Planning and Zoning Department
Telephone (203) 452-5044
Fax (203) 452-5169

Town of Trumbull
CONNECTICUT

Town Hall
5866 Main Street
Trumbull, Connecticut 06611

PLANNING AND ZONING COMMISSION

To: MEMBERS OF THE PLANNING AND ZONING COMMISSION
RE: REGULAR MEETING – **WEDNESDAY, August 19, 2020**

The Planning and Zoning Commission will hold a Regular Meeting on Wednesday, August 19, 2020 at 7:00 p.m. via videoconferencing.

AGENDA

PUBLIC HEARING
7:00 P.M.

PLEDGE OF ALLEGIANCE

ROLL CALL

PUBLIC HEARING

SPECIAL PERMIT/SITE PLAN/ZONE CHANGE/OTHER

1. **5065 and 5085 Main Street:** Applicants, K&K Developers, Inc., Trumbull Shopping Center #2, LLC and WEA CT Houses LLC are requesting a Special Permit with a site plan to allow a proposed 260 unit multi-family residential community and associated site improvements pursuant to Art. II, Sec. 3.4, of the Town of Trumbull Zoning Regulations. **File #20-04**

REGULAR MEETING

ACCEPTANCE OF MINUTES
Acceptance of the Minutes from the May 20, 2020 Planning and Zoning Meeting

Acceptance of the Minutes from the July 15, 2020 Planning and Zoning Special Meeting

Join the meeting online:
https://zoom.us/j/92429540076?pwd=VUFqWTZ4Tm9PMXhZMjJjNTBqUDIzdz09
Webinar ID: 924 2954 0076
Password: 708270

Join by telephone:
(301) 715-8592 or (833) 548-0276 (Toll Free)
Webinar ID: 924 2954 0076

Dated at Trumbull, CT this 13th day of August, 2020.

By: Linda Finger, Clerk

Plans for the above listed application are on file for public inspection in the office of the Planning and Zoning Commission and online on the Town of Trumbull website. **

> ***Note for documents posted to the Town website*: Only new documents submitted since the July 15, 2020 Special Meeting are included and posted with this Agenda for the August 19, 2020 Regular Meeting. In order to view all documents submitted for the July 15, 2020 Special Meeting, please see the Agenda posted for that meeting.*

COMMISSION MEMBERS: PLEASE NOTIFY Linda Finger, Clerk, AT 203-452-5044 or lfinger@trumbull-ct.gov, IF YOU ARE UNABLE TO ATTEND.

Town of Fairfield

Sullivan Independence Hall
725 Old Post Road

Fairfield, Connecticut 06824
Engineering Department

(203) 256-3015
FAX (203) 256-3080

August 11, 2020
Trumbull Planning and Zoning Commission
Town Hall
5866 Main Street
Trumbull CT 06611

Re: 5065 and 5085 Main Street- "The Residences on Main"
260 unit proposal File # 20-04

Dear Mr. Garrity:

As you are aware, the Town of Trumbull received almost 8 inches of rain in a 5 hour period on September 26, 2018. This storm and associated runoff created severe flooding of structures and properties located downstream within the Rooster River Watershed. Other past events, which occurred in 2007, 2006, 2004 early 1990s, 1980s etc., resulted in property loss, damage to homes and even a death. The Town of Trumbull, Town of Fairfield and City of Bridgeport experiences flooding in the Rooster River Watershed during short intense storms or stalled systems that drop heavy rain over the long duration. Runoff from the upper reaches of the watershed contribute to downstream flooding, hence any additional runoff will cause adverse impacts but in the same token, providing detention or stormwater storage helps reduce flooding potential.

Unfortunately, major developments in Trumbull, Fairfield and Bridgeport were built prior to stormwater detention requirements and were built with no consideration for downstream flooding impacts. This includes the Trumbull Mall and surrounding areas.

The Town of Fairfield has hired Private Consulting Engineering Firm (Milone & MacBroom) to design detention sites for the Rooster River watershed, and to seek "other" detention opportunities in the watershed. The development of this site represents an excellent opportunity for detention and additional detention mitigation to help reduce but obviously not eliminate flooding downstream.

The Town of Fairfield Engineering Department comments consist of emphasizing the need for ADDITIONAL detention, no net runoff AND an improvement of drainage conditions being that these original developments lacked detention.

The Town of Fairfield Dept. agrees with Town of Trumbull concern of the concept of using high existing curve numbers to reflect 1964 conditions, we feel the existing conditions should be "grass" or "undeveloped".
The Town of Fairfield is concerned with current detention proposal and from cursory review it seems that additional detention is necessary.
The Town of Fairfield is hoping to work with the Developer/Applicant for reducing proposed runoff conditions and perhaps grant potential easement areas for future detention projects.

Detention for the upper reaches of the watershed benefit all property owners downstream in the Town of Trumbull, City of Bridgeport and Town of Fairfield. This is a regional problem and the Towns of Fairfield, Trumbull and City of Bridgeport have been working together to help alleviate this flooding problem and will continue to do so. An example of this cooperation is the designing of detention areas at the Fairchild Wheeler Golf Course owned by Bridgeport but located in the Town of Fairfield.

The Town will not issue any other unrelated comments for other aspects of the application/proposal just the hydrologic/drainage concerns as this proposal effects thousands of people.

Thank you so much for your time and efforts,

William Hurley

William Hurley P.E.
Engineering Manager

Stantec stated after the year 2000, 100 units results in 9.8 children. This means that the proposed 260 units would result in 25 students. Applying this calculation to all 340 Avalon units would result in 32 students. Currently there are approximately 150 students coming from Avalon.

Adjusting Stantec's calculations to reflect the reality of Avalon, the proposed 260 units would impact the Trumbull school systems by 115 students. Each student cost $17,000 to educate, resulting in an additional $2MUSD required to properly support these student, which excludes additional responsibilities and costs of our emergency departments. The projected total tax revenue increase is $1.4MUSD. Our budget will not be balanced.

Additionally, given the current global think, of the 260 units, are any of these promised to be affordable housing units? It would be proper to ensure that individuals and families from all social, economic, and political backgrounds are able to consider one of these as a potential home.

Lastly, this project is in close proximity to Bridgeport, and I would strongly encourage Trumbull to be good neighbors, and communicate with Bridgeport to gather their opinion and how it would impact their city.

In conclusion, I believe more time is required to perform a proper diligence to ensure the plan chosen is the best one for both the Mall and Trumbull.

Thank You,

Steve Choi
Jane Ryan '93
Madison Middle School '96
Trumbull High School '00

Hello
If we have questions in regards to tonight's meeting , do we address them here or on the zoom ?

1- If unable to fill at $2500. per 2 bedroom , will they allow sec 8 / low income housing ?
2- Why was Costco denied ???
That option encouraged jobs & Trumbull shopping , Stew Leonards would've been a nice option as well .
Both, in my opinion , would be better received & enhance the area at a limited hours of operation , utilization of space with less offense & convenience for Trumbull residents .
3. Sell to Sacred Heart or UCONN .... education remains key.
Affordable is essential for all to thrive.
Best of Luck
Alison Corda
Taxpayer & local nurse

TO: Trumbull Planning & Zoning Commission

FROM: Wesley A. Galloway
65 Bonnie View Drive
Trumbull

DATE: July 27, 2020

RE: Comments and concerns regarding the proposed Main Street apartment complex next to the Trumbull mall.

Having listened to the previous P&Z commission meeting, and a previous presentation by the developer, I have the following comments and concerns regarding the apartment complex as currently proposed:

- At a height of 55 feet (58?), the project is greatly out of character with the neighborhood. It will *overwhelm* the landscape. It will even exceed most of the mall's height. Notably, the developer has NOT presented street level renderings of the property, including berms and vegetation, as seen from street level on Main Street. Such renderings should be required, along with street-level photographs of housing on the other side of the street, so the P&Z commission can make a fully informed decision.

- There are several ways the height and visual impact of this proposed apartment complex could be reduced, including the following:

    - Foremost, the project should be limited to 3 stories, not 4! Some of the reduction in units could be made up for by putting apartments where garages are currently planned. Those currently planned garages could be built elsewhere in the parking area. If needed, a sixth building could be added.

    - Buildings 1, 2, 3, and 4 should be moved 25–30 feet *farther back and away* from Main Street than currently proposed. By so doing, the natural slope of the property will further reduce the height of the buildings as seen from Main Street. In addition, it will allow the gate to be moved farther back from the street and allow more cars to stack up at the gate without spilling out onto Main Street.

    - The width of the berm on Main Street should be increased to allow for additional plantings and preservation of more existing trees to further reduce the visual impact of the apartment complex.

    - The height of the berm on Main Street should be raised 6 feet or more, except where it would kill existing trees that are to be preserved, to further reduce the visual impact of the apartment complex. The soil for this could be obtained by lowering the grade of the property behind the berm, which would have the added benefit of further reducing the height of the complex as seen from Main Street.

    - The top floor of each building in the complex should be faced with a mansard style roof so that the top story appears to be part of the roof. This architectural trompe l'oeil will make the building appear shorter than its actual height. This is different than the

developer's currently proposed false mansard roof that starts *above* the top story. The pitch (and height) of the currently proposed false mansard roof could be reduced to blend it in with the true mansard roof facing the top story.

- In addition, the false mansard roof currently proposed to hide the rooftop AC units could be shortened if the developer were to install geothermal AC, which does not require rooftop equipment.

- The developer keeps referring to their target customer as being "Trumbull" empty nesters "looking to downsize," and unban professionals. They say their presentation is based on fact. What studies can they site that show the number of Trumbull empty nesters who would be willing to move in? Do those studies take into account the other developments currently being built out for that target group in Trumbull?

- Lastly, the developer claims that they plan to hold this apartment complex for decades. In the words of President Reagan, "Trust, but verify." The developer should be required to sign a restrictive covenant that the property must be fully owned by the developer and not be sold, transferred, or otherwise change ownership, in whole or in part, for 25 years or longer, except for sales of units as condominiums. That will ensure that they keep their word and don't dump the property when their projections turn out to be wrong.

On a completely different note, as part of future project approvals or zoning changes for the mall, the mall owner should be required to considered raising Horse Tavern brook above ground in the north parking lot, or even in the lower sections of the mall, to provide more green space and potential recreation. I believe that specific change would enhance the viability of the mall, and improve the town, going forward.

Thank you for your consideration of my comments.

William C. Maurer, PE, LS
Town Engineer

TOWN OF TRUMBULL
CONNECTICUT

Town Hall
5866 Main Street
Trumbull, Connecticut 06611
Phone: 203.452.5050
Fax: 203.452.5061

Applicant: K&K Developers, Inc **Project:** 5085 Main St	**TOWN OF TRUMBULL** **ENGINEERING DEPARTMENT** **REVIEW COMMENTS**	**Designer:** BL Companies 355 Research Prkwy Meriden, CT 06450	
		Review # 1	**Date: 6/29/2020**

Based on the review of the proposed Site Plans and Drainage Report, e-submitted on 5/12/2020, the Engineering Department offers the following comments (**please provide written responses in the space below**):

PROJECT COMMENTS

Comment Number	Page or Sheet #	Review Comments – General Comments	Designer Response
1		Engineer's seal & signature must be placed on all plans & drainage report submitted to the Town.	CT Licensed engineer seal and signature has been added to plans and drainage report. See attached.
2	Drainage Report	While impervious cover calculations are accurate based on 1964 aerial, they do not provide a true baseline. Proposed stormwater system would not be able to safely accommodate the additional run-off from the proposed development. To assure no negative impact on the subject and neighboring properties, please show no increase in run-off compared to the current site conditions.	The pre-developement stormwater model has been revised based on current conditions, not the 1964 aerial. The stormwater system and calculations have been revised to show no increase in peak rate of runoff for post-development conditions. See revised report.
3		Test pits must be to the bottom of proposed stormwater system. Data for system P-2 must be submitted prior to system installation.	The Applicant will provide for test pits to be performed prior to system installation and notify the Town Engineer's office of the results.
4	Site Plan	Though curb is proposed, a guardrail is also recommended along the western & northern sides of the parking lot and roadway, as well as the southern parking lot.	A wooden guardrail has been added to the perimeter of the parking areas where warranted. See revised Site plans.

Comment Number	Page or Sheet #	Review Comments – General Comments	Designer Response
5	Drainage Report	Consider upsizing pipe runs that do not have capacity at 10-yr storm. Please provide pipe capacity data for 25-yr storm event.	The hydraulic grade line for the 10-yr storm is contained within the system. See attached pipe capacity report for the 25-year event.
6	Site Plan	Please show a cross-section of the proposed detention basin P-3.	See attached cross-sections of Basin P-3, sheet EXH-1.
7	Site Plan	The outlet to the Detention basin P-3 should be relocated closer to the eastern portion of the basin.	The outlet from Basin P-3 has been left alone, however, the inlet has been shifted east to reduce the potential for short-circuiting.
8	Drainage Report/ SP	Drainage report says all CBs have a min of 4' sump, detail shows 2'. Please clarify.	Catch basins will have a 2-ft sump in accordance with Town standard detail.
9	Drainage Report	MS4 calculations appear incomplete. Please tabulate required MS4 volume and provided capacity.	MS4 calculations have been revised to include volume and capacity and are provided in the storm report. See attached report.
10		The state of Connecticut General Permit for the Discharge of Stormwater and Dewatering Wastewaters from construction activities is required	The Applicant will submit to CTDEEP for a General Permit prior to the start of construction.
11		The inspection / clean-out locations for each storm system must be depicted on the plan.	Inspection/clean-out locations have been added to the Grading and Drainage Plans. See attached plans.
12		Building Permit is required for walls over 3' high.	The Applicant will submit signed & sealed plans for a building permit for all walls over 3-ft high.
13		Drainage easement from the abutting property is required prior to CO.	The Applicant will acquire a drainage easement from abutting property as required, and file on the land records.
14	Site plan	Depict footing drains on the plan.	Footing drains have been added to the Grading and Drainage plan. See attached plans.
15	EC-1	Provide slope stabilization along east side of the development.	Slope stabilization blanket has been added along east side of the development. See revised Erosion Control plans.
16	EC-2	Revise construction schedule.	Construction schedule has been revised. See sheet EC-2.
17	Site plan	Provide name & phone number for person assigned the responsibility for implementing and maintaining erosion and sediment controls.	Name and number of responsible party has been added to erosion control notes. See plan EC-2.
18		Provide a bond estimate for all soil erosion controls in the amount agreeable to the Town Engineer. Bond must be posted prior to any site disturbance and will be retained for one year after completion.	See attached soil erosion control bond estimate. The Applicant will post bond prior to site disturbance.
19		Provide 3rd Party site monitor for erosion controls during construction. Name and qualifications must be submitted for approval prior to commencement.	A third party site monitor for erosion controls during construction will be provided, and identified prior to commencement.

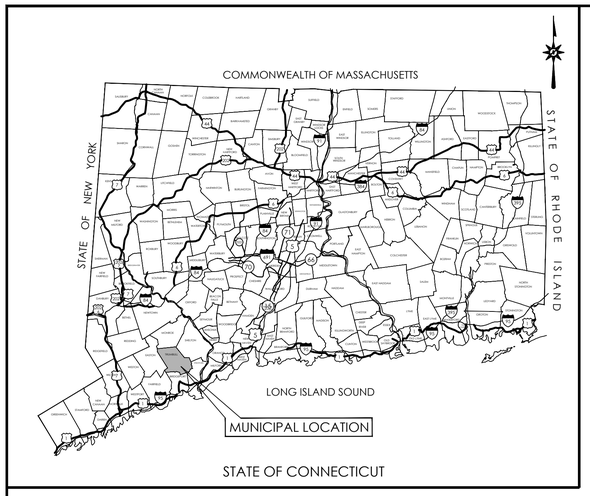
Comment Number	Page or Sheet #	Review Comments – General Comments	Designer Response
20		No debris & stumps to be buried on site.	Debris and stumps will be removed from the site and not buried on site.
21		No pool water shall be discharged into any wetland, Town storm or sanitary system.	No pool water will be discharged into a wetland or storm drain. Discharge into a sanitary system is subject to a CTDEEP General Permit.
22	Site plan	Reference to the storm water management maintenance plan and schedule must be included on the plans.	A note has been added to the General Notes Plan to reference the storm water management plan and schedule. See sheet GN-1, Note 117.
23		A Mylar of the as-built site plan showing the location of the detention basin must be filed in the Town of Trumbull land records.	An as-built mylar will be prepared and filed following construction.
24		Maintenance plan for the proposed detention pond must be provided on the Mylar.	The detention pond as-built mylar will include the maintenance plan.
25		The Town has abandoned existing sanitary sewer and stormwater infrastructure. Any maintenance responsibility to be assumed by the property owner.	The Applicant will assume maintenance responsibility for the abandoned storm and sanitary infrastructure that serves the proposed development.
26		As part of the Engineering review fee, please provide an estimate for the proposed stormwater infrastructure. Payable prior to our sign-off on the building permit application.	An estimate for the proposed stormwater infrastructure will be provided prior to Building Permit submission as requested.
27		Provide a copy of State Encroachment Approval.	A copy of the OSTA and CTDOT Encroachment Permit approval will be provided to the engineering office.
28		A certification letter and as-built plan will be required upon project completion.	A certification letter and as-built plan will be submitted to the engineering office upon project completion.

The Engineering Department may issue further comments based on the responses to the above mentioned items and/or design modifications. If you have any questions or concerns please contact us.

Sincerely,

William C. Maurer, PE, LS
Town Engineer

Tatiana Solovey, PE
Assistant Town Engineer

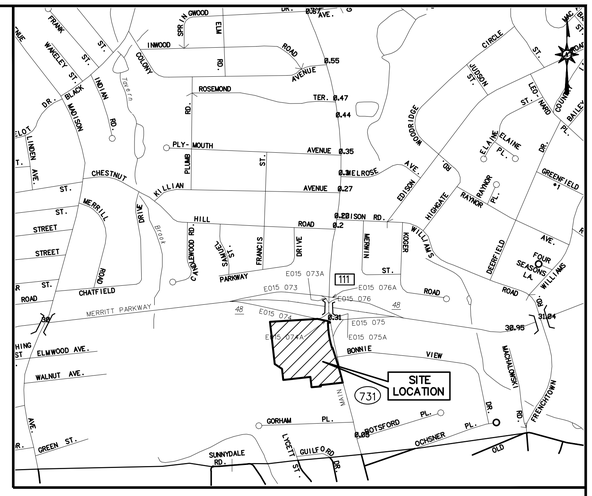


LOCATION MAP

N.T.S.

THE RESIDENCES AT MAIN

THE RESIDENCES AT MAIN
TRUMBULL | CONNECTICUT



VICINITY MAP

SCALE: 1"=800'

5085 MAIN STREET, LOT E11-70, TRUMBULL, CONNECTICUT

PREPARED FOR:

K & K DEVELOPERS, INC.
C/O GARDEN HOMES DEVELOPMENT
820 MORRIS TURNPIKE,
NEW JERSEY 07078

Garden Homes

ROSE EQUITIES
Owner-Builders since 1949

MINNO WASKO
ARCHITECTS AND PLANNERS
80 LAMBERT LANE, SUITE 100, LAWRENCEVILLE, NEW JERSEY 08530 MINNOWASKO.COM

GEI Consultants

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GD-3	STORMWATER POND CROSS SECTION
SU-1	SITE UTILITIES PLAN
EC-1	SEDIMENT AND EROSION CONTROL PLAN
EC-2	SEDIMENT AND EROSION CONTROL NOTES
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LL-2	LANDSCAPE NOTES AND DETAILS
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DN-1, 2, 3, 4, 5, 6, 7, 8	DETAIL SHEETS

PREPARED BY:

BL Companies
ARCHITECTURE
ENGINEERING
ENVIRONMENTAL
LAND SURVEYING

355 RESEARCH PARKWAY
MERIDEN, CONNECTICUT 06450
(203) 630-1406
(203) 630-2615 Fax

NOT FOR CONSTRUCTION
FOR PERMITTING PURPOSES ONLY

DEVELOPER:

K & K DEVELOPERS, INC.
820 MORRIS TURNPIKE
SHORT HILLS, NJ 07078

OWNER:

WEA CT HOUSES, LLC
2730 UNIVERSITY BLVD., SUITE 900
WHEATON, MD 20902

DATES

ISSUE DATE: MAY 28, 2020
REVISION: AUGUST 10, 2020

CAD FILE: CV180051301
XREF(S): XXXXXXXX

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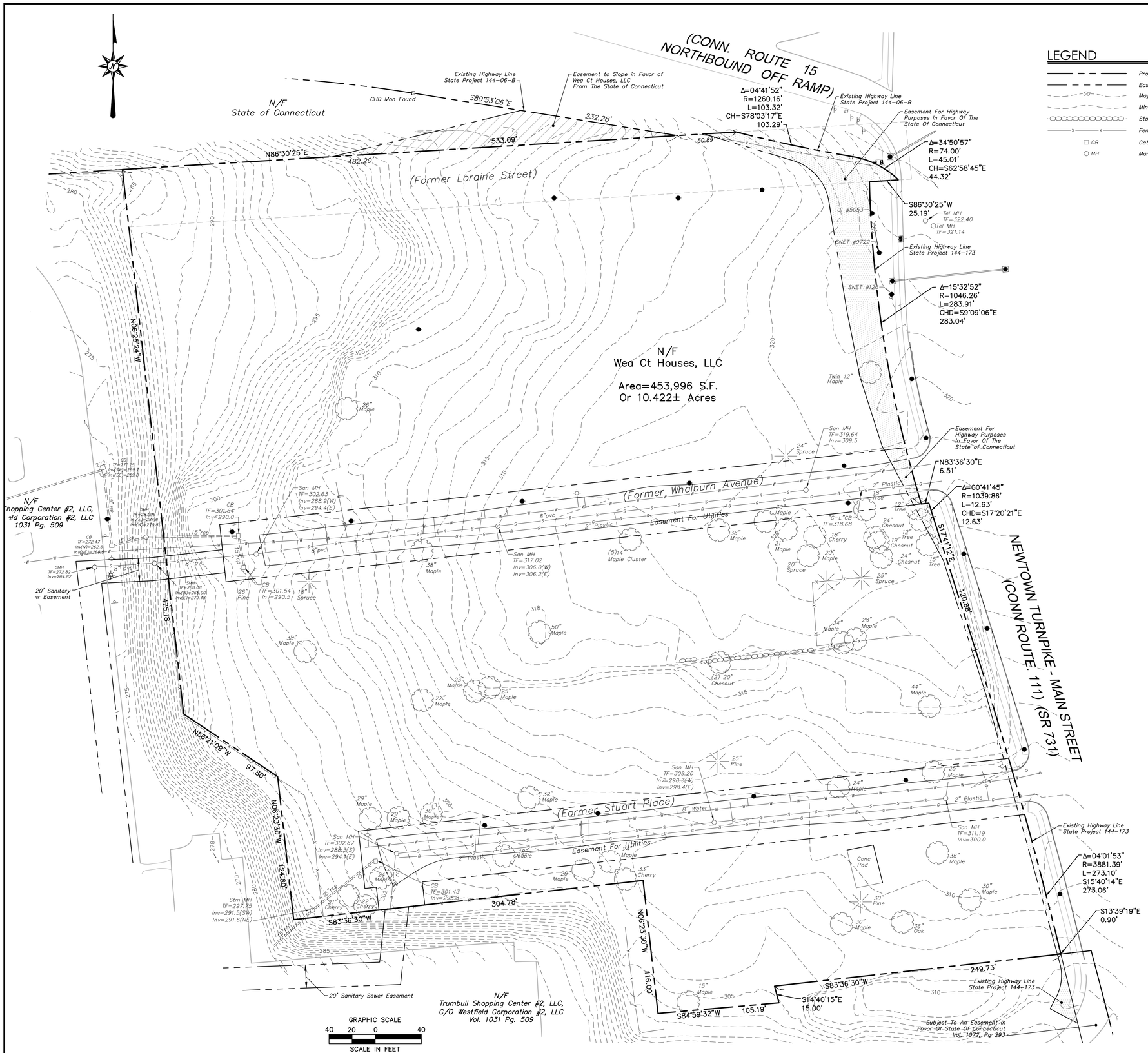
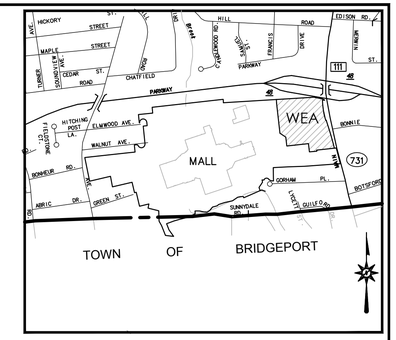


LEGEND

- Property Line
- Easement Line
- Major Contour
- Minor Contour
- Stone Wall
- Fence
- CB — Catch Basin
- MH — Manhole



LOCATION MAP

NOT TO SCALE

GENERAL NOTES

1. A) THIS MAP HAS BEEN PREPARED IN ACCORDANCE WITH THE REGULATIONS OF CONNECTICUT STATE AGENCIES, SECTIONS 20–300b–1 THROUGH 20–300b–20 AND THE "STANDARDS AND SUGGESTED METHODS AND PROCEDURES FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" PREPARED AND ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. AUGUST 29, 2019.

   B) THIS PLAN CONFORMS TO HORIZONTAL ACCURACY CLASS A–2 AND TOPOGRAPHIC ACCURACY CLASS T–2 AND T–3 (AERIAL TOPOGRAPHY).

   C) BOUNDARY DETERMINATION IS BASED UPON A RESURVEY.

   D) THE TYPE OF SURVEY PERFORMED IS A PROPERTY/TOPOGRAPHIC SURVEY AND IS INTENDED TO DEPICT THE POSITION OF THE BOUNDARIES WITH RESPECT TO MONUMENTATION FOUND, STRUCTURES, EASEMENTS, ENCROACHMENTS, VISIBLE UTILITIES, ROADWAYS AND CONTOURS.

2. NORTH ARROW AND BEARINGS REFER TO NAD 83 UTILIZING STATION 607X (USC&GS AND STATE SURVEY BRONZE DISK) WITH THE PUBLISHED COORDINATE VALUES OF: N:646207.592; E:870559.821, AND PUBLISHED BASELINE CONTROL POINTS BC–1, BC–2 & BC–3 OF THE ROUTE 111/15 INTERCHANGE PROJECT #144–173, DATED 2000..

3. ELEVATIONS REFER TO THE NORTH AMERICAN DATUM OF 1929 (NGVD 29).

4. PARCEL IS LOCATED IN A FLOOD AREA "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% CHANCE FLOODPLAIN) AS DEPICTED ON F.I.R.M. COMMUNITY PANEL NO. 09001C0426F PANEL 426 OF 626 EFFECTIVE DATE JUNE 18, 2010.

5. THE UNDERGROUND UTILITIES DEPICTED HAVE BEEN PLOTTED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES DEPICTED COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES DEPICTED ARE IN THE EXACT LOCATION INDICATED THOUGH THEY ARE PLOTTED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY EXPOSED THE UNDERGROUND UTILITIES. PER CONNECTICUT STATE LAW THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF EXCAVATION. CALL BEFORE YOU DIG 1–800–922–4455.

6. THE TOWN OF TRUMBULL HAS ABANDONED ITS INTEREST IN AND DISCONTINUED ITS PUBLIC USE OF PORTIONS OF STUART PLACE AND LORRAINE STREET. SEE TRUMBULL TOWN COUNCIL RESOLUTION TC25–197, EFFECTIVE 10/7/2015, REFERENCE #4549.

7. THE TOWN OF TRUMBULL HAS ABANDONED ITS INTEREST IN AND DISCONTINUED ITS PUBLIC USE OF WHALBURN AVENUE. SEE VOLUME 1723 AT PAGE 424.

8. THE TOWN OF TRUMBULL HAS ABANDONED ITS INTEREST IN AND DISCONTINUED ITS PUBLIC USE OF STUART PLACE. SEE VOLUME 1701 AT PAGE 675.

MAP REFERENCES

A. "LOT CONSOLIDATION PLAN, LAND OF WEA CT HOUSES, LLC, NEWTOWN TURNPIKE – MAIN STREET (CONN ROUTE 111) TRUMBULL, CONNECTICUT" SCALE 1"=50', DATE 09/11/2019, SHEET NO. BS–1 PREPARED BY BL COMPANIES, MERIDEN, CONNECTICUT.

B. "BOUNDARY SURVEY MAP, LAND OF TRUMBULL SHOPPING CENTER #2, LLC, 5065 MAIN STREET (SR 731), TRUMBULL, CONNECTICUT" SCALE 1"=100', DATE 08/21/2019, SHEET NO. BS–2 PREPARED BY BL COMPANIES, MERIDEN, CONNECTICUT.

STATE OF CONNECTICUT · PATRICK J. CORLESS, JR. · No. 70015 · LICENSED LAND SURVEYOR

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

5/27/2020

PATRICK J. CORLESS, JR. L.S. #70015

NO CERTIFICATION IS EXPRESSED OR IMPLIED UNLESS THIS MAP BEARS THE ORIGINAL SIGNATURE AND EMBOSSED SEAL OF THE ABOVE NAMED LAND SURVEYOR.

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

LAND OF
WEA CT HOUSES, LLC
NEWTOWN TURNPIKE - MAIN STREET
(CONN ROUTE 111)
TRUMBULL, CONNECTICUT

No.	Date	Desc.
REVISIONS		

Surveyed	J.C./K.J.
Drawn	JS.
Reviewed	PJC
Scale	1"=40'
Project No.	1800513
Date	01/22/2020
Field Book	536
CAD File:	EX180051301

Title
BOUNDARY/ TOPOGRAPHIC SURVEY

Sheet No.
EX-1

May 27, 2020 4:56pm pcorless G:_JOBS\18-0A\1800513\DWG\EX180051301.dwg
Layout: EX-1 24X36 40sc

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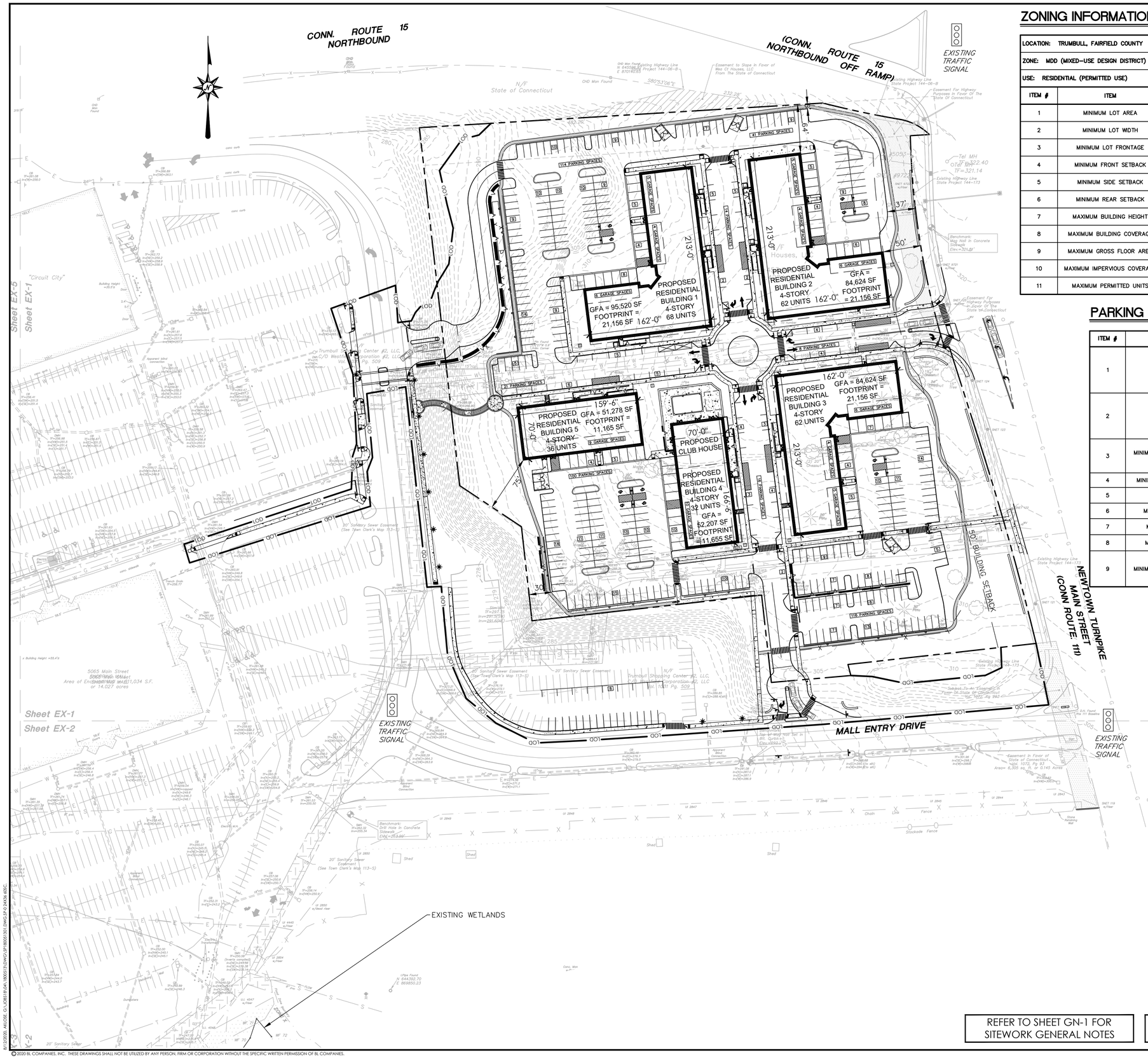

ZONING INFORMATION

LOCATION: TRUMBULL, FAIRFIELD COUNTY

ZONE: MDD (MIXED–USE DESIGN DISTRICT)

USE: RESIDENTIAL (PERMITTED USE)

ITEM #	ITEM	REQUIREMENTS	PROPOSED – MALL	PROPOSED – RESID.	VARIANCE
1	MINIMUM LOT AREA	7 ACRES	3,255,551 S.F. (77.737 AC.)	453,996 S.F. (10.422 AC.)	NO
2	MINIMUM LOT WIDTH	NONE REQUIRED	1640 FEET	643 FEET	NO
3	MINIMUM LOT FRONTAGE	NONE REQUIRED	226.97 FT (MAIN)	697 FEET (MAIN)	NO
4	MINIMUM FRONT SETBACK	50 FEET	1001 FT (MADISON)	50 FEET	NO
5	MINIMUM SIDE SETBACK	0 FEET	52.7 FT (LAF)	64 FEET	NO
6	MINIMUM REAR SETBACK	0 FEET	NONE	75 FEET	NO
7	MAXIMUM BUILDING HEIGHT	65 FEET	< 65 FEET	< 65 FEET	NO
8	MAXIMUM BUILDING COVERAGE	50 PERCENT	20.96 PERCENT	19 PERCENT	NO
9	MAXIMUM GROSS FLOOR AREA	100 PERCENT	42.92 PERCENT	81.1 PERCENT	NO
10	MAXIMUM IMPERVIOUS COVERAGE	85 PERCENT	< 85 PERCENT	58 PERCENT	NO
11	MAXIMUM PERMITTED UNITS	260 UNITS	0	260 UNITS	NO

PARKING INFORMATION

ITEM #	ITEM	REQUIREMENTS	PROPOSED	VARIANCE
1	BUILDING SIZE	NONE REQUIRED	RES. – 368,253 SF MALL–1,089,564 SF	NO
2	PARKING REQUIRED	MULTI–FAMILY HOMES: 1.9 SPACES PER UNIT BEDROOMS = 260 260 X 1.9 = 494 SPACES RETAIL: 1,089,564 / 250=4,359 SPACES	RESIDENTIAL: 428 SURFACE PARKING 64 GARAGE PARKING TOTAL = 493 SPACES RETAIL: 4,408 SPACES	NO
3	MINIMUM HANDICAPPED PARKING SPACES REQUIRED	9 TOTAL ACCESSIBLE SPACES (MINIMUM OF 2 VAN ACCESSIBLE)	TOTAL = 10 SPACES	NO
4	MINIMUM PARKING DIMENSIONS	9 FEET X 18 FEET	9 FEET X 18 FEET	NO
5	MINIMUM AISLE WIDTH	24 FEET – 2–WAY 12 FEET – 1–WAY	24 FEET – 2–WAY	NO
6	MINIMUM FRONT SETBACK	NONE	37 FEET	NO
7	MINIMUM SIDE SETBACK	NONE	6 FEET	NO
8	MINIMUM REAR SETBACK	NONE	30 FEET	NO
9	MINIMUM INTERIOR LANDSCAPING	ONE TREE PER 20 OFF–STREET PARKING SPACES NOT LOCATED WITHIN A PARKING STRUCTURE, 429 SPACES (NOT INCLUDING GARAGE SPACES) = 22 TREES	> 22 INTERIOR TREES	NO

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
60 30 0 60
SCALE IN FEET

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ROSE EQUITIES
Owner-Builders since 1949

STATE OF CONNECTICUT
CHRISTOPHER B. GAUDIO
No. 27798
LICENSED
PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
K & K DEVELOPERS, INC.
5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	1"=60'
Project No.	1800513
Date	05/28/2020
CAD File: SP180051301	

Title

OVERALL SITE PLAN

Sheet No.

SP-0

Xref (s): : BD180051301 : XC180051301 : XY180051302 : XG180051302 : XX05C13801 : XY180051301 : XC180051302 : XR180051302 : XI180051302

BY:ZP0006, AKCORE, GV:\JOBS\RUSA\180513\DWGS\SP180513D1.DWG,SP-0,2-24X36.ABC

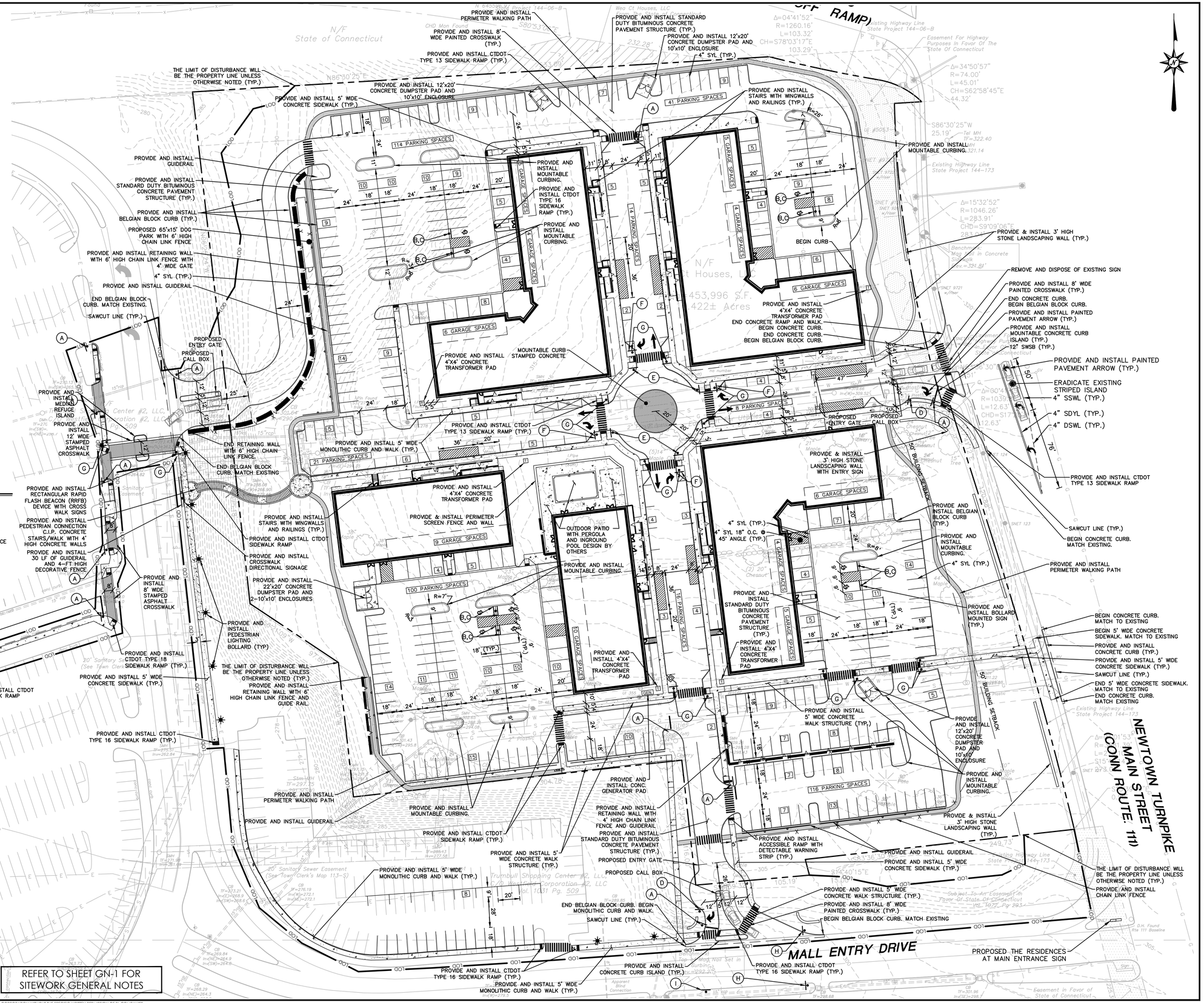
SIGN LEGEND

SIGN NO.	CT-DOT NO. OR MUTCD NO.	LEGEND
A	31-0552	STOP 30"
B	31-0629	HANDICAPPED PARKING FINE AND PENALTY MAXIMUM
C	31-0648	VAN ACCESSIBLE
D	31-1619	NO LEFT TURN — BACKGROUND – SILVER; LEGEND – BLACK; CIRCLE & DIAGONAL – RED
E	31-0523	YIELD — BACKGROUND – SILVER; LEGEND – BLACK
F	41-4672 41-4670	TRAFFIC CIRCLE
G	41-4811	
H	31-1109	DO NOT ENTER — BACKGROUND – SILVER; LEGEND – SILVER; SIGN FACE – RED
I	31-1177	(R) ONE WAY

NOTE: HANDICAPPED SIGNS TO BE INSTALLED IN PIPE BOLLARDS (SEE DETAIL). ALL HANDICAP SIGNAGE TO CONFORM TO LATEST BUILDING CODE.

SITE LEGEND

- LOD — LIMIT OF DISTURBANCE
- PROPOSED CURB
- PROPOSED RETAINING WALL
- X — PROPOSED CHAIN LINK FENCE
- PROPOSED GUIDE RAIL
- PROPOSED CONCRETE
- PROPOSED SAWCUT LINE



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REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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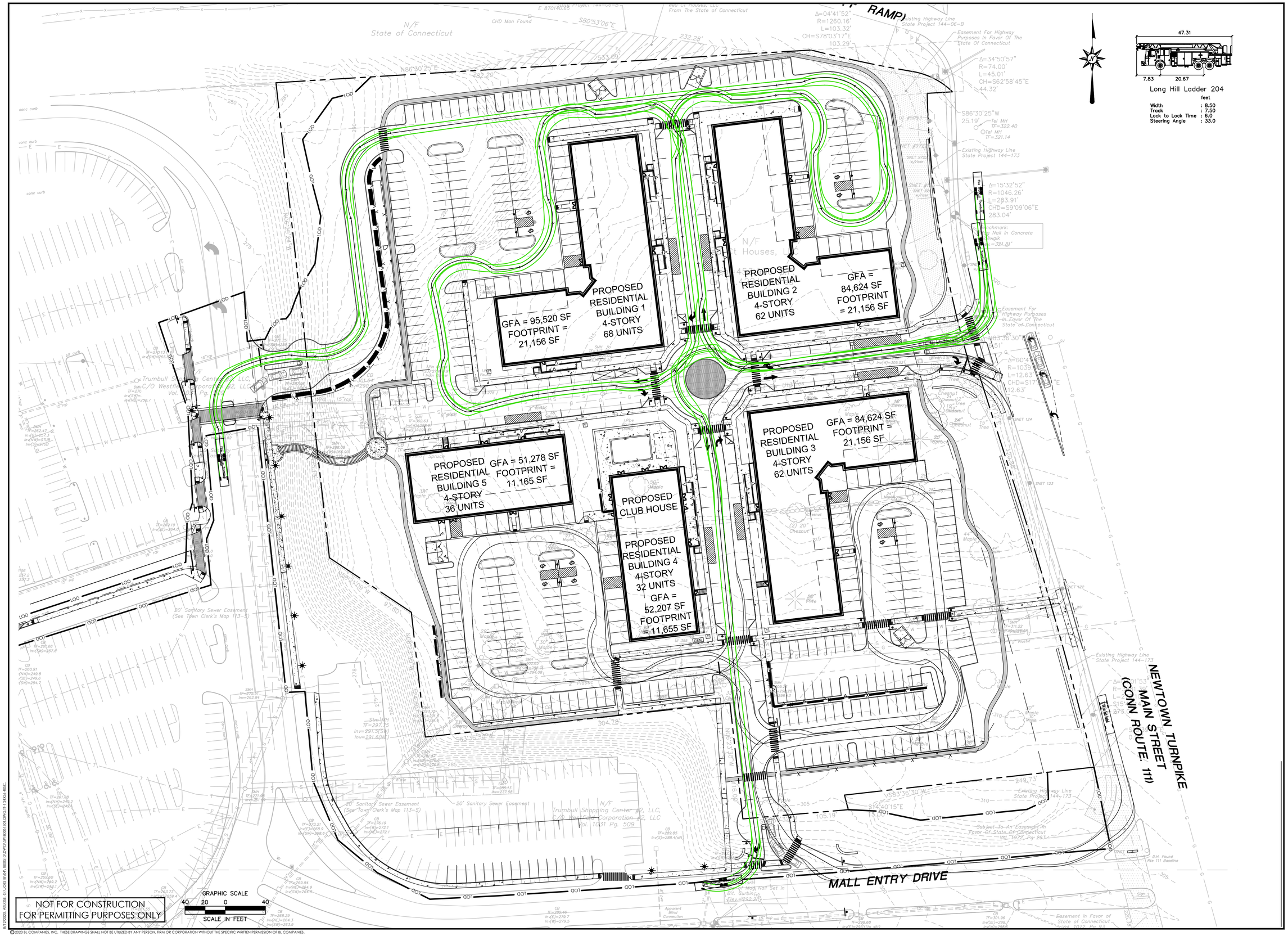
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	1800513
Date	05/28/2020
CAD File: SP180051301	

Title
SITE PLAN

Sheet No.
SP-1

Xref (s): BD180051301 ; XT180051301 ; XC180051301 ; XY0CC13380 ; XV180051302 ; XL180051301



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Drawn	J.S.D.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	1800513
Date	05/28/2020
CAD File: SP180051301	

Title

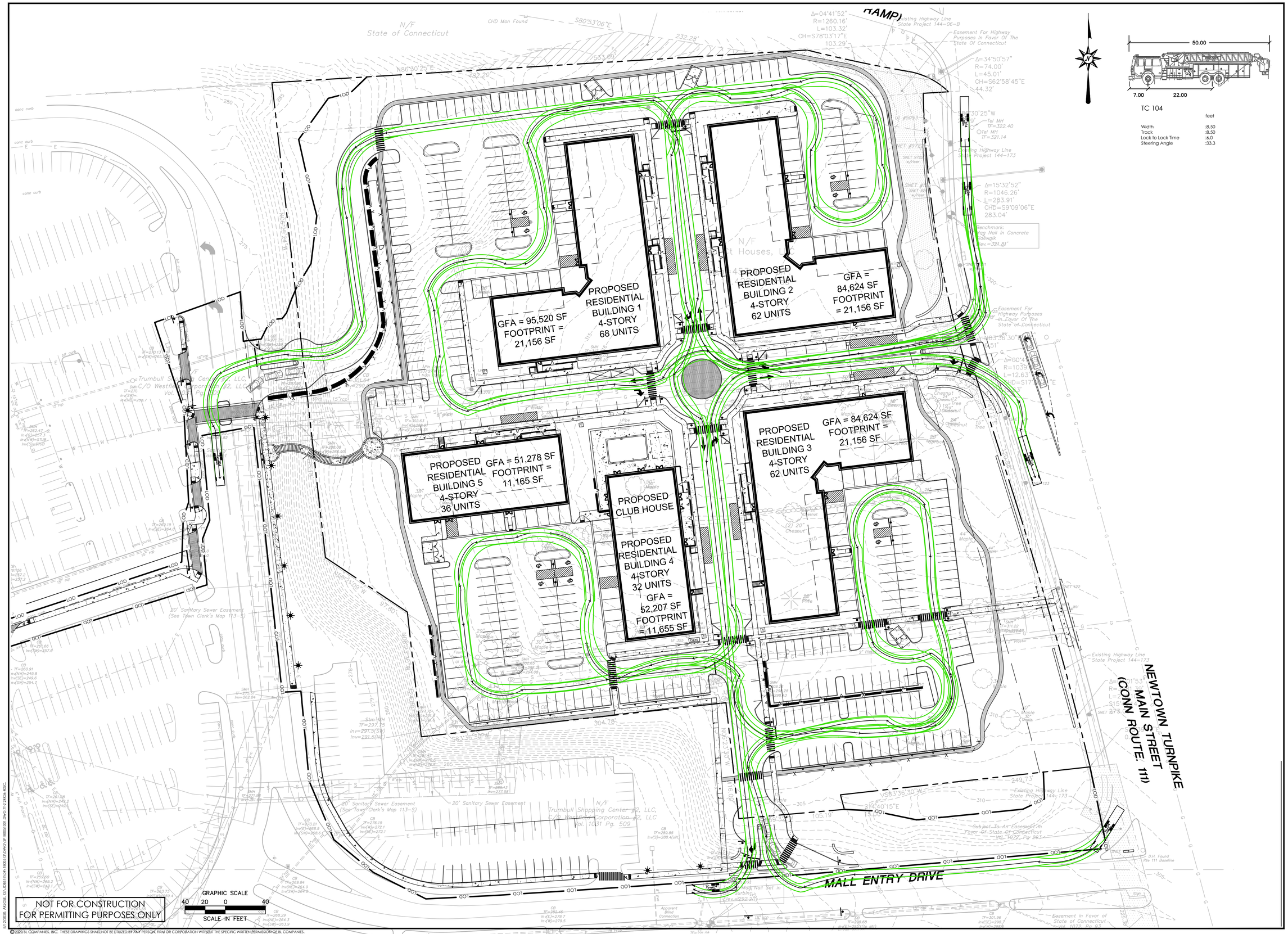
TRUCK TURNING PLAN

Sheet No.

TT-1

Xref (s) : BD180051301 ; XY180051301 ; XC180051301 ; XY05C133801 ; XY180051302 ; XC180051302 ; XI180051301

8/12/2020, AKCORE, G:\CADD\BURA\180051\SYDWG\SP180051301.DWG\TT-1 24X36 40SC



TC 104

	feet
Width	:8.50
Track	:8.50
Lock to Lock Time	:6.0
Steering Angle	:33.3

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No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

REVISIONS

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Drawn	J.S.D.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	1800513
Date	05/28/2020
CAD File: SP180051301	

Title

TRUCK TURNING PLAN

Sheet No.

TT-2

Xref (s) : BD180051301 : XC180051301 : XY180051301 : XY05C13380T : XY180051302 : XC180051302 : XI180051301

8/10/2020, AKCORE, G:\CADD\BLRGA\180051\ENGDWG\SP180051301.DWG\TT-2.DWG4, 40C

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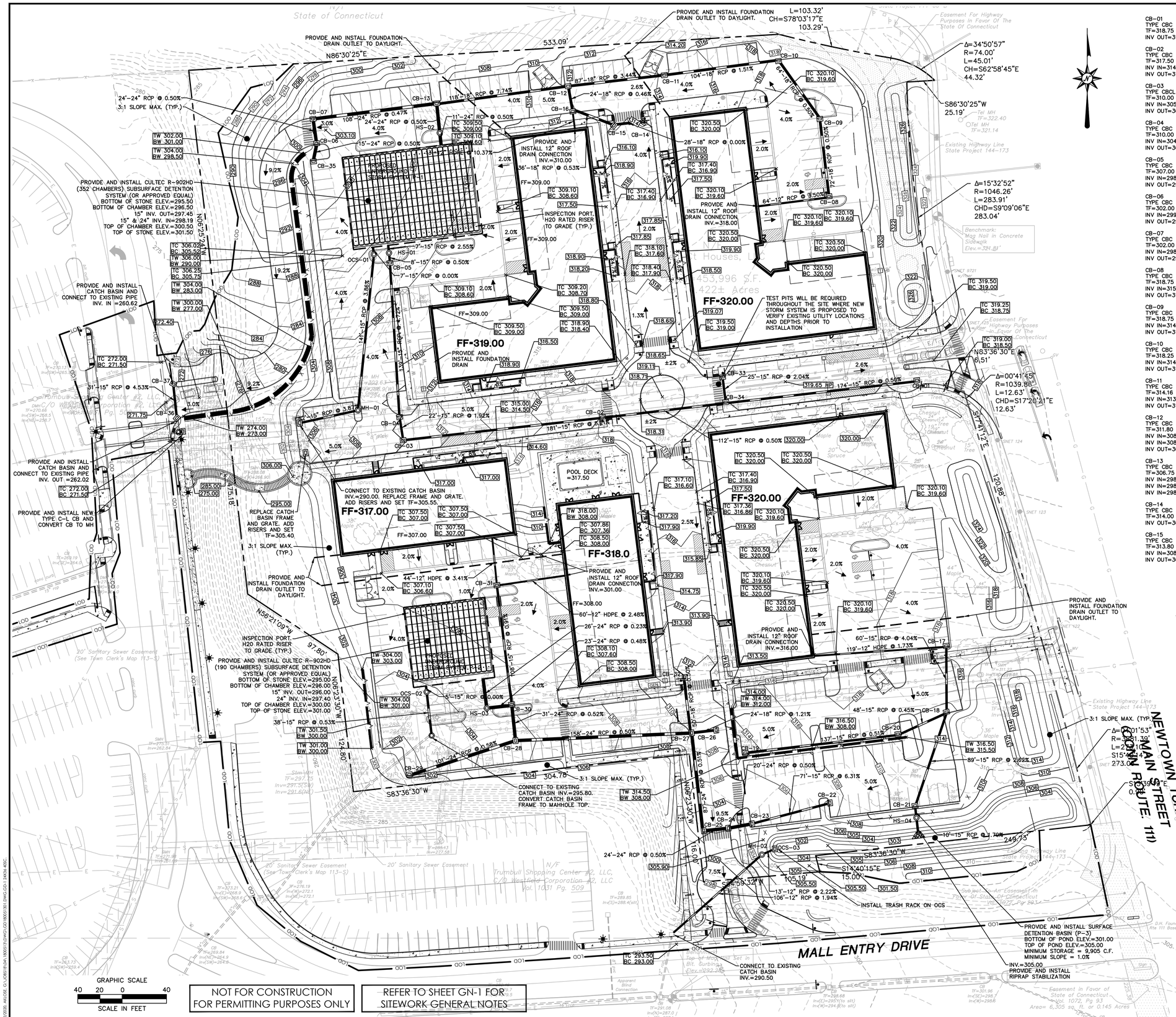

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REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

CB-01 TYPE CBC TF=318.75 INV OUT=316.25(W)	CB-16 TYPE CBC TF=311.80 INV IN=308.11(E) INV IN=308.61(S) INV OUT=308.11(N)
CB-02 TYPE CBC TF=317.50 INV IN=314.82(E) INV OUT=314.82(W)	CB-17 TYPE CBC TF=315.75 INV IN=313.93(W) INV OUT=313.00(S)
CB-03 TYPE CBCL TF=310.00 INV IN=305.40(E) INV OUT=305.40(N)	CB-18 TYPE CBC TF=316.00 INV IN=310.59(SW) INV IN=310.59(N) INV OUT=310.59(S)
CB-04 TYPE CBC TF=310.00 INV IN=304.98(S) INV OUT=304.98(N)	CB-19 TYPE CBC TF=313.75 INV OUT=311.50(E)
CB-05 TYPE CBC TF=307.00 INV IN=298.41(S) INV OUT=298.41(N)	CB-20 TYPE CBC TF=315.75 INV IN=310.81(W) INV OUT=310.81(NE)
CB-06 TYPE CBC TF=302.00 INV IN=299.00(S) INV OUT=299.00(N)	CB-21 TYPE CBCL TF=310.19 INV IN=308.25(N) INV OUT=306.00(S)
CB-07 TYPE CBC TF=302.00 INV IN=298.88(S) INV OUT=298.88(E)	CB-22 TYPE CBC TF=307.50 INV OUT=304.50(W)
CB-08 TYPE CBC TF=318.75 INV IN=315.75(W) INV OUT=315.25(N)	CB-23 (1) TYPE CBC TF=304.50
CB-09 TYPE CBC TF=318.75 INV IN=314.89(S) INV OUT=314.89(NW)	CB-23 TYPE CBC TF=305.81 INV IN=300.00(E) INV OUT=299.12(W)
CB-10 TYPE CBC TF=318.25 INV IN=314.57(SE) INV OUT=314.57(W)	CB-24 TYPE CBC TF=302.06 INV IN=299.02(E) INV OUT=299.02(W)
CB-11 TYPE CBC TF=314.16 INV IN=313.00(E) INV OUT=311.00(W)	CB-25 TYPE CBC TF=302.06 INV IN=298.90(E) INV OUT=298.90(N)
CB-12 TYPE CBC TF=311.80 INV IN=308.00(E) INV IN=308.00(S) INV OUT=308.00(W)	CB-26 TYPE CBC TF=309.30 INV OUT=299.25(W)
CB-13 TYPE CBC TF=306.75 INV IN=298.37(W) INV IN=298.87(E) INV IN=298.25(S)	CB-27 TYPE CBC TF=309.30 INV IN=298.96(E) INV IN=298.46(S) INV IN=298.96(N) INV OUT=298.46(W)
CB-14 TYPE CBC TF=314.00 INV OUT=308.30(W)	CB-28 TYPE CBCL TF=305.50 INV IN=297.67(W) INV IN=297.67(E) INV OUT=297.67(N)
CB-15 TYPE CBC TF=313.80 INV IN=308.30(E) INV OUT=308.30(W)	CB-29 TYPE CBC TF=301.50 INV OUT=298.25(E)
CB-30 TYPE CBC TF=306.00 INV IN=298.26(N) INV IN=297.51(S) INV OUT=297.51(W)	OCS-01 60" DIA. MH TF=305.90 INV IN=297.45(N) INV OUT=297.45(S)
CB-31 TYPE CBC TF=306.50 INV IN=299.50(N) INV IN=299.50(E) INV OUT=299.25(S)	OCS-02 60" DIA. MH TF=303.80 INV IN=296.00(N) INV OUT=296.00(S)
CB-32 TYPE CBC TF=311.60 INV OUT=299.21(S)	OCS-03 TYPE CBCL TF=304.75 INV OUT=301.00(SW)
CB-33 TYPE CBC TF=318.50 INV OUT=315.88(S)	
CB-34 TYPE CBC TF=318.50 INV IN=315.38(E) INV IN=315.38(N) INV OUT=315.38(W)	
CB-35 TYPE CBC TF=303.00 INV OUT=299.07(N)	
CB-36 TYPE CBCL TF=271.75 INV OUT=262.02(N)	
CB-37 TYPE CBCL TF=271.75 INV IN=260.62(S)	
HS-01 60" DIA. MH TF=307.50 INV IN=298.37(S) INV OUT=298.37(N)	
HS-02 60" DIA. MH TF=307.40 INV OUT=298.37(N) INV OUT=298.25(S)	
HS-03 (1) 60" DIA. MH TF=305.00	
HS-03 60" DIA. MH TF=305.00 INV IN=297.40(E) INV OUT=297.40(N)	
HS-04 48" DIA. MH TF=310.00 INV IN=305.83(N) INV OUT=305.83(S)	
MH-01 60" DIA. MH TF=308.50 INV IN=292.00(N) INV OUT=292.00(W)	
MH-02 60" DIA. MH TF=305.75 INV IN=300.72(NE) INV OUT=292.56(SW)	

GRADING AND DRAINAGE LEGEND

PROPERTY LINE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
STORM LINE	
CATCH BASIN	
STORM MANHOLE	
FLARED END	
END WALL OR HEADWALL	
PROPOSED CONTOUR LINE	228
PROPOSED SPOT GRADE	x 100.00
ABBREVIATIONS – TC=TOP OF CURB – BC=BOTTOM OF CURB	x TC=100.00 BC=99.50
– TW=TOP OF WALL – BW=BOTTOM OF WALL	x TW=108.00 BW=100.00
PROPOSED SURFACE SLOPE	2%
ELECTRIC LINE	E E
ELECTRIC AND TELECOMMUNICATIONS LINES	E/T
GAS LINE	G G
WATER LINE	W W
SANITARY SEWER LINE	S
SANITARY SEWER FORCE MAIN	SFM
OVERHEAD LINE	OH OH
TRANSFORMER	T
HYDRANT	
UTILITY POLE	
SANITARY/STORM MANHOLE	
SANITARY/STORM CLEANOUT	CO
WATER VALVE	WV
GATE VALVE	GV
THRUST BLOCK	
GREASE TRAP	

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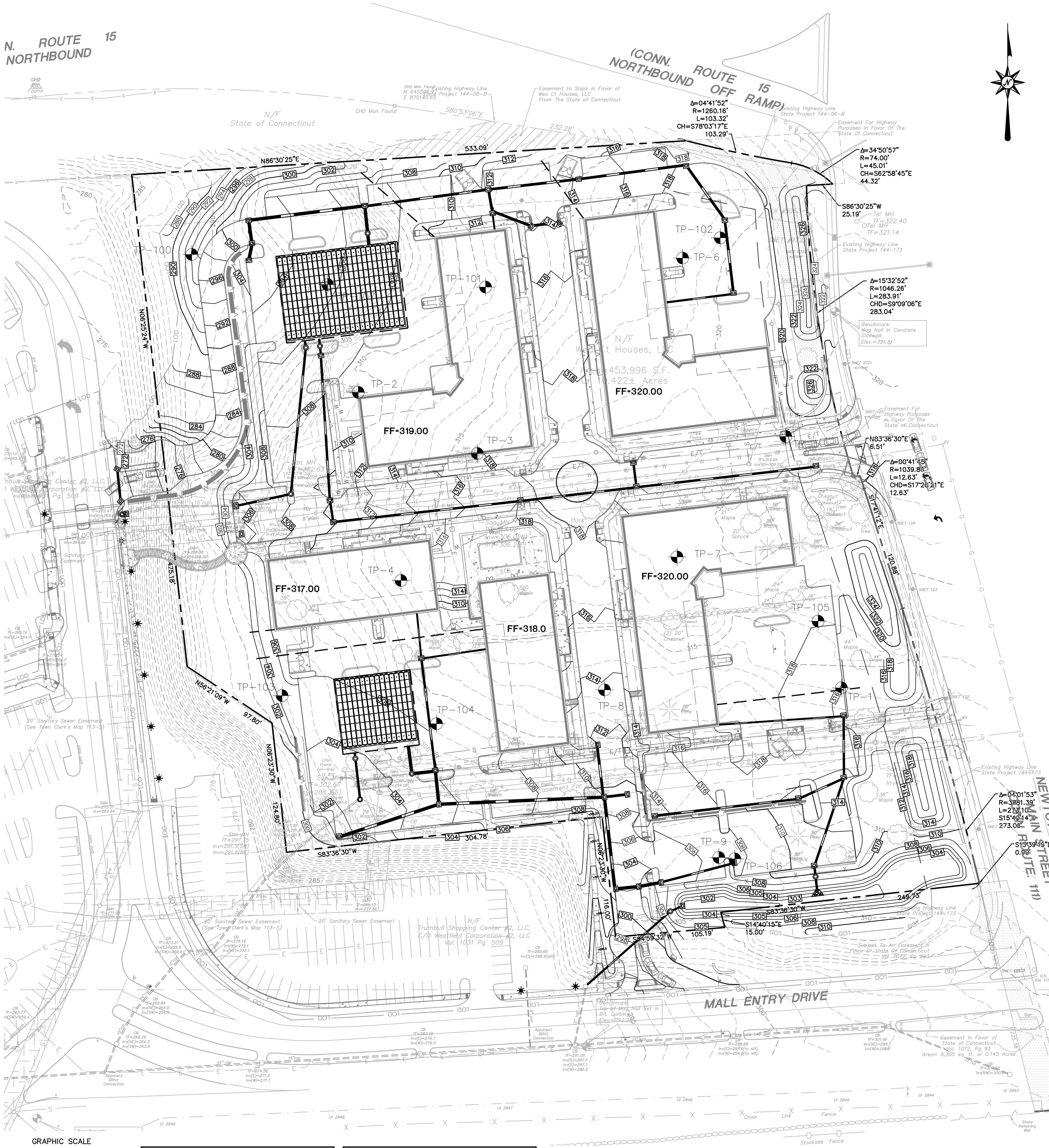
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	1800513
Date	05/28/2020
CAD File: GD180051301	

Title
GRADING AND DRAINAGE PLAN

Sheet No.
GD-1

Xref (s): BD180051301; XY180051301; XV180051302; XC180051303; XOSC113801; XYOSC113801; XC180051301

8/12/2020, AKLOSE, G:\JOBS\BUR\180051301\DWG\GD180051301.DWG,GD-1, 24X36.4DSC



GRAPHIC SCALE

50 25 0 50

SCALE IN FEET

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REFER TO SHEET GN-1 FOR
SITEWORK GENERAL NOTES

GEOTECHNICAL TEST PITS
OCTOBER 21, 2019 - GEI CONSULTANTS

TP-1 SURFACE EL.=314.0 BOTTOM EL.=308.0 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–0.33	F–C SAND AND NP FINES, LITTLE F–C GRAVEL, SUBANGULAR UP TO 6" BROWN, DRY. TOPSOIL. CONTAINS COBBLES, METAL WIRES AND ORGANIC FIBERS
0.3–4.0	F–C SAND AND F–C GRAVEL AND COBBLES, ANGULAR UP TO 8" LITTLE NP FINES, LIGHT BROWN, DRY
4.0–6.0	F–C GRAVEL, ANGULAR TO SUBANGULAR UP TO 6" AND COBBLES AND F–C SAND LITTLE NP FINES, HARD, DENSE AND GRAVELLY, BROWN TO ORANGE–BROWN, DRY. SLIGHT MOTTLING AT 4.0 FT. GROUNDWATER NOT ENCOUNTERED

TP-2 SURFACE EL.=309.0 BOTTOM EL.=305.0 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–1.0	F–C SAND AND NP FINES, LITTLE F–C GRAVEL ANGULAR UP TO 6", BROWN, DRY. CONTAINS ORGANIC FIBERS. TOPSOIL.
1.0–4.0	F–C GRAVEL AND F–C SAND, LITTLE NP FINES. ORANGE–BROWN TO LIGHT BROWN, DRY COARSE ANGULAR COBBLES UP TO 3.0 FT. GROUNDWATER OR SOIL MOTTLING NOT ENCOUNTERED.

TP-3 SURFACE EL.=316.0 BOTTOM EL.=314 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–0.5	F–C SAND AND NP FINES, LITTLE F–C GRAVEL, SUBROUNDED UP TO 5", BROWN, DRY. CONTAINS ORGANIC FIBER AND BRICK FRAGMENTS. TOPSOIL.
0.5–2.0	F–C SAND AND F–C GRAVEL AND COBBLES, ANGULAR UP TO 1", LITTLE NP FINES, LIGHT BROWN, DRY
2.0–4.0	F–C SAND AND F–C GRAVEL AND COBBLES (POTENTIAL WEATHERED ROCK) ANGULAR UP TO 1", LITTLE NP FINES, BROWN TO LIGHT BROWN, DRY. BUCKET SCRAPING PROBABLE ROCK AT 4.0 FT. SLIGHT MOTTLING OBSERVED AT 3.0 FT. GROUNDWATER NOT ENCOUNTERED. BACKFILLED AT 4.0 FT.

TP-4 SURFACE EL.=312.0 BOTTOM EL.=305.0 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–2.0	F–C SAND AND NP FINES, LITTLE F–C GRAVEL, BROWN, DRY. CONTAIN ORGANIC FIBERS. TOPSOIL.
2.0–3.5	F–C SAND, LITTLE NP IFNES, LITTLE F– C GRAVEL ANGULAR, LIGHT ORANGE– BROWN, DRY
3.5–5.0	F–C SAND, SOME F–M GRAVEL AND COBBLES, ANGULAR, NP FINES, GRAYISH BROWN TO LIGHT BROWN, DRY
5.0–7.0	F–C SAND, SOME F–M GRAVEL AND COBBLES, ANGULAR, NP FINES, BROWN, DRY. LIKELY WEATHERED ROCK OBSERVED AT BASE OF PIT SOIL MOTTLING OR GROUNDWATER NOT ENCOUNTERED.

TP-5 SURFACE EL.=319.5 BOTTOM EL.=313.5 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–0.5	F–C SAND AND NP FINES, SOME F–C GRAVEL AND COBBLES, ANGULAR UP TO 6", BROWN, DRY. TOPSOIL.
0.5–2.0	C GRAVEL, TRACE NP FINES, TRACE F SAND, DRY STONE DRAINAGE TRENCH WITH PIPE
2.0–6.0	F–C SAND AND F–C GRAVEL AND COBBLES ANGULAR UP TO 2.0 FT, LITTLE NP FINES, GRAYISH BROWN TO LIGHT BROWN, SOME SLIGHT MOTTLING OBSERVED AT 4.0 FT GROUNDWATER NOT ENCOUNTERED.

TP-6 SURFACE EL.=318.0 BOTTOM EL.=310.75 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–0.33	F–C SAND AND NP FINES, LITTLE F–C GRAVEL, SUBANGULAR UP TO 1" BROWN, DRY
0.3–1.0	DEGRADED ASPHALT, F–C ANGULAR GRAVEL UP TO 2", LITTLE F–C SAND, LITTLE NP FINES, BLACK, DRY.
1.0–3.0	F–C SAND AND NP–LP FINES, F–C GRAVEL, BROWN, DRY. FORMER TOPSOIL.
3.0–5.0	F–C SAND, SOME F–C GRAVEL, SUBANGULAR UP TO 6", LITTLE NP FINES LIGHT BROWN, DRY.
5.0–7.25	M–C GRAVEL AND COBBLES (ANGULAR 6"– 12") AND F–C SAND, LITTLE NP –LP FINES, ORANGE–BROWN TO BROWN, DRY TO MOIST. SOME SOIL MOTTING AT 5.5 FT. POSSIBLE WEATHERED ROCK NEAR BASE OF PIT. GROUNDWATER NOT ENCOUNTERED

TP-7 SURFACE EL.=319.0 BOTTOM EL.=313.0 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–0.33	F–C SAND AND NP FINES, LITTLE F–C GRAVEL, SUBANGULAR UP TO 1" BROWN, DRY. CONTAINS BRICK FRAGMENTS. TOPSOIL.
0.3–1.0	F–C SAND AND F–C GRAVEL, LITTLE NP FINES, BROWN, DRY
1.0–6.0	F–C SAND AND ANGULAR F–C COBBLES AND GRAVEL, LITTLE NP FINES, LIGHT BROWN TO ORANGE–BROWN, DRY. SLIGHT MOTTLING OBSERVED AT 4.0 FT. GROUNDWATER NOT ENCOUNTERED

TP-8 SURFACE EL.=147.0 BOTTOM EL.=136.5 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–2.0	F–C SAND, SOME NP FINES, SOME F–C GRAVEL, 1 ANGULAR UP TO 6", BROWN, DRY, WITH ASPHALT DEBRIS. CONTAINS ORGANIC FIBERS. TOPSOIL.
2.0–4.0	F–C SAND, LITTLE NP FINES, SOME F–C GRAVEL AND COBBLES UP TO 6", LIGHT BROWN, DRY
4.0–6.0	F–C GRAVEL AND COBBLES, SUBANGULAR UP TO 6" AND F–C SAND, LITTLE NP FINES, DENSE MATRIX, BROWN, DRY. GROUNDWATER OR SOIL MOTTLING NOT ENCOUNTERED.

TP-9 SURFACE EL.=306.0 BOTTOM EL.=299.5 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–0.7	F–C SAND AND NP FINES, LITTLE F–C GRAVEL AND COBBLES, ANGULAR UP TO 6" BROWN, DRY. CONTAINS ORGANIC FIBERS.TOPSOIL.
0.7–3.5	F– M SAND, SOME NP FINES, SOME F–C GRAVEL AND COBBLES, SUBROUNDED UP TO 6", LIGHT BROWN, DRY.
3.5–5.0	F–C SAND, LITTLE NP IFNES, SOME F–C GRAVEL AND COBBLES, SUBANGULAR UP TO 6", GRAYISH BROWN TO LIGHT BROWN, DRY.
5.0–6.5	F–C GRAVEL AND COBBLES, ANGULAR UP TO 6" AND F–C SAND, LITTLE NP FINES DENSE MATRIX, BROWN TO REDDISH BROWN, DRY TO MOIST. SLIGHT MOTTLING OBSERVED AT 6.0 FT. GROUNDWATER NOT ENCOUNTERED.

GEOTECHNICAL INFILTRATION TESTING
FEBRUARY 28, 2020 - GEI CONSULTANTS

TP-100 SURFACE EL.=289.0 BOTTOM EL.=283.5 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–0.5	6" TOPSOIL
0.5–3.0	SILTY SAND (SM);~ 60% F–C SAND, ~20% F–C GRAVEL UP TO 1", ~20% NP TO LP FINES, DARK BROWN, WET. CONTAIN ORGANIC FIBERS, COBBLES, RED BRICK, AND SMALL BOULDERS. STRONG ORGANIC–LIKE ODOR. FILL
3.0–5.5	SILTY SAND WITH GRAVEL (SM); ~60% F–C SAND, ~20% F–C GRAVEL UP TO 1", ~20% NP TO LP FINES, DARK BROWN, WET. CONTAIN ORGANIC FIBERS, COBBLES, RED BRICK, BOULDERS, PLASTIC AND METALLIC DEBRIS, AND ROTTED TIMBER PIECES. STRONG ORGANIC–LIKE ODOR. SLIGHT MOTTLING AT 4.0 FT. GROUNDWATER NOT ENCOUNTERED

TP-101 SURFACE EL.=310.5 BOTTOM EL.=304.0 GROUNDWATER ENCOUNTERED AT EL.=304.0	
DEPTH (FT)	DESCRIPTION
0–0.5	6" TOPSOIL
0.5–1.0	WIDELY GRADED SAND WITH SILT (SW–SM); ~80% F–C SAND, ~10% F–C GRAVEL UP TO 1", ~10% NP TO LP FINES, DARK BROWN, MOIST. CONTAINS ORGANIC FIBERS, MODERATE ORGANIC–LIKE ODOR.
1.0–4.0	WIDELY GRADED SAND WITH SILT (SW–SM); ~80% F–C SAND, ~10% NP FINES, ~10% F–C GRAVEL, DARK BROWN TO BROWN, MOIST. FILL CONTAIN COBBLES, BUILDING DEBRIS, FORMER FOUNDATION ENCOUNTERED AT 2.0 FT. ENCOUNTERED FULL FOUNDATION AT 4.0 FT. TEST PIT EXTENDED TO GO BENEATH.
4.0–6.5	WIDELY GRADED SAND WITH SILT (SW–SM); ~80% F–C SAND, ~10% F–C GRAVEL, UP TO 1", ~10% NP FINES, GRAYISH BROWN, MOIST. ~30% COBBLES BY VOLUME. GROUNDWATER INFILTRATION OBSERVED AT 6.5 FT
INFILTRATION RESULTS	TEST 1 = 3.8 IN/HOUR TEST 2 = INVALID

TP-102 SURFACE EL.=319.0 BOTTOM EL.=311.0 GROUNDWATER ENCOUNTERED AT EL.=315.0	
DEPTH (FT)	DESCRIPTION
0–0.5	6" TOPSOIL
0.5–2.0	WIDELY GRADED SAND WITH SILT (SW–SM);~ 80% F–C SAND, ~10% F–C GRAVEL UP TO 1", ~10% NP– LP FINES, DARK BROWN, MOIST. CONTAINS ORGANIC FIBERS, MODERATE ORGANIC–LIKE ODOR. FILL
2.0–4.0	SILTY SAND WITH GRAVEL (SM); ~50% F–C SAND, ~30% LP TO MP FINES, ~20% F–C GRAVEL UP TO 1", BROWN, WET. CONTAINS ROOT FRAGMENTS AND COBBLES. FILL
4.0–8.0	SILTY SAND WITH GRAVEL (SM); ~50% F–M SAND, ~35% LP–MP FINES, ~15% F–C GRAVEL, LIGHT ORANGE–BROWN, MOIST TO WET. CONTAINS SMALL COBBLES.
INFILTRATION RESULTS	TEST 1 = 3.8 IN/HOUR TEST 2 = INVALID

TP-103 SURFACE EL.=301.0 BOTTOM EL.=296.0 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–1.0	SILTY SAND (SM); ~75% F–C SAND, ~15% NPFINES, ~10% F–C GRAVEL UP TO 1", DARK BROWN, MOIST. CONTAINS ORGANIC FIBERS AND COBBLES.
1.0–5.0	SILTY SAND WITH GRAVEL (SM); ~50% F–C SAND, ~30% NP TO LP FINES, ~20% F–C GRAVEL UP TO 1", GRAY–BROWN, MOIST. CONTAINS COBBLES. REFUSAL @ 5.0 FT. ON BOULDER OR WEATHERED ROCK
INFILTRATION RESULTS	TEST 1 = 5.9 IN/HOUR TEST 2 = 9.1 IN/HOUR

TP-104 SURFACE EL.=309.0 BOTTOM EL.=302.0 GROUNDWATER NOT ENCOUNTERED	
DEPTH (FT)	DESCRIPTION
0–0.5	6" TOPSOIL
0.5–4.0	SANDY SILT (ML): ~55% LP–MP FINES, ~45% F SAND, ORANGE–BROWN, MOIST.
4.0–7.0	WIDELY GRADED SAND (SW); ~85% F–M SAND, ~10% F–C GRAVEL, ~5% NP FINES, DARK GRAY, MOIST.
INFILTRATION RESULTS	TEST 1 = 2.2 IN/HOUR TEST 2 = 3.8 IN/HOUR

TP-105 SURFACE EL.=313.0 BOTTOM EL.=304.0 GROUNDWATER ENCOUNTERED AT EL.=304.5	
DEPTH (FT)	DESCRIPTION
0–1.0	SILTY SAND WITH GRAVEL (SM); 45% F–C SAND, 30% NP FINE, 25% F–C GRAVEL AND COBBLES UP TO 12", BROWN TO DARK BROWN, DRY. CONTAIN ORGANIC FIBERS, FRAGMENTS OF BRICK AND CONCRETE BLOCK.
1.0–2.5	SILTY SAND WITH GRAVEL (SM); 60% F–C SAND, 25% F–C GRAVEL AND COBBLES UP TO 12 IN., 15% NP FINES, BROWN TO ORANGE BROWN, DRY.
2.5–9.0	SILTY SAND WITH GRAVEL (SM); ~65% F–C SAND, ~ 25% F–C GRAVEL, ~20% NP –LP FINES, BROWN TO GRAYISH BROWN, DRY TO WET AT 8.5'. GROUNDWATER ENCOUNTERED AT 8.5 FT.

TP-106 SURFACE EL.=306.0 BOTTOM EL.=299.5 GROUNDWATER ENCOUNTERED AT EL.=299.5	
DEPTH (FT)	DESCRIPTION
0–0.5	6" TOPSOIL
0.5–1.0	WIDELY GRADED SAND WITH SILT (SW–SM); ~80% F–C SAND, ~10% NP FINES, ~10% F–C GRAVEL, BROWN, MOIST. CONTAIN ORGANIC FIBERS.
1.0–6.5	WIDELY GRADED SAND WITH SILT AND GRAVEL (SW–SM); ~75% F–C SAND, 15% F–C GRAVEL UP TO 1", 10% NP–LP FINES, BROWN, MOIST. CONTAINS COBBLES/SMALL BOULDERS UP TO 30% BY VOLUME. CONCRETE DEBRIS BETWEEN 1.0 AND 4.0 FT. GROUNDWATER ENCOUNTERED AT 6.5 FT.
INFILTRATION RESULTS	TEST 1 = 9.9 IN/HOUR TEST 2 = INVALID

TP-107 SURFACE EL.=295.5 BOTTOM EL.=288.0 GROUNDWATER ENCOUNTERED AT EL.=288.0	
DEPTH (FT)	DESCRIPTION
0–0.5	SILTY SAND WITH GRAVEL (SM); ~45% F–C SAND, ~35% NP FINES, ~20% F–C GRAVEL, DARK BROWN, DRY. CONTAIN ORGANIC FIBERS, COBBLES/BOULDERS, ASPHALT, CONCRETE DEBRIS.
0.5–3.0	SILTY SAND WITH GRAVEL (SM); ~45% F–C SAND, ~35% F–C GRAVEL AND COBBLES, ~20% NP FINES, BROWN, DRY. CONTAIN ORGANIC FIBERS, COBBLES/BOULDERS, ASPHALT, CONCRETE DEBRIS.
3.0–3.5	LAYER OF BROKEN ASPHALT
3.5–5.5	SILTY SAND WITH GRAVEL (SM); ~35% F–C SAND, ~35% F–C GRAVEL AND COBBLES UP TO 24 IN., ~30% NP FINES, BROWN, DRY TO MOIST.
5.5–7.5	SILTY SAND WITH GRAVEL (SM); ~50% F–C SAND, ~35% F–C GRAVEL AND COBBLES UP TO 24 IN., ~15% NP FINES, ORANGE TO BROWN, DRY TO MOIST. WITH WEATHERED ROCK FRAGMENTS NEAR BASE.

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THE RESIDENCES AT MAIN
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5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	1"=50'
Project No.	1800513
Date	05/28/2020
CAD File:	GD180051301

Title
GRADING AND DRAINAGE PLAN

Sheet No.
GD-2

Xref (s): ; BD180051301 ; XY180051301 ; XC180051301 ; XY05C133801 ; XY180051302 ; XC180051302 ; XC180051303

8/12/2020, AKLOSE, G:\JOBS18\04\1800513\DWG\GD180051301.DWG,GD-2 24X36 50SC,

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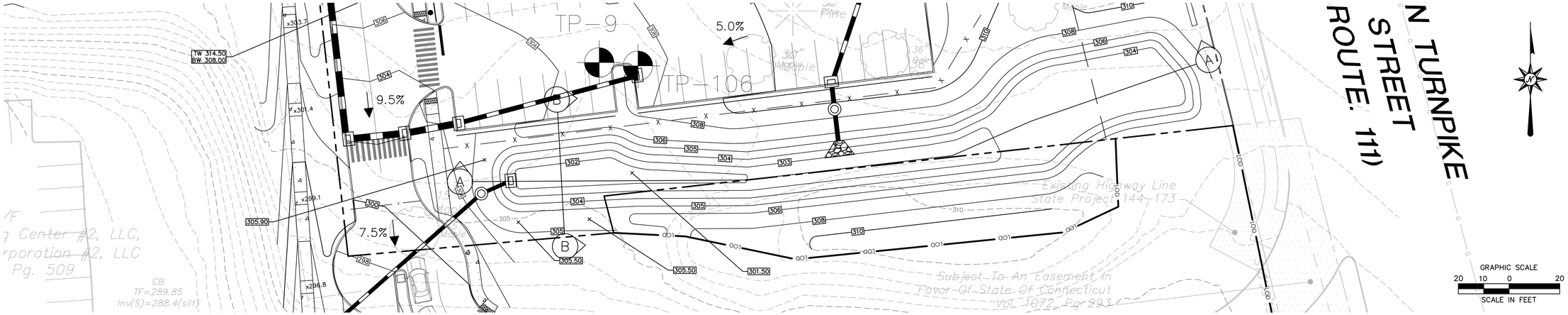
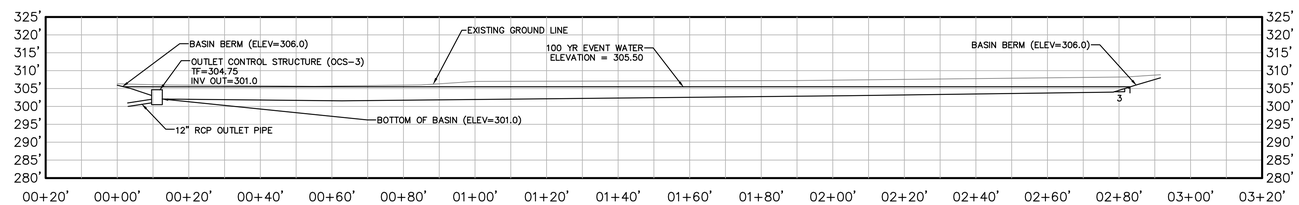
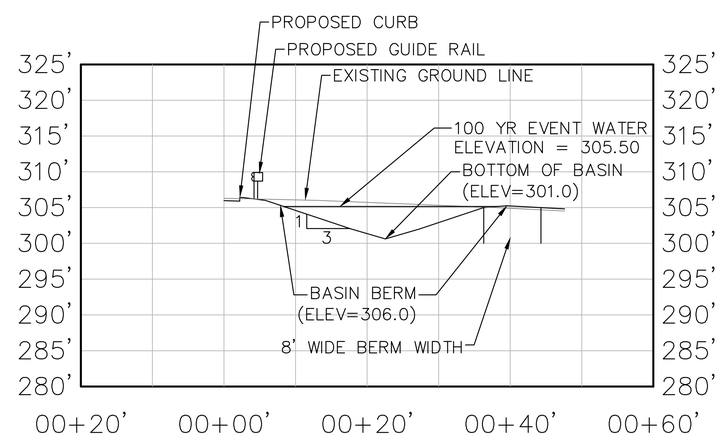




SECTION A-A

SCALE: 1'=20'



SECTION B-B

SCALE: 1'=10'

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
60 30 0 60
SCALE IN FEET

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CHRISTOPHER D. GAUDIO
No. 21795
LICENSED
PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
K & K DEVELOPERS, INC.
5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Desc.
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2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	J.E.S.
Reviewed	J.J.S.
Scale	SEE SHEET
Project No.	1800513
Date	05/28/2020
CAD File: GD180051301	

Title

STORMWATER POND CROSS SECTION

Sheet No.

GD-3

Xref (s): BD180051301 ; XY180051301 ; XC180051301 ; XYXSC1538801 ; XY180051302 ; XC180051302 ; XC180051303

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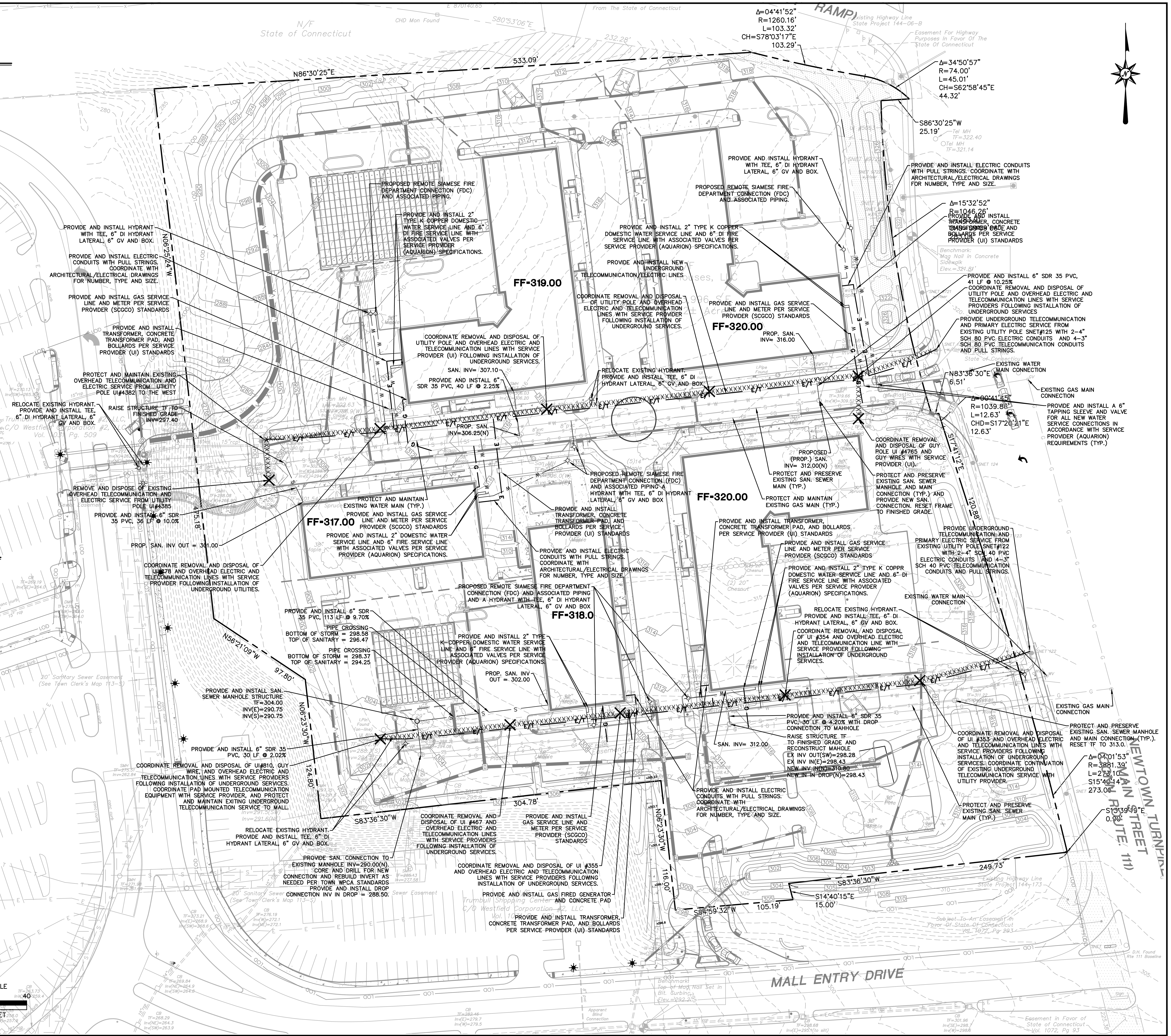
SITE UTILITIES LEGEND

PROPERTY LINE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
ELECTRIC LINE	E E
ELECTRIC AND TELECOMMUNICATIONS LINES	E/T
GAS LINE	G G
WATER LINE	W W
SANITARY SEWER LINE	S
SANITARY SEWER FORCE MAIN	SFM
OVERHEAD LINE	OH OH
TRANSFORMER	T
HYDRANT	
UTILITY POLE	
SANITARY MANHOLE	
SANITARY CLEANOUT	CO
WATER VALVE	WV
GATE VALVE	GV
THRUST BLOCK	
GREASE TRAP	
OUTLET CONTROL STRUCTURE	
HYDRODYNAMIC SEPARATOR	
STORM LINE	
CATCH BASIN	
STORM MANHOLE	
FLARED END	
END WALL OR HEADWALL	
PROPOSED CONTOUR LINE	228
PROPOSED SPOT GRADE	x 100.00
ABBREVIATIONS – TC=TOP OF CURB – BC=BOTTOM OF CURB	x TC=100.00 BC=99.50
– TW=TOP OF WALL – BW=BOTTOM OF WALL	x TW=108.00 BW=100.00
PROPOSED SURFACE SLOPE	2%

NOTES

1. CONTRACTOR SHALL CONFIRM LOCATION, SIZE, CONDITION AND ELEVATION OF ALL EXISTING UTILITY LATERAL STUBS, WATER MAINS, GAS MAINS AND ELECTRICAL SERVICES PRIOR TO CONSTRUCTION.
2. ALL SANITARY MANHOLES AND WATER AND GAS GATES/VALVES TO REMAIN ARE BE RESET TO FINISHED GRADE AS NEEDED.



REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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GRAPHIC SCALE
40 20 0 40
SCALE IN FEET

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REVISIONS

No.	Date	Desc.
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2.	8/10/2020	REVISED PER STAFF COMMENTS

Xref (s): ; BD180051301 ; XY180051301 ; XC180051301 ; XY05C133801 ; XY180051302 ; XC180051302 ; XC180051303

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	1800513
Date	05/28/2020
CAD File:	SU180051301

Title
SITE UTILITIES PLAN

Sheet No.
SU-1

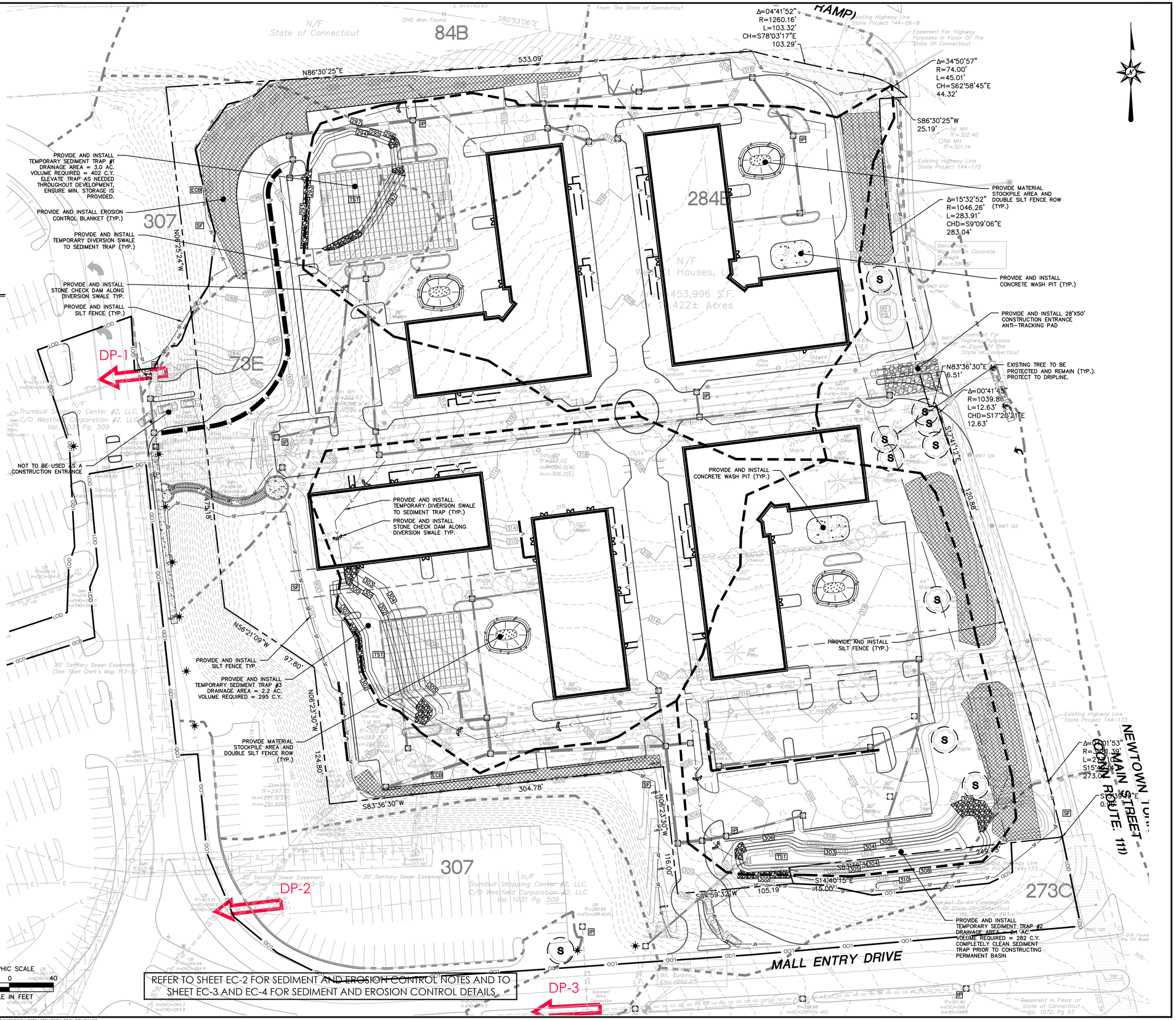
EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
INLET PROTECTION AT CATCH BASINS	IP
STONE CHECK DAM	
SILT FENCE	SF
CONSTRUCTION ENTRANCE	CE
LIMIT OF CLEARING	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
EROSION CONTROL BLANKET	ECB
STOCKPILE AREA WITH DOUBLE ROW OF SILT FENCE	
DIVERSION SWALE	
SOIL TYPE BOUNDARY	
SEDIMENT TRAP CONTRIBUTING AREA	
TEMPORARY SILT TRAP	TST
EXISTING TREE TO BE PROTECTED	S

SOIL TYPES

73E	CHARLTON–CHATFIELD COMPLEX (HSG B)
84B	PAXTON AND MONTAUK FINE SANDY LOAMS (HSG C)
273C	URBAN LAND–CHARLTON CHATFIELD COMPLEX (HSG B/D)
284B	PAXTON–URBAN LAND COMPLEX (HSG C/D)
307	URBAN LAND (HSG D)

NOTE: SOILS DATA REFERENCED FROM NRCS WEBSOIL SURVEY.



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REFER TO SHEET EC-2 FOR SEDIMENT AND EROSION CONTROL NOTES AND TO SHEET EC-3 AND EC-4 FOR SEDIMENT AND EROSION CONTROL DETAILS

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Reviewed	J.J.S.
Scale	1"=40'
Project No.	1800513
Date	05/28/2020
CAD File:	EC180051301

Title
SEDIMENT AND EROSION CONTROL PLAN

Sheet No.
EC-1

Xref (s) : BD180051301 ; XT180051301 ; XC180051301 ; XY0SC113801 ; XY180051302 ; XC180051302 ; XC180051304 ; ED180051301 ; XC180051303

01/7/2020, AKUDRE, G:\CADD\BUDA\180051513\DWG\EC180051301.DWG,EC-1 24X36 ARCH

SEDIMENT AND EROSION CONTROL NOTES

SEDIMENT AND EROSION CONTROL NOTES – CONNECTICUT

SEDIMENT & EROSION CONTROL NARRATIVE
THE SEDIMENT AND EROSION CONTROL PLAN WAS DEVELOPED TO PROTECT THE EXISTING ROADWAY AND STORM DRAINAGE SYSTEMS, ADJACENT PROPERTIES, AND ANY ADJACENT WETLAND AREA AND ANY ADJACENT WATER COURSE FROM SEDIMENT LADEN SURFACE RUNOFF AND EROSION. A CONSTRUCTION SEQUENCE IS PROVIDED TO PROVIDE SURFACE RUNOFF EROSION CONTROLS PRIOR TO THE BEGINNING OF PROJECT DEMOLITION AND/OR CONSTRUCTION.

CONSTRUCTION SCHEDULE
THE ANTICIPATED STARTING DATE FOR CONSTRUCTION IS SPRING 2021 WITH COMPLETION ANTICIPATED SPRING 2021 APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES AS DESCRIBED HEREIN SHALL BE INSTALLED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF ALL DEMOLITION OR CONSTRUCTION ACTIVITY. SCHEDULE WORK TO MINIMIZE THE LENGTH OF TIME THAT BARE SOIL WILL BE EXPOSED.

CONTINGENCY EROSION PLAN
THE CONTRACTOR SHALL INSTALL ALL SPECIFIED SEDIMENT AND EROSION CONTROL MEASURES AND WILL BE REQUIRED TO MAINTAIN THEM IN THEIR INTENDED FUNCTIONING CONDITION. THE AGENTS OF THE MUNICIPALITY AND/OR CIVIL ENGINEER SHALL HAVE THE AUTHORITY TO REQUIRE SUPPLEMENTAL MAINTENANCE OR ADDITIONAL MEASURES IF FIELD CONDITIONS ARE ENCOUNTERED BEYOND WHAT WOULD NORMALLY BE ANTICIPATED.

CONSTRUCTION SEQUENCE
THE FOLLOWING CONSTRUCTION SEQUENCE IS RECOMMENDED:

1. CONTACT MUNICIPALITY AND THE PLANNING & ZONING COMMISSION AGENT AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION OR REGULATED ACTIVITY ON THIS PROJECT.
2. CLEARING LIMITS SHALL BE PHYSICALLY MARKED IN THE FIELD AND APPROVED BY THE MUNICIPALITY AND/OR THEPLANNING & ZONING COMMISSION AGENT PRIOR TO THE START OF WORK ON THE SITE. INSTALL TREE PROTECTION AND PERIMETER SILT FENCE.
3. CONSTRUCT STONE CONSTRUCTION ENTRANCE ANTI-TRACKING PADS AT CONSTRUCTION ENTRANCES/EXITS AND INSTALL FILTER FABRIC AROUND GRATES OF CATCH BASINS OR INSTALL SILT SACKS ON CATCH BASIN INLETS AND ON OFF SITE ROADS. INSTALL SILT FENCE AND OTHER EROSION CONTROL DEVICES INDICATED ON THESE PLANS AT PERIMETER OF PROPOSED SITE DISTURBANCE AND INSTALL ALL EROSION CONTROL MEASURES AND TREE PROTECTION INDICATED ON THESE PLANS. INSTALL SEDIMENT BASINS AND SEDIMENT TRAPS IF REQUIRED AT LOW AREAS OF SITE OR AS ORDERED BY THE ENGINEER OR AS SHOWN ON THESE PLANS.
4. CLEAR AND GRUB SITE. STOCKPILE CHIPS. STOCKPILE TOPSOIL. INSTALL SEDIMENT AND EROSION CONTROLS AT STOCKPILES.
5. SITE DEMOLITION AND REMOVAL. PAVEMENT REMOVAL.
6. INSTALL SILT FENCE, CONSTRUCT DIVERSION SWALES AND SEDIMENT TRAPS. COMMENCE INSTALLATION OF STORM DRAINAGE SYSTEM.
7. COMMENCE EARTHWORK. CONSTRUCT FILL SLOPE, ROADWAY AND RETAINING WALLS. INSTALL ADDITIONAL SEDIMENT AND EROSION CONTROLS AS WORK PROGRESSES AND CONTINUE STORM DRAINAGE SYSTEM CONSTRUCTION, TOPSOIL AND SEED SLOPES WHICH HAVE ACHIEVED FINAL SITE GRADING.
8. CONSTRUCTION STAKING OF ALL BUILDING CORNERS, UTILITIES, ACCESS DRIVES, AND PARKING AREAS.
9. ROUGH GRADING AND FILLING OF SUBGRADES AND SLOPES.
10. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
11. BEFORE DISPOSING OF SOIL OR RECEIVING BORROW FOR THE SITE, THE CONTRACTOR MUST PROVIDE EVIDENCE THAT EACH SPOIL OR BORROW AREA HAS A SEDIMENT AND EROSION CONTROL PLAN APPROVED BY THE MUNICIPALITY AND/OR THE INLAND WETLANDS COMMISSION AND WHICH IS BEING IMPLEMENTED AND MAINTAINED. THE CONTRACTOR SHALL ALSO NOTIFY THE MUNICIPALITY AND/OR THE PLANNING & ZONING COMMISSION IN WRITING OF ALL RECEIVING SPOIL AND BORROW AREAS WHEN THEY HAVE BEEN IDENTIFIED.
12. CONTINUE INSTALLATION OF STORM DRAINAGE AS SUBGRADE ELEVATIONS ARE ACHIEVED.
13. BUILDINGS FOUNDATION SUBGRADE AND PAD SUBGRADE PREPARATION.
14. BUILDINGS FOUNDATION CONSTRUCTION. BEGIN BUILDING SUPERSTRUCTURE
15. THROUGHOUT CONSTRUCTION SEQUENCE, REMOVE SEDIMENT FROM BEHIND SILT FENCES, HAY BALES AND OTHER EROSION CONTROL DEVICES, AND FROM SEDIMENT BASINS AND SEDIMENT TRAPS AS REQUIRED. REMOVAL SHALL BE ON A PERIODIC BASIS (EVERY SIGNIFICANT RAINFALL OF 0.25 INCH OR GREATER). INSPECTION OF SEDIMENT AND EROSION CONTROL MEASURES SHALL BE ON A WEEKLY BASIS AND AFTER EACH RAINFALL OF 0.25 INCHES OR GREATER. SEDIMENT COLLECTED SHALL BE DEPOSITED AND SPREAD EVENLY UPLAND ON SLOPES DURING CONSTRUCTION.
16. INSTALL SANITARY LATERALS AND UTILITIES. COMPLETE STORM DRAINAGE SYSTEM.
17. INSTALL SITE LIGHTING AND CONCRETE PADS AND TRASH ENCLOSURES.
18. COMPLETE GRADING TO SUBGRADES AND CONSTRUCT PARKING AREA SUBGRADE.
19. CONSTRUCT CURBS, PAVEMENT STRUCTURE AND SIDEWALKS.
20. CONDUCT FINE GRADING.
21. PAVING OF PARKING AREAS AND ROADWAYS
22. FINAL FINE GRADING OF SLOPE AND NON-PAVED AREAS.
23. PLACE 4" TOPSOIL ON SLOPES AFTER FINAL GRADING IS COMPLETED. FERTILIZE SEED AND MULCH. SEED MIXTURE TO BE INSTALLED APRIL 15 – JUNE 1 OR AUGUST 15 – OCTOBER 1 USE EROSION CONTROL BLANKETS AS REQUIRED OR ORDERED FOR SLOPES 3:1 AND GREATER THAN 3:1 AND AS SHOWN ON LANDSCAPE PLANS OR EROSION CONTROL PLANS. FOR TEMPORARY STABILIZATION BEYOND SEEDING DATES USE ANNUAL RYE AT 4.0 LBS/1,000 S.F. FERTILIZE WITH 10-10-10 AT 1.0 LBS. OF NITROGEN PER 1,000 S.F. AND LIME AT 100 LBS/1,000 S.F. (MAX.).
24. LANDSCAPE ISLANDS, INTERIOR NON-PAVED AREAS, AND PERIMETER AREAS.
25. INSTALL SIGNING AND PAVEMENT MARKINGS
26. CLEAN STORM DRAINAGE PIPE STRUCTURES, DETENTION SYSTEMS AND WATER QUALITY DEVICES OF DEBRIS AND SEDIMENT.
27. UPON DIRECTION OF THE MUNICIPALITY AND/OR THE PLANNING & ZONING COMMISSION AGENT, SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED FOLLOWING STABILIZATION OF THE SITE.

OPERATION REQUIREMENTS

CLEARING AND GRUBBING OPERATIONS

1. ALL SEDIMENT AND EROSION CONTROL MEASURES, INCLUDING THE CONSTRUCTION OF ANY TEMPORARY SEDIMENTATION BASINS AND STONE CONSTRUCTION ENTRANCE ANTI-TRACKING PADS, WILL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.
2. FOLLOWING INSTALLATION OF ALL SEDIMENT AND EROSION CONTROL MEASURES, THE CONTRACTOR SHALL NOT PROCEED WITH GRADING, FILLING OR OTHER CONSTRUCTION OPERATIONS UNTIL THE ENGINEER HAS INSPECTED AND APPROVED ALL INSTALLATIONS.
3. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CLEARING AND GRUBBING OPERATIONS SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR SEDIMENT AND EROSION CONTROL DEVICES.
4. FOLLOWING THE COMPLETION OF CLEARING AND GRUBBING OPERATIONS, ALL AREAS SHALL BE STABILIZED WITH TOPSOIL AND SEEDING OR CRUSHED STONE AS SOON AS PRACTICAL.

ROUGH GRADING OPERATIONS

1. DURING THE REMOVAL AND/OR PLACEMENT OF EARTH AS INDICATED ON THE GRADING PLAN, TOPSOIL SHALL BE STRIPPED AND APPROPRIATELY STOCKPILED FOR REUSE.
2. ALL STOCKPILED TOPSOIL SHALL BE SEEDED, MULCHED WITH HAY, AND ENCLOSED BY A SILTATION FENCE.

FILLING OPERATIONS

1. PRIOR TO FILLING, ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE PROPERLY IMPLEMENTED, MAINTAINED AND FULLY INSTALLED, AS DIRECTED BY THE ENGINEER AND AS SHOWN ON THIS PLAN.
2. ALL FILL MATERIAL ADJACENT TO ANY WETLAND AREAS, IF APPLICABLE TO THIS PROJECT, SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN), SHALL BE PLACED IN LIFT THICKNESSES NOT GREATER THAN THAT SPECIFIED IN PROJECT SPECIFICATIONS AND/OR THE PROJECT GEOTECHNICAL REPORT. LIFTS SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS OR IN THE GEOTECHNICAL REPORT.
3. AS GENERAL GRADING OPERATIONS PROGRESS, ANY TEMPORARY DIVERSION DITCHES SHALL BE RAISED OR LOWERED, AS NECESSARY, TO DIVERT SURFACE RUNOFF TO THE SEDIMENT BASINS OR SEDIMENT TRAPS.

PLACEMENT OF DRAINAGE STRUCTURES, UTILITIES, AND BUILDING CONSTRUCTION OPERATIONS.

1. SILT FENCES SHALL BE INSTALLED AT THE DOWNHILL SIDES OF BUILDING EXCAVATIONS, MUD PUMP DISCHARGES, AND UTILITY TRENCH MATERIAL STOCKPILES. HAY BALES/STRAW BALES MAY BE USED IF SHOWN ON THE SEDIMENT AND EROSION CONTROL PLANS OR IF DIRECTED BY THE CIVIL ENGINEER.

FINAL GRADING AND PAVING OPERATIONS

1. ALL INLET AND OUTLET PROTECTION SHALL BE PLACED AND MAINTAINED AS SHOWN ON SEDIMENT AND EROSION CONTROL PLANS AND DETAILS, AND AS DESCRIBED IN SPECIFICATIONS AND AS DESCRIBED HEREIN.
2. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS, OR JUTE MESH AND VEGETATION. ALL SLOPES SHALL BE SEEDED, AND ANY ROAD OR DRIVEWAY SHOULDER AND BANKS SHALL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.
3. PAVEMENT SUB-BASE AND BASE COURSES SHALL BE INSTALLED OVER AREAS TO BE PAVED AS SOON AS FINAL SUB-GRADES ARE ESTABLISHED AND UNDERGROUND UTILITIES AND STORM DRAINAGE SYSTEMS HAVE BEEN INSTALLED.
4. AFTER CONSTRUCTION OF PAVEMENT, TOPSOIL, FINAL SEED, MULCH AND LANDSCAPING, REMOVE ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES ONLY AFTER ALL AREAS HAVE BEEN PAVED AND/OR GRASS HAS BEEN WELL ESTABLISHED AND THE SITE IS STABLE AND HAS BEEN INSPECTED AND APPROVED BY THE MUNICIPALITY THE PLANNING & ZONING COMMISSION.

INSTALLATION OF SEDIMENTATION AND EROSION CONTROL MEASURES

I. SILTATION FENCE
A. DIG A SIX INCH TRENCH ON THE UPHILL SIDE OF THE DESIGNATED FENCE LINE LOCATION.

B. POSITION THE POST AT THE BACK OF THE TRENCH (DOWNHILL SIDE), AND HAMMER THE POST AT LEAST 1.5 FEET INTO THE GROUND.

C. LAY THE BOTTOM SIX INCHES OF THE FABRIC INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUN-OFF.

D. BACKFILL THE TRENCH AND COMPACT.

II. HAY BALES/STRAW BALES
A. BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE, ORIENTED PARALLEL TO THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.

B. BALES SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR INCHES. AFTER THE BALES ARE STAKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER.

C. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES.

D. THE GAPS BETWEEN BALES SHALL BE WEDGED WITH STRAW TO PREVENT WATER LEAKAGE.

E. THE BARRIER SHALL BE EXTENDED TO SUCH A LENGTH THAT THE BOTTOMS OF THE END BALES ARE HIGHER IN ELEVATION THAN THE TOP OF THE LOWEST MIDDLE BALE, TO ENSURE THAT RUN-OFF WILL FLOW EITHER THROUGH OR OVER THE BARRIER, BUT NOT AROUND IT.

OPERATION AND MAINTENANCE OF SEDIMENT AND EROSION CONTROL MEASURES
I. SILTATION FENCE
A. ALL SILTATION FENCES SHALL BE INSPECTED AS A MINIMUM WEEKLY OR AFTER EACH RAINFALL. ALL DETERIORATED FABRIC AND DAMAGED POSTS SHALL BE REPLACED AND PROPERLY REPOSITIONED IN ACCORDANCE WITH THIS PLAN.

B. SEDIMENT DEPOSITS SHALL BE REMOVED FROM BEHIND THE FENCE WHEN THEY REACH A MAXIMUM HEIGHT OF ONE FOOT.

II. HAY BALES/STRAW BALES
A. ALL HAY BALE/STRAW BALE RINGS SHALL BE INSPECTED FOLLOWING EACH RAINFALL. REPAIR OR REPLACEMENT SHALL BE PROMPTLY MADE AS NEEDED.

B. DEPOSITS SHALL BE REMOVED AND CLEANED-OUT IF ONE HALF OF THE ORIGINAL HEIGHT OF THE BALES BECOMES FILLED WITH SEDIMENT.

III. SEDIMENT TRAPS
A. CONTRACTOR TO KEEP WEEKLY CHECKLIST LOGS FOR INSPECTIONS OF ALL SEDIMENT AND EROSION CONTROL DEVICES AND HAVE THEM READILY AVAILABLE ON-SITE AT ALL TIMES FOR INSPECTION BY CT DEEP, LOCAL AUTHORITIES OR ENGINEER.

B. ALL SEDIMENT BASINS AND/OR SEDIMENT TRAPS SHALL BE INSPECTED FOLLOWING EACH RAINFALL. REPAIR OF SLOPES SHALL BE PROMPTLY MADE AS NEEDED.

C. SEDIMENT DEPOSITS SHALL BE REMOVED FROM SEDIMENT BASINS AND/OR SEDIMENT TRAPS WHEN THEY REACH A MAXIMUM HEIGHT OF ONE FOOT UNLESS OTHERWISE INDICATED ON THE EROSION CONTROL PLANS AND DETAILS TO BE AT A SPECIFIC ELEVATION PER CLEAN OUT MARKERS.

D. SEDIMENT SHALL BE DISPOSED OF ON-SITE OR AS DIRECTED BY THE ENGINEER AND LOCAL GOVERNING OFFICIALS. SEE SEDIMENT AND EROSION CONTROL NOTES HEREIN REGARDING DISPOSAL REQUIREMENTS FOR OFF SITE SPOIL DISPOSAL.

SEDIMENT AND EROSION CONTROL PLAN
1. HAY BALE/STRAW BALE FILTERS WILL BE INSTALLED AT ALL CULVERT OUTLETS IF CULVERT OUTLETS ARE APPLICABLE TO THIS PROJECT AND SILTATION FENCE INSTALLED ALONG THE TOE OF ALL CRITICAL CUT AND FILL SLOPES.
2. CULVERT DISCHARGE AREAS WILL BE PROTECTED WITH RIP RAP CHANNELS. ENERGY DISSIPATORS WILL BE INSTALLED AS SHOWN ON THESE PLANS AND AS NECESSARY.
3. CATCH BASINS WILL BE PROTECTED WITH HAY BALE/STRAW BALE FILTERS, SILT SACKS, SILTATION FENCE, OR OTHER INLET PROTECTION DEVICES PER DETAILS, THROUGHOUT THE CONSTRUCTION PERIOD AND UNTIL ALL DISTURBED AREAS ARE THOROUGHLY STABILIZED.
4. ALL SEDIMENT AND EROSION CONTROL MEASURES WILL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL OR LATEST EDITION.
5. SEDIMENT AND EROSION CONTROL MEASURES WILL BE INSTALLED PRIOR TO DEMOLITION AND/OR CONSTRUCTION WHENEVER POSSIBLE.
6. ALL CONTROL MEASURES WILL BE MAINTAINED IN EFFECTIVE CONDITION THROUGHOUT THE DEMOLITION AND CONSTRUCTION PERIOD UNTIL THE SITE IS DETERMINED TO BE STABILIZED BY THE AUTHORITY HAVING JURISDICTION.
7. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING THE CONSTRUCTION PERIOD, IF NECESSARY OR REQUIRED OR AS DIRECTED BY THE CIVIL ENGINEER OR BY THE AUTHORITY HAVING JURISDICTION.
8. SEDIMENT REMOVED FROM EROSION CONTROL STRUCTURES WILL BE DISPOSED IN A MANNER WHICH IS CONSISTENT WITH THE INTENT AND REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLANS, NOTES, AND DETAILS.
9. SCOTT LOVENTHAL OF GARDEN HOMES DEVELOPMENT, #973-467-5000 X1212, IS ASSIGNED THE RESPONSIBILITY FOR IMPLEMENTING THIS SEDIMENT AND EROSION 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 THE PLAN, NOTIFICATION OF THE MUNICIPALITY AND THE PLANNING & ZONING COMMISSION OFFICE OR AUTHORITY HAVING JURISDICTION OF ANY TRANSFER OF THIS RESPONSIBILITY AND FOR CONVEYING A COPY OF THE SEDIMENT AND EROSION CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.

SEDIMENT AND EROSION CONTROL NOTES
1. THE SEDIMENT AND EROSION CONTROL PLAN IS ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL TREATMENT FOR THIS SITE. SEE SEDIMENT AND EROSION CONTROL DETAILS AND CONSTRUCTION SEQUENCE. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.
2. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING THIS SEDIMENT AND EROSION CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE PROPER INSTALLATION AND MAINTENANCE OF SEDIMENT AND EROSION CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED WITH CONSTRUCTION ON THE SITE OF THE REQUIREMENTS AND OBJECTIVES OF THIS PLAN, INFORMING THE AUTHORITY HAVING JURISDICTION OR PLANNING & ZONING AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY, AND FOR CONVEYING A COPY OF THE SEDIMENT & EROSION CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.
3. AN EROSION CONTROL BOND MAY BE REQUIRED TO BE POSTED WITH THE TOWN OF TRUMBULL TO ENSURE IMPLEMENTATION OF THE SEDIMENT AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF THIS BOND AND FOR INQUIRIES TO THE TOWN OF TRUMBULL FOR INFORMATION ON THE METHOD, TYPE AND AMOUNT OF THE BOND POSTING UNLESS OTHERWISE DIRECTED BY THE OWNER.
4. VISUAL SITE INSPECTIONS SHALL BE CONDUCTED WEEKLY, AND AFTER EACH MEASURABLE PRECIPITATION EVENT OF 0.25 INCHES OR GREATER BY QUALIFIED PERSONNEL, TRAINED AND EXPERIENCED IN SEDIMENT AND EROSION CONTROL, TO ASCERTAIN THAT THE SEDIMENT AND EROSION CONTROL (E&S) BMPS ARE OPERATIONAL AND EFFECTIVE IN PREVENTING POLLUTION. A WRITTEN REPORT OF EACH INSPECTION SHALL BE KEPT, AND INCLUDE:
A) A SUMMARY OF THE SITE CONDITIONS, E&S BMPS, AND COMPLIANCE; AND
B) THE DATE, TIME, AND THE NAME OF THE PERSON CONDUCTING THE INSPECTION
C) TURBIDITY TESTING AS REQUIRED BY THE CT DEEP CONSTRUCTION GENERAL PERMIT (NPDES)
5. THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL OR LATEST EDITION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE MUNICIPALITY AND THE PLANNING & ZONING COMMISSION. THE CONTRACTOR SHALL KEEP A COPY OF THE GUIDELINES ON-SITE FOR REFERENCE DURING CONSTRUCTION.
6. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, SITE ENGINEER, MUNICIPALITY AND/OR THE PLANNING & ZONING COMMISSION, OR GOVERNING AGENCIES. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED.
7. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS BEFORE AND AFTER EACH STORM (0.25 INCHES OR GREATER RAINFALL), OR AT LEAST WEEKLY, TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS WHERE NECESSARY.
8. THE CONTRACTOR SHALL KEEP A SUPPLY OF SEDIMENT AND EROSION CONTROL MATERIAL (HAY BALES, SILT FENCE, JUTE MESH, RIP RAP, ETC.) ON-SITE FOR MAINTENANCE AND EMERGENCY REPAIRS.
9. PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING AT THE DRIP LINE OR AS SHOWN WITH SNOW FENCE, ORANGE SAFETY FENCE, OR EQUIVALENT FENCING. ANY LIMB TRIMMING SHOULD BE DONE BEFORE CONSTRUCTION BEGINS IN THAT AREA; FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION.
10. INSTALL PERIMETER SEDIMENT AND EROSION CONTROLS PRIOR TO CLEARING OR CONSTRUCTION. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SILT FENCE UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE FENCE.
11. STONE CONSTRUCTION ENTRANCE ANTI-TRACKING PADS SHALL BE INSTALLED AT START OF CONSTRUCTION AND MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION. THE LOCATION OF THE TRACKING PADS MAY CHANGE AS VARIOUS PHASES OF CONSTRUCTION ARE COMPLETED.
12. TOPSOIL SHALL BE STRIPPED AND STOCKPILED FOR USE IN FINAL LANDSCAPING. ALL EARTH STOCKPILES SHALL HAVE HAY BALES OR SILT FENCE AROUND THE LIMIT OF PILE. PILES SHALL BE TEMPORARILY SEEDED IF PILE IS TO REMAIN IN PLACE FOR MORE THAN ONE (1) MONTH.
13. SEDIMENT TRAPS SHALL PROVIDE 134 CUBIC YARDS OF SEDIMENT STORAGE PER ACRE CONTRIBUTING TO THE BASIN. PROVIDE BASIN VOLUMES FOR ALL DISTURBANCE ON SITE.
14. COMPLY WITH REQUIREMENTS OF CGS SECTION 22A 430B, FOR STORMWATER DISCHARGE FROM CONSTRUCTION ACTIVITIES AND WITH CT DEEP RECORD KEEPING AND INSPECTION REQUIREMENTS.
15. STONE CONSTRUCTION ENTRANCE ANTI-TRACKING PADS SHALL BE INSTALLED PRIOR TO ANY ON SITE EXCAVATION AND SHALL BE MAINTAINED DURING ALL DEMOLITION, EXCAVATION AND CONSTRUCTION ACTIVITIES.
16. MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (ONE WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE. IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.
17. MAINTAIN EXISTING PAVED AREAS FOR CONSTRUCTION STAGING FOR AS LONG AS POSSIBLE.
18. SILT FENCE AND OTHER SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH CONTRACT DRAWINGS AND MANUFACTURER'S RECOMMENDATIONS PRIOR TO WORK IN ANY UPLAND AREAS.
19. EXCAVATED MATERIAL FROM TEMPORARY SILT TRAPS MUST BE STOCKPILED ON UPHILL SIDE OF SILT FENCE.
20. INSTALL SILT FENCE ACCORDING TO MANUFACTURER'S INSTRUCTION, PARTICULARLY, BURY LOWER EDGE OF FABRIC INTO GROUND. SILT FENCE SHALL BE TENCATE ENVIROFENCE, PROPEX GEOTEX OR EQUIVALENT APPROVED BY THE CIVIL ENGINEER. FILTER FABRIC USED SHALL BE TENCATE 140N OR 170N, OR APPROVED EQUIVALENT. SEE SPECIFICATIONS FOR FURTHER INFORMATION.
21. WHERE INDICATED ON SEDIMENT AND EROSION CONTROL PLANS USE NEW HAY/STRAW BALES AND REPLACE THEM WHENEVER THEIR CONDITION DETERIORATES BEYOND REASONABLE USABILITY. STAKE BALES SECURELY INTO GROUND AND BUTT TIGHTLY TOGETHER TO PREVENT UNDERCUTTING AND BYPASSING.
22. INSTALL TEMPORARY DIVERSION DITCHES, PLUNGE POOLS, SEDIMENT BASINS, SEDIMENT TRAPS, CONCRETE WASH PITS AND DEWATERING PITS AS SHOWN AND AS NECESSARY DURING VARIOUS PHASES OF CONSTRUCTION TO CONTROL RUNOFF UNTIL UPHILL AREAS ARE DETERMINED TO BE STABILIZED BY THE AUTHORITY HAVING JURISDICTION. LOCATION OF TEMPORARY SEDIMENT BASINS WILL REQUIRE REVIEW AND APPROVAL BY THE CIVIL ENGINEER AND AUTHORITY HAVING JURISDICTION.
23. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE SUCH AS TEMPORARY PITS, SEDIMENT TRAP, SEDIMENT BASINS OR GRASS FILTERS WITHIN THE APPROVED LIMIT OF DISTURBANCE. DISCHARGE TO STORM DRAINAGE SYSTEM OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR.
24. BLOCK THE OPEN UPSTREAM ENDS OF DETENTION BASIN/SEDIMENT TRAP OUTLET CONTROL ORIFICE UNTIL SITE IS STABILIZED. BLOCK END OF STORM SEWERS IN EXPOSED TRENCHES WITH BOARDS AND SANDBAGS AT THE END OF EACH WORKING DAY WHEN RAIN IS EXPECTED.
25. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. OTHER DUST CONTROL MEASURES TO BE USED AS NECESSARY INCLUDE WATERING DOWN DISTURBED AREAS, USING CALCIUM CHLORIDE, AND COVERING LOADS ON DUMP TRUCKS.
26. PERIODICALLY CHECK ACCUMULATED SEDIMENT LEVELS IN THE SEDIMENT BASINS AND SEDIMENT TRAPS DURING CONSTRUCTION AND CLEAN ACCUMULATED SILT WHEN NECESSARY OR WHEN ONE FOOT OF SEDIMENT HAS ACCUMULATED OR PER SPECIFIC CLEANOUT MARKER ELEVATION. CLEAN ACCUMULATED SEDIMENT FROM CATCH BASIN SUMPS AS NECESSARY AND AS DIRECTED BY THE CIVIL ENGINEER OR OWNER'S CONSTRUCTION REPRESENTATIVE. REMOVE ACCUMULATED SEDIMENT FROM BEHIND HAY/STRAW BALES AND SILT FENCE WHEN LEVEL REACHES HALF THE HEIGHT OF THE BALE OR ONE FOOT AT SILT FENCE. DISPOSE OF SEDIMENT LEGALLY EITHER ON OR OFF SITE.
27. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
28. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG OR EQUIVALENT SEDIMENT REMOVAL FACILITY, OVER UNDISTURBED VEGETATED AREAS.
29. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF UTILITY AND STORM PIPE TRENCHES SO AS TO ALLOW THE TRENCH TO INTERCEPT ALL SILT LADEN RUNOFF.
30. CONTRACTOR SHALL ONLY EXCAVATE AS MUCH UTILITY AND STORM PIPE TRENCH WORK AS CAN BE COMPLETED, BACKFILLED AND STABILIZED IN ONE DAY SO AS TO LIMIT THE AMOUNT OF OPEN, DISTURBED TRENCHING.
31. ANY STOCKPILES OF STRIPPED MATERIALS ARE TO BE PERIODICALLY SPRAYED WITH WATER OR A CRUSTING AGENT TO STABILIZE POTENTIALLY WIND-BLOWN MATERIAL. HAUL ROADS BOTH INTO AND AROUND THE SITE ARE TO BE SPRAYED AS NEEDED TO SUPPRESS DUST. TRUCKS HAULING IMPORT FILL MATERIAL ARE TO BE TARPED TO AID IN THE CONTROL OF AIRBORNE DUST. DURING HIGH WIND EVENTS (20 TO 30 MPH SUSTAINED) CONSTRUCTION ACTIVITY SHALL BE LIMITED OR CEASED IF DUST CANNOT BE CONTROLLED BY WETTING.
32. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM OF 70% UNIFORM PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING OR OTHER MOVEMENTS UNLESS OTHERWISE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.
33. MAINTAIN ALL PERMANENT AND TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP PARKING LOT AND REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROLS WHEN AUTHORIZED BY AUTHORITY HAVING JURISDICTION. FILE NOT (NOTICE OF TERMINATION) WITH AUTHORITY HAVING JURISDICTION RESPONSIBLE FOR REGULATING STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES PER NPDES.
34. NO BRUSH, DEBRIS, OR STUMPS SHALL BE BURIED ON-SITE. THESE MATERIALS SHALL BE REMOVED TO AN APPROVED LANDFILL.

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REVISIONS

No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File:	EC180051301

Title
SEDIMENT AND EROSION CONTROL NOTES

Sheet No.
EC-2

Xref (s): ; BD180051301 ; XY180051301 ; XC180051301 ; XY05C133801 ; XY180051302 ; XC180051302 ; XC180051304 ; ED180051301 ; XC180051303

8/12/2020, AKLOSE, G:\JOBS18\04\1800513\DWG\EC180051301.DWG.EC-2 24X36.

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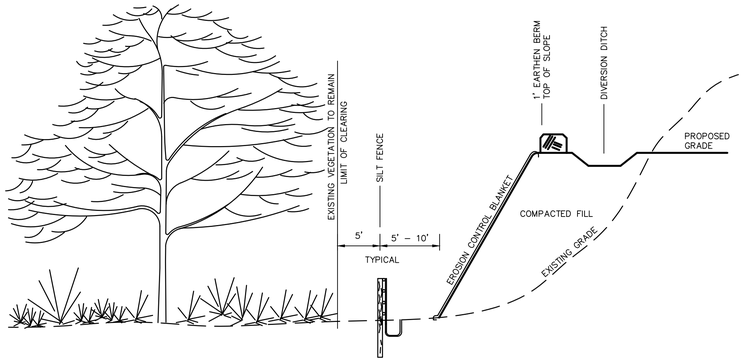
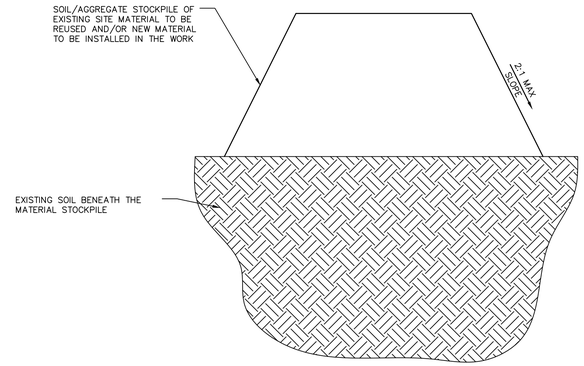
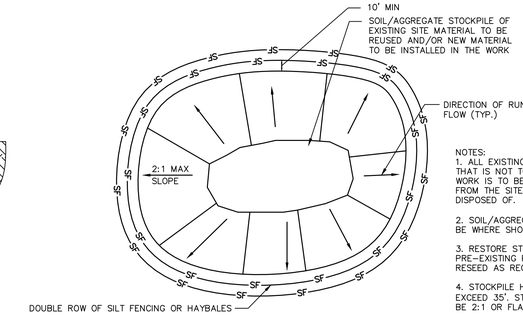


TYPICAL EROSION CONTROL ON SLOPES

N.T.S. BLEC–011





NOTES:
1. ALL EXISTING EXCAVATED MATERIAL THAT IS NOT TO BE REUSED IN THE WORK IS TO BE IMMEDIATELY REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.

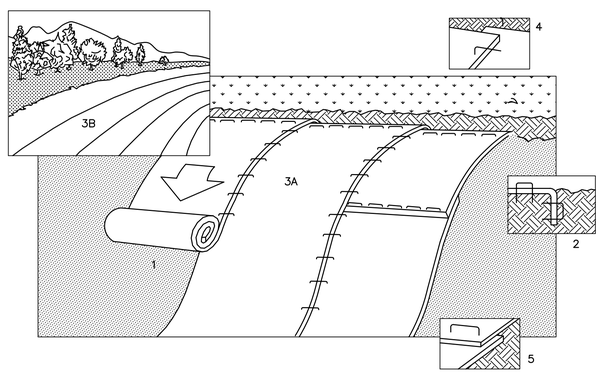
2. SOIL/AGGREGATE STOCKPILE SITES TO BE WHERE SHOWN ON THE DRAWINGS.

3. RESTORE STOCKPILE SITES TO PRE–EXISTING PROJECT CONDITION AND RESEED AS REQUIRED.

4. STOCKPILE HEIGHTS MUST NOT EXCEED 35'. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

MATERIALS STOCKPILE DETAIL

N.T.S. BLEC–006



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER,AND SEED.

2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

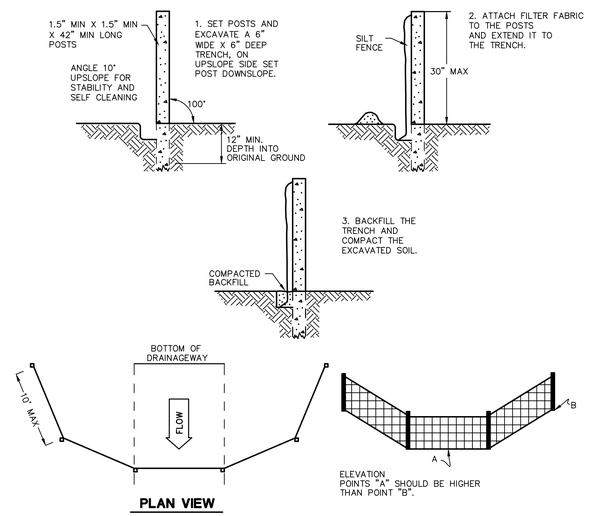
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE.

4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.

5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 4" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.

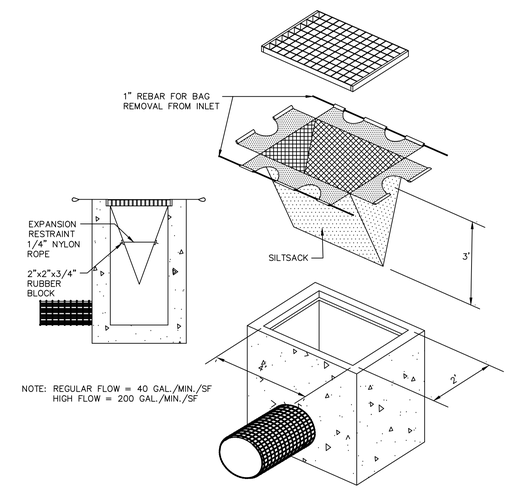
SLOPE STABILIZATION DETAIL

N.T.S. BLEC–010



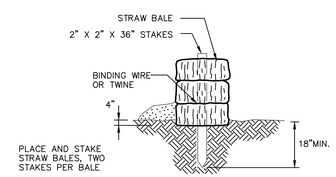
SILT FENCE BARRIER

N.T.S. CTEC–003



SILTSACK DETAIL

N.T.S. BLEC–005



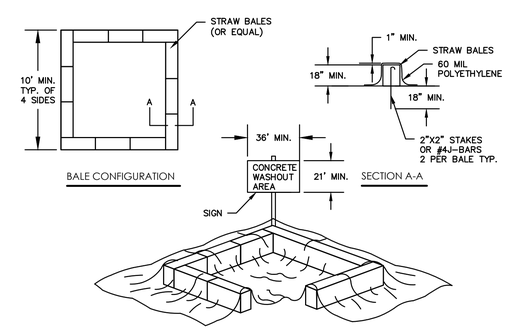
STRAW BALE BARRIERS SHOULD NOT BE USED FOR MORE THAN 3 MONTHS

SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE ABOVE GROUND HEIGHT OF THE BARRIER.

ANY SECTION OF STRAW BALE BARRIER WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.

STRAW BALE DETAIL

N.T.S. BLEC–007



CONCRETE WASH PIT

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ROSE EQUITIES
Owner-Builders since 1949

STATE OF CONNECTICUT
CHRISTOPHER R. GAUDIO
No. 27798
LICENSED
PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
K & K DEVELOPERS, INC.
5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File: EC180051301	

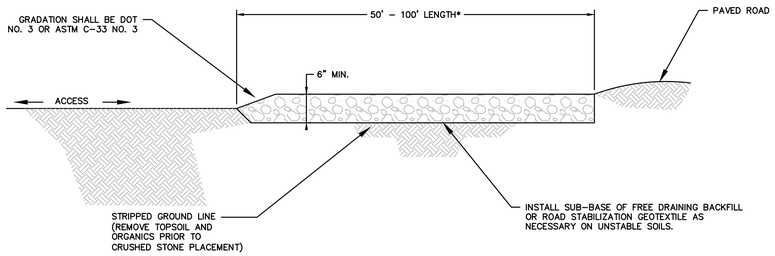
Title
SEDIMENT AND EROSION CONTROL DETAILS

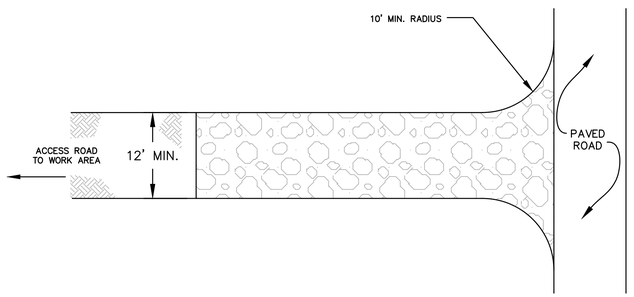
Sheet No.
EC-3

Xref (s): BD180051301 ; XY180051301 ; XC180051301 ; XY05C13380 1 ; XC180051302 ; XC180051304 ; ED180051301 ; XC180051303

8/13/2020 AKORE G:\JOBS\18\0513\DWG\EC-180051301.DWG EC-3 PAGE4

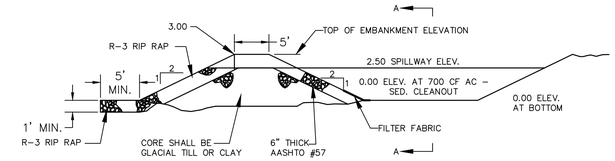
* WHERE SEDIMENTS CONTAIN LESS THAN 80% SAND, A 100 FT MINIMUM IS REQUIRED.





TYPICAL CONSTRUCTION ENTRANCE

N.T.S. CT DEEP CE-2



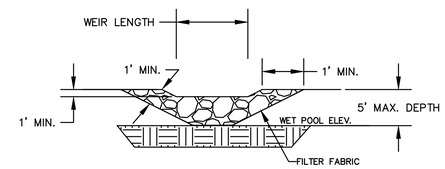
NOTE:
THE OUTLET EMBANKMENT SHELL IS TO BE ENTIRELY OF ROCK. THE DOWNSTREAM SLOPE SHOULD BE LARGER ROCK (R-3) WITH AN UPSTREAM LAYER OF SMALLER STONE (AASHTO #57)

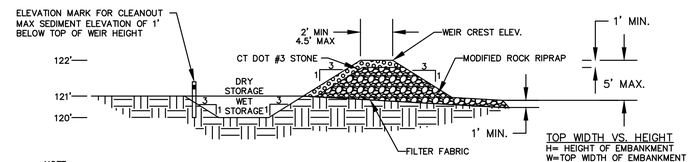
SECTION THROUGH SEDIMENT TRAP EMERGENCY SPILLWAY OUTLET

N.T.S. BLEC-004

SILTSACK DETAIL

N.T.S. BLEC-005





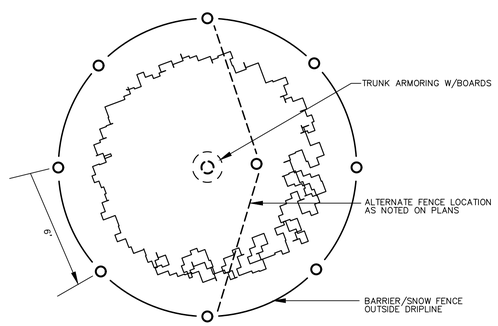
NOTE:
1. ALL DETAIL INFORMATION SHOULD BE USED AS A GUIDELINE. ALL TEMPORARY SEDIMENT TRAPS MUST CONFORM TO THE CT DEEP 2002 GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL MANUAL.
2. THE VOLUME OF THE WET STORAGE SHALL BE AT LEAST TWICE THE VOLUME OF THE SEDIMENT STORAGE VOLUME AND SHALL BE DESIGNED TO A MINIMUM DEPTH OF 2 FEET, PER CT DEEP 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL MANUAL.

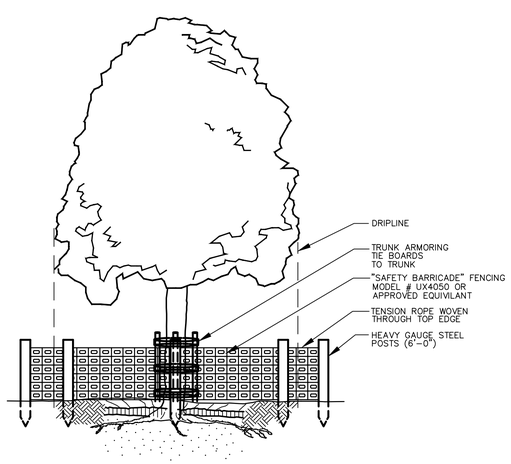
TOP WIDTH VS. HEIGHT
H= HEIGHT OF EMBANKMENT
W=TOP WIDTH OF EMBANKMENT

H(ft)	W (ft)
1.5	2.0
2.0	2.0
2.5	2.5
3.0	2.5
3.5	3.0
4.0	3.0
4.5	4.0
5.0	4.5

TEMPORARY SEDIMENT TRAP

N.T.S. BLEC-002



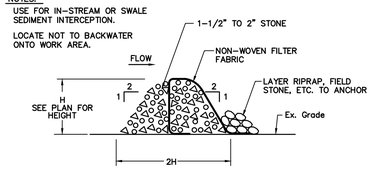


TREE PROTECTION

N.T.S. BLLD-001

NOTES:
USE FOR IN-STREAM OR SWALE SEDIMENT INTERCEPTION.

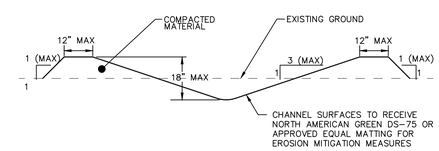
LOCATE NOT TO BACKWATER ONTO WORK AREA.



CROSS SECTION

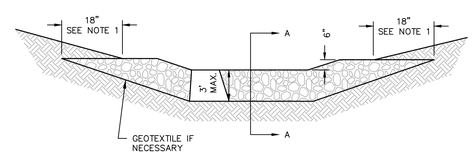
STONE CHECK DAM WITH FILTER FABRIC

N.T.S.

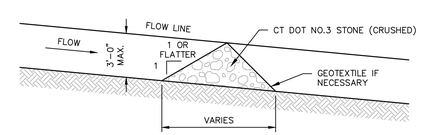


NON-ENGINEERED TEMPORARY DIVERSION DITCH DETAIL

N.T.S.



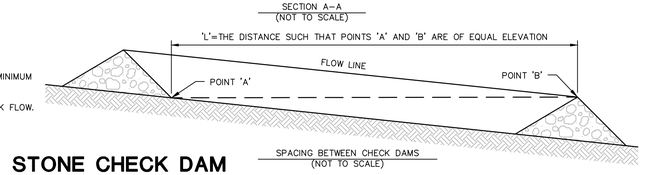
VIEW LOOKING UPSTREAM
(NOT TO SCALE)



SECTION A–A
(NOT TO SCALE)

NOTES:
1) KEY STONE INTO THE DITCH BANKS AND EXTEND INTO THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW FROM FLANKING THE CHECK DAM.

2) THE MINIMUM DESIGN CAPACITY SHALL CONVEY A 2 YEAR – 24 HOUR PEAK FLOW.



SPACING BETWEEN CHECK DAMS
(NOT TO SCALE)

STONE CHECK DAM INSTALLATION IN DRAINAGEWAYS

N.T.S. FIGURE SCD-2

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2.	8/10/2020	REVISED PER STAFF COMMENTS

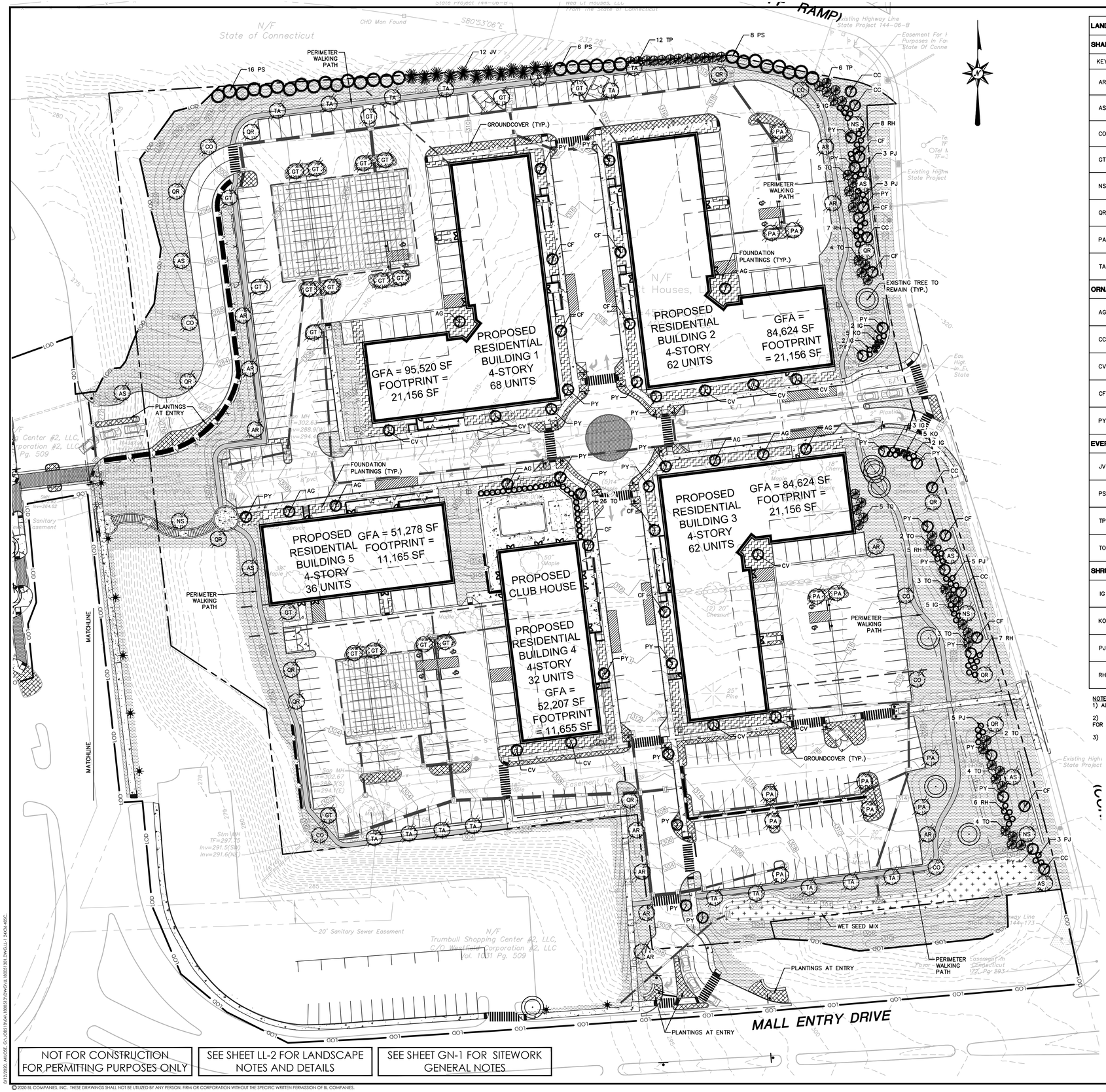
Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File: EC180051301	

Title
SEDIMENT AND EROSION CONTROL DETAILS

Sheet No.
EC-4

Xref (s): : BD180051301 ; XY180051301 ; XC180051301 ; XYOSC153801 ; XY180051302 ; XC180051302 ; XC180051304 ; ED180051301 ; XC180051303

8/12/2020, AKUDS, GS:\JOBS\BSMA\180051\DWG\EC180051301.DWG EC-4 24X36.



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SEE SHEET LL-2 FOR LANDSCAPE NOTES AND DETAILS

SEE SHEET GN-1 FOR SITEWORK GENERAL NOTES

LANDSCAPE PLANT SCHEDULE

SHADE TREES

KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	COMMENTS
AR	11	Acer rubrum 'Franksred'	RED SUNSET RED MAPLE	B&B OR CONT.	3" CAL. MIN.	6' MIN. BRANCH HT.
AS	7	Acer saccharum 'Green Mountain'	GREEN MOUNTAIN SUGAR MAPLE	B&B	3" CAL. MIN.	6' BRANCH HT. MIN.
CO	7	Celtis occidentalis	HACKBERRY	B&B	3" CAL. MIN.	6' BRANCH HT. MIN.
GT	20	Gleditsia triacanthos var. inermis 'Shademaster'	SHADEMASTER HONEYLOCUST	B&B	3" CAL. MIN.	6' BRANCH HT. MIN.
NS	6	Nyssa sylvatica	BLACK GUM	B&B	3" CAL. MIN.	6' BRANCH HT. MIN.
QR	12	Quercus rubra	RED OAK	B&B	3" CAL. MIN.	6' BRANCH HT. MIN.
PA	12	Platanus x acerifolia 'Morton's Circle'	EXCLAMATION! PLANETREE	B&B	3" CAL. MIN.	6' BRANCH HT. MIN.
TA	16	Tilia americana 'Redmond'	AMERICAN LINDEN	B&B	3" CAL. MIN.	6' BRANCH HT. MIN.

ORNAMENTAL FLOWERING TREES

KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	COMMENTS
AG	8	Amelanchier x grandiflora 'Autumn Brilliance'	APPLE SERVICEBERRY	B&B	8" HT. MIN.	MULTI-STEM
CC	6	Cercis canadensis	EASTERN REDBUD	B&B	2" CAL. MIN.	5' BRANCH HT. MIN.
CV	10	Chionanthus virginicus	WHITE FRINGE TREE	B&B	2" CAL. MIN.	5' BRANCH HT. MIN.
CF	13	Cornus florida 'Cherokee Princess'	FLOWERING DOGWOOD	B&B	2" CAL. MIN.	5' BRANCH HT. MIN.
PY	30	Prunus x yedoensis 'Akebono'	YOSHINO CHERRY	B&B	2" CAL. MIN.	5' BRANCH HT. MIN.

EVERGREEN TREES

KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	COMMENTS
JV	12	Juniperus virginiana 'Canaertii'	EASTERN RED CEDAR	B&B	6' HT. MIN.	PLANT 10' O.C.
PS	30	Pinus strobus	EASTERN WHITE PINE	B&B	6' HT. MIN.	PLANT 10' O.C.
TP	18	Thuja plicata 'Green Giant'	GREEN GIANT ARBORVITAE	B&B	6' HT. MIN.	PLANT 10' O.C.
TO	58	Thuja occidentalis 'Techny'	TECHNY ARBORVITAE	B&B OR CONT.	6' HT. MIN.	PLANT 6' O.C.

SHRUBS

KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	COMMENTS
IG	19	Ilex glabra 'Compacta'	COMPACT INKBERRY	CONT.	30" HT. MIN.	PLANT 4' O.C.
KO	10	Rosa x 'KNOCK OUT'	KNOCK OUT ROSE	CONT.	30" HT. MIN.	PLANT 4' O.C.
PJ	19	Pieris japonica 'Mountain Fire'	MOUNTAIN FIRE ANDROMEDA	CONT.	30" HT. MIN.	PLANT 5' O.C.
RH	33	Rhododendron 'Janet Blair'	JANET BLAIR RHODODENDRON	CONT.	30" HT. MIN.	PLANT 5' O.C.

NOTES:

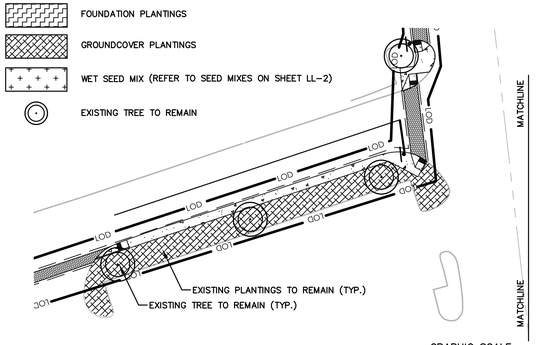
1) ALL SUBSTITUTIONS MUST RECEIVE APPROVAL FROM THE LANDSCAPE ARCHITECT PRIOR TO DELIVERY TO SITE.

2) PROVIDE AND INSTALL ALL PLANTS SHOWN ON THE PLANTING PLAN DRAWINGS; THE QUANTITIES IN THE PLANT LIST ARE PROVIDED FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF DISCREPANCIES OCCUR, THE LARGER QUANTITY SHALL APPLY.

3) IF THERE IS A DISCREPANCY BETWEEN BOTANICAL AND COMMON NAME, BOTANICAL NAME PREVAILS.

LEGEND

PATTERN	DESCRIPTION
	LAWN SEED MIX (REFER TO SEED MIXES ON SHEET LL-2)
	FOUNDATION PLANTINGS
	GROUNDCOVER PLANTINGS
	WET SEED MIX (REFER TO SEED MIXES ON SHEET LL-2)
	EXISTING TREE TO REMAIN



GRAPHIC SCALE

40 20 0 40

SCALE IN FEET

Architecture Engineering Environmental Land Surveying

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355 Research Parkway
Meriden, CT 06450
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REVISIONS

No.	Date	Desc.
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2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	L.M.W.
Drawn	L.M.W.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	1800513
Date	05/28/2020
CAD File: LL180051301	

Title

LANDSCAPE PLAN

Sheet No.

LL-1

Xref (s): : IBD180051301 ; XY180051301 ; XC180051301 ; XY180051302 ; XC180051303 ; XL180051301 ; XC180051301-COLOR

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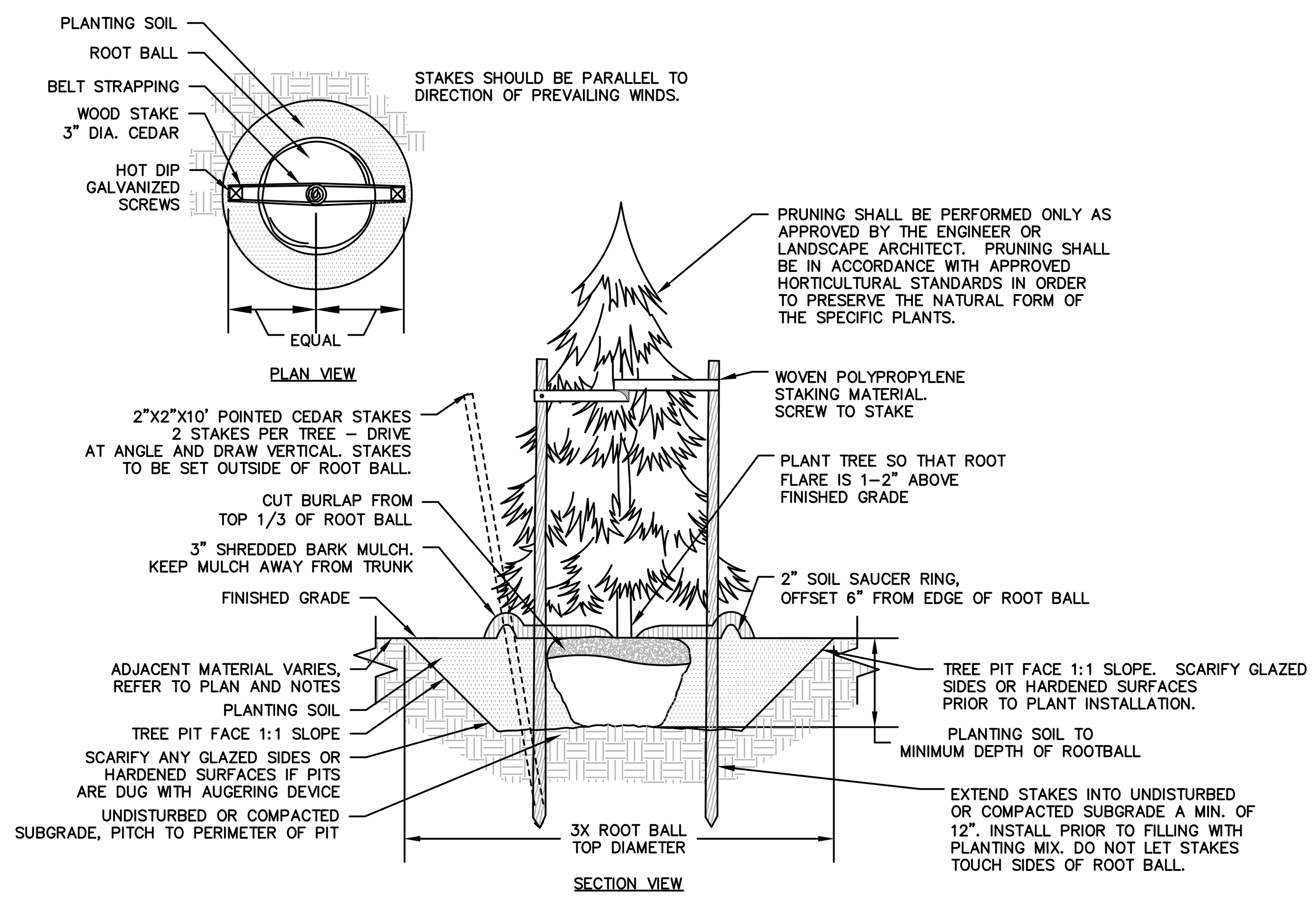


NOTES:
1. STAKING FOR TREES ON 4:1 SLOPES OR LESS TO BE PERFORMED AT CONTRACTOR'S DISCRETION.
2. WOVEN POLYPROPYLENE STAKING MATERIAL SHALL BE DEEPROOT ARBORTIE (GREEN) OR APPROVED EQUIVALENT. MATERIAL SHALL BE LOOPED AROUND TREE THROUGH EACH OTHER, TWISTED, AND SECURED TO THE STAKE. INSTALL SPECIFIED MATERIAL IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
3. BEFORE IN HOLE, REMOVE BOTTOM OF CAGE. ONCE IN HOLE, REMOVE REST OF CAGE FROM ROOT BALL. REMOVE TWINE AND BURLAP FROM TOP 1/3 OF ROOT BALL – SCORE REMAINING 2/3 OF BURLAP. IF BURLAP IS SYNTHETIC OR HAS BEEN TREATED WITH ANTI-DESSICENT, COMPLETELY REMOVE IT FROM ROOT BALL.

EVERGREEN TREE PLANTING

N.T.S

SEED MIX NOTES

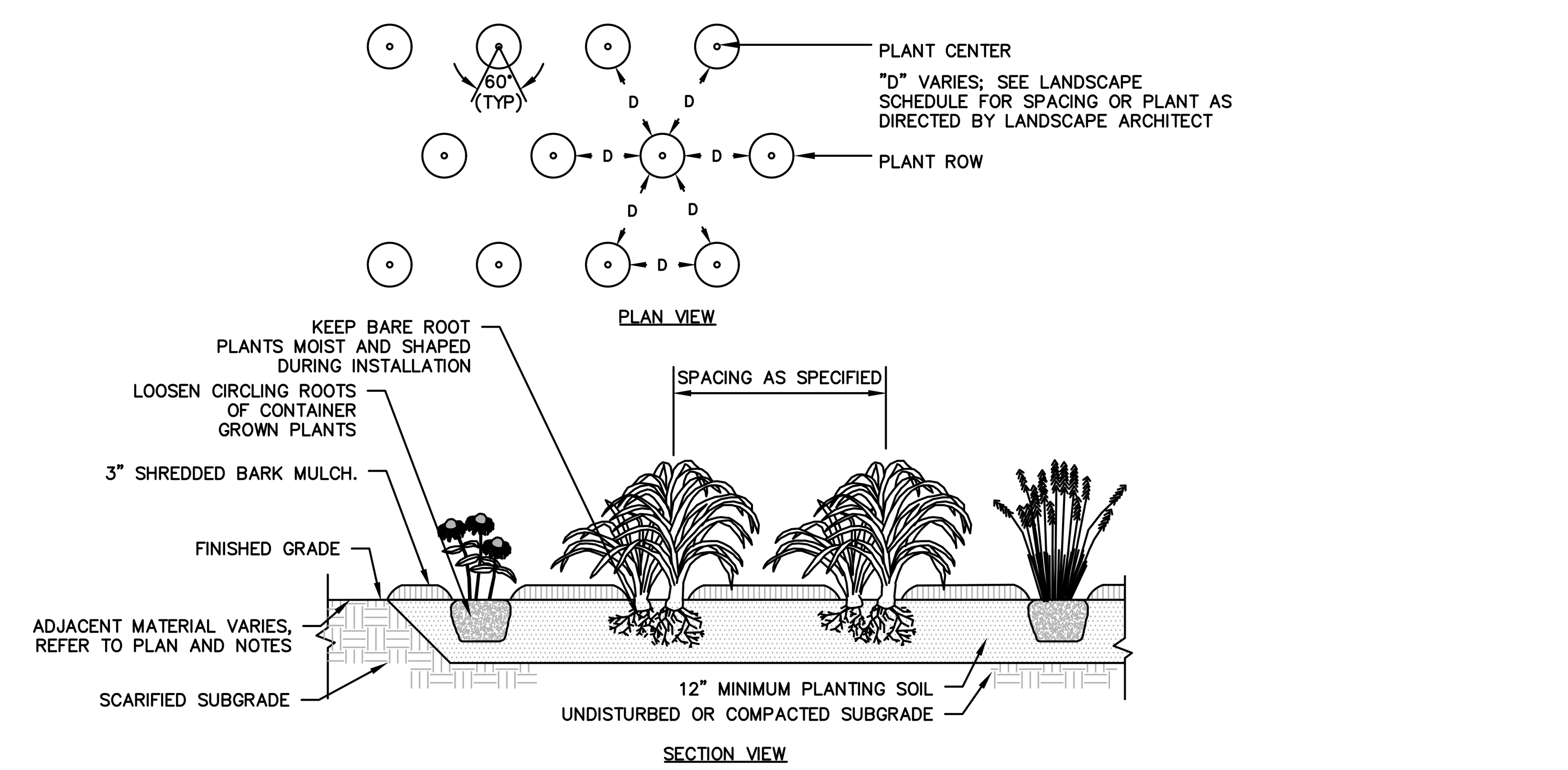
A. LAWN SEEDING MIX:
15 % PERENNIAL RYEGRASS (BLEND OF 3 IMPROVED HYBRIDS)
25 % FINE LEAF OR CREEPING FESCUE (BLEND OF 3 IMPROVED HYBRIDS)
60 % KENTUCKY BLUEGRASS (BLEND OF 3 IMPROVED HYBRIDS)
SEEDING RATE: 5 LBS/1,000 S.F.
SEEDING DATES: AUGUST 15 – OCTOBER 1 AND APRIL 15 – JUNE 30 UNLESS OTHERWISE APPROVED BY THE OWNER OR LANDSCAPE ARCHITECT.

B. WET SEED MIX –
NEW ENGLAND WETMIX (WET SEED MIX)
NEW ENGLAND WETLAND PLANTS INC. OR APPROVED EQUAL

SPECIES: FOX SEDGE (CAREX VULPINOIDEA), LURID SEDGE (CAREX LURIDA), BLUNT BROOM SEDGE (CAREX SCOPARIA), BLUE VERVAIN (VERBENA HASTATA), FOWL BLUEGRASS (POA PALUSTRUS), HOP SEDGE (CAREX LUPULINA), GREEN BULRUSH (SCIRPUS ATROVIRENS), CREEPING SPIKE RUSH (ELEOCHARIS PALUSTRIS), FRINGED SEDGE (CAREX CRINITA), SOFT RUSH (JUNCUS EFFUSUS), SPOTTED JOE PYE WEED (EUPATORIUM MACULATUM), RATTLESNAKE GRASS (GLYCERIA CANADENSIS), SWAMP ASTER (ASTER PUNICEUS), BLUEFLAG (IRIS VERSICOLOR), SWAMP MILKWEED (ASCLEPIAS INCARNATA), MONKEY FLOWER (MIMULUS RINGENS).

APPLICATION RATE: 20 LBS/ACRE AT STORMWATER PONDS
SEEDING DATES: AUGUST 15 – OCTOBER 1 AND APRIL 15 – JUNE 30
UNLESS OTHERWISE APPROVED BY THE OWNER OR LANDSCAPE ARCHITECT.

SEEDING DATES: AUGUST 15 – OCTOBER 1 AND APRIL 15 – JUNE 30
UNLESS OTHERWISE APPROVED BY THE OWNER OR LANDSCAPE ARCHITECT.



GROUNDCOVER PLANTING

N.T.S

LANDSCAPE NOTES

1. THE LANDSCAPE PLAN AND DETAIL SHEET ARE FOR LANDSCAPING INFORMATION ONLY. REFER TO THE OTHER PLANS FOR ALL OTHER INFORMATION.

2. COORDINATE PLANT MATERIAL LOCATIONS WITH SITE UTILITIES. UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. EXERCISE CARE WHEN DIGGING IN AREAS OF POTENTIAL CONFLICT WITH UNDERGROUND OR OVERHEAD UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE DUE TO CONTRACTOR'S NEGLIGENCE AND SHALL REPLACE OR REPAIR ANY DAMAGE AT CONTRACTOR'S EXPENSE. PRIOR TO DIGGING AND INSTALLATION OF PLANT MATERIAL, THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" 72 HOURS BEFORE COMMENCEMENT OF WORK AT "(800)922-4455" AND VERIFY ALL UTILITY SYSTEM LOCATIONS.

3. THE LOCATIONS FOR PLANT MATERIAL ARE APPROXIMATE AND ARE SUBJECT TO FIELD ADJUSTMENT DUE TO UTILITY LOCATIONS AND SITE CONDITIONS. THE CONTRACTOR SHALL ACCURATELY STAKE OUT THE LOCATIONS FOR ALL PLANTS FOR THE REVIEW, ADJUSTMENT, AND APPROVAL BY OWNER OR LANDSCAPE ARCHITECT PRIOR TO PLANTING.

4. THE CONTRACTOR SHALL GUARANTEE THAT ALL PLANTS SHALL BE HEALTHY AND FREE OF DISEASE FOR A PERIOD OF ONE YEAR OR JUNE 1ST OF THE YEAR FOLLOWING INSTALLATION, WHICHEVER IS LONGER, AFTER SUBSTANTIAL COMPLETION AND ACCEPTANCE BY OWNER OR LANDSCAPE ARCHITECT. CONTRACTOR SHALL REPLACE ANY DEAD OR UNHEALTHY PLANTS AT CONTRACTOR'S EXPENSE. PLANT MATERIAL REPLACEMENTS SHALL BE GUARANTEED FOR ONE FULL YEAR FROM DATE OF REPLACEMENT. REPLACEMENT PLANTS SHALL BE THE SAME AS SPECIFIED FOR THE ORIGINAL PLANTING. REPLACEMENTS SHALL BE MADE AS MANY TIMES AS NECESSARY TO ENSURE HEALTHY PLANTS. FINAL ACCEPTANCE SHALL BE MADE IF ALL PLANTS MEET THE GUARANTEE REQUIREMENTS INCLUDING MAINTENANCE. MAINTENANCE RESPONSIBILITIES INCLUDE CULTIVATING, SPRAYING, WEEDING, WATERING, TIGHTENING GUYS, PRUNING, FERTILIZING, MULCHING, AND ANY OTHER OPERATIONS NECESSARY TO MAINTAIN PLANT VIABILITY. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER PLANTING AND CONTINUE UNTIL THE END OF THE GUARANTEE PERIOD. DURING THE LANDSCAPE MAINTENANCE PERIOD (GUARANTEE) THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING OF ANY SITE CONSTRAINTS (PHYSICAL, ENVIRONMENT, ETC.) OR MAINTENANCE DEFICIENCIES THAT MAY AFFECT LANDSCAPE VEGETATION ESTABLISHMENT.

5. THE CONTRACTOR SHALL SUPPLY ALL LABOR, PLANTS, AND MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND LISTED IN THE PLANT SCHEDULE. IN THE EVENT OF A DISCREPANCY BETWEEN QUANTITIES SHOWN IN THE PLANT SCHEDULE AND THOSE REQUIRED BY THE DRAWINGS, THE LARGER SHALL APPLY. ALL PLANTS SHALL BE ACCLIMATED BY THE SUPPLY NURSERY TO THE LOCAL HARDINESS ZONE AND BE CERTIFIED THAT THE PLANTING MATERIAL HAS BEEN GROWN FOR A MINIMUM OF TWO YEARS AT THE SOURCE AND OBTAINED WITHIN 200 MILES OF PROJECT SITE UNLESS OTHERWISE APPROVED BY OWNER OR LANDSCAPE ARCHITECT.

6. PLANTS SHALL HAVE TAGS THAT IDENTIFY PLANT GENUS, SPECIES, CULTIVAR (IF APPLICABLE), PLANT COMMON NAME, NAME OF SOURCE NURSERY, AND SIZE OF PLANT FOR REVIEW OF OWNER OR LANDSCAPE ARCHITECT.

7. NO PLANT SHALL BE PLACED IN THE GROUND BEFORE ROUGH GRADING HAS BEEN COMPLETED AND APPROVED BY THE OWNER OR LANDSCAPE ARCHITECT. STAKING THE LOCATION OF ALL TREES AND SHRUBS SHALL BE COMPLETED PRIOR TO PLANTING FOR APPROVAL BY THE OWNER OR LANDSCAPE ARCHITECT.

8. FINAL GRADES SHALL BLEND SMOOTHLY WITH EXISTING GRADES, AND TOP AND BOTTOM OF SLOPES SHALL BE ROUNDED.

9. ALL TREE AND SHRUB MASSINGS SHALL BE MULCHED TO A DEPTH OF 3". ANNUAL AND PERENNIAL BEDS SHALL BE MULCHED TO A DEPTH OF 2". MULCH SHALL BE UNCOLORED TRIPLE-SHREDDED HARDWOOD BARK MULCH, AGED AT LEAST 6 MONTHS.

10. IF TREE STAKING IS PROPOSED, TREE STAKING MUST BE COMPLETED THE SAME DAY AS THE TREE IS INSTALLED. ALL TREES SHALL BE STAKED OR GUYED PER DETAIL.

11. LANDSCAPE PLANTING AREAS MUST BE FREE DRAINING. PAVEMENT, COMPACTED SUBGRADE, DEAD OR DYING PLANT MATERIAL, BLASTED ROCK, STONES GREATER THAN 1" IN DIAMETER, AND ANY OTHER MATERIAL HARMFUL TO PLANT GROWTH AND DEVELOPMENT SHALL BE REMOVED FROM AREAS TO BE LANDSCAPED AS REQUIRED BY PLANTING DETAILS OR SPECIFICATIONS.

12. PLANTING SOIL:

DEPTH: PLANTING SOIL SHALL BE INSTALLED AT A MINIMUM DEPTH OF 4" OR AS NOTED IN THE LANDSCAPE DETAILS. PLANTING SOIL SHALL BE UTILIZED IN ALL PLANTING AREAS INCLUDING SEEDED AREAS.

TESTING: CONTRACTOR SHALL SUBMIT (2) SOIL SAMPLES PER SOIL STOCKPILE TO A CERTIFIED TESTING LABORATORY TO DETERMINE ACIDITY, ORGANIC CONTENT, MECHANICAL ANALYSIS, AVAILABLE NUTRIENTS (N,P,K,Ca,Mg,S,Fe,Mn,Zn,Cu,B,Al,Pb) AND NECESSARY AMENDMENTS TO SOIL. THE CONTRACTOR SHALL SUBMIT THE TEST RESULTS TO THE OWNER OR LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL. TEST RESULTS SHALL RECOMMEND AMENDMENTS THAT WILL ALTER THE SOIL CHARACTERISTICS SUCH THAT THE CHARACTERISTICS DESCRIBED BELOW ARE ACHIEVED AND THE SPECIFIED PLANTS (CONTRACTOR TO PROVIDE LIST TO TESTING LABORATORY) WILL ACHIEVE PROPER GROWTH THAT IS NEITHER DEFICIENT NOR EXCESSIVE. THE CONTRACTOR SHALL INCORPORATE THESE AMENDMENTS AT NO INCREASE IN CONTRACT PRICE.

CHARACTERISTICS: PLANTING SOIL MAY CONSIST OF EXISTING ON-SITE SOILS, AMENDED ON-SITE SOILS, OR IMPORTED SOILS MEETING THE FOLLOWING CRITERIA:

A. NOT TO CONTAIN MATERIALS HARMFUL TO PLANT LIFE, TO BE CLEAN, FERTILE, FRIABLE, AND WELL DRAINING. ALL PLANTING SOIL SHALL BE FREE OF ANY SUBSOIL EARTH CLODS, SODS, STONES OVER 1" IN ANY DIMENSION, STICKS, ROOTS, WEEDS, LITTER AND OTHER DELETERIOUS MATERIAL. PLANTING SOIL SHALL BE UNIFORM IN QUALITY AND TEXTURE.
B. PLANTING SOIL SHALL HAVE THE FOLLOWING OPTIMUM RANGES UNLESS OTHERWISE APPROVED BY THE OWNER OR LANDSCAPE ARCHITECT.

ORGANIC CONTENT	3% – 6% FOR LAWN OR GRASS AREAS. 4% – 8% FOR TREE AND SHRUB PLANTERS. 8%–16% FOR RETENTION OR DETENTION BASINS.
(BY LOSS OF IGNITION AT 375 C METHOD OF TESTING)	
PH	6.0 – 7.3

C. NUTRIENT LEVELS SHALL BE ACHIEVED BY THE CONTRACTOR'S ADDITION OF AMENDMENTS TO THE PLANTING SOIL TO MEET THE OPTIMUM NUTRIENT LEVELS SPECIFIED IN THE TESTING LABORATORY REPORT FOR EACH OF PLANTS TO BE INSTALLED.
D. SOIL SHALL BE COMPACTED TO A SURFACE PENETRATION RESISTANCE OF 75-125 LBS/SQ.IN.
E. SOIL MAY BE TREATED FOR WEEDS WITH PRE-EMERGENT OR POST-EMERGENT HERBICIDE, AS NEEDED AND AS APPROPRIATE FOR THE APPLICATION SEASON OR LOCATION, OR ELIMINATE GROWTH OF UNWANTED PLANT MATERIAL. APPLY HERBICIDES IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. HERBICIDE APPLICATOR MUST BE LICENSED IN THE STATE OF CONNECTICUT, AND PERFORM APPLICATIONS IN ACCORDANCE WITH LOCAL REQUIREMENTS, PERMITTING STIPULATIONS, AND ANY OTHER RESTRICTIONS INCLUDING AND IN EXCESS OF STATE AND FEDERAL REGULATIONS.
F. PROPOSED TOPSOIL SHALL MEET THE USDA SOILS TEXTURAL PERCENTAGES OF SAND, SILT, AND CLAY FOR FOLLOWING CLASSIFICATIONS:
  - LOAM
  - SANDY LOAM WHERE SAND DOES NOT EXCEED 70% AND CLAY IS NOT LESS THAN 5%.
  - SANDY CLAY LOAM WHERE SAND DOES NOT EXCEED 70% AND CLAY IS LESS THAN 28%.
G. BIORETENTION SOILS: SOIL TO BE INSTALLED IN RETENTION BASINS, PONDS, OR OTHER STORMWATER MANAGEMENT ENVIRONS SHALL MEET THE ABOVE DESCRIBED CHARACTERISTICS AND AS FOLLOWS:
  - SOIL SHALL NOT CONTAIN MORE THAN 20% CLAY AND LESS THAN 40% SILT.
  - SOIL SHALL HAVE AN INFILTRATION RATE BETWEEN 1/2" AND 3" PER HOUR.
H. MODIFICATION TO THE PLANTING SOIL CHARACTERISTICS DESCRIBED ABOVE MAY BE SUBMITTED FOR APPROVAL BY THE LANDSCAPE ARCHITECT. CONTRACTOR MUST DEMONSTRATE PROPOSED CHARACTERISTICS ARE EQUAL TO OR SUPERIOR TO THE SPECIFIED CHARACTERISTICS WITH RESPECT TO SUPPORTING PLANT GROWTH, AND STORMWATER MANAGEMENT.

12. PLANTING AMENDMENTS:
APPLY FERTILIZER AND OTHER AMENDMENTS AS RECOMMENDED FOR EACH PLANTING AREA BY SOIL ANALYSIS. APPLY AMENDMENTS IN A MANNER CONSISTENT WITH MANUFACTURER'S RECOMMENDATIONS. ANY ORGANIC AMENDMENTS SHALL HAVE A pH BETWEEN 4.5 AND 5.5 UNLESS OTHERWISE RECOMMENDED.

13. PLANT REQUIREMENTS: ALL PLANTS SHALL CONFORM IN SIZE AND GRADE TO THE AMERICAN STANDARD FOR NURSERY STOCK, ANSI Z60.1 (LATEST EDITION). ALL PLANTS SHALL MEET THE ADDITIONAL REQUIREMENTS SET FORTH BELOW AND IN WRITTEN SPECIFICATIONS AS APPLICABLE. ALL TREES AND SHRUBS SHALL HAVE BEEN GROWN AT A COMMERCIAL NURSERY WITHIN 200 MILES OF THE PROJECT SITE UNLESS OTHERWISE APPROVED BY OWNER OR LANDSCAPE ARCHITECT. THEY SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY. THEY SHALL BE HEALTHY, SYMMETRICAL, EVENLY AND DENSELY BRANCHED, AND DENSELY FOLIATED WHEN IN LEAF. THEY SHALL BE FREE OF BARK INJURY, DISEASE, AND INSECT PESTS. ALL TREES SHALL HAVE A STRAIGHT TRUNK WITH A SINGLE MAIN LEADER UNLESS OTHERWISE CHARACTERISTIC OF THE SPECIES OR VARIETY. THE OWNER OR LANDSCAPE ARCHITECT WILL ALLOW SUBSTITUTIONS ONLY UPON WRITTEN APPROVAL. SIZES SHALL CONFORM TO THE MEASUREMENT SPECIFIED ON THE DRAWINGS. PLANTS LARGER THAN SPECIFIED MAY BE USED IF APPROVED, BUT THE USE OF SUCH PLANTS SHALL NOT INCREASE THE CONTRACT PRICE. ALL OVERSTORY TREES PLANTED ALONG PARKING AREAS, SIDEWALKS AND PEDESTRIAN ACCESSES SHALL NOT BRANCH BELOW 7' FEET IF THE TREE CALIPER IS 3" INCHES OR GREATER. ALL PLANT MATERIALS ARE SUBJECT TO INSPECTION AND ACCEPTANCE BY THE OWNER OR LANDSCAPE ARCHITECT AT THE NURSERY SOURCE. THE CONTRACTOR SHALL COORDINATE SOURCE VISITS WITH THE LANDSCAPE ARCHITECT AND SHALL ACCOMPANY THE OWNER AND/OR LANDSCAPE ARCHITECT FOR ALL INSPECTIONS. CERTIFICATES OF COMPLIANCE WITH SPECIFICATIONS ARE REQUIRED FOR ALL PLANTS.

14. INSPECTION AND REVIEW:
ALL PLANT MATERIAL SHALL BE SUBJECT TO INSPECTION AND ACCEPTANCE BY THE OWNER OR LANDSCAPE ARCHITECT AT THE NURSERY SOURCE OR PLACE OF GROWTH. THE CONTRACTOR SHALL COORDINATE WITH THE LANDSCAPE ARCHITECT ON A SCHEDULE FOR SOURCE VISITS AND ACCOMPANY THE OWNER OR LANDSCAPE ARCHITECT FOR ALL SOURCE INSPECTIONS. CERTIFICATES OF COMPLIANCE ARE REQUIRED FOR ALL PLANT MATERIALS.
PHOTOGRAPHIC REVIEW OF PLANT MATERIAL IS ACCEPTABLE IF APPROVED BY LANDSCAPE ARCHITECT. PHOTOGRAPHS MUST BE PROVIDED IN QUANTITY AND VARIETY TO ALLOW LANDSCAPE ARCHITECT SUFFICIENT INFORMATION TO MAKE A REASONABLE DETERMINATION AS TO THE PLANTS' QUALITY. OWNER AND LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT PLANT MATERIAL DELIVERED TO THE SITE BUT PREVIOUSLY ACCEPTED IF DAMAGED OR NOT PROPERLY MAINTAINED DURING THE DELIVERY PROCESS.

15. PLANTING SEASONS (UNLESS OTHERWISE APPROVED BY THE OWNER OR LANDSCAPE ARCHITECT)

	SPRING	FALL
EVERGREEN TREES AND SHRUBS	APRIL 1 TO JUNE 15	SEPTEMBER 1 TO OCTOBER 15
DECIDUOUS TREES AND SHRUBS	APRIL 1 TO JUNE 15	SEPTEMBER 15 TO NOVEMBER 15
GROUNDCOVERS	APRIL 1 TO JUNE 15	SEPTEMBER 1 TO OCTOBER 15
PERENNIALS	MAY 15 TO JUNE 15	SEPTEMBER 1 TO OCTOBER 15
BULBS	N/A	SEPTEMBER 15 TO NOVEMBER 15
SEED MIXES	PER MANUFACTURERS RECOMMENDATIONS OR AS LISTED IN SEED MIX NOTES	

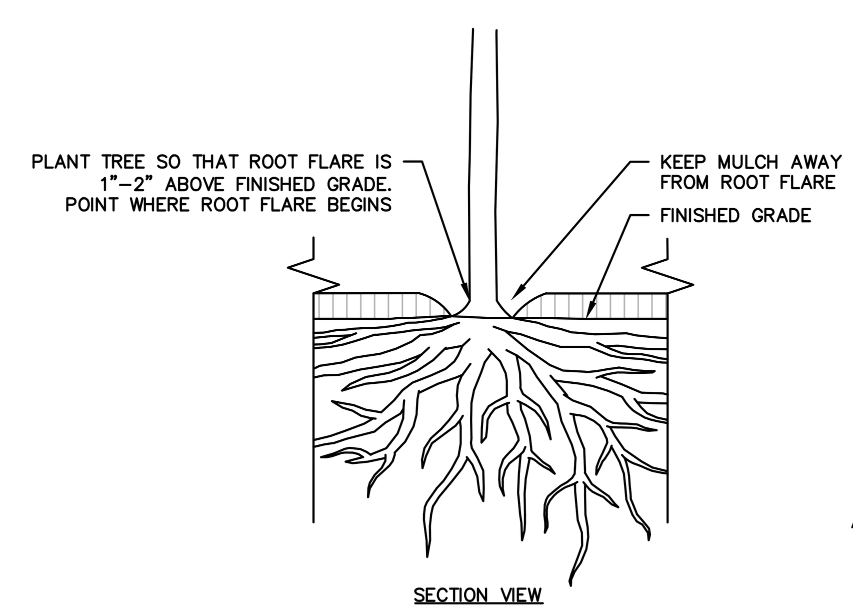
16. SEEDING MIXTURES: REFER TO SEED MIX NOTES. SEEDED AREA SHALL BE ACCEPTED WHEN SEED AREA ACHIEVES 90% COVERAGE.

17. ALL SLOPES 3:1 OR STEEPER RECEIVING A SEED MIX SHALL BE COVERED WITH AN EROSION CONTROL BLANKET OF STRAW FIBER AND BIODEGRADABLE OR PHOTODEGRADABLE NETTING.

18. UNLESS OTHERWISE NOTED IN DRAWING SET, NEW TREELINES SHALL EQUAL CLEARING AND GRUBBING LIMIT FOR CONSTRUCTION.

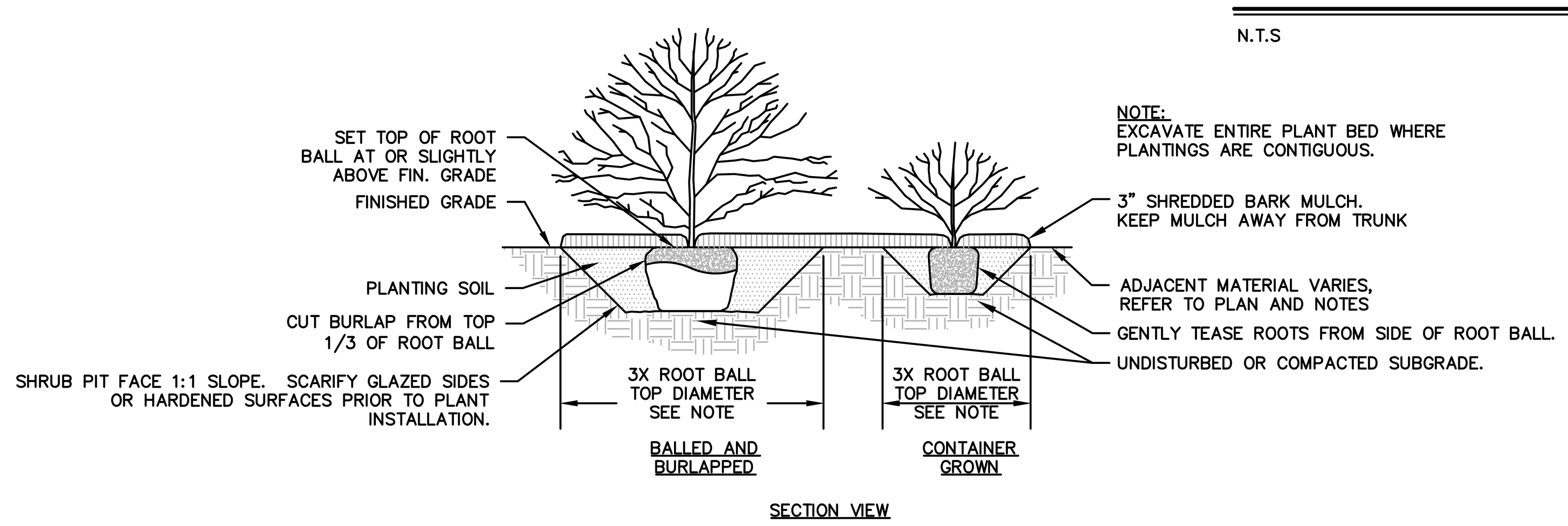
19. ALL DISTURBED AREAS NOT OTHERWISE DEVELOPED SHALL BE SEEDED WITH THE LAWN SEED MIX.

20. ALL SHADE TREE, BUFFER YARD AND OTHER LANDSCAPING INCLUDING WALLS AND FENCES REQUIRED BY LOCAL ORDINANCE OR ZONING SHALL BE PERPETUALLY MAINTAINED BY THE PROPERTY OWNER. ANY LANDSCAPING NEEDED TO MEET AN ORDINANCE OR ZONING REQUIREMENT THAT DIES, IS REMOVED, OR IS SEVERELY DAMAGED SHALL BE REPLACED BY THE CURRENT PROPERTY OWNER AS SOON AS IS PRACTICAL CONSIDERING GROWING SEASONS, WITH A MAXIMUM OF 150 DAYS.



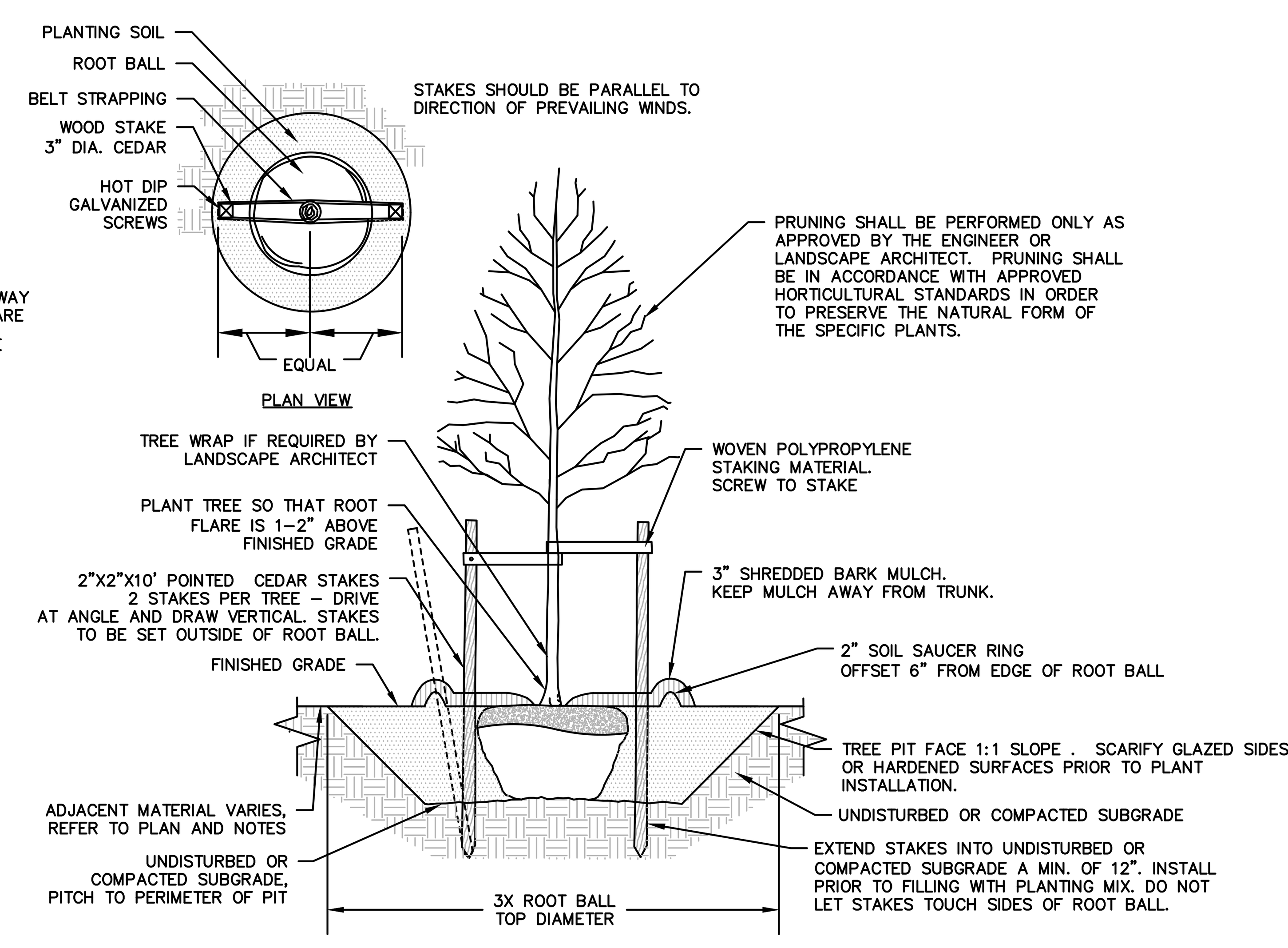
ROOT FLARE DIAGRAM

N.T.S



SHRUB PLANTING

N.T.S



NOTES:
1. STAKING FOR TREES ON 4:1 SLOPES OR LESS THAN 3" CALIPER TO BE PERFORMED AT CONTRACTORS DISCRETION.
2. WOVEN POLYPROPYLENE STAKING MATERIAL SHALL BE DEEPROOT ARBORTIE (GREEN) OR APPROVED EQUIVALENT. MATERIAL SHALL BE LOOPED AROUND TREE THROUGH EACH OTHER, TWISTED, AND SECURED TO THE STAKE. INSTALL SPECIFIED MATERIAL IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
3. BEFORE IN HOLE, REMOVE BOTTOM OF CAGE. ONCE IN HOLE, REMOVE REST OF CAGE FROM ROOT BALL. REMOVE TWINE AND BURLAP FROM TOP 1/3 OF ROOT BALL – SCORE REMAINING 2/3 OF BURLAP. IF BURLAP IS SYNTHETIC OR HAS BEEN TREATED WITH ANTI-DESSICANT, COMPLETELY REMOVE IT FROM ROOT BALL.

DECIDUOUS TREE PLANTING

N.T.S

NOT FOR CONSTRUCTION
FOR PERMITTING PURPOSES ONLY

8/12/2020, AKLOSE, G:\JOBS18\04\1800513\DWG\LL180051301.DWG,LL-2 24X36 NTS.

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Xref (s): ; BD180051301 ; XY180051301 ; XC180051301 ; XY05C133801 ; XY180051302 ; XC180051302 ; XC180051303 ; XL180051301 ; XC180051301-COLOR

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5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	L.M.W.
Drawn	L.M.W.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File:	LL180051301

Title
LANDSCAPE NOTES AND DETAILS

Sheet No.
LL-2

GENERAL DISCLAIMER:

Calculations have been performed according to IES standards and good practice Some differences between measured values and calculated results may occur due to tolerances in calculation methods, testing procedures, component performance, measurement techniques and field conditions such as voltage and temperature variations. Input data used to generate the attached calculations such as room dimensions, reflectances, furniture and architectural elements significantly affect the lighting calculations. If the real environment conditions do not match the input data, differences will occur between measured values and calculated values.

* LLF Determined Using Current Published Lamp Data

NOTE TO REVIEWER:

Total Light Loss Factor (LLF) applied at time of design is determined by applying the Lamp Lumen Depreciation (LLD) from current lamp manufacturer's catalog, a Luminaire Dirt Depreciation Factor (LDD) based on IES recommended values and a Ballast Factor (BF) from current ballast specification sheets. Application of an incorrect Light Loss Factor (LLF) will result in forecasts of performance that will not accurately depict actual results.

For proper comparison of photometric layouts, it is essential that you insist all designers use correct Light Loss Factors.

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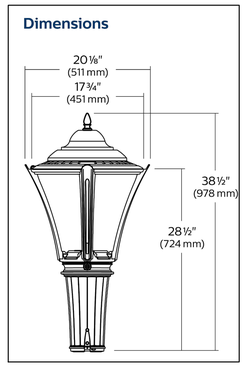
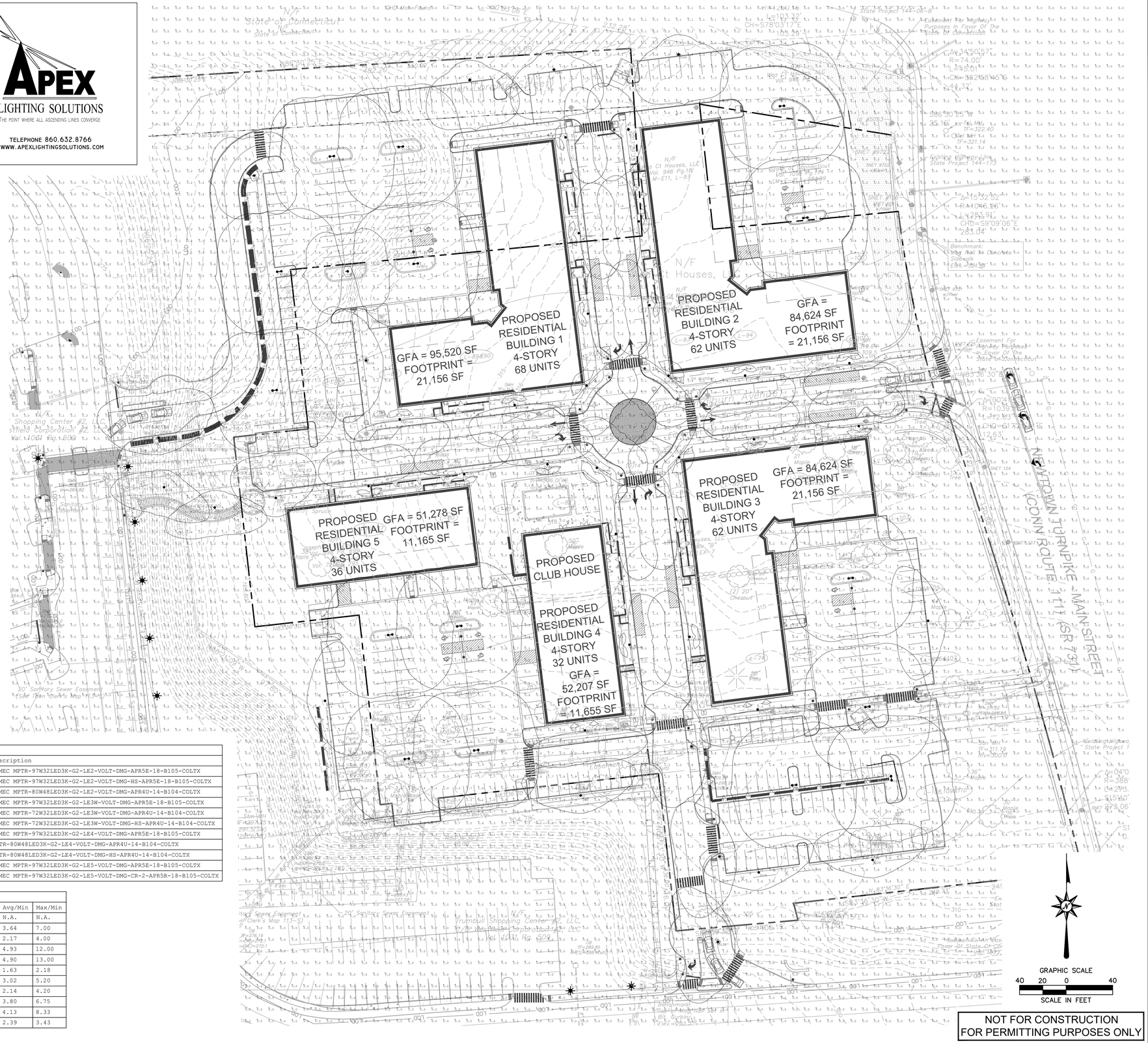


NOTES
1. LUMEC METROSCAPE FIXTURE
2. LED
3. FULL CUT-OFF FIXTURE
4. 14-18 FOOT POLE HEIGHT

TYPICAL LUMINAIRE

N.T.S



Luminaire Schedule							
Qty	Label	Arrangement	Lumens	Input Watts	LLF	BUG Rating	Description
5	SL2A	SINGLE	7172	104.3	0.850	B1-U0-G1	LUMEC MPTR-97W32LED3K-G2-LE2-VOLT-DMG-APR5E-18-B105-COLTX
2	SL2A-H	SINGLE	5958	104.3	0.850	B1-U0-G1	LUMEC MPTR-97W32LED3K-G2-LE2-VOLT-DMG-HS-APR5E-18-B105-COLTX
2	SL2B	SINGLE	6186	81.3	0.850	B1-U0-G1	LUMEC MPTR-80W48LED3K-G2-LE2-VOLT-DMG-APR4U-14-B104-COLTX
5	SL3A	SINGLE	7353	104.3	0.850	B1-U0-G2	LUMEC MPTR-97W32LED3K-G2-LE3W-VOLT-DMG-APR5E-18-B105-COLTX
1	SL3C	SINGLE	5333	70.3	0.850	B1-U0-G2	LUMEC MPTR-72W32LED3K-G2-LE3W-VOLT-DMG-APR4U-14-B104-COLTX
18	SL3C-H	SINGLE	4510	70.3	0.850	B1-U0-G2	LUMEC MPTR-72W32LED3K-G2-LE3W-VOLT-DMG-HS-APR4U-14-B104-COLTX
3	SL4A	SINGLE	7216	104.3	0.850	B1-U0-G2	LUMEC MPTR-97W32LED3K-G2-LE4-VOLT-DMG-APR5E-18-B105-COLTX
1	SL4B	SINGLE	6224	81.3	0.850	B1-U0-G2	MPTR-80W48LED3K-G2-LE4-VOLT-DMG-APR4U-14-B104-COLTX
4	SL4B-H	SINGLE	5453	81.3	0.850	B1-U0-G2	MPTR-80W48LED3K-G2-LE4-VOLT-DMG-HS-APR4U-14-B104-COLTX
2	SL5A	SINGLE	7751	104.3	0.850	B3-U0-G2	LUMEC MPTR-97W32LED3K-G2-LE5-VOLT-DMG-APR5E-18-B105-COLTX
15	SL5A-2	BACK-BACK	7751	104.3	0.850	B3-U0-G2	LUMEC MPTR-97W32LED3K-G2-LE5-VOLT-DMG-CR-2-APR5R-18-B105-COLTX

Calculation Summary						
Label	Grid Height	Avg	Max	Min	Avg/Min	Max/Min
CalcPts_1	0	0.28	4.2	0.0	N.A.	N.A.
CONNECTOR PATH	0	2.55	4.9	0.7	3.64	7.00
EAST DRIVE LANE		1.52	2.8	0.7	2.17	4.00
LOWER LEFT PARKING LOT		1.48	3.6	0.3	4.93	12.00
LOWER RIGHT PARKING LOT		1.47	3.9	0.3	4.90	13.00
NORTH DRIVE LANE		1.79	2.4	1.1	1.63	2.18
SOUTH DRIVE LANE		1.51	2.6	0.5	3.02	5.20
UPPER LEFT DRIVE LANE		1.07	2.1	0.5	2.14	4.20
UPPER LEFT PARKING LOT		1.52	2.7	0.4	3.80	6.75
UPPER RIGHT PARKING LOT		1.24	2.5	0.3	4.13	8.33
WEST DRIVE LANE		1.67	2.4	0.7	2.39	3.43

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8/12/2020, AKLOSE, G:\JOBS18\04\1800513\DWG\LIP1800513O1.DWG,LP-1,

Xref (s): , XYOSC13301, XC1800513O1, XY1800513O2, SL-1, TRUMBULL LUXURY RESIDENCES - TRUMBULL CT 04-24-2020 LED .txd1800513O1

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PROFESSIONAL ENGINEER

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5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Description
1.	6/19/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	L.M.W.
Drawn	L.M.W.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	1800513
Date	05/28/2020
CAD File:	LP1800513O1

Title

SITE LIGHTING PLAN

Sheet No.

LP-1

SITE WORK GENERAL NOTES

1. THESE PLANS ARE FOR PERMITTING PURPOSES ONLY AND ARE NOT FOR CONSTRUCTION.
2. ALL CONSTRUCTION SHALL COMPLY WITH THE PROJECT SPECIFICATION MANUAL; K&K DEVELOPER STANDARDS, MUNICIPAL STANDARDS AND SPECIFICATIONS, CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS, 2010 ADA STANDARDS, AND STATE BUILDING CODE IN THE ABOVE REFERENCED INCREASING HIERARCHY. IF SPECIFICATIONS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION SHALL APPLY. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE OSHA, FEDERAL, STATE AND LOCAL REGULATIONS.
3. REFER TO OTHER PLANS BY OTHER DISCIPLINES, DETAILS AND PROJECT MANUAL FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL VERIFY ALL SITE AND BUILDING CONDITIONS IN THE FIELD AND CONTACT THE CIVIL ENGINEER AND ARCHITECT IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS, SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING. ANY CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONFIRMED WITH THE OWNER'S CONSTRUCTION MANAGER PRIOR TO BIDDING.
4. DO NOT INTERRUPT EXISTING UTILITIES SERVICING FACILITIES OCCUPIED AND USED BY THE OWNER OR OTHERS DURING OCCUPIED HOURS EXCEPT WHEN SUCH INTERRUPTIONS HAVE BEEN AUTHORIZED IN WRITING BY THE OWNER AND THE LOCAL MUNICIPALITIES. INTERRUPTIONS SHALL ONLY OCCUR AFTER ACCEPTABLE TEMPORARY SERVICE HAS BEEN PROVIDED.
5. THE CONTRACTOR SHALL ABIDE BY ALL OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS WHEN OPERATING CRANES, BOOMS, HOISTS, ETC. IN CLOSE PROXIMITY TO OVERHEAD ELECTRIC LINES. IF CONTRACTOR MUST OPERATE EQUIPMENT CLOSE TO ELECTRIC LINES, CONTACT POWER COMPANY TO MAKE ARRANGEMENTS FOR PROPER SAFEGUARDS. ANY UTILITY COMPANY FEES SHALL BE PAID FOR BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORD DRAWINGS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES AND STORMWATER SYSTEM) TO THE OWNER AT THE END OF CONSTRUCTION.
7. THE ARCHITECT OR ENGINEER IS NOT RESPONSIBLE FOR SITE SAFETY MEASURES TO BE EMPLOYED DURING CONSTRUCTION. THE ARCHITECT AND ENGINEER HAVE NO CONTRACTUAL DUTY TO CONTROL THE SAFEST METHODS OR MEANS OF THE WORK, JOB SITE RESPONSIBILITIES, SUPERVISION OR TO SUPERVISE SAFETY AND DOES NOT VOLUNTARILY ASSUME ANY SUCH DUTY OR RESPONSIBILITY.
8. THE CONTRACTOR SHALL COMPLY WITH CFR 29 PART 1926 FOR EXCAVATION, TRENCHING, AND TRENCH PROTECTION REQUIREMENTS.
9. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE SYSTEMS HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY COMPANY AND MUNICIPAL OR STATE RECORD MAPS AND/OR FIELD SURVEY AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE SYSTEMS ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE AND THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STORM DRAINAGE SYSTEMS INCLUDING SERVICES. PRIOR TO DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL CONTACT CT CALL BEFORE YOU DIG (CBYD) 72 HOURS BEFORE COMMENCEMENT OF WORK AT CT (800) 922-4455 OR AT 811 AND VERIFY ALL UTILITY AND STORM DRAINAGE SYSTEM LOCATIONS. THE CONTRACTOR SHALL EMPLOY THE USE OF A UTILITY LOCATING COMPANY TO PROVIDE SUBSURFACE UTILITY ENGINEERING CONSISTING OF DESIGNATING UTILITIES AND STORM PIPING ON PRIVATE PROPERTY WITHIN THE CONTRACT LIMIT AND CONSISTING OF DESIGNATING AND LOCATING WHERE PROPOSED UTILITIES AND STORM PIPING CROSS EXISTING UTILITIES AND STORM PIPING WITHIN THE CONTRACT LIMITS.
10. DO NOT SCALE DRAWINGS. DIMENSIONS GOVERN OVER SCALED DIMENSIONS.
11. IF PLANS AND OR SPECIFICATIONS ARE IN CONFLICT, THE MOST COSTLY SHALL APPLY.
12. ALL CONTRACTORS AND SUBCONTRACTORS SHALL OBTAIN COMPLETE DRAWING PLAN SETS FOR BIDDING AND CONSTRUCTION. PLAN SETS OR PLAN SET ELECTRONIC POSTINGS SHALL NOT BE DISASSEMBLED INTO PARTIAL PLAN SETS FOR USE BY CONTRACTORS AND SUBCONTRACTORS OF INDIVIDUAL TRADES. IT SHALL BE THE CONTRACTOR'S AND SUBCONTRACTOR'S RESPONSIBILITY TO OBTAIN COMPLETE PLAN SETS OR COMPLETE PLAN SET ELECTRONIC POSTINGS FOR USE IN BIDDING AND CONSTRUCTION.
13. ALL NOTES AND DIMENSIONS DESIGNATED "TYPICAL" APPLY TO ALL LIKE OR SIMILAR CONDITIONS THROUGHOUT THE PROJECT.
14. CONTRACTOR(S) TO TAKE AND VERIFY ALL DIMENSIONS AND CONDITIONS OF THE WORK AND BE RESPONSIBLE FOR COORDINATION OF SAME. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO START OF WORK.
15. BL COMPANIES WILL PREPARE FINAL CONSTRUCTION DOCUMENTS SUITABLE FOR BIDDING AND CONSTRUCTION. PROGRESS SETS OF THESE DOCUMENTS ARE NOT SUITABLE FOR THOSE PURPOSES. IF CLIENT ELECTS TO SOLICIT BIDS OR ENTER INTO CONSTRUCTION CONTRACTS UTILIZING CONSTRUCTION DOCUMENTS THAT ARE NOT YET FINAL, CONSULTANT SHALL NOT BE RESPONSIBLE FOR ANY COSTS OR DELAY ARISING AS A RESULT.
16. NO CONSTRUCTION OR DEMOLITION SHALL BEGIN UNTIL APPROVAL OF THE FINAL PLANS IS GRANTED BY ALL GOVERNING AND REGULATORY AGENCIES.
17. THE OWNER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY ZONING PERMITS REQUIRED BY GOVERNMENT AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT AND OBTAIN FROM MUNICIPAL SOURCES AND STATE SOURCES ALL CONSTRUCTION PERMITS, INCLUDING ANY STATE DOT PERMITS, SEWER AND WATER CONNECTION PERMITS, AND ROADWAY CONSTRUCTION PERMITS. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK EXCEPT CTDOT ENCROACHMENT PERMIT BOND.
18. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL PRODUCTS AND MATERIALS PER PLANS AND SPECIFICATIONS TO THE OWNER AND CIVIL ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR DELIVERY TO THE SITE. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
19. THE CONTRACTOR SHALL FOLLOW THE SEQUENCE OF CONSTRUCTION NOTES PROVIDED ON THE SEDIMENT AND EROSION CONTROL NOTES SHEET.
20. THE CONTRACTOR SHALL REFERENCE ARCHITECTURAL PLANS FOR EXACT DIMENSIONS AND CONSTRUCTION DETAILS OF BUILDING, AND THE RAISED CONCRETE SIDEWALKS, LANDINGS, RAMPS, AND STAIRS.
21. SHOULD ANY UNCHARTED OR INCORRECTLY CHARTED, EXISTING PIPING OR OTHER UTILITY BE UNCOVERED DURING EXCAVATION, CONSULT THE CIVIL ENGINEER IMMEDIATELY FOR DIRECTIONS BEFORE PROCEEDING FURTHER WITH WORK IN THIS AREA.
22. ALL SITE DIMENSIONS ARE REFERENCED TO THE FACE OF CURBS OR EDGE OF PAVING AS APPLICABLE UNLESS OTHERWISE NOTED. ALL BUILDING DIMENSIONS ARE REFERENCED TO THE OUTSIDE FACE OF THE STRUCTURE.
23. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC DEVICES FOR PROTECTION OF VEHICLES AND PEDESTRIANS CONSISTING OF DRUMS, BARRIERS, SIGNS, LIGHTS, FENCES, TEMPORARY WALKWAYS, TRAFFIC CONTROLLERS AND UNIFORMED TRAFFIC OFFICERS AS REQUIRED OR AS ORDERED BY THE ENGINEER OR AS REQUIRED BY THE LOCAL GOVERNING AUTHORITIES OR AS REQUIRED BY PERMIT STIPULATIONS OR AS REQUIRED BY THE OWNER. CONTRACTOR SHALL MAINTAIN ALL TRAFFIC LANES AND PEDESTRIAN WALKWAYS FOR USE AT ALL TIMES UNLESS WRITTEN APPROVAL FROM THE APPROPRIATE GOVERNING AGENCY IS GRANTED.
24. TRAFFIC CONTROL SIGNAGE SHALL CONFORM TO THE STATE DOT STANDARD DETAIL SHEETS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. SIGNS SHALL BE INSTALLED PLUMB WITH THE EDGE OF THE SIGN 2' OFF THE FACE OF THE CURB, AND WITH 7' VERTICAL CLEARANCE UNLESS OTHERWISE DETAILED OR NOTED.
25. REFER TO DETAIL SHEETS FOR PAVEMENT, CURBING, AND SIDEWALK INFORMATION.
26. THE CONTRACT LIMIT IS THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE CONTRACT DRAWINGS.
27. THE CONTRACTOR SHALL SUBMIT A SHOP DRAWING OF THE PAVEMENT MARKING PAINT MIXTURE PRIOR TO STRIPING.
28. PAVEMENT MARKING KEY:

    4" SYDL 4' SOLID YELLOW DOUBLE LINE
    4" SYL 4" SOLID YELLOW LINE
    4" SWL 4" SOLID WHITE LINE
    12" SWSB 12" SOLID WHITE STOP BAR
    4" BWL 4" BROKEN WHITE LINE 10' STRIPE 30' SPACE

29. PARKING SPACES SHALL BE STRIPED WITH 4" SYL; HATCHED AREA SHALL BE STRIPED WITH 4"SYL AT A 45° ANGLE, 2' ON CENTER. HATCHING, SYMBOLS, AND STRIPING FOR HANDICAPPED SPACES SHALL BE PAINTED WHITE AND BLUE. OTHER MARKINGS SHALL BE PAINTED WHITE OR AS NOTED.
30. ALL PARKING SPACES AND HATCHED AREAS SHALL HAVE TWO COATS OF PAVEMENT MARKINGS APPLIED TO STRIPING.
31. PAVEMENT MARKINGS SHALL BE HOT APPLIED TYPE IN ACCORDANCE WITH STATE DOT SPECIFICATIONS, UNLESS WHERE EPOXY RESIN PAVEMENT MARKINGS ARE INDICATED.
32. THE CONTRACTOR SHALL RESTORE ANY UTILITY STRUCTURE, DRAINAGE STRUCTURE, PIPE, UTILITY, PAVEMENT, CURBS, SIDEWALKS, LANDSCAPED AREAS, SWALE, PAVEMENT MARKINGS, OR SIGNAGE DISTURBED DURING DEMOLITION AND/OR CONSTRUCTION TO THEIR ORIGINAL CONDITION OR BETTER, AS APPROVED BY THE CIVIL ENGINEER, AND TO THE SATISFACTION OF THE OWNER AND TOWN OF TRUMBULL.
33. EXISTING BOUNDARY AND TOPOGRAPHY IS BASED ON DRAWING TITLED "BOUNDARY/TOPOGRAPHIC SURVEY, LAND OF WEA CT HOUSES, LLC, NEWTOWN TURNPIKE - MAIN STREET (CONN ROUTE 111), TRUMBULL, CONNECTICUT" SCALE 1"=40', DATED 01/22/2020, BY BL COMPANIES INC.
34. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE OWNER, CIVIL ENGINEER, AND APPROPRIATE REGULATORY AGENCY PRIOR TO INSTALLATION DURING THE BIDDING PROCESS.
35. CTDOT ENCROACHMENT PERMIT SHALL BE OBTAINED BY CONTRACTOR WHO SHALL PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC PROTECTION NECESSARY FOR THE WORK. THE OWNER SHALL POST CTDOT ENCROACHMENT PERMIT BOND.
36. AN EROSION CONTROL BOND MAY BE REQUIRED TO BE POSTED BY THE CONTRACTOR BEFORE THE START OF ANY ACTIVITY ON OR OFF SITE. THE AMOUNT OF THE EROSION CONTROL BOND WILL BE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.
37. THE SITE IS CURRENTLY SERVICED BY PUBLIC WATER.
38. NO PART OF THE PROJECT PARCEL IS LOCATED WITHIN ANY FEMA DESIGNATED FLOOD HAZARD AREAS.
39. THERE ARE NO WETLANDS LOCATED ON THE SITE AS INDICATED BY THE NATIONAL WETLANDS INVENTORY ONLINE MAPPING.
40. THERE MAY BE EXISTING STRUCTURES ON SITE TO BE DEMOLISHED. THE CONTRACTOR SHALL SECURE THE NECESSARY PERMITS AND PAY ALL FEES AS APPLICABLE. ALL BUILDING FOOTINGS, FOUNDATION, STRUCTURES, AND BUILDING UTILITY SERVICES SHALL BE REMOVED. CAP UTILITIES AT THE MAIN IN ACCORDANCE WITH UTILITY PROVIDER REQUIREMENTS. COORDINATE WORK WITH UTILITY PROVIDERS. INSTALL TEMPORARY SHEETING AND SHORING TO PROTECT UTILITIES TO REMAIN FROM DAMAGE.
41. 12" SWSB (STOP BAR) AND 4" SYDL AND SWL PAVEMENT MARKINGS LOCATED IN DRIVEWAYS AND IN STATE HIGHWAY SHALL BE EPOXY RESIN TYPE ACCORDING TO CONNDOT SPECIFICATIONS.
42. FIRE LANES SHALL BE ESTABLISHED AND PROPERLY DESIGNATED IN ACCORDANCE WITH THE REQUIREMENTS OF THE FIRE DISTRICT FIRE MARSHAL.
43. THE CONTRACTOR SHALL REMOVE CONFLICTING PAVEMENT MARKINGS IN THE ROADWAY BY METHOD APPROVED BY THE AUTHORITY HAVING JURISDICTION OR DOT AS APPLICABLE FOR THE LOCATION OF THE WORK.
44. ALL ADA DESIGNATED PARKING STALLS, ACCESS AISLES AND PEDESTRIAN WALKWAYS SHALL CONFORM TO THE CURRENT VERSION OF THE AMERICANS WITH DISABILITIES ACT STANDARDS FOR ACCESSIBLE DESIGN AND ANSI STANDARDS AND AS MAY BE SUPERCEDED BY THE STATE BUILDING CODE.
45. CONSTRUCTION OCCURRING ON THIS SITE SHALL COMPLY WITH NFPA 241 STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION AND DEMOLITION OPERATIONS, AND OF NFPA 1 FIRE CODE.
46. CONTRACTOR SHALL SECURE ANY PERMITS, PAY ALL FEES AND PERFORM CLEARING AND GRUBBING AND DEBRIS REMOVAL PRIOR TO COMMENCEMENT OF GRADING OPERATIONS.
47. SEDIMENT AND EROSION CONTROLS AS SHOWN ON THE SEDIMENT AND EROSION CONTROL PLAN AND/OR DEMOLITION PLAN SHALL BE INSTALLED BY THE DEMOLITION CONTRACTOR PRIOR TO START OF DEMOLITION AND CLEARING AND GRUBBING OPERATIONS.
48. REMOVE AND DISPOSE OF ANY SIDEWALKS, FENCES, STAIRS, WALLS, DEBRIS AND RUBBISH REQUIRING REMOVAL FROM THE WORK AREA IN AN APPROVED OFF SITE LANDFILL, BY AN APPROVED HAULER. HAULER SHALL COMPLY WITH ALL REGULATORY REQUIREMENTS.
49. THE CONTRACTOR SHALL SECURE ALL PERMITS FOR THE DEMOLITION AND DISPOSAL OF THE DEMOLITION MATERIAL TO BE REMOVED FROM THE SITE. THE CONTRACTOR SHALL POST BONDS AND PAY PERMIT FEES AS REQUIRED. CONTRACTOR SHALL BE RESPONSIBLE FOR PERMITS AND DISPOSAL OF ALL BUILDING DEMOLITION DEBRIS IN AN APPROVED OFF SITE LANDFILL.
50. ASBESTOS OR HAZARDOUS MATERIAL, IF FOUND ON SITE, SHALL BE REMOVED BY A LICENSED HAZARDOUS MATERIAL ABATEMENT CONTRACTOR.
51. THE CONTRACTOR SHALL PREPARE ALL MANIFEST DOCUMENTS AS REQUIRED PRIOR TO COMMENCEMENT OF DEMOLITION.
52. THE CONTRACTOR SHALL CUT AND PLUG, OR ARRANGE FOR THE APPROPRIATE UTILITY PROVIDER TO CUT AND PLUG ALL SERVICE PIPING AT THE AT THE MAIN, AS REQUIRED BY THE UTILITY PROVIDER, OR AS OTHERWISE NOTED OR SHOWN ON THE CONTRACT DRAWINGS. ALL SERVICES MAY NOT BE SHOWN ON THIS PLAN. THE CONTRACTOR SHALL INVESTIGATE THE SITE PRIOR TO BIDDING TO DETERMINE THE EXTENT OF SERVICE PIPING TO BE REMOVED, CUT OR PLUGGED. THE CONTRACTOR SHALL PAY ALL UTILITY PROVIDER FEES FOR ABANDONMENTS AND REMOVALS.
53. THE CONTRACTOR SHALL PROTECT ALL IRON PINS, MONUMENTS AND PROPERTY CORNERS DURING DEMOLITION AND CONSTRUCTION ACTIVITIES. ANY CONTRACTOR DISTURBED PINS, MONUMENTS, AND OR PROPERTY CORNERS, ETC. SHALL BE RESET BY A LICENSED LAND SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.
54. THE DEMOLITION CONTRACTOR SHALL STABILIZE THE SITE AND KEEP EROSION CONTROL MEASURES IN PLACE UNTIL THE COMPLETION OF HIS WORK OR UNTIL THE COMMENCEMENT OF WORK BY THE SITE CONTRACTOR, WHICHEVER OCCURS FIRST, AS REQUIRED OR DEEMED NECESSARY BY THE ENGINEER OR OWNER'S REPRESENTATIVE. THE SITE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE MAINTENANCE OF EXISTING EROSION AND SEDIMENTATION CONTROLS AND FOR INSTALLATION OF ANY NEW SEDIMENT AND EROSION CONTROLS AS PER THE SEDIMENT AND EROSION CONTROL PLAN, AT THAT TIME.
55. THE CONTRACTOR SHALL PUMP OUT BUILDING FUEL AND WASTE OIL TANKS (IF ANY ARE ENCOUNTERED) AND REMOVE FUEL TO AN APPROVED DISPOSAL AREA BY A LICENSED WASTE OIL HANDLING CONTRACTOR IN STRICT ACCORDANCE WITH STATE REQUIREMENTS.
56. IF IMPACTED OR CONTAMINATED SOIL IS ENCOUNTERED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUSPEND EXCAVATION WORK OF IMPACTED SOIL AND NOTIFY THE OWNER AND/OR OWNER'S ENVIRONMENTAL CONSULTANT PRIOR TO PROCEEDING WITH FURTHER WORK IN THE IMPACTED SOIL LOCATION UNTIL FURTHER INSTRUCTED BY THE OWNER AND/OR OWNER'S ENVIRONMENTAL CONSULTANT.
57. EXISTING WATER SERVICES SHALL BE DISCONNECTED AND CAPPED AT MAIN IN ACCORDANCE WITH THE REQUIREMENTS OF THE WATER UTILITY PROVIDER.
58. EXISTING SANITARY LATERAL SHALL BE PLUGGED WITH NON-SHRINK GROUT AT MAIN CONNECTION IN ACCORDANCE WITH THE SANITARY UTILITY PROVIDER REQUIREMENTS. REMOVE EXISTING LATERAL PIPING FROM SITE UNLESS OTHERWISE SHOWN ON DEMOLITION PLANS OR AS REQUIRED BY THE SANITARY UTILITY PROVIDER.
59. DOMESTIC GAS SERVICES SHALL BE CAPPED AND SERVICE LINES PURGED OF RESIDUAL GAS IN ACCORDANCE WITH THE GAS UTILITY PROVIDER REQUIREMENTS. WORK TO BE COORDINATED BY AND PAID FOR BY THE CONTRACTOR. REMOVE EXISTING SERVICE PIPING ON SITE. ANY PROPANE TANKS SHALL BE PURGED OF RESIDUAL GAS BY PROPANE SUPPLIER. CONTRACTOR SHALL COORDINATE THIS WORK AND PAY NECESSARY FEES.
60. THE CONTRACTOR SHALL PROVIDE DISCONNECT NOTIFICATION TO THE MUNICIPALITY ENGINEERING DEPARTMENT, TELECOMMUNICATIONS UTILITY PROVIDER, GAS UTILITY PROVIDER, ELECTRIC UTILITY PROVIDER, SANITARY UTILITY PROVIDER, AND WATER UTILITY PROVIDER AT LEAST THREE WEEKS PRIOR TO BEGINNING DEMOLITION.
61. THE CONTRACTOR IS RESPONSIBLE FOR SECURING A DEMOLITION PERMIT FROM THE TOWN OF TRUMBULL BUILDING DEPARTMENT AND MUST FURNISH THE REQUIRED APPLICATION MATERIAL AND PAY ALL FEES.
62. BACK FILL DEPRESSIONS, FOUNDATION HOLES AND REMOVED DRIVEWAY AREAS IN LOCATIONS NOT SUBJECT TO FURTHER EXCAVATION WITH SOIL MATERIAL APPROVED BY THE OWNER'S GEOTECHNICAL ENGINEER AND COMPACT, FERTILIZE, SEED AND MULCH DISTURBED AREAS NOT SUBJECT TO FURTHER SITE CONSTRUCTION. DEMOLISHED BUILDING FOUNDATION AREA AND BASEMENT IF PRESENT TO BE BACKFILLED WITH GRAVEL FILL OR MATERIAL SPECIFIED IN THE PROJECT GEOTECHNICAL REPORT IN LIFT THICKNESS SPECIFIED IN THE GEOTECHNICAL REPORT. COMPACT TO 95% MAX. DRY DENSITY PER ASTM D1557 AT MOISTURE CONTENT SPECIFIED IN GEOTECHNICAL REPORT AND EARTHWORK SPECIFICATION. EMPLOY WATERING EQUIPMENT FOR DUST CONTROL.
63. NO DEBRIS AND STUMPS TO BE BURIED ON SITE.
64. THE CONTRACTOR SHALL REPAIR PAVEMENTS BY INSTALLING TEMPORARY AND PERMANENT PAVEMENTS IN PUBLIC RIGHTS OF WAYS (IF APPLICABLE) AS REQUIRED BY LOCAL GOVERNING AUTHORITIES AND THE CT DOT AND PER PERMIT REQUIREMENTS DUE TO DEMOLITION AND PIPE REMOVAL ACTIVITIES.
65. NO WORK ON THIS SITE SHALL BE INITIATED BY THE CONTRACTOR UNTIL A PRE-CONSTRUCTION MEETING WITH OWNER AND THE CIVIL ENGINEER IS PERFORMED. THE CONTRACTOR SHOULD BE AWARE OF ANY SITE INFORMATION AVAILABLE SUCH AS GEOTECHNICAL AND ENVIRONMENTAL REPORTS. THE CONTRACTOR SHALL HAVE CT CALL BEFORE YOU DIG MARK OUTS OF EXISTING UTILITIES COMPLETED PRIOR TO MEETING.
66. THE CONTRACTOR SHALL ARRANGE FOR AND INSTALL TEMPORARY OR PERMANENT UTILITY CONNECTIONS WHERE INDICATED ON PLAN OR AS REQUIRED. MAINTAIN UTILITY SERVICES TO BUILDINGS OR TO SERVICES TO REMAIN. CONTRACTOR TO COORDINATE WITH UTILITY PROVIDERS FOR INSTALLATION AND PAY UTILITY PROVIDER FEES.
67. THE CONTRACTOR SHALL NOT COMMENCE DEMOLITION OR UTILITY DISCONNECTIONS UNTIL AUTHORIZED TO DO SO BY THE OWNER.
68. THE CONTRACTOR OR DEMOLITION CONTRACTOR SHALL INSTALL TEMPORARY SHEETING OR SHORING AS NECESSARY TO PROTECT EXISTING AND NEW BUILDINGS, STRUCTURES AND UTILITIES DURING CONSTRUCTION AND DEMOLITION. SHEETING OR SHORING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER, LICENSED IN THIS STATE AND EVIDENCE OF SUCH SUBMITTED TO THE OWNER PRIOR TO INSTALLATION.
69. NO SALVAGE SHALL BE PERMITTED UNLESS PAID TO THE OWNER AS A CREDIT.
70. ANY EXISTING POTABLE WELL AND ANY EXISTING SEPTIC TANKS/ABSORPTION AREAS SHALL BE ABANDONED AND REMOVED PER THE TRUMBULL HEALTH DEPARTMENT AND HEALTH CODE REQUIREMENTS.
71. THE CONTRACTOR SHALL PRESERVE EXISTING VEGETATION WHERE POSSIBLE AND/OR AS NOTED ON DRAWINGS. REFER TO SEDIMENT AND EROSION CONTROL PLAN FOR LIMIT OF DISTURBANCE AND EROSION CONTROL NOTES, SHEET.
72. TOPSOIL SHALL BE STRIPPED AND STOCKPILED ON SITE FOR USE IN FINAL LANDSCAPING.
73. FILL WITHIN FORMER BUILDING FOUNDATIONS SHALL BE CHECKED BY TEST PIT AND PROOF-ROLLING AND SHALL BE OBSERVED BY THE OWNER'S GEOTECHNICAL ENGINEER. SUBGRADE SHALL BE FORMED WITH REMOVAL AND REPLACEMENT OF FILL AND REMOVAL AND REPLACEMENT OF UNSUITABLE AND SOFT SUBGRADE MATERIAL AS REQUIRED BY THE GEOTECHNICAL ENGINEER. SEE GEOTECHNICAL REPORT AND EARTHWORK SPECIFICATIONS FOR FURTHER DESCRIPTION.
74. THE CONTRACTOR SHALL COMPACT FILL IN LIFT THICKNESS PER THE GEOTECHNICAL REPORT UNDER ALL PARKING, BUILDING, DRIVE, AND STRUCTURE AREAS TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR TEST), OR AS REQUIRED BY THE GEOTECHNICAL ENGINEER.
75. UNDERDRAINS SHALL BE ADDED, IF DETERMINED NECESSARY IN THE FIELD BY THE OWNER/GEOTECHNICAL ENGINEER, AFTER SUBGRADE IS ROUGH GRADED.
76. VERTICAL DATUM IS NGVD 29.
77. CLEARING LIMITS SHALL BE PHYSICALLY MARKED IN THE FIELD AND APPROVED BY THE TOWN OF TRUMBULL AGENT PRIOR TO THE START OF WORK ON THE SITE.
78. PROPER CONSTRUCTION PROCEDURES SHALL BE FOLLOWED ON ALL IMPROVEMENTS WITHIN THIS PARCEL SO AS TO PREVENT THE SILTING OF ANY WATERCOURSE OR WETLANDS IN ACCORDANCE WITH THE REGULATIONS OF THE CT DEEP AND THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION. IN ADDITION, THE CONTRACTOR SHALL STRICTLY ADHERE TO THE SEDIMENT AND EROSION CONTROL PLAN CONTAINED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE TO POST ALL BONDS AS REQUIRED BY THE LOCAL MUNICIPALITIES, OR SOIL THE PLANNING AND ZONING COMMISSION WHICH WOULD GUARANTEE THE PROPER IMPLEMENTATION OF THE PLAN.
79. ALL SITE WORK, MATERIALS OF CONSTRUCTION, AND CONSTRUCTION METHODS FOR EARTHWORK AND STORM DRAINAGE WORK SHALL CONFORM TO THE SPECIFICATIONS AND DETAILS AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS MANUAL. OTHERWISE THIS WORK SHALL CONFORM TO THE CT STATE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND PROJECT GEOTECHNICAL REPORT IF THERE IS NO PROJECT SPECIFICATIONS MANUAL. ALL FILL MATERIAL UNDER STRUCTURES AND PAVED AREAS SHALL BE PER THE ABOVE STATED APPLICABLE SPECIFICATIONS, AND/OR PROJECT GEOTECHNICAL REPORT, AND SHALL BE PLACED IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER. MATERIAL SHALL BE COMPACTED IN LIFT THICKNESSES PER THE PROJECT GEOTECHNICAL REPORT TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 1557 AT MOISTURE CONTENT INDICATED IN PROJECT GEOTECHNICAL REPORT.
80. ALL DISTURBANCE INCURRED TO MUNICIPAL, AND STATE PROPERTY DUE TO CONSTRUCTION SHALL BE RESTORED TO ITS PREVIOUS CONDITION OR BETTER, TO THE SATISFACTION OF THE MUNICIPALITY AND STATE AS APPLICABLE FOR THE LOCATION OF THE WORK.
81. ALL CONSTRUCTION WITHIN A DOT RIGHT OF WAY SHALL COMPLY WITH ALL DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.
82. THE UTILITY PLAN DETAILS SITE INSTALLED PIPES UP TO 5' FROM THE BUILDING FACE. REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING CONNECTIONS. SITE CONTRACTOR SHALL SUPPLY AND INSTALL PIPE ADAPTERS AS NECESSARY AT BUILDING CONNECTION POINT OR AT EXISTING UTILITY OR PIPE CONNECTION POINT.
83. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE PROPOSED SANITARY SEWERS AND WHERE PROPOSED STORM PIPING WILL CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE CIVIL ENGINEER IN THE EVENT OF ANY DISCOVERED OR UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED SANITARY SEWERS, STORM PIPING AND UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.
84. UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY PROVIDER AND GOVERNING AUTHORITY STAFF REVIEW.
85. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY PROVIDERS AND GOVERNING AUTHORITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY PROVIDER.
86. THE CONTRACTOR SHALL ARRANGE FOR AND COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS FOR SERVICE INSTALLATIONS AND CONNECTIONS. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY PROVIDERS AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATIONS MANUAL AND/OR GENERAL CONDITIONS OF THE CONTRACT.
87. ALL EXISTING PAVEMENT WHERE UTILITY PIPING IS TO BE INSTALLED SHALL BE SAW CUT. AFTER UTILITY INSTALLATION IS COMPLETED, THE CONTRACTOR SHALL INSTALL TEMPORARY AND/OR PERMANENT PAVEMENT REPAIR AS DETAILED ON THE DRAWINGS OR AS REQUIRED BY THE OWNER HAVING JURISDICTION.
88. ALL PIPES SHALL BE LAID ON STRAIGHT ALIGNMENTS AND EVEN GRADES USING A PIPE LASER OR OTHER ACCURATE METHOD.
89. SANITARY LATERAL SHALL MAINTAIN (10' MIN. HORIZONTAL 1.5' VERTICAL MIN.) SEPARATION DISTANCE FROM WATER LINES, OR ADDITIONAL PROTECTION MEASURES WILL BE REQUIRED WHERE PERMITTED, WHICH SHALL INCLUDE CONCRETE ENCASEMENT OF PIPING UNLESS OTHERWISE DIRECTED BY THE UTILITY PROVIDERS AND CIVIL ENGINEER.
90. RELOCATION OF UTILITY PROVIDER FACILITIES SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY PROVIDER.
91. THE CONTRACTOR SHALL COMPACT THE PIPE BACKFILL IN 8" LIFTS ACCORDING TO THE PIPE BEDDING DETAILS. TRENCH BOTTOM SHALL BE STABLE IN HIGH GROUNDWATER AREAS. A PIPE FOUNDATION SHALL BE USED PER THE TRENCH DETAILS AND IN AREAS OF ROCK EXCAVATION. STORM DRAINAGE SYSTEM AND UTILITIES ARE TO BE INSTALLED IN 'CUT' CONDITIONS AFTER FINAL SUBGRADE HAS BEEN ESTABLISHED.
92. CONTRACTOR TO PROVIDE STEEL SLEEVES AND ANNULAR SPACE SAND FILL FOR UTILITY PIPE AND CONDUIT CONNECTIONS UNDER FOOTINGS.
93. BUILDING UTILITY PENETRATIONS AND LOCATIONS ARE SHOWN FOR THE CONTRACTOR'S INFORMATION AND SHALL BE VERIFIED WITH THE BUILDING MEP, STRUCTURAL, AND ARCHITECTURAL DRAWINGS AND WITH THE OWNER'S CONSTRUCTION MANAGER.
94. ALL UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION FOR APPROVAL PRIOR TO BACKFILLING, IN ACCORDANCE WITH THE APPROPRIATE UTILITY PROVIDER REQUIREMENTS.
95. A ONE-FOOT MINIMUM VERTICAL CLEARANCE BETWEEN WATER, GAS, ELECTRICAL, AND TELECOMMUNICATION LINES AND STORM PIPING SHALL BE PROVIDED. A SIX-INCH MINIMUM CLEARANCE SHALL BE MAINTAINED BETWEEN STORM PIPING AND SANITARY SEWER WITH A CONCRETE ENCASEMENT. AN 18-INCH TO 6-INCH VERTICAL CLEARANCE BETWEEN SANITARY SEWER PIPING AND STORM PIPING SHALL REQUIRE CONCRETE ENCASEMENT OF THE PROPOSED PIPING.
96. GRAVITY SANITARY SEWER PIPING AND PRESSURIZED WATERLINES SHALL BE LOCATED IN SEPARATE TRENCHES AT LEAST 10 FEET APART WHENEVER POSSIBLE. WHEN INSTALLED IN THE SAME TRENCH, THE WATER PIPE SHALL BE LAID ON A TRENCH BENCH AT LEAST 18 INCHES ABOVE THE TOP OF THE SANITARY SEWER PIPE AND AT LEAST 12 INCHES (PREFERABLY 18 INCHES) FROM THE SIDE OF THE SANITARY SEWER PIPE TRENCH.
97. SITE CONTRACTOR SHALL PROVIDE ALL BENDS, FITTINGS, ADAPTERS, ETC., AS REQUIRED FOR PIPE CONNECTIONS TO BUILDING STUB OUTS, INCLUDING ROOF DRAIN CONNECTIONS TO ROOF LEADERS AND TO STORM DRAINAGE SYSTEM, AND FOOTING DRAIN CONNECTIONS TO STORM DRAINAGE SYSTEM.
98. MANHOLE RIMS AND CATCH BASIN GRATES SHALL BE SET TO ELEVATIONS SHOWN. SET ALL EXISTING MANHOLE RIMS AND VALVE COVERS TO BE RAISED OR LOWERED FLUSH WITH FINAL GRADE AS NECESSARY.
99. SITE CONTRACTOR SHALL COORDINATE INSTALLATION OF CONDUIT AND CABLES FOR SITE LIGHTING WITH THE BUILDING ELECTRICAL CONTRACTOR.
100. CONTRACTOR SHALL COORDINATE INSTALLATION FOR ELECTRICAL SERVICES TO ENTRY SIGN AND SITE LIGHTING WITH THE BUILDING ELECTRICAL CONTRACTOR.
101. THE CONTRACTOR SHALL ARRANGE AND COORDINATE WITH UTILITY PROVIDERS FOR WORK TO BE PERFORMED BY UTILITY PROVIDERS. THE CONTRACTOR SHALL PAY ALL UTILITY FEES UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATION MANUAL AND GENERAL CONDITIONS, AND REPAIR PAVEMENTS AS NECESSARY.
102. ELECTRIC, AND TELECOMMUNICATIONS SERVICES SHALL BE INSTALLED UNDERGROUND FROM SERVICE POLE SNET#125 AND SNET#122. THE CONTRACTOR SHALL PROVIDE AND INSTALL AND BACKFILL 4-3" PVC CONDUITS FOR TELECOMMUNICATIONS SERVICE, 2-4" PVC CONDUITS FOR ELECTRIC SERVICE PRIMARY, PVC CONDUITS FOR ELECTRICAL SECONDARY PER BUILDING ELECTRICAL PLANS, (SCHEDULE 80 UNDER PAVEMENT, SCHEDULE 40 IN NON PAVEMENT AREAS). SERVICES MAY BE INSTALLED IN A COMMON TRENCH WITH 12" CLEAR SPACE BETWEEN. MINIMUM COVER IS 36" ON ELECTRIC CONDUITS, AND 24" ON TELECOMMUNICATIONS CONDUITS. SERVICES SHALL BE MARKED WITH MAGNETIC LOCATOR TAPE AND SHALL BE BEDDED, INSTALLED, AND BACKFILLED IN ACCORDANCE WITH ELECTRIC UTILITY PROVIDER, AND TELECOMMUNICATIONS COMPANY STANDARDS. GALVANIZED STEEL ELECTRICAL CONDUIT SHALL BE USED AT POLE AND TRANSFORMER LOCATIONS. INSTALL HANDHOLES AS REQUIRED TO FACILITATE INSTALLATION AND AS REQUIRED BY UTILITY PROVIDER. INSTALL TRAFFIC LOAD QUALIFIED HANDHOLES IN VEHICULAR AREAS. INSTALL CONCRETE ENCASEMENT ON PRIMARY ELECTRIC CONDUITS IF REQUIRED BY ELECTRIC UTILITY PROVIDER.
103. ALL WATER LINES TO HAVE A MINIMUM COVER OF 4 FEET. ALL LINES SHALL BE BEDDED IN 6" SAND AND INITIALLY BACKFILLED WITH 12" SAND.
104. ALL WATER MAINS, WATER SERVICES AND SANITARY SEWER LATERALS SHALL CONFORM TO THE APPLICABLE WATER UTILITY PROVIDER SPECIFICATIONS, AND TO THE APPLICABLE SANITARY SEWER PROVIDER SPECIFICATIONS, AS WELL AS TO OTHER APPLICABLE INDUSTRY CODES (AWWA) AND PROJECT SPECIFICATIONS FOR POTABLE WATER SYSTEMS, AND FOR SANITARY SEWER SYSTEMS.
105. THE CONTRACTOR SHALL MAINTAIN ALL FLOWS AND UTILITY CONNECTIONS TO EXISTING BUILDINGS WITHOUT INTERRUPTION UNLESS/UNTIL AUTHORIZED TO DISCONNECT BY THE OWNERS, THE CIVIL ENGINEER, UTILITY PROVIDERS AND GOVERNING AUTHORITIES.
106. THE CONTRACTOR MAY SUBSTITUTE MASONRY STRUCTURES FOR PRECAST STRUCTURES IF APPROVED BY THE CIVIL ENGINEER AND ALLOWED BY THE GOVERNING AUTHORITY ENGINEER OR OTHER GOVERNING AUTHORITY.
107. PIPING SHALL BE LAID FROM DOWNGRADIENT END OF PIPE RUN IN AN UPGRADIENT DIRECTION WITH BELL END FACING UPGRADE IN THE DIRECTION OF PIPE LAYING.
108. POLYVINYL CHLORIDE PIPE (PVCP) FOR STORM PIPING SHALL HAVE BUILT-IN RUBBER GASKET JOINTS. PVCP SHALL CONFORM TO ASTM D-3034 (SDR35) WITH COMPRESSION JOINTS AND MOLDED FITTINGS. PVCP SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS; ASTM-D2321 AND MANUFACTURERS RECOMMENDED PROCEDURE.
109. ALL RCP SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-76; ALL RCP SHALL BE CLASS IV UNLESS OTHERWISE SHOWN. JOINTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-443.
110. MANHOLE SECTIONS AND CONSTRUCTION SHALL CONFORM TO ASTM C-478.
111. HIGH DENSITY POLYETHYLENE (HDPE) STORM SEWER 12" OR GREATER IN DIAMETER SHALL BE N 12 WT PIPE AS MANUFACTURED BY ADS OR APPROVED EQUAL. HDPE PIPE SHALL HAVE SMOOTH INTERIOR AND CORRUGATED EXTERIOR AND SHALL MEET THE REQUIREMENTS OF AASHTO M294, TYPE S. PIPE SECTIONS SHALL BE JOINED WITH BELL-AND-SPIGOT JOINT MEETING THE REQUIREMENTS OF AASHTO M294. THE BELL SHALL BE AN INTEGRAL PART OF THE PIPE AND PROVIDE A MINIMUM PULL-APART STRENGTH OF 400 POUNDS. THE JOINT SHALL BE WATERTIGHT ACCORDING TO THE REQUIREMENTS OF ASTM D3212. GASKETS SHALL BE MADE OF POLYISOPRENE MEETING THE REQUIREMENTS OF ASTM F477. ALTERNATIVE HDPE PIPE MAY BE USED IF APPROVED BY THE ENGINEER AND OWNER'S CONSTRUCTION MANAGER PRIOR TO ORDERING.
112. HIGH DENSITY POLYETHYLENE (HDPE) STORM SEWER LESS THAN 12" IN DIAMETER SHALL BE N12 AS MANUFACTURED BY ADS OR APPROVED EQUAL. HDPE PIPE SHALL HAVE SMOOTH INTERIOR AND CORRUGATED EXTERIOR AND SHALL MEET THE REQUIREMENTS OF AASHTO 252, TYPE S. PIPE SECTIONS SHALL BE JOINED WITH COUPLING BANDS OR EXTERNAL SNAP COUPLERS COVERING AT LEAST 2 FULL CORRUGATIONS ON EACH END OF THE PIPE. SOIL-TIGHT (GASKET) CONNECTIONS SHALL INCORPORATE A CLOSED SYNTHETIC EXPANDED RUBBER GASKET. MEETING THE REQUIREMENTS OF ASTM F477. GASKETS SHALL BE INSTALLED ON THE CONNECTION BY THE PIPE MANUFACTURER. WATERTIGHT PIPE SHALL BE ADS N12 WT OR APPROVED EQUAL. ALTERNATIVE HDPE PIPE MAY BE USED IF APPROVED BY THE ENGINEER AND OWNER'S CONSTRUCTION MANAGER PRIOR TO ORDERING.
113. COPPER PIPE SHALL BE TYPE K TUBING WITH COMPRESSION FITTINGS.
114. GAS PIPE MATERIAL SHALL BE PER GAS COMPANY REQUIREMENTS.
115. POLYVINYL CHLORIDE PIPE (PVCP) FOR SANITARY PIPING SHALL HAVE BUILT-IN RUBBER GASKET JOINTS. PVCP SHALL CONFORM TO ASTM D3034 (SDR35) WITH COMPRESSION JOINTS AND MOLDED FITTINGS. PVCP SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS, ASTM D2321 AND MANUFACTURER'S RECOMMENDED PROCEDURE.
116. DUCTILE IRON PIPE SHALL CONFORM TO AWWA C151 FOR CLASS 52 WITH CEMENT LINING IN ACCORDANCE WITH ANSI A21.4 FOR WATER MAINS AND SERVICES 3" ID AND LARGER. JOINTS SHALL BE MADE WITH CONCRETE THRUST BLOCKS OR WITH MEGAULUG RETAINER GLANDS OR WITH RODDING IN ACCORDANCE WITH PROJECT MANUAL SPECIFICATIONS AND IN ACCORDANCE WITH WATER UTILITY PROVIDER REQUIREMENTS TO EXTEND A MINIMUM OF 2 PIPE LENGTHS IN EITHER DIRECTION FROM FITTINGS AND ELBOWS (40 FT MINIMUM). ALL OTHER JOINTS SHALL BE PUSH-ON WITH RUBBER GASKETS (TYTON). USE OF OTHER TYPES OF RETAINER GLANDS SHALL REQUIRE USE WITH CLASS 53 OR GREATER DUCTILE IRON PIPE.
117. REFER TO STORM WATER MANAGEMENT REPORT FOR OPERATIONS AND MAINTENANCE SCHEDULE FOR SYSTEM COMPONENTS.

DEFINITIONS

MUNICIPALITY SHALL MEAN TOWN OF TRUMBULL

COUNTY SHALL MEAN FAIRFIELD COUNTY

STATE SHALL MEAN STATE OF CONNECTICUT

WATER UTILITY PROVIDER SHALL MEAN AQUARION WATER COMPANY

SANITARY UTILITY PROVIDER SHALL MEAN THE TOWN OF TRUMBULL WATER POLLUTION CONTROL AUTHORITY

GAS UTILITY PROVIDER SHALL MEAN SOUTHERN CONNECTICUT GAS

TELECOMMUNICATIONS UTILITY PROVIDER SHALL MEAN CHARTER

ELECTRIC UTILITY PROVIDER SHALL MEAN UNITED ILLUMINATING COMPANY

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Garden Homes

ROSE EQUITIES
Owner-Builders since 1949

STATE OF CONNECTICUT
CHRISTOPHER D. GAGNON
No. 25798
LICENSED
PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
K & K DEVELOPERS, INC.
5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File: GN180051301	

Title
GENERAL NOTES

Sheet No.
GN-1

Xref (s): ; BD180051301

8/12/2020, AKLOSE, G:\JOBS18\04\1800513\DWG\GN180051301.DWG,GN-1 24X36.

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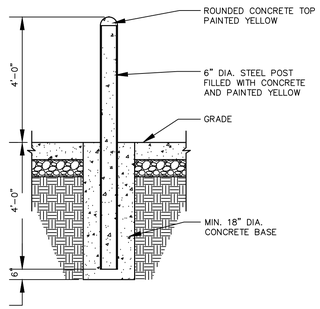
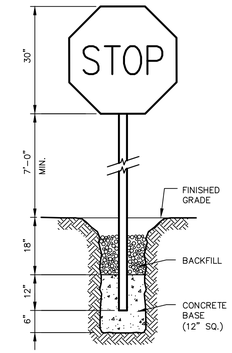


PROTECTIVE POST (BOLLARD) DETAIL

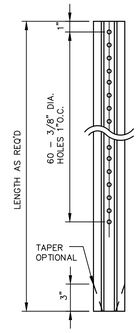
N.T.S. BLSE-005



NOTE:
CONSTRUCT SIGN IN ACCORDANCE WITH DOT SPECIFICATIONS.

TYPICAL SIGN MOUNTING

N.T.S.

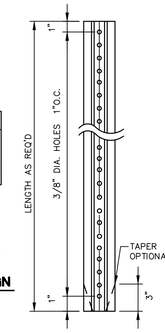


DETAIL A HOLE LOCATION

WT.	A	B	C
3 LB. OR 3 LB.	1-5/8"	1-3/4"	3-1/2"
4 LB.	1-5/8"	1-3/4"	3-1/2"

DETAIL A TYPICAL METAL SIGN

DETAIL B TYPICAL METAL SIGN



DETAIL B HOLE LOCATION

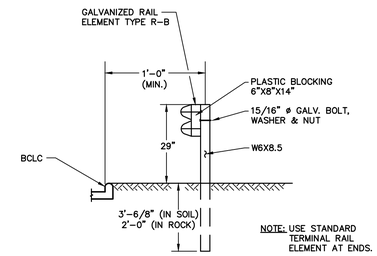
NOTES:
STEEL FOR POSTS SHALL CONFORM TO THE MECHANICAL REQUIREMENTS OF ASTM A 499-81 GRADE 60 AND TO THE CHEMICAL REQUIREMENTS OF ASTM AI-76 CARBON STEEL TEE RAIL HAVING NOMINAL WEIGHT OF "9# LBS OR GREATER PER LINEAR YARD.

AFTER FABRICATION ALL STEEL POSTS SHALL BE GALVANIZED TO MEET THE REQUIREMENTS OF ASTM A-123.

SIGN MOUNTING HEIGHT TO BE APPROVED BY THE ENGINEER.

TYPICAL METAL SIGN POSTS

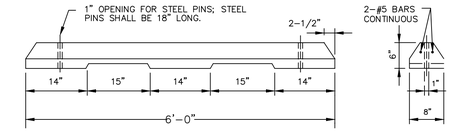
N.T.S. BLSD-001



NOTE: USE STANDARD TERMINAL RAIL ELEMENT AT ENDS.

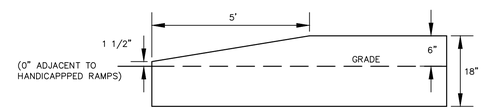
RB-350 METAL BEAM RAIL

N.T.S. ZGR-004



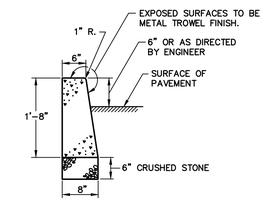
CONCRETE CURB STOP

N.T.S. BLPC-001



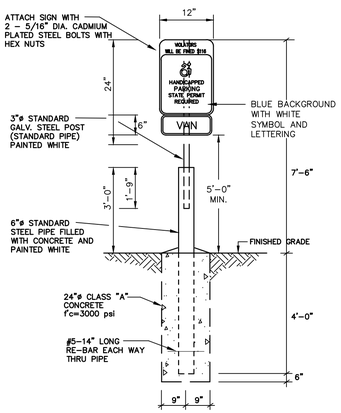
TRANSITION CURB

N.T.S.



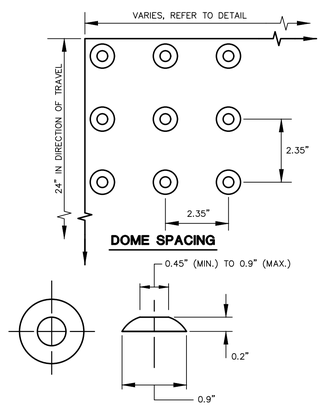
CONCRETE CURB DETAIL

N.T.S. ZPC-014



HANDICAP SIGN BOLLARD DETAIL

N.T.S.

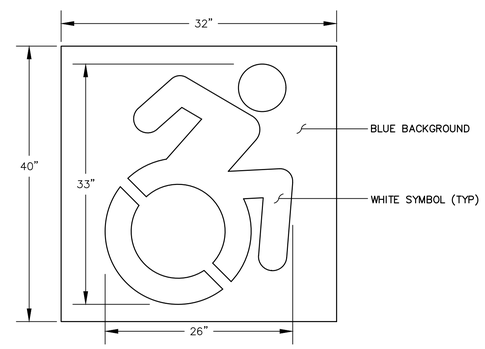


DOME SPACING

DOME SECTION

DETECTABLE WARNING

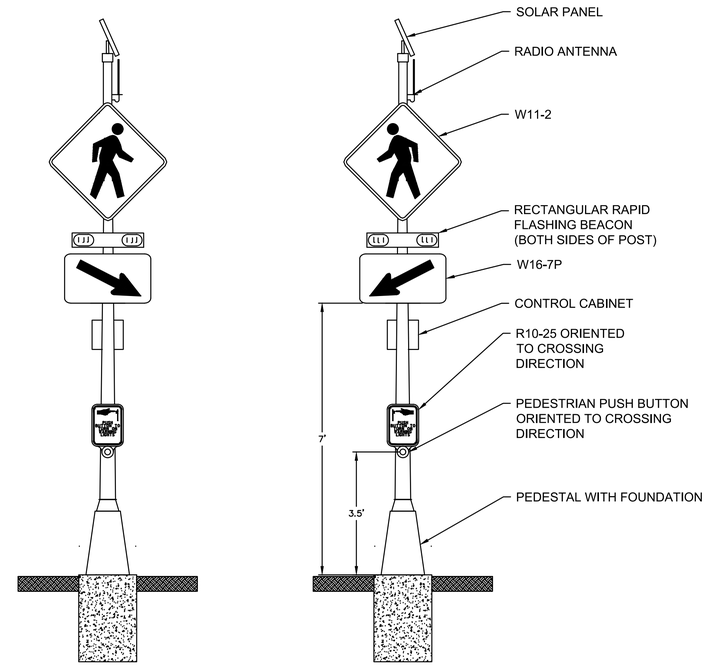
N.T.S.



NOTE: HANDICAP SYMBOL TO ADHERE TO STATE BUILDING CODE, LATEST EDITION

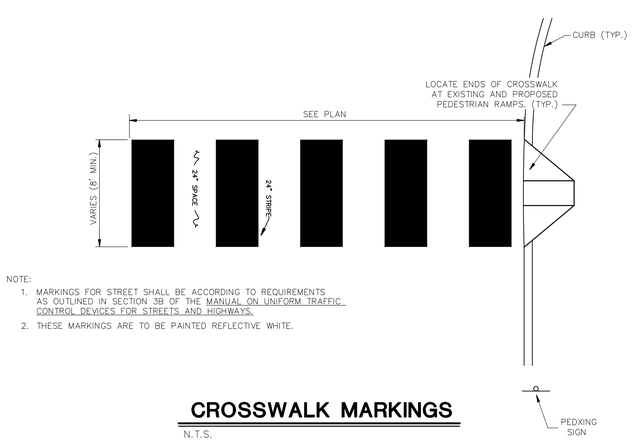
CONNECTICUT SYMBOL OF ACCESSIBILITY

N.T.S.



RECTANGULAR RAPID FLASHING BEACON

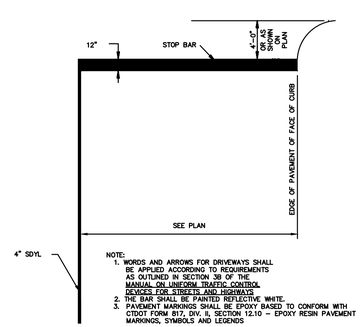
N.T.S.



NOTE:
1. MARKINGS FOR STREET SHALL BE ACCORDING TO REQUIREMENTS AS OUTLINED IN SECTION 3B OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS.
2. THESE MARKINGS ARE TO BE PAINTED REFLECTIVE WHITE.

CROSSWALK MARKINGS

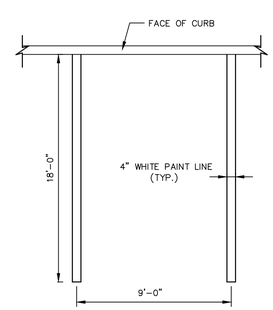
N.T.S.



NOTE:
1. WORDS AND ARROWS FOR DRIVEWAYS SHALL BE APPLIED ACCORDING TO REQUIREMENTS AS OUTLINED IN SECTION 3B OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS
2. THE BAR SHALL BE PAINTED REFLECTIVE WHITE.
3. PAVEMENT MARKINGS SHALL BE EPOXY BASED TO CONFORM WITH CTDOT FORM 817, DIV. II, SECTION 12.10 – EPOXY RESIN PAVEMENT MARKINGS, SYMBOLS AND LEGENDS

STOP BAR PAVEMENT MARKING

N.T.S.



NOTE:
1. PROVIDE 2 COATS OF PAINT ON ALL SURFACES.
2. SEE PLAN FOR ACTUAL SPACE LOCATION AND DIMENSIONS.

TYPICAL PARKING SPACE DETAIL

N.T.S. BLPC-003

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CHRISTOPHER R. GAUDET
No. 27798
LICENSED
PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
K & K DEVELOPERS, INC.
5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

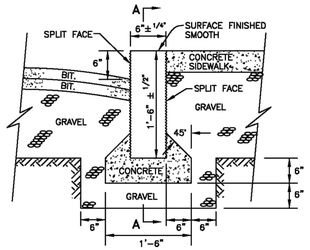
No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	180513
Date	05/28/2020
CAD File: DN180051301	

Title
DETAILS SHEET

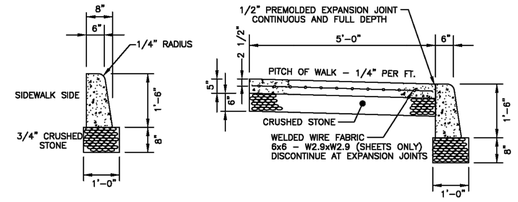
Sheet No.
DN-1

Xref (s) : BD180051301



GRANITE STONE CURB

SCALE: 3/4" = 1'-0"

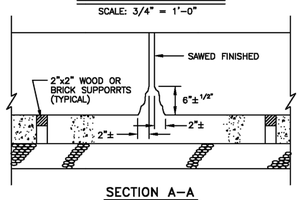


NOTE: A 1/8" STEEL DIVISION PLATE SHALL BE PLACED AT EVERY 10 FEET OF CURBING & REMOVED AFTER CONCRETE HAS SET. A 1/2" APPROVED BITUMINOUS JOINT SHALL BE PLACED AT A MAX. OF EVERY 20 FEET COINCIDING WITH EXPANSION JOINT IN SIDEWALK

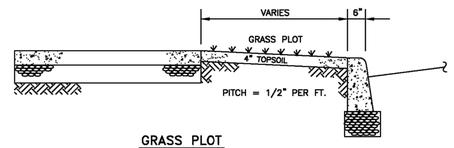
CONTRACTOR TO CONSTRUCT 2" BATTER ON CONCRETE CURBING (STREET SIDE ONLY)

STANDARD CURB & SIDEWALK

SCALE: 1/2" = 1'-0"

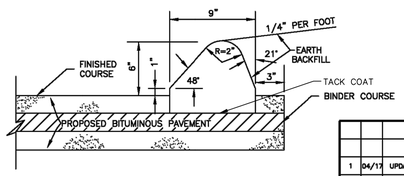


SECTION A–A



GRASS PLOT

NOTES:
1. ALL REINFORCING SHALL BE SUPPORTED ON CHAIRS OR OTHER POSITIVE TYPE SUPPORTS APPROXIMATELY ONE PER 25 SQ.FT.
2. CONCRETE SHALL BE CLASS "C" CEMENT TYPE II, 3000 PSI
3. AIR ENTRAINMENT SHALL BE BETWEEN 6 – 7%.



BITUMINOUS CONCRETE LIP CURBING

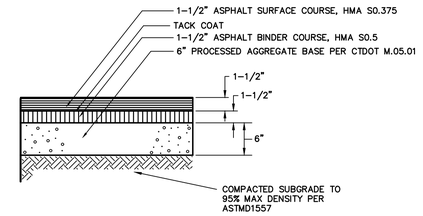
MACHINED FORMED

NO.	DATE	DESCIPTION	CK.
1	04/17	UPDATED DETAILS	FS

REVISIONS

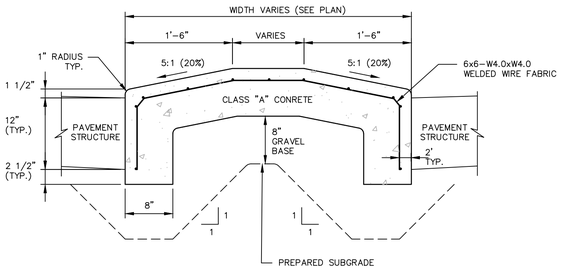
TOWN OF TRUMBULL
ENGINEERING DEPARTMENT
SKETCHES & CALCULATIONS

Project No. & Name STANDARDS
Subject SIDEWALKS & CURBING
Made by FMS Date 8/13/14
Chk. by FMS Date 8/13/14
SW–1 Sheet No. 1 of 2



STANDARD DUTY BITUMINOUS CONCRETE PAVEMENT STRUCTURE

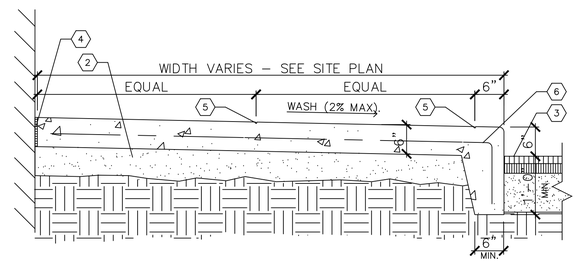
N.T.S. ZPC–029



NOTES:
1. MAINTAIN 1'–6" WIDE SLOPED CONCRETE ALL AROUND ISLAND INCLUDING AT ISLAND NOSES (ENDS).
2. INSTALL PREFORMED EXPANSION JOINT FILLER MATERIAL TRANSVERSE TO ISLAND AT 30' O.C.

MOUNTABLE CONCRETE ISLAND

N.T.S. CTPC–013



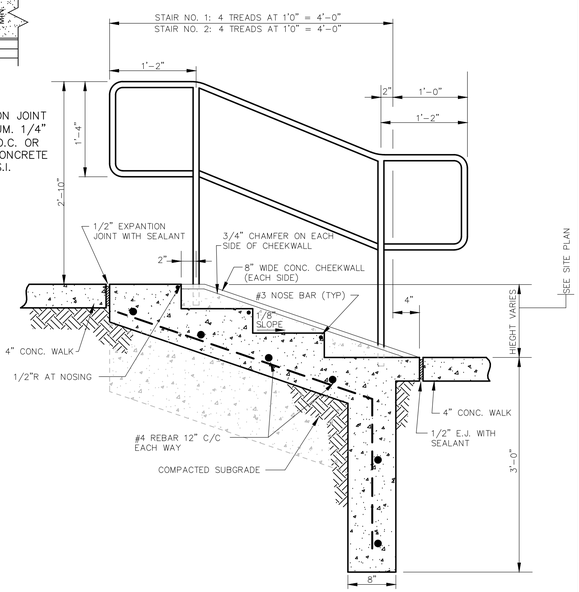
KEYED NOTES

1. N/A
2. 4" COMPACTED GRAVEL BASE
3. PAVEMENT.
4. COMPRESSIBLE FILLER (3/4" MAXIMUM). CUT BACK AND PROVIDE SEALANT, TYPICAL, AT ALL JOINTS WITH FILLER.
5. 1/4" TOOLED JOINT
6. 6" X 6" W 2.1X2.1

NOTE: EXPANSION JOINT 20' O.C. MAXIMUM. 1/4" TOOL JOINT 4' O.C. OR AS DIRECTED. CONCRETE TO BE 4000 P.S.I.

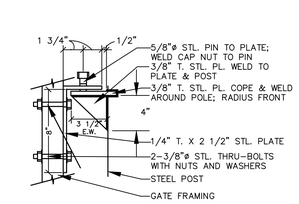
MONOLITHIC CONCRETE CURB AND SIDEWALK DETAIL (ONSITE)

N.T.S. WAG



CONCRETE STAIR DETAIL

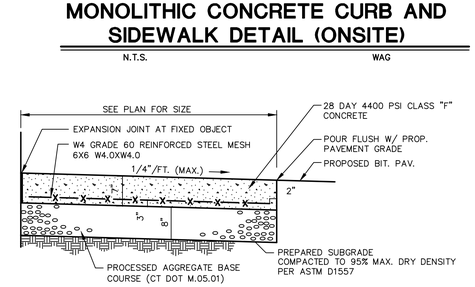
N.T.S.



GATE HINGE

TRASH ENCLOSURE GATE (HALF SECTION)

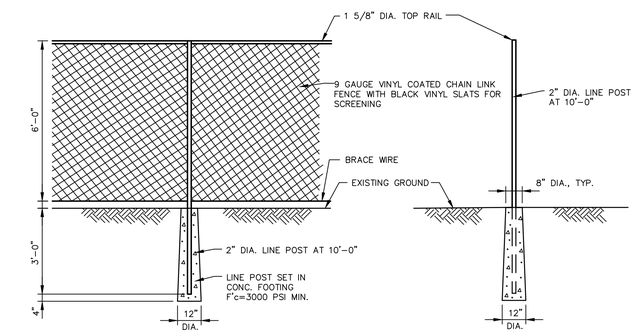
N.T.S. BLSE–001



SECTION VIEW

CONCRETE PAD

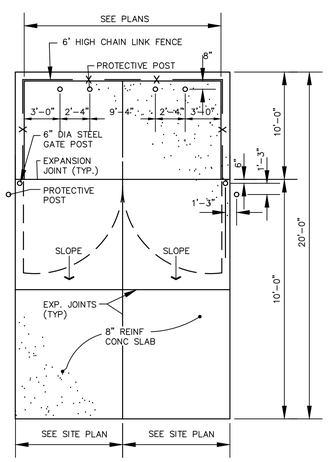
N.T.S. BLPC–002



FRONT VIEW SIDE VIEW

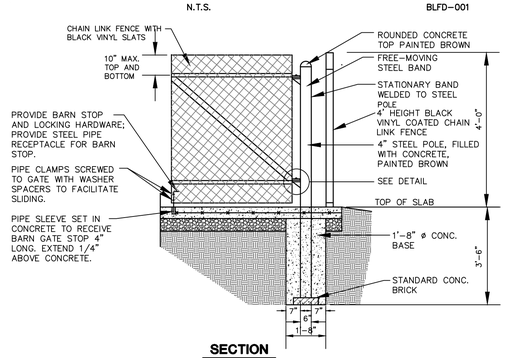
CHAIN LINK FENCE DETAIL

N.T.S. BLFD–001



TRASH ENCLOSURE PLAN

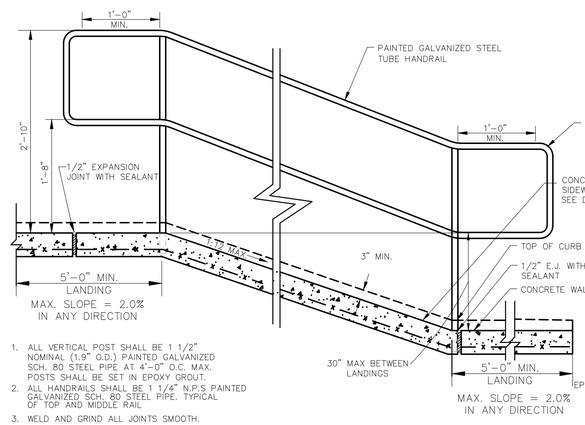
N.T.S. BLSE–004



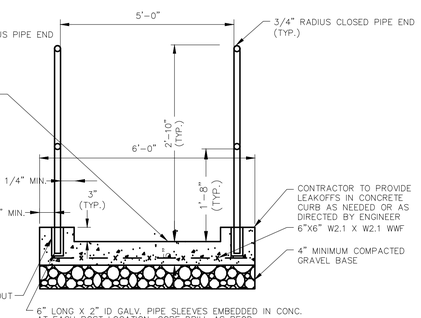
SECTION

TRASH ENCLOSURE DETAIL

N.T.S. BLFD–001



1. ALL VERTICAL POST SHALL BE 1 1/2" NOMINAL (1.9" O.D.) PAINTED GALVANIZED SCH. 80 STEEL PIPE AT 4'–0" O.C. MAX. POSTS SHALL BE SET IN EPOXY GROUT.
2. ALL HANDRAILS SHALL BE 1 1/4" N.P.S PAINTED GALVANIZED SCH. 80 STEEL PIPE. TYPICAL OF TOP AND MIDDLE RAIL
3. WELD AND GRIND ALL JOINTS SMOOTH.



CONCRETE SIDEWALK RAMP DETAIL

N.T.S.

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Architecture Engineering Environmental Land Surveying
BL Companies
355 Research Parkway
Meriden, CT 06450
(203) 630-1406
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Garden Homes

ROSE EQUITIES
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STATE OF CONNECTICUT CHRISTOPHER B. GAUDIO No. 27798 LICENSED PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
K & K DEVELOPERS, INC.
5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS No.	Date	Desc.
1.	4/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File: DN180051301	

Title
DETAILS SHEET

Sheet No.
DN-2

Xref (s) : BD180051301

8/17/2020, AKLOSE, G:\CIVIL\BUILDING\180051301\DWG\DN180051301 DWG DN-2 PAGE4

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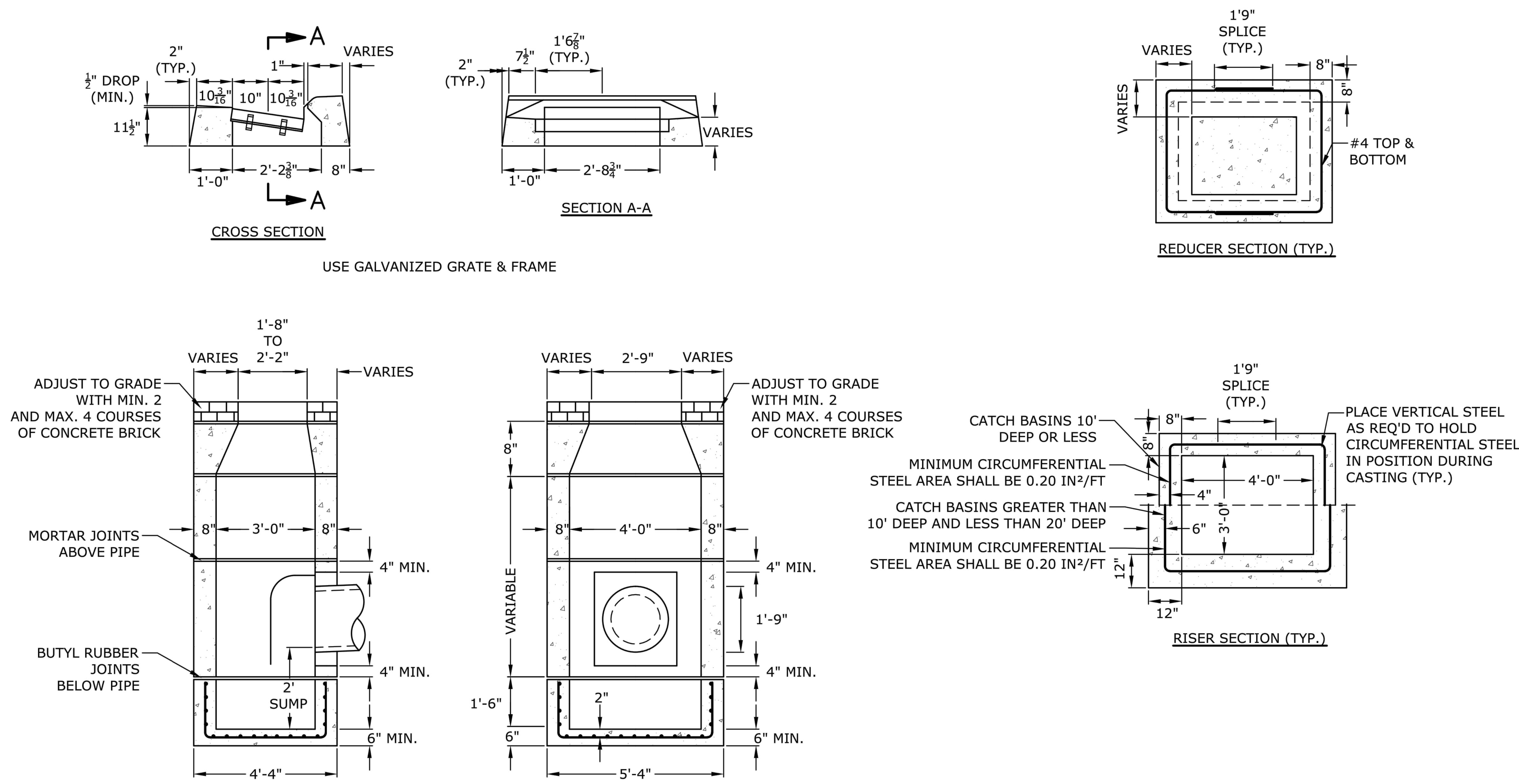


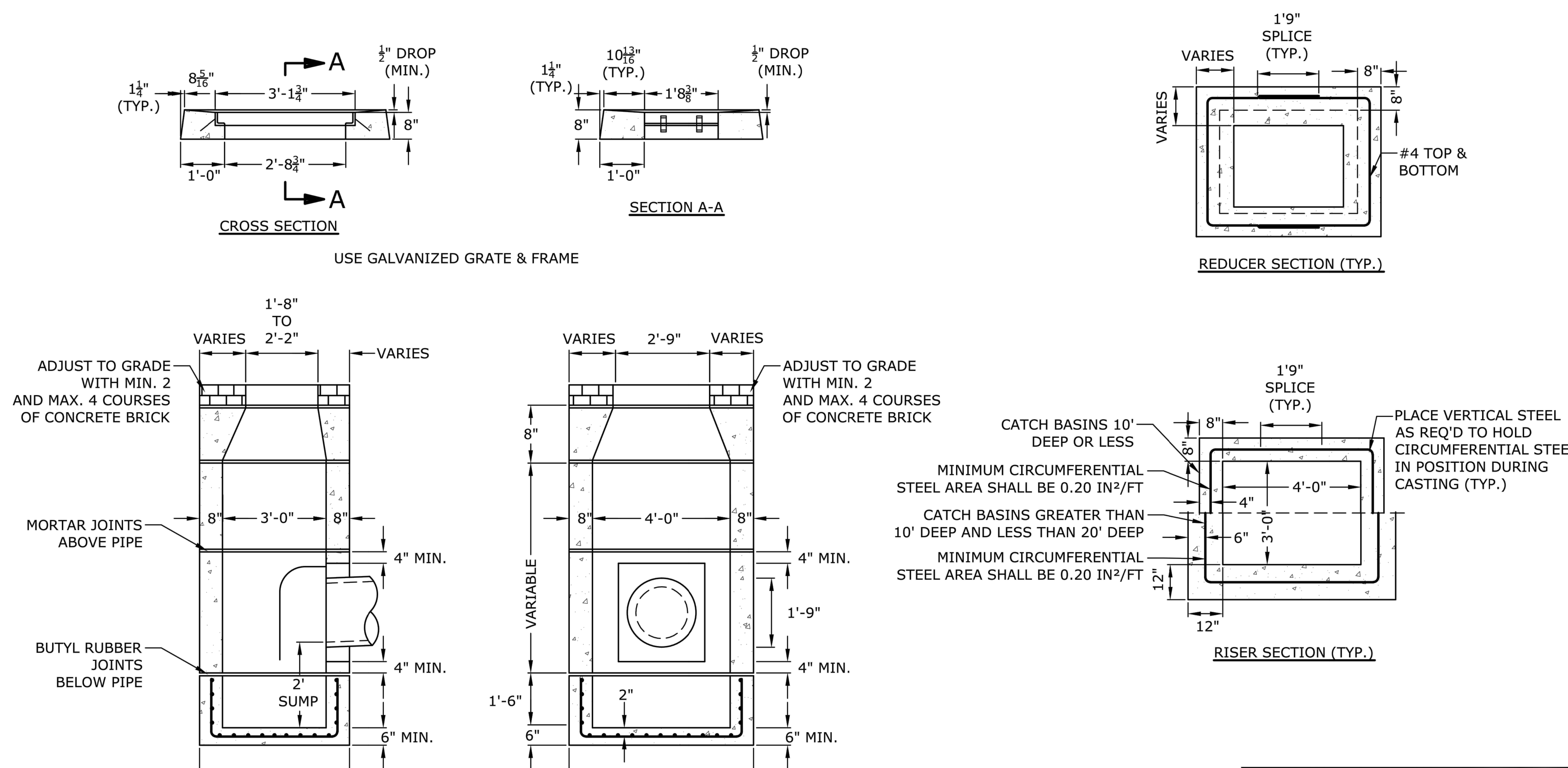
INSTALL BELL TRAP ON PIPE OUTLET

CONNECTICUT DEPARTMENT OF TRANSPORTATION

TYPE "C" CATCH BASIN

NO SCALE

OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
TYPE "C" CATCH BASIN DETAIL TRUMBULL, CONNECTICUT	
Scale: NTS	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: ST-01A



INSTALL BELL TRAP ON PIPE OUTLET

CONNECTICUT DEPARTMENT OF TRANSPORTATION

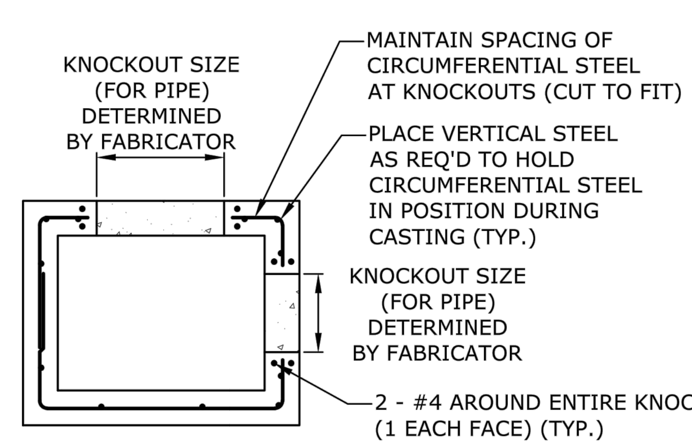
TYPE "C–L" CATCH BASIN

NO SCALE

OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
TYPE "C-L" CATCH BASIN DETAIL TRUMBULL, CONNECTICUT	
Scale: NTS	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: SW-06A

NOTES:

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



TYPICAL SECTION THRU RISER WITH KNOCKOUTS

CONNECTICUT DEPARTMENT OF TRANSPORTATION

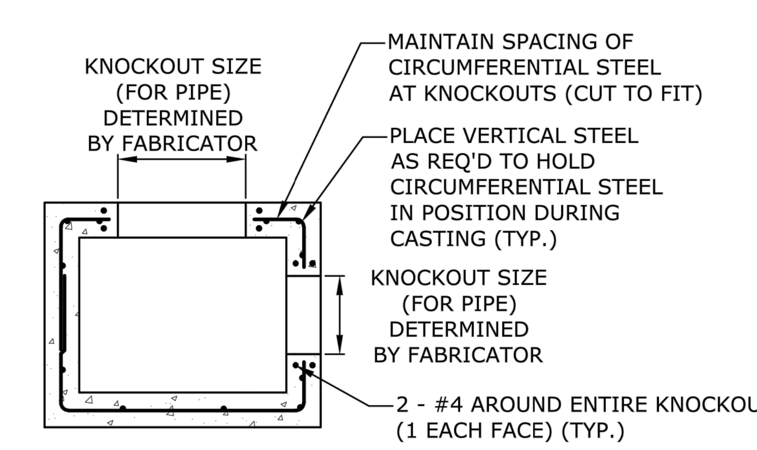
TYPE "C" CATCH BASIN

NO SCALE

OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
TYPE "C" CATCH BASIN DETAIL TRUMBULL, CONNECTICUT	
Scale: NTS	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: SW-01B

NOTES:

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



TYPICAL SECTION THRU RISER WITH KNOCKOUTS

CONNECTICUT DEPARTMENT OF TRANSPORTATION

TYPE "C–L" CATCH BASIN

NO SCALE

OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
TYPE "C-L" CATCH BASIN DETAIL TRUMBULL, CONNECTICUT	
Scale: NTS	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: SW-06B

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Architecture
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BL Companies

355 Research Parkway
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Garden Homes

ROSE EQUITIES
Owner-Builders since 1949

STATE OF CONNECTICUT – CHRISTOPHER D. GAGNON – No. 25798 – LICENSED PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
K & K DEVELOPERS, INC.
5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File:	DN180051301

Title
DETAILS SHEET

Sheet No.
DN-3

Xref (s): ; BD180051301

8/12/2020, AKLOSE, G:\JOBS18\04\1800513\DWG\DN180051301.DWG,DN-3 24X36.

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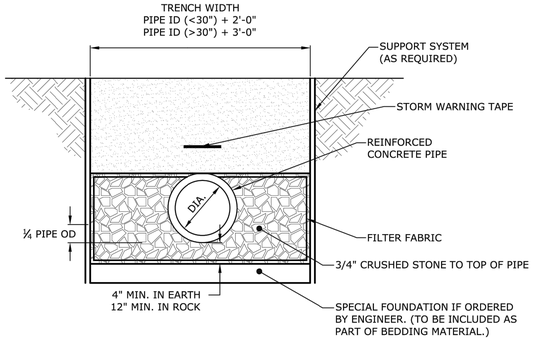
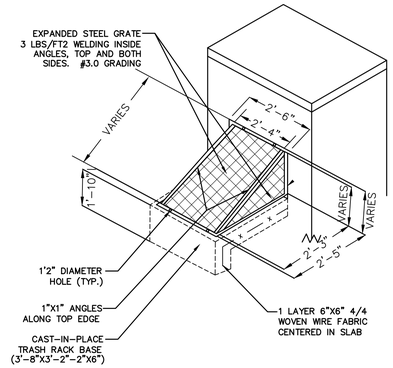


CIRCULAR R.C.P. TRENCH BEDDING

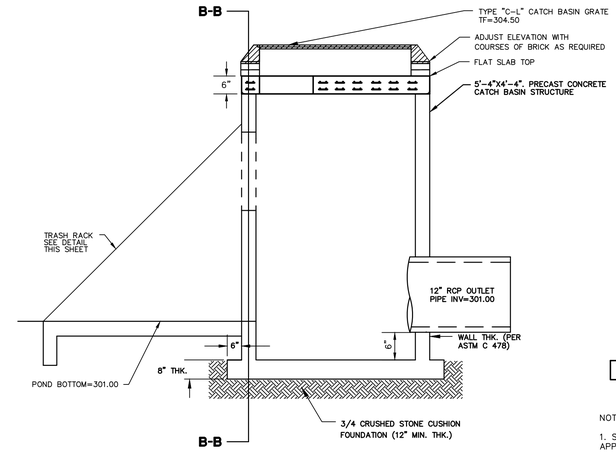
NO SCALE

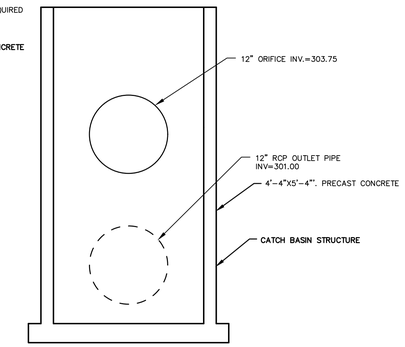
OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
CIRCULAR R.C.P. TRENCH BEDDING DETAIL TRUMBULL, CONNECTICUT	
Scale: NTS	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: SW-03



PRIMARY OUTLET TRASH RACK DETAIL

N.T.S.





SECTION B-B

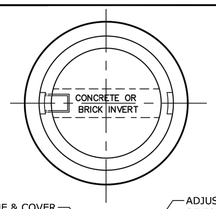
NOTES:

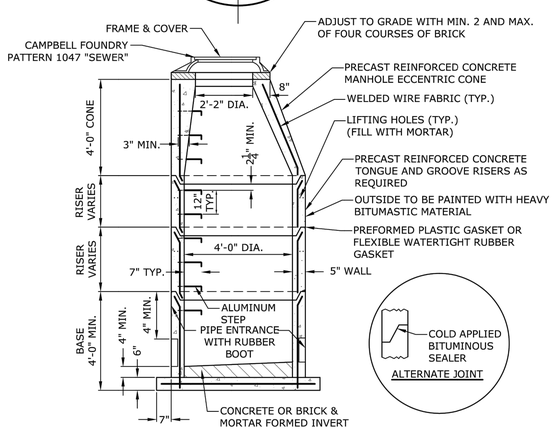
1. SUBMIT SHOP DRAWINGS OF OUTLET STRUCTURE TO OWNER FOR REVIEW & APPROVAL PRIOR TO CONSTRUCTION.

2. SEE GRADING AND DRAINAGE PLANS FOR OUTLET STRUCTURE LOCATION.

DETENTION POND P-3 OUTLET CONTROL STRUCTURE (OCS-03)

N.T.S.



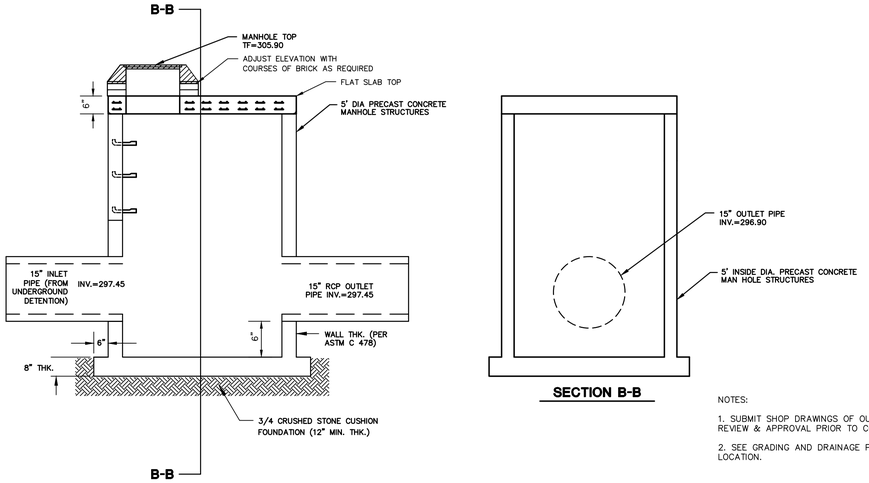


5' OR 6' DIA. PRECAST BASES MAY BE USED WHEN REQUIRED DUE TO SIZE OR NUMBER OF PIPES AT THE MANHOLE.
PRECAST REDUCERS WILL BE PLACED ABOVE THE 5' & 6' BASES AS DIRECTED BY THE ENGINEER.
WALL THICKNESS TO INCREASE 1" FOR EACH 1' OF INSIDE DIAMETER INCREASE.

PRECAST SANITARY MANHOLE

NO SCALE

OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
PRECAST SANITARY MANHOLE DETAIL TRUMBULL, CONNECTICUT	
Scale: NTS	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: SS-05



SECTION B-B

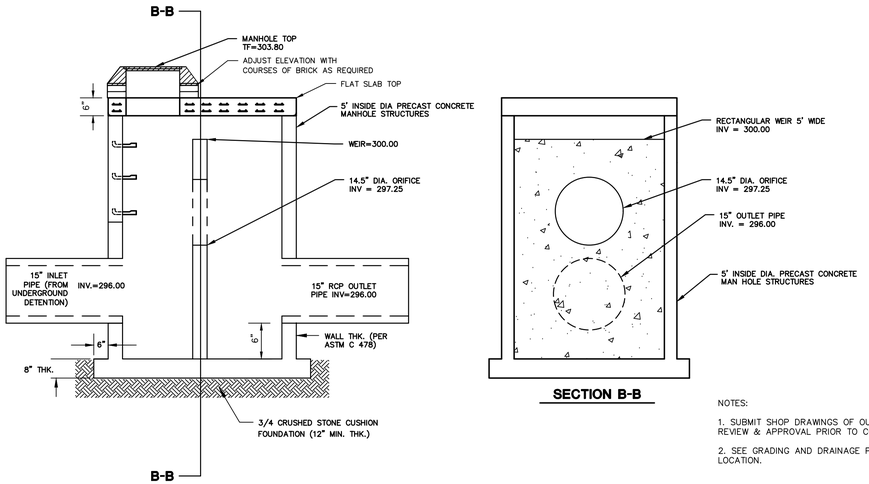
NOTES:

1. SUBMIT SHOP DRAWINGS OF OUTLET STRUCTURE TO OWNER FOR REVIEW & APPROVAL PRIOR TO CONSTRUCTION.

2. SEE GRADING AND DRAINAGE PLANS FOR OUTLET STRUCTURE LOCATION.

DETENTION BASIN P-1 OUTLET CONTROL STRUCTURE (OCS-01)

N.T.S.



SECTION B-B

NOTES:

1. SUBMIT SHOP DRAWINGS OF OUTLET STRUCTURE TO OWNER FOR REVIEW & APPROVAL PRIOR TO CONSTRUCTION.

2. SEE GRADING AND DRAINAGE PLANS FOR OUTLET STRUCTURE LOCATION.

DETENTION BASIN P-2 OUTLET CONTROL STRUCTURE (OCS-02)

N.T.S.

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Garden Homes

ROSE EQUITIES
Owner-Builders since 1949

STATE OF CONNECTICUT
CHRISTOPHER R. GAUDIO
No. 27798
LICENSED
PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
K & K DEVELOPERS, INC.
5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS
No. Date Desc.
1. 6/30/2020 REVISED PER STAFF COMMENTS
2. 8/10/2020 REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File: DN180051301	

Title
DETAILS SHEET

Sheet No.
DN-4

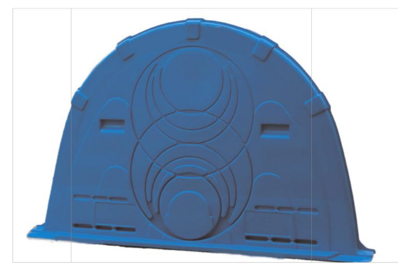
Xref (s) : BD180051301

6/12/2020, AKUDIS, G:\JOBS\BEDIA\180513\DWGS\DN180051301.DWG\DN-4 2.4X36.

CULTEC Recharger® 902HD Stormwater Chamber

The Recharger® 902HD is a 48" (1219 mm) tall, high capacity chamber. Typically when using this model, fewer chambers are required resulting in less labor and a smaller installation area. The Recharger® 902HD has the side portal internal manifold feature. HVLV® FC-48 Feed Connectors are inserted into the side portals to create the internal manifold.

Recharger 902HD Chamber



Recharger 902HD End Cap

Recharger 902HD Chamber	
Size (L x W x H)	4.25' x 78" x 48"
	1.30 m x 1981 mm x 1219 mm
Installed Length	3.67'
	1.12 m
Length Adjustment per Row - with two end caps installed	1.03'
	0.31 m
Length Adjustment per Row - when not using end caps	0.58'
	0.18 m
Chamber Storage	17.31 ft³/ft
	1.61 m³/m
	63.47 ft³/unit
	1.80 m³/unit
Min. Installed Storage	27.06 ft³/ft
	2.53 m³/m
	99.28 ft³/unit
	2.81 m³/unit
Min. Area Required	26.58 ft²
	2.47 m²
Chamber Weight	83.0 lbs
	37.65 kg
Shipping	15 chambers/skid
	1,370 lbs/skid
	14 skids/48' flatbed
Min. Center-to-Center Spacing	7.25'
	2.21 m
Max. Allowable Cover	8.3'
	2.53 m
Max. Allowable O.D. in Side Portal	10" HDPE, 12" PVC
	250 mm HDPE, 300 mm PVC
Compatible Feed Connector	HVLV FC-48 Feed Connector

Calculations are based on installed chamber length.
All above values are nominal.
Includes 12" (305 mm) stone above crown of chamber and typical stone surround at 7.25' (2.21 m) center-to-center spacing and stone foundation depth as listed in table.
Stone void calculated at 40%.

	Stone Foundation Depth		
	9"	12"	18"
	229 mm	305 mm	457 mm
Chamber and Stone Storage Per Chamber	99.28 ft³	101.94 ft³	107.26 ft³
	2.81 m³	2.89 m³	3.04 m³
Min. Effective Depth	5.75'	6.00'	6.5'
	1.75 m	1.83 m	1.98 m
Stone Required Per Chamber	3.32 yd³	3.56 yd³	4.05 yd³
	2.54 m³	2.72 m³	3.06 m³

Recharger 902HD End Cap	
Size (L x W x H)	9.7" x 78" x 48.5"
	246 mm x 1982 mm x 1231 mm
Installed Length	6.2"
	157 mm
End Cap Storage	5.34 ft³/ft
	0.50 m³/m
	2.76 ft³/unit
	0.08 m³/unit
Min. Installed Storage	19.88 ft³/ft
	1.85 m³/m
	10.28 ft³/unit
	0.29 m³/unit
End Cap Weight	52.0 lbs
	23.59 kg
Shipping	15 end caps/skid
	905 lbs/skid
	14 skids/48' flatbed
Max. Inlet Opening in End Cap	30" HDPE, 36" PVC
	750 mm HDPE, 900 mm PVC

Calculations are based on installed chamber length.
All above values are nominal.
Min. installed storage includes 9" (229 mm) stone base, 12" (305 mm) stone above crown of chamber and typical stone surround at 7.25' (2.21 m) center-to-center spacing.

For more information, contact CULTEC at (203) 775-4416 or visit www.cultec.com. 1

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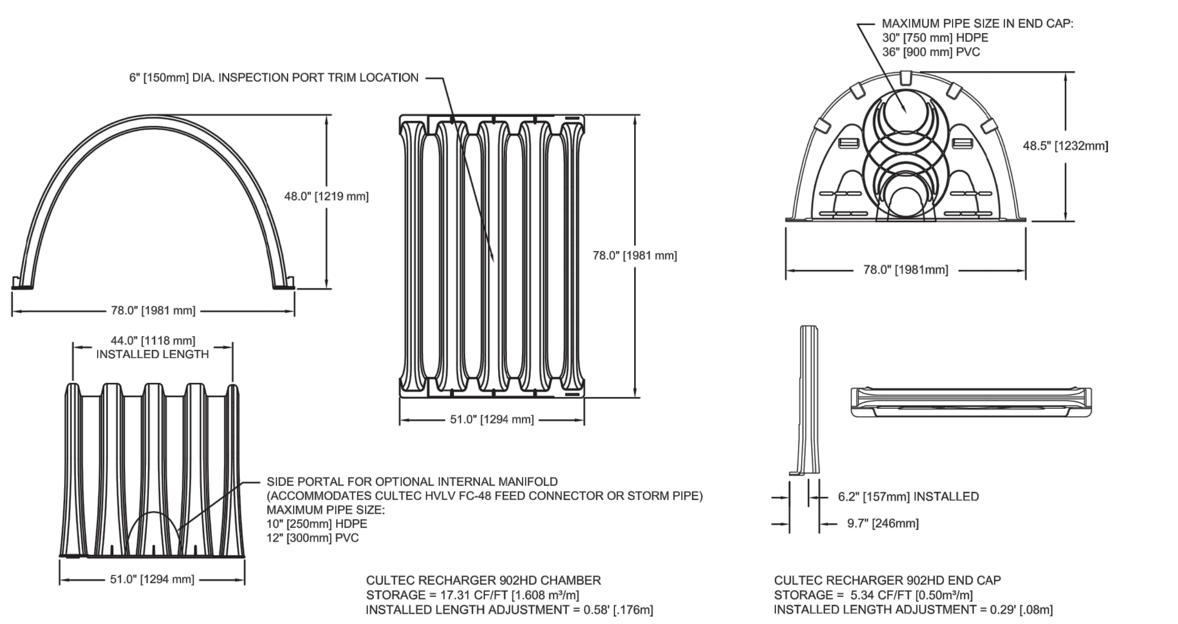
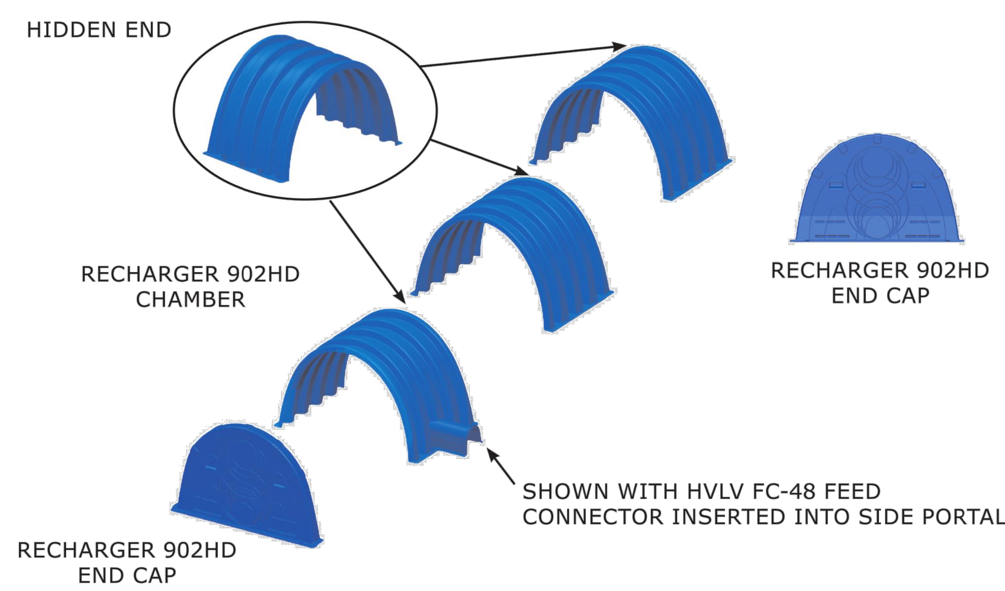
CULTEC Recharger® 902HD Stormwater Chamber

Three View Drawing



Typical Interlock Installation



For more information, contact CULTEC at (203) 775-4416 or visit www.cultec.com. 2

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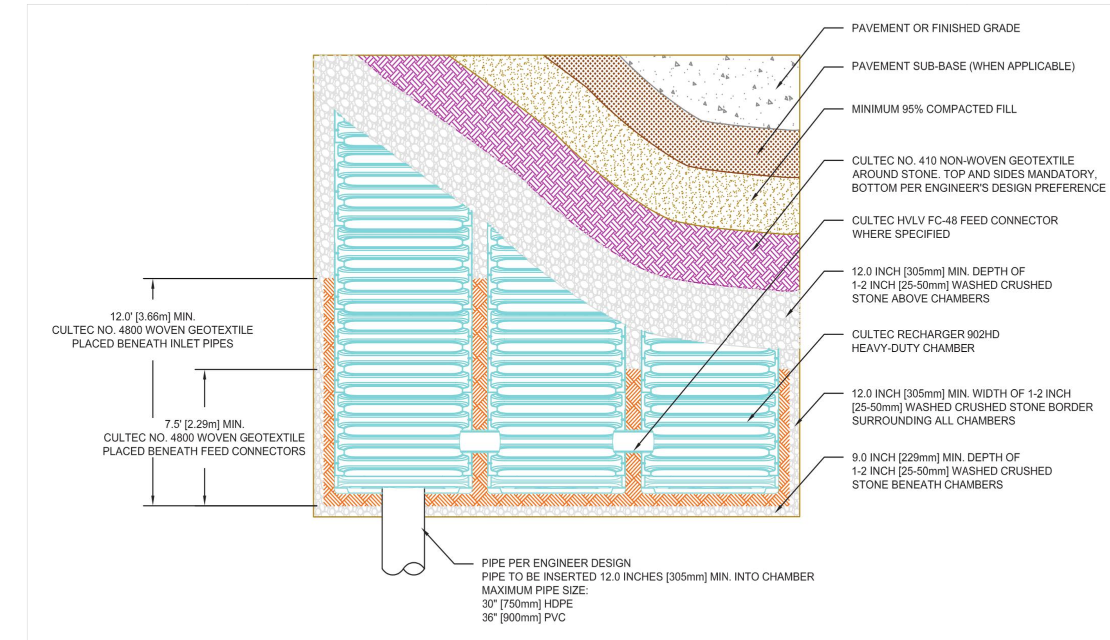
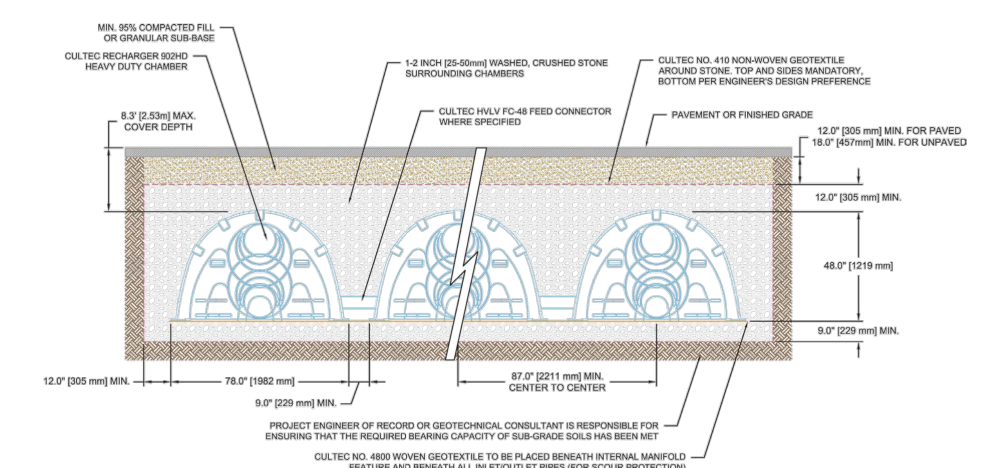
CULTEC Recharger® 902HD Stormwater Chamber

Plan View Drawing



Typical Cross Section for Traffic Application



PROJECT ENGINEER OF RECORD OR GEOTECHNICAL CONSULTANT IS RESPONSIBLE FOR ENSURING THAT THE REQUIRED BEARING CAPACITY OF SUB-GRADE SOILS HAS BEEN MET

CULTEC NO. 4800 WOVEN GEOTEXTILE TO BE PLACED BENEATH INTERNAL MANIFOLD FEATURE AND BENEATH ALL INLET/OUTLET PIPES (FOR SCOUR PROTECTION)

NOTES:
1. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS." THE LOAD CONFIGURATION SHALL INCLUDE:
   1.a. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER
   1.b. MAXIMUM PERMANENT (50-YEAR) COVER LOAD
   1.c. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD
2. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F3430-20 "STANDARD SPECIFICATION FOR CELLULAR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
3. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING:
   3.a. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F3430
   3.b. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75
   3.c. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95

For more information, contact CULTEC at (203) 775-4416 or visit www.cultec.com. 3

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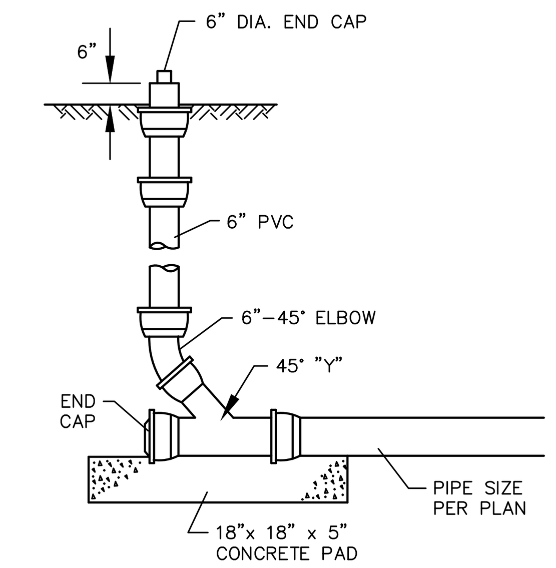
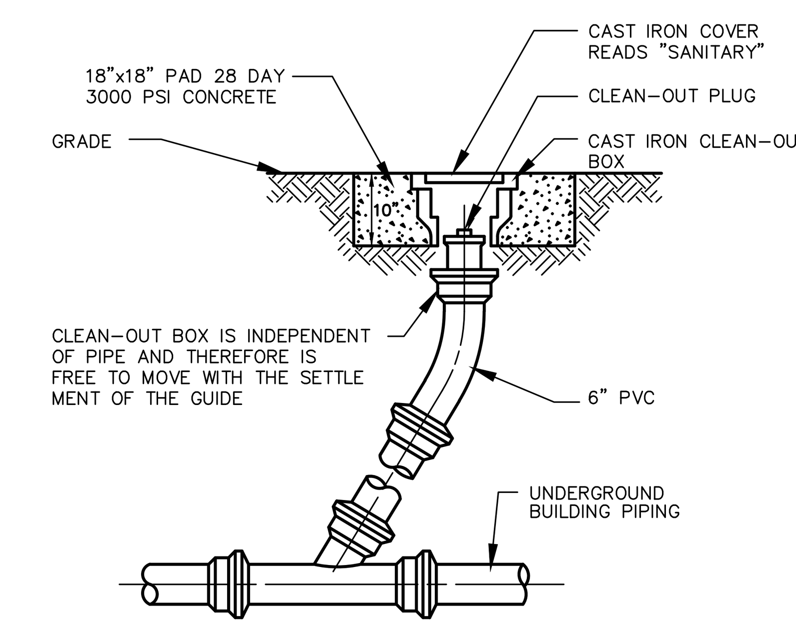


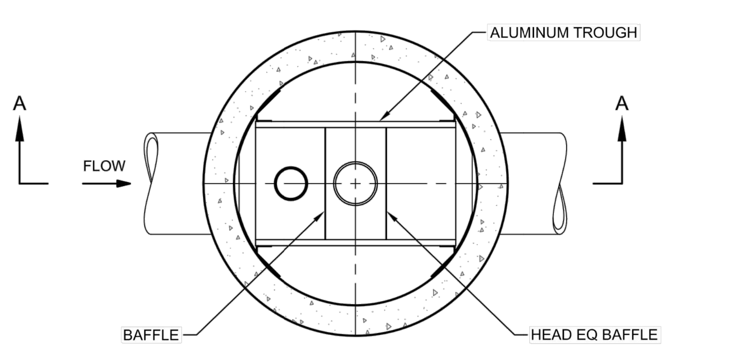
CLEANOUT DETAIL IN LANDSCAPED AREA

N.T.S BLSS-007

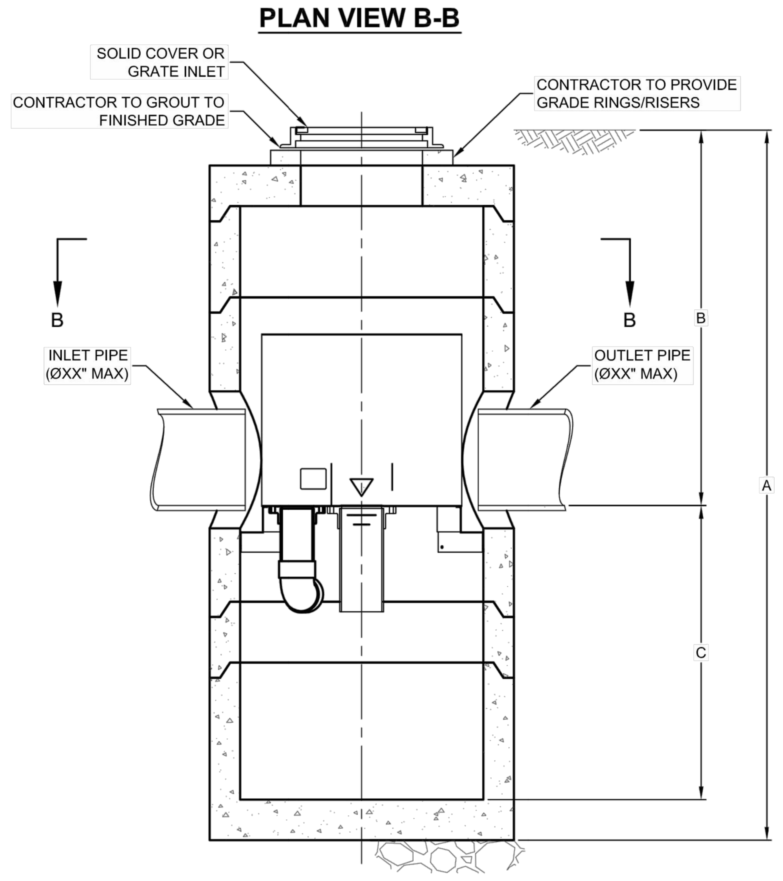


CLEANOUT DETAIL IN PAVED AREAS

N.T.S BLSS-008



PLAN VIEW B-B



SECTION A-A

VortSentry®

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 6,991,114; 7,296,692; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

I:\STORMWATER\COMMOPS\26 VORTSENTRY HS\40 STANDARD DRAWINGS\DWG\VSHS-DTL.DWG 5/16/2014 4:31 PM

VORTSENTRY HS DESIGN NOTES

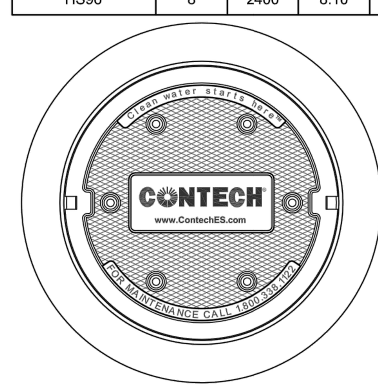
VSHS RATED TREATMENT CAPACITY IS SHOWN IN THE TABLE BELOW, OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY VARIES. CONTACT YOUR CONTECH REPRESENTATIVE FOR ADITIONAL INFORMATION.

THE STANDARD SOLID COVER CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW.

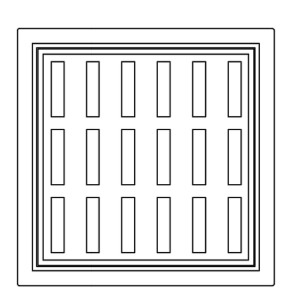
	CONFIGURATION OPTION DESCRIPTION
	GRATE INLET (NO INLET PIPE)
	GRATE INLET WITH INLET PIPE

VORTSENTRY HS GENERAL INFORMATION

Model	Manhole Diameter (ID)		Total Treatment Flow Rate		Typical Total Distance Rim to Outside Bottom A		Typical Distance Rim to Invert B		Typical Depth Below Invert (inside) C		Approximate Minimum Distance Rim to Invert		Maximum Pipe Diameter (ID)	
	FT	mm	CFS	L/S	FT	m	FT	m	FT	mm	FT	m	IN	mm
HS36	3	900	0.55	15.6	10.16	3.10	4.08	1.24	5.58	1702	3.00	0.91	18	450
HS48	4	1200	1.20	34.0	13.25	4.04	6.00	1.83	6.75	2057	4.00	1.22	24	600
HS60	5	1500	2.20	62.3	15.13	4.61	6.50	1.98	7.96	2426	4.82	1.47	30	750
HS72	6	1800	3.70	104.8	16.56	5.05	6.75	2.06	9.15	2788	5.59	1.70	36	900
HS84	7	2100	5.60	158.6	18.85	5.75	7.75	2.36	10.35	3156	5.00	1.52	42	1050
HS96	8	2400	8.10	229.4	20.87	6.36	8.50	2.59	11.54	3518	6.91	2.11	48	1200



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



FRAME AND GRATE
(24" SQUARE)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

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

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. VORTSENTRY HS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.

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

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

VORTSENTRY HS STANDARD DETAIL

STRUCTURE ID	DRAINAGE AREA	MODEL	WQ FLOW RATE
HS-1	PDA-102	HS-60 (OR APPROVED EQUAL)	1.65 CFS
HS-2	PDA-102	HS-60 (OR APPROVED EQUAL)	1.65 CFS
HS-3	PDA-202	HS-60 (OR APPROVED EQUAL)	2.02 CFS
HS-4	PDA-302	HS-60 (OR APPROVED EQUAL)	1.43 CFS

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5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File:	DN180051301

Title
DETAILS SHEET

Sheet No.
DN-5

Xref (s): ; BD180051301

8/12/2020, AKLOSE, G:\JOBS18\04\1800513\DWG\DN180051301.DWG,DN-5 24X36.

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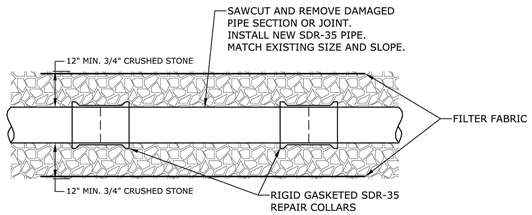
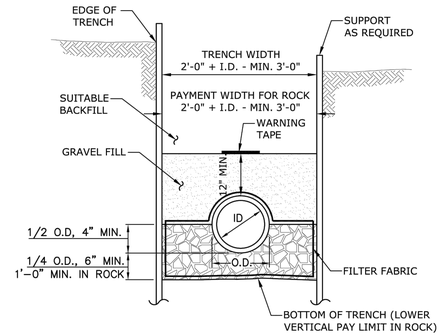


SANITARY SEWER POINT REPAIR
NO SCALE

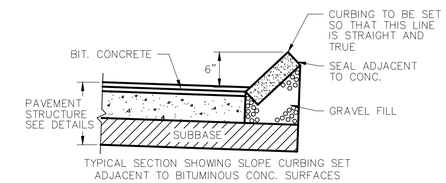
OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
SANITARY SEWER POINT REPAIR DETAIL TRUMBULL, CONNECTICUT	
Scale: xxxxxx	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: SS-02



TYPICAL SANITARY SEWER TRENCH SECTION
NO SCALE

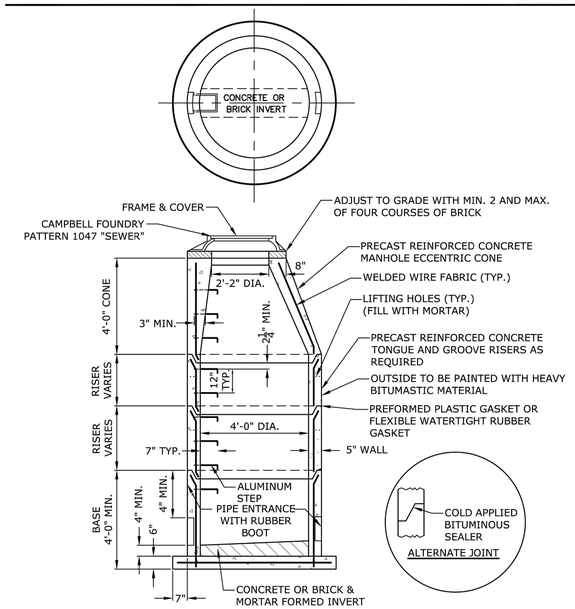
OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
TYPICAL SANITARY SEWER TRENCH SECTION DETAIL TRUMBULL, CONNECTICUT	
Scale: NTS	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: SS-03

STONE ENTRANCE SIGN GATEWAY
N.T.S.



TYPICAL SECTION SHOWING SLOPE CURBING SET ADJACENT TO BITUMINOUS CONC. SURFACES

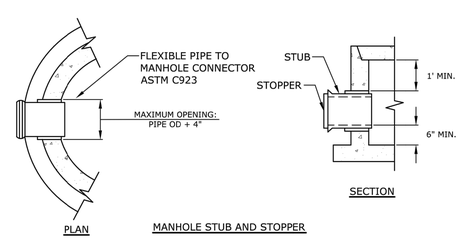
MOUNTABLE GRANITE SLOPE CURBING
N.T.S. ZPC-039



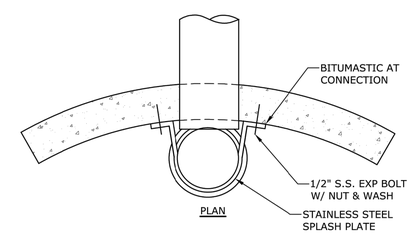
5' OR 6' DIA. PRECAST BASES MAY BE USED WHEN REQUIRED DUE TO SIZE OR NUMBER OF PIPES AT THE MANHOLE.
PRECAST REDUCERS WILL BE PLACED ABOVE THE 5' & 6' BASES AS DIRECTED BY THE ENGINEER.
WALL THICKNESS TO INCREASE 1" FOR EACH 1' OF INSIDE DIAMETER INCREASE.

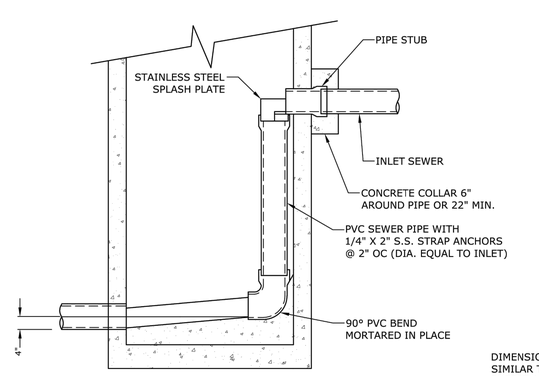
PRECAST SANITARY MANHOLE
NO SCALE

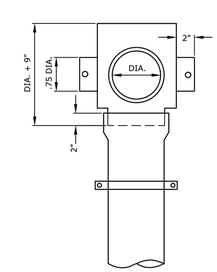
OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
PRECAST SANITARY MANHOLE DETAIL TRUMBULL, CONNECTICUT	
Scale: NTS	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: SS-05



MANHOLE STUB AND STOPPER







SHIELD FOR DROP MANHOLE

DIMENSIONS OF DROP INLET ARE SIMILAR TO THAT OF THE TYPICAL MANHOLE EXCEPT AS NOTED OTHERWISE

INSIDE DROP MANHOLE
NO SCALE

OFFICE OF THE TOWN ENGINEER TOWN OF TRUMBULL 5866 Main Street (203) 452-5050	
INSIDE DROP MANHOLE DETAIL TRUMBULL, CONNECTICUT	
Scale: NTS	Date: 8/15/2014
Drawn by:	Grid:
Approved by:	Sheet: SW-05

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Aug 21, 2014-10:20am Plotted By: jadm
Layout: Details Dwg: V:\TRUMBULL\Town of Trumbull Standard Details\Details\Sewer\SW-05.dwg

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8/12/2020, AutoCAD, JG, V:\PROJ\BLA\18800513\DWG\DN18800513D1.DWG,24x36,24X36,

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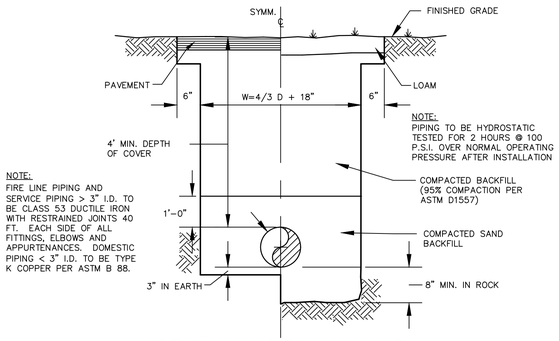
REVISIONS No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File: DN1800513D1	

Title
DETAILS SHEET

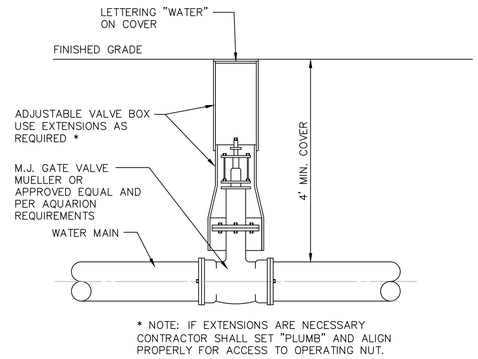
Sheet No.
DN-6

Xref (s): : BD1800513D1



TYPICAL WATER MAIN AND SERVICE TRENCH DETAIL

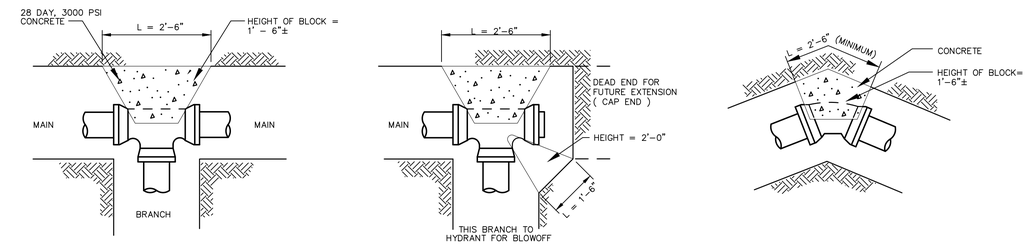
N.T.S.



* NOTE: IF EXTENSIONS ARE NECESSARY CONTRACTOR SHALL SET "PLUMB" AND ALIGN PROPERLY FOR ACCESS TO OPERATING NUT.

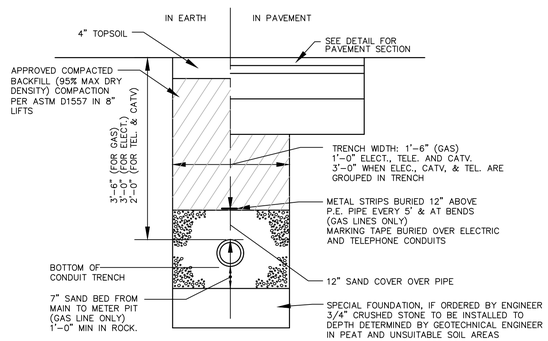
TYPICAL GATE VALVE AND VALVE BOX DETAIL

N.T.S. BLWD-002



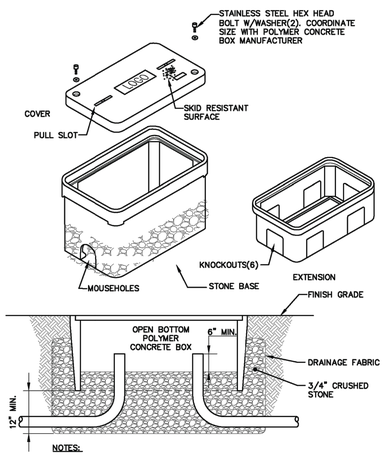
THRUST BLOCKS FOR WATER LINES

N.T.S. BLWD-001



ELECTRICAL, TELECOMMUNICATION AND GAS TRENCH DETAIL

N.T.S.

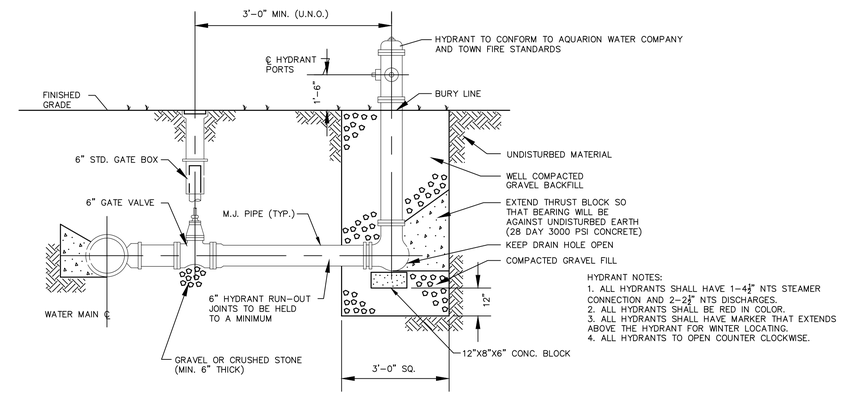


NOTES:

1. PROVIDE 1"x4" BELL PULL SLOT FOR EACH HANDHOLE.
2. COVERING RING AND BOX SHALL BE MADE OF SAME MATERIAL.
3. COORDINATE COVER AND FRAME COLOR OF HANDHOLE WITH ARCHITECT.
4. PROVIDE TIER 15 MINIMUM RATED BOX AND COVER.

PULL BOX DETAIL

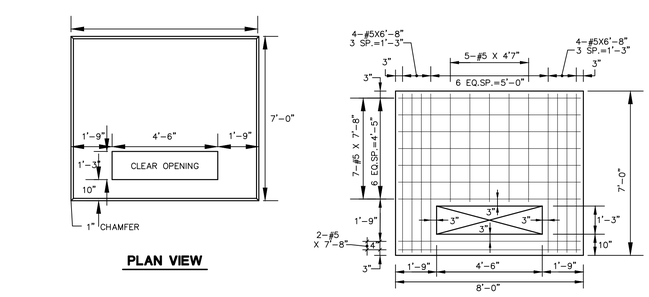
N.T.S.



HYDRANT NOTES:
1. ALL HYDRANTS SHALL HAVE 1-4½" NTS STEAMER CONNECTION AND 2-2½" NTS DISCHARGES.
2. ALL HYDRANTS SHALL BE RED IN COLOR.
3. ALL HYDRANTS SHALL HAVE MARKER THAT EXTENDS ABOVE THE HYDRANT FOR WINTER LOCATING.
4. ALL HYDRANTS TO OPEN COUNTER CLOCKWISE.

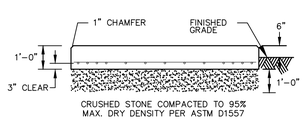
HYDRANT DETAIL WITH GATE BOX

N.T.S. BLWD-003



PLAN VIEW

PLAN OF REINFORCING

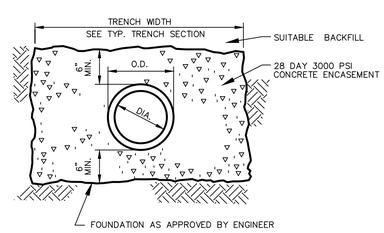


SECTION

NOTE: CONFIRM SIZE WITH UNITED ILLUMINATING COMPANY FOR REQUIRED CONFIGURATION OF PAD PRIOR TO CONSTRUCTION

TRANSFORMER PAD

N.T.S. BLLE-001



CONCRETE PROTECTION FOR PIPING

N.T.S. BLSS-011

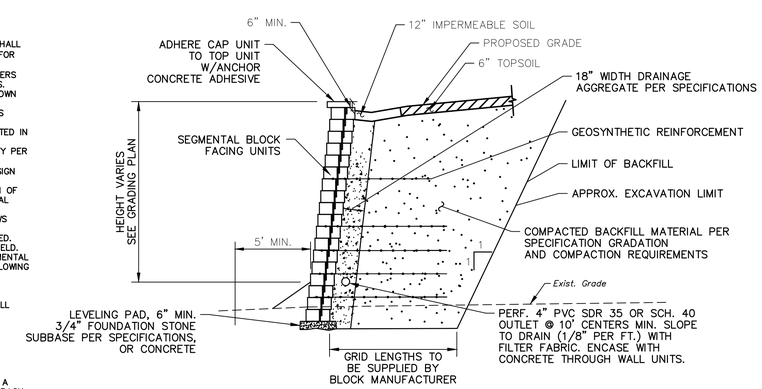
GENERAL NOTES

1. STRIP ALL VEGETATION AND ORGANIC SOIL FROM THE WALL AND GRID ALIGNMENT.
2. BENCH CUT ALL EXCAVATED SLOPES.
3. DO NOT OVER EXCAVATE UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.
4. SITE SOIL ENGINEER SHALL VERIFY FOUNDATION SOILS AS BEING COMPETENT PER THE DESIGN STANDARDS AND PARAMETERS.
5. LEVELING PAD SHALL CONSIST OF 3/4" FOUNDATION STONE, MINIMUM 6" THICK, OR 3,000 PSI CONCRETE.
6. CONTRACTOR MAY OPT FOR A CONCRETE FOOTING. CONCRETE FOOTING SHALL BE UNREINFORCED, DEPTH OF CONCRETE TO BE A MINIMUM THICKNESS OF 6".
7. MINIMUM EMBEDMENT OF WALL BELOW FINISH GRADE SHALL BE 16" FOR WALL HEIGHTS FROM 4' AND UP TO 10', 8" FOR HEIGHTS BELOW 4' UNLESS SHOWN DIFFERENTLY.
8. FOLLOW APPLICABLE PROVISIONS OF THE MANUFACTURERS INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
9. WHERE DRAIN PIPE IS USED, PROVIDE OUTLETS AS SHOWN ON WALL ELEVATIONS.
10. COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED. THE MINIMUM NUMBER OF TESTS SHALL BE DETERMINED BY THE SITE SOILS ENGINEER, OR AS INDICATED IN THE SPECIFICATION.
11. COMPACTION SHALL BE 95% OF MAXIMUM DRY DENSITY PER ASTM D-1557.
12. GEOGRID SHALL BE PER BLOCK MANUFACTURER'S DESIGN ON SHOP DRAWINGS.
13. PULL GEOGRID TIGHT PRIOR TO BACK FILLING. LENGTH OF GEOGRID SHALL BE MEASURED FROM FRONT OF SEGMENTAL CONCRETE UNITS.
14. PROVIDE LATERAL DRAINAGE SWALES TO DIRECT FLOWS AROUND THE ENDS OF THE WALL.
15. ESTABLISH TURF AS SOON AS THE WALL IS COMPLETED.
16. FINAL WALL ALIGNMENT SHALL BE LOCATED IN THE FIELD.
17. REINFORCED BACK FILL REQUIREMENTS FOR THE SEGMENTAL CONCRETE RETAINING WALL SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:

SIEVE SIZE	PERCENT PASSING REINFORCED BACK FILL
2 INCH	100
NO. 4	40–85
NO. 10	25–75
NO. 40	15–50
NO. 100	10–40
NO. 200	4–12

PLASTICITY INDEX (PI) LESS THAN OR EQUAL TO 10 AND A LIQUID LIMIT LESS THAN OR EQUAL TO 40. REINFORCED BACK FILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT EXCEEDING 10 INCHES. REINFORCED BACK FILL SHALL BE COMPACTED TO 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM-1557. THE MOISTURE CONTENT OF THE BACK FILL MATERIAL PRIOR TO AND DURING COMPACTION SHALL BE WITHIN 2 PERCENTAGE POINTS OF DRY OPTIMUM.

IF CONDITIONS ARE DIFFERENT THAN THOSE STATED IN THESE DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR MUST CONTACT THE ENGINEER PRIOR TO PROCEEDING WITH THE CONSTRUCTION OF THE WALL.



NOTE: BLOCK MANUFACTURER TO SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR RETAINING WALLS PRIOR TO CONSTRUCTION PREPARED BY A CT LICENSED PROFESSIONAL ENGINEER

TYPICAL RETAINING WALL SECTION

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TRUMBULL, CONNECTICUT

REVISIONS		
No.	Date	Desc.
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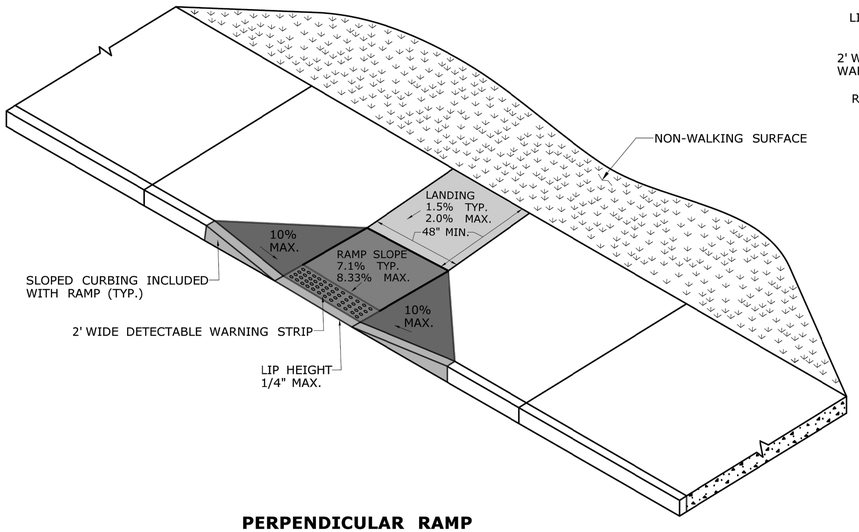
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File: DN180051301	

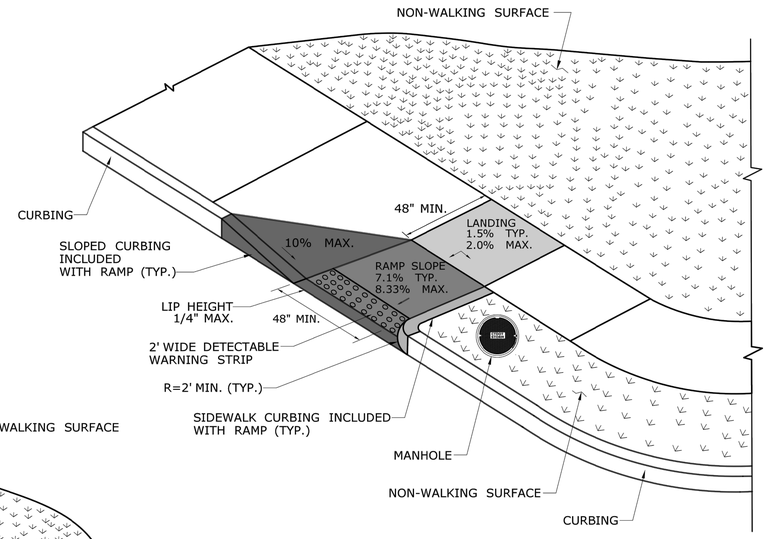
Title
DETAILS SHEET

Sheet No.
DN-7

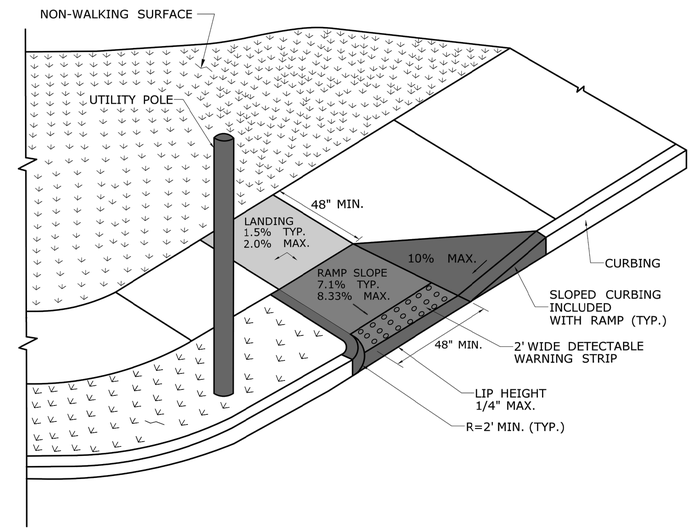
Xref (s) : BD180051301



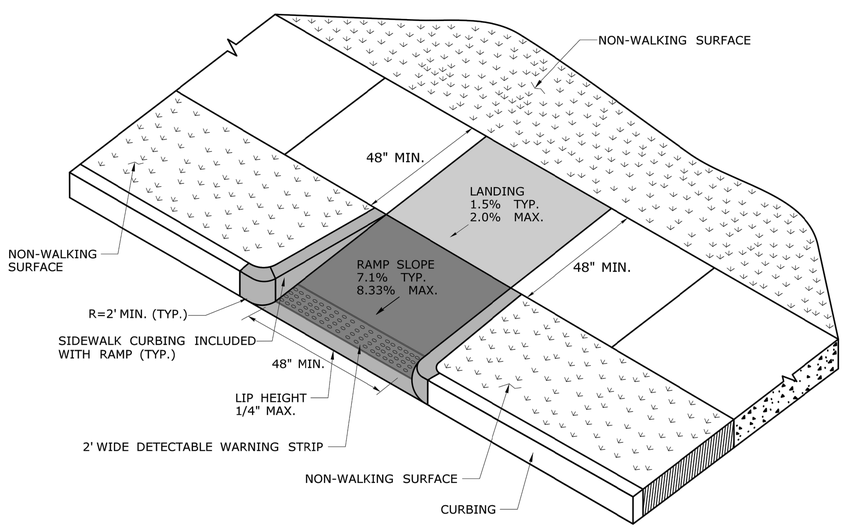
PERPENDICULAR RAMP
WITH 48" BY-PASS
(TYPE 8)



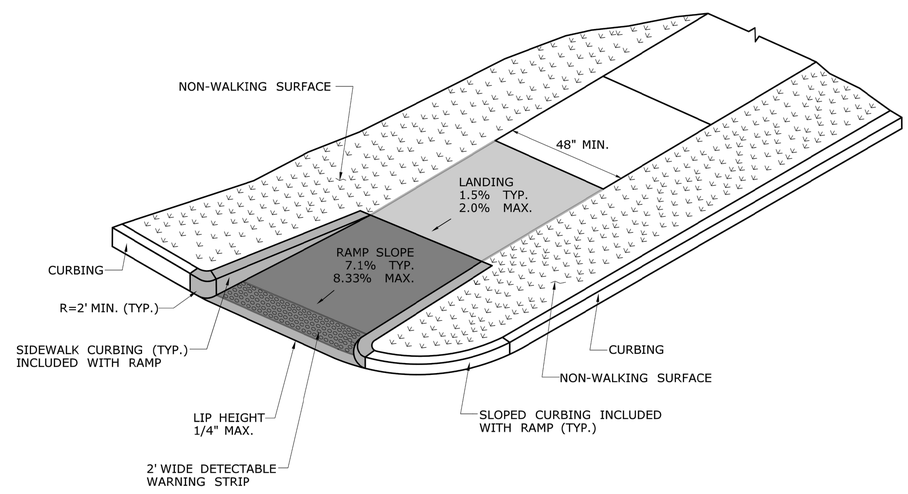
PERPENDICULAR RAMP
WITH NON-WALKING SURFACE
(TYPE 18 LEFT)



PERPENDICULAR RAMP
WITH NON-WALKING SURFACE
(TYPE 18 RIGHT)



PERPENDICULAR RAMP
WITH NON-WALKING SURFACE
(TYPE 13)



SINGLE DIRECTION - RETURN CURB
WITH NON-WALKING SURFACE
(TYPE 16)

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No. 27798
LICENSED
PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
K & K DEVELOPERS, INC.
5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	NONE
Project No.	1800513
Date	05/28/2020
CAD File: DN180051301	

Title

DETAILS SHEET

Sheet No.

DN-8

Xref (s) : BD180051301

8/17/2020, AKLADE, G:\JOBS\18\DATA\180051\DWG\DN180051301.DWG-DN-8 24X36.

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Stormwater Management Report

For the Proposed:

The Residences at Main

Located at:

5085 Main Street
Trumbull, Connecticut

Prepared for Submission to:

Town of Trumbull, Connecticut
Planning and Zoning Commission

May 15, 2020

Revised: August 12, 2020

Prepared for:

K&K Developers, Inc.
C/O Garden Homes Development
820 Morris Turnpike
Short Hills, NJ 07078

Prepared by:

Architecture
Engineering
Environmental
Land Surveying
Companies

BL Companies
355 Research Parkway
Meriden, Connecticut 06450
Phone: (203) 630-1406
Fax: (203) 630-2615

BL Project Number: 1800513

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Executive Summary

This report has been prepared in support of a Special Permit application to the Town of Trumbull by K&K Developers, Inc., for a proposed residential development southeast of the intersection of Connecticut Route 15 and Main Street (Connecticut Route 111). The subject property is approximately 10.42 acres. The parcel is currently developed with two dead-end avenues surrounded by woods. Single-family residential properties once populated the property and have since been demolished. There are no existing wetlands near the subject property. The proposed redevelopment includes the construction of five apartment buildings and associated parking lots, drainage and utilities. The overall existing drainage onsite will be improved with the use of Best Management Practices (BMPs) for water quality and runoff management though treatment, detention and outlet control.

To the north of the property is Route 15. Across Route 15 are residential developments. East of the property is also a residential use. South of the property is the drive and parking lot to Westfield Trumbull Shopping mall. West of the property is the shopping mall.

Generally, the topography of the site slopes downward toward the westerly property, ranging from elevation ±324 to ±284. The western portion of the site features steeper slopes in relation to the eastern portion of the site. Under the existing conditions, site stormwater is either collected by an on-site stormwater network that conveys the flow directly into the shopping mall's drainage network or the site stormwater leaves the site by overland flow which also flows into the shopping mall's drainage network.

A HydroCAD model, utilizing TR-55 methodology, was developed to evaluate the existing and proposed drainage conditions of the property. To mitigate the increase in impervious coverage on the site a subsurface plastic storage chamber system will be installed with an outlet control structure to provide stormwater runoff rate control. The results of the analysis demonstrate that there will not be an increase in peak stormwater runoff rates for, the 2-, 10-, 25-, and 100-year storm events. Water Quality Best Management Practices (BMPs) have been incorporated into the project design to provide a minimum required 80% TSS removal. The majority of impervious area runoff will be captured by hooded catch basins with deep sumps, with the building runoff discharging to roof leaders. The stormwater runoff will then be conveyed through hydrodynamic separators and into underground infiltration chambers or a surface detention pond.

The proposed stormwater management system is designed to be in compliance with the Town of Trumbull regulations and the 2004 Connecticut Stormwater Quality Manual as well as the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

Existing Conditions

General Existing Site Conditions

The existing site consists of impervious areas includes the remains of two former avenues; running from east to west. The property also contains woods and overgrowth throughout the site. A few utilities run along the avenues. Stormwater runoff from the site is collected by an on-site stormwater network or overland flow; both of which flow into the drainage network of the shopping mall south and west of the subject property.

The site soils identified by the United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) area Charlton-Chatfield complex – B, Paxton and Montauk fine sandy loams – C, Urban land-Charlton-Chatfield complex – D, Paxton-Urban land complex – C, Udorthents-Urban land complex – B, and Urban Land – D. A copy of the USDA NRCS Hydrologic Soil Group Map is included in Appendix A and a Soil Report is included in Appendix H for reference.

Per the FEMA Flood Insurance Rate Map Number 09001C0426F for the Town of Trumbull, Connecticut map, effective revision date: June 18, 2010, the site is located in the Flood Hazard Zone X (unshaded), area of minimal flood hazard. A copy of the FEMA Flood insurance rate map is included in Appendix A for reference.

Existing Drainage Conditions

The existing site drainage area that was analyzed for this project totals approximately 17 acres and has approximately 28.2% impervious ground cover. The existing stormwater management system onside includes a few catch basins that connect to the drainage system of the neighboring shopping mall with no treatment prior to leaving the site. Stormwater from the subject property and from portions of the roadway flows in three major existing drainage areas (EDA-100, 200 and 300) that all drain to the stormwater system of the adjacent westerly commercial property. The impervious coverage on the subject property was determined using the 1964 aerial imagery which also consisted of the two avenues running through the property and multiple single family residential homes.

The following is a brief analysis of the existing points of interest as shown on the enclosed Existing Drainage Plan (ED-1), in Appendix E.

Existing Drainage Area 100 (EDA-100): This drainage area covers most of what was formerly Whalburn Avenue, several houses from the 1964 imagery with sheds and driveways and yard areas as well as a native wooded vegetation to the north buffering the residence back yards and the State Route 15. In the EDA-100 drainage area, the stormwater runoff flows east to west through the

property yards and woods. Ultimately the runoff is captured in a swale and catch basin system installed at the toe of the slope at the neighboring mall property prior to the runoff entering the mall parking area.

Existing Drainage Area 200 (EDA-200): This drainage area includes approximately half of Stuart Place, many of the homes and associated drives along the roadway, grass yards, native wooded vegetation, and a parking lot belonging to the westerly mall parcel. In the EDA-200 drainage area, the stormwater runoff is captured in a catch basin network located at the westerly end of Stuart Place and in the remote parking lot of the neighboring mall property.

Existing Drainage Area 300 (EDA-300): This drainage area includes the runoff that comes from Main Street which is directed through the mall entry drive from the roadway gutter. The area also includes a few single-family homes, approximately half of Stuart Place, grass yard, native wooded vegetation, and the main drive to the neighboring shopping mall. In the EDA-300 drainage area, the stormwater runoff is captured in a catch basin network along the main drive of the neighboring mall property.

Table 1 below displays the overall size and hydraulic characteristics used to analyze the existing drainage areas.

Table 1 – Pre-Development (Existing Conditions) Drainage Characteristics

Drainage Area	Total Area SF	Composite Curve Number	Imperviousness Cover %	Time of Concentration Minutes
EDA-100	363,359	78	4.6%	20.10
EDA-200	159,078	84	30.8%	14.40
EDA-300	220,011	87	39.5%	16.50

Proposed Conditions

General Proposed Site Conditions

The proposed development includes the development of the site with 5 apartment buildings totaling 260 residential units and associated roadways, parking, drainage and utilities necessary to support the development. Site modifications will include repaving, re-grading and modifying Whalburn Avenue, closing Stuart Place and adding a new road running north to south.

The overall existing drainage onsite will be improved through the use of Best Management Practices (BMPs) for water quality and runoff management though means of treatment, detention and outlet control.

Proposed Drainage Conditions

For the purposes of the drainage analysis and discussion, as well as to maintain existing drainage patterns to the maximum extent practical, the stormwater runoff points of interest for the proposed conditions analysis are the same as the points of interest analyzed in the existing conditions. The discharge from the proposed stormwater treatment devices will connect directly to the existing stormwater network of the subject property and the neighboring mall property. The proposed development has been analyzed as six drainage and sub-drainage areas, which are illustrated on the enclosed Proposed Drainage Plan (PD-1) located in Appendix E. The proposed analysis includes a total of 17 acres and is approximately 57.7% impervious. The site stormwater management system will provide the necessary stormwater attenuation do to the increase in impervious surface through the installation of a subsurface and surface detention systems with outlet control as well as stormwater quality improvements compared to the existing system through the utilization of hydrodynamic separators for treatment before entering both the existing dranage network to the maximum extent practical. The BMPs have been designed in accordance with the 2004 Connecticut Stormwater Quality Manual.

The following is a brief analysis of the proposed drainage areas as shown on the enclosed Proposed Drainage Plan (PD-1), in Appendix E.

Proposed Drainage Area 101 (PDA-101): This drainage area consists predominately of the native wooded vegetation to the north buffering the residence back yards and the State Route 15. Additionally, this area consists of the runoff from a newly constructed access drive connecting the northwesterly corner of the development to the existing mall circulation road. This area will be connected directly into the existing stormwater network of the mall property. The runoff is captured in a swale and catch basin system installed at the toe of the slope at the neighboring mall property prior to the runoff entering the mall parking area.

Proposed Drainage Area 102 (PDA-102): This drainage area consists predominately of bituminous concrete parking areas as well as the roof drainage associated with buildings 1 and 2 and the former Whalburn avenue roadway running east to west. This drainage area also includes interior landscaping and landscape islands and a portion of runoff from the landscape buffers between the State Route 15 off ramp, Main Street and the subject property. In the PDA-102 drainage area, the stormwater runoff is captured on site through a catch basin network and is routed to the stormwater system under the parking area of building 1. The runoff is treated with hydrodynamic separators prior to entering the system to keep trash and suspended solids out of the system (proprietary system claims to meet 80% TSS removal). The underground stormwater basin

consists of polyethylene storage chambers encased in crushed stone. This system allows for maximum infiltration and groundwater recharge potential. An infiltration rate of 3 inches per hour with a factor of safety of 2 (1.5 in/hr) has been assigned to these systems in the stormwater modeling (see Appendix G for infiltration testing results). Additionally, the system has been designed to retain and infiltrate the 1" water quality volume (WQV) for this drainage area.

Proposed Drainage Area 201 (PDA-201): This drainage area consists predominately of the native wooded vegetation to the southwest of the property and the adjacent mall property and a parking lot belonging to the westerly mall parcel. The stormwater runoff is captured in a catch basin network in the remote parking lot of the neighboring mall property.

Proposed Drainage Area 202 (PDA-202): This drainage area consists predominately of bituminous concrete parking areas as well as the roof drainage associated with buildings 4 and 5. This drainage area also includes interior landscaping and landscape islands and approximately half of the new access road running from the south to the north at the intersection of the former Whalburn Avenue. In the PDA-202 drainage area, the stormwater runoff is captured on site through a catch basin network and is routed to the stormwater system under the parking area of buildings 4 and 5. The runoff is treated with a hydrodynamic separator prior to entering the system to keep trash and suspended solids out of the system (proprietary system claims to meet 80% TSS removal). The underground stormwater basin consists of polyethylene storage chambers encased in crushed stone. This system allows for maximum infiltration and groundwater recharge potential. An infiltration rate of 3 inches per hour with a factor of safety of 2 (1.5 in/hr) has been assigned to these systems in the stormwater modeling (see Appendix G for infiltration testing results). Additionally, the system has been designed to retain and infiltrate the 1" (WQV) for this drainage area.

Proposed Drainage Area 301 (PDA-301): This drainage area includes the runoff that comes from Main Street which is directed through the mall entry drive from the roadway gutter as well as a portion of main drive to the neighboring shopping mall. The stormwater runoff is captured in a catch basin network along the main drive of the neighboring mall property.

Proposed Drainage Area 302 (PDA-302): This drainage area consists predominately of bituminous concrete parking areas as well as the roof drainage associated with building 3. This drainage area also includes interior landscaping and landscape islands and a portion of the landscape buffer between the subject property and Main Street. In the PDA-302 drainage area, the stormwater runoff is captured on site through a catch basin network and is routed a surface detention basin. The runoff captured from the impervious parking areas and roof area is treated with a hydrodynamic separator prior to entering the system to keep trash and suspended solids out of the system (proprietary system claims to meet 80% TSS removal). The pond uses a "Type C-L" catch basin with orifices and a trash rack for stormwater attenuation. The Top of frame grate of

the structure is an emergency overflow orifice set higher than the 100-year storm event elevation in the pond, and the pond then has an additional 6" of freeboard above that elevation. This system allows for some infiltration and groundwater recharge potential; however, an infiltration rate has not been incorporated for storage credit in this design at this time.

Table 2 below displays the overall size and hydraulic characteristics used to analyze the proposed drainage areas.

Table 2 – Post Development Drainage Characteristics

Drainage Area	Total Area SF	Composite Curve Number	Imperviousness Cover %	Time of Concentration Minutes
PDA-101	146,162	75	10.0%	14.90
PDA-102	183,046	93	80.1%	6.00
PDA-201	71,843	87	52.5%	13.10
PDA-202	108,188	95	86.7%	6.00
PDA-301	145,655	89	60.3%	13.70
PDA-302	87,553	88	59.1%	13.60

Stormwater Management

Stormwater Attenuation

A hydrologic analysis to determine peak stormwater discharge rates was performed using the HydroCAD stormwater modeling system computer program, version 10.00 developed by HydroCAD Software Solutions, LLC. Hydrographs for each watershed were developed using the SCS Synthetic Unit Hydrograph Method. Rainfall depths and distribution taken from the NOAA Atlas 14 for Trumbull, Connecticut were used for the calculation of peak flow rates and are listed in Table 3. The drainage areas, or sub-drainage areas as labeled by the program, are depicted by hexagons on the attached drainage diagrams. Pre- and post-development HydroCAD output and details can be found in Appendix B.

Table 3 – Rainfall Depths per NOAA Atlas 14
Appendix B - 24-hour Rainfall Data

Return Period	24-hour Rainfall Depth
2-year	3.52"
10-year	5.42"
25-year	6.61"
100-year	8.45"

The results of the analysis can be found in Table 4 below of the 2-, 10-, 25-, and 100-year storm events. With the use of detention structures with outlet control structures the site proposed stormwater management system meets the requirements of the Town of Trumbull Regulations as well as the 2004 Connecticut Stormwater Quality Manual at all discharge design point locations by not increasing peak runoff rates from the proposed developments at the site.

Table 4 – Existing vs Proposed Peak Rates of Runoff

Analysis Point	**Peak Flows (CFS)**			
	2-YR	10-YR	25-YR	100-YR
EDA-100	9.36	18.48	24.37	33.47
PDA-100	4.10	12.93	17.47	24.14
EDA-100	6.44	11.40	14.47	19.17
PDA-200	3.85	11.00	13.93	19.13
EDA-300	9.31	15.78	19.71	25.72
PDA-300	7.73	14.45	17.83	22.69

In addition to reducing the rate of runoff, the overall volume of stormwater runoff is also being reduced from the site. Table 5 below provides a comparison of the stormwater runoff volumes for the 2-, 10-, 25-, and 100-year storm events.

Table 5 – Existing vs Proposed Runoff Volumes

		Volume of Stormwater Runoff (CF)					Volume of Stormwater Runoff (CF)			
Year Storm		EDA-100	EDA-200	EDA-300	**TOTAL**		PDA-100	PDA-200	PDA-300	**TOTAL**
2		45,738	25,898	40,343	**111,979**		26,482	20,428	42,363	**89,273**
10		92,882	48,476	72,684	**214,042**		67,727	45,411	77,405	**190,543**
25		124,660	63,238	93,559	**281,457**		96,327	62,165	99,832	**258,324**
100		175,635	86,539	126,293	**388,467**		142,563	88,720	134,857	**366,140**
		TOTAL			**995,945**		TOTAL			**904,280**

Stormwater Quality

Along with the reduction of peak storm water discharge rates, an important element of the proposed drainage system is to improve the quality of discharge leaving the property. BMPs for stormwater runoff quality have been implemented in this design, refer to Appendix D for details and calculations.

All catch basins in parking and/or paved areas will have a minimum of two-foot deep sumps to collect sediment carried in the runoff. In addition, all catch basin outlets will be fitted with 'hoods' which trap floating debris in the individual catch basin so they can be removed during regular maintenance. The lawn and landscaped areas can also provide a secondary level of filtration and infiltration. No quantifiable credit is given to this green space, but it can contribute to water quality.

Hydrodynamic separators will be installed downstream of the stormwater collection networks prior to discharging to the detention systems. This unit has been proven to improve storm water quality. The unit has been designed in an "in-line" configuration, which improves the efficiency and is sized to treat the Water Quality Flow (WQF) per the 2004 Connecticut Stormwater Quality Manual. The "in-line" hydrodynamic separators will provide for 80% total suspended solid removal from collected runoff meeting the Connecticut guidelines and applicable Town of Trumbull regulations. Additionally, the two underground detention systems and the above ground pond will retain and infiltrate at minimum the 1" WQV significantly reducing downstream pollutant load and meeting the Town of Trumbull Municipal Separate Storm Sewer System (MS4) requirements for these systems. Table 6 below is a comparison of the required 1" WQV for the site drainage areas and the respective volumes below the outlet inverts (or lowest orifice) for the detention systems' outlet control structure (supporting calculations and tables can be found in Appendix D).

Table 6 – 1" Water Quality Volume Required and Provided (MS4)

Contributing Area	**1" WQV**	
	Required (cf)	Provided (cf)
PDA-102	11,760	11,836
PDA-202	7,486	7,767
PDA-302	4,246	4,256

Stormwater Conveyance

The hydraulic study of the on-site drainage system has been designed to comply with the requirements set forth in the State of Connecticut Department of Transportation Stormwater Drainage Manual, dated 2000, as amended and applicable regulations of the Town of Trumbull. The on-site collection and conveyance system is modeled with StormCAD V8i, for the 10-year storm event. Additionally, the 25-year storm tables have been provided, however the pipe sizes used through the site are limited to the receiving downstream pipe sizes. Refer to Catch Basin Drainage Area Map Sheet No. CB-1 in Appendix B and StormCAD Computation Tables and Hydraulic Profiles in Appendix C form more details.

Soil Erosion and Sediment Control

A soil erosion and sediment control plan has been developed to protect the adjacent roadways, storm drainage systems, properties and wetland areas and any adjacent water course from sediment laden surface runoff and erosion.

Sediment control will be accomplished through rapid stabilization and by the installation of mechanical devices, including a temporary gravel construction entrance, silt fence, haybales, and storm drain inlet protection. The proposed construction activities will be in accordance with policies and requirements of the 2002 Connecticut Guidelines for Sedimentation and Erosion Control, as amended as well as the applicable requirements of the Town of Trumbull. Permanent stabilization will occur as quickly as possible with site-specific seeding mixtures and as required by local officials.

Structural practices utilized as part of this development will include:

1. Temporary Construction Entrance

A temporary construction entrance shall be installed at the stone construction entrance of the development. Mud and debris shall be washed from all construction vehicles and equipment before leaving the site. The sediment laden water will be diverted to a proposed sediment basin/trap. Water tanks will be used if public water is unavailable.

2. Silt Fence

Silt fence shall be installed downstream of disturbed areas to filter the sediment laden sheet flow. Haybale backing will be used upstream of wetlands.

3. Inlet Protection

All storm inlets existing and constructed, that could potentially receive sediment laden runoff will have silt sack and/or haybale protection installed until site stabilization is complete.

4. Temporary Diversion Swales

Temporary diversion swales will be installed along the perimeter slopes to direct flow towards temporary sediment basins. The diversion shall be stabilized immediately following installation with temporary or permanent vegetation to prevent erosion.

5. Stone Check Dams

Stone check dams will be installed along diversion swales to filter sediment laden runoff being directed into temporary sediment traps.

6. Temporary Sediment Traps/Basins

Temporary sediment traps and basins will be installed to provide a minimum of 134 cubic yards of storage per disturbed acre contributing to the basin.

Conclusion

The stormwater design for the project development meets regulatory requirements and stormwater quality goals. The stormwater BMPs aid in keeping pollutants out of the adjacent roadways and properties and maximize the potential for groundwater recharge as well as attenuating peak flows by detaining stormwater for the most frequent storm events as practical. Stormwater quality is being addressed by water quality structures providing the minimum required 80% TSS removal as required in the CT Stormwater Manual. The proposed stormwater management system will meet the stormwater quality requirements of the State of Connecticut and the Town of Trumbull while improving overall existing site drainage conditions.

APPENDIX A

DATA AND MAPPING

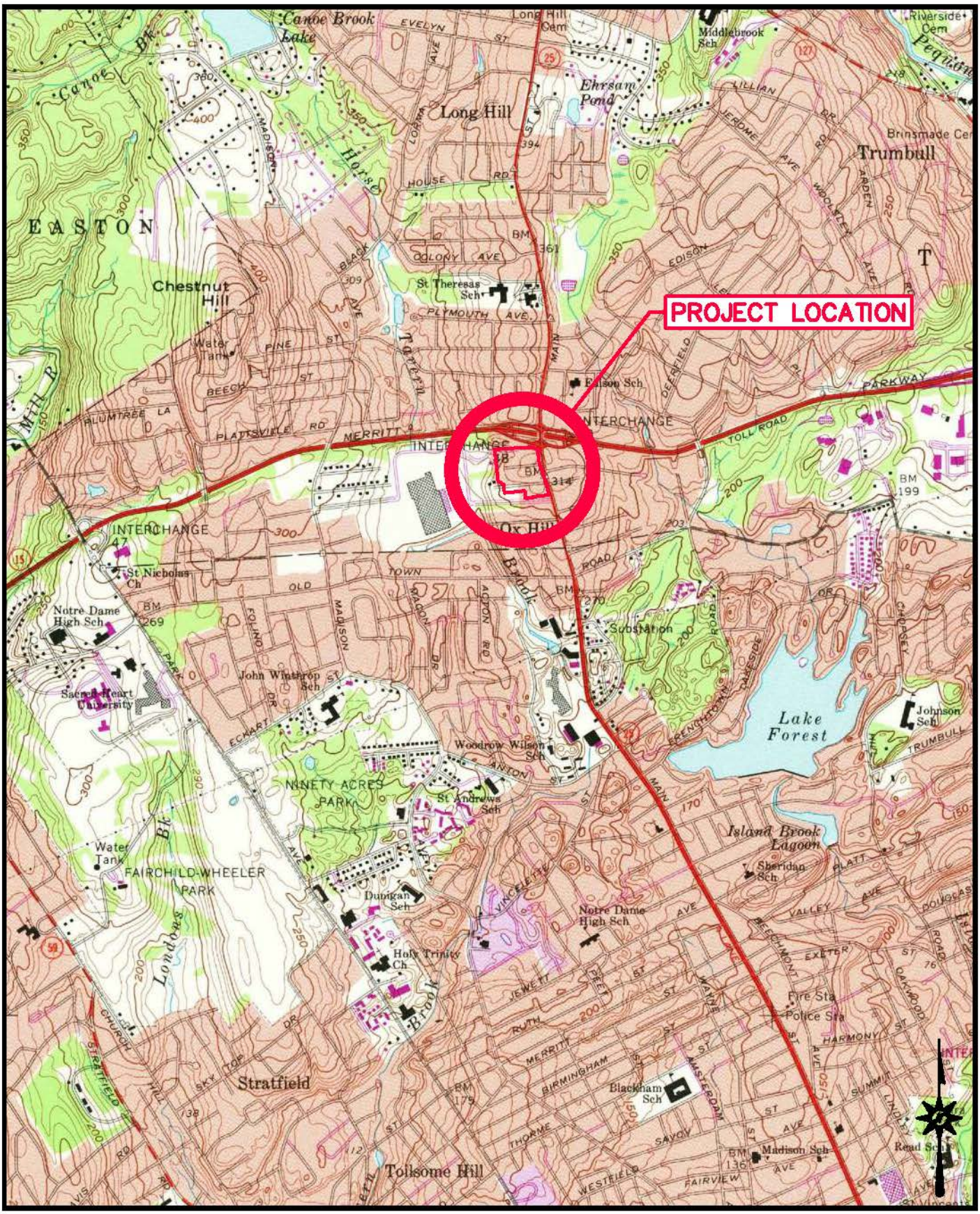
Figure 1A: USGS Location Map

Figure 1B: Aerial Location Map

Figure 2: NRCS Soil Survey Map with Hydrologic Soil Group Data

Figure 3: FEMA Federal Insurance Rate Map

Figure 4: NOAA Atlas 14 Storm Data



ARCHITECTURE
ENGINEERING
ENVIRONMENTAL
LAND SURVEYING

BL Companies

PROPOSED
RESIDENTIAL DEVELOPMENT
NEWTOWN TURNPIKE – MAIN STREET
(CONN ROUTE 111)
TRUMBULL, CONNECTICUT

Designed	J.S.D.
Drawn	J.S.D.
Checked	A.T.K.
Approved	
Scale	1"=2,000'
Project No.	180513
Date	03/02/2020
CAD File	LOC180051301

FIGURE 1A

USGS LOCATION MAP

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LAND SURVEYING

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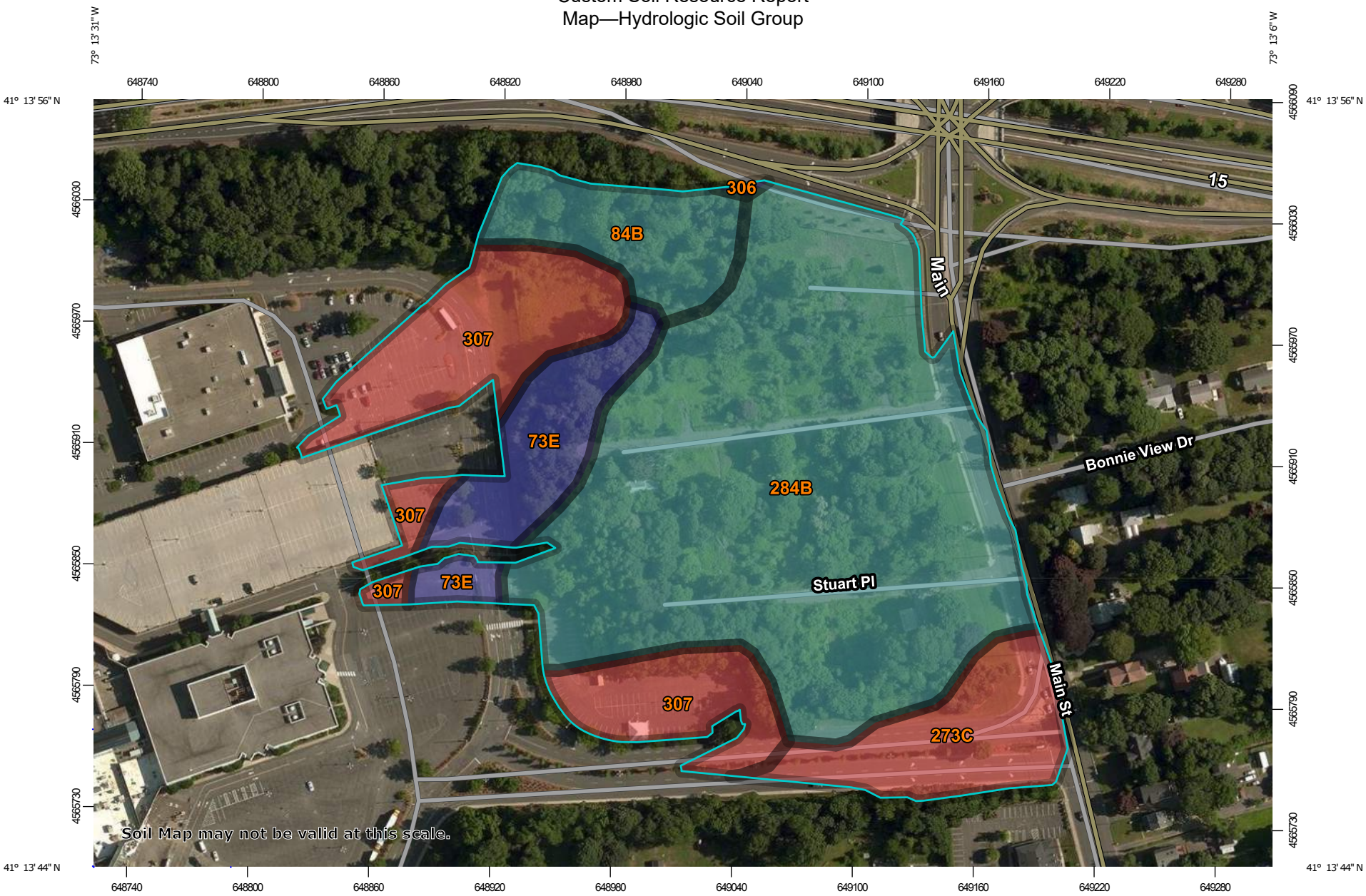
PROPOSED
RESIDENTIAL DEVELOPMENT
NEWTOWN TURNPIKE – MAIN STREET
(CONN ROUTE 111)
TRUMBULL, CONNECTICUT

Designed	J.S.D.
Drawn	J.S.D.
Checked	A.T.K.
Approved	
Scale	1"=200'
Project No.	180513
Date	03/02/2020
CAD File	LOC180051301

FIGURE 1B
AERIAL LOCATION MAP

Custom Soil Resource Report
Map—Hydrologic Soil Group



Map Scale: 1:2,670 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

Streams and Canals

Transportation

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

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 19, Sep 13, 2019

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

Date(s) aerial images were photographed: Jun 27, 2014—Jul 22, 2014

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.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	B	1.6	8.4%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	C	1.5	7.7%
273C	Urban land-Charlton-Chatfield complex, rocky, 3 to 15 percent slopes	D	1.7	8.7%
284B	Paxton-Urban land complex, 3 to 8 percent slopes	C	10.7	56.6%
306	Udorthents-Urban land complex	B	0.0	0.1%
307	Urban land	D	3.5	18.5%
Totals for Area of Interest			**18.9**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

National Flood Hazard Layer FIRMette

FEMA

41°14'5.01"N

73°13'34.47"W

73°12'57.02"W

41°13'37.96"N

Feet 1:6,000

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

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

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/2/2020 at 1:43:57 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.

NOAA Atlas 14, Volume 10, Version 3
Location name: West Haven, Connecticut, USA*
Latitude: 41.269°, Longitude: -72.9706°
Elevation: 69.77 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	0.346 (0.280-0.425)	0.417 (0.337-0.513)	0.532 (0.428-0.657)	0.628 (0.502-0.779)	0.759 (0.584-0.985)	0.858 (0.644-1.14)	0.962 (0.697-1.32)	1.08 (0.735-1.52)	1.25 (0.811-1.81)	1.38 (0.876-2.05)
10-min	0.491 (0.397-0.603)	0.590 (0.477-0.726)	0.753 (0.606-0.929)	0.889 (0.711-1.10)	1.08 (0.828-1.40)	1.22 (0.912-1.61)	1.36 (0.988-1.87)	1.53 (1.04-2.15)	1.77 (1.15-2.57)	1.96 (1.24-2.91)
15-min	0.577 (0.467-0.709)	0.695 (0.562-0.854)	0.887 (0.714-1.10)	1.05 (0.838-1.30)	1.27 (0.974-1.64)	1.43 (1.07-1.90)	1.60 (1.16-2.21)	1.80 (1.23-2.53)	2.08 (1.35-3.02)	2.31 (1.46-3.42)
30-min	0.798 (0.646-0.980)	0.960 (0.777-1.18)	1.23 (0.988-1.51)	1.45 (1.16-1.80)	1.75 (1.35-2.27)	1.98 (1.49-2.62)	2.22 (1.61-3.05)	2.49 (1.69-3.50)	2.88 (1.87-4.18)	3.19 (2.02-4.74)
60-min	1.02 (0.825-1.25)	1.23 (0.991-1.51)	1.57 (1.26-1.93)	1.85 (1.48-2.29)	2.24 (1.72-2.90)	2.53 (1.90-3.35)	2.83 (2.05-3.90)	3.18 (2.16-4.47)	3.67 (2.39-5.34)	4.08 (2.58-6.05)
2-hr	1.32 (1.08-1.62)	1.59 (1.30-1.95)	2.04 (1.65-2.50)	2.41 (1.94-2.97)	2.91 (2.26-3.76)	3.29 (2.49-4.35)	3.70 (2.70-5.07)	4.16 (2.84-5.81)	4.84 (3.16-7.00)	5.41 (3.43-7.97)
3-hr	1.53 (1.25-1.86)	1.85 (1.51-2.25)	2.36 (1.92-2.89)	2.79 (2.25-3.43)	3.38 (2.63-4.34)	3.82 (2.90-5.02)	4.28 (3.14-5.86)	4.83 (3.31-6.72)	5.63 (3.68-8.11)	6.31 (4.01-9.26)
6-hr	1.95 (1.61-2.36)	2.35 (1.93-2.84)	3.00 (2.46-3.65)	3.55 (2.88-4.33)	4.29 (3.36-5.48)	4.85 (3.70-6.34)	5.44 (4.01-7.40)	6.14 (4.22-8.48)	7.17 (4.71-10.3)	8.04 (5.13-11.7)
12-hr	2.43 (2.02-2.92)	2.93 (2.42-3.52)	3.75 (3.09-4.51)	4.42 (3.62-5.36)	5.35 (4.21-6.79)	6.04 (4.64-7.85)	6.78 (5.03-9.17)	7.66 (5.28-10.5)	8.95 (5.89-12.7)	10.0 (6.43-14.6)
24-hr	2.87 (2.39-3.42)	3.49 (2.90-4.16)	4.50 (3.73-5.38)	5.34 (4.39-6.42)	6.49 (5.14-8.20)	7.35 (5.68-9.50)	8.27 (6.18-11.1)	9.39 (6.50-12.8)	11.1 (7.31-15.6)	12.5 (8.04-18.0)
2-day	3.21 (2.69-3.80)	3.97 (3.32-4.70)	5.21 (4.35-6.19)	6.24 (5.17-7.46)	7.65 (6.11-9.64)	8.70 (6.78-11.2)	9.84 (7.42-13.3)	11.3 (7.83-15.3)	13.5 (8.94-18.9)	15.4 (9.94-22.1)
3-day	3.47 (2.93-4.10)	4.31 (3.63-5.08)	5.67 (4.75-6.72)	6.80 (5.66-8.10)	8.36 (6.69-10.5)	9.50 (7.43-12.2)	10.8 (8.15-14.5)	12.3 (8.59-16.7)	14.8 (9.83-20.7)	17.0 (11.0-24.2)
4-day	3.73 (3.15-4.38)	4.61 (3.89-5.42)	6.04 (5.08-7.14)	7.24 (6.04-8.59)	8.88 (7.13-11.1)	10.1 (7.90-12.9)	11.4 (8.65-15.3)	13.1 (9.12-17.6)	15.7 (10.4-21.8)	17.9 (11.6-25.4)
7-day	4.43 (3.77-5.18)	5.39 (4.57-6.30)	6.94 (5.87-8.15)	8.24 (6.91-9.73)	10.0 (8.06-12.4)	11.3 (8.90-14.4)	12.8 (9.67-16.9)	14.5 (10.2-19.4)	17.2 (11.4-23.8)	19.5 (12.6-27.4)
10-day	5.12 (4.37-5.97)	6.12 (5.21-7.14)	7.75 (6.57-9.06)	9.09 (7.65-10.7)	10.9 (8.83-13.5)	12.3 (9.69-15.5)	13.8 (10.5-18.1)	15.6 (10.9-20.7)	18.2 (12.2-25.1)	20.4 (13.3-28.7)
20-day	7.23 (6.21-8.36)	8.31 (7.12-9.62)	10.1 (8.60-11.7)	11.5 (9.77-13.5)	13.6 (11.0-16.5)	15.1 (11.9-18.7)	16.7 (12.6-21.5)	18.4 (13.0-24.3)	20.9 (14.1-28.6)	23.0 (14.9-32.1)
30-day	8.99 (7.75-10.4)	10.1 (8.71-11.7)	12.0 (10.3-13.9)	13.5 (11.5-15.7)	15.6 (12.7-18.9)	17.2 (13.6-21.2)	18.9 (14.2-24.0)	20.6 (14.6-27.1)	23.0 (15.5-31.3)	24.9 (16.2-34.5)
45-day	11.2 (9.67-12.8)	12.4 (10.7-14.2)	14.3 (12.3-16.5)	15.9 (13.6-18.4)	18.1 (14.7-21.7)	19.8 (15.7-24.2)	21.5 (16.2-27.1)	23.2 (16.5-30.3)	25.4 (17.2-34.4)	27.0 (17.6-37.4)
60-day	13.0 (11.3-14.9)	14.2 (12.3-16.3)	16.2 (14.0-18.6)	17.9 (15.3-20.6)	20.1 (16.4-24.1)	21.9 (17.3-26.7)	23.6 (17.8-29.6)	25.3 (18.1-32.9)	27.3 (18.5-36.9)	28.8 (18.8-39.7)

[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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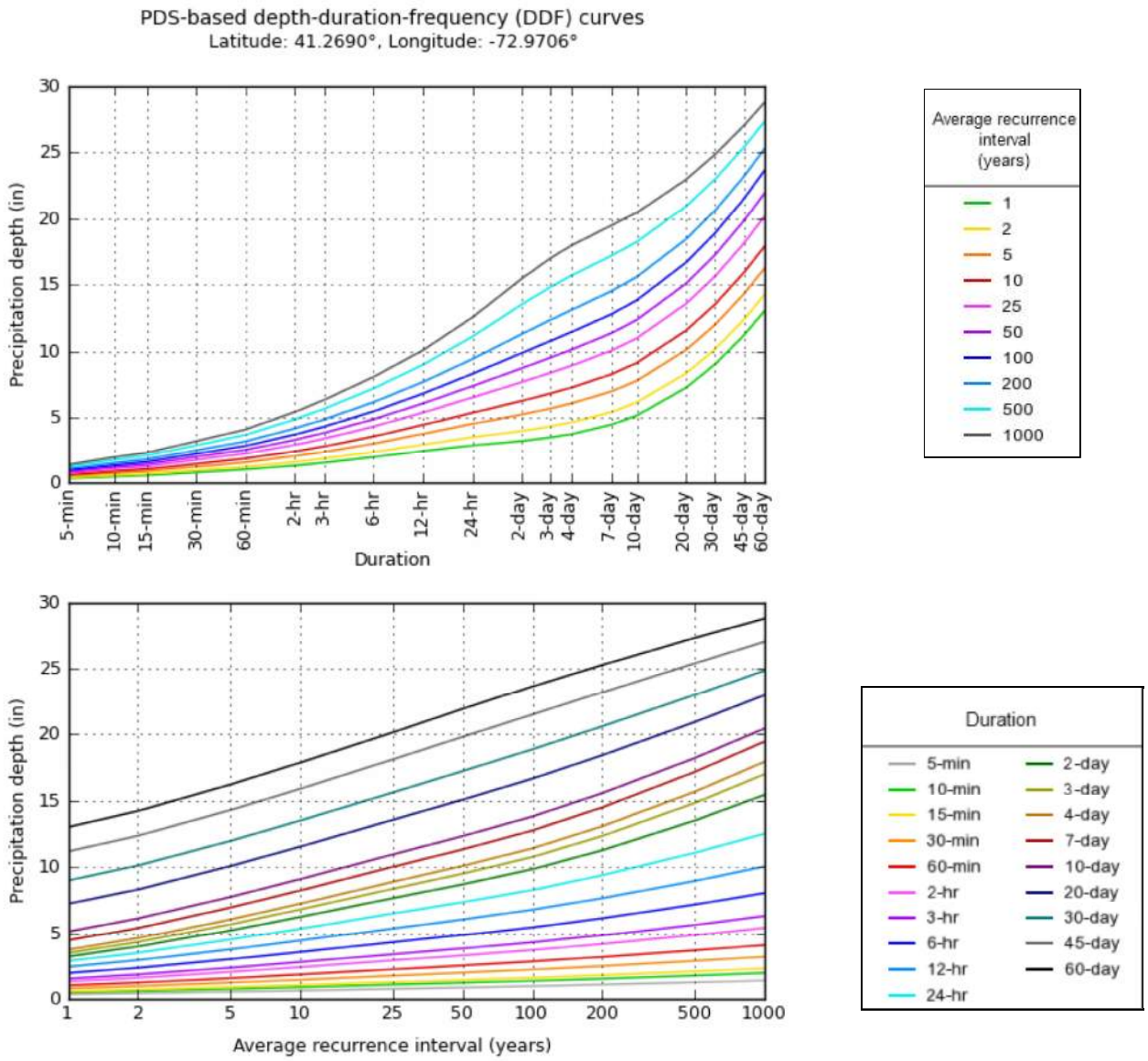
PF graphical



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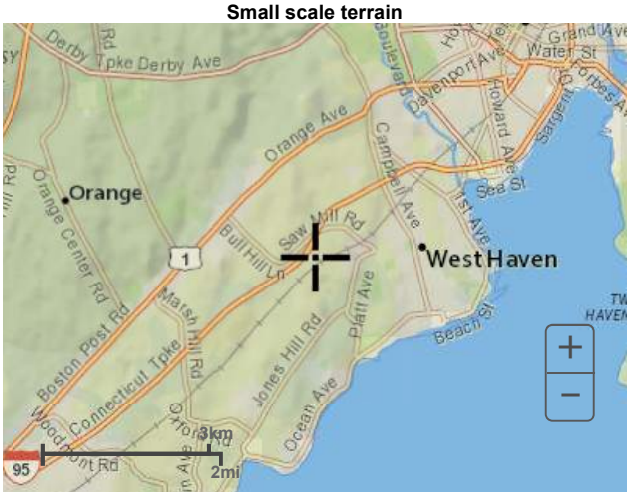
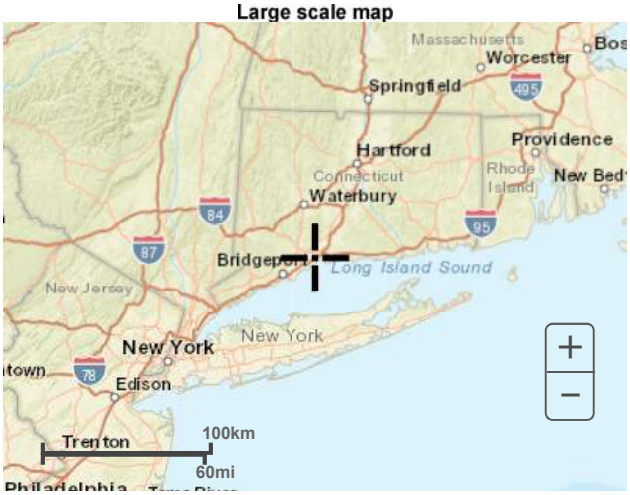
Small scale terrain



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

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NOAA Atlas 14, Volume 10, Version 3
Location name: West Haven, Connecticut, USA*
Latitude: 41.269°, Longitude: -72.9706°
Elevation: 69.77 ft**
* source: ESRI Maps
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POINT PRECIPITATION FREQUENCY ESTIMATES

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PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.15 (3.36-5.10)	5.00 (4.04-6.16)	6.38 (5.14-7.88)	7.54 (6.02-9.35)	9.11 (7.01-11.8)	10.3 (7.73-13.6)	11.5 (8.36-15.9)	12.9 (8.82-18.2)	15.0 (9.73-21.8)	16.6 (10.5-24.6)
10-min	2.95 (2.38-3.62)	3.54 (2.86-4.36)	4.52 (3.64-5.57)	5.33 (4.27-6.62)	6.46 (4.97-8.37)	7.30 (5.47-9.67)	8.18 (5.93-11.2)	9.17 (6.25-12.9)	10.6 (6.90-15.4)	11.8 (7.45-17.5)
15-min	2.31 (1.87-2.84)	2.78 (2.25-3.42)	3.55 (2.86-4.38)	4.19 (3.35-5.20)	5.06 (3.90-6.57)	5.72 (4.30-7.58)	6.42 (4.65-8.82)	7.19 (4.90-10.1)	8.31 (5.41-12.1)	9.22 (5.84-13.7)
30-min	1.60 (1.29-1.96)	1.92 (1.55-2.36)	2.45 (1.98-3.03)	2.89 (2.31-3.59)	3.50 (2.69-4.54)	3.96 (2.97-5.25)	4.44 (3.21-6.10)	4.98 (3.39-6.99)	5.75 (3.74-8.36)	6.38 (4.04-9.48)
60-min	1.02 (0.825-1.25)	1.23 (0.991-1.51)	1.57 (1.26-1.93)	1.85 (1.48-2.29)	2.24 (1.72-2.90)	2.53 (1.90-3.35)	2.83 (2.05-3.90)	3.18 (2.16-4.47)	3.67 (2.39-5.34)	4.08 (2.58-6.05)
2-hr	0.662 (0.539-0.808)	0.797 (0.648-0.974)	1.02 (0.826-1.25)	1.20 (0.968-1.48)	1.46 (1.13-1.88)	1.65 (1.24-2.17)	1.85 (1.35-2.53)	2.08 (1.42-2.90)	2.42 (1.58-3.50)	2.70 (1.72-3.99)
3-hr	0.510 (0.417-0.620)	0.615 (0.502-0.749)	0.787 (0.640-0.961)	0.929 (0.750-1.14)	1.13 (0.874-1.45)	1.27 (0.964-1.67)	1.43 (1.05-1.95)	1.61 (1.10-2.24)	1.88 (1.23-2.70)	2.10 (1.34-3.08)
6-hr	0.326 (0.268-0.394)	0.393 (0.323-0.475)	0.502 (0.411-0.609)	0.592 (0.481-0.723)	0.717 (0.560-0.916)	0.809 (0.618-1.06)	0.908 (0.670-1.24)	1.02 (0.704-1.42)	1.20 (0.786-1.71)	1.34 (0.857-1.96)
12-hr	0.202 (0.167-0.242)	0.243 (0.201-0.292)	0.311 (0.256-0.375)	0.367 (0.300-0.445)	0.444 (0.349-0.564)	0.502 (0.385-0.651)	0.563 (0.417-0.761)	0.635 (0.439-0.872)	0.743 (0.489-1.06)	0.834 (0.534-1.21)
24-hr	0.119 (0.100-0.142)	0.145 (0.121-0.173)	0.187 (0.155-0.224)	0.222 (0.183-0.268)	0.270 (0.214-0.342)	0.306 (0.237-0.396)	0.345 (0.257-0.464)	0.391 (0.271-0.533)	0.462 (0.305-0.651)	0.522 (0.335-0.751)
2-day	0.067 (0.056-0.079)	0.083 (0.069-0.098)	0.108 (0.091-0.129)	0.130 (0.108-0.155)	0.159 (0.127-0.201)	0.181 (0.141-0.234)	0.205 (0.155-0.276)	0.235 (0.163-0.318)	0.281 (0.186-0.394)	0.322 (0.207-0.460)
3-day	0.048 (0.041-0.057)	0.060 (0.050-0.071)	0.079 (0.066-0.093)	0.094 (0.079-0.113)	0.116 (0.093-0.146)	0.132 (0.103-0.170)	0.149 (0.113-0.201)	0.171 (0.119-0.231)	0.206 (0.137-0.288)	0.236 (0.152-0.336)
4-day	0.039 (0.033-0.046)	0.048 (0.040-0.056)	0.063 (0.053-0.074)	0.075 (0.063-0.090)	0.093 (0.074-0.116)	0.105 (0.082-0.135)	0.119 (0.090-0.159)	0.136 (0.095-0.183)	0.163 (0.108-0.227)	0.187 (0.121-0.265)
7-day	0.026 (0.022-0.031)	0.032 (0.027-0.038)	0.041 (0.035-0.049)	0.049 (0.041-0.058)	0.060 (0.048-0.074)	0.067 (0.053-0.086)	0.076 (0.058-0.101)	0.086 (0.060-0.115)	0.102 (0.068-0.141)	0.116 (0.075-0.163)
10-day	0.021 (0.018-0.025)	0.025 (0.022-0.030)	0.032 (0.027-0.038)	0.038 (0.032-0.045)	0.046 (0.037-0.056)	0.051 (0.040-0.065)	0.058 (0.044-0.076)	0.065 (0.046-0.086)	0.076 (0.051-0.105)	0.085 (0.055-0.120)
20-day	0.015 (0.013-0.017)	0.017 (0.015-0.020)	0.021 (0.018-0.024)	0.024 (0.020-0.028)	0.028 (0.023-0.034)	0.031 (0.025-0.039)	0.035 (0.026-0.045)	0.038 (0.027-0.051)	0.044 (0.029-0.060)	0.048 (0.031-0.067)
30-day	0.012 (0.011-0.014)	0.014 (0.012-0.016)	0.017 (0.014-0.019)	0.019 (0.016-0.022)	0.022 (0.018-0.026)	0.024 (0.019-0.029)	0.026 (0.020-0.033)	0.029 (0.020-0.038)	0.032 (0.022-0.043)	0.034 (0.022-0.048)
45-day	0.010 (0.009-0.012)	0.011 (0.010-0.013)	0.013 (0.011-0.015)	0.015 (0.013-0.017)	0.017 (0.014-0.020)	0.018 (0.014-0.022)	0.020 (0.015-0.025)	0.021 (0.015-0.028)	0.024 (0.016-0.032)	0.025 (0.016-0.035)
60-day	0.009 (0.008-0.010)	0.010 (0.009-0.011)	0.011 (0.010-0.013)	0.012 (0.011-0.014)	0.014 (0.011-0.017)	0.015 (0.012-0.019)	0.016 (0.012-0.021)	0.018 (0.013-0.023)	0.019 (0.013-0.026)	0.020 (0.013-0.028)

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

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

Please refer to NOAA Atlas 14 document for more information.

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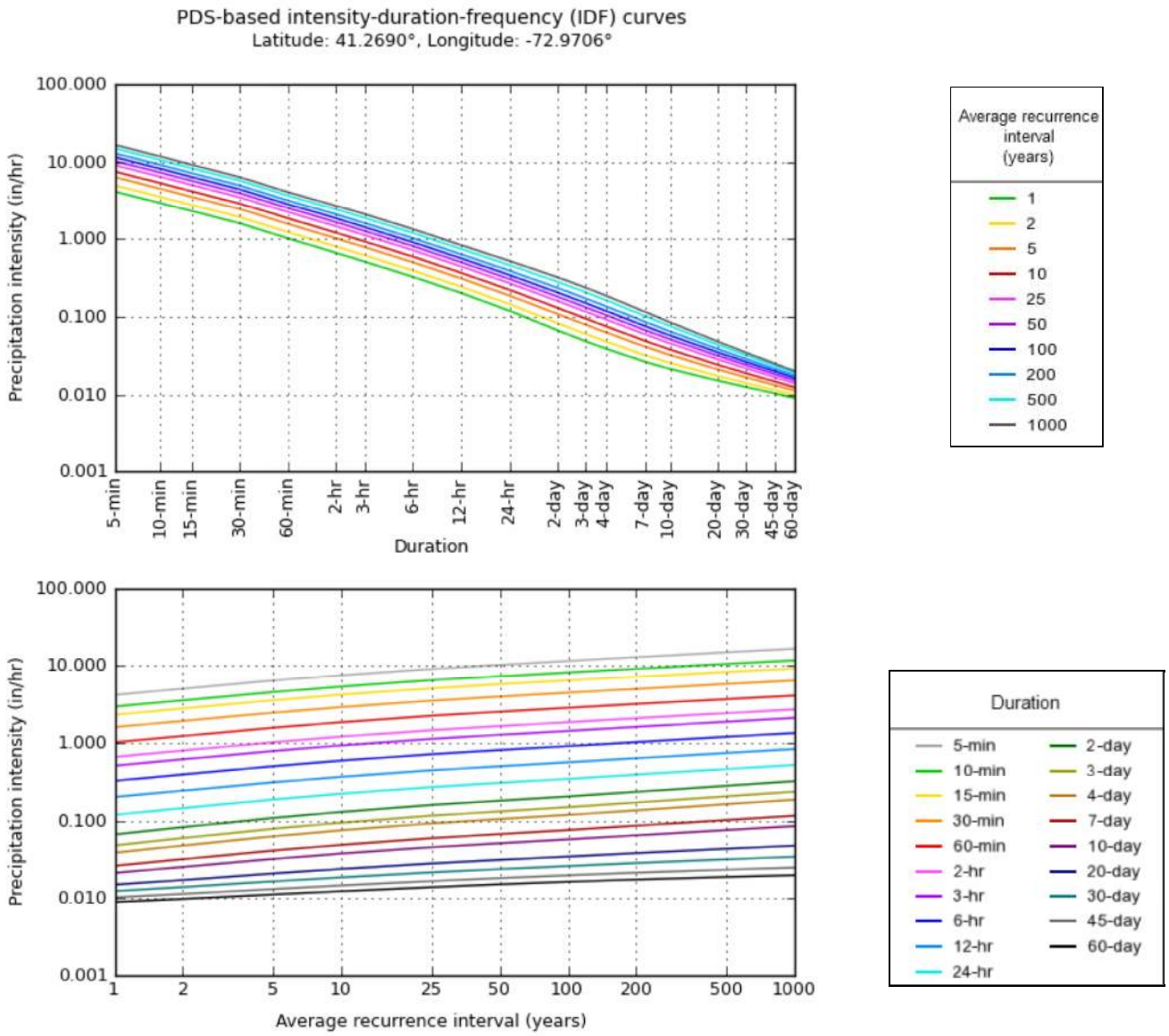
PF graphical



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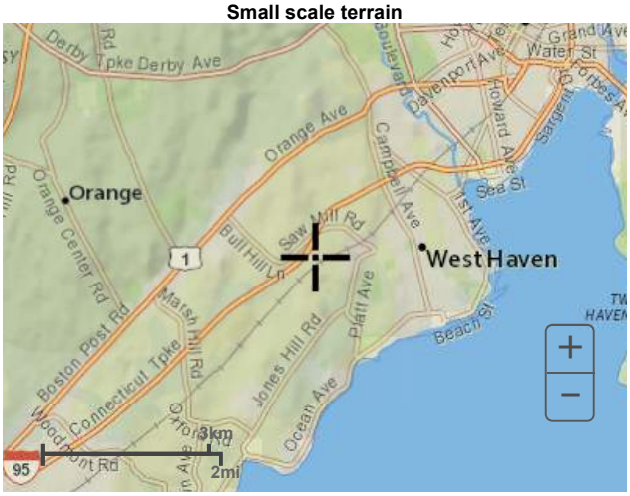
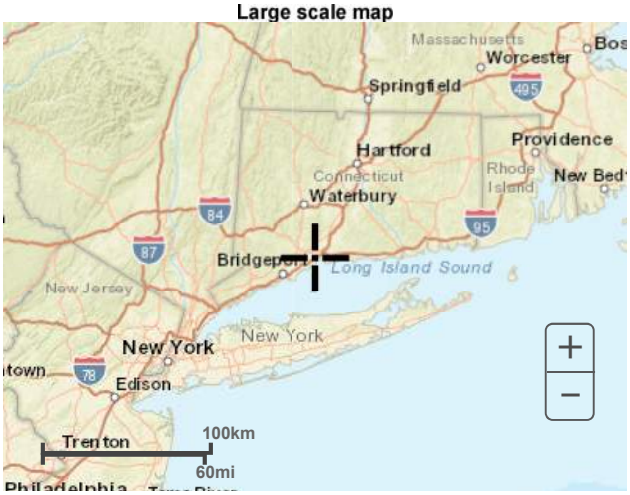
Maps & aerials

Small scale terrain



Large scale terrain

Large scale map



Large scale aerial

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

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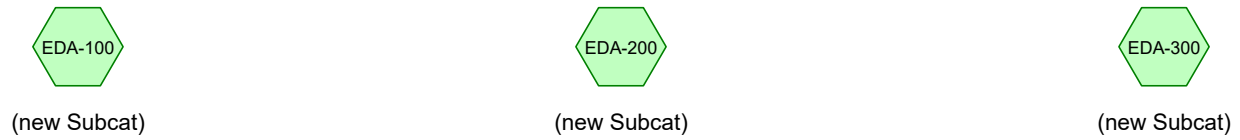
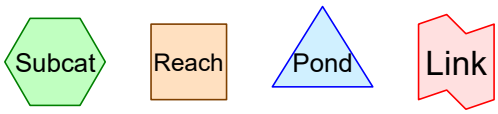
APPENDIX B

HYDROLOGIC ANALYSIS

Pre-Development Hydrological Analysis (2-, 10-, 25- and 100-year storms)

Post-Development Hydrological Analyses (2-, 10-, 25- and 100-year storms)





Routing Diagram for C-DAT-1800513-HYDRO
Prepared by {enter your company name here}, Printed 8/7/2020
HydroCAD® 10.00-22 s/n 01334 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
28,300	69	50-75% Grass cover, Fair, HSG B (EDA-100)
384,651	79	50-75% Grass cover, Fair, HSG C (EDA-100, EDA-200, EDA-300)
61,552	84	50-75% Grass cover, Fair, HSG D (EDA-100, EDA-200, EDA-300)
6,605	91	Gravel roads, HSG D (EDA-100)
64,747	98	Paved parking, HSG C (EDA-100, EDA-200, EDA-300)
87,671	98	Paved parking, HSG D (EDA-100, EDA-200, EDA-300)
16,993	60	Woods, Fair, HSG B (EDA-100)
76,708	73	Woods, Fair, HSG C (EDA-100, EDA-200, EDA-300)
14,718	79	Woods, Fair, HSG D (EDA-100, EDA-200, EDA-300)
741,945	**82**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
45,293	HSG B	EDA-100
526,106	HSG C	EDA-100, EDA-200, EDA-300
170,546	HSG D	EDA-100, EDA-200, EDA-300
0	Other	
741,945		**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	Su Nu
0	28,300	384,651	61,552	0	474,503	50-75% Grass cover, Fair	
0	0	0	6,605	0	6,605	Gravel roads	
0	0	64,747	87,671	0	152,418	Paved parking	
0	16,993	76,708	14,718	0	108,419	Woods, Fair	
0	**45,293**	**526,106**	**170,546**	**0**	**741,945**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-100: (new Subcat) Runoff Area=362,856 sf 4.56% Impervious Runoff Depth=1.51"
Flow Length=867' Tc=20.1 min CN=78 Runoff=9.36 cfs 45,738 cf

Subcatchment EDA-200: (new Subcat) Runoff Area=159,078 sf 30.81% Impervious Runoff Depth=1.95"
Flow Length=738' Tc=14.4 min CN=84 Runoff=6.44 cfs 25,898 cf

Subcatchment EDA-300: (new Subcat) Runoff Area=220,011 sf 39.49% Impervious Runoff Depth=2.20"
Flow Length=787' Tc=16.5 min CN=87 Runoff=9.31 cfs 40,343 cf

Total Runoff Area = 741,945 sf Runoff Volume = 111,978 cf Average Runoff Depth = 1.81"
79.46% Pervious = 589,527 sf 20.54% Impervious = 152,418 sf

Summary for Subcatchment EDA-100: (new Subcat)

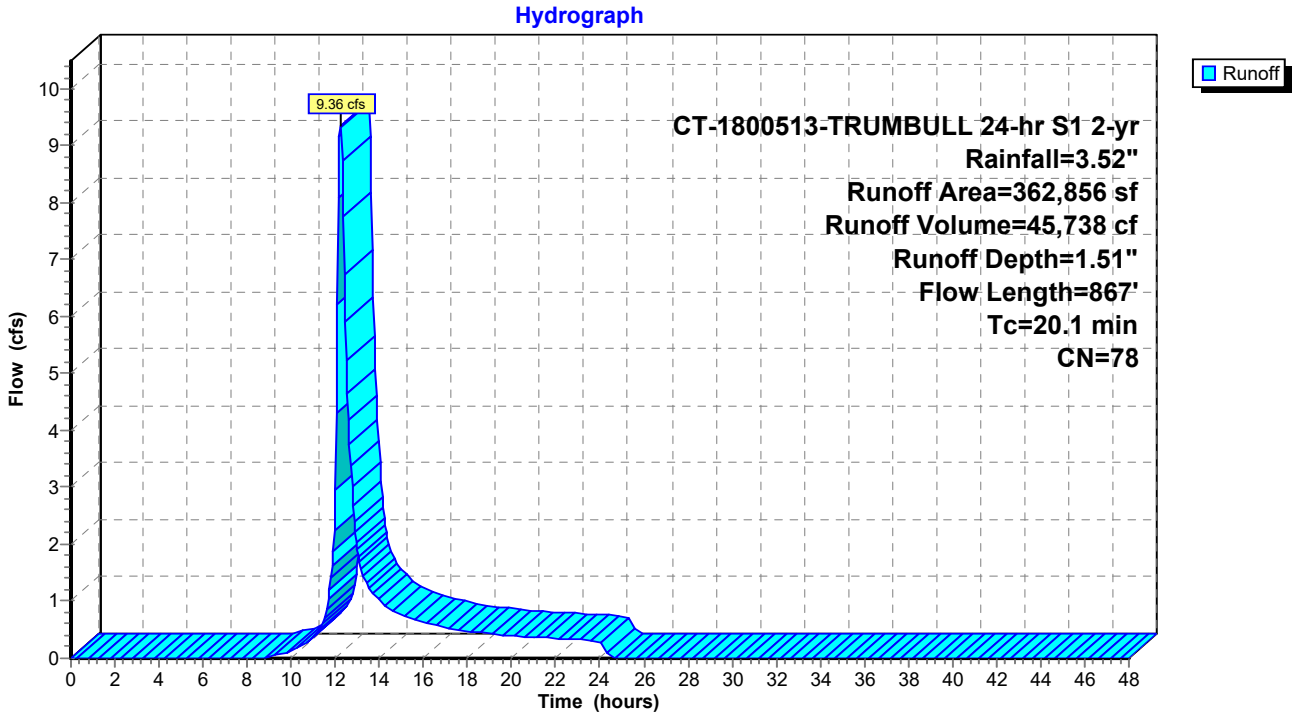
Runoff = 9.36 cfs @ 12.24 hrs, Volume= 45,738 cf, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 2-yr Rainfall=3.52"

Area (sf)	CN	Description
28,300	69	50-75% Grass cover, Fair, HSG B
215,759	79	50-75% Grass cover, Fair, HSG C
36,933	84	50-75% Grass cover, Fair, HSG D
6,605	91	Gravel roads, HSG D
16,456	98	Paved parking, HSG C
78	98	Paved parking, HSG D
16,993	60	Woods, Fair, HSG B
39,675	73	Woods, Fair, HSG C
2,057	79	Woods, Fair, HSG D
362,856	78	Weighted Average
346,322		95.44% Pervious Area
16,534		4.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	100	0.0200	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.00"
0.6	55	0.0436	1.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.6	96	0.0208	1.01		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	27	0.0740	1.90		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.7	71	0.0563	1.66		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	35	0.0570	1.67		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	24	0.0833	2.02		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	14	0.1430	2.65		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	26	0.2310	3.36		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	30	0.0667	1.81		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	52	0.0192	0.97		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	93	0.0540	1.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	46	0.0435	3.36		**Shallow Concentrated Flow, gravel** Unpaved Kv= 16.1 fps
0.2	49	0.2450	3.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	18	0.0270	1.15		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	131	0.0222	2.23		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
20.1	867	Total			

Subcatchment EDA-100: (new Subcat)



Summary for Subcatchment EDA-200: (new Subcat)

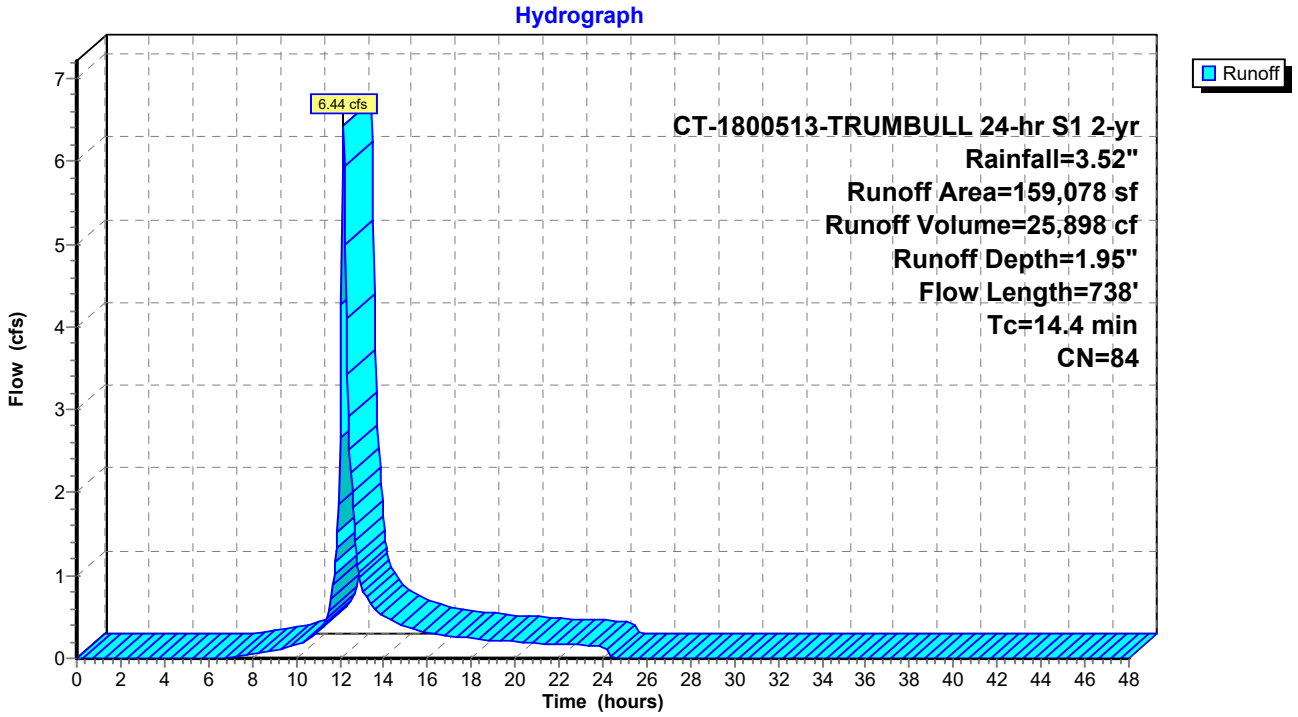
Runoff = 6.44 cfs @ 12.15 hrs, Volume= 25,898 cf, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 2-yr Rainfall=3.52"

Area (sf)	CN	Description
76,042	79	50-75% Grass cover, Fair, HSG C
3,041	84	50-75% Grass cover, Fair, HSG D
23,991	73	Woods, Fair, HSG C
6,992	79	Woods, Fair, HSG D
17,246	98	Paved parking, HSG C
31,766	98	Paved parking, HSG D
159,078	84	Weighted Average
110,066		69.19% Pervious Area
49,012		30.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0500	0.19		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
0.1	10	0.2040	3.16		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	30	0.0330	1.27		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
2.5	103	0.0100	0.70		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	24	0.1667	2.86		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	38	0.0260	3.27		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.5	27	0.0367	0.96		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	22	0.0900	1.50		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	33	0.3030	2.75		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.1	13	0.1487	1.93		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	19	0.0520	1.60		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0506	4.57		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.3	78	0.0511	4.59		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.3	87	0.0573	4.86		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.2	57	0.0529	4.67		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.4	57	0.0175	2.69		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
14.4	738	Total			

Subcatchment EDA-200: (new Subcat)



Summary for Subcatchment EDA-300: (new Subcat)

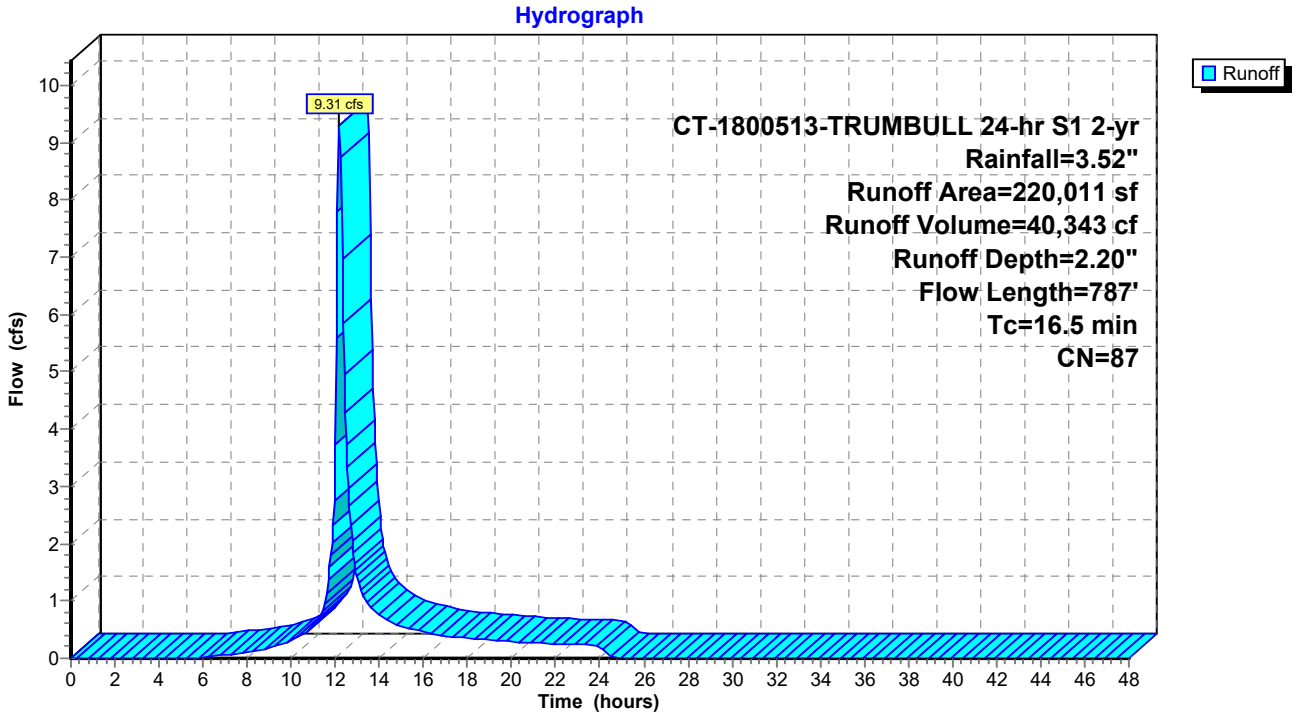
Runoff = 9.31 cfs @ 12.18 hrs, Volume= 40,343 cf, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 2-yr Rainfall=3.52"

Area (sf)	CN	Description
92,850	79	50-75% Grass cover, Fair, HSG C
21,578	84	50-75% Grass cover, Fair, HSG D
13,042	73	Woods, Fair, HSG C
5,669	79	Woods, Fair, HSG D
31,045	98	Paved parking, HSG C
55,827	98	Paved parking, HSG D
220,011	87	Weighted Average
133,139		60.51% Pervious Area
86,872		39.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0300	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
0.3	27	0.0630	1.76		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	67	0.0297	1.21		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	39	0.0640	1.77		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	36	0.0472	4.41		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.8	60	0.0333	1.28		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.6	42	0.0237	1.08		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	16	0.0632	1.76		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	57	0.0176	0.93		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	22	0.0460	1.07		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	20	0.1010	1.59		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.1	12	0.1640	2.02		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	27	0.0745	1.91		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	262	0.0609	5.01		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
16.5	787	Total			

Subcatchment EDA-300: (new Subcat)



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-100: (new Subcat) Runoff Area=362,856 sf 4.56% Impervious Runoff Depth=3.07"
Flow Length=867' Tc=20.1 min CN=78 Runoff=18.48 cfs 92,882 cf

Subcatchment EDA-200: (new Subcat) Runoff Area=159,078 sf 30.81% Impervious Runoff Depth=3.66"
Flow Length=738' Tc=14.4 min CN=84 Runoff=11.40 cfs 48,476 cf

Subcatchment EDA-300: (new Subcat) Runoff Area=220,011 sf 39.49% Impervious Runoff Depth=3.96"
Flow Length=787' Tc=16.5 min CN=87 Runoff=15.78 cfs 72,684 cf

Total Runoff Area = 741,945 sf Runoff Volume = 214,043 cf Average Runoff Depth = 3.46"
79.46% Pervious = 589,527 sf 20.54% Impervious = 152,418 sf

Summary for Subcatchment EDA-100: (new Subcat)

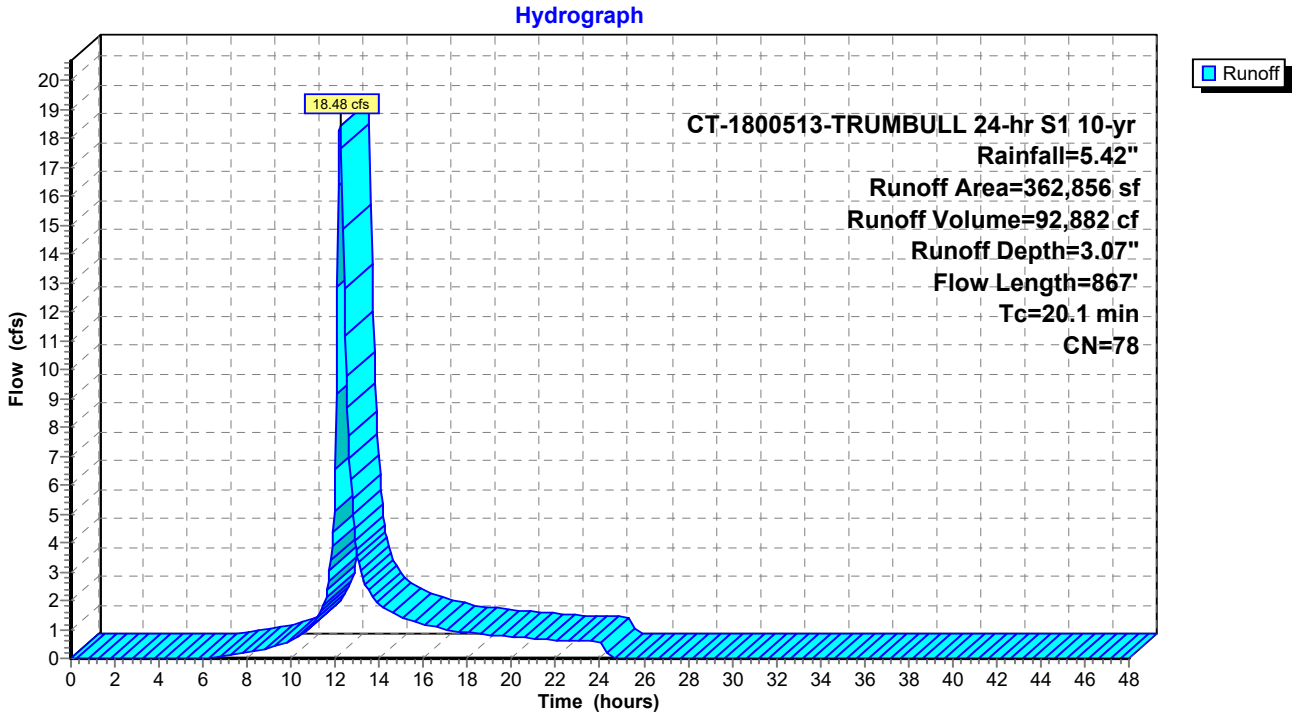
Runoff = 18.48 cfs @ 12.23 hrs, Volume= 92,882 cf, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 10-yr Rainfall=5.42"

Area (sf)	CN	Description
28,300	69	50-75% Grass cover, Fair, HSG B
215,759	79	50-75% Grass cover, Fair, HSG C
36,933	84	50-75% Grass cover, Fair, HSG D
6,605	91	Gravel roads, HSG D
16,456	98	Paved parking, HSG C
78	98	Paved parking, HSG D
16,993	60	Woods, Fair, HSG B
39,675	73	Woods, Fair, HSG C
2,057	79	Woods, Fair, HSG D
362,856	78	Weighted Average
346,322		95.44% Pervious Area
16,534		4.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	100	0.0200	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.00"
0.6	55	0.0436	1.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.6	96	0.0208	1.01		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	27	0.0740	1.90		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.7	71	0.0563	1.66		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	35	0.0570	1.67		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	24	0.0833	2.02		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	14	0.1430	2.65		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	26	0.2310	3.36		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	30	0.0667	1.81		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	52	0.0192	0.97		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	93	0.0540	1.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	46	0.0435	3.36		**Shallow Concentrated Flow, gravel** Unpaved Kv= 16.1 fps
0.2	49	0.2450	3.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	18	0.0270	1.15		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	131	0.0222	2.23		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
20.1	867	Total			

Subcatchment EDA-100: (new Subcat)



Summary for Subcatchment EDA-200: (new Subcat)

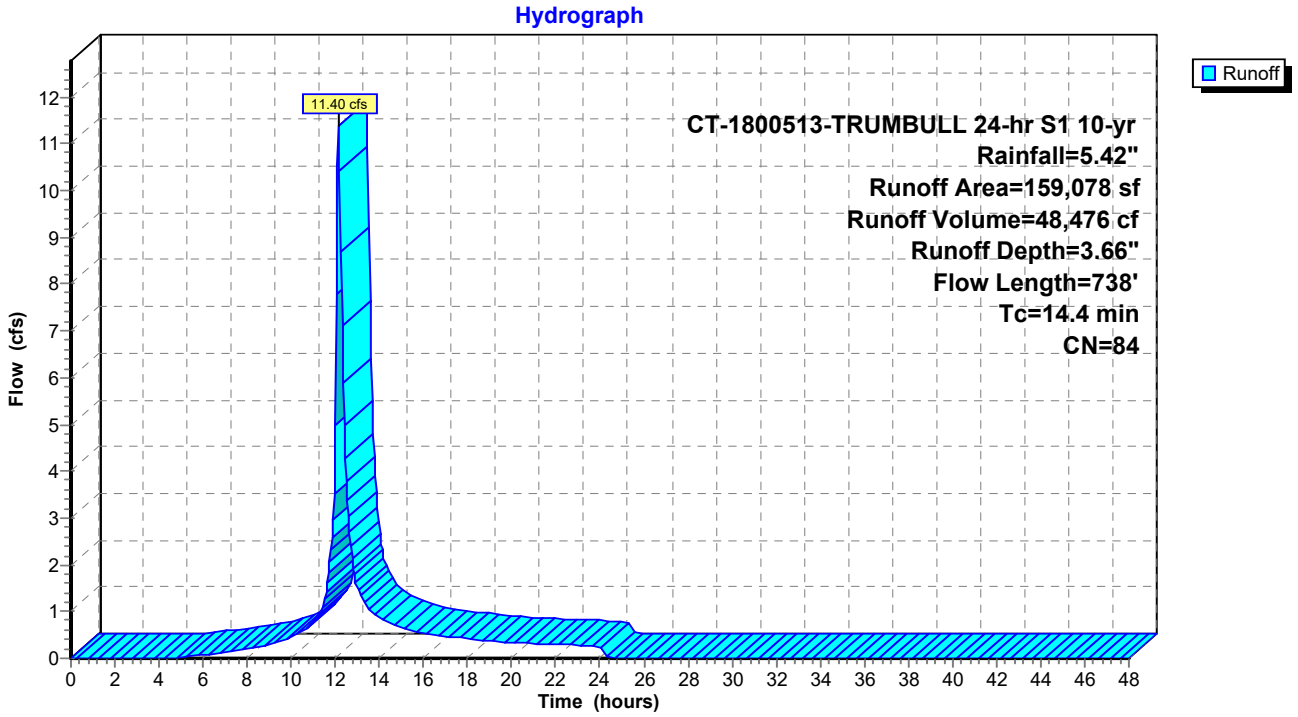
Runoff = 11.40 cfs @ 12.15 hrs, Volume= 48,476 cf, Depth= 3.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 10-yr Rainfall=5.42"

Area (sf)	CN	Description
76,042	79	50-75% Grass cover, Fair, HSG C
3,041	84	50-75% Grass cover, Fair, HSG D
23,991	73	Woods, Fair, HSG C
6,992	79	Woods, Fair, HSG D
17,246	98	Paved parking, HSG C
31,766	98	Paved parking, HSG D
159,078	84	Weighted Average
110,066		69.19% Pervious Area
49,012		30.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0500	0.19		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
0.1	10	0.2040	3.16		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	30	0.0330	1.27		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
2.5	103	0.0100	0.70		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	24	0.1667	2.86		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	38	0.0260	3.27		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.5	27	0.0367	0.96		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	22	0.0900	1.50		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	33	0.3030	2.75		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.1	13	0.1487	1.93		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	19	0.0520	1.60		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0506	4.57		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.3	78	0.0511	4.59		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.3	87	0.0573	4.86		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.2	57	0.0529	4.67		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.4	57	0.0175	2.69		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
14.4	738	Total			

Subcatchment EDA-200: (new Subcat)



Summary for Subcatchment EDA-300: (new Subcat)

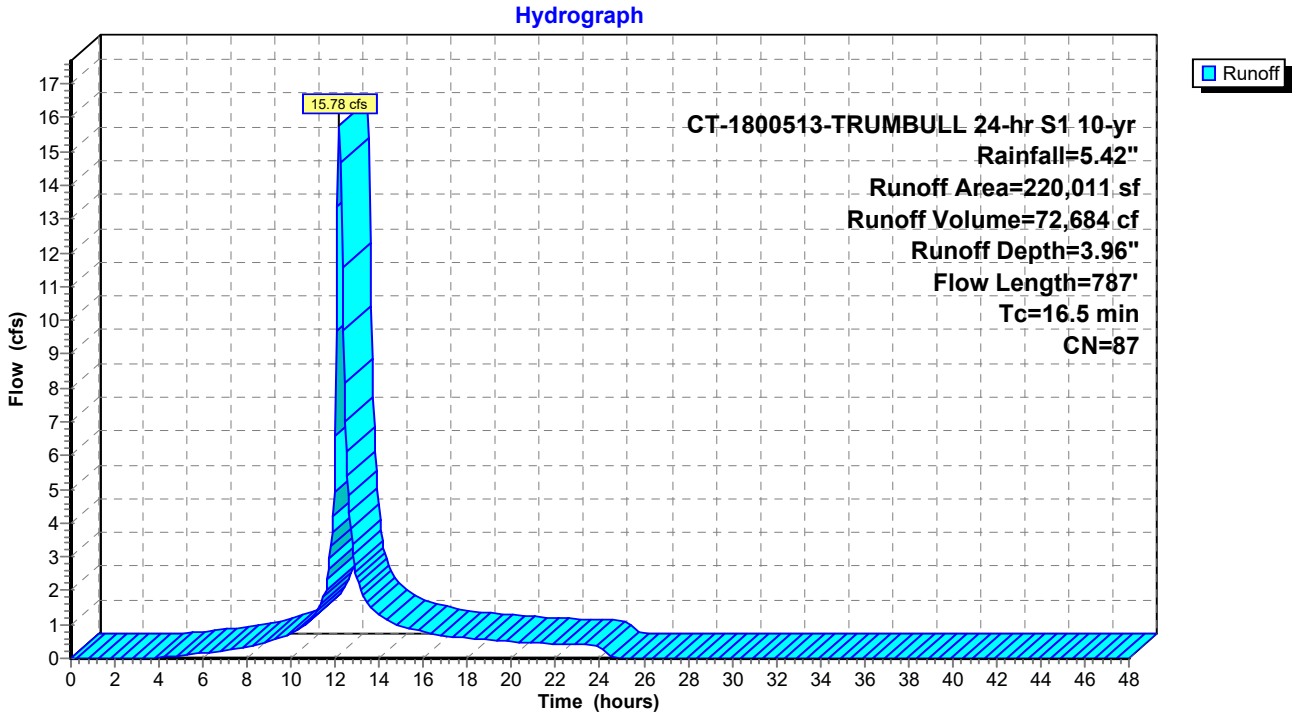
Runoff = 15.78 cfs @ 12.17 hrs, Volume= 72,684 cf, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 10-yr Rainfall=5.42"

Area (sf)	CN	Description
92,850	79	50-75% Grass cover, Fair, HSG C
21,578	84	50-75% Grass cover, Fair, HSG D
13,042	73	Woods, Fair, HSG C
5,669	79	Woods, Fair, HSG D
31,045	98	Paved parking, HSG C
55,827	98	Paved parking, HSG D
220,011	87	Weighted Average
133,139		60.51% Pervious Area
86,872		39.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0300	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
0.3	27	0.0630	1.76		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	67	0.0297	1.21		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	39	0.0640	1.77		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	36	0.0472	4.41		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.8	60	0.0333	1.28		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.6	42	0.0237	1.08		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	16	0.0632	1.76		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	57	0.0176	0.93		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	22	0.0460	1.07		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	20	0.1010	1.59		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.1	12	0.1640	2.02		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	27	0.0745	1.91		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	262	0.0609	5.01		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
16.5	787	Total			

Subcatchment EDA-300: (new Subcat)



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-100: (new Subcat) Runoff Area=362,856 sf 4.56% Impervious Runoff Depth=4.12"
Flow Length=867' Tc=20.1 min CN=78 Runoff=24.37 cfs 124,660 cf

Subcatchment EDA-200: (new Subcat) Runoff Area=159,078 sf 30.81% Impervious Runoff Depth=4.77"
Flow Length=738' Tc=14.4 min CN=84 Runoff=14.47 cfs 63,238 cf

Subcatchment EDA-300: (new Subcat) Runoff Area=220,011 sf 39.49% Impervious Runoff Depth=5.10"
Flow Length=787' Tc=16.5 min CN=87 Runoff=19.71 cfs 93,559 cf

Total Runoff Area = 741,945 sf Runoff Volume = 281,457 cf Average Runoff Depth = 4.55"
79.46% Pervious = 589,527 sf 20.54% Impervious = 152,418 sf

Summary for Subcatchment EDA-100: (new Subcat)

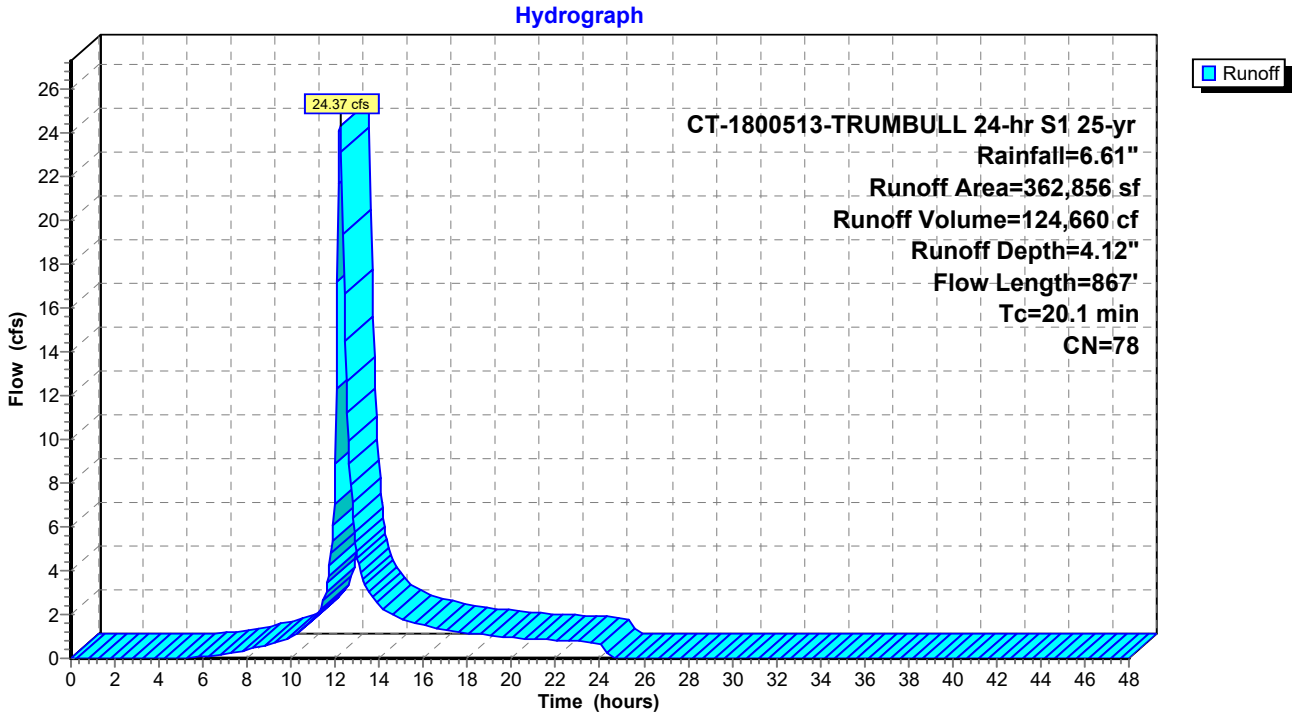
Runoff = 24.37 cfs @ 12.22 hrs, Volume= 124,660 cf, Depth= 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 25-yr Rainfall=6.61"

Area (sf)	CN	Description
28,300	69	50-75% Grass cover, Fair, HSG B
215,759	79	50-75% Grass cover, Fair, HSG C
36,933	84	50-75% Grass cover, Fair, HSG D
6,605	91	Gravel roads, HSG D
16,456	98	Paved parking, HSG C
78	98	Paved parking, HSG D
16,993	60	Woods, Fair, HSG B
39,675	73	Woods, Fair, HSG C
2,057	79	Woods, Fair, HSG D
362,856	78	Weighted Average
346,322		95.44% Pervious Area
16,534		4.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	100	0.0200	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.00"
0.6	55	0.0436	1.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.6	96	0.0208	1.01		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	27	0.0740	1.90		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.7	71	0.0563	1.66		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	35	0.0570	1.67		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	24	0.0833	2.02		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	14	0.1430	2.65		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	26	0.2310	3.36		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	30	0.0667	1.81		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	52	0.0192	0.97		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	93	0.0540	1.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	46	0.0435	3.36		**Shallow Concentrated Flow, gravel** Unpaved Kv= 16.1 fps
0.2	49	0.2450	3.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	18	0.0270	1.15		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	131	0.0222	2.23		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
20.1	867	Total			

Subcatchment EDA-100: (new Subcat)



Summary for Subcatchment EDA-200: (new Subcat)

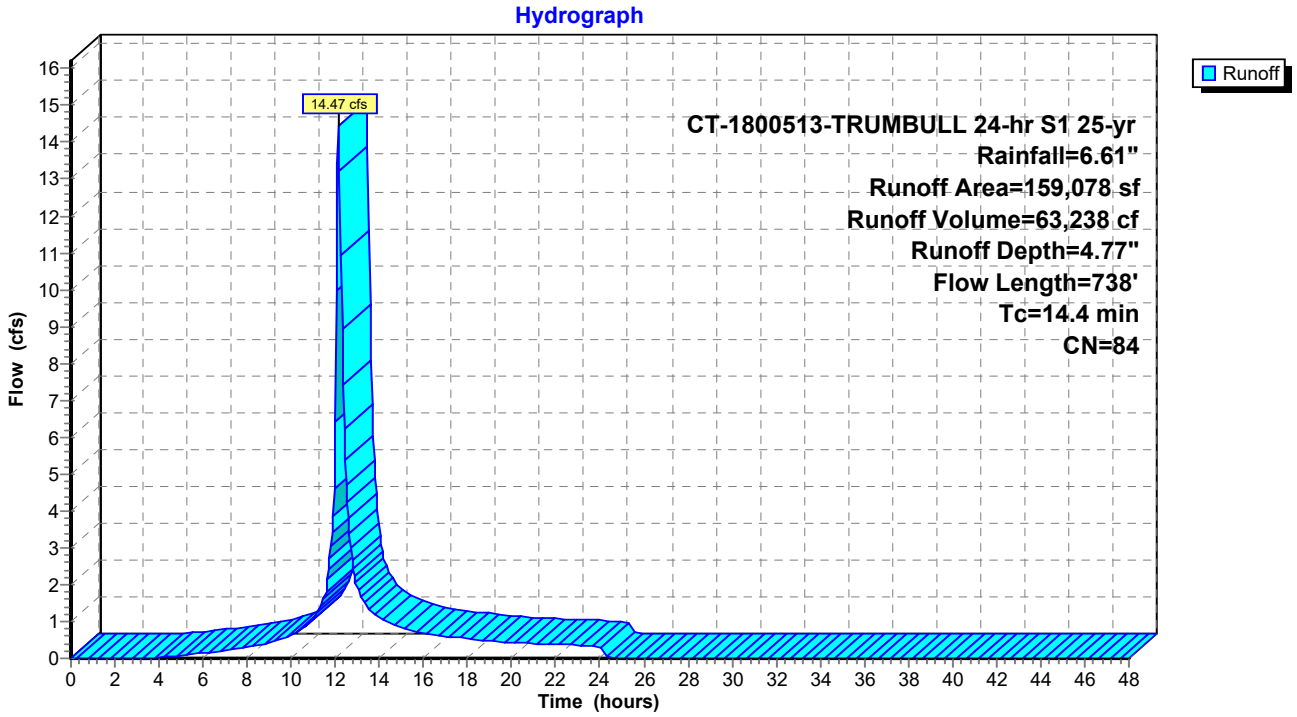
Runoff = 14.47 cfs @ 12.15 hrs, Volume= 63,238 cf, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 25-yr Rainfall=6.61"

Area (sf)	CN	Description
76,042	79	50-75% Grass cover, Fair, HSG C
3,041	84	50-75% Grass cover, Fair, HSG D
23,991	73	Woods, Fair, HSG C
6,992	79	Woods, Fair, HSG D
17,246	98	Paved parking, HSG C
31,766	98	Paved parking, HSG D
159,078	84	Weighted Average
110,066		69.19% Pervious Area
49,012		30.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0500	0.19		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
0.1	10	0.2040	3.16		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	30	0.0330	1.27		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
2.5	103	0.0100	0.70		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	24	0.1667	2.86		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	38	0.0260	3.27		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.5	27	0.0367	0.96		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	22	0.0900	1.50		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	33	0.3030	2.75		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.1	13	0.1487	1.93		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	19	0.0520	1.60		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0506	4.57		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.3	78	0.0511	4.59		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.3	87	0.0573	4.86		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.2	57	0.0529	4.67		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.4	57	0.0175	2.69		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
14.4	738	Total			

Subcatchment EDA-200: (new Subcat)



Summary for Subcatchment EDA-300: (new Subcat)

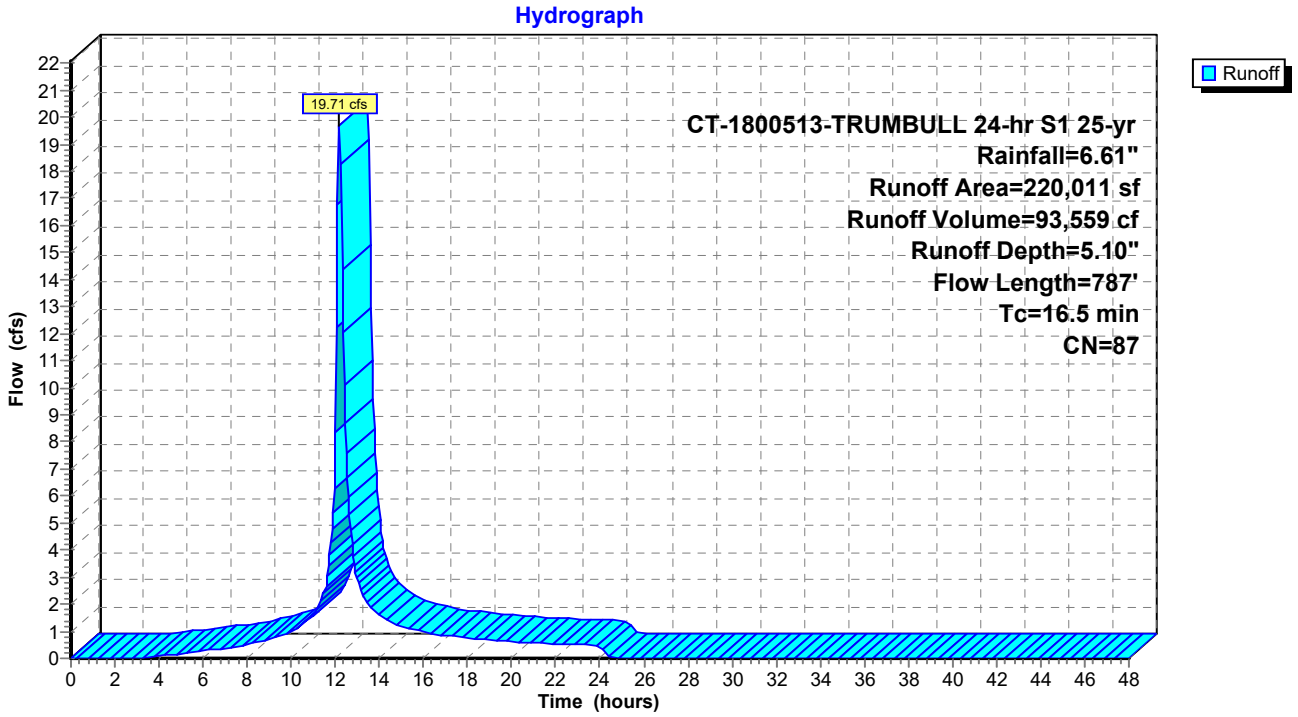
Runoff = 19.71 cfs @ 12.17 hrs, Volume= 93,559 cf, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 25-yr Rainfall=6.61"

Area (sf)	CN	Description
92,850	79	50-75% Grass cover, Fair, HSG C
21,578	84	50-75% Grass cover, Fair, HSG D
13,042	73	Woods, Fair, HSG C
5,669	79	Woods, Fair, HSG D
31,045	98	Paved parking, HSG C
55,827	98	Paved parking, HSG D
220,011	87	Weighted Average
133,139		60.51% Pervious Area
86,872		39.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0300	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
0.3	27	0.0630	1.76		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	67	0.0297	1.21		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	39	0.0640	1.77		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	36	0.0472	4.41		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.8	60	0.0333	1.28		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.6	42	0.0237	1.08		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	16	0.0632	1.76		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	57	0.0176	0.93		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	22	0.0460	1.07		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	20	0.1010	1.59		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.1	12	0.1640	2.02		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	27	0.0745	1.91		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	262	0.0609	5.01		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
16.5	787	Total			

Subcatchment EDA-300: (new Subcat)



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-100: (new Subcat) Runoff Area=362,856 sf 4.56% Impervious Runoff Depth=5.81"
Flow Length=867' Tc=20.1 min CN=78 Runoff=33.47 cfs 175,635 cf

Subcatchment EDA-200: (new Subcat) Runoff Area=159,078 sf 30.81% Impervious Runoff Depth=6.53"
Flow Length=738' Tc=14.4 min CN=84 Runoff=19.17 cfs 86,539 cf

Subcatchment EDA-300: (new Subcat) Runoff Area=220,011 sf 39.49% Impervious Runoff Depth=6.89"
Flow Length=787' Tc=16.5 min CN=87 Runoff=25.72 cfs 126,293 cf

Total Runoff Area = 741,945 sf Runoff Volume = 388,468 cf Average Runoff Depth = 6.28"
79.46% Pervious = 589,527 sf 20.54% Impervious = 152,418 sf

Summary for Subcatchment EDA-100: (new Subcat)

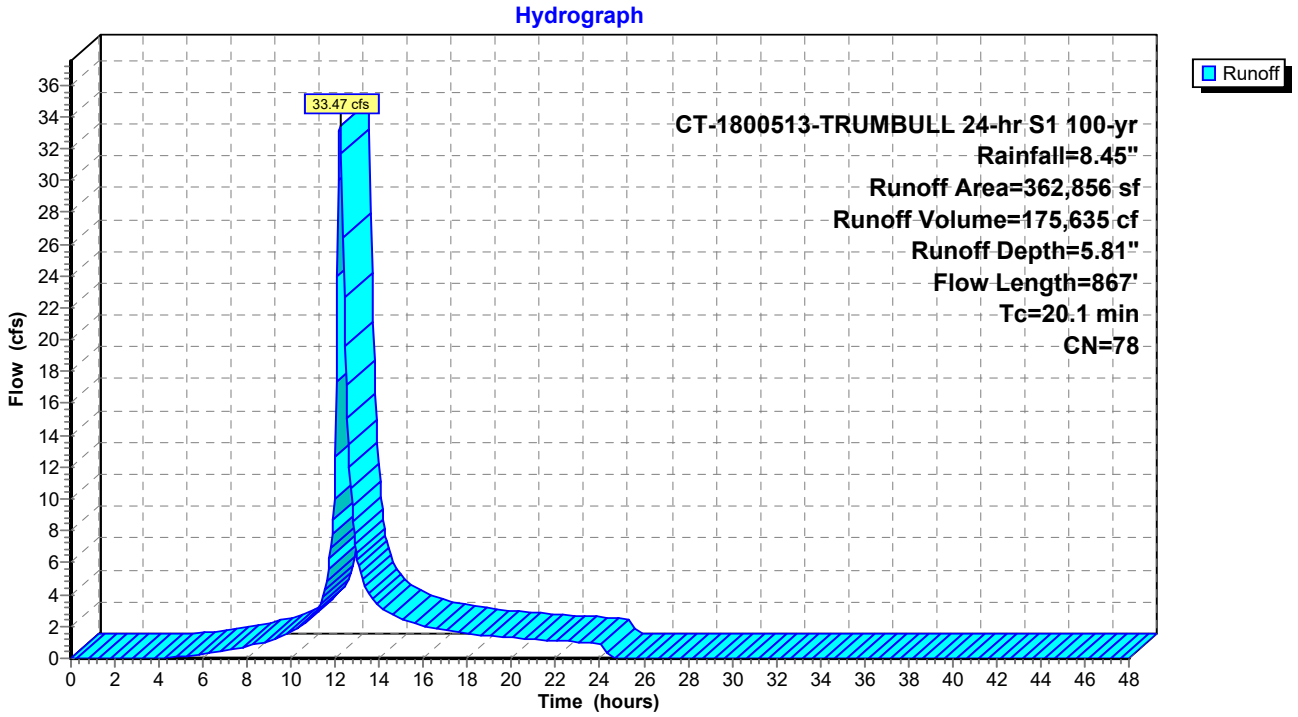
Runoff = 33.47 cfs @ 12.22 hrs, Volume= 175,635 cf, Depth= 5.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 100-yr Rainfall=8.45"

Area (sf)	CN	Description
28,300	69	50-75% Grass cover, Fair, HSG B
215,759	79	50-75% Grass cover, Fair, HSG C
36,933	84	50-75% Grass cover, Fair, HSG D
6,605	91	Gravel roads, HSG D
16,456	98	Paved parking, HSG C
78	98	Paved parking, HSG D
16,993	60	Woods, Fair, HSG B
39,675	73	Woods, Fair, HSG C
2,057	79	Woods, Fair, HSG D
362,856	78	Weighted Average
346,322		95.44% Pervious Area
16,534		4.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.4	100	0.0200	0.13		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.00"
0.6	55	0.0436	1.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.6	96	0.0208	1.01		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	27	0.0740	1.90		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.7	71	0.0563	1.66		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	35	0.0570	1.67		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	24	0.0833	2.02		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	14	0.1430	2.65		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	26	0.2310	3.36		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	30	0.0667	1.81		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	52	0.0192	0.97		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	93	0.0540	1.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	46	0.0435	3.36		**Shallow Concentrated Flow, gravel** Unpaved Kv= 16.1 fps
0.2	49	0.2450	3.46		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	18	0.0270	1.15		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	131	0.0222	2.23		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
20.1	867	Total			

Subcatchment EDA-100: (new Subcat)



Summary for Subcatchment EDA-200: (new Subcat)

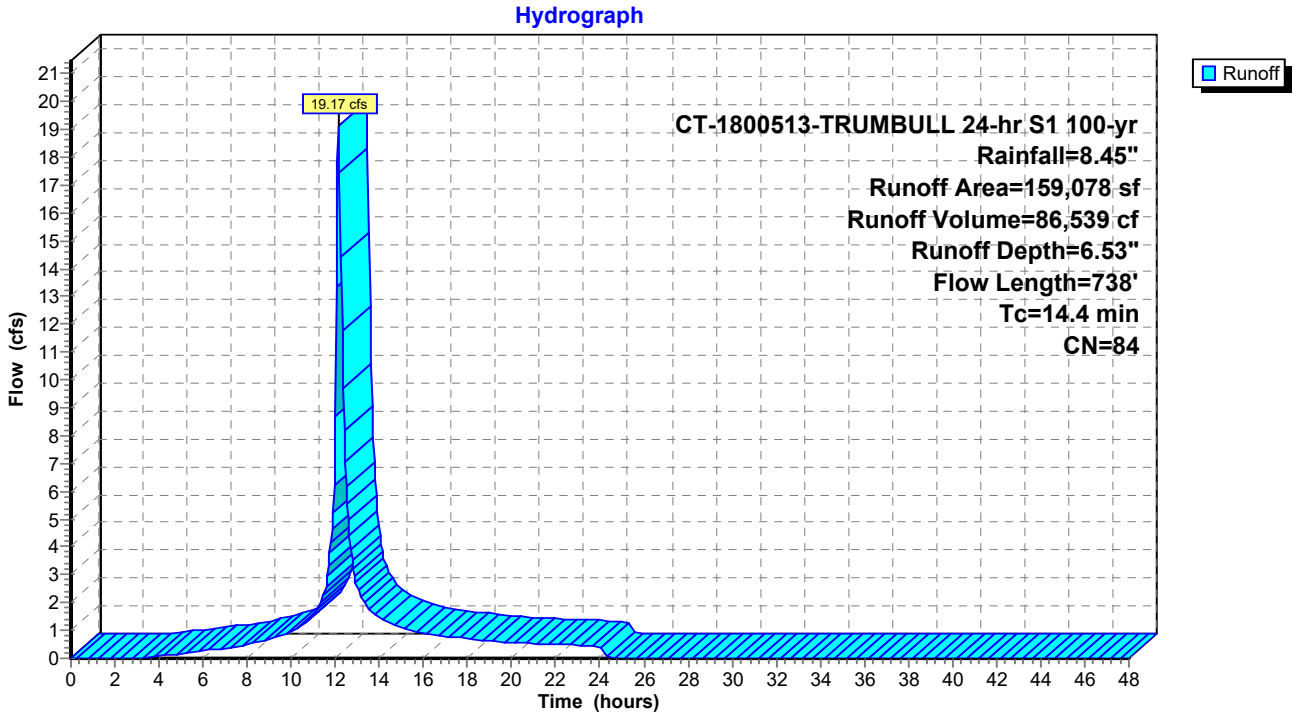
Runoff = 19.17 cfs @ 12.15 hrs, Volume= 86,539 cf, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 100-yr Rainfall=8.45"

Area (sf)	CN	Description
76,042	79	50-75% Grass cover, Fair, HSG C
3,041	84	50-75% Grass cover, Fair, HSG D
23,991	73	Woods, Fair, HSG C
6,992	79	Woods, Fair, HSG D
17,246	98	Paved parking, HSG C
31,766	98	Paved parking, HSG D
159,078	84	Weighted Average
110,066		69.19% Pervious Area
49,012		30.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0500	0.19		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
0.1	10	0.2040	3.16		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	30	0.0330	1.27		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
2.5	103	0.0100	0.70		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	24	0.1667	2.86		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	38	0.0260	3.27		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.5	27	0.0367	0.96		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	22	0.0900	1.50		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	33	0.3030	2.75		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.1	13	0.1487	1.93		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	19	0.0520	1.60		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	40	0.0506	4.57		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.3	78	0.0511	4.59		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.3	87	0.0573	4.86		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.2	57	0.0529	4.67		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.4	57	0.0175	2.69		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
14.4	738	Total			

Subcatchment EDA-200: (new Subcat)



Summary for Subcatchment EDA-300: (new Subcat)

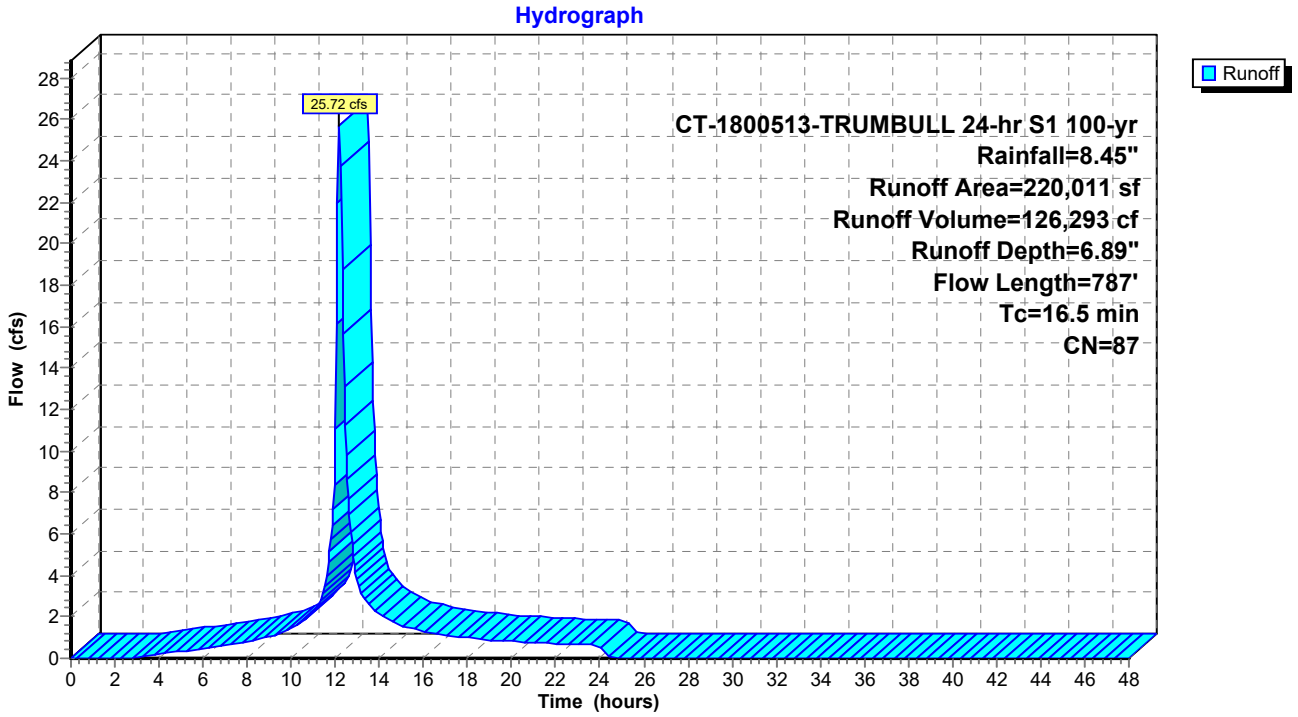
Runoff = 25.72 cfs @ 12.17 hrs, Volume= 126,293 cf, Depth= 6.89"

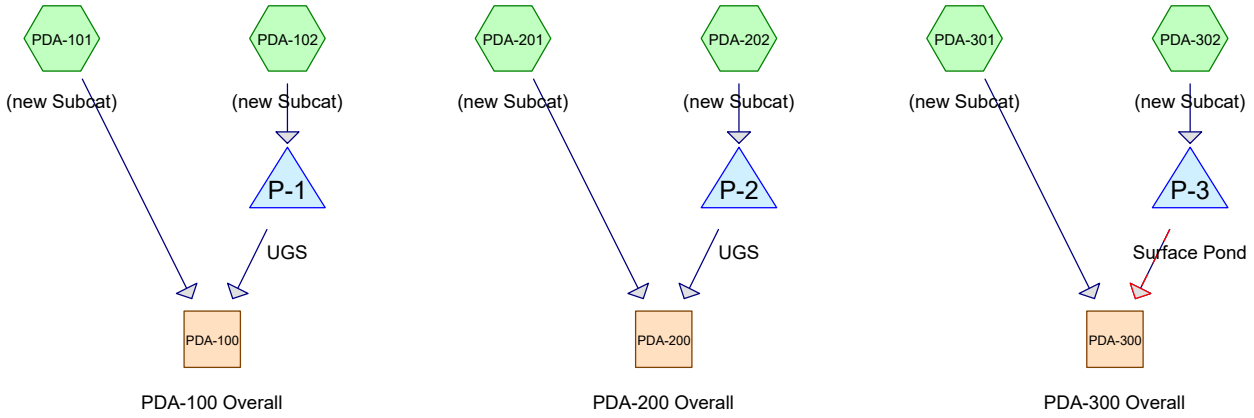
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 100-yr Rainfall=8.45"

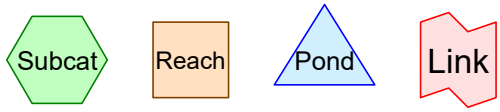
Area (sf)	CN	Description
92,850	79	50-75% Grass cover, Fair, HSG C
21,578	84	50-75% Grass cover, Fair, HSG D
13,042	73	Woods, Fair, HSG C
5,669	79	Woods, Fair, HSG D
31,045	98	Paved parking, HSG C
55,827	98	Paved parking, HSG D
220,011	87	Weighted Average
133,139		60.51% Pervious Area
86,872		39.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0300	0.16		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
0.3	27	0.0630	1.76		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	67	0.0297	1.21		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	39	0.0640	1.77		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.1	36	0.0472	4.41		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
0.8	60	0.0333	1.28		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.6	42	0.0237	1.08		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	16	0.0632	1.76		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	57	0.0176	0.93		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	22	0.0460	1.07		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	20	0.1010	1.59		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.1	12	0.1640	2.02		**Shallow Concentrated Flow, forest** Woodland Kv= 5.0 fps
0.2	27	0.0745	1.91		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	262	0.0609	5.01		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
16.5	787	Total			

Subcatchment EDA-300: (new Subcat)







Routing Diagram for C-DAT-1800513-HYDRO
Prepared by {enter your company name here}, Printed 8/7/2020
HydroCAD® 10.00-22 s/n 01334 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
23,122	61	>75% Grass cover, Good, HSG B (PDA-101, PDA-102)
167,264	74	>75% Grass cover, Good, HSG C (PDA-101, PDA-102, PDA-201, PDA-202, PDA-301, PDA-302)
59,778	80	>75% Grass cover, Good, HSG D (PDA-101, PDA-102, PDA-201, PDA-301)
432,246	98	Paved parking, HSG D (PDA-101, PDA-102, PDA-201, PDA-202, PDA-301, PDA-302)
51,149	73	Woods, Fair, HSG C (PDA-101, PDA-201)
8,888	79	Woods, Fair, HSG D (PDA-201, PDA-301)
742,447	**88**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
23,122	HSG B	PDA-101, PDA-102
218,413	HSG C	PDA-101, PDA-102, PDA-201, PDA-202, PDA-301, PDA-302
500,912	HSG D	PDA-101, PDA-102, PDA-201, PDA-202, PDA-301, PDA-302
0	Other	
742,447		**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	Su Nu
0	23,122	167,264	59,778	0	250,164	>75% Grass cover, Good	
0	0	0	432,246	0	432,246	Paved parking	
0	0	51,149	8,888	0	60,037	Woods, Fair	
0	**23,122**	**218,413**	**500,912**	**0**	**742,447**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	P-1	297.45	293.00	141.0	0.0316	0.011	15.0	0.0	0.0
2	P-2	296.00	295.80	37.0	0.0054	0.011	15.0	0.0	0.0
3	P-3	301.00	290.50	118.0	0.0890	0.011	12.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-101: (new Subcat) Runoff Area=146,162 sf 9.98% Impervious Runoff Depth=1.32"
Flow Length=884' Tc=14.9 min CN=75 Runoff=3.74 cfs 16,029 cf

Subcatchment PDA-102: (new Subcat) Runoff Area=183,046 sf 80.06% Impervious Runoff Depth=2.75"
Tc=6.0 min CN=93 Runoff=14.33 cfs 42,012 cf

Subcatchment PDA-201: (new Subcat) Runoff Area=71,843 sf 52.48% Impervious Runoff Depth=2.20"
Flow Length=126' Tc=13.1 min CN=87 Runoff=3.40 cfs 13,174 cf

Subcatchment PDA-202: (new Subcat) Runoff Area=108,188 sf 86.71% Impervious Runoff Depth=2.96"
Tc=6.0 min CN=95 Runoff=8.89 cfs 26,675 cf

Subcatchment PDA-301: (new Subcat) Runoff Area=145,655 sf 60.33% Impervious Runoff Depth=2.47"
Flow Length=670' Tc=13.7 min CN=90 Runoff=7.53 cfs 29,940 cf

Subcatchment PDA-302: (new Subcat) Runoff Area=87,553 sf 59.08% Impervious Runoff Depth=2.29"
Flow Length=56' Slope=0.0050 '/' Tc=13.6 min CN=88 Runoff=4.23 cfs 16,686 cf

Reach PDA-100: PDA-100 Overall Inflow=4.10 cfs 26,482 cf
Outflow=4.10 cfs 26,482 cf

Reach PDA-200: PDA-200 Overall Inflow=3.85 cfs 20,428 cf
Outflow=3.85 cfs 20,428 cf

Reach PDA-300: PDA-300 Overall Inflow=7.73 cfs 42,363 cf
Outflow=7.73 cfs 42,363 cf

Pond P-1: UGS Peak Elev=298.07' Storage=16,858 cf Inflow=14.33 cfs 42,012 cf
Discarded=0.34 cfs 31,559 cf Primary=1.44 cfs 10,454 cf Outflow=1.78 cfs 42,012 cf

Pond P-2: UGS Peak Elev=297.82' Storage=10,256 cf Inflow=8.89 cfs 26,675 cf
Discarded=0.19 cfs 19,421 cf Primary=1.39 cfs 7,254 cf Outflow=1.57 cfs 26,675 cf

Pond P-3: Surface Pond Peak Elev=304.33' Storage=7,378 cf Inflow=4.23 cfs 16,686 cf
Primary=1.24 cfs 12,423 cf Secondary=0.00 cfs 0 cf Outflow=1.24 cfs 12,423 cf

Total Runoff Area = 742,447 sf Runoff Volume = 144,515 cf Average Runoff Depth = 2.34"
41.78% Pervious = 310,201 sf 58.22% Impervious = 432,246 sf

Summary for Subcatchment PDA-101: (new Subcat)

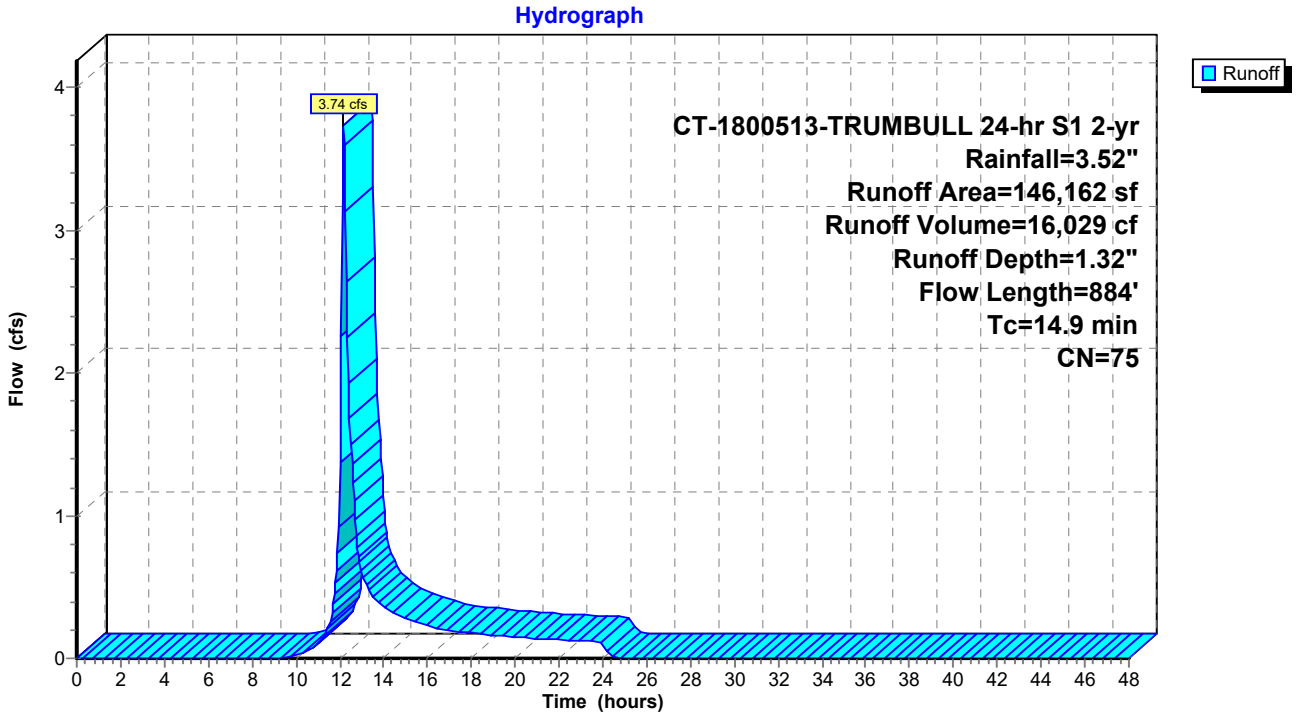
Runoff = 3.74 cfs @ 12.17 hrs, Volume= 16,029 cf, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 2-yr Rainfall=3.52"

Area (sf)	CN	Description
22,554	61	>75% Grass cover, Good, HSG B
38,346	74	>75% Grass cover, Good, HSG C
33,014	80	>75% Grass cover, Good, HSG D
14,587	98	Paved parking, HSG D
37,661	73	Woods, Fair, HSG C
146,162	75	Weighted Average
131,575		90.02% Pervious Area
14,587		9.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0833	0.24		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.00"
0.2	20	0.0400	1.40		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.3	126	0.0516	1.59		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
2.0	96	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
1.2	161	0.1000	2.21		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.8	92	0.0761	1.93		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	45	0.1111	2.33		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	80	0.0500	1.57		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.2	164	0.0222	2.23		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
14.9	884	Total			

Subcatchment PDA-101: (new Subcat)



Summary for Subcatchment PDA-102: (new Subcat)

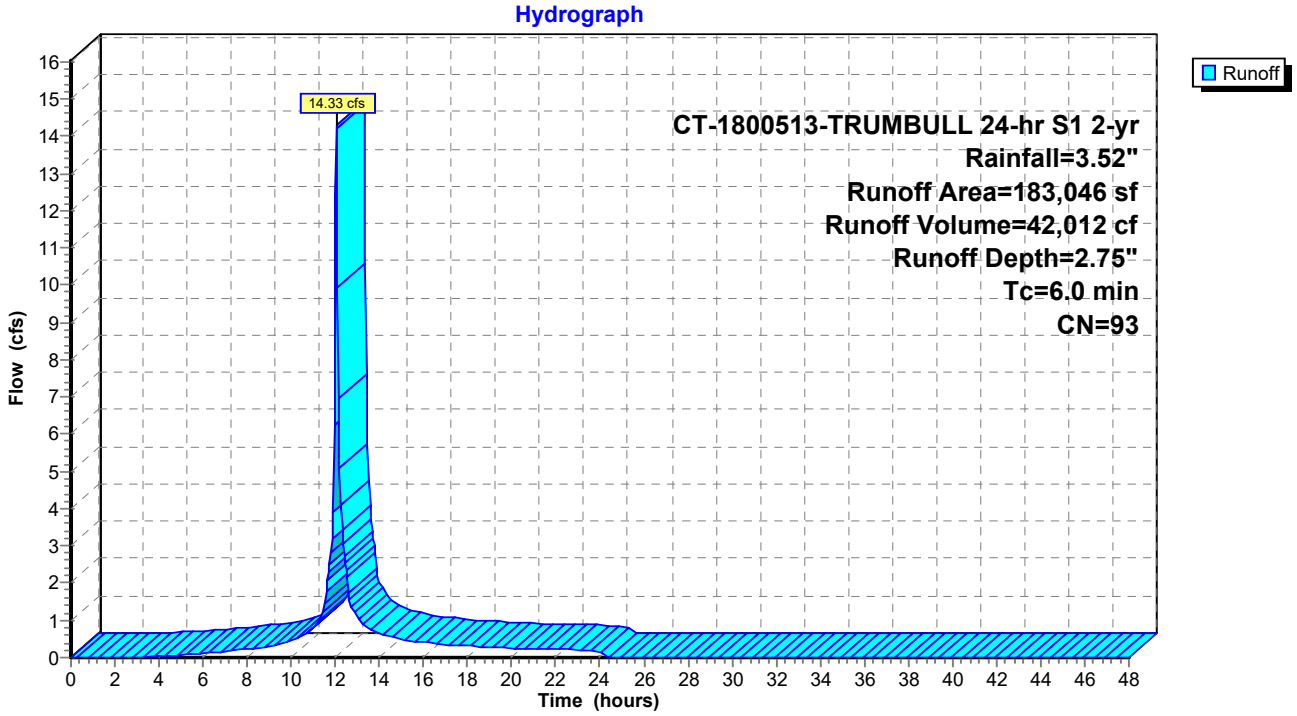
Runoff = 14.33 cfs @ 12.04 hrs, Volume= 42,012 cf, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 2-yr Rainfall=3.52"

Area (sf)	CN	Description
568	61	>75% Grass cover, Good, HSG B
35,492	74	>75% Grass cover, Good, HSG C
439	80	>75% Grass cover, Good, HSG D
146,547	98	Paved parking, HSG D
183,046	93	Weighted Average
36,499		19.94% Pervious Area
146,547		80.06% Impervious Area

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

Subcatchment PDA-102: (new Subcat)



Summary for Subcatchment PDA-201: (new Subcat)

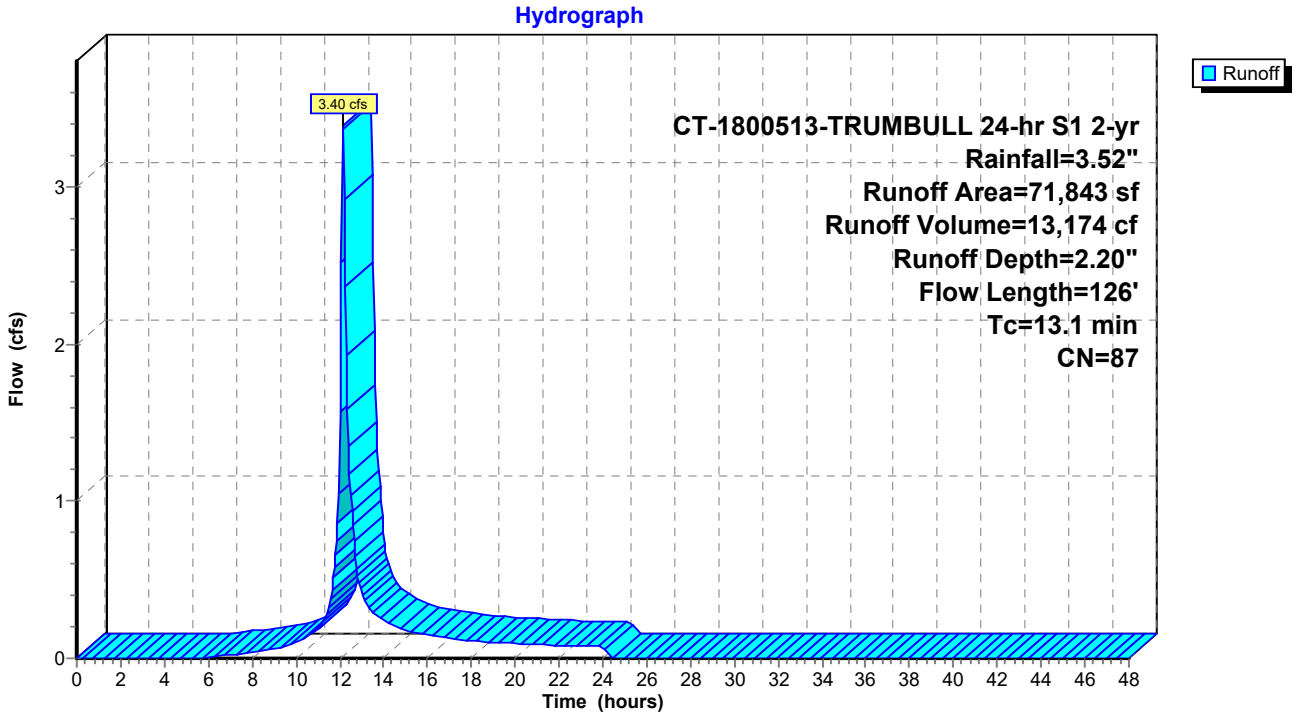
Runoff = 3.40 cfs @ 12.13 hrs, Volume= 13,174 cf, Depth= 2.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 2-yr Rainfall=3.52"

Area (sf)	CN	Description
10,617	74	>75% Grass cover, Good, HSG C
3,041	80	>75% Grass cover, Good, HSG D
13,488	73	Woods, Fair, HSG C
6,992	79	Woods, Fair, HSG D
37,705	98	Paved parking, HSG D
71,843	87	Weighted Average
34,138		47.52% Pervious Area
37,705		52.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	25	0.0286	0.12		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
6.5	20	0.0286	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	14	0.1429	0.09		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.00"
0.3	51	0.2553	2.53		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.2	16	0.0541	1.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
13.1	126	Total			

Subcatchment PDA-201: (new Subcat)



Summary for Subcatchment PDA-202: (new Subcat)

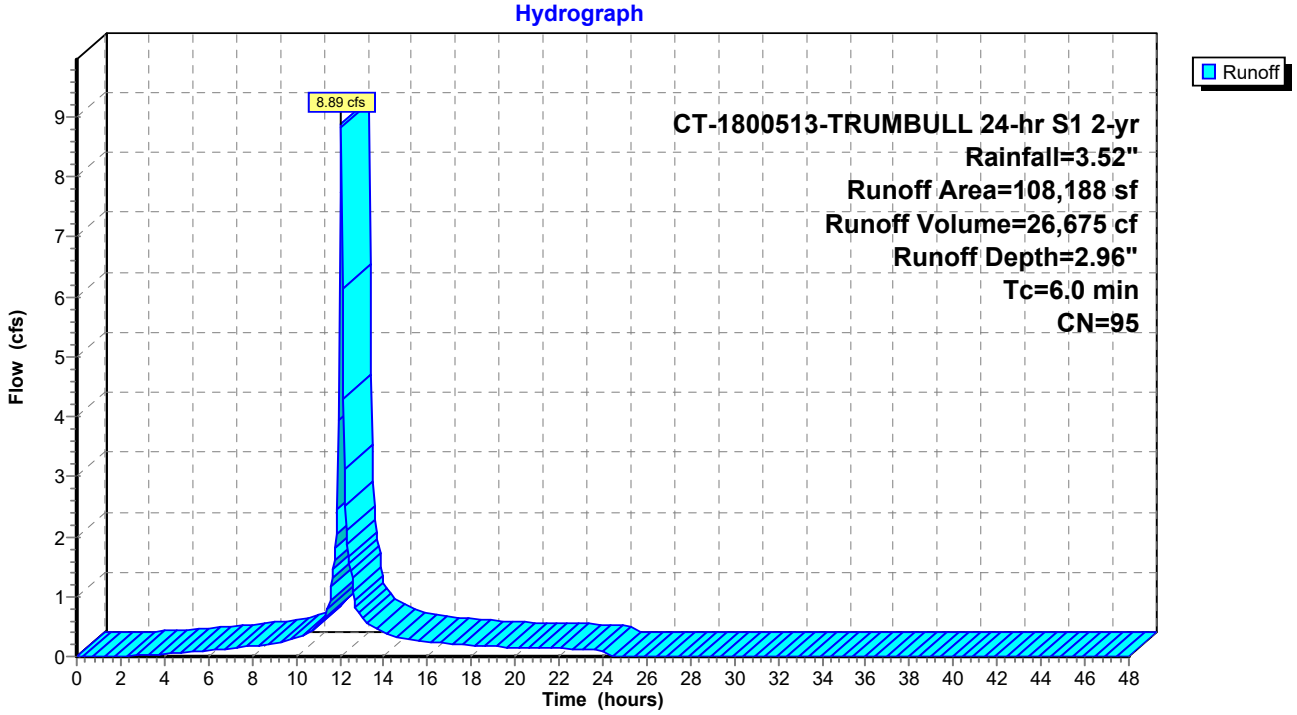
Runoff = 8.89 cfs @ 12.04 hrs, Volume= 26,675 cf, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 2-yr Rainfall=3.52"

Area (sf)	CN	Description
14,378	74	>75% Grass cover, Good, HSG C
93,810	98	Paved parking, HSG D
108,188	95	Weighted Average
14,378		13.29% Pervious Area
93,810		86.71% Impervious Area

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

Subcatchment PDA-202: (new Subcat)



Summary for Subcatchment PDA-301: (new Subcat)

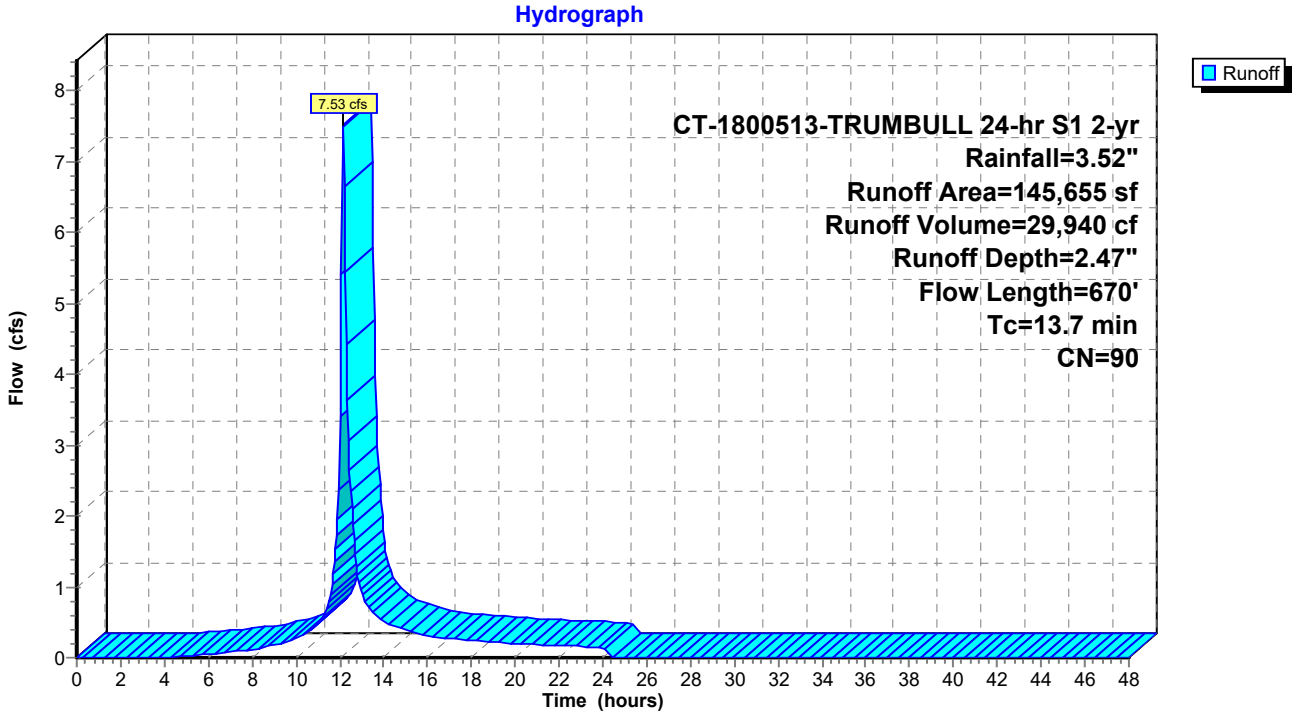
Runoff = 7.53 cfs @ 12.14 hrs, Volume= 29,940 cf, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 2-yr Rainfall=3.52"

Area (sf)	CN	Description
32,607	74	>75% Grass cover, Good, HSG C
23,284	80	>75% Grass cover, Good, HSG D
1,896	79	Woods, Fair, HSG D
87,868	98	Paved parking, HSG D
145,655	90	Weighted Average
57,787		39.67% Pervious Area
87,868		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	70	0.0143	0.11		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
3.0	600	0.0267	3.32		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
13.7	670	Total			

Subcatchment PDA-301: (new Subcat)



Summary for Subcatchment PDA-302: (new Subcat)

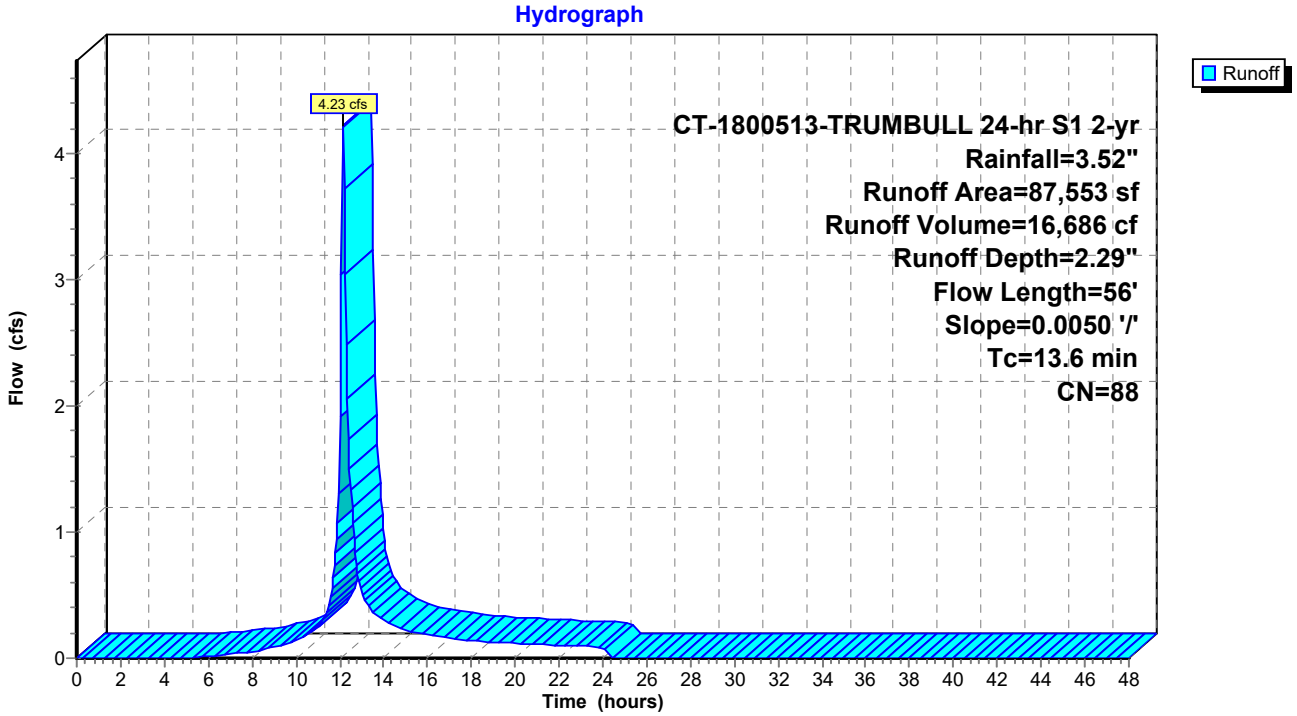
Runoff = 4.23 cfs @ 12.14 hrs, Volume= 16,686 cf, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 2-yr Rainfall=3.52"

Area (sf)	CN	Description
35,824	74	>75% Grass cover, Good, HSG C
51,729	98	Paved parking, HSG D
87,553	88	Weighted Average
35,824		40.92% Pervious Area
51,729		59.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	56	0.0050	0.07		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"

Subcatchment PDA-302: (new Subcat)



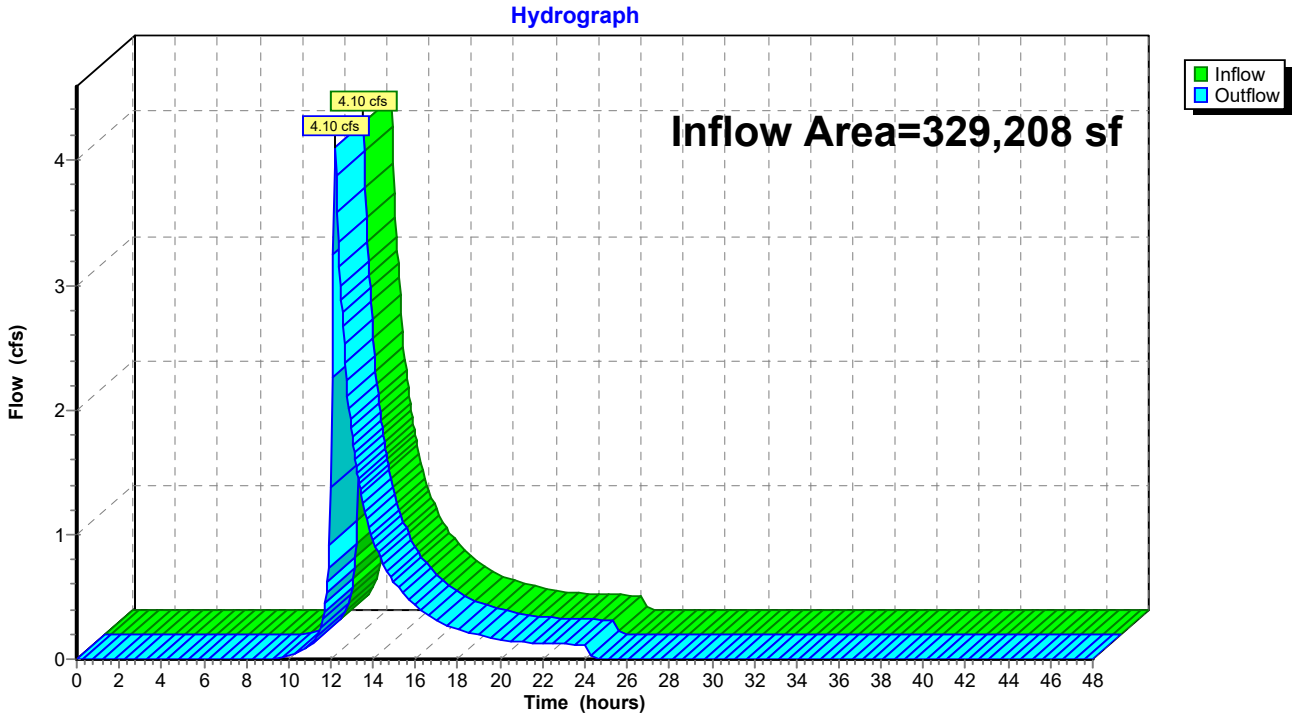
Summary for Reach PDA-100: PDA-100 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 329,208 sf, 48.95% Impervious, Inflow Depth = 0.97" for 2-yr event
Inflow = 4.10 cfs @ 12.20 hrs, Volume= 26,482 cf
Outflow = 4.10 cfs @ 12.20 hrs, Volume= 26,482 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-100: PDA-100 Overall



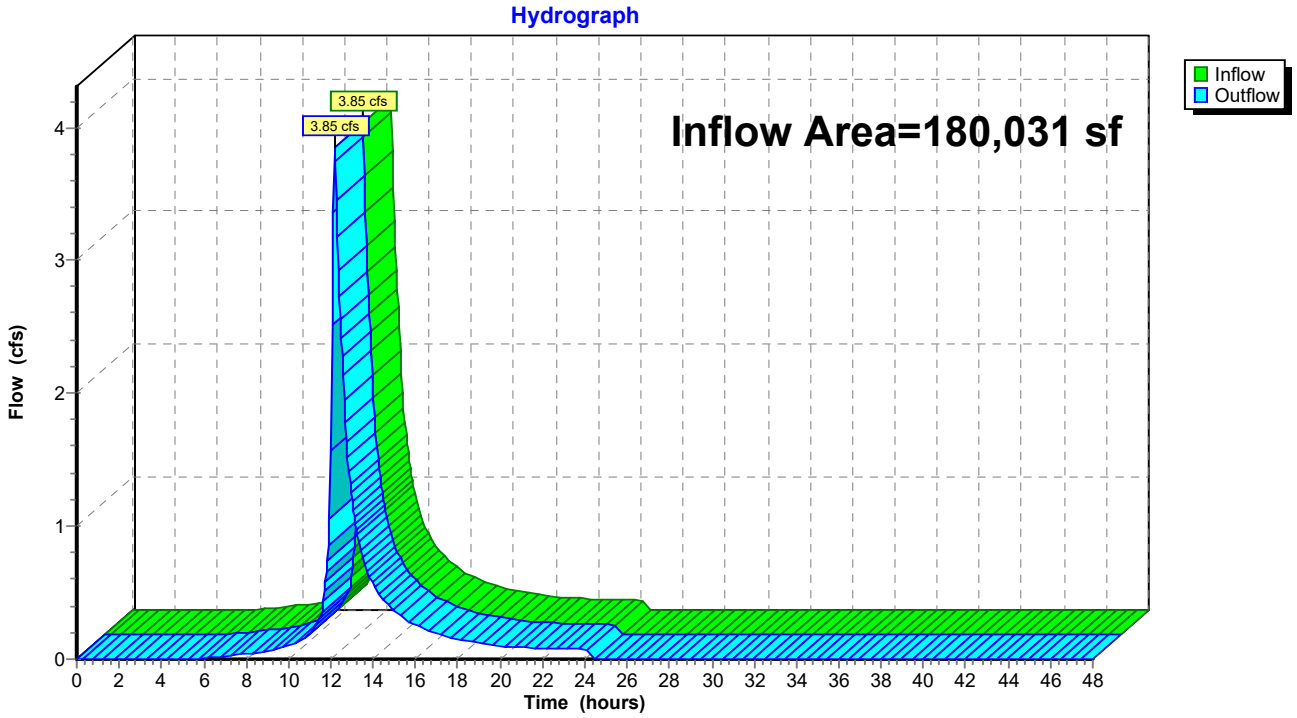
Summary for Reach PDA-200: PDA-200 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 180,031 sf, 73.05% Impervious, Inflow Depth = 1.36" for 2-yr event
Inflow = 3.85 cfs @ 12.17 hrs, Volume= 20,428 cf
Outflow = 3.85 cfs @ 12.17 hrs, Volume= 20,428 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-200: PDA-200 Overall



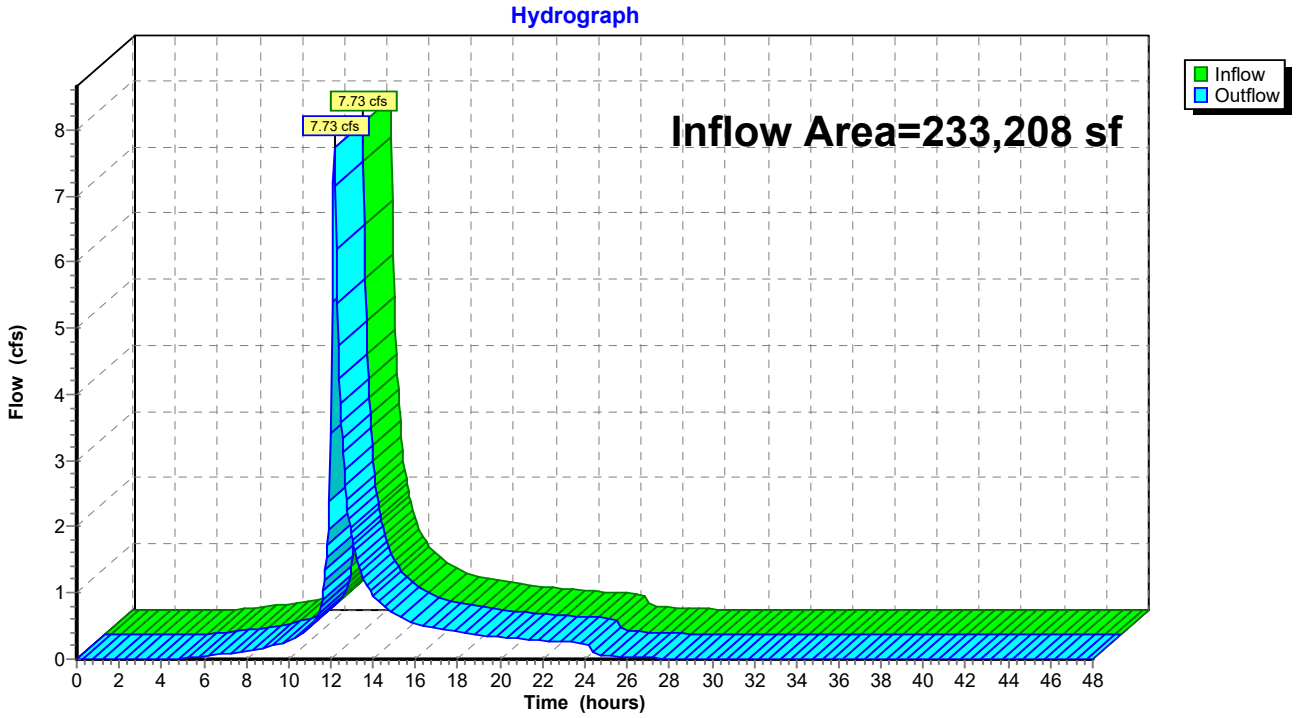
Summary for Reach PDA-300: PDA-300 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 233,208 sf, 59.86% Impervious, Inflow Depth = 2.18" for 2-yr event
Inflow = 7.73 cfs @ 12.15 hrs, Volume= 42,363 cf
Outflow = 7.73 cfs @ 12.15 hrs, Volume= 42,363 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-300: PDA-300 Overall



Summary for Pond P-1: UGS

Inflow Area =	183,046 sf,	80.06% Impervious,	Inflow Depth =	2.75"	for 2-yr event
Inflow =	14.33 cfs @	12.04 hrs,	Volume=	42,012 cf	
Outflow =	1.78 cfs @	12.60 hrs,	Volume=	42,012 cf,	Atten= 88%, Lag= 33.8 min
Discarded =	0.34 cfs @	9.40 hrs,	Volume=	31,559 cf	
Primary =	1.44 cfs @	12.60 hrs,	Volume=	10,454 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 298.07' @ 12.60 hrs Surf.Area= 9,814 sf Storage= 16,858 cf

Plug-Flow detention time= 294.9 min calculated for 42,012 cf (100% of inflow)
Center-of-Mass det. time= 294.8 min (1,094.1 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.50'	14,403 cf	**117.25'W x 83.70'L x 6.00'H Field A** 58,883 cf Overall - 22,875 cf Embedded = 36,008 cf x 40.0% Voids
#2A	296.50'	22,875 cf	**Cultec R-902HD** x 352 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 16 Rows of 22 Chambers Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf
		37,278 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.50'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	297.45'	**15.0" Round Culvert** L= 141.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 297.45' / 293.00' S= 0.0316 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.34 cfs @ 9.40 hrs HW=295.56' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=1.44 cfs @ 12.60 hrs HW=298.07' (Free Discharge)
└─**2=Culvert** (Inlet Controls 1.44 cfs @ 2.37 fps)

Pond P-1: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

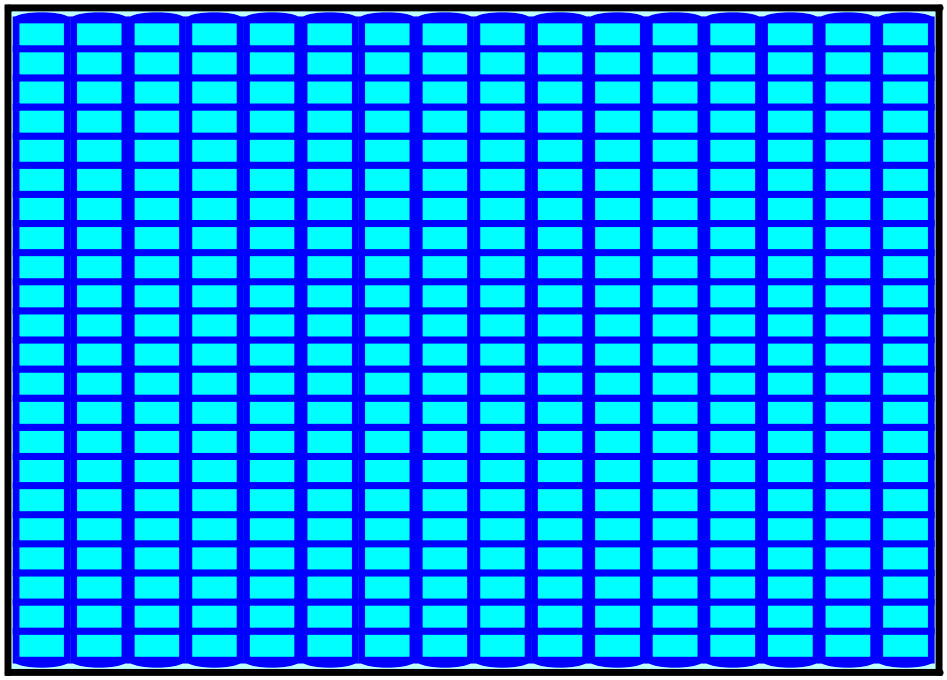
22 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 81.70' Row Length +12.0" End Stone x 2 = 83.70' Base Length
16 Rows x 78.0" Wide + 9.0" Spacing x 15 + 12.0" Side Stone x 2 = 117.25' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

352 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 16 Rows = 22,875.0 cf Chamber Storage

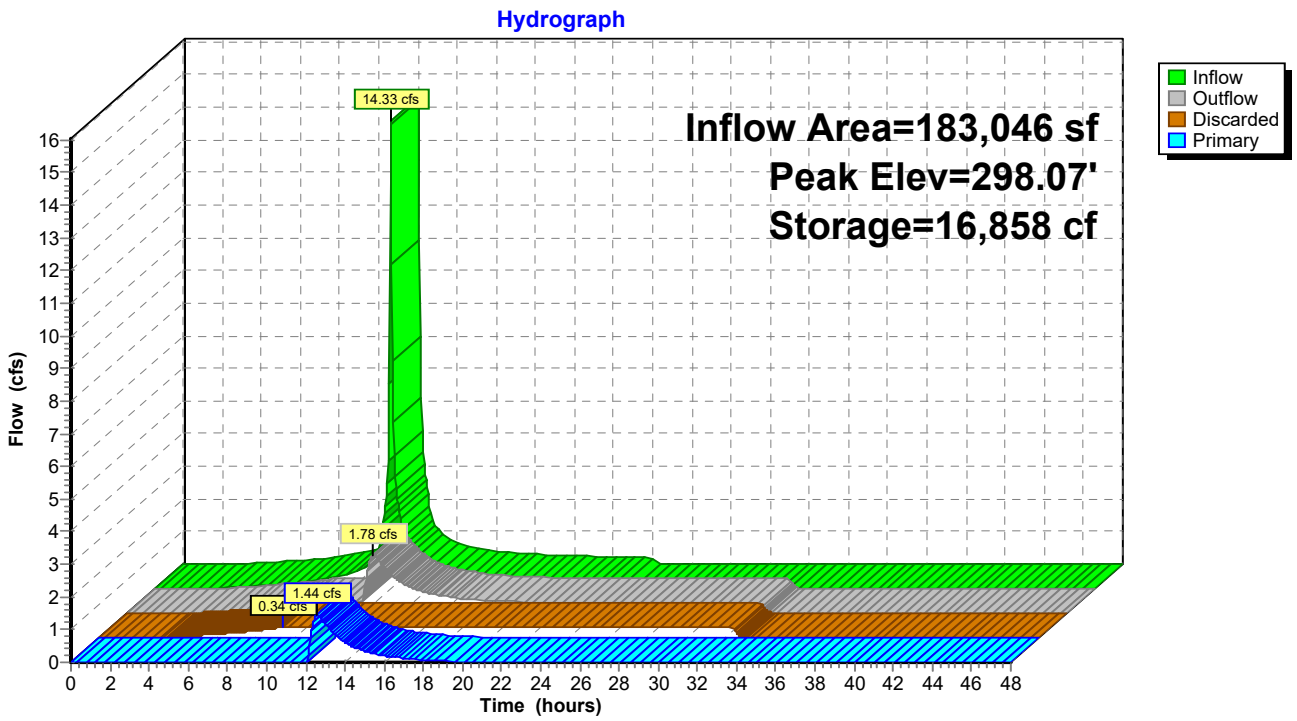
58,883.0 cf Field - 22,875.0 cf Chambers = 36,007.9 cf Stone x 40.0% Voids = 14,403.2 cf Stone Storage

Chamber Storage + Stone Storage = 37,278.2 cf = 0.856 af
Overall Storage Efficiency = 63.3%
Overall System Size = 83.70' x 117.25' x 6.00'

352 Chambers
2,180.9 cy Field
1,333.6 cy Stone



Pond P-1: UGS


Hydrograph
Inflow Area=183,046 sf
Peak Elev=298.07'
Storage=16,858 cf
14.33 cfs
1.78 cfs
1.44 cfs
0.34 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Pond P-2: UGS

Inflow Area =	108,188 sf, 86.71% Impervious, Inflow Depth = 2.96" for 2-yr event				
Inflow =	8.89 cfs @	12.04 hrs,	Volume=	26,675 cf	
Outflow =	1.57 cfs @	12.44 hrs,	Volume=	26,675 cf,	Atten= 82%, Lag= 24.3 min
Discarded =	0.19 cfs @	8.55 hrs,	Volume=	19,421 cf	
Primary =	1.39 cfs @	12.44 hrs,	Volume=	7,254 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 297.82' @ 12.44 hrs Surf.Area= 5,362 sf Storage= 10,256 cf

Plug-Flow detention time= 317.1 min calculated for 26,647 cf (100% of inflow)
Center-of-Mass det. time= 317.4 min (1,102.6 - 785.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.00'	7,926 cf	**73.75'W x 72.70'L x 6.00'H Field A** 32,170 cf Overall - 12,355 cf Embedded = 19,815 cf x 40.0% Voids
#2A	296.00'	12,355 cf	**Cultec R-902HD** x 190 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 19 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		20,281 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.00'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	296.00'	**15.0" Round Culvert** L= 37.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 296.00' / 295.80' S= 0.0054 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Device 2	300.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 2	297.25'	**14.5" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.19 cfs @ 8.55 hrs HW=295.06' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=1.39 cfs @ 12.44 hrs HW=297.82' (Free Discharge)
└─**2=Culvert** (Passes 1.39 cfs of 5.69 cfs potential flow)
  ├─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 1.39 cfs @ 2.58 fps)

Pond P-2: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

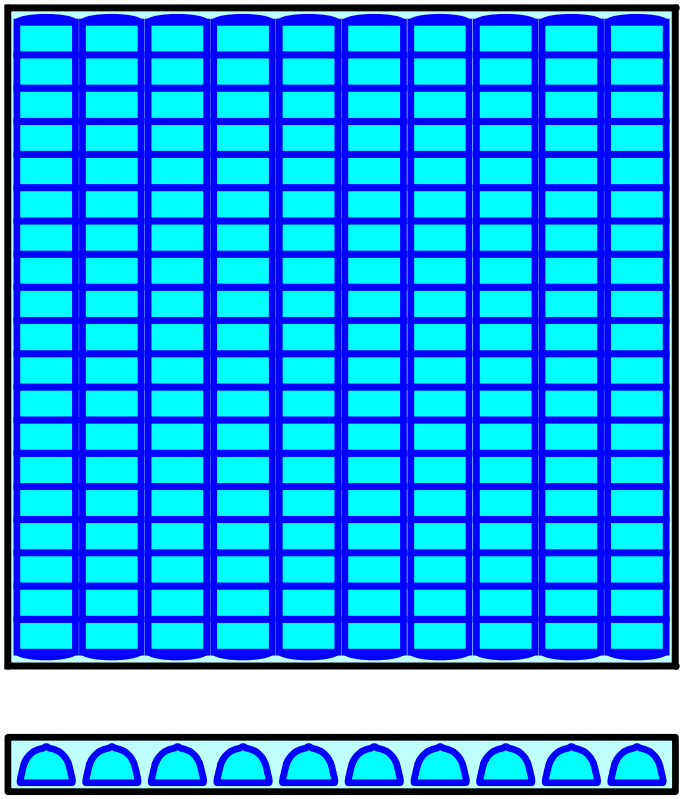
19 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 70.70' Row Length +12.0" End Stone x 2 = 72.70' Base Length
10 Rows x 78.0" Wide + 9.0" Spacing x 9 + 12.0" Side Stone x 2 = 73.75' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

190 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 10 Rows = 12,354.9 cf Chamber Storage

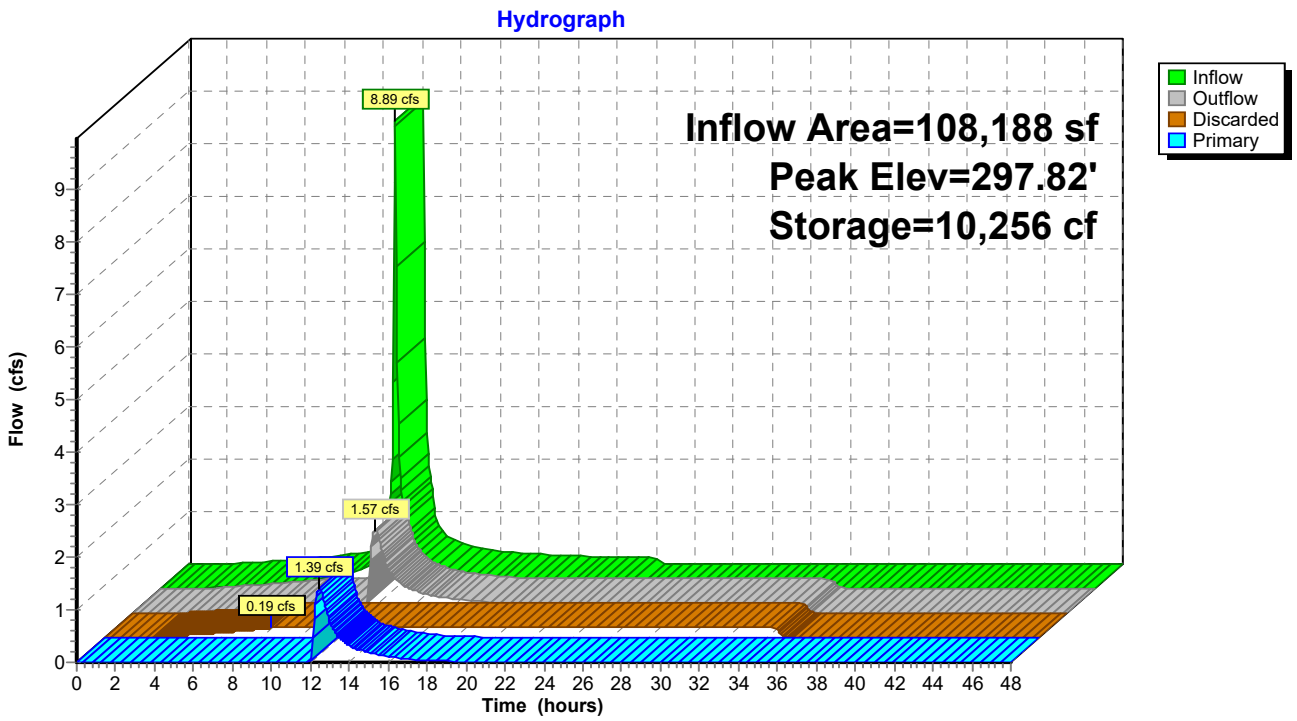
32,169.8 cf Field - 12,354.9 cf Chambers = 19,814.9 cf Stone x 40.0% Voids = 7,926.0 cf Stone Storage

Chamber Storage + Stone Storage = 20,280.8 cf = 0.466 af
Overall Storage Efficiency = 63.0%
Overall System Size = 72.70' x 73.75' x 6.00'

190 Chambers
1,191.5 cy Field
733.9 cy Stone



Pond P-2: UGS


Hydrograph
Inflow Area=108,188 sf
Peak Elev=297.82'
Storage=10,256 cf
8.89 cfs
1.57 cfs
1.39 cfs
0.19 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Pond P-3: Surface Pond

Inflow Area =	87,553 sf, 59.08% Impervious,	Inflow Depth =	2.29"	for 2-yr event	
Inflow =	4.23 cfs @	12.14 hrs,	Volume=	16,686 cf	
Outflow =	1.24 cfs @	12.54 hrs,	Volume=	12,423 cf,	Atten= 71%, Lag= 23.8 min
Primary =	1.24 cfs @	12.54 hrs,	Volume=	12,423 cf	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 304.33' @ 12.54 hrs Surf.Area= 5,940 sf Storage= 7,378 cf

Plug-Flow detention time= 247.1 min calculated for 12,423 cf (74% of inflow)
Center-of-Mass det. time= 142.5 min (976.5 - 834.0)

Volume	Invert	Avail.Storage	Storage Description
#1	301.00'	19,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

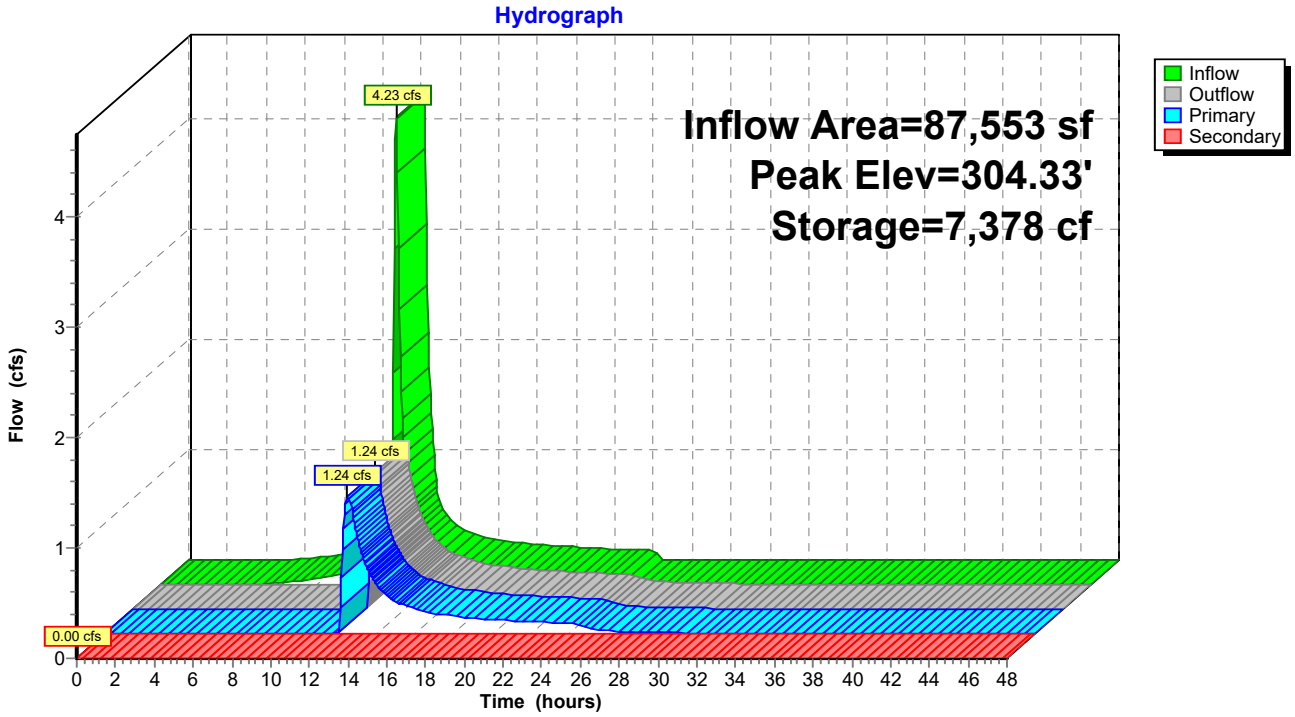
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
301.00	1	0	0
302.00	625	313	313
303.00	2,196	1,411	1,724
304.00	5,344	3,770	5,494
305.00	7,128	6,236	11,730
306.00	8,968	8,048	19,778

Device	Routing	Invert	Outlet Devices
#1	Primary	301.00'	**12.0" Round Culvert** L= 118.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 301.00' / 290.50' S= 0.0890 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	303.75'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	304.50'	**2.0" x 2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	305.50'	**30.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.24 cfs @ 12.54 hrs HW=304.33' (Free Discharge)
└─**1=Culvert** (Passes 1.24 cfs of 6.37 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.24 cfs @ 2.60 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=301.00' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-3: Surface Pond



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-101: (new Subcat) Runoff Area=146,162 sf 9.98% Impervious Runoff Depth=2.79"
Flow Length=884' Tc=14.9 min CN=75 Runoff=7.85 cfs 34,031 cf

Subcatchment PDA-102: (new Subcat) Runoff Area=183,046 sf 80.06% Impervious Runoff Depth=4.61"
Tc=6.0 min CN=93 Runoff=22.13 cfs 70,333 cf

Subcatchment PDA-201: (new Subcat) Runoff Area=71,843 sf 52.48% Impervious Runoff Depth=3.96"
Flow Length=126' Tc=13.1 min CN=87 Runoff=5.73 cfs 23,735 cf

Subcatchment PDA-202: (new Subcat) Runoff Area=108,188 sf 86.71% Impervious Runoff Depth=4.84"
Tc=6.0 min CN=95 Runoff=13.42 cfs 43,598 cf

Subcatchment PDA-301: (new Subcat) Runoff Area=145,655 sf 60.33% Impervious Runoff Depth=4.28"
Flow Length=670' Tc=13.7 min CN=90 Runoff=12.14 cfs 51,979 cf

Subcatchment PDA-302: (new Subcat) Runoff Area=87,553 sf 59.08% Impervious Runoff Depth=4.07"
Flow Length=56' Slope=0.0050 '/' Tc=13.6 min CN=88 Runoff=7.03 cfs 29,689 cf

Reach PDA-100: PDA-100 Overall Inflow=12.93 cfs 67,727 cf
Outflow=12.93 cfs 67,727 cf

Reach PDA-200: PDA-200 Overall Inflow=11.00 cfs 45,411 cf
Outflow=11.00 cfs 45,411 cf

Reach PDA-300: PDA-300 Overall Inflow=14.45 cfs 77,405 cf
Outflow=14.45 cfs 77,405 cf

Pond P-1: UGS Peak Elev=299.12' Storage=24,902 cf Inflow=22.13 cfs 70,333 cf
Discarded=0.34 cfs 36,637 cf Primary=5.32 cfs 33,696 cf Outflow=5.66 cfs 70,333 cf

Pond P-2: UGS Peak Elev=298.80' Storage=14,252 cf Inflow=13.42 cfs 43,598 cf
Discarded=0.19 cfs 21,922 cf Primary=5.36 cfs 21,676 cf Outflow=5.55 cfs 43,598 cf

Pond P-3: Surface Pond Peak Elev=304.87' Storage=10,825 cf Inflow=7.03 cfs 29,689 cf
Primary=3.06 cfs 25,426 cf Secondary=0.00 cfs 0 cf Outflow=3.06 cfs 25,426 cf

Total Runoff Area = 742,447 sf Runoff Volume = 253,366 cf Average Runoff Depth = 4.10"
41.78% Pervious = 310,201 sf 58.22% Impervious = 432,246 sf

Summary for Subcatchment PDA-101: (new Subcat)

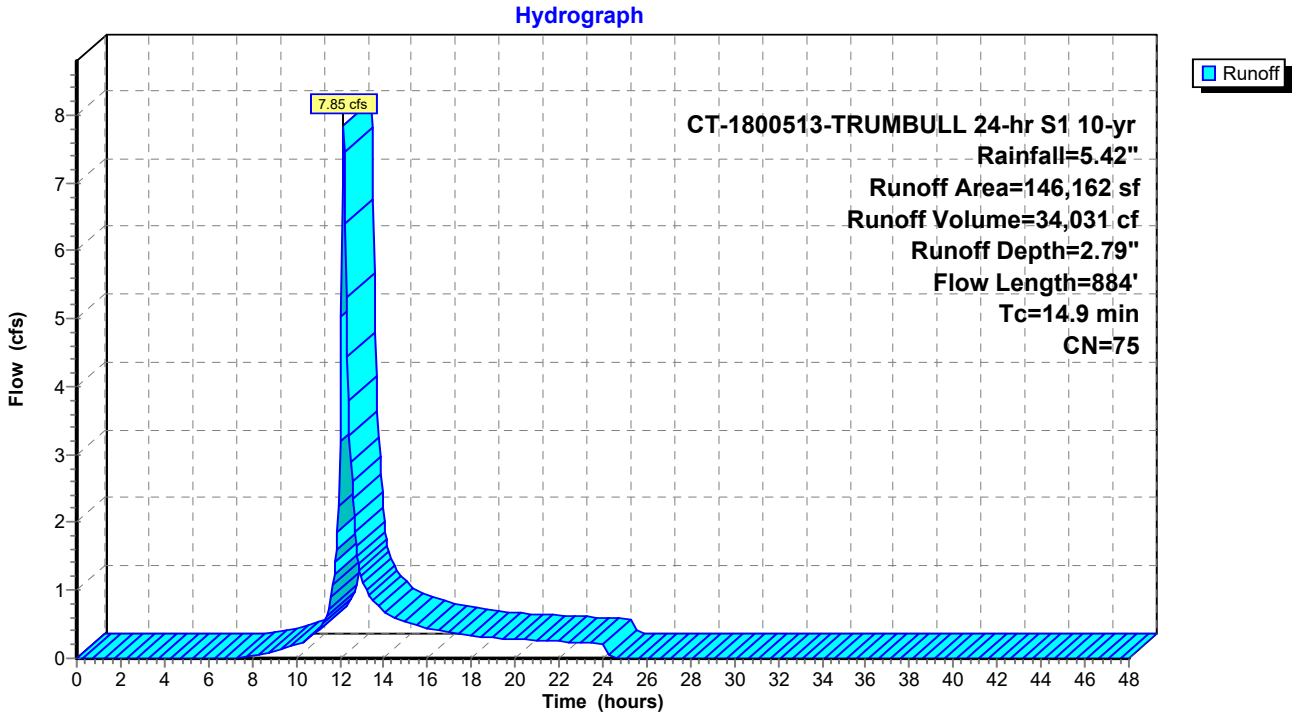
Runoff = 7.85 cfs @ 12.16 hrs, Volume= 34,031 cf, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 10-yr Rainfall=5.42"

Area (sf)	CN	Description
22,554	61	>75% Grass cover, Good, HSG B
38,346	74	>75% Grass cover, Good, HSG C
33,014	80	>75% Grass cover, Good, HSG D
14,587	98	Paved parking, HSG D
37,661	73	Woods, Fair, HSG C
146,162	75	Weighted Average
131,575		90.02% Pervious Area
14,587		9.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0833	0.24		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.00"
0.2	20	0.0400	1.40		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.3	126	0.0516	1.59		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
2.0	96	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
1.2	161	0.1000	2.21		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.8	92	0.0761	1.93		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	45	0.1111	2.33		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	80	0.0500	1.57		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.2	164	0.0222	2.23		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
14.9	884	Total			

Subcatchment PDA-101: (new Subcat)



Summary for Subcatchment PDA-102: (new Subcat)

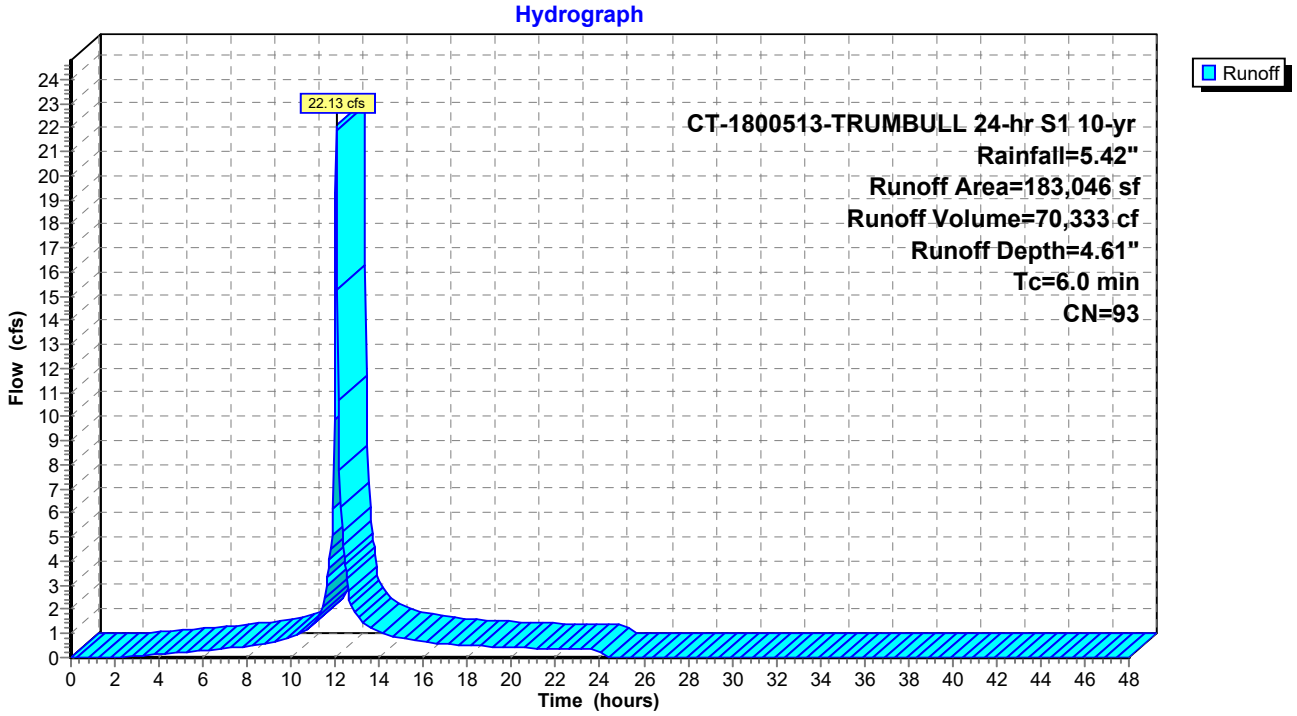
Runoff = 22.13 cfs @ 12.04 hrs, Volume= 70,333 cf, Depth= 4.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 10-yr Rainfall=5.42"

Area (sf)	CN	Description
568	61	>75% Grass cover, Good, HSG B
35,492	74	>75% Grass cover, Good, HSG C
439	80	>75% Grass cover, Good, HSG D
146,547	98	Paved parking, HSG D
183,046	93	Weighted Average
36,499		19.94% Pervious Area
146,547		80.06% Impervious Area

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

Subcatchment PDA-102: (new Subcat)



Summary for Subcatchment PDA-201: (new Subcat)

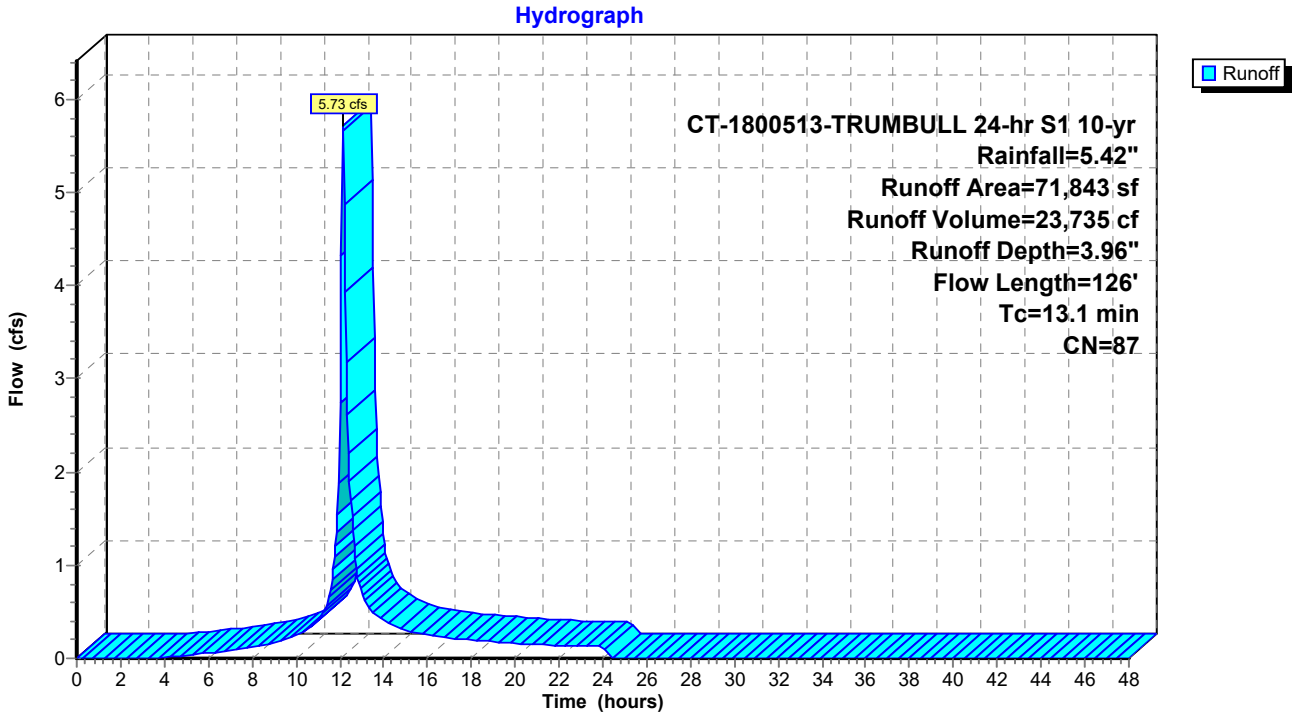
Runoff = 5.73 cfs @ 12.13 hrs, Volume= 23,735 cf, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 10-yr Rainfall=5.42"

Area (sf)	CN	Description
10,617	74	>75% Grass cover, Good, HSG C
3,041	80	>75% Grass cover, Good, HSG D
13,488	73	Woods, Fair, HSG C
6,992	79	Woods, Fair, HSG D
37,705	98	Paved parking, HSG D
71,843	87	Weighted Average
34,138		47.52% Pervious Area
37,705		52.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	25	0.0286	0.12		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
6.5	20	0.0286	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	14	0.1429	0.09		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.00"
0.3	51	0.2553	2.53		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.2	16	0.0541	1.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
13.1	126	Total			

Subcatchment PDA-201: (new Subcat)



Summary for Subcatchment PDA-202: (new Subcat)

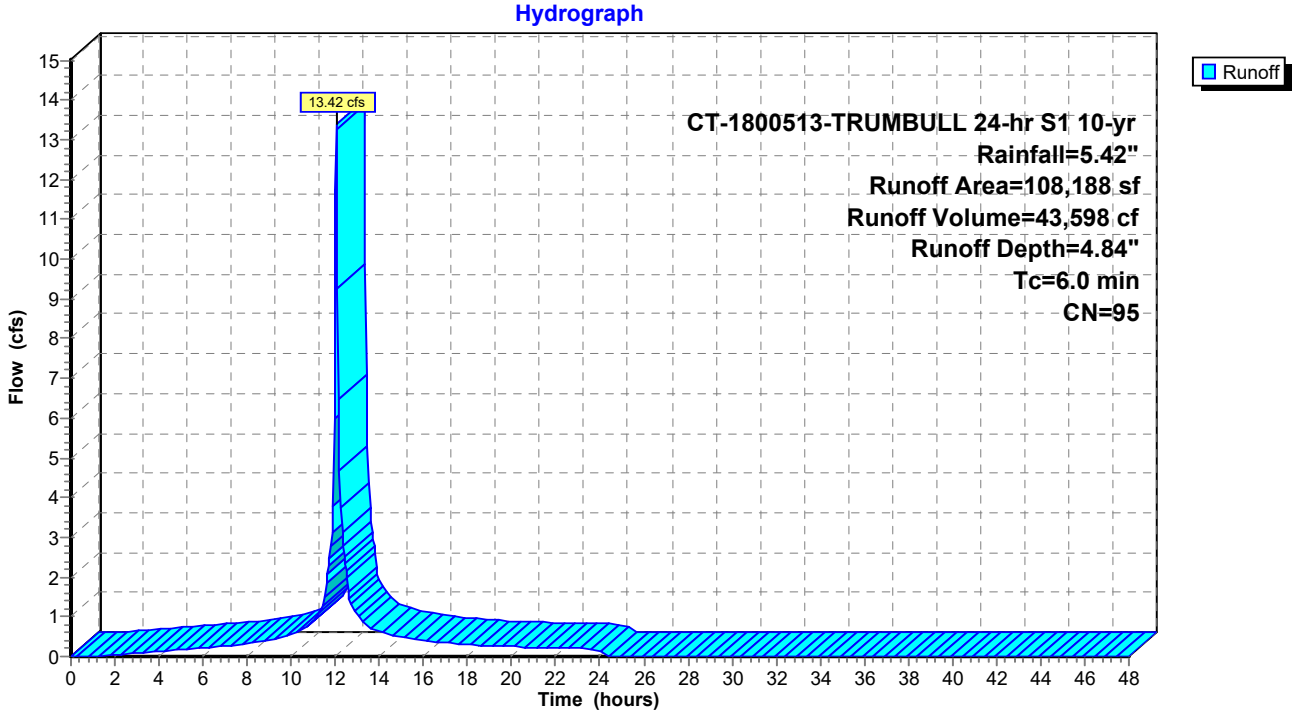
Runoff = 13.42 cfs @ 12.04 hrs, Volume= 43,598 cf, Depth= 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 10-yr Rainfall=5.42"

Area (sf)	CN	Description
14,378	74	>75% Grass cover, Good, HSG C
93,810	98	Paved parking, HSG D
108,188	95	Weighted Average
14,378		13.29% Pervious Area
93,810		86.71% Impervious Area

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

Subcatchment PDA-202: (new Subcat)



Summary for Subcatchment PDA-301: (new Subcat)

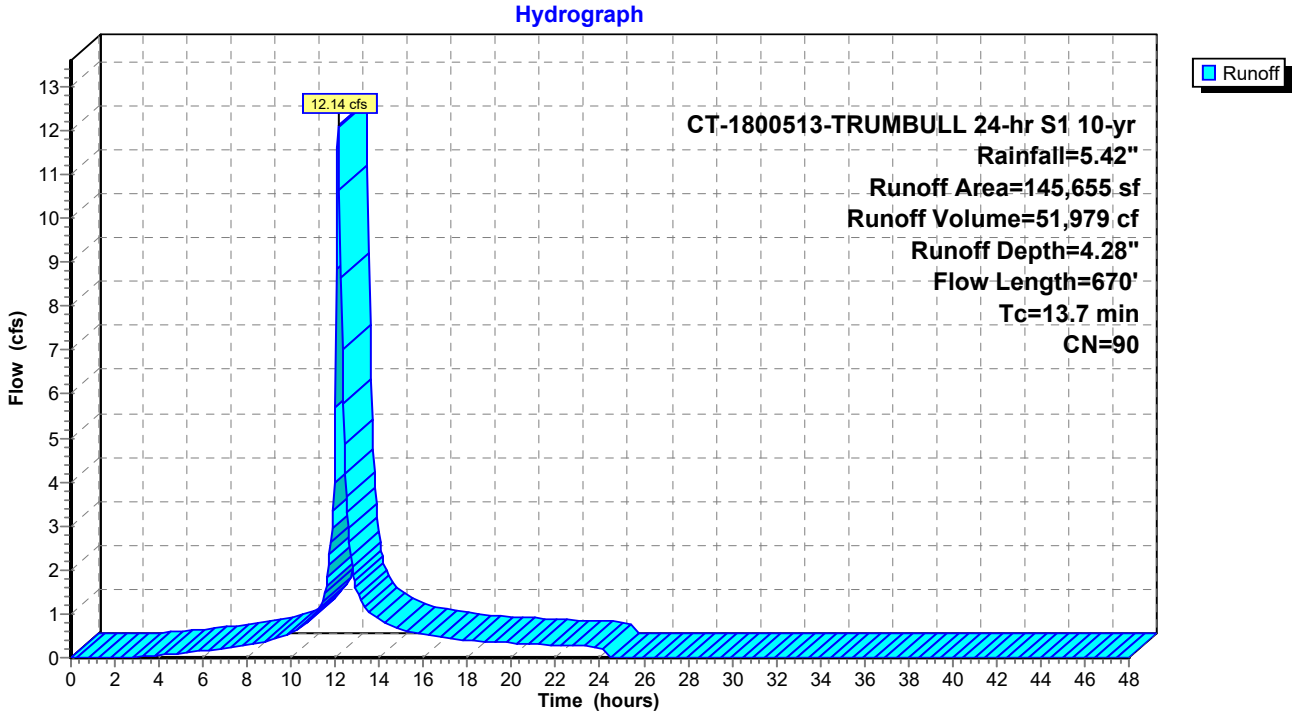
Runoff = 12.14 cfs @ 12.14 hrs, Volume= 51,979 cf, Depth= 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 10-yr Rainfall=5.42"

Area (sf)	CN	Description
32,607	74	>75% Grass cover, Good, HSG C
23,284	80	>75% Grass cover, Good, HSG D
1,896	79	Woods, Fair, HSG D
87,868	98	Paved parking, HSG D
145,655	90	Weighted Average
57,787		39.67% Pervious Area
87,868		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	70	0.0143	0.11		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
3.0	600	0.0267	3.32		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
13.7	670	Total			

Subcatchment PDA-301: (new Subcat)



Summary for Subcatchment PDA-302: (new Subcat)

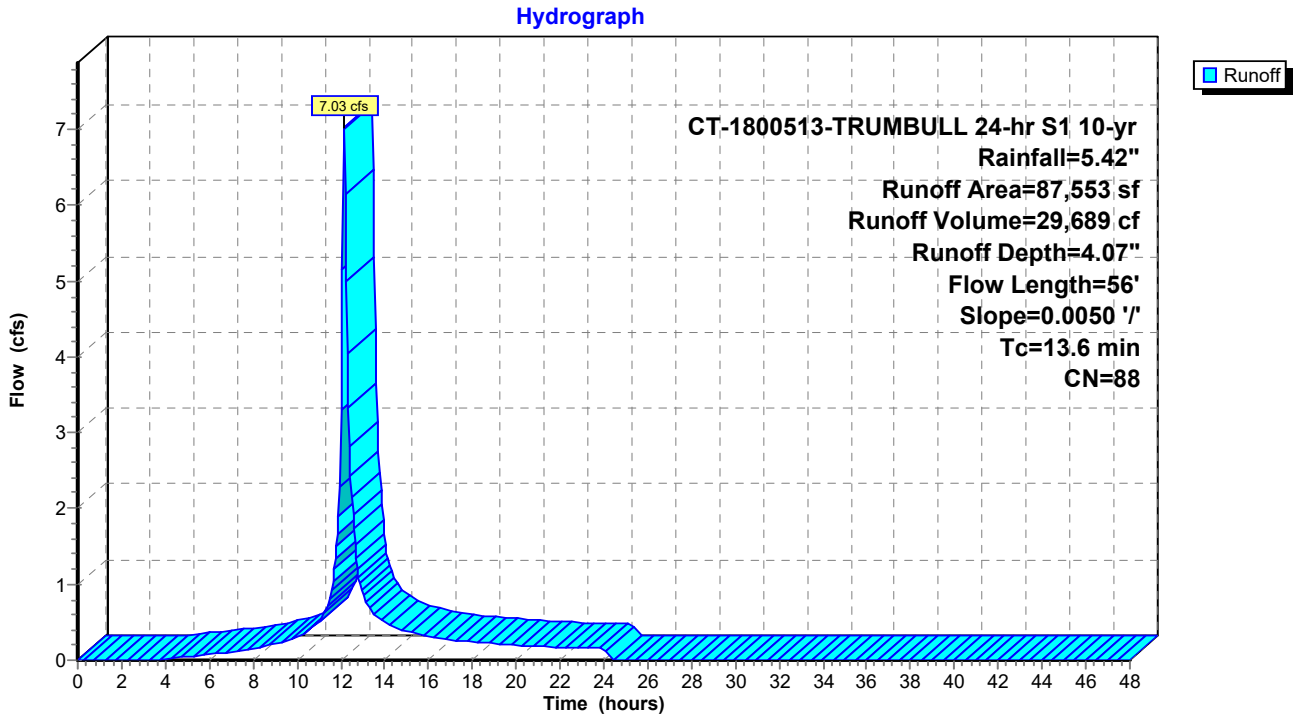
Runoff = 7.03 cfs @ 12.14 hrs, Volume= 29,689 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 10-yr Rainfall=5.42"

Area (sf)	CN	Description
35,824	74	>75% Grass cover, Good, HSG C
51,729	98	Paved parking, HSG D
87,553	88	Weighted Average
35,824		40.92% Pervious Area
51,729		59.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	56	0.0050	0.07		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"

Subcatchment PDA-302: (new Subcat)



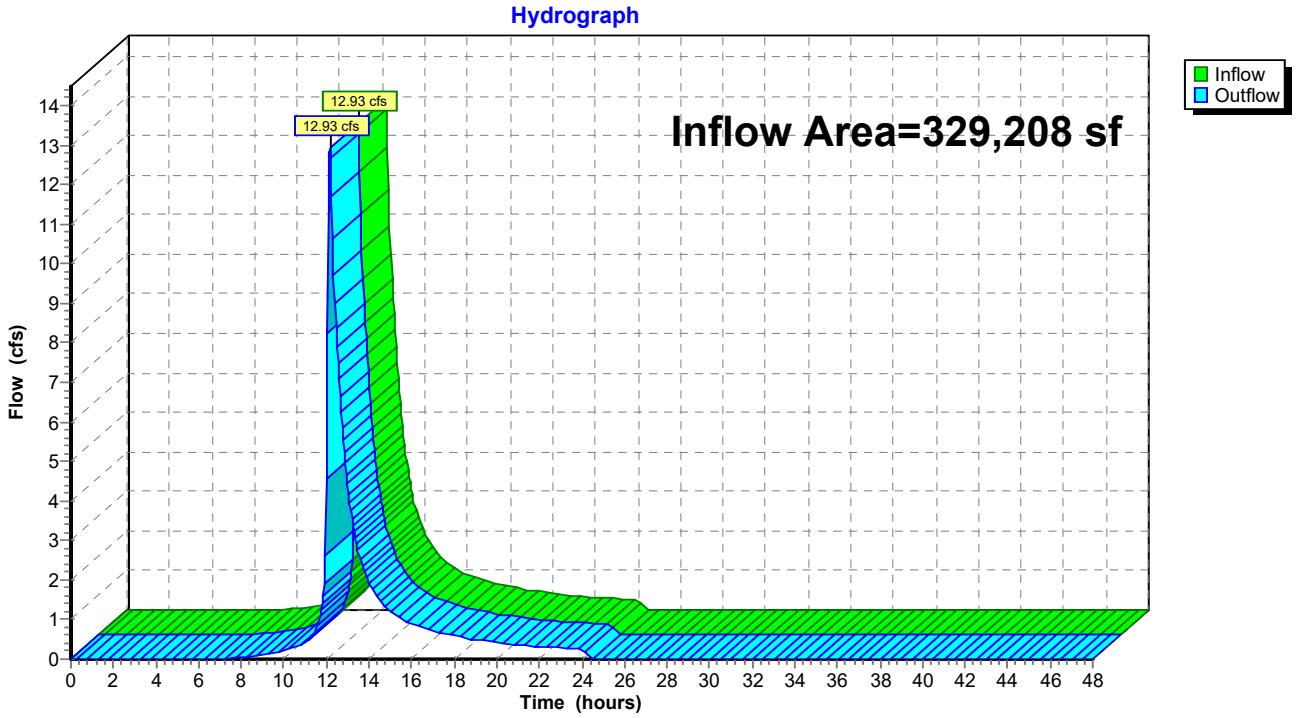
Summary for Reach PDA-100: PDA-100 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 329,208 sf, 48.95% Impervious, Inflow Depth = 2.47" for 10-yr event
Inflow = 12.93 cfs @ 12.17 hrs, Volume= 67,727 cf
Outflow = 12.93 cfs @ 12.17 hrs, Volume= 67,727 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-100: PDA-100 Overall



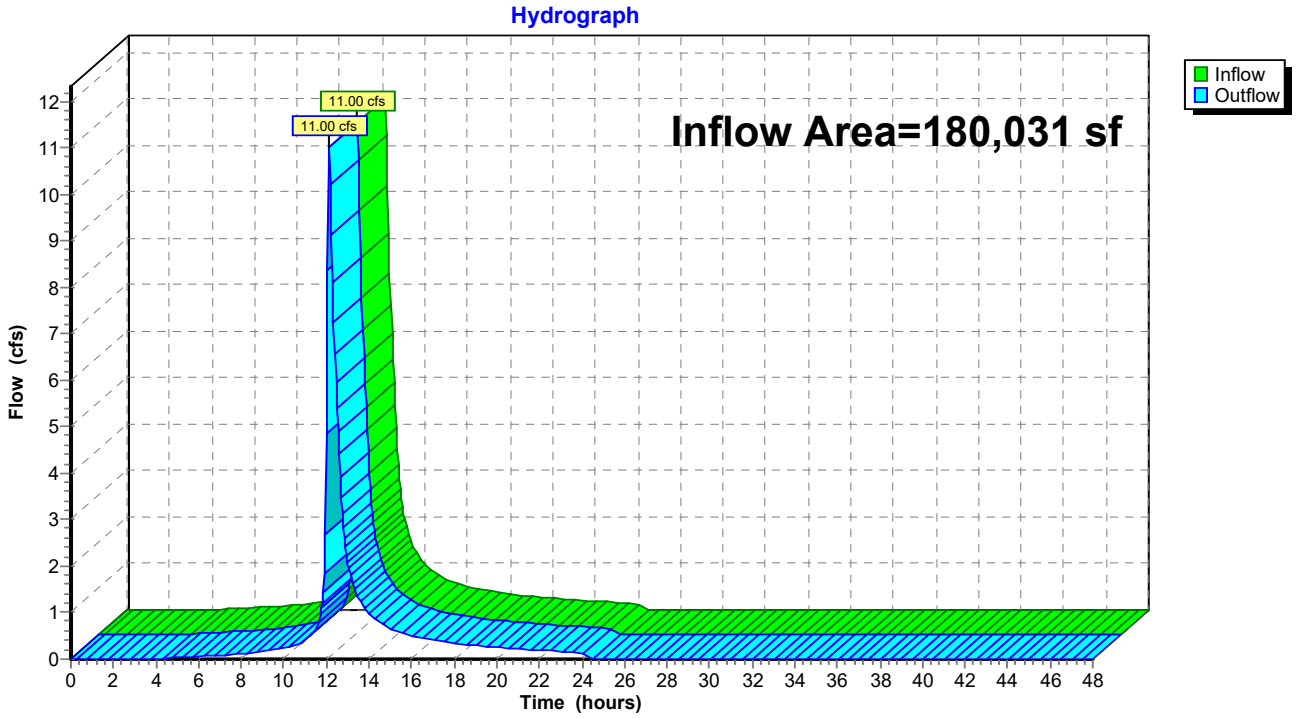
Summary for Reach PDA-200: PDA-200 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 180,031 sf, 73.05% Impervious, Inflow Depth = 3.03" for 10-yr event
Inflow = 11.00 cfs @ 12.14 hrs, Volume= 45,411 cf
Outflow = 11.00 cfs @ 12.14 hrs, Volume= 45,411 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-200: PDA-200 Overall



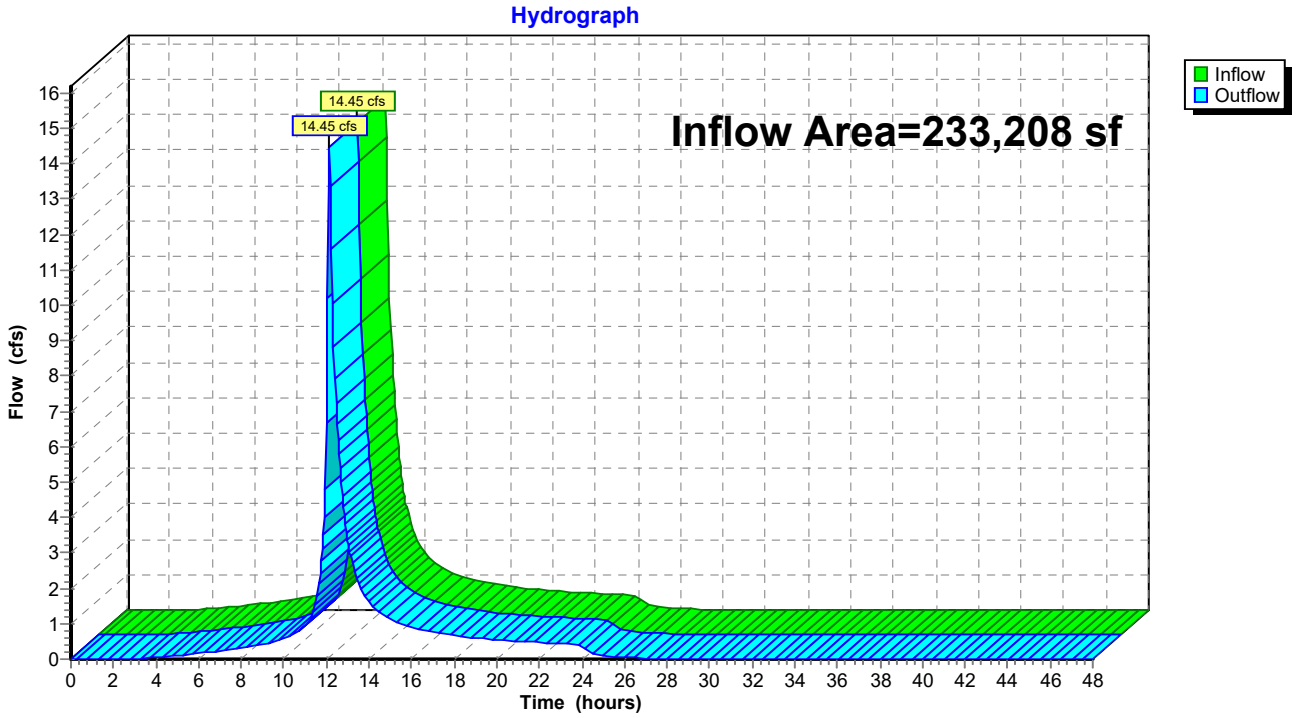
Summary for Reach PDA-300: PDA-300 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 233,208 sf, 59.86% Impervious, Inflow Depth = 3.98" for 10-yr event
Inflow = 14.45 cfs @ 12.15 hrs, Volume= 77,405 cf
Outflow = 14.45 cfs @ 12.15 hrs, Volume= 77,405 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-300: PDA-300 Overall



Summary for Pond P-1: UGS

Inflow Area =	183,046 sf, 80.06% Impervious, Inflow Depth = 4.61" for 10-yr event				
Inflow =	22.13 cfs @	12.04 hrs,	Volume=	70,333 cf	
Outflow =	5.66 cfs @	12.28 hrs,	Volume=	70,333 cf,	Atten= 74%, Lag= 14.5 min
Discarded =	0.34 cfs @	6.75 hrs,	Volume=	36,637 cf	
Primary =	5.32 cfs @	12.28 hrs,	Volume=	33,696 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 299.12' @ 12.28 hrs Surf.Area= 9,814 sf Storage= 24,902 cf

Plug-Flow detention time= 221.1 min calculated for 70,260 cf (100% of inflow)
Center-of-Mass det. time= 221.6 min (1,005.2 - 783.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.50'	14,403 cf	**117.25'W x 83.70'L x 6.00'H Field A** 58,883 cf Overall - 22,875 cf Embedded = 36,008 cf x 40.0% Voids
#2A	296.50'	22,875 cf	**Cultec R-902HD** x 352 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 16 Rows of 22 Chambers Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf
		37,278 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.50'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	297.45'	**15.0" Round Culvert** L= 141.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 297.45' / 293.00' S= 0.0316 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.34 cfs @ 6.75 hrs HW=295.56' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=5.31 cfs @ 12.28 hrs HW=299.11' (Free Discharge)
└─**2=Culvert** (Inlet Controls 5.31 cfs @ 4.33 fps)

Pond P-1: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

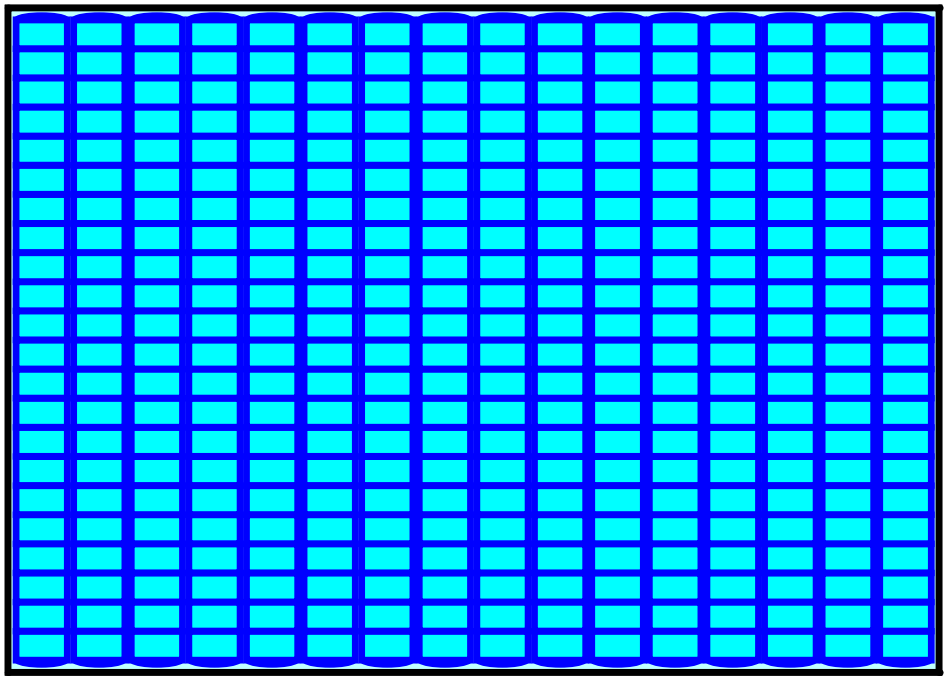
22 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 81.70' Row Length +12.0" End Stone x 2 = 83.70' Base Length
16 Rows x 78.0" Wide + 9.0" Spacing x 15 + 12.0" Side Stone x 2 = 117.25' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

352 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 16 Rows = 22,875.0 cf Chamber Storage

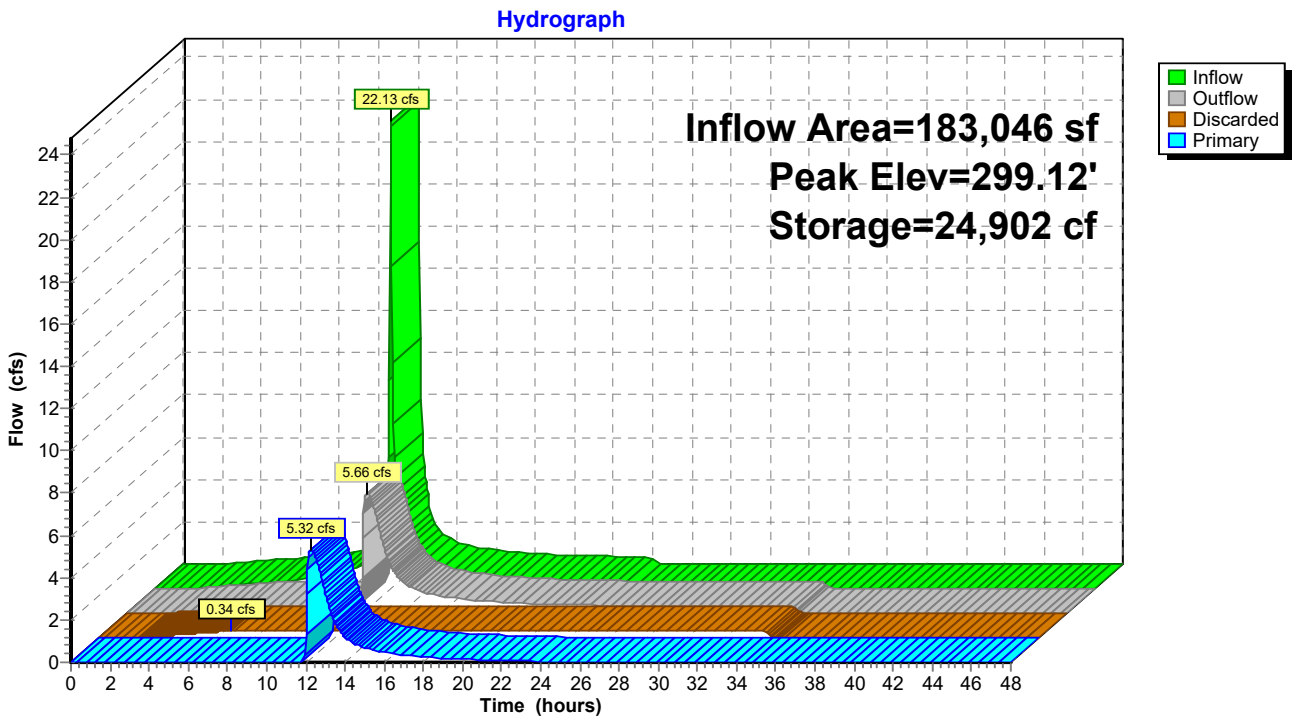
58,883.0 cf Field - 22,875.0 cf Chambers = 36,007.9 cf Stone x 40.0% Voids = 14,403.2 cf Stone Storage

Chamber Storage + Stone Storage = 37,278.2 cf = 0.856 af
Overall Storage Efficiency = 63.3%
Overall System Size = 83.70' x 117.25' x 6.00'

352 Chambers
2,180.9 cy Field
1,333.6 cy Stone



Pond P-1: UGS


Hydrograph
Inflow
Outflow
Discarded
Primary
Inflow Area=183,046 sf
Peak Elev=299.12'
Storage=24,902 cf
22.13 cfs
5.66 cfs
5.32 cfs
0.34 cfs
Flow (cfs)
Time (hours)

Summary for Pond P-2: UGS

Inflow Area =	108,188 sf, 86.71% Impervious, Inflow Depth = 4.84" for 10-yr event				
Inflow =	13.42 cfs @	12.04 hrs,	Volume=	43,598 cf	
Outflow =	5.55 cfs @	12.18 hrs,	Volume=	43,598 cf,	Atten= 59%, Lag= 8.3 min
Discarded =	0.19 cfs @	5.55 hrs,	Volume=	21,922 cf	
Primary =	5.36 cfs @	12.18 hrs,	Volume=	21,676 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 298.80' @ 12.18 hrs Surf.Area= 5,362 sf Storage= 14,252 cf

Plug-Flow detention time= 232.7 min calculated for 43,553 cf (100% of inflow)
Center-of-Mass det. time= 233.3 min (1,004.6 - 771.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.00'	7,926 cf	**73.75'W x 72.70'L x 6.00'H Field A** 32,170 cf Overall - 12,355 cf Embedded = 19,815 cf x 40.0% Voids
#2A	296.00'	12,355 cf	**Cultec R-902HD** x 190 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 19 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		20,281 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.00'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	296.00'	**15.0" Round Culvert** L= 37.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 296.00' / 295.80' S= 0.0054 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Device 2	300.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 2	297.25'	**14.5" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.19 cfs @ 5.55 hrs HW=295.06' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=5.34 cfs @ 12.18 hrs HW=298.79' (Free Discharge)
└─**2=Culvert** (Passes 5.34 cfs of 7.67 cfs potential flow)
  ├─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 5.34 cfs @ 4.66 fps)

Pond P-2: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

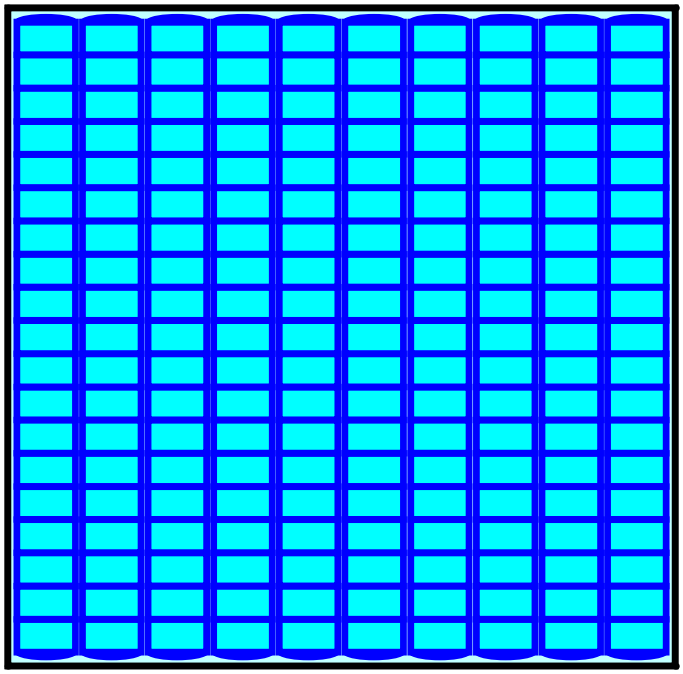
19 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 70.70' Row Length +12.0" End Stone x 2 = 72.70' Base Length
10 Rows x 78.0" Wide + 9.0" Spacing x 9 + 12.0" Side Stone x 2 = 73.75' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

190 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 10 Rows = 12,354.9 cf Chamber Storage

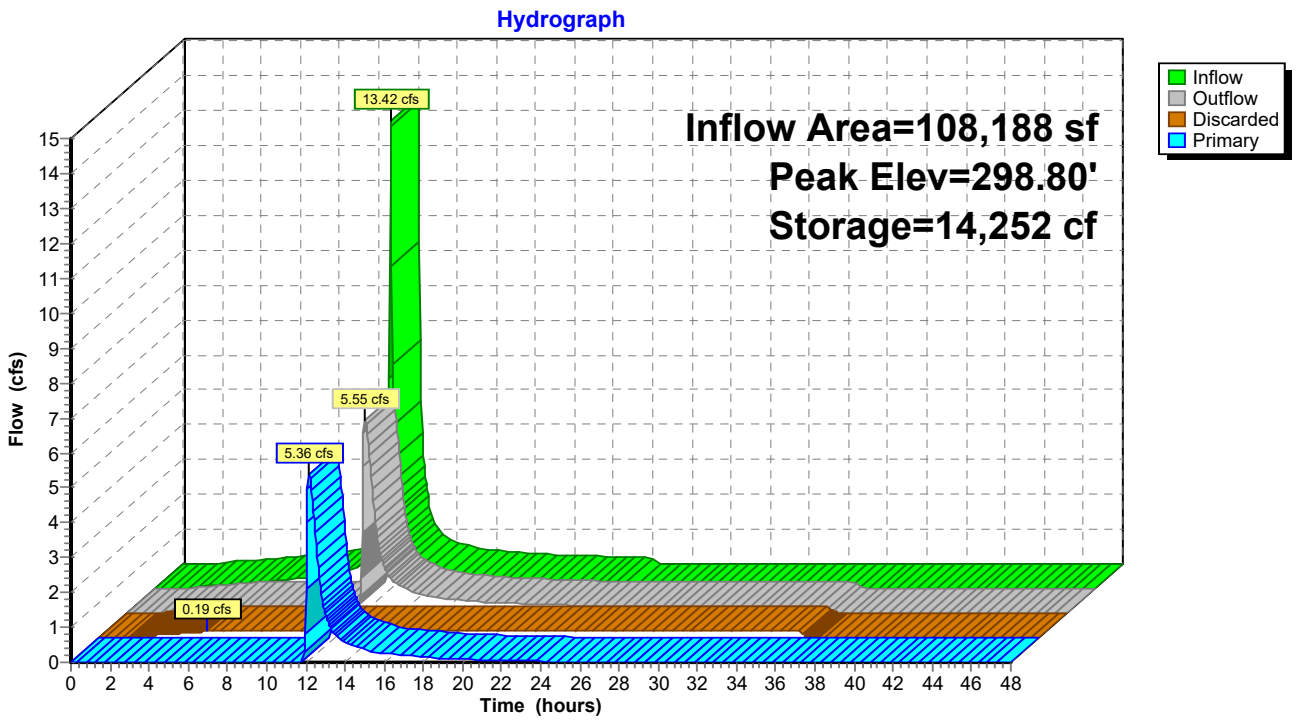
32,169.8 cf Field - 12,354.9 cf Chambers = 19,814.9 cf Stone x 40.0% Voids = 7,926.0 cf Stone Storage

Chamber Storage + Stone Storage = 20,280.8 cf = 0.466 af
Overall Storage Efficiency = 63.0%
Overall System Size = 72.70' x 73.75' x 6.00'

190 Chambers
1,191.5 cy Field
733.9 cy Stone



Pond P-2: UGS


Hydrograph
Inflow Area=108,188 sf
Peak Elev=298.80'
Storage=14,252 cf
13.42 cfs
5.55 cfs
5.36 cfs
0.19 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Pond P-3: Surface Pond

Inflow Area =	87,553 sf, 59.08% Impervious,	Inflow Depth =	4.07"	for	10-yr event
Inflow =	7.03 cfs @ 12.14 hrs,	Volume=	29,689 cf		
Outflow =	3.06 cfs @ 12.38 hrs,	Volume=	25,426 cf,	Atten= 56%,	Lag= 14.4 min
Primary =	3.06 cfs @ 12.38 hrs,	Volume=	25,426 cf		
Secondary =	0.00 cfs @ 0.00 hrs,	Volume=	0 cf		

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 304.87' @ 12.38 hrs Surf.Area= 6,898 sf Storage= 10,825 cf

Plug-Flow detention time= 178.1 min calculated for 25,426 cf (86% of inflow)
Center-of-Mass det. time= 105.9 min (921.3 - 815.4)

Volume	Invert	Avail.Storage	Storage Description
#1	301.00'	19,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

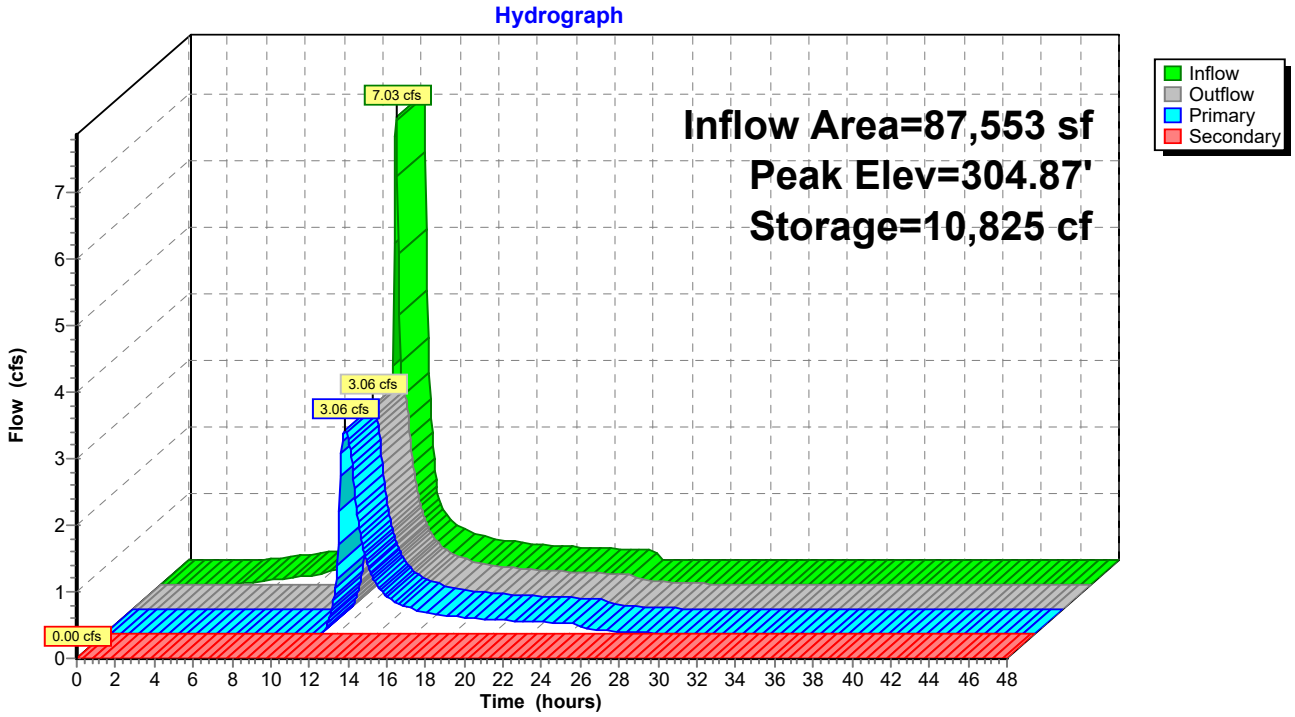
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
301.00	1	0	0
302.00	625	313	313
303.00	2,196	1,411	1,724
304.00	5,344	3,770	5,494
305.00	7,128	6,236	11,730
306.00	8,968	8,048	19,778

Device	Routing	Invert	Outlet Devices
#1	Primary	301.00'	**12.0" Round Culvert** L= 118.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 301.00' / 290.50' S= 0.0890 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	303.75'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	304.50'	**2.0" x 2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	305.50'	**30.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=3.06 cfs @ 12.38 hrs HW=304.87' (Free Discharge)
└─**1=Culvert** (Passes 3.06 cfs of 6.94 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 2.98 cfs @ 3.79 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.08 cfs @ 2.93 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=301.00' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-3: Surface Pond



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-101: (new Subcat) Runoff Area=146,162 sf 9.98% Impervious Runoff Depth=3.81"
Flow Length=884' Tc=14.9 min CN=75 Runoff=10.54 cfs 46,379 cf

Subcatchment PDA-102: (new Subcat) Runoff Area=183,046 sf 80.06% Impervious Runoff Depth=5.79"
Tc=6.0 min CN=93 Runoff=26.87 cfs 88,248 cf

Subcatchment PDA-201: (new Subcat) Runoff Area=71,843 sf 52.48% Impervious Runoff Depth=5.10"
Flow Length=126' Tc=13.1 min CN=87 Runoff=7.15 cfs 30,551 cf

Subcatchment PDA-202: (new Subcat) Runoff Area=108,188 sf 86.71% Impervious Runoff Depth=6.02"
Tc=6.0 min CN=95 Runoff=16.18 cfs 54,255 cf

Subcatchment PDA-301: (new Subcat) Runoff Area=145,655 sf 60.33% Impervious Runoff Depth=5.44"
Flow Length=670' Tc=13.7 min CN=90 Runoff=14.94 cfs 66,046 cf

Subcatchment PDA-302: (new Subcat) Runoff Area=87,553 sf 59.08% Impervious Runoff Depth=5.22"
Flow Length=56' Slope=0.0050 '/' Tc=13.6 min CN=88 Runoff=8.74 cfs 38,050 cf

Reach PDA-100: PDA-100 Overall Inflow=17.47 cfs 96,327 cf
Outflow=17.47 cfs 96,327 cf

Reach PDA-200: PDA-200 Overall Inflow=13.93 cfs 62,165 cf
Outflow=13.93 cfs 62,165 cf

Reach PDA-300: PDA-300 Overall Inflow=17.83 cfs 99,832 cf
Outflow=17.83 cfs 99,832 cf

Pond P-1: UGS Peak Elev=299.95' Storage=30,554 cf Inflow=26.87 cfs 88,248 cf
Discarded=0.34 cfs 38,300 cf Primary=7.13 cfs 49,948 cf Outflow=7.47 cfs 88,248 cf

Pond P-2: UGS Peak Elev=299.40' Storage=16,462 cf Inflow=16.18 cfs 54,255 cf
Discarded=0.19 cfs 22,640 cf Primary=6.87 cfs 31,614 cf Outflow=7.05 cfs 54,255 cf

Pond P-3: Surface Pond Peak Elev=305.13' Storage=12,654 cf Inflow=8.74 cfs 38,050 cf
Primary=3.65 cfs 33,786 cf Secondary=0.00 cfs 0 cf Outflow=3.65 cfs 33,786 cf

Total Runoff Area = 742,447 sf Runoff Volume = 323,529 cf Average Runoff Depth = 5.23"
41.78% Pervious = 310,201 sf 58.22% Impervious = 432,246 sf

Summary for Subcatchment PDA-101: (new Subcat)

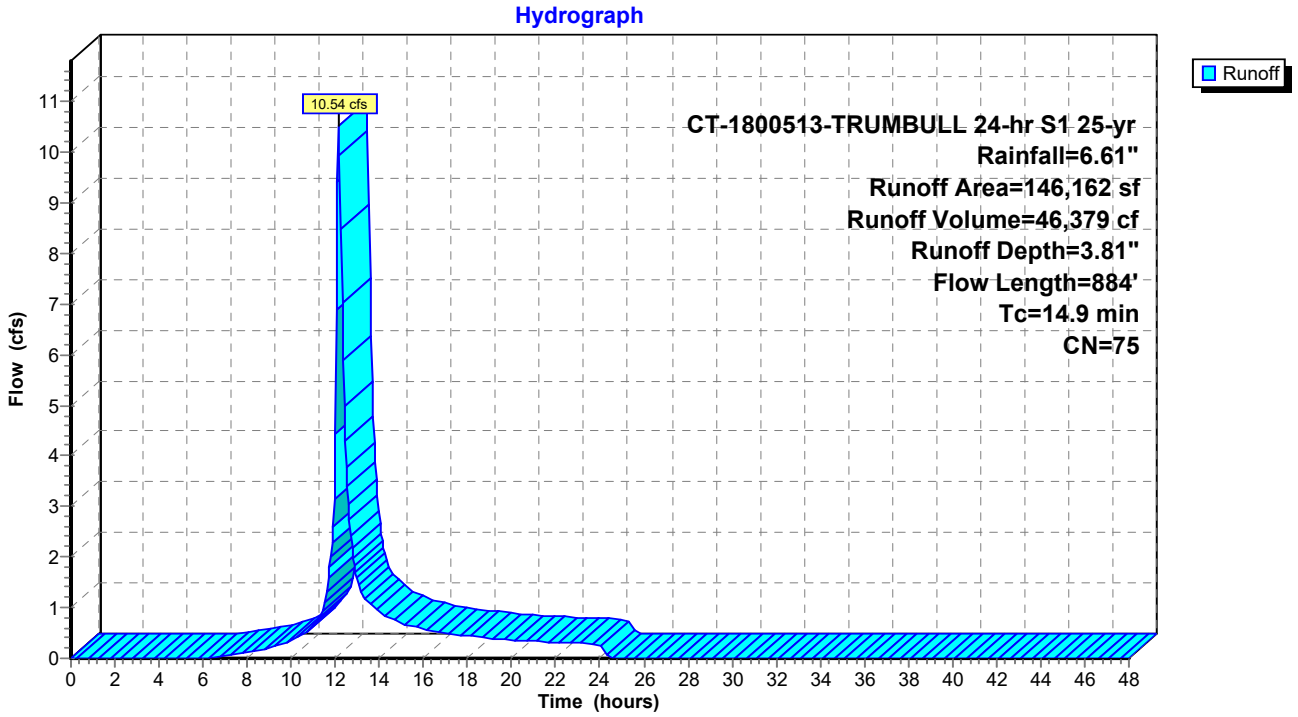
Runoff = 10.54 cfs @ 12.16 hrs, Volume= 46,379 cf, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 25-yr Rainfall=6.61"

Area (sf)	CN	Description
22,554	61	>75% Grass cover, Good, HSG B
38,346	74	>75% Grass cover, Good, HSG C
33,014	80	>75% Grass cover, Good, HSG D
14,587	98	Paved parking, HSG D
37,661	73	Woods, Fair, HSG C
146,162	75	Weighted Average
131,575		90.02% Pervious Area
14,587		9.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0833	0.24		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.00"
0.2	20	0.0400	1.40		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.3	126	0.0516	1.59		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
2.0	96	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
1.2	161	0.1000	2.21		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.8	92	0.0761	1.93		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	45	0.1111	2.33		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	80	0.0500	1.57		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.2	164	0.0222	2.23		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
14.9	884	Total			

Subcatchment PDA-101: (new Subcat)



Summary for Subcatchment PDA-102: (new Subcat)

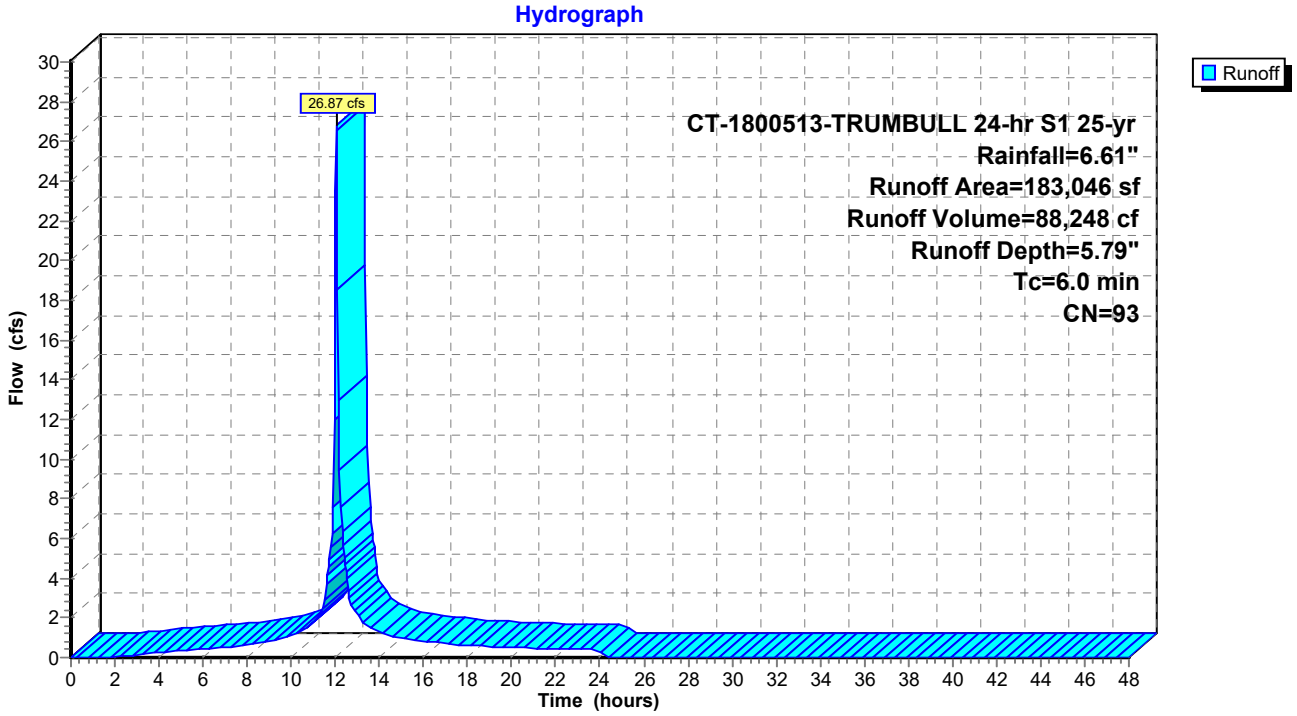
Runoff = 26.87 cfs @ 12.04 hrs, Volume= 88,248 cf, Depth= 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 25-yr Rainfall=6.61"

Area (sf)	CN	Description
568	61	>75% Grass cover, Good, HSG B
35,492	74	>75% Grass cover, Good, HSG C
439	80	>75% Grass cover, Good, HSG D
146,547	98	Paved parking, HSG D
183,046	93	Weighted Average
36,499		19.94% Pervious Area
146,547		80.06% Impervious Area

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

Subcatchment PDA-102: (new Subcat)



Summary for Subcatchment PDA-201: (new Subcat)

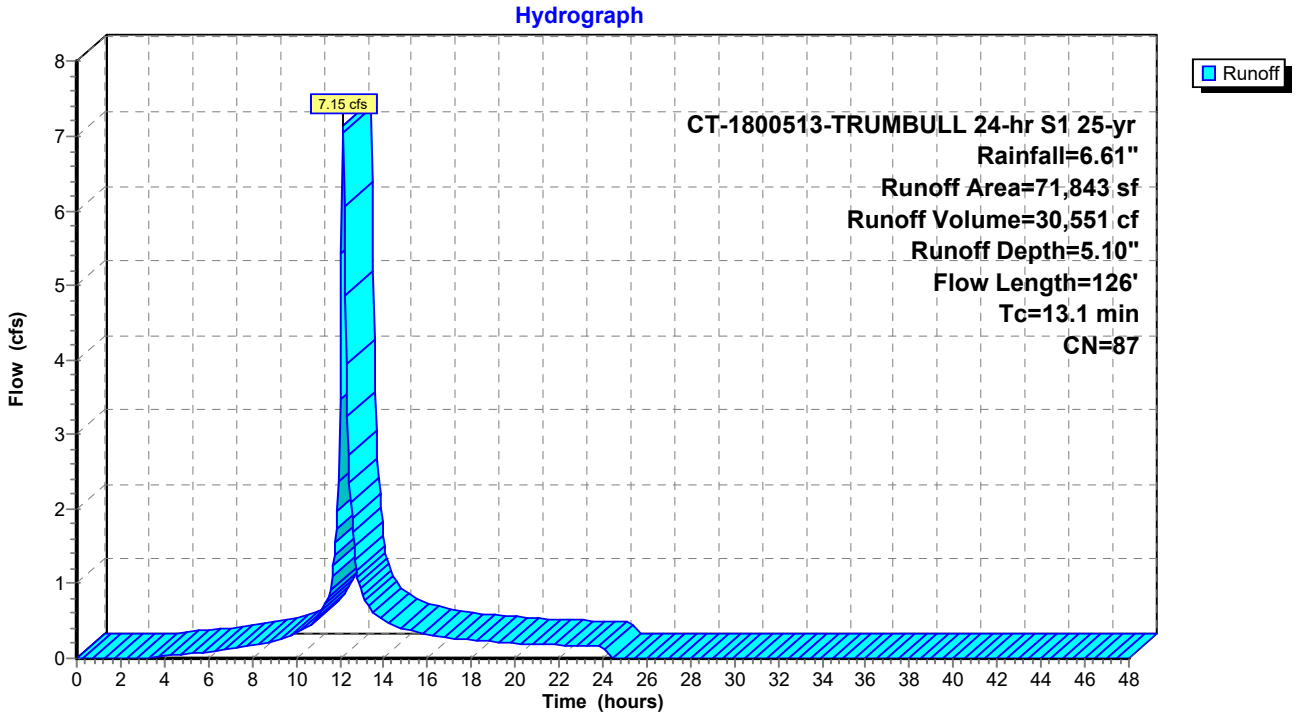
Runoff = 7.15 cfs @ 12.13 hrs, Volume= 30,551 cf, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 25-yr Rainfall=6.61"

Area (sf)	CN	Description
10,617	74	>75% Grass cover, Good, HSG C
3,041	80	>75% Grass cover, Good, HSG D
13,488	73	Woods, Fair, HSG C
6,992	79	Woods, Fair, HSG D
37,705	98	Paved parking, HSG D
71,843	87	Weighted Average
34,138		47.52% Pervious Area
37,705		52.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	25	0.0286	0.12		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
6.5	20	0.0286	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	14	0.1429	0.09		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.00"
0.3	51	0.2553	2.53		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.2	16	0.0541	1.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
13.1	126	Total			

Subcatchment PDA-201: (new Subcat)



Summary for Subcatchment PDA-202: (new Subcat)

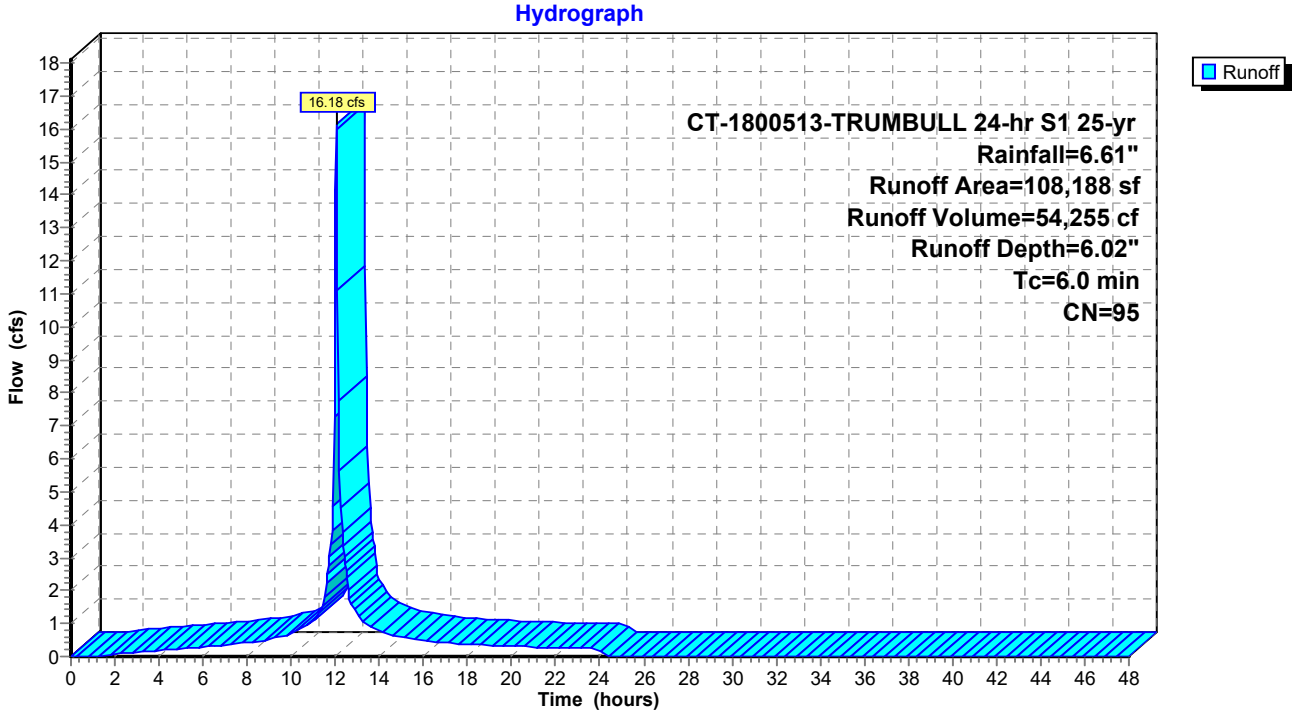
Runoff = 16.18 cfs @ 12.04 hrs, Volume= 54,255 cf, Depth= 6.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 25-yr Rainfall=6.61"

Area (sf)	CN	Description
14,378	74	>75% Grass cover, Good, HSG C
93,810	98	Paved parking, HSG D
108,188	95	Weighted Average
14,378		13.29% Pervious Area
93,810		86.71% Impervious Area

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

Subcatchment PDA-202: (new Subcat)



Summary for Subcatchment PDA-301: (new Subcat)

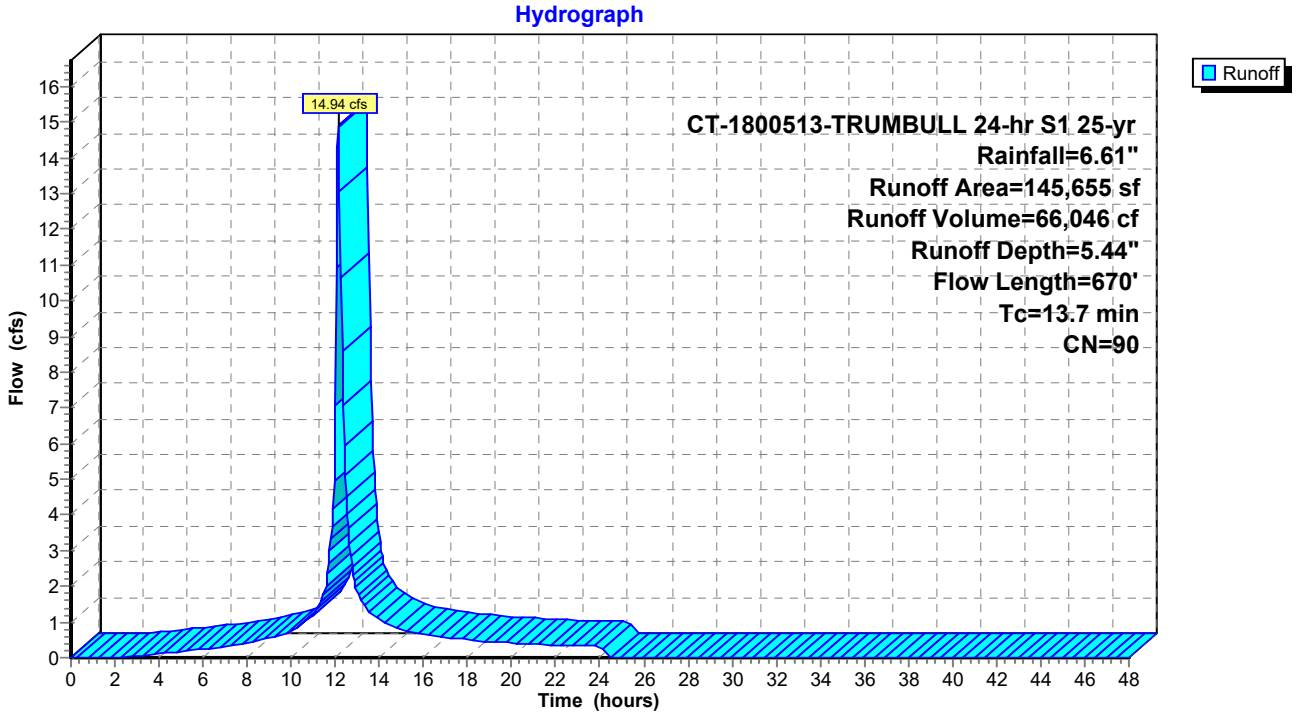
Runoff = 14.94 cfs @ 12.14 hrs, Volume= 66,046 cf, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 25-yr Rainfall=6.61"

Area (sf)	CN	Description
32,607	74	>75% Grass cover, Good, HSG C
23,284	80	>75% Grass cover, Good, HSG D
1,896	79	Woods, Fair, HSG D
87,868	98	Paved parking, HSG D
145,655	90	Weighted Average
57,787		39.67% Pervious Area
87,868		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	70	0.0143	0.11		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
3.0	600	0.0267	3.32		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
13.7	670	Total			

Subcatchment PDA-301: (new Subcat)



Summary for Subcatchment PDA-302: (new Subcat)

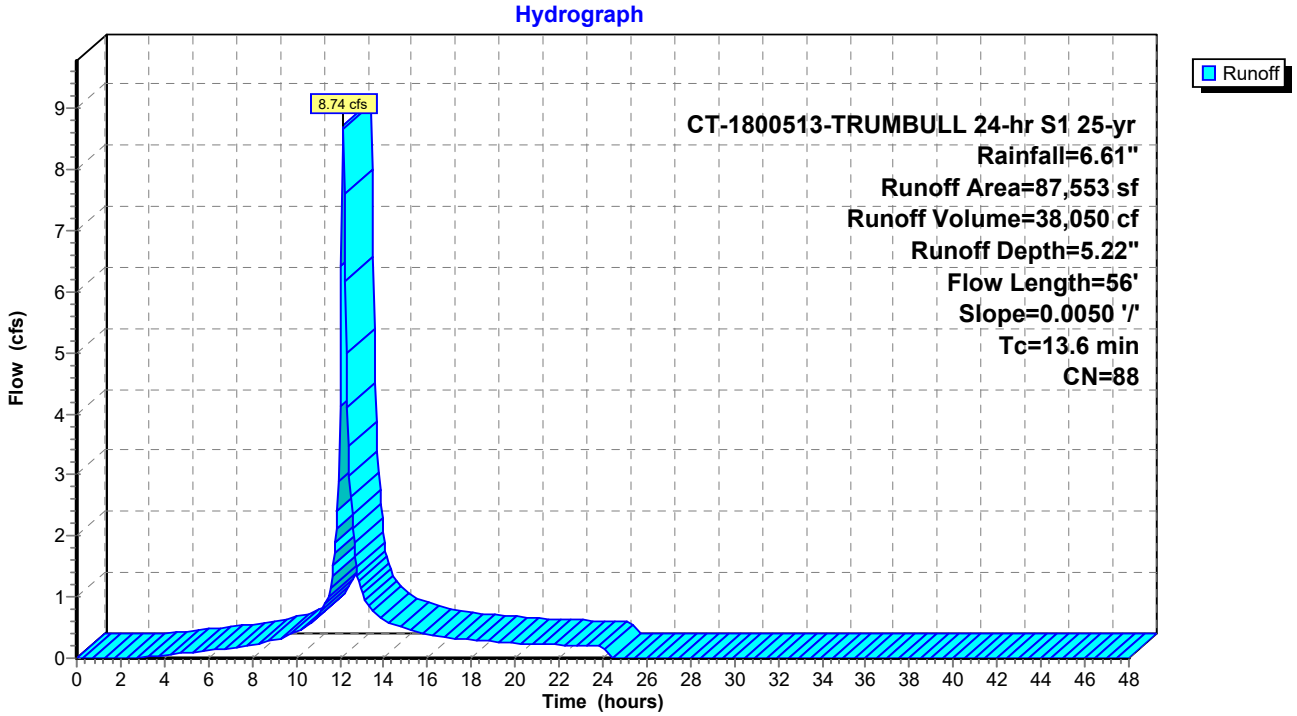
Runoff = 8.74 cfs @ 12.14 hrs, Volume= 38,050 cf, Depth= 5.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 25-yr Rainfall=6.61"

Area (sf)	CN	Description
35,824	74	>75% Grass cover, Good, HSG C
51,729	98	Paved parking, HSG D
87,553	88	Weighted Average
35,824		40.92% Pervious Area
51,729		59.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	56	0.0050	0.07		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"

Subcatchment PDA-302: (new Subcat)



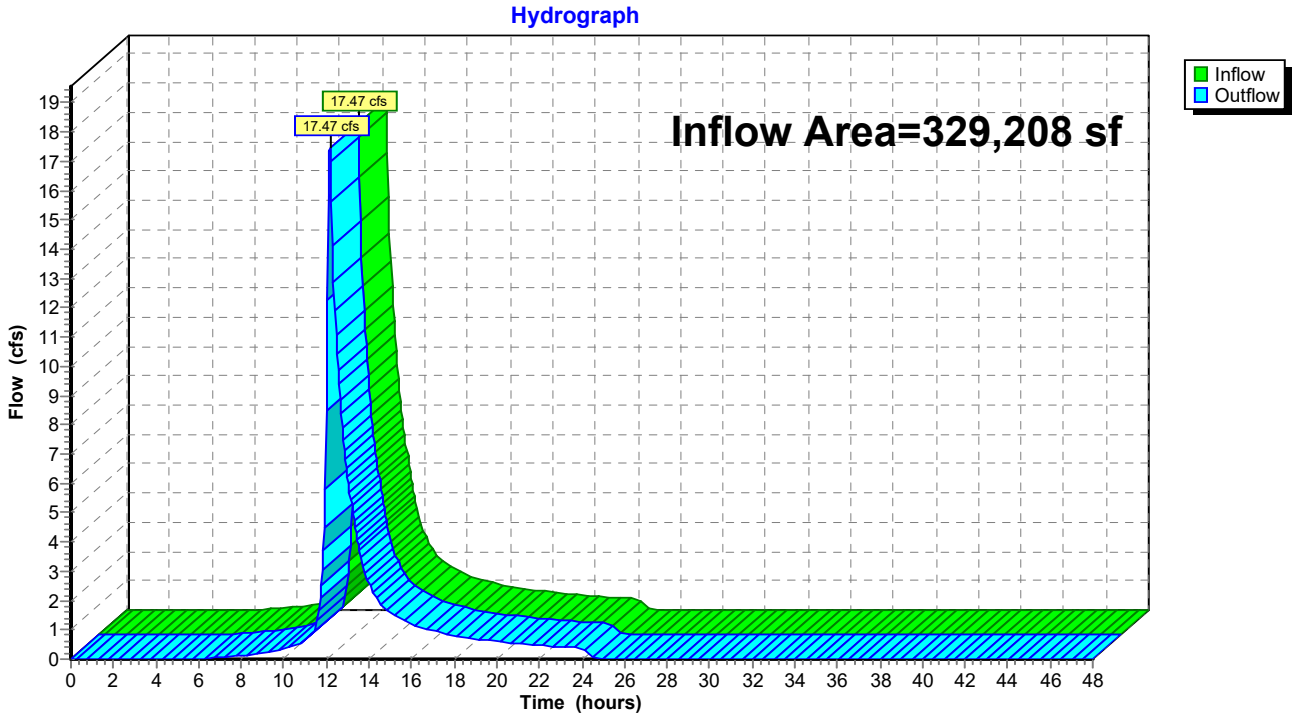
Summary for Reach PDA-100: PDA-100 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 329,208 sf, 48.95% Impervious, Inflow Depth = 3.51" for 25-yr event
Inflow = 17.47 cfs @ 12.17 hrs, Volume= 96,327 cf
Outflow = 17.47 cfs @ 12.17 hrs, Volume= 96,327 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-100: PDA-100 Overall



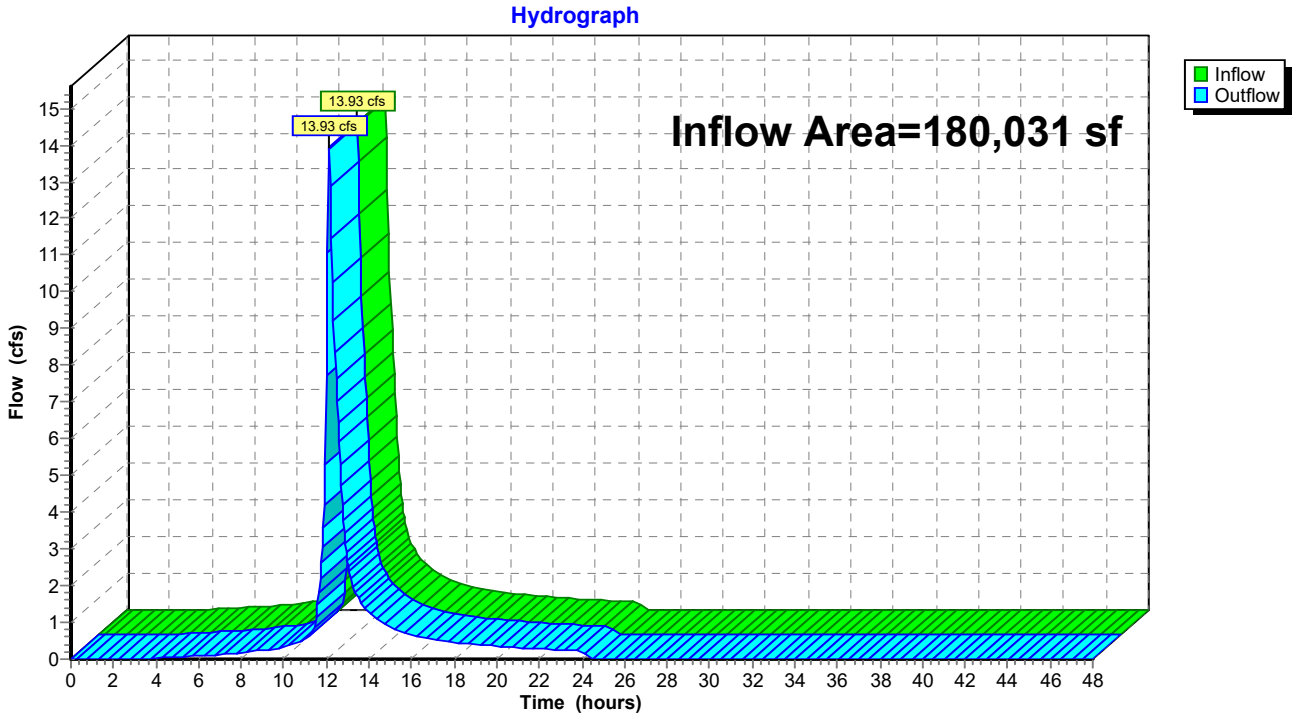
Summary for Reach PDA-200: PDA-200 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 180,031 sf, 73.05% Impervious, Inflow Depth = 4.14" for 25-yr event
Inflow = 13.93 cfs @ 12.14 hrs, Volume= 62,165 cf
Outflow = 13.93 cfs @ 12.14 hrs, Volume= 62,165 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-200: PDA-200 Overall



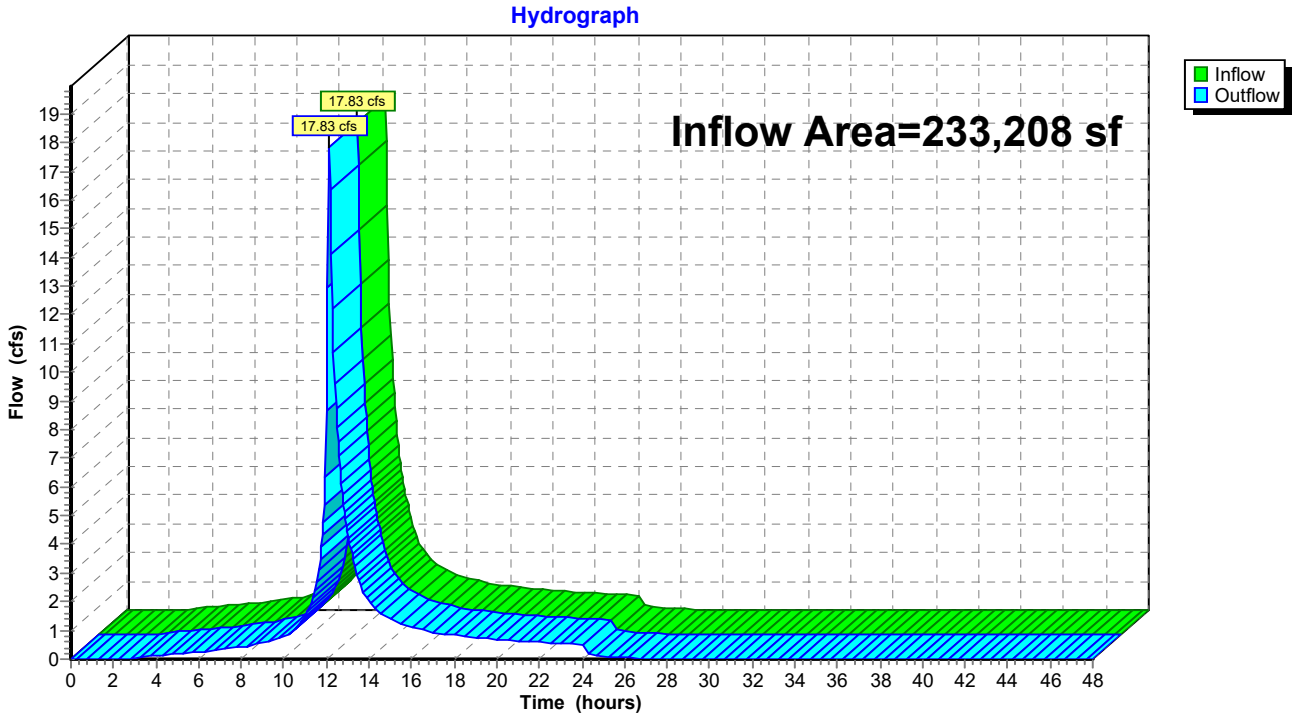
Summary for Reach PDA-300: PDA-300 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 233,208 sf, 59.86% Impervious, Inflow Depth = 5.14" for 25-yr event
Inflow = 17.83 cfs @ 12.15 hrs, Volume= 99,832 cf
Outflow = 17.83 cfs @ 12.15 hrs, Volume= 99,832 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-300: PDA-300 Overall



Summary for Pond P-1: UGS

Inflow Area =	183,046 sf,	80.06% Impervious,	Inflow Depth =	5.79"	for 25-yr event
Inflow =	26.87 cfs @	12.04 hrs,	Volume=	88,248 cf	
Outflow =	7.47 cfs @	12.26 hrs,	Volume=	88,248 cf,	Atten= 72%, Lag= 13.2 min
Discarded =	0.34 cfs @	5.35 hrs,	Volume=	38,300 cf	
Primary =	7.13 cfs @	12.26 hrs,	Volume=	49,948 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 299.95' @ 12.26 hrs Surf.Area= 9,814 sf Storage= 30,554 cf

Plug-Flow detention time= 196.3 min calculated for 88,248 cf (100% of inflow)
Center-of-Mass det. time= 196.2 min (973.1 - 776.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.50'	14,403 cf	**117.25'W x 83.70'L x 6.00'H Field A** 58,883 cf Overall - 22,875 cf Embedded = 36,008 cf x 40.0% Voids
#2A	296.50'	22,875 cf	**Cultec R-902HD** x 352 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 16 Rows of 22 Chambers Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf
		37,278 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.50'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	297.45'	**15.0" Round Culvert** L= 141.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 297.45' / 293.00' S= 0.0316 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.34 cfs @ 5.35 hrs HW=295.56' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=7.12 cfs @ 12.26 hrs HW=299.94' (Free Discharge)
└─**2=Culvert** (Inlet Controls 7.12 cfs @ 5.80 fps)

Pond P-1: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

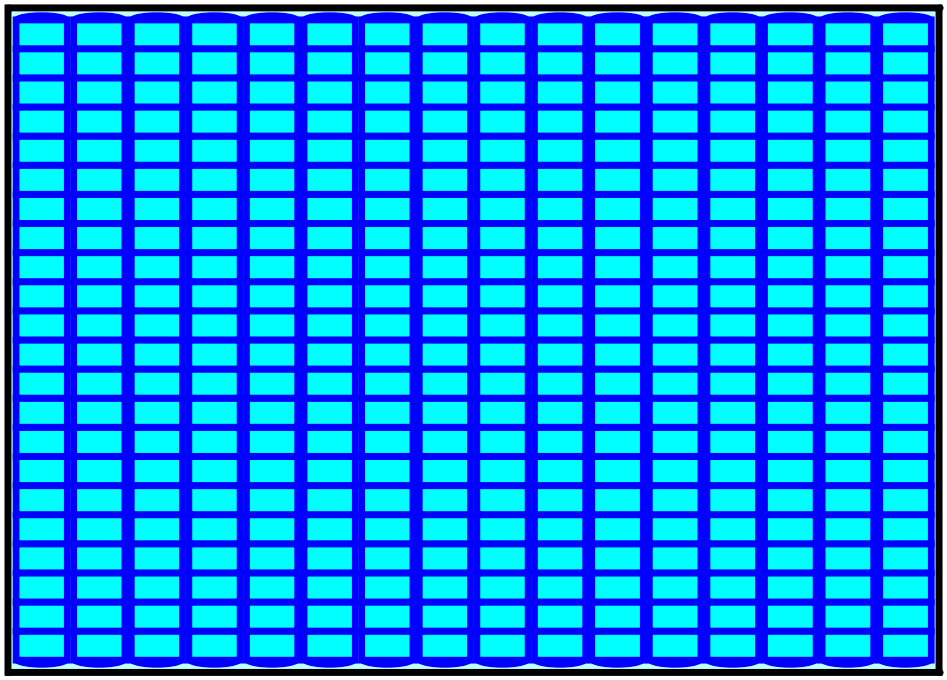
22 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 81.70' Row Length +12.0" End Stone x 2 = 83.70' Base Length
16 Rows x 78.0" Wide + 9.0" Spacing x 15 + 12.0" Side Stone x 2 = 117.25' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

352 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 16 Rows = 22,875.0 cf Chamber Storage

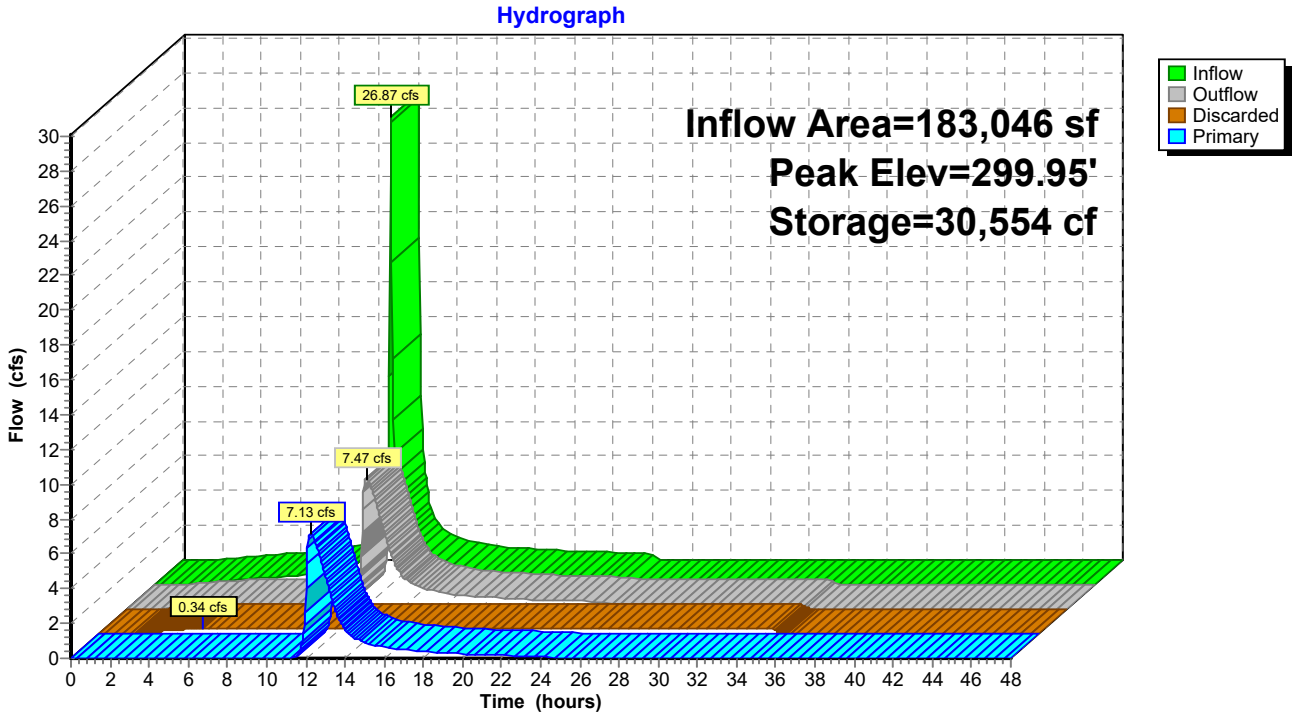
58,883.0 cf Field - 22,875.0 cf Chambers = 36,007.9 cf Stone x 40.0% Voids = 14,403.2 cf Stone Storage

Chamber Storage + Stone Storage = 37,278.2 cf = 0.856 af
Overall Storage Efficiency = 63.3%
Overall System Size = 83.70' x 117.25' x 6.00'

352 Chambers
2,180.9 cy Field
1,333.6 cy Stone



Pond P-1: UGS


Hydrograph
Inflow Area=183,046 sf
Peak Elev=299.95'
Storage=30,554 cf
26.87 cfs
7.47 cfs
7.13 cfs
0.34 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Pond P-2: UGS

Inflow Area =	108,188 sf, 86.71% Impervious, Inflow Depth = 6.02" for 25-yr event				
Inflow =	16.18 cfs @	12.04 hrs,	Volume=	54,255 cf	
Outflow =	7.05 cfs @	12.17 hrs,	Volume=	54,255 cf,	Atten= 56%, Lag= 7.9 min
Discarded =	0.19 cfs @	4.15 hrs,	Volume=	22,640 cf	
Primary =	6.87 cfs @	12.17 hrs,	Volume=	31,614 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 299.40' @ 12.17 hrs Surf.Area= 5,362 sf Storage= 16,462 cf

Plug-Flow detention time= 203.1 min calculated for 54,198 cf (100% of inflow)
Center-of-Mass det. time= 203.6 min (969.2 - 765.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.00'	7,926 cf	**73.75'W x 72.70'L x 6.00'H Field A** 32,170 cf Overall - 12,355 cf Embedded = 19,815 cf x 40.0% Voids
#2A	296.00'	12,355 cf	**Cultec R-902HD** x 190 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 19 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		20,281 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.00'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	296.00'	**15.0" Round Culvert** L= 37.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 296.00' / 295.80' S= 0.0054 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Device 2	300.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 2	297.25'	**14.5" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.19 cfs @ 4.15 hrs HW=295.06' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=6.83 cfs @ 12.17 hrs HW=299.38' (Free Discharge)
└─**2=Culvert** (Passes 6.83 cfs of 8.66 cfs potential flow)
  ├─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 6.83 cfs @ 5.95 fps)

Pond P-2: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

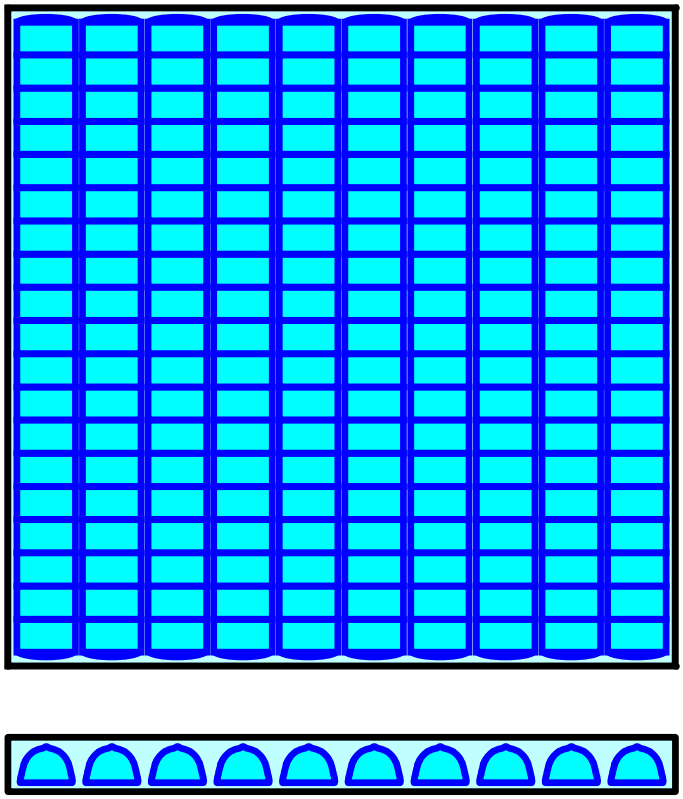
19 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 70.70' Row Length +12.0" End Stone x 2 = 72.70' Base Length
10 Rows x 78.0" Wide + 9.0" Spacing x 9 + 12.0" Side Stone x 2 = 73.75' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

190 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 10 Rows = 12,354.9 cf Chamber Storage

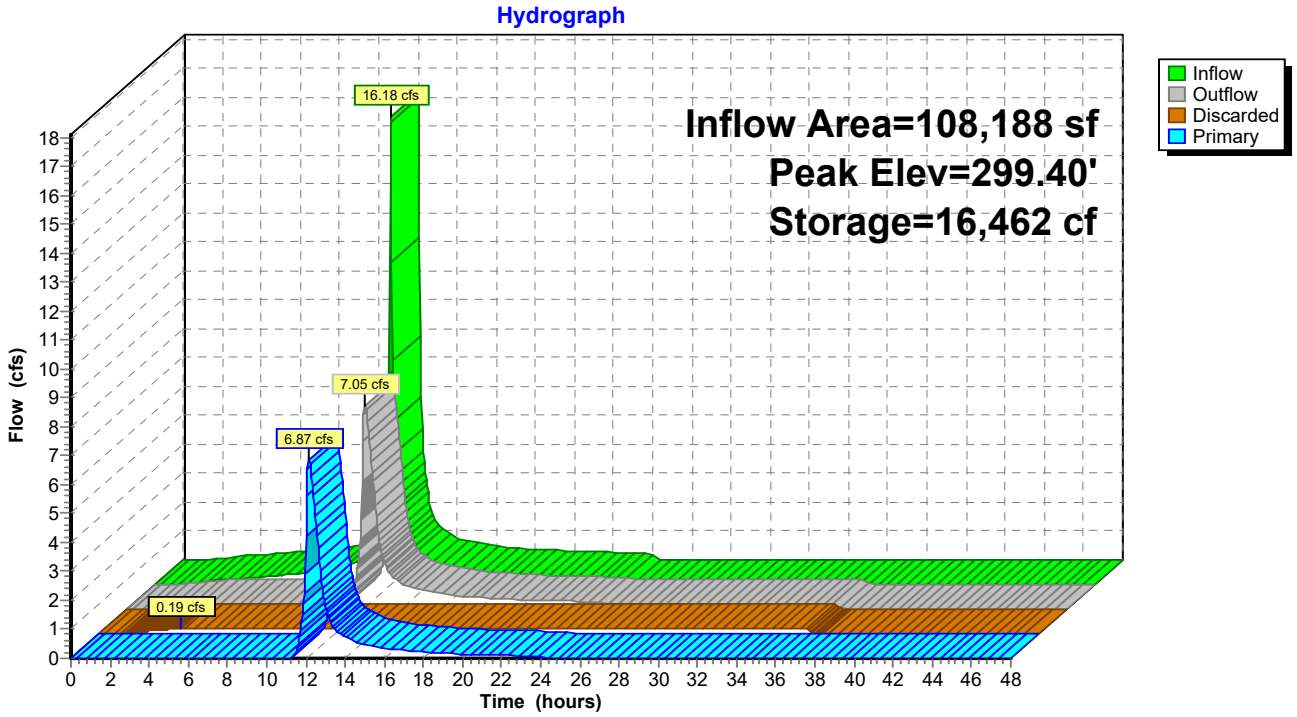
32,169.8 cf Field - 12,354.9 cf Chambers = 19,814.9 cf Stone x 40.0% Voids = 7,926.0 cf Stone Storage

Chamber Storage + Stone Storage = 20,280.8 cf = 0.466 af
Overall Storage Efficiency = 63.0%
Overall System Size = 72.70' x 73.75' x 6.00'

190 Chambers
1,191.5 cy Field
733.9 cy Stone



Pond P-2: UGS


Hydrograph
Inflow
Outflow
Discarded
Primary
Inflow Area=108,188 sf
Peak Elev=299.40'
Storage=16,462 cf
16.18 cfs
7.05 cfs
6.87 cfs
0.19 cfs
Flow (cfs)
Time (hours)

Summary for Pond P-3: Surface Pond

Inflow Area =	87,553 sf, 59.08% Impervious,	Inflow Depth =	5.22"	for 25-yr event	
Inflow =	8.74 cfs @	12.14 hrs,	Volume=	38,050 cf	
Outflow =	3.65 cfs @	12.39 hrs,	Volume=	33,786 cf,	Atten= 58%, Lag= 15.1 min
Primary =	3.65 cfs @	12.39 hrs,	Volume=	33,786 cf	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 305.13' @ 12.39 hrs Surf.Area= 7,363 sf Storage= 12,654 cf

Plug-Flow detention time= 157.1 min calculated for 33,786 cf (89% of inflow)
Center-of-Mass det. time= 97.1 min (904.2 - 807.1)

Volume	Invert	Avail.Storage	Storage Description
#1	301.00'	19,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

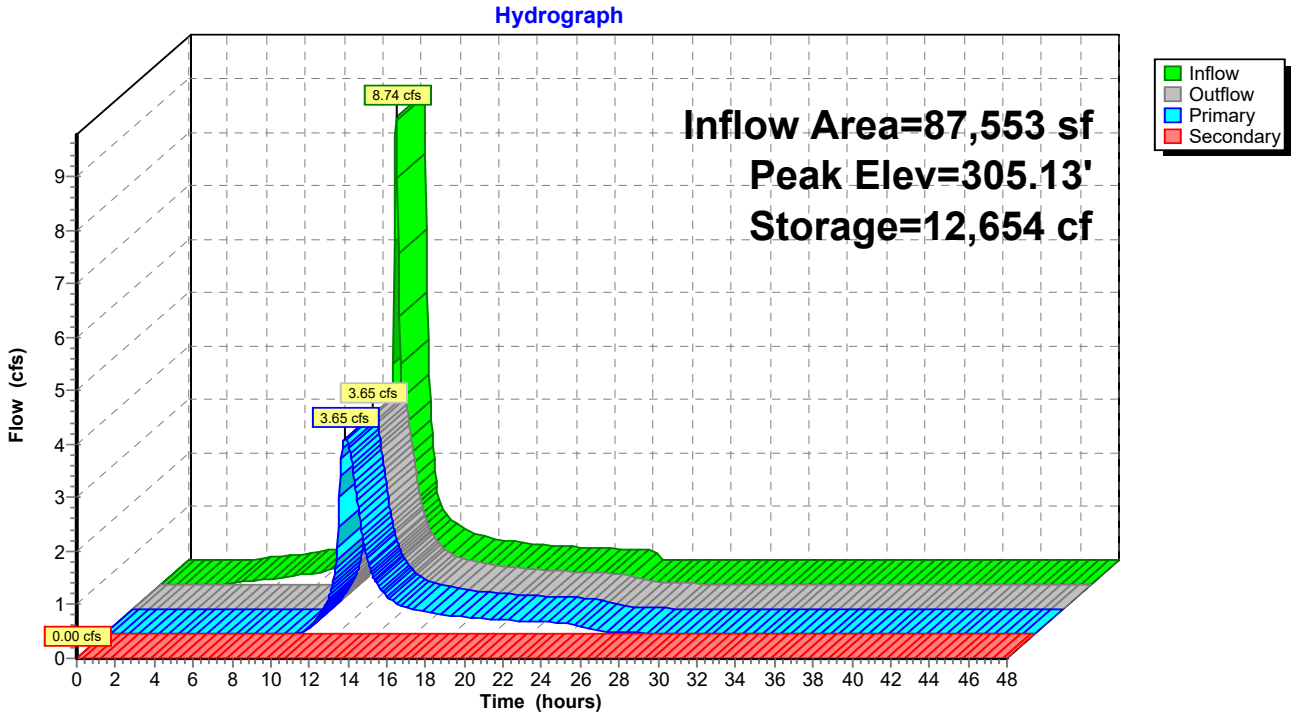
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
301.00	1	0	0
302.00	625	313	313
303.00	2,196	1,411	1,724
304.00	5,344	3,770	5,494
305.00	7,128	6,236	11,730
306.00	8,968	8,048	19,778

Device	Routing	Invert	Outlet Devices
#1	Primary	301.00'	**12.0" Round Culvert** L= 118.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 301.00' / 290.50' S= 0.0890 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	303.75'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	304.50'	**2.0" x 2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	305.50'	**30.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=3.65 cfs @ 12.39 hrs HW=305.13' (Free Discharge)
└─**1=Culvert** (Passes 3.65 cfs of 7.20 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 3.54 cfs @ 4.51 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.11 cfs @ 3.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=301.00' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-3: Surface Pond



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-101: (new Subcat) Runoff Area=146,162 sf 9.98% Impervious Runoff Depth=5.45"
Flow Length=884' Tc=14.9 min CN=75 Runoff=14.75 cfs 66,376 cf

Subcatchment PDA-102: (new Subcat) Runoff Area=183,046 sf 80.06% Impervious Runoff Depth=7.61"
Tc=6.0 min CN=93 Runoff=34.11 cfs 116,072 cf

Subcatchment PDA-201: (new Subcat) Runoff Area=71,843 sf 52.48% Impervious Runoff Depth=6.89"
Flow Length=126' Tc=13.1 min CN=87 Runoff=9.32 cfs 41,240 cf

Subcatchment PDA-202: (new Subcat) Runoff Area=108,188 sf 86.71% Impervious Runoff Depth=7.85"
Tc=6.0 min CN=95 Runoff=20.41 cfs 70,770 cf

Subcatchment PDA-301: (new Subcat) Runoff Area=145,655 sf 60.33% Impervious Runoff Depth=7.25"
Flow Length=670' Tc=13.7 min CN=90 Runoff=19.21 cfs 87,986 cf

Subcatchment PDA-302: (new Subcat) Runoff Area=87,553 sf 59.08% Impervious Runoff Depth=7.01"
Flow Length=56' Slope=0.0050 '/' Tc=13.6 min CN=88 Runoff=11.34 cfs 51,135 cf

Reach PDA-100: PDA-100 Overall Inflow=24.14 cfs 142,563 cf
Outflow=24.14 cfs 142,563 cf

Reach PDA-200: PDA-200 Overall Inflow=19.13 cfs 88,720 cf
Outflow=19.13 cfs 88,720 cf

Reach PDA-300: PDA-300 Overall Inflow=22.69 cfs 134,857 cf
Outflow=22.69 cfs 134,857 cf

Pond P-1: UGS Peak Elev=301.49' Storage=37,242 cf Inflow=34.11 cfs 116,072 cf
Discarded=0.34 cfs 39,885 cf Primary=9.64 cfs 76,187 cf Outflow=9.98 cfs 116,072 cf

Pond P-2: UGS Peak Elev=300.26' Storage=18,700 cf Inflow=20.41 cfs 70,770 cf
Discarded=0.19 cfs 23,290 cf Primary=9.99 cfs 47,480 cf Outflow=10.18 cfs 70,770 cf

Pond P-3: Surface Pond Peak Elev=305.49' Storage=15,420 cf Inflow=11.34 cfs 51,135 cf
Primary=4.34 cfs 46,871 cf Secondary=0.00 cfs 0 cf Outflow=4.34 cfs 46,871 cf

Total Runoff Area = 742,447 sf Runoff Volume = 433,579 cf Average Runoff Depth = 7.01"
41.78% Pervious = 310,201 sf 58.22% Impervious = 432,246 sf

Summary for Subcatchment PDA-101: (new Subcat)

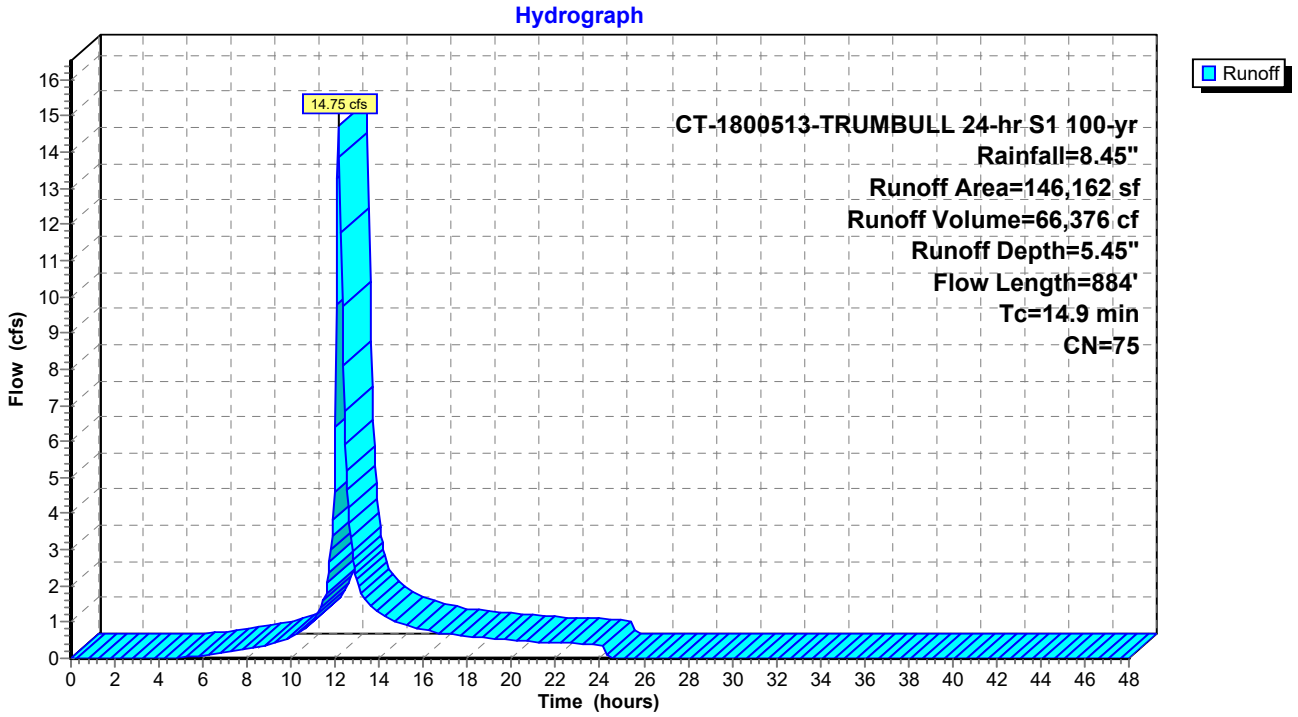
Runoff = 14.75 cfs @ 12.16 hrs, Volume= 66,376 cf, Depth= 5.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 100-yr Rainfall=8.45"

Area (sf)	CN	Description
22,554	61	>75% Grass cover, Good, HSG B
38,346	74	>75% Grass cover, Good, HSG C
33,014	80	>75% Grass cover, Good, HSG D
14,587	98	Paved parking, HSG D
37,661	73	Woods, Fair, HSG C
146,162	75	Weighted Average
131,575		90.02% Pervious Area
14,587		9.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	100	0.0833	0.24		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.00"
0.2	20	0.0400	1.40		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.3	126	0.0516	1.59		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
2.0	96	0.0250	0.79		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
1.2	161	0.1000	2.21		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.8	92	0.0761	1.93		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.3	45	0.1111	2.33		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	80	0.0500	1.57		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.2	164	0.0222	2.23		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
14.9	884	Total			

Subcatchment PDA-101: (new Subcat)



Summary for Subcatchment PDA-102: (new Subcat)

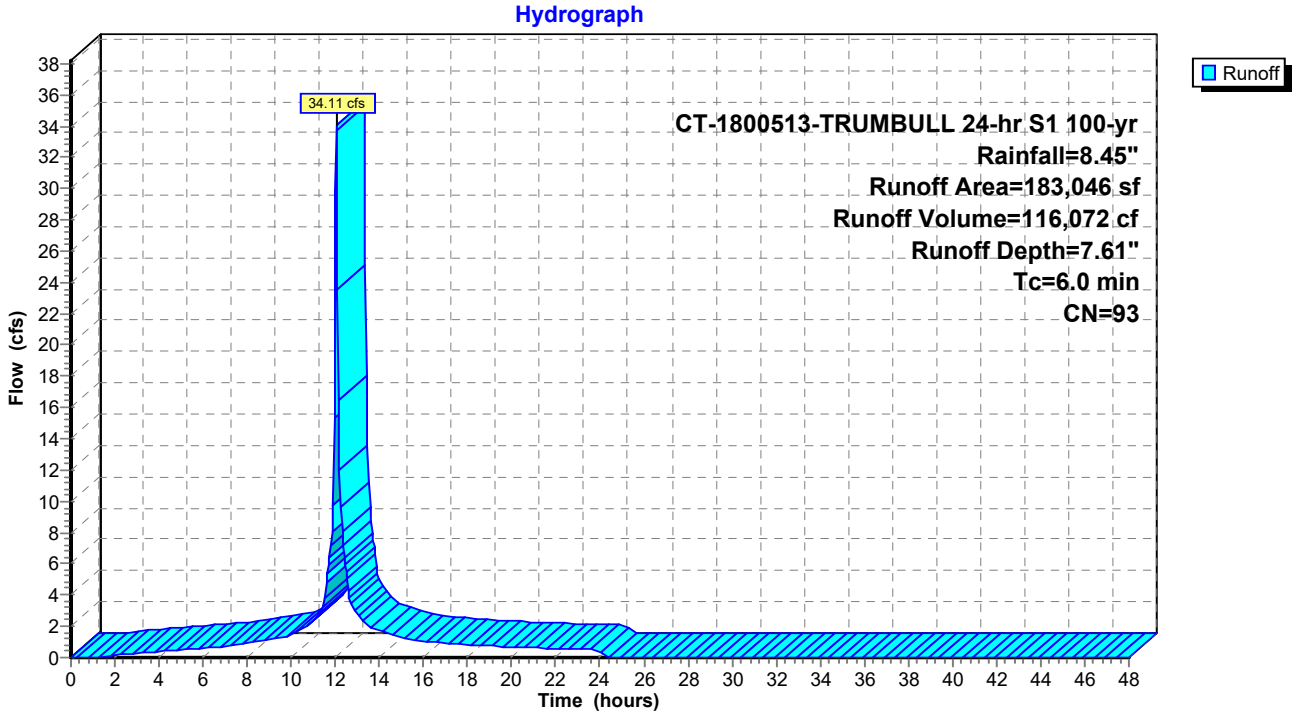
Runoff = 34.11 cfs @ 12.04 hrs, Volume= 116,072 cf, Depth= 7.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 100-yr Rainfall=8.45"

Area (sf)	CN	Description
568	61	>75% Grass cover, Good, HSG B
35,492	74	>75% Grass cover, Good, HSG C
439	80	>75% Grass cover, Good, HSG D
146,547	98	Paved parking, HSG D
183,046	93	Weighted Average
36,499		19.94% Pervious Area
146,547		80.06% Impervious Area

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

Subcatchment PDA-102: (new Subcat)



Summary for Subcatchment PDA-201: (new Subcat)

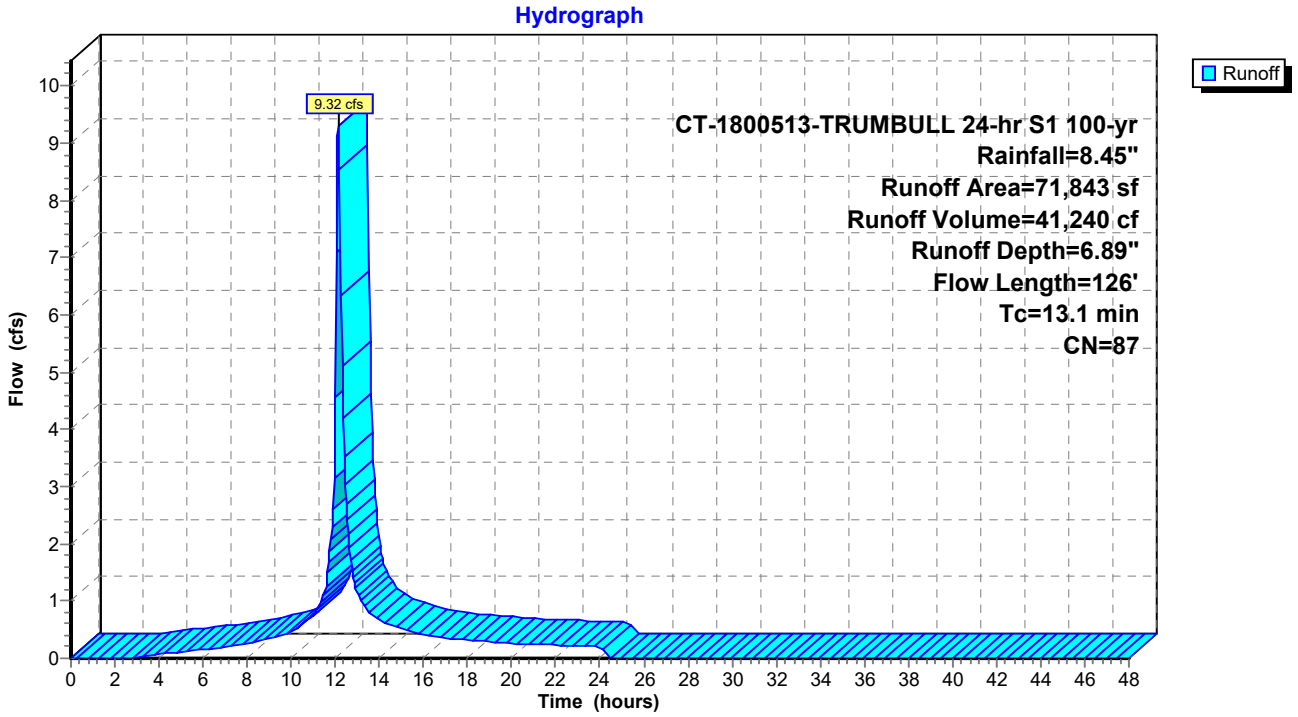
Runoff = 9.32 cfs @ 12.13 hrs, Volume= 41,240 cf, Depth= 6.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 100-yr Rainfall=8.45"

Area (sf)	CN	Description
10,617	74	>75% Grass cover, Good, HSG C
3,041	80	>75% Grass cover, Good, HSG D
13,488	73	Woods, Fair, HSG C
6,992	79	Woods, Fair, HSG D
37,705	98	Paved parking, HSG D
71,843	87	Weighted Average
34,138		47.52% Pervious Area
37,705		52.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	25	0.0286	0.12		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
6.5	20	0.0286	0.05		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	14	0.1429	0.09		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 2.00"
0.3	51	0.2553	2.53		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.2	16	0.0541	1.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
13.1	126	Total			

Subcatchment PDA-201: (new Subcat)



Summary for Subcatchment PDA-202: (new Subcat)

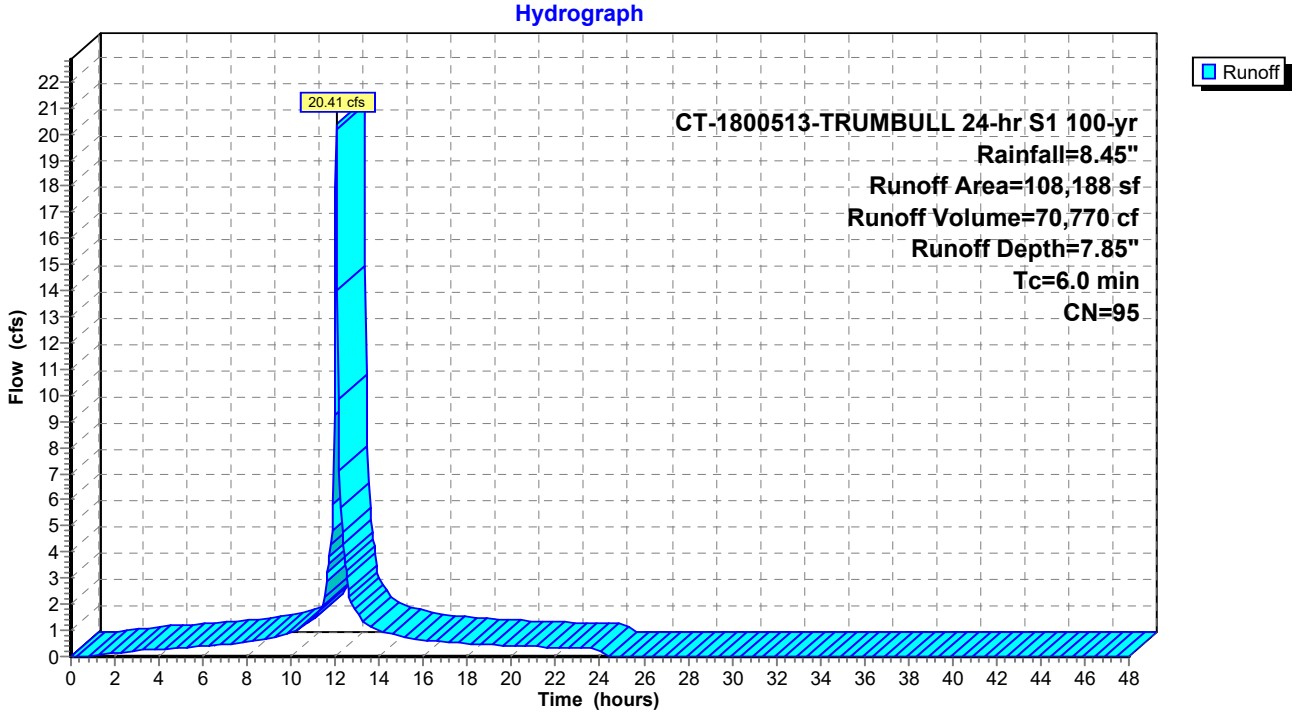
Runoff = 20.41 cfs @ 12.04 hrs, Volume= 70,770 cf, Depth= 7.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 100-yr Rainfall=8.45"

Area (sf)	CN	Description
14,378	74	>75% Grass cover, Good, HSG C
93,810	98	Paved parking, HSG D
108,188	95	Weighted Average
14,378		13.29% Pervious Area
93,810		86.71% Impervious Area

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

Subcatchment PDA-202: (new Subcat)



Summary for Subcatchment PDA-301: (new Subcat)

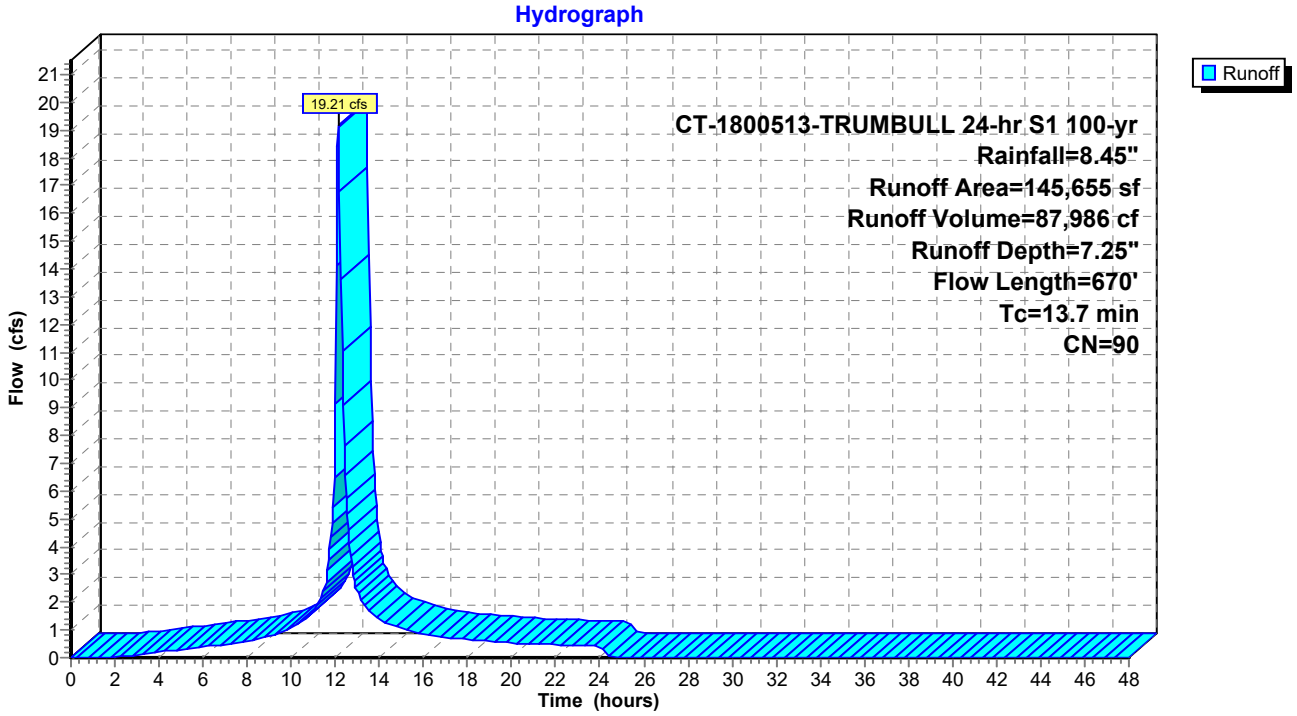
Runoff = 19.21 cfs @ 12.14 hrs, Volume= 87,986 cf, Depth= 7.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 100-yr Rainfall=8.45"

Area (sf)	CN	Description
32,607	74	>75% Grass cover, Good, HSG C
23,284	80	>75% Grass cover, Good, HSG D
1,896	79	Woods, Fair, HSG D
87,868	98	Paved parking, HSG D
145,655	90	Weighted Average
57,787		39.67% Pervious Area
87,868		60.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	70	0.0143	0.11		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"
3.0	600	0.0267	3.32		**Shallow Concentrated Flow, pavement** Paved Kv= 20.3 fps
13.7	670	Total			

Subcatchment PDA-301: (new Subcat)



Summary for Subcatchment PDA-302: (new Subcat)

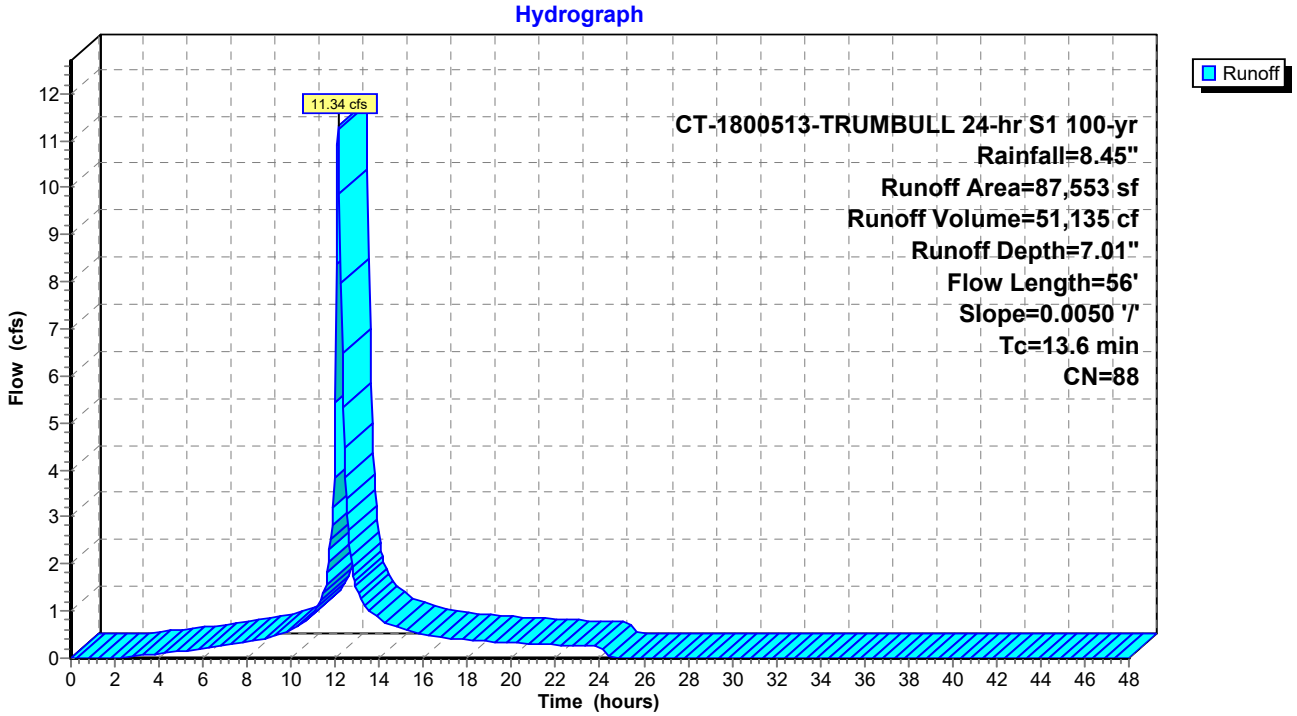
Runoff = 11.34 cfs @ 12.13 hrs, Volume= 51,135 cf, Depth= 7.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
CT-1800513-TRUMBULL 24-hr S1 100-yr Rainfall=8.45"

Area (sf)	CN	Description
35,824	74	>75% Grass cover, Good, HSG C
51,729	98	Paved parking, HSG D
87,553	88	Weighted Average
35,824		40.92% Pervious Area
51,729		59.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6	56	0.0050	0.07		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 2.00"

Subcatchment PDA-302: (new Subcat)



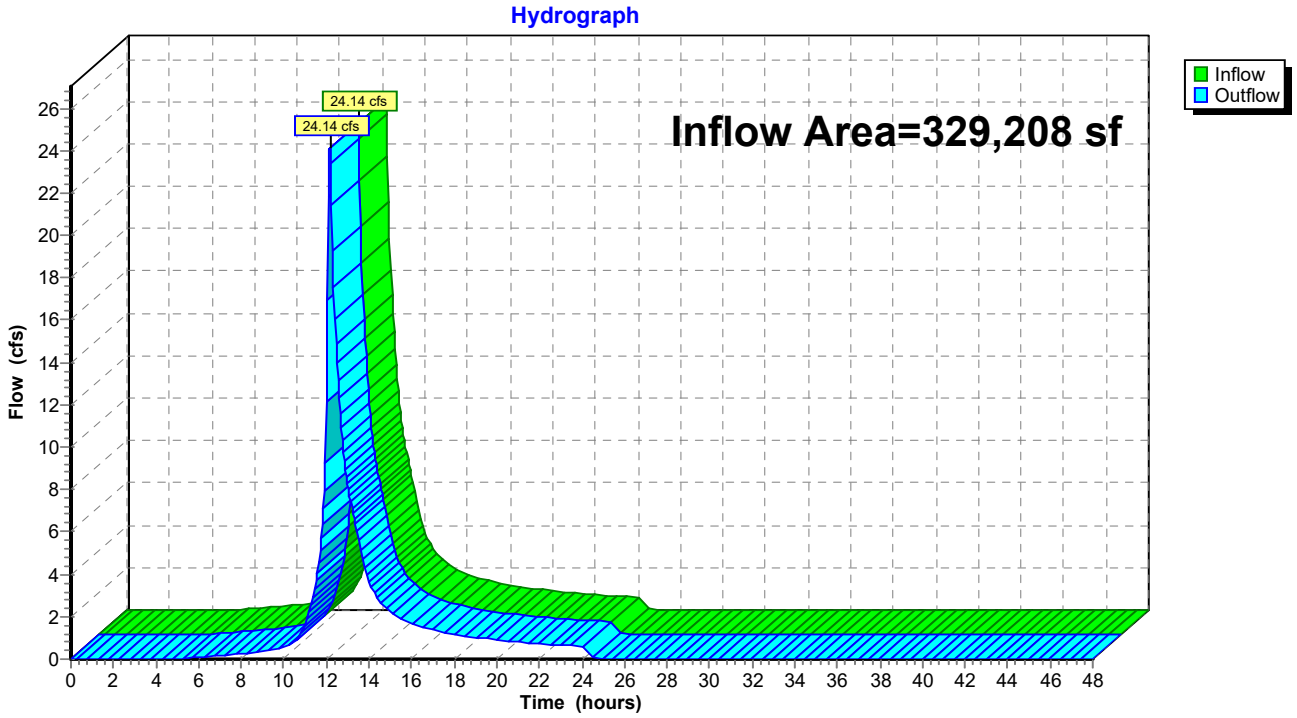
Summary for Reach PDA-100: PDA-100 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 329,208 sf, 48.95% Impervious, Inflow Depth = 5.20" for 100-yr event
Inflow = 24.14 cfs @ 12.16 hrs, Volume= 142,563 cf
Outflow = 24.14 cfs @ 12.16 hrs, Volume= 142,563 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-100: PDA-100 Overall



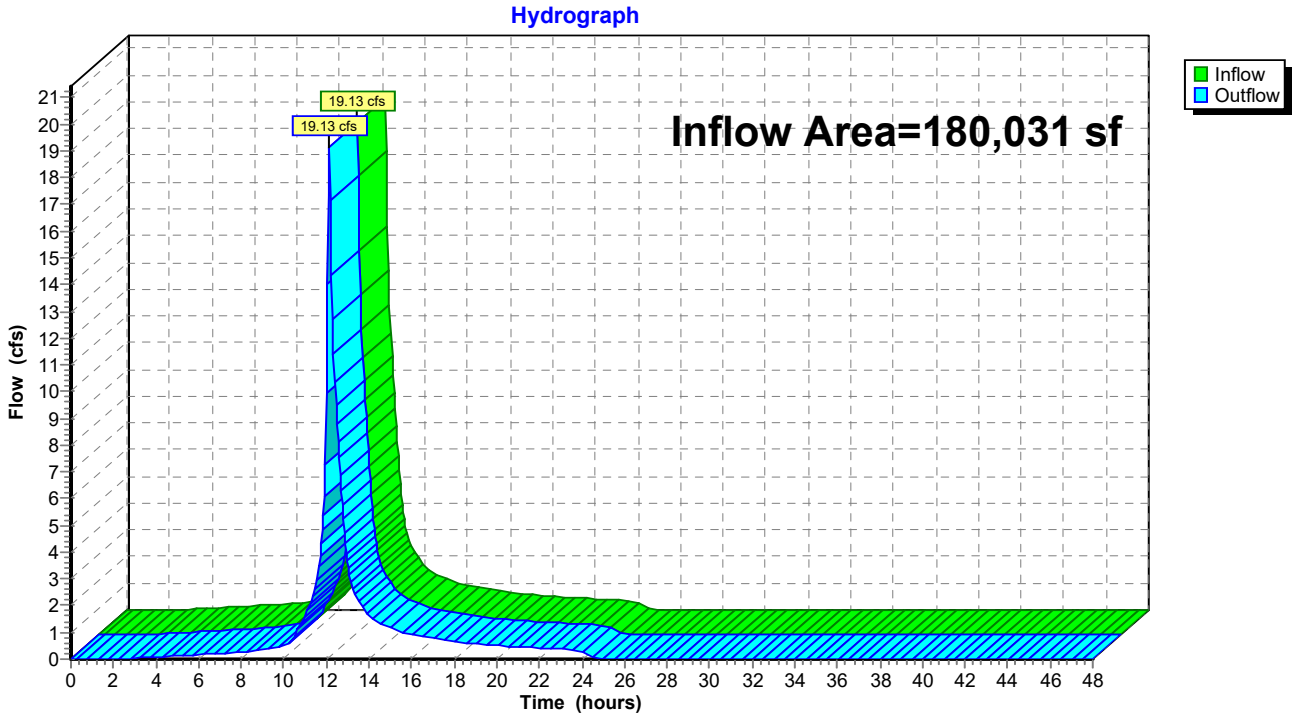
Summary for Reach PDA-200: PDA-200 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 180,031 sf, 73.05% Impervious, Inflow Depth = 5.91" for 100-yr event
Inflow = 19.13 cfs @ 12.15 hrs, Volume= 88,720 cf
Outflow = 19.13 cfs @ 12.15 hrs, Volume= 88,720 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-200: PDA-200 Overall



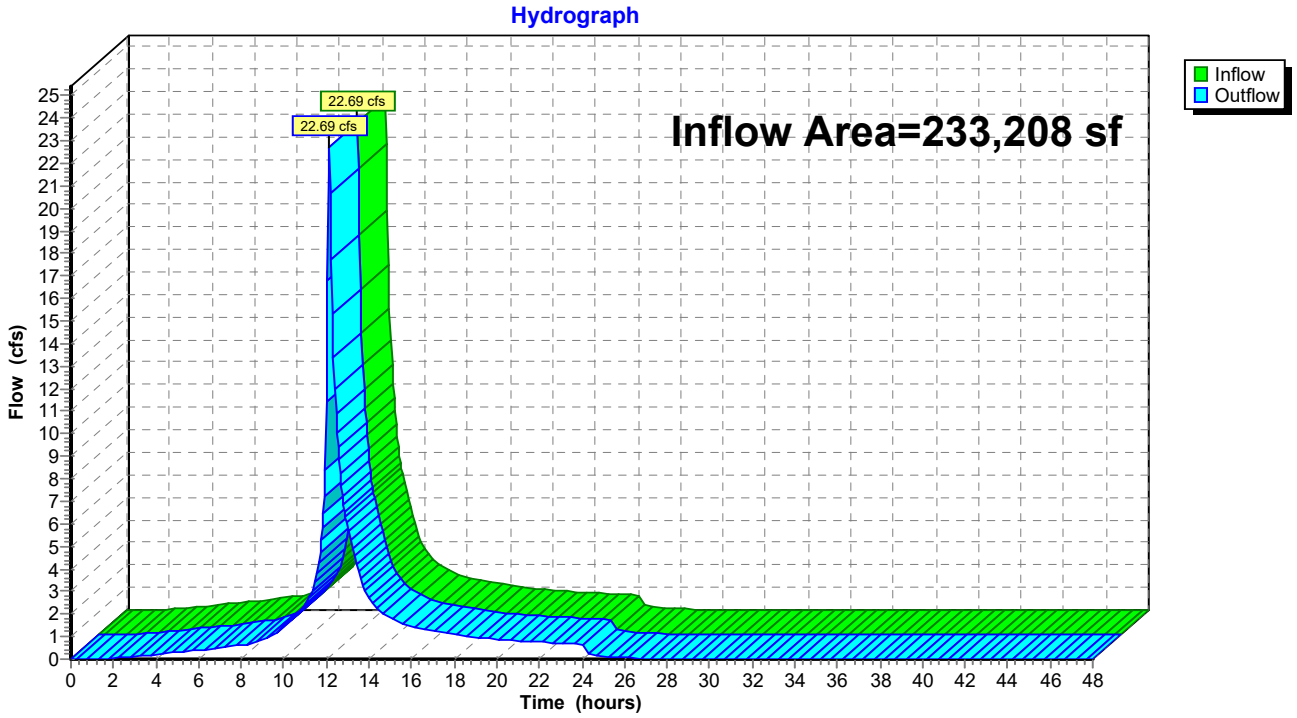
Summary for Reach PDA-300: PDA-300 Overall

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 233,208 sf, 59.86% Impervious, Inflow Depth = 6.94" for 100-yr event
Inflow = 22.69 cfs @ 12.14 hrs, Volume= 134,857 cf
Outflow = 22.69 cfs @ 12.14 hrs, Volume= 134,857 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Reach PDA-300: PDA-300 Overall



Summary for Pond P-1: UGS

Inflow Area =	183,046 sf,	80.06% Impervious,	Inflow Depth =	7.61"	for 100-yr event
Inflow =	34.11 cfs @	12.04 hrs,	Volume=	116,072 cf	
Outflow =	9.98 cfs @	12.25 hrs,	Volume=	116,072 cf,	Atten= 71%, Lag= 12.5 min
Discarded =	0.34 cfs @	3.80 hrs,	Volume=	39,885 cf	
Primary =	9.64 cfs @	12.25 hrs,	Volume=	76,187 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 301.49' @ 12.25 hrs Surf.Area= 9,814 sf Storage= 37,242 cf

Plug-Flow detention time= 171.2 min calculated for 116,072 cf (100% of inflow)
Center-of-Mass det. time= 171.1 min (940.2 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.50'	14,403 cf	**117.25'W x 83.70'L x 6.00'H Field A** 58,883 cf Overall - 22,875 cf Embedded = 36,008 cf x 40.0% Voids
#2A	296.50'	22,875 cf	**Cultec R-902HD** x 352 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 16 Rows of 22 Chambers Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf
		37,278 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.50'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	297.45'	**15.0" Round Culvert** L= 141.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 297.45' / 293.00' S= 0.0316 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.34 cfs @ 3.80 hrs HW=295.56' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=9.63 cfs @ 12.25 hrs HW=301.49' (Free Discharge)
└─**2=Culvert** (Inlet Controls 9.63 cfs @ 7.85 fps)

Pond P-1: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

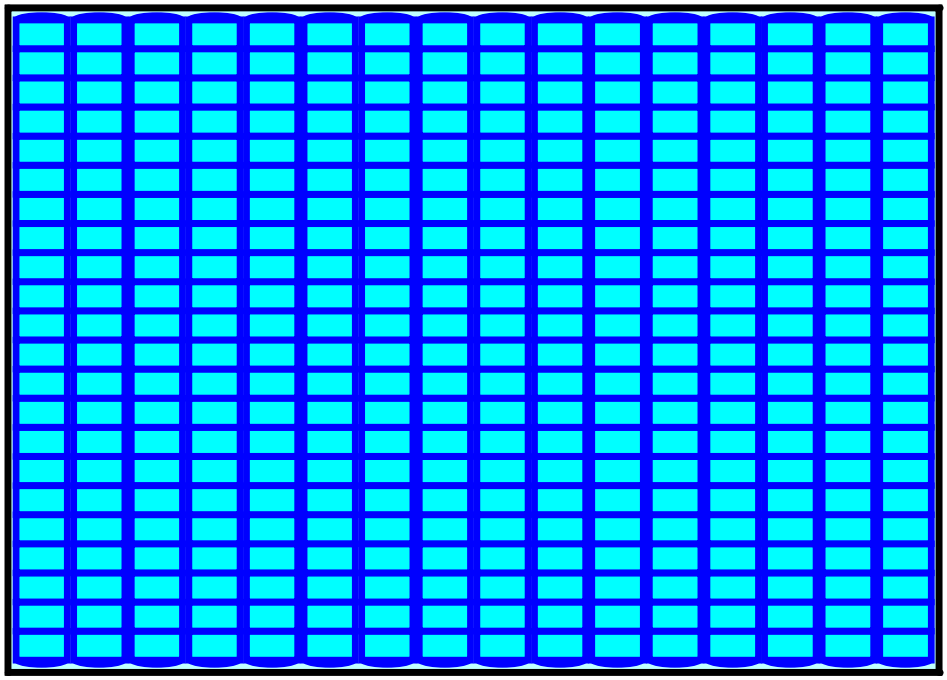
22 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 81.70' Row Length +12.0" End Stone x 2 = 83.70' Base Length
16 Rows x 78.0" Wide + 9.0" Spacing x 15 + 12.0" Side Stone x 2 = 117.25' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

352 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 16 Rows = 22,875.0 cf Chamber Storage

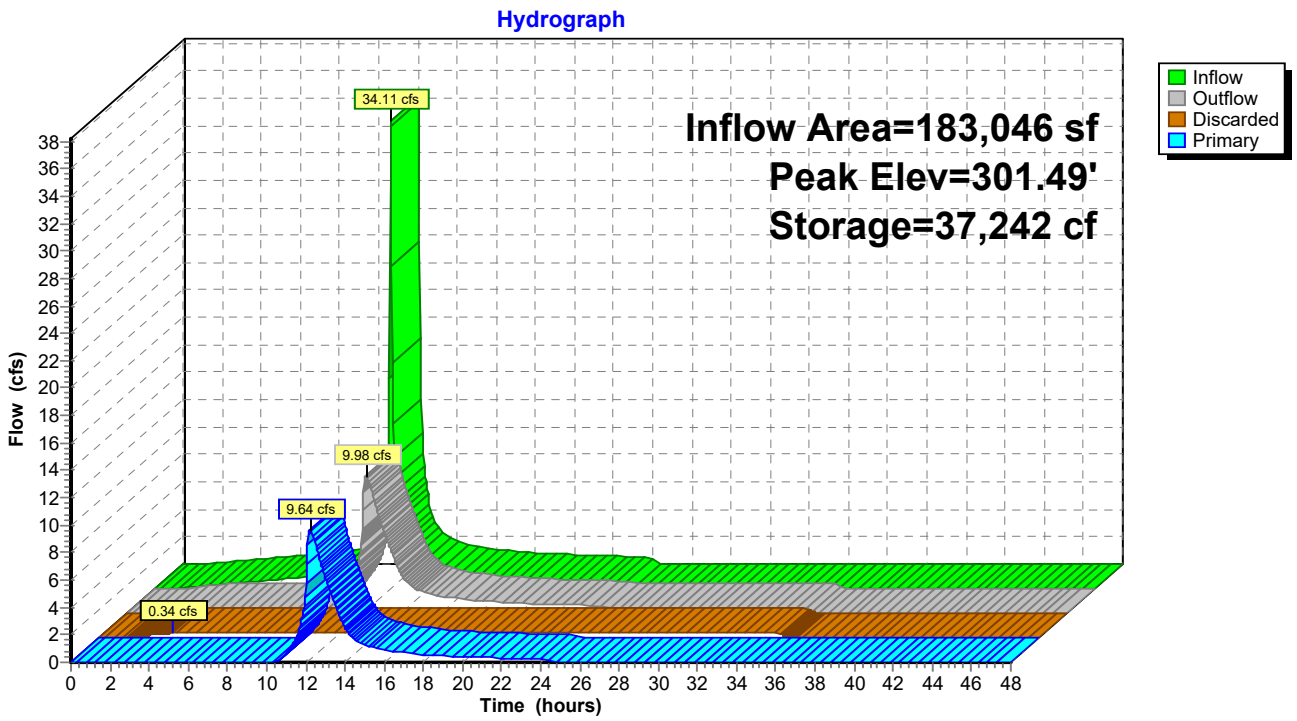
58,883.0 cf Field - 22,875.0 cf Chambers = 36,007.9 cf Stone x 40.0% Voids = 14,403.2 cf Stone Storage

Chamber Storage + Stone Storage = 37,278.2 cf = 0.856 af
Overall Storage Efficiency = 63.3%
Overall System Size = 83.70' x 117.25' x 6.00'

352 Chambers
2,180.9 cy Field
1,333.6 cy Stone



Pond P-1: UGS


Hydrograph
Inflow
Outflow
Discarded
Primary
Inflow Area=183,046 sf
Peak Elev=301.49'
Storage=37,242 cf
34.11 cfs
9.98 cfs
9.64 cfs
0.34 cfs
Flow (cfs)
Time (hours)

Summary for Pond P-2: UGS

Inflow Area =	108,188 sf, 86.71% Impervious,	Inflow Depth =	7.85"	for	100-yr event
Inflow =	20.41 cfs @	12.04 hrs,	Volume=	70,770 cf	
Outflow =	10.18 cfs @	12.16 hrs,	Volume=	70,770 cf,	Atten= 50%, Lag= 7.3 min
Discarded =	0.19 cfs @	2.80 hrs,	Volume=	23,290 cf	
Primary =	9.99 cfs @	12.16 hrs,	Volume=	47,480 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 300.26' @ 12.16 hrs Surf.Area= 5,362 sf Storage= 18,700 cf

Plug-Flow detention time= 173.3 min calculated for 70,696 cf (100% of inflow)
Center-of-Mass det. time= 173.9 min (933.0 - 759.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.00'	7,926 cf	**73.75'W x 72.70'L x 6.00'H Field A** 32,170 cf Overall - 12,355 cf Embedded = 19,815 cf x 40.0% Voids
#2A	296.00'	12,355 cf	**Cultec R-902HD** x 190 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 19 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		20,281 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.00'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	296.00'	**15.0" Round Culvert** L= 37.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 296.00' / 295.80' S= 0.0054 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Device 2	300.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 2	297.25'	**14.5" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.19 cfs @ 2.80 hrs HW=295.06' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=9.90 cfs @ 12.16 hrs HW=300.23' (Free Discharge)
└─**2=Culvert** (Inlet Controls 9.90 cfs @ 8.07 fps)
  ├─**3=Sharp-Crested Rectangular Weir** (Passes < 1.83 cfs potential flow)
  └─**4=Orifice/Grate** (Passes < 8.52 cfs potential flow)

Pond P-2: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

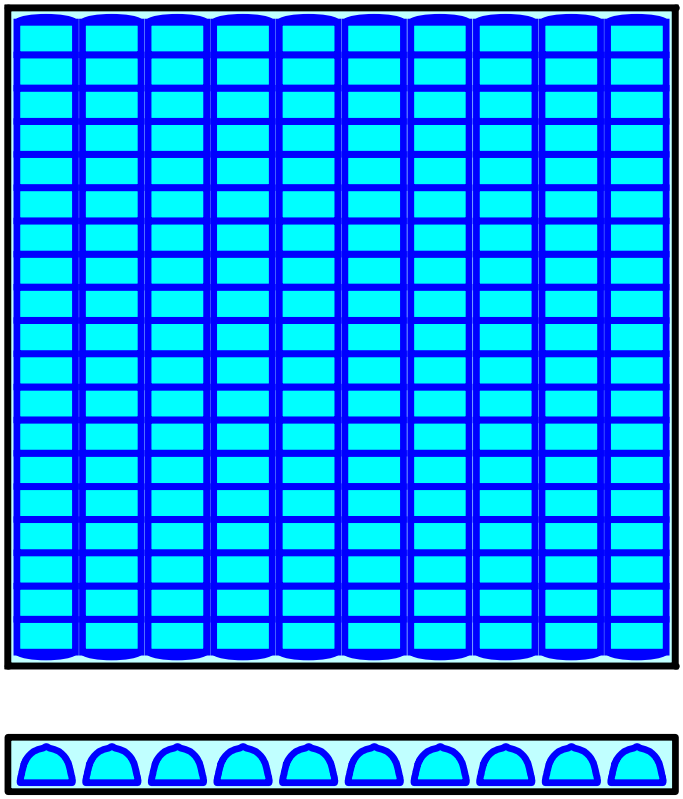
19 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 70.70' Row Length +12.0" End Stone x 2 = 72.70' Base Length
10 Rows x 78.0" Wide + 9.0" Spacing x 9 + 12.0" Side Stone x 2 = 73.75' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

190 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 10 Rows = 12,354.9 cf Chamber Storage

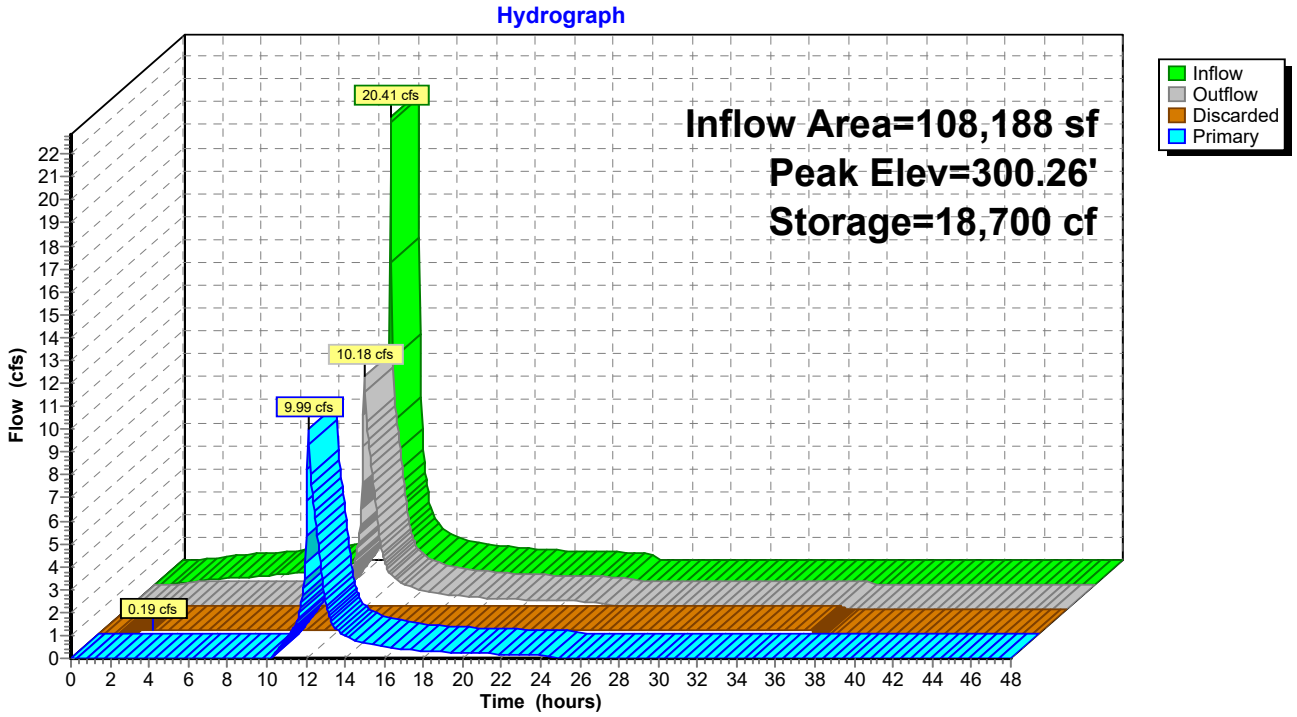
32,169.8 cf Field - 12,354.9 cf Chambers = 19,814.9 cf Stone x 40.0% Voids = 7,926.0 cf Stone Storage

Chamber Storage + Stone Storage = 20,280.8 cf = 0.466 af
Overall Storage Efficiency = 63.0%
Overall System Size = 72.70' x 73.75' x 6.00'

190 Chambers
1,191.5 cy Field
733.9 cy Stone



Pond P-2: UGS


Hydrograph
Inflow Area=108,188 sf
Peak Elev=300.26'
Storage=18,700 cf
20.41 cfs
10.18 cfs
9.99 cfs
0.19 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Pond P-3: Surface Pond

Inflow Area = 87,553 sf, 59.08% Impervious, Inflow Depth = 7.01" for 100-yr event
Inflow = 11.34 cfs @ 12.13 hrs, Volume= 51,135 cf
Outflow = 4.34 cfs @ 12.41 hrs, Volume= 46,871 cf, Atten= 62%, Lag= 16.7 min
Primary = 4.34 cfs @ 12.41 hrs, Volume= 46,871 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 305.49' @ 12.41 hrs Surf.Area= 8,024 sf Storage= 15,420 cf

Plug-Flow detention time= 134.4 min calculated for 46,822 cf (92% of inflow)
Center-of-Mass det. time= 88.1 min (885.4 - 797.3)

Volume	Invert	Avail.Storage	Storage Description
#1	301.00'	19,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

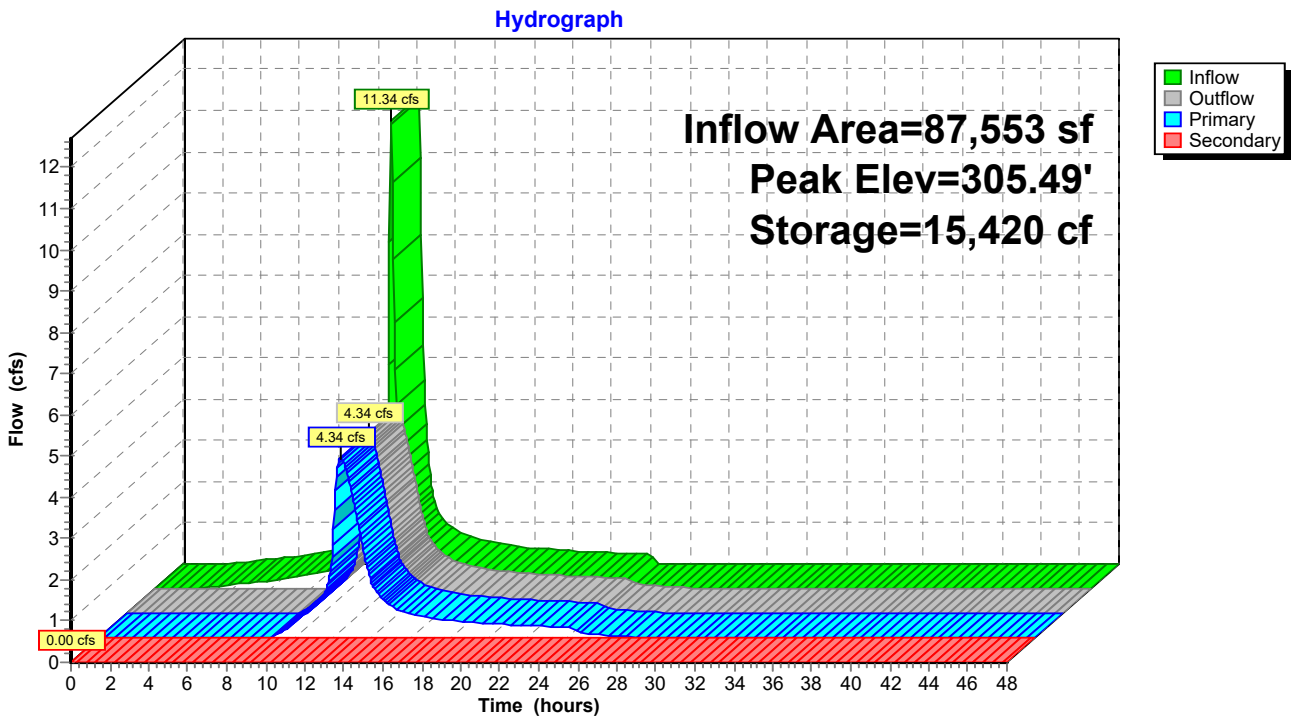
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
301.00	1	0	0
302.00	625	313	313
303.00	2,196	1,411	1,724
304.00	5,344	3,770	5,494
305.00	7,128	6,236	11,730
306.00	8,968	8,048	19,778

Device	Routing	Invert	Outlet Devices
#1	Primary	301.00'	**12.0" Round Culvert** L= 118.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 301.00' / 290.50' S= 0.0890 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	303.75'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	304.50'	**2.0" x 2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	305.50'	**30.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=4.34 cfs @ 12.41 hrs HW=305.49' (Free Discharge)
└─**1=Culvert** (Passes 4.34 cfs of 7.55 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 4.20 cfs @ 5.35 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.13 cfs @ 4.78 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=301.00' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-3: Surface Pond



APPENDIX C

PROPOSED HYDRAULIC ANALYSIS (10- AND 25-YEAR STORMS)

Computation Tables

Hydraulic Profiles

Conduit FlexTable: DOT Hydraulic Grade Line Computations

Label	Start Node	Stop Node	Diameter (in)	Size	Length (ft)	System Rational Flow (cfs)	Total System Flow (cfs)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Slope (Calculated) (ft/ft)	Invert (Start) (ft)	Invert (Stop) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)
CO-5	CB-22	CB-23	15.0	<None>	72.9	0.54	0.54	19.22	6.86	0.063	304.50	300.00	304.89	301.20	304.79	301.19	307.50	304.50
CO-6	CB-21	HS-04	15.0	<None>	15.2	4.73	4.73	8.88	7.35	0.019	306.00	305.83	307.29	307.12	306.88	306.56	312.53	310.00
Pipe - (8) (2) (STORM)	CB-34	CB-2	15.0	<None>	112.0	1.53	1.53	5.40	3.79	0.005	315.38	314.82	316.06	315.65	315.87	315.59	318.50	317.50
Pipe - (8) (STORM)	CB-1	CB-34	15.0	<None>	173.5	0.95	0.95	5.40	3.32	0.005	316.25	315.38	316.77	316.17	316.63	316.14	318.75	318.50
Pipe - (9) (STORM)	CB-2	CB-3	15.0	<None>	181.1	1.77	1.77	17.41	9.12	0.052	314.82	305.40	315.55	306.51	315.35	306.47	317.50	310.00
Pipe - (10) (STORM)	CB-3	CB-4	15.0	<None>	21.9	2.53	2.53	10.59	7.09	0.019	305.40	304.98	306.29	306.16	306.04	306.09	310.00	310.00
Pipe - (11) (STORM)	CB-4	CB-5	15.0	<None>	139.4	3.14	3.14	16.58	10.38	0.047	304.98	298.41	305.99	299.69	305.70	299.59	310.00	307.00
Pipe - (12) (STORM)	CB-6	CB-7	24.0	<None>	23.9	4.41	4.41	18.90	1.40	0.005	299.00	298.88	301.36	301.35	301.33	301.32	302.00	302.00
Pipe - (14) (STORM)	CB-7	CB-13	24.0	<None>	112.4	4.88	4.88	18.31	1.55	0.005	298.88	298.37	301.31	301.28	301.27	301.24	302.00	306.75
Pipe - (17) (STORM)	CB-11	CB-12	18.0	<None>	87.3	6.14	6.14	23.01	11.02	0.034	311.00	308.00	312.37	310.72	311.96	310.53	314.16	311.80
Pipe - (18) (STORM)	CB-12	CB-13	18.0	<None>	119.9	11.53	11.53	34.48	17.57	0.077	308.00	298.87	310.08	301.52	309.29	300.86	311.80	306.75
Pipe - (19) (STORM)	HS-02	CB-13	24.0	<None>	27.6	16.42	16.42	18.78	5.23	0.005	298.37	298.25	300.90	300.81	300.48	300.39	307.40	306.75
Pipe - (20) (STORM)	HS-02	O-2	24.0	<None>	10.8	16.33	16.33	19.52	6.96	0.005	298.25	298.19	300.40	300.34	299.71	299.60	307.40	301.50
Pipe - (23) (STORM)	CB-5	HS-01	15.0	<None>	8.5	3.42	3.42	5.40	4.66	0.005	298.41	298.37	299.60	299.57	299.45	299.44	307.00	307.50
Pipe - (24) (STORM)	HS-01	O-1	15.0	<None>	17.5	3.42	3.42	6.21	5.18	0.007	298.37	298.25	299.42	299.34	299.11	299.12	307.50	301.50
Pipe - (25) (STORM)	CB-8	CB-9	18.0	<None>	72.0	4.43	4.43	8.78	4.98	0.005	315.25	314.89	316.70	316.61	316.59	316.52	318.75	318.75
Pipe - (26) (STORM)	CB-9	CB-10	18.0	<None>	64.2	5.49	5.49	8.77	5.24	0.005	314.89	314.57	316.51	316.39	316.36	316.24	318.75	318.25
Pipe - (27) (STORM)	CB-10	CB-11	18.0	<None>	103.8	5.69	5.69	23.02	10.80	0.034	314.57	311.00	315.88	312.62	315.49	312.46	318.25	314.16
Pipe - (28) (STORM)	CB-14	CB-15	18.0	<None>	27.9	1.15	1.15	0.00	0.65	0.000	308.30	308.30	310.83	310.83	310.83	310.82	314.00	313.80
Pipe - (29) (STORM)	CB-15	CB-16	18.0	<None>	38.1	2.11	2.11	9.01	1.19	0.005	308.30	308.11	310.82	310.81	310.80	310.79	313.80	311.80
Pipe - (30) (STORM)	CB-16	CB-12	18.0	<None>	24.0	5.32	5.32	8.40	3.01	0.005	308.11	308.00	310.74	310.70	310.60	310.56	311.80	311.80
Pipe - (31) (STORM)	CB-31	CB-30	15.0	<None>	108.3	4.24	4.24	7.30	3.46	0.009	299.25	298.26	301.35	301.02	301.17	300.83	306.50	306.00
Pipe - (32) (STORM)	CB-28	CB-30	24.0	<None>	31.9	6.01	6.01	19.27	1.91	0.005	297.67	297.51	301.02	300.99	300.91	300.88	305.50	306.00
Pipe - (33) (STORM)	CB-29	CB-28	24.0	<None>	100.6	3.43	3.43	20.30	1.09	0.006	298.25	297.67	301.13	301.11	301.11	301.09	301.50	305.50
Pipe - (35) (STORM)	CB-30	HS-03	18.0	<None>	22.8	9.39	9.39	8.63	5.31	0.005	297.51	297.40	300.26	300.01	299.42	299.17	306.00	305.00
Pipe - (36) (STORM)	HS-03	O-3	24.0	<None>	26.1	9.36	9.36	12.82	4.46	0.002	297.40	297.34	299.39	299.33	299.06	299.00	305.00	301.00

Conduit FlexTable: DOT Hydraulic Grade Line Computations

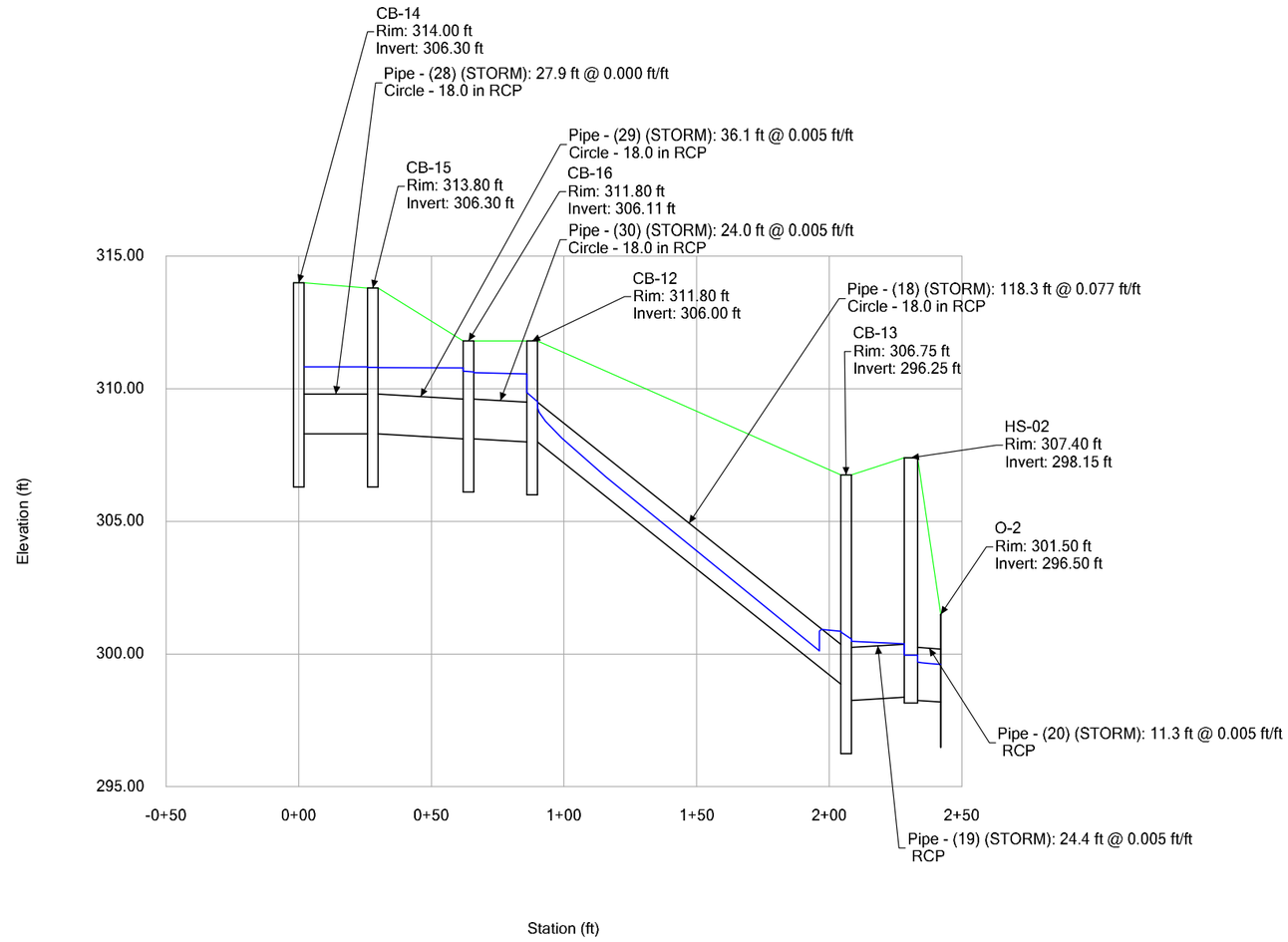
Label	Start Node	Stop Node	Diameter (in)	Size	Length (ft)	System Rational Flow (cfs)	Total System Flow (cfs)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Slope (Calculated) (ft/ft)	Invert (Start) (ft)	Invert (Stop) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)
Pipe - (38) (STORM)	CB-26	CB-27	18.0	<None>	24.0	1.39	1.39	13.66	0.79	0.012	299.25	298.96	301.18	301.18	301.17	301.17	309.30	309.30
Pipe - (39) (STORM)	CB-27	CB-28	24.0	<None>	158.1	3.42	3.42	18.90	1.09	0.005	298.46	297.67	301.16	301.11	301.13	301.08	309.30	305.50
Pipe - (41) (STORM)	CB-24	CB-25	24.0	<None>	24.0	1.68	1.68	18.89	0.53	0.005	299.02	298.90	301.19	301.19	301.19	301.19	302.06	302.06
Pipe - (42) (STORM)	CB-25	CB-27	24.0	<None>	88.8	1.79	1.79	19.01	0.57	0.005	298.90	298.46	301.18	301.18	301.18	301.17	302.06	309.30
Pipe - (43) (STORM)	CB-23	CB-24	24.0	<None>	20.0	1.33	1.33	18.90	0.42	0.005	299.12	299.02	301.19	301.19	301.19	301.19	304.50	302.06
Pipe - (44) (STORM)	HS-04	O-4	15.0	<None>	22.2	4.72	4.72	9.35	7.64	0.015	305.18	305.00	306.47	306.37	306.06	305.72	310.00	306.25
Pipe - (46) (STORM)	CB-18	CB-21	15.0	<None>	72.9	4.52	4.52	13.83	10.09	0.033	310.59	308.25	311.84	310.27	311.45	308.75	316.00	312.53
Pipe - (47) (STORM)	CB-20	CB-18	15.0	<None>	48.7	1.24	1.24	5.21	1.01	0.005	310.81	310.59	312.31	312.30	312.30	312.29	315.75	316.00
Pipe - (48) (STORM)	CB-19	CB-20	15.0	<None>	138.7	0.74	0.74	5.43	3.09	0.005	311.50	310.81	312.34	312.32	312.32	312.32	313.75	315.75
Pipe - (49) (STORM)	CB-17	CB-18	15.0	<None>	51.7	3.59	3.59	16.49	10.74	0.047	313.00	310.59	314.09	312.35	313.77	312.21	315.75	316.00
Pipe - (50) (STORM)	CB-32	CB-27	18.0	<None>	50.4	1.11	1.11	8.74	0.63	0.005	299.21	298.96	301.18	301.18	301.18	301.17	311.60	309.30
Pipe - (51) (STORM)	CB-33	CB-34	15.0	<None>	24.5	0.36	0.36	10.90	4.11	0.020	315.88	315.38	316.20	316.16	316.11	316.16	318.50	318.50
Pipe - (52) (STORM)	CB-35	CB-6	24.0	<None>	14.9	3.18	3.18	18.90	1.01	0.005	299.08	299.00	301.38	301.37	301.36	301.36	303.00	302.00
Pipe - (55) (STORM)	RL-5	CB-31	12.0	<None>	42.9	1.62	1.62	7.78	7.82	0.034	301.00	299.50	301.76	301.47	301.54	301.40	350.00	306.50
Pipe - (56) (STORM)	RL-4	CB-31	12.0	<None>	62.3	1.69	1.69	6.63	7.06	0.025	301.00	299.50	301.78	301.47	301.55	301.40	350.00	306.50
Pipe - (57) (STORM)	RL-3	CB-17	12.0	<None>	119.6	3.06	3.06	5.54	7.23	0.017	316.00	313.93	317.12	315.05	316.75	314.46	350.00	315.75
Pipe - (59) (STORM)	RL-2	CB-8	12.0	<None>	64.5	3.06	3.06	7.88	9.41	0.035	318.00	315.75	319.12	316.88	318.75	316.64	350.00	318.75
Pipe - (60) (STORM)	RL-1	CB-16	12.0	<None>	15.1	3.06	3.06	13.56	13.94	0.104	310.00	308.61	311.12	310.90	310.75	310.66	350.00	311.80

Conduit FlexTable: DOT Storm Drain Computations

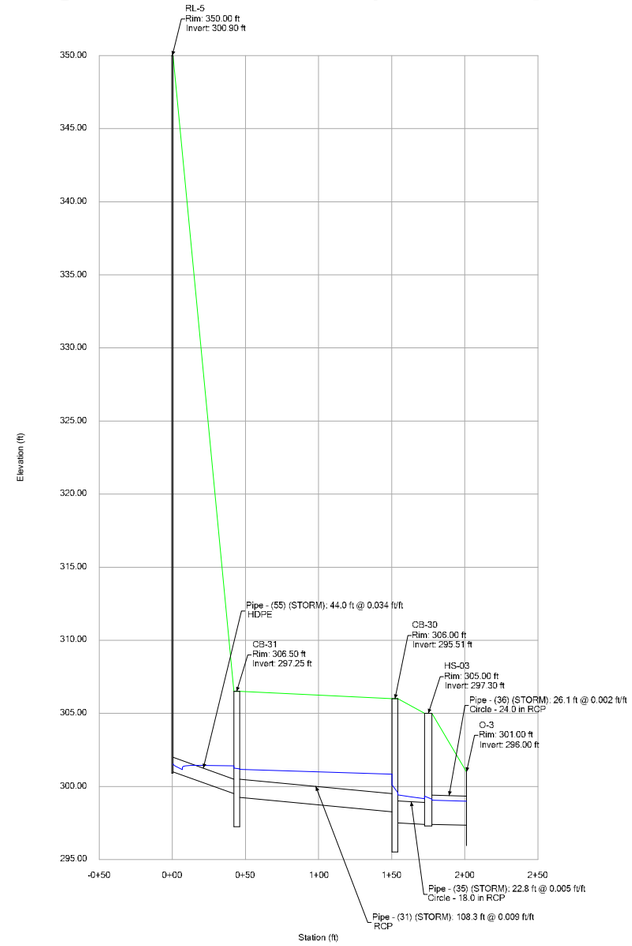
Start Node	Stop Node	Length (ft)	Upstream Inlet Area (acres)	Upstream Inlet C	System CA (acres)	System Flow Time (min)	System Intensity (in/h)	Flow (cfs)	Capacity (Full Flow) (cfs)	Diameter (in)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Slope (Calculated) (ft/ft)
HS-04	O-4	22.2	(N/A)	(N/A)	1.073	13.818	4.367	4.72	9.35	15.0	7.64	305.18	305.00	0.015
HS-01	O-1	17.5	(N/A)	(N/A)	0.556	8.000	6.094	3.42	6.21	15.0	5.18	298.37	298.25	0.007
HS-02	O-2	10.8	(N/A)	(N/A)	2.615	7.765	6.195	16.33	19.52	24.0	6.96	298.25	298.19	0.005
HS-02	CB-13	27.6	(N/A)	(N/A)	2.615	7.687	6.229	16.42	18.78	24.0	5.23	298.37	298.25	0.005
HS-03	O-3	26.1	(N/A)	(N/A)	2.041	13.018	4.548	9.36	12.82	24.0	4.46	297.40	297.34	0.002
CB-1	CB-34	173.5	(N/A)	(N/A)	0.136	6.000	6.958	0.95	5.40	15.0	3.32	316.25	315.38	0.005
CB-2	CB-3	181.1	(N/A)	(N/A)	0.276	7.364	6.369	1.77	17.41	15.0	9.12	314.82	305.40	0.052
CB-3	CB-4	21.9	(N/A)	(N/A)	0.403	7.695	6.226	2.53	10.59	15.0	7.09	305.40	304.98	0.019
CB-4	CB-5	139.4	(N/A)	(N/A)	0.502	7.747	6.203	3.14	16.58	15.0	10.38	304.98	298.41	0.047
CB-5	HS-01	8.5	(N/A)	(N/A)	0.556	7.970	6.107	3.42	5.40	15.0	4.66	298.41	298.37	0.005
CB-6	CB-7	23.9	(N/A)	(N/A)	0.638	6.246	6.852	4.41	18.90	24.0	1.40	299.00	298.88	0.005
CB-7	CB-13	112.4	(N/A)	(N/A)	0.720	6.530	6.729	4.88	18.31	24.0	1.55	298.88	298.37	0.005
CB-8	CB-9	72.0	(N/A)	(N/A)	0.636	6.114	6.909	4.43	8.78	18.0	4.98	315.25	314.89	0.005
CB-9	CB-10	64.2	(N/A)	(N/A)	0.801	6.355	6.805	5.49	8.77	18.0	5.24	314.89	314.57	0.005
CB-10	CB-11	103.8	(N/A)	(N/A)	0.841	6.559	6.717	5.69	23.02	18.0	10.80	314.57	311.00	0.034
CB-11	CB-12	87.3	(N/A)	(N/A)	0.916	6.719	6.647	6.14	23.01	18.0	11.02	311.00	308.00	0.034
CB-12	CB-13	119.9	(N/A)	(N/A)	1.795	7.351	6.374	11.53	34.48	18.0	17.57	308.00	298.87	0.077
CB-14	CB-15	27.9	(N/A)	(N/A)	0.164	6.000	6.958	1.15	0.00	18.0	0.65	308.30	308.30	0.000
CB-15	CB-16	38.1	(N/A)	(N/A)	0.315	6.715	6.649	2.11	9.01	18.0	1.19	308.30	308.11	0.005
CB-16	CB-12	24.0	(N/A)	(N/A)	0.820	7.218	6.432	5.32	8.40	18.0	3.01	308.11	308.00	0.005
CB-17	CB-18	51.7	(N/A)	(N/A)	0.806	13.600	4.416	3.59	16.49	15.0	10.74	313.00	310.59	0.047
CB-18	CB-21	72.9	(N/A)	(N/A)	1.020	13.680	4.398	4.52	13.83	15.0	10.09	310.59	308.25	0.033
CB-19	CB-20	138.7	(N/A)	(N/A)	0.105	6.000	6.958	0.74	5.43	15.0	3.09	311.50	310.81	0.005
CB-20	CB-18	48.7	(N/A)	(N/A)	0.185	6.740	6.638	1.24	5.21	15.0	1.01	310.81	310.59	0.005
CB-21	HS-04	15.2	(N/A)	(N/A)	1.073	13.798	4.372	4.73	8.88	15.0	7.35	306.00	305.83	0.019
CB-22	CB-23	72.9	(N/A)	(N/A)	0.077	6.000	6.958	0.54	19.22	15.0	6.86	304.50	300.00	0.063
CB-23	CB-24	20.0	(N/A)	(N/A)	0.192	6.172	6.884	1.33	18.90	24.0	0.42	299.12	299.02	0.005
CB-24	CB-25	24.0	(N/A)	(N/A)	0.254	6.959	6.544	1.68	18.89	24.0	0.53	299.02	298.90	0.005
CB-25	CB-27	88.8	(N/A)	(N/A)	0.285	7.710	6.219	1.79	19.01	24.0	0.57	298.90	298.46	0.005
CB-26	CB-27	24.0	(N/A)	(N/A)	0.198	6.000	6.958	1.39	13.66	18.0	0.79	299.25	298.96	0.012
CB-27	CB-28	158.1	(N/A)	(N/A)	0.657	10.261	5.171	3.42	18.90	24.0	1.09	298.46	297.67	0.005
CB-28	CB-30	31.9	(N/A)	(N/A)	1.290	12.678	4.625	6.01	19.27	24.0	1.91	297.67	297.51	0.005
CB-29	CB-28	100.6	(N/A)	(N/A)	0.489	6.000	6.958	3.43	20.30	24.0	1.09	298.25	297.67	0.006
CB-30	HS-03	22.8	(N/A)	(N/A)	2.041	12.946	4.564	9.39	8.63	18.0	5.31	297.51	297.40	0.005
CB-31	CB-30	108.3	(N/A)	(N/A)	0.610	6.143	6.896	4.24	7.30	15.0	3.46	299.25	298.26	0.009
CB-32	CB-27	50.4	(N/A)	(N/A)	0.158	6.000	6.958	1.11	8.74	18.0	0.63	299.21	298.96	0.005
CB-33	CB-34	24.5	(N/A)	(N/A)	0.052	6.000	6.958	0.36	10.90	15.0	4.11	315.88	315.38	0.020
CB-34	CB-2	112.0	(N/A)	(N/A)	0.231	6.872	6.581	1.53	5.40	15.0	3.79	315.38	314.82	0.005
CB-35	CB-6	14.9	(N/A)	(N/A)	0.453	6.000	6.958	3.18	18.90	24.0	1.01	299.08	299.00	0.005
RL-1	CB-16	15.1	(N/A)	(N/A)	0.437	6.000	6.958	3.06	13.56	12.0	13.94	310.00	308.61	0.104
RL-2	CB-8	64.5	(N/A)	(N/A)	0.437	6.000	6.958	3.06	7.88	12.0	9.41	318.00	315.75	0.035
RL-3	CB-17	119.6	(N/A)	(N/A)	0.437	6.000	6.958	3.06	5.54	12.0	7.23	316.00	313.93	0.017
RL-4	CB-31	62.3	(N/A)	(N/A)	0.241	6.000	6.958	1.69	6.63	12.0	7.06	301.00	299.50	0.025
RL-5	CB-31	42.9	(N/A)	(N/A)	0.231	6.000	6.958	1.62	7.78	12.0	7.82	301.00	299.50	0.034

Profile Report

Engineering Profile - CB-14 TO O-2 (1800513-Pipe Network.stsw)

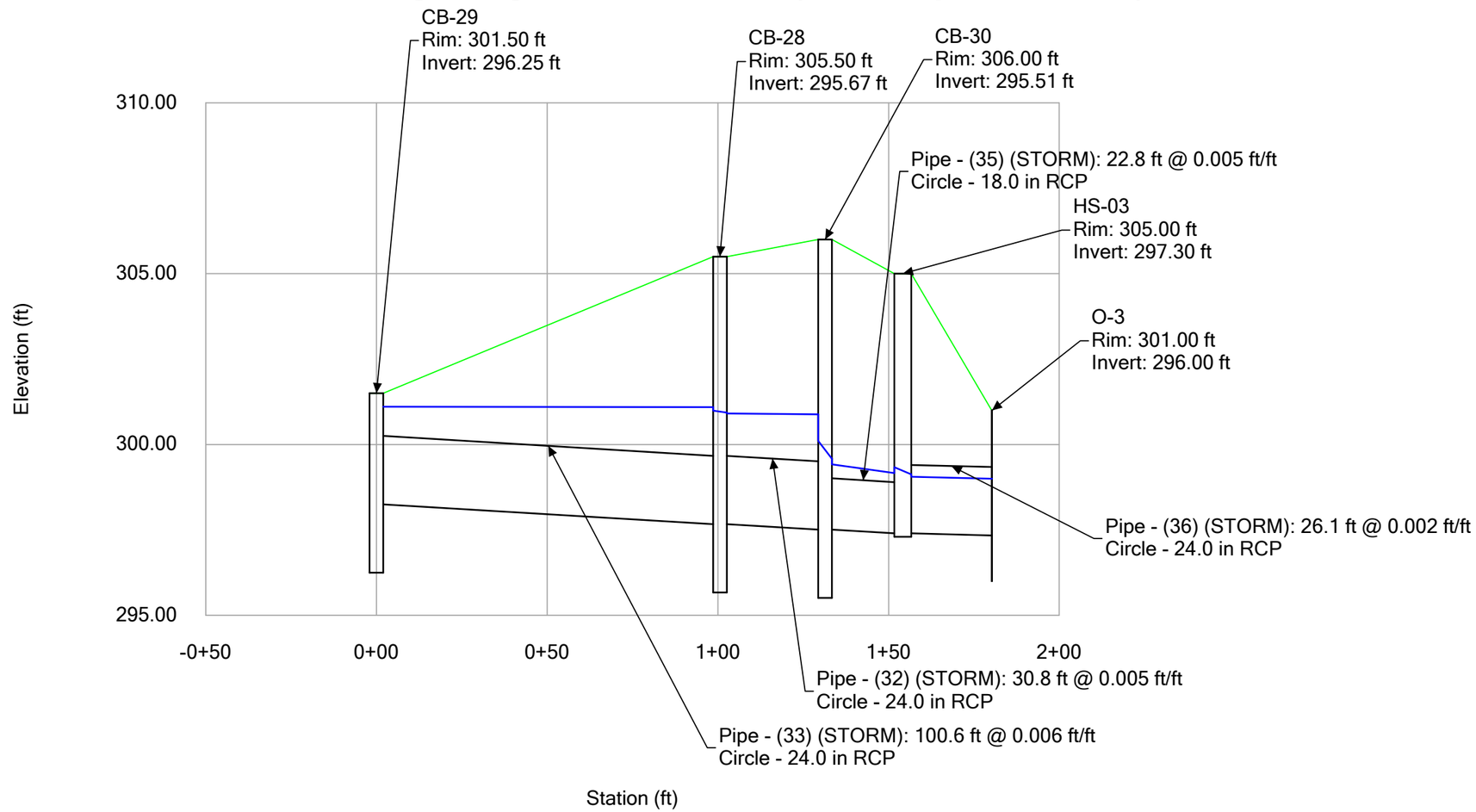


Profile Report
Engineering Profile - RL-5 TO O-3 (1800513-Pipe Network.stsw)

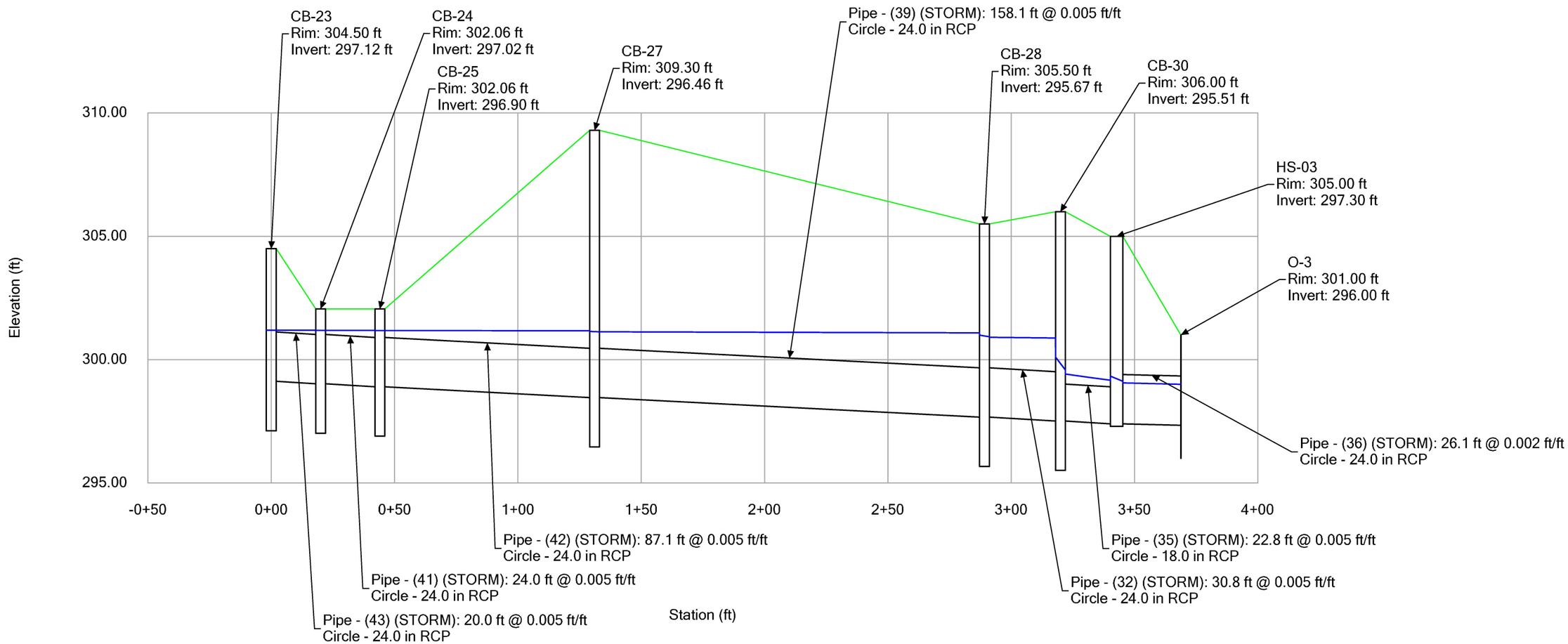


Profile Report

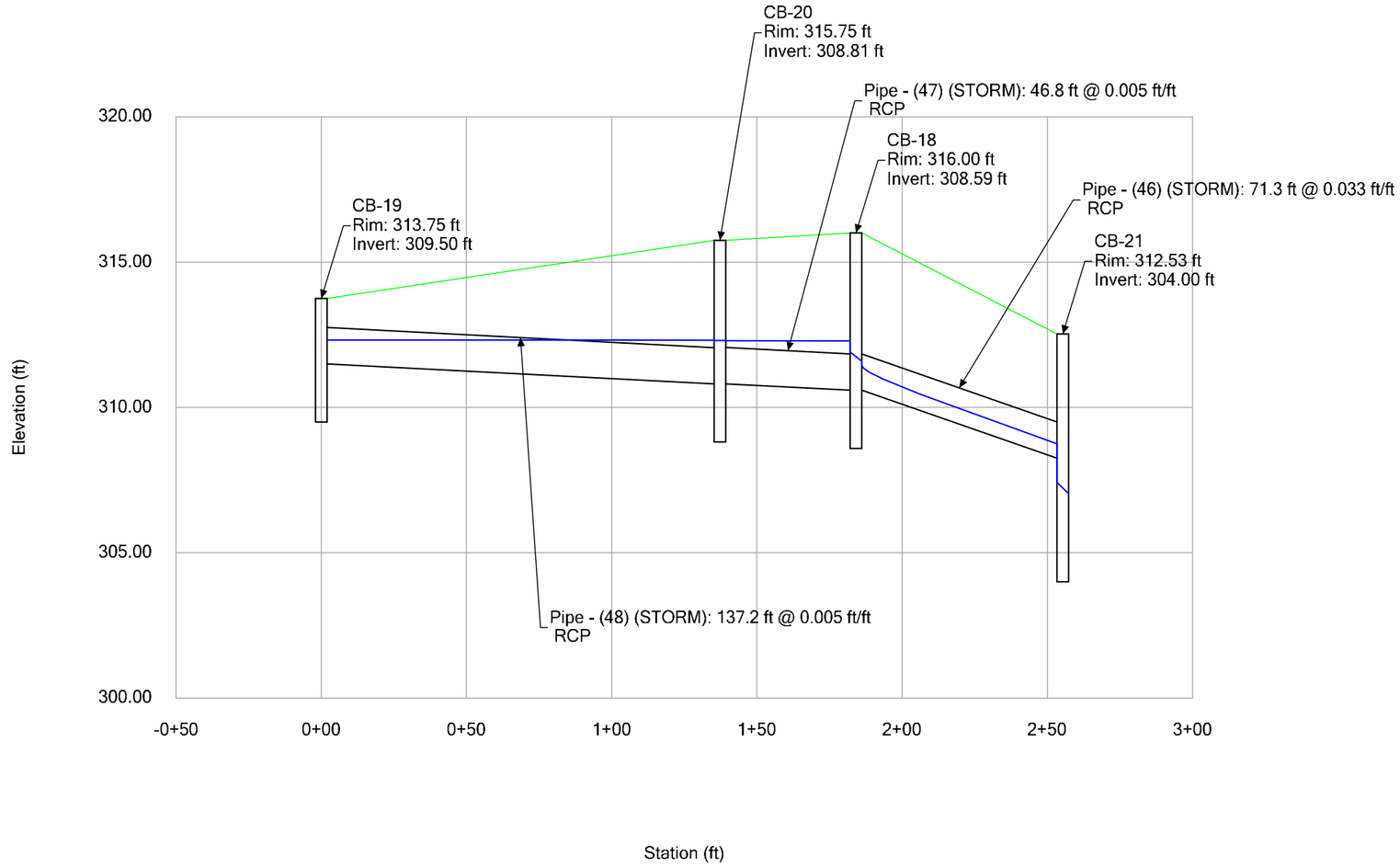
Engineering Profile - CB-29 TO O-3 (1800513-Pipe Network.stsw)



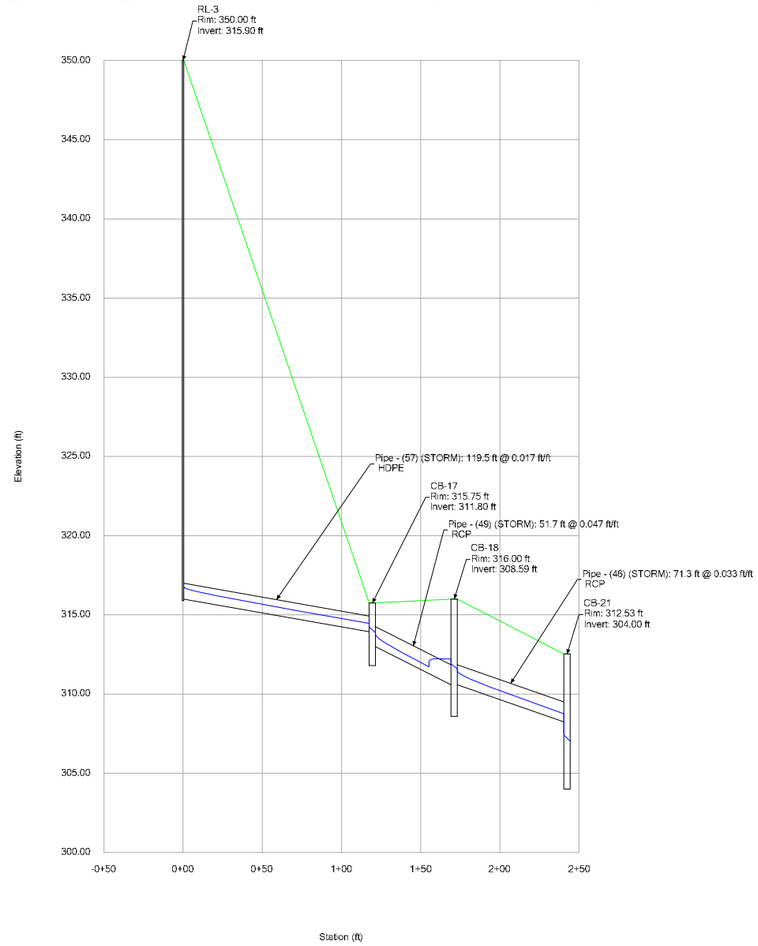
Profile Report
Engineering Profile - CB-22 TO O-4 (1800513-Pipe Network.stsw)



Profile Report
Engineering Profile - CB-19 TO O-4 (1800513-Pipe Network.stsw)

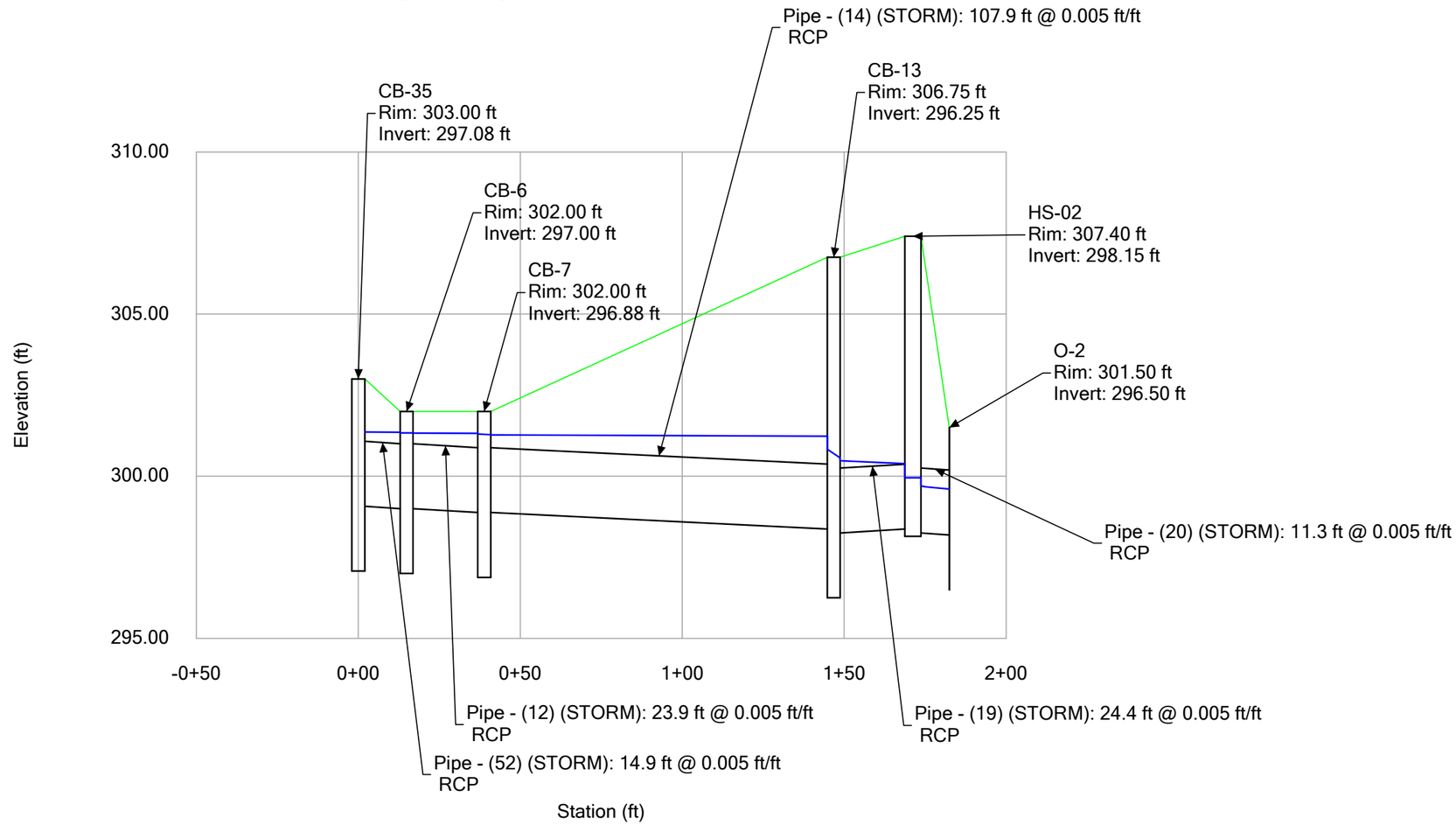


Profile Report
Engineering Profile - RL-3 TO O-4 (1800513-Pipe Network.stsw)



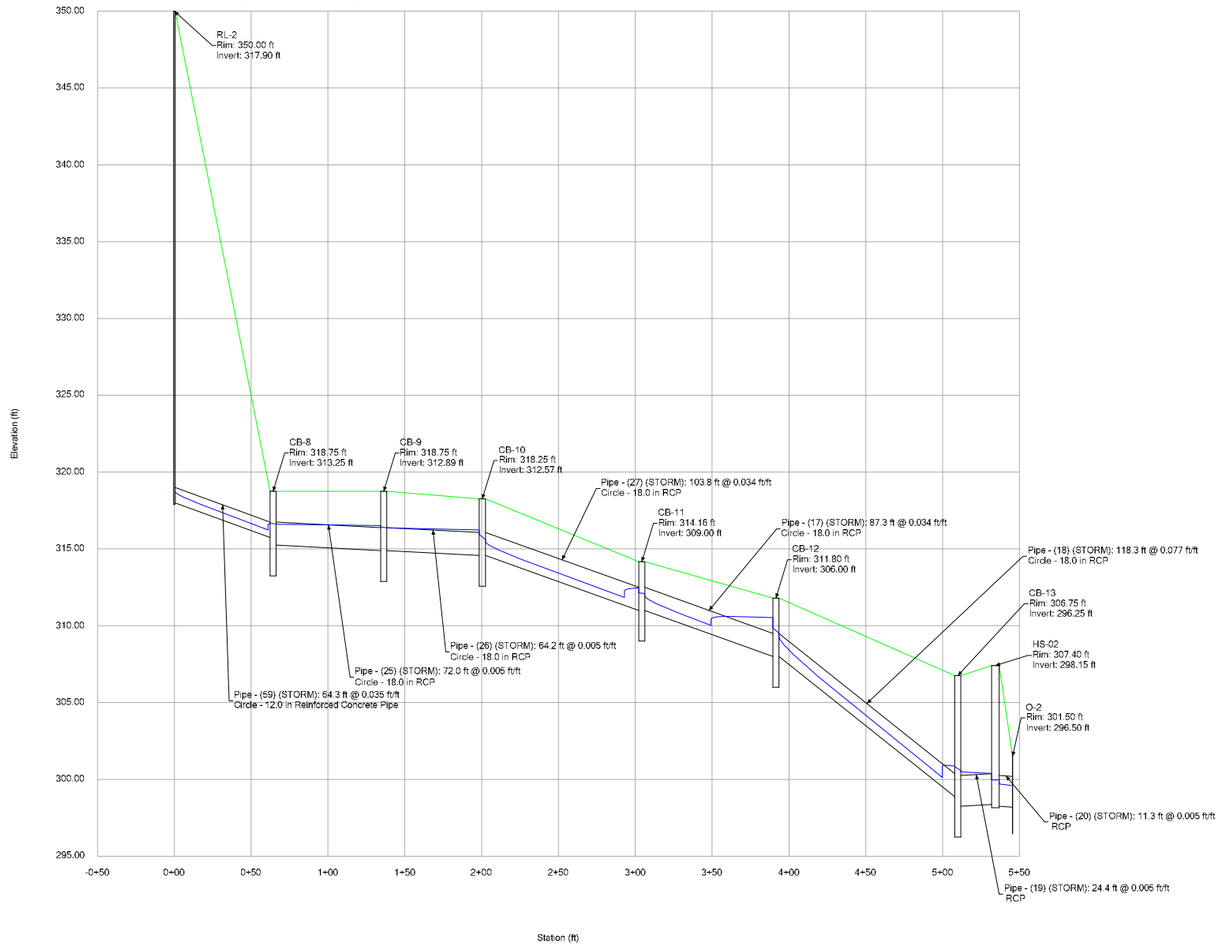
Profile Report

Engineering Profile - CB-35 TO O-2 (1800513-Pipe Network.stsw)

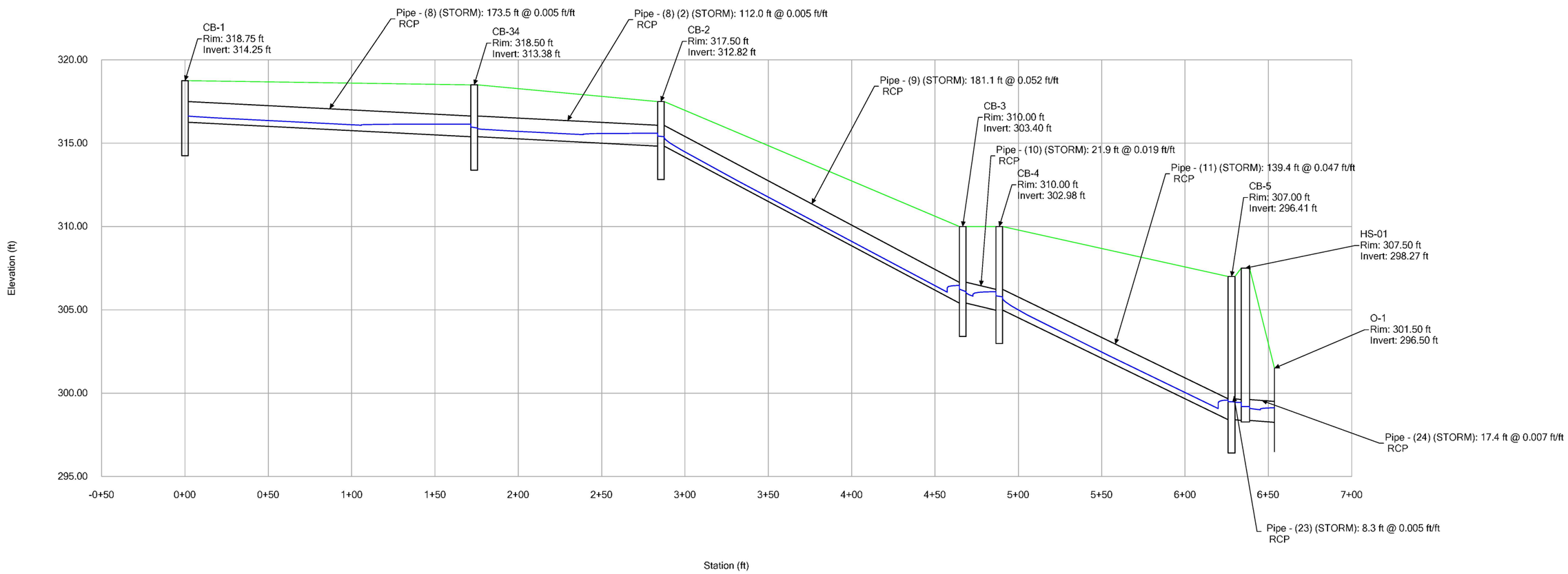


Profile Report

Engineering Profile - RL-2 TO O-2 (1800513-Pipe Network.stsw)



Profile Report
Engineering Profile - CB-1 TO O-1 (1800513-Pipe Network.stsw)



Conduit FlexTable: DOT Hydraulic Grade Line Computations

Label	Start Node	Stop Node	Diameter (in)	Size	Length (ft)	System Rational Flow (cfs)	Total System Flow (cfs)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Slope (Calculated) (ft/ft)	Invert (Start) (ft)	Invert (Stop) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)
CO-5	CB-22	CB-23	15.0	<None>	72.9	0.65	0.65	19.22	7.26	0.063	304.50	300.00	304.93	301.17	304.81	301.17	307.50	304.50
CO-6	CB-21	HS-04	15.0	<None>	15.2	5.66	5.66	8.88	7.67	0.019	306.00	305.83	307.45	307.01	306.96	306.64	312.53	310.00
Pipe - (8) (2) (STORM)	CB-34	CB-2	15.0	<None>	112.0	1.84	1.84	5.40	3.98	0.005	315.38	314.82	316.13	315.73	315.92	315.67	318.50	317.50
Pipe - (8) (STORM)	CB-1	CB-34	15.0	<None>	173.5	1.14	1.14	5.40	3.49	0.005	316.25	315.38	316.83	316.25	316.67	316.22	318.75	318.50
Pipe - (9) (STORM)	CB-2	CB-3	15.0	<None>	181.1	2.13	2.13	17.41	9.63	0.052	314.82	305.40	315.63	306.70	315.40	306.65	317.50	310.00
Pipe - (10) (STORM)	CB-3	CB-4	15.0	<None>	21.9	3.04	3.04	10.59	7.45	0.019	305.40	304.98	306.39	306.33	306.10	306.23	310.00	310.00
Pipe - (11) (STORM)	CB-4	CB-5	15.0	<None>	139.4	3.78	3.78	16.58	10.95	0.047	304.98	298.41	306.10	299.88	305.77	299.74	310.00	307.00
Pipe - (12) (STORM)	CB-6	CB-7	24.0	<None>	23.9	5.28	5.28	18.90	1.68	0.005	299.00	298.88	302.04	302.04	302.00	301.99	302.00	302.00
Pipe - (14) (STORM)	CB-7	CB-13	24.0	<None>	112.4	5.88	5.88	18.31	1.87	0.005	298.88	298.37	301.98	301.92	301.92	301.87	302.00	306.75
Pipe - (17) (STORM)	CB-11	CB-12	18.0	<None>	87.3	7.23	7.23	23.01	11.53	0.034	311.00	308.00	312.52	311.07	312.04	310.81	314.16	311.80
Pipe - (18) (STORM)	CB-12	CB-13	18.0	<None>	119.9	14.01	14.01	34.48	18.50	0.077	308.00	298.87	310.43	302.29	309.38	301.32	311.80	306.75
Pipe - (19) (STORM)	HS-02	CB-13	24.0	<None>	27.6	20.03	20.03	18.78	6.38	0.005	298.37	298.25	301.38	301.24	300.74	300.61	307.40	306.75
Pipe - (20) (STORM)	HS-02	O-2	24.0	<None>	10.8	19.94	19.94	19.52	7.08	0.005	298.25	298.19	300.71	300.65	299.93	299.87	307.40	301.50
Pipe - (23) (STORM)	CB-5	HS-01	15.0	<None>	8.5	4.12	4.12	5.40	4.84	0.005	298.41	298.37	299.77	299.74	299.58	299.57	307.00	307.50
Pipe - (24) (STORM)	HS-01	O-1	15.0	<None>	17.5	4.12	4.12	6.21	5.41	0.007	298.37	298.25	299.55	299.44	299.19	299.12	307.50	301.50
Pipe - (25) (STORM)	CB-8	CB-9	18.0	<None>	72.0	5.30	5.30	8.78	3.00	0.005	315.25	314.89	317.09	316.96	316.95	316.82	318.75	318.75
Pipe - (26) (STORM)	CB-9	CB-10	18.0	<None>	64.2	6.51	6.51	8.77	3.68	0.005	314.89	314.57	316.82	316.64	316.61	316.43	318.75	318.25
Pipe - (27) (STORM)	CB-10	CB-11	18.0	<None>	103.8	6.71	6.71	23.02	11.29	0.034	314.57	311.00	316.02	312.81	315.57	312.59	318.25	314.16
Pipe - (28) (STORM)	CB-14	CB-15	18.0	<None>	27.9	1.38	1.38	0.00	0.78	0.000	308.30	308.30	311.25	311.24	311.24	311.23	314.00	313.80
Pipe - (29) (STORM)	CB-15	CB-16	18.0	<None>	38.1	2.55	2.55	9.01	1.44	0.005	308.30	308.11	311.23	311.22	311.20	311.18	313.80	311.80
Pipe - (30) (STORM)	CB-16	CB-12	18.0	<None>	24.0	6.45	6.45	8.40	3.65	0.005	308.11	308.00	311.12	311.05	310.91	310.85	311.80	311.80
Pipe - (31) (STORM)	CB-31	CB-30	15.0	<None>	108.3	5.08	5.08	7.30	4.14	0.009	299.25	298.26	301.48	301.00	301.21	300.74	306.50	306.00
Pipe - (32) (STORM)	CB-28	CB-30	24.0	<None>	31.9	7.63	7.63	19.27	2.43	0.005	297.67	297.51	300.97	300.94	300.86	300.83	305.50	306.00
Pipe - (33) (STORM)	CB-29	CB-28	24.0	<None>	100.6	4.10	4.10	20.30	1.31	0.006	298.25	297.67	301.09	301.06	301.06	301.04	301.50	305.50
Pipe - (35) (STORM)	CB-30	HS-03	18.0	<None>	22.8	11.95	11.95	8.63	6.76	0.005	297.51	297.40	300.20	299.96	299.39	299.15	306.00	305.00
Pipe - (36) (STORM)	HS-03	O-3	24.0	<None>	26.1	11.92	11.92	12.82	4.64	0.002	297.40	297.34	299.36	299.30	299.02	298.96	305.00	301.00

Conduit FlexTable: DOT Hydraulic Grade Line Computations

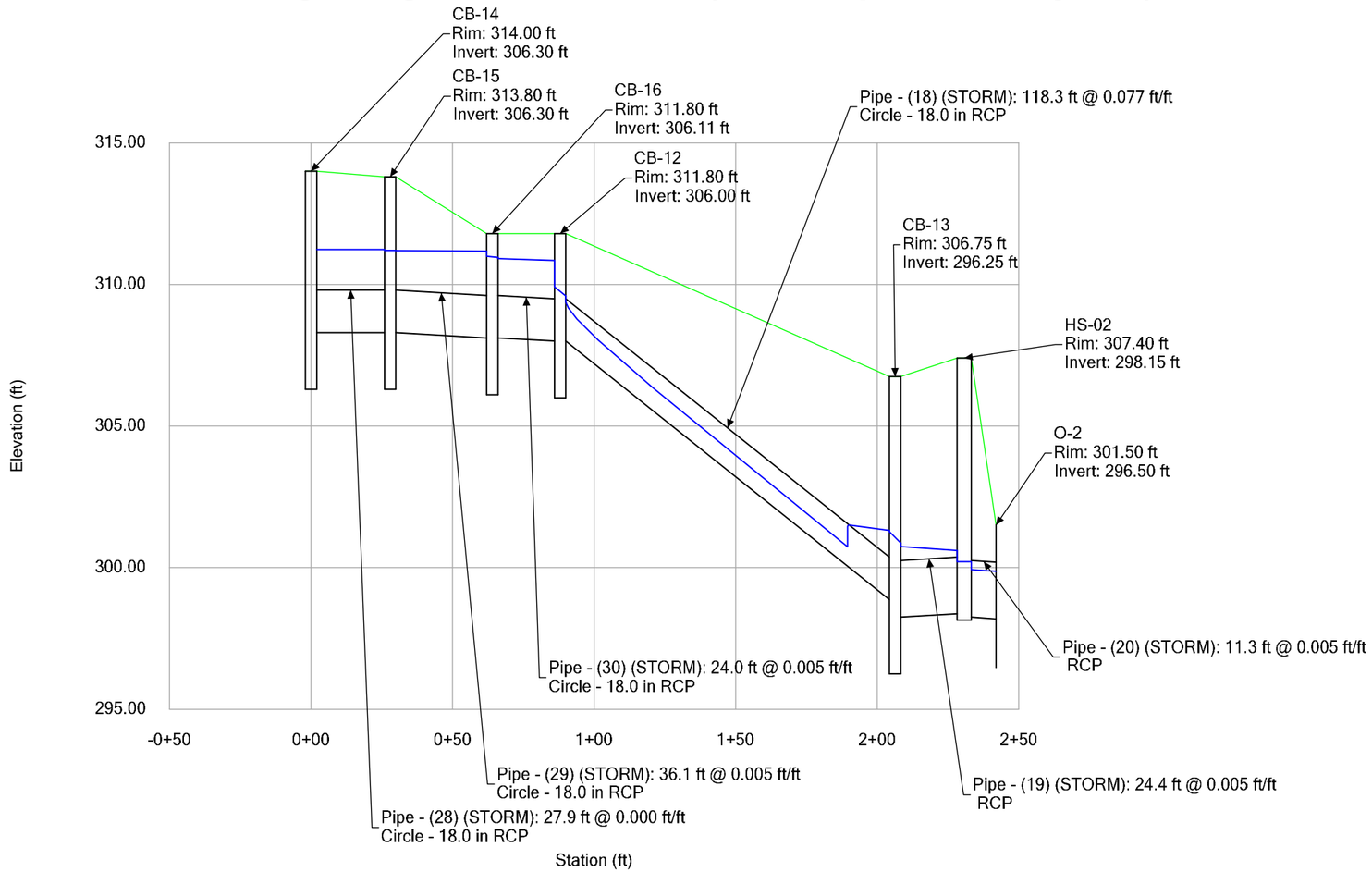
Label	Start Node	Stop Node	Diameter (in)	Size	Length (ft)	System Rational Flow (cfs)	Total System Flow (cfs)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Slope (Calculated) (ft/ft)	Invert (Start) (ft)	Invert (Stop) (ft)	Energy Grade Line (In) (ft)	Energy Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)
Pipe - (38) (STORM)	CB-26	CB-27	18.0	<None>	24.0	1.66	1.66	13.66	0.94	0.012	299.25	298.96	301.15	301.15	301.14	301.13	309.30	309.30
Pipe - (39) (STORM)	CB-27	CB-28	24.0	<None>	158.1	4.30	4.30	18.90	1.37	0.005	298.46	297.67	301.12	301.07	301.08	301.03	309.30	305.50
Pipe - (41) (STORM)	CB-24	CB-25	24.0	<None>	24.0	2.02	2.02	18.89	0.64	0.005	299.02	298.90	301.16	301.16	301.16	301.15	302.06	302.06
Pipe - (42) (STORM)	CB-25	CB-27	24.0	<None>	88.8	2.18	2.18	19.01	0.69	0.005	298.90	298.46	301.15	301.15	301.14	301.14	302.06	309.30
Pipe - (43) (STORM)	CB-23	CB-24	24.0	<None>	20.0	1.59	1.59	18.90	0.51	0.005	299.12	299.02	301.17	301.17	301.16	301.16	304.50	302.06
Pipe - (44) (STORM)	HS-04	O-4	15.0	<None>	22.2	5.66	5.66	9.35	7.98	0.015	305.18	305.00	306.63	306.52	306.14	305.80	310.00	306.25
Pipe - (46) (STORM)	CB-18	CB-21	15.0	<None>	72.9	5.42	5.42	13.83	10.58	0.033	310.59	308.25	312.00	310.45	311.53	308.81	316.00	312.53
Pipe - (47) (STORM)	CB-20	CB-18	15.0	<None>	48.7	1.48	1.48	5.21	1.21	0.005	310.81	310.59	312.53	312.52	312.51	312.49	315.75	316.00
Pipe - (48) (STORM)	CB-19	CB-20	15.0	<None>	138.7	0.88	0.88	5.43	3.25	0.005	311.50	310.81	312.56	312.54	312.55	312.54	313.75	315.75
Pipe - (49) (STORM)	CB-17	CB-18	15.0	<None>	51.7	4.30	4.30	16.49	11.30	0.047	313.00	310.59	314.21	312.58	313.84	312.39	315.75	316.00
Pipe - (50) (STORM)	CB-32	CB-27	18.0	<None>	50.4	1.33	1.33	8.74	0.75	0.005	299.21	298.96	301.15	301.15	301.14	301.14	311.60	309.30
Pipe - (51) (STORM)	CB-33	CB-34	15.0	<None>	24.5	0.44	0.44	10.90	4.33	0.020	315.88	315.38	316.25	316.24	316.20	316.23	318.50	318.50
Pipe - (52) (STORM)	CB-35	CB-6	24.0	<None>	14.9	3.80	3.80	18.90	1.21	0.005	299.08	299.00	302.06	302.05	302.03	302.03	303.00	302.00
Pipe - (55) (STORM)	RL-5	CB-31	12.0	<None>	42.9	1.94	1.94	7.78	8.22	0.034	301.00	299.50	301.84	301.64	301.59	301.55	350.00	306.50
Pipe - (56) (STORM)	RL-4	CB-31	12.0	<None>	62.3	2.02	2.02	6.63	7.42	0.025	301.00	299.50	301.86	301.65	301.61	301.54	350.00	306.50
Pipe - (57) (STORM)	RL-3	CB-17	12.0	<None>	119.6	3.67	3.67	5.54	7.54	0.017	316.00	313.93	317.26	314.95	316.82	314.52	350.00	315.75
Pipe - (59) (STORM)	RL-2	CB-8	12.0	<None>	64.5	3.67	3.67	7.88	9.85	0.035	318.00	315.75	319.26	317.32	318.82	316.98	350.00	318.75
Pipe - (60) (STORM)	RL-1	CB-16	12.0	<None>	15.1	3.67	3.67	13.56	4.67	0.104	310.00	308.61	311.44	311.34	311.10	311.00	350.00	311.80

Conduit FlexTable: DOT Storm Drain Computations

Start Node	Stop Node	Length (ft)	Upstream Inlet Area (acres)	Upstream Inlet C	System CA (acres)	System Flow Time (min)	System Intensity (in/h)	Flow (cfs)	Capacity (Full Flow) (cfs)	Diameter (in)	Velocity (ft/s)	Invert (Start) (ft)	Invert (Stop) (ft)	Slope (Calculated) (ft/ft)
HS-04	O-4	22.2	(N/A)	(N/A)	1.073	13.808	5.232	5.66	9.35	15.0	7.98	305.18	305.00	0.015
HS-01	O-1	17.5	(N/A)	(N/A)	0.556	7.901	7.343	4.12	6.21	15.0	5.41	298.37	298.25	0.007
HS-02	O-2	10.8	(N/A)	(N/A)	2.615	7.468	7.566	19.94	19.52	24.0	7.08	298.25	298.19	0.005
HS-02	CB-13	27.6	(N/A)	(N/A)	2.615	7.404	7.599	20.03	18.78	24.0	6.38	298.37	298.25	0.005
HS-03	O-3	26.1	(N/A)	(N/A)	2.041	11.726	5.794	11.92	12.82	24.0	4.64	297.40	297.34	0.002
CB-1	CB-34	173.5	(N/A)	(N/A)	0.136	6.000	8.324	1.14	5.40	15.0	3.49	316.25	315.38	0.005
CB-2	CB-3	181.1	(N/A)	(N/A)	0.276	7.298	7.654	2.13	17.41	15.0	9.63	314.82	305.40	0.052
CB-3	CB-4	21.9	(N/A)	(N/A)	0.403	7.611	7.493	3.04	10.59	15.0	7.45	305.40	304.98	0.019
CB-4	CB-5	139.4	(N/A)	(N/A)	0.502	7.660	7.467	3.78	16.58	15.0	10.95	304.98	298.41	0.047
CB-5	HS-01	8.5	(N/A)	(N/A)	0.556	7.873	7.358	4.12	5.40	15.0	4.84	298.41	298.37	0.005
CB-6	CB-7	23.9	(N/A)	(N/A)	0.638	6.206	8.218	5.28	18.90	24.0	1.68	299.00	298.88	0.005
CB-7	CB-13	112.4	(N/A)	(N/A)	0.720	6.443	8.096	5.88	18.31	24.0	1.87	298.88	298.37	0.005
CB-8	CB-9	72.0	(N/A)	(N/A)	0.636	6.109	8.268	5.30	8.78	18.0	3.00	315.25	314.89	0.005
CB-9	CB-10	64.2	(N/A)	(N/A)	0.801	6.509	8.062	6.51	8.77	18.0	3.68	314.89	314.57	0.005
CB-10	CB-11	103.8	(N/A)	(N/A)	0.841	6.799	7.912	6.71	23.02	18.0	11.29	314.57	311.00	0.034
CB-11	CB-12	87.3	(N/A)	(N/A)	0.916	6.952	7.833	7.23	23.01	18.0	11.53	311.00	308.00	0.034
CB-12	CB-13	119.9	(N/A)	(N/A)	1.795	7.125	7.744	14.01	34.48	18.0	18.50	308.00	298.87	0.077
CB-14	CB-15	27.9	(N/A)	(N/A)	0.164	6.000	8.324	1.38	0.00	18.0	0.78	308.30	308.30	0.000
CB-15	CB-16	38.1	(N/A)	(N/A)	0.315	6.598	8.016	2.55	9.01	18.0	1.44	308.30	308.11	0.005
CB-16	CB-12	24.0	(N/A)	(N/A)	0.820	7.015	7.800	6.45	8.40	18.0	3.65	308.11	308.00	0.005
CB-17	CB-18	51.7	(N/A)	(N/A)	0.806	13.600	5.288	4.30	16.49	15.0	11.30	313.00	310.59	0.047
CB-18	CB-21	72.9	(N/A)	(N/A)	1.020	13.676	5.267	5.42	13.83	15.0	10.58	310.59	308.25	0.033
CB-19	CB-20	138.7	(N/A)	(N/A)	0.105	6.000	8.324	0.88	5.43	15.0	3.25	311.50	310.81	0.005
CB-20	CB-18	48.7	(N/A)	(N/A)	0.185	6.703	7.961	1.48	5.21	15.0	1.21	310.81	310.59	0.005
CB-21	HS-04	15.2	(N/A)	(N/A)	1.073	13.788	5.237	5.66	8.88	15.0	7.67	306.00	305.83	0.019
CB-22	CB-23	72.9	(N/A)	(N/A)	0.077	6.000	8.324	0.65	19.22	15.0	7.26	304.50	300.00	0.063
CB-23	CB-24	20.0	(N/A)	(N/A)	0.192	6.163	8.240	1.59	18.90	24.0	0.51	299.12	299.02	0.005
CB-24	CB-25	24.0	(N/A)	(N/A)	0.254	6.820	7.901	2.02	18.89	24.0	0.64	299.02	298.90	0.005
CB-25	CB-27	88.8	(N/A)	(N/A)	0.285	7.442	7.580	2.18	19.01	24.0	0.69	298.90	298.46	0.005
CB-26	CB-27	24.0	(N/A)	(N/A)	0.198	6.000	8.324	1.66	13.66	18.0	0.94	299.25	298.96	0.012
CB-27	CB-28	158.1	(N/A)	(N/A)	0.657	9.535	6.500	4.30	18.90	24.0	1.37	298.46	297.67	0.005
CB-28	CB-30	31.9	(N/A)	(N/A)	1.290	11.458	5.866	7.63	19.27	24.0	2.43	297.67	297.51	0.005
CB-29	CB-28	100.6	(N/A)	(N/A)	0.489	6.000	8.324	4.10	20.30	24.0	1.31	298.25	297.67	0.006
CB-30	HS-03	22.8	(N/A)	(N/A)	2.041	11.670	5.809	11.95	8.63	18.0	6.76	297.51	297.40	0.005
CB-31	CB-30	108.3	(N/A)	(N/A)	0.610	6.136	8.254	5.08	7.30	15.0	4.14	299.25	298.26	0.009
CB-32	CB-27	50.4	(N/A)	(N/A)	0.158	6.000	8.324	1.33	8.74	18.0	0.75	299.21	298.96	0.005
CB-33	CB-34	24.5	(N/A)	(N/A)	0.052	6.000	8.324	0.44	10.90	15.0	4.33	315.88	315.38	0.020
CB-34	CB-2	112.0	(N/A)	(N/A)	0.231	6.829	7.896	1.84	5.40	15.0	3.98	315.38	314.82	0.005
CB-35	CB-6	14.9	(N/A)	(N/A)	0.453	6.000	8.324	3.80	18.90	24.0	1.21	299.08	299.00	0.005
RL-1	CB-16	15.1	(N/A)	(N/A)	0.437	6.000	8.324	3.67	13.56	12.0	4.67	310.00	308.61	0.104
RL-2	CB-8	64.5	(N/A)	(N/A)	0.437	6.000	8.324	3.67	7.88	12.0	9.85	318.00	315.75	0.035
RL-3	CB-17	119.6	(N/A)	(N/A)	0.437	6.000	8.324	3.67	5.54	12.0	7.54	316.00	313.93	0.017
RL-4	CB-31	62.3	(N/A)	(N/A)	0.241	6.000	8.324	2.02	6.63	12.0	7.42	301.00	299.50	0.025
RL-5	CB-31	42.9	(N/A)	(N/A)	0.231	6.000	8.324	1.94	7.78	12.0	8.22	301.00	299.50	0.034

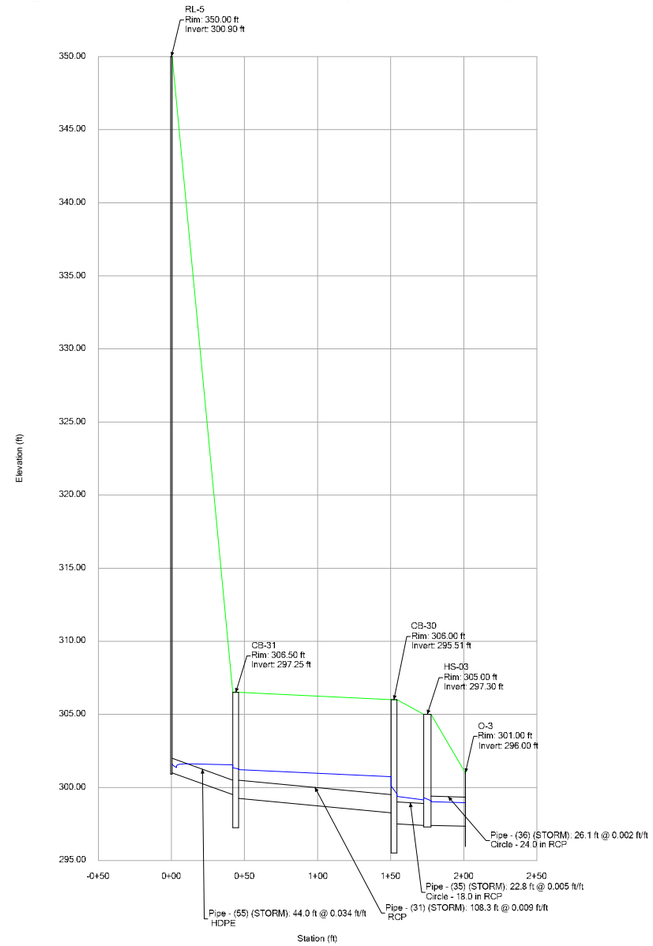
Profile Report

Engineering Profile - CB-14 TO O-2 (1800513-Pipe Network-25 yr.stsw)



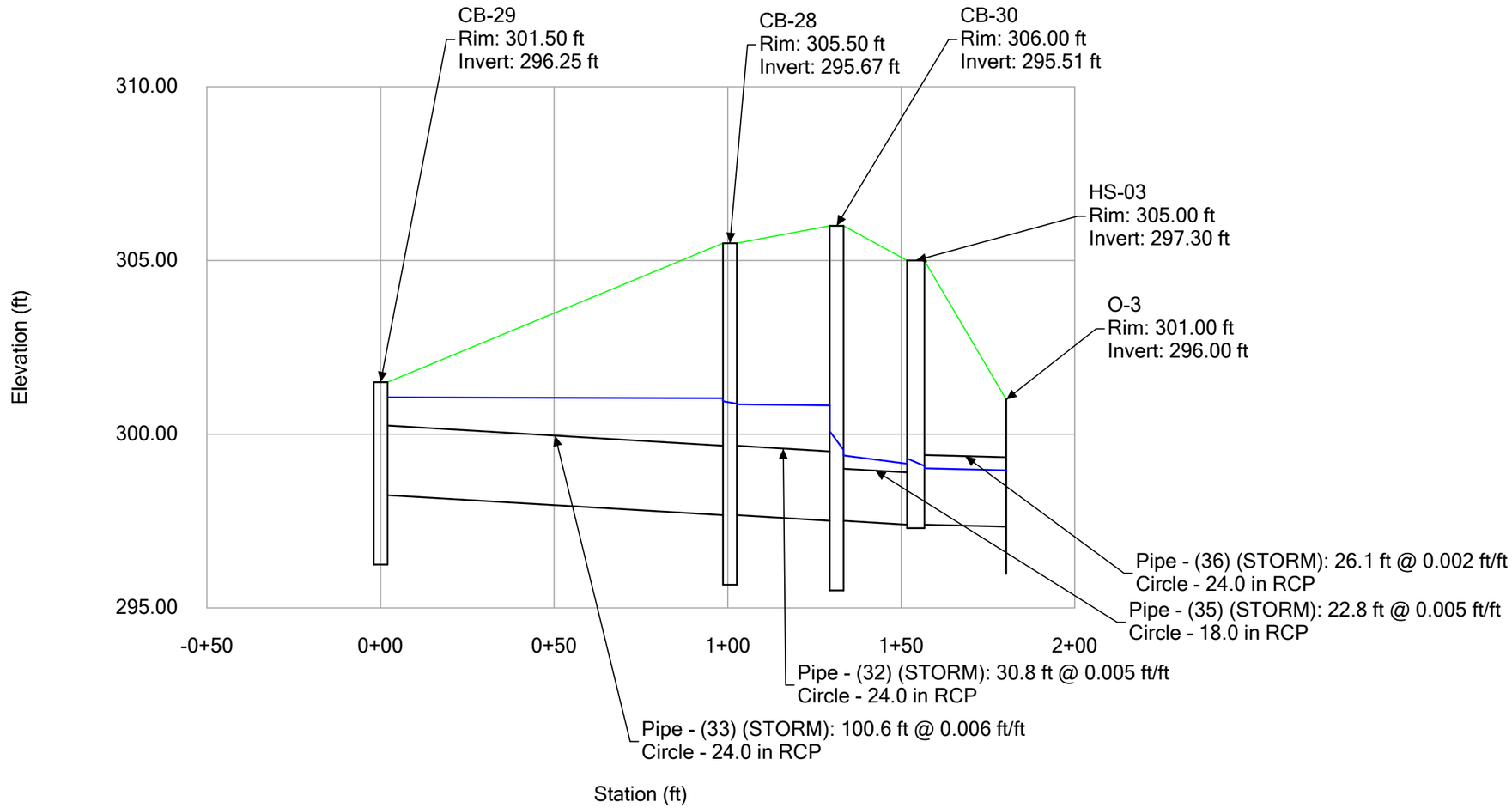
Profile Report

Engineering Profile - RL-5 TO O-3 (1800513-Pipe Network-25 yr.stsw)

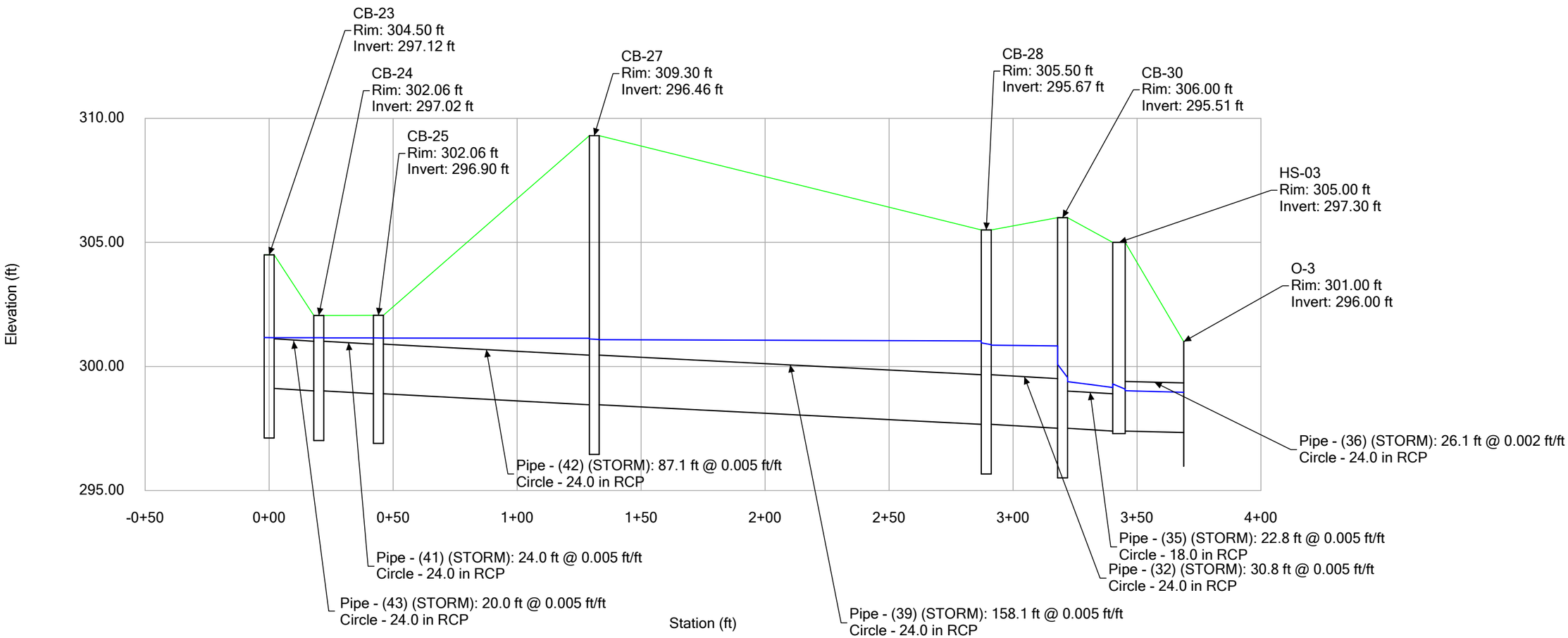


Profile Report

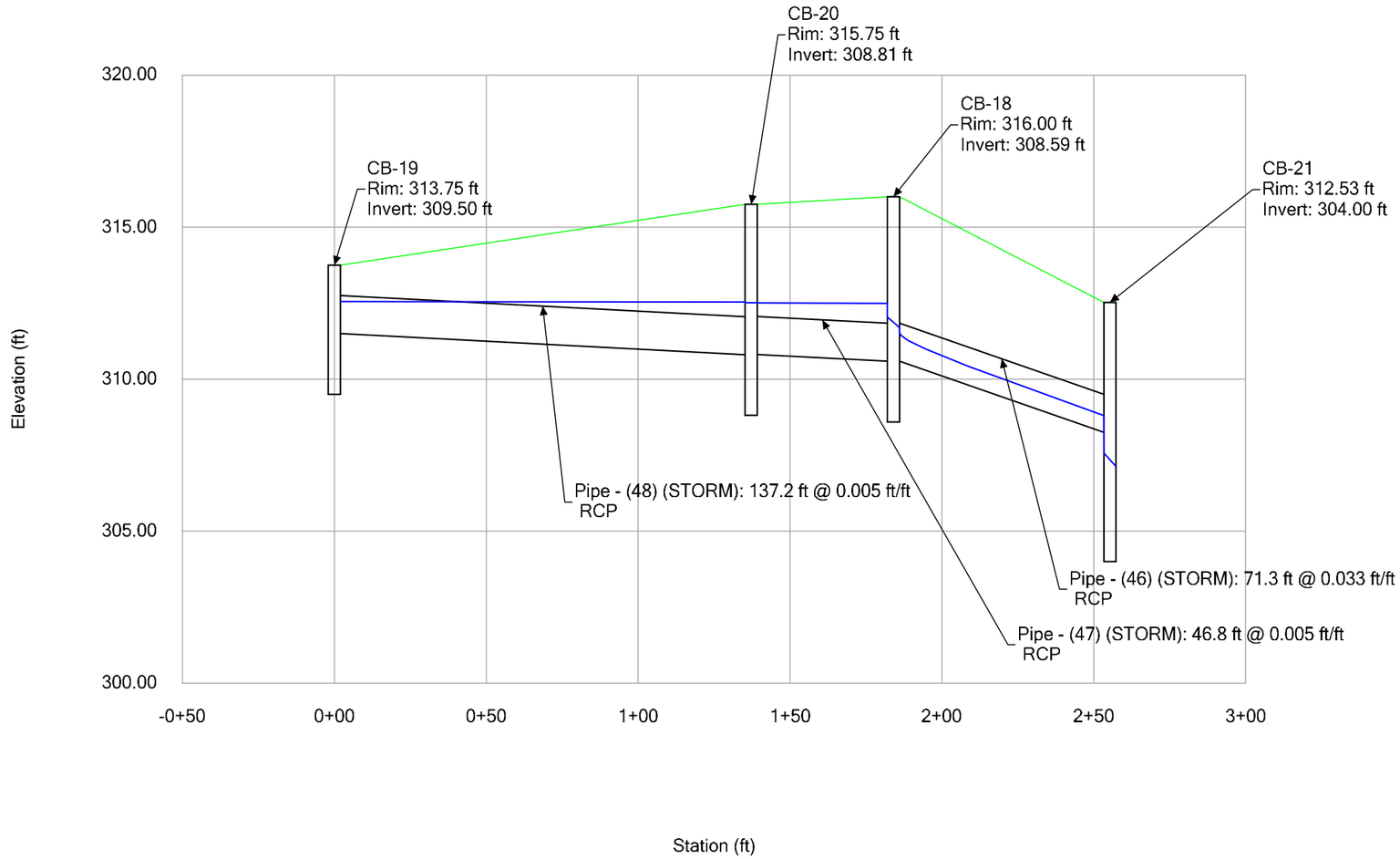
Engineering Profile - CB-29 TO O-3 (1800513-Pipe Network-25 yr.stsw)



Profile Report
Engineering Profile - CB-22 TO O-3 (1800513-Pipe Network-25 yr.stsw)

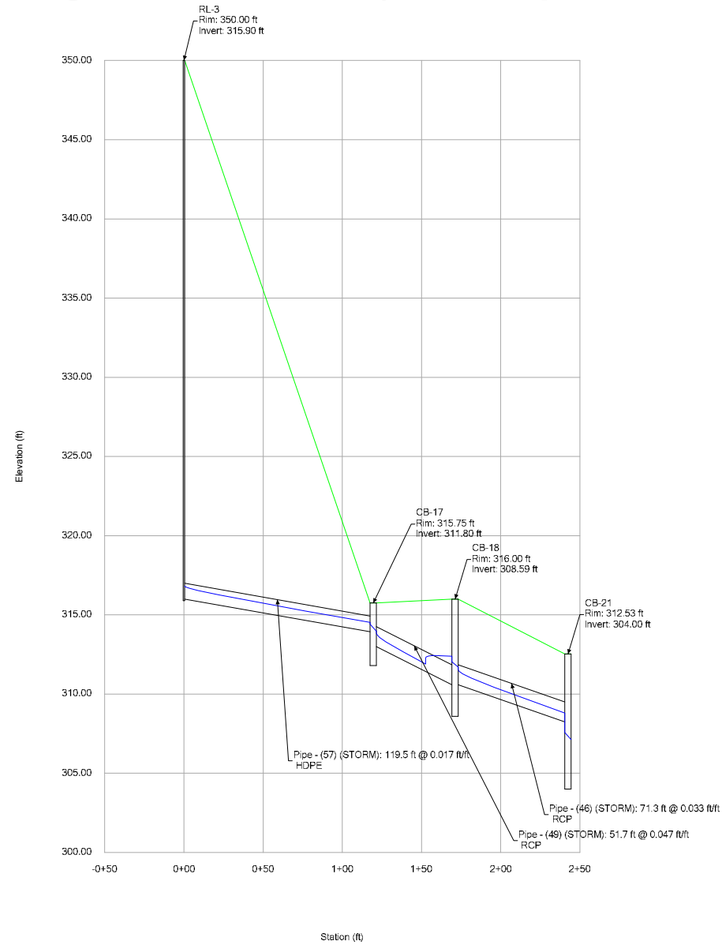


Profile Report
Engineering Profile - CB-19 TO O-4 (1800513-Pipe Network-25 yr.stsw)



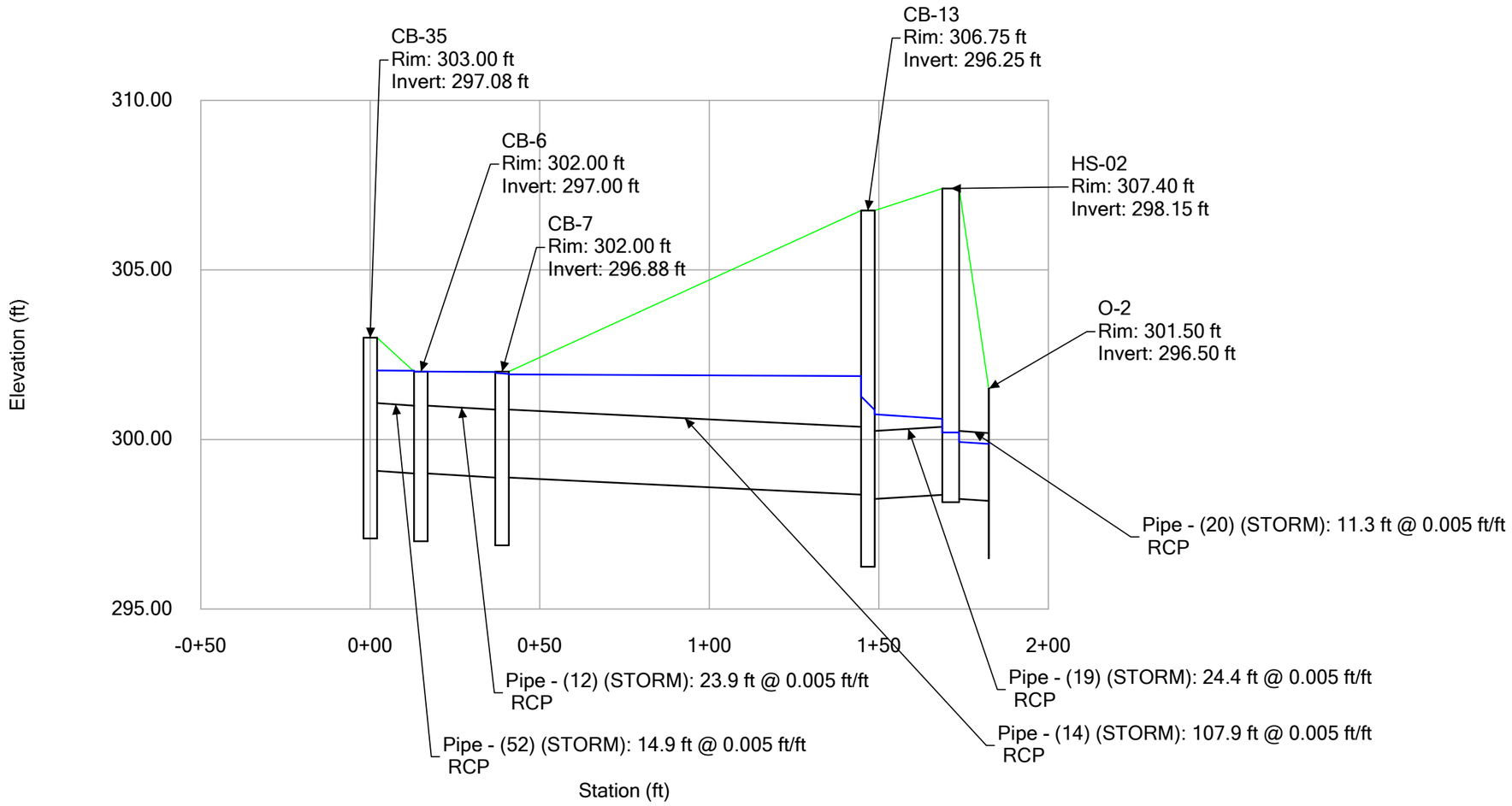
Profile Report

Engineering Profile - RL-3 TO O-4 (1800513-Pipe Network-25 yr.stsw)



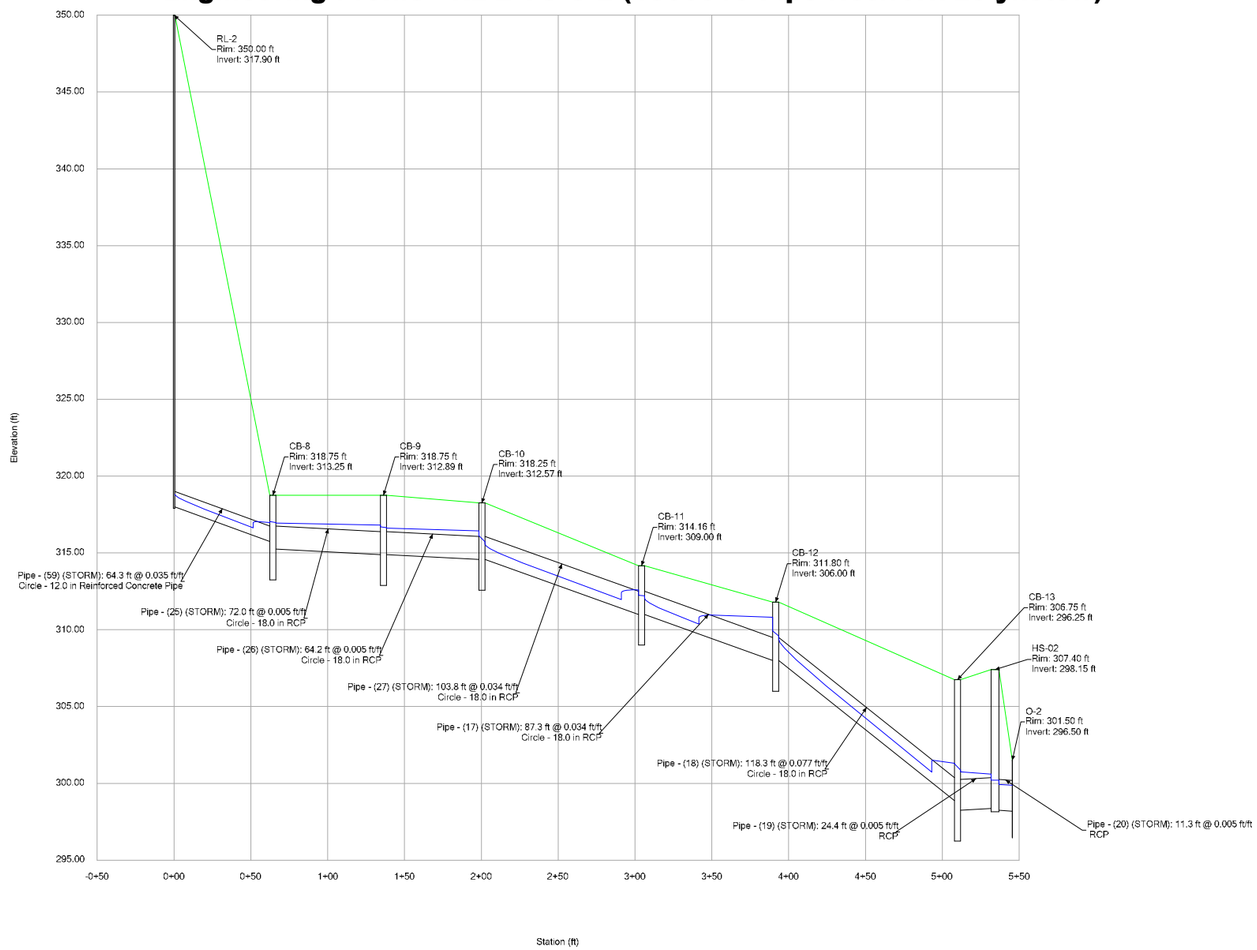
Profile Report

Engineering Profile - CB-35 TO O-2 (1800513-Pipe Network-25 yr.stsw)

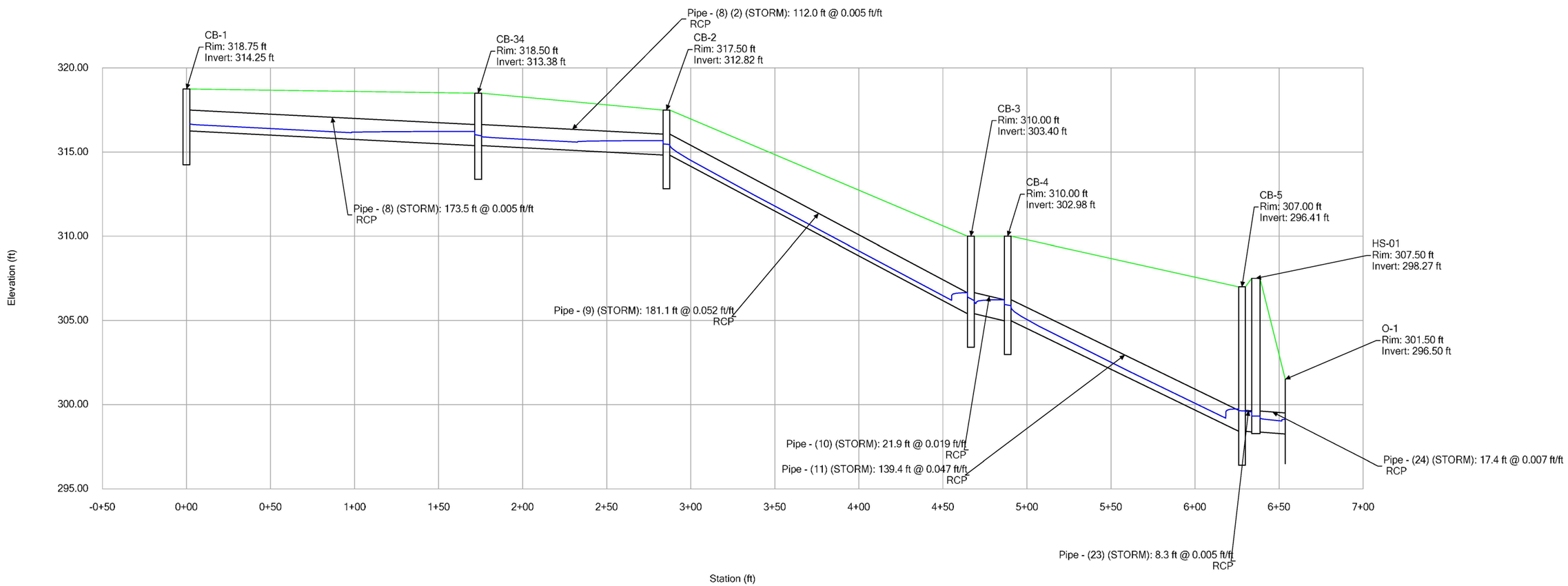


Profile Report

Engineering Profile - RL-2 TO O-2 (1800513-Pipe Network-25 yr.stsw)



Profile Report
Engineering Profile - CB-1 TO O-1 (1800513-Pipe Network-25 yr.stsw)



APPENDIX D

WATER QUALITY CALCULATIONS

Treatment Train Efficiency Worksheet

Water Quality Volume and Water Quality Flow Calculations

Pond Storage Tables

Best Management Practice (BMP) Treatment Train Efficiency Worksheet

Prepared for: Town of Trumbull
Proposed Residential Development
5085 Main Street
Trumbull, Connecticut

Prepared by:
BL Companies
355 Research Parkway
Meriden, Connecticut

Date prepared:
April 30, 2020

Overall Site Treatment Train Efficiency

Et=[1-(1-E1)(1-E2)(1-E3)(1-E4)(1-E?)]*100

BMP	BMP Description	Type pf Treatment	Efficiency Rate %
E1	Impervious Surface Sweeping***	Secondary (Conventional)	10
E2	Deep Sump Hooded Catch Basin	Primary	25
E3	Hydrodynamic Separator**	Primary	80

Overall Treatment Train Efficiency (Et)= **87 % Total Suspended Solids (TSS) Removal**

* 80% require per CT DEP
** Manufacturers claim 80% TSS removal
*** Schueler 1996 & EPA 1993
**** University of New Hampshire

Water Quality Volume (WQV) & Water Quality Flow (WQF) PDA-102

PROJECT	Proposed Development
DATE	8/6/2020
ADDRESS	Main Street Trumbull

WATER QUALITY VOLUME (WQV) CALCULATION

Area (A) =	183046.00	square feet
Area (A) =	4.20	acres
Area (A) =	0.00657	square miles
Design Precipitation (P) =	1	inch
% Impervious Cover (I) =	80.10	
Volumetric Runoff Coefficient (R) =	0.771	
WQV =	**0.270**	**ac-ft**
	11759.16	**cu-ft**

WATER QUALITY FLOW (WQF) CALCULATION

RUNOFF CURVE NUMBER (CN)

Runoff Depth (Q) =	0.771	inches
CN =	98	Figure 2-1 (SWQM)

TIME OF CONCENTRATION (Tc), 10 minute minimum

Tc =	10	min
Tc =	0.17	hours

Initial Abstraction (I_a) =	0.041	Table 4-1 (SWQM)
I_a/P Calculation =	0.041	
Unit Peak Discharge (q_u) =	650	Exhibit 4-111 (SWQM)
WQF =	**3.29**	**cfs**

Water Quality Volume (WQV) & Water Quality Flow (WQF) PDA-202

PROJECT	Proposed Development
DATE	8/6/2020
ADDRESS	Main Street Trumbull

WATER QUALITY VOLUME (WQV) CALCULATION

Area (A) =	108188.00	square feet
Area (A) =	2.48	acres
Area (A) =	0.00388	square miles
Design Precipitation (P) =	1	inch
% Impervious Cover (I) =	86.70	
Volumetric Runoff Coefficient (R) =	0.830	
WQV =	**0.172**	**ac-ft**
	7485.70	**cu-ft**

WATER QUALITY FLOW (WQF) CALCULATION

RUNOFF CURVE NUMBER (CN)

Runoff Depth (Q) =	0.830	inches
CN =	98	Figure 2-1 (SWQM)

TIME OF CONCENTRATION (Tc), 10 minute minimum

Tc =	10	min
Tc =	0.17	hours

Initial Abstraction (I_a) =	0.041	Table 4-1 (SWQM)
I_a/P Calculation =	0.041	
Unit Peak Discharge (q_u) =	650	Exhibit 4-111 (SWQM)
WQF =	**2.09**	**cfs**

Water Quality Volume (WQV) & Water Quality Flow (WQF) PDA-302

PROJECT	Proposed Development
DATE	8/6/2020
ADDRESS	Main Street Trumbull

WATER QUALITY VOLUME (WQV) CALCULATION

Area (A) =	87553.00	square feet
Area (A) =	2.01	acres
Area (A) =	0.00314	square miles
Design Precipitation (P) =	1	inch
% Impervious Cover (I) =	59.10	
Volumetric Runoff Coefficient (R) =	0.582	
WQV =	**0.097**	**ac-ft**
	4245.58	**cu-ft**

WATER QUALITY FLOW (WQF) CALCULATION

RUNOFF CURVE NUMBER (CN)

Runoff Depth (Q) =	0.582	inches
CN =	95	Figure 2-1 (SWQM)

TIME OF CONCENTRATION (Tc), 10 minute minimum

Tc =	10	min
Tc =	0.17	hours

Initial Abstraction (I_a) =	0.041	Table 4-1 (SWQM)
I_a/P Calculation =	0.041	
Unit Peak Discharge (q_u) =	650	Exhibit 4-111 (SWQM)
WQF =	**1.19**	**cfs**

Summary for Pond P-1: UGS

Inflow Area =	183,046 sf, 80.06% Impervious, Inflow Depth = 2.75" for 2-yr event				
Inflow =	14.33 cfs @	12.04 hrs,	Volume=	42,012 cf	
Outflow =	1.78 cfs @	12.60 hrs,	Volume=	42,012 cf,	Atten= 88%, Lag= 33.8 min
Discarded =	0.34 cfs @	9.40 hrs,	Volume=	31,559 cf	
Primary =	1.44 cfs @	12.60 hrs,	Volume=	10,454 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 298.07' @ 12.60 hrs Surf.Area= 9,814 sf Storage= 16,858 cf

Plug-Flow detention time= 294.9 min calculated for 42,012 cf (100% of inflow)
Center-of-Mass det. time= 294.8 min (1,094.1 - 799.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.50'	14,403 cf	**117.25'W x 83.70'L x 6.00'H Field A** 58,883 cf Overall - 22,875 cf Embedded = 36,008 cf x 40.0% Voids
#2A	296.50'	22,875 cf	**Cultec R-902HD** x 352 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 16 Rows of 22 Chambers Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf
		37,278 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.50'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	297.45'	**15.0" Round Culvert** L= 141.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 297.45' / 293.00' S= 0.0316 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Discarded OutFlow Max=0.34 cfs @ 9.40 hrs HW=295.56' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=1.44 cfs @ 12.60 hrs HW=298.07' (Free Discharge)
└─**2=Culvert** (Inlet Controls 1.44 cfs @ 2.37 fps)

Pond P-1: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 16 rows = 88.3 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

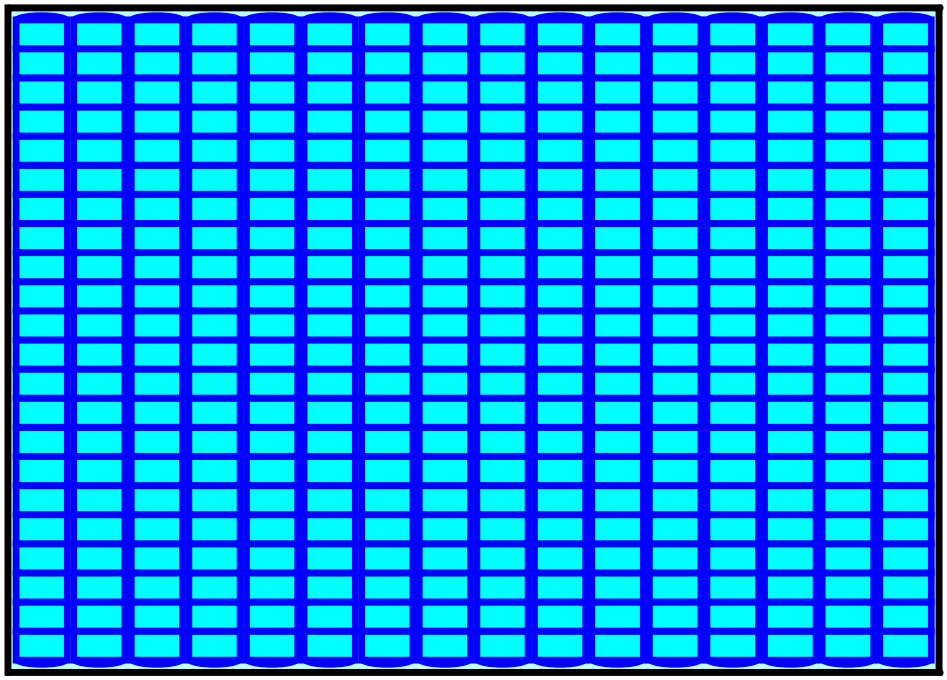
22 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 81.70' Row Length +12.0" End Stone x 2 = 83.70' Base Length
16 Rows x 78.0" Wide + 9.0" Spacing x 15 + 12.0" Side Stone x 2 = 117.25' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

352 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 16 Rows = 22,875.0 cf Chamber Storage

58,883.0 cf Field - 22,875.0 cf Chambers = 36,007.9 cf Stone x 40.0% Voids = 14,403.2 cf Stone Storage

Chamber Storage + Stone Storage = 37,278.2 cf = 0.856 af
Overall Storage Efficiency = 63.3%
Overall System Size = 83.70' x 117.25' x 6.00'

352 Chambers
2,180.9 cy Field
1,333.6 cy Stone



Stage-Area-Storage for Pond P-1: UGS

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
295.50	**9,814**	0
295.60	9,814	393
295.70	9,814	785
295.80	9,814	1,178
295.90	9,814	1,570
296.00	9,814	1,963
296.10	9,814	2,355
296.20	9,814	2,748
296.30	9,814	3,140
296.40	9,814	3,533
296.50	9,814	3,926
296.60	9,814	4,766
296.70	9,814	5,609
296.80	9,814	6,450
296.90	9,814	7,286
297.00	9,814	8,119
297.10	9,814	8,950
297.20	9,814	9,781
297.30	9,814	10,607
297.40	9,814	11,428
297.50	9,814	12,245
297.60	9,814	13,062
297.70	9,814	13,876
297.80	9,814	14,683
297.90	9,814	15,487
298.00	9,814	16,288
298.10	9,814	17,083
298.20	9,814	17,877
298.30	9,814	18,666
298.40	9,814	19,450
298.50	9,814	20,233
298.60	9,814	21,007
298.70	9,814	21,777
298.80	9,814	22,542
298.90	9,814	23,298
299.00	9,814	24,048
299.10	9,814	24,789
299.20	9,814	25,520
299.30	9,814	26,242
299.40	9,814	26,950
299.50	9,814	27,647
299.60	9,814	28,330
299.70	9,814	28,995
299.80	9,814	29,645
299.90	9,814	30,276
300.00	9,814	30,885
300.10	9,814	31,465
300.20	9,814	32,005
300.30	9,814	32,496
300.40	9,814	32,939
300.50	9,814	33,353
300.60	9,814	33,745
300.70	9,814	34,138
300.80	9,814	34,530
300.90	9,814	34,923
301.00	9,814	35,315
301.10	9,814	35,708
301.20	9,814	36,101
301.30	9,814	36,493
301.40	9,814	36,886
301.50	9,814	**37,278**

Summary for Pond P-2: UGS

Inflow Area =	108,188 sf, 86.71% Impervious, Inflow Depth = 2.96" for 2-yr event				
Inflow =	8.89 cfs @	12.04 hrs,	Volume=	26,675 cf	
Outflow =	1.57 cfs @	12.44 hrs,	Volume=	26,675 cf,	Atten= 82%, Lag= 24.3 min
Discarded =	0.19 cfs @	8.55 hrs,	Volume=	19,421 cf	
Primary =	1.39 cfs @	12.44 hrs,	Volume=	7,254 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 297.82' @ 12.44 hrs Surf.Area= 5,362 sf Storage= 10,256 cf

Plug-Flow detention time= 317.1 min calculated for 26,647 cf (100% of inflow)
Center-of-Mass det. time= 317.4 min (1,102.6 - 785.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	295.00'	7,926 cf	**73.75'W x 72.70'L x 6.00'H Field A** 32,170 cf Overall - 12,355 cf Embedded = 19,815 cf x 40.0% Voids
#2A	296.00'	12,355 cf	**Cultec R-902HD** x 190 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 10 Rows of 19 Chambers Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf
		20,281 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	295.00'	**1.500 in/hr Exfiltration over Surface area**
#2	Primary	296.00'	**15.0" Round Culvert** L= 37.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 296.00' / 295.80' S= 0.0054 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Device 2	300.00'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 2	297.25'	**14.5" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.19 cfs @ 8.55 hrs HW=295.06' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=1.39 cfs @ 12.44 hrs HW=297.82' (Free Discharge)
└─**2=Culvert** (Passes 1.39 cfs of 5.69 cfs potential flow)
  ├─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Orifice Controls 1.39 cfs @ 2.58 fps)

Pond P-2: UGS - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 10 rows = 55.2 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

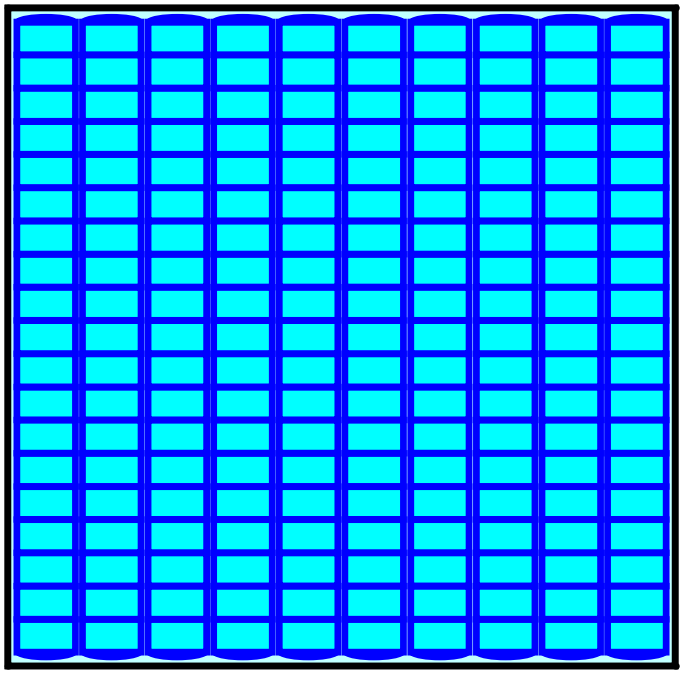
19 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 70.70' Row Length +12.0" End Stone x 2 = 72.70' Base Length
10 Rows x 78.0" Wide + 9.0" Spacing x 9 + 12.0" Side Stone x 2 = 73.75' Base Width
12.0" Base + 48.0" Chamber Height + 12.0" Cover = 6.00' Field Height

190 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 10 Rows = 12,354.9 cf Chamber Storage

32,169.8 cf Field - 12,354.9 cf Chambers = 19,814.9 cf Stone x 40.0% Voids = 7,926.0 cf Stone Storage

Chamber Storage + Stone Storage = 20,280.8 cf = 0.466 af
Overall Storage Efficiency = 63.0%
Overall System Size = 72.70' x 73.75' x 6.00'

190 Chambers
1,191.5 cy Field
733.9 cy Stone



Stage-Area-Storage for Pond P-2: UGS

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
295.00	**5,362**	0
295.10	5,362	214
295.20	5,362	429
295.30	5,362	643
295.40	5,362	858
295.50	5,362	1,072
295.60	5,362	1,287
295.70	5,362	1,501
295.80	5,362	1,716
295.90	5,362	1,930
296.00	5,362	2,145
296.10	5,362	2,601
296.20	5,362	3,059
296.30	5,362	3,515
296.40	5,362	3,969
296.50	5,362	4,422
296.60	5,362	4,873
296.70	5,362	5,324
296.80	5,362	5,773
296.90	5,362	6,219
297.00	5,362	6,663
297.10	5,362	7,106
297.20	5,362	7,548
297.30	5,362	7,987
297.40	5,362	8,423
297.50	5,362	8,858
297.60	5,362	9,290
297.70	5,362	9,721
297.80	5,362	10,150
297.90	5,362	10,576
298.00	5,362	11,001
298.10	5,362	11,422
298.20	5,362	11,840
298.30	5,362	12,256
298.40	5,362	12,666
298.50	5,362	13,074
298.60	5,362	13,477
298.70	5,362	13,874
298.80	5,362	14,266
298.90	5,362	14,651
299.00	5,362	15,030
299.10	5,362	15,401
299.20	5,362	15,763
299.30	5,362	16,116
299.40	5,362	16,460
299.50	5,362	16,791
299.60	5,362	17,107
299.70	5,362	17,401
299.80	5,362	17,668
299.90	5,362	17,911
300.00	5,362	18,136
300.10	5,362	18,351
300.20	5,362	18,565
300.30	5,362	18,780
300.40	5,362	18,994
300.50	5,362	19,208
300.60	5,362	19,423
300.70	5,362	19,637
300.80	5,362	19,852
300.90	5,362	20,066
301.00	5,362	**20,281**

Summary for Pond P-3: Surface Pond

Inflow Area =	87,553 sf, 59.08% Impervious,	Inflow Depth =	2.29"	for 2-yr event	
Inflow =	4.23 cfs @	12.14 hrs,	Volume=	16,686 cf	
Outflow =	1.24 cfs @	12.54 hrs,	Volume=	12,423 cf,	Atten= 71%, Lag= 23.8 min
Primary =	1.24 cfs @	12.54 hrs,	Volume=	12,423 cf	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0 cf	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 304.33' @ 12.54 hrs Surf.Area= 5,940 sf Storage= 7,378 cf

Plug-Flow detention time= 247.1 min calculated for 12,423 cf (74% of inflow)
Center-of-Mass det. time= 142.5 min (976.5 - 834.0)

Volume	Invert	Avail.Storage	Storage Description
#1	301.00'	19,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
301.00	1	0	0
302.00	625	313	313
303.00	2,196	1,411	1,724
304.00	5,344	3,770	5,494
305.00	7,128	6,236	11,730
306.00	8,968	8,048	19,778

Device	Routing	Invert	Outlet Devices
#1	Primary	301.00'	**12.0" Round Culvert** L= 118.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 301.00' / 290.50' S= 0.0890 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#2	Device 1	303.75'	**12.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	304.50'	**2.0" x 2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	305.50'	**30.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.24 cfs @ 12.54 hrs HW=304.33' (Free Discharge)
└─**1=Culvert** (Passes 1.24 cfs of 6.37 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.24 cfs @ 2.60 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=301.00' (Free Discharge)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Stage-Area-Storage for Pond P-3: Surface Pond

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
301.00	1	0
301.05	32	1
301.10	63	3
301.15	95	7
301.20	126	13
301.25	157	20
301.30	188	28
301.35	219	39
301.40	251	50
301.45	282	64
301.50	313	79
301.55	344	95
301.60	375	113
301.65	407	132
301.70	438	154
301.75	469	176
301.80	500	200
301.85	531	226
301.90	563	254
301.95	594	283
302.00	625	313
302.05	704	346
302.10	782	383
302.15	861	424
302.20	939	469
302.25	1,018	518
302.30	1,096	571
302.35	1,175	628
302.40	1,253	689
302.45	1,332	753
302.50	1,411	822
302.55	1,489	894
302.60	1,568	971
302.65	1,646	1,051
302.70	1,725	1,135
302.75	1,803	1,224
302.80	1,882	1,316
302.85	1,960	1,412
302.90	2,039	1,512
302.95	2,117	1,616
303.00	2,196	1,724
303.05	2,353	1,837
303.10	2,511	1,959
303.15	2,668	2,088
303.20	2,826	2,226
303.25	2,983	2,371
303.30	3,140	2,524
303.35	3,298	2,685
303.40	3,455	2,854
303.45	3,613	3,030
303.50	3,770	3,215
303.55	3,927	3,407
303.60	4,085	3,608
303.65	4,242	3,816
303.70	4,400	4,032
303.75	4,557	4,256
303.80	4,714	4,488
303.85	4,872	4,727
303.90	5,029	4,975
303.95	5,187	5,230
304.00	5,344	5,494
304.05	5,433	5,763
304.10	5,522	6,037
304.15	5,612	6,315
304.20	5,701	6,598
304.25	5,790	6,885
304.30	5,879	7,177
304.35	5,968	7,473
304.40	6,058	7,774
304.45	6,147	8,079
304.50	6,236	8,389
304.55	6,325	8,703
304.60	6,414	9,021
304.65	6,504	9,344
304.70	6,593	9,671
304.75	6,682	10,003
304.80	6,771	10,340
304.85	6,860	10,680
304.90	6,950	11,026
304.95	7,039	11,375
305.00	7,128	11,730
305.05	7,220	12,088
305.10	7,312	12,452
305.15	7,404	12,819
305.20	7,496	13,192
305.25	7,588	13,569
305.30	7,680	13,951
305.35	7,772	14,337
305.40	7,864	14,728
305.45	7,956	15,123
305.50	8,048	15,524
305.55	8,140	15,928
305.60	8,232	16,338
305.65	8,324	16,751
305.70	8,416	17,170
305.75	8,508	17,593
305.80	8,600	18,021
305.85	8,692	18,453
305.90	8,784	18,890
305.95	8,876	19,331
306.00	**8,968**	**19,778**

APPENDIX E

DRAINAGE MAPS

ED-1 – Existing Drainage Area Mapping

PD-1 – Proposed Drainage Area Mapping

CB-1 – Proposed Sub-catchment Drainage Area Mapping

EXISTING HYDROLOGY INFORMATION*

DRAINAGE AREA	TOTAL AREA (S.F.)	IMPERVIOUS AREA (S.F.)	PERVIOUS AREA (S.F.)	PERCENT IMPERVIOUS (%)	CN	TIME OF CONCETRATIONS (MIN.)
EDA-100	359,310	40,098	319,212	11.2%	80	20.1
EDA-200	162,700	69,553	93,147	42.7%	86	14.4
EDA-300	221,943	100,396	121,547	45.2%	88	16.5

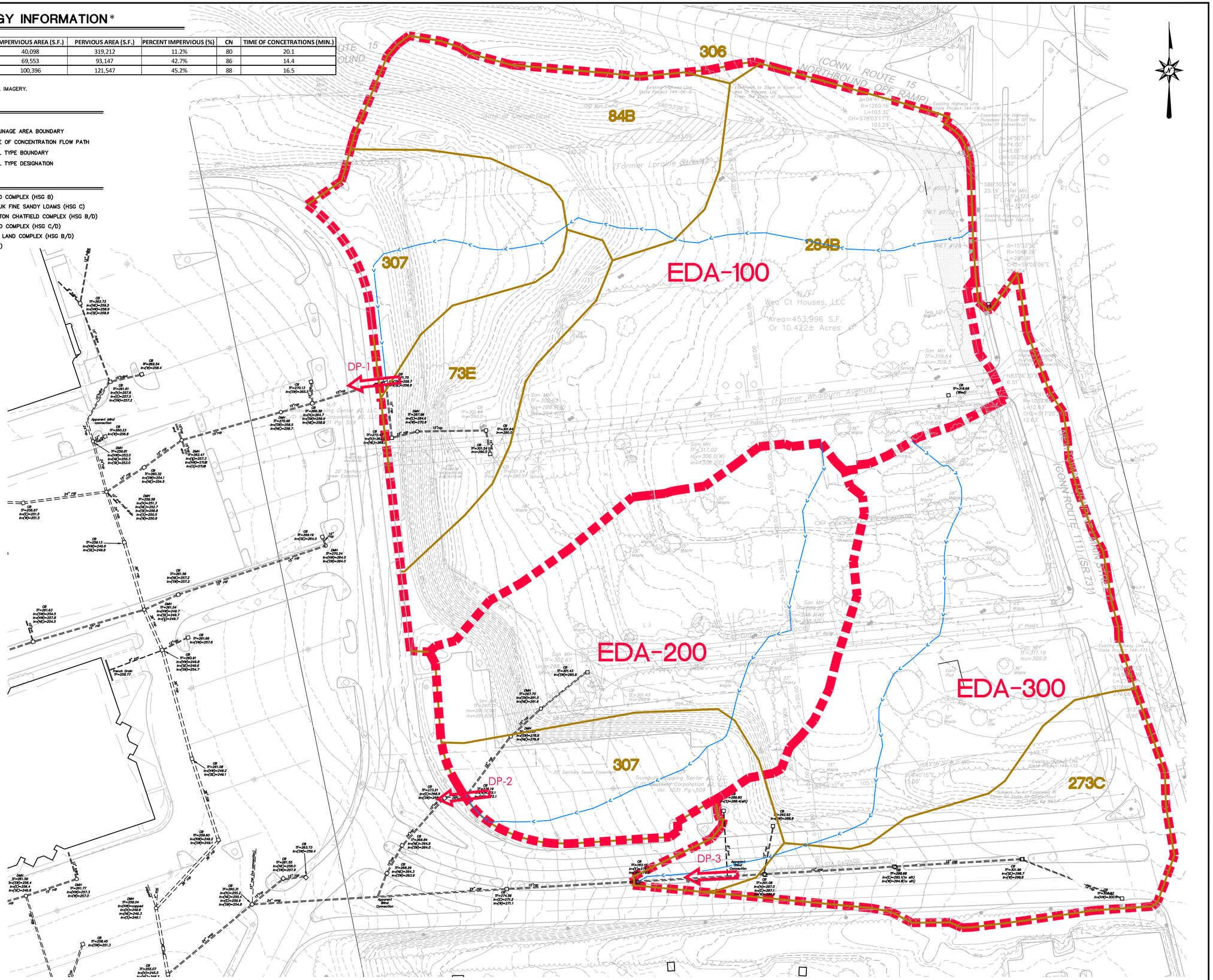
*COVERAGES WERE DETERMINED BY 1964 AERIAL IMAGERY.

LEGEND

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW PATH
- SOIL TYPE BOUNDARY
- 84C — SOIL TYPE DESIGNATION

SOIL TYPES

- 73E — CHARLTON–CHATFIELD COMPLEX (HSG B)
- 84B — PAXTON AND MONTAUK FINE SANDY LOAMS (HSG C)
- 273C — URBAN LAND–CHARLTON CHATFIELD COMPLEX (HSG B/D)
- 284B — PAXTON–URBAN LAND COMPLEX (HSG C/D)
- 306 — UDORTHENTS–URBAN LAND COMPLEX (HSG B/D)
- 307 — URBAN LAND (HSG D)



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No. 28796
LICENSED
PROFESSIONAL ENGINEER

THE RESIDENCES AT MAIN
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5085 MAIN STREET
TRUMBULL, CONNECTICUT

REVISIONS		
No.	Date	Description
1.	6/30/2020	REVISED PER STAFF COMMENTS
2.	8/07/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	1"=50'
Project No.	1800513
Date	05/28/2020
CAD File: ED180051301	

Title

EXISTING DRAINAGE PLAN

Sheet No.

ED-1

Ref (s): BD180051301; ZAVOC2308013; XR180051501; XC180051301; XC180051302

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PROPOSED HYDROLOGY INFORMATION

DRAINAGEA AREA	TOTAL AREA (S.F.)	IMPERVIOUS AREA (S.F.)	PERVIOUS AREA (S.F.)	PERCENT IMPERVIOUS (%)	CN	TIME OF CONCETRATIONS (MIN.)
PDA-101	146,162	13,083	133,079	9.0%	75	14.9
PDA-102	183,046	146,545	36,501	80.1%	93	6.0
PDA-201	71,843	37,705	34,138	52.5%	87	13.1
PDA-202	104,679	90,301	14,378	86.3%	95	6.0
PDA-301	145,655	86,502	59,153	59.4%	89	13.7
PDA-302	91,062	54,353	36,709	59.7%	88	13.6

LEGEND

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW PATH
- SOIL TYPE BOUNDARY
- 84C — SOIL TYPE DESIGNATION

SOIL TYPES

73E	CHARLTON–CHATFIELD COMPLEX (HSG B)
84B	PAXTON AND MONTAUK FINE SANDY LOAMS (HSG C)
273C	URBAN LAND–CHARLTON CHATFIELD COMPLEX (HSG B/D)
284B	PAXTON–URBAN LAND COMPLEX (HSG C/D)
306	UDORTHENTS–URBAN LAND COMPLEX (HSG B/D)
307	URBAN LAND (HSG D)

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Drawn	A.T.K.
Reviewed	J.J.S.
Scale	1"=50'
Project No.	1800513
Date	05/28/2020

CAD File: PD180051301

Title
PROPOSED DRAINAGE PLAN

Sheet No.
PD-1

Xref (s): BD180051301 ; XY05C13380I ; XY180051302 ; XY180051301 ; XC180051301 ; XC180051302 ; ED180051301 ; XZ180051301

PROPOSED HYDRAULIC INFORMATION

Catchment Area	Pervious (sf)	Impervious (sf)	Total (sf)	% Imp	RC	Tc (min)
CB-1	2,689	5,669	8,358	67.83%	0.71	6.0
CB-2	675	1,972	2,647	74.50%	0.75	6.0
CB-3	1,421	5,659	7,080	79.93%	0.78	6.0
CB-4	1,538	4,298	5,836	73.65%	0.74	6.0
CB-5	2,467	1,774	4,241	41.83%	0.55	6.0
CB-6	943	8,639	9,582	90.16%	0.84	6.0
CB-7	247	3,910	4,157	94.06%	0.86	6.0
CB-8	5,060	7,950	13,010	61.11%	0.67	6.0
RL-2	0	21,156	21,156	100.00%	0.90	6.0
CB-9	4,926	6,354	11,280	56.33%	0.64	6.0
CB-10	3,040	918	3,958	23.19%	0.44	6.0
CB-11	106	3,594	3,700	97.14%	0.88	6.0
CB-12	334	2,760	3,094	89.20%	0.84	6.0
CB-13	793	4,595	5,388	85.28%	0.81	6.0
CB-14	1,687	7,394	9,081	81.42%	0.79	6.0
CB-15	1,932	6,651	8,583	77.49%	0.76	6.0
CB-16	1,013	2,971	3,984	74.57%	0.75	6.0
RL-1	0	21,156	21,156	100.00%	0.90	6.0
CB-17	3,853	16,594	20,447	81.16%	0.79	13.6
RL-3	0	21,156	21,156	100.00%	0.90	6.0
CB-18	0	1,421	1,421	100.00%	0.90	6.0
CB-19	382	4,972	5,354	92.87%	0.86	6.0
CB-20	142	3,820	3,962	96.42%	0.88	6.0
CB-21	348	2,426	2,774	87.45%	0.82	6.0
CB-22	383	3,592	3,975	90.36%	0.84	6.0
CB-23	887	5,260	6,147	85.57%	0.81	6.0
CB-24	997	2,648	3,645	72.65%	0.74	6.0
CB-25	973	1,162	2,135	54.43%	0.63	6.0
CB-26	4,295	8,149	12,444	65.49%	0.69	6.0
CB-27	41	777	818	94.99%	0.87	6.0
CB-28	1,765	6,394	8,159	78.37%	0.77	6.0
CB-29	1,326	23,237	24,563	94.60%	0.87	6.0
CB-30	0	6,824	6,824	100.00%	0.90	6.0
CB-31	1,988	6,012	8,000	75.15%	0.75	6.0
RL-4	0	11,655	11,655	100.00%	0.90	6.0
RL-5	0	11,165	11,165	100.00%	0.90	6.0
CB-32	2,090	6,961	9,051	76.91%	0.76	6.0
CB-33	1,047	2,158	3,205	67.33%	0.70	6.0
CB-34	619	1,866	2,485	75.09%	0.75	6.0
CB-35	2,054	21,259	23,313	91.19%	0.85	6.0

LEGEND

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW PATH
- SOIL TYPE BOUNDARY
- 84C — SOIL TYPE DESIGNATION

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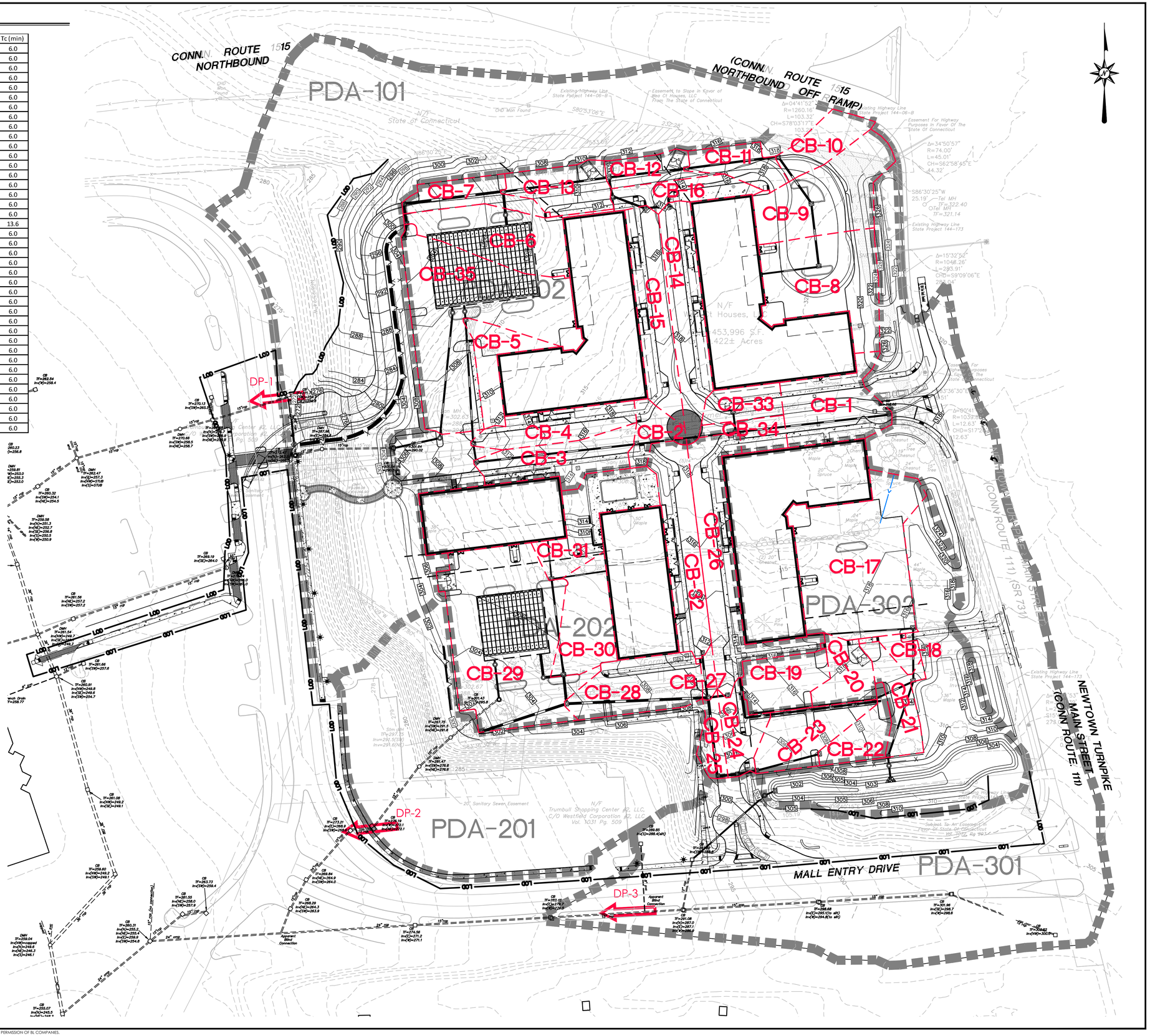

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TRUMBULL, CONNECTICUT

REVISIONS		
No.	Date	Desc.
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2.	8/10/2020	REVISED PER STAFF COMMENTS

Designed	A.T.K.
Drawn	A.T.K.
Reviewed	J.J.S.
Scale	1"=50'
Project No.	1800513
Date	05/28/2020
CAD File: CB180051301	

Title

PROPOSED SUB-CATCHMENT MAPPING

Sheet No.

CB-1

Xref (s) : BD180051301 ; XV05CC153801 ; XY180051301 ; XY180051302 ; XV180051301 ; XC180051302 ; PD180051301 ; XE180051301

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APPENDIX F

STORMWATER SYSTEM
OPERATION AND MAINTENANCE MANUAL

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An Employee-Owned Company

Appendix F:

Stormwater System Operations and Maintenance Plan

For the Proposed:

Residential Development

Located at:

5085 Main Street
Trumbull, Connecticut

Prepared for Submission to:

Town of Trumbull, Connecticut
Planning and Zoning Commission

April 30, 2020

Prepared for:

K&K Developers, Inc.
820 Morris Turnpike
Short Hills, NJ 07078

Prepared by:

Architecture
Engineering
Environmental
Land Surveying
Companies

BL Companies
355 Research Parkway
Meriden, Connecticut 06450
Phone: (203) 630-1406
Fax: (203) 630-2615

BL Project Number: 1800513

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DEICING AND SNOW REMOVAL & STORAGE 7

General Overview

The subject property is approximately 10.42 acres. Single-family residential properties once populated the property and have since been demolished. There are no existing wetlands near the subject property. The proposed redevelopment includes the construction of five apartment buildings and associated parking lots that will cover majority of the site and all associated parking, drainage and utilities associated with the proposed development. A stormwater management system is proposed for peak flow attenuation and stormwater treatment. The intent of the proposed site drainage is to mimic existing drainage patterns to the maximum extent practical. The site stormwater system will provide stormwater detention and quality improvements through deep sump catch basins with hoods, hydrodynamic separators, a surface and subsurface detention systems and a formalized street sweeping program for the impervious surfaces. These measures will treat the stormwater quality flow through structural means to provide water quality treatment in conformance with the State of Connecticut Water Quality Manual.

The following Operations and Maintenance Plan was prepared specifically for this proposed development in the Town of Trumbull, Connecticut. The Plan was developed to satisfy the requirements of the Connecticut Department of Energy and Environmental Protection's 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

Purpose & Goals

The purpose of this Manual is to ensure that the stormwater management components are operated in accordance with all approvals and permits. The primary goal is to inform all the property managers about how the system operates and what maintenance items are necessary to protect downstream wetlands and watercourses. The secondary goal is to provide a practical, efficient means of maintenance planning and record keeping verifying permit compliance.

Responsible Parties

The Property Owner will be responsible for implementing the Plan on the property.

Maintenance inspections shall be performed by a qualified professional.

Some utilities located on the site will be owned and maintained by various utility companies in accordance with their standards. The property owner may maintain the service connections.

List of Permits & Special Conditions

The project will receive several permits, which may contain special conditions that require compliance by the property owner and maintenance contractors. These permits may include the following:

- Town of Trumbull Permits –Site Plan Special Permit and Building Permit

- State of Connecticut – Encroachment Permit, OSTA Approval, CTDEEP Stormwater Discharge Construction General Permit

Maintenance Logs and Checklists

The property owner will keep a record of all maintenance procedures performed, date of inspection/ cleanings, etc. Copies of inspection reports and maintenance records shall be kept on-site.

Forms

The following forms will be developed for annual maintenance. Copies of the forms will be kept on-site as part of the Storm Water Management Plan.

- Annual Checklist
- Monthly Checklist
- Catch Basin Inspection Log

Employee Training

The property owner will have an employee-training program, with annual up-dates, to ensure that the qualified employees charged with maintaining the buildings and grounds do so in accordance with the approved permit conditions. All employees that have maintenance duties will be adequately informed of their responsibilities.

Spill Control

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and clean-up:

- Manufacturer's recommended methods for spill clean-up will be clearly posted and site personnel will be made aware of the procedures and the location of the information and clean-up supplies.
- Materials and equipment necessary for spill clean-up will be kept in the material storage area on-site. Equipment and materials will include but not be limited to: absorbent booms or mats, brooms, dust pans, mops, rags, gloves, goggles, sand, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned immediately after discovery.
- The spill area will be kept well-ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substance.
- Spills of toxic or hazardous material, regardless of size, will be reported to the appropriate State or local government agency.
- If a spill occurs, this plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean the spill if there is another one. A description of the spill, the cause, and the remediation measures will also be included.

A spill report shall be prepared by the property owner following each occurrence. The spill report shall present a description of the release, including quantity and type of material, date of spill, circumstances leading to the release, location of spill, response actions and personnel, documentation of notifications and corrective measures implemented to prevent reoccurrence.

The property owner shall identify an appropriately qualified and trained site employee involved with day-to-day site operations to be the spill prevention and clean-up coordinator. The name(s) of responsible spill personnel shall be posted on-site. Each employee shall be instructed that all spills are to be reported to the spill prevention and clean-up coordinator.

Storm Water Management

System Components

The storm water management system has several components that are shown on the Grading and Drainage Plan (GD-1), that perform various functions in treating storm water runoff.

Catch Basins and Manholes

The property owner is responsible for cleaning the catch basins and manholes on the property. A Connecticut Licensed hauler shall clean the sumps and dispose of removed sand legally. The road sand may be reused for winter sanding but may not be stored on-site. As part of the hauling contract, the hauler shall notify the property owner in writing where the material is being disposed.

Each catch basin shall be inspected every four months, with one inspection occurring during the month of April. Any debris occurring within one foot from the bottom of each sump shall be removed by Vacuum "Vactor" type of maintenance equipment.

During the inspection of each of the catch basin sumps, the hoods (where provided) on each of the outlet pipes shall also be observed. In the event that a hood is damaged or off the hanger, it shall be reset or repaired.

Detention Pond Area

The detention pond area shall be checked for and cleaned of trash, excessive sediment, other debris and erosion. A detailed maintenance logbook shall be kept with information including, but not be limited to, the date of inspection, record of grit depth, condition of vegetation, observation of any floatables, and date of cleaning performed.

For the first year of operation following construction, inspect the detention area each month for the months of June, July, August and September, and once every six months thereafter. After the first year of operation, the detention area shall be inspected a minimum of two times yearly with one inspection occurring in the month of April. Any accumulations found to be occurring within one foot of the inlet/outlet pipes shall be removed from the detention area and properly

disposed off-site. Also, any floating material discovered during inspections shall be removed from the basin.

A detailed maintenance logbook shall be kept for the detention area. Information is to include, but not be limited to, the date of inspection, condition of the inlet pipe(s), condition of outlet control pipes, observation of any floatables, and date of cleaning performed.

Regular inspection/maintenance for the detention area must include:

- removing debris and excess sediment
- checking that the storm inlet into the basin is clear and functioning properly,
- checking that the outlet control pipe is clear and the outlet is functioning properly,
- checking that the emergency spillway is clear and functioning properly,
- mowing the crest of the basin for maintenance access
- removing invasive plant species from of the basin
- checking slopes for any dips or settlement that might indicate seepage

Hydrodynamic Separators (or approved equal)

The hydrodynamic separator manholes will be cleaned periodically during construction, and at the end of construction once the landscaped areas are fully stabilized.

For the first year of operation following construction, inspect each manhole once each month for the months of January, February, March and April, and once every four months thereafter. A graduated measuring device (stadia rod) shall be inserted into each grit chamber and measurements of any accumulations shall be recorded. Any debris, which has accumulated to within one foot of the water surface inside the grit chamber portion of each tank, shall be removed by vacuum "Vactor" type of equipment.

After the first year of operation, each manhole shall be inspected at a minimum, three times yearly with one inspection occurring in the month of April in the same manner as described above for the first season of operation. Any accumulations found to be occurring within one foot of the water surface shall be removed from the manhole and properly disposed off-site. Also, any floating material discovered during inspections shall be removed from the tank.

A detailed maintenance logbook shall be kept for each manhole. Information is to include, but not be limited to, the date of inspection, record of grit depth, condition of baffles, observation of any floatable, and date of cleaning performed.

Underground Detention Systems

The underground detention systems shall be inspected every six months in the months of April and October. Each of the inspection manholes provided shall be opened and visually checked from the surface. Observation of grit inside of the detention system shall be noted and any deposits found to be 2 inches or more, as measured from the invert of pipe, shall be cleaned and removed. The underground detention system qualifies as a Confined Space under OSHA

regulations, and any maintenance involving entry into the pipes should comply with OSHA Confined Space Entry Regulations.

Site Maintenance

Parking Lots

Parking lots and sidewalks shall be swept as necessary by the property owner to clean trash and other debris. The property owner will sweep parking lots on the property in the spring to remove winter accumulations of road sand.

Landscaping

The management company retained by the property owner will maintain landscaped areas. Normally the landscaping maintenance will consist of pruning, mulching, planting, mowing lawns, raking leaves, etc. Use of fertilizers and pesticides will be controlled and limited to minimal amounts necessary for healthy landscape maintenance.

The lawn areas, once established, will be maintained at a typical height of 3 ½". This will allow the grass to be maintained with minimal impact from weeds and/or pests. The low-maintenance areas will be maintained as a meadow or allowed to revert to natural conditions. Topsoil, brush, leaves, clippings, woodchips, mulch, equipment, and other material shall be stored off site.

Outdoor Storage

There will be no outdoor storage of hazardous chemicals, de-icing agents, fertilizer, pesticides, or herbicides anywhere around the buildings.

Deicing and Snow Removal & Storage

The use of clean sand may be used to aid traction in conjunction with salt and/or chemicals for deicing, snow melting and other related winter weather management. Snow shall be shoveled and plowed from sidewalk and parking areas as soon as practical during and after winter storms. Sand accumulation shall be removed from the site at the end of the winter season or appropriate time when seasonal snow has melted. Alternative deicing methods must be submitted prior to use onsite for review to the Town of Trumbull for approval.

MAINTENANCE SCHEDULE

During the First Year of Operation:		
Task:	Completion Date:	Manager's Initials:
JANUARY:		
Employee Training Program with Spill Program		
*Subsurface Detention Systems		
FEBRUARY:		
* Subsurface Detention Systems		
MARCH:		
* Subsurface/Surface Detention Systems		
APRIL:		
*Catch Basin/Yard Drain		
* Subsurface/Surface Detention Systems		
*Sanitary Inspection		
Shrub Fertilization		
Lawn Limbing (if necessary)		
AUGUST:		
*Catch Basin/Yard Drain		
* Subsurface/Surface Detention Systems		
OCTOBER:		
* Subsurface/Surface Detention Systems		
Tree and Lawn Fertilization		
DECEMBER:		
*Catch Basin/Yard Drain		
* Subsurface Detention Systems		

*NOTE: Use appropriate worksheet found in this plan to conduct the inspection.

After the First Year of Operation:			
FOR YEAR_____			
Task:		Completion Date:	Manager's Initials:
JANUARY:			
Employee Training Program with Spill Program			
APRIL:			
*Catch Basin/Yard Drain			
* Subsurface/Surface Detention Systems			
*Sanitary Inspection			
Shrub Fertilization			
Lawn Limbing (if necessary)			
AUGUST:			
*Catch Basin/Yard Drain			
OCTOBER:			
* Subsurface/Surface Detention Systems			
Tree and Lawn Fertilization			
DECEMBER:			
*Catch Basin/Yard Drain			

*NOTE: Use appropriate worksheet found in this plan to conduct the inspection.

CATCH BASIN / CATCH BASIN INSERT INSPECTION LOG

Name of Inspector: Date:

Catch Basin ID	Condition (circle one)		Debris above 1' within sump? (If yes then catch basin is to be cleaned)		Date of Catch Basin Cleaning (if debris is greater than 1')		Condition of Hood (if applicable)	Comments:
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							

	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							
	Fair	Poor	Yes	No	Yes	No		
	Excellent							

On-site Procedures for Inspection and Maintenance of Catch Basin Inserts

• Secure traffic and pedestrian traffic with cones, barrels, etc.

• Clean surface area around each catch basin

• Remove grates and set aside

• Clean grates, remove litter and debris that may be trapped within the grate

• Remove by vactor hose the debris that has been trapped in the trough area. Dispose of in accordance with local, state and federal regulatory agency requirements. Most debris that is captured in the trough or sump area will fall into the non-hazardous waste category.

• Visually inspect and check the condition of the trough area.

• Replace grate and lockdown as needed.

• Un-secure traffic control area.

• Complete service report and submit to facility owner.

APPENDIX G

GEOTECHNICAL REPORTS

Preliminary Geotechnical Assessment

Test Pit and Infiltration Testing Results

GEI Consultants

Consulting
Engineers and
Scientists

Preliminary Geotechnical Assessment

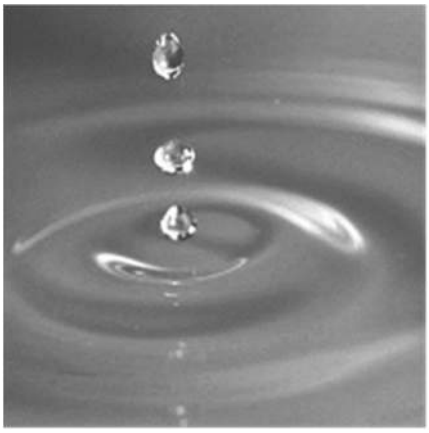
Westfield Mall Residences

Trumbull, Connecticut

Submitted to:
Garden Homes
820 Morris Turnpike
Short Hills, NJ 07078

Submitted by:
GEI Consultants, Inc.
455 Winding Brook Drive, Suite 201
Glastonbury, CT 06033
860-368-5300

October 25, 2019
Project No. 1904976



Matthew Glunt, P.E.
Senior Geotechnical Engineer

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B Historical Aerial Photographs

1. Introduction

1.1 Project Summary

The proposed development adjacent to the Westfield Mall in Trumbull will consist of construction of six detached residential/clubhouse buildings spread across the referenced property with associated site improvements.

The purpose of this study was to provide a preliminary assessment of soil and groundwater conditions and address geotechnical considerations for project planning. Additional explorations and geotechnical study will be required in a later phase of design to confirm or revise the general geotechnical considerations presented herein.

1.2 Scope of Services

Our scope of work included the following tasks:

- Reviewed conceptual site plans and building layout drawings.
- Retained a contractor to dig nine (9) test pit excavations on the property.
- Observed soil samples recovered from the test pits, took groundwater level measurements, and prepared test pit logs.
- Developed preliminary design and construction recommendations for site work and building foundations.
- Prepared this *Preliminary Geotechnical Assessment*.

1.3 Authorization

Our work was performed in general accordance with our proposal dated January 4, 2019.

2. Site and Project Description

2.1 Site Description

The proposed development will occur on approximately 10 acres of vacant land bounded by Westfield Mall, Merritt Parkway (Route 15), and Main Street (Route 111) in Trumbull, Connecticut. The site is covered by low grasses and trees, with exception of the former paved residential streets (Whalburn Avenue and Stuart Place), one remaining dwelling on Whalburn Avenue, and a construction storage yard on the southeast corner.

The overall parcel is the site of a former single-family residential neighborhood that was demolished in or about 2005. At this time, not much is known about the former dwellings, such as presence of basements, utilities, etc., demolition procedures, or what elements may remain on the property. We observed no structural remnants on the property aside from paved driveways and small retaining walls along a few lot boundaries. Historical aerial photographs of the site with layout of the former neighborhood are attached in Appendix B for reference.

We understand a site topographic survey has not yet been conducted. We reviewed the general site topography during our site visits and from the Town GIS website. In general, the site slopes downward rather gently toward the mall, likely following the natural topography, before encountering cut and natural slopes 15 to 25 feet high adjacent to the mall parking lot.

2.2 Proposed Construction

Plans are currently in the conceptual phase. According to the August 13 concept plan provided by Garden Homes, development is to include up to six (6) residential and clubhouse-type structures spread across the property with associated site improvements such as access drives, parking lots, pedestrian plazas, etc. In total, the six buildings will contain 260 units. Parking will be accommodated by a combination of in-building garages, detached garages, driveways, and surface parking.

The site improvements will likely be tiered to fit the overall site topography. Cuts and fills of up to 12 to 15 feet are likely to be required to suitably transition the western part of the site across the steep slope into the mall parking area. Retaining walls may be required where sufficient lateral distance is not available for sloping.

We understand the proposed residential buildings will be four stories with slab-on-grade, wood framing, and conventional shallow foundations supporting load-bearing walls. For the purposes of this assessment, we have assumed that these structures will not include basements.

3. Exploration Procedures

The test pit locations were laid out on the site using the provided site layout plan and a handheld GPS unit. Approximate test pit locations relative to the concept site plan are shown on Figure 2A and relative to a current aerial and Town GIS contours on Figure 2B.

Nine (9) test pit excavations were conducted at the site on October 10, 2019, by General Borings, under subcontract to GEI, with a rubber-tired backhoe. The appropriate one-call utility location service (CBYD) was contacted by General Borings prior to excavation. The test pits were advanced to depths ranging from 4.0 feet to 7.25 feet each and backfilled with tamped spoils upon completion. A GEI professional was present to coordinate the work, sample and classify the soils encountered, and record the depth to apparent soil mottling and groundwater (where encountered). Test pit logs are attached in Appendix A.

4. Subsurface Conditions

4.1 Geologic Setting

Geologic maps indicate the property lies on a thick glacial till upland known locally as Ox Hill. The mall to the west was constructed on valley sands and gravels adjacent to a small watercourse, which now runs under the mall parking area. The slope along the western edge of the proposed development represents the transition between the two geologic units.

Bedrock at the site is mapped as the Carringtons Pond Member of the Trap Falls Formation, described as interlayered medium to dark-gray schist and light-gray gneiss, locally with amphibolite layers (Rodgers, USGS, 1985).

4.2 Subsurface Conditions

The generalized subsurface conditions at the site are described below, in order of increasing depth. The subsurface conditions between test locations may differ. The nature and extent of variations between the sampling points will not become evident until construction.

Topsoil – Organic, brown to dark brown topsoil in the test pits ranged from 4 inches up to approximately 2 feet in thickness. At two locations (TP-3 andTP-7), minor brick fragments were mixed with the topsoil to a depth of about 5 inches.

Fill – Minor amounts of fill with debris such as cables, brick, asphalt, etc. were encountered in several of the test pits near the surface to a depth of about 2 feet. Asphalt was also encountered in TP-6 below the upper few inches of topsoil. Based on our understanding of the property and prior uses, we do not expect that significant grading took place in construction of the former neighborhood. Some subsurface debris should be expected within close proximity of the former house locations.

Glacial Till – Dense, stony glacial tills were encountered in all test pits below the near-surface soils. These soils were typically classified as brown to orange-brown predominantly sand and gravel with frequent cobbles between 6 and 12 inches in size, and less than about 15 percent silty fines. Soils were generally quite dense below depths of 2 to 3 feet.

Apparent Rock – Shallow weathered to sound rock may be present below certain areas of the site. At TP-3, test pit observations indicate that rock may be present at a depth of about 4.0 feet, where the excavator bucket encountered a very hard, impenetrable surface. Potential weathered rock was noted at two other locations (TP-4 and TP-6) near the base of the pit at a depth of about 6.5 feet. If present, we expect that relatively shallow rock potentially follows a line about 2/3 of the way back from Main Street, where the upland areas begin to slope more steeply downward to the west.

4.3 Groundwater Conditions

Free groundwater was not encountered within any of the test pits. However, discontinuous perched water seams are common within similar glacial till soils on dense and/or highly cohesive soils, especially after rainfall events. Slight soil mottling, potentially indicating previous high groundwater, was noted in several test pits near very dense soils at depths of about 4.0 to 6.0 feet.

Groundwater levels are subject to seasonal and weather-related variations. Groundwater measurements made at different times and different locations may be significantly different than the measurements taken as part of this investigation.

5. Preliminary Design Recommendations

5.1 General Suitability

Soils similar to those encountered in our recent investigation are generally well-suited to this type of development, subject to the considerations presented below.

The following potential subsurface risks should be further investigated as part of a final design program:

1. Presence of shallow rock within the depth of interest for building and site development.
2. Suitability of deep cuts expected to be required along the western edge of the property, including potential presence of shallow rock and/or groundwater.
3. Presence of fill soils and/or construction debris associated with former development and demolition of the residential neighborhood. If available, demolition records and photographs should be reviewed as part of this evaluation.
4. Infiltration capacity of soils, for site stormwater design.
5. Suitability of excavated soils for re-use in fill areas of the site, particularly the presence of oversize material and excess silt fines.

5.2 Foundation Support

The proposed buildings will likely bear on dense to very dense native soil or compacted engineered fill. Conventional shallow foundations are expected to be suitable for support of new construction of the type and scale shown on the conceptual plans.

The bearing pressure to be used for design and estimated settlements will be determined as part of the final design geotechnical evaluation. Lower-level floors can likely be designed as slab-on-grade, bearing on a base course of compacted crushed stone placed over a prepared soil subgrade.

5.3 Site and Stormwater Design

Final cut and fill slopes on the project should be limited to a maximum grade of 2H:1V and be suitably vegetated after construction to limit erosion.

The location and type of required stormwater controls are not yet shown on the conceptual plans. In all likelihood, features such as basins, subsurface units, etc. will be founded at depth in soils with relatively poor drainage characteristics.

5.4 Retaining Walls

Retaining walls up to about 12 feet in height may be required to develop the site. In general, the conditions will be suitable for walls of this scale and no special measures are expected to be required.

6. Construction Considerations

6.1 Site Preparation

To prepare the site for grading operations, existing pavement, topsoil, and other deleterious material should be stripped from the building and site improvement areas. Soft, wet, loose, or otherwise unsuitable soils should be removed and replaced, or potentially re-compacted in-place. Based on the results of this investigation, we do not expect there to be significant stabilization required.

Any existing utilities within the proposed building footprints should be rerouted and the pipes fully removed or plugged with grout.

6.2 Excavation and Dewatering

Excavation will primarily be in soil, and conventional earthmoving equipment will be suitable in most instances. Excavations should be sloped or shored in accordance with the local, state, and federal regulations, including Occupational Safety and Health Agency (OSHA 29 CFR Part 1926) excavation trench safety standards.

As noted elsewhere in this report, there is potential for shallow rock requiring pneumatic removal or localized blasting on certain areas of the site to impact development. This may limit feasible use of subsurface elements such as basements, drainage chambers, and the extent of cuts required to grade the site. The depth to, lateral extent, and character of rock should be further investigated using test borings as part of the final design efforts.

Groundwater is not expected to be encountered within most site excavations. If encountered, we expect that excavation dewatering can be accomplished with filtered sumps and pumps located outside the footing or trench excavations.

6.3 Re-use of Excavated Soils

Once the topsoil is stripped and any otherwise unsuitable soils removed, we expect native sands and gravels excavated from the site will generally be suitable for re-use on the project as Structural Fill. Screening of materials in excess of 3 or 6 inches may be required before re-use of soils especially laden with cobbles. The percentage of silt fines by weight should be further evaluated during final design to gauge freeze-thaw susceptibility and general workability of the on-site soils.

7. Limitations

7.1 Additional Investigation

The current program of test pit excavations provides some indication of the range of conditions that may be encountered at the site. However, the number and depth of these excavations does not provide a reliable basis for design of building foundations or other site features. Once the building and site layouts have been finalized, we recommend that a series of test borings be performed within proposed building footprints and at other locations of interest on the property. At minimum, this investigation should address the potential risk items listed in Section 5.1.

7.2 Limitations

This report was prepared for the use of the project design team, exclusively. These considerations are based on the project information provided to us at the time of this report and the results of a preliminary geotechnical investigation. Our professional services for this project have been performed in accordance with generally accepted engineering practices. No warranty, expressed or implied, is made.

Due to the distance between each excavation, subsurface conditions can be expected to vary from the conditions described herein. This report was intended to give general information about overall site conditions only. A design-level geotechnical exploration will be required at a later time to confirm or revise the preliminary geotechnical recommendations given herein.

Figures

SOURCE: Google Earth

SCALE:	NTS	GEI Consultants	**SITE LOCATION PLAN** WESTFIELD MALL RESIDENCES TRUMBULL, CT	FIGURE NO.
DRAWN BY:	BA			1
CHECKED BY:	MG			
DATE:	10/21//2019		GEI PROJECT NO: **1904976**	

SOURCE:
CONCEPT PLAN PROVIDED BY GARDEN HOMES.

0 100 200
SCALE: 1" = 100'

Preliminary Geotechnical Investigation
Westfield Mall Residences
Trumbull, Connecticut

Garden Homes

GEI Consultants

Project 1904976

TEST PIT LOCATION PLAN

October 2019

Fig. 2A

\\Gtb1v-fs01\gis\Projects\1904976_GardenHomes\Site Plan Test Pits.mxd

LEGEND
Test Pit Locations

SOURCE: Town of Trumbull GIS

SCALE:	AS SHOWN
DRAWN BY:	BA
CHECKED BY:	MG
DATE:	10/21/2019

GEI Consultants

TEST PIT LOCATION PLAN
WESTFIELD MALL RESIDENCES
TRUMBULL, CT

GEI PROJECT NO: **1904976**

FIGURE NO.
2B

Appendix A

Test Pit Logs

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-1**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	11.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
1		(0.0-0.33') F-C sand and NP fines, little F-C gravel, subangular up to 6" brown, dry. TOPSOIL. Contains cobbles, metal wires and organic fibers.
2		
3		(0.3-4.0') F-C sand and F-C gravel and cobbles, angular up to 8" little NP fines, light brown, dry.
4		
5		(4.0-6.0') F-C gravel, angular to subangular up to 6" and cobbles and F-C sand little NP fines, hard, dense and gravelly, brown to orange-brown, dry.
6		
7		Slight mottling at 4.0 FT. Groundwater not encountered
8		
9		
10		
		Bottom of test pit at 6.0 feet.

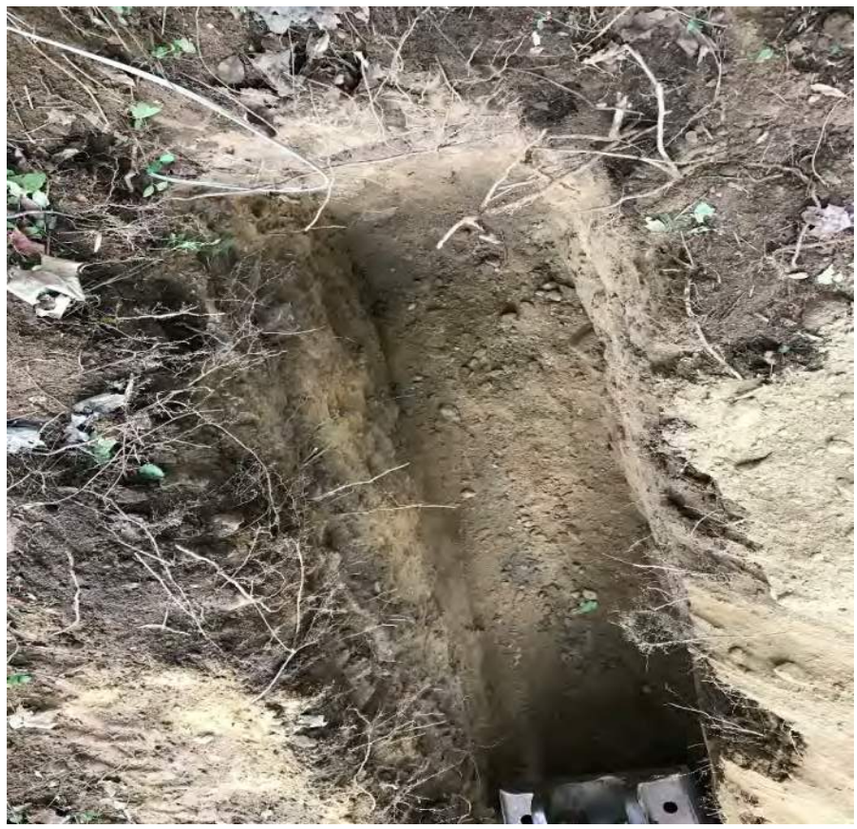
NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-1**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	11.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log



Bottom of test pit at6.0 feet.

Picture showing soil strata at Test pit 1

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-2**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	4.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
1		(0.0-1.0') F-C sand and NP fines, little F-C gravel angular up to 6", brown, dry. Contains organic fibers. TOPSOIL.
2		(1.0-4.0') F-C Gravel and F-C sand, little NP fines. orange-brown to light brown, dry
3		Coarse angular cobbles up to 3.0 FT.
4		
5		
6		
7		
8		Groundwater or soil mottling not encountered.
9		
10		
		Bottom of test pit at 4.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-2**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	4.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 4.0 feet.

Picture showing the soil strata at Test pit 2

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-2**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	4.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 4.0 feet.

Picture showing retaining wall at Test pit 2

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	CLIENT: Garden Homes	TEST PIT LOG	
	PROJECT: Westfield Mall Trumbull	PAGE	TP-3
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	4.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
1		(0.0-0.5') F-C sand and NP fines, little F-C gravel, subrounded up to 5", brown, dry. Contains organic fiber and brick fragments. TOPSOIL.
2		
3		(0.5- 2.0') F-C sand and F-C gravel and cobbles, angular up to 1", little NP fines, light brown, dry.
4		(2.0-4.0') F-C sand and F-C gravel and cobbles (potential weathered rock) angular up to 1", little NP fines, brown to light brown, dry.
5		Bucket scraping probable rock at 4.0 FT
6		
7		
8		Slight mottling observed at 3.0 FT Groundwater not encountered.
9		Backfilled at 4.0 FT.
10		
		Bottom of test pit at 4.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	CLIENT: Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-3**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	4.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	9.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 4.0feet.

Picture showing soil strata at Test pit 3

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-4**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	7.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	15.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
1		(0.0-2.0') F-C sand and NP fines, little F-C gravel, brown, dry. Contain organic fibers. TOPSOIL.
2		
3		(2.0-3.5') F-C sand, little NP ifnes, little F- C gravel angular, light orange- brown, dry.
4		
5		(3.5-5.0') F-C sand, some F-M gravel and cobbles, angular, NP fines, grayish brown to light brown, dry.
6		(5.0 -7.0') F-C sand, some F-M gravel and cobbles, angular, NP fines, brown, dry.
7		Likely weathered rock observed at base of pit
8		Soil mottling or groundwater not encountered.
9		
10		
		Bottom of test pit at 7.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-4**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	7.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	15.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 7.0 feet.

Picture showing soil strata at Test pit 4

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants	GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
		PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-4**
		CITY/STATE: Trumbull, CT	1	
		GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	7.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	15.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 7.0 feet.
Picture showing soil at Test pit 4

NOTES:
IN. = INCHES NM= NOT MEASURED
FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-5**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
1		(0.0-0.5') F-C sand and NP fines, some F-C gravel and cobbles, angular up to 6", brown, dry. TOPSOIL.
2		(0.5- 2.0') C gravel, trace NP fines, trace F sand, dry Stone drainage trench with pipe
3		
4		(2.0-6.0') F-C sand and F-C gravel and cobbles angular up to 2.0 FT, little NP fines, grayish brown to light brown,
5		
6		
7		Some slight mottling observed at 4.0 FT
8		Groundwater not encountered.
9		
10		
		Bottom of test pit at 6.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-5**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 6.0 feet.

Picture showing soil strata at Test pit 5

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-5**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 6.0 feet.

Picture showing soil strata at Test pit 5

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-6**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	7.25 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
1		(0.0-0.33') F-C sand and NP fines, little F-C gravel, subangular up to 1" brown, dry.
2		(0.3-1.0') Degraded Asphalt, F-C angular gravel up to 2", little F-C sand, little NP fines, black, dry.
3		(1.0-3.0') F-C sand and NP-LP fines, F-C gravel, brown, dry. Former Topsoil.
4		
5		(3.0 -5.0') F-C sand, some F-C gravel, subangular up to 6", little NP fines Light brown, dry.
6		(5.0-7.25') M-C gravel and cobbles (angular 6"- 12") and F-C sand, little NP -LP fines, orange-brown to brown, dry to moist.
7		
8		
9		Some soil motting at 5.5 FT. Possible weathered rock near base of pit. Groundwater not encountered
10		
		Bottom of test pit at 7.25 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-6**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 7.25 feet.

Picture showing soil strata at Test pit 6

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-6**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 7.25 feet.

Picture showing soil strata at Test pit 6

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-7**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
1		(0.0-0.33') F-C sand and NP fines, little F-C gravel, subangular up to 1" brown, dry. Contains brick fragments. TOPSOIL.
2		(0.3-1.0') F-C sand and F-C gravel, little NP fines, brown, dry.
3		(1.0-6.0') F-C sand and angular F-C cobbles and gravel, little NP fines, light brown to orange-brown, dry.
4		
5		
6		
7		
8		Slight mottling observed at 4.0 FT.
9		Groundwater not encountered
10		
		Bottom of test pit at 6.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-7**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 6.0 feet.

Picture showing soil strata at Test pit 7

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-8**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
1		(0.0-2.0') F-C sand, some NP fines, some F-C gravel, angular up to 6", brown, dry, with asphalt debris. Contains organic fibers. TOPSOIL.
2		(2.0-4.0') F-C sand, little NP fines, some F-C gravel and cobbles up to 6", light brown, dry.
3		
4		(4.0-6.0') F-C gravel and cobbles, subangular up to 6" and F-C sand, little NP fines, dense matrix, brown, dry.
5		
6		
7		
8		
9		Groundwater or soil mottling not encountered.
10		
		Bottom of test pit at 6.0 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-8**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 6.0 feet.

Picture showing soil strata at Test pit 8

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-9**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.5 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

DEPTH FT.	ANALYZED SAMPLE ID	SOIL DESCRIPTION
1		(0.0-0.7') F-C sand and NP fines, little F-C gravel and cobbles, angular up to 6" brown, dry. Contains organic fibers.Topsoil.
2		
3		(0.7-3.5') F- M sand, some NP fines, some F-C gravel and cobbles, subrounded up to 6", light brown, dry.
4		(3.5-5.0') F-C sand, little NP ifnes, some F-C gravel and cobbles, subangular up to 6", grayish brown to light brown, dry.
5		
6		(5.0 -6.5') F-C gravel and cobbles, angular up to 6" and F-C sand, little NP fines dense matrix, brown to reddish brown, dry to moist.
7		
8		Slight mottling observd at 6.0 FT. Groundwater not encountered.
9		
10		
		Bottom of test pit at 6.5 feet.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NON-PLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-9**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.5 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:		**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	Excavator: Ford 655A	**DATUM VERT. / HORZ.:**	
WEATHER:	70° F Sunny	**DATE START / END**	10/10/2019

Photographic Log

Bottom of test pit at 6.5 feet.

Picture showing soil strata at Test pit 9

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

Appendix B

Historic Aerial Photographs

INQUIRY #: 5799887.4
YEAR: 1991
= 500'
N
EDR

INQUIRY #: 5799887.4

YEAR: 1963

= 500'

N

EDR

INQUIRY #: 5799887.4

YEAR: 1949

= 500'

N

EDR

GEI Consultants

February 28, 2020

Consulting Engineers and Scientists

Garden Homes
820 Morris Turnpike
Short Hills, NJ 07078

Attn: Scott Loventhal

Re: Test Pit and Infiltration Testing Results
Proposed Westfield Mall Residences
Trumbull, CT

Dear Mr. Loventhal:

This letter report details the recent investigations conducted by GEI Consultants, Inc. (GEI) on the subject property, and our recommendations for an infiltration rate to be used for site stormwater design.

Project Description

The proposed development will occur on approximately 10 acres of vacant land bounded by Westfield Mall, Merritt Parkway (Route 15), and Main Street (Route 111) in Trumbull, Connecticut. Plans are currently in the conceptual phase. According to the concept plan provided by BL Companies, development is to include up to six (6) residential and clubhouse-type structures spread across the property with associated site improvements such as access drives, parking lots, pedestrian plazas, etc.

The site improvements will likely be tiered to fit the overall site topography. Cuts and fills of up to 12 to 15 feet are likely to be required to suitably transition the western part of the site across the steep slope into the mall parking area. Retaining walls may be required where sufficient lateral distance is not available for sloping.

Field Investigation

Two previous investigations have been conducted on the property:

1. Test borings and *Preliminary Geotechnical Engineering Report*, Heller and Johnson, June 2008.
2. Test pits and *Preliminary Geotechnical Assessment*, GEI Consultants, October 2019.

We reviewed the results of these investigations and incorporated data contained therein as appropriate for this evaluation.

Eight (8) additional test pits were dug at the site on February 14, 2020, using a rubber-tired backhoe. The test pits were advanced to a planned depth of 6.5 to 9.0 feet, or to digging refusal. The test pits were conducted at or very near the locations requested by BL Companies, as marked on site using a handheld GPS unit.

In-situ hydraulic conductivity was measured during excavation at depths of about 4.0 to 4.6 feet in four (4) of the pits using a Guelph-model permeameter. Constant-head test procedures generally followed ASTM D5126 and manufacturer recommendations. Two tests were conducted at each test pit location with varying water column heights and the results generally averaged, as shown on the attached calculation sheets.

The test pits were logged and photographed by the on-site GEI professional.

Subsurface Conditions

Geologic maps indicate the property lies on a thick glacial till upland known locally as Ox Hill. Glacial till soils in this locale generally consist of a dense mixture of sand, silt, and gravel with frequent cobbles and small boulders arranged in a tight matrix.

The soils encountered in the test pits can be classified as follows:

Topsoil – Organic, brown to dark brown topsoil in the test pits ranged from 6 inches to approximately 2 feet in thickness. Cobbles and debris were often noted within these soils.

Fill – Granular fill with debris such as cables, brick, asphalt, etc. has been encountered in many of the test pits and borings encountered on the property. This material would likely have been placed as the former residential neighborhood was constructed. In general, it appears that the central portion of the property rests on or near "native" ground, with fill thickness increasing gradually towards the north to north-west and south to south-east. In particular, significant fills may be present on the low southwest corner of the property. Fills and debris should also be expected near the footprints of all demolished houses.

Glacial Till – Dense, stony glacial tills were encountered in all test pits below the topsoil and/or fill. These soils were typically classified as brown to orange-brown predominantly sand and gravel with frequent cobbles and small boulders between 6 and 24 inches in size, and about 10 to 30 percent silty fines. A lens of sandy silt also appears to be present near the surface near TP104. Soils were generally quite dense about 2 to 3 feet into this stratum.

Apparent Rock – The test boring investigation conducted in 2008 included sixteen (16) test borings spaced on an approximate grid throughout the property. In general, the depth to rock appears to be somewhat variable, on the order of 4 to 14 feet below current grade. A mantle of weathered rock, thick in places, was present within most borings. During the current test pit investigation, digging refusal on apparent weathered rock was encountered at TP-100 (5.5 feet) and TP-103 (5.0 feet) along the west side of the property.

Groundwater – Groundwater was encountered within five of the test pits at depths ranging from about 4.0 to 8.5 feet. No consistent signs of soil mottling could be discerned from the excavations. Generally, in variable soil profiles similar to this, discontinuous perched water seams are common near abrupt changes in hydraulic conductivity, such as the transition from loose fills to dense glacial till or from granular glacial till to weathered or sound rock.

Groundwater levels are subject to seasonal and weather-related variations. Groundwater observations made at different times and different locations may be significantly different than the measurements taken as part of this investigation.

Subsurface Drainage Design

We understand site stormwater design is still in the conceptual stage. For complexes similar to this, our experience is that a combination of above-ground ponds/basins (where space allows) and below-ground infiltration chambers are generally the most efficient. Based on the results of the investigation, stormwater management features will likely be founded in soils with low to very low infiltration capability.

Near-surface soils on the property are mapped by the NRCS Soil Survey as the Paxton-Urban series. Downward permeability associated with this soil type is described as moderate in the upper 2 feet (0.6 to 2.0 inches/hour) to very slow (less than 0.2 inches/hour) at depth.

The permeameter measurements within the test pits taken at depths between 4.0 and 4.6 feet varied from 2.2 to 9.9 inches/hour for the low-head (5 cm) condition. When the test was repeated with increased water head (10 cm), measurements varied from 3.8 to 9.1 inches/hour. Note that two of the reported 10 cm tests were judged to be not valid, due to likely flooding of the test hole.

From our review of the field testing data, and our local experience with similar soils, we recommend assuming an infiltration rate of **3.0 inches/hour** for stormwater system design. In accordance with CT DEEP stormwater regulations, a factor of safety of 2.0 should be applied to this field-measured value when used in design calculations. The seasonal high groundwater elevation will be variable across the property, and should be judged based on specific conditions below each proposed feature. GEI can assist with us as the site design progresses.

Closure

If you have questions or need clarification regarding any elements of this report, please do not hesitate to contact us. Thank you for the opportunity to work with you on this project.

Sincerely,

GEI Consultants, Inc.

Matthew Glunt, PE
Senior Geotechnical Engineer

Enclosure: Test Pit Location Plan *(as prepared by BL Companies)*
Test Pit Logs and Photographs
Permeameter Field Data and Calculations

Architecture
Engineering
Environmental
Land Surveying
BL Companies
355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

GARDEN HOMES

NEWTOWN TURNPIKE - MAIN STREET
(CONN ROUTE 111)
TRUMBULL, CONNECTICUT

REVISIONS

No.	Date	Desc.

Designed	X.X.X.
Drawn	X.X.X.
Reviewed	
Scale	1"=40'
Project No.	1800513
Date	XX/XX/XX
CAD File: SP180051301	

Title

SITE BORING PLAN

Sheet No.

SB-1

Xref (s) : BD180051301 ; XDSC133801 ; 10-23-2019_Trumbull Concept Site Plan-XREF ; XT180051301 ; 10-23-2019_Trumbull Concept Site Plan-New Roundabout

10/18/2019 AM,CBE, G:\JOBS\BGA\1800513\DWG\SP180051301.DWG,SB-1 (ARCH-ARC)

© 2019 BL COMPANIES, INC. THESE DRAWINGS SHALL NOT BE UTILIZED BY ANY PERSON, FIRM OR CORPORATION WITHOUT THE SPECIFIC WRITTEN PERMISSION OF BL COMPANIES.

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-100**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	289	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	5.5 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	15.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	4.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

DEPTH FT.	ANALYZED SAMPLE ID	SAMPLE DEPTH (FT)	SOIL DESCRIPTION
0			(0.0-0.5'): 6" TOPSOIL
1			
2			(0.5-3.0'): SILTY SAND (SM);~ 60% F-C sand, ~20% F-C gravel up to 1", ~20% NP to LP fines, dark brown, wet. Contain organic fibers, cobbles, red brick, and small boulders. Strong organic-like odor. FILL
3			
4			(3.0 -5.5'): SILTY SAND WITH GRAVEL (SM); ~60% F-C sand, ~20% F-C gravel up to 1", ~20% NP to LP fines, dark brown, wet. Contain organic fibers, cobbles, red brick, boulders, plastic and metallic debris, and rotted timber pieces. Strong organic-like odor.
5			
6			Refusal o boulder or rock at 5.5 FT. Backfilled with excavated soil and tamped down with excavator bucket.
7			Groundwater or soil mottling not encountered.
8			
9			
10			
			Bottom of test pit at 5.5 FT

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NONPLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-100**
	CITY/STATE: Trumbull, CT	2	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	289	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	5.5 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	15.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	4.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 5.5 feet.
Picture showing soil strata at TP-100

NOTES:
IN. = INCHES NM= NOT MEASURED
FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-101**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	310.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.5 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	20.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

DEPTH FT.	ANALYZED SAMPLE ID	SAMPLE DEPTH (FT)	SOIL DESCRIPTION
0			6" TOPSOIL
1			(0.5-1.0'):WIDELY GRADED SAND WITH SILT (SW-SM); ~80% F-C sand, ~10% F-C gravel up to 1", ~10% NP to LP fines, dark brown, moist. Contains organic fibers, moderate organic-like odor.
2			(1.0-4.0'): WIDELY GRADED SAND WITH SILT (SW-SM); ~80% F-C sand, ~10% NP fines, ~10% F-C gravel, dark brown to brown, moist. FILL Contain cobbles, building debris, former foundation encountered at 2.0 FT.
3			Encountered full foundation at 4.0 ft. Test pit extended to go beneath.
4			
5			(4.0' -6.5'): WIDELY GRADED SAND WITH SILT (SW-SM); ~80% F-C sand, ~10% F-C gravel, up to 1", ~10% NP fines, grayish brown, moist. ~30% cobbles by volume.
6			
7			Backfilled with excavated soil and tamped down with excavator bucket.
8			Groundwater infiltration observed at 6.5 FT
9			
10			
			Bottom of test pit at 6.5 FT

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NONPLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-101**
	CITY/STATE: Trumbull, CT	2	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	310.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.5 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	20.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 6.5 FT

Picture showing the soil strata at TP-101

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-102**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	319	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

DEPTH FT.	ANALYZED SAMPLE ID	SAMPLE DEPTH (FT)	SOIL DESCRIPTION
0			6" TOPSOIL
1			(0.5-2.0'):WIDELY GRADED SAND WITH SILT (SW-SM);~ 80% F-C sand, ~10% F-C gravel up to 1", ~10% NP- LP fines, dark brown, moist. Contains organic fibers, moderate organic-like odor. FILL
2			
3			(2.0-4.0'): SILTY SAND WITH GRAVEL (SM); ~50% F-C sand, ~30% LP to MP fines, ~20% F-C gravel up to 1", brown, wet. Contains root fragments and cobbles. FILL
4			
5			
6			(4.0' -8.0'): SILTY SAND WITH GRAVEL (SM); ~50% F-M sand, ~35% LP-MP fines, ~15% F-C gravel, light orange-brown, moist to wet. Contains small cobbles.
7			
8			
9			Backfilled with excavated soil and tamped down with excavator bucket. Groundwater infiltration observed at 4.0 FT
10			

Bottom of test pit at 8.0 FT.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NONPLASTIC	NM= NOT MEASURED
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GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-102**
	CITY/STATE: Trumbull, CT	2	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 8.0 FT

Picture showing the soil strata at TP-102

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-102**
	CITY/STATE: Trumbull, CT	3	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	NM	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	8.0 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 8.0 FT

Picture showing some excavated soil at TP-102

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-103**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	301	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	5.0 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

DEPTH FT.	ANALYZED SAMPLE ID	SAMPLE DEPTH (FT)	SOIL DESCRIPTION
0			
1			(0.0-1.0'): SILTY SAND (SM); ~75% F-C sand, ~15% NPfines, ~10% F-C gravel up to 1", dark brown, moist. Contains organic fibers and cobbles.
2			(1.0-5.0'): SILTY SAND WITH GRAVEL (SM); ~50% F-C sand, ~30% NP to LP fines, ~20% F-C gravel up to 1", gray-brown, moist. Contains cobbles
3			
4			
5			Refusal @ 5.0 ft. on boulder or weathered rock
6			Backfilled with excavated soil and tamped down with excavator bucket. Groundwater or soil mottling not encountered.
7			
8			
9			
10			
			Bottom of test pit at 5.0 FT.

NOTES:

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FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-103**
	CITY/STATE: Trumbull, CT	2	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	301	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	5.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 5.0 feet.

Picture showing the soil strata at TP-103

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-104**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	309	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	7.0 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

DEPTH FT.	ANALYZED SAMPLE ID	SAMPLE DEPTH (FT)	SOIL DESCRIPTION
0			6" TOPSOIL
1			
2			(0.5-4.0'): SANDY SILT (ML): ~55% LP-MP fines, ~45% F sand, orange-brown, moist.
3			
4			
5			(4.0 -7.0'): WIDELY GRADED SAND (SW); ~85% F-M sand, ~10% F-C gravel, ~5% NP fines, dark gray, moist.
6			
7			
			Backfilled with excavated soil and tamped down with excavator bucket.
8			
			Groundwater or soil mottling not encountered.
9			
10			
			Bottom of test pit at 7.0 FT.

NOTES:

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FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-104**
	CITY/STATE: Trumbull, CT	2	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	309	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	7.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	8.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 7.0 FT.

Picture showing the soil strata at TP-104

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-104**
	CITY/STATE: Trumbull, CT	3	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	309	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	7.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	8.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 7.0 FT.

Picture showing excavated soil at TP-104

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-105**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	313	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	9.0 FT
OBSERVED BY:	P. Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

DEPTH FT.	ANALYZED SAMPLE ID	SAMPLE DEPTH (FT)	SOIL DESCRIPTION
0			(0.0-1.0'): SILTY SAND WITH GRAVEL (SM); 45% F-C sand, 30% NP fine, 25% F-C gravel and cobbles up to 12", brown to dark brown, dry. Contain organic fibers, fragments of brick and concrete block.
1			(0.1-2.5'): SILTY SAND WITH GRAVEL (SM); 60% F-C sand, 25% F-C gravel and cobbles up to 12 in., 15% NP fines, brown to orange brown, dry.
2			
3			
4			
5			(2.5 -9.0'): SILTY SAND WITH GRAVEL (SM); ~65% F-C sand, ~ 25% F-C gravel, ~20% NP -LP fines, brown to grayish brown, dry to wet at 8.5'
6			
7			
8			
9			
10			Backfilled with excavated soil and tamped down with excavator bucket. Groundwater encountered at 8.5 FT.
			Bottom of test pit at 9.0 FT.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NONPLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-105**
	CITY/STATE: Trumbull, CT	2	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	313	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	9.0 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 9.0 FT.

Picture showing the soil strata at TP-105

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants	GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
		PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-106**
		CITY/STATE: Trumbull, CT	1	
		GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	306	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.5 FT
OBSERVED BY:	P. Blessing & B. Akereyeni	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

DEPTH FT.	ANALYZED SAMPLE ID	SAMPLE DEPTH (FT)	SOIL DESCRIPTION
0			6" TOPSOIL (0.5-1.0'): WIDELY GRADED SAND WITH SILT (SW-SM); ~80% F-C sand, ~10% NP fines, ~10% F-C gravel, brown, moist. Contain organic fibers.
1			
2			
3			(1.0-6.5'): WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~75% F-C sand, 15% F-C gravel up to 1", 10% NP-LP fines, brown, moist. Contains cobbles/small boulders up to 30% by volume. Concrete debris between 1.0 and 4.0 FT.
4			
5			
6			Backfilled with excavated soil and tamped down with excavator bucket.
7			Groundwater encountered at 6.5 FT.
8			
9			
10			
			Bottom of test pit at 6.5 FT.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NONPLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Trumbull	**PAGE**	**TP-106**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	306	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	6.5 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	12.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 6.5 FT.

Picture showing soil strata at TP-106

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-107**
	CITY/STATE: Trumbull, CT	1	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	295.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	7.5 FT
OBSERVED BY:	P. Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

DEPTH FT.	ANALYZED SAMPLE ID	SAMPLE DEPTH (FT)	SOIL DESCRIPTION
0			(0.0-0.5'): SILTY SAND WITH GRAVEL (SM); ~45% F-C sand, ~35% NP fines, ~20% F-C gravel, dark brown, dry. Contain organic fibers, cobbles/boulders, asphalt, concrete debris.
1			(0.5-3.0'): SILTY SAND WITH GRAVEL (SM); ~45% F-C sand, ~35% F-C gravel and cobbles, ~20% NP fines, brown, dry. Contain organic fibers, cobbles/boulders, asphalt, concrete debris.
2			
3			(3.0-3.5'): Layer of broken asphalt
4			(3.5-5.5'): SILTY SAND WITH GRAVEL (SM); ~35% F-C sand, ~35% F-C gravel and cobbles up to 24 in., ~30% NP fines, brown, dry to moist.
5			
6			(5.5-7.5): SILTY SAND WITH GRAVEL (SM); ~50% F-C sand, ~35% F-C gravel and cobbles up to 24 in., ~15% NP fines, orange to brown, dry to moist. With weathered rock fragments near base.
7			
8			Backfilled with excavated soil and tamped down with excavator bucket.
9			Groundwater encountered at 7.5 FT.
10			
			Bottom of test pit at 7.5 FT.

NOTES:

IN. = INCHES	F=FINE	M=MEDIUM	NP= NONPLASTIC	NM= NOT MEASURED
FT. = FEET	C=COARSE	LP=LOW PLASTICITY	MP=MEDIUM PLASTICITY	

GEI Consultants, Inc. 455 Winding Brook Drive Glastonbury, CT 06033 (860) 368-5300	**CLIENT:** Garden Homes	**TEST PIT LOG**	
	PROJECT: Westfield Mall Resid.	**PAGE**	**TP-107**
	CITY/STATE: Trumbull, CT	2	
	GEI PROJECT NUMBER: 1904976		

GROUND SURFACE ELEVATION (FT):	295.5	**LOCATION:**	See Plan
NORTHING:	**EASTING:**	**TOTAL DEPTH:**	7.5 FT
OBSERVED BY:	Patrick Blessing	**TOTAL LENGTH:**	10.0 FT
CHECKED BY:	M. Glunt	**TOTAL WIDTH:**	3.0 FT
EQUIPMENT:	CAT 416B Rubber Tire Backhoe	**DATUM VERT. / HORZ.:**	
WEATHER:	12- 29° F. Mostly Sunny	**DATE START / END**	2/14/2020

Photographic Log

Bottom of test pit at 7.5 FT.

Picture showing soil strata at TP-107

NOTES:

IN. = INCHES NM= NOT MEASURED

FT. = FEET

GEI Consultants, Inc.
GEI Proj # 1904976
Guelph Permeameter Testing
Test Date 2/14/2020

Field Data TP-101

Reservoir Combined
Depth of Hole 4" *(augered below bottom)*
Bottom of Test Pit 4.0 ft
GEI Rep. P. Blessing & B. Akereyeni
Material Native Sand with Silt and Gravel (SW-SM) with cobbles
GW Depth 6.5 ft

Water Level in Well 5 cm

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.17		1.8		
0.33	0.16	1.9	0.1	0.61
0.50	0.17	2.3	0.4	2.37
0.67	0.17	2.6	0.3	1.80
0.83	0.16	3.1	0.5	3.05
1.00	0.17	3.5	0.4	2.40
1.17	0.17	3.6	0.1	0.59
1.33	0.16	4	0.4	2.44
1.50	0.17	4.3	0.3	1.78
1.67	0.17	4.6	0.3	1.80
1.83	0.16	4.9	0.3	1.83
2.00	0.17	5.2	0.3	1.80
2.17	0.17	5.4	0.2	1.18
2.33	0.16	5.7	0.3	1.83
2.50	0.17	6	0.3	1.78
2.67	0.17	6.2	0.2	1.20
2.83	0.16	6.5	0.3	1.83
3.00	0.17	6.7	0.2	1.20
3.17	0.17	6.9	0.2	1.18
	Steady Rate of Change, R_1 (cm/min)			**1.58**

Water Level in Well 10 cm

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.17		7.1		
0.33	0.16	14	6.9	42.07
0.50	0.17	23.5	9.5	56.21
0.67	0.17	34.5	11	65.87
0.83	0.16	43.5	9	54.88
1.00	0.17	53	9.5	56.89
1.17	0.17	61.2	8.2	48.52
1.33	0.16	70	8.8	53.66
1.50	0.17	80	10	59.17
	Steady Rate of Change, R2 (cm/min)			**56.46**

GEI Consultants, Inc. **Calc. by:** B. Akereyeni **Date:** 2/24/2020
GEI Proj # 1904976 **Check by:** M. Glunt **Date:** 2/27/2020
Guelph Permeameter Testing - TP-101

Single Head Method - Test 1

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_1	-	5	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	4		(Table 2: Coarse and Gravelly Sands)
• Steady State Rate of Water Level Change	R_1	-	1.58	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.36	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_1	-	0.768		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_1	-	0.9282	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	2.648E-03	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	7.355E-03	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Low Head Test

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**2.648E-03**	cm/sec
			3.8	in/hour

Single Head Method - Test 2

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_2	-	10	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	4		(Table 2: Coarse and Gravelly Sands)
• Steady State Rate of Water Level Change	R_2	-	56.46	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.36	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_2	-	1.234		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_2	-	33.14004112	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	4.854E-02	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	1.348E-01	cm^2/sec	(Table 3: One Head, Combined Reservoir)

High Head Test

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**4.854E-02**	cm/sec	**Test invalid**
			68.8	in/hour	

GEI Consultants, Inc.
GEI Proj # 1904976
Guelph Permeameter Testing
Test Date 2/14/2020

Field Data TP-103

Reservoir Combined
Depth of Hole 3" *(augered below bottom)*
Bottom of Test Pit 4.0 ft
GEI Rep. P. Blessing & B. Akereyeni
Material Native Silty Sand with Gravel (SM) and cobbles
GW Depth NE ***Refusal at 5.0 ft. on large boulder or weathered rock*

Water Level in Well 5 cm

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.17		2.5		
0.33	0.16	5.1	2.6	15.85
0.50	0.17	6.1	1	5.92
0.83	0.33	8.1	2	6.04
1.00	0.17	9	0.9	5.39
1.17	0.17	9.9	0.9	5.33
1.33	0.16	10.5	0.6	3.66
1.50	0.17	11.3	0.8	4.73
1.67	0.17	12.1	0.8	4.79
1.83	0.16	12.8	0.7	4.27
2.00	0.17	13.5	0.7	4.19
2.17	0.17	14.1	0.6	3.55
2.33	0.16	14.8	0.7	4.27
2.50	0.17	15.5	0.7	4.14
2.67	0.17	16.1	0.6	3.59
2.83	0.16	16.7	0.6	3.66
3.00	0.17	17.4	0.7	4.19
	Steady Rate of Change, R_1 (cm/min)			**4.10**

Water Level in Well 10 cm

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.166		5		
0.33	0.16	15.5	10.5	64.02
0.499	0.17	21.5	6	35.50
0.666	0.17	25.5	4	23.95
0.83	0.16	28.5	3	18.29
0.997	0.17	31	2.5	14.97
1.166	0.17	33	2	11.83
1.330	0.16	35.5	2.5	15.24
1.499	0.17	37.5	2	11.83
1.665	0.17	39.7	2.2	13.28
1.831	0.17	41.7	2	12.01
1.998	0.17	43	1.3	7.81
2.164	0.17	44.5	1.5	9.01
2.331	0.17	46	1.5	9.01
2.497	0.17	47.5	1.5	9.01
2.664	0.17	49.4	1.9	11.41
2.830	0.17	51	1.6	9.61
2.997	0.17	52.7	1.7	10.21
3.163	0.17	54.5	1.8	10.81
3.330	0.17	56.2	1.7	10.21
3.496	0.17	58	1.8	10.81
	Steady Rate of Change, R2 (cm/min)			**10.61**

GEI Consultants, Inc. **Calc. by:** B. Akereyeni **Date:** 2/24/2020
GEI Proj # 1904976 **Check by:** M. Glunt **Date:** 2/27/2020
Guelph Permeameter Testing - TP-103

Single Head Method - Test 1

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_1	-	5	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_1	-	4.10	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_1	-	0.768		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_1	-	2.4038	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	4.159E-03	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	3.466E-02	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Low Head Test

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**4.159E-03**	cm/sec
			5.9	in/hour

Single Head Method - Test 2

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_2	-	10	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_2	-	10.61	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_2	-	1.234		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_2	-	6.228428428	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	6.450E-03	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	5.375E-02	cm^2/sec	(Table 3: One Head, Combined Reservoir)

High Head Test

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**6.450E-03**	cm/sec
			9.1	in/hour

GEI Consultants, Inc.
GEI Proj # 1904976
Guelph Permeameter Testing
Test Date 2/14/2020

Field Data TP-104

Reservoir Combined
Depth of Hole 3" *(augered below bottom)*
Bottom of Test Pit 4.6 ft
GEI Rep. P. Blessing & B. Akereyeni
Material Native Sand (SW) with gravel
GW Depth NE

Water Level in Well 5 cm

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.17		1.3		
0.33	0.16	2.2	0.9	5.49
0.50	0.17	3	0.8	4.73
0.67	0.17	3.3	0.3	1.80
0.83	0.16	3.6	0.3	1.83
1.00	0.17	4	0.4	2.40
1.17	0.17	4.4	0.4	2.37
1.33	0.16	4.6	0.2	1.22
1.50	0.17	5	0.4	2.37
1.67	0.17	5.3	0.3	1.80
1.83	0.16	5.6	0.3	1.83
2.00	0.17	5.8	0.2	1.20
2.17	0.17	6.1	0.3	1.78
2.33	0.16	6.3	0.2	1.22
2.50	0.17	6.6	0.3	1.78
2.67	0.17	6.8	0.2	1.20
2.83	0.16	7	0.2	1.22
3.00	0.17	7.3	0.3	1.80
	Steady Rate of Change, R_1 (cm/min)			**1.53**

Water Level in Well 10 cm

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.17		7.3		
0.33	0.16	14	6.7	40.85
0.50	0.17	18.5	4.5	26.63
0.67	0.17	22	3.5	20.96
0.83	0.16	24.5	2.5	15.24
1.00	0.17	26.6	2.1	12.57
1.17	0.17	29	2.4	14.20
1.33	0.16	31.5	2.5	15.24
1.50	0.17	33.5	2	11.83
1.66	0.17	35.5	2	12.07
1.83	0.17	37.5	2	12.01
2.00	0.17	39.5	2	12.01
2.16	0.17	41.4	1.9	11.41
2.33	0.17	43.3	1.9	11.41
2.50	0.17	44.9	1.6	9.61
2.66	0.17	46	1.1	6.61
2.83	0.17	47.2	1.2	7.21
3.00	0.17	48.1	0.9	5.41
3.16	0.17	49	0.9	5.41
	Steady Rate of Change, R2 (cm/min)			**6.16**

GEI Consultants, Inc. **Calc. by:** B. Akereyeni **Date:** 2/24/2020
GEI Proj # 1904976 **Check by:** M. Glunt **Date:** 2/27/2020
Guelph Permeameter Testing - TP-104

Single Head Method - Test 1

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_1	-	5	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_1	-	1.53	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_1	-	0.768		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_1	-	0.9005	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	1.558E-03	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	1.298E-02	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Low Head Test

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**1.558E-03**	cm/sec
			2.2	in/hour

Single Head Method - Test 2

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_2	-	10	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Medium and fine sands)
• Steady State Rate of Water Level Change	R_2	-	6.16	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.12	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_2	-	1.234		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_2	-	3.613663664	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	3.742E-03	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	3.118E-02	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Test Averages

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**2.650E-03**	cm/sec
			3.8	in/hour

GEI Consultants, Inc.
GEI Proj # 1904976
Guelph Permeameter Testing
Test Date 2/14/2020

Field Data TP-106

Reservoir Combined
Depth of Hole 3"
Bottom of Test Pit 4.0'
GEI Rep. P. Blessing & B. Akereyeni
Material Native Sand with Silt and Gravel (SW-SM) with cobbles
GW Depth 6.5

Water Level in Well **5 cm**

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.17		4		
0.33	0.16	7.3	3.3	20.12
0.50	0.17	7.7	0.4	2.37
0.67	0.17	8.3	0.6	3.59
0.83	0.16	9.1	0.8	4.88
1.00	0.17	9.5	0.4	2.40
1.17	0.17	10.8	1.3	7.69
1.33	0.16	12	1.2	7.32
1.50	0.17	12.6	0.6	3.55
1.67	0.17	13.2	0.6	3.59
1.83	0.16	13.8	0.6	3.66
2.00	0.17	14.6	0.8	4.79
2.17	0.17	15.3	0.7	4.14
2.33	0.16	16.1	0.8	4.88
2.50	0.17	16.8	0.7	4.14
2.67	0.17	17.4	0.6	3.59
2.83	0.16	18.1	0.7	4.27
3.00	0.17	18.8	0.7	4.19
3.17	0.17	19.5	0.7	4.14
3.34	0.17	20.2	0.7	4.14
3.50	0.17	21	0.8	4.73

Steady Rate of Change, R_1 (cm/min) **4.17**

Water Level in Well **10 cm**

Time (min)	Time Change (min)	Water Level in Res. (cm)	Change in Res. Water Level (cm)	Rate of Change (cm/min)
0.17		5		
0.33	0.16	18	13	79.27
0.50	0.17	28	10	59.17
0.67	0.17	37.5	9.5	56.89
0.83	0.16	45.5	8	48.78
1.00	0.17	53.5	8	47.90
1.17	0.17	62	8.5	50.30
1.33	0.16	69	7	42.68
1.50	0.17	76	7	41.42

Steady Rate of Change, R2 (cm/min) **45.58**

GEI Consultants, Inc. **Calc. by:** B. Akereyeni **Date:** 2/24/2020
GEI Proj # 1904976 **Check by:** M. Glunt **Date:** 2/27/2020
Guelph Permeameter Testing - TP-106

Single Head Method - Test 1

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_1	-	5	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Coarse and Gravelly Sands)
• Steady State Rate of Water Level Change	R_1	-	4.17	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.36	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_1	-	0.768		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_1	-	2.4497	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	6.989E-03	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	1.941E-02	cm^2/sec	(Table 3: One Head, Combined Reservoir)

Low Head Test

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**6.989E-03**	cm/sec
			9.9	in/hour

Single Head Method - Test 2

Test Data and Information

• Reservoir		-	Combined		
• Reservoir Cross-Sectional Area		-	35.22	cm^2	(Provided on Permeameter)
• Water Head Height	H_2	-	10	cm	
• Borehole Radius	a	-	3.2	cm	Assumed slightly larger than 3cm rad. hand auger
• Soil Texture-Structure Category		-	3		(Table 2: Coarse and Gravelly Sands)
• Steady State Rate of Water Level Change	R_2	-	45.58	cm/min	(Obtained during testing)

Test Calculations and Results

• Microscopic Capillary Length Factor	α^*	-	0.36	cm^{-1}	(Table 2: Based on Soil Texture-Structure Category)
• Shape Factor	C_2	-	1.234		(Table 2: Based on Soil Texture-Structure Category)
• Volumetric Flow Rate	Q_2	-	26.75297916	cm^3/sec	(Table 3: One Head, Combined Reservoir)
• Soil Saturated Hydraulic Conductivity	K_{fs}	-	3.918E-02	cm/sec	(Table 3: One Head, Combined Reservoir)
• Soil Matrix Flux Potential	Φ_m	-	1.088E-01	cm^2/sec	(Table 3: One Head, Combined Reservoir)

High Head Test

• Soil Saturated Hydraulic Conductivity	K_{fs}	-	**3.918E-02**	cm/sec
			55.5	in/hour

Test invalid

Table 2

Soil Texture-Structure Category	α^*(cm^{-1})	Shape Factor
Compacted, Structure-less, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01	$C_1 = \left(\frac{H_2/a}{2.081 + 0.121(H_2/a)}\right)^{0.672}$
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04	$C_1 = \left(\frac{H_1/a}{1.992 + 0.091(H_1/a)}\right)^{0.683}$ $C_2 = \left(\frac{H_2/a}{1.992 + 0.091(H_2/a)}\right)^{0.683}$
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.754}$
Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macro pores, etc.	0.36	$C_1 = \left(\frac{H_1/a}{2.074 + 0.093(H_1/a)}\right)^{0.754}$ $C_2 = \left(\frac{H_2/a}{2.074 + 0.093(H_2/a)}\right)^{0.754}$

Calculation formulas related to shape factor (C). Where H_1 is the first water head height (cm), H_2 is the second water head height (cm), a is borehole radius (cm) and α^* is microscopic capillary length factor which is decided according to the soil texture-structure category. For one-head method, only C_1 needs to be calculated while for two-head method, C_1 and C_2 are calculated (Zang et al., 1998).

Table 3

One Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$	$K_{fs} = \frac{C_1 \times Q_1}{2\pi H_1^2 + \pi a^2 C_1 + 2\pi\left(\frac{H_1}{a^*}\right)}$ $\Phi_m = \frac{C_1 \times Q_1}{(2\pi H_1^2 + \pi a^2 C_1)a^* + 2\pi H_1}$
One Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$	
Two Head, Combined Reservoir	$Q_1 = \bar{R}_1 \times 35.22$ $Q_2 = \bar{R}_2 \times 35.22$	$G_1 = \frac{H_2 C_1}{\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $G_2 = \frac{H_1 C_2}{\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $K_{fs} = G_2Q_2 - G_1Q_1$ $G_3 = \frac{(2H_2^2 + a^2C_2)C_1}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $G_4 = \frac{(2H_1^2 + a^2C_1)C_2}{2\pi(2H_1H_2(H_2 - H_1) + a^2(H_1C_2 - H_2C_1))}$ $\Phi_m = G_3Q_1 - G_4Q_2$
Two Head, Inner Reservoir	$Q_1 = \bar{R}_1 \times 2.16$ $Q_2 = \bar{R}_2 \times 2.16$	

Calculation formulas related to one-head and two-head methods. Where R is steady-state rate of fall of water in reservoir (cm/s), K_{fs} is Soil saturated hydraulic conductivity (cm/s), Φ_m is Soil matric flux potential (cm^2/s), a^* is Macroscopic capillary length parameter (from Table 2), a is Borehole radius (cm), H_1 is the first head of water established in borehole (cm) , H_2 is the second head of water established in borehole (cm) and C is Shape factor (from Table 2).

Architecture
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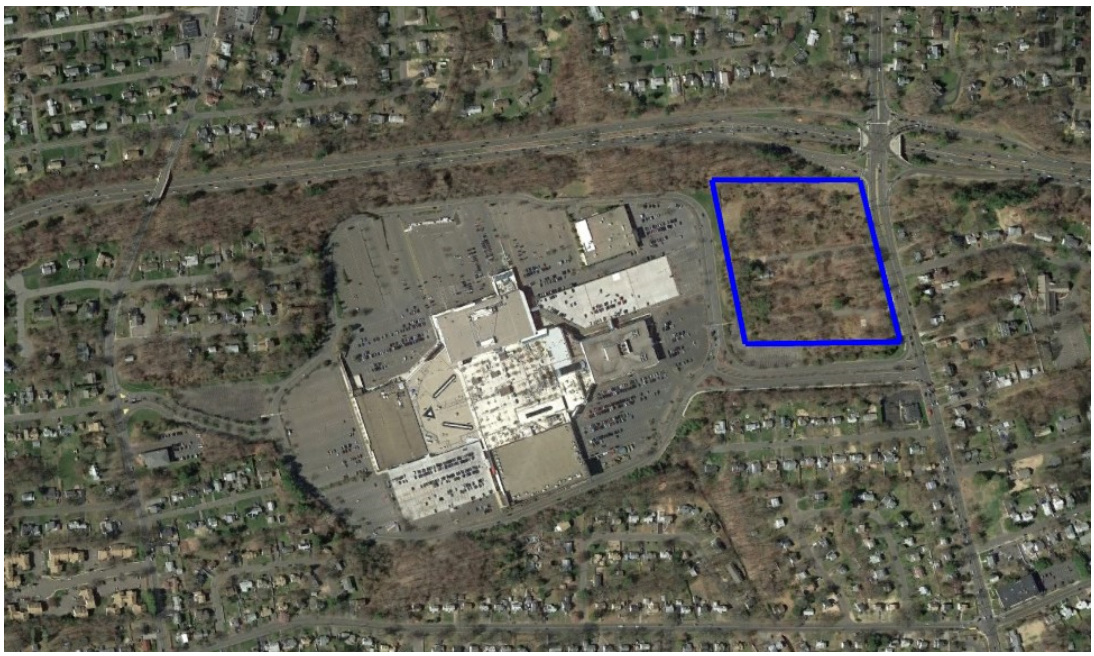
August 2020

Traffic Analysis Addendum

5085 Main Street
Trumbull, CT



BL Companies was tasked with evaluating the 260-unit multi-family residential development proposed at 5085 Main Street in Trumbull, CT. This addendum revises the analysis supplied in the April 2020 dated submission.

After both review by the Town of Trumbull and the Connecticut Department of Transportation (CTDOT), the left turn into the site along Main Street (SR 731 NB) has been eliminated due to safety concerns.

This addendum analyzes the removal of this left turn from the overall traffic analysis. It also incorporates comments that were generated by the CTDOT's Traffic Engineering Department. This included the following:

- Eliminating the pedestrian phase from the intersection of Route 111/SR 731 (Main Street) at Route 15 NB and SB Ramps.
- Updating the signal timings based on the latest signal plans provided by CTDOT.

Trip Distribution and Site Traffic Volumes

The peak hour traffic volumes were assigned to the adjacent street network based on the revised trip distribution (Figure 4A). The revised site traffic volumes are shown in Figure 5A.

Build Traffic Volumes

The assigned site traffic volumes were superimposed onto the No Build Traffic Volumes, which are in the original study. The Build Traffic Volumes are shown in Figure 6A.

Intersection Analysis

The capacity calculations for the revised site access are attached to this Addendum and are summarized in Table 4A below. The table summarized Levels of Service, overall intersection delay, individual movement delay, volume to capacity (v/c) ratio, and the 95th percentile queue length in feet.

After the revision to the analysis, all intersections perform at acceptable levels of service and traffic capacity is insignificantly impacted.

Table 4A-Peak Hour Traffic Operations Summary-Weekday AM

	Background	Build
Route 15 (Merritt Parkway) at Main Street[1]	**B (18" delay)**	**B (19" delay)**
Route 15 NB off ramp Left (200'+225')	C/21"/0.24/50	C/21"/0.24/50
Route 15 NB off ramp Right (200'+225')	B/18"/0.20/50	B/19"/0.21/55
Route 15 SB off ramp Left (410')	C/26"/0.61/110	C/26"/0.62/115
Route 15 SB off ramp Right (200'+200')	B/18"/0.17/45	B/18"/0.17/45
Main Street (SR 731) NB Left (250')	C/22"/0.44/130	C/23"/0.50/150
Main Street (SR 731) NB Through	B/17"/0.19/50	B/17"/0.20/55
Main Street (SR 731) NB Right[2] (75')	A/1"/0.27/25	A/1"/0.29/25
Main Street (Route 111) SB Left (325')	D/41"/0.85/310	D/41"/0.85/315
Main Street (Route 111) SB Through	C/23"/0.54/155	C/23"/0.55/160
Main Street (Route 111) SB Right[2] (325')	A/1"/0.23/25	A/1"/0.23/25
Main Street (SR 731) at Mall Main Driveway[1]	**A (9'' delay)**	**A (10'' delay)**
Mall Driveway Left	B/20"/0.17/35	C/21"/0.30/55
Mall Driveway Right	A/5"/0.13/25	A/5"/0.12/25
Main Street (SR 731) NB Left (400')	C/22"/0.35/75	C/23"/0.38/75
Main Street (SR 731) NB Through	A/4"/0.30/65	A/5"/0.33/65
Main Street (SR 731) SB Through	B/14"/0.44/110	B/15"/0.48/115
Main Street (SR 731) SB Right[2]	A/1"/0.17/25	A/1"/0.17/25
Mall Main Driveway at Ring Road[1]	**A (7" delay)**	**A (8" delay)**
Mall Main Driveway Left	B/10"/0.16/30	B/11"/0.20/35
Mall Main Driveway Right[2]	A/3"/0.20/25	A/3"/0.22/25
Ring Road NB Through	B/11"/0.02/25	B/12"/0.02/25
Ring Road NB Right[2]	A/5"/0.16/25	A/5"/0.17/25
Ring Road SB Left	B/11"/0.11/30	B/12"/0.15/35
Ring Road SB Left/Through	B/11"/0.11/30	B/12"/0.15/35
Main Street (SR 731) at Site Driveway #1		
Site Driveway Right[3]	-	B/13"/0.01/25
Mall Main Driveway and Site Driveway #2		
Site Driveway Right[3]	-	B/11"/0.05/25
Ring Road at Site Drive #3		
Site Drive Left/Right[3]	-	B/11"/0.05/25

Notes: X/0.0/00 - Level of Service/Delay in seconds/veh./V/C ratio/95% Q length in feet

[1] – Signalized intersection

[2] – Channelized free-flow

[3] – Unsignalized movement

Table 4A-Peak Hour Traffic Operations Summary-Weekday PM

	Background	Build
Route 15 (Merritt Parkway) at Main Street[1]	**C (28" delay)**	**C (29" delay)**
Route 15 NB off ramp Left (200'+225')	C/28"/0.44/165	C/28"/0.44/165
Route 15 NB off ramp Right (200'+225')	D/36"/0.53/130	D/37"/0.57/145
Route 15 SB off ramp Left (410')	D/37"/0.81/345	D/39"/0.84/365
Route 15 SB off ramp Right (200'+200')	D/37"/0.56/140	D/37"/0.55/140
Main Street (SR 731) NB Left (250')	D/43"/0.64/195	D/44"/0.67/210
Main Street (SR 731) NB Through	C/26"/0.37/130	C/27"/0.38/135
Main Street (SR 731) NB Right[2] (75')	A/1"/0.44/25	A/1"/0.455/25
Main Street (Route 111) SB Left (325')	D/40"/0.57/175	D/40"/0.55/175
Main Street (Route 111) SB Through	D/42"/0.80/335	D/44"/0.81/340
Main Street (Route 111) SB Right[2] (325')	A/1"/0.09/25	A/1"/0.09/25
Main Street (SR 731) at Mall Main Driveway[1]	**B (19'' delay)**	**B (19'' delay)**
Mall Driveway Left	C/31"/0.74/190	C/31"/0.76/205
Mall Driveway Right	A/10"/0.37/115	A/9"/0.37/115
Main Street (SR 731) NB Left (400')	D/41"/0.79/295	D/42"/0.80/310
Main Street (SR 731) NB Through	A/8"/0.31/115	A/8"/0.31/120
Main Street (SR 731) SB Through	C/30"/0.73/245	C/32"/0.75/265
Main Street (SR 731) SB Right[2]	A/2"/0.50/25	A/2"/0.50/25
Mall Main Driveway at Ring Road[1]	**B (14" delay)**	**B (14" delay)**
Mall Main Driveway Left	B/18"/0.52/125	B/19"/0.53/130
Mall Main Driveway Right[2]	A/4"/0.50/35	A/4"/0.50/35
Ring Road NB Through	C/22"/0.14/40	C/22"/0.14/40
Ring Road NB Right[2]	A/10"/0.66/65	A/10"/0.66/65
Ring Road SB Left	C/23"/0.58/200	C/23"/0.59/225
Ring Road SB Left/Through	C/22"/0.57/195	C/23"/0.58/210
Main Street (SR 731) at Site Driveway #1		
Site Driveway Right[3]	-	C/18"/0.01/25
Mall Main Driveway and Site Driveway #2		
Site Driveway Right[3]	-	B/15"/0.05/25
Ring Road at Site Drive #3		
Site Drive Left/Right[3]	-	C/19"/0.07/25

Notes: X/0.0/00 - Level of Service/Delay in seconds/veh./V/C ratio/95% Q length in feet

[1] – Signalized intersection

[2] – Channelized free-flow

[3] – Unsignalized movement

Table 4A-Peak Hour Traffic Operations Summary-Saturday Mid-Day

	Background	Build
Route 15 (Merritt Parkway) at Main Street[1]	**C (27" delay)**	**C (28" delay)**
Route 15 NB off ramp Left (200'+225')	C/27"/0.40/140	C/28"/0.39/140
Route 15 NB off ramp Right (200'+225')	C/33"/0.44/125	C/34"/0.46/135
Route 15 SB off ramp Left (410')	D/36"/0.79/295	D/37"/0.81/305
Route 15 SB off ramp Right (200'+200')	C/30"/0.18/60	C/31"/0.17/60
Main Street (SR 731) NB Left (250')	D/46"/0.74/270	D/48"/0.78/305
Main Street (SR 731) NB Through	C/27"/0.31/105	C/27"/0.31/110
Main Street (SR 731) NB Right[2] (75')	A/1"/0.43/25	A/1"/0.44/25
Main Street (Route 111) SB Left (325')	D/38"/0.56/195	D/38"/0.55/195
Main Street (Route 111) SB Through	D/41"/0.76/300	D/42"/0.78/310
Main Street (Route 111) SB Right[2] (325')	A/1"/0.09/25	A/1"/0.09/25
Main Street (SR 731) at Mall Main Driveway[1]	**B (17'' delay)**	**B (18'' delay)**
Mall Driveway Left	C/29"/0.74/215	C/29"/0.76/230
Mall Driveway Right	A/8"/0.36/105	A/8"/0.36/105
Main Street (SR 731) NB Left (400')	D/39"/0.75/245	D/41"/0.77/275
Main Street (SR 731) NB Through	A/9"/0.28/105	A/9"/0.29/115
Main Street (SR 731) SB Through	C/27"/0.58/182	C/29"/0.60/195
Main Street (SR 731) SB Right[2]	A/2"/0.53/25	A/2"/0.54/25
Mall Main Driveway at Ring Road[1]	**B (14" delay)**	**B (15" delay)**
Mall Main Driveway Left	B/19"/0.54/130	B/19"/0.55/135
Mall Main Driveway Right[2]	A/4"/0.51/35	A/4"/0.50/35
Ring Road NB Through	C/23"/0.18/45	C/23"/0.19/50
Ring Road NB Right[2]	A/10"/0.69/65	A/10"/0.69/70
Ring Road SB Left	C/23"/0.58/245	C/25"/0.61/270
Ring Road SB Left/Through	C/23"/0.59/245	C/25"/0.61/275
Main Street (SR 731) at Site Driveway #1		
Site Driveway Right[3]	-	C/17"/0.01/25
Mall Main Driveway and Site Driveway #2		
Site Driveway Right[3]	-	B/15"/0.07/25
Ring Road at Site Drive #3		
Site Drive Left/Right[3]	-	C/20"/0.10/25

Notes: X/0.0/00 - Level of Service/Delay in seconds/veh./V/C ratio/95% Q length in feet

[1] – Signalized intersection

[2] – Channelized free-flow

[3] – Unsignalized movement

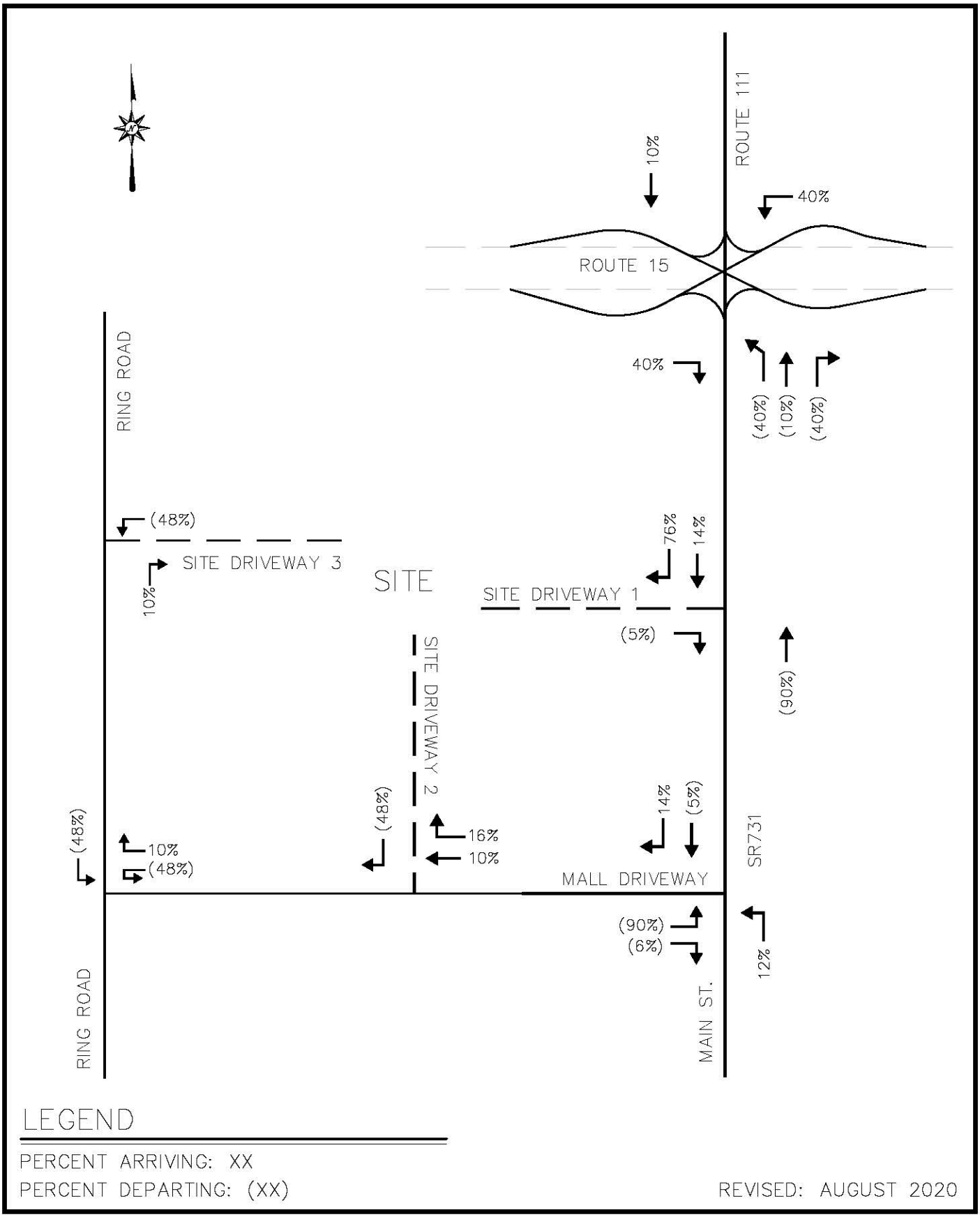
Conclusion

BL Companies was tasked with evaluating the 260-unit multi-family residential development proposed at 5085 Main Street in Trumbull, CT.

This addendum analyzes the removal of this left turn from the overall traffic analysis. It also incorporates comments that were generated by the CTDOT's Traffic Engineering Department. This included the following:

- Eliminating the pedestrian phase from the intersection of Route 111/SR 731 (Main Street) at Route 15 NB and SB Ramps.
- Updating the signal timings based on the latest signal plans provided by CTDOT.

Based on the revised analysis, the elimination of the northbound left turn into the Site from Main Street (SR 731) will have minimal impact to overall traffic capacity of the study area.



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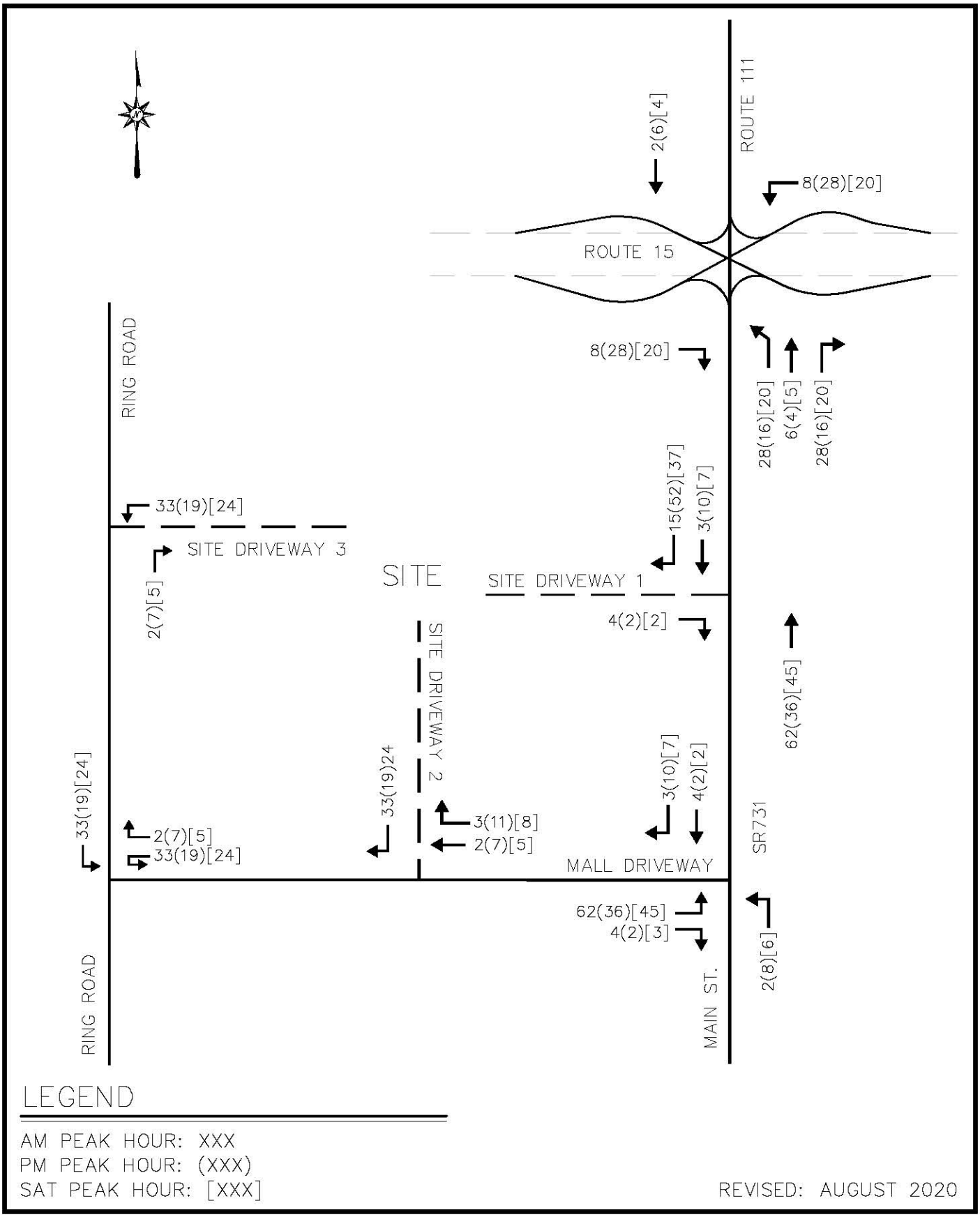
TRIP DISTRIBUTION
PROPOSED RESIDENTIAL DEVELOPMENT
TRUMBULL, CONNECTICUT

SCHEMATIC, NOT TO SCALE

FIGURE 4A

CAD File: TFL01800513



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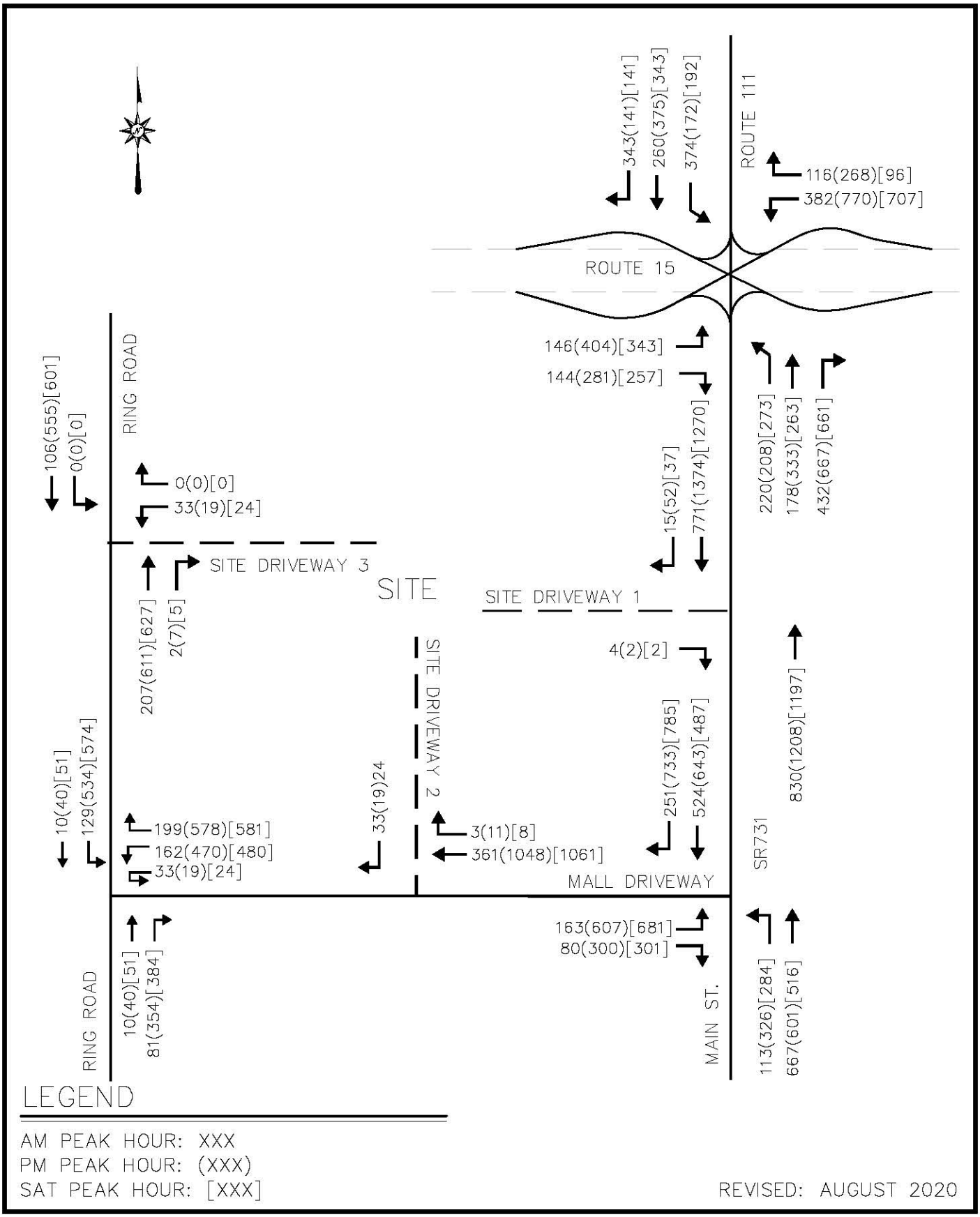
NEW SITE GENERATED TRAFFIC
PROPOSED RESIDENTIAL DEVELOPMENT
TRUMBULL, CONNECTICUT

SCHEMATIC, NOT TO SCALE

FIGURE 5A

CAD File: TFL01800513



BL Companies

BUILD (2022) TRAFFIC VOLUMES
PROPOSED RESIDENTIAL DEVELOPMENT
TRUMBULL, CONNECTICUT

SCHEMATIC, NOT TO SCALE

FIGURE 6A

CAD File: TFLO1800513

CAPACITY ANALYSIS

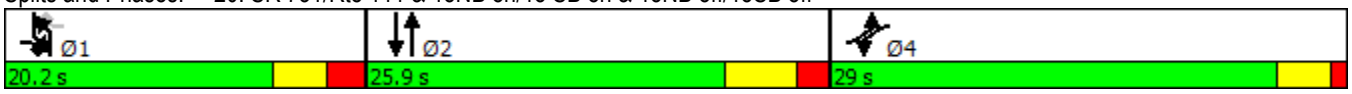
Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Lane Configurations										
Traffic Volume (vph)	146	136	374	116	192	172	404	374	258	343
Future Volume (vph)	146	136	374	116	192	172	404	374	258	343
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)						0%			0%	
Storage Length (ft)	0		400		225			325		
Storage Lanes	2		2		1			1		
Taper Length (ft)	25		150		75			150		
Lane Util. Factor	0.97	0.88	0.97	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Frt		0.850		0.850			0.850			0.850
Flt Protected	0.950		0.950		0.950			0.950		
Satd. Flow (prot)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Flt Permitted	0.950		0.950		0.950			0.950		
Satd. Flow (perm)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Right Turn on Red		No		No			Yes			Yes
Satd. Flow (RTOR)							439			373
Link Speed (mph)						40			40	
Link Distance (ft)						1045			532	
Travel Time (s)						17.8			9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	159	148	407	126	209	187	439	407	280	373
Shared Lane Traffic (%)										
Lane Group Flow (vph)	159	148	407	126	209	187	439	407	280	373
Turn Type	Prot	Prot	Prot	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	4	1	4		1	2		1	2	
Permitted Phases				1			Free			Free
Detector Phase	4	1	4	1	1	2		1	2	
Switch Phase										
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0	15.0		9.0	15.0	
Minimum Split (s)	18.0	16.0	18.0	16.0	16.0	25.0		16.0	25.0	
Total Split (s)	29.0	20.2	29.0	20.2	20.2	25.9		20.2	25.9	
Total Split (%)	38.6%	26.9%	38.6%	26.9%	26.9%	34.5%		26.9%	34.5%	
Maximum Green (s)	25.0	15.0	25.0	15.0	15.0	20.0		15.0	20.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.1		3.0	4.1	
All-Red Time (s)	1.0	2.2	1.0	2.2	2.2	1.8		2.2	1.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.2	4.0	5.2	5.2	5.9		5.2	5.9	
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	5.0		2.0	5.0	
Recall Mode	None	None	None	None	None	Min		None	Min	
Act Effct Green (s)	10.8	15.0	10.8	15.0	15.0	15.6	56.6	15.0	15.6	56.6
Actuated g/C Ratio	0.19	0.27	0.19	0.27	0.27	0.28	1.00	0.27	0.28	1.00
v/c Ratio	0.24	0.20	0.61	0.17	0.44	0.19	0.27	0.85	0.54	0.23
Control Delay	20.4	17.9	25.4	17.7	21.6	16.6	0.4	40.7	22.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	17.9	25.4	17.7	21.6	16.6	0.4	40.7	22.5	0.3
LOS	C	B	C	B	C	B	A	D	C	A

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Approach Delay						9.4			21.7	
Approach LOS						A			C	
Queue Length 50th (ft)	23	21	64	17	56	24	0	125	78	0
Queue Length 95th (ft)	46	49	108	43	127	50	0	#309	154	0
Internal Link Dist (ft)						965			452	
Turn Bay Length (ft)		175	400	100	225		220	325		325
Base Capacity (vph)	1542	751	1542	751	479	1253	1615	479	659	1615
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.20	0.26	0.17	0.44	0.15	0.27	0.85	0.42	0.23

Intersection Summary

Area Type: Other
Cycle Length: 75.1
Actuated Cycle Length: 56.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: SR 731/Rte 111 & 15NB on/15 SB on & 15NB off/15SB off



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	101	76	111	667	520	248
Future Volume (vph)	101	76	111	667	520	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	0	0	375			700
Storage Lanes	2	1	1			1
Taper Length (ft)	8		8			
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3319	1531	1711	3421	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3319	1531	1711	3421	3539	1583
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		64				
Link Speed (mph)	30			40	40	
Link Distance (ft)	922			664	1045	
Travel Time (s)	21.0			11.3	17.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	83	121	725	565	270
Shared Lane Traffic (%)						
Lane Group Flow (vph)	110	83	121	725	565	270
Turn Type	Prot	pt+ov	Prot	NA	NA	Free
Protected Phases	4	1 4	1	1 2	2	
Permitted Phases						Free
Detector Phase	4	4	1	2	2	
Switch Phase						
Minimum Initial (s)	9.0		9.0		15.0	
Minimum Split (s)	13.0		14.2		20.9	
Total Split (s)	29.0		20.2		25.9	
Total Split (%)	38.6%		26.9%		34.5%	
Maximum Green (s)	25.0		15.0		20.0	
Yellow Time (s)	3.0		3.0		4.1	
All-Red Time (s)	1.0		2.2		1.8	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	4.0		5.2		5.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0		5.0	
Recall Mode	None		Min		Min	
Act Effct Green (s)	9.2	19.5	9.7	34.6	17.4	48.3
Actuated g/C Ratio	0.19	0.40	0.20	0.72	0.36	1.00
v/c Ratio	0.17	0.13	0.35	0.30	0.44	0.17
Control Delay	19.7	4.5	22.1	4.0	13.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	4.5	22.1	4.0	13.9	0.2
LOS	B	A	C	A	B	A
Approach Delay	13.2			6.6	9.5	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach LOS	B			A	A	
Queue Length 50th (ft)	13	3	31	41	66	0
Queue Length 95th (ft)	34	23	74	61	110	0
Internal Link Dist (ft)	842			584	965	
Turn Bay Length (ft)			375			700
Base Capacity (vph)	1764	809	545	2571	1505	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.10	0.22	0.28	0.38	0.17

Intersection Summary	
Area Type: Other	
Cycle Length: 75.1	
Actuated Cycle Length: 48.3	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 42.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 28: Main St/SR 731 & Mall Drive

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	162	197	10	81	96	10
Future Volume (vph)	162	197	10	81	96	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	0	
Storage Lanes	2	1		1	1	
Taper Length (ft)	8				8	
Lane Util. Factor	0.97	0.88	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	0.961
Satd. Flow (prot)	3433	2787	1863	1583	1681	1701
Flt Permitted	0.950				0.950	0.961
Satd. Flow (perm)	3433	2787	1863	1583	1681	1701
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		214		88		
Link Speed (mph)	30		30			30
Link Distance (ft)	922		359			275
Travel Time (s)	21.0		8.2			6.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	176	214	11	88	104	11
Shared Lane Traffic (%)					45%	
Lane Group Flow (vph)	176	214	11	88	57	58
Turn Type	Prot	Perm	NA	Perm	Split	NA
Protected Phases	3		2		1	1
Permitted Phases		3		2		
Detector Phase	3	3	2	2	1	1
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	20.0	20.0	11.0	11.0
Total Split (s)	34.0	34.0	34.0	34.0	22.0	22.0
Total Split (%)	37.8%	37.8%	37.8%	37.8%	24.4%	24.4%
Maximum Green (s)	30.0	30.0	30.0	30.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	8.6	8.6	8.3	8.3	8.4	8.4
Actuated g/C Ratio	0.32	0.32	0.31	0.31	0.32	0.32
v/c Ratio	0.16	0.20	0.02	0.16	0.11	0.11
Control Delay	10.1	3.0	11.3	4.7	11.2	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	3.0	11.3	4.7	11.2	11.2
LOS	B	A	B	A	B	B
Approach Delay	6.2		5.5			11.2
Approach LOS	A		A			B

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	13	0	2	0	8	8
Queue Length 95th (ft)	29	16	9	21	28	28
Internal Link Dist (ft)	842		279			195
Turn Bay Length (ft)		150				
Base Capacity (vph)	3179	2597	1725	1472	1203	1217
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.08	0.01	0.06	0.05	0.05

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 26.6	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 7.1	Intersection LOS: A
Intersection Capacity Utilization 22.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Ring Rd & Mall Drive

Lanes, Volumes, Timings
20: SR 731/Rte 111 & 15NB on/15 SB on & 15NB off/15SB off

08/12/2020

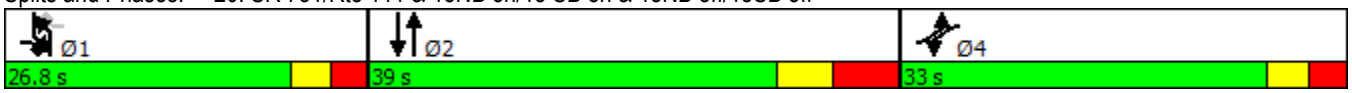
Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Lane Configurations										
Traffic Volume (vph)	404	253	742	268	192	329	651	172	369	141
Future Volume (vph)	404	253	742	268	192	329	651	172	369	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)						0%			0%	
Storage Length (ft)	0		400		225			325		
Storage Lanes	2		2		1			1		
Taper Length (ft)	25		150		75			150		
Lane Util. Factor	0.97	0.88	0.97	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Frt		0.850		0.850			0.850			0.850
Flt Protected	0.950		0.950		0.950			0.950		
Satd. Flow (prot)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Flt Permitted	0.950		0.950		0.950			0.950		
Satd. Flow (perm)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Right Turn on Red		No		No			Yes			Yes
Satd. Flow (RTOR)							708			197
Link Speed (mph)						40			40	
Link Distance (ft)						1045			532	
Travel Time (s)						17.8			9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	439	275	807	291	209	358	708	187	401	153
Shared Lane Traffic (%)										
Lane Group Flow (vph)	439	275	807	291	209	358	708	187	401	153
Enter Blocked Intersection	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)						12			12	
Link Offset(ft)						0			0	
Crosswalk Width(ft)						16			16	
Two way Left Turn Lane										
Headway Factor	1.01	1.01	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	15	15	15		25	15		20
Turn Type	Prot	Prot	Prot	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	4	1	4		1	2		1	2	
Permitted Phases				1			Free			Free
Detector Phase	4	1	4	1	1	2		1	2	
Switch Phase										
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0	15.0		9.0	15.0	
Minimum Split (s)	15.0	14.8	15.0	14.8	14.8	24.0		14.8	24.0	
Total Split (s)	33.0	26.8	33.0	26.8	26.8	39.0		26.8	39.0	
Total Split (%)	33.4%	27.1%	33.4%	27.1%	27.1%	39.5%		27.1%	39.5%	
Maximum Green (s)	27.0	21.0	27.0	21.0	21.0	30.0		21.0	30.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.1		3.0	4.1	
All-Red Time (s)	3.0	2.8	3.0	2.8	2.8	4.9		2.8	4.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	5.8	6.0	5.8	5.8	9.0		5.8	9.0	
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	5.0		3.0	5.0	

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Recall Mode	None	None	None	None	None	Min		None	Min	
Act Effct Green (s)	23.5	15.1	23.5	15.1	15.1	22.3	82.4	15.1	22.3	82.4
Actuated g/C Ratio	0.29	0.18	0.29	0.18	0.18	0.27	1.00	0.18	0.27	1.00
v/c Ratio	0.44	0.53	0.81	0.56	0.64	0.37	0.44	0.57	0.80	0.09
Control Delay	27.1	35.9	36.4	36.6	42.2	26.4	0.9	39.8	41.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	35.9	36.4	36.6	42.2	26.4	0.9	39.8	41.7	0.1
LOS	C	D	D	D	D	C	A	D	D	A
Approach Delay						14.8			32.6	
Approach LOS						B			C	
Queue Length 50th (ft)	95	77	198	81	105	83	0	93	203	0
Queue Length 95th (ft)	164	130	#342	137	192	130	0	173	332	0
Internal Link Dist (ft)						965			452	
Turn Bay Length (ft)		175	400	100	225		220	325		325
Base Capacity (vph)	1181	745	1181	745	476	1333	1615	476	701	1615
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.37	0.68	0.39	0.44	0.27	0.44	0.39	0.57	0.09

Intersection Summary

Area Type: Other
Cycle Length: 98.8
Actuated Cycle Length: 82.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 27.4 Intersection LOS: C
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: SR 731/Rte 111 & 15NB on/15 SB on & 15NB off/15SB off



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	571	298	318	601	641	723
Future Volume (vph)	571	298	318	601	641	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	0	0	375			700
Storage Lanes	2	1	1			1
Taper Length (ft)	8		8			
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3319	1531	1711	3421	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3319	1531	1711	3421	3539	1583
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		17				
Link Speed (mph)	30			40	40	
Link Distance (ft)	922			664	1045	
Travel Time (s)	21.0			11.3	17.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	621	324	346	653	697	786
Shared Lane Traffic (%)						
Lane Group Flow (vph)	621	324	346	653	697	786
Enter Blocked Intersection	Yes	Yes	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	34			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	5			5	5	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.04	1.04	1.00	1.00
Turning Speed (mph)	15	12	15			25
Turn Type	Prot	pt+ov	Prot	NA	NA	Free
Protected Phases	4	1 4	1	1 2	2	
Permitted Phases						Free
Detector Phase	4	4	1	2	2	
Switch Phase						
Minimum Initial (s)	9.0		9.0		15.0	
Minimum Split (s)	13.0		14.2		20.9	
Total Split (s)	35.0		26.2		25.9	
Total Split (%)	40.2%		30.1%		29.7%	
Maximum Green (s)	31.0		21.0		20.0	
Yellow Time (s)	3.0		3.0		4.1	
All-Red Time (s)	1.0		2.2		1.8	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	4.0		5.2		5.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0		5.0	
Recall Mode	None		Min		Min	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Act Effct Green (s)	17.8	40.0	18.1	43.2	19.1	70.4
Actuated g/C Ratio	0.25	0.57	0.26	0.61	0.27	1.00
v/c Ratio	0.74	0.37	0.79	0.31	0.73	0.50
Control Delay	30.4	9.1	40.2	7.5	30.0	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	9.1	40.2	7.5	30.0	1.1
LOS	C	A	D	A	C	A
Approach Delay	23.1			18.8	14.7	
Approach LOS	C			B	B	
Queue Length 50th (ft)	135	67	141	62	149	0
Queue Length 95th (ft)	190	113	#292	114	#243	0
Internal Link Dist (ft)	842			584	965	
Turn Bay Length (ft)			375			700
Base Capacity (vph)	1491	889	520	2162	1026	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.36	0.67	0.30	0.68	0.50

Intersection Summary

Area Type: Other
Cycle Length: 87.1
Actuated Cycle Length: 70.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 18.2 Intersection LOS: B
Intersection Capacity Utilization 64.2% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Main St/SR 731 & Mall Drive

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	470	571	40	354	515	40
Future Volume (vph)	470	571	40	354	515	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	0	
Storage Lanes	2	1		1	1	
Taper Length (ft)	8				8	
Lane Util. Factor	0.97	0.88	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	0.959
Satd. Flow (prot)	3433	2787	1863	1583	1681	1697
Flt Permitted	0.950				0.950	0.959
Satd. Flow (perm)	3433	2787	1863	1583	1681	1697
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		621		385		
Link Speed (mph)	30		30			30
Link Distance (ft)	922		359			275
Travel Time (s)	21.0		8.2			6.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	511	621	43	385	560	43
Shared Lane Traffic (%)					46%	
Lane Group Flow (vph)	511	621	43	385	302	301
Enter Blocked Intersection	Yes	Yes	Yes	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	36		0			12
Link Offset(ft)	0		0			12
Crosswalk Width(ft)	5		5			5
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Turn Type	Prot	Perm	NA	Perm	Split	NA
Protected Phases	3		2		1	1
Permitted Phases		3		2		
Detector Phase	3	3	2	2	1	1
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	20.0	20.0	11.0	11.0
Total Split (s)	34.0	34.0	34.0	34.0	22.0	22.0
Total Split (%)	37.8%	37.8%	37.8%	37.8%	24.4%	24.4%
Maximum Green (s)	30.0	30.0	30.0	30.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	14.9	14.9	8.6	8.6	16.0	16.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Actuated g/C Ratio	0.29	0.29	0.17	0.17	0.31	0.31
v/c Ratio	0.52	0.50	0.14	0.66	0.58	0.57
Control Delay	18.0	3.2	21.4	9.1	22.1	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	3.2	21.4	9.1	22.1	21.7
LOS	B	A	C	A	C	C
Approach Delay	9.9		10.3			21.9
Approach LOS	A		B			C
Queue Length 50th (ft)	64	0	11	0	73	73
Queue Length 95th (ft)	122	34	37	63	#196	193
Internal Link Dist (ft)	842		279			195
Turn Bay Length (ft)		150				
Base Capacity (vph)	2038	1906	1106	1096	598	604
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.33	0.04	0.35	0.51	0.50

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 51.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 43.9%	ICU Level of Service A
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 30: Ring Rd & Mall Drive

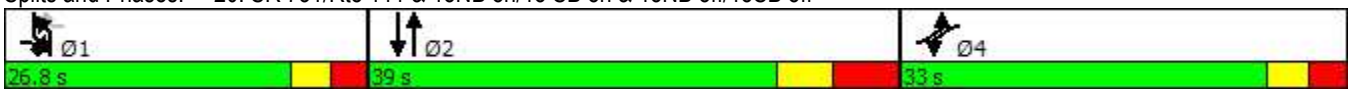
Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Lane Configurations										
Traffic Volume (vph)	343	237	687	96	253	258	641	192	339	141
Future Volume (vph)	343	237	687	96	253	258	641	192	339	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)						0%			0%	
Storage Length (ft)	0		400		225			325		
Storage Lanes	2		2		1			1		
Taper Length (ft)	25		150		75			150		
Lane Util. Factor	0.97	0.88	0.97	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Frt		0.850		0.850			0.850			0.850
Flt Protected	0.950		0.950		0.950			0.950		
Satd. Flow (prot)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Flt Permitted	0.950		0.950		0.950			0.950		
Satd. Flow (perm)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Right Turn on Red		No		No			Yes			Yes
Satd. Flow (RTOR)							697			197
Link Speed (mph)						40			40	
Link Distance (ft)						1045			532	
Travel Time (s)						17.8			9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	373	258	747	104	275	280	697	209	368	153
Shared Lane Traffic (%)										
Lane Group Flow (vph)	373	258	747	104	275	280	697	209	368	153
Turn Type	Prot	Prot	Prot	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	4	1	4		1	2		1	2	
Permitted Phases				1			Free			Free
Detector Phase	4	1	4	1	1	2		1	2	
Switch Phase										
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0	15.0		9.0	15.0	
Minimum Split (s)	15.0	14.8	15.0	14.8	14.8	24.0		14.8	24.0	
Total Split (s)	33.0	26.8	33.0	26.8	26.8	39.0		26.8	39.0	
Total Split (%)	33.4%	27.1%	33.4%	27.1%	27.1%	39.5%		27.1%	39.5%	
Maximum Green (s)	27.0	21.0	27.0	21.0	21.0	30.0		21.0	30.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.1		3.0	4.1	
All-Red Time (s)	3.0	2.8	3.0	2.8	2.8	4.9		2.8	4.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	5.8	6.0	5.8	5.8	9.0		5.8	9.0	
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	5.0		3.0	5.0	
Recall Mode	None	None	None	None	None	Min		None	Min	
Act Effct Green (s)	22.0	16.8	22.0	16.8	16.8	21.1	81.4	16.8	21.1	81.4
Actuated g/C Ratio	0.27	0.21	0.27	0.21	0.21	0.26	1.00	0.21	0.26	1.00
v/c Ratio	0.40	0.44	0.79	0.18	0.74	0.31	0.43	0.56	0.76	0.09
Control Delay	26.9	32.5	35.7	29.9	45.2	26.2	0.8	37.5	40.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	32.5	35.7	29.9	45.2	26.2	0.8	37.5	40.4	0.1
LOS	C	C	D	C	D	C	A	D	D	A

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Approach Delay						16.3			31.1	
Approach LOS						B			C	
Queue Length 50th (ft)	80	65	184	25	133	63	0	97	182	0
Queue Length 95th (ft)	140	122	292	56	#269	103	0	192	300	0
Internal Link Dist (ft)						965			452	
Turn Bay Length (ft)		175	400	100	225		220	325		325
Base Capacity (vph)	1195	755	1195	755	481	1349	1615	481	710	1615
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.34	0.63	0.14	0.57	0.21	0.43	0.43	0.52	0.09

Intersection Summary

Area Type: Other
Cycle Length: 98.8
Actuated Cycle Length: 81.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 26.4 Intersection LOS: C
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: SR 731/Rte 111 & 15NB on/15 SB on & 15NB off/15SB off



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	636	298	278	516	485	778
Future Volume (vph)	636	298	278	516	485	778
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	0	0	375			700
Storage Lanes	2	1	1			1
Taper Length (ft)	8		8			
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3319	1531	1711	3421	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3319	1531	1711	3421	3539	1583
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		50				
Link Speed (mph)	30			40	40	
Link Distance (ft)	922			664	1045	
Travel Time (s)	21.0			11.3	17.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	691	324	302	561	527	846
Shared Lane Traffic (%)						
Lane Group Flow (vph)	691	324	302	561	527	846
Turn Type	Prot	pt+ov	Prot	NA	NA	Free
Protected Phases	4	1 4	1	1 2	2	
Permitted Phases						Free
Detector Phase	4	4	1	2	2	
Switch Phase						
Minimum Initial (s)	9.0		9.0		15.0	
Minimum Split (s)	13.0		14.2		20.9	
Total Split (s)	35.0		26.2		25.9	
Total Split (%)	40.2%		30.1%		29.7%	
Maximum Green (s)	31.0		21.0		20.0	
Yellow Time (s)	3.0		3.0		4.1	
All-Red Time (s)	1.0		2.2		1.8	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	4.0		5.2		5.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0		5.0	
Recall Mode	None		Min		Min	
Act Effct Green (s)	19.2	39.6	16.2	40.0	17.7	68.7
Actuated g/C Ratio	0.28	0.58	0.24	0.58	0.26	1.00
v/c Ratio	0.74	0.36	0.75	0.28	0.58	0.53
Control Delay	28.4	7.5	38.5	8.2	27.0	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	7.5	38.5	8.2	27.0	1.3
LOS	C	A	D	A	C	A
Approach Delay	21.8			18.8	11.2	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach LOS	C			B	B	
Queue Length 50th (ft)	137	52	119	57	105	0
Queue Length 95th (ft)	214	101	#241	104	182	0
Internal Link Dist (ft)	842			584	965	
Turn Bay Length (ft)			375			700
Base Capacity (vph)	1547	921	540	2138	1064	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.35	0.56	0.26	0.50	0.53

Intersection Summary	
Area Type: Other	
Cycle Length: 87.1	
Actuated Cycle Length: 68.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 16.5	Intersection LOS: B
Intersection Capacity Utilization 59.5%	ICU Level of Service B
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Main St/SR 731 & Mall Drive

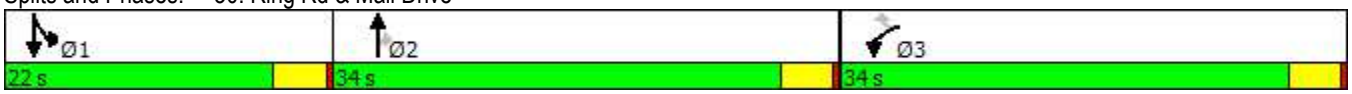
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	480	576	51	384	550	51
Future Volume (vph)	480	576	51	384	550	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150		0	0	
Storage Lanes	2	1		1	1	
Taper Length (ft)	8				8	
Lane Util. Factor	0.97	0.88	1.00	1.00	0.95	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	0.960
Satd. Flow (prot)	3433	2787	1863	1583	1681	1699
Flt Permitted	0.950				0.950	0.960
Satd. Flow (perm)	3433	2787	1863	1583	1681	1699
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		626		417		
Link Speed (mph)	30		30			30
Link Distance (ft)	922		359			275
Travel Time (s)	21.0		8.2			6.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	522	626	55	417	598	55
Shared Lane Traffic (%)					46%	
Lane Group Flow (vph)	522	626	55	417	323	330
Turn Type	Prot	Perm	NA	Perm	Split	NA
Protected Phases	3		2		1	1
Permitted Phases		3		2		
Detector Phase	3	3	2	2	1	1
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	20.0	20.0	11.0	11.0
Total Split (s)	34.0	34.0	34.0	34.0	22.0	22.0
Total Split (%)	37.8%	37.8%	37.8%	37.8%	24.4%	24.4%
Maximum Green (s)	30.0	30.0	30.0	30.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag	Lag	Lead	Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None
Act Effct Green (s)	15.4	15.4	8.8	8.8	17.9	17.9
Actuated g/C Ratio	0.28	0.28	0.16	0.16	0.33	0.33
v/c Ratio	0.54	0.51	0.18	0.69	0.58	0.59
Control Delay	18.9	3.3	22.2	9.5	22.7	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	3.3	22.2	9.5	22.7	22.9
LOS	B	A	C	A	C	C
Approach Delay	10.4		11.0			22.8
Approach LOS	B		B			C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	68	0	15	0	81	83
Queue Length 95th (ft)	126	34	45	65	#241	#245
Internal Link Dist (ft)	842		279			195
Turn Bay Length (ft)		150				
Base Capacity (vph)	1931	1841	1048	1073	567	573
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.34	0.05	0.39	0.57	0.58

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 54.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 47.0%	ICU Level of Service A
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 30: Ring Rd & Mall Drive



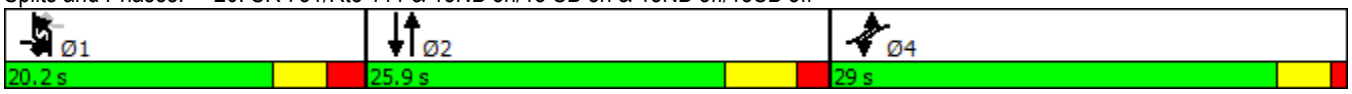
Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Lane Configurations										
Traffic Volume (vph)	146	144	382	116	220	178	432	374	260	343
Future Volume (vph)	146	144	382	116	220	178	432	374	260	343
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)						0%			0%	
Storage Length (ft)	0		400		225			325		
Storage Lanes	2		2		1			1		
Taper Length (ft)	25		150		75			150		
Lane Util. Factor	0.97	0.88	0.97	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Frt		0.850		0.850			0.850			0.850
Flt Protected	0.950		0.950		0.950			0.950		
Satd. Flow (prot)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Flt Permitted	0.950		0.950		0.950			0.950		
Satd. Flow (perm)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Right Turn on Red		No		No			Yes			Yes
Satd. Flow (RTOR)							470			373
Link Speed (mph)						40			40	
Link Distance (ft)						304			532	
Travel Time (s)						5.2			9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	159	157	415	126	239	193	470	407	283	373
Shared Lane Traffic (%)										
Lane Group Flow (vph)	159	157	415	126	239	193	470	407	283	373
Turn Type	Prot	Prot	Prot	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	4	1	4		1	2		1	2	
Permitted Phases				1			Free			Free
Detector Phase	4	1	4	1	1	2		1	2	
Switch Phase										
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0	15.0		9.0	15.0	
Minimum Split (s)	18.0	16.0	18.0	16.0	16.0	25.0		16.0	25.0	
Total Split (s)	29.0	20.2	29.0	20.2	20.2	25.9		20.2	25.9	
Total Split (%)	38.6%	26.9%	38.6%	26.9%	26.9%	34.5%		26.9%	34.5%	
Maximum Green (s)	25.0	15.0	25.0	15.0	15.0	20.0		15.0	20.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.1		3.0	4.1	
All-Red Time (s)	1.0	2.2	1.0	2.2	2.2	1.8		2.2	1.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	5.2	4.0	5.2	5.2	5.9		5.2	5.9	
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	5.0		2.0	5.0	
Recall Mode	None	None	None	None	None	Min		None	Min	
Act Effct Green (s)	10.9	15.1	10.9	15.1	15.1	15.7	56.8	15.1	15.7	56.8
Actuated g/C Ratio	0.19	0.27	0.19	0.27	0.27	0.28	1.00	0.27	0.28	1.00
v/c Ratio	0.24	0.21	0.62	0.17	0.50	0.20	0.29	0.85	0.55	0.23
Control Delay	20.4	18.1	25.6	17.8	22.9	16.8	0.5	41.0	22.7	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	18.1	25.6	17.8	22.9	16.8	0.5	41.0	22.7	0.3
LOS	C	B	C	B	C	B	A	D	C	A

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Approach Delay						9.9			21.9	
Approach LOS						A			C	
Queue Length 50th (ft)	23	22	65	18	66	25	0	126	80	0
Queue Length 95th (ft)	47	52	111	43	146	51	0	#312	157	0
Internal Link Dist (ft)						224			452	
Turn Bay Length (ft)		175	400	100	225		220	325		325
Base Capacity (vph)	1538	749	1538	749	478	1250	1615	478	658	1615
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.21	0.27	0.17	0.50	0.15	0.29	0.85	0.43	0.23

Intersection Summary

Area Type: Other
Cycle Length: 75.1
Actuated Cycle Length: 56.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 18.1 Intersection LOS: B
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: SR 731/Rte 111 & 15NB on/15 SB on & 15NB off/15SB off



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	163	80	113	667	524	251
Future Volume (vph)	163	80	113	667	524	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	0	0	375			0
Storage Lanes	2	1	1			1
Taper Length (ft)	8		8			
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3319	1531	1711	3421	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3319	1531	1711	3421	3539	1583
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		62				
Link Speed (mph)	30			40	40	
Link Distance (ft)	468			664	585	
Travel Time (s)	10.6			11.3	10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	87	123	725	570	273
Shared Lane Traffic (%)						
Lane Group Flow (vph)	177	87	123	725	570	273
Turn Type	Prot	pt+ov	Prot	NA	NA	Free
Protected Phases	4	1 4	1	1 2	2	
Permitted Phases						Free
Detector Phase	4	4	1	2	2	
Switch Phase						
Minimum Initial (s)	9.0		9.0		15.0	
Minimum Split (s)	13.0		14.2		20.9	
Total Split (s)	29.0		20.2		25.9	
Total Split (%)	38.6%		26.9%		34.5%	
Maximum Green (s)	25.0		15.0		20.0	
Yellow Time (s)	3.0		3.0		4.1	
All-Red Time (s)	1.0		2.2		1.8	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	4.0		5.2		5.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0		5.0	
Recall Mode	None		Min		Min	
Act Effct Green (s)	9.1	22.7	9.6	32.7	17.2	51.0
Actuated g/C Ratio	0.18	0.45	0.19	0.64	0.34	1.00
v/c Ratio	0.30	0.12	0.38	0.33	0.48	0.17
Control Delay	20.6	4.8	22.8	4.6	14.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	4.8	22.8	4.6	14.9	0.2
LOS	C	A	C	A	B	A
Approach Delay	15.4			7.2	10.2	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach LOS	B			A	B	
Queue Length 50th (ft)	23	4	32	41	67	0
Queue Length 95th (ft)	51	24	75	62	112	0
Internal Link Dist (ft)	388			584	505	
Turn Bay Length (ft)			375			
Base Capacity (vph)	1633	755	505	2385	1393	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.12	0.24	0.30	0.41	0.17

Intersection Summary	
Area Type: Other	
Cycle Length: 75.1	
Actuated Cycle Length: 51	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 42.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 28: Main St/SR 731 & Mall Drive

Lane Group	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	33	162	199	10	81	129	10
Future Volume (vph)	33	162	199	10	81	129	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0	0	
Storage Lanes		2	1		1	1	
Taper Length (ft)		8				8	
Lane Util. Factor	0.95	0.97	0.88	1.00	1.00	0.95	0.95
Frt			0.850		0.850		
Flt Protected		0.950				0.950	0.959
Satd. Flow (prot)	0	3433	2787	1863	1583	1681	1697
Flt Permitted		0.950				0.950	0.959
Satd. Flow (perm)	0	3433	2787	1863	1583	1681	1697
Right Turn on Red			Yes		Yes		
Satd. Flow (RTOR)			216		88		
Link Speed (mph)		30		30			30
Link Distance (ft)		454		359			571
Travel Time (s)		10.3		8.2			13.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	176	216	11	88	140	11
Shared Lane Traffic (%)						46%	
Lane Group Flow (vph)	0	212	216	11	88	76	75
Turn Type	Prot	Prot	Perm	NA	Perm	Split	NA
Protected Phases	3	3		2		1	1
Permitted Phases			3		2		
Detector Phase	3	3	3	2	2	1	1
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	11.0	11.0
Total Split (s)	34.0	34.0	34.0	34.0	34.0	22.0	22.0
Total Split (%)	37.8%	37.8%	37.8%	37.8%	37.8%	24.4%	24.4%
Maximum Green (s)	30.0	30.0	30.0	30.0	30.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lag	Lag	Lead	Lead
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None
Act Effct Green (s)		8.6	8.6	8.1	8.1	8.4	8.4
Actuated g/C Ratio		0.30	0.30	0.29	0.29	0.30	0.30
v/c Ratio		0.20	0.22	0.02	0.17	0.15	0.15
Control Delay		10.7	3.1	11.9	5.0	11.9	11.9
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		10.7	3.1	11.9	5.0	11.9	11.9
LOS		B	A	B	A	B	B
Approach Delay		6.9		5.8			11.9
Approach LOS		A		A			B

Lane Group	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		15	0	2	0	11	11
Queue Length 95th (ft)		35	17	10	22	35	35
Internal Link Dist (ft)		374		279			491
Turn Bay Length (ft)			150				
Base Capacity (vph)		3129	2559	1698	1450	1188	1199
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.07	0.08	0.01	0.06	0.06	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 28.4	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.22	
Intersection Signal Delay: 7.8	Intersection LOS: A
Intersection Capacity Utilization 23.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Ring Rd & Mall Drive

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	4	0	830	771	15
Future Volume (vph)	0	4	0	830	771	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	50			0
Storage Lanes	0	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.91
Frt		0.865			0.997	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	5070	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	5070	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	303			585	157	
Travel Time (s)	6.9			10.0	2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	4	0	902	838	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	0	902	854	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 26.3%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑↑	↑↑↑↳	
Traffic Vol, veh/h	0	4	0	830	771	15
Future Vol, veh/h	0	4	0	830	771	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	0	902	838	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	427	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	492	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	492	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	492	-	-
HCM Lane V/C Ratio	-	0.009	-	-
HCM Control Delay (s)	-	12.4	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↳			↱
Traffic Volume (vph)	0	243	361	3	0	33
Future Volume (vph)	0	243	361	3	0	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	5085	5080	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	5085	5080	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		454	468		203	
Travel Time (s)		10.3	10.6		4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	264	392	3	0	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	264	395	0	0	36
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 17.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↳			↱
Traffic Vol, veh/h	0	243	361	3	0	33
Future Vol, veh/h	0	243	361	3	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	264	392	3	0	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	198
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	-	0	689
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	689
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	689
HCM Lane V/C Ratio	-	-	-	0.052
HCM Control Delay (s)	-	-	-	10.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	33	0	207	2	0	106
Future Volume (vph)	33	0	207	2	0	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	0.95	0.95
Frt			0.999			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	5080	0	0	3539
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	5080	0	0	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	249		571			155
Travel Time (s)	5.7		13.0			3.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	0	225	2	0	115
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	0	227	0	0	115
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 14.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	33	0	207	2	0	106
Future Vol, veh/h	33	0	207	2	0	106
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	0	225	2	0	115

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	284	114	0	0	227	0
Stage 1	226	-	-	-	-	-
Stage 2	58	-	-	-	-	-
Critical Hdwy	6.29	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	688	779	-	-	908	-
Stage 1	724	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	688	779	-	-	908	-
Mov Cap-2 Maneuver	688	-	-	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	688	908	-
HCM Lane V/C Ratio	-	-	0.052	-	-
HCM Control Delay (s)	-	-	10.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

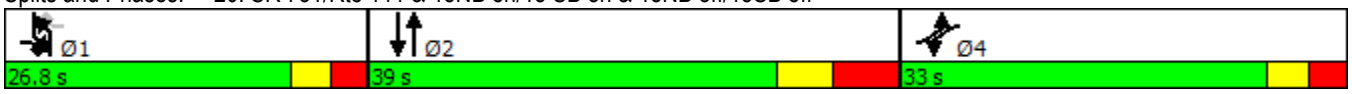
Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Lane Configurations										
Traffic Volume (vph)	404	281	770	268	208	333	667	172	375	141
Future Volume (vph)	404	281	770	268	208	333	667	172	375	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)						0%			0%	
Storage Length (ft)	0		400		225			325		
Storage Lanes	2		2		1			1		
Taper Length (ft)	25		150		75			150		
Lane Util. Factor	0.97	0.88	0.97	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Frt		0.850		0.850			0.850			0.850
Flt Protected	0.950		0.950		0.950			0.950		
Satd. Flow (prot)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Flt Permitted	0.950		0.950		0.950			0.950		
Satd. Flow (perm)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Right Turn on Red		No		No			Yes			Yes
Satd. Flow (RTOR)							725			197
Link Speed (mph)						40			40	
Link Distance (ft)						304			532	
Travel Time (s)						5.2			9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	439	305	837	291	226	362	725	187	408	153
Shared Lane Traffic (%)										
Lane Group Flow (vph)	439	305	837	291	226	362	725	187	408	153
Turn Type	Prot	Prot	Prot	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	4	1	4		1	2		1	2	
Permitted Phases				1			Free			Free
Detector Phase	4	1	4	1	1	2		1	2	
Switch Phase										
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0	15.0		9.0	15.0	
Minimum Split (s)	15.0	14.8	15.0	14.8	14.8	24.0		14.8	24.0	
Total Split (s)	33.0	26.8	33.0	26.8	26.8	39.0		26.8	39.0	
Total Split (%)	33.4%	27.1%	33.4%	27.1%	27.1%	39.5%		27.1%	39.5%	
Maximum Green (s)	27.0	21.0	27.0	21.0	21.0	30.0		21.0	30.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.1		3.0	4.1	
All-Red Time (s)	3.0	2.8	3.0	2.8	2.8	4.9		2.8	4.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	5.8	6.0	5.8	5.8	9.0		5.8	9.0	
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	5.0		3.0	5.0	
Recall Mode	None	None	None	None	None	Min		None	Min	
Act Effct Green (s)	24.2	15.9	24.2	15.9	15.9	22.8	84.3	15.9	22.8	84.3
Actuated g/C Ratio	0.29	0.19	0.29	0.19	0.19	0.27	1.00	0.19	0.27	1.00
v/c Ratio	0.44	0.57	0.84	0.55	0.67	0.38	0.45	0.55	0.81	0.09
Control Delay	27.6	37.0	38.5	36.4	43.7	26.9	0.9	39.3	43.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	37.0	38.5	36.4	43.7	26.9	0.9	39.3	43.4	0.1
LOS	C	D	D	D	D	C	A	D	D	A

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Approach Delay						15.4			33.5	
Approach LOS						B			C	
Queue Length 50th (ft)	97	88	215	83	117	85	0	94	212	0
Queue Length 95th (ft)	164	143	#363	137	207	132	0	173	338	0
Internal Link Dist (ft)						224			452	
Turn Bay Length (ft)		175	400	100	225		220	325		325
Base Capacity (vph)	1151	726	1151	726	463	1299	1615	463	684	1615
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.42	0.73	0.40	0.49	0.28	0.45	0.40	0.60	0.09

Intersection Summary

Area Type: Other
Cycle Length: 98.8
Actuated Cycle Length: 84.3
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 28.4 Intersection LOS: C
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: SR 731/Rte 111 & 15NB on/15 SB on & 15NB off/15SB off



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	607	300	326	601	643	733
Future Volume (vph)	607	300	326	601	643	733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	0	0	375			0
Storage Lanes	2	1	1			1
Taper Length (ft)	8		8			
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3319	1531	1711	3421	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3319	1531	1711	3421	3539	1583
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		17				
Link Speed (mph)	30			40	40	
Link Distance (ft)	468			664	585	
Travel Time (s)	10.6			11.3	10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	660	326	354	653	699	797
Shared Lane Traffic (%)						
Lane Group Flow (vph)	660	326	354	653	699	797
Turn Type	Prot	pt+ov	Prot	NA	NA	Free
Protected Phases	4	1 4	1	1 2	2	
Permitted Phases						Free
Detector Phase	4	4	1	2	2	
Switch Phase						
Minimum Initial (s)	9.0		9.0		15.0	
Minimum Split (s)	13.0		14.2		20.9	
Total Split (s)	35.0		26.2		25.9	
Total Split (%)	40.2%		30.1%		29.7%	
Maximum Green (s)	31.0		21.0		20.0	
Yellow Time (s)	3.0		3.0		4.1	
All-Red Time (s)	1.0		2.2		1.8	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	4.0		5.2		5.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0		5.0	
Recall Mode	None		Min		Min	
Act Effct Green (s)	18.9	41.6	18.6	43.7	19.1	72.0
Actuated g/C Ratio	0.26	0.58	0.26	0.61	0.27	1.00
v/c Ratio	0.76	0.37	0.80	0.31	0.75	0.50
Control Delay	30.9	8.9	42.0	7.9	31.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	8.9	42.0	7.9	31.5	1.1
LOS	C	A	D	A	C	A
Approach Delay	23.6			19.9	15.3	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach LOS	C			B	B	
Queue Length 50th (ft)	147	68	149	65	155	0
Queue Length 95th (ft)	203	113	#310	119	#262	0
Internal Link Dist (ft)	388			584	505	
Turn Bay Length (ft)			375			
Base Capacity (vph)	1457	894	509	2137	1002	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.36	0.70	0.31	0.70	0.50

Intersection Summary

Area Type: Other
Cycle Length: 87.1
Actuated Cycle Length: 72
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 19.0 Intersection LOS: B
Intersection Capacity Utilization 65.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Main St/SR 731 & Mall Drive

Lane Group	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	19	470	578	40	354	534	40
Future Volume (vph)	19	470	578	40	354	534	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0	0	
Storage Lanes		2	1		1	1	
Taper Length (ft)		8				8	
Lane Util. Factor	0.95	0.97	0.88	1.00	1.00	0.95	0.95
Frt			0.850		0.850		
Flt Protected		0.950				0.950	0.959
Satd. Flow (prot)	0	3433	2787	1863	1583	1681	1697
Flt Permitted		0.950				0.950	0.959
Satd. Flow (perm)	0	3433	2787	1863	1583	1681	1697
Right Turn on Red			Yes		Yes		
Satd. Flow (RTOR)			628		385		
Link Speed (mph)		30		30			30
Link Distance (ft)		454		359			515
Travel Time (s)		10.3		8.2			11.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	511	628	43	385	580	43
Shared Lane Traffic (%)						46%	
Lane Group Flow (vph)	0	532	628	43	385	313	310
Turn Type	Prot	Prot	Perm	NA	Perm	Split	NA
Protected Phases	3	3		2		1	1
Permitted Phases			3		2		
Detector Phase	3	3	3	2	2	1	1
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	11.0	11.0
Total Split (s)	34.0	34.0	34.0	34.0	34.0	22.0	22.0
Total Split (%)	37.8%	37.8%	37.8%	37.8%	37.8%	24.4%	24.4%
Maximum Green (s)	30.0	30.0	30.0	30.0	30.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lag	Lag	Lead	Lead
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None
Act Effct Green (s)		15.5	15.5	8.6	8.6	16.9	16.9
Actuated g/C Ratio		0.29	0.29	0.16	0.16	0.32	0.32
v/c Ratio		0.53	0.50	0.14	0.66	0.59	0.58
Control Delay		18.4	3.2	21.8	9.3	22.6	22.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		18.4	3.2	21.8	9.3	22.6	22.2
LOS		B	A	C	A	C	C
Approach Delay		10.2		10.5			22.4
Approach LOS		B		B			C

Lane Group	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		69	0	12	0	77	76
Queue Length 95th (ft)		127	34	37	63	#225	#209
Internal Link Dist (ft)		374		279			435
Turn Bay Length (ft)			150				
Base Capacity (vph)		1974	1869	1071	1074	580	585
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.27	0.34	0.04	0.36	0.54	0.53

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 53.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 44.4%	ICU Level of Service A
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 30: Ring Rd & Mall Drive

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	2	0	1208	1374	52
Future Volume (vph)	0	2	0	1208	1374	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	50			0
Storage Lanes	0	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.91
Frt		0.865			0.994	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	5055	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	5055	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	303			585	157	
Travel Time (s)	6.9			10.0	2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2	0	1313	1493	57
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2	0	1313	1550	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 37.7%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	0	1208	1374	52
Future Vol, veh/h	0	2	0	1208	1374	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	0	1313	1493	57

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	775	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	292	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	292	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	292	-	-
HCM Lane V/C Ratio	-	0.007	-	-
HCM Control Delay (s)	-	17.4	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↳			↱
Traffic Volume (vph)	0	907	1048	11	0	19
Future Volume (vph)	0	907	1048	11	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	5085	5075	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	5085	5075	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		454	468		203	
Travel Time (s)		10.3	10.6		4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	986	1139	12	0	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	986	1151	0	0	21
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↳			↱
Traffic Vol, veh/h	0	907	1048	11	0	19
Future Vol, veh/h	0	907	1048	11	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	986	1139	12	0	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	576
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	-	0	394
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	394
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	394
HCM Lane V/C Ratio	-	-	-	0.052
HCM Control Delay (s)	-	-	-	14.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	19	0	611	7	0	555
Future Volume (vph)	19	0	611	7	0	555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	0.95	0.95
Frt			0.998			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	5075	0	0	3539
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	5075	0	0	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	249		515			155
Travel Time (s)	5.7		11.7			3.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	0	664	8	0	603
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	672	0	0	603
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	0	611	7	0	555
Future Vol, veh/h	19	0	611	7	0	555
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	0	664	8	0	603

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	970	336	0	0	672	0
Stage 1	668	-	-	-	-	-
Stage 2	302	-	-	-	-	-
Critical Hdwy	6.29	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	284	563	-	-	562	-
Stage 1	395	-	-	-	-	-
Stage 2	698	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	284	563	-	-	562	-
Mov Cap-2 Maneuver	284	-	-	-	-	-
Stage 1	395	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	284	562	-
HCM Lane V/C Ratio	-	-	0.073	-	-
HCM Control Delay (s)	-	-	18.7	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

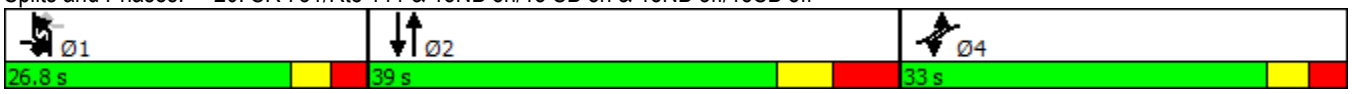
Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Lane Configurations										
Traffic Volume (vph)	343	257	707	96	273	263	661	192	343	141
Future Volume (vph)	343	257	707	96	273	263	661	192	343	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)						0%			0%	
Storage Length (ft)	0		400		225			325		
Storage Lanes	2		2		1			1		
Taper Length (ft)	25		150		75			150		
Lane Util. Factor	0.97	0.88	0.97	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Frt		0.850		0.850			0.850			0.850
Flt Protected	0.950		0.950		0.950			0.950		
Satd. Flow (prot)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Flt Permitted	0.950		0.950		0.950			0.950		
Satd. Flow (perm)	3484	2828	3484	2828	1805	3539	1615	1805	1863	1615
Right Turn on Red		No		No			Yes			Yes
Satd. Flow (RTOR)							718			197
Link Speed (mph)						40			40	
Link Distance (ft)						304			532	
Travel Time (s)						5.2			9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	373	279	768	104	297	286	718	209	373	153
Shared Lane Traffic (%)										
Lane Group Flow (vph)	373	279	768	104	297	286	718	209	373	153
Turn Type	Prot	Prot	Prot	Perm	Prot	NA	Free	Prot	NA	Free
Protected Phases	4	1	4		1	2		1	2	
Permitted Phases				1			Free			Free
Detector Phase	4	1	4	1	1	2		1	2	
Switch Phase										
Minimum Initial (s)	9.0	9.0	9.0	9.0	9.0	15.0		9.0	15.0	
Minimum Split (s)	15.0	14.8	15.0	14.8	14.8	24.0		14.8	24.0	
Total Split (s)	33.0	26.8	33.0	26.8	26.8	39.0		26.8	39.0	
Total Split (%)	33.4%	27.1%	33.4%	27.1%	27.1%	39.5%		27.1%	39.5%	
Maximum Green (s)	27.0	21.0	27.0	21.0	21.0	30.0		21.0	30.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	4.1		3.0	4.1	
All-Red Time (s)	3.0	2.8	3.0	2.8	2.8	4.9		2.8	4.9	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	5.8	6.0	5.8	5.8	9.0		5.8	9.0	
Lead/Lag										
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	5.0		3.0	5.0	
Recall Mode	None	None	None	None	None	Min		None	Min	
Act Effct Green (s)	22.9	17.8	22.9	17.8	17.8	21.7	83.8	17.8	21.7	83.8
Actuated g/C Ratio	0.27	0.21	0.27	0.21	0.21	0.26	1.00	0.21	0.26	1.00
v/c Ratio	0.39	0.46	0.81	0.17	0.78	0.31	0.44	0.55	0.78	0.09
Control Delay	27.3	33.2	37.0	30.1	47.9	26.9	0.9	37.3	41.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	33.2	37.0	30.1	47.9	26.9	0.9	37.3	41.9	0.1
LOS	C	C	D	C	D	C	A	D	D	A

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Approach Delay						17.3			31.9	
Approach LOS						B			C	
Queue Length 50th (ft)	86	76	204	26	155	70	0	103	200	0
Queue Length 95th (ft)	140	132	302	56	#302	106	0	192	306	0
Internal Link Dist (ft)						224			452	
Turn Bay Length (ft)		175	400	100	225		220	325		325
Base Capacity (vph)	1158	731	1158	731	466	1307	1615	466	688	1615
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.38	0.66	0.14	0.64	0.22	0.44	0.45	0.54	0.09

Intersection Summary

Area Type: Other
Cycle Length: 98.8
Actuated Cycle Length: 83.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 27.3 Intersection LOS: C
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 20: SR 731/Rte 111 & 15NB on/15 SB on & 15NB off/15SB off



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	681	301	284	516	487	785
Future Volume (vph)	681	301	284	516	487	785
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	12	12
Storage Length (ft)	0	0	375			0
Storage Lanes	2	1	1			1
Taper Length (ft)	8		8			
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3319	1531	1711	3421	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3319	1531	1711	3421	3539	1583
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		49				
Link Speed (mph)	30			40	40	
Link Distance (ft)	468			664	585	
Travel Time (s)	10.6			11.3	10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	740	327	309	561	529	853
Shared Lane Traffic (%)						
Lane Group Flow (vph)	740	327	309	561	529	853
Turn Type	Prot	pt+ov	Prot	NA	NA	Free
Protected Phases	4	1 4	1	1 2	2	
Permitted Phases						Free
Detector Phase	4	4	1	2	2	
Switch Phase						
Minimum Initial (s)	9.0		9.0		15.0	
Minimum Split (s)	13.0		14.2		20.9	
Total Split (s)	35.0		26.2		25.9	
Total Split (%)	40.2%		30.1%		29.7%	
Maximum Green (s)	31.0		21.0		20.0	
Yellow Time (s)	3.0		3.0		4.1	
All-Red Time (s)	1.0		2.2		1.8	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	4.0		5.2		5.9	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0		2.0		5.0	
Recall Mode	None		Min		Min	
Act Effct Green (s)	20.8	41.6	16.6	40.5	17.8	70.8
Actuated g/C Ratio	0.29	0.59	0.23	0.57	0.25	1.00
v/c Ratio	0.76	0.36	0.77	0.29	0.60	0.54
Control Delay	28.7	7.3	41.0	8.9	28.4	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	7.3	41.0	8.9	28.4	1.3
LOS	C	A	D	A	C	A
Approach Delay	22.1			20.3	11.7	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Approach LOS	C			C	B	
Queue Length 50th (ft)	154	54	128	61	111	0
Queue Length 95th (ft)	230	102	#273	114	191	0
Internal Link Dist (ft)	388			584	505	
Turn Bay Length (ft)			375			
Base Capacity (vph)	1501	921	524	2096	1032	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.36	0.59	0.27	0.51	0.54

Intersection Summary

Area Type: Other
Cycle Length: 87.1
Actuated Cycle Length: 70.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 17.3 Intersection LOS: B
Intersection Capacity Utilization 61.2% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 28: Main St/SR 731 & Mall Drive

Lane Group	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	24	480	581	51	384	574	51
Future Volume (vph)	24	480	581	51	384	574	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0	0	
Storage Lanes		2	1		1	1	
Taper Length (ft)		8				8	
Lane Util. Factor	0.95	0.97	0.88	1.00	1.00	0.95	0.95
Frt			0.850		0.850		
Flt Protected		0.950				0.950	0.960
Satd. Flow (prot)	0	3433	2787	1863	1583	1681	1699
Flt Permitted		0.950				0.950	0.960
Satd. Flow (perm)	0	3433	2787	1863	1583	1681	1699
Right Turn on Red			Yes		Yes		
Satd. Flow (RTOR)			632		417		
Link Speed (mph)		30		30			30
Link Distance (ft)		454		359			515
Travel Time (s)		10.3		8.2			11.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	522	632	55	417	624	55
Shared Lane Traffic (%)						46%	
Lane Group Flow (vph)	0	548	632	55	417	337	342
Turn Type	Prot	Prot	Perm	NA	Perm	Split	NA
Protected Phases	3	3		2		1	1
Permitted Phases			3		2		
Detector Phase	3	3	3	2	2	1	1
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	11.0	11.0
Total Split (s)	34.0	34.0	34.0	34.0	34.0	22.0	22.0
Total Split (%)	37.8%	37.8%	37.8%	37.8%	37.8%	24.4%	24.4%
Maximum Green (s)	30.0	30.0	30.0	30.0	30.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lag	Lag	Lead	Lead
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None
Act Effct Green (s)		16.0	16.0	8.8	8.8	18.3	18.3
Actuated g/C Ratio		0.29	0.29	0.16	0.16	0.33	0.33
v/c Ratio		0.55	0.50	0.19	0.69	0.61	0.61
Control Delay		19.0	3.2	22.6	9.6	24.2	24.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		19.0	3.2	22.6	9.6	24.2	24.2
LOS		B	A	C	A	C	C
Approach Delay		10.5		11.1			24.2
Approach LOS		B		B			C

Lane Group	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		72	0	15	0	86	87
Queue Length 95th (ft)		134	34	46	66	#267	#271
Internal Link Dist (ft)		374		279			435
Turn Bay Length (ft)			150				
Base Capacity (vph)		1892	1820	1027	1059	555	562
Starvation Cap Reductn		0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0
Reduced v/c Ratio		0.29	0.35	0.05	0.39	0.61	0.61

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 55.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 47.7%	ICU Level of Service A
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 30: Ring Rd & Mall Drive

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	2	0	1197	1270	37
Future Volume (vph)	0	2	0	1197	1270	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	50			0
Storage Lanes	0	1	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.91
Frt		0.865			0.996	
Flt Protected						
Satd. Flow (prot)	0	1611	0	3539	5065	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	3539	5065	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	303			585	157	
Travel Time (s)	6.9			10.0	2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2	0	1301	1380	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2	0	1301	1420	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 36.4%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	0	1197	1270	37
Future Vol, veh/h	0	2	0	1197	1270	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	0	1301	1380	40

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	710	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	323	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	323	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	323	-	-
HCM Lane V/C Ratio	-	0.007	-	-
HCM Control Delay (s)	-	16.2	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	982	1061	8	0	24
Future Volume (vph)	0	982	1061	8	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	5085	5080	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	5085	5080	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		454	468		203	
Travel Time (s)		10.3	10.6		4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1067	1153	9	0	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1067	1162	0	0	26
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 30.7%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑↳			↱
Traffic Vol, veh/h	0	982	1061	8	0	24
Future Vol, veh/h	0	982	1061	8	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1067	1153	9	0	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	581
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	-	0	391
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	391
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	391
HCM Lane V/C Ratio	-	-	-	0.067
HCM Control Delay (s)	-	-	-	14.9
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	24	0	627	5	0	601
Future Volume (vph)	24	0	627	5	0	601
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	0.95	0.95
Frt			0.999			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	5080	0	0	3539
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	5080	0	0	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	249		515			155
Travel Time (s)	5.7		11.7			3.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	0	682	5	0	653
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	0	687	0	0	653
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	0	627	5	0	601
Future Vol, veh/h	24	0	627	5	0	601
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	0	682	5	0	653

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1012	344	0	0	687	0
Stage 1	685	-	-	-	-	-
Stage 2	327	-	-	-	-	-
Critical Hdwy	6.29	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	268	557	-	-	553	-
Stage 1	385	-	-	-	-	-
Stage 2	679	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	268	557	-	-	553	-
Mov Cap-2 Maneuver	268	-	-	-	-	-
Stage 1	385	-	-	-	-	-
Stage 2	679	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	268	553	-
HCM Lane V/C Ratio	-	-	0.097	-	-
HCM Control Delay (s)	-	-	19.9	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-