be spaced no closer than 3-pile diameters on center.

The structural characteristics of pile materials and structural connections may impose limitations on pile capacities and should be evaluated by the structural engineer. For example, steel reinforcing will be needed for augercast piles subjected to uplift and bending moments.

It should be noted that no direct information regarding the capacity of augercast piles (for example, driving resistance data) can be obtained while this type of pile is being installed. Therefore, it is important that the pile installation operations be monitored by a qualified Geotechnical Engineer. We recommend GeoEngineers based on our familiarity with the site subsurface conditions. The Geotechnical Engineer should observe the drilling operations, monitor grout injection procedures, record the volume of grout placed in each pile relative to the calculated volume of the hole and evaluate the adequacy of individual pile installations.

Additional analyses should be completed if augercast piles are chosen as the preferred foundation type.

**Soil Surcharge/Unloading**

A preload program may be feasible to induce sufficient settlement to reduce post-construction settlement to an acceptable level. This approach may be considered only for the building slab (supporting the building foundations on aggregate piers or augercast piles) or possibly the entire building footprint.

This approach will require further evaluation, but we would anticipate a minimum 4 to 6-foot thickness of preload extending at least 10 feet outside the building footprint. Due to the presence of existing fill and the variable thickness of organic silt and peat, it is difficult to estimate the length of time a preload would be required, but we anticipate at least 4 to 6 months.

## **Recommended Additional Geotechnical Services**

If Martin Development moves ahead with the purchase of this property, GeoEngineers will prepare a design level geotechnical report once the conceptual design of the planned facility has been further refined to confirm or modify as appropriate the preliminary design recommendations presented in this report. Additional geotechnical explorations will be necessary for the design level report.

During construction, GeoEngineers should observe the installation of the ground improvements and/or deep foundations, evaluate the suitability of the foundation subgrades, evaluate structural backfill, and provide a summary letter of our construction observation services. The purposes of GeoEngineers construction phase services are to confirm that the subsurface conditions are consistent with those observed in the explorations and other reasons described in Appendix B, Report Limitations and Guidelines for Use.

## **LIMITATIONS**

We have prepared this report for the exclusive use of Martin Development and their authorized agents for the Hedges Building C and D development project in Tualatin, Oregon.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.

## **REFERENCES**

GeoDesign, Inc. 1997. Report of Geotechnical Engineering Services, Lots 11 and 12, Franklin Business Park, Southwest Avery Street and Tualatin-Sherwood Road, Tualatin, Oregon, GDI Project: Drake-3, prepared for Drake Management Company, dated June 6, 1997.

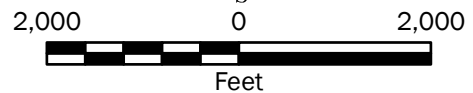
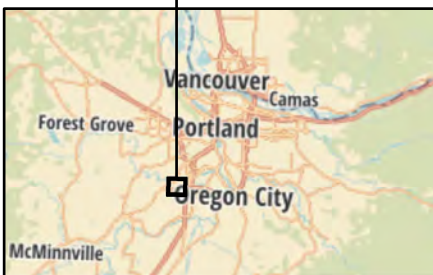
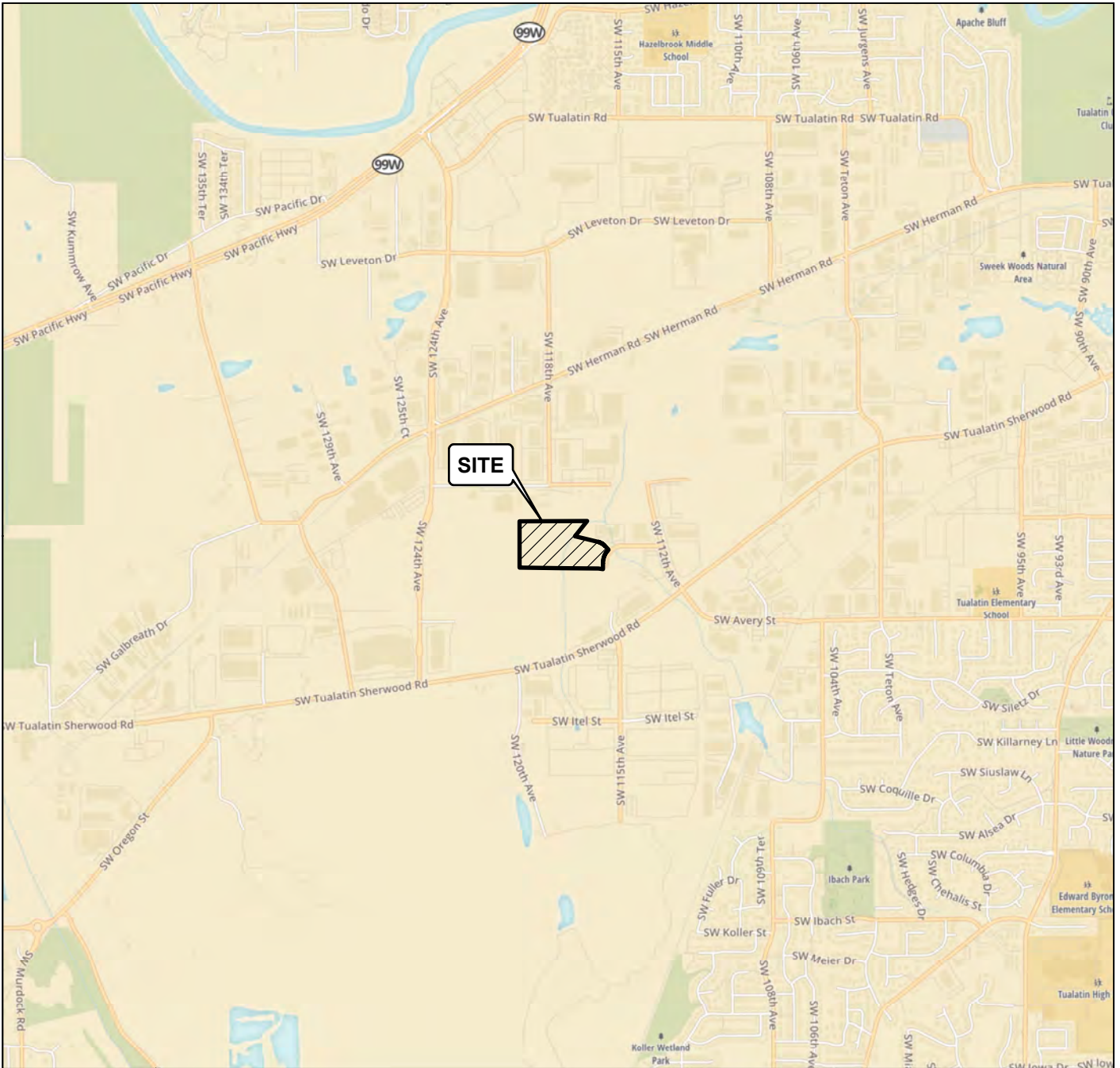
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**Vicinity Map**

**Hedges Buildings C & D  
Tualatin, Oregon**



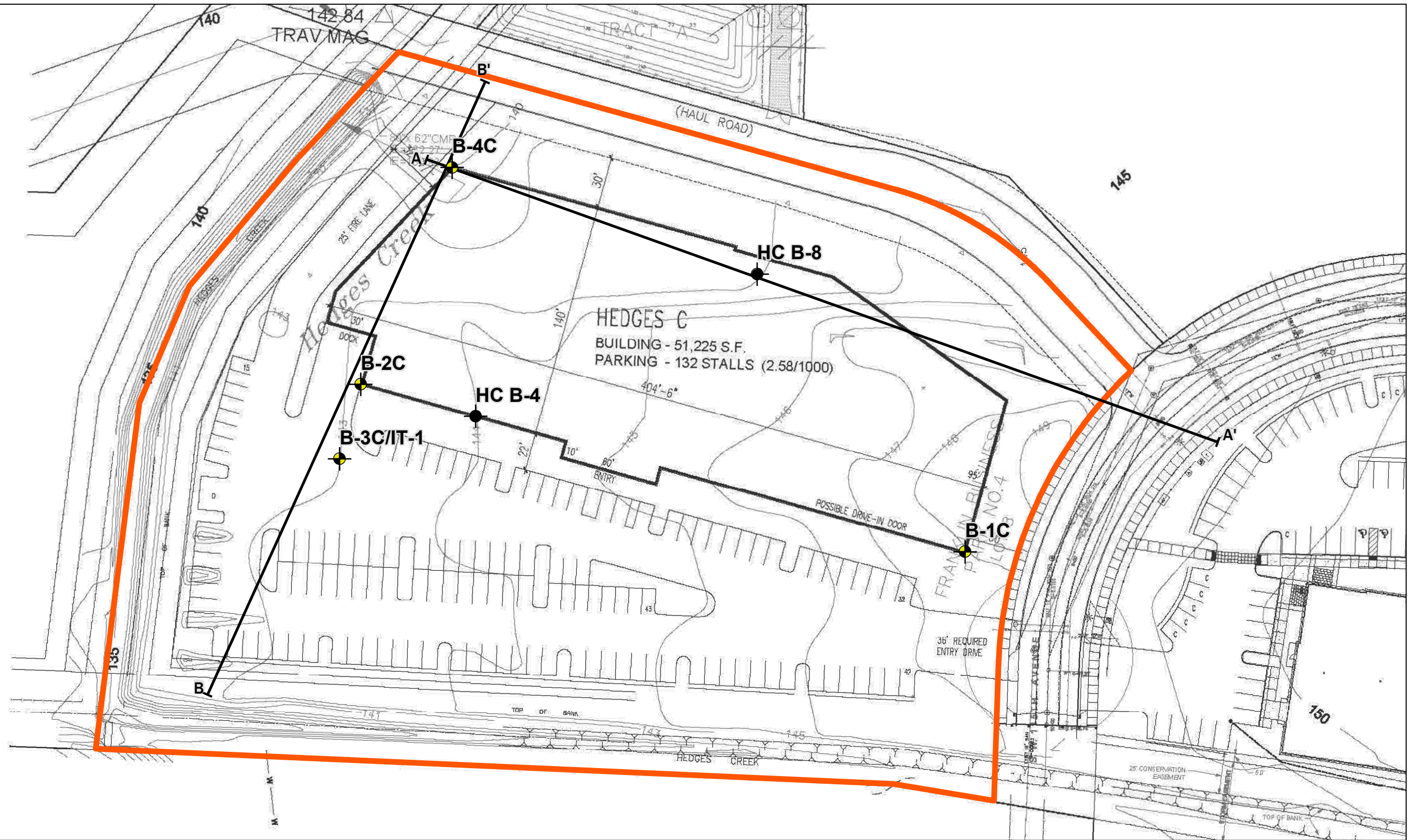
**Figure 1**

**Notes:**

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2017

Projection: NAD 1983 UTM Zone 10N



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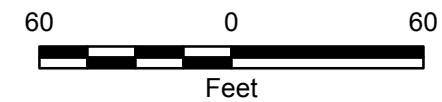
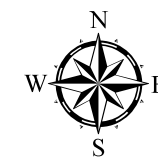
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Data Source: Base from Lance Muller and Associates.

Projection: NAD 1983 HARN StatePlane Oregon North FIPS 3601

**Legend**

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- HC B-4 Exploration Number and Approximate Location (by others)
- Approximate Hedges C Project Area
- Cross Section Location



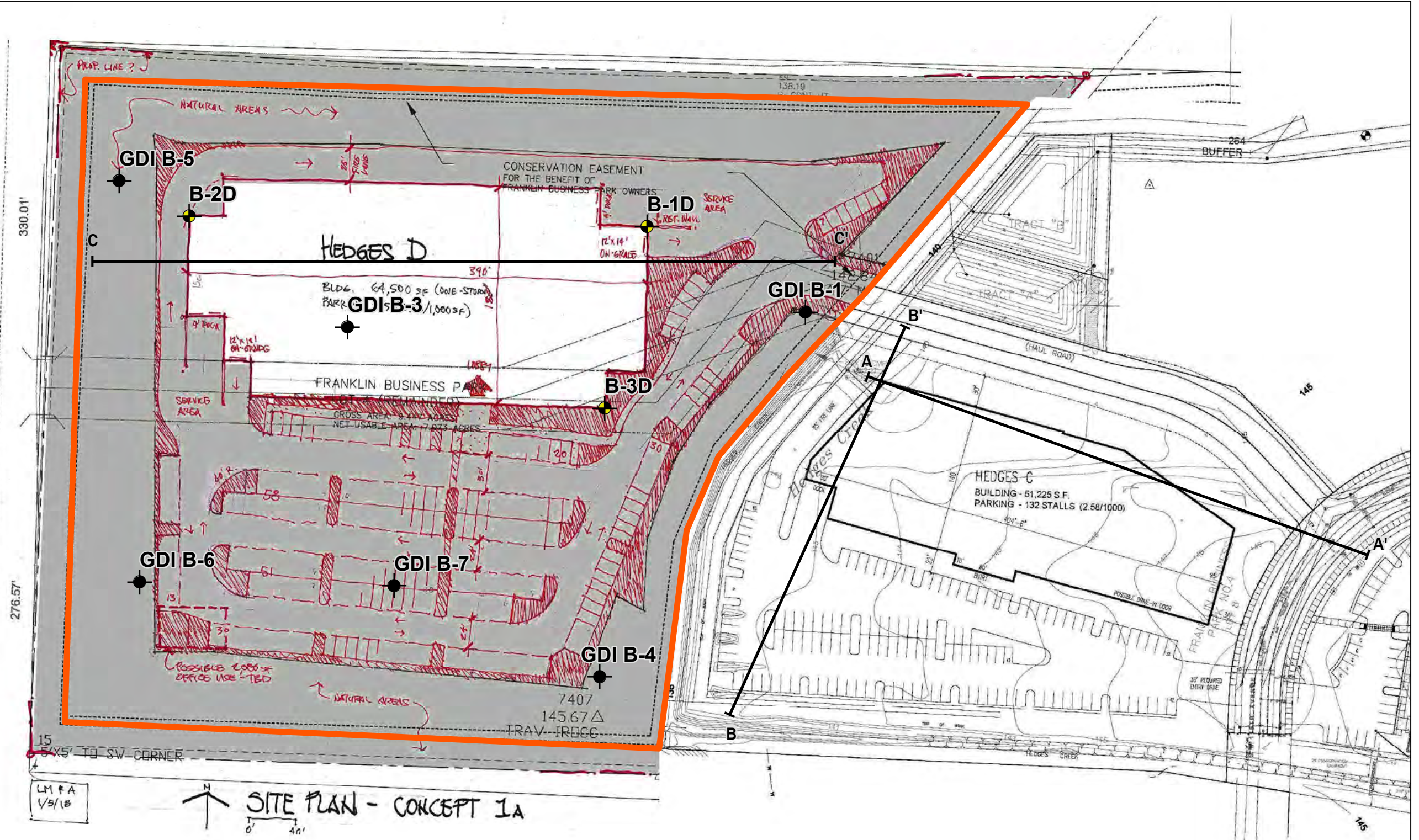
**Site Plan - Hedges C**

Hedges Buildings C & D  
Tualatin, Oregon



Figure 2





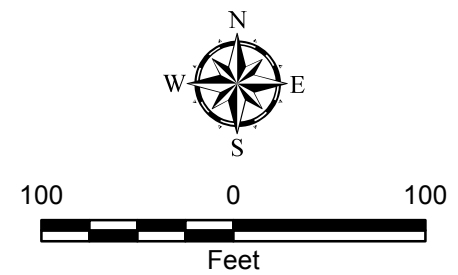
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- Notes:**
1. The locations of all features shown are approximate.
  2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

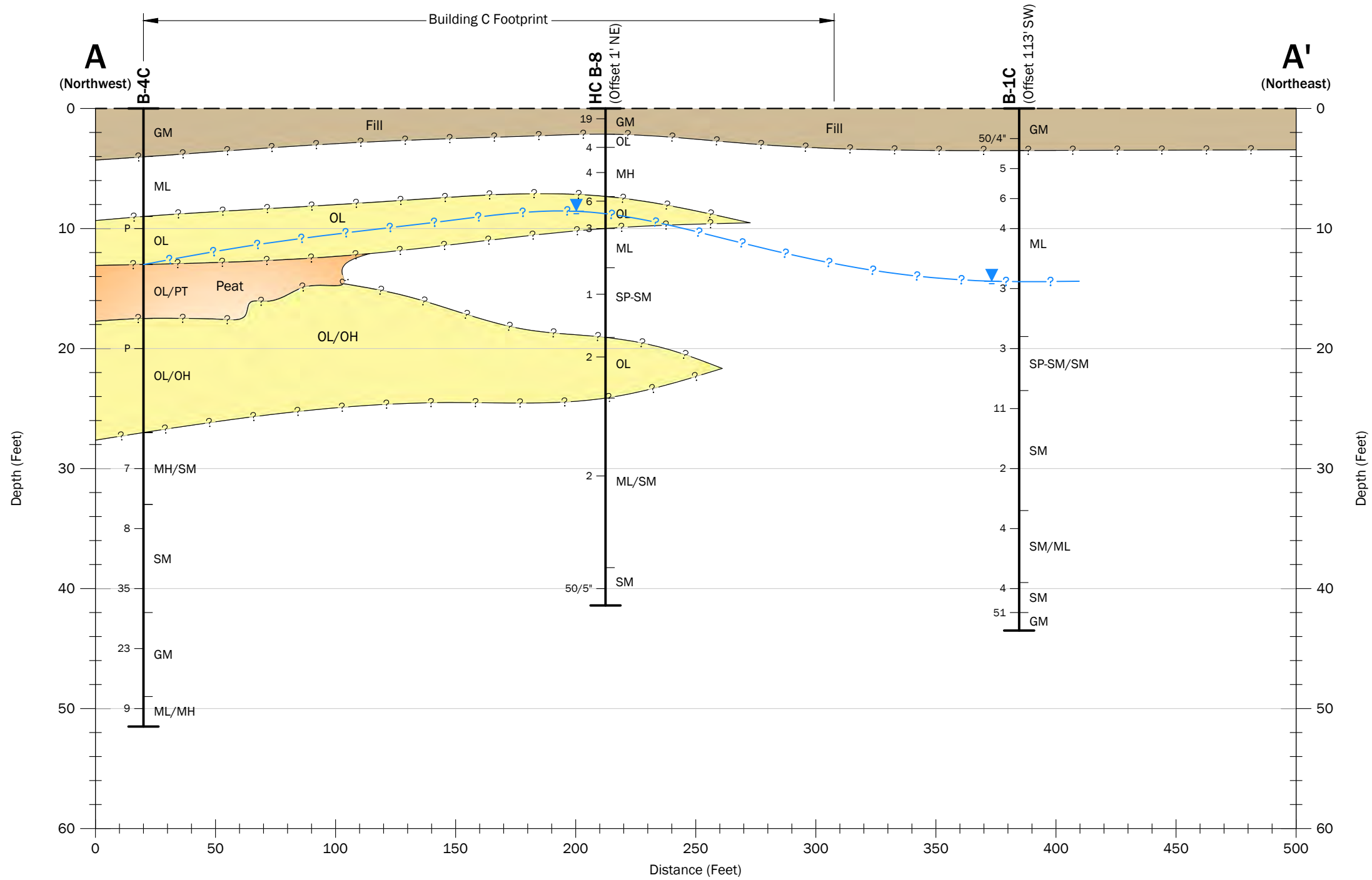
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Projection: NAD 1983 HARN StatePlane Oregon North FIPS 3601

- Legend**
- B-1D GeoEngineers Exploration Number and Approximate Location
  - GDI B-1 Exploration Number and Approximate Location (by others)
  - Approximate Hedges D Project Area
  - Cross Section Location



<b>Site Plan - Hedges D</b>	
Hedges Buildings C & D Tualatin, Oregon	
	<b>Figure 3</b>

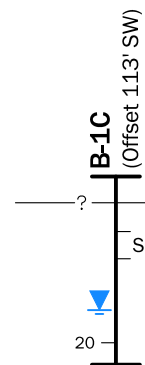
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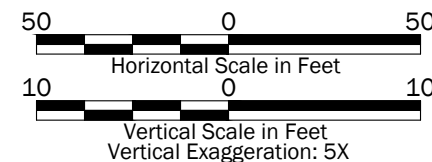
1. The subsurface conditions shown are based on interpolation between widely spaced explorations and should be considered approximate; actual subsurface conditions may vary from those shown.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

Datum: NAVD 88, unless otherwise noted.

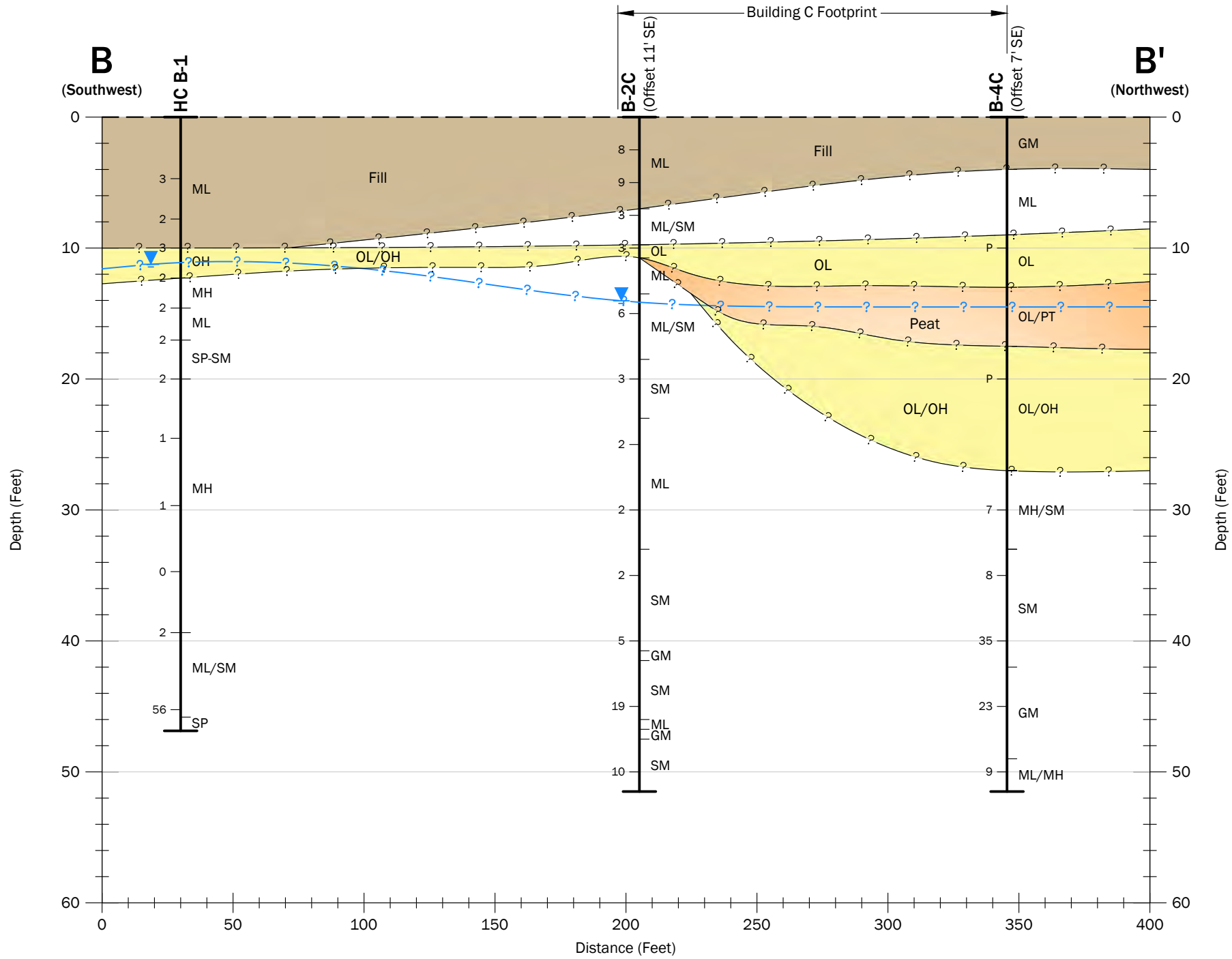


**Legend**

- ? — Inferred Soil Contact
- ? — Soil Classification
- ▼ Groundwater
- 20 Blow Count
- Fill
- OL/OH
- Peat



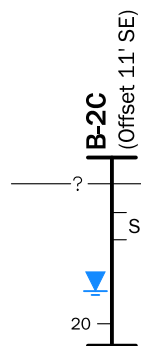
<b>Geologic Cross Section A-A'</b>	
Hedges Buildings C & D Tualatin, Oregon	
	<b>Figure 4</b>



**Notes:**

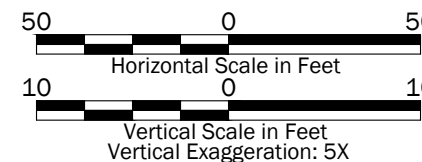
1. The subsurface conditions shown are based on interpolation between widely spaced explorations and should be considered approximate; actual subsurface conditions may vary from those shown.
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Datum: NAVD 88, unless otherwise noted.

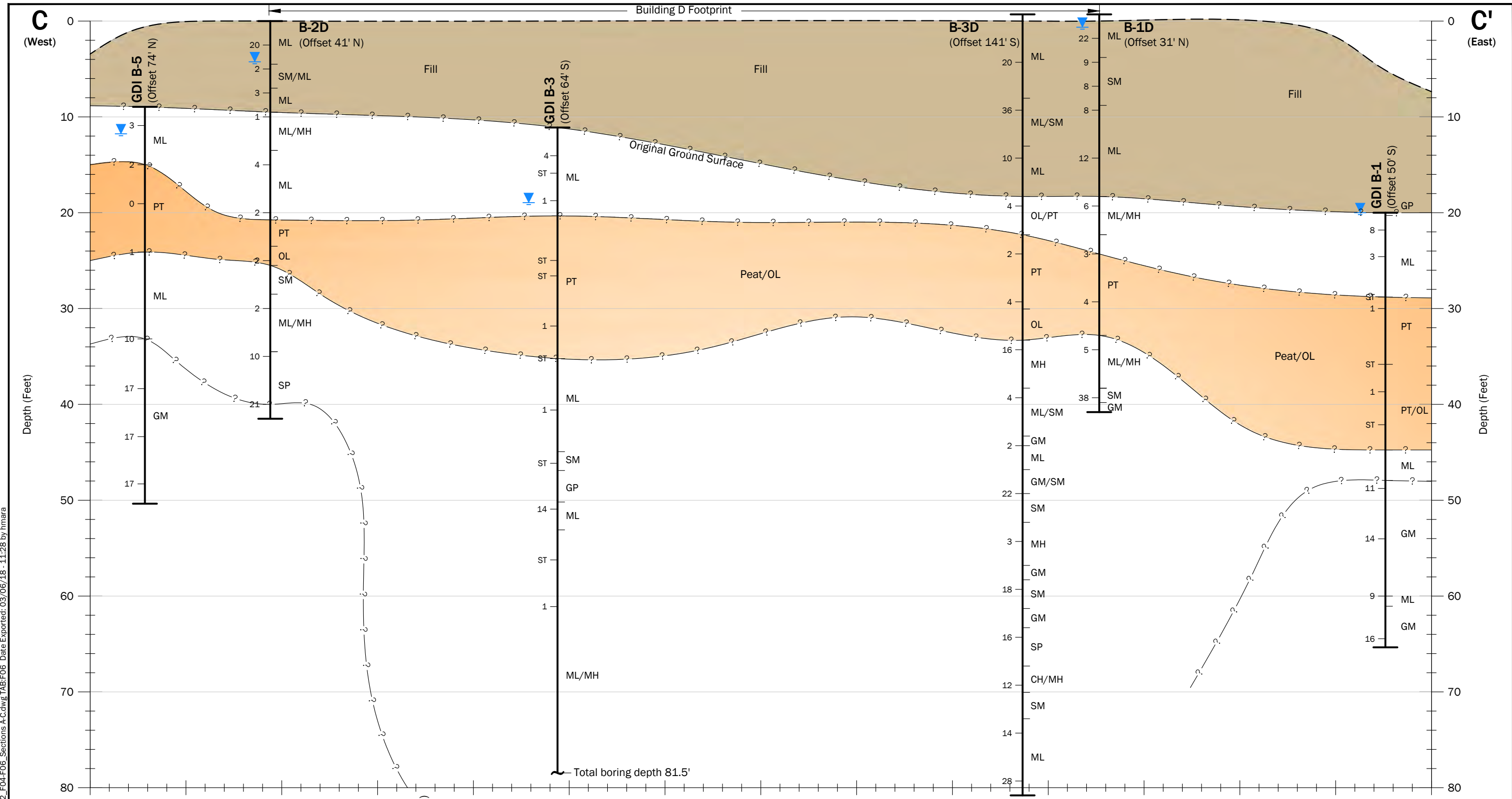


**Legend**

- ?— Inferred Soil Contact
- SM Soil Classification
- ▼ Groundwater
- 20 Blow Count
- Fill
- OL/OH
- Peat



<b>Geologic Cross Section B-B'</b>	
Hedges Buildings C & D Tualatin, Oregon	
	<b>Figure 5</b>



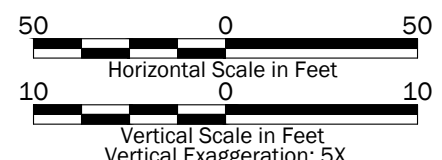
**Notes:**

1. The subsurface conditions shown are based on interpolation between widely spaced explorations and should be considered approximate; actual subsurface conditions may vary from those shown.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

Datum: NAVD 88, unless otherwise noted.

**Legend**

- Boring
- Inferred Soil Contact
- Soil Classification
- Groundwater
- Blow Count
- Fill
- Peat/OL



**Geologic Cross Section C-C'**

Hedges Buildings C & D  
Tualatin, Oregon

**GEOENGINEERS**

**Figure 6**

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**APPENDIX A**  
**Field Explorations and Laboratory Testing**

## **APPENDIX A**

### **FIELD EXPLORATIONS AND LABORATORY TESTING**

Subsurface conditions were explored by drilling four borings with a trailer-mounted drill rig employing solid-stem auger techniques provided by Dan Fisher Drilling on February 14 and 15, 2018. Three borings were drilled using a tracked rig and mud rotary techniques provided by Western States Drilling on February 21 and 22, 2018. The locations of the explorations were estimated by taping/pacing from existing site features. The approximate exploration locations are shown in the Site Plans, Figures 2 and 3.

The drilling was continuously monitored by an engineering geologist from our office who maintained a detailed log of subsurface explorations, visually classified the soil encountered and obtained representative soil samples from the borings.

Representative soil samples were obtained from each boring at approximate 2½- to 10-foot-depth intervals using either: (1) a 1-inch, inside-diameter, standard split spoon sampler; or (2) a 2.4-inch, inside-diameter, split-barrel ring sampler (Dames & Moore [D&M]). The samplers were driven into the soil using a 140-pound hammer free-falling 30 inches on each blow; the trailer mounted (Fisher) rig using rope-and-cathead methods, the track (Western States) using an autohammer.

The number of blows required to drive the sampler each of three, 6-inch increments of penetration were recorded in the field. The sum of the blow counts for the last two, 6-inch increments of penetration is reported on the boring logs as the ASTM D 1556 standard penetration test (SPT) N-value. The N-value for D&M samples have been reduced by approximately 50 percent from the field readings to roughly correlate with the SPT N-values.

Recovered soil samples were visually classified in the field in general accordance with ASTM D 2488 and the classification chart listed in Key to Exploration Logs, Figure A-1. Logs of the borings are presented in Figures A-2 through A-8. The logs are based on interpretation of the field and laboratory data and indicate the depth at which subsurface materials or their characteristics change, although these changes might actually be gradual.

#### **Laboratory Testing**

Soil samples obtained from the explorations were transported to GeoEngineers' laboratory and evaluated to confirm or modify field classifications, as well as to evaluate engineering properties of the soil samples. Representative samples were selected for laboratory testing to determine the moisture content, moisture-density, percent fines (material passing the U.S. No. 200 sieve), Atterberg Limits, and organic content tests. The tests were performed in general accordance with ASTM standard practices or other applicable procedures.

The results of the moisture content and percent fines determinations are presented at the respective sample depths in the exploration logs in Appendix A.

#### **Moisture Content**

Moisture content tests were completed in general accordance with ASTM D 2216 for representative samples obtained from the explorations. The results of these tests are presented in the exploration logs in Appendix A at the depths at which the samples were obtained.

### **Moisture-Density**

We completed moisture density (dry density) testing on selected D&M samples in general accordance with the ASTM D 2937 test method. The results are presented on the boring logs.

### **Percent Passing U.S. No. 200 Sieve (%F)**

Selected samples were “washed” through the U.S. No. 200 mesh sieve to estimate the relative percentages of coarse- and fine-grained particles in the soil. The percent passing value represents the percentage by weight of the sample finer than the U.S. No. 200 sieve. These tests were conducted to verify field descriptions and to estimate the fines content for analysis purposes. The tests were conducted in accordance with ASTM D 1140, and the results are shown in the exploration logs in Appendix A at the respective sample depths.

### **Atterberg Limits**

Atterberg limits testing was performed on one fine grained sample. The test was used to classify the soil as well as evaluate index properties. The liquid and plastic limit were estimated through a procedure performed in general accordance with ASTM D 4318. The result of the Atterberg limits test is presented in the respective exploration log.

### **Organic Content**

Organic content tests were performed to determine the amount of organic material present in selected samples in general accordance with ASTM D 2974, Method C. The results of the organic content tests are presented on the exploration logs in Appendix A.



## SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS <small>(LITTLE OR NO FINES)</small>		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS <small>(LITTLE OR NO FINES)</small>		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		<b>ML</b>	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
		LIQUID LIMIT LESS THAN 50		<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		LIQUID LIMIT LESS THAN 50		<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
		LIQUID LIMIT GREATER THAN 50		<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY
		LIQUID LIMIT GREATER THAN 50		<b>OH</b>	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			<b>PT</b>	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

### Sampler Symbol Descriptions

	2.4-inch I.D. split barrel
	Standard Penetration Test (SPT)
	Shelby tube
	Piston
	Direct-Push
	Bulk or grab
	Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

## ADDITIONAL MATERIAL SYMBOLS

SYMBOLS		TYPICAL DESCRIPTIONS
GRAPH	LETTER	
	<b>AC</b>	Asphalt Concrete
	<b>CC</b>	Cement Concrete
	<b>CR</b>	Crushed Rock/Quarry Spalls
	<b>SOD</b>	Sod/Forest Duff
	<b>TS</b>	Topsoil

### Groundwater Contact



Measured groundwater level in exploration, well, or piezometer



Measured free product in well or piezometer

### Graphic Log Contact



Distinct contact between soil strata



Approximate contact between soil strata

### Material Description Contact



Contact between geologic units



Contact between soil of the same geologic unit

### Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

### Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

## Key to Exploration Logs



Figure A-1

Start Drilled	2/14/2018	End	2/14/2018	Total Depth (ft)	43.5	Logged By	JLL	Checked By	GL	Driller	Dan Fischer Drilling	Drilling Method	Solid-stem Auger
Surface Elevation (ft)	152			Hammer Data	Rope & Cathead			140 (lbs) / 30 (in) Drop		Drilling Equipment	Paul Bunyan Trailer		
Vertical Datum	NAVD88			System Datum	OR State Plane North			NAD83 (feet)		See "Remarks" section for groundwater observed			
Easting (X)	7612083			Notes: D&M N-value reduced by 50 percent to approximate SPT N-value									
Northing (Y)	630795												

Elevation (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
150	0					GM	Gray-brown silty gravel, round to angular basalt gravels, chaotic appearance (very dense, moist) (fill)	27		DD = 94 pcf	
	2	50/4"		1 MD							
	5		5	2		ML	Gray to brown mottling silt with fine sand, low to moderate plasticity (medium stiff, moist) (alluvium)				
145	12										
	16		6	3 %F		SM	Dark brown with gray mottling silty fine to medium sand (loose, moist)	37	47		
	10		4	4 MD		ML	Gray with brown mottling silt with fine sand (soft to medium stiff, moist)	35		DD = 86 pcf	
140	18		3	5			Becomes dark gray, moderate plasticity (soft, wet)			Groundwater observed at approximately 14 feet below ground surface during drilling	
135	20		3	6 %F		SM	Dark gray silty fine to medium sand, uniform/massive (loose, wet)	45	47		
	25		11	7			Becomes medium dense				
130	30		2	8 MD, %F		ML	Dark gray sandy silt, massive (soft, moist)	42	61	DD = 82 pcf	
125	10										
120						SM/ML	Dark gray silty medium sand (loose, wet) with fine sandy silt, low plasticity to non-plastic (soft to				
35											

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring B-01C



Project: The Hedges - Building C and D  
Project Location: Tualatin, Oregon  
Project Number: 0821-014-02

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEIB\_GEOTECH\_STANDARD\_SF\_NO\_GW

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEIB\_GEO TECH\_STANDARD\_SF\_NO\_GW

Elevation (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample						
36	36	8	4				medium stiff, moist)			Approximately 12 inches heave at 36 feet
40	40	10	4		SM	Dark gray silty fine to medium sand, massive (loose, wet) (occasional 1- to 2-inch interbeds of sandy silt)				
42	42	12	51		GM	Dark gray silty gravel with sand, subrounded basalt gravel with silty sandy matrix (very dense, moist)				

**Log of Boring B-01C (continued)**



Project: The Hedges - Building C and D  
 Project Location: Tualatin, Oregon  
 Project Number: 0821-014-02

Start Drilled	2/14/2018	End	2/14/2018	Total Depth (ft)	51.5	Logged By	JLL	Checked By	GL	Driller	Dan Fischer Drilling	Drilling Method	Solid-stem Auger
Surface Elevation (ft)	149			Hammer Data	Rope & Cathead			Drilling Equipment		Paul Bunyan Trailer			
Vertical Datum	NAVD88						140 (lbs) / 30 (in) Drop						
Easting (X)	7611725			System Datum	OR State Plane North			See "Remarks" section for groundwater observed					
Northing (Y)	630878						NAD83 (feet)						
Notes: D&M N-value reduced by 50 percent to approximate SPT N-value													

Elevation (feet)	Depth (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
0						ML	Dark brown silt, roots to 6 to 8 inches, low plasticity (medium stiff, moist) (fill)				
1.45	10	8	1				Becomes gray-brown with red-brown mottling, no organic matter (medium stiff, moist)			PP = 1.0	
5	8	9	2	%F			Gray-brown fine sandy silt (stiff, moist)	46	60	PP = 1.5	
1.40	10	3	3	MD	ML/SM	ML/SM	Brown silt, low plasticity (soft, moist) (occasional interbeds of silty medium sand) (alluvium)	38		DD = 81 pcf	
10	4	3	4	MD	OL	OL	Dark brown organic silt, trace organic fragments, moderate plasticity (soft, moist)	73		DD = 53 pcf	
1.35					ML		Gray-brown silt with fine to medium sand, orange mottling (soft, moist)				
1.30	12	6	5		ML/SM	ML/SM	Interbedded dark gray sandy silt and silty fine to medium sand, low plasticity to non-plastic, horizontal layering (medium stiff and loose, wet)			Groundwater observed at approximately 14 feet below ground surface during drilling	
20	16	3	6		SM	SM	Dark gray silty fine to medium sand, red-brown mottling, much wood debris (stick fragments, reed stems) (loose, wet)				
1.25	12	2	7		ML	ML	Dark gray sandy silt, low plasticity, massive (soft, wet)				
1.20	16	2	8		SM	SM	Dark gray silty fine sand, massive (very loose, wet)				
1.15											

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring B-02C



Project: The Hedges - Building C and D  
Project Location: Tualatin, Oregon  
Project Number: 0821-014-02

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEIB\_GEOTECH\_STANDARD\_SF\_NO\_GW

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEIB\_GEOTECH\_STANDARD\_SF\_NO\_GW

Elevation (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample						
110		10	2		9					
40		12	5		10	GM SM	Dark gray silty gravel with fine to medium sand, round gravel to 1/2-inch in silty sand matrix (loose, wet) Dark gray silty coarse sand with gravel (medium dense, wet)			
45		10	19		11	MI GM SM	Gray silt, low plasticity, trace fine to medium sand (very stiff, wet) Dark gray silty gravel with medium to coarse sand (medium dense, wet) Dark gray silty fine to medium sand (loose to medium dense, wet)			
50		12	10		12					

**Log of Boring B-02C (continued)**



Project: The Hedges - Building C and D  
 Project Location: Tualatin, Oregon  
 Project Number: 0821-014-02

Drilled	Start 2/15/2018	End 2/15/2018	Total Depth (ft)	5.5	Logged By Checked By	JLL GL	Driller	Dan Fischer Drilling		Drilling Method	6-inch Solid-stem Auger	
Surface Elevation (ft) Vertical Datum	149 NAVD88				Hammer Data	N/A				Drilling Equipment	Paul Bunyan Trailer	
Easting (X) Northing (Y)	7611699 630842				System Datum	OR State Plane North NAD83 (feet)				Groundwater not observed at time of exploration		
Notes: Infiltration test IT-1 performed at 6 feet - see report test for details												

Elevation (feet)	Depth (feet)	FIELD DATA					Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log					
0						ML	Brown silt with sand and gravel, occasional debris (stiff, moist) (fill)				
4.45											
5						ML	Gray silt, low plasticity, trace fine roots, massive (medium stiff, moist) (alluvium)				

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring B-03C/IT-1



Project: The Hedges - Building C and D  
Project Location: Tualatin, Oregon  
Project Number: 0821-014-02

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ D:\Library\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEIB\_GEO TECH\_STANDARD\_SF\_NO\_GW

Start Drilled	2/22/2018	End	2/22/2018	Total Depth (ft)	51.5	Logged By	JLL	Checked By	GL	Driller	Western States Soil Conservation, Inc.	Drilling Method	Mud Rotary
Surface Elevation (ft)	147			Hammer Data	Roper & Cathead			Drilling Equipment		CME-850 Truck			
Vertical Datum	NAVD88						140 (lbs) / 30 (in) Drop						
Easting (X)	7611781			System Datum	OR State Plane North			Groundwater not observed at time of exploration					
Northing (Y)	631022						NAD83 (feet)						
Notes:													

Elevation (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
0						GM	¾-inch-minus gravel (fill)				
1.45											
5						ML	Gray silt, low to moderate plasticity (soft, moist) (alluvium)				
1.40											
10	1		P		1	OL	Black to very dark gray organic silt, moderate plasticity, organic fibers (very soft, wet)				
1.35											
15						OL/PT	Mix of organic silt with brown to brown-black peat, trace fine sand			Observed in cuttings	
1.30											
20	18		P		8	ML/MH	Gray-brown silt to elastic silt, moderate plasticity, organic fibers, stems and roots (very soft, wet)	123		OC = 9 percent	
1.25											
25											
1.20											
30	10		7		3	MH/SM	Interbedded dark gray sandy elastic silt, moderate plasticity and silty fine to medium sand, horizontal layers (soft and loose, wet)				
1.15											
35						SM	Very dark gray silty coarse sand with gravel, subrounded to angular basalt gravel in medium coarse sand matrix				

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring B-04C



Project: The Hedges - Building C and D  
Project Location: Tualatin, Oregon  
Project Number: 0821-014-02

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEIB\_GEOTECH\_STANDARD\_SF\_NO\_GW

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEIB\_GEO TECH\_STANDARD\_SF\_NO\_GW

Elevation (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample						
110	38	10	8							
105	40	8	35			Dark gray silty, gravelly coarse sand (dense, wet)				
	45	12	23		GM	Very dark gray silty gravel with medium to coarse sand, angular basalt gravel with silty sand matrix, weakly to well cemented (medium dense, wet)				
100	50	12	9		ML/MH	Light gray silt to elastic silt, moderate plasticity (stiff, moist)				

**Log of Boring B-04C (continued)**



Project: The Hedges - Building C and D  
 Project Location: Tualatin, Oregon  
 Project Number: 0821-014-02



Start Drilled	2/15/2018	End	2/15/2018	Total Depth (ft)	41.5	Logged By	JLL	Checked By	GL	Driller	Dan Fischer Drilling	Drilling Method	Solid-stem Auger
Surface Elevation (ft)	149			Hammer Data	Rope & Cathead			140 (lbs) / 30 (in) Drop		Drilling Equipment		Paul Bunyan Trailer	
Vertical Datum	NAVD88			System Datum	OR State Plane North			NAD83 (feet)		See "Remarks" section for groundwater observed			
Easting (X)	7611554			Notes: D&M N-value reduced by 50 percent to approximate SPT N-value									
Northing (Y)	631175												

Elevation (feet)	Depth (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
0						ML	Brown silt, low to medium plasticity, grass roots to 6 to 8 inches, trace to occasional sand (very stiff, moist) (fill)			Groundwater observed at approximately 6 inches below ground surface during drilling	
1.45	10	22		1							
5	14	9		2		SM	Brown silty fine to medium sand, fine gravel (loose, moist to wet)				
1.40	0	8		3							
10	12	8		4		ML	Light gray-brown fine sandy silt, low plasticity, trace brick fragments and gravel (medium stiff, moist to wet)  Drill action indicates cobble or debris 12½ to 14½ feet				
1.35	0	12		5			Dark gray fine to medium sandy silt with gravel, angular basalt gravel to 4 inches (stiff, wet)				
1.30	10	6		6		ML	Dark gray silt, moderate plasticity, trace to occasional roots and organic fibers, trace fine sand (medium stiff, wet) (alluvium)	31		DD = 86 pcf	
1.25	12	3		7		OL/PT	Dark gray to black organic silt with fine sand, occasional interbeds of brown peat, much fibrous organic matter (soft, wet)		276	OC = 40 percent	
1.20	1	4		8			Gray sandy silt with organic silt (soft to medium stiff, wet)		95	OC = 10 percent	
1.15						ML/MH	Dark gray silt, moderate plasticity, trace fine sand (medium stiff, wet)				
35											

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring B-01D



Project: The Hedges - Building C and D  
Project Location: Tualatin, Oregon  
Project Number: 0821-014-02

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEB\GEO TECH\_STANDARD\_SF\_NO\_GW

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEIB\_GEO TECH\_STANDARD\_SF\_NO\_GW

Elevation (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
48	12	1	5		9						
40	12	12	38		10		SM GM	Dark gray silty medium to coarse sand, occasional gravel (dense, wet) Dark gray silty gravel with coarse sand, angular basalt gravel to 1-inch (dense, wet)			

**Log of Boring B-01D (continued)**



Project: The Hedges - Building C and D  
 Project Location: Tualatin, Oregon  
 Project Number: 0821-014-02

Start Drilled	2/15/2018	End	2/15/2018	Total Depth (ft)	41.5	Logged By	JLL	Checked By	GL	Driller	Dan Fischer Drilling	Drilling Method	Solid-stem Auger
Surface Elevation (ft)	150	Vertical Datum	NAVD88	Hammer Data	Rope & Cathead	140 (lbs) / 30 (in) Drop		Drilling Equipment	Paul Bunyan Trailer				
Easting (X)	7611117	Northing (Y)	631187	System Datum	OR State Plane North NAD83 (feet)			See "Remarks" section for groundwater observed					

Notes: D&M N-value reduced by 50 percent to approximate SPT N-value

Elevation (feet)	FIELD DATA					Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing						
0							ML	Dark brown silt, trace sand and debris (roots to 6 to 8 inches) (stiff, moist) (fill)			
1.45	5	12	20		1			Mixed gray and brown silt with fine to medium sand, occasional gravel, low plasticity (very stiff, moist)			
	5	14	2		2		SM	Brown silty fine sand with occasional interbeds of sandy silt, occasional gravel to 3/4-inch, low plasticity to non-plastic (loose and soft, wet)	26	37	Groundwater observed at approximately 4 feet below ground surface during drilling
	10	14	3		3		ML	Dark gray to occasional brown mottling silt, trace fine sand, low to moderate plasticity (soft, wet)	30		DD = 95 pcf
1.40	10	12	1		4		ML/MH	Gray-brown silt to elastic silt, trace fine sand, occasional gravel, moderate plasticity (very soft, wet) (alluvium)			
1.35	15	16	4		5		ML	Dark gray silt, low to moderate plasticity, occasional organic fragments including fibers, roots and stems, occasional 3- to 4-inch-thick organic silt layers with much organic matter (soft, wet)	31		DD = 88 pcf
1.30	20	0	2		6		OL	Brown organic silt, trace peat, fibrous organic matter, trace fine sand (soft, wet)	212		DD = 33 pcf
1.25	25	4	2		7		SM	Becomes yellow-brown with red-brown mottling, moderate plasticity, stems and grass blades			
	25	4	2		7		SM	Dark gray silty fine sand, massive (very loose, wet)			
1.20	30	8	2		8		ML/MH	Mixed light gray and brown elastic silt with gray-brown silt, trace organic matter, low to medium plasticity (soft, wet)			
1.15	35										

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring B-02D



Project: The Hedges - Building C and D  
Project Location: Tualatin, Oregon  
Project Number: 0821-014-02

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEB\GEOTECH\_STANDARD\_SF\_NO\_GW

Date: 3/6/18 Path: P:\0821-014\GINT\0821-014-02.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEIB\_GEO TECH\_STANDARD\_SF\_NO\_GW

Elevation (feet)	FIELD DATA					Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing					
38	12	10		9		SP	Dark gray poorly-graded coarse sand, massive (loose, wet)			
40	6	21		10						

**Log of Boring B-02D (continued)**



Project: The Hedges - Building C and D  
 Project Location: Tualatin, Oregon  
 Project Number: 0821-014-02

Start Drilled	2/21/2018	End	2/21/2018	Total Depth (ft)	81.5	Logged By	JLL	Checked By	GL	Driller	Western States Soil Conservation, Inc.	Drilling Method	Mud Rotary
Surface Elevation (ft)	149			Hammer Data	Roper & Cathhead			140 (lbs) / 30 (in) Drop		Drilling Equipment	CME-850 Truck		
Vertical Datum	NAVD88			System Datum	OR State Plane North			NAD83 (feet)		Groundwater not observed at time of exploration			
Easting (X)	7611497												
Northing (Y)	630994												
Notes: D&M N-value reduced by 50 percent to approximate SPT N-value													

Elevation (feet)	FIELD DATA					Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing					
0						ML	Dark brown silt, roots and organic matter to 6 to 8 inches, low to moderate plasticity (soft, wet) (fill)			
1.45							Drill action and cuttings indicate occasional cobbles, cobble-sized brick, concrete debris 2 to 4 feet			
5	12	20		1			Becomes dark gray, trace fine sand, occasional fine sandy silt, low plasticity to non-plastic (very stiff, moist)			
1.40							Large debris/cobble fragments 7½ to 9 feet			
10	14	36		2	2 ½ F	ML/SM	Dark gray, occasional brown silt with fine to medium sand and gravel to silty medium to coarse sand with gravel, round to angular basalt gravels (dense and hard, moist)	18	36	
1.35										
15	14	10		3		ML	Dark gray, green, occasional medium silt, low plasticity, trace fine sand, occasional sand, trace angular gravel, brick fragments (stiff, moist)			
1.30										
20	18	4		4	OC #	PT	Black, occasional brown peat, low plasticity, fibrous organic matter (soft, moist) (alluvium)	404		OC = 56 percent
1.25							Occasional wood fragments, wet			
25	18	2		5	MD			304		DD = 17 pcf
1.20										
30	18	4		6	OC	OL	Brown organic silt, much organic fibers, low plasticity, fine horizontal layers (soft, moist)	329		OC = 42 percent
1.15										
35						MH	Gray elastic silt, trace organic matter, moderate			

Note: See Figure A-1 for explanation of symbols.  
Coordinates Data Source: Horizontal approximated based on USGS Topo. Vertical approximated based on USGS Topo.

### Log of Boring B-03D



Project: The Hedges - Building C and D  
Project Location: Tualatin, Oregon  
Project Number: 0821-014-02

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017\GLB\GEB\GEO TECH\_STANDARD\_SF\_NO\_GW

Elevation (feet)	FIELD DATA				Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample						
35		16	P		7		plasticity (very soft, moist)			
40	110	18	4		8 MD	ML/SM	Interbedded gray silt, low plasticity, trace fine sand and silty fine sand, occasional 1-inch layers of coarse sand (soft and loose, wet)	57		DD = 67 pcf
45	105	12	2		9	GM ML	Drill action indicates gravel 44 to 45 feet Gray silt, low to moderate plasticity, trace fine sand (soft, wet)			Lost circulation at 45 feet
50	100	0	22		10	GM/SM SM	Dark gray silty coarse sand with gravel to silty gravel with coarse sand (medium dense, wet)			Drill action indicates gravel, occasional cobble 47½ to 50 feet, coarse sand and gravel in cuttings Lost circulation at 48 feet
55	95	16	3		11	MH	Gray elastic silt, massive (soft, wet)			
60	90	6	18		12	GM SM	Dark gray silty coarse sand with gravel, angular basalt gravel to 1½ inches (medium dense, wet)			Drill action indicates gravel at 57½ Lost circulation at 58 feet
65	85	10	16		13	GM SP	Dark gray poorly-graded coarse sand with gravel (medium dense, wet)			Driller reports very loose to loose gravel
70	80	16	12		14	ML SM	Light gray silt, moderate to high plasticity (very soft, wet) Gray-green silty fine sand, massive to horizontal layers (medium dense, wet)	61		AL (LL = 40, PL = 29, PI = 17)
75	75	18	14		15	ML	Gray-green silt, low plasticity, trace fine sand, massive (stiff, moist)			

Date: 3/6/18 Path: P:\0821014\GINT\082101402.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GEB\_GEO TECH\_STANDARD\_SF\_NO\_GW

**Log of Boring B-03D (continued)**



Project: The Hedges - Building C and D  
 Project Location: Tualatin, Oregon  
 Project Number: 0821-014-02

Elevation (feet)	FIELD DATA					MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing				
80	0	28		16					Becomes gray-green with brown mottling, very stiff

**Log of Boring B-03D (continued)**



Project: The Hedges - Building C and D  
 Project Location: Tualatin, Oregon  
 Project Number: 0821-014-02

**APPENDIX B**  
**Report Limitations and Guidelines for Use**



## **APPENDIX B REPORT LIMITATIONS AND GUIDELINES FOR USE<sup>1</sup>**

This appendix provides information to help you manage your risks with respect to the use of this report.

### **Geotechnical Services Are Performed for Specific Purposes, Persons and Projects**

This report has been prepared for the exclusive use of the Martin Development. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. Our report is prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted geotechnical practices in this area at the time this report was prepared. This report should not be applied for any purpose or project except the one originally contemplated.

### **A Geotechnical Engineering or Geologic Report Is Based on a Unique Set of Project-specific Factors**

This report has been prepared for the Hedges Building C and D project in Tualatin, Oregon. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

---

<sup>1</sup> Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; [www.asfe.org](http://www.asfe.org).

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

### **Subsurface Conditions Can Change**

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

### **Most Geotechnical and Geologic Findings Are Professional Opinions**

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

### **Geotechnical Engineering Report Recommendations Are Not Final**

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

### **A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation**

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

### **Do Not Redraw the Exploration Logs**

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable but recognize that separating logs from the report can elevate risk.

### **Give Contractors a Complete Report and Guidance**

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

### **Contractors Are Responsible for Site Safety on Their Own Construction Projects**

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

### **Read These Provisions Closely**

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

### **Geotechnical, Geologic and Environmental Reports Should Not Be Interchanged**

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

## **Biological Pollutants**

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If Client desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.



# HEDGES 'C'

*SW 115th Street and SW Amu Street  
Tualatin, OR 97062*

## **PRELIMINARY** STORMWATER REPORT

*VLMK Project Number: 20180291*

*Project:* HEDGES 'C' *Project Number:* 20180291  
*Project* SW 115th Street and SW Amu Street  
*Address:* Tualatin, OR 97062

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**I. SITE INFORMATION**

**A. Vicinity Map**



Google Maps, 2018



## II. PROJECT INFORMATION

### A. Site Conditions

The development for Hedges 'C' is located at SW 115<sup>th</sup> Street and SW Amu Street in Tualatin, Oregon. This project covers the development of a single, two-story building, associated parking areas, new driveways, and an onsite stormwater management system. The total property area is approximately 197,709 SF (4.54 acres).

Survey information for the proposed project is from a topographic survey provided by Weddle Surveying, Inc. (1750 SW Skyline Blvd., Suite 105, Portland, OR 97221).

The existing site is undeveloped. The site is bounded by SW Amu Street along the north, SW 115<sup>th</sup> Street on the east, and Hedges Creek along the west and south. Currently, storm runoff drains west into Hedges Creek. The proposed site will be fully served with a new underground piped storm system. All runoff generated from the disturbed area will be collected and routed to new StormFilter<sup>®</sup> water quality units for water quality control. After passing through treatment, runoff will be routed to underground StormTech<sup>®</sup> chamber beds for water quantity control per the current Clean Water Services standards. The total of post-development runoff rates will be equal to or less than pre-development runoff rates. All runoff will be discharged to Hedges Creek.

StormFilter<sup>®</sup> water quality units use filter cartridges to filter sediment out of stormwater during storm events. Filter cartridges are sized to meet CWS water quality flow rates, and continuously treat those rates during all storm events larger than the water quality event. Flows above the treatment flow rate bypass the filters. StormTech<sup>®</sup> chambers are used with control manholes to detain storm events and release at pre-development flow rates.

The proposed developments will disturb approximately 155,930 SF (3.58 acres). The developments will include impervious area (parking, building) and pervious landscaped areas. For the preliminary stormwater report, the entire site development (disturbed area) has been considered impervious to provide a measure of safety to allow for future minor site alterations. The stormwater management calculations in this report cover quality and quantity for the entire disturbed area of the site.

Additional design information used was obtained from:

- The USDA NRCS "Soil Survey of Clackamas County"
- Clean Water Services Design and Construction Standards

### Software Used in Design

- HydroCAD 10 Stormwater Modeling
- AutoCAD Civil 3D 2018
- Microsoft Excel 2016

### III. STORMWATER NARRATIVE

#### A. Water Quality Treatment

The proposed site development consists of approximately 136,974 SF (3.14 acres) of drainage area. All proposed drainage areas will sheet flow to StormFilter® steel catch basin units. StormFilter® cartridges are designed to filter a measured flow rate of stormwater (15 gpm/0.033 cfs), collecting and removing suspended solids in stormwater runoff prior to discharge.

The site is divided into five water quality basins, one for each StormFilter® catch basin. The water quality flowrates for the areas have been calculated and are included in the appendix of this report. The Clean Water Services water quality treatment flowrate (continuous) is equal to 0.36" over the new impervious area, over 4-hours.

#### B. Water Quantity Control (Detention)

The underground StormTech® facilities have an outflow restriction (weir & orifice), which detains the storm events. The restriction will limit post-development runoff rates to at least the pre-development runoff rates, from the 2-year, 10-year, and 25-year events. Because of this outflow restriction, the "live storage" volume of the facility creates a settling pond, trapping additional sediment prior to discharge.

The arched chambers are embedded in a drain rock bed and are open at the base. Storage volumes include void space in the surrounding rock, above and below the chambers. The systems will be lined on the bottom and sides by an impermeable liner to create a watertight storage system.

Runoff enters the system through a 24" connection at a maintenance manhole. This first "Isolator Row" of chambers is wrapped in filter fabric to trap sediment. Testing shows that the Isolator Row™ screens & removes 80% of sand size sediment larger than 110 microns. The filter fabric on the bottom of the Isolator Row allows for long term maintenance with jet-vac equipment without displacing the embedment stone. Trapping large sediment that may bypass the StormFilter® units will provide additional treatment. One row of the underground chamber system connects directly to a control manhole. A perforated underdrain is placed in the bedding rock and connected to the control manhole to allow the system to fully drain after storm events.

Due to elevation restrictions, the northwest corner of the site (12,690 SF) will discharge directly (without being detained) from the StormFilter® catch basins to Hedges Creek. The detention system has been oversized so that the total site outflow is equal to or less than the predevelopment flowrates. Calculations show the undetained storm event hydrographs being combined with the detention system storm event outflow hydrographs to produce a net outflow for the site. See the HydroCAD report in the appendix for additional information.

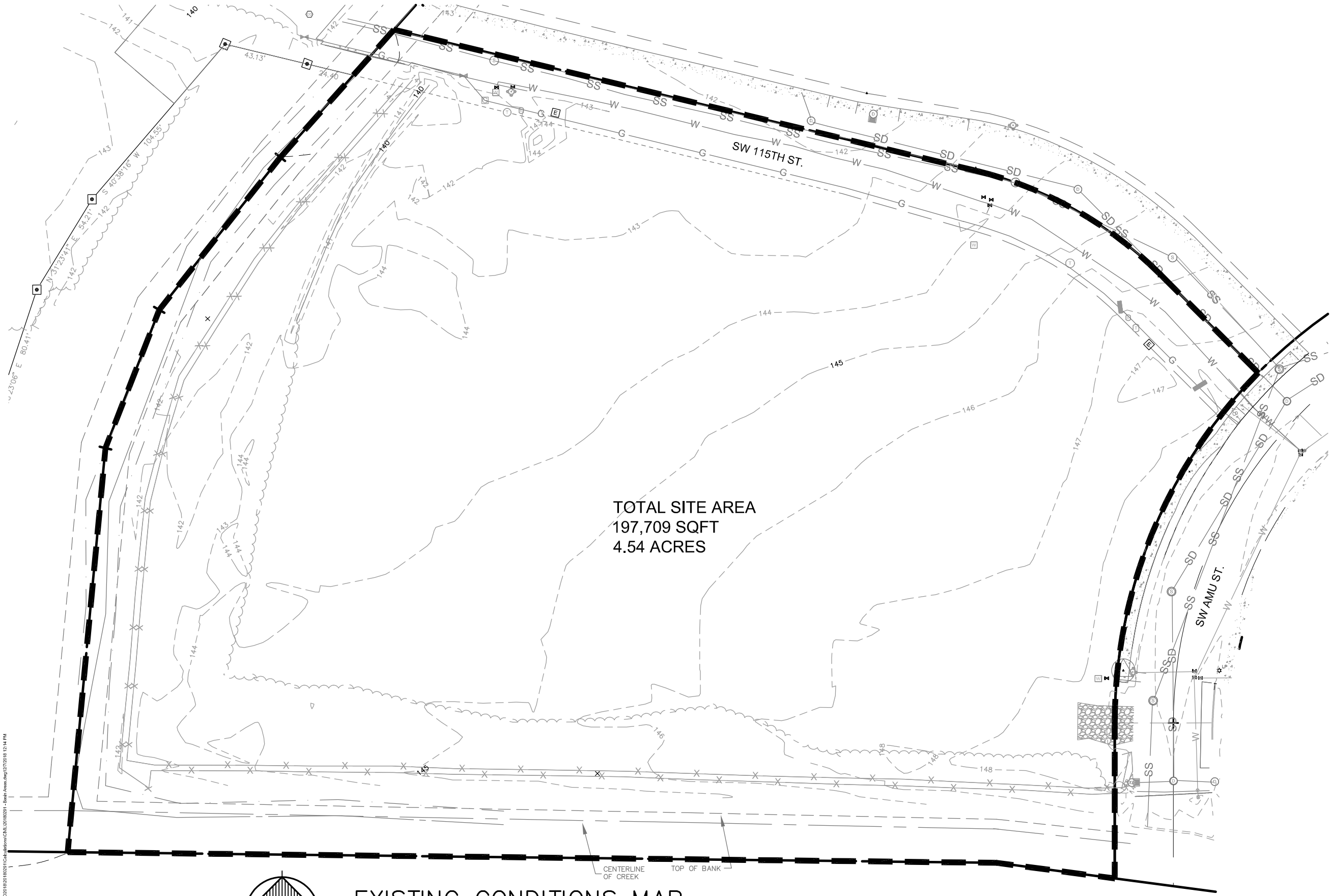
#### Detention Facility Elevations:

The 2-year storm event is expected to reach a peak elevation of 139.66 feet. The 10-year storm event is expected to reach a peak elevation of 139.93 feet. The 25-year storm event is expected to reach a peak elevation of 140.15 feet. The 100-year storm event is expected to reach a peak elevation of 140.41 feet in the underground facility overflowing the weir in the control manhole.

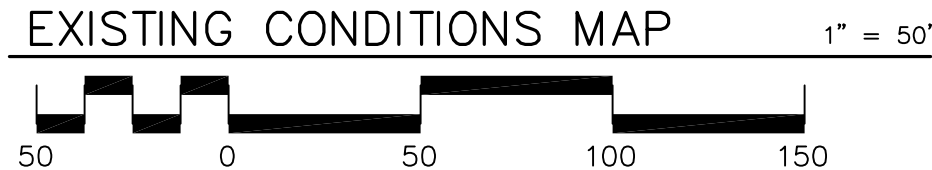
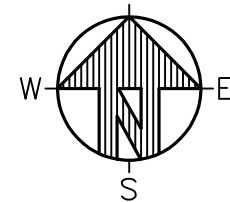
# APPENDIX A

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## EXISTING CONDITIONS MAP

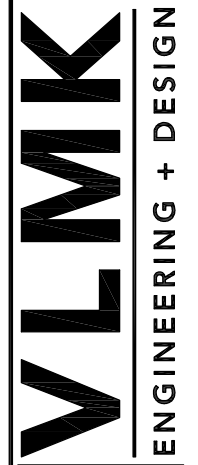


G:\ACAD\2018\20180291\CH\addition\GML\_20180291 - Bath Area.dwg 2/7/2018 12:14 PM



TOTAL SITE AREA  
197,709 SQFT  
4.54 ACRES

3933 SW Kelly Avenue  
Portland, Oregon 97239  
503.222.4453  
VLMK.COM



**ENGINEERING + DESIGN**

**HEDGES 'C'**  
SW 115TH ST AND SW AMU ST  
TUALATIN, OR

DATE	JULY, 2018
SCALE	AS NOTED
PROJ. NO.	20180291
DRAWN	BRG
CHECKED	BMD

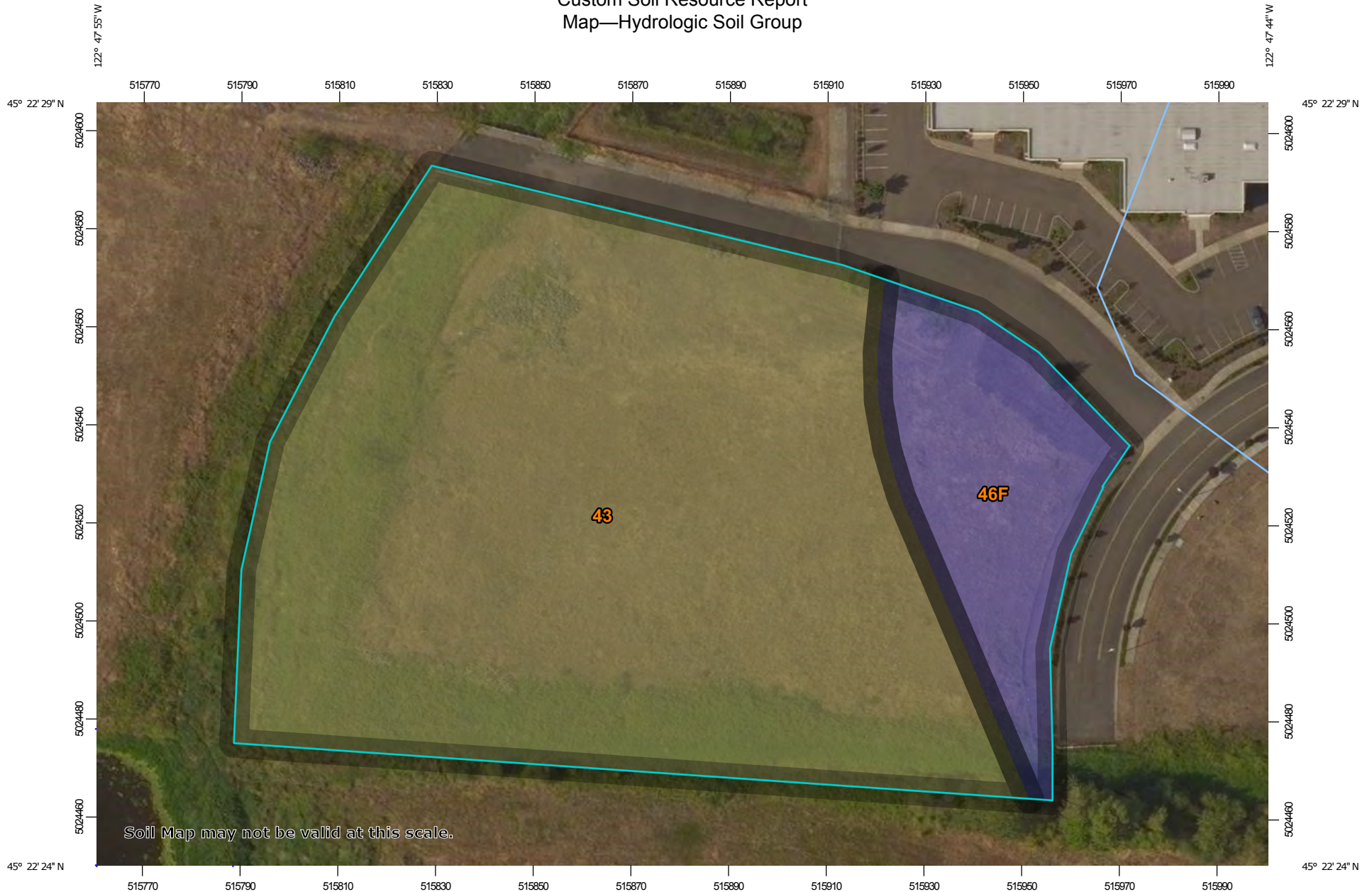
A1

# **APPENDIX B**

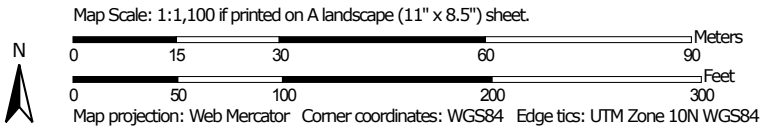
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## **NRCS WEB SOIL SURVEY**

# Custom Soil Resource Report Map—Hydrologic Soil Group



Soil Map may not be valid at this scale.



**Table—Hydrologic Soil Group**

CHOOSE C TO INCREASE PRE-DEV  
TIME OF CONCENTRATION

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
43	Wapato silty clay loam	C/ <del>A</del>	3.7	84.3%
46F	Xerochrepts and Haploxerolls, very steep	B	0.7	15.7%
<b>Totals for Area of Interest</b>			<b>4.4</b>	<b>100.0%</b>

**Rating Options—Hydrologic Soil Group**

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

SEE TR-55 TABLES IN APPENDIX FOR RUNOFF CURVE NUMBERS

COMPOSITE CURVE NUMBERS:

PRE-DEVELOPMENT AREA CONDITION:

0.7 ACRES B, CN = 69

3.7 ACRES C, CN = 79

**COMPOSITE CN = 77.4**

# **APPENDIX C**

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## **TR-55 CURVE NUMBER/COEFFICIENT TABLES**



**Table 2-2a** Runoff curve numbers for urban areas <sup>1/</sup>

Cover description	Average percent impervious area <sup>2/</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
Open space (lawns, parks, golf courses, cemeteries, etc.) <sup>3/</sup> :					
Poor condition (grass cover < 50%)	POST-DEV → 68	79	86	89	
Fair condition (grass cover 50% to 75%)	→ 49	69	79	84	
Good condition (grass cover > 75%)	39	61	74	80	
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)	POST-DEV → 98	98	98	98	
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)	98	98	98	98	
Paved; open ditches (including right-of-way)	83	89	92	93	
Gravel (including right-of-way)	76	85	89	91	
Dirt (including right-of-way)	72	82	87	89	
Western desert urban areas:					
Natural desert landscaping (pervious areas only) <sup>4/</sup>	63	77	85	88	
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)	96	96	96	96	
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82

**Developing urban areas**

Newly graded areas  
(pervious areas only, no vegetation) <sup>5/</sup> 77 86 91 94

Idle lands (CN's are determined using cover types  
similar to those in table 2-2c).

<sup>1/</sup> Average runoff condition, and  $I_a = 0.2S$ .

<sup>2/</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3/</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4/</sup> Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

<sup>5/</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

**Table 2-2c** Runoff curve numbers for other agricultural lands <sup>1/</sup>

Cover description	Hydrologic condition	Curve numbers for hydrologic soil group			
		A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. <sup>2/</sup>	PRE-DEV → Poor Fair Good	68 49 39	79 69 61	86 79 74	89 84 80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. <sup>3/</sup>	Poor Fair Good	48 35 30 <sup>4/</sup>	67 56 48	77 70 65	83 77 73
Woods—grass combination (orchard or tree farm). <sup>5/</sup>	Poor Fair Good	57 43 32	73 65 58	82 76 72	86 82 79
Woods. <sup>6/</sup>	Poor Fair Good	45 36 30 <sup>4/</sup>	66 60 55	77 73 70	83 79 77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

<sup>1</sup> Average runoff condition, and  $I_a = 0.2S$ .

<sup>2</sup> **Poor:** <50% ground cover or heavily grazed with no mulch.

**Fair:** 50 to 75% ground cover and not heavily grazed.

**Good:** > 75% ground cover and lightly or only occasionally grazed.

<sup>3</sup> **Poor:** <50% ground cover.

**Fair:** 50 to 75% ground cover.

**Good:** >75% ground cover.

<sup>4</sup> Actual curve number is less than 30; use CN = 30 for runoff computations.

<sup>5</sup> CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

<sup>6</sup> **Poor:** Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

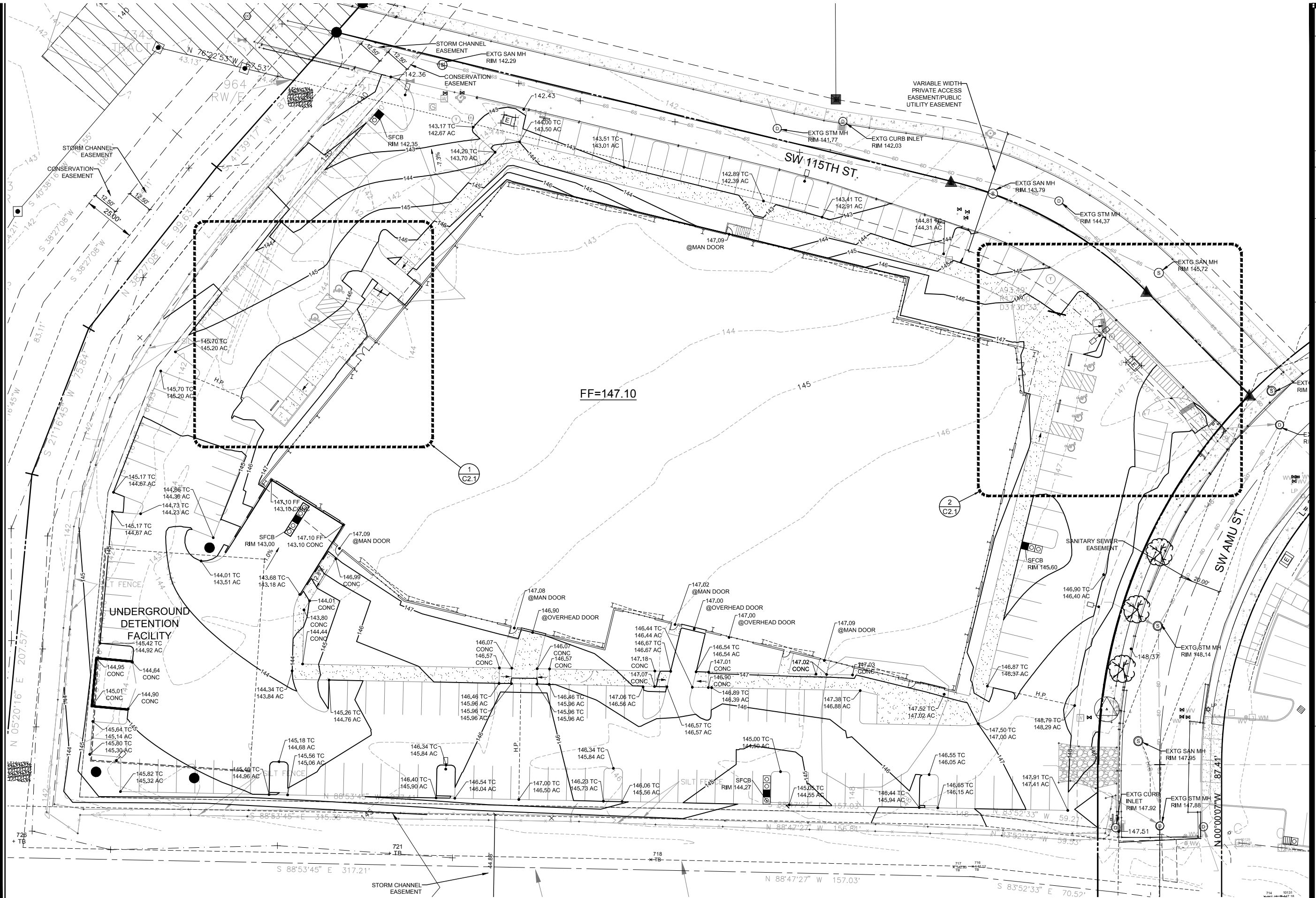
**Fair:** Woods are grazed but not burned, and some forest litter covers the soil.

**Good:** Woods are protected from grazing, and litter and brush adequately cover the soil.

# **APPENDIX D**

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## **GRADING AND DRAINAGE PLAN**



20180291	job no.		
	drawn		
	checked		
JULY 2018	date		
	revision		

**HEDGES C**  
 SW 115th ST. AND SW AMU ST.  
 TUALATIN, OREGON

**SITE GRADING PLAN**  
 RANDI MUELLER & ASSOCIATES  
 ARCHITECTS  
 130 LAKESIDE • SUITE 300 • SEASIDE, WA 98134 • (206) 389-9959

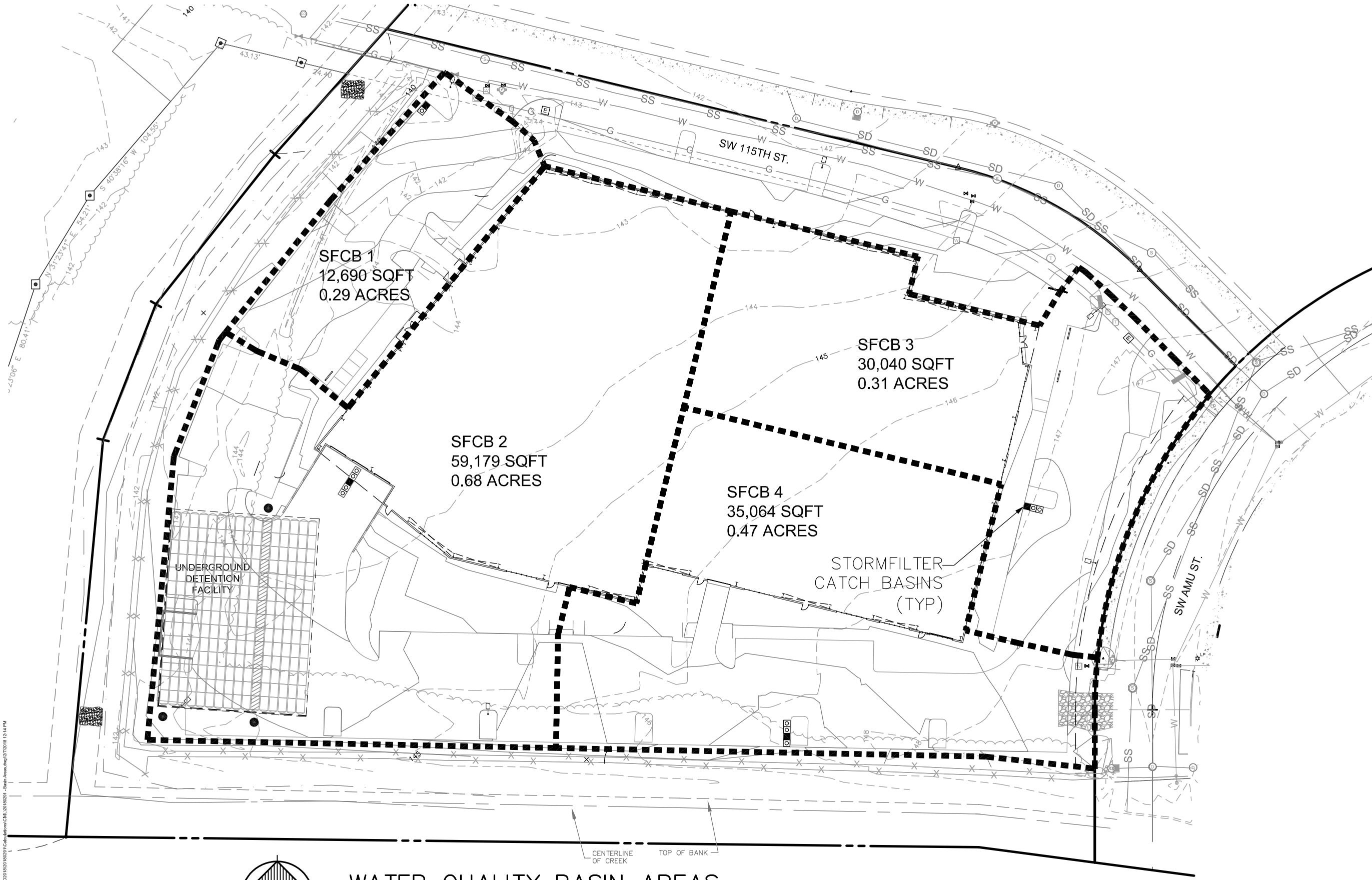
**VLMK ENGINEERING + DESIGN**  
 10000 15th Ave SW, Everett, WA 98203 • (425) 799-9999

sheet  
 D1

# **APPENDIX E**

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## **WATER QUALITY**



SFCB 1  
12,690 SQFT  
0.29 ACRES

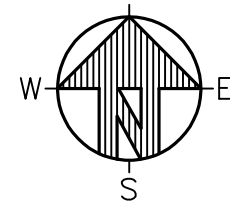
SFCB 2  
59,179 SQFT  
0.68 ACRES

SFCB 3  
30,040 SQFT  
0.31 ACRES

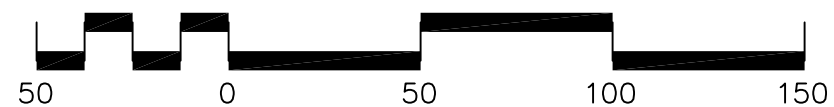
SFCB 4  
35,064 SQFT  
0.47 ACRES

UNDERGROUND  
DETENTION  
FACILITY

STORMFILTER  
CATCH BASINS  
(TYP)



WATER QUALITY BASIN AREAS 1" = 50'



CENTERLINE  
OF CREEK

TOP OF BANK

G:\ACAD\2018\20180291\CH\Hedges\CML\_20180291 - Basin Areas.dwg 2/7/2018 12:14 PM

DATE	JULY, 2018
SCALE	AS NOTED
PROJ. NO.	20180291
DRAWN	BRG
CHECKED	BMD



## Water Quality Calculations

Based on *Clean Water Services 2017 Design and Construction Standards*

Treat using Contech StormFilter Catch Basin units: 18 in.  
 Each cartridge treats: 15 gpm 0.033 cfs

SFCB 1 12,690 sf of Impervious Surface Area

Water Quality Volume ( $V_{wq}$ ):

$V_{wq} = \text{Impervious Area} \cdot 0.36 \text{ in}$

$$V_{wq} = 12690 \text{ sf} \cdot 0.36 \text{ in} \cdot (1\text{ft}/12\text{in})$$

$$V_{wq} = 381 \text{ cf}$$

Water Quality Flowrate ( $Q_{wq}$ ):

$Q_{wq} = V_{wq} / \text{Time}$  Time = 4 Hours

$$Q_{wq} = 0.026 \text{ cfs} < 0.033 \text{ cfs}$$

Use One (18 in.) Cartridge Catch Basin Unit(s)

Treat using Contech StormFilter Catch Basin units: 18 in.  
 Each cartridge treats: 15 gpm 0.033 cfs

SFCB 2 59,179 sf of Impervious Surface Area

Water Quality Volume ( $V_{wq}$ ):

$V_{wq} = \text{Impervious Area} \cdot 0.36 \text{ in}$

$$V_{wq} = 59179 \text{ sf} \cdot 0.36 \text{ in} \cdot (1\text{ft}/12\text{in})$$

$$V_{wq} = 1775 \text{ cf}$$

Water Quality Flowrate ( $Q_{wq}$ ):

$Q_{wq} = V_{wq} / \text{Time}$  Time = 4 Hours

$$Q_{wq} = 0.123 \text{ cfs} < 0.133 \text{ cfs}$$

Use Four (18 in.) Cartridge Catch Basin Unit(s)

Water Quality Requirements Met



## Water Quality Calculations

Based on *Clean Water Services 2017 Design and Construction Standards*

Treat using Contech StormFilter Catch Basin units: 18 in.  
 Each cartridge treats: 15 gpm 0.033 cfs

SFCB 3 30,040 sf of Impervious Surface Area

Water Quality Volume ( $V_{wq}$ ):

$V_{wq} = \text{Impervious Area} \cdot 0.36 \text{ in}$

$$V_{wq} = 30040 \text{ sf} \cdot 0.36 \text{ in} \cdot (1\text{ft}/12\text{in})$$

$$V_{wq} = 901 \text{ cf}$$

Water Quality Flowrate ( $Q_{wq}$ ):

$Q_{wq} = V_{wq} / \text{Time}$  Time = 4 Hours

$$Q_{wq} = 0.063 \text{ cfs} < 0.067 \text{ cfs}$$

Use Two (18 in.) Cartridge Catch Basin Unit(s)

