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May 25, 2022

By E-mail and Hand Delivery
Architectural Review Board
Town Hall Annex
238 Danbury Road
Wilton, CT 06897
Attn: Mr. Michael E. Wrinn – Director of Planning and Land Use Management

Re: ASML US, LLC – Application to Architectural Review Board
Premises: 77 Danbury Road, Wilton, Connecticut

Dear Mr. Chairman and Members of the Board:

Following a discussion regarding lighting, screening and wetlands mapping during our May 5th Zoom meeting, and at Director Wrinn's suggestion, we hereby submit additional materials. We believe that the matters of concern to the ARB appear as bolded in the following list. We hereby submit one (1) copy of each of the following:

1. Campus Traffic Flow Safety Improvements Drawings prepared by Tighe & Bond, Inc. ("**T&B**") dated May 24, 2022:

   a. **Cover Sheet with Location Map**
   b. **General Notes, Legend and Abbreviations (C-000)**
   c. **Existing Conditions Plan (C-100)**
   d. **Roadway Typical Sections (C-200)**
   e. **Alignment Plan (C-210)**
   f. **Driveway Profile (C-220)**
   g. **Site Plan (C-300)**
   h. **Site Plan Enlargement (C-310)**
   i. **Grading Plan (C-400)**

j. Grading Plan Enlargement (C-410)
k. Drainage and Utility Plan (C-500)
l. Drainage and Utility Plan Enlargement (C-510)
m. Sediment and Erosion Control Plan - Phase I (C-601)
n. Sediment and Erosion Control Plan - Phase 2 (C-602)
o. Sediment and Erosion Control Plan - Phase 3 (C-603)
p. Sediment and Erosion Control Plan – Phase 4 (C-604)
q. Sediment and Erosion Control Plan – Phase 5 (C-605)
r. Sediment and Erosion Control Notes, Narrative and Details (C-610)
s. Sediment and Erosion Control Details (C-611)
t. Sediment and Erosion Control Details (C-612)
u. Cross Sections (C-700)
v. Cross Sections (C-701)
w. Cross Sections (C-702)
x. Cross Sections (C-703)
y. Cross Sections (C-704)
z. Cross Sections (C-705)
aa. Cross Sections (C-706)
bb. Cross Sections (C-707)
cc. Cross Sections (C-708)
dd. Traffic Operations Plan (C-800)
ee. Site Details (C-900)
ff. Site Details (C-901)
gg. Site Details (C-902)
hh. Site Details (C-903)
ii. Site Details (C-904)
jj. Site Details (C-905)
kk. Site Details (C-906)
ll. Drainage Details (C-910)
mm. Drainage Details (C-911)
nn. Drainage Details (C-912)
oo. Drainage Details (C-913)
pp. Drainage Details (C-914)
qq. Drainage Details (C-915)
rr. Drainage Details (C-916)
ss. Planting Plan – 1 (L-100)
tt. Planting Plan – 2 (L-101)
uu. Planting Plan – Details (L-102)

2. Campus Traffic Safety Improvements, Inland Wetland and Watercourses Significant Activity Permit Application prepared by T&B dated May 24, 2022.

3. Engineering Report prepared by T&B dated May 24, 2022.

4. Photographs of the Premises taken from Danbury Road by Gregory and Adams on May 23, 2022.

We look forward to discussing the application at the June 2nd meeting.

Respectfully submitted,
Gregory and Adams, P.C.

By: ______________________
James D'Alton Murphy

JD'AM/ko
Enclosures
By email only, with enclosures:
cc: Messrs. Jason Domena and Patrick van den Bogaard – ASML
Ms. Marilee Beebe – WSP
John W. Block, P.E., Joseph A. Canas, P.E. – Tighe & Bond
Kathleen L. Royle, Esq.
Daniel L. Conant, Esq.

M:\Clients\ASML\2022 Driveway Extension\Application to ARB\Supplemental Submission 05-25-22\ARB supplemental submission ltr 05-25-22 (3).doc

ASML
#1


#2


#3


#4


#5


#6

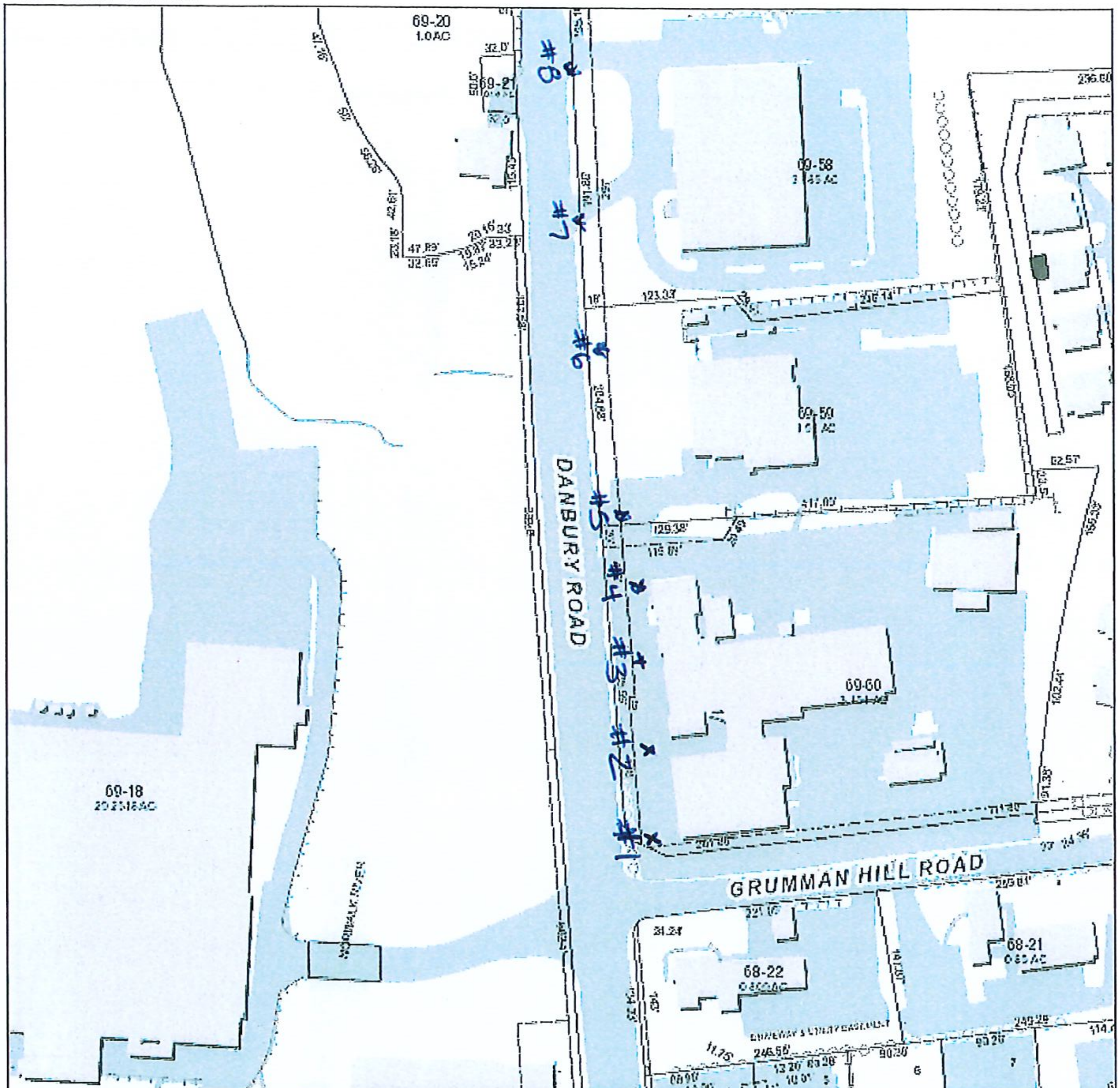

#7


#8

Town of Wilton

Geographic Information System (GIS)

Date Printed: 5/23/2022



* Approximate locations where photos were taken

MAP DISCLAIMER - NOTICE OF LIABILITY
This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Wilton and its mapping contractors assume no legal responsibility for the information contained herein.

Zoning Effective: July 28, 2017

Planimetrics Updated: 2014

Approximate Scale: 1 inch = 150 feet

0 150 Feet

N W E S

Campus Traffic Safety Flow Improvements

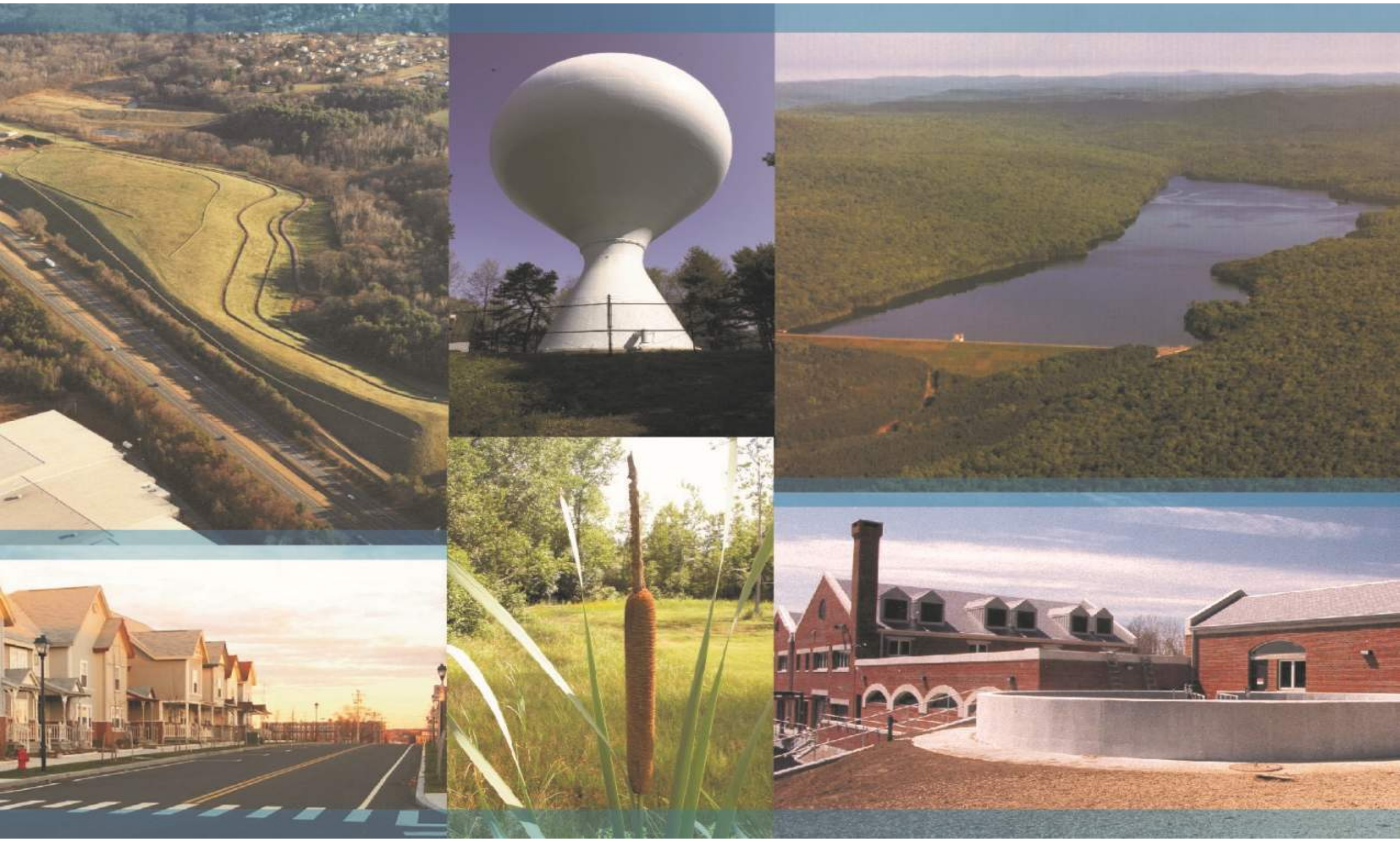
INLAND WETLANDS AND WATERCOURSES SIGNIFICANT ACTIVITY PERMIT APPLICATION

ASML US, Inc.
77 Danbury Road
Wilton, Connecticut

May 24, 2022

Tighe&Bond
Engineers | Environmental Specialists

100% Recyclable



ASML
77 Danbury Road, Wilton, Connecticut

INLAND WETLANDS AND WATERCOURSES SIGNIFICANT ACTIVITY PERMIT APPLICATION

ASML

May 2022

Figure 3- Site Location

2 Site Photographs

3 Soil Report

Web Soil Survey

Natural Diversity Database Map

FEMA Firmette

4 Abutter List

5 Self-Verification Notification Form

J:\A\A0969 ASML\Permitting\ASML IWWC Project Information.docx

Section 1
Introduction

Tighe & Bond is submitting this Inland Wetlands and Watercourse Permit Application on behalf of ASML for Significant Regulated Activity within the 100-Foot Town regulated review area and within the boundary of regulated wetlands. This report details existing wetland and environmental conditions and regulatory compliance for a proposed driveway at 77 Danbury Road in Wilton. The proposed traffic flow safety improvements will alleviate concerns and hazards with the current driveway conditions, allowing employees to safely access the existing parking garage.

Section 2
Existing Conditions

This section provides a description of the project site and wetland resource areas.

2.1 Site Description

The existing 28.88-acre site is bounded by Danbury Road (U.S. Route 7) to the east, the Metro North Commuter Railroad to the west, residential properties along Arrowhead Road to the north, and commercial property to the south. The Norwalk River flows through the eastern portion of the site, and forms part of the boundary along the southern portion of the site, and along the extreme northeast corner of the site. The project property is within a commercial and residentially developed area with interspersed open space and mature forest.

The proposed project area within the northern portion of the property. The project area consists of ledge with an existing cover of mature deciduous forest mixed with sparse evergreen trees. A forested wetland and perennial watercourses are located east of the proposed project area, within the town's 100-Foot Review Area.

The project locations are shown on the USGS Site Location Map (Figure 1) provided in Appendix A. The site and surrounding area are also shown on the Orthophotograph (Figure 2). Photographs of the resource areas are provided in Appendix B.

2.2 Mapped Soil Types

Digitally available soil survey information was obtained from the Natural Resources Conservation Service (NRCS) and generally confirmed during a wetland investigation and delineation conducted by a Tighe & Bond qualified Professional Soil Scientist. The Soil Scientist Report and Soil Survey Map are provided in Appendix C.

2.3 Resource Area Investigation

On April 1, 2022, a Tighe & Bond Certified Professional Soil Scientist and Professional Wetland Scientist conducted wetland resource area delineations within the limits of the project area. Tighe & Bond's wetland delineation was conducted in accordance with local, state, and federal guidelines, the Connecticut Inland Wetlands and Watercourses Act (§ 22a-36 to 22a-45), and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0, U.S. Army Corps of Engineers, January 2012).

2.4 Description of Resource Areas

This section describes wetland and watercourses delineated during the April 1, 2022, field investigation.

2.4.1 Watercourse 1

Watercourse 1 (flag series WC1 100→113; 200→217) consists of an unnamed perennial tributary to the Norwalk River and the Norwalk River. The western bank of the watercourses was demarcated during the field investigation. Both watercourses are classified by the National Wetland Inventory (NWI) as riverine unknown perennial with an unconsolidated bottom and permanently flooded water regime (R5UBH). The northern tributary channel is approximately 20-feet wide with banks at gradient with the wetland boundary. The channel narrows to approximately 10-feet wide, becoming more defined as the watercourse flows south and the west bank increases in height. The bank height increase is due to fill material from previous construction of the adjacent parking lot. The watercourse substrate consists of sand and muck with approximately six to eight-inch-deep flowing water at the time of the delineation.

The confluence of the tributary and Norwalk River is west of the northeastern parking lot. The Norwalk River is approximately 40-feet wide and several feet deep with high velocity flow at the time of the delineation. The west bank has been reinforced with boulders and cut stone, and the vegetation maintained at approximately four feet in height. Besides the reinforced banks, the river has been channelized, redirected, and historically disturbed due to development.

2.4.2 Wetland 1

Wetland 1(flag series 100 →115) is located along the west banks of the Norwalk River and an unnamed tributary, where the watercourses form the eastern wetland boundary. The wetland was not identified by the NWI, however, can be classified as palustrine forested broad-leaved deciduous with a seasonally saturated water regime (PFO1E). The wetland is historically disturbed due to the channelization of the watercourse and development of adjacent properties.

Dominant vegetation observed includes red maple (*Acer rubrum*; FAC), American hornbeam (*Carpinus caroliniana*; FAC); spicebush (*Lindera benzoin*; FACW), speckled alder (*Alnus incana*; FACW), silky dogwood (*Cornus amomum*; FACW), skunk cabbage (*Symplocarpus foetidus*; OBL), and sensitive fern (*Onoclea sensibilis*; FACW).

Hydrologic indicators include surface water (8 inches), saturation to the soil surface, inundation and saturation visible on aerial imagery, water-stained leaves, drainage patterns, and microtopographic relief.

Soil observed was 24 inches of dark gray (10YR 4/1) mucky sand with brown (7.5YR 4/4) redoximorphic concentrations within the matrix. The soil meets the Sandy Mucky Mineral (S1) and Sandy Redox (S5) hydric soil indicators and meets hydric soil criteria.

2.5 Wetland Functions and Values

The functions and values evaluation had been conducted generally in accordance with *The Highway Methodology Workbook Supplement, Wetland Functions and Values: A descriptive Approach* issued by the U.S. Army Corps of Engineers New England District (ACOE NED), September 1999. The *Highway Methodology* recognizes 13 separate wetland functions and values.

Functions are those properties inherent to a given wetland system that exist in the absence of society. Values are the benefits derived from functions and physical characteristics associated with a wetland. Functions and values can be principal if they are an important physical component of a wetland ecosystem (function only), and/or are considered of special value to society, from a local, regional, and/or national perspective.

The degree to which a wetland provides each of these functions and values is determined by one or more of the following factors: landscape position, substrate, hydrology, vegetation, history of disturbance, and size. The delineated wetland area may provide one or more of the listed functions and values at a principal level.

The ACOE NED workbook includes thirteen (13) functions and values that have been recognized as functions wetlands can provide: groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment/toxicant retention, nutrient removal/retention/ transformation, production export, sediment/shoreline stabilization, wildlife habitat, recreation, education/scientific value, uniqueness/heritage, visual quality/aesthetics, and habitat for threatened or endangered species.

The principal functions and values of the wetland system in the project area include groundwater recharge and discharge, floodflow alteration, and wildlife habitat. The reasoning for the principal functions and values include:

<u>Groundwater recharge and discharge</u>

The wetland system allows water to move between the soil surface and subsurface.

<u>Floodflow Alteration</u>

The wetland is broad, concave, and relatively flat allowing flood storage of bank overflow from the two associated perennial watercourses. The wetland system is effective for reducing peak flow and water volume to buffer downstream properties from flooding.

<u>Wildlife Habitat</u>

Signs of wildlife, including deer, racoons, birds, chipmunks, and squirrels were observed during the investigation. The wetland is part of a wildlife corridor and is effective habitat for disturbance tolerant species.

2.6 Floodplain

Based on the Federal Emergency Management Agency's (FEMA) Panel Number 09001C0391F (effective 6/18/2010), the eastern portion of the project site is located within Special Flood Hazard Area Floodway and Zone AE – area with a 1% annual chance of flooding. The FEMA Firmette is provided in Appendix C.

2.7 Natural Diversity Database

The Connecticut Department of Energy and Environmental Protection's Natural Diversity Database (NDDB) map dated December 2021 indicates that there are no areas of concern for endangered and threatened species. The NDDB Map is provided in Appendix C.

Section 3
Project Description

This section provides a description of the proposed driveway, storm water management, proposed site stabilization measures along the project boundaries, Best Management Practices (BMPs), and post-construction measures.

3.1 Proposed Activities

The proposed project will construct a new driveway from the parking lot northeast of the building, proceeding up the hillside, curving northwest, and connecting to the northeast corner of the existing parking garage between the third and fourth floors. The project will address erosion and stormwater runoff from the existing northeastern parking lot. Additional project details are provided in the Engineering Report and Project Plans submitted under separate cover and concurrently with this application.

Construction of the driveway will result in 37,185 sf of disturbance within the 100-Foot Upland Review Area for driveway improvements and 20 sf within wetland boundaries to address washout areas. Total excavation within regulated areas is 940 cy of cut and 1,072 cy of fill for a net fill of 132 cy with an increase of 2,628 sf of impervious surface.

3.2 Driveway Improvements

Driveway Improvements include a full depth reconstruction, milling, regrading, curbing, 12-foot-wide travel lanes with 5-foot-wide sidewalk, and 3-foot-wide shelf for underdrainage. Timber guard rails and lighting will be upgraded along with storm water catch and management basins. Details of improvements are provided in the Engineering Report Project Plans submitted concurrently with this application.

3.3 Protective Measures

Wetland resource areas at the site will be protected by an erosion control barrier consisting of straw bales and/or silt fence. The control measures are to be installed along the edge of the work areas. These protective measures will be placed in a fashion that restricts access to the wetland resource areas while allowing the contractor to conduct work within the limit of the Project. Existing catch basins will be protected with silt sacks prior to the start of construction. The locations of the protective measures are shown on the Project Drawings provided with this application. The Project Drawings also includes Erosion Control Notes on Sheets C-600 and 610 and details on Sheets C-611 and 612.

- The contractor will be required to maintain a reserve supply of straw bales and silt fence on-site to make repairs as necessary
- Protective measures will be inspected after significant precipitation events and repaired as necessary

3.4 Constructive Sequencing

Proposed construction sequencing includes:

- Install sediment and erosion controls
- Grade driveway alignment
- Install underdrains
- Construct stormwater management systems
- Pave and mark driveway and parking lot
- Restore disturbed areas, plant rain garden and bioswale
- Remove sediment and erosion controls after stabilization

3.5 Post Construction Restoration

The restoration measures within the Site will consist of stabilizing all disturbed areas by loaming and seeding. Erosion controls will not be removed from the site until revegetation has occurred. The driveway will be resurfaced once all installation work is completed and backfilled.

3.6 Mitigation

Disturbances within wetland boundaries and the 100-Foot Upland Review Area will be mitigated by improved stormwater management, plantings, and rain gardens. The list of proposed planting species is provided in Table 3-1.

3.6.1 Improved Stormwater Management

The existing parking lot within the project area has limited storm water management by way of surface runoff over maintained grass to the adjacent wetland or Norwalk River, causing erosion along the eastern slope of the parking lot.

Proposed improvements include a network of catch basins and storm drains, increase of the average distance of impervious cover to wetlands, and improved water quality discharged to the river. Infiltration chambers beneath the parking area will recharge ground water and decrease peak volume and flow discharge to the river. Additionally, one 1,158 sf raingarden and a 2,978 sf biofiltration swale will improve stormwater quality discharged from the area.

3.6.2 Planting Plan

Vegetation will be planted within the riparian buffer west of the Norwalk River and east of the driveway to provide plant and habitat diversity, additional nutrient uptake, and reduce overland runoff velocity. In addition, water and drought tolerant vegetation will be added to the two rain gardens and one bioswale for stormwater management and biodiversity.

Table 3-1
Planting Plan Species

Scientific Name	Common Name	Wetland Indicator Status
Raingarden Plantings		
Chasmanthium latifolium (Cl)	Indian Wood-Oats	FACW
Eutrochium purpureum (EP)	Sweet-Scented Joe-Pye-Weed	FAC
Schizachyrium scoparium (Ss)	Little false bluestem	FACU
Asclepias tuberosa (At)	Butterfly milkweed	NI
Panicum virgatum (Pv)	Want panic grass	FAC
Bioswale Plantings		
Carex stricta (Cs)	Uptight Sedge	OBL
Heuchera americana (Ha)	American alumroot	FACU
Morella pensylvanica (Mp)	Northern bayberry	FACU
Viburnum dentatum (Vd)	Arrowwood Viburnum	FAC
Ilex verticillata (Iv)	Winterberry	FACW
Monarda didyma (Md)	Scarlet beebalm	FACU
Symphyotrichum novae-angliae (Sna)	New England American-Aster	FACW
Osmundastrum cinnamomeum (Oc)	Cinnamon Fern	FACW
Riparian Plantings		
Leucothoe fontanesiana (Lf)	Highland Doghobble	FACW
Amelanchier arborea (Aa)	Downy Service-Berry	FACU
Ilex verticillata (Iv)	Winterberry	FACW
Viburnum dentatum (Vd)	Arrowwood Viburnum	FAC
Morella pensylvanica (Mp)	Northern bayberry	FACU

3.7 Alternatives

Four alternatives, No Build, Conducting Activity in a Different Location, Conducting an Activity of a Different Nature, and Alternate Grades, were considered for the design of the new driveway. The project and current proposal evolved through several iterations and was selected by ASML. Alternative assessment details are provided in Section 4.7 of the Engineering Report.

Section 4
Regulatory Information

Wetlands and watercourses are regulated by municipal, state, and federal laws and regulations, each with different definitions and regulatory requirements. Accordingly, the state and municipalities may regulate wetlands and waters that fall outside of federal jurisdiction; however, where federal jurisdiction exists, concurrent state and municipal jurisdiction is almost always present.

Connecticut wetland determinations and municipal regulations are prepared and adopted in accordance with the Connecticut Inland Wetlands and Watercourse Act, § 22a-36 to 22a-45.

4.1 Federal Regulations

Jurisdictional wetlands at the Federal level consist of "Waters of the United States", which includes lakes, rivers and streams, as well as vegetated wetlands (See 33 CFR 328.8). The onsite waters and wetlands, regulated by the U.S. Army Corps of Engineers (ACOE), were delineated in accordance with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual Northcentral and Northeast Region (Version 2.0) (January 2012). This Manual requires there to be dominant hydrophytic vegetation, hydric soils, and hydrological conditions present in determining wetland areas.

Direct impacts to Waters of the United States regulated by the U.S. Army Corps of Engineers requires authorization under the Regional General Permits for the State of Connecticut in accordance with 33 CFR 320-332. A Self-Verification Notification Form (SV) under General Permit 17- New and Expansion of Recreational, Residential, Institutional, and Commercial Developments was submitted to the ACOE concurrently with this permit. The SV is provided in Appendix E.

4.2 State Regulations

State wetland boundaries are based on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land. Watercourses are defined as "rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the state or any portion thereof." Intermittent watercourse determinations are made based on the presence of a defined permanent channel and bank, and two of the following characteristics: (1) evidence of scour or deposits of recent alluvium or detritus, (2) the presence of standing or flowing water for a duration longer than a particular storm incident, and (3) the presence of hydrophytic vegetation.

4.3 Municipal Regulations

The Town of Wilton Inland Wetlands and Watercourse Regulations (revised June 1, 2007), use the state definitions of wetlands and watercourses and apply to activities within the boundaries of wetlands and watercourses, and within 100-feet of wetlands and watercourses (Upland Review Area).

A Wilton Inland Wetlands and Watercourses Permit application is required for the proposed disturbance of 37,185 sf (0.85 acres) within the 100-foot Upland Review Area and 20 sf of wetland.

The proposed project will not substantially change on-site wetland or watercourses, has been designed to minimize disturbance within the Upland Review Area, reduce siltation and sedimentation within natural resources, and enhance pollutant management through stormwater controls.

Section 5
Summary

Two perennial watercourses and one forested wetland were identified during the April 1, 2022, site investigation. Proposed activities are in compliance with the Town of Wilton Significant Regulated Activity for 20 sf of work proposed within wetland boundaries and 37,185 sf of work within the 100-Foot Review Area. The activities directly impacting wetlands require the submittal of a Self-Verification regulated by the U.S. Army Corps of Engineers, submitted concurrently with this application.

APPENDIX A

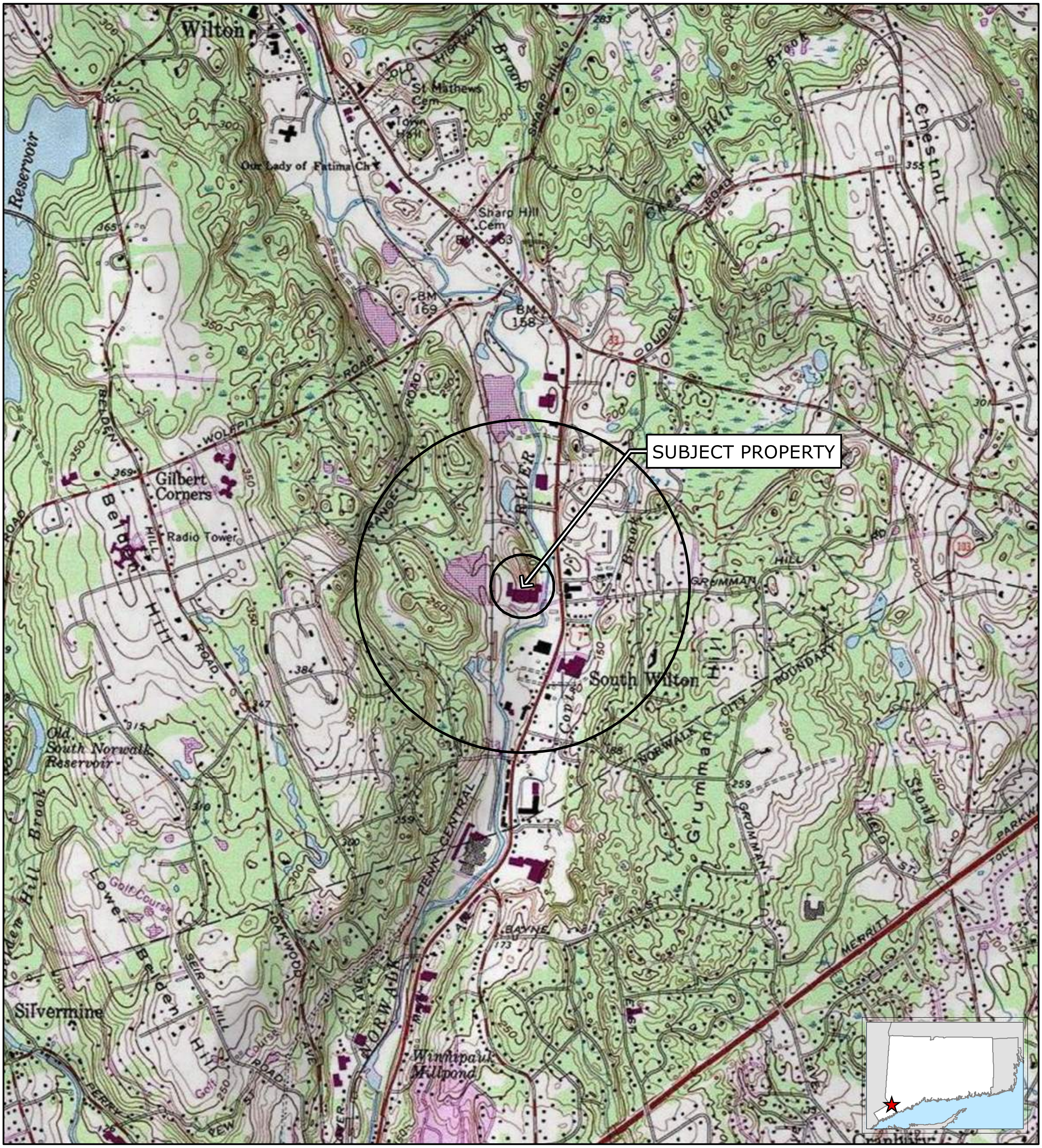


FIGURE 1
SITE LOCATION MAP

ASML Campus Traffic Flow
Safety Improvements
77 Danbury Road
Wilton, Connecticut

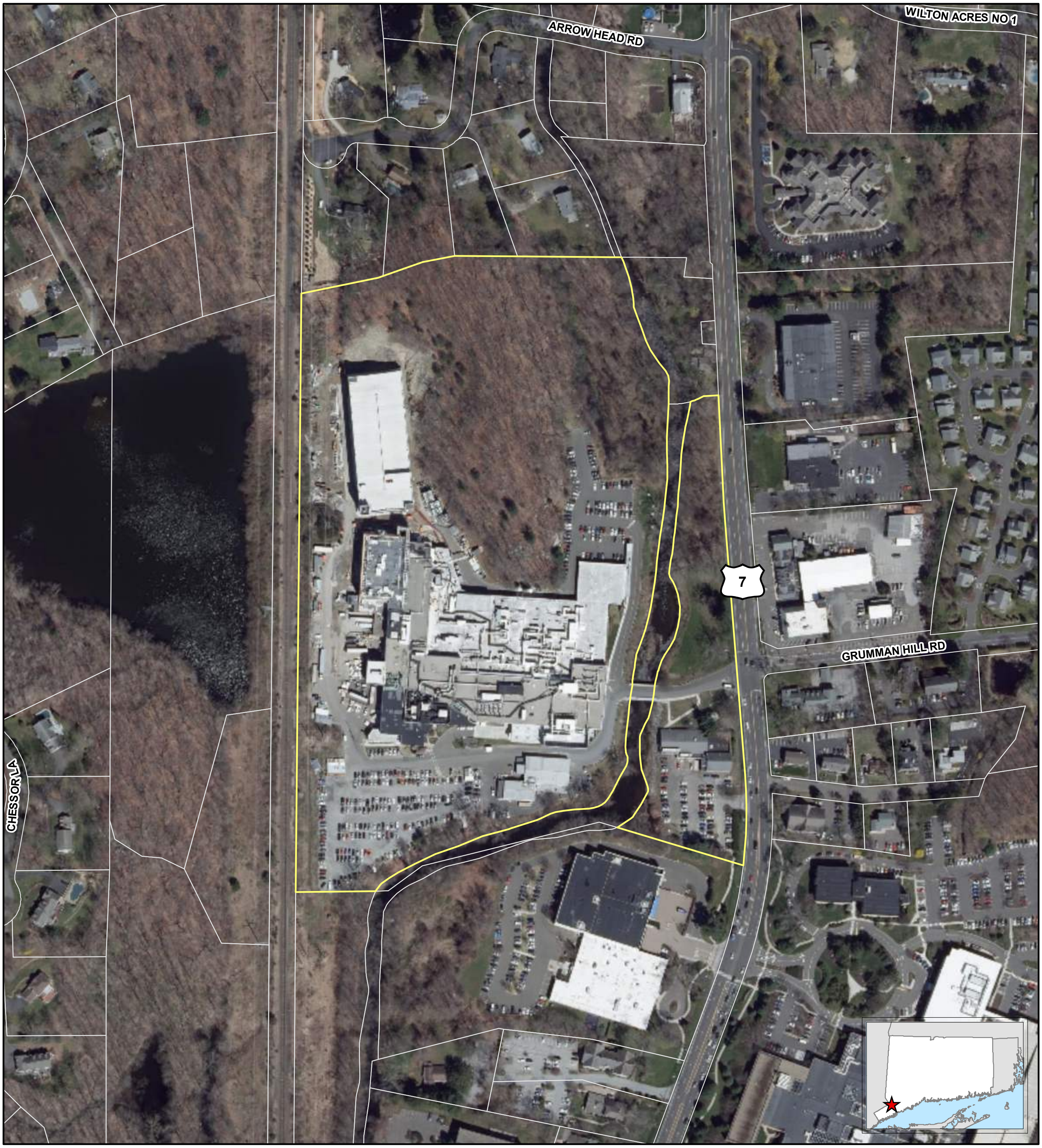
May 2022

1:24,000
0 1,000 2,000
Feet

N

Tighe&Bond

Based on USGS Topographic Map for Norwalk North, Contour Interval Equals 1ft. Circles indicate 500-foot and half-mile radii



LEGEND

Approximate Subject Property

Approximate Parcel Boundary

Tighe&Bond

Based on 2019 Statewide Leaf-Off Orthophotography, Courtesy of CTECO.
Wilton Parcels (FY20) provided by WestCOG and are approximate.

1:3,600

0 150 300

Feet

FIGURE 2
ORTHOPHOTOGRAPH

ASML Campus Traffic Flow
Safety Improvements
77 Danbury Road
Wilton, Connecticut

May 2022

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A-0969

LEGEND

FIGURE 3
SITE LOCATION

ASML Campus Traffic Flow
Safety Improvements
77 Danbury Road
Wilton, Connecticut

1:1,200

0 50 100
Feet

N

Tighe&Bond

Based on 2019 Statewide Leaf-Off Orthophotography, Courtesy of CTECO.

May 2022

APPENDIX B

Photographic Log

Client: ASML **Job Number:** A0969-015

Site: 77 Danbury Road, Wilton, Connecticut

Photograph No.: 1	**Date:** 4/1/2022	**Direction Taken:** West
Description: Stormwater runoff management will include drainage and discharge from the parking lot.		

Photograph No.: 2	**Date:** 4/1/2022	**Direction Taken:** East
Description: The proposed drainage improvements will address the current stormwater runoff conditions.		

Client: ASML **Job Number:** A0969-015

Site: 77 Danbury Road, Wilton, Connecticut

Photograph No.: 3	**Date:** 4/1/2022	**Direction Taken:** North
Description: Norwalk River bounds the site to the east with an upland riparian buffer to the parking lot.		

Photograph No.: 4	**Date:** 4/1/2022	**Direction Taken:** West
Description: Upland buffer between the Norwalk River and existing driveway.		

Tighe&Bond

Client: ASML **Job Number:** A0969-015

Site: 77 Danbury Road, Wilton, Connecticut

Photograph No.: 5	**Date:** 4/1/2022	**Direction Taken:** North
Description: Stormwater collected along the eastern boundary of the parking lot observed flowing into the adjacent wetland.		

Photograph No.: 6	**Date:** 4/1/2022	**Direction Taken:** South
Description: The forested wetland and perennial tributary to the Norwalk River are north of the building and parking lot.		

APPENDIX C

SOIL REPORT

Project: ASML- Driveway Improvement
Wilton, CT

Project No. A-0969-015
Site Inspection Date 4/1/2022

PROJECT DESCRIPTION: *Inland wetland identification and delineation.*

METHOD FOR IDENTIFICATION OF MAP UNITS

Wetlands

_X_ *Field marking (flagging) for survey*

___ *Field plotting on* ________

____ *Field plotting on aerial photography*

Non Wetland Soils

____ *High intensity field identification by Soil Scientist*

_X_ *Medium intensity identification from USDA, Natural Resources Conservation Service*

METHOD OF SOIL IDENTIFICATION

_X_ *Spade and Auger*

____ *Deep test pits (backhoe)*

____ *Other*___________

SOIL MOISTURE CONDITION

*Dry*_____ *Moist* __X__ *Wet*_____

Frost Depth ________*in.*

Snow Depth _______*in.*

The classification system of the National Cooperative Soil Survey, USDA, Soil Conservation Service and the County Identification Legend were used in this investigation. The investigation was conducted by the undersigned Certified Soil Scientist.

All wetland boundary lines established by the undersigned Soil Scientist are subject to change until officially adopted by local, state, or federal regulatory agencies.

Respectively submitted by,

TIGHE & BOND, INC.

Raina Volovski

Raina Volovski
Certified Professional Soil Scientist
Professional Wetland Scientist

SOIL REPORT *continued*

PROJECT: Nystrom Pond Dam

MAPS/PLANS GENERATED

___*Site plan with soil types and wetland flags located by survey*

___*Sketch location of wetlands and other soil types*

_X__*Site Plan with wetland flags, USDA-NRCS Web soil survey*

____*None*

NUMBERING SEQUENCE OF WETLAND BOUNDARY LINE MARKERS

W1 100-115
WC1 100-113, 200-217

SUMMARY SOIL DESCRIPTIONS

Digitally available updated soil survey information was obtained from the Natural Resources Conservation Service (NRCS) as depicted on the attached soil map. The following soil types were identified during the delineation:

Hydric Soils

Pootatuck fine sandy loam (Map Unit 102)
The Pootatuck component is on flood plains with parent material consisting of course-loamy alluvium. The natural drainage class is moderately well drained; however, this soil is frequently flooded. This component is in the F144AY012CT Sandy Low Floodplain ecological site. The ecological site is typically comprised of a floodplain forest found in early to mid-successional staged due to the dynamic nature of floodplains. The frequency, duration, and timing of floods is the primary natural disturbance affecting species composition. River types vary in gradient, hydrologic regime, and fluvial geomorphology resulting in different community composition. This soil meets the Connecticut Inland Wetland hydric criteria and concurrent with the field delineated wetland.

Non-hydric Soils

Hollis-Chatfield- Rock outcrop complex (75E)
The Hollis and Chatfield soils have slopes from 3 to 15 percent. Both of these components are on uplands, bedrock controlled hills and bedrock controlled ridges. The parent material of Hollis soils consists of loamy melt-out till derived from granite and/or schist and/or gneiss, with Chatfield parent material consisting of course-loamy melt-out till derived from granite and/or schist and/or gneiss. The natural drainage class for Hollis soil is somewhat excessively drained, and well drained for Chatfield soil. This component is in the F144AY033MA Shallow Dry Till Uplands ecological site with plant communities dominated by oak forests. Trees are generally lower is stature and productivity relative to forests in deeper soils. This soil complex does not meet hydric criteria.

Charlton-Urban land complex (Map Unit 260C)
The Charlton component is on hills on glaciated uplands with slopes between 8 and 15 percent. The parent material consists of coarse-loamy melt-out till derived from gneiss, granite, and/or schist. The natural drainage class is well drained. This component is in the F144AY034CT Well Drained Till Uplands ecological site. The ecology of the site is dominated by oak species and the unique red soil minerology

of the Connecticut River Valley provides a relatively rich substrate for vegetation growth. This soil does not meet hydric criteria.

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent. No drainage class is assigned and does not meet hydric criteria.

Haven silt loam (Map Unit 703B)
The Haven soil is typically found on outwash terraces on valleys with a 3 to 8 percent slope. The parent material consists of course-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss. This component is in the F144AY023CT Well Drained Outwash ecological site. Representative plant communities are varied but consist largely of pines and oaks. The natural drainage class is well drained and does not meet hydric criteria.


73° 25' 14" W
73° 24' 57" W
632500
632560
632620
632680
632740
632800
632860
41° 10' 27" N
41° 10' 9" N
4559270
4559210
4559150
4559090
4559030
4558970
4558910
4558850
4558790
102
703B
W
7
75E
260C
102
102
W
307
306
103
Danbury Rd
Soil Map may not be valid at this scale.
Map Scale: 1:2,590 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 35 70 140 210
Feet
0 100 200 400 600
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
Area of Interest (AOI)

Soils
Soil Map Unit Polygons
Soil Map Unit Lines
Soil Map Unit Points

Special Point Features
Blowout
Borrow Pit
Clay Spot
Closed Depression
Gravel Pit
Gravelly Spot
Landfill
Lava Flow
Marsh or swamp
Mine or Quarry
Miscellaneous Water
Perennial Water
Rock Outcrop
Saline Spot
Sandy Spot
Severely Eroded Spot
Sinkhole
Slide or Slip
Sodic Spot

Spoil Area
Stony Spot
Very Stony Spot
Wet Spot
Other
Special Line Features

Water Features
Streams and Canals

Transportation
Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background
Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 21, Sep 7, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 8, 2020—Oct 14, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	3.8	14.0%
102	Pootatuck fine sandy loam	3.5	12.8%
103	Rippowam fine sandy loam	0.1	0.5%
260C	Charlton-Urban land complex, 8 to 15 percent slopes	4.9	17.8%
306	Udorthents-Urban land complex	0.8	2.8%
307	Urban land	8.6	31.3%
703B	Haven silt loam, 3 to 8 percent slopes	4.8	17.6%
W	Water	0.8	3.1%
Totals for Area of Interest		**27.3**	**100.0%**

Natural Diversity Data Base Areas

WILTON, CT

December 2021

State and Federal Listed Species

Critical Habitat

Town Boundary

NOTE: This map shows general locations of State and Federal Listed Species and Critical Habitats. Information on listed species is collected and compiled by the Natural Diversity Data Base (NDDB) from a variety of data sources . Exact locations of species have been buffered to produce the generalized locations.

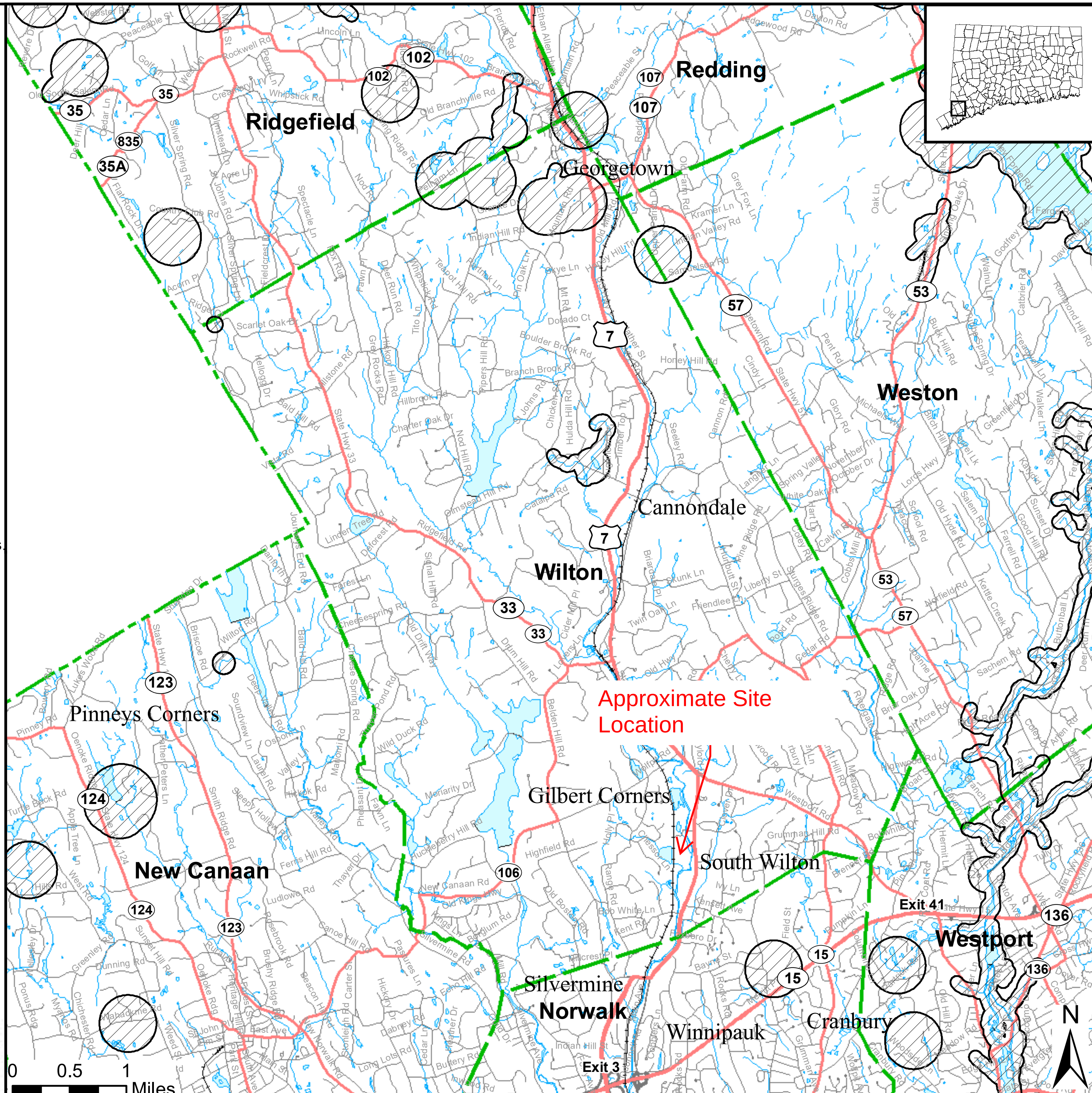
This map is intended for use as a preliminary screening tool for conducting a Natural Diversity Data Base Review Request. To use the map, locate the project boundaries and any additional affected areas. If the project is within a hatched area there may be a potential conflict with a listed species. For more information, complete a Request for Natural Diversity Data Base State Listed Species Review form (DEP-APP-007), and submit it to the NDDB along with the required maps and information. More detailed instructions are provided with the request form on our website.

www.ct.gov/deep/nddbrequest

Use the CTECO Interactive Map Viewers at http://cteco.uconn.edu to more precisely search for and locate a site and to view aerial imagery with NDDB Areas.

QUESTIONS: Department of Energy and Environmental Protection (DEEP)
79 Elm St, Hartford, CT 06106
email: deep.nddbrequest@ct.gov
Phone: (860) 424-3011

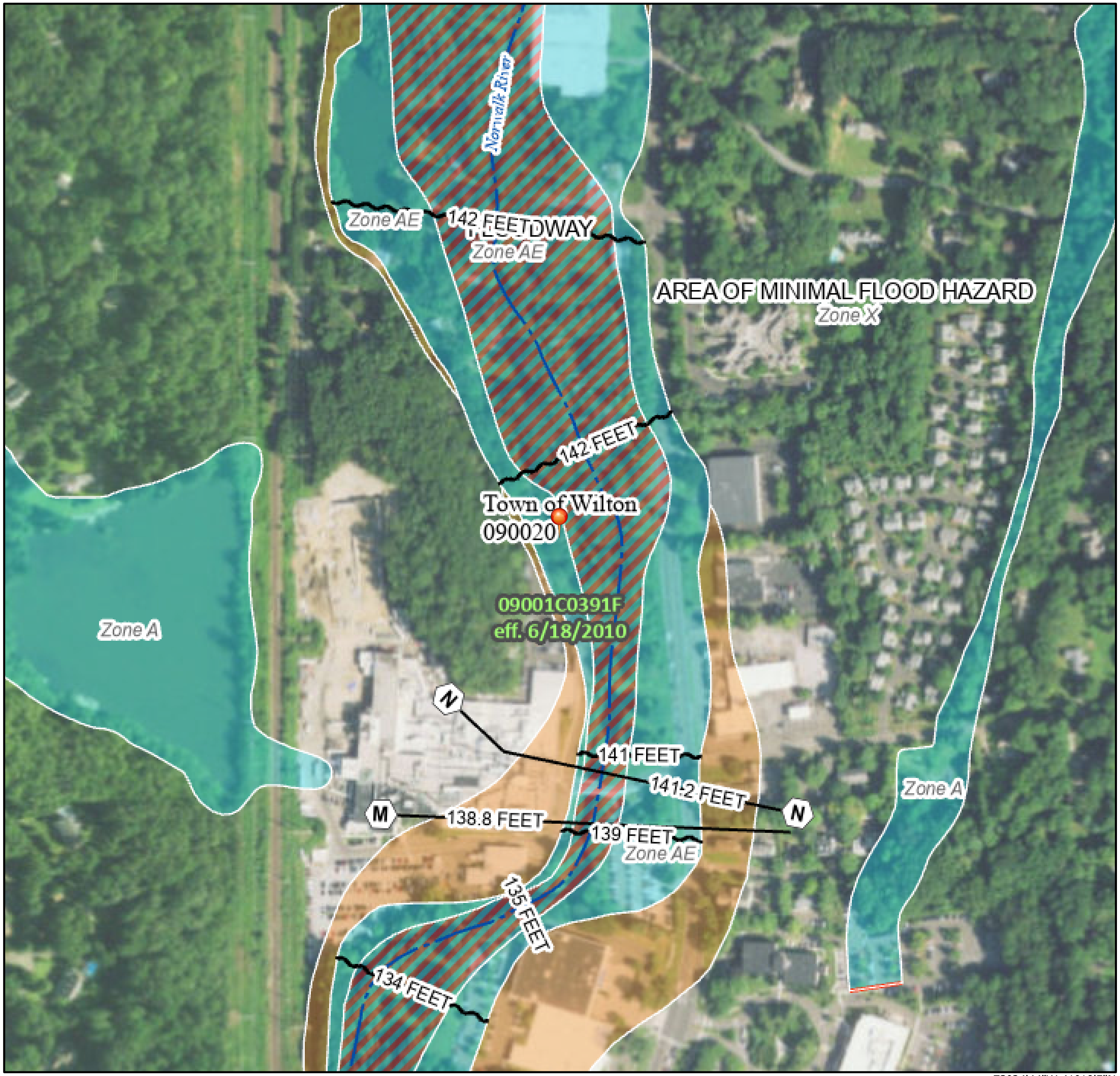
Connecticut Department of Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division



National Flood Hazard Layer FIRMette

FEMA

73°25'22"W 41°10'32"N



73°24'44"W 41°10'5"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/8/2022 at 1:03 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX D

TOWN OF WILTON, CONNECTICUT

Parcel ID	Site Address	Owner Name	Mailing Address	Mailing City	Mailing State	Mailing Zip
68-36-B	59 DANBURY RD	WILTON PROPERTIES RSK LLC	470 WEST AVE STE 2007	STAMFORD	CT	06902- 0000
69-18	77 DANBURY RD	ASML US LLC	6115 CAMP BOWIE #152	FORT WORTH	TX	76116- 0000
69-18	77 DANBURY RD	ASML US LLC	6115 CAMP BOWIE #152	FORT WORTH	TX	76116- 0000
69-20	89 DANBURY RD	HICKEY THOMAS F	89 DANBURY RD	WILTON	CT	06897- 0000
69-22	91 DANBURY RD	WILTON TOWN OF	238 DANBURY RD	WILTON	CT	06897- 0000
69-26	27 ARROWHEAD RD	KIM ZENA	23-88 31ST ST #5D	ASTORIA	NY	11105- 0000
69-27	29 ARROWHEAD RD	ARNOLD LAURENCE J & SANDRA P	29 ARROWHEAD RD	WILTON	CT	06897- 0000
69-28	33 ARROWHEAD RD	CONTRERAS WILSON &	33 ARROWHEAD RD	WILTON	CT	06897- 0000
69-29	39 ARROWHEAD RD	VARRONE NICHOLAS J & MICHELLE L	39 ARROWHEAD RD	WILTON	CT	06897- 0000
70-16-1	DANBURY RD	CONN LIGHT & POWER CO THE	PO BOX 270	HARTFORD	CT	06141- 0000
68-36-A	65 DANBURY RD	WILTON PROJECT LLC	METRO CENTER ONE STATION PL	STAMFORD	CT	06902- 0000
68-36	59-65 DANBURY RD		59-65 DANBURY RD	WILTON	CT	06897- 0000
68-36-C	DANBURY RD	WILTON PROJECT LLC	METRO CENTER ONE STATION PL	STAMFORD	CT	06902- 0000

APPENDIX E

US Army Corps of Engineers®
New England District

Appendix E: Self-Verification Notification Form

This form is required for all inland projects in Connecticut, but it is not required if work is done within boundaries of Mashantucket Pequot or Mohegan Tribal Lands. At least two weeks before work commences, complete all fields (write "none" if applicable) below, send this form, Official Species List (see GC 12), documentation of THPO and SHPO notifications if applicable, site location map, project plans (not required for projects involving the installation of construction mats only) and any State or local approval(s) to:

Regulatory Division, Branch B
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751
or cenae-r-ct@usace.army.mil

and

CT DEEP
79 Elm Street
Hartford, CT 06106-5127
or DEEP.LWRDRegulatorySubmittals@ct.gov

State Permit Number: ____________________ Date of State Permit: ____________________

Permittee: ASML, Jason Domena, Senior Project Manager
Address, City, State & Zip: 77 Danbury Road, Wilton, CT, 06897
Phone(s) and Email: (203) 761-6392, Jason.domena@asml.com

Agent: Tighe & Bond, Raina Volovski
Address, City, State & Zip: 213 Court Street, Middletown, CT 06457
Phone(s) and Email: 860-704-4764, Rvolovski@tighebond.com

Contractor: TBD
Address, City, State & Zip: ____________________
Phone(s) and Email: ____________________

Project Name: CAMPUS TRAFFIC FLOW SAFETY IMPROVEMENTS
Project Location (provide detailed description & locus map):
Address, City, State & Zip: ASML, 77 Danbury Road, Wilton, CT 06897
Lat. ° N, Long ° (Decimal Degrees): 41.170061, -73.417383
Waterway Name: Norwalk River, unnamed tributary

Proposed Work Dates: Start: August 2022 Finish: April 2023

Work will be done under the following GPs (circle all that apply):

2	5	6	9	10	11	12	13	14	15	✓17	18	19	21

Area of Wetland Impacts (SF): Permanent: 20 sf Temporary: ____________

Area of Waterway Impacts (SF): Permanent: 0 sf Temporary: ____________

TOTAL Project Impact (SF): Permanent: 20 sf Temporary: ____________

Describe the specific work that will be undertaken in waters and wetlands: ________________

Storm water runoff from an existing parking lot created washout within the wetland. The proposed work includes the restoration of 20 square feet of previously disturbed wetland along the toe slope of fill. Restoration includes removal of non-native material, loaming and seeding as the wetland and adjacent area is maintained as grass. Wetland soils will not be disturbed due to work activities. No work is proposed within watercourses.

Have the THPOs and the CT SHPO been notified of the proposed work per the procedures in GC 11? If so, attach any responses received to this form.
Yes _______ date contacted _________No x

Are there Federally listed endangered/threatened species, other than the northern long-eared bat, present? (see GC 12) Yes _______ No X

Confirm no SAVs are present or will be impacted: Yes X No_______
Applicable to GPs:

2	5	6	9	10	11	12	13	14	15	17	18	19	21

Confirm no unconfined work with impact to diadromous fish (see App. H): Yes _______ No_______
Applicable to GPs:

2	5	6	9	10	19

Confirm work complies with Stream Crossing BMPs (see App. G): Yes ______No N/A

Applicable to GPs:

2	6	17	19

If GP 19 and work does not comply with Appendix G, identify date of Interagency Meeting where waiver was granted: Date of Meeting: ______________________________

Identify interagency participants: CT DEEP:______________ USACE:____________

Will your project include any secondary effects? _(Secondary effects include, but are not limited to, non-tidal waters or wetlands drained, flooded, fragmented, or mechanically cleared resulting from a single and complete project. See Appendix F - Definitions.) If YES, describe here:

The project will not include secondary effects.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms, eligibility criteria, and general conditions for Self-Verification under the Connecticut GPs.

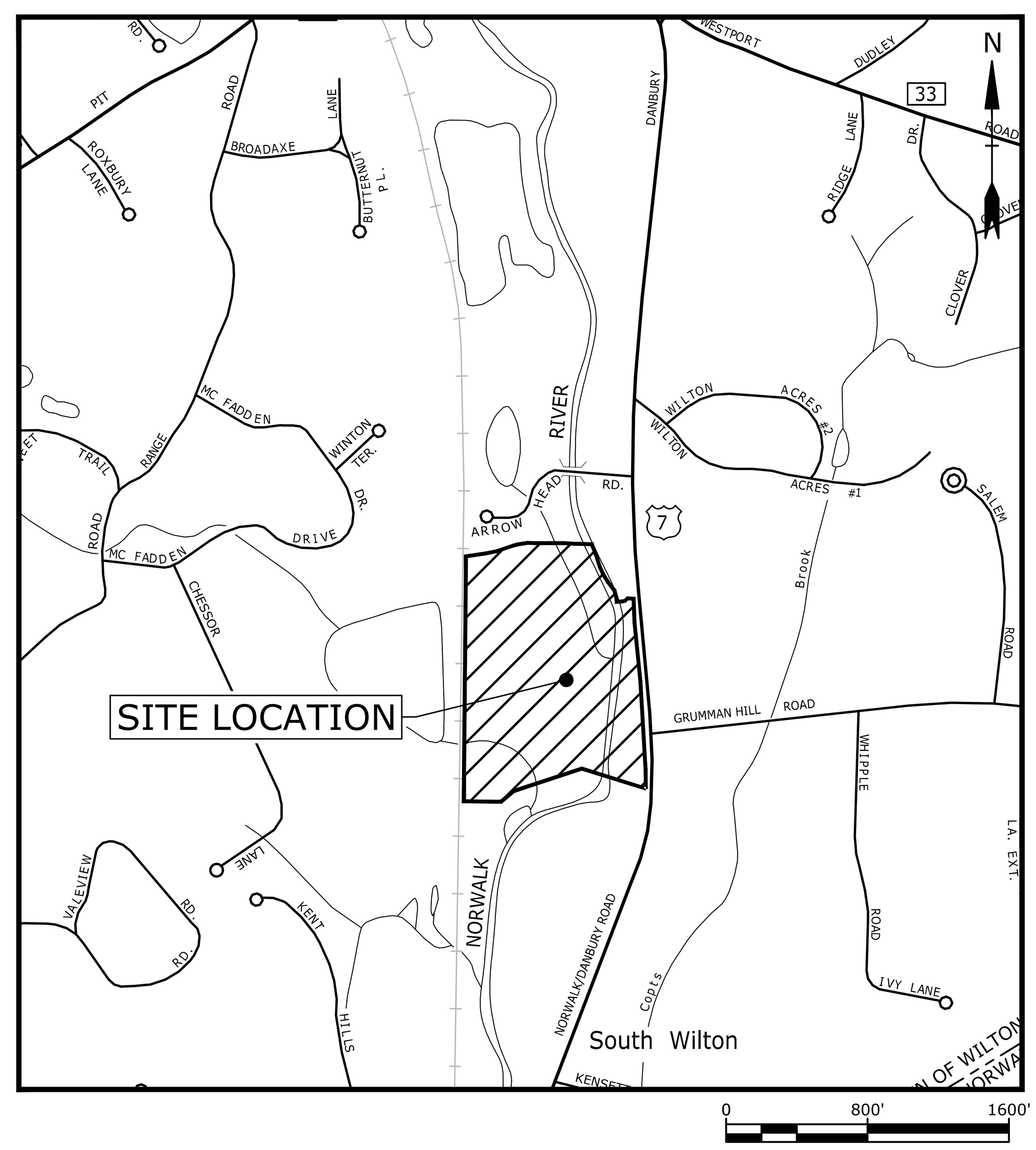
Permittee Signature: Raina Volovski **Date:** 5/19/2022

ASML

CAMPUS TRAFFIC FLOW SAFETY IMPROVEMENTS
DANBURY ROAD
WILTON, CONNECTICUT

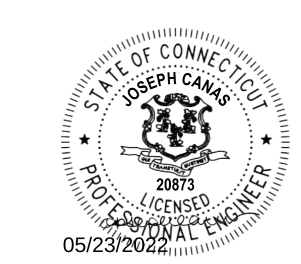
TOWN SUBMISSION DRAWINGS
MAY 24, 2022

LIST OF DRAWINGS		
SHEET NO.	DRAWING NO.	DRAWING TITLE
		GENERAL
1	G-001	COVER SHEET
		CIVIL
2	C-000	GENERAL NOTES, ABBREVIATIONS AND LEGEND
3	C-100	EXISTING CONDITIONS PLAN
4	C-200	ROADWAY TYPICAL SECTIONS
5	C-210	ALIGNMENT PLAN
6	C-220	DRIVEWAY PROFILE
7	C-300	SITE PLAN
8	C-310	SITE PLAN ENLARGEMENT
9	C-400	GRADING PLAN
10	C-410	GRADING PLAN ENLARGEMENT
11	C-500	DRAINAGE AND UTILITY PLAN
12	C-510	DRAINAGE AND UTILITY PLAN EMLARGEMENT
13	C-601	SEDIMENT AND EROSION CONTROL PLAN PHASE - 1
14	C-602	SEDIMENT AND EROSION CONTROL PLAN PHASE - 2
15	C-603	SEDIMENT AND EROSION CONTROL PLAN PHASE - 3
16	C-604	SEDIMENT AND EROSION CONTROL PLAN PHASE - 4
17	C-605	SEDIMENT AND EROSION CONTROL PLAN PHASE - 5
18	C-611	SEDIMENT AND EROSION CONTROL NOTES, NARRATIVE AND DETAILS
19	C-612	SEDIMENT AND EROSION CONTROL DETAILS
20 - 28	C-700-C-708	CROSS-SECTIONS
29	C-800	TRAFFIC OPERATIONS PLAN
30 - 36	C-900 - C-906	SITE DETAILS
37 - 43	C-910 - C-916	DRAINAGE DETAILS
44	L-100	PLANTING PLAN - 1
45	L-101	PLANTING PLAN - 2
46	L-102	PLANTING DETAILS



LOCATION MAP
SCALE: 1" = 800'

PREPARED BY:
Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100



PREPARED FOR:
ASML
77 DANBURY ROAD
WILTON, CT 06897

COMPLETE SET 46 SHEETS

GENERAL NOTES

1. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION SHOWN ON THESE DRAWINGS IS NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL UTILITIES WHICH MAY AFFECT CONSTRUCTION OPERATIONS. THE CONTRACTOR MUST ADEQUATELY PROTECT AND SUPPORT UTILITIES AND SHALL BE RESPONSIBLE FOR ALL DAMAGE INCURRED AT NO EXPENSE TO THE OWNER. ANYONE USING UTILITY INFORMATION AND DATA PROVIDED HEREIN SHALL CONTACT "CALL BEFORE YOU DIG", 1-800-922-4455 OR WWW.CBYD.COM, 72 HOURS IN ADVANCE TO VERIFY THE LOCATION OF UTILITIES PRIOR TO STARTING CONSTRUCTION.
2. REFERENCE IS MADE TO PLAN TITLED "PROPOSED DRIVEWAY, EXISTING CONDITIONS, PREPARED FOR ASML US, INC.." PREPARED BY ARTHUR H. HOWLAND AND ASSOCIATES, PC, DATED APRIL 20, 2022.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR IN EVALUATING THESE PLANS TO MAKE EXAMINATIONS IN THE FIELD BY VARIOUS METHODS AND OBTAIN NECESSARY INFORMATION FROM AVAILABLE RECORDS, UTILITY COMPANIES, AND INDIVIDUALS AS TO THE LOCATION OF SUBSURFACE STRUCTURES.
4. THE WETLANDS DEPICTED ON THE PLANS HAVE BEEN FLAGGED BY RAINA VOLOVSKI, PROFESSIONAL SOIL SCIENTIST OF TIGHE & BOND.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE DRAWINGS, SPECIFICATIONS OR APPLICABLE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE OWNER'S REPRESENTATIVE SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL CONFORMANCE WITH REGULATIONS AND CODES.
6. AS CONSTRUCTION IS COMPLETED, THE CONTRACTOR SHALL REMOVE ALL EXCESS MATERIAL, DEBRIS, ETC. AND RESTORE OR REPLACE ANY DAMAGE TO LANDSCAPING AND SITE FEATURES.
7. AREAS OUTSIDE THE PROJECT LIMIT LINE DISTURBED BY CONSTRUCTION SHALL BE RETURNED TO THEIR ORIGINAL CONDITION OR BETTER AND SHALL BE GRADED TO MEET PROPOSED CONSTRUCTION AS DIRECTED BY THE OWNER'S REPRESENTATIVE. COST FOR THIS WORK SHALL BE BORNE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
8. THE CONTRACTOR SHALL PROCURE ALL THE NECESSARY PERMITS AND LICENSES, AT THE TIME REQUIRED, PAY ALL THE CHARGES AND FEES, AND GIVE NOTICES AS NECESSARY AND DUE IN CONNECTION WITH THE LAWFUL EXECUTION OF THE WORK AT NO ADDITIONAL COST TO THE OWNER.
9. ALL UTILITY BOXES, FRAMES, AND GRATES, ETC. AFFECTED BY THE CONSTRUCTION ACTIVITIES SHALL BE RESET/RECONSTRUCTED TO THE PROPER GRADE. ALL COST RELATED TO SUCH WORK SHALL BE INCLUDED IN THE BID PRICE.
10. EXCAVATION OF ANY TYPE SHALL BE ACCOMPLISHED IN SUCH A MANNER THAT UNDERGROUND UTILITIES OR STRUCTURES ARE NOT DAMAGED. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY FOR ANY DAMAGED INCURRED DURING CONSTRUCTION OPERATIONS. ALL EXCAVATION SHALL BE IN CONFORMANCE WITH THE LATEST OSHA REQUIREMENTS.
11. ALL DRIVEWAYS, ROADS, STAIRS, AND SIDEWALKS DISTURBED BY THE CONSTRUCTION IN OR OUTSIDE THE PROJECT LIMIT LINE SHALL BE RETURNED TO THEIR ORIGINAL CONDITION OR BETTER AND SHALL BE GRADED TO MEET THE PROPOSED CONSTRUCTION AS DIRECTED BY THE OWNER'S REPRESENTATIVE AT NO ADDITIONAL COST TO THE OWNER.
12. THE CONTRACTOR SHALL SUFFICIENTLY COVER ALL DISTURBED AREAS AT THE END OF EACH WORK DAY TO AVOID ANY RISK OF INJURY TO PEDESTRIAN OR VEHICULAR TRAFFIC. THE CONTRACTOR SHALL INSTALL TEMPORARY SUPPORT SYSTEMS OVER TRENCH EXCAVATIONS THAT ARE TAMPER RESISTANT AND SAFE FOR VEHICULAR AND PEDESTRIAN TRAFFIC. THE CONTRACTOR SHALL INSTALL BARRICADES TO PROTECT AGAINST PEDESTRIAN ACCESS. THE CONTRACTOR SHALL OBTAIN APPROVAL OF THE TEMPORARY SAFETY MEASURES BY THE OWNER'S REPRESENTATIVE. ALL MAINTENANCE AND PROTECTION OF BOTH PEDESTRIAN AND VEHICULAR TRAFFIC ARE INCLUDED IN THE BID PRICE FOR THIS PROJECT.
13. THE STANDARD SPECIFICATIONS (FOR SITE /CIVIL WORK) SHALL BE THE STATE OF CONNECTICUT, DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION, FORM 818, 2020, INCLUDING ALL SUPPLEMENTS THERETO. FORM 818 IS AVAILABLE FOR VIEWING ON THE CTDOT WEBSITE WWW.CT.GOV/DOT.
14. ALL DISTURBED AREAS NOT PROVIDED WITH SPECIFIC SITE IMPROVEMENTS (PAVING, CONCRETE SIDEWALK, LANDSCAPING, ETC.) SHALL HAVE TOPSOIL INSTALLED,SEED AND ESTABLISH GRASS .
15. THE CONTRACTOR SHALL RECORD THE LOCATIONS OF ALL UNDERGROUND UTILITIES INSTALLED OR FOUND WITHIN THE PROJECT AREA DURING CONSTRUCTION. THE UTILITIES SHALL BE MEASURED FROM PERMANENT SURFACE FEATURES AND COMPILED BY THE CONTRACTOR ON RECORD DRAWINGS. AN AS-BUILT SURVEY, SHALL BE PREPARED BY A SURVEYOR LICENSED IN THE STATE OF CONNECTICUT AND IN ACCORDANCE THE TOWN OF WILTON, AND SUBMITTED TO THE TOWN OF WILTON AND ENGINEER FOR REVIEW AND APPROVAL.
16. THE CONTRACTOR SHALL COMPLETE ALL WORK SO THAT ANY MATERIALS WHICH ARE TO REMAIN IN PLACE OR WHICH ARE TO REMAIN THE PROPERTY OF THE OWNER, WILL NOT BE DAMAGED. IF THE CONTRACTOR DAMAGES ANY MATERIALS WHICH ARE TO REMAIN, OR WHICH ARE TO REMAIN THE PROPERTY OF THE OWNER, THE DAMAGED MATERIALS SHALL BE REPLACED TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AT THE EXPENSE OF THE CONTRACTOR.
17. EROSION CONTROL PLANS SHALL BE STRICTLY ENFORCED. PUBLIC ROADS SHALL BE SWEPT CLEAN OF ALL DIRT AND DEBRIS AT THE END OF EACH DAY.
18. THERE SHALL BE NO CONSTRUCTION ACTIVITIES ON THE SITE ON SUNDAYS OR FEDERAL HOLIDAYS. ALL CONSTRUCTION RELATED ACTIVITIES SHALL BE LIMITED BETWEEN THE HOURS OF 7:00 A.M. AND 6:00 P.M. MONDAY THROUGH FRIDAY AND BETWEEN THE HOURS OF 8:00 A.M. AND 6 P.M. ON SATURDAYS. THIS CONDITION DOES NOT APPLY TO INTERIOR FINISH WORK PERFORMED WITHIN A FULLY-ENCLOSED BUILDING.
19. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

ZONING TABLE

Lot Dimensions and Coverage			
Item	Required	Existing	Proposed
Min. Lot Area (ac)	10	28.64	28.64
Min. Frontage (feet)	150	1,065.12	1,065.12
Max. Building Coverage	25%	24.0%	24.0%
Max Site Coverage	50%	42.2%	43.3%
Building Setbacks			
Min. Front Yard Overall (ft)	100	5	5
Min. Side Yard Overall (ft)	100	101.3	101.3
Min. Side Yard Abutting Residential (feet)	150 / 50	209.9	209.9
Min. Rear Yard (feet)	100 / 150	N/A	N/A
Min. Rear Yard Abutting Residential District (feet)	150 / 10	100.1	100.1

Building Coverage Summary		
Item	Existing	Proposed
77 Danbury Road (sf)	230,011	242,356
71 Danbury Road (sf)	11,497	11,497
Parking Garage (sf)	38,732	38,732
Total (sf)	292,565	292,585
Site Coverage Summary		
Building Coverage (sf)	292,585	292,585
Other Impervious Areas (sf)	233,701	248,489
Total (sf)	526,600	541,074
Parking Summary		
Industrial Use (1 per 400 sf + 1 per 1000sf outdoor storage) Buildings = 940 spaces Outdoor storage = 4 spaces Total required = 944 spaces	1,193	1,127

Notes:

1. A four story and or 55 foot high building may be located on lots that are in conformance with minimum area requirements of the DE-10 or DE-5 district. They shall not be permitted by action of the Zoning Board of Appeals.
2. Where adjoining property in a residence district to the side or rear lies within the right of way of a railroad, the side or rear yard setbacks may be reduced to 50 feet. Where adjoining property In a residence district to the side and rear lies within the right-of-way of a railroad, and where the railroad property adjoins a public utility right of way and or a publicly owned right of way with a total width of not less than 200 feet, the side and rear yard building setbacks and the parking setbacks maybe reduced to 10 feet.
3. Where property adjoining in a residence district to the side or rear lies within the right-of-way of a railroad, the side or rear yard parking and loading setbacks may be reduced to ten feet.

STANDARD ABBREVIATIONS

@	AT
AC	ACRE/AIR CONDITIONING
BL	BASELINE
BW	BOTTOM OF WALL
BIT	BITUMINOUS
BC	BOTTOM OF CURB
BS	BOTTOM OF STAIRS
BLDG	BUILDING
BOT	BOTTOM
CATV	CABLE TELEVISION
CIP	CAST IRON PIPE
CB	CATCH BASIN
CL	CENTERLINE
CLF	CHAIN LINK FENCE
CL&P	CONNECTICUT LIGHT & POWER
CTDEEP	CONNECTICUT DEPT. OF ENERGY & ENV. PROTECTION
CTDOT	CONNECTICUT DEPT. OF TRANSPORTATION
CONC	CONCRETE
CO	CLEAN-OUT
CPP	CORRUGATED POLYETHYLENE PIPE
CY	CUBIC YARDS
DIP	DUCTILE IRON PIPE
DN	DOWN
DWG	DRAWING
E	EAST/ELECTRIC
EG	EXISTING GRADE
ELEC	ELECTRIC
EL/ELEV	ELEVATION
EMH	ELECTRIC MANHOLE
END	ENDWALL
EX/EXIST	EXISTING
EXP. JT.	EXPANSION JOINT
FF	FIRST FLOOR
G	GAS
GG	GAS GATE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HYD	HYDRANT
IN	INCHES
INC	INCORPORATED
INV	INVERT
L	LENGTH OF CURVE
LT	LEFT
LP	LIGHT POLE
MAX	MAXIMUM
MIN	MINIMUM
MH	MANHOLE
MISC	MISCELLANEOUS
MON	MONUMENT
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
NIC	NOT IN CONTRACT
N	NORTH
NTS	NOT TO SCALE
N/A	NOT APPLICABLE
N/F	NOW OR FORMERLY
OH	OVERHEAD
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PED	PEDESTRIAN
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCY
PRC	POINT OF REVERSE CURVATURE
PVC	POLYVINYL CHLORIDE
R	RADIUS
REV	REVISION
ROW	RIGHT OF WAY
RT	RIGHT
SAN	SANITARY
SCH	SCHEDULE
SF	SQUARE FEET
S	SOUTH
STA	STATION
STD	STANDARD
STRM	STORM
T	TANGENT LENGTH/TEL-DATA
TEL	TEL-DATA
TF	TOP OF FRAME
TYP	TYPICAL
TC	TOP OF CURB
TS	TOP OF STAIRS
TW	TOP OF WALL
W	WATER
WB	WETLAND BOUNDARY
WG/WV	WATER GATE/VALVE
&	AND

LEGEND

DESCRIPTION	EXISTING	PROPOSED
PROPERTY LINE		
EASEMENT LINE		
PROJECT LIMIT LINE		
FENCE		
MINOR CONTOUR		47
MAJOR CONTOUR	50	50
SPOT ELEVATION	+ 219.4	× 36.3
SILT SACK		S.S.
CONSTRUCTION ENTRANCE		
SILT FENCE		
TEMPORARY SOIL STOCKPILE AREA		
TREES	12"OA	
EDGE OF PAVEMENT		
CONCRETE CURB LINE		
WHITE PAINTED LINES		
BUILDING		
WALL		
WOOD POST		
ENDWALL		
STORM SEWER	12"	
STORM MANHOLE	D	
CATCH BASIN	CB	
YARD DRAIN		
DEEP TEST HOLE		
UNDERGROUND ELECTRIC	E	E E
ELECTRIC MANHOLE	E	
LIGHT POLE	LP	
UTILITY POLE		
SANITARY SEWER	8"DI	SS SS
SANITARY LATERAL		SS SS
SANITARY MANHOLE	SMH S	S
FIRE SERVICE		F-HP F-HP
WATER MAIN	PW PW	PW
WATER METER		
WATER VALVE	WV	
HYDRANT		
TEL-DATA - BURIED	T T	TEL-DATA
TEL-DATA MANHOLE	T	
FUEL TANK		
GUIDERAIL		
SIGN & SIGN POST		
SIDEWALK	CONCRETE WALK	
HANDICAP PARKING		
YELLOW PAINT LINE		
STOP BAR		
LIGHT		
INFILTRATION SWALE		
WETLAND LIMIT		
WETLAND FLAG	13	
WETLAND BUFFER		

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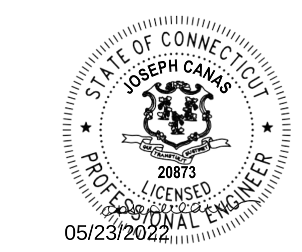


TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

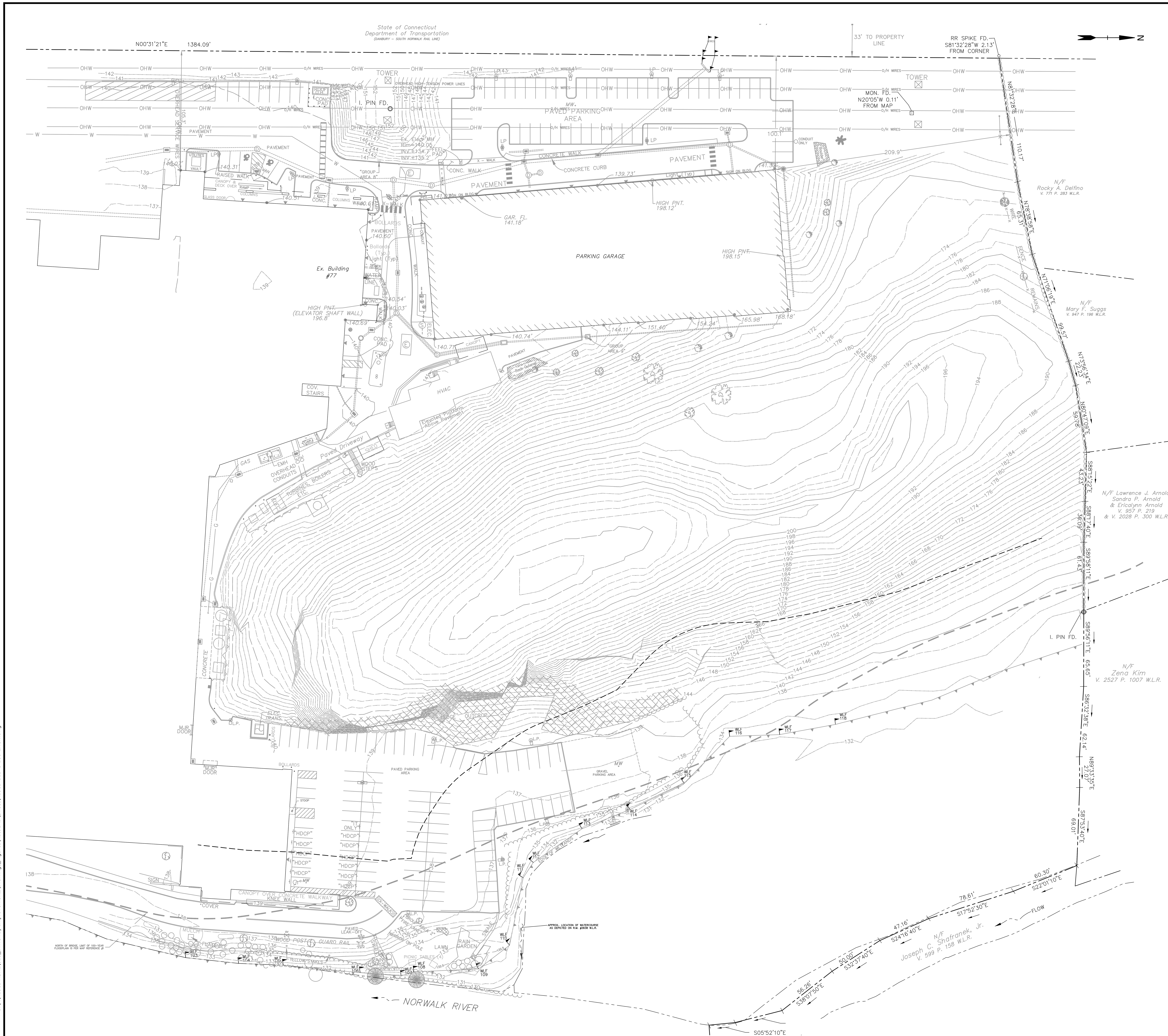
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-000-GENR.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

GENERAL NOTES, LEGEND AND ABBREIVIATIONS

SCALE: NO SCALE

C-000

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:47pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-000-GENR.dwg



EXISTING CONDITION PLAN NOTES

1. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION SHOWN ON THESE DRAWINGS IS NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL UTILITIES WHICH MAY AFFECT CONSTRUCTION OPERATIONS. THE CONTRACTOR MUST ADEQUATELY PROTECT AND SUPPORT UTILITIES AND SHALL BE RESPONSIBLE FOR ALL DAMAGE INCURRED AT NO EXPENSE TO THE OWNER. ANYONE USING UTILITY INFORMATION AND DATA PROVIDED HEREIN SHALL CONTACT "CALL BEFORE YOU DIG", 1-800-922-4455 OR WWW.CBYD.COM, 72 HOURS IN ADVANCE TO VERIFY THE LOCATION OF UTILITIES PRIOR TO STARTING CONSTRUCTION.
2. REFERENCE IS MADE TO PLAN TITLED REFERENCE IS MADE TO PLAN TITLED "PROPOSED DRIVEWAY, EXISTING CONDITIONS, PREPARED FOR ASML US, INC.." PREPARED BY ARTHUR H. HOWLAND AND ASSOCIATES, PC, DATED APRIL 20, 2022.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR IN EVALUATING THESE PLANS TO MAKE EXAMINATIONS IN THE FIELD BY VARIOUS METHODS AND OBTAIN NECESSARY INFORMATION FROM AVAILABLE RECORDS, UTILITY COMPANIES, AND INDIVIDUALS AS TO THE LOCATION OF SUBSURFACE STRUCTURES.
4. THE WETLANDS DEPICTED ON THE PLANS HAVE BEEN FLAGGED BY RAINA VOLOVSKI, PROFESSIONAL SOIL SCIENTIST OF TIGHE & BOND.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE DRAWINGS, SPECIFICATIONS OR APPLICABLE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE OWNER'S REPRESENTATIVE SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL CONFORMANCE WITH REGULATIONS AND CODES.
6. VERTICAL DATUM: NAVD88

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(203) 712-1100

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

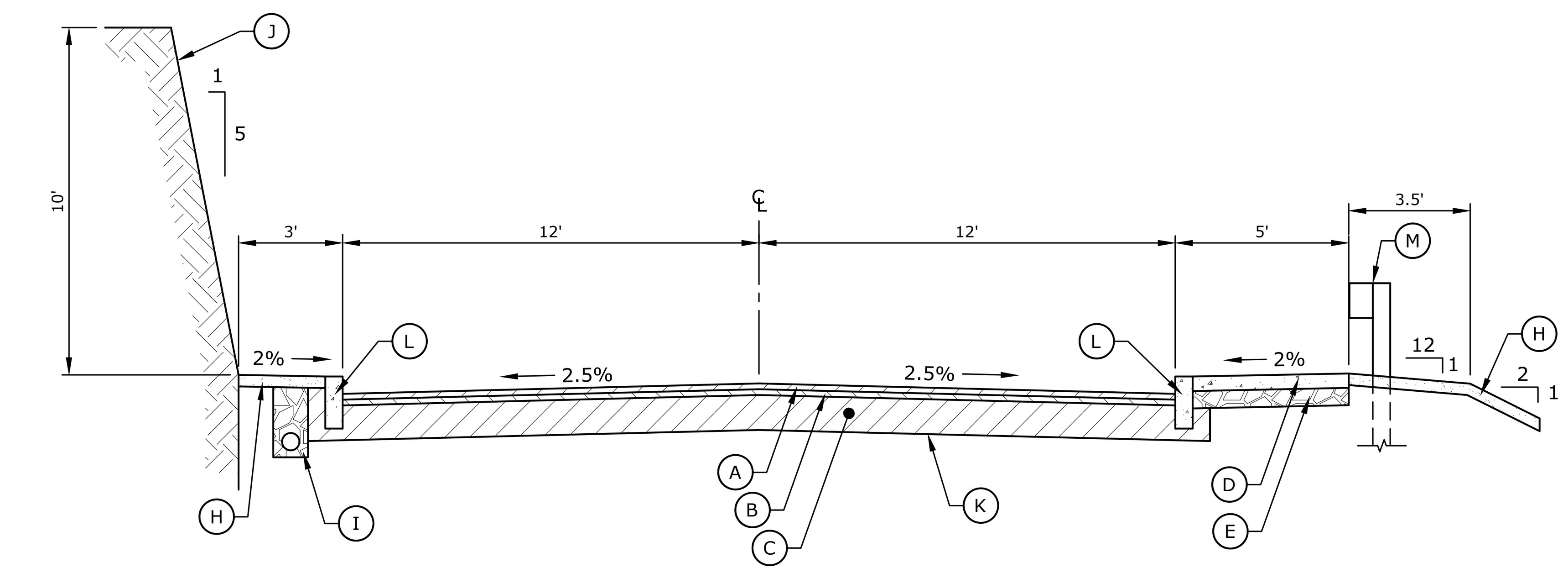
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-100-EXCN.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

EXISTING CONDITIONS PLAN

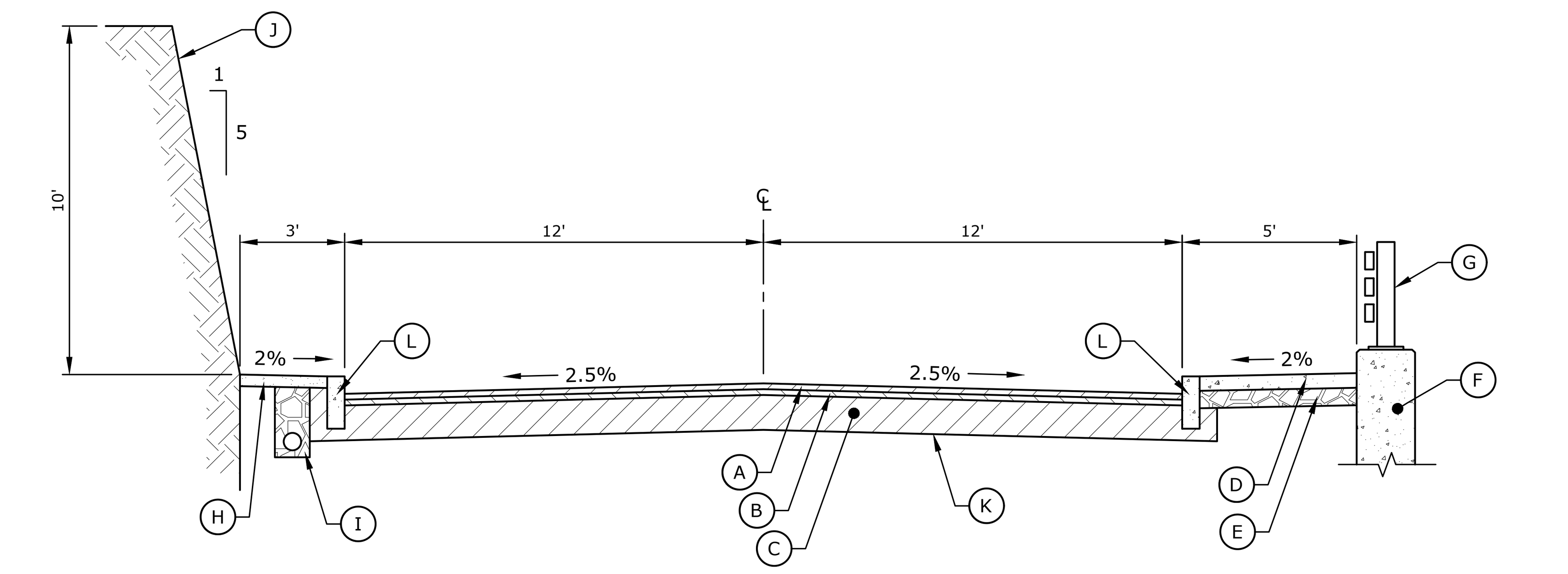
SCALE: 1" = 40'

C-100

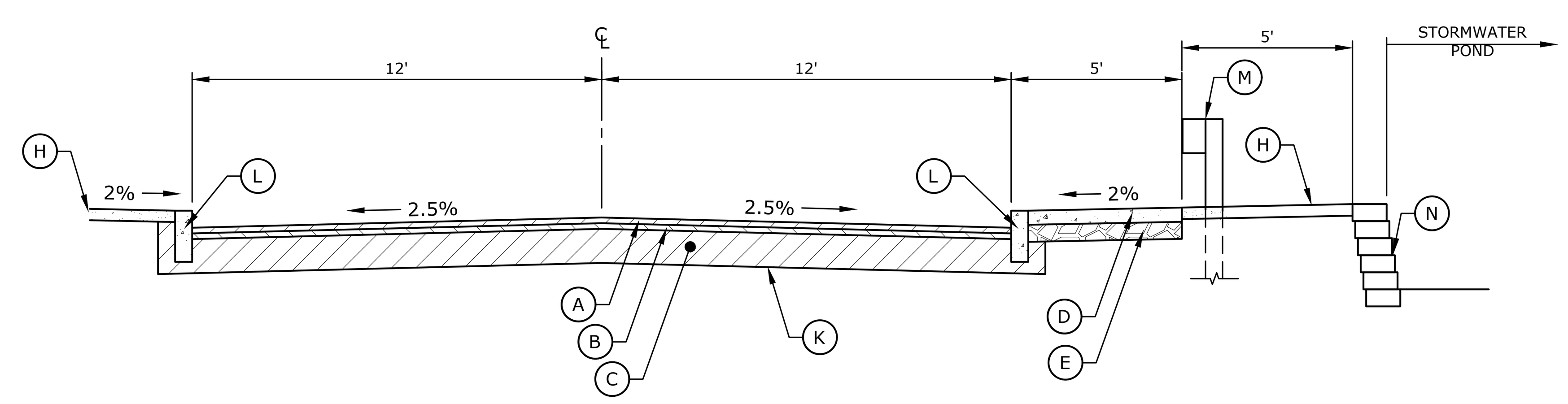
Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:48pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-100-EXCN.dwg



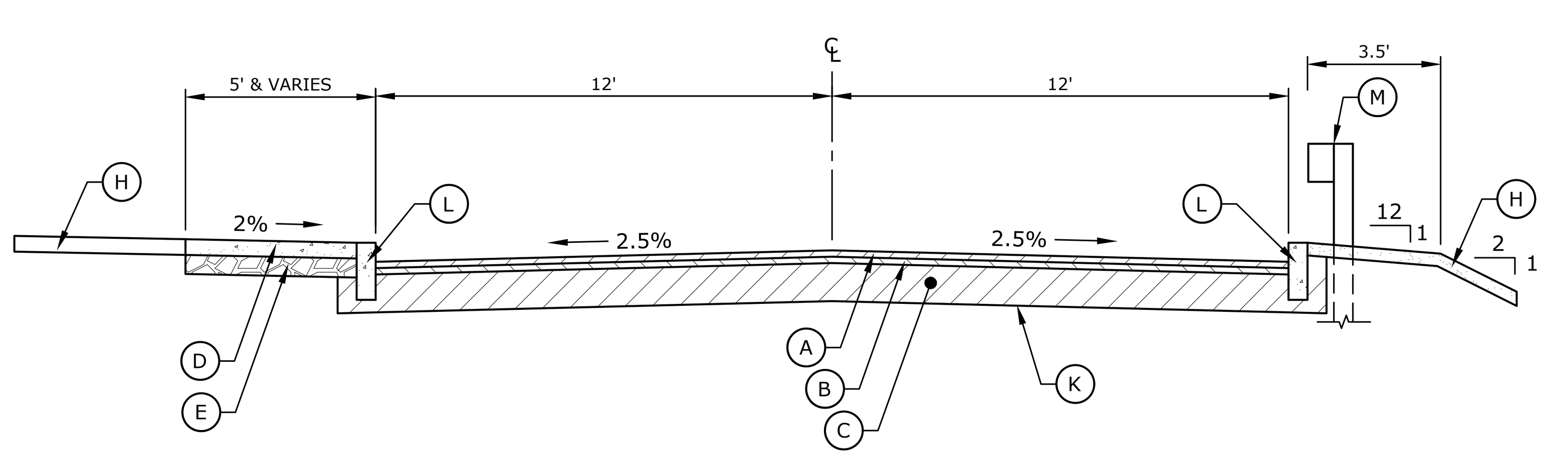
TYPICAL SECTION - 5+70 TO 7+70
SCALE: 1" = 4'



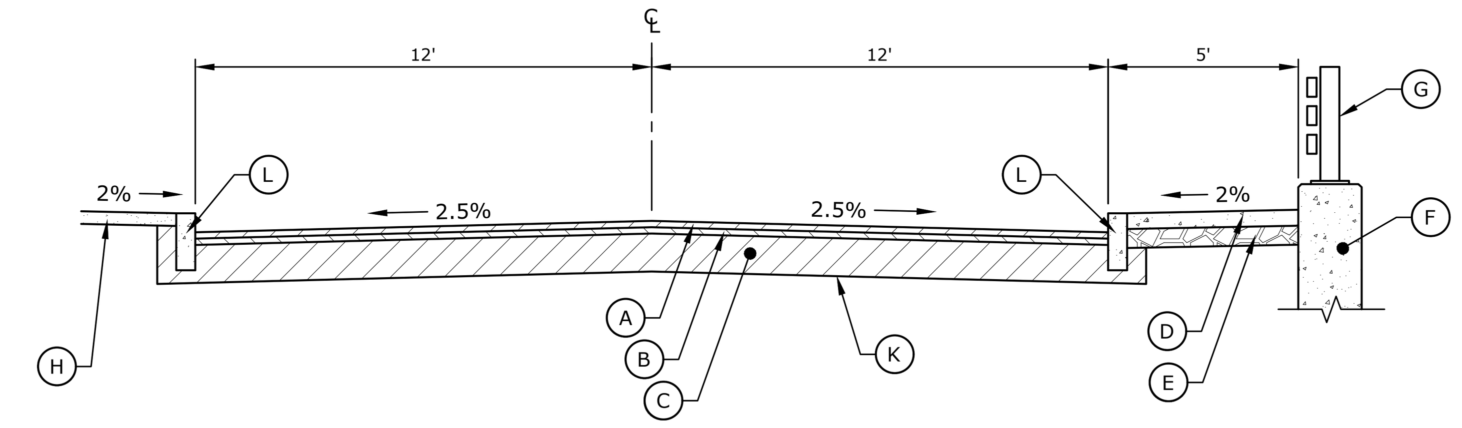
TYPICAL SECTION - 4+20 TO 5+70
SCALE: 1" = 4'



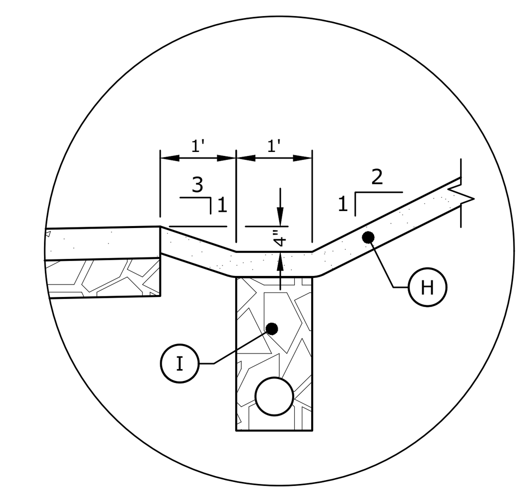
TYPICAL SECTION - 1+80 TO 3+90
SCALE: 1" = 4'



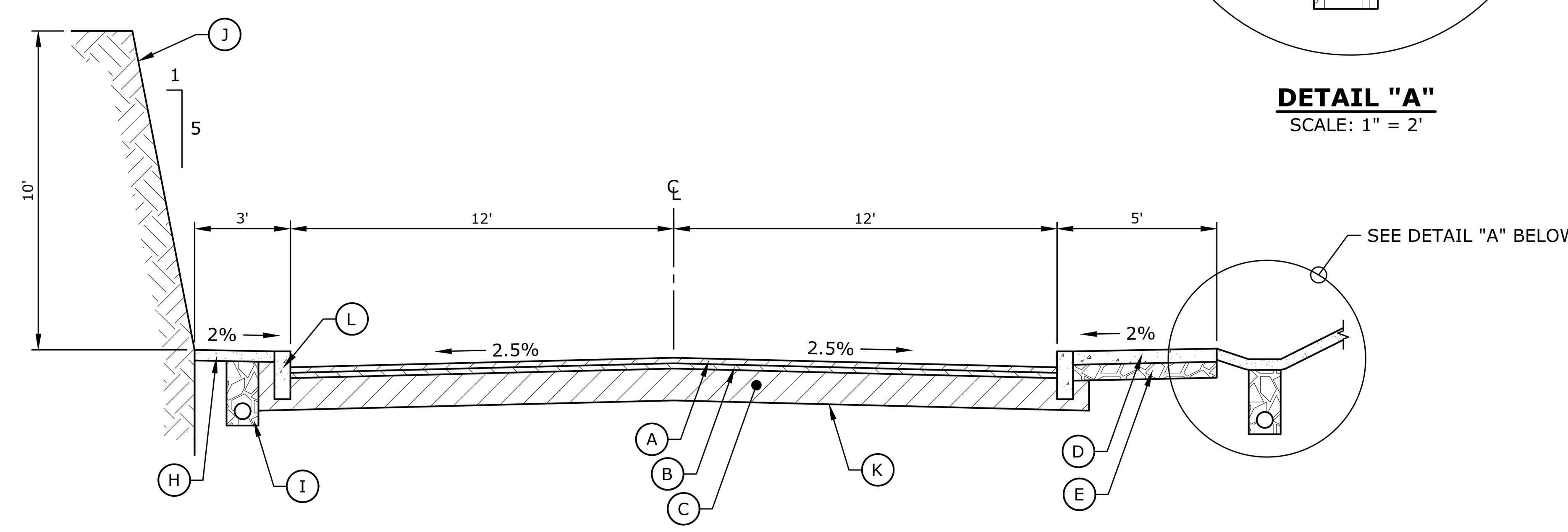
TYPICAL SECTION - 0+00 TO 1+80
SCALE: 1" = 4'



TYPICAL SECTION - 10+50 TO 11+00
SCALE: 1" = 4'



DETAIL "A"
SCALE: 1" = 2'



TYPICAL SECTION - 7+70 TO 9+60
SCALE: 1" = 4'

TYPICAL SECTION LEGEND

- A - 2" HMA S0.5
- B - 2" HMA S1.0
- C - 12" SUBBASE
- D - CONCRETE SIDEWALK
- E - 6" PROCESSED AGGREGATE
- F - CONCRETE RETAINING WALL
- G - THREE TUBE RAIL
- H - 4" TOPSOIL & SEED
- I - UNDERDRAIN
- J - ROCK FACE
- K - SUBGRADE PREP
- L - CONCRETE CURB
- M - TIMBER GUIDERAIL
- N - PRECAST SEGMENTAL BLOCK WALL

0 4' 8'
SCALE: 1" = 4'

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05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

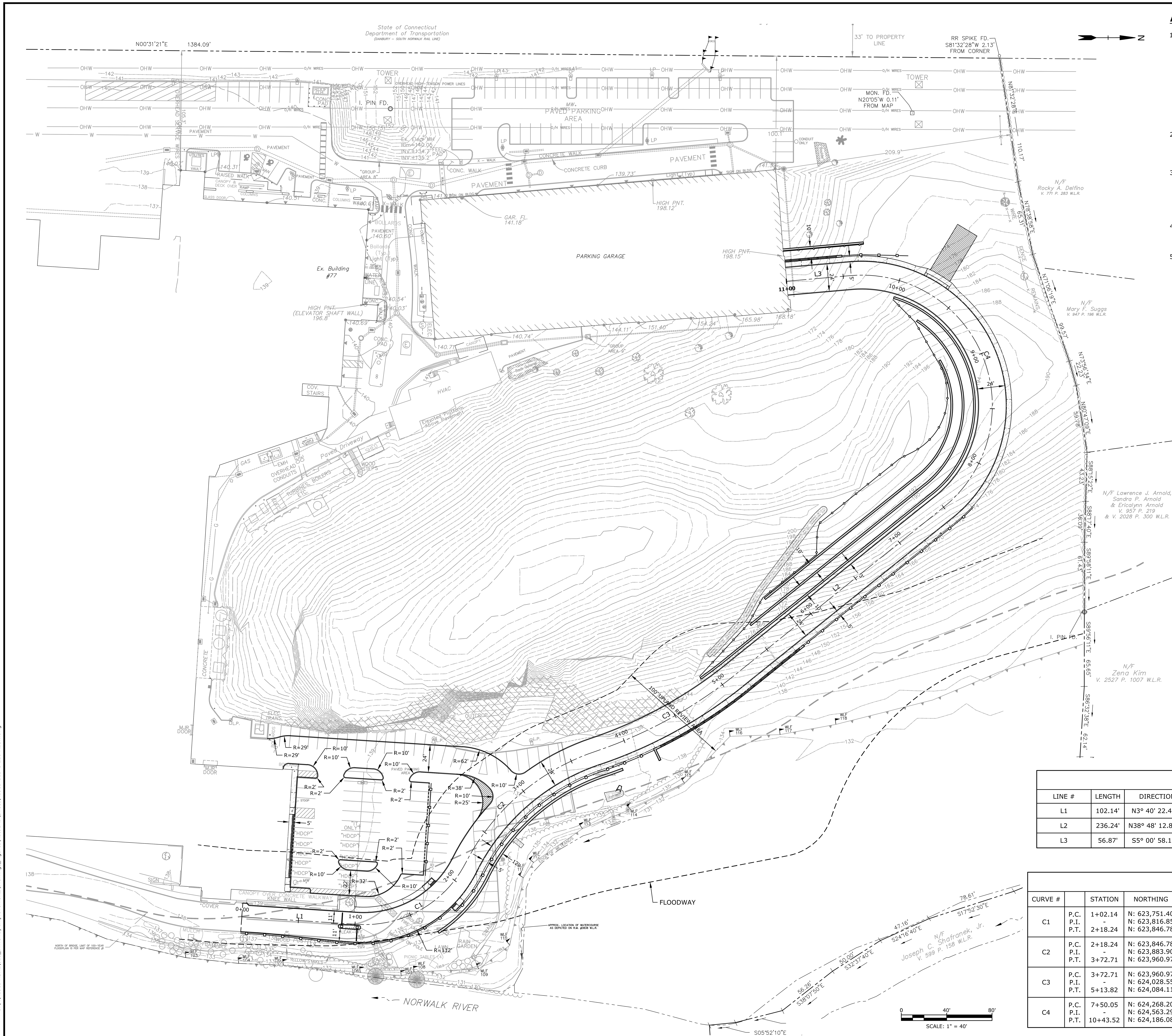
MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-200-TYP.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

ROADWAY
TYPICAL SECTIONS

SCALE: 1" = 4'

C-200



ALIGNMENT PLAN NOTES

1. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION SHOWN ON THESE DRAWINGS IS NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL UTILITIES WHICH MAY AFFECT CONSTRUCTION OPERATIONS. THE CONTRACTOR MUST ADEQUATELY PROTECT AND SUPPORT UTILITIES AND SHALL BE RESPONSIBLE FOR ALL DAMAGE INCURRED AT NO EXPENSE TO THE OWNER. ANYONE USING UTILITY INFORMATION AND DATA PROVIDED HEREIN SHALL CONTACT "CALL BEFORE YOU DIG", 1-800-922-4455 OR WWW.CBYD.COM, 72 HOURS IN ADVANCE TO VERIFY THE LOCATION OF UTILITIES PRIOR TO STARTING CONSTRUCTION.
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ALIGNMENT PLAN LEGEND

- 100 FT UPLAND REVIEW AREA
- PROPERTY LINE
- EASEMENT LINE
- PROPOSED CURB
- PROPOSED RETAINING WALL
- PROPOSED BUILDING
- PROPOSED GUIDE RAIL
- PROPOSED FENCE

LINE TABLE

LINE #	LENGTH	DIRECTION	START POINT	END POINT
L1	102.14'	N3° 40' 22.46"E	N: 623649.47, E: 816289.34	N: 623751.40, E: 816295.88
L2	236.24'	N38° 48' 12.84"W	N: 624084.11, E: 816076.04	N: 624268.20, E: 815928.00
L3	56.87'	S5° 00' 58.10"E	N: 624186.08, E: 815723.82	N: 624129.43, E: 815728.79

CURVE TABLE

CURVE #		STATION	NORTHING	EASTING	DELTA (Δ)	TANGENT	LENGTH	RADIUS
C1	P.C. P.I. P.T.	1+02.14 - 2+18.24	N: 623,751.40 N: 623,816.85 N: 623,846.78	E: 816,295.88 E: 816,300.08 E: 816,241.72	66° 31' 02.9"	65.58'	116.09'	100.00'
C2	P.C. P.I. P.T.	2+18.24 - 3+72.71	N: 623,846.78 N: 623,883.90 N: 623,960.97	E: 816,241.72 E: 816,169.37 E: 816,143.44	44° 15' 10.3"	81.32'	154.47'	200.00'
C3	P.C. P.I. P.T.	3+72.71 - 5+13.82	N: 623,960.97 N: 624,028.55 N: 624,084.11	E: 816,143.44 E: 816,120.71 E: 816,076.04	20° 12' 42.7"	71.29'	141.11'	400.00'
C4	P.C. P.I. P.T.	7+50.05 - 10+43.52	N: 624,268.20 N: 624,563.29 N: 624,186.08	E: 815,928.00 E: 815,690.71 E: 815,723.82	146° 12' 45.3"	378.66'	293.47'	115.00'

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05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

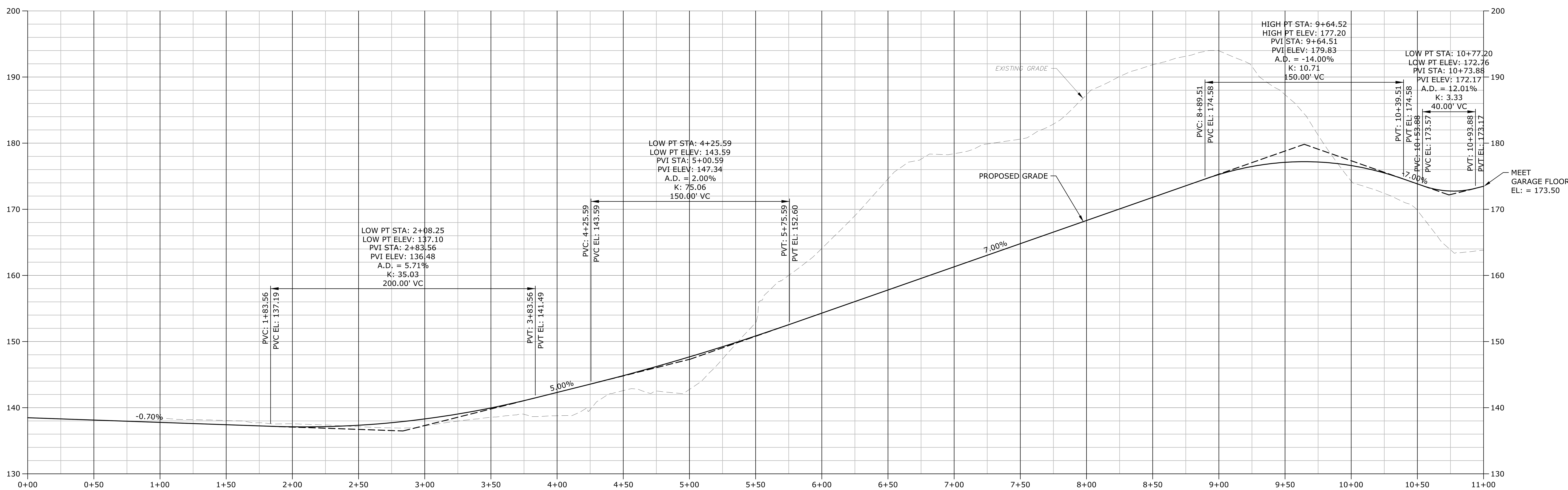
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-210-ALGN.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

ALIGNMENT PLAN

SCALE: 1" = 40'

C-210

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:48pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-210-ALGN.dwg



PROPOSED DRIVE - STA: 0+00 TO 11+00

HORIZONTAL SCALE 1" = 40'
0 40' 80'
0 8' 16'
VERTICAL SCALE 1" = 8'

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STATE OF CONNECTICUT
LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT
JOSEPH CANAS
28873
LICENSED
PROFESSIONAL ENGINEER
05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

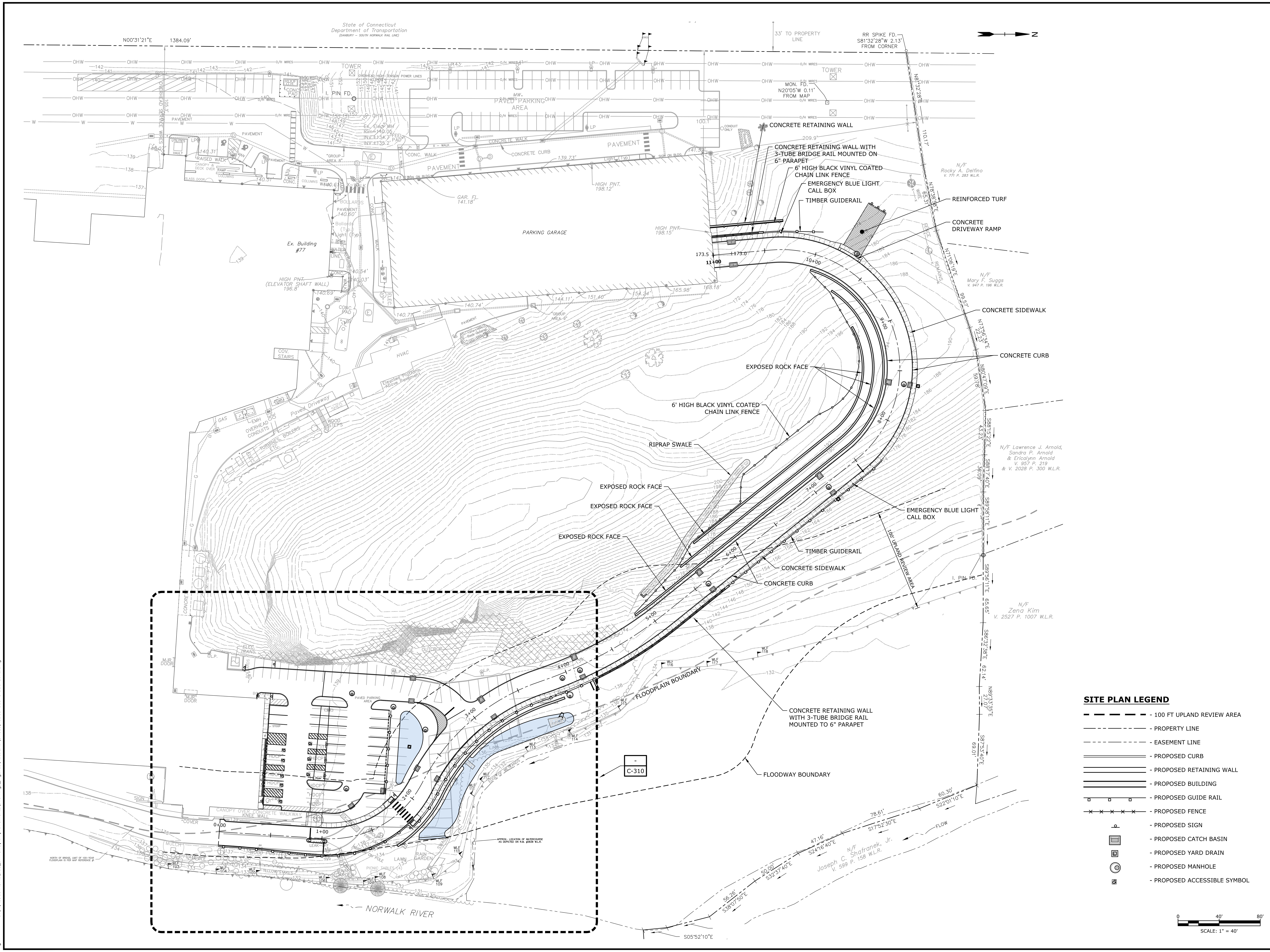
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-220-PROF.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRIVEWAY PROFILE

SCALE: AS SHOWN

C-220

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:48pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-220-PROF.dwg



Last Saved: 5/23/2022
Plotted On: May 23, 2022-4:49pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-300-SITE.dwg

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Shelton, CT 06484
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05/23/2022

TOWN SUBMISSION DRAWINGS

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Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

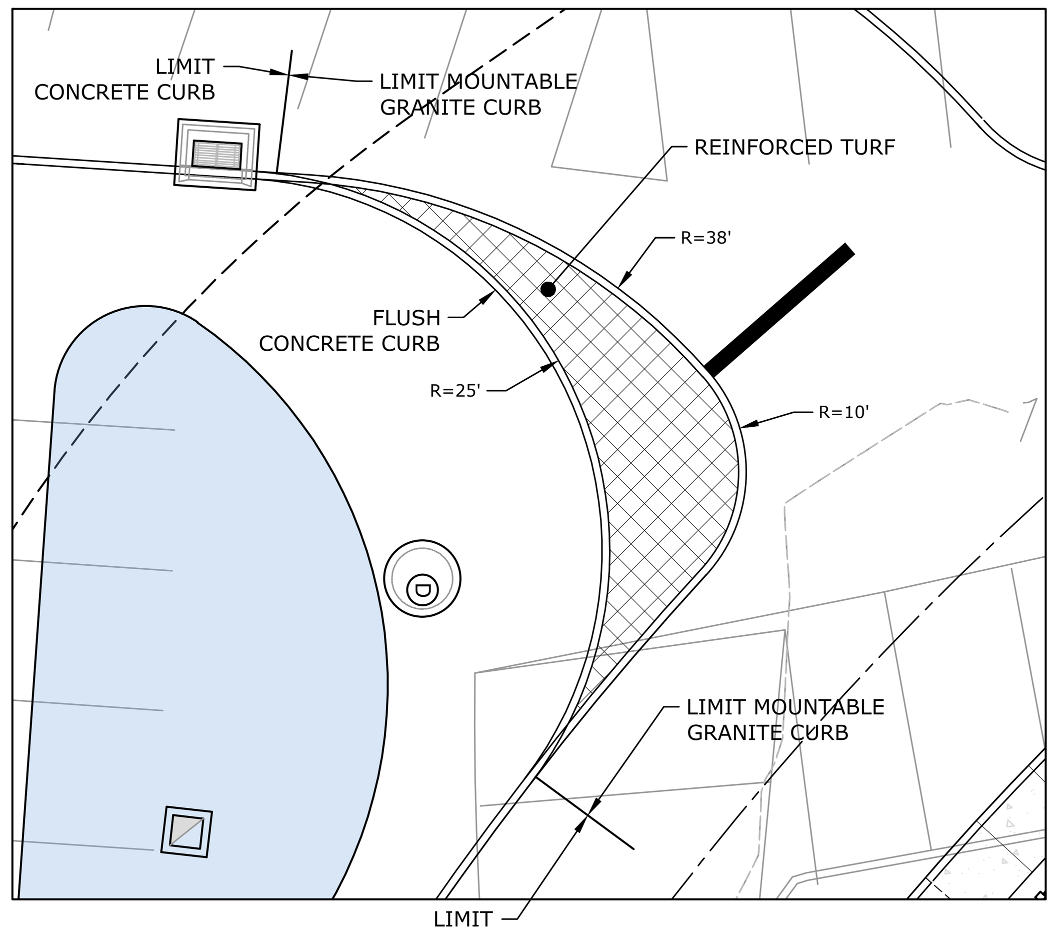
MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-300-SITE.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

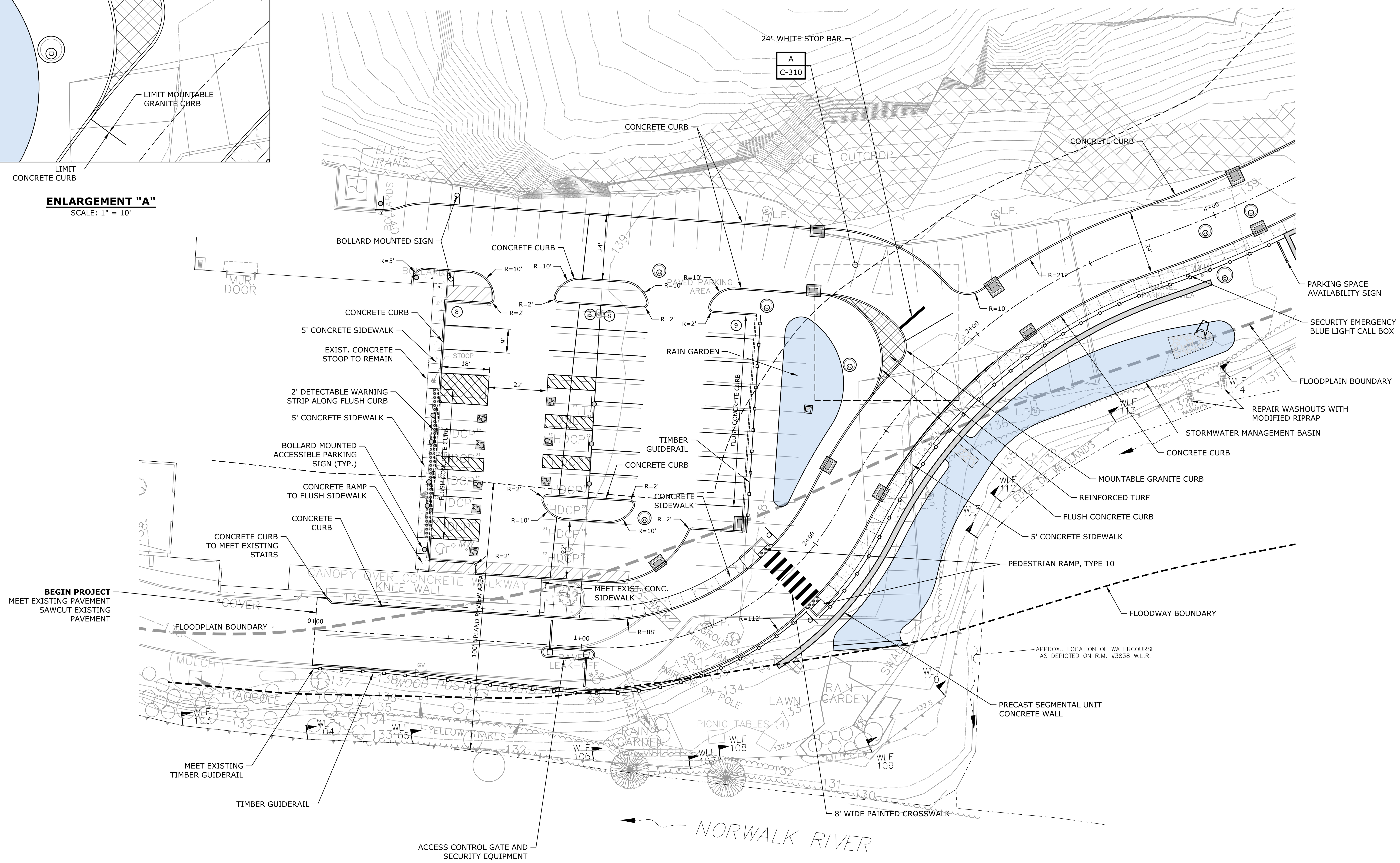
SITE PLAN

SCALE: 1" = 40'

