HOWARD STEIN HUDSON
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SUPPLEMENTAL DATA REPORT

Proposed Redevelopment

Self-Storage Facility

147 Main Street

Leicester, Massachusetts

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Existing Conditions

The subject site consists of one parcel totaling approximately 2.86 acres, the parcel is divided in two districts, the Residential 2, R2, District and the Business, B, District. The address of record for the parcel is 147 Main Street.

The site exists as a vacant parking lot bordering Smith's Pond. There is one existing curb cut along Main Street to allow vehicle access. Within the existing parking lot there are abandoned piles of rubble, abandoned retaining walls and an abandoned foundation.

The site topography generally slopes from northeast to southwest. There is no existing drainage infrastructure which allows all the of the stormwater to runoff untreated directly to the wetlands bordering Smith's Pond.

Proposed Conditions

The proposal calls for the redevelopment of the existing parking lot and addition of semi-permanent storage containers. The existing pavement will be removed, and the area is to be re-graded to allow for proper access and setting of the containers.

The development will consist of 111 semi-permanent storage containers. A 6' chain link fence will border the lot and prevent unauthorized access to the storage units. To access the units there will be one way traffic around the lot, labeled by appropriate signage and pavement markings.

The project proposes curbing throughout the site and will tie into the existing curbing along Main Street via a new curb cut towards the western side of the property frontage. The curbs will create islands where grass will be planted to increase the amount of pervious area on the site. The 6' tall chain link security fence will be installed on the site around the entirety of the accessible development. Retaining walls will be constructed on the east and west side of the site to improve the grading of the site allowing for level areas for the storage units and improved access around the site.

The proposed plan will provide 20' drive aisles throughout to create both vehicular and pedestrian accessibility to the storage units. The limit of work on the property is within the existing improvements proximity to the wetland. Appropriate signage will be put in place so the one-way traffic throughout the site can be easily followed. All proposed construction will not exceed a 25' no disturbance setback from Smith's Pond.

Electric services will be provided from a nearby utility pole and installed underground to a transformer on site which will provide electric service to all units. The existing water line will be reused to provide a hydrant in the proximity of the project entrance. The project does not require sewerage, gas or telecommunications.

In the pre-development condition, the site totals 46,351 square feet of total impervious surface. In the post-development condition, with the site and access reconfiguration, the site totals 41,236 square feet of total impervious surface. Therefore, the site is considered a redevelopment project with a total reduction of 5,115 square feet of impervious surface.

Zoning Summary

147 Main Street – Leicester, MA 01611
Map 23 Block E35 & E38
Parcel ID: 23C E35 0
Business & Residential 2 District
Proposed Use: Storage Facility

Dimensional Requirements Limited Industrial (IA)	Business District Requirements	Residential 2 Requirements	Proposed
Lot Area	15,000 SF	20,000 SF	124,581 SF
Lot Frontage	100 FT	125 FT	414 FT ±
Front Yard Setback	25 FT	25 FT	25 FT ±
Side Yard Setback	10 FT	15 FT	10 FT ± (B), 50 FT± (R2)
Rear Yard Setback	25 FT	25 FT	159 FT ±
Maximum Stories	2.5	2.5	1
Maximum Building Height	35 FT	35 FT	8 FT
Maximum Floor Area Ratio	N/A	N/A	N/A
Maximum Building Coverage	30%	30%	14.3%
Parking Requirements	Required		Proposed
Number of Parking Spaces	5 Spaces		**Parking is intended to be parallel adjacent to the customer's storage unit. See parking proof plan for total spaces on site.**

Stormwater Management Standards

Standard 1: No new untreated discharges

The Massachusetts Stormwater Handbook requires that the project demonstrates that no new stormwater conveyances (e.g., outfalls) discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

The project will not discharge untreated stormwater to the wetland. All impervious surface on site will be captured and treated prior to discharge.

A flared-end section with rip rap is proposed at the outlet of both point discharges to prevent erosion to the slope down to the wetland.

Standard 2: Post-development peak discharge rates not to exceed pre-development peak discharge rates.

Post-development peak discharge rates do not exceed pre-development peak discharge rates and total runoff volumes for all storms. The proposed condition reduces rates by reducing on site impervious flowing toward the Analysis Points.

Storm Event	2-year	10-year	25-year	100-year
Pre-Development Rates (cfs) AP1 Volume (cf) (Smith's Pond)	2.99 9,272	5.85 18,170	7.69 24,046	10.53 33,383
Post-Development Rates (cfs) AP1 Volume (cf) (Smith's Pond)	2.83 9,195	5.39 17,448	7.08 22,970	9.75 31,851
Rate Reductions (cfs) **Volume Reductions (cf)**	**-0.16** **-77**	**-0.46** **-722**	**-0.61** **-1,076**	**-0.78** **-1,532**
Pre-Development Rates (cfs) AP2 Volume (cf) (Main Street)	0.27 947	0.43 1,510	0.52 1,861	0.67 2,405
Post-Development Rates (cfs) AP2 Volume (cf) (Main Street)	0.20 686	0.31 1,093	0.38 1,348	0.49 1,742
Rate Reductions (cfs) **Volume Reductions (cf)**	**-0.07** **-261**	**-0.12** **-417**	**-0.14** **-513**	**-0.18** **-663**

Standard 3: Minimize or eliminate loss of annual recharge to groundwater.

This site is a redevelopment site resulting in an impervious reduction of 5,115 SF in the post-development condition as compared to the pre-development condition. In adding green spaces, water will naturally recharge in place in greater amounts than currently exists on site.

Standard 4: Stormwater management system to remove 80% of the average annual load of Total Suspended Solids (TSS)

Due to the overall reduction in site impervious, the project qualifies as a redevelopment site under the Massachusetts Stormwater Standards. For new developments, projects are required to remove 90% of total suspended solids (TSS) on site. For redevelopment projects, projects are required to meet this requirement to the maximum extent practicable. The stormwater management system is designed to remove greater than 85% average annual load of TSS on site. Values taken from the Massachusetts Stormwater Manual.

TSS REMOVAL CALCULATION

TREATMENT TRAIN – CDS UNIT 1

Area of Impervious = 4,954 SF

- CDS 2015-4*
  - 100% * 93% = 93% *Removed*
  - 100% - 93% = 7% *Remaining*

TSS Removal of the proposed drainage = 93%

**see Appendix C for CDS TSS Removal information.*

TREATMENT TRAIN – CDS UNIT 2

Area of Impervious = 33,448 SF

- CDS 2015-4*
  - 100% * 89% = 89% *Removed*
  - 100% - 89% = 11% *Remaining*

TSS Removal of the proposed drainage = 89%

**see Appendix C for CDS TSS Removal information.*

Standard 5: Land uses with higher potential pollutant loads.

The development is not considered a land use that generally produces higher potential pollutant loads.

Standard 6: Stormwater discharges to critical areas

The development does not discharge to any critical areas.

Standard 7: Redevelopment projects

The project is considered a redevelopment project, with a total site impervious reduction of 5,115 SF.

Standard 8: Control construction-related impacts

The project will install erosion and sediment controls prior to any earthwork activity. Erosion control barriers will be placed down slope from the proposed construction to prevent erosion and sedimentation into the surrounding areas. The barriers will be maintained and inspected periodically during construction; sediment buildup will be removed, and any damaged barrier will be replaced as needed.

Standard 9: Long-term operation and maintenance plan

See Appendix A for the operation and maintenance requirements of the stormwater management system.

Standard 10: No illicit discharges

An illicit discharge compliance statement will be provided by the property owner under separate cover.

Appendix A – Long Term Pollution Prevention Plan

This Long-Term Pollution Prevention Plan (LTPPP) describes the approach for pollution prevention and related maintenance activities for ***21-69 Main Street, Leicester, MA*****.** In general, long-term pollution prevention and related maintenance activities will be conducted consistent with:

- The National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer System (MS4),
- MassDEP Stormwater Handbook

This LTPPP satisfies the requirements related to pollution prevention under Massachusetts Stormwater Standards 4, 5, 6, and 10.

Practices for Long-Term Pollution Prevention

For the facilities covered, long-term pollution prevention includes the following measures.

- *Good housekeeping;*
- *Storing materials and waste products inside or under cover;*
- *Vehicle washing;*
- *Routine inspections and maintenance of Stormwater Control Measures (SCM's);*
- *Spill prevention and response;*
- *Maintenance of lawns, gardens, and other landscaped areas;*
- *Storage and use of fertilizers, herbicides, and pesticides;*
- *Pet waste management; and*
- *Proper management of deicing chemicals and snow.*

Litter Pick-up

Safe N Lock Capital Partners, LLC, or whomever is contracted, both during and after construction, will conduct litter pick-up from the stormwater management facilities in conjunction with routine road maintenance activities.

Inspection and Maintenance of Stormwater Assets

Safe N Lock Capital Partners, LLC, or whomever is contracted, both during and after construction, will conduct inspection and maintenance of drainage infrastructure and the stormwater control measures (SCMs) in accordance with the O&M Plan, as described herein.

Maintenance of Landscaped Areas

Routine weeding and pruning will be conducted. Landscape maintenance is not to take place past limit of work on plans.

Snow and Ice Management

Snow and ice shall be stored within locations specified on the plan, and excess shall be hauled off site.

Parking Lot Sweeping

Routine sweeping of the parking lot with a brush-type street sweeper, will be conducted in accordance with standard Leicester practices. Sweeping will occur bi-annually in the spring and fall.

Prohibition of Illicit Discharges

The MassDEP Stormwater Management Standard 10 prohibits illicit discharges to the stormwater management system. Illicit discharges are discharges that do not consist entirely of stormwater, except for certain specified non-stormwater discharges.

In accordance with the existing MS4 permit and anticipated TS4 permit requirements, examples of discharges from the following sources are not considered illicit discharges:

- Firefighting activities*
- Foundation drains
- Water line flushing
- Footing drains
- Landscape irrigation
- Individual residential car washing
- Uncontaminated groundwater
- Rising groundwater
- Diverted stream flows
- Flows from riparian habitats/wetlands
- Potable water sources
- Dechlorinated swimming pool water
- Street wash waters
- Wash water from residential buildings (no detergents)
- Condensation from air conditioning units
- Run-on from private driveways caused by precipitation
- Lawn watering
- Water from crawl space pumps

*Water from firefighting activities is allowed and need only be addressed where they are identified as significant sources of pollutants to waters of the United States.