Treat using Contech StormFilter Catch Basin units: 18 in.  
 Each cartridge treats: 15 gpm 0.033 cfs

SFCB 4 35,067 sf of Impervious Surface Area

Water Quality Volume ( $V_{wq}$ ):

$V_{wq} = \text{Impervious Area} \cdot 0.36 \text{ in}$

$$V_{wq} = 35067 \text{ sf} \cdot 0.36 \text{ in} \cdot (1\text{ft}/12\text{in})$$

$$V_{wq} = 1052 \text{ cf}$$

Water Quality Flowrate ( $Q_{wq}$ ):

$Q_{wq} = V_{wq} / \text{Time}$  Time = 4 Hours

$$Q_{wq} = 0.073 \text{ cfs} < 0.100 \text{ cfs}$$

Use Three (18 in.) Cartridge Catch Basin Unit(s)

Water Quality Requirements Met





# 24-HOUR RAINFALL DEPTHS

RECURRENCE INTERVAL (YEARS)	TOTAL PRECIPITATION DEPTH (INCHES)
2	2.5
5	3.10
10	3.45
25	3.90
50	4.20
100	4.50

24-HOURS  
RAINFALL DEPTHS



## STORMFILTER CATCHBASIN DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. 1 CARTRIDGE CATCHBASIN HAS A MAXIMUM OF ONE CARTRIDGE. SYSTEM IS SHOWN WITH A 27" CARTRIDGE, AND IS ALSO AVAILABLE WITH AN 18" CARTRIDGE. STORMFILTER CATCHBASIN CONFIGURATIONS ARE AVAILABLE WITH A DRY INLET BAY FOR VECTOR CONTROL. PEAK HYDRAULIC CAPACITY PER TABLE BELOW. IF THE SITE CONDITIONS EXCEED PEAK HYDRAULIC CAPACITY, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

### CARTRIDGE SELECTION

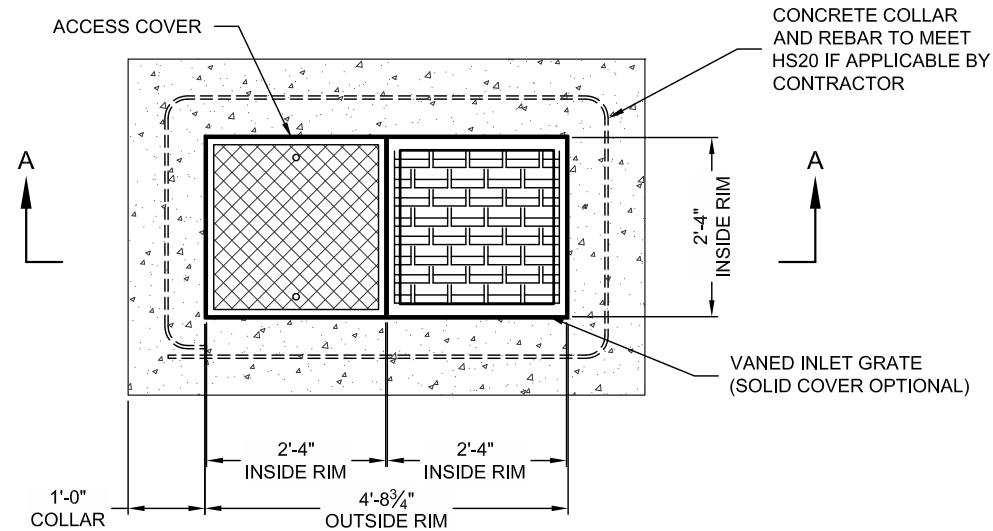
CARTRIDGE HEIGHT	27"		18"		18" DEEP	
	MINIMUM HYDRAULIC DROP (H)	3.05'		2.3'		3.3'
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/ft <sup>2</sup>	1 gpm/ft <sup>2</sup>	2 gpm/ft <sup>2</sup>	1 gpm/ft <sup>2</sup>	2 gpm/ft <sup>2</sup>	1 gpm/ft <sup>2</sup>
CARTRIDGE FLOW RATE (gpm)	22.5	11.25	15	7.5	15	7.5
PEAK HYDRAULIC CAPACITY	1.0		1.0		1.8	
INLET PERMANENT POOL LEVEL (A)	1'-0"		1'-0"		2'-0"	
OVERALL STRUCTURE HEIGHT (B)	4'-9"		3'-9"		4'-9"	

### GENERAL NOTES

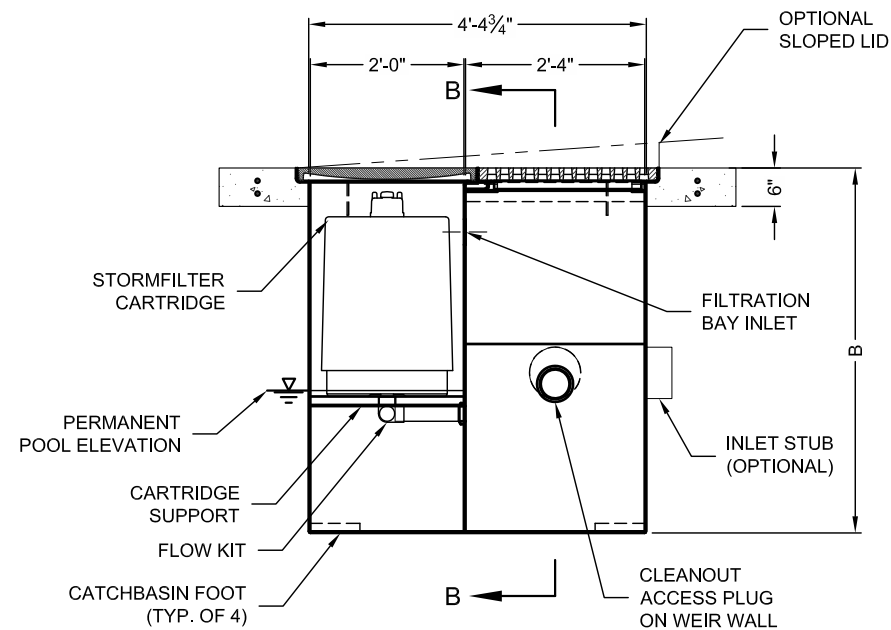
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STORMFILTER CATCHBASIN STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.ContechES.com](http://www.ContechES.com)
- STORMFILTER CATCHBASIN WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- INLET SHOULD NOT BE LOWER THAN OUTLET. INLET (IF APPLICABLE) AND OUTLET PIPING TO BE SPECIFIED BY ENGINEER AND PROVIDED BY CONTRACTOR.
- STORMFILTER CATCHBASIN EQUIPPED WITH 4 INCH (APPROXIMATE) LONG STUBS FOR INLET (IF APPLICABLE) AND OUTLET PIPING. STANDARD OUTLET STUB IS 8 INCHES IN DIAMETER. MAXIMUM OUTLET STUB IS 15 INCHES IN DIAMETER. CONNECTION TO COLLECTION PIPING CAN BE MADE USING FLEXIBLE COUPLING BY CONTRACTOR.
- STEEL STRUCTURE TO BE MANUFACTURED OF 1/4 INCH STEEL PLATE. CASTINGS SHALL MEET AASHTO M306 LOAD RATING. TO MEET HS20 LOAD RATING ON STRUCTURE, A CONCRETE COLLAR IS REQUIRED. WHEN REQUIRED, CONCRETE COLLAR WITH QUANTITY (2) #4 REINFORCING BARS TO BE PROVIDED BY CONTRACTOR.
- 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 IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).

### INSTALLATION NOTES

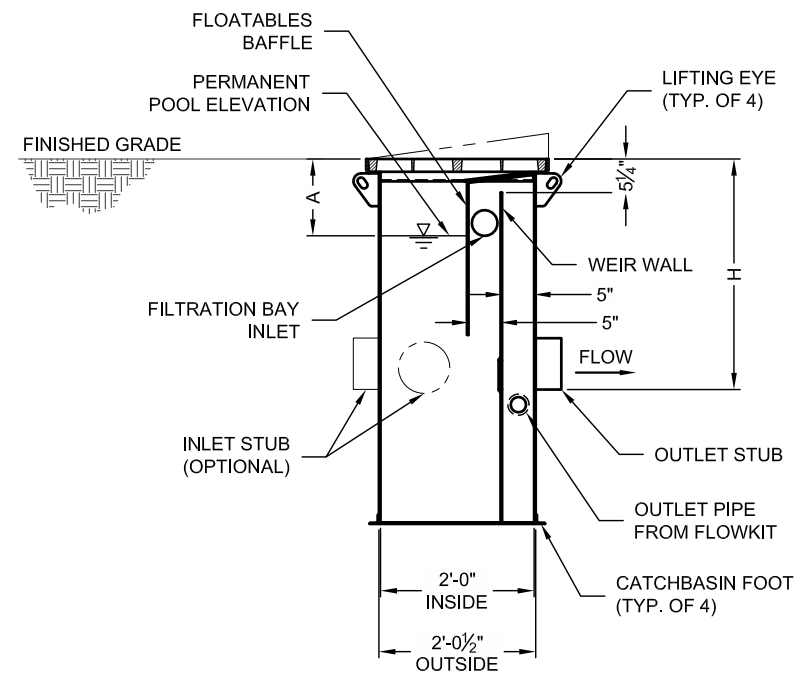
- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CATCHBASIN (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.



**PLAN VIEW**



**SECTION A-A**



**SECTION B-B**

1-CARTRIDGE CATCHBASIN STORMFILTER DATA	
STRUCTURE ID	XXX
WATER QUALITY FLOW RATE (cfs)	X.XX
PEAK FLOW RATE (<1 cfs)	X.XX
RETURN PERIOD OF PEAK FLOW (yrs)	XXX
CARTRIDGE FLOW RATE (gpm)	XX
MEDIA TYPE (CSF, PERLITE, ZPG, GAC, PHS)	XXXXX
RIM ELEVATION	XXX.XX'
PIPE DATA:	I.E. DIAMETER
INLET STUB	XXX.XX' XX"
OUTLET STUB	XXX.XX' XX"
CONFIGURATION	
SLOPED LID	YES/NO
SOLID COVER	YES/NO
NOTES/SPECIAL REQUIREMENTS:	

## STORMFILTER CATCHBASIN DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. 2 CARTRIDGE CATCHBASIN HAS A MAXIMUM OF TWO CARTRIDGES. SYSTEM IS SHOWN WITH A 27" CARTRIDGE, AND IS ALSO AVAILABLE WITH AN 18" CARTRIDGE. STORMFILTER CATCHBASIN CONFIGURATIONS ARE AVAILABLE WITH A DRY INLET BAY FOR VECTOR CONTROL. PEAK HYDRAULIC CAPACITY PER TABLE BELOW. IF THE SITE CONDITIONS EXCEED PEAK HYDRAULIC CAPACITY, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

### CARTRIDGE SELECTION

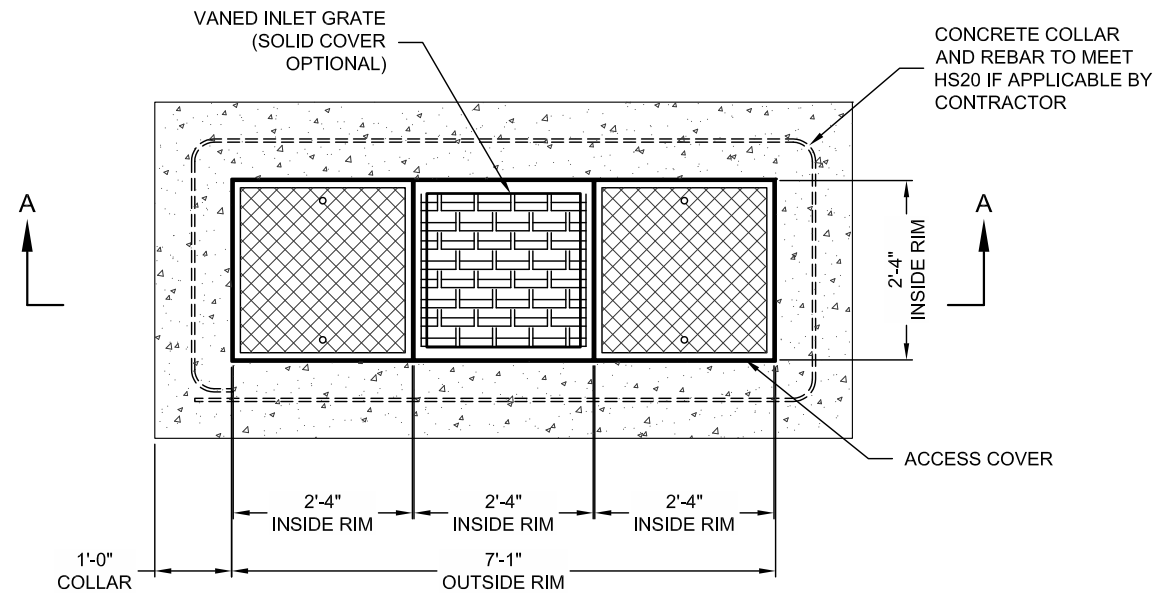
CARTRIDGE HEIGHT	27"		18"		18" DEEP	
MINIMUM HYDRAULIC DROP (H)	3.05'		2.3'		3.3'	
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/sf	1 gpm/sf	2 gpm/sf	1 gpm/sf	2 gpm/sf	1 gpm/sf
CARTRIDGE FLOW RATE (gpm)	22.5	11.25	15	7.5	15	7.5
PEAK HYDRAULIC CAPACITY	1.0		1.0		1.8	
INLET PERMANENT POOL LEVEL (A)	1'-0"		1'-0"		2'-0"	
OVERALL STRUCTURE HEIGHT (B)	4'-9"		3'-9"		4'-9"	

### GENERAL NOTES

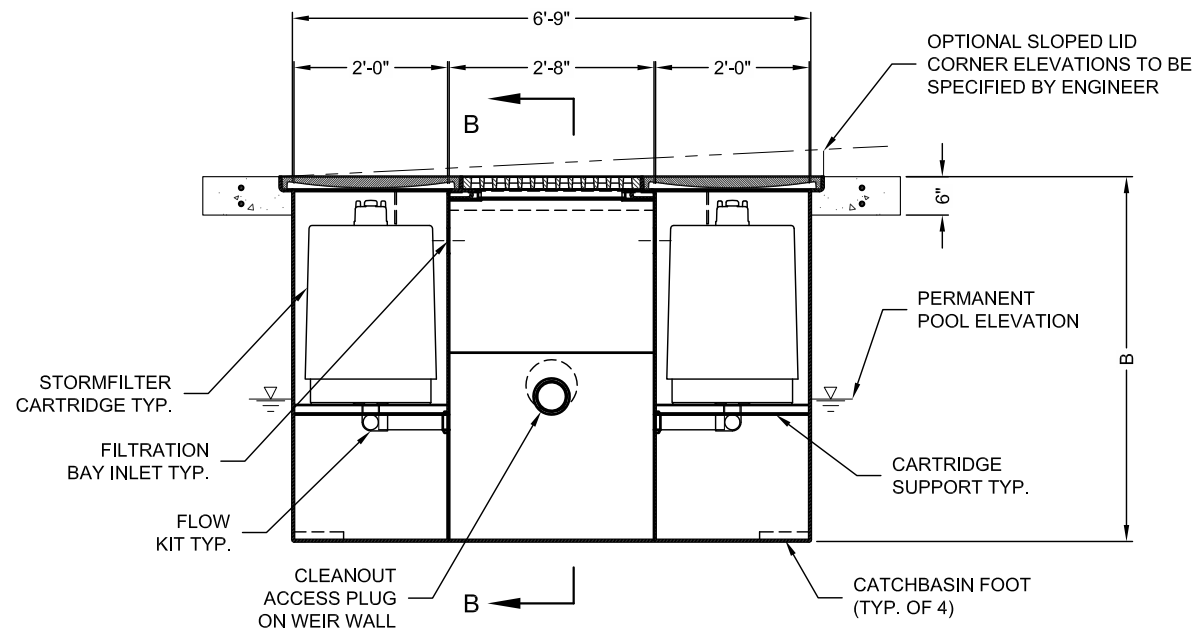
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STORMFILTER CATCHBASIN STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.ContechES.com](http://www.ContechES.com)
- STORMFILTER CATCHBASIN WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- INLET SHOULD NOT BE LOWER THAN OUTLET. INLET (IF APPLICABLE) AND OUTLET PIPING TO BE SPECIFIED BY ENGINEER AND PROVIDED BY CONTRACTOR.
- STORMFILTER CATCHBASIN EQUIPPED WITH 4 INCH (APPROXIMATE) LONG STUBS FOR INLET (IF APPLICABLE) AND OUTLET PIPING. STANDARD OUTLET STUB IS 8 INCHES IN DIAMETER. MAXIMUM OUTLET STUB IS 15 INCHES IN DIAMETER. CONNECTION TO COLLECTION PIPING CAN BE MADE USING FLEXIBLE COUPLING BY CONTRACTOR.
- STEEL STRUCTURE TO BE MANUFACTURED OF 1/4 INCH STEEL PLATE. CASTINGS SHALL MEET AASHTO M306 LOAD RATING. TO MEET HS20 LOAD RATING ON STRUCTURE, A CONCRETE COLLAR IS REQUIRED. WHEN REQUIRED, CONCRETE COLLAR WITH QUANTITY (2) #4 REINFORCING BARS TO BE PROVIDED BY CONTRACTOR.
- 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 IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).

### INSTALLATION NOTES

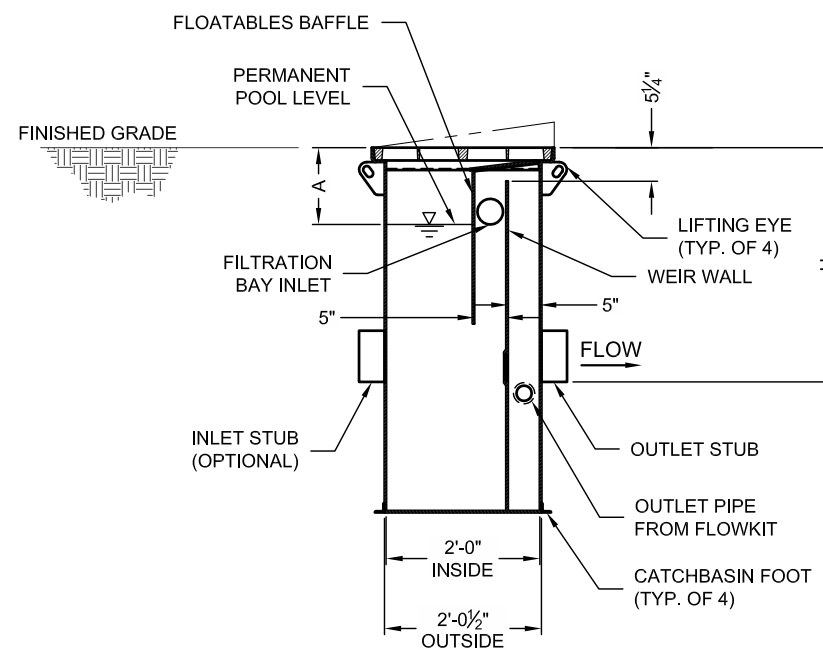
- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CATCHBASIN (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.



**PLAN VIEW**



**SECTION A-A**

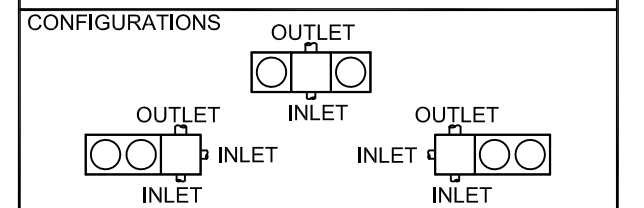


**SECTION B-B**

### 2-CARTRIDGE DEEP CATCHBASIN STORMFILTER DATA

STRUCTURE ID	XXX
WATER QUALITY FLOW RATE (cfs)	X.XX
PEAK FLOW RATE (<1.8 cfs)	X.XX
RETURN PERIOD OF PEAK FLOW (yrs)	XXX
CARTRIDGE FLOW RATE (gpm)	XX
MEDIA TYPE (CSF, PERLITE, ZPG, GAC, PHS)	XXXXX
RIM ELEVATION	XXX.XX'

PIPE DATA:	I.E.	DIAMETER
INLET STUB	XXX.XX'	XX"
OUTLET STUB	XXX.XX'	XX"



SLOPED LID	YES/NO
SOLID COVER	YES/NO
NOTES/SPECIAL REQUIREMENTS:	

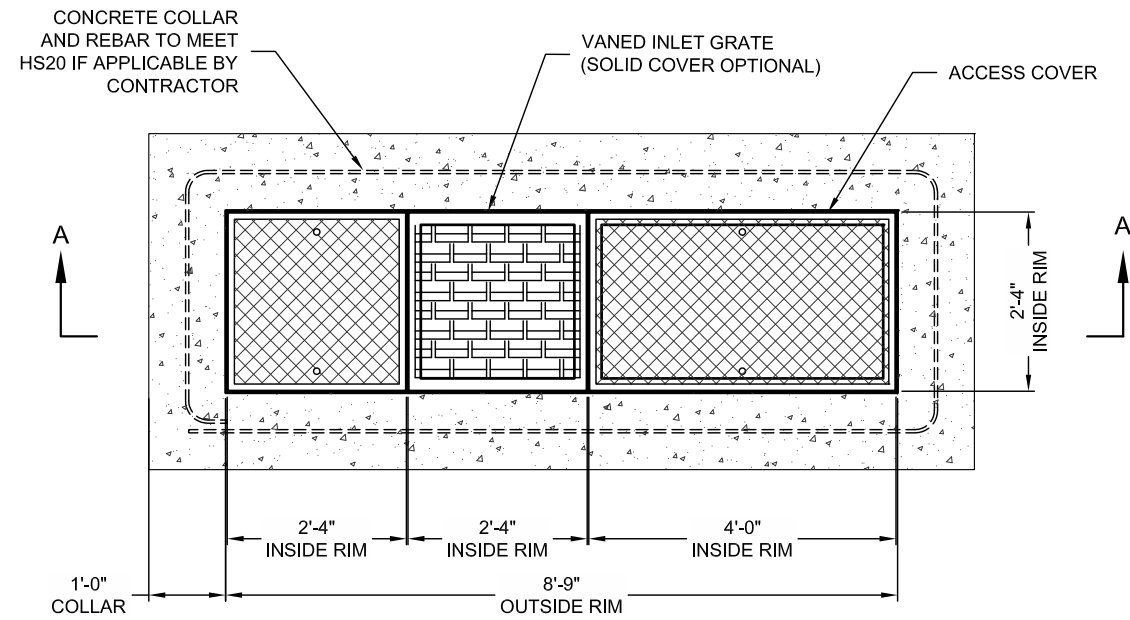
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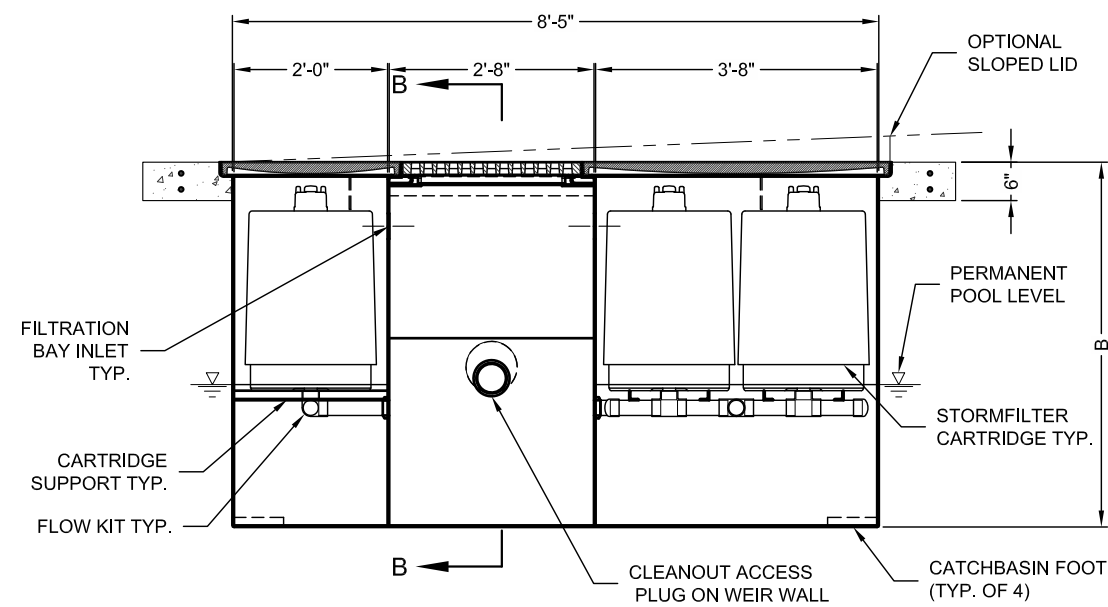
**CONTECH**  
ENGINEERED SOLUTIONS LLC

[www.ContechES.com](http://www.ContechES.com)  
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069  
800-338-1122 513-645-7000 513-645-7993 FAX

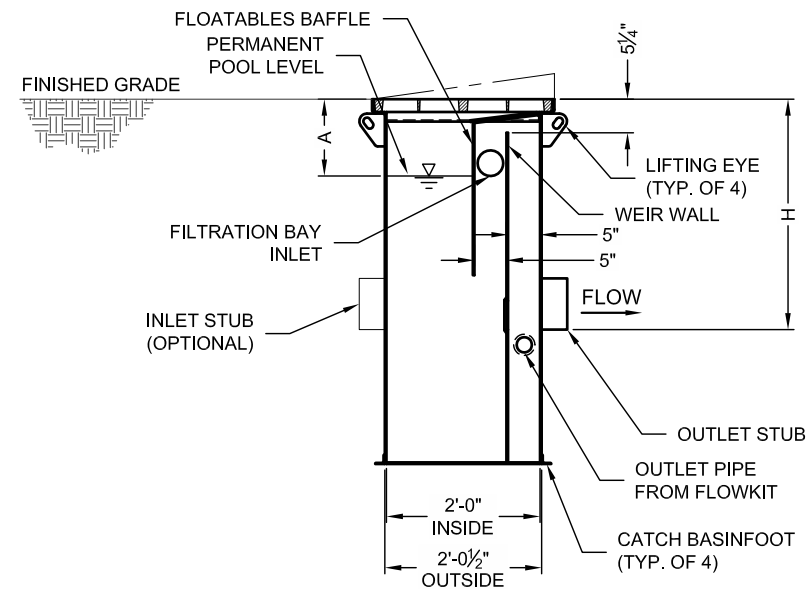
2 CARTRIDGE CATCHBASIN  
STORMFILTER  
STANDARD DETAIL



**PLAN VIEW**



**SECTION A-A**



**SECTION B-B**

**STORMFILTER CATCHBASIN DESIGN NOTES**

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. 3 CARTRIDGE CATCHBASIN HAS A MAXIMUM OF THREE CARTRIDGES. SYSTEM IS SHOWN WITH A 27" CARTRIDGE, AND IS ALSO AVAILABLE WITH AN 18" CARTRIDGE. STORMFILTER CATCHBASIN CONFIGURATIONS ARE AVAILABLE WITH A DRY INLET BAY FOR VECTOR CONTROL. PEAK HYDRAULIC CAPACITY PER TABLE BELOW. IF THE SITE CONDITIONS EXCEED PEAK HYDRAULIC CAPACITY, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

**CARTRIDGE SELECTION**

CARTRIDGE HEIGHT	27"		18"		18" DEEP	
MINIMUM HYDRAULIC DROP (H)	3.05'		2.3'		3.3'	
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/ft <sup>2</sup>	1 gpm/ft <sup>2</sup>	2 gpm/ft <sup>2</sup>	1 gpm/ft <sup>2</sup>	2 gpm/ft <sup>2</sup>	1 gpm/ft <sup>2</sup>
CARTRIDGE FLOW RATE (gpm)	22.5	11.25	15	7.5	15	7.5
PEAK HYDRAULIC CAPACITY	1.0		1.0		1.8	
INLET PERMANENT POOL LEVEL (A)	1'-0"		1'-0"		2'-0"	
OVERALL STRUCTURE HEIGHT (B)	4'-9"		3'-9"		4'-9"	

**GENERAL NOTES**

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STORMFILTER CATCHBASIN STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.ContechES.com](http://www.ContechES.com)
- STORMFILTER CATCHBASIN WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- INLET SHOULD NOT BE LOWER THAN OUTLET. INLET (IF APPLICABLE) AND OUTLET PIPING TO BE SPECIFIED BY ENGINEER AND PROVIDED BY CONTRACTOR.
- STORMFILTER CATCHBASIN EQUIPPED WITH 4 INCH (APPROXIMATE) LONG STUBS FOR INLET (IF APPLICABLE) AND OUTLET PIPING. STANDARD OUTLET STUB IS 8 INCHES IN DIAMETER. MAXIMUM OUTLET STUB IS 15 INCHES IN DIAMETER. CONNECTION TO COLLECTION PIPING CAN BE MADE USING FLEXIBLE COUPLING BY CONTRACTOR.
- STEEL STRUCTURE TO BE MANUFACTURED OF 1/4 INCH STEEL PLATE. CASTINGS SHALL MEET AASHTO M306 LOAD RATING. TO MEET HS20 LOAD RATING ON STRUCTURE, A CONCRETE COLLAR IS REQUIRED. WHEN REQUIRED, CONCRETE COLLAR WITH QUANTITY (2) #4 REINFORCING BARS TO BE PROVIDED BY CONTRACTOR.
- 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 IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).

**INSTALLATION NOTES**

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CATCHBASIN (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

**3-CARTRIDGE CATCHBASIN STORMFILTER DATA**

STRUCTURE ID	XXX
WATER QUALITY FLOW RATE (cfs)	X.XX
PEAK FLOW RATE (<1 cfs)	X.XX
RETURN PERIOD OF PEAK FLOW (yrs)	XXX
CARTRIDGE FLOW RATE (gpm)	XX
MEDIA TYPE (CSF, PERLITE, ZPG, GAC, PHS)	XXXXX
RIM ELEVATION	XXX.XX'

PIPE DATA:	I.E.	DIAMETER
INLET STUB	XXX.XX'	XX"
OUTLET STUB	XXX.XX'	XX"



SLOPED LID	YES/NO
SOLID COVER	YES/NO

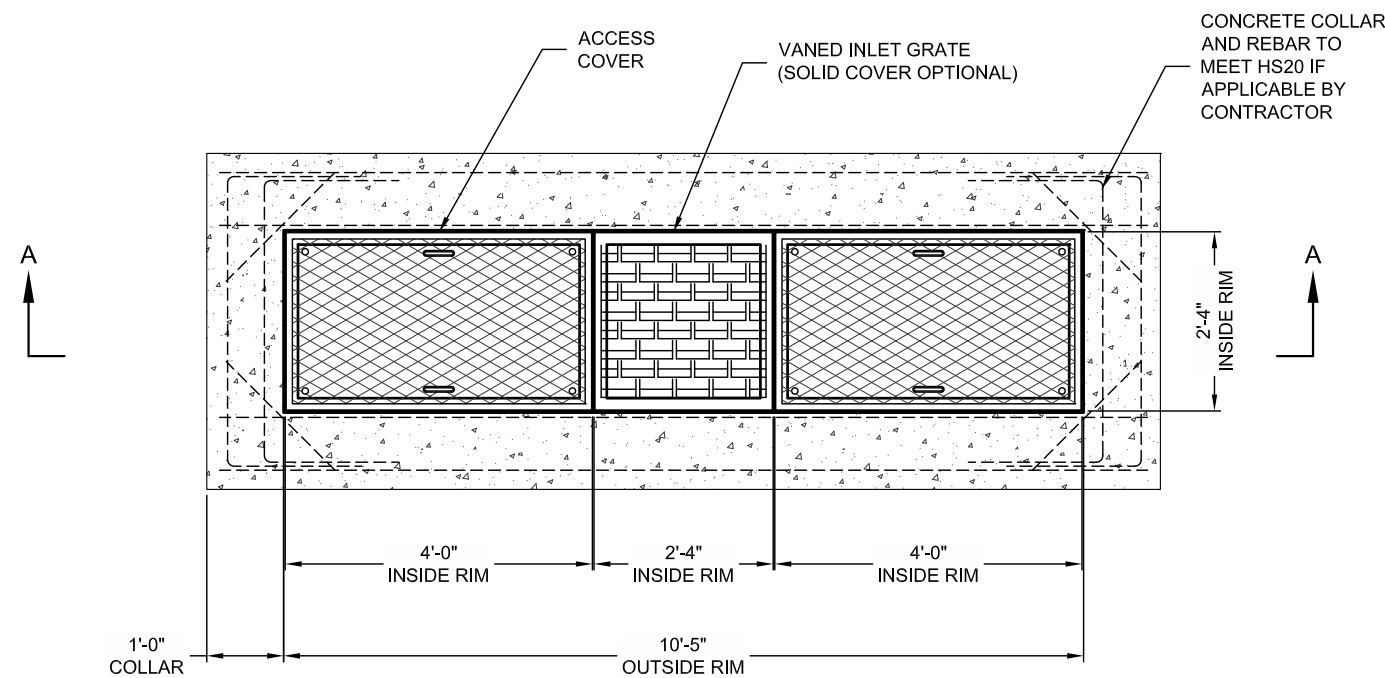
NOTES/SPECIAL REQUIREMENTS:

I:\STORMWATER\COMPMOPS10 STORMFILTER\TER40 STANDARD DRAWINGS\CATCH BASIN SF\FCB-S\DWG\FCB-DTL.DWG 10/21/2014 8:43 AM

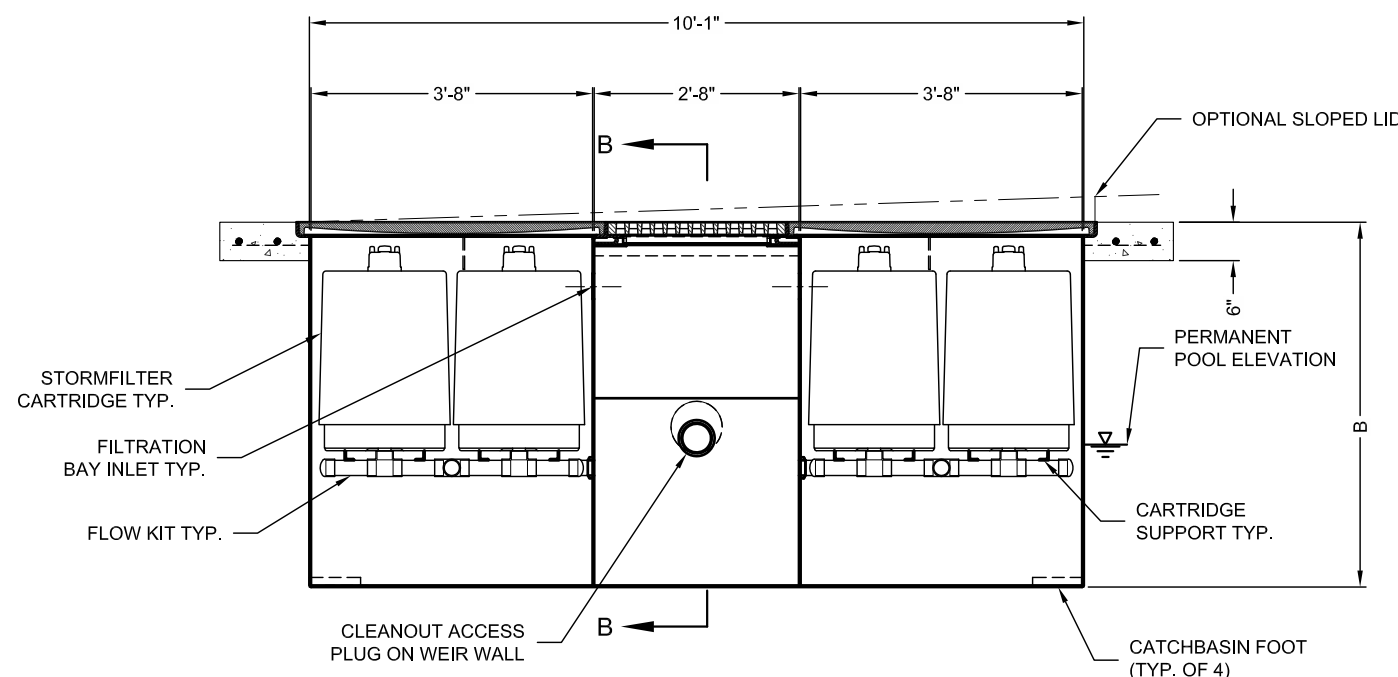


[www.ContechES.com](http://www.ContechES.com)  
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069  
800-338-1122 513-645-7000 513-645-7993 FAX

**3 CARTRIDGE CATCHBASIN STORMFILTER STANDARD DETAIL**



**PLAN VIEW**  
27" CARTRIDGES



**SECTION A-A**

STORMFILTER STEEL CATCHBASIN DESIGN NOTES									
STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. 4 CARTRIDGE CATCHBASIN HAS A MAXIMUM OF FOUR CARTRIDGES. SYSTEM IS SHOWN WITH A 27" CARTRIDGE, AND IS ALSO AVAILABLE WITH AN 18" CARTRIDGE. STORMFILTER CATCHBASIN CONFIGURATIONS ARE AVAILABLE WITH A DRY INLET BAY FOR VECTOR CONTROL. PEAK HYDRAULIC CAPACITY PER TABLE BELOW. IF THE SITE CONDITIONS EXCEED PEAK HYDRAULIC CAPACITY, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.									
CARTRIDGE SELECTION									
CARTRIDGE HEIGHT	27"			18"			18" DEEP		
RECOMMENDED HYDRAULIC DROP (H)	3.05'			2.3'			3.3'		
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf	2 gpm/sf	1.67* gpm/sf	1 gpm/sf
CARTRIDGE FLOW RATE (gpm)	22.5	18.79	11.25	15	12.53	7.5	15	12.53	7.5
PEAK HYDRAULIC CAPACITY	1.0			1.0			1.8		
INLET PERMANENT POOL LEVEL (A)	1'-0"			1'-0"			2'-0"		
OVERALL STRUCTURE HEIGHT (B)	4'-9"			3'-9"			4'-9"		

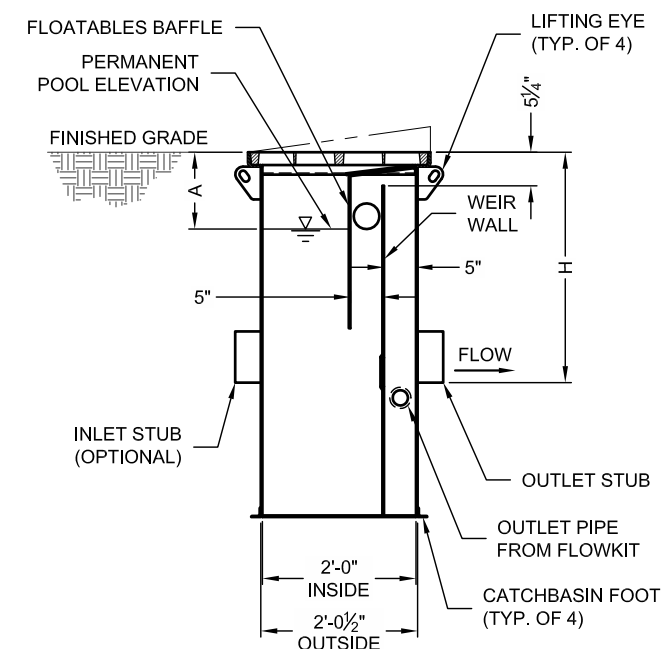
\* 1.67 gpm/sf SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY

**GENERAL NOTES**

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STORMFILTER CATCHBASIN STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.contechES.com](http://www.contechES.com)
- STORMFILTER CATCHBASIN WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- INLET SHOULD NOT BE LOWER THAN OUTLET. INLET (IF APPLICABLE) AND OUTLET PIPING TO BE SPECIFIED BY ENGINEER AND PROVIDED BY CONTRACTOR.
- MANUFACTURER TO APPLY A SURFACE BEAD WELD IN THE SHAPE OF THE LETTER "O" ABOVE THE OUTLET PIPE STUB ON THE EXTERIOR SURFACE OF THE STEEL SFCB.
- STORMFILTER CATCHBASIN EQUIPPED WITH 4 INCH (APPROXIMATE) LONG STUBS FOR INLET (IF APPLICABLE) AND OUTLET PIPING. STANDARD OUTLET STUB IS 8 INCHES IN DIAMETER. MAXIMUM OUTLET STUB IS 15 INCHES IN DIAMETER. CONNECTION TO COLLECTION PIPING CAN BE MADE USING FLEXIBLE COUPLING BY CONTRACTOR.
- STEEL STRUCTURE TO BE MANUFACTURED OF 1/4 INCH STEEL PLATE. CASTINGS SHALL MEET AASHTO M306 LOAD RATING. TO MEET HS20 LOAD RATING ON STRUCTURE, A CONCRETE COLLAR IS REQUIRED. WHEN REQUIRED, CONCRETE COLLAR WITH #4 REINFORCING BARS TO BE PROVIDED BY CONTRACTOR.
- 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 38 SECONDS.
- SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).

**INSTALLATION NOTES**

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CATCHBASIN (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.



