John U. Faulise, Jr., L.S.
Gerald J. Stefon, L.S. (1952-2021)
Demian A. Sorrentino, AICP, C.S.S.
David C. McKay, P.E.
Jacob S. Faulise, E.I.T.

CIVIL ENGINEERING LAND SURVEYING LAND USE PLANNING SOIL SCIENCE

Boundaries LLC
179 Pachaug River Drive
P.O. Box 184
Griswold, CT 06351
T 860.376.2006 | F 860.376.5899
www.boundariesllc.net

STORMWATER MANAGEMENT REPORT

PREPARED FOR:

GATEWAY MONTVILLE, LLC

125-133 DEPOT ROAD
UNCASVILLE, CONNECTICUT

MAY 2022

PREPARED BY:

BOUNDARIES LLC

PROJECT I.D. NO. 22-3140

Table of Contents

Table of Appendices

Table of Figures

Introduction

On behalf of Gateway Montville, LLC., Boundaries, LLC. has prepared the following stormwater management report for the proposed freight transportation and storage operation to be located at 125 and 133 Depot Road. The proposed operation includes the shipping and transfer of freight materials from barges, railways and trucks for short-term storage and distribution. Materials intended to be stored on-site includes solid de-icing materials, soil and stone aggregate, recyclable metals, wood, tarps, and rope, and lumber and metal construction materials. The following analysis demonstrates that the proposed stormwater management methods provide treatment of the water quality volume as recommended in the Connecticut Stormwater Quality Manual.

The location of the project is shown on the Locus Map included as Figure 1. The project area is located between Depot Road and Dock Road along the bank of the Thames River. The Central Vermont Railroad passes between the two subject properties.

There are no inland wetlands or watercourses located on the subject properties. The Thames River is an estuarine tidal river and has no tidal wetlands located in the vicinity of the project area per the United States Fish and Wildlife Service National Wetlands Inventory Mapper included in Appendix A.

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey the soils in the project area consist of Agawam fine sandy loam, 0 to 3% slopes; Udorthents-Urban Land Complex; and Urban Land. Agawam soils and Udorthents-Urban Land Complex are classified as Hydrologic Soil Group B and Urban Land is classified as Hydrologic Soil Group D. The NRCS Web Soil Survey Soils Report is provided in Appendix A.

Post-development conditions watersheds were delineated using the topographic survey and the proposed grading from the site operations plans. The water quality volumes and water quality flows for each watershed were calculated using the methods detailed in the CT DEEP Stormwater Quality Manual. Supporting calculations are included in Appendix B.

The project area formerly consisted of industrial buildings and a power plant located on 125 Depot Road and a coal stockpile area on 133 Depot Road. The properties are now subject to an environmental land use restriction and contain areas of impacted soils. Because the Thames River is a large, tidally influenced river, and the project area consists of less than 5% of the approximately 1,439 square mile watershed (0.0027%), the typical requirements for peak flow rate attenuation do not need to apply to this project per Section 7.6.1 and Section 7.6.3 of the CT DEEP Stormwater Quality Manual. The existing stormwater collection system discharges directly to the Thames River, therefore, the focus of this project is improvements to the existing stormwater management system that will improve the quality of the stormwater discharges from the site by capturing all stormwater runoff from the proposed operation areas and treating it prior to discharge.

Per the conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities all projects that disturb greater than 1 acre of land are required to retain the 1-inch water quality volume on-site, or in the case of redevelopment projects, one half of the water quality volume. This project is considered a redevelopment project of a site with over 40% impervious coverage and would be required to retain one half of the water quality volume on site under most circumstances. In the case of this property retention of stormwater runoff on-site is not proposed, in lieu of retention of runoff on-site, treatment systems are proposed at each outlet of the stormwater management system and will treat greater than the water quality flow generated by the first inch of runoff. On-site retention of stormwater runoff has not been included in the development of this property for the following reasons:

- The property is subject to an environmental land use restriction and is known to have impacted soils from the former industrial uses. There are also groundwater monitoring wells throughout the properties, indicating the presence of bulk petroleum storage areas in the past. Infiltration of stormwater runoff in these areas is not advisable since it could transport pollutants into site groundwater. The areas of impacted soil and groundwater monitoring wells are located throughout the site and do not leave suitable areas for infiltration of stormwater runoff.
- The former coal stockpile area will be converted to a salt stockpile area. Stormwater runoff from this land use should not be infiltrated, especially given the historical use of the area as a coal stockpile. The salt stockpile will be managed in accordance with the required best management practices listed in the CT DEEP General Permit for the Discharge of Stormwater from Industrial Activities to protect downstream surface waters.
- As discussed above, the project area is insignificant in the overall watershed of the Thames River. Per Sections 7.6.1 and 7.6.3 of the Stormwater Quality Manual, runoff reduction is not necessary in these circumstances. Therefore, treatment of runoff from the site is the focus of the proposed stormwater management system.

Pre-Development Conditions

The former industrial buildings, tanks, and silos on the property have all been demolished. 125 Depot Road consists of a mix of asphalt, concrete pads, concrete rubble and gravel areas, and the asphalt caps of areas of contaminated soils. 133 Depot Road includes the former parking lot and a grassed area in the location of the coal stockpile area. Prior to the demolition of the former buildings, the properties consisted of almost entirely impervious surfaces. After demolition the main building footprint is a mix of rubble and concrete. Remaining areas outside of the building footprint are a mix of asphalt and concrete pads. The former coal stockpile area located on 133 Depot Road is currently vegetated with grass and brush. The remaining areas are pavement for the former access driveways and parking area and concrete pads from former buildings. The current conditions of the site after the demolition and environmental cleanup are shown in the drone photo below.

Drone Photograph of Site (2021)

Conditions of the site prior to the demolition are shown in the following aerial photograph.

Aerial Photograph of Site (2016)

Post-Development Conditions

The proposed improvements include the conversion of the former coal stockpile area located on 133 Depot Road to a solid deicing material stockpile area and the construction of new railroad spurs and construction material stockpiles in the former building footprints on 125 Depot Road. Material will be delivered using the existing railroad through the property and by barge to the existing dock in the Thames River. Conveyors will be constructed throughout the site to facilitate transfer of materials from the railcars/barges to the proposed stockpile areas.

The proposed salt stockpile area will be paved to minimize infiltration of runoff from the stockpiled materials and the pile will be covered with a tarp per CT DEEP requirements. All surface runoff will be collected by the proposed swales and catch basins surrounding the property that will connect to the existing discharge locations. Hydrodynamic separators will be installed at the existing discharge points to treat the collected runoff prior to discharge from the property.

The proposed stormwater management system is intended to meet the following design standards:

- The conveyance system leading to, from, and through stormwater management facilities has capacity for the 10-year design storm, at a minimum, per the recommendations of the Connecticut Department of Transportation Drainage Manual, Chapter 6, Appendix A, for curb inlets/storm drainage systems and channels/ditches; and,
- The water quality flow generated by the first inch of stormwater runoff (full water quality volume), at a minimum, is treated by the hydrodynamic separators prior to discharge.

The post development conditions watersheds are shown on Figure 2. All watersheds on 125 Depot Road were assumed to be 100% impervious. Although the majority of the property will have a crushed stone surface per railroad requirements that will not generate as much runoff as pavement, the stormwater conveyance and treatment systems have been sized conservatively based on the assumption that all contributing areas on 125 Depot Road consist of impervious surfaces. Peak runoff rates were estimated using the Rational Method assuming the minimum Time of Concentration of five (5) minutes due to the lack of dense vegetation on the properties.

Photographs of the existing discharge locations to be maintained are below. The discharge of the south watershed is not shown due to dense vegetation obscuring the photograph. The southern discharge is located at the end of Dock Road.

Existing 24" CI Drainage Discharge from 133 Depot Road (West Watershed)

Existing 10" PVC Discharge to be Replaced Upslope (North Watershed)

Existing 4" PVC Discharge to be Replaced Upslope (CB-E Watershed)

Existing 20" PE Discharge to be Reused (Middle Watershed)

Stormwater Management System Design

Pipe Sizing

Stormwater runoff from the proposed development area will be collected and discharged to five (5) existing discharge locations. The existing stormwater collection system consists of catch basins and piping that collected runoff from the former building rooftops and paved circulation driveways. The existing drains were evaluated to verify that they have capacity for the 10-year storm event, at a minimum, based on the calculated Manning's capacity of each pipe reach in accordance with the Connecticut Department of Transportation Drainage Manual. Inadequately sized existing drains are proposed to be replaced, with pipe ends located above elevation 2.3, above the high tide line. Pipe sizing calculations are included in Appendix B.

Water Quality Volume and Water Quality Flow

The stormwater management system is intended to provide treatment of runoff from the proposed impervious areas. Treatment of runoff from the site will be accomplished using hydrodynamic separators prior to the outlet. Water Quality Flow calculations are included in Appendix B. Cut sheets for the proposed hydrodynamic separators are included in Appendix C. The treated water quality flow as reported by the Connecticut Department of Transportation was used to select the proposed treatment systems. Hydrodynamic separator characteristics are presented in Table 1.