C-300



ENLARGEMENT "A"
SCALE: 1" = 10'



SCALE: 1" = 20'

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Shelton, CT 06484
(203) 712-1100

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION
1	04/25/2022	PROJECT REVIEW

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-300-SITE.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

SITE PLAN ENLARGEMENT

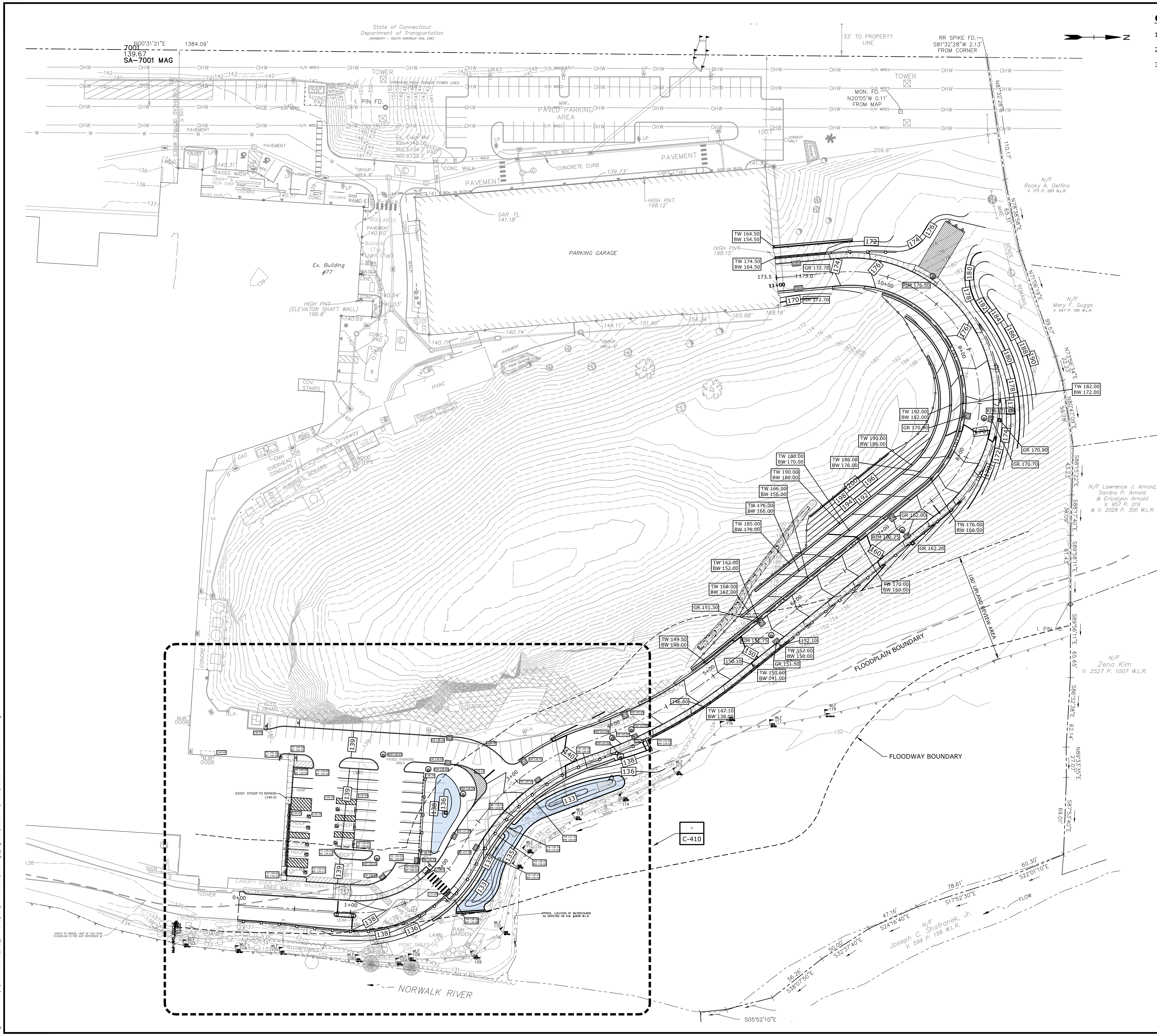
SCALE: 1" = 20'

C-310

Last Saved: 5/23/2022
Plotted On: May 23, 2022-4:49pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-300-SITE.dwg

GRADING PLAN NOTES

1. ACCESSIBLE SPACES TO BE GRADED AT 2% OR LESS.
2. ACCESSIBLE ROUTE TO BUILDING NOT TO EXCEED 5%.
3. VERTICAL DATUM: NAVD88



GRADING PLAN LEGEND

- 25 - EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- x 141.2 - EXISTING SPOT ELEVATION
- 25 - PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- + 32.0 - PROPOSED SPOT ELEVATION
- PROPOSED RETAINING WALL
- PROPOSED BUILDING
- PROPOSED CATCH BASIN
- PROPOSED YARD DRAIN
- TP-1 - TEST PIT LOCATION
- B-2 - SOIL BORING LOCATION

0 40' 80'
SCALE: 1" = 40'

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Shelton, CT 06484
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STATE OF CONNECTICUT LICENSED PROFESSIONAL ENGINEER
JOSEPH CANAS 20873 LICENSED PROFESSIONAL ENGINEER
05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

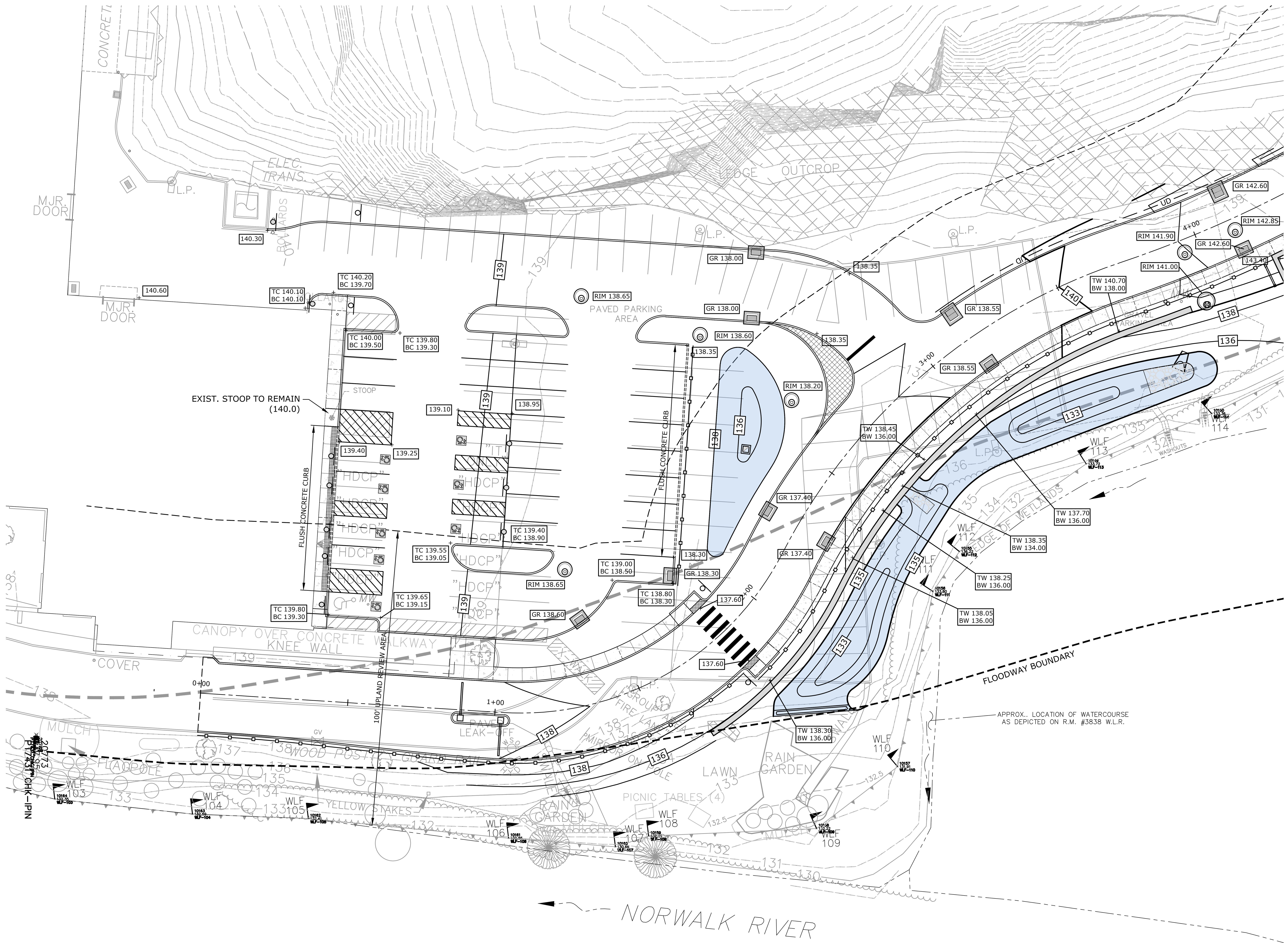
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-400-GRAD.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

GRADING PLAN

SCALE: 1" = 40'

C-400

Last Saved: 5/23/2022
Plotted On: May 23, 2022-4:49pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-400-GRAD.dwg



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STATE OF CONNECTICUT JOSEPH CANAS 20873 LICENSED PROFESSIONAL ENGINEER
05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

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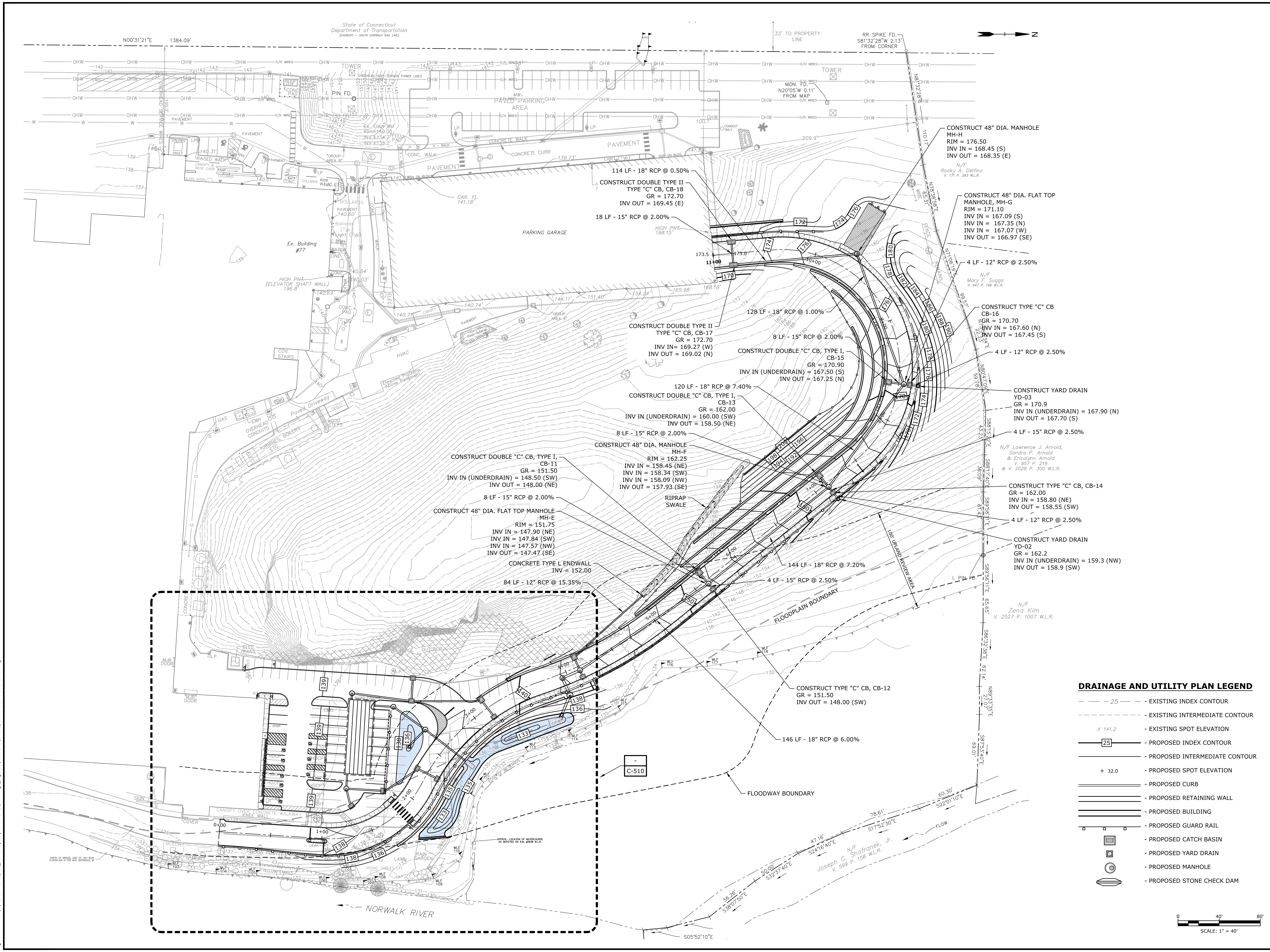
FILE:	A0969-015-C-400-GRAD.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

GRADING PLAN ENLARGEMENT

SCALE: 1" = 20'

C-410

Last Saved: 5/23/2022
Plotted On: May 23, 2022-4:49pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-400-GRAD.dwg



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STATE OF CONNECTICUT LICENSED PROFESSIONAL ENGINEER
JOSEPH CANAS 20873
05/23/2022

TOWN SUBMISSION DRAWINGS

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Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-500-UTIL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRAINAGE AND UTILITY PLAN

SCALE: 1" = 40'

C-500

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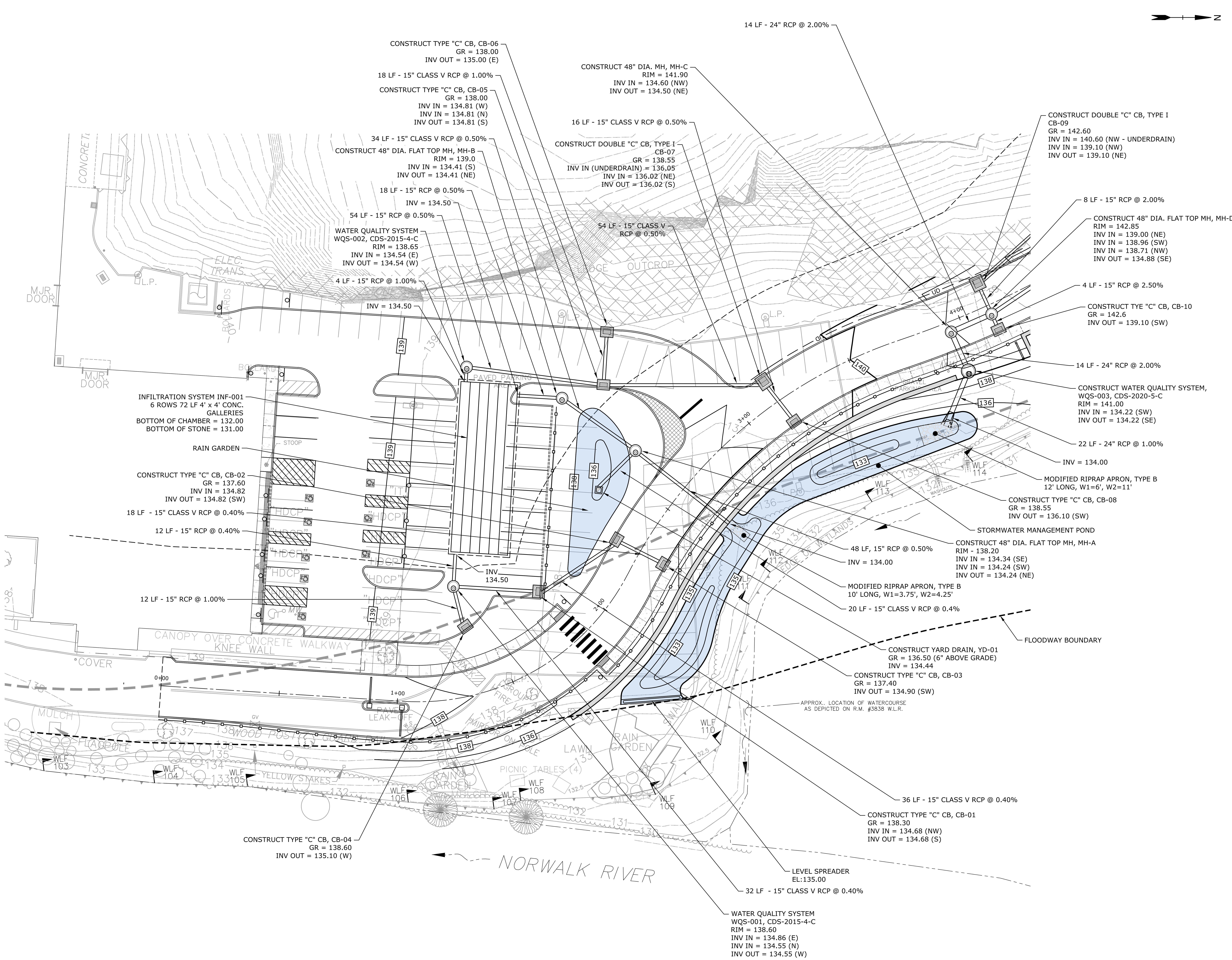

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STATE OF CONNECTICUT
JOSEPH CANAS
20873
LICENSED
PROFESSIONAL ENGINEER
05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-500-UTIL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRAINAGE AND UTILITY PLAN ENLARGEMENT

SCALE: 1" = 20'

C-510

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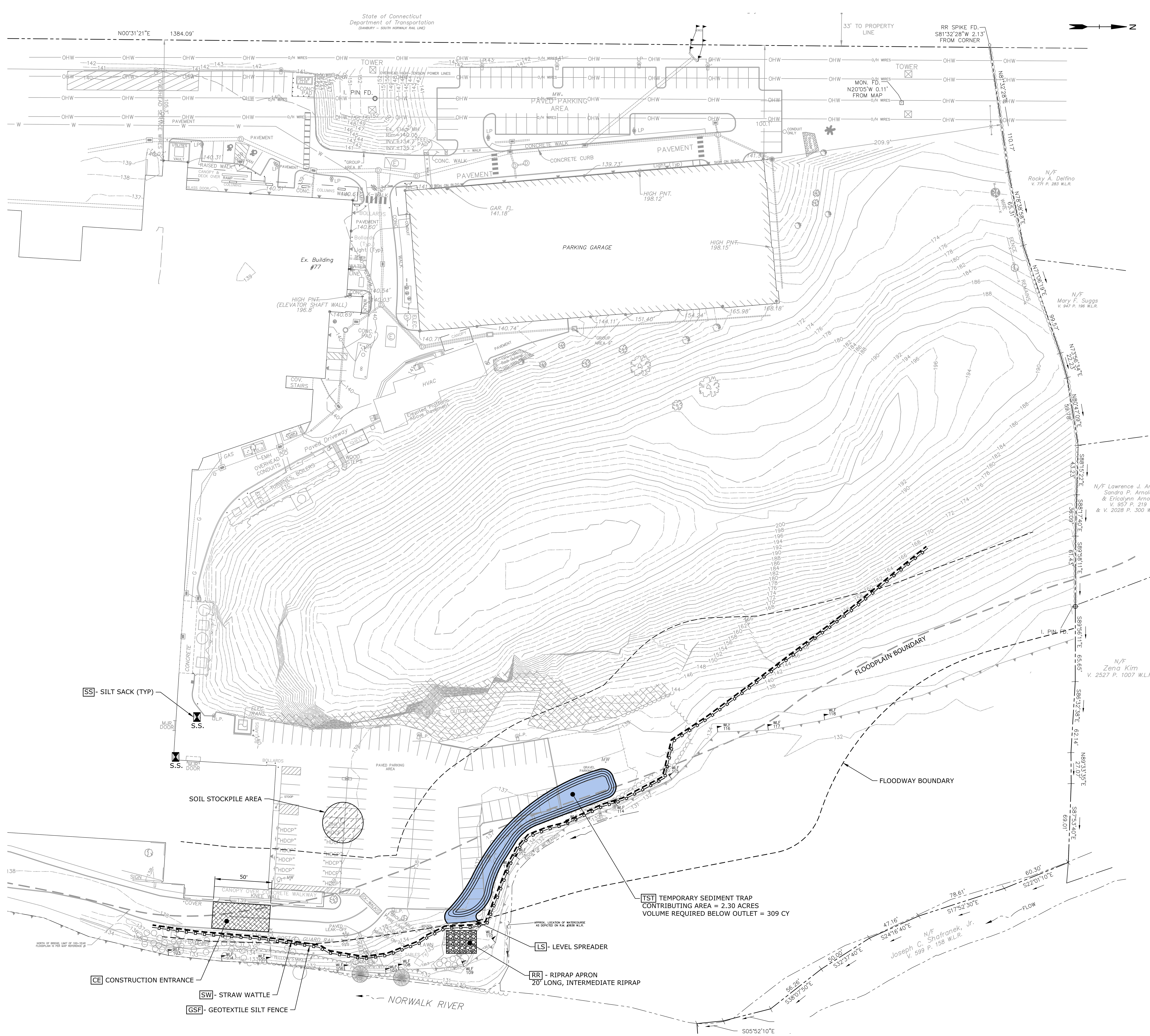

SOIL EROSION AND SEDIMENT CONTROL PLAN LEGEND

- ——000—— - EXISTING CONTOURS
- 699 - PROPOSED CONTOURS
- EXISTING STORM SEWER CATCH BASIN
- PROPOSED CATCH BASIN TYPE "C"
- PROPOSED STRAW WATTLE BARRIER
- PROPOSED GEOTEXTILE SILT FENCE
- PROPOSED CATCH BASIN HAYBALE BARRIER
- S.S. - PROPOSED SILT SACK
- PROPOSED CONSTRUCTION ENTRANCE

0 40' 80'
SCALE: 1" = 40'

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DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

SEDIMENT AND EROSION CONTROL PLAN
PHASE 1

SCALE: 1" = 40'

C-601

SOIL EROSION AND SEDIMENT CONTROL PLAN LEGEND

- 000 - EXISTING CONTOURS
- 699 - PROPOSED CONTOURS
- EXISTING STORM SEWER CATCH BASIN
- PROPOSED CATCH BASIN TYPE "C"
- PROPOSED STRAW WATTLE BARRIER
- PROPOSED GEOTEXTILE SILT FENCE
- PROPOSED CATCH BASIN HAYBALE BARRIER
- S.S. - PROPOSED SILT SACK
- PROPOSED CONSTRUCTION ENTRANCE

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SEDIMENT AND EROSION CONTROL PLAN PHASE 2

SCALE: 1" = 40'

C-602

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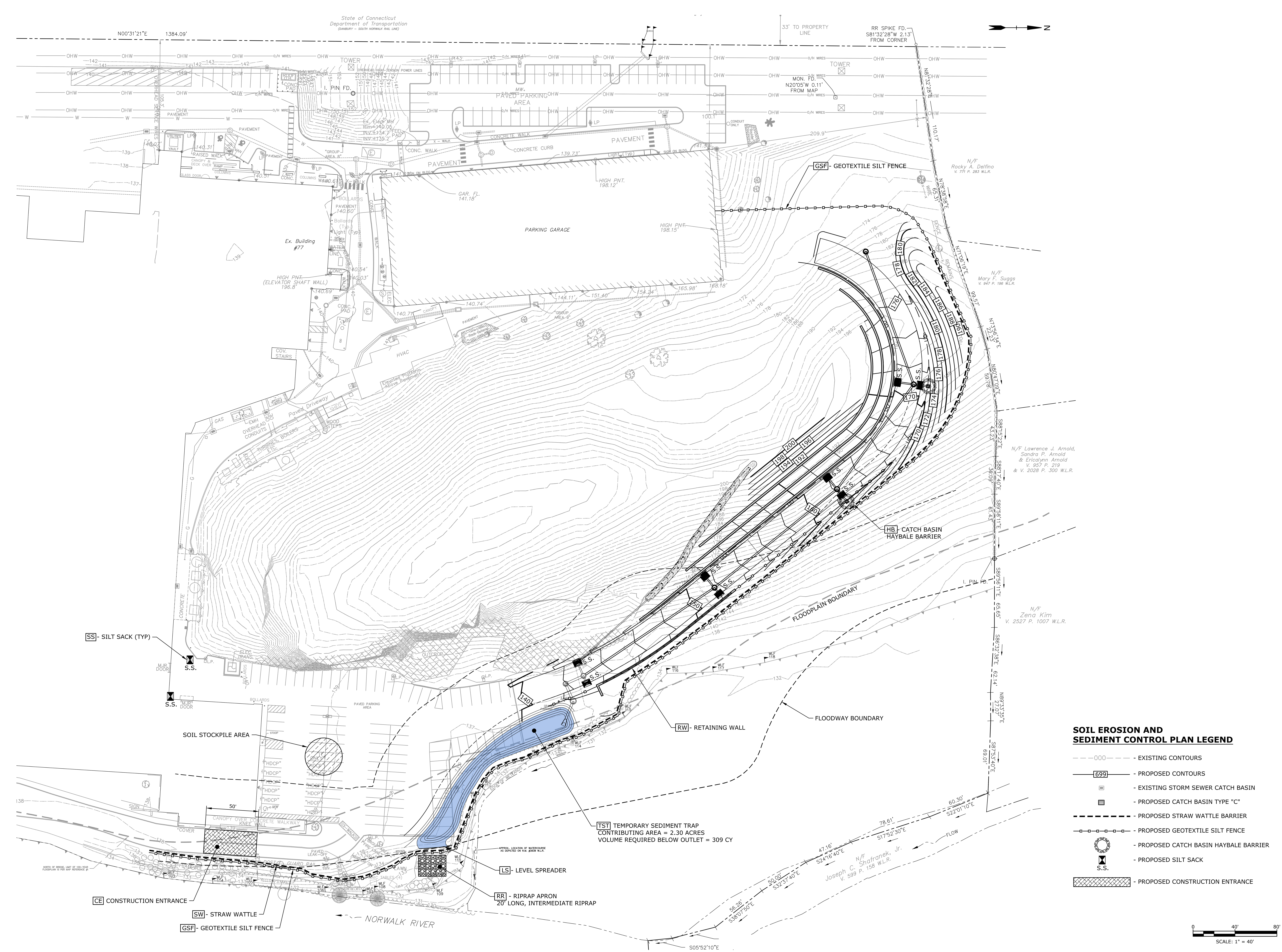

SOIL EROSION AND SEDIMENT CONTROL PLAN LEGEND

- 000 - EXISTING CONTOURS
- 699 - PROPOSED CONTOURS
- EXISTING STORM SEWER CATCH BASIN
- PROPOSED CATCH BASIN TYPE "C"
- PROPOSED STRAW WATTLE BARRIER
- PROPOSED GEOTEXTILE SILT FENCE
- PROPOSED CATCH BASIN HAYBALE BARRIER
- S.S. - PROPOSED SILT SACK
- PROPOSED CONSTRUCTION ENTRANCE

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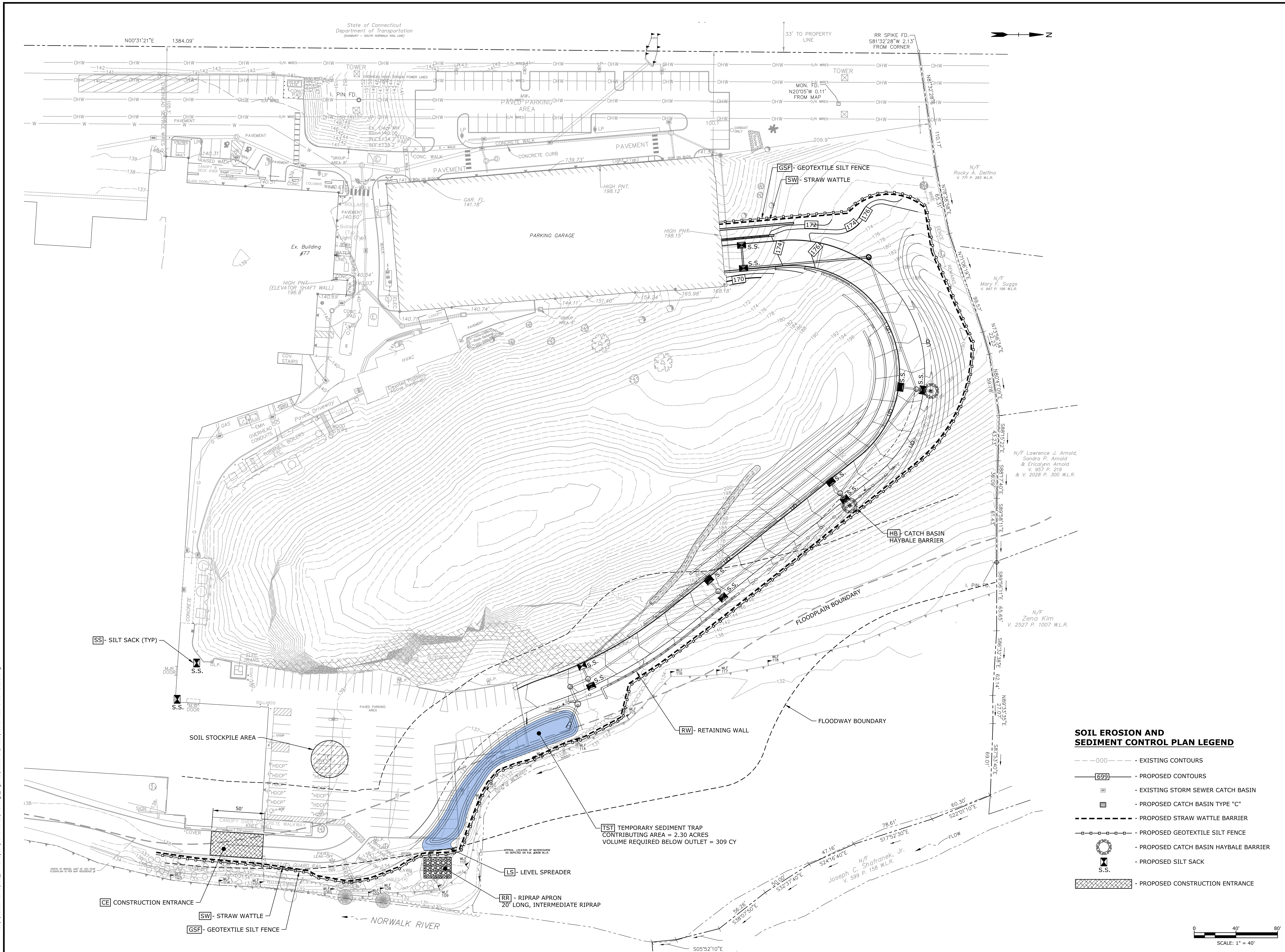
SEDIMENT AND EROSION CONTROL PLAN PHASE 3

SCALE: 1" = 40'

C-603



SOIL EROSION AND SEDIMENT CONTROL PLAN LEGEND

- EXISTING CONTOURS
- 699 - PROPOSED CONTOURS
- EXISTING STORM SEWER CATCH BASIN
- PROPOSED CATCH BASIN TYPE "C"
- PROPOSED STRAW WATTLE BARRIER
- PROPOSED GEOTEXTILE SILT FENCE
- PROPOSED CATCH BASIN HAYBALE BARRIER
- S.S. - PROPOSED SILT SACK
- PROPOSED CONSTRUCTION ENTRANCE

SCALE: 1" = 40'

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SEDIMENT AND EROSION CONTROL PLAN PHASE 4

SCALE: 1" = 40'

C-604

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SOIL EROSION AND SEDIMENT CONTROL PLAN LEGEND

- 000 - EXISTING CONTOURS
- 699 - PROPOSED CONTOURS
- EXISTING STORM SEWER CATCH BASIN
- PROPOSED CATCH BASIN TYPE "C"
- PROPOSED HAYBALE BARRIER
- PROPOSED GEOTEXTILE SILT FENCE
- PROPOSED CONSTRUCTION FENCE
- PROPOSED CATCH BASIN HAYBALE BARRIER
- S.S. - PROPOSED SILT SACK
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED TREE PROTECTION

0 40' 80'
SCALE: 1" = 40'

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STATE OF CONNECTICUT JOSEPH CANAS 20873 LICENSED PROFESSIONAL ENGINEER 05/23/2022

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Campus Traffic Flow Safety Improvements

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DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

SEDIMENT AND EROSION CONTROL PLAN PHASE 5

SCALE: 1" = 40'

C-605

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SEDIMENT AND EROSION CONTROL NOTES

1. ALL SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE "2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL", CTDEEP BULLETIN NO. 34, AND ALL AMENDMENTS AND ADDENDA THERETO AS PUBLISHED BY THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION.
2. LAND DISTURBANCE SHALL BE KEPT TO THE MINIMUM NECESSARY FOR CONSTRUCTION OPERATIONS.
3. INSTALL ALL EROSION CONTROL MEASURES AS SHOWN ON THE PLAN AND ELSEWHERE AS ORDERED BY THE ENGINEER OR THE TOWN.
4. PROTECT ALL CATCH BASINS WITH A SILT SACKS, HAYBALE RING, SILT FENCE OR BLOCK AND STONE INLET PROTECTION THROUGHOUT THE CONSTRUCTION PERIOD AND UNTIL ALL DISTURBED AREAS ARE THOROUGHLY STABILIZED.
5. WHENEVER POSSIBLE, INSTALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO CONSTRUCTION. SEE "EROSION CONTROL NARRATIVE".
6. INSTALL ADDITIONAL CONTROL MEASURES DURING THE CONSTRUCTION PERIOD AS ORDERED BY THE ENGINEER.
7. MAINTAIN ALL SEDIMENTATION AND EROSION CONTROL MEASURES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD.
8. SEDIMENT REMOVED SHALL BE DISPOSED OF OFF SITE OR IN A MANNER AS REQUIRED BY THE ENGINEER.
9. THE CONSTRUCTION CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF ALL CONTROL MEASURES THROUGHOUT THE CONSTRUCTION PERIOD.
10. PROTECT ALL DISTURBED AREAS EXPOSED FOR MORE THAN 30 DAYS WITH A TEMPORARY VEGETATIVE COVER. SEED THESE AREAS WITH PERENNIAL RYEGRASS AT THE RATE OF 40 LBS. PER ACRE (1 LB. PER 1,000 SQ. FT). APPLY SOIL AMENDMENTS AND MULCH AS REQUIRED TO ESTABLISH A UNIFORM STAND OF VEGETATION OVER ALL DISTURBED AREAS.
11. THE CONSTRUCTION CONTRACTOR SHALL UTILIZE APPROVED METHODS/MATERIALS FOR PREVENTING THE BLOWING AND MOVEMENT OF DUST FROM EXPOSED SOIL SURFACES ONTO ADJACENT PROPERTIES AND SITE AREAS.
12. THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A SUPPLY OF SILT FENCE/HAYBALES AND ANTI-TRACKING CRUSHED STONE ON SITE FOR EMERGENCY REPAIRS.
13. THE CONTRACTOR SHALL INSPECT WEEKLY AT A MINIMUM, ALL DRAINAGE STRUCTURES AND CLEAN THEM AS NEEDED TO PREVENT THE BUILD-UP OF SILT.
14. THE CONSTRUCTION CONTRACTOR SHALL CAREFULLY COORDINATE THE PLACEMENT OF EROSION CONTROL MEASURES WITH THE PHASING OF CONSTRUCTION.
15. KEEP ALL PAVED ROADWAYS CLEAN. SWEEP BEFORE FORECASTED STORMS.
16. TREAT ALL UNPAVED SURFACE WITH 4" MINIMUM OF TOPSOIL PRIOR TO FINAL STABILIZATION.
17. INSTALL HAYBALE BARRIERS AND SILT FENCING ALONG THE TOE OF CRITICAL CUT AND FILL SLOPES.
18. THE CONTRACTOR SHALL NOTIFY THE TOWN OF WILTON'S ENVIRONMENTAL OFFICIAL PRIOR TO THE INSTALLATION OF EROSION CONTROLS, CUTTING OF TREES, OR ANY EXCAVATION.
19. COVER ALL TRUCKS LEAVING THE SITE.
20. SOIL TYPE BOUNDARIES SHOWN ON THESE MAPS WERE OBTAINED FROM DIGITAL FILES FROM THE UNIVERSITY OF CONNECTICUT'S MAP AND GEOGRAPHIC INFORMATION CENTER. SOIL TYPE DESIGNATIONS WERE TAKEN FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE "SOIL SURVEY OF FAIRFIELD COUNTY."
21. CHECK ALL SEDIMENTATION AND EROSION CONTROLS WEEKLY AND/OR AFTER EACH RAINFALL EVENT. MAKE NECESSARY REPAIRS IMMEDIATELY.
22. INSPECT AND REPAIR EROSION AND SEDIMENT CONTROLS PRIOR TO FORECASTED RAIN EVENTS.
23. REMOVE EROSION CONTROLS WHEN ALL DISTURBED AREAS HAVE BEEN STABILIZED AND THE TOWN HAS PROVIDED AUTHORIZATION. DISTURBED AREAS SHALL BE SEEDED AND MULCHED.

CONSTRUCTION SEQUENCE

PHASE 1

1. HOLD PRE-CONSTRUCTION MEETING WITH DESIGN TEAM AND THE TOWN'S ENVIRONMENTAL AFFAIRS DIRECTOR TO DISCUSS THE SEQUENCE OF OPERATIONS AND THE SEDIMENT AND EROSION CONTROLS.
2. INSTALL SILT FENCE AND STRAW WATTLES ALONG RIPARIAN CORRIDOR.
3. INSTALL SILT SACKS AT CATCH BASINS
4. POST SIGNAGE AT DRIVEWAY BRIDGE DIRECTING ALL TRAFFIC TO TURN LEFT, EXCEPT CONSTRUCTION VEHICLES.
5. INSTALL CONSTRUCTION ENTRANCE
6. EXCAVATE TEMPORARY SEDIMENT TRAP

PHASE 2

1. MAINTAIN AND REPLENISH/REPLACE CONTROLS FROM PHASE 1.
2. CONSTRUCT LOWER RETAINING WALL
3. ROUGH GRADE LOWER SECTION OF ROADWAY
4. EXCAVATE UP THE HILLSIDE TO CREATE HAUL ROAD ACCESS TO THE TOP OF THE RIDGE.
5. PLACE SOME OF THE ROCK REMOVED ON THE DOWN SLOPE SIDE OF THE HAUL ROAD FILL TO ARMOR THE SLOPE,
6. INSTALL LOWEST PORTION OF DRAINAGE SYSTEM.
7. PROTECT BASIN INLETS WITH SILT SACKS.
8. PROTECT HEADWALL INLET WITH STONE CHECK DAM.

PHASE 3

1. MAINTAIN AND REPLENISH/REPLACE CONTROLS FROM PHASE 2.
2. INSTALL SEDIMENT AND EROSION CONTROLS NEAR PARKING GARAGE.
3. EXCAVATE EASTERN PORTION OF DRIVEWAY AND ROUGH GRADE, CONSTRUCTING ROCK CUTS AND WALLS.
4. CONSTRUCT RIPRAP SWALE ABOVE WALLS.
5. INSTALL DRAINAGE SYSTEM.
6. PROTECT NEW CATCH BASINS WITH SILT SACKS.

PHASE 4

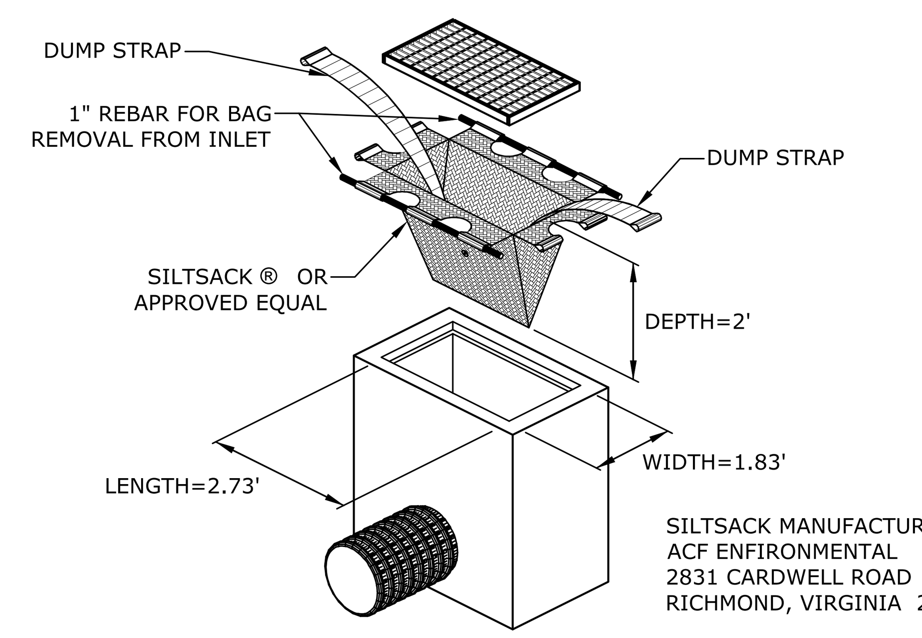
1. MAINTAIN AND REPLENISH/REPLACE CONTROLS FROM PHASE 3.
2. CONSTRUCT RETAINING WALLS NEAR PARKING GARAGE.
3. MAKE STRUCTURAL MODIFICATIONS TO PARKING GARAGE FOR NEW ENTRANCE.
4. INSTALL UPPERMOST CATCH BASINS OF DRIVEWAY DRAINAGE SYSTEM.
5. PROTECT NEW CATCH BASINS WITH SILT SACKS.

PHASE 5

1. ROUGH GRADE PARKING LOT.
2. INSTALL PARKING LOT DRAINAGE, RAIN GARDEN AND INFILTRATION SYSTEM.
3. CONSTRUCT SIDEWALKS, REINFORCED TURF AREAS, AND OTHER APPURTENANCES.
4. CONSTRUCT STORMWATER MANAGEMENT BASIN AND RETAINING WALL.
5. PAVE PARKING AREA AND DRIVEWAY.
6. ESTABLISH TURF AND STABILIZE.
7. REMOVE EROSION CONTROLS.

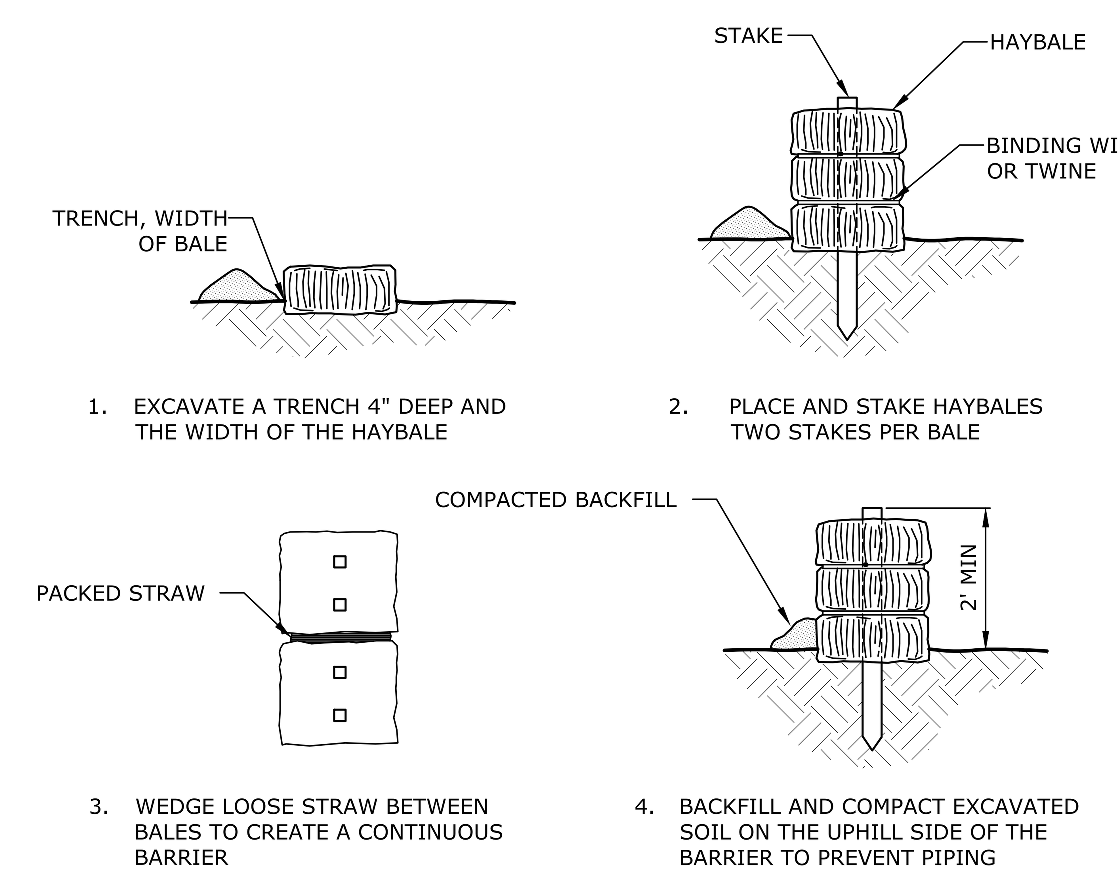
SEDIMENT AND EROSION CONTROL NARRATIVE

1. THE STORMWATER MANAGEMENT MEASURES WILL ADDRESS THE STORMWATER QUALITY ONCE THE SITE HAS BEEN CONSTRUCTED AND STABILIZED. SEDIMENTATION AND EROSION CONTROL MEASURES WILL BE INSTALLED DURING CONSTRUCTION WHICH WILL MINIMIZE ADVERSE IMPACTS FROM CONSTRUCTION ACTIVITIES.
2. ALL SEDIMENTATION AND EROSION CONTROL MEASURES PROPOSED FOR THIS DEVELOPMENT HAVE BEEN DESIGNED IN ACCORDANCE WITH THE "2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENTATION CONTROL" AS PUBLISHED BY THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION AS RECOMMENDED FOR SEDIMENTATION CONTROL DURING CONSTRUCTION ACTIVITIES.

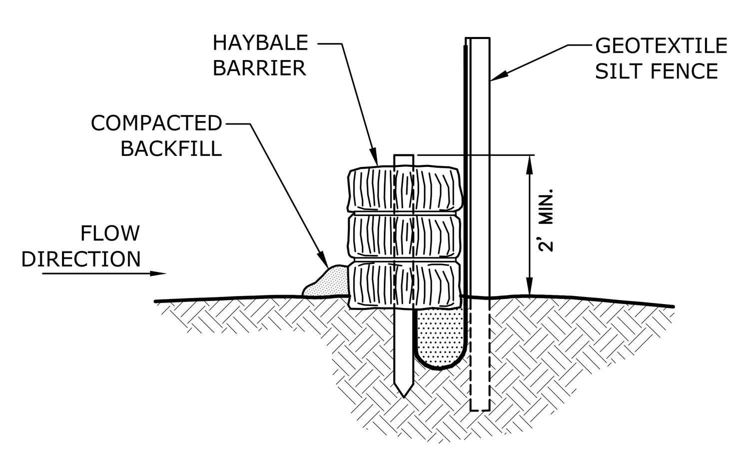


SILTSACK MANUFACTURED BY:
ACF ENFIRONMENTAL
2831 CARDWELL ROAD
RICHMOND, VIRGINIA 23237

SILTSACK®
NO SCALE

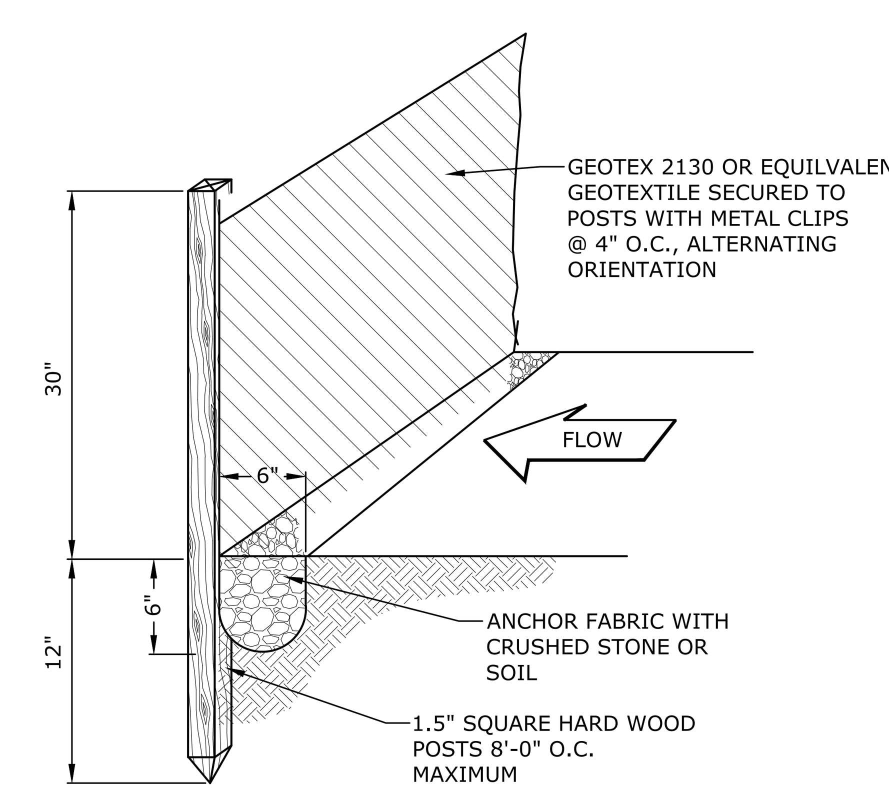


PLACEMENT AND CONSTRUCTION OF HAYBALE BARRIER
NO SCALE



BACKFILL AND COMPACT THE EXCAVATED SOIL AS SHOWN ON THE UPHILL SIDE OF THE BARRIER TO PREVENT PIPING.

SILT FENCE AND HAYBALE COMBINED BARRIER
NO SCALE



SILT FENCE
NO SCALE

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Campus Traffic Flow Safety Improvements

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APPROVED BY:	JWB

SEDIMENT AND EROSION CONTROL NOTES, NARRATIVE AND DETAILS

SCALE: NO SCALE

C-611

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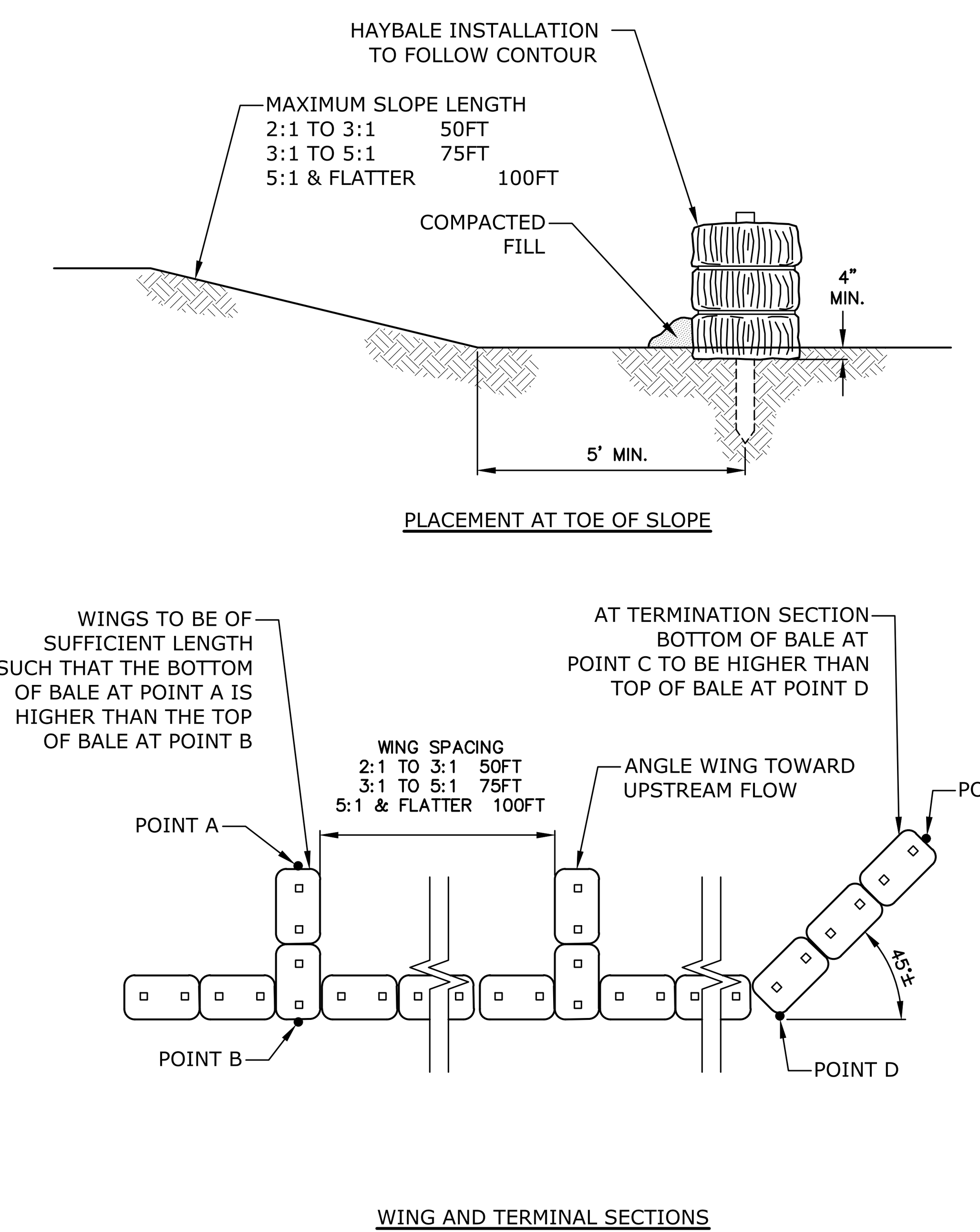

HAYBALE EROSION CHECKS
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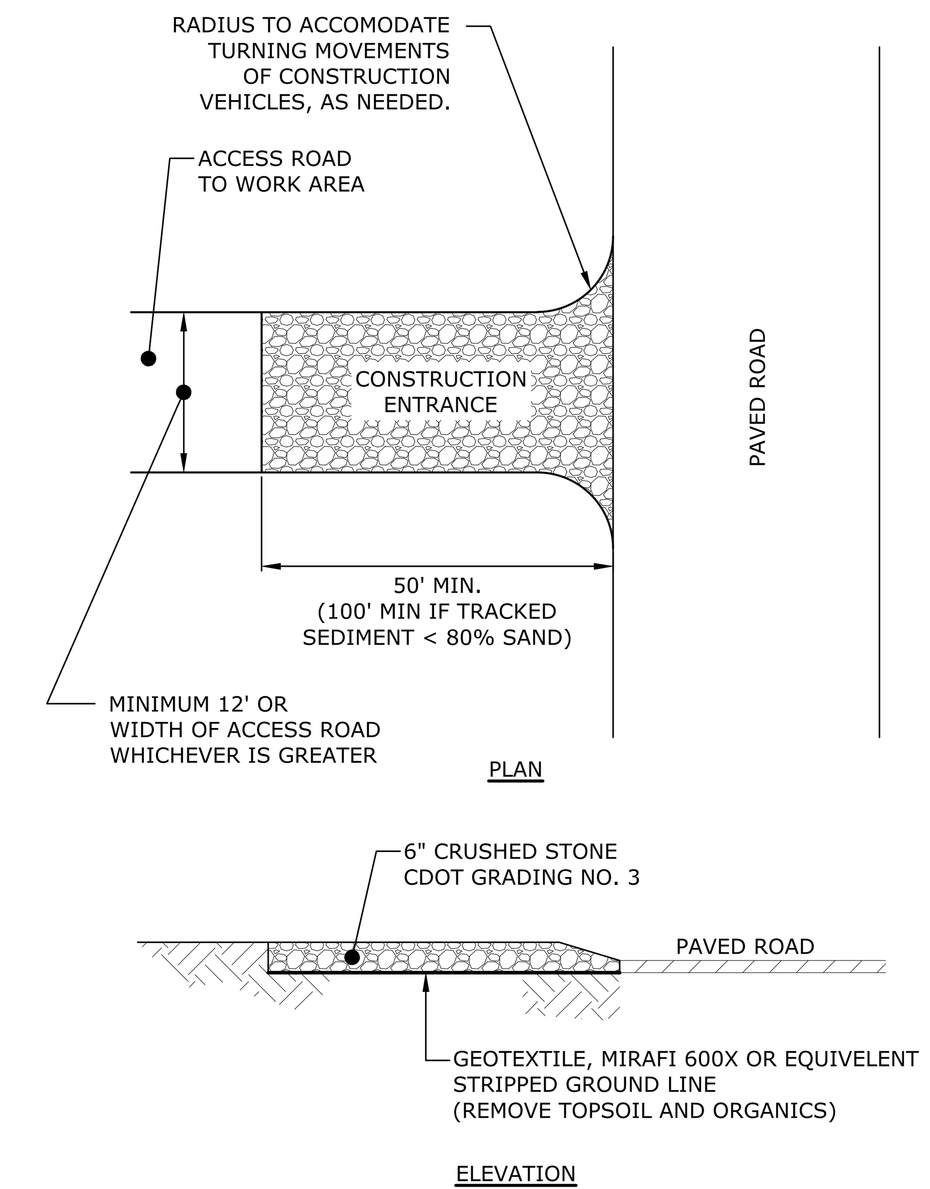

CONSTRUCTION ENTRANCE
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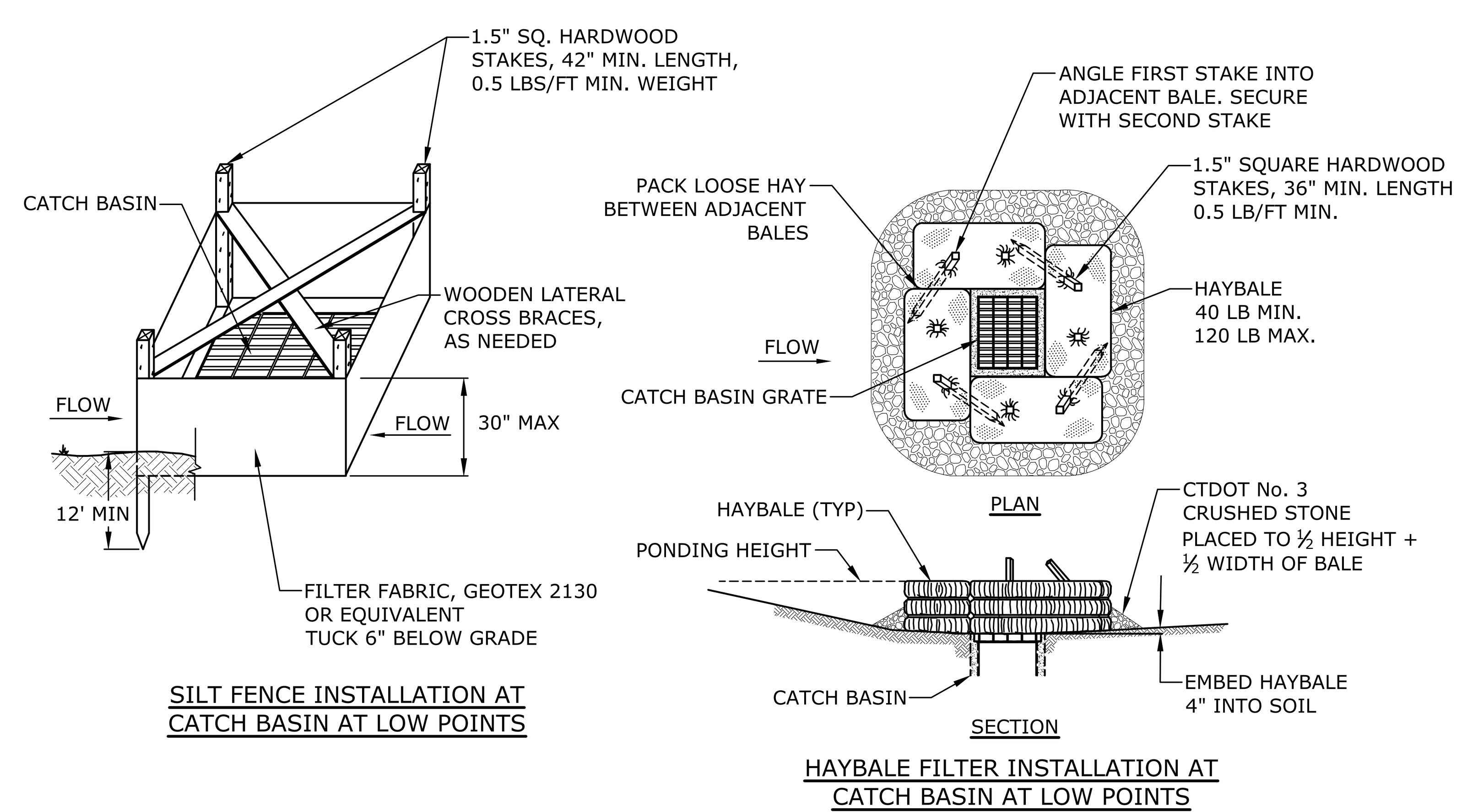

CATCH BASIN EROSION CONTROL
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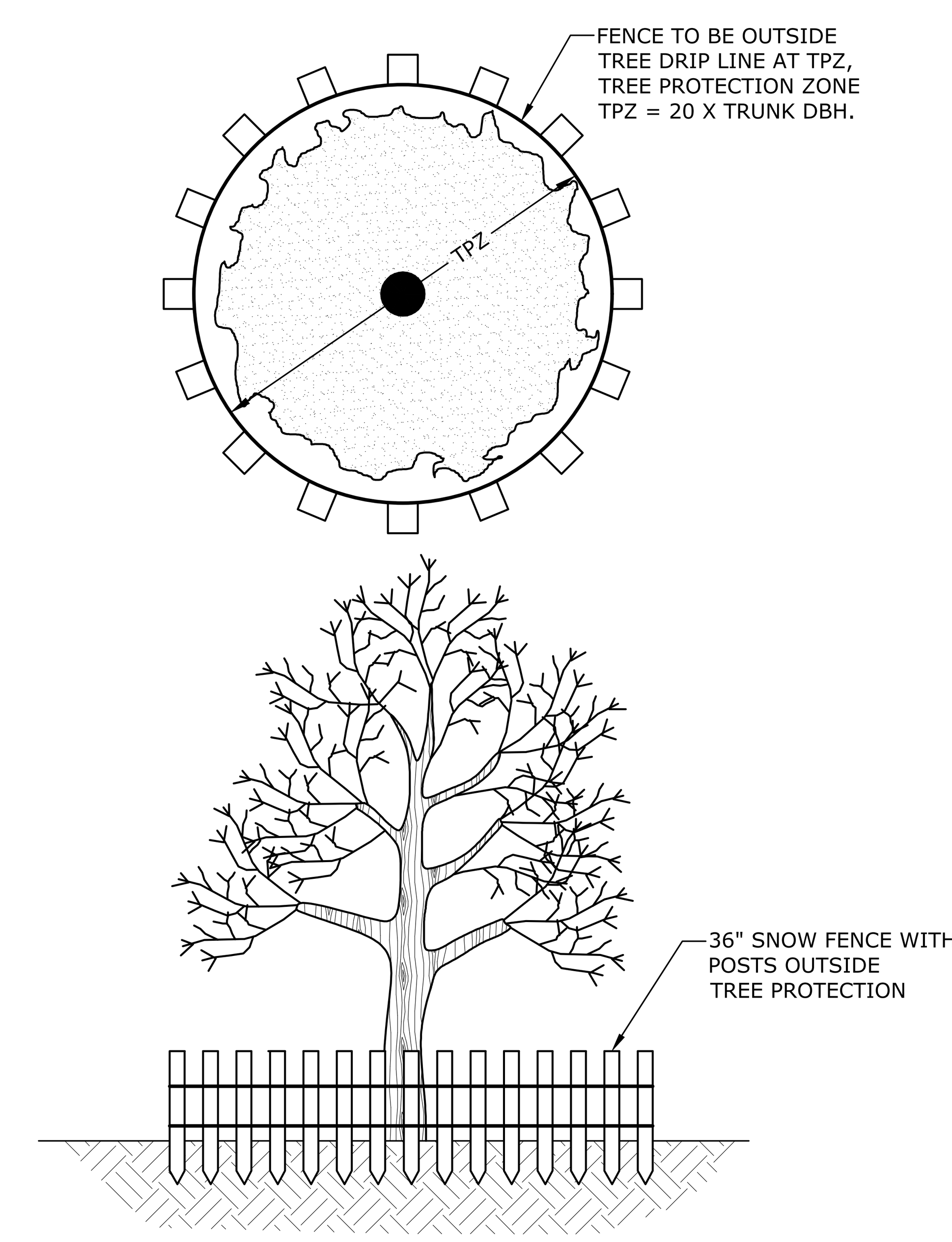

TREE PROTECTION
NO SCALE

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SEDIMENT AND EROSION CONTROL DETAILS

SCALE: NO SCALE

C-612

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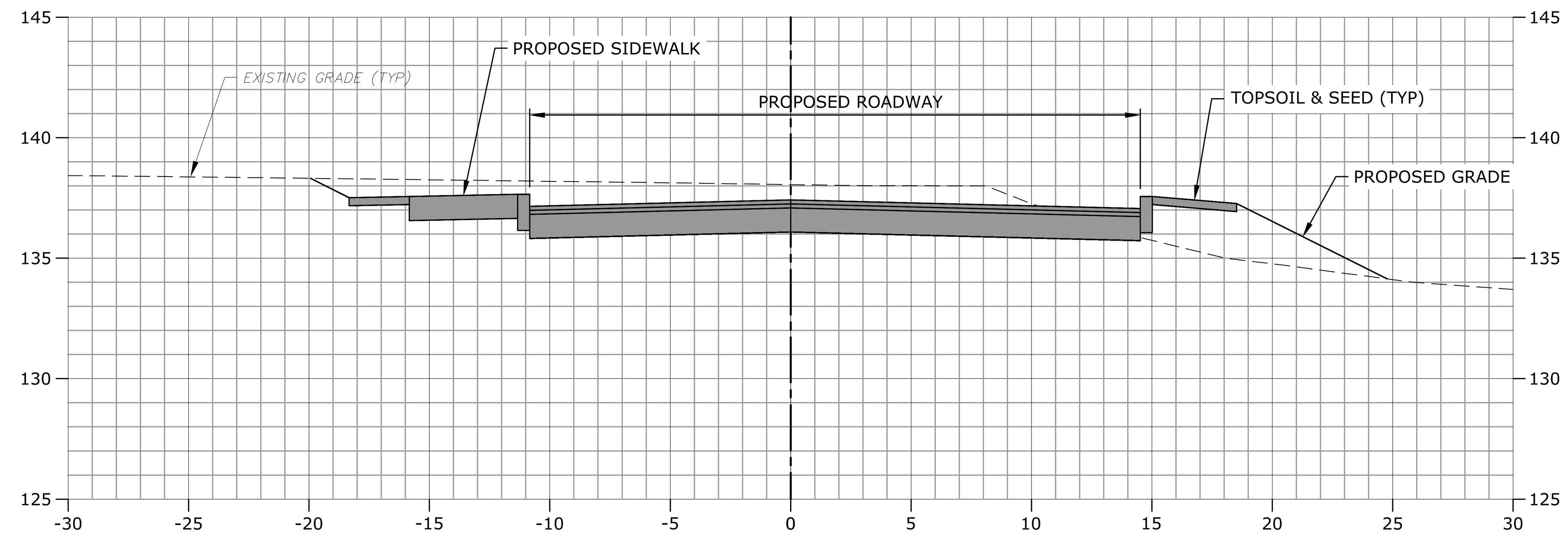

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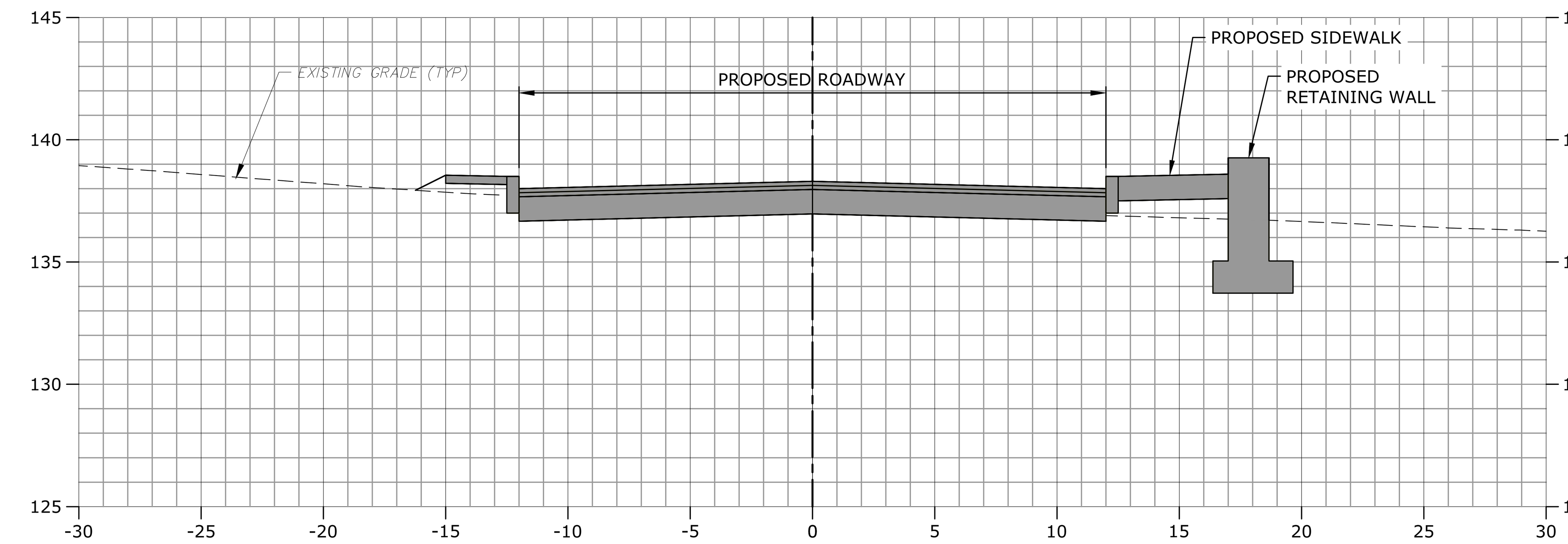

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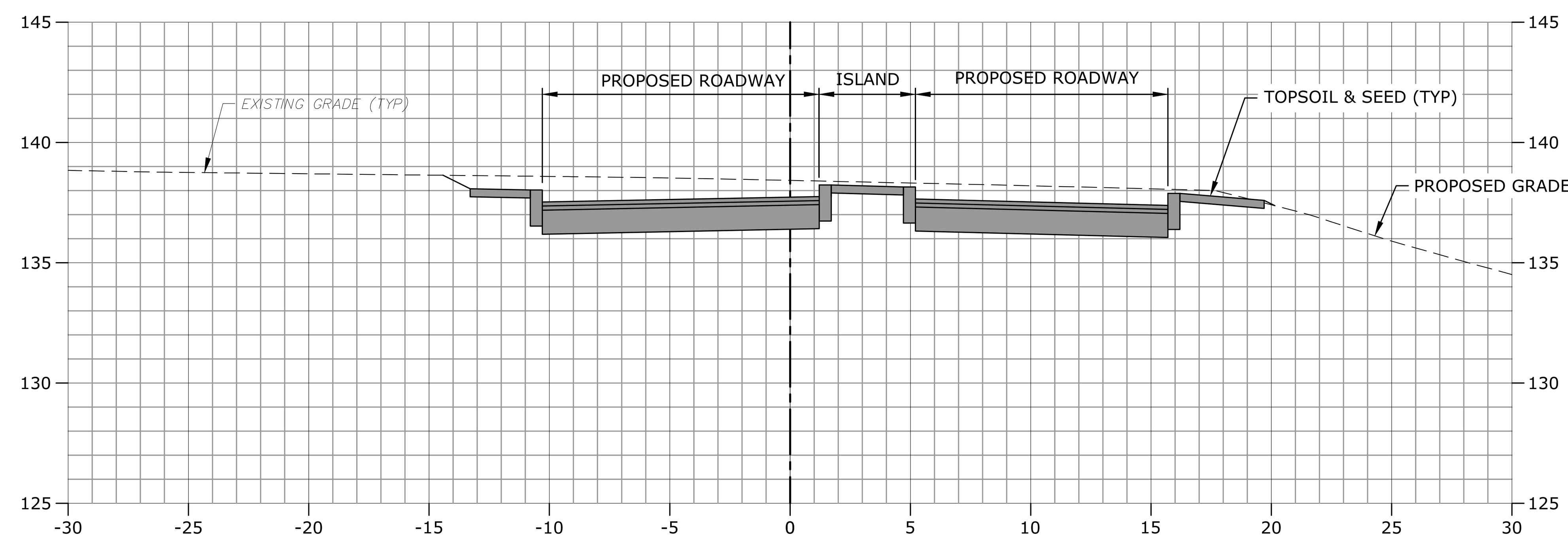

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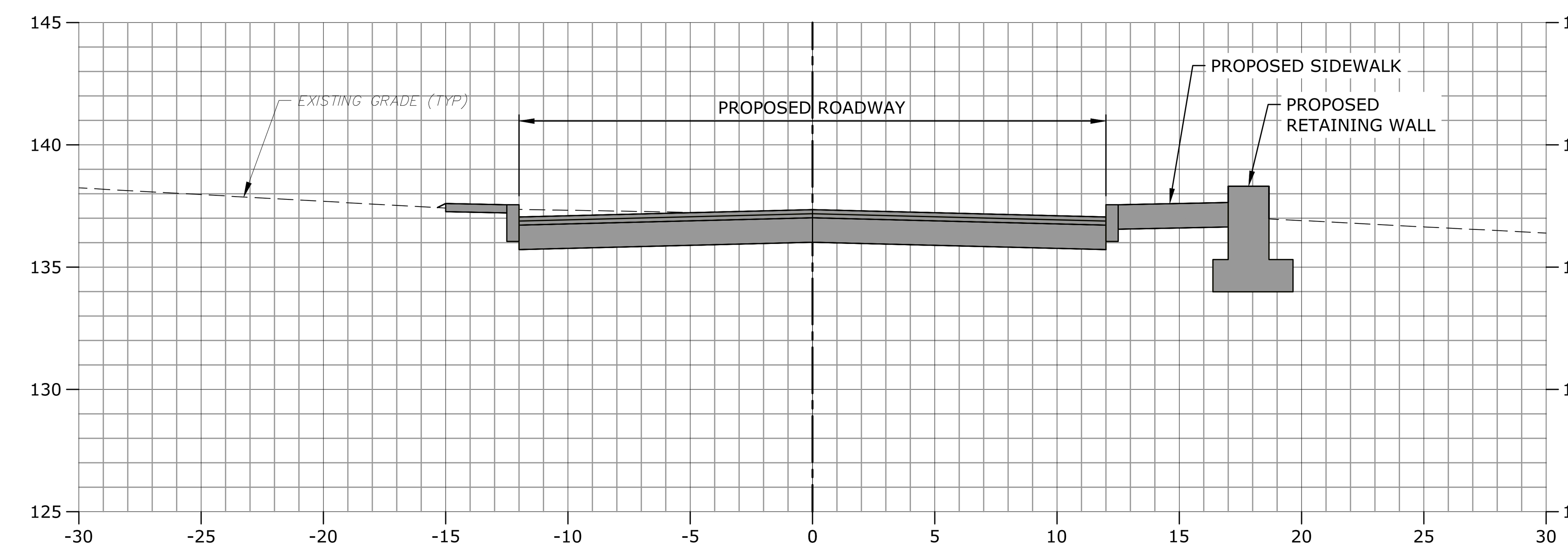

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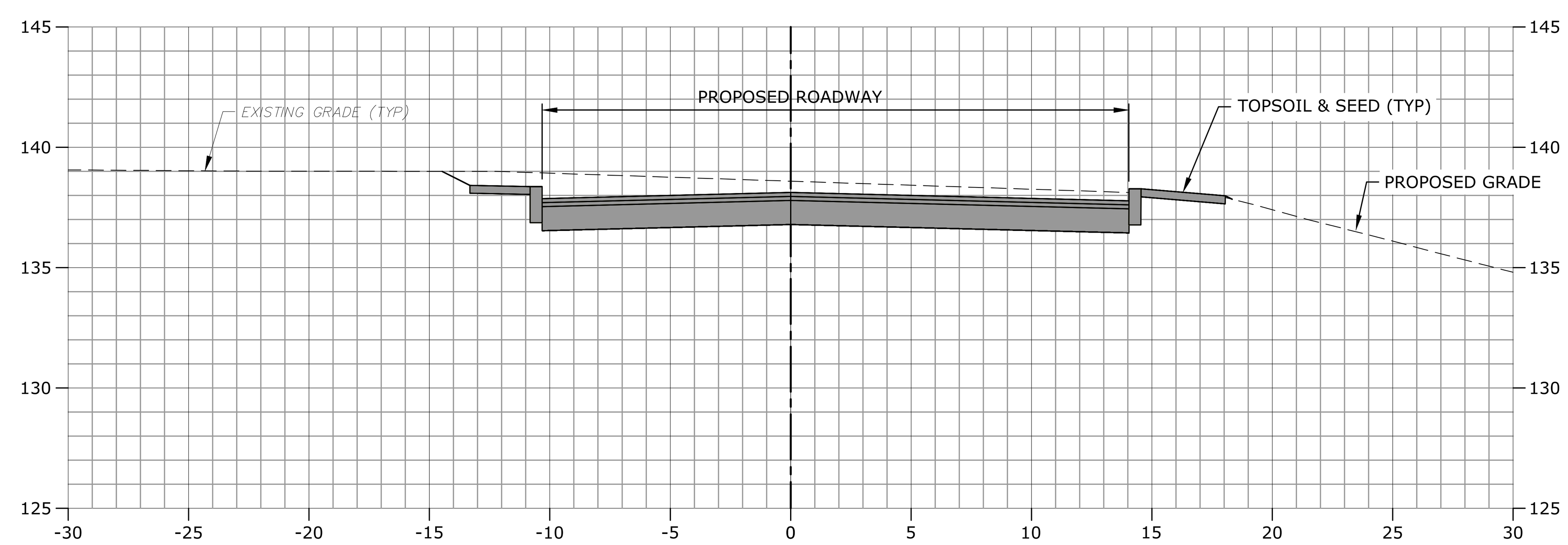

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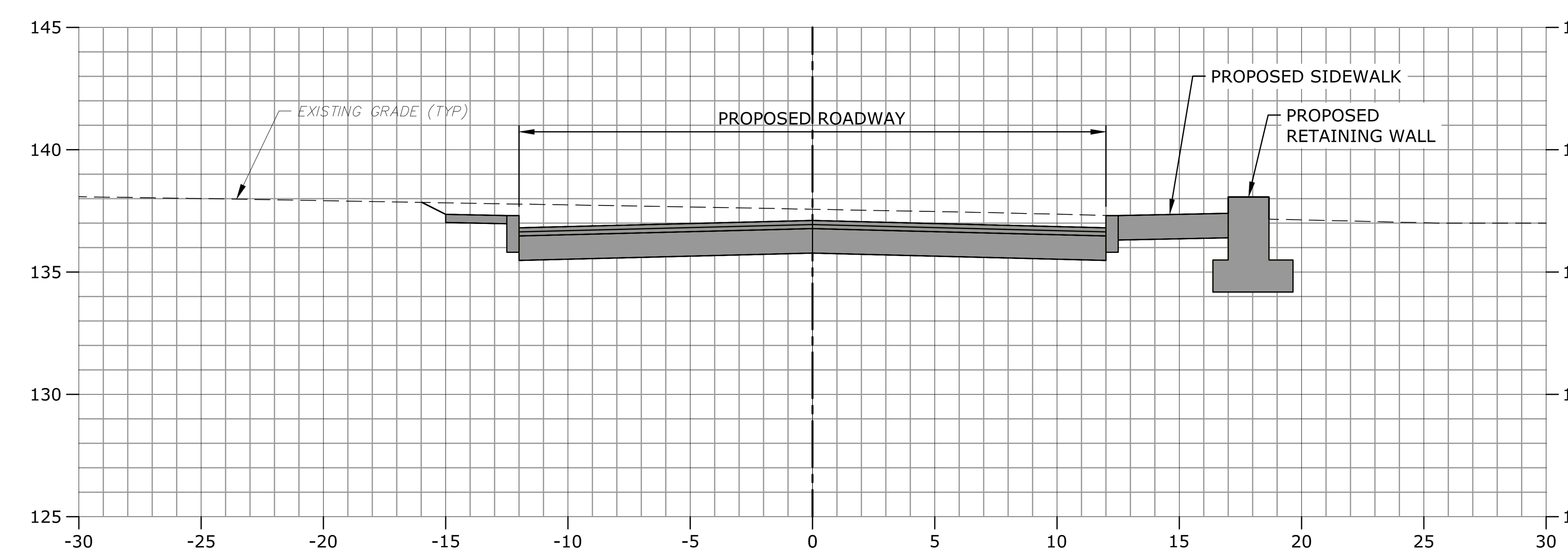

STATION: 2+00

SCALE: 1" = 5'

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APPROVED BY:	JWB

DRIVEWAY CROSS-SECTIONS STA: 0+00 - 3+00

SCALE: 1" = 5'

C-700

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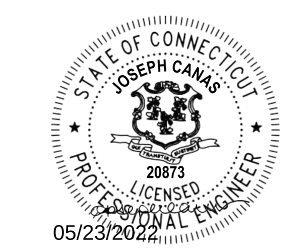
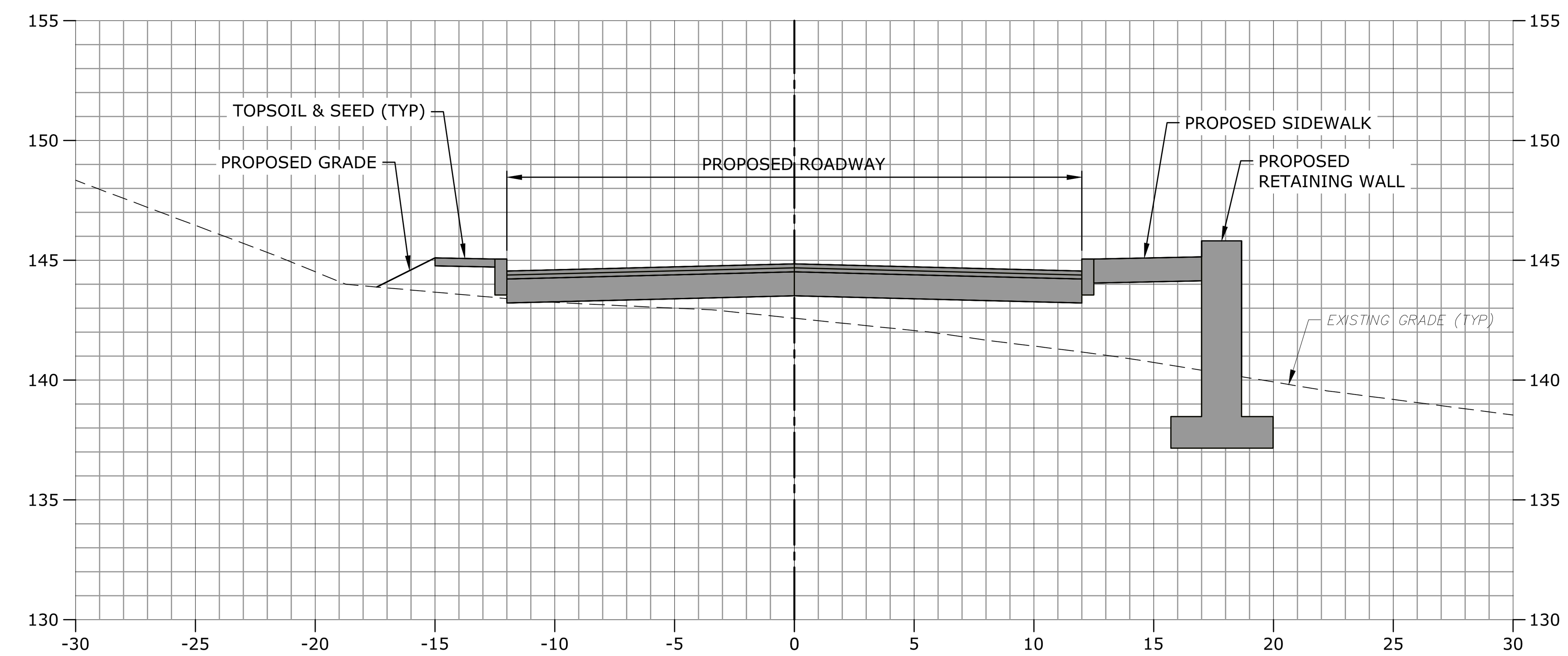
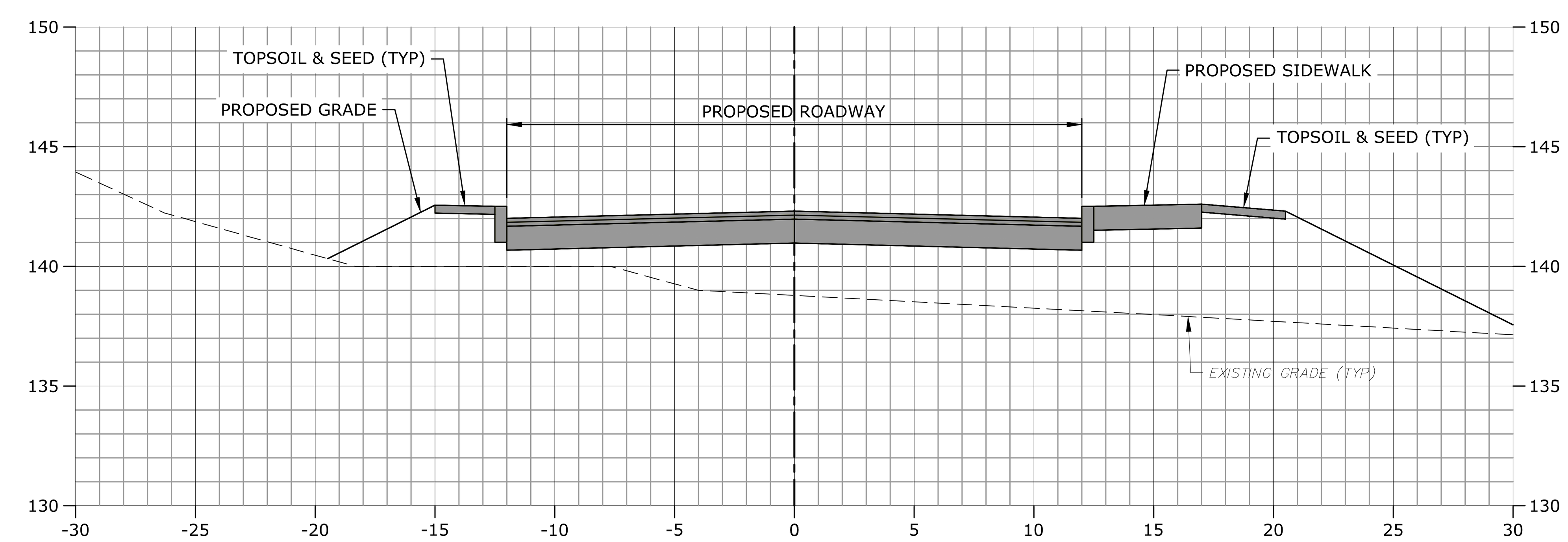
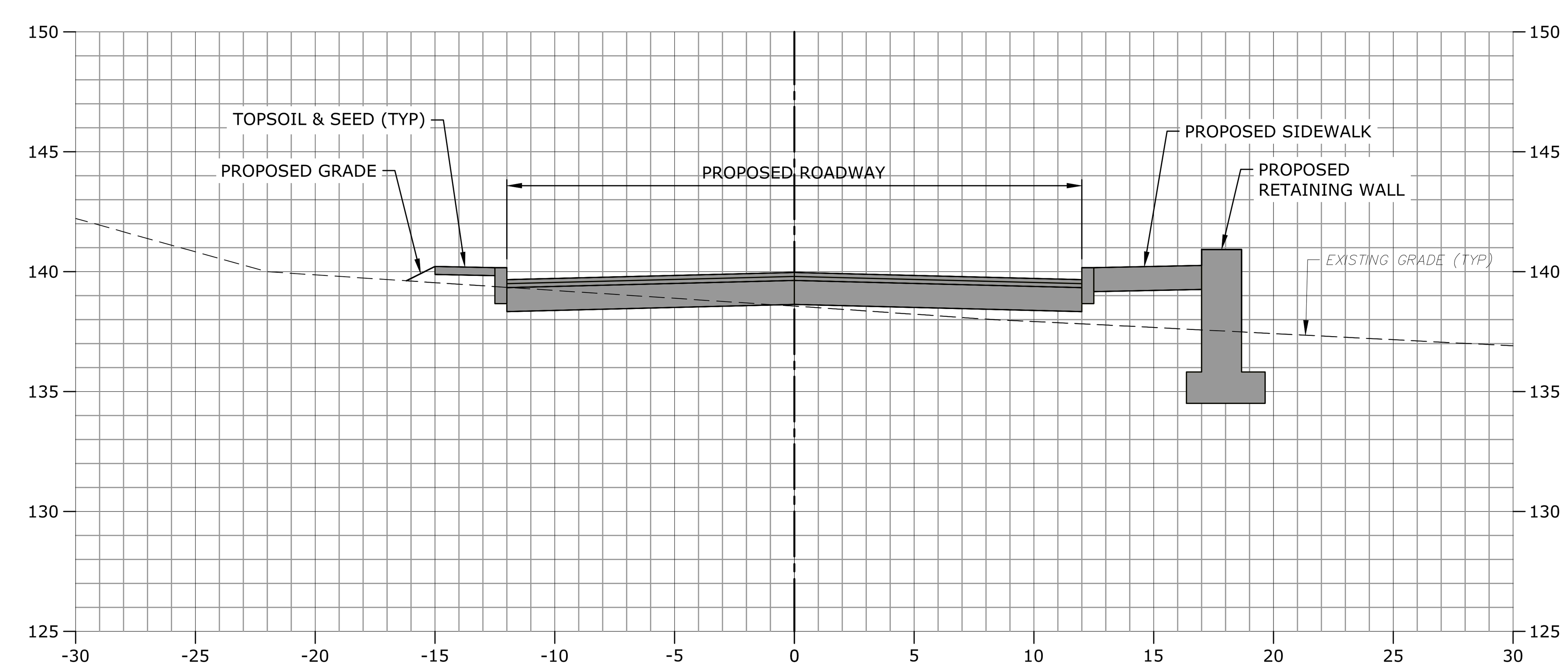




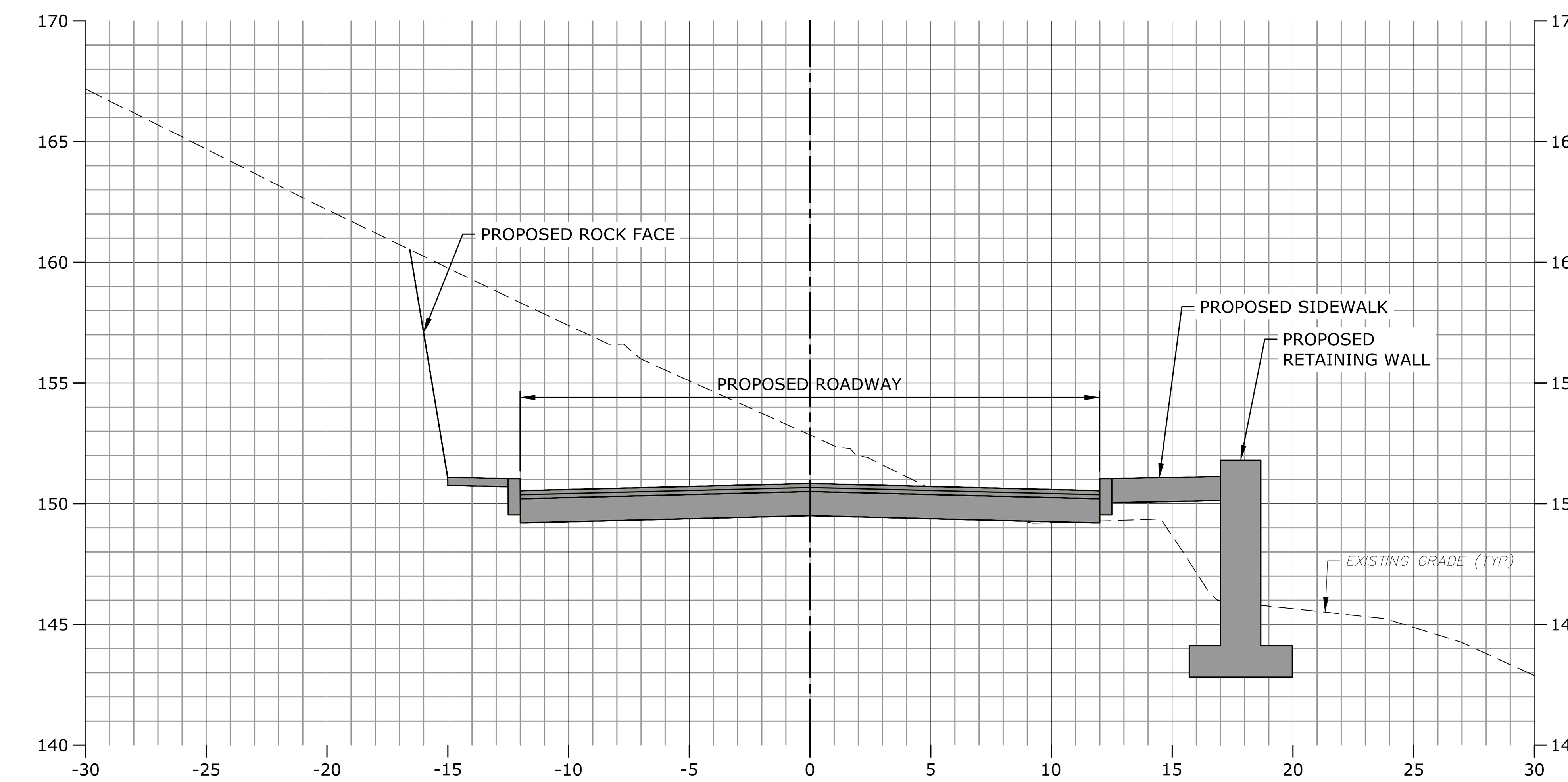
STATION: 4+50



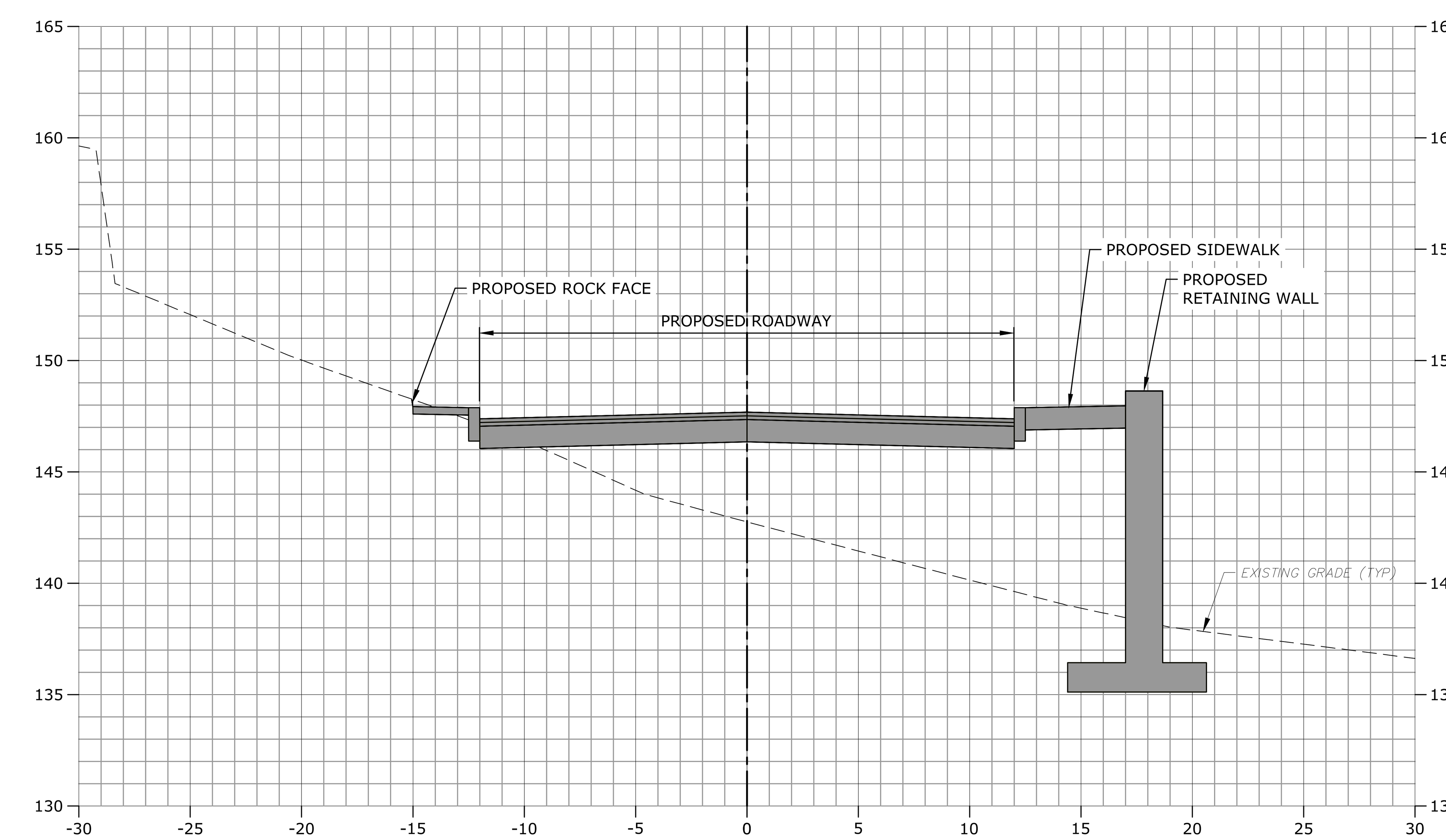
STATION: 4+00



STATION: 3+50



STATION: 5+50



STATION: 5+00

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

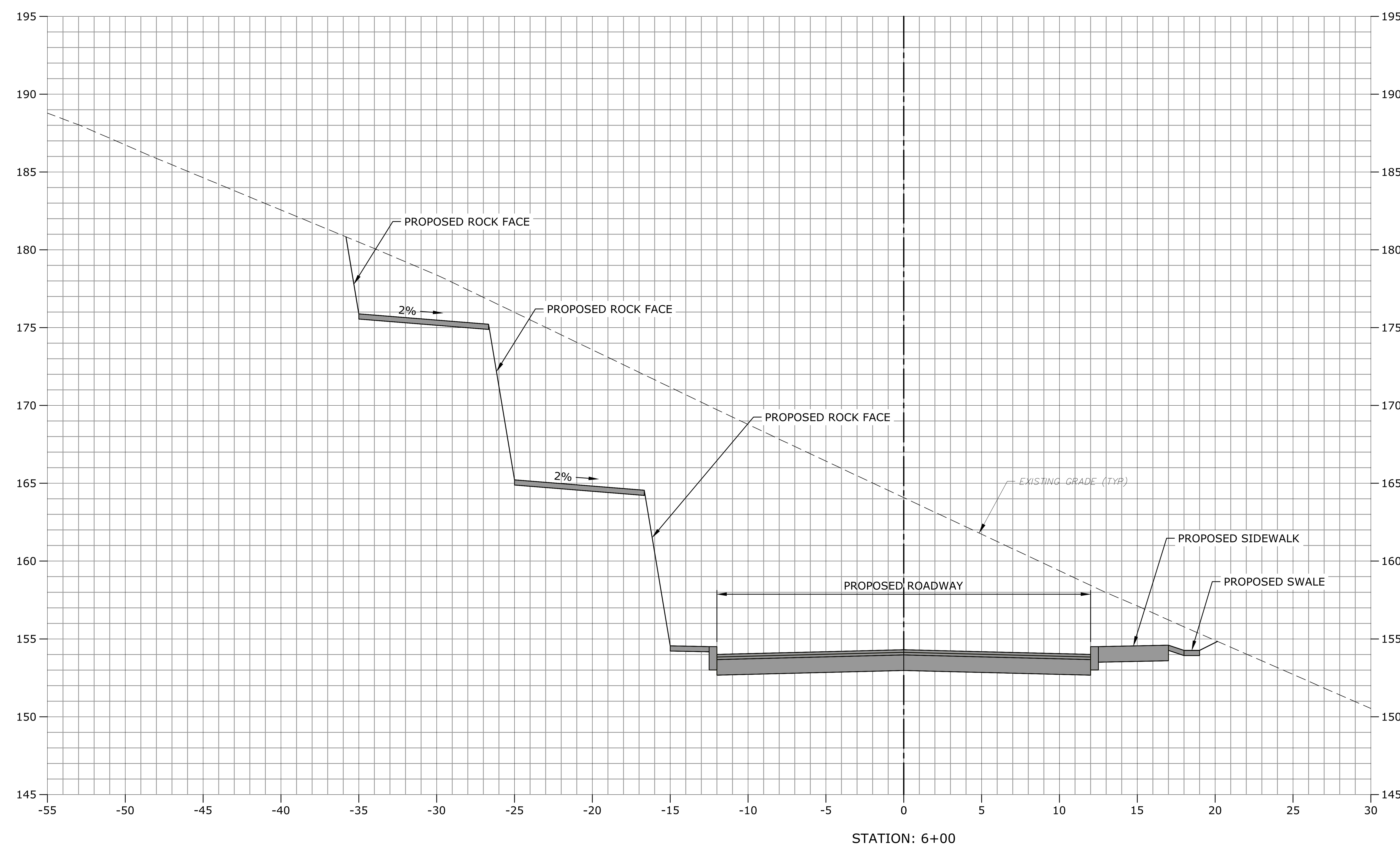
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-700-XSEC.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRIVEWAY
CROSS-SECTIONS
STA: 03+50 - 5+00

0 5' 10'
SCALE: 1" = 5'

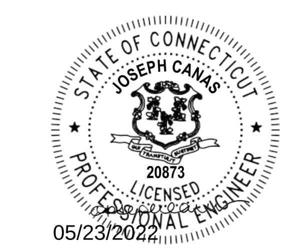
SCALE: 1" = 5'

C-701



0 5' 10'
SCALE: 1" = 5'

Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100



TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
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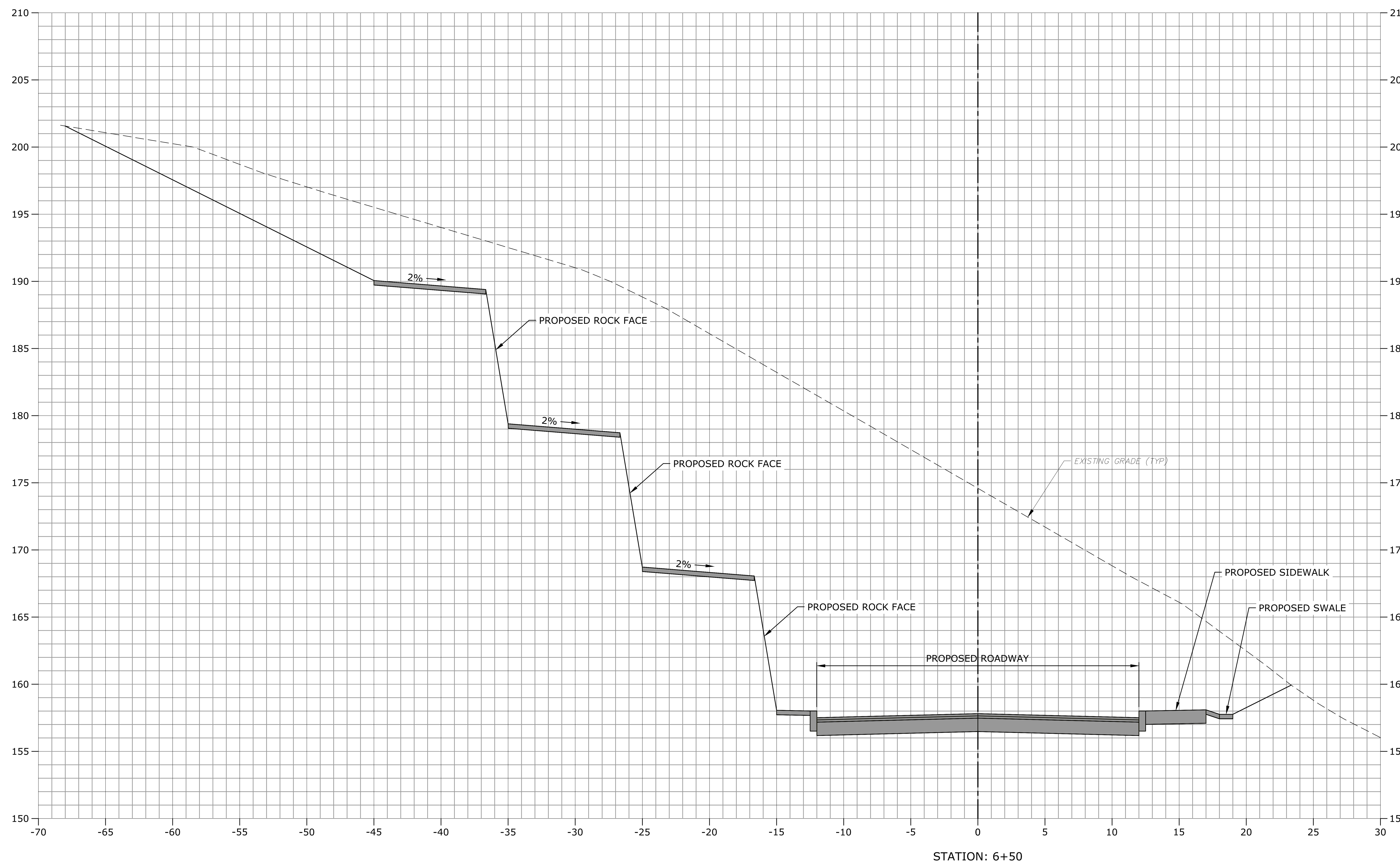
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRIVEWAY
CROSS-SECTIONS
STA: 5+50

SCALE: 1" = 5'

C-702

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:51pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-700-XSEC.dwg



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05/23/2022

TOWN SUBMISSION DRAWINGS

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Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

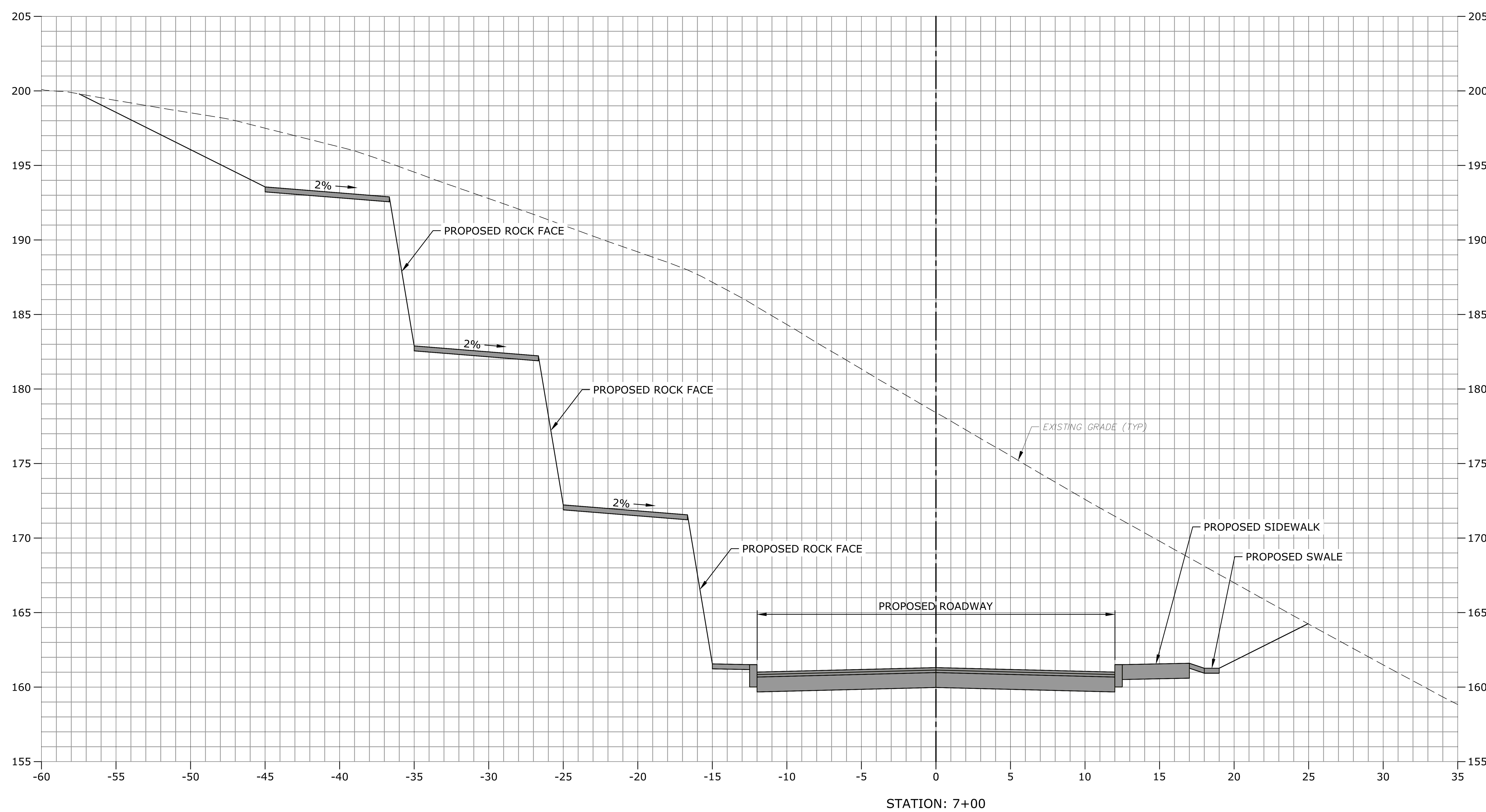
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-700-XSEC.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRIVEWAY
CROSS-SECTIONS
STA: 6+00

SCALE: 1" = 5'

C-703

0 5' 10'
SCALE: 1" = 5'



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Shelton, CT 06484
(203) 712-1100

STATE OF CONNECTICUT JOHN W. BLOCK 69425 LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT JOSEPH CANAS 20873 LICENSED PROFESSIONAL ENGINEER
05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
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FILE:	A0969-015-C-700-XSEC.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

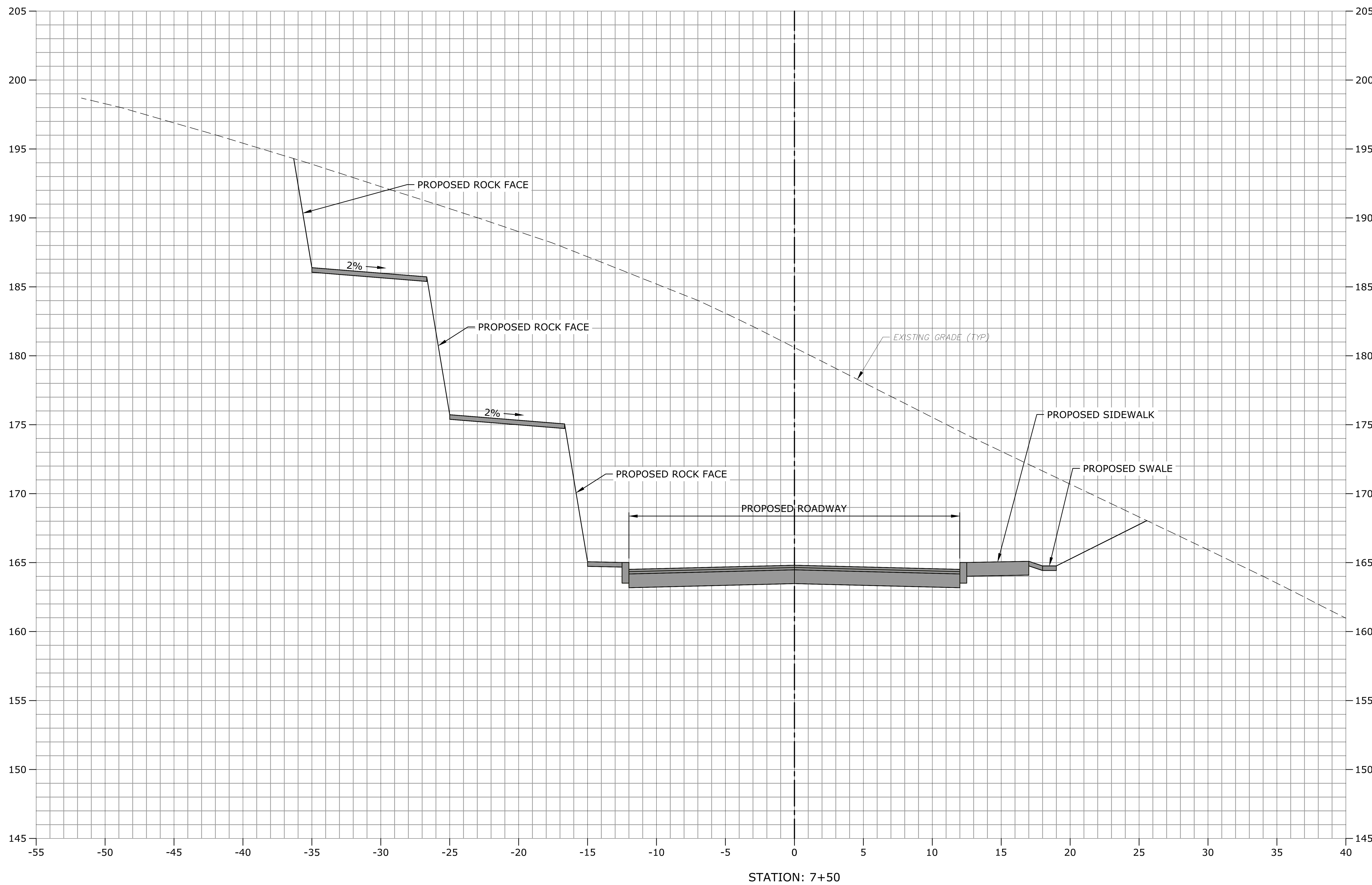
DRIVEWAY
CROSS-SECTIONS
STA: 6+50

SCALE: 1" = 5'

0 5' 10'
SCALE: 1" = 5'

C-704

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-700-XSEC.dwg



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1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100

05/23/2022

TOWN SUBMISSION DRAWINGS

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Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

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PROJECT NO:	A0969-015
DATE:	05/24/2022
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DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

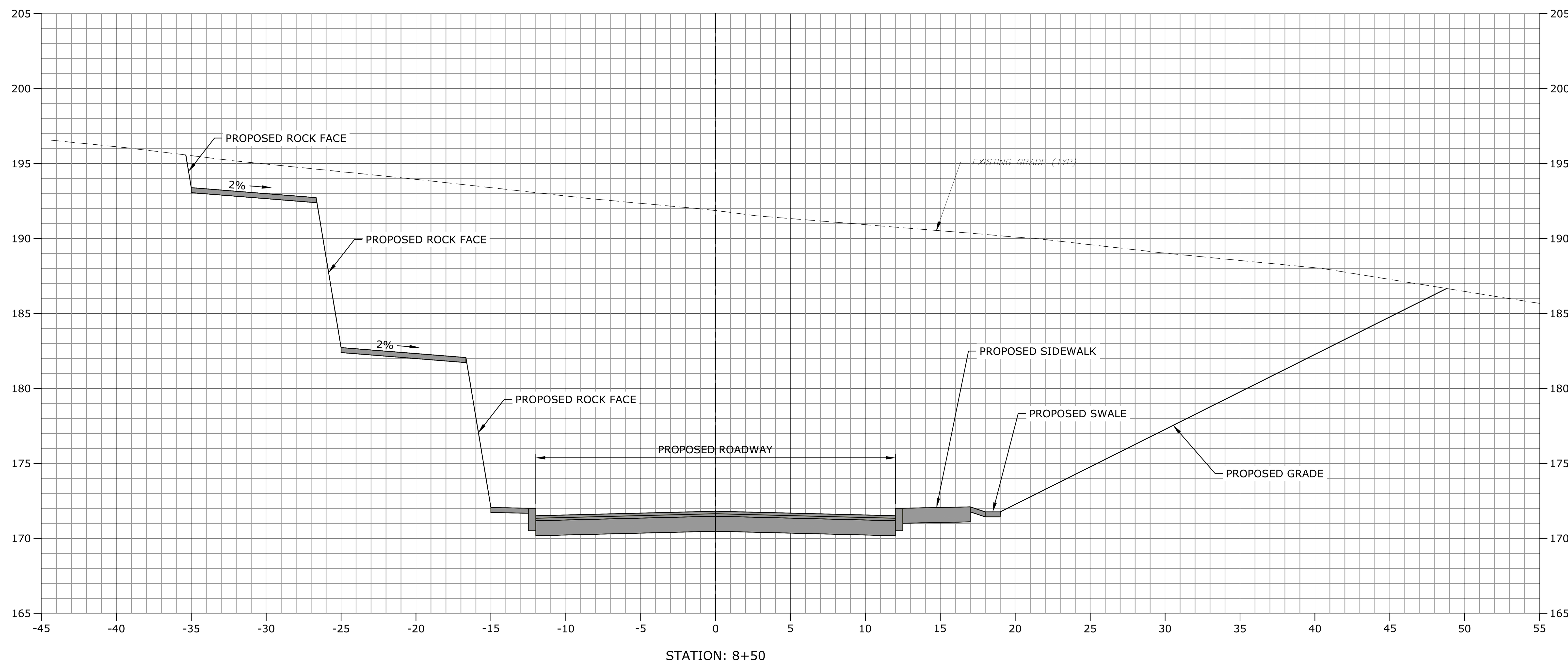
DRIVEWAY
CROSS-SECTIONS
STA: 7+00

SCALE: 1" = 5'