**SECTION C-C**

**4-CARTRIDGE CATCHBASIN  
STORMFILTER DATA**

STRUCTURE ID	
WATER QUALITY FLOW RATE (cfs)	
PEAK FLOW RATE (<1 cfs)	
RETURN PERIOD OF PEAK FLOW (yrs)	
CARTRIDGE FLOW RATE (gpm)	
MEDIA TYPE (PERLITE, ZPG, PSORB)	
RIM ELEVATION	
PIPE DATA:	I.E. DIAMETER
INLET STUB	
OUTLET STUB	
CONFIGURATION	
SLOPED LID	YES/NO
SOLID COVER	YES/NO
NOTES/SPECIAL REQUIREMENTS:	
*PER ENGINEER OF RECORD	

I:\COMMON\CAD\TREATMENT\10 STORMFILTER\10 STANDARD DRAWINGS\FCB\FCB-S\DWG\FCB-DTL.DWG 7/18/2016 2:51 PM



**CONTECH**  
ENGINEERED SOLUTIONS LLC

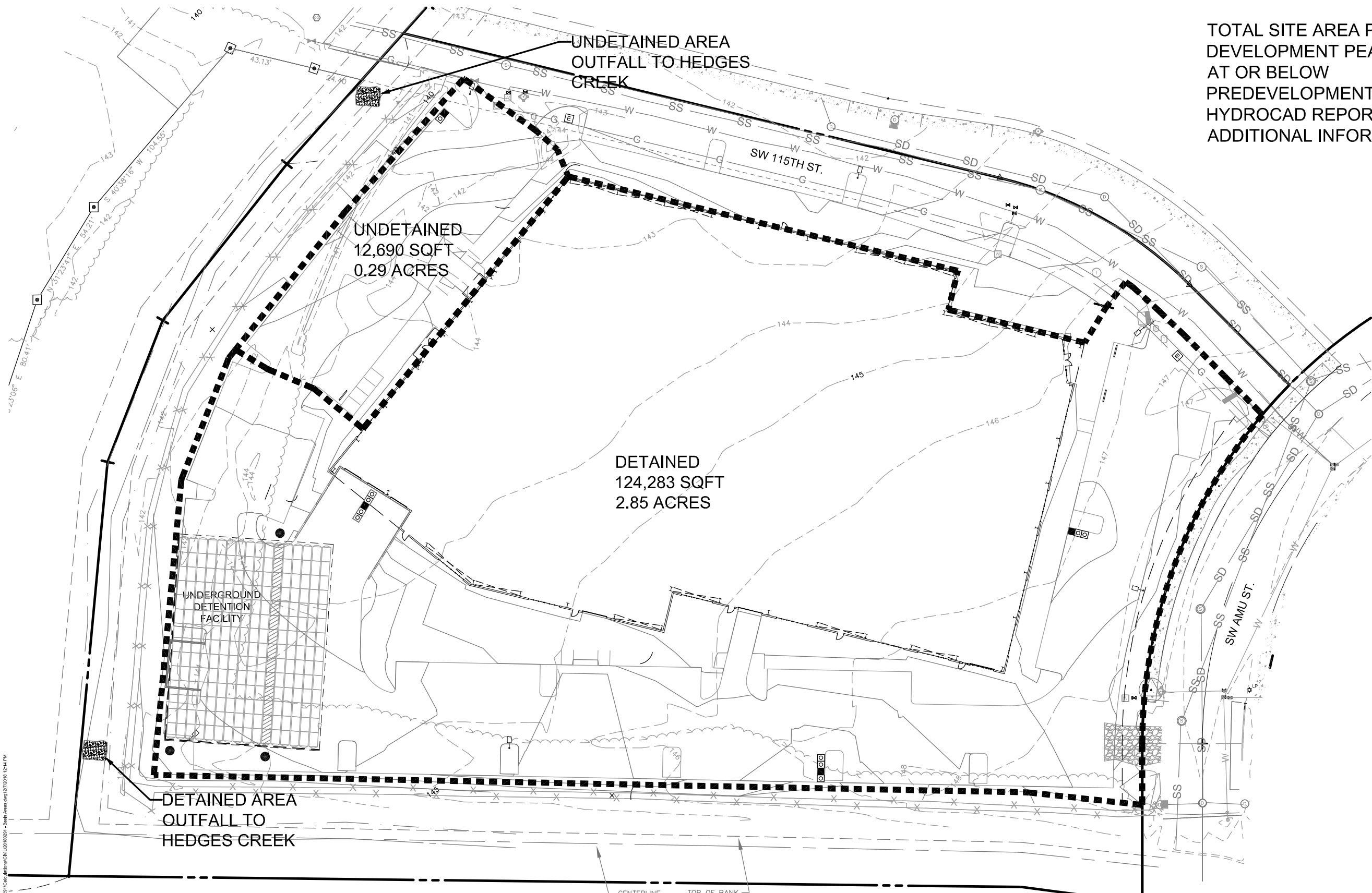
[www.contechES.com](http://www.contechES.com)  
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069  
800-526-3999 513-645-7000 513-645-7993 FAX

4 CARTRIDGE CATCHBASIN  
STORMFILTER  
STANDARD DETAIL

# APPENDIX F

---

## WATER QUANTITY



TOTAL SITE AREA POST DEVELOPMENT PEAK RATES ARE AT OR BELOW PREDEVELOPMENT RATES, SEE HYDROCAD REPORT FOR ADDITIONAL INFORMATION

DETAINED AREA  
OUTFALL TO  
HEDGES CREEK

UNDETAINED AREA  
OUTFALL TO HEDGES  
CREEK

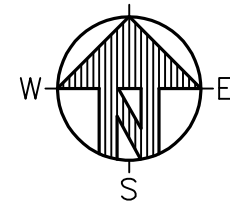
UNDETAINED  
12,690 SQFT  
0.29 ACRES

DETAINED  
124,283 SQFT  
2.85 ACRES

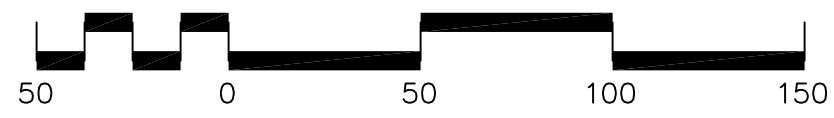
UNDERGROUND  
DETENTION  
FACILITY

CENTERLINE  
OF CREEK

TOP OF BANK



WATER QUANTITY BASIN AREAS 1" = 50'



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3933 SW Kelly Avenue  
Portland, Oregon 97239  
503.222.4453  
VLMK.COM

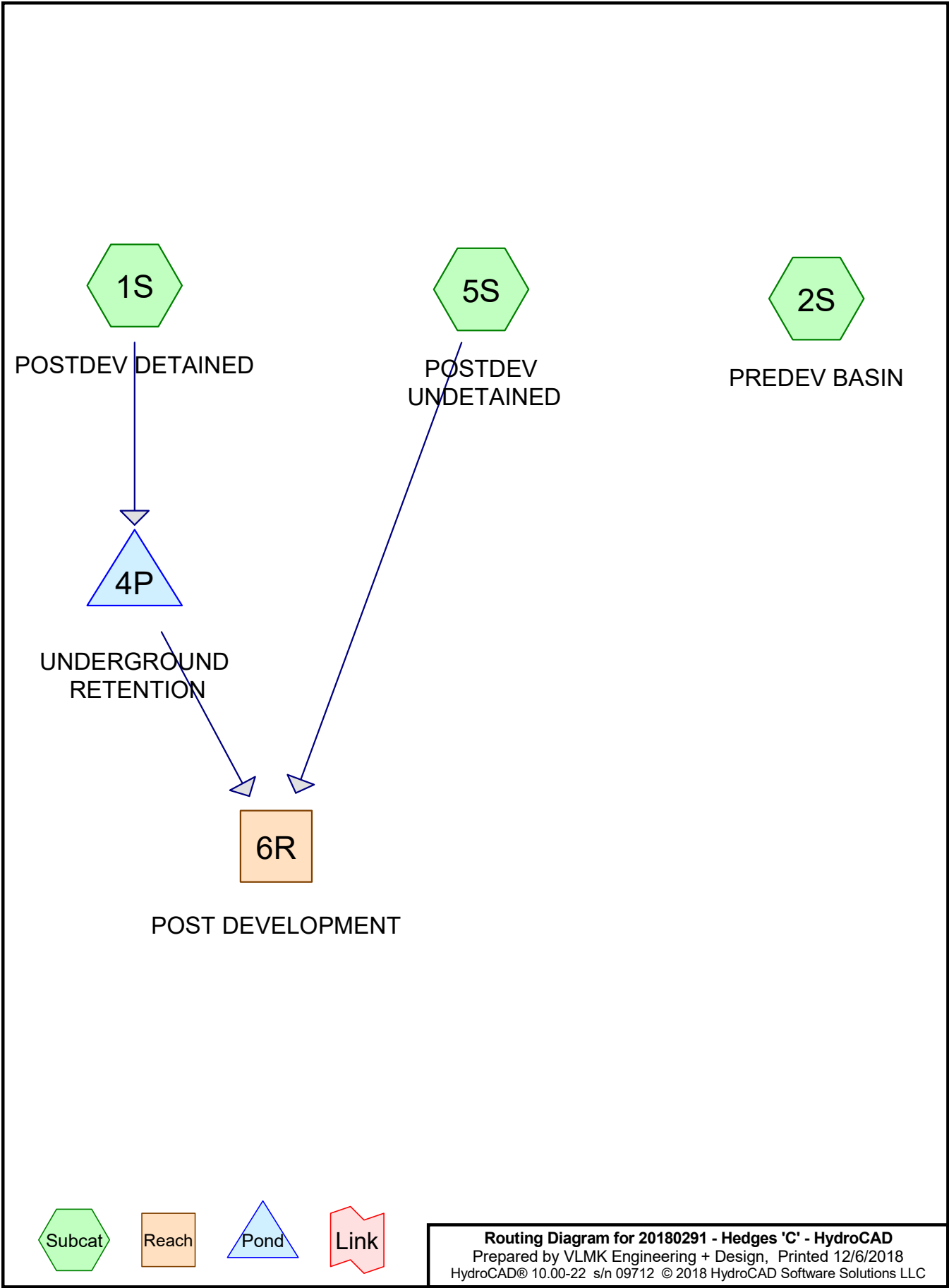
**VLMK**  
ENGINEERING + DESIGN

HEDGES 'C'  
SW 115TH ST AND SW AMU ST  
TUALATIN, OR  
**WATER QUANTITY BASIN AREAS**

DATE: JULY, 2018  
SCALE: AS NOTED  
PROJ. NO.: 20180291  
DRAWN: BRG  
CHECKED: BMD



F1





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Hedges 'C'  
Type IA 24-hr 2-Year Rainfall=2.50"

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Page 2

**Summary for Subcatchment 1S: POSTDEV DETAINED**

Runoff = 1.64 cfs @ 7.90 hrs, Volume= 0.540 af, Depth= 2.27"

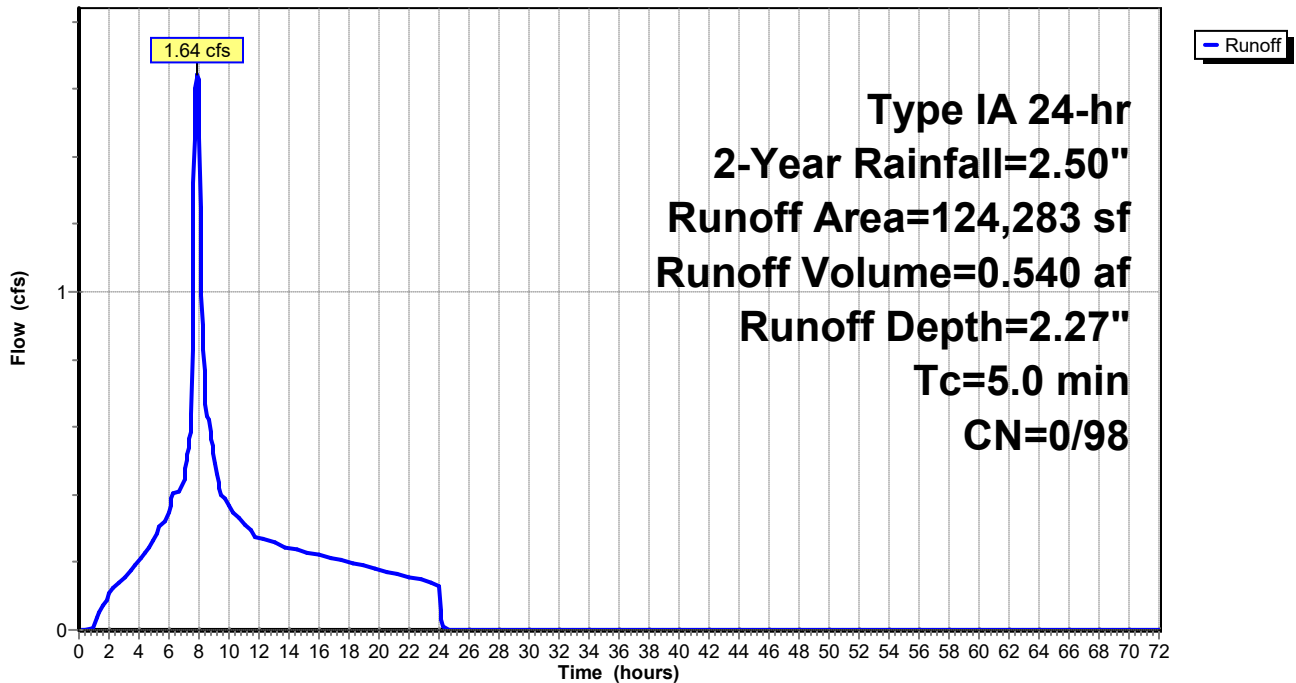
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 2-Year Rainfall=2.50"

Area (sf)	CN	Description
124,283	98	Paved parking, HSG C
124,283	98	100.00% Impervious Area

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

**Subcatchment 1S: POSTDEV DETAINED**

Hydrograph



**20180291 - Hedges 'C' - HydroCAD**

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Hedges 'C'  
Type IA 24-hr 2-Year Rainfall=2.50"

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Page 3

**Summary for Subcatchment 2S: PREDEV BASIN**

Runoff = 0.25 cfs @ 8.24 hrs, Volume= 0.194 af, Depth= 0.74"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 2-Year Rainfall=2.50"

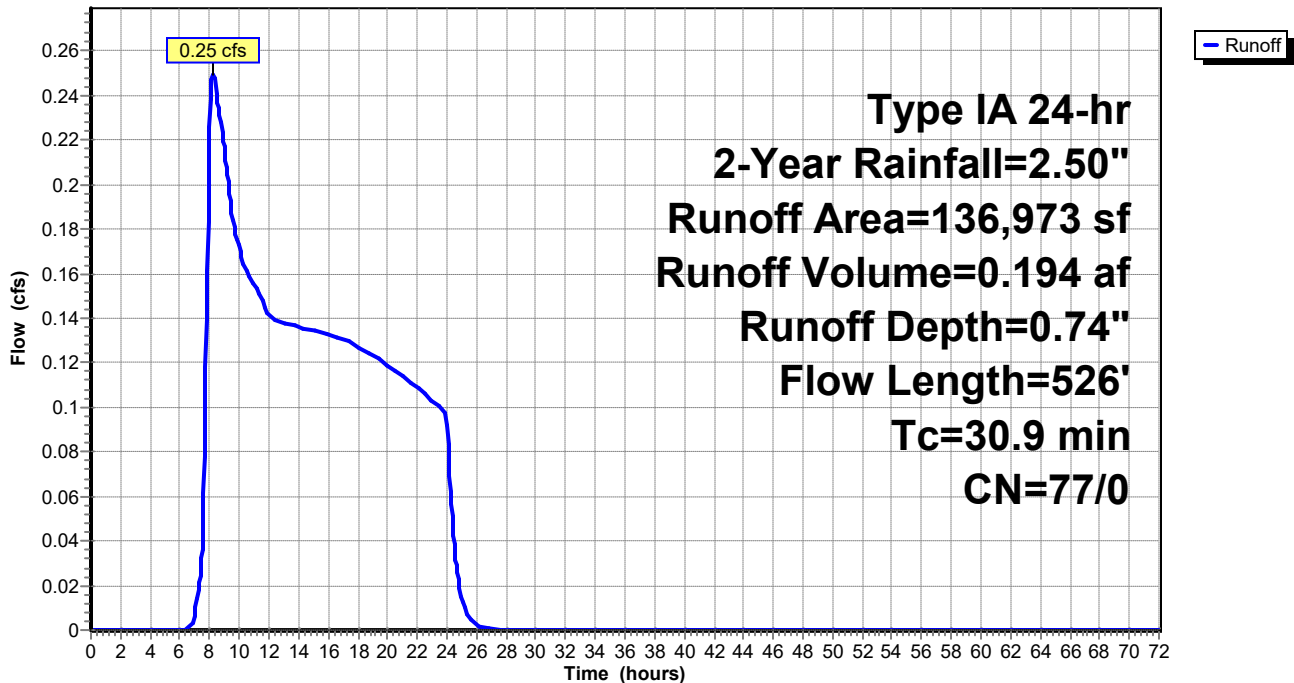
Area (sf)	CN	Description
* 136,973	77	See appendix for composite CN
136,973	77	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.3	300	0.0173	0.18		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.50"
2.6	226	0.0080	1.44		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
30.9	526	Total			

**Subcatchment 2S: PREDEV BASIN**

Hydrograph



**20180291 - Hedges 'C' - HydroCAD**

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Hedges 'C'  
Type IA 24-hr 2-Year Rainfall=2.50"

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Page 4

**Summary for Subcatchment 5S: POSTDEV UNDETAINED**

Runoff = 0.12 cfs @ 8.04 hrs, Volume= 0.055 af, Depth= 2.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 2-Year Rainfall=2.50"

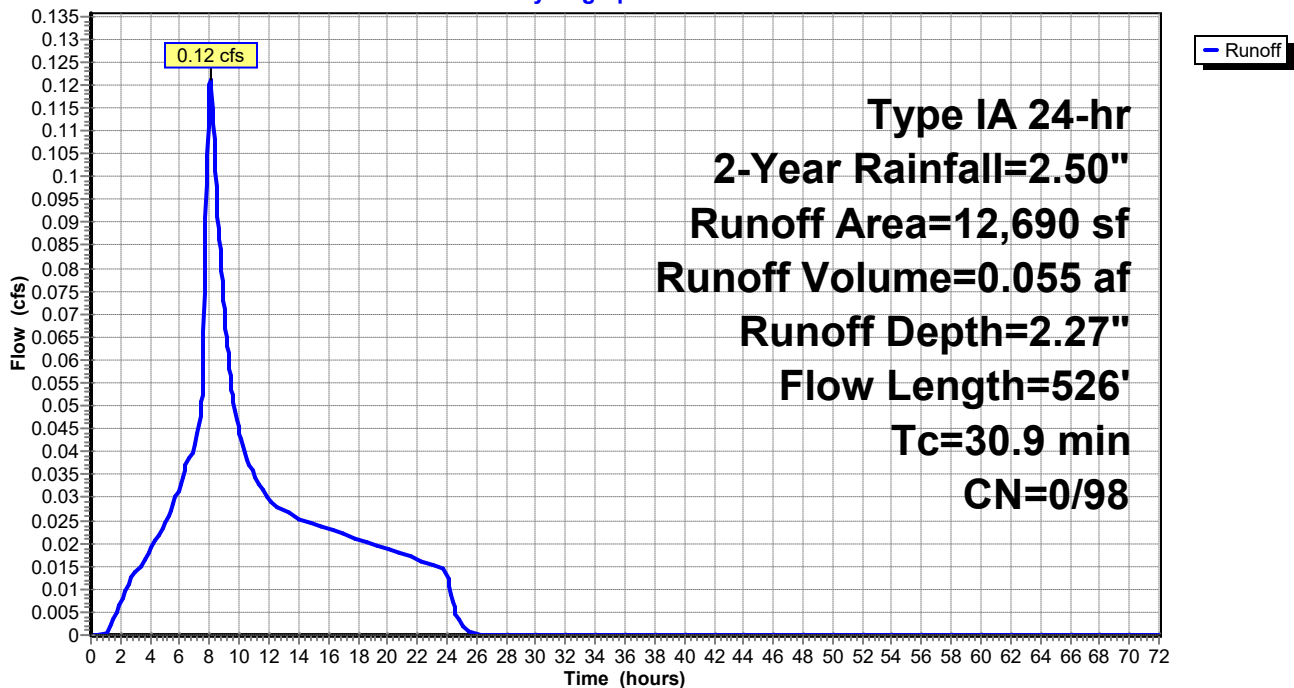
Area (sf)	CN	Description
12,690	98	Paved parking, HSG C
12,690	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.3	300	0.0173	0.18		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.50"
2.6	226	0.0080	1.44		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
30.9	526	Total			

**Subcatchment 5S: POSTDEV UNDETAINED**

Hydrograph



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Hedges 'C'  
Type IA 24-hr 2-Year Rainfall=2.50"

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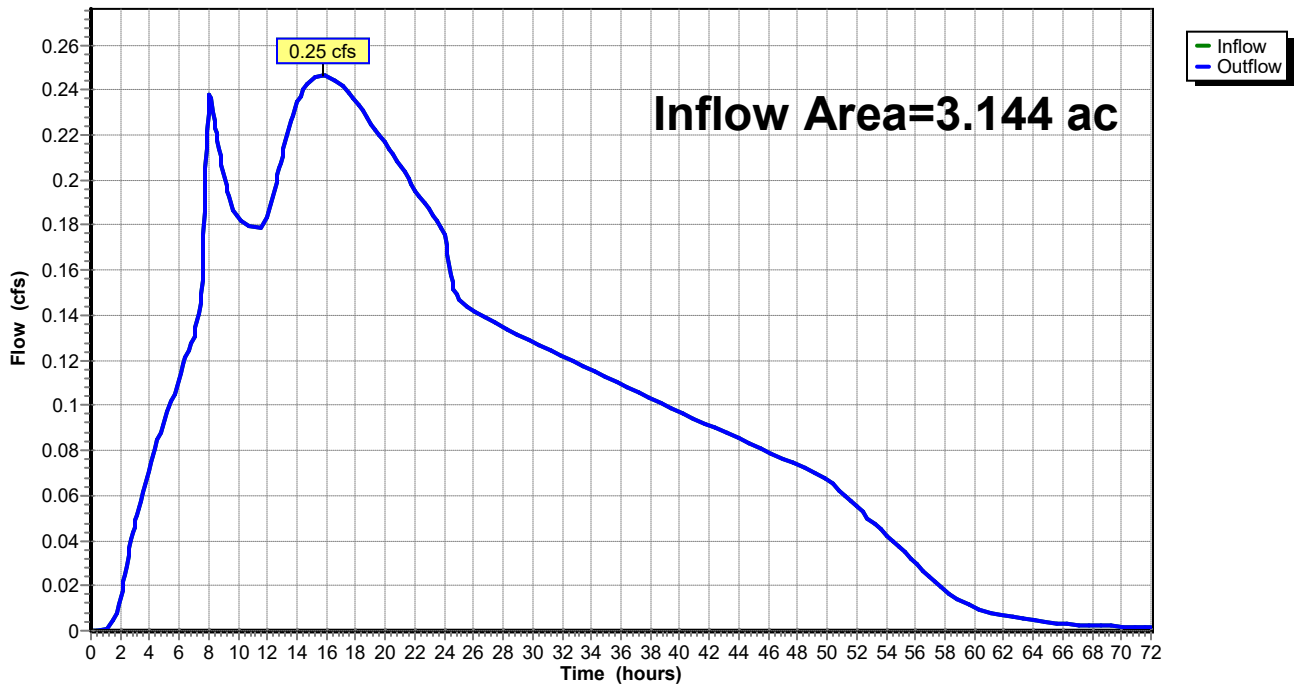
**Summary for Reach 6R: POST DEVELOPMENT**

Inflow Area = 3.144 ac, 100.00% Impervious, Inflow Depth > 2.26" for 2-Year event  
Inflow = 0.25 cfs @ 15.70 hrs, Volume= 0.593 af  
Outflow = 0.25 cfs @ 15.70 hrs, Volume= 0.593 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Reach 6R: POST DEVELOPMENT**

Hydrograph



**20180291 - Hedges 'C' - HydroCAD**

Type IA 24-hr 2-Year Rainfall=2.50"

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Page 6

**Summary for Pond 4P: UNDERGROUND RETENTION**

Inflow Area = 2.853 ac, 100.00% Impervious, Inflow Depth = 2.27" for 2-Year event  
 Inflow = 1.64 cfs @ 7.90 hrs, Volume= 0.540 af  
 Outflow = 0.22 cfs @ 15.88 hrs, Volume= 0.538 af, Atten= 86%, Lag= 479.1 min  
 Primary = 0.22 cfs @ 15.88 hrs, Volume= 0.538 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 139.66' @ 15.88 hrs Surf.Area= 0.184 ac Storage= 0.277 af

Plug-Flow detention time= 907.8 min calculated for 0.538 af (100% of inflow)  
 Center-of-Mass det. time= 905.0 min ( 1,578.8 - 673.8 )

Volume	Invert	Avail.Storage	Storage Description
#1A	137.50'	0.163 af	<b>77.50'W x 103.30'L x 3.50'H Field A</b> 0.643 af Overall - 0.236 af Embedded = 0.407 af x 40.0% Voids
#2A	138.00'	0.236 af	<b>ADS_StormTech SC-740 +Cap</b> x 224 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 16 Rows of 14 Chambers
		0.399 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	140.30'	<b>4.0' long Weir</b> 2 End Contraction(s)
#2	Primary	139.50'	<b>5.5" Vert. Orifice/Grate</b> C= 0.600
#3	Primary	137.50'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.22 cfs @ 15.88 hrs HW=139.66' (Free Discharge)

- 1=Weir ( Controls 0.00 cfs)
- 2=Orifice/Grate (Orifice Controls 0.07 cfs @ 1.37 fps)
- 3=Orifice/Grate (Orifice Controls 0.15 cfs @ 6.94 fps)

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Hedges 'C'  
Type IA 24-hr 2-Year Rainfall=2.50"

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**Pond 4P: UNDERGROUND RETENTION - Chamber Wizard Field A**

**Chamber Model = ADS\_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

14 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 101.30' Row Length +12.0" End Stone x 2 = 103.30' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

224 Chambers x 45.9 cf = 10,290.6 cf Chamber Storage

28,019.2 cf Field - 10,290.6 cf Chambers = 17,728.7 cf Stone x 40.0% Voids = 7,091.5 cf Stone Storage

Chamber Storage + Stone Storage = 17,382.0 cf = 0.399 af

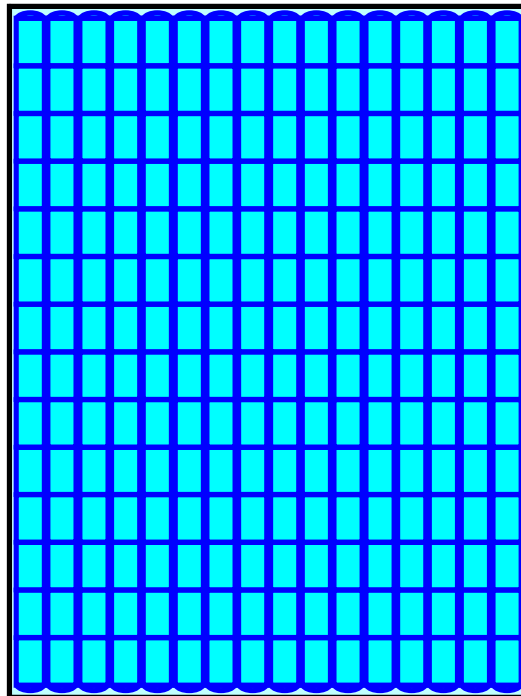
Overall Storage Efficiency = 62.0%

Overall System Size = 103.30' x 77.50' x 3.50'

224 Chambers

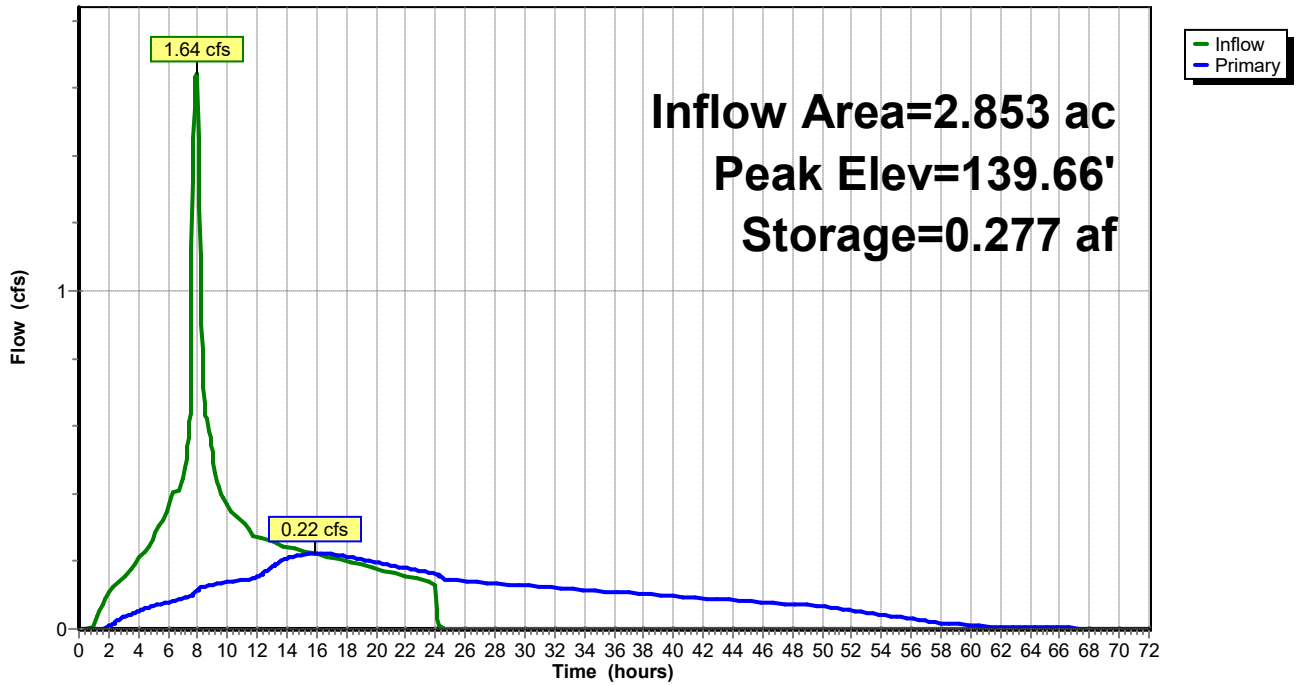
1,037.7 cy Field

656.6 cy Stone



### Pond 4P: UNDERGROUND RETENTION

Hydrograph



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Type IA 24-hr 2-Year Rainfall=2.50"

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**Stage-Discharge for Pond 4P: UNDERGROUND RETENTION**

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
137.50	0.00	138.52	0.10	139.54	0.15	140.56	2.62
137.52	0.00	138.54	0.10	139.56	0.16	140.58	2.83
137.54	0.00	138.56	0.10	139.58	0.17	140.60	3.04
137.56	0.01	138.58	0.10	139.60	0.18	140.62	3.26
137.58	0.01	138.60	0.11	139.62	0.19	140.64	3.49
137.60	0.01	138.62	0.11	139.64	0.21	140.66	3.73
137.62	0.02	138.64	0.11	139.66	0.22	140.68	3.97
137.64	0.02	138.66	0.11	139.68	0.24	140.70	4.21
137.66	0.03	138.68	0.11	139.70	0.26	140.72	4.46
137.68	0.03	138.70	0.11	139.72	0.28	140.74	4.72
137.70	0.04	138.72	0.11	139.74	0.30	140.76	4.98
137.72	0.04	138.74	0.11	139.76	0.32	140.78	5.25
137.74	0.04	138.76	0.11	139.78	0.35	140.80	5.52
137.76	0.04	138.78	0.11	139.80	0.37	140.82	5.80
137.78	0.05	138.80	0.12	139.82	0.39	140.84	6.08
137.80	0.05	138.82	0.12	139.84	0.42	140.86	6.36
137.82	0.05	138.84	0.12	139.86	0.44	140.88	6.65
137.84	0.05	138.86	0.12	139.88	0.47	140.90	6.95
137.86	0.06	138.88	0.12	139.90	0.49	140.92	7.25
137.88	0.06	138.90	0.12	139.92	0.51	140.94	7.55
137.90	0.06	138.92	0.12	139.94	0.53	140.96	7.86
137.92	0.06	138.94	0.12	139.96	0.54	140.98	8.17
137.94	0.06	138.96	0.12	139.98	0.56	141.00	<b>8.48</b>
137.96	0.06	138.98	0.12	140.00	0.58		
137.98	0.07	139.00	0.13	140.02	0.59		
138.00	0.07	139.02	0.13	140.04	0.61		
138.02	0.07	139.04	0.13	140.06	0.62		
138.04	0.07	139.06	0.13	140.08	0.64		
138.06	0.07	139.08	0.13	140.10	0.65		
138.08	0.07	139.10	0.13	140.12	0.66		
138.10	0.08	139.12	0.13	140.14	0.68		
138.12	0.08	139.14	0.13	140.16	0.69		
138.14	0.08	139.16	0.13	140.18	0.70		
138.16	0.08	139.18	0.13	140.20	0.72		
138.18	0.08	139.20	0.13	140.22	0.73		
138.20	0.08	139.22	0.13	140.24	0.74		
138.22	0.08	139.24	0.14	140.26	0.75		
138.24	0.09	139.26	0.14	140.28	0.76		
138.26	0.09	139.28	0.14	140.30	0.77		
138.28	0.09	139.30	0.14	140.32	0.82		
138.30	0.09	139.32	0.14	140.34	0.90		
138.32	0.09	139.34	0.14	140.36	1.00		
138.34	0.09	139.36	0.14	140.38	1.11		
138.36	0.09	139.38	0.14	140.40	1.24		
138.38	0.09	139.40	0.14	140.42	1.38		
138.40	0.09	139.42	0.14	140.44	1.53		
138.42	0.10	139.44	0.14	140.46	1.69		
138.44	0.10	139.46	0.14	140.48	1.86		
138.46	0.10	139.48	0.14	140.50	2.04		
138.48	0.10	139.50	0.15	140.52	2.22		
138.50	0.10	139.52	0.15	140.54	2.42		



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Hedges 'C'  
Type IA 24-hr 10-Year Rainfall=3.45"

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**Summary for Subcatchment 1S: POSTDEV DETAINED**

Runoff = 2.30 cfs @ 7.90 hrs, Volume= 0.765 af, Depth= 3.22"

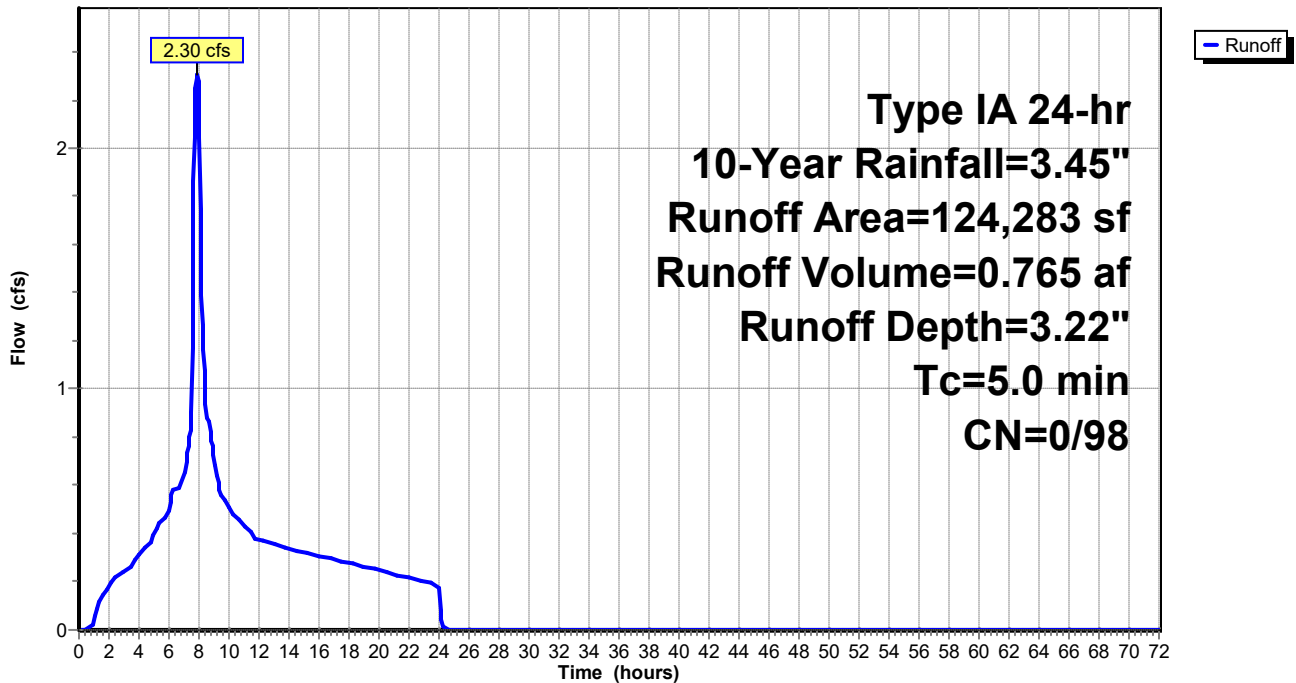
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 10-Year Rainfall=3.45"

Area (sf)	CN	Description
124,283	98	Paved parking, HSG C
124,283	98	100.00% Impervious Area

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

**Subcatchment 1S: POSTDEV DETAINED**

Hydrograph



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Hedges 'C'  
Type IA 24-hr 10-Year Rainfall=3.45"

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**Summary for Subcatchment 2S: PREDEV BASIN**

Runoff = 0.61 cfs @ 8.12 hrs, Volume= 0.365 af, Depth= 1.39"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 10-Year Rainfall=3.45"

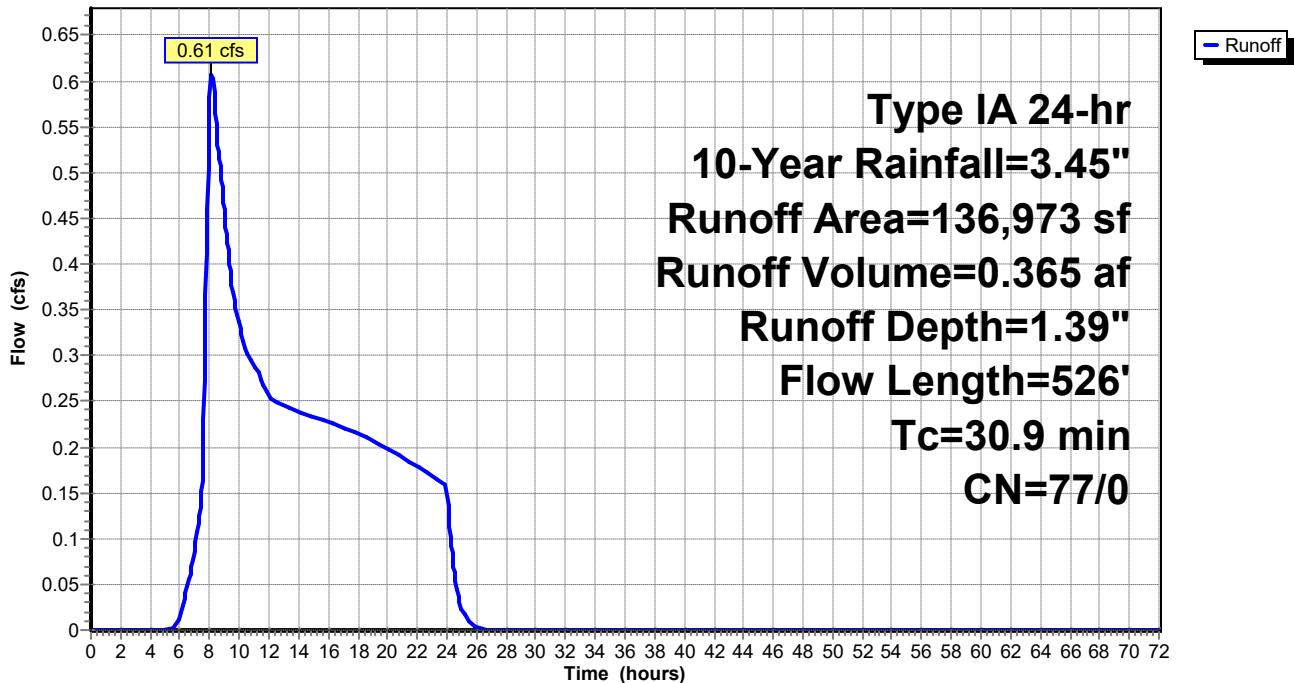
Area (sf)	CN	Description
* 136,973	77	See appendix for composite CN
136,973	77	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.3	300	0.0173	0.18		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.50"
2.6	226	0.0080	1.44		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
30.9	526	Total			

**Subcatchment 2S: PREDEV BASIN**

Hydrograph



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Hedges 'C'  
Type IA 24-hr 10-Year Rainfall=3.45"

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**Summary for Subcatchment 5S: POSTDEV UNDETAINED**

Runoff = 0.17 cfs @ 8.04 hrs, Volume= 0.078 af, Depth= 3.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 10-Year Rainfall=3.45"

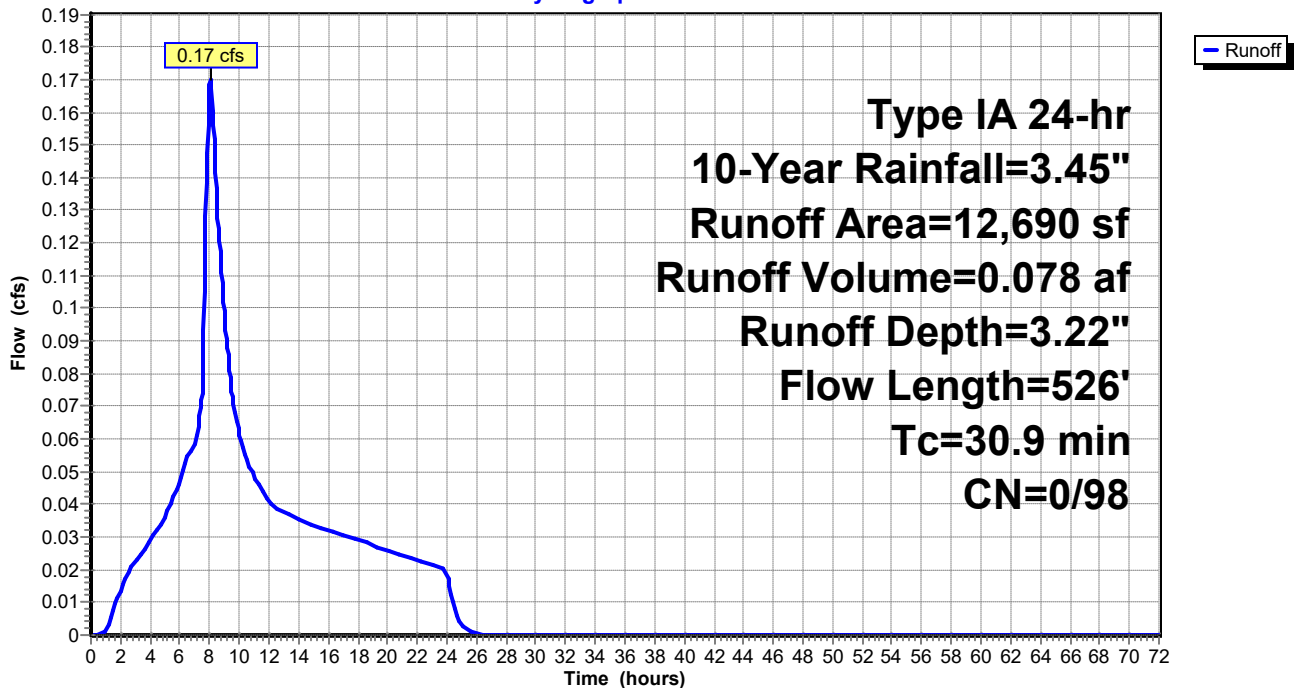
Area (sf)	CN	Description
12,690	98	Paved parking, HSG C
12,690	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.3	300	0.0173	0.18		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.50"
2.6	226	0.0080	1.44		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
30.9	526	Total			

**Subcatchment 5S: POSTDEV UNDETAINED**

Hydrograph



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Hedges 'C'  
Type IA 24-hr 10-Year Rainfall=3.45"