Based on plan review and confirmation in the field, there are no known or proposed illicit connections associated with 21-69 Main Street, Leicester.

Spill Prevention and Response

Response procedures will be implemented at the infiltration basin for any significant release of hazardous materials such as fuels, oils, or chemical materials to any stormwater inlet or the infiltration basin onsite.

Reportable quantities will immediately be reported to the applicable Federal, State, and local agencies as required by law. Reportable quantities of chemical, fuels, or oils are established under the Clean Water Act and enforced through MassDEP. The MassDEP Emergency

Response Program shall be immediately notified in accordance with required procedures for the report of a release (telephone (888) 304-1133).

In the case of a spill, applicable containment and clean-up procedures will be performed immediately. These procedures are implemented in accordance with the Unified Response Manual at the local level by first responders, which includes the Leicester local public safety departments (e.g., fire, police, public works, board of health). Spill material collected during the response will be promptly removed and disposed of in accordance with Federal, State, and local requirements. If necessary, a licensed emergency response contractor will assist in cleanup of releases depending on the amount of the release and the ability of the responsible party to perform the required response.

Contech CDS Unit (2015-4)

System Owner: Safe N Lock Capital Partners LLC, or future owner.

(See CDS Inspection and Maintenance Guide Attached)

CONTECH®
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CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. 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. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two 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 allows both sump cleanout and access outside the screen.

The CDS system 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 weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems 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 should be cleaned out immediately. 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 from the CDS system 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.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.3	3.0	0.9	1.3	1.0
CDS2020	5	1.3	3.5	1.1	1.3	1.0
CDS2025	5	1.3	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, earth stabilization and wastewater treament products. For information, visit www.ContechES.com or call 800.338.1122

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CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

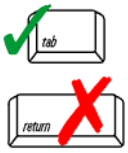
Appendix B – Massachusetts Stormwater Checklist

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- [X] No disturbance to any Wetland Resource Areas
- [ ] Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- [X] Reduced Impervious Area (Redevelopment Only)
- [ ] Minimizing disturbance to existing trees and shrubs
- [ ] LID Site Design Credit Requested:
  - [ ] Credit 1
  - [ ] Credit 2
  - [ ] Credit 3
- [ ] Use of "country drainage" versus curb and gutter conveyance and pipe
- [ ] Bioretention Cells (includes Rain Gardens)
- [ ] Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- [ ] Treebox Filter
- [ ] Water Quality Swale
- [ ] Grass Channel
- [ ] Green Roof
- [ ] Other (describe): _____

Standard 1: No New Untreated Discharges

- [X] No new untreated discharges
- [X] Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- [X] Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☒ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Appendix C: Contech CDS 2015-4 Supplemental Information

Hydrodynamic Separation Product Calculator

147 Main St Leicester

STC-1

CDS 2015-4

Project Information					
Project Name	147 Main St Leicester			**Option #**	A
Country	UNITED_STATES	**State**	Massachusetts	**City**	Leicester

Contact Information			
First Name	Kasey	**Last Name**	Ferreira
Company	Howard Stein Hudson	**Phone #**	978-844-5255
Email	Kferreira@hshassoc.com		

Design Criteria					
Site Designation	STC-1			**Sizing Method**	Net Annual
Screening Required?	Yes	**Drainage Area (ac)**	0.17	**Peak Flow (cfs)**	1.00
Groundwater Depth (ft)	0 - 5	**Pipe Invert Depth (ft)**	0 - 5	**Bedrock Depth (ft)**	5 - 10
Multiple Inlets?	No	**Grate Inlet Required?**	Yes	**Pipe Size (in)**	12.00
Required Particle Size Distribution?	No	**90° between two inlets?**	N/A	**180° between inlet and outlet?**	No
Runoff Coefficient	0.89	**Rainfall Station**	69 - Boston Airport, MA	**TC (Min)**	6

Treatment Selection					
Treatment Unit	CDS	**System Model**	2015-4		
Target Removal	80%	**Particle Size Distribution (PSD)**	125	**Predicted Net Annual Removal**	93.33%

CONTECH ENGINEERED SOLUTIONS

Hydrodynamic Separation Product Calculator

147 Main St Leicester

STC-1

CDS 2015-4

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 (%)
0.0200	10.17%	10.17%	10.17%	0.0030	0.0030	0.43%	100.00%	10.17%
0.0400	9.65%	19.82%	9.65%	0.0061	0.0061	0.87%	100.00%	9.65%
0.0600	9.45%	29.27%	9.45%	0.0091	0.0091	1.30%	100.00%	9.45%
0.0800	7.74%	37.01%	7.74%	0.0121	0.0121	1.73%	100.00%	7.74%
0.1000	8.57%	45.58%	8.57%	0.0151	0.0151	2.16%	100.00%	8.57%
0.1200	6.30%	51.88%	6.30%	0.0182	0.0182	2.60%	100.00%	6.30%
0.1400	4.66%	56.54%	4.66%	0.0212	0.0212	3.03%	100.00%	4.66%
0.1600	4.64%	61.18%	4.64%	0.0242	0.0242	3.46%	100.00%	4.64%
0.1800	3.54%	64.72%	3.54%	0.0272	0.0272	3.89%	100.00%	3.54%
0.2000	4.34%	69.06%	4.34%	0.0303	0.0303	4.33%	100.00%	4.34%
0.2500	8.00%	77.06%	8.00%	0.0378	0.0378	5.40%	100.00%	8.00%
0.3000	5.59%	82.65%	5.59%	0.0454	0.0454	6.49%	100.00%	5.59%
0.3500	4.37%	87.02%	4.37%	0.0530	0.0530	7.57%	99.90%	4.37%
0.4000	2.53%	89.55%	2.53%	0.0605	0.0605	8.64%	99.68%	2.52%
0.4500	2.53%	92.08%	2.53%	0.0681	0.0681	9.73%	99.46%	2.52%
0.5000	1.38%	93.46%	1.38%	0.0757	0.0757	10.81%	99.25%	1.37%
0.7500	5.04%	98.50%	5.04%	0.1135	0.1135	16.21%	98.17%	4.95%
1.0000	1.01%	99.51%	1.01%	0.1513	0.1513	21.61%	97.09%	0.98%
1.5000	0.00%	99.51%	0.00%	0.2270	0.2270	32.43%	94.92%	0.00%
2.0000	0.00%	99.51%	0.00%	0.3026	0.3026	43.23%	92.76%	0.00%
3.0000	0.48%	99.99%	0.48%	0.4539	0.4539	64.84%	88.44%	0.42%
								99.78%
							Removal Efficiency Adjustment[2] =	6.45%
							Predicted % Annual Rainfall Treated =	93.54%
							Predicted Net Annual Load Removal Efficiency =	93.33%

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA

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.

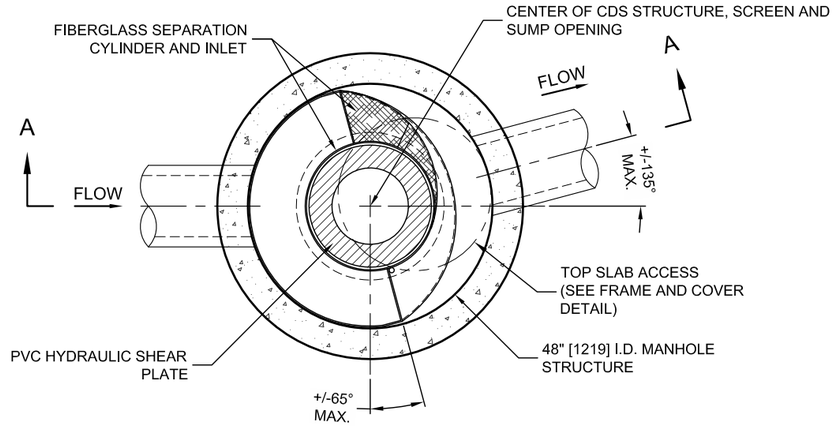
4.3 The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent 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.

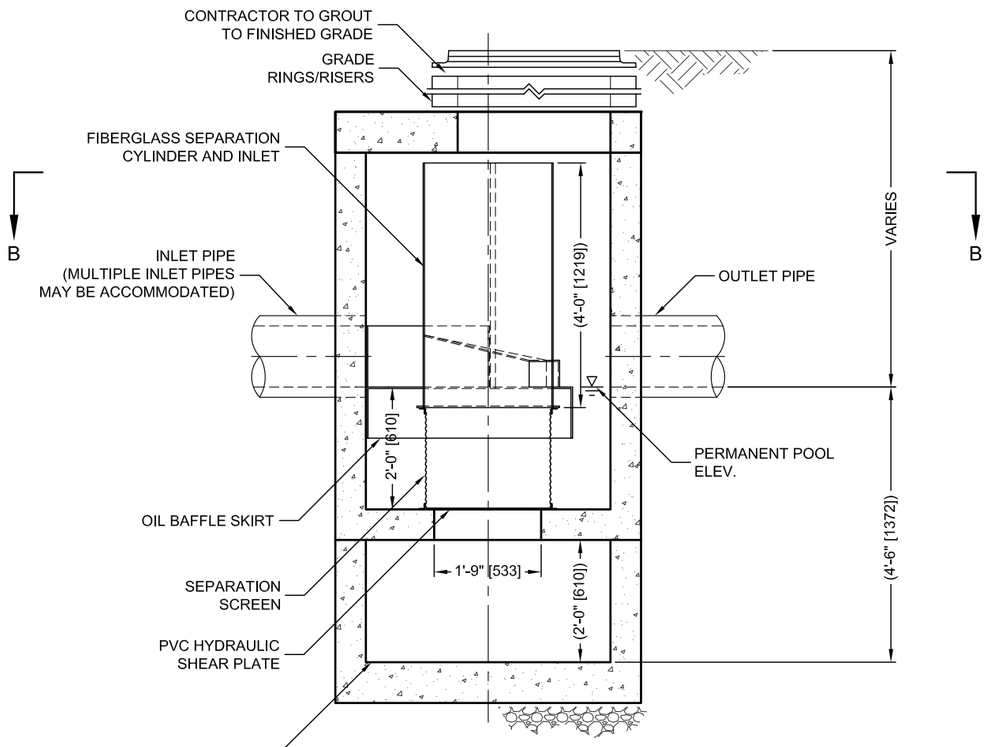
TABLE 1
Storm Water Treatment Device
Storage Capacities

