

D'ANDREA SURVEYING & ENGINEERING, PC

LAND PLANNERS • ENGINEERS • SURVEYORS

SIX NEIL LANE • P.O. BOX 549
RIVERSIDE, CONNECTICUT 06878
TELEPHONE: 203 637-1779
FAX: 203 637-1770
EMAIL: info@rvdi.com

July 9, 2021

Via Electronic Mail (vdesimone@northcastleny.com)

Hon. Christopher Carthy, Chairman
and Members of the Planning Board
Town Hall Annex
17 Bedford Road
Armonk NY 10504

Re: Applications of 45 Hurlingham, LLC for Site Plan, Special Permit, Wetlands Permit and Tree Removal Permit, Approvals to Construct a New Residence, Caretaker's Quarters, Driveway, Tennis Court, Dock and Related Utilities and Improvements
Property: 45 Hurlingham Drive, Town of North Castle
Tax Identification No.: Section 102.04, Block 1, Lot 26

Dear Chairman Carthy and Members of the Planning Board:

This submission is made to address comments raised in the Review Memoranda of the Town Planner dated June 1, 2021 (the "Planning Memorandum") and the Consulting Town Engineer, dated February 17, 2021, June 10, 2021 (the "Engineering Memorandum").

We submit the following plans (last revised July 6, 2021 unless otherwise stated) and documents, which document the revisions to address the items in the Planning Memorandum and Engineering Memorandum:

1. Plans prepared by D'Andrea Surveying & Engineering, P.C., as follows:
 - a. Site Plan Review Set, consisting of:
 - i. Topographic Survey;
 - ii. Zoning Location Survey;
 - iii. Development Plan (Sheet 1);
 - iv. Sediment & Erosion Controls (Sheet 2);
 - v. Notes and Details (Sheet 3); and
 - vi. Septic Design & Details (Sheet 4);
 - b. Average Grade Plan (for the Main House and Caretaker's Quarters);
 - c. Exhibit A Proposed Coverage Analysis
 - d. Exhibit B Net Lot Area for Possible Lots
 - e. Development Plan Showing Possible Subdivision for Caretaker's Quarters (the "Phantom Subdivision Plan"); and
 - f. Stormwater Pollution Prevention Plan (SWPPP).

Planning Memorandum

July 9, 2021

A. Overall Summary of Revisions:

1. The Phantom Subdivision Plan (item 1(e)) has been updated to include a zoning conformance chart showing how each lot conforms with the minimum requirements of the R-2A Zoning District with a Net Lot Area Table included. Refer also to Exhibit B (item 1(d)).
2. Refer to Exhibit A for documentation of gross land coverage. Note that proposed land coverage has been reduced by reducing paving in garage areas and other reductions. The maximum allowed gross land coverage has been recalculated to be 42,015 sf and the proposed land coverage is now 41,591 sf. Refer to the attached Zoning Location Survey and the cited Exhibit A.

Engineering Memorandum

A. Overall Summary of Revisions:

1. The Phantom Subdivision Plan (item 1(e)) has been updated to include a zoning conformance chart showing how each lot conforms with the minimum requirements of the R-2A Zoning District with a Net Lot Area Table included. Refer also. Exhibit B (item 1(d)). Note that the Zoning Setbacks have been added to this Plan.
2. Our office has forwarded the Site Plan to the Bedfords-Banksville Fire Dept. and will follow up for review comments.
3. The cited drywell system with the 100' existing well setback has been relocated to be beyond the 100' setback, after confirmation form WCDH that this setback applies.
4. Concerning the stone trench level spreader downslope of Drywell Chamber 2 a section has been added to the detail sheet 3 of 4 to document that the trench will function as an overflow.
5. Inspection ports have added at each inlet connection for the drywell chamber systems.
6. Concerning the Sediment and Erosion Control Plan additional silt fencing has been added to the plan to provide additional protection.
7. The SWPPP has been revised to include the additional storm events.

Should you have any questions, please contact us. We look forward to seeing you at the meeting in August.

Sincerely,

D'Andrea Surveying & Engineering, PC


Richard Regan PE

RAR:adm
20JS_TRANS_1

Enclosures

cc: 45 Hurlingham, LLC
Geraldine N. Tortorella, Esquire

D'ANDREA SURVEYING & ENGINEERING, PC

SITE PLAN REVIEW SET PROPOSED RESIDENCE

LOCATION

**45 HURLINGHAM DRIVE
NORTH CASTLE, NEW YORK
& GREENWICH, CONNECTICUT**

PREPARED FOR

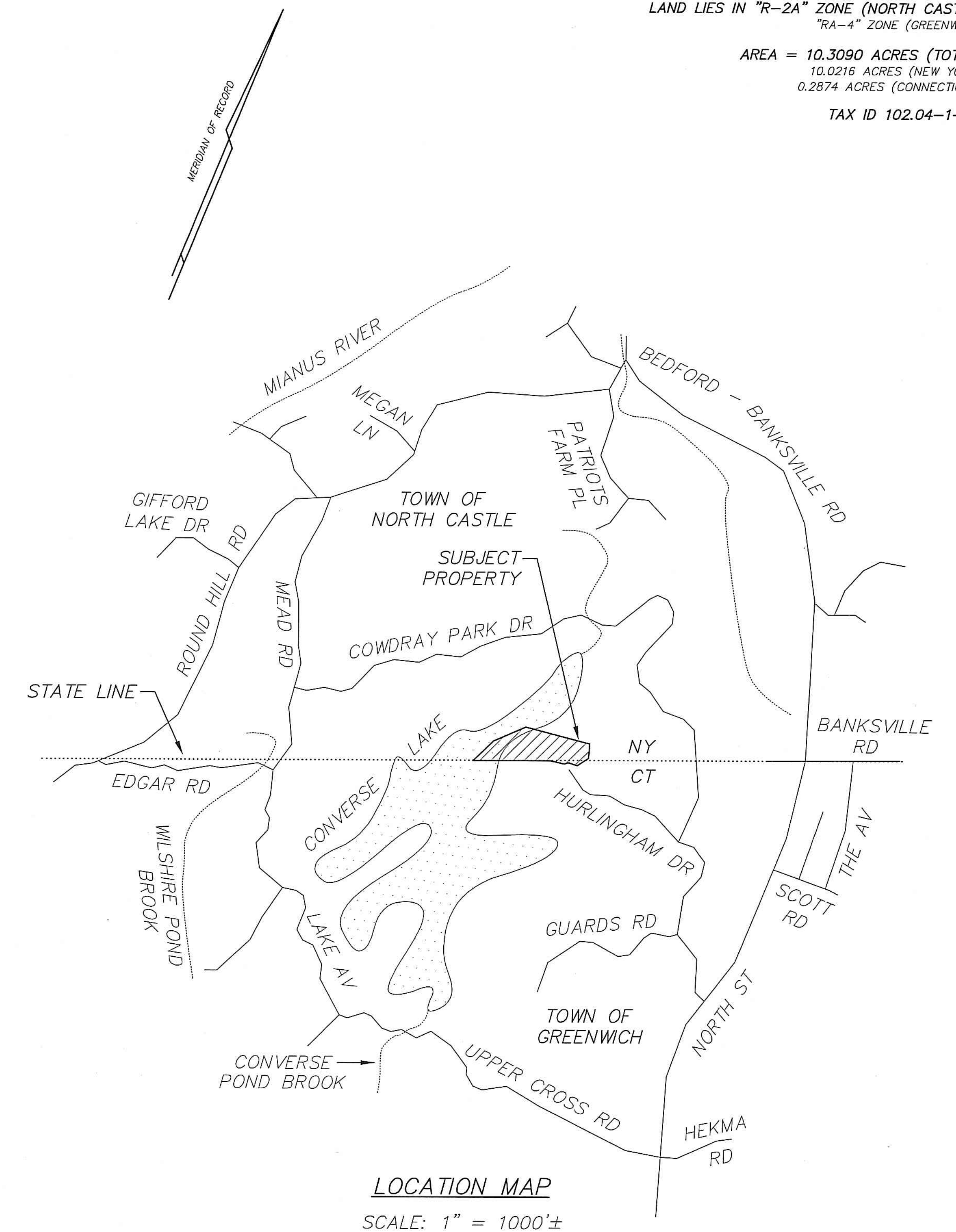
45 HURLINGHAM, LLC

REFER TO MAPS No. 21767 W.C.L.R. AND 5970 G.L.R.

LAND LIES IN "R-2A" ZONE (NORTH CASTLE)
"RA-4" ZONE (GREENWICH)

AREA = 10.3090 ACRES (TOTAL)
10.0216 ACRES (NEW YORK)
0.2874 ACRES (CONNECTICUT)

TAX ID 102.04-1-26



SHEET INDEX

SHEET	TITLE	REVISION	DATE
-	TOPOGRAPHIC SURVEY	-	06-01-21
-	ZONING LOCATION SURVEY	-	07-06-21
1 OF 4	DEVELOPMENT PLAN	3	07-06-21
2 OF 4	SEDIMENTATION & EROSION CONTROLS	2	07-06-21
3 OF 4	NOTES & DETAILS	2	07-06-21
4 OF 4	SEPTIC DESIGN & DETAILS	2	07-06-21

APPLICANT INFO:
45 HURLINGHAM, LLC
c/o GERALDINE N. TORTORELLA, ESQ.
HOCHERMAN TORTORELLA & WEKSTEIN LLP
ONE NORTH BROADWAY, SUITE 701
WHITE PLAINS, NY 10601
(914)-421-1800 EXT. 11

ENGINEERING PLANS PREPARED BY:

Richard A. Regan
D'ANDREA SURVEYING & ENGINEERING, P.C. DATE 07-06-21
RICHARD A. REGAN N.Y. PE No. 61598

ONLY COPIES OF THIS SET BEARING AN ORIGINAL IMPRINT OF THE ENGINEER'S / SURVEYOR'S EMBOSSED SEAL SHALL BE CONSIDERED TO BE TRUE, VALID COPIES.

NOTE:
UNAUTHORIZED ALTERATION OR ADDITION TO THESE PLANS IS NOT PERMITTED UNDER SECTION 2207-(2) OF THE NEW YORK STATE EDUCATION LAW

THESE PLANS AND THE SCOPE OF WORK DETAILED HEREIN ARE APPROVED FOR CONSTRUCTION BY THE PLANNING BOARD OF THE TOWN OF NORTH CASTLE.

CHRISTOPHER CARTHY, CHAIR DATE

D'ANDREA SURVEYING & ENGINEERING, P.C.
LAND PLANNERS
ENGINEERS
P.O. BOX 549 RIVERSIDE, CT 06878 5 HELL LANE TEL. 637-1779

PROJECT **PROPOSED RESIDENCE**

PREPARED FOR **45 HURLINGHAM, LLC**

LOCATION **45 HURLINGHAM DRIVE
NORTH CASTLE, NEW YORK**

REV.	DATE	DESCRIPTION
2	7-6-21	ADDRESS MUNICIPAL COMMENTS ISSUE TO PB AND WCDM
1	06-01-21	CHANGE SITE LAYOUT AND ADDRESS MUNICIPAL COMMENTS
0	02-08-21	ISSUE TO PB

CONVERSE LAKE CONVERSE LAKE (POND)

20/05

N/F
FIFTH AVENUE PROPERTIES
c/o CDL FAMILY OFFICE SERVICES
LOT No. 79

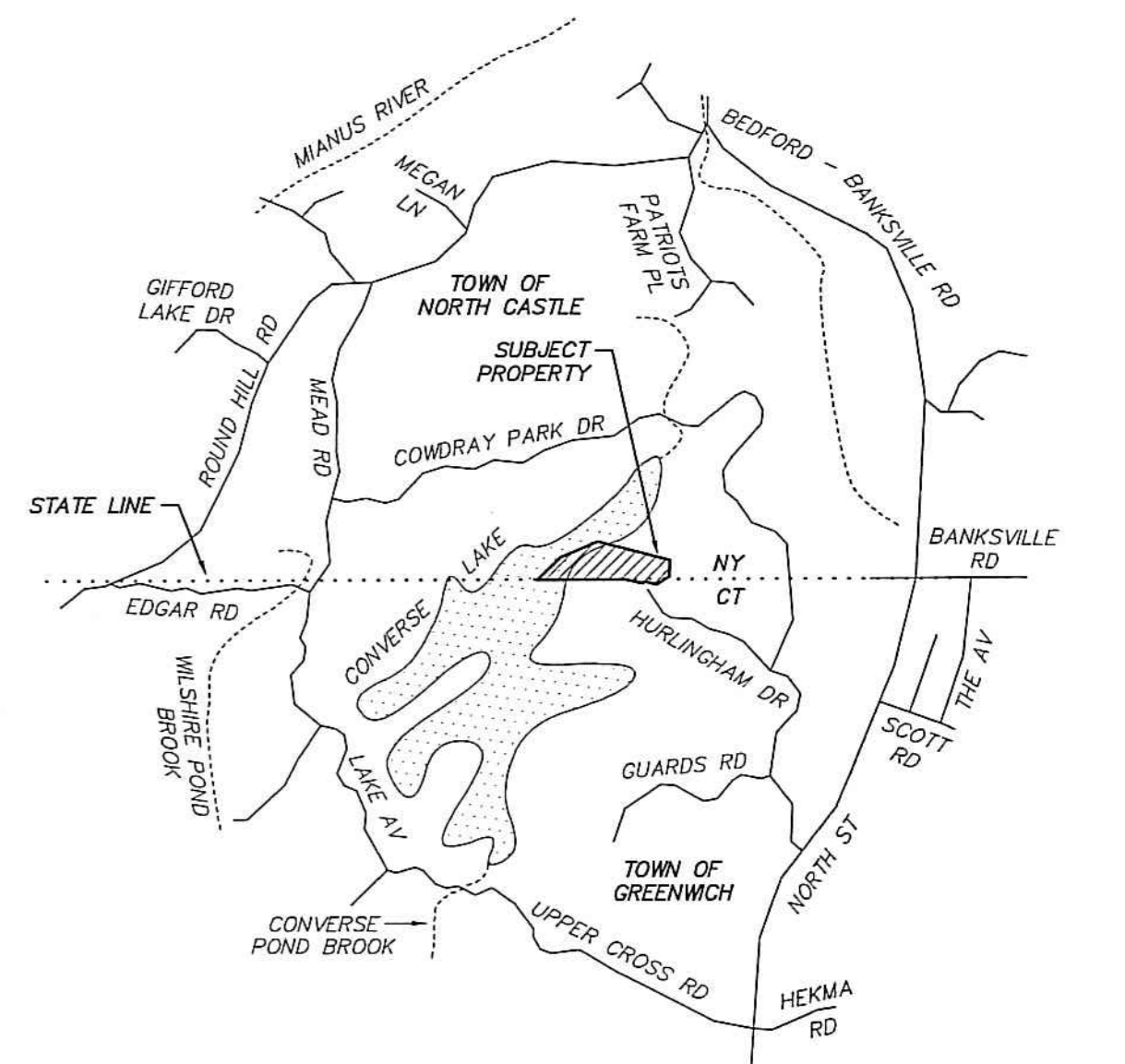
N/F
FIFTH AVENUE PROPERTIES
c/o CDL FAMILY OFFICE SERVICES
LOT No. 80

CONVERSE LAKE
LAKE ELEV. = 58.8' (JULY 31, 1989)

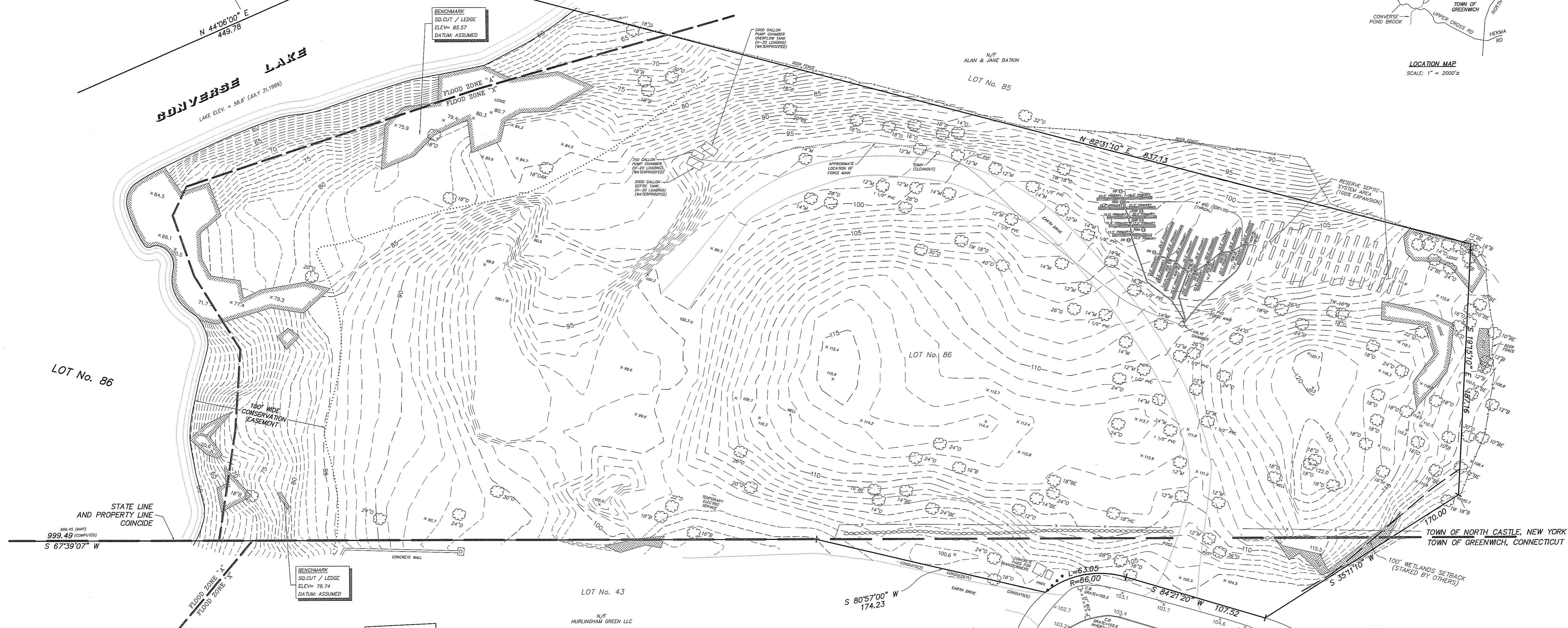
N/F
ALAN & JANE BATON
LOT No. 85

LOT No. 86

LOT No. 43
N/F
HURLINGHAM GREEN LLC



LOCATION MAP
SCALE: 1" = 2000'



TREE LEGEND

B	-	BIRCH
BE	-	BEECH
HC	-	HORSECHESNUT
M	-	MAPLE
O	-	OAK

THIS PROPERTY IS LOCATED IN FLOOD HAZARD ZONE "A" AND MINIMAL HAZARD ZONE "X" AS DEPICTED ON FIRM No. 36119C0169F PUBLISHED BY FEMA DATED 9/28/2007 AND TRANSCRIBED HEREON.

CONTOURS AND ELEVATIONS DEPICTED HEREON ARE BASED ON AN ASSUMED VERTICAL DATUM.

THIS MAP IS BASED ON A FIELD SURVEY UNDER THE DIRECT SUPERVISION OF THE UNDERSIGNED, COMPLETED ON NOVEMBER 24, 2020, AND IS INTENDED ONLY TO DEPICT TOPOGRAPHY AND PLANIMETRIC FEATURES OF A PORTION OF THE PROPERTY.

IT IS A VIOLATION OF THE STATE EDUCATION LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED LAND SURVEYOR, TO ALTER ITEMS DEPICTED HEREON IN ANY WAY.

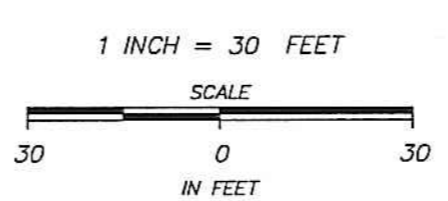
0.2874 ACRES (CONNECTICUT)
10.0216 ACRES (NEW YORK)
AREA = 10.3090 ACRES (TOTAL)
LAND LIES IN "R-2A" ZONE (NORTH CASTLE)
"RA-4" ZONE (GREENWICH)
TAX ID 102.04-1-26 (NORTH CASTLE)

REFER TO MAPS No. 21767 W.C.L.R AND 5970 G.L.R.

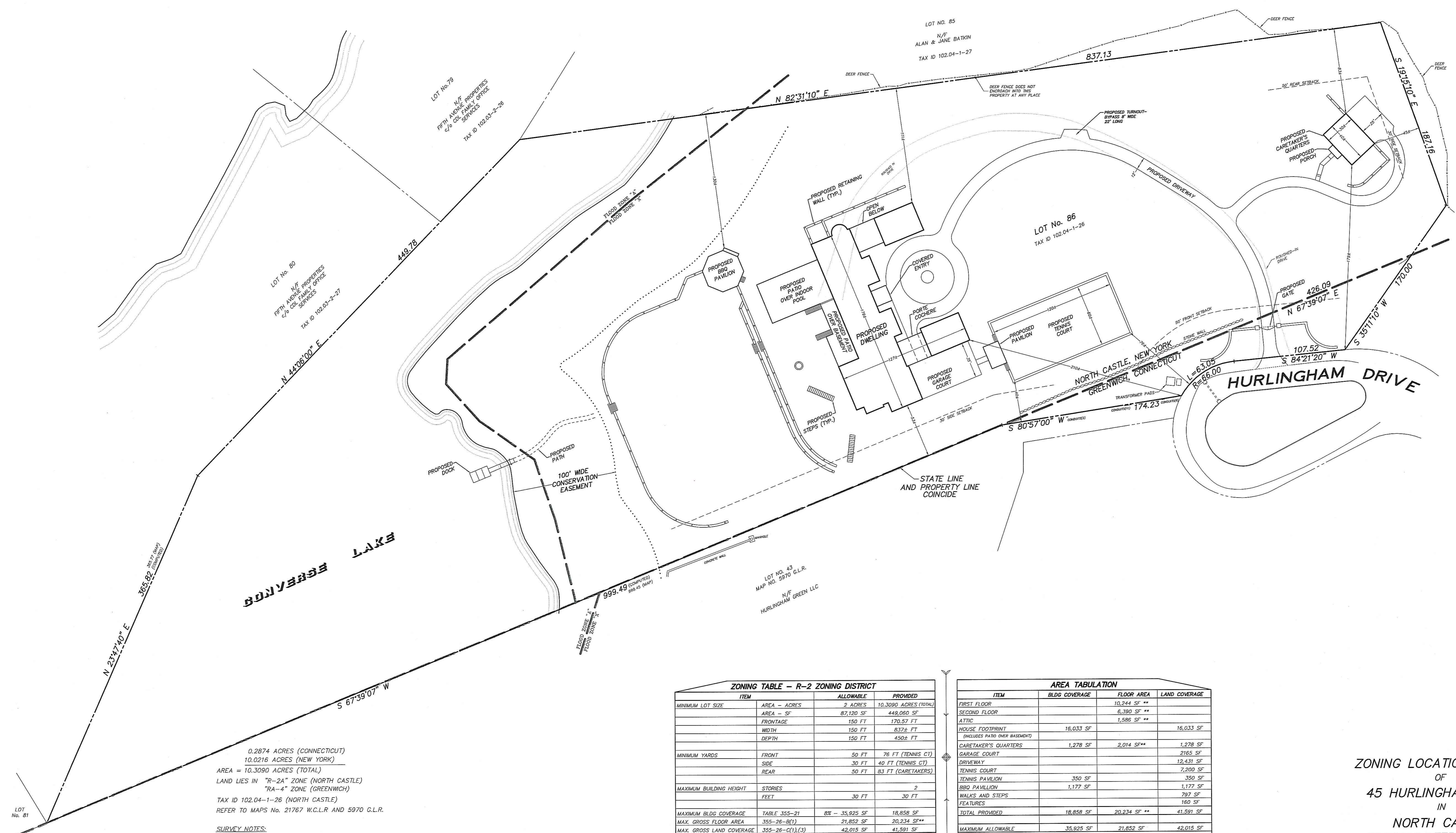
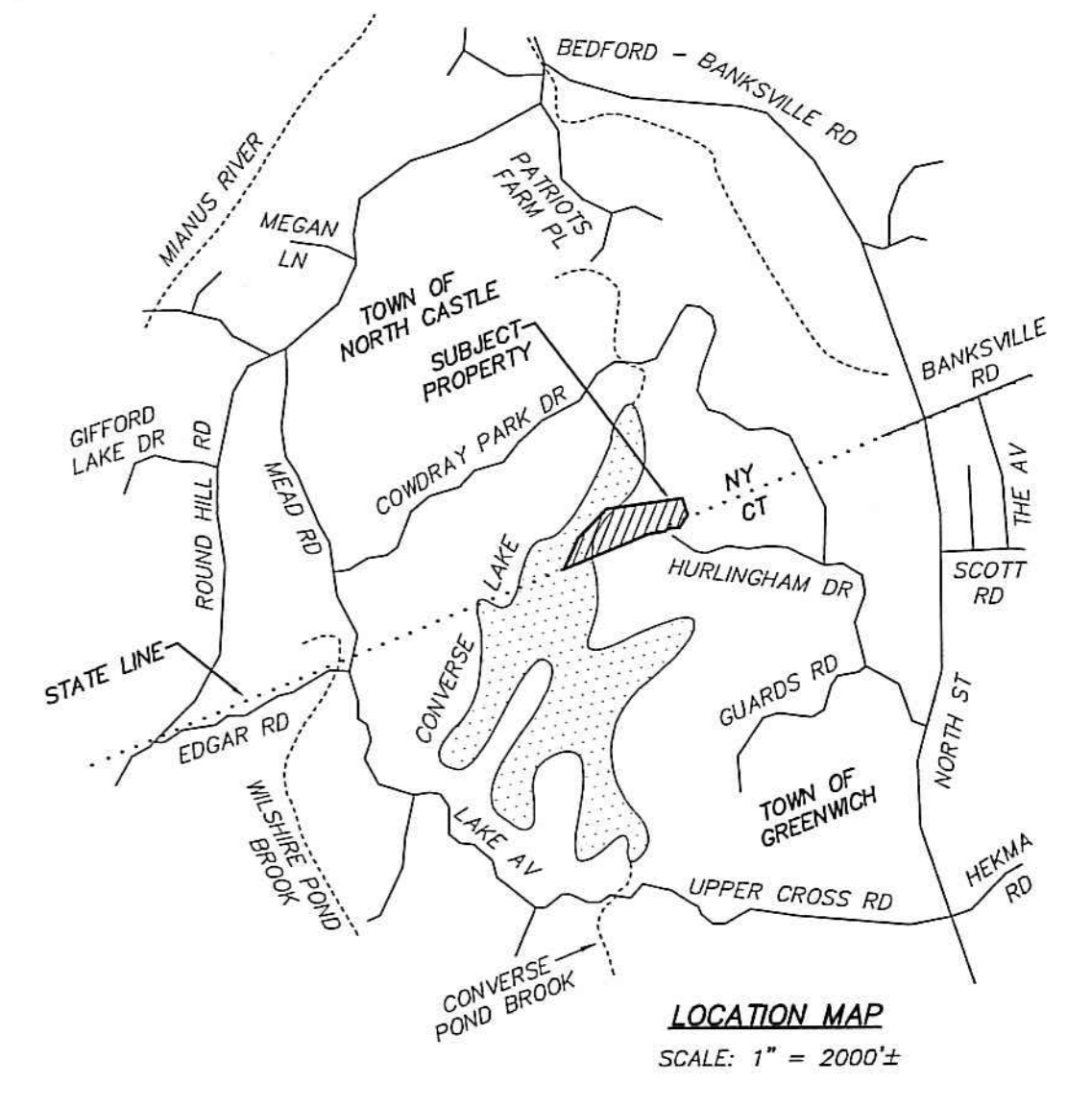
D'ANDREA ENGINEERING AND SURVEYING, P.C.

EDWIN W. RHODES III - NY LS No. 051073
RIVERSIDE, CONNECTICUT

FEBRUARY 8, 2021 JUNE 1, 2021 (ADD FLOOD ZONE BOUNDARY)



TOPOGRAPHIC SURVEY
DEPICTING A PORTION OF
45 HURLINGHAM DRIVE
IN
NORTH CASTLE,
WESTCHESTER COUNTY,
NEW YORK
AND
GREENWICH, CONNECTICUT
PREPARED FOR
45 HURLINGHAM LLC



0.2874 ACRES (CONNECTICUT)
 10.0216 ACRES (NEW YORK)
 AREA = 10.3090 ACRES (TOTAL)
 LAND LIES IN "R-2A" ZONE (NORTH CASTLE)
 "RA-4" ZONE (GREENWICH)
 TAX ID 102.04-1-26 (NORTH CASTLE)
 REFER TO MAPS No. 21767 W.C.L.R AND 5970 G.L.R.

SURVEY NOTES:
 THIS PROPERTY IS LOCATED IN FLOOD HAZARD ZONE "A"
 AND MINIMAL HAZARD ZONE "X" AS DEPICTED ON FIRM No.
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 LAND SURVEYOR, TO ALTER ITEMS DEPICTED HEREON IN ANY WAY.

ZONING TABLE - R-2 ZONING DISTRICT			
ITEM	AREA - ACRES	ALLOWABLE	PROVIDED
MINIMUM LOT SIZE	AREA - ACRES	2 ACRES	10.3090 ACRES (TOTAL)
	AREA - SF	87,120 SF	449,060 SF
	FRONTAGE	150 FT	170.57 FT
	WIDTH	150 FT	837.2 FT
	DEPTH	150 FT	450.2 FT
MINIMUM YARDS	FRONT	50 FT	76 FT (TENNIS CT)
	SIDE	30 FT	40 FT (TENNIS CT)
	REAR	50 FT	83 FT (CARETAKERS)
MAXIMUM BUILDING HEIGHT	STORIES		2
	FEET	30 FT	30 FT
MAXIMUM BLDG COVERAGE	TABLE 355-21	25% - 35,925 SF	18,858 SF
MAX. GROSS FLOOR AREA	355-26-B(1)	21,852 SF	20,234 SF**
MAX. GROSS LAND COVERAGE	355-26-C(1),(3)	42,015 SF	41,591 SF

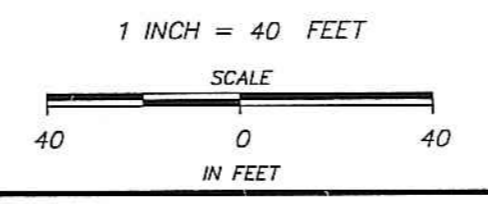
AREA TABULATION			
ITEM	BLDG COVERAGE	FLOOR AREA	LAND COVERAGE
FIRST FLOOR		10,244 SF **	
SECOND FLOOR		6,390 SF **	
ATTIC		1,586 SF **	
HOUSE FOOTPRINT	16,033 SF		16,033 SF
(INCLUDES PATIO OVER BASEMENT)			
CARETAKER'S QUARTERS	1,278 SF	2,014 SF**	1,278 SF
GARAGE COURT			2165 SF
DRIVEWAY			12,431 SF
TENNIS COURT			2,200 SF
TENNIS PAVILION	350 SF		350 SF
BBO PAVILION	1,177 SF		1,177 SF
WALKS AND STEPS			797 SF
FEATURES			160 SF
TOTAL PROVIDED	18,858 SF	20,234 SF **	41,591 SF
MAXIMUM ALLOWABLE	35,925 SF	21,852 SF	42,015 SF

** FLOOR AREAS FROM TASSOS KOKORIS, AIA

ZONING LOCATION SURVEY
 OF
 45 HURLINGHAM DRIVE
 IN
 NORTH CASTLE,
 WESTCHESTER COUNTY,
 NEW YORK
 AND
 GREENWICH, CONNECTICUT
 PREPARED FOR
 45 HURLINGHAM, LLC

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

D'ANDREA ENGINEERING AND SURVEYING, P.C.
 EDWIN W. RHODES III - NY LS No. 051073
 RIVERSIDE, CONNECTICUT FEBRUARY 8, 2021, JUNE 1, 2021, JULY 6, 2021



COMPALE_2025_23.E_P.DWG

SOIL TESTING RECORDS

Recorded by D'Andrea Surveying & Engineering P.C. on November 2, 2020.

All depths are in inches.

Infiltration tests were performed on December 8 & 9, 2020 by D'Andrea Surveying & Engineering P.C. in the presence of an inspector with Kellors Sessions, consultant engineers for the Town of North Castle.

Test holes #101-106 were recorded in the presence of an inspector with the Westchester County Department of Health.

Test holes SW-1 through SW-7 were recorded in the presence of an engineer consulting for the Town of North Castle.

Table with 3 columns: Test Hole ID, Soil Description, and Infiltration Test Results. Includes data for #101-106 and SW-1 through SW-7.

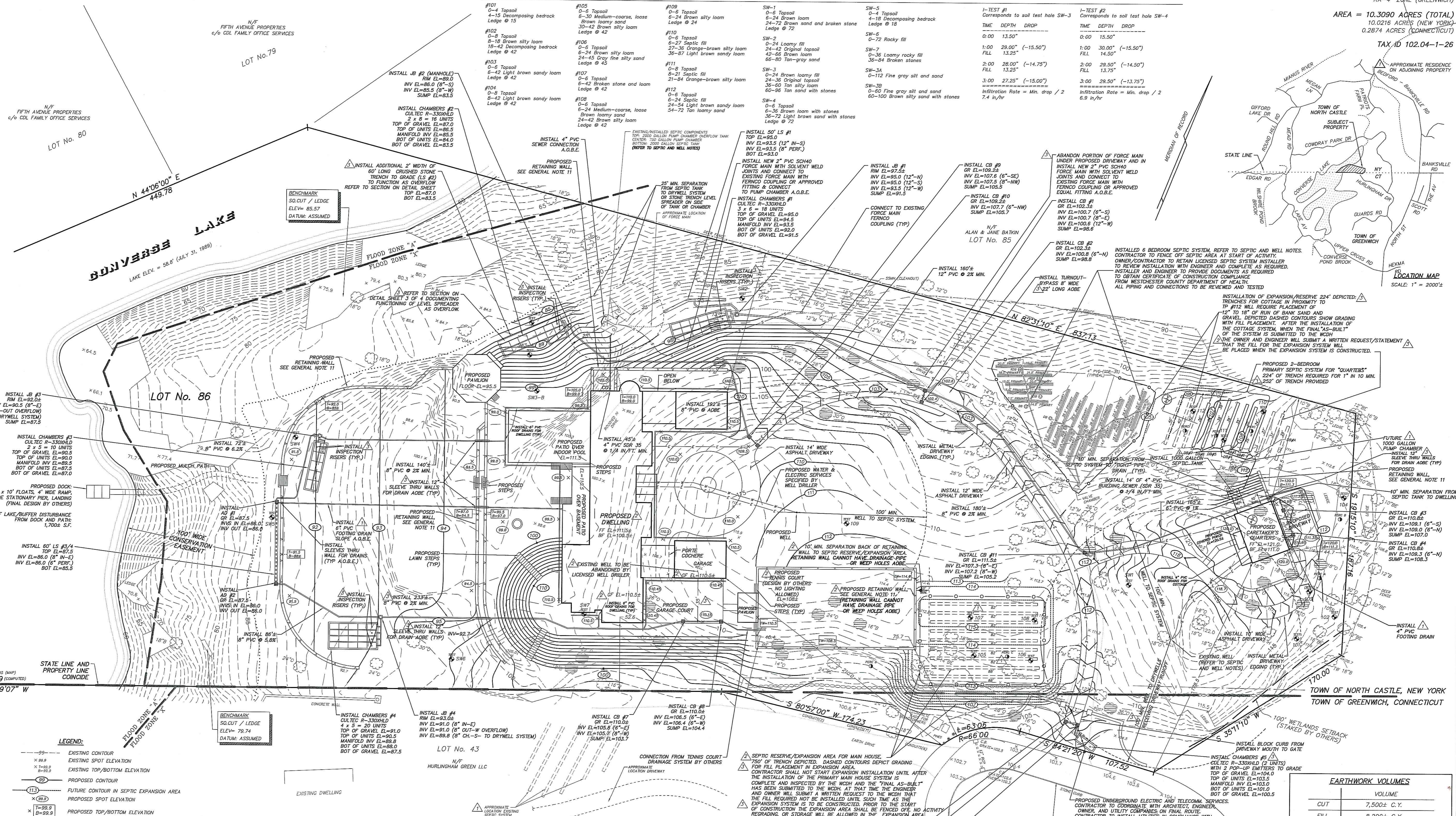
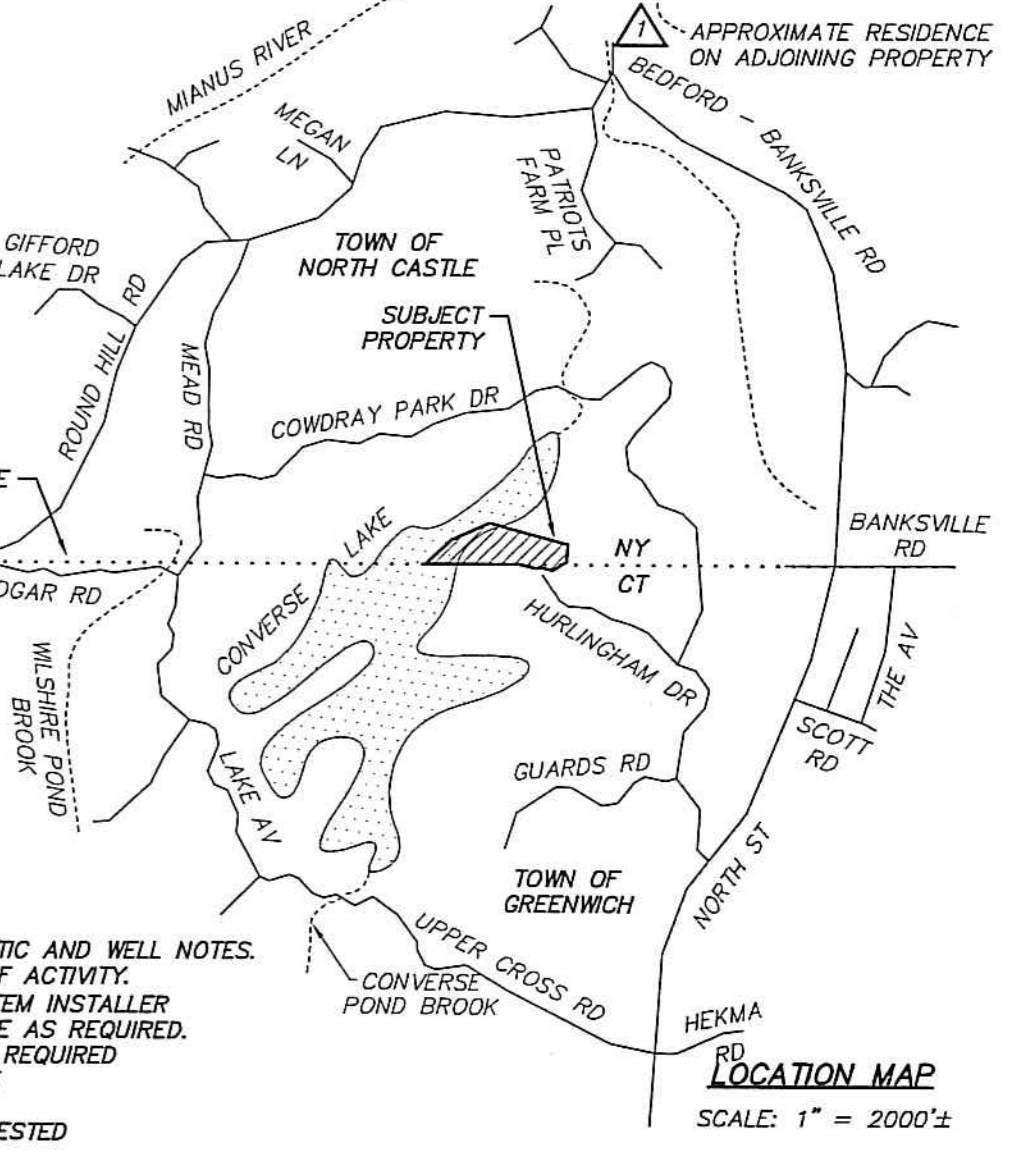
Table with 2 columns: I-TEST #1 and I-TEST #2. Shows infiltration test results for soil test hole SW-3.

REFER TO MAPS No. 21767 W.C.L.R. AND 5970 G.L.R.

LAND LIES IN "R-2A" ZONE (NORTH CASTLE) "RA-4" ZONE (GREENWICH)

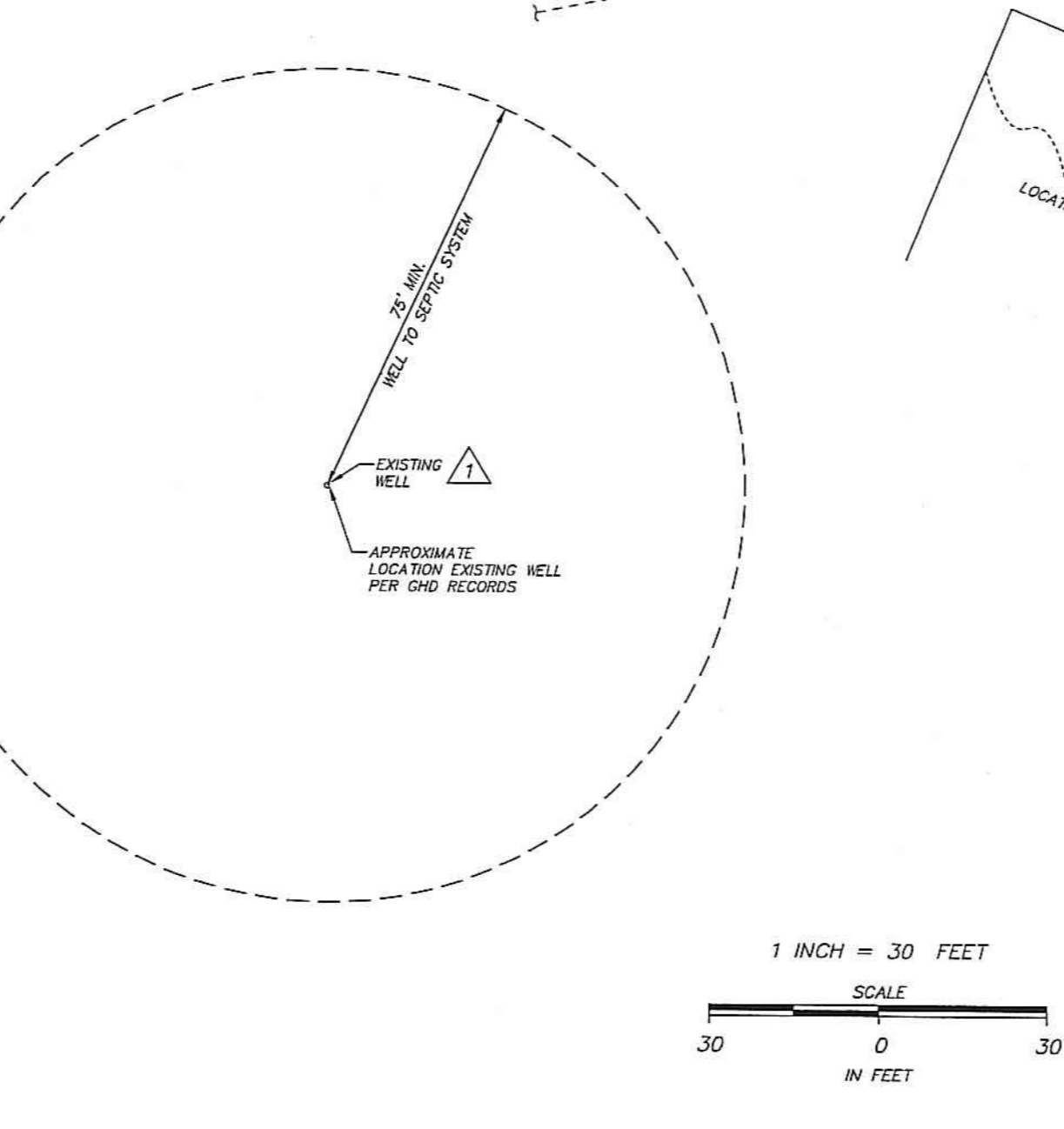
AREA = 10.3090 ACRES (TOTAL) 10.0216 ACRES (NEW YORK) 0.2874 ACRES (CONNECTICUT)

TAX ID 102.04-1-26



Legend table defining symbols for existing contours, proposed contours, wetland flags, and various utility lines.

- GENERAL NOTES: 1. Refer to a survey entitled 'Topographic Survey of 45 Hurlingham Drive in North Castle, Westchester County, New York and Greenwich, Connecticut prepared by 45 Hurlingham LLC' prepared by this firm dated February 8, 2021.



SEPTIC AND WELL NOTES: 1. The Westchester County Department of Health (WCDH) reviewed and approved the 6 bedroom septic system depicted herein circa 1990. The septic system was installed in 1991 and the WCDH inspected on August 2, 1991, in October 2005, the office reviewed with Ms. Natasha Court P.E. of the WCDH the status of the installed septic system.

EARTHWORK VOLUMES table showing CUT, FILL, and NET volumes in cubic yards.

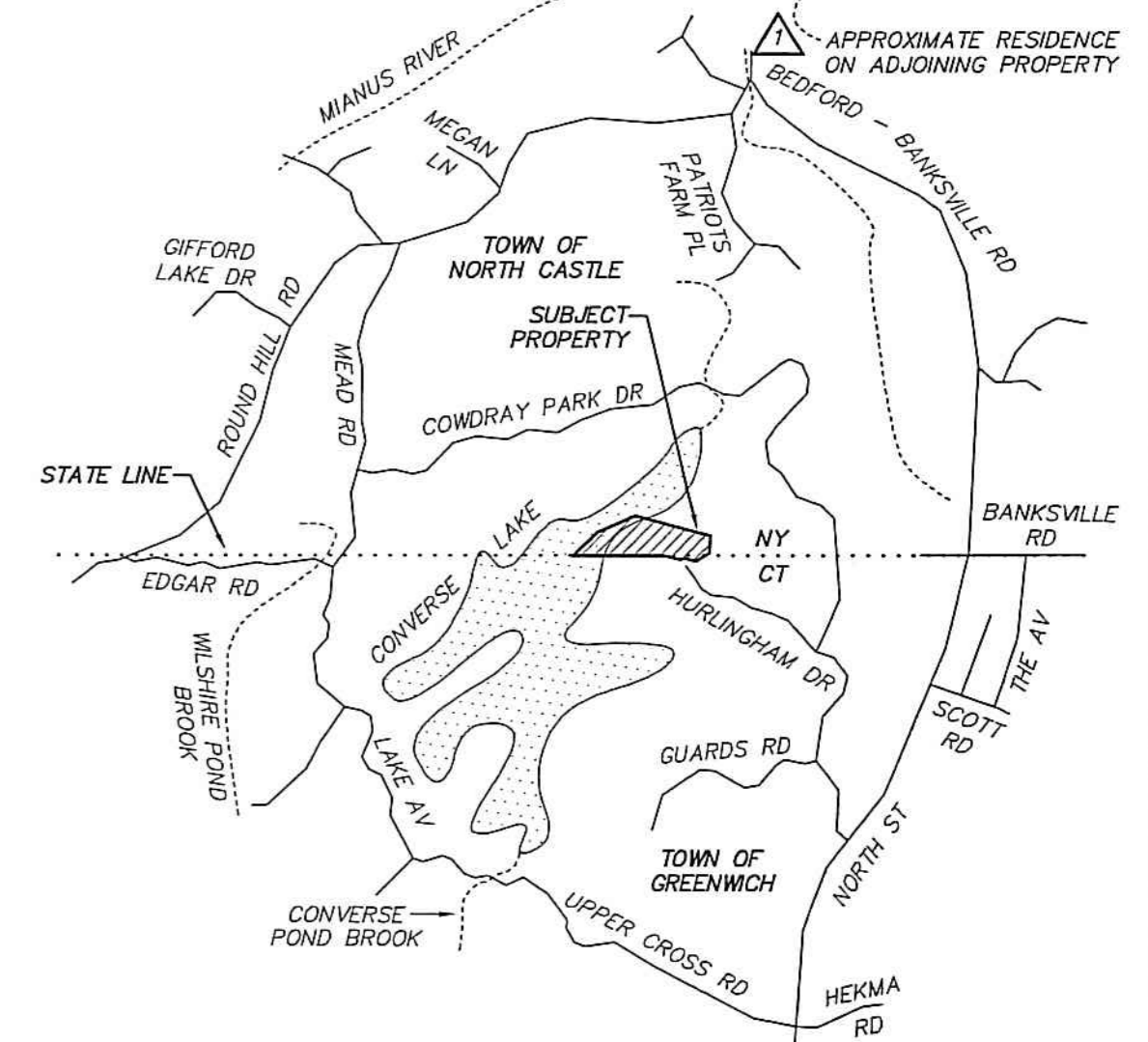
AREA OF ONSITE TOWN REGULATED WETLAND: WATERCOURSE (LAKE) AREA = 3.12 ACRES OTHER WETLAND AREA* = 0.00 ACRES WETLAND BUFFER AREA = 1.43 ACRES WATERCOURSE DISTURBED = 0.01 ACRES OTHER WETLAND DISTURBED = 0.00 ACRES WETLAND BUFFER DISTURBED = 0.03 ACRES

D'ANDREA SURVEYING & ENGINEERING, P.C. PROJECT: PROPOSED RESIDENCE PREPARED FOR: 45 HURLINGHAM, LLC LOCATION: 45 HURLINGHAM DRIVE NORTH CASTLE, NEW YORK 1 OF 4 DEVELOPMENT PLAN

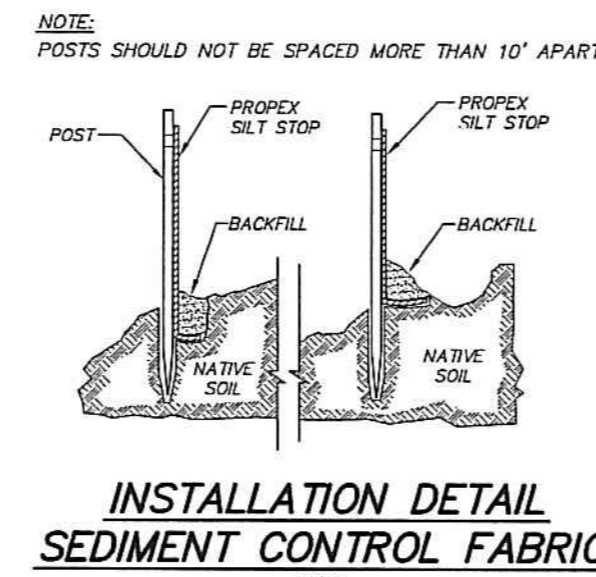
OWNER ADDRESS: 45 HURLINGHAM, LLC 145 WEST 67th ST, APT 47C NY, NY 10023

REVISIONS table with columns for date, description, and initials. Includes revisions for 'SHIFT HOUSE & COURT EAST', 'ISSUE TO NCPB & WCDH', and 'ISSUE TO NCPB & NCPB'.

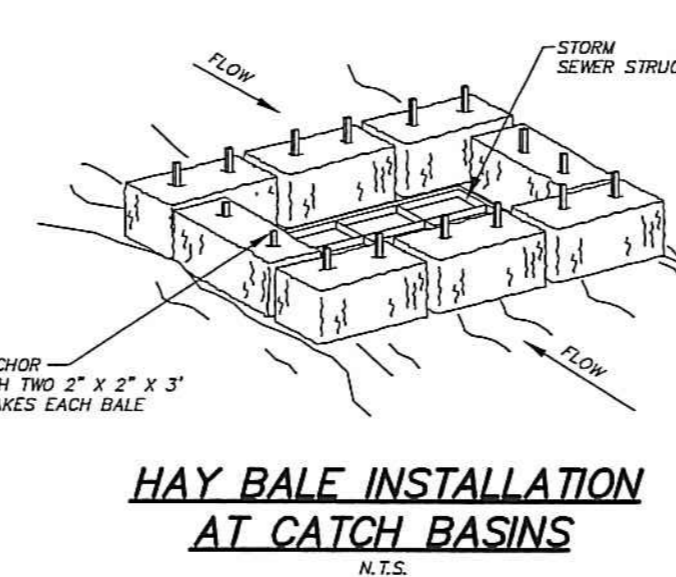
NOTE: UNAUTHORIZED ALTERATION OR ADDITION TO THESE PLANS IS NOT PERMITTED UNDER SECTION 2207-(2) OF THE NEW YORK STATE EDUCATION LAW



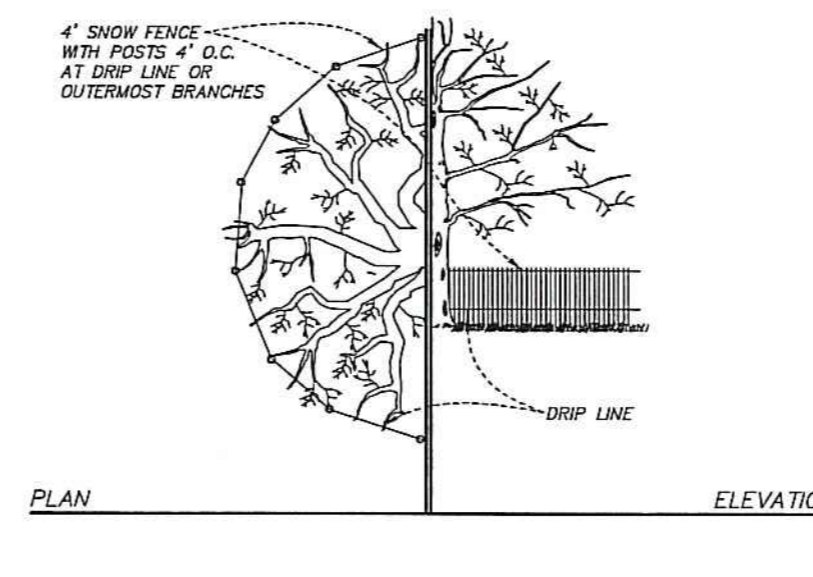
LOCATION MAP
SCALE: 1" = 2000'



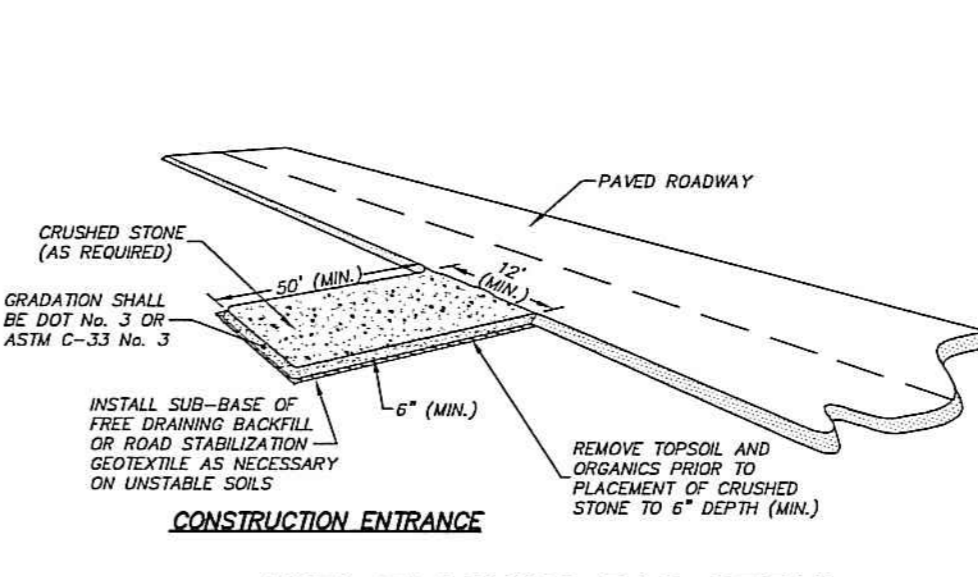
INSTALLATION DETAIL
SEDIMENT CONTROL FABRIC
N.T.S.



HAY BALE INSTALLATION
AT CATCH BASINS
N.T.S.



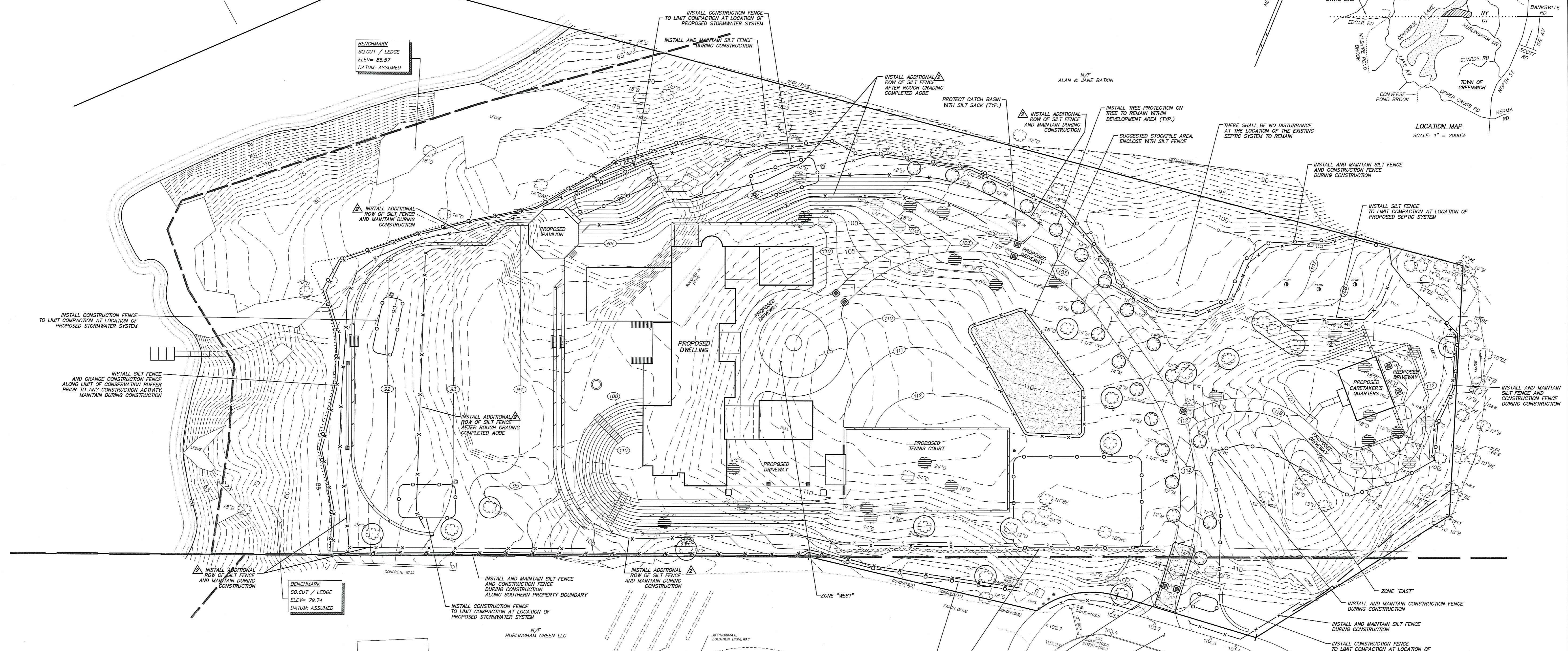
TREE PROTECTION
N.T.S.



ANTI-TRACKING PAD DETAIL
N.T.S.

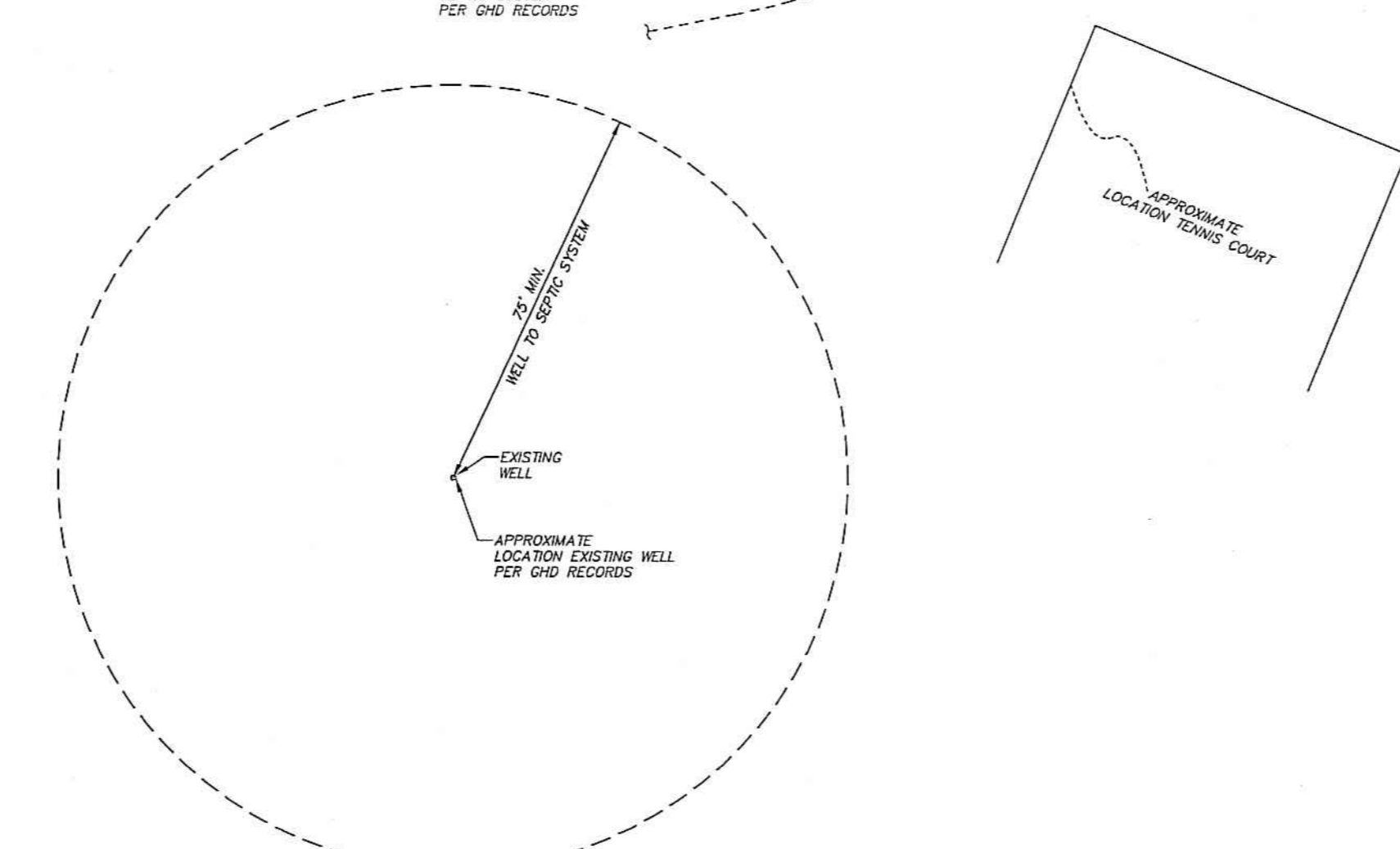
N/F
FIFTH AVENUE PROPERTIES
c/o CDL FAMILY OFFICE SERVICES

N/F
FIFTH AVENUE PROPERTIES
c/o CDL FAMILY OFFICE SERVICES

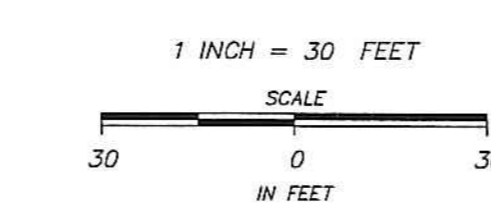


- SEDIMENT AND EROSION CONTROL NOTES:**
1. Temporary soil and erosion control measures, inclusive of filter barriers and anti-tracking areas, shall remain in place for as long as necessary to permanently stabilize developed areas.
 2. Erosion and sediment control devices shall be installed in their proper sequence. No clearing or grading may be done in any area until the erosion control devices for that area, as shown on the plan, are in place and functional.
 3. Natural vegetation shall be maintained and protected where practical.
 4. No changes of this soil erosion and sediment control plan may be made without prior approval of the supervising engineer.
 5. Land disturbance is to be kept to a minimum. Re-establishment and/or stabilization of disturbed areas shall be scheduled as soon as practical.
 6. Erosion controls shall be monitored periodically to verify that they are maintained in effective working order. If, during construction, additional control measures are necessary, they shall be installed by that contractor.
 7. Sediment or debris shall be removed from the drainage pipes and structures as it accumulates during construction. It shall be disposed of in a manner which is consistent with the intent of this plan.
 8. The contractor may provide alternate means of sediment control, but may not eliminate placement of protection in the areas indicated herein.
 9. Sediment fencing shall be installed where required prior to commencing construction. Fencing shall be Press Silt Stop (TM) as manufactured by Amoco, or engineer approved equivalent.
 10. The contractor shall re-grade, topsoil, and seed all disturbed areas immediately after construction has been completed.
 11. All designated trees shall be protected during the construction period, except those designated to be removed. Tree protection shall be in accordance with generally accepted standards.
 12. Roof leader down spouts and drains shall be connected to the storm drainage system as designated on the development plans.
 13. Copies of the proposed Sedimentation and Erosion Control Plan are to be maintained at the site, and provided to the project foreman and subcontractors prior to the start of work at or before the on-site meeting with staff.
 14. Additional protection measures shall be implemented should site conditions warrant them.
 15. Refer to the New York State Standards for Erosion and Sediment Control for more information.

- CONSTRUCTION STAGING:**
1. Install sedimentation and erosion controls.
 2. Remove existing trees as shown on plan.
 3. Rough grade access drive.
 4. Strip topsoil and stockpile.
 5. Excavate and construct proposed cottage foundation.
 6. Install proposed drainage, sewer, and utilities as required.
 7. Backfill and rough grade.
 8. Construct proposed cottage.
 9. Construct proposed driveway.
 10. Fine grade and stabilize.
 11. Strip topsoil and stockpile.
 12. Excavate and construct proposed house foundation and retaining walls.
 13. Install proposed drainage, sewer, and utilities as required.
 14. Backfill and rough grade.
 15. Construct proposed driveway and tennis court.
 16. Construct proposed driveway.
 17. Fine grade and stabilize.
 18. Landscape as required.
 19. Remove sedimentation and erosion controls.
- NOTE: BOTH ZONES/STRUCTURES CAN BE CONSTRUCTED AT SAME TIME.



CATCH BASIN SILTSACK DETAIL
N.T.S.



S&E SYMBOLS:

—x—x—x—x—	SILT FENCE
—o—o—o—o—	CONSTRUCTION FENCE
(circle with cross)	TREE PROTECTION
(square with cross)	SILT SACK

D'ANDREA SURVEYING & ENGINEERING, P.C.
LAND PLANNERS
ENGINEERS
SURVEYORS

P.O. BOX 549
RIVERSIDE, CT 06878
6 NIEL LANE
TEL. 637-1779

PROJECT	PROPOSED RESIDENCE
PREPARED FOR	45 HURLINGHAM, LLC
LOCATION	45 HURLINGHAM DRIVE NORTH CASTLE, NEW YORK
DATE	7-6-21
REV. DATE	DESCRIPTION
7-6-21	ADD SILT FENCE AND ADDRESS NO COMMENTS ISSUE TO ACP, WCH, & FIRE MARSHALS
6-1-21	MODIFY SITE LAYOUT
2-8-21	SUBMIT TO PLANNING BOARD

2 OF 4

THE LIMITS OF DISTURBANCE ARE DEPICTED WITH SILT FENCING AND CONSTRUCTION FENCING. PROTECTED AREAS MUST NOT BE ENCROACHED UPON.
TOTAL DISTURBED AREA = 4.7± ACRES

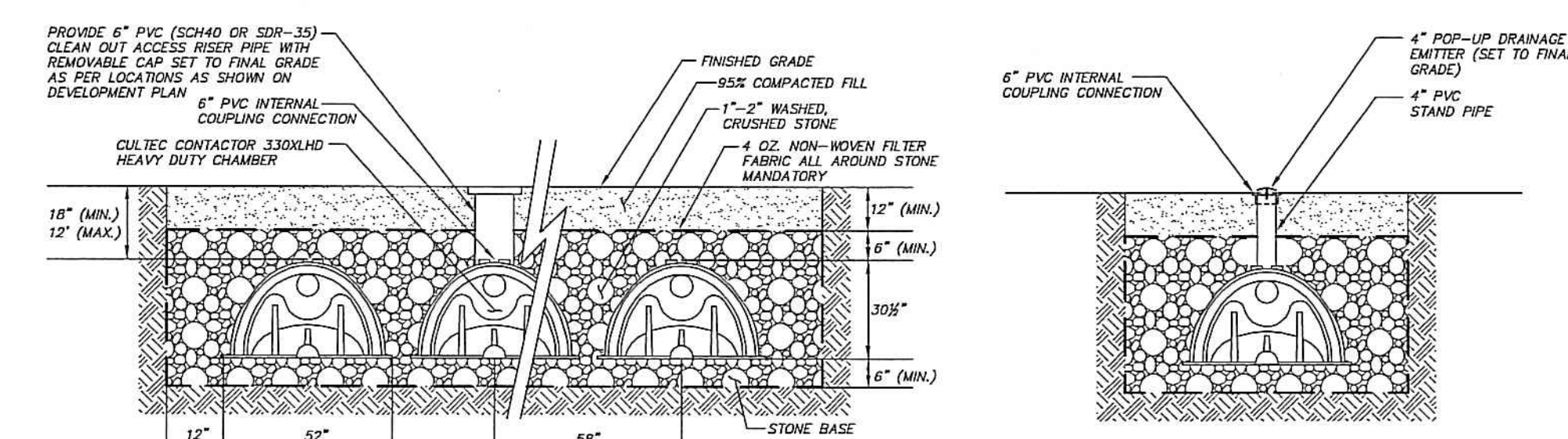
REVISIONS:
7-6-21 ADD SILT FENCE AND ADDRESS NO COMMENTS ISSUE TO ACP, WCH, & FIRE MARSHALS
6-1-21 MODIFY SITE LAYOUT
2-8-21 SUBMIT TO PLANNING BOARD

RICHARD A. REDAN NY PE No. 61509
DATE 7-6-21
ENGINEER

CONVAIL_2025_SE_L_DRAWING (457)

CONSTRUCTION NOTES:

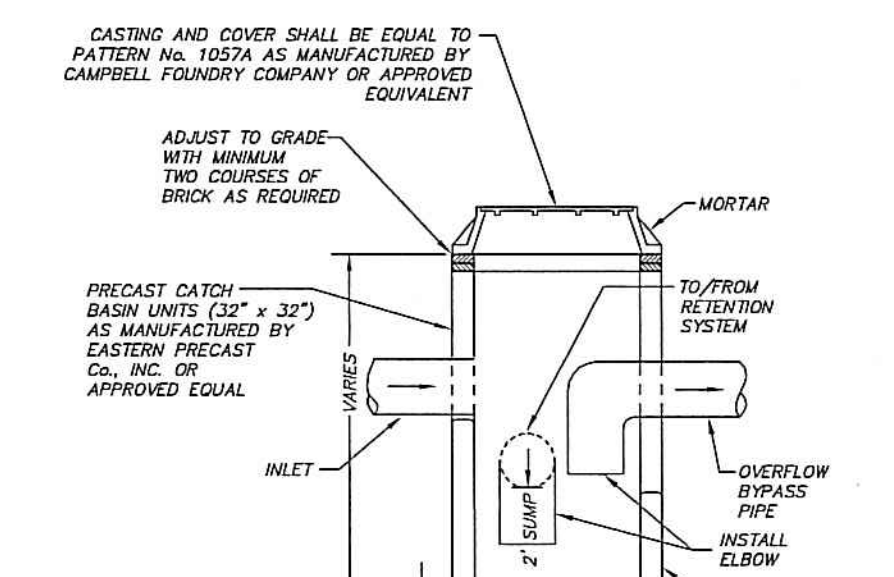
- The contractor shall verify the depth and location of all utilities prior to commencing construction, and shall "Call or Click 811 Before You Dig" 48 hours prior to commencing construction.
- All construction shall comply with applicable sections of State, County, Local, and International Building codes, and those criteria shall take precedent over these plans.
- Construction shall be inspected by a professional engineer prior to backfill and as the work progresses.
- Any changes to the plan without the prior approval of the design engineer are not permitted.
- Certification by a registered professional engineer is required that construction is substantially in accordance with these plans, including the submission of an "as-built" map prepared by a licensed land surveyor.
- Final design for all utilities other than sewer and drainage shall be provided by the respective utility company.
- Existing utilities in conflict with the proposed development as depicted on this plan shall be relocated as directed by the appropriate utility company and/or the owner. The contractor shall excavate test pits as required to verify the location and depth of utilities where conflicts may exist.
- Existing inverts on storm drains and sanitary sewers shall be field verified where appropriate before commencing construction. The contractor shall excavate test pits where indicated hereon or wherever design conflicts may occur. Design conflicts, if any, shall be brought to the attention of the project engineer. Plate or backfill and patch test pits as directed by the project engineer.
- All gravity PVC storm drain and sanitary sewer pipes shall conform to ASTM D 3034 "Standard Specification for Type PSM Poly Vinyl Chloride (PVC) Sewer Pipes and Fittings" or approved equal (SDR35). Pipes shall be sloped at 2% (minimum) or as otherwise noted.
- Where unsuitable foundation is encountered during construction of storm drains or sanitary sewers, the contractor shall remove the unsuitable material and replace it with other material approved by the project engineer.
- All existing manhole frames, catch basin grates, and utility structures shall be adjusted to new finished grade as required.
- In accordance with Town regulations and standard practices, all clear water sources cannot discharge to the sanitary sewer. This includes air conditioning condensate lines and high efficiency boiler/heater system units.
- The contractor shall provide all equipment, tools, labor, and materials necessary to satisfactorily clean and remove all visible obstructions, dirt, sand, sludge, roots, gravel, stones, etc. from the storm drains, sanitary sewers, and manholes.
- There shall be no dumping of construction debris and/or excess excavated material into or in proximity to any wetland areas.
- Excess material excavated during construction shall be disposed of legally off site in an environmentally sound manner.
- All trenches within the private right of way shall be backfilled and/or plotted after work hours each day, with the traffic and pedestrian right of way restored to safe/usable conditions.
- Re-grading, filling, and other alterations to the site shall be restricted to the minimum level necessary to complete the project as shown on the approved plans.
- All retaining walls greater than three feet are required to be designed and inspected during construction by a Professional Engineer registered in the State of New York.
- Shoulders and disturbed areas shall receive four inches of topsoil, fine graded, and seeded as soon as practical to prevent erosion.
- All specimen trees shall be protected during the construction period, except those specifically designated to be removed.



**TYPICAL CROSS SECTION DETAIL
CULTEC CHAMBER SYSTEM
RECHARGER 330XLHD
UNPAVED (H-20) LOADING**
N.T.S.

- NOTES:
- STORMWATER CHAMBERS SHALL BE MANUFACTURED BY CULTEC, INC. (800) 428-8622 OR ENGINEER APPROVED EQUAL.
 - ALL CHAMBERS SHALL BE INSTALLED ACCORDING TO MANUFACTURER SPECIFICATIONS.
 - THE SOILS BELOW THE INFILTRATION SYSTEM SHALL BE SCAMFED OR FILLED TO IMPROVE INFILTRATION.

WITH POP-UP EMITTER



BYPASS JUNCTION BOX DETAIL
N.T.S.

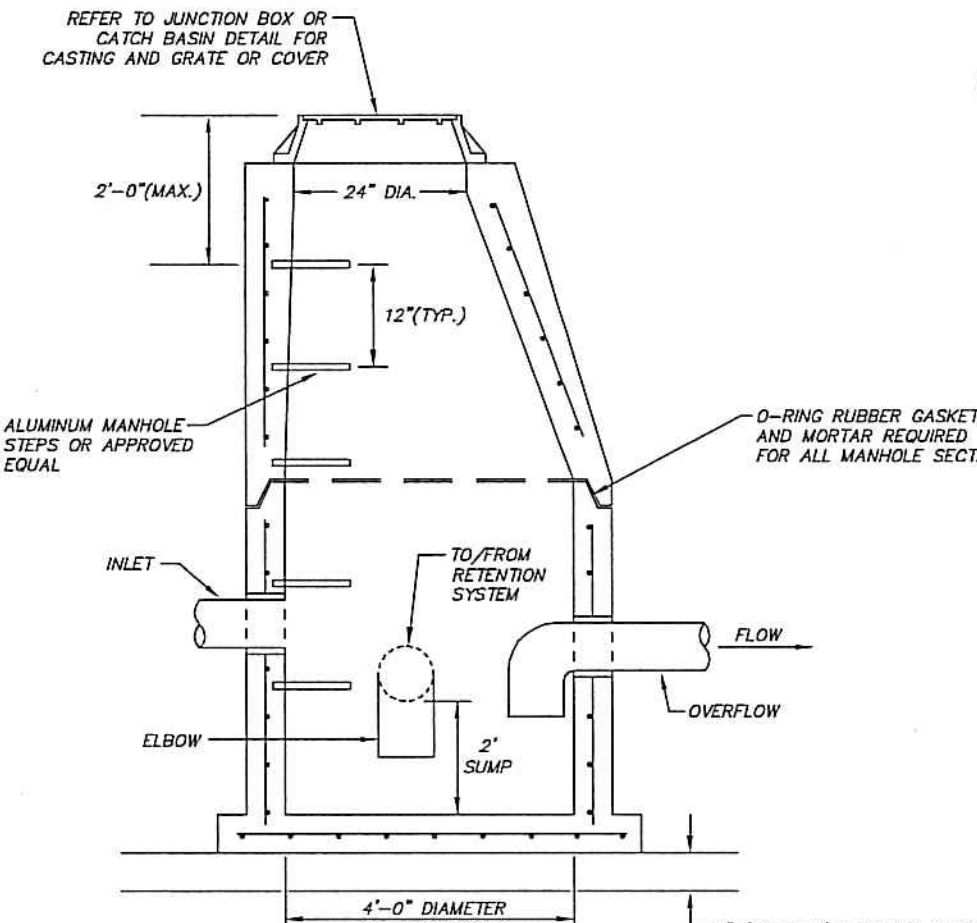
NOTES:

- JUNCTION BOXES AND CATCH BASINS SHALL HAVE A MINIMUM SUMP OF 2 FEET AS MEASURED FROM THE LOWEST PIPE INVERT ELEVATION TO THE INTERIOR BOTTOM OF THE STRUCTURE.

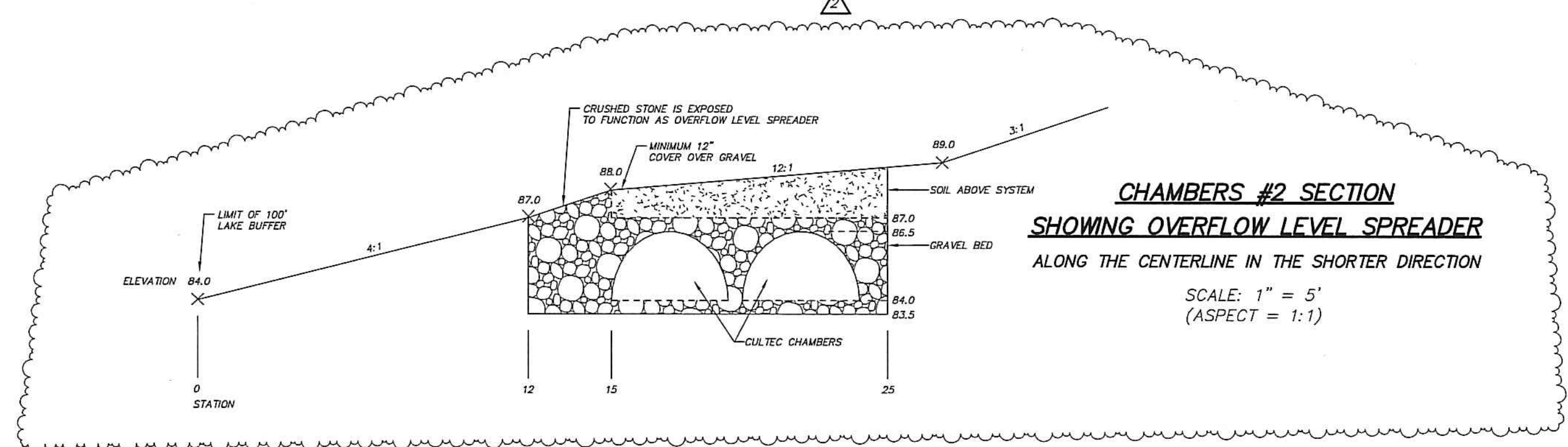
CONTRACTOR SHALL PURCHASE AND INSTALL A SEPARATE SUMP SECTION. NO OUTLET OR INLET PIPES SHALL PENETRATE THE BOTTOM SUMP SECTION.

REFER TO DEVELOPMENT PLAN FOR INVERT ELEVATIONS, DIAMETERS, AND DIRECTIONS OF ALL PIPES.

CATCH BASIN DETAIL TYPE "A" AND AREA DRAIN DETAIL
N.T.S.

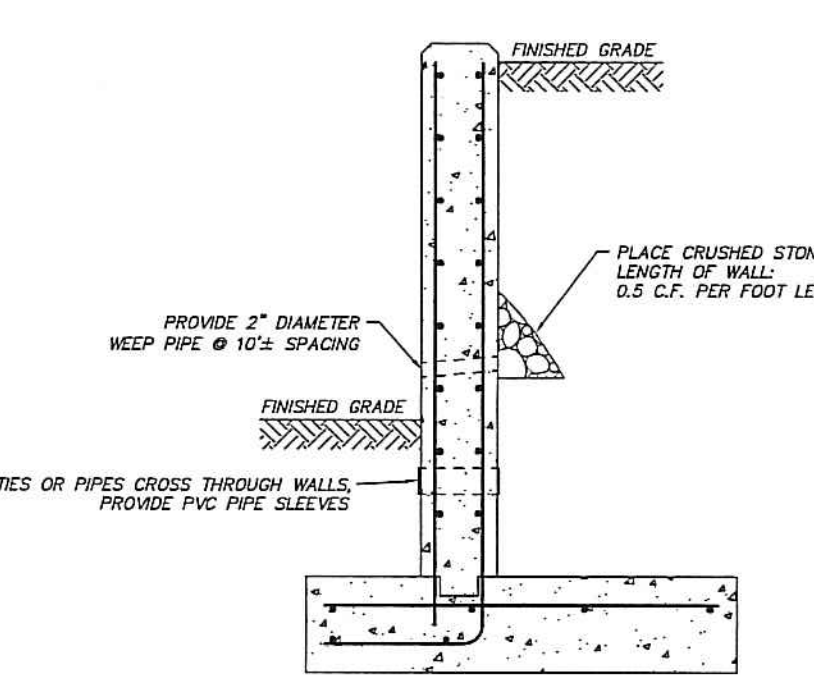


**STORM DRAIN MANHOLE DETAIL
(FOR DEEP JUNCTION BOXES AND CATCH BASINS)**
N.T.S.



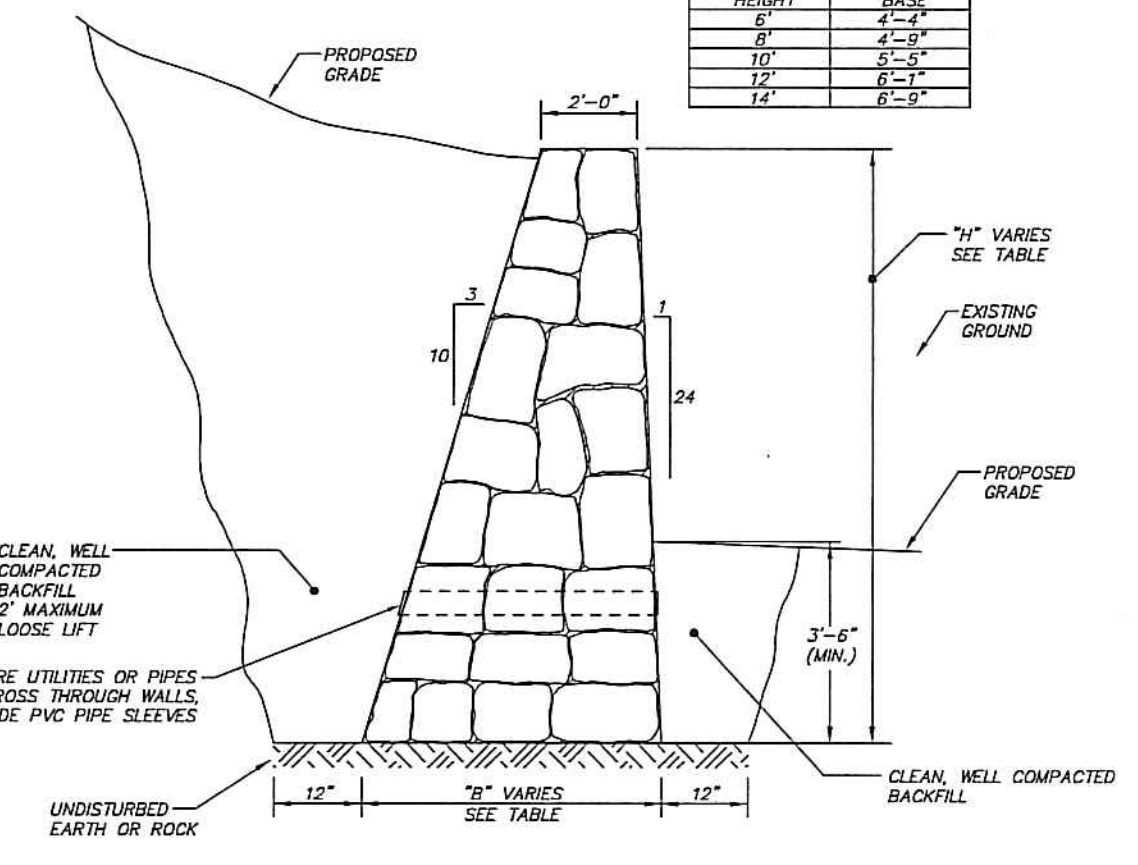
**CHAMBERS #2 SECTION
SHOWING OVERFLOW LEVEL SPREADER
ALONG THE CENTERLINE IN THE SHORTER DIRECTION**
SCALE: 1" = 5"
(ASPECT = 1:1)

HEIGHT	THICKNESS
4	8"
6	12"
8	16"
10	20"
12	24"
14	28"
16	32"



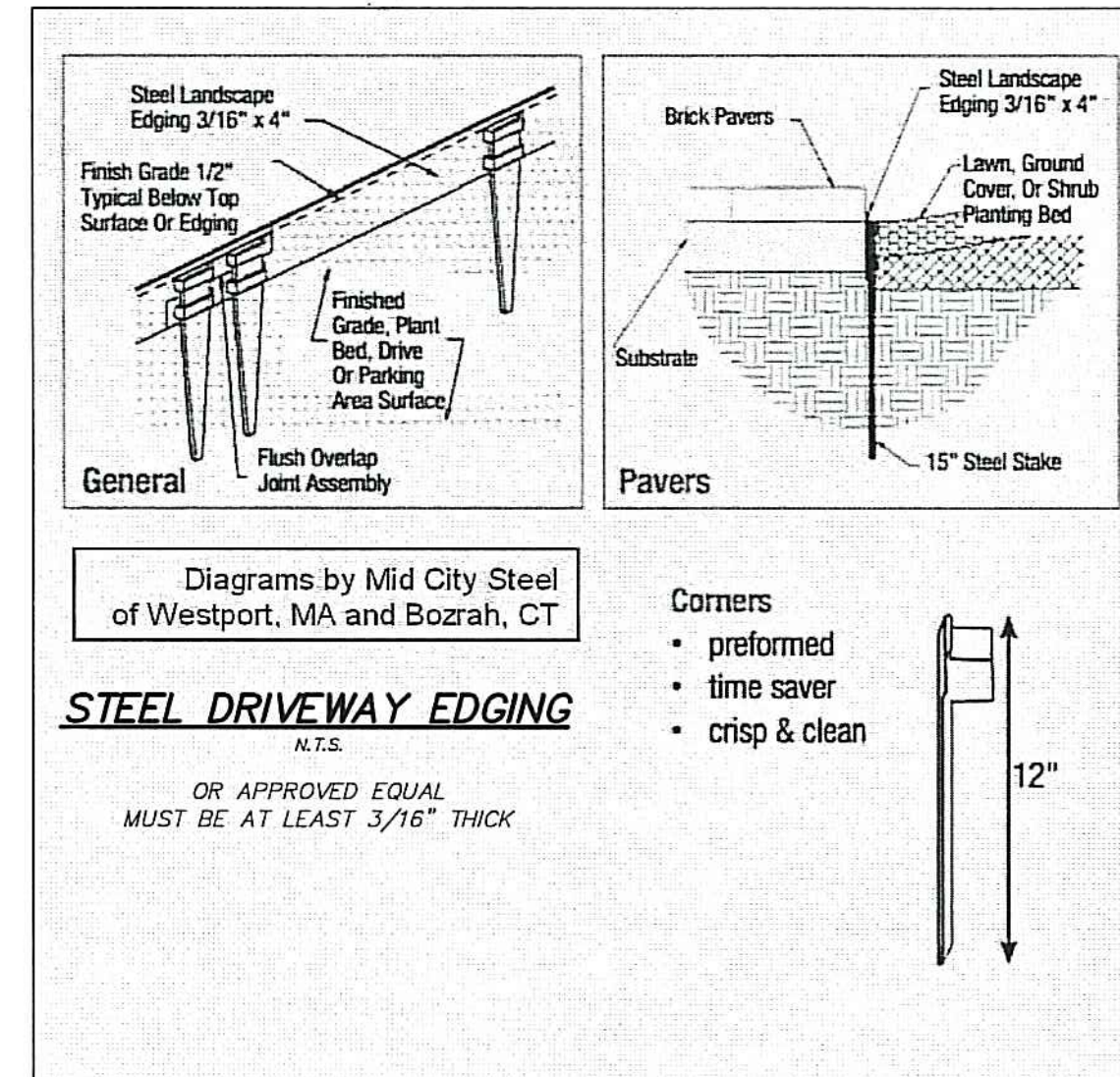
CONCRETE RETAINING WALL DETAIL
N.T.S.

STRUCTURE IS SCHEMATIC ONLY. ALL WALLS AT LEAST 4 FEET TALL TO BE DESIGNED BY A STRUCTURAL ENGINEER.



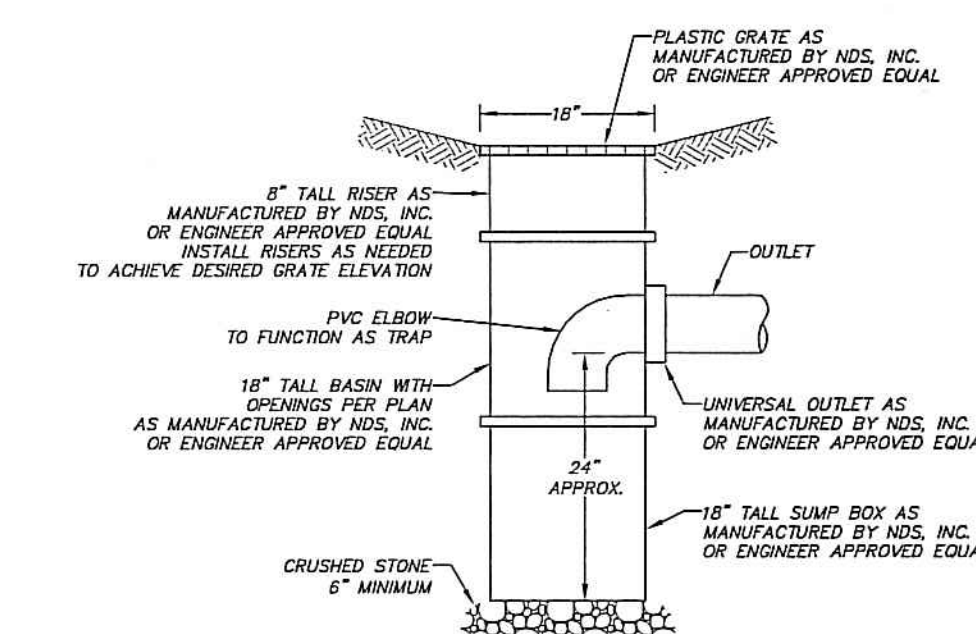
STONE MASONRY WALL
N.T.S.

(ALTERNATE)



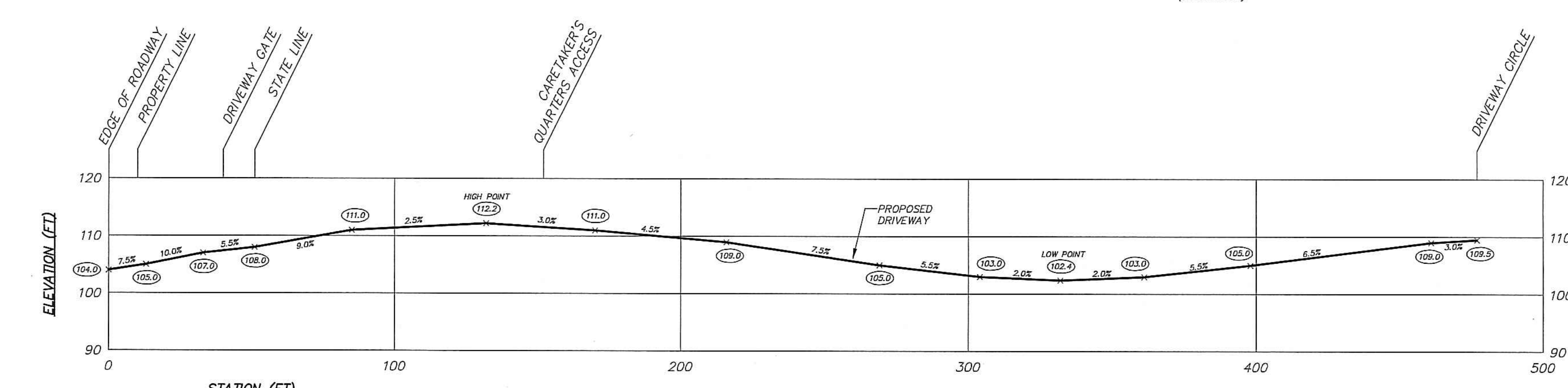
STEEL DRIVEWAY EDGING
N.T.S.

OR APPROVED EQUAL MUST BE AT LEAST 3/16" THICK



18"x18" PLASTIC YARD DRAIN
N.T.S.

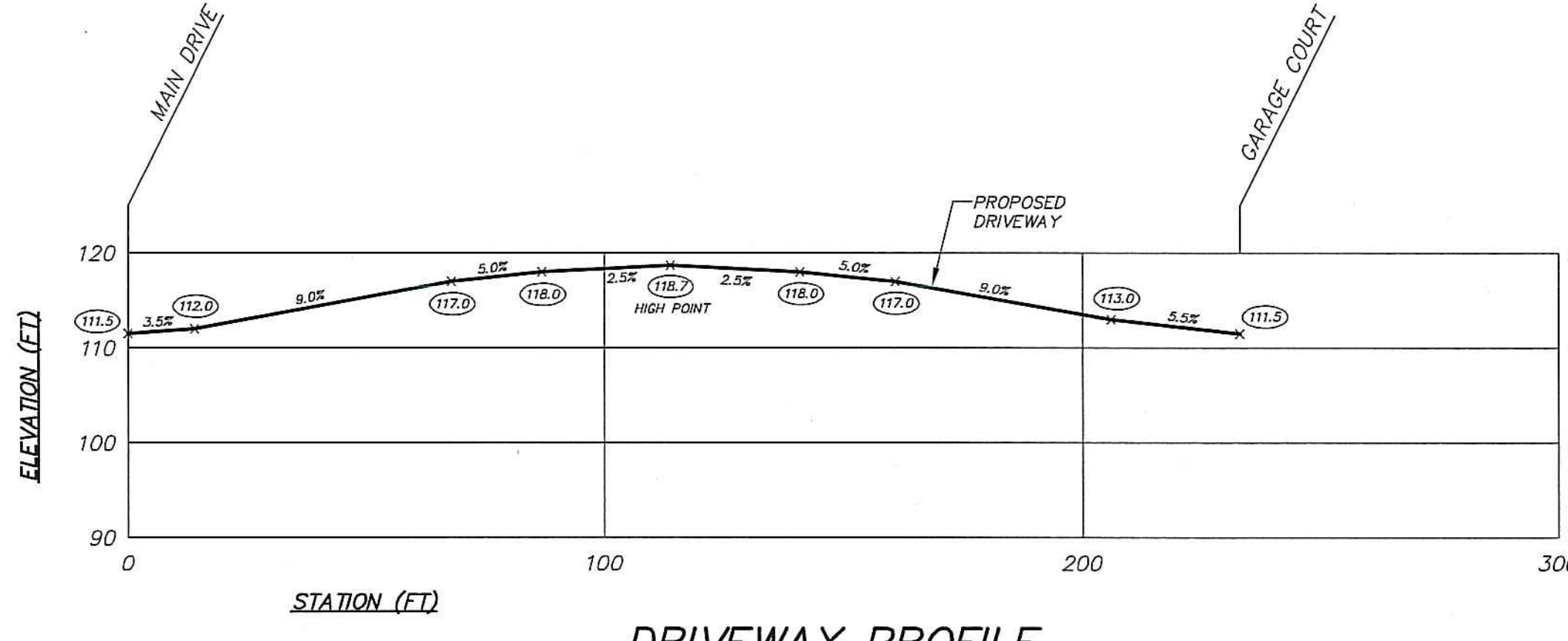
(CONTRACTOR TO PROVIDE ALTERNATE PRICE FOR 18"x18" YARD DRAINS IN LIEU OF AREA DRAINS)



DRIVEWAY PROFILE

MAIN DRIVE FROM STREET TO DRIVEWAY CIRCLE

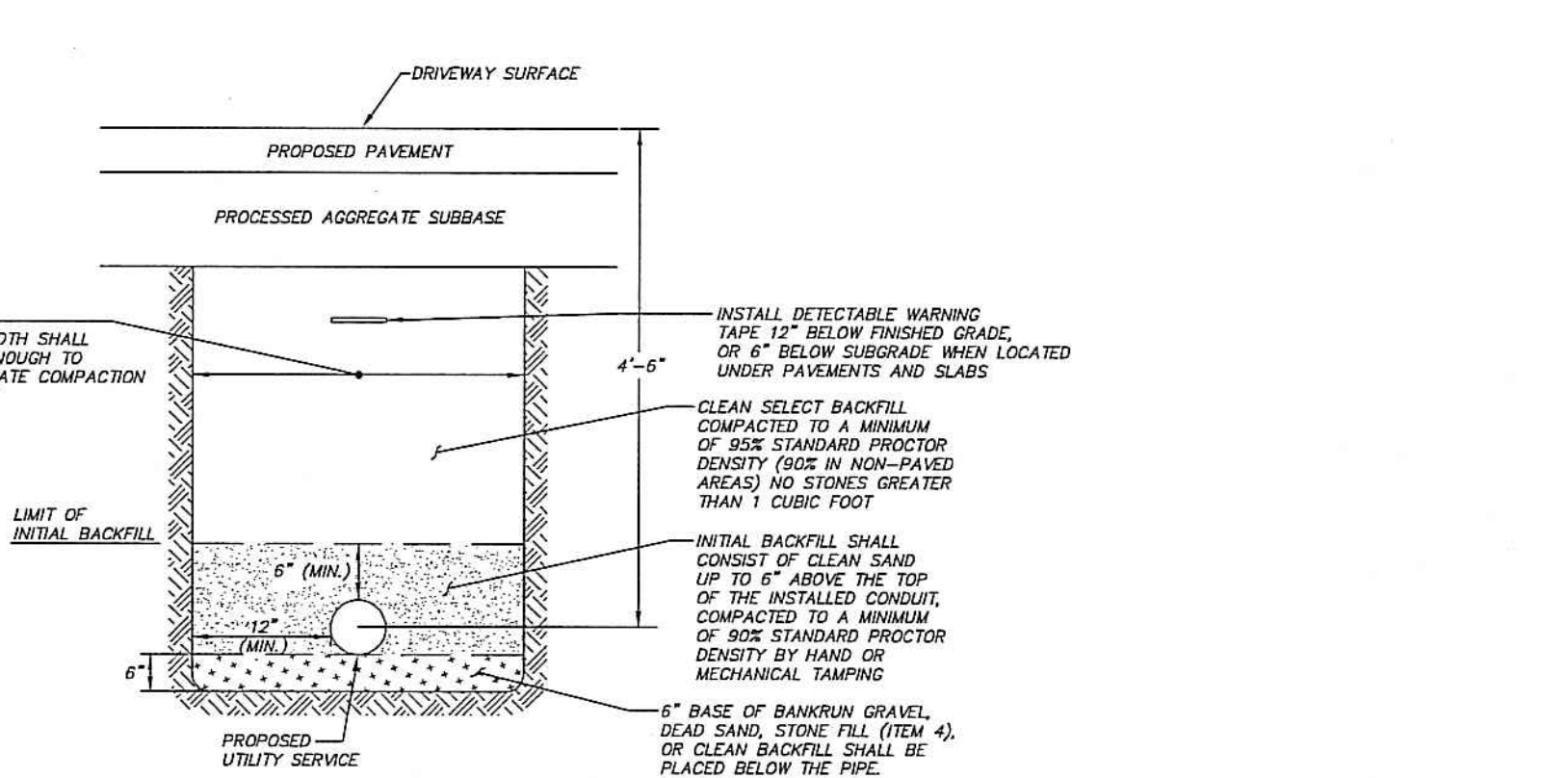
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 15'
(ASPECT = 2:1)



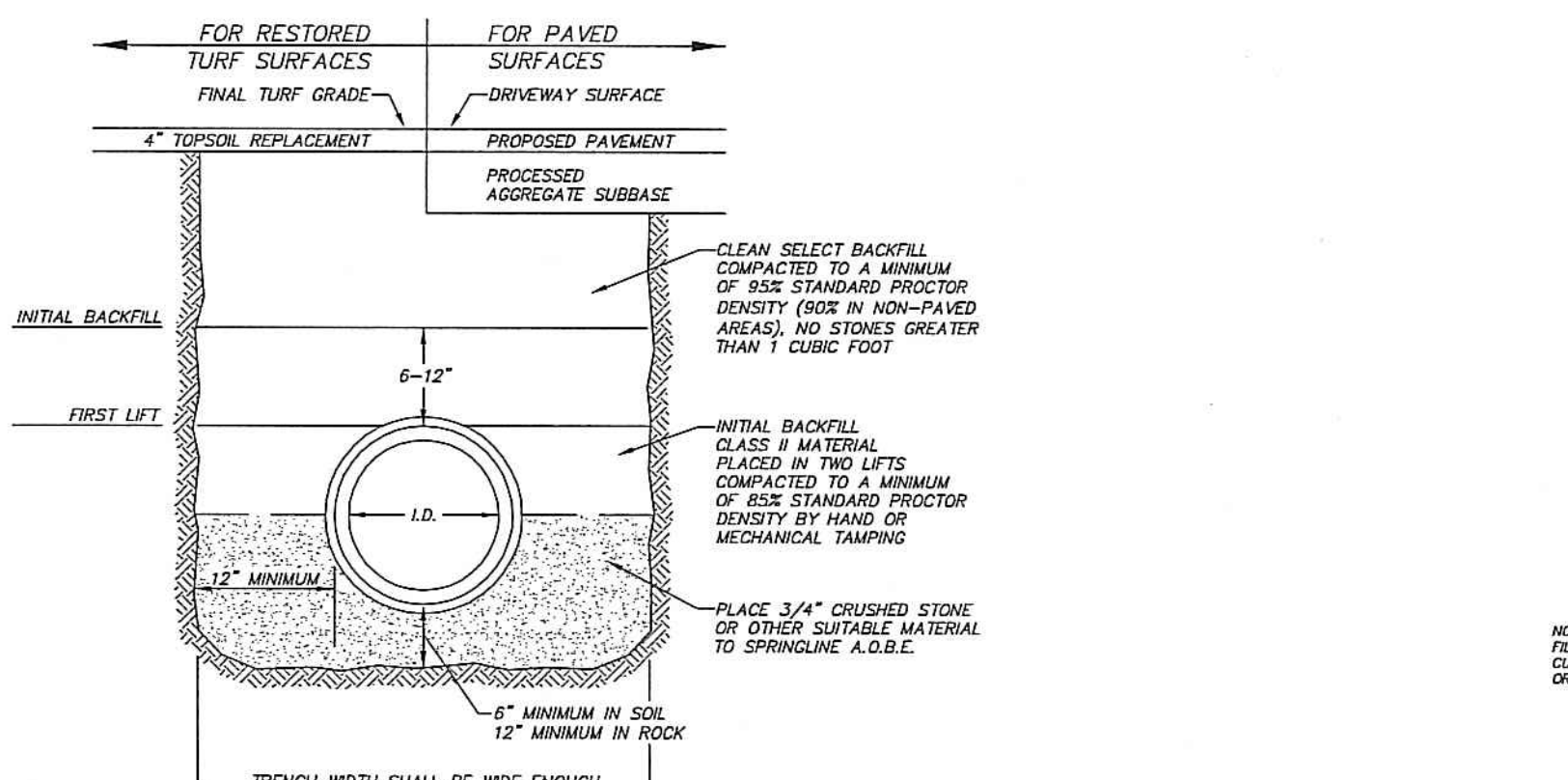
DRIVEWAY PROFILE

TO CARETAKER'S QUARTERS

HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 15'
(ASPECT = 2:1)



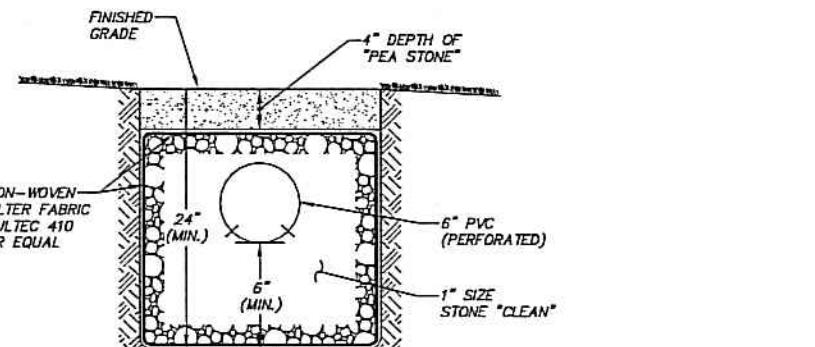
DETAIL FOR UTILITY SERVICE INSTALLATION
N.T.S.



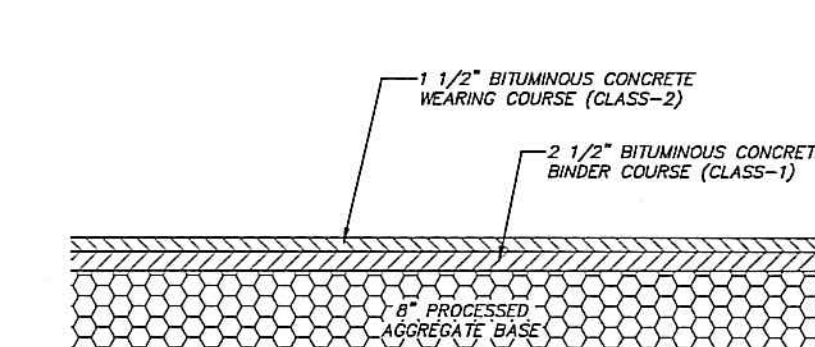
DETAIL FOR P.V.C. SANITARY SEWER AND P.V.C. STORM DRAIN INSTALLATION
N.T.S.

NOTES:

- REFER TO ASTM D2122 STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS FOR TRENCHING SPECIFICATIONS.



STORM WATER LEVEL SPREADER DETAIL
N.T.S.



ASPHALT DRIVEWAY DETAIL
N.T.S.

(COORDINATE PAVEMENT THICKNESS WITH OWNER, ARCHITECT AND ENGINEER)

D'ANDREA SURVEYING & ENGINEERING, P.C.
LAND PLANNERS
ENGINEERS
SURVEYORS
P.O. BOX 549
RIVERSIDE, CT 06878
6 NEIL LANE
TEL. 637-1779

NO.	DATE	DESCRIPTION	PROJECT	PROPOSED RESIDENCE
1	7-8-21	ISSUE TO NCPB	PROJECT	PROPOSED RESIDENCE
2	6-1-21	SHIFT HOUSE & COURT EAST, ISSUE TO NCPB & WCDH	PREPARED FOR	45 HURLINGHAM, LLC
3	2-8-21	SUBMIT TO PLANNING BOARD	LOCATION	45 HURLINGHAM DRIVE NORTH CASTLE, NEW YORK
4	7-16-21	ENGINEER'S SEAL	DATE	3 OF 4 NOTES & DETAILS

Construction Notes: Note: Contractor shall review site plan. Main house septic system leaching fields and tanks have been installed. Installer and owner to coordinate with engineer.

After an site inspection with engineer and architect. Contractor shall submit a proposal for approval specifying cost for completion and testing of the installed septic tank, pump chamber and overflow tank with required piping, pump, electrical wiring to make the tanks operational A.O.B.E. Refer to notes on sheet 1.

- Contours and elevations shown hereon are based on an assumed datum. The supervising engineer shall transfer a control benchmark into the working area after site preparation is complete.
- In accordance with New York Code Rule 753, the owner or the contractor shall be required to verify the depth and location of all utilities prior to commencing construction, and shall contact "Big Safety, New York" at 1-800-962-7962, 72 hours prior to commencing construction for mark out of underground utilities. (two full working days not counting day of call, not counting weekends or holidays). Refer to big-safety.com for additional information.
- Earth material used to cover the sewage disposal system shall be free of large stones, masonry, stumps or construction debris.
- Machinery that may disturb the alignment of the disposal system shall be allowed on the disposal area. The septic system areas shall be isolated and protected against damage by erosion, storage of materials, displacement, compaction or other adverse physical change in the characteristics of the soil or in the drainage of the area.
- No permanent structure shall be constructed over the reserve area.
- All construction shall comply with applicable sections of the State of New York and County of Westchester Health Codes. Construction shall also comply with the Westchester County Health Department Rules and Regulations for the Design and Construction of Residential Subsurface Sewage Treatment Systems and Drilled Wells in Westchester New York... effective Jan. 1, 2002.
- D'Andrea Engineering and Surveying, P.C. will not be responsible for the performance of the system unless constructed according to design as it may be amended.
- Areas disturbed during construction shall be regraded, seeded and mulched, for permanent stabilization within seven days after construction.
- Select fill (bank run stone) shall be placed in 8" to 12" lifts and allowed to settle naturally for a minimum of two months. No mechanical compaction is allowed. Gradation of select fill shall be as follows:

MAIN HOUSE SYSTEM ELEVATIONS

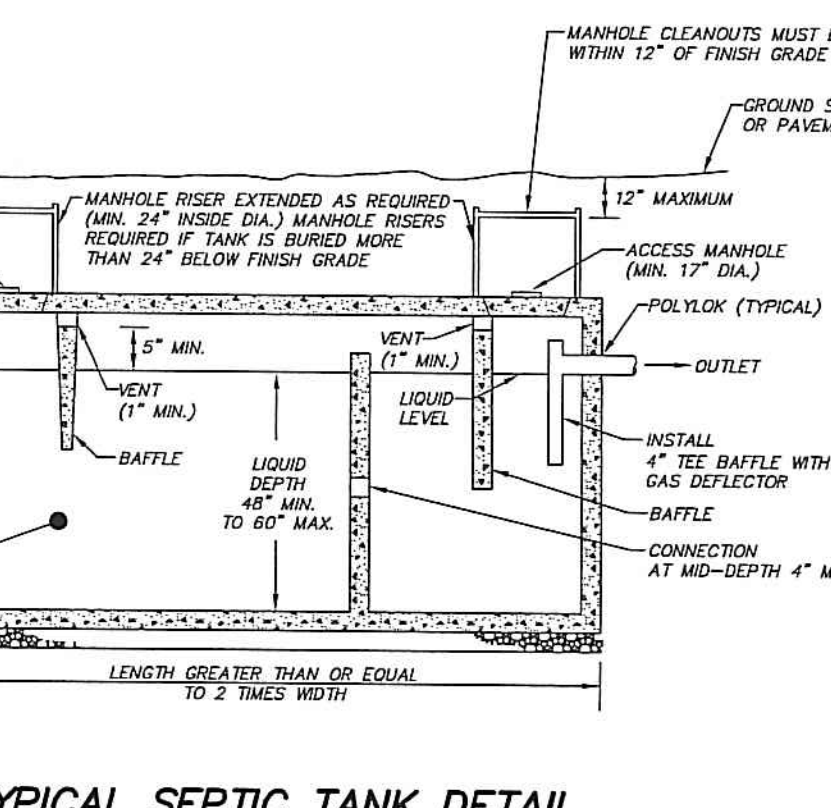
HOUSE, SEPTIC TANK AND PUMP CHAMBER	
INV. EL. OUT OF DWELLING (FT.)	INV. EL. INTO OF SEPTIC TANK (FT.)
97.0±	90.5±
VF/ A.O.B.E.	VF/ A.O.B.E.

NOTE: INSTALLER TO VERIFY SEPTIC TANK AND PUMP CHAMBER ELEVATIONS WITH ENGINEER PRIOR TO START OF CONSTRUCTION. INSTALLER SHALL ALSO VERIFY OVERFLOW TANK ELEVATIONS WITH ENGINEER PRIOR TO CONSTRUCTION.

10. This system is not designed to accept the wastes from garbage disposal units, backwash from water treatment or discharge from wastewater pipe baths greater than 99 gallons.
11. Any change in the location or design of the system without prior approval of the design engineer and the Health Department is not permitted.
12. The septic installer shall be a licensed by Westchester County septic contractor who shall notify D'Andrea Engineering and Surveying, P.C. (DSEPC), and the WCHD 48 hours prior to starting each phase. DSEPC shall supervise the installation of the septic system(s) and make on open works inspection.
13. Manholes on septic tank, pump chamber, and overflow tank, if located under a driveway or traveled way, shall have bolted manhole covers with rubber gaskets.
14. Service access manholes on the septic tank, pump chamber and overflow tank shall be set to grade.
15. The pump discharge lines shall be installed 42" below grade (minimum).
16. Installation of the septic system shall be inspected in progress by a professional engineer and an as-built plan certified by a professional engineer, shall be submitted to the Westchester County Health Department before a "Permit to Use and/or Operate" is issued.
17. The contractor shall be solely responsible to coordinate his work with the work being done by others. The contractor shall likewise bear the responsibility for delays or other factors related to the work by others. No claims shall be allowed due to the contractor's failure to adequately coordinate such work.
18. Gravelly PVC pipe shall conform to ASTM D-3034 standard specification for Type PSM-Poly Vinyl Chloride (PVC) sewer pipe and fitting" or approved equal (SDR-35) unless otherwise noted. Building sewer to conform to force main specifications.
19. Soil tests were conducted by D'Andrea Engineering and Surveying, P.C. with the Westchester County Health Department.
20. There shall be no part of a septic system located within 100 feet of a well when the well is located upgradient from the septic system.
21. All distribution boxes shall be designed and constructed for H-10 loading as manufactured by Eastern Precast Co., Inc.
22. All distribution boxes shall be leveled and installed on a minimum of twelve (12) inches of crushed stone.
23. Prior to commencing construction, all of the portions of the septic system shall be clearly marked and enclosed using saw fencing so that they are not subject to H-20 loading from construction equipment or vehicles or other heavy loads from construction activities.
24. Sediment fencing shall be installed where required prior to commencing construction and shall remain in place for the duration of the project. Fencing shall be equivalent to that manufactured by Amoco.
25. All sediment and erosion control devices and provisions shall be maintained in operational condition by the contractor until final acceptance of the project.
26. There shall be no dumping of construction debris and/or excess excavated material into or in proximity to any wetland areas.
27. This property is served by a private well(s).
28. Cast Iron Pipe (CIP) shall be extra heavy class with rubber gasket water tight joints. Pipe to comply with County of Westchester standards. Contractor to supply transition coupling from PVC to CIP as required. Pipe shall comply with ASTM A-74 or ASTM-888. Note: SDR 35 PVC specified for building sewer, not for H-10 loading. For H-10 loading SDR 35 PVC sewer pipe for building sewer pipe is acceptable in Town of North Castle and for Westchester County Health Department.

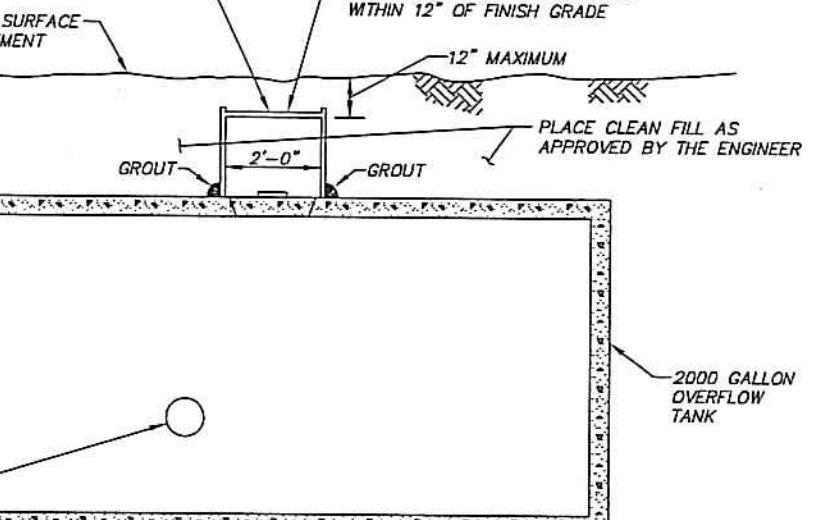
DEPARTMENT OF HEALTH NOTES

1. The minimum well yield is 5 gpm; yields less than 5 gpm must be immediately reported to the department.
2. The Westchester County Health Department approval expires one year from the date on the approval stamp and is required to be renewed on or before the expiration date. The approval is renewable for cause or may be amended or modified when considered necessary by the department.
3. The installation of the well(s) and On-site Wastewater Treatment System (OWTS) shall be in accordance with the Rules and Regulations for the Design and Construction of Residential Subsurface Sewage Treatment Systems and Drilled Wells in Westchester County, NY.
4. If for any reason the approved construction plan can not be followed, a revised plan must be prepared, submitted, and approved by WCHD.
5. There are no sources of contamination within 200 feet of the proposed well, except as noted on the design plans.
6. There are no OWTS within 200' of well unless otherwise shown on plan, except as noted on the design plans.
7. Any roof and footing drains from the proposed structure are to be located away from the proposed well and OWTS.
8. **ADDITIONAL WELL(S) ON A SINGLE PROPERTY**
In accordance with the requirements of Chapter 873, Article VII, Section 873.700(4) of the Westchester County Sanitary Code, the Department will only issue an approval for a proposed additional well(s) on a single parcel of within an area not served by a public water supply when on the following conditions outlined below are met:
-When a new well is drilled and the yield is above 5 gallons per minute (gpm), the existing well is required to be abandoned, in accordance with the requirements of the WCHD Rules and Regulations. Any request to retain the existing well must be accompanied by a 6 hour stabilized yield test demonstrating that the existing well is less than 5 gpm.
-If the existing well(s) and the new well individual yields, are above 5 gpm, offsite wells located immediately around the subject property must be identified and monitored and demonstrated to the satisfaction of the Dept. that there is no direct influence any of the offsite well during the 6 hour stabilized simultaneous yield testing on all onsite wells. In this case, offsite well monitoring plans must be submitted to the Dept. for approval prior to the scheduled yield testing.
9. Within 24-hours of the completion of the septic system, the design professional must notify the WCHD that the septic system is ready for inspection by submitting a completed request for an open works inspection on the appropriate form to the WCHD.
NOTE: THAT NO BACKFILLING OF A COMPLETED SEPTIC SYSTEM CAN OCCUR UNTIL AFTER IT HAS BEEN INSPECTED AND ACCEPTED BY THE WCHD.
10. There shall be no trees within 10' of the septic system.



PERC TEST "C"			PERC TEST "D"		
TMC (IN)	SCALE (IN)	RATE (IN/HR)	TMC (IN)	SCALE (IN)	RATE (IN/HR)
0	17	4 1/2	0	23	
16	21	2 1/2	25	28 1/2	3 1/2
0	17		0	19	
14	26	3 1" IN 4.6 MIN.	19	22	3 1" IN 6.3 MIN.
0	17		0	19	
24	29	3 1" IN 8.0 MIN.	24	22	3 1" IN 8.0 MIN.
0	17		0	19	
0	17	3 1" IN 11.0 MIN.	0	19	3 1" IN 15.6 MIN.
23	20		47	22	
0	17	3 1" IN 10.7 MIN.	0	19	3 1" IN 15.3 MIN.
23	20		46	22	
1" IN 11.0 MIN.			1" IN 15.6 MIN.		

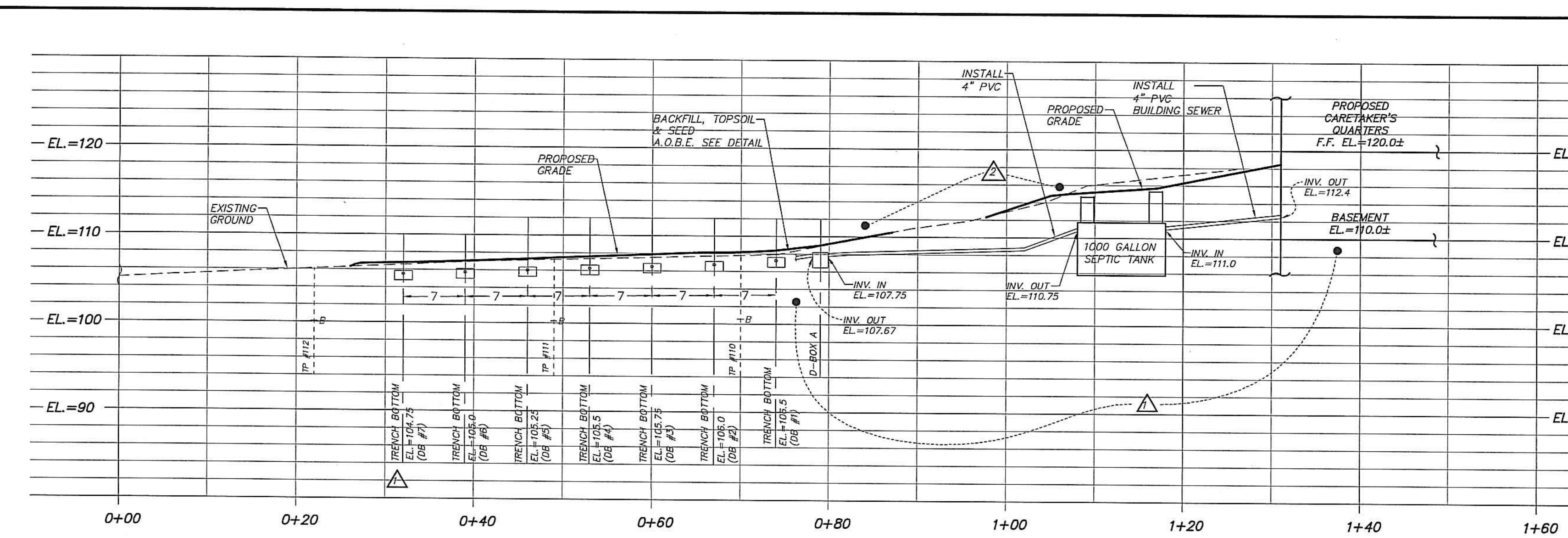
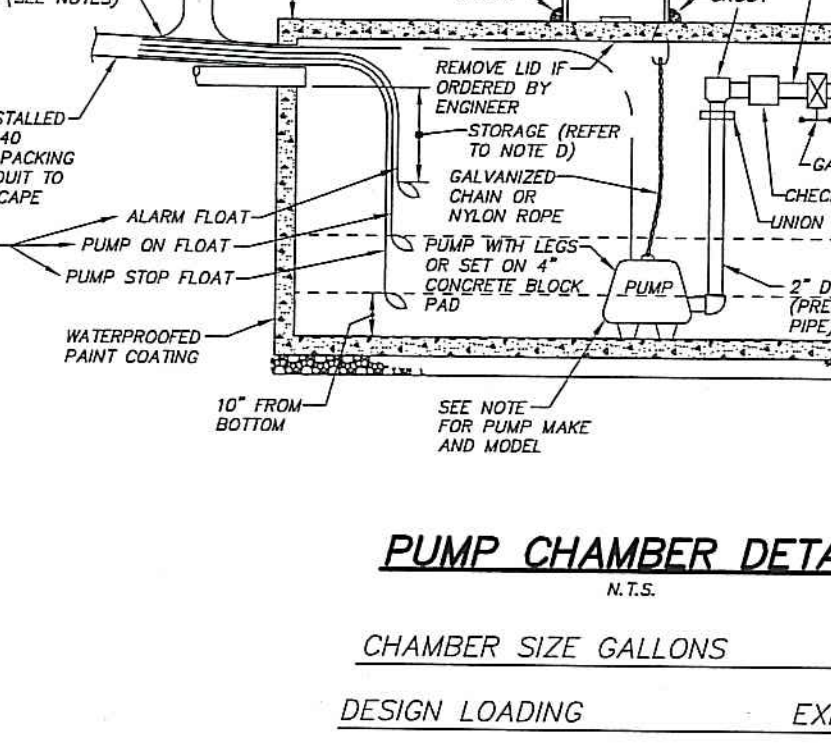
PERC TEST "A"			PERC TEST "B"		
TMC (IN)	SCALE (IN)	RATE (IN/HR)	TMC (IN)	SCALE (IN)	RATE (IN/HR)
0	18		0	19	
18	21	3 1" IN 6.0 MIN.	15	22	3 1" IN 8.0 MIN.
0	18		0	19	
25	21	3 1" IN 8.0 MIN.	24	22	3 1" IN 8.0 MIN.
0	18		0	19	
30	21	3 1" IN 10.0 MIN.	28	22	3 1" IN 8.7 MIN.
0	18		0	19	
30	21	3 1" IN 10.0 MIN.	36	22	3 1" IN 12.0 MIN.
0	18		0	19	
30	21	3 1" IN 8.3 MIN.	47	22 1/2	1/2" IN 10.4 MIN.
28	21		47	22 1/2	
1" IN 10.0 MIN.			1" IN 12.0 MIN.		



PERC TEST "A"			PERC TEST "B"		
TMC (IN)	SCALE (IN)	RATE (IN/HR)	TMC (IN)	SCALE (IN)	RATE (IN/HR)
0	18		0	19	
18	21	3 1" IN 6.0 MIN.	15	22	3 1" IN 8.0 MIN.
0	18		0	19	
25	21	3 1" IN 8.0 MIN.	24	22	3 1" IN 8.0 MIN.
0	18		0	19	
30	21	3 1" IN 10.0 MIN.	28	22	3 1" IN 8.7 MIN.
0	18		0	19	
30	21	3 1" IN 10.0 MIN.	36	22	3 1" IN 12.0 MIN.
0	18		0	19	
30	21	3 1" IN 8.3 MIN.	47	22 1/2	1/2" IN 10.4 MIN.
28	21		47	22 1/2	
1" IN 10.0 MIN.			1" IN 12.0 MIN.		