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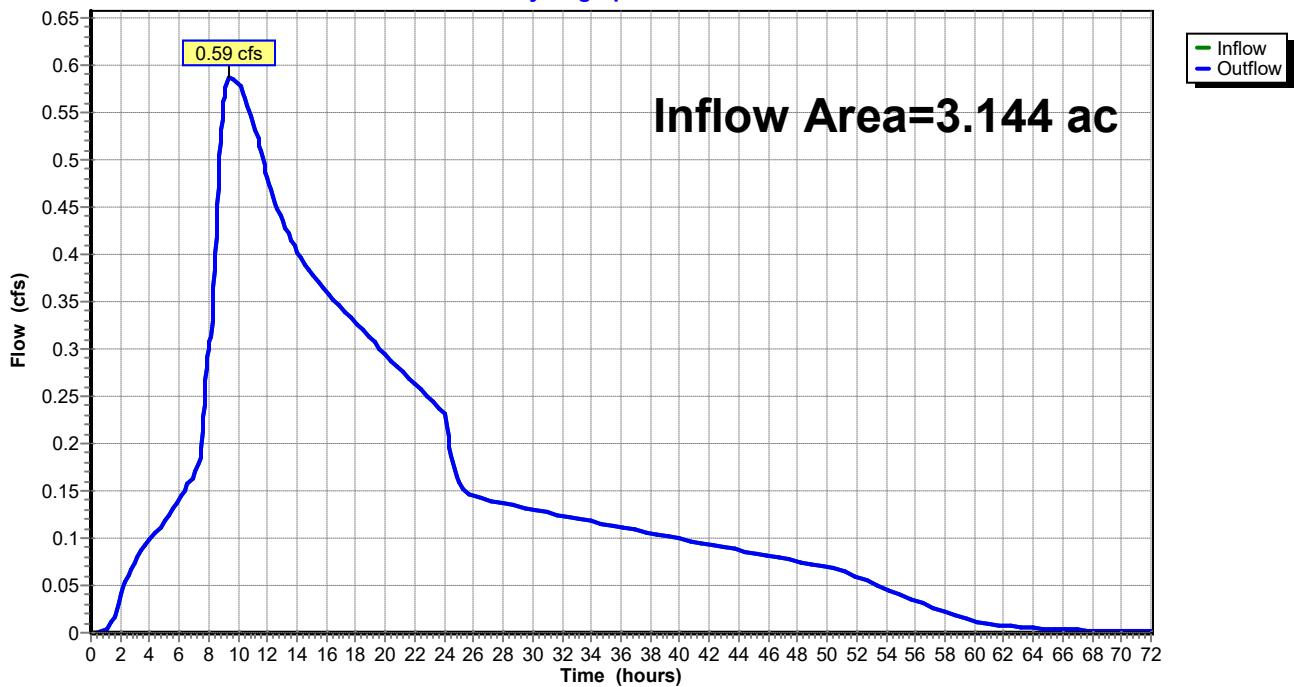
**Summary for Reach 6R: POST DEVELOPMENT**

Inflow Area = 3.144 ac, 100.00% Impervious, Inflow Depth > 3.21" for 10-Year event  
Inflow = 0.59 cfs @ 9.42 hrs, Volume= 0.841 af  
Outflow = 0.59 cfs @ 9.42 hrs, Volume= 0.841 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Reach 6R: POST DEVELOPMENT**

Hydrograph



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Hedges 'C'  
Type IA 24-hr 10-Year Rainfall=3.45"

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**Summary for Pond 4P: UNDERGROUND RETENTION**

Inflow Area = 2.853 ac, 100.00% Impervious, Inflow Depth = 3.22" for 10-Year event  
Inflow = 2.30 cfs @ 7.90 hrs, Volume= 0.765 af  
Outflow = 0.52 cfs @ 9.96 hrs, Volume= 0.763 af, Atten= 77%, Lag= 123.7 min  
Primary = 0.52 cfs @ 9.96 hrs, Volume= 0.763 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Peak Elev= 139.93' @ 9.96 hrs Surf.Area= 0.184 ac Storage= 0.309 af

Plug-Flow detention time= 702.3 min calculated for 0.762 af (100% of inflow)  
Center-of-Mass det. time= 701.7 min ( 1,366.1 - 664.4 )

Volume	Invert	Avail.Storage	Storage Description
#1A	137.50'	0.163 af	<b>77.50'W x 103.30'L x 3.50'H Field A</b> 0.643 af Overall - 0.236 af Embedded = 0.407 af x 40.0% Voids
#2A	138.00'	0.236 af	<b>ADS_StormTech SC-740 +Cap</b> x 224 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 16 Rows of 14 Chambers
		0.399 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	140.30'	<b>4.0' long Weir</b> 2 End Contraction(s)
#2	Primary	139.50'	<b>5.5" Vert. Orifice/Grate</b> C= 0.600
#3	Primary	137.50'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.52 cfs @ 9.96 hrs HW=139.93' (Free Discharge)

- 1=Weir ( Controls 0.00 cfs)
- 2=Orifice/Grate (Orifice Controls 0.36 cfs @ 2.23 fps)
- 3=Orifice/Grate (Orifice Controls 0.16 cfs @ 7.38 fps)

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Hedges 'C'  
Type IA 24-hr 10-Year Rainfall=3.45"

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**Pond 4P: UNDERGROUND RETENTION - Chamber Wizard Field A**

**Chamber Model = ADS\_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

14 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 101.30' Row Length +12.0" End Stone x 2 = 103.30' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

224 Chambers x 45.9 cf = 10,290.6 cf Chamber Storage

28,019.2 cf Field - 10,290.6 cf Chambers = 17,728.7 cf Stone x 40.0% Voids = 7,091.5 cf Stone Storage

Chamber Storage + Stone Storage = 17,382.0 cf = 0.399 af

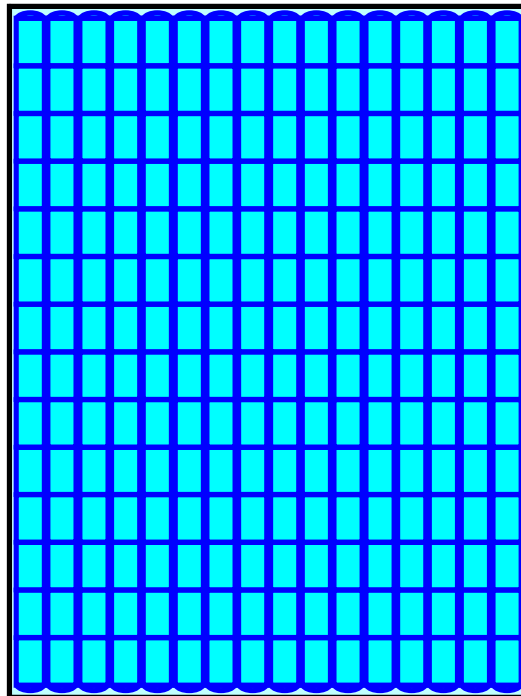
Overall Storage Efficiency = 62.0%

Overall System Size = 103.30' x 77.50' x 3.50'

224 Chambers

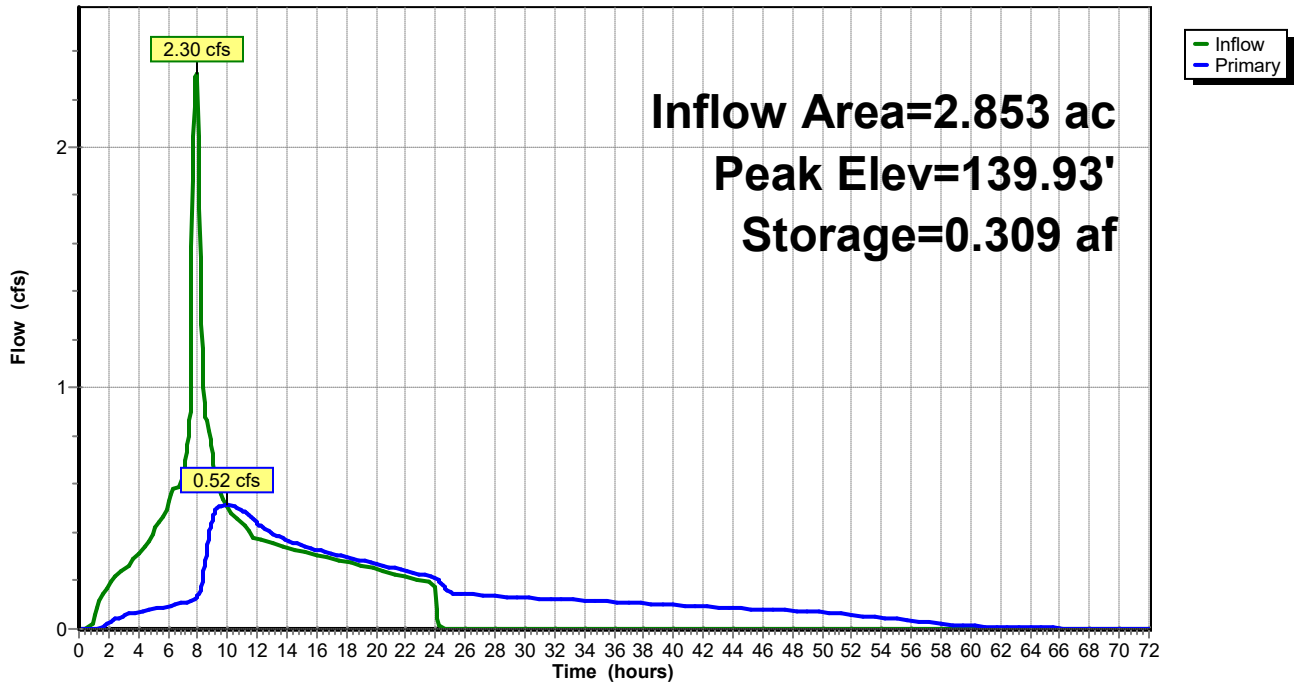
1,037.7 cy Field

656.6 cy Stone



### Pond 4P: UNDERGROUND RETENTION

Hydrograph



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Hedges 'C'  
Type IA 24-hr 10-Year Rainfall=3.45"

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**Stage-Discharge for Pond 4P: UNDERGROUND RETENTION**

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
137.50	0.00	138.52	0.10	139.54	0.15	140.56	2.62
137.52	0.00	138.54	0.10	139.56	0.16	140.58	2.83
137.54	0.00	138.56	0.10	139.58	0.17	140.60	3.04
137.56	0.01	138.58	0.10	139.60	0.18	140.62	3.26
137.58	0.01	138.60	0.11	139.62	0.19	140.64	3.49
137.60	0.01	138.62	0.11	139.64	0.21	140.66	3.73
137.62	0.02	138.64	0.11	139.66	0.22	140.68	3.97
137.64	0.02	138.66	0.11	139.68	0.24	140.70	4.21
137.66	0.03	138.68	0.11	139.70	0.26	140.72	4.46
137.68	0.03	138.70	0.11	139.72	0.28	140.74	4.72
137.70	0.04	138.72	0.11	139.74	0.30	140.76	4.98
137.72	0.04	138.74	0.11	139.76	0.32	140.78	5.25
137.74	0.04	138.76	0.11	139.78	0.35	140.80	5.52
137.76	0.04	138.78	0.11	139.80	0.37	140.82	5.80
137.78	0.05	138.80	0.12	139.82	0.39	140.84	6.08
137.80	0.05	138.82	0.12	139.84	0.42	140.86	6.36
137.82	0.05	138.84	0.12	139.86	0.44	140.88	6.65
137.84	0.05	138.86	0.12	139.88	0.47	140.90	6.95
137.86	0.06	138.88	0.12	139.90	0.49	140.92	7.25
137.88	0.06	138.90	0.12	139.92	0.51	140.94	7.55
137.90	0.06	138.92	0.12	139.94	0.53	140.96	7.86
137.92	0.06	138.94	0.12	139.96	0.54	140.98	8.17
137.94	0.06	138.96	0.12	139.98	0.56	141.00	<b>8.48</b>
137.96	0.06	138.98	0.12	140.00	0.58		
137.98	0.07	139.00	0.13	140.02	0.59		
138.00	0.07	139.02	0.13	140.04	0.61		
138.02	0.07	139.04	0.13	140.06	0.62		
138.04	0.07	139.06	0.13	140.08	0.64		
138.06	0.07	139.08	0.13	140.10	0.65		
138.08	0.07	139.10	0.13	140.12	0.66		
138.10	0.08	139.12	0.13	140.14	0.68		
138.12	0.08	139.14	0.13	140.16	0.69		
138.14	0.08	139.16	0.13	140.18	0.70		
138.16	0.08	139.18	0.13	140.20	0.72		
138.18	0.08	139.20	0.13	140.22	0.73		
138.20	0.08	139.22	0.13	140.24	0.74		
138.22	0.08	139.24	0.14	140.26	0.75		
138.24	0.09	139.26	0.14	140.28	0.76		
138.26	0.09	139.28	0.14	140.30	0.77		
138.28	0.09	139.30	0.14	140.32	0.82		
138.30	0.09	139.32	0.14	140.34	0.90		
138.32	0.09	139.34	0.14	140.36	1.00		
138.34	0.09	139.36	0.14	140.38	1.11		
138.36	0.09	139.38	0.14	140.40	1.24		
138.38	0.09	139.40	0.14	140.42	1.38		
138.40	0.09	139.42	0.14	140.44	1.53		
138.42	0.10	139.44	0.14	140.46	1.69		
138.44	0.10	139.46	0.14	140.48	1.86		
138.46	0.10	139.48	0.14	140.50	2.04		
138.48	0.10	139.50	0.15	140.52	2.22		
138.50	0.10	139.52	0.15	140.54	2.42		



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Hedges 'C'  
Type IA 24-hr 25-Year Rainfall=3.90"

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**Summary for Subcatchment 1S: POSTDEV DETAINED**

Runoff = 2.61 cfs @ 7.90 hrs, Volume= 0.871 af, Depth= 3.67"

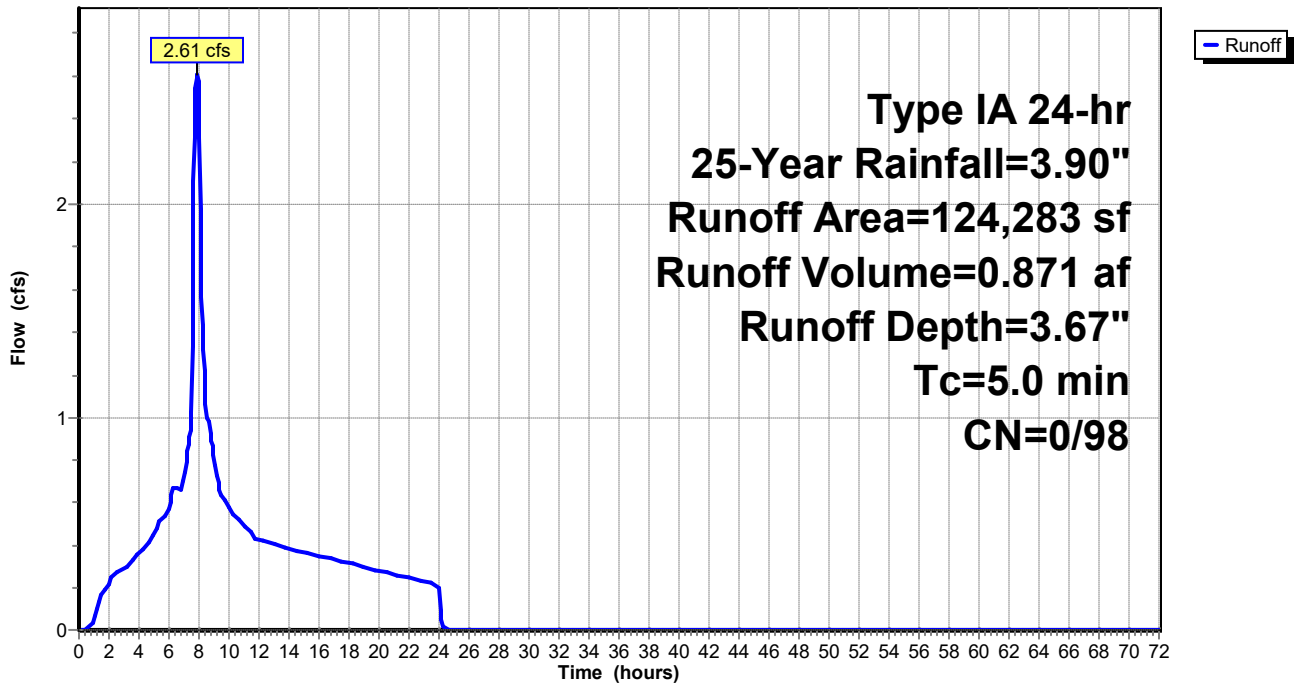
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 25-Year Rainfall=3.90"

Area (sf)	CN	Description
124,283	98	Paved parking, HSG C
124,283	98	100.00% Impervious Area

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

**Subcatchment 1S: POSTDEV DETAINED**

Hydrograph



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Hedges 'C'  
Type IA 24-hr 25-Year Rainfall=3.90"

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**Summary for Subcatchment 2S: PREDEV BASIN**

Runoff = 0.80 cfs @ 8.10 hrs, Volume= 0.454 af, Depth= 1.73"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 25-Year Rainfall=3.90"

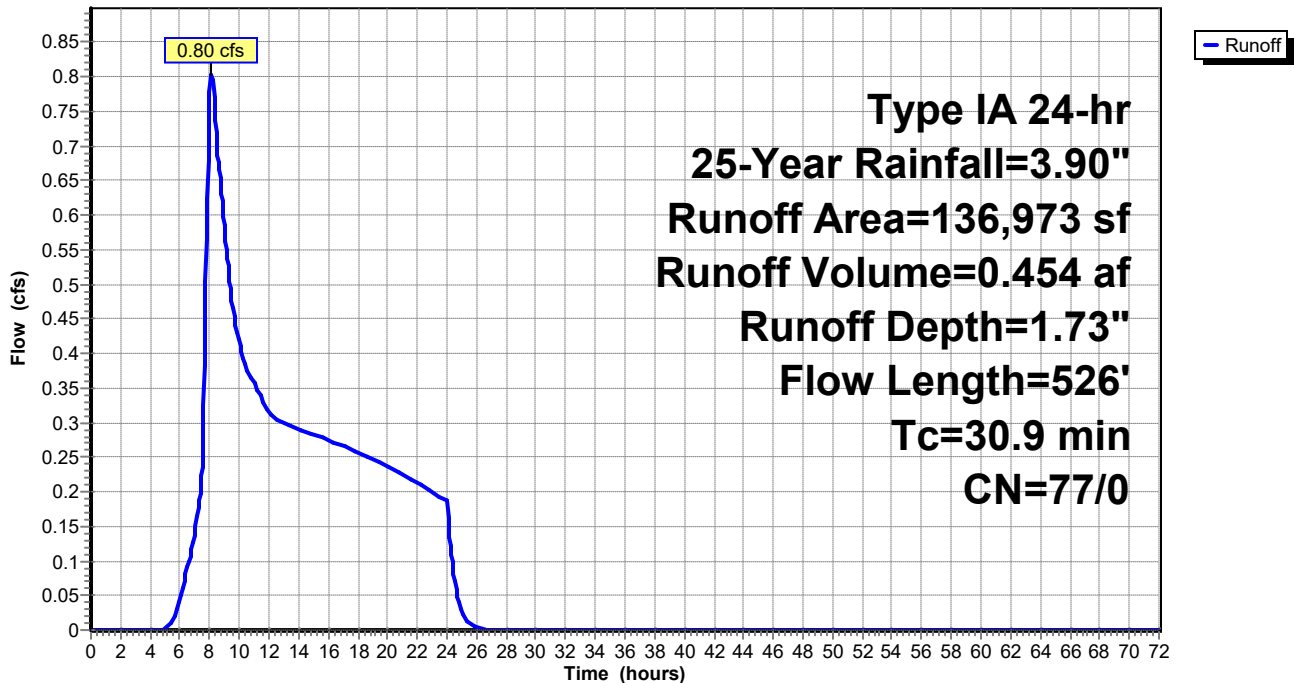
Area (sf)	CN	Description
* 136,973	77	See appendix for composite CN
136,973	77	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.3	300	0.0173	0.18		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.50"
2.6	226	0.0080	1.44		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
30.9	526	Total			

**Subcatchment 2S: PREDEV BASIN**

Hydrograph



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Hedges 'C'  
Type IA 24-hr 25-Year Rainfall=3.90"

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**Summary for Subcatchment 5S: POSTDEV UNDETAINED**

Runoff = 0.19 cfs @ 8.04 hrs, Volume= 0.089 af, Depth= 3.67"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 25-Year Rainfall=3.90"

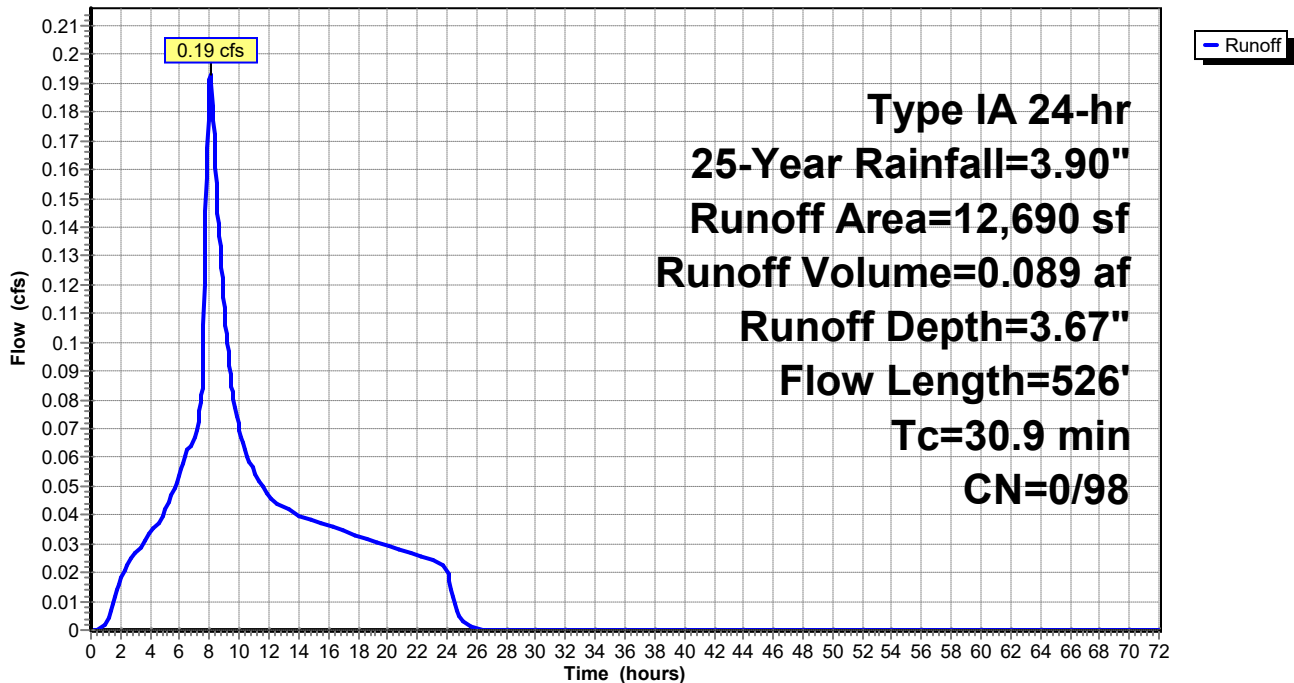
Area (sf)	CN	Description
12,690	98	Paved parking, HSG C
12,690	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.3	300	0.0173	0.18		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.50"
2.6	226	0.0080	1.44		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
30.9	526	Total			

**Subcatchment 5S: POSTDEV UNDETAINED**

Hydrograph



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Type IA 24-hr 25-Year Rainfall=3.90"

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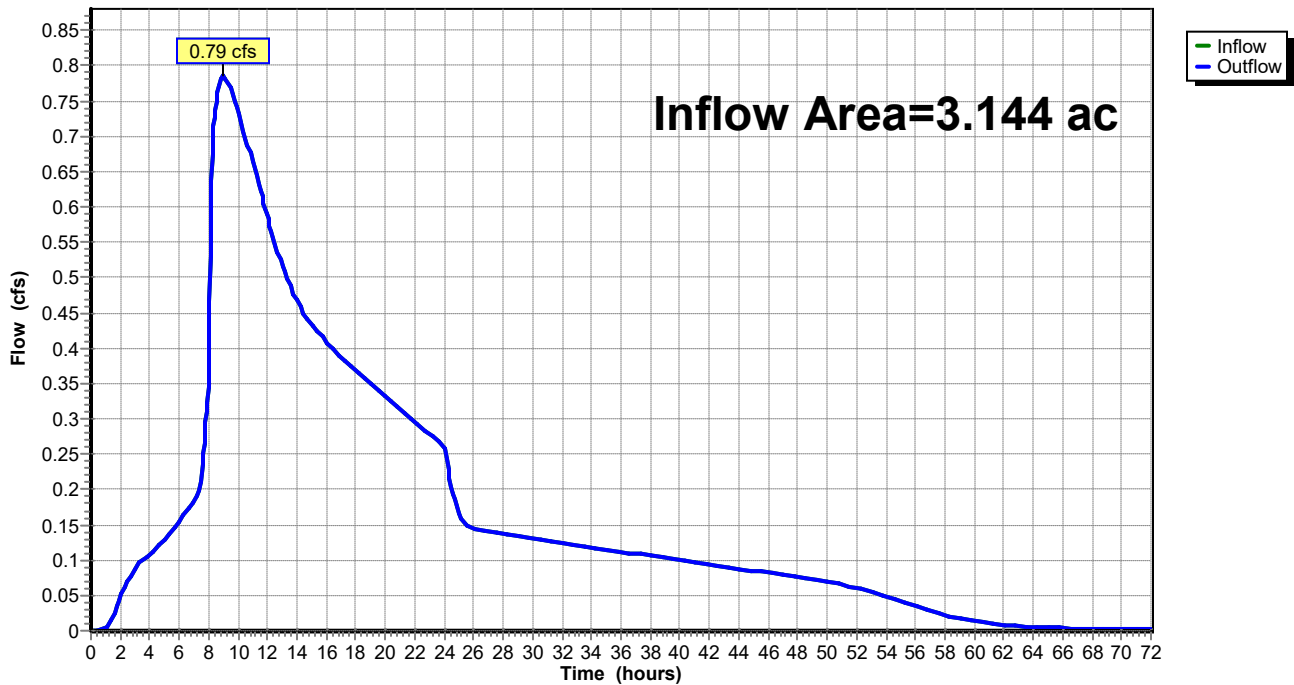
**Summary for Reach 6R: POST DEVELOPMENT**

Inflow Area = 3.144 ac, 100.00% Impervious, Inflow Depth > 3.66" for 25-Year event  
Inflow = 0.79 cfs @ 9.03 hrs, Volume= 0.958 af  
Outflow = 0.79 cfs @ 9.03 hrs, Volume= 0.958 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Reach 6R: POST DEVELOPMENT**

Hydrograph



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Type IA 24-hr 25-Year Rainfall=3.90"

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**Summary for Pond 4P: UNDERGROUND RETENTION**

Inflow Area = 2.853 ac, 100.00% Impervious, Inflow Depth = 3.67" for 25-Year event  
 Inflow = 2.61 cfs @ 7.90 hrs, Volume= 0.871 af  
 Outflow = 0.68 cfs @ 9.30 hrs, Volume= 0.869 af, Atten= 74%, Lag= 84.0 min  
 Primary = 0.68 cfs @ 9.30 hrs, Volume= 0.869 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 140.15' @ 9.30 hrs Surf.Area= 0.184 ac Storage= 0.333 af

Plug-Flow detention time= 637.4 min calculated for 0.869 af (100% of inflow)  
 Center-of-Mass det. time= 635.5 min ( 1,296.9 - 661.3 )

Volume	Invert	Avail.Storage	Storage Description
#1A	137.50'	0.163 af	<b>77.50'W x 103.30'L x 3.50'H Field A</b> 0.643 af Overall - 0.236 af Embedded = 0.407 af x 40.0% Voids
#2A	138.00'	0.236 af	<b>ADS_StormTech SC-740 +Cap</b> x 224 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 16 Rows of 14 Chambers
		0.399 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	140.30'	<b>4.0' long Weir</b> 2 End Contraction(s)
#2	Primary	139.50'	<b>5.5" Vert. Orifice/Grate</b> C= 0.600
#3	Primary	137.50'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=0.68 cfs @ 9.30 hrs HW=140.15' (Free Discharge)

├─1=Weir ( Controls 0.00 cfs)  
 └─2=Orifice/Grate (Orifice Controls 0.52 cfs @ 3.12 fps)  
 └─3=Orifice/Grate (Orifice Controls 0.17 cfs @ 7.71 fps)

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**Pond 4P: UNDERGROUND RETENTION - Chamber Wizard Field A**

**Chamber Model = ADS\_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

14 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 101.30' Row Length +12.0" End Stone x 2 = 103.30' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

224 Chambers x 45.9 cf = 10,290.6 cf Chamber Storage

28,019.2 cf Field - 10,290.6 cf Chambers = 17,728.7 cf Stone x 40.0% Voids = 7,091.5 cf Stone Storage

Chamber Storage + Stone Storage = 17,382.0 cf = 0.399 af

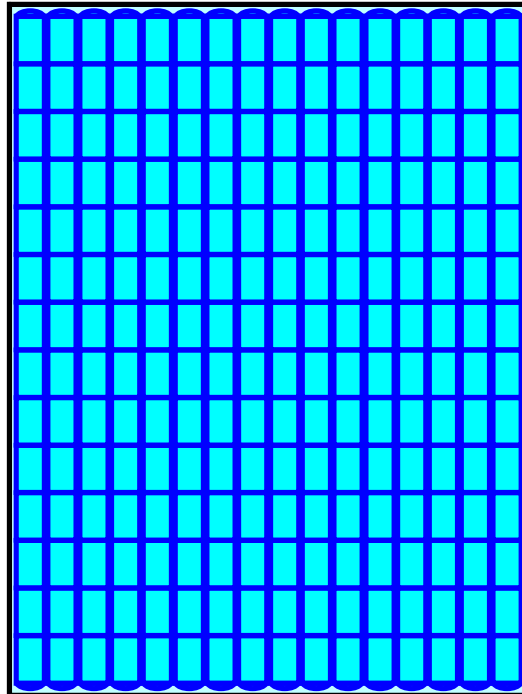
Overall Storage Efficiency = 62.0%

Overall System Size = 103.30' x 77.50' x 3.50'

224 Chambers

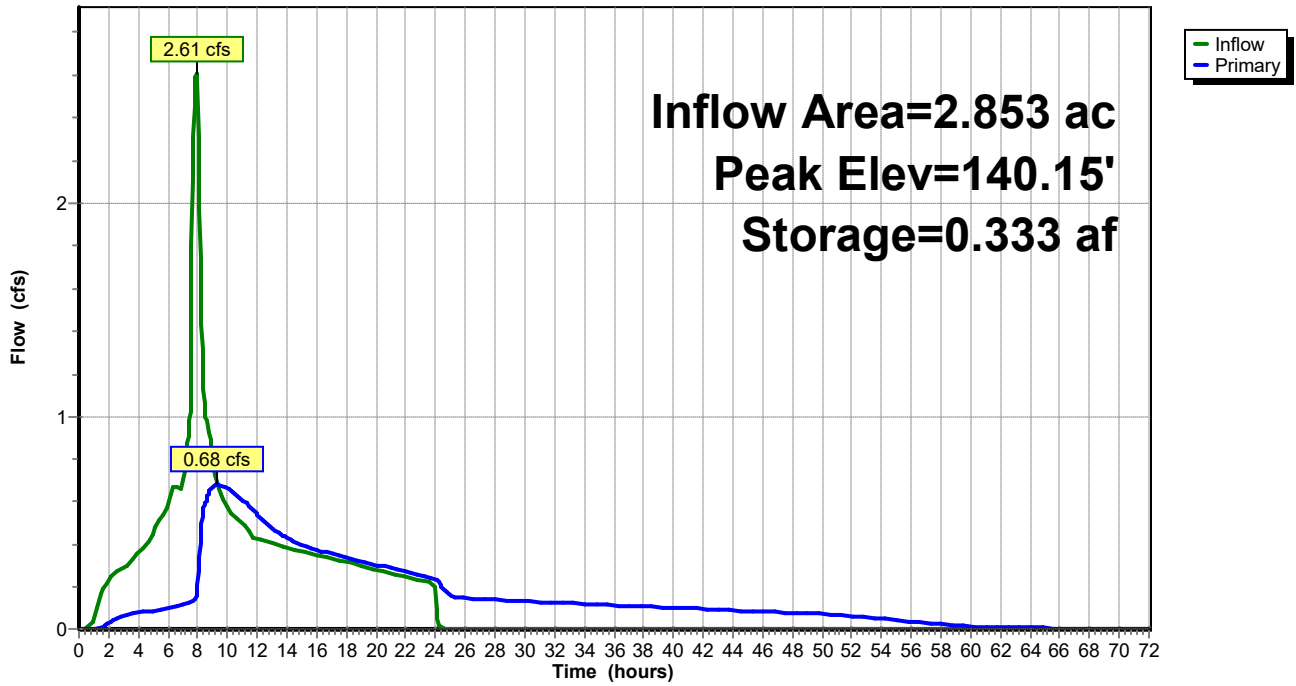
1,037.7 cy Field

656.6 cy Stone



### Pond 4P: UNDERGROUND RETENTION

Hydrograph



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Type IA 24-hr 25-Year Rainfall=3.90"

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**Stage-Discharge for Pond 4P: UNDERGROUND RETENTION**

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
137.50	0.00	138.52	0.10	139.54	0.15	140.56	2.62
137.52	0.00	138.54	0.10	139.56	0.16	140.58	2.83
137.54	0.00	138.56	0.10	139.58	0.17	140.60	3.04
137.56	0.01	138.58	0.10	139.60	0.18	140.62	3.26
137.58	0.01	138.60	0.11	139.62	0.19	140.64	3.49
137.60	0.01	138.62	0.11	139.64	0.21	140.66	3.73
137.62	0.02	138.64	0.11	139.66	0.22	140.68	3.97
137.64	0.02	138.66	0.11	139.68	0.24	140.70	4.21
137.66	0.03	138.68	0.11	139.70	0.26	140.72	4.46
137.68	0.03	138.70	0.11	139.72	0.28	140.74	4.72
137.70	0.04	138.72	0.11	139.74	0.30	140.76	4.98
137.72	0.04	138.74	0.11	139.76	0.32	140.78	5.25
137.74	0.04	138.76	0.11	139.78	0.35	140.80	5.52
137.76	0.04	138.78	0.11	139.80	0.37	140.82	5.80
137.78	0.05	138.80	0.12	139.82	0.39	140.84	6.08
137.80	0.05	138.82	0.12	139.84	0.42	140.86	6.36
137.82	0.05	138.84	0.12	139.86	0.44	140.88	6.65
137.84	0.05	138.86	0.12	139.88	0.47	140.90	6.95
137.86	0.06	138.88	0.12	139.90	0.49	140.92	7.25
137.88	0.06	138.90	0.12	139.92	0.51	140.94	7.55
137.90	0.06	138.92	0.12	139.94	0.53	140.96	7.86
137.92	0.06	138.94	0.12	139.96	0.54	140.98	8.17
137.94	0.06	138.96	0.12	139.98	0.56	141.00	<b>8.48</b>
137.96	0.06	138.98	0.12	140.00	0.58		
137.98	0.07	139.00	0.13	140.02	0.59		
138.00	0.07	139.02	0.13	140.04	0.61		
138.02	0.07	139.04	0.13	140.06	0.62		
138.04	0.07	139.06	0.13	140.08	0.64		
138.06	0.07	139.08	0.13	140.10	0.65		
138.08	0.07	139.10	0.13	140.12	0.66		
138.10	0.08	139.12	0.13	140.14	0.68		
138.12	0.08	139.14	0.13	140.16	0.69		
138.14	0.08	139.16	0.13	140.18	0.70		
138.16	0.08	139.18	0.13	140.20	0.72		
138.18	0.08	139.20	0.13	140.22	0.73		
138.20	0.08	139.22	0.13	140.24	0.74		
138.22	0.08	139.24	0.14	140.26	0.75		
138.24	0.09	139.26	0.14	140.28	0.76		
138.26	0.09	139.28	0.14	140.30	0.77		
138.28	0.09	139.30	0.14	140.32	0.82		
138.30	0.09	139.32	0.14	140.34	0.90		
138.32	0.09	139.34	0.14	140.36	1.00		
138.34	0.09	139.36	0.14	140.38	1.11		
138.36	0.09	139.38	0.14	140.40	1.24		
138.38	0.09	139.40	0.14	140.42	1.38		
138.40	0.09	139.42	0.14	140.44	1.53		
138.42	0.10	139.44	0.14	140.46	1.69		
138.44	0.10	139.46	0.14	140.48	1.86		
138.46	0.10	139.48	0.14	140.50	2.04		
138.48	0.10	139.50	0.15	140.52	2.22		
138.50	0.10	139.52	0.15	140.54	2.42		



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Hedges 'C'

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## Summary for Subcatchment 1S: POSTDEV DETAINED

Runoff = 3.03 cfs @ 7.90 hrs, Volume= 1.014 af, Depth= 4.26"

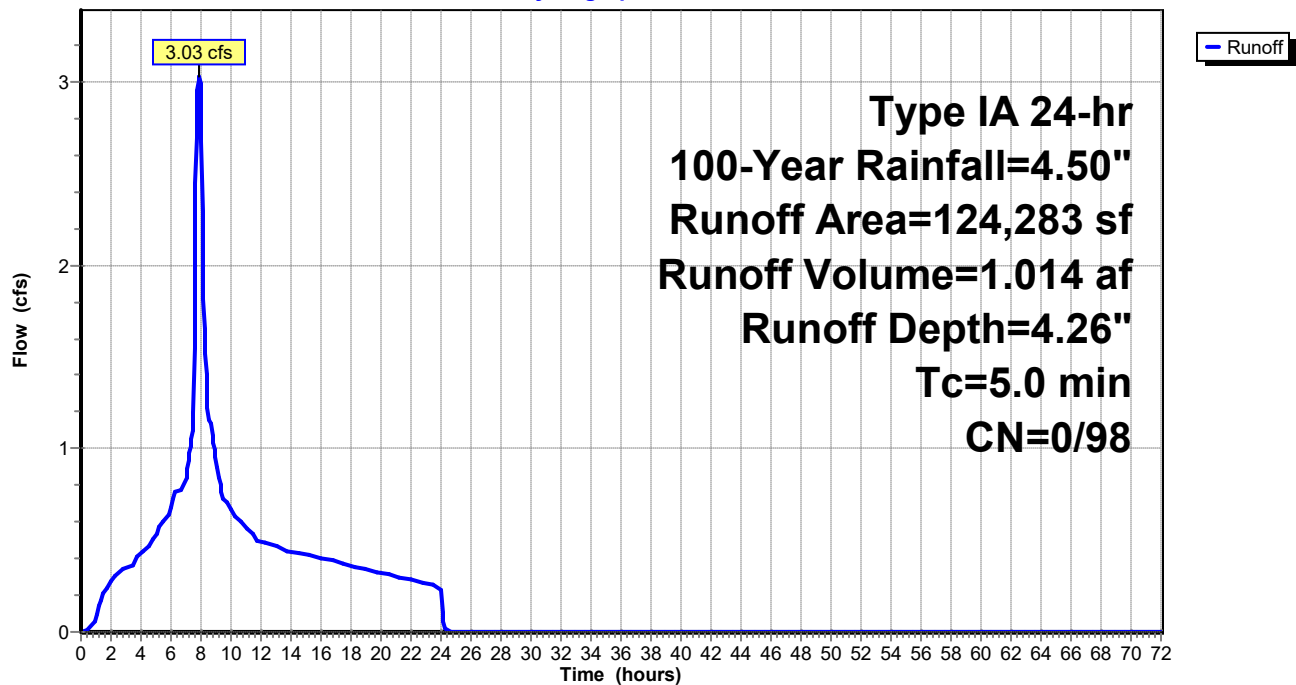
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 100-Year Rainfall=4.50"

Area (sf)	CN	Description
124,283	98	Paved parking, HSG C
124,283	98	100.00% Impervious Area

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

## Subcatchment 1S: POSTDEV DETAINED

Hydrograph



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Hedges 'C'  
Type IA 24-hr 100-Year Rainfall=4.50"

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**Summary for Subcatchment 2S: PREDEV BASIN**

Runoff = 1.08 cfs @ 8.07 hrs, Volume= 0.579 af, Depth= 2.21"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 100-Year Rainfall=4.50"

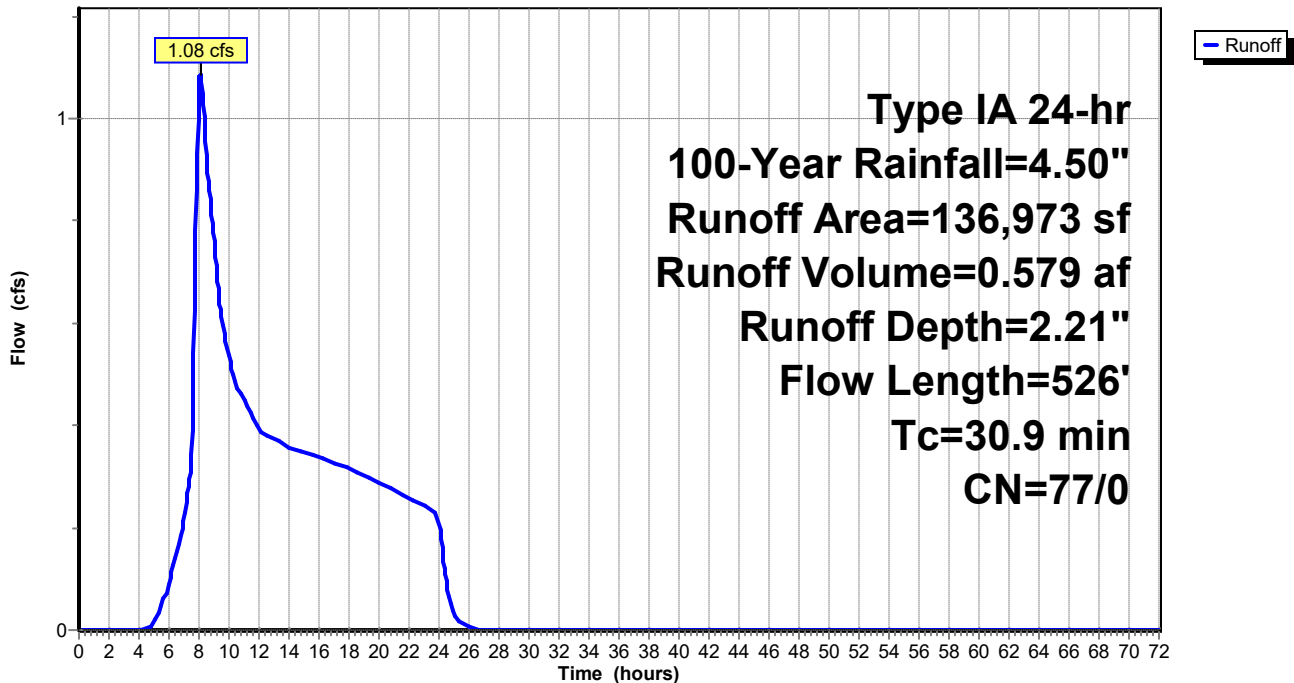
Area (sf)	CN	Description
* 136,973	77	See appendix for composite CN
136,973	77	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.3	300	0.0173	0.18		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.50"
2.6	226	0.0080	1.44		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
30.9	526	Total			