Table 1
Water Quality Design Criteria

Discharge Location	Hydrodynamic Separator Model	Rated Water Quality Flow Per CT DOT	Design Water Quality Flow
West Watershed (HDS A)	Contech CDS 5640-10-C	5.8 CFS	3.82 CFS
South Watershed (HDS B)	Contech Cascade CS-3	1.0 CFS	0.68 CFS
CB-E Watershed	Contech Cascade CS-3	1.0 CFS	0.19 CFS
CB-F Watershed	Contech Cascade CS-3	1.0 CFS	0.25 CFS
North Watershed (HDS-1)	Contech CDS 4030-8-C	3.7 CFS	2.38 CFS
Middle Watershed (HDS-2)	Contech CDS 5640-10-C	5.8 CFS	4.38 CFS
South Watershed (HDS-3)	Contech CDS 4030-8-C	3.7 CFS	2.83 CFS

As presented above, the proposed stormwater management system improvements provide treatment in excess of the calculated water quality flow prior to discharge.

Groundwater Recharge Volume
Infiltration has not been considered as part of the stormwater management system due to the historical contamination on the property and the proposed land use being considered to have a higher potential pollutant load.

Construction Phase Stormwater Management

Construction phase stormwater management is intended to be provided in accordance with the Stormwater Pollution Control Plan (SWPCP) included in the Site Operations Plans. The following best management practices will be implemented to protect downstream water quality:

- Downgradient sediment barriers will be installed throughout the unpaved portions of the property.
- Inlet protection will be installed in all existing and proposed catch basins.
- Land disturbance will be completed in phases, separated by the railroad tracks.
  - Phase 1 includes the construction of the new haul road and deicing material stockpile area. The disturbed area will be approximately 4.9 acres. Disturbed areas outside of the paved driveways and paved material stockpile pad will be seeded, mulched and stabilized with a straw blanket.
  - Phase 2 includes the construction of new railroad spurs to the east of the railroad tracks and includes the placement of fill materials in the existing rubble/debris areas. The total

disturbed area will be approximately 11.4 acres. Phase 2 will be sequenced in three portions so that the active work area is no greater than 5 acres at any time.

- Intermediate sediment barriers will be installed during grading operations.
- The sediment trap is sized for 134 cubic yards of storage per acre of upgradient contributing area.
- Temporary seeding with perennial rye grass is intended for all stockpiles and disturbed areas that will remain unworked for greater than 21 days.

Summary

The proposed stormwater management system is intended to comply with the applicable requirements of CT DEEP.

The proposed improvements are shown on plans titled "Site Operations Plan, Gateway Montville, LLC., 125 & 133 Depot Road, Uncasville, Connecticut" prepared by Boundaries LLC.

Appendix A
Wetlands and Soils Maps

U.S. Fish and Wildlife Service
National Wetlands Inventory

Gateway Montville - Depot Road

April 5, 2022

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Map Scale: 1:2,940 if printed on A portrait (8.5" x 11") sheet.

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: Mar 20, 2019—Mar 27, 2019

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
29A	Agawam fine sandy loam, 0 to 3 percent slopes	B	8.9	34.1%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	0.0	0.1%
306	Udorthents-Urban land complex	B	0.9	3.5%
307	Urban land	D	14.9	57.4%
W	Water		1.3	4.9%
Totals for Area of Interest			**26.0**	**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
Supporting Stormwater Calculations

Hydraulic Analysis Report

Project Data

Project Title: Depot Road

Designer: DCM

Project Date: Wednesday, April 27, 2022

Project Units: U.S. Customary Units

Notes:

Rational Analysis: Swale North Subarea1

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.5200 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results
Flowrate: 3.0 cfs

Rational Analysis: Swale North Subarea3
Notes:

Rational Method Input Parameters
Runoff Coefficient: 0.95

Basin Area: 0.2300 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters
User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters
Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results
Flowrate: 1.3 cfs

Rational Analysis: Swale North Subarea2
Notes:

Rational Method Input Parameters
Runoff Coefficient: 0.95

Basin Area: 1.2200 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 7.1 cfs

Rational Analysis: Swale North Subarea4

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.6200 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 3.6 cfs

Rational Analysis: Swale Middle Subarea1

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.9100 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 5.3 cfs

Rational Analysis: Swale Middle Subarea2

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.9900 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 5.7 cfs

Rational Analysis: Swale Middle Subarea3

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 1.2900 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters
User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters
Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results
Flowrate: 7.5 cfs

Rational Analysis: Swale Middle Subarea4
Notes:

Rational Method Input Parameters
Runoff Coefficient: 0.95

Basin Area: 1.3900 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters
User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 8.1 cfs

Rational Analysis: Swale South Subarea1

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.8600 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 5.0 cfs

Rational Analysis: Swale South Subarea2

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 1.2600 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 7.3 cfs

Rational Analysis: Swale South Subarea3

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.8100 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 4.7 cfs

Rational Analysis: CB F Subarea

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.1800 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 1.0 cfs

Rational Analysis: CB E Subarea

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.2100 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 1.2 cfs

Rational Analysis: West Overall

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.81

Basin Area: 6.3200 acres

Rainfall Intensity: 5.00 in/hr

Time of Concentration: 8.50 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 8.50 min

Rational Method Results

Flowrate: 25.8 cfs

Rational Analysis: CB G Subarea

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.0800 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 0.5 cfs

Rational Analysis: Bench West Subarea1

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.51

Basin Area: 0.5900 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 1.8 cfs

Rational Analysis: Swale West Subarea3

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.78

Basin Area: 1.4100 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 6.7 cfs

Rational Analysis: Swale West Subarea2

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.66

Basin Area: 1.0500 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 4.2 cfs

Rational Analysis: Gutter West Subarea4

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 1.8700 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 10.9 cfs

Rational Analysis: Pipe Inlet Subarea

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.6900 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 4.0 cfs

Rational Analysis: Basins West Subarea5

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.75

Basin Area: 1.4000 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 6.4 cfs

Rational Analysis: Basins West Subarea4S

Notes:

Rational Method Input Parameters

Runoff Coefficient: 0.95

Basin Area: 0.9700 acres

Rainfall Intensity: 6.06 in/hr

Time of Concentration: 5.00 minutes

Recurrence Year: 10 year

IDF Input Parameters

User Supplied Data

10 year Recurrence, 5 min duration: 6.06 in/hr

10 year Recurrence, 10 min duration: 4.66 in/hr

10 year Recurrence, 15 min duration: 3.85 in/hr

10 year Recurrence, 30 min duration: 2.69 in/hr

10 year Recurrence, 60 min duration: 1.74 in/hr

Time of Concentration Input Parameters

Specified Time of Concentration

Time of Concentration: 5.00 min

Rational Method Results

Flowrate: 5.6 cfs

Channel Analysis: Reverse Bench

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 2.0000 ft/ft

Side Slope 2 (Z2): 5.0000 ft/ft

Longitudinal Slope: 0.0200 ft/ft

Manning's n: 0.0250

Flow 1.8000 cfs

Result Parameters

Depth 0.4220 ft

Area of Flow 0.6233 ft^2

Wetted Perimeter 3.0954 ft

Hydraulic Radius 0.2014 ft

Average Velocity 2.8879 ft/s

Top Width 2.9540 ft

Froude Number: 1.1079

Critical Depth 0.4579 ft

Critical Velocity 2.4531 ft/s

Critical Slope: 0.0129 ft/ft

Critical Top Width 3.93 ft

Calculated Max Shear Stress 0.5267 lb/ft^2

Calculated Avg Shear Stress 0.2513 lb/ft^2

Channel Analysis: Stockpile Yard Perimeter Swales

Notes:

Input Parameters

Channel Type: Trapezoidal

Side Slope 1 (Z1): 2.0000 ft/ft

Side Slope 2 (Z2): 2.0000 ft/ft

Channel Width 4.00 ft

Longitudinal Slope: 0.0100 ft/ft

Manning's n: 0.0300

Flow 8.3000 cfs

Result Parameters

Depth 0.5629 ft

Area of Flow 2.8852 ft^2

Wetted Perimeter 6.5173 ft

Hydraulic Radius 0.4427 ft

Average Velocity 2.8768 ft/s

Top Width 6.2515 ft

Froude Number: 0.7463

Critical Depth 0.4707 ft

Critical Velocity 3.5683 ft/s

Critical Slope: 0.0188 ft/ft

Critical Top Width 5.88 ft

Calculated Max Shear Stress 0.3512 lb/ft^2

Calculated Avg Shear Stress 0.2762 lb/ft^2

Channel Analysis: Salt Storage Perimeter Swale

Notes:

Input Parameters

Channel Type: Trapezoidal

Side Slope 1 (Z1): 2.0000 ft/ft

Side Slope 2 (Z2): 2.0000 ft/ft

Channel Width 5.00 ft

Longitudinal Slope: 0.0100 ft/ft

Manning's n: 0.0300

Flow 8.0000 cfs

Result Parameters

Depth 0.4908 ft

Area of Flow 2.9359 ft^2

Wetted Perimeter 7.1950 ft

Hydraulic Radius 0.4080 ft

Average Velocity 2.7249 ft/s

Top Width 6.9632 ft

Froude Number: 0.7395

Critical Depth 0.4063 ft

Critical Velocity 3.3879 ft/s

Critical Slope: 0.0192 ft/ft

Critical Top Width 6.63 ft

Calculated Max Shear Stress 0.3063 lb/ft^2

Calculated Avg Shear Stress 0.2546 lb/ft^2

Appendix b

Pipe Sizing Calculations

Manning's Equation for Open Channel Flow

$$\boxed{Q = \frac{1.49}{n} AR^{2/3} S^{1/2}}$$

Maximum pipe capacities for the trunk line drains are presented below as compared to the peak flow rates calculated using the Rational Method for the contributing watersheds.
Pipes are sized with capacity for the 10-year design storm minimum in accordance with the recommendations of the CT DOT Drainage Manual for curb and gutter systems.