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)

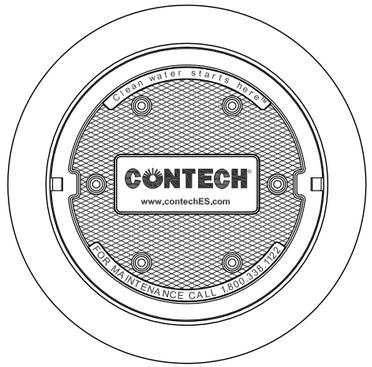
END OF SECTION



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
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

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

Hydrodynamic Separation Product Calculator

147 Main St Leicester

STC-2

CDS 2015-4

Project Information					
Project Name	147 Main St Leicester			**Option #**	A
Country	UNITED_STATES	**State**	Massachusetts	**City**	Leicester

Contact Information			
First Name	Kasey	**Last Name**	Ferreira
Company	Howard Stein Hudson	**Phone #**	978-844-5255
Email	Kferreira@hshassoc.com		

Design Criteria					
Site Designation	STC-2			**Sizing Method**	Net Annual
Screening Required?	Yes	**Drainage Area (ac)**	1.02	**Peak Flow (cfs)**	1.00
Groundwater Depth (ft)	0 - 5	**Pipe Invert Depth (ft)**	0 - 5	**Bedrock Depth (ft)**	5 - 10
Multiple Inlets?	No	**Grate Inlet Required?**	Yes	**Pipe Size (in)**	12.00
Required Particle Size Distribution?	No	**90° between two inlets?**	N/A	**180° between inlet and outlet?**	No
Runoff Coefficient	0.89	**Rainfall Station**	69 - Boston Airport, MA	**TC (Min)**	6

Treatment Selection					
Treatment Unit	CDS	**System Model**	2015-4		
Target Removal	80%	**Particle Size Distribution (PSD)**	125	**Predicted Net Annual Removal**	89.33%

CONTECH ENGINEERED SOLUTIONS

Hydrodynamic Separation Product Calculator

147 Main St Leicester

STC-2

CDS 2015-4

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 (%)
0.0200	10.17%	10.17%	10.17%	0.0182	0.0182	2.60%	100.00%	10.17%
0.0400	9.65%	19.82%	9.65%	0.0363	0.0363	5.19%	100.00%	9.65%
0.0600	9.45%	29.27%	9.45%	0.0545	0.0545	7.79%	99.85%	9.44%
0.0800	7.74%	37.01%	7.74%	0.0726	0.0726	10.37%	99.33%	7.69%
0.1000	8.57%	45.58%	8.57%	0.0908	0.0908	12.97%	98.81%	8.47%
0.1200	6.30%	51.88%	6.30%	0.1089	0.1089	15.56%	98.30%	6.19%
0.1400	4.66%	56.54%	4.66%	0.1271	0.1271	18.16%	97.78%	4.56%
0.1600	4.64%	61.18%	4.64%	0.1452	0.1452	20.74%	97.26%	4.51%
0.1800	3.54%	64.72%	3.54%	0.1634	0.1634	23.34%	96.74%	3.42%
0.2000	4.34%	69.06%	4.34%	0.1816	0.1816	25.94%	96.22%	4.18%
0.2500	8.00%	77.06%	8.00%	0.2270	0.2270	32.43%	94.92%	7.59%
0.3000	5.59%	82.65%	5.59%	0.2723	0.2723	38.90%	93.63%	5.23%
0.3500	4.37%	87.02%	4.37%	0.3177	0.3177	45.39%	92.33%	4.03%
0.4000	2.53%	89.55%	2.53%	0.3631	0.3631	51.87%	91.03%	2.30%
0.4500	2.53%	92.08%	2.53%	0.4085	0.4085	58.36%	89.73%	2.27%
0.5000	1.38%	93.46%	1.38%	0.4539	0.4539	64.84%	88.44%	1.22%
0.7500	5.04%	98.50%	5.04%	0.6809	0.6809	97.27%	81.95%	4.13%
1.0000	1.01%	99.51%	0.78%	0.9078	0.7000	100.00%	62.77%	0.63%
1.5000	0.00%	99.51%	0.00%	1.3617	0.7000	100.00%	41.84%	0.00%
2.0000	0.00%	99.51%	0.00%	1.8156	0.7000	100.00%	31.38%	0.00%
3.0000	0.48%	99.99%	0.12%	2.7234	0.7000	100.00%	20.92%	0.10%
								95.78%
							Removal Efficiency Adjustment[2] =	6.45%
							Predicted % Annual Rainfall Treated =	92.95%
							Predicted Net Annual Load Removal Efficiency =	89.33%
1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA								
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.

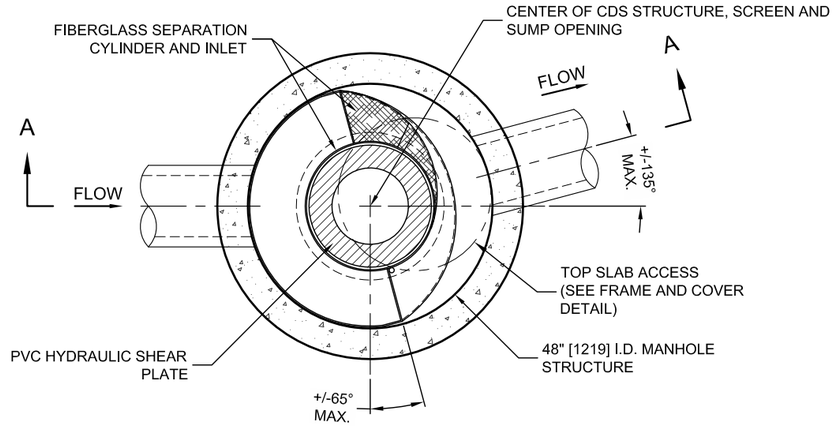
4.3 The contractor shall fill all voids associated with lifting provisions provided by the manufacturer. These voids shall be filled with non-shrinking grout providing a finished surface consistent with adjacent surfaces. The contractor shall trim all protruding lifting provisions flush with the adjacent 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.

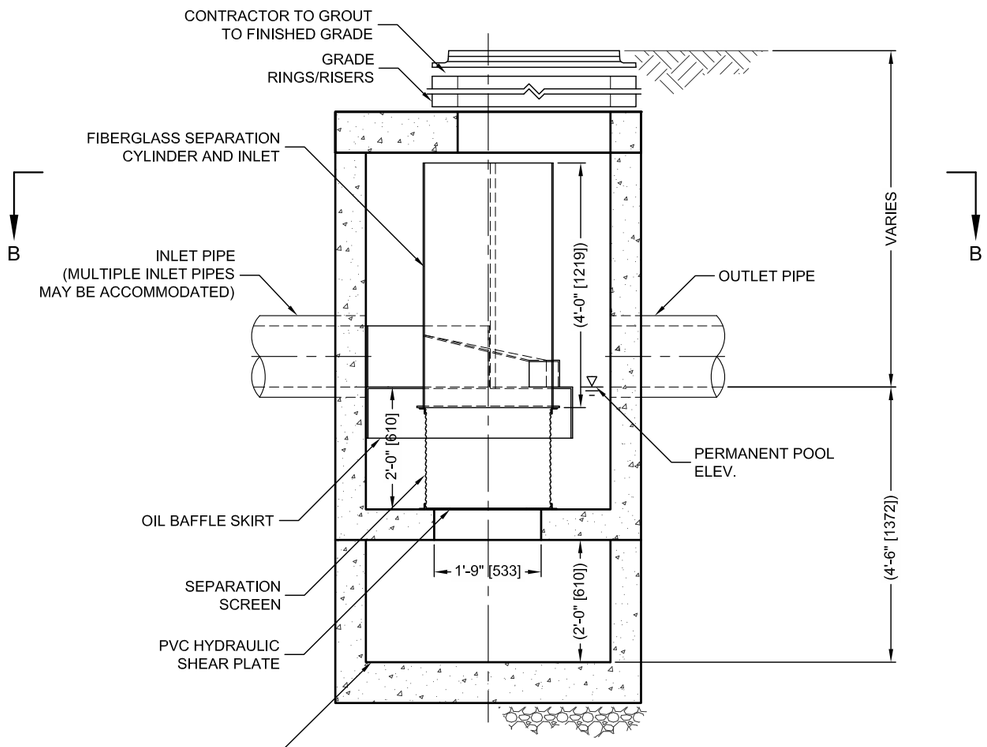
TABLE 1
Storm Water Treatment Device
Storage Capacities

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)

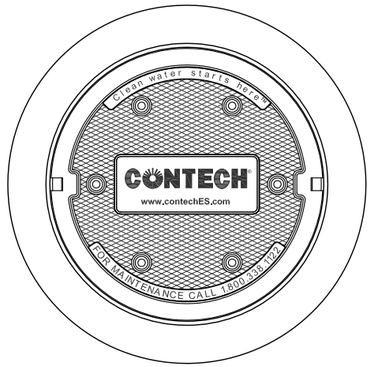
END OF SECTION



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
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