**Subcatchment 2S: PREDEV BASIN**

Hydrograph



**20180291 - Hedges 'C' - HydroCAD**

Prepared by VLMK Engineering + Design

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Hedges 'C'  
Type IA 24-hr 100-Year Rainfall=4.50"

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**Summary for Subcatchment 5S: POSTDEV UNDETAINED**

Runoff = 0.22 cfs @ 8.04 hrs, Volume= 0.104 af, Depth= 4.26"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
Type IA 24-hr 100-Year Rainfall=4.50"

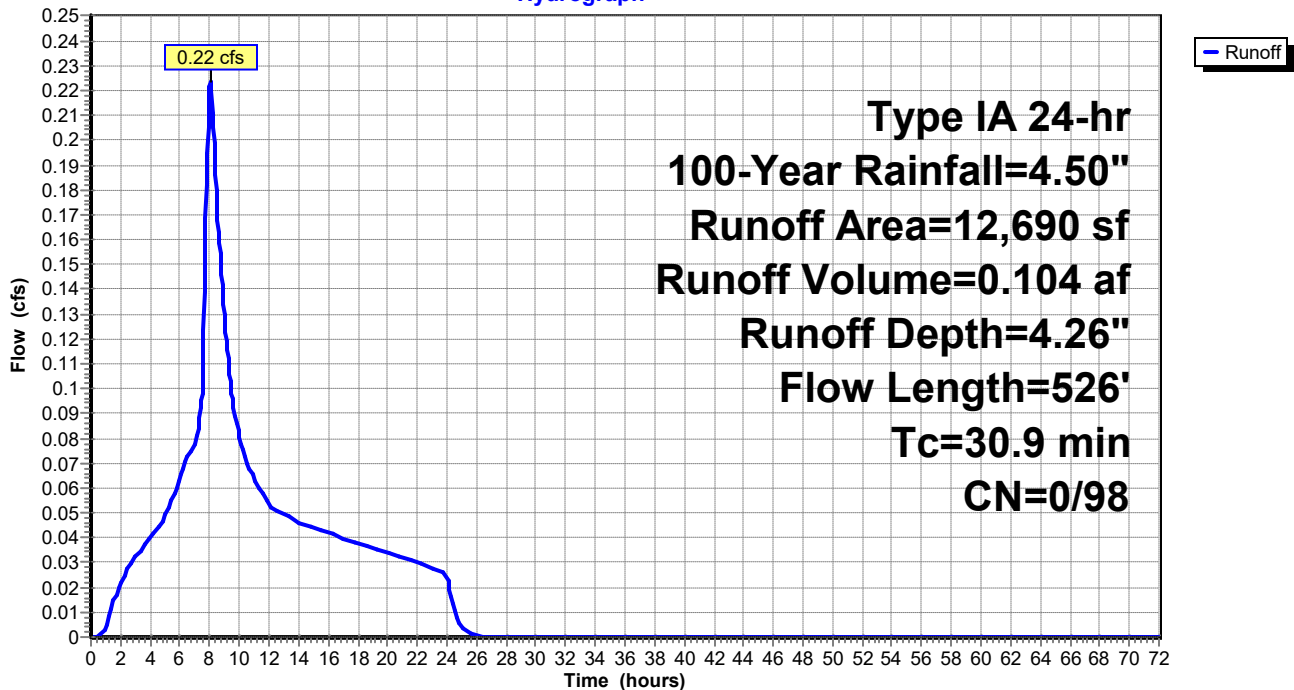
Area (sf)	CN	Description
12,690	98	Paved parking, HSG C
12,690	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.3	300	0.0173	0.18		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 2.50"
2.6	226	0.0080	1.44		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
30.9	526	Total			

**Subcatchment 5S: POSTDEV UNDETAINED**

Hydrograph



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Hedges 'C'  
Type IA 24-hr 100-Year Rainfall=4.50"

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Page 29

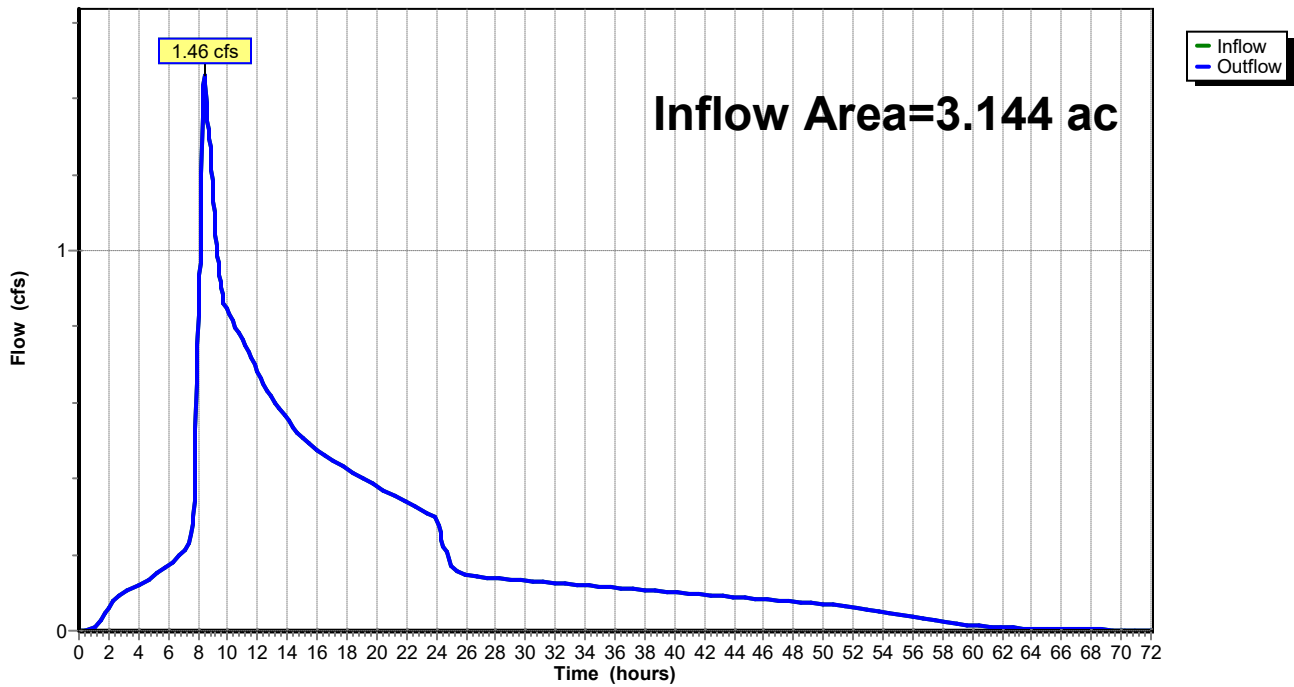
**Summary for Reach 6R: POST DEVELOPMENT**

Inflow Area = 3.144 ac, 100.00% Impervious, Inflow Depth > 4.26" for 100-Year event  
Inflow = 1.46 cfs @ 8.41 hrs, Volume= 1.115 af  
Outflow = 1.46 cfs @ 8.41 hrs, Volume= 1.115 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

**Reach 6R: POST DEVELOPMENT**

Hydrograph



**20180291 - Hedges 'C' - HydroCAD**

Type IA 24-hr 100-Year Rainfall=4.50"

Prepared by VLMK Engineering + Design

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**Summary for Pond 4P: UNDERGROUND RETENTION**

Inflow Area = 2.853 ac, 100.00% Impervious, Inflow Depth = 4.26" for 100-Year event  
 Inflow = 3.03 cfs @ 7.90 hrs, Volume= 1.014 af  
 Outflow = 1.28 cfs @ 8.42 hrs, Volume= 1.012 af, Atten= 58%, Lag= 31.6 min  
 Primary = 1.28 cfs @ 8.42 hrs, Volume= 1.012 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 140.41' @ 8.42 hrs Surf.Area= 0.184 ac Storage= 0.355 af

Plug-Flow detention time= 566.1 min calculated for 1.011 af (100% of inflow)  
 Center-of-Mass det. time= 566.0 min ( 1,224.1 - 658.1 )

Volume	Invert	Avail.Storage	Storage Description
#1A	137.50'	0.163 af	<b>77.50'W x 103.30'L x 3.50'H Field A</b> 0.643 af Overall - 0.236 af Embedded = 0.407 af x 40.0% Voids
#2A	138.00'	0.236 af	<b>ADS_StormTech SC-740 +Cap</b> x 224 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 16 Rows of 14 Chambers
		0.399 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	140.30'	<b>4.0' long Weir</b> 2 End Contraction(s)
#2	Primary	139.50'	<b>5.5" Vert. Orifice/Grate</b> C= 0.600
#3	Primary	137.50'	<b>2.0" Vert. Orifice/Grate</b> C= 0.600

**Primary OutFlow** Max=1.27 cfs @ 8.42 hrs HW=140.41' (Free Discharge)

- 1=Weir (Weir Controls 0.44 cfs @ 1.06 fps)
- 2=Orifice/Grate (Orifice Controls 0.65 cfs @ 3.96 fps)
- 3=Orifice/Grate (Orifice Controls 0.18 cfs @ 8.09 fps)

**20180291 - Hedges 'C' - HydroCAD**

Prepared by VLMK Engineering + Design

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Hedges 'C'  
Type IA 24-hr 100-Year Rainfall=4.50"

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**Pond 4P: UNDERGROUND RETENTION - Chamber Wizard Field A**

**Chamber Model = ADS\_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)**

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

14 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 101.30' Row Length +12.0" End Stone x 2 = 103.30' Base Length

16 Rows x 51.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 77.50' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

224 Chambers x 45.9 cf = 10,290.6 cf Chamber Storage

28,019.2 cf Field - 10,290.6 cf Chambers = 17,728.7 cf Stone x 40.0% Voids = 7,091.5 cf Stone Storage

Chamber Storage + Stone Storage = 17,382.0 cf = 0.399 af

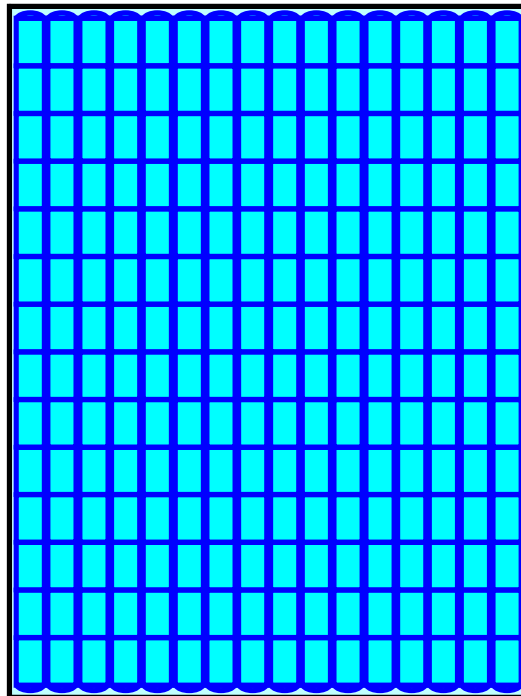
Overall Storage Efficiency = 62.0%

Overall System Size = 103.30' x 77.50' x 3.50'

224 Chambers

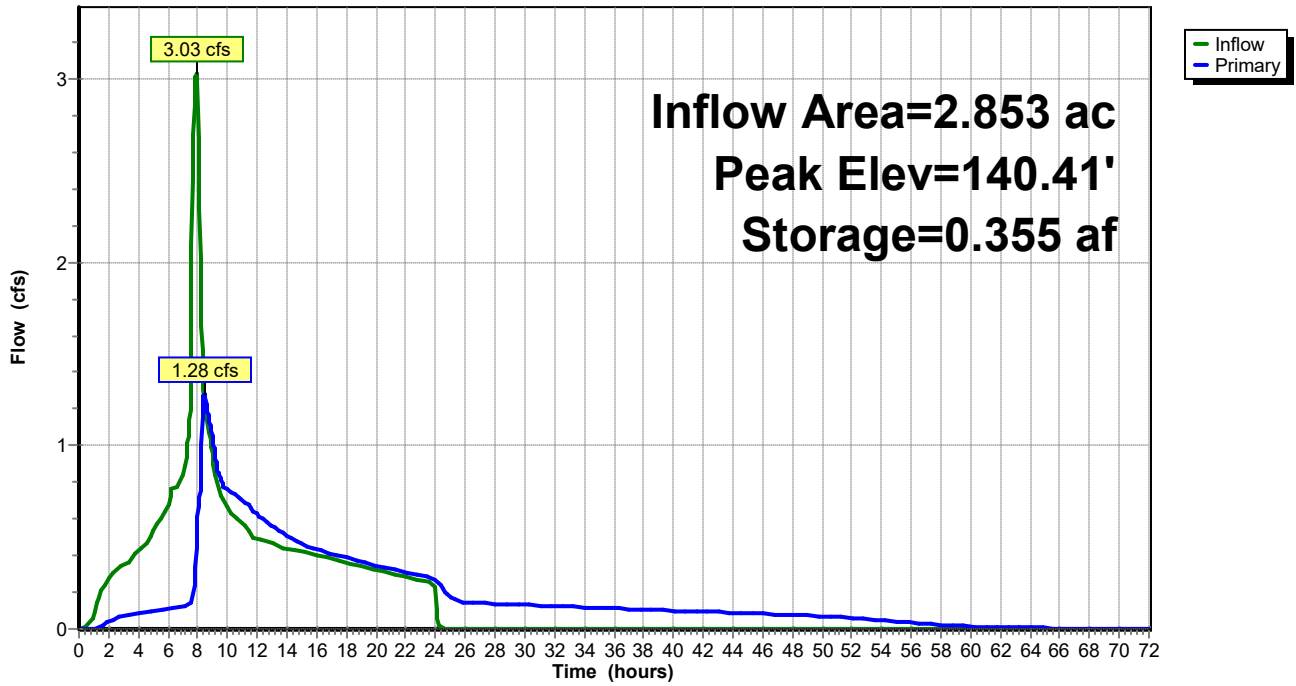
1,037.7 cy Field

656.6 cy Stone



### Pond 4P: UNDERGROUND RETENTION

Hydrograph



**20180291 - Hedges 'C' - HydroCAD**

Type IA 24-hr 100-Year Rainfall=4.50"

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Printed 12/6/2018

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**Stage-Discharge for Pond 4P: UNDERGROUND RETENTION**

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
137.50	0.00	138.52	0.10	139.54	0.15	140.56	2.62
137.52	0.00	138.54	0.10	139.56	0.16	140.58	2.83
137.54	0.00	138.56	0.10	139.58	0.17	140.60	3.04
137.56	0.01	138.58	0.10	139.60	0.18	140.62	3.26
137.58	0.01	138.60	0.11	139.62	0.19	140.64	3.49
137.60	0.01	138.62	0.11	139.64	0.21	140.66	3.73
137.62	0.02	138.64	0.11	139.66	0.22	140.68	3.97
137.64	0.02	138.66	0.11	139.68	0.24	140.70	4.21
137.66	0.03	138.68	0.11	139.70	0.26	140.72	4.46
137.68	0.03	138.70	0.11	139.72	0.28	140.74	4.72
137.70	0.04	138.72	0.11	139.74	0.30	140.76	4.98
137.72	0.04	138.74	0.11	139.76	0.32	140.78	5.25
137.74	0.04	138.76	0.11	139.78	0.35	140.80	5.52
137.76	0.04	138.78	0.11	139.80	0.37	140.82	5.80
137.78	0.05	138.80	0.12	139.82	0.39	140.84	6.08
137.80	0.05	138.82	0.12	139.84	0.42	140.86	6.36
137.82	0.05	138.84	0.12	139.86	0.44	140.88	6.65
137.84	0.05	138.86	0.12	139.88	0.47	140.90	6.95
137.86	0.06	138.88	0.12	139.90	0.49	140.92	7.25
137.88	0.06	138.90	0.12	139.92	0.51	140.94	7.55
137.90	0.06	138.92	0.12	139.94	0.53	140.96	7.86
137.92	0.06	138.94	0.12	139.96	0.54	140.98	8.17
137.94	0.06	138.96	0.12	139.98	0.56	141.00	<b>8.48</b>
137.96	0.06	138.98	0.12	140.00	0.58		
137.98	0.07	139.00	0.13	140.02	0.59		
138.00	0.07	139.02	0.13	140.04	0.61		
138.02	0.07	139.04	0.13	140.06	0.62		
138.04	0.07	139.06	0.13	140.08	0.64		
138.06	0.07	139.08	0.13	140.10	0.65		
138.08	0.07	139.10	0.13	140.12	0.66		
138.10	0.08	139.12	0.13	140.14	0.68		
138.12	0.08	139.14	0.13	140.16	0.69		
138.14	0.08	139.16	0.13	140.18	0.70		
138.16	0.08	139.18	0.13	140.20	0.72		
138.18	0.08	139.20	0.13	140.22	0.73		
138.20	0.08	139.22	0.13	140.24	0.74		
138.22	0.08	139.24	0.14	140.26	0.75		
138.24	0.09	139.26	0.14	140.28	0.76		
138.26	0.09	139.28	0.14	140.30	0.77		
138.28	0.09	139.30	0.14	140.32	0.82		
138.30	0.09	139.32	0.14	140.34	0.90		
138.32	0.09	139.34	0.14	140.36	1.00		
138.34	0.09	139.36	0.14	140.38	1.11		
138.36	0.09	139.38	0.14	140.40	1.24		
138.38	0.09	139.40	0.14	140.42	1.38		
138.40	0.09	139.42	0.14	140.44	1.53		
138.42	0.10	139.44	0.14	140.46	1.69		
138.44	0.10	139.46	0.14	140.48	1.86		
138.46	0.10	139.48	0.14	140.50	2.04		
138.48	0.10	139.50	0.15	140.52	2.22		
138.50	0.10	139.52	0.15	140.54	2.42		

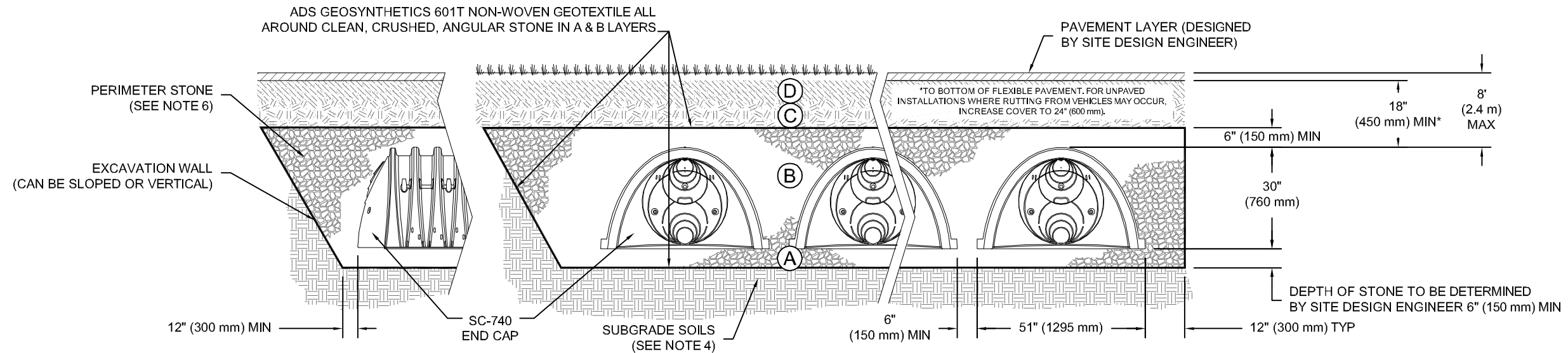


## ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	<b>FINAL FILL:</b> FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	<b>INITIAL FILL:</b> FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 <sup>1</sup> A-1, A-2-4, A-3  OR AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN), DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	<b>EMBEDMENT STONE:</b> FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	<b>FOUNDATION STONE:</b> FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2 3</sup>

**PLEASE NOTE:**

- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.




**NOTES:**

- SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

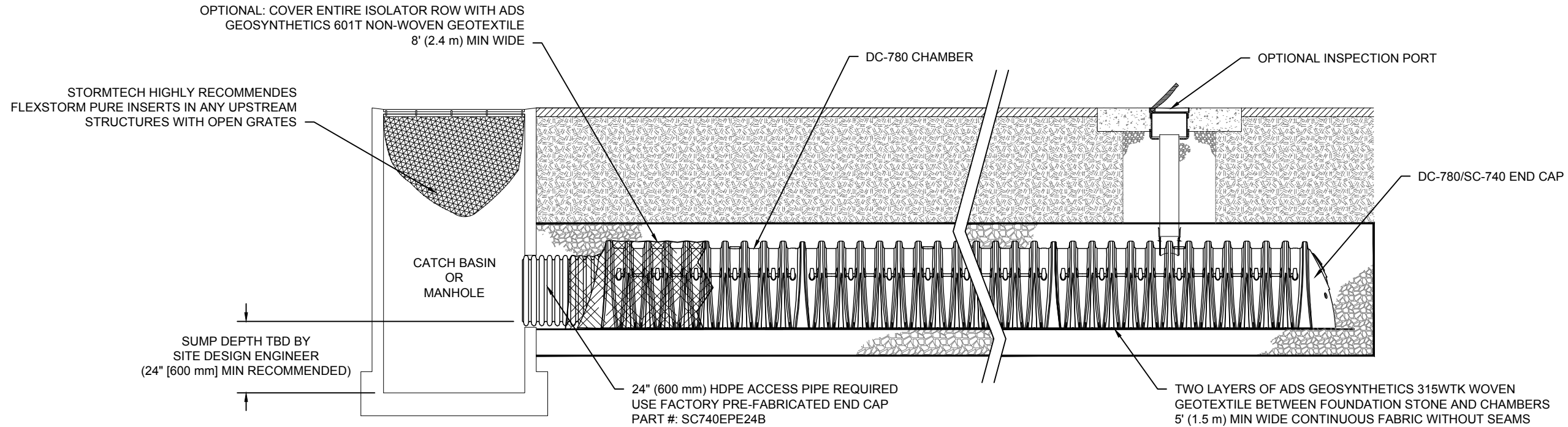
**SC-740**  
**STANDARD CROSS SECTION**  
 DATE: 11/18/14  
 DRAWN: JLM  
 CHECKED: JLM  
 PROJECT #:

REV	DRW	CHK	DESCRIPTION
01/19/16	JLM	JLM	UPDATE

  
**StormTech**  
Determiner • Restorer • Water Quality  
 70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06867  
 860-528-8188 | 888-892-2894 | WWW.STORMTECH.COM

  
**ADS**  
ADVANCED DRAINAGE SYSTEMS, INC.  
 4640 TRUEMAN BLVD  
 HILLIARD, OH 43026  
 1-800-733-7473

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.



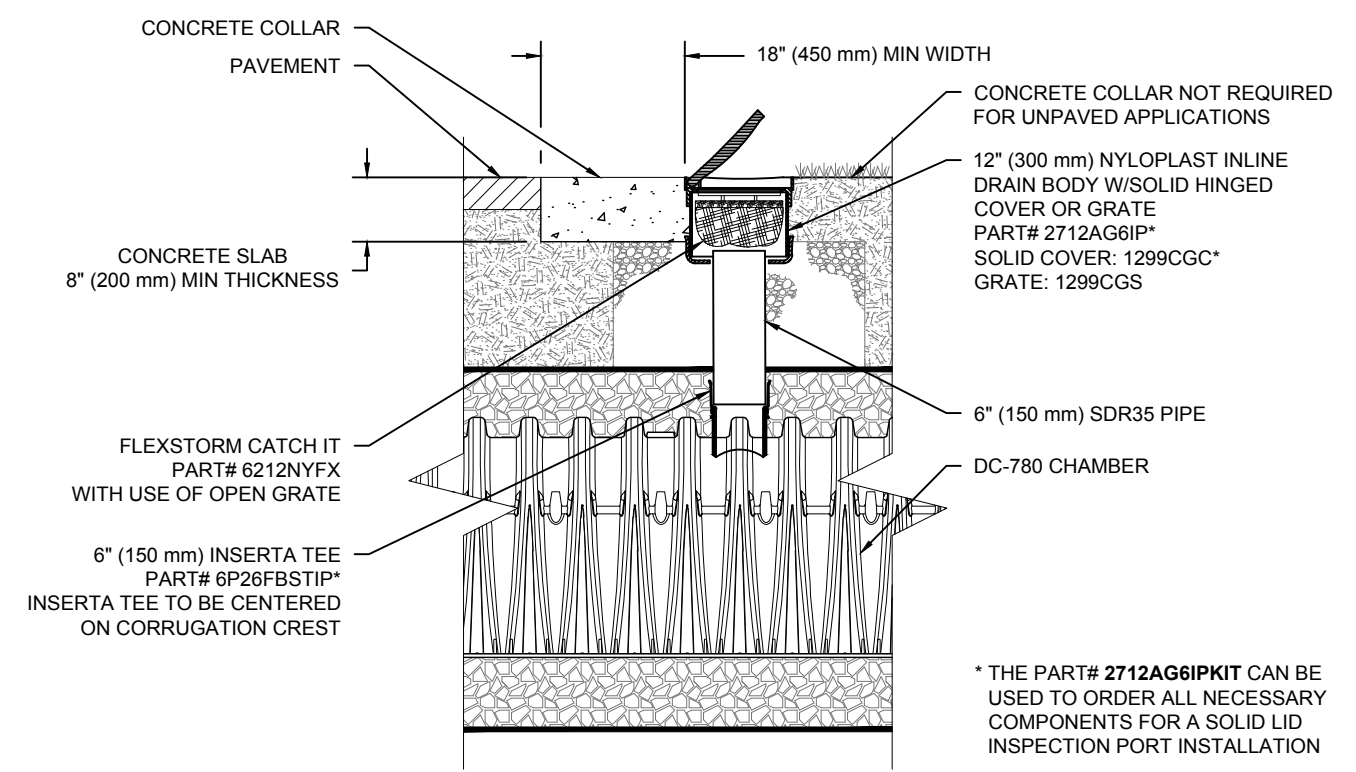
**DC-780 ISOLATOR ROW DETAIL**  
NTS

**INSPECTION & MAINTENANCE**

- STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
    - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
    - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
    - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
    - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
    - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
  - B. ALL ISOLATOR ROWS
    - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
    - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
      - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
      - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
    - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
  - B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
  - C. VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

**NOTES**

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



**DC-780 6" INSPECTION PORT DETAIL**  
NTS

<b>ISOLATOR ROW DETAILS</b>		DC-780
DATE:	03/08/17	DRAWN: JLM
PROJECT #:		
REV	DWN	CKD
10/17/17	JLM	
DESCRIPTION	UPDATE NON-WOVEN GEOTEXTILE	

4640 TRUEMAN BLVD  
HILLIARD, OH 43026

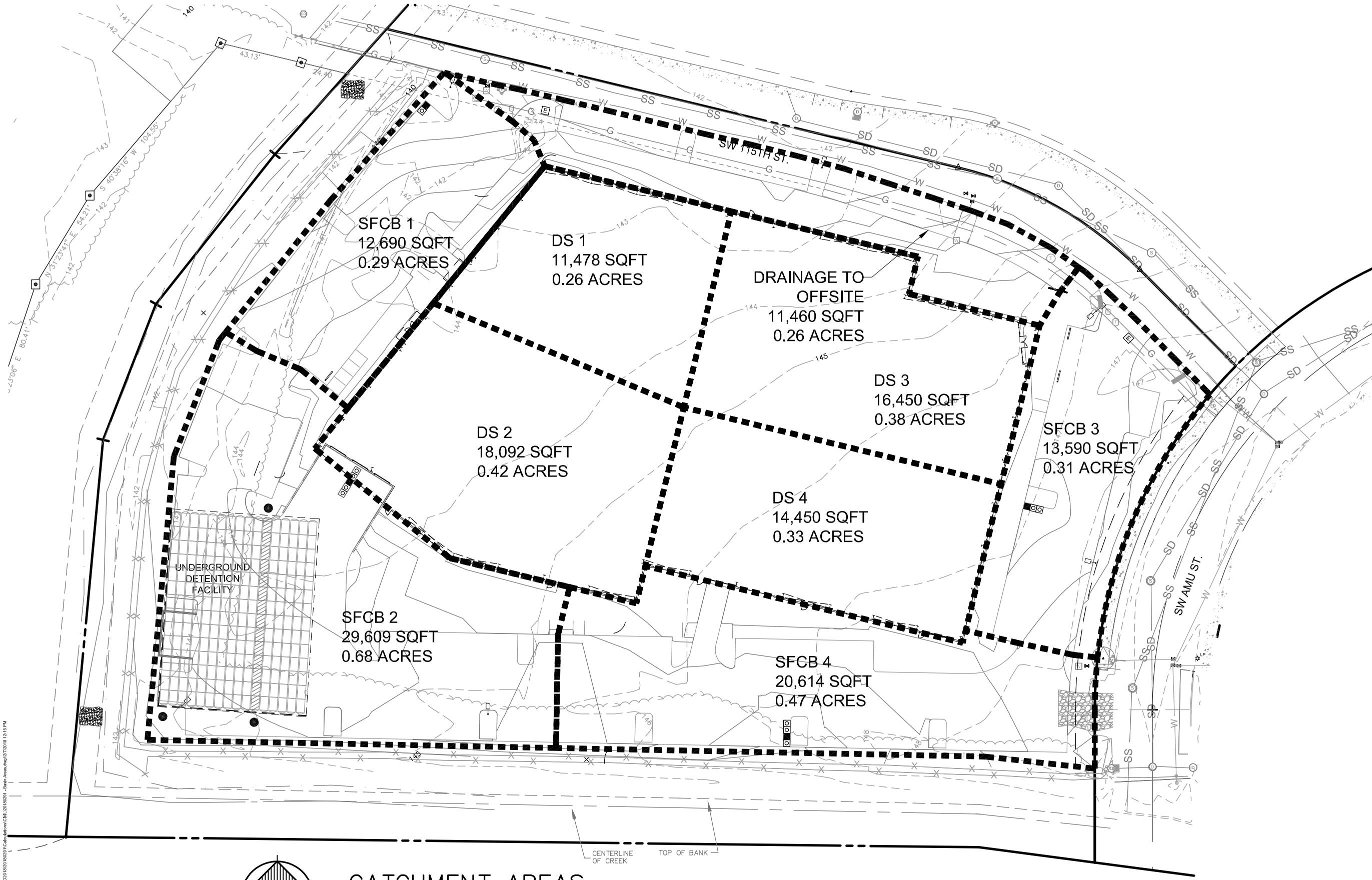
ADVANCED DRAINAGE SYSTEMS, INC.

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# APPENDIX G

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## CONVEYANCE



G:\ACAD\2018\20180291\Catch\Hedges 'C' - Drain Areas.dwg 2/7/2018 12:15 PM

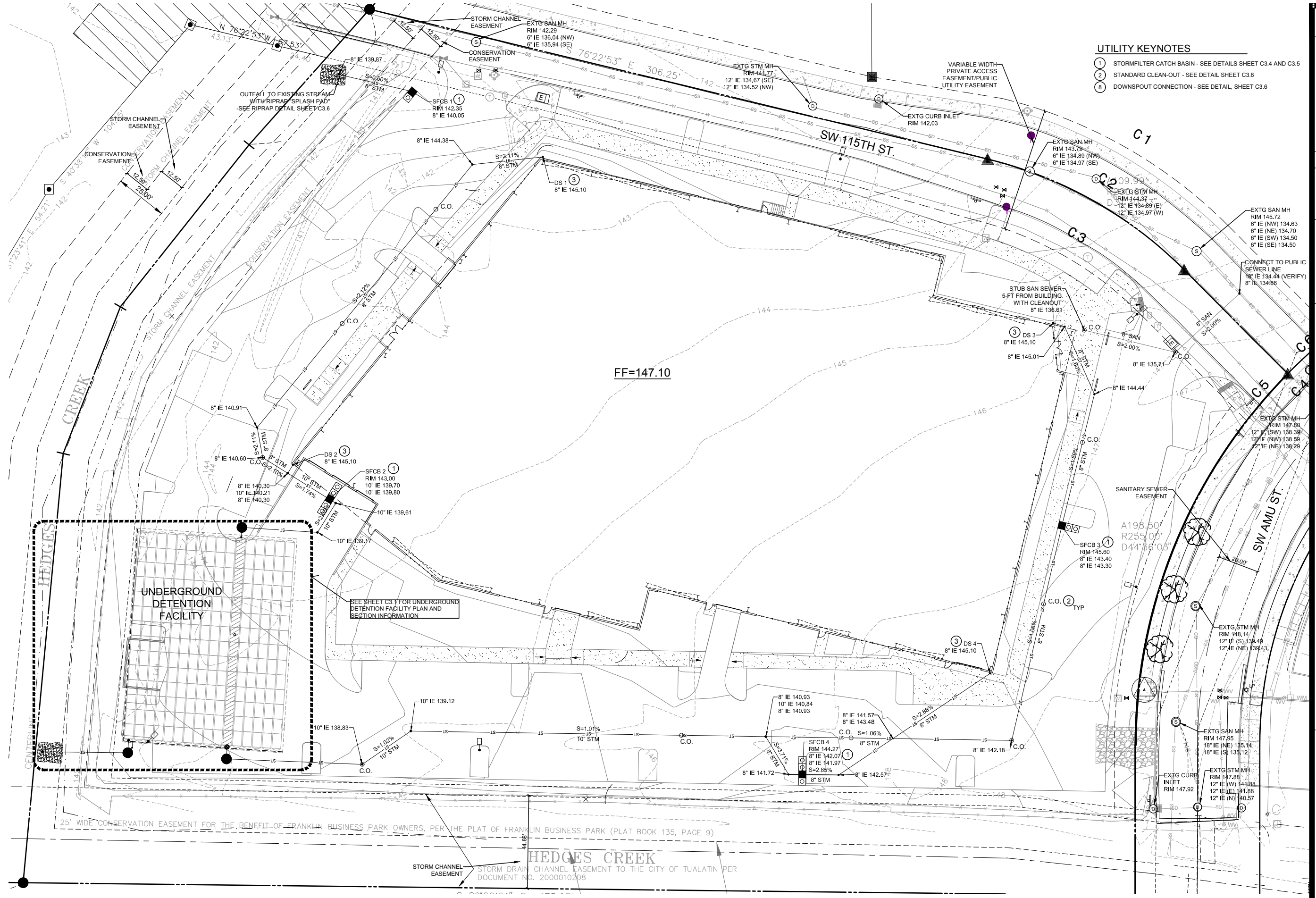
3933 SW Kelly Avenue  
Portland, Oregon 97239  
503.222.4453  
VLMK.COM

**VLMK**  
ENGINEERING + DESIGN

**HEDGES 'C'**  
SW 115TH ST AND SW AMU ST  
TUALATIN, OR  
**CATCHMENT AREAS**

DATE: JULY, 2018  
SCALE: AS NOTED  
PROJ. NO.: 20180291  
DRAWN: BRG  
CHECKED: BMD





- UTILITY KEYNOTES**
- 1 STORMFILTER CATCH BASIN - SEE DETAILS SHEET C3.4 AND C3.5
  - 2 STANDARD CLEAN-OUT - SEE DETAIL SHEET C3.6
  - 3 DOWNSPOUT CONNECTION - SEE DETAIL SHEET C3.6

DATE		REVISION		JOB NO.	20180291
DRAWN		CHECKED		DATE	JULY 2018

HEDGES C

SW 115th ST. AND SW AMU ST.

TUALATIN, OREGON

---

SITE UTILITY PLAN

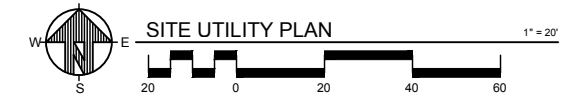
LANCE MUELLER & ASSOCIATES  
130 LACROIX BLVD. SUITE 200 • SEASIDE, WA 98138 • (206) 399-9555

VLMK ENGINEERING + DESIGN

VLMK ENGINEERING + DESIGN IS AN AFFILIATE OF THE MUELLER ENGINEERING FIRM.

sheet

G2



**Date: Dec 10, 2018**

Blueridge Lighting & Controls  
4145 SW Watson Avenue  
Beaverton OR 97005  
Phone: (503) 644-5618  
Fax:

Job Name  
**Hedges C**  
BLUERIDGE-W18-63386  
Tualatin or

Bid Date  
Dec 10, 2018

Submittal Date  
Dec 10, 2018

*Architect:*  
Lance Mueller & Assoc. - Seattle  
130 Lakeside Ave.  
Seattle WA 98122

# Transmittal

Blueridge Lighting & Controls  
4145 SW Watson Avenue  
Beaverton OR 97005  
Phone: (503) 644-5618  
**From: Jasmine Baker**

**Project** Hedges C  
**Quote#** BLUERIDGE-W18-63386  
**Location** Tualatin or  
Contact:

ATTACHED WE ARE SENDING YOU 1 COPY OF THE FOLLOWING ITEM:

- |                                   |   |        |
|-----------------------------------|---|--------|
| <input type="checkbox"/> Drawings | <input type="checkbox"/> Specifications | Other: |
| <input type="checkbox"/> Prints   | <input type="checkbox"/> Information    |        |
| <input type="checkbox"/> Plans    | <input type="checkbox"/> Submittals     |        |

THESE ARE TRANSMITTED FOR:

- |  |   |                                 |
|--|---|---------------------------------|
| <input checked="" type="checkbox"/> Prior Approval | <input type="checkbox"/> Resubmittal for Approval | <input type="checkbox"/> Record |
| <input type="checkbox"/> Approval                  | <input type="checkbox"/> Corrections              | Bids due on:                    |
| <input type="checkbox"/> Approval as Submitted     | <input type="checkbox"/> Your Use                 | Other:                          |
| <input type="checkbox"/> Approval as Noted         | <input type="checkbox"/> Review and Comment       |                                 |

Type	MFG	Part
	Streetworks	TMU-E04-LED-E-U-RW-GM
	Streetworks	TMU-E04-LED-E-U-T3-GM
	Streetworks	TMU-E04-LED-E-U-T3 DUAL-GM
	Streetworks	TMU-E04-LED-E-U-T4-GM
	Streetworks	TMU-E04-LED-E-U-T4-GM-WM
	Lumark	XTOR4B-W

**Job Name:**  
Hedges C  
Architect: Lance Mueller & Assoc. - Seattle  
(Seattle)

Notes:

BLUERIDGE-W18-63386

# Streetworks

## DESCRIPTION

The Talon luminaire is the most versatile, functionally designed, universally adaptable outdoor luminaire available. Incorporating modular LED LightBAR™ technology, Talon brings outstanding uniformity and energy conscious illumination to walkways, parking lots, roadways, building areas and any security lighting application. UL/cUL listed for wet locations.

<b>Catalog #</b>		<b>Type</b>
<b>Project</b>		
<b>Comments</b>		<b>Date</b>
<b>Prepared by</b>		

## SPECIFICATION FEATURES

### Construction

One-piece heavy-wall, die-cast aluminum construction with integral reveal channels along top surface of housing. Optimized for reliable operation from 40°C down to -40°C, internal cast-in wall separates optical and electrical chambers allowing components to operate cooler. Stainless steel latches and hinges allow for tool-less opening and removal of door frame.

### Optics

Choice of twelve patented, high-efficiency AccuLED Optics™ distributions. Optics are precisely designed to shape the light output, maximizing efficiency and application spacing. AccuLED Optics technology creates consistent distributions with the scalability to meet customized application requirements. Offered **Standard in 4000K** (+/- 275K) CCT and minimum 70 CRI. Optional 3000K CCT, 5000K CCT and 5700K CCT. For the ultimate level of spill light control, an optional house-side shield accessory can be field or factory installed. The house-side shield is designed to seamlessly integrate with the SL2, SL3 or SL4 optics.

### Electrical

LED drivers mount to die-cast aluminum back housing for optimal heat sinking, operation efficacy, and prolonged life. Standard drivers feature electronic universal voltage (120-277V 50/60Hz), 347V 60Hz or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Greater than 0.9 power factor, less than 20% harmonic distortion. All fixtures are shipped standard with 10kV/10kA common – and differential – mode surge protection. LightBARs feature an IP66 enclosure rating and maintain greater than 95% lumen maintenance at 60,000 hours per IESNA TM-21. Occupancy sensor and dimming options available.

### Mounting

Extruded 8" aluminum arm includes internal bolt guides allowing for easy positioning of fixture during installation to pole or wall surface. Standard single carton packaging of housing, square pole arm and round pole adapter for contractor friendly arrival of product on site. 3G vibration rated.

### Finish

Housing and arm finished in a five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Standard colors include black, bronze, grey, white, dark platinum and graphite metallic. RAL and custom color matches available. Consult the McGraw-Edison Architectural Colors brochure for the complete selection.

### Warranty

Five-year warranty.



