DRAINAGE REPORT

§

THOMPSON COMMONS

13 CARLSON PLACE & 360 THOMPSON AVENUE
EAST HAVEN, CT

January 2024

Prepared for:

13 Carlson Place LLC
East Haven, CT

Prepared by:

CODESPOTI
& ASSOCIATES P.C.

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INTRODUCTION

This report has been prepared in conjunction with the 360 Thompson Avenue redevelopment project located in East Haven, Connecticut.

The project site is composed of two parcels of land with frontage on Thompson Avenue and Carlson Place containing a total of 1.05 acres. The first parcel (0.80 Ac) identified as 13 Carlson Place has 10' of frontage on Carlson Place consisting of a gravel driveway to access the interior portion of the property. There are two commercial garages located in the interior portion of the parcel. The open interior areas were also used for boat storage as well as a number of residential apartments in the past. A second access to Thompson Avenue exists via a 25' right of way over the adjoining parcel of land (0.05 Ac) identified as 360 Thompson Avenue. This parcel has 87' of frontage along the roadway. The 360 Thompson Ave parcel presently contains a single family house. The two parcels contain a total of 9,471 ft^2 (21%) of impervious coverage.

All existing buildings and impervious cover on the two parcels will be demolished and removed from the site. A total of six triplex and one duplex buildings containing a total of 20 residential attached dwellings and associated parking area are being proposed.

Impervious coverage for the proposed development will be 30,553 ft^2 (67%) and represents an increase of 21,082 ft^2 or 46% from existing conditions. The runoff curve number (CN) will be reduced from 84 to 79. While not seeming to be logical that an increase in impervious coverage results in a decrease in runoff curve number, the decrease i is the result of the existing parking and storage areas while being compacted are not being considered to be impervious albeit having a high runoff curve number.

With a reduction in runoff curve number, there will be an overall decrease in the peak rate and runoff volume of runoff from the property.

WATERSHED CHARACTERISTICS

The entire site lies within the South Central Shoreline watershed (basin number 5000-46-1-L1) and is outside of the Coastal Area Management (CAM).

The site topography based upon field survey is generally flat ranging in elevation from 11.2 to 12.6 with several depressions in the middle portion of the property. Review of available LIDAR data indicates that there is run on to the subject site from the middle portions of properties on Ivers Ave to the north between Carlson Place and Thompson Avenue as well as the middle portions of properties on Dodge Avenue to the south between Carlson Place and Thompson Avenue. Runoff on site, is primarily sheet and shallow concentrated flow as there is no internal storm drainage to the property.

Review of the NRCS Web Soil Survey indicates the primary soils on site consist of Penwood Urban land (235B) encompassing 100% of the site. The soils have the following Hydrologic Soil Group (HSG) and Drainage Classifications:

Soil Unit	HSG	Drainage Class
229B – Agawam Urban land complex	A	Excessively drained

The project site is located in "Zone X" - (areas of minimal flooding) based upon FEMA Map Number 09009C0444J, New Haven County, Effective Date: July 8, 2013.

Review of the water quality maps published by the State of Connecticut Department of Energy and Environmental Protection indicate that the site is located in a "GB" groundwater area. Class GB designated uses are industrial process water and cooling waters and base flow for hydraulically-connected water bodies and is presumed not suitable for human consumption without treatment.

STORM WATER MANAGEMENT

An analysis of the impacts that may occur from the proposed project has been performed. The study involved the analysis of existing and proposed conditions and the impact to the surrounding area.

The following applicable standards were utilized in the development of the stormwater analysis:

- Water Quality - 2004 Stormwater Water Quality Manual by the Connecticut Department of Environmental Protection Agency (WQM).
- Rainfall data – National Oceanic and Atmospheric Administration (NOAA) Atlas 14 rainfall data for the site location. NOAA 24 hour D distribution.
- Runoff Curve Number - Soil Properties – Natural Resource Conservation Service (NRCS)
- Minimum Time of Concentration – 6 minutes

Stormwater management will be accomplished through a variety of Best Management Practices (BMP's) including water quality enhancements, retention / detention and infiltration. The design of these features will be in accordance with the 2004 Stormwater Water Quality Manual by the Connecticut Department of Environmental Protection Agency and General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems by the Connecticut Department of Energy & Environmental Protection (DEEP). There are five components considered for design:

1. Water Quality Volume (WQV) – The volume of stormwater to be captured and treated. This is equivalent to the runoff associated with the first inch of rainfall.

   In the case of redevelopment projects with greater than 40% of directly connected impervious area (DCIA), the runoff volume to be treated associated with the first one-half inch of rainfall shall be provided for. Since this site does not have greater than 40% DCIA, treatment of the full water quality volume will be provided.

   For grass drainage channels, proprietary stormwater treatment devices, and flow diversion structures, the water quality flow rate (WQF) is used for the basis of design. The WQF is the peak flow rate associated with the water quality design storm. For this project, both the WQV and WQF are used as the basis of design.

   There will be one main collection system for the proposed stormwater management system to collect runoff from the proposed parking and roof areas.

System 1 (Roof and Paved Area to Galleries)

A WQV of 2,353 ft^3 has been calculated for the proposed tributary area of 32,532 ft^2 for the proposed roof, parking and tributary landscape areas. Treatment will be provided via an underground gallery system consisting of eighteen units of concrete galleries (4' w x 8' l x 2' h) with 6" of stone under, and 12" of stone around the perimeter. The gallery system has a dead storage capacity of 1,059 ft^3.

Stormwater runoff will be collected from the roof drains and underground piping and discharged to a hydrodynamic separator (HDS) for pre-treatment. The HDS will be a "Hydroworks HS4" and will provide for the removal of suspended solids and floatable prior to discharge to the galleries. The Hydroworks HS4 will provide for 87% TSS based on their calculations.

HydroCad software was used to calculate the rainfall depth that would equal the WQV. For this watershed, a rainfall depth of 1.51 inches was found to generate a runoff volume of 2,372 ft^3 and a discharge rate of 0.77 cfs.

Soil testing in the vicinity of the proposed galleries was conducted via two deep test pits. Both test pits indicate sandy loam over medium to fine sand. Groundwater was observed at elevation 4.8 to 4.9.

Infiltration testing was conducted adjacent to both test pits at approximate elevation 6.5. Infiltration rates in excess of 100 inches per hour were encountered and would be expected for the sandy Penwood soils on site. While the onsite infiltration rates exceed the maximum recommended infiltration rate of 8 inches per hour, the underlying groundwater is unsuitable for drinking water and it is my opinion that the pre-treatment provided by the Hydroworks HS4 will negate any adverse impact from the higher infiltration rates encountered.

A conservative infiltration rate of 5.0 inches per hour was used in the calculations, which provides for a safety factor of at least 2 as recommended in the guidelines for infiltration as defined in the 2004 Connecticut Stormwater Quality Manual.

2. Groundwater Recharge Volume (GRV) – Is the post-development design recharge volume (i.e., on a storm event basis) required to minimize the loss of annual pre-development groundwater recharge.

   The calculated GRV of 1,018 ft^3 for the site will be provided by the proposed gallery system. The galleries will provide for a dead storage volume of 1,059 ft^3 and therefore the GRV has been met.

3. Runoff Capture Volume (RCV) – Where runoff discharges are less than 500 feet from tidal wetlands, which are not fresh-tidal wetlands, the stormwater runoff volume generated by the first inch of rainfall, must be retained on-site for such discharges. The runoff capture volume is equivalent to the WQV.

   There are no tidal wetlands within 500 feet of the property, therefore RCV is not applicable.

4. Peak Flow Control – Using Best Management Practices, the post-development peak rates of runoff for the 2, 10, 25, 50, and 100-year storms should be controlled to the corresponding pre-development peak rates of runoff.

With a reduction in runoff curve number, there will be an overall decrease in the peak rate and runoff volume of runoff from the property. As such, stormwater management for the control of peak rates or volumes of runoff are not required.

Offsite areas which drain onto the subject property will be intercepted and diverted around the proposed HDS and galleries and connected to the overflow system.

5. The proposed stormwater management plan is also consistent with DEEP's MS4 requirements by providing for stormwater disconnection from the City drainage system and waters of the State. This is accomplished by retaining the water quality volume of 2,353 ft^3, which results in a decrease of 100% of Directly Connected Impervious Area (DCIA) from the tributary drainage area to the galleries. A small portion (800 ft^2) of the front driveway will flow directly to Thompson Ave and represents a DCIA of 1.8% for the entire site. The existing site has approximately 1,355 ft^2 (3.0%) of DCIA. With a reduction in DCIA of 1.2%, the proposed development is consistent with the MS4 requirements.

A summary of the calculated peak discharge flows are provided below.

360 Thompson Avenue 1.05 Acre Site
HydroCad Discharge Summary (24 hour duration - Atlas 14 rainfall data)

		Even Values									
		2-Year		10-Year		25-Year		50-Year		100-Year	
ID	Description	Peak Discharge (cfs)	Volume (cubic ft.)	Peak Discharge (cfs)	Volume (cubic ft.)	Peak Discharge (cfs)	Volume (cubic ft.)	Peak Discharge (cfs)	Volume (cubic ft.)	Peak Discharge (cfs)	Volume (cubic ft.)
EDA1	Existing Site	2.3	7,093	4.2	13,183	5.4	17,144	6.3	20,128	7.2	23,396
PDA1	Proposed Drainage Area to Galleries	2.2	7,205	3.6	11,967	4.4	14,960	5.0	17,187	5.6	19,606
1P	Galleries	1.8	1,229	3.1	3,519	4.0	5,114	4.6	6,346	5.2	7,732
PDA2	Proposed South DA to Thompson	0.0	44	0.1	316	0.1	580	0.2	812	0.3	1,092
PDA3	Proposed North DA to Thompson	0.0	11	0.0	140	0.1	278	0.1	403	0.2	557
PDA4	Proposed Drainage Area to Carlson	0.0	0	0.0	23	0.0	50	0.0	76	0.0	109
P1L	Proposed Combined Site	1.8	1,286	3.2	3,998	4.1	6,022	4.9	7,637	5.7	9,490

It is our professional opinion, that if the project is constructed in accordance with the provided plans and properly maintained, there will not be any significant stormwater impacts from this development.

Calculations are attached which substantiate our findings. The proposed drainage plan and details have been incorporated into sheets SP2, SP7 and SP8 of the project drawings dated 1/5/24.

Digitally signed by Robert Wheway
DN: cn=Robert Wheway, o=Codespoti & Associates, ou, email=rwheway@codespoti.net, c=US
Date: 2024.01.09 12:46:52 -05'00'



Appendix A - Support Data
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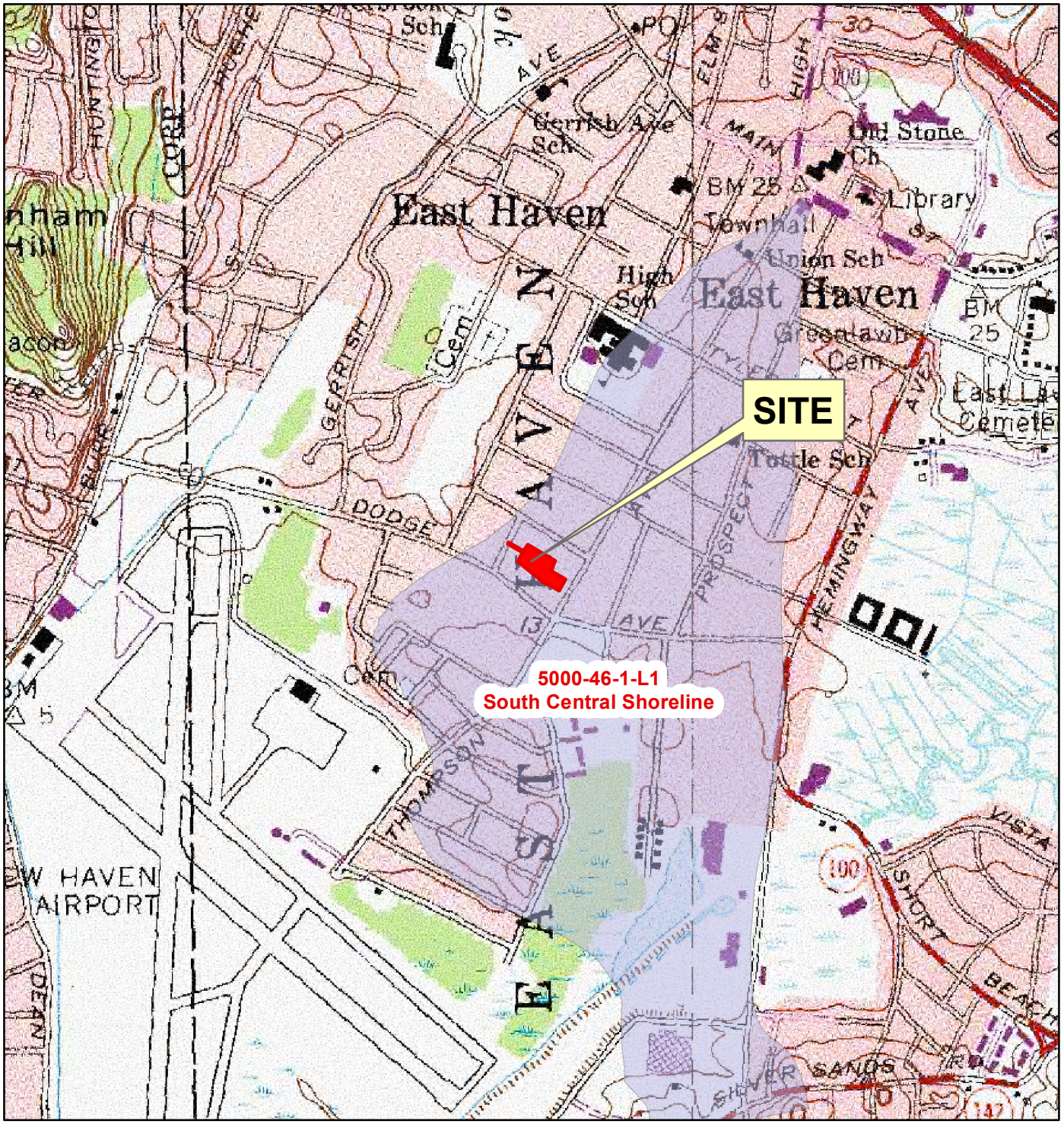
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Contents of this report are based upon drawings titled "Proposed Site Development Plans, 360 Thompson Avenue, East Haven Connecticut", prepared for 13 Carlson Place, LLC, sheets SP1 through SP8, dated 1/5/24 by Codespoti & Associates and were prepared by the staff of Codespoti and Associates, P.C.

The contents are based upon the best information available at the time. All engineering design calculations are based upon accepted engineering and scientific methods and may be subject to revision as more appropriate methods become available. Should any design revisions be made or additional information become available, this report may need to be re-evaluated.

Calculation Methods:

The methodology used to determine both rates of runoff and quantities is based on the Natural Resources Conservation Service (NRCS) techniques, as outlined in the National Engineering Handbook, Section 4. Computer applications of this method were utilized through the use of HydroCad ver 10.10. The NOAA 24 hour design storm using a type D distribution was used for all calculations.



Legend

Site

BASIN_NO

5000-46-1-L1

U.S.G.S. MAP / WATERSHED MAP

360 THOMPSON AVENUE
EAST HAVEN, CT
NEW HAVEN & BRANFORD QUADS
4/7/23

CODESPOTI & ASSOCIATES P.C.

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1,000 500 0 1,000 Feet

NOAA Atlas 14, Volume 10, Version 3
Location name: East Haven, Connecticut, USA*
Latitude: 41.2707°, Longitude: -72.8783°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.343 (0.281-0.417)	0.414 (0.338-0.504)	0.530 (0.432-0.648)	0.626 (0.506-0.769)	0.759 (0.589-0.974)	0.859 (0.650-1.12)	0.964 (0.703-1.31)	1.08 (0.740-1.50)	1.25 (0.817-1.80)	1.39 (0.882-2.04)
10-min	0.486 (0.398-0.591)	0.586 (0.480-0.714)	0.751 (0.612-0.916)	0.888 (0.718-1.09)	1.08 (0.835-1.38)	1.22 (0.921-1.59)	1.37 (0.996-1.85)	1.53 (1.05-2.13)	1.78 (1.16-2.55)	1.97 (1.25-2.89)
15-min	0.571 (0.468-0.695)	0.690 (0.564-0.840)	0.884 (0.720-1.08)	1.05 (0.845-1.28)	1.27 (0.982-1.62)	1.43 (1.08-1.88)	1.61 (1.17-2.18)	1.81 (1.23-2.50)	2.09 (1.36-3.00)	2.32 (1.47-3.40)
30-min	0.786 (0.643-0.956)	0.949 (0.776-1.16)	1.22 (0.989-1.49)	1.44 (1.16-1.77)	1.74 (1.35-2.23)	1.97 (1.49-2.58)	2.21 (1.61-3.00)	2.48 (1.69-3.44)	2.87 (1.87-4.12)	3.19 (2.02-4.67)
60-min	1.00 (0.819-1.22)	1.21 (0.988-1.47)	1.55 (1.26-1.89)	1.83 (1.48-2.25)	2.22 (1.72-2.84)	2.51 (1.90-3.28)	2.81 (2.05-3.82)	3.16 (2.16-4.38)	3.66 (2.38-5.24)	4.06 (2.57-5.94)
2-hr	1.30 (1.07-1.57)	1.58 (1.30-1.91)	2.03 (1.66-2.46)	2.40 (1.96-2.93)	2.92 (2.28-3.72)	3.30 (2.52-4.31)	3.71 (2.73-5.03)	4.19 (2.87-5.77)	4.89 (3.19-6.96)	5.47 (3.47-7.94)
3-hr	1.51 (1.25-1.81)	1.83 (1.51-2.20)	2.35 (1.94-2.85)	2.79 (2.28-3.39)	3.39 (2.66-4.31)	3.84 (2.93-4.99)	4.31 (3.18-5.83)	4.87 (3.35-6.69)	5.70 (3.73-8.09)	6.40 (4.07-9.26)
6-hr	1.92 (1.60-2.30)	2.33 (1.93-2.78)	2.98 (2.47-3.58)	3.53 (2.90-4.26)	4.28 (3.38-5.41)	4.85 (3.73-6.26)	5.45 (4.04-7.31)	6.15 (4.24-8.39)	7.21 (4.74-10.2)	8.10 (5.17-11.6)
12-hr	2.39 (2.01-2.84)	2.89 (2.42-3.43)	3.69 (3.08-4.40)	4.36 (3.60-5.22)	5.28 (4.19-6.62)	5.96 (4.61-7.65)	6.69 (4.99-8.93)	7.56 (5.23-10.2)	8.84 (5.83-12.4)	9.93 (6.35-14.2)
24-hr	2.82 (2.38-3.32)	3.42 (2.88-4.04)	4.40 (3.69-5.22)	5.22 (4.34-6.21)	6.34 (5.07-7.92)	7.17 (5.59-9.16)	8.07 (6.06-10.7)	9.16 (6.36-12.3)	10.8 (7.14-15.0)	12.2 (7.83-17.3)
2-day	3.15 (2.67-3.69)	3.89 (3.30-4.56)	5.09 (4.30-5.99)	6.09 (5.10-7.20)	7.47 (6.01-9.29)	8.48 (6.66-10.8)	9.59 (7.27-12.8)	11.0 (7.65-14.7)	13.1 (8.71-18.2)	15.0 (9.67-21.1)
3-day	3.41 (2.91-3.98)	4.22 (3.59-4.93)	5.55 (4.70-6.50)	6.64 (5.59-7.83)	8.15 (6.59-10.1)	9.26 (7.30-11.8)	10.5 (7.98-13.9)	12.0 (8.39-16.0)	14.4 (9.57-19.8)	16.5 (10.6-23.1)
4-day	3.66 (3.13-4.25)	4.51 (3.85-5.25)	5.91 (5.02-6.90)	7.07 (5.96-8.30)	8.66 (7.01-10.7)	9.83 (7.76-12.4)	11.1 (8.48-14.7)	12.7 (8.90-16.9)	15.2 (10.1-20.9)	17.4 (11.2-24.3)
7-day	4.34 (3.73-5.01)	5.26 (4.52-6.09)	6.77 (5.79-7.87)	8.03 (6.81-9.38)	9.76 (7.93-12.0)	11.0 (8.73-13.8)	12.4 (9.47-16.2)	14.1 (9.91-18.6)	16.7 (11.1-22.7)	18.9 (12.2-26.2)
10-day	5.00 (4.32-5.77)	5.97 (5.14-6.89)	7.55 (6.47-8.74)	8.86 (7.54-10.3)	10.7 (8.68-13.0)	12.0 (9.50-14.9)	13.4 (10.2-17.4)	15.1 (10.7-19.9)	17.7 (11.8-24.0)	19.8 (12.9-27.4)
20-day	7.06 (6.14-8.08)	8.11 (7.03-9.29)	9.81 (8.47-11.3)	11.2 (9.61-13.0)	13.2 (10.8-15.8)	14.6 (11.6-18.0)	16.2 (12.3-20.5)	17.9 (12.7-23.3)	20.3 (13.6-27.3)	22.2 (14.4-30.5)
30-day	8.80 (7.67-10.0)	9.88 (8.60-11.3)	11.7 (10.1-13.3)	13.1 (11.3-15.1)	15.2 (12.4-18.1)	16.7 (13.3-20.3)	18.3 (13.9-23.0)	19.9 (14.2-25.8)	22.2 (15.0-29.8)	24.0 (15.6-32.8)
45-day	11.0 (9.59-12.4)	12.1 (10.6-13.7)	13.9 (12.1-15.9)	15.5 (13.3-17.7)	17.6 (14.4-20.8)	19.2 (15.3-23.2)	20.8 (15.8-25.9)	22.4 (16.0-28.9)	24.5 (16.6-32.6)	26.0 (17.0-35.4)
60-day	12.8 (11.2-14.4)	13.9 (12.2-15.8)	15.8 (13.8-18.0)	17.4 (15.0-19.9)	19.5 (16.1-23.0)	21.2 (16.9-25.5)	22.9 (17.3-28.2)	24.4 (17.5-31.3)	26.3 (17.8-34.9)	27.6 (18.0-37.5)

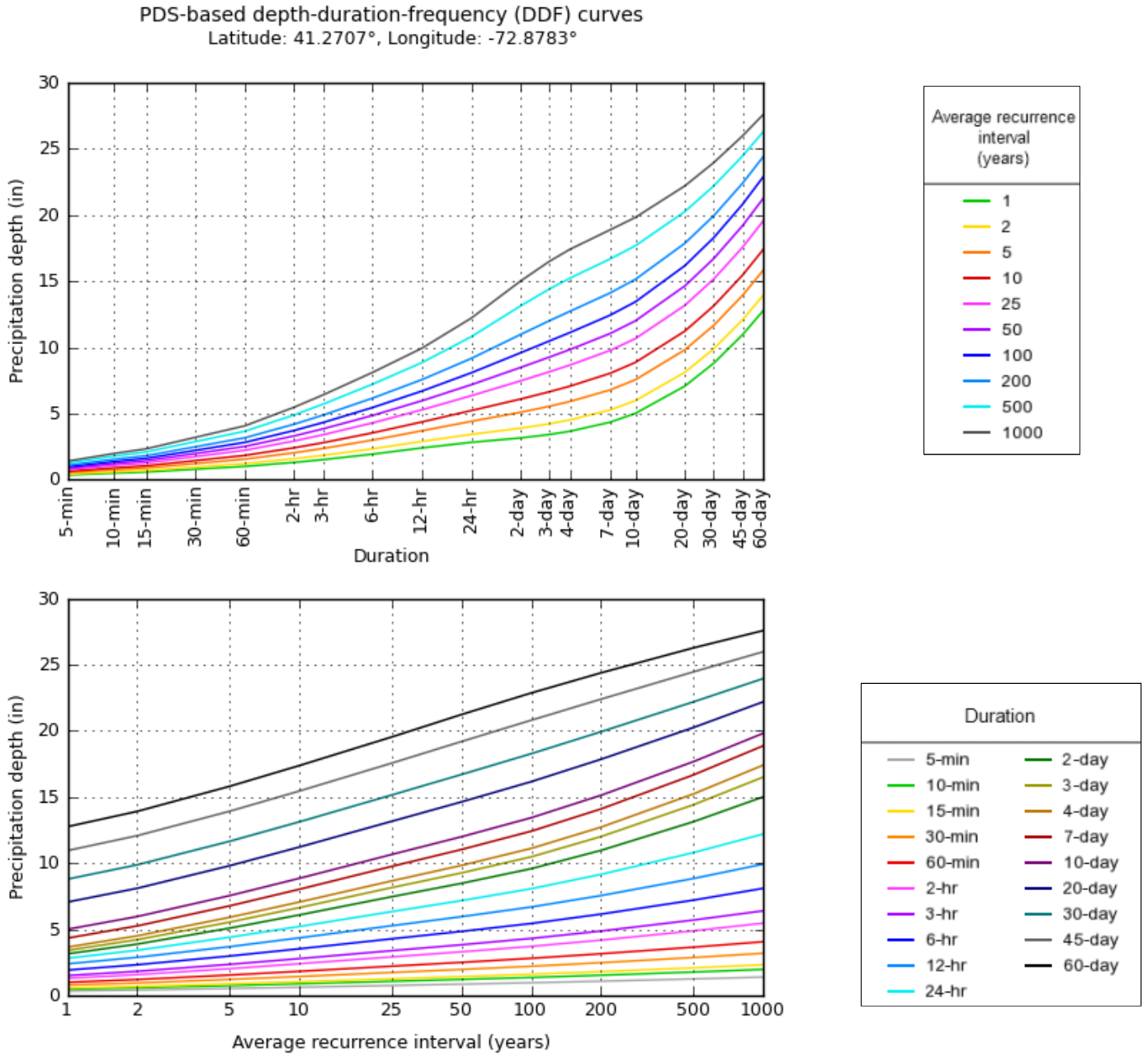
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



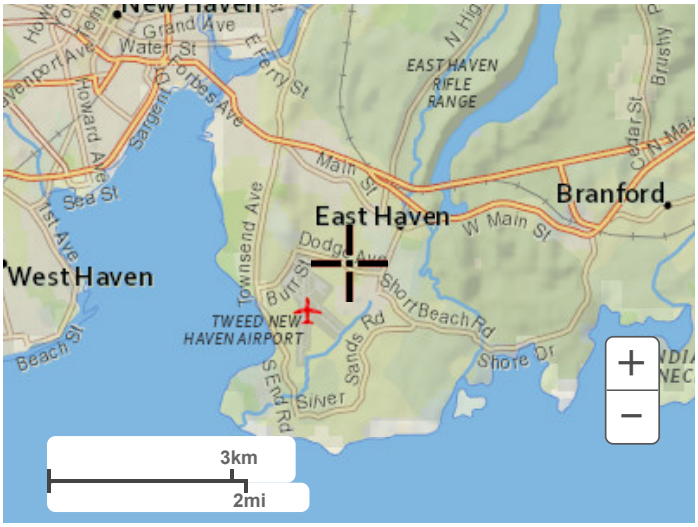
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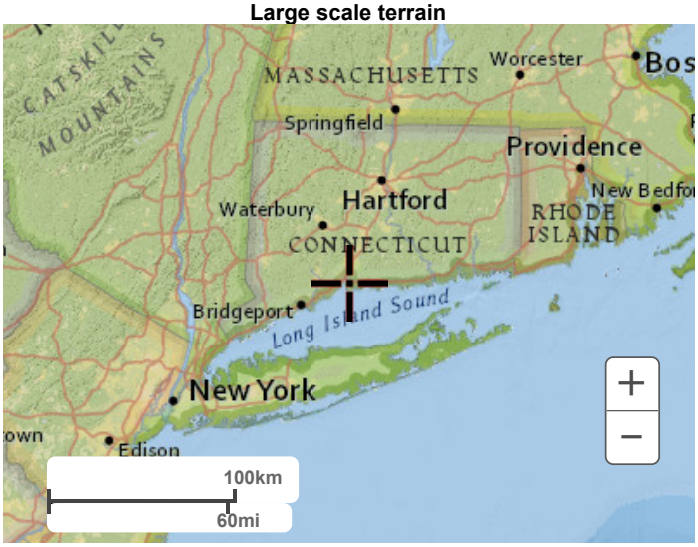
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Maps & aerials

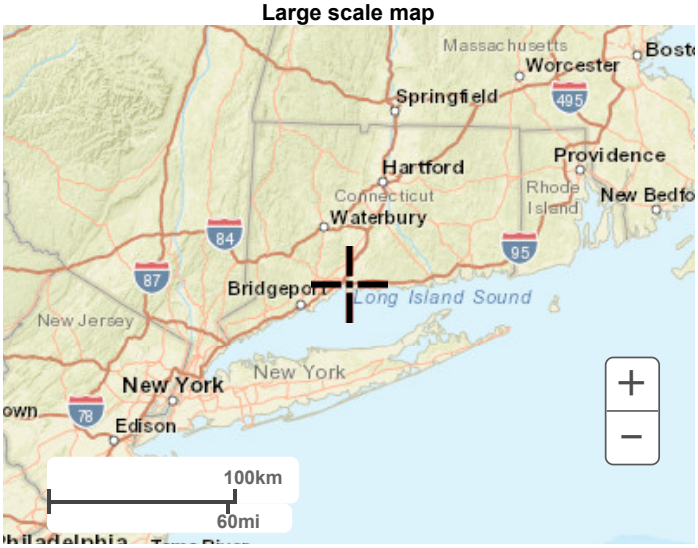
Small scale terrain



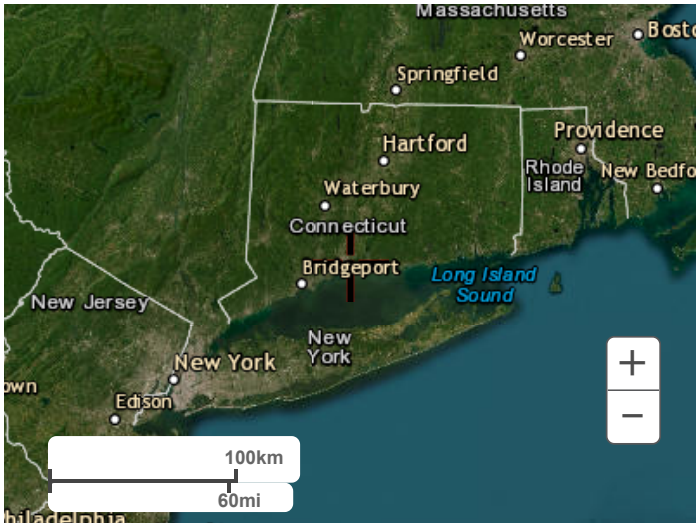
Large scale terrain



Large scale map



Large scale aerial



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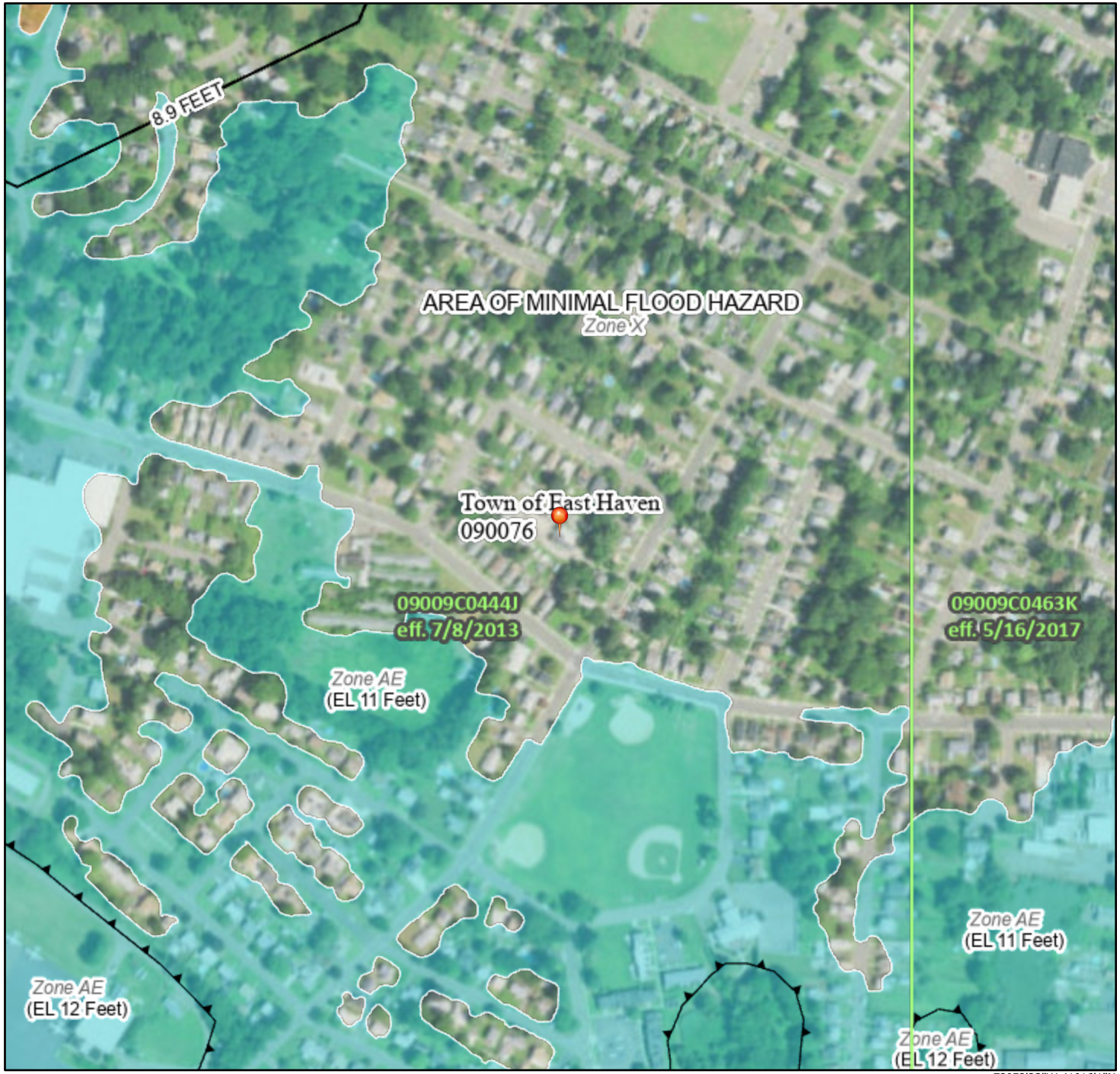
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

National Flood Hazard Layer FIRMette

FEMA

72°53'1"W 41°16'28"N



Feet 1:6,000

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

72°52'23"W 41°16'1"N

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

Legend

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

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

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

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

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

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

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

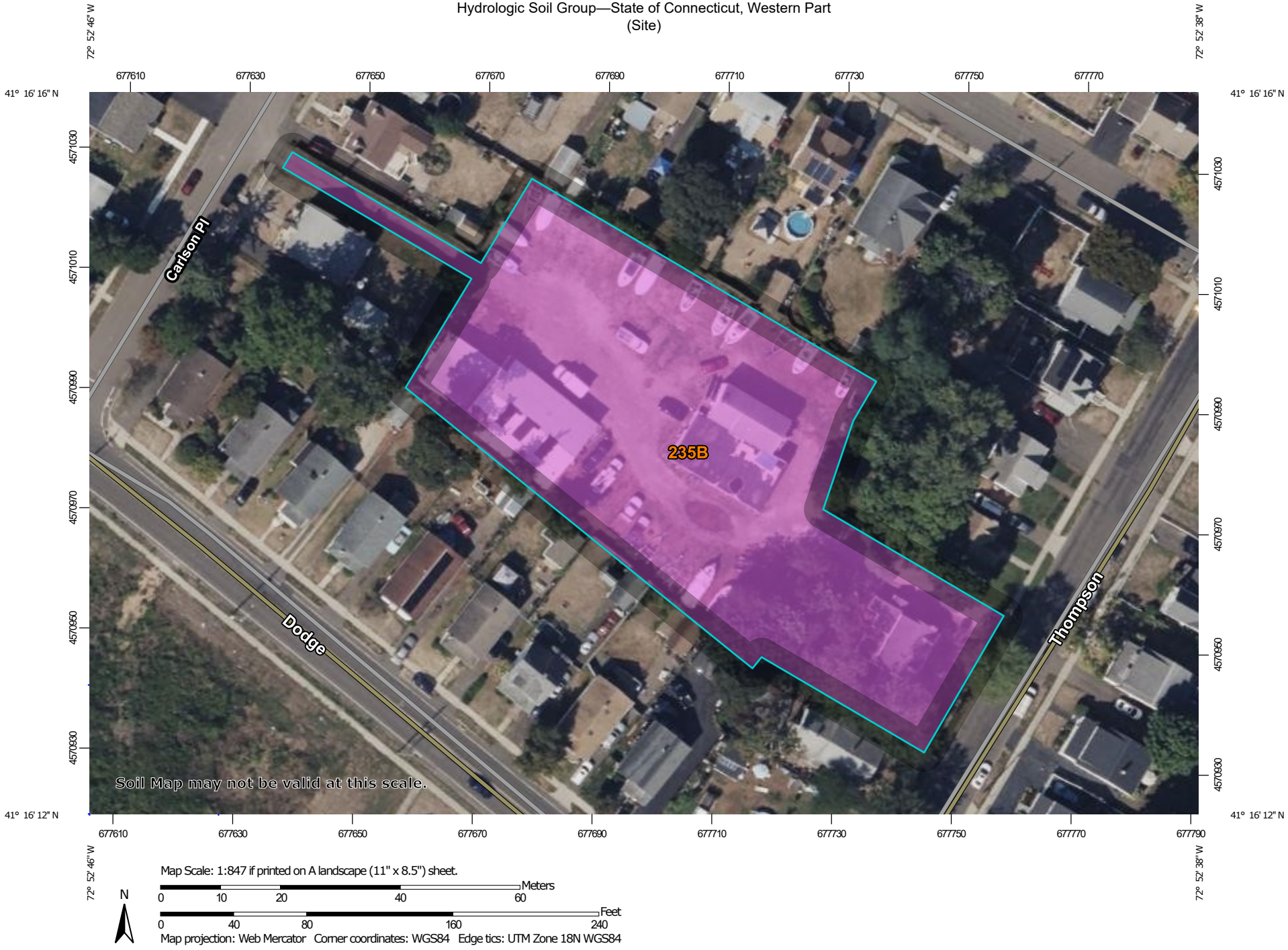
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/7/2023 at 2:26 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Hydrologic Soil Group—State of Connecticut, Western Part
(Site)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
235B	Penwood-Urban land complex, 0 to 8 percent slopes	A	1.0	100.0%
Totals for Area of Interest			**1.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

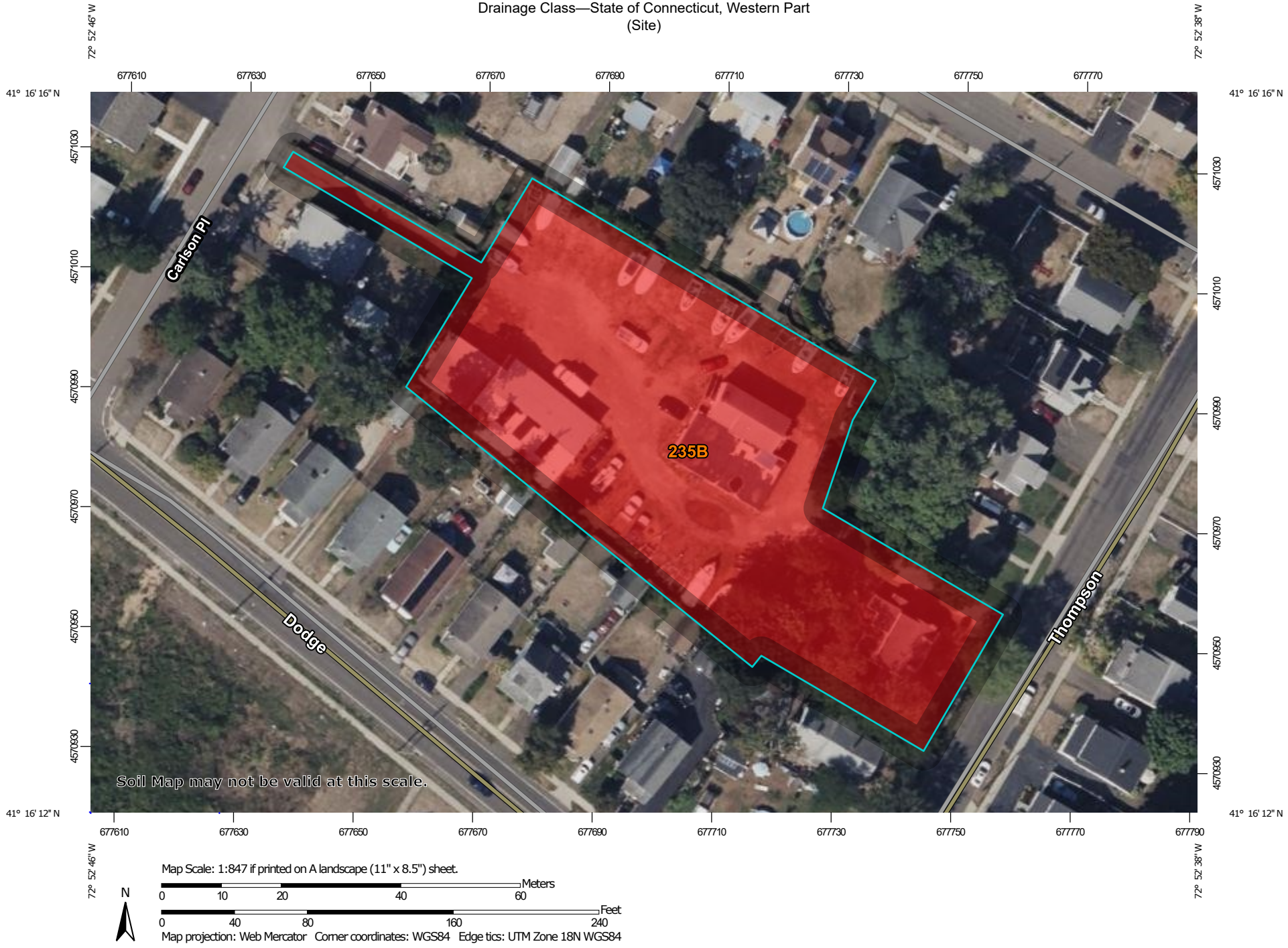
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Drainage Class—State of Connecticut, Western Part
(Site)



Map Scale: 1:847 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Lines

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Points

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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

Drainage Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
235B	Penwood-Urban land complex, 0 to 8 percent slopes	Excessively drained	1.0	100.0%
Totals for Area of Interest			**1.0**	**100.0%**

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

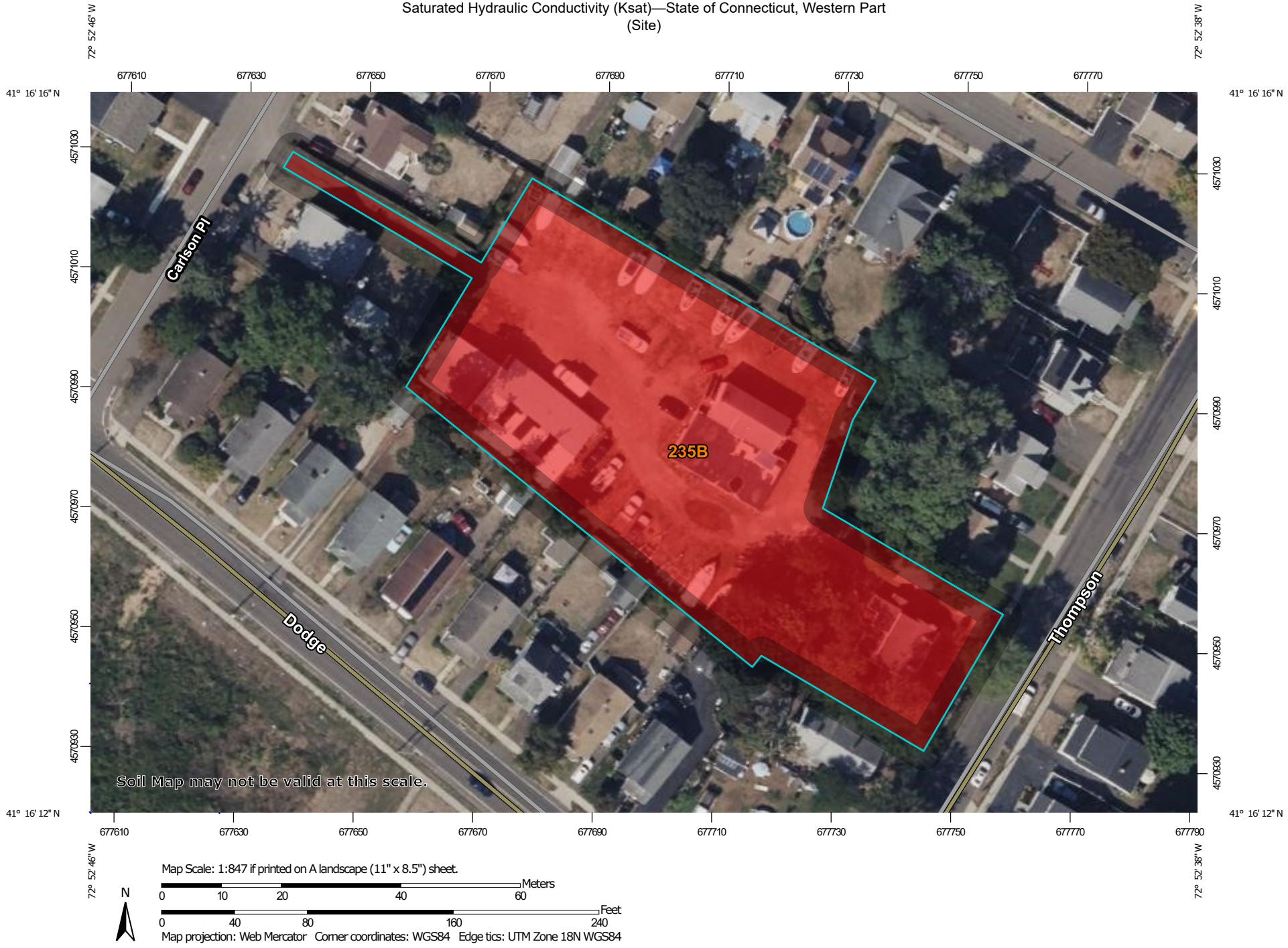
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Saturated Hydraulic Conductivity (Ksat)—State of Connecticut, Western Part
(Site)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

= 141.0000

Not rated or not available

Soil Rating Lines

= 141.0000

Not rated or not available

Soil Rating Points

= 141.0000

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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

Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
235B	Penwood-Urban land complex, 0 to 8 percent slopes	141.0000	1.0	100.0%
Totals for Area of Interest			**1.0**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 6

Bottom Depth: 72

Units of Measure: Inches

WATER QUALITY CLASSIFICATIONS
EAST HAVEN, CT

SURFACE WATER QUALITY CLASSES

A	A
AA	AA
B, B*	B, B*
SA	SA
SB	SB

NOTES:
Surface Water Classifications beginning with S refer to Coastal and Marine Surface Water.
B* is a subset of Class B where no direct wastewater discharges are allowed other than those consistent with Class AA, A and SA surface waters.

GROUND WATER QUALITY CLASSES

GA (white background)

GAA, GAAs

GA, GAA may not meet current standards

GB

GC

Area of Contribution to Public Supply Well

Final Aquifer Protection Area (Level A)

Major Basin Boundary

EXPLANATION

WATER QUALITY CLASSIFICATIONS (WQC) MAPS are one of the elements of the Water Quality Standards (WQS) for the State of Connecticut. The WQS are a part of Connecticut's clean water program and are essential for protecting and improving water quality. The WQS follow the principles of Connecticut's Clean Water Act which is in Chapter 446K of the Connecticut General Statutes. The WQS provide policy guidance in many areas, for example decisions on acceptable discharges to water resources, siting of landfills, remediation or prioritization of municipal sewerage system projects. The first two elements of the WQS are the Standards, which set an overall policy for management of water quality, and the Criteria, which are descriptive and numerical standards that describe the allowable parameters and goals for various water quality classifications. A discussion of these two elements is found in the Water Quality Standards document available on the CT DEEP website. The third element is the Classifications and the Water Quality Classification Maps which show the Classification assigned to each surface and groundwater resource throughout the State. The WQS are adopted using a public participation process. The WQC maps are also adopted using a public participation process but go through hearings separately from the Standards and Criteria hearings. Revision and adoption of the WQC data occurs in accordance with the public participation procedures contained in Section 22a-426 of the Connecticut General Statutes. Ground WQC is subject to Connecticut regulation and changes must be reviewed and adopted. All changes to the Surface WQC require an adoption process which is subject to federal review and approval in addition to CT regulation. The adoption dates for the WQC by major drainage basin are: Housatonic River, Hudson River and Southwest Coastal Basins - March 1999; Connecticut River and South Central Coastal Basins - February 1993; Thames River, Pawcatuck River and Southeast Coastal Basins - December 1986. Surface Water Classifications do not change after the adoption date until the next major revision. Ground Water Classifications may change after the adoption date under specific circumstances. The map may have more than one WQC adoption date because a town may be in more than one major drainage basin.

SURFACE WATERS in Connecticut are divided into freshwater classified as AA, A, B or B* and saline waters classified as SA or SB. Class AA designated uses are existing or proposed drinking water supplies; habitat for fish and other aquatic life and wildlife; recreation; and water supply for industry and agriculture. Class A designated uses are habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture. Class SA designated uses are habitat for marine fish, other aquatic life and wildlife; shellfish harvesting for direct human consumption; recreation; industrial water supply; and navigation. Class B designated uses are habitat for fish and aquatic life and wildlife; recreation; navigation; and industrial and agricultural water supply. Class B*, applicable to Candlewood Lake, is a subset of Class B and is identical in all ways to the designated uses, criteria and standards for Class B waters except for the restriction on direct discharges. Class SB designated uses are habitat for marine fish and aquatic life and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation.

Surface waters which are not specifically classified shall be considered as Class A or Class AA. Surface waters in GA ground water areas are assumed Class A or Class SA unless otherwise indicated. Surface waters in GAA ground water areas are assumed Class AA unless otherwise indicated.

On the WQC map a surface water quality goal of A is represented by blue colored water bodies. Surface water quality goal of AA is represented by purple colored water bodies. Surface water quality goal of B is represented by gold colored water bodies.

GROUND WATERS in Connecticut are classified as GAA, GA, GB and GC. Class GAA designated uses are existing or potential public supply of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. The Class GAAs is a subclass of GAA for ground water that is tributary to a public water supply reservoir. The area of contribution to a public water supply well is represented by a 500-foot radius around the well and is assumed to be Class GAA unless otherwise classified. Class GA designated uses are existing private and potential public or private supplies of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. All ground waters not specifically classified are considered as Class GA. Class GB designated uses are industrial process water and cooling waters and baseflow for hydraulically-connected water bodies and is presumed not suitable for human consumption without treatment. Class GC designated uses are assimilation of discharges authorized by the Commissioner pursuant to Section 22a-430 of the General Statutes.

On the WQC map GA is represented by white colored land areas. Class GAA and class GAAs are represented by blue colored land areas. The area of contribution to a public water supply well is shown by a blue cross-hatch overprint. A notation of GAA followed by a state abbreviation indicates a watershed that contributes to the public water supply for a state other than Connecticut. Class GA or Class GAA areas that currently may not be meeting the GA or GAA standards are represented on the WQC maps by tan colored land areas. Class GB is represented by green colored land areas. Class GC is represented by magenta colored land areas.

FINAL AQUIFER PROTECTION AREAS (Level A) are included on the WQC maps for informational purposes. These areas are anticipated to be reclassified GAA during the next major basin updates, subject to public participation. The Aquifer Protection Program helps protect Connecticut's public drinking water resources by delineating aquifer protection areas (also called wellhead protection areas) for public supply wells and establishing land use regulations within these areas. These areas represent the land area contributing ground water to active public water supply wells or well fields that serve more than 1000 people and are set in sand and gravel aquifers (stratified drift deposits).

DATA SOURCES

WATER QUALITY CLASSIFICATIONS DATA – Water quality classifications shown on this map are based on information from the following digital spatial datasets that are typically shown together – Ground Water Quality Classifications Poly, Surface Water Quality Classifications Line, and Surface Water Quality Classifications Poly. The map legend above reflects the content of these three data sources. These WQC data were initially compiled on 1:24,000-scale 7.5 minute USGS topographic quadrangle maps and later digitized at 1:24,000 scale. For example, the Surface Water Quality Classifications Line and Surface Water Quality Classifications Poly digital data assigns surface water quality classifications to water bodies such as rivers, streams, reservoirs, lakes, ponds and coves found in 1:24,000-scale hydrography data available from CT DEEP. The hydrography may not include all the waterbodies in Connecticut. The Ground Water Quality Classifications Poly data assigns ground water quality classifications, at 1:24,000 scale, to the remaining land areas in Connecticut.

AQUIFER PROTECTION AREA DATA – Aquifer Protection Areas shown on this map are from the Aquifer Protection Area digital dataset which contains polygon data intended to be used at 1:24,000 scale. The dataset contains regulated areas classified as Level A Aquifer Protection Area (Final) and Level B Aquifer Protection Area (Preliminary). The Level B areas are not shown on the WQC maps. The data was collected from 1991 to the present and is actively updated as Final area mapping replaces earlier Preliminary areas. The Aquifer Protection Areas are delineated by the individual water companies owning the well fields and submitted to the CT DEEP for approval. Preliminary mapping provides a general estimate of the area contributing ground water to the well field. Final mapping is based on extensive, site-specific, detailed modeling of the ground water flow system. CT DEEP may adjust Final area boundaries to be consistent with 1:24,000 scale topography and base map data where appropriate during the approval process.

MAJOR DRAINAGE BASIN DATA – Major drainage basins shown on this map are from Major Basin Line data developed by CT DEEP and intended to be used at 1:24,000 scale.

BASE MAP DATA - Based on data originally from 1:24,000-scale USGS 7.5 minute topographic quadrangle maps published between 1969 and 1992. It includes political boundaries, railroads, airports, hydrography, geographic names and geographic places. Streets and street names are from Tele Atlas® copyrighted data. Base map information is neither current nor complete.

RELATED INFORMATION
This map is intended to be printed at its original dimensions in order to maintain the 1:24,000 scale (1 inch = 2000 feet).
WATER QUALITY STANDARDS - Go to the CT DEEP website for a summary and the full text of the "Water Quality Standards" and for other information on water quality.
AQUIFER PROTECTION AREAS - Go to the CT DEEP website for more information.

ADOPTED DATES

Water Quality Standards
February 25, 2011

Thames River, Pawcatuck River and Southeast Coastal Basins: December 1986

Connecticut River and South Central Coastal Basins: February 1993

Housatonic River, Hudson River and Southwest Coastal Basins: March 1999

MAJOR BASINS

1 Pawcatuck
2 Southeast Coast
3 Thames
4 Connecticut
5 South Central Coast
6 Housatonic
7 Southwest Coast
8 Hudson

MAP LOCATION



State Plane Coordinate System of 1983, Zone 3526
Lambert Conformal Conic Projection
North American Datum of 1983

1 0.5 0 1 Miles
1000 0 1000 2000 3000 4000 5000 6000 7000 Feet
1 0.5 0 1 Kilometers

SCALE 1:24,000 (1 inch = 2000 feet) when map is printed at original size

STATE OF CONNECTICUT
DEPARTMENT OF
ENERGY & ENVIRONMENTAL PROTECTION
79 Elm Street
Hartford, CT 06106-5127

Map created by CT DEEP
October 2018

Map is not colorfast
Protect from light and moisture

360 Thompson Avenue Watershed Data

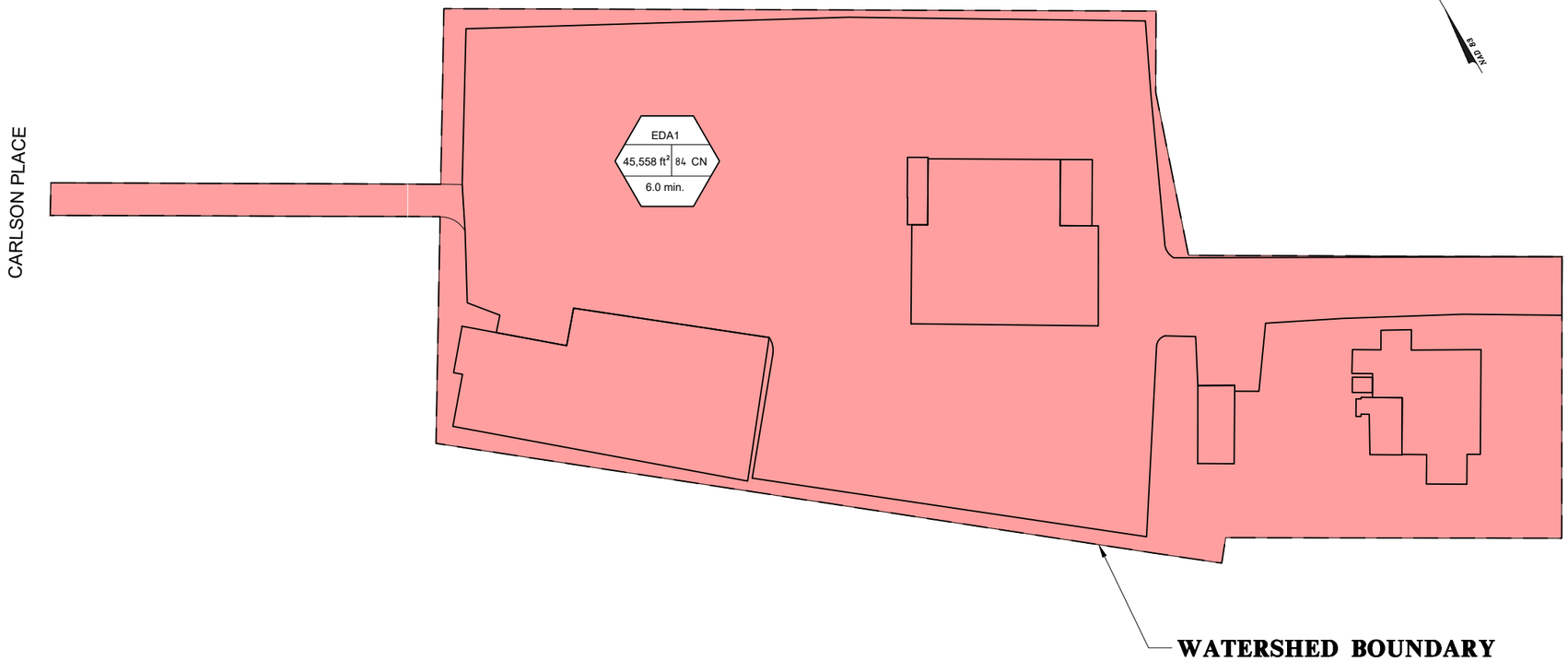
Watershed ID	Description	Area Ft²	CN	Tc (min)	Impervious Ft²	Impervious %
EDA1	Existing Drainage Area	45,558	84	6	9,471	20.8%
	Total Watershed -Existing	45,558	84		9,471	20.8%
PDA1	Proposed Drainage Area to Galleries	32,532	93	6.0	29,560	90.9%
PDA2	Proposed South DA to Thompson	7,391	45	6.0	793	10.7%
PDA3	Proposed North DA to Thompson	4,533	42	6.0	200	4.4%
PDA4	Proposed Drainage Area to Carlson	1,100	39	6.0	-	0.0%
	Total Watershed - Proposed	45,556	79		30,553	67.1%

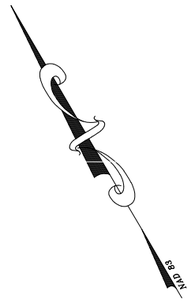
360 Thompson Ave HydroCad Discharge Summary (24 hour duration - Atlas 14 rainfall data)

Number	Name	2-Year Peak Discharge (cfs)	2-Year Elevation(feet)	2-Year Volume (cubic-feet)	10-Year Peak Discharge (cfs)	10-Year Elevation(feet)	10-Year Volume (cubic-feet)	25-Year Peak Discharge (cfs)	25-Year Elevation(feet)	25-Year Volume (cubic-feet)	50-Year Peak Discharge (cfs)	50-Year Elevation(feet)	50-Year Volume (cubic-feet)	100-Year Peak Discharge (cfs)	100-Year Elevation(feet)	100-Year Volume (cubic-feet)
EDA1	Existing Site	2.3	0.0	7,093	4.2	0.0	13,183	5.4	0.0	17,144	6.3	0.0	20,128	7.2	0.0	23,396
PDA1	Proposed Drainage Area to Galleries	2.2	0.0	7,205	3.6	0.0	11,967	4.4	0.0	14,960	5.0	0.0	17,187	5.6	0.0	19,606
1P	Galleries	1.8	8.8	1,229	3.1	9.1	3,519	4.0	9.3	5,114	4.6	9.4	6,346	5.2	9.6	7,732
PDA2	Proposed South DA to Thompson	0.0	0.0	44	0.1	0.0	316	0.1	0.0	580	0.2	0.0	812	0.3	0.0	1,092
PDA3	Proposed North DA to Thompson	0.0	0.0	11	0.0	0.0	140	0.1	0.0	278	0.1	0.0	403	0.2	0.0	557
PDA4	Proposed Drainage Area to Carlson	0.0	0.0	0	0.0	0.0	23	0.0	0.0	50	0.0	0.0	76	0.0	0.0	109
P1L	Proposed Combined Site	1.8	0.0	1,286	3.2	0.0	3,998	4.1	0.0	6,022	4.9	0.0	7,637	5.7	0.0	9,490

EDA1

Existing Site





GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

AGENCY SUBMISSION DRAWINGS
NOT FOR CONSTRUCTION

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REVISIONS

#######

CODESPOTI & ASSOCIATES P.C.
SITE PLANNING
LANDSCAPE ARCHITECTURE
ENGINEERING
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268 BOSTON POST ROAD, SUITE 5
ORANGE, CONNECTICUT 06477
TEL 203-799-1400
FAX 203-799-0011

PROPOSED SITE DEVELOPMENT PLANS
360 THOMPSON AVENUE
PREPARED FOR
13 CARLSON PLACE LLC
EAST HAVEN, CONNECTICUT

EXISTING WATERSHED

CAD FILE
4632
DATE
01/05/24
SCALE
1" = 20'
JOB NO.
4632
SHEET
W1

A25

\\dc2\Shared\Autocad Projects\Civil3D 2014\4632-360 Thompson\4632-Watershed.dwg, Existing Watershed, 1/9/2024 10:43:24 AM, 1:2.14857

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Existing Site

Subcat Reach Pond Link

Routing Diagram for 4632-Pre-360 Thompson Ave
Prepared by Codespoti & Associates, P.C., Printed 12/19/2023
HydroCAD® 10.10-5a s/n 07361 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NOAA 24-hr	D	Default	24.00	1	3.42	2
2	10-Year	NOAA 24-hr	D	Default	24.00	1	5.22	2
3	25-Year	NOAA 24-hr	D	Default	24.00	1	6.34	2
4	50-Year	NOAA 24-hr	D	Default	24.00	1	7.17	2
5	100-Year	NOAA 24-hr	D	Default	24.00	1	8.07	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
9,577	39	>75% Grass cover, Good, HSG A (EDA1)
26,510	96	Gravel surface, HSG A (EDA1)
1,279	98	Paved parking, HSG A (EDA1)
7,634	98	Roofs, HSG A (EDA1)
558	98	Sidewalks / Patios, HSG A (EDA1)
45,558	**84**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
45,558	HSG A	EDA1
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
45,558		**TOTAL AREA**

Ground Covers (selected 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
9,577	0	0	0	0	9,577	>75% Grass cover, Good	
26,510	0	0	0	0	26,510	Gravel surface	
1,279	0	0	0	0	1,279	Paved parking	
7,634	0	0	0	0	7,634	Roofs	
558	0	0	0	0	558	Sidewalks / Patios	
45,558	**0**	**0**	**0**	**0**	**45,558**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EDA1: Existing Site Runoff Area=45,558 sf 20.79% Impervious Runoff Depth=1.87"
Tc=6.0 min CN=84 Runoff=2.30 cfs 7,093 cf

Total Runoff Area = 45,558 sf Runoff Volume = 7,093 cf Average Runoff Depth = 1.87"
79.21% Pervious = 36,088 sf 20.79% Impervious = 9,471 sf

Summary for Subcatchment EDA1: Existing Site

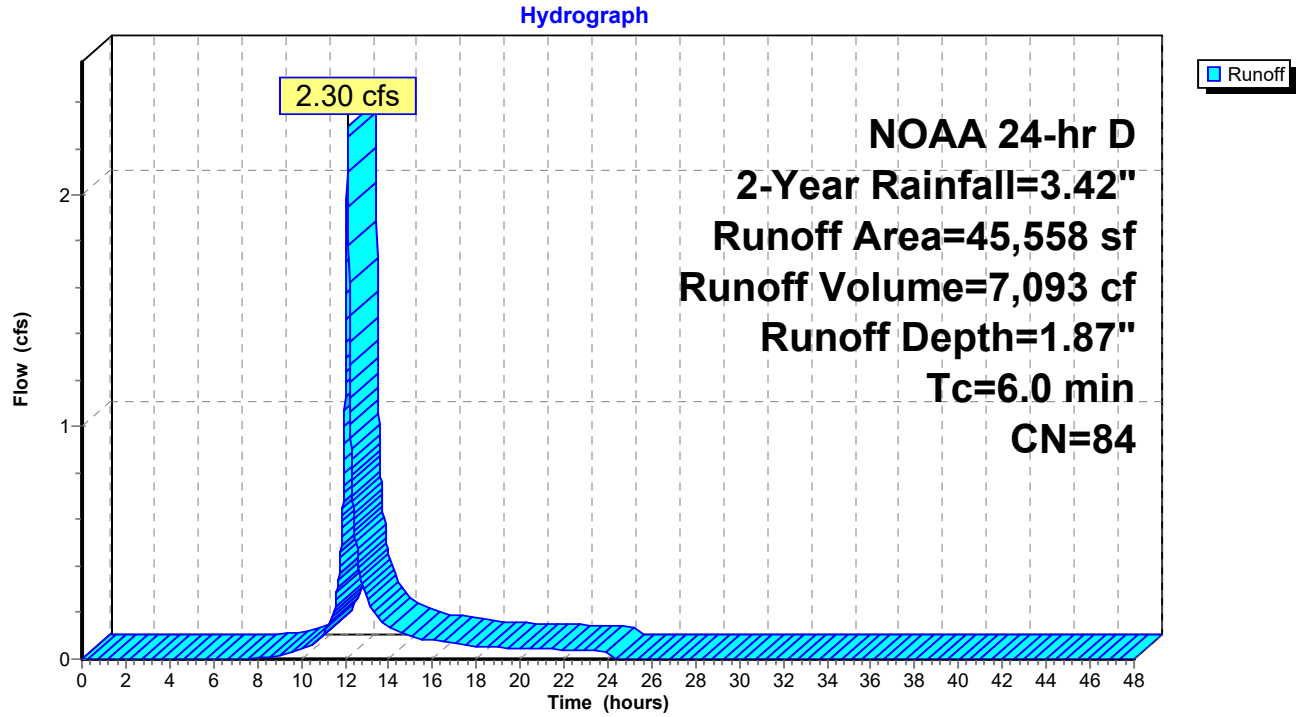
Runoff = 2.30 cfs @ 12.13 hrs, Volume= 7,093 cf, Depth= 1.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.42"

Area (sf)	CN	Description
9,577	39	>75% Grass cover, Good, HSG A
26,510	96	Gravel surface, HSG A
1,279	98	Paved parking, HSG A
7,634	98	Roofs, HSG A
558	98	Sidewalks / Patios, HSG A
45,558	84	Weighted Average
36,088		79.21% Pervious Area
9,471		20.79% Impervious Area

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

Subcatchment EDA1: Existing Site



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EDA1: Existing Site Runoff Area=45,558 sf 20.79% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=84 Runoff=4.19 cfs 13,183 cf

Total Runoff Area = 45,558 sf Runoff Volume = 13,183 cf Average Runoff Depth = 3.47"
79.21% Pervious = 36,088 sf 20.79% Impervious = 9,471 sf

Summary for Subcatchment EDA1: Existing Site

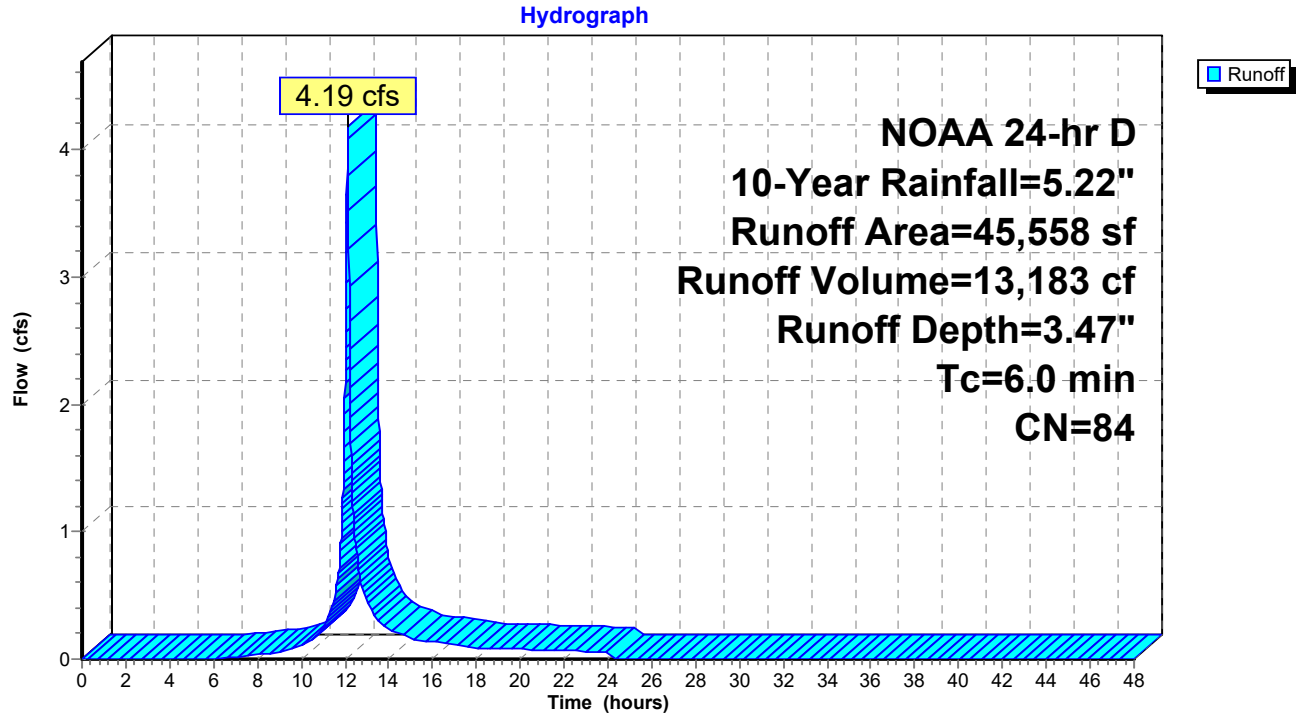
Runoff = 4.19 cfs @ 12.13 hrs, Volume= 13,183 cf, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=5.22"

Area (sf)	CN	Description
9,577	39	>75% Grass cover, Good, HSG A
26,510	96	Gravel surface, HSG A
1,279	98	Paved parking, HSG A
7,634	98	Roofs, HSG A
558	98	Sidewalks / Patios, HSG A
45,558	84	Weighted Average
36,088		79.21% Pervious Area
9,471		20.79% Impervious Area

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

Subcatchment EDA1: Existing Site



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EDA1: Existing Site Runoff Area=45,558 sf 20.79% Impervious Runoff Depth=4.52"
Tc=6.0 min CN=84 Runoff=5.37 cfs 17,144 cf

Total Runoff Area = 45,558 sf Runoff Volume = 17,144 cf Average Runoff Depth = 4.52"
79.21% Pervious = 36,088 sf 20.79% Impervious = 9,471 sf

Summary for Subcatchment EDA1: Existing Site

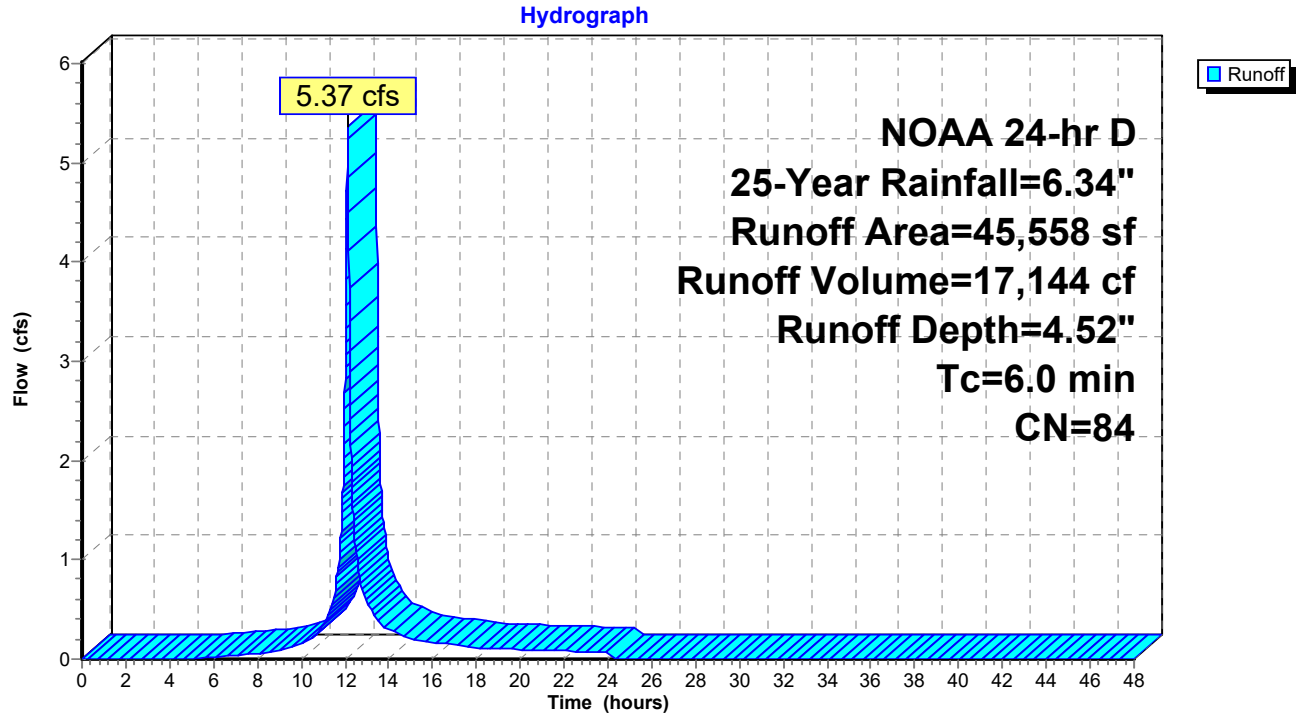
Runoff = 5.37 cfs @ 12.13 hrs, Volume= 17,144 cf, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 25-Year Rainfall=6.34"

Area (sf)	CN	Description
9,577	39	>75% Grass cover, Good, HSG A
26,510	96	Gravel surface, HSG A
1,279	98	Paved parking, HSG A
7,634	98	Roofs, HSG A
558	98	Sidewalks / Patios, HSG A
45,558	84	Weighted Average
36,088		79.21% Pervious Area
9,471		20.79% Impervious Area

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

Subcatchment EDA1: Existing Site



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EDA1: Existing Site Runoff Area=45,558 sf 20.79% Impervious Runoff Depth=5.30"
Tc=6.0 min CN=84 Runoff=6.25 cfs 20,128 cf

Total Runoff Area = 45,558 sf Runoff Volume = 20,128 cf Average Runoff Depth = 5.30"
79.21% Pervious = 36,088 sf 20.79% Impervious = 9,471 sf

Summary for Subcatchment EDA1: Existing Site

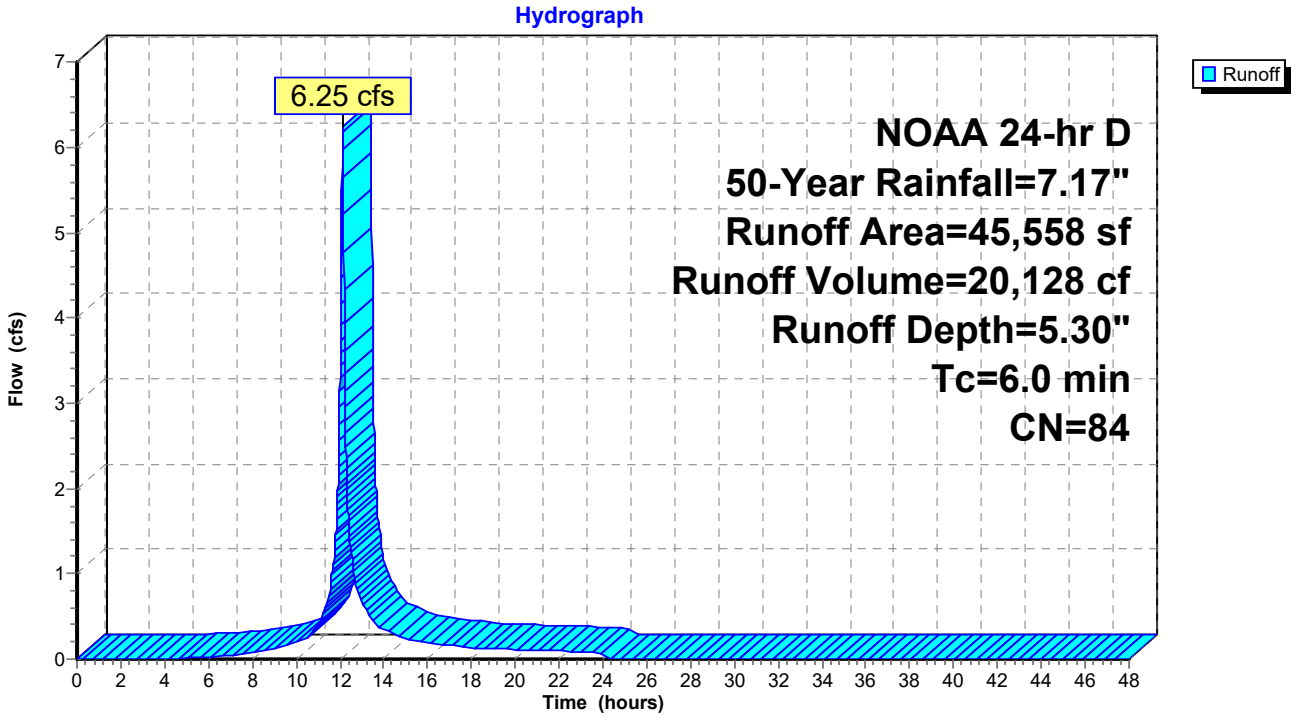
Runoff = 6.25 cfs @ 12.13 hrs, Volume= 20,128 cf, Depth= 5.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 50-Year Rainfall=7.17"

Area (sf)	CN	Description
9,577	39	>75% Grass cover, Good, HSG A
26,510	96	Gravel surface, HSG A
1,279	98	Paved parking, HSG A
7,634	98	Roofs, HSG A
558	98	Sidewalks / Patios, HSG A
45,558	84	Weighted Average
36,088		79.21% Pervious Area
9,471		20.79% Impervious Area

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

Subcatchment EDA1: Existing Site



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EDA1: Existing Site Runoff Area=45,558 sf 20.79% Impervious Runoff Depth=6.16"
Tc=6.0 min CN=84 Runoff=7.21 cfs 23,396 cf

Total Runoff Area = 45,558 sf Runoff Volume = 23,396 cf Average Runoff Depth = 6.16"
79.21% Pervious = 36,088 sf 20.79% Impervious = 9,471 sf

Summary for Subcatchment EDA1: Existing Site

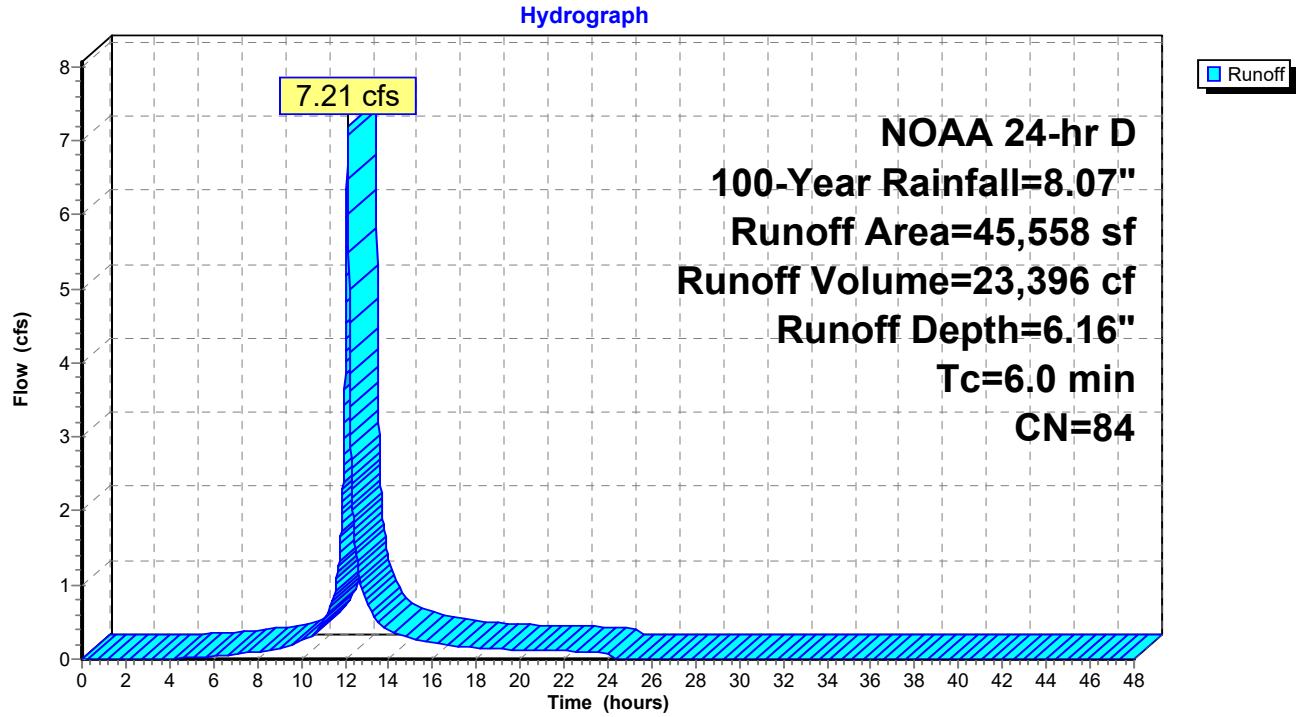
Runoff = 7.21 cfs @ 12.13 hrs, Volume= 23,396 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=8.07"

Area (sf)	CN	Description
9,577	39	>75% Grass cover, Good, HSG A
26,510	96	Gravel surface, HSG A
1,279	98	Paved parking, HSG A
7,634	98	Roofs, HSG A
558	98	Sidewalks / Patios, HSG A
45,558	84	Weighted Average
36,088		79.21% Pervious Area
9,471		20.79% Impervious Area

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

Subcatchment EDA1: Existing Site



Events for Subcatchment EDA1: Existing Site

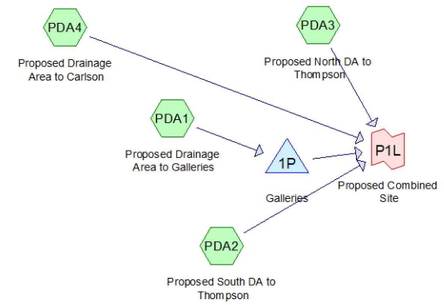
Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.42	2.30	7,093	1.87
10-Year	5.22	4.19	13,183	3.47
25-Year	6.34	5.37	17,144	4.52
50-Year	7.17	6.25	20,128	5.30
100-Year	**8.07**	**7.21**	**23,396**	**6.16**

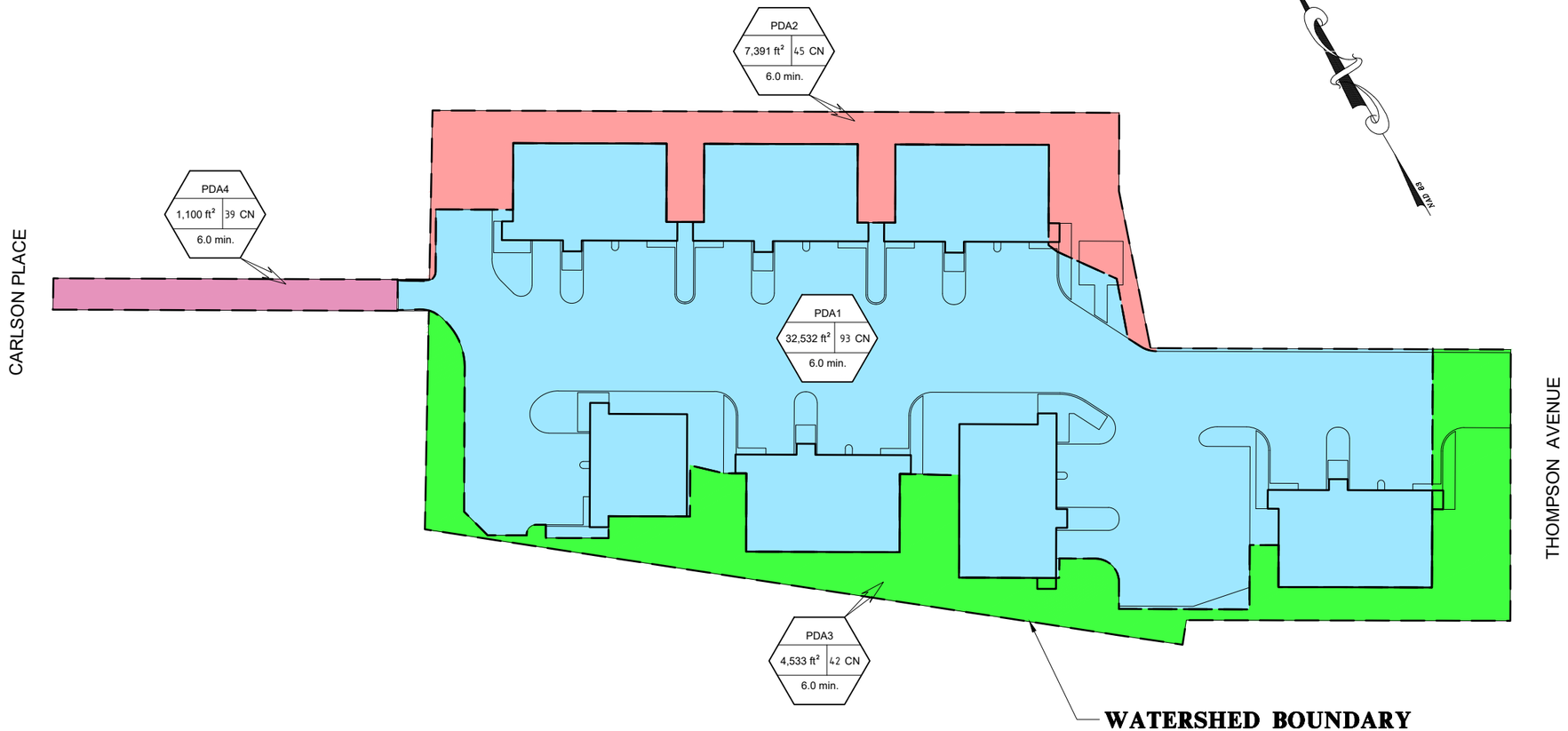
360 Thompson Avenue Watershed Data

Watershed ID	Description	Area Ft²	CN	Tc (min)	Impervious Ft²	Impervious %
EDA1	Existing Drainage Area	45,558	84	6	9,471	20.8%
	Total Watershed -Existing	45,558	84		9,471	20.8%
PDA1	Proposed Drainage Area to Galleries	32,532	93	6.0	29,560	90.9%
PDA2	Proposed South DA to Thompson	7,391	45	6.0	793	10.7%
PDA3	Proposed North DA to Thompson	4,533	42	6.0	200	4.4%
PDA4	Proposed Drainage Area to Carlson	1,100	39	6.0	-	0.0%
	Total Watershed - Proposed	45,556	79		30,553	67.1%

360 Thompson Ave HydroCad Discharge Summary (24 hour duration - Atlas 14 rainfall data)

Number	Name	2-Year Peak Discharge (cfs)	2-Year Elevation(feet)	2-Year Volume (cubic-feet)	10-Year Peak Discharge (cfs)	10-Year Elevation(feet)	10-Year Volume (cubic-feet)	25-Year Peak Discharge (cfs)	25-Year Elevation(feet)	25-Year Volume (cubic-feet)	50-Year Peak Discharge (cfs)	50-Year Elevation(feet)	50-Year Volume (cubic-feet)	100-Year Peak Discharge (cfs)	100-Year Elevation(feet)	100-Year Volume (cubic-feet)
EDA1	Existing Site	2.3	0.0	7,093	4.2	0.0	13,183	5.4	0.0	17,144	6.3	0.0	20,128	7.2	0.0	23,396
PDA1	Proposed Drainage Area to Galleries	2.2	0.0	7,205	3.6	0.0	11,967	4.4	0.0	14,960	5.0	0.0	17,187	5.6	0.0	19,606
1P	Galleries	1.8	8.8	1,229	3.1	9.1	3,519	4.0	9.3	5,114	4.6	9.4	6,346	5.2	9.6	7,732
PDA2	Proposed South DA to Thompson	0.0	0.0	44	0.1	0.0	316	0.1	0.0	580	0.2	0.0	812	0.3	0.0	1,092
PDA3	Proposed North DA to Thompson	0.0	0.0	11	0.0	0.0	140	0.1	0.0	278	0.1	0.0	403	0.2	0.0	557
PDA4	Proposed Drainage Area to Carlson	0.0	0.0	0	0.0	0.0	23	0.0	0.0	50	0.0	0.0	76	0.0	0.0	109
P1L	Proposed Combined Site	1.8	0.0	1,286	3.2	0.0	3,998	4.1	0.0	6,022	4.9	0.0	7,637	5.7	0.0	9,490





GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

AGENCY SUBMISSION DRAWINGS
NOT FOR CONSTRUCTION

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PROPOSED SITE DEVELOPMENT PLANS
360 THOMPSON AVENUE
PREPARED FOR
13 CARLSON PLACE LLC
EAST HAVEN, CONNECTICUT

PROPOSED WATERSHED

CAD FILE 4632
DATE 01/05/24
SCALE 1" = 20'
JOB NO. 4632
SHEET W2

A45

\\dc2\Shared\Autocad Projects\Civil3D 2014\4632-360 Thompson\4632-Watershed.dwg, Proposed Watershed, 1/9/2024 10:43:27 AM, 1:2.14857

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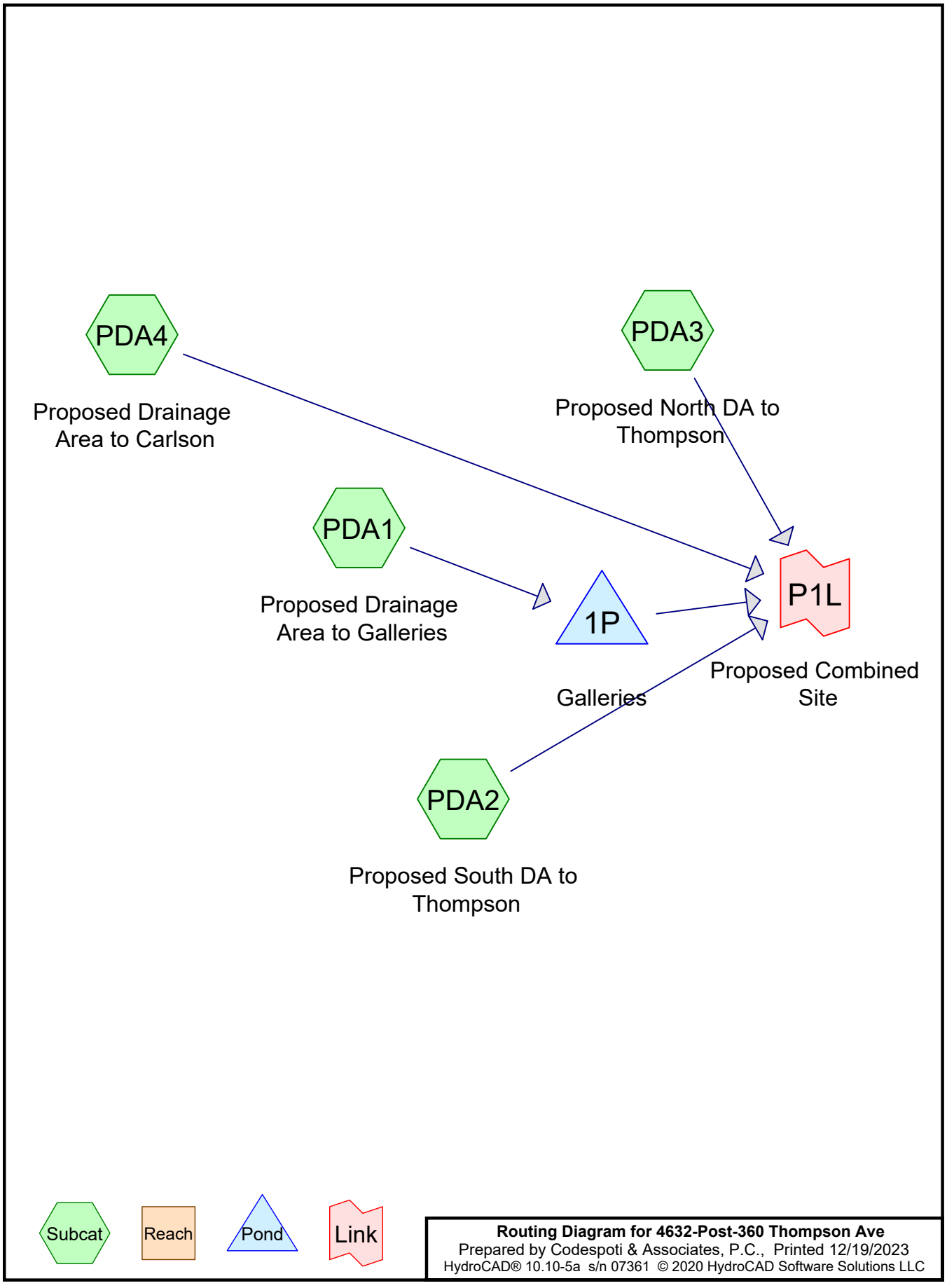
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Routing Diagram for 4632-Post-360 Thompson Ave
Prepared by Codespoti & Associates, P.C., Printed 12/19/2023
HydroCAD® 10.10-5a s/n 07361 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NOAA 24-hr	D	Default	24.00	1	3.42	2
2	10-Year	NOAA 24-hr	D	Default	24.00	1	5.22	2
3	25-Year	NOAA 24-hr	D	Default	24.00	1	6.34	2
4	50-Year	NOAA 24-hr	D	Default	24.00	1	7.17	2
5	100-Year	NOAA 24-hr	D	Default	24.00	1	8.07	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
15,001	39	>75% Grass cover, Good, HSG A (PDA1, PDA2, PDA3, PDA4)
18,492	98	Paved parking, HSG A (PDA1, PDA2, PDA3)
10,547	98	Roofs, HSG A (PDA1, PDA2, PDA3)
1,515	98	Sidewalks / Patios, HSG A (PDA1, PDA2, PDA3)
45,555	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
45,555	HSG A	PDA1, PDA2, PDA3, PDA4
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
45,555		**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
15,001	0	0	0	0	15,001	>75% Grass cover, Good	
18,492	0	0	0	0	18,492	Paved parking	
10,547	0	0	0	0	10,547	Roofs	
1,515	0	0	0	0	1,515	Sidewalks / Patios	
45,555	**0**	**0**	**0**	**0**	**45,555**	**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	8.00	7.95	5.0	0.0100	0.013	0.0	15.0	0.0

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment PDA1: Proposed Drainage Runoff Area=32,532 sf 90.87% Impervious Runoff Depth=2.66"
Tc=6.0 min CN=93 Runoff=2.21 cfs 7,205 cf

Subcatchment PDA2: Proposed South DA Runoff Area=7,391 sf 10.73% Impervious Runoff Depth=0.07"
Tc=6.0 min CN=45 Runoff=0.00 cfs 44 cf

Subcatchment PDA3: Proposed North DA to Runoff Area=4,533 sf 4.42% Impervious Runoff Depth=0.03"
Tc=6.0 min CN=42 Runoff=0.00 cfs 11 cf

Subcatchment PDA4: Proposed Drainage Runoff Area=1,100 sf 0.00% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0 cf

Pond 1P: Galleries Peak Elev=8.80' Storage=1,066 cf Inflow=2.21 cfs 7,205 cf
Discarded=0.37 cfs 5,960 cf Primary=1.83 cfs 1,229 cf Outflow=2.20 cfs 7,189 cf

Link P1L: Proposed Combined Site Inflow=1.83 cfs 1,286 cf
Primary=1.83 cfs 1,286 cf

Total Runoff Area = 45,555 sf Runoff Volume = 7,261 cf Average Runoff Depth = 1.91"
32.93% Pervious = 15,001 sf 67.07% Impervious = 30,553 sf

Summary for Subcatchment PDA1: Proposed Drainage Area to Galleries

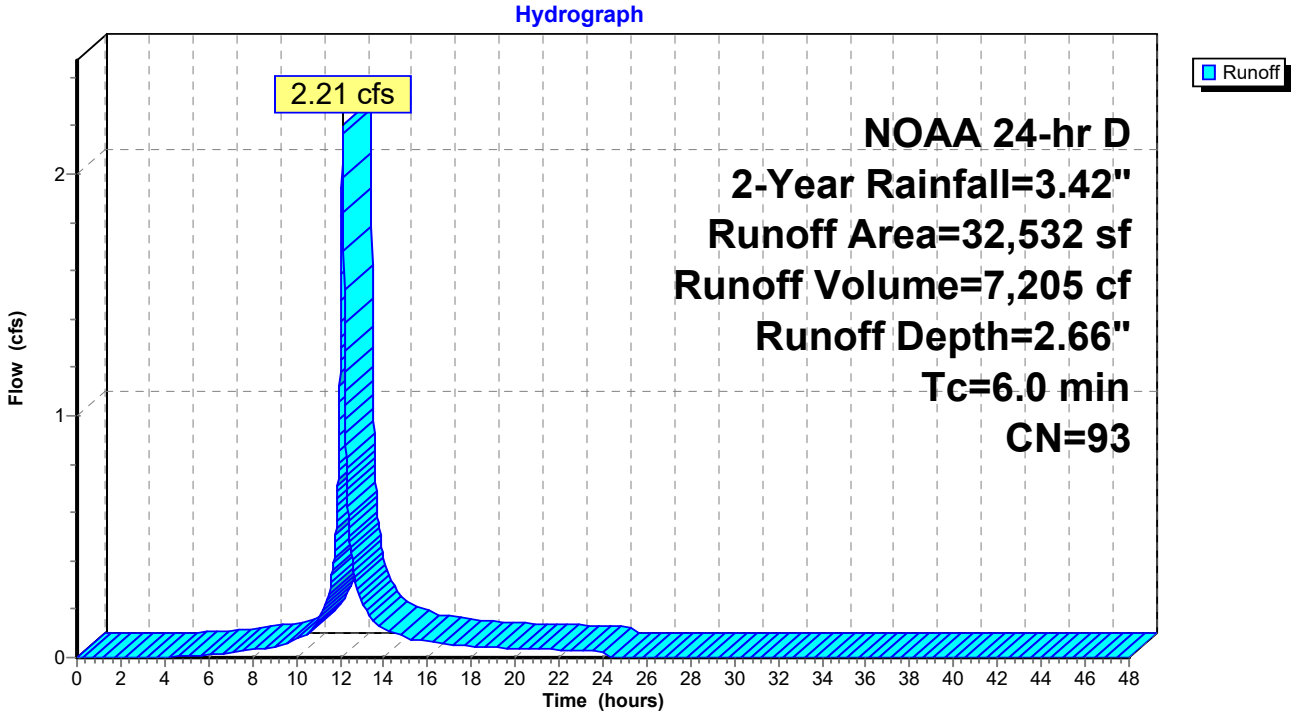
Runoff = 2.21 cfs @ 12.13 hrs, Volume= 7,205 cf, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.42"

Area (sf)	CN	Description
2,972	39	>75% Grass cover, Good, HSG A
17,832	98	Paved parking, HSG A
10,484	98	Roofs, HSG A
1,245	98	Sidewalks / Patios, HSG A
32,532	93	Weighted Average
2,972		9.13% Pervious Area
29,560		90.87% Impervious Area

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

Subcatchment PDA1: Proposed Drainage Area to Galleries



Summary for Subcatchment PDA2: Proposed South DA to Thompson

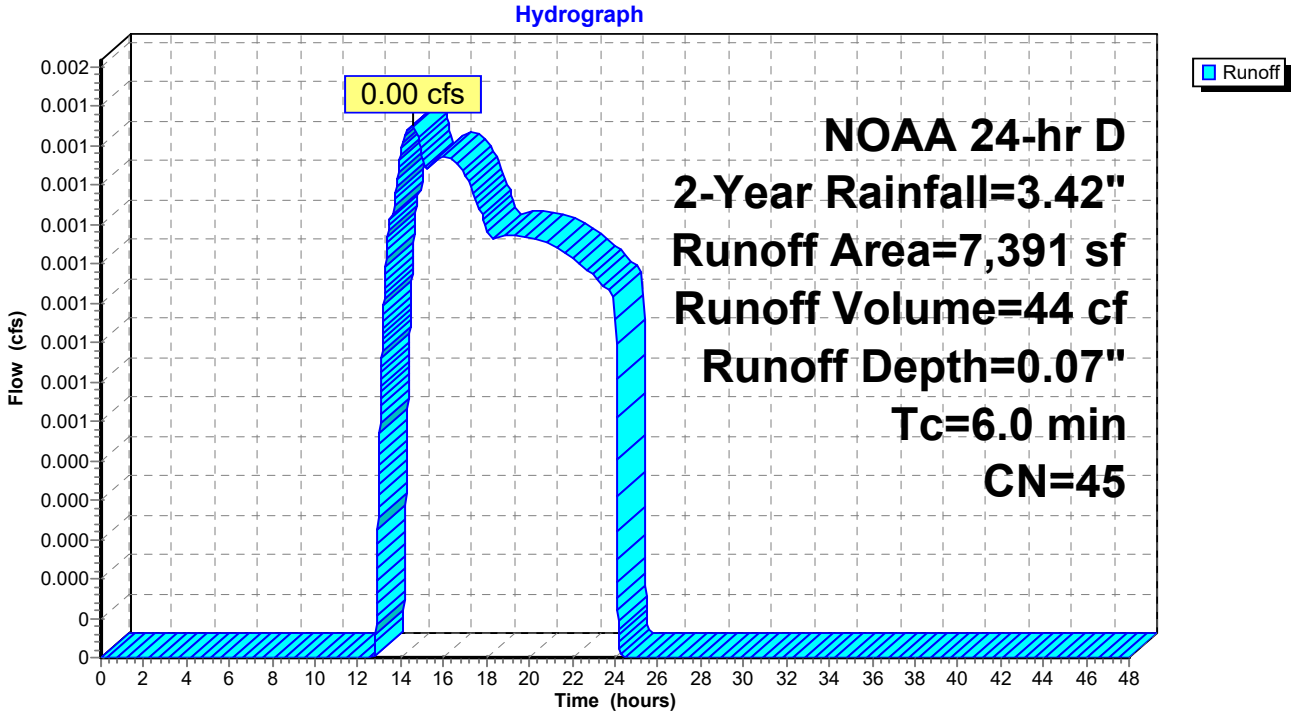
Runoff = 0.00 cfs @ 14.54 hrs, Volume= 44 cf, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.42"

Area (sf)	CN	Description
6,598	39	>75% Grass cover, Good, HSG A
659	98	Paved parking, HSG A
42	98	Roofs, HSG A
91	98	Sidewalks / Patios, HSG A
7,391	45	Weighted Average
6,598		89.27% Pervious Area
793		10.73% Impervious Area

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

Subcatchment PDA2: Proposed South DA to Thompson



Summary for Subcatchment PDA3: Proposed North DA to Thompson

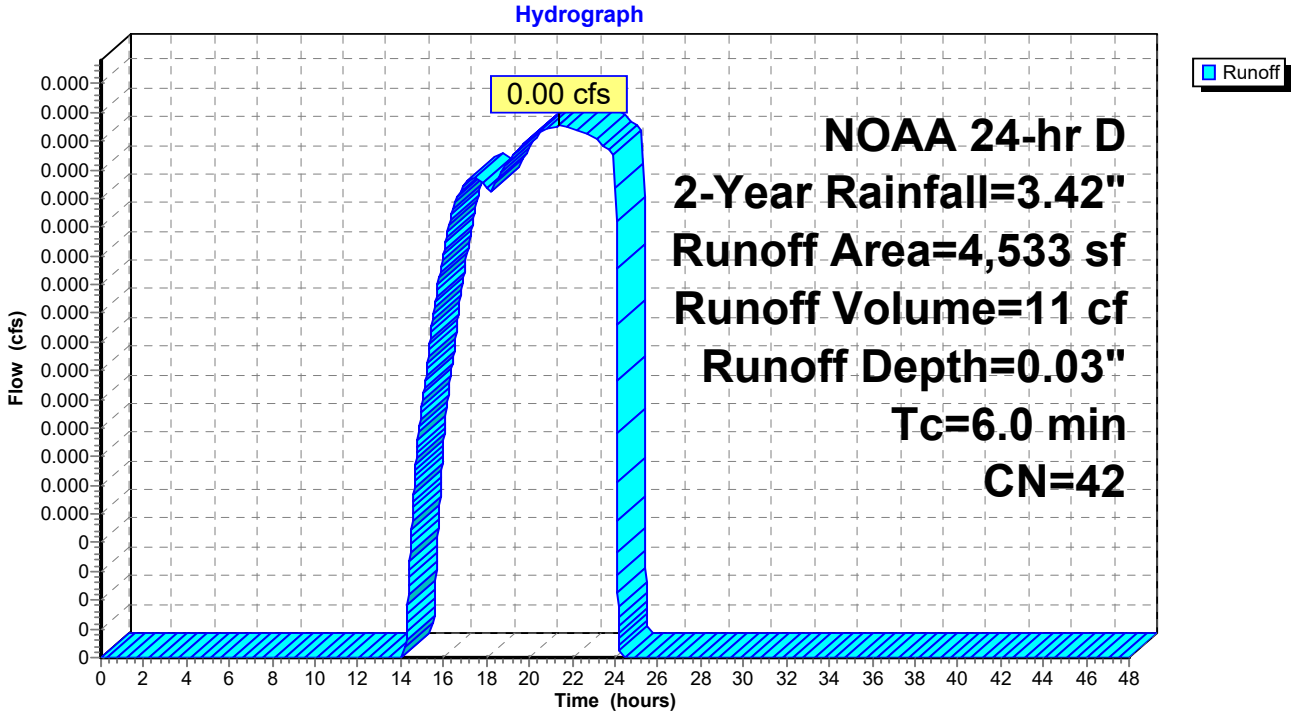
Runoff = 0.00 cfs @ 21.43 hrs, Volume= 11 cf, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.42"

Area (sf)	CN	Description
4,332	39	>75% Grass cover, Good, HSG A
1	98	Paved parking, HSG A
21	98	Roofs, HSG A
179	98	Sidewalks / Patios, HSG A
4,533	42	Weighted Average
4,332		95.58% Pervious Area
200		4.42% Impervious Area

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

Subcatchment PDA3: Proposed North DA to Thompson



Summary for Subcatchment PDA4: Proposed Drainage Area to Carlson

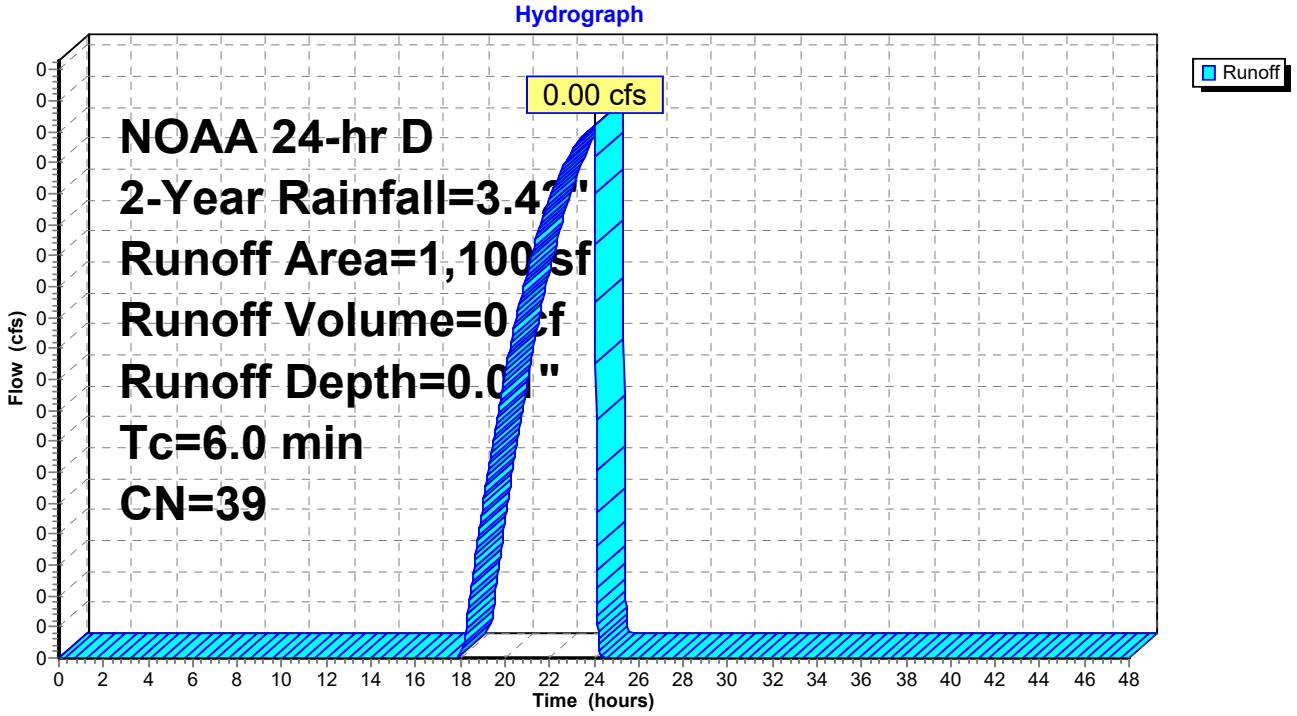
Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 2-Year Rainfall=3.42"

Area (sf)	CN	Description
1,100	39	>75% Grass cover, Good, HSG A
1,100		100.00% Pervious Area

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

Subcatchment PDA4: Proposed Drainage Area to Carlson



Summary for Pond 1P: Galleries

Inflow Area = 32,532 sf, 90.87% Impervious, Inflow Depth = 2.66" for 2-Year event
Inflow = 2.21 cfs @ 12.13 hrs, Volume= 7,205 cf
Outflow = 2.20 cfs @ 12.13 hrs, Volume= 7,189 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.37 cfs @ 12.13 hrs, Volume= 5,960 cf
Primary = 1.83 cfs @ 12.13 hrs, Volume= 1,229 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 8.80' @ 12.13 hrs Surf.Area= 704 sf Storage= 1,066 cf

Plug-Flow detention time= 27.0 min calculated for 7,189 cf (100% of inflow)
Center-of-Mass det. time= 25.6 min (821.5 - 795.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	5.75'	244 cf	**14.00'W x 50.00'L x 2.50'H Field A** 1,750 cf Overall - 1,140 cf Embedded = 610 cf x 40.0% Voids
#2A	6.25'	815 cf	**Concrete Galley 4x8x2** x 18 Inside #1 Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf 18 Chambers in 3 Rows
#3	7.10'	21 cf	**2.00'W x 2.00'L x 5.30'H Prismatoid**
		1,080 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	8.00'	**15.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.00' / 7.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Discarded	5.75'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 4.90'

Discarded OutFlow Max=0.37 cfs @ 12.13 hrs HW=8.80' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.37 cfs)

Primary OutFlow Max=1.83 cfs @ 12.13 hrs HW=8.80' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 1.83 cfs @ 3.15 fps)

Pond 1P: Galleries - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x8x2 (Concrete Galley, UCPI 24" Low Profile Galley or equivalent)
Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf
Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf

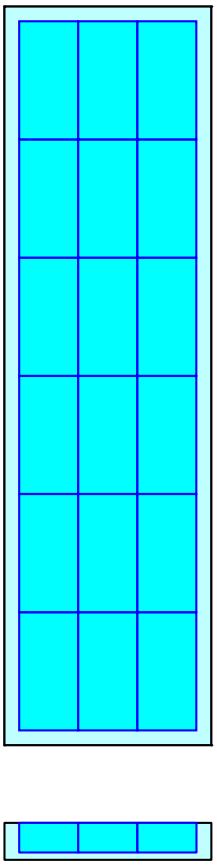
6 Chambers/Row x 8.00' Long = 48.00' Row Length +12.0" End Stone x 2 = 50.00' Base Length
3 Rows x 48.0" Wide + 12.0" Side Stone x 2 = 14.00' Base Width
6.0" Stone Base + 24.0" Chamber Height = 2.50' Field Height

18 Chambers x 45.3 cf = 815.4 cf Chamber Storage
18 Chambers x 63.4 cf = 1,140.5 cf Displacement

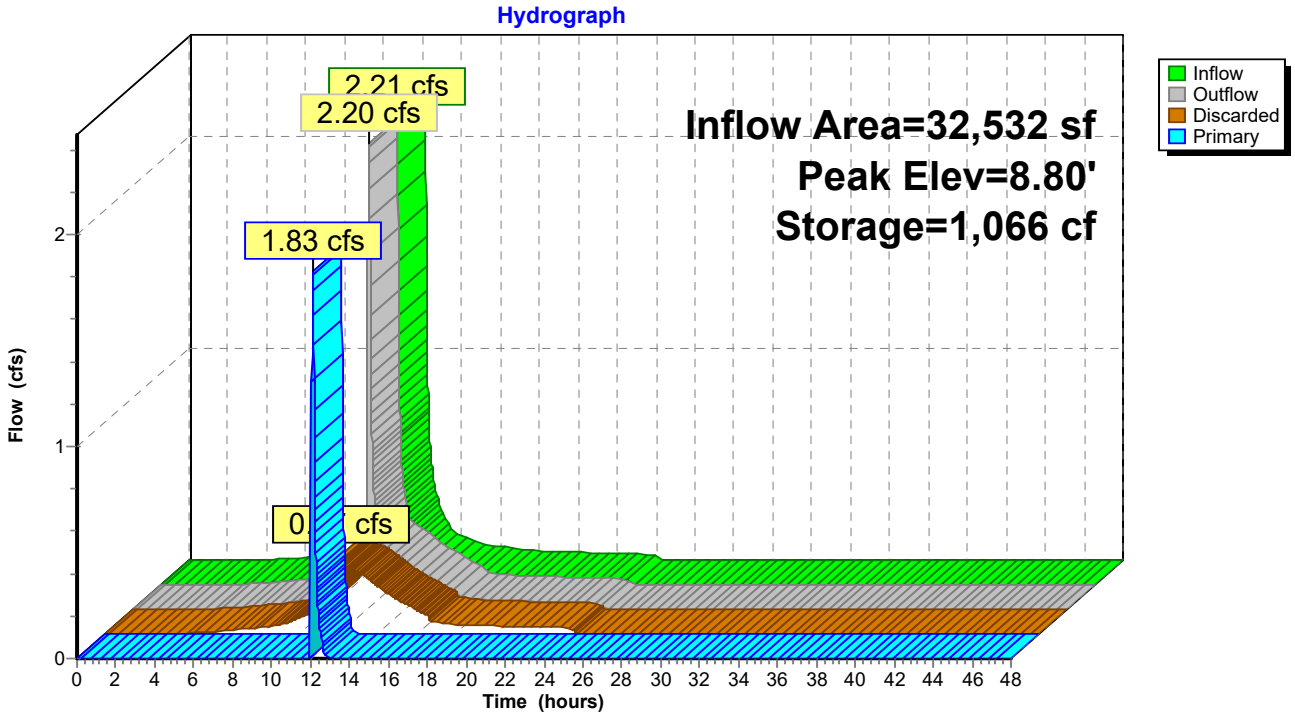
1,750.0 cf Field - 1,140.5 cf Chambers = 609.5 cf Stone x 40.0% Voids = 243.8 cf Stone Storage

Chamber Storage + Stone Storage = 1,059.2 cf = 0.024 af
Overall Storage Efficiency = 60.5%
Overall System Size = 50.00' x 14.00' x 2.50'

18 Chambers
64.8 cy Field
22.6 cy Stone



Pond 1P: Galleries

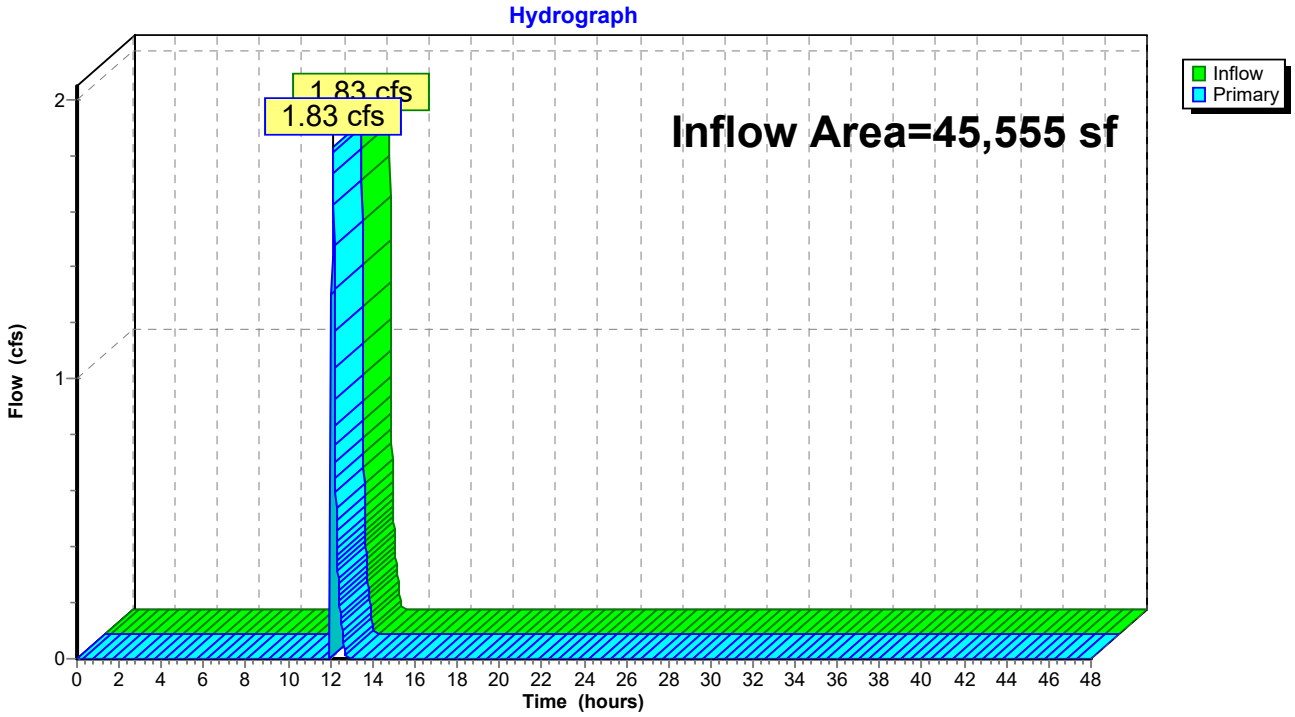


Summary for Link P1L: Proposed Combined Site

Inflow Area = 45,555 sf, 67.07% Impervious, Inflow Depth = 0.34" for 2-Year event
Inflow = 1.83 cfs @ 12.13 hrs, Volume= 1,286 cf
Primary = 1.83 cfs @ 12.13 hrs, Volume= 1,286 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link P1L: Proposed Combined Site



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment PDA1: Proposed Drainage Runoff Area=32,532 sf 90.87% Impervious Runoff Depth=4.41"
Tc=6.0 min CN=93 Runoff=3.55 cfs 11,967 cf

Subcatchment PDA2: Proposed South DA Runoff Area=7,391 sf 10.73% Impervious Runoff Depth=0.51"
Tc=6.0 min CN=45 Runoff=0.05 cfs 316 cf

Subcatchment PDA3: Proposed North DA to Runoff Area=4,533 sf 4.42% Impervious Runoff Depth=0.37"
Tc=6.0 min CN=42 Runoff=0.01 cfs 140 cf

Subcatchment PDA4: Proposed Drainage Runoff Area=1,100 sf 0.00% Impervious Runoff Depth=0.25"
Tc=6.0 min CN=39 Runoff=0.00 cfs 23 cf

Pond 1P: Galleries Peak Elev=9.11' Storage=1,067 cf Inflow=3.55 cfs 11,967 cf
Discarded=0.40 cfs 8,434 cf Primary=3.14 cfs 3,519 cf Outflow=3.55 cfs 11,952 cf

Link P1L: Proposed Combined Site Inflow=3.19 cfs 3,998 cf
Primary=3.19 cfs 3,998 cf

Total Runoff Area = 45,555 sf Runoff Volume = 12,446 cf Average Runoff Depth = 3.28"
32.93% Pervious = 15,001 sf 67.07% Impervious = 30,553 sf

Summary for Subcatchment PDA1: Proposed Drainage Area to Galleries

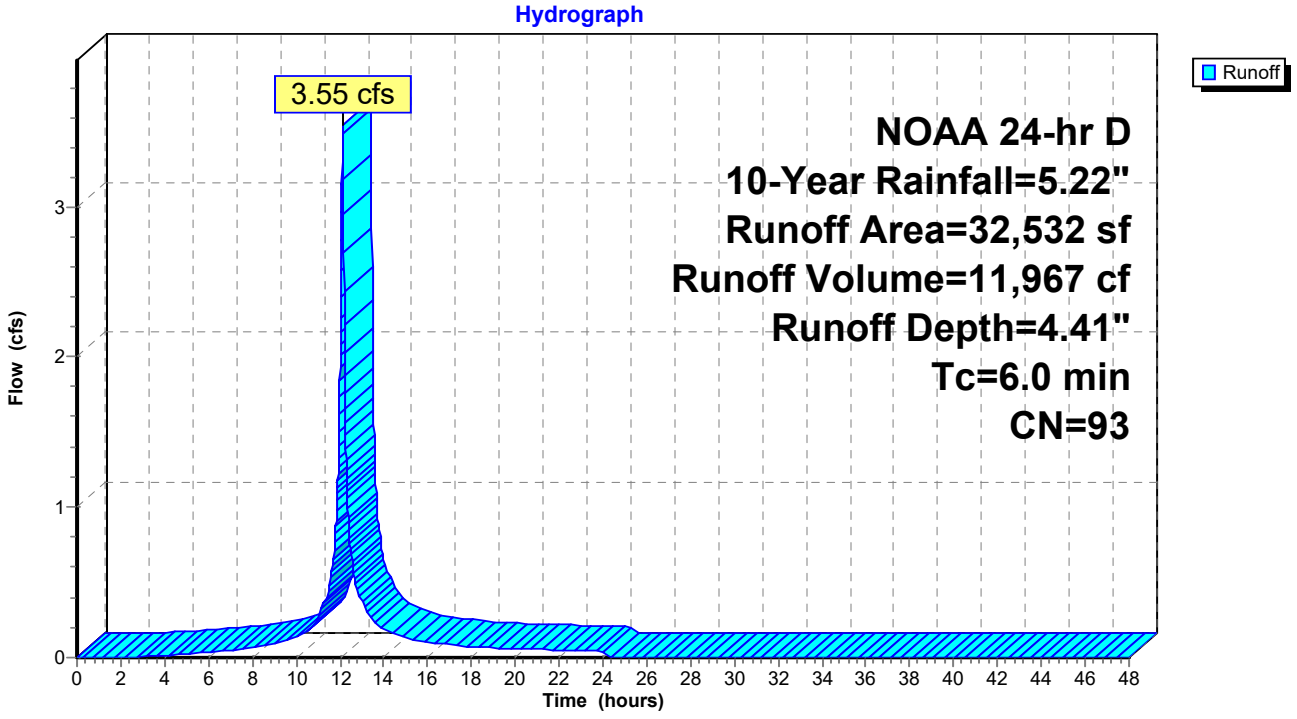
Runoff = 3.55 cfs @ 12.13 hrs, Volume= 11,967 cf, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=5.22"

Area (sf)	CN	Description
2,972	39	>75% Grass cover, Good, HSG A
17,832	98	Paved parking, HSG A
10,484	98	Roofs, HSG A
1,245	98	Sidewalks / Patios, HSG A
32,532	93	Weighted Average
2,972		9.13% Pervious Area
29,560		90.87% Impervious Area

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

Subcatchment PDA1: Proposed Drainage Area to Galleries



Summary for Subcatchment PDA2: Proposed South DA to Thompson

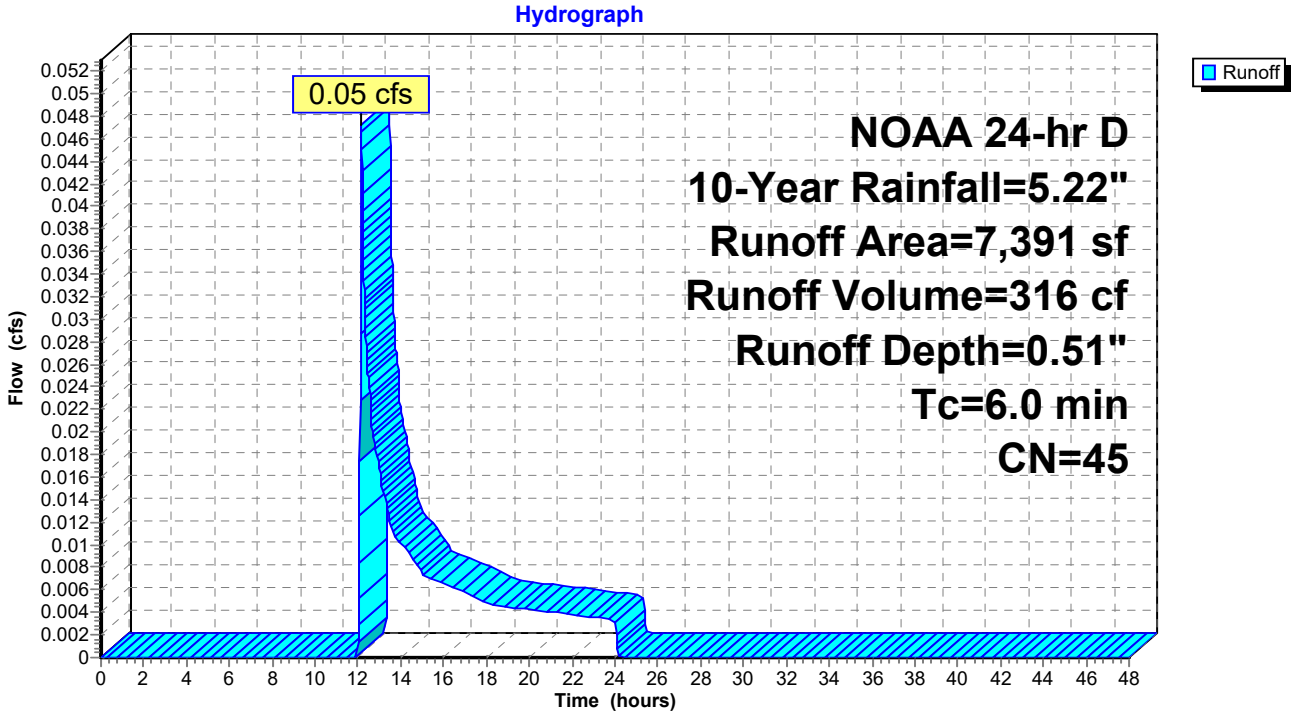
Runoff = 0.05 cfs @ 12.16 hrs, Volume= 316 cf, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=5.22"

Area (sf)	CN	Description
6,598	39	>75% Grass cover, Good, HSG A
659	98	Paved parking, HSG A
42	98	Roofs, HSG A
91	98	Sidewalks / Patios, HSG A
7,391	45	Weighted Average
6,598		89.27% Pervious Area
793		10.73% Impervious Area

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

Subcatchment PDA2: Proposed South DA to Thompson



Summary for Subcatchment PDA3: Proposed North DA to Thompson

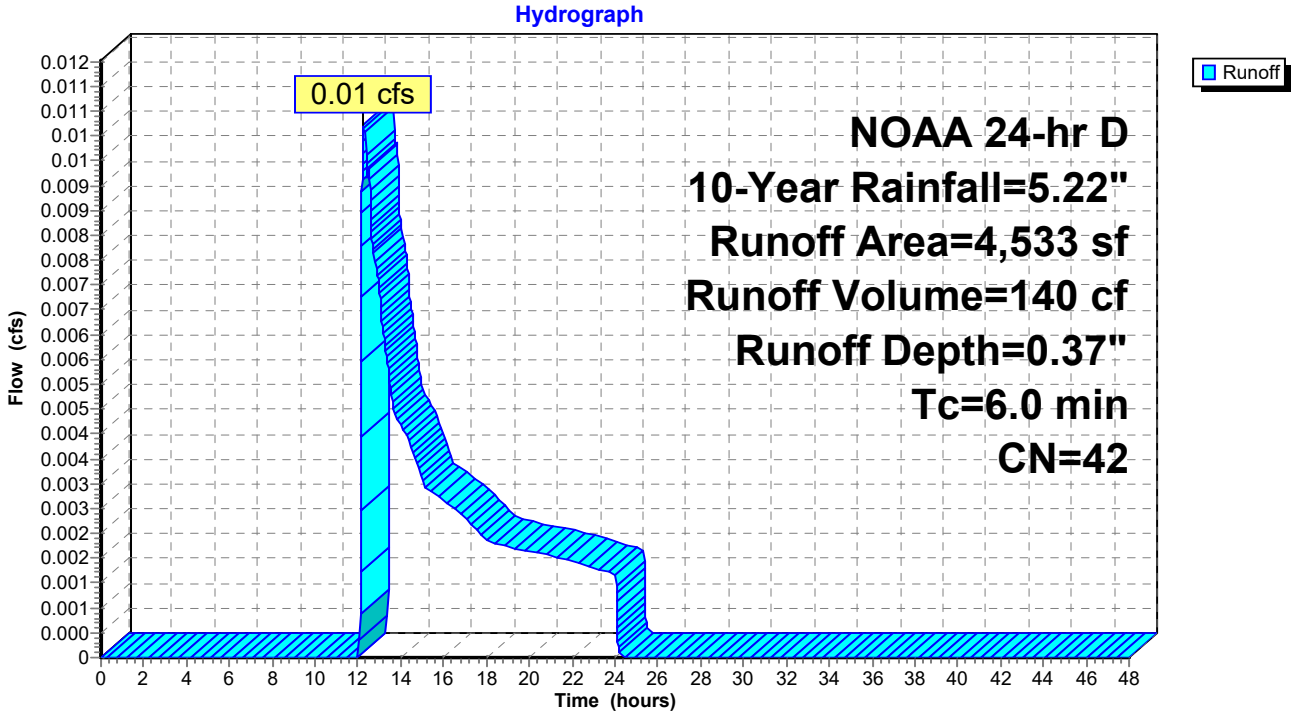
Runoff = 0.01 cfs @ 12.26 hrs, Volume= 140 cf, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=5.22"

Area (sf)	CN	Description
4,332	39	>75% Grass cover, Good, HSG A
1	98	Paved parking, HSG A
21	98	Roofs, HSG A
179	98	Sidewalks / Patios, HSG A
4,533	42	Weighted Average
4,332		95.58% Pervious Area
200		4.42% Impervious Area

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

Subcatchment PDA3: Proposed North DA to Thompson



Summary for Subcatchment PDA4: Proposed Drainage Area to Carlson

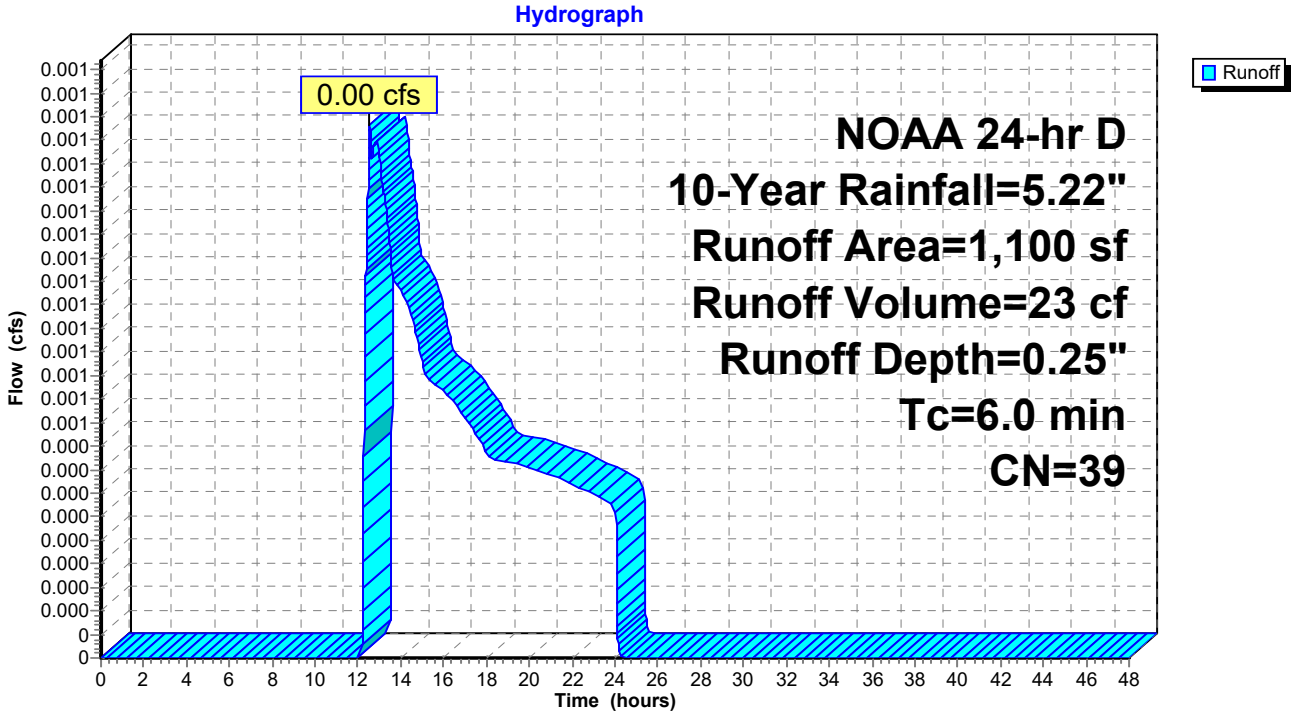
Runoff = 0.00 cfs @ 12.55 hrs, Volume= 23 cf, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 10-Year Rainfall=5.22"

Area (sf)	CN	Description
1,100	39	>75% Grass cover, Good, HSG A
1,100		100.00% Pervious Area

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

Subcatchment PDA4: Proposed Drainage Area to Carlson



Summary for Pond 1P: Galleries

Inflow Area = 32,532 sf, 90.87% Impervious, Inflow Depth = 4.41" for 10-Year event
Inflow = 3.55 cfs @ 12.13 hrs, Volume= 11,967 cf
Outflow = 3.55 cfs @ 12.13 hrs, Volume= 11,952 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.40 cfs @ 12.13 hrs, Volume= 8,434 cf
Primary = 3.14 cfs @ 12.13 hrs, Volume= 3,519 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 9.11' @ 12.13 hrs Surf.Area= 704 sf Storage= 1,067 cf

Plug-Flow detention time= 23.9 min calculated for 11,952 cf (100% of inflow)
Center-of-Mass det. time= 23.1 min (804.1 - 781.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	5.75'	244 cf	**14.00'W x 50.00'L x 2.50'H Field A** 1,750 cf Overall - 1,140 cf Embedded = 610 cf x 40.0% Voids
#2A	6.25'	815 cf	**Concrete Galley 4x8x2** x 18 Inside #1 Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf 18 Chambers in 3 Rows
#3	7.10'	21 cf	**2.00'W x 2.00'L x 5.30'H Prismatoid**
		1,080 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	8.00'	**15.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.00' / 7.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Discarded	5.75'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 4.90'

Discarded OutFlow Max=0.40 cfs @ 12.13 hrs HW=9.11' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.40 cfs)

Primary OutFlow Max=3.14 cfs @ 12.13 hrs HW=9.11' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.14 cfs @ 3.63 fps)

Pond 1P: Galleries - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x8x2 (Concrete Galley, UCPI 24" Low Profile Galley or equivalent)
Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf
Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf

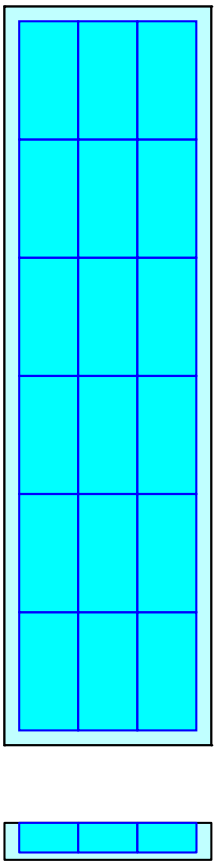
6 Chambers/Row x 8.00' Long = 48.00' Row Length +12.0" End Stone x 2 = 50.00' Base Length
3 Rows x 48.0" Wide + 12.0" Side Stone x 2 = 14.00' Base Width
6.0" Stone Base + 24.0" Chamber Height = 2.50' Field Height

18 Chambers x 45.3 cf = 815.4 cf Chamber Storage
18 Chambers x 63.4 cf = 1,140.5 cf Displacement

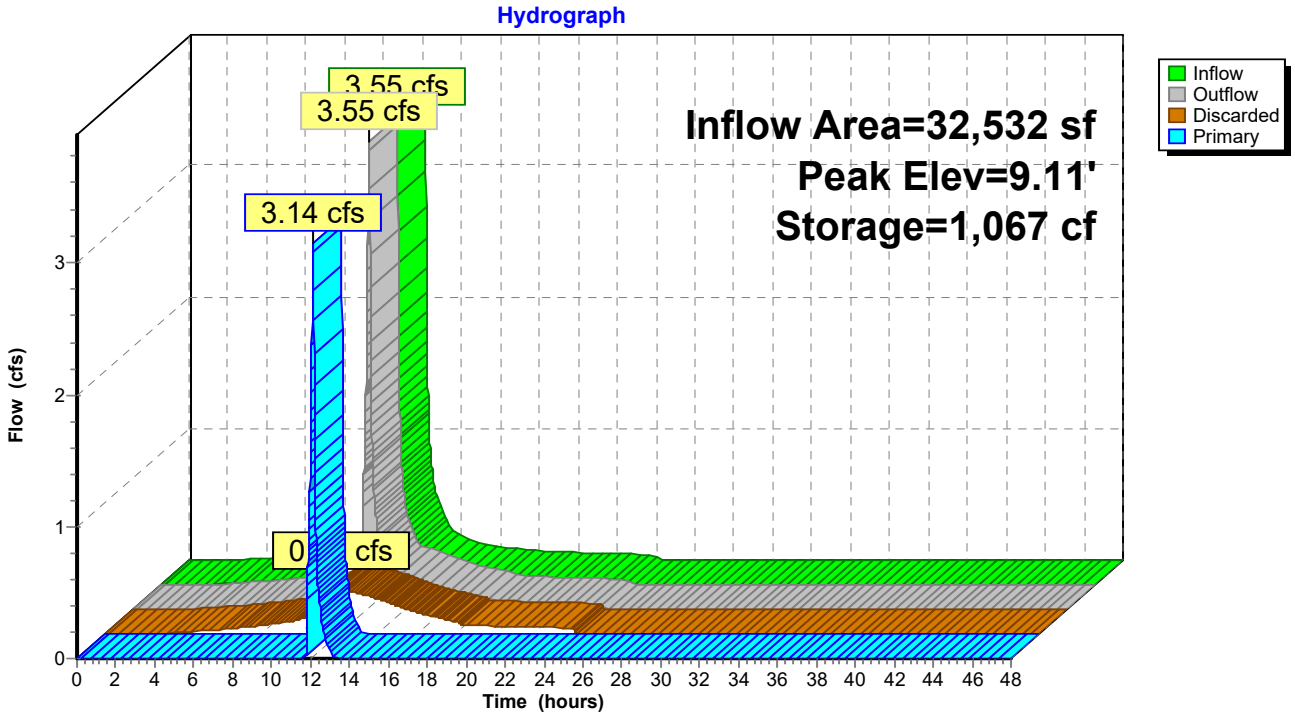
1,750.0 cf Field - 1,140.5 cf Chambers = 609.5 cf Stone x 40.0% Voids = 243.8 cf Stone Storage

Chamber Storage + Stone Storage = 1,059.2 cf = 0.024 af
Overall Storage Efficiency = 60.5%
Overall System Size = 50.00' x 14.00' x 2.50'

18 Chambers
64.8 cy Field
22.6 cy Stone



Pond 1P: Galleries

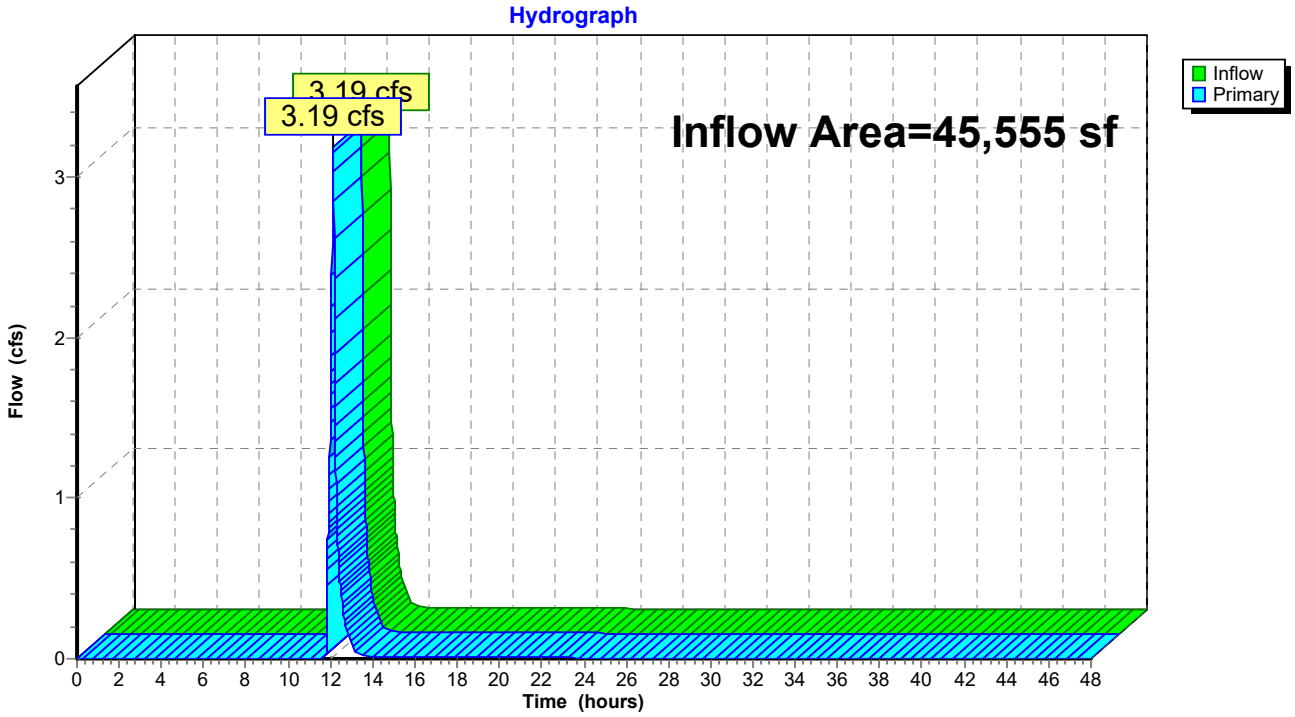


Summary for Link P1L: Proposed Combined Site

Inflow Area = 45,555 sf, 67.07% Impervious, Inflow Depth = 1.05" for 10-Year event
Inflow = 3.19 cfs @ 12.13 hrs, Volume= 3,998 cf
Primary = 3.19 cfs @ 12.13 hrs, Volume= 3,998 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link P1L: Proposed Combined Site



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment PDA1: Proposed Drainage Runoff Area=32,532 sf 90.87% Impervious Runoff Depth=5.52"
Tc=6.0 min CN=93 Runoff=4.37 cfs 14,960 cf

Subcatchment PDA2: Proposed South DA Runoff Area=7,391 sf 10.73% Impervious Runoff Depth=0.94"
Tc=6.0 min CN=45 Runoff=0.14 cfs 580 cf

Subcatchment PDA3: Proposed North DA to Runoff Area=4,533 sf 4.42% Impervious Runoff Depth=0.74"
Tc=6.0 min CN=42 Runoff=0.05 cfs 278 cf

Subcatchment PDA4: Proposed Drainage Runoff Area=1,100 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=39 Runoff=0.01 cfs 50 cf

Pond 1P: Galleries Peak Elev=9.29' Storage=1,068 cf Inflow=4.37 cfs 14,960 cf
Discarded=0.42 cfs 9,845 cf Primary=3.95 cfs 5,114 cf Outflow=4.37 cfs 14,959 cf

Link P1L: Proposed Combined Site Inflow=4.14 cfs 6,022 cf
Primary=4.14 cfs 6,022 cf

Total Runoff Area = 45,555 sf Runoff Volume = 15,868 cf Average Runoff Depth = 4.18"
32.93% Pervious = 15,001 sf 67.07% Impervious = 30,553 sf

Summary for Subcatchment PDA1: Proposed Drainage Area to Galleries

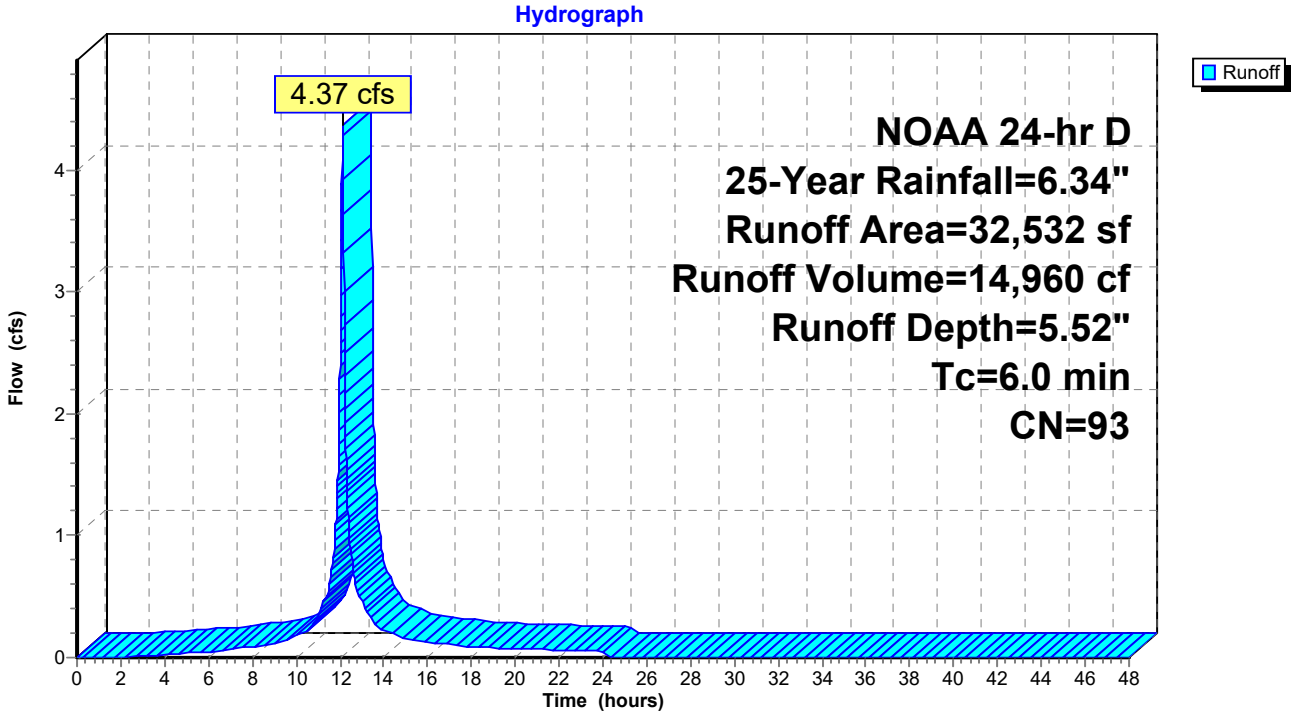
Runoff = 4.37 cfs @ 12.13 hrs, Volume= 14,960 cf, Depth= 5.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 25-Year Rainfall=6.34"

Area (sf)	CN	Description
2,972	39	>75% Grass cover, Good, HSG A
17,832	98	Paved parking, HSG A
10,484	98	Roofs, HSG A
1,245	98	Sidewalks / Patios, HSG A
32,532	93	Weighted Average
2,972		9.13% Pervious Area
29,560		90.87% Impervious Area

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

Subcatchment PDA1: Proposed Drainage Area to Galleries



Summary for Subcatchment PDA2: Proposed South DA to Thompson

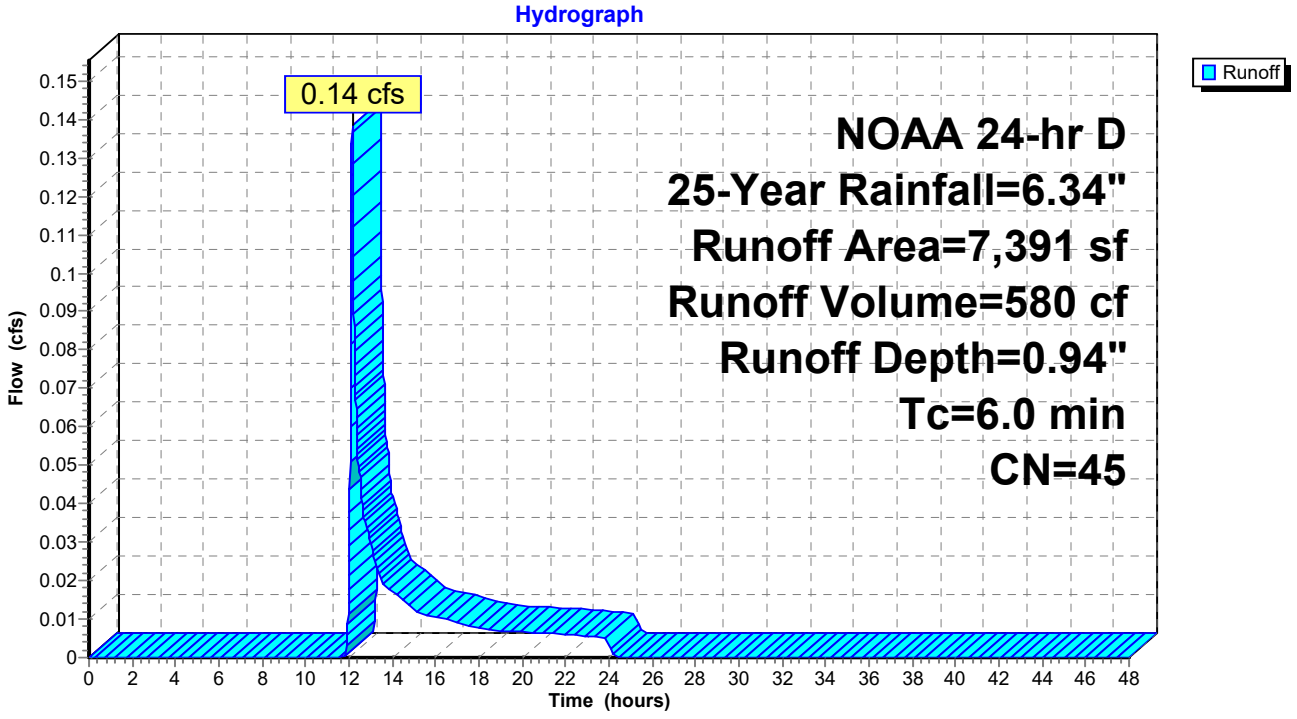
Runoff = 0.14 cfs @ 12.15 hrs, Volume= 580 cf, Depth= 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 25-Year Rainfall=6.34"

Area (sf)	CN	Description
6,598	39	>75% Grass cover, Good, HSG A
659	98	Paved parking, HSG A
42	98	Roofs, HSG A
91	98	Sidewalks / Patios, HSG A
7,391	45	Weighted Average
6,598		89.27% Pervious Area
793		10.73% Impervious Area

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

Subcatchment PDA2: Proposed South DA to Thompson



Summary for Subcatchment PDA3: Proposed North DA to Thompson

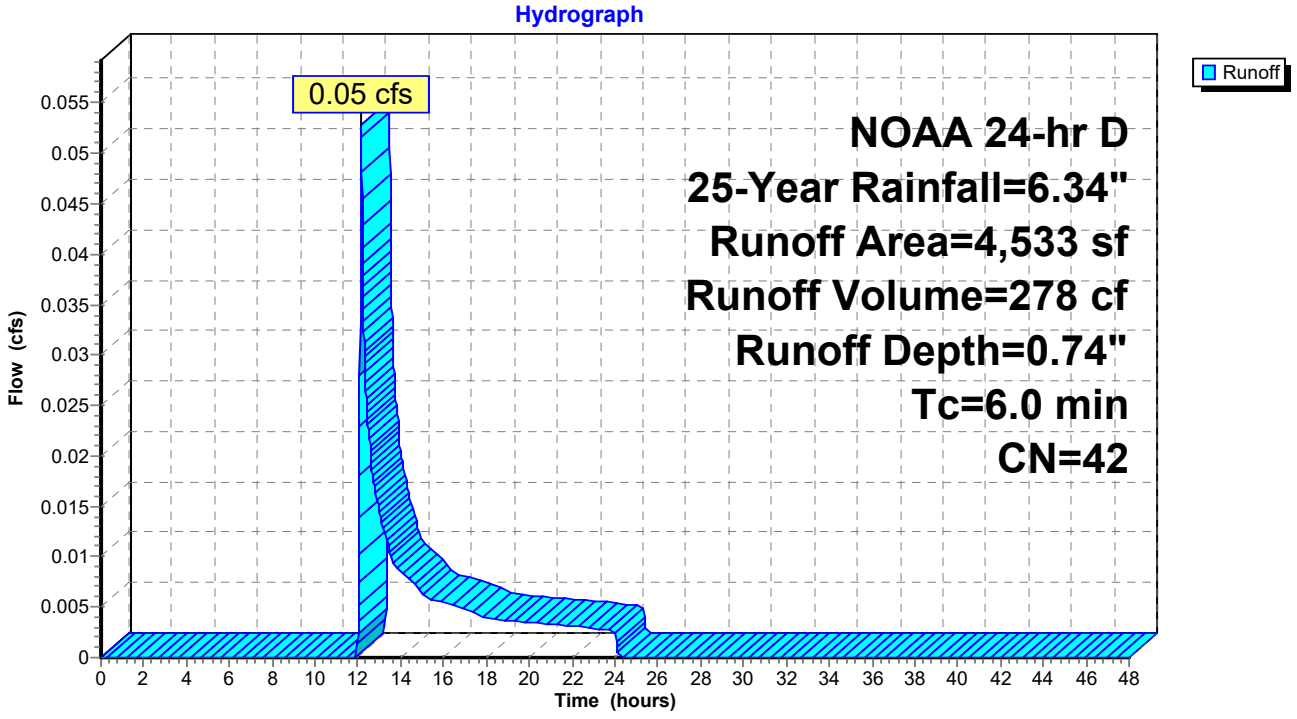
Runoff = 0.05 cfs @ 12.15 hrs, Volume= 278 cf, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 25-Year Rainfall=6.34"

Area (sf)	CN	Description
4,332	39	>75% Grass cover, Good, HSG A
1	98	Paved parking, HSG A
21	98	Roofs, HSG A
179	98	Sidewalks / Patios, HSG A
4,533	42	Weighted Average
4,332		95.58% Pervious Area
200		4.42% Impervious Area

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

Subcatchment PDA3: Proposed North DA to Thompson



Summary for Subcatchment PDA4: Proposed Drainage Area to Carlson

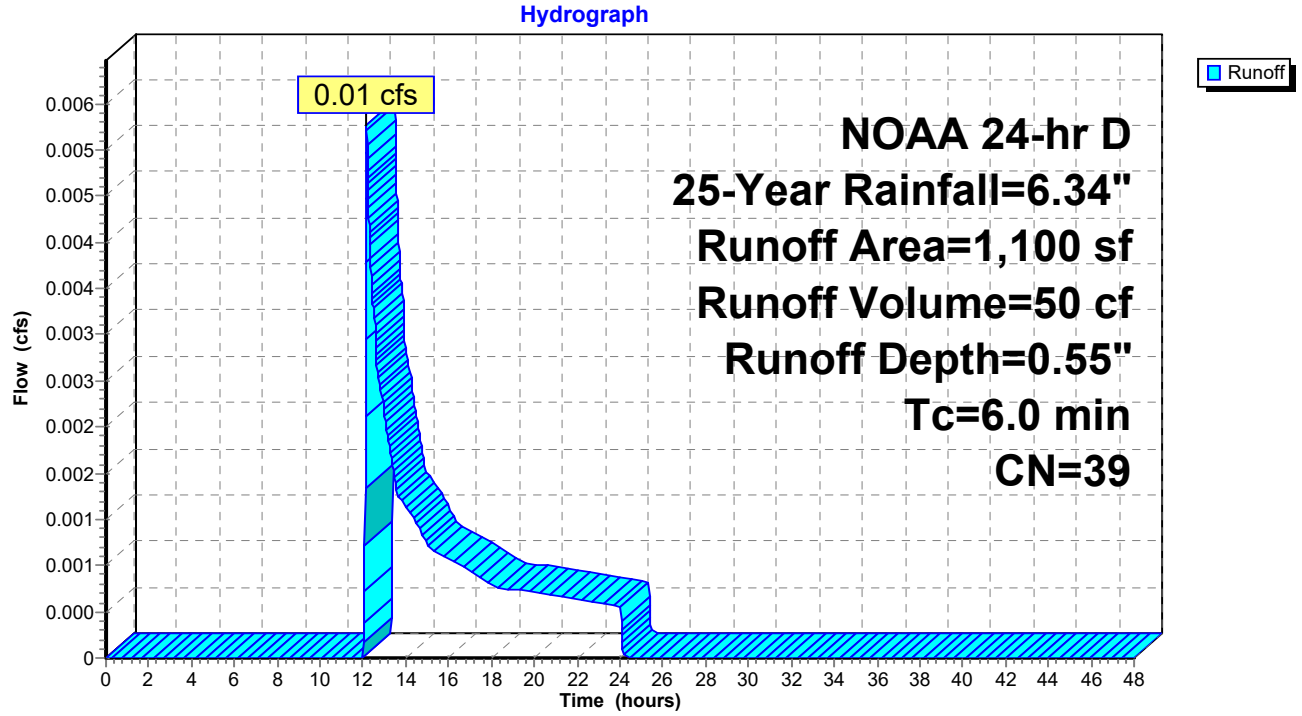
Runoff = 0.01 cfs @ 12.17 hrs, Volume= 50 cf, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 25-Year Rainfall=6.34"

Area (sf)	CN	Description
1,100	39	>75% Grass cover, Good, HSG A
1,100		100.00% Pervious Area

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

Subcatchment PDA4: Proposed Drainage Area to Carlson



Summary for Pond 1P: Galleries

Inflow Area = 32,532 sf, 90.87% Impervious, Inflow Depth = 5.52" for 25-Year event
Inflow = 4.37 cfs @ 12.13 hrs, Volume= 14,960 cf
Outflow = 4.37 cfs @ 12.13 hrs, Volume= 14,959 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.42 cfs @ 12.13 hrs, Volume= 9,845 cf
Primary = 3.95 cfs @ 12.13 hrs, Volume= 5,114 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 9.29' @ 12.13 hrs Surf.Area= 704 sf Storage= 1,068 cf

Plug-Flow detention time= 22.5 min calculated for 14,956 cf (100% of inflow)
Center-of-Mass det. time= 22.5 min (797.3 - 774.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	5.75'	244 cf	**14.00'W x 50.00'L x 2.50'H Field A** 1,750 cf Overall - 1,140 cf Embedded = 610 cf x 40.0% Voids
#2A	6.25'	815 cf	**Concrete Galley 4x8x2** x 18 Inside #1 Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf 18 Chambers in 3 Rows
#3	7.10'	21 cf	**2.00'W x 2.00'L x 5.30'H Prismatoid**
		1,080 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	8.00'	**15.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.00' / 7.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Discarded	5.75'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 4.90'

Discarded OutFlow Max=0.42 cfs @ 12.13 hrs HW=9.29' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.42 cfs)

Primary OutFlow Max=3.95 cfs @ 12.13 hrs HW=9.29' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 3.95 cfs @ 3.88 fps)

Pond 1P: Galleries - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x8x2 (Concrete Galley, UCPI 24" Low Profile Galley or equivalent)
Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf
Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf

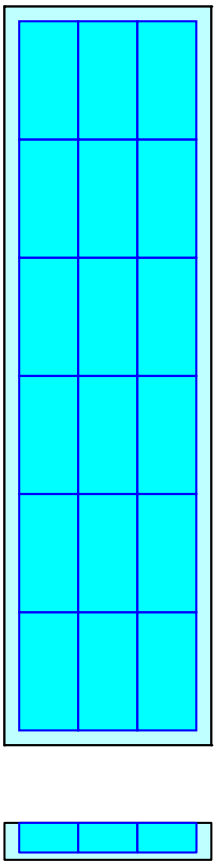
6 Chambers/Row x 8.00' Long = 48.00' Row Length +12.0" End Stone x 2 = 50.00' Base Length
3 Rows x 48.0" Wide + 12.0" Side Stone x 2 = 14.00' Base Width
6.0" Stone Base + 24.0" Chamber Height = 2.50' Field Height

18 Chambers x 45.3 cf = 815.4 cf Chamber Storage
18 Chambers x 63.4 cf = 1,140.5 cf Displacement

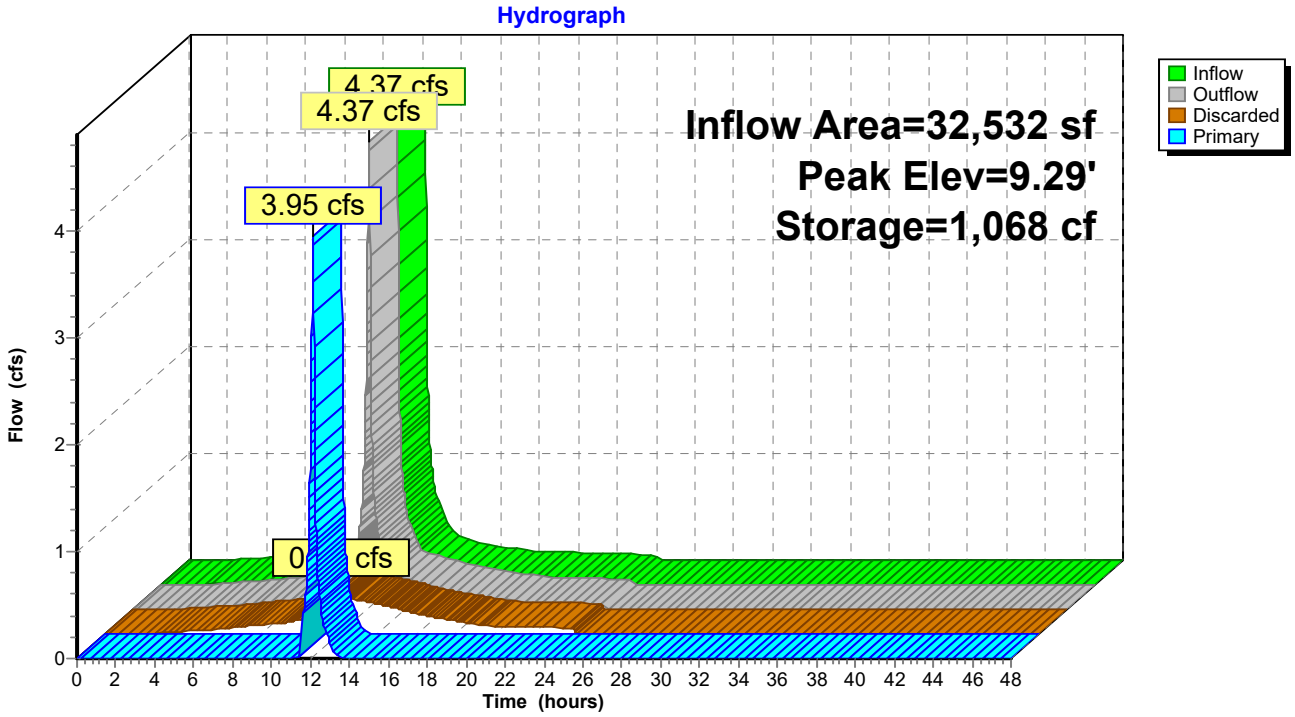
1,750.0 cf Field - 1,140.5 cf Chambers = 609.5 cf Stone x 40.0% Voids = 243.8 cf Stone Storage

Chamber Storage + Stone Storage = 1,059.2 cf = 0.024 af
Overall Storage Efficiency = 60.5%
Overall System Size = 50.00' x 14.00' x 2.50'

18 Chambers
64.8 cy Field
22.6 cy Stone



Pond 1P: Galleries

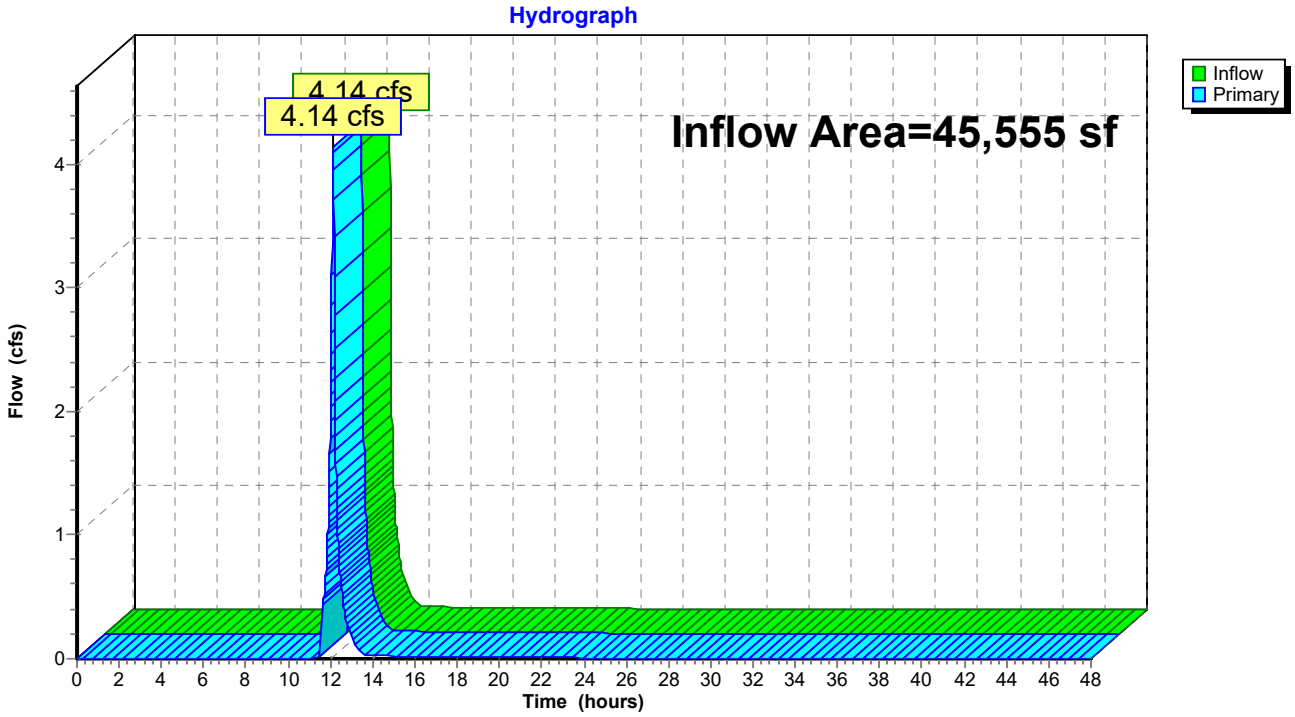


Summary for Link P1L: Proposed Combined Site

Inflow Area = 45,555 sf, 67.07% Impervious, Inflow Depth = 1.59" for 25-Year event
Inflow = 4.14 cfs @ 12.13 hrs, Volume= 6,022 cf
Primary = 4.14 cfs @ 12.13 hrs, Volume= 6,022 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link P1L: Proposed Combined Site



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment PDA1: Proposed Drainage Runoff Area=32,532 sf 90.87% Impervious Runoff Depth=6.34"
Tc=6.0 min CN=93 Runoff=4.98 cfs 17,187 cf

Subcatchment PDA2: Proposed South DA Runoff Area=7,391 sf 10.73% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=45 Runoff=0.22 cfs 812 cf

Subcatchment PDA3: Proposed North DA to Runoff Area=4,533 sf 4.42% Impervious Runoff Depth=1.07"
Tc=6.0 min CN=42 Runoff=0.10 cfs 403 cf

Subcatchment PDA4: Proposed Drainage Runoff Area=1,100 sf 0.00% Impervious Runoff Depth=0.83"
Tc=6.0 min CN=39 Runoff=0.01 cfs 76 cf

Pond 1P: Galleries Peak Elev=9.43' Storage=1,069 cf Inflow=4.98 cfs 17,187 cf
Discarded=0.43 cfs 10,842 cf Primary=4.55 cfs 6,346 cf Outflow=4.98 cfs 17,188 cf

Link P1L: Proposed Combined Site Inflow=4.87 cfs 7,637 cf
Primary=4.87 cfs 7,637 cf

Total Runoff Area = 45,555 sf Runoff Volume = 18,477 cf Average Runoff Depth = 4.87"
32.93% Pervious = 15,001 sf 67.07% Impervious = 30,553 sf

Summary for Subcatchment PDA1: Proposed Drainage Area to Galleries

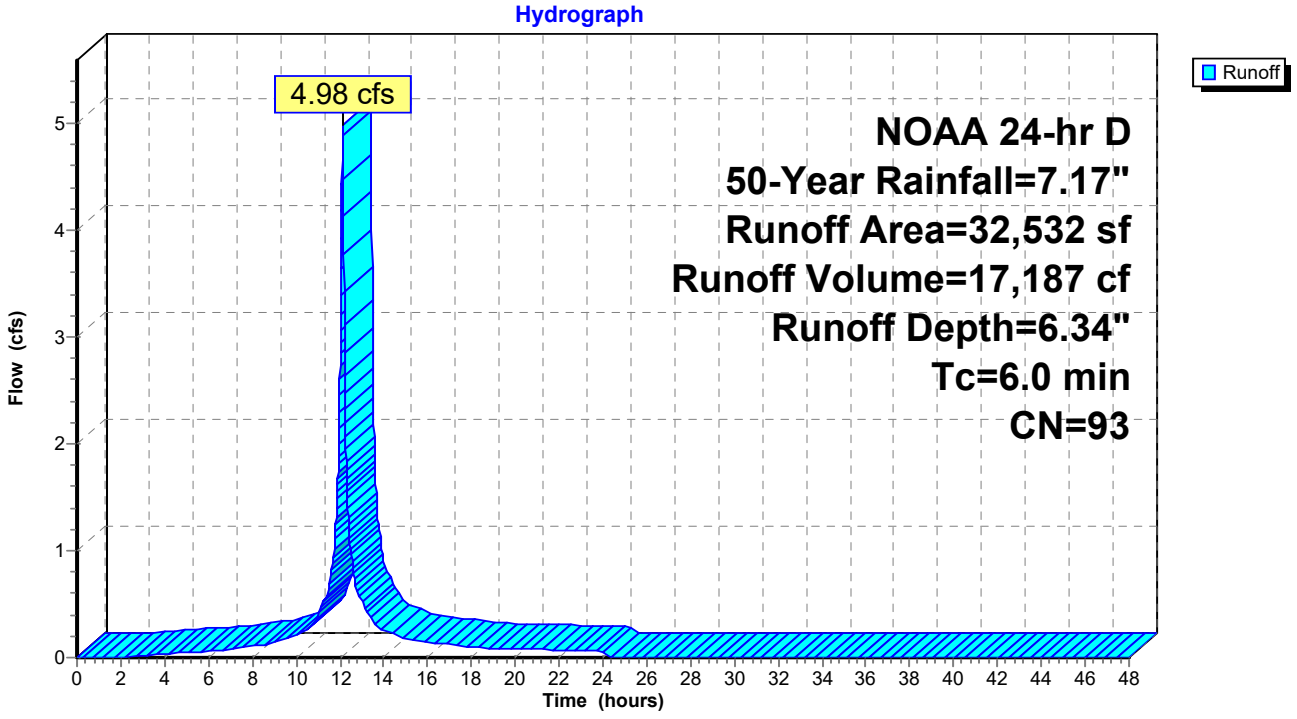
Runoff = 4.98 cfs @ 12.13 hrs, Volume= 17,187 cf, Depth= 6.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 50-Year Rainfall=7.17"

Area (sf)	CN	Description
2,972	39	>75% Grass cover, Good, HSG A
17,832	98	Paved parking, HSG A
10,484	98	Roofs, HSG A
1,245	98	Sidewalks / Patios, HSG A
32,532	93	Weighted Average
2,972		9.13% Pervious Area
29,560		90.87% Impervious Area

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

Subcatchment PDA1: Proposed Drainage Area to Galleries



Summary for Subcatchment PDA2: Proposed South DA to Thompson

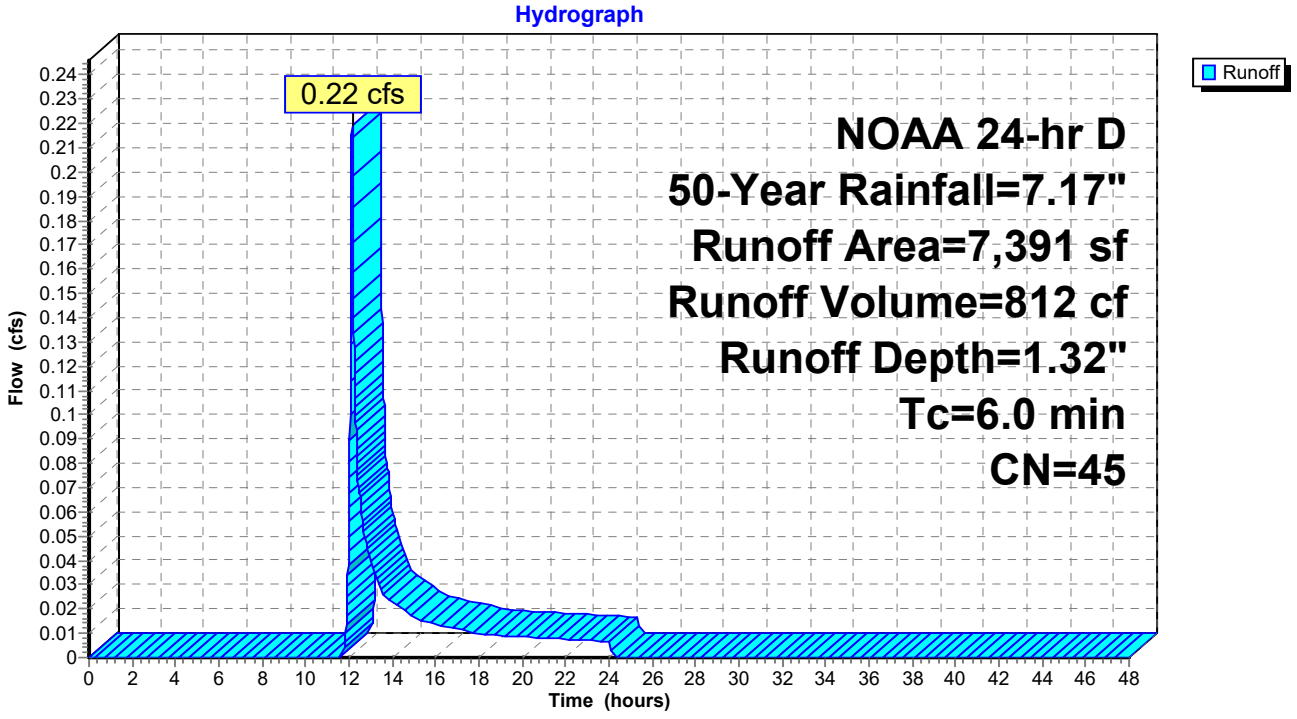
Runoff = 0.22 cfs @ 12.14 hrs, Volume= 812 cf, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 50-Year Rainfall=7.17"

Area (sf)	CN	Description
6,598	39	>75% Grass cover, Good, HSG A
659	98	Paved parking, HSG A
42	98	Roofs, HSG A
91	98	Sidewalks / Patios, HSG A
7,391	45	Weighted Average
6,598		89.27% Pervious Area
793		10.73% Impervious Area

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

Subcatchment PDA2: Proposed South DA to Thompson



Summary for Subcatchment PDA3: Proposed North DA to Thompson

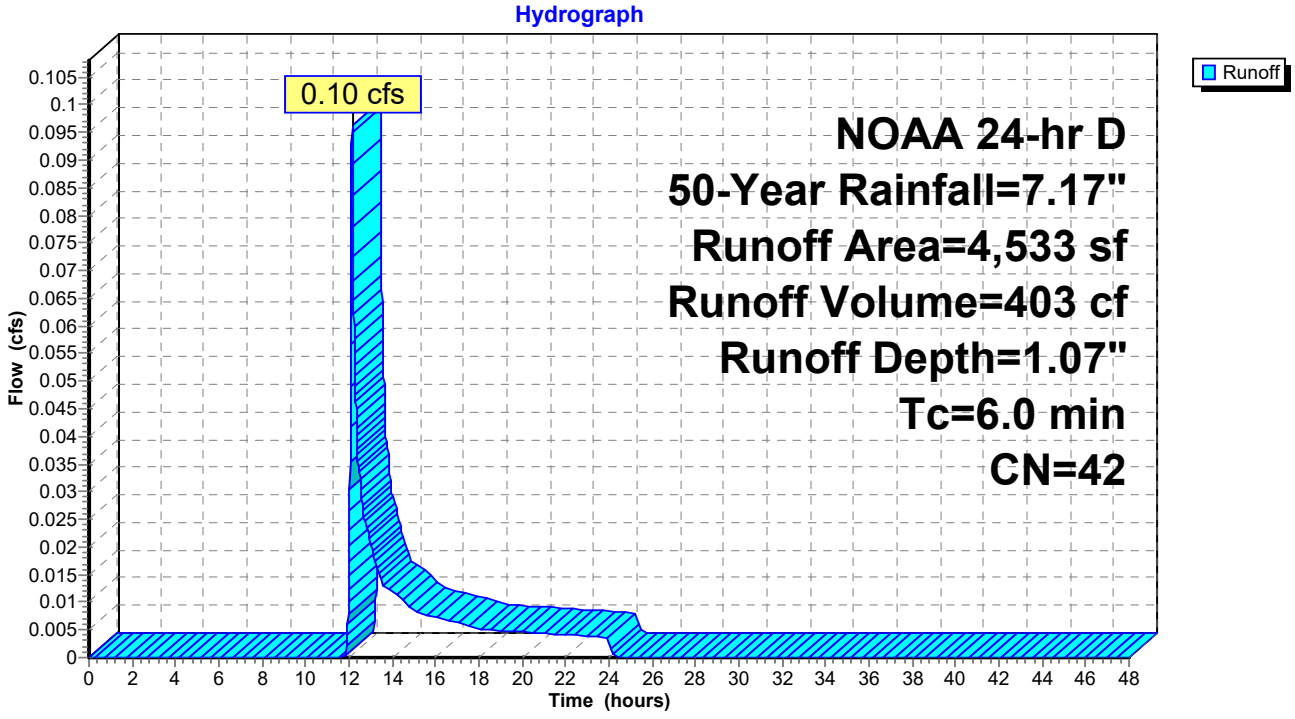
Runoff = 0.10 cfs @ 12.15 hrs, Volume= 403 cf, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 50-Year Rainfall=7.17"

Area (sf)	CN	Description
4,332	39	>75% Grass cover, Good, HSG A
1	98	Paved parking, HSG A
21	98	Roofs, HSG A
179	98	Sidewalks / Patios, HSG A
4,533	42	Weighted Average
4,332		95.58% Pervious Area
200		4.42% Impervious Area

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

Subcatchment PDA3: Proposed North DA to Thompson



Summary for Subcatchment PDA4: Proposed Drainage Area to Carlson

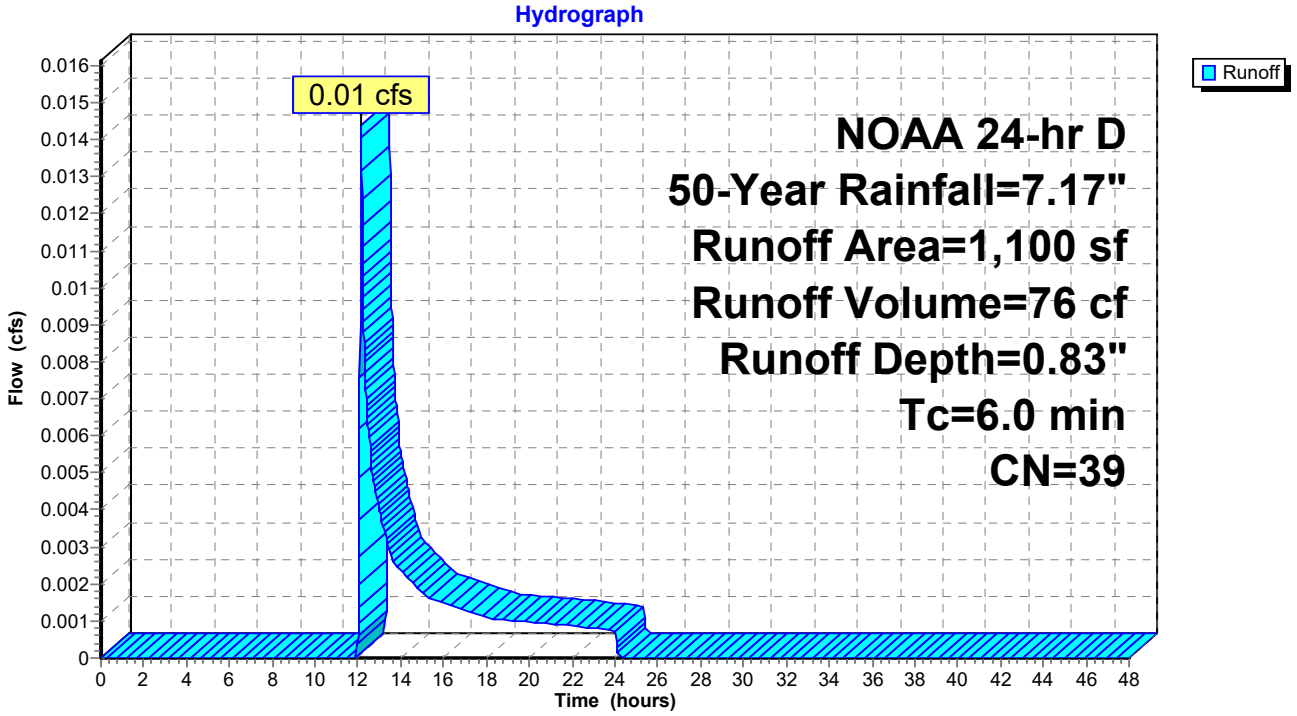
Runoff = 0.01 cfs @ 12.15 hrs, Volume= 76 cf, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 50-Year Rainfall=7.17"

Area (sf)	CN	Description
1,100	39	>75% Grass cover, Good, HSG A
1,100		100.00% Pervious Area

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

Subcatchment PDA4: Proposed Drainage Area to Carlson



Summary for Pond 1P: Galleries

Inflow Area = 32,532 sf, 90.87% Impervious, Inflow Depth = 6.34" for 50-Year event
Inflow = 4.98 cfs @ 12.13 hrs, Volume= 17,187 cf
Outflow = 4.98 cfs @ 12.13 hrs, Volume= 17,188 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.43 cfs @ 12.13 hrs, Volume= 10,842 cf
Primary = 4.55 cfs @ 12.13 hrs, Volume= 6,346 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 9.43' @ 12.13 hrs Surf.Area= 704 sf Storage= 1,069 cf

Plug-Flow detention time= 22.2 min calculated for 17,185 cf (100% of inflow)
Center-of-Mass det. time= 22.3 min (793.5 - 771.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	5.75'	244 cf	**14.00'W x 50.00'L x 2.50'H Field A** 1,750 cf Overall - 1,140 cf Embedded = 610 cf x 40.0% Voids
#2A	6.25'	815 cf	**Concrete Galley 4x8x2** x 18 Inside #1 Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf 18 Chambers in 3 Rows
#3	7.10'	21 cf	**2.00'W x 2.00'L x 5.30'H Prismatoid**
		1,080 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	8.00'	**15.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.00' / 7.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Discarded	5.75'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 4.90'

Discarded OutFlow Max=0.43 cfs @ 12.13 hrs HW=9.43' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.43 cfs)

Primary OutFlow Max=4.55 cfs @ 12.13 hrs HW=9.43' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 4.55 cfs @ 4.06 fps)

Pond 1P: Galleries - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x8x2 (Concrete Galley, UCPI 24" Low Profile Galley or equivalent)
Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf
Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf

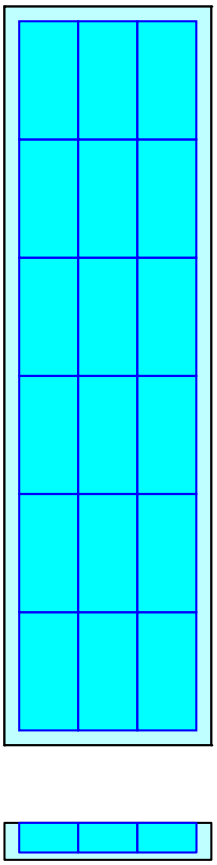
6 Chambers/Row x 8.00' Long = 48.00' Row Length +12.0" End Stone x 2 = 50.00' Base Length
3 Rows x 48.0" Wide + 12.0" Side Stone x 2 = 14.00' Base Width
6.0" Stone Base + 24.0" Chamber Height = 2.50' Field Height

18 Chambers x 45.3 cf = 815.4 cf Chamber Storage
18 Chambers x 63.4 cf = 1,140.5 cf Displacement

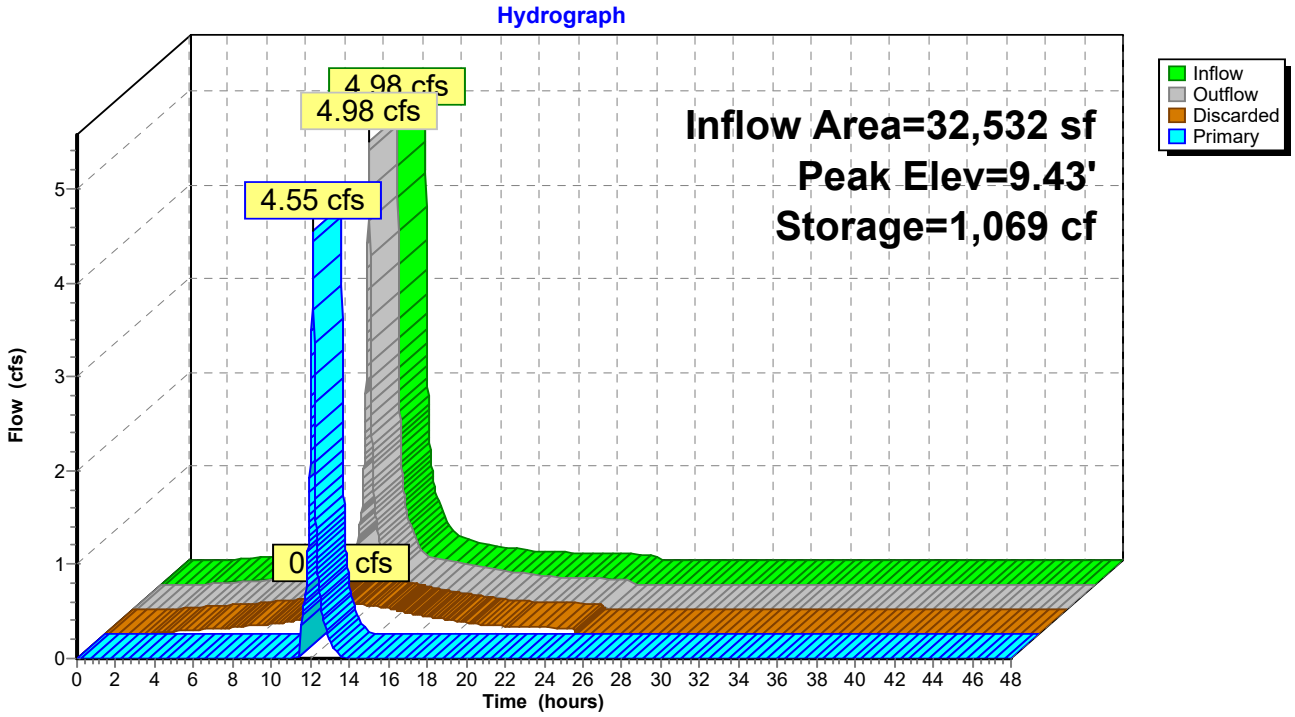
1,750.0 cf Field - 1,140.5 cf Chambers = 609.5 cf Stone x 40.0% Voids = 243.8 cf Stone Storage

Chamber Storage + Stone Storage = 1,059.2 cf = 0.024 af
Overall Storage Efficiency = 60.5%
Overall System Size = 50.00' x 14.00' x 2.50'

18 Chambers
64.8 cy Field
22.6 cy Stone



Pond 1P: Galleries

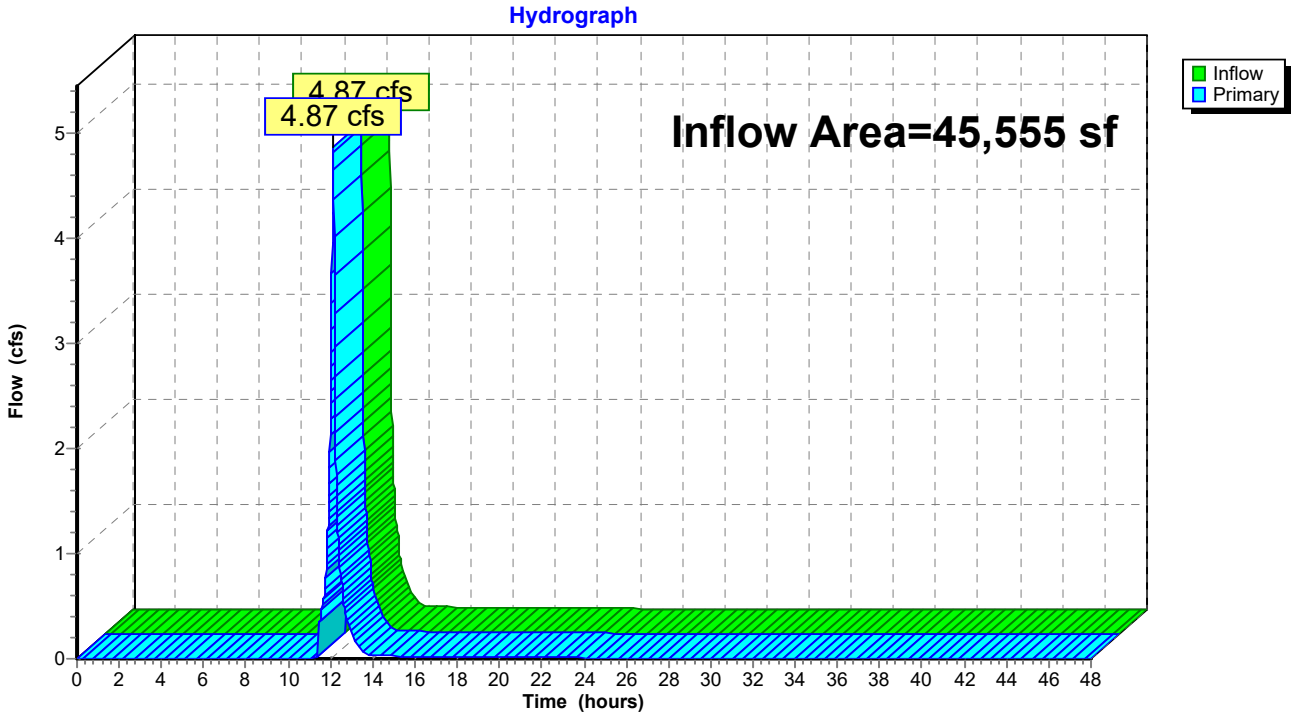


Summary for Link P1L: Proposed Combined Site

Inflow Area = 45,555 sf, 67.07% Impervious, Inflow Depth = 2.01" for 50-Year event
Inflow = 4.87 cfs @ 12.13 hrs, Volume= 7,637 cf
Primary = 4.87 cfs @ 12.13 hrs, Volume= 7,637 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link P1L: Proposed Combined Site



Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment PDA1: Proposed Drainage Runoff Area=32,532 sf 90.87% Impervious Runoff Depth=7.23"
Tc=6.0 min CN=93 Runoff=5.64 cfs 19,606 cf

Subcatchment PDA2: Proposed South DA Runoff Area=7,391 sf 10.73% Impervious Runoff Depth=1.77"
Tc=6.0 min CN=45 Runoff=0.32 cfs 1,092 cf

Subcatchment PDA3: Proposed North DA to Runoff Area=4,533 sf 4.42% Impervious Runoff Depth=1.47"
Tc=6.0 min CN=42 Runoff=0.15 cfs 557 cf

Subcatchment PDA4: Proposed Drainage Runoff Area=1,100 sf 0.00% Impervious Runoff Depth=1.19"
Tc=6.0 min CN=39 Runoff=0.03 cfs 109 cf

Pond 1P: Galleries Peak Elev=9.61' Storage=1,069 cf Inflow=5.64 cfs 19,606 cf
Discarded=0.45 cfs 11,875 cf Primary=5.19 cfs 7,732 cf Outflow=5.64 cfs 19,608 cf

Link P1L: Proposed Combined Site Inflow=5.67 cfs 9,490 cf
Primary=5.67 cfs 9,490 cf

Total Runoff Area = 45,555 sf Runoff Volume = 21,364 cf Average Runoff Depth = 5.63"
32.93% Pervious = 15,001 sf 67.07% Impervious = 30,553 sf

Summary for Subcatchment PDA1: Proposed Drainage Area to Galleries

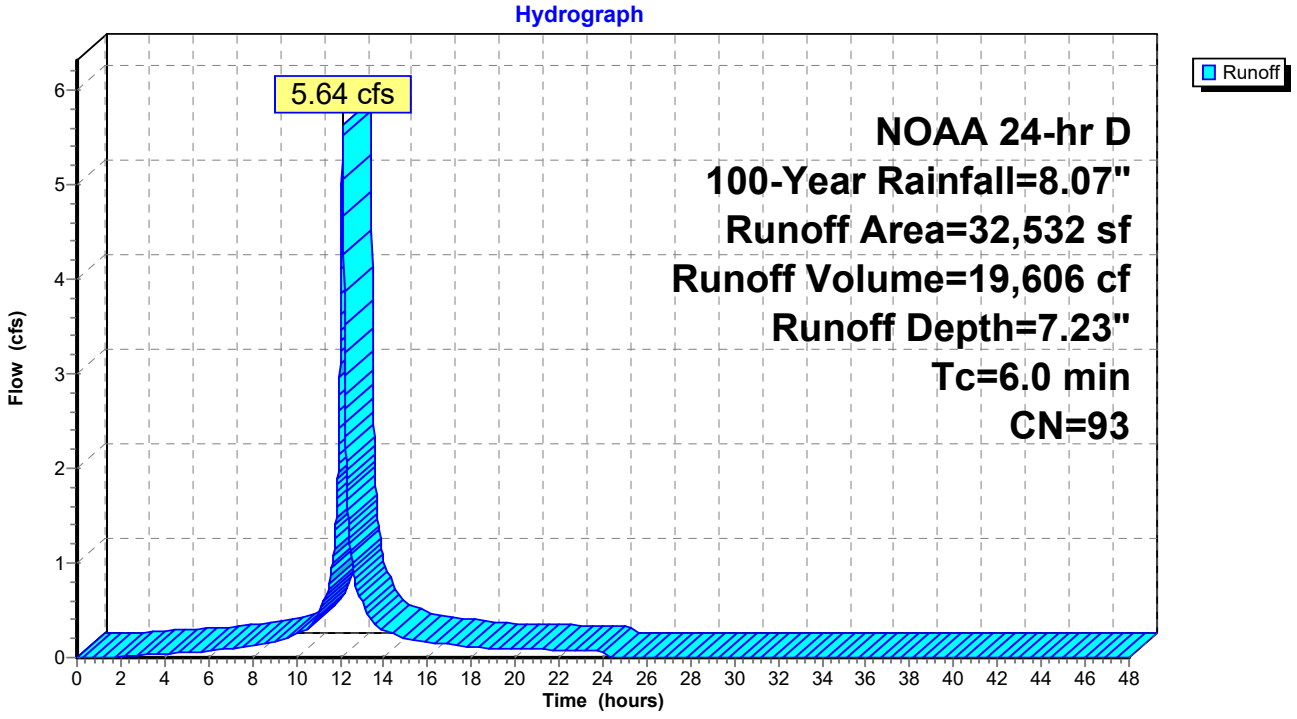
Runoff = 5.64 cfs @ 12.13 hrs, Volume= 19,606 cf, Depth= 7.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=8.07"

Area (sf)	CN	Description
2,972	39	>75% Grass cover, Good, HSG A
17,832	98	Paved parking, HSG A
10,484	98	Roofs, HSG A
1,245	98	Sidewalks / Patios, HSG A
32,532	93	Weighted Average
2,972		9.13% Pervious Area
29,560		90.87% Impervious Area

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

Subcatchment PDA1: Proposed Drainage Area to Galleries



Summary for Subcatchment PDA2: Proposed South DA to Thompson

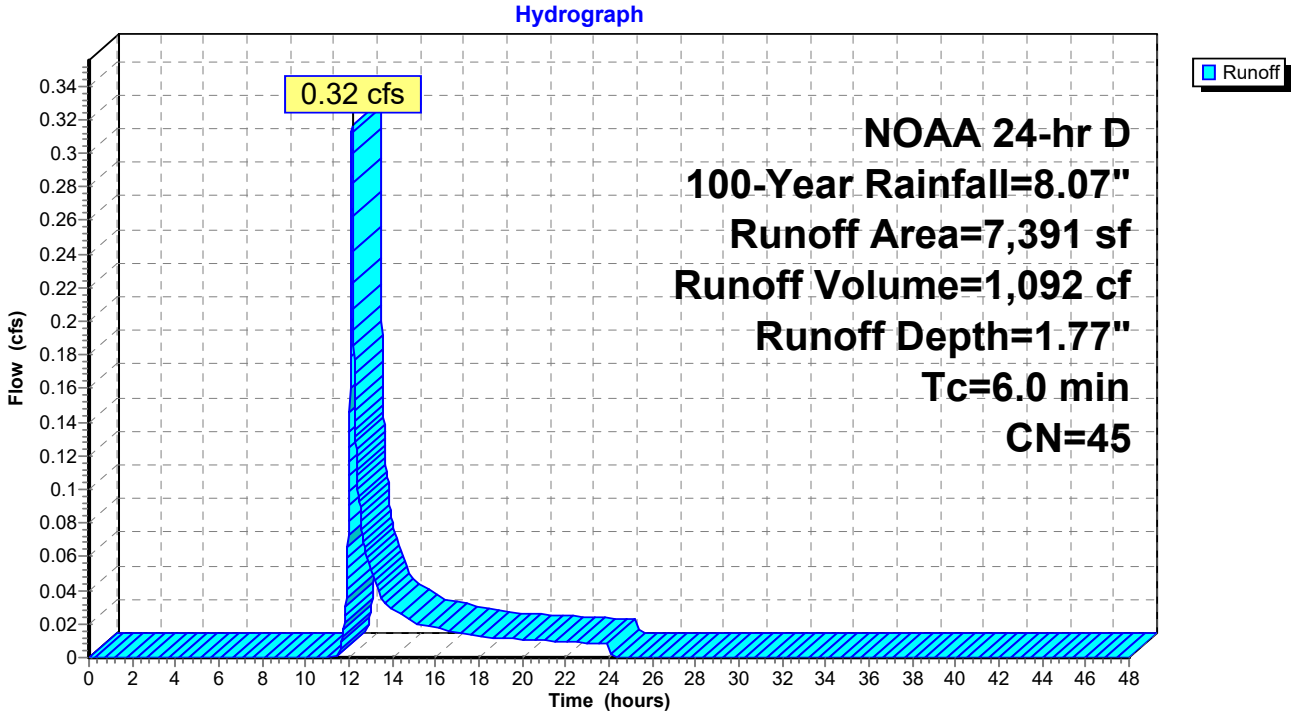
Runoff = 0.32 cfs @ 12.14 hrs, Volume= 1,092 cf, Depth= 1.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=8.07"

Area (sf)	CN	Description
6,598	39	>75% Grass cover, Good, HSG A
659	98	Paved parking, HSG A
42	98	Roofs, HSG A
91	98	Sidewalks / Patios, HSG A
7,391	45	Weighted Average
6,598		89.27% Pervious Area
793		10.73% Impervious Area

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

Subcatchment PDA2: Proposed South DA to Thompson



Summary for Subcatchment PDA3: Proposed North DA to Thompson

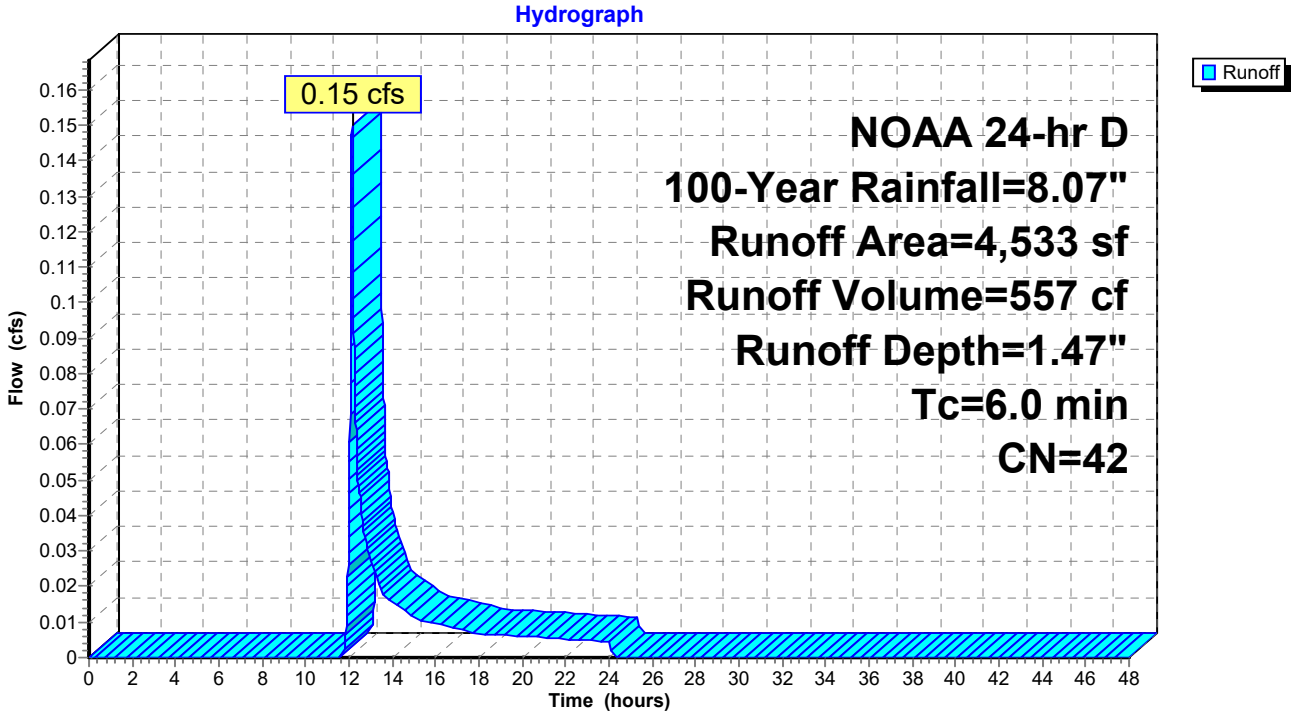
Runoff = 0.15 cfs @ 12.14 hrs, Volume= 557 cf, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=8.07"

Area (sf)	CN	Description
4,332	39	>75% Grass cover, Good, HSG A
1	98	Paved parking, HSG A
21	98	Roofs, HSG A
179	98	Sidewalks / Patios, HSG A
4,533	42	Weighted Average
4,332		95.58% Pervious Area
200		4.42% Impervious Area

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

Subcatchment PDA3: Proposed North DA to Thompson



Summary for Subcatchment PDA4: Proposed Drainage Area to Carlson

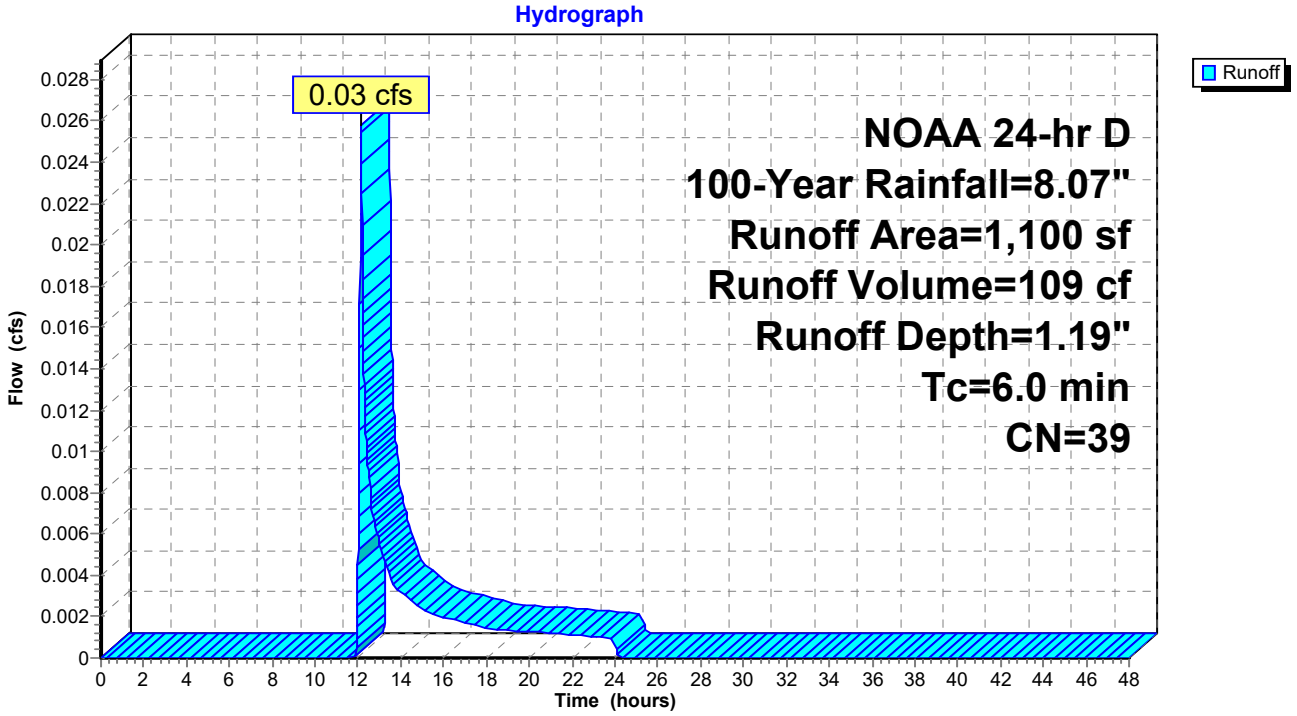
Runoff = 0.03 cfs @ 12.15 hrs, Volume= 109 cf, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D 100-Year Rainfall=8.07"

Area (sf)	CN	Description
1,100	39	>75% Grass cover, Good, HSG A
1,100		100.00% Pervious Area

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

Subcatchment PDA4: Proposed Drainage Area to Carlson



Summary for Pond 1P: Galleries

Inflow Area = 32,532 sf, 90.87% Impervious, Inflow Depth = 7.23" for 100-Year event
Inflow = 5.64 cfs @ 12.13 hrs, Volume= 19,606 cf
Outflow = 5.64 cfs @ 12.13 hrs, Volume= 19,608 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.45 cfs @ 12.13 hrs, Volume= 11,875 cf
Primary = 5.19 cfs @ 12.13 hrs, Volume= 7,732 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 9.61' @ 12.13 hrs Surf.Area= 704 sf Storage= 1,069 cf

Plug-Flow detention time= 22.1 min calculated for 19,604 cf (100% of inflow)
Center-of-Mass det. time= 22.2 min (790.1 - 767.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	5.75'	244 cf	**14.00'W x 50.00'L x 2.50'H Field A** 1,750 cf Overall - 1,140 cf Embedded = 610 cf x 40.0% Voids
#2A	6.25'	815 cf	**Concrete Galley 4x8x2** x 18 Inside #1 Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf 18 Chambers in 3 Rows
#3	7.10'	21 cf	**2.00'W x 2.00'L x 5.30'H Prismatoid**
		1,080 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	8.00'	**15.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.00' / 7.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Discarded	5.75'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 4.90'

Discarded OutFlow Max=0.45 cfs @ 12.13 hrs HW=9.61' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.45 cfs)

Primary OutFlow Max=5.18 cfs @ 12.13 hrs HW=9.61' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 5.18 cfs @ 4.27 fps)

Pond 1P: Galleries - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x8x2 (Concrete Galley, UCPI 24" Low Profile Galley or equivalent)
Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf
Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf

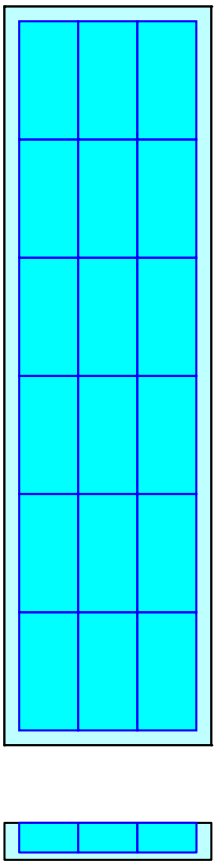
6 Chambers/Row x 8.00' Long = 48.00' Row Length +12.0" End Stone x 2 = 50.00' Base Length
3 Rows x 48.0" Wide + 12.0" Side Stone x 2 = 14.00' Base Width
6.0" Stone Base + 24.0" Chamber Height = 2.50' Field Height

18 Chambers x 45.3 cf = 815.4 cf Chamber Storage
18 Chambers x 63.4 cf = 1,140.5 cf Displacement

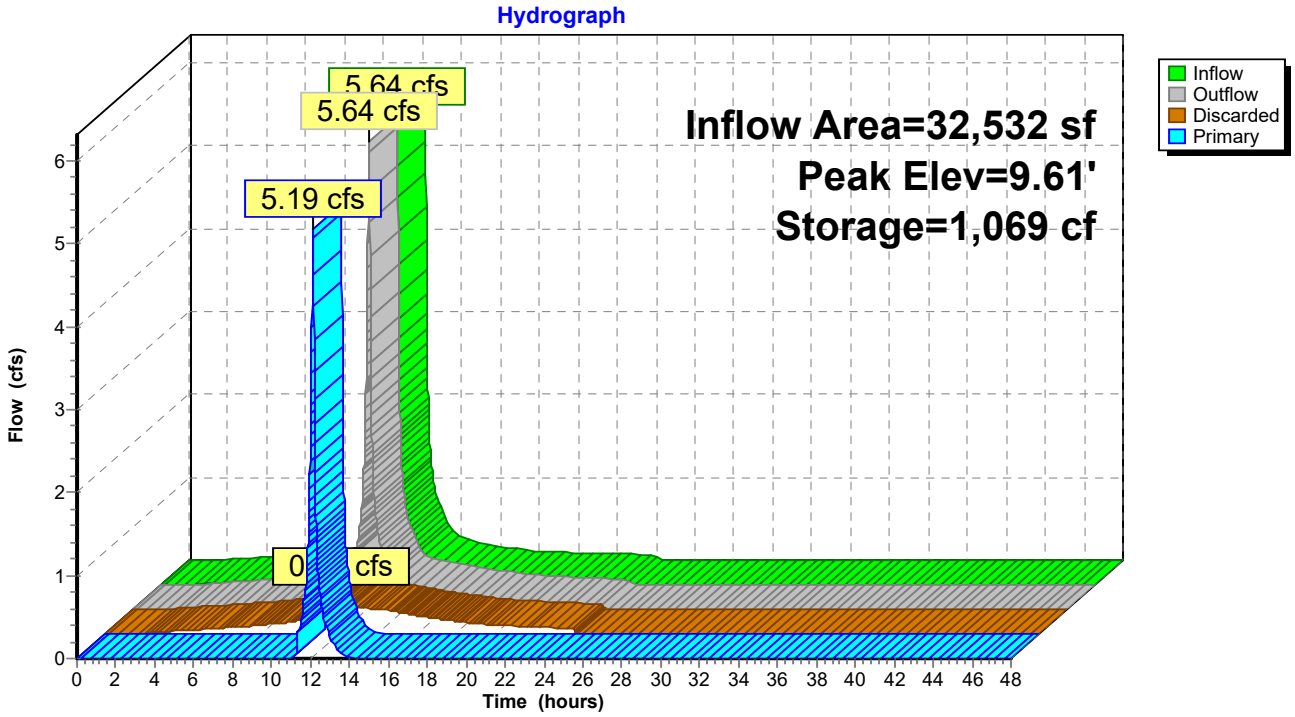
1,750.0 cf Field - 1,140.5 cf Chambers = 609.5 cf Stone x 40.0% Voids = 243.8 cf Stone Storage

Chamber Storage + Stone Storage = 1,059.2 cf = 0.024 af
Overall Storage Efficiency = 60.5%
Overall System Size = 50.00' x 14.00' x 2.50'

18 Chambers
64.8 cy Field
22.6 cy Stone



Pond 1P: Galleries

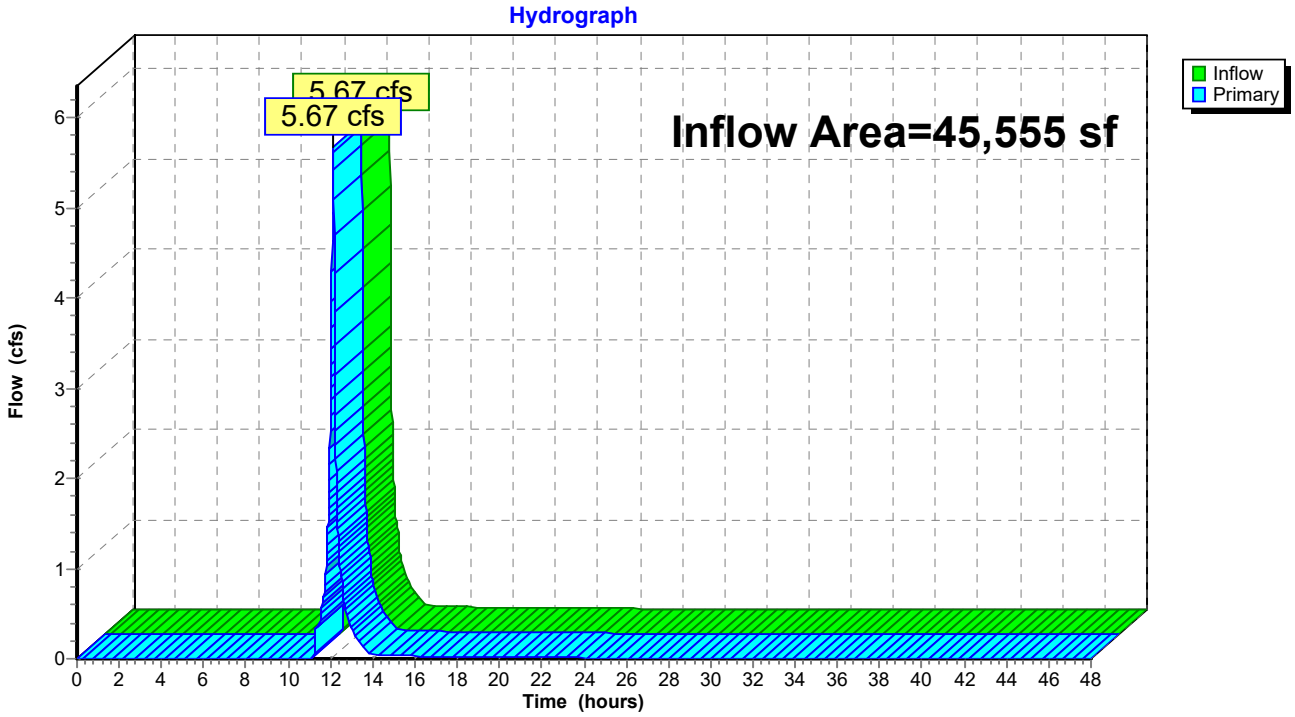


Summary for Link P1L: Proposed Combined Site

Inflow Area = 45,555 sf, 67.07% Impervious, Inflow Depth = 2.50" for 100-Year event
Inflow = 5.67 cfs @ 12.13 hrs, Volume= 9,490 cf
Primary = 5.67 cfs @ 12.13 hrs, Volume= 9,490 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link P1L: Proposed Combined Site



Events for Subcatchment PDA1: Proposed Drainage Area to Galleries

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.42	2.21	7,205	2.66
10-Year	5.22	3.55	11,967	4.41
25-Year	6.34	4.37	14,960	5.52
50-Year	7.17	4.98	17,187	6.34
100-Year	**8.07**	**5.64**	**19,606**	**7.23**

Events for Subcatchment PDA2: Proposed South DA to Thompson

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.42	0.00	44	0.07
10-Year	5.22	0.05	316	0.51
25-Year	6.34	0.14	580	0.94
50-Year	7.17	0.22	812	1.32
100-Year	**8.07**	**0.32**	**1,092**	**1.77**

Events for Subcatchment PDA3: Proposed North DA to Thompson

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.42	0.00	11	0.03
10-Year	5.22	0.01	140	0.37
25-Year	6.34	0.05	278	0.74
50-Year	7.17	0.10	403	1.07
100-Year	**8.07**	**0.15**	**557**	**1.47**

Events for Subcatchment PDA4: Proposed Drainage Area to Carlson

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-Year	3.42	0.00	0	0.01
10-Year	5.22	0.00	23	0.25
25-Year	6.34	0.01	50	0.55
50-Year	7.17	0.01	76	0.83
100-Year	**8.07**	**0.03**	**109**	**1.19**

Events for Pond 1P: Galleries

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
2-Year	2.21	2.20	0.37	1.83	8.80	1,066
10-Year	3.55	3.55	0.40	3.14	9.11	1,067
25-Year	4.37	4.37	0.42	3.95	9.29	1,068
50-Year	4.98	4.98	0.43	4.55	9.43	1,069
100-Year	**5.64**	**5.64**	**0.45**	**5.19**	**9.61**	**1,069**

Events for Link P1L: Proposed Combined Site

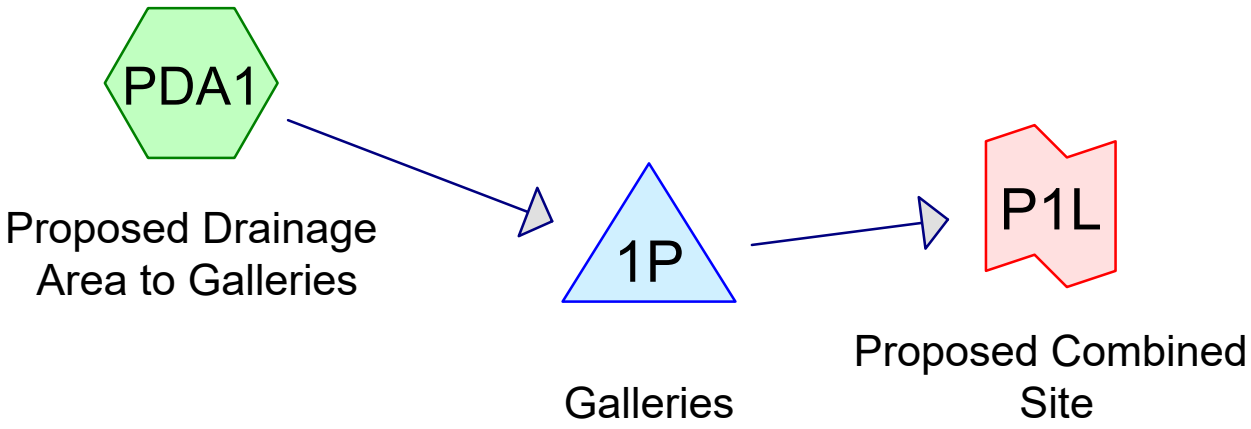
Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2-Year	1.83	1.83	**0.00**
10-Year	3.19	3.19	0.00
25-Year	4.14	4.14	0.00
50-Year	4.87	4.87	0.00
100-Year	**5.67**	**5.67**	0.00

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Subcat Reach Pond Link

Routing Diagram for 4632-Post-360 Thompson Ave
Prepared by Codespoti & Associates, P.C., Printed 12/19/2023
HydroCAD® 10.10-5a s/n 07361 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQV	NOAA 24-hr	D	Default	24.00	1	1.51	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,972	39	>75% Grass cover, Good, HSG A (PDA1)
17,832	98	Paved parking, HSG A (PDA1)
10,484	98	Roofs, HSG A (PDA1)
1,245	98	Sidewalks / Patios, HSG A (PDA1)
32,532	**93**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
32,532	HSG A	PDA1
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
32,532		**TOTAL AREA**

Ground Covers (selected 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
2,972	0	0	0	0	2,972	>75% Grass cover, Good	
17,832	0	0	0	0	17,832	Paved parking	
10,484	0	0	0	0	10,484	Roofs	
1,245	0	0	0	0	1,245	Sidewalks / Patios	
32,532	**0**	**0**	**0**	**0**	**32,532**	**TOTAL AREA**	

Pipe Listing (selected 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	8.00	7.95	5.0	0.0100	0.013	0.0	15.0	0.0

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment PDA1: Proposed Drainage Runoff Area=32,532 sf 90.87% Impervious Runoff Depth=0.88"
Tc=6.0 min CN=93 Runoff=0.77 cfs 2,372 cf

Pond 1P: Galleries Peak Elev=6.98' Storage=522 cf Inflow=0.77 cfs 2,372 cf
Discarded=0.20 cfs 2,372 cf Primary=0.00 cfs 0 cf Outflow=0.20 cfs 2,372 cf

Link P1L: Proposed Combined Site Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 32,532 sf Runoff Volume = 2,372 cf Average Runoff Depth = 0.88"
9.13% Pervious = 2,972 sf 90.87% Impervious = 29,560 sf

Summary for Subcatchment PDA1: Proposed Drainage Area to Galleries

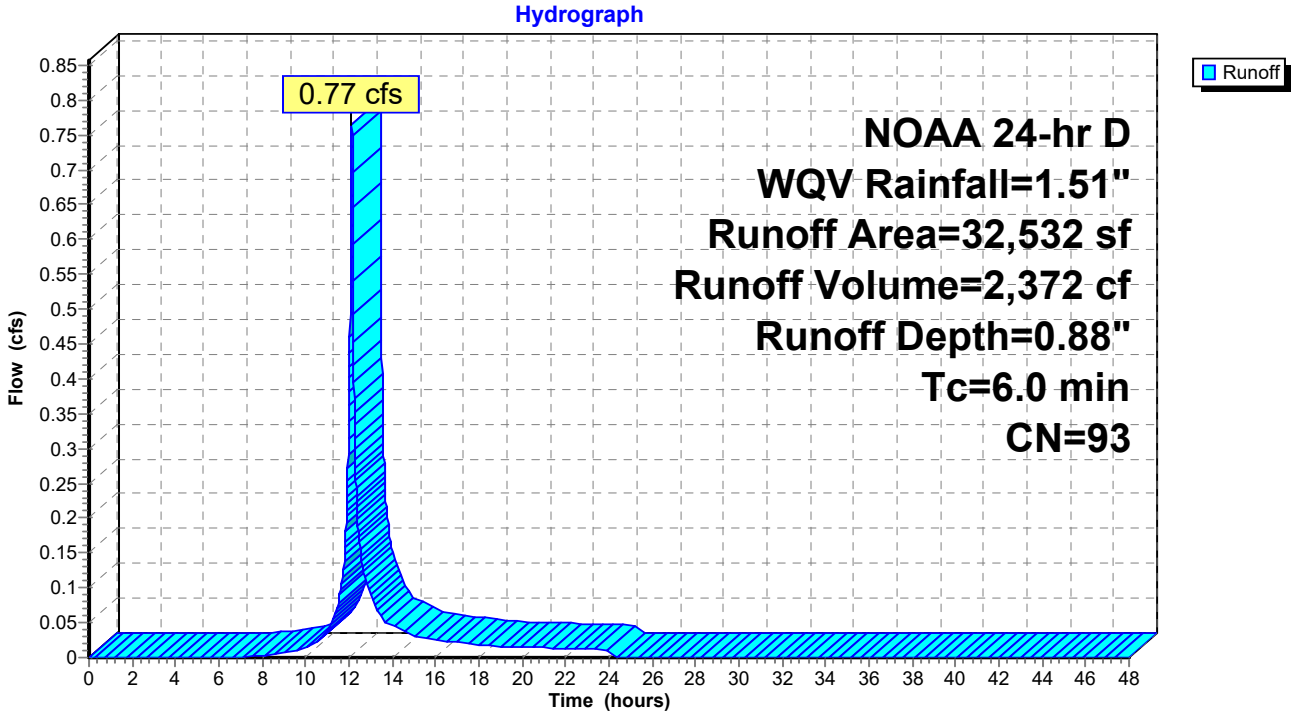
Runoff = 0.77 cfs @ 12.13 hrs, Volume= 2,372 cf, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
NOAA 24-hr D WQV Rainfall=1.51"

Area (sf)	CN	Description
2,972	39	>75% Grass cover, Good, HSG A
17,832	98	Paved parking, HSG A
10,484	98	Roofs, HSG A
1,245	98	Sidewalks / Patios, HSG A
32,532	93	Weighted Average
2,972		9.13% Pervious Area
29,560		90.87% Impervious Area

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

Subcatchment PDA1: Proposed Drainage Area to Galleries



Summary for Pond 1P: Galleries

Inflow Area = 32,532 sf, 90.87% Impervious, Inflow Depth = 0.88" for WQV event
Inflow = 0.77 cfs @ 12.13 hrs, Volume= 2,372 cf
Outflow = 0.20 cfs @ 12.39 hrs, Volume= 2,372 cf, Atten= 74%, Lag= 15.6 min
Discarded = 0.20 cfs @ 12.39 hrs, Volume= 2,372 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 6.98' @ 12.39 hrs Surf.Area= 700 sf Storage= 522 cf

Plug-Flow detention time= 19.3 min calculated for 2,372 cf (100% of inflow)
Center-of-Mass det. time= 19.3 min (850.0 - 830.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	5.75'	244 cf	**14.00'W x 50.00'L x 2.50'H Field A** 1,750 cf Overall - 1,140 cf Embedded = 610 cf x 40.0% Voids
#2A	6.25'	815 cf	**Concrete Galley 4x8x2** x 18 Inside #1 Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf 18 Chambers in 3 Rows
#3	7.10'	21 cf	**2.00'W x 2.00'L x 5.30'H Prismatoid**
		1,080 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	8.00'	**15.0" Round Culvert** L= 5.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 8.00' / 7.95' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Discarded	5.75'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 4.90'

Discarded OutFlow Max=0.20 cfs @ 12.39 hrs HW=6.98' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=5.75' (Free Discharge)
↑—**1=Culvert** (Controls 0.00 cfs)

Pond 1P: Galleries - Chamber Wizard Field A

Chamber Model = Concrete Galley 4x8x2 (Concrete Galley, UCPI 24" Low Profile Galley or equivalent)
Inside= 42.0"W x 21.0"H => 6.04 sf x 7.50'L = 45.3 cf
Outside= 48.0"W x 24.0"H => 7.92 sf x 8.00'L = 63.4 cf

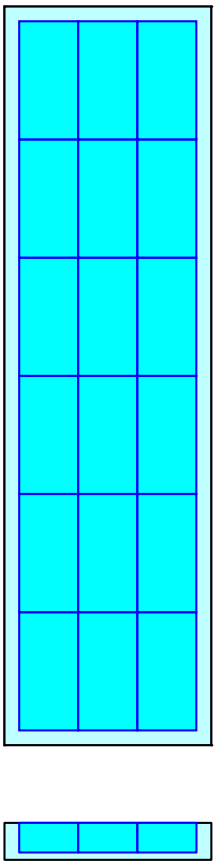
6 Chambers/Row x 8.00' Long = 48.00' Row Length +12.0" End Stone x 2 = 50.00' Base Length
3 Rows x 48.0" Wide + 12.0" Side Stone x 2 = 14.00' Base Width
6.0" Stone Base + 24.0" Chamber Height = 2.50' Field Height

18 Chambers x 45.3 cf = 815.4 cf Chamber Storage
18 Chambers x 63.4 cf = 1,140.5 cf Displacement

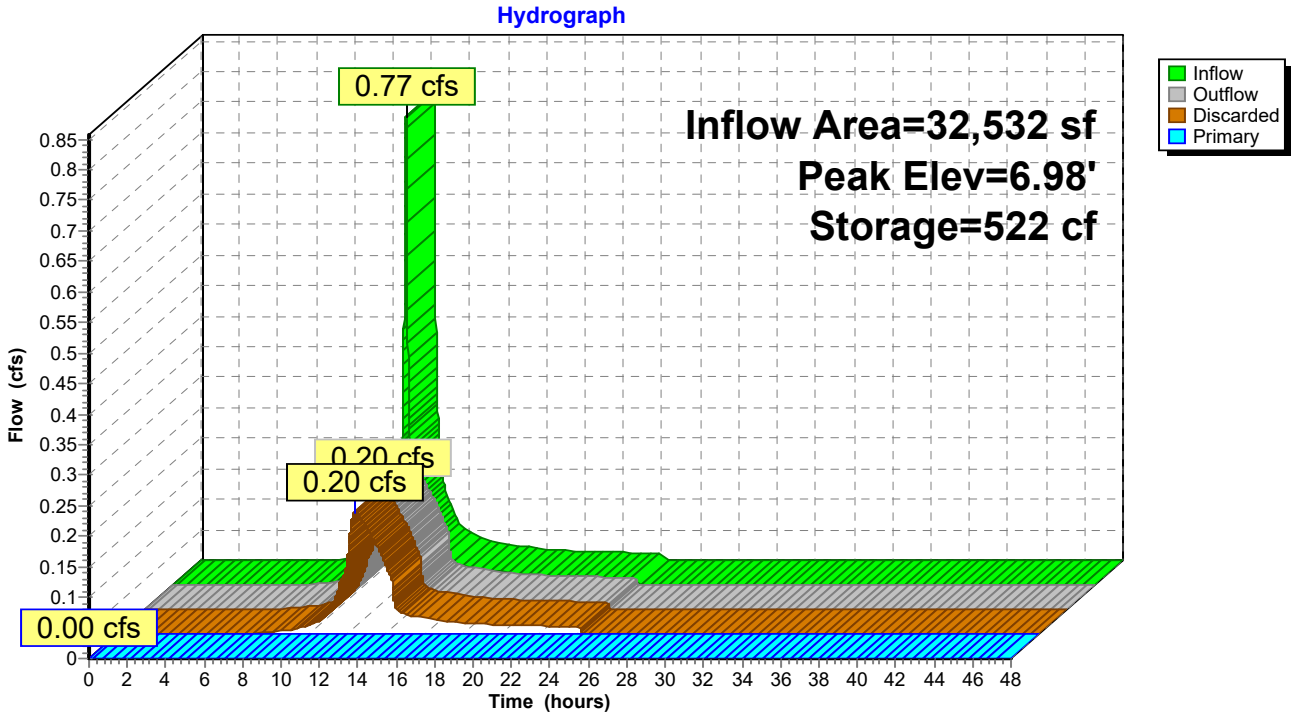
1,750.0 cf Field - 1,140.5 cf Chambers = 609.5 cf Stone x 40.0% Voids = 243.8 cf Stone Storage

Chamber Storage + Stone Storage = 1,059.2 cf = 0.024 af
Overall Storage Efficiency = 60.5%
Overall System Size = 50.00' x 14.00' x 2.50'

18 Chambers
64.8 cy Field
22.6 cy Stone



Pond 1P: Galleries

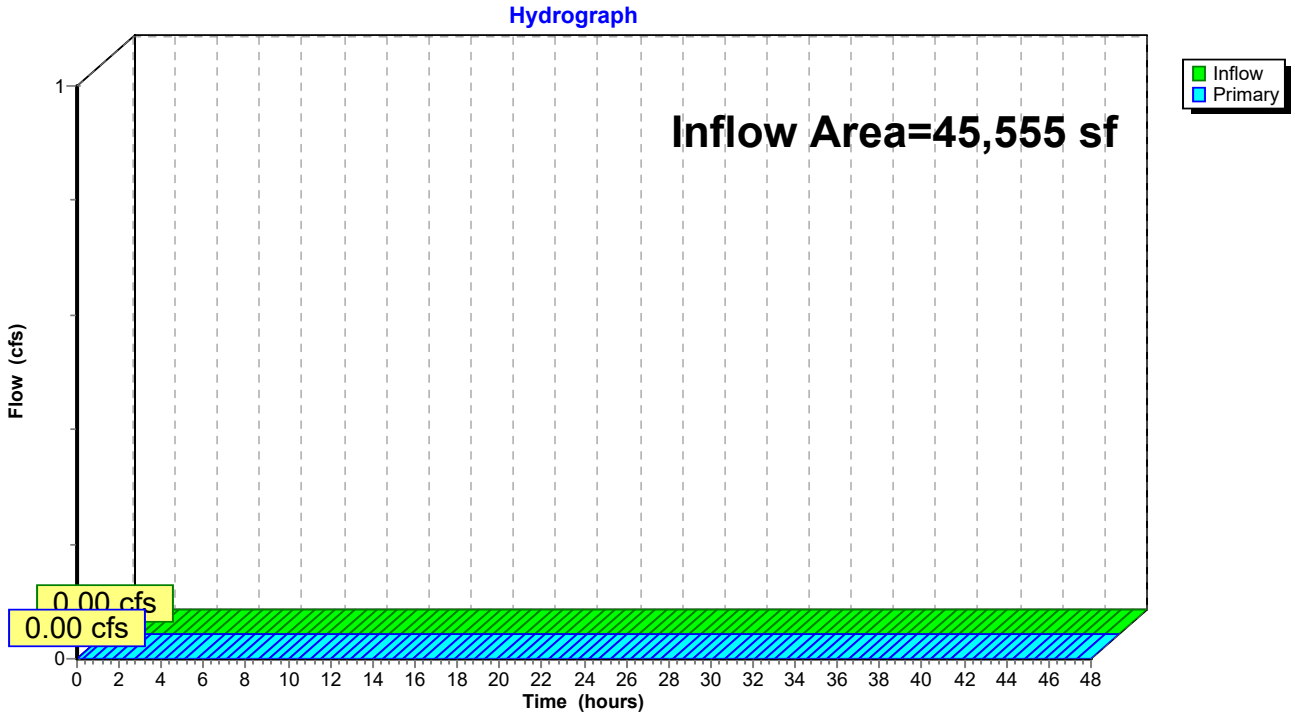


Summary for Link P1L: Proposed Combined Site

Inflow Area = 45,555 sf, 67.07% Impervious, Inflow Depth = 0.00" for WQV event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link P1L: Proposed Combined Site



Events for Subcatchment PDA1: Proposed Drainage Area to Galleries

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
WQV	**1.51**	**0.77**	**2,372**	**0.88**

Events for Pond 1P: Galleries

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
WQV	**0.77**	**0.20**	**0.20**	**0.00**	**6.98**	**522**

Events for Link P1L: Proposed Combined Site

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
WQV	**0.00**	**0.00**	**0.00**

PROJECT:

Proposed Site Development Plans - 360 Thompson Avenue - East Haven CT

DATE: 11/24/23

PREPARED BY: Robert Wheway

IMPERVIOUS COVER ANALYSIS

PROJECT AREA

45.558 Sq. Ft.

IMPERVIOUS COVER
(ANY AREA ASSIGNED A CN OF 98) 9,471 Existing , 30,553 Proposed Sq. Ft.

EXISTING DIRECTLY
CONNECTED IMPERVIOUS AREA (DCIA) 1,355 Sq. Ft.

EXISTING % DCIA

3.0

PROPOSED DCIA

800 Sq. Ft.

PROPOSED % DCIA

1.8

DECREASE (-)/INCREASE (+) DCIA

-555 Sq. Ft.

DECREASE (-)/INCREASE (+) % DCIA -1.2

IF DCIA >40%,ONE HALF WATER QUALITY VOLUME RETAINED
ON SITE

IF DCIA <40%, FULL WQV RETAINED ON SITE

CODESPOTI & ASSOCIATES, P.C.
263 Boston Post Road
Orange, CT. 06477
PHONE (203) 799-1400
FAX (203) 799-0011

JOB **4632 - 360 Thompson Avenue**

SHEET NO.	1	OF	2
CALCULATED BY	BW	DATE	1/3/24
CHECKED BY		DATE	
SCALE			

Water Quality Volume for Roof & Parking based on 2004 Water Quality Manual (7.4.1)

WQV= (P) x (R) x (A)/12

R = 0.05 + 0.009 (I)

= 0.87

WQV = 2,353 Ft^3

A = Area * 32,532 Ft^2

I = Impervious Area 29,560 Ft^2

% Impervious Cover 90.9%

P = 90% Rainfall 1 in.

* Tributary area (PCS1) to gallery storage (1P)

The WQV is to be stored / infiltrated by the stormwater management feature.

Using HydroCad, an interation of the design storm rainfall depths were used to determine the rainfall amount that would equal the Water Quality Volume from above. This rainfall depth was then used in the routing calculations. It was found that a 1.51" rainfall event would produce 2,366 ft^3 of runoff.

Proposed Design = 18 units - 4'W x 8'L x 2'H concrete galleries with 12" stone along sides and 6" base.

Dead storage volume provided = 1,059 ft^3

Infiltrated volume for water quality event (from HydroCad model)= 2,372 ft^3

Summary	Required	Provided
WQV	2,353 Ft^3	2,372 Ft^3

CODESPOTI & ASSOCIATES, P.C.
263 Boston Post Road
Orange, CT. 06477
PHONE (203) 799-1400
FAX (203) 799-0011

JOB	4632 - 360 Thompson Avenue		
SHEET NO.	2	OF	2
CALCULATED BY	BW	DATE	1/3/24
CHECKED BY		DATE	
SCALE			

Groundwater Recharge Volume for Site

Groundwater Recharge Volume based on 2004 Water Quality Manual (7.5.1)

GRV= (D) x (A) x (I)/12

GRV = 1,018 Ft^3

A = Area *	45,558	Ft^2
I = Impervious Area	30,553	Ft^2
% Impervious Cover	67%	
D = Depth of runoff to be recharged	0.40	in.

HSG	(D)	Area	(D) X Area
A	0.40	45,558	18,223
B	0.25	-	-
C	0.10	-	-
D	0.00	-	-
		45,558	0.40

Table 7-4
Groundwater Recharge Depth

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

* Area based on total site area.

The GRV is to be stored / infiltrated by the stormwater management feature.

Provided storage is based upon the dead storage volume of the concrete galleries = (1,059ft^3)

Summary	Required	Provided
GRV	1,018 Ft^3	1,059 Ft^3

Project Name:

Project #: 4632 Test Date: 9/19/2023 68°, Sunny

Project Address: **360 Thompson Avenue, East Haven CT**

Engineer: **Codespoti & Associates**

Test Pit or Soil Boring #: DT1 Existing Ground Elevation: 11.6

Elevation	Soil Description	Depth Range in Inches	
11.3	Grey process base	0	4
10.5	Dark brown sandy loam, compact	4	13
9.8	Brown sandy loam, moderatelty compact	13	22
9.4	Orange brown medium sand lense	22	26
0.1	Dark orange brown fine sand	26	138
	NRCS Designation (235B) Penwood-Urban land		

Elevation		Depth in Inches
	Roots	None
	Mottling (none apparent)	None
4.8	Groundwater	82
	Refusal	None

*All test pits or soil borings shall be excavated to an elevation three feet below the proposed bottom elevation of the infiltration system.

Saturated Hydraulic Conductivity Test Location #: IT1

Existing Ground Elevation:	11.6'
Shelf Depth	57.0"
Pipe Length	4.0"
Height of Pipe above Shelf	
Bottom Elevation of Test	6.5'
Bottom Elevation of Proposed Infiltration System:	
Separating Distanc to Mottling / Groundwater	
Separating Distance to Refusal	
Top Elevation of Proposed Infiltration System:	
Minimum Finish Grade:	

Test Method (check one of the following acceptable methods**):

- Double ring permeameter -ASTM D3385-18,D5093-15e1,D5126-16e1 Methods
- Turf-Tec Infiltrometer method
- Guelph permeameter-ASTM D5126-16e1 Method
- Falling head permeameter-ASTM D5126-16e1 Method
- Borehole infiltration test (NHDES, 2008)

Calculated Saturated Hydraulic Conductivity Rate: 165.0 in/hr

**A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.

Attach field data forms for the respective infiltration test method.

Project Name:

Project #: 4632 Test Date: 9/19/2023 68°, Sunny

Project Address: **360 Thompson Avenue, East Haven CT**

Engineer: **Codespoti & Associates**

Test Pit or Soil Boring #: DT2 Existing Ground Elevation: 11.8

Elevation	Soil Description	Depth Range in Inches	
11.5	Grey process base	0	4
10.3	Dark brown sandy loam, compact	4	18
7.1	Orange brown fine sand	18	56
1.0	Dark orange brown fine sand	56	130
	NRCS Designation (235B) Penwood-Urban land		

Elevation		Depth in Inches
7.5	Roots (few and fine)	52
	Mottling (none apparent)	None
4.9	Groundwater	83
	Refusal	None

*All test pits or soil borings shall be excavated to an elevation three feet below the proposed bottom elevation of the infiltration system.

Saturated Hydraulic Conductivity Test Location #: IT2

Existing Ground Elevation:	11.8'
Shelf Depth	60.0"
Pipe Length	4.0"
Height of Pipe above Shelf	
Bottom Elevation of Test	6.5'
Bottom Elevation of Proposed Infiltration System:	29.92'
Separating Distanc to Mottling / Groundwater	300.4"
Separating Distance to Refusal	> 4'
Top Elevation of Proposed Infiltration System:	31.50
Minimum Finish Grade:	33.20'

Test Method (check one of the following acceptable methods**):

	Double ring permeameter -ASTM D3385-18,D5093-15e1,D5126-16e1 Methods
x	Turf-Tec Infiltrometer method
	Guelph permeameter-ASTM D5126-16e1 Method
	Falling head permeameter-ASTM D5126-16e1 Method
	Borehole infiltration test (NHDES, 2008)

Calculated Saturated Hydraulic Conductivity Rate: 120.0 in/hr

**A percolation test, performed in accordance with the guidelines of the Connecticut State Health Code or otherwise, is not an acceptable test for saturated hydraulic conductivity. Percolation tests overestimate the saturated hydraulic conductivity rate.

Attach field data forms for the respective infiltration test method.

Job #	**4632**	Street Name	**360 Thompson Avenue**
Date	**9/19/2023**	Town	**East Haven**
	68°, sunny		

Hole Information

Test #	IT-1	Shelf Depth	57
		Inner Ring Diameter	2.375"
		Outer Ring Diameter	4.250"
		Inner Ring Height	5"

Infiltration Test 9/19/2023

Time	ΔT (min.)	Scale Reading (in.)	Incremental Drop (in.)	Infil. Rate (in. / hr.)
11:09 AM		**0.000**		
11:14 AM	**0:05**	**3.500**	**3.500**	**42.0**
		(dry)		
11:15 AM		**0.000**		
11:17 AM	**0:02**	**3.500**	**3.500**	**105.0**
		dry		
11:18 AM		**0.000**		
11:19 AM	**0:01**	**2.750**	**2.750**	**165.0**
11:20 AM		**0.000**		
11:21 AM	**0:01**	**2.750**	**2.750**	**165.0**

Notes: Testing performed at DT1 extended, using Turf-Tec IN2-W Infiltrometer (double ring 2.375 & 4.25")

Test Performed By: Bob Wheway

Witnessed By:

Hole Information

Test #		Shelf Depth
		Inner Ring
		Outer Ring
		Inner Ring

Infiltration Test 9/19/2023

Time	ΔT (min.)	Depth to Water (in.)	Incremental Drop (in.)	Infil. Rate (in. / hr.)

Notes: 11:09 & 11:15am test invalid due to test going dry

Test Performed By:

Witnessed By:

Job #	**4632**	Street Name	**360 Thompson Avenue**
Date	**9/19/2023**	Town	**East Haven**
	68°, sunny		

Hole Information

Test #	IT-2	Shelf Depth	60
		Inner Ring Diameter	2.375"
		Outer Ring Diameter	4.250"
		Inner Ring Height	5"

Infiltration Test 9/19/2023

Time	ΔT (min.)	Scale Reading (in.)	Incremental Drop (in.)	Infil. Rate (in. / hr.)
12:28 PM		**0.000**		
12:29 PM	**0:01**	**2.375**	**2.375**	**142.5**
12:30 PM		**0.000**		
12:31 PM	**0:01**	**2.125**	**2.125**	**127.5**
12:32 PM		**0.000**		
12:33 PM	**0:01**	**1.875**	**1.875**	**112.5**
12:34 PM		**0.000**		
12:35 PM	**0:01**	**2.000**	**2.000**	**120.0**

Notes: Testing performed at DT2 extended, using Turf-Tec IN2-W Infiltrometer (double ring 2.375 & 4.25")

Test Performed By: Bob Wheway

Witnessed By:

Hole Information

Test #	Shelf Depth	
	Inner Ring	
	Outer Ring	
	Inner Ring	

Infiltration Test 9/19/2023

Time	ΔT (min.)	Depth to Water (in.)	Incremental Drop (in.)	Infil. Rate (in. / hr.)

Notes:

Test Performed By:

Witnessed By:



Technical Design Submission

360 Thompson Avenue
East Haven, CT

Revised
12/20/2023

Hydroworks, LLC

Hydroworks Technical Submission for 360 Thompson Avenue

Hydroworks is pleased to make a submission regarding the stormwater treatment structures for 360 Thompson Avenue in East Haven, CT. We propose the use of a HS 4i hydrodynamic separator for this project. Sizing calculations were based on an annual TSS removal objective of 80% for a truncated NJDEP particle size distribution and treatment of the water quality flow rate.

Hydroworks HS Operation

The Hydroworks HydroStorm separator is a vortex separator with a high flow bypass. Accordingly, high flows do not scour out the fines that are settled in the low flow path since they are bypassed downstream without entering the lower chamber as shown in Figure 1.

The HS separator consists of 4 areas:

1. A pre-treatment area designed to remove coarse solids
2. An inner chamber where water enters the treatment chamber and oil is trapped
3. A lower chamber where fine solids are removed
4. A high flow bypass to convey higher flows directly downstream

Under normal or low flows, water enters a pre-treatment area with a horizontal grate. The area underneath the grate is submerged with openings to the main treatment area of the separator. Coarse solids fall through the grate and are either trapped in the pretreatment area or conveyed into the main treatment area depending on the flow rate (Figure 1A). Fines are transported into the main treatment area. Openings and weirs in the pretreatment area allow entry of water and solids into the main treatment area and cause water to rotate in the main treatment area creating a vortex motion. Water in the main treatment area is forced to rise along the walls of the separator to discharge from the treatment area to the downstream pipe.

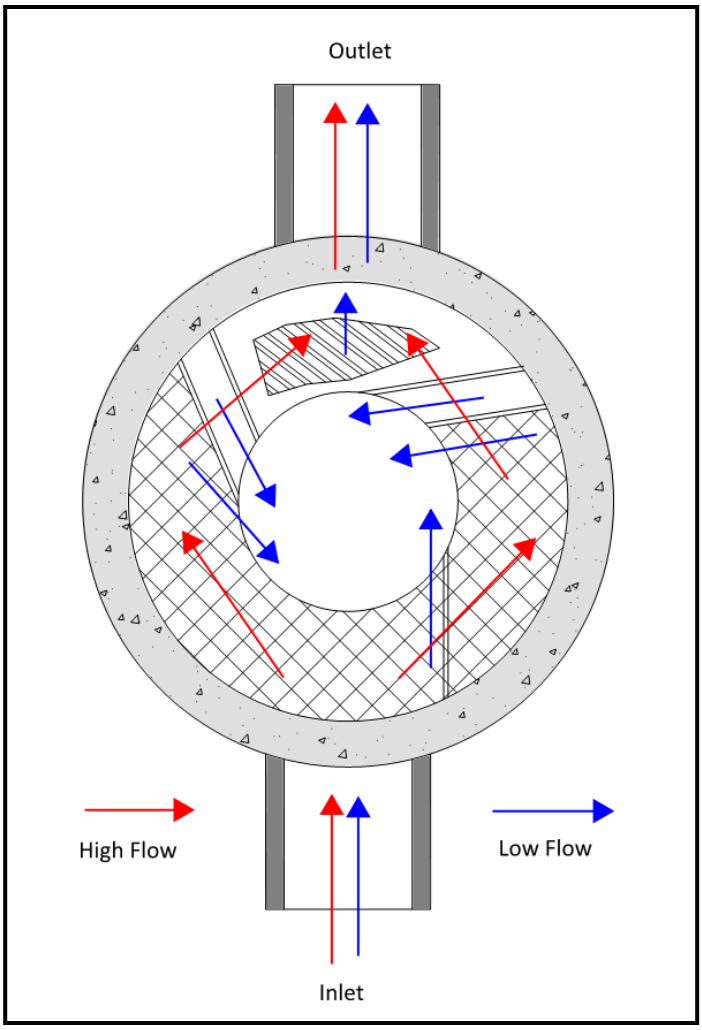


Figure 1A Hydroworks HydroStorm Operation – Plan View

The vortex motion forces solids and floatables to the middle of the inner chamber. Floatables are trapped since the inlet to the treatment area is submerged. The design maximizes the retention of settled solids since solids are forced to the center of the inner chamber by the vortex motion of water while water must flow up the walls of the separator to discharge into the downstream pipe.

A set of high flow weirs near the outlet pipe create a high flow bypass over both the pretreatment area and main treatment chamber. The rate of flow into the treatment area is regulated by the number and size of openings into the treatment chamber and the height of by-pass weirs. High flows flow over the weirs directly to the outlet pipe preventing the scour and resuspension of any fines collected in the treatment chamber.

A central tube is located in the structure to provide access for cleaning. The arrangement of the inlet area and bypass weirs near the outlet pipe facilitate the use of multiple inlet pipes. Figure 1B is a profile view of the HydroStorm separator showing the flow patterns for low and high flows.

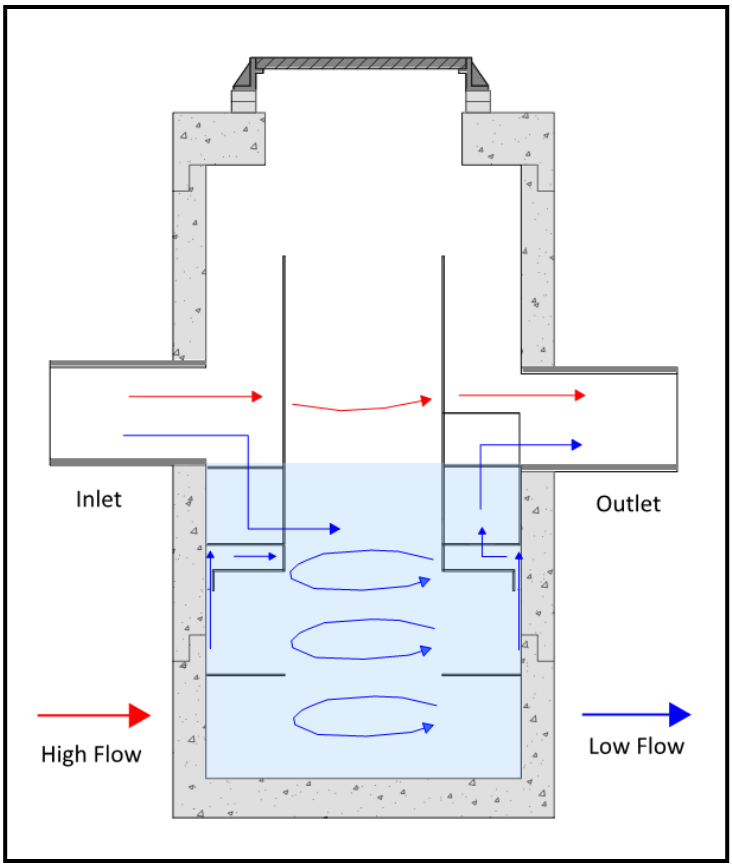


Figure 1B Hydroworks HydroStorm Operation – Profile View

The HSi is an inlet version of the HydroStorm (HS) separator (Figure 2). There is a catch-basin grate on top of the HSi. Water flows directly into the HSi from above through the catch-basin grate on top of the structure. The grate is oversized to allow maintenance of the entire structure. A funnel sits under the grate on the top cap and directs the water to the inlet side of the separator.

Water continues moving through the separator similar to a standard unit once the water falls on the upstream side of the by-pass weirs.

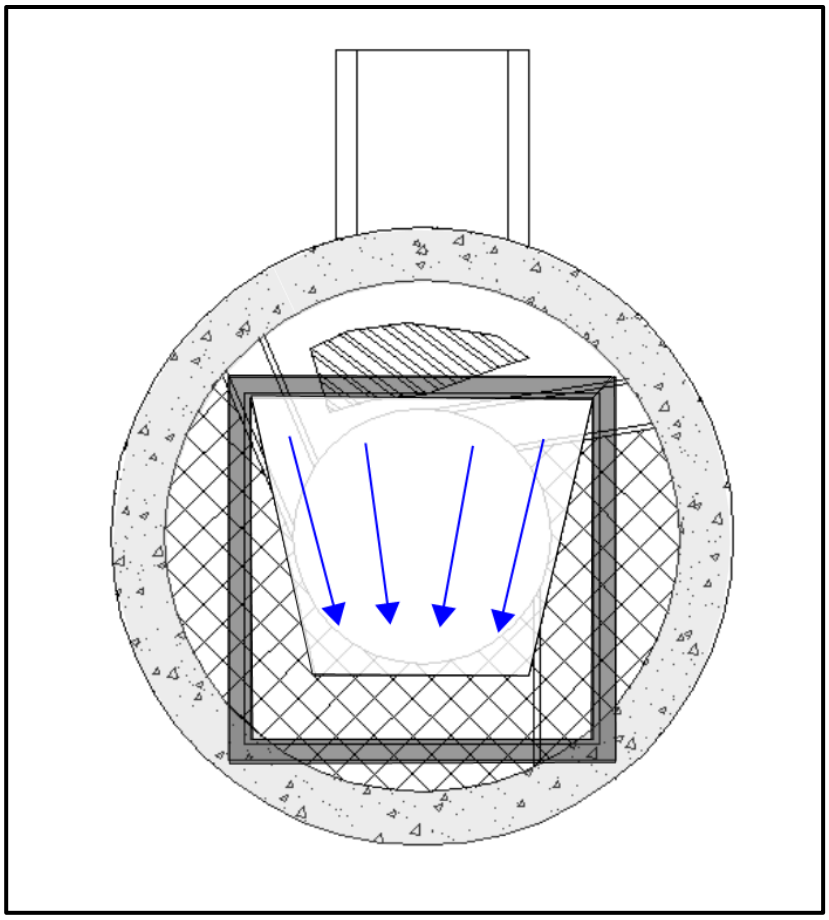


Figure 2. Hydroworks HSi Flow Path

The HSi provides the same separate flow paths for low and high flow as the other HydroStorm models. The funnel is removed for inspection and cleaning providing the exact same access for operations and maintenance as the standard HydroStorm models.

Construction Materials

The inner chamber and outlet baffle are made out of a copolymer plastic. The shell of the structure is pre-cast concrete. Pre-cast concrete is readily accepted by all municipalities since it has the following advantages:

- long service life
- ease of installation (less dependent on backfill (contractor proficiency) for structural integrity)
- concrete structures are designed for both anti-buoyancy and traffic loading without any field requirements (such as structural loading slabs in traffic areas and anti-buoyancy slabs to prevent groundwater uplift).
- low maintenance requirements

Hydroworks HS Separator Dimensions and Capacities

The HS separator is manufactured in a variety of sizes from 4 ft inside diameter to 12 ft inside diameter as shown in Table 1. Larger sizes may not be available in all areas. Please check with Hydroworks to ensure availability of the larger model sizes.

Table 1. Hydroworks HS Separator Dimensions*

Model	Structure Inside Diam. (SID) (ft)	Structure Depth (ft)*	Sediment/ Sinking Trash Volume (ft^3)	Oil/Floating Trash Volume (gal)	Permanent Pool Wet Volume (gal)
HS 4	4	4	30	95	375
HS 5	5	5	60	165	730
HS 6	6	6	110	270	1265
HS 7	7	6.5	160	410	1870
HS 8	8	7	220	615	2630
HS 10	10	9	465	1130	5285
HS 12	12	11	835	1875	9035

*Dimensions vary with project requirements

The volumes provided in Table 1 for oil and sediment are to full capacity and not indicative of recommended depths/volumes for maintenance.

Headloss

Any water quality system implemented in a storm drain network will create headloss in the system. In general, depending on the configuration of the by-pass, systems designed to treat high flows or all of the flow will have a higher headloss impact on the storm drain network than systems that by-pass high flows.

The headloss created by the HS separator was measured in an independent laboratory (Alden Research Laboratory) for a full-scale HS 4. The K value ($h = K\, v2/(2g)$) for headloss calculations was determined to be 1.04 as shown in Figure 3.

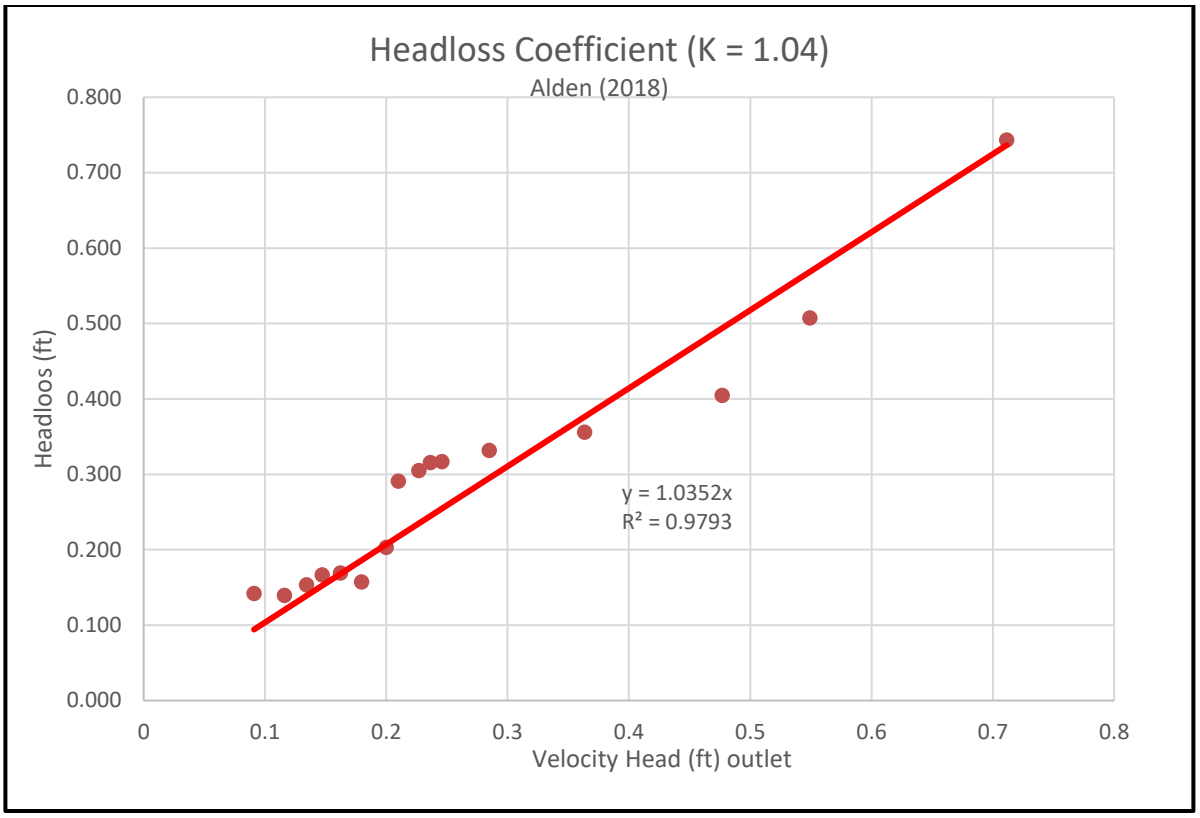


Figure 3. HydroStorm Headloss K Factor (1.04)

Site Drainage

Drainage area and imperviousness was provided by Codespoti and Associates and is shown on the site plan (Figure 4). Table 2 provides the design information for the specified separator.

Table 2. 360 Thompson Avenue Water Quality Separator Parameters

Location	Area (ac)	Impervious (%)	MADEP WQF (cfs)*	Recommended Unit
WQS1	0.75	90.9	0.77	HS 4i

*Based on 1" of runoff and 6 min time of concentration

The separator drainage area is outlined in blue on Figure 4.

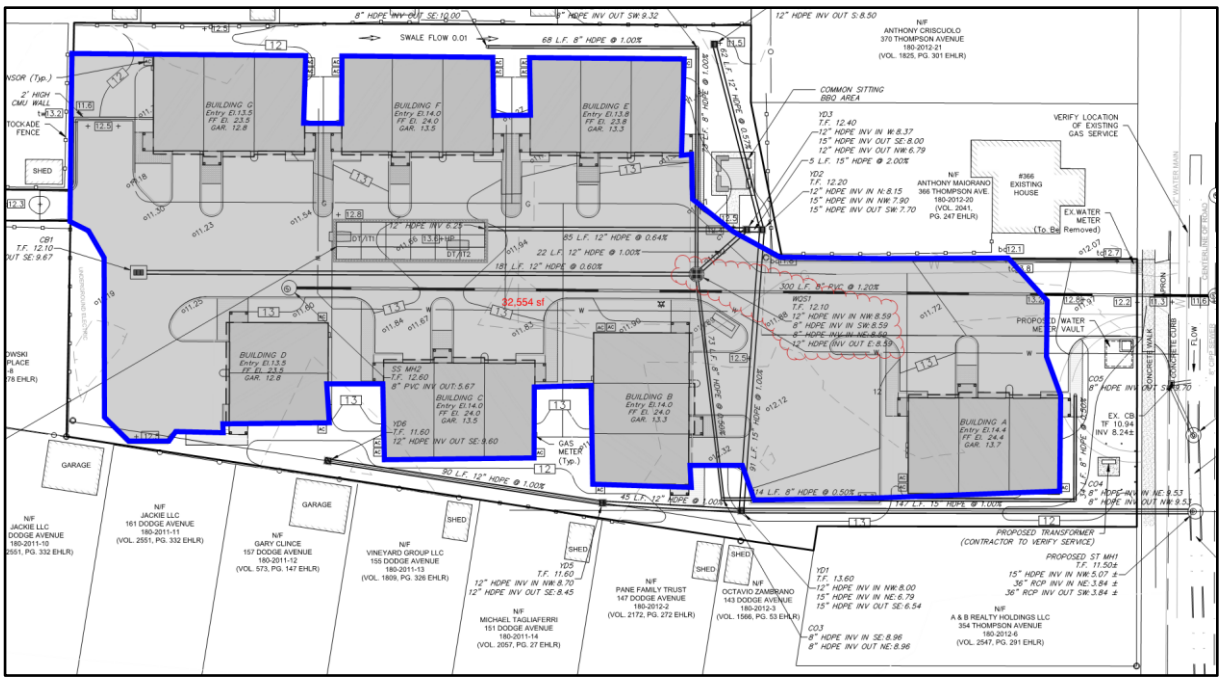


Figure 4. 360 Thompson Avenue Separator Drainage Area

The required minimum WQF specified for the separators is 0.77 cfs from Table 2. The HydroStorm HS 4 was certified by NJDEP in 2018 for a flow rate of 0.88 cfs. Therefore, the HS 4i is recommended as the appropriate separator form WQS1 on the 360 Thompson Avenue project.

TSS Removal Calculations for the Specified System

Hydroworks sizes separators based on continuous modeling of rainfall, runoff, TSS buildup, TSS washoff, TSS settling and TSS transport through the system.

The continuous simulation model is based on SWMM 4.4. The model uses the buildup and washoff models directly from SWMM. Settling was calculated based on independent laboratory TSS removal results (Alden, 2008) for dynamic (flowing water) timesteps. During periods with no flow (quiescent) settling is calculated based on Cheng's Equation. These calculations require a user input particle size distribution. We have used the NJDEP particle size distribution for this project truncated at 20 um.

Table 3. 360 Thompson Avenue TSS Particle Size Distribution	
Particle Size (um)	% by Mass
20	35
35	10
63	5
88	10
125	15
200	15
325	5
750	5

TSS removal calculations in the sizing program are based on the HydroStorm being a completely mixed reactor vessel. The removal calculations solve a first order differential equation for the concentration of solids in the tank at any time. The first order differential equation is for continuity of mass.

$C'V = QC_i - QC_t - r_cV$

C' = the change in concentration of solids in the tank with time
Q = flow rate through the tank
C_i = solids concentration in the influent to the tank
C_t = solids concentration in the tank
V = tank volume
r_c = reduction in solids in the tank (TSS Removal)

Continuous simulation requires historical rainfall data. Twenty two years of rainfall data (1948-1969) from New Haven, CT were used to analyze 360 Thompson Avenue project.

Continuous simulation provides the most accurate way of estimating performance possible since it takes into account:

- The effect of flow rate (detention time) on settling
- Back to back storms
- Pollutant buildup and washoff
- Inter-event settling.

Hydroworks has developed a sizing methodology based on the Peclet Number to estimate TSS removal for particle size distributions that are different from the NJDEP distribution that was tested.

The independent laboratory testing (Alden Research Laboratory, 2018) results for TSS removal for the HydroStorm using the NJDEP particle size distribution is provided in Figure 5. Figure 6 shows the NJDEP particle size distribution tested by Alden on the HS 4.

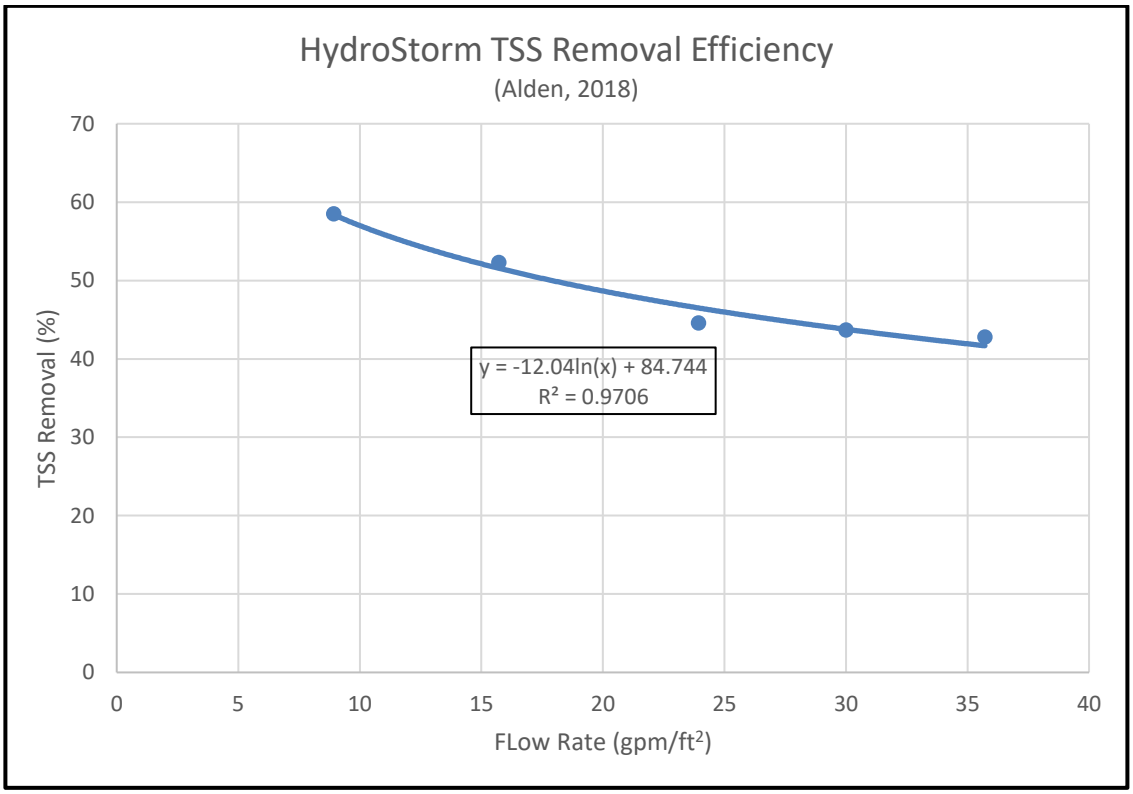


Figure 5. Independent Laboratory Results (Alden, 2018)

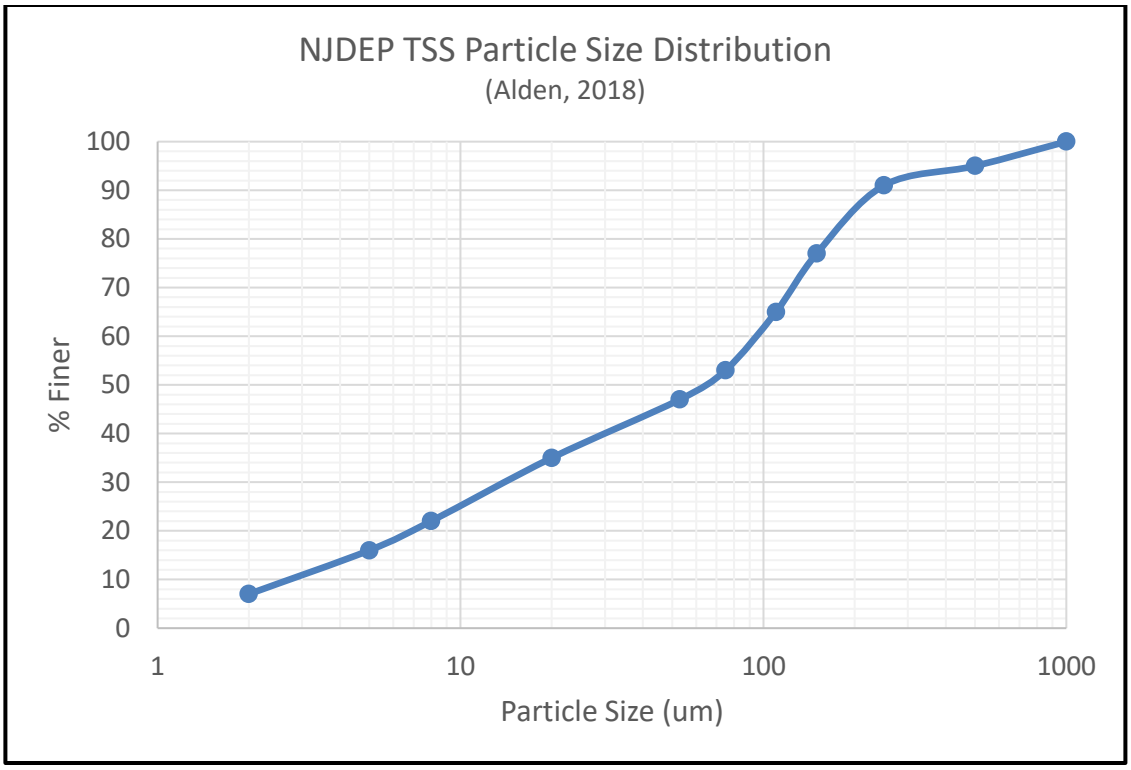


Figure 6. Independent Testing Particle Size Distribution (Alden, 2018)

Hydroworks uses the Peclet Number to calculate TSS removal based on the independent laboratory testing. The Peclet number has been used as a dimensionless scaling number for sediment deposition in lakes (Dhamotharan, et. Al. 1981). Others have suggested its use for scaling of TSS removal results for hydrodynamic separators (Dhanak, 2008, Gulliver, Guo and Wu, 2008).

The Peclet number is the ratio of convection (convective settling) to diffusion (turbulence keeping particles in suspension). The Peclet number (Equation 1) varies with the size of separator, particle size of TSS, and flow rate.

$$Pe = Vs\ h\ d\ /Q \qquad \text{Equation 1}$$

Where Pe = Peclet number
Vs = settling velocity
h = depth of separator sump
d = separator diameter
Q = flow rate

A particle will be removed in the separator if the Peclet number is equal to, or greater than, the Peclet number calculated for removal of that particle based on the independent laboratory results. Based on the NJDEP PSD in Figure 6, the TSS removal in Figure 5, and the dimensions of the tested HS 4, critical Peclet Numbers can be calculated for each particle size in Figure 6 (critical Peclet number is the Peclet Number above which the particle is removed). A critical Peclet Number curve was then developed and input to the model (Figure 7).

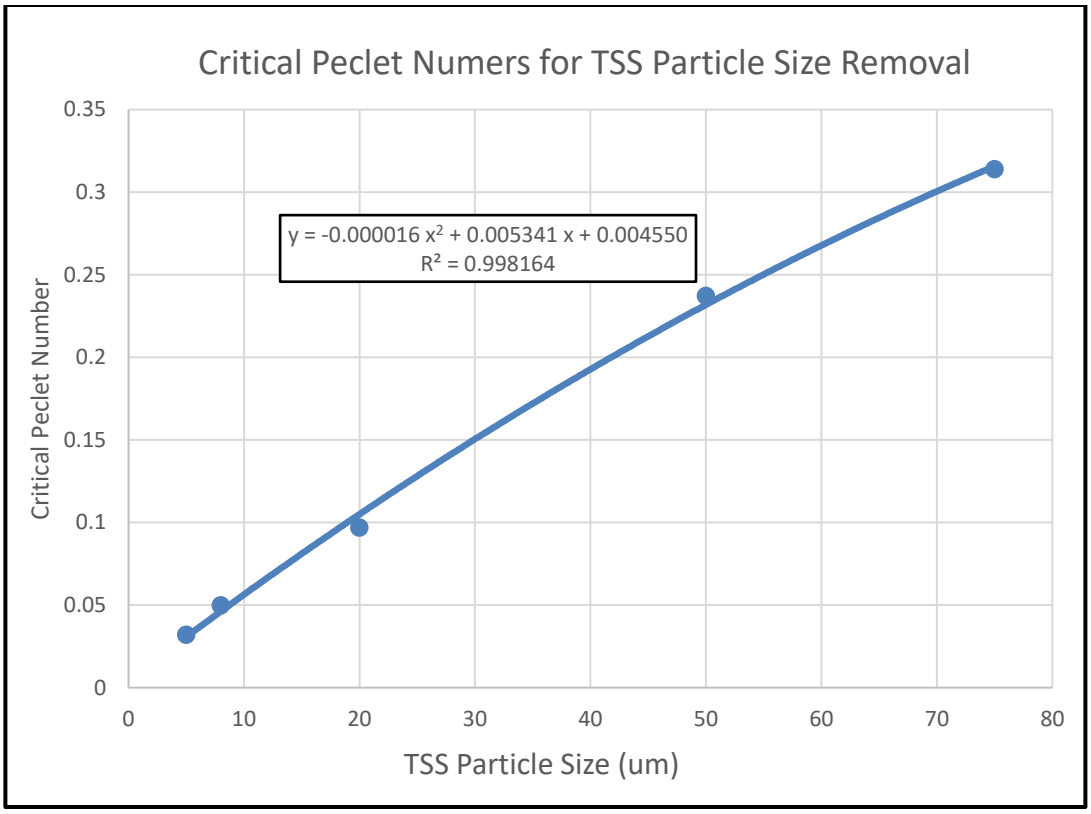


Figure 7. Critical Peclet Number Curve

At each timestep the Peclet Number is calculated for every flow and every Hydroworks separator for each particle size in the design particle size distribution. The calculated Peclet Number is then compared to the Critical Peclet Number to determine if the particle is removed at that timestep or not (removed if the calculated Peclet Number is greater than the Critical Peclet Number and not removed if less than the Critical Peclet Number). These calculations are done for the entire rainfall record to determine an overall TSS removal percentage.

Hydroworks added a Peclet routine to the USEPA SWMM model to determine TSS removal based on the Peclet number calibrated to the independent laboratory testing completed by Alden Research Laboratory (Figure 7). Figure 8 shows the calibrated model results compared to the independent laboratory testing results from Alden Labs for a HydroStorm HS4 based on the NJDEP particle size distribution used by Alden for testing purposes.

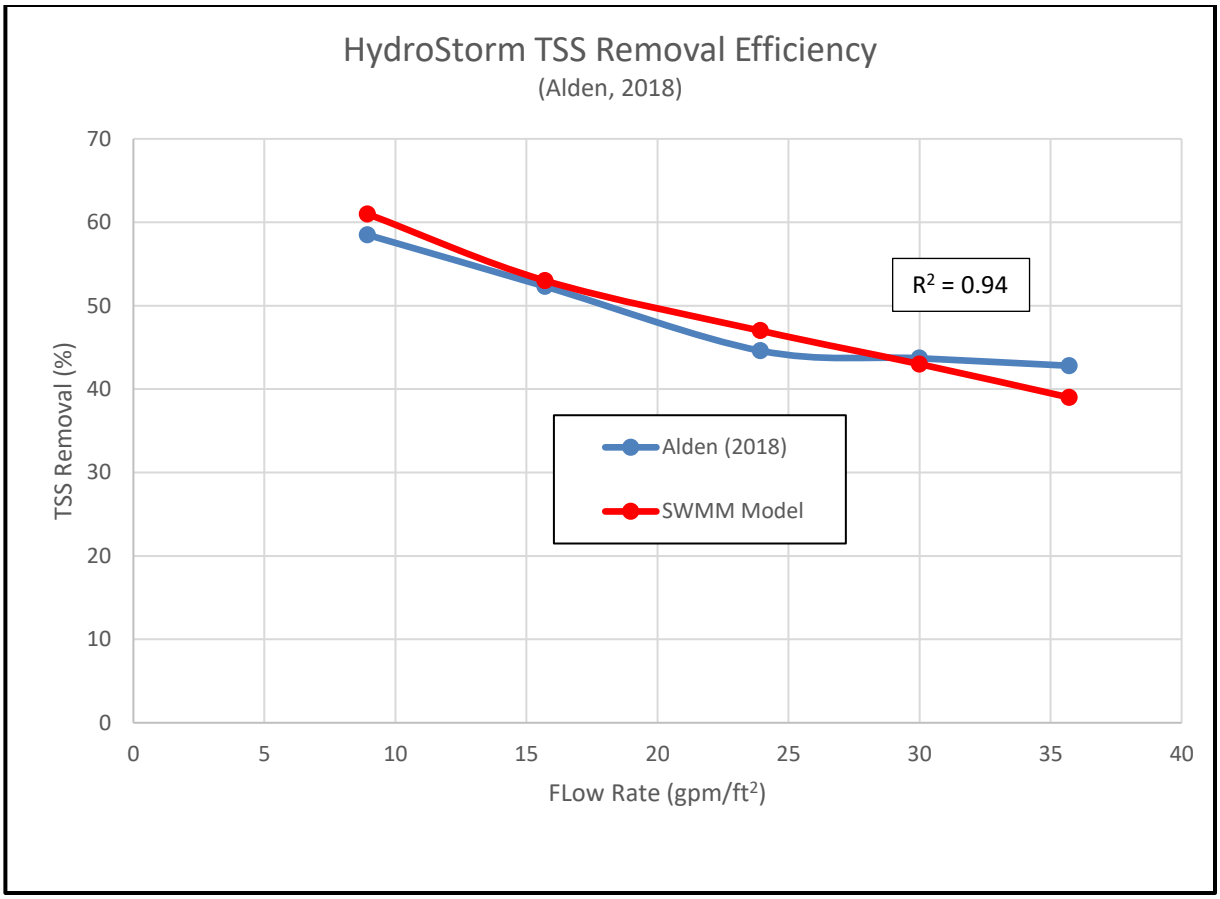


Figure 8. Independent Laboratory TSS Removal Performance versus Peclet Sizing Model

The use of the Peclet Number allows Hydroworks to size the HydroStorm based on any particle size and design storm or local hydrology

Sizing Recommendations

TSS Removal

The sizing simulation (Figures 9) results indicate that the HS 4i is appropriate for 80% annual TSS removal based on the particle size distribution given in Table 3. Detailed simulation results are provided in Appendix 3.

A HS 4i is proposed to meet both the water quality flow for the 1" storm as well as provide 80% annual TSS removal.

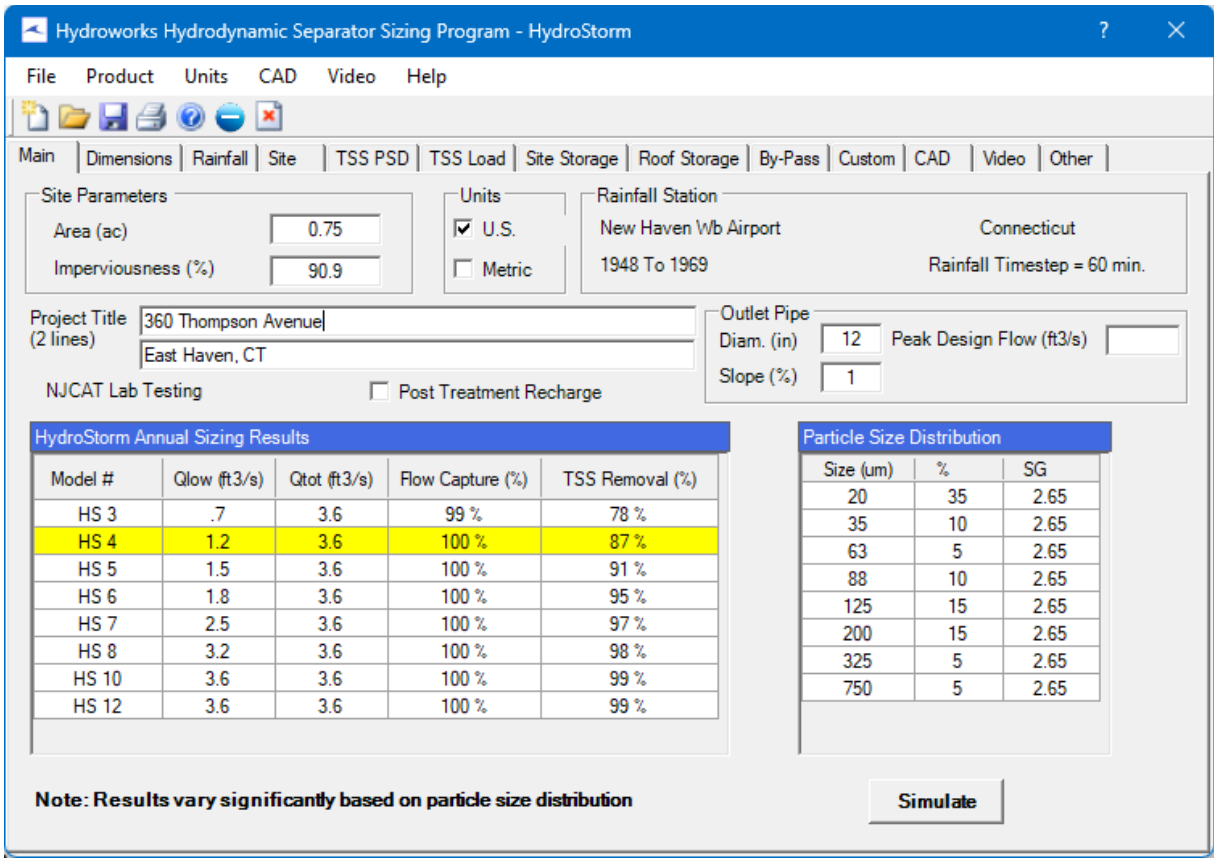


Figure 9. 360 Thompson Avenue Annual TSS Removal

Approvals

HydroStorm is approved by ConnDOT (2021)

HydroStorm is verified by the New Jersey Center for Advanced Technology (NJCAT, 2018) (TARP Tier 1 Approval).

HydroStorm is ETV Canada verified (ETV Canada, 2018).

HydroStorm has received Environmental Technology Verification based on ISO 14034:2016

HydroStorm is approved by the Virginia Department of Environmental Quality and is listed on the Virginia BMP Clearinghouse (VDEQ, 2018)

Local Production

Hydroworks units are made locally in CT by United Concrete. Most of the internal components for HydroStorm are made in Groveland, MA. HydroStorm was independently tested by Alden Labs in Holden, MA. Therefore, the use of HydroStorm supports the local New England and CT economy.

Summary

We propose the use of one HydroStorm HS 4i separator for the 360 Thompson Avenue project in East Haven, CT. The proposed HydroStorm separator will provide 80% annual TSS removal for the NJDEP TSS particle size distribution and treat the MADEP site water quality flow rate.

APPENDIX 1

Approvals

State of New Jersey

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Mail Code – 401-02B
Division of Water Quality
Bureau of Nonpoint Pollution Control
P.O. Box 420 – 401 E. State St.
Trenton, NJ 08625-0420
Phone: (609) 633-7021 / Fax: (609) 777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

CATHERINE R. McCABE
Acting Commissioner

March 27, 2018

Graham Bryant, M.Sc., P.E.
President
Hydroworks, LLC
136 Central Avenue
Clark, NJ 07066

Re: MTD Lab Certification
HydroStorm Hydrodynamic Separator by Hydroworks, LLC
Online Installation

TSS Removal Rate 50%

Dear Mr. Bryant:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7 (c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Hydroworks, LLC has requested an MTD Laboratory Certification for the Hydroworks HydroStorm Hydrodynamic Separator.

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated February 2018) for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

The NJDEP certifies the use of the HydroStorm by Hydroworks, LLC at a TSS removal rate of 50% when designed, operated, and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

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1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5.

2. The HydroStorm shall be installed using the same configuration reviewed by NJCAT and shall be sized in accordance with the criteria specified in item 6 below.

3. This HydroStorm cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.

4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at www.njstormwater.org.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the Hydrostorm. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at http://www.hydroworks.com/hydrostormo&m.pdf for any changes to the maintenance requirements.

6. Sizing Requirement:

   The example below demonstrates the sizing procedure for the Hydrostorm:

   Example: A 0.25-acre impervious site is to be treated to 50% TSS removal using a HydroStorm. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

   Maximum Treatment Flow Rate (MTFR) Evaluation:

   The site runoff (Q) was based on the following:
   time of concentration = 10 minutes
   i = 3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)
   c = 0.99 (runoff coefficient for impervious)
   Q = ciA = 0.99 x 3.2 x 0.25 = 0.79 cfs

   Given the site runoff is 0.79 cfs and based on Table 1 below, the HydroStorm Model HS4 with a MTFR of 0.88 cfs could be used for this site to remove 50% of the TSS from the impervious area without exceeding the MTFR.

   The sizing table corresponding to the available system models is noted below. Additional specifications regarding each model can be found in the Verification Appendix under Table A-1.

Table 1 HydroStorm Sizing Information

HydroStorm Model	NJDEP 50% TSS Maximum Treatment Flow Rate (cfs)	Treatment Area (ft^2)	Hydraulic Loading Rate (gpm/ft^2)	50% Maximum Sediment Storage (ft^3)
HS3	0.50	7.1	31.4	3.6
HS4	0.88	12.6	31.4	6.3
HS5	1.37	19.6	31.4	9.8
HS6	1.98	28.3	31.4	14.2
HS7	2.69	38.5	31.4	19.3
HS8	3.52	50.3	31.4	25.2
HS9	4.45	63.6	31.4	31.8
HS10	5.49	78.5	31.4	39.3
HS11	6.65	95.0	31.4	47.5
HS12	7.91	113.0	31.4	56.5

A detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Brian Salvo or Nick Grotts of my office at (609) 633-7021.

Sincerely,

James J. Murphy, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, NJDEP - DLUR
Ravi Patraju, NJDEP - BES
Gabriel Mahon, NJDEP - BNPC
Brian Salvo, NJDEP – BNPC
Nick Grotts, NJDEP – BNPC

Center for Environmental Systems
Stevens Institute of Technology
One Castle Point
Hoboken, NJ 07030-0000

January 25, 2018

Jim Murphy, Chief
NJDEP
Bureau of Non-Point Pollution Control
Division of Water Quality
Mail Code 401-02B, PO Box 420
Trenton, NJ 08625-0420

Dear Mr. Murphy,

Based on my review, evaluation and assessment of the testing conducted on the Hydroworks HydroStorm (Model HS 4) hydrodynamic separator at the Alden Research Laboratory, Inc. (Alden), Holden, Massachusetts, under the direct supervision of Alden's senior stormwater engineer, James Mailloux, the test protocol requirements contained in the *"New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device (January 25, 2013)"* (NJDEP HDS Protocol) were met or exceeded. Specifically

Test Sediment Feed

The mean PSD of the test sediments comply with the PSD criteria established by the NJDEP HDS protocol. The removal efficiency test sediment PSD analysis was plotted against the NJDEP removal efficiency test PSD specification. The test sediment was shown to be slightly finer than the sediment blend specified by the protocol (<75µ); the test sediment d_{50} was 67 microns. The scour test sediment PSD analysis was plotted against the NJDEP scour test PSD specification and shown to meet the protocol specifications.

Removal Efficiency Testing

In accordance with the NJDEP HDS Protocol, removal efficiency testing was executed on the HydroStorm (HS 4), a 4-ft. diameter commercially available unit, to establish the ability of the HydroStorm to remove the specified test sediment at 25%, 50%, 75%, 100% and 125% of the

target MTFR. The HS 4 demonstrated 50.1% annualized weighted solids removal as defined in the NJDEP HDS Protocol. The flow rates, feed rates and influent concentration all met the NJDEP HDS test protocol's coefficient of variance requirements and the background concentration for all five test runs never exceeded 20 mg/L (maximum of 8.9 mg/L).

Scour Testing

To demonstrate the ability of the HydroStorm to be used as an online treatment device, scour testing was conducted at 228% of the MTFR which exceeds the 200% MTFR required by the NJDEP HDS Protocol. The scour test was conducted with the 50% capacity (6") false floor installed. An additional 4" of the 50-1000-micron test sediment was preloaded on top of the false floor, resulting in the unit being preloaded to the 83% storage capacity of 10".

The average flow rate during the online scour test was 2.01 cfs (903 gpm), which represents 228% of the MTFR (MTFR = 0.88 cfs). Background concentrations were <3.1 mg/L throughout the scour testing, which complies with the 20 mg/L maximum background concentration specified by the test protocol. Unadjusted effluent concentrations ranged from 10.9 mg/L to 30.3 mg/L, with an average concentration of 16.8 mg/L. When adjusted for background concentrations, the average effluent concentration was 14.6 mg/L. These results confirm that the HS 4 did not scour at 200% MTFR and meets the criteria for online use.

Maintenance Frequency

The predicted maintenance frequency for all HydroStorm models is 50 months.

Sincerely,



Richard S. Magee, Sc.D., P.E., BCEE

January 24, 2018

Dr. Richard Magee, P.E., BCEE
Executive Director
New Jersey Corporation for Advanced Technology
Center for Environmental Systems
Stevens Institute of Technology
One Castle Point
Hoboken, NJ 07030

Conflict of Interest Statement

Alden Research Laboratory (ALDEN) is a non-biased independent testing entity which receives compensation for testing services rendered. ALDEN does not have any vested interest in the products it tests or their affiliated companies. There is no financial, personal or professional conflict of interest between ALDEN and Hydroworks, LLC.

Protocol Compliance Statement

Alden performed design research testing, as well as verification testing on the Hydroworks HydroStorm 4 (HS 4) separator. All submitted data was collected on the selected final design, as discussed in the report. The Technical Report and all required supporting documentation has been submitted as required by the protocol.

Testing performed by ALDEN on the Hydroworks HydroStorm HS 4 unit met or exceeded the requirements as stated in the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device", (January 25, 2013), with the following exception:

The reported 25% MTFR test flow was higher than the +10% allowance as per the protocol. However, the higher test flow also results in a higher treatment velocity, which is conservative for removal of sediment particles.

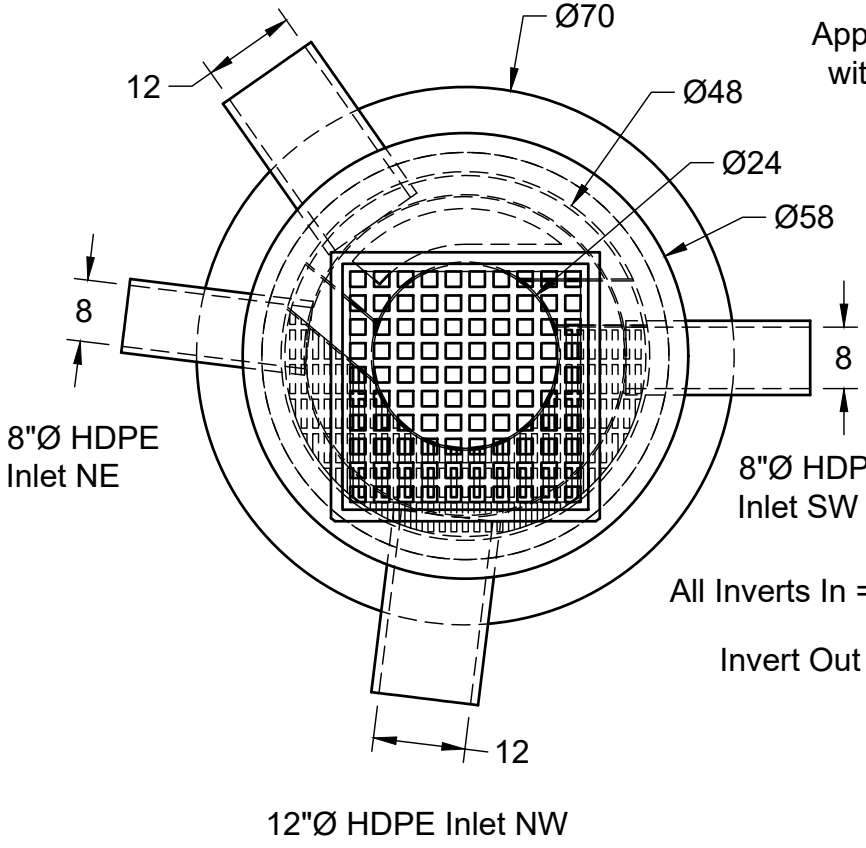
James T. Mailloux

Senior Engineer
Alden Research Laboratory
jmailloux@aldenlab.com

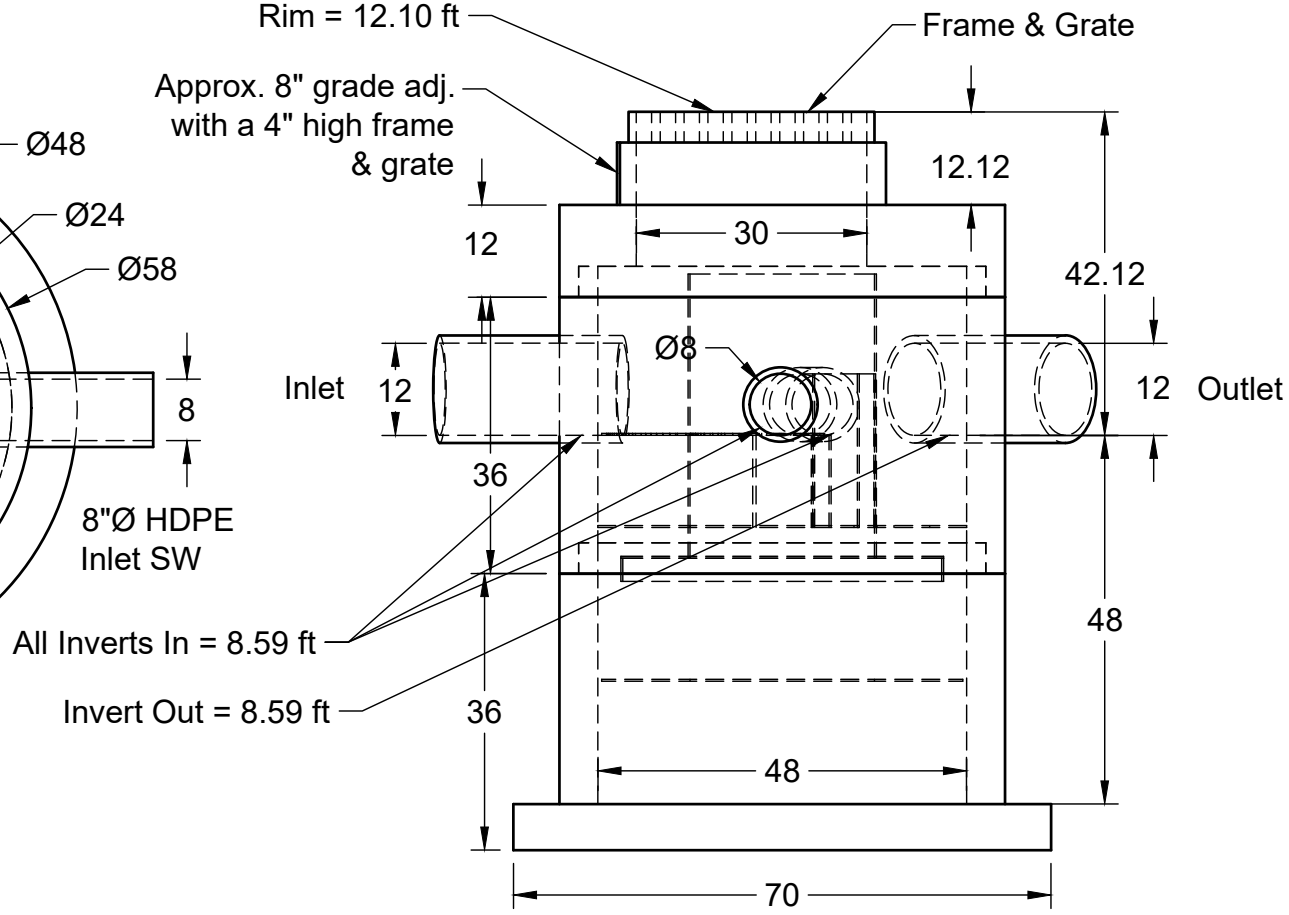
(508) 829-6000 x6446

APPENDIX 2

CAD Drawings



Plan



Profile

Independently tested & verified by NJCAT and ETV Canada (ISO-14034)

US Patent # 10,710,907

HydroStorm HS 4i		
Project : 360 Thompson Avenue, WQS1		
Location : East Haven, CT		
Date : 12/20/2023	**Scale :** 1:25	**Rev. :** 1.0

Hydroworks

A154

APPENDIX 3

TSS Removal Calculations

Hydroworks Sizing Summary

360 Thompson Avenue
East Haven, CT

12-20-2023

Recommended Size: HydroStorm HS 4i

A HydroStorm HS 4i is recommended to provide 80 % annual TSS removal based on a drainage area of 0.75 (ac) with an imperviousness of 90.9 % and New Haven Wb Airport, Connecticut rainfall for the Hydroworks standard particle size distribution.

The recommended HydroStorm HS 4i treats 100 % of the annual runoff and provides 87 % annual TSS removal for the New Haven Wb Airport rainfall records and Hydroworks standard particle size distribution.

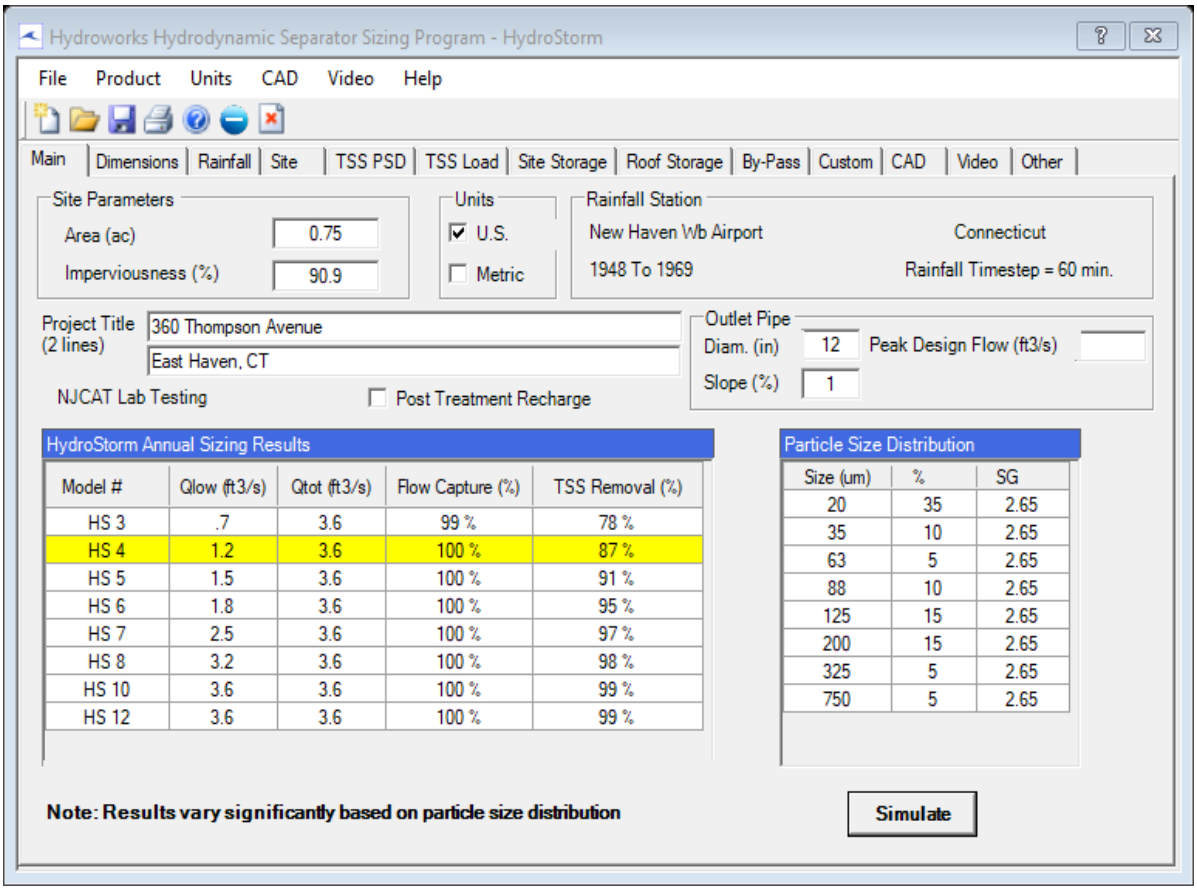
The HydroStorm has a headloss coefficient (K) of 1.04. Since a peak flow was not specified, headloss was calculated using the full pipe flow of 3.56 (ft3/s) for the given 12 (in) pipe diameter at 1% slope. The headloss was calculated to be 4 (in) based on a flow depth of 12 (in) (full pipe flow).

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

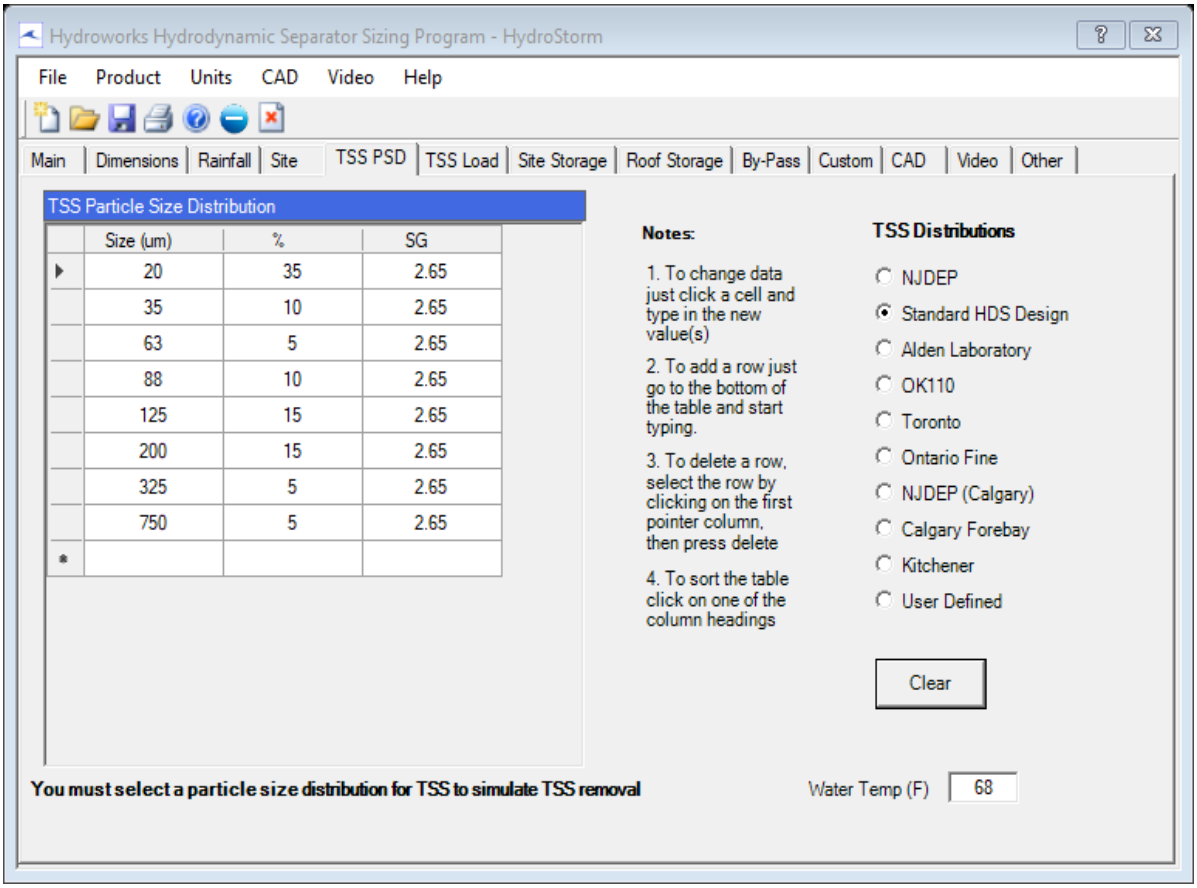
If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroStorm .

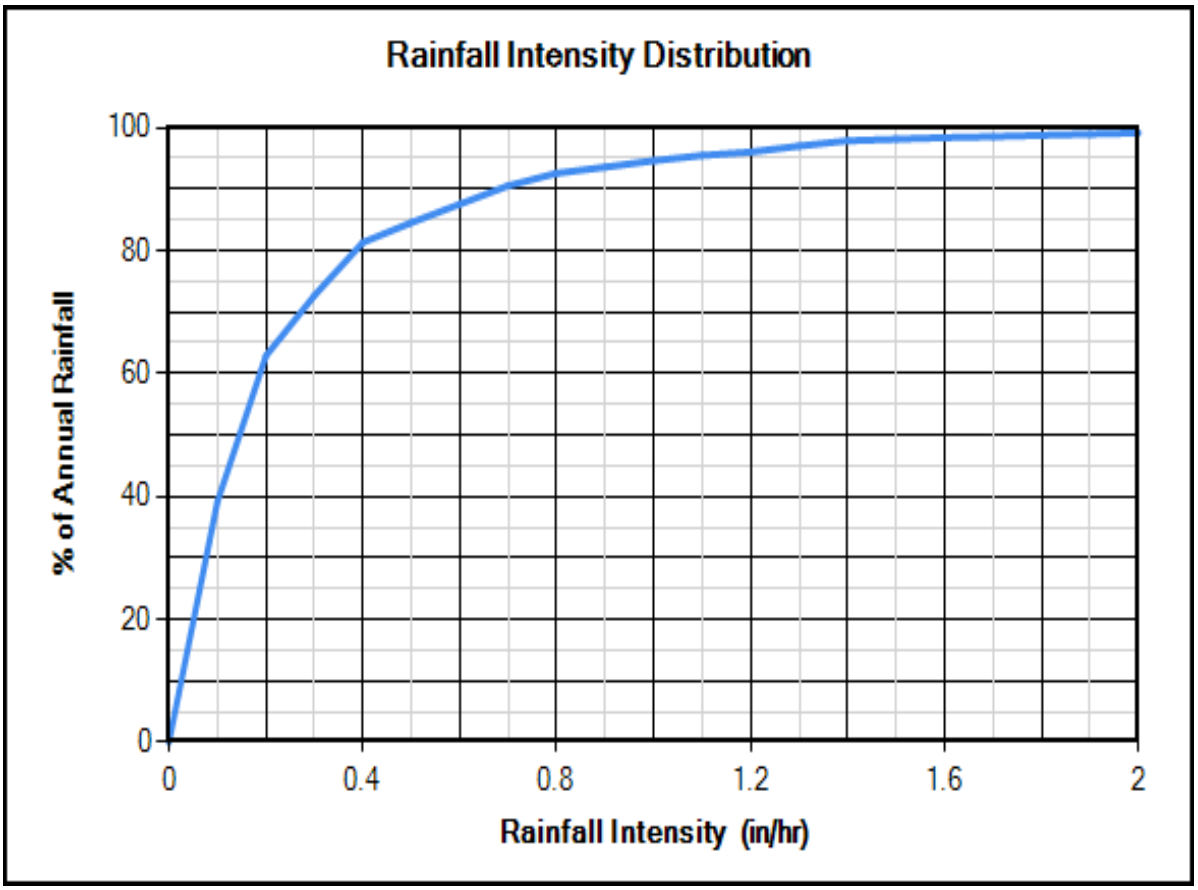
TSS Removal Sizing Summary



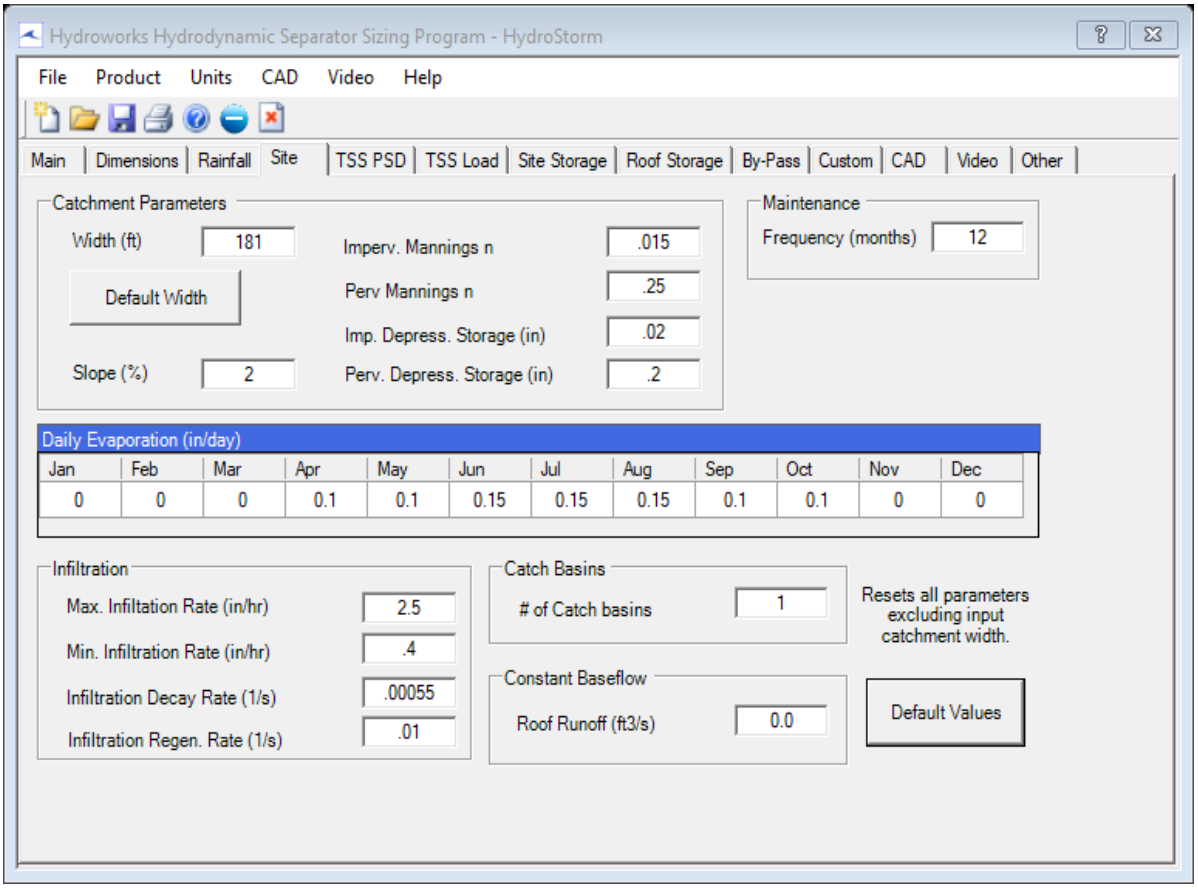
TSS Particle Size Distribution



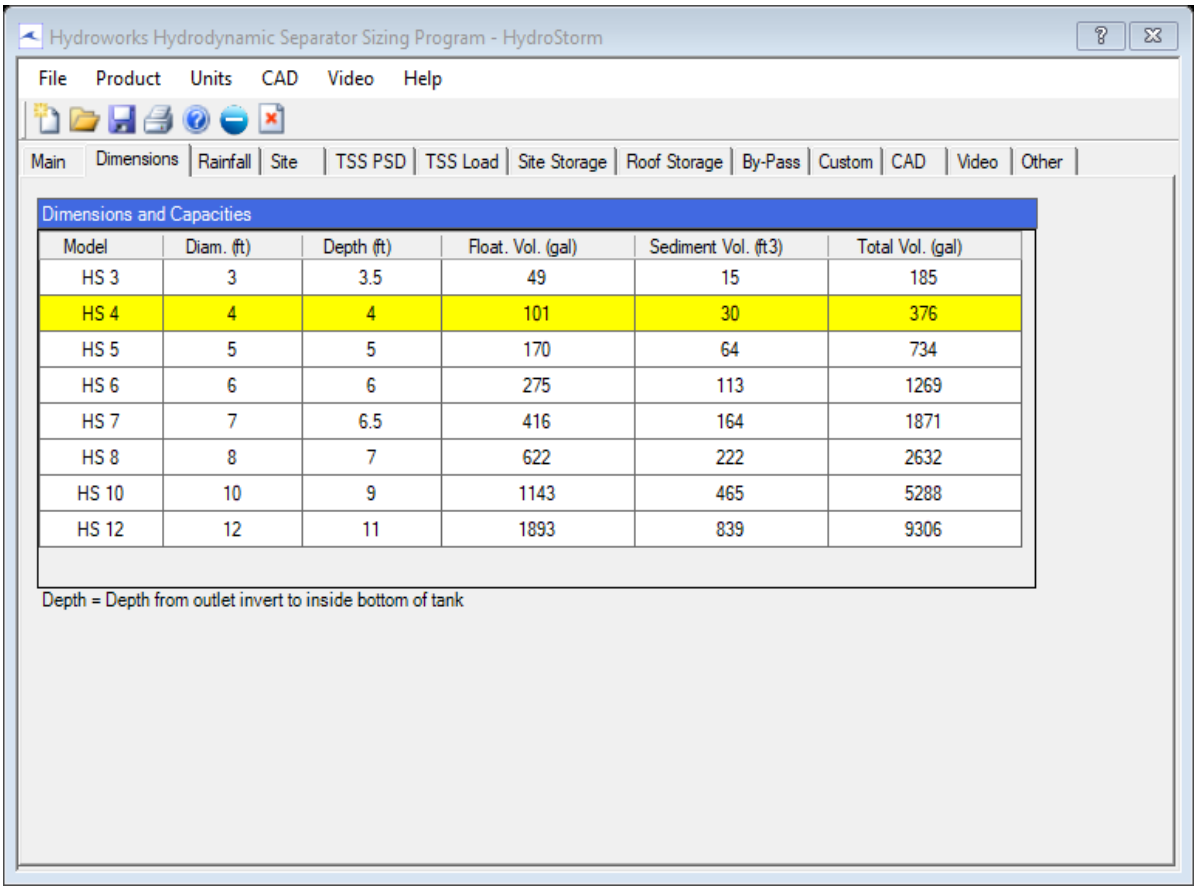
Rainfall Station - New Haven Wb Airport, Connecticut(1948 To 1969)



Site Physical Characteristics



Dimensions And Capacities

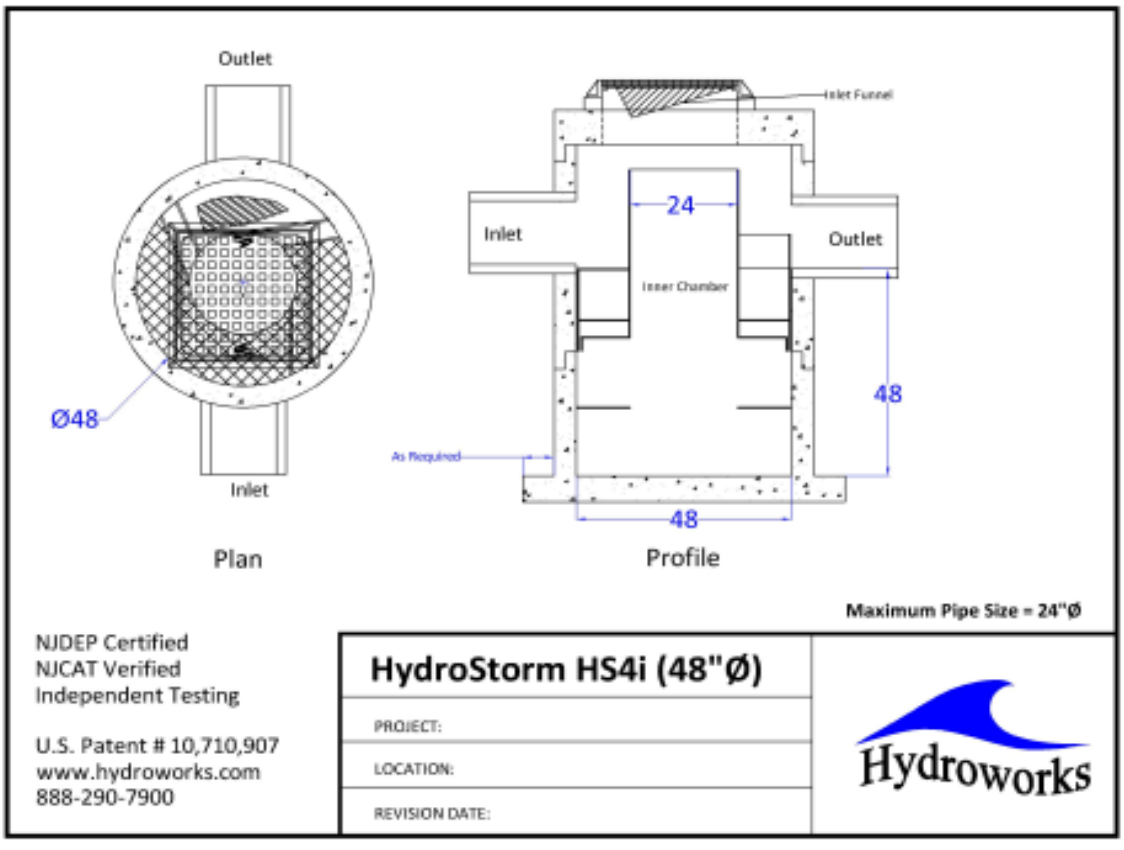


Dimensions and Capacities

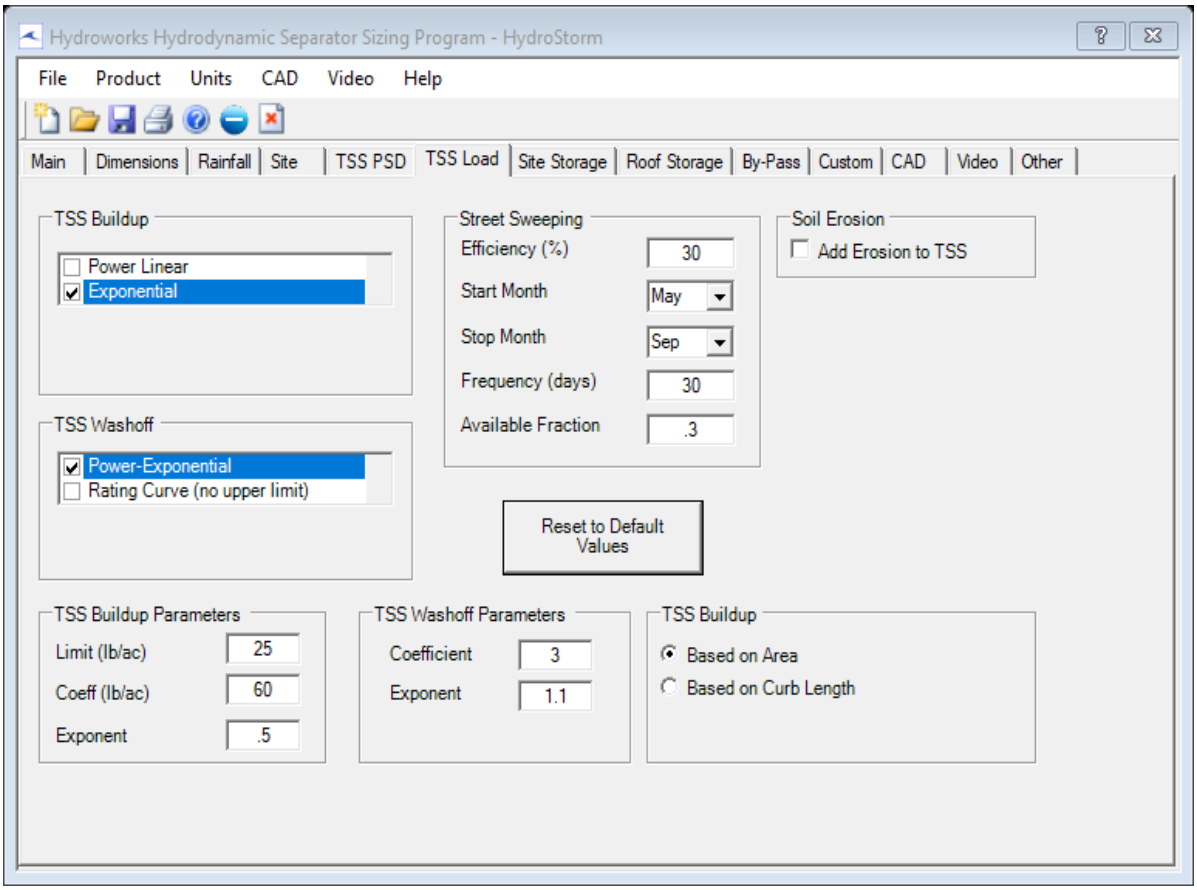
Model	Diam. (ft)	Depth (ft)	Float. Vol. (gal)	Sediment Vol. (ft3)	Total Vol. (gal)
HS 3	3	3.5	49	15	185
HS 4	4	4	101	30	376
HS 5	5	5	170	64	734
HS 6	6	6	275	113	1269
HS 7	7	6.5	416	164	1871
HS 8	8	7	622	222	2632
HS 10	10	9	1143	465	5288
HS 12	12	11	1893	839	9306

Depth = Depth from outlet invert to inside bottom of tank

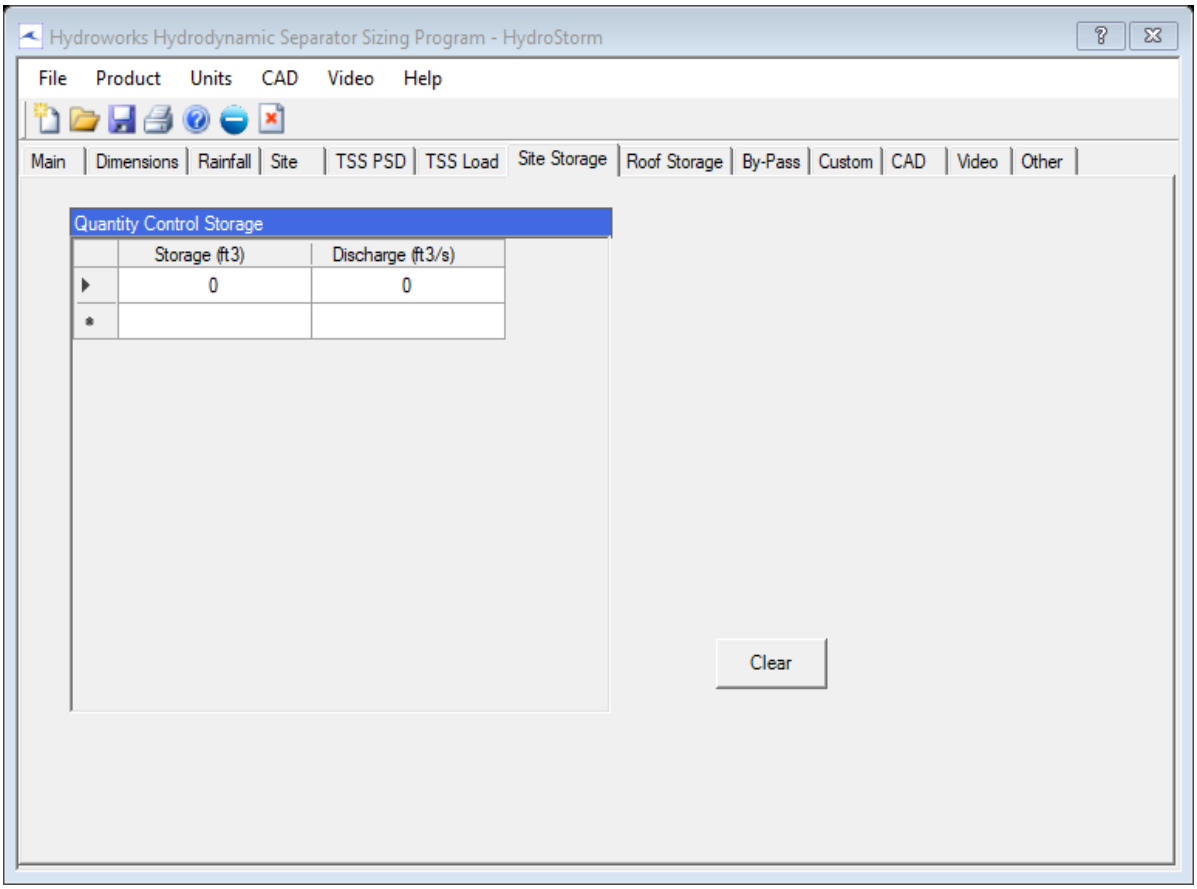
Generic HS 4i CAD Drawing



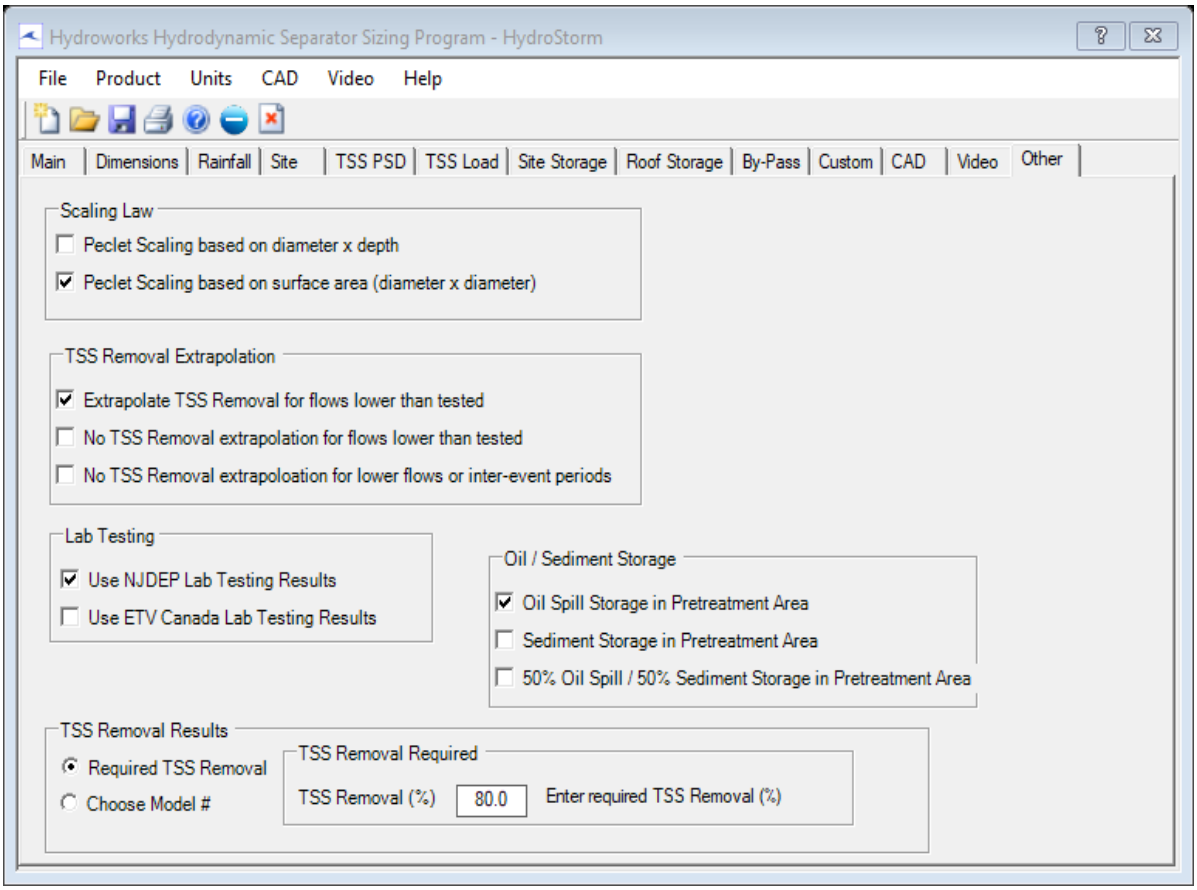
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Flagged Issues

None

Hydroworks Sizing Program - Version 5.9
Copyright Hydroworks, LLC, 2023
1-800-290-7900
www.hydroworks.com

Operations and Maintenance Plan

360 Thompson Avenue, East Haven CT

1/3/24

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the existing and proposed stormwater components installed at 360 Thompson Avenue are maintained in operational condition throughout the life of the project. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance.

Recommended Frequency of Service:

As further defined below, all stormwater components should be checked on a periodic basis and kept in full working order. Ultimately, the required frequency of inspection and service will depend on runoff quantities, pollutant loading, and clogging due to debris. At a minimum, we recommend that all stormwater components be inspected and serviced twice per year, once before winter begins and once during spring cleanup.

Qualified Inspector:

The inspections must be completed by an individual experienced in the construction and maintenance of stormwater drainage systems. Once every five years the inspections must be completed by a professional engineer.

Service Procedures:

1. Catch Basins & Drainage Inlets:
    a. Catch basins and drainage inlets shall be completely cleaned of accumulated debris and sediments at the completion of construction.
    b. For the first year, catch basins and drainage inlets shall be inspected on a quarterly basis.
    c. Any accumulated debris within the catch basins/inlets shall be removed and any repairs as required.
    d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
    e. Accumulated debris within the catch basins/inlets shall be removed and repairs made as required.
    f. Accumulated sediments shall be removed at which time they are within 24 inches of the invert of the outlet pipe or for structure that include a hooded outlet, 12” from the bottom of the hood.
    g. For structures that include a hooded outlet, if floatables are present they shall be skimmed off and/or if an oil sheen is present, the structure shall be pumped out using standard truck-mounted sewer and catch basin cleaners

with positive displacement rotary lobe vacuum pumps and 8-in diameter suction hose.

h. Any additional maintenance required per the manufacturer's specifications shall also be completed

2. Storm Drainage Piping and Manholes/Junction Boxes:
    a. All storm drainage piping shall be completely flushed of debris and accumulated sediment at the completion of construction.
    b. Manholes/Junction Boxes shall be inspected and repaired on an annual basis.
    c. Unless system performance indicates degradation of piping, comprehensive video inspection of storm drainage piping shall occur once every ten years.
    d. Any additional maintenance required per the manufacturer's specifications shall also be completed.

3. Stormwater Galleries:
    a. For the first year, the galleries shall be inspected on a quarterly basis preferably within 48 hours of a one-inch rainfall or greater.
    b. The inlets to the galleries shall inspected and any accumulated sediment shall be removed.
    c. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
    d. Evidence of standing water in the galleries after 48 hours from a one-inch or greater rainfall event is an indication that the infiltration capacity may be diminished.
    e. Any accumulated sediment shall be removed and the stone repaired / replaced as needed.
4. Water Quality Structures – HydroWorks - Hydrostorm
    a. During construction, the unit should be inspected every four week and after every storm over 0.5".
    b. Post construction inspection should be performed during the first year of operation. The initial post construction inspection will indicate the future frequency of inspection needed.
    c. A more detailed operations plan is provided by the manufacturer and attached as an addendum.
5. Roof Gutters:
    a. Remove accumulated debris and inspect for damage. Any damage should be repaired as required.
6. Parking:
    a. The use of sodium chloride for de-icing of the parking areas is prohibited.
    b. It is recommended that a combination of Magnesium Chloride or preferably Calcium Magnesium Acetate in concert with biodegradeable brine products such as Beet Heet™ or equivalent, be utilized.

i. These should be applied per Manufacturer's recommendation. Generally, the mix should be applied before much snow or ice has fallen. This is necessary for a "bottom up" application that keeps falling precipitation from adhering to the surface.

ii. It is recommended to start with a heavier application and taper off as time goes on.

c. The parking areas shall be inspected a minimum of twice per year for debris and sediment accumulation. Vacuuming with an industrial grade sweeper shall be performed a minimum of twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.

Disposal of Debris and Sediment:

All debris and sediment removed from the stormwater structures and detention / water quality basins shall be disposed of legally. There shall be no dumping of silt or debris into or in proximity to any inland or tidal wetlands.

Maintenance Records:

The Owners(s) must maintain all records (logs, invoices, reports, data, etc.) and have them readily available for inspection at all times.

Type of Inspection: ¨ Spring ¨ Fall ¨ Other

Inspector's Name:_____ Date of Inspection: _____

Affiliation:_____ Phone #:_____

Catch Basins & Drainage Inlets:

- Has accumulated debris been removed from grates? ¨ Yes ¨ No ¨ N/A
- Do any basins require repair? (identify below): ¨ Yes ¨ No ¨ N/A
- Have sumps been cleaned of sediment? ¨ Yes ¨ No ¨ N/A

Notes:

Storm Drainage Piping and Manholes/Junction Boxes:

- Has accumulated debris been removed? ¨ Yes ¨ No ¨ N/A
- Do any manholes require additional repair? (identify below): ¨ Yes ¨ No ¨ N/A
- Is there any evidence of stormwater piping failure? ¨ Yes ¨ No ¨ N/A
- Has a comprehensive video inspection been completed? ¨ Yes ¨ No ¨ N/A

Notes:

Stormwater Galleries:

- Is there standing water inside the galleries? ¨ Yes ¨ No ¨ N/A
- Is there visible evidence of sediments accumulated to the top of stone? ¨ Yes ¨ No ¨ N/A
- If so, has the sediment been removed? ¨ Yes ¨ No ¨ N/A

Notes:

Water Quality Structures:

- A - Is the sediment level greater than 12” (record depth below)? ¨ Yes ¨ No ¨ N/A
- B - Is the floatable depth and oil sheen greater than 0.5”? ¨ Yes ¨ No ¨ N/A
- If A or B is yes, have chambers been pumped out? ¨ Yes ¨ No ¨ N/A

Notes:

Roof Gutters:

- Has accumulated debris been removed from gutters? ¨ Yes ¨ No ¨ N/A
- Do any gutters require repair? (identify below): ¨ Yes ¨ No ¨ N/A

Notes:

Parking Lot:

- Is there debris / sediment buildup in any portion of the parking? ¨ Yes ¨ No ¨ N/A
- Has vacuum sweeping been performed / documented? ¨ Yes ¨ No ¨ N/A

Notes:

Please make additional notes/observations and particular concerns below. Also record any additional maintenance that has been performed:

SIGNATURE OF INSPECTOR: DATE:



Hydroworks® HydroStorm

Operations & Maintenance Manual

Version 1.1

Introduction

The HydroStorm is a state of the art hydrodynamic separator. Hydrodynamic separators remove solids, debris and lighter than water (oil, trash, floating debris) pollutants from stormwater. Hydrodynamic separators and other water quality measures are mandated by regulatory agencies (Town/City, State, Federal Government) to protect storm water quality from pollution generated by urban development (traffic, people) as part of new development permitting requirements.

As storm water treatment structures fill up with pollutants they become less and less effective in removing new pollution. Therefore, it is important that storm water treatment structures be maintained on a regular basis to ensure that they are operating at optimum performance. The HydroStorm is no different in this regard and this manual has been assembled to provide the owner/operator with the necessary information to inspect and coordinate maintenance of their HydroStorm.

Hydroworks® HydroStorm Operation

The Hydroworks HydroStorm (HS) separator is a unique hydrodynamic by-pass separator. It incorporates a protected submerged pretreatment zone to collect larger solids, a treatment tank to remove finer solids, and a dual set of weirs to create a high flow bypass. High flows are conveyed directly to the outlet and do not enter the treatment area, however, the submerged pretreatment area still allows removal of coarse solids during high flows.

Under normal or low flows, water enters an inlet area with a horizontal grate. The area underneath the grate is submerged with openings to the main treatment area of the separator. Coarse solids fall through the grate and are either trapped in the pretreatment area or conveyed into the main treatment area depending on the flow rate. Fines are transported into the main treatment area. Openings and weirs in the pretreatment area allow entry of water and solids into the main treatment area and cause water to rotate in the main treatment area creating a vortex motion. Water in the main treatment area is forced to rise along the walls of the separator to discharge from the treatment area to the downstream pipe.

The vortex motion forces solids and floatables to the middle of the inner chamber. Floatables are trapped since the inlet to the treatment area is submerged. The design maximizes the retention of settled solids since solids are forced to the center of the inner chamber by the vortex motion of water while water must flow up the walls of the separator to discharge into the downstream pipe.

A set of high flow weirs near the outlet pipe create a high flow bypass over both the pretreatment area and main treatment chamber. The rate of flow into the treatment area is regulated by the number and size of openings into the treatment chamber and the height of by-pass weirs. High flows flow over the weirs directly to the outlet pipe preventing the scour and resuspension of any fines collected in the treatment chamber.

A central access tube is located in the structure to provide access for cleaning. The arrangement of the inlet area and bypass weirs near the outlet pipe facilitate the use of multiple inlet pipes.

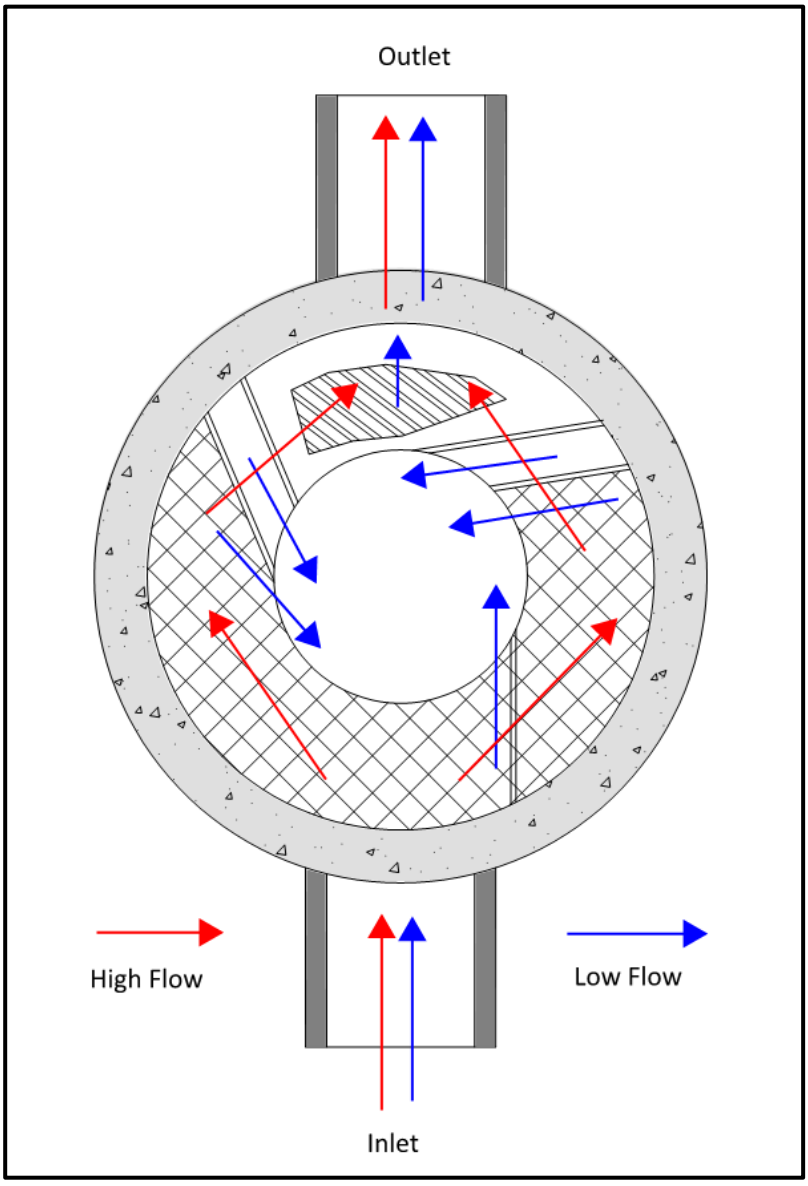


Figure 1. Hydroworks HydroStorm Operation – Plan View

Figure 2 is a profile view of the HydroStorm separator showing the flow patterns for low and high flows.

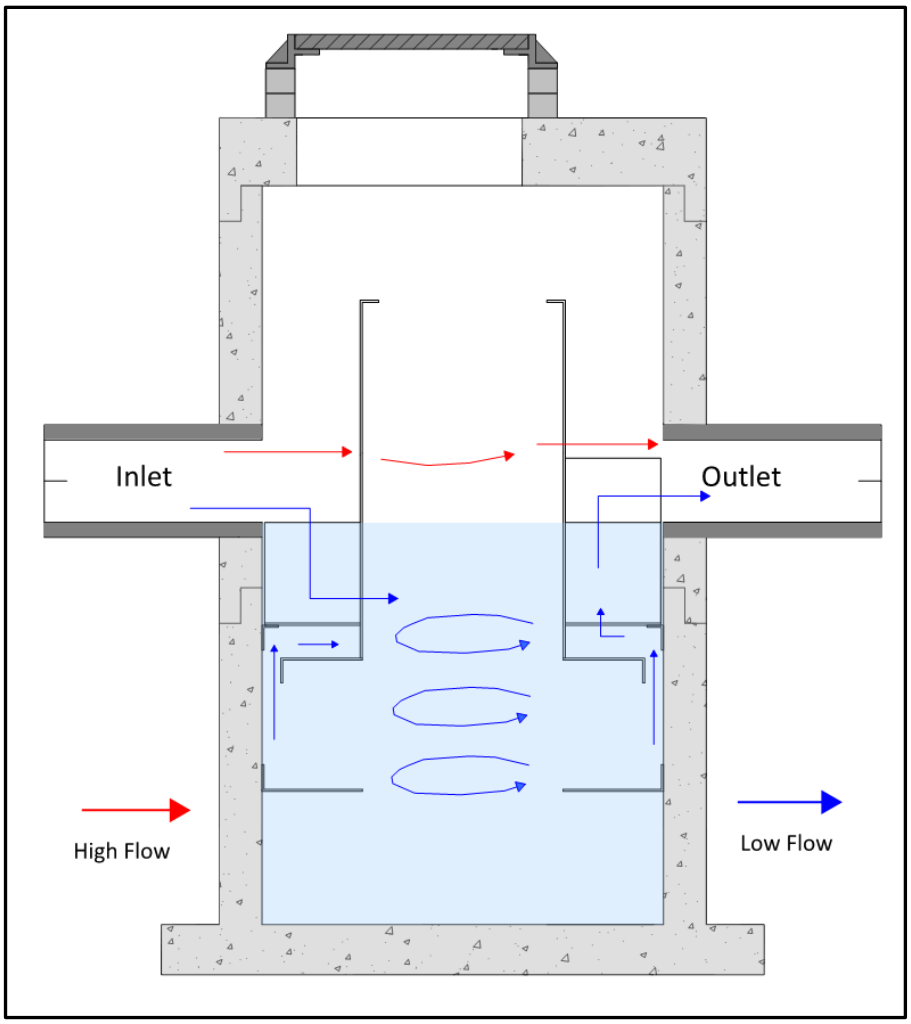


Figure 2. Hydroworks HydroStorm Operation – Profile View

The HS 4i is an inlet version of the HS 4 separator. There is a catch-basin grate on top of the HS 4i. A funnel sits sits underneath the grate on the frame and directs the water to the inlet side of the separator to ensure all lows flows are properly treated. The whole funnel is removed for inspection and cleaning.

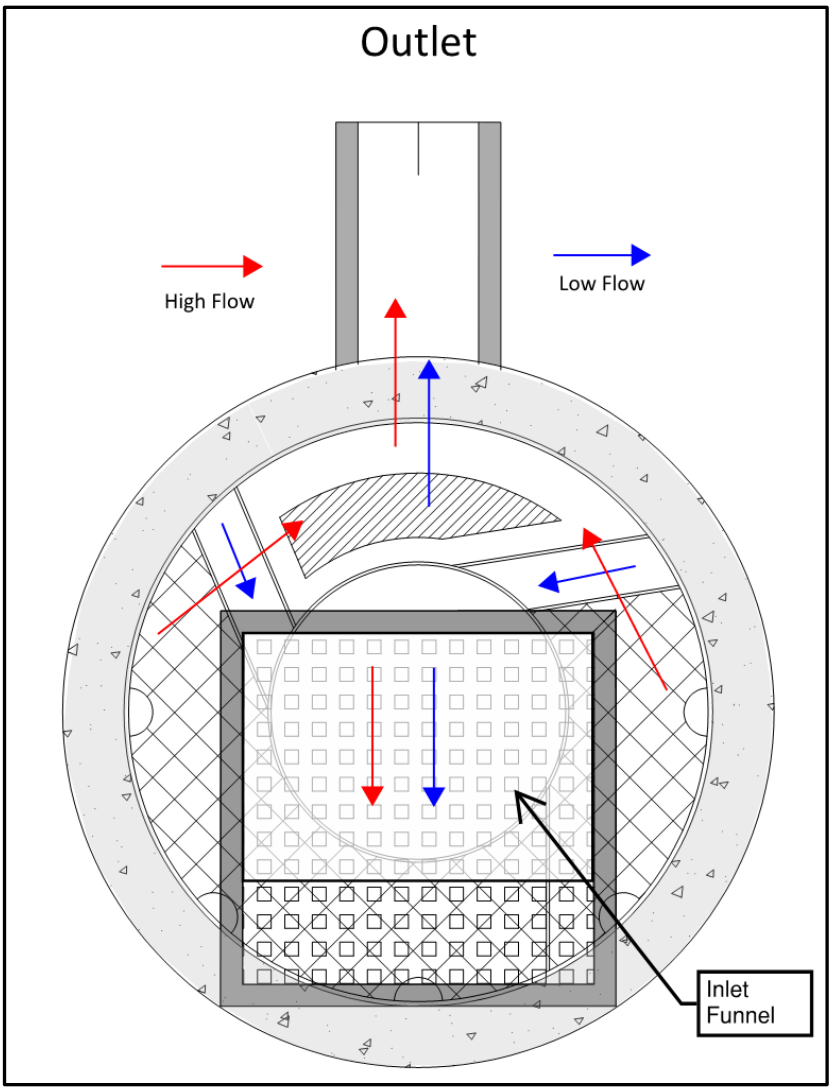


Figure 3. Hydroworks HS 4i Funnel

Inspection

Procedure

Floatables

A visual inspection can be conducted for floatables by removing the covers and looking down into the center access tube of the separator. Separators with an inlet grate (HS 4i or custom separator) will have a plastic funnel located under the grate that must be removed from the frame prior to inspection or maintenance. If you are missing a funnel please contact Hydroworks at the numbers provided at the end of this document.

TSS/Sediment

Inspection for TSS build-up can be conducted using a Sludge Judge®, Core Pro®, AccuSludge® or equivalent sampling device that allows the measurement of the depth of TSS/sediment in the unit. These devices typically have a ball valve at the bottom of the tube that allows water and TSS to flow into the tube when lowering the tube into the unit. Once the unit touches the bottom of the device, it is quickly pulled upward such that the water and TSS in the tube forces the ball valve closed allowing the user to see a full core of water/TSS in the unit. The unit should be inspected for TSS through each of the access covers. Several readings (2 or 3) should be made at each access cover to ensure that an accurate TSS depth measurement is recorded.

Frequency

Construction Period

The HydroStorm separator should be inspected every four weeks and after every large storm (over 0.5" (12.5 mm) of rain) during the construction period.

Post-Construction Period

The Hydroworks HydroStorm separator should be inspected during the first year of operation for normal stabilized sites (grassed or paved areas). If the unit is subject to oil spills or runoff from unstabilized (storage piles, exposed soils) areas the HydroStorm separator should be inspected more frequently (4 times per year). The initial annual inspection will indicate the required future frequency of inspection and maintenance if the unit was maintained after the construction period.

Reporting

Reports should be prepared as part of each inspection and include the following information:

1. Date of inspection
2. GPS coordinates of Hydroworks unit
3. Time since last rainfall
4. Date of last inspection
5. Installation deficiencies (missing parts, incorrect installation of parts)
6. Structural deficiencies (concrete cracks, broken parts)
7. Operational deficiencies (leaks, blockages)
8. Presence of oil sheen or depth of oil layer
9. Estimate of depth/volume of floatables (trash, leaves) captured
10. Sediment depth measured
11. Recommendations for any repairs and/or maintenance for the unit
12. Estimation of time before maintenance is required if not required at time of inspection

A sample inspection checklist is provided at the end of this manual.

Maintenance

Procedure

The Hydroworks HydroStorm unit is typically maintained using a vacuum truck. There are numerous companies that can maintain the HydroStorm separator. Maintenance with a vacuum truck involves removing all of the water and sediment together. The water is then separated from the sediment on the truck or at the disposal facility.

A central access opening (24” or greater) is provided to the gain access to the lower treatment tank of the unit. This is the primary location to maintain by vacuum truck. The pretreatment area can also be vacuumed and/or flushed into the lower treatment tank of the separator for cleaning via the central access once the water level is lowered below the pretreatment floor.

In instances where a vacuum truck is not available other maintenance methods (i.e. clamshell bucket) can be used, but they will be less effective. If a clamshell bucket is used the water must be decanted prior to cleaning since the sediment is under water and typically fine in nature.

The local municipality should be consulted for the allowable disposal options for both water and sediments prior to any maintenance operation. Once the water is decanted the sediment can be removed with the clamshell bucket.

Disposal of the contents of the separator depend on local requirements. Maintenance of a Hydroworks HydroStorm unit will typically take 1 to 2 hours based on a vacuum truck and longer for other cleaning methods (i.e. clamshell bucket).

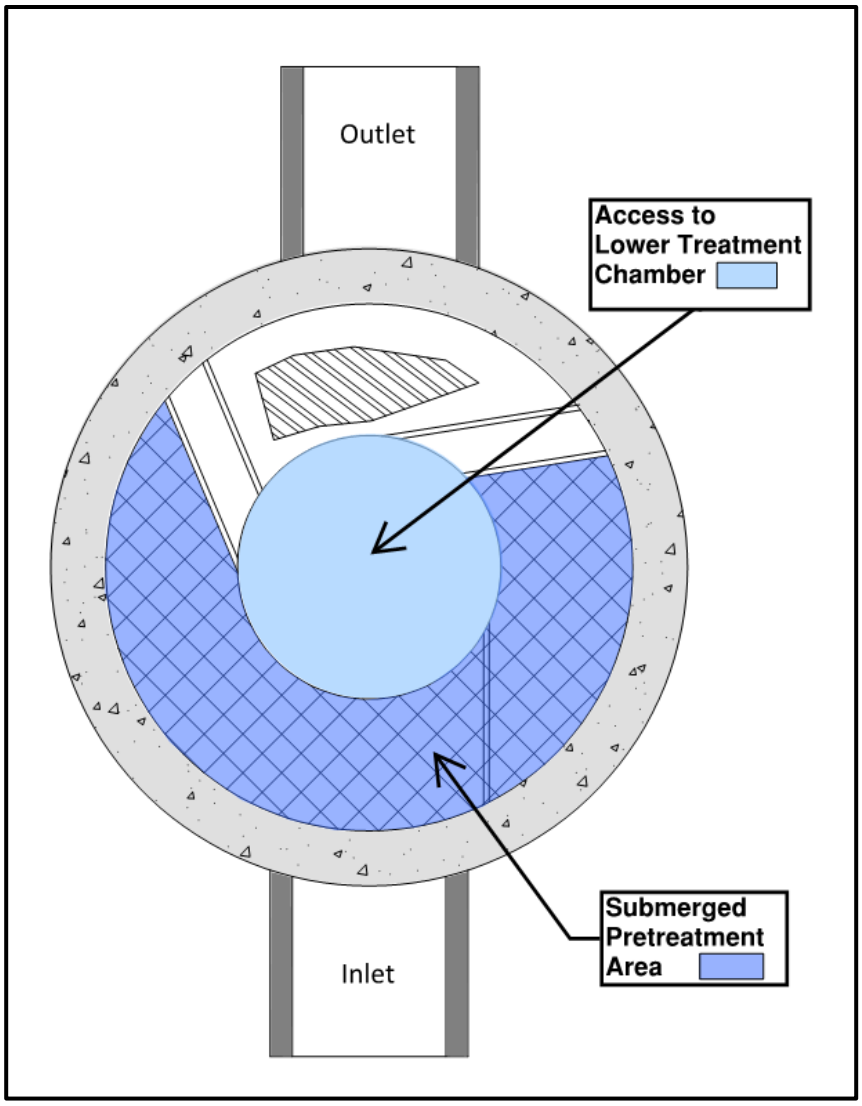


Figure 3. Maintenance Access

Frequency

Construction Period

A HydroStorm separator can fill with construction sediment quickly during the construction period. The HydroStorm must be maintained during the construction period when the depth of TSS/sediment reaches 24” (600 mm). It must also be maintained during the construction period if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the area of the separator

The HydroStorm separator should be maintained at the end of the construction period, prior to operation for the post-construction period.

Post-Construction Period

The HydroStorm was independently tested by Alden Research Laboratory in 2017. A HydroStorm HS 4 was tested for scour with a 50% sediment depth of 0.5 ft. Therefore, maintenance for sediment accumulation is required if the depth of sediment is 1 ft or greater in separators with standard water (sump) depths (Table 1).

There will be designs with increased sediment storage based on specifications or site-specific criteria. A measurement of the total water depth in the separator through the central access tube should be taken and compared to water depth given in Table 1. The standard water depth from Table 1 should be subtracted from the measured water depth and the resulting extra depth should be added to the 1 ft to determine the site-specific sediment maintenance depth for that separator.

For example, if the measured water depth in the HS-7 is 7 feet, then the sediment maintenance depth for that HS-7 is 2 ft (= 1 + 7 – 6) and the separator does not need to be cleaned for sediment accumulation until the measure sediment depth is 2 ft.

The HydroStorm separator must also be maintained if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the water surface of the separator.

Table 1 Standard Dimensions for Hydroworks HydroStorm Models

Model	Diameter (ft)	Total Water Depth (ft)	Sediment Maintenance Depth for Table 1 Total Water Depth(ft)
HS-3	3	3	1
HS-4	4	4	1
HS-5	5	4	1
HS-6	6	4	1
HS-7	7	6	1
HS-8	8	7	1
HS-9	9	7.5	1
HS-10	10	8	1
HS-11	11	9	1
HS-12	12	9.5	1

HYDROSTORM INSPECTION SHEET

Date _____
Date of Last Inspection _____

Site _____
City _____
State _____
Owner _____

GPS Coordinates _____

Date of last rainfall _____

Site Characteristics	**Yes**	**No**
Soil erosion evident	☐	☐
Exposed material storage on site	☐	☐
Large exposure to leaf litter (lots of trees)	☐	☐
High traffic (vehicle) area	☐	☐

HydroStorm	**Yes**	**No**
Obstructions in the inlet or outlet	☐ *	☐
Missing internal components	☐ **	☐
Improperly installed inlet or outlet pipes	☐ ***	☐
Internal component damage (cracked, broken, loose pieces)	☐ **	☐
Floating debris in the separator (oil, leaves, trash)	☐	☐
Large debris visible in the separator	☐ *	☐
Concrete cracks/deficiencies	☐ ***	☐
Exposed rebar	☐ **	☐
Water seepage (water level not at outlet pipe invert)	☐ ***	☐

Water level depth below outlet pipe invert _____"

Routine Measurements

Floating debris depth	**< 0.5" (13mm)**	☐	**>0.5" 13mm)**	☐ *
Floating debris coverage	**< 50% of surface area**	☐	**> 50% surface area**	☐ *
Sludge depth	**< 12" (300mm)**	☐	**> 12" (300mm)**	☐ *****

* Maintenance required
** Repairs required
*** Further investigation is required

Other Comments:

Hydroworks® HydroStorm

One Year Limited Warranty

Hydroworks, LLC warrants, to the purchaser and subsequent owner(s) during the warranty period subject to the terms and conditions hereof, the Hydroworks HydroStorm to be free from defects in material and workmanship under normal use and service, when properly installed, used, inspected and maintained in accordance with Hydroworks written instructions, for the period of the warranty. The standard warranty period is 1 year.

The warranty period begins once the separator has been manufactured and is available for delivery. Any components determined to be defective, either by failure or by inspection, in material and workmanship will be repaired, replaced or remanufactured at Hydroworks' option provided, however, that by doing so Hydroworks, LLC will not be obligated to replace an entire insert or concrete section, or the complete unit. This warranty does not cover shipping charges, damages, labor, any costs incurred to obtain access to the unit, any costs to repair/replace any surface treatment/cover after repair/replacement, or other charges that may occur due to product failure, repair or replacement.

This warranty does not apply to any material that has been disassembled or modified without prior approval of Hydroworks, LLC, that has been subjected to misuse, misapplication, neglect, alteration, accident or act of God, or that has not been installed, inspected, operated or maintained in accordance with Hydroworks, LLC instructions and is in lieu of all other warranties expressed or implied. Hydroworks, LLC does not authorize any representative or other person to expand or otherwise modify this limited warranty.

The owner shall provide Hydroworks, LLC with written notice of any alleged defect in material or workmanship including a detailed description of the alleged defect upon discovery of the defect. Hydroworks, LLC should be contacted at 136 Central Ave., Clark, NJ 07066 or any other address as supplied by Hydroworks, LLC. (888-290-7900).

This limited warranty is exclusive. There are no other warranties, express or implied, or merchantability or fitness for a particular purpose and none shall be created whether under the uniform commercial code, custom or usage in the industry or the course of dealings between the parties. Hydroworks, LLC will replace any goods that are defective under this warranty as the sole and exclusive remedy for breach of this warranty.

Subject to the foregoing, all conditions, warranties, terms, undertakings or liabilities (including liability as to negligence), expressed or implied, and howsoever arising, as to the condition, suitability, fitness, safety, or title to the Hydroworks HydroStorm are hereby negated and excluded and Hydroworks, LLC gives and makes no such representation, warranty or undertaking except as expressly set forth herein. Under no circumstances shall Hydroworks, LLC be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the HydroStorm, or the cost of other goods or services related to the purchase and installation of the HydroStorm. For this Limited Warranty to apply, the HydroStorm must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Hydroworks' written installation instructions.

Hydroworks, LLC expressly disclaims liability for special, consequential or incidental damages (even if it has been advised of the possibility of the same) or breach of expressed or implied warranty. Hydroworks, LLC shall not be liable for penalties or liquidated damages, including loss of production and profits; labor and materials; overhead costs; or other loss or expense incurred by the purchaser or any third party. Specifically excluded from limited warranty coverage are damages to the HydroStorm arising from ordinary wear and tear; alteration, accident, misuse, abuse or neglect; improper maintenance, failure of the product due to improper installation of the concrete sections or improper sizing; or any other event not caused by Hydroworks, LLC. This limited warranty represents Hydroworks' sole liability to the purchaser for claims related to the HydroStorm, whether the claim is based upon contract, tort, or other legal basis.

PROPOSED SITE DEVELOPMENT PLANS

THOMPSON COMMONS

360 THOMPSON AVENUE
EAST HAVEN, CONNECTICUT

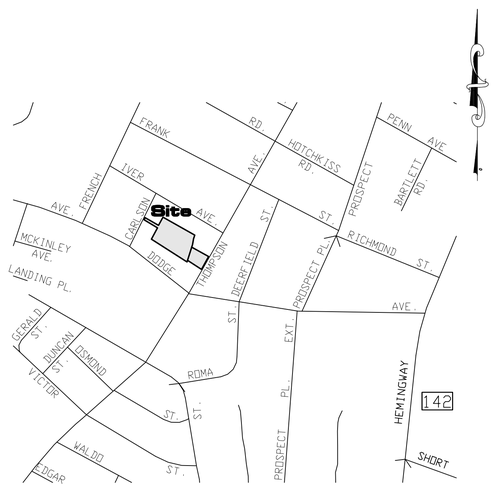
ZONE: R-1
AGENCY SUBMISSION DRAWINGS

DATE: JANUARY 5, 2024

LIST OF DRAWINGS

CIVIL PLANS-	DATE - REVISION
EXISTING CONDITIONS/SURVEY	03/06/23
SP1 SITE PLAN	01/05/24
SP2 SITE GRADING/UTILITY PLAN	01/05/24
SP3 SOIL EROSION & SEDIMENT CONTROL PLAN	01/05/24
SP4 LANDSCAPE PLAN	01/05/24
SP5 LIGHTING PLAN	01/05/24
SP6 SITE EROSION / PLANTING DETAILS	01/05/24
SP7 DRAINAGE / SEWER DETAILS	01/05/24
SP8 ROADWAY & WQC SRUCTURE DETAILS	01/05/24
ARCHITECTURAL PLANS-	
A-101 BUILDINGS A&C FIRST & SECOND FLOOR PLANS	09/03/23
A-102 BUILDINGS A&C FIRST & SECOND FLOOR PLANS	09/03/23
A-103 BUILDINGS B,E,F&G FIRST & SECOND FLOOR PLANS	09/03/23
A-104 BUILDINGS B,E,F&G THIRD FLOOR / ROOF PLANS	09/03/23
A-105 BUILDING D FIRST & SECOND FLOOR PLANS	09/03/23
A-106 BUILDING D THIRD FLOOR / ROOF PLANS	09/03/23
A-201 BUILDINGS A&C EXTERIOR ELEVATIONS	09/03/23
A-202 BUILDINGS A&C EXTERIOR ELEVATIONS	09/03/23
A-203 BUILDINGS B,E,F&G EXTERIOR ELEVATIONS	09/03/23
A-204 BUILDINGS B,E,F&G EXTERIOR ELEVATIONS	09/03/23
A-205 BUILDING D EXTERIOR ELEVATIONS	09/03/23
A-206 BUILDING D EXTERIOR ELEVATIONS	09/03/23

LOCATION PLAN



OWNER:

OWNER OF RECORD: 13 CARLSON PLACE LLC
ASSESSORS MAP 180, BLOCK 2012, LOT 19.
360 THOMPSON AVENUE
ASSESSORS MAP 180, BLOCK 2011, LOT 25.
13 CARLSON PLACE
EAST HAVEN, CT. 06512

APPLICANT:

13 CARLSON PLACE LLC
c/o JOHN HALL
19 MARIETTA STREET
HAMDEN, CT. 06514

PROJECT PLANNING & DESIGN

CODESPOTI & ASSOCIATES, P.C.
SITE PLANNING
LANDSCAPE ARCHITECTURE
ENGINEERING
LAND SURVEYING
263 BOSTON POST ROAD STE#5
ORANGE, CONNECTICUT
06477 203-799-1400

GREW DESIGN
• Architecture • Interior Design • Construction Management •
MILTON GREGORY GREW, AIA
Architect
241 Main St. South
Woodbury, Connecticut 06798
Tel: (203) 217-1074 E-mail:MGGrew@GrewDesign.com

\\dc2\Shared\Autocad Projects\Civil3D 2014\4632-360 Thompson\4632-Det.dwg, CVR, 1/9/2024 12:40:05 PM, 1:1

MAP REFERENCES:

1. "LAND BELONGING TO O. T. CARLSON DODGE AVENUE AND THOMPSON AVENUE EAST HAVEN, CT." MAY 926 1" = 40' BY H. MILLE.

2. "MAP OF TUTTLE GROVE EAST HAVEN, CT. OWNED AND DEVELOPED BY O. T. CARLSON AND SON" AUG. 1928 1" = 50' BY BY H. MILLE.

NOTES:

1. UNDERGROUND UTILITY, STRUCTURE AND FACILITY LOCATIONS DEPICTED AND NOTED HEREON HAVE BEEN COMPILED, IN PART, FROM RECORD MAPPING SUPPLIED BY THE RESPECTIVE UTILITY COMPANIES OR GOVERNMENTAL AGENCIES, FROM PAROLE TESTIMONY AND FROM OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE, THE EXISTENCE OF WHICH ARE UNKNOWN TO US. THE SIZE, LOCATION AND EXISTENCE OF ALL SUCH FEATURES MUST BE FIELD DETERMINED AND VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION. CALL BEFORE YOU DIG 1-800-922-4455.

2. THIS SURVEY SHALL NOT BE USED WITH AN AFFIDAVIT OR LETTER OF ANY KIND FOR REUSE INCLUDING, BUT NOT LIMITED TO, FUTURE CLOSINGS, PLOT PLANS, CONSTRUCTION, LANDSCAPING, PERMITTING, ETC., IT IS A VIOLATION OF THE FEDERAL COPYRIGHT ACT TO COPY OR MODIFY AND REUSE THIS SURVEY BEYOND THE DATE AND SCOPE NOTED HEREIN. CODESPOTI & ASSOCIATES, P.C., AND/OR ITS AGENTS SHALL NOT BE LIABLE FOR USE OF THIS SURVEY BY ANY OTHER ENTITIES OR PERSONS FOR ANY PURPOSE BEYOND THE DATE & SCOPE.

3. THE SUBJECT PARCEL APPEARS TO LIE WITHIN FLOOD ZONE "X" AS DEPICTED ON FEMA'S FLOOD INSURANCE RATE MAP (FIRM), ENTITLED NEW HAVEN COUNTY, CONNECTICUT (ALL JURISDICTIONS); PANEL NO. 09009C0444J EFFECTIVE JULY 8, 2013 1"=500'. ANY FEMA FLOODPLAIN AND/OR FLOODWAY INFORMATION OF CODESPOTI & ASSOCIATES P.C. DOES NOT WARRANT THE ACCURACY OF THIS INFORMATION, AND MAKES NO REPRESENTATIONS UPON WHICH THE CLIENT SHOULD RELY IN CONNECTION WITH THE FLOOD ZONE OF THE SUBJECT PARCEL OR ANY FEMA FLOODPLAIN AND/OR FLOODWAY INFORMATION DEPICTED HEREON.

4. PLANIMETRICS AND TOPOGRAPHIC INFORMATION SHOWN HEREON HAS BEEN OBTAINED FROM GROUND SURVEYS BY CODESPOTI & ASSOCIATES, FIELD WORK COMPLETED DURING MARCH 2022.

5. OFFSETS (IF SHOWN) ARE FOR SURVEY REFERENCES ONLY AND ARE NOT TO BE USED IN CONSTRUCTION OF ANY TYPE.

6. THE SURVEYED PROPERTY IS SUBJECT BUT NOT LIMITED TO THE FOLLOWING FACTS AS REVEALED BY THE HEREON REFERENCED INFORMATION. THE INFORMATION SHOWN HEREON DOES NOT CONSTITUTE A TITLE SEARCH BY THE SURVEYOR. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT, AND MAY NOT REFLECT ALL FACTS THAT MAY BE REVEALED BY A CURRENT AND ACCURATE TITLE COMMITMENT.

NOTES CONTINUED:

7. THE SUBJECT PARCEL IS LOCATED IN THE R-1 ZONE OF EAST HAVEN. ZONING INFORMATION SHOWN HEREON IS TAKEN FROM RECORD PLANS, DEEDS AND TOWN ZONING ORDINANCES AND DOES NOT REPRESENT AN OPINION BY THE SURVEYOR.

8. UNLESS SPECIFICALLY NOTED HEREON, STORM AND SANITARY SEWER INFORMATION, INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE, WAS OBSERVED AND MEASURED AT FIELD LOCATED STRUCTURES (MANHOLES/CATCH BASINS, ETC.) CONDITIONS CAN VARY FROM THOSE ENCOUNTERED AT THE TIMES WHEN AND LOCATIONS WHERE DATA IS OBTAINED. DESPITE MEETING THE REQUIRED STANDARD OF CARE, THE SURVEYOR CANNOT, AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES.

9. ALL BUILDINGS AND STRUCTURES WERE LOCATED AND MEASURED AT VARIOUS LEVELS. THE SURVEYOR MAKES NO DETERMINATIONS OR GUARANTEES AS TO THE ABSENCE, EXISTENCE OR LOCATION OF UNDERGROUND STRUCTURES, FOUNDATIONS, FOOTINGS, PROJECTIONS, WALLS, TANKS, SEPTIC SYSTEMS, ETC. NO TEST PITS, EXCAVATIONS OR GROUND PENETRATING RADAR WERE PERFORMED AS PART OF THIS SURVEY.

10. IF DEPICTED, ALL ELEVATIONS / TOPOGRAPHY BASED ON NAVD 1988 GPS DERIVED.

11. RECORD MAPS, DEEDS AND OTHER DRAWINGS IN THE THE FILES OF VARIOUS DEPARTMENTS OF THE TOWN OF EAST HAVEN EVIDENCE DISCREPANCIES, IN SOME CASES SIGNIFICANT, WITH RESPECT TO LINES OF TITLE (INCLUDING STREET LINES). THE LINES OF TITLE EVIDENCED IN THE DOCUMENTS REFERENCED HEREIN DO NOT NECESSARILY AGREE WITH PINS, PIPES, MONUMENTS, ETC. FOUND OR WITH OTHER PHYSICAL EVIDENCE FOUND. THE TOWN OF EAST HAVEN HAS NOT ESTABLISHED STREET LINES IN THE SUBJECT AREA. THE PROPERTY LINES, INCLUDING THE STREET LINES DEPICTED AND NOTED HEREON REPRESENT THE APPARENT "BEST FIT" OF THESE CONFLICTING ELEMENTS AND ARE CONSIDERED TO BE THOSE WHICH ARE TO BE MOST LIKELY CORRECT AND ARE SUBJECT TO ANY REVISION OR CORRECTION WHICH MAY BE REQUIRED BY APPROPRIATE LEGAL PROCEEDINGS OR BY DISCOVERY OF ADDITIONAL INFORMATION.

12. SURVEY REPORT. THE ABOVE ANALYSIS AND RESULTS ARE A REASONABLE OPINION BASED ON A DEFENDABLE SOLUTION TO A COMPLICATED SITUATION. ALTHOUGH THIS IS AN OPINION THAT CAN BE SUPPORTED BY 'LOGIC AND INFORMATION THAT A SURVEYOR OF ORDINARY PRUDENCE AND CARE WOULD USE UNDER SIMILAR CIRCUMSTANCES," IT DOES NOT RESOLVE THE FACT THAT UNCERTAINTY IN THE POSITION OF THE ORIGINAL BOUNDARIES WILL CONTINUE TO EXIST. AS A CONSEQUENCE, ANOTHER SURVEYOR EXERCISING ORDINARY PRUDENCE USING THE SAME INFORMATION MAY AND COULD VERY WELL ARRIVE AT A DIFFERENT CONCLUSION AND LOCATION OF THE BOUNDARIES.

N 48° 04' 28" W
28.00'

SCHEDULE "B" BULK STANDARDS		
ZONING DATA R-1	REQUIRED	EXISTING #13
MIN. LOT AREA	7,200 Sq.Ft.	34,775 Sq.Ft.±
MIN. SQUARE DIM.	60'	less than 60'
MIN. LOT FRONTAGE	60'	133.75'
MAX. HEIGHT STORIES	3	1/2
MAX. HEIGHT	40'	
MIN. FRONT YARD SETBACK	25'	5.0'
MIN. SIDE YARD	10'	3.0'
MIN. REAR YARD	20'	23.2'
MAX. LOT COVERAGE	25%	17.7% (6,174sf)
MAX. FLOOR AREA	50%	17.7%(3,883+2,488sf)
MIN. FLOOR AREA EACH UNIT	900 sf	3,883 sf +2,488 sf
*Pre-existing non-conforming		

ALL ZONING DATA SUBJECT TO VERIFICATION BY CITY OF EAST HAVEN

OWNER OF RECORD: 13 CARLSON PLACE LLC
13 CARLSON PLACE
EAST HAVEN, CT.
(VOL. 2813, PG.1 EHLR)

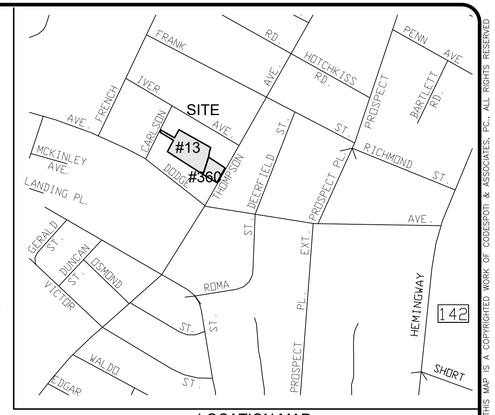
TOTAL PARCEL AREA: 34,775 SQ.FT.±
0.80 AC.±
ASSESSORS MAP 180, BLOCK 2011, LOT 25.
PARCEL IS IN ZONE: R-1

SCHEDULE "B" BULK STANDARDS		
ZONING DATA R-1	REQUIRED	EXISTING #360
MIN. LOT AREA	7,200 Sq.Ft.	10,784 Sq.Ft.±
MIN. SQUARE DIM.	60'	less than 60'
MIN. LOT FRONTAGE	60'	86.60'
MAX. HEIGHT STORIES	3	1.5
MAX. HEIGHT	40'	
MIN. FRONT YARD SETBACK	25'	24.9'±
MIN. SIDE YARD	10'	16.6'±
MIN. REAR YARD	20'	57.3'±
MAX. LOT COVERAGE	25%	13.0% (1,400sf)
MAX. FLOOR AREA	50%	15.1%(1,627sf)
MIN. FLOOR AREA EACH UNIT	900 sf	
*Pre-existing non-conforming		

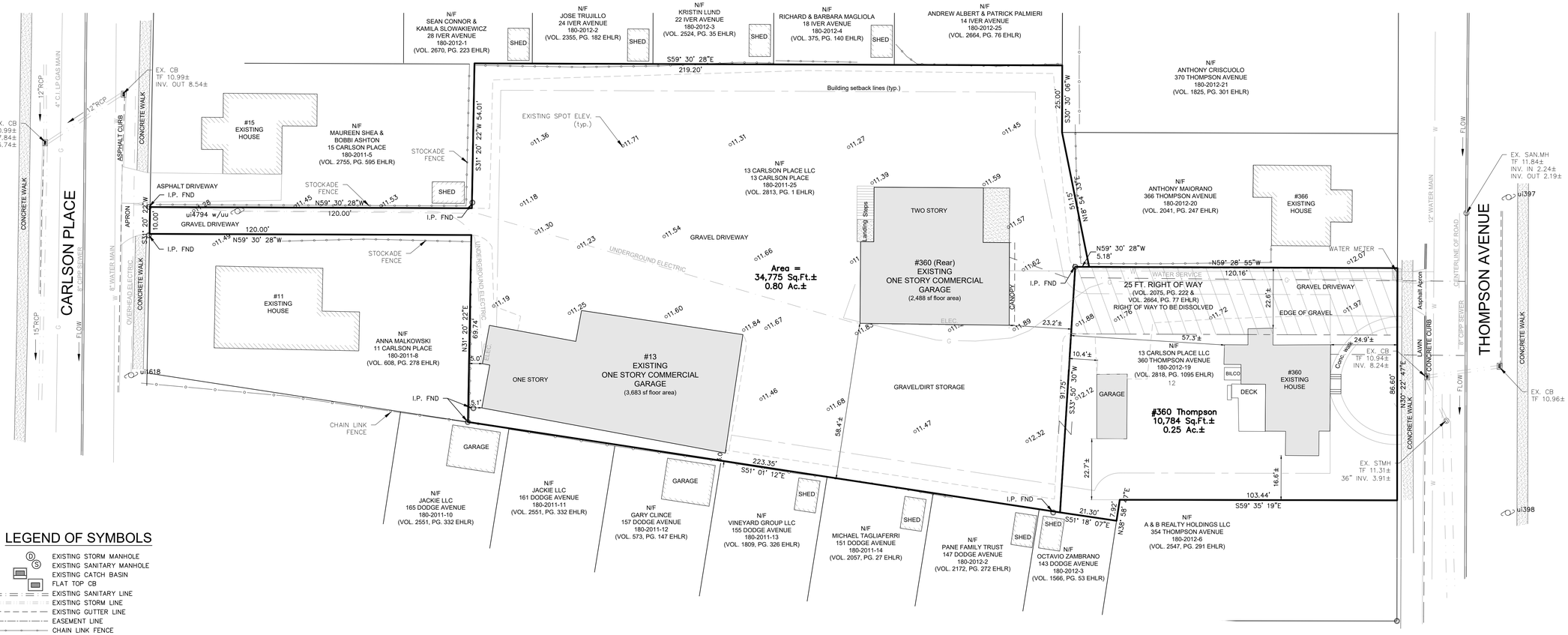
ALL ZONING DATA SUBJECT TO VERIFICATION BY CITY OF EAST HAVEN

OWNER OF RECORD: 13 CARLSON PLACE LLC
360 THOMPSON AVENUE
EAST HAVEN, CT.
(VOL. 2818, PG. 1095 EHLR)

TOTAL PARCEL AREA: 10,784 SQ.FT.±
0.25 AC.±
ASSESSORS MAP 180, BLOCK 2012, LOT 19.
PARCEL IS IN ZONE: R-1



LOCATION MAP
SCALE: 1" = 500'



LEGEND OF SYMBOLS

- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING CATCH BASIN
- FLAT TOP CB
- EXISTING SANITARY LINE
- EXISTING STORM LINE
- EXISTING GUTTER LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- UTILITY POLE
- GUY ANCHOR
- WATER METER / VALVE
- GAS METER/VALVE
- AIR CONDITIONER UNITS/CONC. PAD
- MONUMENT FOUND
- EXISTING LAMP POST
- HYDRANT
- WATER SHUT OFF
- BOLLARD
- IRON PIPE/REBAR
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- UNDERGROUND WATER
- UNDERGROUND GAS
- UNDERGROUND FOOTING DRAIN
- UNDERGROUND SANITARY LATERAL
- 250.80 SPOT ELEVATION

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

THIS MAP IS VALID AND AUTHORIZED BY THE BELOW SIGNATORY WHEN AND ONLY WHEN ACCOMPANIED WITH A RED LIVE SIGNATURE, A STAMPED SEAL IN BLUE INK AND A LIVE EMBOSSED SEAL OVER THE SIGNATURE'S NAME. ANY OTHER REPRODUCTIONS SHALL BE CONSIDERED UNAUTHORIZED.

NOTES:

1. THIS MAP AND SURVEY HAS BEEN PREPARED IN ACCORDANCE WITH THE REGULATIONS OF CONNECTICUT STATE AGENCIES, SECTIONS 20-300B-1 THRU 20-300B-20, THE MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT EFFECTIVE JUNE 21, 1996, AMENDED OCTOBER 26, 2018. ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC.:
   A) THE HORIZONTAL ACCURACY CONFORMS TO CLASS "A-2"
   B) THE BOUNDARY DETERMINATION CATEGORY IS A "RESURVEY"
   C) THE TYPE OF SURVEY IS A "PROPERTY SURVEY"

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

JOSEPH M. CODESPOTI DATE L.S.#70177

THIS MAP IS NOT VALID WITHOUT A LIVE SIGNATURE AND SEAL.

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BY	REVISIONS
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CODESPOTI & ASSOCIATES P.C.
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LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
SURVEYING
263 BOSTON POST ROAD, SUITE 5
ORANGE, CONNECTICUT 06477
TEL. 203-799-1400
FAX 203-799-0011

PROPERTY SURVEY
360 THOMPSON AVENUE
PREPARED FOR
13 CARLSON PLACE LLC
EAST HAVEN, CONNECTICUT

EXISTING CONDITIONS/ SURVEY

DWG #	CHECKED
D4630	
CAD FILE	CAD VER
4632	C3D2014
DATE	
03/06/23	
SCALE	
1"=20'	
JOB NO.	
4632	
SHEET	

EC/SV

\\dc2\Shared\Autocad Projects\Civil3D 2014\4632-360 Thompson\4632-Reg Ex-Conditions-Survey 360 Thompson Ave, 1/5/2024 12:40:13 PM, 1:1



LEGEND OF SYMBOLS

- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING CATCH BASIN
- FLAT TOP CB
- EXISTING SANITARY LINE
- EXISTING STORM LINE
- EXISTING GUTTER LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- UTILITY POLE
- GUY ANCHOR
- WATER METER / VALVE
- GAS METER/VALVE
- AIR CONDITIONER UNITS/CONC. PAD
- MONUMENT FOUND
- EXISTING LAMP POST
- HYDRANT
- WATER SHUT OFF
- BOLLARD
- IRON PIPE/REBAR
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- UNDERGROUND WATER
- UNDERGROUND GAS
- UNDERGROUND FOOTING DRAIN
- UNDERGROUND SANITARY LATERAL
- 250.80 SPOT ELEVATION
- EXISTING 2' CONTOUR LINE
- EXISTING 10' CONTOUR LINE

OWNER OF RECORD: 13 CARLSON PLACE LLC
13 CARLSON PLACE
EAST HAVEN, CT.
(VOL. 2813, PG.1 EHLR)

TOTAL PARCEL AREA: 34,775 SQ.FT.±
0.80 AC.±
ASSESSORS MAP 180, BLOCK 2011, LOT 25.
PARCEL IS IN ZONE: R-1

OWNER OF RECORD: 13 CARLSON PLACE LLC
360 THOMPSON AVENUE
EAST HAVEN, CT.
(VOL. 2818, PG. 1095 EHLR)

TOTAL PARCEL AREA: 10,784 SQ.FT.±
0.25 AC.±
ASSESSORS MAP 180, BLOCK 2012, LOT 19.
PARCEL IS IN ZONE: R-1

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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REVISIONS	BY
####### .	

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TEL. 203-799-1400
FAX 203-799-0511

ZONING LOCATION SURVEY
360 THOMPSON AVENUE
PREPARED FOR
13 CARLSON PLACE LLC
EAST HAVEN, CONNECTICUT

DEMOLITION PLAN

DWG #	CHECKED
D4630	
CAD FILE	CAD VER
4632	C3D2014
DATE	
01/05/24	
SCALE	
1"=20'	
JOB NO.	
4632	
SHEET	
DEM	

\\dc2\Shared\Autocad Projects\Civil3D 2014\4632-360 Thompson\4632.dwg Demolition plan, 1/9/2024 12:40:17 PM, 1:1

SCHEDULE "B" BULK STANDARDS				
ZONING DATA R-1	REQUIRED/ALLOWED	EXISTING #13 CARLSON	EXISTING 360 THOMPSON	PROPOSED B-30G COMBINED
MIN. LOT AREA	7,200 Sf.	34,775 Sf.±/0.8 Ac.	10,784 Sf.±/0.25 Ac.	45,559 Sf.±/1.05 Ac.
MIN. SQUARE DIM.	60'	less than 60'	60'+	N/a
MIN. LOT FRONTAGE	60'	133.75'		N/a
MAX. HEIGHT STORIES	3	1/2	3	3
MAX. HEIGHT	40'		38'±	35'±
MIN. FRONT YARD SETBACK	25'	5.0'		25'
MIN. SIDE YARD	10'	3.0'		8.4' Min.
MIN. REAR YARD	20'	23.2'		N/a
MAX. LOT COVERAGE	25%	17.7% (6,174 Sf.)		22.9% (10,450 Sf.)
MAX. FLOOR AREA	50%	17.7%(3,883+2,488sf)		61.5% (19@852.6@4197=28,034sf)
MIN. FLOOR AREA EACH UNIT	900 sf	3,883 sf +2,488 sf		1,390 Sf.
PARKING: HB6107 2/2BR UNIT	2x20 = 40			20 GARAGE +30 DRIVEWAY +7 SURFACE = 57 TOTAL

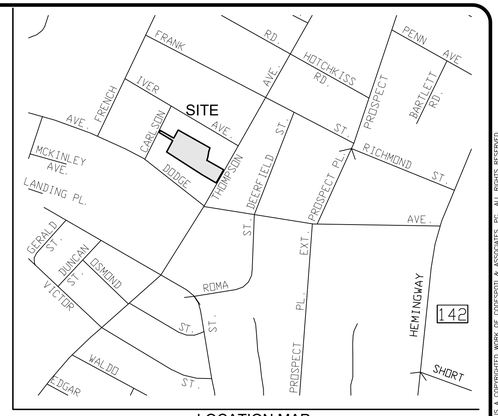
*Pre-existing non-conforming
ALL ZONING DATA SUBJECT TO VERIFICATION BY CITY OF EAST HAVEN

OWNER OF RECORD: 13 CARLSON PLACE LLC
360 THOMPSON AVENUE
EAST HAVEN, CT.
(VOL. 2818, PG. 1095 EHLR)

TOTAL PARCEL AREA: 10,784 SQ.FT.±
0.25 AC.±
ASSESSORS MAP 180, BLOCK 2012, LOT 19.
PARCEL IS IN ZONE: R-1

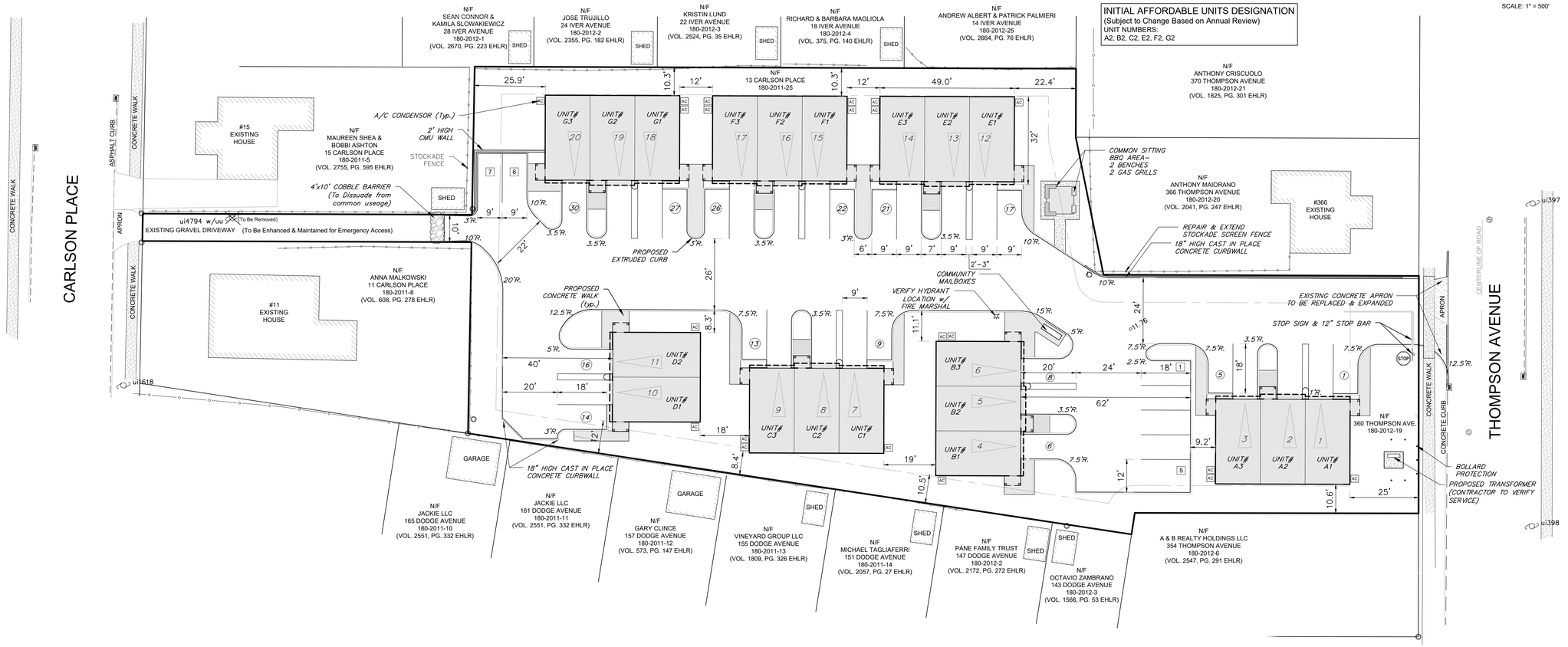
OWNER OF RECORD: 13 CARLSON PLACE LLC
13 CARLSON PLACE
EAST HAVEN, CT.
(VOL. 2813, PG.1 EHLR)

TOTAL PARCEL AREA: 34,775 SQ.FT.±
0.80 AC.±
ASSESSORS MAP 180, BLOCK 2011, LOT 25.
PARCEL IS IN ZONE: R-1



LOCATION MAP
SCALE: 1" = 500'

INITIAL AFFORDABLE UNITS DESIGNATION
(Subject to Change Based on Annual Review)
UNIT NUMBERS:
A2, B2, C2, E2, F2, G2



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

AGENCY SUBMISSION DRAWINGS
NOT FOR CONSTRUCTION

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REVISIONS
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CODESPOTI & ASSOCIATES P.C.
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ENGINEERING
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263 BOSTON POST ROAD, SUITE 5
ORANGE, CONNECTICUT 06477
TEL: 203-799-1400
FAX 203-799-0011

PROPOSED SITE DEVELOPMENT PLANS
THOMPSON COMMONS
PREPARED FOR
13 CARLSON PLACE LLC
EAST HAVEN, CONNECTICUT
360 THOMPSON AVENUE

SITE PLAN

CAD FILE
4632
DATE
01/05/24
SCALE
AS NOTED
JOB NO.
4632
SHEET
SP1

\\fs1\Shared\Autocad Projects\Civil\3D 2014\4632-360 Thompson\4632-Site.dwg, SP1 - Site plan, 1/9/2024 12:40:28 PM, 1:1

General Notes:

1. *All construction methods, materials and system installation are to conform to all applicable local and state health codes.*
2. *Topographic information based upon field survey by Codespoti & Associates. Vertical datum is NAVD 1988.*
3. *Property is to be served by public water and sewer.*
4. *Benchmark to be set by engineer/surveyor prior to the start of construction.*
5. *It is the contractors responsibility to verify all on-site and off-site field conditions and determine that no changes have occurred since the issuance of this plan. The Design Engineer is to be notified of any field conditions which conflict with this plan.*
6. *Soil erosion control measures are to be implemented prior to the start of construction and shall be properly maintained for the duration of construction.*
7. *Footing and roof drain discharges are to be protected from unwanted entry of foreign objects and fauna.*
8. *The locations of existing utilities are shown in an approximate way only and have not been independently verified by the owner or its representative. The contractor shall determine the exact location of all existing utilities before commencing work and assumes all responsibility for any and all damages which might be occasioned by the contractor's failure to exactly locate and preserve any and all underground utilities.*
9. *For location of underground electric, telephone, gas, cable t.v. and other facilities of public utility companies, inquire of "**CALL BEFORE YOU DIG, INC. 800-922-4455**".*
10. *The subject parcel appears to lie within flood zone "X" as depicted on Fema's Flood Insurance Rate Map (FIRM), entitled New Haven County, Connecticut (all jurisdictions); Panel no. 09009C0444J effective date July 8, 2013 1"=500'. Any FEMA floodplain and/or floodway information by Codespoti & Associates P.C. does not warrant the accuracy of this infomation, and makes no representation upon which the client should rely in connection with the flood zone of the subject parcel or any FEMA floodplain and/or floodway information depicted hereon.*

Sanitary Sewer Notes:

1. *The contractor shall verify all dimensions and elevations in the field. Any discrepancies shall be brought to the engineer's attention.*
2. *All construction materials and methods of construction shall be in accordance with City of East Haven standards.*
3. *The contractor shall be responsible for the restoration of all disturbed areas during the course of construction. This includes pavement, sidewalks, driveways, fencing, irrigation, ornamental landscaping, etc. Lawn areas shall be prepared with 4" of topsoil prior to the placement of grass seed or sod. The contractor shall be responsible for providing site photographs of existing conditions prior to any site disturbance.*

Storm Water Gallery Notes:

1. *Stormwater galleries to be sized to store and infiltrate the volume of stormwater runoff generated by a 1.0" rainfall event. The entire roof area from each building shall be directed to the galleries. Refer to drainage report for watershed map. The bottom of system shall provide a minimum 12" separating distance to seasonal high groundwater.*
2. *No runoff shall be directed to the galleries until the entire tributary drainage area has been stabilized (paved/landscaped).*
3. *Locations of galleries are subject to field conditions. All elevations shall be confirmed by the contractor prior to installation. Location should be no closer than 10' to the building and otherwise comply with separating distances as prescribed by the State of Connecticut Health Code.*
4. *Shop drawings shall be provided to the engineer prior to installation.*
5. *Care should be taken during site preparation and construction to protect the gallery area from unnecessary disturbance and compaction to avoid premature failure of the system.*
6. *The storm water management system shall be installed in accordance with the manufacturer's requirements.*
7. *Installation of the system shall be supervised by a professional engineer.*
8. *Contractor shall notify the City of Milford Engineering Department and design engineer for inspection and obtaining as-built information prior to backfilling of galleries.*

Construction schedule:

1. *Clear and grub trees and vegetation in proposed construction area.*
2. *Install silt fence and mud tracking pad as indicated on plan.*
3. *Excavate for footings, demolish structures and remove debris. Footings to be placed on virgin ground a minimum of 42" below finish grade.*
4. *Stockpile areas to be appropriately located and protected.*
5. *Proceed with grading for house and driveway construction.*
6. *Install storm drainage and sanitary structures.*
7. *Install protection for internal drainage structures with hay-bales prior to becoming operable.*
8. *Install storm water infiltration galleries.*
9. *Finish grading and seed disturbed areas.*
10. *Remove silt fence and dispose of sediment as directed by the engineer.*
11. *John Hall is assigned the responsibility for implementing these erosion control measures. This responsibility includes the installation and maintenance of control measures, informing all parties engaged on the construction site of the requirements and objectives of this plan.*

LEGEND OF SYMBOLS

- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING CATCH BASIN
- FLAT TOP CB
- EXISTING SANITARY LINE
- EXISTING STORM LINE
- EXISTING GUTTER LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- UTILITY POLE
- GUY ANCHOR
- WATER METER / VALVE
- GAS METER/VALVE
- POST & RAIL FENCE
- AIR CONDITIONER UNITS/CONC. PAD
- MONUMENT FOUND
- EXISTING LAMP POST
- HYDRANT
- WATER SHUT OFF
- BOLLARD
- EXISTING SIGN
- IRON PIPE/REBAR
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- UNDERGROUND WATER
- UNDERGROUND GAS
- UNDERGROUND FOOTING DRAIN
- UNDERGROUND SANITARY LATERAL
- 250.80 SPOT ELEVATION
- EXISTING 2' CONTOUR LINE
- EXISTING 10' CONTOUR LINE
- PROPOSED CONTOUR LINE

OWNER OF RECORD: 13 CARLSON PLACE LLC
13 CARLSON PLACE
360 THOMPSON AVENUE
EAST HAVEN, CT.

PARCEL IS IN ZONE: R-1

AGENCY SUBMISSION DRAWINGS
NOT FOR CONSTRUCTION

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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REVISIONS
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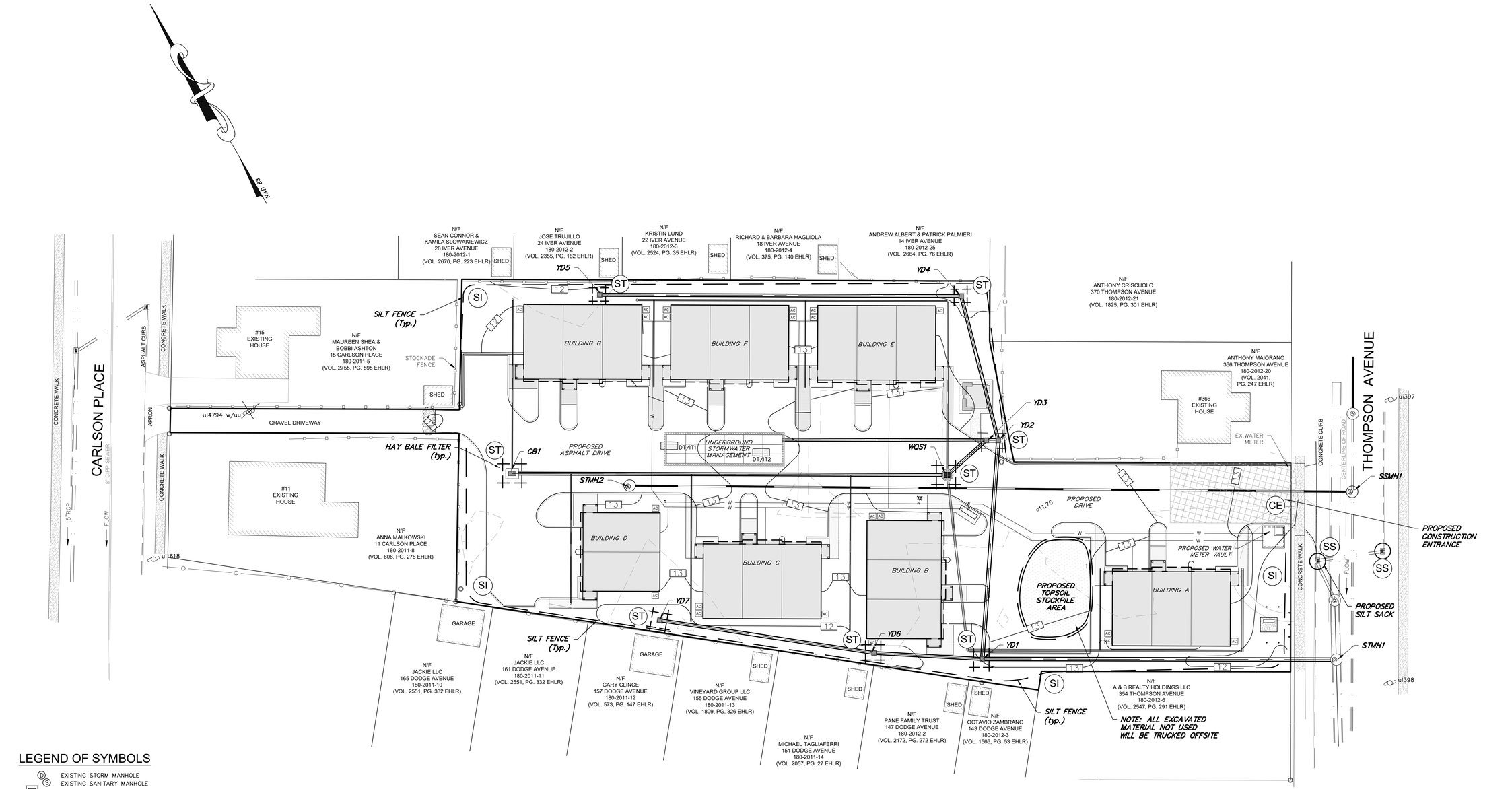
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SITE PLANNING
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SURVEYING
263 BOSTON POST ROAD, SUITE 5
ORANGE, CONNECTICUT 06477
TEL 203-799-1400
FAX 203-799-0011

PROPOSED SITE DEVELOPMENT PLANS
THOMPSON COMMONS
PREPARED FOR
13 CARLSON PLACE LLC
EAST HAVEN, CONNECTICUT
360 THOMPSON AVENUE

SITE GRADING & UTILITY PLAN

CAD FILE
4632
DATE
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LEGEND OF SYMBOLS

- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING CATCH BASIN
- FLAT TOP CB
- EXISTING SANITARY LINE
- EXISTING STORM LINE
- EXISTING GUTTER LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- UTILITY POLE
- GUY ANCHOR
- WATER METER / VALVE
- GAS METER/VALVE
- POST & RAIL FENCE
- AIR CONDITIONER UNITS/CONC. PAD
- MONUMENT FOUND
- EXISTING LAMP POST
- HYDRANT
- WATER SHUT OFF
- BOLLARD
- IRON PIPE/REBAR
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- UNDERGROUND WATER
- UNDERGROUND GAS
- UNDERGROUND FOOTING DRAIN
- UNDERGROUND SANITARY LATERAL
- SPOT ELEVATION
- EXISTING 2' CONTOUR LINE
- EXISTING 10' CONTOUR LINE
- PROPOSED CONTOUR LINE
- DEEP TEST PIT
- INFILTRATION TEST

LEGEND:

CE - CONSTRUCTION ENTRANCE
DV - DIVERSION
OP - OUTLET PROTECTION
PV - PERMANENT VEGETATION
RR - RIP RAP
SI SILT FENCE
SS - SILT SACK
ST - HAYBALE FILTER
TV - TEMPORARY VEGETATIVE COVER
VP - VEGETATIVE PROTECTION

AGENCY SUBMISSION DRAWINGS
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GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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REVISIONS
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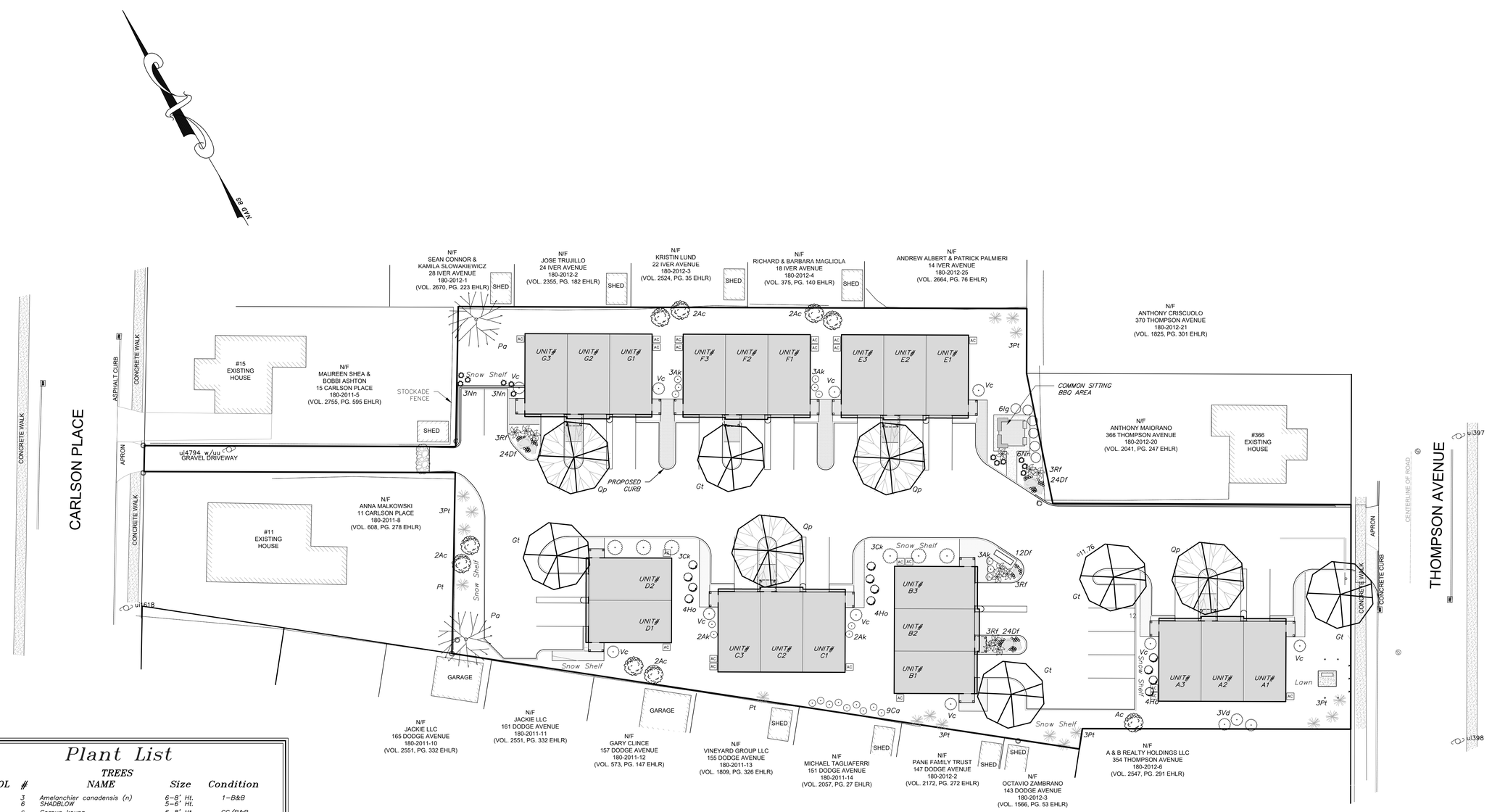
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PROPOSED SITE DEVELOPMENT PLANS
THOMPSON COMMONS
PREPARED FOR
13 CARLSON PLACE LLC
360 THOMPSON AVENUE EAST HAVEN, CONNECTICUT

SOIL EROSION & SEDIMENT CONTROL PLAN

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Plant List

TREES

SYMBOL	#	NAME	Size	Condition
Ac	3	*Amelanchier canadensis (n)* SHADBLOW	6–8' Ht.	1–B&B
Ac*	6		5–6' Ht.	
Ck	6	*Cornus kousa* CHINESE DOGWOOD	6–8' Ht.	CG/B&B
Gt	5	*Gleditsia triacanthos inermis* SHADEMASTER HONEYLOCUST (n)	2.5–3" cal.	2–B&B
Pa	2	*Platanus acerifolia 'Bloodgood'* BLOODGOOD LONDON PLANE	2.5–3" cal.	2–B&B
Qp	4	*Quercus palustris* PIN OAK (n)	2–2.5" cal.	2–B&B
Pt	17	*Pinus thunbergiana* JAPANESE BLACK PINE	5–6' Ht.	3–B&B
		Existing Tree to Remain SPECIES VARY	>6" Cal.	4

1– CLUMP FORM MINIMUM 5 CANES
2– STRAIGHT TRUNK, SINGLE LEADER, NO LIMBS BELOW 6 FT.
3– STRAIGHT TRUNK, SINGLE LEADER, LOW BRANCHED
4– SEE EXISTING CONDITIONS PLAN OR LANDSCAPE PLAN

SHRUBS

Ak	13	*Azalea kurume Delaware Valley White* DELAWARE VALLEY WHITE AZALEA	2–2.5' Ht.	CG
Ca	9	*Clethra alnifolia (n)* SUMMERSWEET	2–2.5' Ht.	CG
Ho	12	*Hydrangea macrophylla* ENDLESS SUMMER HYDRANGEA	2–2.5' spr.	CG/B&B
Ig	6	*Ilex glabra (n)* INKBERRY	2.5–3' Ht.	CG/B&B
Vc	10	*Viburnum carlesi* CARLESI VIBURNUM	2–2.5' Ht.	CG/B&B
Vd	3	*Viburnum dentatum (n)* ARROWWOOD VIBURNUM	2–3' Ht.	CG/B&B

GRASSES, GROUNDCOVER

Rf	12	*Rosa 'polyantha'* THE FAIRY 'PINK'	2–3' Ht.	CG
Nn	12	*Nipponanthemum nipponicum* MONTAUK DAISY	2–3' Ht.	CG
Df	84	*Narcissus Amaryllidoidae* DAFFODILS		BULB
	7	LANDSCAPE BOULDERS		

NOTES:
1) IF THERE ARE ANY CONFLICTS BETWEEN PLANT LIST TOTALS AND DRAWINGS THE HIGHER NUMBER WILL PREVAIL.
2) WHEN A COMPARABLE NATIVE VARIETY IS AVAILABLE, IT SHOULD BE UTILIZED IN LIEU OF THE SPECIFIED MATERIAL.

OWNER OF RECORD: 13 CARLSON PLACE LLC — 13 CARLSON PLACE LLC
13 CARLSON PLACE — 360 THOMPSON AVENUE
EAST HAVEN, CT. — EAST HAVEN, CT.

PARCEL AREAS: 34,775 SQ.FT.± — 10,784 SQ.FT.±
0.80 AC.± — 0.248 AC.±

TOTAL PARCEL AREA: 45,559 SQ.FT.±
1.05 AC.±

PARCEL IS IN ZONE: R-1

GRAPHIC SCALE

20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

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THOMPSON COMMONS
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EAST HAVEN, CONNECTICUT
360 THOMPSON AVENUE

LANDSCAPE PLAN

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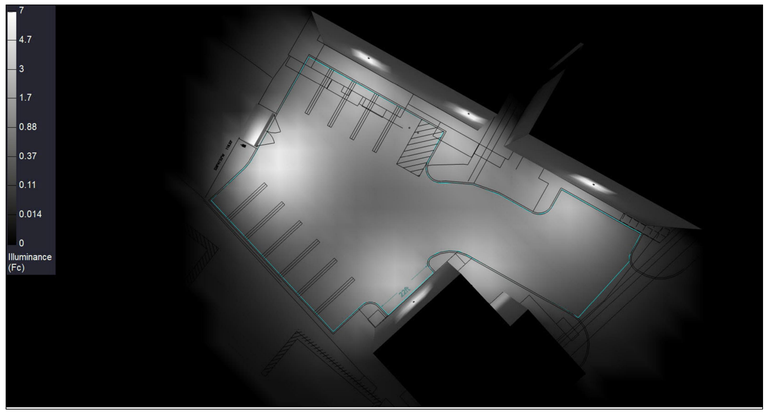
Calculation Summary											
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min	Description	PtSpcLr	PtSpcTb	Meter Type
CalcPts	Illuminance	Fc	0.90	6.1	0.0	N.A.	N.A.	Readings taken at 0'-0" AFG	5	5	Horizontal
StatArea - Parking Lot	Illuminance	Fc	2.01	6.1	0.3	6.70	20.33	Readings taken at 0'-0" AFG			

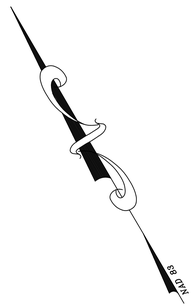
Luminaire Tag Summary	
Tag	Qty
A	16
B	4

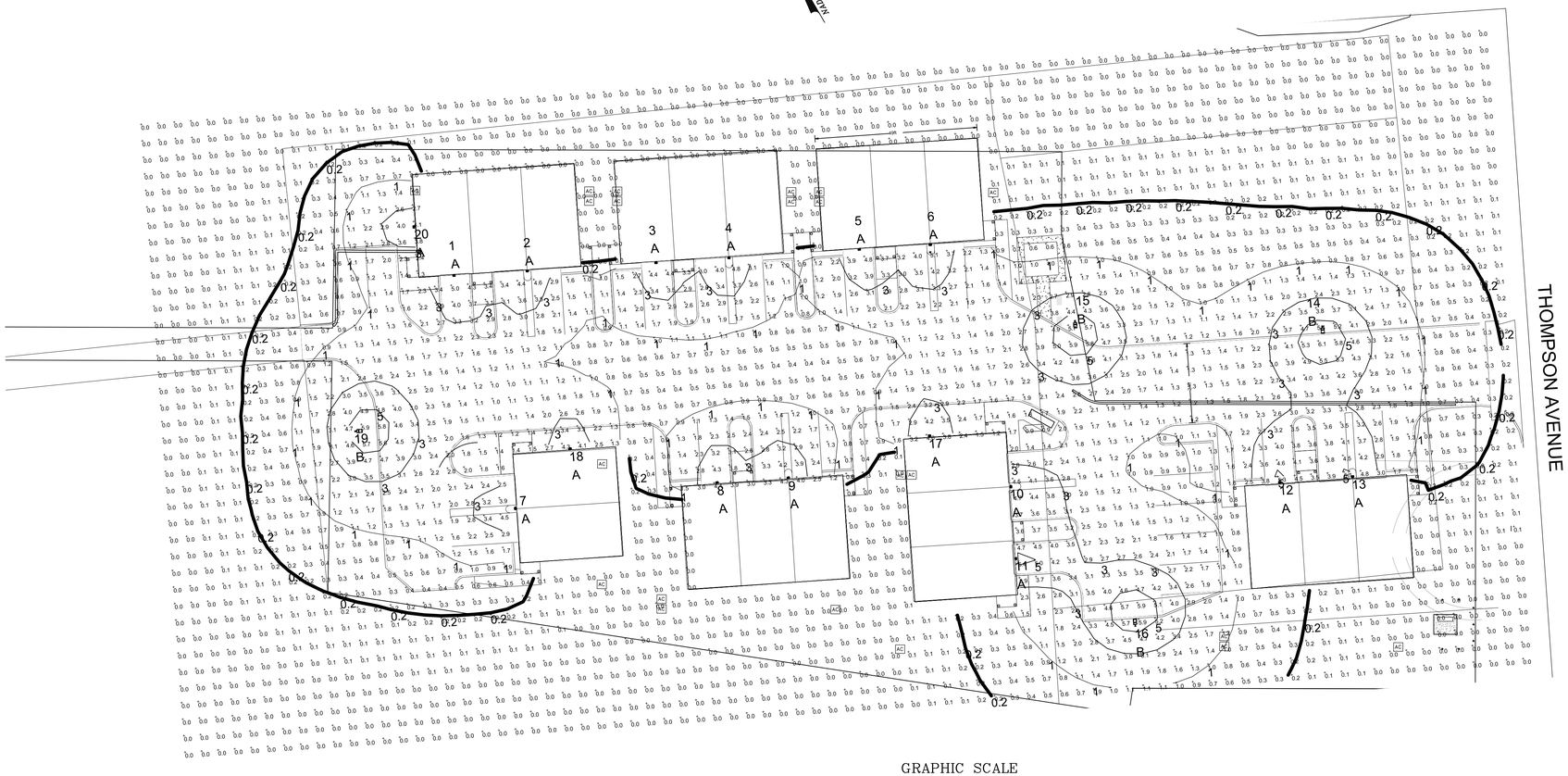
Luminaire Schedule												
Symbol	**Qty**	**Tag**	**Label**	**Arrangement**	**LLF**	**Luminaire Lumens**	**Arrangement Luminaire Lumens**	**Description**	**Luminaire Watts**	**Arrangement Watts**	**Total Watts**	**Mounting Height**
	16	A	SLIM12N	Single	1.000	2039	2039	Wall Mount	14.9	14.9	238.4	15
	4	B	A17-4T70N	Single	1.000	9903	9903	Type IV Pole Mount, 15ft Pole on 3ft Base; Base by Others	70.37	70.37	281.48	18

Expanded Luminaire Location Summary						
LumNo	**Tag**	**X**	**Y**	**MTG HT**	**Orient**	**Tilt**
1	A	170.714	145.558	15	270	0
2	A	192.872	145.401	15	270	0
3	A	231.801	145.147	15	270	0
4	A	253.908	145.078	15	270	0
5	A	293.331	144.873	15	270	0
6	A	314.821	144.804	15	270	0
7	A	184.407	73.988	15	180	0
8	A	245.578	77.377	15	90	0
9	A	267.138	77.324	15	90	0
10	A	333.868	70.097	15	0	0
11	A	333.844	48.332	15	0	0
12	A	415.115	65.579	15	90	0
13	A	437.154	65.785	15	90	0
14	B	431.198	111.907	18	270	0
15	B	356.787	118.76	18	270	0
16	B	368.536	25.421	18	90	0
17	A	310.56	87.015	15	90	0
18	A	202.014	90.679	15	90	0
19	B	137.575	100.593	18	0	0
20	A	159.75	160.893	15	180	0

RAB
408 W 14th Street, New York, NY 10014
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GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NOTES:
* The light loss factor (LLF) is a product of many variables. RAB's standard is to use the initial 1.0 LLF in accordance with most municipal lighting ordinance light trespass requirements, unless otherwise noted.

* Illumination values shown (in footcandles) are the predicted results for planes of calculation either horizontal, vertical or inclined as designated in the calculation summary. Meter orientation is normal to the plane of calculation.

* The calculated results of this lighting simulation represent an anticipated prediction of system performance. Actual measured results may vary from the anticipated performance and are subject to means and methods which are beyond the control of RAB Lighting Inc.

* Mounting height determination is job site specific, our lighting simulations assume a mounting height (insertion point of the luminaire symbol) to be taken at the top of the symbol for ceiling mounted luminaires and at the bottom of the symbol for all other luminaire mounting configurations.

* RAB disclaims all responsibility for the suitability of existing or proposed poles and bases to support proposed fixtures. This is the owner's, installer's and/or end-user's responsibility based on the weight and effective projected area ("EPA") of the proposed fixtures and the owner's site and soil conditions, wind zone, and many other factors. A professional engineer licensed to practice in the state the site is located should be engaged to assist in this determination.

* The landscape material shown hereon is conceptual and is not intended to be an accurate representation of any particular plant, shrub, bush, or tree, as these materials are living objects, and subject to constant change. The conceptual objects shown are for illustrative purposes only. The actual illumination values measured in the field will vary.

* Photometric model elements such as buildings, rooms, plants, furnishings or any architectural details which impact the dispersion of light must be detailed by the customer documents for inclusion in the RAB Lighting Design. The owner/contractor/customer/end-user must provide accurate and complete construction drawings that reflect what will be the final construction RAB is not responsible for any inaccuracies caused by incomplete, inaccurate, or outdated information provided by the owner/contractor/customer/end-user.

* RAB Lighting Inc. luminaire and product designs are protected under U.S. and International intellectual property laws. Patents issued or pending may apply. Please see www.rablighting.com/ip.

* The Lighting Analysis, EZLayout, Energy Analysis and/or Visual Simulation ("Lighting Design") provided by RAB Lighting Inc. ("RAB") represents an anticipated prediction of lighting system performance based upon design parameters and information supplied by others. These design parameters and information provided by others have not been field verified by RAB and therefore actual measured results may vary from the actual field conditions. RAB recommends that design parameters and other information be field verified to reduce variation.

* RAB does not warranty, either implied or stated, actual measured light levels or energy consumption levels as compared to those illustrated by the Lighting Design.

* RAB does not warranty, either implied or stated, nor represents the appropriateness, completeness or suitability of the Lighting Design as compliant with any applicable regulatory code requirements with the exception of those expressly stated on drawings created and submitted by RAB. The Lighting Design is issued, in whole or in part, as advisory documents for informational and convenience purposes only, is not intended for construction nor as a part of a project's construction documentation package and should not be relied upon for any purpose.

* Immediately prior to any party ordering RAB products used in the Lighting Design, the ordering party must verify that the lumen output of the fixtures being ordered (as shown on RAB's website) match the lumen output shown in the Lighting Design. Occasionally, Lighting Designs previously provided use fixtures that are then updated prior to an order and such updates could change the lumen output of the fixture. This in turn, could impact the installed lighting performance that differs from the Lighting Design.

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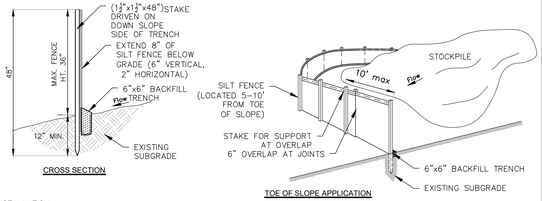
PROPOSED SITE DEVELOPMENT PLANS
THOMPSON COMMONS
PREPARED FOR
13 CARLSON PLACE LLC
EAST HAVEN, CONNECTICUT
360 THOMPSON AVENUE

LIGHTING PLAN

CAD FILE
4632
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Geotextile Silt Fencing Minimum Requirements		
Physical Property	Text Method	Minimum Requirements
Filtering efficiency	ASTM 5141	75% (min)
Grab tensile strength (lbs.)	ASTM D4632	100 lbs.
Elongation at failure	ASTM D4632	15%
Mullen burst strength	ASTM D3786	250 psi.
Puncture strength	ASTM 4833	50 lbs.
Apparent opening size	ASTM D4751	no less than 0.90mm & no greater than 0.60mm
Flow rate	ASTM D4491	0.2 gal./ft2/min.
Permativity	ASTM D4491	0.05 sec.-1 (min)
Ultraviolet radiation stability %	ASTM D4355	70% after 500 hours of exposure (min.)

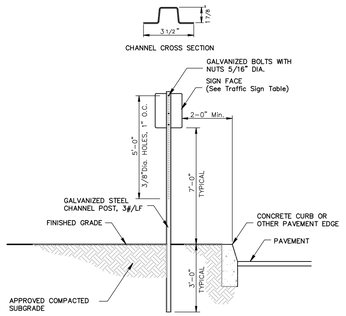


INSTALLATION:
1. LOCATE AS NECESSARY FOR APPLICATION. (SEE DIAGRAM)
2. EXCAVATE TRENCH TO A MINIMUM OF 6" DEEP BY 6" WIDE ON UP SLOPE SIDE OF FENCE FOR SLOPES LESS THAN 10%. EXTEND TRENCH UP SLOPE AT BOTH ENDS OF THE FENCE TO PREVENT WATER FROM RUNNING AROUND. ENCIRCLE CATCH BASINS IN DEPRESSIONS, CUTTING FABRIC ON THE BOTTOM CORNERS 4"± TO ALLOW FABRIC TO LAY FLAT AROUND CORNERS
3. DRIVE HARDWOOD STAKES (1½"x1½"x48") ON DOWN SLOPE SIDE OF FENCE AT A MAXIMUM SPACING OF 10', OR CLOSER WHEN CONCENTRATED FLOWS ARE ANTICIPATED.
4. STAPLE OR SECURE FENCE TO STAKES PER MANUFACTURERS INSTRUCTIONS SUCH THAT AT LEAST 8" OF FABRIC LAYS WITHIN TRENCH.
5. PLACE FABRIC JOINTS AT STAKES WITH A 6" OVERLAP OF FABRIC.
6. BACKFILL & COMPACT TRENCH.

PLACEMENT & CONSTRUCTION SILT FENCE (FILTER FENCE)

n.t.s. CADFILE: 02722-11.DWG

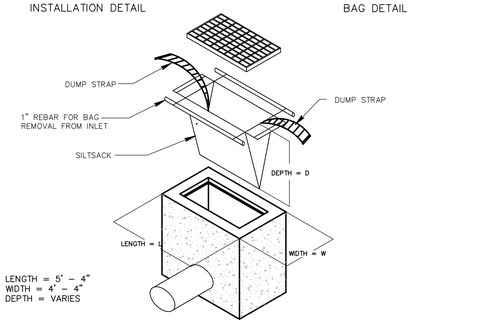
#	SIGN	SIZE	DESC.	MOUNTING TYPE	MOUNT. HGT.	REGULATORY	Reflect-orized
1	STOP	30"x30"	SILVER ON RED	STEEL CHANNEL	7'-0"	31-0002	X



TRAFFIC SIGN POST

N.T.S. CADFILE: 02853-06.DWG

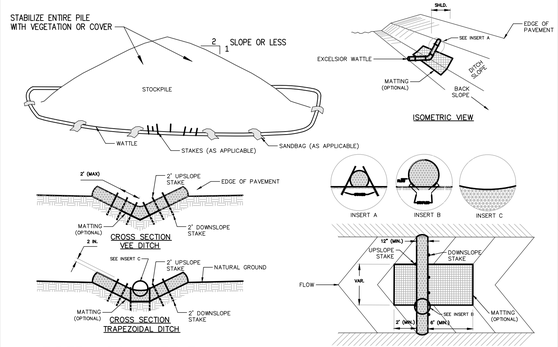




INLET SEDIMENT CONTROL DEVICE DETAIL

N.T.S.

NOTES:
1. USE MINIMUM 8-12 IN. DIAMETER EXCELSIOR WATTLE.
2. USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
3. ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
4. INSTALL A MINIMUM OF 2 UP-SLOPE STAKES AND 4 DOWN-SLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
5. PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
6. INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
7. ON FLAT SURFACES, (STABILIZING FILL PILES), OR PAVED SURFACES, SECURE BY STAKE OR SANDBAG.



FIBER LOG WATTLE

N.T.S. CADFILE:02722-143.DWG

NARRATIVE:

THE PROPOSED PROJECT INVOLVES THE CONSTRUCTION OF 7 NEW RESIDENTIAL BUILDINGS, WITH TWO DRIVEWAYS. THE PRIMARY ACCESS WILL BE ON THOMPSON AVENUE, THE EMERGENCY ACCESS ON CARLSON PLACE. THE PROPERTY WILL BE RECONFIGURED WITH THE MERGER OF TWO LOTS. IT WILL UTILIZE GARAGE, DRIVEWAY, LIMITED SURFACE PARKING & A STORMWATER MANAGEMENT SYSTEM.

THE PROPOSED CONSTRUCTION WILL DISTURB APPROXIMATELY 90% OF THE SITE DURING CONSTRUCTION WHICH WILL INCLUDE EXCAVATION AND GRADING FOR THIS STRUCTURES. THERE WILL BE A POTENTIAL FOR EROSION FROM THE SITE. TO MITIGATE THIS POTENTIAL, A COMPREHENSIVE "SOIL EROSION AND SEDIMENT CONTROL PLAN" HAS BEEN DEVELOPED IN CONJUNCTION WITH THIS PROJECT. DURING MOST PHASES OF THE PROJECT HEAVY CONSTRUCTION EQUIPMENT MAY BE UTILIZED.

THE PRIMARY TYPE OF EROSION WHICH MAY RESULT FROM THE PROPOSED CONSTRUCTION WILL BE RILL AND GULLY WHICH IS INDICATIVE OF SITE GRADING. CONSTRUCTION/SILT FENCING AND HAY BALE BARRIERS SHOULD PROVIDE THE MOST EFFECTIVE MEANS OF CONTROLLING THE EROSION POTENTIAL IN THE DISTURBED AREA. PRIOR TO ANY WORK COMMENCING ON THE SITE, THE SENSITIVE AREAS WILL BE APPROPRIATELY NOTED TO THE CONTRACTOR AS AREAS OF NO DISTURBANCE AND OFF LIMITS TO CONSTRUCTION EQUIPMENT, UNLESS OTHERWISE SHOWN ON THE APPROVED SITE PLAN. ALL SILT FENCING SHOULD BE INSTALLED IN ACCORDANCE WITH THE DETAIL PLAN AND IN GENERAL BE PLACED PERPENDICULAR TO THE FLOW.

EROSION CONTROLS SHALL BE INSPECTED BY THE DEVELOPER PERIODICALLY AND AFTER STORMS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY AND ALSO REMOVE ANY EXCESS SEDIMENT WHICH WOULD HAMPER THE USEFULNESS OF THE CONTROL MEASURE. THE SILTS REMOVED, ARE TO BE BURIED ON SITE OR DISPOSED OF IN A MANNER APPROVED BY THE DIRECTOR OF PUBLIC WORKS. RESPONSIBILITY FOR AN OPERATING AND MAINTENANCE PROGRAM SHALL LIE WITH THE DEVELOPER DURING CONSTRUCTION. WHERE APPLICABLE, ALL CONTROL MEASURES ARE DESIGNED IN ACCORDANCE WITH THE "GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL FOR THE STATE OF CONNECTICUT." DETAILS FOR SAID MEASURES CAN BE FOUND ON THIS SHEET.

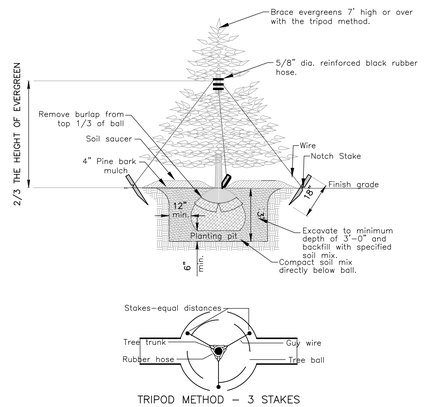
SEQUENCE OF CONSTRUCTION:

1) Locate Construction Entrances and install silt fencing as shown on plan.
2) Stockpile areas to be determined and appropriately stabilized.
3) Demolish and dispose of materials from exisitng structures
4) Initiate rough grading for foundation installation.
5) Site drainage and utility installation.
6) Stabilize all areas as grading progresses.
7) Install protection for internal drainage structures prior to becoming operable.
9) Finish grading and pavement placing.
9) Establish permanent vegetative cover.
10) Remove control measures and dispose of siltation as directed.

NARRATIVE-SEQUENCE OF CONSTRUCTION

CADFILE: 02722-20.DWG

NOTES:
Trees shall be planted so that the roots or tree ball are at the same elevation at which they/it grew in the nursery.



TYPICAL EVERGREEN PLANTING & STAKING DETAIL

CADFILE: 02950-07.DWG

1. ALL PROPOSED PLANTING AREAS SHALL BE DESIGNATED OFF LIMITS TO HEAVY MACHINERY AND REPEATED GENERAL VEHICULAR ACTIVITY. NON-COMPLIANCE TO THIS REQUIREMENT MAY CAUSE SOIL COMPACTION AND BREAKDOWN OF THE SOIL STRUCTURE. SHOULD INTRUSION INTO THE OFF LIMITS AREA OCCUR, THE CONTRACTOR MAY BE REQUIRED TO REMOVE THE COMPACTED SOILS AND REPLACE WITH THE APPROVED MIX.
2. BOTANICAL NAMES SHALL PREVAIL OVER COMMON NAMES.
3. NO PLANT SUBSTITUTIONS SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
4. ALL PLANT MATERIALS SHALL BE BALLED AND BURLAPPED OR CONTAINER GROWN OR AS OTHERWISE SPECIFIED. NO CONSTRUCTED BALLS SHALL BE ACCEPTED.
5. ALL PLANT MATERIALS SHALL BE PLACED, OR LOCATIONS STAKED, ON THE SITE AS SHOWN ON THE PLANTING PLAN PRIOR TO COMMENCEMENT OF PLANT EXCAVATION FOR THE LANDSCAPE ARCHITECT'S APPROVAL. THE CONTRACTOR MUST NOTIFY THE LANDSCAPE ARCHITECT OF ALL PLANTING OPERATIONS A MINIMUM OF 24 HOURS IN ADVANCE BY CALLING (203) 799-1400.
6. ALL PLANT MATERIALS ARE TO BE SET WITH THE TOP OF THE ROOT BALL EVEN WITH THE FINISHED GRADE.
7. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER EACH PLANT IS PLANTED, AND SHALL CONTINUE UNTIL ACCEPTANCE. PLANTS SHALL BE WATERED, REMULCHED, WEEDED, PRUNED, SPRAYED, FERTILIZED, CULTIVATED, AND OTHERWISE MAINTAINED AND PROTECTED UNTIL ACCEPTANCE OF WORK. SETTLED PLANTS SHALL BE RESET TO PROPER GRADE AND POSITION, PLANTING SAUCER RESTORED, AND DEAD MATERIAL REMOVED. GUYS SHALL BE TIGHTENED AND REPAIRED. DEFECTIVE WORK SHALL BE CORRECTED AS SOON AS POSSIBLE AFTER IT BECOMES APPARENT, WHEN WEATHER AND SEASON PERMIT. UPON COMPLETION OF PLANTING AND PRIOR TO ACCEPTANCE, THE LANDSCAPE CONTRACTOR SHALL REMOVE FROM THE SITE EXCESS SOIL AND DEBRIS AND REPAIR ANY DAMAGE RESULTING FROM PLANTING OPERATIONS. DANGEROUS CONDITIONS SHALL BE REPAIRED IMMEDIATELY.
8. UPON COMPLETION OF ALL LANDSCAPE OPERATIONS AN INSPECTION WILL BE MADE TO DETERMINE THE ACCEPTABILITY OF THE JOB. AT THIS TIME, A ONE YEAR GUARANTEE PERIOD SHALL BEGIN, TO BE CULMINATED BY A FINAL INSPECTION. IMMEDIATELY PRIOR TO FINAL INSPECTION, UNLESS OTHERWISE DIRECTED, THE CONTRACTOR SHALL REMOVE SOIL SAUCERS, HOSE, GUY WIRES, WRAPPING MATERIAL AND STAKES. ONLY THOSE MATERIALS FOUND TO BE ALIVE AND IN A VIGOROUS, HEALTHY CONDITION AT THAT TIME WILL BE GRANTED FINAL ACCEPTANCE. ALL OTHER MATERIALS SHALL BE REPLACED AT ~~THE~~ CONTRACTOR'S EXPENSE.
9. REPORT ANY DISCREPANCIES TO THE LANDSCAPE ARCHITECT IMMEDIATELY FOR DECISION.
10. SEED ALL DISTURBED AREAS. GRASS SEED SHALL BE FRESH, CLEAN, NEW CROP SEED COMPOSED OF THE FOLLOWING VARIETIES MIXED IN THE PROPORTIONS BY WEIGHT SHOWN AND TESTING THE MINIMUM PERCENTAGE OF PURITY AND GERMINATION:

TYPE I	% BY WEIGHT	TYPE II	% BY WEIGHT
PERENNIAL RYE	25%	F-31 TALL FESCUE	80%
KENTUCKY BLUEGRASS	25%	ANNUAL RYEGRASS	20%
CREEPING RED OR PENNLAWN FESCUE	50%		

11. SEEDING OF LAWN AREAS SHALL BE AT THE RATE OF AT LEAST 5 LBS. PER 1,000 SQUARE FEET. ALL LAWN AREAS SHALL BE TYPE I MIX UNLESS OTHERWISE DESIGNATED.
12. ALL NEW LAWN AREAS SHALL BE MULCHED WITH HAY OR EQUAL AS APPROVED BY THE LANDSCAPE ARCHITECT.
13. ALL LAWN AREAS SHALL BE FURNISHED WITH A COMPLETE FERTILIZER, AT LEAST HALF OF THE NITROGEN OF WHICH IS DERIVED FROM A NATURAL ORGANIC SOURCE. IT SHALL BE OF A 1:1:1 RATIO IN THE SPRING USING A MINIMUM ANALYSIS OF 10:10:10 AND A 1:2:1 RATIO IN THE FALL USING A MINIMUM ANALYSIS OF 5:10:5.
14. PLANTING SOIL MIX SHALL CONSIST OF 5 PARTS TOPSOIL (OR EXCAVATED SOIL IF APPROVED BY THE LANDSCAPE ARCHITECT), ONE PART "BOVUNG" DEHYDRATED COW MANURE, AND ONE PART GAP-GRADED SAND.
15. SHRUB BEDS OF HIGH VISIBILITY ARE TO BE TOPPED WITH A 3" LAYER OF PINE BARK MULCH.
16. ALL PLANT MATERIAL SHALL BE NURSERY GROWN, NO COLLECTED MATERIALS SHALL BE ACCEPTED.
17. PLANTS SHALL CONFORM WITH THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS IN ALL WAYS INCLUDING DIMENSIONS.
18. ALL PLANTS ARE TO BE APPROVED AND/OR TAGGED BY THE LANDSCAPE ARCHITECT. THE LANDSCAPE ARCHITECT HAS THE RIGHT TO REJECT ANY PLANT MATERIALS UPON DELIVERY TO THE PROJECT. SELECTION BY THE LANDSCAPE ARCHITECT DOES NOT WAIVE THE RIGHT OF REJECTION.
19. QUANTITIES SHOWN ON CONTRACT DRAWINGS TAKE PRECEDENCE OVER PLANT MATERIALS LIST. PLANT MATERIALS SHALL BE FURNISHED AND PLANTED AS SPECIFIED. ANY DEVIATION FROM THESE SPECIFICATIONS WILL BE REJECTED.
20. ALL REPLACEMENTS SHALL BE PLANTS OF THE SAME KIND AND SIZE AS SPECIFIED IN THE PLANT LIST, OR AS IS NECESSARY TO MATCH SURVIVING PLANTS OF THE SAME PLANTING GROUP. ALL COSTS SHALL BE BORNE BY THE LANDSCAPE CONTRACTOR EXCEPT FOR THE REPLACEMENTS RESULTING FROM LOSS OR DAMAGE DUE TO VANDALISM OR ACTS OR NEGLECT ON THE PART OF OTHERS, PHYSICAL DAMAGE BY ANIMALS, VEHICLES, FIRE, ETC., AS MAY BE DETERMINED BY THE LANDSCAPE ARCHITECT.
21. ALL LAWN AREAS SHALL BE TOP DRESSED AND FINE GRADED WITH SIX INCHES OF TOPSOIL SO AS TO ALLOW FOR COMPACTION.

PLANTING NOTES

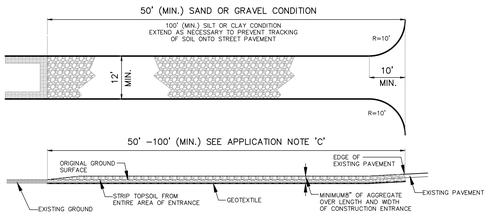
n.t.s.

CONSTRUCTION ENTRANCE
DEFINITION: AN ENTRANCE TO THE SITE SPECIFICALLY DESIGNED TO REDUCE THE AMOUNT OF SEDIMENT TRACKED OFF BY VEHICLES.

APPLICATION:
A - LOCATED WHERE CONSTRUCTION VEHICLES ENTER AND LEAVE WORK SITE ONTO PUBLIC R.O.W.
B - REDUCES BUT MAY NOT ELIMINATE NEED FOR STREET SWEEPING
C - FOR SANDY OR GRAVELLY SOIL ON SITE, MINIMUM LENGTH IS 50'. FOR SILTY OR CLAY SOILS ON SITE MINIMUM IS LENGTH IS 100'
D - PLAN TO MAKE STONE AVAILABLE FOR MAINTENANCE OF ENTRANCE

INSTALLATION:
1. CLEAR ENTRANCE OF VEGETATION AND EXTRANEOUS MATERIALS AND STRIP EXISTING TOPSOIL.
2. AT POORLY DRAINED LOCATIONS INSTALL SUBSURFACE DRAINAGE. PROVIDE FOR SURFACE WATER CONVEYANCE UNDER ENTRANCE WITH CULVERTS AS NEEDED.
3. PLACE FILTER FABRIC UNDERLINER OVER THE FULL WIDTH AND LENGTH OF ENTRANCE AND COVER WITH CT. D.O.T. #3 2" STONE TO A DEPTH OF NO LESS THAN 8".
4. AS NEEDED INSTALL WASH RACKS AND SEDIMENTATION FACILITIES FOR WASHING WHEN MAJORITY OF MUD IS NOT REMOVED FROM VEHICLES TRAVELING OVER THE STONE. SEDIMENT SHOULD BE INTERCEPTED AND TRAPPED SO IT CAN BE REMOVED AND STABLIZED.

MAINTENANCE:
- AS REQUESTED, APPLY ADDITIONAL STONE OR WASH AND REWORK EXISTING STONE
- REMOVE ANY SEDIMENT APPEARING ON OR IN ROADWAYS OR STORM DRAINS IMMEDIATELY.



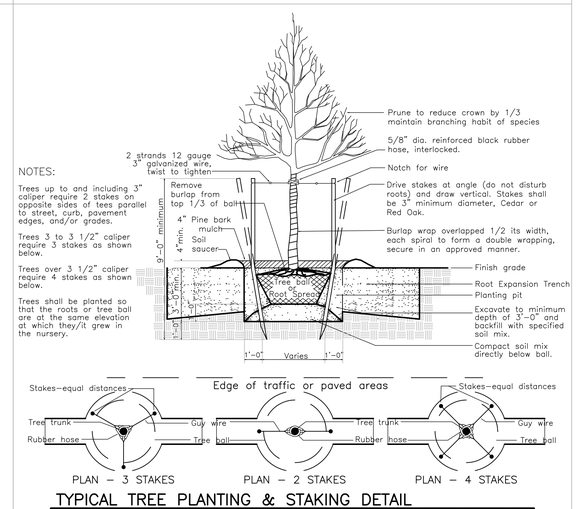
PLACEMENT AND CONSTRUCTION OF A STABILIZED CONSTRUCTION ENTRANCE

n.t.s. CADFILE: 02722-16A.DWG

SOIL EROSION CONTROL NOTES

1. LAND DISTURBANCES WILL BE KEPT TO A MINIMUM. RESTABILIZATION WILL BE SCHEDULED AS SOON AS POSSIBLE. TEMPORARY SEEDING OR PERMANENT HYDRO-SEEDING SHOULD TAKE PLACE IMMEDIATELY UPON COMPLETION OF GRADING. PERMANENT SEEDING WILL BE SCHEDULED DURING THE PERIOD APRIL 1 - JUNE 15; AUGUST 15 - SEPTEMBER 15.
2. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED PRIOR TO CONSTRUCTION WHENEVER POSSIBLE AND WILL BE MAINTAINED IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD.
3. HAY BALE FILTERS WILL BE INSTALLED AS SHOWN ON THIS PLAN AS WELL AS AT ALL CULVERT OUTLETS AND ALONG THE TOE OF ALL CRITICAL CUT AND FILL SLOPES.
4. ALL DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND THE EMBANKMENTS STABILIZED AS SOON AS POSSIBLE AFTER THE CONSTRUCTION COMMENCES.
5. CULVERT DISCHARGE AREAS WILL BE PROTECTED WITH RIP-RAP CHANNELS; ENERGY DISSIPATERS WILL BE PROVIDED AS NECESSARY.
6. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING THE CONSTRUCTION PERIOD IF NECESSARY AS REQUIRED.
7. ALL EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE "2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL" CONNECTICUT COUNCIL ON SOIL AND WATER CONSERVATION.
8. CROWNVETCH / PERENNIAL RYE GRASS (40% - 60% MIXTURE) IS RECOMMENDED TO BE APPLIED AT A RATE OF 2.5 LBS. PER 1000 SQUARE FEET TO STABILIZE ALL FILL AND CUT EMBANKMENTS.
9. SEDIMENT REMOVED FROM CONTROL STRUCTURES WILL BE BURIED OR DISPOSED OF AS DETERMINED BY THE TOWN ENGINEER.
10. JOHN HALL (203)410-4991
NAME PHONE
IS ASSIGNED THE RESPONSIBILITY FOR IMPLEMENTING THIS EROSION AND SEDIMENT CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THIS PLAN, NOTIFYING THE INLAND WETLAND OFFICE OF ANY TRANSFER OF THIS RESPONSIBILITY, AND FOR CONVEYING A COPY OF THE EROSION AND SEDIMENT CONTROL PLAN IF THE TITLE OF THE LAND IS TRANSFERRED.
11. A PRE CONSTRUCTION CONFERENCE WITH THE WETLANDS ENFORCEMENT OFFICER AND THE PARTY RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL MUST BE HELD.
12. ANY CHANGES TO THE SUBMITTED PLANS MUST BE RESUBMITTED TO THE PLANNING & ZONING COMMISSION FOR APPROVAL.
13. PRIOR TO THE START OF CONSTRUCTION THE WETLANDS ENFORCEMENT OFFICER SHALL BE NOTIFIED FOR THE INSPECTION OF SEDIMENT & EROSION CONTROLS. SEDIMENT & EROSION CONTROLS INCLUDING CONSTRUCTION ENTRANCE(S) SHALL BE MONITORED THROUGHOUT CONSTRUCTION.

CADFILE: 02722-09.DWG



NOTES:
Trees up to and including 3" caliper require 2 stakes on opposite sides of tees parallel to street, curb, pavement edges, and/or grades.
Trees 3 to 3 1/2" caliper require 3 stakes as shown below.
Trees over 3 1/2" caliper require 4 stakes as shown below.
Trees shall be planted so that the roots or tree ball are at the same elevation at which they/it grew in the nursery.

TYPICAL TREE PLANTING & STAKING DETAIL

n.t.s. CADFILE: 02950-01.DWG

AGENCY SUBMISSION DRAWINGS NOT FOR CONSTRUCTION

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REVISIONS
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CODESPOTI & ASSOCIATES P.C.
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263 BOSTON POST ROAD, SUITE 5
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TEL 203-799-1400
FAX 203-799-0011

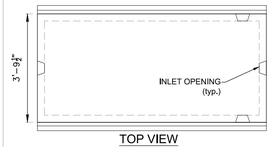
PROPOSED SITE DEVELOPMENT PLANS
THOMPSON COMMONS
PREPARED FOR
13 CARLSON PLACE LLC
EAST HAVEN, CONNECTICUT
360 THOMPSON AVENUE

SITE EROSION AND PLANTING DETAILS

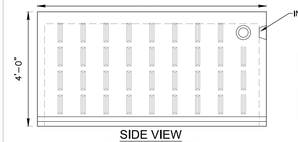
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SHEET	SP6

\\dc5\Shared\Autocad Projects\Civil\3D 2014\4632-360 Thompson\4632-Det.dwg, SP6 Erosion Planting, 1/9/2024 12:41:26 PM, 1:1

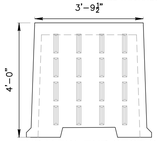
A191



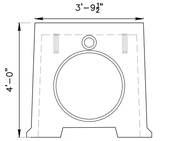
TOP VIEW
(ROOF SLAB THICKNESS IS 5")



SIDE VIEW
(WALL THICKNESS IS 3")



END VIEW (END SECTION)
(WALL THICKNESS IS 3")



END VIEW (CENTER SECTION)
(WALL THICKNESS IS 3")

GALLEY DESIGN SPECIFICATIONS CONFORMS TO LATEST; ASTM DESIGNATION C913

NOTE:
1. PIPE INLET LOCATIONS HAVE 4" DIAMETER KNOCKOUTS, TYPICAL. CUSTOM KNOCKOUTS CAN BE CAST ON REQUEST.
2. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A615.
3. CONCRETE COMPRESSIVE STRENGTH - 4000 PSI AT 28 DAYS.
4. METHOD OF MANUFACTURE: WETCAST.
5. SECTION IS MONLITHIC.
6. THE GALLERY IS DESIGNED FOR H-20 LOADING WITH 18" OF SOIL COVER.

WEIGHT CHART

PRODUCT APPROX. 4x8x4' GALLERY	WEIGHT 4200 LBS.

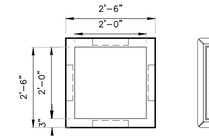
LEACHING DATA

FLOW LINE (INCHES)	LEACHING (GALL/LF)	LEACHING FT²/UNIT)	INSIDE CAPACITY (GALLONS)
38	9.2	73.6	700

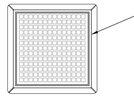
4'x8'x4' H-20 LEACHING CHAMBER
n.t.s.

UNITED CONCRETE PRODUCTS INC.

CADFILE: 02722-153.DWG

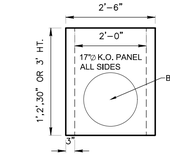


TOP PLAN VIEW

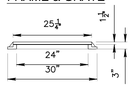


FRAME & GRATE

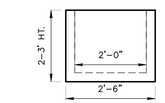
CAMPBELL FOUNDRY GRATE #3193 OR EQUIVALENT



ELEVATION RISER



BACKFILLED TRENCH

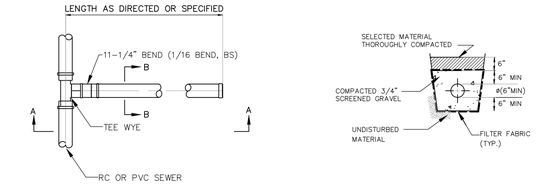


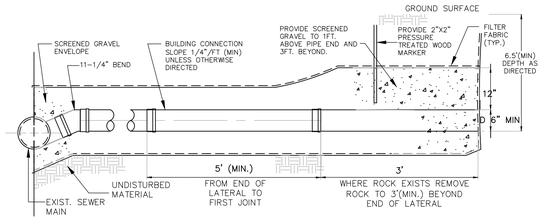
ELEVATION SUMP

NOTES:
1. REINFORCING STEEL WELDED WIRE FABRIC CONFORMS TO LATEST ASTM SPECIFICATION A185.
2. REINFORCING STEEL DEFORMED BARS CONFORM TO LATEST ASTM SPECIFICATION A615.
3. CONCRETE COMPRESSIVE STRENGTH - 4000 PSI AT 28 DAYS.
4. METHOD OF MANUFACTURE: WET CAST.
5. SECTION IS MONOLITHIC.
6. DESIGN LOAD: AASHTO H-20
7. WEIGHT: 2' RISER W/BASE 730 LBS.

UNITED CONCRETE 2'x2' YARD DRAIN DETAIL (YD1)
n.t.s.

CADFILE: 02722-150.DWG





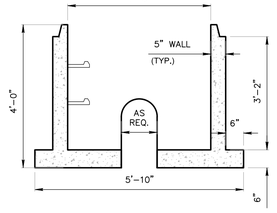
BUILDING LATERAL SEWER (FOR PVC PIPE)
n.t.s.

CADFILE: 02732-06A.DWG

AGENCY SUBMISSION DRAWINGS
NOT FOR CONSTRUCTION

NOTES:

1. RISER SECTIONS PER STANDARD MANHOLE DETAIL



UNITED CONCRETE 4' DOGHOUSE BASE DETAIL
n.t.s.

CADFILE: 02732-87.DWG

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REVISIONS
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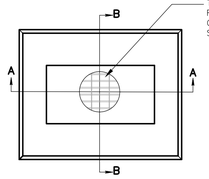
CODESPOTI & ASSOCIATES P.C.
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LANDSCAPE ARCHITECTURE
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263 BOSTON POST ROAD, SUITE 5
ORANGE, CONNECTICUT 06477
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PROPOSED SITE DEVELOPMENT PLANS
THOMPSON COMMONS
PREPARED FOR
13 CARLSON PLACE LLC
EAST HAVEN, CONNECTICUT
360 THOMPSON AVENUE

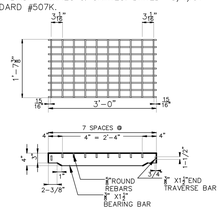
SITE DRAINAGE DETAILS

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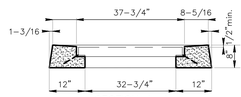
NOTES:
1. CATCH BASIN TOPS SHALL BE APPROVED PRECAST UNITS. FACTORY MANUFACTURED.
2. FRAMES AND GRATES SHALL BE GALVANIZED STEEL PER CDOT SPECIFICATIONS.



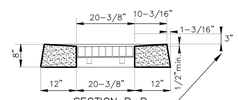
PLAN VIEW



GRATE TYPE 'A'



SECTION A-A

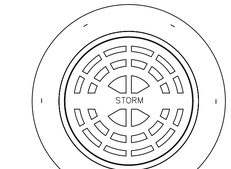


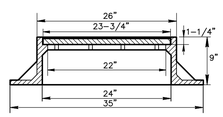
SECTION B-B

NORMAL FINISH GRADING. GRADING TO BE VARIED ADJACENT TO CATCH BASIN AS DIRECTED.

STANDARD "TYPE CL" CATCH BASIN TOP
n.t.s.

CADFILE: 02722-03.DWG

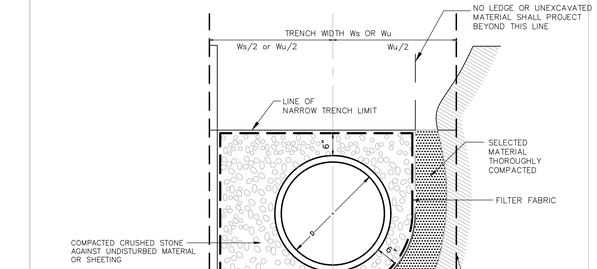




CAMPBELL FOUNDRY PATTERN NO. 1049

STANDARD MANHOLE FRAME AND COVER
n.t.s.

CADFILE: 02732-25.DWG

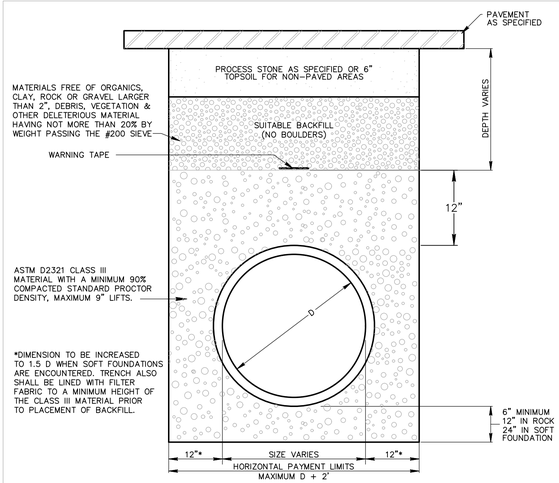


TRENCH SECTIONS (FOR PVC PIPE)

DIAM OF PIPE D	TRENCH WIDTH Ws OR Wu Wu UNSHEETED	Ws SHEETED
12" OR SMALLER	3'-0"	4'-2"
15"	3'-2"	4'-4"
18"	3'-6"	4'-8"

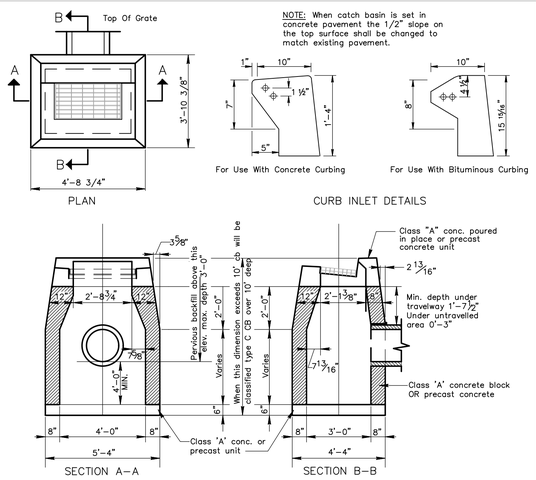
SEWER TRENCH DETAIL 18" PVC PIPE OR SMALLER
n.t.s.

CADFILE: 02732-09A.DWG



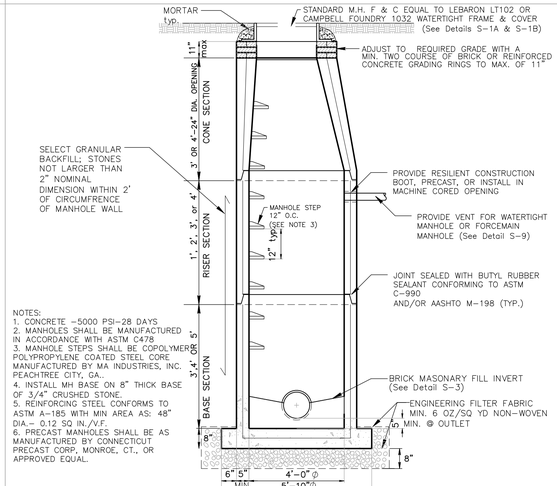
STORM SEWER TRENCH DETAIL (HDPE)
n.t.s.

CADFILE: 02722-6H.DWG



TYPE "C" CATCH BASIN
n.t.s.

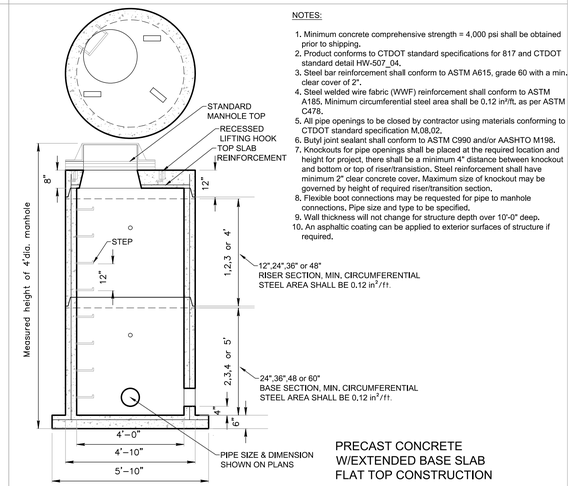
CADFILE: 02722-01.DWG



NOTES:
1. CONCRETE -5000 PSI-28 DAYS
2. MANHOLES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C478
3. MANHOLE STEPS SHALL BE COPOLYMER POLYPROPYLENE COATED STEEL CORE MANUFACTURED BY MA INDUSTRIES, INC. PEACHTREE CITY, GA.
4. INSTALL MH BASE ON 8" THICK BASE OF 3/4" CRUSHED STONE.
5. REINFORCING STEEL CONFORMS TO ASTM A-185 WITH MIN AREA AS: 48" DIA.- 0.12 SQ IN./V.F.
6. PRECAST MANHOLES SHALL BE AS MANUFACTURED BY CONNECTICUT PRECAST CORP., MONROE, CT., OR APPROVED EQUAL.

48" PRECAST SANITARY SEWER MANHOLE STRUCTURE
n.t.s.

CADFILE: 02732-01A.DWG



NOTES:

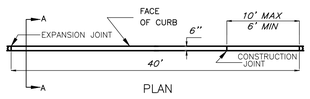
1. Minimum concrete comprehensive strength = 4,000 psi shall be obtained prior to shipping.
2. Product conforms to CTDOT standard specifications for 817 and CTDOT standard detail HW-507_04.
3. Steel bar reinforcement shall conform to ASTM A615, grade 60 with a min. clear cover of 2".
4. Steel welded wire fabric (WWF) reinforcement shall conform to ASTM A185. Minimum circumferential steel area shall be 0.12 in²/ft. as per ASTM C478.
5. All pipe openings to be closed by contractor using materials conforming to CTDOT standard specification M.08.02.
6. Butyl joint sealant shall conform to ASTM C990 and/or AASHTO M198.
7. Knockouts for pipe openings shall be placed at the required location and height for project, there shall be a minimum 4" distance between knockout and bottom or top of riser/transition. Steel reinforcement shall have minimum 2" clear concrete cover, Maximum size of knockout may be governed by height of required riser/transition section.
8. Flexible boot connections may be requested for pipe to manhole connections, Pipe size and type to be specified,
9. Wall thickness will not change for structure depth over 10'-0" deep.
10. An asphaltic coating can be applied to exterior surfaces of structure if required.

PRECAST CONCRETE W/EXTENDED BASE SLAB FLAT TOP CONSTRUCTION

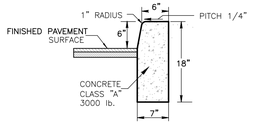
SHALLOW SANITARY SEWER MANHOLE DETAIL
n.t.s.

CADFILE: 02732-88.DWG

\\dc02\Shared\Autocad Projects\Civil3D 2014\4632-360 Thompson\4632-Dwt.dwg, SP7 Drainage & Sewer, 1/9/2024 12:41:33 PM, 1:1



PLAN



SECTION A–A

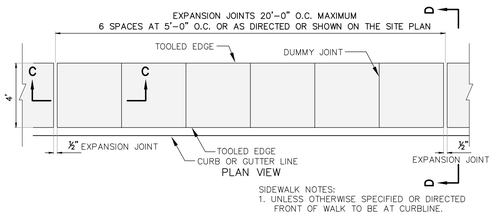
GENERAL NOTES

1. Concrete shall be "Class C" and shall contain 5 to 7 percent entrained air
2. Expansion joints shall be made of pre–formed bituminous joint filler 1/2 inch thick and shall be installed every 40 feet.
3. All exposed surfaces shall be float finished.
4. Minimum length of curb section shall be 6 feet.

CEMENT CONCRETE CURB DETAIL

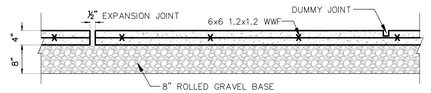
N.T.S.

CADFILE: 02513–11.DWG

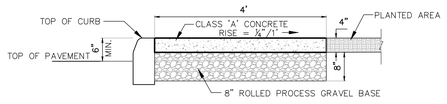


PLAN VIEW

SIDEWALK NOTES:
1. UNLESS OTHERWISE SPECIFIED OR DIRECTED FRONT OF WALK TO BE AT CURBLINE.



SECTION C–C

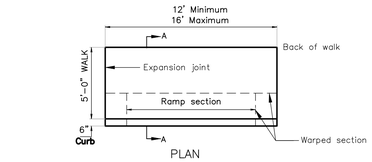


SECTION D–D

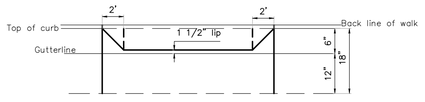
TYPICAL CONCRETE SIDEWALK DETAILS (WITHOUT GRASS STRIP)

n.t.s.

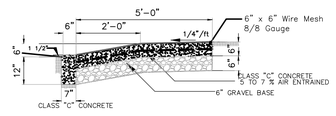
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PLAN



ELEVATION

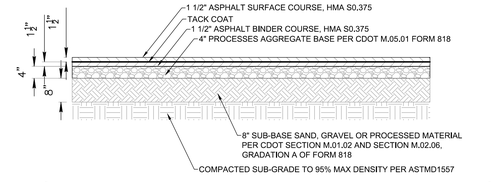


SECTION A–A

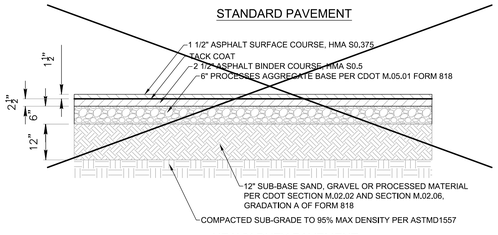
STANDARD DRIVEWAY CONCRETE RAMP

N.T.S.

CADFILE: 02513–13.DWG



STANDARD PAVEMENT



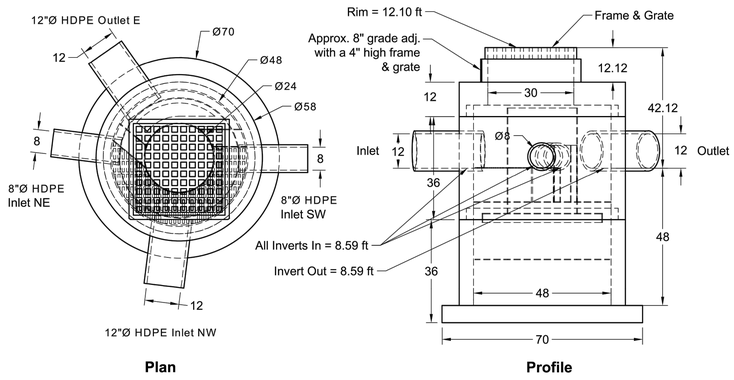
HEAVY DUTY PAVEMENT

NOTE: PROPOSED THICKNESSES SUBJECT TO FINAL GEOTECH RECOMMENDATIONS

PAVING DETAILS

n.t.s.

CADFILE: 02510–36.DWG



Plan

Profile

HYDROSTORM HS4i WARTER QUALITY DETAIL

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REVISIONS

#######

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LANDSCAPE ARCHITECTURE
ENGINEERING
SURVEYING
263 BOSTON POST ROAD, SUITE 5
ORANGE, CONNECTICUT 06477
TEL 203-799-1400
FAX 203-799-0011

PROPOSED SITE DEVELOPMENT PLANS

THOMPSON COMMONS

PREPARED FOR

13 CARLSON PLACE LLC

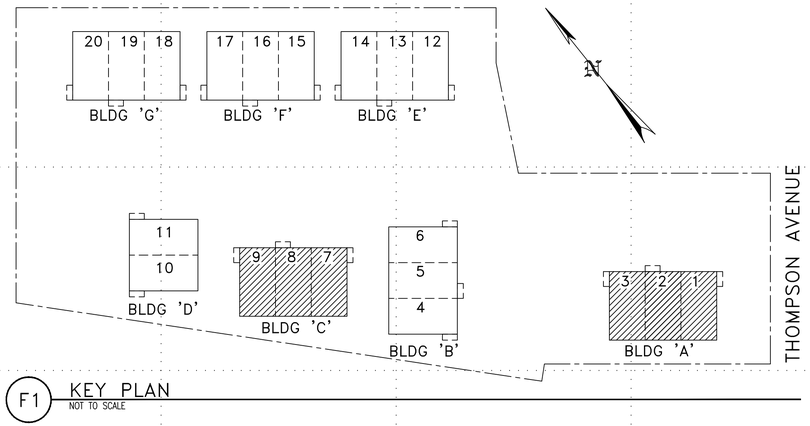
360 THOMPSON AVENUE EAST HAVEN, CONNECTICUT

ROADWAY & WQC STRUCTURE DETAILS

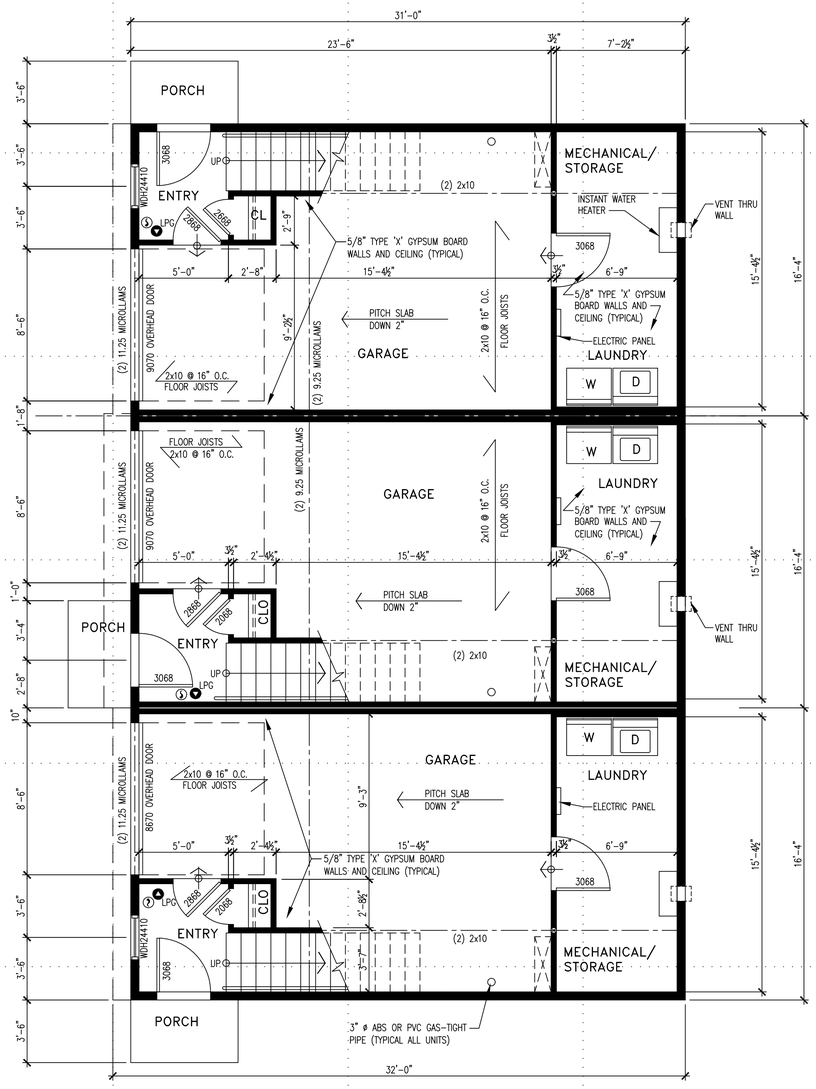
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DATE
01/05/24
SCALE
AS NOTED
JOB NO.
4632
SHEET
SP8

AGENCY SUBMISSION DRAWINGS
NOT FOR CONSTRUCTION

\\dc02\Shared\Autocad Projects\Civil3D 2014\4632-360 Thompson\4632-Dot4\dwg\ SP8 Roadway Details, 1/9/2024 12:41:38 PM, 1:1

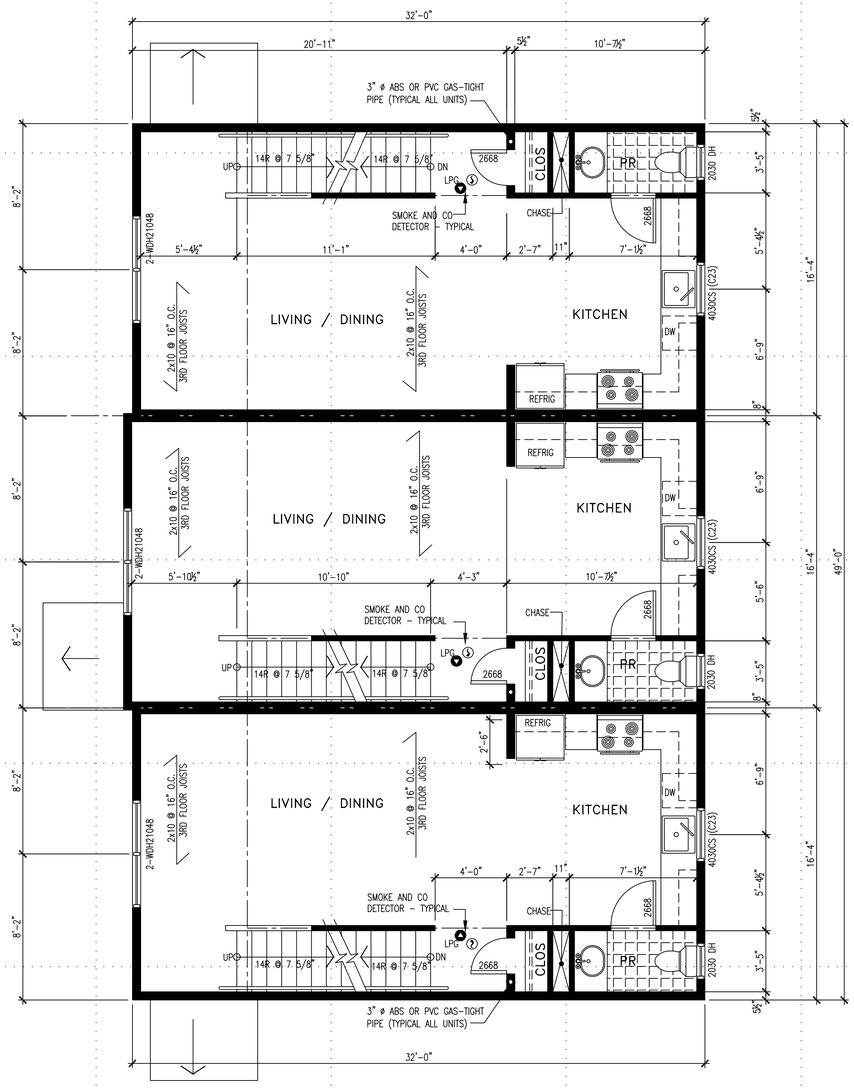


F1 KEY PLAN
NOT TO SCALE



A1 FIRST FLOOR PLAN 1st FLR. CTR. UNIT = 470 S.F. / 1st FLR. END UNITS = 466 S.F.
1/4"=1'-0"

NOTE: ALL WINDOW SILLS ARE 24" HIGH OR MORE.



A5 SECOND FLOOR PLAN 2nd FLR. CTR. UNIT = 491 S.F. / 2nd FLR. END UNITS = 480 S.F. (LIVING)
1/4"=1'-0"

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NO. 4166
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Milton Gregory Grew

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Applicant: John Hall

MARK	DATE	DESCRIPTION
P&Z	09-03-2023	SUBMIT TO PLANNING & ZONING

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CAD DWG FILE:	
DRAWN BY:	GDI
CHK'D BY:	MGG

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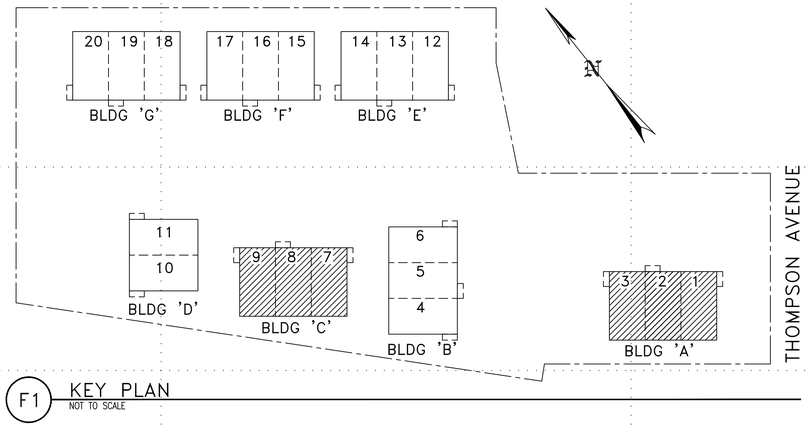
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BUILDINGS – A&C
FIRST AND SECOND
FLOOR PLANS

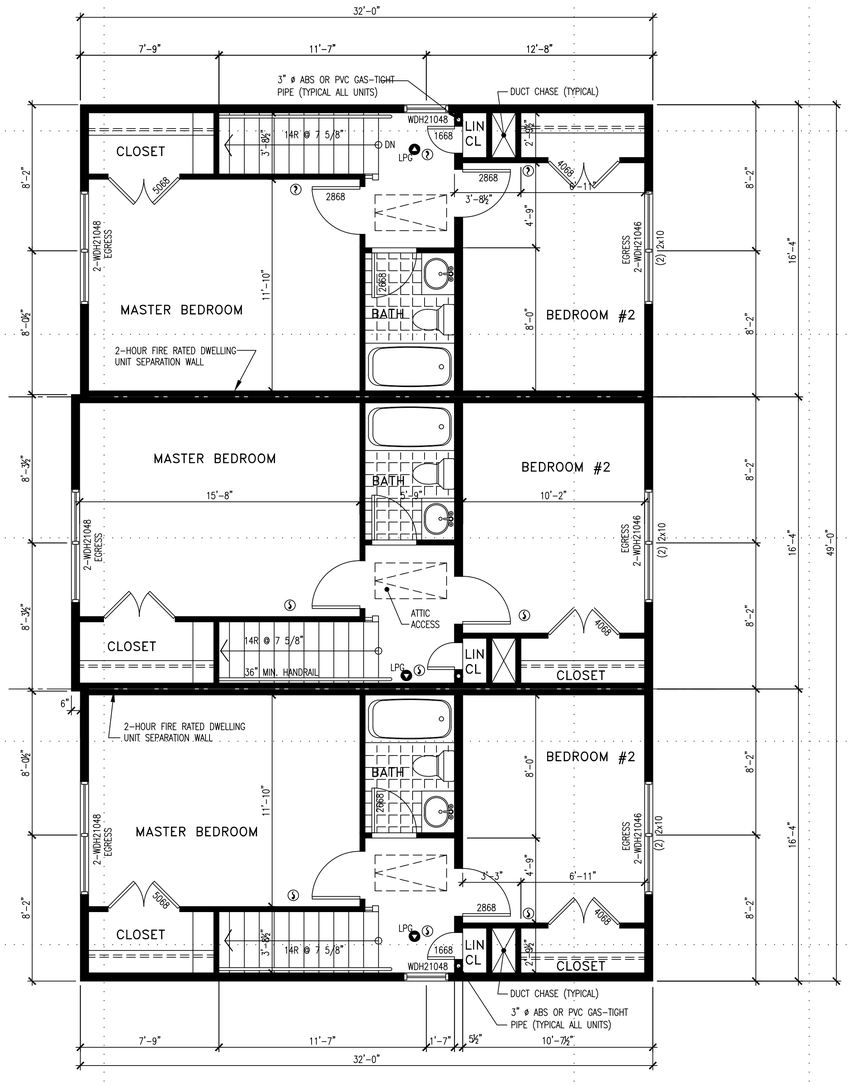
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SHEET 8 OF 12

A194



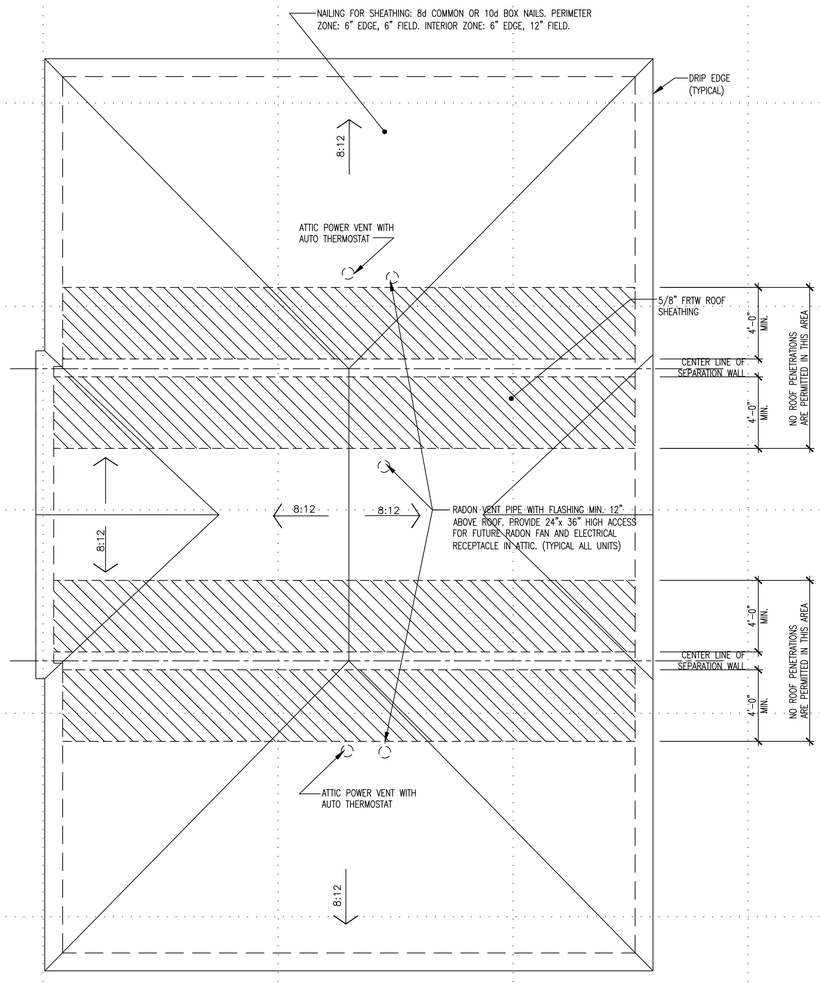
F1 KEY PLAN
NOT TO SCALE



A1 THIRD FLOOR PLAN 3rd FLR. CTR. UNIT = 456 S.F. / 3rd FLR. END UNITS = 444 S.F. (LIVING)
1/4"=1'-0"

TYPICAL ROOF CONSTRUCTION

1. ARCHITECTURAL LAMINATED ROOFING SHINGLES (HIGH WIND NAILING).
2. TAPE ALL SHEATHING PANEL EDGE SEAMS OR COVER ENTIRE ROOF WITH ICE AND WATER BARRIER.
3. IF TAPING SEAMS, FIELD CAN BE #15 FELT UNDERLAYMENT AND ICE AND WATER BARRIER WHALL BE INSTALLED AT EAVES (2 ROWS), HIPS, VALLEYS, RIDGES AND ROOF/WALL INTERSECTIONS.
4. 1/2" STRUCTURAL PANEL ROOF SHEATHING.
5. ALUMINUM DRIP AND RAKE EDGES.
6. ALUMINUM GUTTERS AND DOWNSPOUTS.



A6 ROOF PLAN
1/4"=1'-0"

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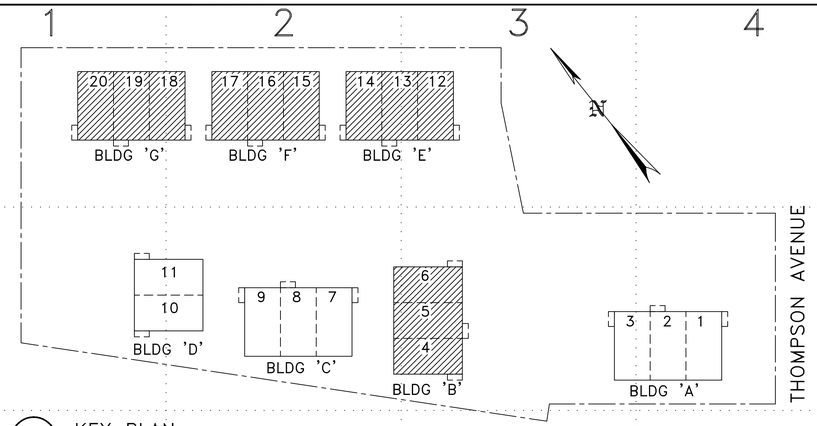
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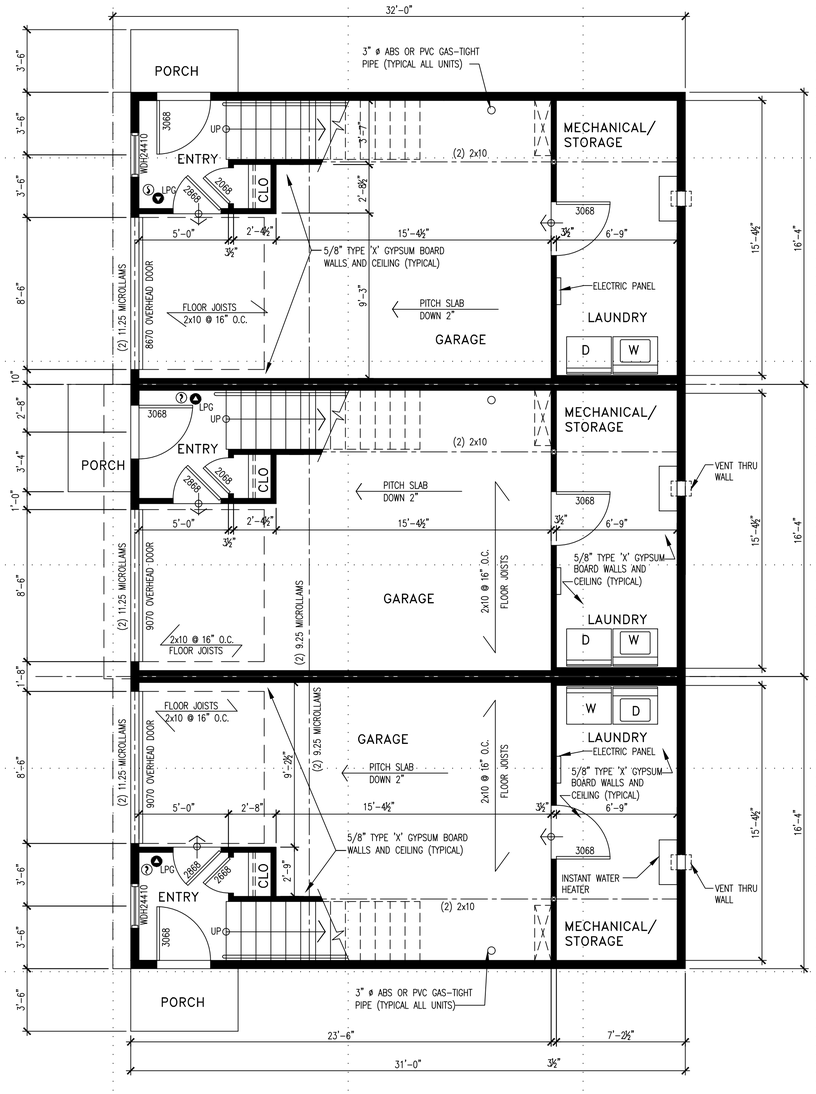
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FIRST AND SECOND
FLOOR PLANS

A-102
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A195

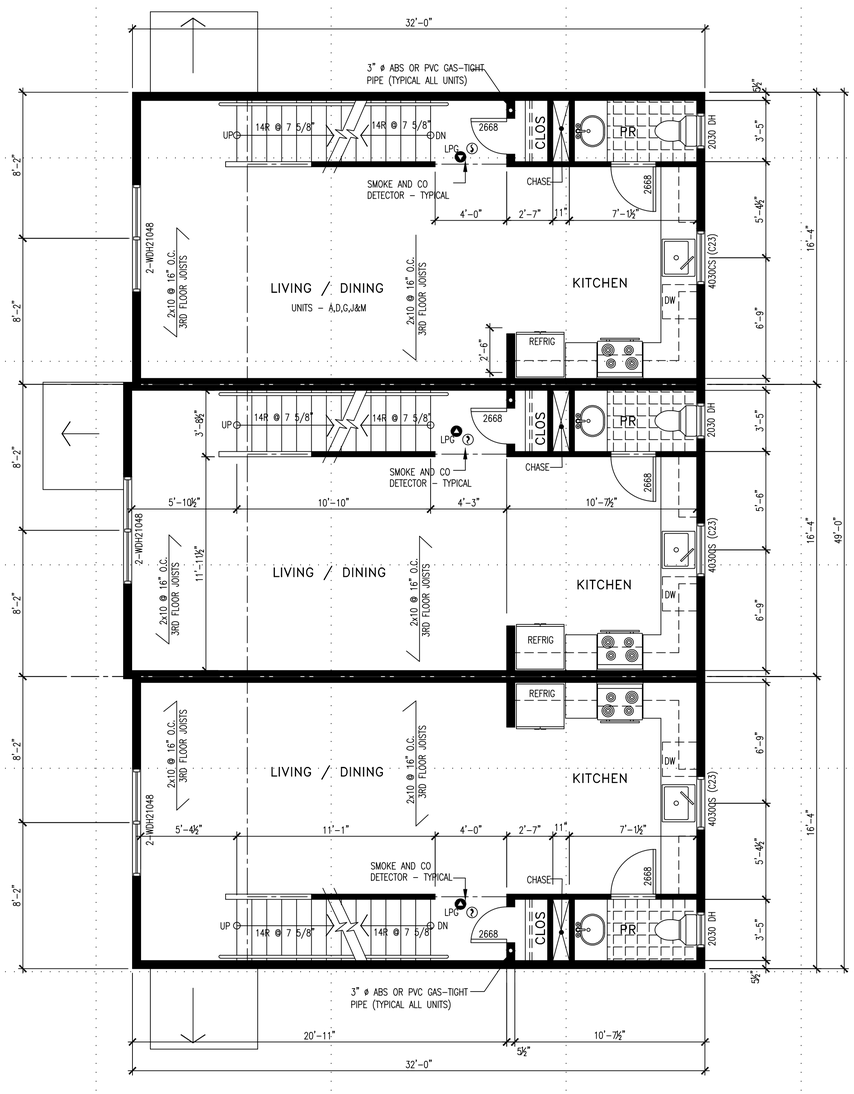


F1 KEY PLAN
NOT TO SCALE



A1 FIRST FLOOR PLAN 1st FLR. CTR. UNIT = 470 S.F. / 1st FLR. END UNITS = 466 S.F.
1/4"=1'-0"

NOTE: ALL WINDOW SILLS ARE 24" HIGH OR MORE.



A5 SECOND FLOOR PLAN 2nd FLR. CTR. UNIT = 491 S.F. / 2nd FLR. END UNITS = 480 S.F. (LIVING)
1/4"=1'-0"

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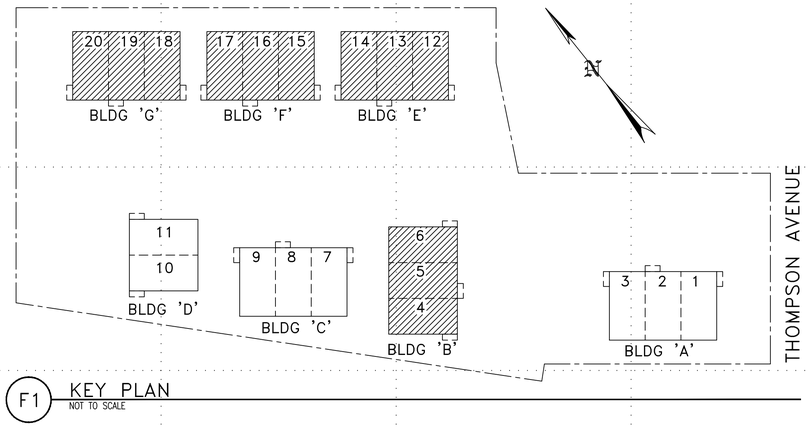
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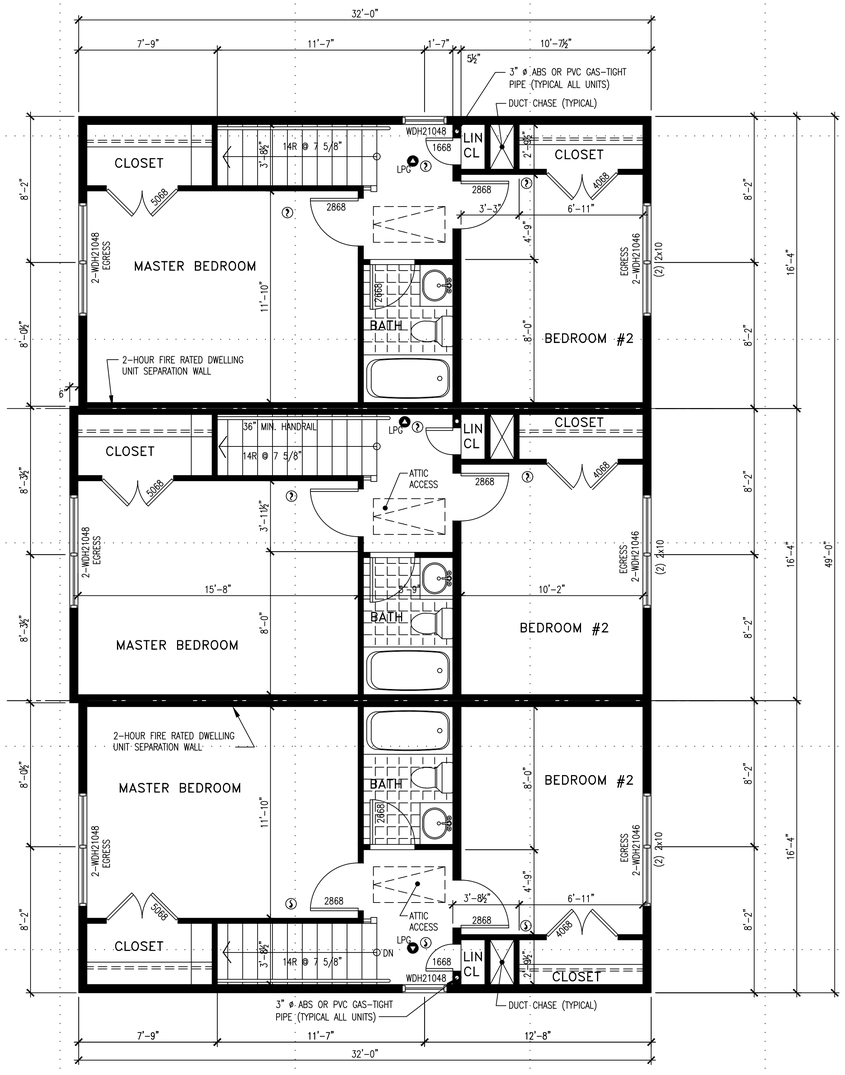
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BUILDINGS -B,E,F&G
FIRST AND SECOND
FLOOR PLANS

A-103
SHEET 8 OF 8

A196

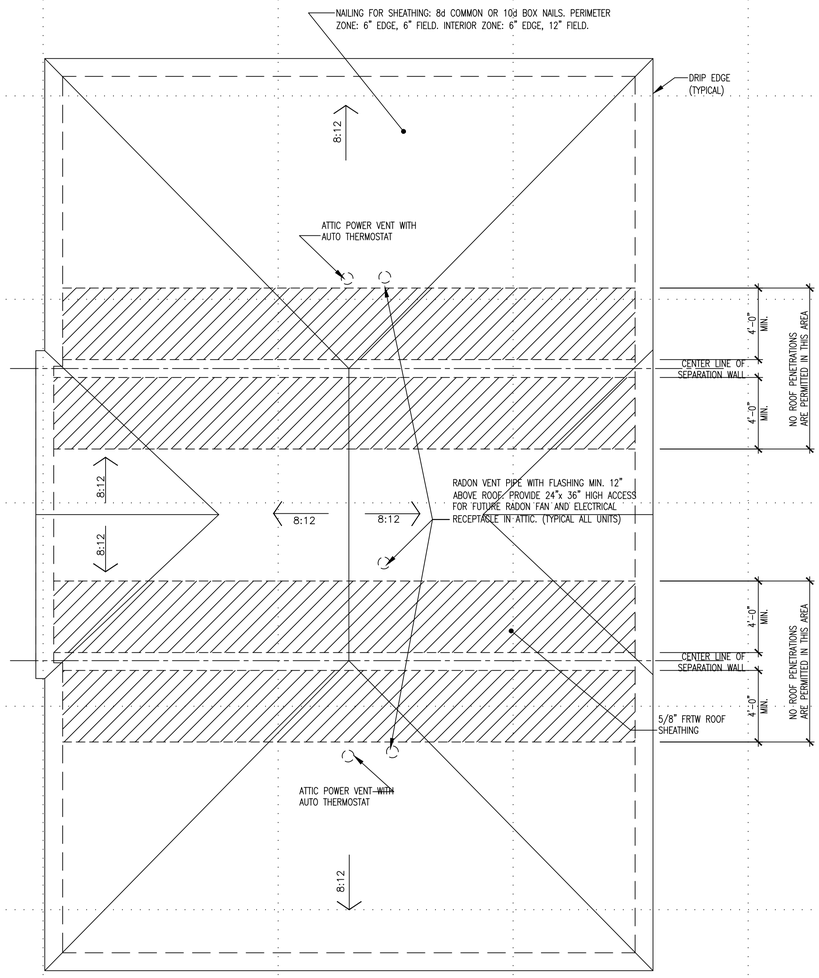


F1 KEY PLAN
NOT TO SCALE



A1 THIRD FLOOR PLAN 3rd FLR. CTR. UNIT = 456 S.F. / 3rd FLR. END UNITS = 444 S.F. (LIVING)
1/4"=1'-0"

NOTE: ALL WINDOW SILLS ARE 24" HIGH OR MORE.



A6 ROOF PLAN
1/4"=1'-0"

TYPICAL ROOF CONSTRUCTION

1. ARCHITECTURAL LAMINATED ROOFING SHINGLES (HIGH WIND NAILING).
2. TAPE ALL SHEATHING PANEL EDGE SEAMS OR COVER ENTIRE ROOF WITH ICE AND WATER BARRIER.
3. IF TAPING SEAMS, FIELD CAN BE #15 FELT UNDERLAYMENT AND ICE AND WATER BARRIER WHALL BE INSTALLED AT EAVES (2 ROWS), HIPS, VALLEYS, RIDGES AND ROOF/WALL INTERSECTIONS.
4. 1/2" STRUCTURAL PANEL ROOF SHEATHING.
5. ALUMINUM DRIP AND RAKE EDGES.
6. ALUMINUM GUTTERS AND DOWNSPOUTS.

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DRAWN BY:	GDI
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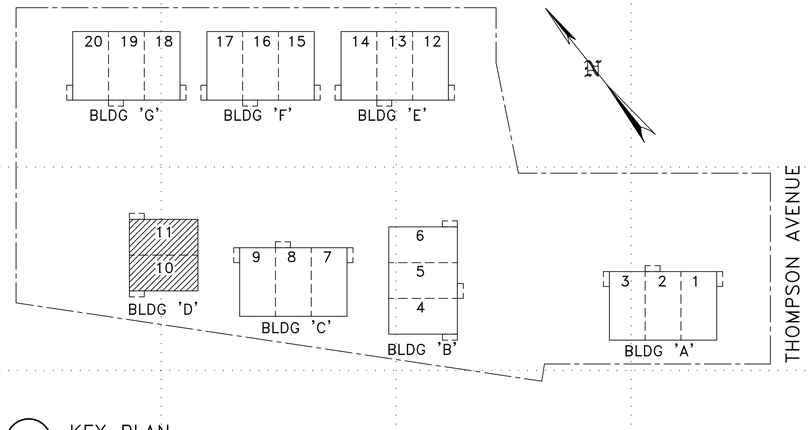
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BUILDINGS – B,E,F&G
THIRD FLOOR AND
ROOF PLANS

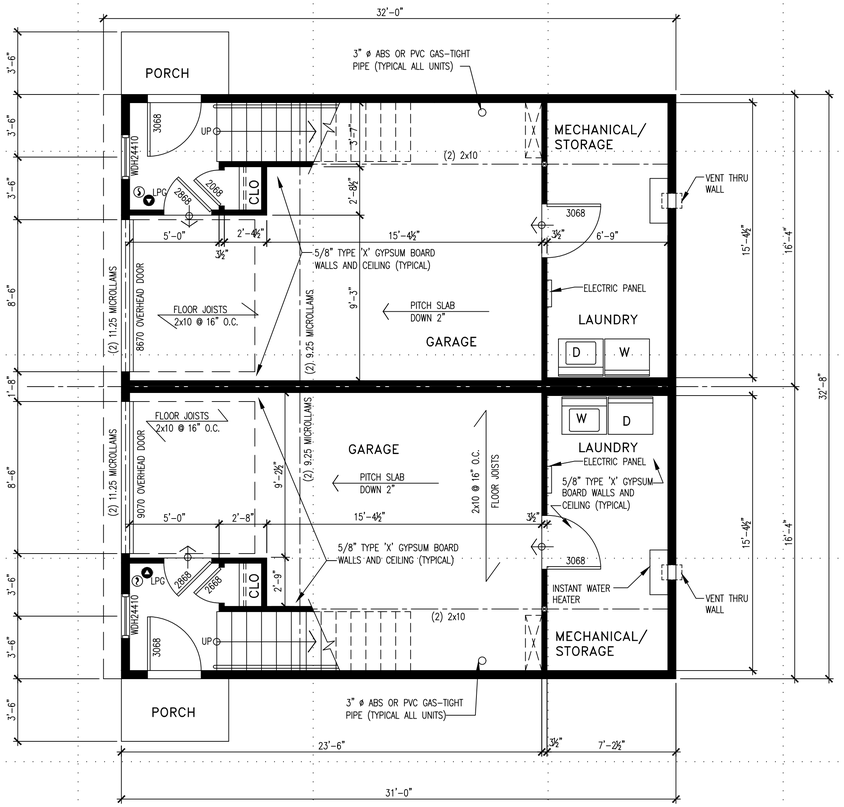
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SHEET 8 OF 8

A197

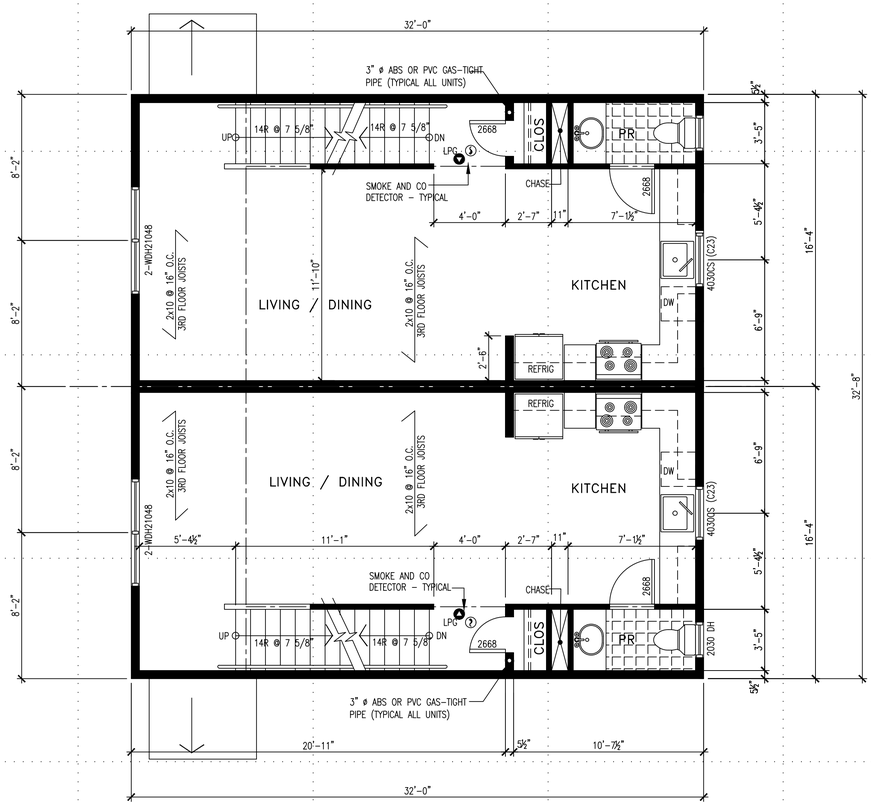


F1 KEY PLAN
NOT TO SCALE



A1 FIRST FLOOR PLAN 1st FLR. END UNIT = 466 S.F. / 932 S.F. TOTAL
1/4"=1'-0"

NOTE: ALL WINDOW SILLS ARE 24" HIGH OR MORE.



A5 SECOND FLOOR PLAN 2nd FLR. END UNIT = 480 S.F. / 960 S.F. TOTAL
1/4"=1'-0"

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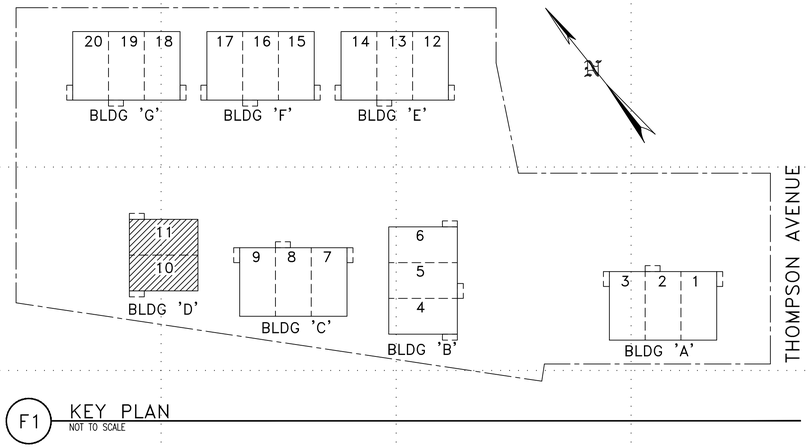
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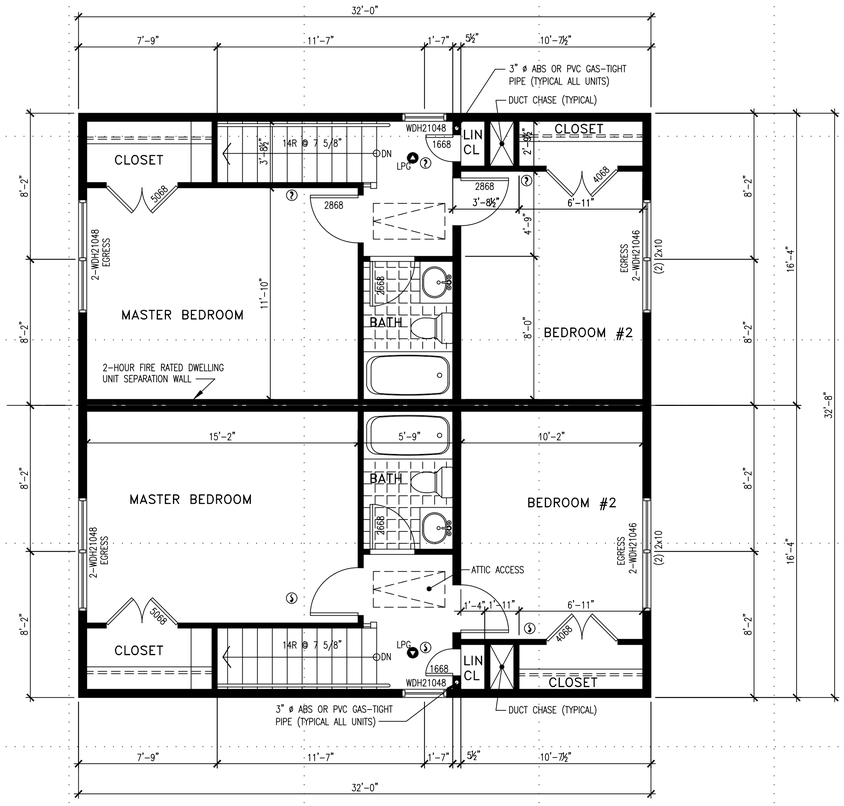
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BUILDING - D
FIRST AND SECOND
FLOOR PLANS

A-105
SHEET # OF ##

A198

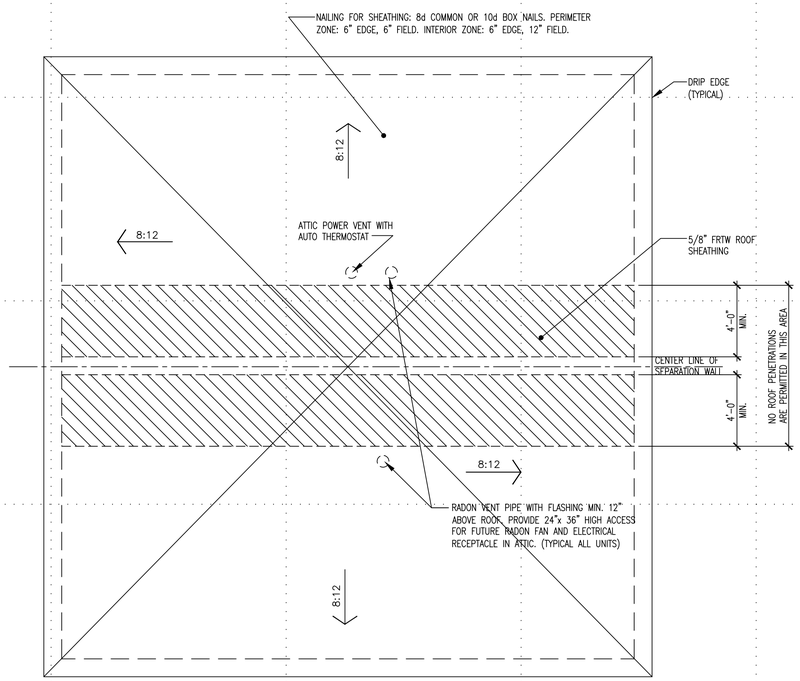


F1 KEY PLAN
NOT TO SCALE



A1 THIRD FLOOR PLAN 3rd FLR. END UNITS = 444 S.F. / 960 S.F. TOTAL
1/4"=1'-0"

NOTE: ALL WINDOW SILLS ARE 24" HIGH OR MORE.



A6 ROOF PLAN
1/4"=1'-0"

TYPICAL ROOF CONSTRUCTION

1. ARCHITECTURAL LAMINATED ROOFING SHINGLES (HIGH WIND NAILING).
2. TAPE ALL SHEATHING PANEL EDGE SEAMS OR COVER ENTIRE ROOF WITH ICE AND WATER BARRIER.
3. IF TAPING SEAMS, FIELD CAN BE #15 FELT UNDERLAYMENT AND ICE AND WATER BARRIER WHALL BE INSTALLED AT EAVES (2 ROWS), HIPS, VALLEYS, RIDGES AND ROOF/WALL INTERSECTIONS.
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PROJECT #:	23.048
CAD DWG FILE:	~~23048-1A-1BC.DWG~~
DRAWN BY:	GDI
CHK'D BY:	MGG

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SHEET TITLE:

BUILDING – D
THIRD FLOOR AND ROOF PLANS

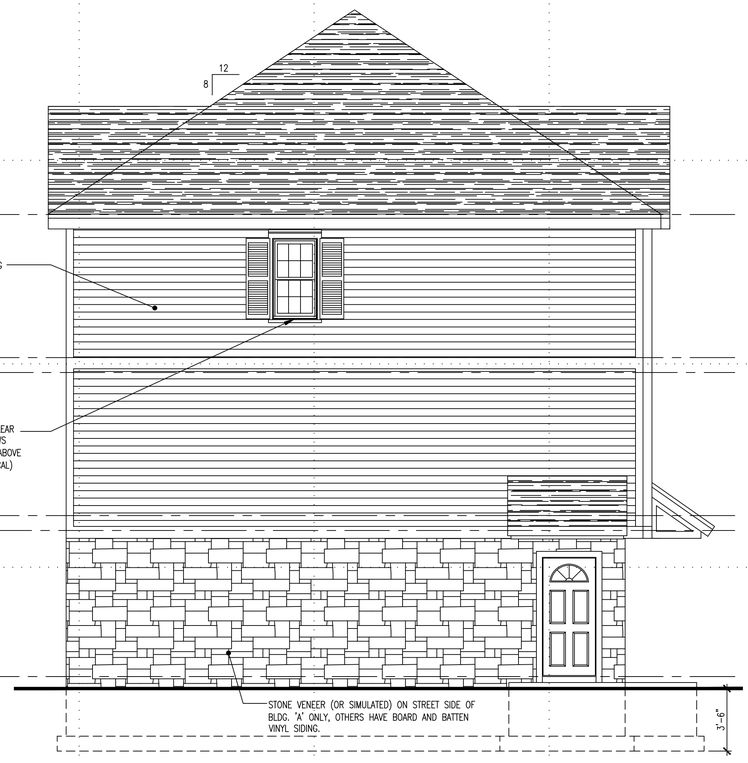
A-106

SHEET 8 OF 8

A199



A1 FRONT ELEVATION
1/4"=1'-0"



A6 LEFTT-SIDE ELEVATION
1/4"=1'-0"

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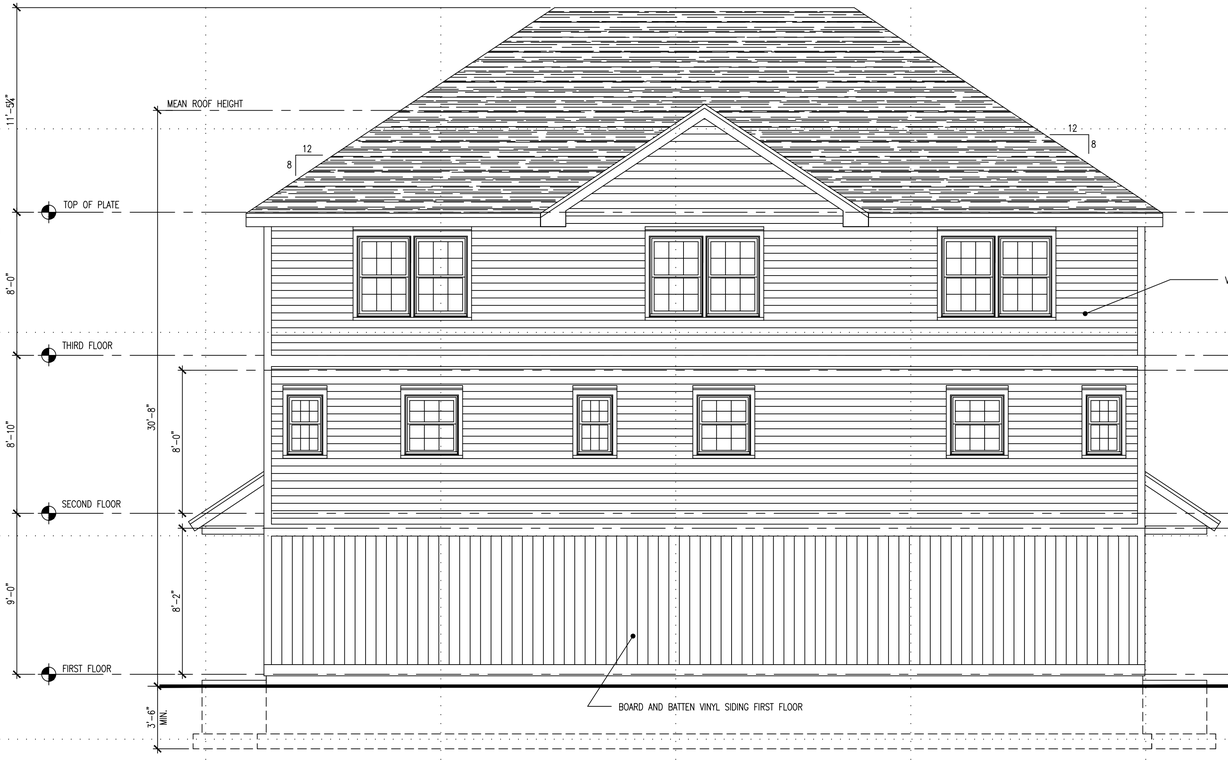
SHEET TITLE:

BUILDINGS A & C
EXTERIOR ELEVATIONS

A-201

SHEET # OF #

A200



A1 REAR ELEVATION
1/4"=1'-0"



A6 RIGHT-SIDE ELEVATION
1/4"=1'-0"

GREWDESIGN
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STATE OF CONNECTICUT
MILTON GREGORY GREW
NO. 4165
LICENSED ARCHITECT
Milton Gregory Grew

PROJECT:

PROPOSED TOWNHOUSES
360 THOMPSON AVENUE
EAST HAVEN, CT

OWNER:

PATRICK PALMIERI
13 Carlson Place
360 Thompson Avenue
East Haven, CT
Applicant: John Hall

MARK	DATE	DESCRIPTION
P&Z	09-03-2023	SUBMIT TO PLANNING & ZONING

PROJECT #:	23.048
CAD DWG FILE:	23048-4A-202.DWG
DRAWN BY:	GDI
CHK'D BY:	MGG

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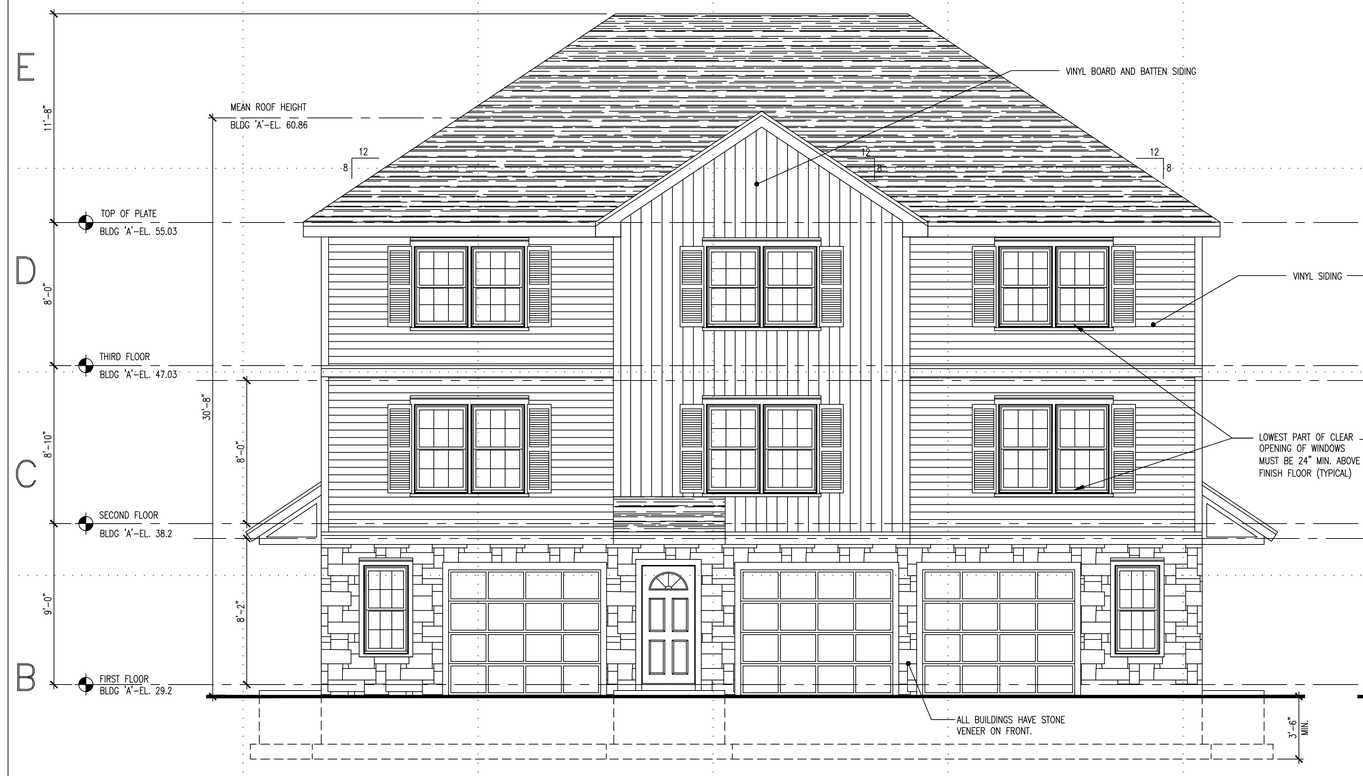
SHEET TITLE:

BUILDINGS – A&C
EXTERIOR ELEVATIONS

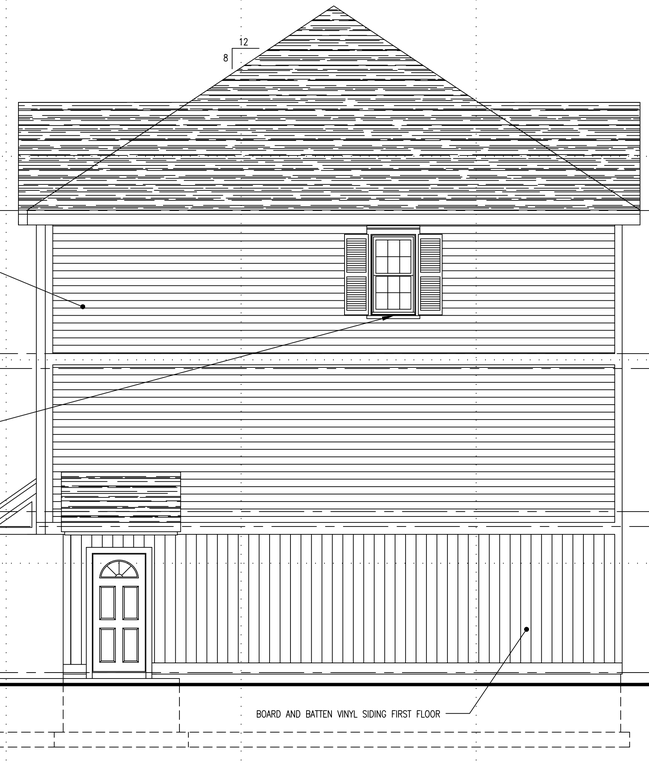
A-202

SHEET 8 OF 28

A201



A1 FRONT ELEVATION
1/4"=1'-0"



A6 RIGHT-SIDE ELEVATION
1/4"=1'-0"

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PROJECT:
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PROJECT #:	23.048
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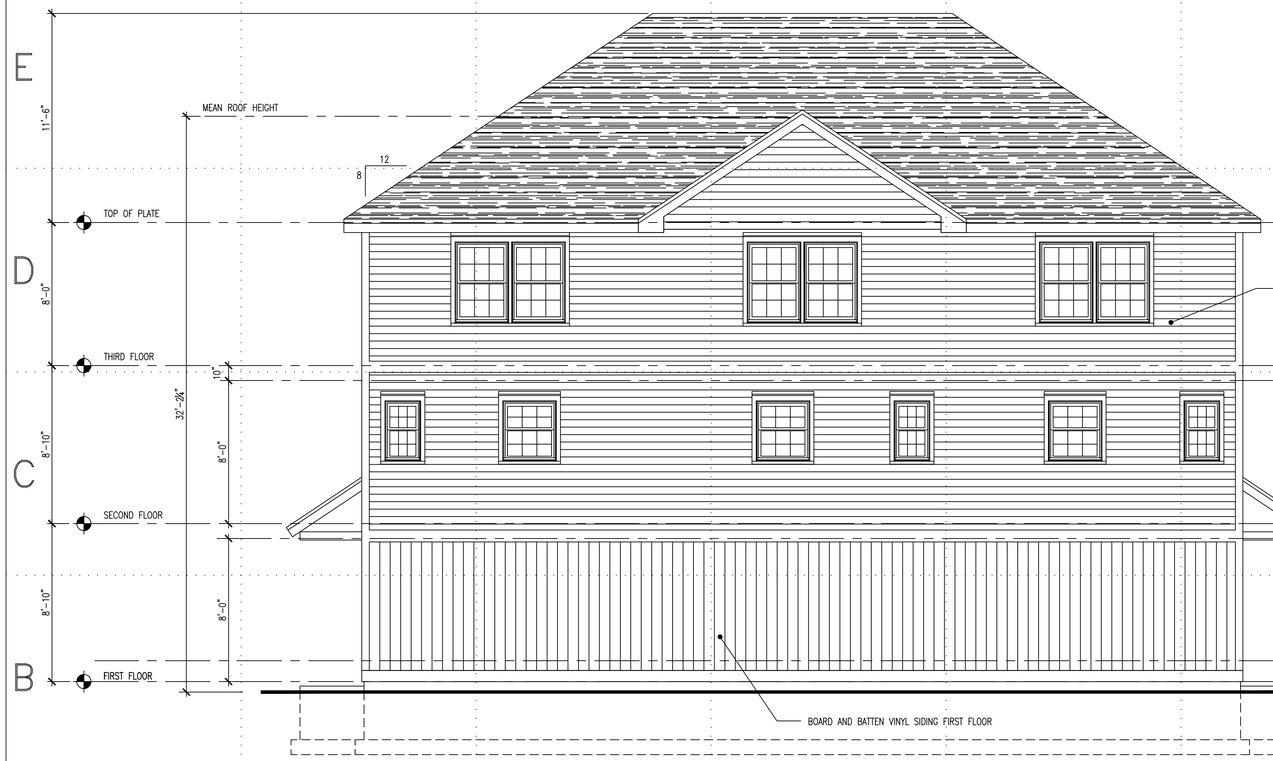
SHEET TITLE:

BUILDINGS B,E,F & G
EXTERIOR ELEVATIONS

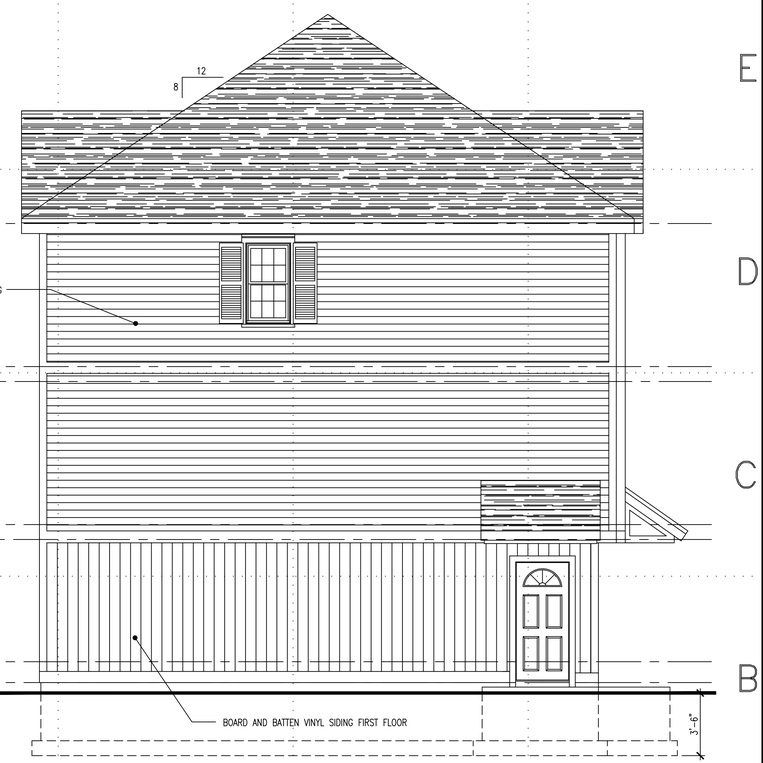
A-203

SHEET 8 OF 8

A202



A1 REAR ELEVATION
1/4"=1'-0"



A6 LEFT-SIDE ELEVATION
1/4"=1'-0"

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MARK	DATE	DESCRIPTION
PZ	09-03-2023	SUBMIT TO PLANNING & ZONING

PROJECT #:	23.048
CAD DWG FILE:	23048-4A-204.DWG
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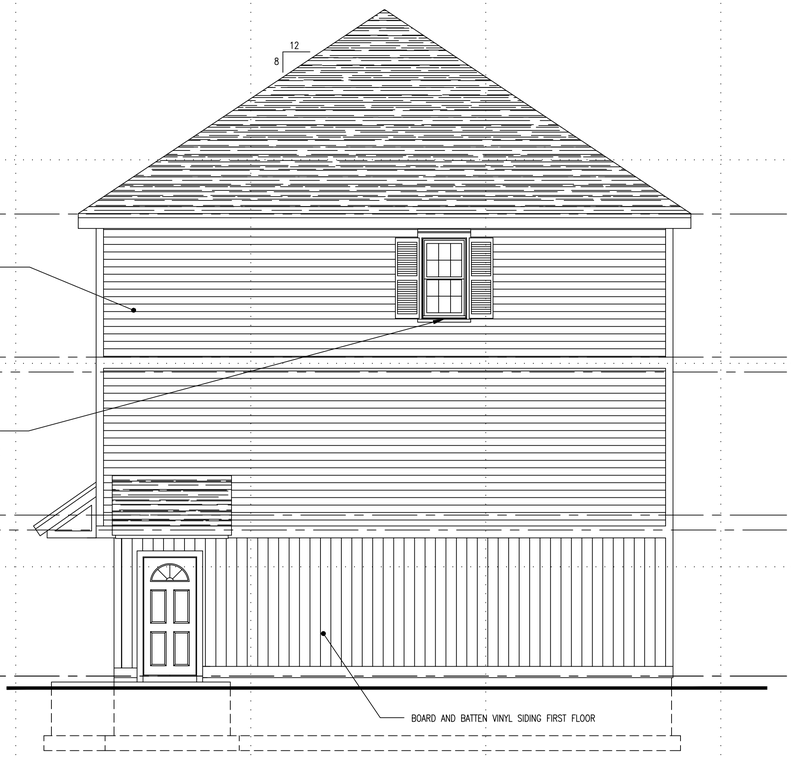
BUILDINGS B,E,F & G
EXTERIOR ELEVATIONS

A-204
SHEET ⊠ OF ⊠

A203



A1 FRONT ELEVATION
1/4"=1'-0"



A6 RIGHT-SIDE ELEVATION
1/4"=1'-0"

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MARK	DATE	DESCRIPTION
P&Z	09-03-2023	SUBMIT TO PLANNING & ZONING

PROJECT #:	23.048
CAD DWG FILE:	23048-4A-205.DWG
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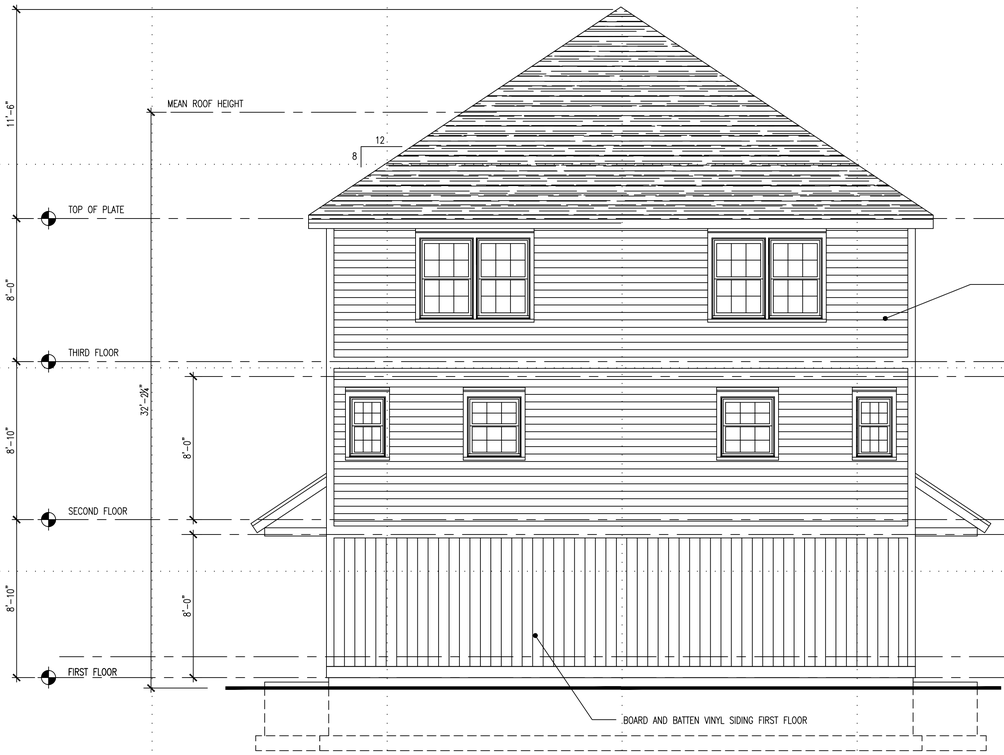
SHEET TITLE:

BUILDING – D
EXTERIOR ELEVATIONS

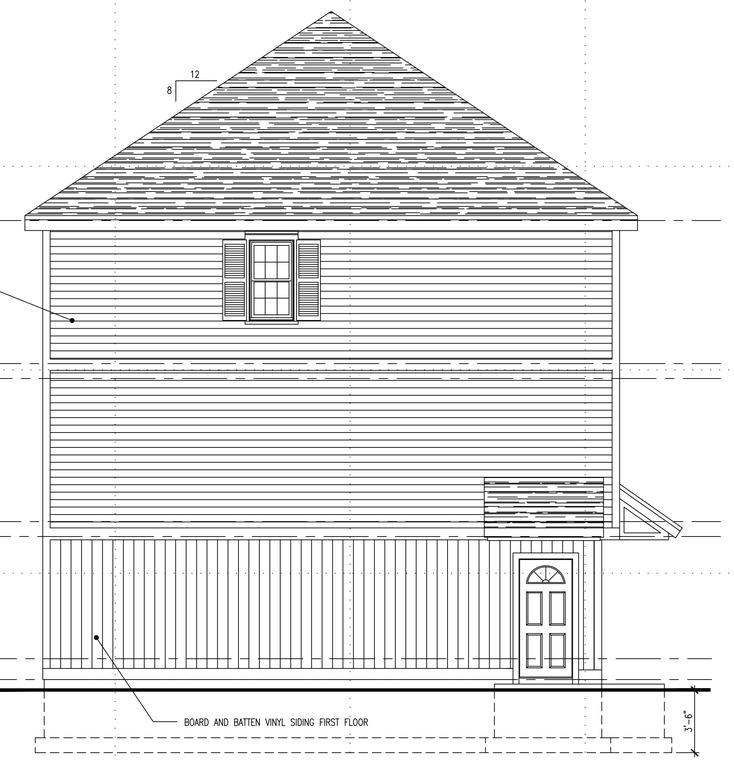
A-205

SHEET ⊠ OF ⊠

A204



A1 REAR ELEVATION
1/4"=1'-0"



A6 LEFT-SIDE ELEVATION
1/4"=1'-0"

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MARK	DATE	DESCRIPTION
PZ	09-03-2023	SUBMIT TO PLANNING & ZONING

PROJECT #:	23.048
CAD DWG FILE:	23048-4A-206.DWG
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SHEET TITLE:

BUILDING – D
EXTERIOR ELEVATIONS

A-206

SHEET ⊠ OF ⊠

A205