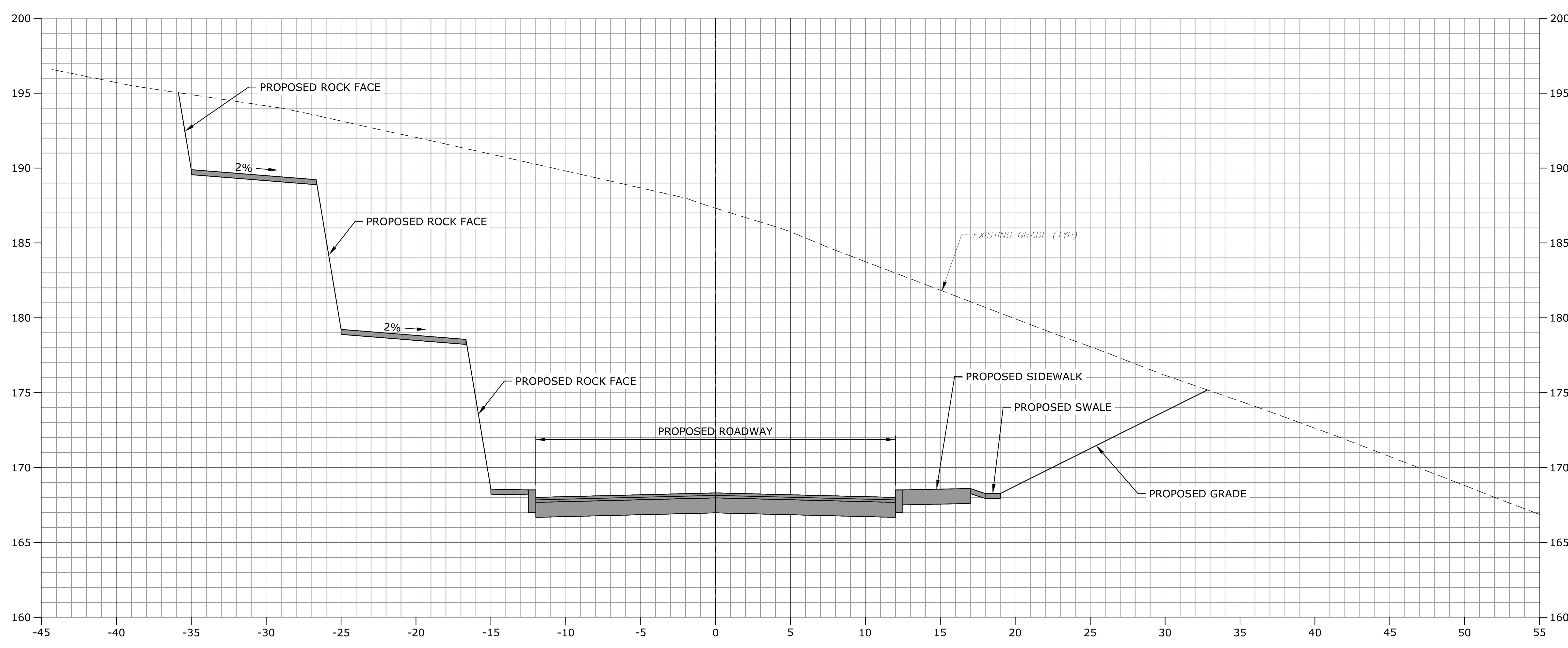
0 5' 10'
SCALE: 1" = 5'

C-705

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-700-XSEC.dwg



STATION: 8+50



STATION: 8+00

SCALE: 1" = 5'

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-700-XSEC.dwg

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TOWN SUBMISSION DRAWINGS

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Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

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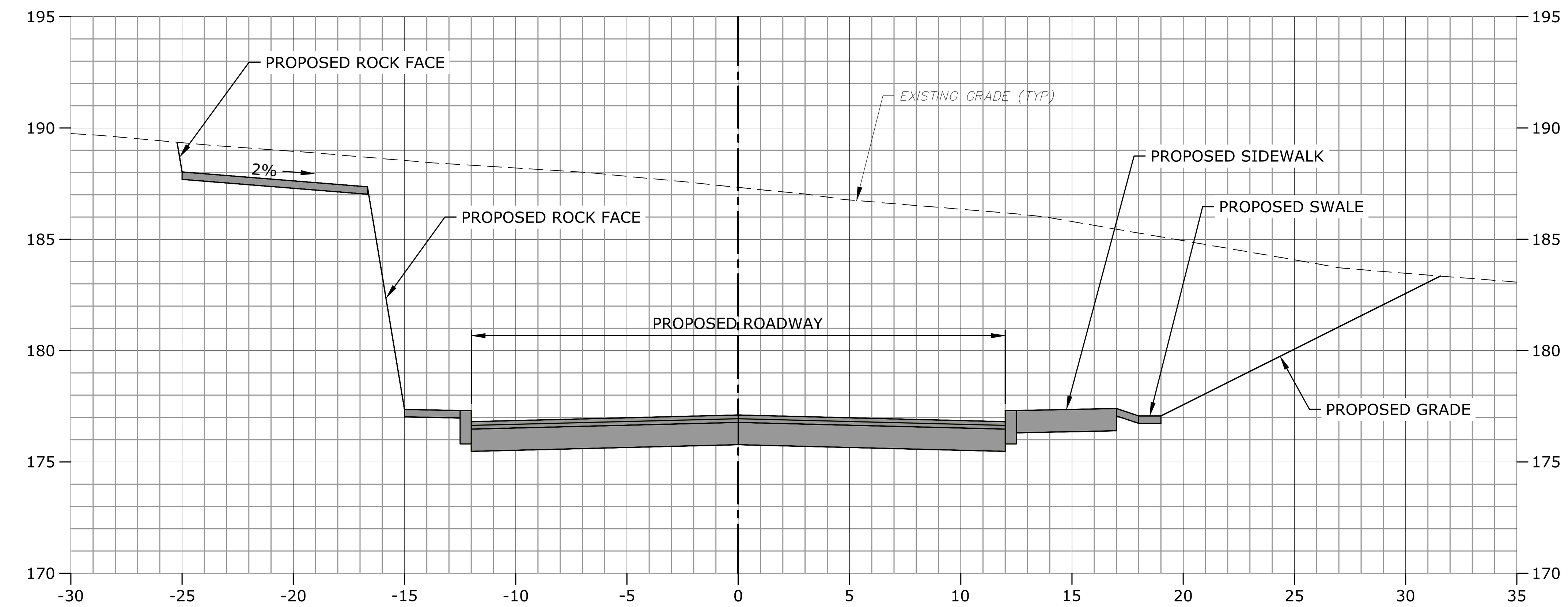
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

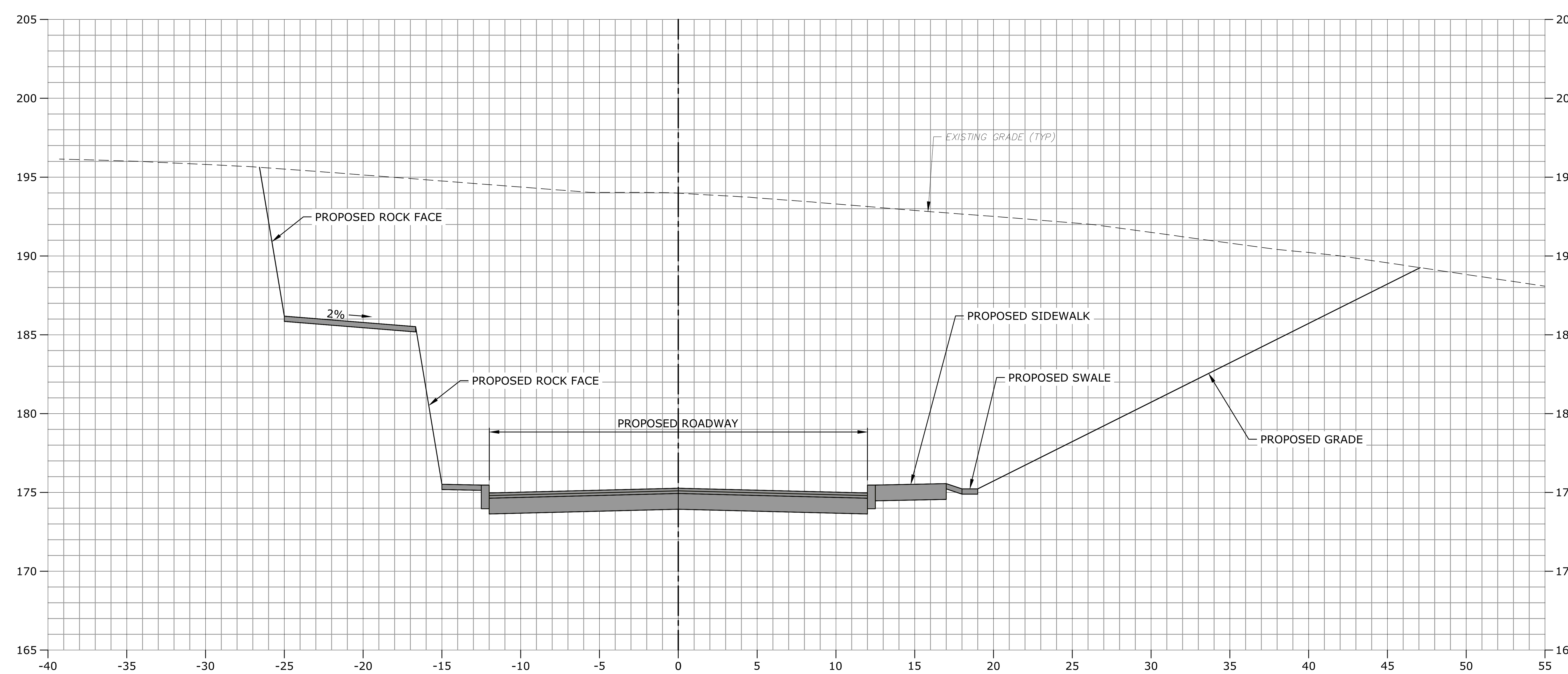
DRIVEWAY CROSS-SECTIONS
STA: 7+50 - 8+00

SCALE: 1" = 5'

C-706



STATION: 9+50



STATION: 9+00

0 5' 10'
SCALE: 1" = 5'

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1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100

STATE OF CONNECTICUT
LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT
JOSEPH CANAS
20873
LICENSED PROFESSIONAL ENGINEER
05/23/2022

TOWN SUBMISSION DRAWINGS

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Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

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DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRIVEWAY
CROSS-SECTIONS
STA: 8+50 - 9+00

SCALE: 1" = 5'

C-707

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-700-XSEC.dwg

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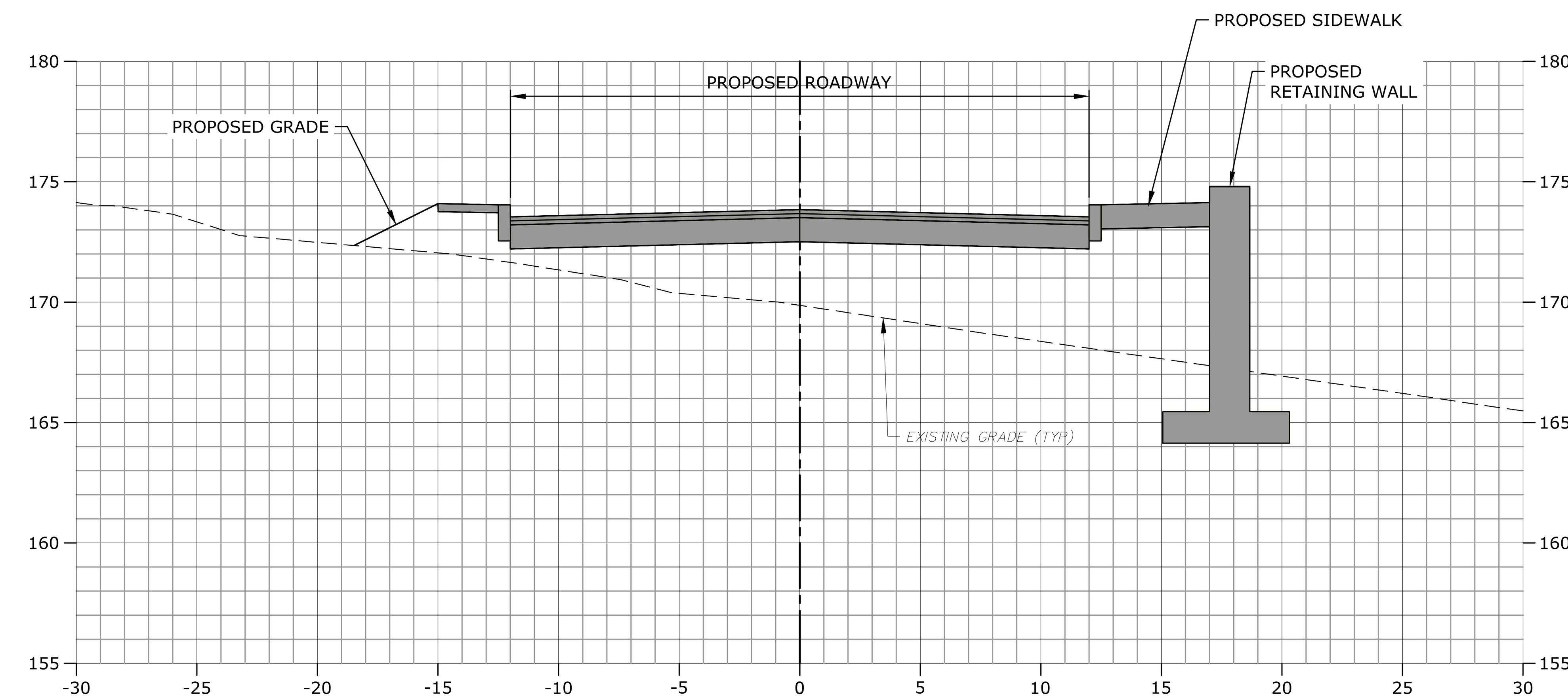
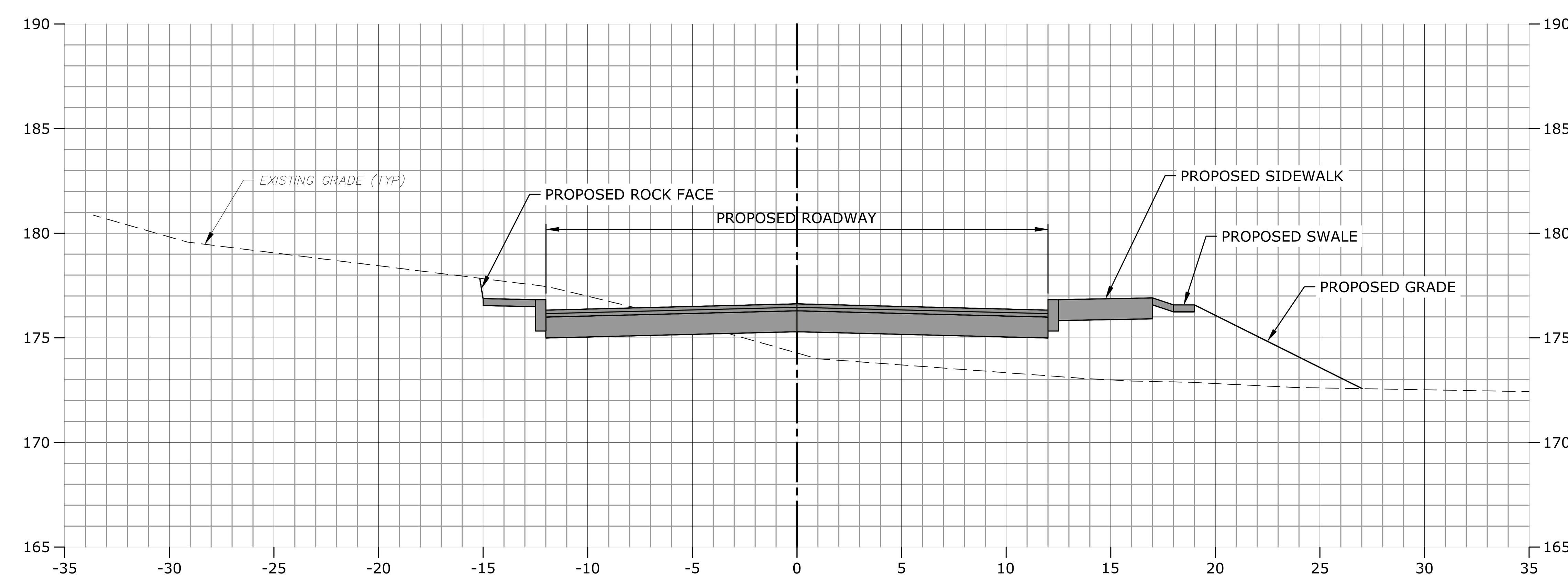
(203) 712-1100



STATION: 10+50



STATION: 10+00

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
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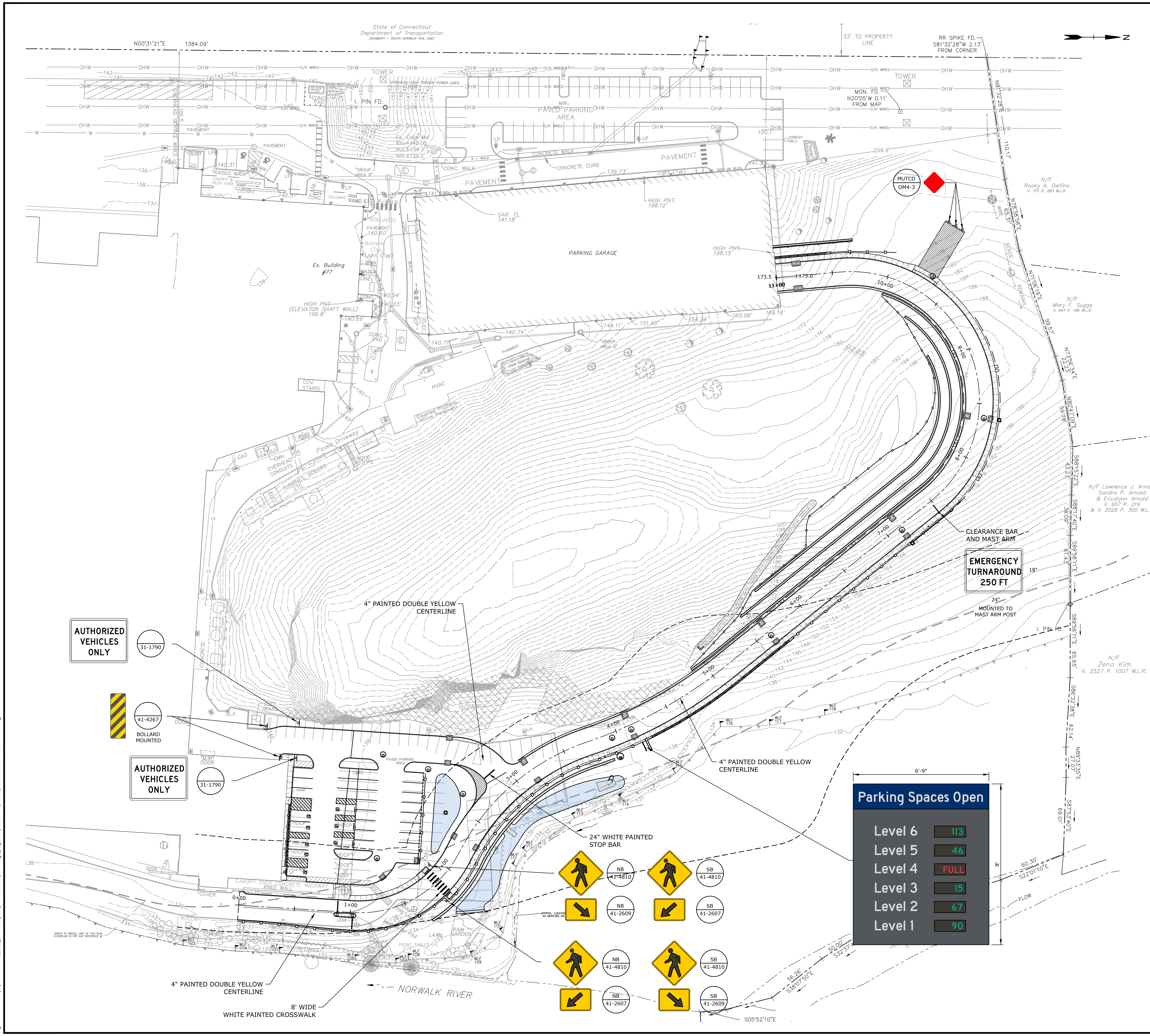
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRIVEWAY
CROSS-SECTIONS
STA: 9+50 - 10+00

SCALE: 1" = 5'

C-708



TRAFFIC OPERATIONS PLAN NOTES

1. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION SHOWN ON THESE DRAWINGS IS NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL UTILITIES WHICH MAY AFFECT CONSTRUCTION OPERATIONS. THE CONTRACTOR MUST ADEQUATELY PROTECT AND SUPPORT UTILITIES AND SHALL BE RESPONSIBLE FOR ALL DAMAGE INCURRED AT NO EXPENSE TO THE OWNER. ANYONE USING UTILITY INFORMATION AND DATA PROVIDED HEREIN SHALL CONTACT "CALL BEFORE YOU DIG", 1-800-922-4455 OR WWW.CBYD.COM, 72 HOURS IN ADVANCE TO VERIFY THE LOCATION OF UTILITIES PRIOR TO STARTING CONSTRUCTION.
2. REFERENCE IS MADE TO PLAN TITLED ....
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR IN EVALUATING THESE PLANS TO MAKE EXAMINATIONS IN THE FIELD BY VARIOUS METHODS AND OBTAIN NECESSARY INFORMATION FROM AVAILABLE RECORDS, UTILITY COMPANIES, AND INDIVIDUALS AS TO THE LOCATION OF SUBSURFACE STRUCTURES.
4. THE WETLANDS DEPICTED ON THE PLANS HAVE BEEN FLAGGED BY MATTHEW E. DAVISON PROFESSIONAL SOILS OF TIGHE & BOND.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE DRAWINGS, SPECIFICATIONS OR APPLICABLE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE OWNER'S REPRESENTATIVE SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL CONFORMANCE WITH REGULATIONS AND CODES.

TRAFFIC OPERATION PLAN LEGEND

- 100 FT UPLAND REVIEW AREA
- PROPERTY LINE
- EASEMENT LINE
- PROPOSED CURB
- PROPOSED RETAINING WALL
- PROPOSED BUILDING
- PROPOSED GUIDE RAIL
- PROPOSED SIGN
- PROPOSED ACCESSIBLE SYMBOL
- DOUBLE YELLOW CENTERLINE
- GATE CONTROL
- PAINTED CROSSWALK

0 40' 80'
SCALE: 1" = 40'

Tighe&Bond
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Suite 320
Shelton, CT 06484
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STATE OF CONNECTICUT LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT JOSEPH CANAS LICENSED PROFESSIONAL ENGINEER 20873
05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-800-TRAF.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

TRAFFIC OPERATIONS PLAN

SCALE: 1" = 40'

C-800

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-800-TRAF.dwg

Tighe&Bond
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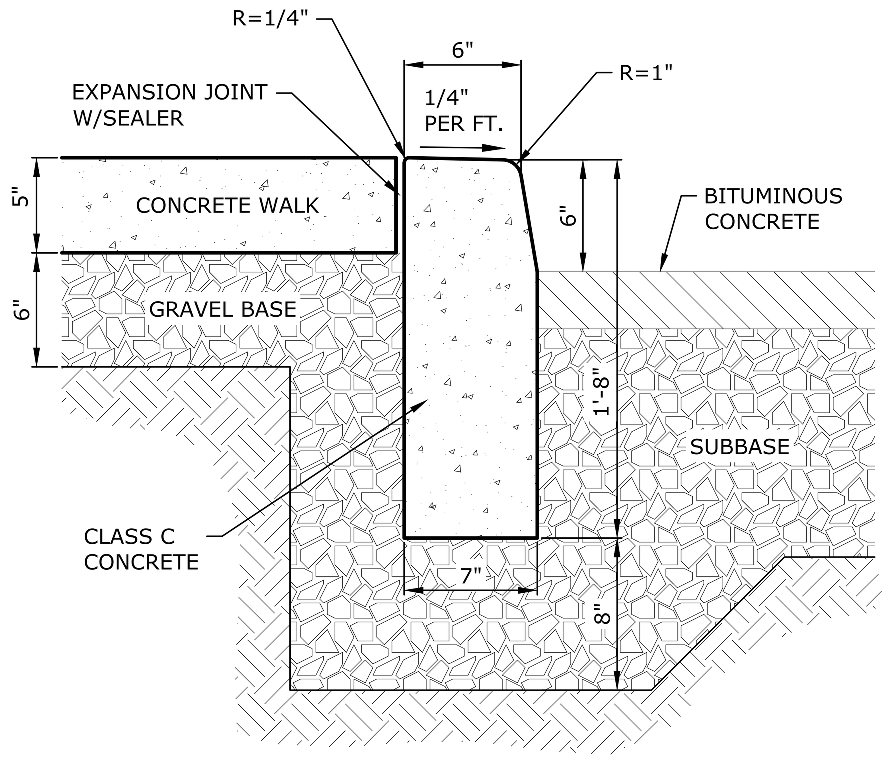
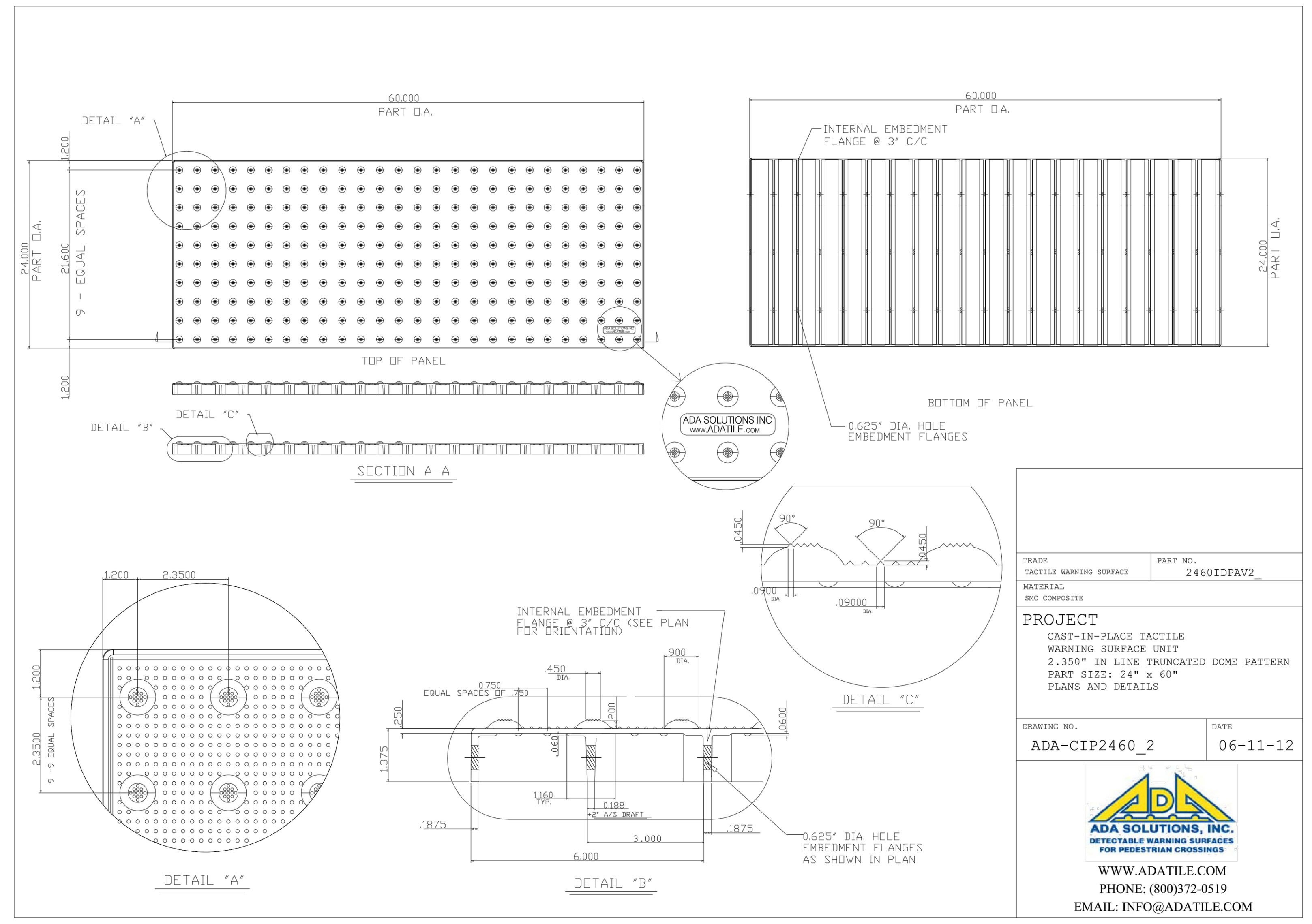
Suite 320
Shelton, CT 06484
(203) 712-1100



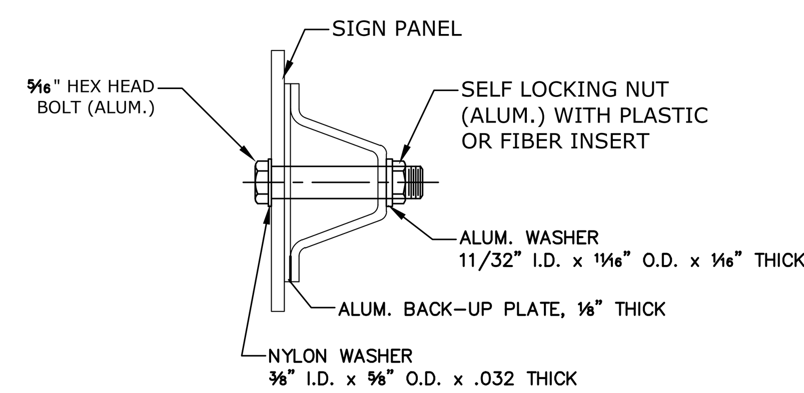
NOTE:

1. CONSTRUCT CURBING IN SECTIONS NOT TO EXCEED 10 FEET IN LENGTH, SUCH THAT THE CURBING JOINTS ALIGN WITH JOINTS IN THE CONCRETE PAVEMENT SLAB. NO SECTION SHALL BE LESS THAN 6 FEET IN LENGTH.

CONCRETE CURB AND CONCRETE SIDEWALK
NO SCALE



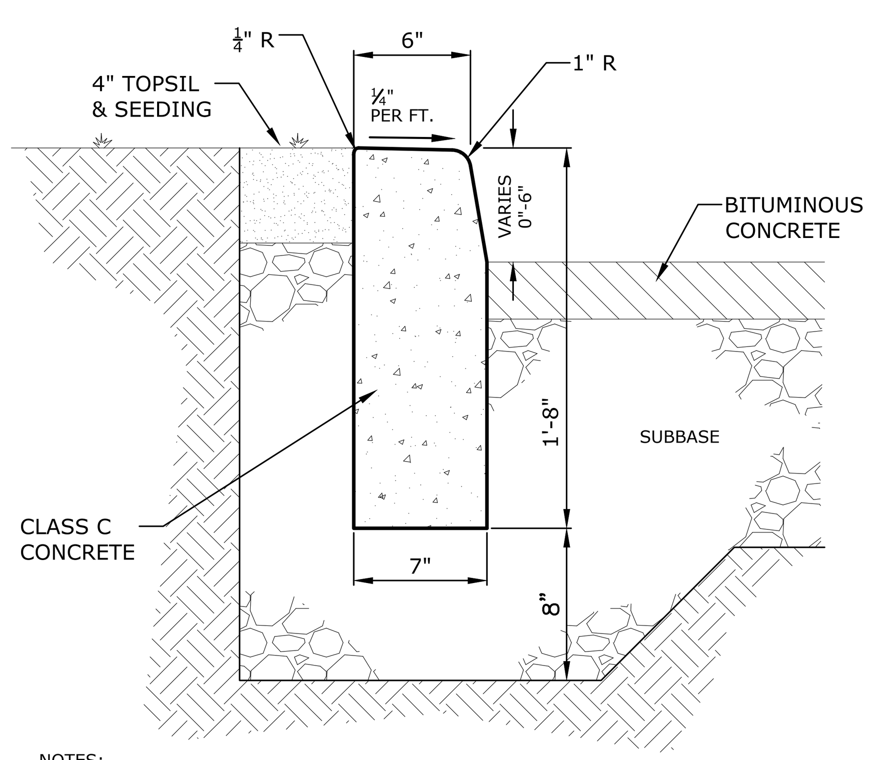
DETECTABLE WARNING TILE
NO SCALE



TYPICAL SIGN PANEL ATTACHMENT
NO SCALE

TOWN SUBMISSION DRAWINGS

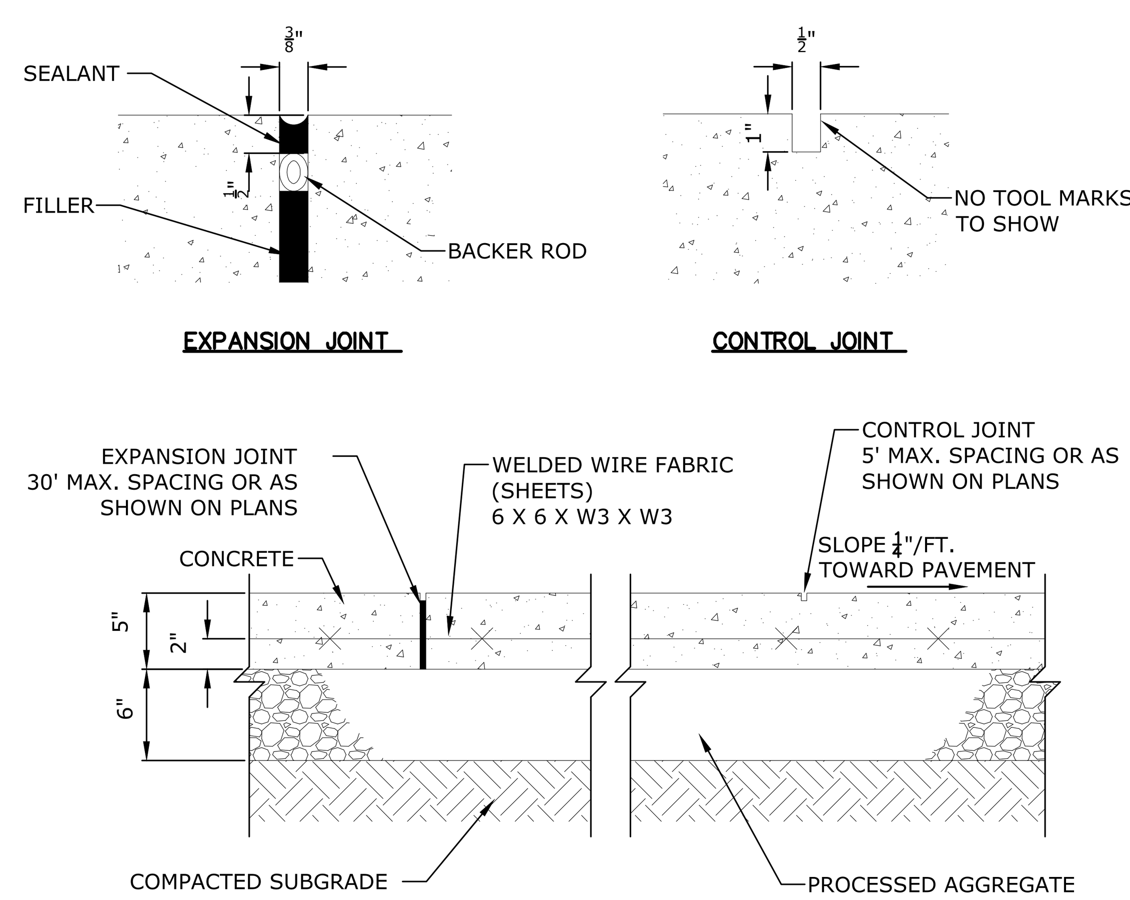
ASML



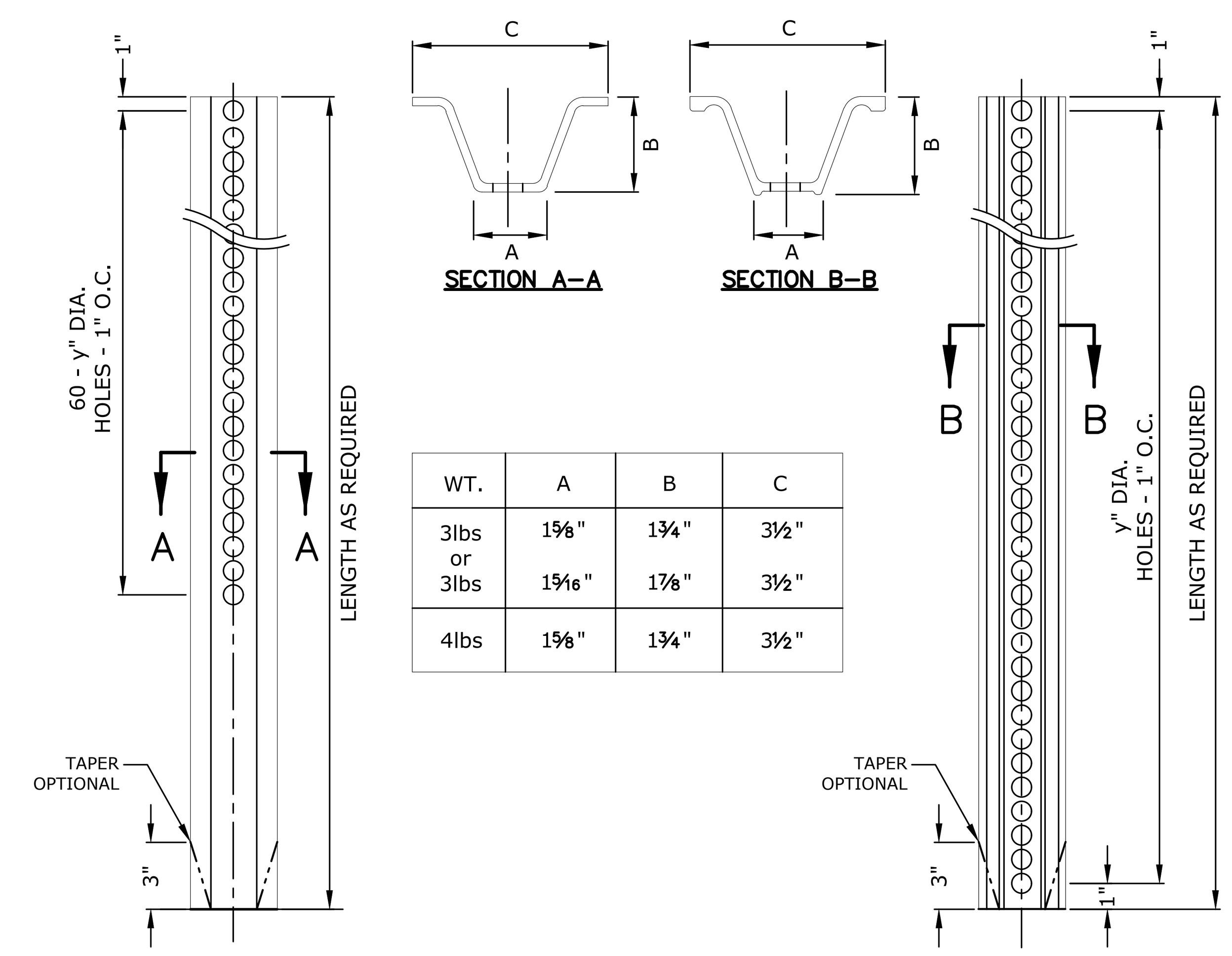
NOTES:

1. CONSTRUCT CURBING IN SECTIONS NOT TO EXCEED 10 FEET IN LENGTH, SUCH THAT THE CURBING JOINTS ALIGN WITH JOINTS IN THE CONCRETE PAVEMENT SLAB. NO SECTION SHALL BE LESS THAN 6 FEET IN LENGTH.

CONCRETE CURB ADJACENT TO GRASS
NO SCALE



CONCRETE SIDEWALK DETAIL
NO SCALE



WT.	A	B	C
3lbs or 3lbs	1⅝" / 1⁹⁄₁₆"	1¾" / 1⅞"	3½" / 3½"
4lbs	1⅝"	1¾"	3½"

NOTES:

1. STEEL FOR POSTS SHALL CONFORM TO THE MECHANICAL REQUIREMENTS OF ASTM A 499-81 GRADE 60 AND TO THE CHEMICAL REQUIREMENTS OF ASTM A1-76 CARBON STEEL TEE RAIL HAVING NOMINAL WEIGHT OF 91 LBS. OR GREATER PER LINEAR YARD.
2. AFTER FABRICATION, ALL STEEL POSTS SHALL BE GALVANIZED TO MEET THE REQUIREMENTS OF ASTM A 123.
3. ALL SIGN POSTS SHALL HAVE "BREAKAWAY" FEATURES THAT MEET AASHTO REQUIREMENTS CONTAINED IN "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS-1985." THE "BREAKAWAY" FEATURES SHALL BE STRUCTURALLY ADEQUATE TO CARRY THE SIGNS SHOWN IN THE PLANS AT 60 MPH WIND LOADINGS. INSTALLATIONS SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
4. TYPE A POSTS - 3 LB/FT TYPE B POSTS - 4 LB/FT.

TYPICAL METAL SIGN POSTS
NO SCALE

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

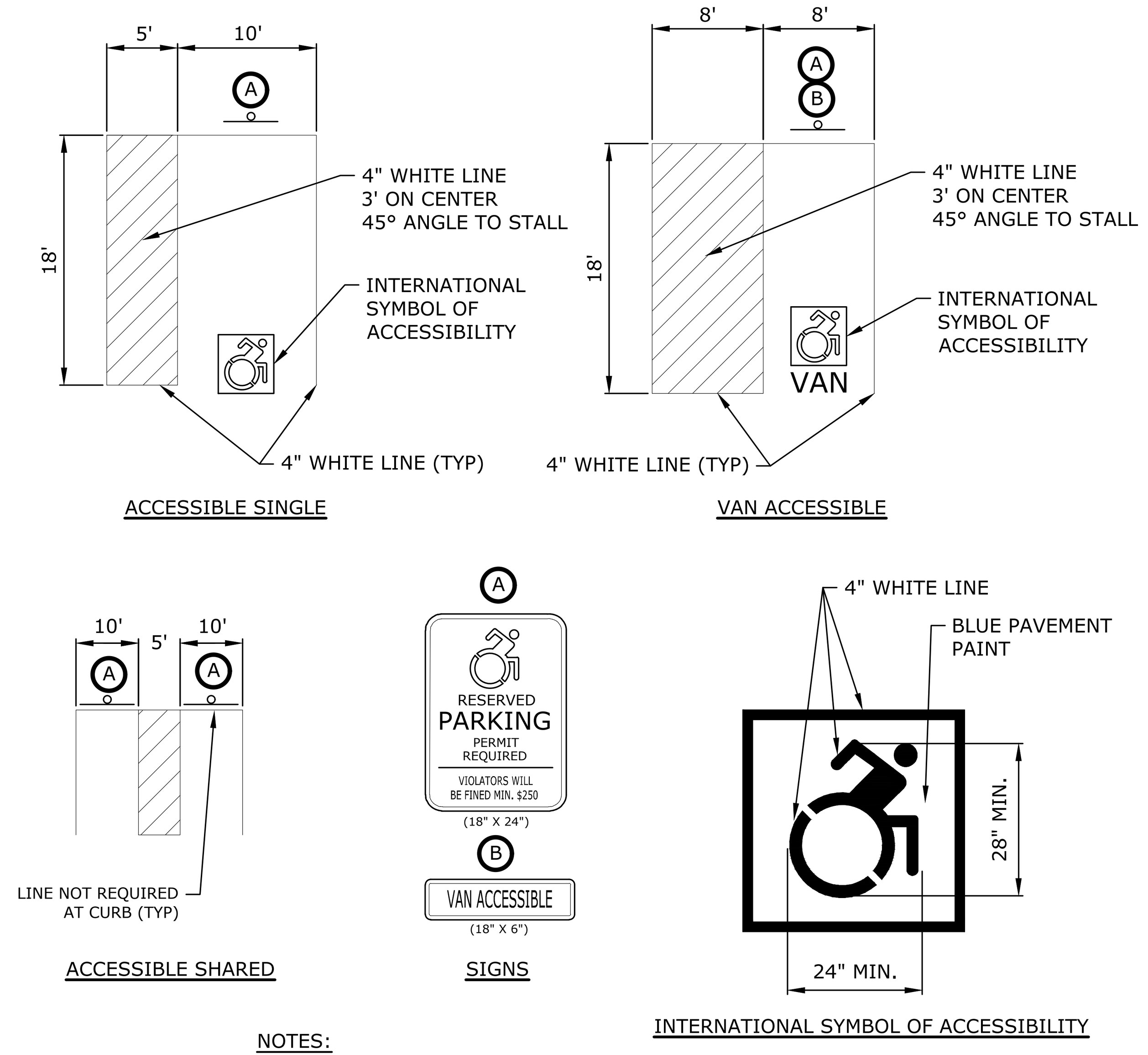
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

SITE DETAILS - 1

SCALE: NO SCALE

C-900

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg

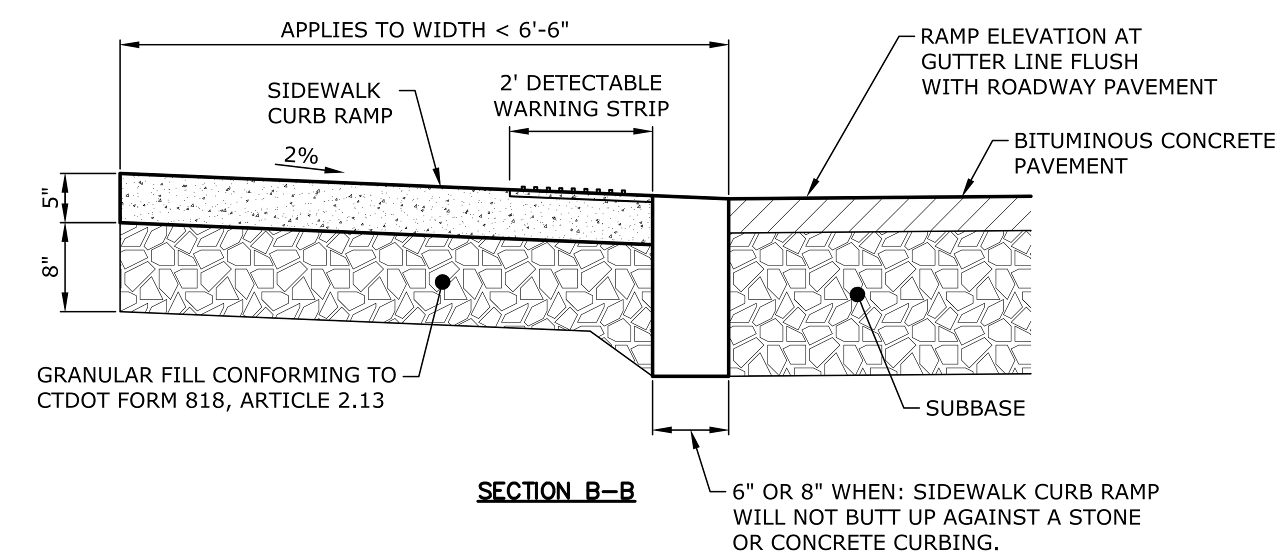


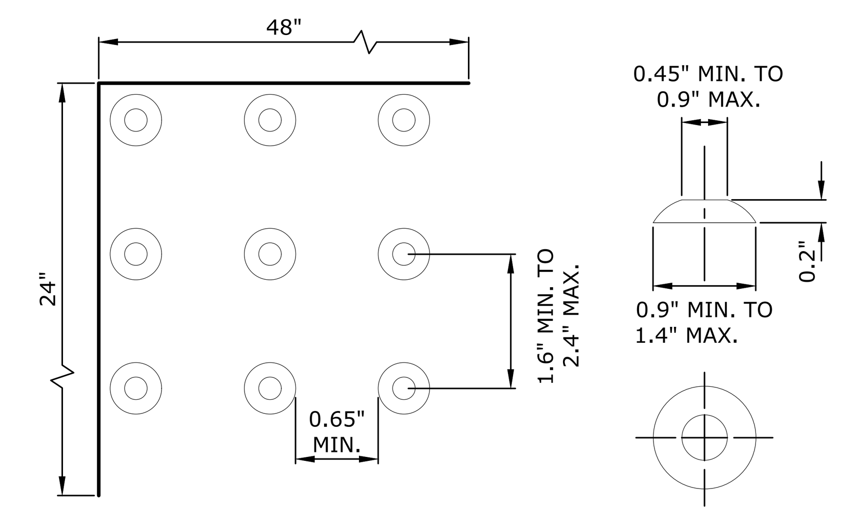
NOTES:

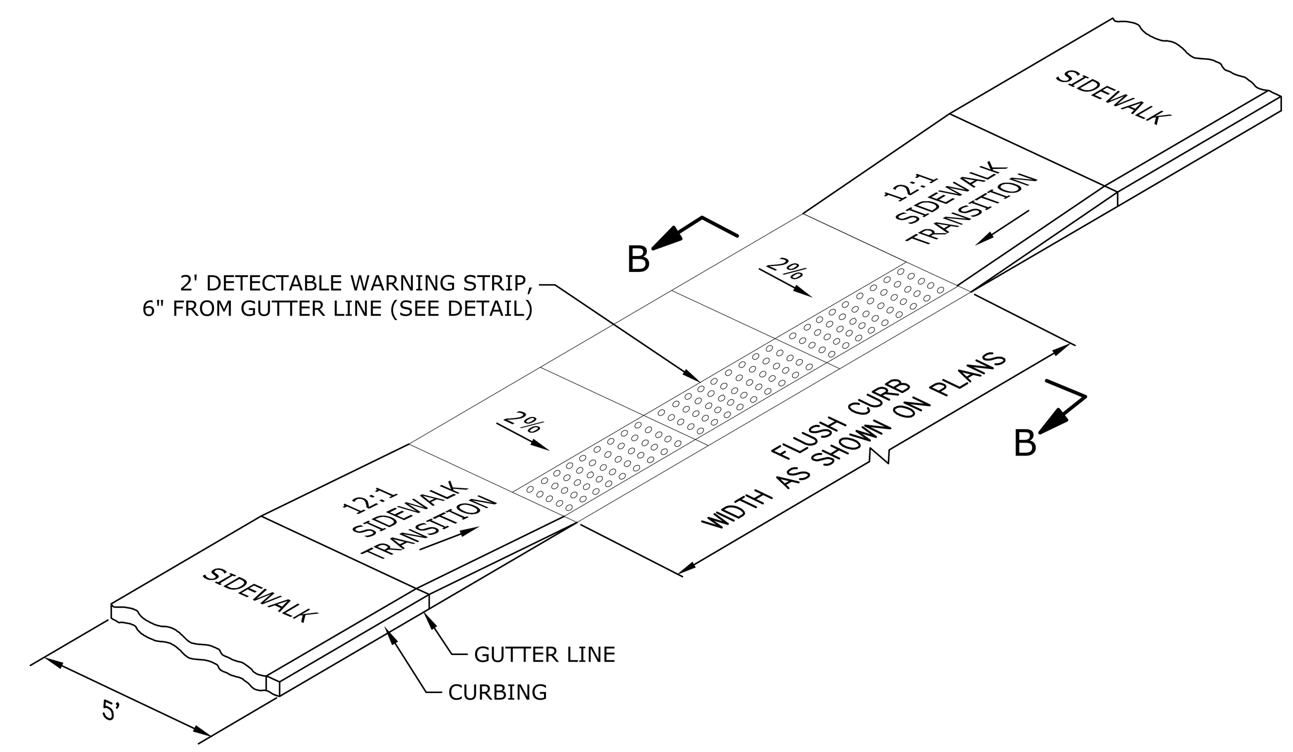
1. SIGN LOCATED AT ALL HANDICAPPED PARKING SPACES.
2. 18' X 15' D.O.T STANDARD ACCESSIBLE PARKING STALL
3. SIGN BACKGROUND - BLUE REFLECTIVE
4. LETTERS, GRAPHICS & BORDER - WHITE REFLECTIVE

ACCESSIBLE PARKING STRIPING DETAILS

NO SCALE

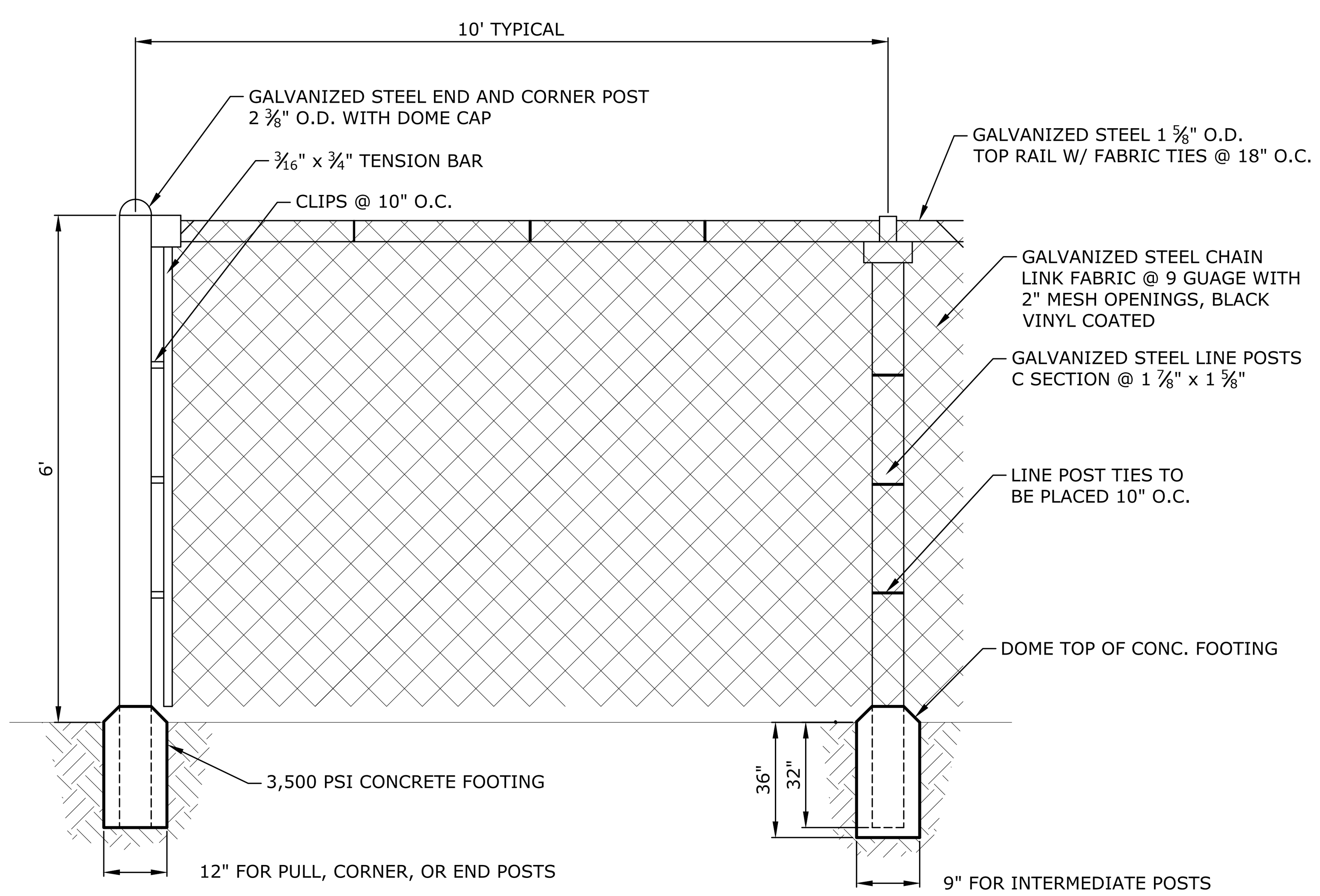






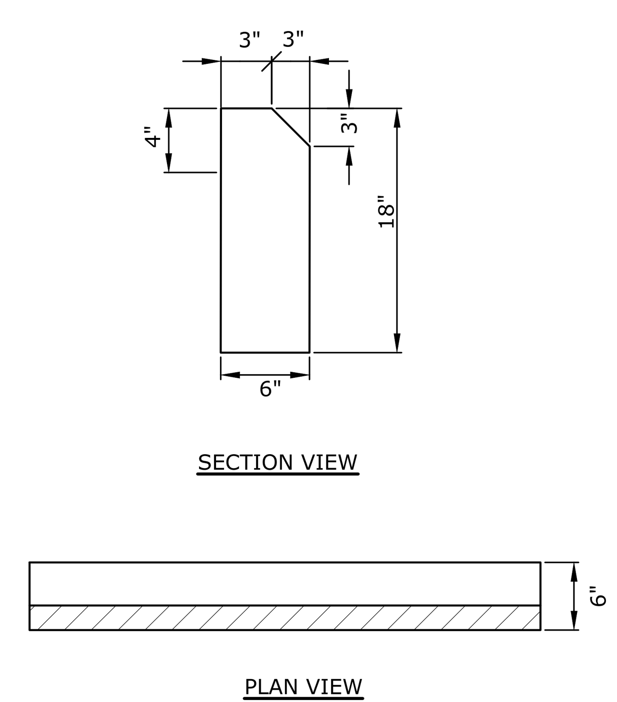
FLUSH CURB AND SIDEWALK AT ACCESSIBLE PARKING

NO SCALE



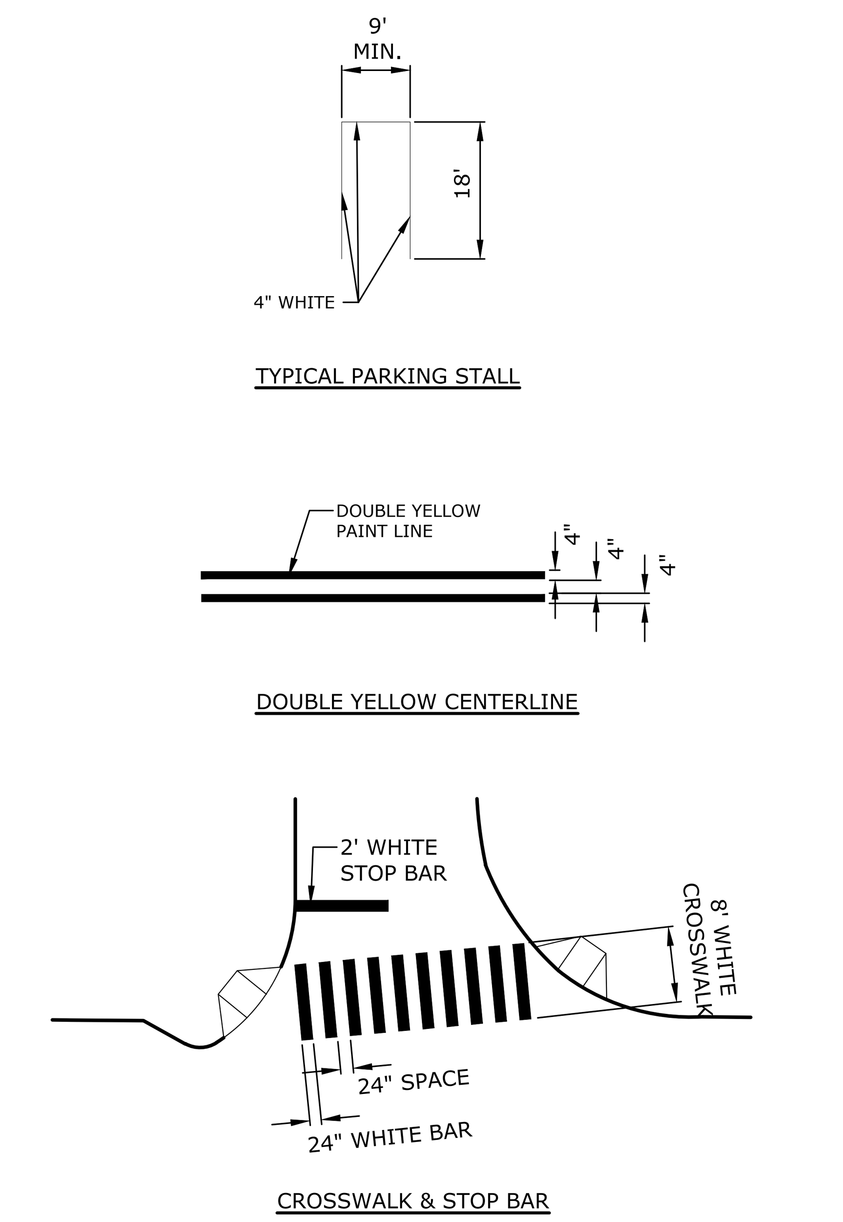
VINYL-COATED MESH 6' CHAIN LINK FENCE

NO SCALE



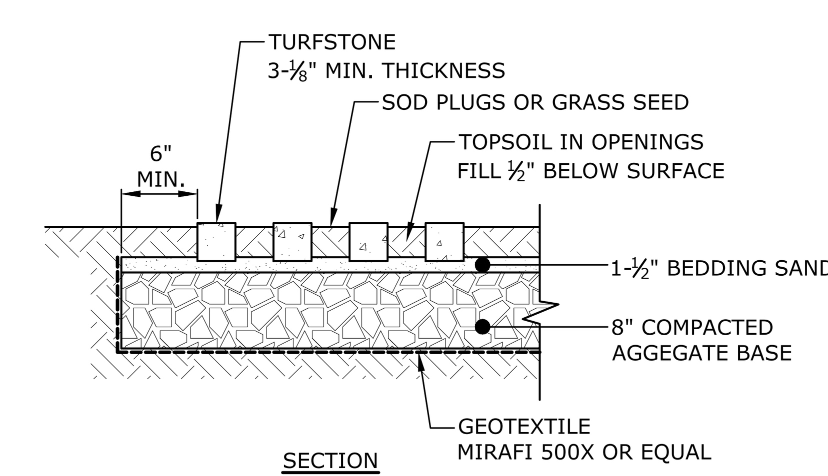
MOUNTABLE GRANITE CURB

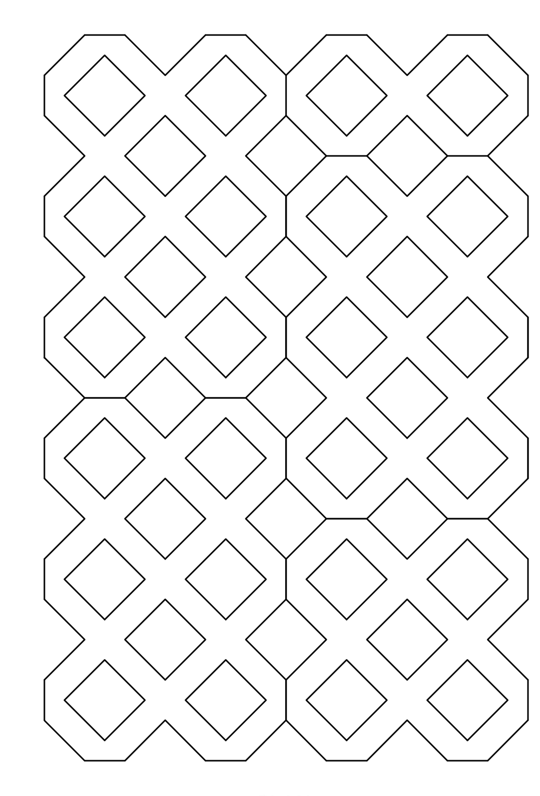
NO SCALE



TYPICAL PAVEMENT MARKING DETAILS

NO SCALE





NOTE:

1. TURFSTONE MANUFACTURED BY IDEAL CONCRETE BLOCK, WALTHAM, MASSACHUSETTS.

TURFSTONE PAVING

NO SCALE

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1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
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05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

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DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

SITE DETAILS - 2

SCALE: NO SCALE

C-901

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg

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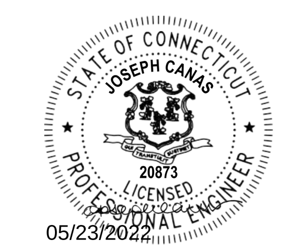
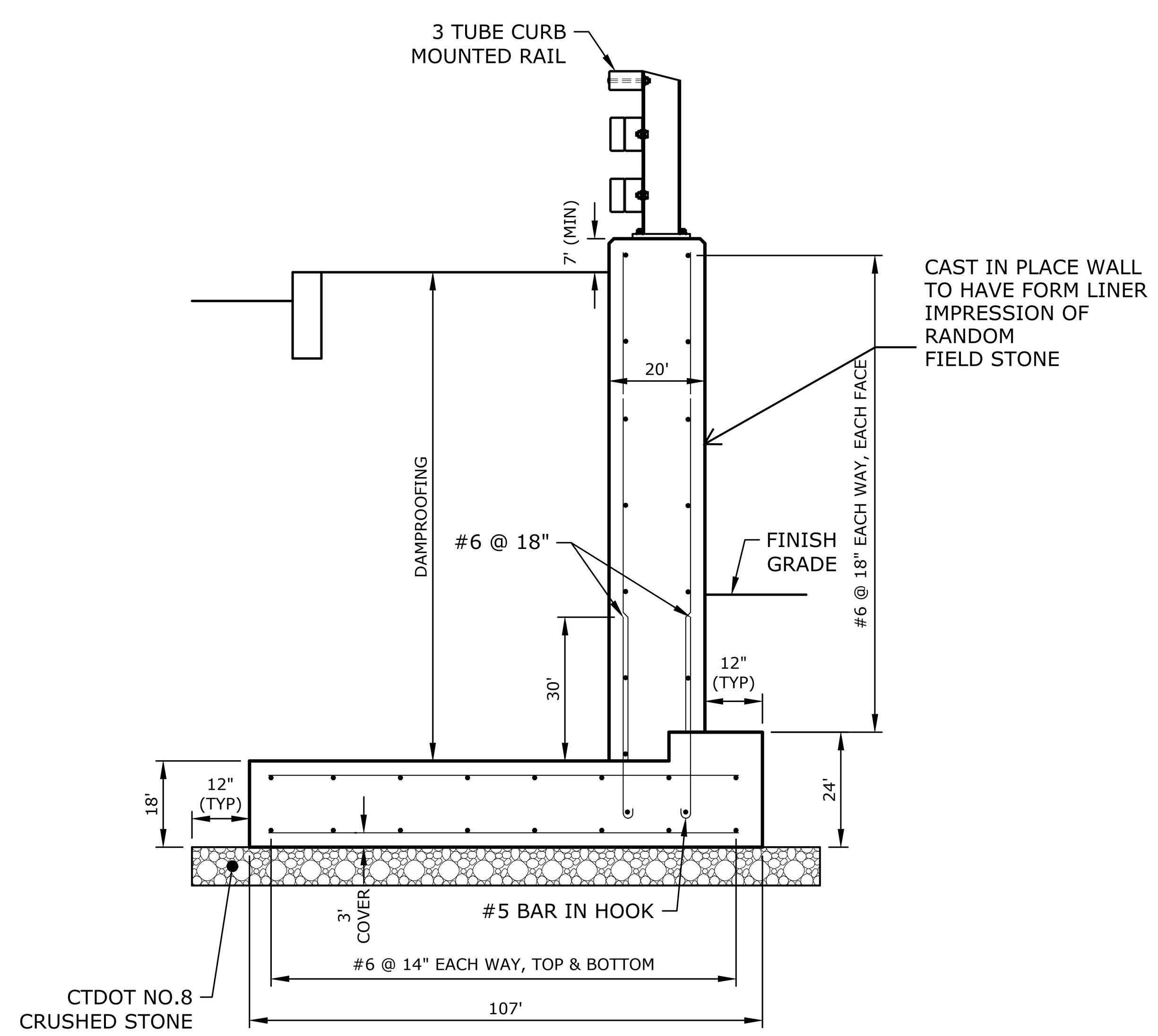
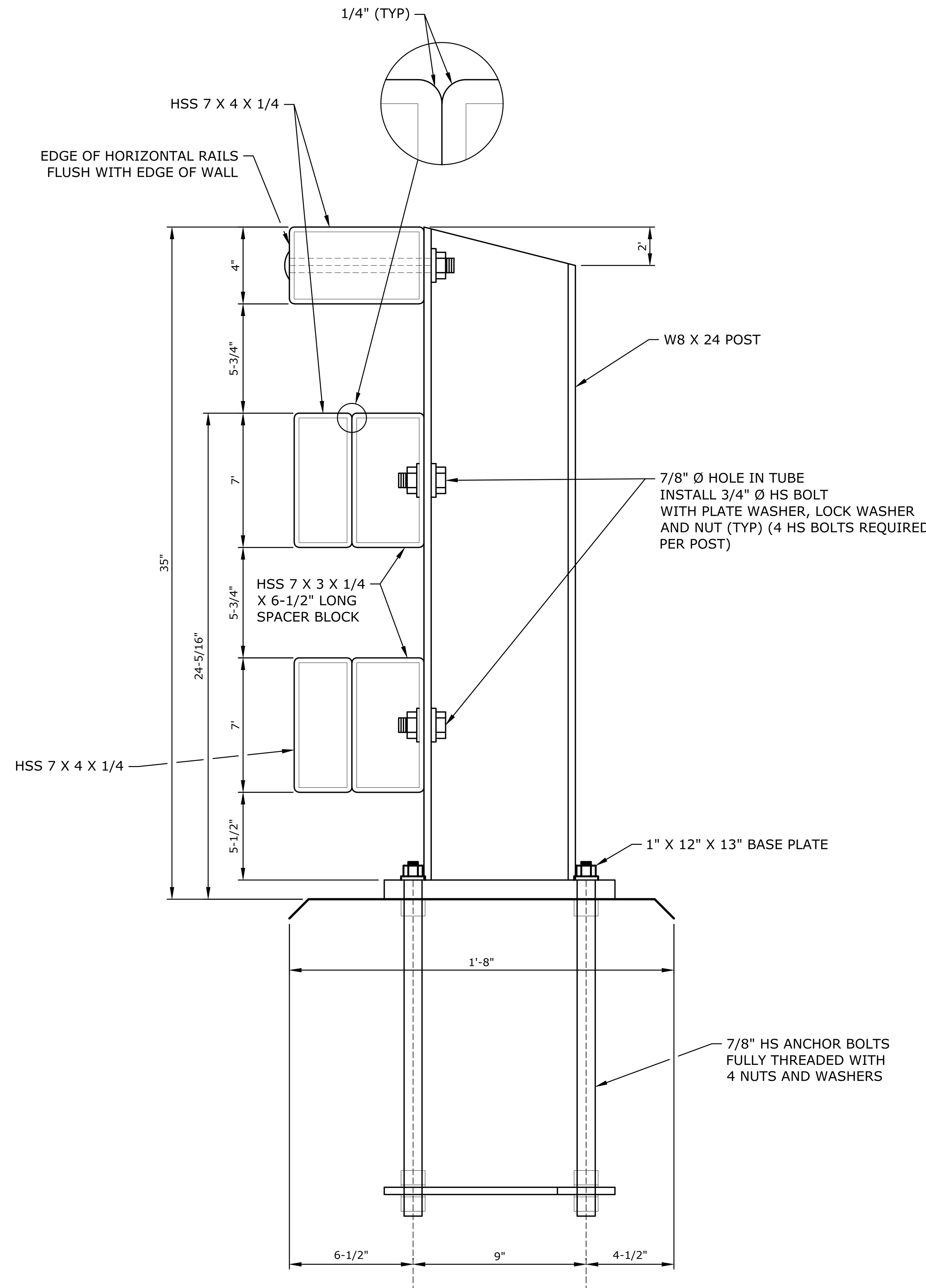




RETAINING WALL WITH 3-TUBE RAIL SECTION DETAIL

NO SCALE

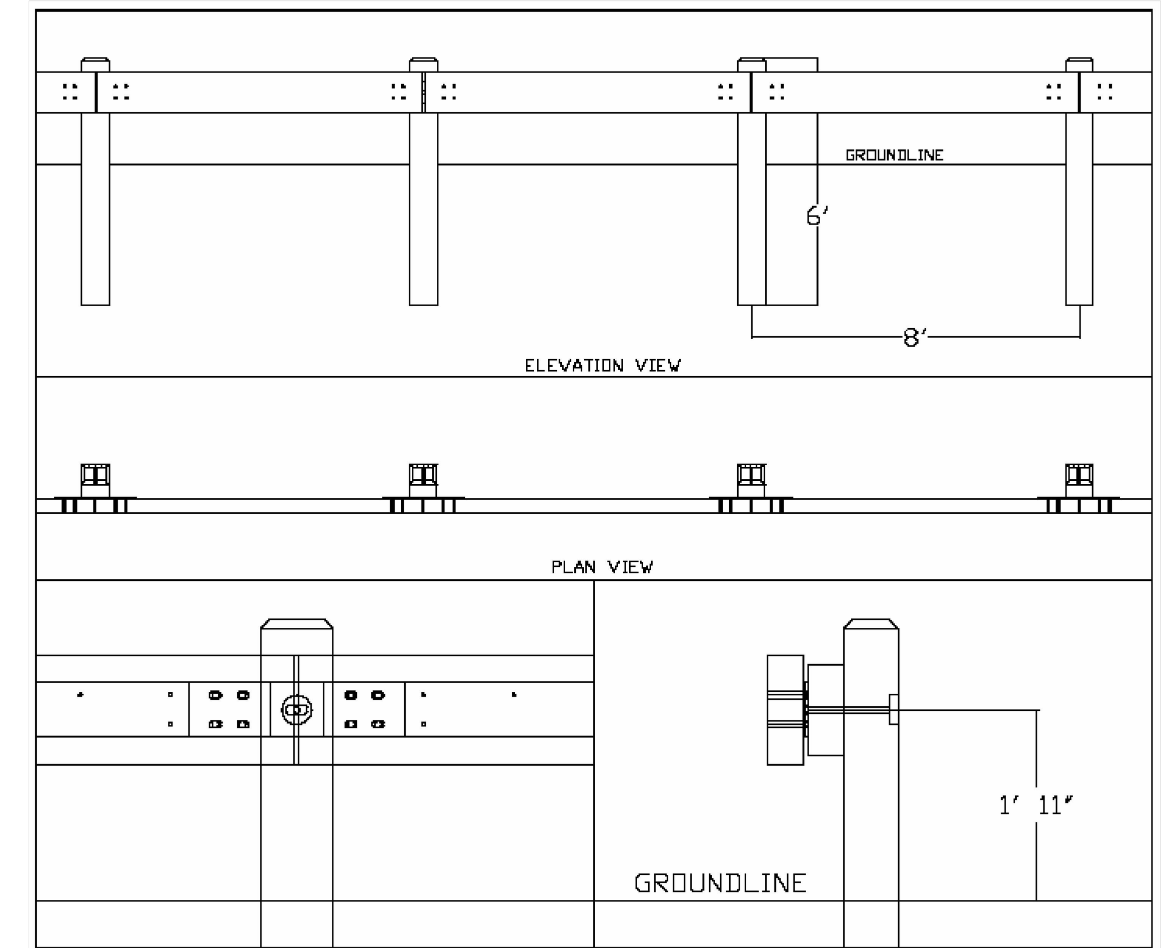


NOTE:

ALL EXPOSED GUIDERAIL ELEMENTS TO BE POWDER COATED, FEDERAL STANDARD 17038, MATTE BLACK.

3-TUBE - CURB MOUNTED RAIL SECTION

NO SCALE



NOTES:

1) THE TIMBARRIER STREETGUARD PLUS SYSTEM IS CRASHWORTHY FOR LOW SPEED ROADWAYS UP TO 45 MPH, PER NCHRP-350 TEST LEVEL 2 CRITERIA.

2) ALL TIMBER COMPONENTS SHALL BE #1 GRADE SOUTHERN PINE, S4S, IN ACCORDANCE WITH SOUTHERN PINE INSPECTION BUREAU (SPIB) AND CCA PRESSURE TREATED IN ACCORDANCE WITH AMERICAN WOOD PRESERVERS (AWPA) STANDARD C14 TO A MINIMUM NET RETENSION OF 0.60 LBS./CU.FT.

3) ALL STEEL BACKING AND SPLICE PLATES SHALL BE ASTM A588 WEATHERING STEEL.

4) ALL FASTENERS SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS: CARRIAGE BOLTS: A307 (A242 WEATHERING); NUTS: A563 TYPE DH3; WASHERS: F436 TYPE 3; LAG SCREWS: A307.

5) IF SHOULDER SLOPE IS STEEPER THAN 10:1 OR IF SLOPE BREAK IS LESS THAN 2' BEHIND BACK OF POST, INCREASE POST LENGTH TO 7' OR 8', AS REQUIRED.

6) DRIVING POSTS WITH A COMMERCIAL GRADE POST DRIVER IS THE PREFERRED METHOD OF INSTALLATION. HOWEVER, AUGERING A HOLE, BACKFILLING, AND COMPACTING ADEQUATELY SO AS NOT TO SETTLE AFTER INSTALLATION, IS PERMITTED.

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

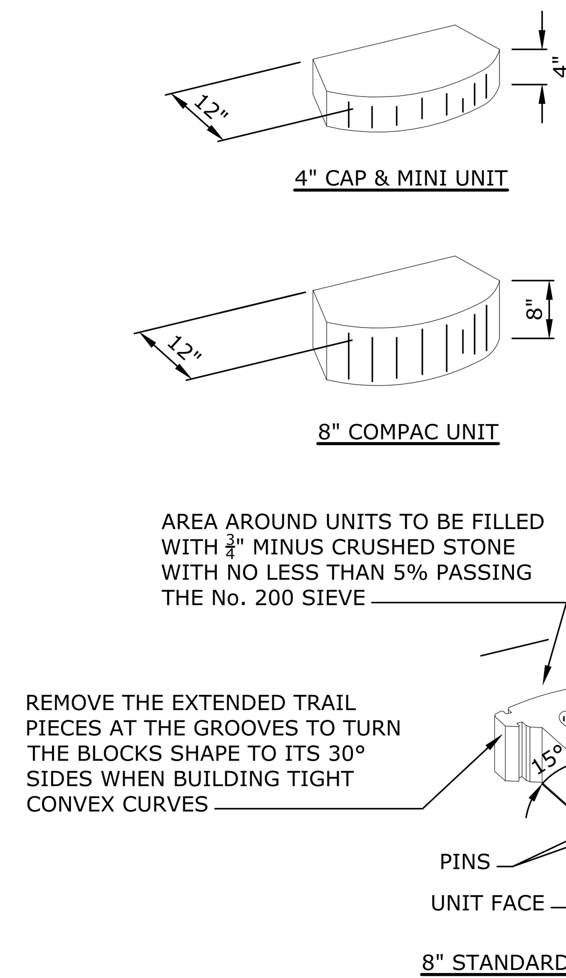
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

SITE DETAILS - 3

SCALE: NO SCALE

C-902

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg



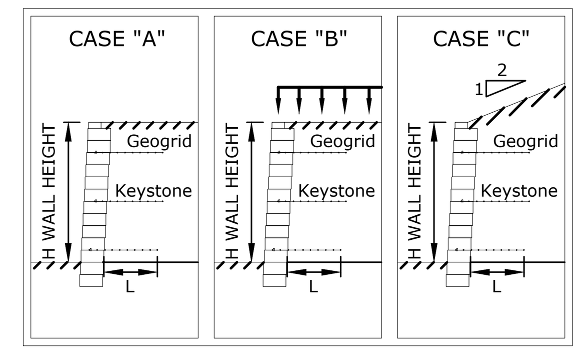
GEOGRID PLACEMENT CHART

SINCE ACTUAL PROJECT CONDITIONS MAY VARY FROM THOSE ASSUMED IN DEVELOPMENT OF THIS CHART, IT IS IMPORTANT TO RECOGNIZE THE CONDITIONS FOR WHICH THE CHART APPLIES, WHICH ARE:

- THE BEARING CAPACITY OF THE FOUNDATION SOIL BELOW THE WALL US ADEQUATE. (MAC. REQUIRED ALLOWABLE BEARING CAPACITY FOR THE CASES PRESENTED IS 3500 PSF).
- IN CASES A, B, AND C, THE REINFORCED WALL FILL, RETAINED BACKFILL, & FOUNDATION SOILS ARE SANDY SILTS OR GRAVELY SANDS WHICH HAVE A STRENGTH DEFINED BY AN EFFECTED ANGLE OF FRICTION OF 32°, ZERO COHESION AND A MOIST UNIT WEIGHT OF 125 PCF.
- BOTH REINFORCED WALL FILL AND RETAINED BACKFILL ARE WELL DRAINED.
- MINIMUM FACTORS OF SAFETY ARE: 1.5 AGAINST REINFORCEMENT PULLOUT AND REINFORCEMENT RUPTURE; 1.5 AGAINST EXTERNAL SLIDING FAILURES; AND 2.0 AGAINST EXTERNAL OVERTURNING.

WALL HEIGHT FEET	CASE	GRID TYPE	NUMBER OF LAYERS	GEOGRID LENGTH FEET	GEOGRID LAYER # 1	2	3	4	5	DISTANCE ABOVE BASE IN FEET
4	A		-							
4	B		-							
4	C		1	2.5	1.5					
5	A		-							
5	B		1	2.5	2					
5	C		2	3.7	1.3	3.3				
6	A		1	2.5	2.7					
6	B		2	2.5	1.3	3.3				
6	C		3	4.3	.7	2	4			
7	A		2	3.0	1.3	4.0				
7	B		3	3.0	1.3	2.7	4.7			
7	C		3	4.9	1.3	2.7	4.7			
8	A		3	3.2	1.3	3.3	5.3			
8	B		4	3.5	.7	2.7	4.7	6.7		
8	C		3	5.8	1.3	3.3	5.3			
10	A		3	4.3	1.3	4	6.7			
10	B		4	4.6	1.3	3.3	5.3	7.3		
10	C		3	7.0	1.3	4	6.7			
12	A		3	5.5	1.3	4.7	8.0			
12	B		4	5.7	1.3	4	6.7	9.3		
12	C		5	8.1	1.3	4	6	8	10	

*THE CHART IS TO BE USED FOR ESTIMATING PURPOSES ONLY. DESIGN MUST BE DONE BY A QUALIFIED ENGINEER USING DESIGN CRITERIA FOR SPECIFIC GRID TYPE.



KEYSTONE MODULAR RETAINING WALL UNITS

MATERIALS

A. CONCRETE UNITS

1. CONCRETE WALL UNITS SHALL HAVE A MIN. 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI. THE CONCRETE TO HAVE ADEQUATE FREEZE/THAW PROTECTION WITH MAX. MOISTURE ABSORPTION RATE OF 6%.
2. RETAINING WALL UNITS SHALL PROVIDE A MIN. OF 150 LBS/ PER SQ. FOOT OF WALL FACE AREA. FILL WHICH IS CONTAINED WITHIN DIMENSIONS OF THE UNITS MAY BE CONSIDERED AS 80% EFFECTIVE WEIGHT.
3. UNITS SHALL HAVE ANGLED SIDES & BE CAPABLE OF ATTAINING CONCAVE & CONVEX ALIGNMENT CURVES WITH A MIN RAD. OF 3.5 FT.
4. UNITS SHALL BE INTERLOCKED WITH NONCORROSIVE FIBERGLASS PINS.

B. FIBERGLASS CONNECTING PINS

1. NYLON RESIN RODS WITH FIBERGLASS REINFORCEMENT.
2. PINS MIN. FLEXURAL STRENGTH TO BE 180,000 PSI.

C. BASE MATERIAL

1. FOOTING MATERIAL SHALL CONSIST OF 95% COMPACTED SANDS, GRAVEL AND/OR CONC. AS SHOWN ON THE CONSTRUCTION DRAWINGS. A MIN. AT 6 INCHES OF COMPACTED BASE IS REQUIRED. FOR WALLS UNDER 10'-0" BASE TO BE LEVEL; WALLS OVER 10'-0" BASE TO TILT FROM FRONT TO BACK SO THAT BACK IS 1" LOWER THAN FRONT.

D. BACKFILL

1. MATERIAL SHALL BE IN SITU SOILS WHEN APPROVED BY ENGINEER. UNSUITABLE FILL SHALL NOT BE USED.ADDITIONAL FILL IS TO BE APPROVED BY THE ENGINEER.

RETAINING WALL INSTALLATION

A. FOUNDATION SOIL PREPARATION

1. FOUNDATION SOIL SHALL BE EXAMINED BY ENGINEER TO ASSURE THAT THE ACTUAL FOUNDATION SOIL STRENGTH MEETS OR EXCEEDS ASSUMED DESIGN STRENGTH. UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE FILL. OVER-EXCAVATED AREAS SHALL BE FILLED WITH APPROVED MATERIAL.

B. UNIT INSTALLATION

1. FIRST COURSE OF CONC. WALL UNITS SHALL BE PLACED ON THE FOOTING. THE UNITS SHALL BE CHECKED FOR LEVEL AND ALIGNMENT. FIRST COURSE IS THE MOST IMPORTANT TO INSURE ACCURATE & ACCEPTABLE RESULTS.
2. INSURE THAT UNITS ARE IN FULL CONTACT WITH BASE.
3. UNITS ARE PLACED SIDE BY SIDE FOR FULL LENGTH OF WALL ALIGNMENT. ALIGNMENT MAY BE DONE BY MEANS OF A STRING LINE OR OFFSET FROM BASE LINE.
4. INSTALL FIBERGLASS CONNECTING PINS AND FILL ALL VOIDS WITH COARSE GRANULAR MATERIAL. TAMP FILL.
5. SWEEP ALL EXCESS MATERIAL FROM TOP OF UNITS AND INSTALL NEXT COURSE. INSURE EACH COURSE IS COMPLETELY FILLED PRIOR TO PROCEEDING TO NEXT COURSE.
6. LAY UP EACH COURSE INSURING THAT PINS PROTRUDE INTO ADJOINING COURSES A MIN. OF ONE INCH. TWO PINS ARE REQUIRED PER UNIT. PULL EACH UNIT FORWARD, AWAY FROM THE EMBANKMENT, AGAINST PINS IN THE PREVIOUS COURSE & BACKFILL AS THE COURSE IS COMPLETED. REPEAT PROCEDURE TO THE EXTENT OF WALL HEIGHT.
7. AS APPROPRIATE WHERE THE WALL CHANGES ELEVATION, UNITS CAN BE TURNED INTO THE EMBANKMENT WITH A CONVEX RETURN END. A MIN. OF 2 UNITS SHALL BE INSTALLED BELOW GRADE AT THESE ENDS. ONLY THE FRONT FACE OF THE UNITS SHALL BE VISIBLE FROM THE SIDE OF THE WALL.

GEOGRID WALL REINFORCEMENT

GENERAL

A. DELIVERY STORAGE AND HANDLING

1. CONTRACTOR SHALL CHECK THE GEOGRID UPON DELIVERY TO ASSURE THAT THE PROPER MATERIAL HAS BEEN RECEIVED.
2. GEOGRIDS SHALL BE ABOVE -20°F.
3. CONTRACTOR SHALL PREVENT EXCESSIVE MUD, WET CEMENT, EPOXY & LIKE MATERIALS WHICH MAY AFFIX THEMSELVES TO THE GRIDWORKS, FROM COMING IN CONTACT WITH THE GEOGRID MATERIAL.
4. STORE ROLLED GEOGRID MATERIAL LAYING FLAT OR STANDING ON END.

MATERIALS

A. DEFINITION & ACCEPTABLE MANUFACTURES

1. GEOGRID PRODUCTS SHALL BE OF HIGH DENSITY POLYETHYLENE OR POLYESTER FIBER SPECIFICALLY FABRICATED FOR USE AS A SOIL REINFORCEMENT MATERIAL.
2. A MANUFACTURER'S PRODUCT SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

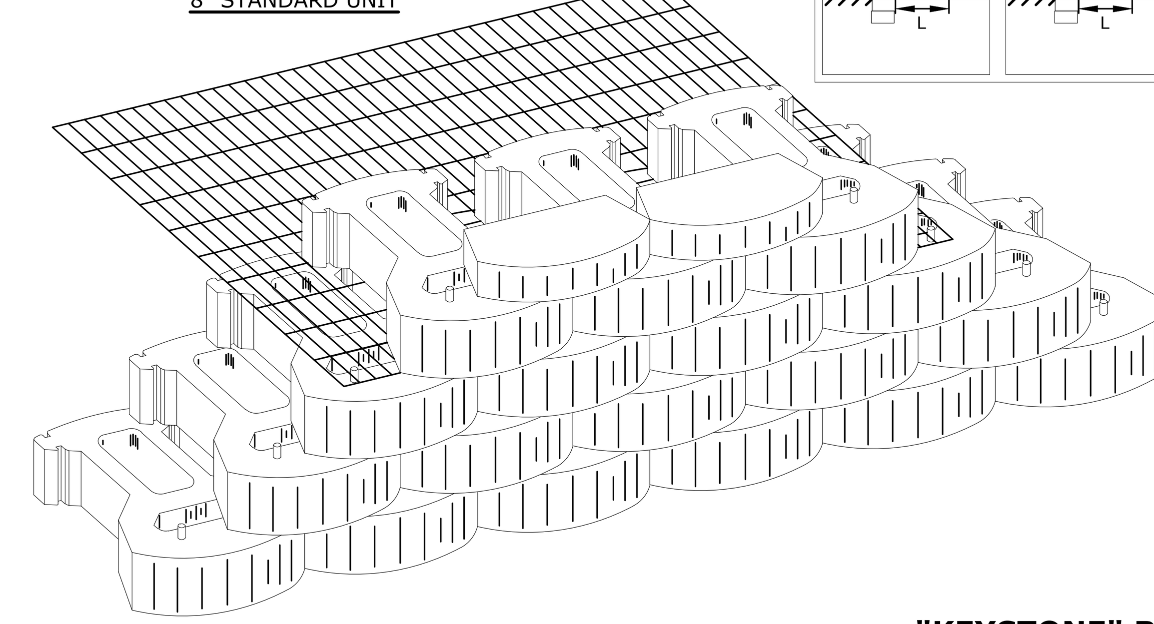
EXECUTION

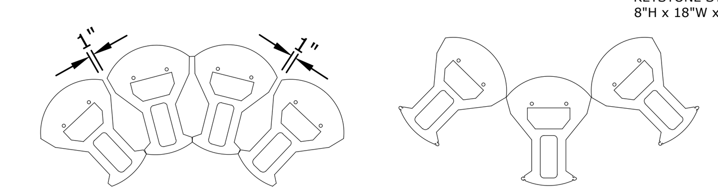
A. GEOGRID INSTALLATION FOR RETAINING WALLS

1. THE GEOGRID SOIL REINFORCEMENT SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL, CONNECTED TO THE CONCRETE WALL & UNITS EMBEDDED A MIN. OF 12" INCHES. HOOK GRID OVER FIBERGLASS, PINS, PULL TAUT, & ANCHOR BEFORE BACKFILLING ON GEOGRID.
2. SLACK IN THE GEOGRID AT THE WALL UNIT CONNECTIONS WILL BE REMOVED IN A MANNER, & TO SUCH A DEGREE, ASA APPROVED BY ENGINEER.
3. GEOGRID SHALL BE LAID AT THE PROPER ELEVATION & ORIENTATION AS SHOWN ON CONSTRUCTION DRAWINGS OR AS DIRECTED BY ENGINEER.
4. CORRECT ORIENTATION (ROLL DIRECTION) OF THE GEOGRID SHALL BE VERIFIED BY THE CONTRACTOR.
5. GEOGRID MAY BE SECURED IN-PLACE WITH STAPLES, PINS, SAND, BAGS, OR BACKFILL, AS REQUIRED BY FILL PROPERTIES, FILL PLACEMENT PROCEDURES, OR WEATHER CONDITIONS, OR AS DIRECTED BY ENGINEER.
6. FOLLOW MANUFACTURES GUIDELINES RELATIVE TO OVERLAP REQUIREMENTS OF UNIAXIAL AND BIAXIAL GEOGRIDS.

B. FILL PLACEMENT

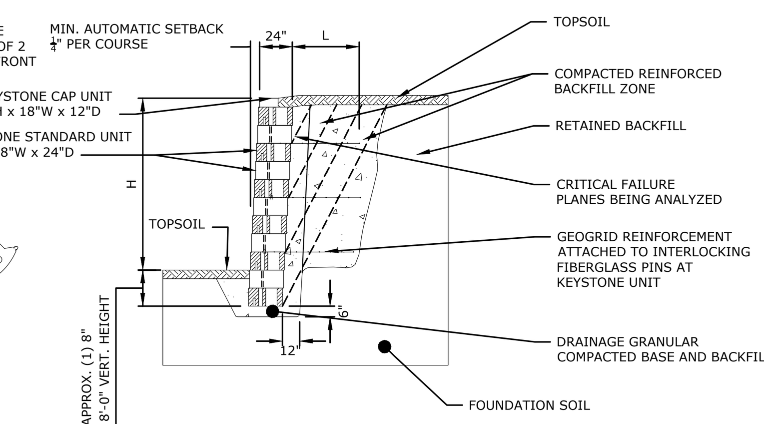
1. WALL FILL MATERIAL SHALL BE PLACED IN 8 INCH LIFTS & COMPACTED TO 95PERCENT OF STANDARD PROCTOR.
2. BACKFILL SHALL BE PLACED, SPREAD, & COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF WRINKLES IN AND/OR MOVEMENT OF THE GEOGRID.
3. ONLY HAND-OPERATED COMPACTION EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET OF THE WALL FACE.
4. BACKFILL SHALL BE PLACED FROM THE WALL OUTWARD, TO INSURE THAT THE GEOGRID REMAINS TAUT.
5. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MIN. BACKFILL THICKNESS OF 6 INCHES IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MIN. TO PREVENT TRACKS DISPLACING THE FILL & DAMAGING THE GEOGRID.





CONVEX CURVES

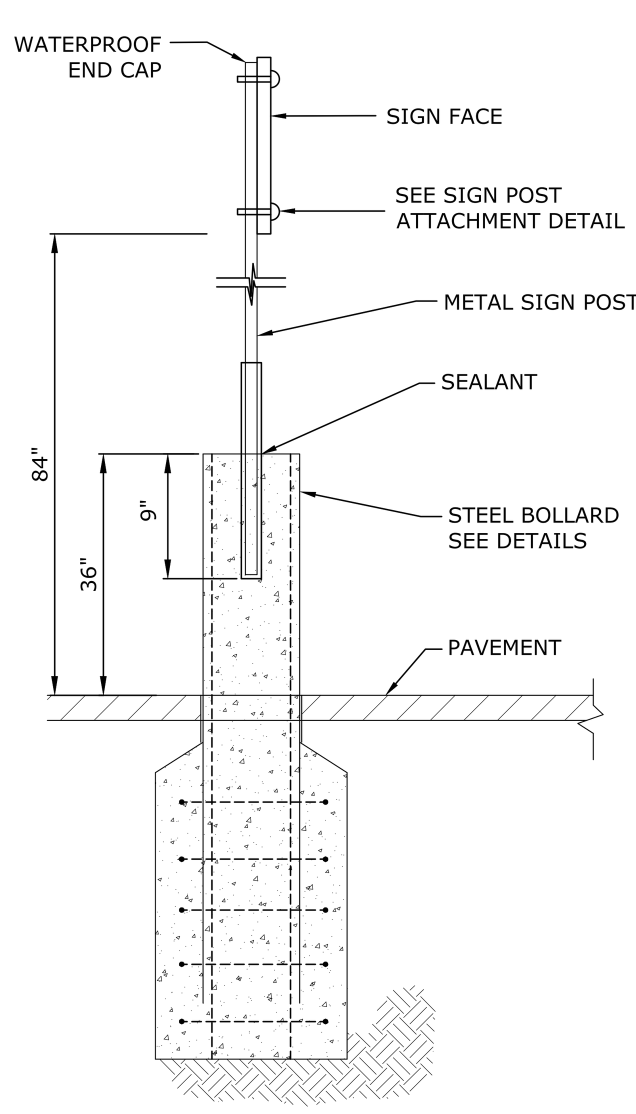
CONCAVE CURVES



TYPICAL WALL SECTION TERMS

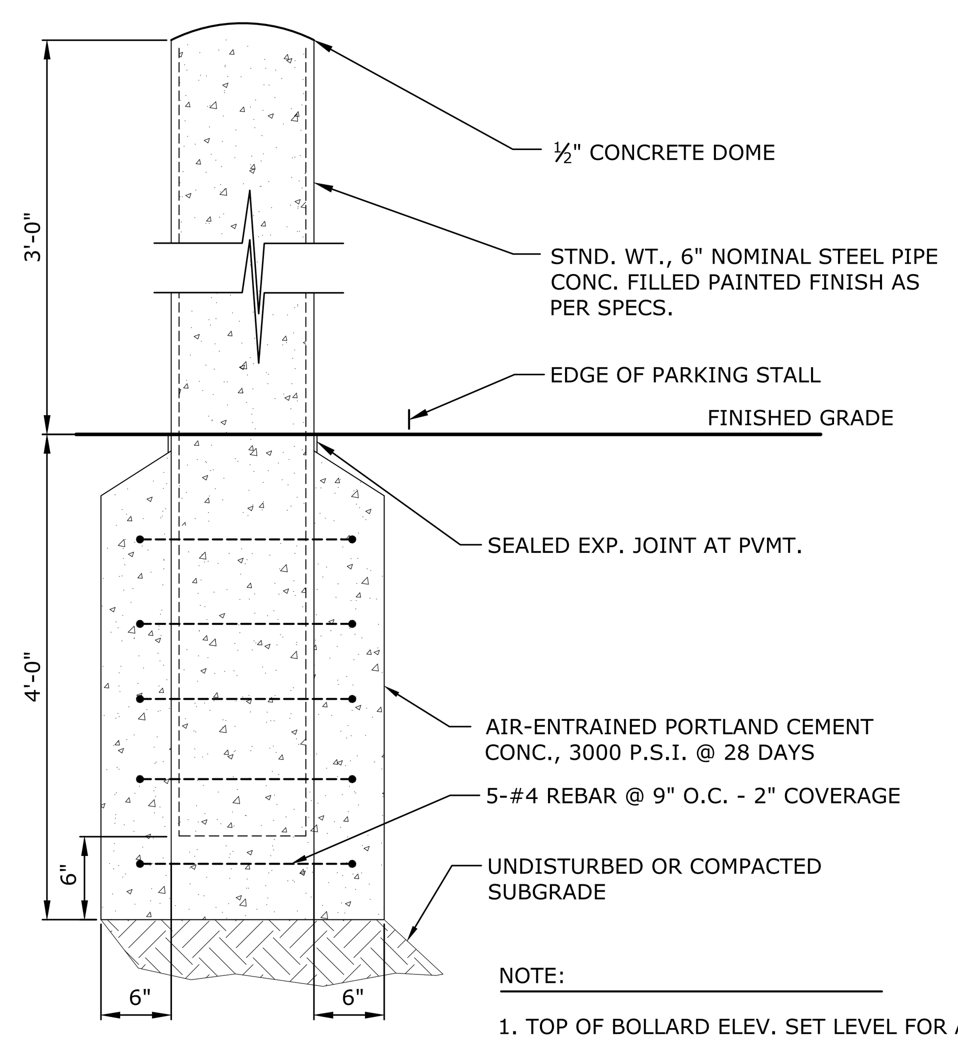
"KEYSTONE" RETAINING WALL DETAIL

NO SCALE



BOLLARD SIGN MOUNTING DETAIL

NO SCALE

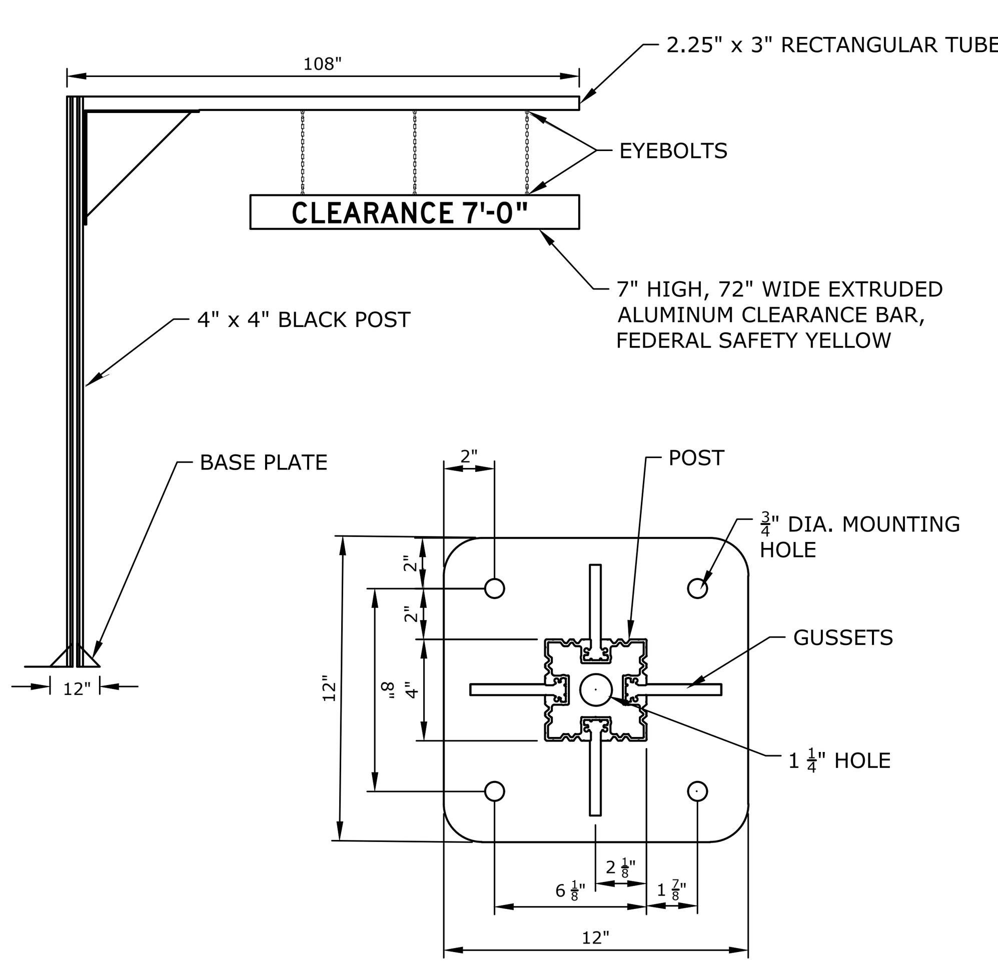


NOTE:

1. TOP OF BOLLARD ELEV. SET LEVEL FOR ALL IN-LINE BOLLARDS.

STEEL BOLLARD DETAIL

NO SCALE



CLEARANCE BAR AND MAST ARM

NO SCALE

Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

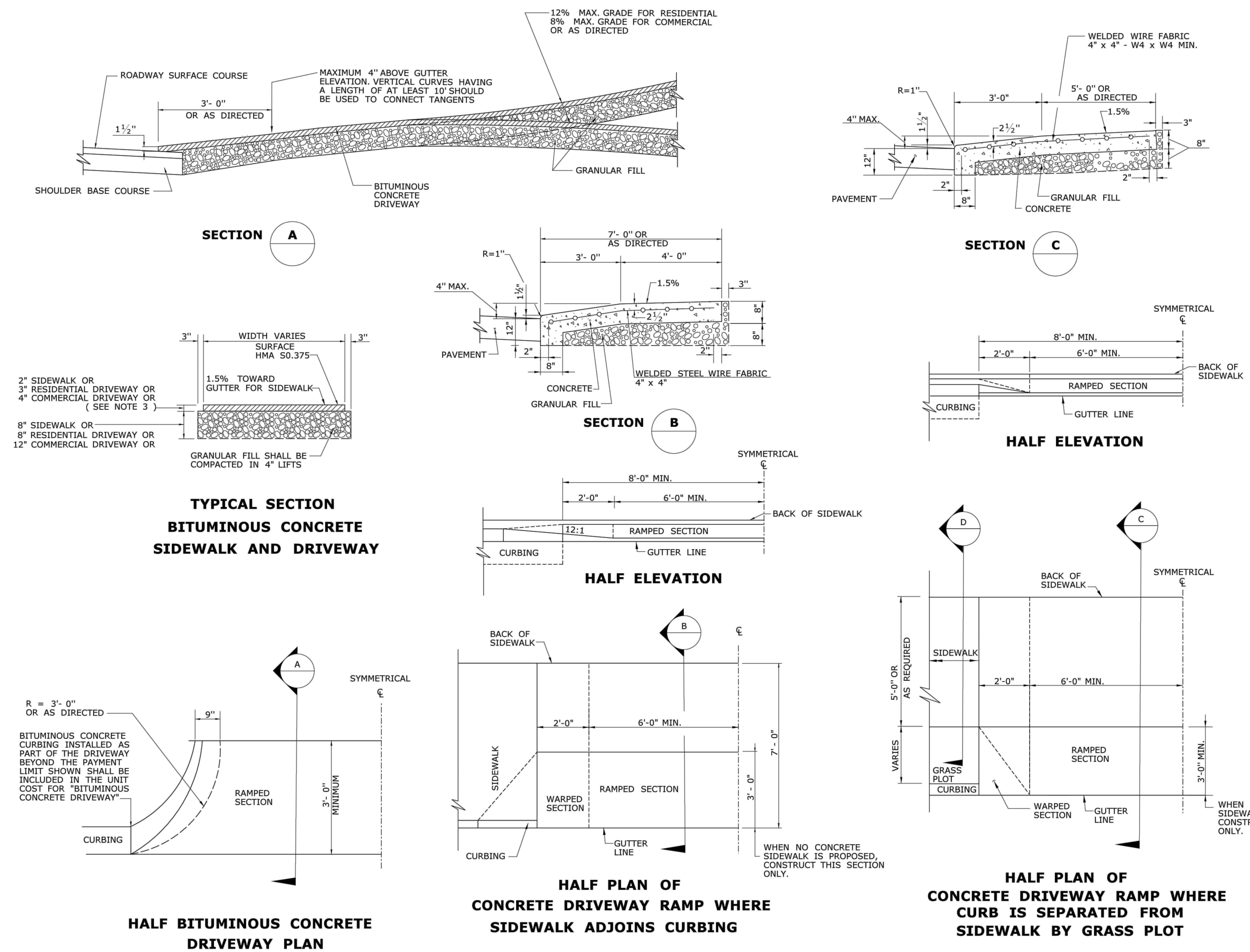
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

SITE DETAILS - 4

SCALE: NO SCALE

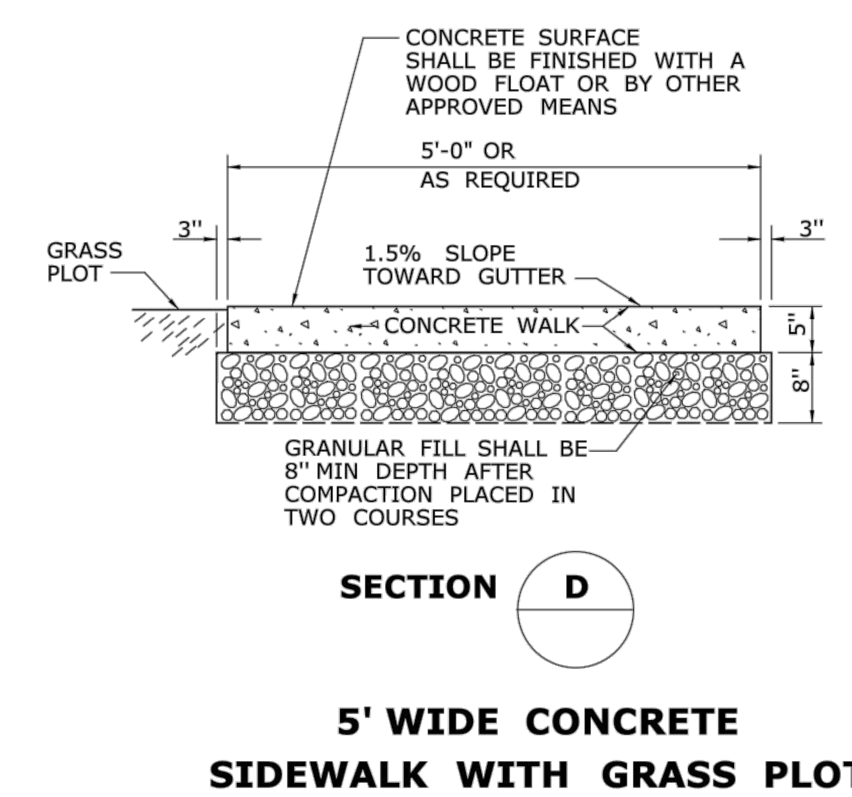
C-903

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg



GENERAL NOTES:

1. DRIVEWAY ENTRANCE SHALL BE A MINIMUM OF 12' WIDE, EXCLUDING CURBING WHEN PRESENT.
2. WELDED WIRE FABRIC MATS WITH REINFORCING AT CLOSER SPACING MAY BE USED.
3. SURFACE HMA S0.375 TO BE PLACED IN TWO EQUAL LIFTS FOR BOTH RESIDENTIAL AND COMMERCIAL DRIVEWAYS.



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PLOTTED DATE: 7/1/2020

Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

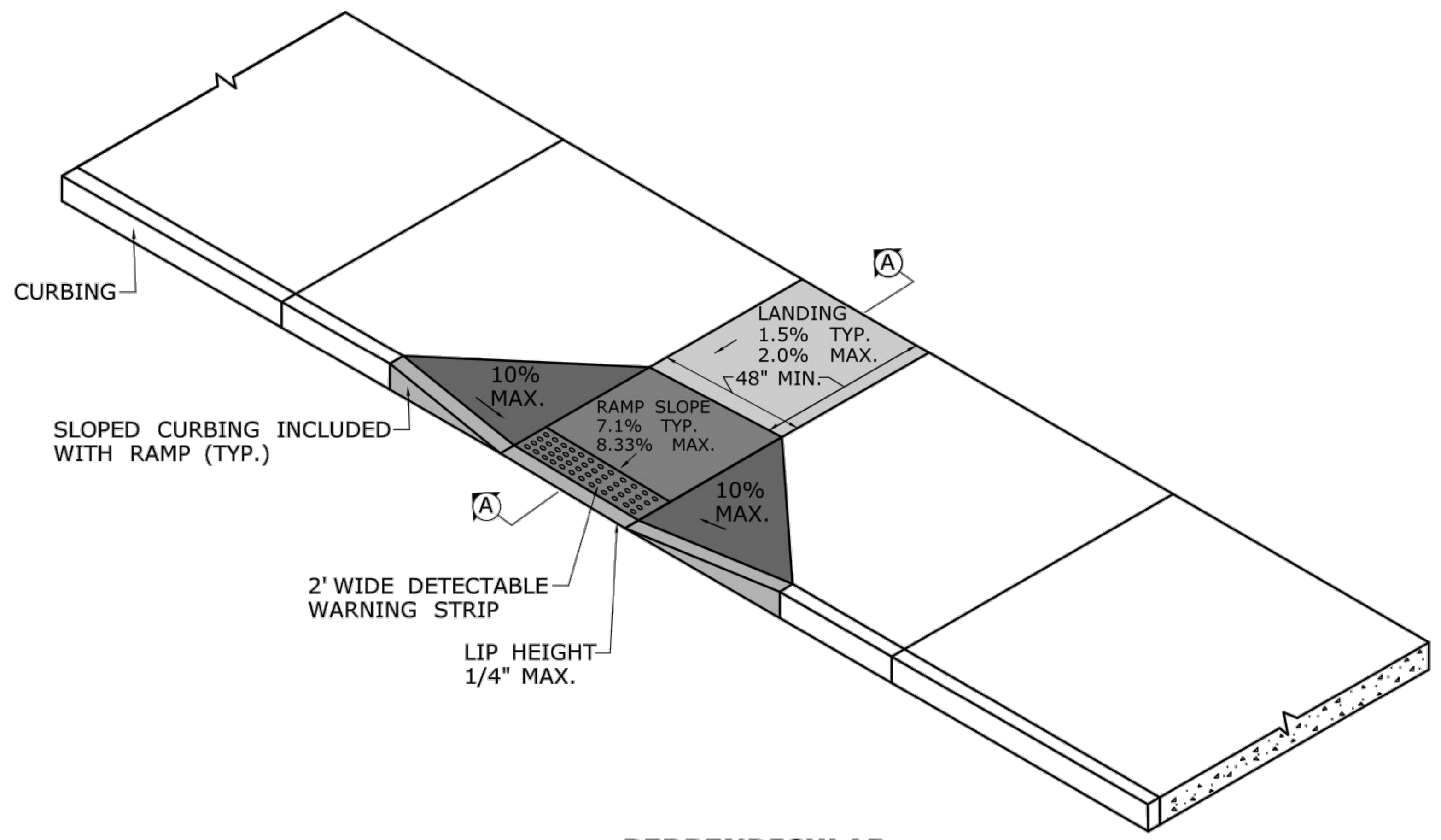
SITE DETAILS - 5

SCALE: NO SCALE

C-904

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg

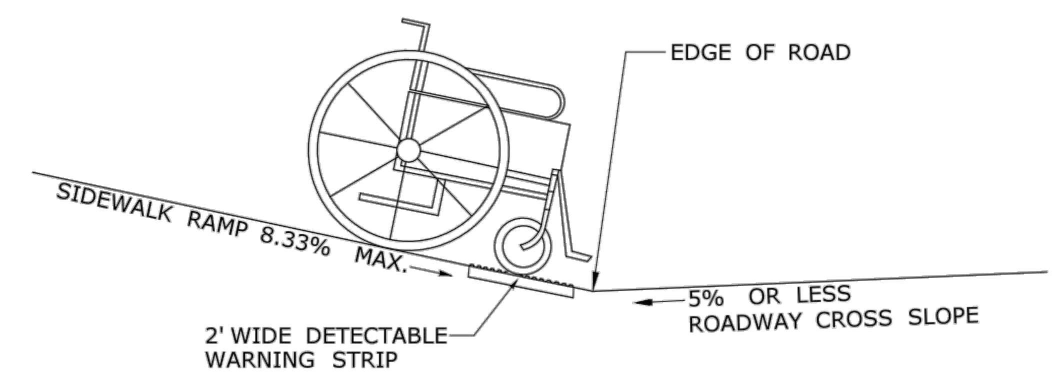
Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100



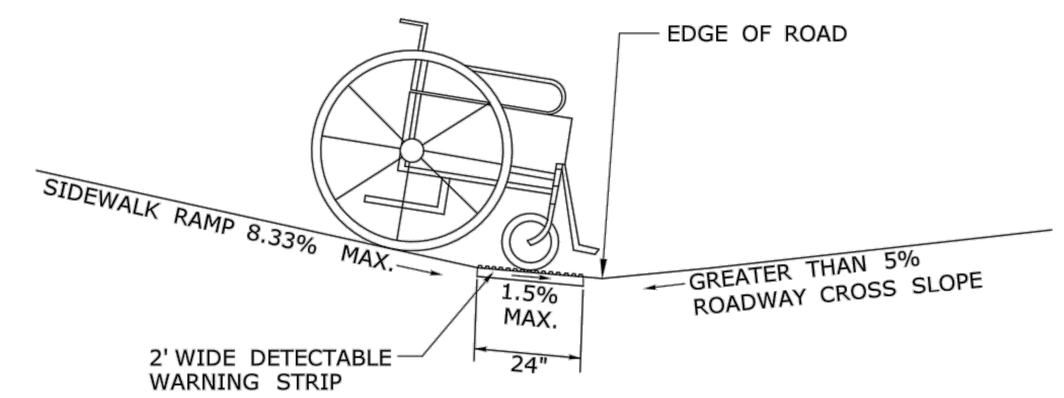
PERPENDICULAR SIDEWALK RAMP

GENERAL NOTES:

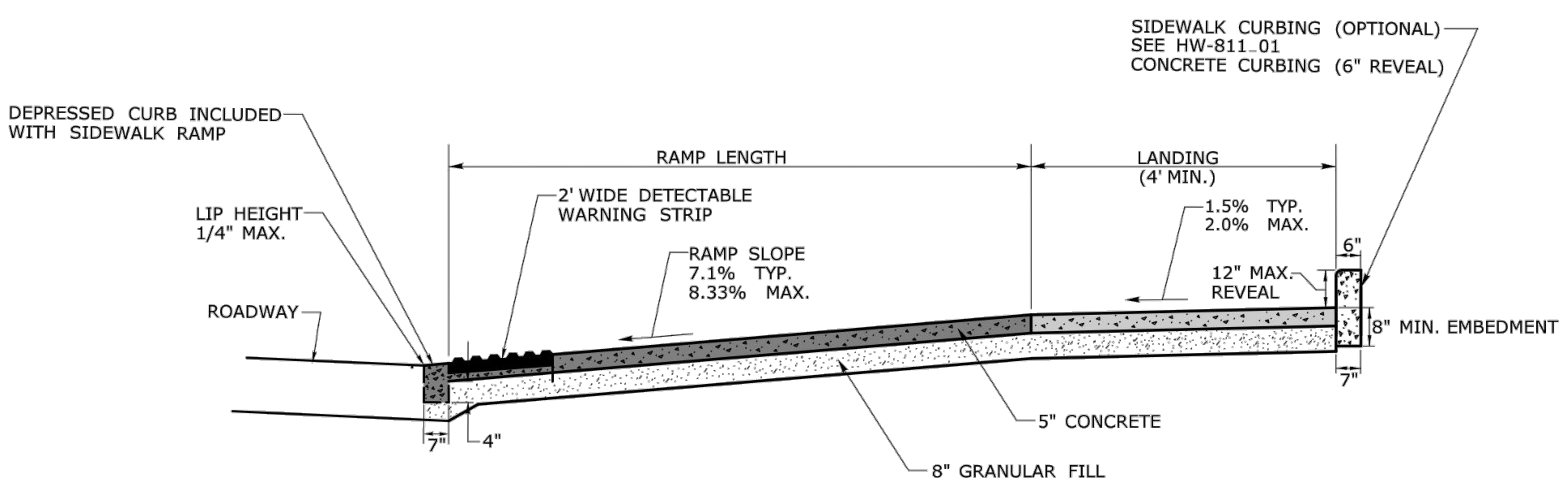
1. SIDEWALK RAMPS SHALL HAVE A COARSE BROOM FINISH TRAVERSE TO THE SLOPE OF THE RAMP.
2. VERTICAL SURFACE DISCONTINUITIES AT JOINTS SHALL NOT EXCEED 1/4 INCH.
3. REMOVAL OF EXISTING SIDEWALK FOR NEW RAMP INSTALLATIONS SHALL BE TO THE NEAREST EXPANSION OR CONTRACTION JOINT.
4. THE RUNNING SLOPE OF THE CURB RAMP SHALL BE 8.3 PERCENT MAXIMUM BUT SHALL NOT REQUIRE THE RAMP LENGTH TO EXCEED 15 FEET.



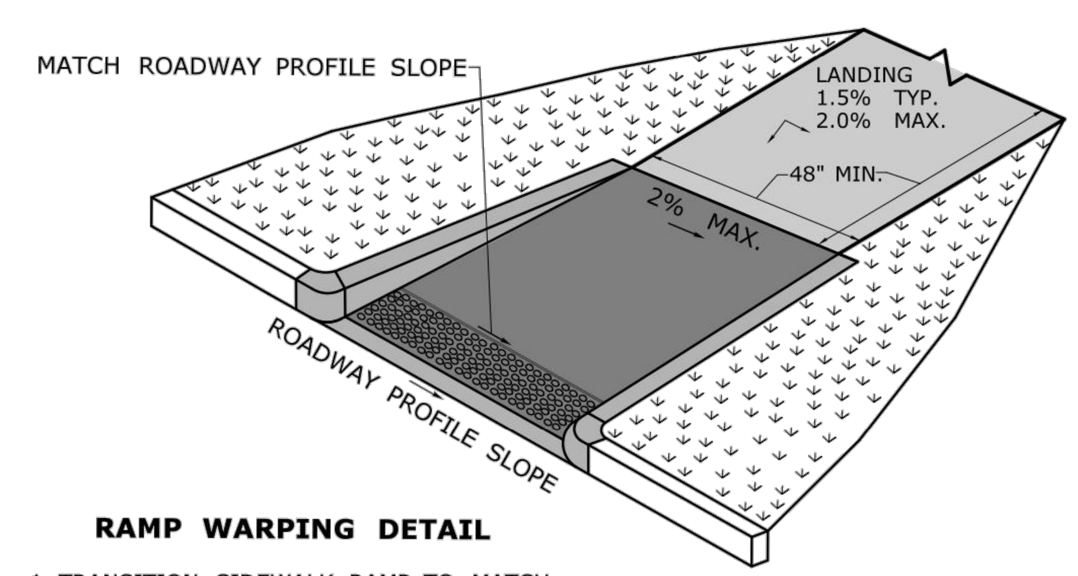
SIDEWALK RAMP GRADE AT ROADWAY CROSS SLOPE OF 5% OR LESS



SIDEWALK RAMP GRADE AT ROADWAY CROSS SLOPE OF GREATER THAN 5%



SECTION AA



RAMP WARPING DETAIL

1. TRANSITION SIDEWALK RAMP TO MATCH ROADWAY PROFILE AS GRADUALLY AS POSSIBLE. DO NOT EXCEED 3 % PER FOOT CROSS SLOPE RATE OF CHANGE WHEN TRANSITIONING TO ROADWAY PROFILE.
2. COMPLETE TRANSITION TO ROADWAY PROFILE BEHIND DETECTABLE WARNING SURFACE.

DESIGN INITIATED CHANGE ORDER NO. Y - mm/dd/yy

REV.	DATE	REVISION DESCRIPTION	SHEET NO.
1.	6/19	REVISED MAX LANDING SLOPE TO 2% AND DRAWING TITLE	

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

Plotted Date: 6/11/2019

DESIGNER/DRAFTER: -
CHECKED BY: -

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\CTDOT_HIGHWAY.GD [5-30-19].dgn

SIGNATURE/BLOCK:
OFFICE OF ENGINEERING
APPROVED BY:

PROJECT TITLE: - - -

TOWN: - -

DRAWING TITLE: **CONCRETE SIDEWALK RAMPS SHEET 1**

PROJECT NO. -
DRAWING NO.
SHEET NO.

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

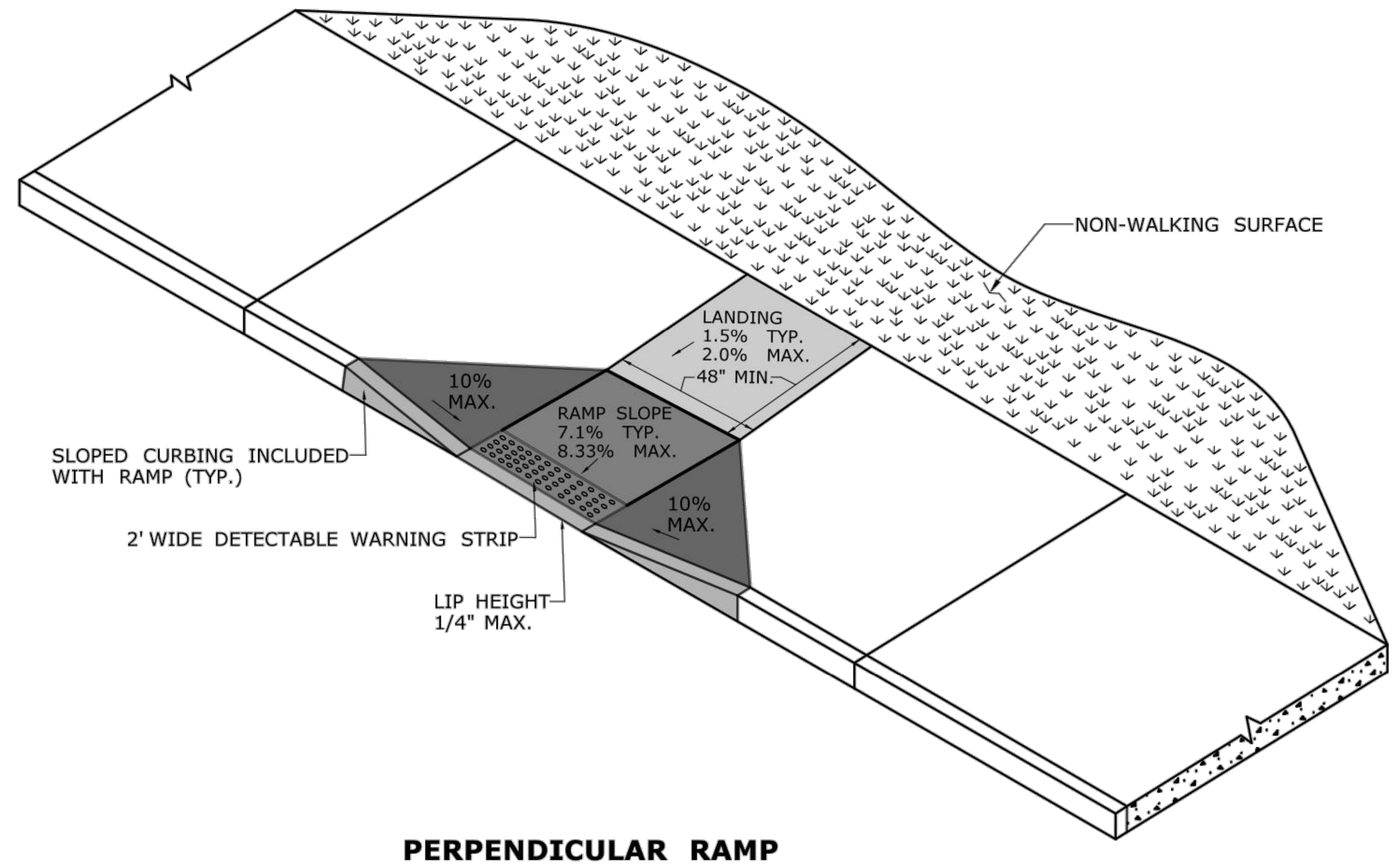
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

SITE DETAILS - 6

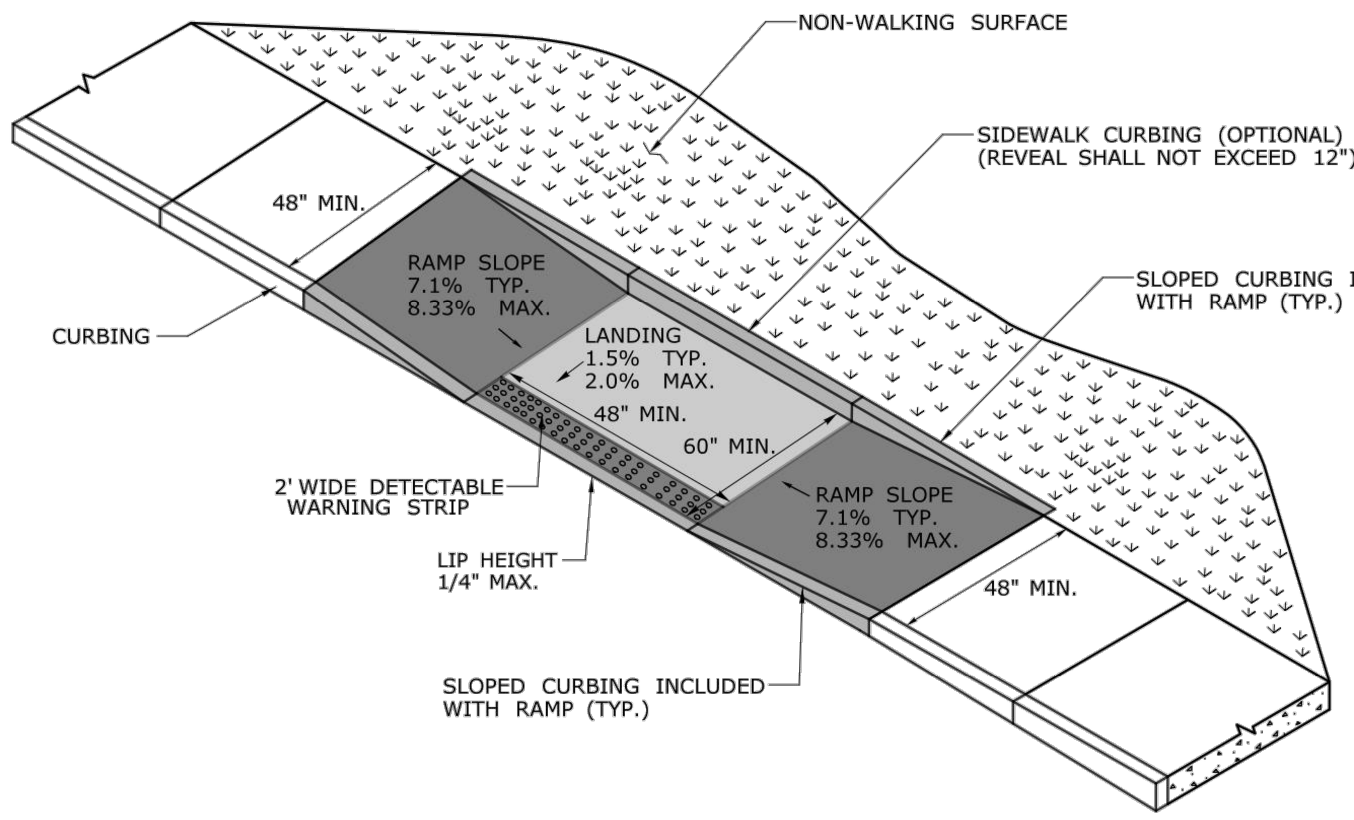
SCALE: NO SCALE

C-905

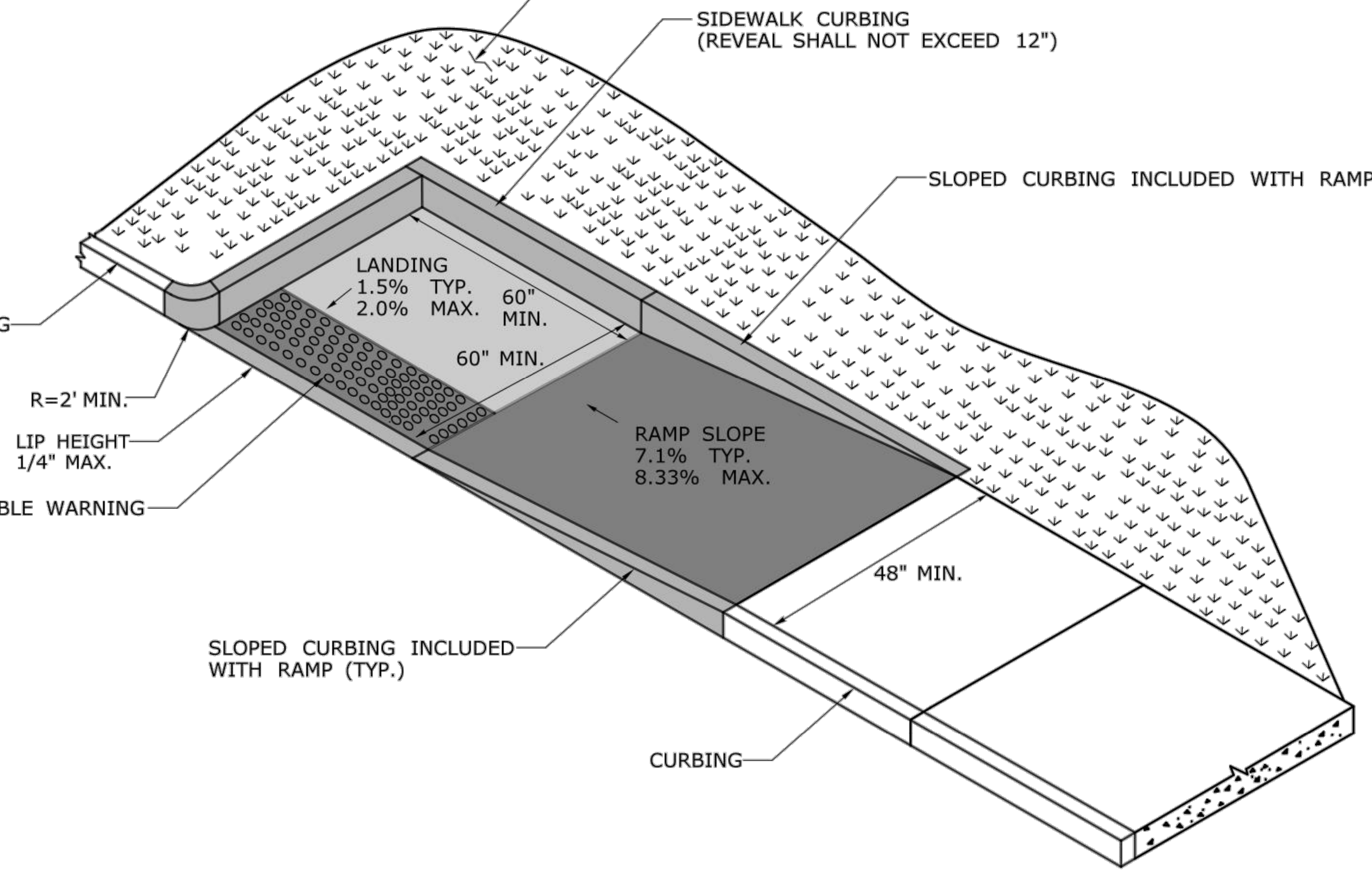
Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg



**PERPENDICULAR RAMP
WITH 48" BY-PASS
(TYPE 8)**



**PARALLEL RAMP WITHOUT
NON-WALKING SURFACE
(TYPE 9)**



**PARALLEL RAMP
WITH LANDING AT BOTTOM ON CORNER
(TYPE 10)**

DESIGN INITIATED CHANGE ORDER NO. Y - mm/dd/yy

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Plotted Date: 1/30/2019

DESIGNER/DRAFTER: -
CHECKED BY: -

**STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION**

Filename: ...\CTDOT_HIGHWAY_GD_[1-28-19].dgn

SIGNATURE/
BLOCK:
OFFICE OF ENGINEERING
APPROVED BY:

PROJECT TITLE:
-
-
-

TOWN:
-
-

DRAWING TITLE:
**CONCRETE SIDEWALK
RAMPS SHEET 4**

PROJECT NO. -
DRAWING NO.
SHEET NO.

Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100

STATE OF CONNECTICUT JOHN W. BLOCK 00425 LICENSED PROFESSIONAL ENGINEER
5/24/22

STATE OF CONNECTICUT JOSEPH CANAS 20873 LICENSED PROFESSIONAL ENGINEER
05/23/2022

**TOWN
SUBMISSION
DRAWINGS**

ASML

Campus Traffic
Flow Safety
Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
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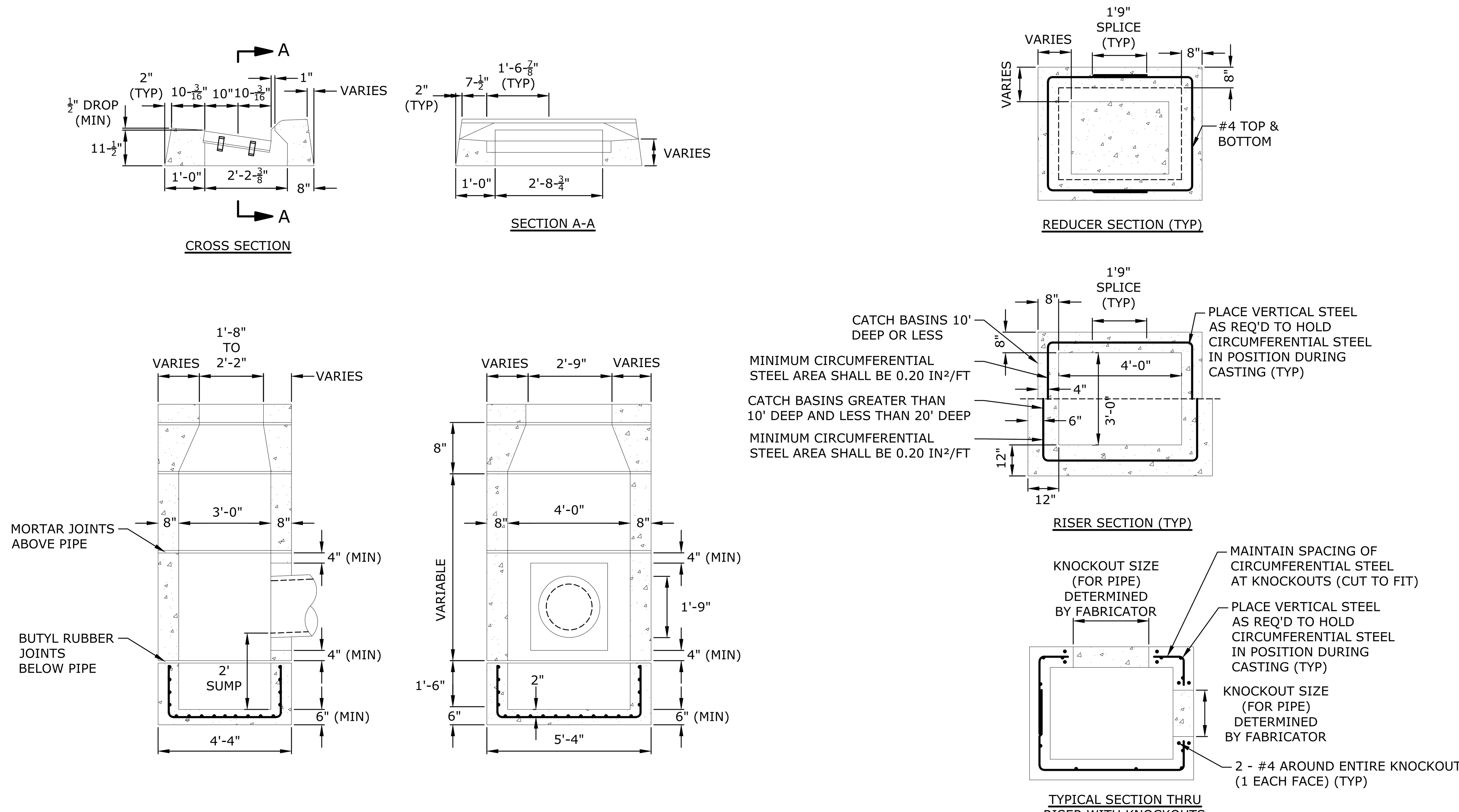
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

SITE DETAILS - 7

SCALE: NO SCALE

C-906

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg



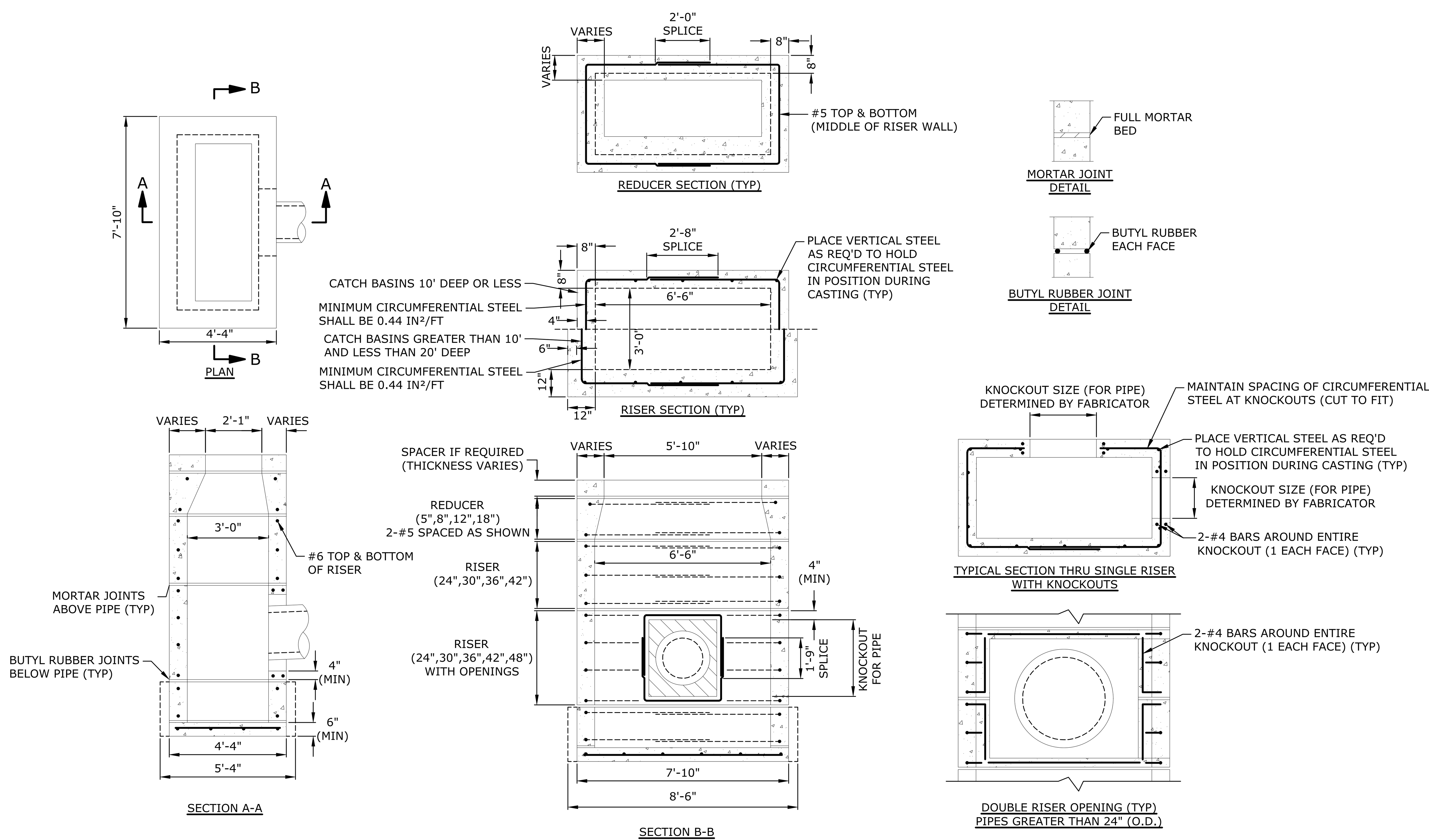
CONNECTICUT DEPARTMENT OF TRANSPORTATION

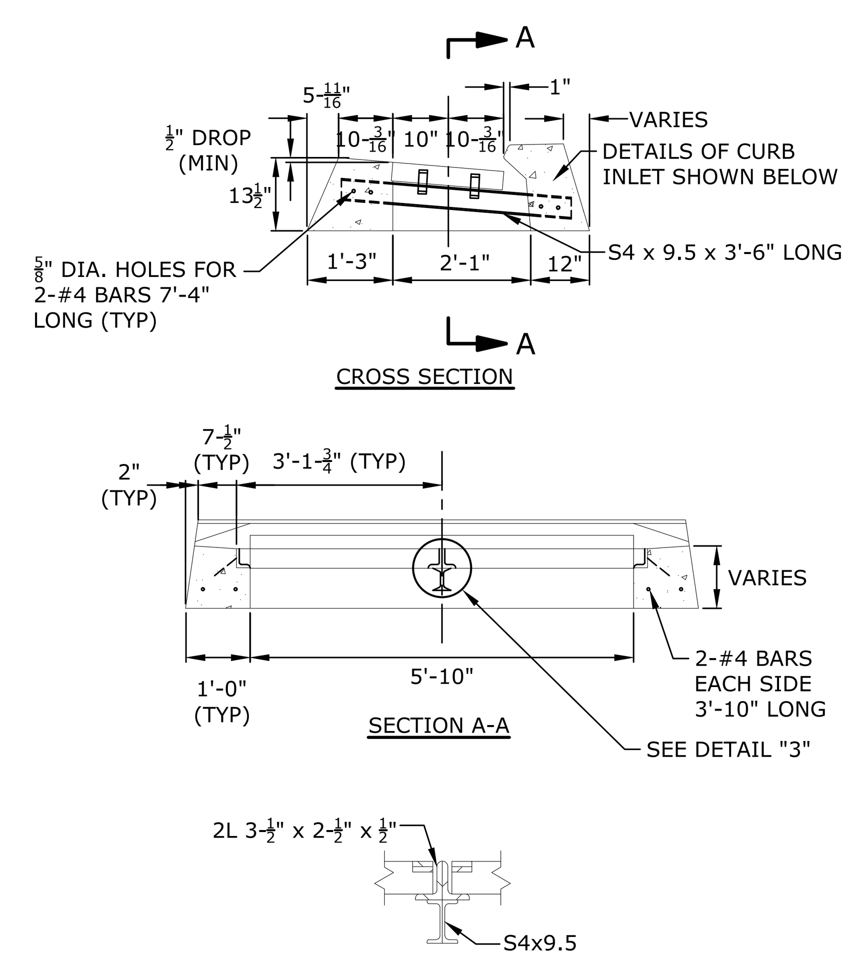
TYPE "C" CATCH BASIN

NO SCALE

NOTES:

1. REINFORCEMENT SHALL CONFORM TO ASTM A615, GRADE 60.
2. DETAILS ON THIS SHEET SHOW STANDARD REINFORCEMENT. WELDED WIRE FABRIC WITH AN AREA EQUAL TO OR GREATER THAN THE REINFORCING SHOWN MAY BE SUBSTITUTED.
3. ALL LAP SPLICES, DEVELOPMENT LENGTHS, BENDS FOR REINFORCEMENT, AND WELDED WIRE FABRIC SHALL CONFORM TO AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.
4. ALL REINFORCEMENT SHALL HAVE A MINIMUM CLEAR COVER OF 2", EXCEPT FOR BENEATH BOTTOM REINFORCEMENT IN TOP SLABS, WHERE THE MINIMUM MAY BE 1½"
5. MINIMUM CONCRETE COMPRESSIVE STRENGTH FC'=4,000PSI SHALL BE OBTAINED BEFORE SHIPPING.
6. BASES AND RISERS AT A DEPTH OF 20' AND GREATER SHALL BE DESIGNED BY THE CONTRACTOR AND WORKING DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
7. SEE STANDARD DRAWING 507-K FOR CATCH BASIN FRAMES AND GRATES.
8. FOR DOT MAINTENANCE PERSONNEL, RISERS MAY BE PREFABRICATED WITH PIPE OPENINGS IN ALL FOUR WALLS. ADEQUATE REINFORCING AROUND PIPE OPENINGS TO CONFORMING TO THESE PLANS SHALL BE PROVIDED. ANY RISERS USED WHERE A PIPE OPENING IS TO REMAIN IN PLACE MUST BE FORMED UP WITH BRICK AS DIRECTED BY THE ENGINEER.
9. RISERS SHALL NEVER HAVE CORNER PIPE ENTRIES. WHERE THE ALIGNMENT OF THE PIPE WITH RESPECT TO THE CORNER OF THE CATCH BASIN CANNOT BE CHANGED, A ROUND STRUCTURE CONFORMING TO ASTM C478 SHALL BE USED. REINFORCING FOR THE ROUND TOP SLAB WITH A RECTANGULAR OPENING SHALL CONFORM TO DETAILS SHOWN HERE.
10. ALL PIPE OPENINGS SHALL BE CLOSED USING MATERIALS WHICH CONFORM TO STATE OF CONNECTICUT STANDARD SPECIFICATIONS SECTION M.08.02. IF THE ENGINEER DETERMINES THAT THE CLOSURE OF ANY PIPE OPENING IS UNSATISFACTORY, THE CONTRACTOR SHALL RECLOSE SAID OPENING AT NO ADDITIONAL COST TO THE STATE. KNOCKOUTS FOR PIPE OPENINGS SHALL NOT RESULT IN A REDUCED WALL THICKNESS.
11. THE LATEST STATE OF CONNECTICUT STANDARD SPECIFICATIONS AND SUPPLEMENTALS SHALL GOVERN.
12. FOR ADDITIONAL DETAILS, SEE OTHER CATCH BASIN SHEETS.
13. WALL THICKNESS OF ALL CB'S OVER 10' DEEP SHALL BE INCREASED TO 12" THICK. INSIDE DIMENSION SHALL REMAIN THE SAME. (THE 12" THICKNESS SHALL START AFTER THE FIRST 10")
14. BUTYL RUBBER JOINT SEAL SHALL CONFORM TO AASHTO M-198 AND MORTAR SHALL CONFORM TO THE LATEST STATE OF CONNECTICUT STANDARD SPECIFICATIONS MATERIAL SECTION M11.04.
15. SHRINKAGE AND TEMPERATURE REINFORCEMENT SHALL BE PROVIDED IN THE TOPS OF SLABS. THE TOTAL AREA OF REINFORCEMENT PROVIDED SHALL BE AT LEAST 0.125 IN²/FT IN EACH DIRECTION. THE MAXIMUM SPACING OF THIS REINFORCEMENT SHALL NOT EXCEED 18 INCHES.
16. THE DETAILS SHOWN IN THE PLAN VIEW FOR THE PRECAST CONCRETE ROUND STRUCTURES SHALL ALSO BE USED FOR CONVERTING MANHOLES TO CATCH BASINS.





CONNECTICUT DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE TYPE "C" DOUBLE GRATE TYPE ii CATCH BASIN

NO SCALE

Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

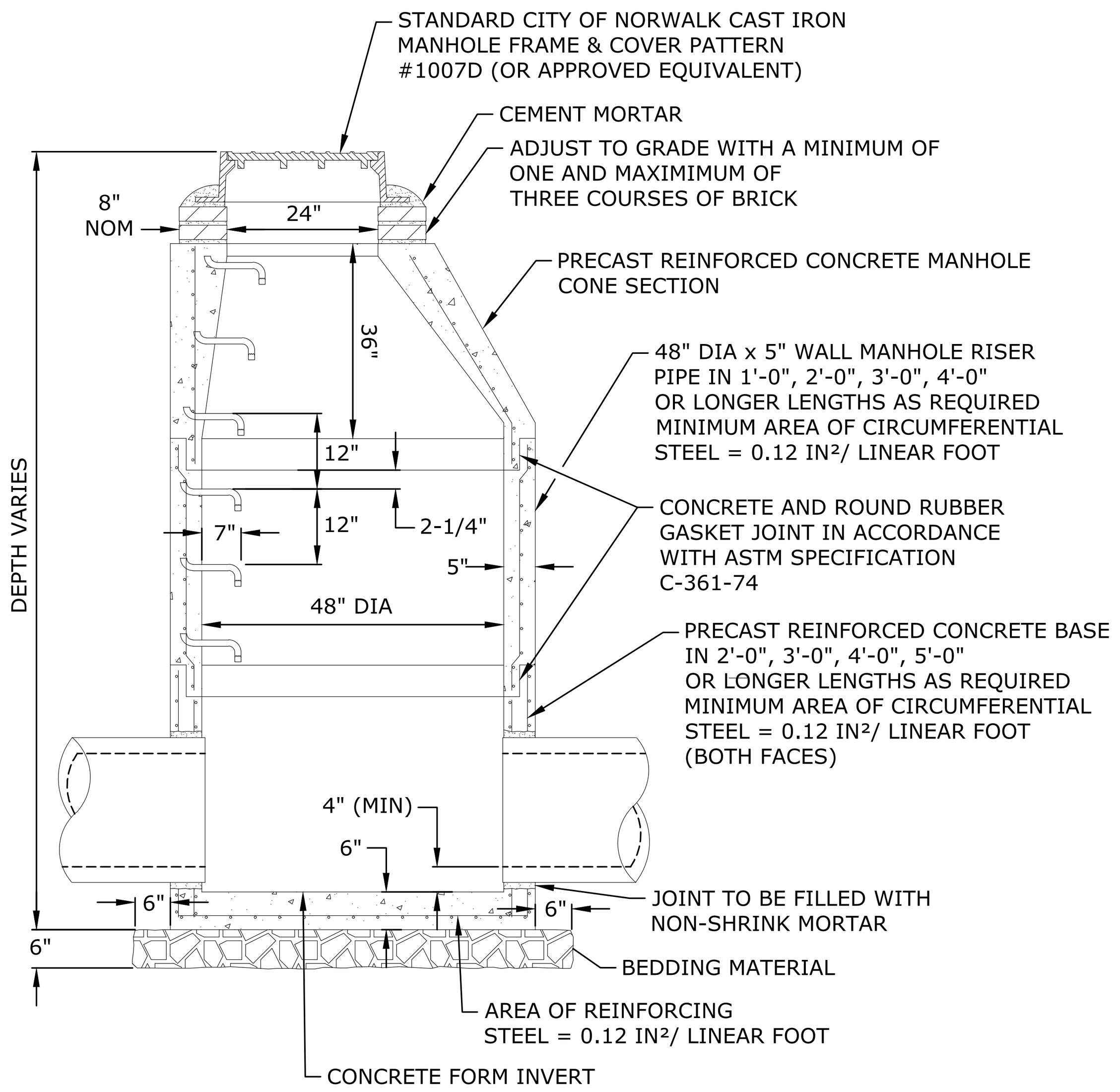
PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRAINAGE DETAILS - 1

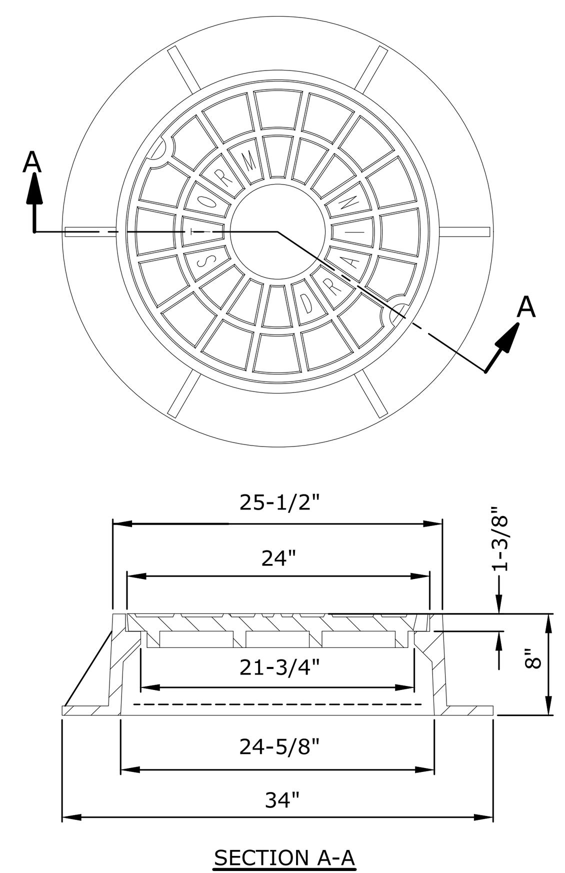
SCALE: NO SCALE

C-910

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:52pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg



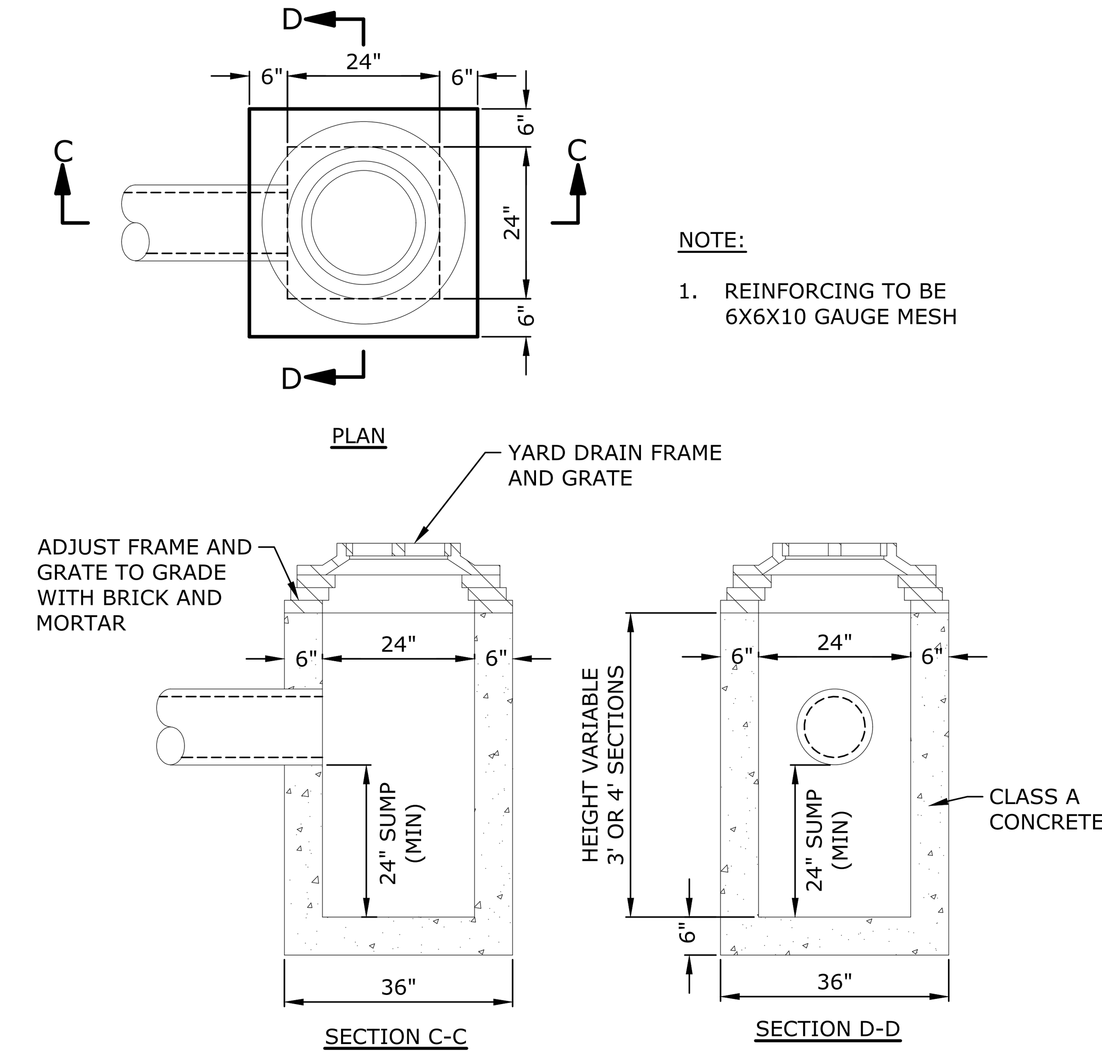
STANDARD MANHOLE DETAIL
NO SCALE



NOTE:

MANHOLE FRAMES & COVERS SHALL BE PATTERN #1007D AS MANUFACTURED BY THE CAMPBELL FOUNDRY COMPANY OF NORTH HAVEN, CONNECTICUT, OR APPROVED EQUAL.

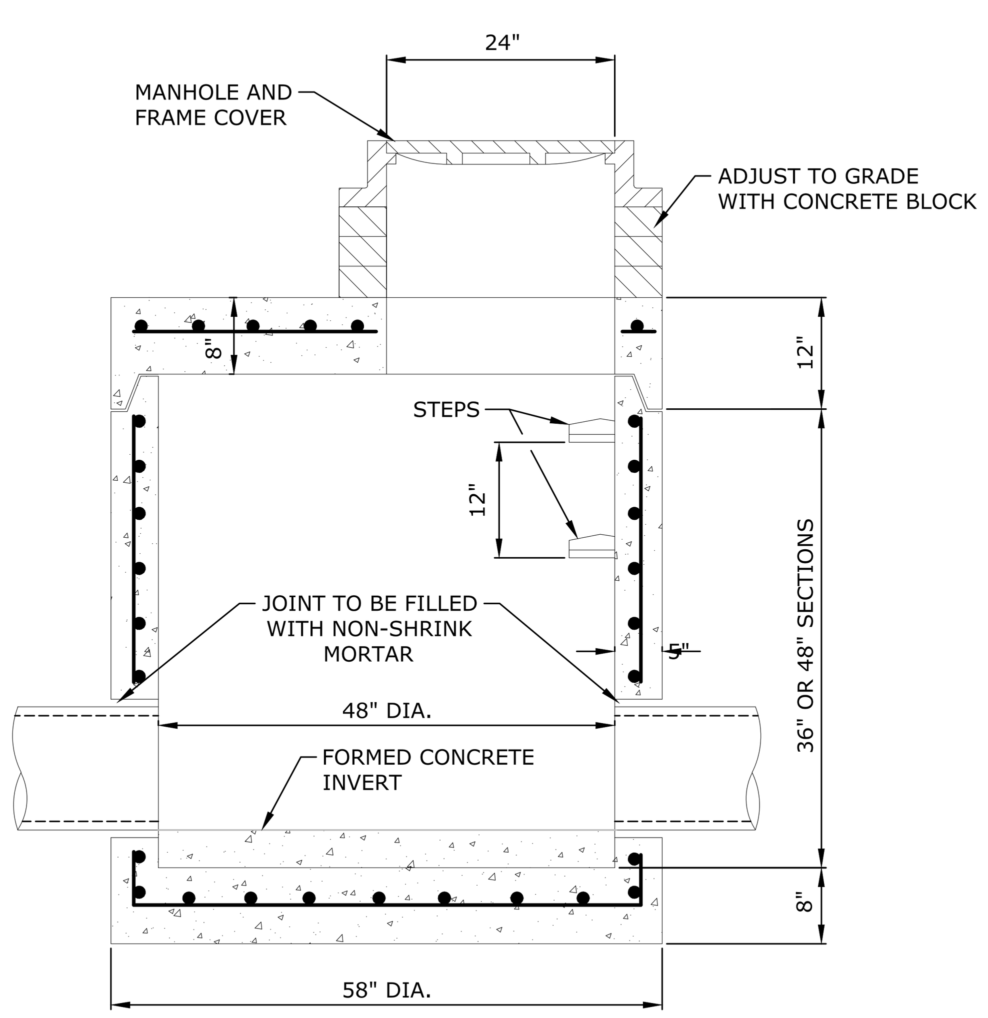
MANHOLE FRAME AND COVER
NO SCALE



NOTE:

1. REINFORCING TO BE 6X6X10 GAUGE MESH

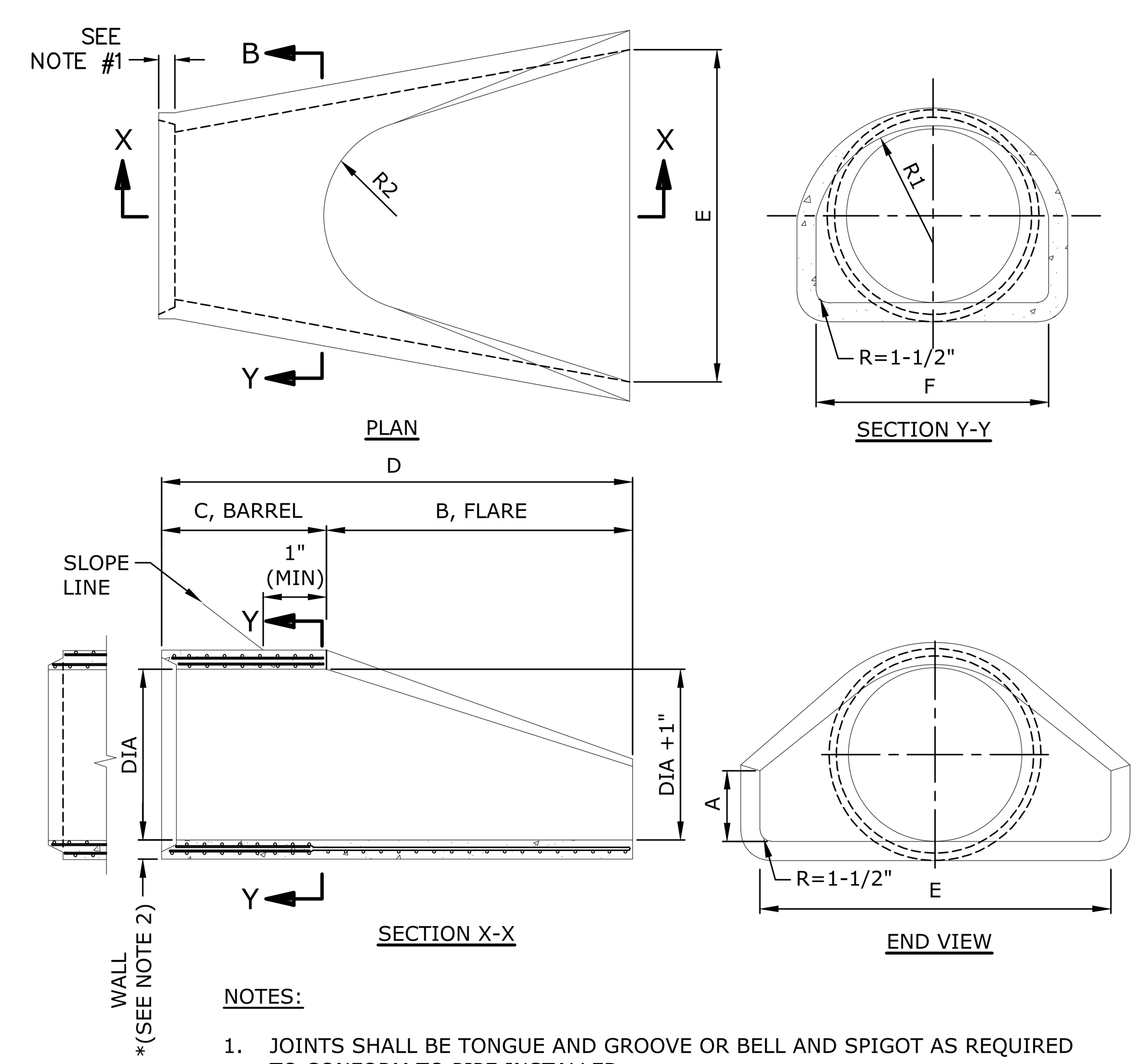
YARD DRAIN
NO SCALE



NOTES:

1. JOINT SEALANT SHALL BE PREFORMED BUTYL RUBBER MASTIC TYPE SEAL COMPLYING WITH AASHTO SPECIFICATION M198.
2. REINFORCING 0.12 IN²/VERTICAL FOOT PER ASTM A185.
3. CONCRETE COMPRESSIVE STRENGTH: 5,000 PSI, 28 DAYS
4. BASE SECTION IS MONOLITHIC.

SHALLOW MANHOLE
NO SCALE

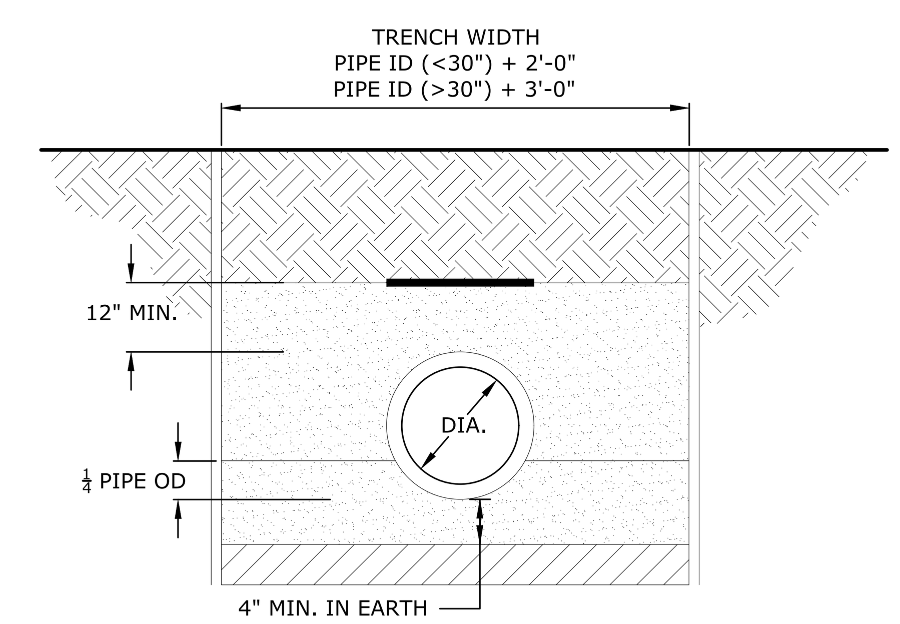


NOTES:

1. JOINTS SHALL BE TONGUE AND GROOVE OR BELL AND SPIGOT AS REQUIRED TO CONFORM TO PIPE INSTALLED.
2. WALL THICKNESS SHALL CONFORM TO PIPE THICKNESS.

DIMENSIONS FOR REINFORCED CONCRETE CULVERT END									FLARE REINFORCEMENT ONE LAYER ONLY IN CENTER OF WALL	
DIA.	A	B	C	D	E	F	R_1	R_2	MIN. AREA OF LONGITUDINALS SQ. IN PER FT.	MIN. AREA OF TRANSVERSE STEEL SQ. IN PER FT.
12"	4"	2'-0"	4'-0 3/8"	6'-0 3/8"	2'-0"	1'-7 15/16"	10 1/4"	9"	0.048	0.048
15"	6"	2'-3"	3'-10"	6'-1"	2'-6"	2'-0 5/16"	1'-0 1/2"	11"	0.054	0.054
18"	9"	2'-3"	3'-10"	6'-1"	3'-0"	2'-5"	1'-3 1/2"	1'-0"	0.060	0.060
21"	9"	2'-11"	3'-2"	6'-1"	3'-6"	2'-7 1/2"	1'-4"	1'-1"	0.066	0.066
24"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	2'-9 3/16"	1'-4 3/16"	1'-2"	0.072	0.072
30"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3'-1"	1'-6 1/2"	1'-3"	0.084	0.084
36"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	3'-11 13/16"	2'-0 5/16"	1'-8"	0.096	0.096
42"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	4'-5 7/8"	2'-3 1/2"	1'-10"	0.108	0.108
48"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	4'-8 1/2"	2'-4 1/2"	1'-10"	0.120	0.120
54"	2'-3"	5'-5"	2'-11"	8'-4"	7'-6"	5'-5 1/2"	2-9 1/8"	2'-0"	0.132	0.132
60"	2'-9"	5'-0"	3'-3"	8'-3"	8'-0"	6'-0 1/2"	3'-0 11/16"	2'-0"	0.144	0.144

REINFORCED CONCRETE CULVERT END
NO SCALE



CIRCULAR R.C.P. TRENCH BEDDING
NO SCALE

Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100

STATE OF CONNECTICUT JOHN M. BLOCK 00425 LICENSED PROFESSIONAL ENGINEER
5/24/22

STATE OF CONNECTICUT JOSEPH CANAS 20873 LICENSED PROFESSIONAL ENGINEER
05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

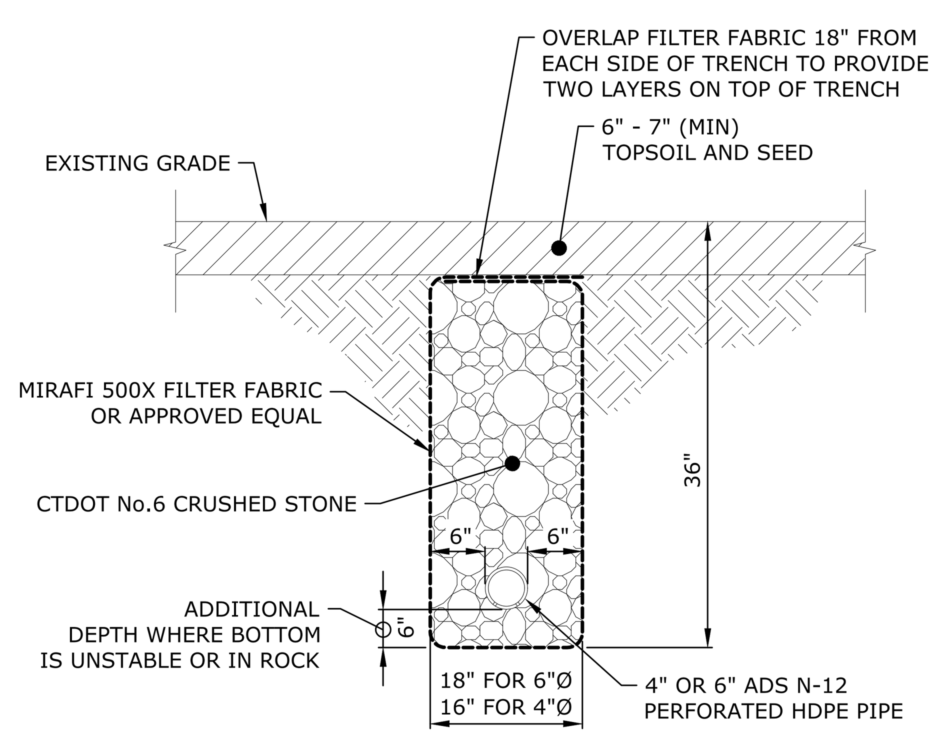
MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

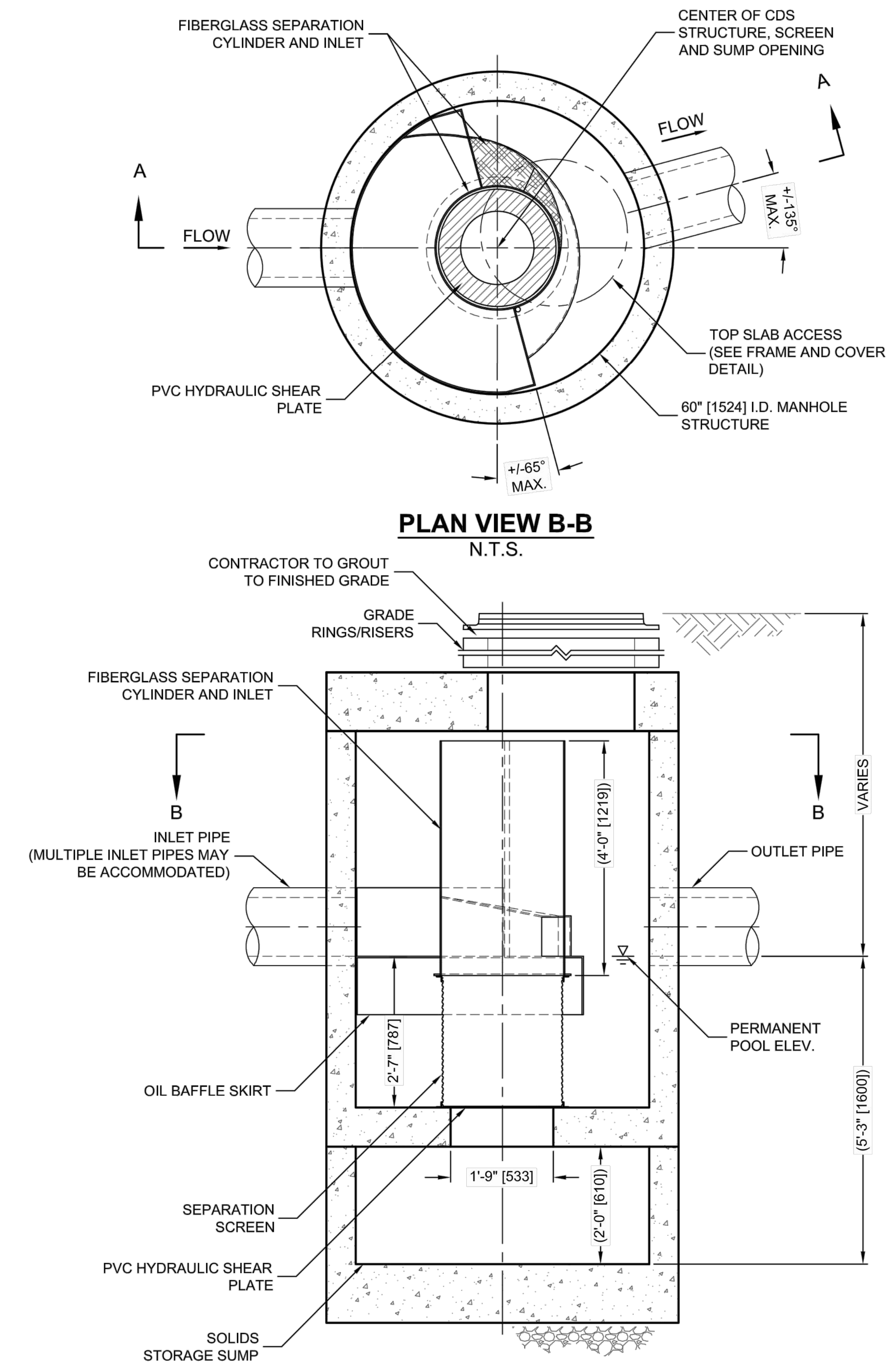
DRAINAGE DETAILS - 2

SCALE: NO SCALE

C-911



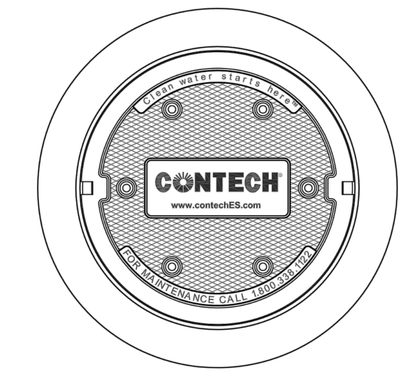
UNDERDRAIN DETAIL
36 INCH TOTAL DEPTH
NO SCALE



CDS2020-5-C DESIGN NOTES

THE STANDARD CDS2020-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			

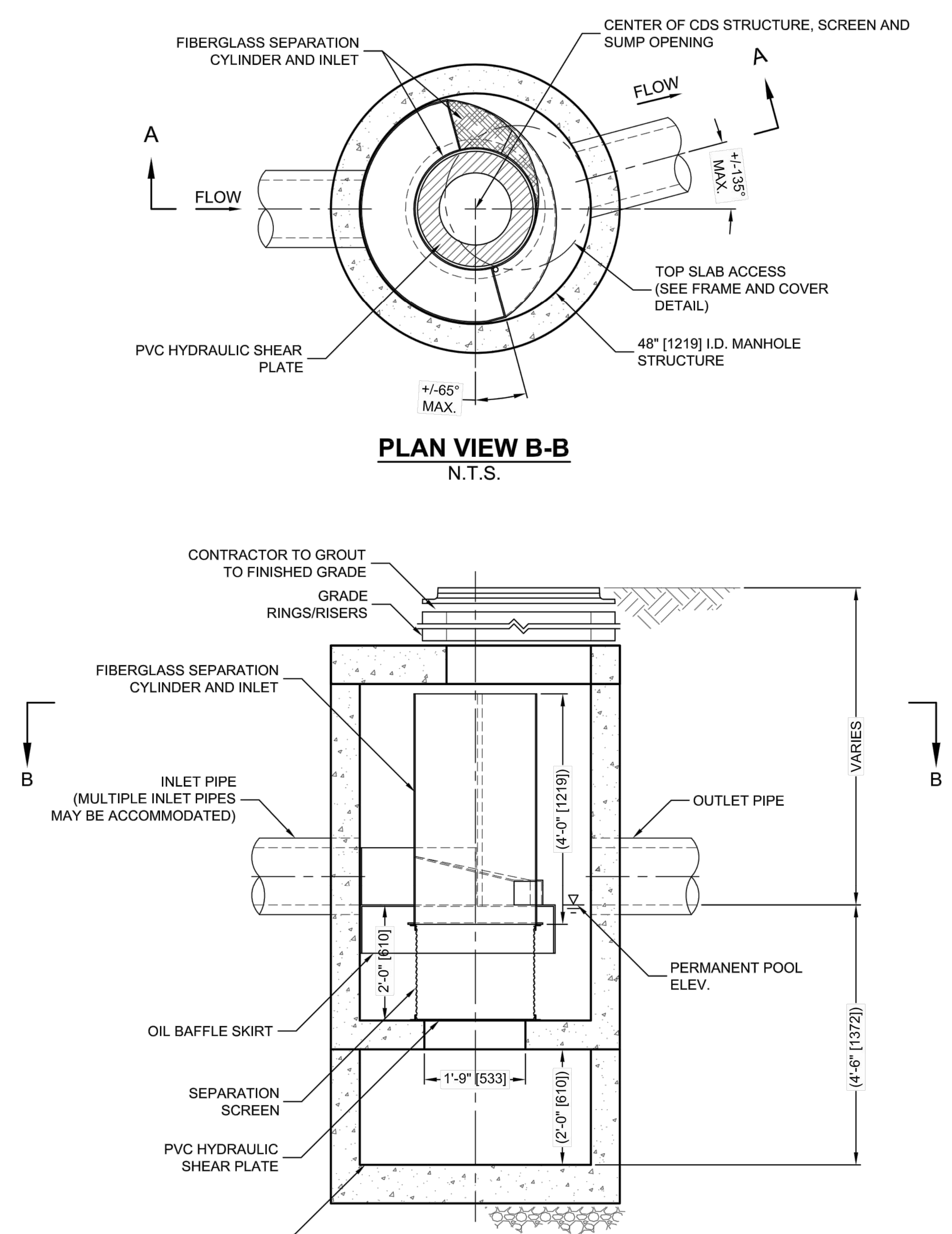
* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH® ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

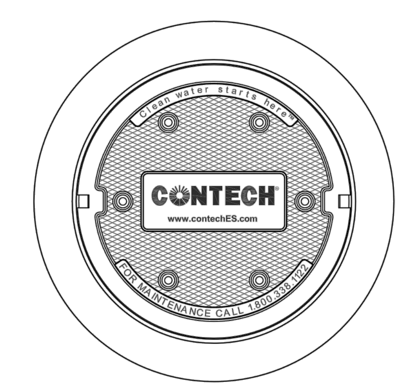
CDS2020-5-C
INLINE CDS
STANDARD DETAIL



CDS2015-4-C DESIGN NOTES

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2015-4-C
INLINE CDS
STANDARD DETAIL

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1000 Bridgeport Avenue
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05/23/2022

TOWN SUBMISSION DRAWINGS

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DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRAINAGE DETAILS - 3

SCALE: NO SCALE

C-912

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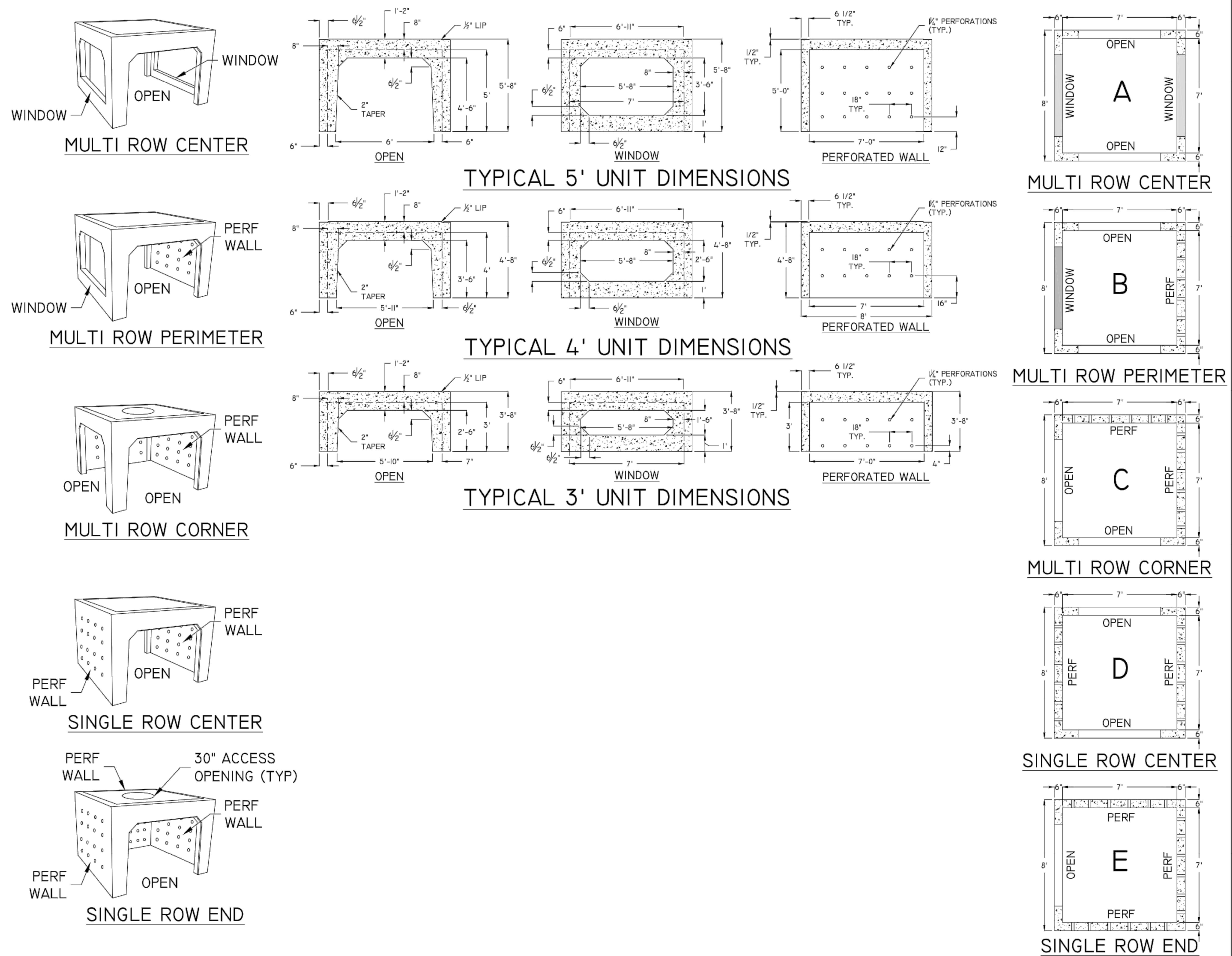
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg



ASTM SPECIFICATIONS:

1. CONCRETE - 5,000 PSI, 28 DAYS
2. REINFORCING STEEL CONFORMS TO LATEST ASTM A615
3. H-20 DESIGN LOADING PER AASHTO HS-20-44

ANY MODIFICATIONS TO THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF RETAIN IT SHALL RENDER IT INVALID AND UNUSABLE.

retain it
Stormwater Management Systems

STORM WATER MANAGEMENT
DETENTION / RETENTION AND INFILTRATION SYSTEM

RETAIN IT
560 SALMON BROOK STREET
GRANBY, CT 06035
(860) 413-3050
RETAIN-IT.COM

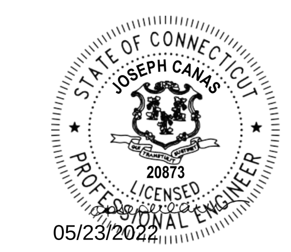
SINGLE SYSTEM

No.	Revision/Issue	Date
1	SUBMITTAL OF REVIEW	12-16-12

AUTOCAD
TYPICAL
DETAILS

Project ~
Date 5/2/14
Scale N.T.S.
Sheet

Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100



TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO: A0969-015
DATE: 05/24/2022
FILE: A0969-015-C-900-DETL.dwg
DRAWN BY: MDS
DESIGNED/CHECKED BY: JAC
APPROVED BY: JWB

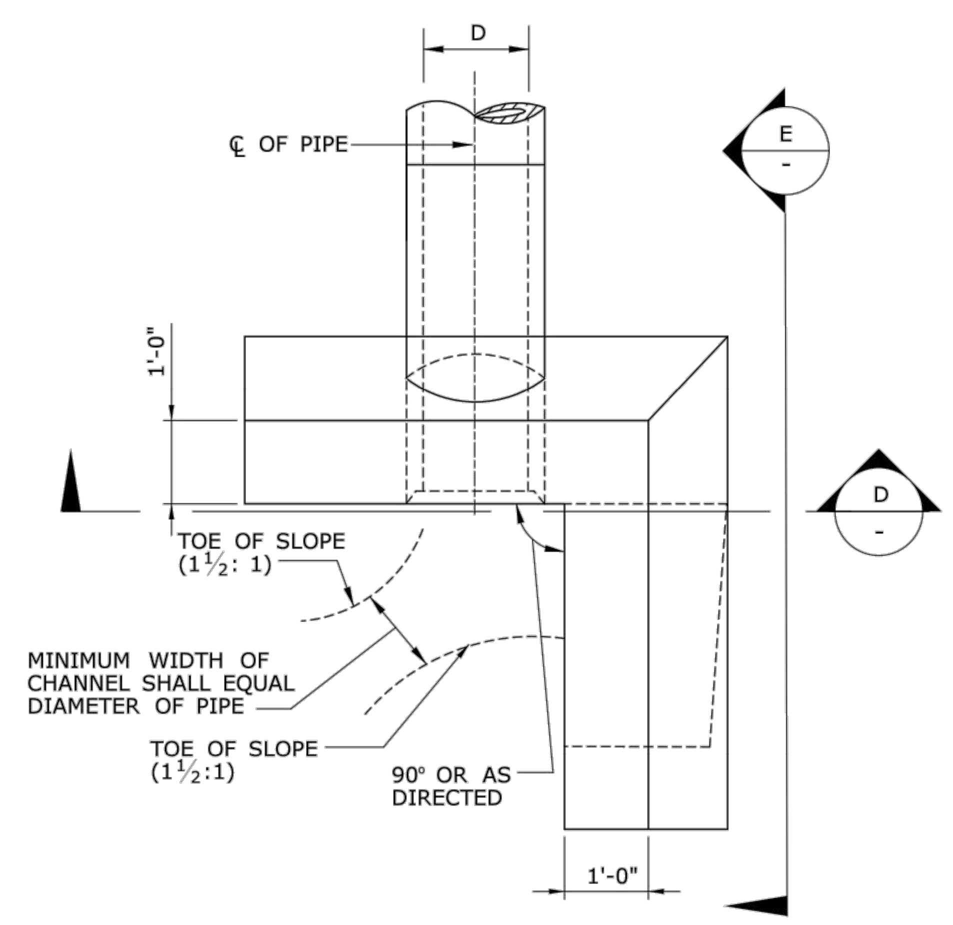
DRAINAGE DETAILS - 4

SCALE: NO SCALE

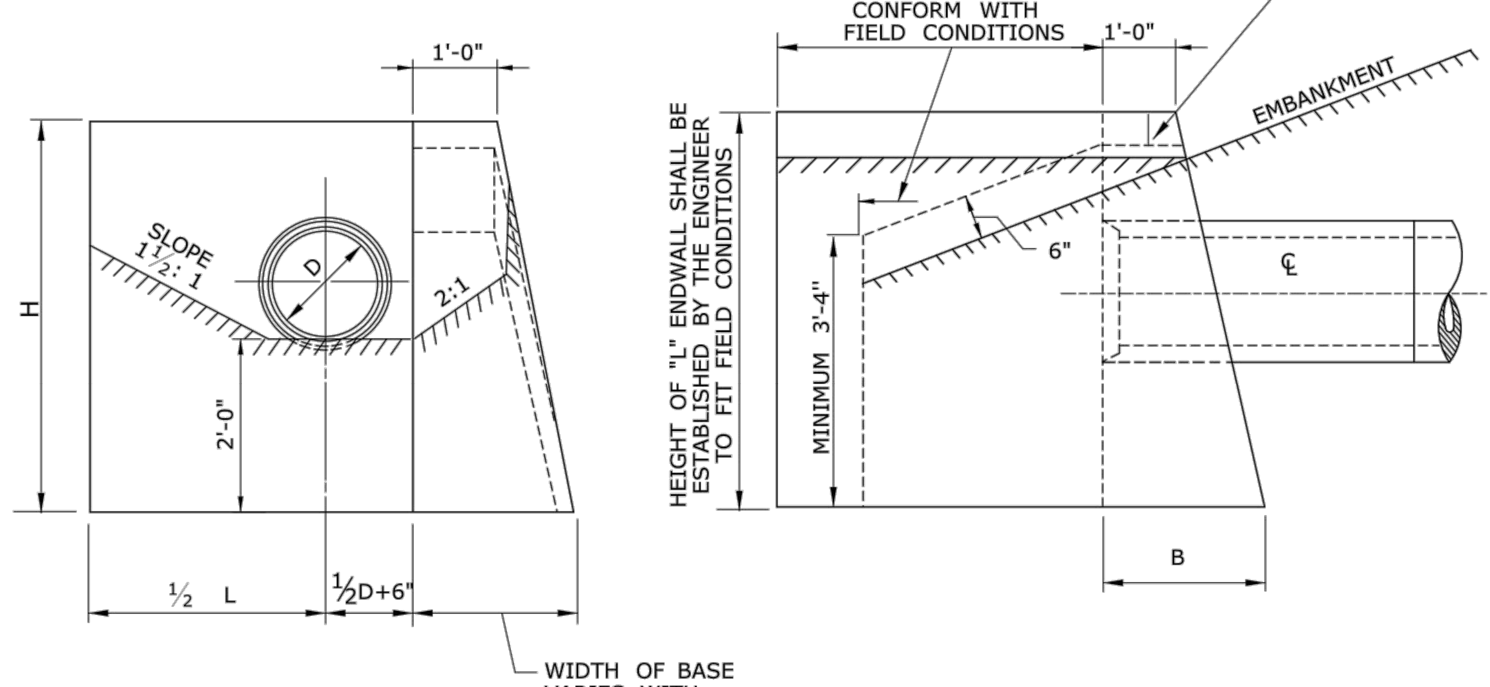
C-913

Last Saved: 5/23/2022
Plotted On: May 23, 2022-4:52pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg

TYPE "L" ENDWALL DIMENSIONS				
D IN.	H FT. - IN.	½L FT. - IN.	BATTER IN./FT.	B FT. - IN.
12"	4'-6"	2'-3"	2½"	1'-11¼"
15"	4'-9"	2'-9"	2½"	1'-11⅞"
18"	5'-0"	3'-3"	2½"	2'-0½"
24"	5'-6"	4'-3"	2½"	2'-1¾"
30"	6'-0"	5'-3"	2½"	2'-3"
36"	6'-6"	6'-3"	3"	2'-7½"
42"	7'-0"	7'-3"	3"	2'-9"
48"	7'-6"	8'-3"	3"	2'-10½"



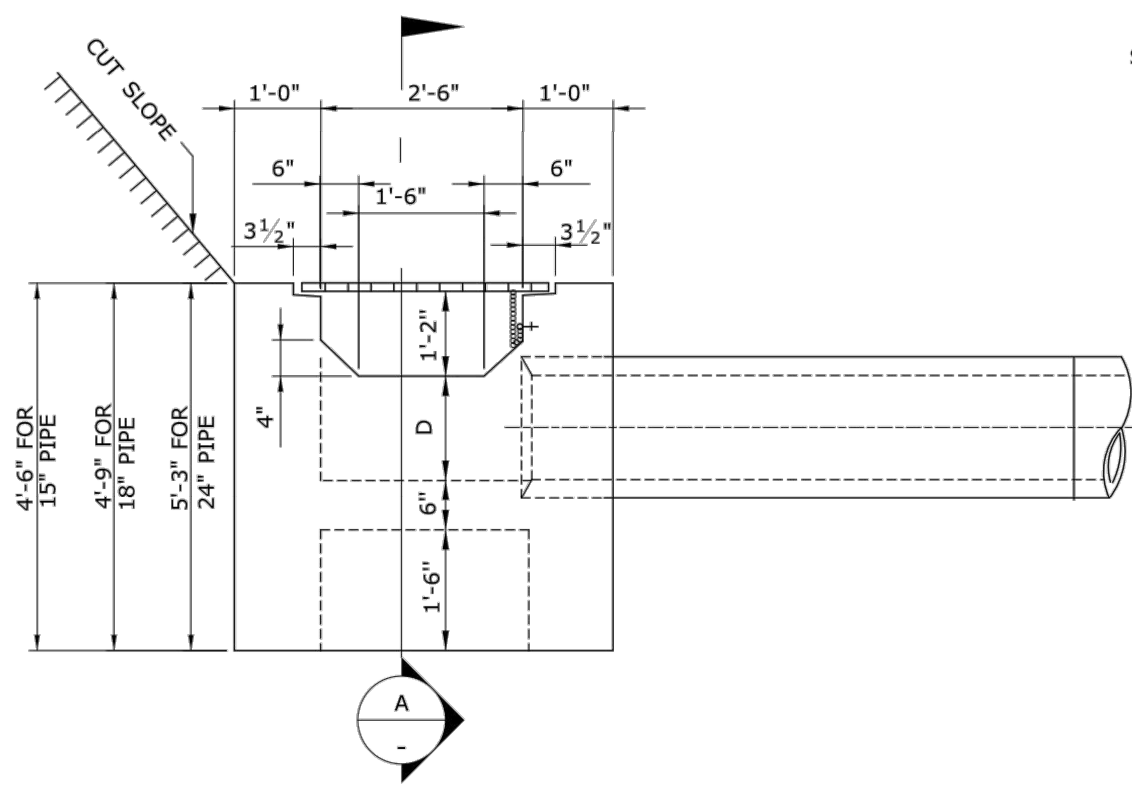
PLAN



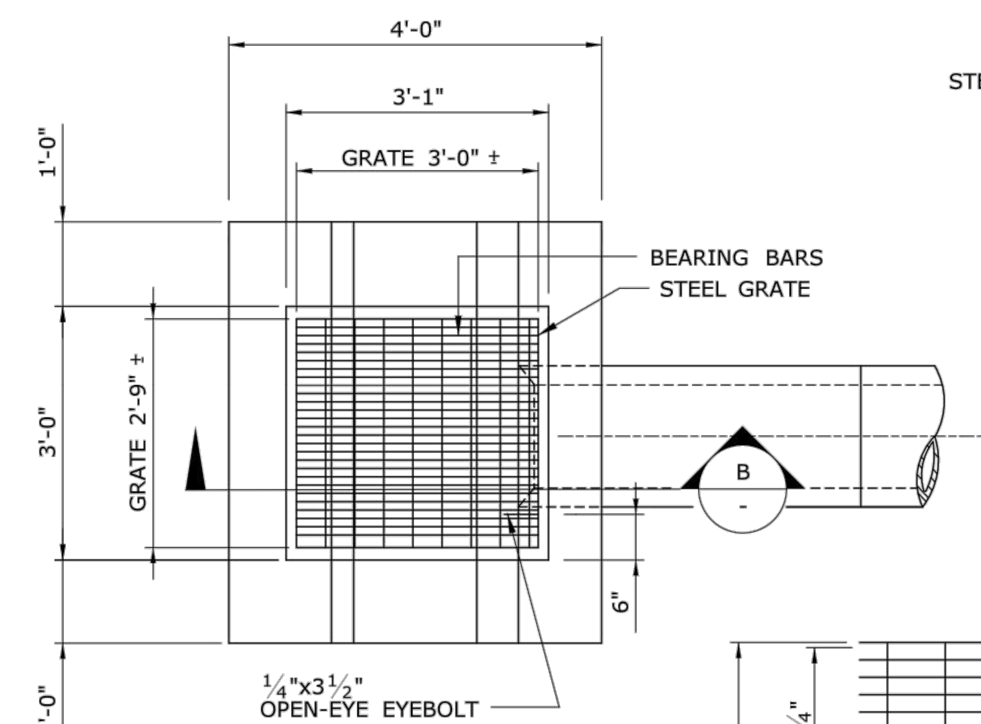
SECTION D

SECTION E

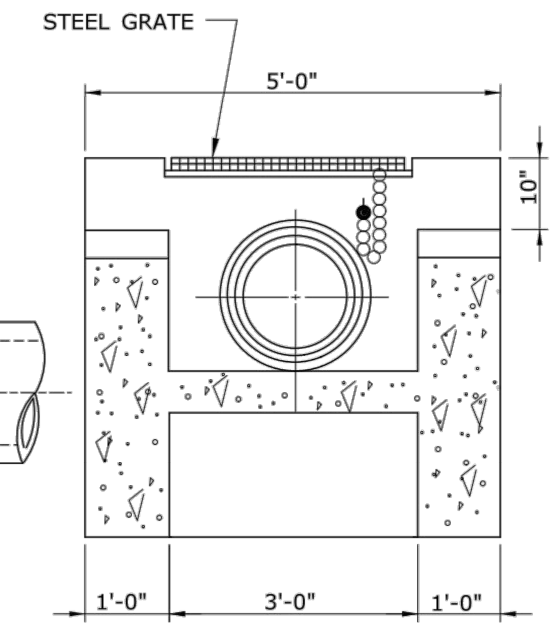
TYPE "L" ENDWALL



SIDE ELEVATION



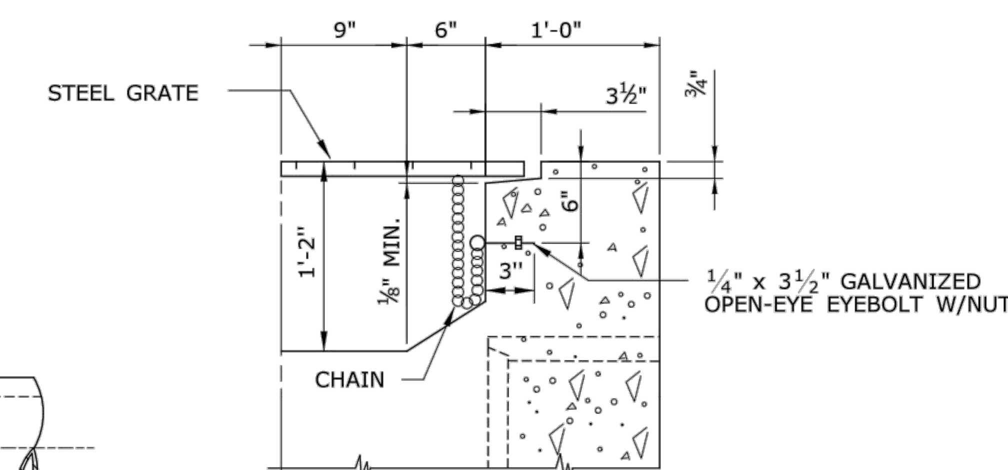
PLAN



SECTION A

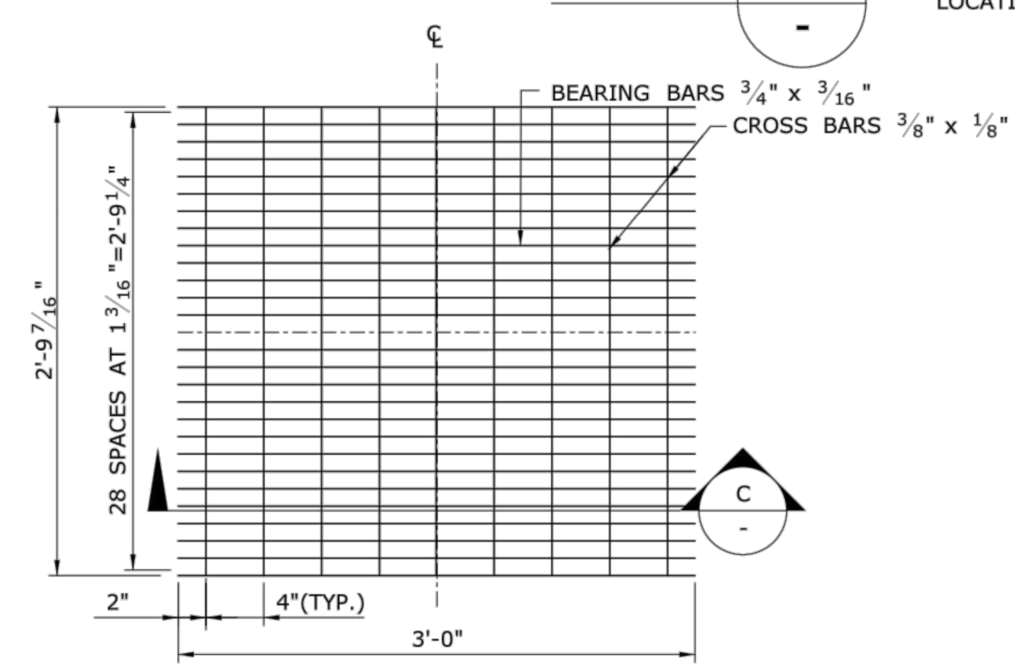
GENERAL NOTES:

1. THESE ENDWALLS SHALL ONLY BE USED AT LOCATIONS WHERE THEY ARE OUTSIDE THE DESIGN CLEAR ZONE.
2. FOR ALL TYPE "D-G" & "L" ENDWALLS, ALL EDGES OF EXPOSED SURFACES SHALL BE CHAMFERED APPROXIMATELY 1".
3. ALL CONSTRUCTION DIMENSIONS ARE NOMINAL.
4. WHEN CONSTRUCTING TYPE "D-G" ENDWALLS, CARE MUST BE TAKEN TO HAVE THE SHORT AXIS OF THE WELL OPENING PARALLEL TO THE LONG AXIS OF THE GRATE IN ORDER TO ALLOW THE BEARING BARS TO PERFORM THEIR FUNCTION PROPERLY.
5. TYPE "D-G" AND "L" ENDWALLS SHALL BE CONSTRUCTED OF CONCRETE OR CEMENT RUBBLE MASONRY.
6. STEEL GRATING SHALL BE MECHANICALLY LOCKED UNDER HYDRAULIC PRESSURE, WELDED, OR ELECTROFORGED. APPROXIMATE WEIGHT = 45 LBS. THE GRATE SHALL BE GALVANIZED IN ACCORDANCE WITH M.06.03. ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH AWS D1.1 - STRUCTURAL WELDING CODE.
7. ALL REINFORCING BARS SHALL HAVE A 3" MIN. COVER.
8. STEEL GRATE SHALL CONFORM TO ASTM A-36 STEEL.
9. D = INSIDE DIAMETER OF PIPE.

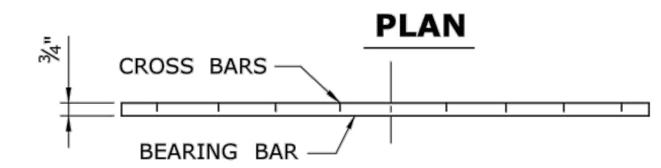


SECTION B

HALF SECTION SHOWING LOCATION OF CHAIN AND EYEBOLT



PLAN



SECTION C
STEEL GRATE

TYPE "D-G" ENDWALL DIMENSIONS	
PIPE DIAMETER IN.	CONCRETE VOLUME CY.
15"	2.44
18"	2.57
24"	2.85

TYPE "D-G" ENDWALL

NOT TO SCALE ####	SIGNATURE BLOCK: OFFICE OF ENGINEERING 2800 BERLIN TURNPIKE NEWINGTON, CT 06111	SUBMITTED BY: Leo Fontaine, P.E. 2020.07.08 09:21:49-04'00'	APPROVED BY: James Fallon, P.E.	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	CTDOT STANDARD SHEET	STANDARD SHEET TITLE: TYPE "D - G" AND "L" ENDWALLS	STANDARD SHEET NO.: HW-506_02

PLOTTED DATE: 6/30/2020

Tighe&Bond
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRAINAGE DETAILS - 5

SCALE: NO SCALE

C-914

Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:53pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg

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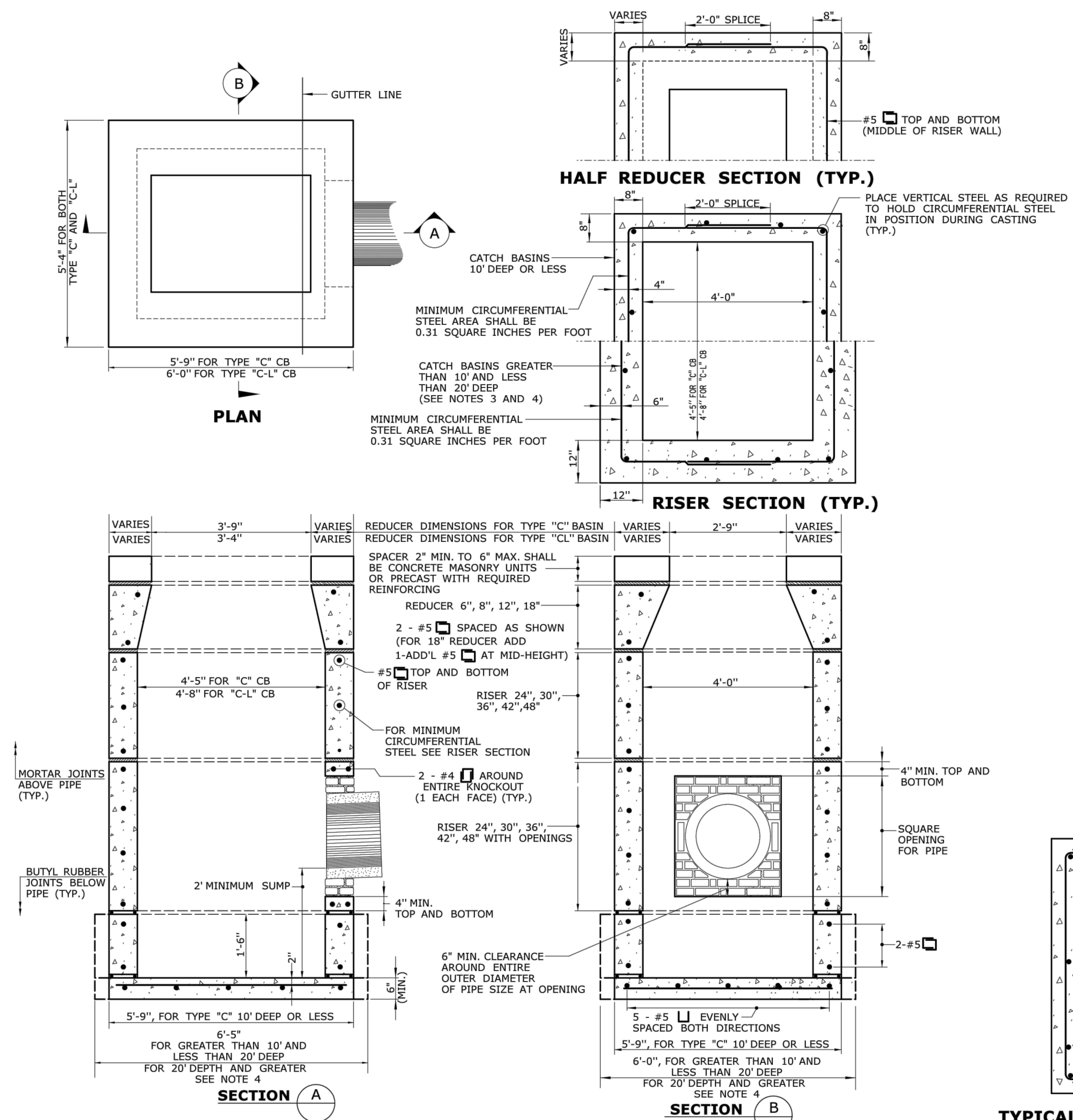
1000 Bridgeport Avenue
Suite 320
Shelton, CT 06484
(203) 712-1100



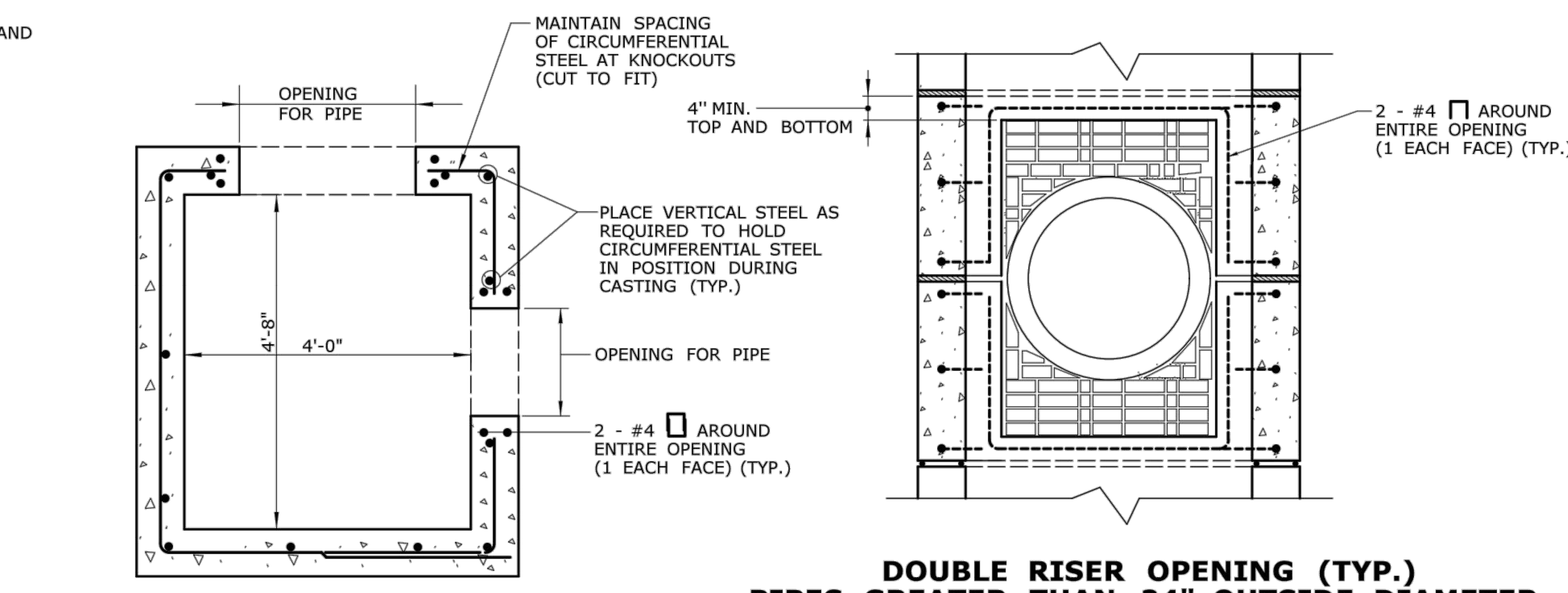
PRECAST CONCRETE TYPE "C" AND "C-L" DOUBLE GRATE TYPE I CATCH BASIN
(UNDER 10' DEEP SHOWN)

GENERAL NOTES:

1. WELDED WIRE FABRIC WITH AN AREA EQUAL TO OR GREATER THAN THE REINFORCING SHOWN MAY BE SUBSTITUTED AS APPROVED BY THE ENGINEER.
2. ALL REINFORCEMENT SHALL HAVE A MINIMUM CLEAR COVER OF 2 INCHES, EXCEPT FOR BENEATH BOTTOM REINFORCEMENT IN TOP SLABS, WHERE THE MINIMUM MAY BE $1\frac{1}{2}$ INCHES.
3. WALL THICKNESS OF ALL CATCH BASINS OVER 10 FEET DEEP SHALL BE INCREASED TO 12 INCHES. INSIDE DIMENSIONS SHALL REMAIN THE SAME. THE 12 INCH THICKNESS SHALL START AFTER THE FIRST 10 FEET.
4. BASES AND RISERS AT A DEPTH OF 20 FEET AND GREATER SHALL BE DESIGNED BY THE CONTRACTOR AND WORKING DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
5. RISERS MAY BE PREFABRICATED WITH PIPE OPENINGS IN ALL FOUR WALLS. ADEQUATE REINFORCING AROUND PIPE OPENINGS SHALL BE PROVIDED. RISERS USED WHERE A PIPE OPENING IS TO REMAIN IN PLACE MUST BE FORMED UP WITH BRICK AS DIRECTED BY THE ENGINEER.
6. RISERS SHALL NEVER HAVE CORNER PIPE ENTRIES. ROUND STRUCTURES SHALL BE USED WHEN PIPES CANNOT ALIGN WITH A RECTANGULAR STRUCTURE KNOCK OUT.
7. FOR CATCH BASIN TOPS, SEE SHEET NO. HW-586_07.

MORTAR JOINT

BUTYL RUBBER JOINT



TYPICAL SECTION THRU SINGLE RISER WITH OPENING

DOUBLE RISER OPENING (TYP.)
PIPES GREATER THAN 24" OUTSIDE DIAMETER

NOT TO SCALE ####	SIGNATURE BLOCK: OFFICE OF ENGINEERING 2800 BERLIN TURNPIKE NEWINGTON, CT 06111	SUBMITTED BY: Leo Fontaine, P.E. 2020.07.08 09:23:46-04'00'	APPROVED BY: James Fallon, P.E.	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	CTDOT STANDARD SHEET	STANDARD SHEET TITLE: PRECAST CATCH BASIN TYPES FOR DOUBLE GRATE TYPE I	STANDARD SHEET NO.: HW-586_05

PLOTTED DATE: 6/30/2020

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRAINAGE DETAILS - 6

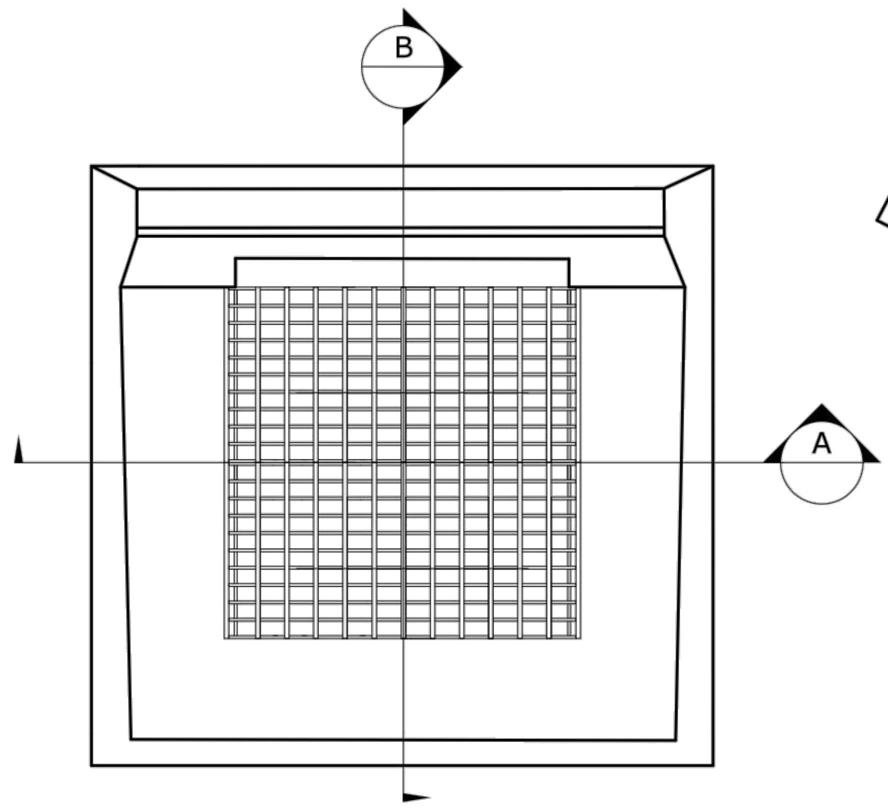
SCALE: NO SCALE

C-915

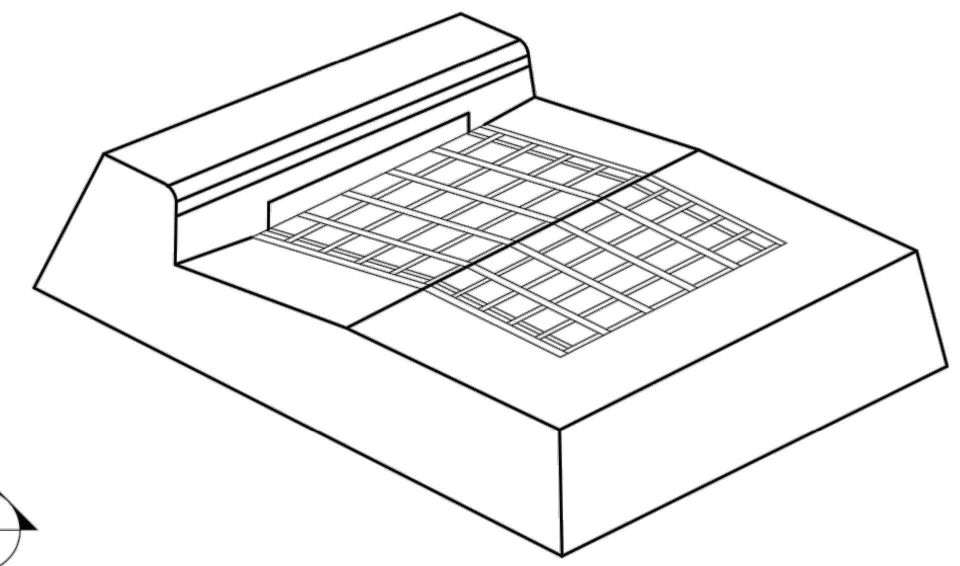
Last Saved: 5/23/2022
Plotted On:May 23, 2022-4:53pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg

GENERAL NOTES:

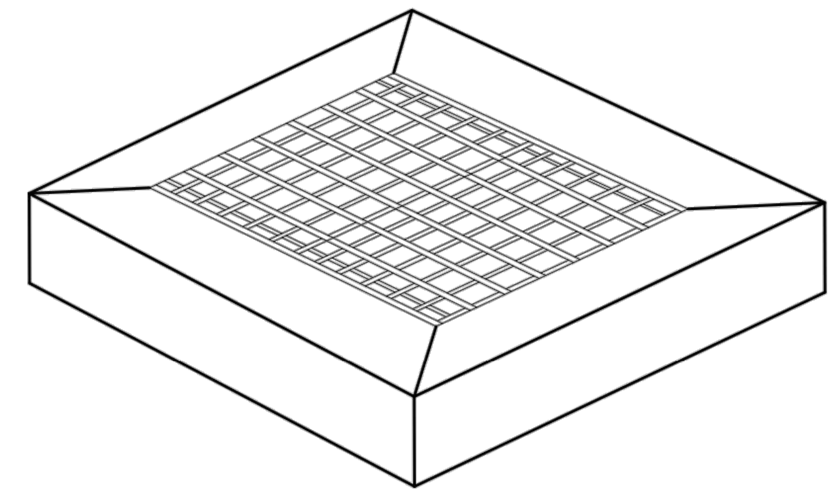
1. SEE SHEET HW-586.08 FOR CATCH BASIN FRAMES AND GRATES, AND HW-586.09 CATCH BASIN LOCK DOWN TOPS.
2. SEE SHEET HW-586.02 CATCH BASIN TOPS (TYPES "C" AND "C-L") FOR DOUBLE GRATE TYPE I TO DETERMINE THE TOP OF FRAME AT THE GUTTER.
3. ALL BARS SHALL HAVE A MINIMUM 2" COVER.



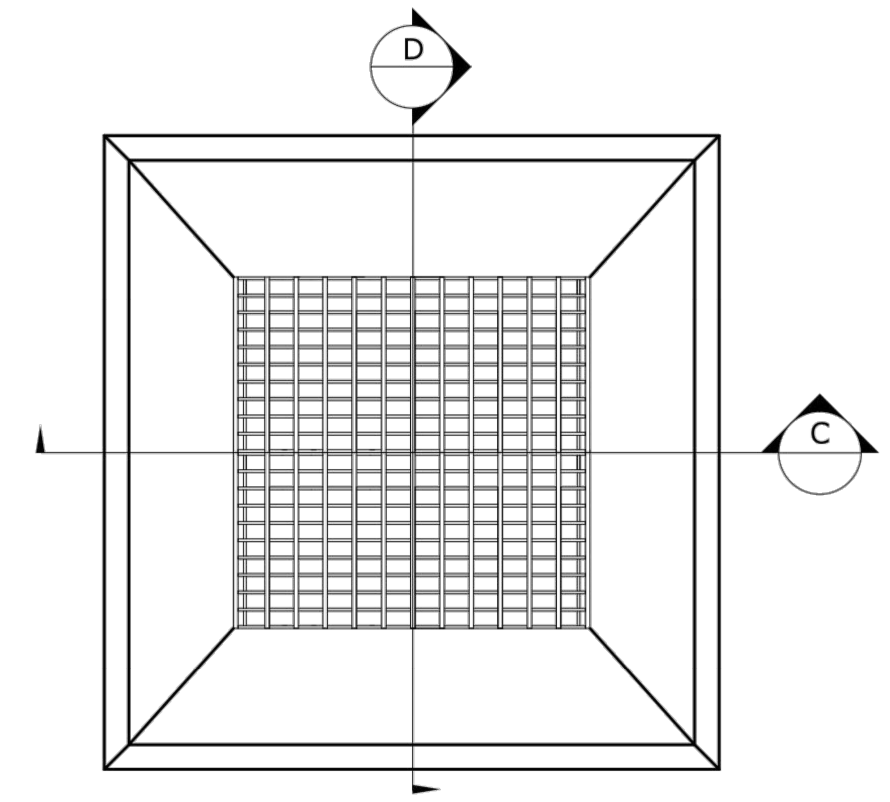
TYPE "C" CATCH BASIN DOUBLE GRATE TYPE I TOP PLAN



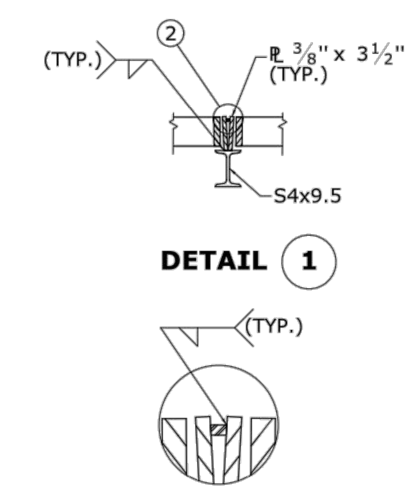
TYPE "C" CATCH BASIN DOUBLE GRATE TYPE I TOP



TYPE "C-L" CATCH BASIN DOUBLE GRATE TYPE I TOP

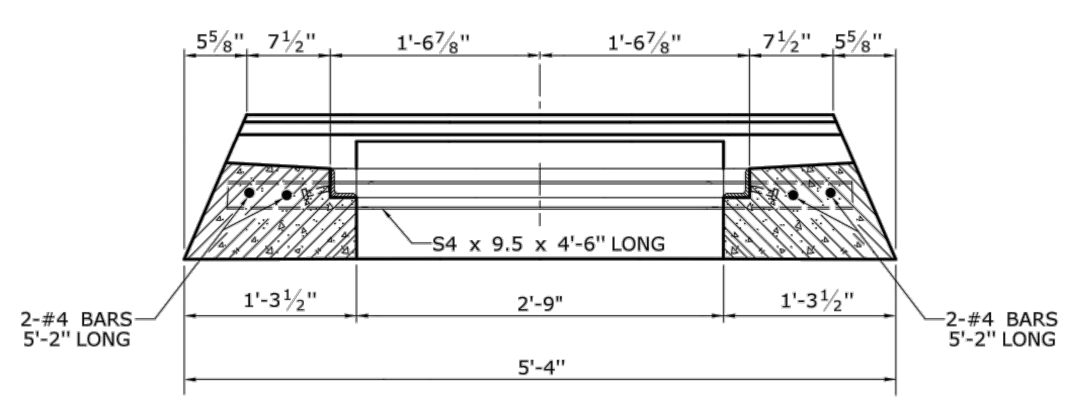


TYPE "C-L" CATCH BASIN DOUBLE GRATE TYPE I TOP PLAN



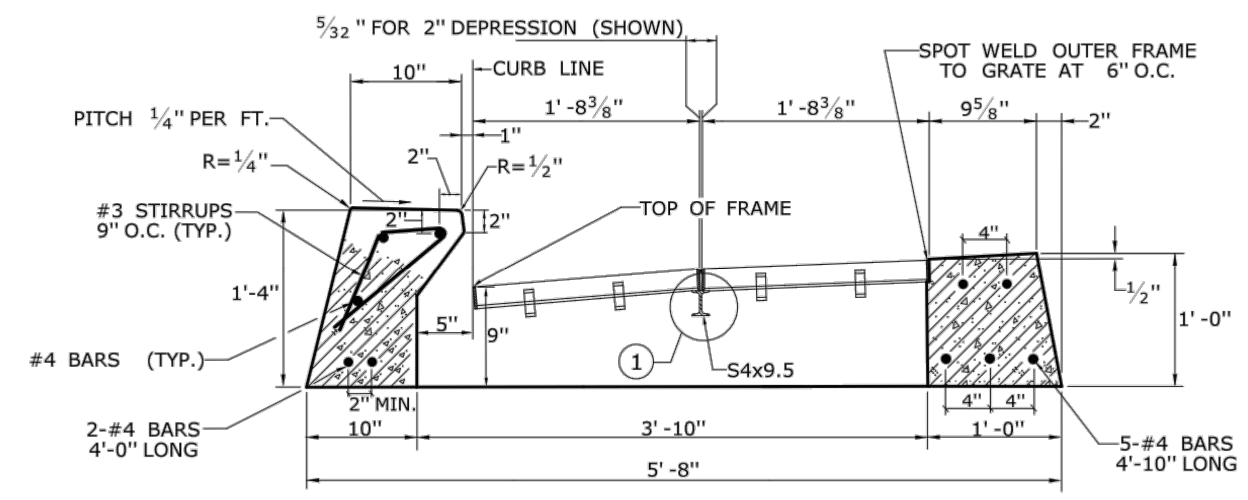
DETAIL 1

DETAIL 2



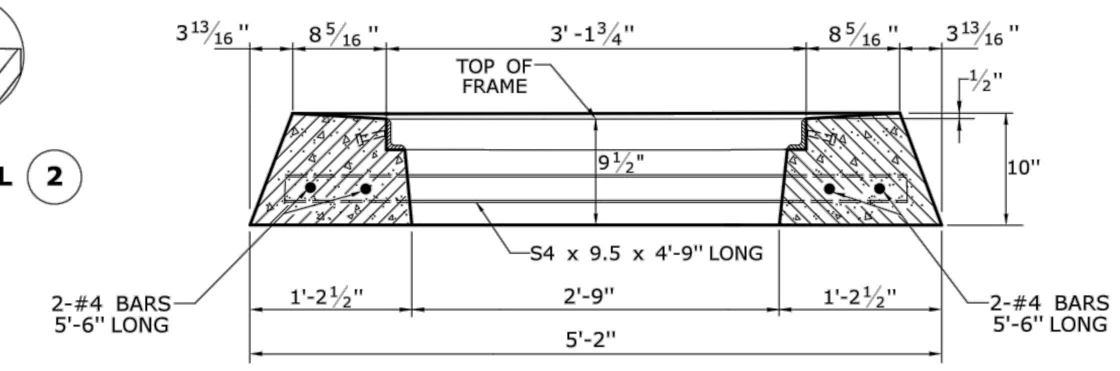
TYPE "C" CATCH BASIN DOUBLE GRATE TYPE I TOP

SECTION A



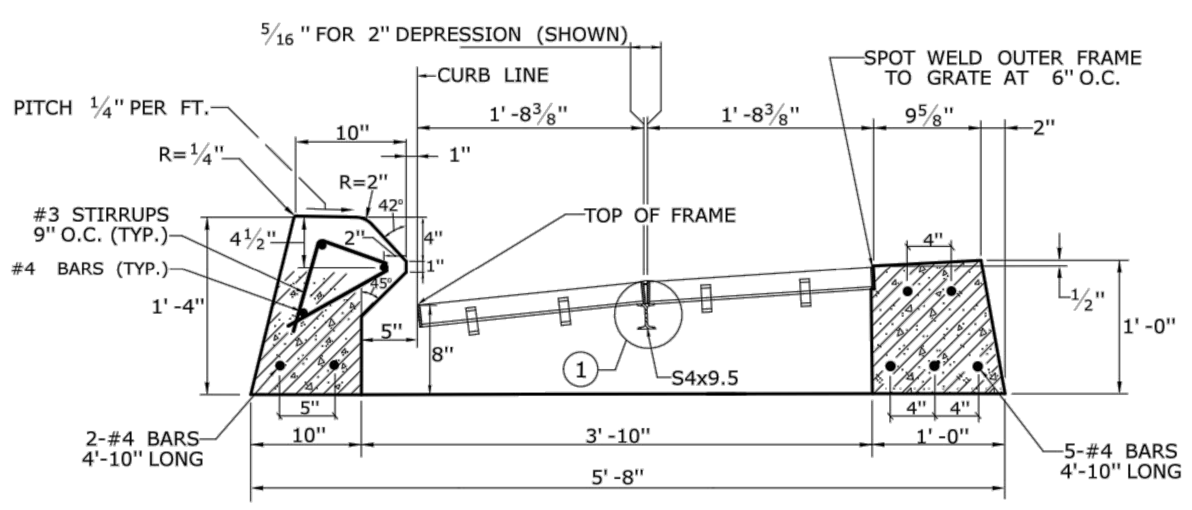
TYPE "C" CATCH BASIN DOUBLE GRATE TYPE I TOP FOR 6" CONCRETE CURBING OR 6" STONE CURBING

SECTION B



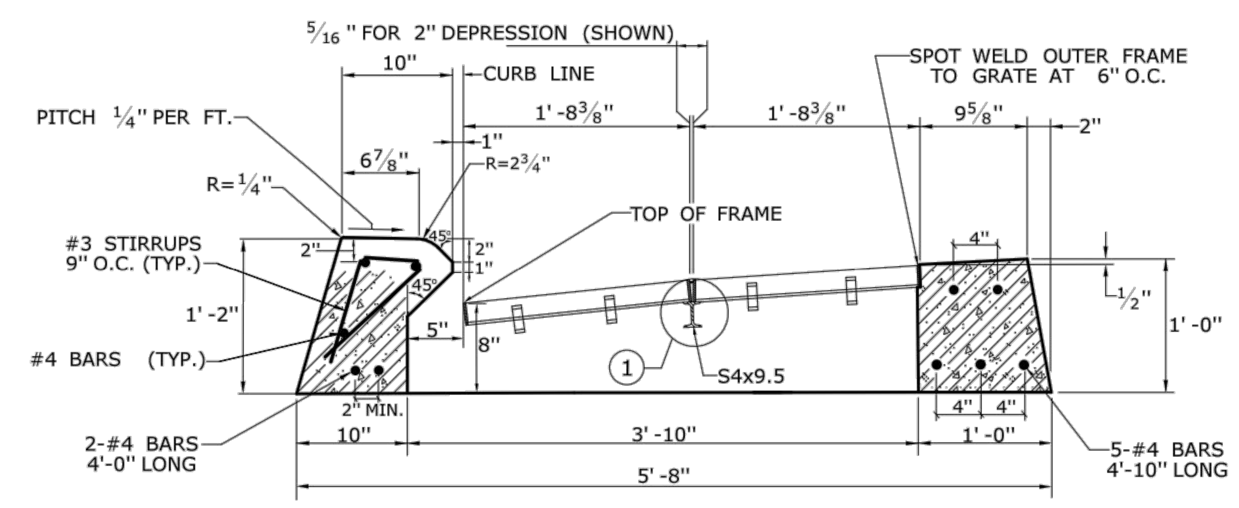
TYPE "C-L" CATCH BASIN DOUBLE GRATE TYPE I TOP

SECTION C



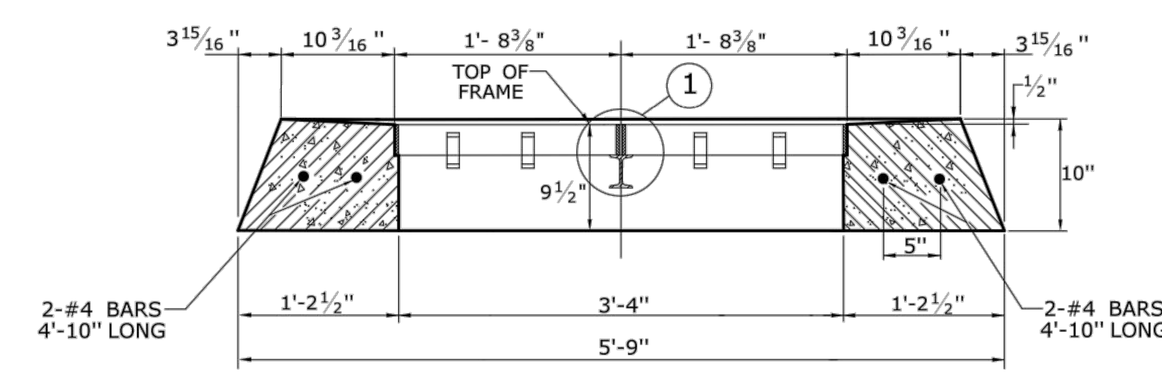
TYPE "C" CATCH BASIN DOUBLE GRATE TYPE I TOP FOR 6" BITUMINOUS CONCRETE LIP CURBING

SECTION B



TYPE "C" CATCH BASIN DOUBLE GRATE TYPE I TOP FOR 4" CONCRETE PARK CURBING OR 4" BITUMINOUS CONCRETE PARK CURBING

SECTION B



TYPE "C-L" CATCH BASIN DOUBLE GRATE TYPE I TOP

SECTION D

SIGNATURE BLOCK:

NOT TO SCALE ####	SIGNATURE BLOCK: OFFICE OF ENGINEERING 2800 BERLIN TURNPIKE NEWINGTON, CT 06111	SUBMITTED BY: Digitally signed by Leo Fontaine, P.E. Date: 2021.11.02 09:34:22-04'00'	APPROVED BY: Digitally signed by Calabrese, Michael Date: 2021.11.09 07:41:33-05'00'	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	CTDOT STANDARD SHEET	STANDARD SHEET TITLE: CATCH BASIN TYPE "C" AND "C-L" DOUBLE GRATE TYPE I TOPS	STANDARD SHEET NO.: HW-586_07b

PLOTTED DATE: 10/29/2021

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1000 Bridgeport Avenue
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(203) 712-1100

05/23/2022

TOWN SUBMISSION DRAWINGS

ASML

Campus Traffic Flow Safety Improvements

77 Danbury Road
Wilton, Connecticut

MARK	DATE	DESCRIPTION

PROJECT NO:	A0969-015
DATE:	05/24/2022
FILE:	A0969-015-C-900-DETL.dwg
DRAWN BY:	MDS
DESIGNED/CHECKED BY:	JAC
APPROVED BY:	JWB

DRAINAGE DETAILS - 7

SCALE: NO SCALE

C-916

Last Saved: 5/23/2022
Plotted On: May 23, 2022-4:53pm By: SansoneM
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Sheet\A0969-015-C-900-DETL.dwg

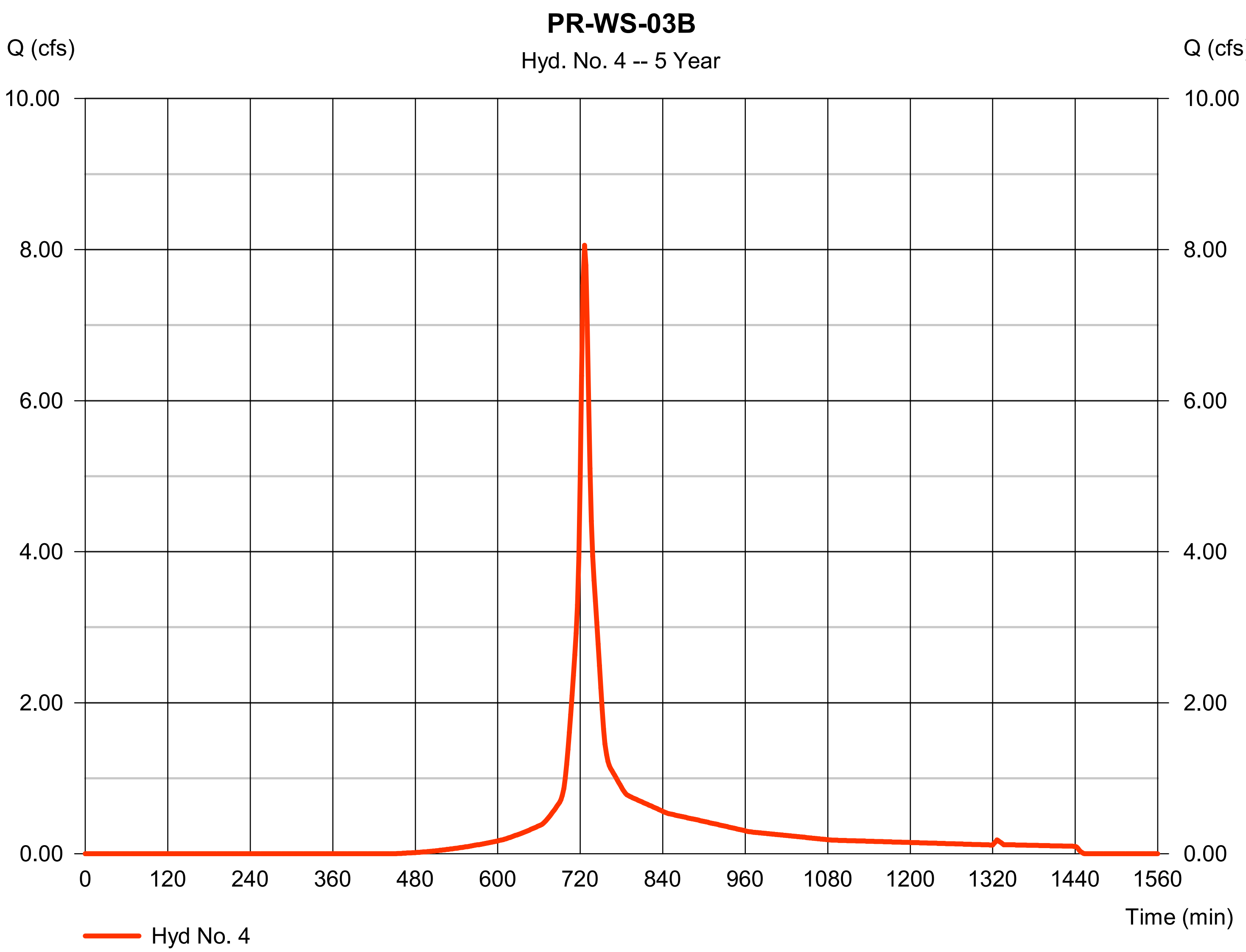
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Saturday, 05 / 21 / 2022

Hyd. No. 4

PR-WS-03B

Hydrograph type	= SCS Runoff	Peak discharge	= 8.058 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 27,522 cuft
Drainage area	= 2.867 ac	Curve number	= 81.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.80 min
Total precip.	= 4.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

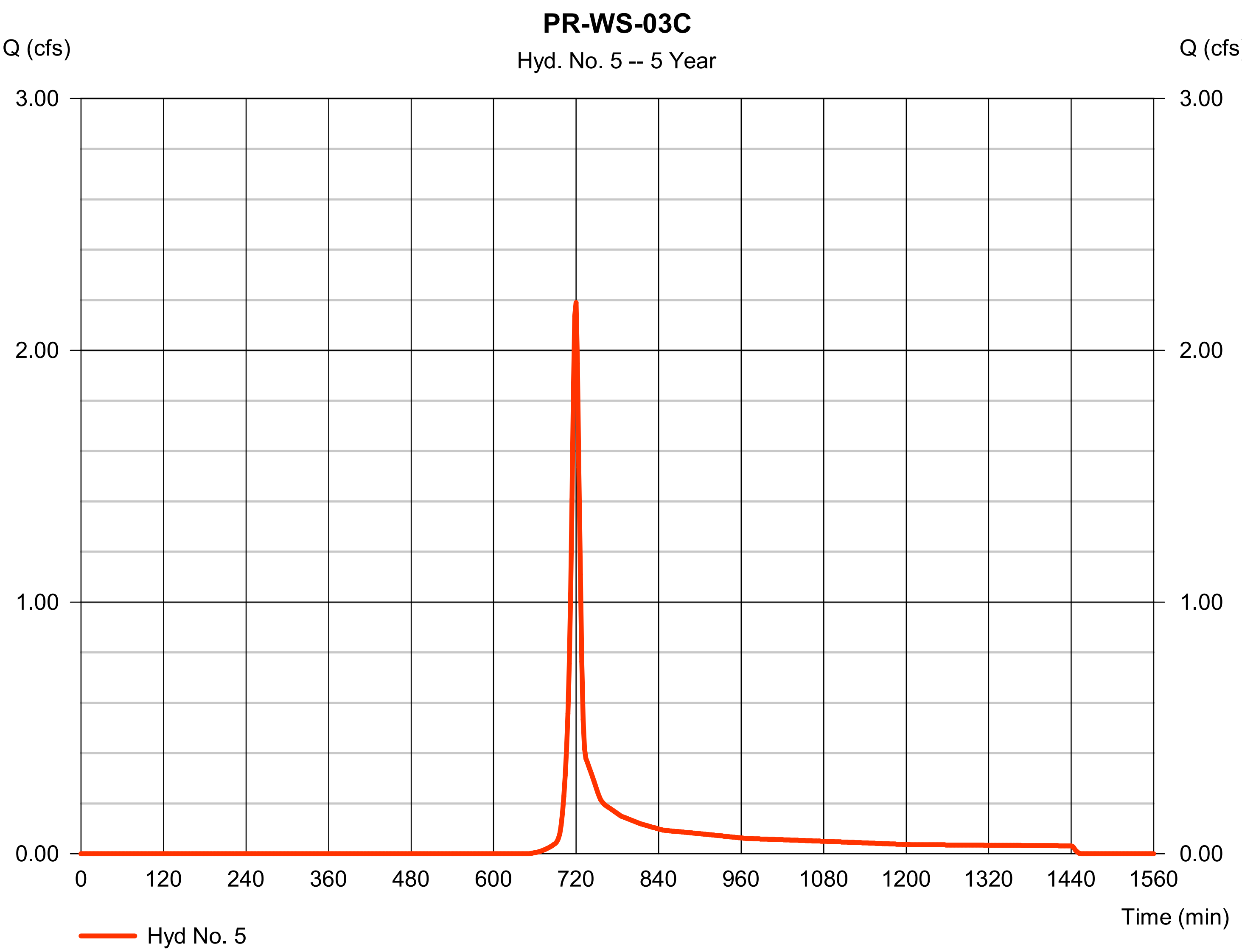


Hydrograph Report

Hyd. No. 5

PR-WS-03C

Hydrograph type	= SCS Runoff	Peak discharge	= 2.190 cfs
Storm frequency	= 5 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 5,068 cuft
Drainage area	= 0.950 ac	Curve number	= 66.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.60 min
Total precip.	= 4.54 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

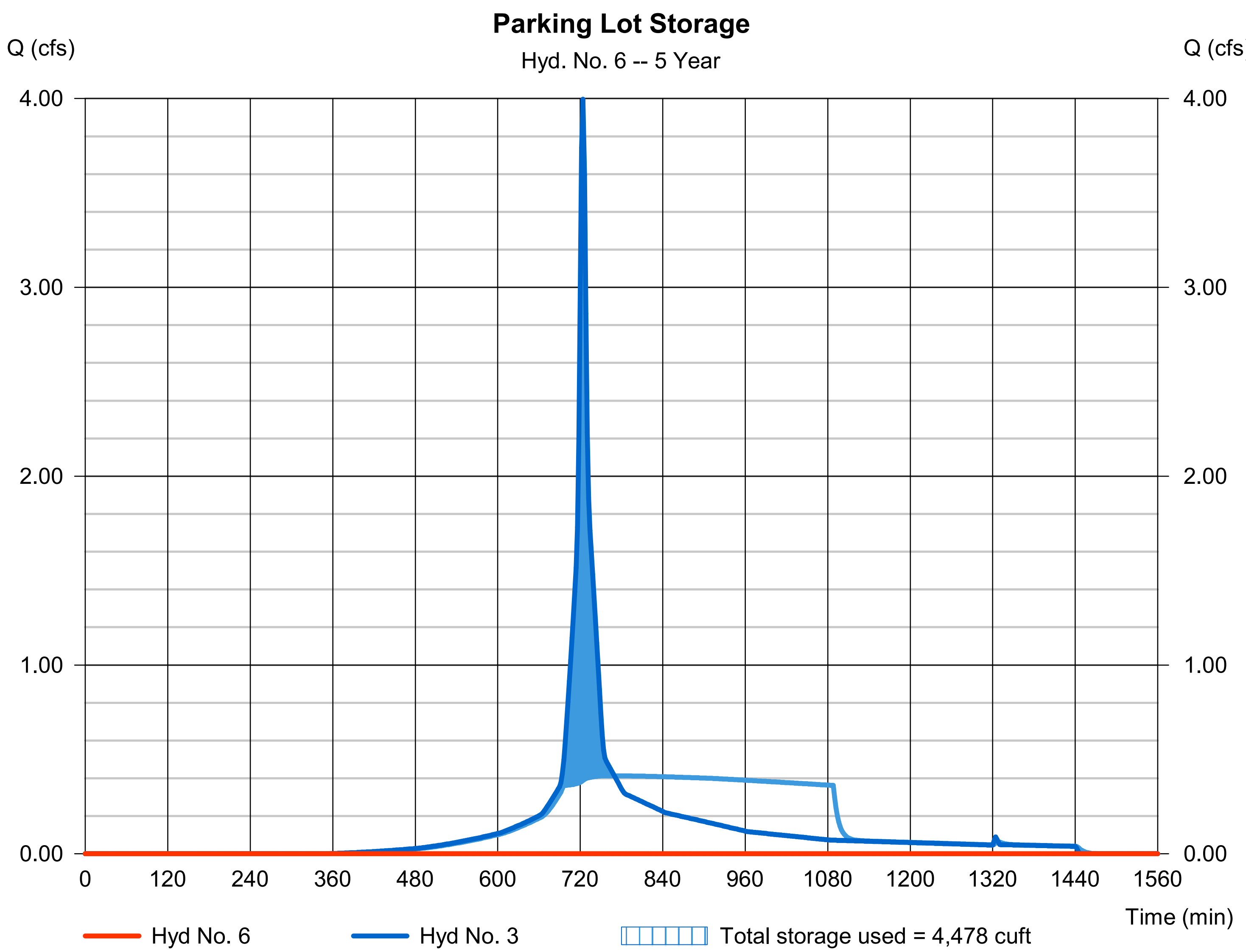
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Saturday, 05 / 21 / 2022

Hyd. No. 6

Parking Lot Storage

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= 674 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 3 - PR-WS-03A	Max. Elevation	= 132.33 ft
Reservoir name	= Parking Lot Detention	Max. Storage	= 4,478 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

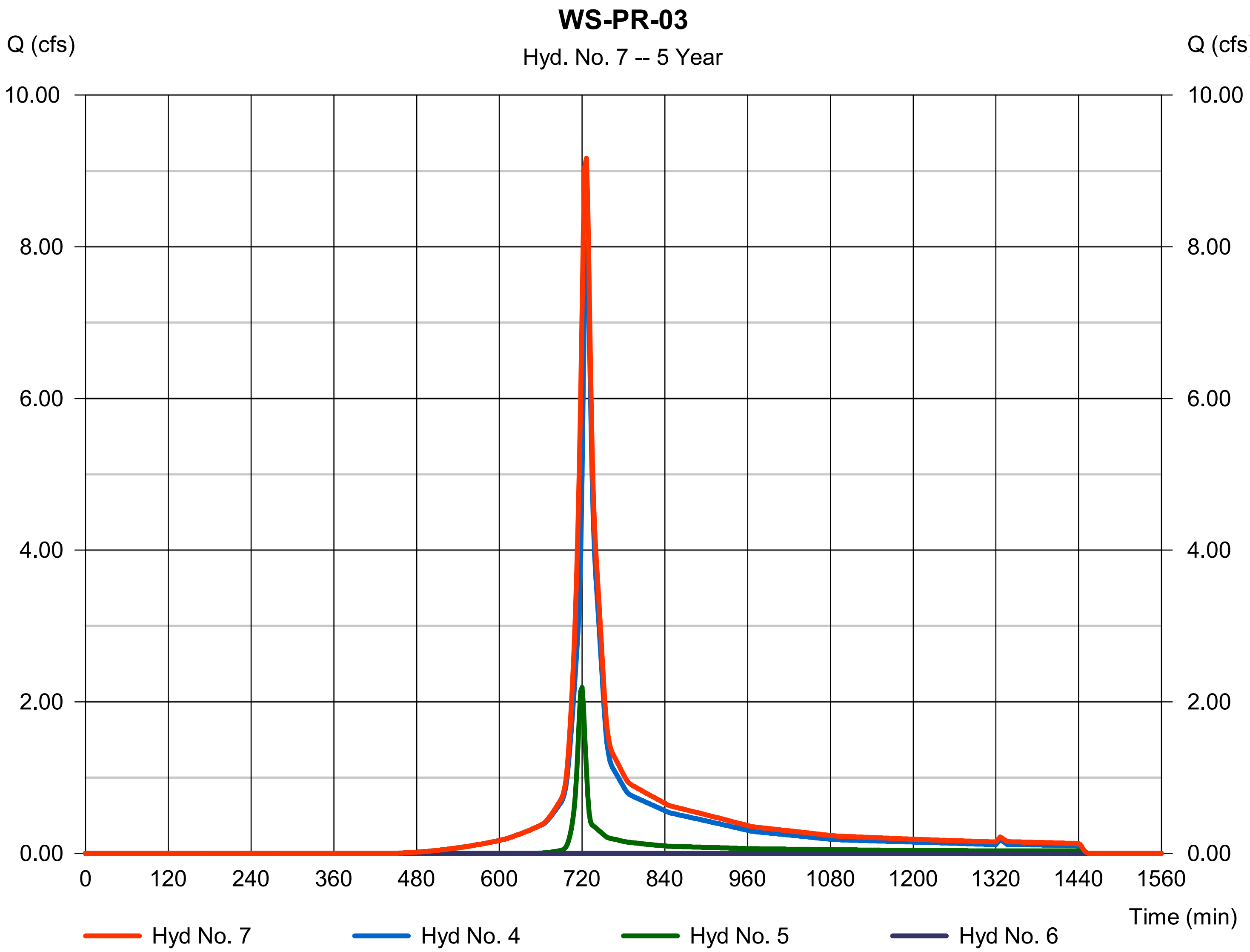


Hydrograph Report

Hyd. No. 7

WS-PR-03

Hydrograph type	= Combine	Peak discharge	= 9.167 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 32,590 cuft
Inflow hyds.	= 4, 5, 6	Contrib. drain. area	= 3.817 ac



Hydrograph Summary Report

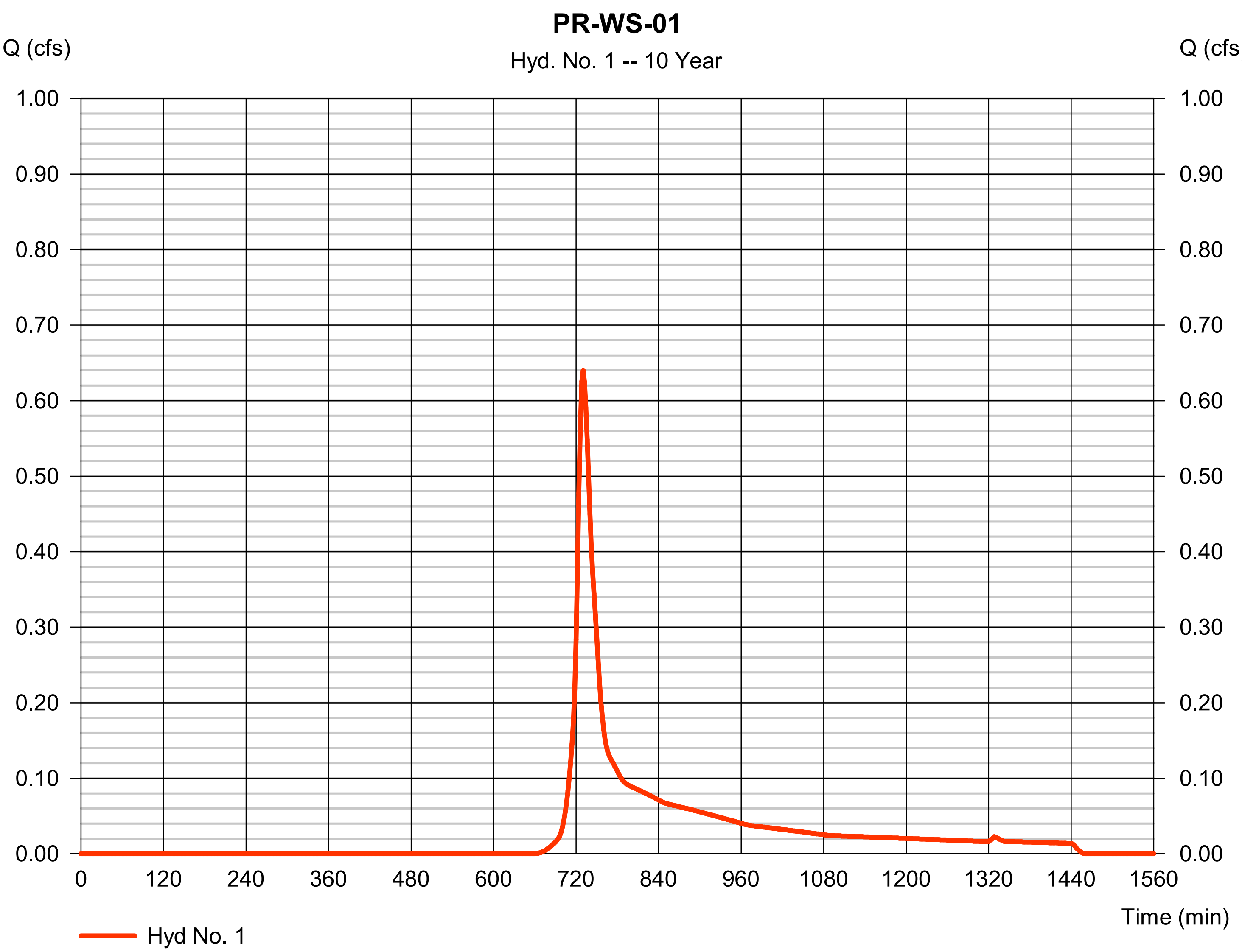
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.640	2	730	2,659	------	------	------	PR-WS-01
2	SCS Runoff	5.030	2	732	20,770	------	------	------	PR-WS-02
3	SCS Runoff	4.963	2	724	15,205	------	------	------	PR-WS-03A
4	SCS Runoff	10.30	2	726	35,298	------	------	------	PR-WS-03B
5	SCS Runoff	3.080	2	720	7,062	------	------	------	PR-WS-03C
6	Reservoir	0.000	2	580	0	3	132.70	6,014	Parking Lot Storage
7	Combine	11.83	2	726	42,360	4, 5, 6	------	------	WS-PR-03

Hydrograph Report

Hyd. No. 1

PR-WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 0.640 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 2,659 cuft
Drainage area	= 0.458 ac	Curve number	= 60.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

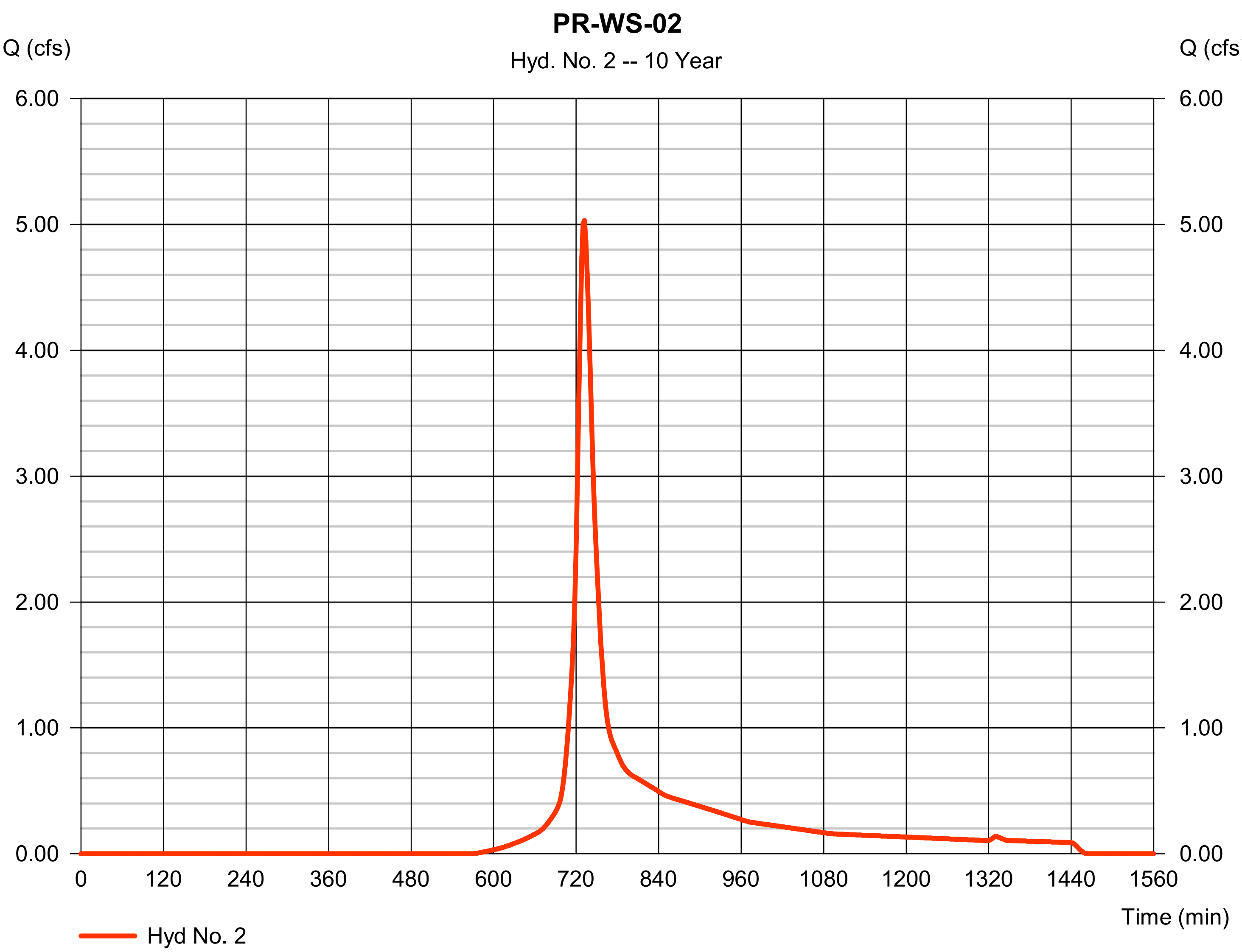


Hydrograph Report

Hyd. No. 2

PR-WS-02

Hydrograph type	= SCS Runoff	Peak discharge	= 5.030 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 20,770 cuft
Drainage area	= 2.527 ac	Curve number	= 70
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.80 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

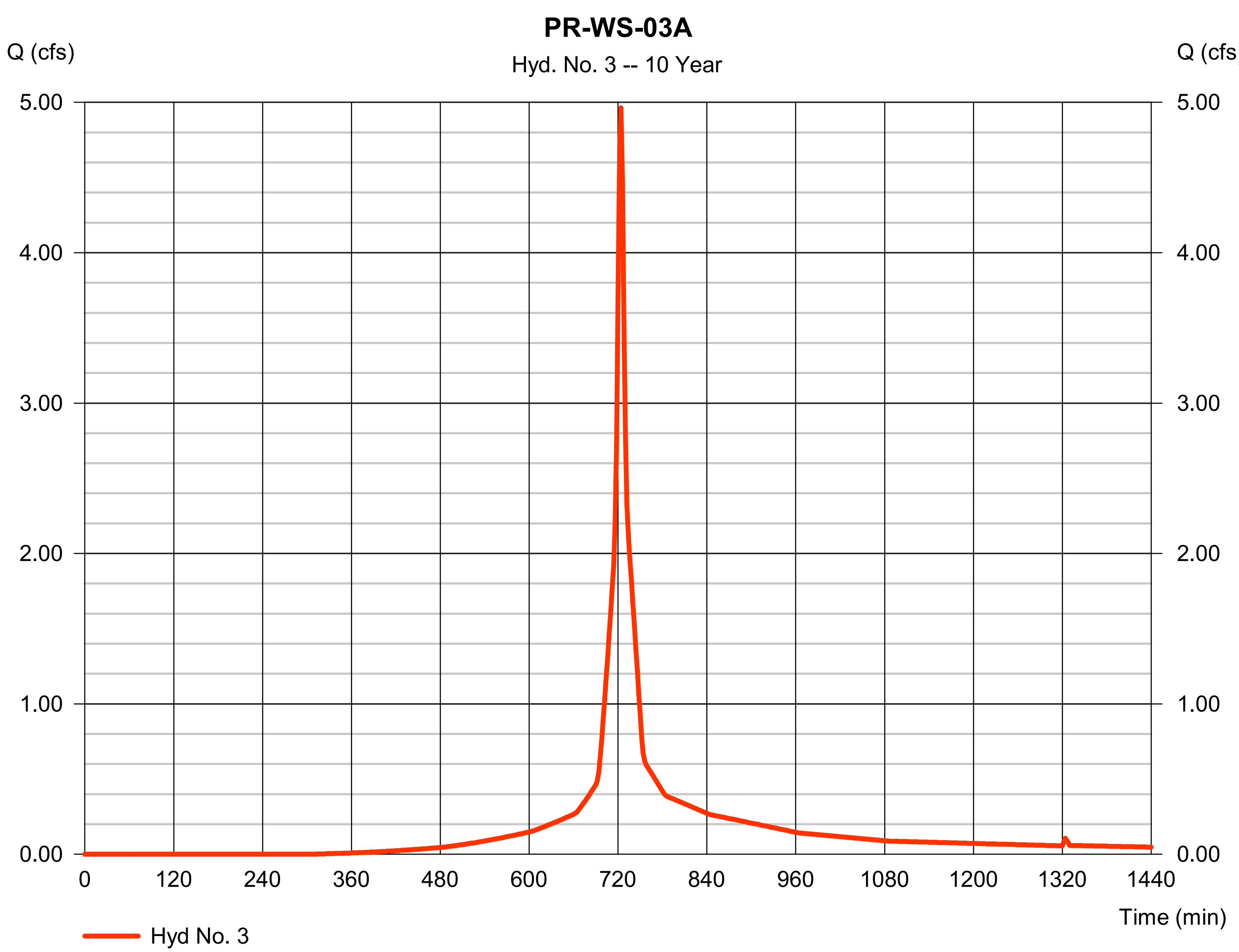


Hydrograph Report

Hyd. No. 3

PR-WS-03A

Hydrograph type	= SCS Runoff	Peak discharge	= 4.963 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 15,205 cuft
Drainage area	= 1.147 ac	Curve number	= 86.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

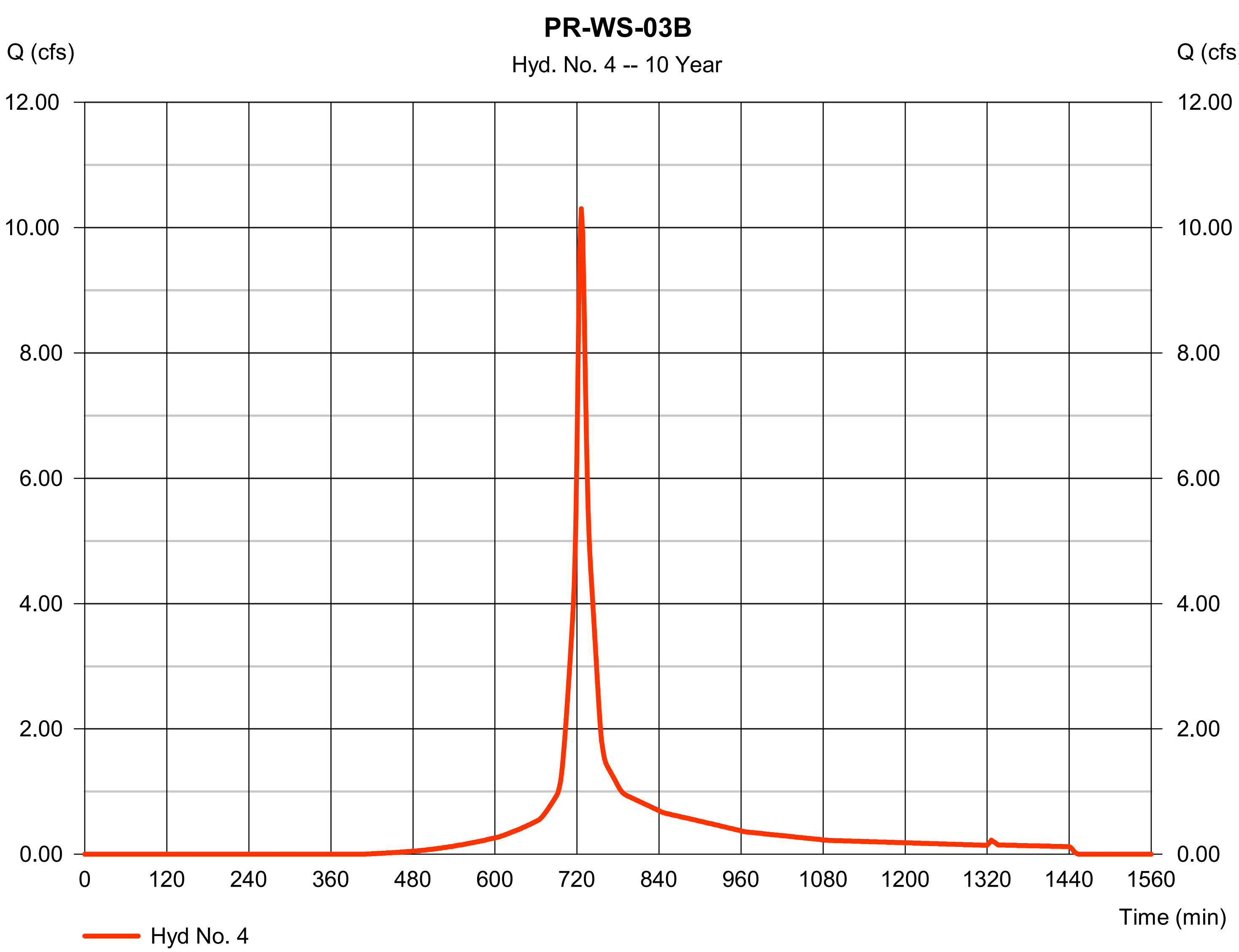


Hydrograph Report

Hyd. No. 4

PR-WS-03B

Hydrograph type	= SCS Runoff	Peak discharge	= 10.30 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 35,298 cuft
Drainage area	= 2.867 ac	Curve number	= 81.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.80 min
Total precip.	= 5.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

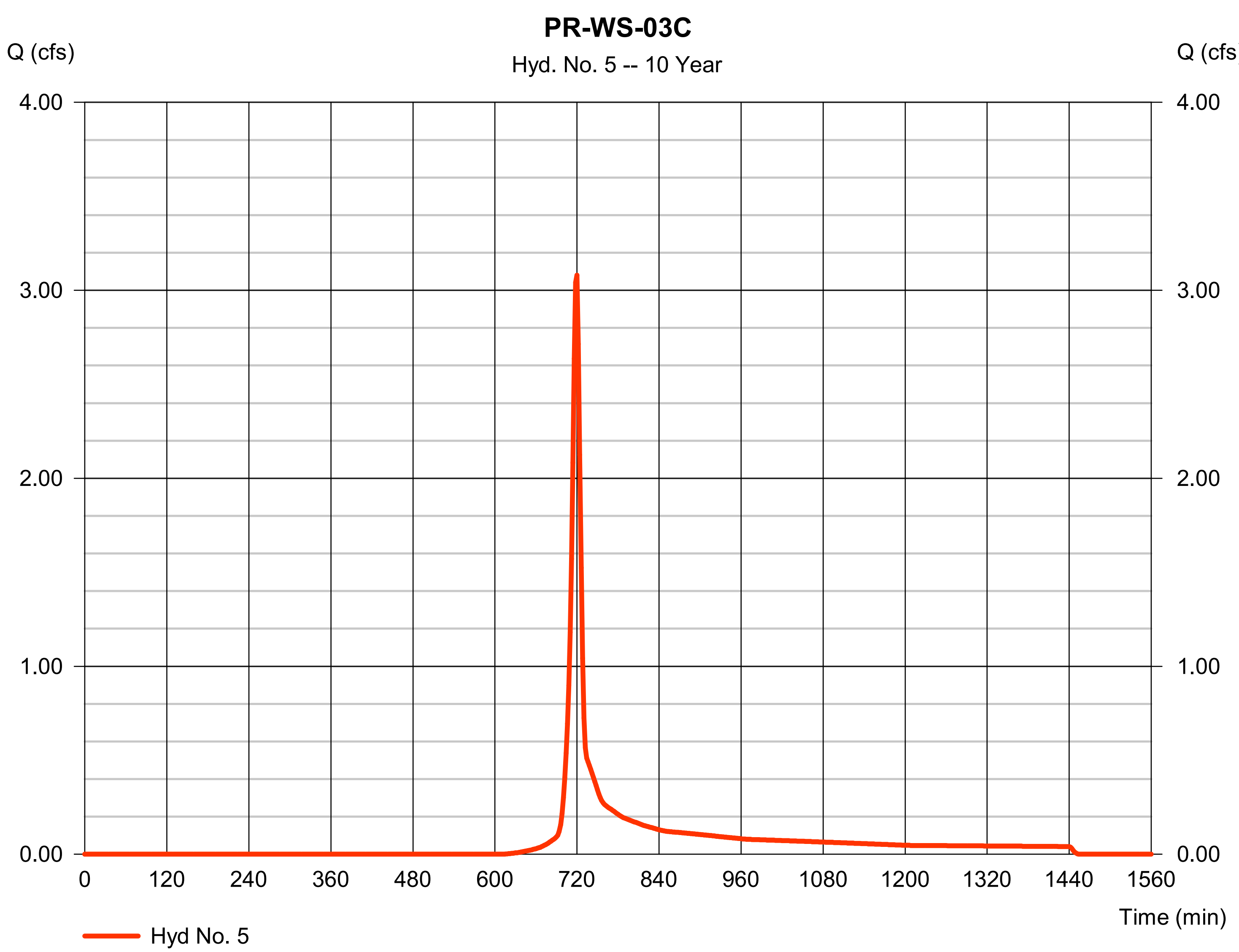


Hydrograph Report

Hyd. No. 5

PR-WS-03C

Hydrograph type	= SCS Runoff	Peak discharge	= 3.080 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 7,062 cuft
Drainage area	= 0.950 ac	Curve number	= 66.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.60 min
Total precip.	= 5.38 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



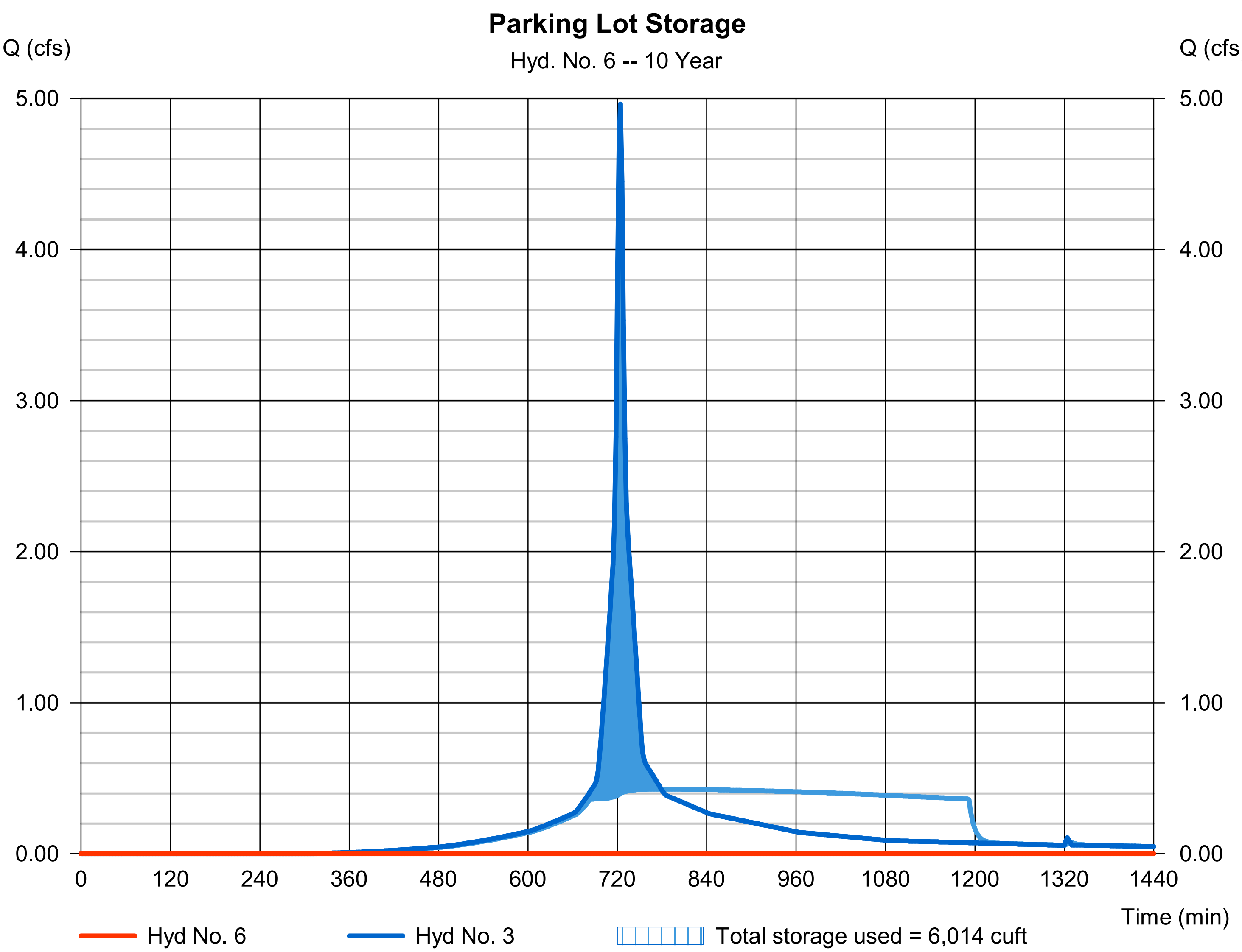
Hydrograph Report

Hyd. No. 6

Parking Lot Storage

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 580 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 3 - PR-WS-03A	Max. Elevation	= 132.70 ft
Reservoir name	= Parking Lot Detention	Max. Storage	= 6,014 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



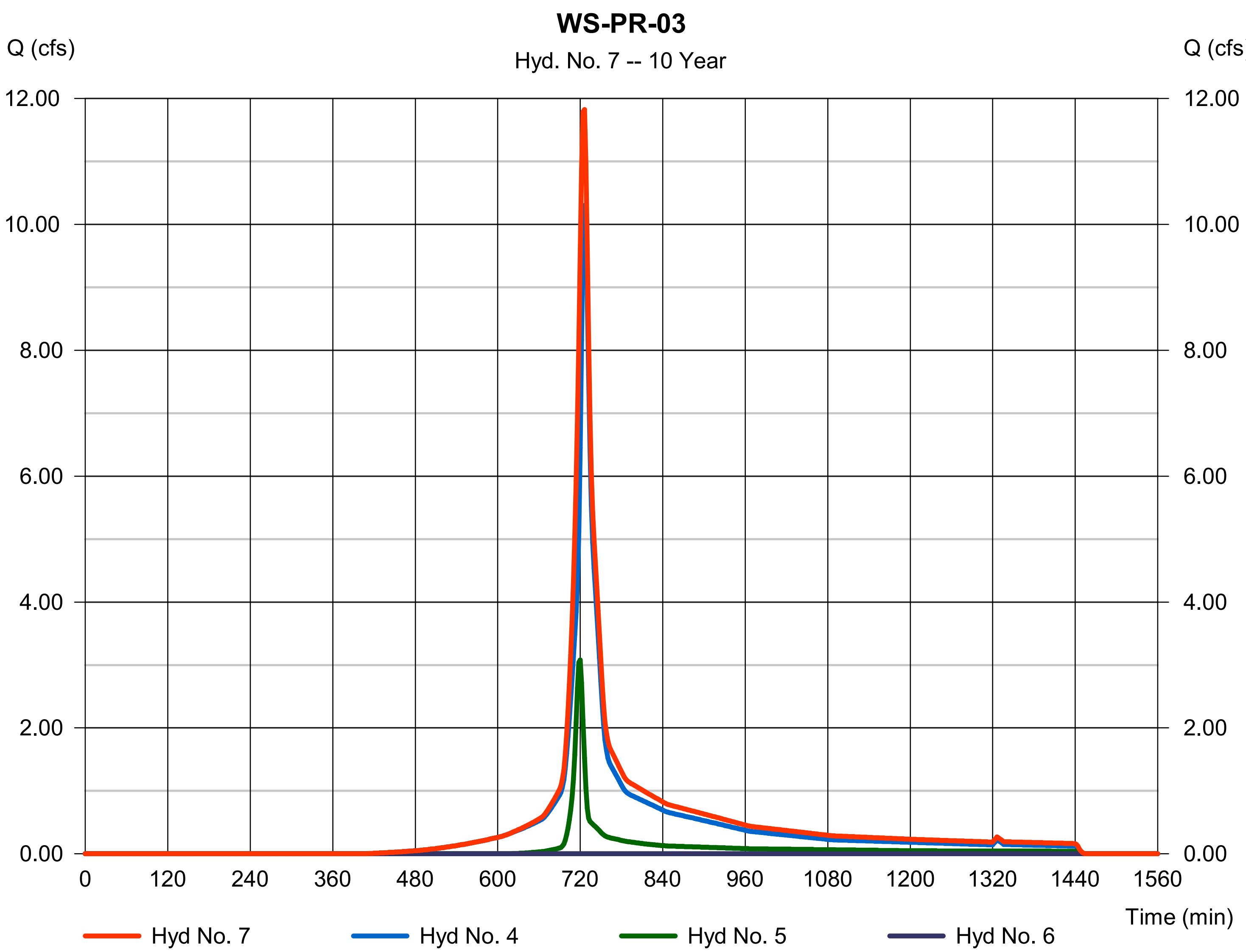
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 | Saturday, 05 / 21 / 2022

Hyd. No. 7

WS-PR-03

Hydrograph type	= Combine	Peak discharge	= 11.83 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 42,360 cuft
Inflow hyds.	= 4, 5, 6	Contrib. drain. area	= 3.817 ac



Hydrograph Summary Report

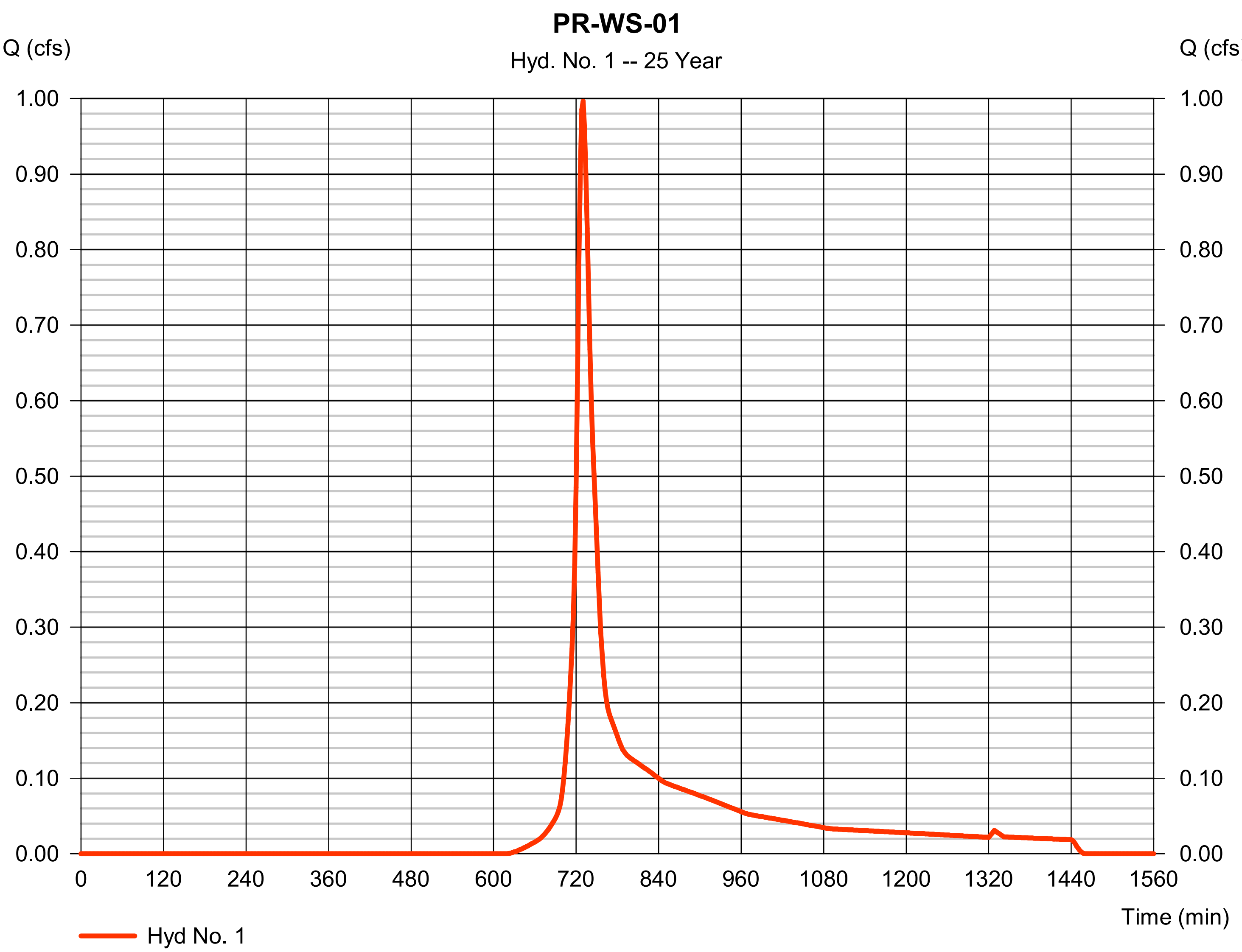
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.997	2	730	3,973	------	------	------	PR-WS-01
2	SCS Runoff	7.100	2	730	29,047	------	------	------	PR-WS-02
3	SCS Runoff	6.306	2	724	19,563	------	------	------	PR-WS-03A
4	SCS Runoff	13.46	2	726	46,453	------	------	------	PR-WS-03B
5	SCS Runoff	4.402	2	720	10,080	------	------	------	PR-WS-03C
6	Reservoir	0.000	2	618	0	3	133.25	8,312	Parking Lot Storage
7	Combine	15.66	2	724	56,533	4, 5, 6	------	------	WS-PR-03

Hydrograph Report

Hyd. No. 1

PR-WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 0.997 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 3,973 cuft
Drainage area	= 0.458 ac	Curve number	= 60.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 6.55 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



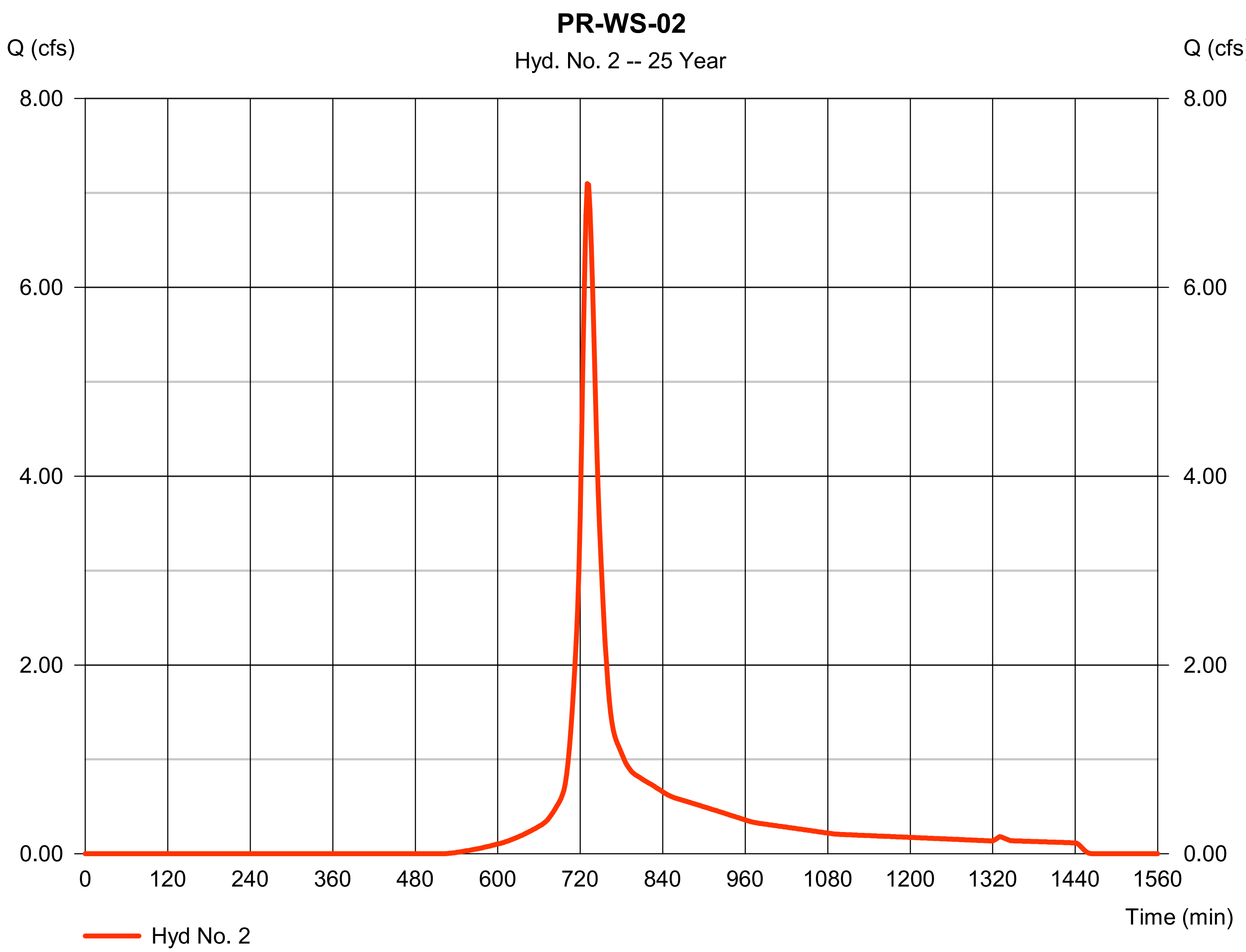
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Saturday, 05 / 21 / 2022

Hyd. No. 2

PR-WS-02

Hydrograph type	= SCS Runoff	Peak discharge	= 7.100 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 29,047 cuft
Drainage area	= 2.527 ac	Curve number	= 70
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.80 min
Total precip.	= 6.55 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

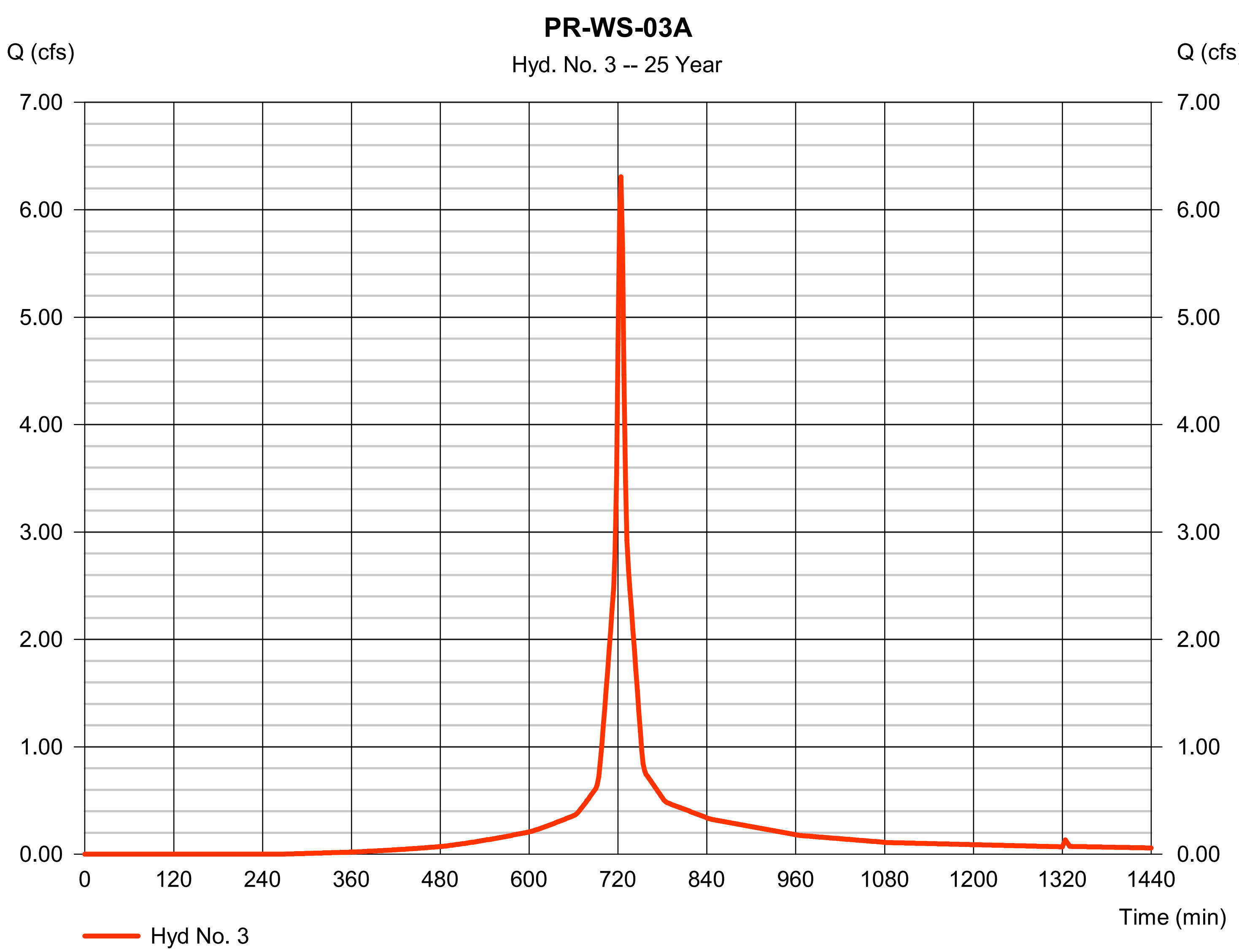


Hydrograph Report

Hyd. No. 3

PR-WS-03A

Hydrograph type	= SCS Runoff	Peak discharge	= 6.306 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 19,563 cuft
Drainage area	= 1.147 ac	Curve number	= 86.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.55 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

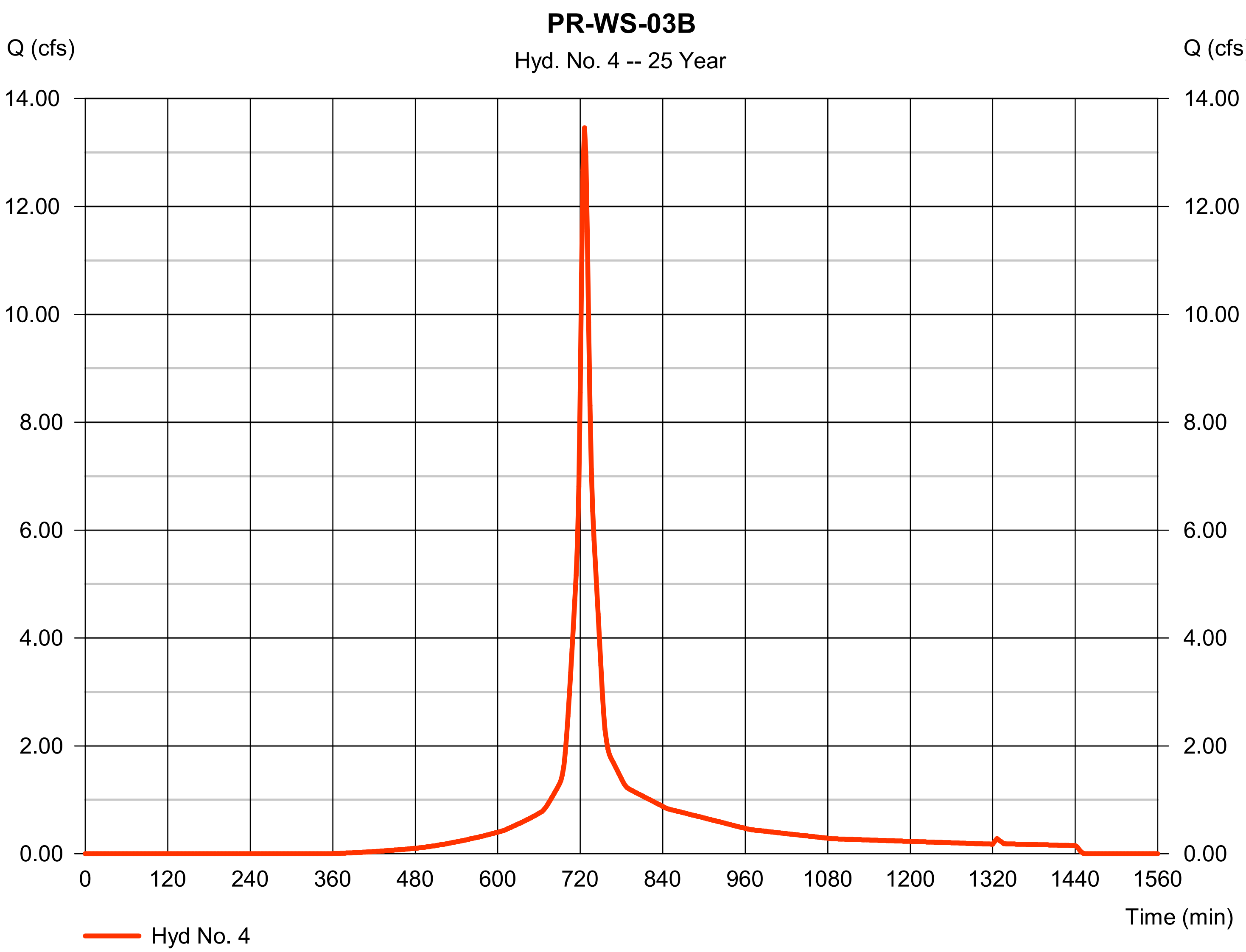


Hydrograph Report

Hyd. No. 4

PR-WS-03B

Hydrograph type	= SCS Runoff	Peak discharge	= 13.46 cfs
Storm frequency	= 25 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 46,453 cuft
Drainage area	= 2.867 ac	Curve number	= 81.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.80 min
Total precip.	= 6.55 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

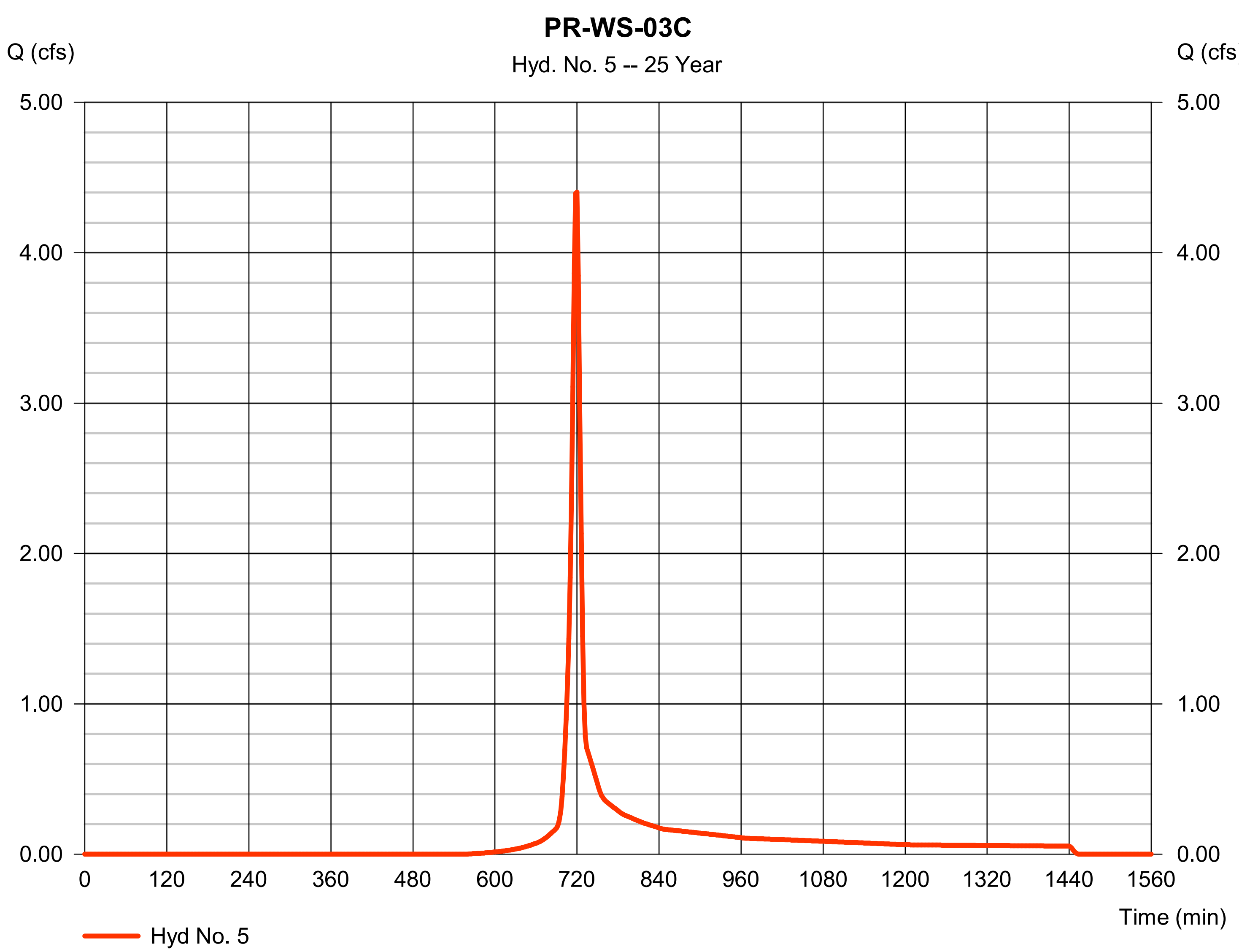


Hydrograph Report

Hyd. No. 5

PR-WS-03C

Hydrograph type	= SCS Runoff	Peak discharge	= 4.402 cfs
Storm frequency	= 25 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 10,080 cuft
Drainage area	= 0.950 ac	Curve number	= 66.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.60 min
Total precip.	= 6.55 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

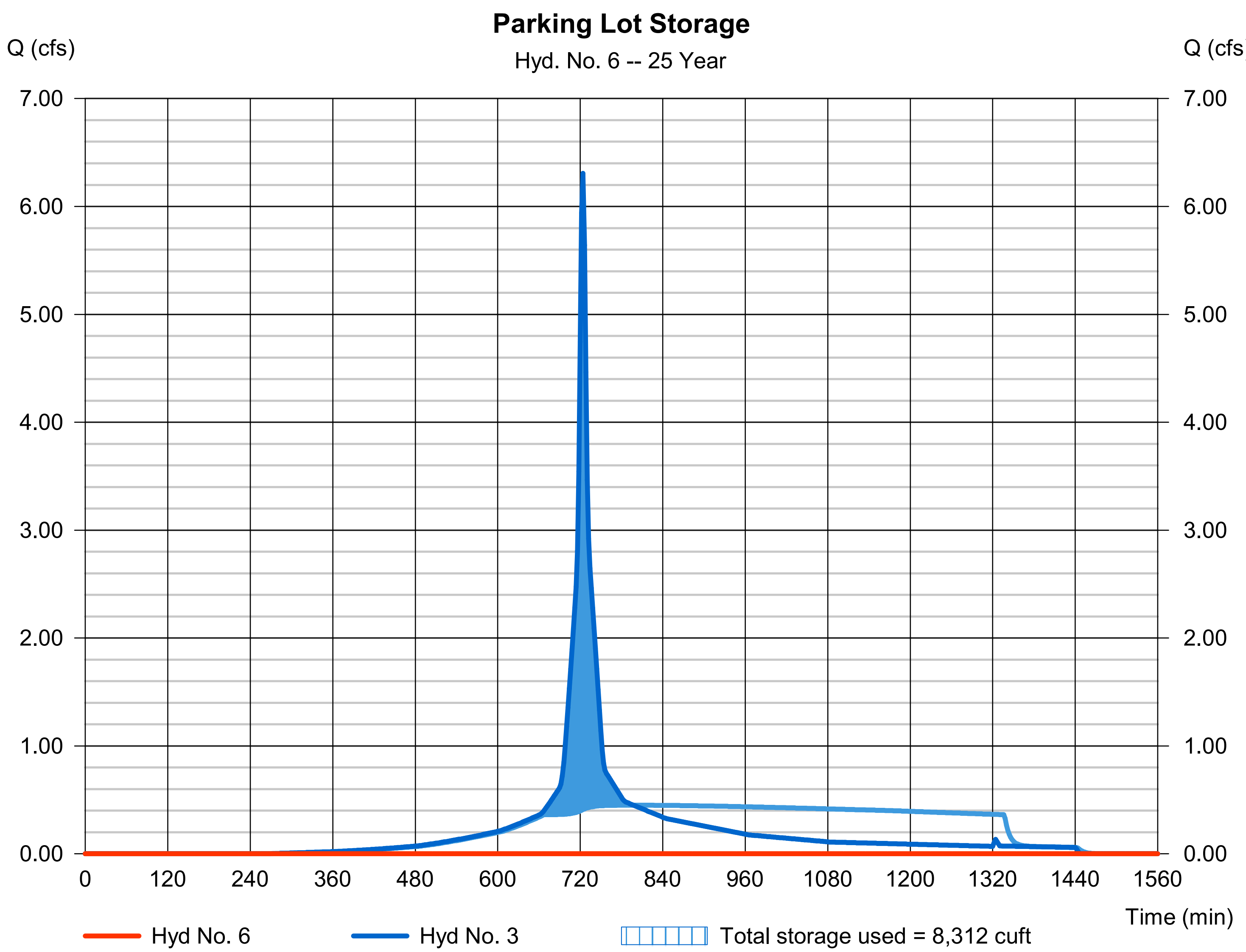
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 | Saturday, 05 / 21 / 2022

Hyd. No. 6

Parking Lot Storage

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= 618 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 3 - PR-WS-03A	Max. Elevation	= 133.25 ft
Reservoir name	= Parking Lot Detention	Max. Storage	= 8,312 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

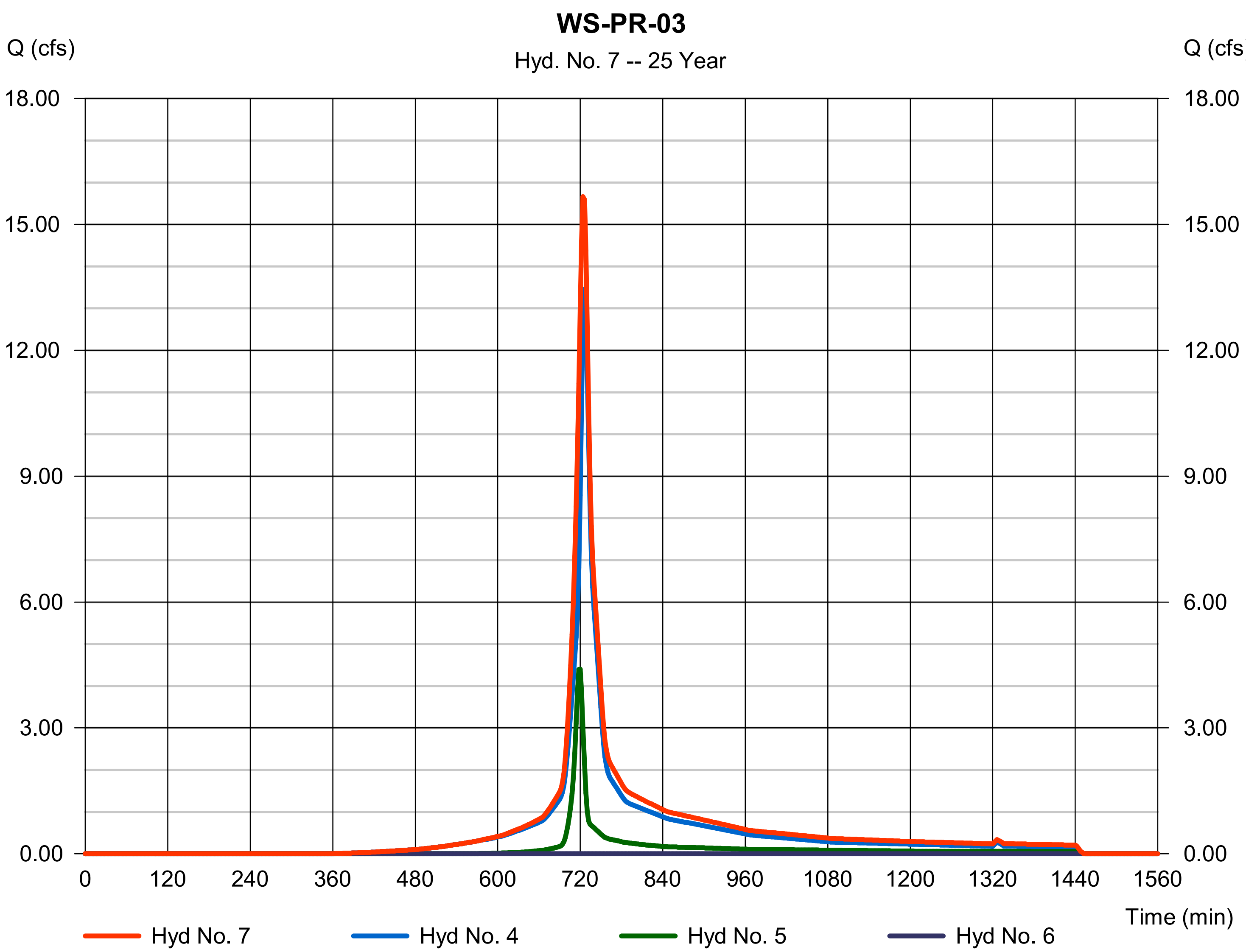


Hydrograph Report

Hyd. No. 7

WS-PR-03

Hydrograph type	= Combine	Peak discharge	= 15.66 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 56,533 cuft
Inflow hyds.	= 4, 5, 6	Contrib. drain. area	= 3.817 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

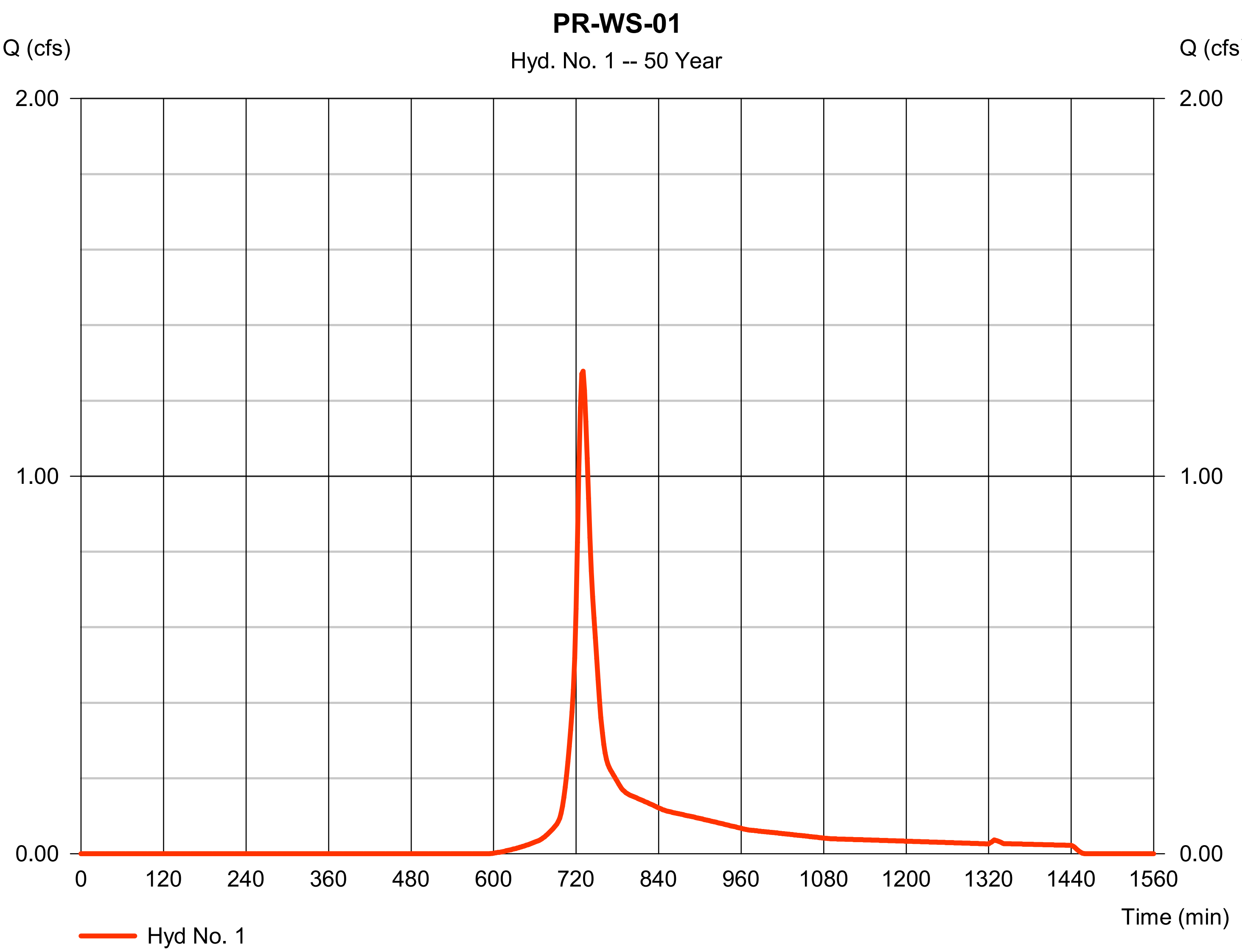
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.278	2	730	5,021	------	------	------	PR-WS-01
2	SCS Runoff	8.695	2	730	35,433	------	------	------	PR-WS-02
3	SCS Runoff	7.288	2	724	22,802	------	------	------	PR-WS-03A
4	SCS Runoff	15.79	2	726	54,818	------	------	------	PR-WS-03B
5	SCS Runoff	5.432	2	718	12,431	------	------	------	PR-WS-03C
6	Reservoir	0.000	2	598	0	3	133.69	10,128	Parking Lot Storage
7	Combine	18.55	2	724	67,249	4, 5, 6	------	------	WS-PR-03

Hydrograph Report

Hyd. No. 1

PR-WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 1.278 cfs
Storm frequency	= 50 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 5,021 cuft
Drainage area	= 0.458 ac	Curve number	= 60.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

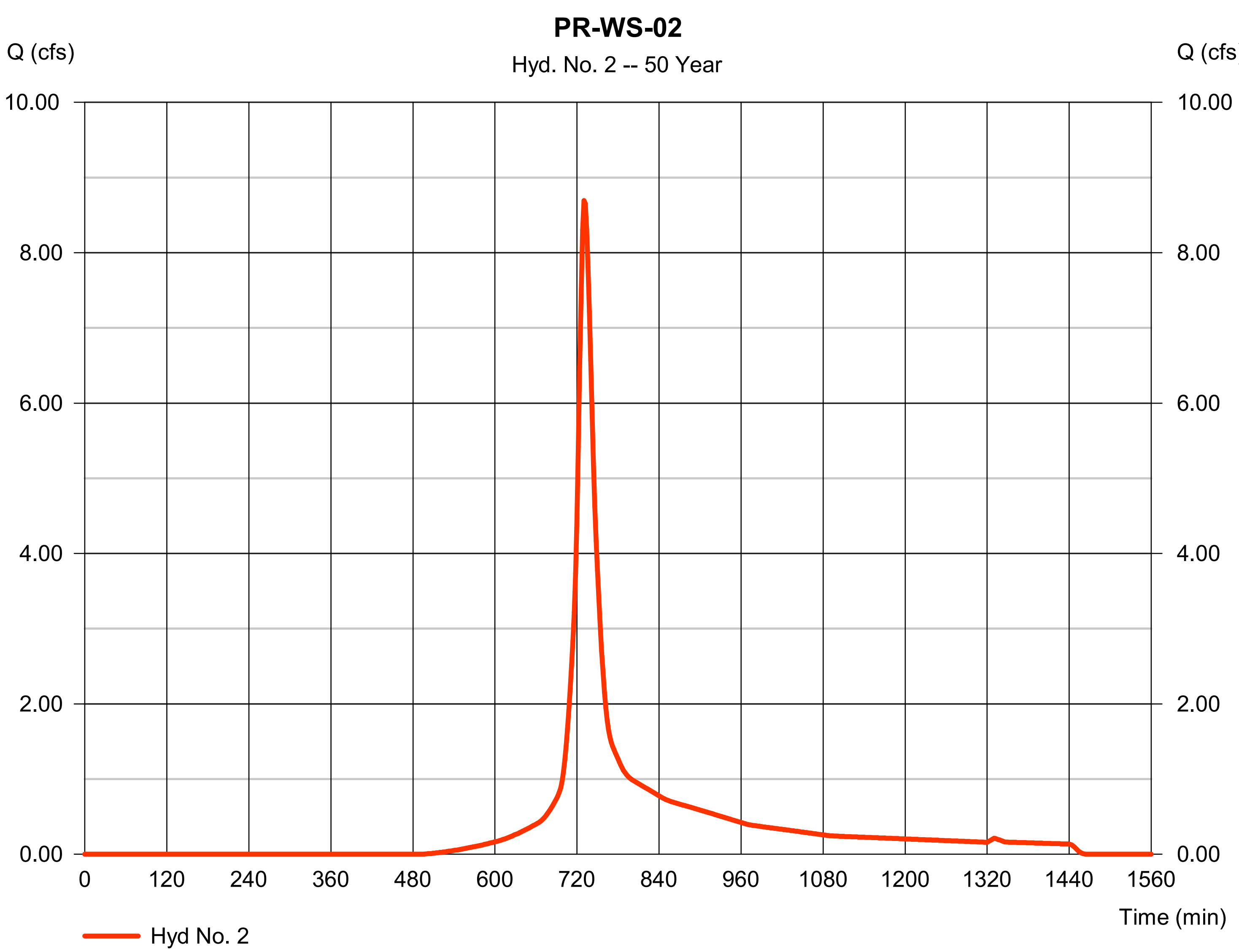


Hydrograph Report

Hyd. No. 2

PR-WS-02

Hydrograph type	= SCS Runoff	Peak discharge	= 8.695 cfs
Storm frequency	= 50 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 35,433 cuft
Drainage area	= 2.527 ac	Curve number	= 70
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.80 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

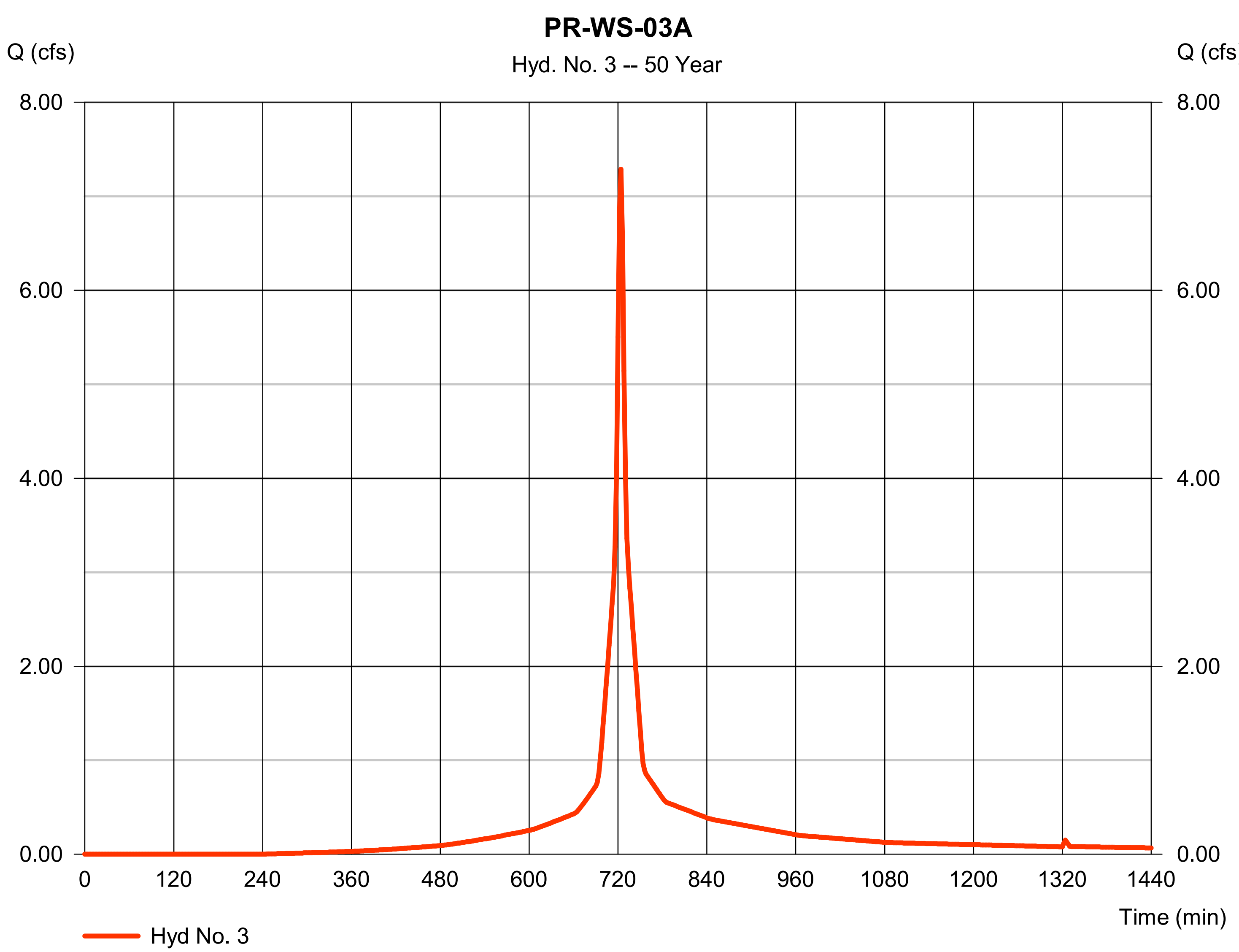


Hydrograph Report

Hyd. No. 3

PR-WS-03A

Hydrograph type	= SCS Runoff	Peak discharge	= 7.288 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 22,802 cuft
Drainage area	= 1.147 ac	Curve number	= 86.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



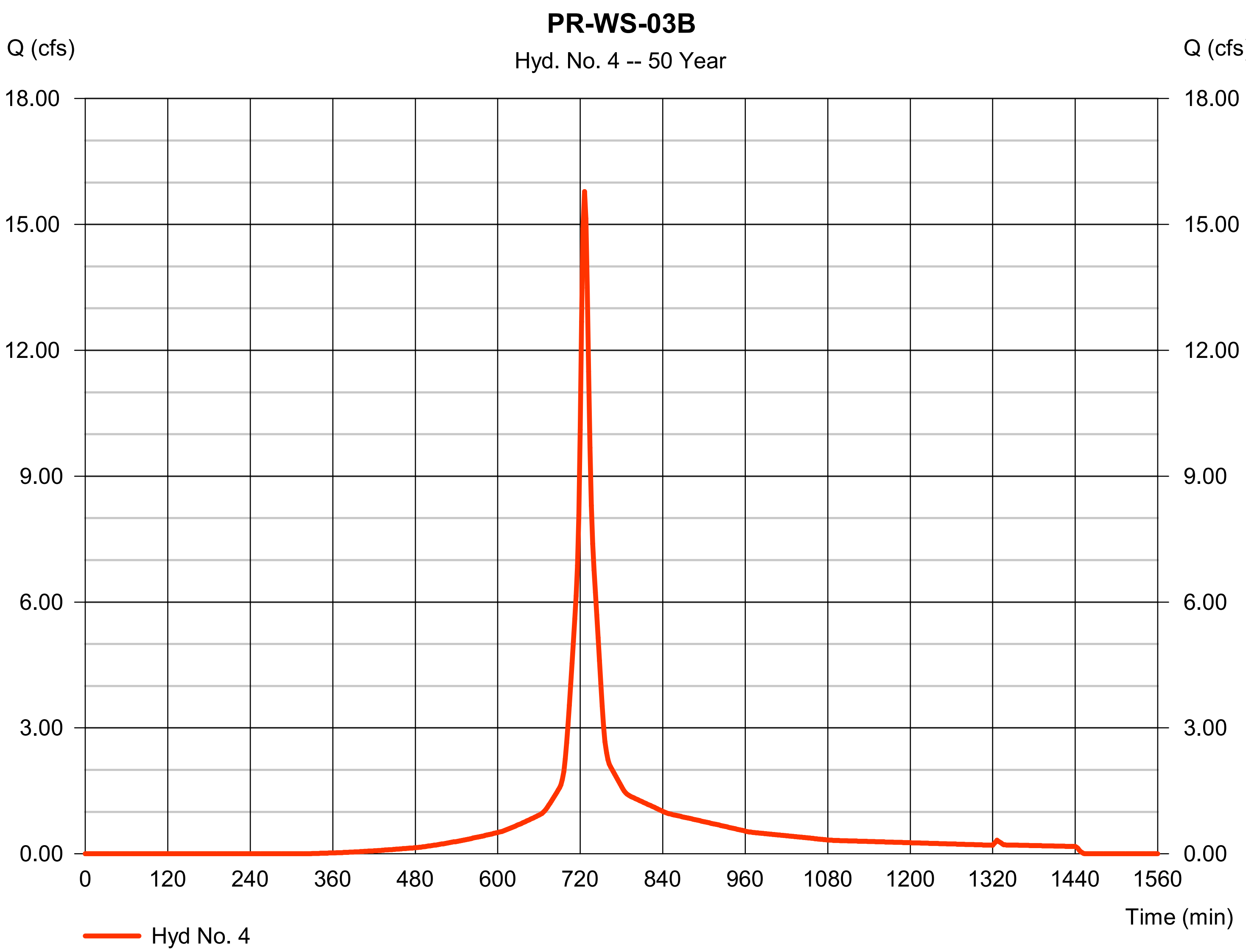
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Saturday, 05 / 21 / 2022

Hyd. No. 4

PR-WS-03B

Hydrograph type	= SCS Runoff	Peak discharge	= 15.79 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 54,818 cuft
Drainage area	= 2.867 ac	Curve number	= 81.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.80 min
Total precip.	= 7.41 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



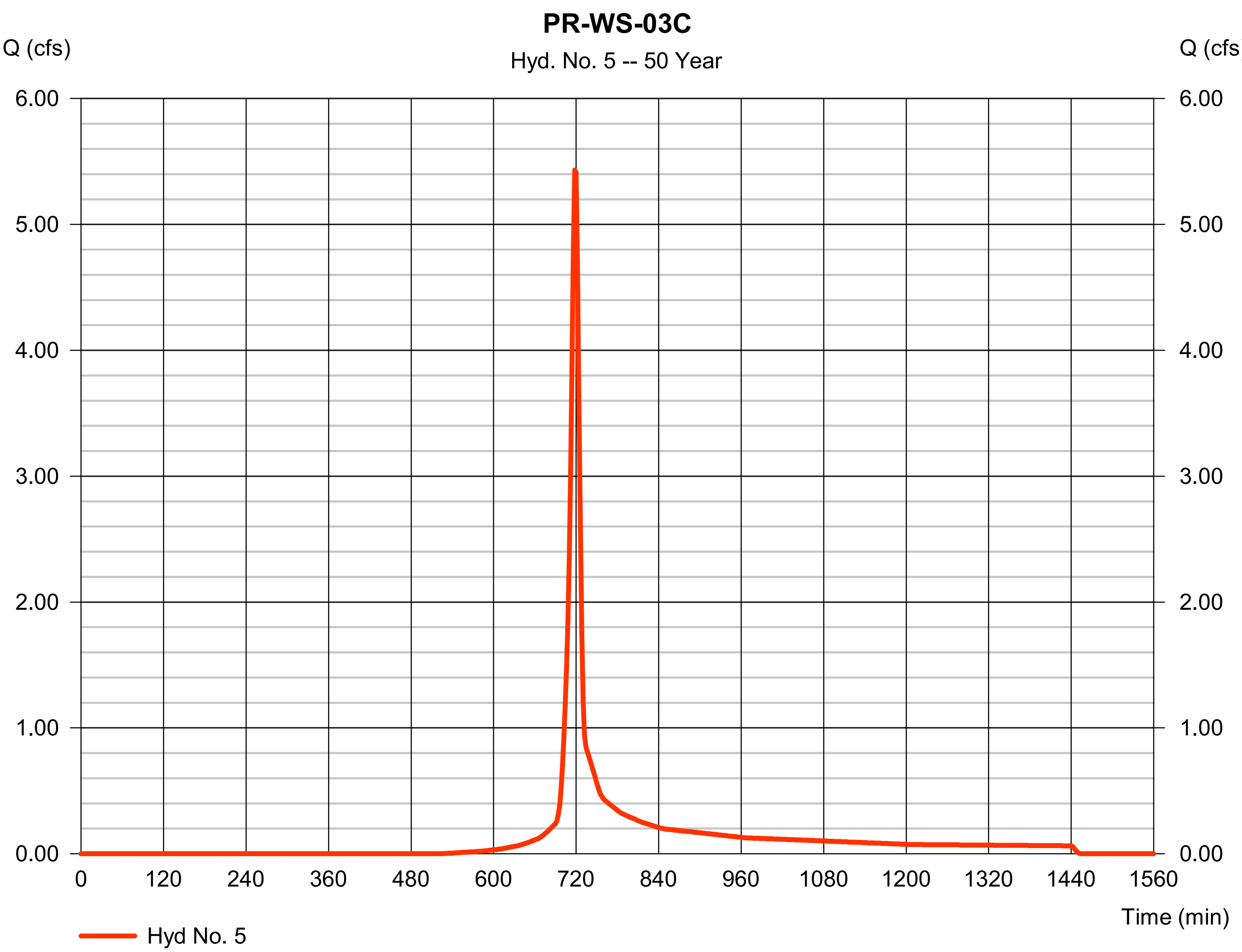
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Saturday, 05 / 21 / 2022

Hyd. No. 5

PR-WS-03C

Hydrograph type	= SCS Runoff	Peak discharge	= 5.432 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 12,431 cuft
Drainage area	= 0.950 ac	Curve number	= 66.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.60 min
Total precip.	= 7.41 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



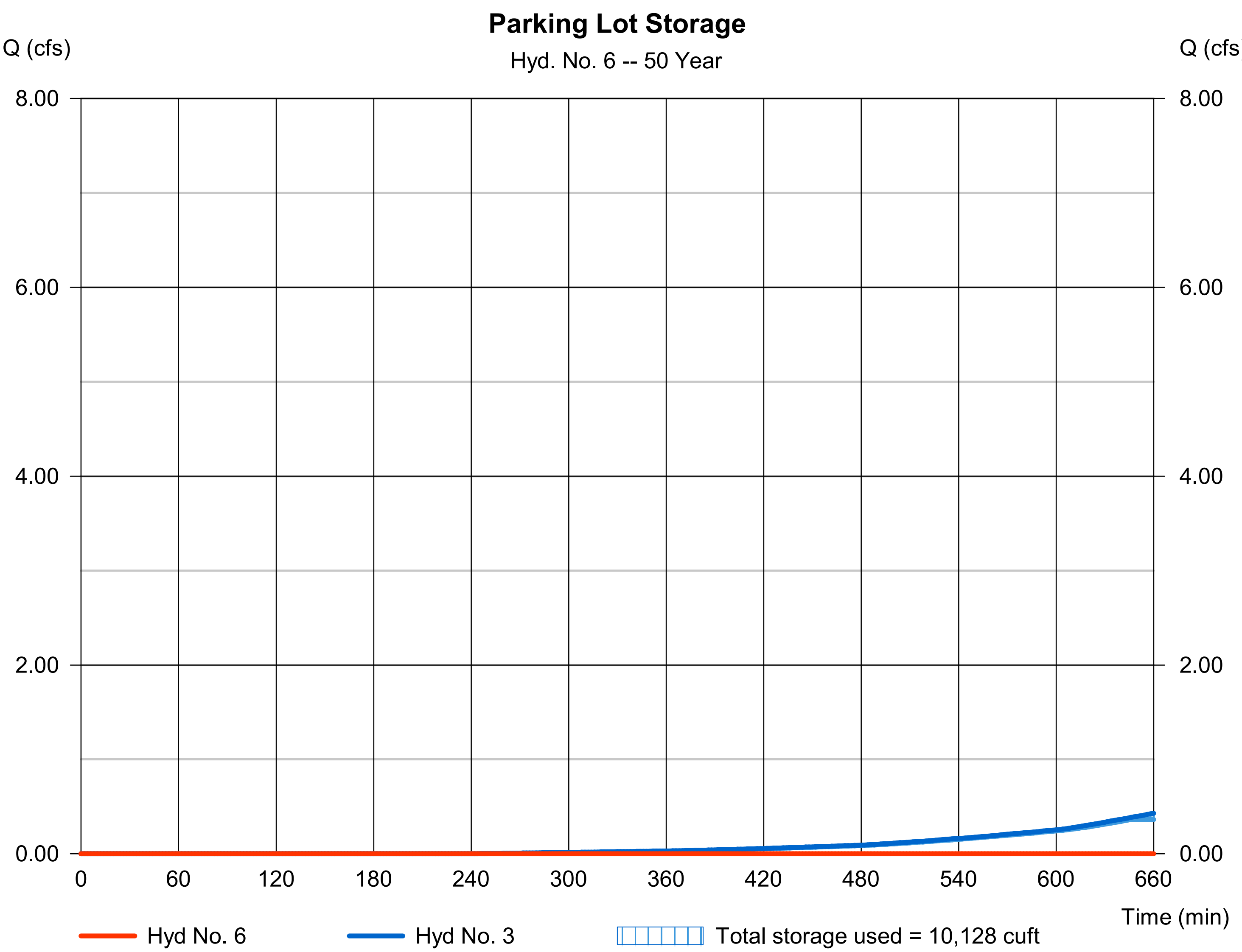
Hydrograph Report

Hyd. No. 6

Parking Lot Storage

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 50 yrs	Time to peak	= 598 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 3 - PR-WS-03A	Max. Elevation	= 133.69 ft
Reservoir name	= Parking Lot Detention	Max. Storage	= 10,128 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

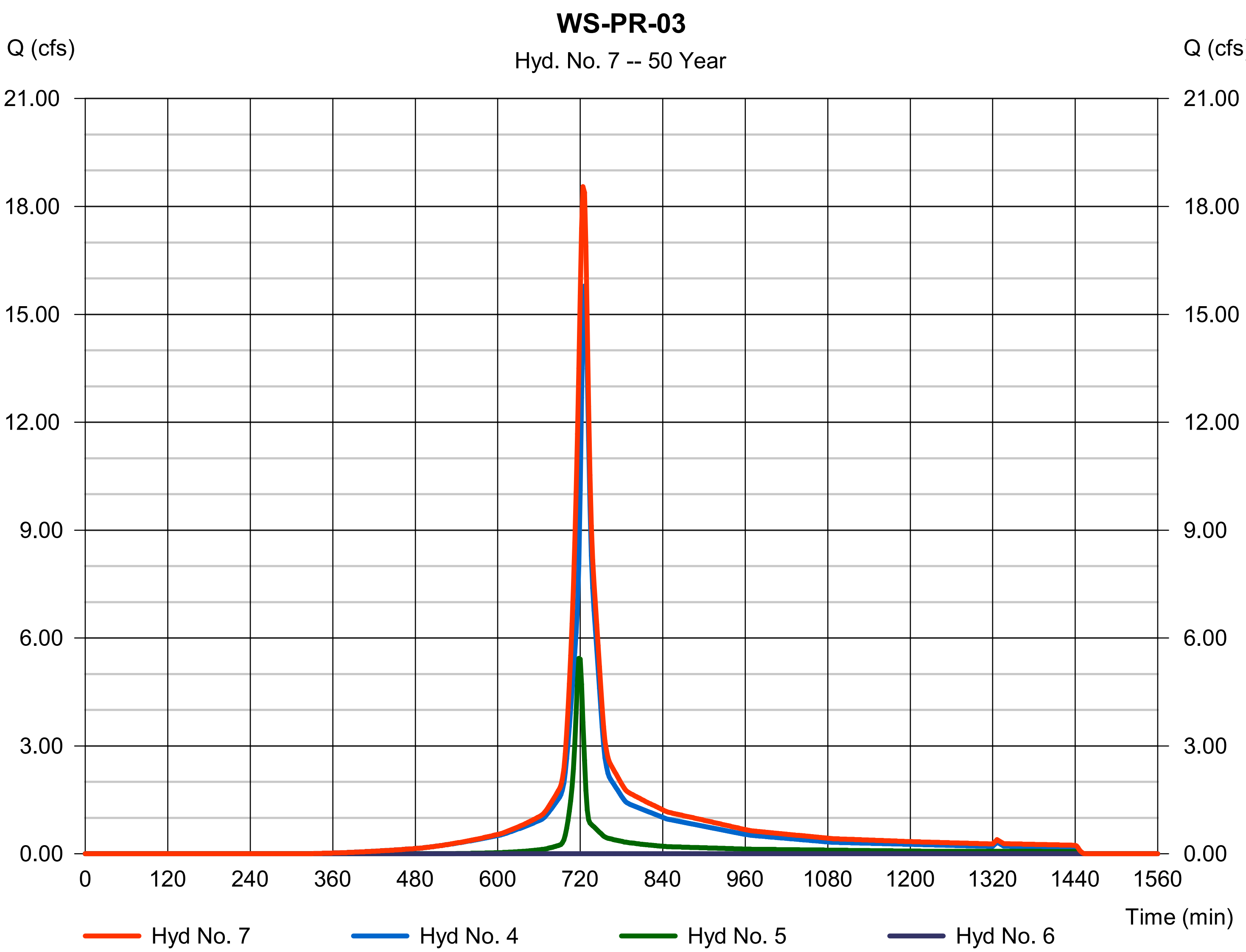


Hydrograph Report

Hyd. No. 7

WS-PR-03

Hydrograph type	= Combine	Peak discharge	= 18.55 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 67,249 cuft
Inflow hyds.	= 4, 5, 6	Contrib. drain. area	= 3.817 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.596	2	730	6,215	------	------	------	PR-WS-01
2	SCS Runoff	10.46	2	730	42,553	------	------	------	PR-WS-02
3	SCS Runoff	8.346	2	724	26,329	------	------	------	PR-WS-03A
4	SCS Runoff	18.31	2	726	63,976	------	------	------	PR-WS-03B
5	SCS Runoff	6.586	2	718	15,069	------	------	------	PR-WS-03C
6	Reservoir	0.000	2	572	0	3	134.19	12,198	Parking Lot Storage
7	Combine	21.68	2	724	79,046	4, 5, 6	------	------	WS-PR-03

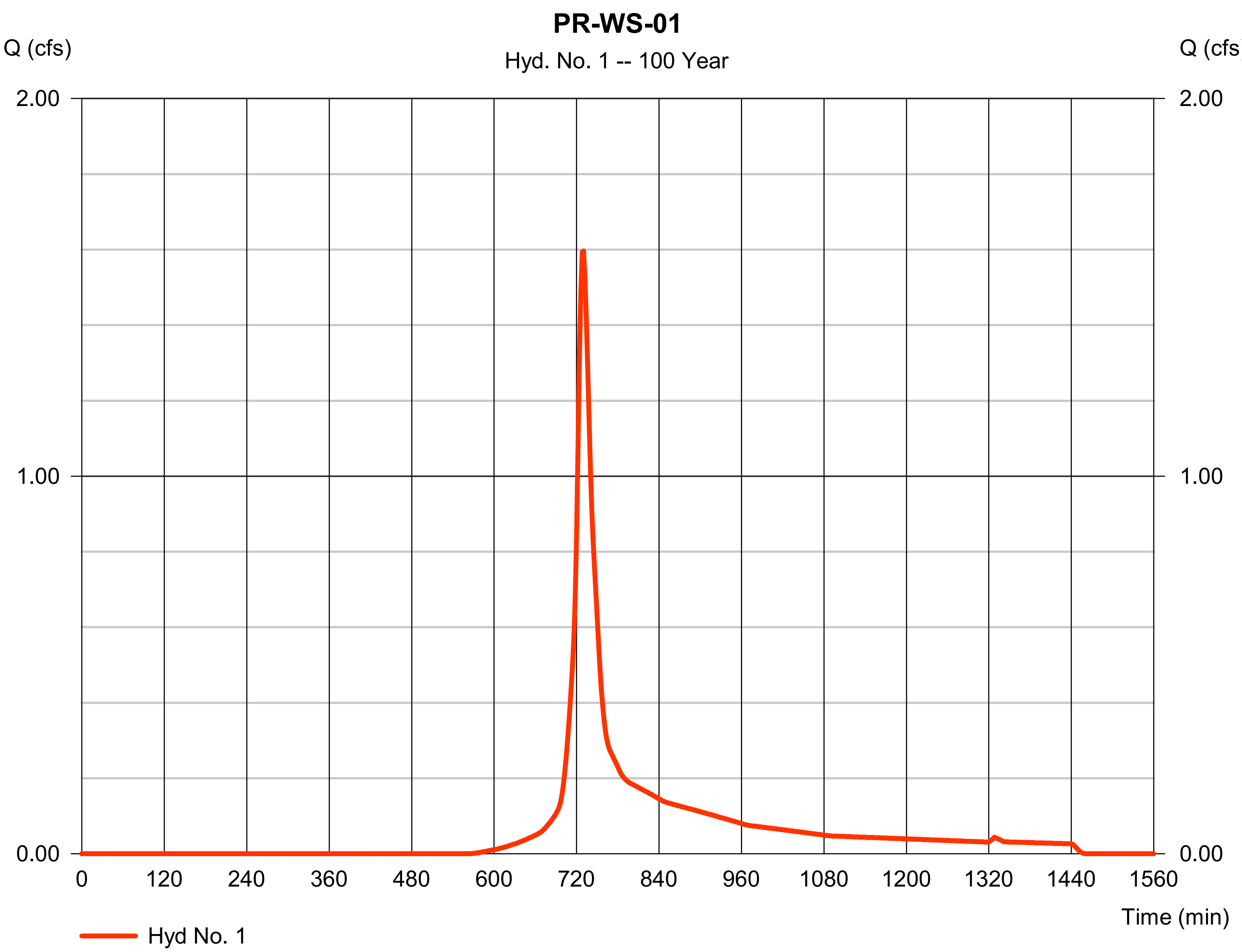
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 | Saturday, 05 / 21 / 2022

Hyd. No. 1

PR-WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 1.596 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 6,215 cuft
Drainage area	= 0.458 ac	Curve number	= 60.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

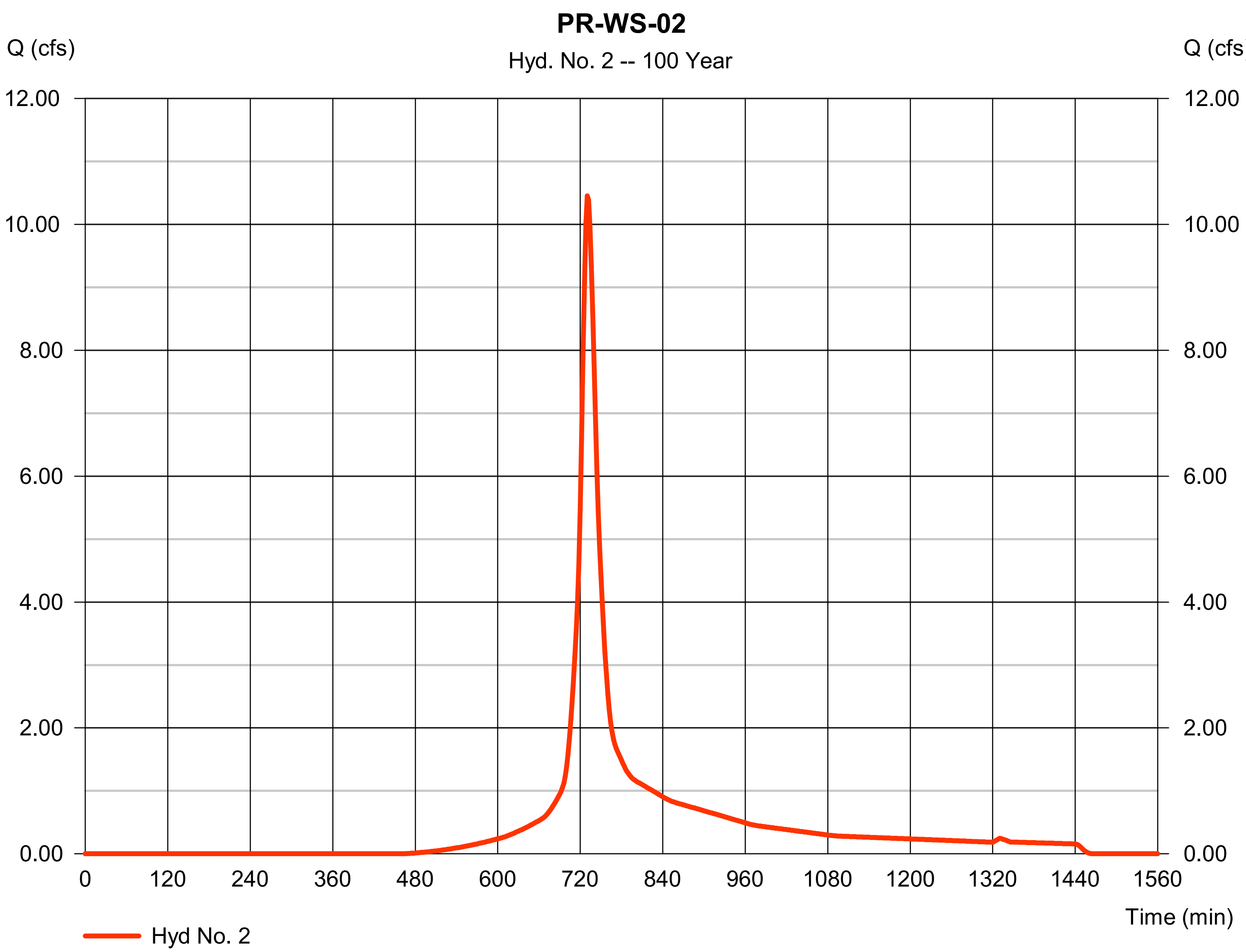


Hydrograph Report

Hyd. No. 2

PR-WS-02

Hydrograph type	= SCS Runoff	Peak discharge	= 10.46 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 42,553 cuft
Drainage area	= 2.527 ac	Curve number	= 70
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.80 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

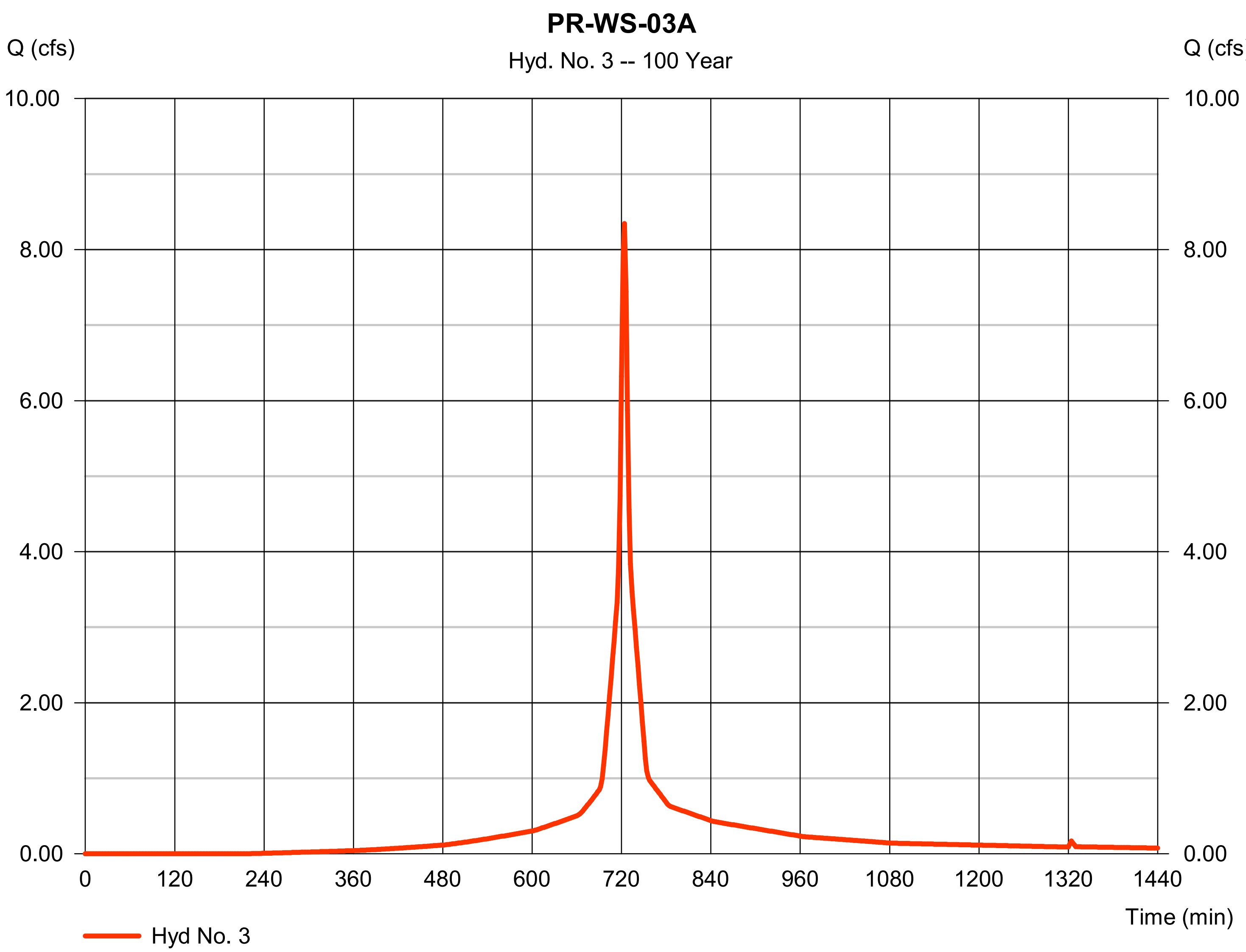


Hydrograph Report

Hyd. No. 3

PR-WS-03A

Hydrograph type	= SCS Runoff	Peak discharge	= 8.346 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 26,329 cuft
Drainage area	= 1.147 ac	Curve number	= 86.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



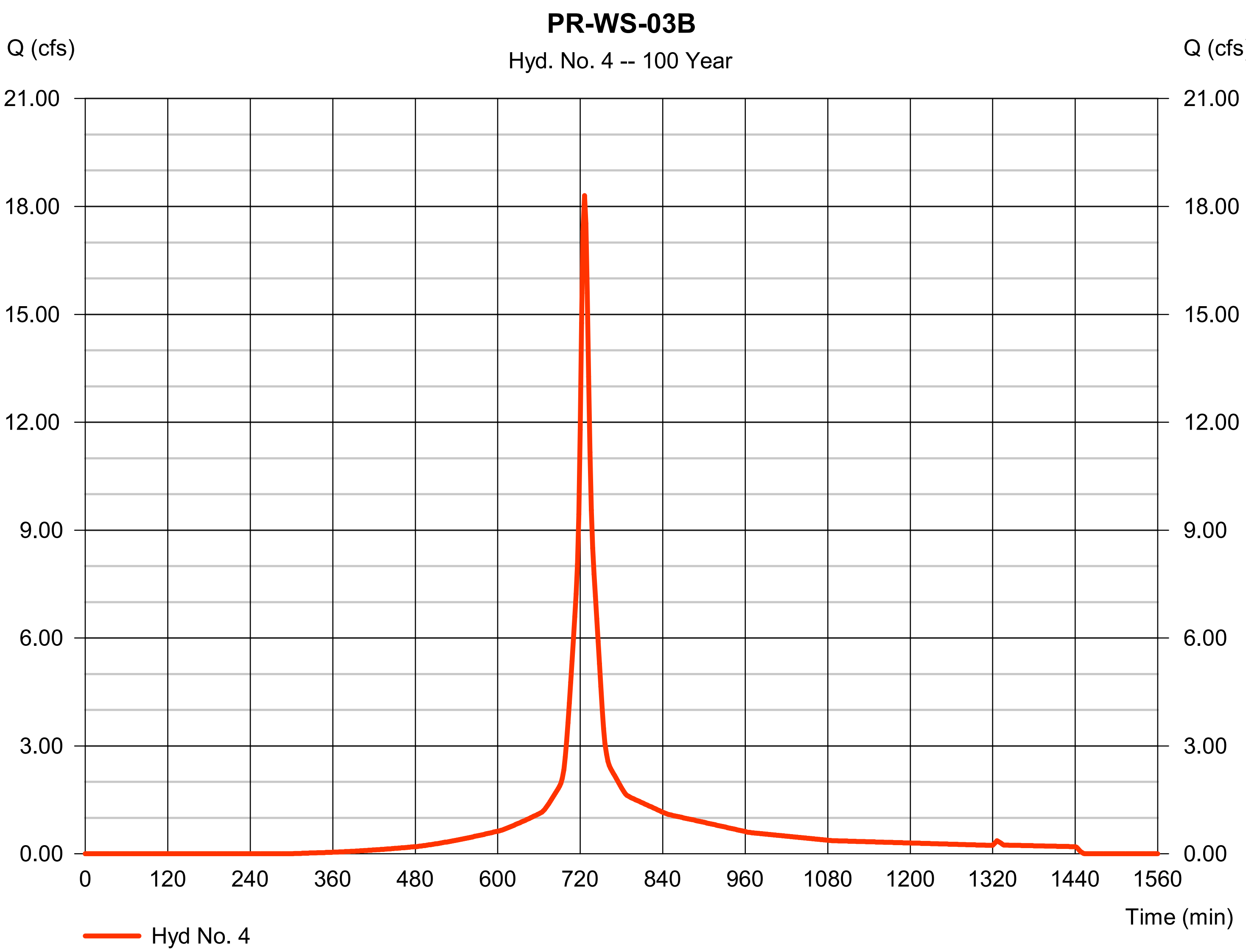
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Saturday, 05 / 21 / 2022

Hyd. No. 4

PR-WS-03B

Hydrograph type	= SCS Runoff	Peak discharge	= 18.31 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 63,976 cuft
Drainage area	= 2.867 ac	Curve number	= 81.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.80 min
Total precip.	= 8.34 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

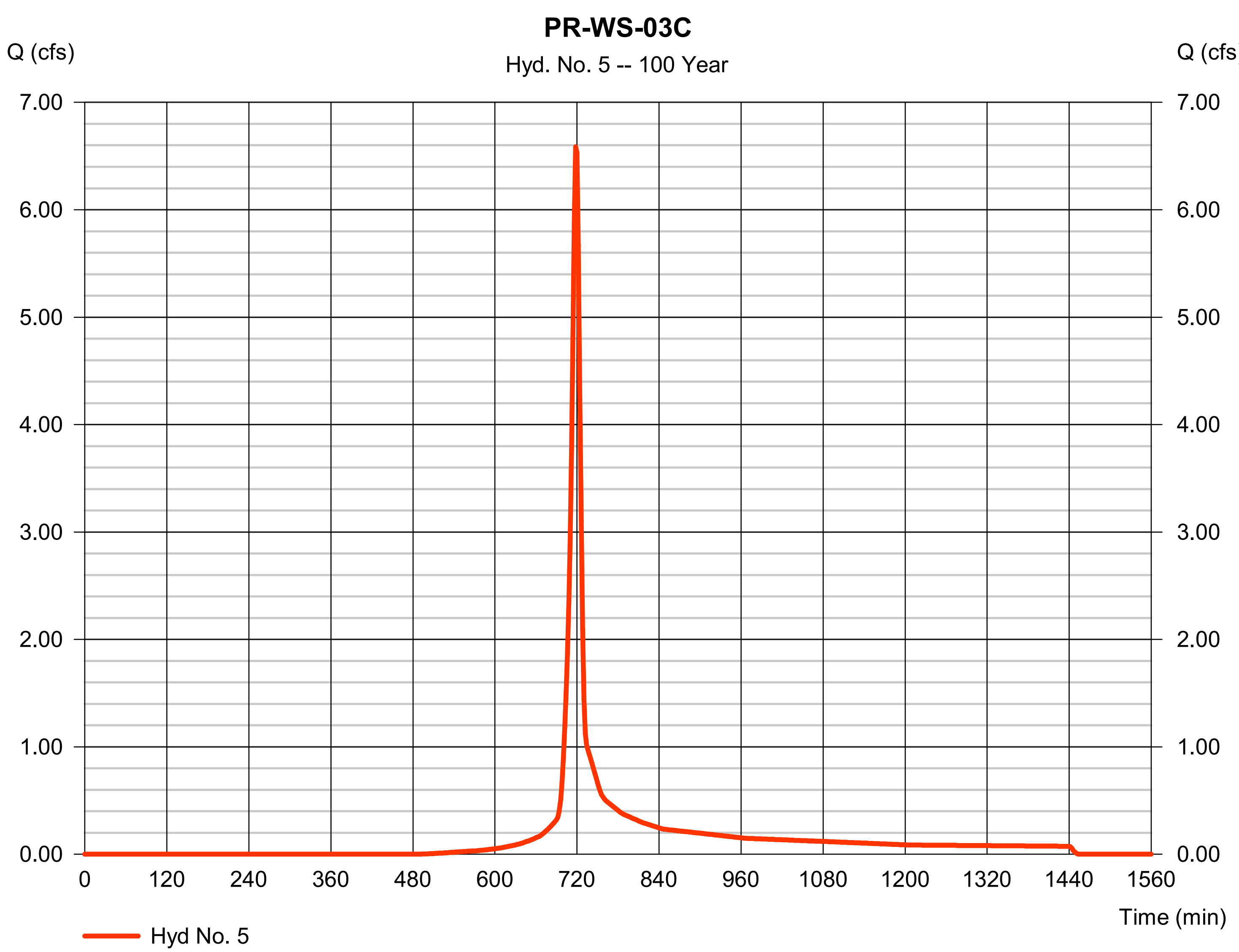


Hydrograph Report

Hyd. No. 5

PR-WS-03C

Hydrograph type	= SCS Runoff	Peak discharge	= 6.586 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 15,069 cuft
Drainage area	= 0.950 ac	Curve number	= 66.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.60 min
Total precip.	= 8.34 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

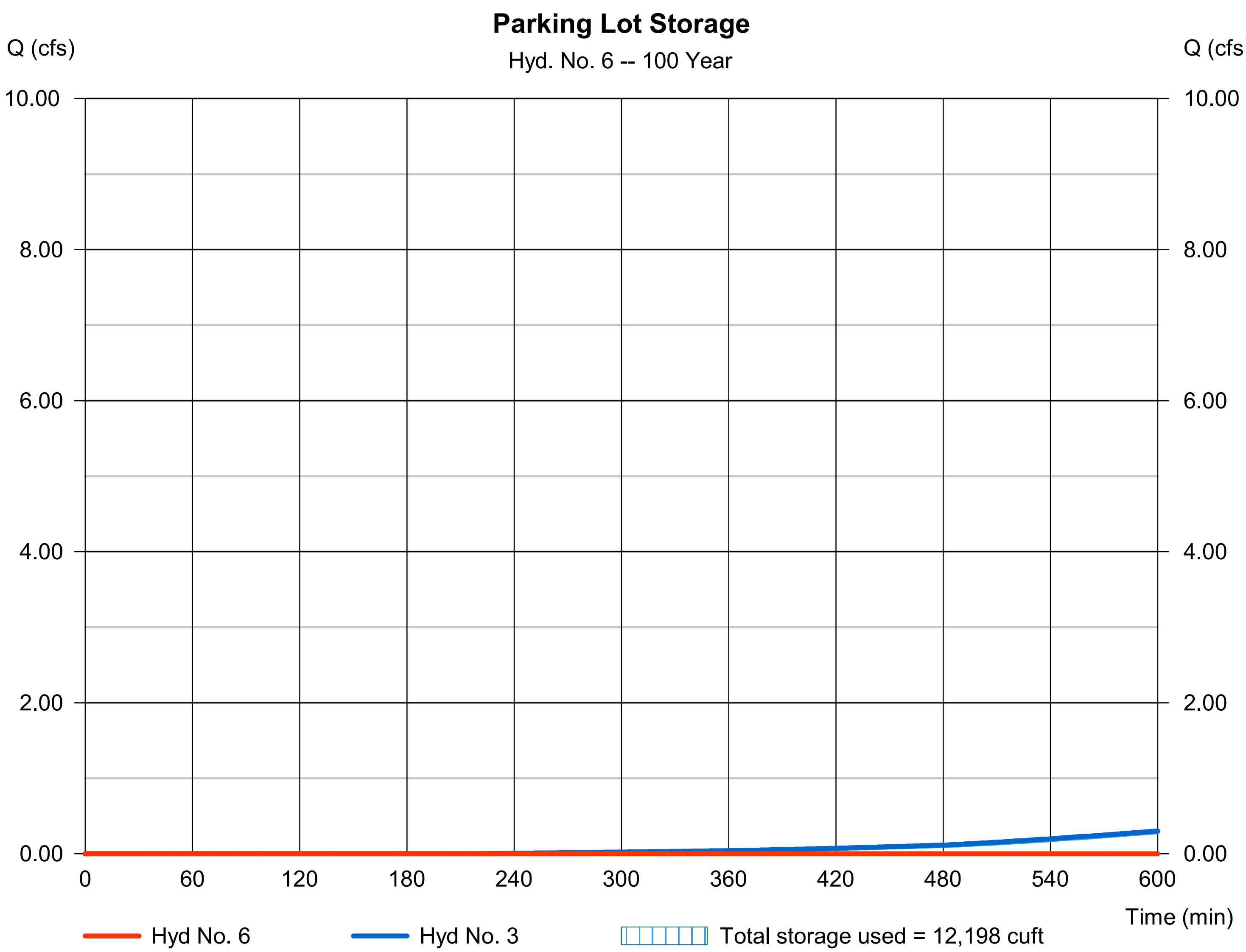
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Saturday, 05 / 21 / 2022