## TMU TALON MEDIUM LED

1 - 6 LightBARs  
Solid State LED

ARCHITECTURAL AREA  
LUMINAIRE



### CERTIFICATION DATA

UL/cUL Listed  
IP66 LightBARs  
3G Vibration Rated  
ISO 9001  
DesignLights Consortium® Qualified\*

### ENERGY DATA

**Electronic LED Driver**  
>0.9 Power Factor  
<20% Total Harmonic Distortion  
120-277V/50 & 60Hz, 347V/60Hz,  
480V/60Hz  
-40°C Minimum Temperature  
40°C Maximum Ambient Temperature

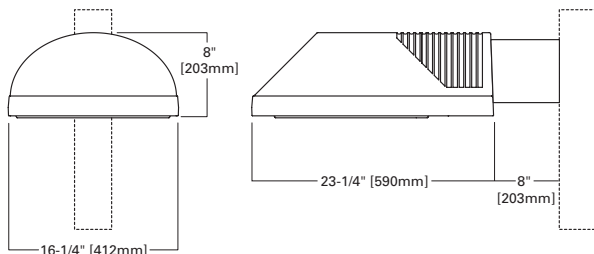
### EPA

**Effective Projected Area:** (Sq. Ft.)  
Luminaire w/o Arm: 0.79  
Luminaire w/ Arm: 1.89  
8" Arm: 0.43

### SHIPPING DATA

**Approximate Net Weight:**  
42 lbs. (19.09 kgs.)

## DIMENSIONS





**POWER AND LUMENS BY BAR COUNT (21 LED LIGHTBARS)**

Number of LightBARs		E01	E02	E03	E04	E05	E06
<b>Drive Current</b>		350mA Drive Current					
<b>Power (Watts)</b>		25W	52W	75W	97W	127W	149W
<b>Current @ 120V (A)</b>		0.22	0.44	0.63	0.82	1.07	1.26
<b>Current @ 277V (A)</b>		0.10	0.20	0.28	0.36	0.48	0.56
<b>Power (Watts)</b>		31W	58W	82W	99W	132W	159W
<b>Current @ 347V (A)</b>		0.11	0.19	0.28	0.29	0.39	0.48
<b>Current @ 480V (A)</b>		0.09	0.15	0.20	0.21	0.30	0.36
<b>T2</b>	Lumens	3,064	6,128	9,192	12,255	15,319	18,383
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T3</b>	Lumens	3,084	6,168	9,252	12,336	15,420	18,504
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T4</b>	Lumens	3,022	6,044	9,066	12,088	15,110	18,132
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>5MQ</b>	Lumens	3,224	6,448	9,672	12,896	16,120	19,344
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2
<b>5WQ</b>	Lumens	3,184	6,368	9,551	12,735	15,919	19,103
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3
<b>5XQ</b>	Lumens	3,181	6,361	9,542	12,722	15,903	19,083
	BUG Rating	B2-U0-G2	B3-U0-G2	B3-U0-G3	B4-U0-G3	B4-U0-G4	B4-U0-G4
<b>SL2</b>	Lumens	3,055	6,110	9,165	12,220	15,275	18,331
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3
<b>SL3</b>	Lumens	3,036	6,072	9,108	12,145	15,181	18,217
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>SL4</b>	Lumens	2,954	5,908	8,862	11,816	14,771	17,725
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>RW</b>	Lumens	3,124	6,248	9,372	12,496	15,620	18,744
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4	B4-U0-G4
<b>SLL/SLR</b>	Lumens	2,782	5,565	8,347	11,130	13,912	16,695
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G3	B2-U0-G4

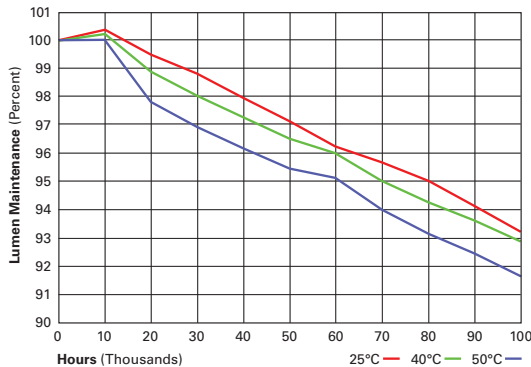
**LUMEN MAINTENANCE**

Ambient Temperature	25,000 Hours*	50,000 Hours*	60,000 Hours*	100,000 Hours	Theoretical L70 (Hours)
25°C	> 99%	> 97%	> 96%	> 93%	> 450,000
40°C	> 98%	> 97%	> 96%	> 92%	> 425,000
50°C	> 97%	> 96%	> 95%	> 91%	> 400,000

\* Per IESNA TM-21 data.

**LUMEN MULTIPLIER**

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99
50°C	0.96



**Job Name:**  
Hedges C  
Architect: Lance Mueller & Assoc. - Seattle  
(Seattle)

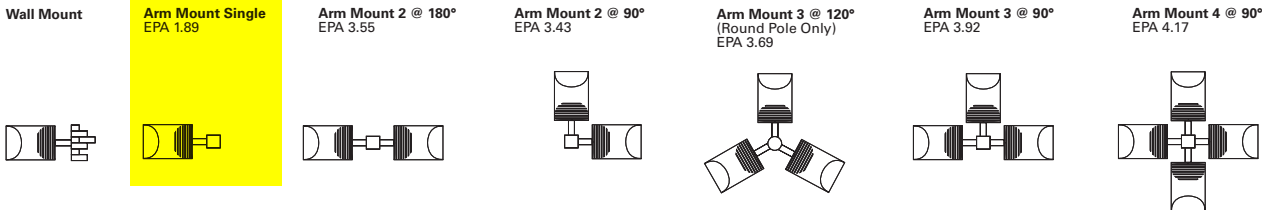
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BLUERIDGE-W18-63386

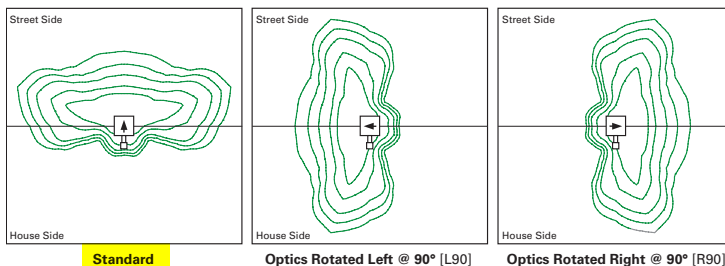
page 4

**TMU TALON MEDIUM LED**

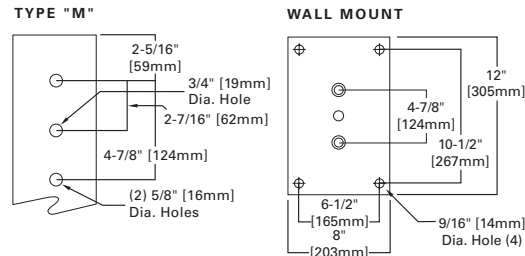
**MOUNTING CONFIGURATIONS**



**OPTIC ORIENTATION**



**ARM DRILLING**



**ORDERING INFORMATION**

Sample Number: TMU-E04-LED-E-U-T3-AP

Product Family <sup>1,2,3</sup>	Number of LightBARs <sup>4,5</sup>	Lamp Type	Ballast Type	Voltage	Distribution	Color <sup>7</sup>
<b>TMU=Talon Medium</b>	<b>E01=(1) 21 LED LightBAR</b> <b>E02=(2) 21 LED LightBARs</b> <b>E03=(3) 21 LED LightBARs</b> <b>E04=(4) 21 LED LightBARs</b> <b>E05=(5) 21 LED LightBARs</b> <b>E06=(6) 21 LED LightBARs</b> <b>F01=(1) 7 LED LightBAR</b> <b>F02=(2) 7 LED LightBARs</b> <b>F03=(3) 7 LED LightBARs</b> <b>F04=(4) 7 LED LightBARs</b> <b>F05=(5) 7 LED LightBARs</b> <b>F06=(6) 7 LED LightBARs</b>	<b>LED=Solid State Light Emitting Diodes</b>	<b>E=Electronic</b> <b>D=0-10V Dimming Drivers</b>	<b>U=Universal (120-277V)</b> <b>8=480V<sup>6</sup></b> <b>9=347V</b>	<b>T2=Type II</b> <b>T3=Type III</b> <b>T4=Type IV</b> <b>5MQ=Type V Square Medium</b> <b>5WQ=Type V Square Wide</b> <b>5XQ=Type V Square Extra Wide</b> <b>RW=Rectangular Wide</b> <b>SL2=Type II w/Spill Control</b> <b>SL3=Type III w/Spill Control</b> <b>SL4=Type IV w/Spill Control</b> <b>SLL=90° Spill Light Eliminator Left</b> <b>SLR=90° Spill Light Eliminator Right</b>	<b>AP=Grey</b> <b>BZ=Bronze</b> <b>BK=Black</b> <b>DP=Dark Platinum</b> <b>GM=Graphite Metallic</b> <b>WH=White</b>
<b>Options (Add as Suffix)</b>				<b>Accessories (Order Separately)<sup>18</sup></b>		
7030=70 CRI / 3000K CCT <sup>8</sup> 7050=70 CRI / 5000K CCT <sup>8</sup> 7060=70 CRI / 5700K CCT <sup>8</sup> 8030=80 CRI / 3000K CCT <sup>8</sup> P=Button Type Photocontrol (120, 208, 240 or 277V. Must Specify Voltage) 3=Three-Position Terminal Block 4=NEMA Twistlock Photocontrol Receptacle 4N7=7-PIN Twistlock Photocontrol Receptacle 2L=Two Circuits <sup>9</sup> DIM=0-10V Dimming Drivers <sup>10</sup> U=UL Listed/CSA Certified R=Electrical Power Tray L90=Optics Rotated Left 90° R90=Optics Rotated Right 90° LCF=LightBAR Cover Plate Matches Housing Finish DM=Direct Mount for Round or Square Pole DW=Direct Wall Mount MS=External Mast Arm Adapter WM=Wall Mount with Arm MS-LXX=Motion Sensor for On/Off Operation <sup>11</sup> MS/X-LXX=Motion Sensor for Bi-Level Operation <sup>12</sup> MS/DIM-LXX=Motion Sensor for Dimming Operation <sup>13,14</sup> HSS=Factory Installed House Side Shield <sup>15</sup>				MA1010-XX=Single Tenon Adapter for 3-1/2" O.D. Tenon MA1011-XX=2 @ 180° Tenon Adapter for 3-1/2" O.D. Tenon MA1012-XX=3 @ 120° Tenon Adapter for 3-1/2" O.D. Tenon MA1013-XX=4 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1014-XX=2 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1015-XX=2 @ 120° Tenon Adapter for 3-1/2" O.D. Tenon MA1016-XX=3 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1017-XX=Single Tenon Adapter for 2-3/8" O.D. Tenon MA1018-XX=2 @ 180° Tenon Adapter for 2-3/8" O.D. Tenon MA1019-XX=3 @ 120° Tenon Adapter for 2-3/8" O.D. Tenon MA1045-XX=4 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon MA1048-XX=2 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon MA1049-XX=3 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon FSR-100=Wireless Configuration Tool for Occupancy Sensor <sup>17</sup> OA/RA1016=NEMA Twistlock Photocontrol - Multi-Tap OA/RA1027=NEMA Twistlock Photocontrol - 480V OA/RA1201=NEMA Twistlock Photocontrol - 347V OA/RA1013=Photocontrol Shorting Cap MA1253=10kV Circuit Module Replacement LB/HSS-21=Field Installed House Side Shield for "E" LightBARs <sup>18</sup> LB/HSS-07=Field Installed House Side Shield for "F" LightBARs <sup>18</sup>		

**NOTES:**

- Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
- DesignLights Consortium<sup>1</sup> Qualified. Refer to [www.designlights.org](http://www.designlights.org) Qualified Products List under Family Models for details.
- 8" Arm and round pole adapter included with fixture.
- Standard 4000K CCT and nominal 70CRI.
- 21 LED LightBAR powered at 350mA, 7 LED LightBAR powered at 1A.
- Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
- Custom and RAL color matching available upon request. Consult your lighting representative at Eaton for more information.
- Extended lead times apply. See website for IES files.
- Low Level output varies by bar count specified. Consult factory for more information.
- Available in E02, E06 and F02, F06 only.
- Sensor housed in external box mounted to the luminaire. Available in E02-E6 and F02-F6 configurations. Replace XX with mounting height in feet for proper lens selection, (e.g., MS-L25). Consult factory for additional information.
- Sensor housed in external box mounted to the luminaire. Available in E02-E6 and F02-F6 configurations. Replace X with number of bars operating in low output mode and replace XX with mounting height for proper lens selection, (e.g., MS/3-L25). Maximum 4 bars in low output mode. Consult factory for additional information.
- Only available in E02-E06 and F02-F06. Not available in 347V or 480V. Must specify dimming driver.
- Replace XX with mounting height in feet for proper lens selection, (e.g., MS/DIM-L25).
- Only for use with SL2, SL3 and SL4 distributions. Not available with L90 or R90 options.
- Replace XX with color suffix.
- Only compatible with MS/DIM-LXX motion sensor.
- One required for each LightBAR. Not available with L90 or R90 options.



Eaton  
1121 Highway 74 South  
Peachtree City, GA 30269  
P: 770-486-4300  
[www.eaton.com/lighting](http://www.eaton.com/lighting)

Specifications and dimensions subject to change without notice.

TD500011EN  
March 1, 2018 11:12 AM

# Streetworks

**DESCRIPTION**

The Talon luminaire is the most versatile, functionally designed, universally adaptable outdoor luminaire available. Incorporating modular LED LightBAR™ technology, Talon brings outstanding uniformity and energy conscious illumination to walkways, parking lots, roadways, building areas and any security lighting application. UL/cUL listed for wet locations.

<b>Catalog #</b>		<b>Type</b>	
<b>Project</b>		<b>Date</b>	
<b>Comments</b>			
<b>Prepared by</b>			

**SPECIFICATION FEATURES**

**Construction**

One-piece heavy-wall, die-cast aluminum construction with integral reveal channels along top surface of housing. Optimized for reliable operation from 40°C down to -40°C, internal cast-in wall separates optical and electrical chambers allowing components to operate cooler. Stainless steel latches and hinges allow for tool-less opening and removal of door frame.

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Choice of twelve patented, high-efficiency AccuLED Optics™ distributions. Optics are precisely designed to shape the light output, maximizing efficiency and application spacing. AccuLED Optics technology creates consistent distributions with the scalability to meet customized application requirements. Offered **Standard in 4000K (+/- 275K) CCT** and minimum 70 CRI. Optional 3000K CCT, 5000K CCT and 5700K CCT. For the ultimate level of spill light control, an optional house-side shield accessory can be field or factory installed. The house-side shield is designed to seamlessly integrate with the SL2, SL3 or SL4 optics.

**Electrical**

LED drivers mount to die-cast aluminum back housing for optimal heat sinking, operation efficacy, and prolonged life. Standard drivers feature electronic universal voltage (120-277V 50/60Hz), 347V 60Hz or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Greater than 0.9 power factor, less than 20% harmonic distortion. All fixtures are shipped standard with 10kV/10kA common – and differential – mode surge protection. LightBARs feature an IP66 enclosure rating and maintain greater than 95% lumen maintenance at 60,000 hours per IESNA TM-21. Occupancy sensor and dimming options available.

**Mounting**

Extruded 8" aluminum arm includes internal bolt guides allowing for easy positioning of fixture during installation to pole or wall surface. Standard single carton packaging of housing, square pole arm and round pole adapter for contractor friendly arrival of product on site. 3G vibration rated.

**Finish**

Housing and arm finished in a five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Standard colors include black, bronze, grey, white, dark platinum and graphite metallic. RAL and custom color matches available. Consult the McGraw-Edison Architectural Colors brochure for the complete selection.

**Warranty**

Five-year warranty.



**TMU  
TALON MEDIUM  
LED**

1 - 6 LightBARs  
Solid State LED

ARCHITECTURAL AREA  
LUMINAIRE



**CERTIFICATION DATA**

UL/cUL Listed  
IP66 LightBARs  
3G Vibration Rated  
ISO 9001  
DesignLights Consortium® Qualified\*

**ENERGY DATA**

**Electronic LED Driver**  
>0.9 Power Factor  
<20% Total Harmonic Distortion  
120-277V/50 & 60Hz, 347V/60Hz,  
480V/60Hz  
-40°C Minimum Temperature  
40°C Maximum Ambient Temperature

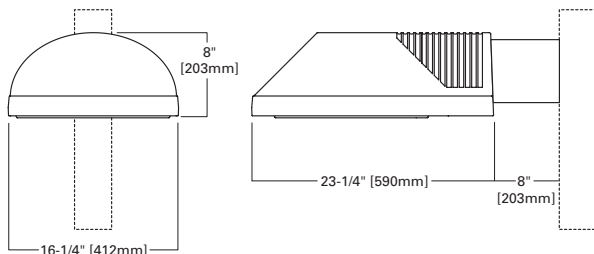
**EPA**

**Effective Projected Area:** (Sq. Ft.)  
Luminaire w/o Arm: 0.79  
Luminaire w/ Arm: 1.89  
8" Arm: 0.43

**SHIPPING DATA**

**Approximate Net Weight:**  
42 lbs. (19.09 kgs.)

**DIMENSIONS**



**POWER AND LUMENS BY BAR COUNT (21 LED LIGHTBARS)**

Number of LightBARs		E01	E02	E03	E04	E05	E06
<b>Drive Current</b>		350mA Drive Current					
<b>Power (Watts)</b>		25W	52W	75W	97W	127W	149W
<b>Current @ 120V (A)</b>		0.22	0.44	0.63	0.82	1.07	1.26
<b>Current @ 277V (A)</b>		0.10	0.20	0.28	0.36	0.48	0.56
<b>Power (Watts)</b>		31W	58W	82W	99W	132W	159W
<b>Current @ 347V (A)</b>		0.11	0.19	0.28	0.29	0.39	0.48
<b>Current @ 480V (A)</b>		0.09	0.15	0.20	0.21	0.30	0.36
<b>T2</b>	Lumens	3,064	6,128	9,192	12,255	15,319	18,383
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T3</b>	Lumens	3,084	6,168	9,252	12,336	15,420	18,504
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T4</b>	Lumens	3,022	6,044	9,066	12,088	15,110	18,132
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>5MQ</b>	Lumens	3,224	6,448	9,672	12,896	16,120	19,344
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2
<b>5WQ</b>	Lumens	3,184	6,368	9,551	12,735	15,919	19,103
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3
<b>5XQ</b>	Lumens	3,181	6,361	9,542	12,722	15,903	19,083
	BUG Rating	B2-U0-G2	B3-U0-G2	B3-U0-G3	B4-U0-G3	B4-U0-G4	B4-U0-G4
<b>SL2</b>	Lumens	3,055	6,110	9,165	12,220	15,275	18,331
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3
<b>SL3</b>	Lumens	3,036	6,072	9,108	12,145	15,181	18,217
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>SL4</b>	Lumens	2,954	5,908	8,862	11,816	14,771	17,725
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>RW</b>	Lumens	3,124	6,248	9,372	12,496	15,620	18,744
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4	B4-U0-G4
<b>SLL/SLR</b>	Lumens	2,782	5,565	8,347	11,130	13,912	16,695
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G3	B2-U0-G4

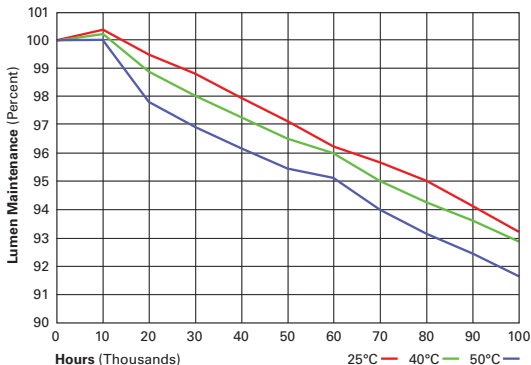
**LUMEN MAINTENANCE**

Ambient Temperature	25,000 Hours*	50,000 Hours*	60,000 Hours*	100,000 Hours	Theoretical L70 (Hours)
25°C	> 99%	> 97%	> 96%	> 93%	> 450,000
40°C	> 98%	> 97%	> 96%	> 92%	> 425,000
50°C	> 97%	> 96%	> 95%	> 91%	> 400,000

\* Per IESNA TM-21 data.

**LUMEN MULTIPLIER**

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99
50°C	0.96



**Job Name:**  
Hedges C  
Architect: Lance Mueller & Assoc. - Seattle  
(Seattle)

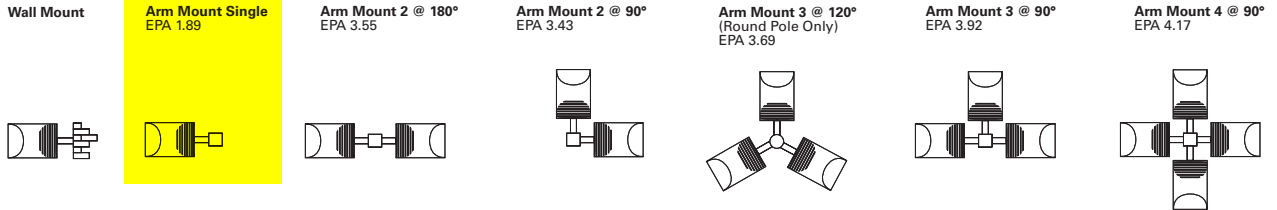
Notes:

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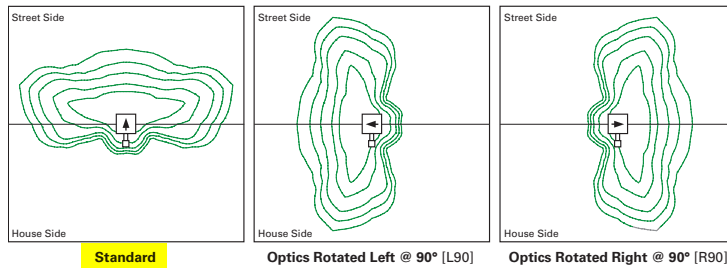
page 4

**TMU TALON MEDIUM LED**

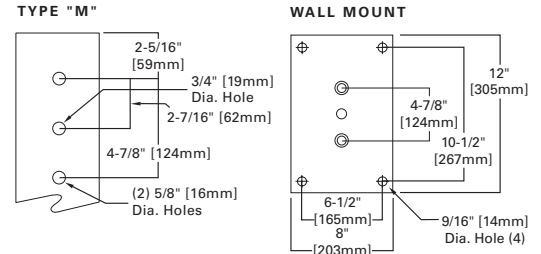
**MOUNTING CONFIGURATIONS**



**OPTIC ORIENTATION**



**ARM DRILLING**



**ORDERING INFORMATION**

Sample Number: TMU-E04-LED-E-U-T3-AP

Product Family <sup>1,2,3</sup>	Number of LightBARs <sup>4,5</sup>	Lamp Type	Ballast Type	Voltage	Distribution	Color <sup>7</sup>
<b>TMU=Talon Medium</b>	<b>E01=(1) 21 LED LightBAR</b> <b>E02=(2) 21 LED LightBARs</b> <b>E03=(3) 21 LED LightBARs</b> <b>E04=(4) 21 LED LightBARs</b> <b>E05=(5) 21 LED LightBARs</b> <b>E06=(6) 21 LED LightBARs</b> <b>F01=(1) 7 LED LightBAR</b> <b>F02=(2) 7 LED LightBARs</b> <b>F03=(3) 7 LED LightBARs</b> <b>F04=(4) 7 LED LightBARs</b> <b>F05=(5) 7 LED LightBARs</b> <b>F06=(6) 7 LED LightBARs</b>	<b>LED=Solid State Light Emitting Diodes</b>	<b>E=Electronic</b> <b>D=0-10V Dimming Drivers</b>	<b>U=Universal (120-277V)</b> <b>8=480V<sup>6</sup></b> <b>9=347V</b>	<b>T2=Type II</b> <b>T3=Type III</b> <b>T4=Type IV</b> <b>5MQ=Type V Square Medium</b> <b>5WQ=Type V Square Wide</b> <b>5XQ=Type V Square Extra Wide</b> <b>RW=Rectangular Wide</b> <b>SL2=Type II w/Spill Control</b> <b>SL3=Type III w/Spill Control</b> <b>SL4=Type IV w/Spill Control</b> <b>SLL=90° Spill Light Eliminator Left</b> <b>SLR=90° Spill Light Eliminator Right</b>	<b>AP=Grey</b> <b>BZ=Bronze</b> <b>BK=Black</b> <b>DP=Dark Platinum</b> <b>GM=Graphite Metallic</b> <b>WH=White</b>
<b>Options (Add as Suffix)</b>				<b>Accessories (Order Separately)<sup>18</sup></b>		
7030=70 CRI / 3000K CCT <sup>8</sup> 7050=70 CRI / 5000K CCT <sup>8</sup> 7060=70 CRI / 5700K CCT <sup>8</sup> 8030=80 CRI / 3000K CCT <sup>8</sup> P=Button Type Photocontrol (120, 208, 240 or 277V. Must Specify Voltage) 3=Three-Position Terminal Block 4=NEMA Twistlock Photocontrol Receptacle 4N7=7-PIN Twistlock Photocontrol Receptacle 2L=Two Circuits <sup>9</sup> DIM=0-10V Dimming Drivers <sup>10</sup> U=UL Listed/CSA Certified R=Electrical Power Tray L90=Optics Rotated Left 90° R90=Optics Rotated Right 90° LCF=LightBAR Cover Plate Matches Housing Finish DM=Direct Mount for Round or Square Pole DW=Direct Wall Mount MS=External Mast Arm Adapter WM=Wall Mount with Arm MS-LXX=Motion Sensor for On/Off Operation <sup>11</sup> MS/X-LXX=Motion Sensor for Bi-Level Operation <sup>12</sup> MS/DIM-LXX=Motion Sensor for Dimming Operation <sup>13,14</sup> HSS=Factory Installed House Side Shield <sup>15</sup>				MA1010-XX=Single Tenon Adapter for 3-1/2" O.D. Tenon MA1011-XX=2 @ 180° Tenon Adapter for 3-1/2" O.D. Tenon MA1012-XX=3 @ 120° Tenon Adapter for 3-1/2" O.D. Tenon MA1013-XX=4 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1014-XX=2 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1015-XX=2 @ 120° Tenon Adapter for 3-1/2" O.D. Tenon MA1016-XX=3 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1017-XX=Single Tenon Adapter for 2-3/8" O.D. Tenon MA1018-XX=2 @ 180° Tenon Adapter for 2-3/8" O.D. Tenon MA1019-XX=3 @ 120° Tenon Adapter for 2-3/8" O.D. Tenon MA1045-XX=4 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon MA1048-XX=2 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon MA1049-XX=3 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon FSR-100=Wireless Configuration Tool for Occupancy Sensor <sup>17</sup> OA/RA1016=NEMA Twistlock Photocontrol - Multi-Tap OA/RA1027=NEMA Twistlock Photocontrol - 480V OA/RA1201=NEMA Twistlock Photocontrol - 347V OA/RA1013=Photocontrol Shorting Cap MA1253=10kV Circuit Module Replacement LB/HSS-21=Field Installed House Side Shield for "E" LightBARs <sup>18</sup> LB/HSS-07=Field Installed House Side Shield for "F" LightBARs <sup>18</sup>		

- NOTES:**
- Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
  - DesignLights Consortium<sup>1</sup> Qualified. Refer to [www.designlights.org](http://www.designlights.org) Qualified Products List under Family Models for details.
  - 8" Arm and round pole adapter included with fixture.
  - Standard 4000K CCT and nominal 70CRI.
  - 21 LED LightBAR powered at 350mA, 7 LED LightBAR powered at 1A.
  - Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
  - Custom and RAL color matching available upon request. Consult your lighting representative at Eaton for more information.
  - Extended lead times apply. See website for IES files.
  - Low Level output varies by bar count specified. Consult factory for more information.
  - Available in E02, E06 and F02, F06 only.
  - Sensor housed in external box mounted to the luminaire. Available in E02-E6 and F02-F6 configurations. Replace XX with mounting height in feet for proper lens selection, (e.g., MS-L25). Consult factory for additional information.
  - Sensor housed in external box mounted to the luminaire. Available in E02-E6 and F02-F6 configurations. Replace X with number of bars operating in low output mode and replace XX with mounting height for proper lens selection, (e.g., MS/3-L25). Maximum 4 bars in low output mode. Consult factory for additional information.
  - Only available in E02-E06 and F02-F06. Not available in 347V or 480V. Must specify dimming driver.
  - Replace XX with mounting height in feet for proper lens selection, (e.g., MS/DIM-L25).
  - Only for use with SL2, SL3 and SL4 distributions. Not available with L90 or R90 options.
  - Replace XX with color suffix.
  - Only compatible with MS/DIM-LXX motion sensor.
  - One required for each LightBAR. Not available with L90 or R90 options.



Eaton  
1121 Highway 74 South  
Peachtree City, GA 30269  
P: 770-486-4300  
[www.eaton.com/lighting](http://www.eaton.com/lighting)

Specifications and dimensions subject to change without notice.

TD500011EN  
March 1, 2018 11:12 AM

Submitted by Blueridge Lighting & Controls		<b>Catalog Number:</b> TMU-E04-LED-E-U-T3 DUAL-GM	<b>Type:</b>  BLUERIDGE-W18-63386
<b>Job Name:</b> Hedges C Architect: Lance Mueller & Assoc. - Seattle (Seattle)		<b>Notes:</b>	

# Streetworks

## DESCRIPTION

The Talon luminaire is the most versatile, functionally designed, universally adaptable outdoor luminaire available. Incorporating modular LED LightBAR™ technology, Talon brings outstanding uniformity and energy conscious illumination to walkways, parking lots, roadways, building areas and any security lighting application. UL/cUL listed for wet locations.

<b>Catalog #</b>		<b>Type</b>	
<b>Project</b>		<b>Date</b>	
<b>Comments</b>			
<b>Prepared by</b>			

## SPECIFICATION FEATURES

### Construction

One-piece heavy-wall, die-cast aluminum construction with integral reveal channels along top surface of housing. Optimized for reliable operation from 40°C down to -40°C, internal cast-in wall separates optical and electrical chambers allowing components to operate cooler. Stainless steel latches and hinges allow for tool-less opening and removal of door frame.

### Optics

Choice of twelve patented, high-efficiency AccuLED Optics™ distributions. Optics are precisely designed to shape the light output, maximizing efficiency and application spacing. AccuLED Optics technology creates consistent distributions with the scalability to meet customized application requirements. Offered **Standard in 4000K** (+/- 275K) CCT and minimum 70 CRI. Optional 3000K CCT, 5000K CCT and 5700K CCT. For the ultimate level of spill light control, an optional house-side shield accessory can be field or factory installed. The house-side shield is designed to seamlessly integrate with the SL2, SL3 or SL4 optics.

### Electrical

LED drivers mount to die-cast aluminum back housing for optimal heat sinking, operation efficacy, and prolonged life. Standard drivers feature electronic universal voltage (120-277V 50/60Hz), 347V 60Hz or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Greater than 0.9 power factor, less than 20% harmonic distortion. All fixtures are shipped standard with 10kV/10kA common – and differential – mode surge protection. LightBARs feature an IP66 enclosure rating and maintain greater than 95% lumen maintenance at 60,000 hours per IESNA TM-21. Occupancy sensor and dimming options available.

### Mounting

Extruded 8" aluminum arm includes internal bolt guides allowing for easy positioning of fixture during installation to pole or wall surface. Standard single carton packaging of housing, square pole arm and round pole adapter for contractor friendly arrival of product on site. 3G vibration rated.

### Finish

Housing and arm finished in a five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Standard colors include black, bronze, grey, white, dark platinum and graphite metallic. RAL and custom color matches available. Consult the McGraw-Edison Architectural Colors brochure for the complete selection.

### Warranty

Five-year warranty.



## TMU TALON MEDIUM LED

1 - 6 LightBARs  
Solid State LED

ARCHITECTURAL AREA  
LUMINAIRE



### CERTIFICATION DATA

UL/cUL Listed  
IP66 LightBARs  
3G Vibration Rated  
ISO 9001  
DesignLights Consortium® Qualified\*

### ENERGY DATA

**Electronic LED Driver**  
>0.9 Power Factor  
<20% Total Harmonic Distortion  
120-277V/50 & 60Hz, 347V/60Hz,  
480V/60Hz  
-40°C Minimum Temperature  
40°C Maximum Ambient Temperature

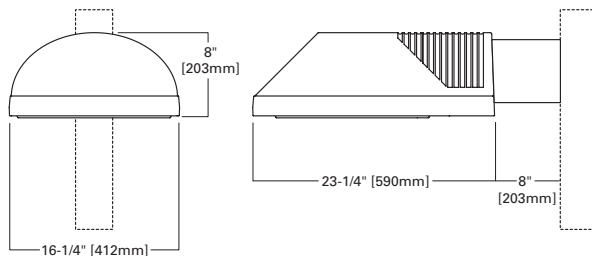
### EPA

**Effective Projected Area:** (Sq. Ft.)  
Luminaire w/o Arm: 0.79  
Luminaire w/ Arm: 1.89  
8" Arm: 0.43

### SHIPPING DATA

**Approximate Net Weight:**  
42 lbs. (19.09 kgs.)

## DIMENSIONS



\*www.designlights.org



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March 1, 2018 11:12 AM

**POWER AND LUMENS BY BAR COUNT (21 LED LIGHTBARS)**

Number of LightBARs		E01	E02	E03	E04	E05	E06
<b>Drive Current</b>		350mA Drive Current					
<b>Power (Watts)</b>		25W	52W	75W	97W	127W	149W
<b>Current @ 120V (A)</b>		0.22	0.44	0.63	0.82	1.07	1.26
<b>Current @ 277V (A)</b>		0.10	0.20	0.28	0.36	0.48	0.56
<b>Power (Watts)</b>		31W	58W	82W	99W	132W	159W
<b>Current @ 347V (A)</b>		0.11	0.19	0.28	0.29	0.39	0.48
<b>Current @ 480V (A)</b>		0.09	0.15	0.20	0.21	0.30	0.36
<b>T2</b>	Lumens	3,064	6,128	9,192	12,255	15,319	18,383
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T3</b>	Lumens	3,084	6,168	9,252	12,336	15,420	18,504
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T4</b>	Lumens	3,022	6,044	9,066	12,088	15,110	18,132
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>5MQ</b>	Lumens	3,224	6,448	9,672	12,896	16,120	19,344
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2
<b>5WQ</b>	Lumens	3,184	6,368	9,551	12,735	15,919	19,103
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3
<b>5XQ</b>	Lumens	3,181	6,361	9,542	12,722	15,903	19,083
	BUG Rating	B2-U0-G2	B3-U0-G2	B3-U0-G3	B4-U0-G3	B4-U0-G4	B4-U0-G4
<b>SL2</b>	Lumens	3,055	6,110	9,165	12,220	15,275	18,331
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3
<b>SL3</b>	Lumens	3,036	6,072	9,108	12,145	15,181	18,217
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>SL4</b>	Lumens	2,954	5,908	8,862	11,816	14,771	17,725
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>RW</b>	Lumens	3,124	6,248	9,372	12,496	15,620	18,744
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4	B4-U0-G4
<b>SLL/SLR</b>	Lumens	2,782	5,565	8,347	11,130	13,912	16,695
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G3	B2-U0-G4

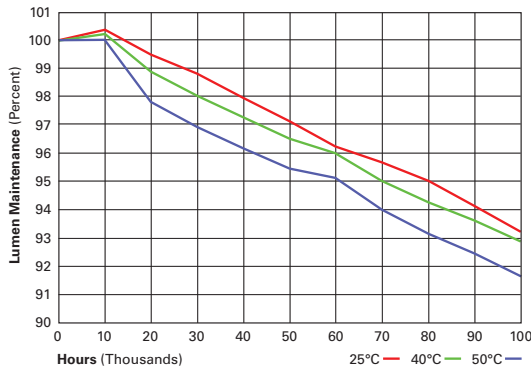
**LUMEN MAINTENANCE**

Ambient Temperature	25,000 Hours*	50,000 Hours*	60,000 Hours*	100,000 Hours	Theoretical L70 (Hours)
25°C	> 99%	> 97%	> 96%	> 93%	> 450,000
40°C	> 98%	> 97%	> 96%	> 92%	> 425,000
50°C	> 97%	> 96%	> 95%	> 91%	> 400,000

\* Per IESNA TM-21 data.

**LUMEN MULTIPLIER**

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99
50°C	0.96



**Job Name:**  
Hedges C  
Architect: Lance Mueller & Assoc. - Seattle  
(Seattle)

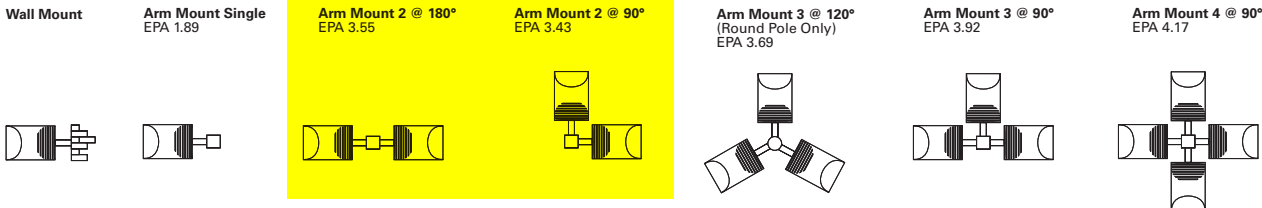
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BLUERIDGE-W18-63386

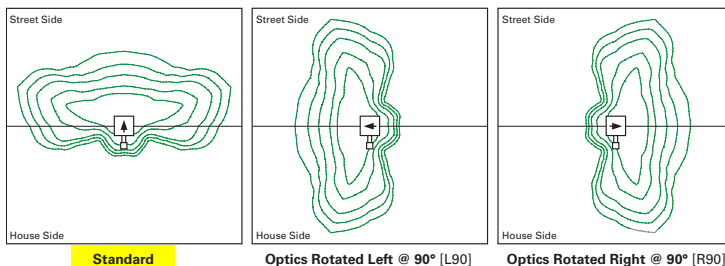
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TMU TALON MEDIUM LED

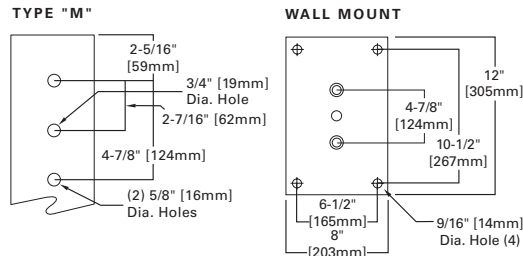
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**ARM DRILLING**



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<b>Options (Add as Suffix)</b>				<b>Accessories (Order Separately)<sup>18</sup></b>		
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- Extended lead times apply. See website for IES files.
- Low Level output varies by bar count specified. Consult factory for more information.
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- Replace XX with color suffix.
- Only compatible with MS/DIM-LXX motion sensor.
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Eaton  
1121 Highway 74 South  
Peachtree City, GA 30269  
P: 770-486-4300  
[www.eaton.com/lighting](http://www.eaton.com/lighting)

Specifications and dimensions subject to change without notice.

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# Streetworks

**DESCRIPTION**

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<b>Catalog #</b>		<b>Type</b>	
<b>Project</b>		<b>Date</b>	
<b>Comments</b>			
<b>Prepared by</b>			

**SPECIFICATION FEATURES**

**Construction**

One-piece heavy-wall, die-cast aluminum construction with integral reveal channels along top surface of housing. Optimized for reliable operation from 40°C down to -40°C, internal cast-in wall separates optical and electrical chambers allowing components to operate cooler. Stainless steel latches and hinges allow for tool-less opening and removal of door frame.

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**Electrical**

LED drivers mount to die-cast aluminum back housing for optimal heat sinking, operation efficacy, and prolonged life. Standard drivers feature electronic universal voltage (120-277V 50/60Hz), 347V 60Hz or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Greater than 0.9 power factor, less than 20% harmonic distortion. All fixtures are shipped standard with 10kV/10kA common – and differential – mode surge protection. LightBARs feature an IP66 enclosure rating and maintain greater than 95% lumen maintenance at 60,000 hours per IESNA TM-21. Occupancy sensor and dimming options available.

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**Warranty**

Five-year warranty.



**TMU  
TALON MEDIUM  
LED**

1 - 6 LightBARs  
Solid State LED

ARCHITECTURAL AREA  
LUMINAIRE



**CERTIFICATION DATA**

UL/cUL Listed  
IP66 LightBARs  
3G Vibration Rated  
ISO 9001  
DesignLights Consortium® Qualified\*

**ENERGY DATA**

**Electronic LED Driver**  
>0.9 Power Factor  
<20% Total Harmonic Distortion  
120-277V/50 & 60Hz, 347V/60Hz,  
480V/60Hz  
-40°C Minimum Temperature  
40°C Maximum Ambient Temperature

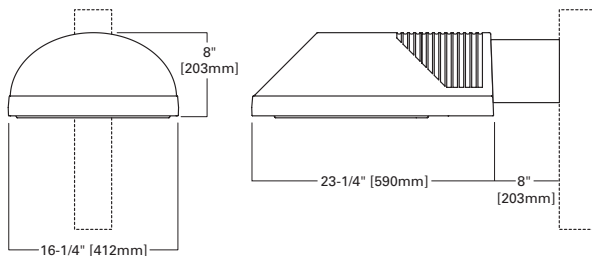
**EPA**

**Effective Projected Area:** (Sq. Ft.)  
Luminaire w/o Arm: 0.79  
Luminaire w/ Arm: 1.89  
8" Arm: 0.43

**SHIPPING DATA**

**Approximate Net Weight:**  
42 lbs. (19.09 kgs.)

**DIMENSIONS**



**POWER AND LUMENS BY BAR COUNT (21 LED LIGHTBARS)**

Number of LightBARs		E01	E02	E03	E04	E05	E06
<b>Drive Current</b>		350mA Drive Current					
<b>Power (Watts)</b>		25W	52W	75W	97W	127W	149W
<b>Current @ 120V (A)</b>		0.22	0.44	0.63	0.82	1.07	1.26
<b>Current @ 277V (A)</b>		0.10	0.20	0.28	0.36	0.48	0.56
<b>Power (Watts)</b>		31W	58W	82W	99W	132W	159W
<b>Current @ 347V (A)</b>		0.11	0.19	0.28	0.29	0.39	0.48
<b>Current @ 480V (A)</b>		0.09	0.15	0.20	0.21	0.30	0.36
<b>T2</b>	Lumens	3,064	6,128	9,192	12,255	15,319	18,383
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T3</b>	Lumens	3,084	6,168	9,252	12,336	15,420	18,504
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T4</b>	Lumens	3,022	6,044	9,066	12,088	15,110	18,132
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>5MQ</b>	Lumens	3,224	6,448	9,672	12,896	16,120	19,344
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2
<b>5WQ</b>	Lumens	3,184	6,368	9,551	12,735	15,919	19,103
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3
<b>5XQ</b>	Lumens	3,181	6,361	9,542	12,722	15,903	19,083
	BUG Rating	B2-U0-G2	B3-U0-G2	B3-U0-G3	B4-U0-G3	B4-U0-G4	B4-U0-G4
<b>SL2</b>	Lumens	3,055	6,110	9,165	12,220	15,275	18,331
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3
<b>SL3</b>	Lumens	3,036	6,072	9,108	12,145	15,181	18,217
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>SL4</b>	Lumens	2,954	5,908	8,862	11,816	14,771	17,725
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>RW</b>	Lumens	3,124	6,248	9,372	12,496	15,620	18,744
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4	B4-U0-G4
<b>SLL/SLR</b>	Lumens	2,782	5,565	8,347	11,130	13,912	16,695
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G3	B2-U0-G4

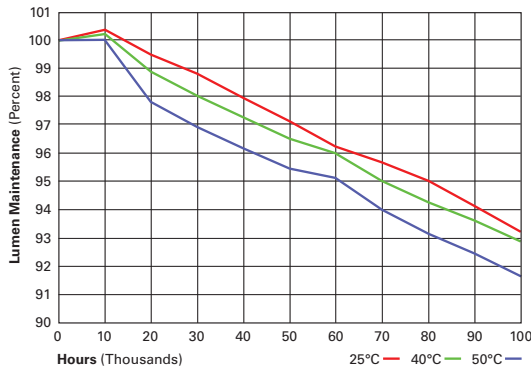
**LUMEN MAINTENANCE**

Ambient Temperature	25,000 Hours*	50,000 Hours*	60,000 Hours*	100,000 Hours	Theoretical L70 (Hours)
25°C	> 99%	> 97%	> 96%	> 93%	> 450,000
40°C	> 98%	> 97%	> 96%	> 92%	> 425,000
50°C	> 97%	> 96%	> 95%	> 91%	> 400,000

\* Per IESNA TM-21 data.

**LUMEN MULTIPLIER**

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99
50°C	0.96



**Job Name:**  
Hedges C  
Architect: Lance Mueller & Assoc. - Seattle  
(Seattle)

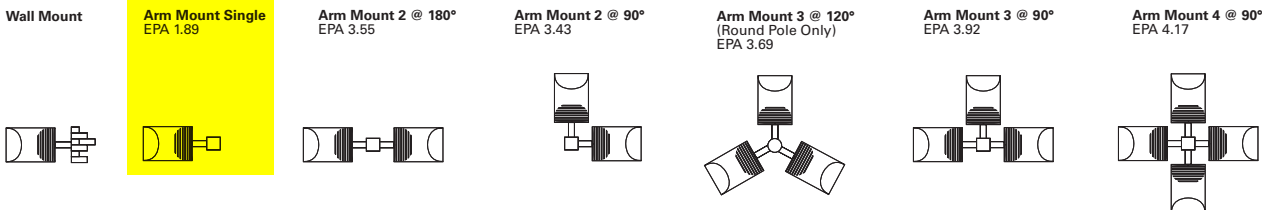
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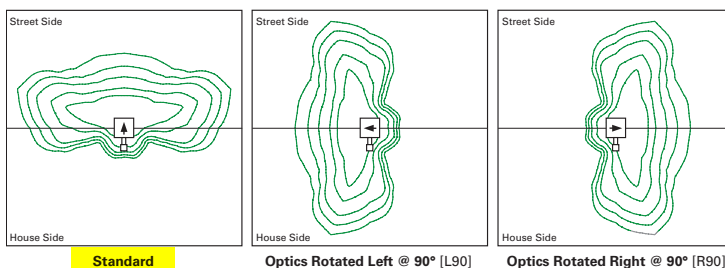
page 4

**TMU TALON MEDIUM LED**

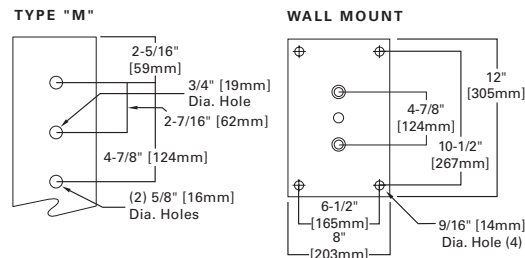
**MOUNTING CONFIGURATIONS**



**OPTIC ORIENTATION**



**ARM DRILLING**



**ORDERING INFORMATION**

Sample Number: TMU-E04-LED-E-U-T3-AP

Product Family <sup>1,2,3</sup>	Number of LightBARs <sup>4,5</sup>	Lamp Type	Ballast Type	Voltage	Distribution	Color <sup>7</sup>
TMU=Talon Medium	E01=(1) 21 LED LightBAR E02=(2) 21 LED LightBARs E03=(3) 21 LED LightBARs E04=(4) 21 LED LightBARs E05=(5) 21 LED LightBARs E06=(6) 21 LED LightBARs F01=(1) 7 LED LightBAR F02=(2) 7 LED LightBARs F03=(3) 7 LED LightBARs F04=(4) 7 LED LightBARs F05=(5) 7 LED LightBARs F06=(6) 7 LED LightBARs	LED=Solid State Light Emitting Diodes	E=Electronic D=0-10V Dimming Drivers	U=Universal (120-277V) 8=480V <sup>6</sup> 9=347V	T2=Type II T3=Type III T4=Type IV 5MQ=Type V Square Medium 5WQ=Type V Square Wide 5XQ=Type V Square Extra Wide RW=Rectangular Wide SL2=Type II w/Spill Control SL3=Type III w/Spill Control SL4=Type IV w/Spill Control SLL=90° Spill Light Eliminator Left SLR=90° Spill Light Eliminator Right	AP=Grey BZ=Bronze BK=Black DP=Dark Platinum GM=Graphite Metallic WH=White
<b>Options (Add as Suffix)</b>				<b>Accessories (Order Separately)<sup>18</sup></b>		
7030=70 CRI / 3000K CCT <sup>8</sup> 7050=70 CRI / 5000K CCT <sup>8</sup> 7060=70 CRI / 5700K CCT <sup>8</sup> 8030=80 CRI / 3000K CCT <sup>8</sup> P=Button Type Photocontrol (120, 208, 240 or 277V. Must Specify Voltage) 3=Three-Position Terminal Block 4=NEMA Twistlock Photocontrol Receptacle 4N7=7-PIN Twistlock Photocontrol Receptacle 2L=Two Circuits <sup>9</sup> DIM=0-10V Dimming Drivers <sup>10</sup> U=UL Listed/CSA Certified R=Electrical Power Tray L90=Optics Rotated Left 90° R90=Optics Rotated Right 90° LCF=LightBAR Cover Plate Matches Housing Finish DM=Direct Mount for Round or Square Pole DW=Direct Wall Mount MS=External Mast Arm Adapter WM=Wall Mount with Arm MS-LXX=Motion Sensor for On/Off Operation <sup>11</sup> MS/X-LXX=Motion Sensor for Bi-Level Operation <sup>12</sup> MS/DIM-LXX=Motion Sensor for Dimming Operation <sup>13,14</sup> HSS=Factory Installed House Side Shield <sup>15</sup>				MA1010-XX=Single Tenon Adapter for 3-1/2" O.D. Tenon MA1011-XX=2 @ 180° Tenon Adapter for 3-1/2" O.D. Tenon MA1012-XX=3 @ 120° Tenon Adapter for 3-1/2" O.D. Tenon MA1013-XX=4 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1014-XX=2 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1015-XX=2 @ 120° Tenon Adapter for 3-1/2" O.D. Tenon MA1016-XX=3 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1017-XX=Single Tenon Adapter for 2-3/8" O.D. Tenon MA1018-XX=2 @ 180° Tenon Adapter for 2-3/8" O.D. Tenon MA1019-XX=3 @ 120° Tenon Adapter for 2-3/8" O.D. Tenon MA1045-XX=4 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon MA1048-XX=2 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon MA1049-XX=3 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon FSR-100=Wireless Configuration Tool for Occupancy Sensor <sup>17</sup> OA/RA1016=NEMA Twistlock Photocontrol - Multi-Tap OA/RA1027=NEMA Twistlock Photocontrol - 480V OA/RA1201=NEMA Twistlock Photocontrol - 347V OA/RA1013=Photocontrol Shorting Cap MA1253=10kV Circuit Module Replacement LB/HSS-21=Field Installed House Side Shield for "E" LightBARs <sup>18</sup> LB/HSS-07=Field Installed House Side Shield for "F" LightBARs <sup>18</sup>		

**NOTES:**

- Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
- DesignLights Consortium<sup>®</sup> Qualified. Refer to [www.designlights.org](http://www.designlights.org) Qualified Products List under Family Models for details.
- 8" Arm and round pole adapter included with fixture.
- Standard 4000K CCT and nominal 70CRI.
- 21 LED LightBAR powered at 350mA, 7 LED LightBAR powered at 1A.
- Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
- Custom and RAL color matching available upon request. Consult your lighting representative at Eaton for more information.
- Extended lead times apply. See website for IES files.
- Low Level output varies by bar count specified. Consult factory for more information.
- Available in E02, E06 and F02, F06 only.
- Sensor housed in external box mounted to the luminaire. Available in E02-E6 and F02-F6 configurations. Replace XX with mounting height in feet for proper lens selection, (e.g., MS-L25). Consult factory for additional information.
- Sensor housed in external box mounted to the luminaire. Available in E02-E6 and F02-F6 configurations. Replace X with number of bars operating in low output mode and replace XX with mounting height for proper lens selection, (e.g., MS/3-L25). Maximum 4 bars in low output mode. Consult factory for additional information.
- Only available in E02-E06 and F02-F06. Not available in 347V or 480V. Must specify dimming driver.
- Replace XX with mounting height in feet for proper lens selection, (e.g., MS/DIM-L25).
- Only for use with SL2, SL3 and SL4 distributions. Not available with L90 or R90 options.
- Replace XX with color suffix.
- Only compatible with MS/DIM-LXX motion sensor.
- One required for each LightBAR. Not available with L90 or R90 options.



Eaton  
1121 Highway 74 South  
Peachtree City, GA 30269  
P: 770-486-4300  
[www.eaton.com/lighting](http://www.eaton.com/lighting)

Specifications and dimensions subject to change without notice.

TD500011EN  
March 1, 2018 11:12 AM

# Streetworks

**DESCRIPTION**

The Talon luminaire is the most versatile, functionally designed, universally adaptable outdoor luminaire available. Incorporating modular LED LightBAR™ technology, Talon brings outstanding uniformity and energy conscious illumination to walkways, parking lots, roadways, building areas and any security lighting application. UL/cUL listed for wet locations.

<b>Catalog #</b>		<b>Type</b>	
<b>Project</b>		<b>Date</b>	
<b>Comments</b>			
<b>Prepared by</b>			

**SPECIFICATION FEATURES**

**Construction**

One-piece heavy-wall, die-cast aluminum construction with integral reveal channels along top surface of housing. Optimized for reliable operation from 40°C down to -40°C, internal cast-in wall separates optical and electrical chambers allowing components to operate cooler. Stainless steel latches and hinges allow for tool-less opening and removal of door frame.

**Optics**

Choice of twelve patented, high-efficiency AccuLED Optics™ distributions. Optics are precisely designed to shape the light output, maximizing efficiency and application spacing. AccuLED Optics technology creates consistent distributions with the scalability to meet customized application requirements. Offered **Standard in 4000K** (+/- 275K) CCT and minimum 70 CRI. Optional 3000K CCT, 5000K CCT and 5700K CCT. For the ultimate level of spill light control, an optional house-side shield accessory can be field or factory installed. The house-side shield is designed to seamlessly integrate with the SL2, SL3 or SL4 optics.

**Electrical**

LED drivers mount to die-cast aluminum back housing for optimal heat sinking, operation efficacy, and prolonged life. Standard drivers feature electronic universal voltage (120-277V 50/60Hz), 347V 60Hz or 480V 60Hz operation. 480V is compatible for use with 480V Wye systems only. Greater than 0.9 power factor, less than 20% harmonic distortion. All fixtures are shipped standard with 10kV/10kA common – and differential – mode surge protection. LightBARs feature an IP66 enclosure rating and maintain greater than 95% lumen maintenance at 60,000 hours per IESNA TM-21. Occupancy sensor and dimming options available.

**Mounting**

Extruded 8" aluminum arm includes internal bolt guides allowing for easy positioning of fixture during installation to pole or wall surface. Standard single carton packaging of housing, square pole arm and round pole adapter for contractor friendly arrival of product on site. 3G vibration rated.

**Finish**

Housing and arm finished in a five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness for superior protection against fade and wear. Standard colors include black, bronze, grey, white, dark platinum and graphite metallic. RAL and custom color matches available. Consult the McGraw-Edison Architectural Colors brochure for the complete selection.

**Warranty**

Five-year warranty.



**TMU  
TALON MEDIUM  
LED**

1 - 6 LightBARs  
Solid State LED

ARCHITECTURAL AREA  
LUMINAIRE



**CERTIFICATION DATA**

UL/cUL Listed  
IP66 LightBARs  
3G Vibration Rated  
ISO 9001  
DesignLights Consortium® Qualified\*

**ENERGY DATA**

**Electronic LED Driver**  
>0.9 Power Factor  
<20% Total Harmonic Distortion  
120-277V/50 & 60Hz, 347V/60Hz,  
480V/60Hz  
-40°C Minimum Temperature  
40°C Maximum Ambient Temperature

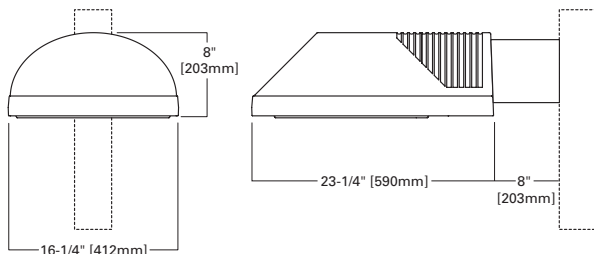
**EPA**

**Effective Projected Area:** (Sq. Ft.)  
Luminaire w/o Arm: 0.79  
Luminaire w/ Arm: 1.89  
8" Arm: 0.43

**SHIPPING DATA**

**Approximate Net Weight:**  
42 lbs. (19.09 kgs.)

**DIMENSIONS**



**POWER AND LUMENS BY BAR COUNT (21 LED LIGHTBARS)**

Number of LightBARs		E01	E02	E03	E04	E05	E06
<b>Drive Current</b>		350mA Drive Current					
<b>Power (Watts)</b>		25W	52W	75W	97W	127W	149W
<b>Current @ 120V (A)</b>		0.22	0.44	0.63	0.82	1.07	1.26
<b>Current @ 277V (A)</b>		0.10	0.20	0.28	0.36	0.48	0.56
<b>Power (Watts)</b>		31W	58W	82W	99W	132W	159W
<b>Current @ 347V (A)</b>		0.11	0.19	0.28	0.29	0.39	0.48
<b>Current @ 480V (A)</b>		0.09	0.15	0.20	0.21	0.30	0.36
<b>T2</b>	Lumens	3,064	6,128	9,192	12,255	15,319	18,383
	BUG Rating	B1-U0-G1	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T3</b>	Lumens	3,084	6,168	9,252	12,336	15,420	18,504
	BUG Rating	B1-U0-G1	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3	B3-U0-G3
<b>T4</b>	Lumens	3,022	6,044	9,066	12,088	15,110	18,132
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>5MQ</b>	Lumens	3,224	6,448	9,672	12,896	16,120	19,344
	BUG Rating	B2-U0-G1	B3-U0-G1	B3-U0-G2	B4-U0-G2	B4-U0-G2	B4-U0-G2
<b>5WQ</b>	Lumens	3,184	6,368	9,551	12,735	15,919	19,103
	BUG Rating	B2-U0-G1	B3-U0-G1	B4-U0-G2	B4-U0-G2	B4-U0-G2	B5-U0-G3
<b>5XQ</b>	Lumens	3,181	6,361	9,542	12,722	15,903	19,083
	BUG Rating	B2-U0-G2	B3-U0-G2	B3-U0-G3	B4-U0-G3	B4-U0-G4	B4-U0-G4
<b>SL2</b>	Lumens	3,055	6,110	9,165	12,220	15,275	18,331
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B3-U0-G3	B3-U0-G3
<b>SL3</b>	Lumens	3,036	6,072	9,108	12,145	15,181	18,217
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>SL4</b>	Lumens	2,954	5,908	8,862	11,816	14,771	17,725
	BUG Rating	B1-U0-G1	B1-U0-G2	B2-U0-G2	B2-U0-G2	B2-U0-G3	B3-U0-G3
<b>RW</b>	Lumens	3,124	6,248	9,372	12,496	15,620	18,744
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B4-U0-G4	B4-U0-G4	B4-U0-G4
<b>SLL/SLR</b>	Lumens	2,782	5,565	8,347	11,130	13,912	16,695
	BUG Rating	B1-U0-G1	B1-U0-G2	B1-U0-G3	B2-U0-G3	B2-U0-G3	B2-U0-G4

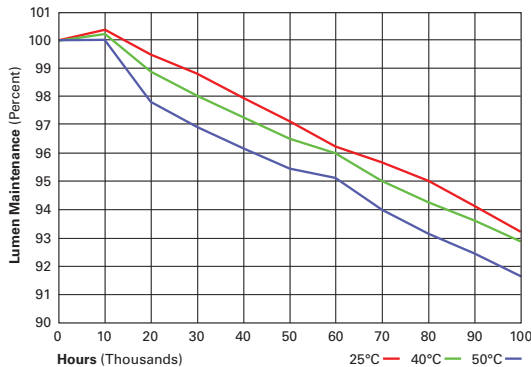
**LUMEN MAINTENANCE**

Ambient Temperature	25,000 Hours*	50,000 Hours*	60,000 Hours*	100,000 Hours	Theoretical L70 (Hours)
25°C	> 99%	> 97%	> 96%	> 93%	> 450,000
40°C	> 98%	> 97%	> 96%	> 92%	> 425,000
50°C	> 97%	> 96%	> 95%	> 91%	> 400,000

\* Per IESNA TM-21 data.

**LUMEN MULTIPLIER**

Ambient Temperature	Lumen Multiplier
10°C	1.02
15°C	1.01
25°C	1.00
40°C	0.99
50°C	0.96



**Job Name:**  
Hedges C  
Architect: Lance Mueller & Assoc. - Seattle  
(Seattle)

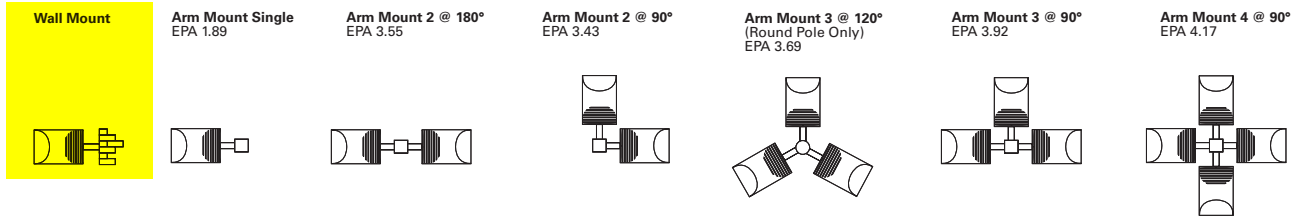
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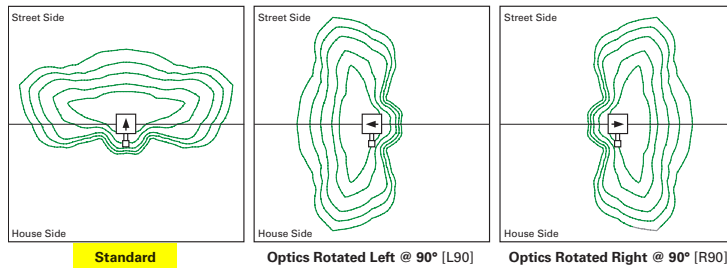
page 4

TMU TALON MEDIUM LED

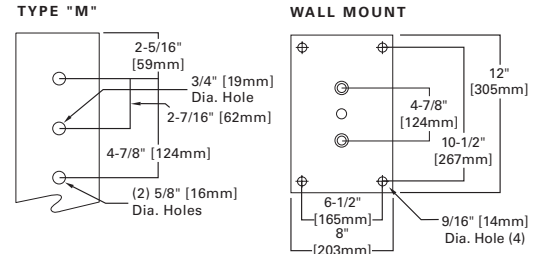
**MOUNTING CONFIGURATIONS**



**OPTIC ORIENTATION**



**ARM DRILLING**



**ORDERING INFORMATION**

Sample Number: TMU-E04-LED-E-U-T3-AP

Product Family <sup>1,2,3</sup>	Number of LightBARs <sup>4,5</sup>	Lamp Type	Ballast Type	Voltage	Distribution	Color <sup>7</sup>
TMU=Talon Medium	E01=(1) 21 LED LightBAR E02=(2) 21 LED LightBARs E03=(3) 21 LED LightBARs E04=(4) 21 LED LightBARs E05=(5) 21 LED LightBARs E06=(6) 21 LED LightBARs F01=(1) 7 LED LightBAR F02=(2) 7 LED LightBARs F03=(3) 7 LED LightBARs F04=(4) 7 LED LightBARs F05=(5) 7 LED LightBARs F06=(6) 7 LED LightBARs	LED=Solid State Light Emitting Diodes	E=Electronic D=0-10V Dimming Drivers	U=Universal (120-277V) 8=480V <sup>6</sup> 9=347V	T2=Type II T3=Type III T4=Type IV 5MQ=Type V Square Medium 5WQ=Type V Square Wide 5XQ=Type V Square Extra Wide RW=Rectangular Wide SL2=Type II w/Spill Control SL3=Type III w/Spill Control SL4=Type IV w/Spill Control SLL=90° Spill Light Eliminator Left SLR=90° Spill Light Eliminator Right	AP=Grey BZ=Bronze BK=Black DP=Dark Platinum GM=Graphite Metallic WH=White
<b>Options (Add as Suffix)</b>				<b>Accessories (Order Separately)<sup>18</sup></b>		
7030=70 CRI / 3000K CCT <sup>8</sup> 7050=70 CRI / 5000K CCT <sup>8</sup> 7060=70 CRI / 5700K CCT <sup>8</sup> 8030=80 CRI / 3000K CCT <sup>8</sup> P=Button Type Photocontrol (120, 208, 240 or 277V. Must Specify Voltage) 3=Three-Position Terminal Block 4=NEMA Twistlock Photocontrol Receptacle 4N7=7-PIN Twistlock Photocontrol Receptacle 2L=Two Circuits <sup>9</sup> DIM=0-10V Dimming Drivers <sup>10</sup> U=UL Listed/CSA Certified R=Electrical Power Tray L90=Optics Rotated Left 90° R90=Optics Rotated Right 90° LCF=LightBAR Cover Plate Matches Housing Finish DM=Direct Mount for Round or Square Pole DW=Direct Wall Mount MS=External Mast Arm Adapter WM=Wall Mount with Arm MS-LXX=Motion Sensor for On/Off Operation <sup>11</sup> MS/X-LXX=Motion Sensor for Bi-Level Operation <sup>12</sup> MS/DIM-LXX=Motion Sensor for Dimming Operation <sup>13,14</sup> HSS=Factory Installed House Side Shield <sup>15</sup>				MA1010-XX=Single Tenon Adapter for 3-1/2" O.D. Tenon MA1011-XX=2 @ 180° Tenon Adapter for 3-1/2" O.D. Tenon MA1012-XX=3 @ 120° Tenon Adapter for 3-1/2" O.D. Tenon MA1013-XX=4 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1014-XX=2 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1015-XX=2 @ 120° Tenon Adapter for 3-1/2" O.D. Tenon MA1016-XX=3 @ 90° Tenon Adapter for 3-1/2" O.D. Tenon MA1017-XX=Single Tenon Adapter for 2-3/8" O.D. Tenon MA1018-XX=2 @ 180° Tenon Adapter for 2-3/8" O.D. Tenon MA1019-XX=3 @ 120° Tenon Adapter for 2-3/8" O.D. Tenon MA1045-XX=4 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon MA1048-XX=2 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon MA1049-XX=3 @ 90° Tenon Adapter for 2-3/8" O.D. Tenon FSR-100=Wireless Configuration Tool for Occupancy Sensor <sup>17</sup> OA/RA1016=NEMA Twistlock Photocontrol - Multi-Tap OA/RA1027=NEMA Twistlock Photocontrol - 480V OA/RA1201=NEMA Twistlock Photocontrol - 347V OA/RA1013=Photocontrol Shorting Cap MA1253=10kV Circuit Module Replacement LB/HSS-21=Field Installed House Side Shield for "E" LightBARs <sup>18</sup> LB/HSS-07=Field Installed House Side Shield for "F" LightBARs <sup>18</sup>		

**NOTES:**

- Customer is responsible for engineering analysis to confirm pole and fixture compatibility for all applications. Refer to our white paper WP513001EN for additional support information.
- DesignLights Consortium<sup>®</sup> Qualified. Refer to [www.designlights.org](http://www.designlights.org) Qualified Products List under Family Models for details.
- 8" Arm and round pole adapter included with fixture.
- Standard 4000K CCT and nominal 70CRI.
- 21 LED LightBAR powered at 350mA, 7 LED LightBAR powered at 1A.
- Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
- Custom and RAL color matching available upon request. Consult your lighting representative at Eaton for more information.
- Extended lead times apply. See website for IES files.
- Low Level output varies by bar count specified. Consult factory for more information.
- Available in E02, E06 and F02, F06 only.
- Sensor housed in external box mounted to the luminaire. Available in E02-E6 and F02-F6 configurations. Replace XX with mounting height in feet for proper lens selection, (e.g., MS-L25). Consult factory for additional information.
- Sensor housed in external box mounted to the luminaire. Available in E02-E6 and F02-F6 configurations. Replace X with number of bars operating in low output mode and replace XX with mounting height for proper lens selection, (e.g., MS/3-L25). Maximum 4 bars in low output mode. Consult factory for additional information.
- Only available in E02-E06 and F02-F06. Not available in 347V or 480V. Must specify dimming driver.
- Replace XX with mounting height in feet for proper lens selection, (e.g., MS/DIM-L25).
- Only for use with SL2, SL3 and SL4 distributions. Not available with L90 or R90 options.
- Replace XX with color suffix.
- Only compatible with MS/DIM-LXX motion sensor.
- One required for each LightBAR. Not available with L90 or R90 options.



Eaton  
1121 Highway 74 South  
Peachtree City, GA 30269  
P: 770-496-4300  
[www.eaton.com/lighting](http://www.eaton.com/lighting)

Specifications and dimensions subject to change without notice.

TD500011EN  
March 1, 2018 11:12 AM

**Job Name:**

Hedges C  
Architect: Lance Mueller & Assoc. - Seattle  
(Seattle)

**XTOR4B-W**

Notes:

BLUERIDGE-W18-63386

# Lumark

**DESCRIPTION**

The patented Lumark Crosstour™ LED Wall Pack Series of luminaires provides an architectural style with super bright, energy efficient LEDs. The low-profile, rugged die-cast aluminum construction, universal back box, stainless steel hardware along with a sealed and gasketed optical compartment make the Crosstour impervious to contaminants. The Crosstour wall luminaire is ideal for wall/surface, inverted mount for façade/canopy illumination, post/bollard, site lighting, floodlight and low level pathway illumination including stairs. Typical applications include building entrances, multi-use facilities, apartment buildings, institutions, schools, stairways and loading docks test.

**SPECIFICATION FEATURES**

**Construction**

Slim, low-profile LED design with rugged one-piece, die-cast aluminum hinged removable door and back box. Matching housing styles incorporate both a small and medium design. The small housing is available in 12W, 18W and 26W. The medium housing is available in the 38W model. Patented secure lock hinge feature allows for safe and easy tool-less electrical connections with the supplied push-in connectors. Back box includes three half-inch, NPT threaded conduit entry points. The universal back box supports both the small and medium forms and mounts to standard 3-1/2" to 4" round and octagonal, 4" square, single gang and masonry junction boxes. Key hole gasket allows for adaptation to junction box or wall. External fin design extracts heat from the fixture surface. One-piece silicone gasket seals door and back box. Minimum 5" wide pole for site lighting application. Not recommended for car wash applications.

**Optical**

Silicone sealed optical LED chamber incorporates a custom engineered mirrored anodized reflector providing high-efficiency illumination. Optical assembly includes impact-resistant tempered glass and meets IESNA requirements for full cutoff compliance. Available in seven lumen packages; 5000K, 4000K and 3000K CCT.

**Electrical**

LED driver is mounted to the die-cast housing for optimal heat sinking. LED thermal management system incorporates both conduction and natural convection to transfer heat rapidly away from the LED source. 12W, 18W, 26W and 38W series operate in -40°C to 40°C [-40°F to 104°F]. High ambient 50°C models available. Crosstour luminaires maintain greater than 89% of initial light output after 72,000 hours of operation. Three half-inch NPT threaded conduit entry points allow for thru-branch wiring. Back box is an authorized

electrical wiring compartment. Integral LED electronic driver incorporates surge protection. 120-277V 50/60Hz or 347V 60Hz models.

**Finish**

Crosstour is protected with a Super durable TGIC carbon bronze or summit white polyester powder coat paint. Super durable TGIC powder coat paint finishes withstand extreme climate conditions while providing optimal color and gloss retention of the installed life.

**Warranty**

Five-year warranty.

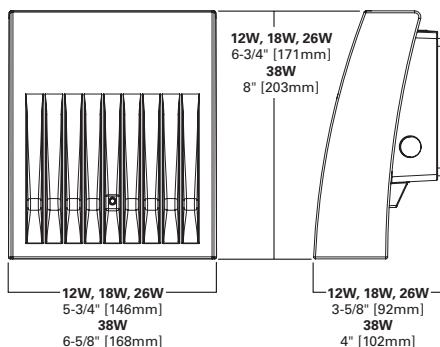
<b>Catalog #</b>		<b>Type</b>
<b>Project</b>		
<b>Comments</b>		<b>Date</b>
<b>Prepared by</b>		



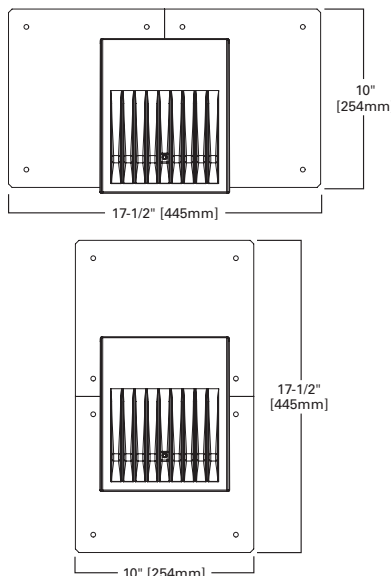
## XTOR CROSTOUR LED

- APPLICATIONS:**
- WALL / SURFACE
  - POST / BOLLARD
  - LOW LEVEL
  - FLOODLIGHT
  - INVERTED
  - SITE LIGHTING

**DIMENSIONS**



**ESCUTCHEON PLATES**



**CERTIFICATION DATA**

- UL/cUL Wet Location Listed
- LM79 / LM80 Compliant
- ROHS Compliant
- ADA Compliant
- NOM Compliant Models
- IP66 Ingressed Protection Rated
- Title 24 Compliant
- DesignLights Consortium® Qualified\*

**TECHNICAL DATA**

- 40°C Maximum Ambient Temperature
- External Supply Wiring 90°C Minimum

**EPA**

- Effective Projected Area (Sq. Ft.):
- XTOR1B, XTOR2B, XTOR3B=0.34
- XTOR4B=0.45

**SHIPPING DATA:**

- Approximate Net Weight:
- 3.7 – 5.25 lbs. [1.7 – 2.4 kgs.]



**XTOR CROSSTOUR LED**

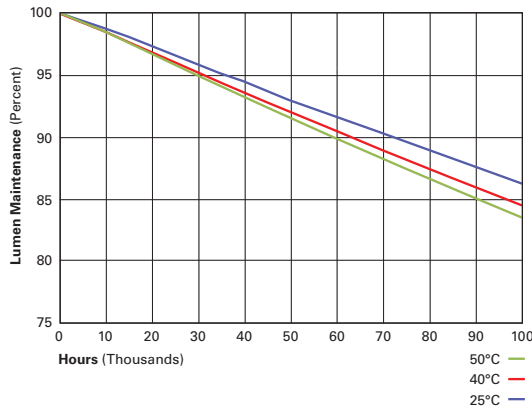
**POWER AND LUMENS BY FIXTURE MODEL**

LED Information	XTOR1B	XTOR1B-W	XTOR1B-Y	XTOR2B	XTOR2B-W	XTOR2B-Y	XTOR3B	XTOR3B-W	XTOR3B-Y	XTOR4B	XTOR4B-W	XTOR4B-Y
Delivered Lumens (Wall Mount)	1,418	1,396	1,327	2,135	2,103	1,997	2,751	2,710	2,575	4,269	4,205	3,995
Delivered Lumens (With Flood Accessory Kit) <sup>1</sup>	1,005	990	940	1,495	1,472	1,399	2,099	2,068	1,965	3,168	3,121	2,965
B.U.G. Rating <sup>2</sup>	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B1-U0-G0	B2-U0-G0	B2-U0-G0	B2-U0-G0
CCT (Kelvin)	5,000	4,000	3,000	5,000	4,000	3,000	5,000	4,000	3,000	5,000	4,000	3,000
CRI (Color Rendering Index)	70	70	70	70	70	70	70	70	70	70	70	70
Power Consumption (Watts)	12W	12W	12W	18W	18W	18W	26W	26W	26W	38W	38W	38W

NOTES: 1 Includes shield and visor. 2 B.U.G. Rating does not apply to floodlighting.

**LUMEN MAINTENANCE**

Ambient Temperature	TM-21 Lumen Maintenance (72,000 Hours)	Theoretical L70 (Hours)
<b>XTOR1B Model</b>		
25°C	> 90%	255,000
40°C	> 89%	234,000
50°C	> 88%	215,000
<b>XTOR2B Model</b>		
25°C	> 89%	240,000
40°C	> 88%	212,000
50°C	> 87%	196,000
<b>XTOR3B Model</b>		
25°C	> 89%	240,000
40°C	> 88%	212,000
50°C	> 87%	196,000
<b>XTOR4B Model</b>		
25°C	> 89%	222,000
40°C	> 87%	198,000
50°C	> 87%	184,000



**CURRENT DRAW**

Voltage	Model Series			
	XTOR1B	XTOR2B	XTOR3B	XTOR4B
120V	0.103A	0.15A	0.22A	0.34A
208V	0.060A	0.09A	0.13A	0.17A
240V	0.053A	0.08A	0.11A	0.17A
277V	0.048A	0.07A	0.10A	0.15A
347V	0.039A	0.06A	0.082A	0.12A



Submitted by Blueridge Lighting & Controls		<b>Catalog Number:</b> XTOR4B-W	<b>Type:</b>  BLUERIDGE-W18-63386
<b>Job Name:</b> Hedges C Architect: Lance Mueller & Assoc. - Seattle (Seattle)		<b>Notes:</b>	

**XTOR** CROSSTOUR LED

**ORDERING INFORMATION**

Sample Number: XTOR2B-W-WT-PC1

Series <sup>1</sup>	LED Kelvin Color	Housing Color	Options (Add as Suffix)	Accessories (Order Separately)
XTOR1B=Small Door, 12W XTOR2B=Small Door, 18W XTOR3B=Small Door, 26W XTOR4B=Medium Door, 38W	[Blank]=Bright White (Standard), 5000K W=Neutral White, 4000K Y=Warm White, 3000K	[Blank]=Carbon Bronze (Standard) WT=Summit White BK=Black BZ=Bronze AP=Grey GM=Graphite Metallic DP=Dark Platinum	PC1=Photocontrol 120V <sup>2</sup> PC2=Photocontrol 208-277V <sup>2,3</sup> 347V=347V <sup>4</sup> HA=50°C High Ambient <sup>4</sup>	WG/XTOR=Wire Guard <sup>5</sup> XTORFLD-KNC=Knuckle Floodlight Kit <sup>6</sup> XTORFLD-TRN=Trunnion Floodlight Kit <sup>6</sup> XTORFLD-KNC-WT=Knuckle Floodlight Kit, Summit White <sup>6</sup> XTORFLD-TRN-WT=Trunnion Floodlight Kit, Summit White <sup>6</sup> EWP/XTOR=Escutcheon Wall Plate, Carbon Bronze EWP/XTOR-WT=Escutcheon Wall Plate, Summit White

**NOTES:**

- DesignLights Consortium® Qualified and classified for both DLC Standard and DLC Premium, refer to www.designlights.org for details.
- Photocontrols are factory installed.
- Order PC2 for 347V models.
- Thru-branch wiring not available with HA option or with 347V. XTOR3B not available with HA and 347V or 120V combination.
- Wire guard for wall/surface mount. Not for use with floodlight kit accessory.
- Floodlight kit accessory supplied with knuckle (KNC) or trunnion (TRN) base, small and large top visors and small and large impact shields.

**STOCK ORDERING INFORMATION**

12W Series	18W Series	26W Series	38W Series
XTOR1B=12W, 5000K, Carbon Bronze	XTOR2B=18W, 5000K, Carbon Bronze	XTOR3B=26W, 5000K, Carbon Bronze	XTOR4B=38W, 5000K, Carbon Bronze
XTOR1B-WT=12W, 5000K, Summit White	XTOR2B-W=18W, 4000K, Carbon Bronze	XTOR3B-W=26W, 4000K, Carbon Bronze	XTOR4B-W=38W, 4000K, Carbon Bronze
XTOR1B-PC1=12W, 5000K, 120V PC, Carbon Bronze	XTOR2B-WT=18W, 5000K, Summit White	XTOR3B-WT=26W, 5000K, Summit White	XTOR4B-WT=38W, 5000K, Summit White
XTOR1B-W=12W, 4000K, Carbon Bronze	XTOR2B-PC1=18W, 5000K, 120V PC, Carbon Bronze	XTOR3B-PC1=26W, 5000K, 120V PC, Carbon Bronze	XTOR4B-PC1=38W, 5000K, 120V PC, Carbon Bronze
XTOR1B-W-PC1=12W, 4000K, 120V PC, Carbon Bronze	XTOR2B-W-PC1=18W, 4000K, 120V PC, Carbon Bronze		XTOR4B-W-PC1=38W, 4000K, 120V PC, Carbon Bronze



Eaton  
1121 Highway 74 South  
Peachtree City, GA 30269  
P: 770-486-4800  
www.eaton.com/lighting

Specifications and dimensions subject to change without notice.

TD514013EN  
2017-07-25 12:21:59



Water supply modeling is necessary for larger projects to determine the impact of the project's water demand on the water supply system. Water supply modeling will be performed by a consulting engineer based on the most recent version of the Tualatin Water System Master Plan.

Due to possible impacts to the water supply system, the following projects in Tualatin require hydraulic modeling based on the size and type of the project and projected water use for the finished project. The outcome of modeling could require offsite improvements to the water supply system in order to ensure that adequate water supply is available to serve the project and reduce impacts to the overall system.

**Hydraulic modeling of the water supply system is required for the following project type/sizes/demand:**

Project Type	Criteria	Permit Fee
<b>Commercial or Industrial Building</b>	Building floor area greater than 48,300 square feet <b>or</b> Anticipated daily water demand greater than 870 gallons per acre per day	\$ 300 per building
<b>Residential development</b>	More than 49 dwelling units	\$ 1,000
<b>Multi-family development</b>	More than 49 dwelling units <b>or</b> a combined building floor area greater than 48,300 square feet	\$ 300 per building

Please complete this form and submit the form and required fee (if applicable) with your land-use application (architectural review, subdivision, etc.).

Commercial or Industrial Development

- Building floor area 71,100 square feet *GRASS FLOOR AREA.*
- Anticipated water demand (if known) NOT KNOWN gallons per day
- Described planned building use MANUFACTURING + OFFICES

Residential Development

- Number of dwelling units or single family home lots \_\_\_\_\_

Multi-Family Residential Development

- Number of dwelling units \_\_\_\_\_
- Building floor area (sum of all building) \_\_\_\_\_
- Number of multi-family buildings \_\_\_\_\_

Permit fee required based on the information provided above \$ 0

- If no fee is required, enter \$0.

NOTE: Water Supply Modeling does not replace the requirement for fire hydrant flow testing. Flow testing of fire hydrants will still be required to verify adequate fire flow of finished system

December 6, 2018

Project #: 23574

Mac Martin  
Martin Development  
P.O. Box 15523  
Seattle, WA 98115***RE: Hedges C Development Trip Debiting Letter***

Dear Mr. Martin:

Martin Development proposes to construct a 72,970 square foot manufacturing building for the Hedges C development within Franklin Business Park in Tualatin, Oregon. This letter provides trip generation estimates for the new building, documents trips consumed by site development to date, and compares the total trip generation of the proposed and constructed uses with the previously approved and vested overall site trip generation. As documented herein, the proposed Hedges C development generates a volume of trips that is consistent with the previously analyzed full build-out of Franklin Business Park, and vested trips will remain for other future site development assuming Hedges C is approved and constructed. As such, no additional traffic impact analysis is needed.

**BACKGROUND**

Kittelison & Associates, Inc. (Kittelison), prepared a traffic study for the site in October 1997 assuming development of up to 350,000 square feet (sf) of light industrial space or up to 450,000 sf of light industrial space for the full business park. The study concluded that either scenario could be accommodated. Kittelison subsequently prepared an updated traffic study in 1999 that assumed a development scenario consisting of 90,000 sf of retail space, 360,000 sf of office space, and 450,000 sf of light industrial space and again demonstrated that the transportation system could accommodate the development.

Most recently, Kittelison prepared a 2014 trip debiting letter for the site. That letter assumed the development of 101,300 sf of light industrial space (constructed), 101,400 sf of warehousing space (constructed), 64,808 sf of manufacturing space (then proposed), and 6,535 sf of retail space (then proposed). The 2014 trip debiting letter is attached for reference.

Since preparation of the 2014 trip debiting letter, the 101,400 sf warehousing building was constructed along with 30,000 sf of office space and 34,808 sf of additional warehousing space (the latter two uses constructed within the previously proposed 64,808 sf building).

Martin Development now proposes to construct the Hedges C development, which consists of a 72,970 sf manufacturing building.

## TRIP GENERATION

Weekday daily, weekday a.m. peak hour, and weekday p.m. peak hour vehicle trip generation estimates were calculated from empirical observations (at other similar developments) for the existing and proposed uses. For consistency with previous analyses, these observations were obtained from *Trip Generation Manual, 9<sup>th</sup> Edition*, published by the Institute of Transportation Engineers (ITE). Trip generation estimates for the existing and proposed uses are summarized in Table 1.

**Table 1 Trip Generation Estimates**

Land Use	ITE Code	Size (sf)	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
				Total	In	Out	Total	In	Out
<b>Existing (Constructed) Uses</b>									
Light Industrial	110	101,300	710	93	82	11	98	12	86
Warehousing	150	136,208	485	41	32	9	44	11	33
Office	710	30,000	331	47	41	6	45	8	37
Subtotal Trips			1,526	181	155	26	187	31	156
<b>Proposed Uses</b>									
Manufacturing	140	72,790	278	53	41	12	53	19	34
<b>Existing + Proposed Uses</b>									
<b>Total Trips</b>			1,804	234	196	38	240	50	190

## TRIP ACCOUNTING

The 1999 traffic study documents that there are 1,328 weekday p.m. peak hour trips associated with the Franklin Business Park vesting. Table 2 provides a trip summary of the existing and proposed uses.

**Table 2 Trip Debiting Summary**


Use	Number of PM Peak Hour Trips	PM Peak Hour Vested Trips Remaining
1999 Traffic Study Vesting	1,328	1,328
Uses constructed to date	(187)	1,141
Proposed Hedges C	(53)	1,088

After accounting for the existing uses and the proposed Hedges C development, 1,088 weekday PM peak hour trips remain vested for future development of the site.

If any additional information is needed regarding this evaluation, please call us at (503) 535-7433.

Sincerely,  
KITTELSON & ASSOCIATES, INC.

  
Kelly Blume, PE  
Associate Engineer

  
Chris Brehmer, PE  
Senior Principal Engineer





# Cash Register Receipt

City of Tualatin

Receipt Number  
**R6272**

DESCRIPTION	ACCOUNT	QTY	PAID
<b>ProjectTRAK</b>			<b>\$300.00</b>
<b>AR18-0008 Address: 0 Apn: 2S127BA00600</b>			<b>\$300.00</b>
<b>HYDRAULIC WATER MODELING</b>			\$300.00
HYDRAULIC WATER MODEL COM IND MF	XP41	1	\$300.00
<b>TOTAL FEES PAID BY RECEIPT: R6272</b>			<b>\$300.00</b>

Date Paid: Tuesday, January 29, 2019

Paid By: John Martin

Cashier: LSAN

Pay Method: CREDIT CARD 119233