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

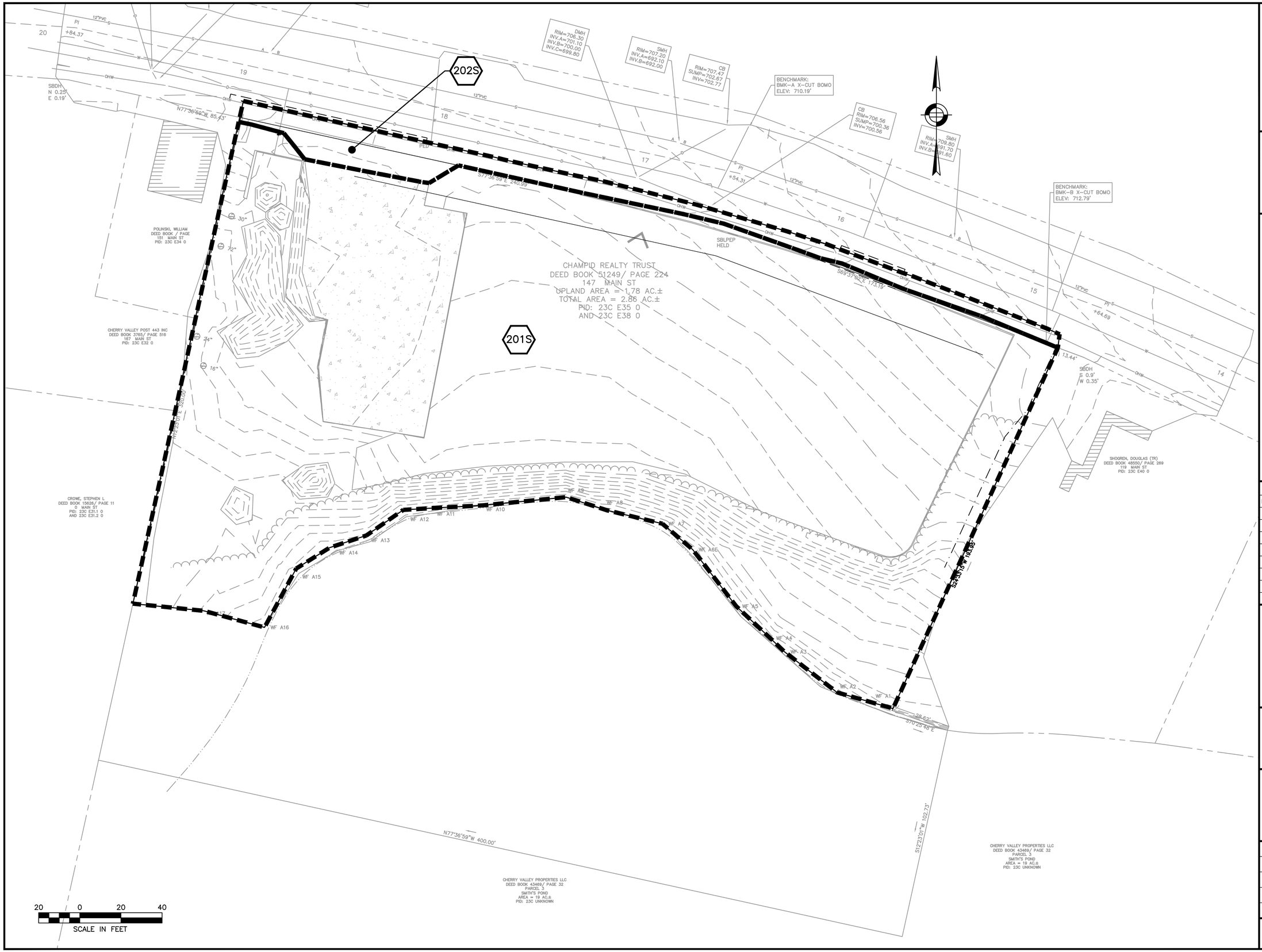
GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE.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

Appendix D: Pre- and Post-development Watershed Plans



HOWARD STEIN HUDSON
370 Main Street
Worcester, MA 01608
www.hshassoc.com

PREPARED FOR:

SAFE N LOCK CAPITAL PARTNERS LLC
3333 NEW HYDE PARK ROAD
SUITE 200
LAKE SUCCESS, NY 11042

PROPOSED SELF-STORAGE
147 MAIN STREET
LEICESTER, MA, 01611
WORCESTER COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION

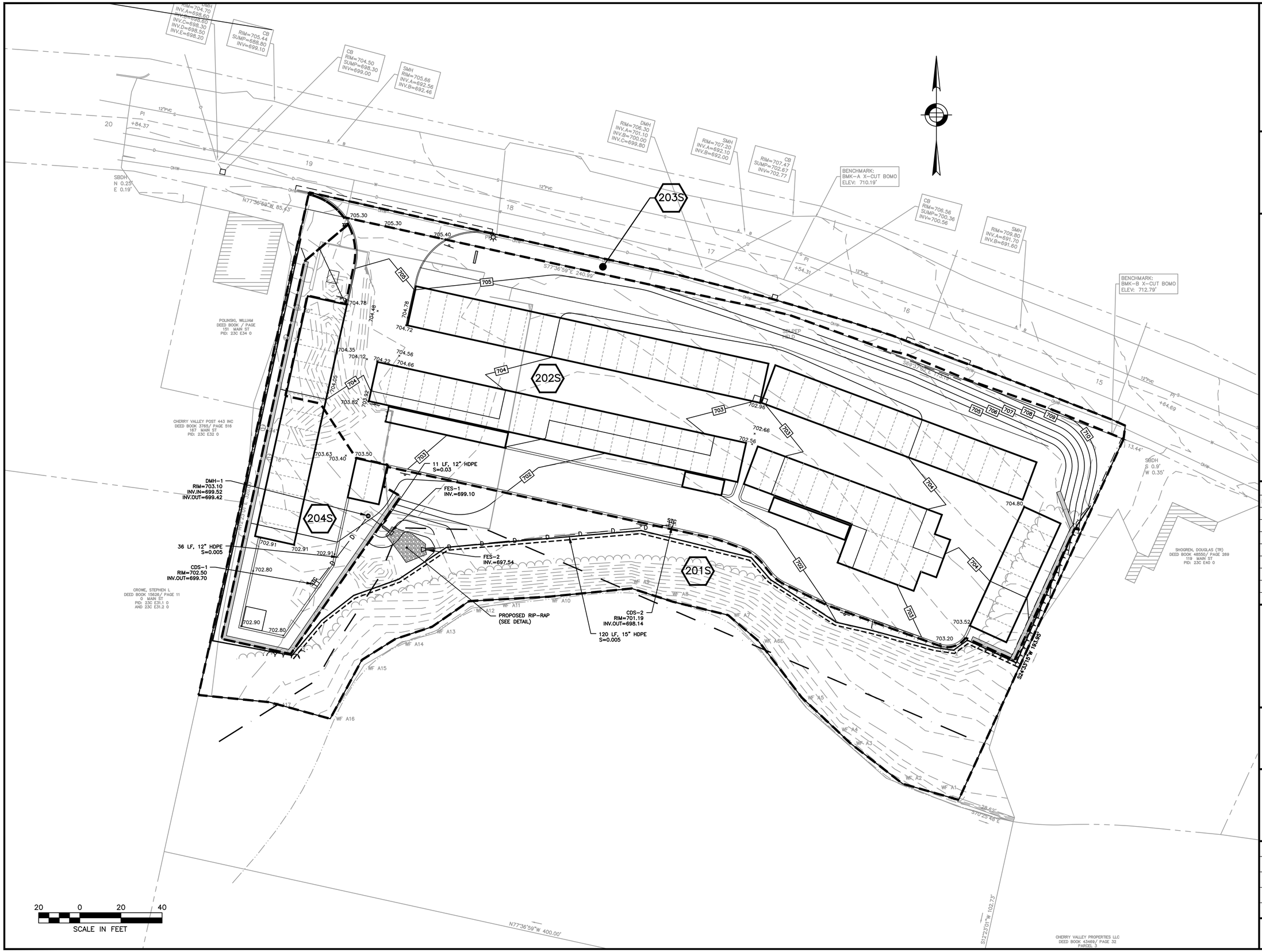
SITE
PLAN

PRE DEVELOPMENT DRAINAGE PLAN

DATE:	NOVEMBER 22, 2022
PROJECT NUMBER:	21084.00
DESIGNED BY:	KF
DRAWN BY:	KF/KF
CHECKED BY:	KE

C.1

1/22/2022 L:\21084\21084.00\21084.00 Drainage.dwg
Last Saved by: KMercier
Printed by: Kasey Ferreira



HOWARD STEIN HUDSON
370 Main Street
Worcester, MA 01608
www.hshassoc.com

PREPARED FOR:

SAFE N LOCK CAPITAL PARTNERS LLC
3333 NEW HYDE PARK ROAD
SUITE 200
LAKE SUCCESS, NY 11042

PROPOSED SELF-STORAGE

147 MAIN STREET
LEICESTER, MA, 01611
WORCESTER COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION

SITE
PLAN

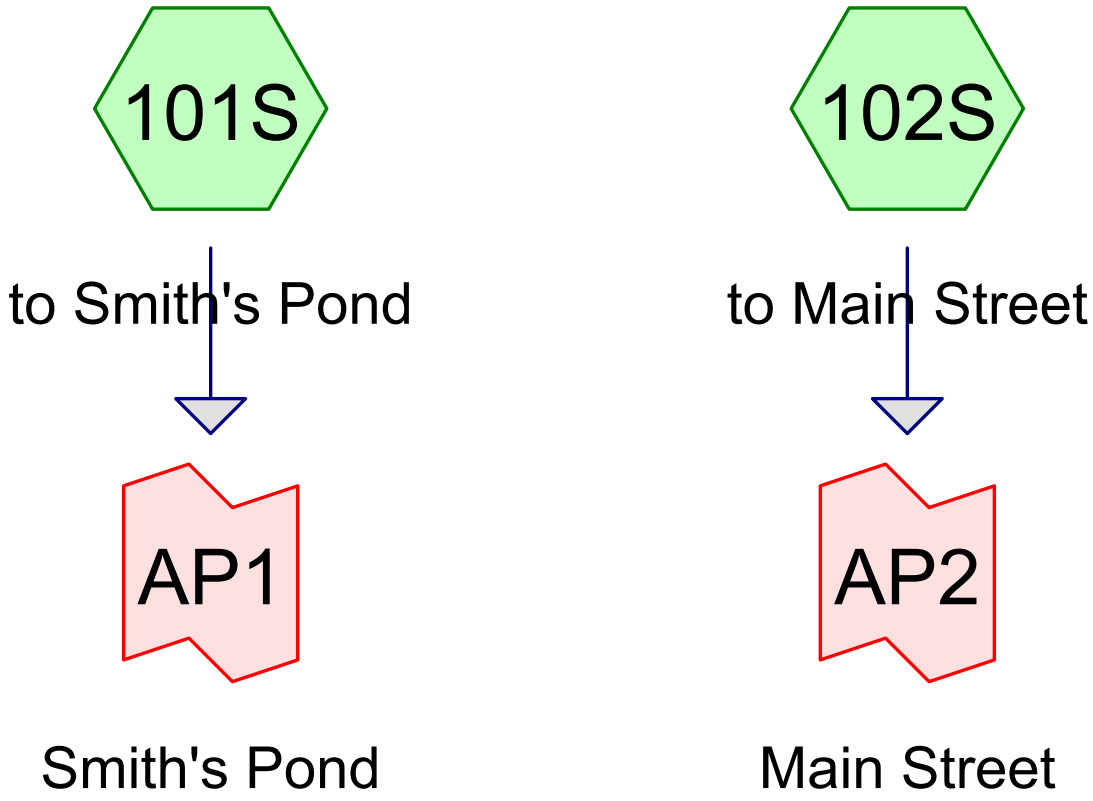
POST
DEVELOPMENT
DRAINAGE PLAN

DATE:	NOVEMBER 22, 2022
PROJECT NUMBER:	21084.00
DESIGNED BY:	KF
DRAWN BY:	KF/MR
CHECKED BY:	KE

C.2

11/22/2022 - L:\21084\21084.00\21084.00 Drainage.dwg
Last Saved by: KFerreira
Printed by: Kasey Ferreira