Existing Outlet for West Side of Tracks (24-inch CI at S=0.026) — Design Flow - West Overall

Q=	**36.58**	**CFS**	Flow Rate	Q10=	25.8 CFS
n=	0.013		Roughness Coefficient		
A=	3.14	SF	Area of Pipe		
R=	0.5	FT	Hydraulic Radius = A/P		
S=	0.026	FT/FT	Pipe Slope		
r=	1	FT	Pipe Radius		
P=	6.28	FT	Pipe Perimeter		

HDS A to Existing 24-inch CI (24-inch HDPE at S=0.015) — Design Flow - West Overall

Q=	**27.78**	**CFS**	Flow Rate	Q10=	25.8 CFS
n=	0.013		Roughness Coefficient		
A=	3.14	SF	Area of Pipe		
R=	0.5	FT	Hydraulic Radius = A/P		
S=	0.015	FT/FT	Pipe Slope		
r=	1	FT	Pipe Radius		
P=	6.28	FT	Pipe Perimeter		

CB A to HDS A (18-inch HDPE at S = 0.020) — Design Flow - West Subarea 5

Q=	**14.90**	**CFS**	Flow Rate	Q10=	6.4 CFS
n=	0.013		Roughness Coefficient		
A=	1.77	SF	Area of Pipe		
R=	0.375	FT	Hydraulic Radius = A/P		
S=	0.02	FT/FT	Pipe Slope		
r=	0.75	FT	Pipe Radius		
P=	4.71	FT	Pipe Perimeter		

CB B to CB A (18-inch HDPE at S = 0.005) — Design Flow - West Subarea 5

Q=	**7.45**	**CFS**	Flow Rate	Q10=	6.4 CFS
n=	0.013		Roughness Coefficient		
A=	1.77	SF	Area of Pipe		
R=	0.375	FT	Hydraulic Radius = A/P		
S=	0.005	FT/FT	Pipe Slope		
r=	0.75	FT	Pipe Radius		
P=	4.71	FT	Pipe Perimeter		

Appendix b

Pipe Sizing Calculations

CB C to HDS A (24-inch HDPE at S = 0.025)

Q=	**35.87**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	3.14	SF	Area of Pipe
R=	0.5	FT	Hydraulic Radius = A/P
S=	0.025	FT/FT	Pipe Slope
r=	1	FT	Pipe Radius
P=	6.28	FT	Pipe Perimeter

Design Flow - West Subarea 1-4

Q10= 23.6 CFS

CB D to CB C (18-inch HDPE at S = 0.015)

Q=	**12.90**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	1.77	SF	Area of Pipe
R=	0.375	FT	Hydraulic Radius = A/P
S=	0.015	FT/FT	Pipe Slope
r=	0.75	FT	Pipe Radius
P=	4.71	FT	Pipe Perimeter

Design Flow - West Subarea 3+4S

Q10= 12.3 CFS

North Swale to CB C (15-inch HDPE at S = 0.063)

Q=	**16.26**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	1.23	SF	Area of Pipe
R=	0.3125	FT	Hydraulic Radius = A/P
S=	0.063	FT/FT	Pipe Slope
r=	0.625	FT	Pipe Radius
P=	3.93	FT	Pipe Perimeter

Design Flow - West Subarea 1+2

Q10= 6 CFS

South Swale to CB C (15-inch HDPE at S = 0.020)

Q=	**9.16**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	1.23	SF	Area of Pipe
R=	0.3125	FT	Hydraulic Radius = A/P
S=	0.02	FT/FT	Pipe Slope
r=	0.625	FT	Pipe Radius
P=	3.93	FT	Pipe Perimeter

Design Flow - West Subarea 3

Q10= 6.7 CFS

CB E to Outlet (15-inch HDPE at S = 0.005)

Q=	**4.58**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	1.23	SF	Area of Pipe
R=	0.3125	FT	Hydraulic Radius = A/P
S=	0.005	FT/FT	Pipe Slope
r=	0.625	FT	Pipe Radius
P=	3.93	FT	Pipe Perimeter

Design Flow - CB-E Subarea

Q10= 1.2 CFS

Appendix b

Pipe Sizing Calculations

CB F to Outlet (15-inch HDPE at S = 0.020)

Q=	**9.16**	**CFS**	Flow Rate	Q10=	1.5	CFS
n=	0.013		Roughness Coefficient			
A=	1.23	SF	Area of Pipe			
R=	0.3125	FT	Hydraulic Radius = A/P			
S=	0.02	FT/FT	Pipe Slope			
r=	0.625	FT	Pipe Radius			
P=	3.93	FT	Pipe Perimeter			

Design Flow - CB-F/G Subarea

CB G to CB F (15-inch HDPE at S = 0.005)

Q=	**4.58**	**CFS**	Flow Rate	Q10=	0.5	CFS
n=	0.013		Roughness Coefficient			
A=	1.23	SF	Area of Pipe			
R=	0.3125	FT	Hydraulic Radius = A/P			
S=	0.005	FT/FT	Pipe Slope			
r=	0.625	FT	Pipe Radius			
P=	3.93	FT	Pipe Perimeter			

Design Flow - CB-G Subarea

Pipe Inlet to HDS B (18-inch RCP at S = 0.003)

Q=	**5.77**	**CFS**	Flow Rate	Q10=	4	CFS
n=	0.013		Roughness Coefficient			
A=	1.77	SF	Area of Pipe			
R=	0.375	FT	Hydraulic Radius = A/P			
S=	0.003	FT/FT	Pipe Slope			
r=	0.75	FT	Pipe Radius			
P=	4.71	FT	Pipe Perimeter			

Design Flow - Pipe Inlet Subarea

HDS B to DMH (18-inch RCP at S = 0.003)

Q=	**5.77**	**CFS**	Flow Rate	Q10=	4	CFS
n=	0.013		Roughness Coefficient			
A=	1.77	SF	Area of Pipe			
R=	0.375	FT	Hydraulic Radius = A/P			
S=	0.003	FT/FT	Pipe Slope			
r=	0.75	FT	Pipe Radius			
P=	4.71	FT	Pipe Perimeter			

Design Flow - Pipe Inlet Subarea

DMH to Outlet (Existing 24-inch CI at S = 0.024)

Q=	**35.14**	**CFS**	Flow Rate	Q10=	21	CFS
n=	0.013		Roughness Coefficient			
A=	3.14	SF	Area of Pipe			
R=	0.5	FT	Hydraulic Radius = A/P			
S=	0.024	FT/FT	Pipe Slope			
r=	1	FT	Pipe Radius			
P=	6.28	FT	Pipe Perimeter			

Design Flow - Pipe Inlet + South

Appendix b

Pipe Sizing Calculations

HDS 1 to Outlet (18-inch HDPE at S = 0.021) — Design Flow - North 1-4

Q=	**15.26**	**CFS**	Flow Rate	Q10=	15	CFS
n=	0.013		Roughness Coefficient			
A=	1.77	SF	Area of Pipe			
R=	0.375	FT	Hydraulic Radius = A/P			
S=	0.021	FT/FT	Pipe Slope			
r=	0.75	FT	Pipe Radius			
P=	4.71	FT	Pipe Perimeter			

CB 1 to HDS 1 (18-inch HDPE at S = 0.021) — Design Flow - North 1-4

Q=	**15.26**	**CFS**	Flow Rate	Q10=	15	CFS
n=	0.013		Roughness Coefficient			
A=	1.77	SF	Area of Pipe			
R=	0.375	FT	Hydraulic Radius = A/P			
S=	0.021	FT/FT	Pipe Slope			
r=	0.75	FT	Pipe Radius			
P=	4.71	FT	Pipe Perimeter			

CB 2 to CB 1 (15-inch HDPE at S = 0.005) — Design Flow - North 1

Q=	**4.58**	**CFS**	Flow Rate	Q10=	3	CFS
n=	0.013		Roughness Coefficient			
A=	1.23	SF	Area of Pipe			
R=	0.3125	FT	Hydraulic Radius = A/P			
S=	0.005	FT/FT	Pipe Slope			
r=	0.625	FT	Pipe Radius			
P=	3.93	FT	Pipe Perimeter			

CB 3 to CB 1 (15-inch HDPE at S = 0.006) — Design Flow - North 3-4

Q=	**5.02**	**CFS**	Flow Rate	Q10=	4.9	CFS
n=	0.013		Roughness Coefficient			
A=	1.23	SF	Area of Pipe			
R=	0.3125	FT	Hydraulic Radius = A/P			
S=	0.006	FT/FT	Pipe Slope			
r=	0.625	FT	Pipe Radius			
P=	3.93	FT	Pipe Perimeter			

CB 4 to CB 3 (15-inch HDPE at S = 0.005) — Design Flow - North4

Q=	**4.58**	**CFS**	Flow Rate	Q10=	3.6	CFS
n=	0.013		Roughness Coefficient			
A=	1.23	SF	Area of Pipe			
R=	0.3125	FT	Hydraulic Radius = A/P			
S=	0.005	FT/FT	Pipe Slope			
r=	0.625	FT	Pipe Radius			
P=	3.93	FT	Pipe Perimeter			

Appendix b

Pipe Sizing Calculations

CB 5 to CB 4 (15-inch HDPE at S = 0.005) — Design Flow - North4

Q=	**4.58**	**CFS**	Flow Rate	Q10=	3.6	CFS
n=	0.013		Roughness Coefficient			
A=	1.23	SF	Area of Pipe			
R=	0.3125	FT	Hydraulic Radius = A/P			
S=	0.005	FT/FT	Pipe Slope			
r=	0.625	FT	Pipe Radius			
P=	3.93	FT	Pipe Perimeter			

CB 6 to CB 5 (15-inch HDPE at S = 0.005) — Design Flow - North4

Q=	**4.58**	**CFS**	Flow Rate	Q10=	3.6	CFS
n=	0.013		Roughness Coefficient			
A=	1.23	SF	Area of Pipe			
R=	0.3125	FT	Hydraulic Radius = A/P			
S=	0.005	FT/FT	Pipe Slope			
r=	0.625	FT	Pipe Radius			
P=	3.93	FT	Pipe Perimeter			

HDS 2 to DMH (24-inch HDPE at S = 0.014) — Design Flow - Middle 1-4

Q=	**26.84**	**CFS**	Flow Rate	Q10=	26.6	CFS
n=	0.013		Roughness Coefficient			
A=	3.14	SF	Area of Pipe			
R=	0.5	FT	Hydraulic Radius = A/P			
S=	0.014	FT/FT	Pipe Slope			
r=	1	FT	Pipe Radius			
P=	6.28	FT	Pipe Perimeter			

CB 7 to HDS 2 (24-inch HDPE at S = 0.014) — Design Flow - Middle 1-4

Q=	**26.84**	**CFS**	Flow Rate	Q10=	26.6	CFS
n=	0.013		Roughness Coefficient			
A=	3.14	SF	Area of Pipe			
R=	0.5	FT	Hydraulic Radius = A/P			
S=	0.014	FT/FT	Pipe Slope			
r=	1	FT	Pipe Radius			
P=	6.28	FT	Pipe Perimeter			

CB 8 to CB 7 (18-inch HDPE at S = 0.015) — Design Flow - Middle 1-2

Q=	**12.90**	**CFS**	Flow Rate	Q10=	11	CFS
n=	0.013		Roughness Coefficient			
A=	1.77	SF	Area of Pipe			
R=	0.375	FT	Hydraulic Radius = A/P			
S=	0.015	FT/FT	Pipe Slope			
r=	0.75	FT	Pipe Radius			
P=	4.71	FT	Pipe Perimeter			

Appendix b

Pipe Sizing Calculations

CB 9 to CB 8 (15-inch HDPE at S = 0.103)

Q=	**20.79**	**CFS**	Flow Rate	
n=	0.013		Roughness Coefficient	
A=	1.23	SF	Area of Pipe	
R=	0.3125	FT	Hydraulic Radius = A/P	
S=	0.103	FT/FT	Pipe Slope	
r=	0.625	FT	Pipe Radius	
P=	3.93	FT	Pipe Perimeter	

Design Flow - Middle 1

Q10= 5.3 CFS

CB 10 to CB 7 (15-inch HDPE at S = 0.016)

Q=	**8.19**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	1.23	SF	Area of Pipe
R=	0.3125	FT	Hydraulic Radius = A/P
S=	0.016	FT/FT	Pipe Slope
r=	0.625	FT	Pipe Radius
P=	3.93	FT	Pipe Perimeter

Design Flow - Middle 4

Q10= 8.1 CFS

HDS 3 to Existing CB (24-inch HDPE at S = 0.006)

Q=	**17.57**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	3.14	SF	Area of Pipe
R=	0.5	FT	Hydraulic Radius = A/P
S=	0.006	FT/FT	Pipe Slope
r=	1	FT	Pipe Radius
P=	6.28	FT	Pipe Perimeter

Design Flow - South 1-3

Q10= 17 CFS

CB 11 to HDS 3 (24-inch HDPE at S = 0.006)

Q=	**17.57**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	3.14	SF	Area of Pipe
R=	0.5	FT	Hydraulic Radius = A/P
S=	0.006	FT/FT	Pipe Slope
r=	1	FT	Pipe Radius
P=	6.28	FT	Pipe Perimeter

Design Flow - South 1-3

Q10= 17 CFS

CB 12 to CB 11 (24-inch HDPE at S = 0.011)

Q=	**23.79**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	3.14	SF	Area of Pipe
R=	0.5	FT	Hydraulic Radius = A/P
S=	0.011	FT/FT	Pipe Slope
r=	1	FT	Pipe Radius
P=	6.28	FT	Pipe Perimeter

Design Flow - South 1-2

Q10= 12.3 CFS

Appendix b

Pipe Sizing Calculations

CB 13 to CB 12 (15-inch HDPE at S = 0.006)

Q=	**5.02**	**CFS**	Flow Rate
n=	0.013		Roughness Coefficient
A=	1.23	SF	Area of Pipe
R=	0.3125	FT	Hydraulic Radius = A/P
S=	0.006	FT/FT	Pipe Slope
r=	0.625	FT	Pipe Radius
P=	3.93	FT	Pipe Perimeter

Design Flow - South 1

Q10=	5	CFS

Water Quality Calculations per Appendix B, CT DEEP SWQM		
HDS-A - Contech CDS10		
Water Quality Volume - 1" x R x A / 12		
Gross Drainage Area (A)	6.32	Acres
Impervious Area	4.85	Acres
% Impervious (I)	76.74	%
Volumetric Runoff Coefficient	0.74	R=0.05+(0.009 x I)
Water Quality Volume	0.39	Acre-Feet
Water Quality Volume	16,992	Cubic Feet
Water Quality Flow		
Runoff Depth (Q = WQV x 12 / A)	0.74	Inches
CN	97.43	

$$CN = \frac{1000}{[10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}]}$$

where: CN = Runoff Curve Number
P = design precipitation, inches (1" for water quality storm)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre - feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Tc (10 minute minimum per SWQM)	10	Minutes
Ia (Table 4-1 of TR-55)	0.041	Inches
qu (Exhibit 4-III of TR-55)	650	csm/in
WQF	4.75	CFS

$$WQF = (q_u)(A)(Q)$$

where: WQV = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi2/inch)
A = drainage area (mi2)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre - feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Water Quality Calculations per Appendix B, CT DEEP SWQM		
HDS-B - Contech Cascade CS-3		
Water Quality Volume - 1" x R x A / 12		
Gross Drainage Area (A)	0.7	Acres
Impervious Area	0.7	Acres
% Impervious (I)	100.00	%
Volumetric Runoff Coefficient	0.95	R=0.05+(0.009 x I)
Water Quality Volume	0.06	Acre-Feet
Water Quality Volume	2,414	Cubic Feet
Water Quality Flow		
Runoff Depth (Q = WQV x 12 / A)	0.95	Inches
CN	99.57	

$$CN = \frac{1000}{[10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}]}$$

where: CN = Runoff Curve Number
P = design precipitation, inches (1" for water quality storm)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV(acre-feet)]\text{x}[12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Tc (10 minute minimum per SWQM)	10	Minutes
Ia (Table 4-1 of TR-55)	0.041	Inches
qu (Exhibit 4-III of TR-55)	650	csm/in
WQF	0.68	CFS

$$WQF = (q_u)(A)(Q)$$

where: WQV = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi2/inch)
A = drainage area (mi2)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV(acre-feet)]\text{x}[12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Water Quality Calculations per Appendix B, CT DEEP SWQM
CB-E - Contech Cascade CS3

Water Quality Volume - 1" x R x A / 12		
Gross Drainage Area (A)	0.2	Acres
Impervious Area	0.2	Acres
% Impervious (I)	100.00	%
Volumetric Runoff Coefficient	0.95	R=0.05+(0.009 x I)
Water Quality Volume	0.02	Acre-Feet
Water Quality Volume	690	Cubic Feet
Water Quality Flow		
Runoff Depth (Q = WQV x 12 / A)	0.95	Inches
CN	99.57	

$$CN = \frac{1000}{[10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}]}$$

where: CN = Runoff Curve Number
P = design precipitation, inches
(1" for water quality storm)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre-feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Tc (10 minute minimum per SWQM)	10	Minutes
Ia (Table 4-1 of TR-55)	0.041	Inches
qu (Exhibit 4-III of TR-55)	650	csm/in
WQF	0.19	CFS

$$WQF = (q_u)(A)(Q)$$

where: WQV = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi2/inch)
A = drainage area (mi2)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre-feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Water Quality Calculations per Appendix B, CT DEEP SWQM
CB-F - Contech Cascade CS3

Water Quality Volume - 1" x R x A / 12		
Gross Drainage Area (A)	0.26	Acres
Impervious Area	0.26	Acres
% Impervious (I)	100.00	%
Volumetric Runoff Coefficient	0.95	R=0.05+(0.009 x I)
Water Quality Volume	0.02	Acre-Feet
Water Quality Volume	897	Cubic Feet
Water Quality Flow		
Runoff Depth (Q = WQV x 12 / A)	0.95	Inches
CN	99.57	

$$CN = \frac{1000}{[10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}]}$$

where: CN = Runoff Curve Number
P = design precipitation, inches (1" for water quality storm)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre-feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Tc (10 minute minimum per SWQM)	10	Minutes
Ia (Table 4-1 of TR-55)	0.041	Inches
qu (Exhibit 4-III of TR-55)	650	csm/in
WQF	0.25	CFS

$$WQF = (q_u)(A)(Q)$$

where: WQV = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi2/inch)
A = drainage area (mi2)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre-feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Water Quality Calculations per Appendix B, CT DEEP SWQM		
HDS-1 - Contech CDS8		
Water Quality Volume - 1" x R x A / 12		
Gross Drainage Area (A)	2.47	Acres
Impervious Area	2.47	Acres
% Impervious (I)	100	%
Volumetric Runoff Coefficient	0.95	R=0.05+(0.009 x I)
Water Quality Volume	0.20	Acre-Feet
Water Quality Volume	8,518	Cubic Feet
Water Quality Flow		
Runoff Depth (Q = WQV x 12 / A)	0.95	Inches
CN	99.57	

$$CN = \frac{1000}{[10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}]}$$

where: CN = Runoff Curve Number
P = design precipitation, inches
(1" for water quality storm)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre - feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Tc (10 minute minimum per SWQM)	10	Minutes
Ia (Table 4-1 of TR-55)	0.041	Inches
qu (Exhibit 4-III of TR-55)	650	csm/in
WQF	2.38	CFS

$$WQF = (q_u)(A)(Q)$$

where: WQV = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi2/inch)
A = drainage area (mi2)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre - feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Water Quality Calculations per Appendix B, CT DEEP SWQM
HDS-2 - Contech CDS10

Water Quality Volume - 1" x R x A / 12		
Gross Drainage Area (A)	4.54	Acres
Impervious Area	4.54	Acres
% Impervious (I)	100	%
Volumetric Runoff Coefficient	0.95	R=0.05+(0.009 x I)
Water Quality Volume	0.36	Acre-Feet
Water Quality Volume	15,656	Cubic Feet
Water Quality Flow		
Runoff Depth (Q = WQV x 12 / A)	0.95	Inches
CN	99.57	

$$CN = \frac{1000}{[10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}]}$$

where: CN = Runoff Curve Number
P = design precipitation, inches (1" for water quality storm)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre-feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Tc (10 minute minimum per SWQM)	10	Minutes
Ia for CN(Table 4-1 of TR-55)	0.041	Inches
qu (Exhibit 4-III of TR-55)	650	csm/in
WQF	4.38	CFS

$$WQF = (q_u)(A)(Q)$$

where: WQV = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi2/inch)
A = drainage area (mi2)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre-feet)] \times [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

Water Quality Calculations per Appendix B, CT DEEP SWQM
HDS-3 - Contech CDS8

Water Quality Volume - 1" x R x A / 12		
Gross Drainage Area (A)	2.93	Acres
Impervious Area	2.93	Acres
% Impervious (I)	100	%
Volumetric Runoff Coefficient	0.95	R=0.05+(0.009 x I)
Water Quality Volume	0.23	Acre-Feet
Water Quality Volume	10,104	Cubic Feet
Water Quality Flow		
Runoff Depth (Q = WQV x 12 / A)	0.95	Inches
CN	99.57	

$$CN = \frac{1000}{[10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}]}$$

where: CN = Runoff Curve Number
P = design precipitation, inches (1" for water quality storm)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre - feet)] \times [12\,(inches/foot)]}{Drainage\ Area\ (acres)}$$

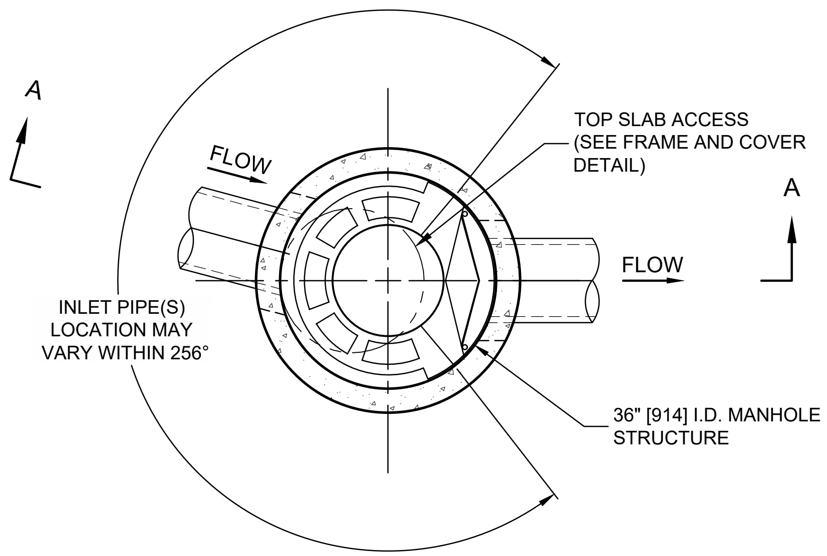
Tc (10 minute minimum per SWQM)	10	Minutes
Ia (Table 4-1 of TR-55)	0.041	Inches
qu (Exhibit 4-III of TR-55)	650	csm/in
WQF	2.83	CFS

$$WQF = (q_u)(A)(Q)$$

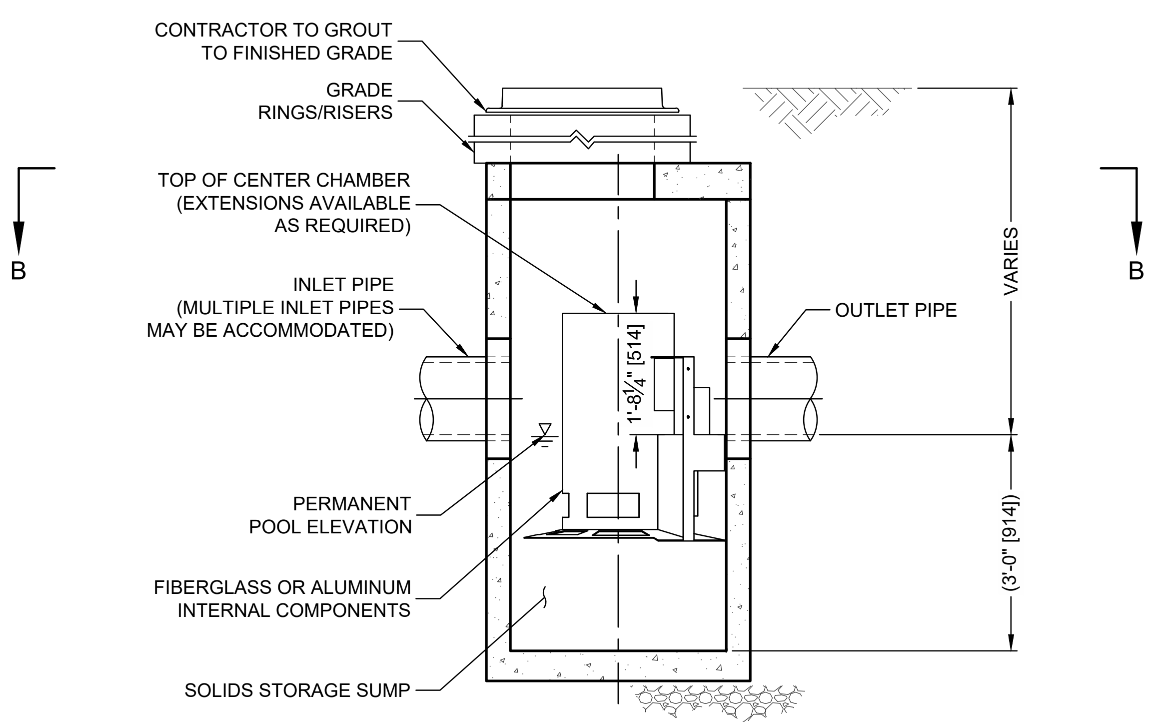
where: WQV = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi2/inch)
A = drainage area (mi2)
Q = runoff depth (in watershed inches)

$$= \frac{[WQV\,(acre - feet)] \times [12\,(inches/foot)]}{Drainage\ Area\ (acres)}$$

Appendix C
Hydrodynamic Separator Cut Sheets



PLAN VIEW B-B
NOT TO SCALE



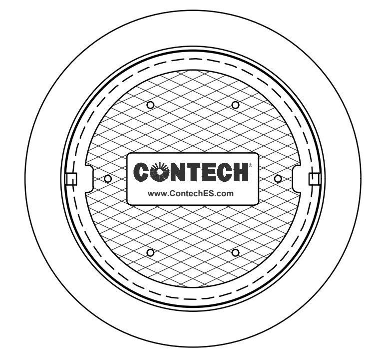
ELEVATION A-A
NOT TO SCALE

CASCADE
separator™

CASCADE SEPARATOR DESIGN NOTES

THE STANDARD CS-3 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



FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs [L/s])			
PEAK FLOW RATE (cfs [L/s])			
RETURN PERIOD OF PEAK FLOW (yrs)			
RIM ELEVATION			
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
NOTES / SPECIAL REQUIREMENTS:			

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

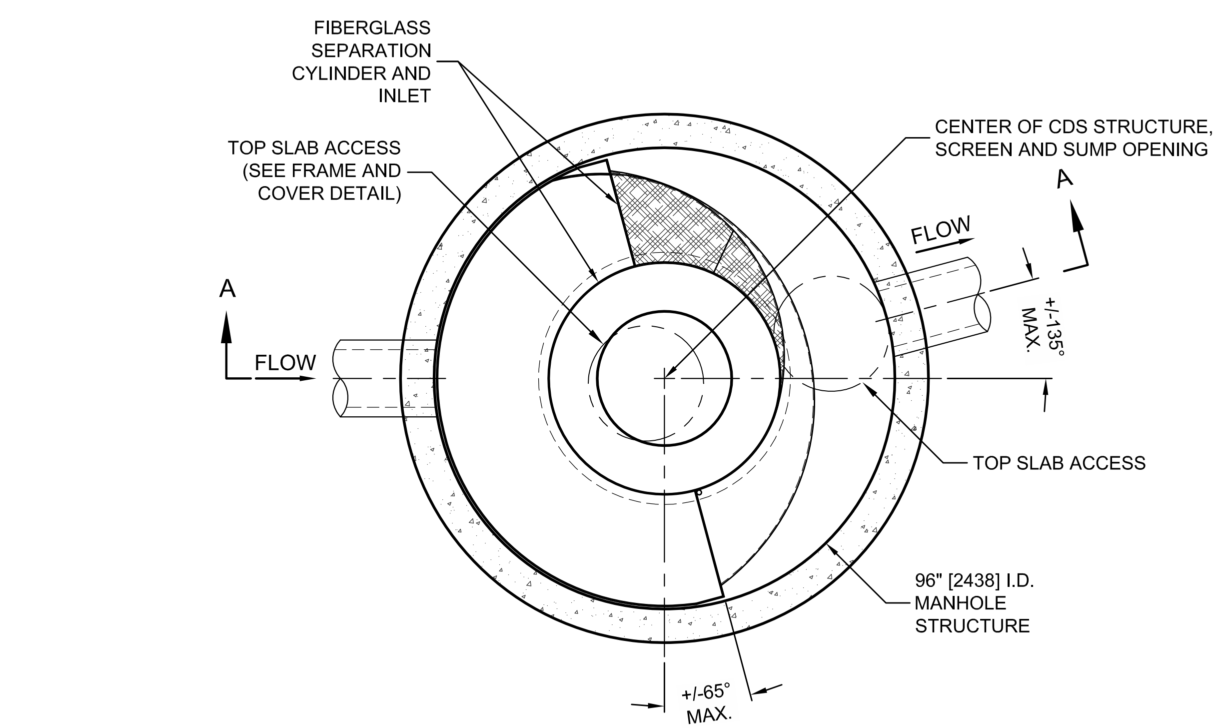
INSTALLATION NOTES

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 CASCADE SEPARATOR MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
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

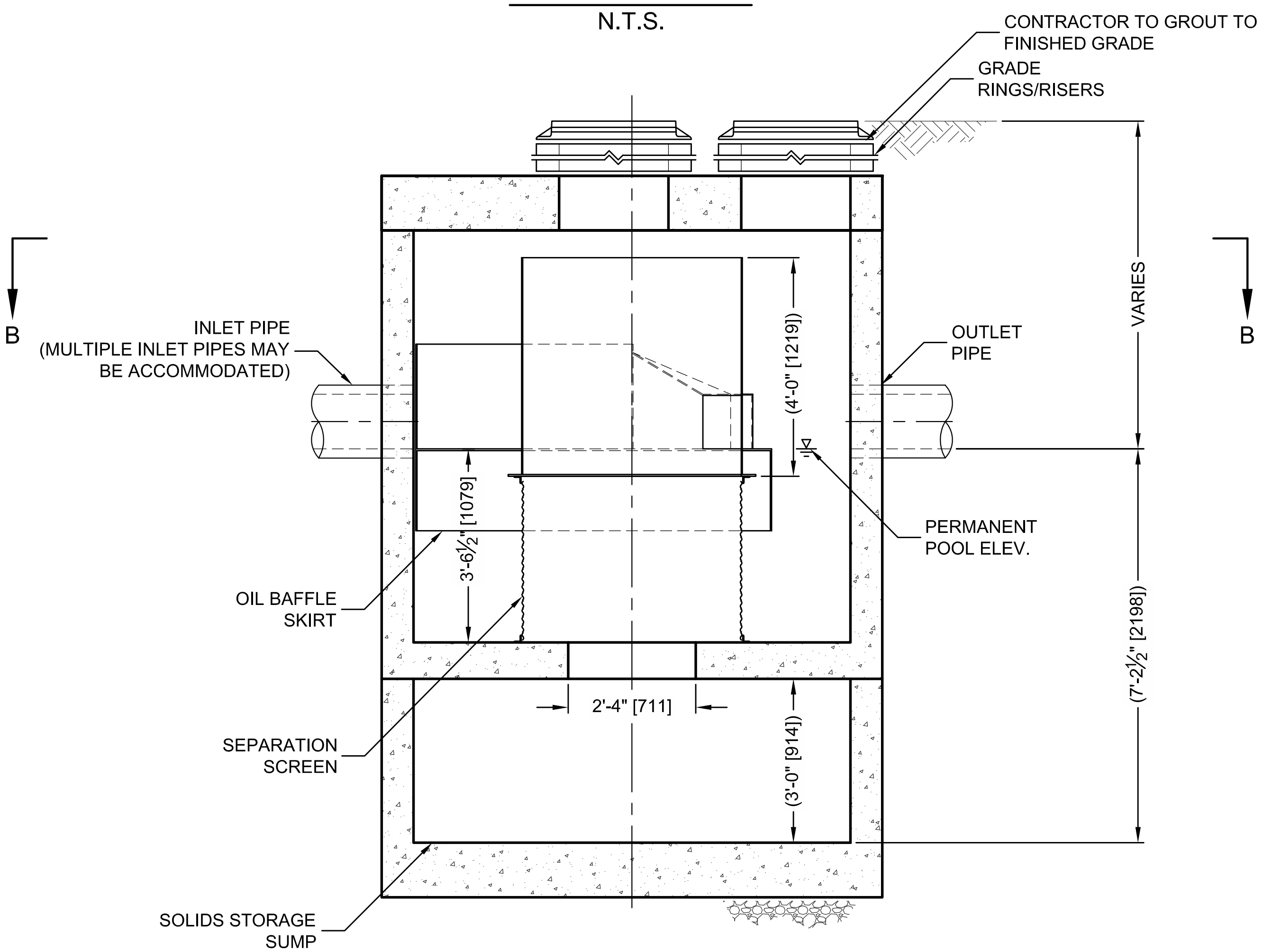
CS-3
CASCADE SEPARATOR
STANDARD DETAIL

I:\COMMON\CAD\TREATMENT\21 CASCADE\40 STANDARD DRAWINGS\DWG\CS-3-DTL.DWG 6/18/2020 4:23 PM



PLAN VIEW B-B

N.T.S.



ELEVATION A-A

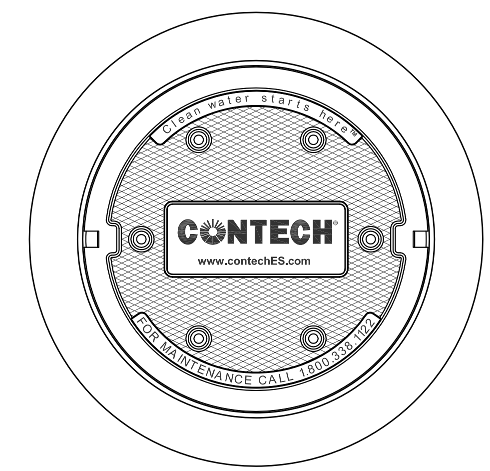
N.T.S.

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.

CDS4030-8-C DESIGN NOTES

THE STANDARD CDS4030-8-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

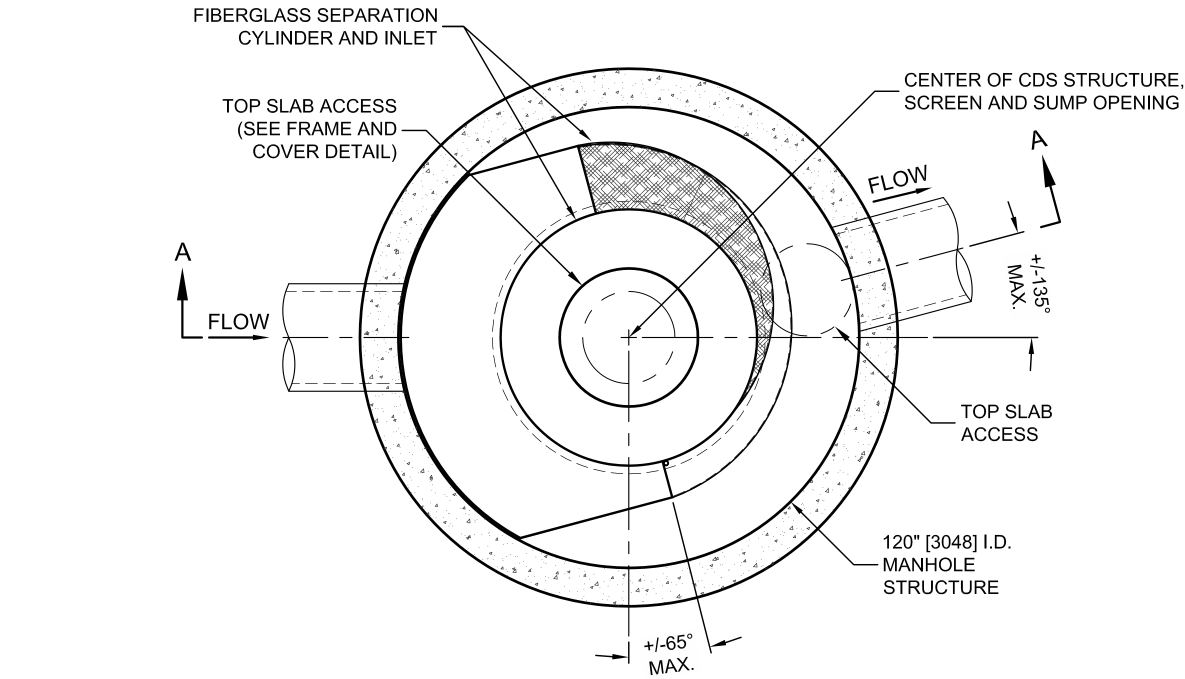
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECHENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
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.

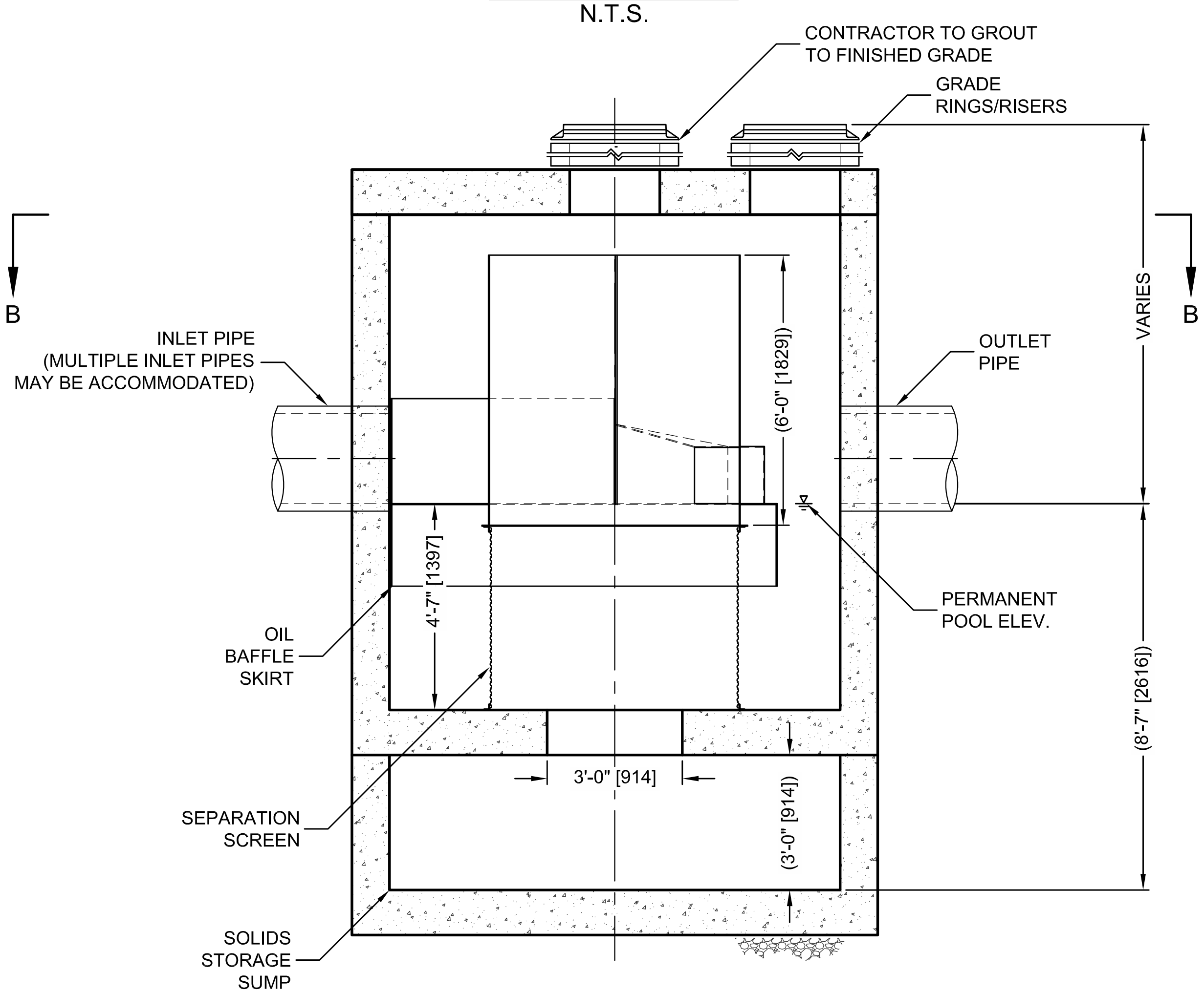
CONTECH® ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS4030-8-C
INLINE CDS
STANDARD DETAIL



PLAN VIEW B-B

N.T.S.



ELEVATION A-A

N.T.S.

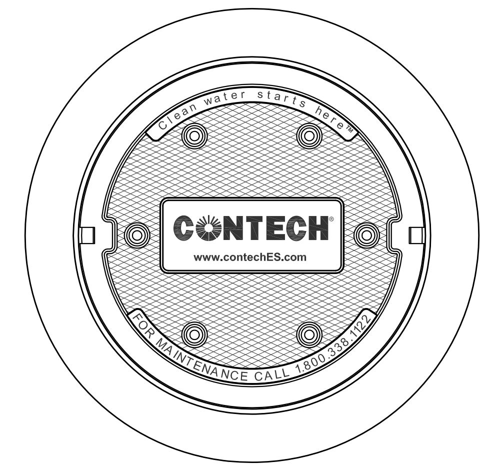
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,848; 6,641,720; 6,511,595; 6,581,783; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

C:\USERS\SCHLACHTERH\DESKTOP\CDS DETAILS 180 MICRON SIZING\ACAD\CDS5640-10-C-DTL.DWG 5/19/2014 5:37 PM

CDS5640-10-C DESIGN NOTES

THE STANDARD CDS5640-10-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.

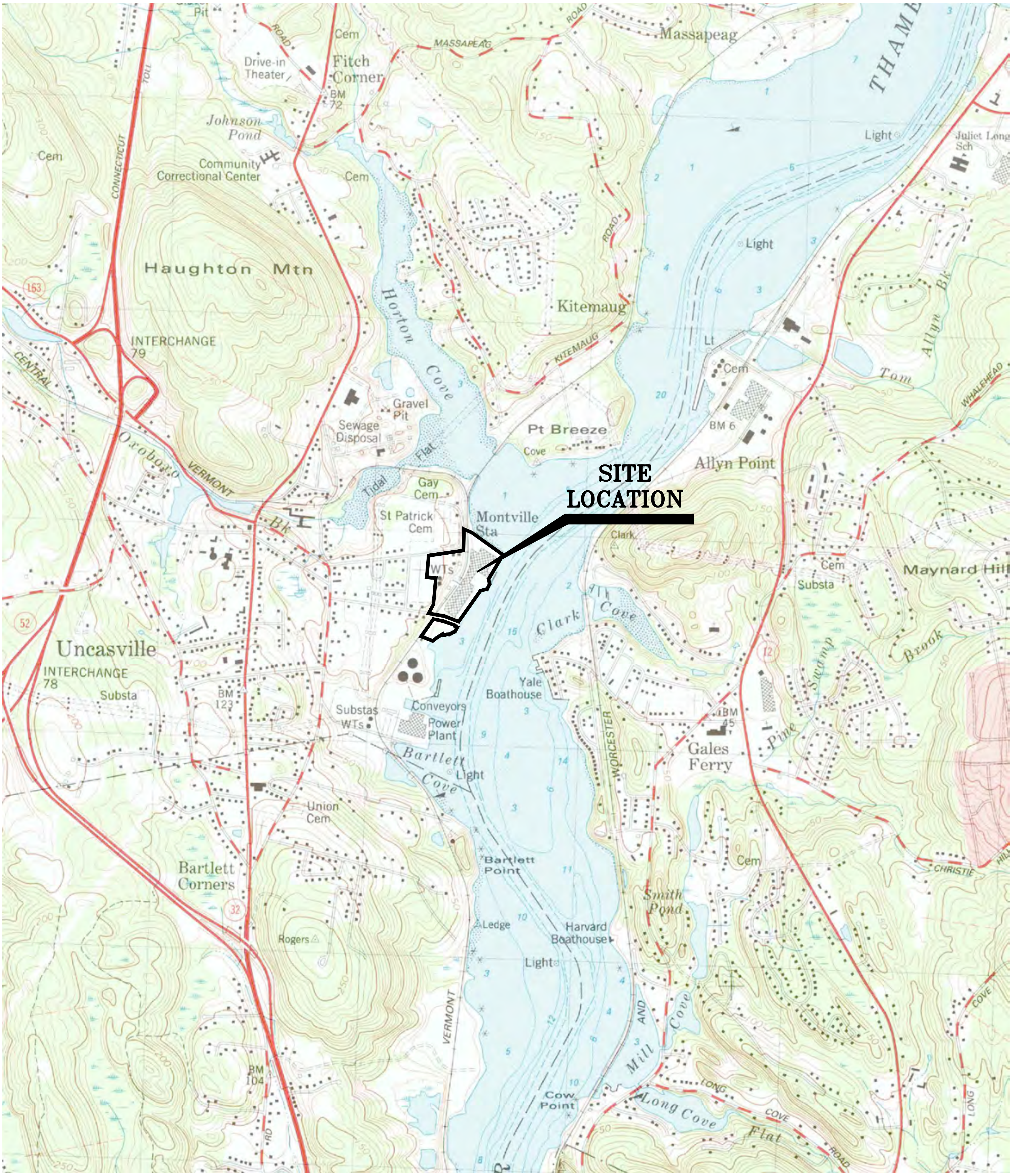
INSTALLATION NOTES

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

CDS5640-10-C
INLINE CDS
STANDARD DETAIL

Figures



BOUNDARIES

CIVIL ENGINEERING · LAND SURVEYING · LAND USE PLANNING · SOIL SCIENCE

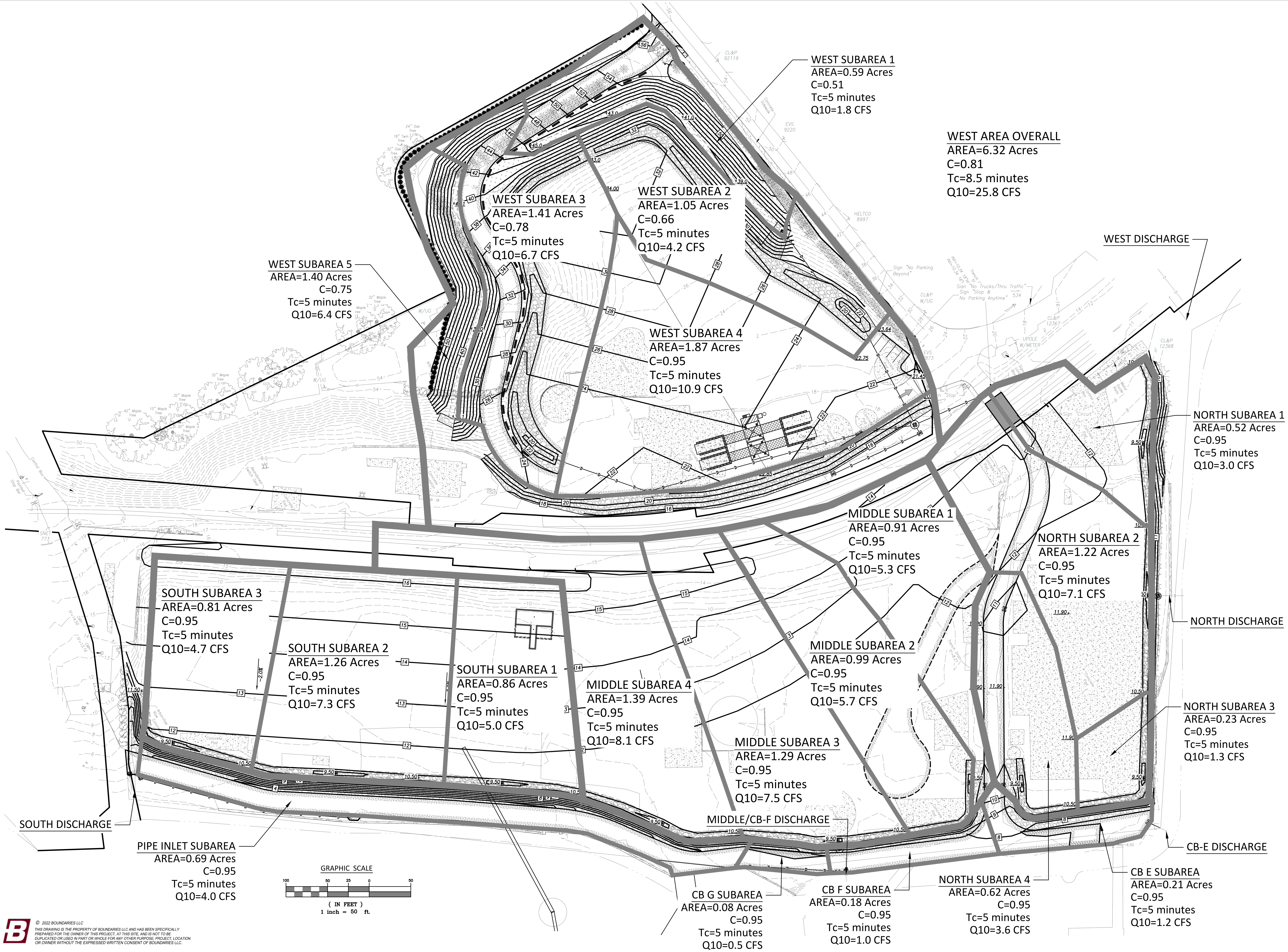
Boundaries LLC
179 Pachaug River Drive, Griswold, CT 06351
T 860.376.2006 | www.boundariesllc.net

N

Location Map
(Uncasville Quad)
Gateway Montville, LLC

125 & 133 Depot Road, Uncasville, CT

SCALE:	1"=2,000'
DATE:	May 2022
JOB NO.	22-3140
FIGURE 1	



\\192.168.2.3\PROJECTS\CIVIL 3D PROJECTS\2022\22-3140 GATEWAY TERMINAL\TECH\STORMWATER\DEPOT ROAD STORMWATER.DWG

BOUNDARIES
CIVIL ENGINEERING · LAND SURVEYING · LAND USE PLANNING · SOIL SCIENCE
Boundaries LLC
179 Pachaug River Drive, Griswold, CT 06351
T 860.376.2006 | www.boundariesllc.net

Site Operations/Development Plan
"Figure 2 - Post-Development Conditions Watersheds"

Prepared for
Gateway Montville, LLC
125 & 133 Depot Road - Uncasville, Connecticut

SCALE:	1" = 50'
DATE:	May 2022
JOB I.D. NO.	22-3140

Revisions

SHEET NO.
1
1