PERC TEST "A"			PERC TEST "B"		
TMC (IN)	SCALE (IN)	RATE (IN/HR)	TMC (IN)	SCALE (IN)	RATE (IN/HR)
0	18		0	19	
18	21	3 1" IN 6.0 MIN.	15	22	3 1" IN 8.0 MIN.
0	18		0	19	
25	21	3 1" IN 8.0 MIN.	24	22	3 1" IN 8.0 MIN.
0	18		0	19	
30	21	3 1" IN 10.0 MIN.	28	22	3 1" IN 8.7 MIN.
0	18		0	19	
30	21	3 1" IN 10.0 MIN.	36	22	3 1" IN 12.0 MIN.
0	18		0	19	
30	21	3 1" IN 8.3 MIN.	47	22 1/2	1/2" IN 10.4 MIN.
28	21		47	22 1/2	
1" IN 10.0 MIN.			1" IN 12.0 MIN.		

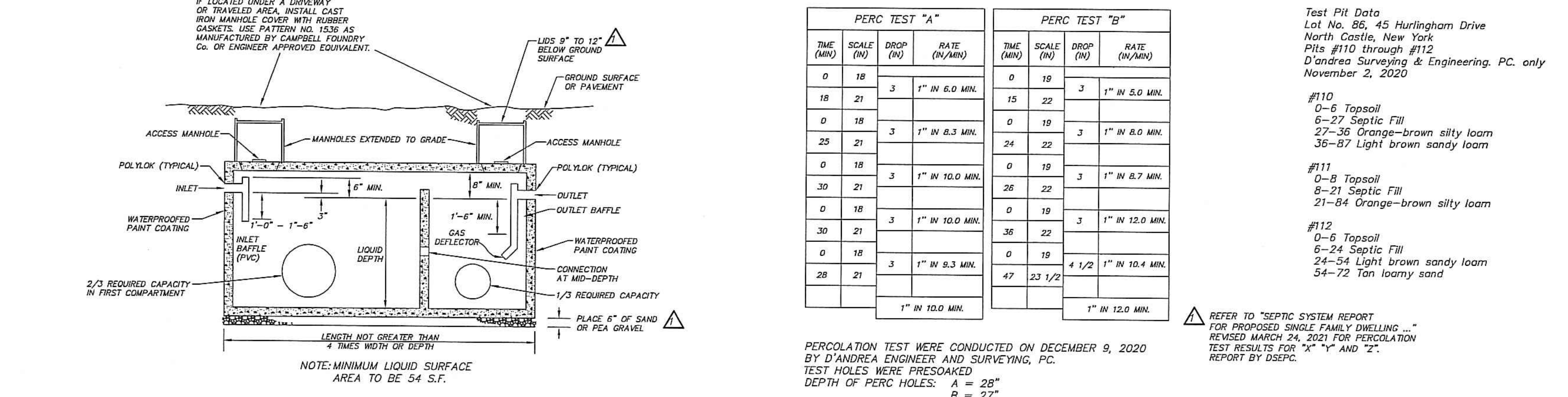
PERC TEST "A"			PERC TEST "B"		
TMC (IN)	SCALE (IN)	RATE (IN/HR)	TMC (IN)	SCALE (IN)	RATE (IN/HR)
0	18		0	19	
18	21	3 1" IN 6.0 MIN.	15	22	3 1" IN 8.0 MIN.
0	18		0	19	
25	21	3 1" IN 8.0 MIN.	24	22	3 1" IN 8.0 MIN.
0	18		0	19	
30	21	3 1" IN 10.0 MIN.	28	22	3 1" IN 8.7 MIN.
0	18		0	19	
30	21	3 1" IN 10.0 MIN.	36	22	3 1" IN 12.0 MIN.
0	18		0	19	
30	21	3 1" IN 8.3 MIN.	47	22 1/2	1/2" IN 10.4 MIN.
28	21		47	22 1/2	
1" IN 10.0 MIN.			1" IN 12.0 MIN.		



TEST PIT LEGEND:
B - BOTTOM
TW - TOP OF WALL
FB - BOTTOM OF WALL
A.O.B.E. - AS ORDERED BY ENGINEER

PERC TEST "A" DATA:

TMC (IN)	SCALE (IN)	RATE (IN/HR)
0	18	
18	21	3 1" IN 6.0 MIN.
0	18	
25	21	3 1" IN 8.0 MIN.
0	18	
30	21	3 1" IN 10.0 MIN.
0	18	
30	21	3 1" IN 10.0 MIN.
0	18	
30	21	3 1" IN 8.3 MIN.
28	21	
1" IN 10.0 MIN.		



CARETAKER'S QUARTERS SYSTEM ELEVATIONS

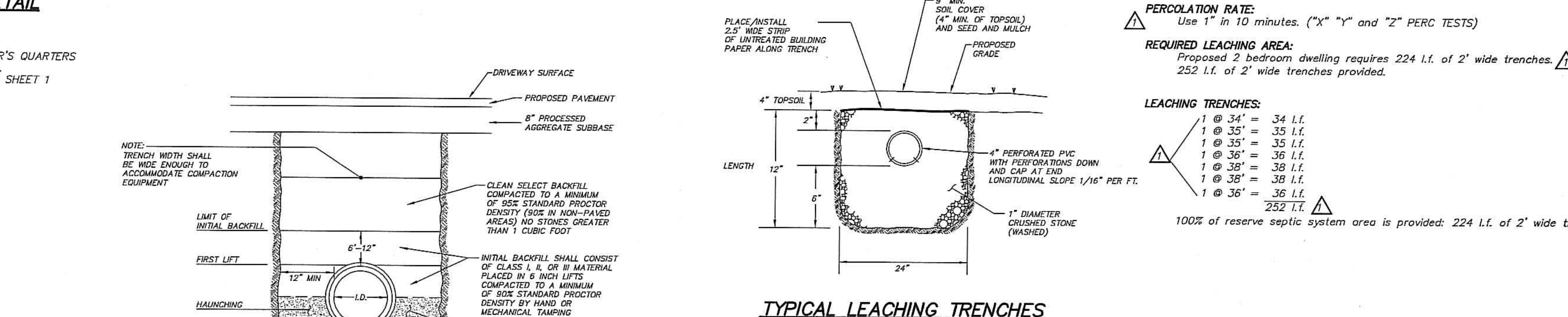
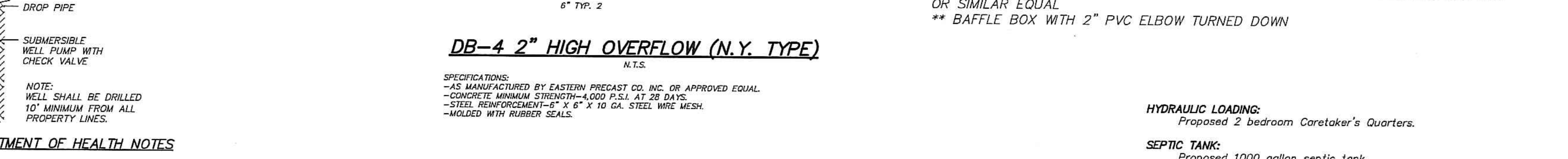
INV. EL. OUT OF DWELLING (FT.)	INV. EL. INTO OF SEPTIC TANK (FT.)	INV. EL. OUT OF SEPTIC TANK (FT.)	INV. EL. INTO OF PUMP CHAMBER (FT.)	INV. EL. OUT OF PUMP CHAMBER (FT.)
112.40	111.0	110.75	---	---

PERC TEST "A" DATA:

TMC (IN)	SCALE (IN)	RATE (IN/HR)
0	18	
18	21	3 1" IN 6.0 MIN.
0	18	
25	21	3 1" IN 8.0 MIN.
0	18	
30	21	3 1" IN 10.0 MIN.
0	18	
30	21	3 1" IN 10.0 MIN.
0	18	
30	21	3 1" IN 8.3 MIN.
28	21	
1" IN 10.0 MIN.		

DISTRIBUTION BOX

HIGH OVERFLOW DIST. BOX (H.O.D.B.)	INV. EL. INTO DIST. BOX (FT.)	INV. EL. INTO DIST. BOX (FT.)	INV. EL. TO LEFT TRENCH (FT.)	INV. EL. TO RIGHT TRENCH (FT.)	BOTTOM OF TRENCH EL. (FT.)	TOP OF TRENCH EL. (FT.)
1	107.58	107.50	-----	107.33	106.5	107.5
2	107.08	107.0	-----	106.83	106.0	107.0
3	106.83	-----	-----	106.58	105.75	106.75
4	106.58	106.5	-----	106.33	105.5	106.5
5	106.33	106.25	-----	106.08	105.25	106.25
6	106.08	106.0	-----	105.83	105.0	106.0
7	105.83	-----	-----	105.67	104.75	105.75
A SPLIT	107.75	107.67(2)	-----	-----	-----	-----



DETAIL FOR PVC SANITARY SEWER
N.E.S.

REFER TO NOTE 34. NO FREE DRAINING MATERIAL WITHIN 24" OF SEPTIC SYSTEM.

PUMP CHAMBER DETAIL
N.E.S.

CHAMBER SIZE GALLONS: 750 (VERIFY WITH ENGINEER)
DESIGN LOADING: EXISTING

(TO BE VERIFIED WITH ENGINEER AT TIME OF PUMP TEST)
(NOTE: PRECAST PUMP CHAMBER HAS BEEN INSTALLED REFER TO PLAN)

A. The pump chamber shall have installed a pump with capacity for a total head from 15 to 50'. The pump shall be a Liberty Simplex Control Panel both with 1 1/2" discharge or equal approved by the design engineer. Pump controls shall be set to discharge 170 gallons per cycle (1 1/2" discharge, 0.5" VFD with Engineer). A high level alarm with light pump chamber, shall be installed outside the dwelling and a service shut-off switch, visible from the pump chamber, shall be installed outside the dwelling. Alarm float activates 3" above pump on pump on.

B. Electrical connections for the pump shall be housed in a water proof box set a minimum of 12" above finished grade. All electrical installations shall meet State and local codes. Underground cable shall be installed in PVC conduit. The septic system installer shall provide a pull line in each conduit. Electrical wiring shall be installed by a licensed electrician; an electrical permit shall be obtained.

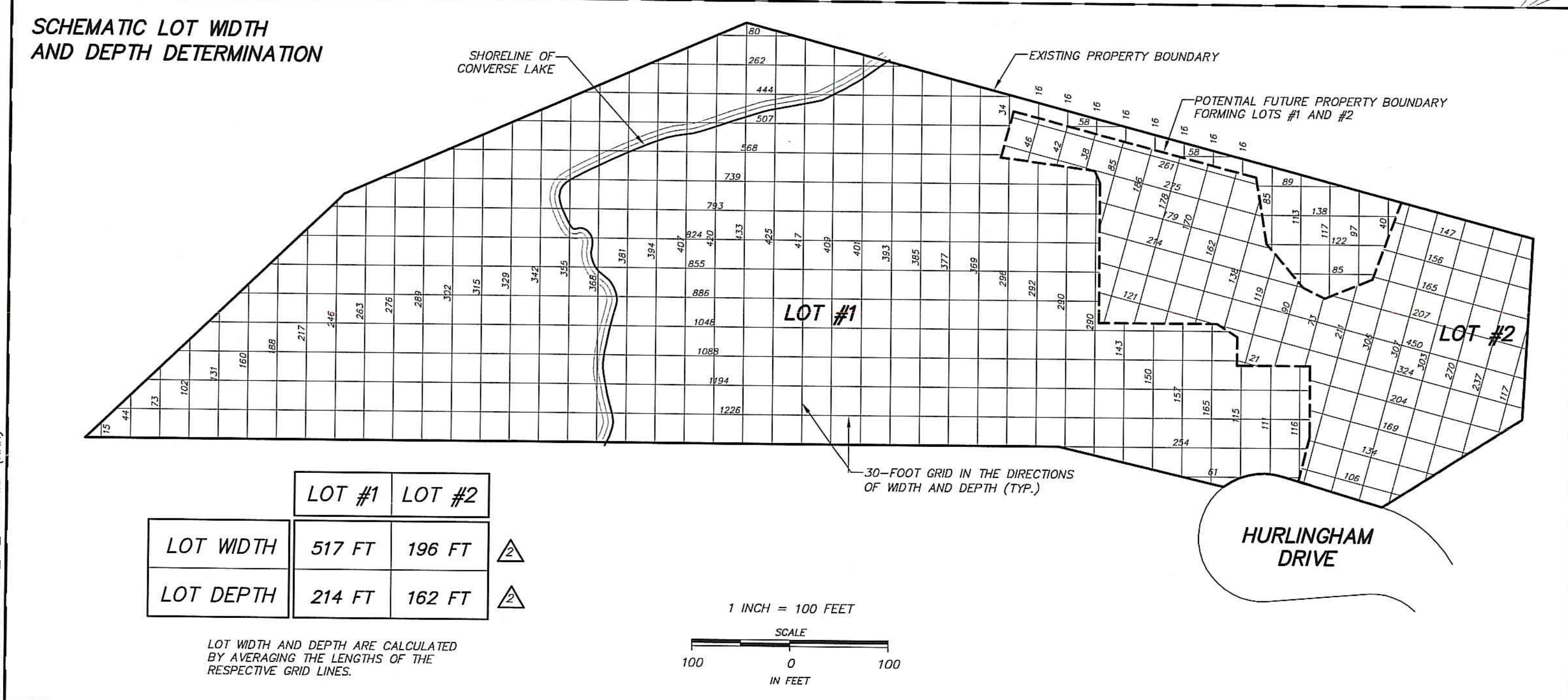
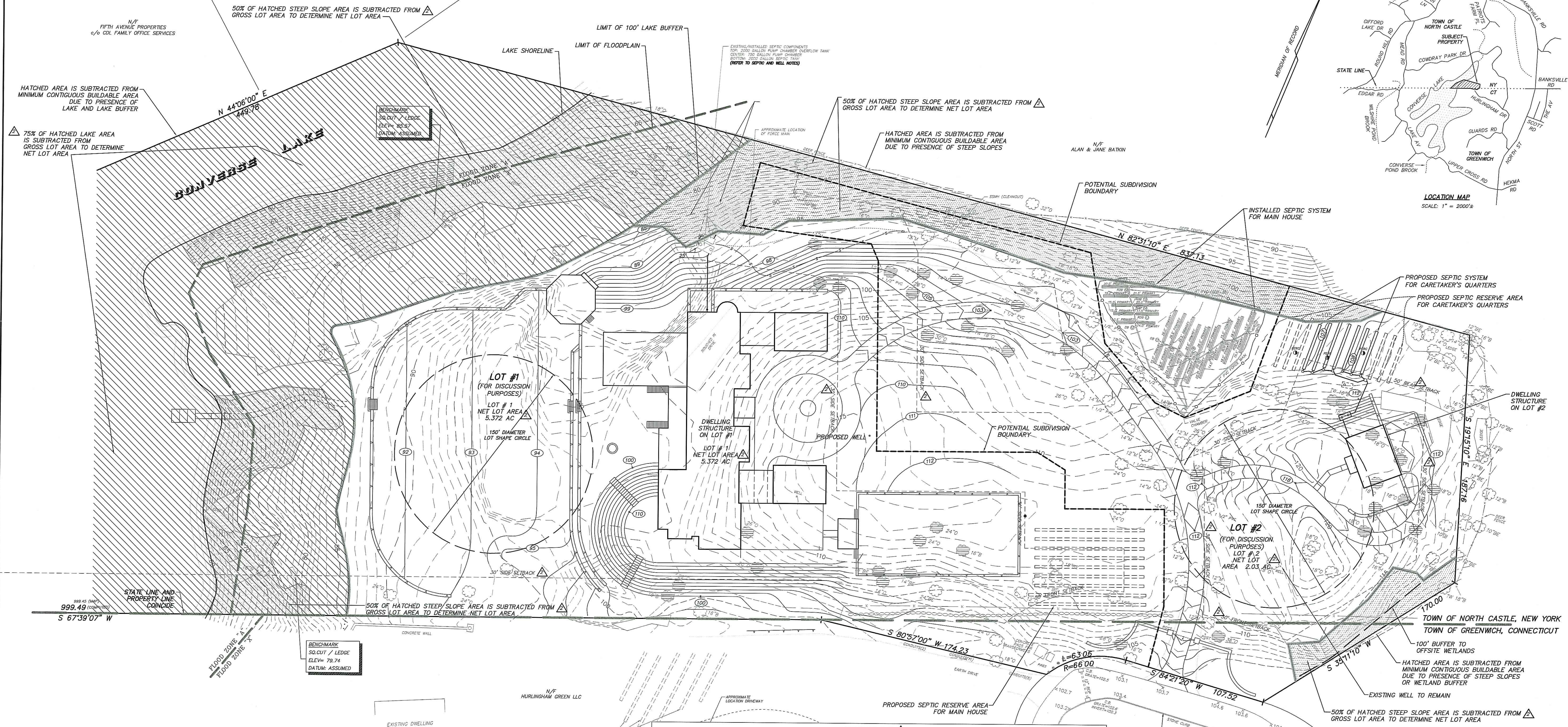
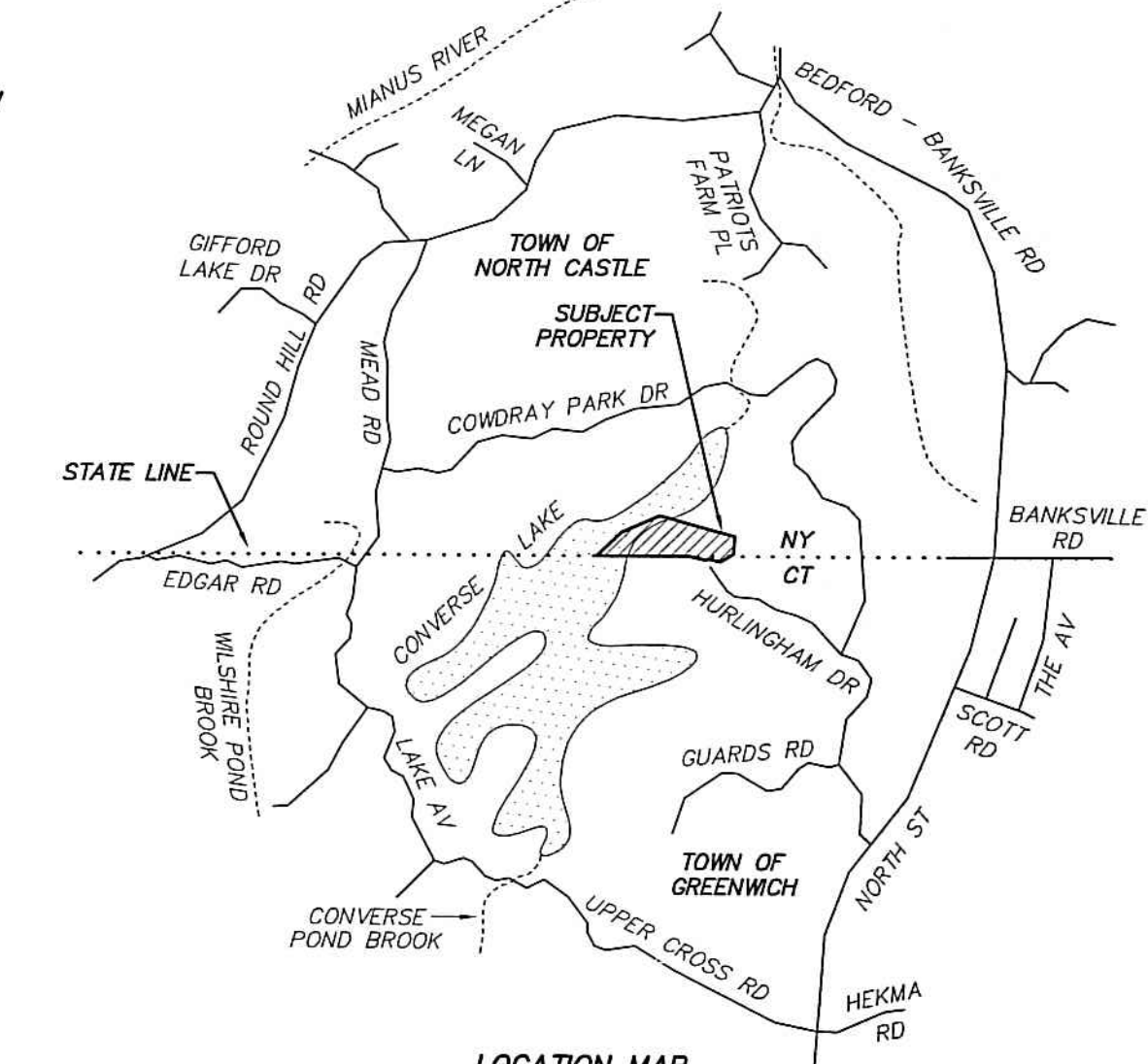
C. Submit Pump and Control Specification package for review and approval by Engineer.

D'ANDREA ENGINEERING AND SURVEYING, P.C.
LAND PLANNERS
ENGINEERS
SURVEYORS

PROJECT: PROPOSED RESIDENCE
PREPARED FOR: 45 HURLINGHAM, LLC
LOCATION: LOT 86, 45 HURLINGHAM DRIVE, TOWN OF NORTH CASTLE, NEW YORK
REVISION: 4 of 4
DATE: 11-14-21

NOTES:

- The purpose of this drawing is to support the conclusion that the two dwelling structures proposed by the property owner have the possibility of being subdivided into two lots that comply with the Town of North Castle zoning regulations.
- No actual subdivision is intended.
- The Conyers Farm neighborhood association prohibits any subdivision resulting in lots smaller than 10 acres in area.
- For a more complete depiction of the site and proposed development, refer to the "Site Plan Review Set" prepared by this firm dated February 8, 2021.



ZONING TABLES

MINIMUM CONTIGUOUS BUILDABLE AREA
TOWN OF NORTH CASTLE ZONING REGULATIONS - SEC. 355-26 F

LOT #	TOTAL LOT AREA	SUBTRACTED AREA	REMAINING AREA	REQUIRED AREA
LOT #1	8.29± ACRES	4.80± ACRES	3.49± ACRES	35,000 S.F. = 0.80± ACRES
LOT #2	2.02± ACRES	0.23± ACRES	1.79± ACRES	35,000 S.F. = 0.80± ACRES

NET LOT AREA
TOWN OF NORTH CASTLE ZONING REGULATIONS - SEC. 355-4 F

LOT #	GROSS/TOTAL LOT AREA (AC)	SUBTRACTED AREA (AC)	75% OF NETS AND 50% OF STEEP SLOPES "NET" REMAINING AREA (AC)	REQUIRED AREA (S.F.)
LOT #1	356,713	8,396	122,717	233,996
LOT #2	92,347	2,12	5095	87,252

LOT 1 ZONING TABLE - R-2 ZONING DISTRICT

ITEM	ALLOWED/REQUIRED	PROVIDED
MINIMUM LOT SIZE	AREA - ACRES: 2 ACRES	5.372 NET ACRES
AREA - SF	87,120 SF	233,996 NET SF
FRONTAGE	150 FT	653 FT**
WIDTH	150 FT	517 ± FT
DEPTH	150 FT	214 ± FT
MINIMUM YARDS	FRONT: 50 FT	76 FT (TENNIS CT)
	SIDE: 30 FT	40 FT (TENNIS CT)
	REAR: 50 FT	915 FT (B&D TRAV)
MAXIMUM BUILDING HEIGHT	STORIES: 2	2
	FEET: 30 FT	26 FT

LOT 2 ZONING TABLE - R-2 ZONING DISTRICT

ITEM	ALLOWED/REQUIRED	PROVIDED
MINIMUM LOT SIZE	AREA - ACRES: 2 ACRES	2.03 NET ACRES
AREA - SF	87,120 SF	87,251 NET SF
FRONTAGE	150 FT	150 FT
WIDTH	150 FT	196 ± FT
DEPTH	150 FT	162 ± FT
MINIMUM YARDS	FRONT: 50 FT	170 FT
	SIDE: 30 FT	45 FT
	REAR: 50 FT	83 FT
MAXIMUM BUILDING HEIGHT	STORIES: 2	2
	FEET: 30 FT	22 FT

MARK T ON CURB 104.41 ± ASSUMED

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LAND PLANNERS
ENGINEERS
SURVEYORS

P.O. BOX 549 RIVERSIDE, CT 06878

6 NEIL LANE TEL. 637-1779

PROJECT: PROPOSED RESIDENCE
PREPARED FOR: 45 HURLINGHAM, LLC
LOCATION: 45 HURLINGHAM DRIVE NORTH CASTLE, NEW YORK
1 OF 1: SHOWING POSSIBLE SUBDIVISION FOR CARETAKER'S QUARTERS

REV. DATE DESCRIPTION
7-6-21 NET LOT AREA AND ADDRESS NO CHANGES ISSUE TO NORA, NOLA, & FIRE MARSHALS
8-1-21 ALTERNATE SITE LAYOUT
2-8-21 SUBMIT TO PLANNING BOARD
7-6-21 DATE

1 INCH = 30 FEET SCALE

COMPAR. 2021.03.05. PHASE 02 - REVIZING (RAW)

NOTES:

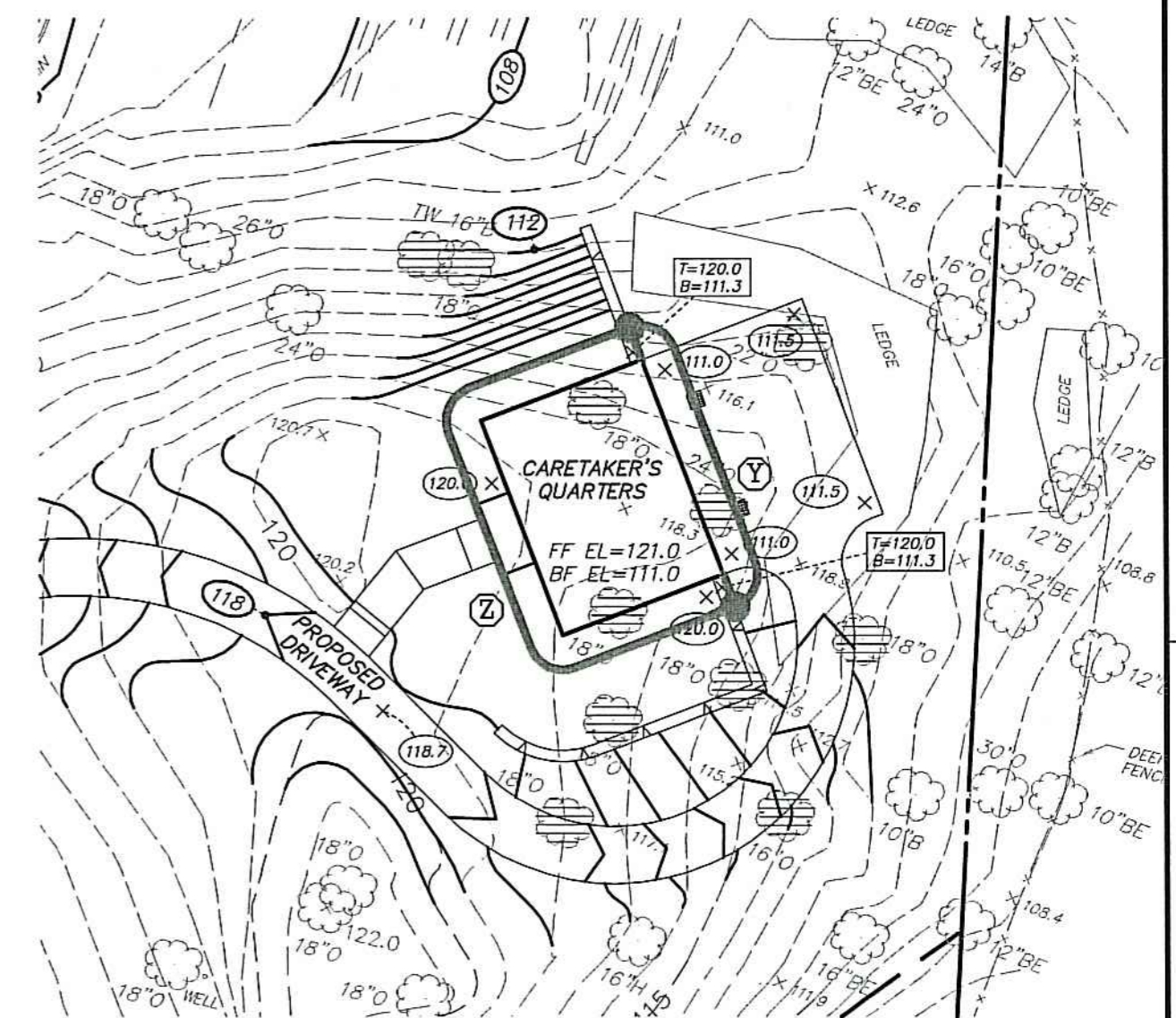
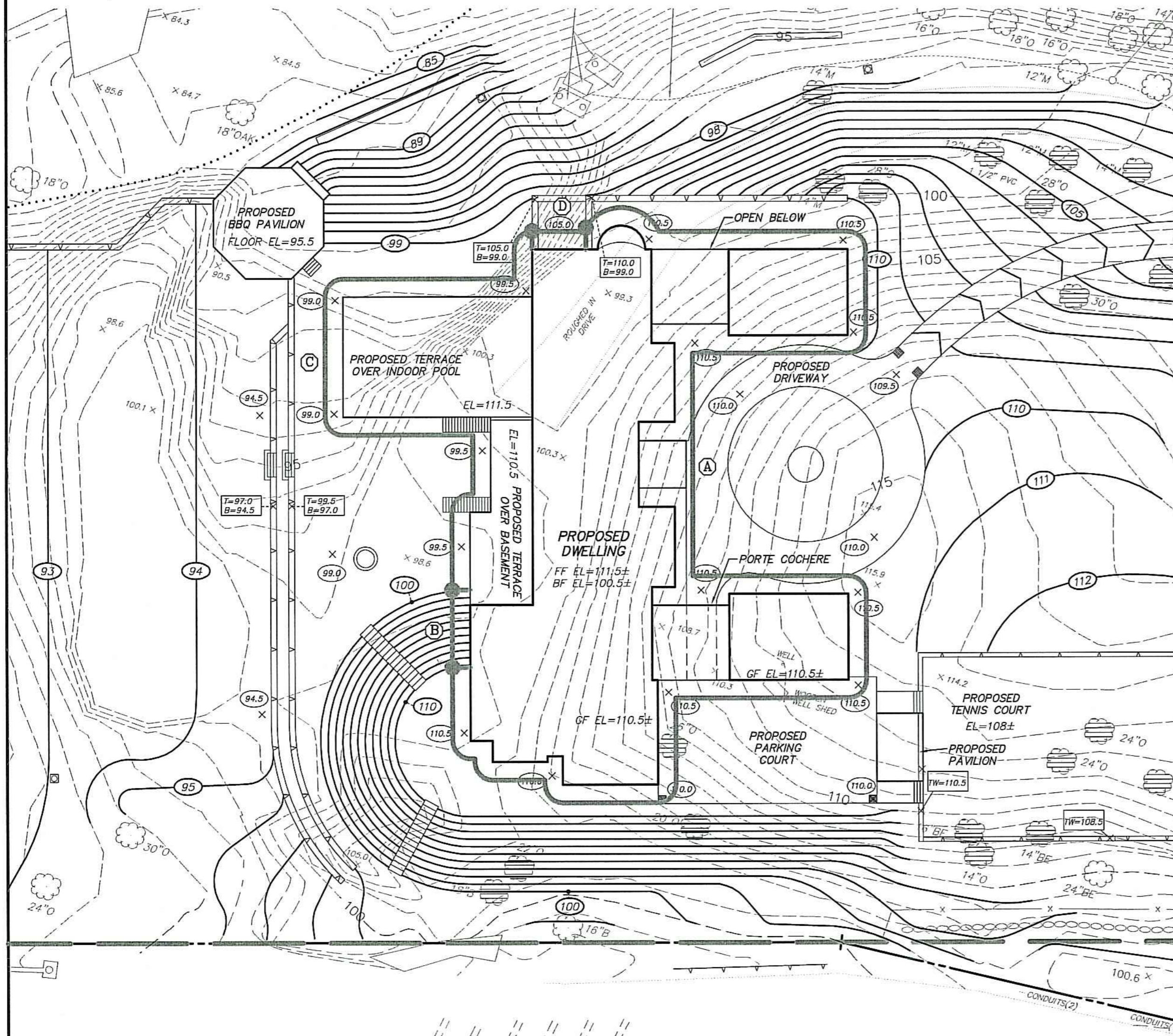
1. For a depiction of the site and proposed development, refer to the "Site Plan Review Set" prepared by this firm dated July 6, 2021.
2. Refer to architectural plans prepared by Tasos Kokoris AIA of Westport, CT.
3. Contours and elevations depicted hereon are based on an assumed datum.

REFER TO MAPS No. 21767 W.C.L.R. AND 5970 G.L.R.

LAND LIES IN "R-2A" ZONE (NORTH CASTLE)
"RA-4" ZONE (GREENWICH)

AREA = 10.3090 ACRES (TOTAL)
10.0216 ACRES (NEW YORK)
0.2874 ACRES (CONNECTICUT)

TAX ID 102.04-1-26



**AVERAGE GRADE CALCULATION
CARETAKER'S QUARTERS**

6-Foot Envelope Segment	Length (ft)	Average or lowest grade (ft)	Length x Grade	Perimeter Segment	Perimeter Length (ft)	Lowest Grade at Wall (ft) (GR)	Adj. Floor Elevation (ft) (FF)	Differential (FF - GR)
Y	58.8	111.0	6,527	Y	100.0	120.0	121.0	1.0
Z	118.8	120.0	14,256	Z	40.0	110.0	121.0	11.0
Total	177.6		20,783	Total	140.0			
Average Grade = $\text{sum}(L \cdot Z) / \text{sum}(L)$			117.0	Sum of Length at 5' or more below adj. floor:			40.0	
First Floor Elevation			121.0	in percent of Total Length:			28.6%	
Differential			4.0					
Lowest Grade at Perimeter			111.0					
Differential			10.0					

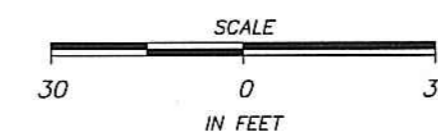
**AVERAGE GRADE CALCULATION
MAIN DWELLING**

6-Foot Envelope Segment	Length (ft)	Average or lowest grade (ft)	Length x Grade	Perimeter Segment	Perimeter Length (ft)	Lowest Grade at Wall (ft) (GR)	Adj. Floor Elevation (ft) (FF)	Differential (FF - GR)
A	569	110.5	62,875	A	624	110.0	111.5	1.5
B	26	105.0	2,730	B	26	100.0	111.5	11.5
C	236	99.5	23,482	C	234	99.5	111.5	12.0
D	19	105.0	1,995	D	18	105.0	111.5	6.5
Total	850		91,082	Total	902			
Average Grade = $\text{sum}(L \cdot Z) / \text{sum}(L)$			107.2	Sum of Length at 5' or more below adj. floor:			278	
First Floor Elevation (FF)			111.5	in percent of Total Length:			30.8%	
Differential (Avg. Grade - FF)			4.3					
Lowest Grade at Perimeter			99.5					
Differential (Lowest Grade - FF)			12.0					

LEGEND

- 99 --- EXISTING CONTOUR
- x 99.9 EXISTING SPOT ELEVATION
- 99 --- PROPOSED CONTOUR
- x 99.9 PROPOSED SPOT ELEVATION
- x 102.0 / B=96.0 PROPOSED TOP/BOTTOM OF WALL ELEVATION
- --- RETAINING WALL
- --- AVERAGE GRADE ENVELOPE
- (A) AVERAGE GRADE SEGMENT

CONTOUR INTERVAL = ONE FOOT
1 INCH = 30 FEET



REV.	DATE	DESCRIPTION
2	7-6-21	ADDITIONAL TABULATION, ISSUE TO NCPB
1	6-1-21	MODIFY SITE LAYOUT
0	2-8-21	SUBMIT TO NORTH CASTLE

RICHARD A. REGAN NY PE No. 61598
Richard A. Regan 7-6-21
 ENGINEER DATE

ONLY COPIES OF THIS PLAN BEARING AN ORIGINAL IMPRINT OF THE ENGINEER'S EMBOSSED SEAL ARE TRUE, VALID COPIES.



D'ANDREA SURVEYING & ENGINEERING, P.C.

• LAND PLANNERS
• ENGINEERS
• SURVEYORS

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6 NEIL LANE TEL. 637-1779

PROJECT	PROPOSED RESIDENCE
PREPARED FOR	45 HURLINGHAM, LLC
LOCATION	45 HURLINGHAM DRIVE NORTH CASTLE, NEW YORK
1 OF 1	AVERAGE GRADE PLAN

net lot area 7-6-21								
lot	gross area sf	wetland or pond	75% of wet or pond	steep slope	50% of steep slope	total deductions	net area SF	net area acres
1	356713	135904	101928	9205 32374 41579	20789.5	122717.5	233895.5	5.371797521
43560 449060	2	92347	0	1204 5914 3073 10191	5095.5	5095.5	87251.5	2.003018825

EXHIBIT B NET LOT AREA 7-6-21

45 Hurlingham Drive
 DSE PC
 Richard K. PE
 for DSE PC

NET LOT AREA
 TOWN OF NORTH CASTLE ZONING REGULATIONS - SEC. 355-4 F

	GROSS/TOTAL LOT AREA		SUBTRACTED AREA 75% OF WETS AND 50% OF STEEP SLOPES "NET" REMAINING AREA		REQUIRED AREA
	(SF)	(AC)	(SF)	(AC)	
LOT #1	356,713	8.396	122,717	2.837	87,120 S.F. = 2.000 ACRES
LOT #2	92,347	2.12	5,095	0.116	87,120 S.F. = 2.000 ACRES



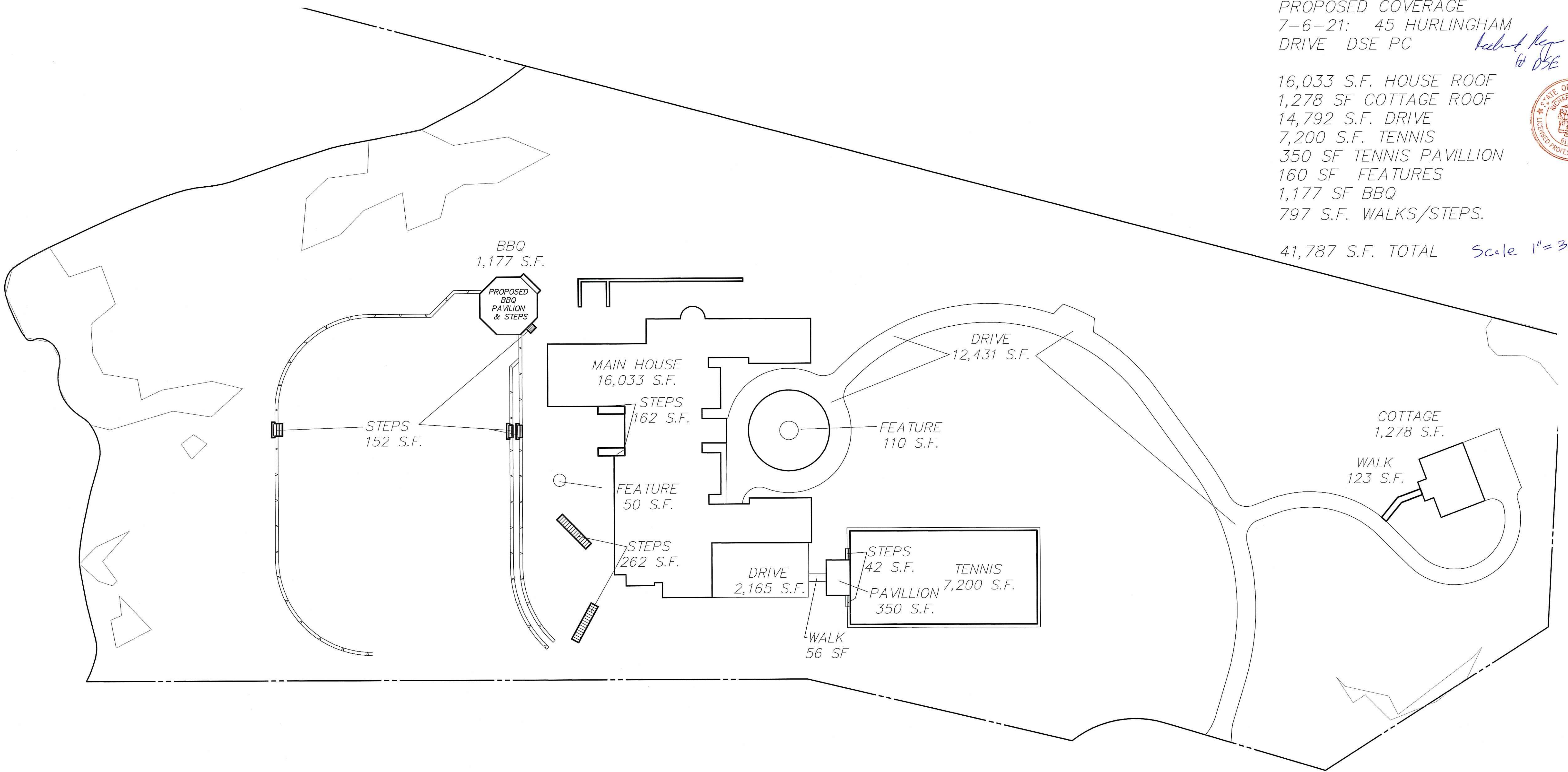
EXHIBIT 'A'
PROPOSED COVERAGE
7-6-21: 45 HURLINGHAM
DRIVE DSE PC

*Richard A. Regan PE
to DSE PC*

16,033 S.F. HOUSE ROOF
1,278 SF COTTAGE ROOF
14,792 S.F. DRIVE
7,200 S.F. TENNIS
350 SF TENNIS PAVILLION
160 SF FEATURES
1,177 SF BBQ
797 S.F. WALKS/STEPS.



41,787 S.F. TOTAL Scale 1"=30'



**STORMWATER POLLUTION
PREVENTION PLAN (SWPPP)**

For

Proposed Residence

At

**45 Hurlingham Drive
North Castle, New York**

Prepared For

45 Hurlingham, LLC

**Revised
July 6, 2021**

Original
February 8, 2021



Richard A. Regan PE
Richard A. Regan, PE
NY License #61598

20JS SWPPP 2

P.O. Box 549 / 6 Neil Lane
Riverside, CT 06878



D'Andrea Surveying & Engineering P.C.

LAND PLANNERS • CIVIL ENGINEERS • SURVEYORS

203.637.1779
www.rvdi.com

Table of Contents

Introduction

Watershed Analysis	2
Existing Conditions	3
Proposed Conditions	3
Construction	3
Conclusion	4

Exhibits

Watershed Map – Existing Conditions	Exhibit A
Watershed Map – Proposed Conditions	Exhibit B
USDA Soil Delineation Map	Exhibit C
Rainfall Depths and Intensity	Exhibit D
Contractor Certification Statement	Exhibit E
Notice of Intent	Exhibit F
SWPPP Preparer Certification Form	Exhibit G
SWPPP Acceptance Form	Exhibit H
Flood Insurance Rate Map (FIRM) by FEMA	Exhibit I

Appendices

Design Calculations	Appendix A
HydroCAD Analysis – Existing Conditions	Appendix B
HydroCAD Analysis – Proposed Conditions	Appendix C
Operations & Maintenance Plan	Appendix D

Revision 7/6/21: Clarification on water quality volume calculations in Appendix A, proposed conditions model printouts for the 1- and 100-year storm added to Appendix C (model itself was unchanged)

Project Summary

The owners are proposing to develop a residence at 45 Hurlingham Drive (a.k.a. Lot 86) in North Castle, New York. This vacant property covers about 10.3 acres in the Conyers Farm private neighborhood, on the border with the State of Connecticut. Also present is a small lake known as Converse Lake.

In addition to the proposed main dwelling, other improvements include a caretaker's quarters, tennis court, indoor pool, driveway, landscaping, grading, utilities, septic systems, and a drainage system. The lake and its 100-foot conservation buffer are meant to be undisturbed.

The proposed development will create 43,720 square feet of impervious cover, in addition to any exposed ledge to remain. A drainage system will be installed to infiltrate the Water Quality Volume (WQV), attenuate peak flows to adjacent properties (excluding the lake) for the 10- and 100-year storm events, and provide non-erosive conveyance. Sedimentation and erosion (S&E) controls will be installed and maintained to prevent pollution and loss of topsoil during construction.

For a depiction of the site and the proposed development, refer to a set of plans prepared by this firm entitled "Final Site Plan Review Set" dated July 6, 2021.

Watershed Analysis

Drainage patterns for the site were analyzed using HydroCAD version 10, with runoff data generated for the 1, 2, 5, 10, 25, 50 and 100-year storm frequency events.

In this analysis, the site was divided into various drainage areas discharging to four primary Points of Concern (POCs) and one ultimate POC. Referring to the watershed maps in Exhibits A & B:

- POC A is the shoreline of Converse Lake
- POC B is the adjacent property to the north/east
- POC C is Hurlingham Drive
- POC D is the adjacent property to the south

POCs B, C, and D eventually discharge to the lake as well. Therefore:

- POC Z is the confluence of POCs A-D and represents Converse Lake

The model boundaries are the land portion of the site – the lake surface is excluded. Little to no offsite area contributes runoff to the subject property.

According to the USDA soil delineation map included in Exhibit C, the property lies within a mapped area of HSG-D soils due to the presence of rock outcrop. On-site soil test pit results, as shown on the plans, reveal varying conditions which determine the locations of the proposed stormwater infiltration systems.

Converse Lake is part of the Byram River watershed, which flows to the Long Island Sound. However, an aqueduct in the Town of Greenwich may divert some water to an adjacent watershed.

Existing Conditions

Under existing conditions, the site has no buildings. It does however have a roughed-in driveway with tree rows, a complete but unused septic system, and evidence of previous earthwork. A quarter-acre section of the site including the driveway entrance is located within the Town of Greenwich, Connecticut, but the vast majority of the site is in the Town of North Castle, New York. No stormwater infrastructure was found on the property, although there are catch basins in Hurlingham Drive.

Existing condition drainage areas are depicted on the Watershed Map in Exhibit A. Refer to Appendix B for inputs and results of the HydroCAD model.

Proposed Conditions

Under proposed conditions, roof drains and driveway catch basins will collect runoff and route to various drywell systems. The systems are located in areas of fill or where soil testing revealed adequate depth to the restrictive layer (typically ledge for this site). Each consists of an array of plastic chambers buried in a gravel bed below the lawn. The systems retain and infiltrate the Water Quality Volume (WQV) of their contributing areas. Overflows are routed to level spreaders for non-erosive discharge. All discharges are outside the 100-foot watercourse conservation easement.

Proposed condition drainage areas are depicted on the Watershed Map in Exhibit B. Refer to Appendix C for inputs and results of the HydroCAD model.

Construction

A copy of this document shall be present at the construction site. The individuals responsible for S&E (sedimentation and erosion) controls and drainage installation shall sign the Contractor Certification Statement (Exhibit E) before commencing construction activities. Refer to *NYS DEC SPDES General Permit for Stormwater Discharges from Construction Activity, Part IV (Inspection and Maintenance Requirements)*.

A “Trained Contractor” is responsible for implementing this SWPPP (installing the S&E controls and drainage components). They must be a contractor who completes 4 hours of NYS DEC endorsed training in S&E controls every 3 years.

A “Qualified Inspector” is responsible for inspecting the work of the contractor. They must be a Professional Engineer, Certified Professional in Erosion and Sediment Control, Registered Landscape Architect, NYS Erosion and Sediment Control Certificate Program holder, or someone under the direct supervision of any of the previous and with the same training as the trained contractor.

The contractor shall inspect their S&E controls periodically and especially after a large storm and keep a log. The log should include which areas of the site are stabilized and which are active, the amount of sediment accumulation, the condition of silt fencing and other controls, and evidence of erosion.

Prior to the start of construction, sedimentation and erosion controls will be installed. These include silt fencing downhill of the development area, construction fence delineating the remaining development boundary, and a crushed stone tracking pad at the driveway/construction entrance. The contractor will install protection fencing for any trees within the development area that are to remain, remove those trees designated to be removed, and begin stripping and stockpiling topsoil.

Construction activity can be divided into three zones: The eastern zone which will include the caretaker's quarters, the central zone which includes the tennis court and extensive regrading, and the western zone which will include the primary dwelling. The contractor is directed to do earthwork and grading on one zone at a time to minimize disturbance. If construction is halted in a certain zone or area of the site for an extended period of time (ex. 3 weeks or longer), then that area's soils should be temporary stabilized.

As construction progresses, all sedimentation and erosion controls should be monitored and replaced as needed. The contractor will sweep the street clean and the end of each working day. As the chamber systems are installed, construction fencing should protect them from vehicle traffic and compaction. Newly installed catch basins should also be protected with silt sacks. Any construction debris or litter must be collected and stockpiled before disposing off-site. Chemicals that could pollute the soil and stormwater or are otherwise hazardous must be stored and sealed as appropriate. Contractors shall follow spill prevention protocols and keep spill response protocols.

Nearing completion of construction in an area, topsoil shall be applied and stabilized with plantings, sod, mulch, or hay and grass seed. Once landscaping and lawn has been established, then sedimentation and erosion controls will be removed.

Construction staging and S&E controls are depicted on the Sedimentation and Erosion Control Plan within the civil site plan set.

The property owner is responsible for long-term stormwater management, as listed in the Operations & Maintenance Plan (Appendix D).

Conclusion

The following tables compare the peak flow rates and volumes to each POC for all modeled storm events. Peak flows are reduced to POCs B, C and D for all required storm events. We request exemption for POC A because it is a large water body, of which the site is obviously much less than 10% of the contributing watershed. Total runoff from the site (to POC Z) is

reduced through the 10-year storm, and peaks reduced up to the 1-year storm, because a lot of retention is provided for water quality.

Satisfaction of water quality, runoff reduction, and drawdown requirements are shown in Appendix A. Refer to Appendices B and C for additional information about the hydrologic models.

Since the proposed development of the site will reduce the peak rate and volume of runoff flowing off-site to each point of concern to the maximum extent practicable, and measures are proposed to provide treatment of runoff from new impervious surfaces, the design will not cause any adverse impacts to the site or surrounding area.

This report, the site engineer, the owner, and the contractor are obligated to comply with Town Code Chapter 267: Stormwater Management, as well as the NYS DEC General Permit.

Point of Concern	Storm Frequency	Peak Flow Rate (cfs)			
		Existing	Proposed	Δ	Δ %
A	1 year	5.11	6.14	1.03	20%
	2-year	7.06	10.29	3.23	46%
	5-year	10.39	15.64	5.25	51%
	10-year	13.26	19.61	6.35	48%
	25-year	17.22	25.09	7.87	46%
	50-year	20.16	29.15	8.99	45%
	100-year	23.31	33.50	10.19	44%
B	1 year	3.24	2.07	-1.17	-36%
	2-year	4.50	2.89	-1.61	-36%
	5-year	6.67	4.3	-2.37	-36%
	10-year	8.54	5.53	-3.01	-35%
	25-year	11.12	7.22	-3.90	-35%
	50-year	13.04	8.48	-4.56	-35%
	100-year	15.11	9.83	-5.28	-35%
C	1 year	0.82	0.82	0.00	0%
	2-year	1.15	1.12	-0.03	-3%
	5-year	1.70	1.58	-0.12	-7%
	10-year	2.19	2.03	-0.16	-7%
	25-year	2.85	2.64	-0.21	-7%
	50-year	3.35	3.09	-0.26	-8%
	100-year	3.88	3.58	-0.30	-8%
D	1 year	0.95	0.59	-0.36	-38%
	2-year	1.34	0.83	-0.51	-38%
	5-year	2.00	1.24	-0.76	-38%
	10-year	2.58	1.60	-0.98	-38%
	25-year	3.38	2.10	-1.28	-38%
	50-year	3.97	2.47	-1.50	-38%
	100-year	4.61	2.87	-1.74	-38%
Z (total)	1 year	9.91	8.92	-0.99	-10%
	2-year	13.77	15.10	1.33	10%
	5-year	20.35	22.67	2.32	11%
	10-year	26.04	28.72	2.68	10%
	25-year	33.89	37.00	3.11	9%
	50-year	39.74	43.14	3.40	9%
	100-year	46.00	49.70	3.70	8%

Point of Concern	Storm Frequency	Runoff Volume (cf)			
		Existing	Proposed	Δ	Δ %
A	1 year	16,637	21,649	5,012	30%
	2-year	22,835	30,805	7,970	35%
	5-year	33,560	46,431	12,871	38%
	10-year	42,983	60,028	17,045	40%
	25-year	56,219	79,001	22,782	41%
	50-year	66,225	93,282	27,057	41%
	100-year	77,059	108,702	31,643	41%
B	1 year	11,763	6,626	-5,137	-44%
	2-year	16,206	9,171	-7,035	-43%
	5-year	23,915	13,601	-10,314	-43%
	10-year	30,701	17,510	-13,191	-43%
	25-year	40,247	23,017	-17,230	-43%
	50-year	47,470	27,189	-20,281	-43%
	100-year	55,295	31,713	-23,582	-43%
C	1 year	2,788	2,159	-629	-23%
	2-year	3,850	3,070	-780	-20%
	5-year	5,696	4,649	-1,047	-18%
	10-year	7,322	6,038	-1,284	-18%
	25-year	9,612	7,991	-1,621	-17%
	50-year	11,346	9,469	-1,877	-17%
	100-year	13,225	11,069	-2,156	-16%
D	1 year	3,046	1,988	-1,058	-35%
	2-year	4,233	2,763	-1,470	-35%
	5-year	6,304	4,114	-2,190	-35%
	10-year	8,135	5,309	-2,826	-35%
	25-year	10,718	6,996	-3,722	-35%
	50-year	12,677	8,274	-4,403	-35%
	100-year	14,802	9,662	-5,140	-35%
Z (total)	1 year	34,235	32,423	-1,812	-5%
	2-year	47,125	45,809	-1,316	-3%
	5-year	69,474	68,795	-679	-1%
	10-year	89,141	88,885	-256	0%
	25-year	116,795	117,005	210	0%
	50-year	137,718	138,214	496	0%
	100-year	160,382	161,146	764	0%

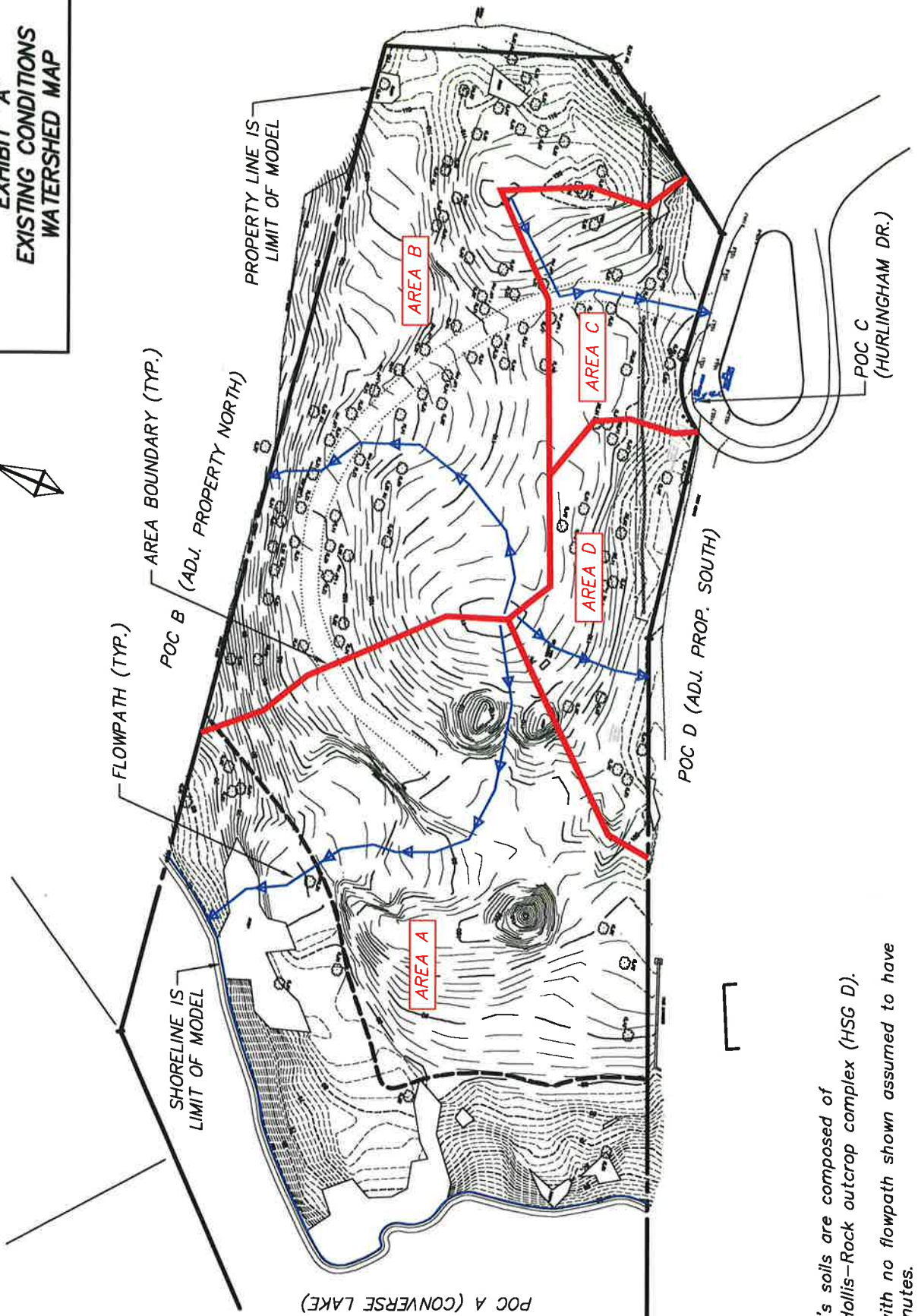
D'ANDREA SURVEYING & ENGINEERING, P.C.
 • LAND PLANNERS
 • ENGINEERS
 • SURVEYORS

P.O. BOX 549
 RIVERSIDE, CT 06878

6 NEIL LANE
 TEL. 203-637-1779

EXHIBIT "A"
EXISTING CONDITIONS
WATERSHED MAP

SCALE: 1" = 120'

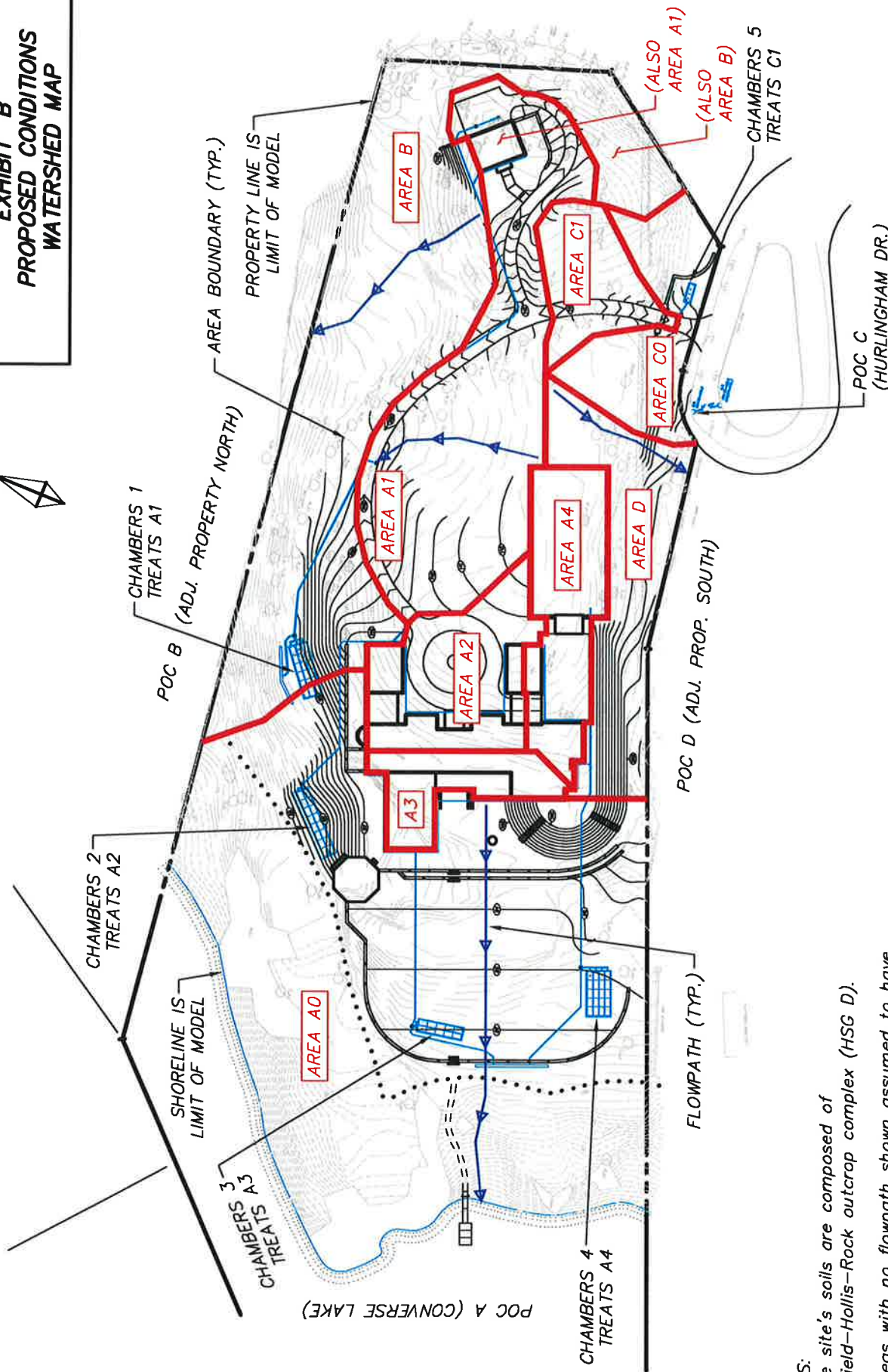


- NOTES:
1. The site's soils are composed of Chatfield-Hollis-Rock outcrop complex (HSG D).
 2. Areas with no flowpath shown assumed to have $T_c = 5$ minutes.

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LAND PLANNERS
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TEL. 203-637-1779

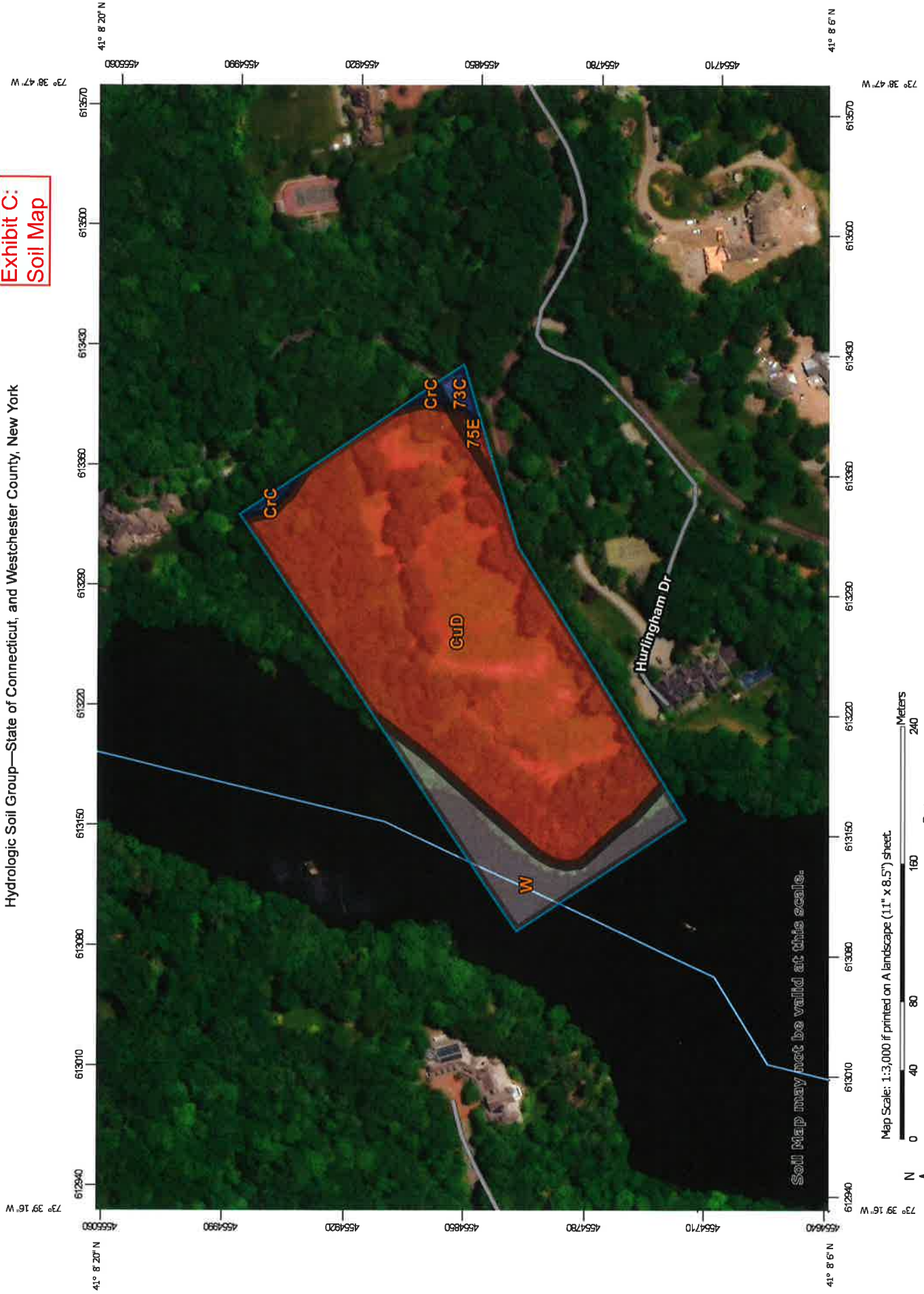
EXHIBIT "B" PROPOSED CONDITIONS WATERSHED MAP

SCALE: 1" = 120'



- NOTES:
1. The site's soils are composed of Chatfield-Hollis-Rock outcrop complex (HSG D).
 2. Areas with no flowpath shown assumed to have $T_c = 5$ minutes.









































































































**Exhibit C:
Soil Map**



Map Scale: 1:3,000 if printed on A landscape (11" x 8.5") sheet.

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

MAP LEGEND

Area of Interest (AOI)	 Area of Interest (AOI)								
Soils	<table border="0"> <tr> <td> A</td> <td> A/D</td> <td> B</td> <td> B/D</td> <td> C</td> <td> C/D</td> <td> D</td> <td> Not rated or not available</td> </tr> </table>	 A	 A/D	 B	 B/D	 C	 C/D	 D	 Not rated or not available
 A	 A/D	 B	 B/D	 C	 C/D	 D	 Not rated or not available		
Soil Rating Polygons	<table border="0"> <tr> <td> A</td> <td> A/D</td> <td> B</td> <td> B/D</td> <td> C</td> <td> C/D</td> <td> D</td> <td> Not rated or not available</td> </tr> </table>	 A	 A/D	 B	 B/D	 C	 C/D	 D	 Not rated or not available
 A	 A/D	 B	 B/D	 C	 C/D	 D	 Not rated or not available		
Soil Rating Lines	<table border="0"> <tr> <td> A</td> <td> A/D</td> <td> B</td> <td> B/D</td> <td> C</td> <td> C/D</td> <td> D</td> <td> Not rated or not available</td> </tr> </table>	 A	 A/D	 B	 B/D	 C	 C/D	 D	 Not rated or not available
 A	 A/D	 B	 B/D	 C	 C/D	 D	 Not rated or not available		
Soil Rating Points	<table border="0"> <tr> <td> A</td> <td> A/D</td> <td> B</td> <td> B/D</td> </tr> </table>	 A	 A/D	 B	 B/D				
 A	 A/D	 B	 B/D						
Water Features	<table border="0"> <tr> <td> Streams and Canals</td> </tr> </table>	 Streams and Canals							
 Streams and Canals									
Transportation	<table border="0"> <tr> <td> Rails</td> <td> Interstate Highways</td> </tr> <tr> <td> US Routes</td> <td> Major Roads</td> </tr> <tr> <td> Local Roads</td> <td></td> </tr> </table>	 Rails	 Interstate Highways	 US Routes	 Major Roads	 Local Roads			
 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 20, Jun 9, 2020
 Soil Survey Area: Westchester County, New York
 Survey Area Data: Version 16, Jun 11, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 16, 2017

MAP LEGEND

MAP INFORMATION

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	0.1	1.2%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	D	0.1	1.0%
Subtotals for Soil Survey Area			0.2	2.1%
Totals for Area of Interest			9.3	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CrC	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	0.1	1.2%
CuD	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	D	7.8	83.8%
W	Water		1.2	12.9%
Subtotals for Soil Survey Area			9.1	97.9%
Totals for Area of Interest			9.3	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

**Exhibit D:
Precipitation
Frequency**



NOAA Atlas 14, Volume 10, Version 3
Location name: Armonk, New York, USA*
Latitude: 41.1371°, Longitude: -73.6507°
Elevation: 463.74 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 & aeriels](#)

PF tabular

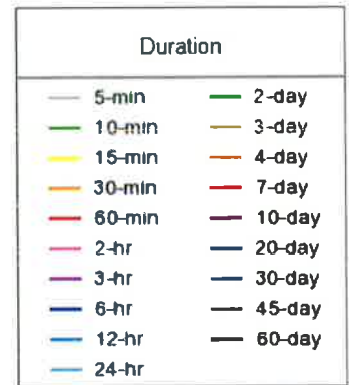
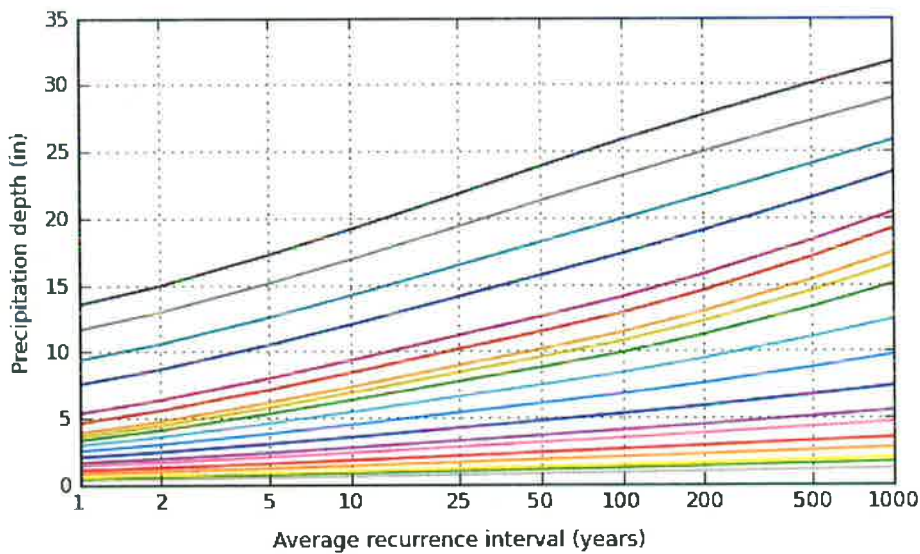
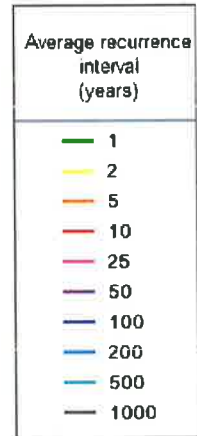
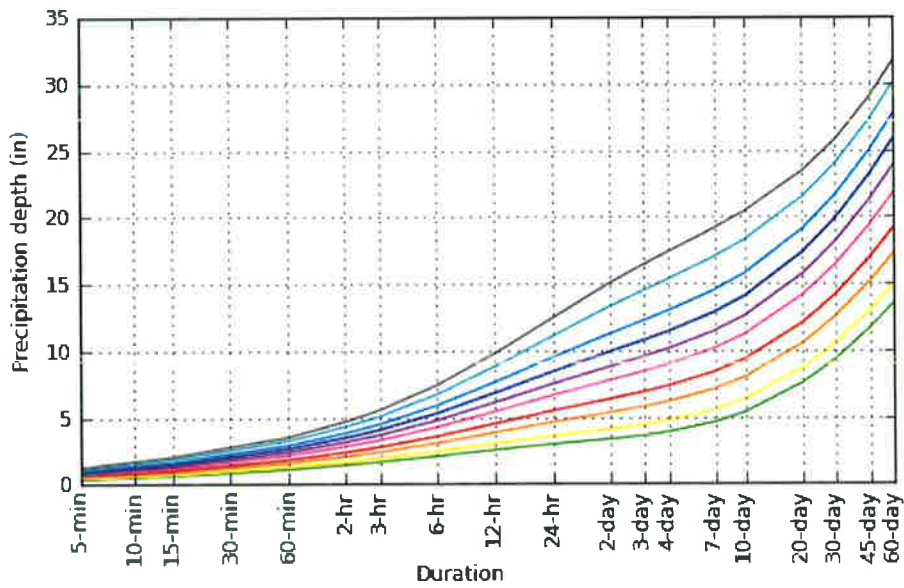
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.363 (0.278-0.464)	0.423 (0.324-0.541)	0.520 (0.397-0.668)	0.601 (0.457-0.774)	0.712 (0.525-0.945)	0.797 (0.576-1.07)	0.884 (0.621-1.22)	0.978 (0.657-1.38)	1.11 (0.718-1.60)	1.21 (0.768-1.78)
10-min	0.514 (0.395-0.657)	0.599 (0.459-0.766)	0.737 (0.563-0.945)	0.852 (0.647-1.10)	1.01 (0.744-1.34)	1.13 (0.816-1.52)	1.25 (0.879-1.73)	1.39 (0.930-1.95)	1.57 (1.02-2.27)	1.72 (1.09-2.52)
15-min	0.605 (0.464-0.773)	0.704 (0.540-0.901)	0.866 (0.662-1.11)	1.00 (0.761-1.29)	1.19 (0.875-1.58)	1.33 (0.959-1.79)	1.47 (1.03-2.04)	1.63 (1.09-2.30)	1.85 (1.20-2.67)	2.02 (1.28-2.97)
30-min	0.852 (0.654-1.09)	0.990 (0.759-1.27)	1.22 (0.930-1.56)	1.40 (1.07-1.81)	1.66 (1.22-2.20)	1.86 (1.34-2.50)	2.06 (1.44-2.83)	2.27 (1.52-3.19)	2.55 (1.65-3.68)	2.77 (1.75-4.06)
60-min	1.10 (0.844-1.41)	1.28 (0.979-1.63)	1.57 (1.20-2.01)	1.81 (1.37-2.33)	2.14 (1.57-2.83)	2.39 (1.72-3.21)	2.65 (1.85-3.63)	2.91 (1.95-4.09)	3.25 (2.11-4.69)	3.51 (2.22-5.15)
2-hr	1.44 (1.11-1.83)	1.67 (1.29-2.13)	2.05 (1.58-2.62)	2.37 (1.81-3.03)	2.81 (2.08-3.69)	3.14 (2.28-4.19)	3.48 (2.44-4.75)	3.83 (2.58-5.35)	4.31 (2.80-6.18)	4.68 (2.97-6.82)
3-hr	1.66 (1.29-2.11)	1.94 (1.50-2.46)	2.39 (1.84-3.03)	2.76 (2.12-3.52)	3.28 (2.43-4.30)	3.67 (2.67-4.88)	4.07 (2.87-5.56)	4.50 (3.04-6.26)	5.08 (3.31-7.26)	5.54 (3.53-8.05)
6-hr	2.09 (1.63-2.63)	2.46 (1.91-3.09)	3.06 (2.37-3.85)	3.56 (2.74-4.50)	4.24 (3.17-5.54)	4.76 (3.49-6.31)	5.30 (3.77-7.22)	5.89 (3.99-8.16)	6.73 (4.39-9.56)	7.40 (4.72-10.7)
12-hr	2.55 (2.00-3.19)	3.04 (2.38-3.80)	3.84 (2.99-4.80)	4.50 (3.49-5.65)	5.41 (4.06-7.02)	6.09 (4.49-8.04)	6.81 (4.88-9.25)	7.62 (5.18-10.5)	8.79 (5.76-12.4)	9.75 (6.24-14.0)
24-hr	2.98 (2.35-3.69)	3.60 (2.83-4.47)	4.61 (3.62-5.74)	5.46 (4.26-6.81)	6.62 (5.01-8.56)	7.48 (5.55-9.84)	8.40 (6.08-11.4)	9.48 (6.46-13.0)	11.1 (7.27-15.5)	12.4 (7.96-17.6)
2-day	3.35 (2.66-4.13)	4.10 (3.25-5.06)	5.33 (4.20-6.58)	6.35 (4.98-7.87)	7.75 (5.90-9.98)	8.78 (6.57-11.5)	9.91 (7.23-13.4)	11.3 (7.70-15.3)	13.3 (8.76-18.5)	15.1 (9.69-21.3)
3-day	3.63 (2.89-4.45)	4.45 (3.53-5.46)	5.78 (4.58-7.12)	6.89 (5.42-8.52)	8.42 (6.44-10.8)	9.55 (7.17-12.5)	10.8 (7.89-14.6)	12.3 (8.40-16.6)	14.5 (9.57-20.1)	16.4 (10.6-23.2)
4-day	3.89 (3.10-4.76)	4.75 (3.78-5.81)	6.16 (4.89-7.56)	7.33 (5.78-9.03)	8.94 (6.84-11.4)	10.1 (7.61-13.2)	11.4 (8.37-15.4)	13.0 (8.91-17.5)	15.3 (10.1-21.2)	17.4 (11.2-24.4)
7-day	4.63 (3.71-5.63)	5.57 (4.45-6.78)	7.11 (5.67-8.68)	8.39 (6.65-10.3)	10.1 (7.80-12.9)	11.5 (8.63-14.8)	12.9 (9.44-17.2)	14.5 (10.0-19.5)	17.0 (11.3-23.4)	19.2 (12.4-26.8)
10-day	5.35 (4.30-6.49)	6.35 (5.09-7.70)	7.98 (6.38-9.70)	9.32 (7.41-11.4)	11.2 (8.61-14.1)	12.6 (9.48-16.1)	14.0 (10.3-18.6)	15.8 (10.9-21.1)	18.3 (12.1-25.1)	20.4 (13.2-28.4)
20-day	7.56 (6.11-9.10)	8.67 (7.00-10.4)	10.5 (8.44-12.7)	12.0 (9.60-14.6)	14.1 (10.9-17.6)	15.7 (11.8-19.9)	17.3 (12.6-22.5)	19.1 (13.2-25.2)	21.5 (14.3-29.2)	23.4 (15.2-32.3)
30-day	9.39 (7.61-11.3)	10.6 (8.58-12.7)	12.6 (10.1-15.1)	14.2 (11.4-17.1)	16.4 (12.7-20.4)	18.2 (13.7-22.9)	19.9 (14.5-25.6)	21.7 (15.1-28.6)	24.0 (16.1-32.5)	25.8 (16.8-35.5)
45-day	11.6 (9.48-13.9)	13.0 (10.5-15.5)	15.1 (12.2-18.1)	16.9 (13.6-20.3)	19.4 (15.0-23.8)	21.3 (16.1-26.5)	23.1 (16.9-29.5)	25.0 (17.5-32.8)	27.3 (18.3-36.7)	28.9 (18.9-39.6)
60-day	13.5 (11.0-16.1)	14.9 (12.2-17.8)	17.2 (14.0-20.6)	19.1 (15.4-23.0)	21.8 (16.9-26.7)	23.8 (18.1-29.6)	25.8 (18.8-32.8)	27.7 (19.4-36.2)	30.0 (20.2-40.4)	31.7 (20.7-43.3)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

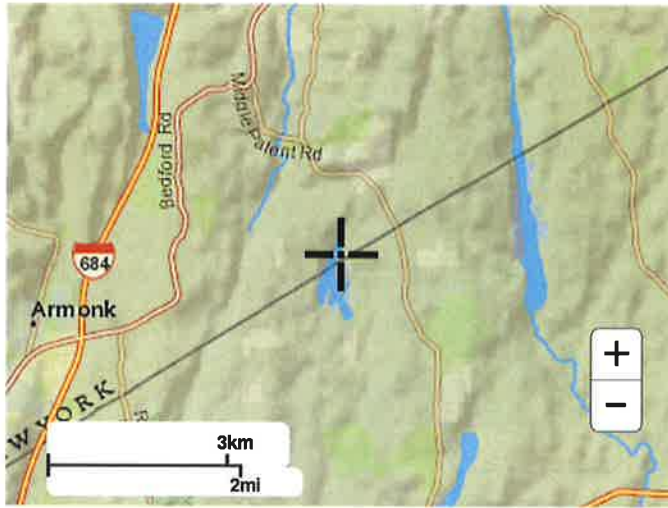
PF graphical

PDS-based depth-duration-frequency (DDF) curves
 Latitude: 41.1371°, Longitude: -73.6507°



Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



[Back to Top](#)

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

[Disclaimer](#)

Proposed Residence - 45 Hurlingham Drive, North Castle, NY

Certification Statement - All contractors and sub-contractors identified in a SWPPP in accordance with Part III.E.1 of this permit shall sign a copy of the following certification statement before undertaking any construction activity at the site identified in the SWPPP:

“I certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP for the construction site identified in such SWPPP as a condition of authorization to discharge stormwater. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (SPDES) general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards”.

Name

Title

Date

Firm Name

Address

Phone

Emergency phone and contact

Email

Note: The signatory requirements outlined in the General Permit must be followed

NOTICE OF INTENT**New York State Department of Environmental Conservation****Division of Water****625 Broadway, 4th Floor****Albany, New York 12233-3505**
 NYR

(for DEC use only)

**Stormwater Discharges Associated with Construction Activity Under State
Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-15-002**

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-**RETURN THIS FORM TO THE ADDRESS ABOVE****OWNER/OPERATOR MUST SIGN FORM**

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State

Zip

 -

Phone (Owner/Operator)

 - -

Fax (Owner/Operator)

 - -

Email (Owner/Operator)

FED TAX ID

 -

(not required for individuals)

Project Site Information

Project/Site Name

4 5 H u r l i n g h a m D r i v e

Street Address (NOT P.O. BOX)

4 5 H u r l i n g h a m D r i v e

Side of Street

 North South East West

City/Town/Village (THAT ISSUES BUILDING PERMIT)

N o r t h C a s t l e

State Zip

N Y 1 0 5 0 4 -

County

W e s t c h e s t e r

DEC Region

3

Name of Nearest Cross Street

C o w d r a y P a r k D r i v e

Distance to Nearest Cross Street (Feet)

1 8 0 0

Project In Relation to Cross Street

 North South East West

Tax Map Numbers

Section-Block-Parcel

1 0 2 . 0 4 - 1 - 2 6

Tax Map Numbers

1 0 2 . 0 4

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you must go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

6 1 3 2 9 4

Y Coordinates (Northing)

4 5 5 4 8 7 6

2. What is the nature of this construction project?

- New Construction
- Redevelopment with increase in impervious area
- Redevelopment with no increase in impervious area

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

**Pre-Development
Existing Land Use**

- FOREST
- PASTURE/OPEN LAND
- CULTIVATED LAND
- SINGLE FAMILY HOME
- SINGLE FAMILY SUBDIVISION
- TOWN HOME RESIDENTIAL
- MULTIFAMILY RESIDENTIAL
- INSTITUTIONAL/SCHOOL
- INDUSTRIAL
- COMMERCIAL
- ROAD/HIGHWAY
- RECREATIONAL/SPORTS FIELD
- BIKE PATH/TRAIL
- LINEAR UTILITY
- PARKING LOT
- OTHER

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**Post-Development
Future Land Use**

- SINGLE FAMILY HOME Number of Lots
- SINGLE FAMILY SUBDIVISION

--	--	--
- TOWN HOME RESIDENTIAL
- MULTIFAMILY RESIDENTIAL
- INSTITUTIONAL/SCHOOL
- INDUSTRIAL
- COMMERCIAL
- MUNICIPAL
- ROAD/HIGHWAY
- RECREATIONAL/SPORTS FIELD
- BIKE PATH/TRAIL
- LINEAR UTILITY (water, sewer, gas, etc.)
- PARKING LOT
- CLEARING/GRADING ONLY
- DEMOLITION, NO REDEVELOPMENT
- WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- OTHER

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

***Note:** for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area																								
<table border="1"><tr><td></td><td></td><td>1</td><td>0</td><td>.</td><td>3</td></tr></table>			1	0	.	3	<table border="1"><tr><td></td><td></td><td></td><td></td><td>.</td><td></td></tr></table>					.		<table border="1"><tr><td></td><td></td><td></td><td></td><td>.</td><td></td></tr></table>					.		<table border="1"><tr><td></td><td></td><td></td><td></td><td>.</td><td></td></tr></table>					.	
		1	0	.	3																						
				.																							
				.																							
				.																							

5. Do you plan to disturb more than 5 acres of soil at any one time? Yes No

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	B	C	D												
<table border="1"><tr><td></td><td></td><td></td></tr></table> %				<table border="1"><tr><td></td><td></td><td></td></tr></table> %				<table border="1"><tr><td></td><td></td><td></td></tr></table> %				<table border="1"><tr><td>1</td><td>0</td><td>0</td></tr></table> %	1	0	0
1	0	0													

7. Is this a phased project? Yes No

8. Enter the planned start and end dates of the disturbance activities.

Start Date	End Date																	
<table border="1"><tr><td>0</td><td>4</td></tr></table> / <table border="1"><tr><td>0</td><td>1</td></tr></table> / <table border="1"><tr><td>2</td><td>0</td><td>2</td><td>1</td></tr></table>	0	4	0	1	2	0	2	1	-	<table border="1"><tr><td>0</td><td>4</td></tr></table> / <table border="1"><tr><td>0</td><td>1</td></tr></table> / <table border="1"><tr><td>2</td><td>0</td><td>2</td><td>3</td></tr></table>	0	4	0	1	2	0	2	3
0	4																	
0	1																	
2	0	2	1															
0	4																	
0	1																	
2	0	2	3															

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? Yes No Unknown

16. What is the name of the municipality/entity that owns the separate storm sewer system?

Two rows of empty grid boxes for text entry.

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? Yes No Unknown

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? Yes No

19. Is this property owned by a state authority, state agency, federal government or local government? Yes No

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) Yes No

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? Yes No

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? Yes No
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? Yes No

25. Has a construction sequence schedule for the planned management practices been prepared? Yes No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- Check Dams
- Construction Road Stabilization
- Dust Control
- Earth Dike
- Level Spreader
- Perimeter Dike/Swale
- Pipe Slope Drain
- Portable Sediment Tank
- Rock Dam
- Sediment Basin
- Sediment Traps
- Silt Fence
- Stabilized Construction Entrance
- Storm Drain Inlet Protection
- Straw/Hay Bale Dike
- Temporary Access Waterway Crossing
- Temporary Stormdrain Diversion
- Temporary Swale
- Turbidity Curtain
- Water bars

Biotechnical

- Brush Matting
- Wattling

Other

S	t	r	e	e	t		s	w	e	e	p	i	n	g	,		s	t	a	g	i	n	g	,		c	o	n	s	t	r	u	c	t	i	o	n		
f	e	n	c	e	,		p	e	r	m	a	n	e	n	t		l	e	v	e	l		s	p	r	e	a	d	e	r	s								

Vegetative Measures

- Brush Matting
- Dune Stabilization
- Grassed Waterway
- Mulching
- Protecting Vegetation
- Recreation Area Improvement
- Seeding
- Sodding
- Straw/Hay Bale Dike
- Streambank Protection
- Temporary Swale
- Topsoiling
- Vegetating Waterways

Permanent Structural

- Debris Basin
- Diversion
- Grade Stabilization Structure
- Land Grading
- Lined Waterway (Rock)
- Paved Channel (Concrete)
- Paved Flume
- Retaining Wall
- Riprap Slope Protection
- Rock Outlet Protection
- Streambank Protection

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- Preservation of Undisturbed Areas
- Preservation of Buffers
- Reduction of Clearing and Grading
- Locating Development in Less Sensitive Areas
- Roadway Reduction
- Sidewalk Reduction
- Driveway Reduction
- Cul-de-sac Reduction
- Building Footprint Reduction
- Parking Reduction

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

- All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).
- Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

. acre-feet

29. Identify the RR techniques (Area Reduction), RR techniques (Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

<u>RR Techniques (Area Reduction)</u>	<u>Total Contributing Area (acres)</u>	<u>Total Contributing Impervious Area (acres)</u>
<input checked="" type="radio"/> Conservation of Natural Areas (RR-1) ...	2 . 5	and/or
<input type="radio"/> Sheetflow to Riparian Buffers/Filters Strips (RR-2)		and/or
<input type="radio"/> Tree Planting/Tree Pit (RR-3)		and/or
<input type="radio"/> Disconnection of Rooftop Runoff (RR-4) ..		and/or
<u>RR Techniques (Volume Reduction)</u>		
<input type="radio"/> Vegetated Swale (RR-5)		
<input type="radio"/> Rain Garden (RR-6)		
<input type="radio"/> Stormwater Planter (RR-7)		
<input type="radio"/> Rain Barrel/Cistern (RR-8)		
<input type="radio"/> Porous Pavement (RR-9)		
<input type="radio"/> Green Roof (RR-10)		
<u>Standard SMPs with RRv Capacity</u>		
<input type="radio"/> Infiltration Trench (I-1)		
<input type="radio"/> Infiltration Basin (I-2)		
<input type="radio"/> Dry Well (I-3)		
<input checked="" type="radio"/> Underground Infiltration System (I-4)	0	9 2
<input type="radio"/> Bioretention (F-5)		
<input type="radio"/> Dry Swale (O-1)		
<u>Standard SMPs</u>		
<input type="radio"/> Micropool Extended Detention (P-1)		
<input type="radio"/> Wet Pond (P-2)		
<input type="radio"/> Wet Extended Detention (P-3)		
<input type="radio"/> Multiple Pond System (P-4)		
<input type="radio"/> Pocket Pond (P-5)		
<input type="radio"/> Surface Sand Filter (F-1)		
<input type="radio"/> Underground Sand Filter (F-2)		
<input type="radio"/> Perimeter Sand Filter (F-3)		
<input type="radio"/> Organic Filter (F-4)		
<input type="radio"/> Shallow Wetland (W-1)		
<input type="radio"/> Extended Detention Wetland (W-2)		
<input type="radio"/> Pond/Wetland System (W-3)		
<input type="radio"/> Pocket Wetland (W-4)		
<input type="radio"/> Wet Swale (O-2)		

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided
 . acre-feet

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).

.

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? Yes No

If Yes, go to question 36.

If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required
 . acre-feet

CPv Provided
 . acre-feet

36a. The need to provide channel protection has been waived because:

- Site discharges directly to tidal waters or a fifth order or larger stream.
- Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development
 . CFS

Post-development
 . CFS

Total Extreme Flood Control Criteria (Qf)

Pre-Development
 . CFS

Post-development
 . CFS



SWPPP Preparer Certification Form

*SPDES General Permit for Stormwater
Discharges From Construction Activity
(GP-0-20-001)*

Project Site Information

Project/Site Name

Proposed Estate - 45 Hurlingham Drive, North Castle

Owner/Operator Information

Owner/Operator (Company Name/Private Owner/Municipality Name)

45 Hurlingham LLC

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Richard	A	Regan
First name	MI	Last Name

Signature

Date



Department of
Environmental
Conservation

NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

**MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance
Form**

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information

1. Owner/Operator Name:

2. Contact Person:

3. Street Address:

4. City/State/Zip:

II. Project Site Information

5. Project/Site Name: Proposed Residence

6. Street Address: 45 Hurlingham Drive

7. City/State/Zip: North Castle, New York 10504

III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information

8. SWPPP Reviewed by:

9. Title/Position:

10. Date Final SWPPP Reviewed and Accepted:

IV. Regulated MS4 Information

11. Name of MS4:

12. MS4 SPDES Permit Identification Number: NYR20A

13. Contact Person:

14. Street Address:

15. City/State/Zip:

16. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).
Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

Appendix “A”
Design Calculations

Client: 45 Hurlingham LLC
 Address: 45 Hurlingham Drive, North Castle NY
 Date: July 6, 2021

Water Quality Volume (WQV)

$$WQV = \frac{1 \text{ ft}}{12 \text{ in}} P_{90} (R_I A_I + R_P A_P)$$

Where:

P_{90}	=	90 th percentile rainfall	=	1.5 inches
R_I	=	Runoff coefficient for impervious	=	0.95
R_P	=	Runoff coefficient for turf	=	0.05
A_I	=	Area of impervious		
A_P	=	Area of turf		

Contributing Areas	Treatment	Impervious Area (sf)	Pervious Area (sf)	WQV (cf)
A0	None	1,860	128,990	1,027
A1	Chambers 1	9,220	32,700	1,299
A2	Chambers 2	9,880	5,910	1,210
A3	Chambers 3	7,250	0	861
A4	Chambers 4	14,020	0	1,665
B	None	0	62,790	392
C0	None	220	13,020	108
C1	Chambers 5	1,270	7,610	198
D	None	0	19,320	121
Total		43,720	270,340	6,881

Areas A0, B, C0, and D represent portions of the property that cannot feasibly be treated. They are typically downhill or undisturbed areas containing mostly pervious area and ledge. Ledge is counted as pervious for water quality purposes.

Limiting site disturbance satisfies the water quality requirement for the undisturbed area:

Undisturbed Area (WQV is satisfied)	WQV Subtracted from Total (cf)	Remaining WQV (cf)
2.50 acres (pervious)	681	$(6,881 - 681) = 6,200$

Proposed SMPs

Proposed SMP	To POC	WQV (cf)	Retained Volume (cf)	Total Volume (cf)
Chambers #1	A	1,299	1,633	1,633
Chambers #2	A	1,210	1,458	1,475
Chambers #3	A	861	1,114	1,127
Chambers #4	A	1,665	1,790	1,809
Chambers #5	C	198	262	262
Total		6,200*	6,257	6,306

*Remaining WQV site-wide

SMP Drawdown

$$t_{drawdown} = \frac{V}{kA}$$

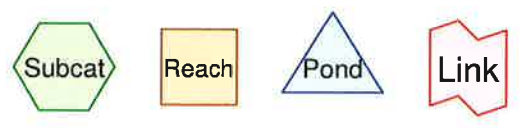
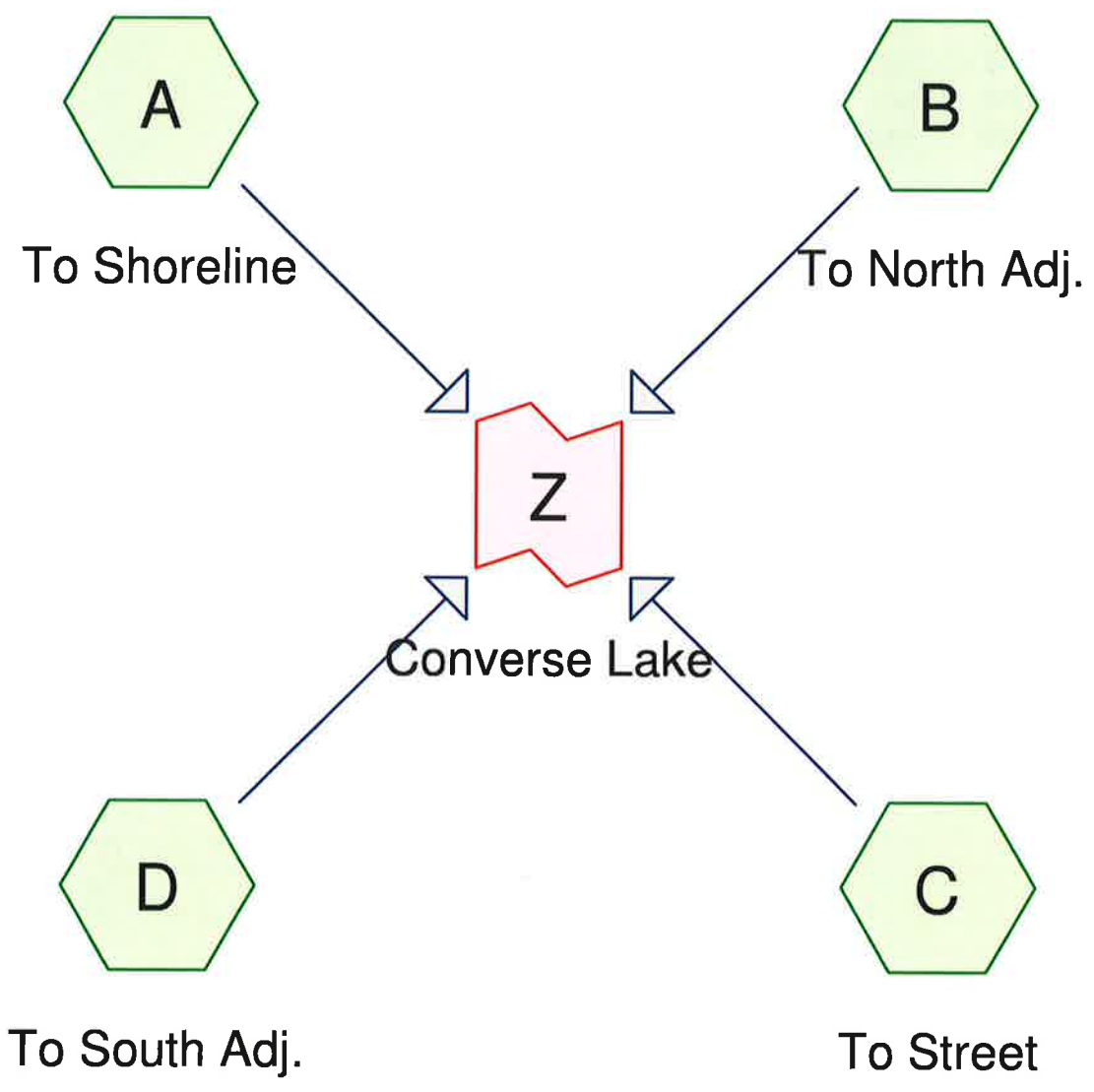
Where:

- V = Retained Volume
k = Infiltration (Rawl's) Rate = 6.9 in/hr (Test #2)
A = Infiltration (bottom) Area

Storage SMP	Design Volume (cf)	Infiltration Area (sf)	Drawdown Time (hr)
Chambers #1	1,633	732	4
Chambers #2	1,458	668	4
Chambers #3	1,114	532	4
Chambers #4	1,790	806	4
Chambers #5	262	219	2

Appendix “B”

**HydroCAD Analysis –
Existing Conditions**



Existing

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Page 2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
287,220	80.0	>75% Grass cover, Good, HSG D (A, B, C, D)
10,710	89.0	Compacted Dirt Drive (A, B, C)
15,230	98.0	Rock (A, B)
313,160	81.2	TOTAL AREA

Existing

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Type III 24-hr 1-Year Rainfall=2.98"

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Page 3

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: To Shoreline

Runoff Area=149,330 sf 8.08% Impervious Runoff Depth=1.34"
Flow Length=420' Tc=7.2 min CN=81.6 Runoff=5.11 cfs 16,637 cf

Subcatchment B: To North Adj.

Runoff Area=108,200 sf 2.93% Impervious Runoff Depth=1.30"
Flow Length=300' Tc=10.4 min CN=81.1 Runoff=3.24 cfs 11,763 cf

Subcatchment C: To Street

Runoff Area=26,030 sf 0.00% Impervious Runoff Depth=1.29"
Flow Length=210' Tc=8.2 min CN=80.8 Runoff=0.82 cfs 2,788 cf

Subcatchment D: To South Adj.

Runoff Area=29,600 sf 0.00% Impervious Runoff Depth=1.24"
Flow Length=120' Tc=6.5 min CN=80.0 Runoff=0.95 cfs 3,046 cf

Link Z: Converse Lake

Inflow=9.91 cfs 34,235 cf
Primary=9.91 cfs 34,235 cf

Total Runoff Area = 313,160 sf Runoff Volume = 34,235 cf Average Runoff Depth = 1.31"
95.14% Pervious = 297,930 sf 4.86% Impervious = 15,230 sf

Existing

Prepared by RVDI

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Type III 24-hr 2-Year Rainfall=3.60"

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Page 4

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: To Shoreline

Runoff Area=149,330 sf 8.08% Impervious Runoff Depth=1.84"
Flow Length=420' Tc=7.2 min CN=81.6 Runoff=7.06 cfs 22,835 cf

Subcatchment B: To North Adj.

Runoff Area=108,200 sf 2.93% Impervious Runoff Depth=1.80"
Flow Length=300' Tc=10.4 min CN=81.1 Runoff=4.50 cfs 16,206 cf

Subcatchment C: To Street

Runoff Area=26,030 sf 0.00% Impervious Runoff Depth=1.77"
Flow Length=210' Tc=8.2 min CN=80.8 Runoff=1.15 cfs 3,850 cf

Subcatchment D: To South Adj.

Runoff Area=29,600 sf 0.00% Impervious Runoff Depth=1.72"
Flow Length=120' Tc=6.5 min CN=80.0 Runoff=1.34 cfs 4,233 cf

Link Z: Converse Lake

Inflow=13.77 cfs 47,125 cf
Primary=13.77 cfs 47,125 cf

Total Runoff Area = 313,160 sf Runoff Volume = 47,125 cf Average Runoff Depth = 1.81"
95.14% Pervious = 297,930 sf 4.86% Impervious = 15,230 sf

Existing

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Type III 24-hr 5-Year Rainfall=4.61"

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Page 5

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: To Shoreline

Runoff Area=149,330 sf 8.08% Impervious Runoff Depth=2.70"
Flow Length=420' Tc=7.2 min CN=81.6 Runoff=10.39 cfs 33,560 cf

Subcatchment B: To North Adj.

Runoff Area=108,200 sf 2.93% Impervious Runoff Depth=2.65"
Flow Length=300' Tc=10.4 min CN=81.1 Runoff=6.67 cfs 23,915 cf

Subcatchment C: To Street

Runoff Area=26,030 sf 0.00% Impervious Runoff Depth=2.63"
Flow Length=210' Tc=8.2 min CN=80.8 Runoff=1.70 cfs 5,696 cf

Subcatchment D: To South Adj.

Runoff Area=29,600 sf 0.00% Impervious Runoff Depth=2.56"
Flow Length=120' Tc=6.5 min CN=80.0 Runoff=2.00 cfs 6,304 cf

Link Z: Converse Lake

Inflow=20.35 cfs 69,474 cf
Primary=20.35 cfs 69,474 cf

Total Runoff Area = 313,160 sf Runoff Volume = 69,474 cf Average Runoff Depth = 2.66"
95.14% Pervious = 297,930 sf 4.86% Impervious = 15,230 sf

Existing

Type III 24-hr 10-Year Rainfall=5.46"

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Page 6

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: To Shoreline

Runoff Area=149,330 sf 8.08% Impervious Runoff Depth=3.45"
Flow Length=420' Tc=7.2 min CN=81.6 Runoff=13.26 cfs 42,983 cf

Subcatchment B: To North Adj.

Runoff Area=108,200 sf 2.93% Impervious Runoff Depth=3.40"
Flow Length=300' Tc=10.4 min CN=81.1 Runoff=8.54 cfs 30,701 cf

Subcatchment C: To Street

Runoff Area=26,030 sf 0.00% Impervious Runoff Depth=3.38"
Flow Length=210' Tc=8.2 min CN=80.8 Runoff=2.19 cfs 7,322 cf

Subcatchment D: To South Adj.

Runoff Area=29,600 sf 0.00% Impervious Runoff Depth=3.30"
Flow Length=120' Tc=6.5 min CN=80.0 Runoff=2.58 cfs 8,135 cf

Link Z: Converse Lake

Inflow=26.04 cfs 89,141 cf
Primary=26.04 cfs 89,141 cf

Total Runoff Area = 313,160 sf Runoff Volume = 89,141 cf Average Runoff Depth = 3.42"
95.14% Pervious = 297,930 sf 4.86% Impervious = 15,230 sf

Existing

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Type III 24-hr 25-Year Rainfall=6.62"

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Page 7

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: To Shoreline

Runoff Area=149,330 sf 8.08% Impervious Runoff Depth=4.52"
Flow Length=420' Tc=7.2 min CN=81.6 Runoff=17.22 cfs 56,219 cf

Subcatchment B: To North Adj.

Runoff Area=108,200 sf 2.93% Impervious Runoff Depth=4.46"
Flow Length=300' Tc=10.4 min CN=81.1 Runoff=11.12 cfs 40,247 cf

Subcatchment C: To Street

Runoff Area=26,030 sf 0.00% Impervious Runoff Depth=4.43"
Flow Length=210' Tc=8.2 min CN=80.8 Runoff=2.85 cfs 9,612 cf

Subcatchment D: To South Adj.

Runoff Area=29,600 sf 0.00% Impervious Runoff Depth=4.35"
Flow Length=120' Tc=6.5 min CN=80.0 Runoff=3.38 cfs 10,718 cf

Link Z: Converse Lake

Inflow=33.89 cfs 116,795 cf
Primary=33.89 cfs 116,795 cf

Total Runoff Area = 313,160 sf Runoff Volume = 116,795 cf Average Runoff Depth = 4.48"
95.14% Pervious = 297,930 sf 4.86% Impervious = 15,230 sf

Existing

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Type III 24-hr 50-Year Rainfall=7.48"

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Page 8

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: To Shoreline

Runoff Area=149,330 sf 8.08% Impervious Runoff Depth=5.32"
Flow Length=420' Tc=7.2 min CN=81.6 Runoff=20.16 cfs 66,225 cf

Subcatchment B: To North Adj.

Runoff Area=108,200 sf 2.93% Impervious Runoff Depth=5.26"
Flow Length=300' Tc=10.4 min CN=81.1 Runoff=13.04 cfs 47,470 cf

Subcatchment C: To Street

Runoff Area=26,030 sf 0.00% Impervious Runoff Depth=5.23"
Flow Length=210' Tc=8.2 min CN=80.8 Runoff=3.35 cfs 11,346 cf

Subcatchment D: To South Adj.

Runoff Area=29,600 sf 0.00% Impervious Runoff Depth=5.14"
Flow Length=120' Tc=6.5 min CN=80.0 Runoff=3.97 cfs 12,677 cf

Link Z: Converse Lake

Inflow=39.74 cfs 137,718 cf
Primary=39.74 cfs 137,718 cf

Total Runoff Area = 313,160 sf Runoff Volume = 137,718 cf Average Runoff Depth = 5.28"
95.14% Pervious = 297,930 sf 4.86% Impervious = 15,230 sf

Existing

Prepared by RVDI

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 9

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A: To Shoreline

Runoff Area=149,330 sf 8.08% Impervious Runoff Depth=6.19"
Flow Length=420' Tc=7.2 min CN=81.6 Runoff=23.31 cfs 77,059 cf

Subcatchment B: To North Adj.

Runoff Area=108,200 sf 2.93% Impervious Runoff Depth=6.13"
Flow Length=300' Tc=10.4 min CN=81.1 Runoff=15.11 cfs 55,295 cf

Subcatchment C: To Street

Runoff Area=26,030 sf 0.00% Impervious Runoff Depth=6.10"
Flow Length=210' Tc=8.2 min CN=80.8 Runoff=3.88 cfs 13,225 cf

Subcatchment D: To South Adj.

Runoff Area=29,600 sf 0.00% Impervious Runoff Depth=6.00"
Flow Length=120' Tc=6.5 min CN=80.0 Runoff=4.61 cfs 14,802 cf

Link Z: Converse Lake

Inflow=46.00 cfs 160,382 cf
Primary=46.00 cfs 160,382 cf

Total Runoff Area = 313,160 sf Runoff Volume = 160,382 cf Average Runoff Depth = 6.15"
95.14% Pervious = 297,930 sf 4.86% Impervious = 15,230 sf

Existing

Prepared by RVDI

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Type III 24-hr 10-Year Rainfall=5.46"

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Page 10

Summary for Subcatchment A: To Shoreline

Runoff = 13.26 cfs @ 12.10 hrs, Volume= 42,983 cf, Depth= 3.45"

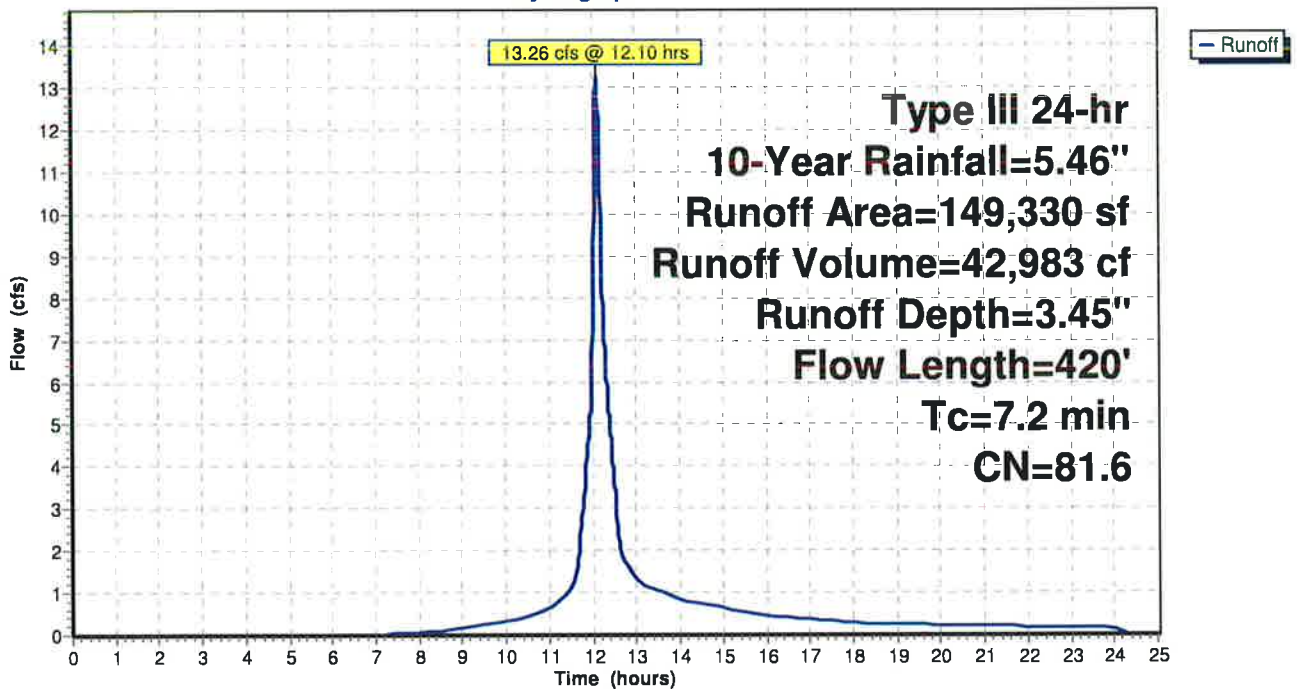
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
135,260	80.0	>75% Grass cover, Good, HSG D
* 12,060	98.0	Rock
* 2,010	89.0	Compacted Dirt Drive
149,330	81.6	Weighted Average
137,270		91.92% Pervious Area
12,060		8.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.1400	0.27		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
1.0	320	0.1200	5.20		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
7.2	420	Total			

Subcatchment A: To Shoreline

Hydrograph



Existing

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Type III 24-hr 10-Year Rainfall=5.46"

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Page 11

Summary for Subcatchment B: To North Adj.

Runoff = 8.54 cfs @ 12.14 hrs, Volume= 30,701 cf, Depth= 3.40"

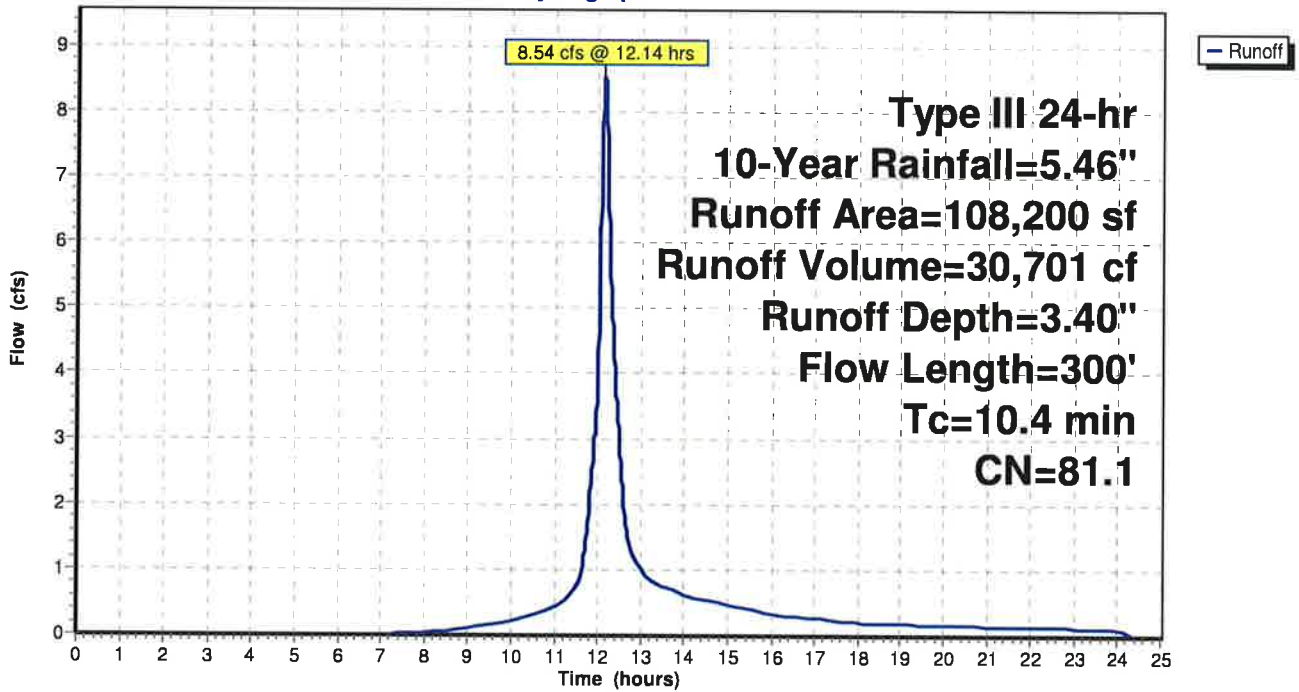
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
98,730	80.0	>75% Grass cover, Good, HSG D
* 3,170	98.0	Rock
* 6,300	89.0	Compacted Dirt Drive
108,200	81.1	Weighted Average
105,030		97.07% Pervious Area
3,170		2.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0450	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.7	200	0.1000	4.74		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
10.4	300	Total			

Subcatchment B: To North Adj.

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 12

Summary for Subcatchment C: To Street

Runoff = 2.19 cfs @ 12.12 hrs, Volume= 7,322 cf, Depth= 3.38"

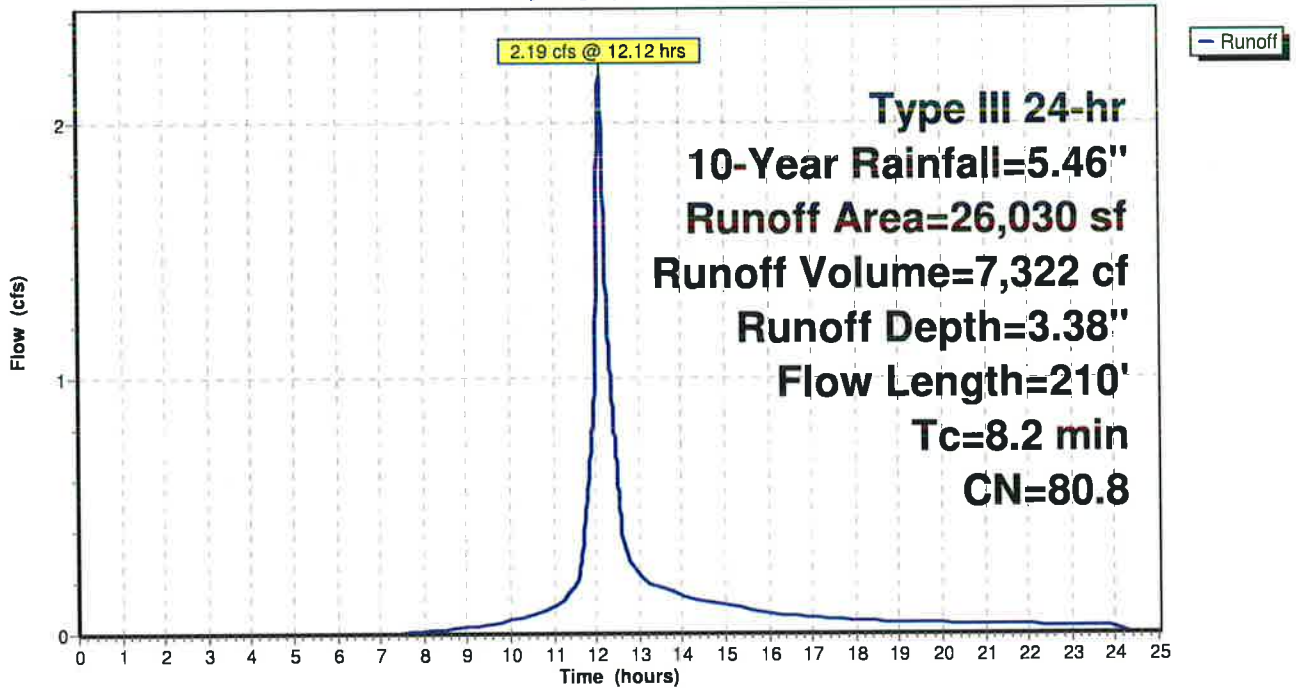
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
23,630	80.0	>75% Grass cover, Good, HSG D
* 2,400	89.0	Compacted Dirt Drive
26,030	80.8	Weighted Average
26,030		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0800	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.5	110	0.0700	3.97		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
8.2	210	Total			

Subcatchment C: To Street

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 13

Summary for Subcatchment D: To South Adj.

Runoff = 2.58 cfs @ 12.09 hrs, Volume= 8,135 cf, Depth= 3.30"

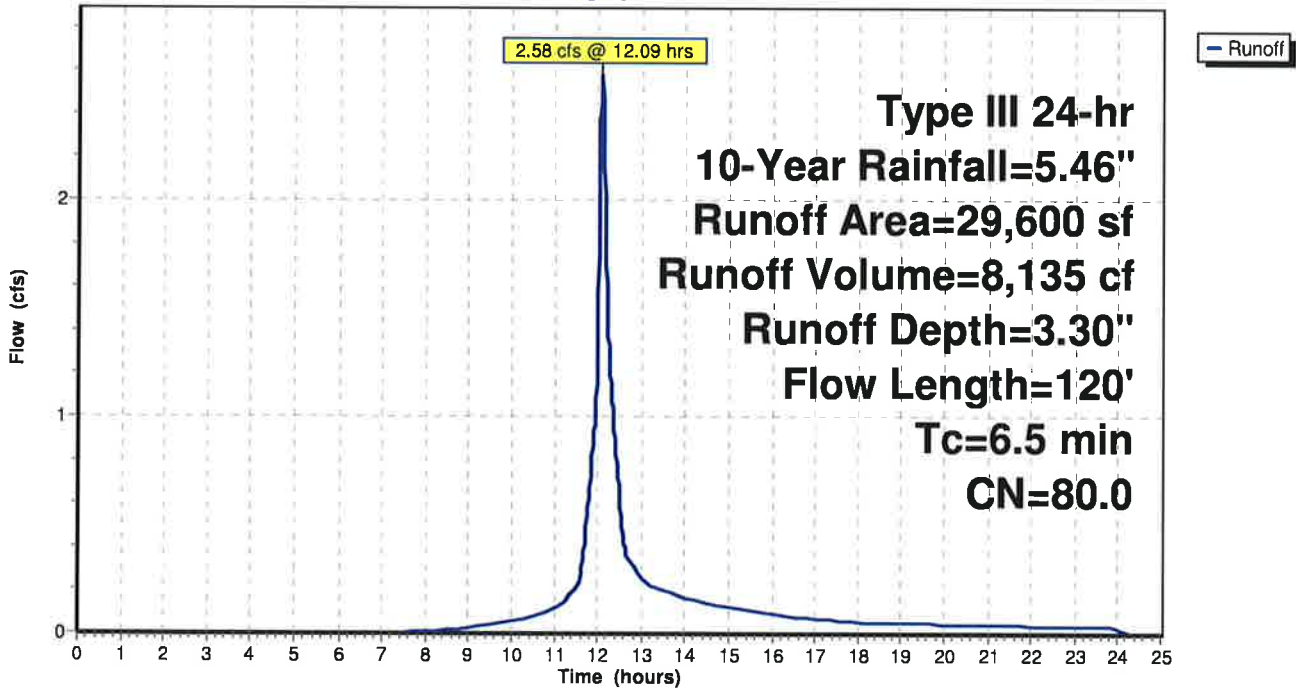
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
29,600	80.0	>75% Grass cover, Good, HSG D
29,600		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	100	0.1300	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.1	20	0.1200	5.20		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.5	120	Total			

Subcatchment D: To South Adj.

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 14

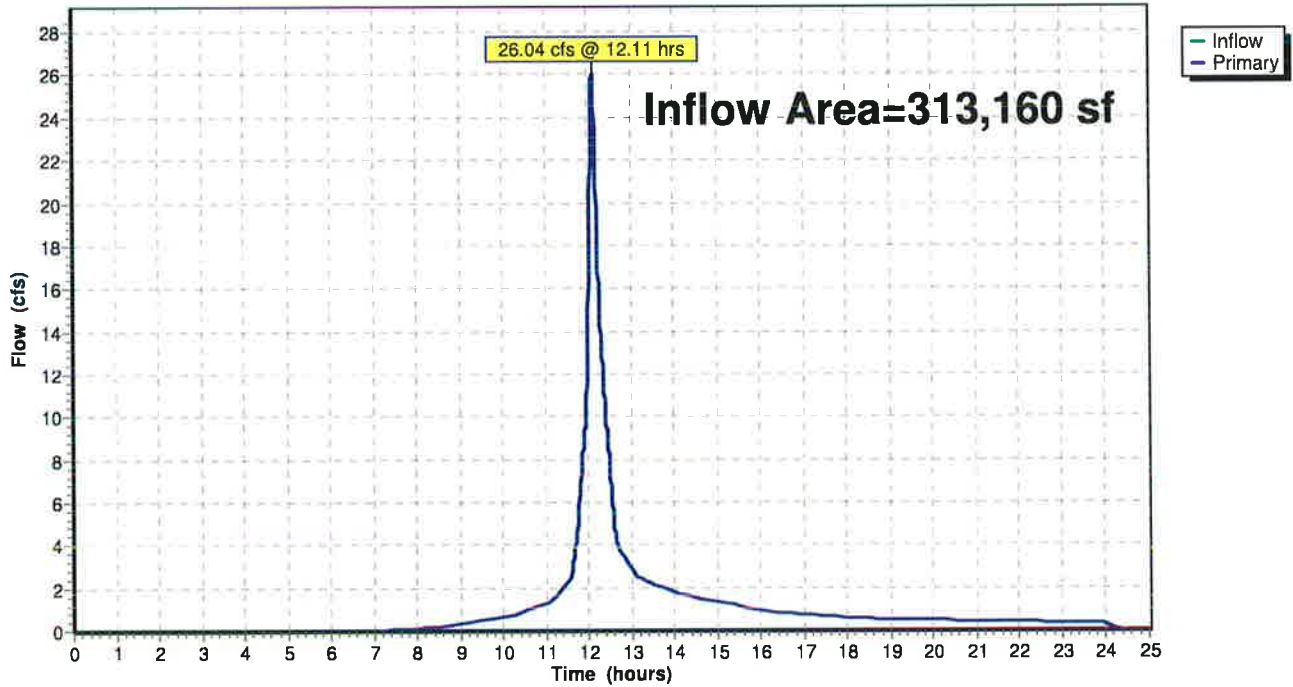
Summary for Link Z: Converse Lake

Inflow Area = 313,160 sf, 4.86% Impervious, Inflow Depth = 3.42" for 10-Year event
Inflow = 26.04 cfs @ 12.11 hrs, Volume= 89,141 cf
Primary = 26.04 cfs @ 12.11 hrs, Volume= 89,141 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

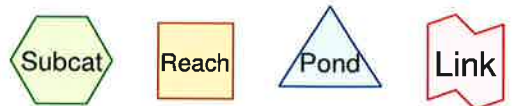
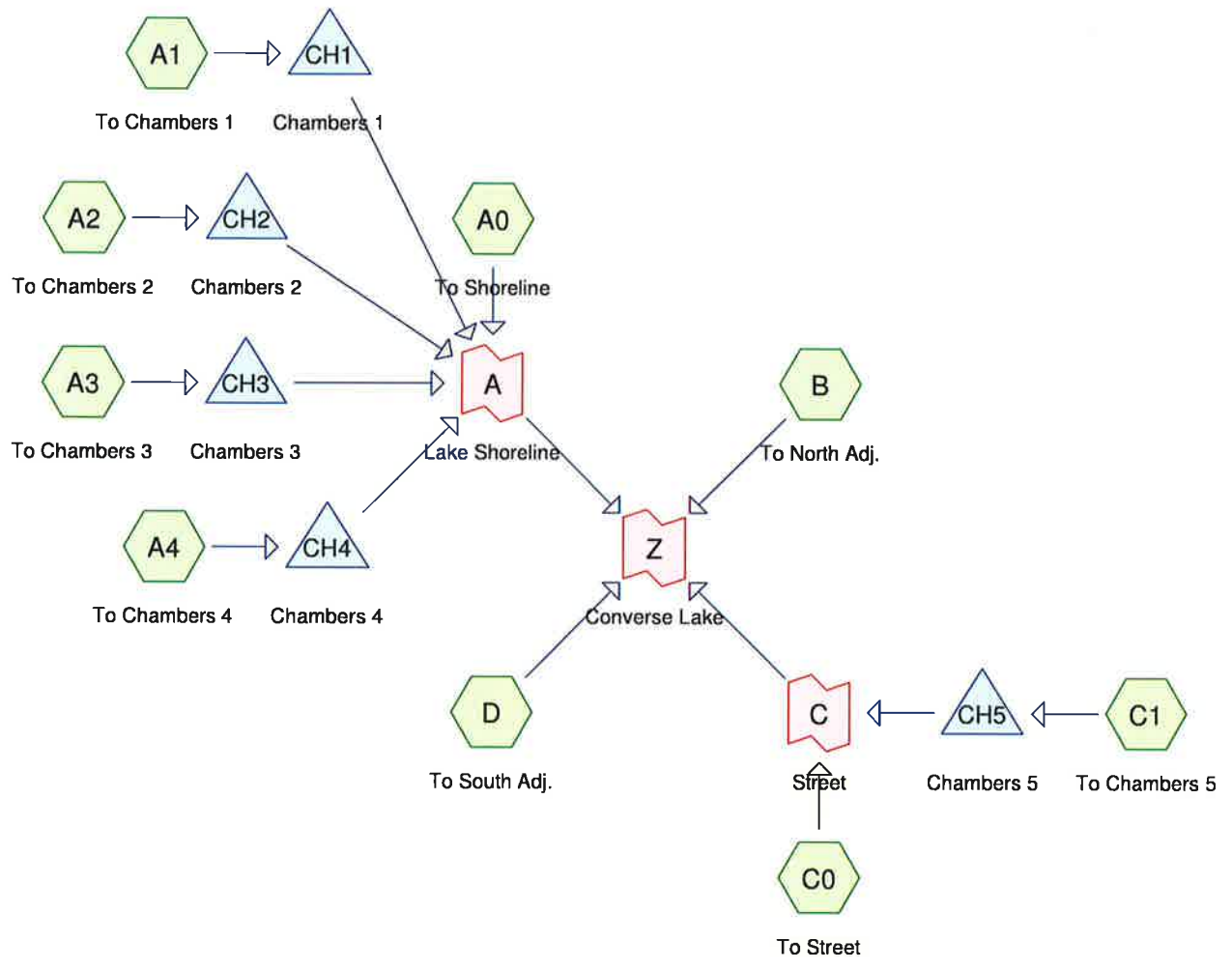
Link Z: Converse Lake

Hydrograph



Appendix “C”

**HydroCAD Analysis –
Proposed Conditions**



Routing Diagram for Proposed 2
 Prepared by RVDI, Printed 7/9/2021
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Proposed 2

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Page 2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
256,500	80.0	>75% Grass cover, Good, HSG D (A0, A1, A2, B, C0, C1, D)
15,770	98.0	Drive (A1, A2, A4, C0, C1)
13,840	98.0	Rock (A0, B)
11,830	98.0	Roof (A0, A1, A2, A4)
7,250	98.0	Roof & Patio (A3)
7,860	98.0	Tennis (A4)
1,010	98.0	Walk (A0, A1, A4)
314,060	83.3	TOTAL AREA

Proposed 2

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Type III 24-hr 1-Year Rainfall=2.98"

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Page 3

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A0: To Shoreline	Runoff Area=130,850 sf 10.64% Impervious Runoff Depth=1.36" Flow Length=190' Tc=6.2 min CN=81.9 Runoff=4.71 cfs 14,793 cf
Subcatchment A1: To Chambers 1	Runoff Area=41,920 sf 21.99% Impervious Runoff Depth=1.50" Flow Length=430' Tc=7.6 min CN=84.0 Runoff=1.60 cfs 5,239 cf
Subcatchment A2: To Chambers 2	Runoff Area=15,790 sf 62.57% Impervious Runoff Depth=2.08" Flow Length=470' Tc=14.7 min CN=91.3 Runoff=0.67 cfs 2,736 cf
Subcatchment A3: To Chambers 3	Runoff Area=7,250 sf 100.00% Impervious Runoff Depth=2.75" Tc=6.0 min CN=98.0 Runoff=0.48 cfs 1,660 cf
Subcatchment A4: To Chambers 4	Runoff Area=14,020 sf 100.00% Impervious Runoff Depth=2.75" Tc=6.0 min CN=98.0 Runoff=0.93 cfs 3,211 cf
Subcatchment B: To North Adj.	Runoff Area=62,790 sf 2.83% Impervious Runoff Depth=1.27" Flow Length=165' Tc=6.6 min CN=80.5 Runoff=2.07 cfs 6,626 cf
Subcatchment C0: To Street	Runoff Area=13,240 sf 1.66% Impervious Runoff Depth=1.25" Tc=6.0 min CN=80.3 Runoff=0.44 cfs 1,383 cf
Subcatchment C1: To Chambers 5	Runoff Area=8,880 sf 14.30% Impervious Runoff Depth=1.40" Tc=6.0 min CN=82.6 Runoff=0.33 cfs 1,038 cf
Subcatchment D: To South Adj.	Runoff Area=19,320 sf 0.00% Impervious Runoff Depth=1.24" Flow Length=120' Tc=7.9 min CN=80.0 Runoff=0.59 cfs 1,988 cf
Pond CH1: Chambers 1	Peak Elev=95.92' Storage=1,632 cf Inflow=1.60 cfs 5,239 cf Outflow=2.47 cfs 3,619 cf
Pond CH2: Chambers 2	Peak Elev=87.02' Storage=1,463 cf Inflow=0.67 cfs 2,736 cf Outflow=0.40 cfs 1,278 cf
Pond CH3: Chambers 3	Peak Elev=90.63' Storage=1,126 cf Inflow=0.48 cfs 1,660 cf Outflow=0.06 cfs 543 cf
Pond CH4: Chambers 4	Peak Elev=91.52' Storage=1,805 cf Inflow=0.93 cfs 3,211 cf Outflow=0.71 cfs 1,416 cf
Pond CH5: Chambers 5	Peak Elev=105.21' Storage=272 cf Inflow=0.33 cfs 1,038 cf Outflow=0.39 cfs 776 cf
Link A: Lake Shoreline	Inflow=6.14 cfs 21,649 cf Primary=6.14 cfs 21,649 cf
Link C: Street	Inflow=0.82 cfs 2,159 cf Primary=0.82 cfs 2,159 cf

Proposed 2

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Type III 24-hr 1-Year Rainfall=2.98"

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Page 4

Link Z: Converse Lake

Inflow=8.92 cfs 32,423 cf
Primary=8.92 cfs 32,423 cf

Total Runoff Area = 314,060 sf Runoff Volume = 38,676 cf Average Runoff Depth = 1.48"
81.67% Pervious = 256,500 sf 18.33% Impervious = 57,560 sf

Proposed 2

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Type III 24-hr 2-Year Rainfall=3.60"

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Page 5

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A0: To Shoreline Runoff Area=130,850 sf 10.64% Impervious Runoff Depth=1.86"
Flow Length=190' Tc=6.2 min CN=81.9 Runoff=6.50 cfs 20,258 cf

Subcatchment A1: To Chambers 1 Runoff Area=41,920 sf 21.99% Impervious Runoff Depth=2.02"
Flow Length=430' Tc=7.6 min CN=84.0 Runoff=2.16 cfs 7,065 cf

Subcatchment A2: To Chambers 2 Runoff Area=15,790 sf 62.57% Impervious Runoff Depth=2.66"
Flow Length=470' Tc=14.7 min CN=91.3 Runoff=0.85 cfs 3,506 cf

Subcatchment A3: To Chambers 3 Runoff Area=7,250 sf 100.00% Impervious Runoff Depth=3.37"
Tc=6.0 min CN=98.0 Runoff=0.58 cfs 2,034 cf

Subcatchment A4: To Chambers 4 Runoff Area=14,020 sf 100.00% Impervious Runoff Depth=3.37"
Tc=6.0 min CN=98.0 Runoff=1.13 cfs 3,933 cf

Subcatchment B: To North Adj. Runoff Area=62,790 sf 2.83% Impervious Runoff Depth=1.75"
Flow Length=165' Tc=6.6 min CN=80.5 Runoff=2.89 cfs 9,171 cf

Subcatchment C0: To Street Runoff Area=13,240 sf 1.66% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=80.3 Runoff=0.62 cfs 1,918 cf

Subcatchment C1: To Chambers 5 Runoff Area=8,880 sf 14.30% Impervious Runoff Depth=1.91"
Tc=6.0 min CN=82.6 Runoff=0.46 cfs 1,415 cf

Subcatchment D: To South Adj. Runoff Area=19,320 sf 0.00% Impervious Runoff Depth=1.72"
Flow Length=120' Tc=7.9 min CN=80.0 Runoff=0.83 cfs 2,763 cf

Pond CH1: Chambers 1 Peak Elev=95.84' Storage=1,632 cf Inflow=2.16 cfs 7,065 cf
Outflow=2.19 cfs 5,444 cf

Pond CH2: Chambers 2 Peak Elev=87.03' Storage=1,467 cf Inflow=0.85 cfs 3,506 cf
Outflow=0.90 cfs 2,048 cf

Pond CH3: Chambers 3 Peak Elev=90.83' Storage=1,131 cf Inflow=0.58 cfs 2,034 cf
Outflow=0.34 cfs 917 cf

Pond CH4: Chambers 4 Peak Elev=92.37' Storage=1,808 cf Inflow=1.13 cfs 3,933 cf
Outflow=1.73 cfs 2,138 cf

Pond CH5: Chambers 5 Peak Elev=105.36' Storage=272 cf Inflow=0.46 cfs 1,415 cf
Outflow=0.50 cfs 1,152 cf

Link A: Lake Shoreline Inflow=10.29 cfs 30,805 cf
Primary=10.29 cfs 30,805 cf

Link C: Street Inflow=1.12 cfs 3,070 cf
Primary=1.12 cfs 3,070 cf

Proposed 2

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Type III 24-hr 2-Year Rainfall=3.60"

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Page 6

Link Z: Converse Lake

Inflow=15.10 cfs 45,809 cf

Primary=15.10 cfs 45,809 cf

Total Runoff Area = 314,060 sf Runoff Volume = 52,062 cf Average Runoff Depth = 1.99"
81.67% Pervious = 256,500 sf 18.33% Impervious = 57,560 sf

Proposed 2

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Type III 24-hr 5-Year Rainfall=4.61"

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Page 7

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A0: To Shoreline	Runoff Area=130,850 sf 10.64% Impervious Runoff Depth=2.72" Flow Length=190' Tc=6.2 min CN=81.9 Runoff=9.52 cfs 29,700 cf
Subcatchment A1: To Chambers 1	Runoff Area=41,920 sf 21.99% Impervious Runoff Depth=2.92" Flow Length=430' Tc=7.6 min CN=84.0 Runoff=3.10 cfs 10,186 cf
Subcatchment A2: To Chambers 2	Runoff Area=15,790 sf 62.57% Impervious Runoff Depth=3.64" Flow Length=470' Tc=14.7 min CN=91.3 Runoff=1.14 cfs 4,784 cf
Subcatchment A3: To Chambers 3	Runoff Area=7,250 sf 100.00% Impervious Runoff Depth=4.37" Tc=6.0 min CN=98.0 Runoff=0.75 cfs 2,643 cf
Subcatchment A4: To Chambers 4	Runoff Area=14,020 sf 100.00% Impervious Runoff Depth=4.37" Tc=6.0 min CN=98.0 Runoff=1.45 cfs 5,110 cf
Subcatchment B: To North Adj.	Runoff Area=62,790 sf 2.83% Impervious Runoff Depth=2.60" Flow Length=165' Tc=6.6 min CN=80.5 Runoff=4.30 cfs 13,601 cf
Subcatchment C0: To Street	Runoff Area=13,240 sf 1.66% Impervious Runoff Depth=2.58" Tc=6.0 min CN=80.3 Runoff=0.92 cfs 2,849 cf
Subcatchment C1: To Chambers 5	Runoff Area=8,880 sf 14.30% Impervious Runoff Depth=2.79" Tc=6.0 min CN=82.6 Runoff=0.67 cfs 2,062 cf
Subcatchment D: To South Adj.	Runoff Area=19,320 sf 0.00% Impervious Runoff Depth=2.56" Flow Length=120' Tc=7.9 min CN=80.0 Runoff=1.24 cfs 4,114 cf
Pond CH1: Chambers 1	Peak Elev=96.17' Storage=1,633 cf Inflow=3.10 cfs 10,186 cf Outflow=3.11 cfs 8,565 cf
Pond CH2: Chambers 2	Peak Elev=87.04' Storage=1,469 cf Inflow=1.14 cfs 4,784 cf Outflow=1.23 cfs 3,325 cf
Pond CH3: Chambers 3	Peak Elev=91.04' Storage=1,136 cf Inflow=0.75 cfs 2,643 cf Outflow=0.75 cfs 1,525 cf
Pond CH4: Chambers 4	Peak Elev=92.08' Storage=1,807 cf Inflow=1.45 cfs 5,110 cf Outflow=1.45 cfs 3,315 cf
Pond CH5: Chambers 5	Peak Elev=105.63' Storage=272 cf Inflow=0.67 cfs 2,062 cf Outflow=0.67 cfs 1,800 cf
Link A: Lake Shoreline	Inflow=15.64 cfs 46,431 cf Primary=15.64 cfs 46,431 cf
Link C: Street	Inflow=1.58 cfs 4,649 cf Primary=1.58 cfs 4,649 cf

Proposed 2

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Type III 24-hr 5-Year Rainfall=4.61"

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Page 8

Link Z: Converse Lake

Inflow=22.67 cfs 68,795 cf
Primary=22.67 cfs 68,795 cf

Total Runoff Area = 314,060 sf Runoff Volume = 75,049 cf Average Runoff Depth = 2.87"
81.67% Pervious = 256,500 sf 18.33% Impervious = 57,560 sf

Proposed 2

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Type III 24-hr 10-Year Rainfall=5.46"

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Page 9

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A0: To Shoreline	Runoff Area=130,850 sf 10.64% Impervious Runoff Depth=3.48" Flow Length=190' Tc=6.2 min CN=81.9 Runoff=12.13 cfs 37,987 cf
Subcatchment A1: To Chambers 1	Runoff Area=41,920 sf 21.99% Impervious Runoff Depth=3.69" Flow Length=430' Tc=7.6 min CN=84.0 Runoff=3.90 cfs 12,904 cf
Subcatchment A2: To Chambers 2	Runoff Area=15,790 sf 62.57% Impervious Runoff Depth=4.46" Flow Length=470' Tc=14.7 min CN=91.3 Runoff=1.38 cfs 5,872 cf
Subcatchment A3: To Chambers 3	Runoff Area=7,250 sf 100.00% Impervious Runoff Depth=5.22" Tc=6.0 min CN=98.0 Runoff=0.89 cfs 3,155 cf
Subcatchment A4: To Chambers 4	Runoff Area=14,020 sf 100.00% Impervious Runoff Depth=5.22" Tc=6.0 min CN=98.0 Runoff=1.72 cfs 6,102 cf
Subcatchment B: To North Adj.	Runoff Area=62,790 sf 2.83% Impervious Runoff Depth=3.35" Flow Length=165' Tc=6.6 min CN=80.5 Runoff=5.53 cfs 17,510 cf
Subcatchment C0: To Street	Runoff Area=13,240 sf 1.66% Impervious Runoff Depth=3.33" Tc=6.0 min CN=80.3 Runoff=1.18 cfs 3,671 cf
Subcatchment C1: To Chambers 5	Runoff Area=8,880 sf 14.30% Impervious Runoff Depth=3.55" Tc=6.0 min CN=82.6 Runoff=0.84 cfs 2,629 cf
Subcatchment D: To South Adj.	Runoff Area=19,320 sf 0.00% Impervious Runoff Depth=3.30" Flow Length=120' Tc=7.9 min CN=80.0 Runoff=1.60 cfs 5,309 cf
Pond CH1: Chambers 1	Peak Elev=96.57' Storage=1,633 cf Inflow=3.90 cfs 12,904 cf Outflow=3.91 cfs 11,283 cf
Pond CH2: Chambers 2	Peak Elev=87.04' Storage=1,470 cf Inflow=1.38 cfs 5,872 cf Outflow=1.38 cfs 4,414 cf
Pond CH3: Chambers 3	Peak Elev=91.11' Storage=1,137 cf Inflow=0.89 cfs 3,155 cf Outflow=0.89 cfs 2,038 cf
Pond CH4: Chambers 4	Peak Elev=92.38' Storage=1,809 cf Inflow=1.72 cfs 6,102 cf Outflow=1.72 cfs 4,307 cf
Pond CH5: Chambers 5	Peak Elev=106.01' Storage=272 cf Inflow=0.84 cfs 2,629 cf Outflow=0.84 cfs 2,367 cf
Link A: Lake Shoreline	Inflow=19.61 cfs 60,028 cf Primary=19.61 cfs 60,028 cf
Link C: Street	Inflow=2.03 cfs 6,038 cf Primary=2.03 cfs 6,038 cf

Proposed 2

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Type III 24-hr 10-Year Rainfall=5.46"

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Page 10

Link Z: Converse Lake

Inflow=28.72 cfs 88,885 cf
Primary=28.72 cfs 88,885 cf

Total Runoff Area = 314,060 sf Runoff Volume = 95,139 cf Average Runoff Depth = 3.64"
81.67% Pervious = 256,500 sf 18.33% Impervious = 57,560 sf

Proposed 2

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Type III 24-hr 25-Year Rainfall=6.62"

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Page 11

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A0: To Shoreline	Runoff Area=130,850 sf 10.64% Impervious Runoff Depth=4.55" Flow Length=190' Tc=6.2 min CN=81.9 Runoff=15.72 cfs 49,617 cf
Subcatchment A1: To Chambers 1	Runoff Area=41,920 sf 21.99% Impervious Runoff Depth=4.78" Flow Length=430' Tc=7.6 min CN=84.0 Runoff=5.00 cfs 16,697 cf
Subcatchment A2: To Chambers 2	Runoff Area=15,790 sf 62.57% Impervious Runoff Depth=5.60" Flow Length=470' Tc=14.7 min CN=91.3 Runoff=1.72 cfs 7,368 cf
Subcatchment A3: To Chambers 3	Runoff Area=7,250 sf 100.00% Impervious Runoff Depth=6.38" Tc=6.0 min CN=98.0 Runoff=1.08 cfs 3,855 cf
Subcatchment A4: To Chambers 4	Runoff Area=14,020 sf 100.00% Impervious Runoff Depth=6.38" Tc=6.0 min CN=98.0 Runoff=2.09 cfs 7,455 cf
Subcatchment B: To North Adj.	Runoff Area=62,790 sf 2.83% Impervious Runoff Depth=4.40" Flow Length=165' Tc=6.6 min CN=80.5 Runoff=7.22 cfs 23,017 cf
Subcatchment C0: To Street	Runoff Area=13,240 sf 1.66% Impervious Runoff Depth=4.38" Tc=6.0 min CN=80.3 Runoff=1.55 cfs 4,830 cf
Subcatchment C1: To Chambers 5	Runoff Area=8,880 sf 14.30% Impervious Runoff Depth=4.63" Tc=6.0 min CN=82.6 Runoff=1.09 cfs 3,424 cf
Subcatchment D: To South Adj.	Runoff Area=19,320 sf 0.00% Impervious Runoff Depth=4.35" Flow Length=120' Tc=7.9 min CN=80.0 Runoff=2.10 cfs 6,996 cf
Pond CH1: Chambers 1	Peak Elev=97.25' Storage=1,633 cf Inflow=5.00 cfs 16,697 cf Outflow=5.00 cfs 15,076 cf
Pond CH2: Chambers 2	Peak Elev=87.05' Storage=1,470 cf Inflow=1.72 cfs 7,368 cf Outflow=1.72 cfs 5,910 cf
Pond CH3: Chambers 3	Peak Elev=91.25' Storage=1,141 cf Inflow=1.08 cfs 3,855 cf Outflow=1.08 cfs 2,738 cf
Pond CH4: Chambers 4	Peak Elev=92.89' Storage=1,809 cf Inflow=2.09 cfs 7,455 cf Outflow=2.09 cfs 5,660 cf
Pond CH5: Chambers 5	Peak Elev=106.68' Storage=272 cf Inflow=1.09 cfs 3,424 cf Outflow=1.09 cfs 3,161 cf
Link A: Lake Shoreline	Inflow=25.09 cfs 79,001 cf Primary=25.09 cfs 79,001 cf
Link C: Street	Inflow=2.64 cfs 7,991 cf Primary=2.64 cfs 7,991 cf

Proposed 2

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Type III 24-hr 25-Year Rainfall=6.62"

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Page 12

Link Z: Converse Lake

Inflow=37.00 cfs 117,005 cf

Primary=37.00 cfs 117,005 cf

Total Runoff Area = 314,060 sf Runoff Volume = 123,259 cf Average Runoff Depth = 4.71"
81.67% Pervious = 256,500 sf 18.33% Impervious = 57,560 sf

Proposed 2

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Type III 24-hr 50-Year Rainfall=7.48"

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Page 13

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A0: To Shoreline	Runoff Area=130,850 sf 10.64% Impervious Runoff Depth=5.36" Flow Length=190' Tc=6.2 min CN=81.9 Runoff=18.39 cfs 58,404 cf
Subcatchment A1: To Chambers 1	Runoff Area=41,920 sf 21.99% Impervious Runoff Depth=5.60" Flow Length=430' Tc=7.6 min CN=84.0 Runoff=5.82 cfs 19,553 cf
Subcatchment A2: To Chambers 2	Runoff Area=15,790 sf 62.57% Impervious Runoff Depth=6.45" Flow Length=470' Tc=14.7 min CN=91.3 Runoff=1.96 cfs 8,483 cf
Subcatchment A3: To Chambers 3	Runoff Area=7,250 sf 100.00% Impervious Runoff Depth=7.24" Tc=6.0 min CN=98.0 Runoff=1.22 cfs 4,374 cf
Subcatchment A4: To Chambers 4	Runoff Area=14,020 sf 100.00% Impervious Runoff Depth=7.24" Tc=6.0 min CN=98.0 Runoff=2.36 cfs 8,459 cf
Subcatchment B: To North Adj.	Runoff Area=62,790 sf 2.83% Impervious Runoff Depth=5.20" Flow Length=165' Tc=6.6 min CN=80.5 Runoff=8.48 cfs 27,189 cf
Subcatchment C0: To Street	Runoff Area=13,240 sf 1.66% Impervious Runoff Depth=5.17" Tc=6.0 min CN=80.3 Runoff=1.82 cfs 5,708 cf
Subcatchment C1: To Chambers 5	Runoff Area=8,880 sf 14.30% Impervious Runoff Depth=5.44" Tc=6.0 min CN=82.6 Runoff=1.27 cfs 4,023 cf
Subcatchment D: To South Adj.	Runoff Area=19,320 sf 0.00% Impervious Runoff Depth=5.14" Flow Length=120' Tc=7.9 min CN=80.0 Runoff=2.47 cfs 8,274 cf
Pond CH1: Chambers 1	Peak Elev=97.87' Storage=1,633 cf Inflow=5.82 cfs 19,553 cf Outflow=5.82 cfs 17,932 cf
Pond CH2: Chambers 2	Peak Elev=87.06' Storage=1,470 cf Inflow=1.96 cfs 8,483 cf Outflow=1.96 cfs 7,024 cf
Pond CH3: Chambers 3	Peak Elev=91.36' Storage=1,143 cf Inflow=1.22 cfs 4,374 cf Outflow=1.22 cfs 3,257 cf
Pond CH4: Chambers 4	Peak Elev=93.31' Storage=1,809 cf Inflow=2.36 cfs 8,459 cf Outflow=2.36 cfs 6,664 cf
Pond CH5: Chambers 5	Peak Elev=107.29' Storage=272 cf Inflow=1.27 cfs 4,023 cf Outflow=1.27 cfs 3,761 cf
Link A: Lake Shoreline	Inflow=29.15 cfs 93,282 cf Primary=29.15 cfs 93,282 cf
Link C: Street	Inflow=3.09 cfs 9,469 cf Primary=3.09 cfs 9,469 cf

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Type III 24-hr 50-Year Rainfall=7.48"

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Page 14

Link Z: Converse Lake

Inflow=43.14 cfs 138,214 cf

Primary=43.14 cfs 138,214 cf

Total Runoff Area = 314,060 sf Runoff Volume = 144,468 cf Average Runoff Depth = 5.52"
81.67% Pervious = 256,500 sf 18.33% Impervious = 57,560 sf

Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 15

Time span=0.00-25.00 hrs, dt=0.01 hrs, 2501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment A0: To Shoreline Runoff Area=130,850 sf 10.64% Impervious Runoff Depth=6.23"
Flow Length=190' Tc=6.2 min CN=81.9 Runoff=21.24 cfs 67,915 cf

Subcatchment A1: To Chambers 1 Runoff Area=41,920 sf 21.99% Impervious Runoff Depth=6.48"
Flow Length=430' Tc=7.6 min CN=84.0 Runoff=6.69 cfs 22,636 cf

Subcatchment A2: To Chambers 2 Runoff Area=15,790 sf 62.57% Impervious Runoff Depth=7.36"
Flow Length=470' Tc=14.7 min CN=91.3 Runoff=2.22 cfs 9,679 cf

Subcatchment A3: To Chambers 3 Runoff Area=7,250 sf 100.00% Impervious Runoff Depth=8.16"
Tc=6.0 min CN=98.0 Runoff=1.37 cfs 4,930 cf

Subcatchment A4: To Chambers 4 Runoff Area=14,020 sf 100.00% Impervious Runoff Depth=8.16"
Tc=6.0 min CN=98.0 Runoff=2.65 cfs 9,534 cf

Subcatchment B: To North Adj. Runoff Area=62,790 sf 2.83% Impervious Runoff Depth=6.06"
Flow Length=165' Tc=6.6 min CN=80.5 Runoff=9.83 cfs 31,713 cf

Subcatchment C0: To Street Runoff Area=13,240 sf 1.66% Impervious Runoff Depth=6.04"
Tc=6.0 min CN=80.3 Runoff=2.11 cfs 6,661 cf

Subcatchment C1: To Chambers 5 Runoff Area=8,880 sf 14.30% Impervious Runoff Depth=6.31"
Tc=6.0 min CN=82.6 Runoff=1.47 cfs 4,671 cf

Subcatchment D: To South Adj. Runoff Area=19,320 sf 0.00% Impervious Runoff Depth=6.00"
Flow Length=120' Tc=7.9 min CN=80.0 Runoff=2.87 cfs 9,662 cf

Pond CH1: Chambers 1 Peak Elev=98.63' Storage=1,633 cf Inflow=6.69 cfs 22,636 cf
Outflow=6.69 cfs 21,015 cf

Pond CH2: Chambers 2 Peak Elev=87.06' Storage=1,470 cf Inflow=2.22 cfs 9,679 cf
Outflow=2.22 cfs 8,220 cf

Pond CH3: Chambers 3 Peak Elev=91.50' Storage=1,147 cf Inflow=1.37 cfs 4,930 cf
Outflow=1.37 cfs 3,813 cf

Pond CH4: Chambers 4 Peak Elev=93.86' Storage=1,809 cf Inflow=2.65 cfs 9,534 cf
Outflow=2.67 cfs 7,738 cf

Pond CH5: Chambers 5 Peak Elev=108.07' Storage=272 cf Inflow=1.47 cfs 4,671 cf
Outflow=1.47 cfs 4,409 cf

Link A: Lake Shoreline Inflow=33.50 cfs 108,702 cf
Primary=33.50 cfs 108,702 cf

Link C: Street Inflow=3.58 cfs 11,069 cf
Primary=3.58 cfs 11,069 cf

Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 16

Link Z: Converse Lake

Inflow=49.70 cfs 161,146 cf

Primary=49.70 cfs 161,146 cf

Total Runoff Area = 314,060 sf Runoff Volume = 167,400 cf Average Runoff Depth = 6.40"
81.67% Pervious = 256,500 sf 18.33% Impervious = 57,560 sf

Proposed 2

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Type III 24-hr 1-Year Rainfall=2.98"

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Page 17

Summary for Subcatchment A0: To Shoreline

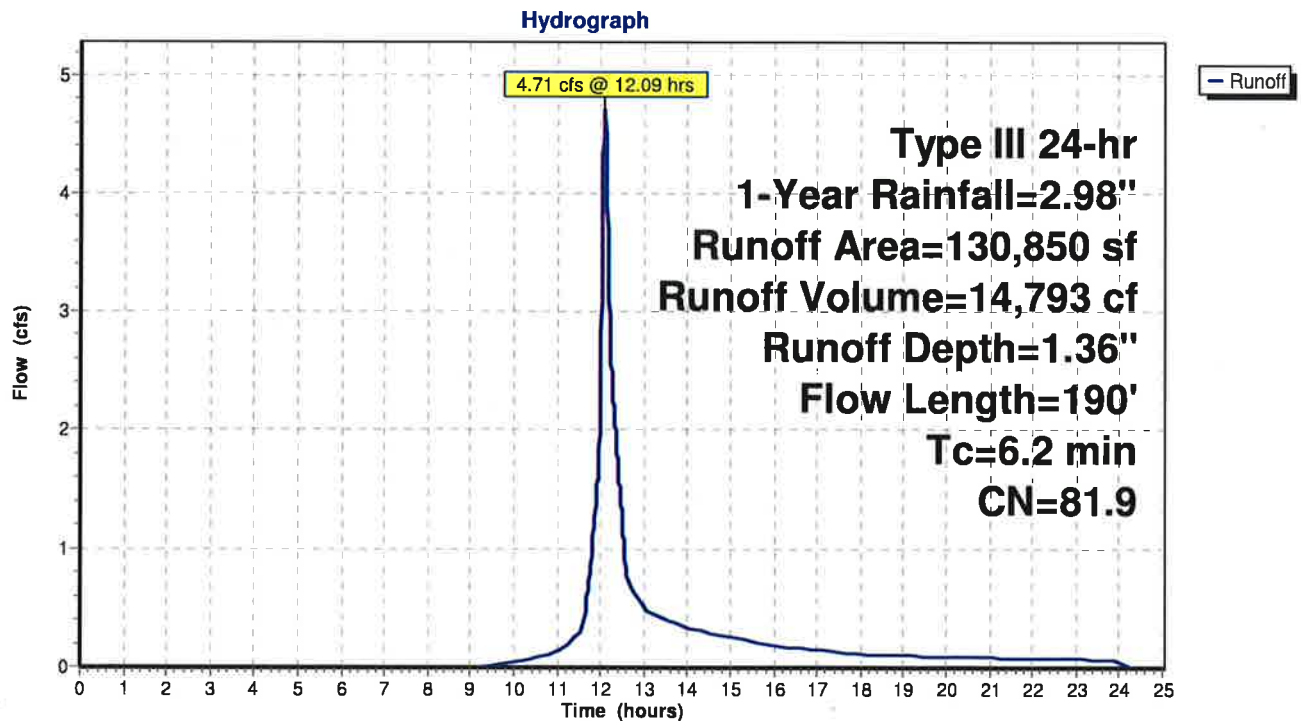
Runoff = 4.71 cfs @ 12.09 hrs, Volume= 14,793 cf, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.98"

Area (sf)	CN	Description
116,930	80.0	>75% Grass cover, Good, HSG D
* 12,060	98.0	Rock
* 550	98.0	Walk
* 1,310	98.0	Roof
130,850	81.9	Weighted Average
116,930		89.36% Pervious Area
13,920		10.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	100	0.1500	0.28		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.2	90	0.3000	8.22		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.2	190	Total			

Subcatchment A0: To Shoreline



Proposed 2

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Type III 24-hr 1-Year Rainfall=2.98"

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Page 18

Summary for Subcatchment A1: To Chambers 1

Runoff = 1.60 cfs @ 12.11 hrs, Volume= 5,239 cf, Depth= 1.50"

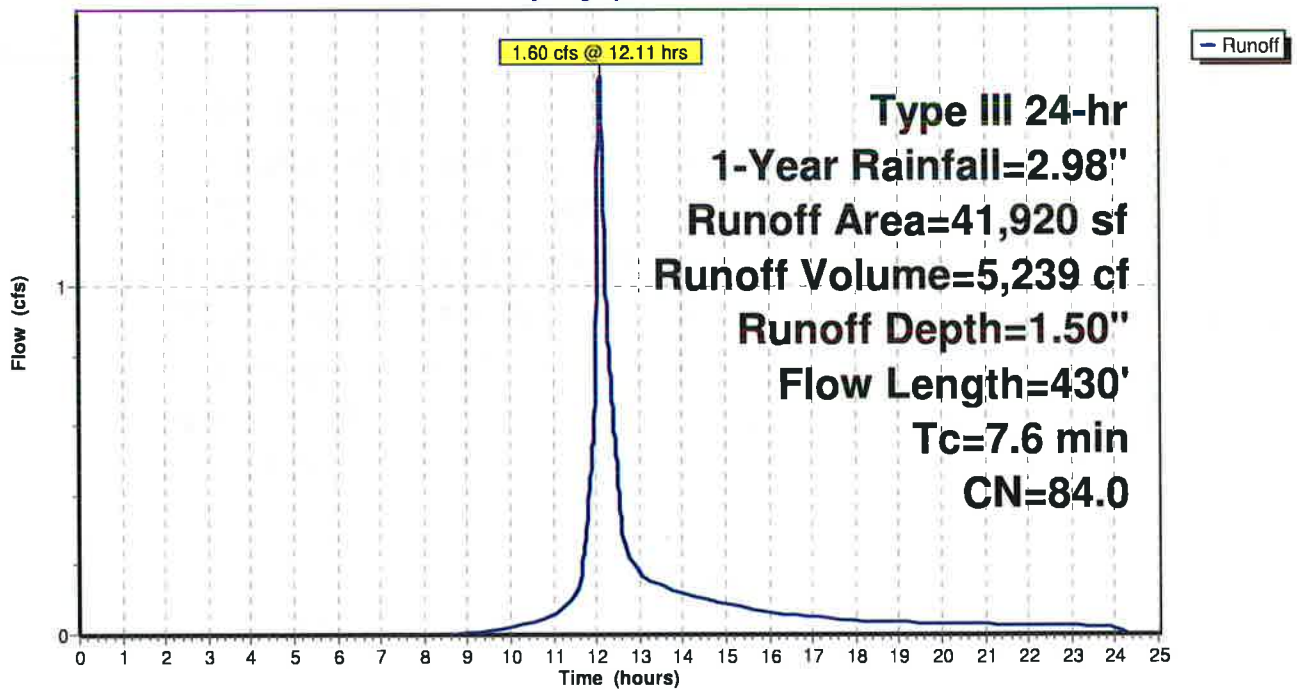
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.98"

	Area (sf)	CN	Description
*	1,280	98.0	Roof
*	7,710	98.0	Drive
*	230	98.0	Walk
	32,700	80.0	>75% Grass cover, Good, HSG D
	41,920	84.0	Weighted Average
	32,700		78.01% Pervious Area
	9,220		21.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	85	0.1000	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
1.4	345	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.6	430	Total			

Subcatchment A1: To Chambers 1

Hydrograph



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 19

Summary for Subcatchment A2: To Chambers 2

Runoff = 0.67 cfs @ 12.20 hrs, Volume= 2,736 cf, Depth= 2.08"

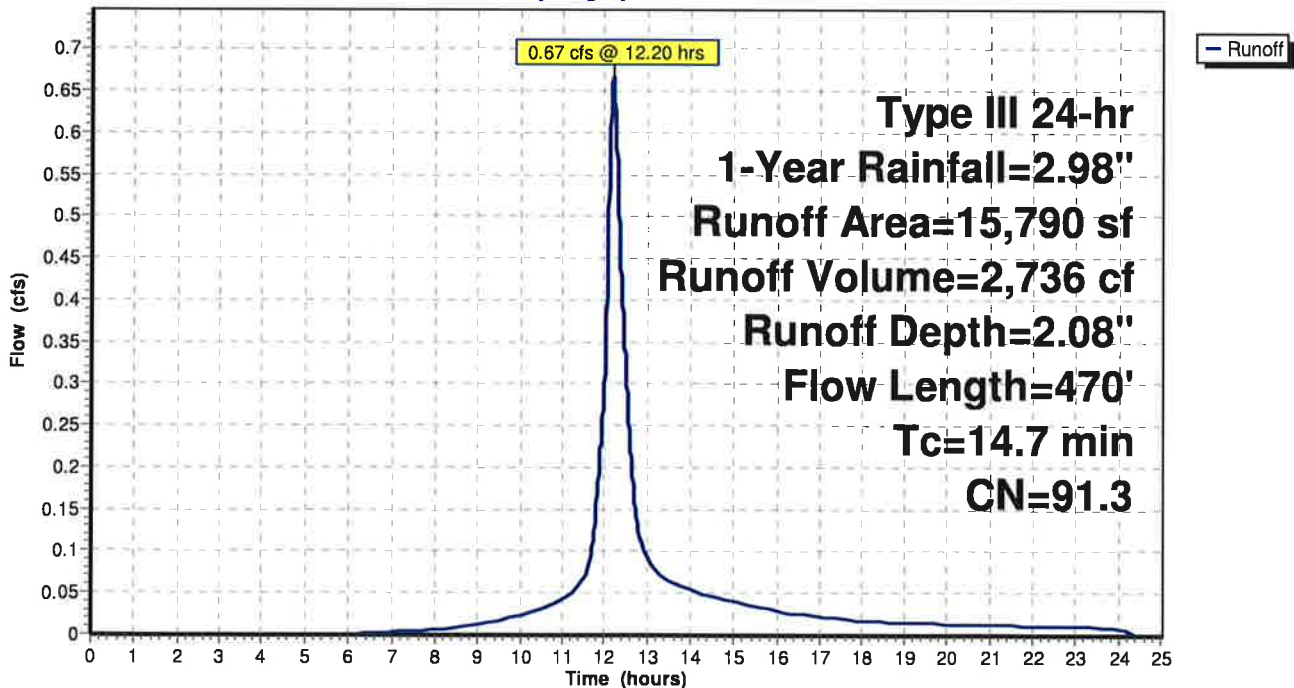
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.98"

Area (sf)	CN	Description
* 6,340	98.0	Roof
* 3,540	98.0	Drive
5,910	80.0	>75% Grass cover, Good, HSG D
15,790	91.3	Weighted Average
5,910		37.43% Pervious Area
9,880		62.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0250	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
1.8	280	0.0300	2.60		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	90	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
14.7	470	Total			

Subcatchment A2: To Chambers 2

Hydrograph



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 20

Summary for Subcatchment A3: To Chambers 3

Runoff = 0.48 cfs @ 12.08 hrs, Volume= 1,660 cf, Depth= 2.75"

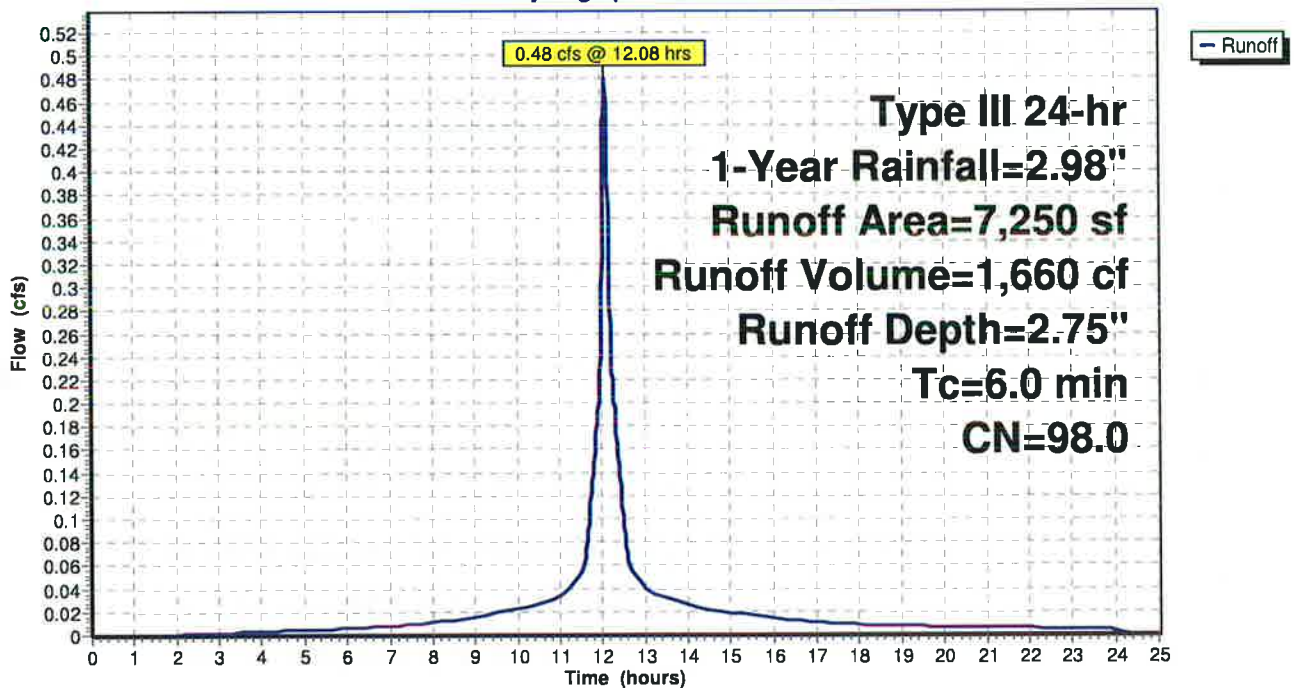
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.98"

	Area (sf)	CN	Description
*	7,250	98.0	Roof & Patio
	7,250		100.00% Impervious Area

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

Subcatchment A3: To Chambers 3

Hydrograph



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 21

Summary for Subcatchment A4: To Chambers 4

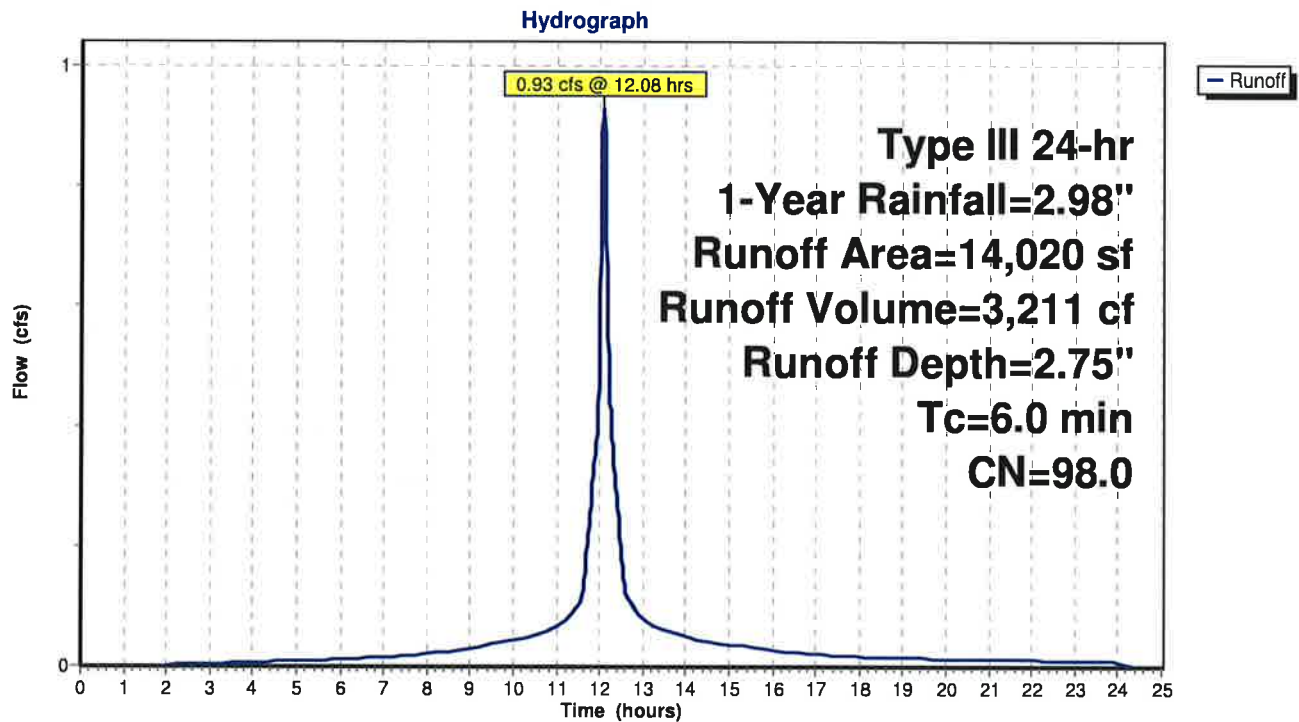
Runoff = 0.93 cfs @ 12.08 hrs, Volume= 3,211 cf, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.98"

Area (sf)	CN	Description
* 2,900	98.0	Roof
* 3,030	98.0	Drive
* 7,860	98.0	Tennis
* 230	98.0	Walk
14,020	98.0	Weighted Average
14,020		100.00% Impervious Area

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

Subcatchment A4: To Chambers 4



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 22

Summary for Subcatchment B: To North Adj.

Runoff = 2.07 cfs @ 12.10 hrs, Volume= 6,626 cf, Depth= 1.27"

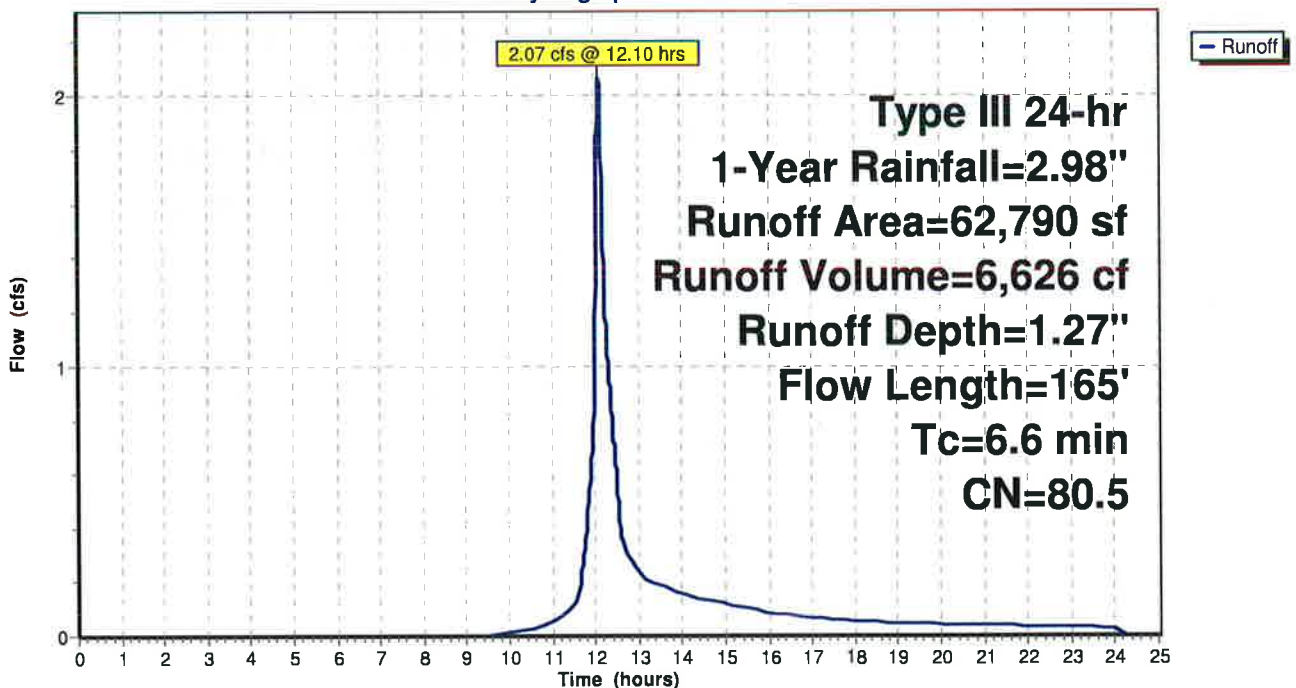
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.98"

Area (sf)	CN	Description
61,010	80.0	>75% Grass cover, Good, HSG D
* 1,780	98.0	Rock
62,790	80.5	Weighted Average
61,010		97.17% Pervious Area
1,780		2.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	60	0.1600	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.3	15	0.0150	0.89		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
2.2	25	0.1200	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.2	65	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.6	165	Total			

Subcatchment B: To North Adj.

Hydrograph



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 23

Summary for Subcatchment C0: To Street

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 1,383 cf, Depth= 1.25"

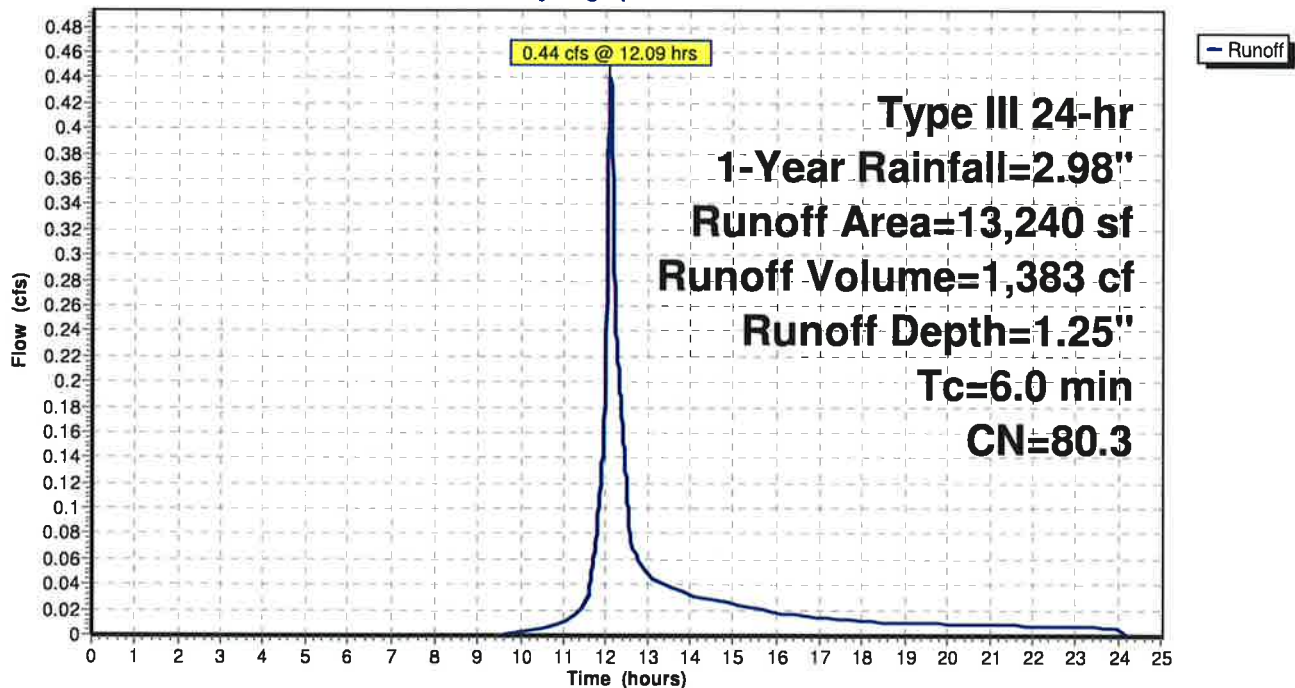
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.98"

Area (sf)	CN	Description
220	98.0	Drive
13,020	80.0	>75% Grass cover, Good, HSG D
13,240	80.3	Weighted Average
13,020		98.34% Pervious Area
220		1.66% Impervious Area

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

Subcatchment C0: To Street

Hydrograph



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 24

Summary for Subcatchment C1: To Chambers 5

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 1,038 cf, Depth= 1.40"

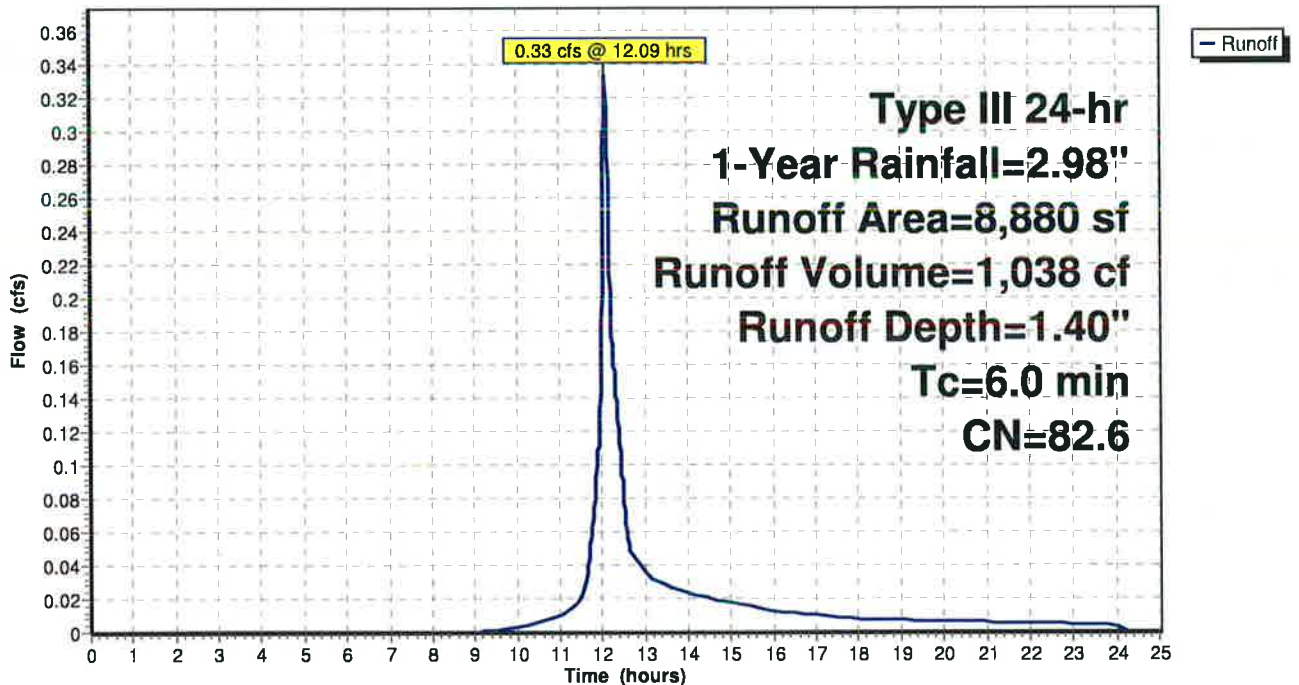
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.98"

	Area (sf)	CN	Description
*	1,270	98.0	Drive
	7,610	80.0	>75% Grass cover, Good, HSG D
	8,880	82.6	Weighted Average
	7,610		85.70% Pervious Area
	1,270		14.30% Impervious Area

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

Subcatchment C1: To Chambers 5

Hydrograph



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 25

Summary for Subcatchment D: To South Adj.

Runoff = 0.59 cfs @ 12.12 hrs, Volume= 1,988 cf, Depth= 1.24"

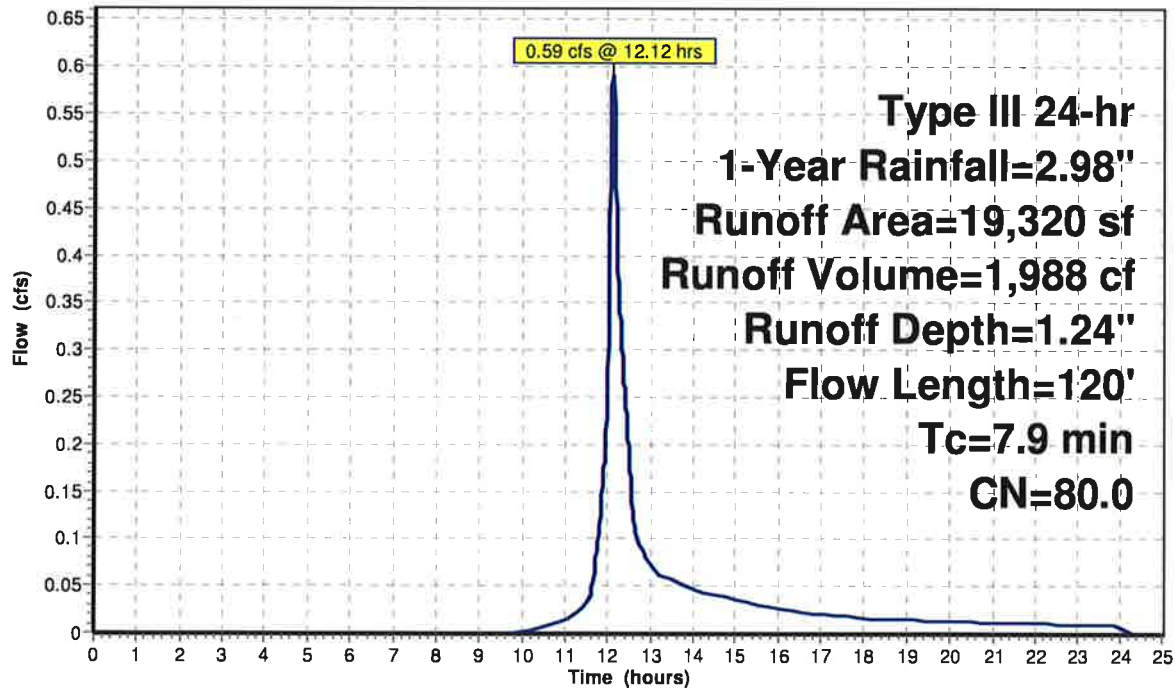
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.98"

Area (sf)	CN	Description
19,320	80.0	>75% Grass cover, Good, HSG D
19,320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0800	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.2	20	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
7.9	120	Total			

Subcatchment D: To South Adj.

Hydrograph



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 26

Summary for Pond CH1: Chambers 1

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=13)

Inflow Area = 41,920 sf, 21.99% Impervious, Inflow Depth = 1.50" for 1-Year event
 Inflow = 1.60 cfs @ 12.11 hrs, Volume= 5,239 cf
 Outflow = 2.47 cfs @ 12.16 hrs, Volume= 3,619 cf, Atten= 0%, Lag= 3.0 min
 Primary = 2.47 cfs @ 12.16 hrs, Volume= 3,619 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 95.92' @ 12.16 hrs Surf.Area= 732 sf Storage= 1,632 cf

Plug-Flow detention time= 159.4 min calculated for 3,617 cf (69% of inflow)
 Center-of-Mass det. time= 60.3 min (894.7 - 834.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	91.50'	642 cf	16.00'W x 45.50'L x 3.54'H Field A 2,578 cf Overall - 972 cf Embedded = 1,606 cf x 40.0% Voids
#2A	92.00'	972 cf	Cultec R-330XLHD x 18 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 3 rows
#3	91.50'	18 cf	2.00'W x 2.00'L x 4.50'H Junction Box
		1,633 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=2.43 cfs @ 12.16 hrs HW=95.91' TW=0.00' (Dynamic Tailwater)
 ↑1=Orifice/Grate (Orifice Controls 2.43 cfs @ 3.25 fps)

Proposed 2

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Type III 24-hr 1-Year Rainfall=2.98"

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Page 27

Pond CH1: Chambers 1 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 3 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

6 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 43.50' Row Length +12.0" End Stone x 2 = 45.50' Base Length

3 Rows x 52.0" Wide + 6.0" Spacing x 2 + 12.0" Side Stone x 2 = 16.00' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

18 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 3 Rows = 972.4 cf Chamber Storage

2,578.3 cf Field - 972.4 cf Chambers = 1,606.0 cf Stone x 40.0% Voids = 642.4 cf Stone Storage

Chamber Storage + Stone Storage = 1,614.7 cf = 0.037 af

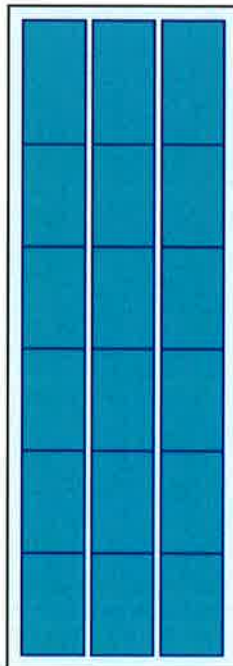
Overall Storage Efficiency = 62.6%

Overall System Size = 45.50' x 16.00' x 3.54'

18 Chambers

95.5 cy Field

59.5 cy Stone



Proposed 2

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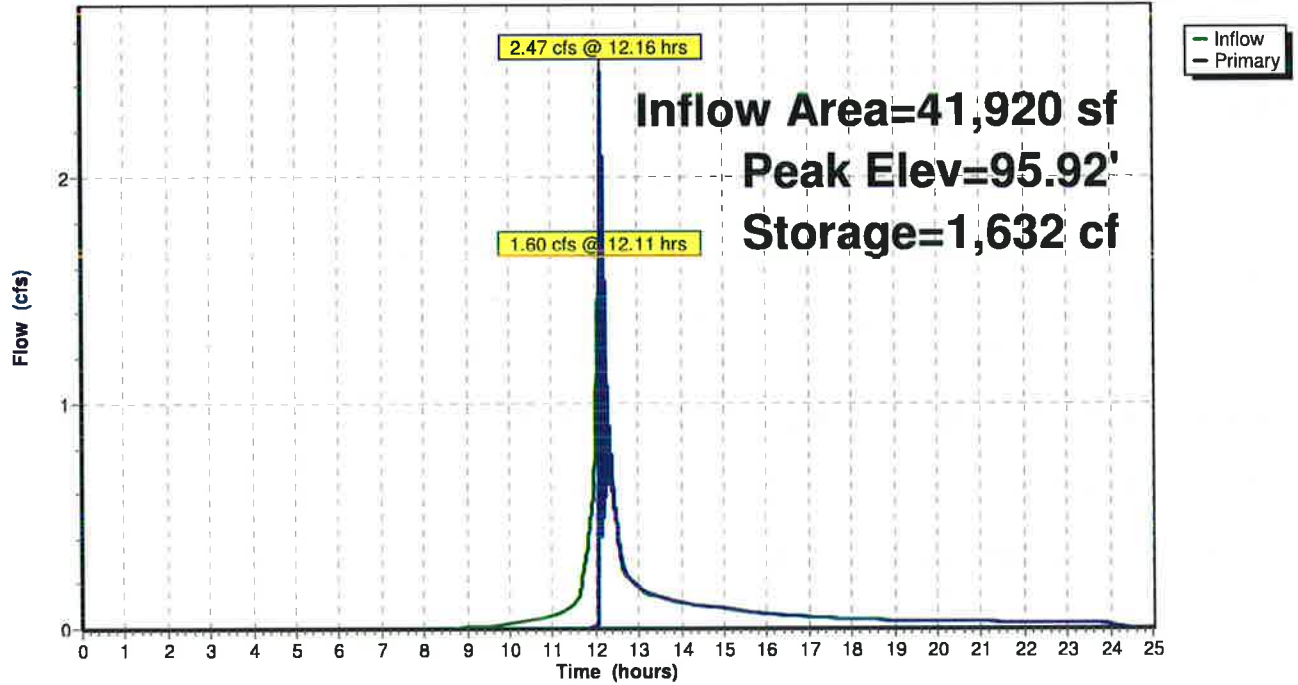
Type III 24-hr 1-Year Rainfall=2.98"

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Page 28

Pond CH1: Chambers 1

Hydrograph



Proposed 2

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Type III 24-hr 1-Year Rainfall=2.98"

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Page 29

Stage-Area-Storage for Pond CH1: Chambers 1

<u>Elevation</u> <u>(feet)</u>	<u>Storage</u> <u>(cubic-feet)</u>	<u>Elevation</u> <u>(feet)</u>	<u>Storage</u> <u>(cubic-feet)</u>
91.50	0	94.10	1,320
91.55	15	94.15	1,342
91.60	30	94.20	1,363
91.65	44	94.25	1,383
91.70	59	94.30	1,402
91.75	74	94.35	1,420
91.80	89	94.40	1,437
91.85	103	94.45	1,454
91.90	118	94.50	1,469
91.95	133	94.55	1,484
92.00	148	94.60	1,499
92.05	178	94.65	1,513
92.10	208	94.70	1,528
92.15	238	94.75	1,543
92.20	268	94.80	1,558
92.25	298	94.85	1,572
92.30	328	94.90	1,587
92.35	358	94.95	1,602
92.40	388	95.00	1,617
92.45	418	95.05	1,629
92.50	448	95.10	1,629
92.55	478	95.15	1,629
92.60	508	95.20	1,630
92.65	537	95.25	1,630
92.70	566	95.30	1,630
92.75	595	95.35	1,630
92.80	625	95.40	1,630
92.85	654	95.45	1,631
92.90	683	95.50	1,631
92.95	711	95.55	1,631
93.00	740	95.60	1,631
93.05	769	95.65	1,631
93.10	798	95.70	1,632
93.15	827	95.75	1,632
93.20	855	95.80	1,632
93.25	884	95.85	1,632
93.30	912	95.90	1,632
93.35	940	95.95	1,633
93.40	967	96.00	1,633
93.45	994		
93.50	1,021		
93.55	1,048		
93.60	1,075		
93.65	1,101		
93.70	1,127		
93.75	1,152		
93.80	1,178		
93.85	1,203		
93.90	1,227		
93.95	1,251		
94.00	1,275		
94.05	1,298		

Proposed 2

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Page 30

Summary for Pond CH2: Chambers 2

Inflow Area = 15,790 sf, 62.57% Impervious, Inflow Depth = 2.08" for 1-Year event
 Inflow = 0.67 cfs @ 12.20 hrs, Volume= 2,736 cf
 Outflow = 0.40 cfs @ 12.50 hrs, Volume= 1,278 cf, Atten= 41%, Lag= 18.3 min
 Primary = 0.40 cfs @ 12.50 hrs, Volume= 1,278 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 87.02' @ 12.50 hrs Surf.Area= 668 sf Storage= 1,463 cf

Plug-Flow detention time= 242.2 min calculated for 1,278 cf (47% of inflow)
 Center-of-Mass det. time= 126.1 min (937.9 - 811.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	83.50'	599 cf	11.17'W x 59.50'L x 3.54'H Field A 2,353 cf Overall - 857 cf Embedded = 1,496 cf x 40.0% Voids
#2A	84.00'	857 cf	Cultec R-330XLHD x 16 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
#3	83.50'	20 cf	2.00'W x 2.00'L x 5.00'H Junction Box
#4	88.00'	10 cf	1.00'W x 1.00'L x 0.10'H dummy storage for oscillation errors x 100
		1,485 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	59.5' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.36 cfs @ 12.50 hrs HW=87.02' TW=0.00' (Dynamic Tailwater)

↑1=**Broad-Crested Rectangular Weir** (Weir Controls 0.36 cfs @ 0.34 fps)

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Page 31

Pond CH2: Chambers 2 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

16 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 856.9 cf Chamber Storage

2,353.1 cf Field - 856.9 cf Chambers = 1,496.3 cf Stone x 40.0% Voids = 598.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,455.4 cf = 0.033 af

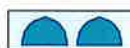
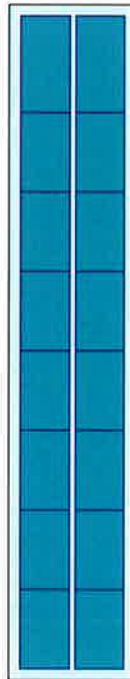
Overall Storage Efficiency = 61.8%

Overall System Size = 59.50' x 11.17' x 3.54'

16 Chambers

87.2 cy Field

55.4 cy Stone



Proposed 2

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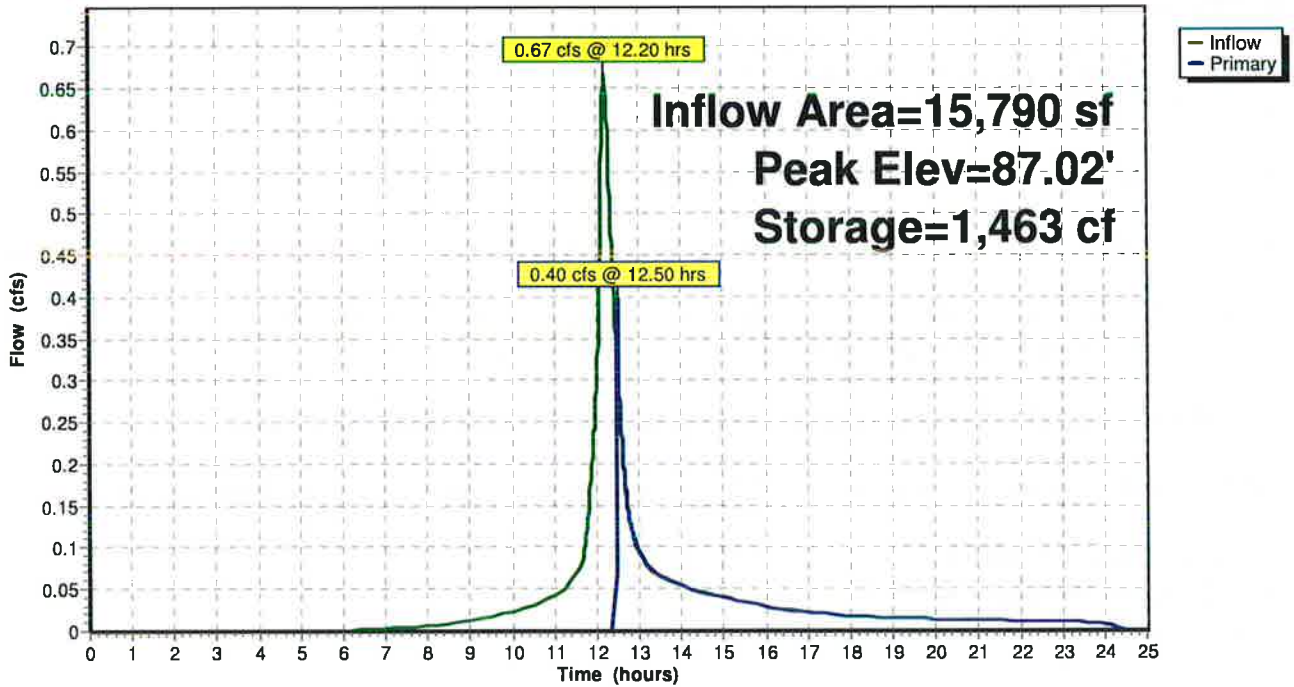
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Page 32

Pond CH2: Chambers 2

Hydrograph



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Page 33

Stage-Area-Storage for Pond CH2: Chambers 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
83.50	0	86.10	1,188
83.55	13	86.15	1,208
83.60	27	86.20	1,227
83.65	40	86.25	1,245
83.70	54	86.30	1,263
83.75	67	86.35	1,279
83.80	81	86.40	1,295
83.85	94	86.45	1,309
83.90	108	86.50	1,323
83.95	121	86.55	1,337
84.00	135	86.60	1,350
84.05	162	86.65	1,364
84.10	189	86.70	1,377
84.15	216	86.75	1,391
84.20	243	86.80	1,404
84.25	270	86.85	1,418
84.30	297	86.90	1,431
84.35	324	86.95	1,445
84.40	351	87.00	1,458
84.45	378	87.05	1,470
84.50	405	87.10	1,470
84.55	431	87.15	1,470
84.60	458	87.20	1,470
84.65	484	87.25	1,470
84.70	511	87.30	1,471
84.75	537	87.35	1,471
84.80	563	87.40	1,471
84.85	589	87.45	1,471
84.90	615	87.50	1,471
84.95	641	87.55	1,472
85.00	667	87.60	1,472
85.05	693	87.65	1,472
85.10	719	87.70	1,472
85.15	744	87.75	1,472
85.20	770	87.80	1,473
85.25	796	87.85	1,473
85.30	821	87.90	1,473
85.35	846	87.95	1,473
85.40	871	88.00	1,473
85.45	895	88.05	1,479
85.50	919	88.10	1,484
85.55	943	88.15	1,484
85.60	967	88.20	1,484
85.65	991	88.25	1,484
85.70	1,014	88.30	1,485
85.75	1,037	88.35	1,485
85.80	1,060	88.40	1,485
85.85	1,082	88.45	1,485
85.90	1,104	88.50	1,485
85.95	1,126		
86.00	1,147		
86.05	1,168		

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Page 34

Summary for Pond CH3: Chambers 3

Inflow Area = 7,250 sf, 100.00% Impervious, Inflow Depth = 2.75" for 1-Year event
 Inflow = 0.48 cfs @ 12.08 hrs, Volume= 1,660 cf
 Outflow = 0.06 cfs @ 12.62 hrs, Volume= 543 cf, Atten= 87%, Lag= 32.2 min
 Primary = 0.06 cfs @ 12.62 hrs, Volume= 543 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 90.63' @ 12.62 hrs Surf.Area= 532 sf Storage= 1,126 cf

Plug-Flow detention time= 379.9 min calculated for 543 cf (33% of inflow)
 Center-of-Mass det. time= 209.4 min (967.3 - 757.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	87.00'	460 cf	11.17'W x 45.50'L x 3.54'H Field A 1,799 cf Overall - 648 cf Embedded = 1,151 cf x 40.0% Voids
#2A	87.50'	648 cf	Cultec R-330XLHD x 12 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
#3	87.00'	18 cf	2.00'W x 2.00'L x 4.50'H Junction Box
#4	90.50'	20 cf	1.00'W x 1.00'L x 1.00'H dummy storage for oscillation errors x 20
		1,147 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.50'	8.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.62 hrs HW=90.63' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Orifice/Grate** (Orifice Controls 0.06 cfs @ 1.24 fps)

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Page 35

Pond CH3: Chambers 3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

6 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 43.50' Row Length +12.0" End Stone x 2 = 45.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

12 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 648.2 cf Chamber Storage

1,799.5 cf Field - 648.2 cf Chambers = 1,151.2 cf Stone x 40.0% Voids = 460.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,108.7 cf = 0.025 af

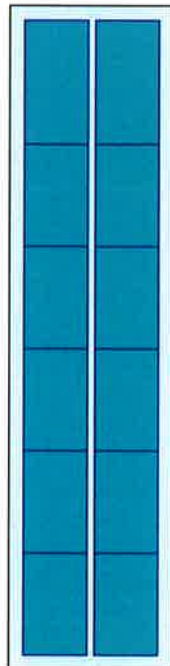
Overall Storage Efficiency = 61.6%

Overall System Size = 45.50' x 11.17' x 3.54'

12 Chambers

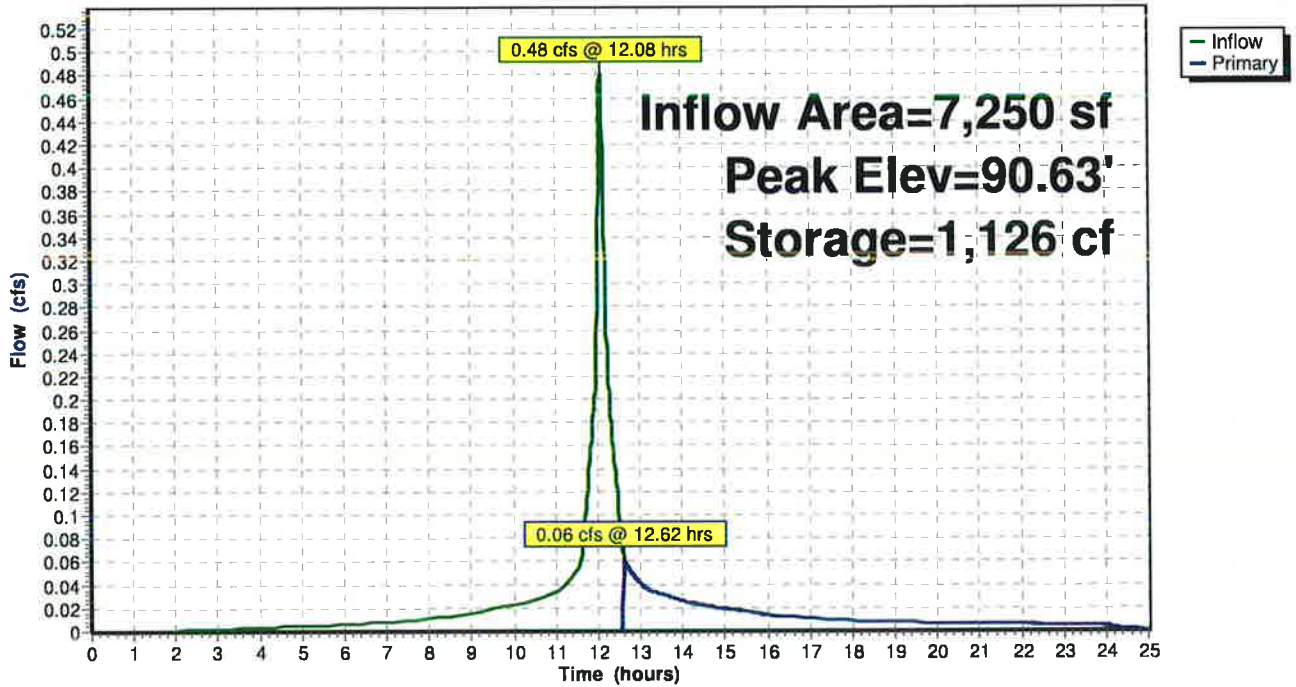
66.6 cy Field

42.6 cy Stone



Pond CH3: Chambers 3

Hydrograph



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Page 37

Stage-Area-Storage for Pond CH3: Chambers 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
87.00	0	89.60	907
87.05	10	89.65	922
87.10	21	89.70	937
87.15	31	89.75	951
87.20	41	89.80	964
87.25	52	89.85	977
87.30	62	89.90	989
87.35	73	89.95	1,000
87.40	83	90.00	1,011
87.45	93	90.05	1,021
87.50	104	90.10	1,031
87.55	124	90.15	1,042
87.60	145	90.20	1,052
87.65	166	90.25	1,062
87.70	186	90.30	1,073
87.75	207	90.35	1,083
87.80	227	90.40	1,094
87.85	248	90.45	1,104
87.90	268	90.50	1,114
87.95	289	90.55	1,124
88.00	309	90.60	1,125
88.05	330	90.65	1,126
88.10	350	90.70	1,128
88.15	370	90.75	1,129
88.20	390	90.80	1,130
88.25	410	90.85	1,131
88.30	430	90.90	1,132
88.35	450	90.95	1,134
88.40	470	91.00	1,135
88.45	489	91.05	1,136
88.50	509	91.10	1,137
88.55	529	91.15	1,138
88.60	549	91.20	1,140
88.65	568	91.25	1,141
88.70	588	91.30	1,142
88.75	607	91.35	1,143
88.80	627	91.40	1,144
88.85	646	91.45	1,146
88.90	665	91.50	1,147
88.95	683		
89.00	702		
89.05	720		
89.10	738		
89.15	756		
89.20	774		
89.25	792		
89.30	809		
89.35	826		
89.40	843		
89.45	860		
89.50	876		
89.55	892		

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Page 38

Summary for Pond CH4: Chambers 4

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=5)

Inflow Area = 14,020 sf, 100.00% Impervious, Inflow Depth = 2.75" for 1-Year event
 Inflow = 0.93 cfs @ 12.08 hrs, Volume= 3,211 cf
 Outflow = 0.71 cfs @ 12.23 hrs, Volume= 1,416 cf, Atten= 23%, Lag= 8.8 min
 Primary = 0.71 cfs @ 12.23 hrs, Volume= 1,416 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 91.52' @ 12.23 hrs Surf.Area= 806 sf Storage= 1,805 cf

Plug-Flow detention time= 285.2 min calculated for 1,416 cf (44% of inflow)
 Center-of-Mass det. time= 148.8 min (906.7 - 757.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	87.50'	701 cf	20.83'W x 38.50'L x 3.54'H Field A 2,841 cf Overall - 1,088 cf Embedded = 1,753 cf x 40.0% Voids
#2A	88.00'	1,088 cf	Cultec R-330XLHD x 20 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
#3	87.50'	20 cf	2.00'W x 2.00'L x 5.00'H Junction Box
		1,809 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	8.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.69 cfs @ 12.23 hrs HW=91.51' TW=0.00' (Dynamic Tailwater)
 ↑1=Orifice/Grate (Orifice Controls 0.69 cfs @ 2.42 fps)

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Page 39

Pond CH4: Chambers 4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 = 38.50' Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

20 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 1,087.8 cf Chamber Storage

2,840.7 cf Field - 1,087.8 cf Chambers = 1,752.9 cf Stone x 40.0% Voids = 701.1 cf Stone Storage

Chamber Storage + Stone Storage = 1,789.0 cf = 0.041 af

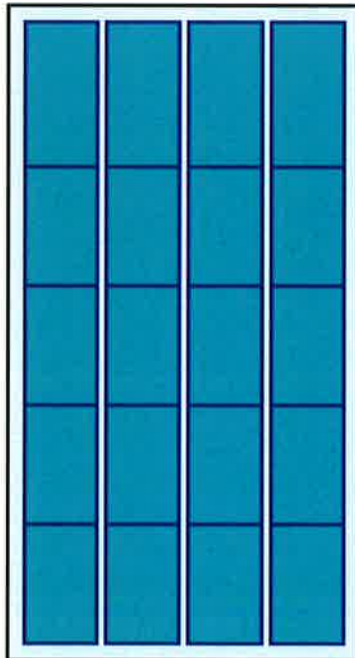
Overall Storage Efficiency = 63.0%

Overall System Size = 38.50' x 20.83' x 3.54'

20 Chambers

105.2 cy Field

64.9 cy Stone



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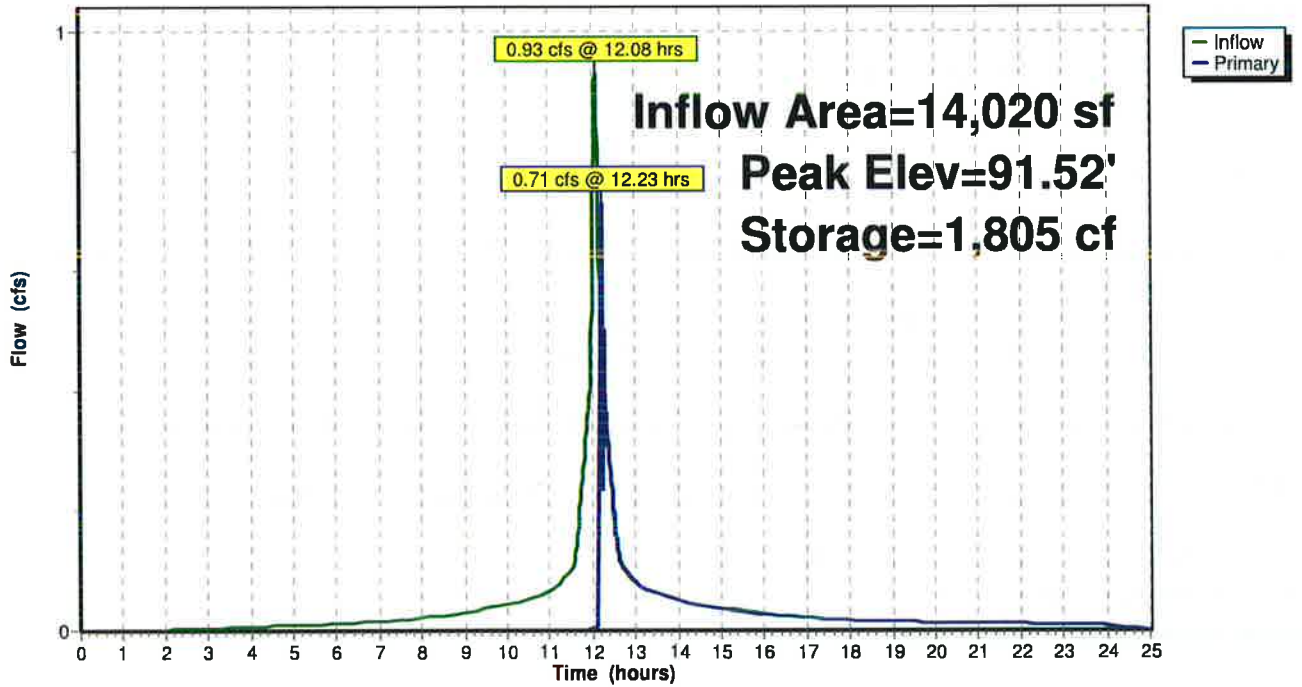
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Page 40

Pond CH4: Chambers 4

Hydrograph



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Page 41

Stage-Area-Storage for Pond CH4: Chambers 4

<u>Elevation</u> <u>(feet)</u>	<u>Storage</u> <u>(cubic-feet)</u>	<u>Elevation</u> <u>(feet)</u>	<u>Storage</u> <u>(cubic-feet)</u>
87.50	0	90.10	1,463
87.55	16	90.15	1,487
87.60	32	90.20	1,510
87.65	49	90.25	1,532
87.70	65	90.30	1,553
87.75	81	90.35	1,573
87.80	97	90.40	1,592
87.85	114	90.45	1,610
87.90	130	90.50	1,627
87.95	146	90.55	1,643
88.00	162	90.60	1,660
88.05	196	90.65	1,676
88.10	230	90.70	1,692
88.15	263	90.75	1,708
88.20	296	90.80	1,725
88.25	330	90.85	1,741
88.30	363	90.90	1,757
88.35	396	90.95	1,773
88.40	430	91.00	1,790
88.45	463	91.05	1,803
88.50	496	91.10	1,803
88.55	529	91.15	1,804
88.60	562	91.20	1,804
88.65	595	91.25	1,804
88.70	627	91.30	1,804
88.75	659	91.35	1,804
88.80	692	91.40	1,805
88.85	724	91.45	1,805
88.90	756	91.50	1,805
88.95	788	91.55	1,805
89.00	820	91.60	1,805
89.05	852	91.65	1,806
89.10	884	91.70	1,806
89.15	916	91.75	1,806
89.20	948	91.80	1,806
89.25	979	91.85	1,806
89.30	1,010	91.90	1,807
89.35	1,041	91.95	1,807
89.40	1,072	92.00	1,807
89.45	1,102	92.05	1,807
89.50	1,132	92.10	1,807
89.55	1,162	92.15	1,808
89.60	1,191	92.20	1,808
89.65	1,220	92.25	1,808
89.70	1,249	92.30	1,808
89.75	1,277	92.35	1,808
89.80	1,305	92.40	1,809
89.85	1,333	92.45	1,809
89.90	1,360	92.50	1,809
89.95	1,386		
90.00	1,412		
90.05	1,438		

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Page 42

Summary for Pond CH5: Chambers 5

[93] Warning: Storage range exceeded by 0.11'

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 8,880 sf, 14.30% Impervious, Inflow Depth = 1.40" for 1-Year event
 Inflow = 0.33 cfs @ 12.09 hrs, Volume= 1,038 cf
 Outflow = 0.39 cfs @ 12.11 hrs, Volume= 776 cf, Atten= 0%, Lag= 1.1 min
 Primary = 0.39 cfs @ 12.11 hrs, Volume= 776 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Peak Elev= 105.21' @ 12.11 hrs Surf.Area= 219 sf Storage= 272 cf

Plug-Flow detention time= 137.8 min calculated for 776 cf (75% of inflow)

Center-of-Mass det. time= 47.5 min (885.3 - 837.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	100.50'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	101.00'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
#3	100.50'	36 cf	2.00'W x 2.00'L x 4.50'H Catch Basin x2 x 2
#4	105.00'	10 cf	1.00'W x 1.00'L x 0.10'H Dummy (for oscillation error) x 100
		272 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	4.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.38 cfs @ 12.11 hrs HW=105.21' TW=0.00' (Dynamic Tailwater)↑**1=Orifice/Grate** (Orifice Controls 0.38 cfs @ 2.20 fps)

Proposed 2

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Type III 24-hr 1-Year Rainfall=2.98"

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Page 43

Pond CH5: Chambers 5 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

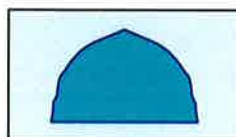
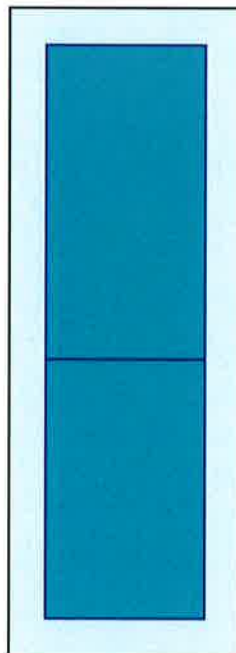
Overall Storage Efficiency = 57.7%

Overall System Size = 17.50' x 6.33' x 3.54'

2 Chambers

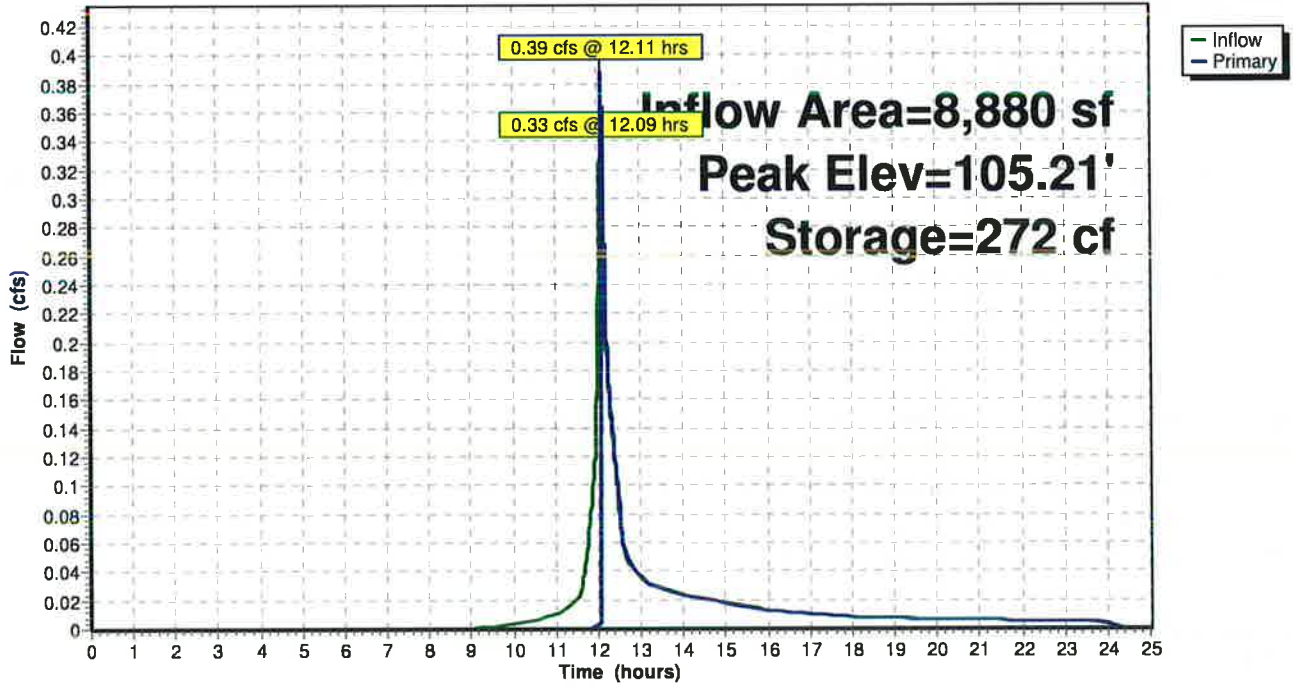
14.5 cy Field

10.3 cy Stone



Pond CH5: Chambers 5

Hydrograph



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 45

Stage-Area-Storage for Pond CH5: Chambers 5

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
100.50	0	103.10	202
100.55	3	103.15	205
100.60	5	103.20	209
100.65	8	103.25	212
100.70	10	103.30	215
100.75	13	103.35	218
100.80	16	103.40	221
100.85	18	103.45	224
100.90	21	103.50	226
100.95	24	103.55	229
101.00	26	103.60	232
101.05	31	103.65	234
101.10	35	103.70	237
101.15	40	103.75	239
101.20	44	103.80	242
101.25	48	103.85	245
101.30	53	103.90	247
101.35	57	103.95	250
101.40	62	104.00	252
101.45	66	104.05	255
101.50	70	104.10	255
101.55	75	104.15	256
101.60	79	104.20	256
101.65	84	104.25	256
101.70	88	104.30	257
101.75	92	104.35	257
101.80	97	104.40	258
101.85	101	104.45	258
101.90	105	104.50	258
101.95	110	104.55	259
102.00	114	104.60	259
102.05	118	104.65	260
102.10	122	104.70	260
102.15	127	104.75	260
102.20	131	104.80	261
102.25	135	104.85	261
102.30	139	104.90	262
102.35	144	104.95	262
102.40	148	105.00	262
102.45	152	105.05	267
102.50	156	105.10	272
102.55	160	105.15	272
102.60	164	105.20	272
102.65	168		
102.70	172		
102.75	176		
102.80	180		
102.85	183		
102.90	187		
102.95	191		
103.00	195		
103.05	198		

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Type III 24-hr 1-Year Rainfall=2.98"

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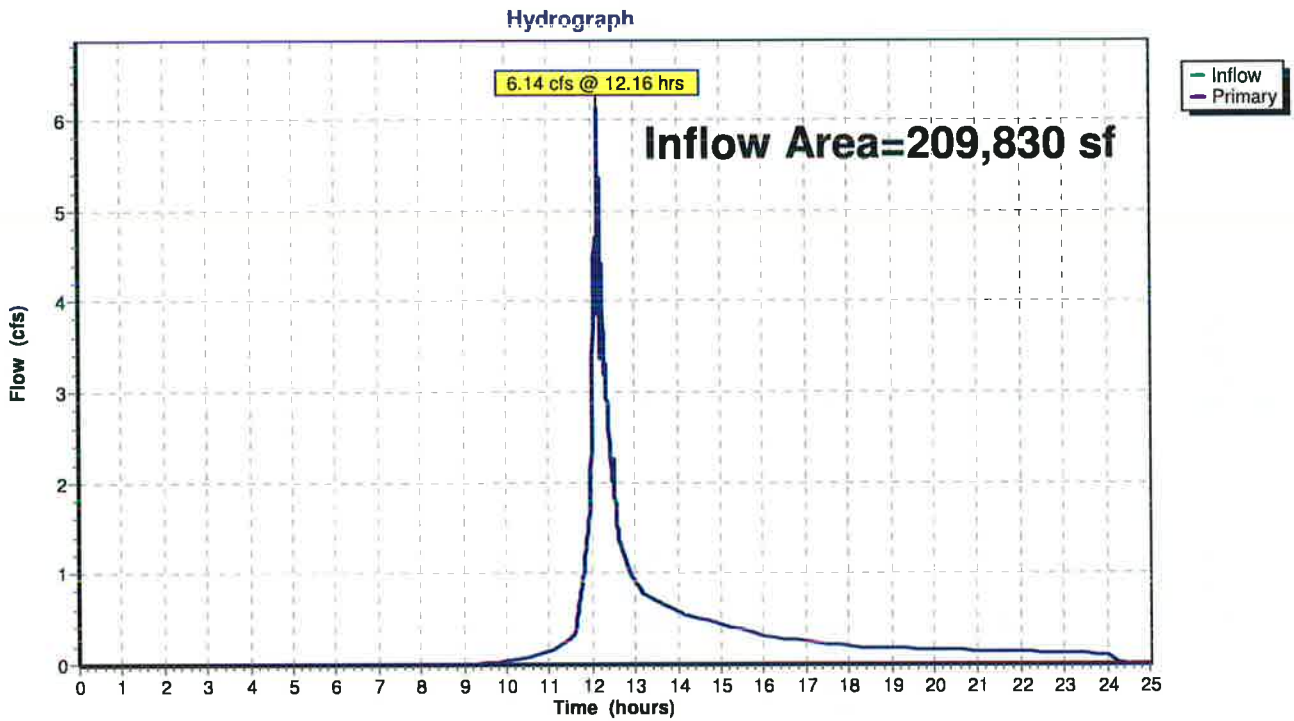
Page 46

Summary for Link A: Lake Shoreline

Inflow Area = 209,830 sf, 25.87% Impervious, Inflow Depth > 1.24" for 1-Year event
Inflow = 6.14 cfs @ 12.16 hrs, Volume= 21,649 cf
Primary = 6.14 cfs @ 12.16 hrs, Volume= 21,649 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link A: Lake Shoreline



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Type III 24-hr 1-Year Rainfall=2.98"

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Page 47

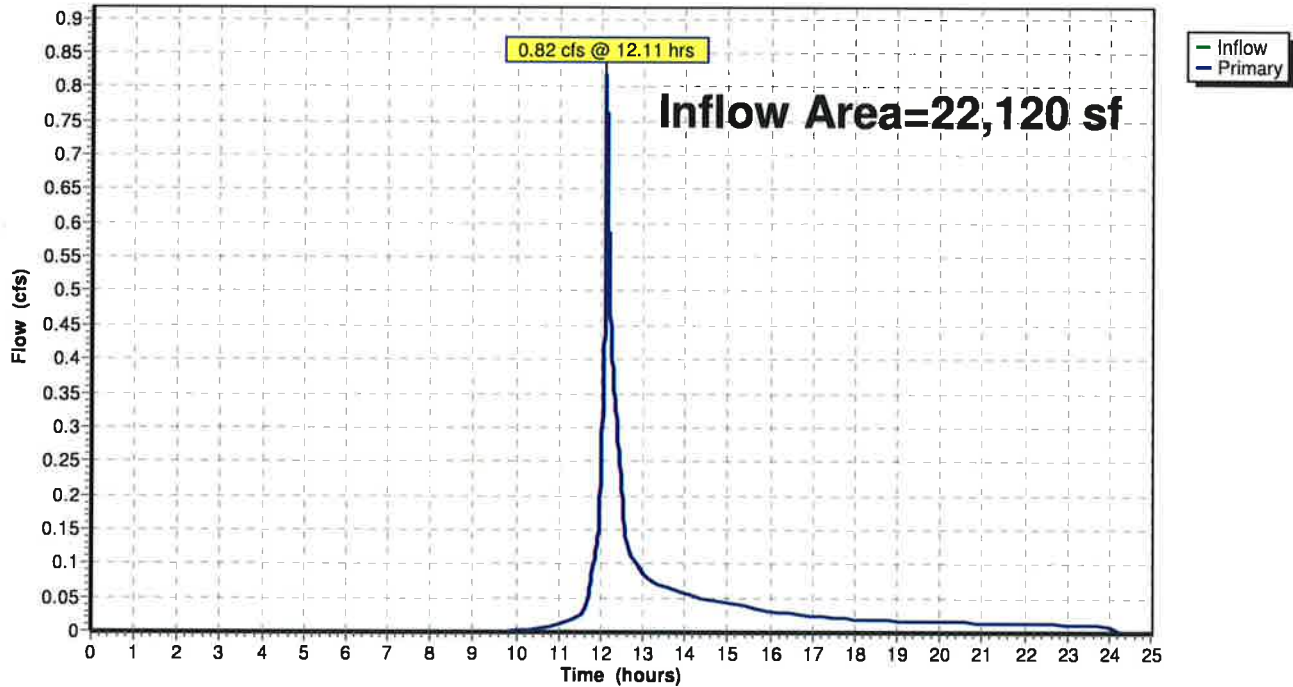
Summary for Link C: Street

Inflow Area = 22,120 sf, 6.74% Impervious, Inflow Depth = 1.17" for 1-Year event
Inflow = 0.82 cfs @ 12.11 hrs, Volume= 2,159 cf
Primary = 0.82 cfs @ 12.11 hrs, Volume= 2,159 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link C: Street

Hydrograph



Proposed 2

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Type III 24-hr 1-Year Rainfall=2.98"

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Page 48

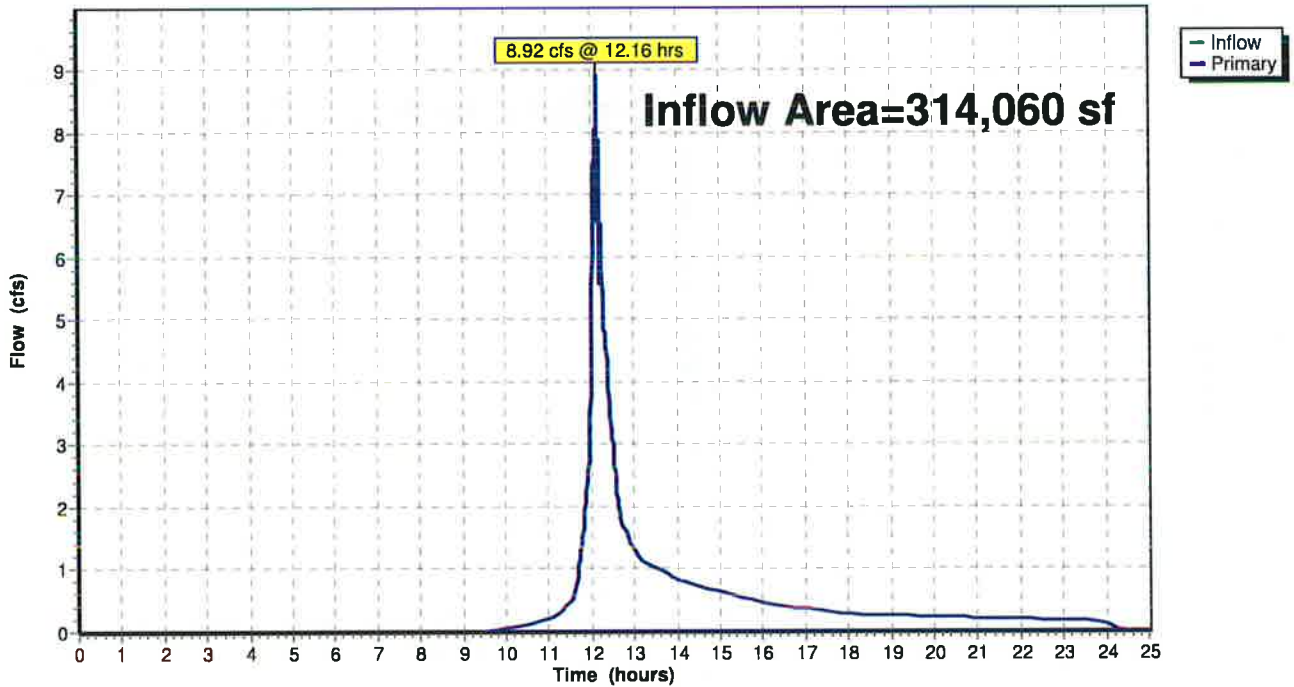
Summary for Link Z: Converse Lake

Inflow Area = 314,060 sf, 18.33% Impervious, Inflow Depth > 1.24" for 1-Year event
Inflow = 8.92 cfs @ 12.16 hrs, Volume= 32,423 cf
Primary = 8.92 cfs @ 12.16 hrs, Volume= 32,423 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link Z: Converse Lake

Hydrograph



Proposed 2

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Type III 24-hr 10-Year Rainfall=5.46"

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Page 49

Summary for Subcatchment A0: To Shoreline

Runoff = 12.13 cfs @ 12.09 hrs, Volume= 37,987 cf, Depth= 3.48"

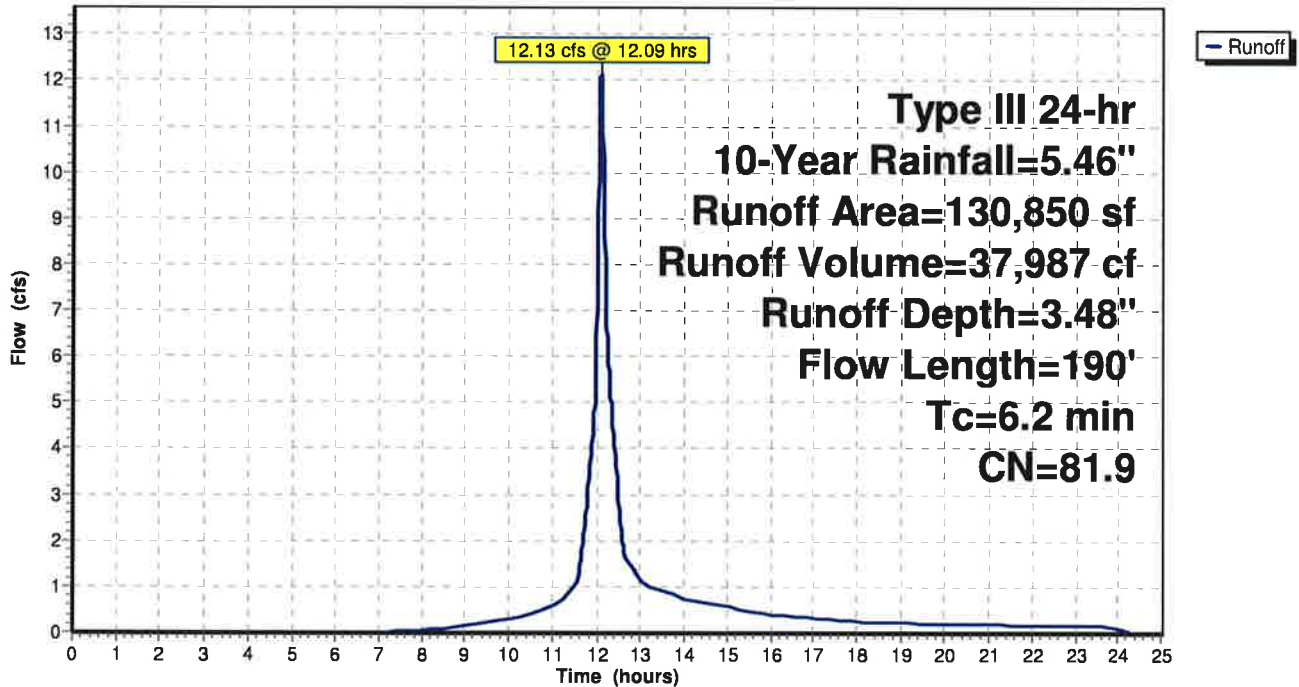
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
116,930	80.0	>75% Grass cover, Good, HSG D
* 12,060	98.0	Rock
* 550	98.0	Walk
* 1,310	98.0	Roof
130,850	81.9	Weighted Average
116,930		89.36% Pervious Area
13,920		10.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	100	0.1500	0.28		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.2	90	0.3000	8.22		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.2	190	Total			

Subcatchment A0: To Shoreline

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 50

Summary for Subcatchment A1: To Chambers 1

Runoff = 3.90 cfs @ 12.11 hrs, Volume= 12,904 cf, Depth= 3.69"

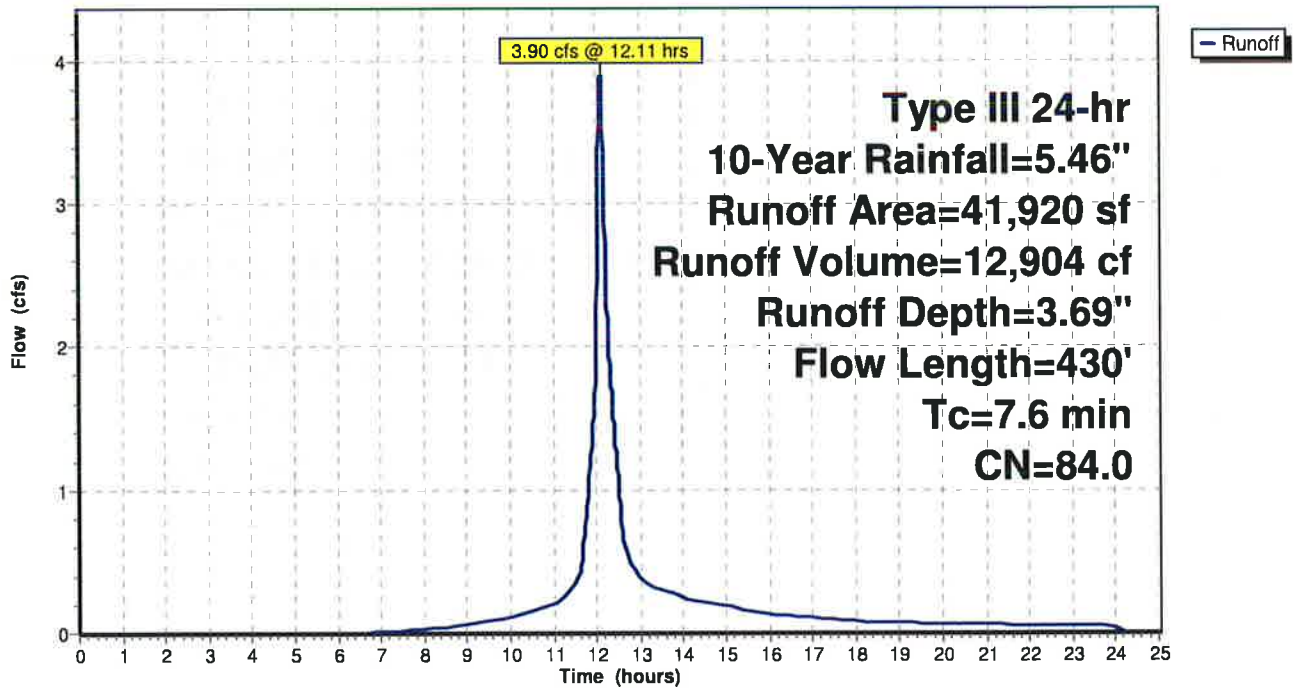
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

	Area (sf)	CN	Description
*	1,280	98.0	Roof
*	7,710	98.0	Drive
*	230	98.0	Walk
	32,700	80.0	>75% Grass cover, Good, HSG D
	41,920	84.0	Weighted Average
	32,700		78.01% Pervious Area
	9,220		21.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	85	0.1000	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
1.4	345	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.6	430	Total			

Subcatchment A1: To Chambers 1

Hydrograph



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Page 51

Summary for Subcatchment A2: To Chambers 2

Runoff = 1.38 cfs @ 12.20 hrs, Volume= 5,872 cf, Depth= 4.46"

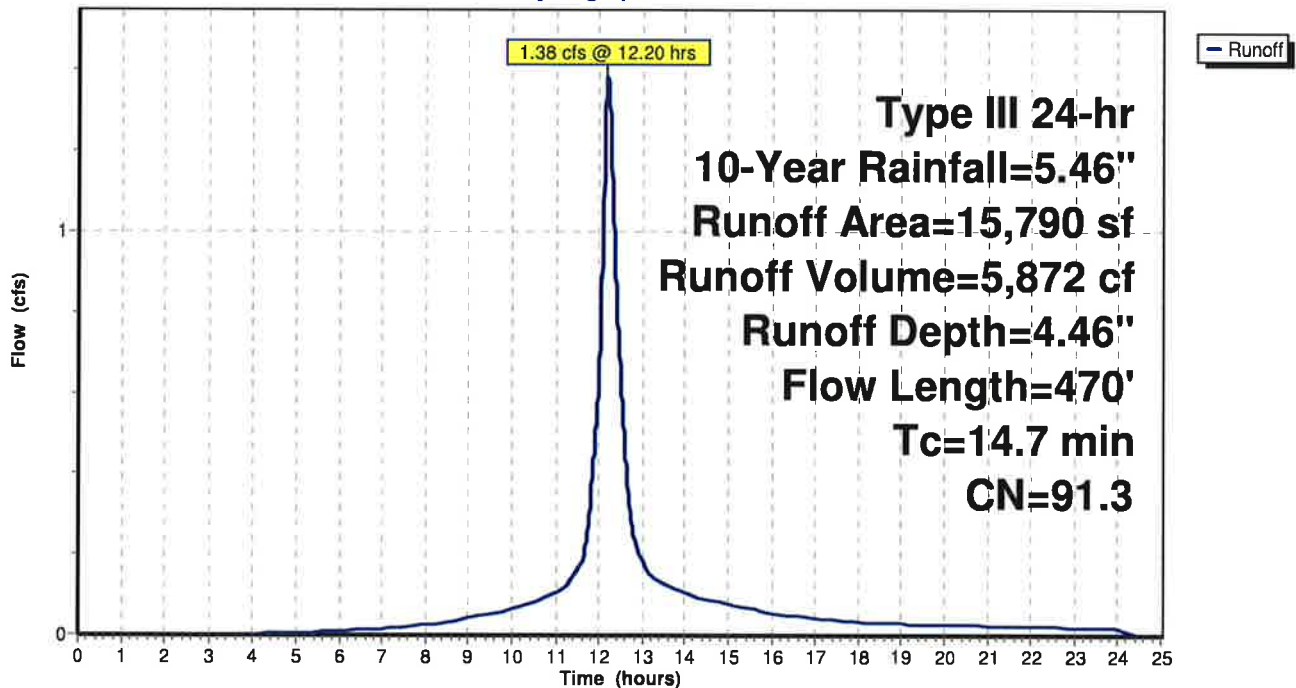
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
* 6,340	98.0	Roof
* 3,540	98.0	Drive
5,910	80.0	>75% Grass cover, Good, HSG D
15,790	91.3	Weighted Average
5,910		37.43% Pervious Area
9,880		62.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0250	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
1.8	280	0.0300	2.60		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	90	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
14.7	470	Total			

Subcatchment A2: To Chambers 2

Hydrograph



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Page 52

Summary for Subcatchment A3: To Chambers 3

Runoff = 0.89 cfs @ 12.08 hrs, Volume= 3,155 cf, Depth= 5.22"

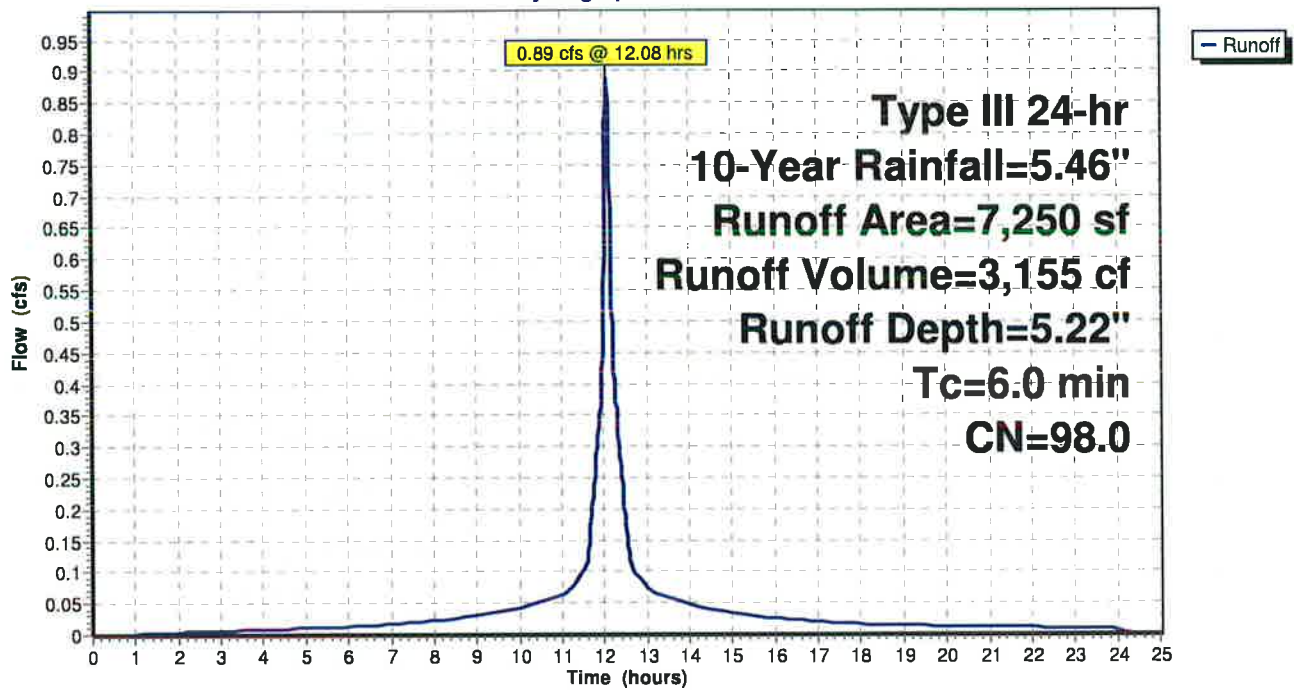
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

	Area (sf)	CN	Description
*	7,250	98.0	Roof & Patio
	7,250		100.00% Impervious Area

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

Subcatchment A3: To Chambers 3

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 53

Summary for Subcatchment A4: To Chambers 4

Runoff = 1.72 cfs @ 12.08 hrs, Volume= 6,102 cf, Depth= 5.22"

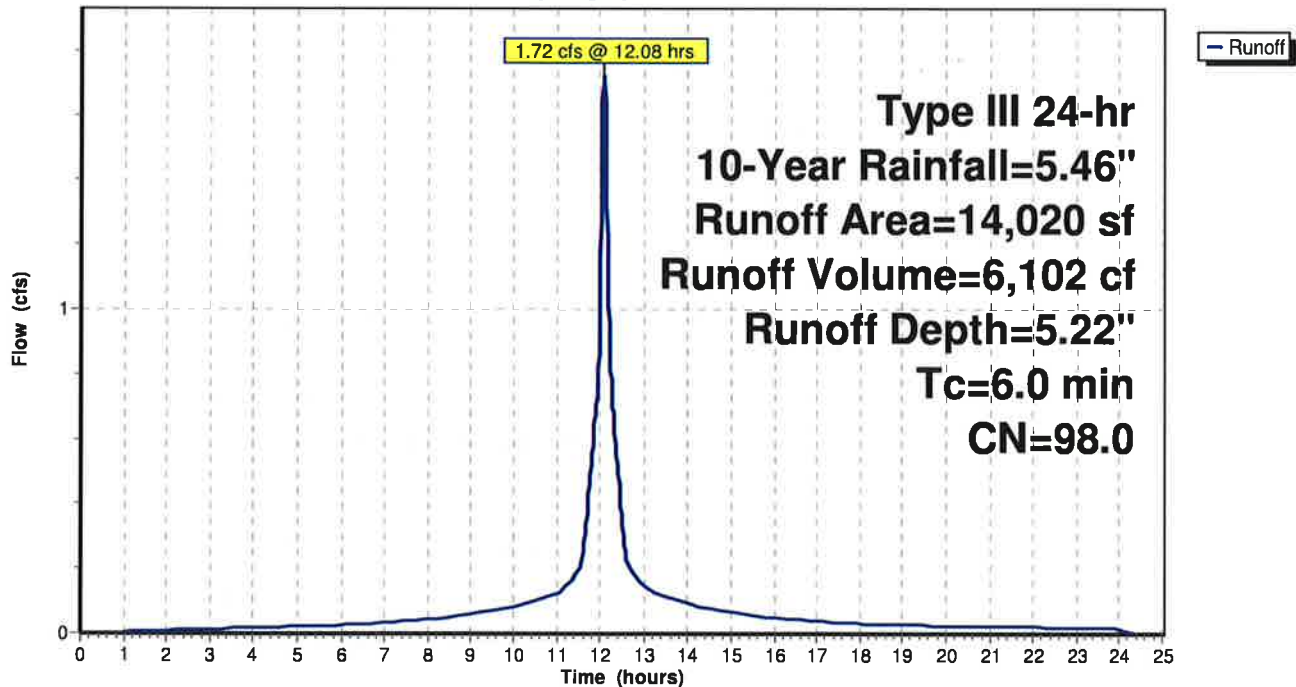
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
* 2,900	98.0	Roof
* 3,030	98.0	Drive
* 7,860	98.0	Tennis
* 230	98.0	Walk
14,020	98.0	Weighted Average
14,020		100.00% Impervious Area

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

Subcatchment A4: To Chambers 4

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 54

Summary for Subcatchment B: To North Adj.

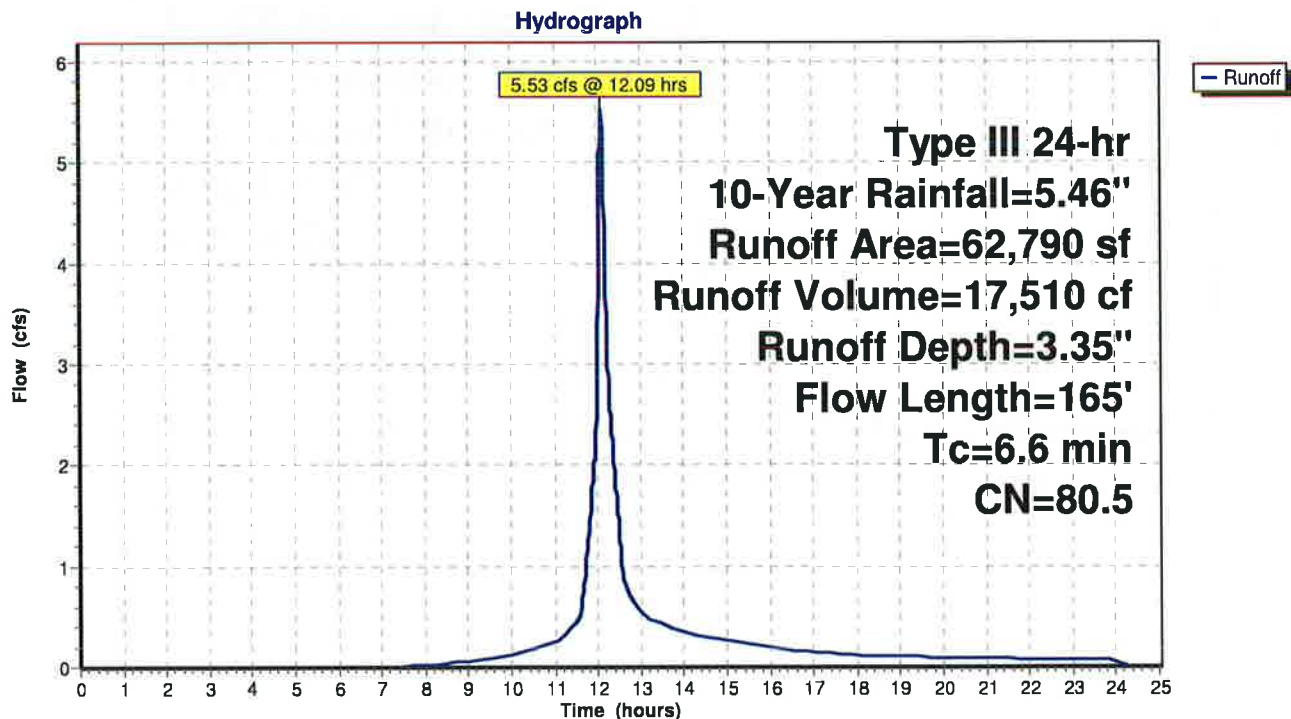
Runoff = 5.53 cfs @ 12.09 hrs, Volume= 17,510 cf, Depth= 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
61,010	80.0	>75% Grass cover, Good, HSG D
* 1,780	98.0	Rock
62,790	80.5	Weighted Average
61,010		97.17% Pervious Area
1,780		2.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	60	0.1600	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.3	15	0.0150	0.89		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
2.2	25	0.1200	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.2	65	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.6	165	Total			

Subcatchment B: To North Adj.



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 55

Summary for Subcatchment C0: To Street

Runoff = 1.18 cfs @ 12.09 hrs, Volume= 3,671 cf, Depth= 3.33"

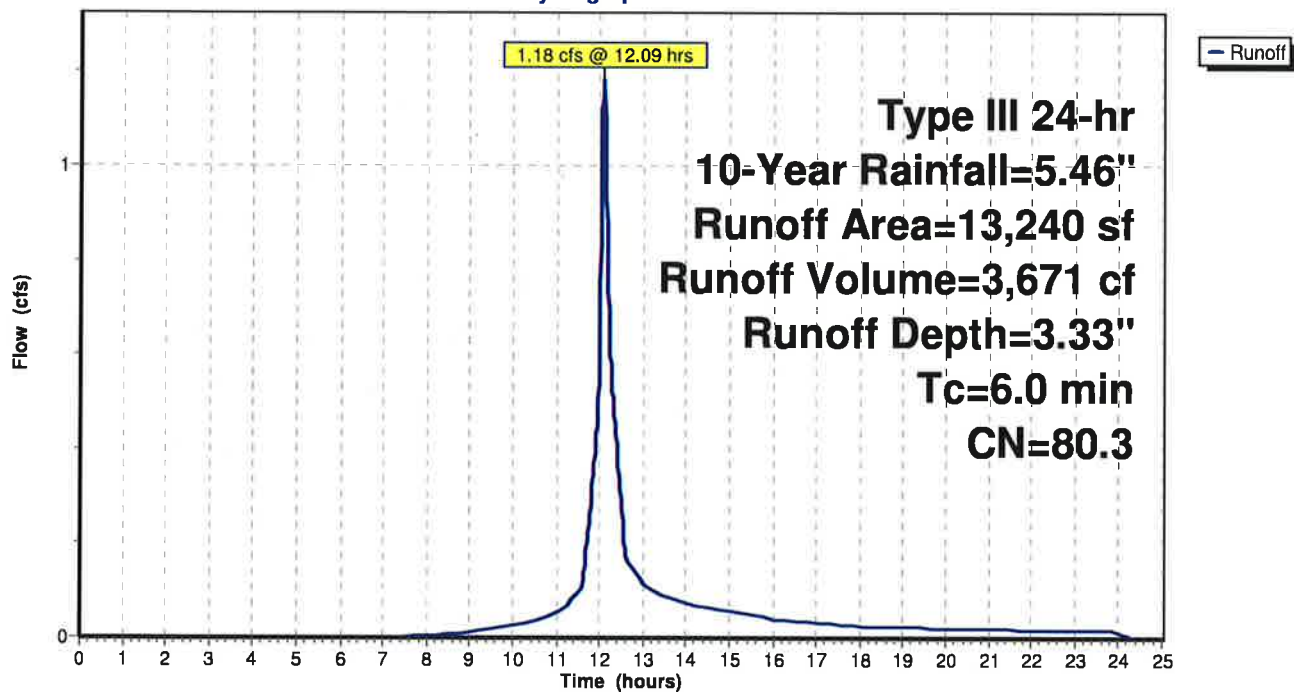
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
* 220	98.0	Drive
13,020	80.0	>75% Grass cover, Good, HSG D
13,240	80.3	Weighted Average
13,020		98.34% Pervious Area
220		1.66% Impervious Area

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

Subcatchment C0: To Street

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 56

Summary for Subcatchment C1: To Chambers 5

Runoff = 0.84 cfs @ 12.09 hrs, Volume= 2,629 cf, Depth= 3.55"

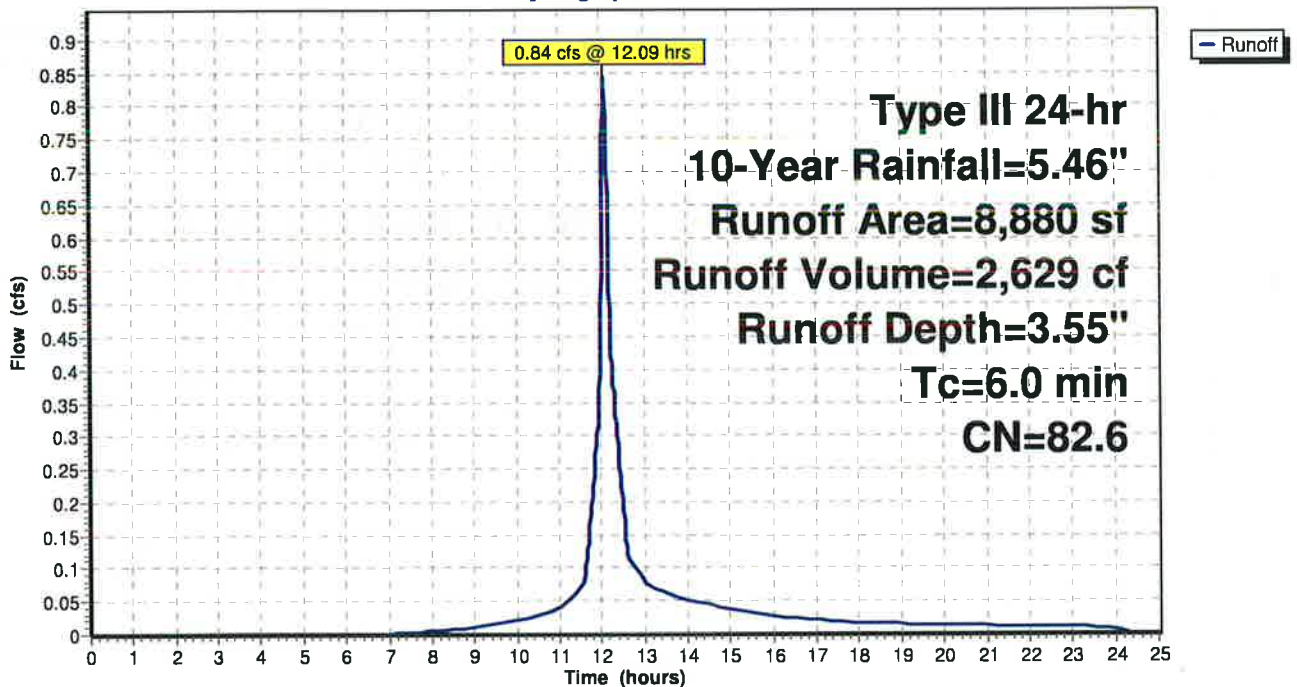
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

	Area (sf)	CN	Description
*	1,270	98.0	Drive
	7,610	80.0	>75% Grass cover, Good, HSG D
	8,880	82.6	Weighted Average
	7,610		85.70% Pervious Area
	1,270		14.30% Impervious Area

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

Subcatchment C1: To Chambers 5

Hydrograph



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Page 57

Summary for Subcatchment D: To South Adj.

Runoff = 1.60 cfs @ 12.11 hrs, Volume= 5,309 cf, Depth= 3.30"

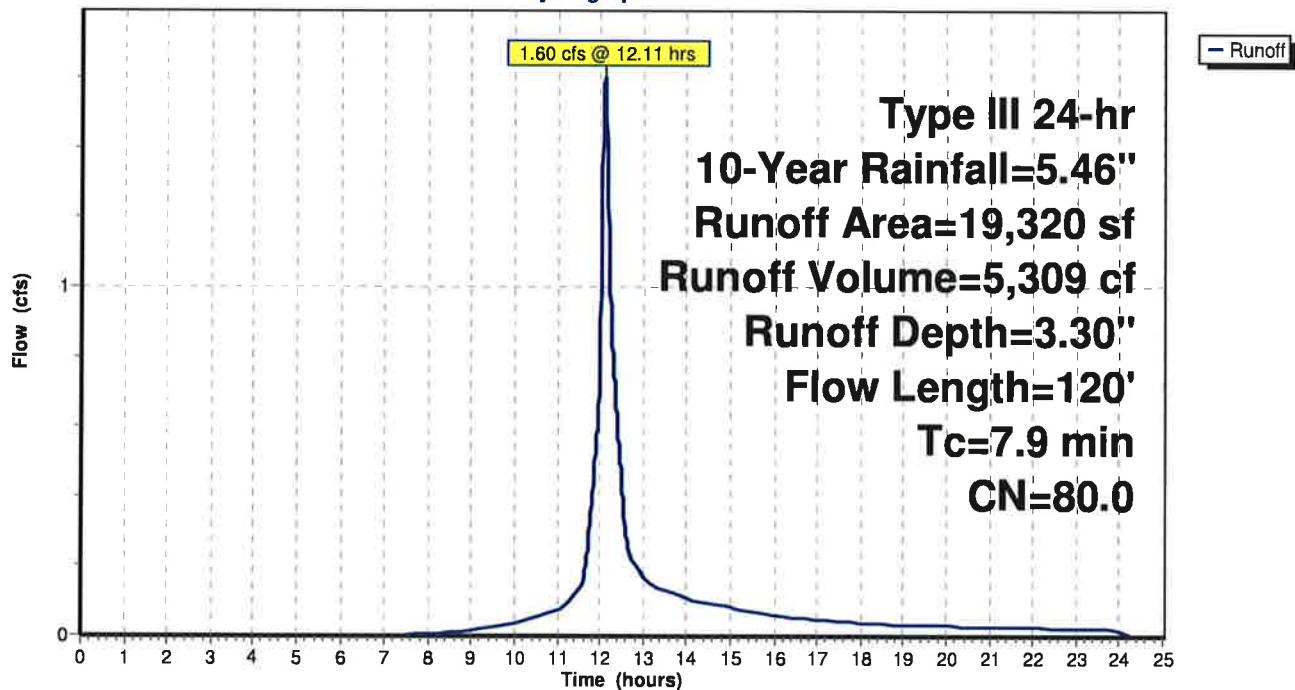
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.46"

Area (sf)	CN	Description
19,320	80.0	>75% Grass cover, Good, HSG D
19,320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0800	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.2	20	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
7.9	120	Total			

Subcatchment D: To South Adj.

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 58

Summary for Pond CH1: Chambers 1

[93] Warning: Storage range exceeded by 0.57'

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=5)

Inflow Area = 41,920 sf, 21.99% Impervious, Inflow Depth = 3.69" for 10-Year event
 Inflow = 3.90 cfs @ 12.11 hrs, Volume= 12,904 cf
 Outflow = 3.91 cfs @ 12.10 hrs, Volume= 11,283 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.91 cfs @ 12.10 hrs, Volume= 11,283 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 96.57' @ 12.10 hrs Surf.Area= 732 sf Storage= 1,633 cf

Plug-Flow detention time= 85.1 min calculated for 11,278 cf (87% of inflow)
 Center-of-Mass det. time= 28.2 min (836.8 - 808.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	91.50'	642 cf	16.00'W x 45.50'L x 3.54'H Field A 2,578 cf Overall - 972 cf Embedded = 1,606 cf x 40.0% Voids
#2A	92.00'	972 cf	Cultec R-330XLHD x 18 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 3 rows
#3	91.50'	18 cf	2.00'W x 2.00'L x 4.50'H Junction Box
		1,633 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=3.90 cfs @ 12.10 hrs HW=96.56' TW=0.00' (Dynamic Tailwater)
 ↑1=Orifice/Grate (Orifice Controls 3.90 cfs @ 4.96 fps)

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Type III 24-hr 10-Year Rainfall=5.46"

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Page 59

Pond CH1: Chambers 1 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 3 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

6 Chambers/Row x 7.00' Long + 1.50' Row Adjustment = 43.50' Row Length + 12.0" End Stone x 2 = 45.50' Base Length

3 Rows x 52.0" Wide + 6.0" Spacing x 2 + 12.0" Side Stone x 2 = 16.00' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

18 Chambers x 52.2 cf + 1.50' Row Adjustment x 7.45 sf x 3 Rows = 972.4 cf Chamber Storage

2,578.3 cf Field - 972.4 cf Chambers = 1,606.0 cf Stone x 40.0% Voids = 642.4 cf Stone Storage

Chamber Storage + Stone Storage = 1,614.7 cf = 0.037 af

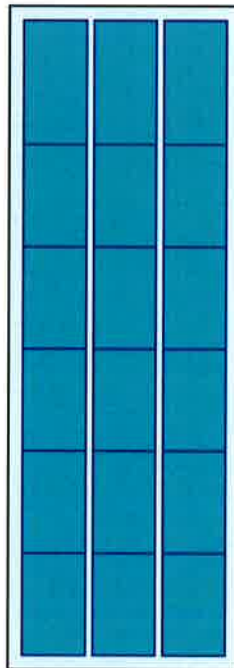
Overall Storage Efficiency = 62.6%

Overall System Size = 45.50' x 16.00' x 3.54'

18 Chambers

95.5 cy Field

59.5 cy Stone



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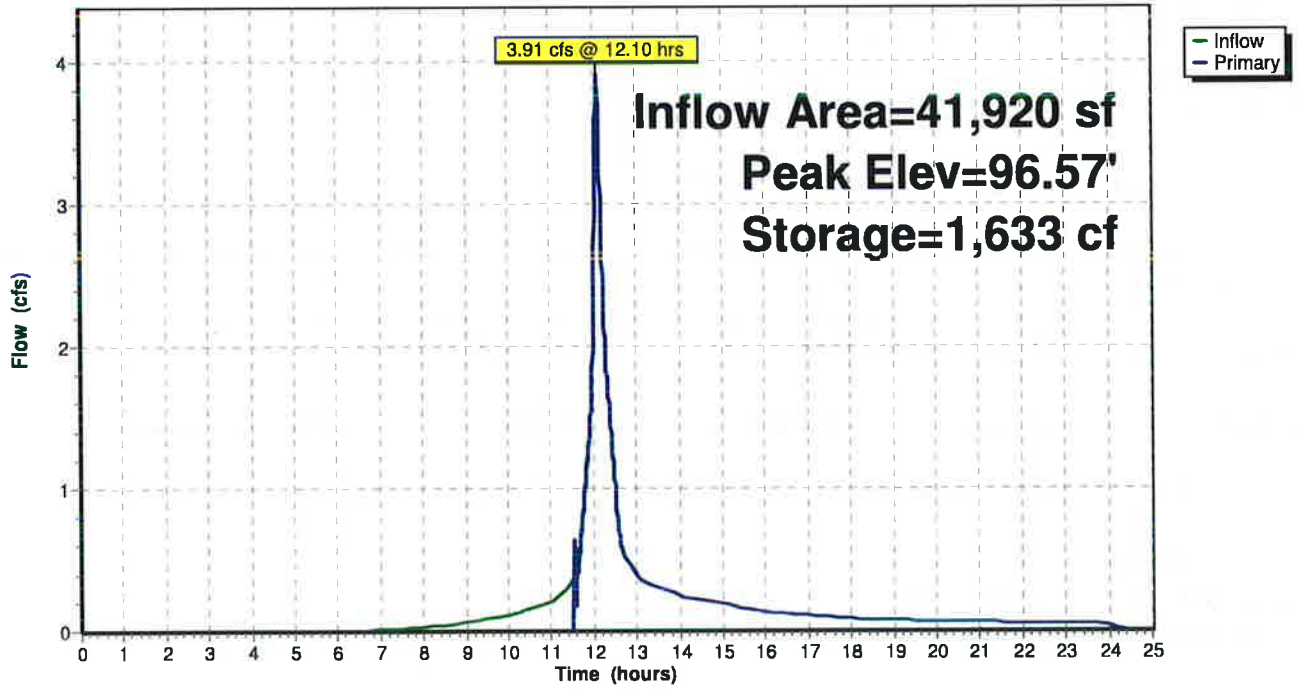
Type III 24-hr 10-Year Rainfall=5.46"

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Page 60

Pond CH1: Chambers 1

Hydrograph



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Page 61

Stage-Area-Storage for Pond CH1: Chambers 1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
91.50	0	93.58	1,064	95.66	1,631
91.54	12	93.62	1,085	95.70	1,632
91.58	24	93.66	1,106	95.74	1,632
91.62	35	93.70	1,127	95.78	1,632
91.66	47	93.74	1,147	95.82	1,632
91.70	59	93.78	1,168	95.86	1,632
91.74	71	93.82	1,188	95.90	1,632
91.78	83	93.86	1,208	95.94	1,633
91.82	94	93.90	1,227	95.98	1,633
91.86	106	93.94	1,246	96.02	1,633
91.90	118	93.98	1,265	96.06	1,633
91.94	130	94.02	1,284	96.10	1,633
91.98	142	94.06	1,302	96.14	1,633
92.02	160	94.10	1,320	96.18	1,633
92.06	184	94.14	1,338	96.22	1,633
92.10	208	94.18	1,355	96.26	1,633
92.14	232	94.22	1,371	96.30	1,633
92.18	256	94.26	1,387	96.34	1,633
92.22	280	94.30	1,402	96.38	1,633
92.26	304	94.34	1,417	96.42	1,633
92.30	328	94.38	1,431	96.46	1,633
92.34	352	94.42	1,444	96.50	1,633
92.38	376	94.46	1,457	96.54	1,633
92.42	400	94.50	1,469	96.58	1,633
92.46	424	94.54	1,481		
92.50	448	94.58	1,493		
92.54	472	94.62	1,504		
92.58	496	94.66	1,516		
92.62	519	94.70	1,528		
92.66	543	94.74	1,540		
92.70	566	94.78	1,552		
92.74	590	94.82	1,563		
92.78	613	94.86	1,575		
92.82	636	94.90	1,587		
92.86	659	94.94	1,599		
92.90	683	94.98	1,611		
92.94	706	95.02	1,623		
92.98	729	95.06	1,629		
93.02	752	95.10	1,629		
93.06	775	95.14	1,629		
93.10	798	95.18	1,629		
93.14	821	95.22	1,630		
93.18	844	95.26	1,630		
93.22	867	95.30	1,630		
93.26	889	95.34	1,630		
93.30	912	95.38	1,630		
93.34	934	95.42	1,630		
93.38	956	95.46	1,631		
93.42	978	95.50	1,631		
93.46	1,000	95.54	1,631		
93.50	1,021	95.58	1,631		
93.54	1,043	95.62	1,631		

Proposed 2

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Page 62

Summary for Pond CH2: Chambers 2

Inflow Area = 15,790 sf, 62.57% Impervious, Inflow Depth = 4.46" for 10-Year event
 Inflow = 1.38 cfs @ 12.20 hrs, Volume= 5,872 cf
 Outflow = 1.38 cfs @ 12.20 hrs, Volume= 4,414 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.38 cfs @ 12.20 hrs, Volume= 4,414 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 87.04' @ 12.20 hrs Surf.Area= 668 sf Storage= 1,470 cf

Plug-Flow detention time= 140.6 min calculated for 4,412 cf (75% of inflow)
 Center-of-Mass det. time= 56.5 min (847.4 - 790.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	83.50'	599 cf	11.17'W x 59.50'L x 3.54'H Field A 2,353 cf Overall - 857 cf Embedded = 1,496 cf x 40.0% Voids
#2A	84.00'	857 cf	Cultec R-330XLHD x 16 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
#3	83.50'	20 cf	2.00'W x 2.00'L x 5.00'H Junction Box
#4	88.00'	10 cf	1.00'W x 1.00'L x 0.10'H dummy storage for oscillation errors x 100
		1,485 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	59.5' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.38 cfs @ 12.20 hrs HW=87.04' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 1.38 cfs @ 0.53 fps)

Proposed 2

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Page 63

Pond CH2: Chambers 2 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

16 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 856.9 cf Chamber Storage

2,353.1 cf Field - 856.9 cf Chambers = 1,496.3 cf Stone x 40.0% Voids = 598.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,455.4 cf = 0.033 af

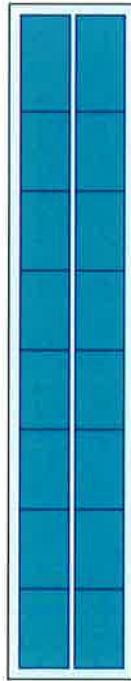
Overall Storage Efficiency = 61.8%

Overall System Size = 59.50' x 11.17' x 3.54'

16 Chambers

87.2 cy Field

55.4 cy Stone



Proposed 2

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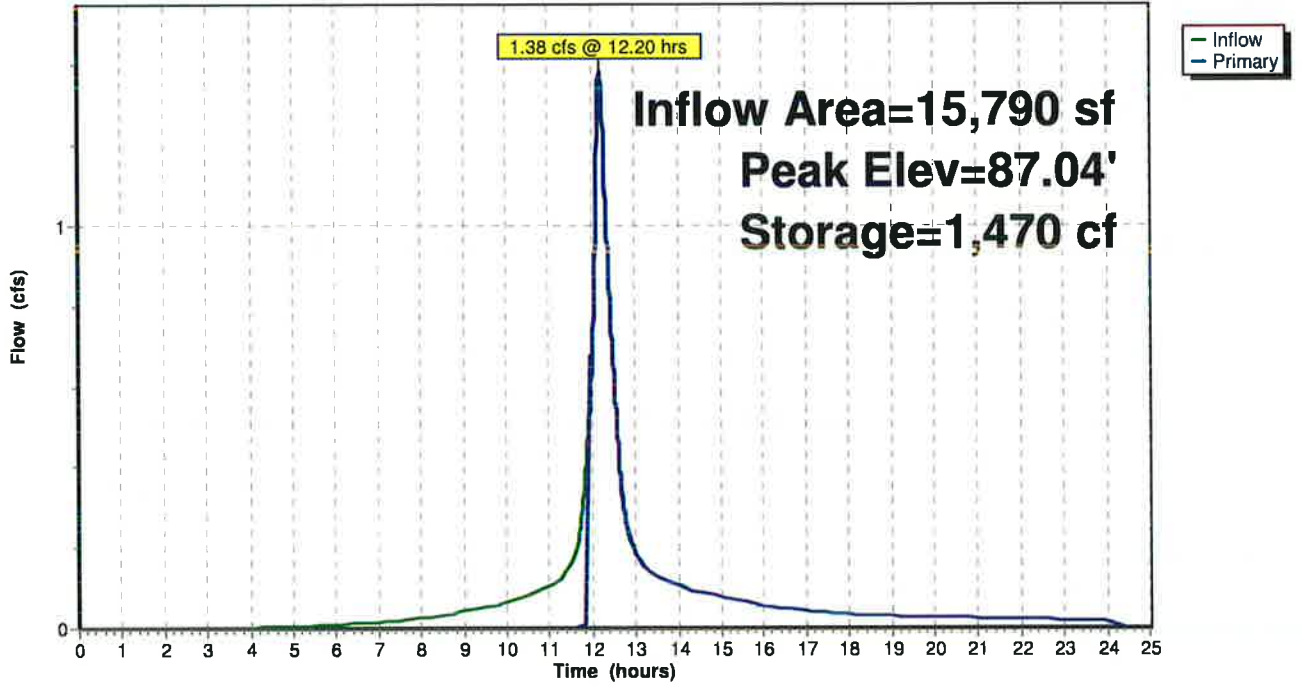
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Page 64

Pond CH2: Chambers 2

Hydrograph



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Page 65

Stage-Area-Storage for Pond CH2: Chambers 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
83.50	0	86.10	1,188
83.55	13	86.15	1,208
83.60	27	86.20	1,227
83.65	40	86.25	1,245
83.70	54	86.30	1,263
83.75	67	86.35	1,279
83.80	81	86.40	1,295
83.85	94	86.45	1,309
83.90	108	86.50	1,323
83.95	121	86.55	1,337
84.00	135	86.60	1,350
84.05	162	86.65	1,364
84.10	189	86.70	1,377
84.15	216	86.75	1,391
84.20	243	86.80	1,404
84.25	270	86.85	1,418
84.30	297	86.90	1,431
84.35	324	86.95	1,445
84.40	351	87.00	1,458
84.45	378	87.05	1,470
84.50	405	87.10	1,470
84.55	431	87.15	1,470
84.60	458	87.20	1,470
84.65	484	87.25	1,470
84.70	511	87.30	1,471
84.75	537	87.35	1,471
84.80	563	87.40	1,471
84.85	589	87.45	1,471
84.90	615	87.50	1,471
84.95	641	87.55	1,472
85.00	667	87.60	1,472
85.05	693	87.65	1,472
85.10	719	87.70	1,472
85.15	744	87.75	1,472
85.20	770	87.80	1,473
85.25	796	87.85	1,473
85.30	821	87.90	1,473
85.35	846	87.95	1,473
85.40	871	88.00	1,473
85.45	895	88.05	1,479
85.50	919	88.10	1,484
85.55	943	88.15	1,484
85.60	967	88.20	1,484
85.65	991	88.25	1,484
85.70	1,014	88.30	1,485
85.75	1,037	88.35	1,485
85.80	1,060	88.40	1,485
85.85	1,082	88.45	1,485
85.90	1,104	88.50	1,485
85.95	1,126		
86.00	1,147		
86.05	1,168		

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Page 66

Summary for Pond CH3: Chambers 3

Inflow Area = 7,250 sf, 100.00% Impervious, Inflow Depth = 5.22" for 10-Year event
 Inflow = 0.89 cfs @ 12.08 hrs, Volume= 3,155 cf
 Outflow = 0.89 cfs @ 12.09 hrs, Volume= 2,038 cf, Atten= 0%, Lag= 0.2 min
 Primary = 0.89 cfs @ 12.09 hrs, Volume= 2,038 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 91.11' @ 12.09 hrs Surf.Area= 532 sf Storage= 1,137 cf

Plug-Flow detention time= 201.8 min calculated for 2,037 cf (65% of inflow)
 Center-of-Mass det. time= 98.2 min (844.8 - 746.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	87.00'	460 cf	11.17'W x 45.50'L x 3.54'H Field A 1,799 cf Overall - 648 cf Embedded = 1,151 cf x 40.0% Voids
#2A	87.50'	648 cf	Cultec R-330XLHD x 12 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
#3	87.00'	18 cf	2.00'W x 2.00'L x 4.50'H Junction Box
#4	90.50'	20 cf	1.00'W x 1.00'L x 1.00'H dummy storage for oscillation errors x 20
		1,147 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.50'	8.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.89 cfs @ 12.09 hrs HW=91.11' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Orifice/Grate** (Orifice Controls 0.89 cfs @ 2.66 fps)

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Type III 24-hr 10-Year Rainfall=5.46"

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Page 67

Pond CH3: Chambers 3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

6 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 43.50' Row Length +12.0" End Stone x 2 = 45.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

12 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 648.2 cf Chamber Storage

1,799.5 cf Field - 648.2 cf Chambers = 1,151.2 cf Stone x 40.0% Voids = 460.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,108.7 cf = 0.025 af

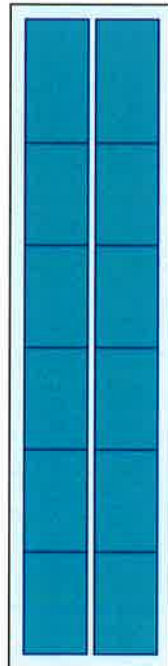
Overall Storage Efficiency = 61.6%

Overall System Size = 45.50' x 11.17' x 3.54'

12 Chambers

66.6 cy Field

42.6 cy Stone



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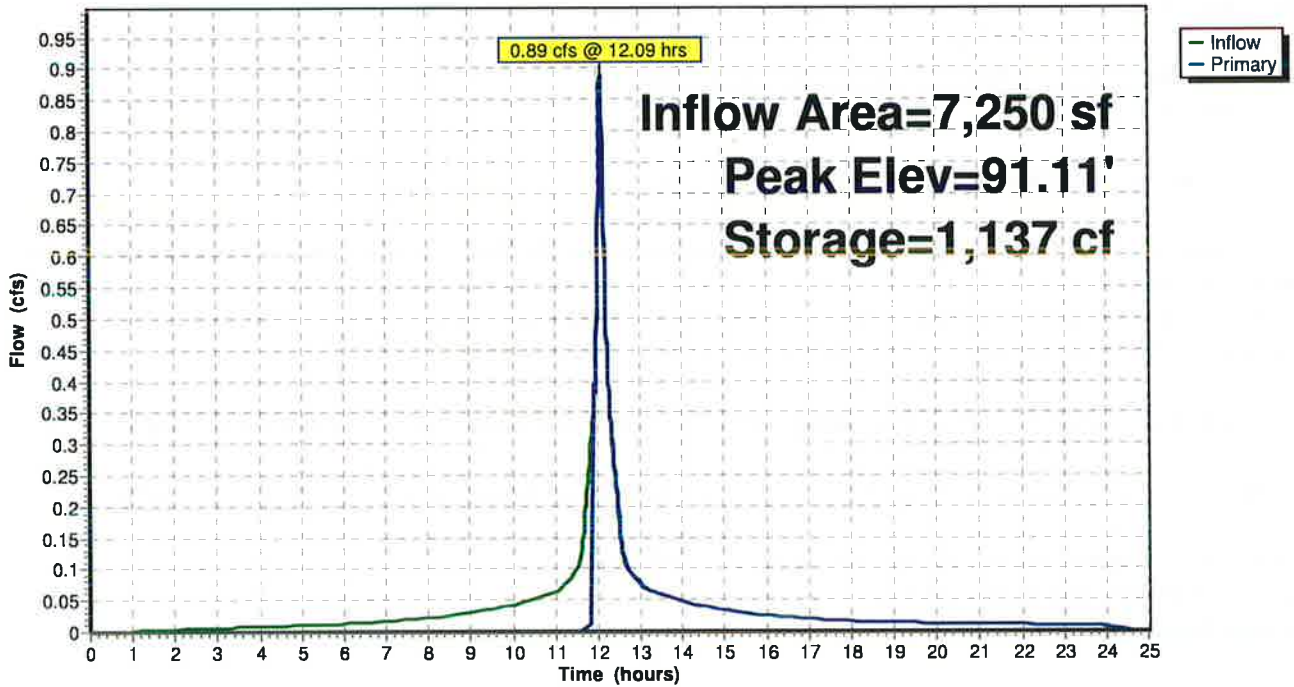
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Page 68

Pond CH3: Chambers 3

Hydrograph



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Page 69

Stage-Area-Storage for Pond CH3: Chambers 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
87.00	0	89.60	907
87.05	10	89.65	922
87.10	21	89.70	937
87.15	31	89.75	951
87.20	41	89.80	964
87.25	52	89.85	977
87.30	62	89.90	989
87.35	73	89.95	1,000
87.40	83	90.00	1,011
87.45	93	90.05	1,021
87.50	104	90.10	1,031
87.55	124	90.15	1,042
87.60	145	90.20	1,052
87.65	166	90.25	1,062
87.70	186	90.30	1,073
87.75	207	90.35	1,083
87.80	227	90.40	1,094
87.85	248	90.45	1,104
87.90	268	90.50	1,114
87.95	289	90.55	1,124
88.00	309	90.60	1,125
88.05	330	90.65	1,126
88.10	350	90.70	1,128
88.15	370	90.75	1,129
88.20	390	90.80	1,130
88.25	410	90.85	1,131
88.30	430	90.90	1,132
88.35	450	90.95	1,134
88.40	470	91.00	1,135
88.45	489	91.05	1,136
88.50	509	91.10	1,137
88.55	529	91.15	1,138
88.60	549	91.20	1,140
88.65	568	91.25	1,141
88.70	588	91.30	1,142
88.75	607	91.35	1,143
88.80	627	91.40	1,144
88.85	646	91.45	1,146
88.90	665	91.50	1,147
88.95	683		
89.00	702		
89.05	720		
89.10	738		
89.15	756		
89.20	774		
89.25	792		
89.30	809		
89.35	826		
89.40	843		
89.45	860		
89.50	876		
89.55	892		

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Page 70

Summary for Pond CH4: Chambers 4

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=5)

Inflow Area = 14,020 sf, 100.00% Impervious, Inflow Depth = 5.22" for 10-Year event
 Inflow = 1.72 cfs @ 12.08 hrs, Volume= 6,102 cf
 Outflow = 1.72 cfs @ 12.08 hrs, Volume= 4,307 cf, Atten= 0%, Lag= 0.1 min
 Primary = 1.72 cfs @ 12.08 hrs, Volume= 4,307 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Peak Elev= 92.38' @ 12.08 hrs Surf.Area= 806 sf Storage= 1,809 cf

Plug-Flow detention time= 179.9 min calculated for 4,305 cf (71% of inflow)

Center-of-Mass det. time= 85.6 min (832.2 - 746.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	87.50'	701 cf	20.83'W x 38.50'L x 3.54'H Field A 2,841 cf Overall - 1,088 cf Embedded = 1,753 cf x 40.0% Voids
#2A	88.00'	1,088 cf	Cultec R-330XLHD x 20 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
#3	87.50'	20 cf	2.00'W x 2.00'L x 5.00'H Junction Box
		1,809 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	8.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.72 cfs @ 12.08 hrs HW=92.38' TW=0.00' (Dynamic Tailwater)↑ **1=Orifice/Grate** (Orifice Controls 1.72 cfs @ 4.92 fps)

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Page 71

Pond CH4: Chambers 4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 = 38.50' Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

20 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 1,087.8 cf Chamber Storage

2,840.7 cf Field - 1,087.8 cf Chambers = 1,752.9 cf Stone x 40.0% Voids = 701.1 cf Stone Storage

Chamber Storage + Stone Storage = 1,789.0 cf = 0.041 af

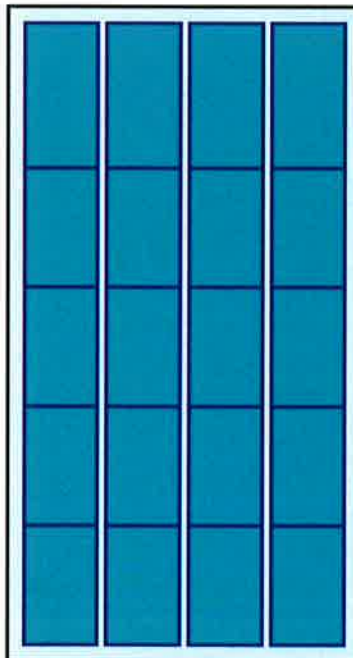
Overall Storage Efficiency = 63.0%

Overall System Size = 38.50' x 20.83' x 3.54'

20 Chambers

105.2 cy Field

64.9 cy Stone



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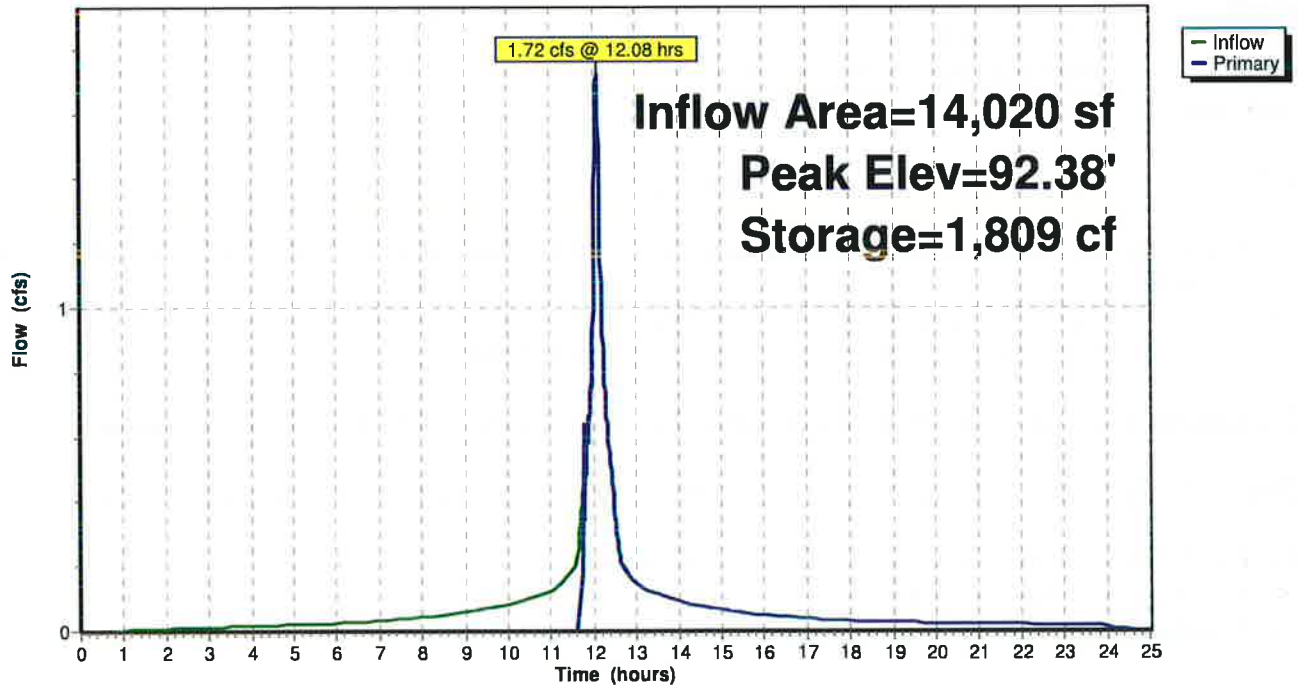
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Page 72

Pond CH4: Chambers 4

Hydrograph



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Page 73

Stage-Area-Storage for Pond CH4: Chambers 4

<u>Elevation</u> <u>(feet)</u>	<u>Storage</u> <u>(cubic-feet)</u>	<u>Elevation</u> <u>(feet)</u>	<u>Storage</u> <u>(cubic-feet)</u>
87.50	0	90.10	1,463
87.55	16	90.15	1,487
87.60	32	90.20	1,510
87.65	49	90.25	1,532
87.70	65	90.30	1,553
87.75	81	90.35	1,573
87.80	97	90.40	1,592
87.85	114	90.45	1,610
87.90	130	90.50	1,627
87.95	146	90.55	1,643
88.00	162	90.60	1,660
88.05	196	90.65	1,676
88.10	230	90.70	1,692
88.15	263	90.75	1,708
88.20	296	90.80	1,725
88.25	330	90.85	1,741
88.30	363	90.90	1,757
88.35	396	90.95	1,773
88.40	430	91.00	1,790
88.45	463	91.05	1,803
88.50	496	91.10	1,803
88.55	529	91.15	1,804
88.60	562	91.20	1,804
88.65	595	91.25	1,804
88.70	627	91.30	1,804
88.75	659	91.35	1,804
88.80	692	91.40	1,805
88.85	724	91.45	1,805
88.90	756	91.50	1,805
88.95	788	91.55	1,805
89.00	820	91.60	1,805
89.05	852	91.65	1,806
89.10	884	91.70	1,806
89.15	916	91.75	1,806
89.20	948	91.80	1,806
89.25	979	91.85	1,806
89.30	1,010	91.90	1,807
89.35	1,041	91.95	1,807
89.40	1,072	92.00	1,807
89.45	1,102	92.05	1,807
89.50	1,132	92.10	1,807
89.55	1,162	92.15	1,808
89.60	1,191	92.20	1,808
89.65	1,220	92.25	1,808
89.70	1,249	92.30	1,808
89.75	1,277	92.35	1,808
89.80	1,305	92.40	1,809
89.85	1,333	92.45	1,809
89.90	1,360	92.50	1,809
89.95	1,386		
90.00	1,412		
90.05	1,438		

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Page 74

Summary for Pond CH5: Chambers 5

[93] Warning: Storage range exceeded by 0.91'

Inflow Area = 8,880 sf, 14.30% Impervious, Inflow Depth = 3.55" for 10-Year event
 Inflow = 0.84 cfs @ 12.09 hrs, Volume= 2,629 cf
 Outflow = 0.84 cfs @ 12.09 hrs, Volume= 2,367 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.84 cfs @ 12.09 hrs, Volume= 2,367 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 106.01' @ 12.09 hrs Surf.Area= 219 sf Storage= 272 cf

Plug-Flow detention time= 71.8 min calculated for 2,367 cf (90% of inflow)
 Center-of-Mass det. time= 23.3 min (834.4 - 811.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	100.50'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	101.00'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
#3	100.50'	36 cf	2.00'W x 2.00'L x 4.50'H Catch Basin x2 x 2
#4	105.00'	10 cf	1.00'W x 1.00'L x 0.10'H Dummy (for oscillation error) x 100
		272 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	4.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.84 cfs @ 12.09 hrs HW=106.01' TW=0.00' (Dynamic Tailwater)
 ↗ **1=Orifice/Grate** (Orifice Controls 0.84 cfs @ 4.83 fps)

Proposed 2

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Type III 24-hr 10-Year Rainfall=5.46"

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Page 75

Pond CH5: Chambers 5 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

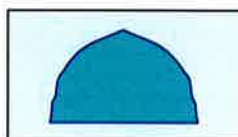
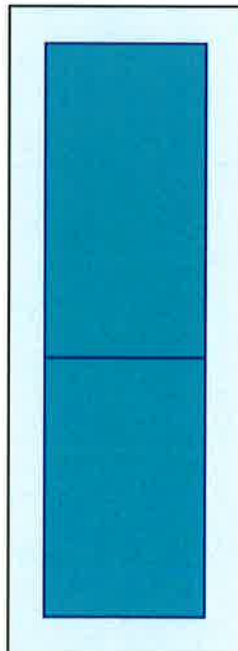
Overall Storage Efficiency = 57.7%

Overall System Size = 17.50' x 6.33' x 3.54'

2 Chambers

14.5 cy Field

10.3 cy Stone



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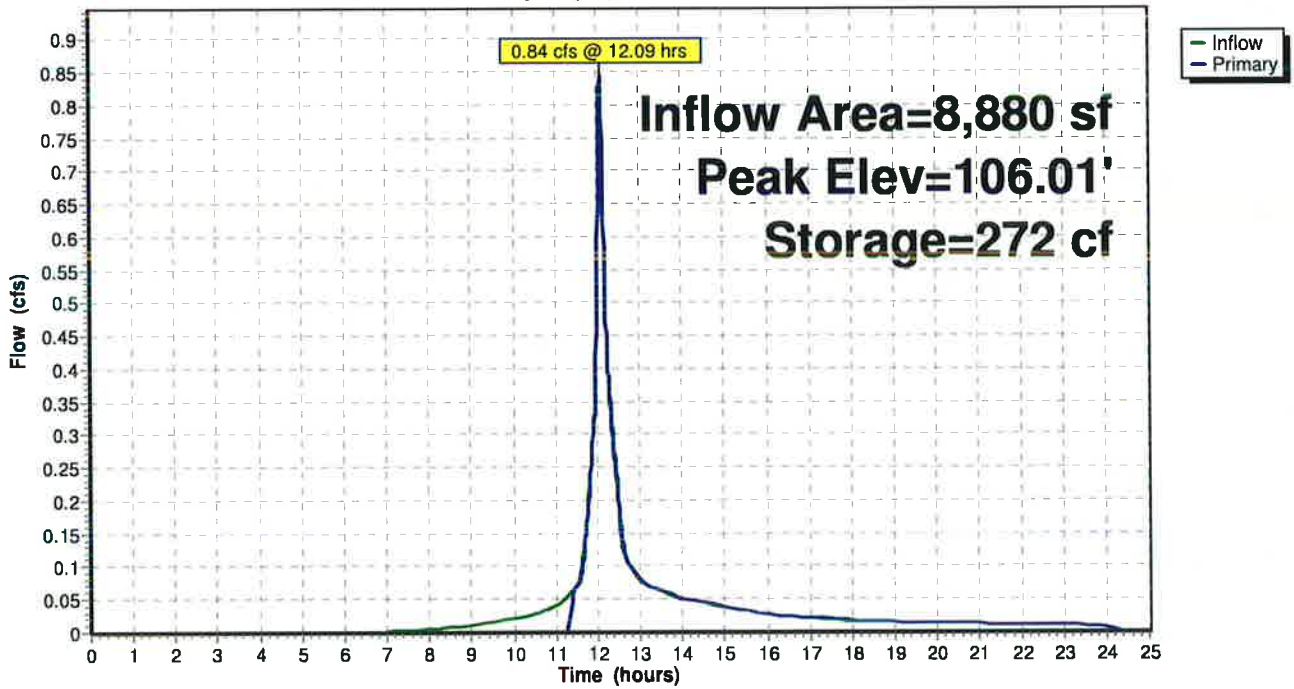
Type III 24-hr 10-Year Rainfall=5.46"

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Page 76

Pond CH5: Chambers 5

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 77

Stage-Area-Storage for Pond CH5: Chambers 5

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
100.50	0	102.58	162	104.66	260
100.54	2	102.62	166	104.70	260
100.58	4	102.66	169	104.74	260
100.62	6	102.70	172	104.78	261
100.66	8	102.74	175	104.82	261
100.70	10	102.78	178	104.86	261
100.74	13	102.82	181	104.90	262
100.78	15	102.86	184	104.94	262
100.82	17	102.90	187	104.98	262
100.86	19	102.94	190	105.02	264
100.90	21	102.98	193	105.06	268
100.94	23	103.02	196	105.10	272
100.98	25	103.06	199	105.14	272
101.02	28	103.10	202	105.18	272
101.06	32	103.14	204	105.22	272
101.10	35	103.18	207	105.26	272
101.14	39	103.22	210	105.30	272
101.18	42	103.26	212	105.34	272
101.22	46	103.30	215	105.38	272
101.26	49	103.34	217	105.42	272
101.30	53	103.38	220	105.46	272
101.34	56	103.42	222	105.50	272
101.38	60	103.46	224	105.54	272
101.42	63	103.50	226	105.58	272
101.46	67	103.54	228	105.62	272
101.50	70	103.58	230	105.66	272
101.54	74	103.62	233	105.70	272
101.58	78	103.66	235	105.74	272
101.62	81	103.70	237	105.78	272
101.66	85	103.74	239	105.82	272
101.70	88	103.78	241	105.86	272
101.74	91	103.82	243	105.90	272
101.78	95	103.86	245	105.94	272
101.82	98	103.90	247	105.98	272
101.86	102	103.94	249	106.02	272
101.90	105	103.98	251		
101.94	109	104.02	254		
101.98	112	104.06	255		
102.02	116	104.10	255		
102.06	119	104.14	255		
102.10	122	104.18	256		
102.14	126	104.22	256		
102.18	129	104.26	256		
102.22	133	104.30	257		
102.26	136	104.34	257		
102.30	139	104.38	257		
102.34	143	104.42	258		
102.38	146	104.46	258		
102.42	149	104.50	258		
102.46	153	104.54	259		
102.50	156	104.58	259		
102.54	159	104.62	259		

Proposed 2

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Type III 24-hr 10-Year Rainfall=5.46"

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Page 78

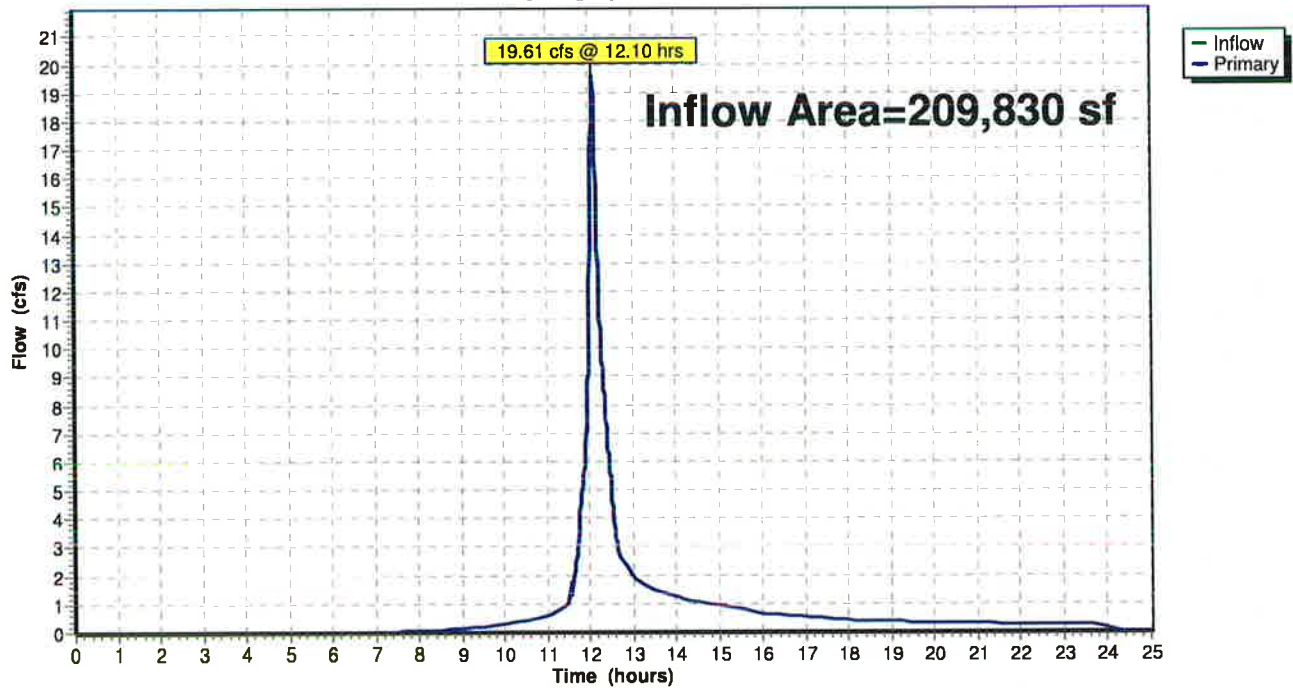
Summary for Link A: Lake Shoreline

Inflow Area = 209,830 sf, 25.87% Impervious, Inflow Depth > 3.43" for 10-Year event
Inflow = 19.61 cfs @ 12.10 hrs, Volume= 60,028 cf
Primary = 19.61 cfs @ 12.10 hrs, Volume= 60,028 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link A: Lake Shoreline

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 79

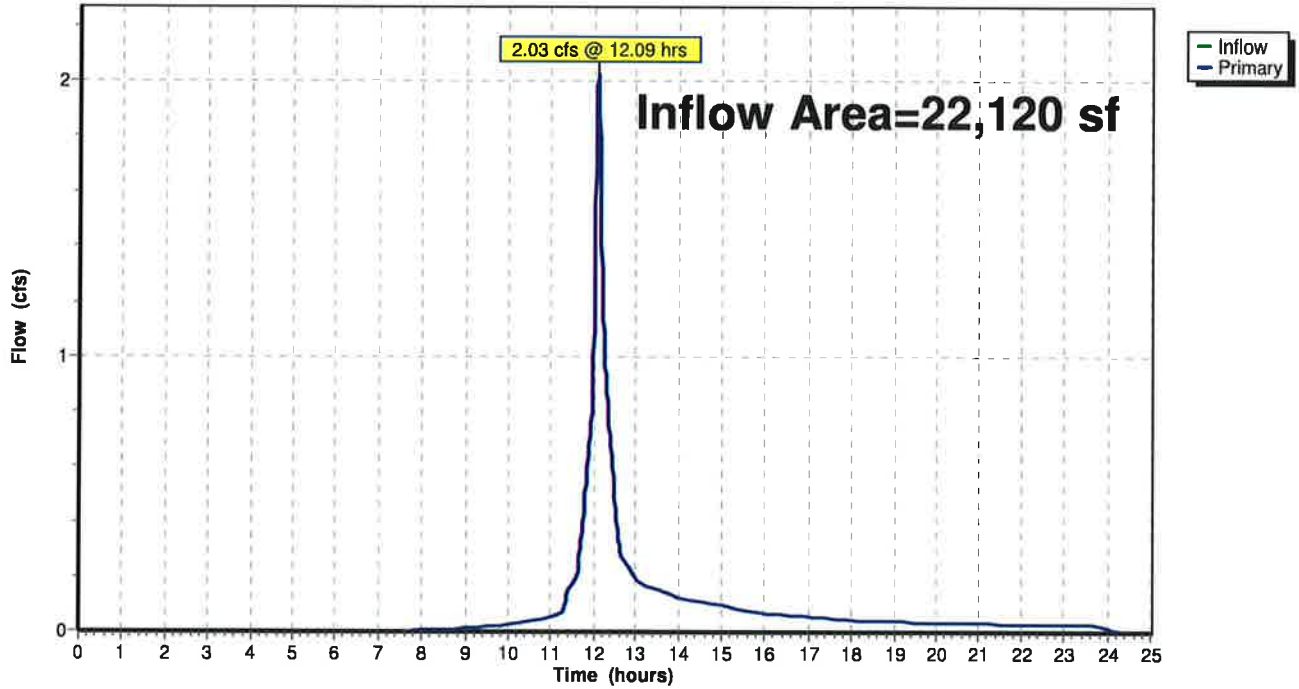
Summary for Link C: Street

Inflow Area = 22,120 sf, 6.74% Impervious, Inflow Depth = 3.28" for 10-Year event
Inflow = 2.03 cfs @ 12.09 hrs, Volume= 6,038 cf
Primary = 2.03 cfs @ 12.09 hrs, Volume= 6,038 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link C: Street

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.46"

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Page 80

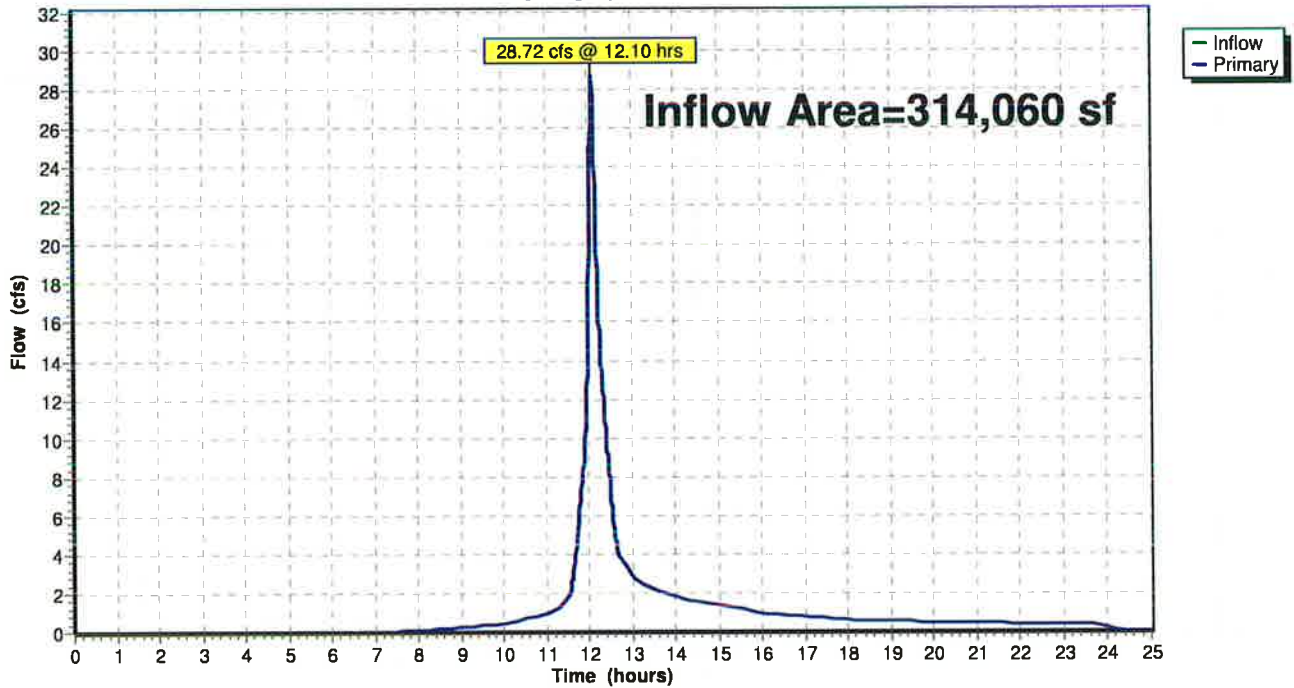
Summary for Link Z: Converse Lake

Inflow Area = 314,060 sf, 18.33% Impervious, Inflow Depth = 3.40" for 10-Year event
Inflow = 28.72 cfs @ 12.10 hrs, Volume= 88,885 cf
Primary = 28.72 cfs @ 12.10 hrs, Volume= 88,885 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link Z: Converse Lake

Hydrograph



Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 81

Summary for Subcatchment A0: To Shoreline

Runoff = 21.24 cfs @ 12.09 hrs, Volume= 67,915 cf, Depth= 6.23"

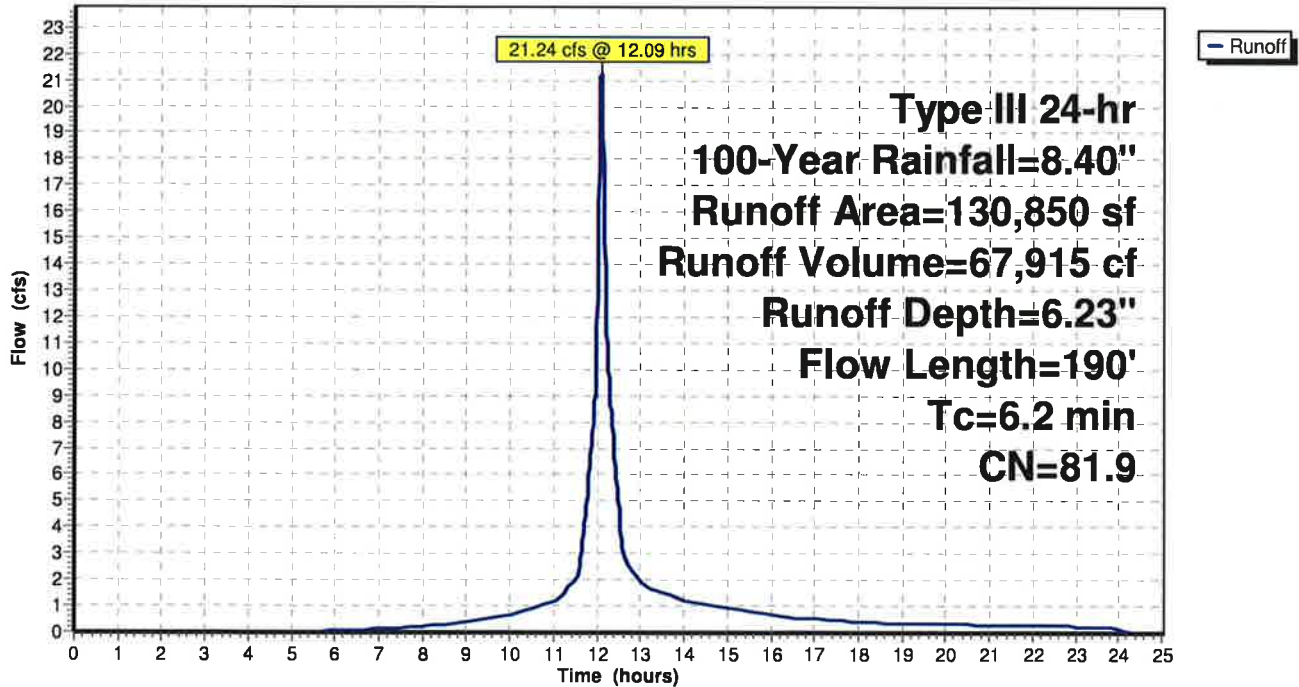
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.40"

Area (sf)	CN	Description
116,930	80.0	>75% Grass cover, Good, HSG D
* 12,060	98.0	Rock
* 550	98.0	Walk
* 1,310	98.0	Roof
130,850	81.9	Weighted Average
116,930		89.36% Pervious Area
13,920		10.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	100	0.1500	0.28		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.2	90	0.3000	8.22		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.2	190	Total			

Subcatchment A0: To Shoreline

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 82

Summary for Subcatchment A1: To Chambers 1

Runoff = 6.69 cfs @ 12.10 hrs, Volume= 22,636 cf, Depth= 6.48"

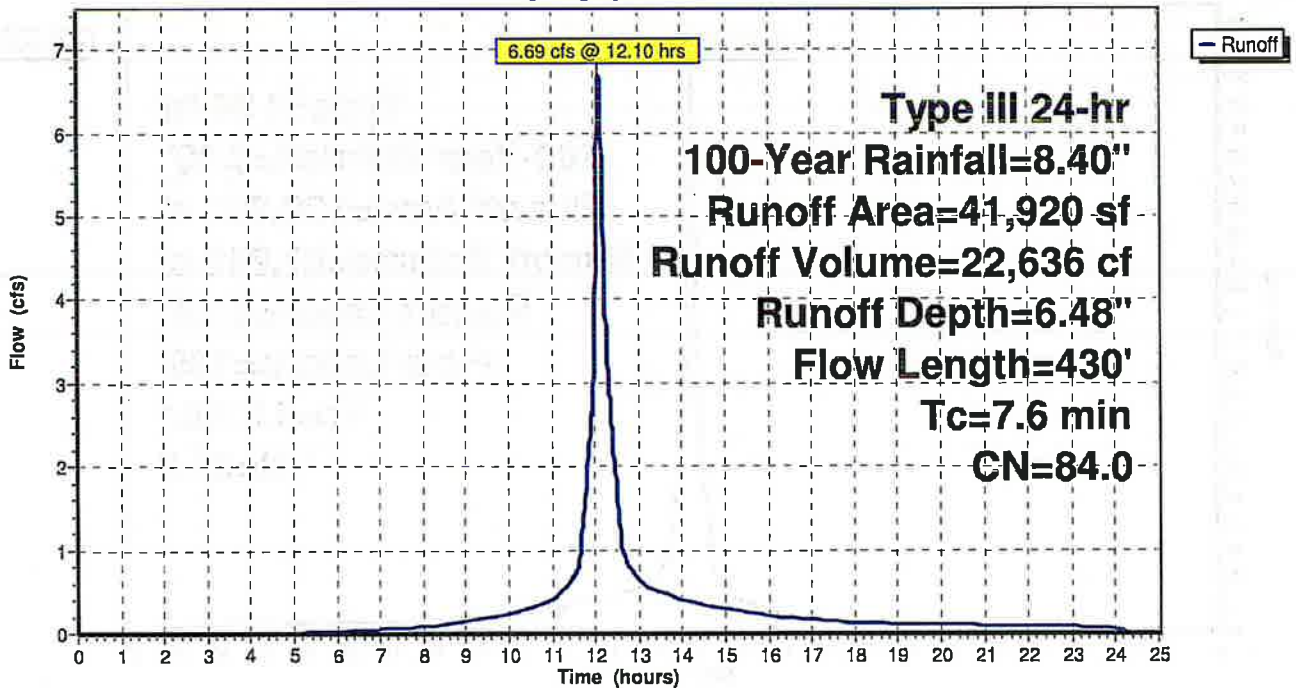
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.40"

Area (sf)	CN	Description
* 1,280	98.0	Roof
* 7,710	98.0	Drive
* 230	98.0	Walk
32,700	80.0	>75% Grass cover, Good, HSG D
41,920	84.0	Weighted Average
32,700		78.01% Pervious Area
9,220		21.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	85	0.1000	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
1.4	345	0.0400	4.06		Shallow Concentrated Flow, Paved Kv= 20.3 fps
7.6	430	Total			

Subcatchment A1: To Chambers 1

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 83

Summary for Subcatchment A2: To Chambers 2

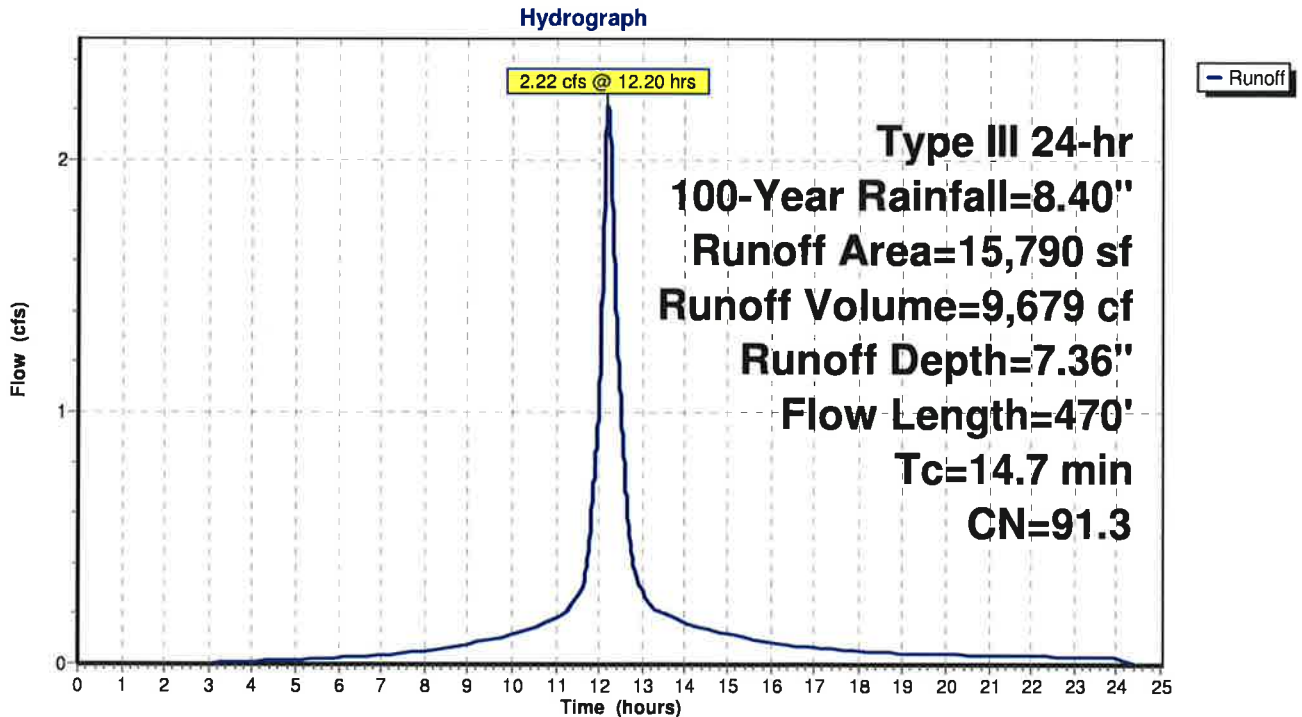
Runoff = 2.22 cfs @ 12.20 hrs, Volume= 9,679 cf, Depth= 7.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.40"

	Area (sf)	CN	Description
*	6,340	98.0	Roof
*	3,540	98.0	Drive
	5,910	80.0	>75% Grass cover, Good, HSG D
	15,790	91.3	Weighted Average
	5,910		37.43% Pervious Area
	9,880		62.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	100	0.0250	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
1.8	280	0.0300	2.60		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.6	90	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
14.7	470	Total			

Subcatchment A2: To Chambers 2



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 84

Summary for Subcatchment A3: To Chambers 3

Runoff = 1.37 cfs @ 12.08 hrs, Volume= 4,930 cf, Depth= 8.16"

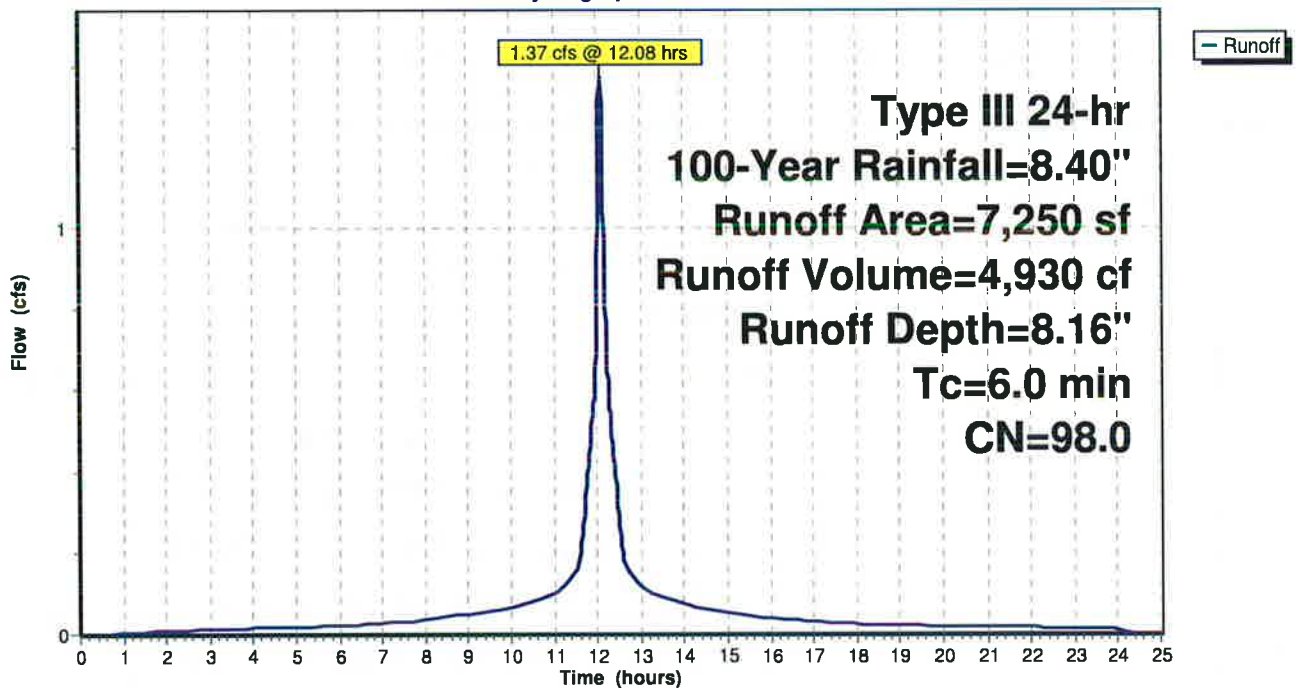
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.40"

	Area (sf)	CN	Description
*	7,250	98.0	Roof & Patio
	7,250		100.00% Impervious Area

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

Subcatchment A3: To Chambers 3

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 85

Summary for Subcatchment A4: To Chambers 4

Runoff = 2.65 cfs @ 12.08 hrs, Volume= 9,534 cf, Depth= 8.16"

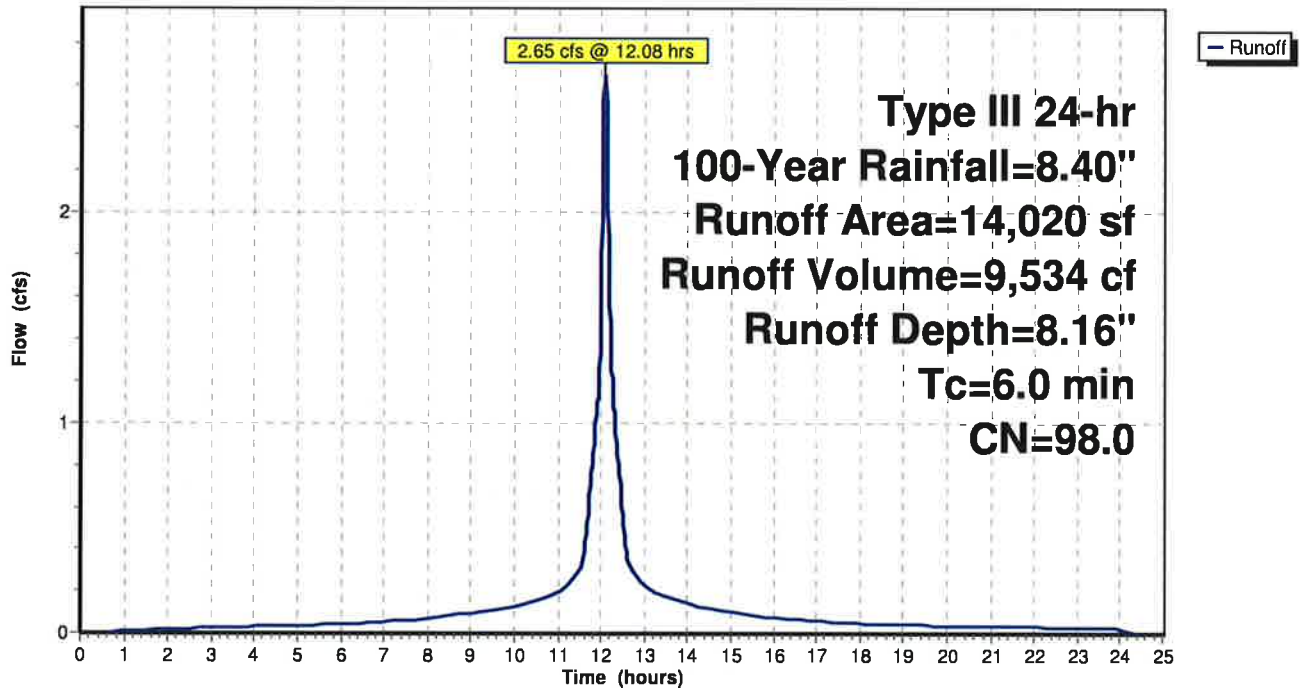
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.40"

	Area (sf)	CN	Description
*	2,900	98.0	Roof
*	3,030	98.0	Drive
*	7,860	98.0	Tennis
*	230	98.0	Walk
	14,020	98.0	Weighted Average
	14,020		100.00% Impervious Area

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

Subcatchment A4: To Chambers 4

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 86

Summary for Subcatchment B: To North Adj.

Runoff = 9.83 cfs @ 12.09 hrs, Volume= 31,713 cf, Depth= 6.06"

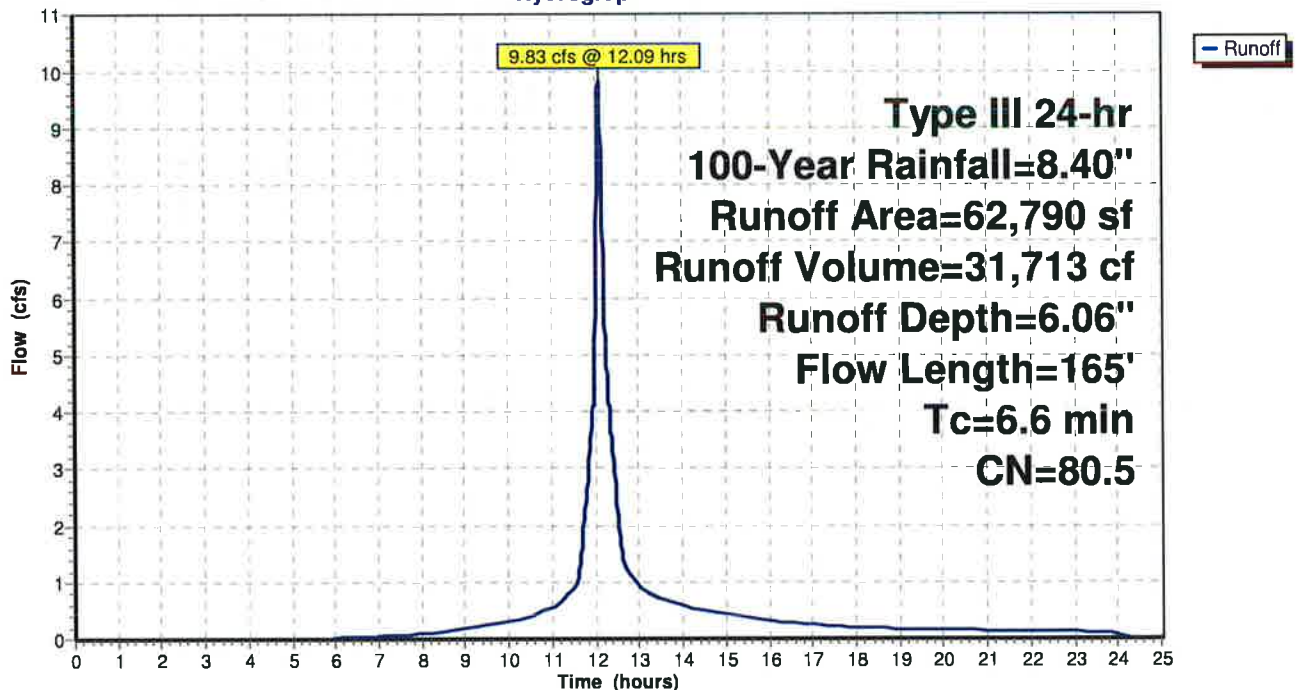
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.40"

Area (sf)	CN	Description
61,010	80.0	>75% Grass cover, Good, HSG D
* 1,780	98.0	Rock
62,790	80.5	Weighted Average
61,010		97.17% Pervious Area
1,780		2.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	60	0.1600	0.26		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.3	15	0.0150	0.89		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
2.2	25	0.1200	0.19		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.2	65	0.1500	5.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.6	165	Total			

Subcatchment B: To North Adj.

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 87

Summary for Subcatchment C0: To Street

Runoff = 2.11 cfs @ 12.09 hrs, Volume= 6,661 cf, Depth= 6.04"

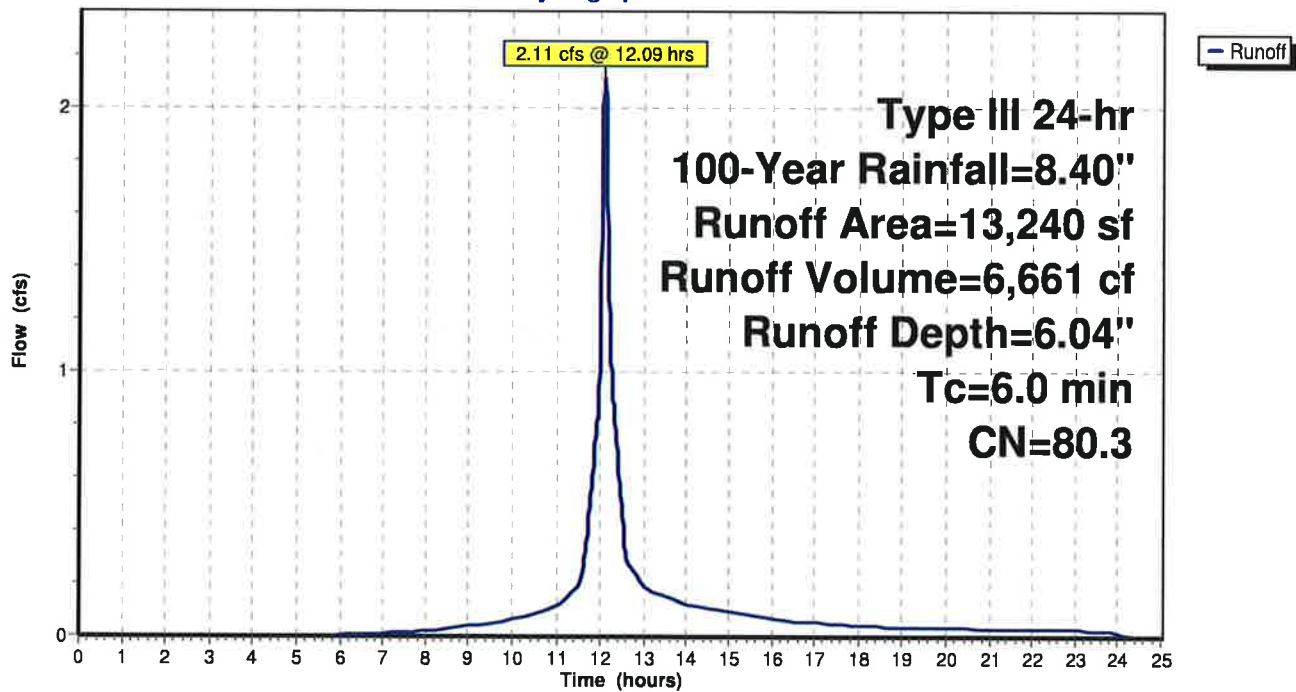
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.40"

Area (sf)	CN	Description
220	98.0	Drive
13,020	80.0	>75% Grass cover, Good, HSG D
13,240	80.3	Weighted Average
13,020		98.34% Pervious Area
220		1.66% Impervious Area

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

Subcatchment C0: To Street

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 88

Summary for Subcatchment C1: To Chambers 5

Runoff = 1.47 cfs @ 12.09 hrs, Volume= 4,671 cf, Depth= 6.31"

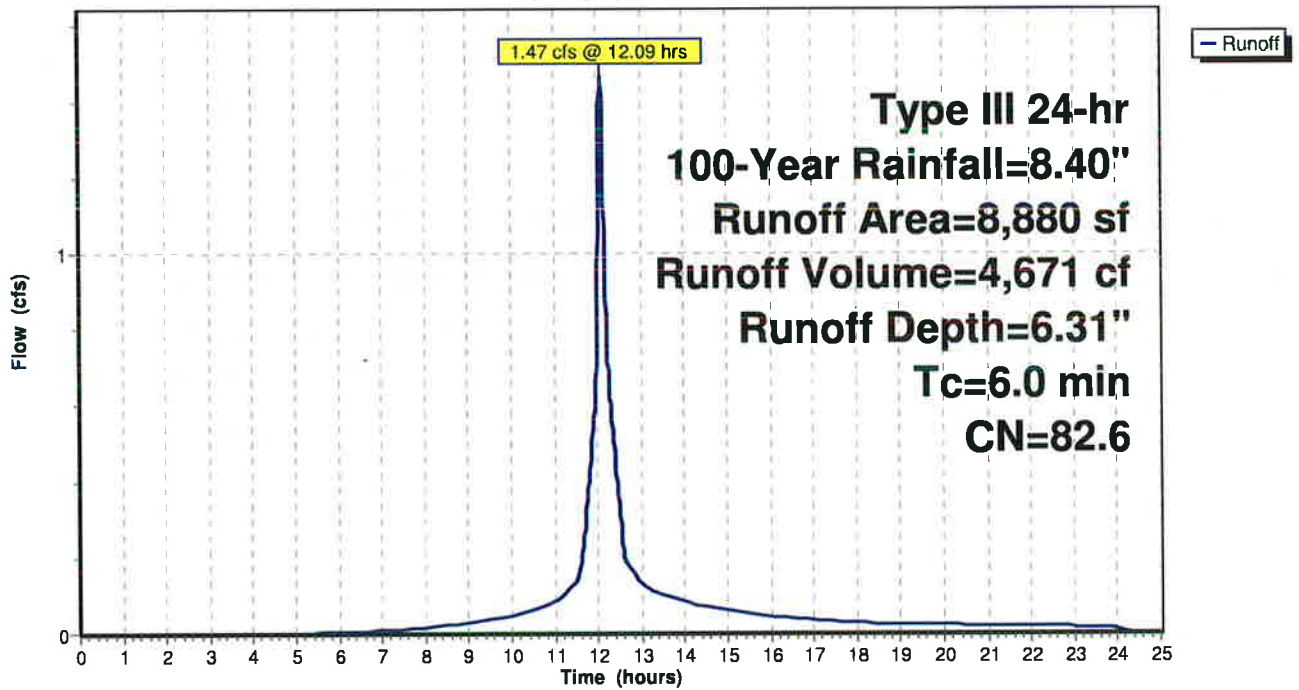
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.40"

	Area (sf)	CN	Description
*	1,270	98.0	Drive
	7,610	80.0	>75% Grass cover, Good, HSG D
	8,880	82.6	Weighted Average
	7,610		85.70% Pervious Area
	1,270		14.30% Impervious Area

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

Subcatchment C1: To Chambers 5

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 89

Summary for Subcatchment D: To South Adj.

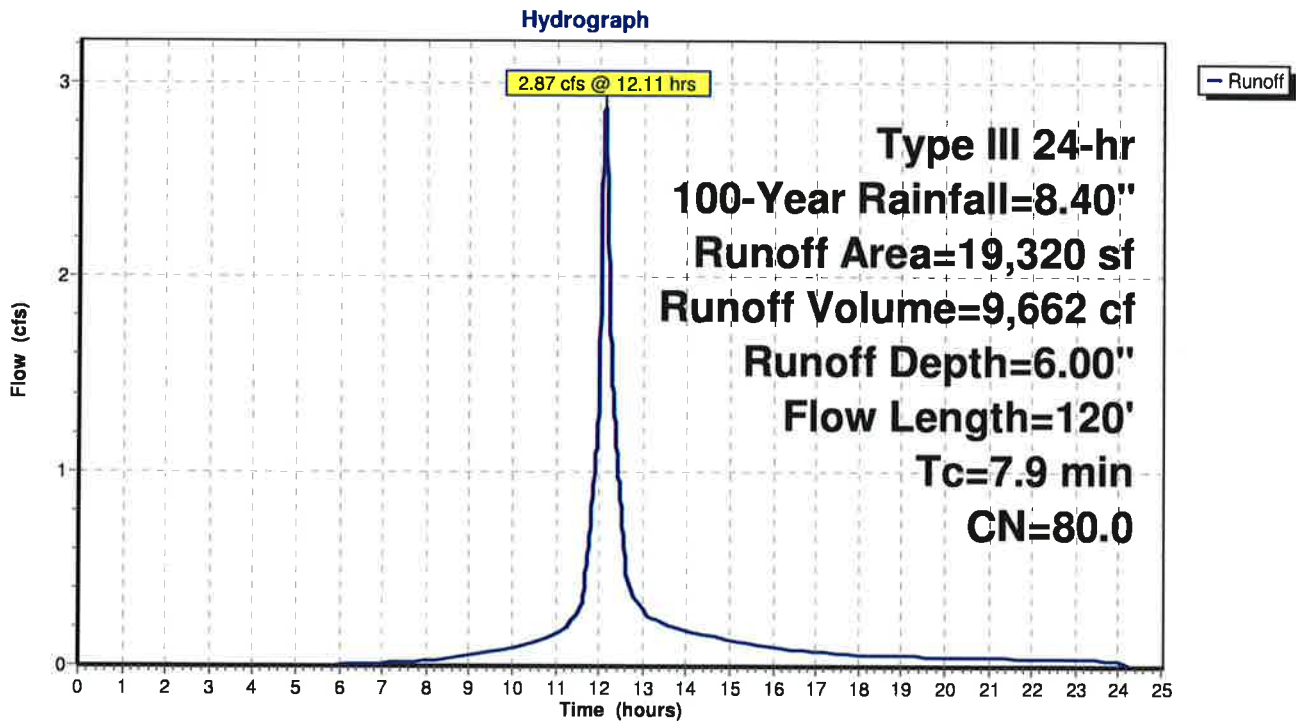
Runoff = 2.87 cfs @ 12.11 hrs, Volume= 9,662 cf, Depth= 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.40"

Area (sf)	CN	Description
19,320	80.0	>75% Grass cover, Good, HSG D
19,320		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	100	0.0800	0.22		Sheet Flow, Grass: Dense n= 0.240 P2= 3.60"
0.2	20	0.0200	2.12		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
7.9	120	Total			

Subcatchment D: To South Adj.



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 90

Summary for Pond CH1: Chambers 1

[93] Warning: Storage range exceeded by 2.63'

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 41,920 sf, 21.99% Impervious, Inflow Depth = 6.48" for 100-Year event
 Inflow = 6.69 cfs @ 12.10 hrs, Volume= 22,636 cf
 Outflow = 6.69 cfs @ 12.10 hrs, Volume= 21,015 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.69 cfs @ 12.10 hrs, Volume= 21,015 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 98.63' @ 12.10 hrs Surf.Area= 732 sf Storage= 1,633 cf

Plug-Flow detention time= 59.2 min calculated for 21,007 cf (93% of inflow)
 Center-of-Mass det. time= 21.6 min (814.5 - 792.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	91.50'	642 cf	16.00'W x 45.50'L x 3.54'H Field A 2,578 cf Overall - 972 cf Embedded = 1,606 cf x 40.0% Voids
#2A	92.00'	972 cf	Cultec R-330XLHD x 18 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 3 rows
#3	91.50'	18 cf	2.00'W x 2.00'L x 4.50'H Junction Box
		1,633 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=6.68 cfs @ 12.10 hrs HW=98.62' TW=0.00' (Dynamic Tailwater)
 ↑ **1=Orifice/Grate** (Orifice Controls 6.68 cfs @ 8.50 fps)

Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 91

Pond CH1: Chambers 1 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 3 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

6 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 43.50' Row Length +12.0" End Stone x 2 = 45.50' Base Length

3 Rows x 52.0" Wide + 6.0" Spacing x 2 + 12.0" Side Stone x 2 = 16.00' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

18 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 3 Rows = 972.4 cf Chamber Storage

2,578.3 cf Field - 972.4 cf Chambers = 1,606.0 cf Stone x 40.0% Voids = 642.4 cf Stone Storage

Chamber Storage + Stone Storage = 1,614.7 cf = 0.037 af

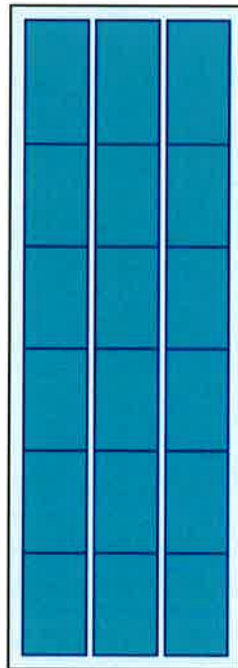
Overall Storage Efficiency = 62.6%

Overall System Size = 45.50' x 16.00' x 3.54'

18 Chambers

95.5 cy Field

59.5 cy Stone



Proposed 2

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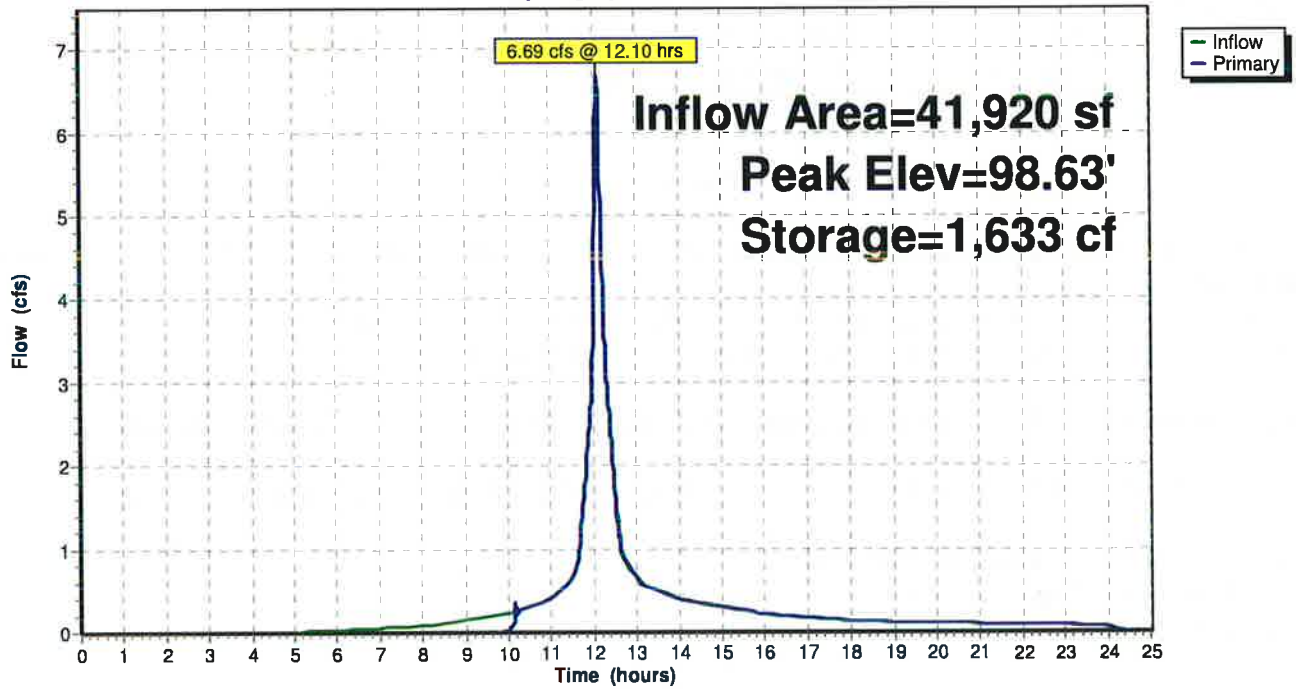
Type III 24-hr 100-Year Rainfall=8.40"

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Page 92

Pond CH1: Chambers 1

Hydrograph



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Page 93

Stage-Area-Storage for Pond CH1: Chambers 1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
91.50	0	96.70	1,633
91.60	30	96.80	1,633
91.70	59	96.90	1,633
91.80	89	97.00	1,633
91.90	118	97.10	1,633
92.00	148	97.20	1,633
92.10	208	97.30	1,633
92.20	268	97.40	1,633
92.30	328	97.50	1,633
92.40	388	97.60	1,633
92.50	448	97.70	1,633
92.60	508	97.80	1,633
92.70	566	97.90	1,633
92.80	625	98.00	1,633
92.90	683	98.10	1,633
93.00	740	98.20	1,633
93.10	798	98.30	1,633
93.20	855	98.40	1,633
93.30	912	98.50	1,633
93.40	967	98.60	1,633
93.50	1,021		
93.60	1,075		
93.70	1,127		
93.80	1,178		
93.90	1,227		
94.00	1,275		
94.10	1,320		
94.20	1,363		
94.30	1,402		
94.40	1,437		
94.50	1,469		
94.60	1,499		
94.70	1,528		
94.80	1,558		
94.90	1,587		
95.00	1,617		
95.10	1,629		
95.20	1,630		
95.30	1,630		
95.40	1,630		
95.50	1,631		
95.60	1,631		
95.70	1,632		
95.80	1,632		
95.90	1,632		
96.00	1,633		
96.10	1,633		
96.20	1,633		
96.30	1,633		
96.40	1,633		
96.50	1,633		
96.60	1,633		

Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 94

Summary for Pond CH2: Chambers 2

Inflow Area = 15,790 sf, 62.57% Impervious, Inflow Depth = 7.36" for 100-Year event
 Inflow = 2.22 cfs @ 12.20 hrs, Volume= 9,679 cf
 Outflow = 2.22 cfs @ 12.19 hrs, Volume= 8,220 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.22 cfs @ 12.19 hrs, Volume= 8,220 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 87.06' @ 12.19 hrs Surf.Area= 668 sf Storage= 1,470 cf

Plug-Flow detention time= 108.9 min calculated for 8,220 cf (85% of inflow)
 Center-of-Mass det. time= 44.9 min (823.1 - 778.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	83.50'	599 cf	11.17'W x 59.50'L x 3.54'H Field A 2,353 cf Overall - 857 cf Embedded = 1,496 cf x 40.0% Voids
#2A	84.00'	857 cf	Cultec R-330XLHD x 16 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
#3	83.50'	20 cf	2.00'W x 2.00'L x 5.00'H Junction Box
#4	88.00'	10 cf	1.00'W x 1.00'L x 0.10'H dummy storage for oscillation errors x 100
		1,485 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	87.00'	59.5' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.22 cfs @ 12.19 hrs HW=87.06' TW=0.00' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Weir Controls 2.22 cfs @ 0.62 fps)

Proposed 2

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Page 95

Pond CH2: Chambers 2 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

8 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 57.50' Row Length +12.0" End Stone x 2 = 59.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

16 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 856.9 cf Chamber Storage

2,353.1 cf Field - 856.9 cf Chambers = 1,496.3 cf Stone x 40.0% Voids = 598.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,455.4 cf = 0.033 af

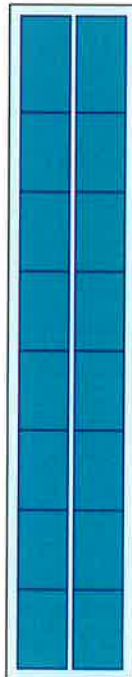
Overall Storage Efficiency = 61.8%

Overall System Size = 59.50' x 11.17' x 3.54'

16 Chambers

87.2 cy Field

55.4 cy Stone



Proposed 2

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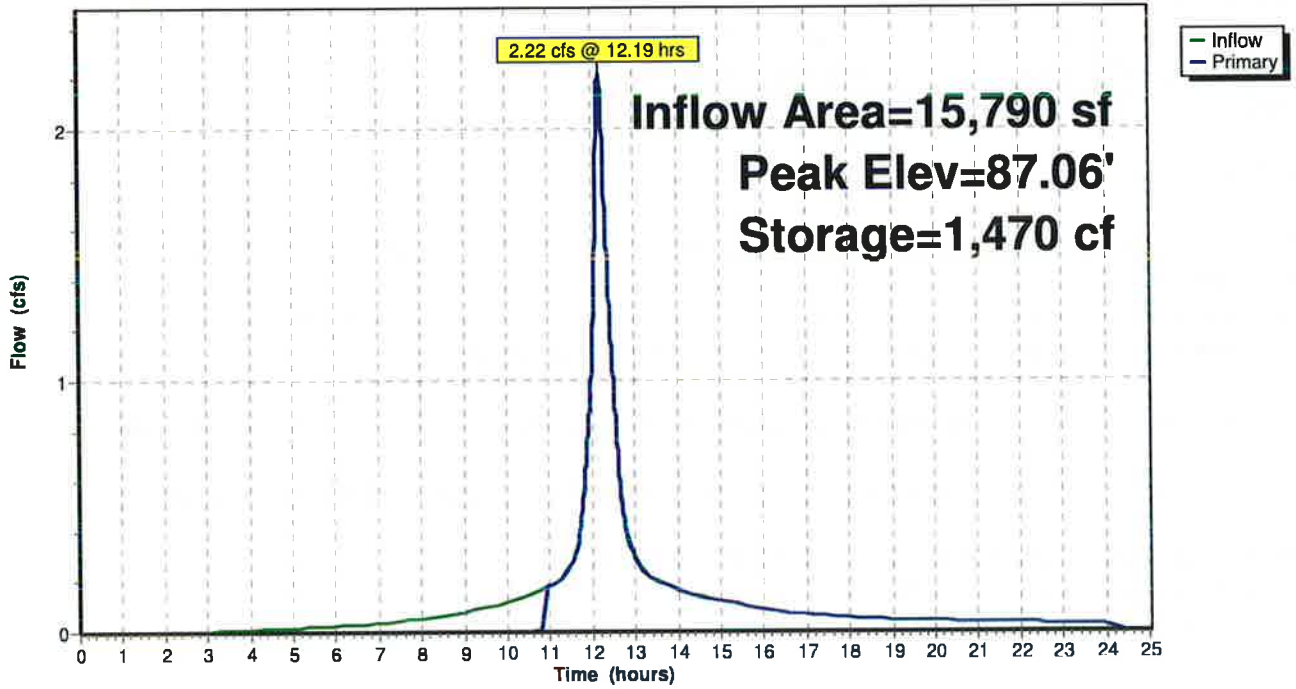
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Page 96

Pond CH2: Chambers 2

Hydrograph



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Page 97

Stage-Area-Storage for Pond CH2: Chambers 2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
83.50	0	86.10	1,188
83.55	13	86.15	1,208
83.60	27	86.20	1,227
83.65	40	86.25	1,245
83.70	54	86.30	1,263
83.75	67	86.35	1,279
83.80	81	86.40	1,295
83.85	94	86.45	1,309
83.90	108	86.50	1,323
83.95	121	86.55	1,337
84.00	135	86.60	1,350
84.05	162	86.65	1,364
84.10	189	86.70	1,377
84.15	216	86.75	1,391
84.20	243	86.80	1,404
84.25	270	86.85	1,418
84.30	297	86.90	1,431
84.35	324	86.95	1,445
84.40	351	87.00	1,458
84.45	378	87.05	1,470
84.50	405	87.10	1,470
84.55	431	87.15	1,470
84.60	458	87.20	1,470
84.65	484	87.25	1,470
84.70	511	87.30	1,471
84.75	537	87.35	1,471
84.80	563	87.40	1,471
84.85	589	87.45	1,471
84.90	615	87.50	1,471
84.95	641	87.55	1,472
85.00	667	87.60	1,472
85.05	693	87.65	1,472
85.10	719	87.70	1,472
85.15	744	87.75	1,472
85.20	770	87.80	1,473
85.25	796	87.85	1,473
85.30	821	87.90	1,473
85.35	846	87.95	1,473
85.40	871	88.00	1,473
85.45	895	88.05	1,479
85.50	919	88.10	1,484
85.55	943	88.15	1,484
85.60	967	88.20	1,484
85.65	991	88.25	1,484
85.70	1,014	88.30	1,485
85.75	1,037	88.35	1,485
85.80	1,060	88.40	1,485
85.85	1,082	88.45	1,485
85.90	1,104	88.50	1,485
85.95	1,126		
86.00	1,147		
86.05	1,168		

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Page 98

Summary for Pond CH3: Chambers 3

Inflow Area = 7,250 sf, 100.00% Impervious, Inflow Depth = 8.16" for 100-Year event
 Inflow = 1.37 cfs @ 12.08 hrs, Volume= 4,930 cf
 Outflow = 1.37 cfs @ 12.09 hrs, Volume= 3,813 cf, Atten= 0%, Lag= 0.4 min
 Primary = 1.37 cfs @ 12.09 hrs, Volume= 3,813 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 91.50' @ 12.09 hrs Surf.Area= 532 sf Storage= 1,147 cf

Plug-Flow detention time= 160.8 min calculated for 3,811 cf (77% of inflow)
 Center-of-Mass det. time= 77.5 min (818.1 - 740.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	87.00'	460 cf	11.17'W x 45.50'L x 3.54'H Field A 1,799 cf Overall - 648 cf Embedded = 1,151 cf x 40.0% Voids
#2A	87.50'	648 cf	Cultec R-330XLHD x 12 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
#3	87.00'	18 cf	2.00'W x 2.00'L x 4.50'H Junction Box
#4	90.50'	20 cf	1.00'W x 1.00'L x 1.00'H dummy storage for oscillation errors x 20
		1,147 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.50'	8.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.37 cfs @ 12.09 hrs HW=91.50' TW=0.00' (Dynamic Tailwater)
 ↑1=Orifice/Grate (Orifice Controls 1.37 cfs @ 3.92 fps)

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Page 99

Pond CH3: Chambers 3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

6 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 43.50' Row Length +12.0" End Stone x 2 = 45.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

12 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 648.2 cf Chamber Storage

1,799.5 cf Field - 648.2 cf Chambers = 1,151.2 cf Stone x 40.0% Voids = 460.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,108.7 cf = 0.025 af

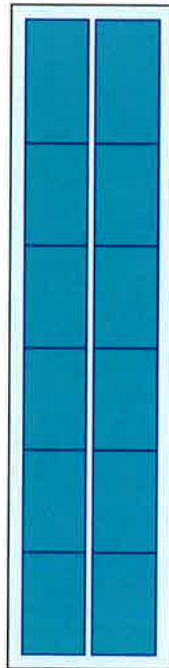
Overall Storage Efficiency = 61.6%

Overall System Size = 45.50' x 11.17' x 3.54'

12 Chambers

66.6 cy Field

42.6 cy Stone



Proposed 2

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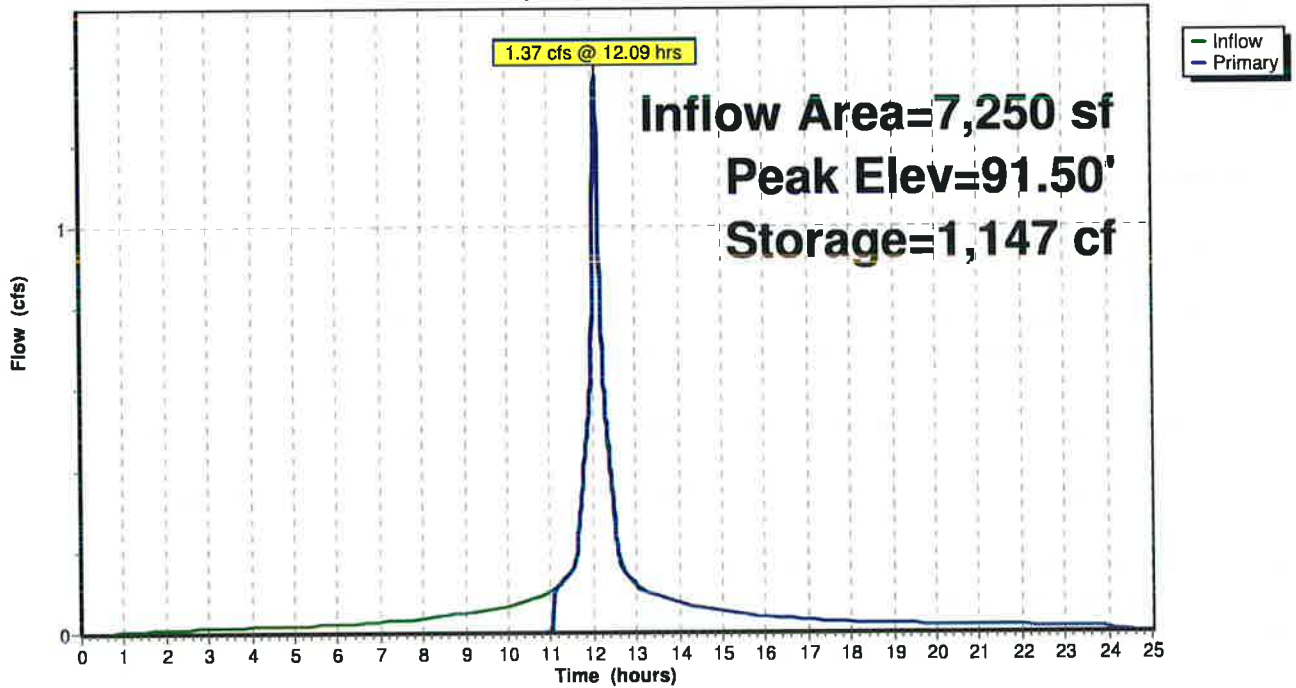
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Page 100

Pond CH3: Chambers 3

Hydrograph



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Page 101

Stage-Area-Storage for Pond CH3: Chambers 3

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
87.00	0	89.60	907
87.05	10	89.65	922
87.10	21	89.70	937
87.15	31	89.75	951
87.20	41	89.80	964
87.25	52	89.85	977
87.30	62	89.90	989
87.35	73	89.95	1,000
87.40	83	90.00	1,011
87.45	93	90.05	1,021
87.50	104	90.10	1,031
87.55	124	90.15	1,042
87.60	145	90.20	1,052
87.65	166	90.25	1,062
87.70	186	90.30	1,073
87.75	207	90.35	1,083
87.80	227	90.40	1,094
87.85	248	90.45	1,104
87.90	268	90.50	1,114
87.95	289	90.55	1,124
88.00	309	90.60	1,125
88.05	330	90.65	1,126
88.10	350	90.70	1,128
88.15	370	90.75	1,129
88.20	390	90.80	1,130
88.25	410	90.85	1,131
88.30	430	90.90	1,132
88.35	450	90.95	1,134
88.40	470	91.00	1,135
88.45	489	91.05	1,136
88.50	509	91.10	1,137
88.55	529	91.15	1,138
88.60	549	91.20	1,140
88.65	568	91.25	1,141
88.70	588	91.30	1,142
88.75	607	91.35	1,143
88.80	627	91.40	1,144
88.85	646	91.45	1,146
88.90	665	91.50	1,147
88.95	683		
89.00	702		
89.05	720		
89.10	738		
89.15	756		
89.20	774		
89.25	792		
89.30	809		
89.35	826		
89.40	843		
89.45	860		
89.50	876		
89.55	892		

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Page 102

Summary for Pond CH4: Chambers 4

[93] Warning: Storage range exceeded by 1.36'

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=2)

Inflow Area = 14,020 sf, 100.00% Impervious, Inflow Depth = 8.16" for 100-Year event
 Inflow = 2.65 cfs @ 12.08 hrs, Volume= 9,534 cf
 Outflow = 2.67 cfs @ 12.08 hrs, Volume= 7,738 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.67 cfs @ 12.08 hrs, Volume= 7,738 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 93.86' @ 12.08 hrs Surf.Area= 806 sf Storage= 1,809 cf

Plug-Flow detention time= 143.9 min calculated for 7,738 cf (81% of inflow)
 Center-of-Mass det. time= 68.6 min (809.2 - 740.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	87.50'	701 cf	20.83'W x 38.50'L x 3.54'H Field A 2,841 cf Overall - 1,088 cf Embedded = 1,753 cf x 40.0% Voids
#2A	88.00'	1,088 cf	Cultec R-330XLHD x 20 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 4 rows
#3	87.50'	20 cf	2.00'W x 2.00'L x 5.00'H Junction Box
		1,809 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	8.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=2.66 cfs @ 12.08 hrs HW=93.85' TW=0.00' (Dynamic Tailwater)
 ↑1=Orifice/Grate (Orifice Controls 2.66 cfs @ 7.63 fps)

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Page 103

Pond CH4: Chambers 4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 4 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 = 38.50' Base Length

4 Rows x 52.0" Wide + 6.0" Spacing x 3 + 12.0" Side Stone x 2 = 20.83' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

20 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 4 Rows = 1,087.8 cf Chamber Storage

2,840.7 cf Field - 1,087.8 cf Chambers = 1,752.9 cf Stone x 40.0% Voids = 701.1 cf Stone Storage

Chamber Storage + Stone Storage = 1,789.0 cf = 0.041 af

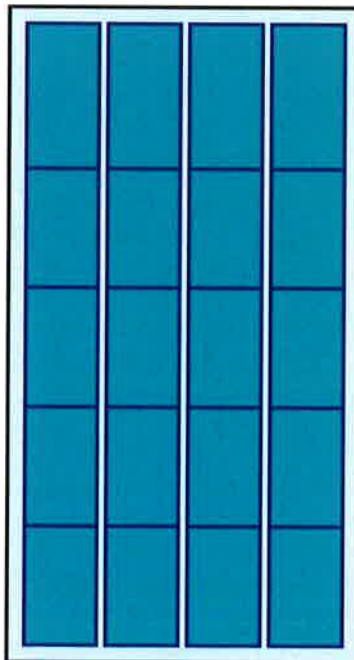
Overall Storage Efficiency = 63.0%

Overall System Size = 38.50' x 20.83' x 3.54'

20 Chambers

105.2 cy Field

64.9 cy Stone



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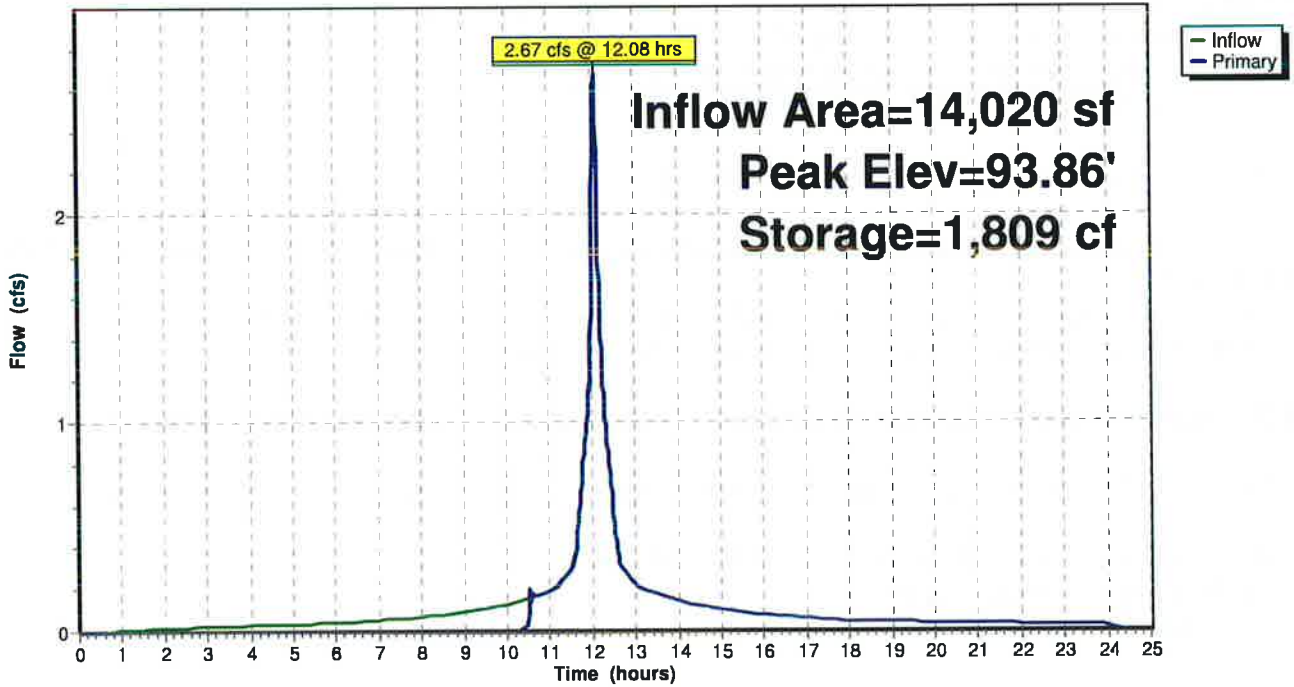
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Page 104

Pond CH4: Chambers 4

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.40"

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Page 105

Stage-Area-Storage for Pond CH4: Chambers 4

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
87.50	0	92.70	1,809
87.60	32	92.80	1,809
87.70	65	92.90	1,809
87.80	97	93.00	1,809
87.90	130	93.10	1,809
88.00	162	93.20	1,809
88.10	230	93.30	1,809
88.20	296	93.40	1,809
88.30	363	93.50	1,809
88.40	430	93.60	1,809
88.50	496	93.70	1,809
88.60	562	93.80	1,809
88.70	627	93.90	1,809
88.80	692		
88.90	756		
89.00	820		
89.10	884		
89.20	948		
89.30	1,010		
89.40	1,072		
89.50	1,132		
89.60	1,191		
89.70	1,249		
89.80	1,305		
89.90	1,360		
90.00	1,412		
90.10	1,463		
90.20	1,510		
90.30	1,553		
90.40	1,592		
90.50	1,627		
90.60	1,660		
90.70	1,692		
90.80	1,725		
90.90	1,757		
91.00	1,790		
91.10	1,803		
91.20	1,804		
91.30	1,804		
91.40	1,805		
91.50	1,805		
91.60	1,805		
91.70	1,806		
91.80	1,806		
91.90	1,807		
92.00	1,807		
92.10	1,807		
92.20	1,808		
92.30	1,808		
92.40	1,809		
92.50	1,809		
92.60	1,809		

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 106

Summary for Pond CH5: Chambers 5

[93] Warning: Storage range exceeded by 2.97'

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 8,880 sf, 14.30% Impervious, Inflow Depth = 6.31" for 100-Year event
 Inflow = 1.47 cfs @ 12.09 hrs, Volume= 4,671 cf
 Outflow = 1.47 cfs @ 12.08 hrs, Volume= 4,409 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.47 cfs @ 12.08 hrs, Volume= 4,409 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs
 Peak Elev= 108.07' @ 12.08 hrs Surf.Area= 219 sf Storage= 272 cf

Plug-Flow detention time= 48.5 min calculated for 4,407 cf (94% of inflow)
 Center-of-Mass det. time= 17.8 min (812.7 - 794.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	100.50'	111 cf	6.33'W x 17.50'L x 3.54'H Field A 393 cf Overall - 115 cf Embedded = 277 cf x 40.0% Voids
#2A	101.00'	115 cf	Cultec R-330XLHD x 2 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 1 rows
#3	100.50'	36 cf	2.00'W x 2.00'L x 4.50'H Catch Basin x2 x 2
#4	105.00'	10 cf	1.00'W x 1.00'L x 0.10'H Dummy (for oscillation error) x 100
		272 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	105.00'	4.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.47 cfs @ 12.08 hrs HW=108.05' TW=0.00' (Dynamic Tailwater)
 ↑1=Orifice/Grate (Orifice Controls 1.47 cfs @ 8.41 fps)

Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 107

Pond CH5: Chambers 5 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 1 rows

2 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 15.50' Row Length +12.0" End Stone x 2 = 17.50' Base Length

1 Rows x 52.0" Wide + 12.0" Side Stone x 2 = 6.33' Base Width

6.0" Base + 30.5" Chamber Height + 6.0" Cover = 3.54' Field Height

2 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 1 Rows = 115.5 cf Chamber Storage

392.5 cf Field - 115.5 cf Chambers = 277.0 cf Stone x 40.0% Voids = 110.8 cf Stone Storage

Chamber Storage + Stone Storage = 226.3 cf = 0.005 af

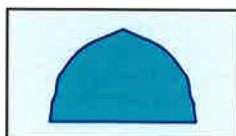
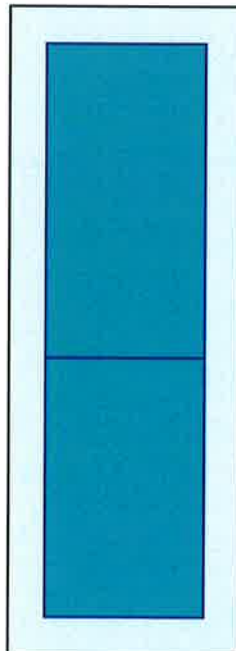
Overall Storage Efficiency = 57.7%

Overall System Size = 17.50' x 6.33' x 3.54'

2 Chambers

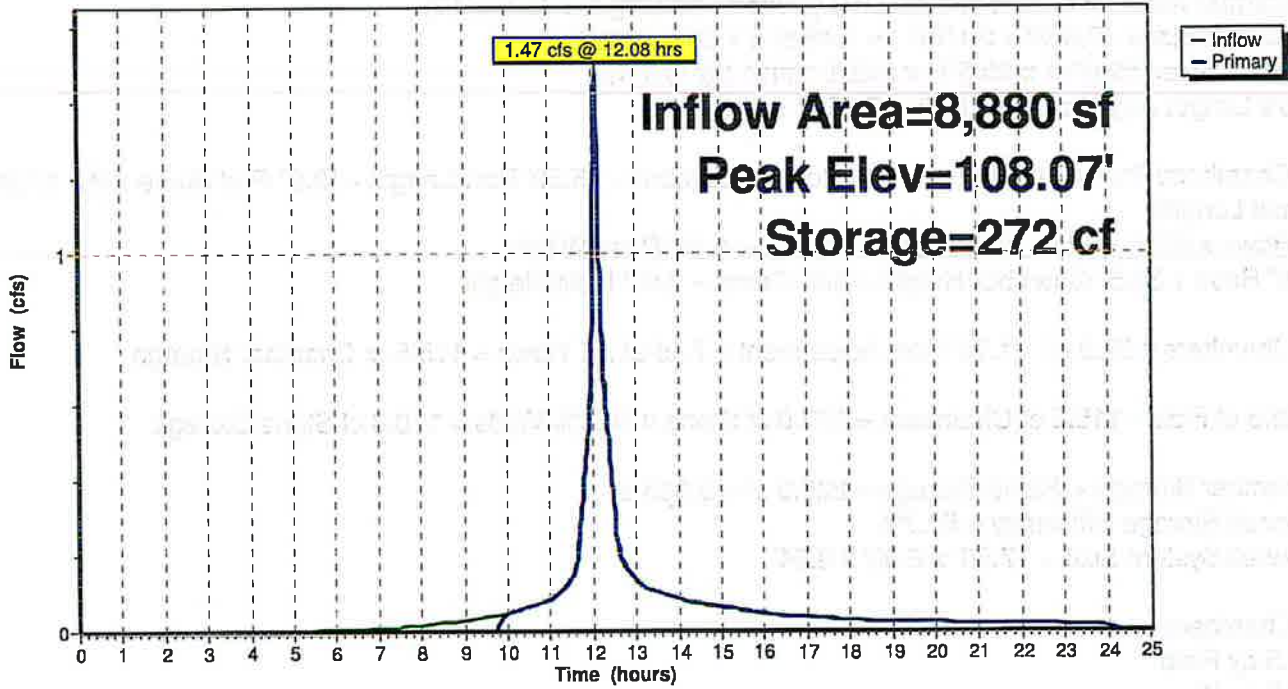
14.5 cy Field

10.3 cy Stone



Pond CH5: Chambers 5

Hydrograph



Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 109

Stage-Area-Storage for Pond CH5: Chambers 5

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
100.50	0	105.70	272
100.60	5	105.80	272
100.70	10	105.90	272
100.80	16	106.00	272
100.90	21	106.10	272
101.00	26	106.20	272
101.10	35	106.30	272
101.20	44	106.40	272
101.30	53	106.50	272
101.40	62	106.60	272
101.50	70	106.70	272
101.60	79	106.80	272
101.70	88	106.90	272
101.80	97	107.00	272
101.90	105	107.10	272
102.00	114	107.20	272
102.10	122	107.30	272
102.20	131	107.40	272
102.30	139	107.50	272
102.40	148	107.60	272
102.50	156	107.70	272
102.60	164	107.80	272
102.70	172	107.90	272
102.80	180	108.00	272
102.90	187		
103.00	195		
103.10	202		
103.20	209		
103.30	215		
103.40	221		
103.50	226		
103.60	232		
103.70	237		
103.80	242		
103.90	247		
104.00	252		
104.10	255		
104.20	256		
104.30	257		
104.40	258		
104.50	258		
104.60	259		
104.70	260		
104.80	261		
104.90	262		
105.00	262		
105.10	272		
105.20	272		
105.30	272		
105.40	272		
105.50	272		
105.60	272		

Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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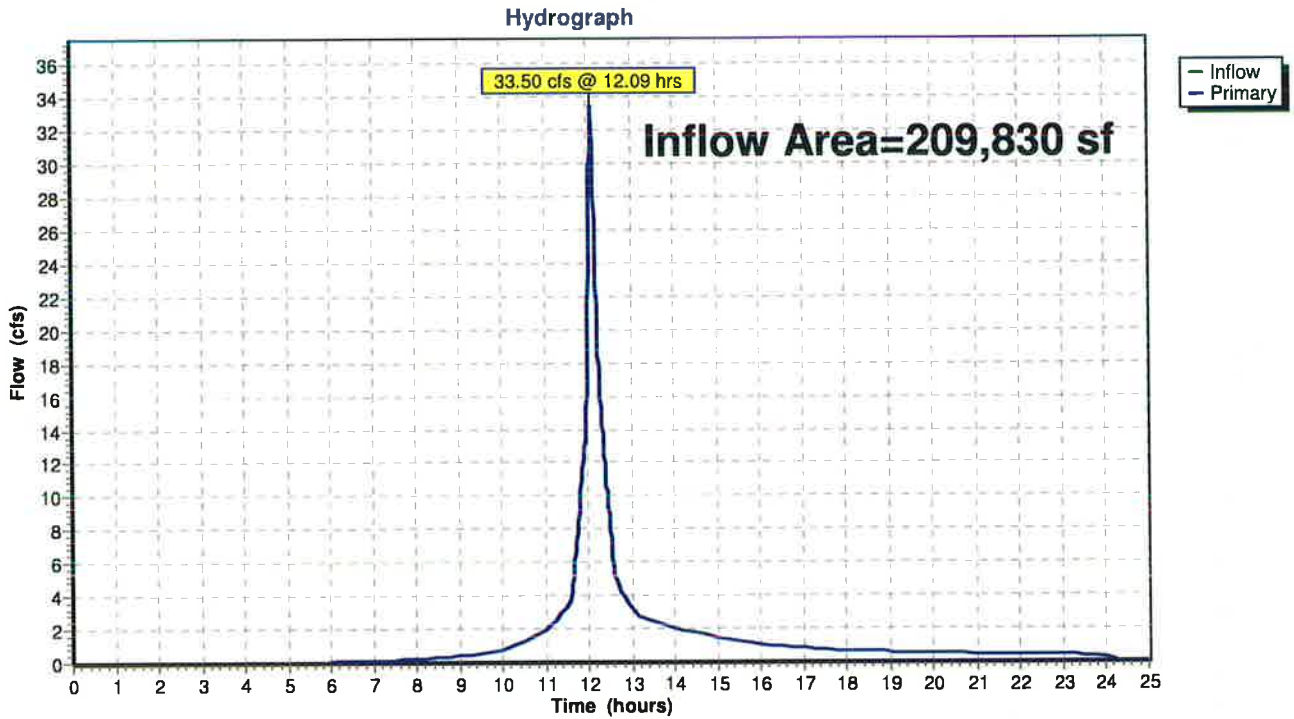
Page 110

Summary for Link A: Lake Shoreline

Inflow Area = 209,830 sf, 25.87% Impervious, Inflow Depth = 6.22" for 100-Year event
Inflow = 33.50 cfs @ 12.09 hrs, Volume= 108,702 cf
Primary = 33.50 cfs @ 12.09 hrs, Volume= 108,702 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link A: Lake Shoreline



Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 111

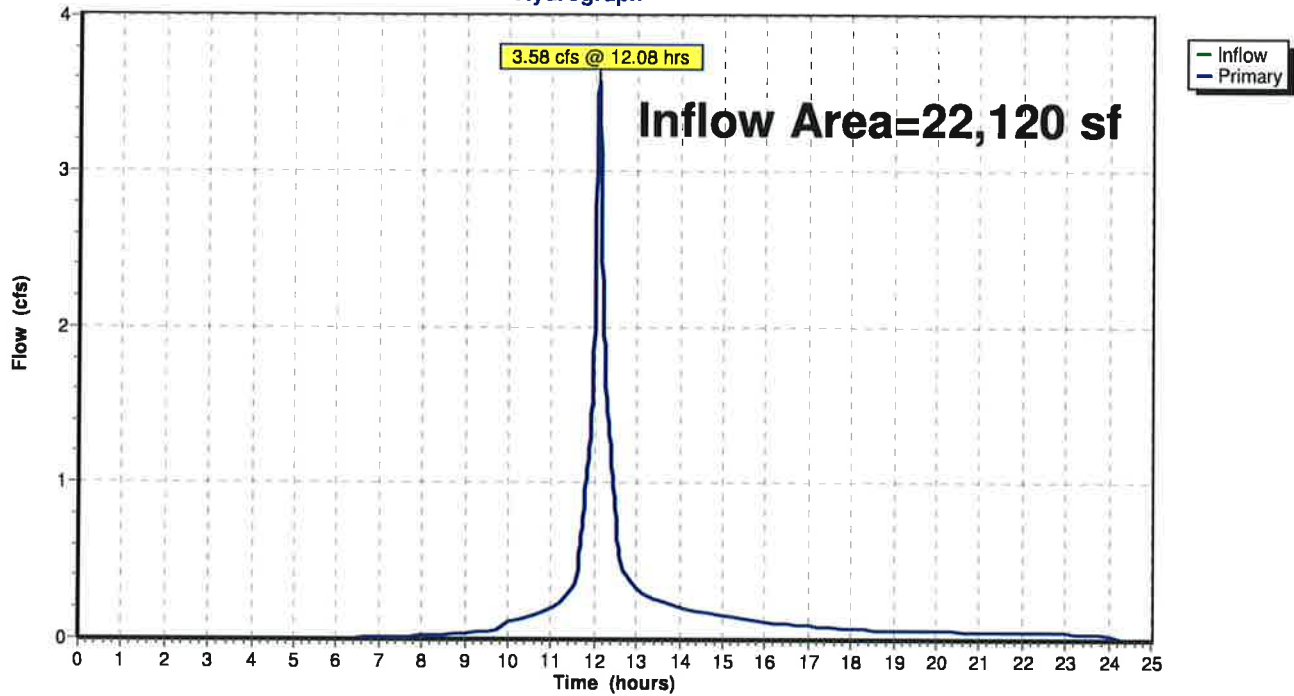
Summary for Link C: Street

Inflow Area = 22,120 sf, 6.74% Impervious, Inflow Depth = 6.01" for 100-Year event
Inflow = 3.58 cfs @ 12.08 hrs, Volume= 11,069 cf
Primary = 3.58 cfs @ 12.08 hrs, Volume= 11,069 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link C: Street

Hydrograph



Proposed 2

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Type III 24-hr 100-Year Rainfall=8.40"

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Page 112

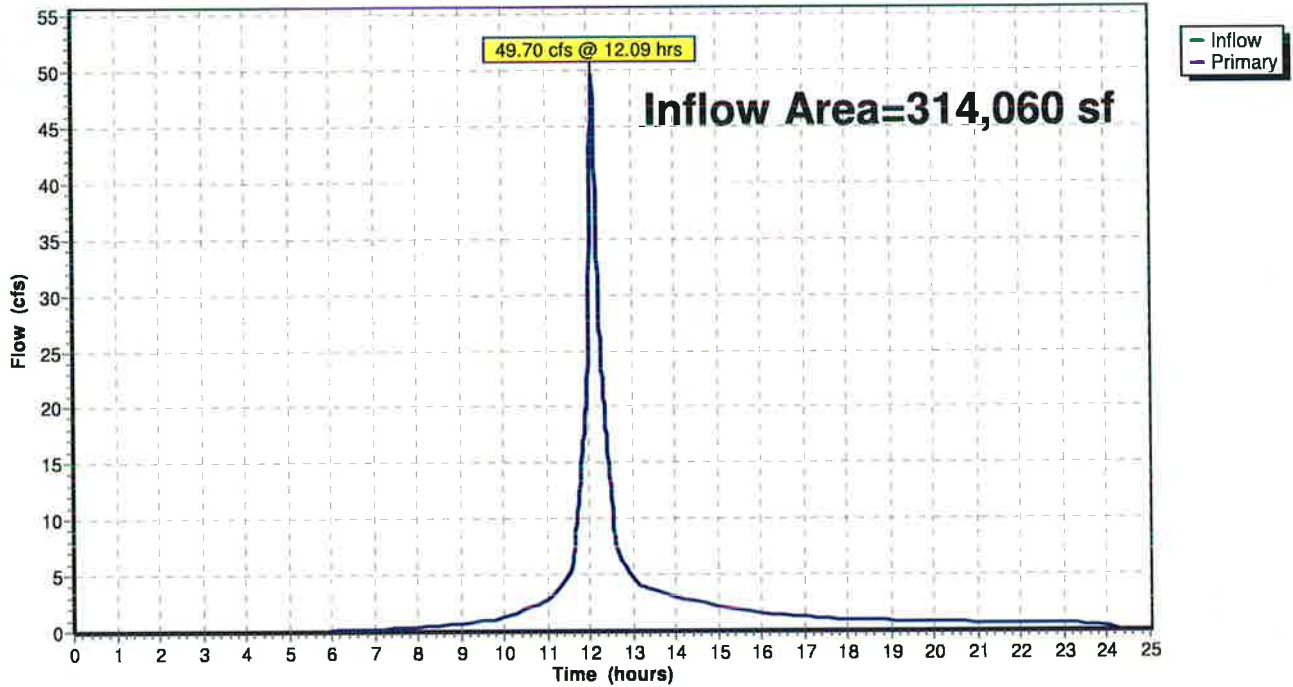
Summary for Link Z: Converse Lake

Inflow Area = 314,060 sf, 18.33% Impervious, Inflow Depth = 6.16" for 100-Year event
Inflow = 49.70 cfs @ 12.09 hrs, Volume= 161,146 cf
Primary = 49.70 cfs @ 12.09 hrs, Volume= 161,146 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-25.00 hrs, dt= 0.01 hrs

Link Z: Converse Lake

Hydrograph



Appendix “D”

**Operations &
Maintenance Plan**

Operation & Maintenance Plan

45 Hurlingham Drive, North Castle, NY

February 8, 2021

Scope:

The purpose of the Operations and Maintenance Plan is to ensure that the existing and proposed stormwater components installed at 45 Hurlingham Drive are maintained in operational condition throughout the life of the project. The service procedures associated with this plan shall be performed as required by the parties legally responsible for their maintenance.

Recommended Frequency of Service:

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

Qualified Inspector:

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

Service Procedures:

1. Catch Basins & Drainage Inlets:

- a. Catch basins and drainage inlets shall be completely cleaned of accumulated debris and sediments at the completion of construction.
- b. For the first year, catch basins and drainage inlets shall be inspected on a quarterly basis.
- c. Any accumulated debris within the catch basins/inlets shall be removed and any repairs as required.
- d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris within the catch basins/inlets shall be removed and repairs made as required.
- f. Accumulated sediments shall be removed at which time they are within 12 inches of the invert of the outlet pipe.
- g. Any additional maintenance required per the manufacturer's specifications shall also be completed.

2. Storm Drainage Piping and Manholes/Junction Boxes:

- a. All storm drainage piping shall be completely flushed of debris and accumulated sediment at the completion of construction.

- b. Manholes/Junction Boxes shall be inspected and repaired on an annual basis.
- c. Unless system performance indicates degradation of piping, comprehensive video inspection of storm drainage piping shall occur once every ten years.
- d. Any additional maintenance required per the manufacturer's specifications shall also be completed.

3. Stormwater Control Structures:

- a. All control structures (orifice, weir, etc.) shall be completely cleaned of accumulated debris and sediments at the completion of construction. Any repairs shall be performed.
- b. For the first year, control structures (orifice, weir, etc.) shall be inspected on a quarterly basis.
- c. Any accumulated debris shall be removed and any repairs made to the control structures (orifice, weir, etc.) as required.
- d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris shall be removed and repairs made as required.
- f. Any additional maintenance required per the manufacturer's specifications shall also be completed.

4. Drainage Outfalls/Splash Pads/Scour Holes/Level Spreaders:

- a. All outfalls shall be completely cleaned of accumulated debris and sediments at the completion of construction. Any repairs to outlet protection material (rip rap) shall be performed.
- b. For the first year, outfalls shall be inspected on a quarterly basis.
- c. Any accumulated debris shall be removed and any repairs made to the outfalls as required.
- d. From the second year onward, visual inspections shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris shall be removed and repairs made as required.
- f. Any erosion shall be promptly repaired and the cause of the erosion shall be identified and corrected.
- g. Any additional maintenance required per the manufacturer's specifications shall also be completed.

5. Drywells and Infiltration Systems:

- a. All drywells/infiltrators shall be completely cleaned of accumulated debris and sediments upon the completion of construction.
- b. For the first year, the drywells/infiltrators shall be inspected on a quarterly basis.
- c. Any accumulated debris within the drywells/infiltrators shall be removed and any repairs made to the units as required.
- d. From the second year onward, visual inspection shall occur twice per year, once in the spring and once in the fall, after fall cleanup of leaves has occurred.
- e. Accumulated debris within the units shall be removed and repairs made as required.
- f. Any additional maintenance required per the manufacturer's specifications shall also be completed.

6. Roof Gutters:

- a. Remove accumulated debris and inspect for damage. Any damage should be repaired as required.

Disposal of Debris and Sediment:

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

Maintenance Records:

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

Operation & Maintenance Log (Page 2 of 3)

45 Hurlingham Drive, North Castle, NY

February 8, 2021

Drainage Outfalls/Splash Pads/Scour Holes/Level Spreaders:

- Have all drainage outlets been cleared of debris? Yes No N/A
- Have all outlet protections been inspected/repared? Yes No N/A
- Have all erosion issues been repaired? Yes No N/A

Notes:

Drywells and Infiltration Systems:

- Have units been cleared of debris/sediments? Yes No N/A
- Do units require additional repair? (identify below): Yes No N/A
- Has draining times of system been verified? Yes No N/A

Notes:

Roof Gutters:

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

Notes:

Operation & Maintenance Log (Page 3 of 3)

45 Hurlingham Drive, North Castle, NY

February 8, 2021

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

Signature of Inspector:

Date: