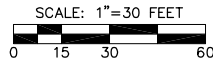


SEC 15, TWP 18N, RGE 1W, W.M.

LEGEND

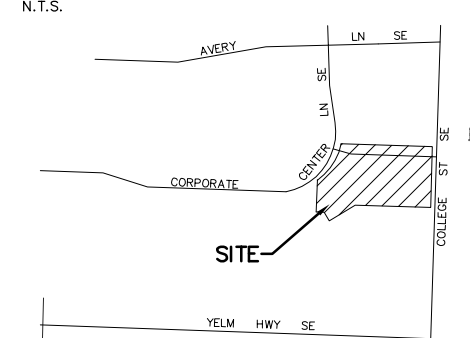
EXISTING	PROPOSED	
SS	SS	SANITARY SEWER
W	W	WATER
SD	SD	STORM
	RD	ROOF DRAIN
	CB	CATCH BASIN
	SM	SEWER MANHOLE
	SC	SEWER CLEANOUT
	FH	FIRE HYDRANT
	WM	WATER METER



SURVEY NOTE

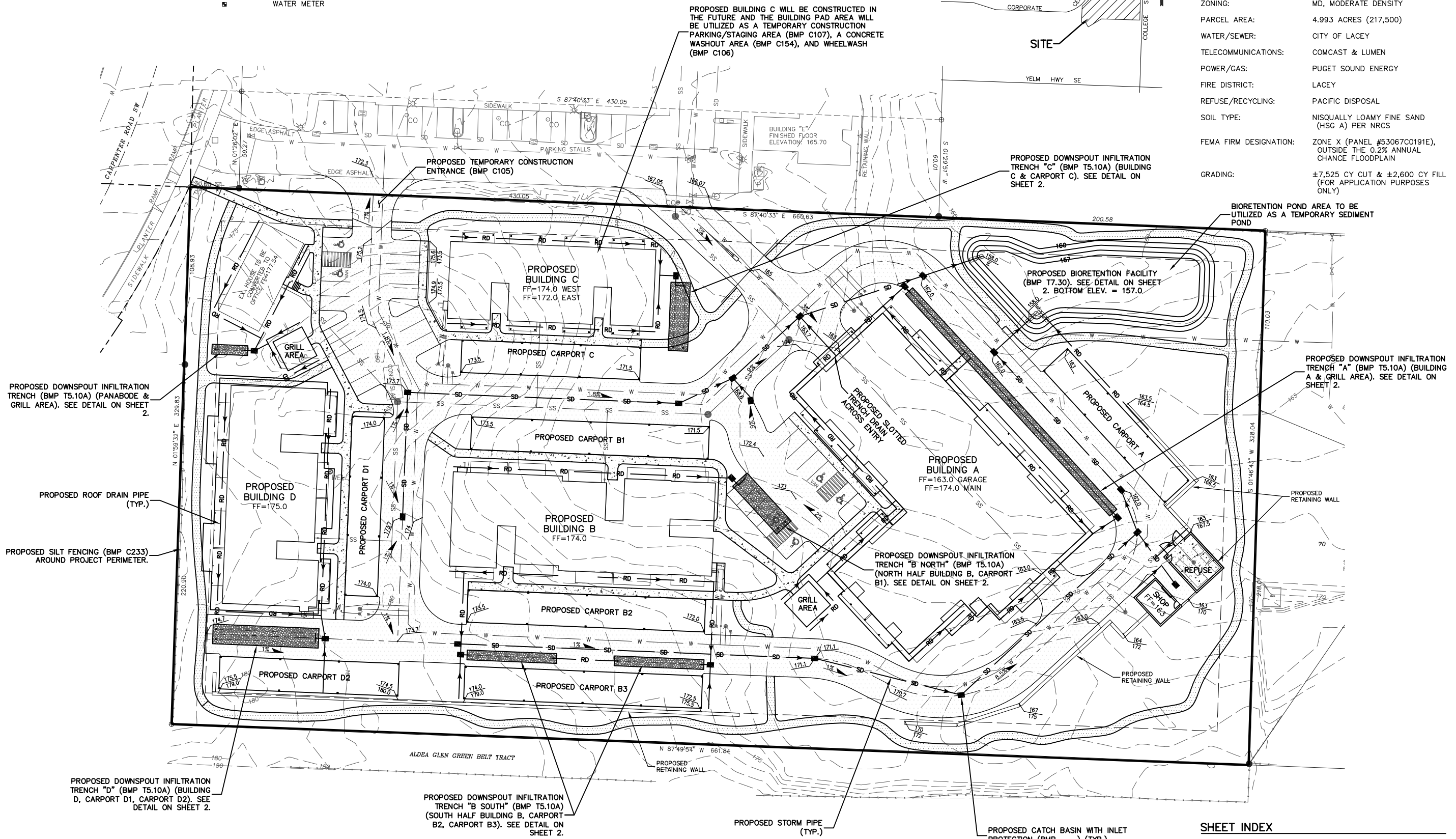
THE BOUNDARY AND TOPOGRAPHIC SURVEY INFORMATION DEPICTED HEREON WAS PROVIDED BY BUTLER SURVEYING AND OBTAINED FROM CITY RECORDS. THIS SURVEY INFORMATION WAS NOT FIELD VERIFIED BY OLYMPIC ENGINEERING AND OLYMPIC ENGINEERING ASSUMES NO LIABILITY IN THE ACCURACY OF THIS INFORMATION OR FOR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DRAWINGS AS A RESULT.

VICINITY MAP



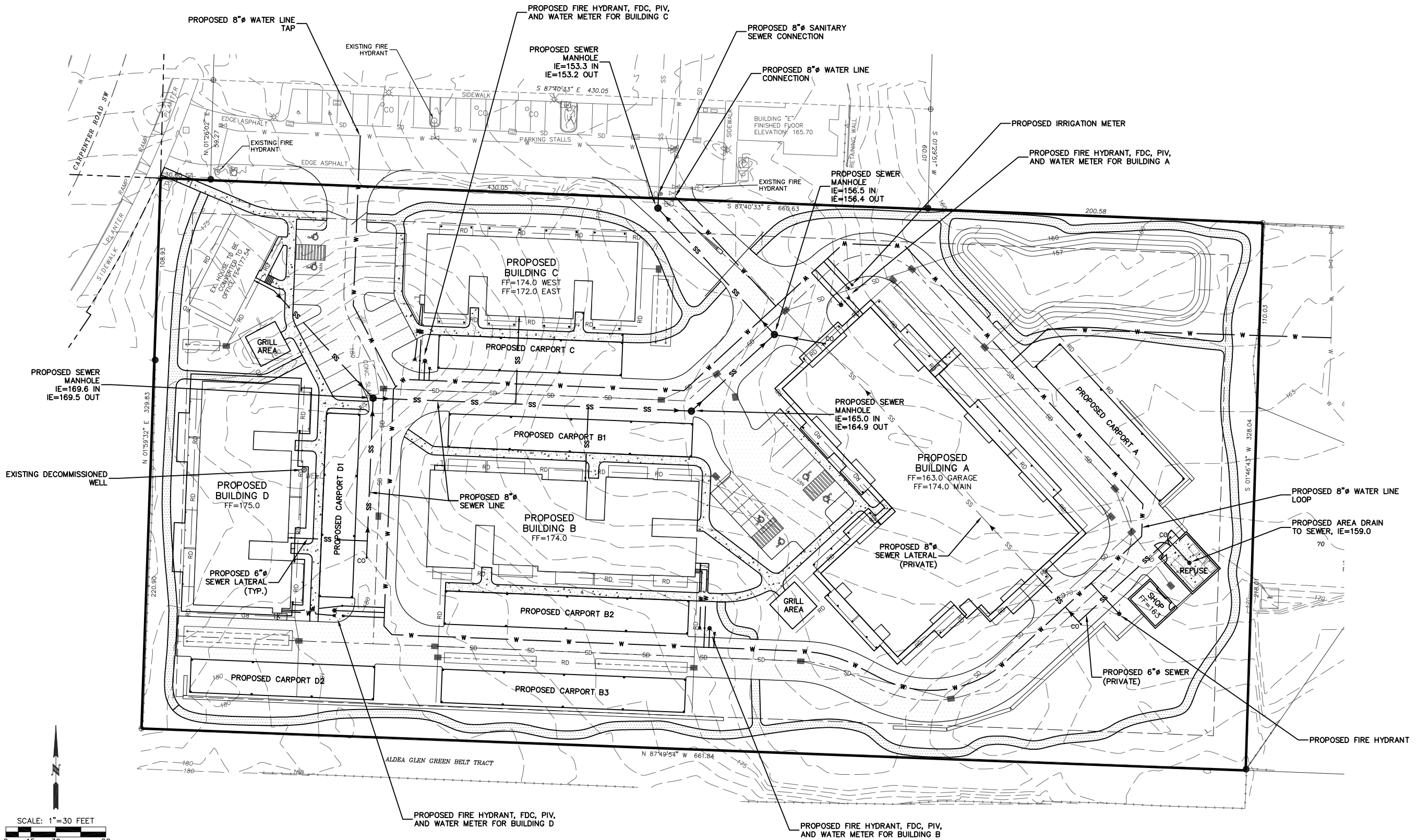
PROJECT INFORMATION

OWNER/APPLICANT:	OLYMPIA HANGARS, LLC 7842 OLD HWY 99 SE, HANGAR #M-5 TUMWATER, WA 98501
PARCEL NO:	11815310200
SITE ADDRESS:	456 CARPENTER RD. SE LACEY, WA 98503
ZONING:	MD, MODERATE DENSITY
PARCEL AREA:	4.993 ACRES (217,500)
WATER/SEWER:	CITY OF LACEY
TELECOMMUNICATIONS:	COMCAST & LUMEN
POWER/GAS:	PUGET SOUND ENERGY
FIRE DISTRICT:	LACEY
REFUSE/RECYCLING:	PACIFIC DISPOSAL
SOIL TYPE:	NISQUALLY LOAMY FINE SAND (HSG A) PER NRCS
FEMA FIRM DESIGNATION:	ZONE X (PANEL #53067C0191E), OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN
GRADING:	±7,525 CY CUT & ±2,600 CY FILL (FOR APPLICATION PURPOSES ONLY)



REVISION	
DATE	
NO.	
<b>THE LODGE</b>	CITY OF LACEY, WASHINGTON
<b>PRELIMINARY EROSION CONTROL AND DRAINAGE PLAN</b>	
DESIGNED BY:	CMM
DRAWN BY:	CMM
CHECKED BY:	
SCALE:	1" = 30'
DATE:	3/17/2023
JOB NUMBER:	22020
DRAWING NAME:	22020_SITE
SHEET:	1 OF 3

"CALL UNDERGROUND LOCATE AT 1-800-424-5555 OR 811 BEFORE YOU DIG"



"CALL UNDERGROUND LOCATE AT 1-800-424-5555 OR 811 BEFORE YOU DIG"

REVISION

NO. DATE

NO. DATE

THE LODGE

CITY OF LACEY, WASHINGTON

PRELIMINARY WATER AND SANITARY SEWER PLAN

DESIGNED BY: CMM  
 DRAWN BY: CMM  
 CHECKED BY:  
 SCALE: 1" = 30'  
 DATE: 3/17/2023



PO Box 12690  
 Olympia, WA 98508  
 360.705.2474  
 www.olympic.com



JOB NUMBER: 22020  
 DRAWING NAME: 22020\_UTIL

SEC 15, TWP 18N, RGE 1W, W.M.

**BIORETENTION SOIL MIX (BSM) REQUIREMENTS**

Contractor shall submit proposed BSM specifications to Olympic Engineering and Pacific Testing & Inspection for review and approval prior to installation.

Bioretention soil shall be a well-blended mixture of mineral aggregate and composted material measured on a volume basis. Bioretention soil shall consist of two parts fine compost (approximately 35 to 40 percent) by volume and three parts mineral aggregate (approximately 60 to 65 percent), by volume. The mixture shall be well blended to produce a homogeneous mix.

**Mineral Aggregate:**

- Percent Fines: A range of 2 to 4 percent passing the US #200 sieve is ideal and fines should not be above 5 percent for a proper functioning specification according to ASTM D422.

**Mineral Aggregate Gradation:**

- Mineral Aggregate shall be free of wood, waste, coating, or any other deleterious material. The aggregate portion of the Bioretention Soil Mix (BSM) should be well-graded. According to ASTM D 2487-98 (Classification of Soils for Engineering Purposes (Unified Soil Classification System)), well-graded sand should have the following gradation coefficients:
  - Coefficient of Uniformity ( $C_u = D_{60}/D_{10}$ ) equal to or greater than 4, and
  - Coefficient of Curve ( $C_c = (D_{30})^2/D_{60} \times D_{10}$ ) greater than or equal to 1 and less than or equal to 3.

Aggregate shall be analyzed by an accredited lab using the US sieve numbers and gradation noted below.

US Sieve Number	Percent Passing
0.375 inch	100
4	95-100
10	75-90
40	24-40
100	4-10
200	2-5

Where existing soils meet the above aggregate gradation, those soils may be amended rather than importing mineral aggregate.

Compost to Aggregate Ratio, Organic Matter Content, Cation Exchange Capacity:

- Compost to aggregate ratio: 60-65 percent mineral aggregate, 35-40 percent compost.
- Organic matter content: 5-8 percent by weight.
- Cation Exchange Capacity (CEC) must be > 5 milliequivalents/100 g dry soil. Note: Soil mixes meeting the above specifications do not have to be tested for CEC. They will readily meet the minimum CEC.

**Composted Material**

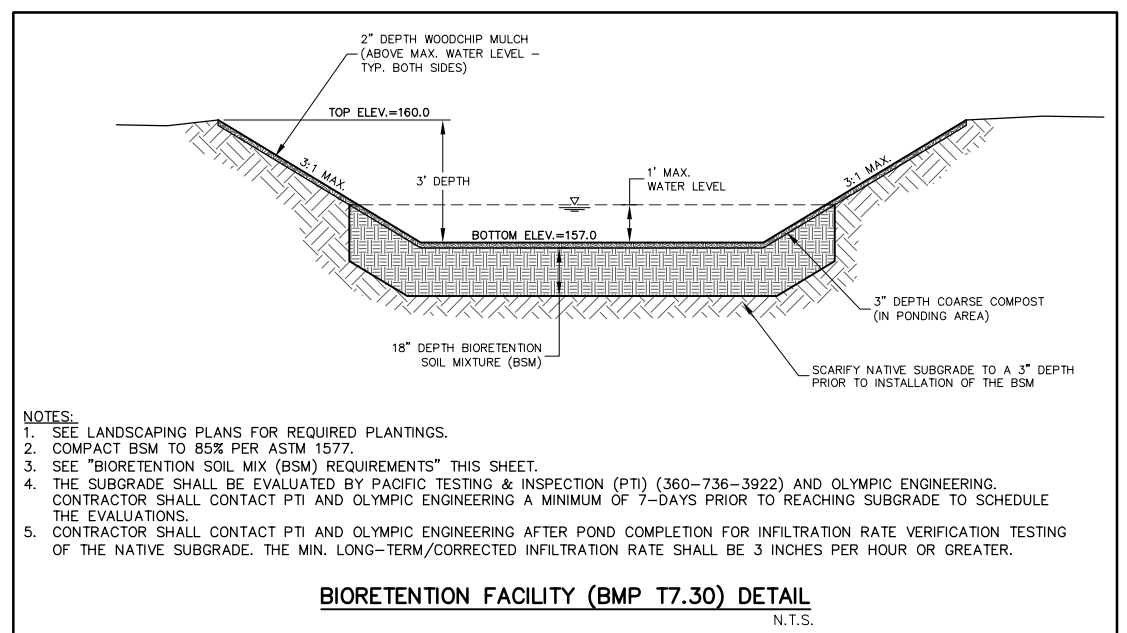
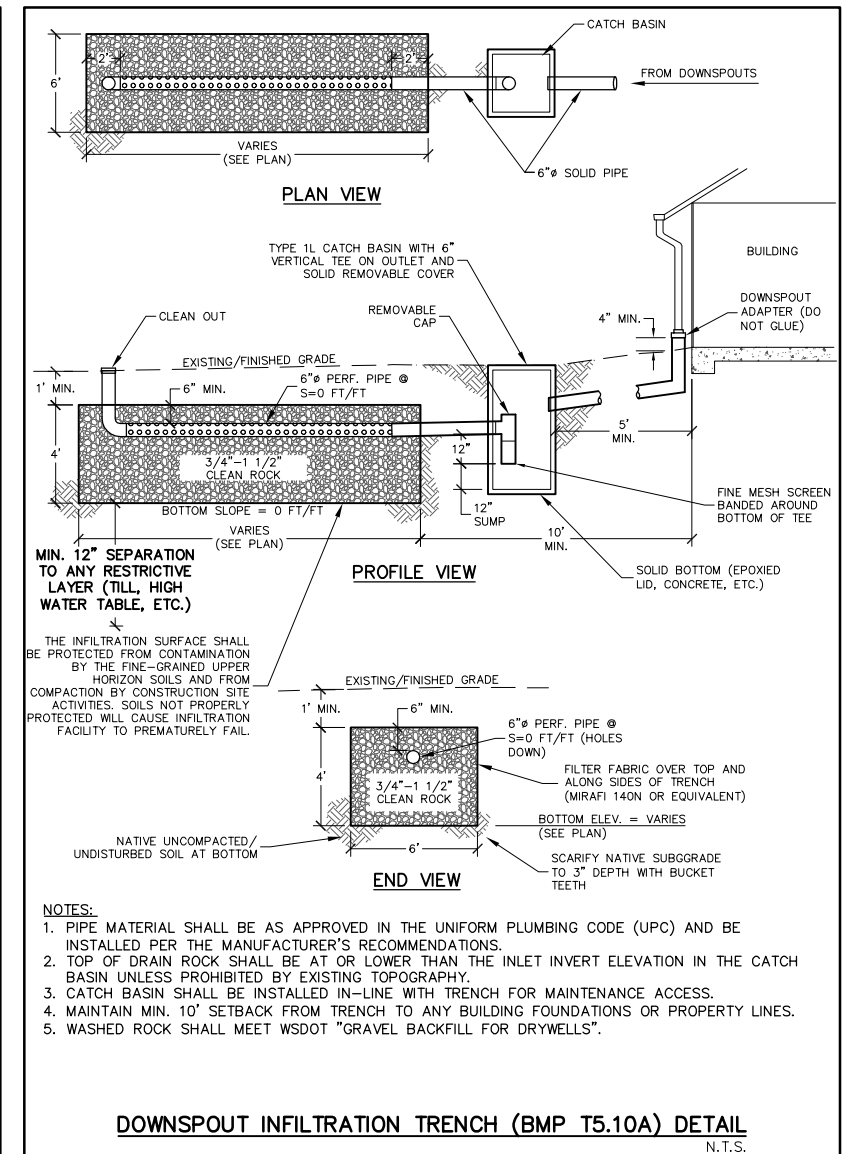
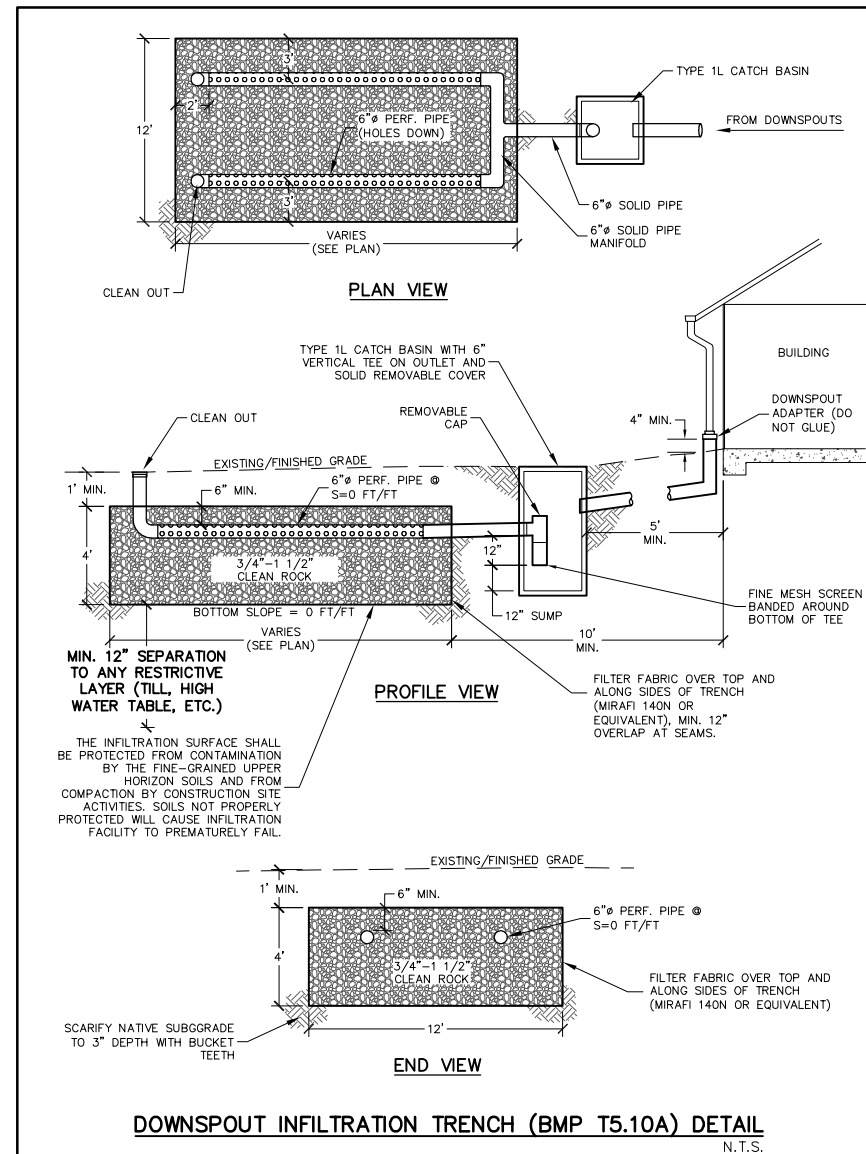
To ensure that the BSM will support healthy plant growth and root development, contribute to biofiltration of pollutants, and not restrict infiltration when used in the proportions cited herein, the following compost standards are required:

- Material must meet the definition of "composted material" in WAC 173-350-100 and complies with the testing parameters and standards in wac 173-350-220.
- Material must be produced at a composting facility that is permitted by a jurisdictional health authority. Permitted compost facilities in Washington State are included on a list available at <https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste/Organic-materials/Managing-organics-compost>.
- The completed compost product must originate a minimum of 65 percent by volume from recycled plant waste comprising "yard debris", "crop residues", and "bulking agents" as those terms are defined in WAC 173-350-100. A maximum of 35 percent by volume of "postconsumer food waste" as defined in WAC 173-350-100, but no including biosolids, may be substituted for recycled plant waste.
- Moisture content must be such that there is no visible free water or dust produced when handling the material.
- The material shall be tested in accordance with the U.S. Composting Council "Test Method for the Examination of Compost and Composting" (TMECC), as established in the Composting Council's "Seal of Testing Assurance" (STA) program. Most Washington compost BMPs now use these tests.
- Composted material shall meet the size gradations established in the U.S. Composting Council's Seal of Testing Assurance (STA) program, as follows: Fine Compost shall meet the following gradation by dry weight:

	Min.	Max.
Percent passing 2"	100	100
Percent passing 1"	99	100
Percent passing 0.625"	90	100
Percent passing 0.25"	75	100

- The pH shall be between 6.0 and 8.5 (TMECC 04.11-A).
- "Physical contaminants" (as defined in WAC 173-350-100) content shall be less than 1 percent by weight (TMECC 03.08-A) total, not to exceed 0.25 percent film plastic by dry weight.
- Minimum organic matter content shall be 40 percent by dry weight basis as determined by TMECC 05.07-A, "Loss-On-Ignition Organic Matter Method."
- Soluble salt contents shall be less than 4.0 dS/mm (mmhos/cm) tested in accordance with TMECC 04.10-A, "1:5 Slurry Method, Mass Basis."
- Maturity indicators from a cucumber bioassay shall be greater than 80 percent for both emergence and vigor, in accordance with TMECC 05.05-A, "Germination and Vigor".
- The material must be stable (low oxygen use and CO2 generation) and mature (capable of supporting plant growth). This is critical to plant success in a bioretention soil mixes. Stability shall be 7 mg CO2-C/g OM/day or below in accordance with TMECC 05.08-B, "Carbon Dioxide Evolution Rate."
- Fine Compost shall have a carbon to nitrogen ratio of less than 25:1 as determined using TMECC 05.02A "Carbon to Nitrogen Ratio" which uses the TMECC 04.01 "Organic Carbon" and TMECC 04.02-D "Total Nitrogen by Oxidation." The Engineer may specify a Carbon:Nitrogen ratio up to 35:1 for projects where the plants selected are entirely Puget Sound lowland native species, and up to 40:1 for coarse compost to be used as a surface mulch (not in a soil mix).

Compost not conforming to the above requirements or taken from a source other than those tested and accepted shall be immediately removed from the project and replaced.



- NOTES:**
- SEE LANDSCAPING PLANS FOR REQUIRED PLANTINGS.
  - COMPACT BSM TO 85% PER ASTM 1577.
  - SEE "BIORETENTION SOIL MIX (BSM) REQUIREMENTS" THIS SHEET.
  - THE SUBGRADE SHALL BE EVALUATED BY PACIFIC TESTING & INSPECTION (PTI) (360-736-3922) AND OLYMPIC ENGINEERING. CONTRACTOR SHALL CONTACT PTI AND OLYMPIC ENGINEERING A MINIMUM OF 7-DAYS PRIOR TO REACHING SUBGRADE TO SCHEDULE THE EVALUATIONS.
  - CONTRACTOR SHALL CONTACT PTI AND OLYMPIC ENGINEERING AFTER POND COMPLETION FOR INFILTRATION RATE VERIFICATION TESTING OF THE NATIVE SUBGRADE. THE MIN. LONG-TERM/CORRECTED INFILTRATION RATE SHALL BE 3 INCHES PER HOUR OR GREATER.

"CALL UNDERGROUND LOCATE AT 1-800-424-5555 OR 811 BEFORE YOU DIG"

REVISION					
NO.	DATE				
<b>THE LODGE</b>					
<b>DETAILS AND NOTES</b>					
DESIGNED BY:	CMM	DRAWN BY:	CMM	CHECKED BY:	N.T.S.
SCALE:		DATE:	3/17/2023		
PO Box 12690 Olympia, WA 98508 360.705.2474 www.olympic.com					
JOB NUMBER: 22020 DRAWING NAME: 22020_DET1 SHEET: 3 OF 3					