Appendix E: HydroCAD Report



Subcat Reach Pond Link

Routing Diagram for 21084 Pre 147 Main
Prepared by Howard Stein Hudson Associates, Printed 11/22/2022

Project Notes

Rainfall events imported from "21084 Drainage Post.hcp"
Rainfall events imported from "21084 Post 147 Main.hcp"

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.14	2
2	10-year	Type III 24-hr		Default	24.00	1	4.87	2
3	25-year	Type III 24-hr		Default	24.00	1	5.95	2
4	100-year	Type III 24-hr		Default	24.00	1	7.62	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
11,898	61	>75% Grass cover, Good, HSG B (101S)
2,820	96	Gravel surface, HSG B (101S)
46,351	98	Paved parking, HSG B (101S, 102S)
14,253	55	Woods, Good, HSG B (101S)
75,322	**84**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
75,322	HSG B	101S, 102S
0	HSG C	
0	HSG D	
0	Other	
75,322		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	11,898	0	0	0	11,898	>75% Grass cover, Good	
0	2,820	0	0	0	2,820	Gravel surface	
0	46,351	0	0	0	46,351	Paved parking	
0	14,253	0	0	0	14,253	Woods, Good	
0	**75,322**	**0**	**0**	**0**	**75,322**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 101S: to Smith's Pond Runoff Area=71,409 sf 59.43% Impervious Runoff Depth>1.56"
Tc=6.0 min CN=83 Runoff=2.99 cfs 9,272 cf

Subcatchment 102S: to Main Street Runoff Area=3,913 sf 100.00% Impervious Runoff Depth>2.91"
Tc=6.0 min CN=98 Runoff=0.27 cfs 947 cf

Link AP1: Smith's Pond Inflow=2.99 cfs 9,272 cf
Primary=2.99 cfs 9,272 cf

Link AP2: Main Street Inflow=0.27 cfs 947 cf
Primary=0.27 cfs 947 cf

Total Runoff Area = 75,322 sf Runoff Volume = 10,220 cf Average Runoff Depth = 1.63"
38.46% Pervious = 28,971 sf 61.54% Impervious = 46,351 sf

Summary for Subcatchment 101S: to Smith's Pond

Runoff = 2.99 cfs @ 12.09 hrs, Volume= 9,272 cf, Depth> 1.56"
Routed to Link AP1 : Smith's Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.14"

Area (sf)	CN	Description
42,438	98	Paved parking, HSG B
2,820	96	Gravel surface, HSG B
11,898	61	>75% Grass cover, Good, HSG B
14,253	55	Woods, Good, HSG B
71,409	83	Weighted Average
28,971		40.57% Pervious Area
42,438		59.43% Impervious Area

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

Summary for Subcatchment 102S: to Main Street

Runoff = 0.27 cfs @ 12.08 hrs, Volume= 947 cf, Depth> 2.91"
Routed to Link AP2 : Main Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.14"

Area (sf)	CN	Description
3,913	98	Paved parking, HSG B
3,913		100.00% Impervious Area

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

Summary for Link AP1: Smith's Pond

Inflow Area = 71,409 sf, 59.43% Impervious, Inflow Depth > 1.56" for 2-year event
Inflow = 2.99 cfs @ 12.09 hrs, Volume= 9,272 cf
Primary = 2.99 cfs @ 12.09 hrs, Volume= 9,272 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link AP2: Main Street

Inflow Area = 3,913 sf,100.00% Impervious, Inflow Depth > 2.91" for 2-year event
Inflow = 0.27 cfs @ 12.08 hrs, Volume= 947 cf
Primary = 0.27 cfs @ 12.08 hrs, Volume= 947 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 101S: to Smith's Pond Runoff Area=71,409 sf 59.43% Impervious Runoff Depth>3.05"
Tc=6.0 min CN=83 Runoff=5.85 cfs 18,170 cf

Subcatchment 102S: to Main Street Runoff Area=3,913 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.43 cfs 1,510 cf

Link AP1: Smith's Pond Inflow=5.85 cfs 18,170 cf
Primary=5.85 cfs 18,170 cf

Link AP2: Main Street Inflow=0.43 cfs 1,510 cf
Primary=0.43 cfs 1,510 cf

Total Runoff Area = 75,322 sf Runoff Volume = 19,680 cf Average Runoff Depth = 3.14"
38.46% Pervious = 28,971 sf 61.54% Impervious = 46,351 sf

Summary for Subcatchment 101S: to Smith's Pond

Runoff = 5.85 cfs @ 12.09 hrs, Volume= 18,170 cf, Depth> 3.05"
Routed to Link AP1 : Smith's Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.87"

Area (sf)	CN	Description
42,438	98	Paved parking, HSG B
2,820	96	Gravel surface, HSG B
11,898	61	>75% Grass cover, Good, HSG B
14,253	55	Woods, Good, HSG B
71,409	83	Weighted Average
28,971		40.57% Pervious Area
42,438		59.43% Impervious Area

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

Summary for Subcatchment 102S: to Main Street

Runoff = 0.43 cfs @ 12.08 hrs, Volume= 1,510 cf, Depth> 4.63"
Routed to Link AP2 : Main Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.87"

Area (sf)	CN	Description
3,913	98	Paved parking, HSG B
3,913		100.00% Impervious Area

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

Summary for Link AP1: Smith's Pond

Inflow Area = 71,409 sf, 59.43% Impervious, Inflow Depth > 3.05" for 10-year event
Inflow = 5.85 cfs @ 12.09 hrs, Volume= 18,170 cf
Primary = 5.85 cfs @ 12.09 hrs, Volume= 18,170 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link AP2: Main Street

Inflow Area = 3,913 sf,100.00% Impervious, Inflow Depth > 4.63" for 10-year event
Inflow = 0.43 cfs @ 12.08 hrs, Volume= 1,510 cf
Primary = 0.43 cfs @ 12.08 hrs, Volume= 1,510 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 101S: to Smith's Pond Runoff Area=71,409 sf 59.43% Impervious Runoff Depth>4.04"
Tc=6.0 min CN=83 Runoff=7.69 cfs 24,046 cf

Subcatchment 102S: to Main Street Runoff Area=3,913 sf 100.00% Impervious Runoff Depth>5.71"
Tc=6.0 min CN=98 Runoff=0.52 cfs 1,861 cf

Link AP1: Smith's Pond Inflow=7.69 cfs 24,046 cf
Primary=7.69 cfs 24,046 cf

Link AP2: Main Street Inflow=0.52 cfs 1,861 cf
Primary=0.52 cfs 1,861 cf

Total Runoff Area = 75,322 sf Runoff Volume = 25,907 cf Average Runoff Depth = 4.13"
38.46% Pervious = 28,971 sf 61.54% Impervious = 46,351 sf

Summary for Subcatchment 101S: to Smith's Pond

Runoff = 7.69 cfs @ 12.09 hrs, Volume= 24,046 cf, Depth> 4.04"
Routed to Link AP1 : Smith's Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=5.95"

Area (sf)	CN	Description
42,438	98	Paved parking, HSG B
2,820	96	Gravel surface, HSG B
11,898	61	>75% Grass cover, Good, HSG B
14,253	55	Woods, Good, HSG B
71,409	83	Weighted Average
28,971		40.57% Pervious Area
42,438		59.43% Impervious Area

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

Summary for Subcatchment 102S: to Main Street

Runoff = 0.52 cfs @ 12.08 hrs, Volume= 1,861 cf, Depth> 5.71"
Routed to Link AP2 : Main Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=5.95"

Area (sf)	CN	Description
3,913	98	Paved parking, HSG B
3,913		100.00% Impervious Area

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

Summary for Link AP1: Smith's Pond

Inflow Area = 71,409 sf, 59.43% Impervious, Inflow Depth > 4.04" for 25-year event
Inflow = 7.69 cfs @ 12.09 hrs, Volume= 24,046 cf
Primary = 7.69 cfs @ 12.09 hrs, Volume= 24,046 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link AP2: Main Street

Inflow Area = 3,913 sf,100.00% Impervious, Inflow Depth > 5.71" for 25-year event
Inflow = 0.52 cfs @ 12.08 hrs, Volume= 1,861 cf
Primary = 0.52 cfs @ 12.08 hrs, Volume= 1,861 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 101S: to Smith's Pond Runoff Area=71,409 sf 59.43% Impervious Runoff Depth>5.61"
Tc=6.0 min CN=83 Runoff=10.53 cfs 33,383 cf

Subcatchment 102S: to Main Street Runoff Area=3,913 sf 100.00% Impervious Runoff Depth>7.37"
Tc=6.0 min CN=98 Runoff=0.67 cfs 2,405 cf

Link AP1: Smith's Pond Inflow=10.53 cfs 33,383 cf
Primary=10.53 cfs 33,383 cf

Link AP2: Main Street Inflow=0.67 cfs 2,405 cf
Primary=0.67 cfs 2,405 cf

Total Runoff Area = 75,322 sf Runoff Volume = 35,787 cf Average Runoff Depth = 5.70"
38.46% Pervious = 28,971 sf 61.54% Impervious = 46,351 sf

Summary for Subcatchment 101S: to Smith's Pond

Runoff = 10.53 cfs @ 12.09 hrs, Volume= 33,383 cf, Depth> 5.61"
Routed to Link AP1 : Smith's Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.62"