Hyd. No. 6

Parking Lot Storage

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 100 yrs	Time to peak	= 572 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 3 - PR-WS-03A	Max. Elevation	= 134.19 ft
Reservoir name	= Parking Lot Detention	Max. Storage	= 12,198 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



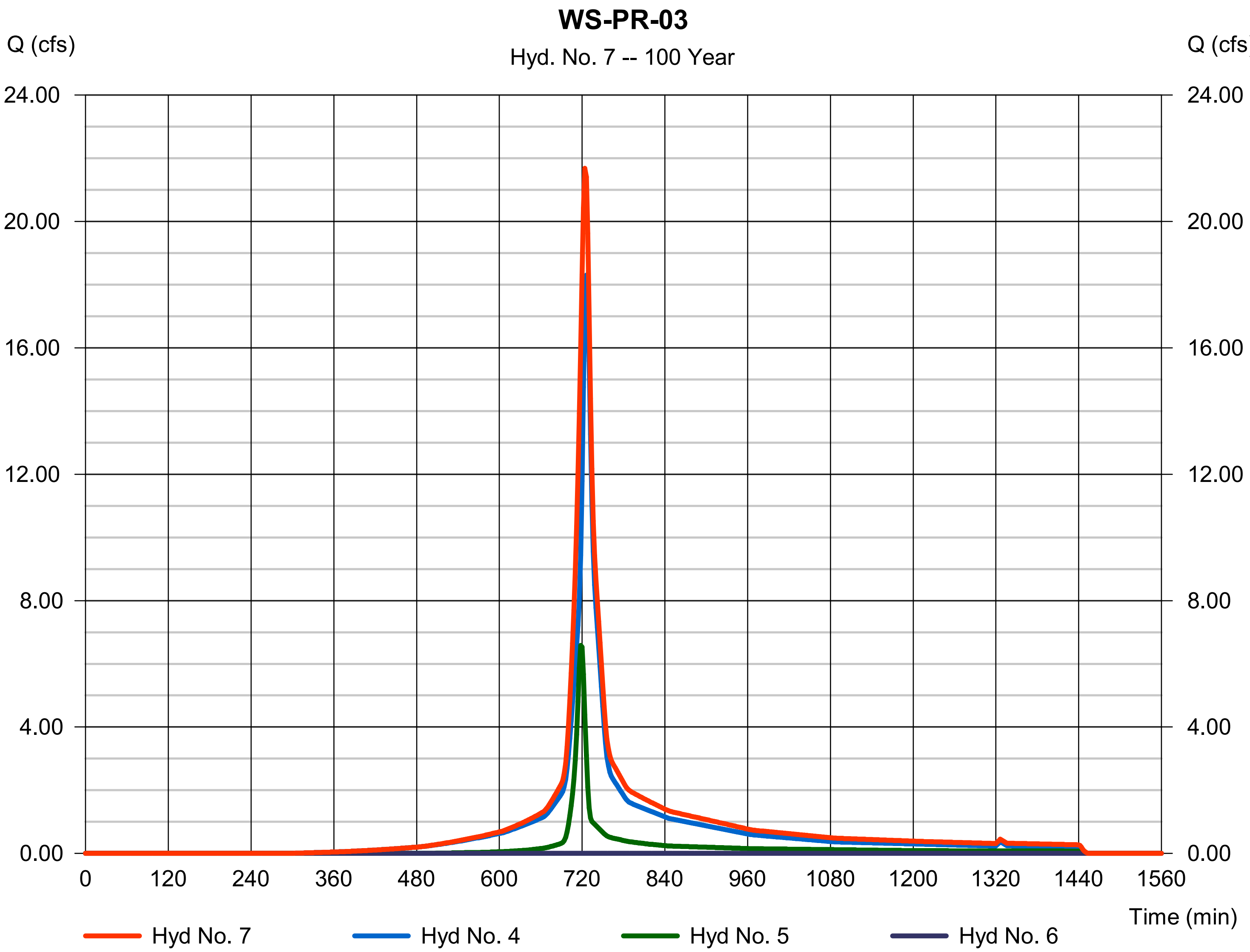
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 — Saturday, 05 / 21 / 2022

Hyd. No. 7

WS-PR-03

Hydrograph type	= Combine	Peak discharge	= 21.68 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 79,046 cuft
Inflow hyds.	= 4, 5, 6	Contrib. drain. area	= 3.817 ac



APPENDIX D

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **CB-01**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.151	0.90	0.136
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.016	0.30	0.005
	0.167		0.140

Weighted C: 0.84

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	300	0.006	6.0

Total Tc: 6.0

Designation: **CB-02**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.172	0.90	0.155
Gravel	0.024	0.70	0.017
Wooded	0.029	0.45	0.013
Landscaped and Lawns	0.007	0.30	0.002
	0.232		0.187

Weighted C: 0.81

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	300	0.006	6.0

Total Tc: 6.0

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **CB-03**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.037	0.90	0.033
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.005	0.30	0.002
	0.042		0.035

Weighted C: 0.82

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	118	0.005	3.0

Total Tc: 3.0
Minimum Tc: 5.0

Designation: **CB-04**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.026	0.90	0.023
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.000	0.30	0.000
	0.026		0.023

Weighted C: 0.90

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	89	0.005	2.4

Total Tc: 2.4
Minimum Tc: 5.0

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **CB-05**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.072	0.90	0.065
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.008	0.30	0.002
	0.080		0.067

Weighted C: 0.84

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	149	0.015	2.4

Total Tc: 2.4
Minimum Tc: 5.0

Designation: **CB-06**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.138	0.90	0.124
Gravel	0.027	0.70	0.019
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.000	0.30	0.000
	0.165		0.143

Weighted C: 0.87

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	69	0.261	5.6
Segment B - C	0.015	21	0.381	0.1
Segment C - D	0.015	81	0.015	1.4

Total Tc: 7.2

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **CB-07**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.122	0.90	0.110
Gravel	0.045	0.70	0.032
Wooded	0.209	0.45	0.094
Landscaped and Lawns	0.000	0.30	0.000
	0.376		0.236

Weighted C: 0.63

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	127	0.472	7.2
Segment B - C	0.015	25	0.400	0.2
Segment C - D	0.015	81	0.037	1.0

Total Tc: 8.4

Designation: **CB-08**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.037	0.90	0.033
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.007	0.30	0.002
	0.044		0.035

Weighted C: 0.81

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	105	0.029	1.4

Total Tc: 1.4
Minimum Tc: 5.0

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **CB-09**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.088	0.90	0.079
Gravel	0.000	0.70	0.000
Wooded	0.252	0.45	0.113
Landscaped and Lawns	0.010	0.30	0.003
	0.350		0.196

Weighted C: 0.56

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	151	0.46	8.4
Segment B - C	0.015	40	0.05	0.5

Total Tc: 8.9

Designation: **CB-10**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.060	0.90	0.054
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.000	0.30	0.000
	0.060		0.054

Weighted C: 0.90

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	163	0.047	1.6

Total Tc: 1.6
Minimum Tc: 5.0

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **CB-11**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.158	0.90	0.142
Gravel	0.000	0.70	0.000
Wooded	0.091	0.45	0.041
Landscaped and Lawns	0.010	0.30	0.003
	0.259		0.186

Weighted C: 0.72

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	39	0.103	5.2
Segment B - C	0.015	226	0.071	1.8

Total Tc: 6.9

Designation: **CB-12**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.059	0.90	0.053
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.017	0.30	0.005
	0.076		0.058

Weighted C: 0.76

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	161	1	0.5

Total Tc: 0.5
Minimum Tc: 5.0

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **CB-13**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.087	0.90	0.079
Gravel	0.000	0.70	0.000
Wooded	0.002	0.45	0.001
Landscaped and Lawns	0.008	0.30	0.002
	0.097		0.082

Weighted C: 0.84

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	168	0.071	1.4

Designation: **CB-14**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.051	0.90	0.046
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.000	0.30	0.000
	0.051		0.046

Weighted C: 0.90

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	142	1	0.4

Total Tc: 0.4
Minimum Tc: 5.0

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Engineers | Environmental Specialists

Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **CB-15**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.058	0.90	0.053
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.008	0.30	0.002
	0.066		0.055

Weighted C: 0.83

Time of Concentration
(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	114	0.061	1.1

Total Tc: 1.1
Minimum Tc: 5.0

Designation: **CB-16**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.052	0.90	0.047
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.023	0.30	0.007
	0.075		0.053

Weighted C: 0.71

Time of Concentration
(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	25	0.400	1.4
Segment B - C	0.015	96	0.052	1.0

Total Tc: 2.4
Minimum Tc: 5.0

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Tighe&Bond
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Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **CB-17**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.049	0.90	0.044
Gravel	0.000	0.70	0.000
Wooded	0.191	0.45	0.086
Landscaped and Lawns	0.038	0.30	0.011
	0.277		0.141

Weighted C: 0.51

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.015	118	0.034	1.4

Total Tc: 1.4
Minimum Tc: 5.0

Designation: **CB-18**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.056	0.90	0.051
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.000	0.30	0.000
	0.056		0.051

Weighted C: 0.90

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.4	132	0.106	13.6

Total Tc: 13.6

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **SW-01**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.000	0.90	0.000
Gravel	0.000	0.70	0.000
Wooded	0.200	0.45	0.090
Landscaped and Lawns	0.000	0.30	0.000
	0.200		0.090

Weighted C: 0.45

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.4	127	0.409	7.7

Total Tc: 7.7

Designation: **YD-01**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.205	0.90	0.184
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.081	0.30	0.024
	0.285		0.208

Weighted C: 0.73

Time of Concentration

(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	Surface "n"	Flow Length (ft.)	Slope (ft/ft)	Time (min.)
Segment A - B	0.015	121	0.005	3.1
Segment B - C	0.24	20	0.050	2.7

Total Tc: 5.8

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

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Project Name: **Campus Traffic Flow Safety Improvements**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Proposed C & Tc Calculations**
Prepared By: **NDG** Date: **March 20, 2022**

Designation: **YD-02**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.000	0.90	0.000
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.046	0.30	0.014
	0.046		0.014

Weighted C: 0.30

Time of Concentration
(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	25	0.500	1.3
Segment B - C	0.24	90	0.067	8.0

Total Tc: 9.2

Designation: **YD-03**

Cover Type	Area, ac	Coef.	A x C
Hardscape/Rock	0.000	0.90	0.000
Gravel	0.000	0.70	0.000
Wooded	0.000	0.45	0.000
Landscaped and Lawns	0.078	0.30	0.023
	0.078		0.023

Weighted C: 0.30

Time of Concentration
(computed in accordance with ConnDOT Drainage Manual, Sec. 6C)

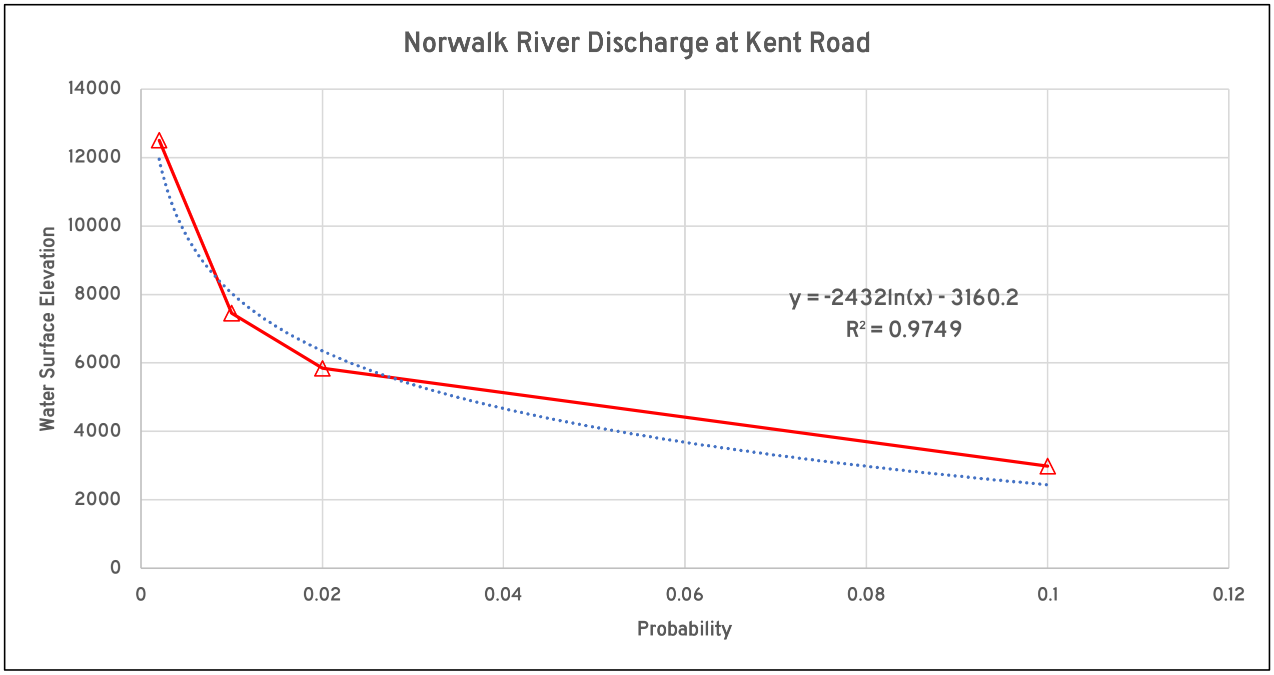
Overland				
Segment	**Surface "n"**	**Flow Length (ft.)**	**Slope (ft/ft)**	**Time (min.)**
Segment A - B	0.24	24	0.500	1.2
Segment B - C	0.24	90	0.056	8.6

Total Tc: 9.8

Note: Overland time of concentration computed using "Kinematic Wave" equation
Gutter and pipe time of concentration computed using Manning's equation

2-YEAR DISCHARGE COMPUTATION
ASML CAMPUS TRAFFIC SAFETY IMRPOVEMENTS
22-May-22
By: J. Canas

Tighe&Bond
Engineers | Environmental Specialists



Frequency	Probability	FIS	Computed
10	0.1	2980	2440
50	0.02	5840	6354
100	0.01	7455	8040
500	0.002	12505	11954
2	0.5		344.10

Log -Pearson Analysis Using USGS Gauging Station at South Wilton, CT

Tighe&Bond

Ranking of Gauging Data

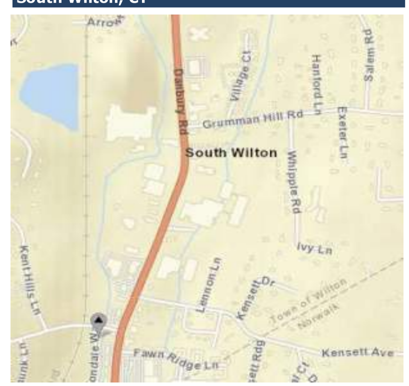
Rank	Year	Peak Flow (cfs)	log Q	(log Q - avg(logQ))^2	(log Q - avg(logQ))^3	Return Period [(n+1)/m]	Exceedence Probability (1/Tr)
1	1956	12,000	4.0792	1.0887	1.1359	47.0000	0.0213
2	2007	3,490	3.5428	0.2571	0.1304	23.5000	0.0426
3	2011	2,440	3.3874	0.1236	0.0435	15.6667	0.0638
4	2006	2,340	3.3692	0.1112	0.0371	11.7500	0.0851
5	1980	2,300	3.3617	0.1062	0.0346	9.4000	0.1064
6	1979	1,940	3.2878	0.0635	0.0160	7.8333	0.1277
7	2021	1,870	3.2718	0.0557	0.0132	6.7143	0.1489
8	2010	1,830	3.2625	0.0514	0.0116	5.8750	0.1702
9	1989	1,800	3.2553	0.0482	0.0106	5.2222	0.1915
10	1999	1,720	3.2355	0.0399	0.0080	4.7000	0.2128
11	1987	1,710	3.2330	0.0389	0.0077	4.2727	0.2340
12	1972	1,690	3.2279	0.0369	0.0071	3.9167	0.2553
13	1984	1,690	3.2279	0.0369	0.0071	3.6154	0.2766
14	1970	1,660	3.2201	0.0340	0.0063	3.3571	0.2979
15	1973	1,610	3.2068	0.0293	0.0050	3.1333	0.3191
16	1974	1,540	3.1875	0.0230	0.0035	2.9375	0.3404
17	1996	1,510	3.1790	0.0205	0.0029	2.7647	0.3617
18	1978	1,480	3.1703	0.0181	0.0024	2.6111	0.3830
19	1983	1,480	3.1703	0.0181	0.0024	2.4737	0.4043
20	1977	1,440	3.1584	0.0150	0.0018	2.3500	0.4255
21	1982	1,400	3.1461	0.0122	0.0013	2.2381	0.4468
22	1997	1,400	3.1461	0.0122	0.0013	2.1364	0.4681
23	1971	1,360	3.1335	0.0096	0.0009	2.0435	0.4894
24	1991	1,360	3.1335	0.0096	0.0009	1.9583	0.5106
25	2004	1,340	3.1271	0.0083	0.0008	1.8800	0.5319
26	2008	1,320	3.1206	0.0072	0.0006	1.8077	0.5532
27	1976	1,290	3.1106	0.0056	0.0004	1.7407	0.5745
28	2014	1,280	3.1072	0.0051	0.0004	1.6786	0.5957
29	2019	1,270	3.1038	0.0046	0.0003	1.6207	0.6170
30	2009	1,230	3.0899	0.0029	0.0002	1.5667	0.6383
31	1975	1,220	3.0864	0.0026	0.0001	1.5161	0.6596
32	2020	1,200	3.0792	0.0019	0.0001	1.4688	0.6809
33	2018	1,190	3.0755	0.0016	0.0001	1.4242	0.7021
34	1969	1,100	3.0414	0.0000	0.0000	1.3824	0.7234
35	1994	1,090	3.0374	0.0000	0.0000	1.3429	0.7447
36	1968	1,020	3.0086	0.0007	0.0000	1.3056	0.7660
37	1990	1,010	3.0043	0.0010	0.0000	1.2703	0.7872
38	1985	969	2.9863	0.0024	-0.0001	1.2368	0.8085
39	1986	962	2.9832	0.0028	-0.0001	1.2051	0.8298
40	2005	892	2.9504	0.0073	-0.0006	1.1750	0.8511
41	2015	831	2.9196	0.0135	-0.0016	1.1463	0.8723
42	1963	715	2.8543	0.0329	-0.0060	1.1190	0.8936
43	1964	715	2.8543	0.0329	-0.0060	1.0930	0.9149
44	2012	707	2.8494	0.0347	-0.0065	1.0682	0.9362
45	1993	672	2.8274	0.0434	-0.0091	1.0444	0.9574
46	2001	655	2.8162	0.0482	-0.0106	1.0217	0.9787
47	2013	618	2.7910	0.0599	-0.0147	1.0000	1.0000
48	1992	612	2.7868	0.0620	-0.0154	0.9792	1.0213
49	2003	586	2.7679	0.0718	-0.0192	0.9592	1.0426
50	1981	560	2.7482	0.0827	-0.0238	0.9400	1.0638
51	2002	556	2.7451	0.0845	-0.0246	0.9216	1.0851
52	1998	523	2.7185	0.1007	-0.0319	0.9038	1.1064
53	2017	517	2.7135	0.1039	-0.0335	0.8868	1.1277
54	2000	495	2.6946	0.1164	-0.0397	0.8704	1.1489
55	2016	477	2.6785	0.1276	-0.0456	0.8545	1.1702

Log-Pearson Distribution Analysis, Flows at South Wilton, CT Gauging Sta.

No. of Years in Record	60	
Avg. Q Peak	1376.33	
Avg. log Q	3.036	
Sum {(log Q - avg(log Q))^2}	4.407	
Sum {(log Q - avg(log Q))^3}	0.693	
Variance log Q	0.0747	
Std. Dev. log Q	0.2733	
Skewness (C_s)	0.5953	
Skew coefficient (C_m)	0.70	- from USGS Publication 17B
Variance of Regional Skewness V(C_m)	0.302	- 0.302 for U.S.
A = - 0.52 + 0.3(C_s)	-0.34141	
B = 0.94 - 0.26(C_s)	0.78523	
Variance of Station Skewness V(C_s)	0.111574	$V(C_s) = 10^{[A-B*(\log(n/10))]}$
Weighting Factor (W)	0.73022	$W = V(C_m)/[V(C_s)+V(C_m)]$
Weighted Skewness (C_w)	0.62354	$C_w = [W*C_s] + [(1-W)*C_m]$
Table Upper C_w Value	0.7	- from Table 7.7
Table Lower C_w Value	0.6	- from Table 7.7
Calculated C_w Value	0.62354	

Return Period, T_r	K lower	K upper	Slope	K calculated	Q (cfs)
2	-1.880	-1.506	3.74	-1.792	352
5	0.800	0.790	-0.1	0.798	1794
10	1.328	1.333	0.05	1.329	2506
25	1.939	1.967	0.28	1.946	3694
50	2.359	2.407	0.48	2.370	4826
100	2.755	2.824	0.69	2.771	6211
200	3.132	3.223	0.91	3.153	7900

USGS Gauge 01209700
South Wilton, CT



Transposition of Flow to Site

100-Year Event	
Q_2, Flow at Gauged Site	352
A_1, Watershed at Site	29.1
A_2, Watershed at Gauge	30

Using Transposition Eqn 347 cfs

$$Q_1 = Q_2\sqrt{\frac{A_1}{A_2}}$$

56	1965	470	2.6721	0.1323	-0.0481	0.8393	1.1915
57	1988	400	2.6021	0.1881	-0.0816	0.8246	1.2128
58	1967	365	2.5623	0.2242	-0.1062	0.8103	1.2340
59	1966	350	2.5441	0.2418	-0.1189	0.7966	1.2553
60	1995	313	2.4955	0.2919	-0.1577	0.7833	1.2766

Frequency Factors K for Gamma and log-Pearson Type III Distributions (Haan, 1977, Table 7.7)

WEIGHTED SKEW COEFI Cw	Recurrence Interval In Years							
	1	2	5	10	25	50	100	200
	Percent Chance (>=) = 1-F							
	99	50	20	10	4	2	1	0.5
3	-0.667	-0.396	0.42	1.18	2.278	3.152	4.051	4.97
2.9	-0.69	-0.39	0.44	1.195	2.277	3.134	4.013	4.904
2.8	-0.714	-0.384	0.46	1.21	2.275	3.114	3.973	4.847
2.7	-0.74	-0.376	0.479	1.224	2.272	3.093	3.932	4.783
2.6	-0.769	-0.368	0.499	1.238	2.267	3.071	3.889	4.718
2.5	-0.799	-0.36	0.518	1.25	2.262	3.048	3.845	4.652
2.4	-0.832	-0.351	0.537	1.262	2.256	3.023	3.8	4.584
2.3	-0.867	-0.341	0.555	1.274	2.248	2.997	3.753	4.515
2.2	-0.905	-0.33	0.574	1.284	2.24	2.97	3.705	4.444
2.1	-0.946	-0.319	0.592	1.294	2.23	2.942	3.656	4.372
2	-0.99	-0.307	0.609	1.302	2.219	2.912	3.605	4.298
1.9	-1.037	-0.294	0.627	1.31	2.207	2.881	3.553	4.223
1.8	-1.087	-0.282	0.643	1.318	2.193	2.848	3.499	4.147
1.7	-1.14	-0.268	0.66	1.324	2.179	2.815	3.444	4.069
1.6	-1.197	-0.254	0.675	1.329	2.163	2.78	3.388	3.99
1.5	-1.256	-0.24	0.69	1.333	2.146	2.743	3.33	3.91
1.4	-1.318	-0.225	0.705	1.337	2.128	2.706	3.271	3.828
1.3	-1.383	-0.21	0.719	1.339	2.108	2.666	3.211	3.745
1.2	-1.449	-0.195	0.732	1.34	2.087	2.626	3.149	3.661
1.1	-1.518	-0.18	0.745	1.341	2.066	2.585	3.087	3.575
1	-1.588	-0.164	0.758	1.34	2.043	2.542	3.022	3.489
0.9	-1.66	-0.148	0.769	1.339	2.018	2.498	2.957	3.401
0.8	-1.733	-0.132	0.78	1.336	1.993	2.453	2.891	3.312
0.7	-1.806	-0.116	0.79	1.333	1.967	2.407	2.824	3.223
0.6	-1.88	-0.099	0.8	1.328	1.939	2.359	2.755	3.132
0.5	-1.955	-0.083	0.808	1.323	1.91	2.311	2.686	3.041
0.4	-2.029	-0.066	0.816	1.317	1.88	2.261	2.615	2.949
0.3	-2.104	-0.05	0.824	1.309	1.849	2.211	2.544	2.856
0.2	-2.178	-0.033	0.83	1.301	1.818	2.159	2.472	2.763
0.1	-2.252	-0.017	0.836	1.292	1.785	2.107	2.4	2.67
0	-2.326	0	0.842	1.282	1.751	2.054	2.326	2.576
-0.1	-2.4	0.017	0.846	1.27	1.716	2	2.252	2.482
-0.2	-2.472	0.033	0.85	1.258	1.68	1.945	2.178	2.388
-0.3	-2.544	0.05	0.853	1.245	1.643	1.89	2.104	2.294
-0.4	-2.615	0.066	0.855	1.231	1.606	1.834	2.029	2.201
-0.5	-2.686	0.083	0.856	1.216	1.567	1.777	1.955	2.108
-0.6	-2.755	0.099	0.857	1.2	1.528	1.72	1.88	2.016
-0.7	-2.824	0.116	0.857	1.183	1.488	1.663	1.806	1.926
-0.8	-2.891	0.132	0.856	1.166	1.448	1.606	1.733	1.837
-0.9	-2.957	0.148	0.854	1.147	1.407	1.549	1.66	1.749
-1	-3.022	0.164	0.852	1.128	1.366	1.492	1.588	1.664
-1.1	-3.087	0.18	0.848	1.107	1.324	1.435	1.518	1.581
-1.2	-3.149	0.195	0.844	1.086	1.282	1.379	1.449	1.501
-1.3	-3.211	0.21	0.838	1.064	1.24	1.324	1.383	1.424
-1.4	-3.271	0.225	0.832	1.041	1.198	1.27	1.318	1.351
-1.5	-3.33	0.24	0.825	1.018	1.157	1.217	1.256	1.282
-1.6	-3.88	0.254	0.817	0.994	1.116	1.166	1.197	1.216
-1.7	-3.444	0.268	0.808	0.97	1.075	1.116	1.14	1.155
-1.8	-3.499	0.282	0.799	0.945	1.035	1.069	1.087	1.097
-1.9	-3.553	0.294	0.788	0.92	0.996	1.023	1.037	1.044
-2	-3.605	0.307	0.777	0.895	0.959	0.98	0.99	0.995
-2.1	-3.656	0.319	0.765	0.869	0.923	0.939	0.946	0.949
-2.2	-3.705	0.33	0.752	0.844	0.888	0.9	0.905	0.907
-2.3	-3.753	0.341	0.739	0.819	0.855	0.864	0.867	0.869
-2.4	-3.8	0.351	0.725	0.795	0.823	0.83	0.832	0.833
-2.5	-3.845	0.36	0.711	0.711	0.793	0.798	0.799	0.8
-2.6	-3.899	0.368	0.696	0.747	0.764	0.768	0.769	0.769
-2.7	-3.932	0.376	0.681	0.724	0.738	0.74	0.74	0.741
-2.8	-3.973	0.384	0.666	0.702	0.712	0.714	0.714	0.714
-2.9	-4.013	0.39	0.651	0.681	0.683	0.689	0.69	0.69
-3	-4.051	0.396	0.636	0.66	0.666	0.666	0.667	0.667

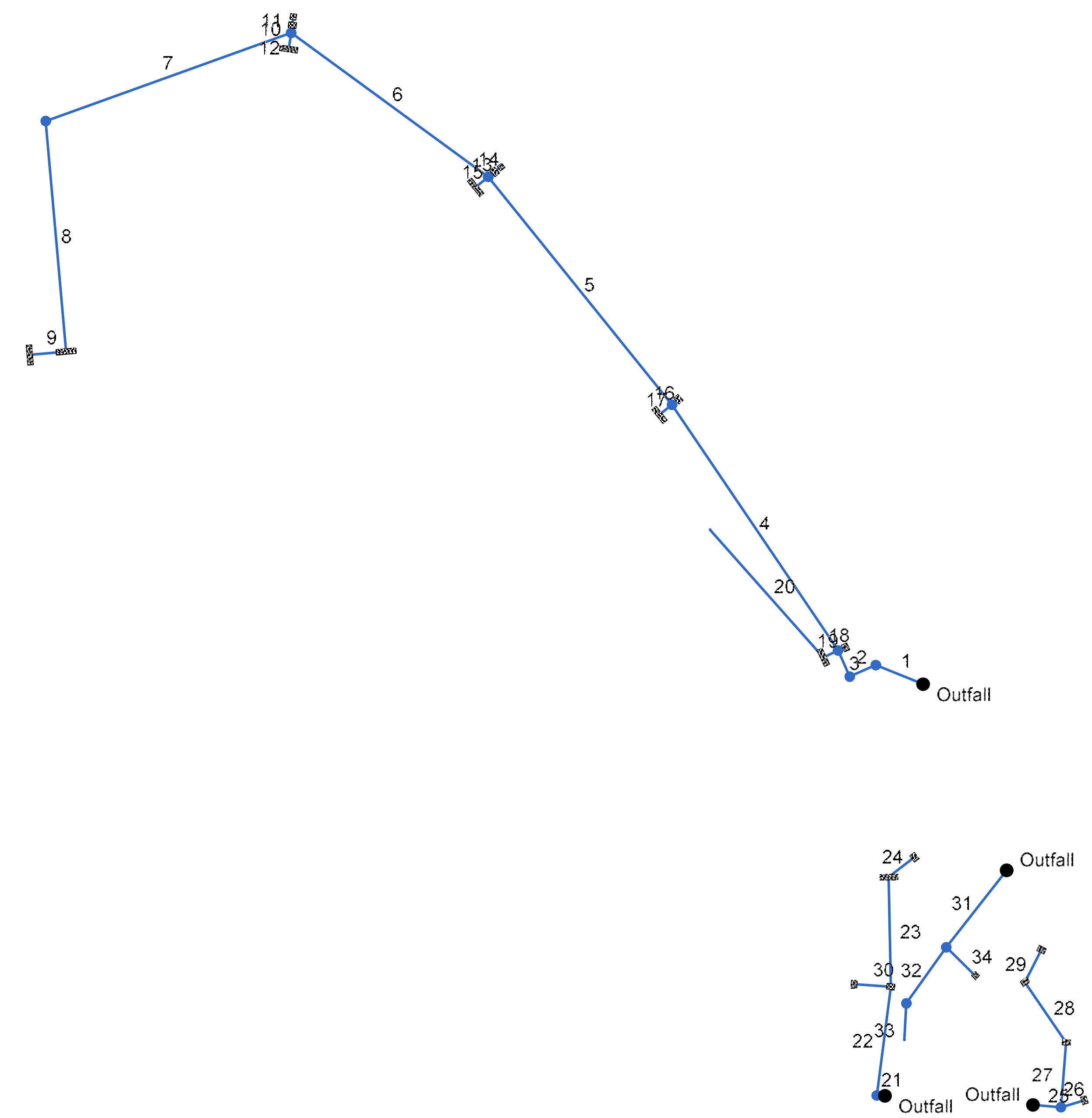
HEC-RAS Plan: EXIST River: RIVER-1 Reach: Reach-1 Profile: 50% Chance

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	29920	50% Chance	347.00	147.00	148.79	148.79	149.36	0.012637	6.07	57.54	51.97	1.00
Reach-1	29760	50% Chance	347.00	142.20	144.79		144.88	0.001279	2.43	142.56	87.81	0.34
Reach-1	28240	50% Chance	347.00	138.00	139.78	139.78	140.33	0.012939	5.93	58.63	54.94	1.01
Reach-1	27468	50% Chance	347.00	132.10	138.74		138.74	0.000001	0.10	4715.82	499.27	0.01
Reach-1	27110	50% Chance	347.00	136.60	138.64		138.72	0.001351	2.79	231.26	179.61	0.36
Reach-1	27025	50% Chance	347.00	135.50	138.16	137.47	138.47	0.003089	4.51	81.60	43.66	0.55
Reach-1	27020		Bridge									
Reach-1	27015	50% Chance	347.00	135.50	138.07	137.48	138.41	0.003540	4.70	78.00	43.22	0.58
Reach-1	26680	50% Chance	347.00	134.00	137.02	136.34	137.33	0.002861	4.63	100.21	80.84	0.54
Reach-1	26209	50% Chance	347.00	133.40	134.83		135.24	0.007705	5.15	67.38	50.53	0.79
Reach-1	26136	50% Chance	347.00	130.20	134.92	132.33	135.01	0.000375	2.41	144.06	56.00	0.21
Reach-1	26127.5		Bridge									
Reach-1	26119	50% Chance	347.00	131.30	134.69	133.14	134.80	0.000838	2.65	130.95	49.09	0.29
Reach-1	26058	50% Chance	347.00	131.30	134.63	133.13	134.74	0.000900	2.71	128.03	49.03	0.30
Reach-1	25358	50% Chance	347.00	131.00	132.57	132.56	133.12	0.012416	6.66	77.85	80.61	1.02
Reach-1	25340	50% Chance	347.00	128.10	132.91		132.96	0.000197	1.81	370.12	299.31	0.15
Reach-1	25334	50% Chance	347.00	130.31	132.86		132.95	0.001293	2.74	198.44	154.16	0.35
Reach-1	24975	50% Chance	347.00	129.20	131.12	131.12	131.83	0.012066	6.76	51.33	36.52	1.01
Reach-1	24922	50% Chance	347.00	127.89	131.26		131.40	0.001135	3.04	114.26	45.49	0.34
Reach-1	24677	50% Chance	347.00	127.87	131.20		131.24	0.000316	1.64	211.54	81.18	0.18
Reach-1	24620	50% Chance	347.00	128.90	130.62	130.62	131.14	0.013758	5.76	60.25	60.21	1.01
Reach-1	24597	50% Chance	347.00	127.30	129.76		129.90	0.001952	3.07	112.94	66.00	0.41
Reach-1	24570	50% Chance	347.00	127.60	129.61	129.09	129.83	0.003297	3.78	91.86	66.39	0.54
Reach-1	24542.5		Bridge									
Reach-1	24540	50% Chance	347.00	127.60	129.09	129.09	129.59	0.013128	5.72	60.69	64.37	1.00
Reach-1	24485	50% Chance	347.00	126.30	128.59		128.92	0.003896	4.64	83.39	49.80	0.60
Reach-1	24430	50% Chance	347.00	126.60	128.37		128.60	0.007804	3.87	89.65	69.12	0.60
Reach-1	24401	50% Chance	347.00	124.66	128.33		128.44	0.002561	2.60	133.48	76.83	0.35
Reach-1	24381	50% Chance	347.00	124.66	128.22		128.39	0.001523	3.47	116.23	69.19	0.39
Reach-1	24180	50% Chance	347.00	124.70	127.92		128.07	0.001616	3.14	110.60	54.80	0.39
Reach-1	24105	50% Chance	347.00	124.80	127.66		127.90	0.002882	3.94	88.15	46.92	0.51
Reach-1	23805	50% Chance	347.00	124.00	127.15		127.30	0.001373	3.12	111.32	49.16	0.37
Reach-1	23415	50% Chance	347.00	123.00	125.31	125.31	126.04	0.012066	6.85	50.63	35.13	1.01
Reach-1	23171	50% Chance	347.00	120.30	124.40		124.54	0.001195	3.02	115.02	47.99	0.34
Reach-1	23036	50% Chance	347.00	121.70	123.84	123.44	124.22	0.005348	4.91	70.69	43.93	0.68
Reach-1	22916	50% Chance	347.00	121.00	122.62	122.62	123.25	0.012502	6.38	54.41	43.39	1.00
Reach-1	22765	50% Chance	347.00	114.20	121.53		121.54	0.000024	0.71	492.28	88.75	0.05
Reach-1	22450	50% Chance	347.00	116.90	121.30		121.49	0.001549	3.51	98.76	31.38	0.35
Reach-1	22140	50% Chance	347.00	117.00	120.52		120.83	0.002978	4.50	84.83	77.39	0.54
Reach-1	21825	50% Chance	347.00	115.90	120.52		120.57	0.000249	1.82	217.68	69.79	0.17

HEC-RAS Plan: EXIST River: RIVER-1 Reach: Reach-1 Profile: 50% Chance (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	21770	50% Chance	347.00	115.40	120.52	116.98	120.55	0.000079	1.19	290.68	91.28	0.10
Reach-1	21757.5		Bridge									
Reach-1	21745	50% Chance	347.00	115.40	120.52	116.98	120.54	0.000079	1.19	290.53	91.26	0.10
Reach-1	21695	50% Chance	347.00	114.20	120.52		120.54	0.000090	1.20	288.09	67.17	0.10
Reach-1	21285	50% Chance	347.00	114.30	120.50	115.93	120.51	0.000042	0.87	406.46	101.77	0.07

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: A0969-015 Proposed Storm Sewers.stm	Number of lines: 34	Date: 5/21/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	25.034	0.00	1.72	0.00	0.00	1.07	0.0	16.7	4.7	5.04	22.97	4.66	24	0.88	134.00	134.22	134.72	135.01	134.00	141.00	Pipe - (12)
2	1	14.000	0.00	1.72	0.00	0.00	1.07	0.0	16.7	4.7	5.05	34.65	4.37	24	2.00	134.22	134.50	135.01	135.29	141.00	141.90	Pipe - (11)
3	2	14.000	0.00	1.72	0.00	0.00	1.07	0.0	16.6	4.7	5.06	34.65	4.81	24	2.00	134.60	134.88	135.29	135.67	141.90	142.85	Pipe - (10)
4	3	146.000	0.00	1.11	0.00	0.00	0.73	0.0	16.3	4.8	3.49	27.87	7.49	18	6.00	138.71	147.47	139.07	148.18	142.85	151.75	Pipe - (09)
5	4	144.000	0.00	0.77	0.00	0.00	0.48	0.0	15.6	4.9	2.36	30.51	3.60	18	7.19	147.57	157.93	148.18	158.51	151.75	162.25	Pipe - (08)
6	5	120.000	0.00	0.57	0.00	0.00	0.34	0.0	15.1	5.0	1.68	30.95	3.76	18	7.40	158.09	166.97	158.51	167.46	162.25	171.10	Pipe - (07)
7	6	128.000	0.00	0.34	0.00	0.00	0.20	0.0	14.3	5.2	1.01	11.38	2.87	18	1.00	167.07	168.35	167.46	168.73	171.10	176.50	Pipe - (06)
8	7	114.000	0.28	0.34	0.51	0.14	0.20	5.0	13.7	5.3	1.04	8.04	3.04	18	0.50	168.45	169.02	168.81	169.40	176.50	172.70	CB-02
9	8	18.000	0.06	0.06	0.90	0.05	0.05	13.6	13.6	5.3	0.29	3.86	2.56	12	1.00	169.27	169.45	169.45	169.67	172.70	172.70	Pipe - (04)
10	6	4.000	0.08	0.16	0.71	0.06	0.08	5.0	9.8	6.3	0.51	11.06	3.54	15	2.50	167.35	167.45	167.53	167.73	171.10	170.70	Pipe - (14)
11	10	4.000	0.08	0.08	0.30	0.02	0.02	9.8	9.8	6.3	0.15	11.06	2.06	15	2.50	167.60	167.70	167.73	167.85	170.70	170.90	
12	6	8.000	0.07	0.07	0.83	0.06	0.06	5.0	5.0	8.6	0.50	9.89	2.08	15	2.00	167.09	167.25	167.46	167.52	171.10	170.90	Pipe - (15)
13	5	4.000	0.05	0.10	0.90	0.05	0.06	5.0	9.2	6.5	0.39	11.06	3.28	15	2.50	158.45	158.55	158.61	158.79	162.25	162.00	Pipe - (18)
14	13	4.000	0.05	0.05	0.30	0.02	0.02	9.2	9.2	6.5	0.10	11.06	2.20	15	2.50	158.80	158.90	158.88	159.02	162.00	162.20	Pipe - (17)
15	5	8.000	0.10	0.10	0.84	0.08	0.08	5.0	5.0	8.6	0.72	9.89	3.73	15	2.00	158.34	158.50	158.57	158.83	162.25	162.00	Pipe - (16)
16	4	4.000	0.08	0.08	0.76	0.06	0.06	5.0	5.0	8.6	0.52	11.06	2.52	15	2.50	147.90	148.00	148.18	148.28	151.75	151.50	Pipe - (19)
17	4	8.000	0.26	0.26	0.72	0.19	0.19	6.9	6.9	7.5	1.40	9.89	4.24	15	2.00	147.84	148.00	148.18	148.47	151.75	151.50	Pipe - (20)
18	3	4.000	0.06	0.06	0.90	0.05	0.05	5.0	5.0	8.6	0.46	11.06	3.45	15	2.50	139.00	139.10	139.17	139.36	142.85	142.60	Pipe - (19) (1)
19	3	8.000	0.35	0.55	0.56	0.20	0.29	8.9	8.9	6.6	1.90	5.10	4.99	12	1.75	138.96	139.10	139.38	139.69	142.85	142.60	Pipe - (22)
20	19	84.000	0.20	0.20	0.45	0.09	0.09	7.7	7.7	7.1	0.64	15.12	2.07	12	15.36	139.10	152.00	139.69	152.33	142.60	152.00	Pipe - (21)
21	End	4.000	0.00	0.67	0.00	0.00	0.49	0.0	9.0	6.6	3.22	6.99	4.64	15	1.00	134.50	134.54	135.16	135.26	138.65	138.65	Pipe - (26)
22	21	54.000	0.08	0.67	0.84	0.07	0.49	5.0	8.7	6.7	3.25	4.95	4.31	15	0.50	134.54	134.81	135.28	135.55	138.65	138.00	Pipe - (25)
23	22	54.000	0.38	0.42	0.63	0.24	0.27	8.4	8.4	6.8	1.85	10.47	2.60	15	2.24	134.81	136.02	135.98	136.56	138.00	138.55	Pipe - (24)

Project File: A0969-015 Proposed Storm Sewers.stm | Number of lines: 34 | Run Date: 5/21/2022

NOTES:Intensity = 39.87 / (Inlet time + 3.80) ^ 0.71; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
24	23	16.000	0.04	0.04	0.81	0.03	0.03	5.0	5.0	8.6	0.28	4.95	1.34	15	0.50	136.02	136.10	136.56	136.30	138.55	138.55	Pipe - (23)
25	End	13.712	0.00	0.47	0.00	0.00	0.39	0.0	6.7	7.6	2.92	4.22	3.99	15	0.36	134.50	134.55	135.19	135.30	138.60	138.60	Pipe - (35)
26	25	12.000	0.03	0.03	0.90	0.02	0.02	5.0	5.0	8.6	0.20	9.89	1.13	15	2.00	134.86	135.10	135.53	135.27	138.60	0.00	Pipe - (36)
27	25	32.000	0.04	0.44	0.82	0.03	0.36	5.0	6.5	7.7	2.78	4.46	2.85	15	0.41	134.55	134.68	135.53	135.56	138.60	138.30	Pipe - (34)
28	27	36.000	0.23	0.40	0.81	0.19	0.33	6.0	6.3	7.8	2.57	4.36	2.52	15	0.39	134.68	134.82	135.70	135.74	138.30	137.60	Pipe - (33)
29	28	18.000	0.17	0.17	0.84	0.14	0.14	6.0	6.0	8.0	1.14	4.66	1.06	15	0.44	134.82	134.90	135.89	135.89	137.60	137.40	Pipe - (32)
30	22	18.000	0.17	0.17	0.87	0.15	0.15	7.2	7.2	7.3	1.08	7.19	2.00	15	1.06	134.81	135.00	135.98	135.41	138.00	138.00	CB-15
31	End	48.000	0.00	0.29	0.00	0.00	0.21	0.0	6.0	7.9	4.87	4.95	4.01	15	0.50	134.00	134.24	135.23	135.43	134.00	138.20	Pipe - (30)
32	31	34.000	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	3.22	4.95	2.62	15	0.50	134.24	134.41	135.68	135.75	138.20	139.00	Pipe - (29)
33	32	18.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.22	4.95	2.62	15	0.50	134.41	134.50	135.82	135.85	139.00	138.65	Pipe - (28)
34	31	20.000	0.29	0.29	0.73	0.21	0.21	5.8	5.8	8.1	1.68	7.00	1.37	15	1.00	134.24	134.44	135.68	135.69	138.20	0.00	Pipe - (31)

Project File: A0969-015 Proposed Storm Sewers.stm | Number of lines: 34 | Run Date: 5/21/2022

NOTES:Intensity = 39.87 / (Inlet time + 3.80) ^ 0.71; Return period =Yrs. 25 ; c = cir e = ellip b = box

FE-01, 24"
Q_{25} = 5.04 cfs,
V_{25} = 4.66 ft/s

OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in)									
	12	15	18	24	30	36	42	48	54	60
0-5	***10***	***10***		***USE***						
5.5	12	11								
6		12	***12***			***MINIMUM***				
7		14	13	**12**						
8			15	13						
8.5			16	14				***LENGTH***		
9				14						
10				15	***14***					
11				16	15					
12				17	15	***14***			***OUTLINED***	
13				18	16	15				
14					17	15	***14***			
16		***USE***			18	16	15	***14***		
18						18	16	15		
20						19	17	16		
22						20	18	16		
24							19	17	***16***	
26							20	18	17	***16***
28				***PREFORMED***			21	19	17	16
30							21	19	18	17
32							22	20	18	17
35								21	19	18
40								23	21	19
45								25	23	21
48					***SCOUR***			26	24	22
50									24	22
55									26	23
60									27	25
63									28	26
65										26
75							***HOLE***			29
80										30

Table 11-13.1 - Length - L_a (feet)
Type B or C Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

	X	W_1	W_2
Type A Riprap Apron	3	$3S_p$	$3S_p+0.7\ La$
Type B Riprap Apron	5	$3S_p$	$3S_p+0.4\ La$

W1 = 6'
W2 = 10.8'

EW-01, 15"
Q_{25} = 4.87 cfs,
V_{25} = 4.01 ft/s

OUTLET PROTECTION - OUTLET VELOCITY ≤ 14 feet/sec

DISCHARGE (cfs)	OUTLET PIPE DIAMETER OR SPAN (in) 12	15	18	24	30	36	42	48	54	60
0-5	***10***	***10***		***USE***						
5.5	12	11								
6		12	***12***			***MINIMUM***				
7		14	13	**12**						
8			15	13						
8.5			16	14				***LENGTH***		
9				14						
10				15	***14***					
11				16	15					
12				17	15	***14***			***OUTLINED***	
13				18	16	15				
14					17	15	***14***			
16		***USE***			18	16	15	***14***		
18						18	16	15		
20						19	17	16		
22						20	18	16		
24							19	17	***16***	
26							20	18	17	***16***
28				***PREFORMED***			21	19	17	16
30							21	19	18	17
32							22	20	18	17
35								21	19	18
40								23	21	19
45								25	23	21
48					***SCOUR***			26	24	22
50									24	22
55									26	23
60									27	25
63									28	26
65										26
75							***HOLE***			29
80										30

Table 11-13.1 - Length - L_a (feet)
Type B or C Riprap Apron

Notes: 1. Bold face outlined boxes indicate minimum L_a to be used for a given pipe diameter or span.
2. Rounding and interpolating are acceptable.

	X	W_1	W_2
Type A Riprap Apron	3	$3S_p$	$3S_p+0.7\ La$
Type B Riprap Apron	5	$3S_p$	$3S_p+0.4\ La$

W1 = 3.75'
W2 = 4.15'

APPENDIX E

Tighe&Bond

Water Quality Volume Computation: WS-PR-03A + 03B
ASML Campus Traffic Safety Improvements
Date: May 22, 2022
Prepared by: J. Canas

Impervious Area	1.831	acres
Area	4.014	acres
% Impervious	45.62%	

$$WQV = \frac{(1")(R)(A)}{12}$$

where:
WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient = 0.05+0.009(I)
I = percent impervious cover
A = site area in acres

R	0.4605			
WQV	0.1541	acre-ft	6710.4	ft^3

Groundwater Recharge Volume Computation

Table 7-4
Groundwater Recharge Depth

NRCS Hydrologic Soil Group	Average Annual Recharge	Groundwater Recharge Depth (D)
A	18 inches/year	0.4 inches
B	12 inches/year	0.25 inches
C	6 inches/year	0.10 inches
D	3 inches/year	0 inches (waived)

$$GRV = \frac{(D)(A)(I)}{12}$$

where:
GRV = groundwater recharge volume (ac-ft)
D = depth of runoff to be recharged (inches), see **Table 7-4**
A = site area (acres)
I = post-development site imperviousness (decimal, not percent) for new development projects or the net increase in site imperviousness for re-development projects

GRV	0.0381	acre-ft	1661.6	ft^3

► 15,555 cubic feet provided below chamber system outlet, so WQV and GRV met

Chamber System Design - Drawdown

Drawdown time, use default Rawls infiltration rates (Rawls, Brakenseik and Saxton, 1982):

Sandy Loam, HSG B = 1.02 inches/hour

48 in / 1.02 in/hr = 47.059 hours

Tighe&Bond

Water Quality Flow Computation

ASML Campus Traffic Safety Improvements, WQS-001

Date: May 22, 2022

Prepared by: J. Canas

Proposed Conditions CN	89.5			
Area	0.47	acres	0.0007	mi2
Time of Concentration	6.7	minutes	0.1117	hours

Table 4-1 I_a values for runoff curve numbers

Curve number	I_a (in)	Curve number	I_a (in)	Curve number	I_a (in)	Curve number	I_a (in)
40	3.000	55	1.636	70	0.857	85	0.353
41	2.878	56	1.571	71	0.817	86	0.326
42	2.762	57	1.509	72	0.778	87	0.299
43	2.651	58	1.448	73	0.740	88	0.273
44	2.545	59	1.390	74	0.703	89	0.247
45	2.444	60	1.333	75	0.667	90	0.222
46	2.348	61	1.279	76	0.632	91	0.198
47	2.255	62	1.226	77	0.597	92	0.174
48	2.167	63	1.175	78	0.564	93	0.151
49	2.082	64	1.125	79	0.532	94	0.128
50	2.000	65	1.077	80	0.500	95	0.105
51	1.922	66	1.030	81	0.469	96	0.083
52	1.846	67	0.985	82	0.439	97	0.062
53	1.774	68	0.941	83	0.410	98	0.041
54	1.704	69	0.899	84	0.381		

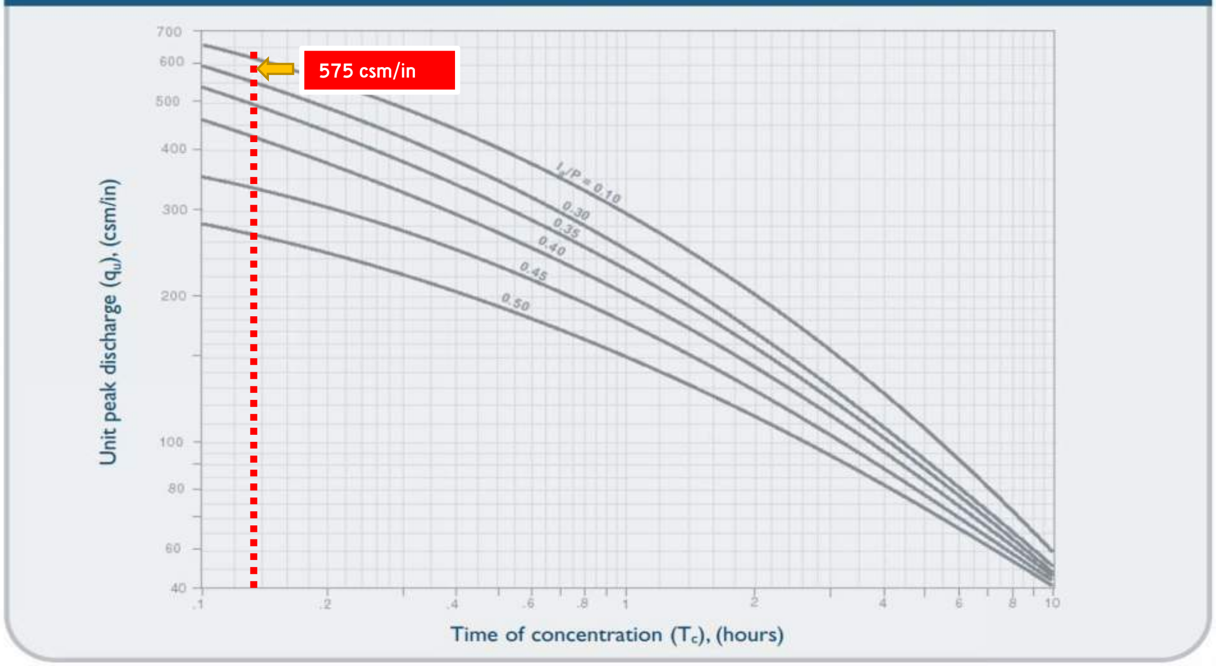
From Table 4-1, I_a, in

	Upper	Lower	Diff	Interpolated
CN	90	89	1	89.5
I_a	0.222	0.247	-0.025	0.2345

P, water quality storm	1 inches		Ia/P	0.2345

From Exhibit 4-111, q_u, csm/in

Exhibit 4-111 Unit peak discharge (q_u) for NRCS (SCS) type III rainfall distribution



$WQF = q_u \times A \times Q$

q_u	575	cfs/mi^2/inch
A	0.0007	mi^2

Q = WQV(ac-ft) x 12 (in/ft) / A (acres)

WQV	0.0312	ac-ft
A	0.47	acres
Q	0.797	cfs

WQF	0.3365 cfs

Tighe&Bond

Water Quality Flow Computation

ASML Campus Traffic Safety Improvements, WQS-002

Date: May 22, 2022

Prepared by: J. Canas

Proposed Conditions CN	84.5			
Area	0.67	acres	0.001	mi2
Time of Concentration	9	minutes	0.15	hours

Table 4-1 I_a values for runoff curve numbers

Curve number	I_a (in)	Curve number	I_a (in)	Curve number	I_a (in)	Curve number	I_a (in)
40	3.000	55	1.636	70	0.857	85	0.353
41	2.878	56	1.571	71	0.817	86	0.326
42	2.762	57	1.509	72	0.778	87	0.299
43	2.651	58	1.448	73	0.740	88	0.273
44	2.545	59	1.390	74	0.703	89	0.247
45	2.444	60	1.333	75	0.667	90	0.222
46	2.348	61	1.279	76	0.632	91	0.198
47	2.255	62	1.226	77	0.597	92	0.174
48	2.167	63	1.175	78	0.564	93	0.151
49	2.082	64	1.125	79	0.532	94	0.128
50	2.000	65	1.077	80	0.500	95	0.105
51	1.922	66	1.030	81	0.469	96	0.083
52	1.846	67	0.985	82	0.439	97	0.062
53	1.774	68	0.941	83	0.410	98	0.041
54	1.704	69	0.899	84	0.381		

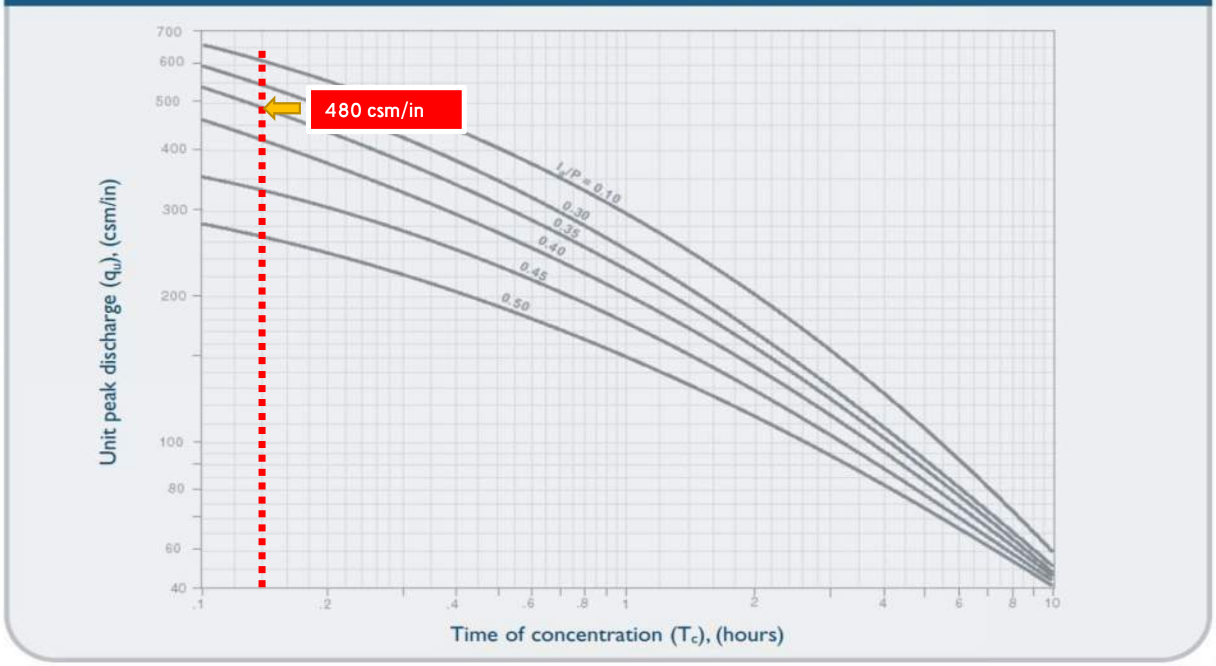
From Table 4-1, I_a, in

	Upper	Lower	Diff	Interpolated
CN	85	84	1	84.5
I_a	0.353	0.381	-0.028	0.367

P, water quality storm	1 inches	Ia/P	0.367

From Exhibit 4-111, q_u, csm/in

Exhibit 4-111 Unit peak discharge (q_u) for NRCS (SCS) type III rainfall distribution



$WQF = q_u \times A \times Q$

q_u	480	cfs/mi^2/inch
A	0.001	mi^2

Q = WQV(ac-ft) x 12 (in/ft) / A (acres)

WQV	0.0395	ac-ft
A	0.67	acres
Q	0.7079	cfs

WQF	0.3557 cfs

Tighe&Bond

Water Quality Flow Computation

ASML Campus Traffic Safety Improvements, WQS-003

Date: May 22, 2022

Prepared by: J. Canas

Proposed Conditions CN	80.5			
Area	1.72	acres	0.0027	mi2
Time of Concentration	16.7	minutes	0.2783	hours

Table 4-1 I_a values for runoff curve numbers

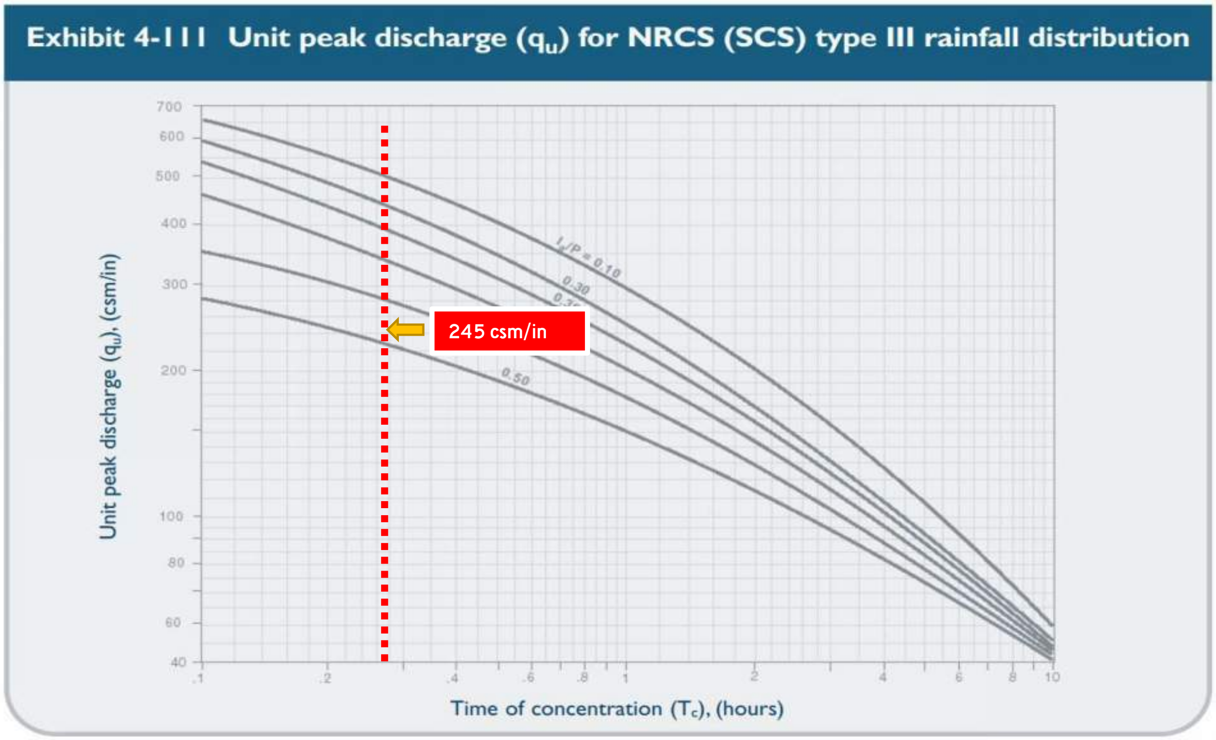
Curve number	I_a (in)	Curve number	I_a (in)	Curve number	I_a (in)	Curve number	I_a (in)
40	3.000	55	1.636	70	0.857	85	0.353
41	2.878	56	1.571	71	0.817	86	0.326
42	2.762	57	1.509	72	0.778	87	0.299
43	2.651	58	1.448	73	0.740	88	0.273
44	2.545	59	1.390	74	0.703	89	0.247
45	2.444	60	1.333	75	0.667	90	0.222
46	2.348	61	1.279	76	0.632	91	0.198
47	2.255	62	1.226	77	0.597	92	0.174
48	2.167	63	1.175	78	0.564	93	0.151
49	2.082	64	1.125	79	0.532	94	0.128
50	2.000	65	1.077	80	0.500	95	0.105
51	1.922	66	1.030	81	0.469	96	0.083
52	1.846	67	0.985	82	0.439	97	0.062
53	1.774	68	0.941	83	0.410	98	0.041
54	1.704	69	0.899	84	0.381		

From Table 4-1, I_a, in

	Upper	Lower	Diff	Interpolated
CN	81	80	1	80.5
I_a	0.469	0.5	-0.031	0.4845

P, water quality storm	1 inches	Ia/P	0.4845

From Exhibit 4-111, q_u, csm/in



$WQF = q_u \times A \times Q$

q_u	245	cfs/mi^2/inch
A	0.0027	mi^2

Q = WQV(ac-ft) x 12 (in/ft) / A (acres)

WQV	0.0874	ac-ft
A	1.72	acres
Q	0.6098	cfs

WQF	0.4015 cfs

Hydrodynamic Separation Product Calculator

ASML Campus Traffic Safety Improvements

WQS-001

CDS CDS2015-4-C

Project Information					
Project Name	ASML Campus Traffic Safety Improvements			**Option #**	A
Country	UNITED_STATES	**State**	Connecticut	**City**	Wilton

Contact Information			
First Name	Joseph	**Last Name**	Canas
Company	Tighe & Bond	**Phone #**	203-712-1109
Email	jacanas@tighebond.com		

Design Criteria					
Site Designation	WQS-001			**Sizing Method**	Treatment Flow Rate
Screening Required?	No	**Treatment Flow Rate**	0.34	**Peak Flow (cfs)**	2.92
Groundwater Depth (ft)	5 - 10	**Pipe Invert Depth (ft)**	0 - 5	**Bedrock Depth (ft)**	5 - 10
Multiple Inlets?	Yes	**Grate Inlet Required?**	No	**Pipe Size (in)**	15.00
Required Particle Size Distribution?	No	**90° between two inlets?**	Yes		

Treatment Selection				
Treatment Unit	CDS	**System Model**	CDS2015-4-C	
Target Removal	80%	**Particle Size Distribution (PSD)**	50	

Hydrodynamic Separation Product Calculator

ASML Campus Traffic Safety Improvements

WQS-001

CDS CDS2015-4-C

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD								
Rainfall Intensity¹ (in/hr)	% Rainfall Volume¹	Cumulative Rainfall Volume	Rainfall Volume Treated	Total Flowrate (cfs)	Treated Flowrate (cfs)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
Removal Efficiency Adjustment² =								
Predicted % Annual Rainfall Treated =								
Predicted Net Annual Load Removal Efficiency =								
1 -								
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.								

SECTION (_____)
STORM WATER TREATMENT DEVICE

1.0 GENERAL

1.1 This item shall govern the furnishing and installation of the CDS® by Contech Engineered Solutions LLC, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents.

1.2 The Contractor shall furnish all labor, equipment and materials necessary to install the storm water treatment device(s) (SWTD) and appurtenances specified in the Drawings and these specifications.

1.3 The manufacturer of the SWTD shall be one that is regularly engaged in the engineering design and production of systems deployed for the treatment of storm water runoff for at least five (5) years and which have a history of successful production, acceptable to the Engineer. In accordance with the Drawings, the SWTD(s) shall be a CDS® device manufactured by:

Contech Engineered Solutions LLC
9025 Centre Pointe Drive
West Chester, OH, 45069
Tel: 1 800 338 1122

1.4 Related Sections

1.4.1 Section 02240: Dewatering
1.4.2 Section 02260: Excavation Support and Protection
1.4.3 Section 02315: Excavation and Fill
1.4.4 Section 02340: Soil Stabilization

1.5 All components shall be subject to inspection by the engineer at the place of manufacture and/or installation. All components are subject to being rejected or identified for repair if the quality of materials and manufacturing do not comply with the requirements of this specification. Components which have been identified as defective may be subject for repair where final acceptance of the component is contingent on the discretion of the Engineer.

1.6 The manufacturer shall guarantee the SWTD components against all manufacturer originated defects in materials or workmanship for a period of twelve (12) months from the date the components are delivered to the owner for installation. The manufacturer shall upon its determination repair, correct or replace any manufacturer originated defects advised in writing to the manufacturer within the referenced warranty period. The use of SWTD components shall be limited to the application for which it was specifically designed.

1.7 The SWTD manufacturer shall submit to the Engineer of Record a "Manufacturer's Performance Certification" certifying that each SWTD is capable of achieving the specified removal efficiencies listed in these specifications. The certification shall be supported by independent third-party research

1.8 No product substitutions shall be accepted unless submitted 10 days prior to project bid date, or as directed by the Engineer of Record. Submissions for substitutions require review and approval by the Engineer of Record, for hydraulic performance, impact to project designs, equivalent treatment performance, and any required project plan and report (hydrology/hydraulic, water quality, stormwater pollution) modifications that would be required by the approving jurisdictions/agencies. Contractor to coordinate with the Engineer of Record any applicable modifications to the project estimates of cost, bonding amount determinations, plan check fees for changes to approved documents, and/or any other regulatory requirements resulting from the product substitution.

2.0 MATERIALS

2.1 Housing unit of stormwater treatment device shall be constructed of pre-cast or cast-in-place concrete, no exceptions. Precast concrete components shall conform to applicable sections of ASTM C 478, ASTM C 857 and ASTM C 858 and the following:

- 2.1.1 Concrete shall achieve a minimum 28-day compressive strength of 4,000 pounds per square-inch (psi);
- 2.1.2 Unless otherwise noted, the precast concrete sections shall be designed to withstand lateral earth and AASHTO H-20 traffic loads;
- 2.1.3 Cement shall be Type III Portland Cement conforming to ASTM C 150;
- 2.1.4 Aggregates shall conform to ASTM C 33;
- 2.1.5 Reinforcing steel shall be deformed billet-steel bars, welded steel wire or deformed welded steel wire conforming to ASTM A 615, A 185, or A 497.
- 2.1.6 Joints shall be sealed with preformed joint sealing compound conforming to ASTM C 990.
- 2.1.7 Shipping of components shall not be initiated until a minimum compressive strength of 4,000 psi is attained or five (5) calendar days after fabrication has expired, whichever occurs first.

2.2 Internal Components and appurtenances shall conform to the following:

- 2.2.1 Screen and support structure shall be manufactured of Type 316 and 316L stainless steel conforming to ASTM F 1267-01;
- 2.2.2 Hardware shall be manufactured of Type 316 stainless steel conforming to ASTM A 320;
- 2.2.3 Fiberglass components shall conform to applicable sections of ASTM D-4097
- 2.2.4 Access system(s) conform to the following:
- 2.2.5 Manhole castings shall be designed to withstand AASHTO H-20 loadings and manufactured of cast-iron conforming to ASTM A 48 Class 30.

3.0 PERFORMANCE

3.1 The SWTD shall be sized to either achieve an 80 percent average annual reduction in the total suspended solid load with a particle size distribution having a mean particle size (d_{50}) of 125 microns unless otherwise stated.

3.2 The SWTD shall be capable of capturing and retaining 100 percent of pollutants greater than or equal to 2.4 millimeters (mm) regardless of the pollutant's specific gravity (i.e.: floatable and neutrally buoyant materials) for flows up to the device's rated-treatment capacity. The SWTD shall be designed to retain all previously captured pollutants addressed by this

subsection under all flow conditions. The SWTD shall be capable of capturing and retaining total petroleum hydrocarbons. The SWTD shall be capable of achieving a removal efficiency of 92 and 78 percent when the device is operating at 25 and 50 percent of its rated-treatment capacity. These removal efficiencies shall be based on independent third-party research for influent oil concentrations representative of storm water runoff (20 ± 5 mg/L). The SWTD shall be greater than 99 percent effective in controlling dry-weather accidental oil spills.

3.3 The SWTD shall be designed with a sump chamber for the storage of captured sediments and other negatively buoyant pollutants in between maintenance cycles. The minimum storage capacity provided by the sump chamber shall be in accordance with the volume listed in Table 1. The boundaries of the sump chamber shall be limited to that which do not degrade the SWTD's treatment efficiency as captured pollutants accumulate. The sump chamber shall be separate from the treatment processing portion(s) of the SWTD to minimize the probability of fine particle re-suspension. In order to not restrict the Owner's ability to maintain the SWTD, the minimum dimension providing access from the ground surface to the sump chamber shall be 16 inches in diameter.

3.4 The SWTD shall be designed to capture and retain Total Petroleum Hydrocarbons generated by wet-weather flow and dry-weather gross spills and have a capacity listed in Table 1 of the required unit.

3.5 The SWTD shall convey the flow from the peak storm event of the drainage network, in accordance with required hydraulic upstream conditions as defined by the Engineer. If a substitute SWTD is proposed, supporting documentation shall be submitted that demonstrates equal or better upstream hydraulic conditions compared to that specified herein. This documentation shall be signed and sealed by a Professional Engineer registered in the State of the work. All costs associated with preparing and certifying this documentation shall be born solely by the Contractor.

3.6 The SWTD shall have completed field tested following TARP Tier II protocol requirements

4.0 <u>EXECUTION</u>

4.1 The contractor shall exercise care in the storage and handling of the SWTD components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be borne by the contractor.

4.2 The SWTD shall be installed in accordance with the manufacturer's recommendations and related sections of the contract documents. The manufacturer shall provide the contractor installation instructions and offer on-site guidance during the important stages of the installation as identified by the manufacturer at no additional expense. A minimum of 72 hours notice shall be provided to the manufacturer prior to their performance of the services included under this subsection.

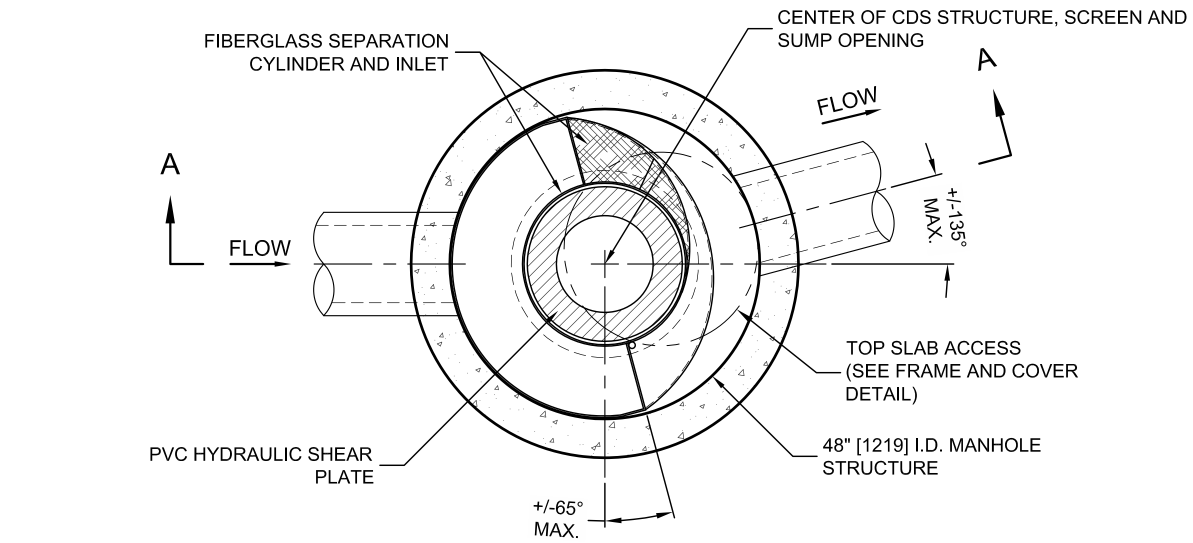
4.3 The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface in a manner, which leaves no sharp points or edges.

4.4 The contractor shall removal all loose material and pooling water from the SWTD prior to the transfer of operational responsibility to the Owner.

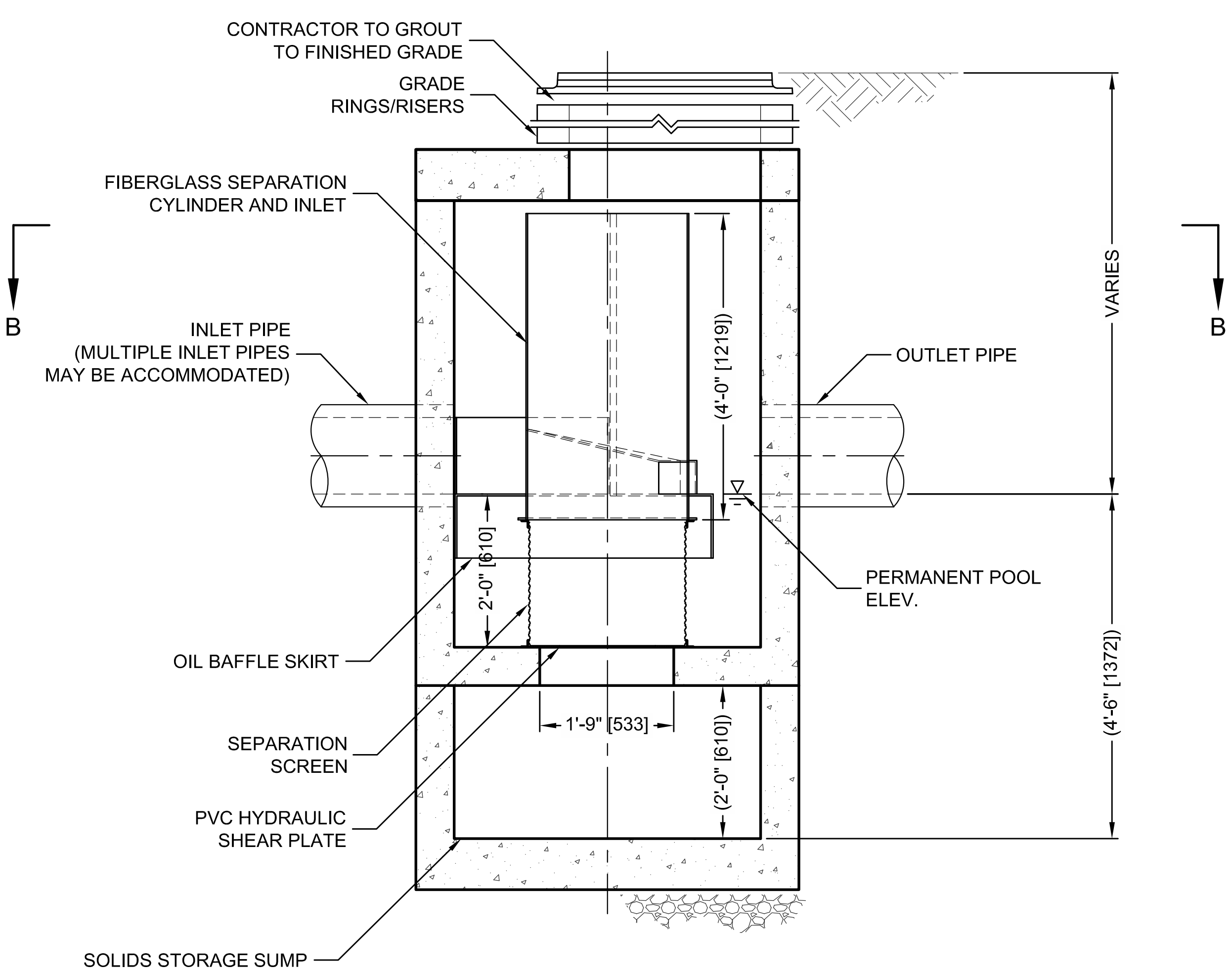
TABLE 1
Storm Water Treatment Device
Storage Capacities

CDS Model	Minimum Sump Storage Capacity (yd^3)/(m^3)	Minimum Oil Storage Capacity (gal)/(L)
CDS2015-4	0.9(0.7)	61(232)
CDS2015-5	1.5(1.1)	83(313)
CDS2020-5	1.5(1.1)	99(376)
CDS2025-5	1.5(1.1)	116(439)
CDS3020-6	2.1 (1.6)	184(696)
CDS3025-6	2.1(1.6)	210(795)
CDS3030-6	2.1 (1.6)	236(895)
CDS3035-6	2.1 (1.6)	263(994)
CDS3535-7	2.9(2.2)	377(1426)
CDS4030-8	5.6(4.3)	426(1612)
CDS4040-8	5.6 (4.3)	520(1970)
CDS4045-8	5.6 (4.3)	568(2149)
CDS5640-10	8.7(6.7)	758(2869)
CDS5653-10	8.7(6.7)	965(3652)
CDS5668-10	8.7(6.7)	1172(4435)
CDS5678-10	8.7(6.7)	1309(4956)
CDS7070-DV	3.6(2.8)	914 (3459)
CDS10060-DV	5.0 (3.8)	792 (2997)
CDS10080-DV	5.0 (3.8)	1057 (4000)
CDS100100-DV	5.0 (3.8)	1320 (4996)

END OF SECTION



PLAN VIEW B-B
N.T.S.

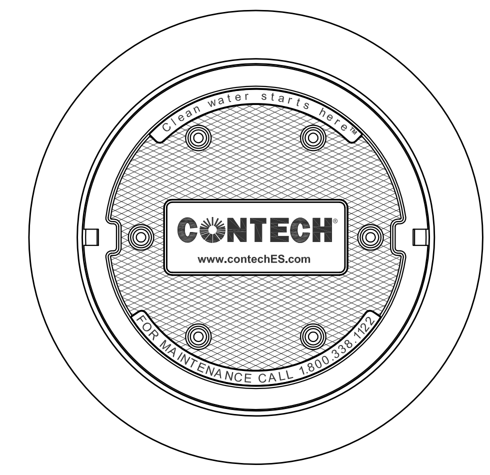


ELEVATION A-A
N.T.S.

CDS2015-4-C DESIGN NOTES

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH
ENGINEERED SOLUTIONS LLC
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800-338-1122 513-645-7000 513-645-7993 FAX

CDS2015-4-C
INLINE CDS
STANDARD DETAIL

Hydrodynamic Separation Product Calculator

ASML Campus Traffic Safety Improvements

WQS-002

CDS CDS2015-4-C

Project Information					
Project Name	ASML Campus Traffic Safety Improvements			**Option #**	A
Country	UNITED_STATES	**State**	Connecticut	**City**	Wilton

Contact Information			
First Name	Joseph	**Last Name**	Canas
Company	Tighe & Bond	**Phone #**	203-712-1109
Email	jacanas@tighebond.com		

Design Criteria					
Site Designation	WQS-002			**Sizing Method**	Treatment Flow Rate
Screening Required?	No	**Treatment Flow Rate**	0.35	**Peak Flow (cfs)**	3.22
Groundwater Depth (ft)	0 - 5	**Pipe Invert Depth (ft)**	0 - 5	**Bedrock Depth (ft)**	0 - 5
Multiple Inlets?	No	**Grate Inlet Required?**	No	**Pipe Size (in)**	15.00
Required Particle Size Distribution?	No	**90° between two inlets?**	N/A		

Treatment Selection				
Treatment Unit	CDS	**System Model**	CDS2015-4-C	
Target Removal	80%	**Particle Size Distribution (PSD)**	50	

Hydrodynamic Separation Product Calculator

ASML Campus Traffic Safety Improvements

WQS-002

CDS CDS2015-4-C

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD								
Rainfall Intensity[1] (in/hr)	% Rainfall Volume[1]	Cumulative Rainfall Volume	Rainfall Volume Treated	Total Flowrate (cfs)	Treated Flowrate (cfs)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
Removal Efficiency Adjustment[2] =								
Predicted % Annual Rainfall Treated =								
Predicted Net Annual Load Removal Efficiency =								
1 -								
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.								

SECTION (_____)
STORM WATER TREATMENT DEVICE

1.0 GENERAL

1.1 This item shall govern the furnishing and installation of the CDS® by Contech Engineered Solutions LLC, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents.

1.2 The Contractor shall furnish all labor, equipment and materials necessary to install the storm water treatment device(s) (SWTD) and appurtenances specified in the Drawings and these specifications.

1.3 The manufacturer of the SWTD shall be one that is regularly engaged in the engineering design and production of systems deployed for the treatment of storm water runoff for at least five (5) years and which have a history of successful production, acceptable to the Engineer. In accordance with the Drawings, the SWTD(s) shall be a CDS® device manufactured by:

Contech Engineered Solutions LLC
9025 Centre Pointe Drive
West Chester, OH, 45069
Tel: 1 800 338 1122

1.4 Related Sections

1.4.1 Section 02240: Dewatering
1.4.2 Section 02260: Excavation Support and Protection
1.4.3 Section 02315: Excavation and Fill
1.4.4 Section 02340: Soil Stabilization

1.5 All components shall be subject to inspection by the engineer at the place of manufacture and/or installation. All components are subject to being rejected or identified for repair if the quality of materials and manufacturing do not comply with the requirements of this specification. Components which have been identified as defective may be subject for repair where final acceptance of the component is contingent on the discretion of the Engineer.

1.6 The manufacturer shall guarantee the SWTD components against all manufacturer originated defects in materials or workmanship for a period of twelve (12) months from the date the components are delivered to the owner for installation. The manufacturer shall upon its determination repair, correct or replace any manufacturer originated defects advised in writing to the manufacturer within the referenced warranty period. The use of SWTD components shall be limited to the application for which it was specifically designed.

1.7 The SWTD manufacturer shall submit to the Engineer of Record a “Manufacturer’s Performance Certification” certifying that each SWTD is capable of achieving the specified removal efficiencies listed in these specifications. The certification shall be supported by independent third-party research

1.8 No product substitutions shall be accepted unless submitted 10 days prior to project bid date, or as directed by the Engineer of Record. Submissions for substitutions require review and approval by the Engineer of Record, for hydraulic performance, impact to project designs, equivalent treatment performance, and any required project plan and report (hydrology/hydraulic, water quality, stormwater pollution) modifications that would be required by the approving jurisdictions/agencies. Contractor to coordinate with the Engineer of Record any applicable modifications to the project estimates of cost, bonding amount determinations, plan check fees for changes to approved documents, and/or any other regulatory requirements resulting from the product substitution.

2.0 MATERIALS

2.1 Housing unit of stormwater treatment device shall be constructed of pre-cast or cast-in-place concrete, no exceptions. Precast concrete components shall conform to applicable sections of ASTM C 478, ASTM C 857 and ASTM C 858 and the following:

- 2.1.1 Concrete shall achieve a minimum 28-day compressive strength of 4,000 pounds per square-inch (psi);
- 2.1.2 Unless otherwise noted, the precast concrete sections shall be designed to withstand lateral earth and AASHTO H-20 traffic loads;
- 2.1.3 Cement shall be Type III Portland Cement conforming to ASTM C 150;
- 2.1.4 Aggregates shall conform to ASTM C 33;
- 2.1.5 Reinforcing steel shall be deformed billet-steel bars, welded steel wire or deformed welded steel wire conforming to ASTM A 615, A 185, or A 497.
- 2.1.6 Joints shall be sealed with preformed joint sealing compound conforming to ASTM C 990.
- 2.1.7 Shipping of components shall not be initiated until a minimum compressive strength of 4,000 psi is attained or five (5) calendar days after fabrication has expired, whichever occurs first.

2.2 Internal Components and appurtenances shall conform to the following:

- 2.2.1 Screen and support structure shall be manufactured of Type 316 and 316L stainless steel conforming to ASTM F 1267-01;
- 2.2.2 Hardware shall be manufactured of Type 316 stainless steel conforming to ASTM A 320;
- 2.2.3 Fiberglass components shall conform to applicable sections of ASTM D-4097
- 2.2.4 Access system(s) conform to the following:
- 2.2.5 Manhole castings shall be designed to withstand AASHTO H-20 loadings and manufactured of cast-iron conforming to ASTM A 48 Class 30.

3.0 PERFORMANCE

3.1 The SWTD shall be sized to either achieve an 80 percent average annual reduction in the total suspended solid load with a particle size distribution having a mean particle size (d_{50}) of 125 microns unless otherwise stated.

3.2 The SWTD shall be capable of capturing and retaining 100 percent of pollutants greater than or equal to 2.4 millimeters (mm) regardless of the pollutant's specific gravity (i.e.: floatable and neutrally buoyant materials) for flows up to the device's rated-treatment capacity. The SWTD shall be designed to retain all previously captured pollutants addressed by this

subsection under all flow conditions. The SWTD shall be capable of capturing and retaining total petroleum hydrocarbons. The SWTD shall be capable of achieving a removal efficiency of 92 and 78 percent when the device is operating at 25 and 50 percent of its rated-treatment capacity. These removal efficiencies shall be based on independent third-party research for influent oil concentrations representative of storm water runoff (20 ± 5 mg/L). The SWTD shall be greater than 99 percent effective in controlling dry-weather accidental oil spills.

3.3 The SWTD shall be designed with a sump chamber for the storage of captured sediments and other negatively buoyant pollutants in between maintenance cycles. The minimum storage capacity provided by the sump chamber shall be in accordance with the volume listed in Table 1. The boundaries of the sump chamber shall be limited to that which do not degrade the SWTD's treatment efficiency as captured pollutants accumulate. The sump chamber shall be separate from the treatment processing portion(s) of the SWTD to minimize the probability of fine particle re-suspension. In order to not restrict the Owner's ability to maintain the SWTD, the minimum dimension providing access from the ground surface to the sump chamber shall be 16 inches in diameter.

3.4 The SWTD shall be designed to capture and retain Total Petroleum Hydrocarbons generated by wet-weather flow and dry-weather gross spills and have a capacity listed in Table 1 of the required unit.

3.5 The SWTD shall convey the flow from the peak storm event of the drainage network, in accordance with required hydraulic upstream conditions as defined by the Engineer. If a substitute SWTD is proposed, supporting documentation shall be submitted that demonstrates equal or better upstream hydraulic conditions compared to that specified herein. This documentation shall be signed and sealed by a Professional Engineer registered in the State of the work. All costs associated with preparing and certifying this documentation shall be born solely by the Contractor.

3.6 The SWTD shall have completed field tested following TARP Tier II protocol requirements

4.0 EXECUTION

4.1 The contractor shall exercise care in the storage and handling of the SWTD components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be borne by the contractor.

4.2 The SWTD shall be installed in accordance with the manufacturer's recommendations and related sections of the contract documents. The manufacturer shall provide the contractor installation instructions and offer on-site guidance during the important stages of the installation as identified by the manufacturer at no additional expense. A minimum of 72 hours notice shall be provided to the manufacturer prior to their performance of the services included under this subsection.

4.3 The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface in a manner, which leaves no sharp points or edges.

4.4 The contractor shall removal all loose material and pooling water from the SWTD prior to the transfer of operational responsibility to the Owner.

TABLE 1
Storm Water Treatment Device
Storage Capacities

CDS Model	Minimum Sump Storage Capacity (yd^3)/(m^3)	Minimum Oil Storage Capacity (gal)/(L)
CDS2015-4	0.9(0.7)	61(232)
CDS2015-5	1.5(1.1)	83(313)
CDS2020-5	1.5(1.1)	99(376)
CDS2025-5	1.5(1.1)	116(439)
CDS3020-6	2.1 (1.6)	184(696)
CDS3025-6	2.1(1.6)	210(795)
CDS3030-6	2.1 (1.6)	236(895)
CDS3035-6	2.1 (1.6)	263(994)
CDS3535-7	2.9(2.2)	377(1426)
CDS4030-8	5.6(4.3)	426(1612)
CDS4040-8	5.6 (4.3)	520(1970)
CDS4045-8	5.6 (4.3)	568(2149)
CDS5640-10	8.7(6.7)	758(2869)
CDS5653-10	8.7(6.7)	965(3652)
CDS5668-10	8.7(6.7)	1172(4435)
CDS5678-10	8.7(6.7)	1309(4956)
CDS7070-DV	3.6(2.8)	914 (3459)
CDS10060-DV	5.0 (3.8)	792 (2997)
CDS10080-DV	5.0 (3.8)	1057 (4000)
CDS100100-DV	5.0 (3.8)	1320 (4996)

END OF SECTION

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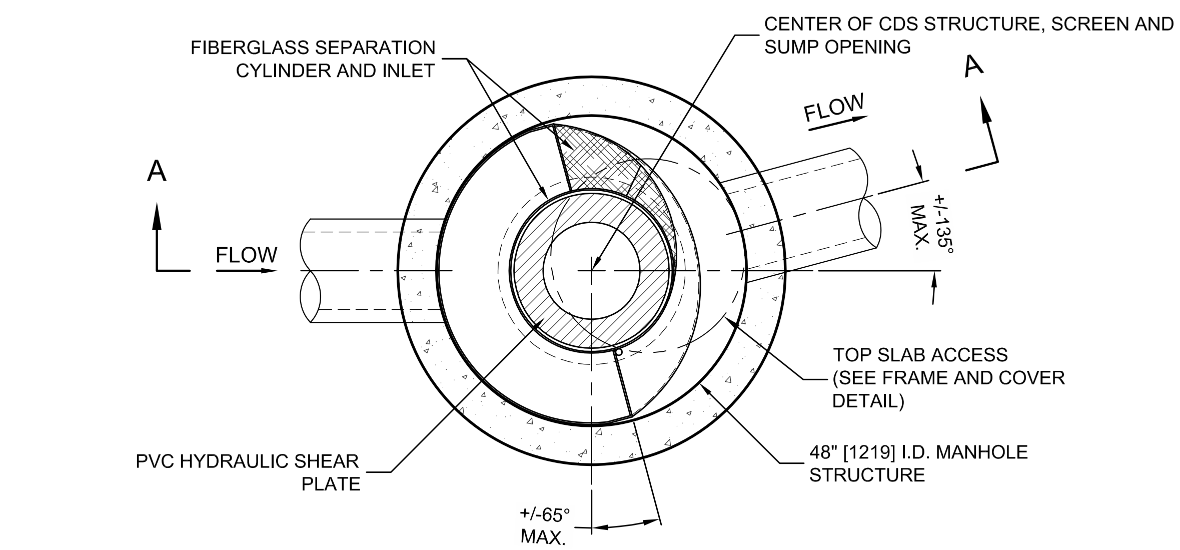
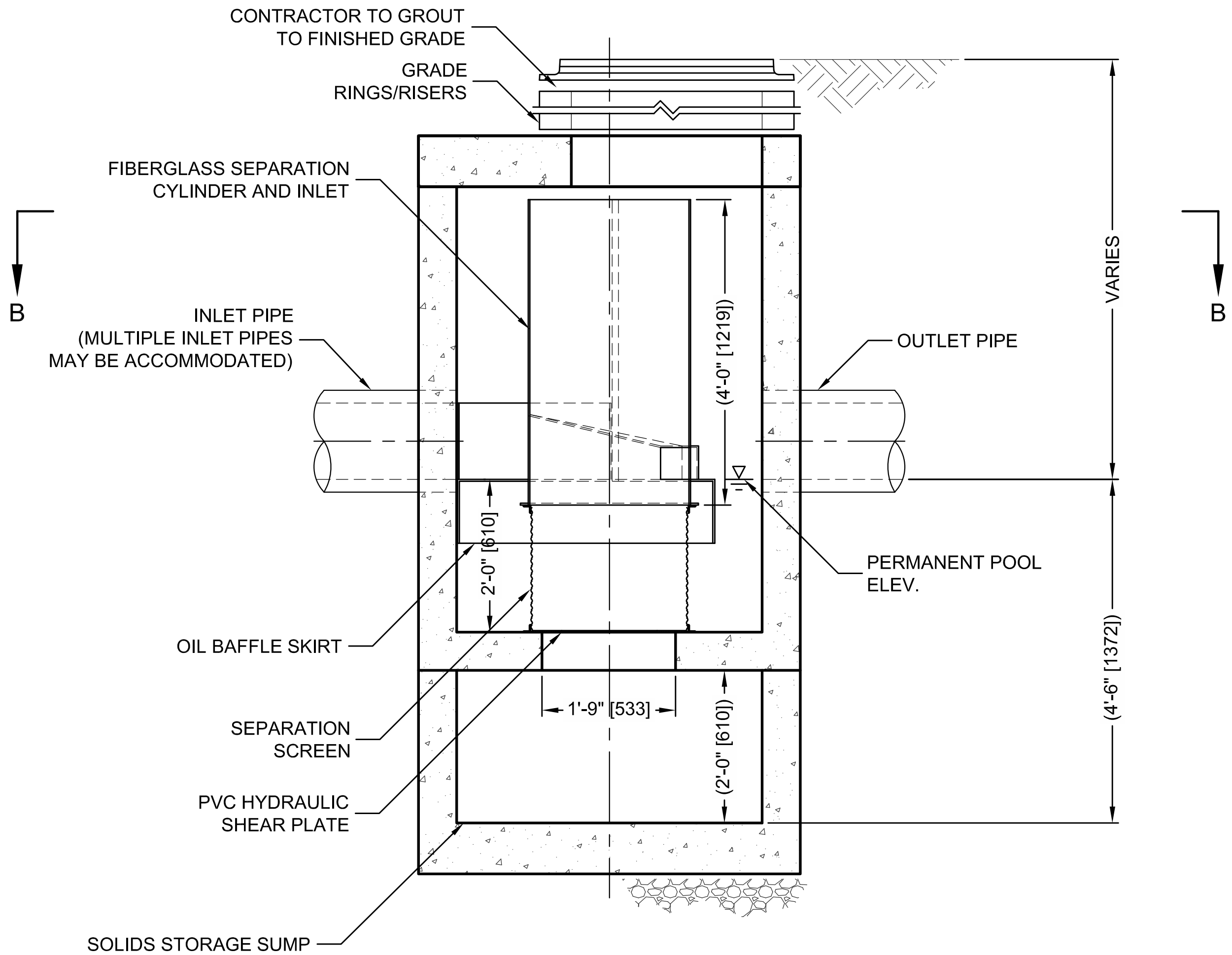


PLAN VIEW B-B
N.T.S.

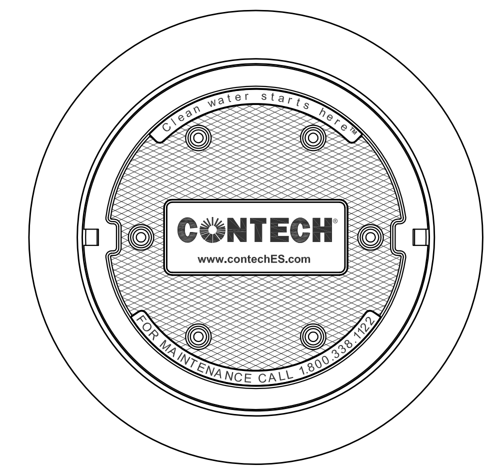


ELEVATION A-A
N.T.S.

CDS2015-4-C DESIGN NOTES

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



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

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
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4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

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CDS2015-4-C
INLINE CDS
STANDARD DETAIL

Hydrodynamic Separation Product Calculator

ASML Campus Traffic Safety Improvements

WQS-003

CDS CDS2020-5-C

Project Information					
Project Name	ASML Campus Traffic Safety Improvements			**Option #**	A
Country	UNITED_STATES	**State**	Connecticut	**City**	Wilton

Contact Information			
First Name	Joseph	**Last Name**	Canas
Company	Tighe & Bond	**Phone #**	203-712-1109
Email	jacanas@tighebond.com		

Design Criteria					
Site Designation	WQS-003			**Sizing Method**	Treatment Flow Rate
Screening Required?	No	**Treatment Flow Rate**	0.41	**Peak Flow (cfs)**	5.04
Groundwater Depth (ft)	5 - 10	**Pipe Invert Depth (ft)**	5 - 10	**Bedrock Depth (ft)**	5 - 10
Multiple Inlets?	No	**Grate Inlet Required?**	No	**Pipe Size (in)**	24.00
Required Particle Size Distribution?	No	**90° between two inlets?**	N/A		

Treatment Selection				
Treatment Unit	CDS	**System Model**	CDS2020-5-C	
Target Removal	80%	**Particle Size Distribution (PSD)**	50	

Hydrodynamic Separation Product Calculator

ASML Campus Traffic Safety Improvements

WQS-003

CDS CDS2020-5-C

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD								
Rainfall Intensity[1] (in/hr)	% Rainfall Volume[1]	Cumulative Rainfall Volume	Rainfall Volume Treated	Total Flowrate (cfs)	Treated Flowrate (cfs)	Operating Rate (%)	Removal Efficiency (%)	Incremental Removal (%)
							Removal Efficiency Adjustment[2] =	
							Predicted % Annual Rainfall Treated =	
							Predicted Net Annual Load Removal Efficiency =	
1 -								
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.								

SECTION (_____)
STORM WATER TREATMENT DEVICE

1.0 GENERAL

1.1 This item shall govern the furnishing and installation of the CDS® by Contech Engineered Solutions LLC, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents.

1.2 The Contractor shall furnish all labor, equipment and materials necessary to install the storm water treatment device(s) (SWTD) and appurtenances specified in the Drawings and these specifications.

1.3 The manufacturer of the SWTD shall be one that is regularly engaged in the engineering design and production of systems deployed for the treatment of storm water runoff for at least five (5) years and which have a history of successful production, acceptable to the Engineer. In accordance with the Drawings, the SWTD(s) shall be a CDS® device manufactured by:

Contech Engineered Solutions LLC
9025 Centre Pointe Drive
West Chester, OH, 45069
Tel: 1 800 338 1122

1.4 Related Sections

1.4.1 Section 02240: Dewatering
1.4.2 Section 02260: Excavation Support and Protection
1.4.3 Section 02315: Excavation and Fill
1.4.4 Section 02340: Soil Stabilization

1.5 All components shall be subject to inspection by the engineer at the place of manufacture and/or installation. All components are subject to being rejected or identified for repair if the quality of materials and manufacturing do not comply with the requirements of this specification. Components which have been identified as defective may be subject for repair where final acceptance of the component is contingent on the discretion of the Engineer.

1.6 The manufacturer shall guarantee the SWTD components against all manufacturer originated defects in materials or workmanship for a period of twelve (12) months from the date the components are delivered to the owner for installation. The manufacturer shall upon its determination repair, correct or replace any manufacturer originated defects advised in writing to the manufacturer within the referenced warranty period. The use of SWTD components shall be limited to the application for which it was specifically designed.

1.7 The SWTD manufacturer shall submit to the Engineer of Record a "Manufacturer's Performance Certification" certifying that each SWTD is capable of achieving the specified removal efficiencies listed in these specifications. The certification shall be supported by independent third-party research

1.8 No product substitutions shall be accepted unless submitted 10 days prior to project bid date, or as directed by the Engineer of Record. Submissions for substitutions require review and approval by the Engineer of Record, for hydraulic performance, impact to project designs, equivalent treatment performance, and any required project plan and report (hydrology/hydraulic, water quality, stormwater pollution) modifications that would be required by the approving jurisdictions/agencies. Contractor to coordinate with the Engineer of Record any applicable modifications to the project estimates of cost, bonding amount determinations, plan check fees for changes to approved documents, and/or any other regulatory requirements resulting from the product substitution.

2.0 MATERIALS

2.1 Housing unit of stormwater treatment device shall be constructed of pre-cast or cast-in-place concrete, no exceptions. Precast concrete components shall conform to applicable sections of ASTM C 478, ASTM C 857 and ASTM C 858 and the following:

- 2.1.1 Concrete shall achieve a minimum 28-day compressive strength of 4,000 pounds per square-inch (psi);
- 2.1.2 Unless otherwise noted, the precast concrete sections shall be designed to withstand lateral earth and AASHTO H-20 traffic loads;
- 2.1.3 Cement shall be Type III Portland Cement conforming to ASTM C 150;
- 2.1.4 Aggregates shall conform to ASTM C 33;
- 2.1.5 Reinforcing steel shall be deformed billet-steel bars, welded steel wire or deformed welded steel wire conforming to ASTM A 615, A 185, or A 497.
- 2.1.6 Joints shall be sealed with preformed joint sealing compound conforming to ASTM C 990.
- 2.1.7 Shipping of components shall not be initiated until a minimum compressive strength of 4,000 psi is attained or five (5) calendar days after fabrication has expired, whichever occurs first.

2.2 Internal Components and appurtenances shall conform to the following:

- 2.2.1 Screen and support structure shall be manufactured of Type 316 and 316L stainless steel conforming to ASTM F 1267-01;
- 2.2.2 Hardware shall be manufactured of Type 316 stainless steel conforming to ASTM A 320;
- 2.2.3 Fiberglass components shall conform to applicable sections of ASTM D-4097
- 2.2.4 Access system(s) conform to the following:
- 2.2.5 Manhole castings shall be designed to withstand AASHTO H-20 loadings and manufactured of cast-iron conforming to ASTM A 48 Class 30.

3.0 PERFORMANCE

3.1 The SWTD shall be sized to either achieve an 80 percent average annual reduction in the total suspended solid load with a particle size distribution having a mean particle size (d_{50}) of 125 microns unless otherwise stated.

3.2 The SWTD shall be capable of capturing and retaining 100 percent of pollutants greater than or equal to 2.4 millimeters (mm) regardless of the pollutant’s specific gravity (i.e.: floatable and neutrally buoyant materials) for flows up to the device’s rated-treatment capacity. The SWTD shall be designed to retain all previously captured pollutants addressed by this

subsection under all flow conditions. The SWTD shall be capable of capturing and retaining total petroleum hydrocarbons. The SWTD shall be capable of achieving a removal efficiency of 92 and 78 percent when the device is operating at 25 and 50 percent of its rated-treatment capacity. These removal efficiencies shall be based on independent third-party research for influent oil concentrations representative of storm water runoff (20 ± 5 mg/L). The SWTD shall be greater than 99 percent effective in controlling dry-weather accidental oil spills.

3.3 The SWTD shall be designed with a sump chamber for the storage of captured sediments and other negatively buoyant pollutants in between maintenance cycles. The minimum storage capacity provided by the sump chamber shall be in accordance with the volume listed in Table 1. The boundaries of the sump chamber shall be limited to that which do not degrade the SWTD's treatment efficiency as captured pollutants accumulate. The sump chamber shall be separate from the treatment processing portion(s) of the SWTD to minimize the probability of fine particle re-suspension. In order to not restrict the Owner's ability to maintain the SWTD, the minimum dimension providing access from the ground surface to the sump chamber shall be 16 inches in diameter.

3.4 The SWTD shall be designed to capture and retain Total Petroleum Hydrocarbons generated by wet-weather flow and dry-weather gross spills and have a capacity listed in Table 1 of the required unit.

3.5 The SWTD shall convey the flow from the peak storm event of the drainage network, in accordance with required hydraulic upstream conditions as defined by the Engineer. If a substitute SWTD is proposed, supporting documentation shall be submitted that demonstrates equal or better upstream hydraulic conditions compared to that specified herein. This documentation shall be signed and sealed by a Professional Engineer registered in the State of the work. All costs associated with preparing and certifying this documentation shall be born solely by the Contractor.

3.6 The SWTD shall have completed field tested following TARP Tier II protocol requirements

4.0 EXECUTION

4.1 The contractor shall exercise care in the storage and handling of the SWTD components prior to and during installation. Any repair or replacement costs associated with events occurring after delivery is accepted and unloading has commenced shall be borne by the contractor.

4.2 The SWTD shall be installed in accordance with the manufacturer's recommendations and related sections of the contract documents. The manufacturer shall provide the contractor installation instructions and offer on-site guidance during the important stages of the installation as identified by the manufacturer at no additional expense. A minimum of 72 hours notice shall be provided to the manufacturer prior to their performance of the services included under this subsection.

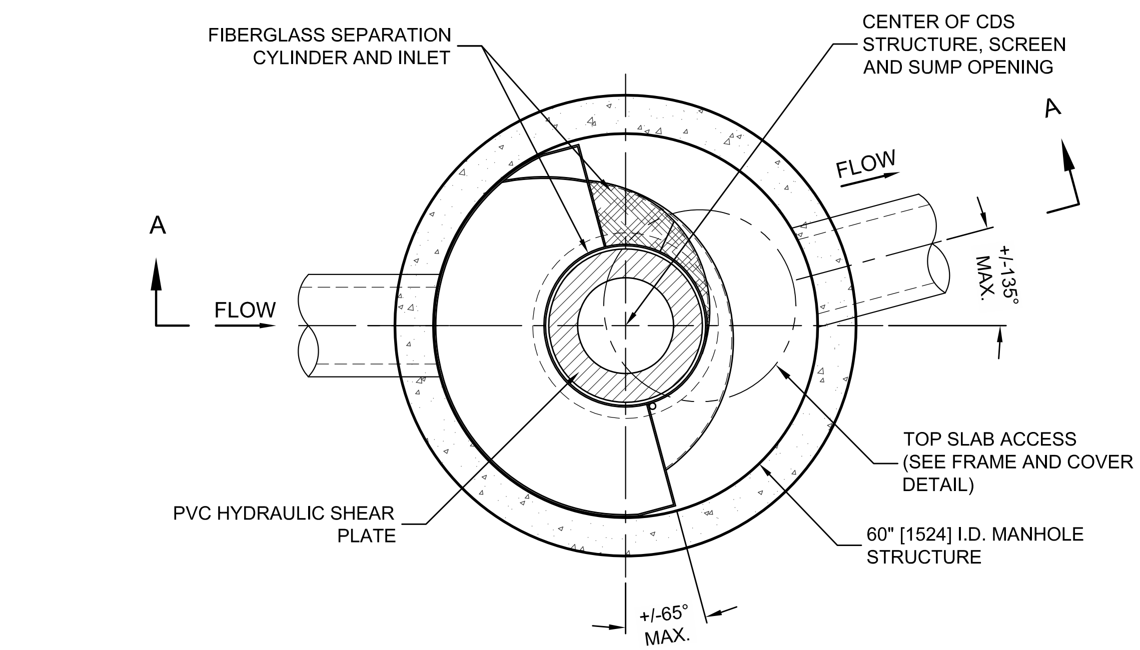
4.3 The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent concrete surface in a manner, which leaves no sharp points or edges.

4.4 The contractor shall removal all loose material and pooling water from the SWTD prior to the transfer of operational responsibility to the Owner.

TABLE 1
Storm Water Treatment Device
Storage Capacities

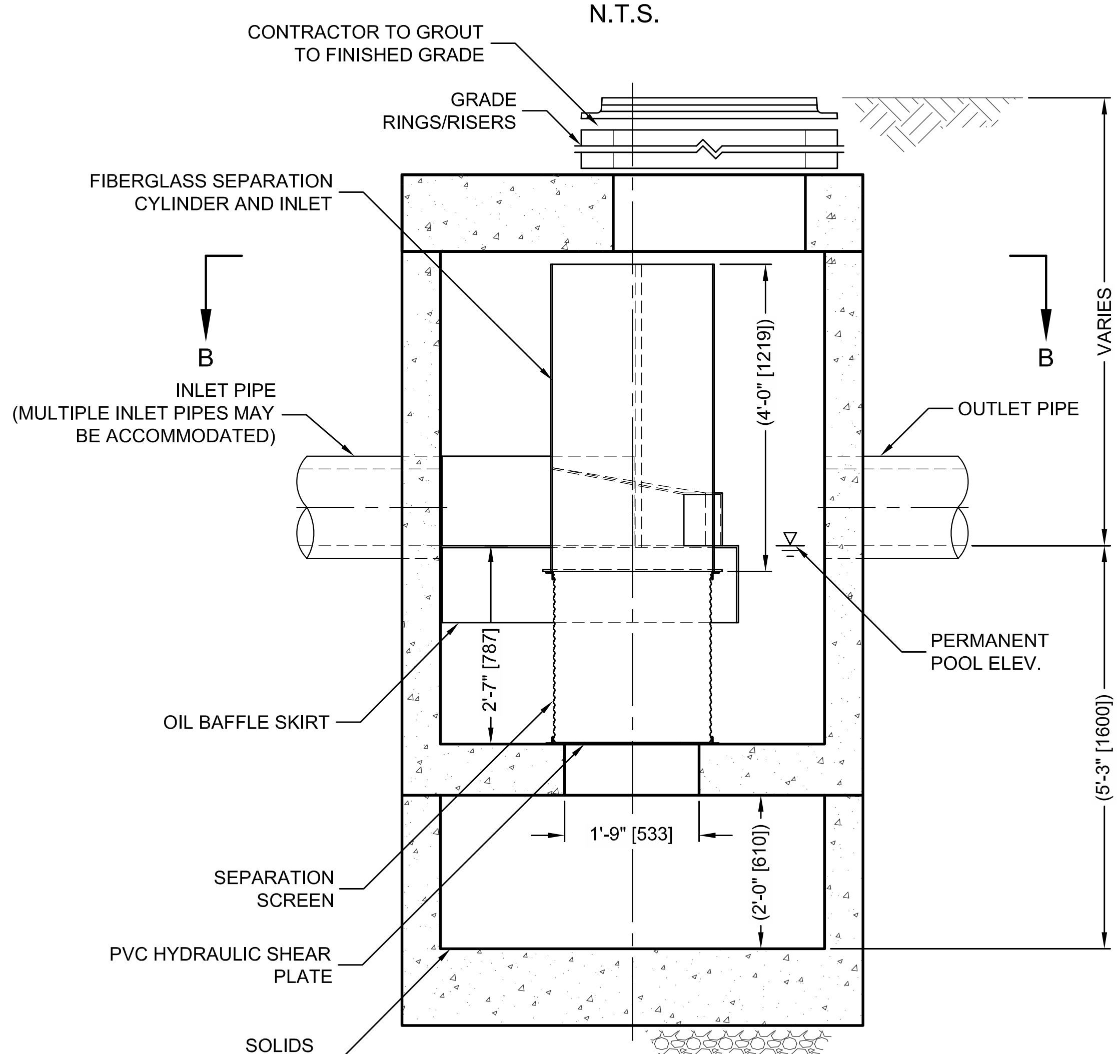
CDS Model	Minimum Sump Storage Capacity $(yd^3)/(m^3)$	Minimum Oil Storage Capacity (gal)/(L)
CDS2015-4	0.9(0.7)	61(232)
CDS2015-5	1.5(1.1)	83(313)
CDS2020-5	1.5(1.1)	99(376)
CDS2025-5	1.5(1.1)	116(439)
CDS3020-6	2.1 (1.6)	184(696)
CDS3025-6	2.1(1.6)	210(795)
CDS3030-6	2.1 (1.6)	236(895)
CDS3035-6	2.1 (1.6)	263(994)
CDS3535-7	2.9(2.2)	377(1426)
CDS4030-8	5.6(4.3)	426(1612)
CDS4040-8	5.6 (4.3)	520(1970)
CDS4045-8	5.6 (4.3)	568(2149)
CDS5640-10	8.7(6.7)	758(2869)
CDS5653-10	8.7(6.7)	965(3652)
CDS5668-10	8.7(6.7)	1172(4435)
CDS5678-10	8.7(6.7)	1309(4956)
CDS7070-DV	3.6(2.8)	914 (3459)
CDS10060-DV	5.0 (3.8)	792 (2997)
CDS10080-DV	5.0 (3.8)	1057 (4000)
CDS100100-DV	5.0 (3.8)	1320 (4996)

END OF SECTION



PLAN VIEW B-B

N.T.S.



ELEVATION A-A

N.T.S.

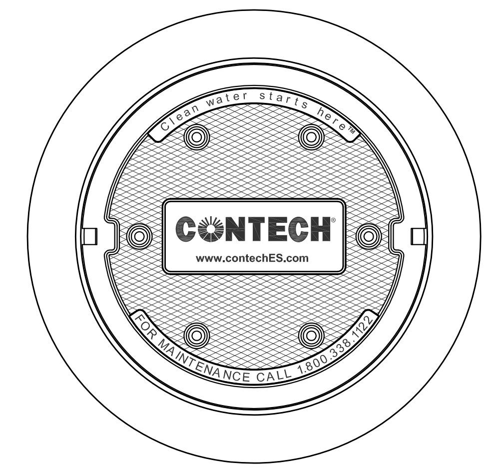
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,848; 6,641,720; 6,511,595; 6,581,783; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

C:\USERS\SCHLACHTERH\DESKTOP\CDS DETAILS 180 MICRON SIZING\ACAD\CDS2020-5-C-DTL.DWG 5/19/2014 5:19 PM

CDS2020-5-C DESIGN NOTES

THE STANDARD CDS2020-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



FRAME AND COVER

(DIAMETER VARIES)

N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

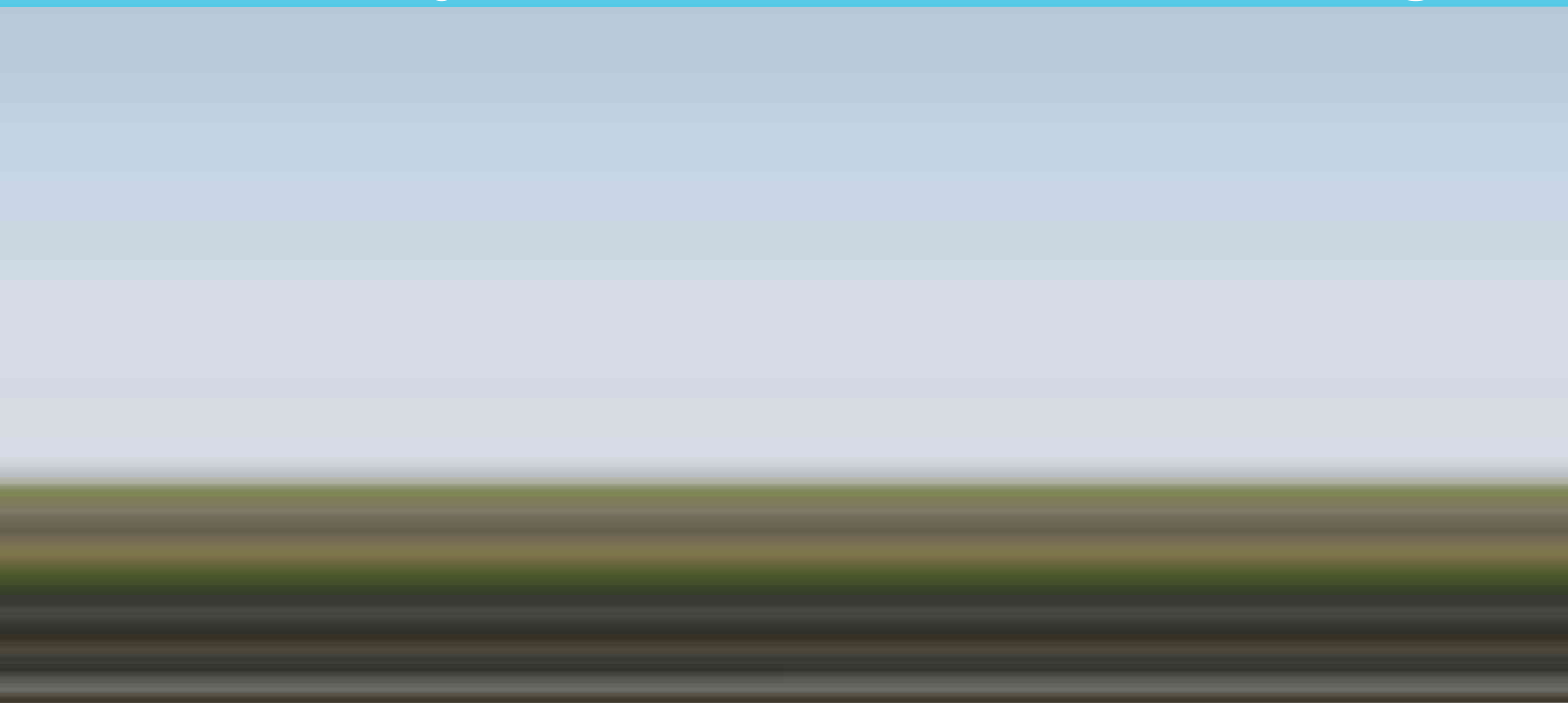
CONTECH® ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2020-5-C
INLINE CDS
STANDARD DETAIL

CONTECH®
ENGINEERED SOLUTIONS

Hydrodynamic Separation

The experts you need to solve your stormwater challenges



Contech is the leader in stormwater solutions, helping engineers, contractors and owners with infrastructure and land development projects throughout North America.

With our responsive team of stormwater experts, local regulatory expertise and flexible solutions, Contech is the trusted partner you can count on for stormwater management solutions.

Your Contech Team

STORMWATER CONSULTANT

It's my job to recommend the best solution to meet permitting requirements.

STORMWATER DESIGN ENGINEER

I work with consultants to design the best approved solution to meet your project's needs.

REGULATORY MANAGER

I understand the local stormwater regulations and what solutions will be approved.

SALES ENGINEER

I make sure our solutions meet the needs of the contractor during construction.

Contech is your partner in stormwater management solutions

Removing Pollutants using Hydrodynamic Separation

Utilize high-performance hydrodynamic separation to effectively remove finer sediment, oil and grease, and floating and sinking debris.

HDS systems play a vital role in protecting our waterways by removing high levels of sediment, trash, debris, and hydrocarbons from stormwater runoff.

Frequently used as end-of-pipe solutions, they are also used to provide stormwater quality treatment in places where space is limited.

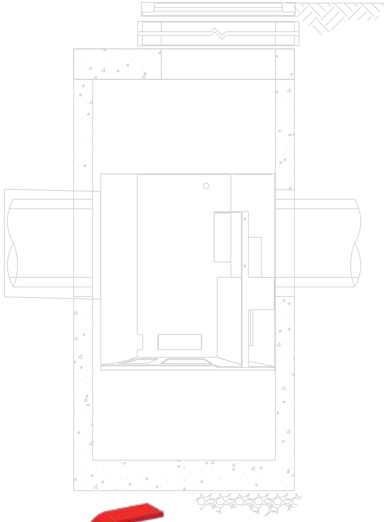
HDS systems capture and retain a variety of stormwater pollutants and are very easy to maintain. These two key benefits have resulted in new uses for HDS technologies, such as pretreating detention, Low Impact Development, and green infrastructure practices, as well as other land-based stormwater treatment systems.

CASCADE separator™

CDS®

Vortechs®

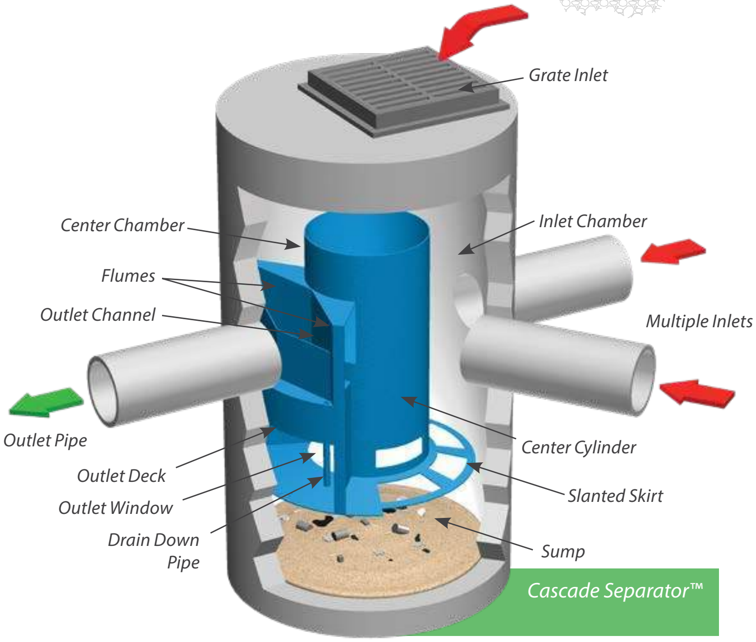
The Cascade Separator™ System



Advanced Sediment Capture Technology ...

The Cascade Separator™ is the newest innovation in stormwater treatment from Contech. The Cascade Separator was developed by Contech's stormwater experts using advanced modeling tools and Contech's industry leading stormwater laboratory.

This innovative hydrodynamic separator excels at sediment capture and retention while also removing hydrocarbons, trash, and debris from stormwater runoff. What makes the Cascade Separator unique is the use of opposing vortices that enhance particle settling and a unique skirt design that allows for sediment transport into the sump while reducing turbulence and resuspension of previously captured material. These two factors allow the Cascade Separator to treat high flow rates in a small footprint, resulting in an efficient and economical solution for any site.



FEATURE	BENEFIT
Unique skirt design & opposing vortices	Superior TSS removal; reduced system size and costs
Inlet area accepts wide range of inlet pipe angles	Design and installation flexibility
Accepts multiple inlet pipes	Eliminates the need for separate junction structure
Grate inlet option	Eliminates the need for a separate grate inlet structure
Internal bypass	Eliminates the need for a separate bypass structure
Clear access to sump and stored pollutants	Fast, easy maintenance

Learn More:
www.ContechES.com/cascade

SELECT CASCADE APPROVALS

- New Jersey Department of Environmental Protection Certification (NJDEP)

CASCADE MAINTENANCE

Cascade provides unobstructed access to stored pollutants, making it easy to maintain using a vacuum truck, with no requirement to enter the unit.

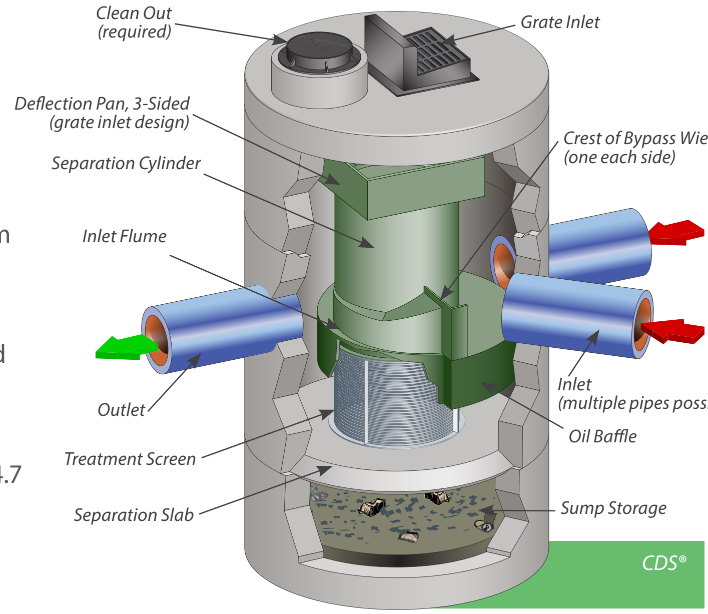
Setting new standards in Stormwater Treatment

The CDS® System

Superior Trash Removal ...

The CDS is a hybrid technology that uses a combination of swirl concentration and indirect screening to separate and trap trash, debris, sediment, and hydrocarbons from stormwater runoff.

At the heart of the CDS system is a unique screening technology used to capture and retain trash and debris. The screen face is louvered so that it is smooth in the downstream direction. The effect created is called "Continuous Deflective Separation." The power of the incoming flow is harnessed to continually shear debris off the screen and to direct trash and sediment toward the center of the separation cylinder. This results in a screen that is self-cleaning and provides 100% removal of floatables and neutrally buoyant material debris 4.7 mm or larger, without blinding.



FEATURE	BENEFIT
Captures and retains 100% of floatables and neutrally buoyant debris 4.7 mm or larger	Superior trash removal
Self-cleaning screen	Ease of maintenance
Isolated storage sump eliminates scour potential	Excellent pollutant retention
Internal bypass	Eliminates the need for additional structures
Multiple pipe inlets and 90-180º angles	Design flexibility
Clear access to sump and stored pollutants	Fast, easy maintenance

Learn More:
www.ContechES.com/cds

SELECT CDS APPROVALS

- Washington Department of Ecology (GULD) – Pretreatment
- New Jersey Department of Environmental Protection Certification (NJDEP)
- Canadian Environmental Technology Verification (ETV)
- California Statewide Trash Amendments Full Capture System Certified*

** The CDS System has been certified by the California State Water Resources Control Board as a Full Capture System provided that it is sized to treat the peak flow rate from the region specific 1-year, 1-hour design storm, or the peak flow capacity of the corresponding storm drain, whichever is less.*

The Vortechs® System

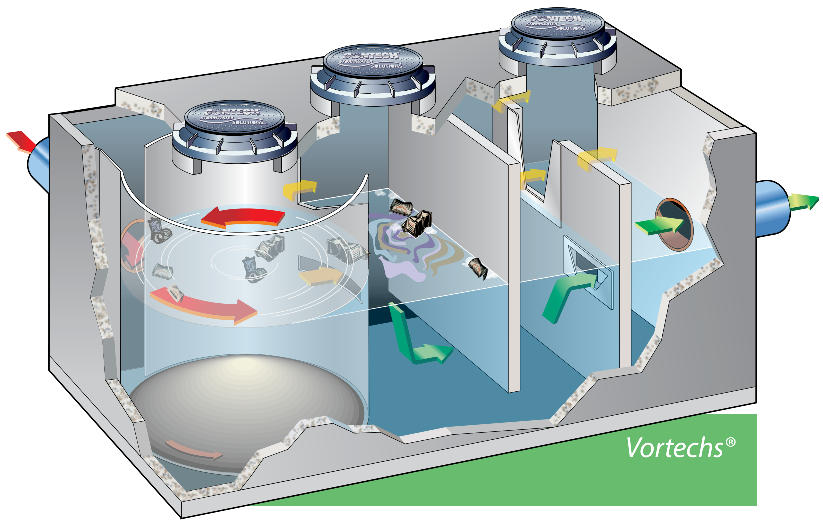
Stormwater Treatment in a Shallow Footprint ....

Vortechs combines swirl concentration and flow controls into a single treatment unit that captures and retains trash, debris, sediment, and hydrocarbons from stormwater runoff.

The Vortechs system's large swirl chamber and flow controls work together to create a low energy environment, ideal for capturing and retaining particles down to 50 microns.

Vortechs is the ideal solution for sites with high groundwater, bedrock, utility conflicts, or sites with a large volume runoff.

The Vortechs System is approved by the Washington Department of Ecology (GULD) - Pretreatment.



SELECT VORTECHS APPROVALS

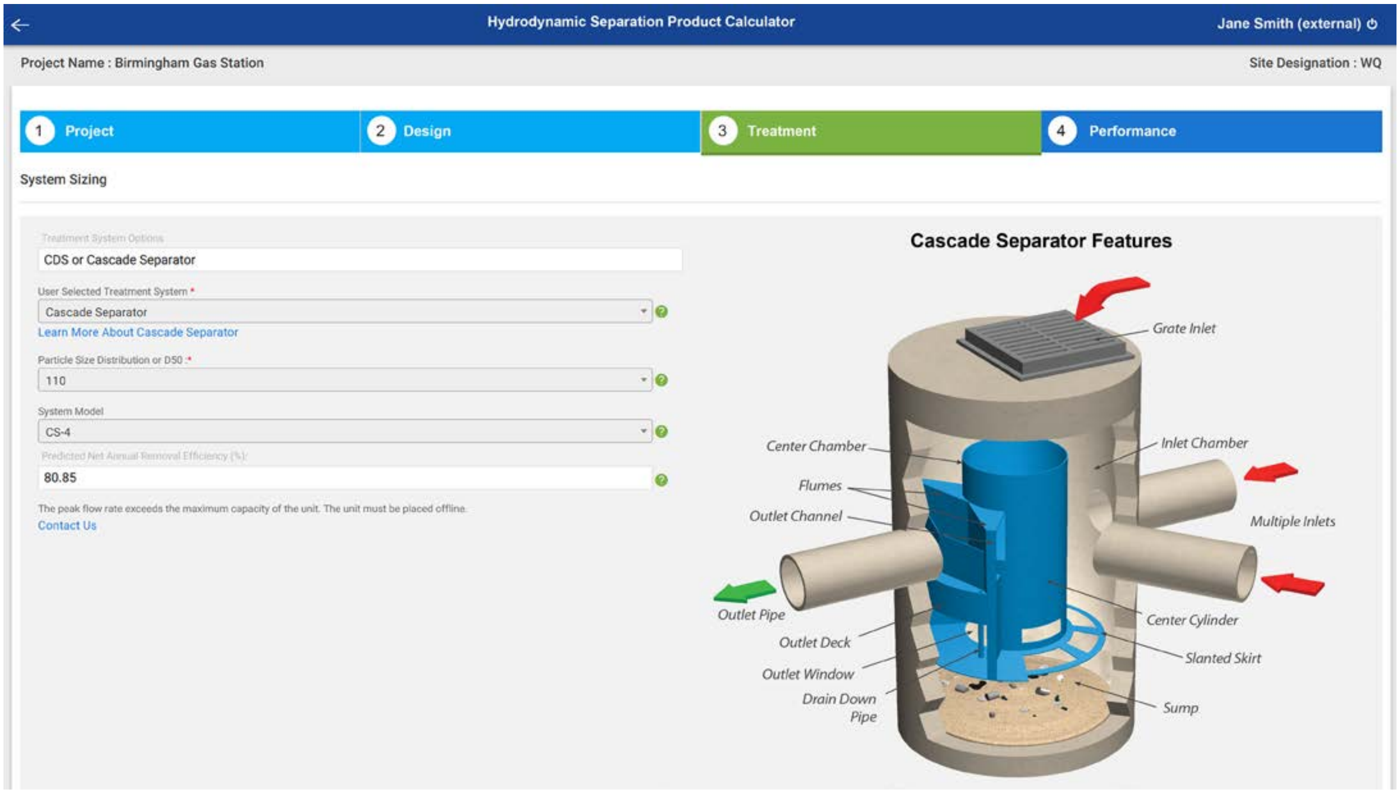
- Washington Department of Ecology (GULD) – Pretreatment

Learn More:
www.ContechES.com/vortechs

FEATURE	BENEFIT
Large swirl chamber	Fine particle removal down to 50 microns
Shallow profile – Typical depth below pipe invert is only 3 feet.	Can be used on sites with high groundwater, bedrock, or utility conflicts
Unobstructed access to stored pollutants	Fast, easy maintenance

The ideal solution for sites with high groundwater

Design Your Own Hydrodynamic Separator (DYOHDS™)



Learn More:
www.ContechES.com/dyohds

Quickly prepare designs for estimates and project meetings ...

Engineers are always looking for new ways to quickly prepare designs for estimates and project meetings. Contech has developed an online tool to help with the hydrodynamic separation product selection process… the Design Your Own Hydrodynamic Separator (DYOHDS™) tool.

This free, online tool fully automates the layout process for identifying the proper hydrodynamic separator for your site. You can create multiple systems for each project while saving all project information for future use.

- Multiple sizing methods available.
- Site-specific questions ensure the selected unit will comply with site constraints.
- Multiple treatment options may be available based on regulations and site parameters.
- Follow up reports contain a site-specific design, sizing summary, standard detail, and specification.

A free, online tool to aid in the selection of a hydrodynamic separation solution.

A partner you can rely on

STORMWATER SOLUTIONS

PIPE SOLUTIONS

STRUCTURES SOLUTIONS

Few companies offer the wide range of high-quality stormwater resources you can find with us — state-of-the-art products, decades of expertise, and all the maintenance support you need to operate your system cost-effectively.

THE CONTECH WAY

Contech® Engineered Solutions provides innovative, cost-effective site solutions to engineers, contractors, and developers on projects across North America. Our portfolio includes bridges, drainage, erosion control, retaining wall, sanitary sewer and stormwater management products.

TAKE THE NEXT STEP

For more information: www.ContechES.com

CONTECH® ENGINEERED SOLUTIONS

Get social with us:

800-338-1122 | www.ContechES.com

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **ASML Campus Traffic Flow Safety Improvement**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Stormwater BMP Pollutant Removal Estimate**
Prepared By: **JAC** Date: **May 22, 2022**

Item	Units	Pollutant					
		TKN	P	TSS	Pb	Cu	Zn
Proposed, Pre Treatment	lb/yr	5.61	0.96	328.11	0.49	0.14	1.07
Proposed, Post Treatment	lb/yr	0.00	0.00	0.00	0.00	0.00	0.00
Reduction, Pre to Post Treat	---	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Project Name:	**ASML Campus Traffic Flow Safety Improvement**
Project Number:	**A0969-015**
Project Location:	**Wilton, CT**
Description:	**Stormwater BMP Pollutant Removal Estimate**
Prepared By: **JAC**	Date: **May 22, 2022**

Location: **Infiltration System (PR-WS-03B)** Condition: **Proposed**

Annual Rainfall: 44.84 inches

Impervious Fraction: 0.73 Total Area = 0.67 acres

Pollutant	Residential A (acres)	Residential EMC (mg/L)	Commercial A (acres)	Commercial EMC (mg/l)	Open A (acres)	Open EMC (mg/L)	Weighted EMC (mg/L)	L (lbs/yr)
Total Nitrogen (N)	0.000	1.900	0.670	1.180	0.000	0.965	1.180	5.611
Total Phosphorus (P)	0.000	0.383	0.670	0.201	0.000	0.121	0.201	0.956
Total Suspended Solids	0.000	101.0	0.670	69.0	0.000	70.0	69.0	328.1
Lead	0.000	0.144	0.670	0.104	0.000	0.030	0.104	0.495
Copper	0.000	0.033	0.670	0.029	0.000	0.000	0.029	0.138
Zinc	0.000	0.135	0.670	0.226	0.000	0.195	0.226	1.075

L = 0.2266 * EMC * [0.15 + 0.75*I] * P *A

L	Pollution Loading (lbs/year)
EMC	Mean Event Mean Concentration (mg/L)
I	Fraction of Impervious Acres (acres)
P	Annual Rainfall (in)
A	Watershed Area (acres)

Notes:

1. Pollution loading calculated using *Municipal Stormwater Management, Second Edition* , by Debo & Reese, pgs. 193-195.

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **ASML Campus Traffic Flow Safety Improvement**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Stormwater BMP Pollutant Removal Estimate**
Prepared By: **JAC** Date: **May 22, 2022**

Location: **North Parking Lot** Condition: **Proposed**
Annual Rainfall: 44.84 inches
Impervious Fraction: 0.73 Total Area = 0.67 acres
BMP: **Gross Particle Separators WQS-001 + WQS-002**

Pollutant	Lin 1 (lbs)	Lin 2 (lbs)	Sum L (lbs)	RR (-)	Lremoved (lbs)	Lout (lbs)
Total Nitrogen (N)	5.611	0.000	5.611	18.3	1.03	4.584
Total Phosphorus (P)	0.956	0.000	0.956	66.9	0.64	0.316
Total Suspended Solids	328.111	0.0	328.1	50	164.06	164.1
Lead	0.495	0.000	0.495	46.5	0.23	0.265
Copper	0.138	0.000	0.138	56.2	0.08	0.060
Zinc	1.075	0.000	1.075	85.3	0.92	0.158
Lin 1	Pollutant Load Area 1					
Sum L	Sum of Pollutant Load to this BMP					
RR	Removal rate in percentage					
Lout	Pollutant Load out of BMP					

Notes:
1. Pollution loading calculated using *Municipal Stormwater Management, Second Edition* , by Debo & Reese, pgs. 193-195.
2. Pollutant removal rates for Rain Garden/Infiltration Trench and Wet Pond taken from *Municipal Stormwater Management, Second Edition* , by Debo & Reese, Tbl. 13-13, p. 748.
3. Pollutant removal rates for Vortechnics Stormwater Quality Unit and Deep Sump Catch Basins taken from *Final Report, Stormwater Treatment Devices Section 319 Project, Project #99-07* , Submitted to CT DEP April 15, 2002.
4. Pollutant removal rates for Ultra Urban Filter Catch Basin inserts taken from *Final Report: Sediment Removal from Simulated Stormwater Runoff by Abtech Industries, Inc. UltraUrban Filter-CO in Laboratory Flume Tests* , Submitted by Stan Galicki, Ph.D.,Millsaps College December 9th, 2009.

Tighe&Bond
Engineers | Environmental Specialists

Project Name: **ASML Campus Traffic Flow Safety Improvement**
Project Number: **A0969-015**
Project Location: **Wilton, CT**
Description: **Stormwater BMP Pollutant Removal Estimate**
Prepared By: **JAC** Date: **May 22, 2022**

Location: **North Parking Lot** Condition: **Proposed**
Annual Rainfall: 44.84 inches
Impervious Fraction: 0.73 Total Area = 0.67 acres
BMP: **Infiltration System**

Pollutant	Lin 1 (lbs)	Sum L (lbs)	RR (%)	Lremoved (lbs)	Lout (lbs)
Total Nitrogen (N)	4.584	4.584	100	4.58	0.000
Total Phosphorus (P)	0.316	0.316	100	0.32	0.000
Total Suspended Solids	164.055	164.1	100	164.06	0.0
Lead	0.265	0.265	100	0.26	0.000
Copper	0.060	0.060	100	0.06	0.000
Zinc	0.158	0.158	100	0.16	0.000
Lin 1	Pollutant Load Out of Deep Sump Catch Basins BMP				
Sum L	Sum of Pollutant Load to this BMP				
RR	Removal rate in percentage				
Lout	Pollutant Load out of BMP				

Notes:
1. Pollution loading calculated using *Municipal Stormwater Management, Second Edition*, by Debo & Reese, pgs. 193-195.
2. Pollutant removal rates for Rain Garden/Infiltration Trench and Wet Pond taken from *Municipal Stormwater Management, Second Edition*, by Debo & Reese, Tbl. 13-13, p. 748.
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APPENDIX F

ASML Campus Traffic Safety Improvements
Stormwater Maintenance Plan

May 24, 2022

F.1 Storm Drainage Maintenance and Inspection Schedule

The maintenance of stormwater treatment systems is critical to their performance because without proper maintenance, these structures are likely to fail. Proper operation and maintenance ensure that the structures remain effective at removing pollutants as originally designed. It will:

- Reduce failure, therefore improve water quality;
- Maintain the volume of stormwater treated in the long term; and
- Increase pollutant removal efficiency

The storm drainage system as a whole will be inspected semi-annually to ensure that the system is functioning properly. The inspections will occur in early fall and late spring initially. If these inspections show that debris and sediment accumulate, more frequent inspections will be scheduled according to the rate of debris generation. Additional inspections and cleanup work will be conducted following major runoff events.

The initial inspection will be made during an intense rainfall to check the adequacy of the catch basins, piping, oil separators, gross particle separators and outlets.

The following is a generalized checklist of items that will be checked and maintained during scheduled maintenance operations.

1. Catch basin grates will be cleaned of all debris. Catch basins and sumps will be cleaned of all silt, debris, and sediment, and the outlets from the catch basins will be inspected and cleaned to make sure nothing is clogging the discharge pipe.

2. The gross particle separators will be skimmed, and oil and scum removed. In a separate operation, silt sand and sediment will be removed. Once the structures are cleaned of debris, the chamber will be refilled with clean water to prevent wash through of debris and oil during next storm event.

3. All pipe outlets will be inspected, and any debris removed.

4. Remove accumulated trash and debris around the site on a weekly basis to prevent debris from washing into inlets.

5. Inspect the underground chamber system for signs of clogging.

6. Inspect the rain garden and stormwater management pond for signs of erosion, and confirm plantings are in good condition.

F1.1 Catch Basins

F1.1.1 Design Purpose

A catch basin is an inlet with a grate designed to intercept the flow of stormwater from the surface and to convey it into the storm sewer system.

F1.1.2 Design Features

Catch basins have sumps, a space below the lowest outlet pipe. The purpose of the sump is to catch and collect debris before it enters the outlet pipe, potentially clogging the pipe, or resulting in the downstream accumulation of the debris.

F1.1.3 Inspection Requirements

Each catch basin shall be inspected quarterly, with one inspection occurring during the month of April. Note depth of debris accumulation, and overall condition of the catch basin structure itself. Note any floating oils or sheens. Maintain a log of inspections.

F1.1.4 Maintenance Requirements

Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment by a Connecticut licensed hauler who shall legally dispose of removed sand at an off-site location. The road sand may not be reused or stored on-site. As part of the hauling contract, the hauler shall notify the Owner in writing where the material is being disposed. Maintain a log of maintenance activity.

Floating oils shall be removed using oil absorptive pads and disposed in a legal manner off site.

F1.2 Manholes

F1.2.1 Design Purpose

A manhole is used as a structure to join two or more segments of storm sewer piping as a junction, or to allow deflections along a pipe alignment. Manholes do not allow for capture of surface stormwater runoff.

F1.2.2 Design Features

Manholes have formed inverts which allow for less abrupt flow transitions around alignment deflections.

F1.2.3 Inspection Requirements

Each manhole shall be opened once a year in April. Note any accumulation of debris and sediment, as well as the structural integrity of the manhole itself. Maintain a log of inspections.

F1.2.4 Maintenance Requirements

Any debris occurring within the manhole shall be removed by Vacuum "Vactor" type of maintenance equipment by a Connecticut licensed hauler who shall legally dispose of removed sand at an off-site location. The road sand may not be reused or stored on-site. As part of the hauling contract, the hauler shall notify the Owner in writing where the material is being disposed. Maintain a log of maintenance activity.

F1.3 Yard Drains

F1.3.1 Design Purpose

Yard drains are inlets with a grate designed to intercept the flow of stormwater from the surface and to convey it into the storm sewer system. Yard drains are similar to catch basins, except that they are smaller in cross section because they drain smaller areas. Trench drains are inlets with a with long and narrow grates, typically positioned around buildings and parking garages to prevent stormwater from entering.

F1.3.2 Design Features

Yard drains have sumps, a space below the lowest outlet pipe. The purpose of the sump is to catch and collect debris before it enters the outlet pipe, potentially clogging the pipe, or resulting in the downstream deposition of the debris. Trench drains contain a channel below the grate where stormwater runoff flows to the outlet pipe. Smaller debris is collected within this channel prior to discharging.

F1.3.3 Inspection Requirements

Each yard drain and trench drain shall be inspected quarterly, with one inspection occurring during the month of April. Note depth of debris accumulation, any visible oil sheens, and overall condition of the yard drain and trench drain structure itself. Maintain a log of inspections.

F1.3.4 Maintenance Requirements

Any debris occurring within one foot from the bottom of each sump or significant debris accumulation within the trench drain channel shall be removed by Vacuum "Vactor" type of maintenance equipment or by hand using hand tools by a Connecticut licensed hauler who shall legally dispose of removed sand at an off-site location. The road sand may not be reused or stored on-site. As part of the hauling contract, the hauler shall notify the Owner in writing where the material is being disposed. Maintain a log of maintenance activity.

Floating oils shall be removed using oil absorptive pads and disposed in a legal manner off site.

F1.4 Gross Particle Separators

F1.4.1 Design Purpose

Gross particle separators promote the interception of oils and suspended solids by forcing low flows into a swirl chamber, utilizing hydrodynamic separation to achieve pollutant removal.

F1.4.2 Design Features

Gross particle separators include internal bypasses to allow heavier storm events to bypass the swirl chamber, avoiding resuspension of sediments.

F1.4.3 Inspection Requirements

Inspection is the key to effective maintenance. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. Keep inspection records.

Access to the gross particle separators are typically achieved through the manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allow both sump cleanout and access outside the screen.

F1.4.4 Maintenance Requirements

The gross particle separators should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine whether the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

F1.5 Underground Infiltration Chambers

F1.5.1 Design Purpose

The underground infiltration chambers are intended to retain the water quality volume to meet the MS4 Permit requirements, and the groundwater recharge volume requirement. Stormwater entering the chambers will be pretreated by the gross particle separator to maximize the performance of the system.

F1.5.2 Design Features

The infiltration chambers are concrete, which are more durable than plastic systems. They are surrounded by stone on the sides and bottom which provides additional stormwater storage in the voids.

F1.5.3 Inspection Requirements

Inspection is the key to effective maintenance. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations.

Inspections shall note if there is evidence of an unusual amount of silt build-up, the presence of water, and other structural defects.

The underground chamber systems have inspection manholes to facilitate access to observe underlying conditions, such as sediment build-up and failure to drain.

F1.5.4 Maintenance Requirements

The underground chamber systems should be vacuumed out when sediment begins to accumulate to the extent that the system does not drain within 48 hours. Large accumulations of debris that reduce the storage capacity shall be removed. Cleanout should be scheduled during dry weather.

F1.6 Rain Garden

F1.6.1 Design Purpose

The rain garden is proposed to promote biological uptake of stormwater pollutants and to recharge groundwater. The rain garden is designed to allow up to 6 inches of ponding, at which point, the ponded runoff would overflow into a grate set 6 inches above the bottom of the rain garden.

F1.6.2 Design Features

The rain garden is designed with specifically selected plantings that can tolerate periodic inundation and dryness.

F1.6.3 Inspection Requirements

Inspection is the key to effective maintenance. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations.

Inspections shall note if there is evidence of an unusual amount of silt build-up, the persistent presence of water, and other structural defects.

F1.6.4 Maintenance Requirements

The large accumulations of debris that reduce the storage capacity shall be removed. Cleanout should be scheduled during dry weather.

F1.7 Other Site Areas

F1.7.1 Vegetated Areas

Inspect annually in April, and after heavy rains, observe all slopes and embankments for signs of erosion, and replant areas of bare soil or with sparse growth. Armor rill erosion areas with riprap or divert the runoff to a stable area.

Throughout the year, mow vegetated areas as needed.

F1.7.2 Driveways and Parking Areas

The Owner shall sweep paved areas on the property in the spring to remove winter accumulations of road sand. Perform a visual inspection of paved areas four times per year with one inspection after the last snowfall, but no later than April 1. Clean paved areas as necessary during the remainder of the year

F1.7.3 Preventative Maintenance Overview

The following preventative maintenance schedule and activities are recommended for the site.

Table F-1
Stormwater Preventative Maintenance Schedule

Frequency	Preventative Maintenance Actions	Stormwater Measures/ No.
Monthly	Vegetation mowing and removal in growing season	Throughout site
Quarterly	Inspect catch basins and yard drains for accumulation of sediment and debris, note structural integrity of catch basin or yard drain. Remove if debris is within one foot of the sump.	CB, TD & YD
Semiannual	Inspect gross particle separators.	WQS
Annual	Inspect manholes for accumulation of sediment and debris, note structural integrity of manhole. Remove debris.	MH
	Sweep parking lots and driveways of accumulated sand	Parking lots and driveways
Unscheduled	Quick inspection after every 1” rain	CB, TD, YD, WQS Vegetated areas
	Mow vegetated areas as needed	Vegetated areas

F.2 Tools and Supplies Required

The following lists tools that may be necessary to carry out a maintenance program. Additional tools and supplies may be needed depending on the task:

Table F-2
Preventative Maintenance Equipment List

Tool	Purpose
Clipboard and pen	Filling out maintenance logs
Manhole hook	For lifting grates
Safety goggles	Eye protection
Work gloves	Performing manual activities
Tape measure	Measurement of depth
Flashlight	Make observations in dark spaces
Shovel	Sediment removal from rain gardens
Vactor truck	Removal of sediments from sumps and gross particle separators
Lawn mower	Maintaining vegetation height in lawn and rain garden areas
Debris containers	Collection of debris
Hard hat	Safety
First Aid kit	Safety

Some of the items in the list may need to be subcontracted out, such as the Vactor Truck.

APPENDIX G

HEC-RAS Plan: EXIST River: RIVER-1 Reach: Reach-1 Profile: 1% Chance

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	29920	1% Chance	7455.00	147.00	153.96	153.96	155.12	0.004919	11.86	1676.50	693.44	0.83
Reach-1	29760	1% Chance	7455.00	142.20	152.19		152.97	0.001276	7.45	1317.25	222.00	0.44
Reach-1	28240	1% Chance	7455.00	138.00	147.71	147.71	149.80	0.003506	12.69	1059.97	366.77	0.75
Reach-1	27468	1% Chance	7455.00	132.10	147.53		147.54	0.000024	1.37	10389.13	832.33	0.06
Reach-1	27110	1% Chance	7455.00	136.60	147.46		147.51	0.000187	3.29	6234.70	1005.58	0.18
Reach-1	27025	1% Chance	7455.00	135.50	146.24	146.03	147.20	0.002112	10.68	2304.78	899.67	0.59
Reach-1	27020		Bridge									
Reach-1	27015	1% Chance	7455.00	135.50	146.08	146.08	147.18	0.002399	11.26	2163.67	894.64	0.63
Reach-1	26680	1% Chance	7455.00	134.00	142.89		143.57	0.002787	10.60	2063.23	590.00	0.65
Reach-1	26209	1% Chance	7455.00	133.40	143.04		143.12	0.000252	2.70	4826.43	949.44	0.19
Reach-1	26136	1% Chance	7455.00	130.20	142.10	141.28	142.87	0.001511	9.59	2344.50	703.85	0.51
Reach-1	26127.5		Bridge									
Reach-1	26119	1% Chance	7455.00	131.30	142.25	138.86	142.41	0.000532	5.04	3781.94	742.73	0.28
Reach-1	26058	1% Chance	7455.00	131.30	142.21		142.37	0.000543	5.08	3755.15	742.11	0.28
Reach-1	25358	1% Chance	7455.00	131.00	141.83		141.99	0.000552	5.61	3360.84	499.89	0.30
Reach-1	25340	1% Chance	7455.00	128.10	141.64		141.96	0.000587	6.55	3740.65	512.66	0.32
Reach-1	25334	1% Chance	7455.00	130.31	141.74		141.92	0.000444	4.96	3149.10	457.22	0.27
Reach-1	24975	1% Chance	7455.00	129.20	140.90		141.61	0.001359	8.49	1683.39	414.42	0.46
Reach-1	24922	1% Chance	7455.00	127.89	140.97		141.50	0.000829	7.23	1850.23	441.04	0.37
Reach-1	24677	1% Chance	7455.00	127.87	140.94		141.30	0.000460	5.44	2180.83	396.78	0.28
Reach-1	24620	1% Chance	7455.00	128.90	140.48		141.22	0.001143	7.78	1737.87	369.05	0.42
Reach-1	24597	1% Chance	7455.00	127.30	140.63		141.12	0.000653	6.38	2207.50	395.10	0.32
Reach-1	24570	1% Chance	7455.00	127.60	139.43	135.90	140.99	0.001698	10.31	1145.22	348.43	0.54
Reach-1	24542.5		Bridge									
Reach-1	24540	1% Chance	7455.00	127.60	138.19	135.88	140.32	0.002630	11.88	844.91	232.45	0.66
Reach-1	24485	1% Chance	7455.00	126.30	136.91	136.91	139.86	0.005771	14.75	837.67	207.98	0.90
Reach-1	24430	1% Chance	7455.00	126.60	137.85		138.46	0.002969	6.88	1464.10	254.64	0.39
Reach-1	24401	1% Chance	7455.00	124.66	137.67		138.37	0.003234	6.86	1278.84	257.49	0.39
Reach-1	24381	1% Chance	7455.00	124.66	136.85		138.24	0.002563	10.71	931.57	185.57	0.62
Reach-1	24180	1% Chance	7455.00	124.70	136.78	133.49	137.70	0.001560	8.02	1209.32	290.98	0.48
Reach-1	24105	1% Chance	7455.00	124.80	135.32	134.24	137.40	0.004605	11.57	660.02	164.97	0.79
Reach-1	23805	1% Chance	7455.00	124.00	135.70		136.34	0.001191	7.99	2548.56	544.98	0.44
Reach-1	23415	1% Chance	7455.00	123.00	133.11	133.11	135.33	0.004719	14.27	1451.84	358.59	0.84
Reach-1	23171	1% Chance	7455.00	120.30	131.12	130.85	132.49	0.003967	9.91	913.48	264.15	0.67
Reach-1	23036	1% Chance	7455.00	121.70	131.62		132.07	0.000479	3.98	1491.73	341.41	0.25
Reach-1	22916	1% Chance	7455.00	121.00	131.63		131.97	0.000628	5.38	2037.14	480.80	0.31
Reach-1	22765	1% Chance	7455.00	114.20	131.64		131.87	0.000301	4.19	2548.37	511.91	0.19
Reach-1	22450	1% Chance	7455.00	116.90	131.48		131.70	0.001059	4.04	2388.82	500.92	0.21

HEC-RAS Plan: EXIST River: RIVER-1 Reach: Reach-1 Profile: 1% Chance (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	22140	1% Chance	7455.00	117.00	127.84	127.84	130.78	0.005382	16.12	1119.61	224.02	0.92
Reach-1	21825	1% Chance	7455.00	115.90	125.26	125.26	128.03	0.005781	14.07	847.23	239.90	0.91
Reach-1	21770	1% Chance	7455.00	115.40	125.08	123.47	127.59	0.003512	12.71	586.71	127.05	0.75
Reach-1	21757.5		Bridge									
Reach-1	21745	1% Chance	7455.00	115.40	124.39	123.47	127.33	0.004565	13.75	542.30	121.68	0.84
Reach-1	21695	1% Chance	7455.00	114.20	124.15	123.52	127.06	0.005894	13.66	548.04	85.02	0.89
Reach-1	21285	1% Chance	7455.00	114.30	124.30	122.75	125.23	0.001823	8.42	1577.95	503.26	0.52

HEC-RAS Plan: PROPOSED River: RIVER-1 Reach: Reach-1 Profile: 1% Chance

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	29920	1% Chance	7455.00	147.00	153.96	153.96	155.12	0.004919	11.86	1676.50	693.44	0.83
Reach-1	29760	1% Chance	7455.00	142.20	152.19		152.97	0.001276	7.45	1317.25	222.00	0.44
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Reach-1	27025	1% Chance	7455.00	135.50	146.24	146.03	147.20	0.002112	10.68	2304.78	899.67	0.59
Reach-1	27020		Bridge									
Reach-1	27015	1% Chance	7455.00	135.50	146.08	146.08	147.18	0.002399	11.26	2163.67	894.64	0.63
Reach-1	26680	1% Chance	7455.00	134.00	142.89		143.57	0.002786	10.59	2063.45	590.02	0.65
Reach-1	26209	1% Chance	7455.00	133.40	143.04		143.12	0.000252	2.70	4826.73	949.44	0.19
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Reach-1	24430	1% Chance	7455.00	126.60	137.85		138.46	0.002969	6.88	1464.10	254.64	0.39
Reach-1	24401	1% Chance	7455.00	124.66	137.67		138.37	0.003234	6.86	1278.84	257.49	0.39
Reach-1	24381	1% Chance	7455.00	124.66	136.85		138.24	0.002563	10.71	931.57	185.57	0.62
Reach-1	24180	1% Chance	7455.00	124.70	136.78	133.49	137.70	0.001560	8.02	1209.32	290.98	0.48
Reach-1	24105	1% Chance	7455.00	124.80	135.32	134.24	137.40	0.004605	11.57	660.02	164.97	0.79
Reach-1	23805	1% Chance	7455.00	124.00	135.70		136.34	0.001191	7.99	2548.56	544.98	0.44
Reach-1	23415	1% Chance	7455.00	123.00	133.11	133.11	135.33	0.004719	14.27	1451.84	358.59	0.84
Reach-1	23171	1% Chance	7455.00	120.30	131.12	130.85	132.49	0.003967	9.91	913.48	264.15	0.67
Reach-1	23036	1% Chance	7455.00	121.70	131.62		132.07	0.000479	3.98	1491.73	341.41	0.25
Reach-1	22916	1% Chance	7455.00	121.00	131.63		131.97	0.000628	5.38	2037.14	480.80	0.31
Reach-1	22765	1% Chance	7455.00	114.20	131.64		131.87	0.000301	4.19	2548.37	511.91	0.19
Reach-1	22450	1% Chance	7455.00	116.90	131.48		131.70	0.001059	4.04	2388.82	500.92	0.21

HEC-RAS Plan: PROPOSED River: RIVER-1 Reach: Reach-1 Profile: 1% Chance (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	22140	1% Chance	7455.00	117.00	127.84	127.84	130.78	0.005382	16.12	1119.61	224.02	0.92
Reach-1	21825	1% Chance	7455.00	115.90	125.26	125.26	128.03	0.005781	14.07	847.23	239.90	0.91
Reach-1	21770	1% Chance	7455.00	115.40	125.08	123.47	127.59	0.003512	12.71	586.71	127.05	0.75
Reach-1	21757.5		Bridge									
Reach-1	21745	1% Chance	7455.00	115.40	124.39	123.47	127.33	0.004565	13.75	542.30	121.68	0.84
Reach-1	21695	1% Chance	7455.00	114.20	124.15	123.52	127.06	0.005894	13.66	548.04	85.02	0.89
Reach-1	21285	1% Chance	7455.00	114.30	124.30	122.75	125.23	0.001823	8.42	1577.95	503.26	0.52

APPENDIX H

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
PROPOSED VOLUME	**1.000**	**1.000**	52836.77 Sq. Ft.	6751.83 Cu. Yd.	2238.70 Cu. Yd.	4513.13 Cu. Yd.<Cut>
Totals			52836.77 Sq. Ft.	6751.83 Cu. Yd.	2238.70 Cu. Yd.	4513.13 Cu. Yd.<Cut>

ASML CAMPUS TRAFFIC SAFETY
WILTON, CT

ALTERNATIVE 1
(9% GRADE)
(ALIGNMENT A)

DATE: 03/28/2022
SCALE: AS SHOWN
FIGURE:

Tighe&Bond

Last Saved: 12/20/2021
Plotted On: May 17, 2022-3:56pm By: CanasJ
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Data\Driveway Alternatives\Cut & Fill 2021_12-16.dwg

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
CUT & FILL	**1.000**	**1.000**	52258.12 Sq. Ft.	7209.52 Cu. Yd.	2703.48 Cu. Yd.	4506.04 Cu. Yd.<Cut>
Totals			52258.12 Sq. Ft.	7209.52 Cu. Yd.	2703.48 Cu. Yd.	4506.04 Cu. Yd.<Cut>

ASML DRIVEWAY
WILTON, CT

ALTERNATIVE 2
(9% SLOPE)
(ALIGNMENT B)

DATE: 03/28/2022
SCALE: AS SHOWN
FIGURE:

Tighe&Bond

Department of Transportation
(DANBURY - SOUTH NORWALK RAIL LINE)
RAILROAD MAP CENTERLINE
(REFER TO MAP REFERENCE #5)
33' TO PROPERTY LINE
RR SPIKE FD.
S81°32'28"W 2.13'
FROM CORNER
N00°31'21"E 1384.09'
7001
139.67
SA-7001 MAG
TOWER
OVERHEAD HIGH-TENSION POWER LINES
PAVED PARKING AREA
MON. FD.
N20°05'W 0.11'
FROM MAP
I. PIN FD.
PAVEMENT
CONCRETE WALK
CONCRETE CURB
NEW FOUNDATION
1-19-19
PARKING GARAGE
CANOPY
Ex. Building
#77
HVAC
Elevated Platform Above Pavement
Paved Driveway
SHED
WOOD STEPS
OVERHEAD CONDUITS
TURBINES, BOILERS
PAVED PARKING AREA
CANOPY OVER CONCRETE WALKWAY
KNEE WALL
GUARD RAIL
PICNIC TABLES (4)
NORTH OF BRIDGE, LIMIT OF 100-YEAR FLOODPLAIN IS PER MAP REFERENCE #1
NORWALK RIVER
APPROX. LOCATION OF WATERCOURSE AS DEPICTED ON R.M. #3838 W.L.R.
LEDGE OUTCROP
VIEWLINE A
VIEWLINE B
VIEWLINE C
VIEWLINE D
VIEWLINE E
PROPOSED WALL
PROPOSED WALL
PROPOSED WALL
N/F
Rocky A. Delfino
V. 771 P. 283 W.L.R.
N/F
Mary F. Suggs
V. 947 P. 196 W.L.R.
N73°56'34"E
22.23'
N/F Lawrence J. Arnold,
Sandra P. Arnold & Ericalynn Arnold
V. 957 P. 219 & V. 2028 P. 300 W.L.R.
N/F
Zena Kim
V. 2527 P. 1007 W.L.R.
N89°33'35"E
27.07'
N/F
Joseph C. Shafranek, Jr.
V. 599 P. 158 W.L.R.
S05°52'10"E
23.18'
N86°01'10"E
FLOW
SCALE: 1" = 40'
ASML CAMPUS TRAFFIC SAFETY
WILTON, CT
ALTERNATIVE 3
(10% SLOPE)
(ALIGNMENT B)
DATE: 03/28/2022
SCALE: AS SHOWN
FIGURE:
Tighe&Bond
Last Saved: 5/17/2022
Plotted On: May 17, 2022-4:34pm By: Canas)
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Data\Driveway Alternatives\Drawing Files\Alt 03 2022_03-28 Cut & Fill.dwg

Last Saved: 5/17/2022
Plotted On: May 17, 2022-4:55pm By: Canasj
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Data\Driveway Alternatives\Drawing Files\Alt 04 2022_03-28 Cut & Fill.dwg

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
CUT & FILL	**1.000**	**1.000**	50540.54 Sq. Ft.	9587.22 Cu. Yd.	2155.57 Cu. Yd.	7431.65 Cu. Yd.<Cut>
Totals			50540.54 Sq. Ft.	9587.22 Cu. Yd.	2155.57 Cu. Yd.	7431.65 Cu. Yd.<Cut>

ASML CAMPUS TRAFFIC SAFETY
WILTON, CT

ALTERNATIVE 5
(8% GRADE)
(ALIGNMNENT B)

DATE: 03/28/2022
SCALE: AS SHOWN
FIGURE:

Tighe&Bond

Last Saved: 5/17/2022
Plotted On:May 17, 2022-5:01pm By: Canas)
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Data\Driveway Alternatives\Drawing Files\Alt 05 2022_03-28 Cut & Fill.dwg

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
CUT & FILL	**1.000**	**1.000**	64183.89 Sq. Ft.	13486.91 Cu. Yd.	2074.85 Cu. Yd.	11412.06 Cu. Yd.<Cut>
Totals			64183.89 Sq. Ft.	13486.91 Cu. Yd.	2074.85 Cu. Yd.	11412.06 Cu. Yd.<Cut>

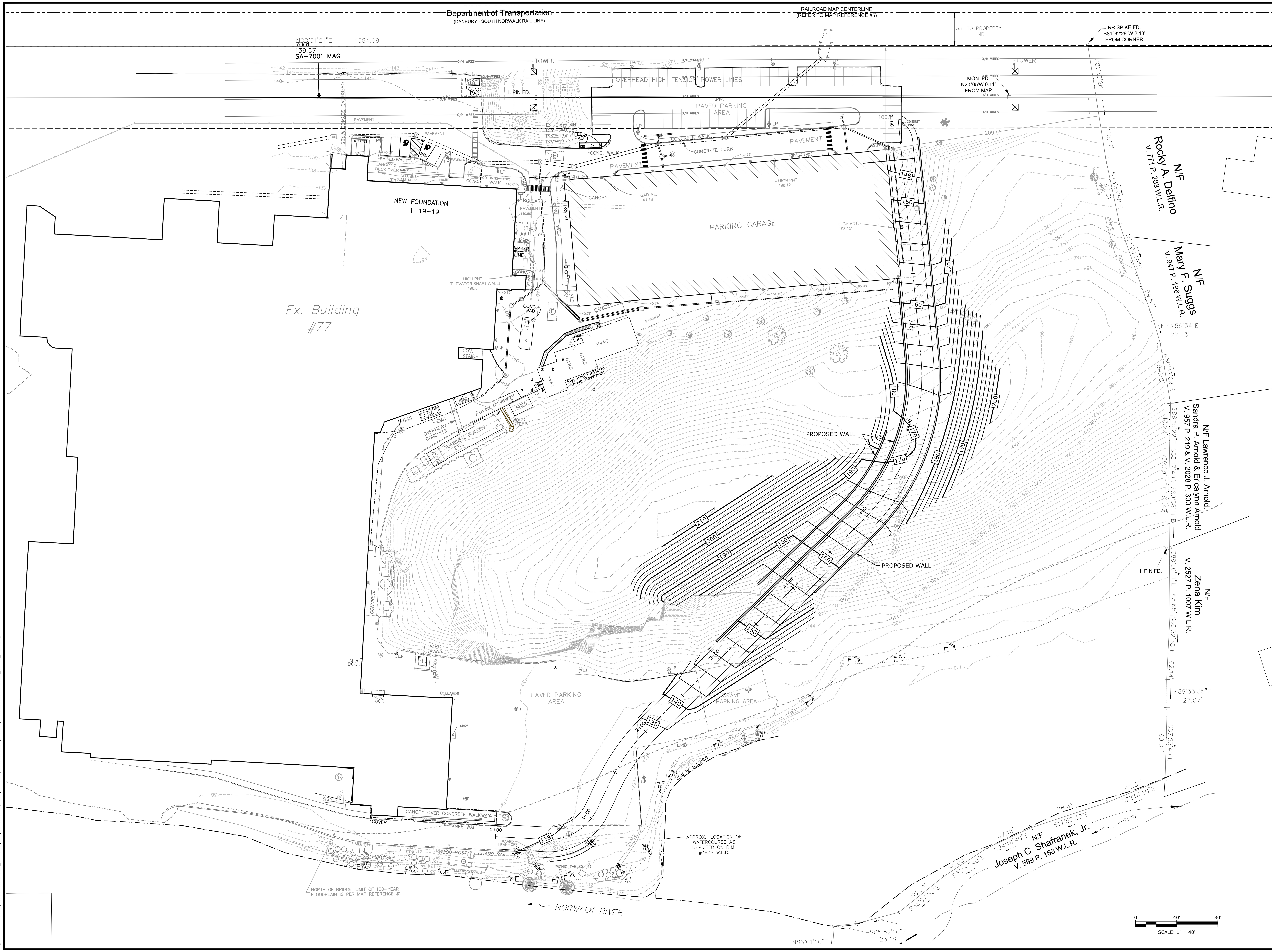
ASML CAMPUS TRAFFIC SAFETY
WILTON, CT

ALTERNATIVE 6
(7% SLOPE)
(ALIGNMENT B)

DATE: 03/28/2022
SCALE: AS SHOWN
FIGURE:

Tighe&Bond

Last Saved: 3/30/2022
Plotted On: May 17, 2022-5:05pm By: Canas
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Data\Driveway Alternatives\Cut & Fill Alt 6.dwg



ASML CAMPUS TRAFFIC SAFETY
WILTON, CT

ALTERNATIVE 7
(10% GRADE)
(ALIGNMENT C)

DATE: 03/28/2022
SCALE: AS SHOWN
FIGURE:

Tighe&Bond

Last Saved: 3/4/2022
Plotted On: May 17, 2022-5:13pm By: Canas)
Tighe & Bond: J:\A\A0969 ASML\015_Driveway Improvements\Data\Driveway Alternatives\Drawing Files\Cut & Fill 2022_03-02_ALT.dwg

APPENDIX I

SEDIMENT TRAP COMPUTATIONS

ASML CAMPUS TRAFFIC SAFETY IMPROVEMENTS

Date: May 22, 2022

Prepared by J. Canas

Tighe&Bond
Engineers | Environmental Specialists

Disturbance Summary	
Area Disturbed	2.3 acres
Trap Required	308.2 cubic yards
	8321.4 cubic feet

Proposed Stormwater Management Pond

	Cell Area		Area	Area	Depth	Vol	Cum Vol
Elev	South	North	Total, sf	Avg, ft2	ft	ft3	ft3
133	221	147	368				0
				879	1	879	
134	797	593	1390				879
				2184	1	2184	
135			2978				3063

* Too small, need to enlarge during construction

Proposed Sediment Trap

	Cell Area		Area	Area	Depth	Vol	Cum Vol
Elev	South	North	Total, sf	Avg, ft2	ft	ft3	ft3
132			1774				0
				2046.5	1	2046.5	
133			2319				2046.5
				2721	1	2721	
134			3123				4767.5
				3576	1	3576	
135			4029				8343.5

Campus Traffic Safety Flow Improvements

ENGINEERING REPORT

ASML US, Inc.
77 Danbury Road
Wilton, Connecticut

May 24, 2022

Tighe&Bond
Engineers | Environmental Specialists

100% Recyclable

05/23/2022

Campus Traffic Safety Flow Improvements

ENGINEERING REPORT

ASML US, Inc.
77 Danbury Road
Wilton, Connecticut

May 24, 2022

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Abbreviations

ac	acres
BFE	Base Flood Elevation
BMP	Best Management Practice
CAM	Coastal Area Management
CB	catch basin
CCMA	Connecticut Coastal Management Act
cf	cubic feet
cfs	cubic feet per second
CGS	Connecticut General Statutes
CIRCA	Connecticut Institute for Resilience and Climate Adaptation
CN	Curve Number
CT	Connecticut
CTDEEP	Connecticut Department of Energy and Environmental Protection
CTSWQM	Connecticut Stormwater Quality Manual
DCIA	Directly Connected Impervious Area
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
ft	feet
ft/s	feet per second
GNHWPCA	Greater New Haven Water Pollution Control Authority
gpd	gallons per day
GRV	Groundwater Recharge Volume
HSG	Hydrologic Soil Group
LEP	Licensed Environmental Professional
LiDAR	Light Imaging and Detection and Rnaging
LLC	Limited Liability Corporation
MH	Manhole
NAVD88	North American vertical Datum of 1988
NDDB	Natural Diversity Database
NFIP	National Flood Insurance Program
NGVD29	National Geodetic Vertical Datum of 1929
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
RCP	Reinforced Concrete Pipe
RCV	Runoff Capture Volume
RWA	Regional Water Authority

s	second
TD	Trench Drain
TSS	Total Suspended Solids
UI	United Illuminating
USACE	United States Army Corps of Engineers
WQF	Water Quality Flow
WQS	Water Quality System
WQV	Water Quality Volume
YD	Yard Drain

Section 1
Introduction and Site Conditions

Tighe & Bond has prepared this engineering report in connection with the ASML Traffic Flow Safety Improvements at ASML's campus located at 77 Danbury Road in Wilton, Connecticut. ASML proposes the construction of a new driveway from the north parking lot, climbing the existing topography to reach the landing between the third and fourth floor of the existing parking garage. The proposed driveway will include the construction of new stormwater management systems, and landscaping.

Refer to **Figure 1** for the Site Location Map.

1.1 Site Description

The existing 28.64 acre site is bounded by Danbury Road (U.S. Route 7) to the east, the Metro North Commuter Railroad to the west, residential properties along Arrowhead Drive to the north, and commercial property to the south. The Norwalk River flows through the eastern portion of the site, and forms part of the boundary along the southern portion of the site, and along the extreme northeast corner of the site. The property is located in Zoning District DE-10.

The main facility building and the parking garage are located on the portion of the site west of the Norwalk River. Most of the on-site parking is located in the parking garage, although there are surface lots located immediately west of the parking garage, southwest of the building, and northeast of the building along the Norwalk River. Another building on the subject parcel, is located east of the Norwalk River at the southeastern corner of the site, with an address of 71 Danbury Road.

Loading docks are located along the west facing side of the main facility building. All existing traffic accessing the parking garage must turn left after the Norwalk River bridge and proceed around the south side of the building, and pass through the loading dock area.

Please refer to Aerial Map in **Figure 2**.

The southern portion of the property is generally flat, draining toward the Norwalk River. The north central portion of the site is dominated by up to an 80 foot rise in the topography that acts as a ridge separating the parking garage from the northeast parking lot.

There are wetlands associated with the Norwalk River corridor, as well as a regulatory floodway and floodplain.

1.2 Project Proposal

The proposed project will construct a new driveway from the parking lot northeast of the building that would proceed up the hillside, curving approximately 150 degrees, and connecting to the northeast corner of the parking garage between the third and fourth floors. Associated lighting, landscaping, security and stormwater management improvements are also proposed to accommodate the new driveway. The driveway will be constructed at a grade of 7%, which will require rock cuts and retaining walls along the alignment. A sidewalk is also proposed along the driveway, as well as an emergency vehicle turnaround near the entrance to the parking garage.

The northeastern parking area will be reconfigured to accommodate the alignment of the proposed driveway, resulting in the loss of 66 spaces. The loss of the 66 spaces would bring the total number of parking spaces on the site down to 1,127, which is more than the 944 parking spaces that are required.

1.2.1 Project Purpose

Under existing conditions, in order to access the parking garage, all traffic entering the site must turn left at the driveway bridge after entering the site from Route 7, and proceed in a clockwise path around the building to access the parking garage at the northwest corner of the site. As a result passenger cars and truck traffic is comingled, and must pass through the active loading areas on the south and west sides of the building. In order to improve the safety of the campus traffic flow, ASML proposes the new driveway so that employees can turn right after the driveway bridge and continue along the driveway to access the parking garage. The new driveway would allow for separation of vehicular and truck traffic, and reduce the amount of traffic proceeding through the active loading areas, which would improve overall campus traffic flow safety.

Refer to **Figures 3 and 4** for current and proposed traffic flow.

1.2.2 Proposed Lighting

The proposed site lighting fixtures are full cutoff and have been selected to avoid light trespass onto adjacent properties.

1.2.5 Stormwater Management

The proposed driveway will have a network of catch basins and storm drains. The proposed improvements will increase the average distance of impervious coverage from the wetlands associated with the Norwalk River. New stormwater treatment practices are proposed that will improve the quality of stormwater that is discharged into the river, as none exist under existing conditions. Proposed infiltration chambers beneath the proposed parking area will recharge groundwater and decrease peak volume and flow discharged into the river, and proposed rain gardens and a biofiltration swale will also improve stormwater quality discharged from the project area. Please refer to Section 2 for more detail.

1.3 Floodplain Management

The Flood Insurance Study for Fairfield County, dated June 18, 2010 shows that there is a Special Flood Hazard Area, Zone AE and floodway associated with the Norwalk River.

The proposed driveway is located outside of the regulatory floodway, though a portion of the embankment near the first curve to the northwest are within the floodway. Portions of the driveway are within the regulatory floodplain, extending from the existing driveway bridge north to just east of the proposed northeast parking lot entrance.

Base flood (1% annual chance) elevations near the northeastern parking lot are approximately elevation 140 NAVD88. We prepared a hydraulic model to demonstrate compliance with the Town's floodplain management regulations, and to demonstrate compliance with the no-rise standard for encroachments into the regulatory floodway.

Please refer to **Figure 5** for the flood zone in the area.

1.4 Soils & Geology

The NRCS Web Soil Survey indicates that the underlying soils for the project area includes Pootatuck Fine Sandy Loam (102) for the northeastern part of the site, Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes (75E) for the east slope of the hillside, and Charlton-Urban land complex, 8 to 15 percent slopes (260C) for the west slope of the hillside. The balance of the work area around the building is Urban Land (307).

The Hydrologic Soil Group for each of the soil types is described in Table 1-1 below.

Table 1-1
Hydrologic Soils Group

Description	HSG
Charlton-Urban land complex, 8 to 15 percent slopes (260C)	B
Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes (75E)	D
Pootatuck Fine Sandy Loam (102)	B
Urban Land (307)	D

The NRCS Web Soil Survey Report is located in **Appendix A**.

Please refer to **Figure 6** for the soil type boundaries.

1.4.1 Hydrologic Soil Groups

Soils are classified by the Natural Resource Conservation Service into four Hydrologic Soil Groups (HSG) based on the soil's runoff potential. The four Hydrologic Soils Groups are A, B, C and D. Group A soils generally have the smallest runoff potential, while Group D soils have the greatest runoff potential. All on-site soils are HSG B.

Group A. Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

Group B. Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

Group C. Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

Group D. Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential.

Dual Group Soils. Certain wet soils are placed in group D based solely on the presence of a water table within 24 inches of the surface even though the saturated hydraulic conductivity may be favorable for water transmission. If these soils can be adequately drained, then they are assigned to dual hydrologic soil groups (A/D, B/D, and C/D) based on their saturated hydraulic conductivity and the water table depth when drained.

Based on the Surficial Map of Connecticut (1993) and Bedrock Geological Mpa of Connecticut (1985), the site subsurface conditions are anticipated to consist of naturally deposited sands and gravel over bedrock. The bedrock is anticipated to consist of the Harrison Gneiss formation.

1.5 Natural Diversity Communities

The Connecticut Department of Energy and Environmental Protection’s Natural Diversity Database (NDDB) map dated December 2021 indicates that there are no areas of concern for endangered and threatened species, as shown in **Figure 7**.

1.6 Earthwork Activities

The proposed driveway will require cut into the existing hillside, as well as some limited areas of fill. The filling will occur on the downslope side of the driveway. In some instances, the extent of fill will be restrained by a proposed retaining wall to minimize encroachment into the floodway and the wetlands along the east side of the site. Additionally, a retaining wall is proposed on the north side of the proposed driveway, where it connects to the existing parking garage. The proposed driveway will be on the high side of the wall. The wall is proposed in this location to minimize the extent to fill encroachment so that it does not project into the exterior openings of the existing garage.

We anticipate that due to the depth of cut, portions of the excavation will be in rock.

The maximum depth of cut will be approximately 27 feet, as shown in **Figure 8.**

Blasting is not expected for rock removal, since the rock was able to be hammered for the parking garage, and blasting could disrupt the sensitive operations within the building.

We have scheduled borings to better determine the characteristics of the underlying rock, and its depth.

The Town of Wilton has a limitation on the contiguous area allowed to be disturbed on slopes of 15% and 35% and greater. The proposed project will disturb 17,541 square feet of land steeper than 35%, with a maximum contiguous area steeper than 15% disturbed of 24,026 square feet. There is currently a proposed text amendment to the zoning regulations that would increase the 15,000 square foot limit on such disturbances in the Zoning Regulations. Please refer to **Figure 9**.

Earthwork is summarized in Table 1-2.

Table 1-2
Earthwork Summary

Cut	Fill	Net
12,657 cy	2,245 cy	10,412 cy

Please refer to Section 5 for a detailed description of the Construction Sequence and proposed erosion controls.

1.6.1 Chemical and Physical Description of Fill Materials

The proposed project will require limited fill within the upland review area to support the construction of the driveway. The fill material to be deposited will be clean soil, free of large stone, organic material and woody debris. The fill material shall be moderately to well drained.

Other material to be deposited within the upland review area includes crushed stone for to support the foundation of the proposed retaining wall.

.

Section 2
Stormwater Management

2.1 Design Criteria

The following storm drainage design criteria were used in our hydrologic and hydraulic analyses:

1. Design storm rainfall data was based on NOAA Precipitation Atlas 14.

2. Comparative hydrology assessed the 2, 10, 25, 50 and 100-year storm events.

3. Piped storm drainage system and the outlets are designed for a 25-year storm event.

4. Minimum time of concentration = 5 minutes.

5. For Rational Method peak flow calculations, runoff coefficients were as follows:

    a. Impervious (Pavement/Roof) areas = 0.90

    b. Wooded areas = 0.50

    c. Landscaped areas = 0.30

6. Minimum diameter pipes, excluding roof leaders, underdrains, outlet control and foundation drains = 12 inches

7. Minimum pipe slope = 0.35 percent

8. The storm water management plan for the site is designed to treat the Water Quality Volume, remove Total Suspended Solids and promote groundwater recharge while reducing peak flow.

9. Watershed areas delineated using polylines in AutoCAD Civil 3D 2018.

10. Comparative hydrology analyzed using AutoCAD Civil 3D 2018 Hydraflow Hydrographs Extension Version 10.40 by Autodesk software.

11. Storm sewer capacities analyzed using AutoCAD Civil 3D 2018 Hydraflow Storm Sewers by Autodesk.

2.1.1 Site Soil Characteristics

The underlying site soil characteristics are described in Section 1.4 Soils & Geology.

2.1.2 Location of Surface Waterbodies

The Norwalk River runs through the eastern portion of the site. There is a small tributary that drains a pond north of Arrowhead Drive that drains through the site, and discharges to the Norwalk River approximately 480 feet north of the ASML driveway bridge over the Norwalk River. The proposed project begins approximately 290 feet north of the driveway bridge, and therefore the proposed improvements run parallel to the Norwalk River from the project beginning north to the confluence of the tributary, and then parallel to the tributary for approximately 300 feet, before entering a 150 curve toward the parking garage.

Immediately west of the site, there is a pond located west of the Metro North Railroad that discharges into a short channel beneath the railroad, and into the on-site drainage system. The proposed improvements are located outside the watershed of the pond and watercourse and will not have any adverse impact to that system.

2.1.3 Surface and Groundwater Quality Classifications

2.1.3.1 Surface Waters

CTDEEP classifies the unnamed tributary as Class A. Class A water designated uses are potential drinking water supply, fish and wildlife habitat, recreation use, agricultural and industrial supply and other legitimate uses including navigation. CTDEEP classifies the Norwalk River as Class B. Class B designated uses are habitat for fish and aquatic life and wildlife recreation navigation and industrial and agricultural water supply. The project's stormwater management measures have been designed in accordance with the 2004 Connecticut Stormwater Management Manual to improve the quality of stormwater discharge and to preserve the designated uses.

2.1.3.2 Groundwater

CTDEEP classifies the groundwater quality on the site. Class GA water designated uses include existing private supplies of water suitable for drinking without treatment, baseflow for hydraulically connected surface waterbodies. The project's stormwater management measures have been designed in accordance with the 2004 Connecticut Stormwater Management Manual to improve the quality of stormwater discharge and to preserve the designated uses.

2.1.4 Impaired Waterbodies

CTDEEP's 2020 Integrated Water Quality Report lists the Norwalk River as impaired. The impairments identified for the segment of the Norwalk River along the frontage of the site are bacteria and "other pollutant of concern". The cause of the impairment is listed as Escherichia coli, cause unknown. The impaired designated use is recreation, habitat for fish, other aquatic life and wildlife. The project proposed stormwater best management practices will improve the quality of the stormwater discharged from the site by encouraging infiltration and biological uptake through purposefully selected native plantings.

2.2 Precipitation Depths

Precipitation depths for both existing and proposed conditions were computed from NOAA's Atlas 14 Point Precipitation Frequency Estimates online utility. The precipitation depths for a 24-hour duration storm at the project site are shown in **Table 2-1**.

Table 2-1
24-Hour Duration Precipitation Depth (inches)

2-year	5-year	10-year	25-year	50-year	100-year
3.52	4.54	5.38	6.55	7.41	8.34

The precipitation output from the NOAA website is in **Appendix B**.

2.3 Existing Site Hydrologic Analysis

The project is located in the Norwalk River Mainstem Regional Drainage Subbasin.

The project location discharges into three directions, northwest from the garage, southwest toward the drainage system between the building and the parking garage, and east toward the Norwalk River corridor and the unnamed tributary, as shown in **Figure 10**.

Impervious and pervious areas, weighted curve numbers, and times of concentration were calculated for each watershed and entered into a hydraulic model to determine the project's peak flow as part of the comparative hydrology analysis. The hydrologic analysis was conducted using the Hydraflow Hydrographs modeling software, utilizing the Natural Resources Conservation Service (NRCS) Curve Number (CN) method.

A breakdown of watershed composite curve numbers, concentration times, and existing conditions volumetric hydrographs, are included in **Appendix C** of this report, respectively.

We selected the most downstream discharge point of the proposed improvements for peak flow comparison, which is located approximately 350 feet north of the ASML driveway bridge. Using the Hydraflow Hydrographs extension for Autodesk Civil 3D 2018, the peak flows of the site under existing and proposed conditions were calculated for both design points.

The results of the existing conditions are summarized in **Table 2-2**.

Table 2-2
Existing Conditions Peak Flow Summary (cfs)

	Frequency (Years)					
Design Point	**2**	**5**	**10**	**25**	**50**	**100**
EX-WS-01 Northwest	0.50	0.99	1.44	2.14	2.68	3.28
EX-WS-02 Southwest	2.08	3.64	5.05	7.12	8.71	10.48
EX-WS-03 Norwalk River	7.47	11.45	14.84	19.66	23.23	27.10

2.3.1 Existing Impervious Cover

The parking area north of the building is impervious cover that discharges untreated impervious cover to the river and tributary. Total impervious coverage on the site is 526,285 square feet.

2.4 Proposed Site Hydrologic Analysis

Stormwater runoff will generally follow the same drainage patterns, though the runoff from the portion of the driveway near the garage entrance will be directed to the east under proposed conditions. Runoff from the proposed improvements will be collected by a series of inlets and conveyed by storm drains.

Runoff from the portion of the driveway above the entrance to the north parking lot will be collected and sent to a two-cell stormwater pond. The upper cell of the pond overflows to a lower cell, which will discharge over a level spreader to the Norwalk River. The purpose of the two-cell system is to provide extended detention and stormwater treatment. Stormwater will be pretreated by a gross particle separator prior to discharge into the stormwater treatment pond.

Runoff from the lower driveway and the north parking lot will discharge into an underground stormwater infiltration chamber located under the north parking lot. Under existing conditions, the north parking lot discharges untreated to the Norwalk River via sheet flow, which has caused bank erosion. The project will repair some washouts. Stormwater will be pretreated by a gross particle separator prior to discharge into the stormwater treatment pond. Additionally, a portion of the runoff will discharge for treatment in a rain garden located between the driveway and the reconfigured parking lot.

The proposed treatment measures have been sized to meet the Water Quality Volume, and the gross particle separators have been sized for the Water Quality Flow volume. The proposed watershed map is shown in **Figure 11**.

The results of the proposed conditions peak flows are summarized in **Table 2-3**.

Table 2-3
Proposed Conditions Peak Flow Summary (cfs)

	Frequency (Years)					
Design Point	**2**	**5**	**10**	**25**	**50**	**100**
EX-WS-01 Northwest	0.18	0.41	0.64	0.99	1.27	1.59
EX-WS-02 Southwest	2.08	3.64	5.03	7.10	8.69	10.46
EX-WS-03 Norwalk River	6.04	9.17	11.83	15.66	18.55	21.68

A breakdown of watershed composite curve numbers, concentration times, and proposed conditions volumetric hydrographs, are included in **Appendix C** of this report, respectively.

2.4.1 Proposed Impervious Cover

The proposed improvements will add 14,788 square feet of impervious cover to the site as a result of the proposed driveway, of which 2,628 square feet within the regulated area.

Although impervious cover is increasing, the amount of Directly Connected Impervious Area will be reduced from existing conditions because of the new stormwater treatment measures. The decrease in directly connected impervious area is 36,319 square feet.

2.5 Comparative Hydrology

A summary of the existing and proposed peak runoff from the project area, is shown in **Table 2-4**.

Table 2-4
Comparison of Existing and Proposed Conditions Peak Flow, (cfs)

		Frequency (Years)					
Design Point	**Condition**	**2**	**5**	**10**	**25**	**50**	**100**
EX-WS-01 Northwest	Existing	0.50	0.99	1.44	2.14	2.68	3.28
	Proposed	0.18	0.41	0.64	0.99	1.27	1.59
	Change	↓ 64%	↓ 58%	↓ 55%	↓ 53%	↓ 52%	↓ 51%
EX-WS-02 Southwest	Existing	2.08	3.64	5.05	7.12	8.71	10.48
	Proposed	2.08	3.64	5.03	7.10	8.69	10.46
	Change	-	-	↓ 0.3%	↓ 0.2%	↓ 0.2%	↓ 0.1%

		Frequency (Years)					
Design Point	**Condition**	**2**	**5**	**10**	**25**	**50**	**100**
EX-WS-03 Norwalk River	Existing	7.47	11.45	14.84	19.66	23.23	27.10
	Proposed	6.04	9.17	11.83	15.66	18.55	21.68
	Change	↓ 19%	↓ 19%	↓ 20%	↓ 20%	↓ 20%	↓ 20%

As shown in the Table above, the resulting total peak flows under proposed conditions are lower than the existing conditions in all three directions. Due to the proposed infiltration chambers, rain garden and stormwater management pond, there is an overall decrease in stormwater runoff to the Norwalk River. Runoff to the northwest is decreased because the total drainage area in that direction has been reduced. Runoff to the southwest is decreased due to a slight decrease in drainage area.

Table 2-5 below compares the volume of discharge between existing and proposed conditions for all three directions, and shows a decrease in runoff volume in all three directions.

Table 2-5
Comparison of Existing and Proposed Conditions Volume, (cf)

		Frequency (Years)					
Design Point	**Condition**	**2**	**5**	**10**	**25**	**50**	**100**
EX-WS-01 Northwest	Existing	2,842	5,059	7,138	10,310	12,797	15,598
	Proposed	947	1,816	2,659	3,973	5,021	6,215
	Change	↓ 66%	↓ 64%	↓ 62%	↓ 61%	↓ 60%	↓ 60%
EX-WS-02 Southwest	Existing	9,176	15,288	20,846	29,137	35,530	42,658
	Proposed	9,127	15,223	20,770	29,047	35,433	42,553
	Change	↓ 0.5%	↓ 0.4%	↓ 0.3%	↓ 0.3%	↓ 0.2%	↓ 0.2%
EX-WS-03 Norwalk River	Existing	25,749	39,100	50,704	67,462	80,087	93,951
	Proposed	21,408	32,590	42,360	56,533	67,249	79,046
	Change	↓ 16%	↓ 16%	↓ 16%	↓ 16%	↓ 16%	↓ 15%

2.6 Hydraulic Design

We analyzed the proposed storm drainage system to convey a 25-year storm without ponding, using the AutoCAD Civil 3D Hydraflow Storm Sewers Extension for the analysis. The first step in the analysis is to delineate the area contributing to each inlet of the system and then develop a runoff coefficient and time of concentration for each area. The inlet watershed computation worksheets appear in **Appendix D.** The contributing area to each inlet of the system is shown in **Figure 12**.

The results of the Storm Sewers Analysis also appear in **Appendix D**. The results show that the proposed storm sewer system is capable of conveying the 25-year storm event.

2.6.1 Starting Water Surface Elevation

The Norwalk River will exert a tailwater influence on any storm drainage system. In order to determine the appropriate tailwater for design, we utilized the Joint Probability Analysis Table in Chapter 8 of the CTDOT Drainage Manual. The procedure compares the watershed size of the site to the watercourse, and assigns a storm frequency for the watercourse tailwater based on the ratio. The storm system drainage area is 3.6 acres, while the watershed above is 18,624 acres, an area ratio greater than 1,000:1, therefore for a 25-year design on the stormwater conveyance system, a 2-year water surface elevation was used on the Norwalk River as the tailwater condition for the storm sewers analysis.

Since flow rates for the 2-year frequency are not published in the FIS, we estimated the 2-year discharge on the Norwalk River by plotting the discharge probability against the discharge and fitting a logarithmic best fit curve to the data to interpolate the discharge. We estimated 344 cfs using this method. As a check, we applied a Log-Pearson Distribution analysis for the USGS Stream Gauge downstream of the site at Kent Road, and then applied the USGS Transposition Equation to the results to obtain the flow rate at the site. Using this method, we obtained a 2-year discharge of 347 cfs, which is what we used in the existing condition HEC-RAS hydraulic model of the river to determine the corresponding water surface elevation for a 2-year event. The model computed a water surface elevation of 132.91 NGVD29, or approximately 131.91 NAVD88.

2.6.2 Outfall Energy Dissipation

The proposed outfalls will have a riprap energy dissipator. The dissipators have been designed in accordance with the CTDOT Drainage Manual, Chapter 11. The velocities under full at both outfalls are both less than 14 ft/s, and the discharges are both less than the maximum for a standard riprap apron. Please refer to the riprap sizing computations in **Appendix D**.

2.7 Stormwater Quality

2.7.1 Water Quality Volume and Water Quality Flow

The Water Quality Volume (WQV) for the area of the proposed improvements was calculated to be 6,711 cubic feet, based on the equation in Chapter 7 of the Connecticut Stormwater Quality Manual. The WQV will be provided by the proposed infiltration system.

Since we are proposing the use of a proprietary stormwater gross particle separator, the Water Quality Flow (WQF) is the appropriate measure to size the pretreatment practice. We are proposing three gross particle separators, with water quality flow requirements highlighted in **Table 2-6**.

Table 2-6
Water Quality Flow Summary

System	WQF (cfs)	Unit Model
WQS-001, south inlet to infiltration system	0.336	CDS-2015-4-C
WQS-002, north inlet to infiltration system	0.355	CDS-2015-4-C
WQS-003, near outlet of main driveway drainage	0.401	CDS-2020-5-C

Please refer to the Water Quality Volume and Water Quality Flow computations in **Appendix E**.

2.7.2 Groundwater Recharge Volume

We computed a groundwater recharge volume of 1,662 cubic feet based upon the impervious area and the underlying soils, using the appropriate equation in the 2004 Connecticut Stormwater Quality Manual. The computed water quality volume is 6,711 cubic feet, which will be captured by the on-site retention system.

The development proposes an underground chamber system that will provide 15,555 cubic feet of storage, meeting the Groundwater Recharge Volume requirement and the requirement to retain the full water quality volume on the site.

2.7.3 Runoff Capture Volume

The Runoff Capture Volume only applies to new stormwater discharges within 500 feet of tidal wetlands which are not fresh-tidal wetlands. Since tidal wetlands do not exist on the site, the RCV is not required.

2.7.4 Stream Channel Protection

The Stream Channel Protection criterion in Section 7.6.1 of the CTSWQM does not apply to the project, as it meets one of the three exceptions, specifically, that the site discharges to a large river, fourth order or greater, where the development area is less than 5% of the watershed above. The project site is 0.02 percent of the watershed of the Norwalk River above the site, and the Norwalk River is a fifth order stream as it passes the site. Please refer to **Figure 13** for an analysis of the stream order.

2.7.5 Conveyance Protection

The project exceeds the Conveyance Protection criterion in Section 7.6.2 of the CTSWQM, which requires a 10-year conveyance design. The project proposes a 25-year design.

2.7.6 Peak Runoff Attenuation

The project meets the Peak Runoff Attenuation criterion in Section 7.6.3 of the CTSQWM, since peak runoff is reduced for all storms analyzed, principally through reduction of directly connected impervious coverage.

2.7.7 Emergency Outlet Sizing

The project has a stormwater pond and rain garden. Both features can pass the 100-year storm safely. The rain garden has an overflow grate set 6 inches above the bottom of the treatment measure, and the stormwater pond has a level spreader at its downstream end to allow runoff to discharge without overtopping.

2.7.8 Downstream Analysis

Section 7.6.5 of the CTSWQM requires routing computations downstream to a confluence point where the site drainage area represents 10 percent of the total drainage area. The site is only 0.02 percent of the watershed area of the Norwalk River, therefore, this criteria does not apply.

2.8 Stormwater Best Management Practices

The proposed Stormwater Management Plan is designed to meet Connecticut Department of Energy and Environmental Protection's (CTDEEP) goal of 80% removal of suspended solids from site stormwater discharge. Runoff from the proposed building roofs, driveways, sidewalks, and landscaped areas will be collected by a system of catch basins, drains, and pipes and will be routed through stormwater treatment practices before discharging from the site. Structures such as gross particle separators, infiltration systems, and storm drainage inlets will function to remove suspended solids and pollutants from stormwater runoff.

The on-site BMPs include:

2.8.1 Catch Basins with Sumps:

Catch basins are installed to have a two foot sump below the outlet pipe to collect sediment and debris. The installation of traps on the upstream-most structure on-site prevents the discharge of oil, floatable debris, and other pollutants into the Town storm drainage system.

2.8.2 Gross Particle Separators

Gross particle separators are installed to remove grit, contaminated sediment, metals, hydrocarbons, and other floating fluids from surface runoff. Suspended sands, grit, and sediment in the stormwater runoff will be allowed to settle with the separator. Any suspended oils will rise to the surface within the separator, where they will be trapped.

This systems are designed for 80% removal of suspended solids. Under pre-existing conditions, no water quality systems were present, and runoff discharged untreated into the West River. In the proposed condition, runoff from the building and driveway will be treated by gross particle separators prior to discharge off-site. The gross particle separator has been located beneath the building but in an area with more vertical clearance to allow for maintenance.

2.8.3 Underground Infiltration Chambers

The underground infiltration chambers are intended to retain the water quality volume to meet the MS4 Permit requirements, and the groundwater recharge volume requirement. Stormwater entering the chambers will be pretreated by the gross particle separator to maximize the performance of the system.

We used default infiltration rates (Rawls, Brakensiek and Saxton, 1982) to compute the drawdown time for the proposed chambers, and estimated that they will drawdown within 48 hours.

2.8.4 Rain Gardens

A rain garden is proposed to treat the runoff from the north parking area. The plantings were selected by the project wetland scientist to promote biological uptake and pollutant renovation.

2.9 Pollutant Removal

Pollutant loadings for the existing and proposed conditions were calculated using the method prescribed by Debo and Reese in "Municipal Stormwater Management", 1995. This method determines the mass of pollutant loading by inputting the fraction of impervious area, the contributing area, the mean annual rainfall, and the event mean concentration of pollutant (EMC). The EMC is based upon the pollutant analyzed and the general characteristic of the contributing area – residential, commercial, or open space.

The area of proposed disturbance was chosen for the comparison of existing and proposed conditions. The pollutant loadings were calculated for existing and proposed conditions.

For the proposed conditions, the contributing area was further broken down into contributing areas to certain best management practices (BMPs). Pollutant loading reductions were taken at certain BMPs, depending upon the removal efficiency of the BMP as stated in the 2003 edition of Debo and Reese. Pollutant removal efficiencies for proprietary products were taken from data provided by the New Jersey Corporation for Advanced Technology. Based upon these pollutant reductions, we have determined that pollutant loadings will be less for the proposed conditions, as shown in **Table 2-7** below.

Table 2-7
Pollutant Loading Summary

Item	Units	Pollutant					
		TKN	**P**	**TSS**	**Pb**	**Cu**	**Zn**
Infiltration System to EW-01							
Proposed, Pre Treatment	lb/yr	5.61	0.96	328.11	0.49	0.14	1.07
Proposed, Post Treatment	lb/yr	0.00	0.00	0.00	0.00	0.00	0.00
Reduction, Pre to Post Treat	---	100%	100%	100%	100%	100%	100%
Upper Driveway to FE-01							
Proposed, Pre Treatment	lb/yr	12.72	2.17	743.51	1.12	0.31	2.44
Proposed, Post Treatment	lb/yr	7.79	0.51	63.20	0.20	0.07	0.13
Reduction, Pre to Post Treat	---	38.7%	76.5%	91.5%	82.3%	76.3%	94.6%

The pollutant loading calculations are presented in **Appendix E**.

The project will also reduce the salinity of water discharged under existing conditions, since the first flush from the parking lot will be treated by infiltration, and the runoff from the driveway will be treated in the proposed stormwater management pond. Currently, there is no treatment of the runoff from the parking lot.

Section 3
Floodplain Management

3.1 Floodplain Management Overview

The Flood Insurance Study for Fairfield County, Connecticut, dated June 18, 2010, Panel No. 09001C0391F shows that there is a Special Flood Hazard Area, Zone AE and floodway associated with the Norwalk River.

The proposed driveway is located outside of the regulatory floodway, though a portion of the embankment near the first curve to the northwest are within the floodway. Portions of the driveway are within the regulatory floodplain, extending from the existing driveway bridge north to just east of the proposed northeast parking lot entrance.

Base flood (1% annual chance) elevations near the northeastern parking lot are approximately between elevations 140 and 141 NAVD88.

There are several requirements that the project will need to meet, the most significant of which are highlighted below:

3.1.1 No-Rise for Work within the Floodway

The Town of Wilton's floodplain management regulations, specified in Section 29-9.F.7.j requires that no encroachments, including fill, new construction, substantial improvements, and other developments shall be permitted unless certification (with supporting technical data) by a registered professional engineer is provided demonstrating through hydrologic and hydraulic analysis performed in accordance with standard engineering practices that the proposed encroachments shall not result in any (0.00 feet) increase in flood levels during occurrence of the base flood discharge. Our analysis indicates that there will no increase in the base flood elevation as a result of the proposed project.

3.1.2 Equal Conveyance

Section 29-9.F.7.k of the Town's floodplain management regulations requires that within the floodplain, except those areas which are tidally influenced, as designated on the flood insurance rate map (FIRM) for the community, encroachments resulting from filling, new construction or substantial improvements involving an increase in footprint of the structure, are prohibited unless the applicant provides certification by a registered professional engineer demonstrating, with supporting hydrologic and hydraulic analyses performed in accordance with standard engineering practices, that such encroachments shall not result in any (0.00 feet) increase in flood levels (base flood elevation). Work within the floodplain and the land adjacent to the floodplain, including work to provide compensatory storage shall not be constructed in such a way so as to cause an increase in flood stage or flood velocity. The project will not reduce conveyance based upon our computations and analysis.

3.1.3 Compensatory Storage

Section 29.9-F.7.l of the Town's floodplain management regulations states that the water holding capacity of the floodplain, except those areas which are tidally influenced, shall not be reduced. Any reduction caused by filling, new construction or substantial improvements involving an increase in footprint to the structure, shall be compensated for by deepening and/or widening of the floodplain. Storage shall be provided on-site, unless easements have been gained from adjacent property owners; it shall be provided within the same hydraulic reach and a volume not previously used for flood storage; it shall be hydraulically comparable and incrementally equal to the theoretical volume of flood water at each elevation, up to and including the 100-year flood elevation, which would be displaced by the proposed project. Such compensatory volume shall have an unrestricted hydraulic connection to the same waterway or water body.

Within the floodplain, the proposed embankment adds 18 cubic yards of fill material within the floodplain, but the excavation for the proposed stormwater management basin above the elevation of the basin outlet's level spreader will result in 55 cubic yards of cut that are hydraulically connected to the floodplain. Therefore, the proposed project results in a net cut of material in the floodplain, increasing storage.

3.2 Comparison of Existing and Proposed Conditions

In order to determine the impact of the proposed project, and document compliance with the Town floodplain management regulations requiring that there will be no increase in the base flood elevation for the 100-year storm event, and no loss of storage or conveyance, we used the HEC-RAS model that was used for the river improvement project that was approved by the Town in 2013. Since the improvements have been completed, we used the as-built conditions HEC-RAS model from that project as the

HEC-RAS is a hydraulic modeling software developed by the U.S. Army Corps of Engineers, and is the primary modeling software used in FEMA's Flood Insurance Studies. HEC-RAS is the successor modeling system to USACE's HEC-2, which was used for older flood insurance studies.

3.2.1 Water Surface Elevations

We ran the model for existing conditions, and then modified the cross section impacted by the proposed improvements to reflect grading changes and changes in surface roughness. Under both models, we used a 100-year discharge of 7,455 cfs, which is the same discharge used in the Flood Insurance Study.

The model cross section locations are shown in **Figure 14.**

We compiled the results for the water surface elevations, and compared them in **Table 3-1**.

Table 3-1
100-year Water Surface Elevation, Existing Model vs. Proposed

River Station	Existing WSEL (NGVD29)	Proposed WSEL (NGVD29)	Difference (ft)	Notes
29920	153.96	153.96	0.00	
29760	152.19	152.19	0.00	
28240	147.71	147.71	0.00	
27468	147.53	147.53	0.00	
27110	147.46	147.46	0.00	
27025	146.24	146.24	0.00	
27020				Substation Bridge
27015	146.08	146.08	0.00	
26680	142.89	142.89	0.00	
26209	143.04	143.04	0.00	
26136	142.10	142.10	0.00	
26127.5				Arrowhead Drive
26119	142.25	142.25	0.00	
26058	142.21	142.21	0.00	
25358	141.83	141.83	0.00	ASML Site, North End
25340	141.64	141.64	0.00	
25334	141.74	141.74	0.00	
24975	140.90	140.90	0.00	Project Area
24922	140.97	140.96	-0.01	Project Area
24677	140.94	140.94	0.00	
24620	140.48	140.48	0.00	
24597	140.63	140.63	0.00	
24570	139.43	139.43	0.00	
24542.5				ASML Driveway Bridge
24540	138.19	138.19	0.00	
24485	136.91	136.91	0.00	
24430	137.85	137.85	0.00	
24401	137.67	137.67	0.00	
24381	136.85	136.85	0.00	
24180	136.78	136.78	0.00	
24105	135.32	135.32	0.00	
23805	135.70	135.70	0.00	ASML Site, South End
23415	133.11	133.11	0.00	
23171	131.12	131.12	0.00	

Table 3-1
100-year Water Surface Elevation, Existing Model vs. Proposed

River Station	Existing WSEL (NGVD29)	Proposed WSEL (NGVD29)	Difference (ft)	Notes
23036	131.62	131.62	0.00	
22916	131.63	131.63	0.00	
22765	131.64	131.64	0.00	
22450	131.48	131.48	0.00	
22140	127.84	127.84	0.00	
21825	125.26	125.26	0.00	
21770	125.08	125.08	0.00	
21757.5				Kent Road
21745	124.39	124.39	0.00	
21695	124.15	124.15	0.00	
21285	124.30	124.30	0.00	Norwalk Town Line

3.2.2 Velocities

We also ran the HEC-RAS model to compare the resultant velocities. There will be a very slight increase in velocity as a result of the project near the beginning of the project. However, the velocity increase is less than 1% and is therefore not expected to have an adverse impact on the stability of the river embankment.

Table 3-2
100-year Base Flood Velocities, Existing Model vs. Proposed

River Station	Existing Velocity (ft/s)	Proposed Velocity (ft/s)	Difference (ft/s)	Notes
29920	11.86	11.86	0.00	
29760	7.45	7.45	0.00	
28240	12.69	12.69	0.00	
27468	1.37	1.37	0.00	
27110	3.29	3.29	0.00	
27025	10.68	10.68	0.00	
27020				Substation Bridge
27015	11.26	11.26	0.00	
26680	10.6	10.59	0.00	
26209	2.70	2.70	0.00	
26136	9.59	9.59	0.00	
26127.5				Arrowhead Drive

Table 3-2
100-year Base Flood Velocities, Existing Model vs. Proposed

River Station	Existing Velocity (ft/s)	Proposed Velocity (ft/s)	Difference (ft/s)	Notes
26119	5.04	5.04	0.00	
26058	5.08	5.07	-0.01	
25358	5.61	5.61	0.00	ASML Site, North End
25340	6.55	6.55	0.00	
25334	4.96	4.96	0.00	
24975	8.49	8.49	0.00	Project Area
24922	7.23	7.30	+ 0.07	Project Area
24677	5.44	5.44	0.00	
24620	7.78	7.78	0.00	
24597	6.38	6.38	0.00	
24570	10.31	10.31	0.00	
24542.5				ASML Driveway Bridge
24540	11.88	11.88	0.00	
24485	14.75	14.75	0.00	
24430	6.88	6.88	0.00	
24401	6.86	6.86	0.00	
24381	10.71	10.71	0.00	
24180	8.02	8.02	0.00	
24105	11.57	11.57	0.00	
23805	7.99	7.99	0.00	ASML Site, South End
23415	14.27	14.27	0.00	
23171	9.91	9.91	0.00	
23036	3.98	3.98	0.00	
22916	5.38	5.38	0.00	
22765	4.19	4.19	0.00	
22450	4.04	4.04	0.00	
22140	16.12	16.12	0.00	
21825	14.07	14.07	0.00	
21770	12.71	12.71	0.00	
21757.5				Kent Road
21745	13.75	13.75	0.00	
21695	13.66	13.66	0.00	
21285	8.42	8.42	0.00	Norwalk Town Line

3.3 Floodplain Impacts

Table 3-1 shows that the proposed improvements will not increase base flood elevations while Table 3-2 shows that the increase in velocity will be of no significant impact, since it is less than 1%. Therefore, the proposed project is complaint with the NFIP requirements as well as the requirements of the Town of Wilton.

Please refer to **Appendix G** for the HEC-RAS modeling results.

Section 4
Wetlands and Watercourses

4.1 Overview

The Project design has been made to avoid impact when possible and to minimize and mitigate the impacts which are unavoidable to accomplish the Project.

Due to the nature of the project, complete avoidance of the Site's wetland and upland review areas is not possible. The Applicant proposes to minimize impacts to the greatest extent practicable. Impacts will be minimized through implementation of best management practices, including construction phasing.

Wetlands impacts are limited to 20 square feet, and involve the repair of existing eroded areas along the bank.

An analysis of the possible effects of unavoidable impacts is provided below.

4.2 Natural Diversity Communities

The Connecticut Department of Energy and Environmental Protection's Natural Diversity Database (NDDB) Map for the Town of Wilton, dated June 2021, shows no state endangered or threatened species on the site.

4.3 Aquifer Protection Areas

The proposed crossing is not located within any Aquifer Protection Area as identified by CTDEEP.

4.4 Floodplain Management

The Flood Insurance Study for Fairfield County, dated June 18, 2010 shows that there is a Special Flood Hazard Area, Zone AE and floodway associated with the Norwalk River. Refer to Section 3 of this report.

4.5 Wetland Identification

Raina Volovski, Professional Soils Scientist, of Tighe & Bond identified wetland soils and their boundaries, which were located by Arthur H. Howland & Associates, Inc.

4.6 Wetland Impacts

The project proposes a direct impact of 20 square feet to the wetlands to repair areas of erosion along the riverbank.

Upland review area impacts construction of the proposed driveway, walkway and associated grading, retaining walls, and stormwater infrastructure.

The project impacts are summarized in **Table 4-1.**

Table 4-1
Impact Summary within Project Limits

Type	Disturbance sf	Disturbance ac
Wetlands		
Disturbance for Erosion Repair	20	< 0.001
Upland Review Area		
Proposed Disturbance	26,113	0.599
Existing Disturbance	22,080	0.506
Net Increase Existing to Proposed	4,033	0.092

4.7 Alternatives Assessment

The proposed activity within the riparian corridor represents the most feasible and prudent alternative considered with the least amount of environmental impact.

4.7.1 No-Build

The no-build alternative would not address the safety challenges the current site experiences with traffic flow, and is therefore neither prudent or feasible.

4.7.2 Conducting the Activity in a Different Location

The proposed activity requires separation of truck and delivery traffic from employee traffic. The route left from the driveway bridge is constrained, having choke points at the southeast corner of the building due to the proximity of the river, and along the west side of the building due to the railroad.

Routing traffic along the north side of the building would be challenging because of all the support equipment such as power equipment and storage tanks that are located in the narrow corridor between the north face of the building and the hillside. Therefore, the driveway alignment over the hillside is the only location where the driveway can be constructed and meet the project traffic safety objectives.

4.7.3 Alternatives Considered

The project evolved through several alternatives before the current proposal was selected by ASML. Please refer to the supporting figures in **Appendix H**.

4.7.3.1 Alternative 1: 9% Grade, Alignment A

The Town of Wilton allows driveway grades of up to 10%. Alternative 1 was the initial layout based upon concept drawings provided by ASML. Alternative 1 explores a driveway at a 9% grade, and preservation of as many parking spaces north of the building as possible. The alignment brought the edge of the driveway 5 feet from the adjacent wetlands, and left little room for stormwater management facilities. The alignment also featured a series of “broken back” curves, which are also undesirable.

A large paved turnaround for emergency vehicles in front of the garage is also provided.

4.7.3.2 Alternative 2: 9% Grade, Alignment B

Alternative 1 brough the roadway too close to the wetlands and didn't provide enough room for stormwater management. Alternative 2 kept the driveway grade at 9%, but adjusted the alignment to increase the separation distance from the wetlands, and to better align the curves and the approach to the parking garage. Minimum separation distance to the wetlands increased to 21 feet.

The improved alignment allows more room for stormwater management features, though it removes more parking spaces from the north lot. Additionally, the areas of existing parking closest to the wetlands will be removed, including the gravel parking area that is only 4 feet from the wetlands. At that point, the proposed sidewalk along the east side of the new driveway will be 41 feet from the wetland boundary.

Alternative 2 also reconfigures the parking lot, providing a turnaround area for vehicles that are denied entry. Alternative 2 also retains the paved turnaround for emergency vehicles in front of the garage.

4.7.3.3 Alternative 3: 10% Grade, Alignment B

Alternative 3 is a permutation of Alternative 2, using the steeper alignment, but increasing the grade to 10 percent. The intent was to explore the grading impacts of using a steeper grade, which would reduce earthwork, but our analysis showed that the increase was not significant to warrant a steeper driveway, as tiered rock slopes / retaining walls would still be required, as would the retaining wall near the beginning of the site driveway.

4.7.3.4 Alternative 4: 6% Grade, Alignment C

Alternative 4 uses a slightly different alignment than Alternative 3, taking a more direct route up the hillside than Alternative 3. The alignment is similar to the south end of the alignment used in Alternative 4, but diverges from Alignment B as it climbs the slope. The minimum separation to the wetlands is the same as Alignment B. Alternative 4 is at a 6% grade, and results in additional retaining walls on the east side as it approaches the garage.

4.7.3.5 Alternative 5 – 8% Grade, Alignment B

Alternative 5 follows Alignment B, which was used in Alternatives 2 and 3, and is on an 8% grade. Although there is more earthwork, the retaining wall configuration remains the same as Alternatives 2 and 3, the earthwork isn't substantially different, and provides a less steep driveway.

4.7.3.6 Alternative 6 – 7% Grade, Alignment B

Alternative 6 also follows Alignment B, but at a 7% grade. There is additional cut, but the configuration of walls is similar to Alternatives 2, 3, and 6. 7% is the maximum grade the Town allows without additional special consideration under its Zoning Regulations.

4.7.3.7 Alternative 7 – 10% Grade, Alignment D

Alternative 7 is on a new alignment that would connect to the parking area at grade level near the garage as opposed to between the third and fourth levels. Although this would provide a minimum 35 foot separation from the wetlands, it would also require up to a 60 foot cut into the hillside, essentially creating a trench through the hillside, which would generate an enormous amount of earthwork, therefore, this alternative was not considered feasible or prudent.

4.7.3.8 Alternative 8, 7% Grade, Alignment E

Alternative 8 is the project proposal. It is a further refinement of Alternates 1 through 6. The alignment was adjusted to increase the minimum separation distance from the wetlands to 23 feet. It also eliminates the two turnarounds, and instead relies upon reinforced turf for vehicle turning movements.

Section 5
Sedimentation & Erosion Control

5.1 Erosion Control Narrative

The stormwater management measures will address the stormwater quality once the site has been constructed and stabilized. Sedimentation and erosion control measures will be installed during construction which will minimize adverse impacts from construction activities.

All sedimentation and erosion control measures proposed for this development have been designed in accordance with the "2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control" as published by the Connecticut Council on Soil Erosion and Water Conservation. Additional guidelines have also been followed that are available from the Connecticut Department of Energy and Environmental Protection as recommended for sedimentation control during construction activities.

5.1.1. General

1. The proposed development is entitled "ASML Campus Traffic Safety Improvements" in Wilton, Connecticut.

2. Estimated
   Project Start: Fall 2022
   Project Completion: Spring 2023

3. Erosion Control Narrative refers to Drawings C600 to C610

4. The Site is located at 77 Danbury Road, Wilton, Connecticut.

5.1.2 Construction Sequence

5.1.2.1 Phase 1

1. Hold pre-construction meeting with design team and the Town's Environmental Affairs Director to discuss the sequence of operations and the sediment and erosion controls.

2. Install silt fence and straw wattles along riparian corridor.

3. Install silt sacks at catch basins

4. Post signage at driveway bridge directing all traffic to turn left, except construction vehicles.

5. Install construction entrance

6. Excavate Temporary Sediment Trap

5.1.2.2 Phase 2

1. Maintain and replenish/replace controls from Phase 1.
2. Construct lower retaining wall
3. Rough grade lower section of roadway
4. Excavate up the hillside to create haul road access to the top of the ridge.
5. Place some of the rock removed on the down slope side of the haul road fill to armor the slope,
6. Install lowest portion of drainage system.
7. Protect basin inlets with silt sacks.
8. Protect headwall inlet with stone check dam.

5.1.2.3 Phase 3

1. Maintain and replenish/replace controls from Phase 2.
2. Install sediment and erosion controls near parking garage.
3. Excavate eastern portion of driveway and rough grade, constructing rock cuts and walls.
4. Construct riprap swale above walls.
5. Install drainage system.
6. Protect new catch basins with silt sacks.

5.1.2.4 Phase 4

1. Maintain and replenish/replace controls from Phase 3.
2. Construct retaining walls near parking garage.
3. Make structural modifications to parking garage for new entrance.
4. Install uppermost catch basins of driveway drainage system.
5. Protect new catch basins with silt sacks.

5.1.2.5 Phase 5

1. Rough grade parking lot.
2. Install parking lot drainage, rain garden and infiltration system.
3. Construct sidewalks, reinforced turf areas, and other appurtenances.

4. Construct stormwater management basin and retaining wall.

5. Pave parking area and driveway.

6. Establish turf and stabilize.

7. Remove erosion controls.

5.2 Erosion Control Notes

1. All sedimentation and erosion control measures shall be constructed in accordance with the standards and specifications of the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control", DEP Bulletin No. 34, and all amendments and addenda thereto as published by the Connecticut Department of Environmental Protection.

2. Land disturbance shall be kept to the minimum necessary for construction operations.

3. Install all erosion control measures as shown on the plan and elsewhere as ordered by the Engineer or the City.

4. Protect all catch basins with a silt sacks, haybale ring, silt fence or block and stone inlet protection throughout the construction period and until all disturbed areas are thoroughly stabilized.

5. Whenever possible, install erosion and sediment control measures prior to construction. See "Erosion Control Narrative".

6. Install additional control measures during the construction period as ordered by the Engineer.

7. Maintain all sedimentation and erosion control measures in effective condition throughout the construction period.

8. Sediment removed shall be disposed of off-site or in a manner as required by the Engineer

9. The construction contractor shall be responsible for construction and maintenance of all control measures throughout the construction period.

10. Protect all disturbed areas exposed for more than 30 days with a temporary vegetative cover. Seed these areas with perennial ryegrass at the rate of 40 lbs. per acre (1 lb. per 1,000 sq. ft). Apply soil amendments and mulch as required to establish a uniform stand of vegetation over all disturbed areas.

11. The construction contractor shall utilize approved methods/materials for preventing the blowing and movement of dust from exposed soil surfaces onto adjacent properties and site areas.

12. The construction contractor shall maintain a supply of silt fence/haybales and anti-tracking crushed stone on site for emergency repairs.

13. The contractor shall inspect weekly at a minimum, and before all forecasted storms all drainage structures and clean them as needed to prevent the build-up of silt.

14. The construction contractor shall carefully coordinate the placement of erosion control measures with the phasing of construction.

15. Keep all paved roadways clean. Sweep the driveways used for construction access before forecasted storms. Sweep adjacent roadways as warranted.

16. Treat all unpaved surfaces with 4" minimum of topsoil prior to final stabilization.

17. Install haybale barriers and silt fencing along the toe of critical cut and fill slopes.

18. The contractor shall notify the Town of Wilton Environmental Official prior to the installation of erosion controls, cutting of trees, or any excavation.

19. Cover all trucks leaving the site.

20. Check all sedimentation and erosion controls weekly and/or after each rainfall event. Make necessary repairs immediately.

21. Inspect and repair erosion and sediment controls prior to forecasted rain events.

22. Remove erosion controls when all disturbed areas have been stabilized and the city has provided authorization. Disturbed areas shall be seeded and mulched.

5.3 Engineered Controls

The proposed stormwater basin will function as a temporary sediment trap during construction. The trap was sized in accordance with the criteria in the 2002 Connecticut Erosion and Sediment Control Guidelines. The trap will be reshaped, cleaned, restored and planted prior to project completion. Please refer to computations in **Appendix I**.

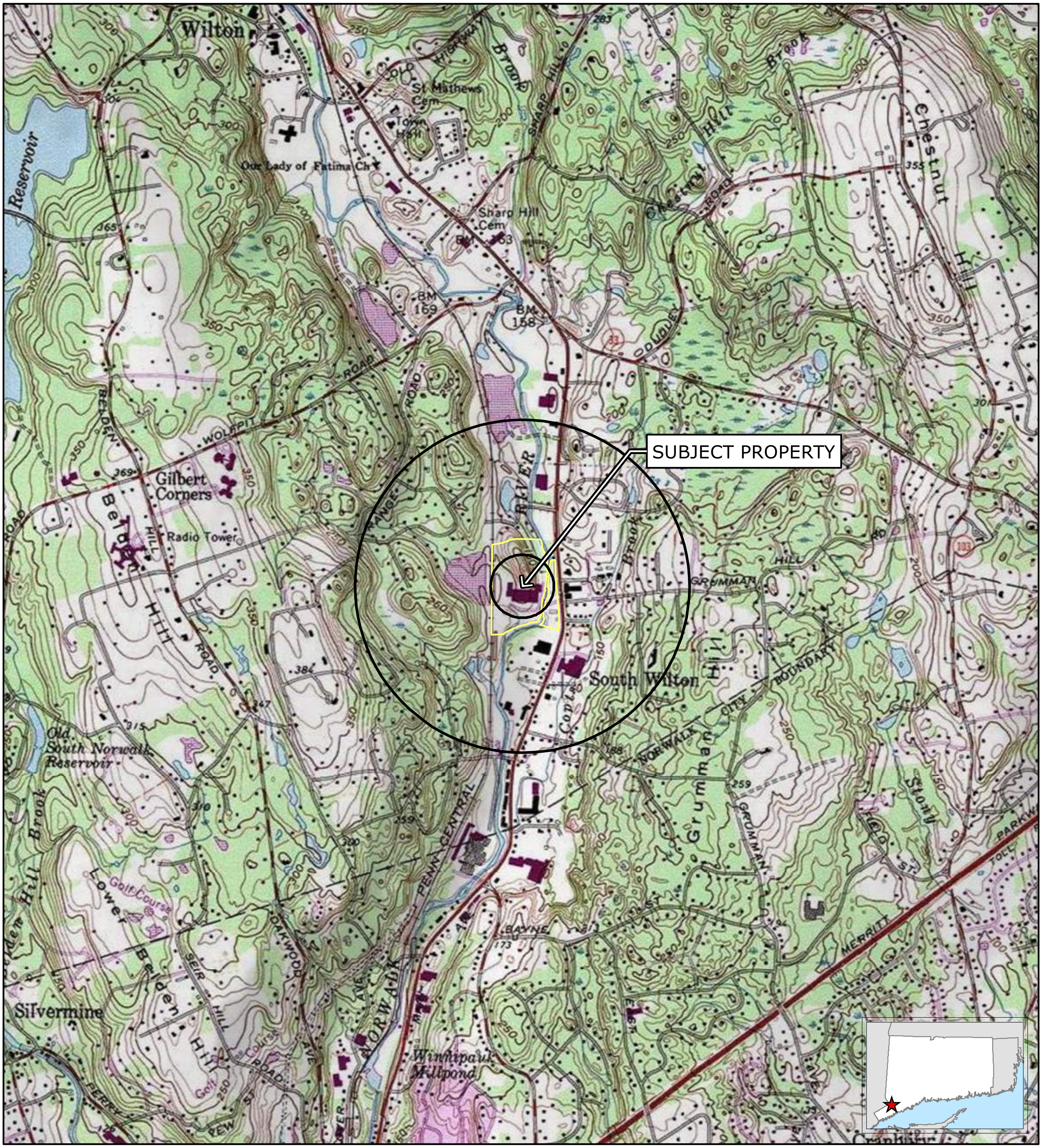


FIGURE 1
SITE LOCATION MAP
ASML Campus Traffic
Safety Improvements
77 Danbury Road
Wilton, Connecticut

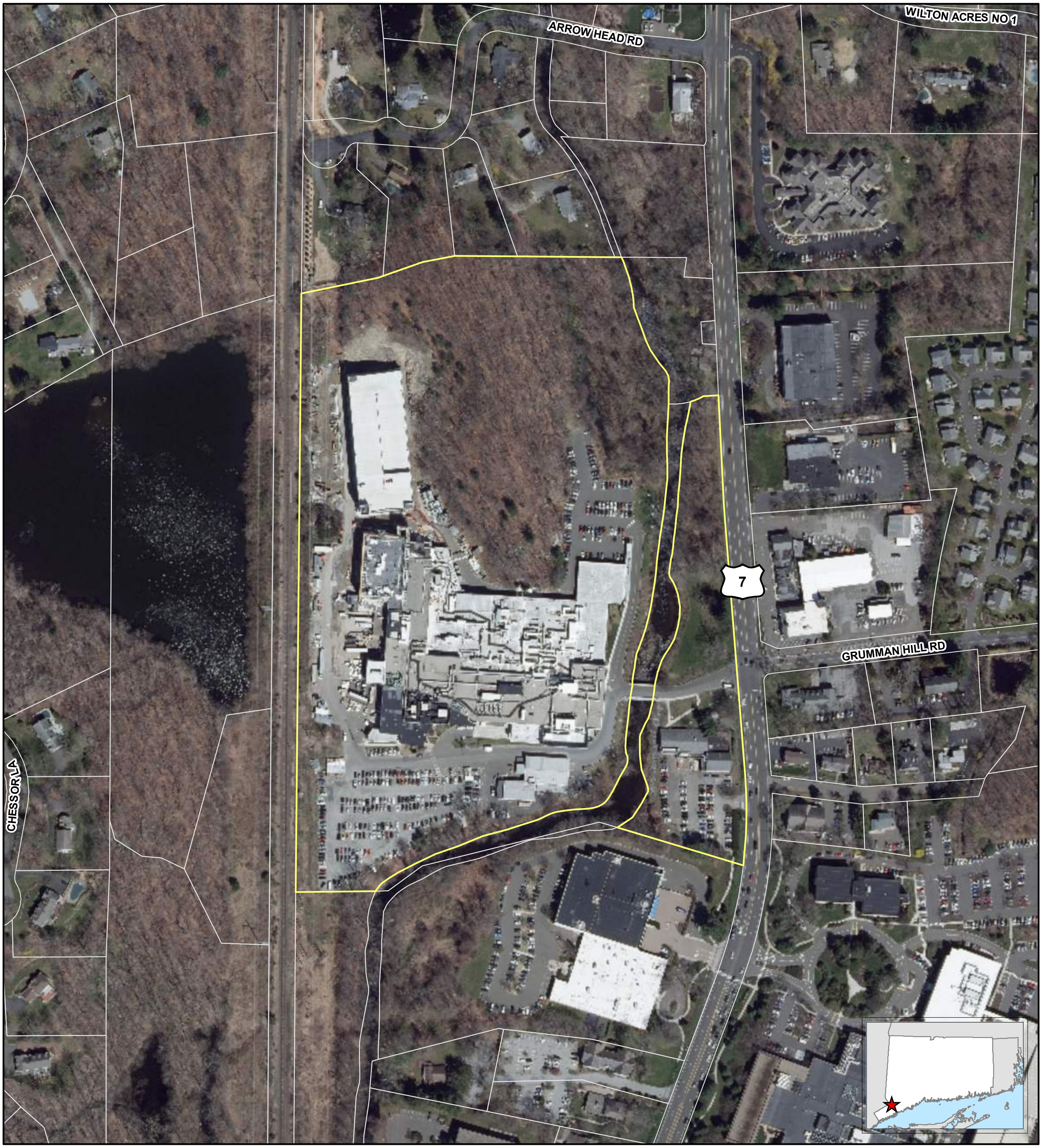
May 2022

1:24,000
0 1,000 2,000
Feet

N

Tighe&Bond

Based on USGS Topographic Map for Norwalk North, Contour Interval Equals 1ft. Circles indicate 500-foot and half-mile radii



LEGEND

Approximate Subject Property

Approximate Parcel Boundary

1:3,600

0 150 300

Feet

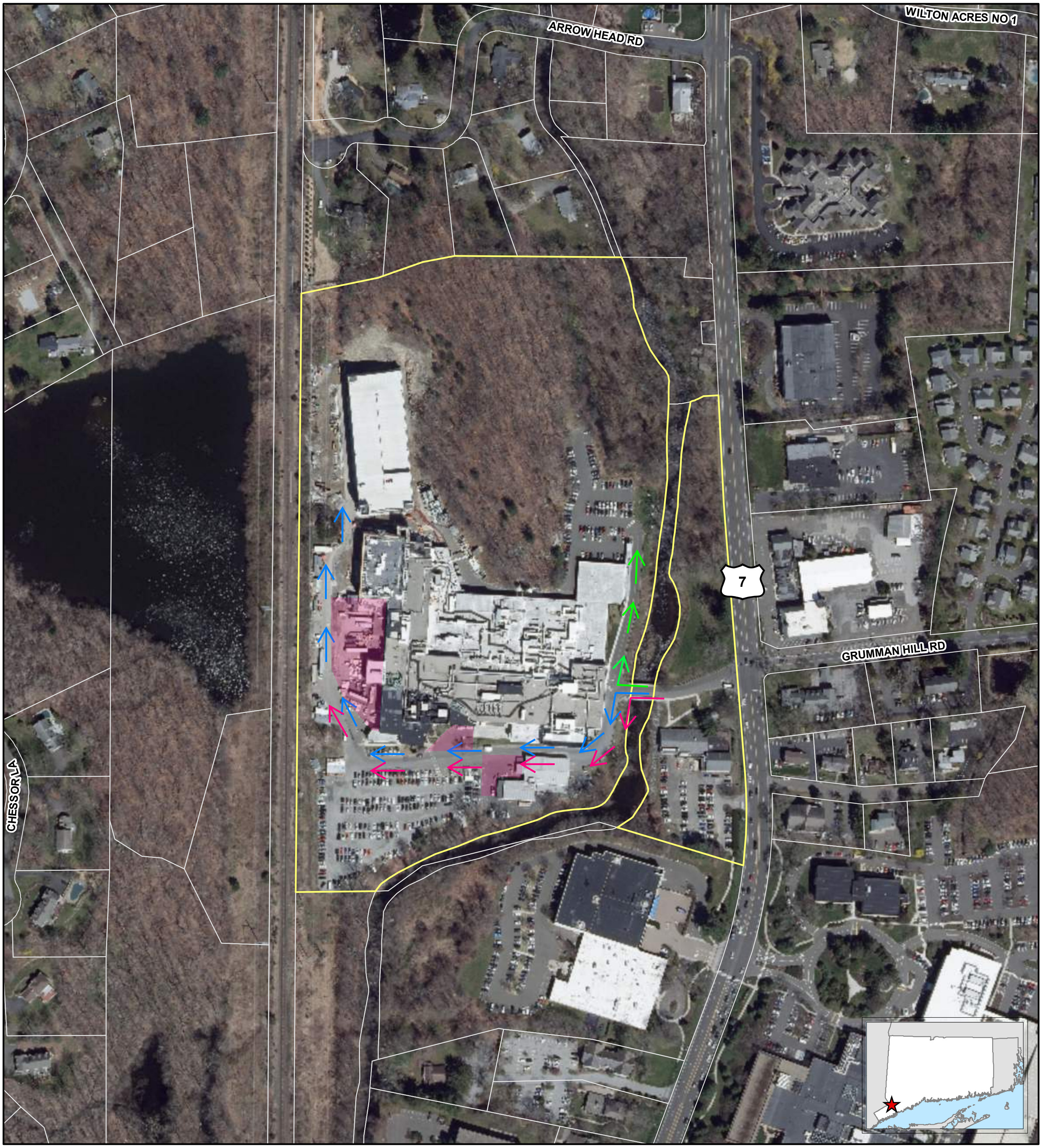
Tighe&Bond

Based on 2019 Statewide Leaf-Off Orthophotography, Courtesy of CTECO.
Wilton Parcels (FY20) provided by WestCOG and are approximate.

FIGURE 2
ORTHOPHOTOGRAPH

ASML Campus Traffic Safety Improvements
77 Danbury Road
Wilton, Connecticut

May 2022



LEGEND

Active Loading Areas

Truck Traffic

Employee Traffic

Visitor Traffic

1:3,600

0 150 300

Feet

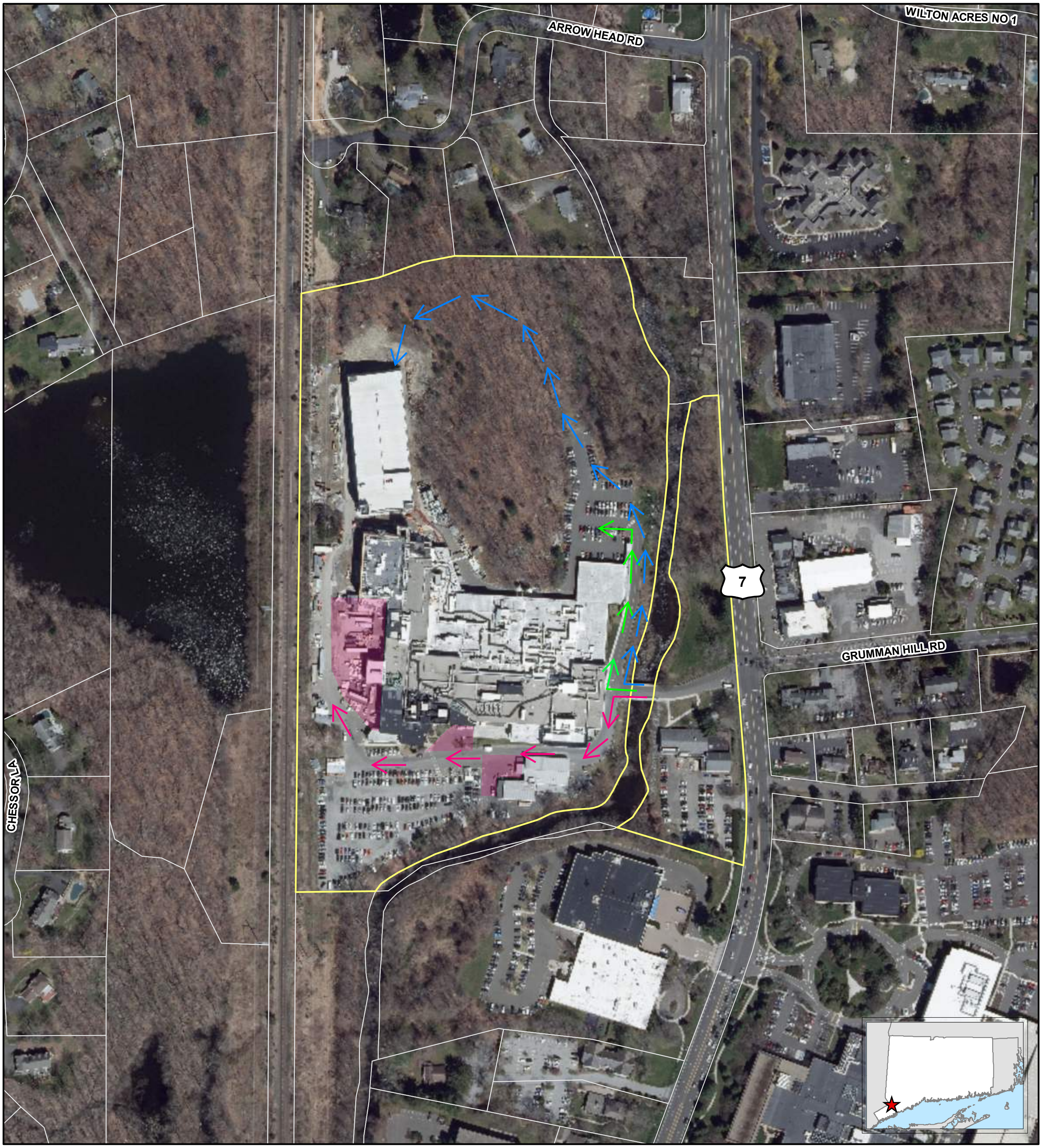
Tighe&Bond

Based on 2019 Statewide Leaf-Off Orthophotography, Courtesy of CTECO.
Wilton Parcels (FY20) provided by WestCOG and are approximate.

FIGURE 3
EXISTING TRAFFIC FLOW

ASML Campus Traffic
Safety Improvements
77 Danbury Road
Wilton, Connecticut

May 2022



LEGEND

Active Loading Areas

Truck Traffic

Employee Traffic

Visitor Traffic

1:3,600

0 150 300

Feet

N

Tighe&Bond

Based on 2019 Statewide Leaf-Off Orthophotography, Courtesy of CTECO.
Wilton Parcels (FY20) provided by WestCOG and are approximate.

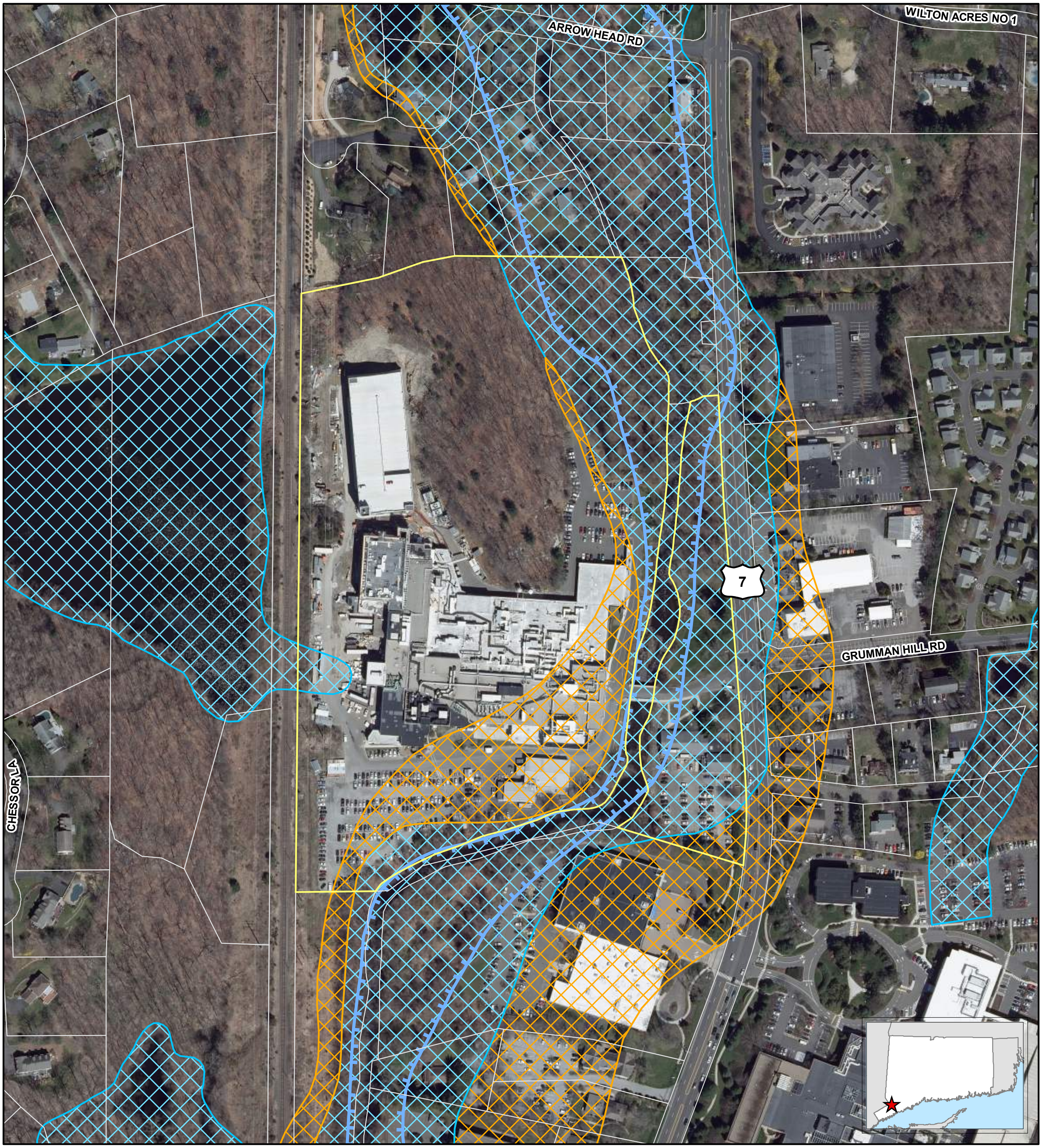
FIGURE 4
PROPOSED TRAFFIC FLOW

ASML Campus Traffic
Safety Improvements
77 Danbury Road
Wilton, Connecticut

May 2022

V:\Projects\A\A0969\ASMLDrivewayImprovement_aerial.mxd [Exported By: SMMorse, 5/17/2022, 12:01:58 PM]

A-0969



LEGEND

- FEMA Floodway
- 100-Year Flood Zone
- 500-Year Flood Zone
- Approximate Subject Property
- Approximate Parcel Boundary

Tighe&Bond

Based on 2019 Statewide Orthophotography,
Courtesy of CT ECO.
FEMA data from CTDEEP.

1:3,600

0 150 300

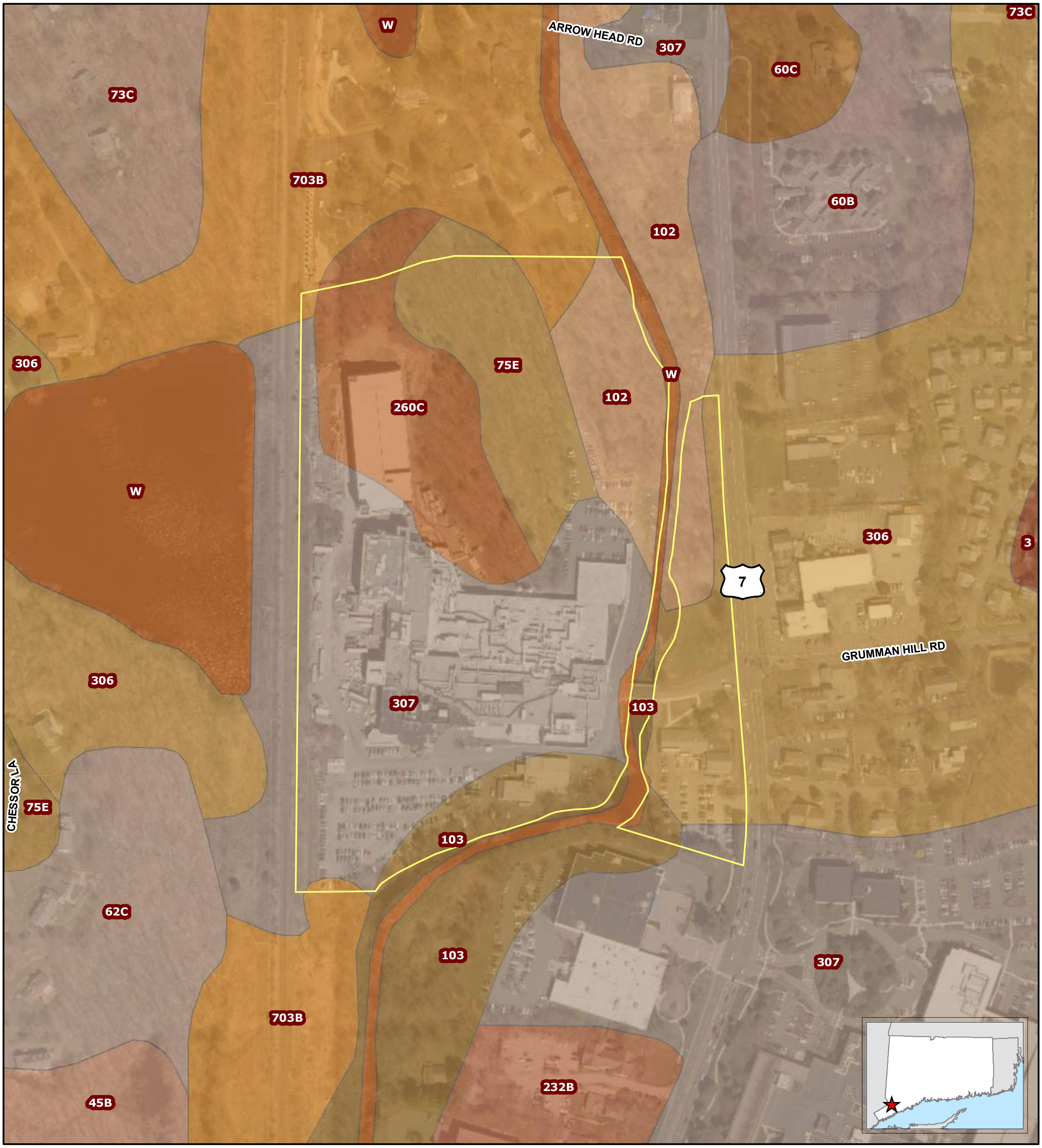
Feet

N

FIGURE 5
FEMA FLOOD ZONES

ASML Campus Traffic
Safety Improvements
77 Danbury Road
Wilton, Connecticut

May 2022



LEGEND

Map Unit Symbol

102
103
232B
260C
3
306
307
45B
60B
60C
62C
703B
73C
75E
W

Source:
Based on 2019 Statewide Leaf-Off Orthophotography, Courtesy of CTECO.
Soil Boundary data obtained from the United States Department of Agriculture Natural Resources Conservation Service (NRCS; http://soildatamart.nrcs.usda.gov/).

Tighe&Bond

1:3,600

0 150 300

Feet

N

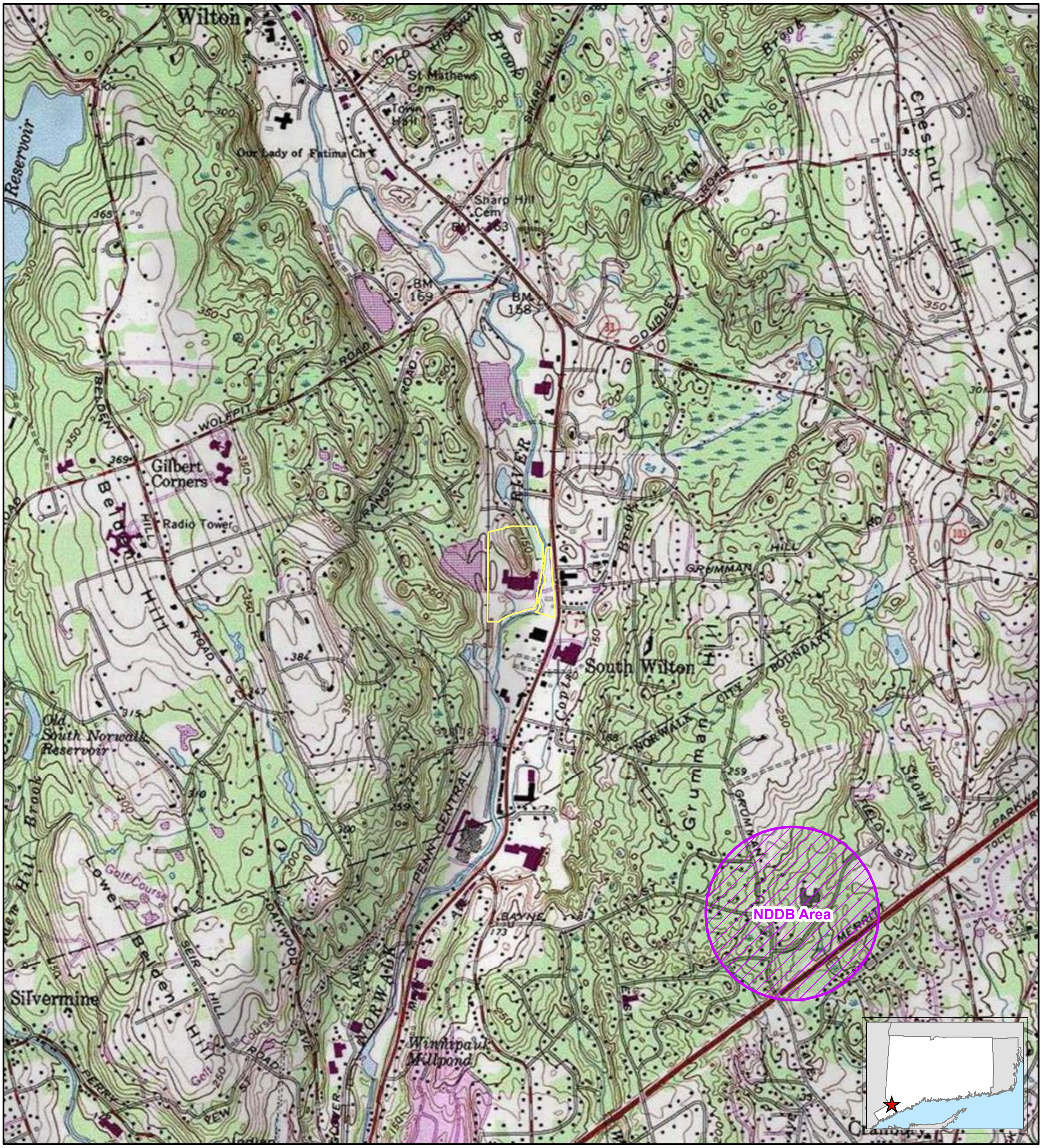
FIGURE 6
SOILS MAP

ASML Campus Traffic Safety Improvements
77 Danbury Road
Wilton, Connecticut

May 2022

V:\Projects\A\A0969\ASMLDrivewayImprovement_soils.mxd [Exported By: SMMorse, 5/17/2022, 12:28:42 PM]

A-0969



LEGEND

- Natural Diversity Database Area (Dec 2021)
- Approximate Subject Property

Tighe&Bond

Based on 2019 Statewide Orthophotography, Courtesy of CT ECO. NDDB data from CTDEEP.

1:24,000

0 1,000 2,000

Feet

N

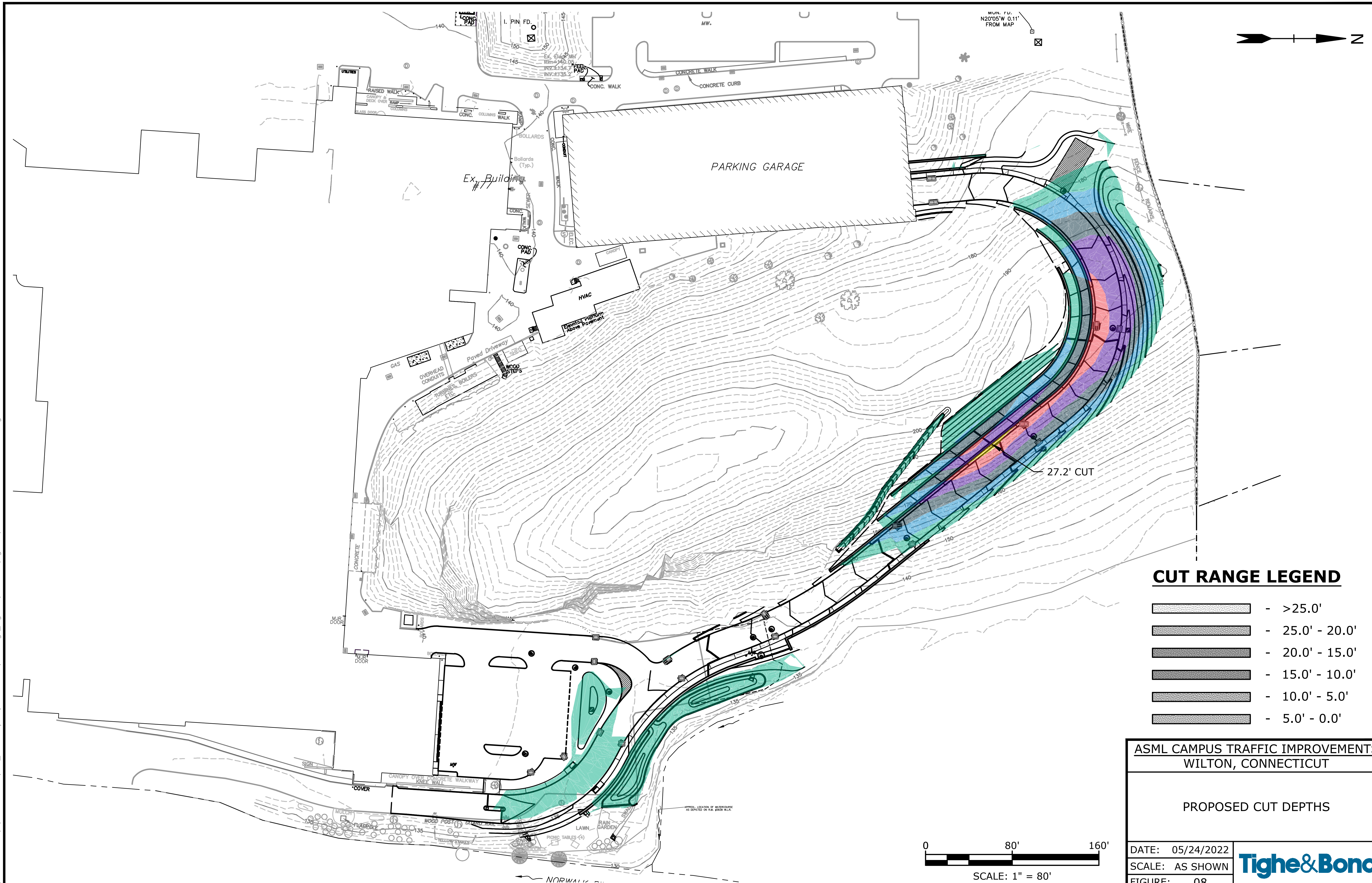
FIGURE 7
NDDB AREA

ASML Campus Traffic Safety Improvements
77 Danbury Road
Wilton, Connecticut

May 2022

V:\Projects\A\A0969\ASMLDrivewayImprovement_NDDB.mxd [Exported By: SMMorse, 5/17/2022, 1:00:55 PM]

A-0969



CUT RANGE LEGEND

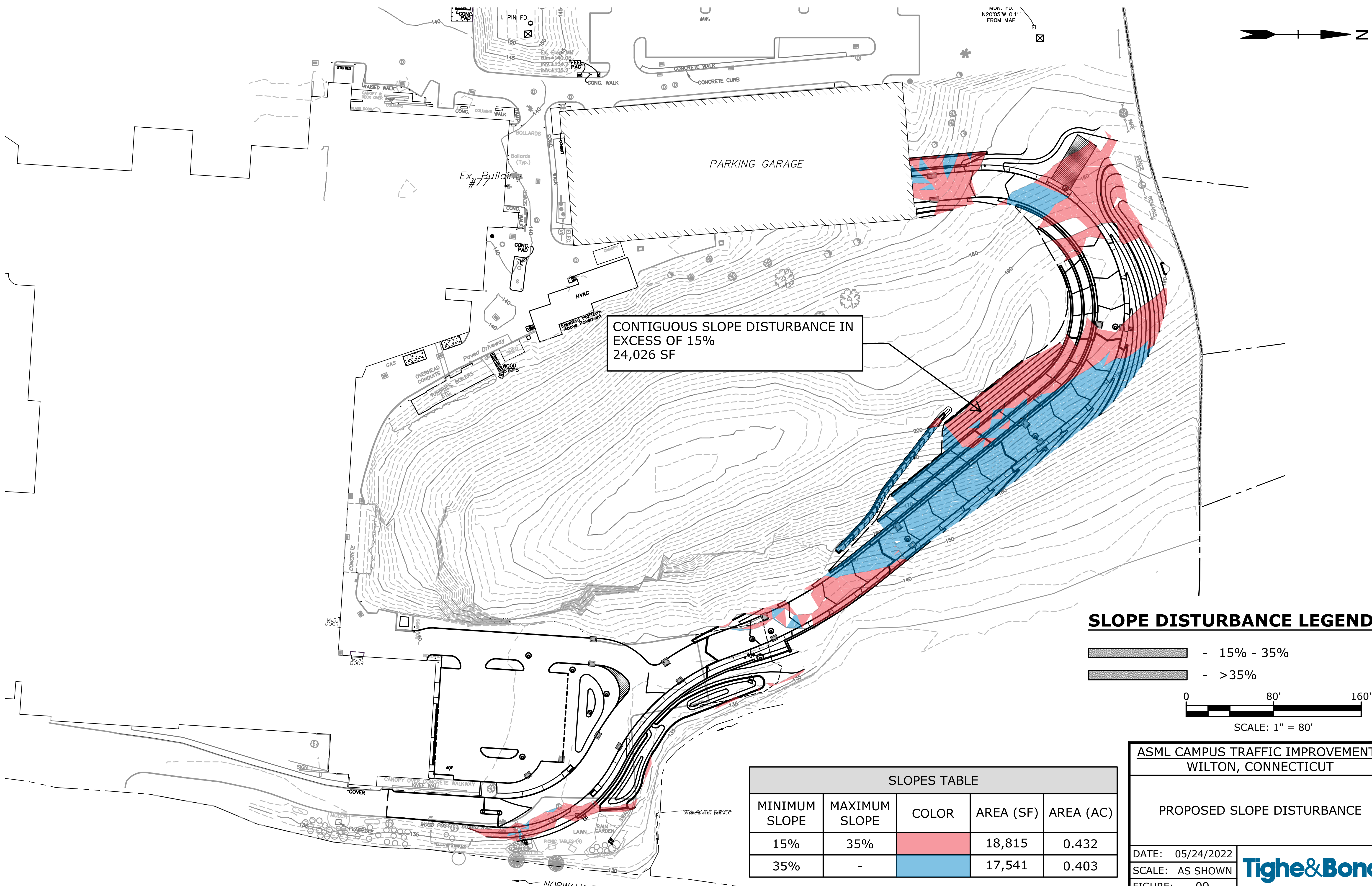
- >25.0'
- 25.0' - 20.0'
- 20.0' - 15.0'
- 15.0' - 10.0'
- 10.0' - 5.0'
- 5.0' - 0.0'

ASML CAMPUS TRAFFIC IMPROVEMENTS
WILTON, CONNECTICUT

PROPOSED CUT DEPTHS

DATE: 05/24/2022
SCALE: AS SHOWN
FIGURE: 08

Tighe&Bond



SLOPE DISTURBANCE LEGEND

- 15% - 35%
- >35%

0 80' 160'

SCALE: 1" = 80'

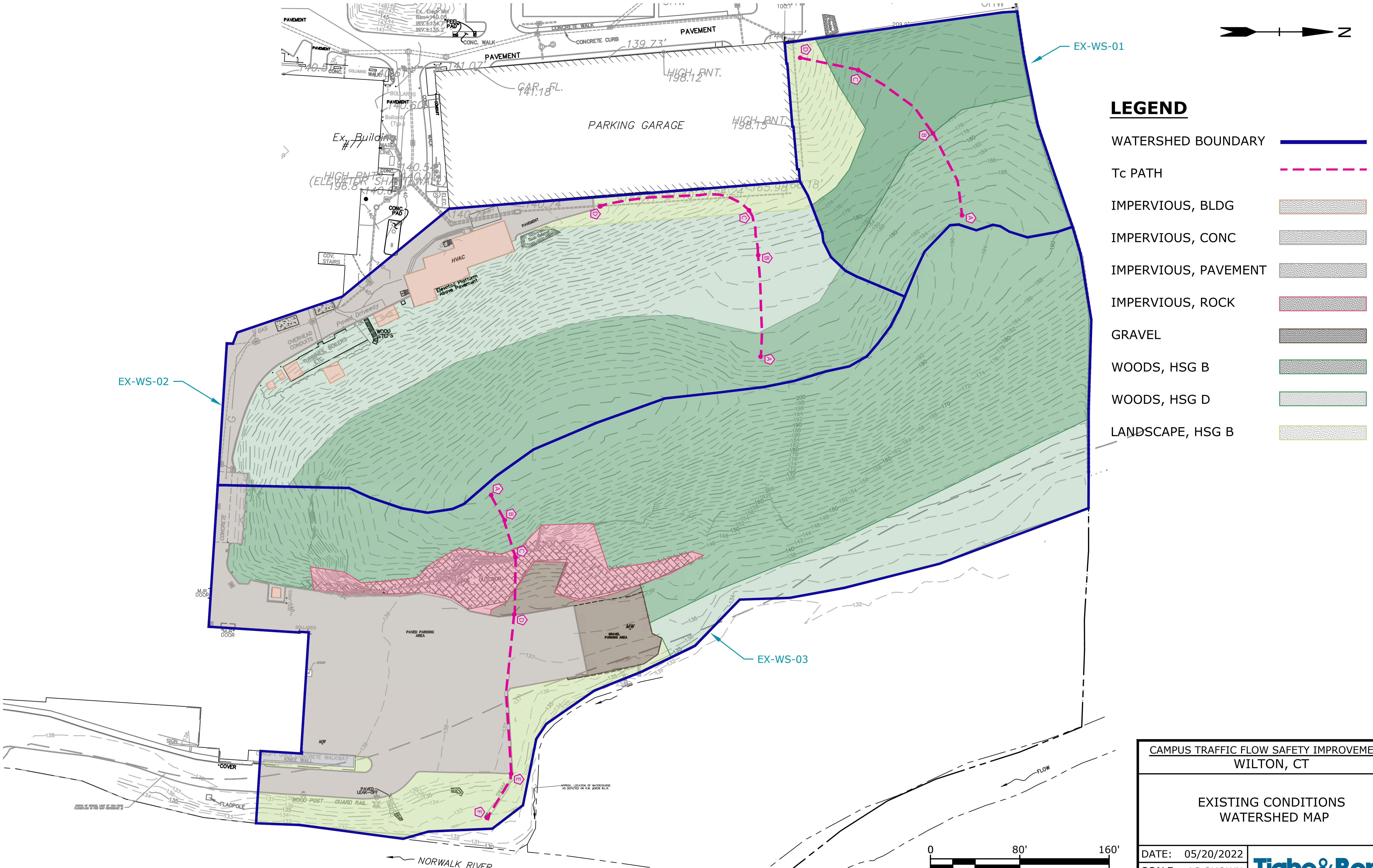
SLOPES TABLE				
MINIMUM SLOPE	MAXIMUM SLOPE	COLOR	AREA (SF)	AREA (AC)
15%	35%		18,815	0.432
35%	-		17,541	0.403

ASML CAMPUS TRAFFIC IMPROVEMENTS
WILTON, CONNECTICUT

PROPOSED SLOPE DISTURBANCE

DATE: 05/24/2022
SCALE: AS SHOWN
FIGURE: 09

Tighe&Bond



CAMPUS TRAFFIC FLOW SAFETY IMPROVEMENTS

WILTON, CT

EXISTING CONDITIONS WATERSHED MAP

DATE:	05/20/2022
SCALE:	AS SHOWN
FIGURE:	10

Tighe&Bond

LEGEND

- WATERSHED BOUNDARY
- Tc PATH
- IMPERVIOUS, BLDG
- IMPERVIOUS, CONC
- IMPERVIOUS, PAVEMENT
- IMPERVIOUS, ROCK
- GRAVEL
- WOODS, HSG B
- WOODS, HSG D
- LANDSCAPE, HSG B

N

0 80' 160'

SCALE: 1" = 80'

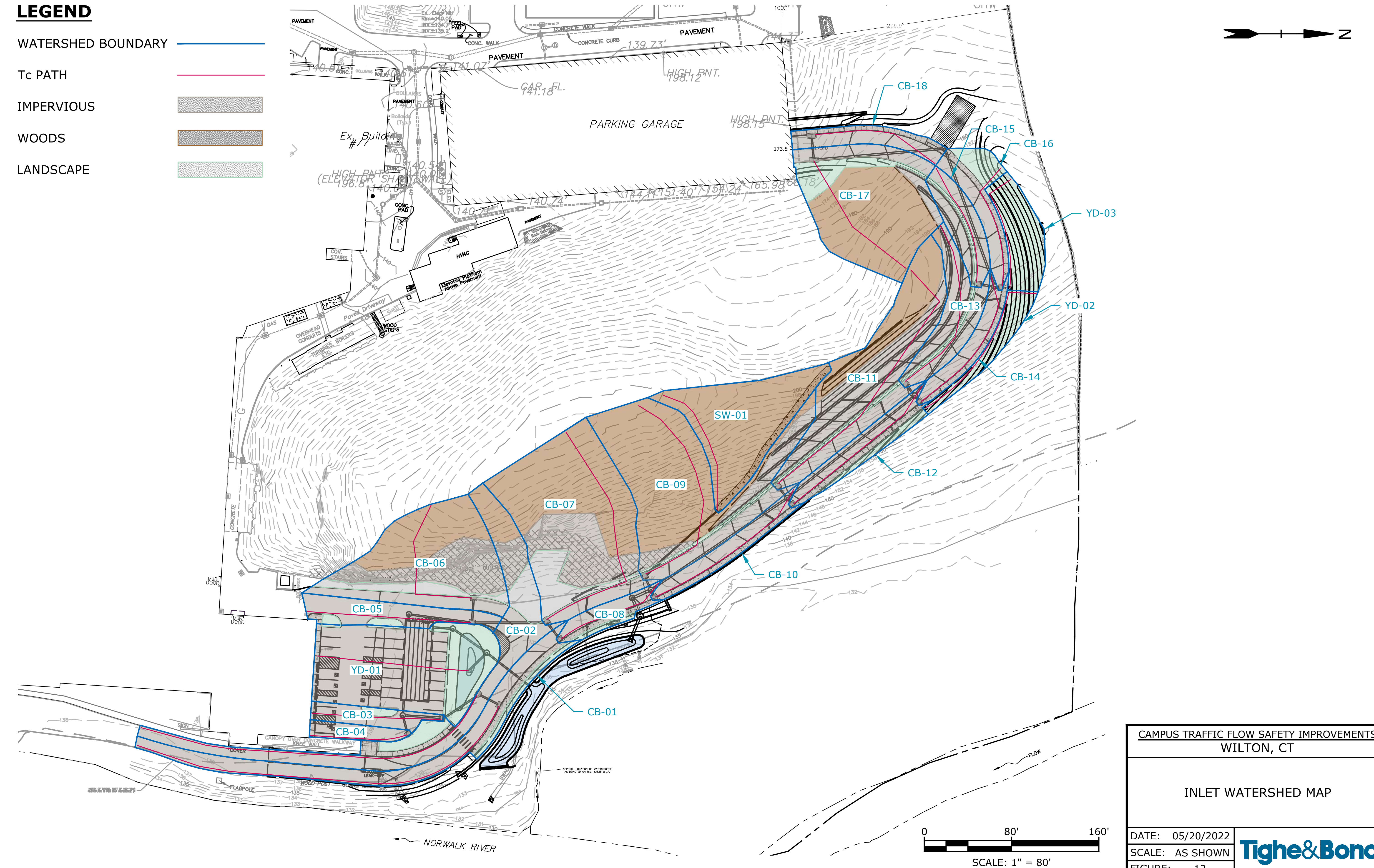
CAMPUS TRAFFIC FLOW SAFETY IMPROVEMENTS
WILTON, CT

PROPOSED CONDITIONS
WATERSHED MAP

DATE: 05/20/2022
SCALE: AS SHOWN
FIGURE: 11

Tighe&Bond

Plotted On:May 21, 2022-4:25pm By: CanasJ
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Figures\A0969-015 PROP CN WS MAP.dwg



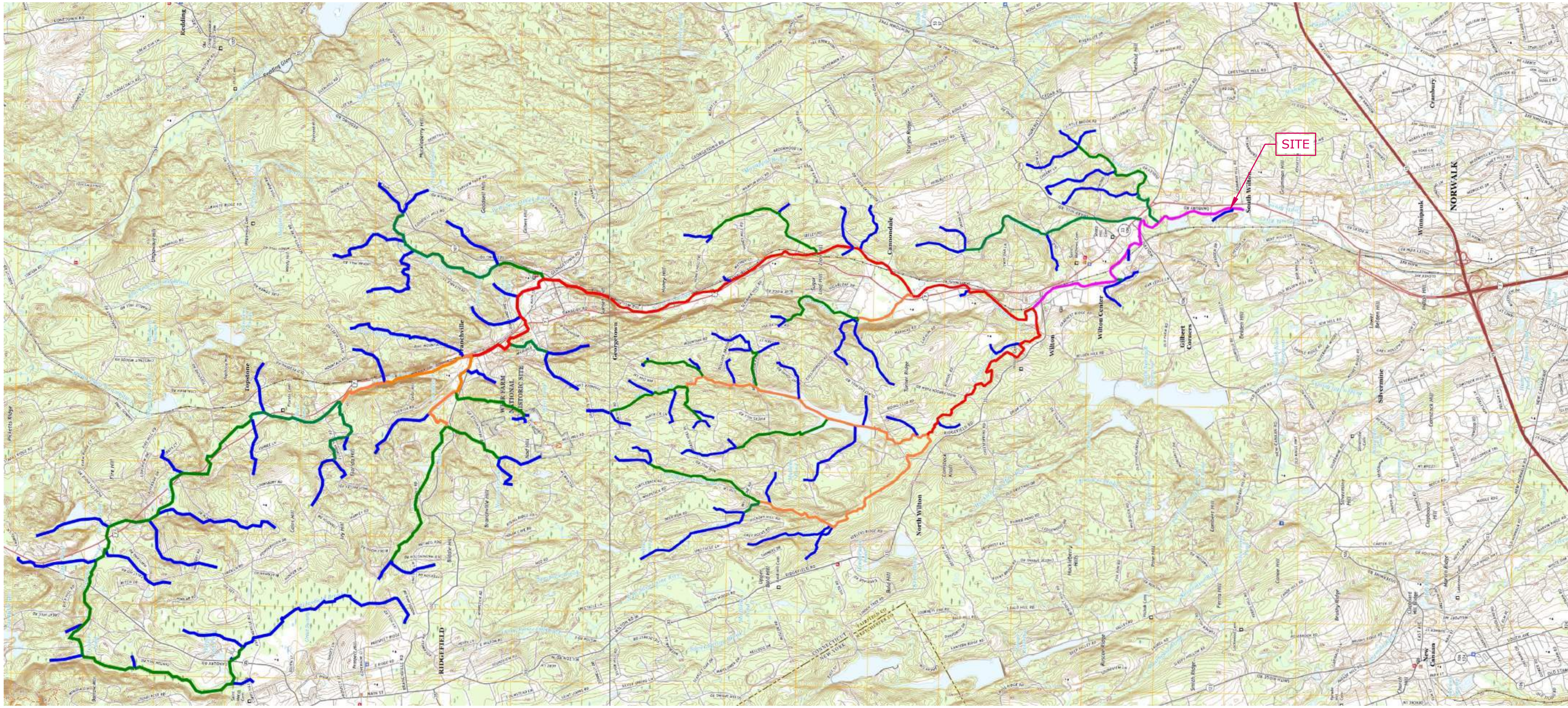
CAMPUS TRAFFIC FLOW SAFETY IMPROVEMENTS
WILTON, CT

INLET WATERSHED MAP

DATE: 05/20/2022
SCALE: AS SHOWN
FIGURE: 12

Tighe&Bond

Plotted On:May 21, 2022-4:45pm By: CanasJ
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Figures\A0969-015 INLET WS MAP.dwg



LEGEND

- FIRST ORDER STREAM
- SECOND ORDER STREAM
- THIRD ORDER STREAM
- FOURTH ORDER STREAM
- FIFTH ORDER STREAM

0 5000' 10000'

SCALE: 1" = 5000'

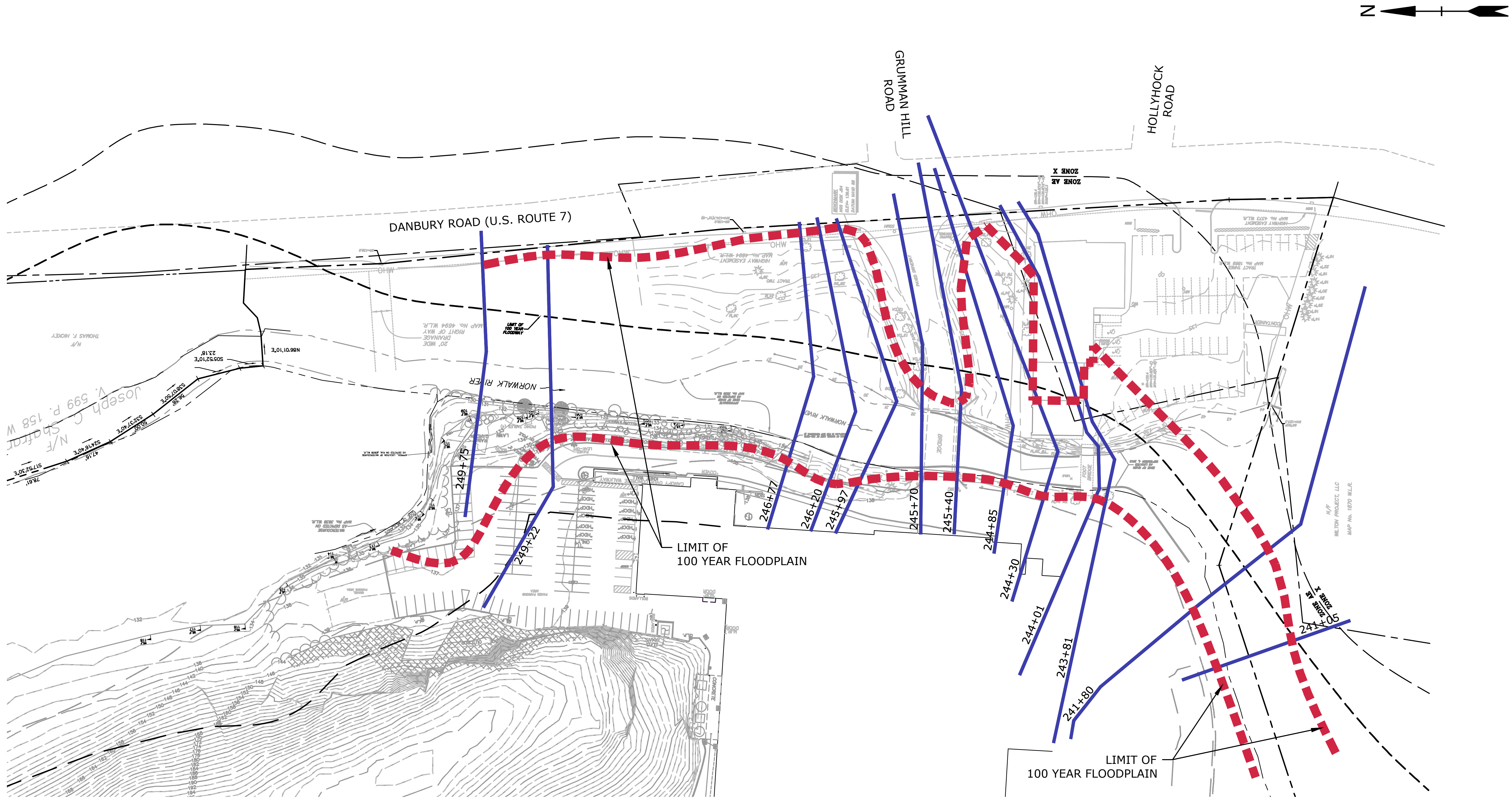
ASML TRAFFIC SAFETY
WILTON, CONNECTICUT

NORWALK RIVER
WATERSHED
STREAM ORDER

DATE:	05/20/2021
SCALE:	1" = 5000'
FIGURE:	13

Tighe&Bond

Plotted On:May 19, 2022-3:50pm By: SansoneM
Tighe & Bond:J:\A\A0969 ASML\015_Driveway Improvements\Drawings_Figures\AutoCAD\Figures\Figure 14.dwg



ASML TRAFFIC SAFETY
WILTON, CONNECTICUT

HEC-RAS MODEL
CROSS-SECTION LOCATIONS

DATE:	05/20/2021
SCALE:	1" =100'
FIGURE:	14

Tighe&Bond

Plotted On:May 19, 2022-4:24pm By: SansoneM
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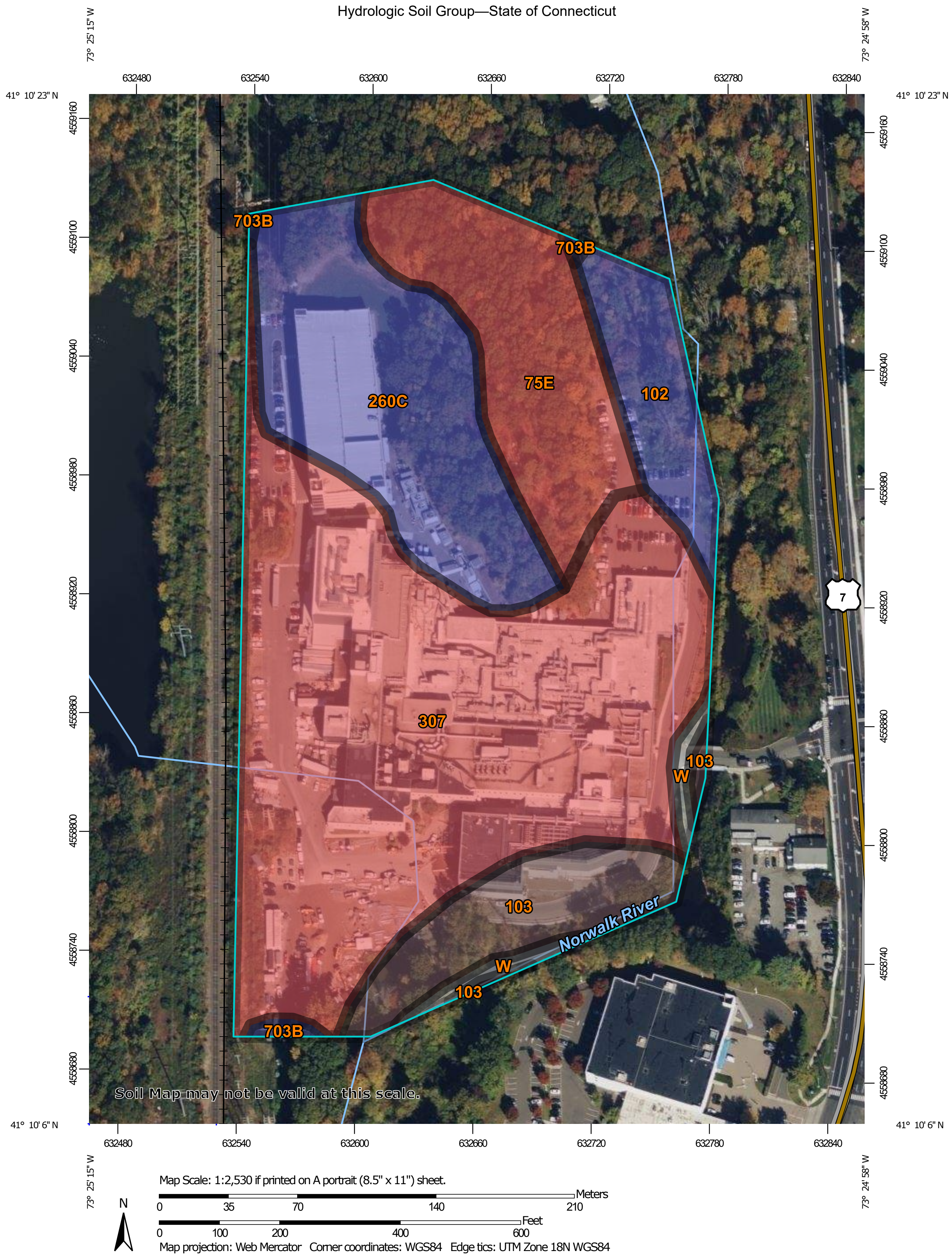
APPENDIX A



Map Scale: 1:2,530 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 35, 70, 140, 210

Feet: 0, 100, 200, 400, 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 21, Sep 7, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 8, 2020—Oct 14, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	D	3.1	14.0%
102	Pootatuck fine sandy loam	B	1.4	6.3%
103	Rippowam fine sandy loam	B/D	1.8	8.0%
260C	Charlton-Urban land complex, 8 to 15 percent slopes	B	4.2	19.0%
307	Urban land	D	11.4	50.8%
703B	Haven silt loam, 3 to 8 percent slopes	B	0.1	0.4%
W	Water		0.3	1.4%
Totals for Area of Interest			**22.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX B

NOAA Atlas 14, Volume 10, Version 3
Location name: Wilton, Connecticut, USA*
Latitude: 41.1708°, Longitude: -73.4183°
Elevation: 164 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.365 (0.286-0.461)	0.425 (0.333-0.537)	0.523 (0.408-0.663)	0.604 (0.468-0.770)	0.716 (0.536-0.946)	0.801 (0.586-1.08)	0.888 (0.629-1.23)	0.981 (0.662-1.40)	1.11 (0.719-1.63)	1.21 (0.766-1.82)
10-min	0.518 (0.405-0.654)	0.602 (0.471-0.761)	0.740 (0.577-0.938)	0.855 (0.664-1.09)	1.01 (0.759-1.34)	1.14 (0.831-1.53)	1.26 (0.892-1.75)	1.39 (0.938-1.98)	1.57 (1.02-2.31)	1.71 (1.09-2.57)
15-min	0.609 (0.477-0.769)	0.709 (0.555-0.896)	0.872 (0.680-1.11)	1.01 (0.781-1.28)	1.19 (0.894-1.58)	1.34 (0.977-1.80)	1.48 (1.05-2.06)	1.64 (1.10-2.33)	1.85 (1.20-2.72)	2.02 (1.28-3.03)
30-min	0.849 (0.665-1.07)	0.987 (0.772-1.25)	1.21 (0.946-1.54)	1.40 (1.09-1.78)	1.66 (1.24-2.19)	1.86 (1.36-2.49)	2.06 (1.45-2.84)	2.26 (1.53-3.22)	2.53 (1.65-3.73)	2.74 (1.74-4.12)
60-min	1.09 (0.853-1.38)	1.26 (0.990-1.60)	1.55 (1.21-1.97)	1.79 (1.39-2.29)	2.12 (1.59-2.80)	2.38 (1.74-3.19)	2.63 (1.85-3.63)	2.88 (1.95-4.11)	3.22 (2.09-4.73)	3.47 (2.19-5.21)
2-hr	1.39 (1.10-1.75)	1.64 (1.29-2.06)	2.05 (1.61-2.59)	2.39 (1.87-3.03)	2.86 (2.16-3.76)	3.22 (2.37-4.31)	3.58 (2.56-4.96)	3.98 (2.70-5.64)	4.54 (2.96-6.64)	4.99 (3.17-7.44)
3-hr	1.60 (1.26-2.00)	1.90 (1.50-2.38)	2.39 (1.89-3.00)	2.80 (2.19-3.54)	3.37 (2.55-4.42)	3.79 (2.81-5.08)	4.24 (3.04-5.87)	4.74 (3.21-6.69)	5.45 (3.55-7.95)	6.03 (3.84-8.96)
6-hr	2.01 (1.60-2.50)	2.41 (1.92-2.99)	3.06 (2.42-3.81)	3.60 (2.83-4.51)	4.34 (3.31-5.67)	4.90 (3.65-6.52)	5.49 (3.97-7.57)	6.16 (4.20-8.65)	7.15 (4.68-10.4)	7.98 (5.09-11.8)
12-hr	2.49 (1.99-3.07)	2.99 (2.39-3.69)	3.81 (3.03-4.71)	4.49 (3.55-5.58)	5.42 (4.15-7.04)	6.12 (4.59-8.11)	6.86 (4.99-9.42)	7.73 (5.28-10.8)	8.99 (5.90-12.9)	10.1 (6.43-14.7)
24-hr	2.90 (2.34-3.55)	3.52 (2.84-4.32)	4.54 (3.64-5.58)	5.38 (4.29-6.66)	6.55 (5.05-8.45)	7.41 (5.59-9.77)	8.34 (6.11-11.4)	9.43 (6.47-13.1)	11.1 (7.28-15.8)	12.4 (7.99-18.1)
2-day	3.21 (2.60-3.90)	3.97 (3.22-4.83)	5.21 (4.21-6.37)	6.24 (5.01-7.67)	7.67 (5.95-9.86)	8.72 (6.63-11.5)	9.86 (7.29-13.5)	11.2 (7.74-15.5)	13.4 (8.83-19.0)	15.2 (9.79-22.0)
3-day	3.44 (2.80-4.17)	4.28 (3.48-5.19)	5.65 (4.58-6.87)	6.78 (5.46-8.29)	8.34 (6.50-10.7)	9.50 (7.25-12.4)	10.8 (7.98-14.7)	12.3 (8.47-16.8)	14.6 (9.68-20.7)	16.7 (10.7-24.0)
4-day	3.67 (3.00-4.44)	4.56 (3.72-5.51)	6.00 (4.88-7.28)	7.20 (5.81-8.78)	8.85 (6.91-11.3)	10.1 (7.70-13.1)	11.4 (8.46-15.5)	13.0 (8.99-17.8)	15.5 (10.2-21.8)	17.6 (11.3-25.2)
7-day	4.37 (3.58-5.25)	5.33 (4.37-6.41)	6.90 (5.64-8.32)	8.20 (6.66-9.95)	10.00 (7.83-12.7)	11.3 (8.68-14.7)	12.8 (9.48-17.1)	14.5 (10.0-19.6)	17.0 (11.3-23.8)	19.1 (12.4-27.3)
10-day	5.05 (4.16-6.04)	6.06 (4.99-7.26)	7.71 (6.32-9.27)	9.09 (7.40-11.0)	11.0 (8.61-13.8)	12.4 (9.50-15.9)	13.9 (10.3-18.5)	15.6 (10.9-21.1)	18.1 (12.1-25.3)	20.2 (13.1-28.8)
20-day	7.12 (5.91-8.47)	8.26 (6.84-9.82)	10.1 (8.34-12.1)	11.6 (9.54-14.0)	13.8 (10.8-17.1)	15.4 (11.8-19.5)	17.0 (12.6-22.3)	18.8 (13.2-25.2)	21.2 (14.2-29.4)	23.2 (15.1-32.7)
30-day	8.85 (7.37-10.5)	10.1 (8.37-11.9)	12.1 (9.99-14.3)	13.7 (11.3-16.4)	16.0 (12.6-19.8)	17.8 (13.7-22.3)	19.5 (14.4-25.3)	21.3 (15.0-28.5)	23.7 (15.9-32.7)	25.5 (16.6-36.0)
45-day	11.0 (9.18-13.0)	12.3 (10.3-14.5)	14.5 (12.0-17.1)	16.3 (13.4-19.4)	18.7 (14.8-23.0)	20.7 (15.9-25.8)	22.6 (16.7-29.0)	24.4 (17.2-32.4)	26.8 (18.0-36.8)	28.5 (18.6-39.9)
60-day	12.8 (10.7-15.0)	14.2 (11.9-16.7)	16.5 (13.7-19.5)	18.4 (15.2-21.8)	21.0 (16.7-25.7)	23.1 (17.8-28.7)	25.0 (18.5-32.0)	26.9 (19.0-35.7)	29.3 (19.8-40.1)	31.0 (20.3-43.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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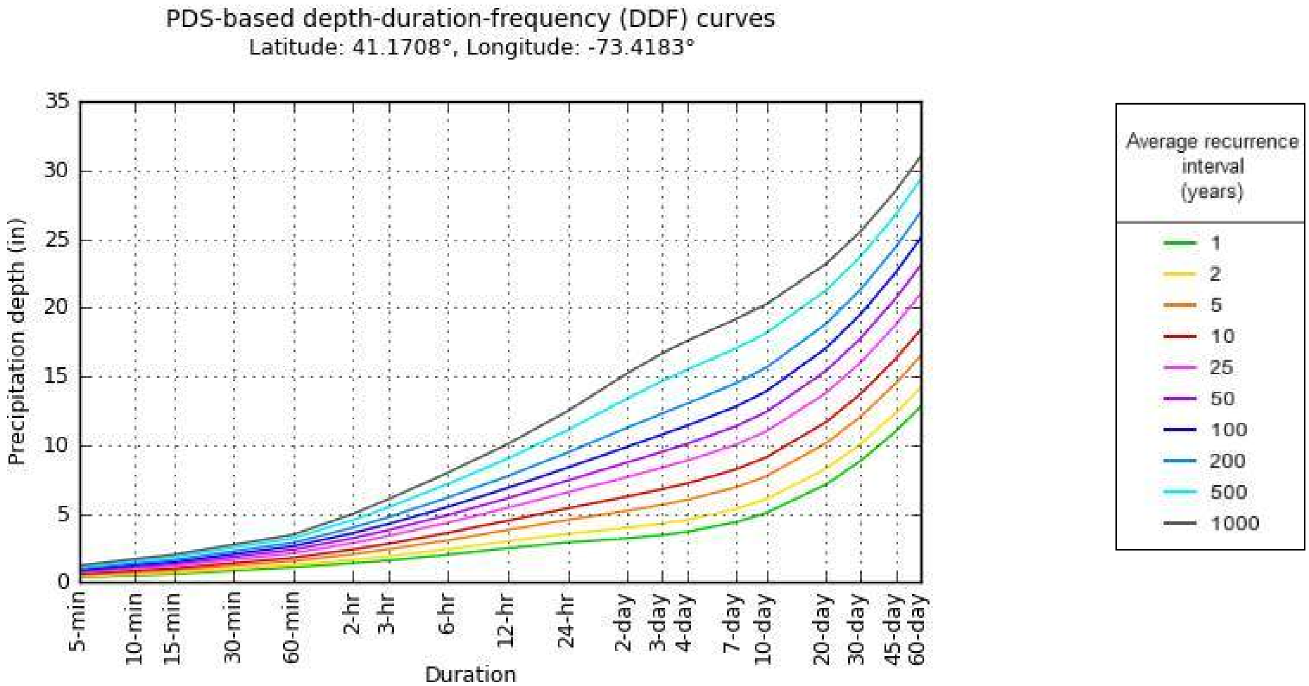
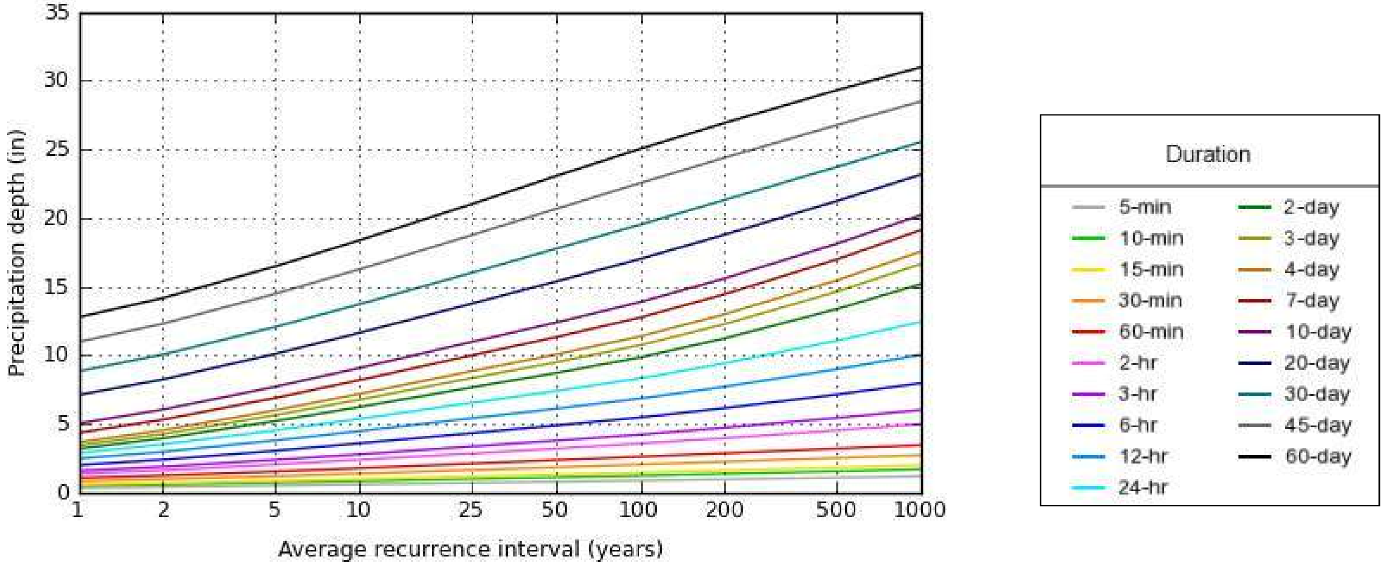
PF graphical





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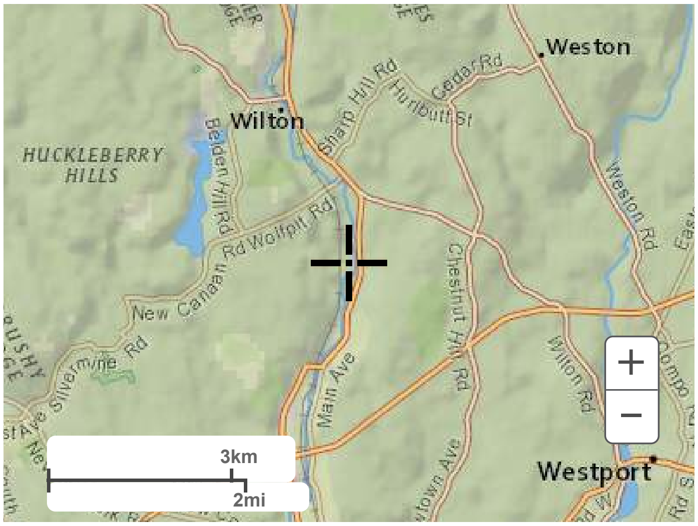
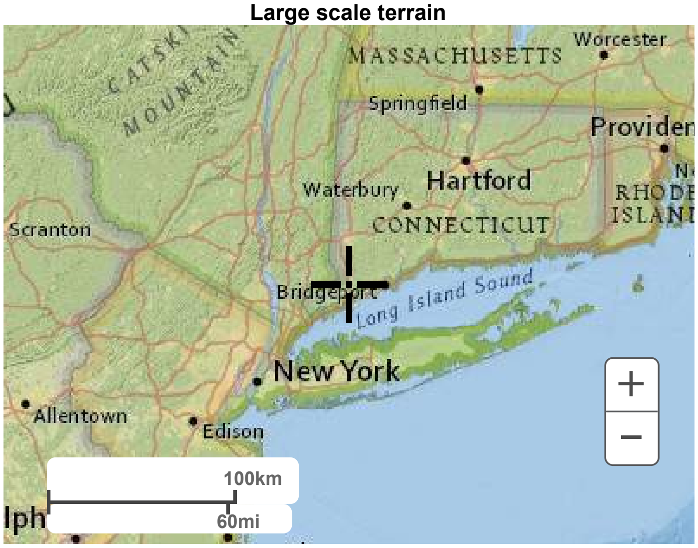
Maps & aerials

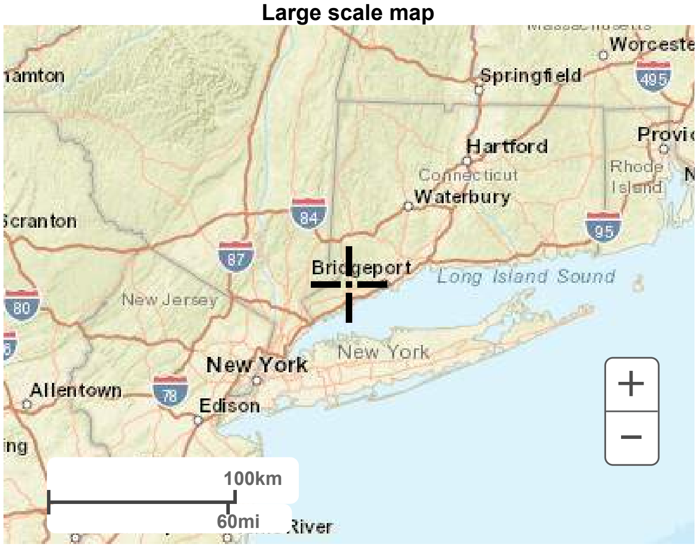
Small scale terrain



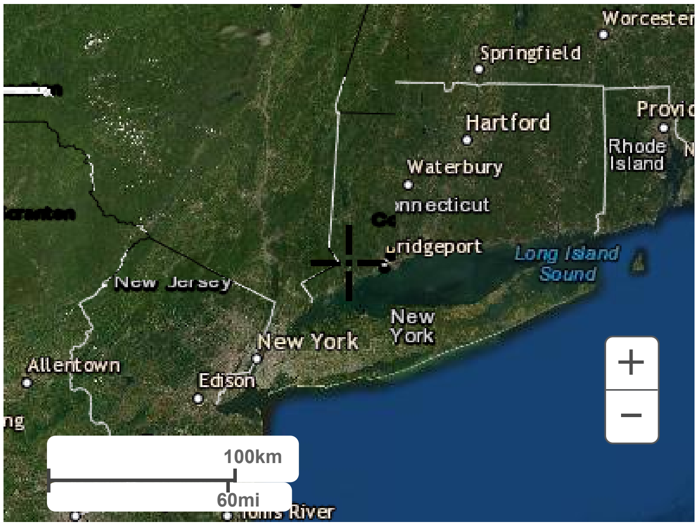
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX C

ASML Campus Traffic Flow Safety
Wilton, CT
CN Tc Worksheet

Tighe&Bond

Name: **EX-WS-01**
Location: North of parking garage

Runoff Coefficient:

Cover Type	Area (ac)	CN	A x CN
Building	0.000	98.00	0.000
Gravel	0.000	85.00	0.000
Pervious HSG B, Good Condition	0.148	61.00	9.010
Pavement	0.000	98.00	0.000
Rock	0.000	98.00	0.000
Sidewalk	0.000	98.00	0.000
Woods, HSG B, Good Condition	0.451	55.00	24.822
Woods, HSG D, Good Condition	0.415	77.00	31.993
			65.825

Total Area: **1.015** **CN:** **64.88**

Time of Concentration:

Sheet-Flow Travel Time					
Segment ID	"n"	P_2 (in)	Flow Length (ft)	Slope (ft/ft)	Time (min)
A - B	0.4	3.4	77	0.286	5.8
B - C	0.4	3.4	90	0.067	11.8
C - D	0.4	3.4	53	0.415	3.7

Shallow Concentrated Flow Travel Time					
Segment ID	Cover	Flow Length (ft)	Slope (ft/ft)	V (ft/s)	Time (min)
	Paved	0	0.010	2.03	0.0

Total Tc = **21.4**

References:
NRCS Technical Release 55
ConnDOT Drainage Manual, Chapter 6

Name: **EX-WS-02**
Location: West facing slope located east of parking garage

Runoff Coefficient:

Cover Type	Area (ac)	CN	A x CN
Building	0.085	98.00	8.340
Gravel	0.000	85.00	0.000
Pervious HSG B, Good Condition	0.119	61.00	7.272
Pavement	0.277	98.00	27.159
Rock	0.000	98.00	0.000
Sidewalk	0.000	98.00	0.000
Woods, HSG B, Good Condition	1.055	55.00	58.047
Woods, HSG D, Good Condition	0.991	77.00	76.277
			177.095

Total Area: **2.527** **CN:** **70.07**

Time of Concentration:

Sheet-Flow Travel Time					
Segment ID	**"n"**	**P_2 (in)**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min)**
A - B	0.4	3.4	94	0.085	11.1
B - C	0.4	3.4	41	0.341	3.3

Shallow Concentrated Flow Travel Time					
Segment ID	**Cover**	**Flow Length (ft)**	**Slope (ft/ft)**	**V (ft/s)**	**Time (min)**
C - D	Unpaved	138	0.152	6.29	0.4

Total Tc = **14.8**

References:
NRCS Technical Release 55
ConnDOT Drainage Manual, Chapter 6

Name: **EX-WS-03**
Location: East facing slope

Runoff Coefficient:

Cover Type	Area (ac)	CN	A x CN
Building	0.002	98.00	0.157
Gravel	0.147	85.00	12.465
Pervious HSG B, Good Condition	0.318	61.00	19.399
Pavement	0.908	98.00	89.010
Rock	0.238	98.00	23.371
Sidewalk	0.022	98.00	2.167
Woods, HSG B, Good Condition	0.452	55.00	24.851
Woods, HSG D, Good Condition	2.320	77.00	178.624
			350.044

Total Area: **4.407** **CN:** **79.43**

Time of Concentration:

Sheet-Flow Travel Time					
Segment ID	**"n"**	**P_2 (in)**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min)**
A - B	0.4	3.4	25	0.240	2.5
B - C	0.4	3.4	34	0.471	2.5

Shallow Concentrated Flow Travel Time					
Segment ID	**Cover**	**Flow Length (ft)**	**Slope (ft/ft)**	**V (ft/s)**	**Time (min)**
C - D	Paved	50	0.400	12.86	0.1
D - E	Paved	142	0.007	1.71	1.4
E - F	Unpaved	64	0.063	4.03	0.3

Total Tc = **6.7**

References:
NRCS Technical Release 55
ConnDOT Drainage Manual, Chapter 6

Name: **PR-WS-01**
Location: North of parking garage

Runoff Coefficient:

Cover Type	Area (ac)	CN	A x CN
Building	0.000	98.00	0.000
Gravel	0.000	85.00	0.000
Pervious HSG B, Good Condition	0.122	61.00	7.451
Pavement	0.000	98.00	0.000
Rock	0.000	98.00	0.000
Sidewalk	0.000	98.00	0.000
Woods, HSG B, Good Condition	0.259	55.00	14.254
Woods, HSG D, Good Condition	0.077	77.00	5.897
			27.602

Total Area: **0.458** **CN:** **60.28**

Time of Concentration:

Sheet-Flow Travel Time					
Segment ID	**"n"**	**P_2 (in)**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min)**
A - B	0.4	3.4	8	0.500	0.8
B - C	0.4	3.4	51	0.118	6.0
C - D	0.4	3.4	53	0.415	3.7

Shallow Concentrated Flow Travel Time					
Segment ID	**Cover**	**Flow Length (ft)**	**Slope (ft/ft)**	**V (ft/s)**	**Time (min)**
	Paved	0	0.010	2.03	0.0

Total Tc = **10.5**

References:
NRCS Technical Release 55
ConnDOT Drainage Manual, Chapter 6

Name: **PR-WS-02**
Location: West facing slope located east of parking garage

Runoff Coefficient:

Cover Type	Area (ac)	CN	A x CN
Building	0.085	98.00	8.340
Gravel	0.000	85.00	0.000
Pervious HSG B, Good Condition	0.119	61.00	7.272
Pavement	0.277	98.00	27.159
Rock	0.000	98.00	0.000
Sidewalk	0.000	98.00	0.000
Woods, HSG B, Good Condition	1.055	55.00	58.047
Woods, HSG D, Good Condition	0.991	77.00	76.277
			177.095

Total Area: **2.527** **CN:** **70.07**

Time of Concentration:

Sheet-Flow Travel Time					
Segment ID	**"n"**	**P_2 (in)**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min)**
A - B	0.4	3.4	94	0.085	11.1
B - C	0.4	3.4	41	0.341	3.3

Shallow Concentrated Flow Travel Time					
Segment ID	**Cover**	**Flow Length (ft)**	**Slope (ft/ft)**	**V (ft/s)**	**Time (min)**
C - D	Unpaved	138	0.152	6.29	0.4

Total Tc = **14.8**

References:
NRCS Technical Release 55
ConnDOT Drainage Manual, Chapter 6

Fitch + Whalley
New Haven, CT
CN Tc Worksheet

Tighe&Bond

Name: **PR-WS-03A**
Location: Parking area

Runoff Coefficient:

Cover Type	Area (ac)	CN	A x CN
Building	0.002	98.00	0.157
Gravel	0.002	85.00	0.191
Pervious HSG B, Good Condition	0.142	61.00	8.661
Pavement	0.498	98.00	48.757
Rock	0.119	98.00	11.694
Sidewalk	0.020	98.00	1.989
Woods, HSG B, Good Condition	0.000	55.00	0.000
Woods, HSG D, Good Condition	0.364	77.00	28.048
			99.498

Total Area: **1.147** **CN:** **86.73**

Time of Concentration:

Sheet-Flow Travel Time					
Segment ID	**"n"**	**P_2 (in)**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min)**
A - B	0.4	3.4	36	0.278	3.2
B - C	0.015	3.4	39	1.462	0.1

Shallow Concentrated Flow Travel Time					
Segment ID	**Cover**	**Flow Length (ft)**	**Slope (ft/ft)**	**V (ft/s)**	**Time (min)**
C - D	Paved	55	0.009	1.94	0.5

Total Tc = 5.0 Minimum

References:
NRCS Technical Release 55
ConnDOT Drainage Manual, Chapter 6

Name: **PR-WS-03B**
Location: Roadway

Runoff Coefficient:

Cover Type	Area (ac)	CN	A x CN
Building	0.000	98.00	0.000
Gravel	0.067	85.00	5.708
Pervious HSG B, Good Condition	0.637	61.00	38.860
Pavement	0.694	98.00	68.024
Rock	0.356	98.00	34.867
Sidewalk	0.142	98.00	13.879
Woods, HSG B, Good Condition	0.081	55.00	4.432
Woods, HSG D, Good Condition	0.891	77.00	68.582
			234.352

Total Area: **2.867** **CN:** **81.74**

Time of Concentration:

Sheet-Flow Travel Time					
Segment ID	**"n"**	**P_2 (in)**	**Flow Length (ft)**	**Slope (ft/ft)**	**Time (min)**
A - B	0.4	3.4	59	0.305	4.6
B - C	0.4	3.4	38	0.158	4.2

Shallow Concentrated Flow Travel Time					
Segment ID	**Cover**	**Flow Length (ft)**	**Slope (ft/ft)**	**V (ft/s)**	**Time (min)**
	Paved	0	0.009	1.94	0.0

Total Tc = **8.8**

References:
NRCS Technical Release 55
ConnDOT Drainage Manual, Chapter 6

Name: **PR-WS-03C**
Location: Below Roadway

Runoff Coefficient:

Cover Type	Area (ac)	CN	A x CN
Building	0.000	98.00	0.000
Gravel	0.000	85.00	0.000
Pervious HSG B, Good Condition	0.000	61.00	0.000
Pavement	0.000	98.00	0.000
Rock	0.000	98.00	0.000
Sidewalk	0.000	98.00	0.000
Woods, HSG B, Good Condition	0.444	55.00	24.395
Woods, HSG D, Good Condition	0.506	77.00	38.986
			63.381

Total Area: **0.950** **CN:** **66.73**

Time of Concentration:

Sheet-Flow Travel Time					
Segment ID	"n"	P_2 (in)	Flow Length (ft)	Slope (ft/ft)	Time (min)
A - B	0.4	3.4	41	0.439	3.0
B - C	0.4	3.4	72	0.181	6.6

Shallow Concentrated Flow Travel Time					
Segment ID	Cover	Flow Length (ft)	Slope (ft/ft)	V (ft/s)	Time (min)
	Paved	0	0.009	1.94	0.0

Total Tc = **9.6**

References:
NRCS Technical Release 55
ConnDOT Drainage Manual, Chapter 6

Watershed Model Schematic

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	0.506	-------	0.991	1.445	2.142	2.683	3.288	EX-WS-01
2	SCS Runoff	------	-------	2.088	-------	3.649	5.050	7.123	8.719	10.48	EX-WS-02
3	SCS Runoff	------	-------	7.474	-------	11.45	14.84	19.66	23.23	27.10	EX-WS-03

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.506	2	740	2,842	------	------	------	EX-WS-01
2	SCS Runoff	2.088	2	732	9,176	------	------	------	EX-WS-02
3	SCS Runoff	7.474	2	726	25,749	------	------	------	EX-WS-03

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.991	2	738	5,059	------	------	------	EX-WS-01
2	SCS Runoff	3.649	2	732	15,288	------	------	------	EX-WS-02
3	SCS Runoff	11.45	2	726	39,100	------	------	------	EX-WS-03

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.445	2	738	7,138	------	------	------	EX-WS-01
2	SCS Runoff	5.050	2	732	20,846	------	------	------	EX-WS-02
3	SCS Runoff	14.84	2	726	50,704	------	------	------	EX-WS-03

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.142	2	736	10,310	------	------	------	EX-WS-01
2	SCS Runoff	7.123	2	730	29,137	------	------	------	EX-WS-02
3	SCS Runoff	19.66	2	726	67,462	------	------	------	EX-WS-03

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

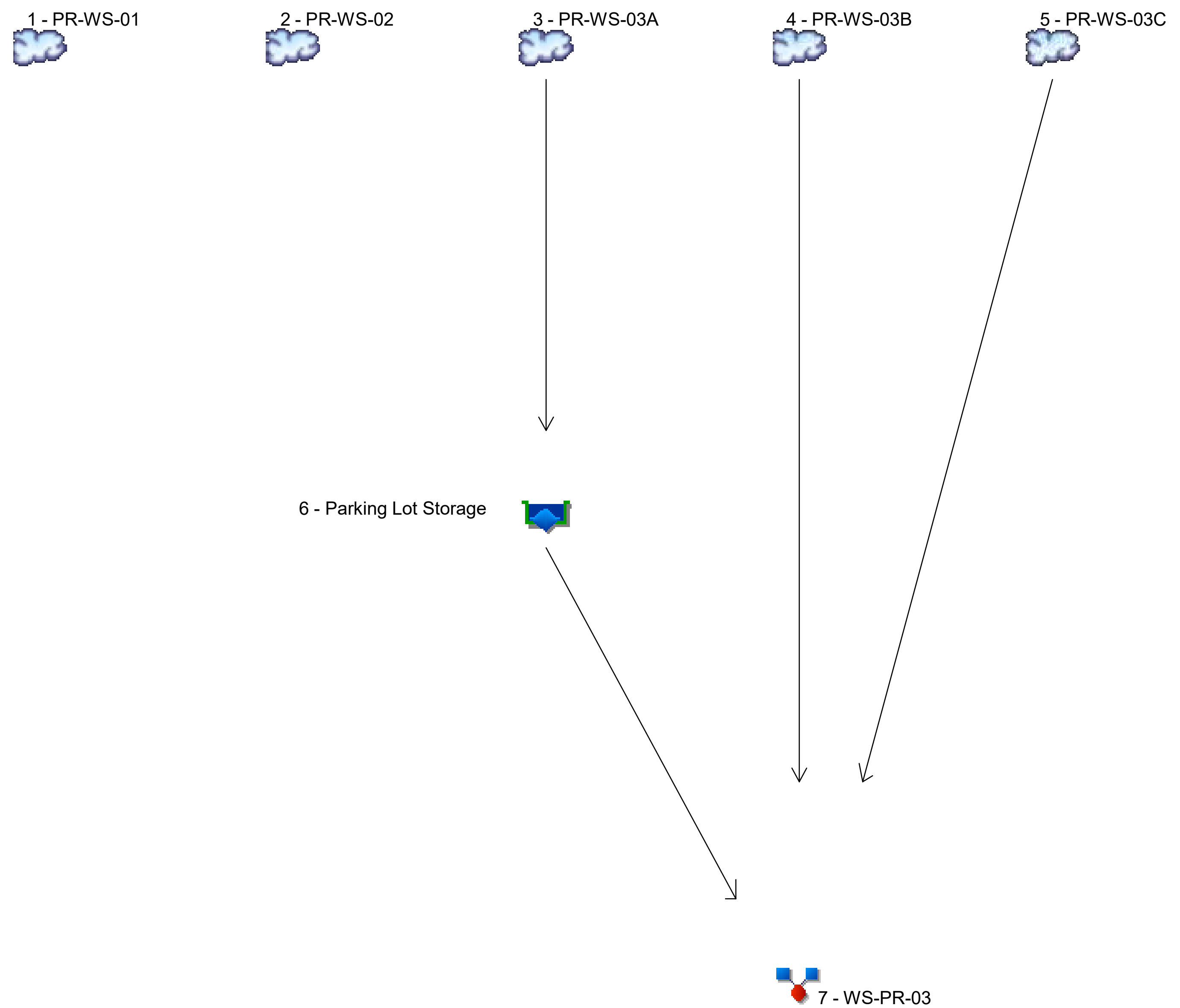
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.683	2	736	12,797	------	------	------	EX-WS-01
2	SCS Runoff	8.719	2	730	35,530	------	------	------	EX-WS-02
3	SCS Runoff	23.23	2	726	80,087	------	------	------	EX-WS-03

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.288	2	736	15,598	------	------	------	EX-WS-01
2	SCS Runoff	10.48	2	730	42,658	------	------	------	EX-WS-02
3	SCS Runoff	27.10	2	726	93,951	------	------	------	EX-WS-03

Watershed Model Schematic



Project: A0969-015 2022_04-04 Proposed Conditions.gpw	Saturday, 05 / 21 / 2022

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	0.175	-------	0.410	0.640	0.997	1.278	1.596	PR-WS-01
2	SCS Runoff	------	-------	2.074	-------	3.631	5.030	7.100	8.695	10.46	PR-WS-02
3	SCS Runoff	------	-------	2.828	-------	3.997	4.963	6.306	7.288	8.346	PR-WS-03A
4	SCS Runoff	------	-------	5.402	-------	8.058	10.30	13.46	15.79	18.31	PR-WS-03B
5	SCS Runoff	------	-------	1.208	-------	2.190	3.080	4.402	5.432	6.586	PR-WS-03C
6	Reservoir	3	-------	0.000	-------	0.000	0.000	0.000	0.000	0.000	Parking Lot Storage
7	Combine	4, 5, 6	-------	6.046	-------	9.167	11.83	15.66	18.55	21.68	WS-PR-03

Hydrograph Summary Report

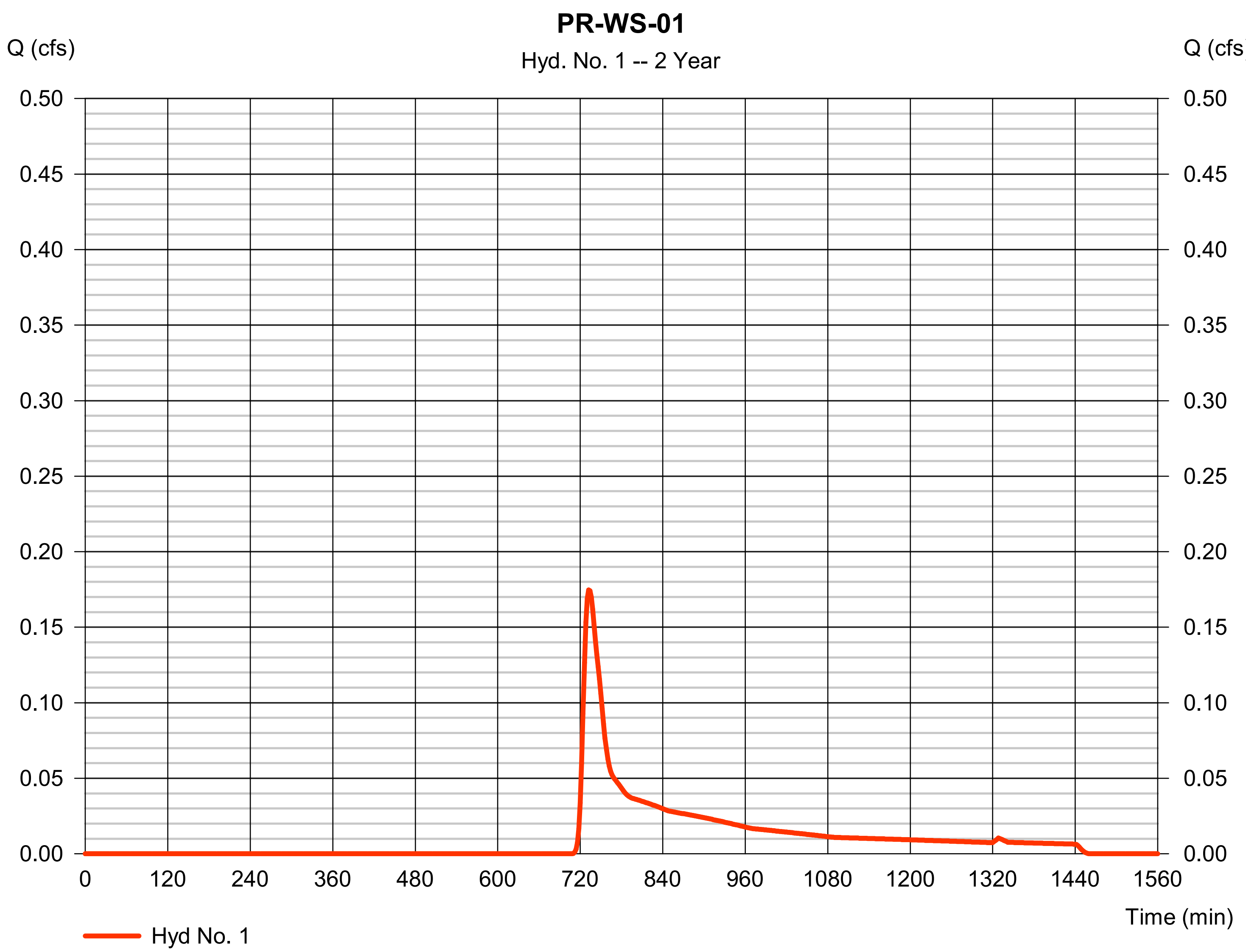
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.175	2	732	947	------	------	------	PR-WS-01
2	SCS Runoff	2.074	2	732	9,127	------	------	------	PR-WS-02
3	SCS Runoff	2.828	2	724	8,489	------	------	------	PR-WS-03A
4	SCS Runoff	5.402	2	726	18,490	------	------	------	PR-WS-03B
5	SCS Runoff	1.208	2	720	2,918	------	------	------	PR-WS-03C
6	Reservoir	0.000	2	660	0	3	131.89	2,772	Parking Lot Storage
7	Combine	6.046	2	726	21,408	4, 5, 6	------	------	WS-PR-03

Hydrograph Report

Hyd. No. 1

PR-WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 0.175 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 947 cuft
Drainage area	= 0.458 ac	Curve number	= 60.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

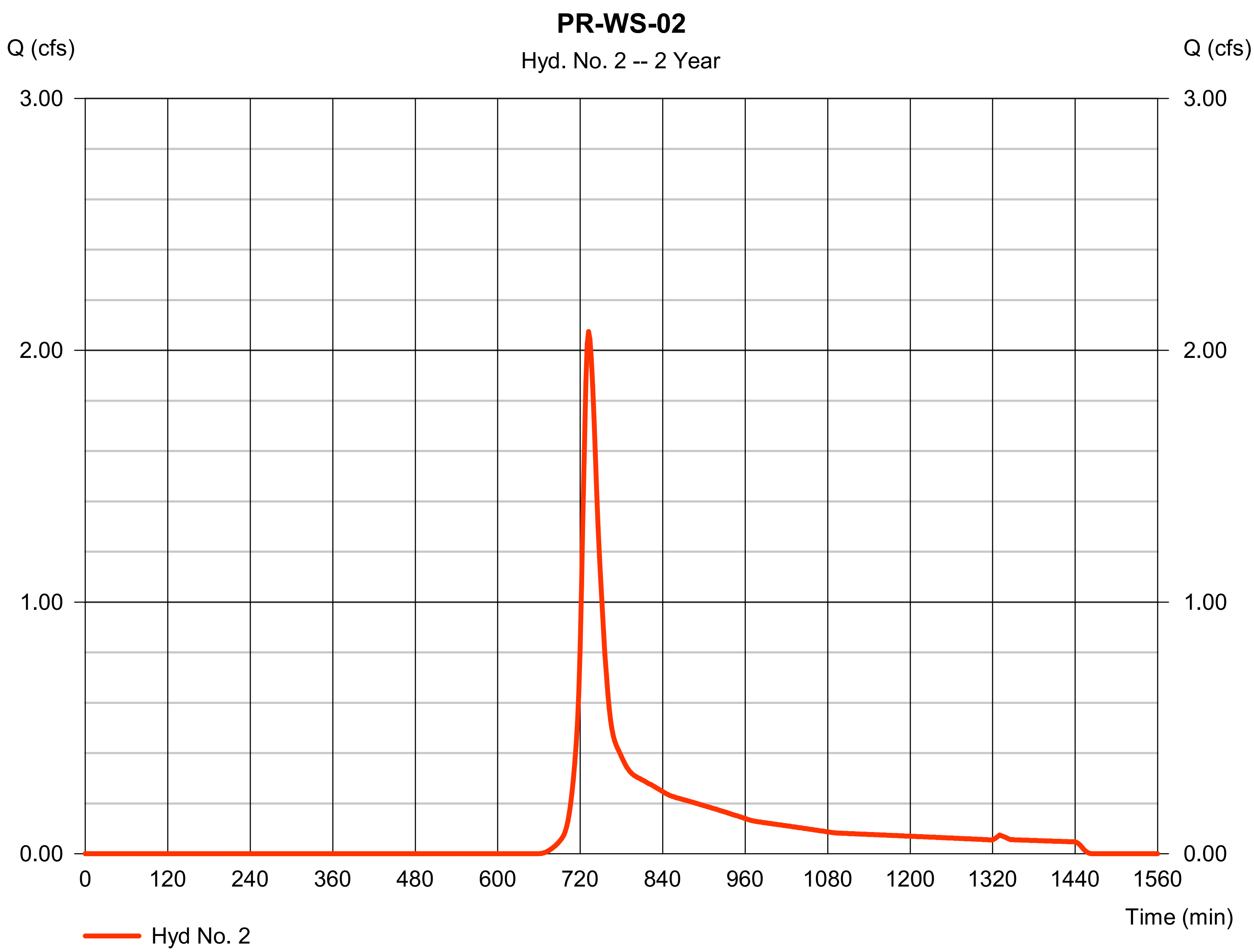


Hydrograph Report

Hyd. No. 2

PR-WS-02

Hydrograph type	= SCS Runoff	Peak discharge	= 2.074 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 9,127 cuft
Drainage area	= 2.527 ac	Curve number	= 70
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.80 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

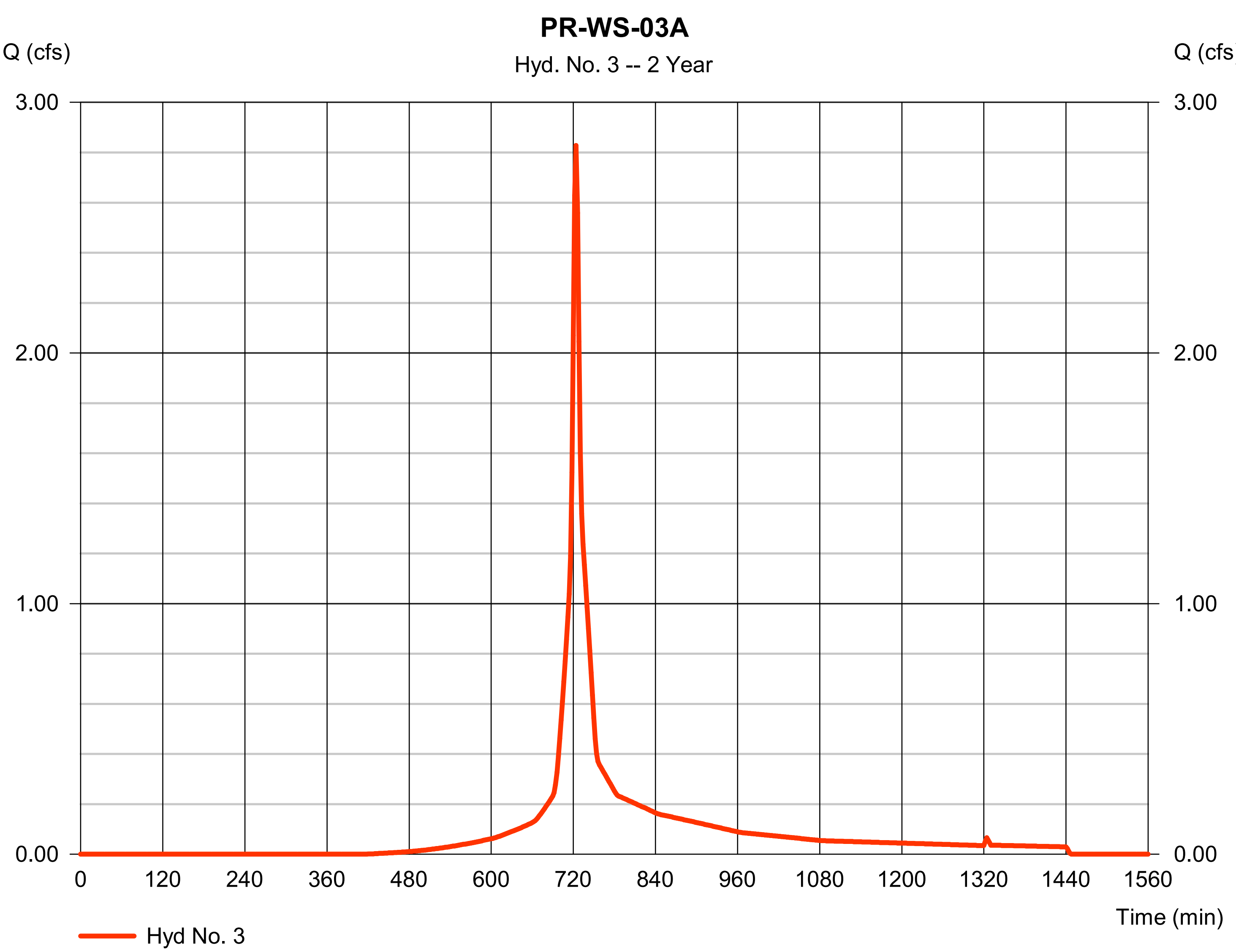


Hydrograph Report

Hyd. No. 3

PR-WS-03A

Hydrograph type	= SCS Runoff	Peak discharge	= 2.828 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 8,489 cuft
Drainage area	= 1.147 ac	Curve number	= 86.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

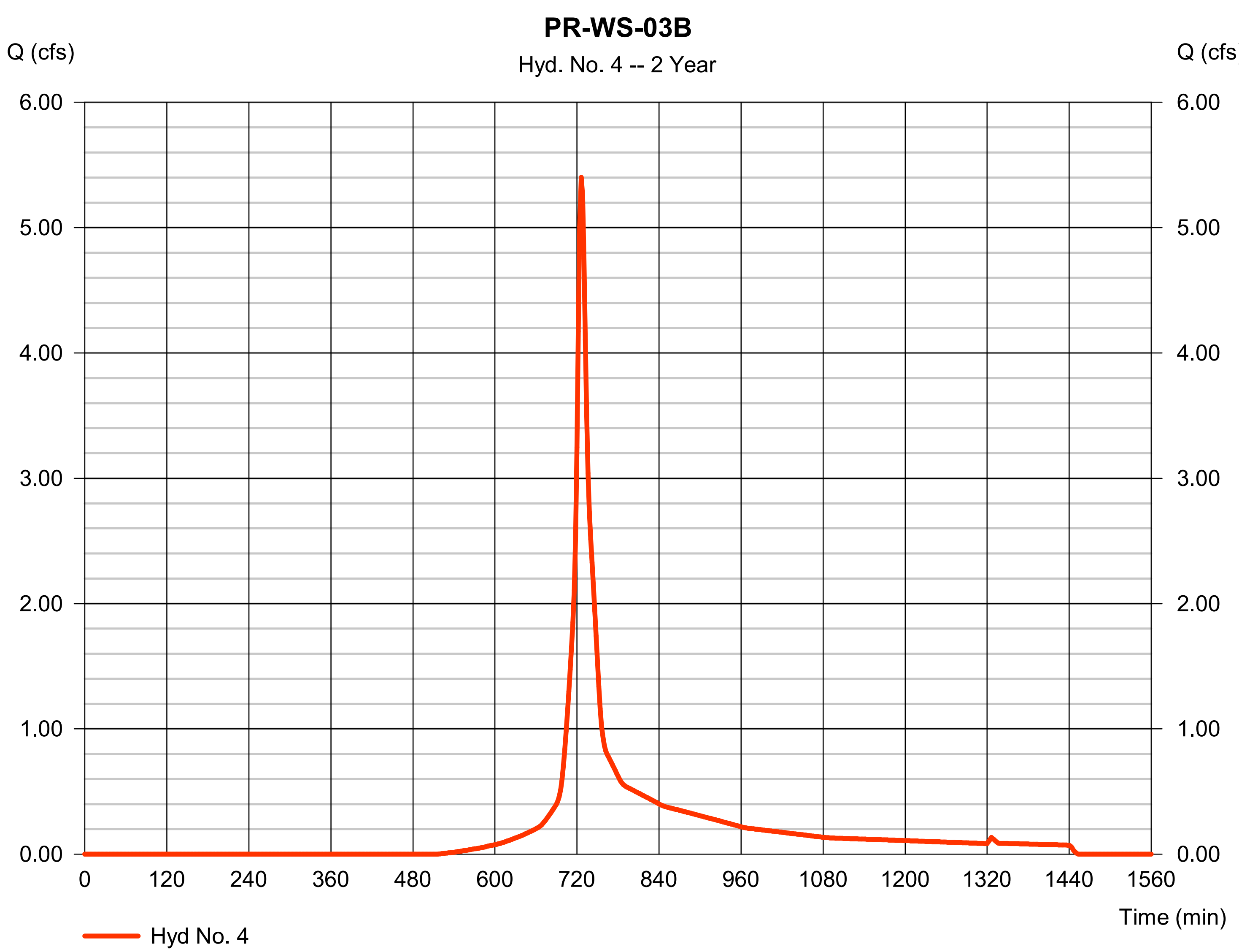


Hydrograph Report

Hyd. No. 4

PR-WS-03B

Hydrograph type	= SCS Runoff	Peak discharge	= 5.402 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 18,490 cuft
Drainage area	= 2.867 ac	Curve number	= 81.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 8.80 min
Total precip.	= 3.52 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

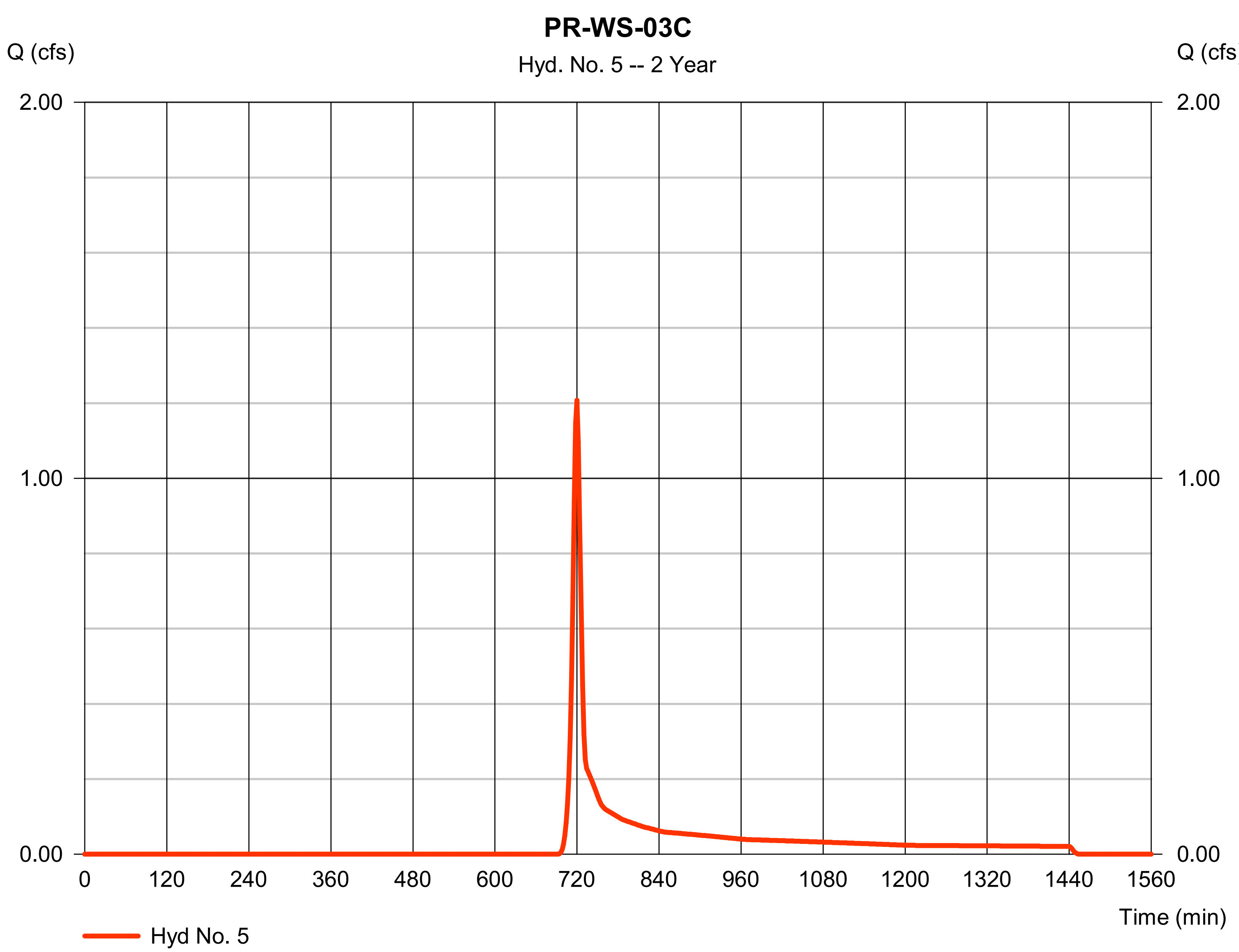


Hydrograph Report

Hyd. No. 5

PR-WS-03C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.208 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 2,918 cuft
Drainage area	= 0.950 ac	Curve number	= 66.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 9.60 min
Total precip.	= 3.52 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

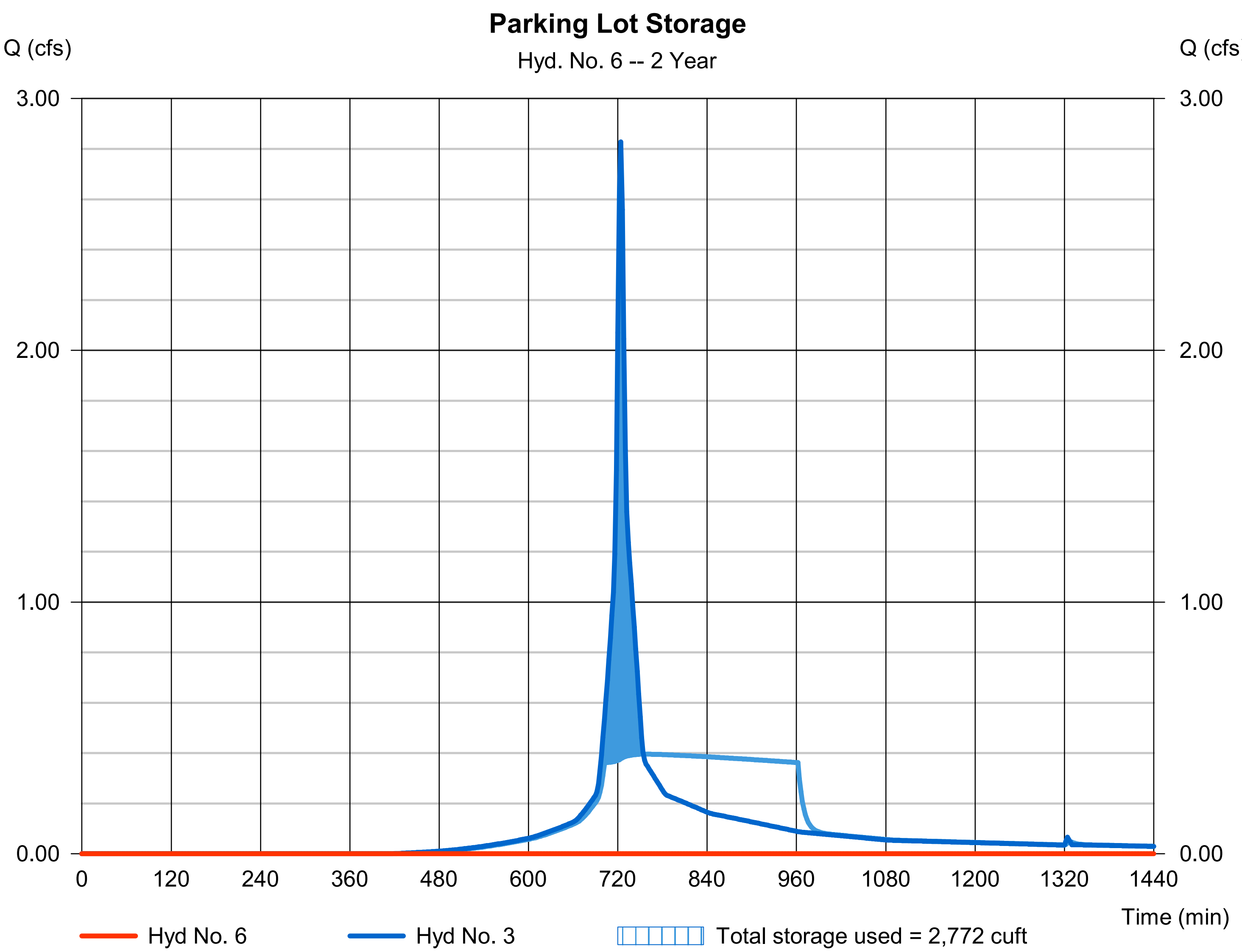
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Saturday, 05 / 21 / 2022

Hyd. No. 6

Parking Lot Storage

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 660 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 3 - PR-WS-03A	Max. Elevation	= 131.89 ft
Reservoir name	= Parking Lot Detention	Max. Storage	= 2,772 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Pond No. 1 - Parking Lot Detention

Pond Data

UG Chambers -Invert elev. = 132.00 ft, Rise x Span = 4.00 x 4.00 ft, Barrel Len = 72.00 ft, No. Barrels = 6, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 131.00 ft, Width = 18.00 ft, Height = 5.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	131.00	n/a	0	0
0.50	131.50	n/a	1,556	1,556
1.00	132.00	n/a	1,556	3,111
1.50	132.50	n/a	2,074	5,185
2.00	133.00	n/a	2,074	7,259
2.50	133.50	n/a	2,074	9,333
3.00	134.00	n/a	2,074	11,407
3.50	134.50	n/a	2,074	13,481
4.00	135.00	n/a	2,074	15,555
4.50	135.50	n/a	2,074	17,629
5.00	136.00	n/a	2,074	19,703

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 135.00	0.00	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 2.000 (by Wet area)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	131.00	0.00	---	---	---	---	---	---	---	0.000	---	0.000
0.05	156	131.05	0.00	---	---	---	---	---	---	---	0.362	---	0.362
0.10	311	131.10	0.00	---	---	---	---	---	---	---	0.364	---	0.364
0.15	467	131.15	0.00	---	---	---	---	---	---	---	0.366	---	0.366
0.20	622	131.20	0.00	---	---	---	---	---	---	---	0.368	---	0.368
0.25	778	131.25	0.00	---	---	---	---	---	---	---	0.370	---	0.370
0.30	933	131.30	0.00	---	---	---	---	---	---	---	0.372	---	0.372
0.35	1,089	131.35	0.00	---	---	---	---	---	---	---	0.374	---	0.374
0.40	1,244	131.40	0.00	---	---	---	---	---	---	---	0.376	---	0.376
0.45	1,400	131.45	0.00	---	---	---	---	---	---	---	0.378	---	0.378
0.50	1,556	131.50	0.00	---	---	---	---	---	---	---	0.380	---	0.380
0.55	1,711	131.55	0.00	---	---	---	---	---	---	---	0.382	---	0.382
0.60	1,867	131.60	0.00	---	---	---	---	---	---	---	0.384	---	0.384
0.65	2,022	131.65	0.00	---	---	---	---	---	---	---	0.386	---	0.386
0.70	2,178	131.70	0.00	---	---	---	---	---	---	---	0.388	---	0.388
0.75	2,333	131.75	0.00	---	---	---	---	---	---	---	0.390	---	0.390
0.80	2,489	131.80	0.00	---	---	---	---	---	---	---	0.392	---	0.392
0.85	2,644	131.85	0.00	---	---	---	---	---	---	---	0.394	---	0.394
0.90	2,800	131.90	0.00	---	---	---	---	---	---	---	0.396	---	0.396
0.95	2,955	131.95	0.00	---	---	---	---	---	---	---	0.398	---	0.398
1.00	3,111	132.00	0.00	---	---	---	---	---	---	---	0.400	---	0.400
1.05	3,318	132.05	0.00	---	---	---	---	---	---	---	0.402	---	0.402
1.10	3,526	132.10	0.00	---	---	---	---	---	---	---	0.404	---	0.404
1.15	3,733	132.15	0.00	---	---	---	---	---	---	---	0.406	---	0.406
1.20	3,941	132.20	0.00	---	---	---	---	---	---	---	0.408	---	0.408
1.25	4,148	132.25	0.00	---	---	---	---	---	---	---	0.410	---	0.410
1.30	4,355	132.30	0.00	---	---	---	---	---	---	---	0.412	---	0.412
1.35	4,563	132.35	0.00	---	---	---	---	---	---	---	0.414	---	0.414
1.40	4,770	132.40	0.00	---	---	---	---	---	---	---	0.416	---	0.416
1.45	4,978	132.45	0.00	---	---	---	---	---	---	---	0.418	---	0.418
1.50	5,185	132.50	0.00	---	---	---	---	---	---	---	0.420	---	0.420
1.55	5,392	132.55	0.00	---	---	---	---	---	---	---	0.422	---	0.422

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Parking Lot Detention

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.60	5,600	132.60	0.00	---	---	---	---	---	---	---	0.424	---	0.424
1.65	5,807	132.65	0.00	---	---	---	---	---	---	---	0.426	---	0.426
1.70	6,015	132.70	0.00	---	---	---	---	---	---	---	0.428	---	0.428
1.75	6,222	132.75	0.00	---	---	---	---	---	---	---	0.430	---	0.430
1.80	6,429	132.80	0.00	---	---	---	---	---	---	---	0.432	---	0.432
1.85	6,637	132.85	0.00	---	---	---	---	---	---	---	0.434	---	0.434
1.90	6,844	132.90	0.00	---	---	---	---	---	---	---	0.436	---	0.436
1.95	7,052	132.95	0.00	---	---	---	---	---	---	---	0.438	---	0.438
2.00	7,259	133.00	0.00	---	---	---	---	---	---	---	0.440	---	0.440
2.05	7,466	133.05	0.00	---	---	---	---	---	---	---	0.442	---	0.442
2.10	7,674	133.10	0.00	---	---	---	---	---	---	---	0.444	---	0.444
2.15	7,881	133.15	0.00	---	---	---	---	---	---	---	0.446	---	0.446
2.20	8,089	133.20	0.00	---	---	---	---	---	---	---	0.448	---	0.448
2.25	8,296	133.25	0.00	---	---	---	---	---	---	---	0.450	---	0.450
2.30	8,503	133.30	0.00	---	---	---	---	---	---	---	0.452	---	0.452
2.35	8,711	133.35	0.00	---	---	---	---	---	---	---	0.454	---	0.454
2.40	8,918	133.40	0.00	---	---	---	---	---	---	---	0.456	---	0.456
2.45	9,126	133.45	0.00	---	---	---	---	---	---	---	0.458	---	0.458
2.50	9,333	133.50	0.00	---	---	---	---	---	---	---	0.460	---	0.460
2.55	9,540	133.55	0.00	---	---	---	---	---	---	---	0.462	---	0.462
2.60	9,748	133.60	0.00	---	---	---	---	---	---	---	0.464	---	0.464
2.65	9,955	133.65	0.00	---	---	---	---	---	---	---	0.466	---	0.466
2.70	10,163	133.70	0.00	---	---	---	---	---	---	---	0.468	---	0.468
2.75	10,370	133.75	0.00	---	---	---	---	---	---	---	0.470	---	0.470
2.80	10,577	133.80	0.00	---	---	---	---	---	---	---	0.472	---	0.472
2.85	10,785	133.85	0.00	---	---	---	---	---	---	---	0.474	---	0.474
2.90	10,992	133.90	0.00	---	---	---	---	---	---	---	0.476	---	0.476
2.95	11,200	133.95	0.00	---	---	---	---	---	---	---	0.478	---	0.478
3.00	11,407	134.00	0.00	---	---	---	---	---	---	---	0.480	---	0.480
3.05	11,614	134.05	0.00	---	---	---	---	---	---	---	0.482	---	0.482
3.10	11,822	134.10	0.00	---	---	---	---	---	---	---	0.484	---	0.484
3.15	12,029	134.15	0.00	---	---	---	---	---	---	---	0.486	---	0.486
3.20	12,237	134.20	0.00	---	---	---	---	---	---	---	0.488	---	0.488
3.25	12,444	134.25	0.00	---	---	---	---	---	---	---	0.490	---	0.490
3.30	12,651	134.30	0.00	---	---	---	---	---	---	---	0.492	---	0.492
3.35	12,859	134.35	0.00	---	---	---	---	---	---	---	0.494	---	0.494
3.40	13,066	134.40	0.00	---	---	---	---	---	---	---	0.496	---	0.496
3.45	13,274	134.45	0.00	---	---	---	---	---	---	---	0.498	---	0.498
3.50	13,481	134.50	0.00	---	---	---	---	---	---	---	0.500	---	0.500
3.55	13,688	134.55	0.00	---	---	---	---	---	---	---	0.502	---	0.502
3.60	13,896	134.60	0.00	---	---	---	---	---	---	---	0.504	---	0.504
3.65	14,103	134.65	0.00	---	---	---	---	---	---	---	0.506	---	0.506
3.70	14,311	134.70	0.00	---	---	---	---	---	---	---	0.508	---	0.508
3.75	14,518	134.75	0.00	---	---	---	---	---	---	---	0.510	---	0.510
3.80	14,726	134.80	0.00	---	---	---	---	---	---	---	0.512	---	0.512
3.85	14,933	134.85	0.00	---	---	---	---	---	---	---	0.514	---	0.514
3.90	15,140	134.90	0.00	---	---	---	---	---	---	---	0.516	---	0.516
3.95	15,348	134.95	0.00	---	---	---	---	---	---	---	0.518	---	0.518
4.00	15,555	135.00	0.00	---	---	---	---	---	---	---	0.520	---	0.520
4.05	15,763	135.05	0.01 ic	---	---	---	---	---	---	---	0.522	---	0.533
4.10	15,970	135.10	0.04 ic	---	---	---	---	---	---	---	0.524	---	0.568
4.15	16,177	135.15	0.10 ic	---	---	---	---	---	---	---	0.526	---	0.624
4.20	16,385	135.20	0.17 ic	---	---	---	---	---	---	---	0.528	---	0.699
4.25	16,592	135.25	0.26 ic	---	---	---	---	---	---	---	0.530	---	0.792
4.30	16,800	135.30	0.37 ic	---	---	---	---	---	---	---	0.532	---	0.903
4.35	17,007	135.35	0.49 ic	---	---	---	---	---	---	---	0.534	---	1.029
4.40	17,214	135.40	0.63 ic	---	---	---	---	---	---	---	0.536	---	1.168
4.45	17,422	135.45	0.78 ic	---	---	---	---	---	---	---	0.538	---	1.322
4.50	17,629	135.50	0.95 ic	---	---	---	---	---	---	---	0.540	---	1.487
4.55	17,837	135.55	1.12 ic	---	---	---	---	---	---	---	0.542	---	1.660
4.60	18,044	135.60	1.30 ic	---	---	---	---	---	---	---	0.544	---	1.843
4.65	18,251	135.65	1.48 ic	---	---	---	---	---	---	---	0.546	---	2.029
4.70	18,459	135.70	1.67 oc	---	---	---	---	---	---	---	0.548	---	2.220
4.75	18,666	135.75	1.81 oc	---	---	---	---	---	---	---	0.550	---	2.364
4.80	18,874	135.80	1.94 oc	---	---	---	---	---	---	---	0.552	---	2.491
4.85	19,081	135.85	2.05 oc	---	---	---	---	---	---	---	0.554	---	2.600
4.90	19,288	135.90	2.13 oc	---	---	---	---	---	---	---	0.556	---	2.682
4.95	19,496	135.95	2.16 oc	---	---	---	---	---	---	---	0.558	---	2.722
5.00	19,703	136.00	2.08 oc	---	---	---	---	---	---	---	0.560	---	2.638

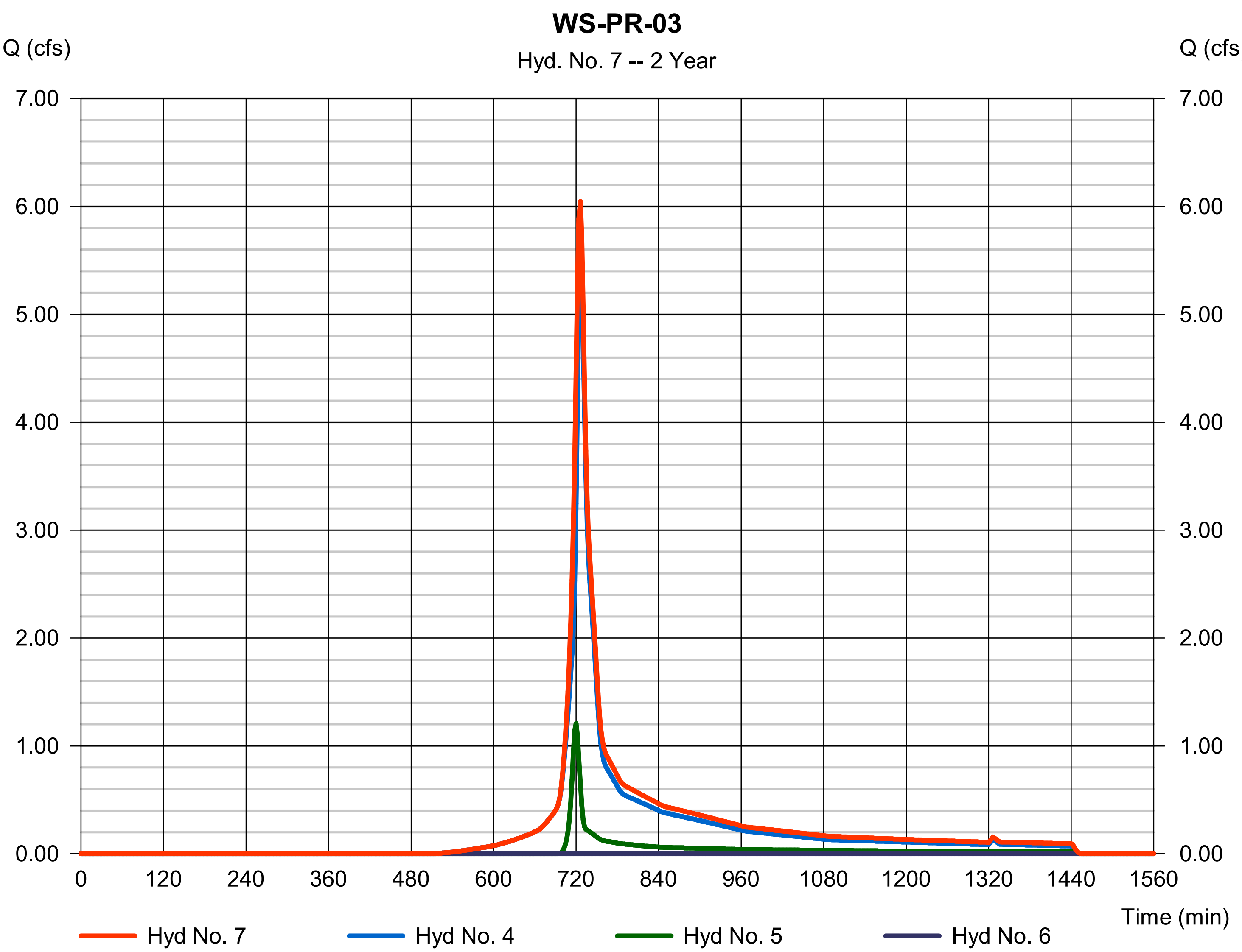
...End

Hydrograph Report

Hyd. No. 7

WS-PR-03

Hydrograph type	= Combine	Peak discharge	= 6.046 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 21,408 cuft
Inflow hyds.	= 4, 5, 6	Contrib. drain. area	= 3.817 ac



Hydrograph Summary Report

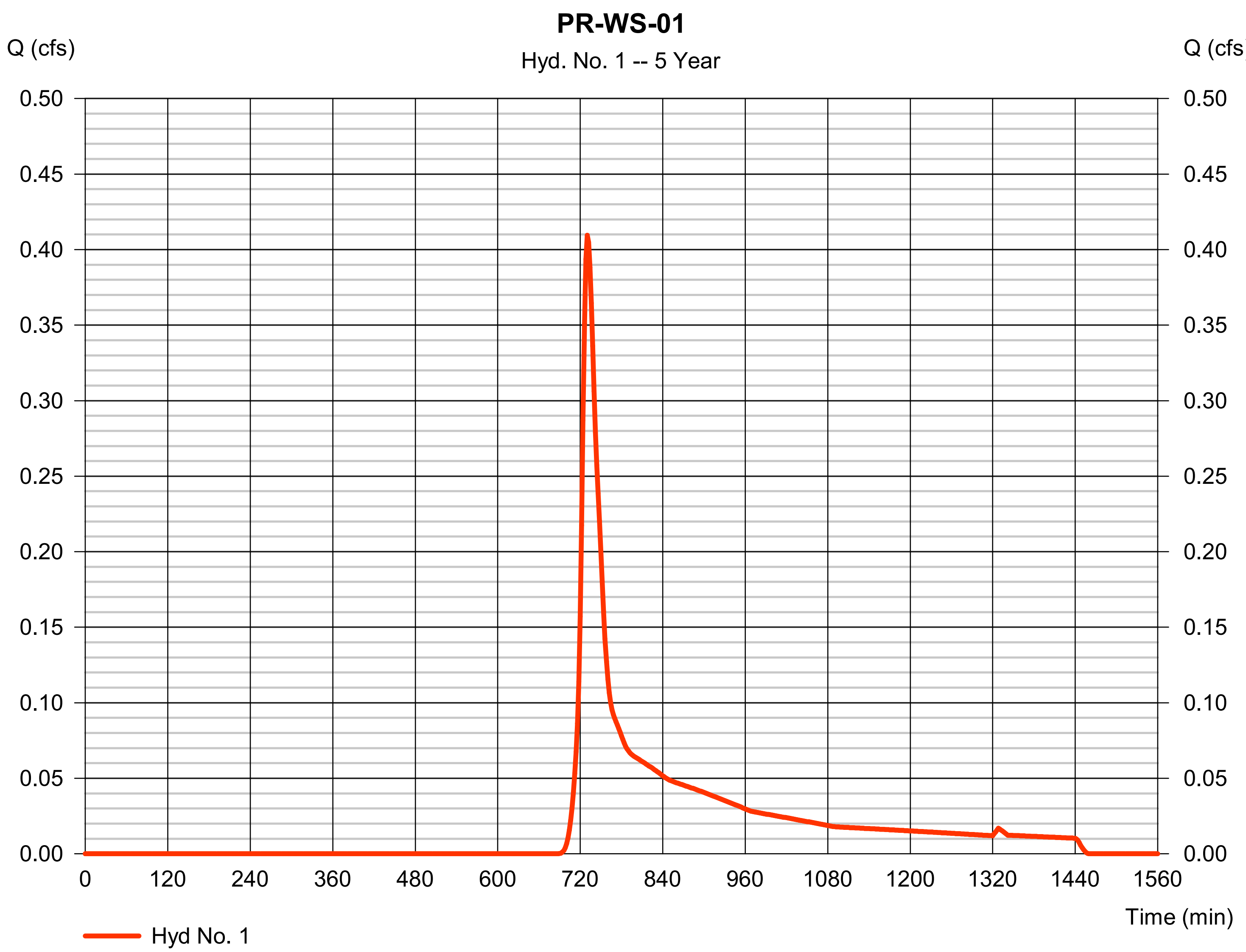
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.410	2	730	1,816	------	------	------	PR-WS-01
2	SCS Runoff	3.631	2	732	15,223	------	------	------	PR-WS-02
3	SCS Runoff	3.997	2	724	12,129	------	------	------	PR-WS-03A
4	SCS Runoff	8.058	2	726	27,522	------	------	------	PR-WS-03B
5	SCS Runoff	2.190	2	720	5,068	------	------	------	PR-WS-03C
6	Reservoir	0.000	2	674	0	3	132.33	4,478	Parking Lot Storage
7	Combine	9.167	2	726	32,590	4, 5, 6	------	------	WS-PR-03

Hydrograph Report

Hyd. No. 1

PR-WS-01

Hydrograph type	= SCS Runoff	Peak discharge	= 0.410 cfs
Storm frequency	= 5 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,816 cuft
Drainage area	= 0.458 ac	Curve number	= 60.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 4.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

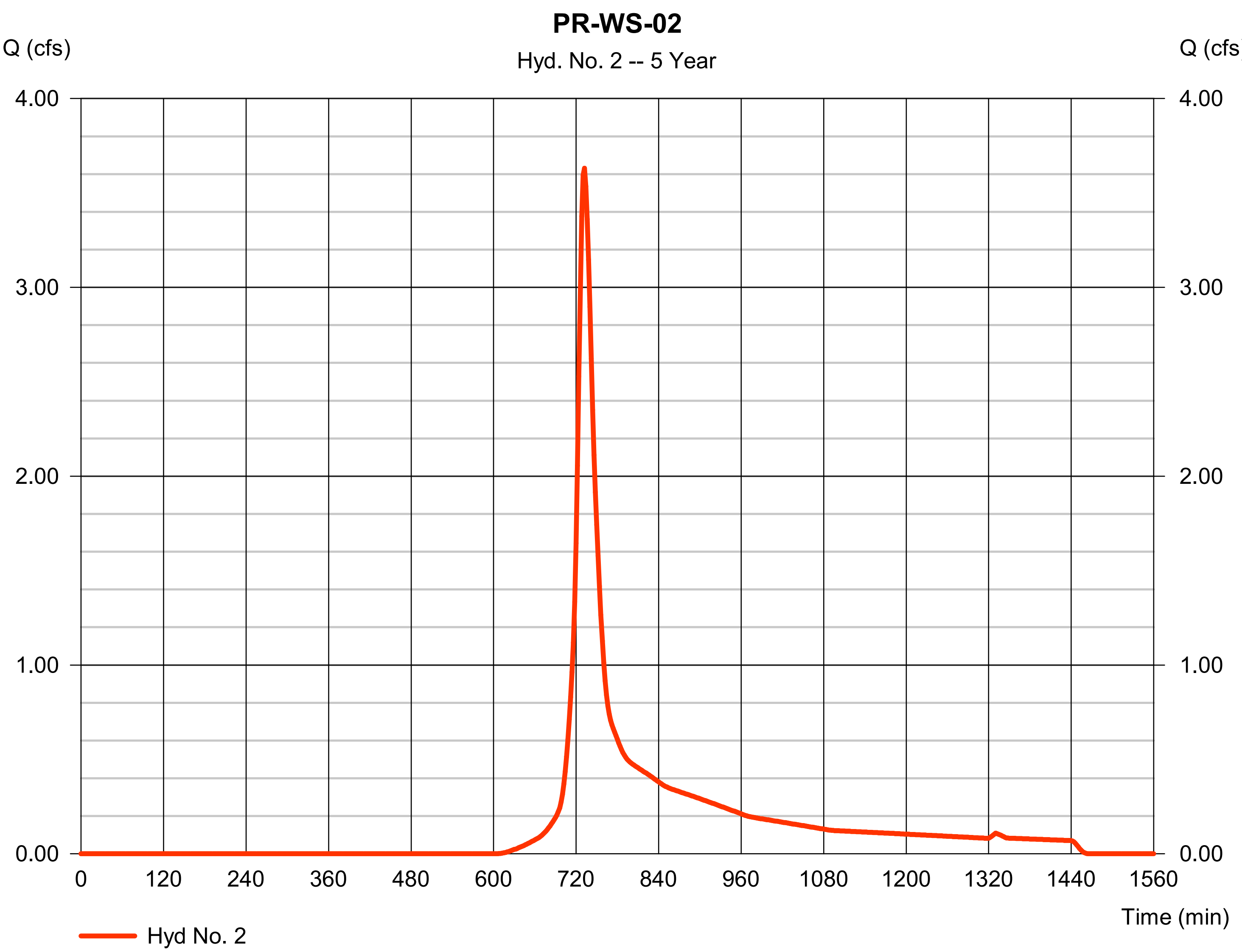


Hydrograph Report

Hyd. No. 2

PR-WS-02

Hydrograph type	= SCS Runoff	Peak discharge	= 3.631 cfs
Storm frequency	= 5 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 15,223 cuft
Drainage area	= 2.527 ac	Curve number	= 70
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.80 min
Total precip.	= 4.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hyd. No. 3

PR-WS-03A

Hydrograph type	= SCS Runoff	Peak discharge	= 3.997 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 12,129 cuft
Drainage area	= 1.147 ac	Curve number	= 86.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.54 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484