Area (sf)	CN	Description
42,438	98	Paved parking, HSG B
2,820	96	Gravel surface, HSG B
11,898	61	>75% Grass cover, Good, HSG B
14,253	55	Woods, Good, HSG B
71,409	83	Weighted Average
28,971		40.57% Pervious Area
42,438		59.43% Impervious Area

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

Summary for Subcatchment 102S: to Main Street

Runoff = 0.67 cfs @ 12.08 hrs, Volume= 2,405 cf, Depth> 7.37"
Routed to Link AP2 : Main Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.62"

Area (sf)	CN	Description
3,913	98	Paved parking, HSG B
3,913		100.00% Impervious Area

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

Summary for Link AP1: Smith's Pond

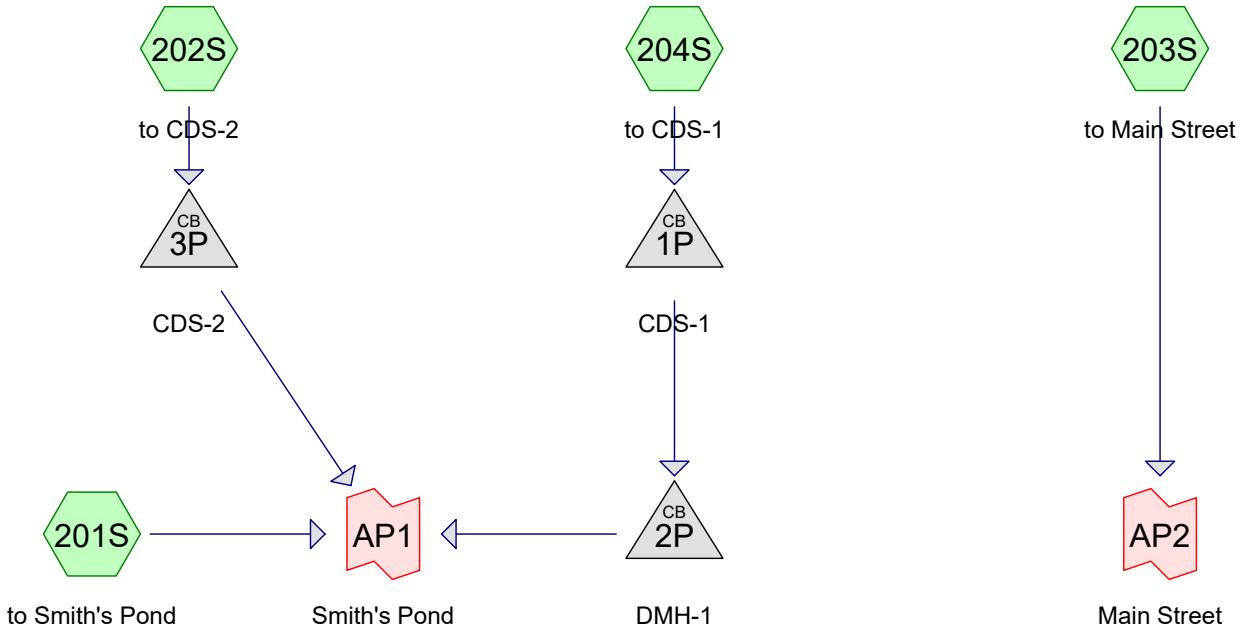
Inflow Area = 71,409 sf, 59.43% Impervious, Inflow Depth > 5.61" for 100-year event
Inflow = 10.53 cfs @ 12.09 hrs, Volume= 33,383 cf
Primary = 10.53 cfs @ 12.09 hrs, Volume= 33,383 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link AP2: Main Street

Inflow Area = 3,913 sf,100.00% Impervious, Inflow Depth > 7.37" for 100-year event
Inflow = 0.67 cfs @ 12.08 hrs, Volume= 2,405 cf
Primary = 0.67 cfs @ 12.08 hrs, Volume= 2,405 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs



Subcat Reach Pond Link

Routing Diagram for 21084 Post 147 Main

Prepared by Howard Stein Hudson Associates, Printed 11/22/2022

Project Notes

Rainfall events imported from "21084 Drainage Post.hcp"

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.14	2
2	10-year	Type III 24-hr		Default	24.00	1	4.87	2
3	25-year	Type III 24-hr		Default	24.00	1	5.95	2
4	100-year	Type III 24-hr		Default	24.00	1	7.62	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
20,386	61	>75% Grass cover, Good, HSG B (201S, 202S, 204S)
1,030	96	Gravel surface, HSG B (202S, 204S)
23,476	98	Paved parking, HSG B (202S, 203S, 204S)
17,760	98	Roofs, HSG B (202S, 204S)
12,670	55	Woods, Good, HSG B (201S)
75,322	**81**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
75,322	HSG B	201S, 202S, 203S, 204S
0	HSG C	
0	HSG D	
0	Other	
75,322		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	20,386	0	0	0	20,386	>75% Grass cover, Good	
0	1,030	0	0	0	1,030	Gravel surface	
0	23,476	0	0	0	23,476	Paved parking	
0	17,760	0	0	0	17,760	Roofs	
0	12,670	0	0	0	12,670	Woods, Good	
0	**75,322**	**0**	**0**	**0**	**75,322**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	1P	699.70	699.52	36.0	0.0050	0.013	0.0	12.0	0.0
2	2P	699.42	699.10	11.0	0.0291	0.013	0.0	12.0	0.0
3	3P	698.14	697.54	120.0	0.0050	0.013	0.0	15.0	0.0

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 201S: to Smith's Pond Runoff Area=20,989 sf 0.00% Impervious Runoff Depth>0.29"
Tc=6.0 min CN=57 Runoff=0.06 cfs 506 cf

Subcatchment 202S: to CDS-2 Runoff Area=44,457 sf 75.24% Impervious Runoff Depth>2.02"
Tc=6.0 min CN=89 Runoff=2.41 cfs 7,501 cf

Subcatchment 203S: to Main Street Runoff Area=2,834 sf 100.00% Impervious Runoff Depth>2.91"
Tc=6.0 min CN=98 Runoff=0.20 cfs 686 cf

Subcatchment 204S: to CDS-1 Runoff Area=7,042 sf 70.35% Impervious Runoff Depth>2.02"
Tc=6.0 min CN=89 Runoff=0.38 cfs 1,188 cf

Pond 1P: CDS-1 Peak Elev=700.07' Inflow=0.38 cfs 1,188 cf
12.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=0.38 cfs 1,188 cf

Pond 2P: DMH-1 Peak Elev=699.73' Inflow=0.38 cfs 1,188 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0291 '/' Outflow=0.38 cfs 1,188 cf

Pond 3P: CDS-2 Peak Elev=699.04' Inflow=2.41 cfs 7,501 cf
15.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=2.41 cfs 7,501 cf

Link AP1: Smith's Pond Inflow=2.83 cfs 9,195 cf
Primary=2.83 cfs 9,195 cf

Link AP2: Main Street Inflow=0.20 cfs 686 cf
Primary=0.20 cfs 686 cf

Total Runoff Area = 75,322 sf Runoff Volume = 9,881 cf Average Runoff Depth = 1.57"
45.25% Pervious = 34,086 sf 54.75% Impervious = 41,236 sf

Summary for Subcatchment 201S: to Smith's Pond

Runoff = 0.06 cfs @ 12.30 hrs, Volume= 506 cf, Depth> 0.29"
Routed to Link AP1 : Smith's Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.14"

Area (sf)	CN	Description
8,319	61	>75% Grass cover, Good, HSG B
12,670	55	Woods, Good, HSG B
20,989	57	Weighted Average
20,989		100.00% Pervious Area

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

Summary for Subcatchment 202S: to CDS-2

Runoff = 2.41 cfs @ 12.09 hrs, Volume= 7,501 cf, Depth> 2.02"
Routed to Pond 3P : CDS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.14"

Area (sf)	CN	Description
17,401	98	Paved parking, HSG B
670	96	Gravel surface, HSG B
10,339	61	>75% Grass cover, Good, HSG B
16,047	98	Roofs, HSG B
44,457	89	Weighted Average
11,009		24.76% Pervious Area
33,448		75.24% Impervious Area

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

Summary for Subcatchment 203S: to Main Street

Runoff = 0.20 cfs @ 12.08 hrs, Volume= 686 cf, Depth> 2.91"
Routed to Link AP2 : Main Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.14"

Area (sf)	CN	Description
2,834	98	Paved parking, HSG B
2,834		100.00% Impervious Area

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

Summary for Subcatchment 204S: to CDS-1

Runoff = 0.38 cfs @ 12.09 hrs, Volume= 1,188 cf, Depth> 2.02"
Routed to Pond 1P : CDS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.14"

Area (sf)	CN	Description
3,241	98	Paved parking, HSG B
360	96	Gravel surface, HSG B
1,728	61	>75% Grass cover, Good, HSG B
1,713	98	Roofs, HSG B
7,042	89	Weighted Average
2,088		29.65% Pervious Area
4,954		70.35% Impervious Area

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

Summary for Pond 1P: CDS-1

Inflow Area = 7,042 sf, 70.35% Impervious, Inflow Depth > 2.02" for 2-year event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,188 cf
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 1,188 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,188 cf
Routed to Pond 2P : DMH-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 700.07' @ 12.09 hrs
Flood Elev= 702.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	699.70'	**12.0" Round Culvert** L= 36.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 699.70' / 699.52' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.38 cfs @ 12.09 hrs HW=700.07' TW=699.73' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.38 cfs @ 2.12 fps)

Summary for Pond 2P: DMH-1

Inflow Area = 7,042 sf, 70.35% Impervious, Inflow Depth > 2.02" for 2-year event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,188 cf
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 1,188 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,188 cf
Routed to Link AP1 : Smith's Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 699.73' @ 12.09 hrs
Flood Elev= 703.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	699.42'	**12.0" Round Culvert** L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 699.42' / 699.10' S= 0.0291 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.38 cfs @ 12.09 hrs HW=699.73' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.38 cfs @ 1.88 fps)

Summary for Pond 3P: CDS-2

Inflow Area = 44,457 sf, 75.24% Impervious, Inflow Depth > 2.02" for 2-year event
Inflow = 2.41 cfs @ 12.09 hrs, Volume= 7,501 cf
Outflow = 2.41 cfs @ 12.09 hrs, Volume= 7,501 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.41 cfs @ 12.09 hrs, Volume= 7,501 cf
Routed to Link AP1 : Smith's Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 699.04' @ 12.09 hrs
Flood Elev= 701.19'

Device	Routing	Invert	Outlet Devices
#1	Primary	698.14'	**15.0" Round Culvert** L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 698.14' / 697.54' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.41 cfs @ 12.09 hrs HW=699.04' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.41 cfs @ 3.58 fps)

Summary for Link AP1: Smith's Pond

Inflow Area = 72,488 sf, 52.98% Impervious, Inflow Depth > 1.52" for 2-year event
Inflow = 2.83 cfs @ 12.09 hrs, Volume= 9,195 cf
Primary = 2.83 cfs @ 12.09 hrs, Volume= 9,195 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link AP2: Main Street

Inflow Area = 2,834 sf,100.00% Impervious, Inflow Depth > 2.91" for 2-year event
Inflow = 0.20 cfs @ 12.08 hrs, Volume= 686 cf
Primary = 0.20 cfs @ 12.08 hrs, Volume= 686 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 201S: to Smith's Pond Runoff Area=20,989 sf 0.00% Impervious Runoff Depth>1.03"
Tc=6.0 min CN=57 Runoff=0.49 cfs 1,809 cf

Subcatchment 202S: to CDS-2 Runoff Area=44,457 sf 75.24% Impervious Runoff Depth>3.64"
Tc=6.0 min CN=89 Runoff=4.25 cfs 13,500 cf

Subcatchment 203S: to Main Street Runoff Area=2,834 sf 100.00% Impervious Runoff Depth>4.63"
Tc=6.0 min CN=98 Runoff=0.31 cfs 1,093 cf

Subcatchment 204S: to CDS-1 Runoff Area=7,042 sf 70.35% Impervious Runoff Depth>3.64"
Tc=6.0 min CN=89 Runoff=0.67 cfs 2,138 cf

Pond 1P: CDS-1 Peak Elev=700.21' Inflow=0.67 cfs 2,138 cf
12.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=0.67 cfs 2,138 cf

Pond 2P: DMH-1 Peak Elev=699.83' Inflow=0.67 cfs 2,138 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0291 '/' Outflow=0.67 cfs 2,138 cf

Pond 3P: CDS-2 Peak Elev=699.47' Inflow=4.25 cfs 13,500 cf
15.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=4.25 cfs 13,500 cf

Link AP1: Smith's Pond Inflow=5.39 cfs 17,448 cf
Primary=5.39 cfs 17,448 cf

Link AP2: Main Street Inflow=0.31 cfs 1,093 cf
Primary=0.31 cfs 1,093 cf

Total Runoff Area = 75,322 sf Runoff Volume = 18,541 cf Average Runoff Depth = 2.95"
45.25% Pervious = 34,086 sf 54.75% Impervious = 41,236 sf

Summary for Subcatchment 201S: to Smith's Pond

Runoff = 0.49 cfs @ 12.10 hrs, Volume= 1,809 cf, Depth> 1.03"
Routed to Link AP1 : Smith's Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.87"

Area (sf)	CN	Description
8,319	61	>75% Grass cover, Good, HSG B
12,670	55	Woods, Good, HSG B
20,989	57	Weighted Average
20,989		100.00% Pervious Area

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

Summary for Subcatchment 202S: to CDS-2

Runoff = 4.25 cfs @ 12.09 hrs, Volume= 13,500 cf, Depth> 3.64"
Routed to Pond 3P : CDS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.87"

Area (sf)	CN	Description
17,401	98	Paved parking, HSG B
670	96	Gravel surface, HSG B
10,339	61	>75% Grass cover, Good, HSG B
16,047	98	Roofs, HSG B
44,457	89	Weighted Average
11,009		24.76% Pervious Area
33,448		75.24% Impervious Area

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

Summary for Subcatchment 203S: to Main Street

Runoff = 0.31 cfs @ 12.08 hrs, Volume= 1,093 cf, Depth> 4.63"
Routed to Link AP2 : Main Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.87"

Area (sf)	CN	Description
2,834	98	Paved parking, HSG B
2,834		100.00% Impervious Area

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

Summary for Subcatchment 204S: to CDS-1

Runoff = 0.67 cfs @ 12.09 hrs, Volume= 2,138 cf, Depth> 3.64"
Routed to Pond 1P : CDS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=4.87"

Area (sf)	CN	Description
3,241	98	Paved parking, HSG B
360	96	Gravel surface, HSG B
1,728	61	>75% Grass cover, Good, HSG B
1,713	98	Roofs, HSG B
7,042	89	Weighted Average
2,088		29.65% Pervious Area
4,954		70.35% Impervious Area

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

Summary for Pond 1P: CDS-1

Inflow Area = 7,042 sf, 70.35% Impervious, Inflow Depth > 3.64" for 10-year event
Inflow = 0.67 cfs @ 12.09 hrs, Volume= 2,138 cf
Outflow = 0.67 cfs @ 12.09 hrs, Volume= 2,138 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.09 hrs, Volume= 2,138 cf
Routed to Pond 2P : DMH-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 700.21' @ 12.09 hrs
Flood Elev= 702.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	699.70'	**12.0" Round Culvert** L= 36.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 699.70' / 699.52' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.67 cfs @ 12.09 hrs HW=700.21' TW=699.83' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.67 cfs @ 2.43 fps)

Summary for Pond 2P: DMH-1

Inflow Area = 7,042 sf, 70.35% Impervious, Inflow Depth > 3.64" for 10-year event
Inflow = 0.67 cfs @ 12.09 hrs, Volume= 2,138 cf
Outflow = 0.67 cfs @ 12.09 hrs, Volume= 2,138 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.09 hrs, Volume= 2,138 cf
Routed to Link AP1 : Smith's Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 699.83' @ 12.09 hrs
Flood Elev= 703.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	699.42'	**12.0" Round Culvert** L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 699.42' / 699.10' S= 0.0291 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.67 cfs @ 12.09 hrs HW=699.83' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.67 cfs @ 2.19 fps)

Summary for Pond 3P: CDS-2

Inflow Area = 44,457 sf, 75.24% Impervious, Inflow Depth > 3.64" for 10-year event
Inflow = 4.25 cfs @ 12.09 hrs, Volume= 13,500 cf
Outflow = 4.25 cfs @ 12.09 hrs, Volume= 13,500 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.25 cfs @ 12.09 hrs, Volume= 13,500 cf
Routed to Link AP1 : Smith's Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 699.47' @ 12.09 hrs
Flood Elev= 701.19'

Device	Routing	Invert	Outlet Devices
#1	Primary	698.14'	**15.0" Round Culvert** L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 698.14' / 697.54' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.24 cfs @ 12.09 hrs HW=699.47' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 4.24 cfs @ 4.05 fps)

Summary for Link AP1: Smith's Pond

Inflow Area = 72,488 sf, 52.98% Impervious, Inflow Depth > 2.89" for 10-year event
Inflow = 5.39 cfs @ 12.09 hrs, Volume= 17,448 cf
Primary = 5.39 cfs @ 12.09 hrs, Volume= 17,448 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link AP2: Main Street

Inflow Area = 2,834 sf,100.00% Impervious, Inflow Depth > 4.63" for 10-year event
Inflow = 0.31 cfs @ 12.08 hrs, Volume= 1,093 cf
Primary = 0.31 cfs @ 12.08 hrs, Volume= 1,093 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 201S: to Smith's Pond Runoff Area=20,989 sf 0.00% Impervious Runoff Depth>1.64"
Tc=6.0 min CN=57 Runoff=0.85 cfs 2,874 cf

Subcatchment 202S: to CDS-2 Runoff Area=44,457 sf 75.24% Impervious Runoff Depth>4.68"
Tc=6.0 min CN=89 Runoff=5.39 cfs 17,348 cf

Subcatchment 203S: to Main Street Runoff Area=2,834 sf 100.00% Impervious Runoff Depth>5.71"
Tc=6.0 min CN=98 Runoff=0.38 cfs 1,348 cf

Subcatchment 204S: to CDS-1 Runoff Area=7,042 sf 70.35% Impervious Runoff Depth>4.68"
Tc=6.0 min CN=89 Runoff=0.85 cfs 2,748 cf

Pond 1P: CDS-1 Peak Elev=700.28' Inflow=0.85 cfs 2,748 cf
12.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=0.85 cfs 2,748 cf

Pond 2P: DMH-1 Peak Elev=699.89' Inflow=0.85 cfs 2,748 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0291 '/' Outflow=0.85 cfs 2,748 cf

Pond 3P: CDS-2 Peak Elev=700.08' Inflow=5.39 cfs 17,348 cf
15.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=5.39 cfs 17,348 cf

Link AP1: Smith's Pond Inflow=7.08 cfs 22,970 cf
Primary=7.08 cfs 22,970 cf

Link AP2: Main Street Inflow=0.38 cfs 1,348 cf
Primary=0.38 cfs 1,348 cf

Total Runoff Area = 75,322 sf Runoff Volume = 24,318 cf Average Runoff Depth = 3.87"
45.25% Pervious = 34,086 sf 54.75% Impervious = 41,236 sf

Summary for Subcatchment 201S: to Smith's Pond

Runoff = 0.85 cfs @ 12.10 hrs, Volume= 2,874 cf, Depth> 1.64"
Routed to Link AP1 : Smith's Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=5.95"

Area (sf)	CN	Description
8,319	61	>75% Grass cover, Good, HSG B
12,670	55	Woods, Good, HSG B
20,989	57	Weighted Average
20,989		100.00% Pervious Area

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

Summary for Subcatchment 202S: to CDS-2

Runoff = 5.39 cfs @ 12.08 hrs, Volume= 17,348 cf, Depth> 4.68"
Routed to Pond 3P : CDS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=5.95"

Area (sf)	CN	Description
17,401	98	Paved parking, HSG B
670	96	Gravel surface, HSG B
10,339	61	>75% Grass cover, Good, HSG B
16,047	98	Roofs, HSG B
44,457	89	Weighted Average
11,009		24.76% Pervious Area
33,448		75.24% Impervious Area

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

Summary for Subcatchment 203S: to Main Street

Runoff = 0.38 cfs @ 12.08 hrs, Volume= 1,348 cf, Depth> 5.71"
Routed to Link AP2 : Main Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=5.95"

Area (sf)	CN	Description
2,834	98	Paved parking, HSG B
2,834		100.00% Impervious Area

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

Summary for Subcatchment 204S: to CDS-1

Runoff = 0.85 cfs @ 12.08 hrs, Volume= 2,748 cf, Depth> 4.68"
Routed to Pond 1P : CDS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=5.95"

Area (sf)	CN	Description
3,241	98	Paved parking, HSG B
360	96	Gravel surface, HSG B
1,728	61	>75% Grass cover, Good, HSG B
1,713	98	Roofs, HSG B
7,042	89	Weighted Average
2,088		29.65% Pervious Area
4,954		70.35% Impervious Area

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

Summary for Pond 1P: CDS-1

Inflow Area = 7,042 sf, 70.35% Impervious, Inflow Depth > 4.68" for 25-year event
Inflow = 0.85 cfs @ 12.08 hrs, Volume= 2,748 cf
Outflow = 0.85 cfs @ 12.08 hrs, Volume= 2,748 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.08 hrs, Volume= 2,748 cf
Routed to Pond 2P : DMH-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 700.28' @ 12.08 hrs
Flood Elev= 702.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	699.70'	**12.0" Round Culvert** L= 36.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 699.70' / 699.52' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 12.08 hrs HW=700.28' TW=699.89' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.85 cfs @ 2.57 fps)

Summary for Pond 2P: DMH-1

Inflow Area = 7,042 sf, 70.35% Impervious, Inflow Depth > 4.68" for 25-year event
Inflow = 0.85 cfs @ 12.08 hrs, Volume= 2,748 cf
Outflow = 0.85 cfs @ 12.08 hrs, Volume= 2,748 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.08 hrs, Volume= 2,748 cf
Routed to Link AP1 : Smith's Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 699.89' @ 12.08 hrs
Flood Elev= 703.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	699.42'	**12.0" Round Culvert** L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 699.42' / 699.10' S= 0.0291 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 12.08 hrs HW=699.89' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.85 cfs @ 2.34 fps)

Summary for Pond 3P: CDS-2

Inflow Area = 44,457 sf, 75.24% Impervious, Inflow Depth > 4.68" for 25-year event
Inflow = 5.39 cfs @ 12.08 hrs, Volume= 17,348 cf
Outflow = 5.39 cfs @ 12.08 hrs, Volume= 17,348 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.39 cfs @ 12.08 hrs, Volume= 17,348 cf
Routed to Link AP1 : Smith's Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 700.08' @ 12.08 hrs
Flood Elev= 701.19'

Device	Routing	Invert	Outlet Devices
#1	Primary	698.14'	**15.0" Round Culvert** L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 698.14' / 697.54' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.38 cfs @ 12.08 hrs HW=700.07' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 5.38 cfs @ 4.38 fps)

Summary for Link AP1: Smith's Pond

Inflow Area = 72,488 sf, 52.98% Impervious, Inflow Depth > 3.80" for 25-year event
Inflow = 7.08 cfs @ 12.09 hrs, Volume= 22,970 cf
Primary = 7.08 cfs @ 12.09 hrs, Volume= 22,970 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link AP2: Main Street

Inflow Area = 2,834 sf,100.00% Impervious, Inflow Depth > 5.71" for 25-year event
Inflow = 0.38 cfs @ 12.08 hrs, Volume= 1,348 cf
Primary = 0.38 cfs @ 12.08 hrs, Volume= 1,348 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 201S: to Smith's Pond Runoff Area=20,989 sf 0.00% Impervious Runoff Depth>2.73"
Tc=6.0 min CN=57 Runoff=1.49 cfs 4,777 cf

Subcatchment 202S: to CDS-2 Runoff Area=44,457 sf 75.24% Impervious Runoff Depth>6.31"
Tc=6.0 min CN=89 Runoff=7.14 cfs 23,372 cf

Subcatchment 203S: to Main Street Runoff Area=2,834 sf 100.00% Impervious Runoff Depth>7.37"
Tc=6.0 min CN=98 Runoff=0.49 cfs 1,742 cf

Subcatchment 204S: to CDS-1 Runoff Area=7,042 sf 70.35% Impervious Runoff Depth>6.31"
Tc=6.0 min CN=89 Runoff=1.13 cfs 3,702 cf

Pond 1P: CDS-1 Peak Elev=700.39' Inflow=1.13 cfs 3,702 cf
12.0" Round Culvert n=0.013 L=36.0' S=0.0050 '/' Outflow=1.13 cfs 3,702 cf

Pond 2P: DMH-1 Peak Elev=699.97' Inflow=1.13 cfs 3,702 cf
12.0" Round Culvert n=0.013 L=11.0' S=0.0291 '/' Outflow=1.13 cfs 3,702 cf

Pond 3P: CDS-2 Peak Elev=701.05' Inflow=7.14 cfs 23,372 cf
15.0" Round Culvert n=0.013 L=120.0' S=0.0050 '/' Outflow=7.14 cfs 23,372 cf

Link AP1: Smith's Pond Inflow=9.75 cfs 31,851 cf
Primary=9.75 cfs 31,851 cf

Link AP2: Main Street Inflow=0.49 cfs 1,742 cf
Primary=0.49 cfs 1,742 cf

Total Runoff Area = 75,322 sf Runoff Volume = 33,593 cf Average Runoff Depth = 5.35"
45.25% Pervious = 34,086 sf 54.75% Impervious = 41,236 sf

Summary for Subcatchment 201S: to Smith's Pond

Runoff = 1.49 cfs @ 12.09 hrs, Volume= 4,777 cf, Depth> 2.73"
Routed to Link AP1 : Smith's Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.62"

Area (sf)	CN	Description
8,319	61	>75% Grass cover, Good, HSG B
12,670	55	Woods, Good, HSG B
20,989	57	Weighted Average
20,989		100.00% Pervious Area

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

Summary for Subcatchment 202S: to CDS-2

Runoff = 7.14 cfs @ 12.08 hrs, Volume= 23,372 cf, Depth> 6.31"
Routed to Pond 3P : CDS-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.62"

Area (sf)	CN	Description
17,401	98	Paved parking, HSG B
670	96	Gravel surface, HSG B
10,339	61	>75% Grass cover, Good, HSG B
16,047	98	Roofs, HSG B
44,457	89	Weighted Average
11,009		24.76% Pervious Area
33,448		75.24% Impervious Area

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

Summary for Subcatchment 203S: to Main Street

Runoff = 0.49 cfs @ 12.08 hrs, Volume= 1,742 cf, Depth> 7.37"
Routed to Link AP2 : Main Street

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.62"

Area (sf)	CN	Description
2,834	98	Paved parking, HSG B
2,834		100.00% Impervious Area

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

Summary for Subcatchment 204S: to CDS-1

Runoff = 1.13 cfs @ 12.08 hrs, Volume= 3,702 cf, Depth> 6.31"
Routed to Pond 1P : CDS-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.62"

Area (sf)	CN	Description
3,241	98	Paved parking, HSG B
360	96	Gravel surface, HSG B
1,728	61	>75% Grass cover, Good, HSG B
1,713	98	Roofs, HSG B
7,042	89	Weighted Average
2,088		29.65% Pervious Area
4,954		70.35% Impervious Area

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

Summary for Pond 1P: CDS-1

Inflow Area = 7,042 sf, 70.35% Impervious, Inflow Depth > 6.31" for 100-year event
Inflow = 1.13 cfs @ 12.08 hrs, Volume= 3,702 cf
Outflow = 1.13 cfs @ 12.08 hrs, Volume= 3,702 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.13 cfs @ 12.08 hrs, Volume= 3,702 cf
Routed to Pond 2P : DMH-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 700.39' @ 12.08 hrs
Flood Elev= 702.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	699.70'	**12.0" Round Culvert** L= 36.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 699.70' / 699.52' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.13 cfs @ 12.08 hrs HW=700.39' TW=699.97' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.13 cfs @ 2.75 fps)

Summary for Pond 2P: DMH-1

Inflow Area = 7,042 sf, 70.35% Impervious, Inflow Depth > 6.31" for 100-year event
Inflow = 1.13 cfs @ 12.08 hrs, Volume= 3,702 cf
Outflow = 1.13 cfs @ 12.08 hrs, Volume= 3,702 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.13 cfs @ 12.08 hrs, Volume= 3,702 cf
Routed to Link AP1 : Smith's Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 699.97' @ 12.08 hrs
Flood Elev= 703.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	699.42'	**12.0" Round Culvert** L= 11.0' Ke= 0.500 Inlet / Outlet Invert= 699.42' / 699.10' S= 0.0291 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.13 cfs @ 12.08 hrs HW=699.97' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.13 cfs @ 2.53 fps)

Summary for Pond 3P: CDS-2

Inflow Area = 44,457 sf, 75.24% Impervious, Inflow Depth > 6.31" for 100-year event
Inflow = 7.14 cfs @ 12.08 hrs, Volume= 23,372 cf
Outflow = 7.14 cfs @ 12.08 hrs, Volume= 23,372 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.14 cfs @ 12.08 hrs, Volume= 23,372 cf
Routed to Link AP1 : Smith's Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 701.05' @ 12.08 hrs
Flood Elev= 701.19'

Device	Routing	Invert	Outlet Devices
#1	Primary	698.14'	**15.0" Round Culvert** L= 120.0' Ke= 0.500 Inlet / Outlet Invert= 698.14' / 697.54' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=7.12 cfs @ 12.08 hrs HW=701.04' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 7.12 cfs @ 5.81 fps)

Summary for Link AP1: Smith's Pond

Inflow Area = 72,488 sf, 52.98% Impervious, Inflow Depth > 5.27" for 100-year event
Inflow = 9.75 cfs @ 12.09 hrs, Volume= 31,851 cf
Primary = 9.75 cfs @ 12.09 hrs, Volume= 31,851 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link AP2: Main Street

Inflow Area = 2,834 sf,100.00% Impervious, Inflow Depth > 7.37" for 100-year event
Inflow = 0.49 cfs @ 12.08 hrs, Volume= 1,742 cf
Primary = 0.49 cfs @ 12.08 hrs, Volume= 1,742 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs