

To:	North Castle Engineering Kellard Sessions, Joseph Cermele, P.E.		
From:	Ahneman Kirby, LLC - Keith Werner		
Project:	Eric Birenberg 16 Quaker Meeting House Rd Armonk, NY 10504		
RE:	Eric Birenberg 16 Quaker Meeting House Rd Section 101.03, Block 4, Lot 44		
Subject:	Site Development Review Comments and Conditions of Approval	AKL Project No:	20-087-D083
Comment Date:	March 5, 2021	Response Date:	March 23, 2021

No.	Comment	Comment Section	Author	Response
1	The proposed pool improvements are located beyond the Clearing and Grading Limit Line (CGLL), as established by the Leisure Farm Subdivision Plat. An approval from the Planning Board will be required for the proposed expansion of the CGLL for the pool as proposed.	General Comments	Joseph Cermele, P.E.	Confirmed. We are awaiting planning board approval of the proposed pool.
2	The proposed retaining wall is required for the construction of the proposed pool. As such, it must respect the principal side yard setback. The plan should be revised to avoid this, or an area variance will be required.	General Comments	Joseph Cermele, P.E.	The retaining wall has been shown to stop at the required side yard setback.
3	The plan shall illustrate and quantify the limit of disturbance. Additionally, the plan shall illustrate and quantify the disturbance area beyond the approved Clearing and Grading Limit Line, as established by the Leisure Farm Subdivision Plat.	General Comments	Joseph Cermele, P.E.	The plan has been updated to illustrate and quantify the limits of disturbance. The plan has been updated to illustrate and quantify the limits of disturbance beyond the clearing and grading limit line.
4	Show the location of the existing septic primary area on the plan. The plan shall show this area to be cordoned off during construction. Additionally, the plan shall demonstrate that all required separation distances to the existing septic system and drilled well, per the Westchester County Department of Health (WCHD), have been maintained to the proposed infiltration system and pool.	General Comments	Joseph Cermele, P.E.	The subject property is currently and will continue to be on sewer service.
5	The elevations noted on the deep test results shall coordinate with the existing survey elevations. The test result summary shall be revised accordingly.	General Comments	Joseph Cermele, P.E.	The deep test elevations have been updated to match the survey elevations.
6	It appears the proposed infiltration system does not meet the required three (3) foot separation between the record elevation of ledge and bottom of the infiltration practice, as per Chapter 6 Section 6.3 of the NYSDEC Stormwater Management Design Manual. The system layout shall be revised accordingly.	General Comments	Joseph Cermele, P.E.	The Cultec system layout has been revised to provide for separation between the bottom of the system and ledge surface.

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7	As per Town policy and the RPRC determination letter, dated February 9th, 2021, the six (6) inch pool drawdown volume, without benefit of percolation, was found to be greater than the runoff volume generated by the net impervious increase from the 25-year, 24-hour design storm. The proposed infiltration system shall be revised to accommodate the six (6) inch pool drawdown volumetric storage capacity. The stormwater calculations shall be revised accordingly.	General Comments	Joseph Cermele, P.E.	The drainage system has been updated to accommodate the volume for the 6 inch pool drawdown. The calculations have been updated.
8	It appears the proposed grading will allow upland gradient runoff to discharge into the proposed pool. The applicant should consider revising the plan accordingly to divert the upland runoff around the proposed pool. Provide details.	General Comments	Joseph Cermele, P.E.	The plan has been updated to show spot elevations of pool coping. 3-4" above surrounding ground.
9	The plan shall include a pool fence and gate detail. The plan shall illustrate the proposed location of the pool fence. The plan shall note that the pool fence and gate shall comply with all applicable NYS Building Code requirements.	General Comments	Joseph Cermele, P.E.	A pool fence and gate detail has been included on the plan.
10	The plan shall clarify whether or not the proposed trench drain located on the east portion of the proposed pool is required. It is unclear how stormwater runoff generated from the proposed pool development will be collected into the proposed trench drain. If required, the plan shall illustrate a detail for the proposed trench drain.	General Comments	Joseph Cermele, P.E.	The trench drain has been eliminated and a yard drain has been added to collect surface water coming towards the pool development.
11	As shown on the plan, the pool equipment is located downgradient from the proposed infiltration system. The plan shall illustrate the connection between the pool equipment and drawdown mitigation practice and clarify how the proposed pool will be drawn down for winterization.	General Comments	Joseph Cermele, P.E.	The plan has been updated to show the pool equipment connected to the drainage system.

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12	As shown on the plan, it appears additional tree removal will be required based on the proposed locations of the proposed infiltration system, propane tank, and grading downgradient from the propane tank. The applicant shall consider which trees will require removal based on the proposed site improvements. All trees eight (8) inches dbh or greater located within and ten (10) feet beyond the proposed limit of disturbance shall be indicated to be removed and/or protected.	General Comments	Joseph Cermele, P.E.	All trees have been indicated to be removed and/or protected. Grading will take place to not disturb existing trees
13	The plan shall include a typical section of the proposed pool.	General Comments	Joseph Cermele, P.E.	The trench drain has been eliminated and a yard drain has been added to collect surface water coming towards the pool development.
14	The plan shall note the construction sequencing for the proposed pool development.	General Comments	Joseph Cermele, P.E.	A construction staging sequence has been added to the plan.
15	The plan shall illustrate the proposed elevation of the pool coping.	General Comments	Joseph Cermele, P.E.	Spot elevations have been added for the proposed pool coping and surrounding area.
16	The plan shall include a detail for the proposed retaining wall.	General Comments	Joseph Cermele, P.E.	A retaining wall detail has been added.



CONTROL OUTLET  
STRUCTURE #1  
GRATE EL. = 504.20  
6"Ø PVC OVERFLOW EL. = 503.20  
INV. (IN) = 502.00  
3" ORIFICE INV. = 502.50  
INV. (OUT) = 502.50  
SUMP EL. = 499.50

YARD DRAIN  
GRATE EL. = 504.00  
INV. (OUT) = 503.00

PROPOSED 10' x 18"  
LEVEL SPREADER  
GRAVEL EL. = 500.00  
INV. (IN) = 499.00

- SERBIAN SPRUCE
- (3) ZEBRA GRASS  
5 GAL. CONT.
- (3) PINK DOUBLE KNOCKOUT ROSES  
3 GAL. CONT.
- (4) HYDRANGEA  
ALL SUMMER BEAUTY  
36"-42"
- (7) DARK AMERICAN ARBORVITAE  
VEGETATED SCREENING ALONG  
PROPERTY LINE  
8'-10"
- (1) TUSCARORA CRAPEMYRTLE  
8'-10"
- (5) SHASTA DAISEYS -  
VARIETY BECKY  
GAL. CONT.
- (5) LIMELIGHT HYDRANGAS  
42"-48"

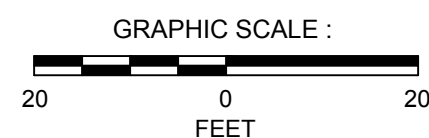
PROPOSED (12) CULTEC 100HD  
W/ HVLV FC-24 FEED CONNECTORS  
TOP OF GRAVEL EL. = 503.70  
TOP OF UNIT EL. = 503.20  
BOTTOM OF UNIT EL. = 502.16  
BOTTOM OF GRAVEL EL. = 501.66  
INV. (IN) (ALL) = 502.20  
INV. (OUT) = 502.20

18 QUAKER MEETING  
HOUSE RD  
101.03-3-28

42 BYRAM RIDGE RD  
101.03-4-45

Lot No. 24  
WCLR Map No. 26434

Lot Area = 72,965.7 Sq. Ft. (1.68 Ac.)



**GENERAL NOTES:**

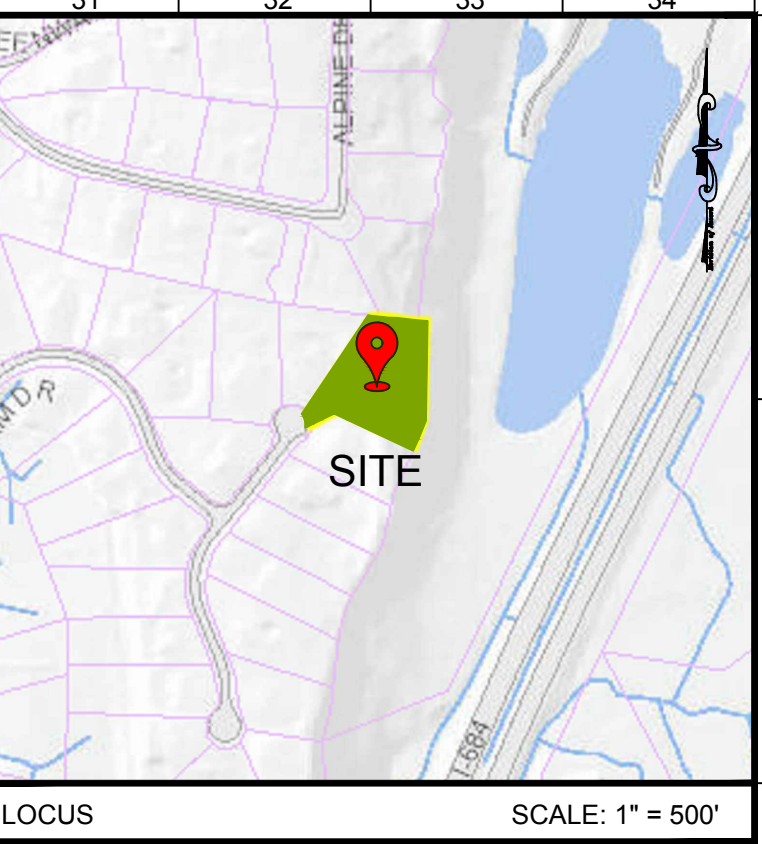
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE MEANS, METHODS AND SEQUENCES OF CONSTRUCTION AND FOR THE SAFETY OF WORKERS AND OTHERS ON THE CONSTRUCTION SITE.
- THE CONTRACTOR SHALL LOCATE AND VERIFY THE SIZE, LOCATION, DEPTH AND INVERTS OF ANY AND ALL EXISTING UTILITIES PRIOR TO COMMENCING OPERATIONS. THE CONTRACTOR SHALL ALSO BE REQUIRED TO CONTACT THE TOLL FREE "CALL-BEFORE-YOU-DIG" PHONE NUMBER AT 1-800-922-4455.
- THE EXISTING DRIVEWAYS WILL SERVE AS THE MACHINERY ACCESS ROUTE AS SHOWN HEREON.
- ANY DRIVEWAY AREAS, PLANTINGS, LAWN AREAS AND TREES NOT TO BE REMOVED SHALL BE PROTECTED DURING CONSTRUCTION.
- ANY EXISTING DRAINAGE, SEWER OR OTHER SUBSURFACE STRUCTURES FOUND WITHIN THE PROPOSED CONSTRUCTION AREA THAT INTERFERE WITH THE PROPOSED CONSTRUCTION INDICATED HEREON SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER.
- ANY REQUIRED FILL SECTIONS SHALL BE PLACED ON THE PERIMETER OF THE AREA AND SPREAD WITH A SMALL CRAWLER, TRACTOR OR OTHER APPROVED MACHINERY AND COMPACTED TO 95-PERCENT OPTIMUM DRY DENSITY.
- A NEW YORK REGISTERED PROFESSIONAL ENGINEER ACCEPTABLE TO THE CITY SHALL INSPECT CONSTRUCTION OF THE FACILITIES INDICATED HEREON TO INSURE COMPLIANCE WITH THE PROPOSED PLAN.

**EROSION CONTROL NARRATIVE:**

THE PURPOSE OF THIS SEDIMENT AND EROSION NARRATIVE, DETAILS AND NOTES IS TO OUTLINE A PROGRAM THAT MINIMIZE SOIL EROSION DURING CONSTRUCTION. THE PRIMARY POLICIES OF THIS PROGRAM ARE:

- AVOID CONTAMINATION OF ADJACENT NEIGHBORING PROPERTIES AND DOWN GRADIENT MUNICIPAL ROADWAYS.
  - TRAPPING PARTICLES AT THEIR SOURCE BY PROMPTLY STABILIZING DISTURBED AREAS.
  - AVOID CONCENTRATION OF WATER OR STORM WATER RUNOFF.
  - AVOID CONTAMINATION OF EXISTING STORM DRAIN STRUCTURES AND DRAINAGE PIPES.
  - MAINTENANCE SHALL BE WEEKLY AND AFTER EVERY STORM EVENT FOR ALL CONTROLS TO ENSURE THEY ARE FUNCTIONING PROPERLY.
- PROPOSED EROSION CONTROLS SHALL BE INSTALLED TO THE LOCATIONS AND DETAILS SHOWN ON THESE PLANS PRIOR TO CONSTRUCTION AS APPROVED IN THE FIELD BY THE APPROPRIATE MUNICIPAL AGENCY PERSONNEL. PROPOSED CONSTRUCTION PHASING TO BE DETERMINED IN CONSULTATION WITH THE APPROPRIATE MUNICIPAL AGENCY PRIOR TO THE START OF CONSTRUCTION.
  - LAND DISTURBANCE WILL BE KEPT TO A MINIMUM. RESTABILIZATION WILL BE SCHEDULED AS SOON AS POSSIBLE WITH A MINIMUM OF 4 INCHES TOPSOIL, SEED AND MULCH. "HYDRO-SEED" MAY BE REQUIRED BASED ON FIELD CONDITIONS FOR TEMPORARY GRASS GERMINATION DURING SEASONAL PLANTING PERIODS TO INSURE MINIMAL SEDIMENTATION AND EROSION.
  - HAY BALES AND SNOW FENCE AND/OR SILT CURTAIN BARRIERS WILL BE INSTALLED AT THE LOCATIONS INDICATED ON THESE PLANS AND, IF NEEDED, ALONG THE TOE OF ALL CUT AND FILL SLOPES. ALL EROSION CONTROLS SHALL BE REVIEWED WITH AND APPROVED BY THE APPROPRIATE MUNICIPAL AGENCY PERSONNEL PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
  - ALL CONTROL MEASURES WILL BE MAINTAINED DURING THE CONSTRUCTION PERIOD.
  - ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING THE CONSTRUCTION PERIOD IF NECESSARY OR REQUIRED.
  - SEDIMENT REMOVED FROM CONTROL STRUCTURES WILL BE DISPOSED OF IN A MANNER WHICH IS CONSISTENT WITH THE INTENT OF THESE PLANS AND/OR AS DIRECTED BY THE MUNICIPAL STAFF.
  - IT IS THE RESPONSIBILITY OF THE OWNER/DEVELOPER TO INCLUDE THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, NOTIFYING THE MUNICIPAL STAFF OF ANY TRANSFER OF THIS RESPONSIBILITY, AND FOR CONVEYING A COPY OF THESE PLANS IF THE TITLE TO THE LAND IS TRANSFERRED.
  - THE EROSION CONTROLS (WHICH WILL BE INSTALLED IMMEDIATELY DOWNSTREAM OF THE PROPOSED CONSTRUCTED AREAS) SHALL BE INSPECTED PERIODICALLY AND ESPECIALLY FOLLOWING ANY PERIODS OF EXTENDED PRECIPITATION. ANY SILTATION WHICH WAS ACCUMULATED UPSLOPE OF THE PROPOSED EROSION BARRIERS IF GREATER THAN 6 INCHES IN DEPTH SHALL BE REMOVED AND THE EROSION CONTROLS CHECKED AND REPAIRED AS NECESSARY TO INSURE THAT NO BREACHING OCCURRED. ALL LAWN AND PROPOSED PLANTED AREAS SHALL BE CHECKED TO INSURE THAT GERMINATION HAS OCCURRED AND ANY REQUIRED ADJUSTMENTS PERFORMED AS NECESSARY PRIOR TO REMOVE OF TEMPORARY CONSTRUCTION EROSION CONTROLS.
  - TREES TO BE CUT, FALLEN TREES OR BUSH WITHIN DESIGNATED PROPOSED CONSTRUCTION AREAS SHALL BE CUT TO FIREPLACE LENGTHS AND STACKED OUTSIDE OF THOSE AREAS, FEED SMALLER BRANCHES AND TWIGS THROUGH CHIPPER AND STOCKPILE. ALL STOCKPILES SHALL BE INSIDE OF DRIP LINES OF PROTECTED TREES.
  - TREES TO BE SAVED SHALL BE Banded WITH A BRIGHT-COLORED SURVEYOR'S RIBBON LOCATED AT A HEIGHT VISIBLE TO EQUIPMENT OPERATORS. TREE ARMORING PROTECTION MEASURES SHALL BE USED AS SHOWN IN THE DETAIL ON THIS PLAN.
  - INDIVIDUAL TREES OR STANDS TO BE SAVED WITHIN DESIGNATED AREAS OF PROPOSED STRUCTURES SHALL BE PROTECTED BY FENCING WHICH CIRCUMSCRIBES THE DRIP LINE OF THE INDIVIDUAL GROUP PER THE DETAIL ON THIS DRAWING.

ZONE: R-1A



**LEGEND**

- 95 EXISTING MAJOR CONTOURS
- 96 EXISTING MINOR CONTOURS
- TREE EXISTING TREES
- 90 PROPOSED CONTOURS
- x 94 PROPOSED SPOT GRADES
- SF SILT FENCE
- TREE TREES TO BE REMOVED
- TREE TREES TO BE PROTECTED
- TREE EXISTING TREES

**ABBREVIATIONS**

- INV. INVERT ELEVATION
- TYP. TYPICAL
- EL. ELEVATION
- T.B.R. TO BE REMOVED
- EX. EXISTING
- N/F. NOW OR FORMERLY
- R.O.W. RIGHT OF WAY

**DRAINAGE NOTES:**

- CONTRACTOR TO PROBE AND EXCAVATE WHERE POTENTIAL CONFLICTS MAY EXIST PRIOR TO DRAINAGE INSTALLATION. ALL KNOWN OR POTENTIAL CONFLICTS SHOULD BE BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER.
- ALL NEW AND EXISTING AND FINISHED GRADES SHALL SLOPE TO DRAIN AWAY FROM THE PROPOSED AND EXISTING BUILDINGS.
- ALL PVC PIPE TO BE SCHEDULE 40, OR EQUAL. MINIMUM PIPE PITCH SHALL BE 1-PERCENT.
- ALL RETAINING WALLS GREATER THAN THREE FEET REQUIRE COMPUTATIONS SEALED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW YORK TO BE SUBMITTED FOR ENGINEERING DIVISIONS RECORDS, PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- ALL DETENTION/RETENTION SYSTEMS SHALL BE INSTALLED PER MANUFACTURERS SPECIFICATIONS. ALL SYSTEMS SHALL USE A MANIFOLD SYSTEM TO DISTRIBUTE RUNOFF EVENLY INTO EACH ROW OF INFILTRATORS. THE MANIFOLD SHALL BE INSTALLED ON THE INLET AND OVERFLOW SIDES WHEN NOT HANDLING THE FIRST FLUSH AND ONLY ON THE INLET SIDE WHEN A FIRST FLUSH SYSTEM IS BEING INSTALLED.
- EACH BMP TO BE INSTALLED SHALL HAVE THE SOILS BENEATH THE BMP SCARIFIED OR TILLED TO IMPROVE INFILTRATION.
- ALL AREAS THAT ARE USED BY CONSTRUCTION EQUIPMENT AND USED FOR CONTRACTOR PARKING MUST HAVE THE SOIL TILLED 12 TO 16 INCHES AND AMENDED WITH SMALL AMOUNTS OF ORGANIC MATERIAL IF NEEDED. THE AREA TO BE RESTORED SHALL BE DETERMINED BY THE SITE ENGINEER.

**GENERAL CONSTRUCTION STAGING:**

- INSTALL EROSION & SEDIMENT CONTROLS.
- MARK AND CUT TREES TO BE REMOVED.
- INSTALL TREE PROTECTION AS REQUIRED.
- STRIP TOPSOIL AND STOCKPILE IT WITH APPROPRIATE SEDIMENTATION CONTROL MEASURES.
- ROUGH IN PROPOSED POOL AND CONSTRUCTION ACCESS.
- CONSTRUCT POOL.
- FINE GRADE AND STABILIZE ALL SLOPES.
- LANDSCAPE AS REQUIRED.
- REMOVE EROSION AND SEDIMENT CONTROLS.

**DEEP TESTS PERFORMED BY AKL 2/19/2021**

Test Pit or Soil Boring #:	1	Ground Elevation:	504.2
Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches	
504.20	Top Soil	0-4	
503.87	Brown Silty Fine Sand	4-29	
501.78	Gray Sandy Loam	29-60	

Elevation	Mottling (Seasonally High Groundwater)	Depth in Inches
NA	Groundwater	-
499.2	Ledge	60

Test Pit or Soil Boring #:	2	Ground Elevation:	500.5
Elevation	Soil Texture (Percent Sand, Silt and Clay)	Depth Range in Inches	
500.50	Top Soil	0-7	
499.92	Brown Silty Fine Sand	7-24	

Elevation	Mottling (Seasonally High Groundwater)	Depth in Inches
NA	Groundwater	-
498.5	Ledge	24

PERCOLATION TEST RESULTS				
Date: February 19, 2021				
AKL Witness: Ida Gheibi				
Note: Test holes were pre-soaked				
Time	Depth to Water (in)	Difference (in)	Perc. Rate (min/in)	
1:44 PM	19	-	-	
1:48 PM	20	1.0	2.0	
1:48 PM	21	1.0	2.0	
1:50 PM	22	1.0	2.0	
Average 'A' =				2.0 min/in
				30.00 in/hr

Town of North Castle Schedule of Regulations for Residence Districts Zoning District R-1A			
Maximum Gross Floor Area (See definition in 355-4)	Required	Existing Lot	Proposed
Area, total (square feet)	43,560	72,966	72,966
Frontage (feet)	125	38.2	38.2
Width (feet)	125	293.74	293.74
Depth (feet)	150	320.62	320.62
<b>Minimum Yard Dimensions:</b>			
Front (feet)	50	52.32	52.32
Side (feet)	25	47.32	26.00
Rear (feet)	40	172.80	58.11
<b>Maximum Height of Building:</b>			
In feet	30	30.00	30.00
<b>Maximum Building Coverage</b>			
	12%	4.80%	4.80%
<b>Minimum Dwelling Unit Size:</b>			
(square feet)	1,200	N/A	N/A

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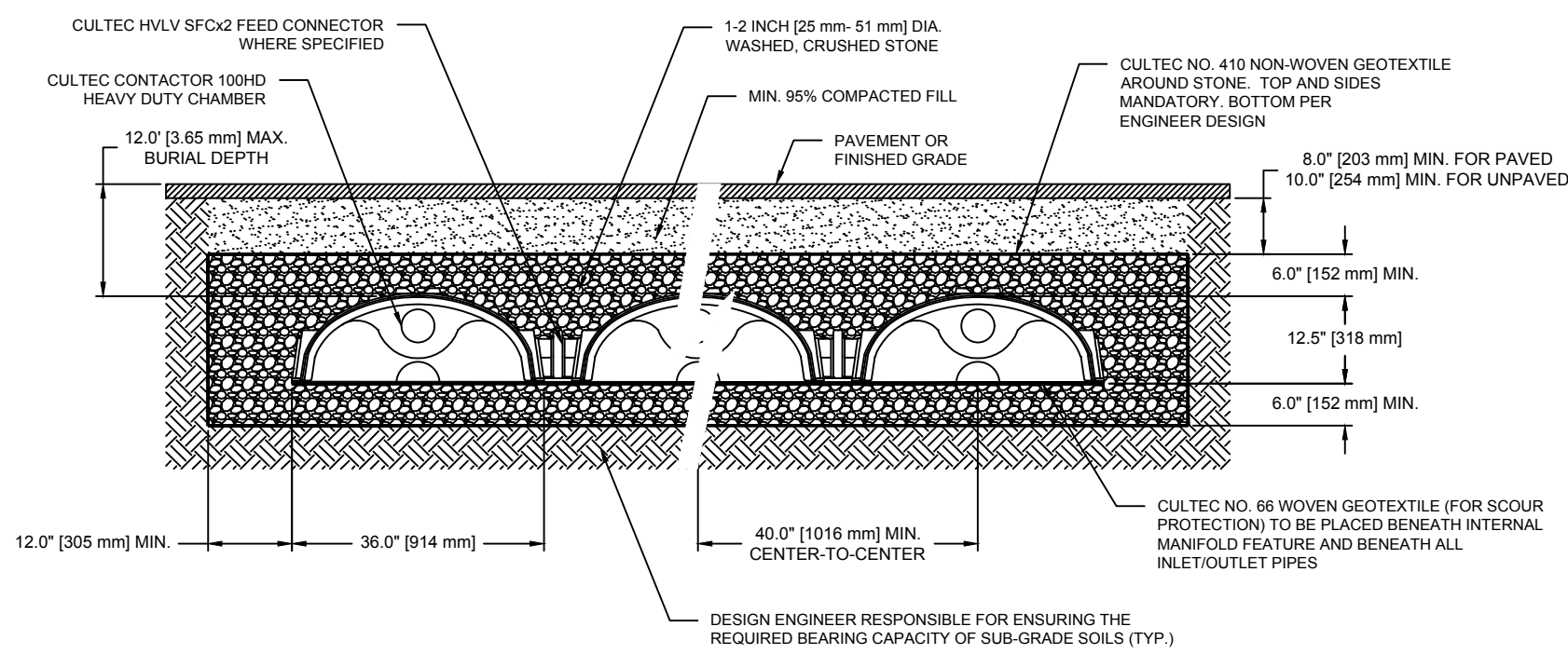


REV. #	REV. DESCRIPTION	DATE
2	ADDRESS PLANNING BOARD COMMENTS	03/24/2021
1	ADDRESS RPRC COMMENTS, PLANNING BOARD APPLICATION	2/19/2021

**AK AHNEMANKIRBY**  
ENGINEERS • SURVEYORS • PLANNERS  
SINCE 1871  
1171 East Putnam Avenue, Riverside, CT 06878  
Tel: 203.869.7707 • Fax: 203.869.4606  
www.ahnemankirby.com

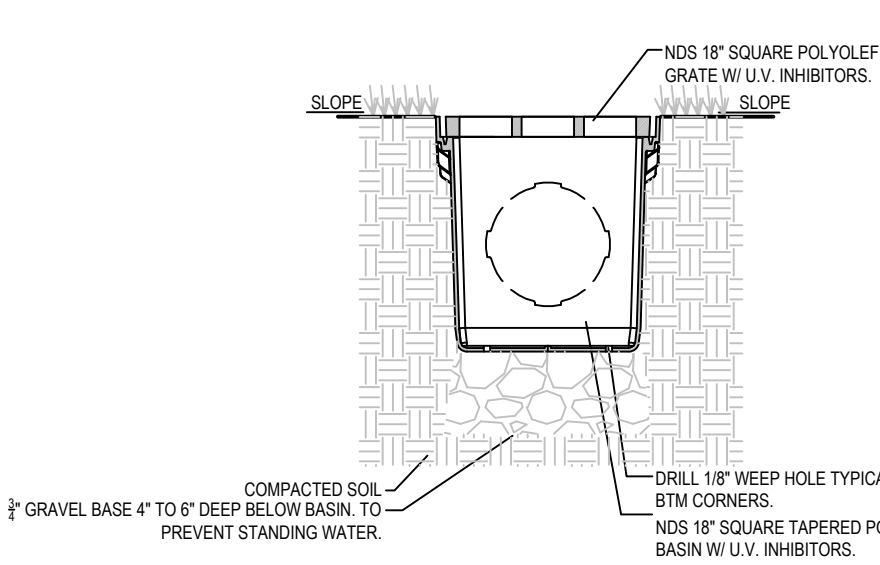
Date:	December 9, 2020
Scale:	1" = 20'
Drawn/Checked By:	KBF, KW / TGA
Book #:	257-108
Job #:	20-087-D083
Reference:	D083

PREPARED FOR:  
**BIRENBERG RESIDENCE**  
18 Quaker Meeting House Road, Armonk, NY 10504  
(Tax ID: 101.03-4-44)  
**PROPOSED POOL PLAN**  
SP-1



**GENERAL NOTES**  
 CONTACTOR 100HD BY CULTEC, INC. OF BROOKFIELD, CT. STORAGE PROVIDED = 3.84 CF/FT (0.82 M<sup>3</sup>/3) PER DESIGN UNIT. REFER TO CULTEC, INC.'S CURRENT RECOMMENDED INSTALLATION GUIDELINES. MAXIMUM ALLOWED COVER ON TOP OF UNIT SHALL BE 12.0' (3.66 m). THE CHAMBER WILL BE DESIGNED TO WITHSTAND TRAFFIC LOADS.

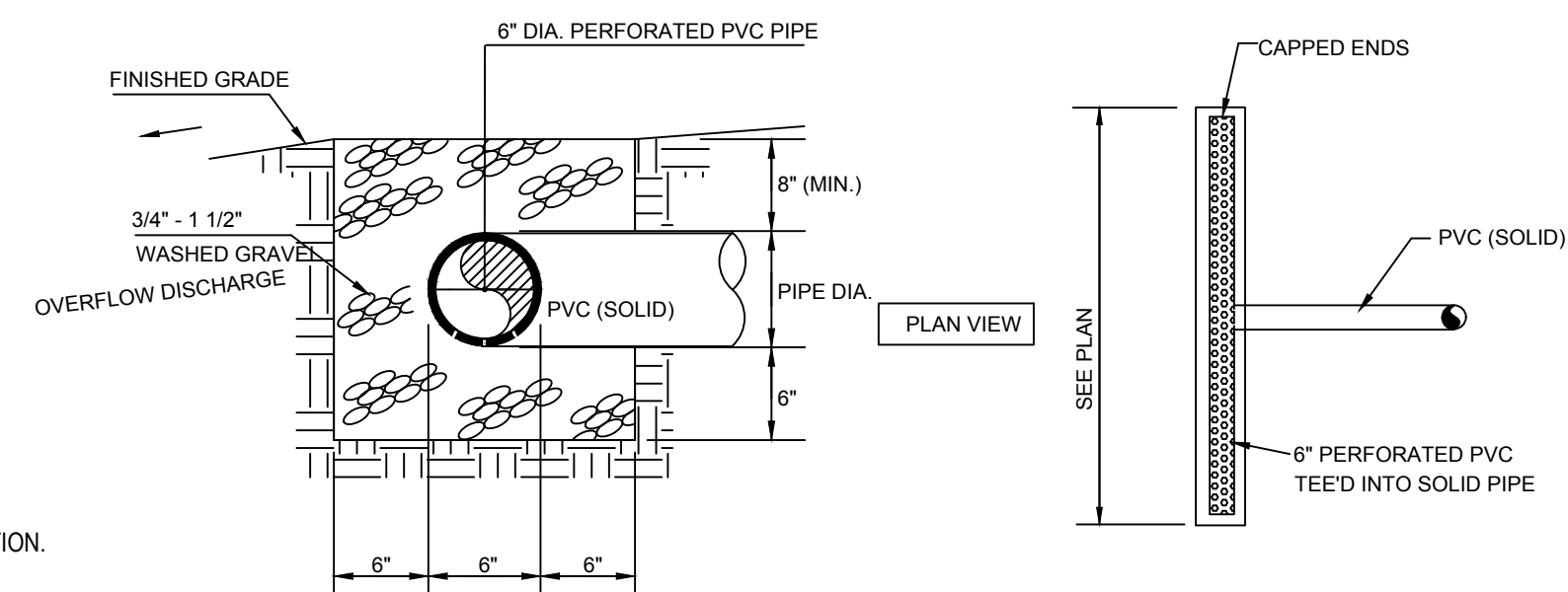
WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS ALL CONTACTOR 100HD HEAVY DUTY UNITS ARE MARKED WITH A COLOR STRIPE FORMED INTO THE PART ALONG THE LENGTH OF THE CHAMBER. ALL CONTACTOR 100 CHAMBERS MUST BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THE SOILS BENEATH THE CULTEC UNITS SHALL BE SCARIFIED OR TILLED TO IMPROVE INFILTRATION.



- NOTES:**
1. GRATE TO BE ATTACHED TO CATCH BASIN WITH SCREW PROVIDED AT TIME OF INSTALLATION.
  2. RISER CAN BE CUT TO ACHIEVE EXACT ELEVATION.
  3. DO NOT USE OVER 5 RISERS WITH CATCH BASIN.
  4. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

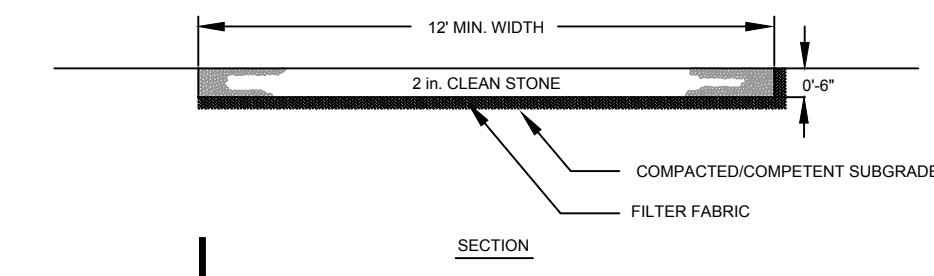
**YARD DRAIN DETAIL**

SCALE: N.T.S.  
 FOR USE WITHIN SUBJECT PROPERTY ONLY



**LEVEL SPREADER DETAIL**

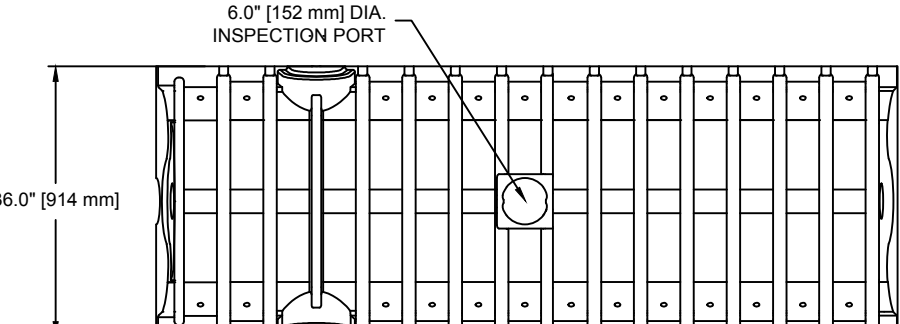
N.T.S.



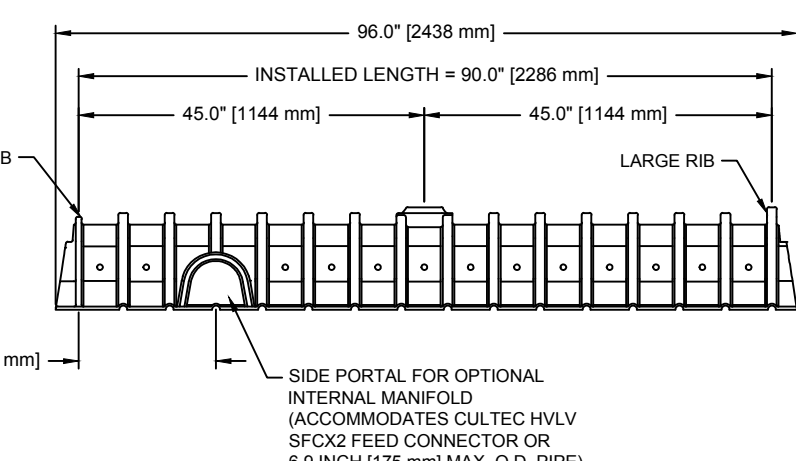
**ANTI-TRACKING PAD DETAIL**

N.T.S.

- INSTALLATION NOTES**
1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
  2. LENGTH - AS REQUIRED, BUT NOT LESS THAN 15 FEET.
  3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
  4. WIDTH - 10 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCUR.
  5. FILTER FABRIC - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
  6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
  7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT OF WAY MUST BE REMOVED IMMEDIATELY.
  8. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
  9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

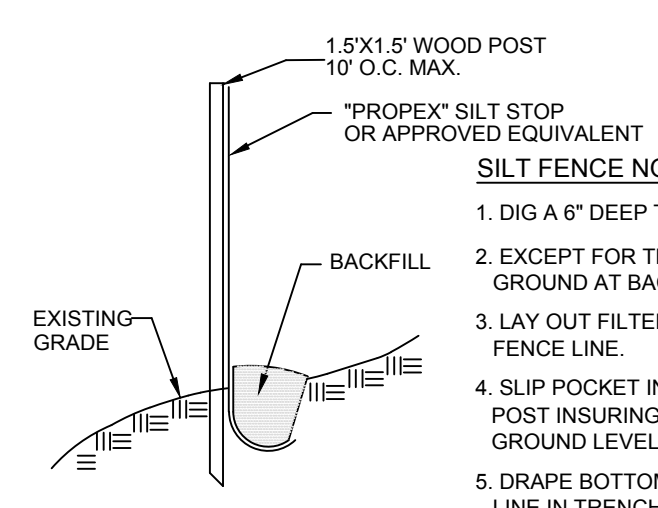


CULTEC CONTACTOR 100HD CHAMBER STORAGE = 1.866 CF/FT (0.173 m<sup>3</sup>/m)  
 INSTALLED LENGTH ADJUSTMENT = 0.9' (0.15 m)  
 ALL CONTACTOR 100HD HEAVY DUTY UNITS ARE MARKED WITH A COLORED STRIPE FORMED INTO THE PART ALONG THE LENGTH OF THE CHAMBER.



**CULTEC CONTACTOR 100HD**

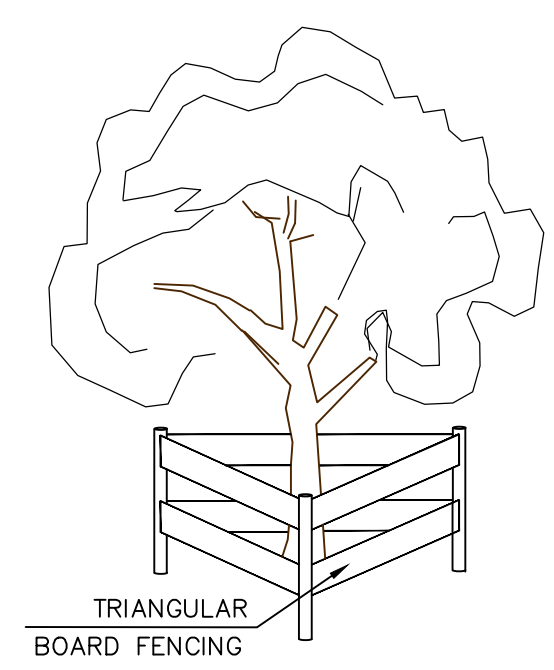
N.T.S.



- SILT FENCE NOTES**
1. DIG A 6" DEEP TRENCH ALONG THE INTENDED FENCE LINE.
  2. EXCEPT FOR THE END POST, DRIVE ALL POSTS INTO THE GROUND AT BACK SIDE OF TRENCH 10' O.C. MAX.
  3. LAY OUT FILTER FABRIC ON THE UPHILL SIDE ALONG THE FENCE LINE.
  4. SLIP POCKET IN END OF FILTER FABRIC OVER THE FIRST POST INSURING THAT THE BOTTOM RED GAUGE LINE IS AT GROUND LEVEL.
  5. DRAPE BOTTOM 6" OF FILTER FABRIC BELOW RED GAUGE LINE IN TRENCH, BACK FILL WITH SOIL AND COMPACT.

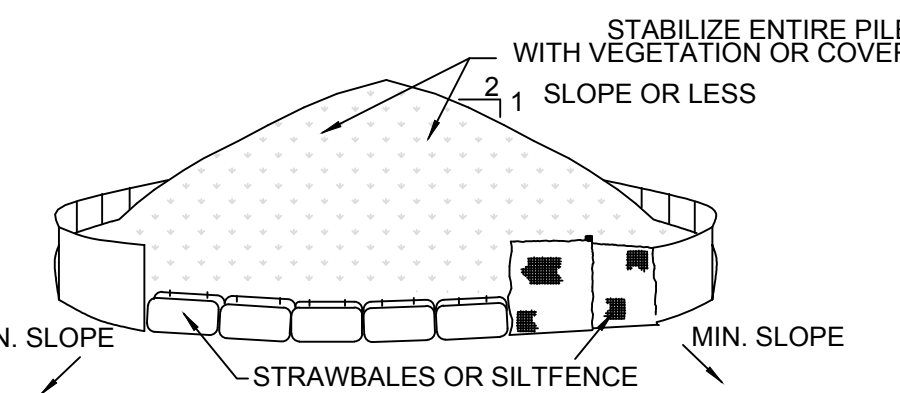
**EROSION CONTROL SILT FENCE DETAIL**

N.T.S.



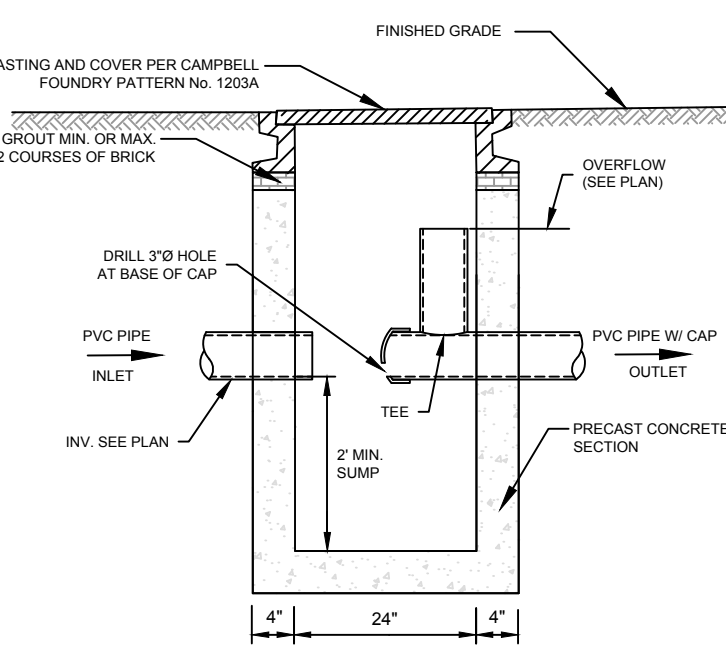
**TREE PROTECTION DETAIL**

(AS REQUIRED FOR ALL TREES TO BE SAVED)  
 SCALE: N.T.S.



- INSTALLATION NOTES:**
1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
  2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1:2.
  3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAWBALES, THEN STABILIZED WITH VEGETATION OR COVERED.
  4. SEE DETAIL THIS SHEET FOR INSTALLATION OF SILT FENCE.
  5. PROVIDE PLASTIC BELOW STOCK PILE + PROTECT UNDERSIDE.

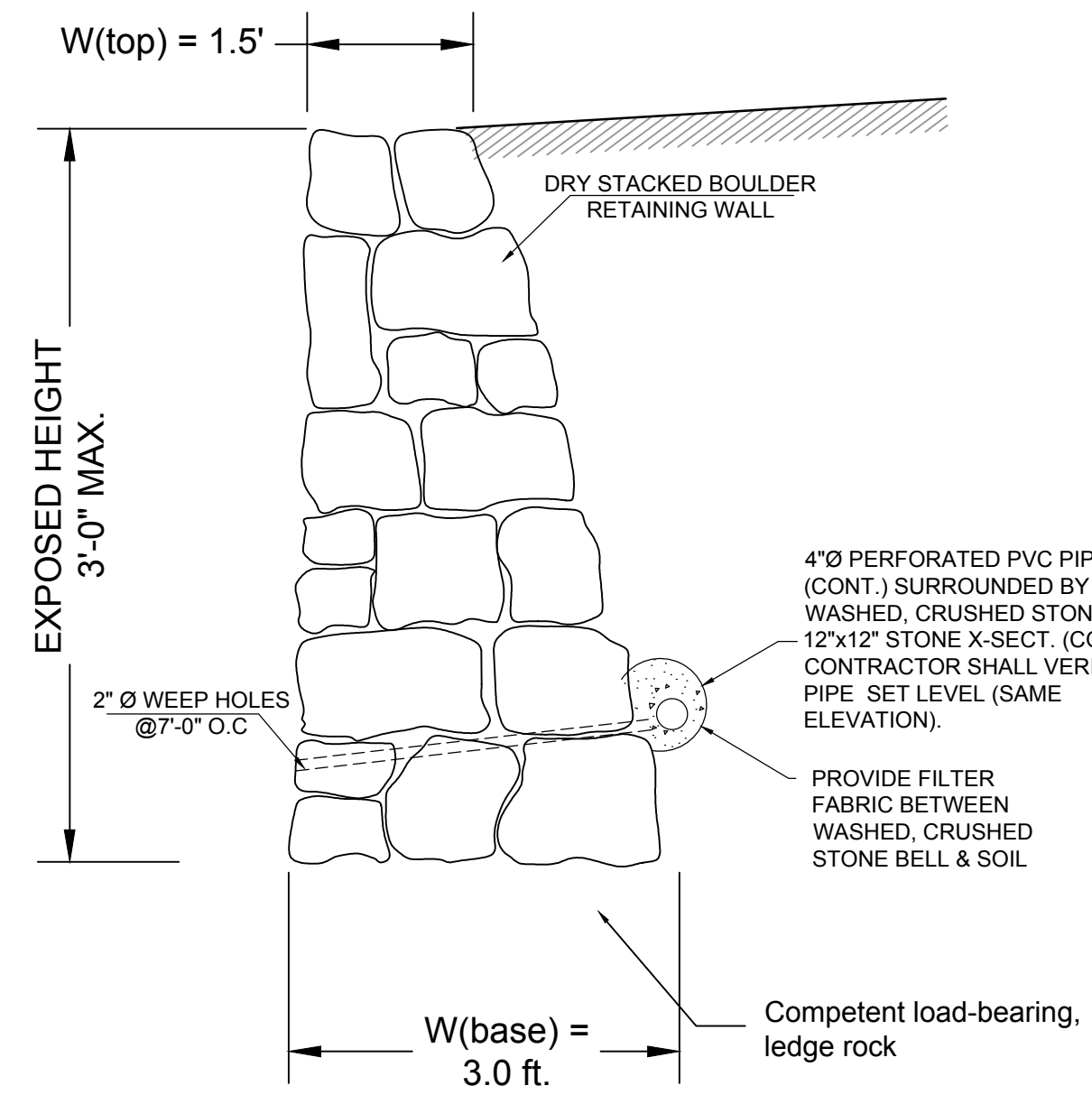
**STOCKPILE DETAIL**



FOR USE WITHIN SUBJECT PROPERTY ONLY AND AS MANUFACTURED BY CONNECTICUT PRECAST CO., INC., MONROE, CT., OR APPROVED EQUIVALENT.  
 1. REINFORCED # 4 @ 16 GAUGE MESH OR TO SPECIFICATIONS.  
 2. MINIMUM CONCRETE COMPRESSIVE STRENGTH: 4,000 PSI @ 28 DAYS.

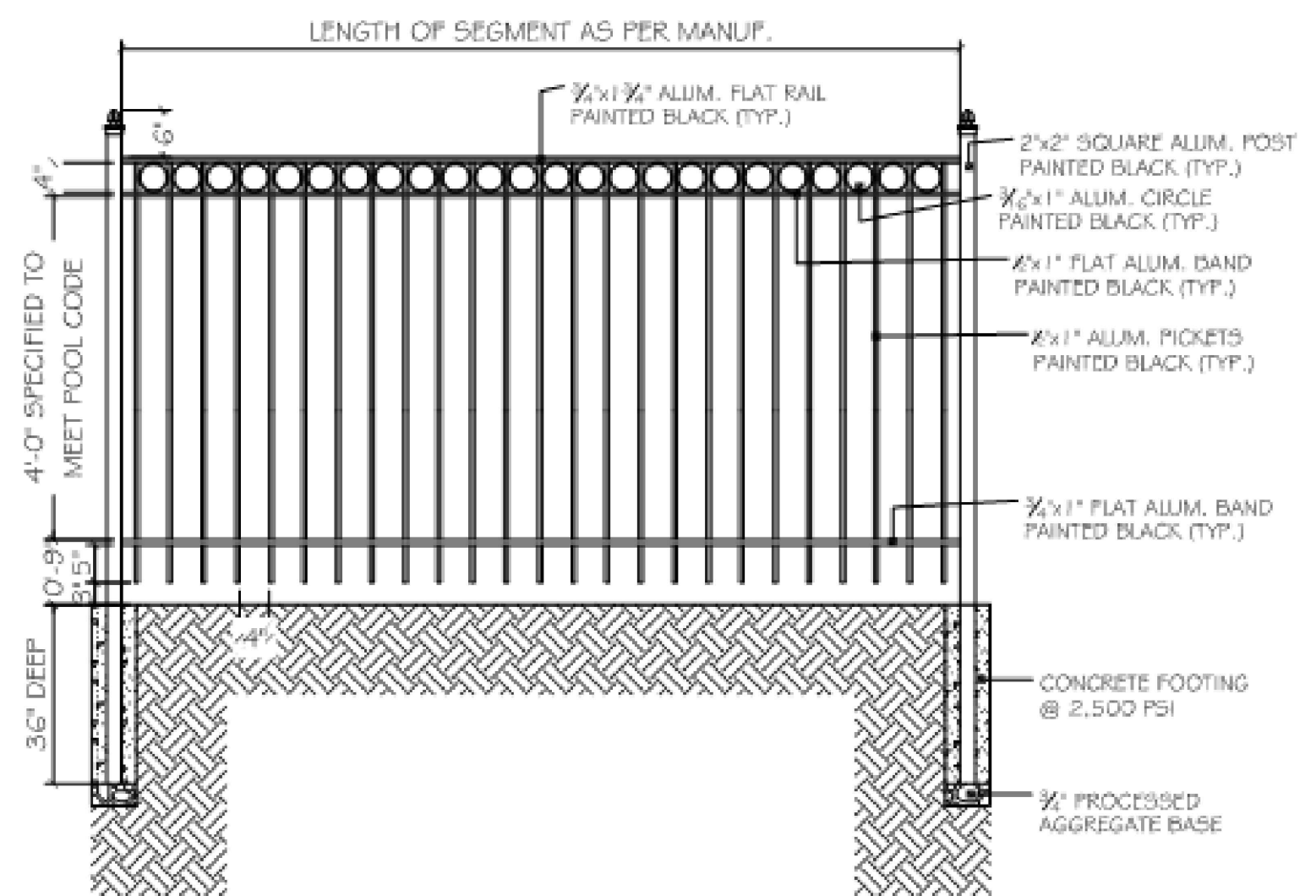
**CONTROL OUTLET STRUCTURE DETAIL**

N.T.S.



**DRY STACK BOULDER RETAINING WALL SECTION**

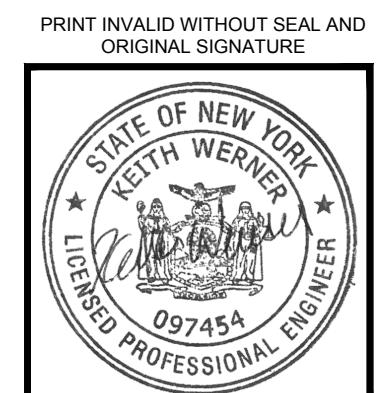
Not to Scale



**METAL FENCE DETAIL**

N.T.S.

Date:	March 22, 2021
Scale:	1" = 20'
Drawn/Checked By:	KW / TGA
Book #:	257-108
Job #:	20-087-D083
Reference:	D083



REV. #	REV. DESCRIPTION	DATE

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 www.ahnemankirby.com

PREPARED FOR:  
**BIRENBERG RESIDENCE**  
 18 Quaker Meeting House Road, Ammonk, NY 10804  
 (Fax: 101-101-034-444)  
**PROPOSED**  
 SITE DETAILS  
 SP-2

# Stormwater Management Report

Prepared for:

Josef Thor

16 Quaker Meeting House Rd

Armonk, NY 10504

February 19, 2021

March 22, 2021 - Revision #1

Prepared by:



Ahneman Kirby, LLC

1171 East Putnam Avenue

Riverside, Connecticut

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## **Project Narrative**

Property of Eric Birenberg

16 Quaker Meeting House Rd, Armonk, NY 10504

March 22, 2021

### **A. GEOGRAPHICAL LOCATION AND DESCRIPTION**

The subject parcel is located in the Northeast corner of a cul-de-sac at the North end of Quaker Meeting House Road, North of Leisure Farm Dr and has a lot area of 1.68 Acres. The topographic nature of the lot is sloped outward from the center where the existing dwelling is located. The property slopes down to the Northeast behind the existing dwelling and down to the Southwest in front of the existing dwelling. The property contains several rock outcroppings along the Southern boundary, with trees, and wooded open space. There is a driveway entrance to the property from Quaker Meeting House Road which leads uphill to the residence in the center of the parcel.

### **B. PURPOSE AND DESCRIPTION**

This application package proposes a new swimming pool on the parcel. The pool footprint is 924 ft<sup>2</sup> (See Appendix A). The regrading keeps the topography of the site going from the Southwest to the Northeast towards the pond at a rate of approximately 8% in the rear yard with shallower slopes around the existing dwelling and proposed pool.

Drainage design was performed in accordance with the Town of North Castle Town Code Chapter 267-6, with a net zero increase in the rate of runoff or a six (6) inch pool drawdown volume; whichever is greater. We proposed collecting runoff from the swimming pool area and treating it with North Castle's Stormwater Best Management Practices (BMP).

The area of the site being collected is in the Northwestern portion of the lot. Due to the existing topography of the site the swimming pool area needed to be leveled out with a low height retaining wall to meet the existing contours. The stormwater will be collected by a yard drain and an existing roof downspout. From the drains the stormwater is then conveyed to twelve (12) Cultec 330XLHD Recharger basins placed underneath the lawn area behind the proposed swimming pool. The outlet from the Cultecs will then be routed to a control outlet structure to control the discharge rate. From the controlled outlet the runoff is directed to a level spreader located to the Northeast of the proposed pool (See Plans).

### **C. SOIL EVALUATION**

The soils within the site below the surface are 63% Type B and 37% Type D per the USDA Natural Resource Conservation Service and are depicted on the soils map located in Appendix B of this report as follows:

- Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky (map unit symbol CrC)
- Chatfield-Charlton complex, 15 to 35 percent slopes, very rocky (map unit symbol CsD)
- Hollis-Rock outcrop complex, 35 to 60 percent slopes (map unit symbol HrF)



Refer to Appendix C for USDA Soils Engineering Properties.

**D. PRE & POST DEVELOPMENT SITE HYDROLOGY COMPARISON**

The proposed development increases the impervious coverage for the watershed but will decrease peak flows to all points of concern. The trench drain will pick up the runoff from the newly introduced impervious surfaces. The proposed grades slope towards the same location as the existing grades making for a straight forward comparison of pre and post development hydrology at a common Point of Interest.

Refer to Table 1 for a comparison of peak flow rates for the existing and proposed site conditions at point of interest A. The peak runoff to all points of concern has a zero increase for the 1, 2, 5, 10, and 25 year storms. Upon completion of the construction depicted on the proposed developments plans, there will be no drainage impacts to any of the adjoining properties.

**Table 1: Comparison of Existing and Proposed Peak Flow Rates for Point of Interest A**

<b>16 Quaker Meeting House Rd, Armonk, NY - P.O.I "A"</b>						
<b>Existing / Proposed Stormwater Runoff Data Comparison Chart</b>						
<b>STORM EVENT</b>	<b>POINT OF INTEREST</b>	<b>Flow/Volume</b>	<b>EXISTING</b>	<b>PROPOSED</b>	<b>Δ</b>	<b>Δ (%)</b>
1 YEAR	<b>TOTAL FLOW P.O.I. A</b>	q(ft <sup>3</sup> /s)	0.40	0.36	-0.04	-10.00%
2 YEAR		q(ft <sup>3</sup> /s)	0.68	0.61	-0.07	-10.29%
5 YEAR		q(ft <sup>3</sup> /s)	1.28	1.15	-0.13	-10.16%
10 YEAR		q(ft <sup>3</sup> /s)	1.88	1.69	-0.19	-10.11%
25 YEAR		q(ft <sup>3</sup> /s)	2.95	2.66	-0.29	-9.83%

**E. ALTERNATIVES CONSIDERED**

The alternatives considered included drywells collecting runoff from catch basins in the driveway and a trench drain installed along the existing driveway.

The drywells were discarded due to limiting the area of disturbance to the backyard rather than removing and replacing the existing driveway.

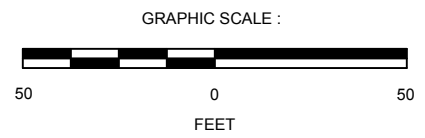
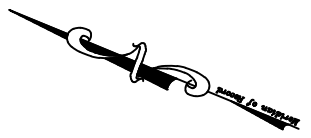
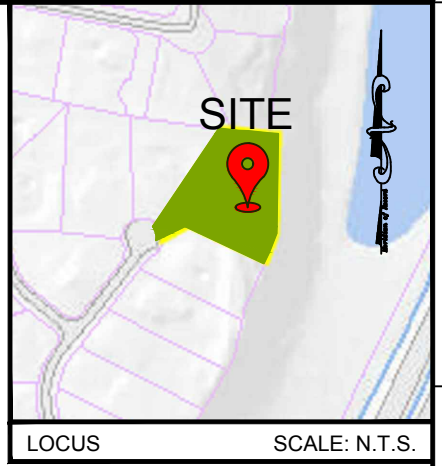
The trench drain collection, storage, and discharge option in the existing driveway was eliminated again due to limiting the area of disturbance to the backyard where the other work will be taking place.





## **Appendix A Impervious Coverage Pre & Post Development**

C:\Users\keithwerner\Ahmanan Kirby Dropbox\Keith Werner\gshare\AKL\_project\16 Quaker Meeting House Rd JT Construction\Engineering\Hydrology\16 Quaker Meeting House Rd JT Existing Watershed.dwg 02/10/21 - 2:18pm keithwerner



Date:	December 2, 2020
Scale:	1" = 50'
Drawn/Checked By:	KW / TGA
Book #:	257:108
Job #:	20-087-D083
Reference:	D083

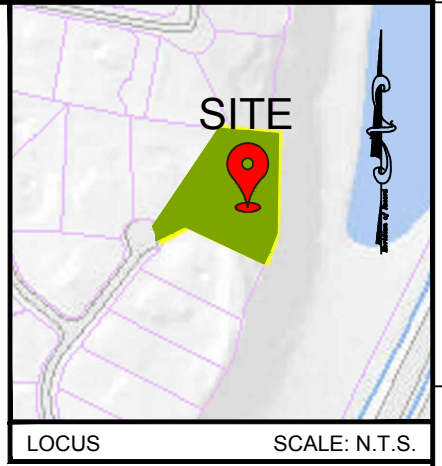
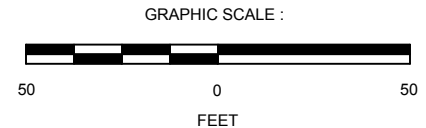
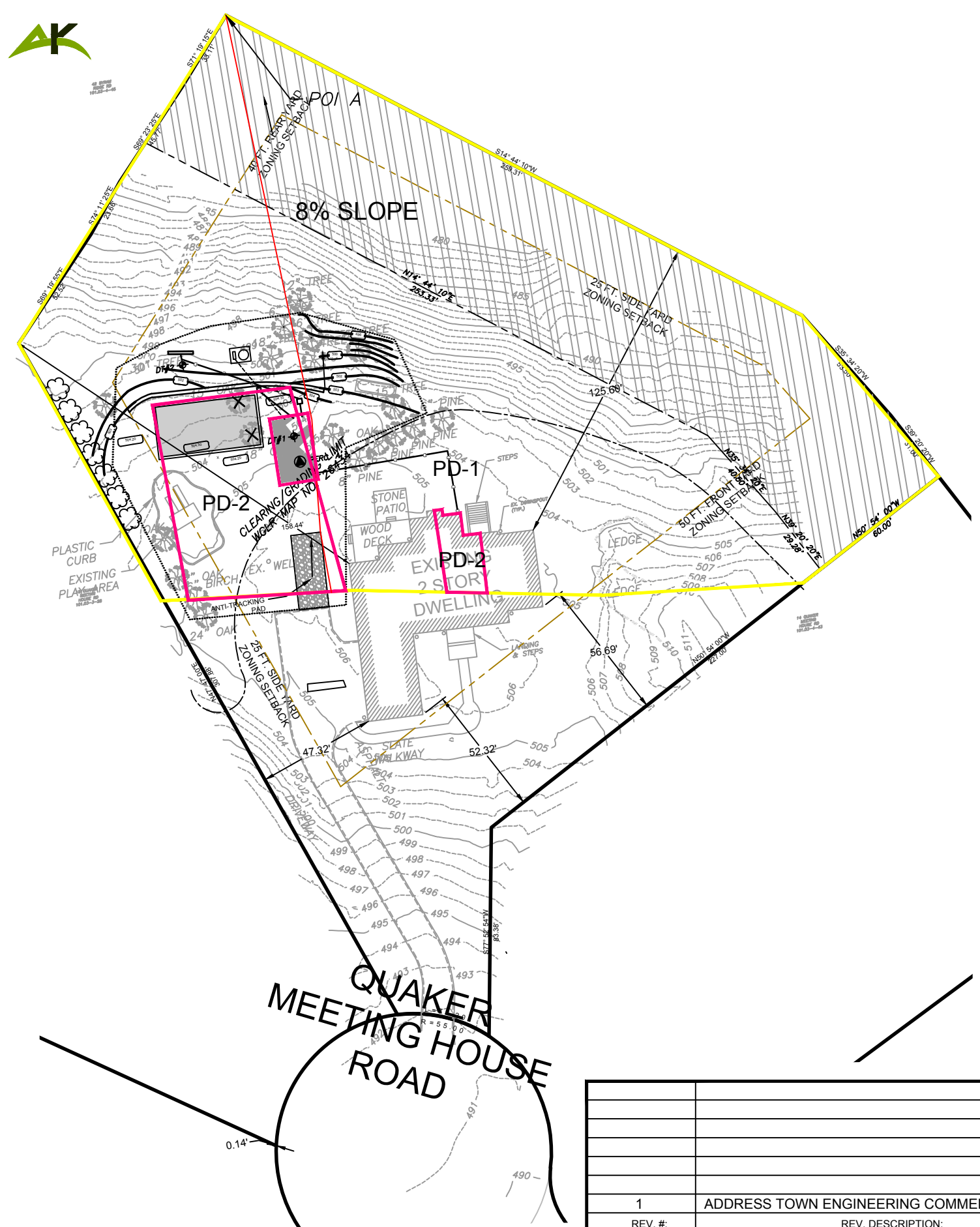
**QUAKER MEETING HOUSE ROAD**

REV. #:	REV. DESCRIPTION:	DATE:

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Tel: 203.869.7707 • Fax: 203.869.4606  
www.ahnemankirby.com

PREPARED FOR:  
**JT CONSTRUCTION**  
16 Quaker Meeting House Rd., Armonk, NY 10504  
(Tax ID: 101.03-444)  
**EXISTING WATERSHED MAP**  
**EW-1**

C:\Users\keithwerner\Ahmman Kirby Dropbox\Keith Werner\gshare\AKL\_project\16 Quaker Meeting House Rd\_10504\_JT Construction\Engineering\Hydrology\REV 1116 Quaker Meeting House Rd JT Proposed Watershed.dwg 03/23/21 - 4:43pm keithwerner



Date:	February 10, 2021
Scale:	1" = 50'
Drawn/Checked By:	KW / TGA
Book #:	257:108
Job #:	20-087-D083
Reference:	D083

QUAKER MEETING HOUSE ROAD

REV. #:	REV. DESCRIPTION:	DATE:
1	ADDRESS TOWN ENGINEERING COMMENTS	03/22/2021

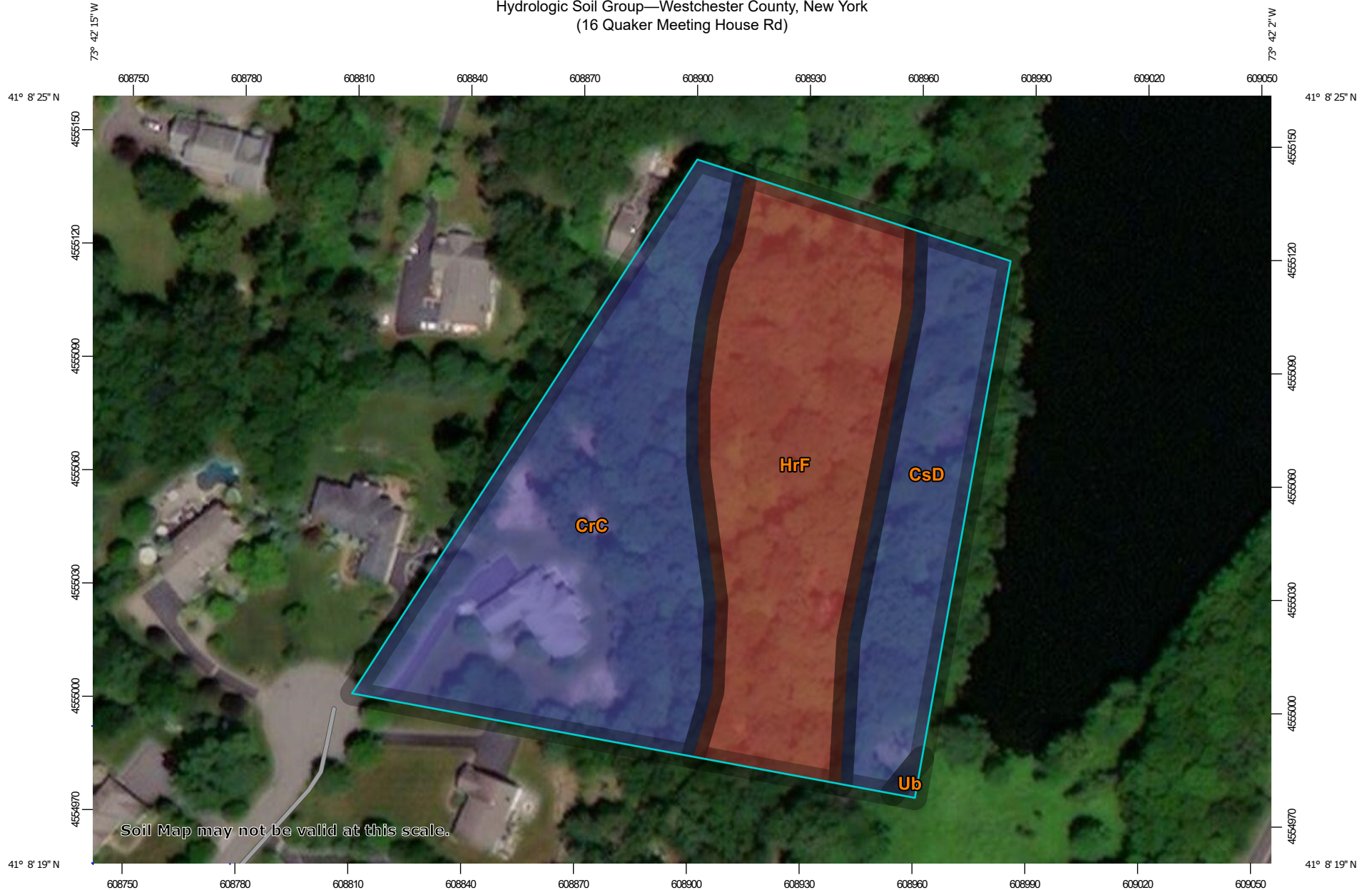
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PREPARED FOR:  
**JT CONSTRUCTION**  
16 Quaker Meeting House Rd., Armonk, NY 10504  
(Tax ID: 101.03-444)  
**PROPOSED WATERSHED MAP**  
PW-1

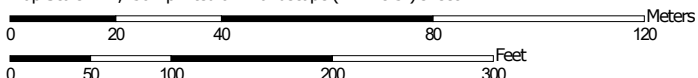


## **Appendix B USDA Soils Engineering Properties**

Hydrologic Soil Group—Westchester County, New York  
(16 Quaker Meeting House Rd)



Map Scale: 1:1,430 if printed on A landscape (11" x 8.5") sheet.




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



## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





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

#### Soil Rating Lines

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

#### Soil Rating Points


 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available


### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Westchester County, New York  
 Survey Area Data: Version 16, Jun 11, 2020

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

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
CrC	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	1.9	43.4%
CsD	Chatfield-Charlton complex, 15 to 35 percent slopes, very rocky	B	0.9	18.9%
HrF	Hollis-Rock outcrop complex, 35 to 60 percent slopes	D	1.7	37.5%
Ub	Udorthents, smoothed	B	0.0	0.2%
<b>Totals for Area of Interest</b>			<b>4.5</b>	<b>100.0%</b>

## Description

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

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

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

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

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

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

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

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher





## **Appendix C HydroCAD Pre & Post Development Calculations**

**16 Quaker Meeting House Rd Armonk NY\_HydroCAD**

Prepared by Microsoft

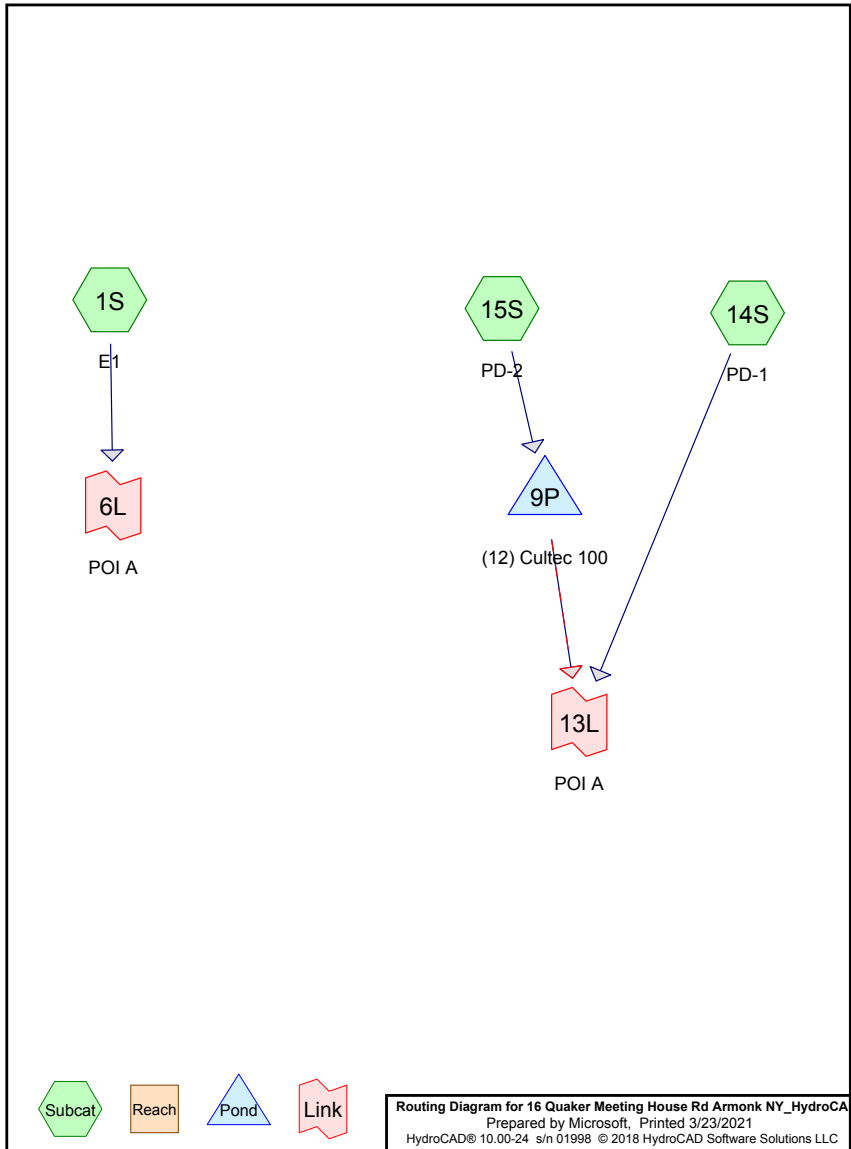
HydroCAD® 10.00-24 s/n 01998 © 2018 HydroCAD Software Solutions LLC

Printed 3/23/2021

Page 2

**Area Listing (all nodes)**

Area (sq-ft)	CN	Description (subcatchment-numbers)
4,785	61	>75% Grass cover, Good, HSG B (15S)
546	98	Existing Deck (1S, 14S)
3,218	98	Existing Dwelling (1S, 14S)
330	98	Existing Patio (1S, 14S)
472	98	Existing Roof (15S)
96,823	65	Woods/grass comb., Fair, HSG B (1S, 14S)
<b>106,174</b>	<b>66</b>	<b>TOTAL AREA</b>



Routing Diagram for 16 Quaker Meeting House Rd Armonk NY\_HydroCAD  
 Prepared by Microsoft, Printed 3/23/2021  
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**16 Quaker Meeting House Rd Armonk NY\_HydroCAD**

Prepared by Microsoft

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Page 3

**Soil Listing (all nodes)**

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
101,608	HSG B	1S, 14S, 15S
0	HSG C	
0	HSG D	
4,566	Other	1S, 14S, 15S
<b>106,174</b>		<b>TOTAL AREA</b>

**16 Quaker Meeting House Rd Armonk NY\_HydroCAD**

Prepared by Microsoft

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Printed 3/23/2021

Page 4

**Ground Covers (all nodes)**

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	4,785	0	0	0	4,785	>75% Grass cover, Good
0	0	0	0	546	546	Existing Deck
0	0	0	0	3,218	3,218	Existing Dwelling
0	0	0	0	330	330	Existing Patio
0	0	0	0	472	472	Existing Roof
0	96,823	0	0	0	96,823	Woods/grass comb., Fair
<b>0</b>	<b>101,608</b>	<b>0</b>	<b>0</b>	<b>4,566</b>	<b>106,174</b>	<b>TOTAL AREA</b>

Su  
Nu

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

**Subcatchment1S: E1** Runoff Area=53,087 sf 4.30% Impervious Runoff Depth>0.50"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=0.40 cfs 2,191 cf

**Subcatchment14S: PD-1** Runoff Area=47,830 sf 3.79% Impervious Runoff Depth>0.50"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=0.36 cfs 1,974 cf

**Subcatchment15S: PD-2** Runoff Area=5,257 sf 8.98% Impervious Runoff Depth>0.43"  
 Tc=5.0 min CN=64 Runoff=0.04 cfs 186 cf

**Pond 9P: (12) Cultec 100** Peak Elev=501.47' Storage=1 cf Inflow=0.04 cfs 186 cf  
 Discarded=0.04 cfs 186 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 186 cf

**Link 6L: POI A** Inflow=0.40 cfs 2,191 cf  
 Primary=0.40 cfs 2,191 cf

**Link 13L: POI A** Inflow=0.36 cfs 1,974 cf  
 Primary=0.36 cfs 1,974 cf

**Total Runoff Area = 106,174 sf Runoff Volume = 4,352 cf Average Runoff Depth = 0.49"**  
**95.70% Pervious = 101,608 sf 4.30% Impervious = 4,566 sf**

**Summary for Subcatchment 1S: E1**

Runoff = 0.40 cfs @ 12.26 hrs, Volume= 2,191 cf, Depth> 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
50,804	65	Woods/grass comb., Fair, HSG B
* 1,845	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
53,087	66	Weighted Average
50,804		95.70% Pervious Area
2,283		4.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 14S: PD-1**

Runoff = 0.36 cfs @ 12.26 hrs, Volume= 1,974 cf, Depth> 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
46,019	65	Woods/grass comb., Fair, HSG B
* 1,373	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
47,830	66	Weighted Average
46,019		96.21% Pervious Area
1,811		3.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 15S: PD-2**

Runoff = 0.04 cfs @ 12.10 hrs, Volume= 186 cf, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 1-Year Rainfall=2.90"

Area (sf)	CN	Description
4,785	61	>75% Grass cover, Good, HSG B
* 472	98	Existing Roof
5,257	64	Weighted Average
4,785		91.02% Pervious Area
472		8.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Pond 9P: (12) Cultec 100**

Inflow Area = 5,257 sf, 8.98% Impervious, Inflow Depth > 0.43" for 1-Year event  
 Inflow = 0.04 cfs @ 12.10 hrs, Volume= 186 cf  
 Outflow = 0.04 cfs @ 12.11 hrs, Volume= 186 cf, Atten= 0%, Lag= 0.4 min  
 Discarded = 0.04 cfs @ 12.11 hrs, Volume= 186 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 501.47' @ 12.11 hrs Surf.Area= 375 sf Storage= 1 cf

Plug-Flow detention time= 0.4 min calculated for 186 cf (100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 909.5 - 909.2 )

Volume	Invert	Avail.Storage	Storage Description
#1A	501.46'	238 cf	<b>15.00'W x 25.00'L x 2.04'H Field A</b> 766 cf Overall - 171 cf Embedded = 594 cf x 40.0% Voids
#2A	501.96'	171 cf	<b>Cultec C-100HD x 12 Inside #1</b> Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 4 rows
			409 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	502.50'	<b>6.0" Vert. Outlet Pipe</b> C= 0.600
#2	Device 1	502.50'	<b>3.0" Vert. Control Outlet X 4.00</b> C= 0.600
#3	Device 1	503.20'	<b>6.0" Horiz. Overflow</b> C= 0.600 Limited to weir flow at low heads
#4	Discarded	501.46'	<b>15.000 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.13 cfs @ 12.11 hrs HW=501.47' (Free Discharge)  
 ↳ **4=Exfiltration** (Exfiltration Controls 0.13 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=501.46' (Free Discharge)  
 ↳ **1=Outlet Pipe** ( Controls 0.00 cfs)  
 ↳ **2=Control Outlet** ( Controls 0.00 cfs)  
 ↳ **3=Overflow** ( Controls 0.00 cfs)

**Pond 9P: (12) Cultec 100 - Chamber Wizard Field A**

**Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)**

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf  
 Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap  
 Row Length Adjustment= +0.50' x 1.86 sf x 4 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

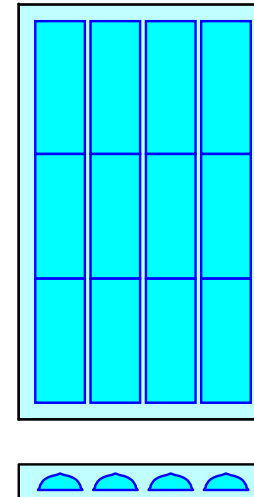
3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00' Base Length  
 4 Rows x 36.0" Wide + 4.0" Spacing x 3 + 12.0" Side Stone x 2 = 15.00' Base Width  
 6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

12 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 4 Rows = 171.3 cf Chamber Storage

765.6 cf Field - 171.3 cf Chambers = 594.4 cf Stone x 40.0% Voids = 237.7 cf Stone Storage

Chamber Storage + Stone Storage = 409.0 cf = 0.009 af  
 Overall Storage Efficiency = 53.4%  
 Overall System Size = 25.00' x 15.00' x 2.04'

12 Chambers  
 28.4 cy Field  
 22.0 cy Stone



**Stage-Area-Storage for Pond 9P: (12) Cultec 100**

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
501.46	375	0	502.50	458	227
501.48	377	3	502.52	460	232
501.50	378	6	502.54	461	238
501.52	380	9	502.56	463	243
501.54	381	12	502.58	465	248
501.56	383	15	502.60	466	253
501.58	385	18	502.62	468	258
501.60	386	21	502.64	469	263
501.62	388	24	502.66	471	268
501.64	389	27	502.68	473	273
501.66	391	30	502.70	474	278
501.68	393	33	502.72	476	282
501.70	394	36	502.74	477	287
501.72	396	39	502.76	479	291
501.74	397	42	502.78	481	295
501.76	399	45	502.80	482	300
501.78	401	48	502.82	484	304
501.80	402	51	502.84	485	308
501.82	404	54	502.86	487	311
501.84	405	57	502.88	489	315
501.86	407	60	502.90	490	318
501.88	409	63	502.92	492	322
501.90	410	66	502.94	493	325
501.92	412	69	502.96	495	328
501.94	413	72	502.98	497	331
501.96	415	75	503.00	498	334
501.98	417	81	503.02	500	337
502.00	418	87	503.04	501	340
502.02	420	93	503.06	503	343
502.04	421	99	503.08	505	346
502.06	423	104	503.10	506	349
502.08	425	110	503.12	508	352
502.10	426	116	503.14	509	355
502.12	428	122	503.16	511	358
502.14	429	127	503.18	513	361
502.16	431	133	503.20	514	364
502.18	433	139	503.22	516	367
502.20	434	144	503.24	517	370
502.22	436	150	503.26	519	373
502.24	437	156	503.28	521	376
502.26	439	161	503.30	522	379
502.28	441	167	503.32	524	382
502.30	442	173	503.34	525	385
502.32	444	178	503.36	527	388
502.34	445	184	503.38	529	391
502.36	447	189	503.40	530	394
502.38	449	195	503.42	532	397
502.40	450	200	503.44	533	400
502.42	452	206	503.46	535	403
502.44	453	211	503.48	537	406
502.46	455	217	503.50	<b>538</b>	<b>409</b>
502.48	457	222			

**Summary for Link 6L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 0.50" for 1-Year event  
 Inflow = 0.40 cfs @ 12.26 hrs, Volume= 2,191 cf  
 Primary = 0.40 cfs @ 12.26 hrs, Volume= 2,191 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 13L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 0.45" for 1-Year event  
 Inflow = 0.36 cfs @ 12.26 hrs, Volume= 1,974 cf  
 Primary = 0.36 cfs @ 12.26 hrs, Volume= 1,974 cf, Atten= 0%, Lag= 0.0 min

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

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

**Subcatchment1S: E1** Runoff Area=53,087 sf 4.30% Impervious Runoff Depth>0.74"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=0.68 cfs 3,288 cf

**Subcatchment14S: PD-1** Runoff Area=47,830 sf 3.79% Impervious Runoff Depth>0.74"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=0.61 cfs 2,962 cf

**Subcatchment15S: PD-2** Runoff Area=5,257 sf 8.98% Impervious Runoff Depth>0.65"  
 Tc=5.0 min CN=64 Runoff=0.08 cfs 287 cf

**Pond 9P: (12) Cultec 100** Peak Elev=501.47' Storage=2 cf Inflow=0.08 cfs 287 cf  
 Discarded=0.08 cfs 287 cf Primary=0.00 cfs 0 cf Outflow=0.08 cfs 287 cf

**Link 6L: POI A** Inflow=0.68 cfs 3,288 cf  
 Primary=0.68 cfs 3,288 cf

**Link 13L: POI A** Inflow=0.61 cfs 2,962 cf  
 Primary=0.61 cfs 2,962 cf

**Total Runoff Area = 106,174 sf Runoff Volume = 6,537 cf Average Runoff Depth = 0.74"**  
**95.70% Pervious = 101,608 sf 4.30% Impervious = 4,566 sf**



**Summary for Subcatchment 1S: E1**

Runoff = 0.68 cfs @ 12.23 hrs, Volume= 3,288 cf, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
50,804	65	Woods/grass comb., Fair, HSG B
* 1,845	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
53,087	66	Weighted Average
50,804		95.70% Pervious Area
2,283		4.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 14S: PD-1**

Runoff = 0.61 cfs @ 12.23 hrs, Volume= 2,962 cf, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
46,019	65	Woods/grass comb., Fair, HSG B
* 1,373	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
47,830	66	Weighted Average
46,019		96.21% Pervious Area
1,811		3.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 15S: PD-2**

Runoff = 0.08 cfs @ 12.09 hrs, Volume= 287 cf, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 2-Year Rainfall=3.40"

Area (sf)	CN	Description
4,785	61	>75% Grass cover, Good, HSG B
* 472	98	Existing Roof
5,257	64	Weighted Average
4,785		91.02% Pervious Area
472		8.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Pond 9P: (12) Cultec 100**

Inflow Area = 5,257 sf, 8.98% Impervious, Inflow Depth > 0.65" for 2-Year event  
 Inflow = 0.08 cfs @ 12.09 hrs, Volume= 287 cf  
 Outflow = 0.08 cfs @ 12.10 hrs, Volume= 287 cf, Atten= 0%, Lag= 0.4 min  
 Discarded = 0.08 cfs @ 12.10 hrs, Volume= 287 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 501.47' @ 12.10 hrs Surf.Area= 375 sf Storage= 2 cf

Plug-Flow detention time= 0.4 min calculated for 286 cf (100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 892.2 - 891.9 )

Volume	Invert	Avail.Storage	Storage Description
#1A	501.46'	238 cf	<b>15.00'W x 25.00'L x 2.04'H Field A</b> 766 cf Overall - 171 cf Embedded = 594 cf x 40.0% Voids
#2A	501.96'	171 cf	<b>Cultec C-100HD</b> x 12 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 4 rows
		409 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	502.50'	<b>6.0" Vert. Outlet Pipe</b> C= 0.600
#2	Device 1	502.50'	<b>3.0" Vert. Control Outlet X 4.00</b> C= 0.600
#3	Device 1	503.20'	<b>6.0" Horiz. Overflow</b> C= 0.600 Limited to weir flow at low heads
#4	Discarded	501.46'	<b>15.000 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.13 cfs @ 12.10 hrs HW=501.47' (Free Discharge)  
 ↳ **4=Exfiltration** (Exfiltration Controls 0.13 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=501.46' (Free Discharge)  
 ↳ **1=Outlet Pipe** ( Controls 0.00 cfs)  
 ↳ **2=Control Outlet** ( Controls 0.00 cfs)  
 ↳ **3=Overflow** ( Controls 0.00 cfs)

**Pond 9P: (12) Cultec 100 - Chamber Wizard Field A**

**Chamber Model = Cultec C-100HD (Cultec Contactor®100HD)**

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf  
 Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap  
 Row Length Adjustment= +0.50' x 1.86 sf x 4 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00'

Base Length

4 Rows x 36.0" Wide + 4.0" Spacing x 3 + 12.0" Side Stone x 2 = 15.00' Base Width

6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

12 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 4 Rows = 171.3 cf Chamber Storage

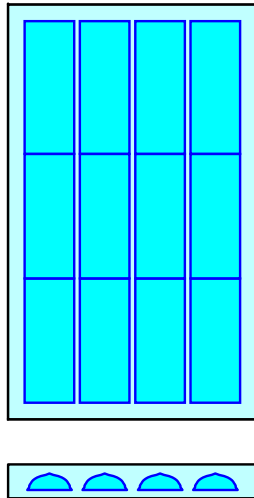
765.6 cf Field - 171.3 cf Chambers = 594.4 cf Stone x 40.0% Voids = 237.7 cf Stone Storage

Chamber Storage + Stone Storage = 409.0 cf = 0.009 af

Overall Storage Efficiency = 53.4%

Overall System Size = 25.00' x 15.00' x 2.04'

12 Chambers  
 28.4 cy Field  
 22.0 cy Stone



**Stage-Area-Storage for Pond 9P: (12) Cultec 100**

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
501.46	375	0	502.50	458	227
501.48	377	3	502.52	460	232
501.50	378	6	502.54	461	238
501.52	380	9	502.56	463	243
501.54	381	12	502.58	465	248
501.56	383	15	502.60	466	253
501.58	385	18	502.62	468	258
501.60	386	21	502.64	469	263
501.62	388	24	502.66	471	268
501.64	389	27	502.68	473	273
501.66	391	30	502.70	474	278
501.68	393	33	502.72	476	282
501.70	394	36	502.74	477	287
501.72	396	39	502.76	479	291
501.74	397	42	502.78	481	295
501.76	399	45	502.80	482	300
501.78	401	48	502.82	484	304
501.80	402	51	502.84	485	308
501.82	404	54	502.86	487	311
501.84	405	57	502.88	489	315
501.86	407	60	502.90	490	318
501.88	409	63	502.92	492	322
501.90	410	66	502.94	493	325
501.92	412	69	502.96	495	328
501.94	413	72	502.98	497	331
501.96	415	75	503.00	498	334
501.98	417	81	503.02	500	337
502.00	418	87	503.04	501	340
502.02	420	93	503.06	503	343
502.04	421	99	503.08	505	346
502.06	423	104	503.10	506	349
502.08	425	110	503.12	508	352
502.10	426	116	503.14	509	355
502.12	428	122	503.16	511	358
502.14	429	127	503.18	513	361
502.16	431	133	503.20	514	364
502.18	433	139	503.22	516	367
502.20	434	144	503.24	517	370
502.22	436	150	503.26	519	373
502.24	437	156	503.28	521	376
502.26	439	161	503.30	522	379
502.28	441	167	503.32	524	382
502.30	442	173	503.34	525	385
502.32	444	178	503.36	527	388
502.34	445	184	503.38	529	391
502.36	447	189	503.40	530	394
502.38	449	195	503.42	532	397
502.40	450	200	503.44	533	400
502.42	452	206	503.46	535	403
502.44	453	211	503.48	537	406
502.46	455	217	503.50	538	409
502.48	457	222			

**Summary for Link 6L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 0.74" for 2-Year event  
Inflow = 0.68 cfs @ 12.23 hrs, Volume= 3,288 cf  
Primary = 0.68 cfs @ 12.23 hrs, Volume= 3,288 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 13L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 0.67" for 2-Year event  
Inflow = 0.61 cfs @ 12.23 hrs, Volume= 2,962 cf  
Primary = 0.61 cfs @ 12.23 hrs, Volume= 2,962 cf, Atten= 0%, Lag= 0.0 min

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

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

**Subcatchment1S: E1** Runoff Area=53,087 sf 4.30% Impervious Runoff Depth>1.26"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=1.28 cfs 5,594 cf

**Subcatchment14S: PD-1** Runoff Area=47,830 sf 3.79% Impervious Runoff Depth>1.26"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=1.15 cfs 5,040 cf

**Subcatchment15S: PD-2** Runoff Area=5,257 sf 8.98% Impervious Runoff Depth>1.14"  
 Tc=5.0 min CN=64 Runoff=0.15 cfs 501 cf

**Pond 9P: (12) Cultec 100** Peak Elev=501.51' Storage=7 cf Inflow=0.15 cfs 501 cf  
 Discarded=0.13 cfs 501 cf Primary=0.00 cfs 0 cf Outflow=0.13 cfs 501 cf

**Link 6L: POI A** Inflow=1.28 cfs 5,594 cf  
 Primary=1.28 cfs 5,594 cf

**Link 13L: POI A** Inflow=1.15 cfs 5,040 cf  
 Primary=1.15 cfs 5,040 cf

**Total Runoff Area = 106,174 sf Runoff Volume = 11,135 cf Average Runoff Depth = 1.26"**  
**95.70% Pervious = 101,608 sf 4.30% Impervious = 4,566 sf**

**Summary for Subcatchment 1S: E1**

Runoff = 1.28 cfs @ 12.22 hrs, Volume= 5,594 cf, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 5-Year Rainfall=4.30"

Area (sf)	CN	Description
50,804	65	Woods/grass comb., Fair, HSG B
* 1,845	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
53,087	66	Weighted Average
50,804		95.70% Pervious Area
2,283		4.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 14S: PD-1**

Runoff = 1.15 cfs @ 12.22 hrs, Volume= 5,040 cf, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 5-Year Rainfall=4.30"

Area (sf)	CN	Description
46,019	65	Woods/grass comb., Fair, HSG B
* 1,373	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
47,830	66	Weighted Average
46,019		96.21% Pervious Area
1,811		3.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 15S: PD-2**

Runoff = 0.15 cfs @ 12.08 hrs, Volume= 501 cf, Depth> 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 5-Year Rainfall=4.30"

Area (sf)	CN	Description
4,785	61	>75% Grass cover, Good, HSG B
* 472	98	Existing Roof
5,257	64	Weighted Average
4,785		91.02% Pervious Area
472		8.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Pond 9P: (12) Cultec 100**

Inflow Area = 5,257 sf, 8.98% Impervious, Inflow Depth > 1.14" for 5-Year event  
 Inflow = 0.15 cfs @ 12.08 hrs, Volume= 501 cf  
 Outflow = 0.13 cfs @ 12.13 hrs, Volume= 501 cf, Atten= 13%, Lag= 2.7 min  
 Discarded = 0.13 cfs @ 12.13 hrs, Volume= 501 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 501.51' @ 12.13 hrs Surf.Area= 375 sf Storage= 7 cf

Plug-Flow detention time= 0.4 min calculated for 501 cf (100% of inflow)  
 Center-of-Mass det. time= 0.4 min ( 872.6 - 872.3 )

Volume	Invert	Avail.Storage	Storage Description
#1A	501.46'	238 cf	<b>15.00'W x 25.00'L x 2.04'H Field A</b> 766 cf Overall - 171 cf Embedded = 594 cf x 40.0% Voids
#2A	501.96'	171 cf	<b>Cultec C-100HD x 12 Inside #1</b> Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 4 rows
			409 cf Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	502.50'	<b>6.0" Vert. Outlet Pipe</b> C= 0.600
#2	Device 1	502.50'	<b>3.0" Vert. Control Outlet X 4.00</b> C= 0.600
#3	Device 1	503.20'	<b>6.0" Horiz. Overflow</b> C= 0.600 Limited to weir flow at low heads
#4	Discarded	501.46'	<b>15.000 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.13 cfs @ 12.13 hrs HW=501.51' (Free Discharge)  
 ↳ **4=Exfiltration** (Exfiltration Controls 0.13 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=501.46' (Free Discharge)  
 ↳ **1=Outlet Pipe** ( Controls 0.00 cfs)  
 ↳ **2=Control Outlet** ( Controls 0.00 cfs)  
 ↳ **3=Overflow** ( Controls 0.00 cfs)

**Pond 9P: (12) Cultec 100 - Chamber Wizard Field A**

**Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)**  
 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf  
 Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap  
 Row Length Adjustment= +0.50' x 1.86 sf x 4 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

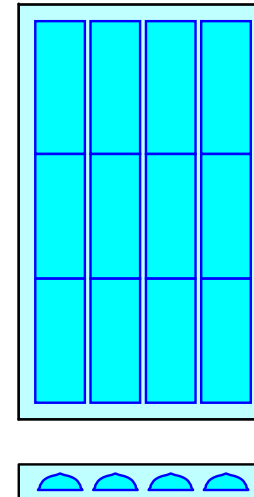
3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00'  
 Base Length  
 4 Rows x 36.0" Wide + 4.0" Spacing x 3 + 12.0" Side Stone x 2 = 15.00' Base Width  
 6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

12 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 4 Rows = 171.3 cf Chamber Storage

765.6 cf Field - 171.3 cf Chambers = 594.4 cf Stone x 40.0% Voids = 237.7 cf Stone Storage

Chamber Storage + Stone Storage = 409.0 cf = 0.009 af  
 Overall Storage Efficiency = 53.4%  
 Overall System Size = 25.00' x 15.00' x 2.04'

12 Chambers  
 28.4 cy Field  
 22.0 cy Stone



Stage-Area-Storage for Pond 9P: (12) Cultec 100

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
501.46	375	0	502.50	458	227
501.48	377	3	502.52	460	232
501.50	378	6	502.54	461	238
501.52	380	9	502.56	463	243
501.54	381	12	502.58	465	248
501.56	383	15	502.60	466	253
501.58	385	18	502.62	468	258
501.60	386	21	502.64	469	263
501.62	388	24	502.66	471	268
501.64	389	27	502.68	473	273
501.66	391	30	502.70	474	278
501.68	393	33	502.72	476	282
501.70	394	36	502.74	477	287
501.72	396	39	502.76	479	291
501.74	397	42	502.78	481	295
501.76	399	45	502.80	482	300
501.78	401	48	502.82	484	304
501.80	402	51	502.84	485	308
501.82	404	54	502.86	487	311
501.84	405	57	502.88	489	315
501.86	407	60	502.90	490	318
501.88	409	63	502.92	492	322
501.90	410	66	502.94	493	325
501.92	412	69	502.96	495	328
501.94	413	72	502.98	497	331
501.96	415	75	503.00	498	334
501.98	417	81	503.02	500	337
502.00	418	87	503.04	501	340
502.02	420	93	503.06	503	343
502.04	421	99	503.08	505	346
502.06	423	104	503.10	506	349
502.08	425	110	503.12	508	352
502.10	426	116	503.14	509	355
502.12	428	122	503.16	511	358
502.14	429	127	503.18	513	361
502.16	431	133	503.20	514	364
502.18	433	139	503.22	516	367
502.20	434	144	503.24	517	370
502.22	436	150	503.26	519	373
502.24	437	156	503.28	521	376
502.26	439	161	503.30	522	379
502.28	441	167	503.32	524	382
502.30	442	173	503.34	525	385
502.32	444	178	503.36	527	388
502.34	445	184	503.38	529	391
502.36	447	189	503.40	530	394
502.38	449	195	503.42	532	397
502.40	450	200	503.44	533	400
502.42	452	206	503.46	535	403
502.44	453	211	503.48	537	406
502.46	455	217	503.50	538	409
502.48	457	222			

Summary for Link 6L: POI A

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 1.26" for 5-Year event  
 Inflow = 1.28 cfs @ 12.22 hrs, Volume= 5,594 cf  
 Primary = 1.28 cfs @ 12.22 hrs, Volume= 5,594 cf, Atten= 0%, Lag= 0.0 min

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



**Summary for Link 13L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 1.14" for 5-Year event  
 Inflow = 1.15 cfs @ 12.22 hrs, Volume= 5,040 cf  
 Primary = 1.15 cfs @ 12.22 hrs, Volume= 5,040 cf, Atten= 0%, Lag= 0.0 min

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

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

**Subcatchment1S: E1** Runoff Area=53,087 sf 4.30% Impervious Runoff Depth>1.79"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=1.88 cfs 7,916 cf

**Subcatchment14S: PD-1** Runoff Area=47,830 sf 3.79% Impervious Runoff Depth>1.79"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=1.69 cfs 7,133 cf

**Subcatchment15S: PD-2** Runoff Area=5,257 sf 8.98% Impervious Runoff Depth>1.64"  
 Tc=5.0 min CN=64 Runoff=0.23 cfs 720 cf

**Pond 9P: (12) Cultec 100** Peak Elev=501.72' Storage=39 cf Inflow=0.23 cfs 720 cf  
 Discarded=0.14 cfs 720 cf Primary=0.00 cfs 0 cf Outflow=0.14 cfs 720 cf

**Link 6L: POI A** Inflow=1.88 cfs 7,916 cf  
 Primary=1.88 cfs 7,916 cf

**Link 13L: POI A** Inflow=1.69 cfs 7,133 cf  
 Primary=1.69 cfs 7,133 cf

**Total Runoff Area = 106,174 sf Runoff Volume = 15,769 cf Average Runoff Depth = 1.78"  
 95.70% Pervious = 101,608 sf 4.30% Impervious = 4,566 sf**

**Summary for Subcatchment 1S: E1**

Runoff = 1.88 cfs @ 12.21 hrs, Volume= 7,916 cf, Depth> 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 10-Year Rainfall=5.10"

Area (sf)	CN	Description
50,804	65	Woods/grass comb., Fair, HSG B
* 1,845	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
53,087	66	Weighted Average
50,804		95.70% Pervious Area
2,283		4.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 14S: PD-1**

Runoff = 1.69 cfs @ 12.21 hrs, Volume= 7,133 cf, Depth> 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 10-Year Rainfall=5.10"

Area (sf)	CN	Description
46,019	65	Woods/grass comb., Fair, HSG B
* 1,373	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
47,830	66	Weighted Average
46,019		96.21% Pervious Area
1,811		3.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 15S: PD-2**

Runoff = 0.23 cfs @ 12.08 hrs, Volume= 720 cf, Depth> 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 10-Year Rainfall=5.10"

Area (sf)	CN	Description
4,785	61	>75% Grass cover, Good, HSG B
* 472	98	Existing Roof
5,257	64	Weighted Average
4,785		91.02% Pervious Area
472		8.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Pond 9P: (12) Cultec 100**

Inflow Area = 5,257 sf, 8.98% Impervious, Inflow Depth > 1.64" for 10-Year event  
 Inflow = 0.23 cfs @ 12.08 hrs, Volume= 720 cf  
 Outflow = 0.14 cfs @ 12.19 hrs, Volume= 720 cf, Atten= 40%, Lag= 6.6 min  
 Discarded = 0.14 cfs @ 12.19 hrs, Volume= 720 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 501.72' @ 12.19 hrs Surf.Area= 375 sf Storage= 39 cf

Plug-Flow detention time= 1.2 min calculated for 720 cf (100% of inflow)  
 Center-of-Mass det. time= 1.2 min ( 861.9 - 860.7 )

Volume	Invert	Avail.Storage	Storage Description
#1A	501.46'	238 cf	<b>15.00'W x 25.00'L x 2.04'H Field A</b> 766 cf Overall - 171 cf Embedded = 594 cf x 40.0% Voids
#2A	501.96'	171 cf	<b>Cultec C-100HD</b> x 12 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 4 rows
		409 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	502.50'	<b>6.0" Vert. Outlet Pipe</b> C= 0.600
#2	Device 1	502.50'	<b>3.0" Vert. Control Outlet X 4.00</b> C= 0.600
#3	Device 1	503.20'	<b>6.0" Horiz. Overflow</b> C= 0.600 Limited to weir flow at low heads
#4	Discarded	501.46'	<b>15.000 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.14 cfs @ 12.19 hrs HW=501.72' (Free Discharge)  
 ↳ **4=Exfiltration** (Exfiltration Controls 0.14 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=501.46' (Free Discharge)  
 ↳ **1=Outlet Pipe** ( Controls 0.00 cfs)  
 ↳ **2=Control Outlet** ( Controls 0.00 cfs)  
 ↳ **3=Overflow** ( Controls 0.00 cfs)

**Pond 9P: (12) Cultec 100 - Chamber Wizard Field A**

**Chamber Model = Cultec C-100HD (Cultec Contactor®100HD)**

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf  
 Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap  
 Row Length Adjustment= +0.50' x 1.86 sf x 4 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00'

Base Length

4 Rows x 36.0" Wide + 4.0" Spacing x 3 + 12.0" Side Stone x 2 = 15.00' Base Width

6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

12 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 4 Rows = 171.3 cf Chamber Storage

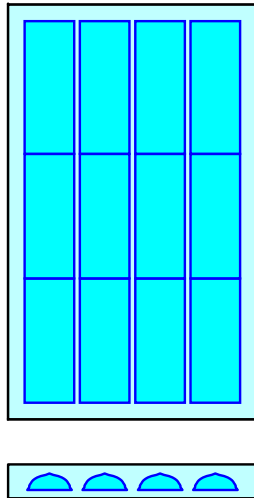
765.6 cf Field - 171.3 cf Chambers = 594.4 cf Stone x 40.0% Voids = 237.7 cf Stone Storage

Chamber Storage + Stone Storage = 409.0 cf = 0.009 af

Overall Storage Efficiency = 53.4%

Overall System Size = 25.00' x 15.00' x 2.04'

12 Chambers  
 28.4 cy Field  
 22.0 cy Stone



**Stage-Area-Storage for Pond 9P: (12) Cultec 100**

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
501.46	375	0	502.50	458	227
501.48	377	3	502.52	460	232
501.50	378	6	502.54	461	238
501.52	380	9	502.56	463	243
501.54	381	12	502.58	465	248
501.56	383	15	502.60	466	253
501.58	385	18	502.62	468	258
501.60	386	21	502.64	469	263
501.62	388	24	502.66	471	268
501.64	389	27	502.68	473	273
501.66	391	30	502.70	474	278
501.68	393	33	502.72	476	282
501.70	394	36	502.74	477	287
501.72	396	39	502.76	479	291
501.74	397	42	502.78	481	295
501.76	399	45	502.80	482	300
501.78	401	48	502.82	484	304
501.80	402	51	502.84	485	308
501.82	404	54	502.86	487	311
501.84	405	57	502.88	489	315
501.86	407	60	502.90	490	318
501.88	409	63	502.92	492	322
501.90	410	66	502.94	493	325
501.92	412	69	502.96	495	328
501.94	413	72	502.98	497	331
501.96	415	75	503.00	498	334
501.98	417	81	503.02	500	337
502.00	418	87	503.04	501	340
502.02	420	93	503.06	503	343
502.04	421	99	503.08	505	346
502.06	423	104	503.10	506	349
502.08	425	110	503.12	508	352
502.10	426	116	503.14	509	355
502.12	428	122	503.16	511	358
502.14	429	127	503.18	513	361
502.16	431	133	503.20	514	364
502.18	433	139	503.22	516	367
502.20	434	144	503.24	517	370
502.22	436	150	503.26	519	373
502.24	437	156	503.28	521	376
502.26	439	161	503.30	522	379
502.28	441	167	503.32	524	382
502.30	442	173	503.34	525	385
502.32	444	178	503.36	527	388
502.34	445	184	503.38	529	391
502.36	447	189	503.40	530	394
502.38	449	195	503.42	532	397
502.40	450	200	503.44	533	400
502.42	452	206	503.46	535	403
502.44	453	211	503.48	537	406
502.46	455	217	503.50	538	409
502.48	457	222			

**Summary for Link 6L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 1.79" for 10-Year event  
Inflow = 1.88 cfs @ 12.21 hrs, Volume= 7,916 cf  
Primary = 1.88 cfs @ 12.21 hrs, Volume= 7,916 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 13L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 1.61" for 10-Year event  
Inflow = 1.69 cfs @ 12.21 hrs, Volume= 7,133 cf  
Primary = 1.69 cfs @ 12.21 hrs, Volume= 7,133 cf, Atten= 0%, Lag= 0.0 min

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

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

**Subcatchment1S: E1** Runoff Area=53,087 sf 4.30% Impervious Runoff Depth>2.73"  
 Flow Length=500' Slope=0.0800 1/100 Tc=14.5 min CN=66 Runoff=2.95 cfs 12,083 cf

**Subcatchment14S: PD-1** Runoff Area=47,830 sf 3.79% Impervious Runoff Depth>2.73"  
 Flow Length=500' Slope=0.0800 1/100 Tc=14.5 min CN=66 Runoff=2.66 cfs 10,887 cf

**Subcatchment15S: PD-2** Runoff Area=5,257 sf 8.98% Impervious Runoff Depth>2.55"  
 Tc=5.0 min CN=64 Runoff=0.37 cfs 1,117 cf

**Pond 9P: (12) Cultec 100** Peak Elev=502.16' Storage=133 cf Inflow=0.37 cfs 1,117 cf  
 Discarded=0.15 cfs 1,117 cf Primary=0.00 cfs 0 cf Outflow=0.15 cfs 1,117 cf

**Link 6L: POI A** Inflow=2.95 cfs 12,083 cf  
 Primary=2.95 cfs 12,083 cf

**Link 13L: POI A** Inflow=2.66 cfs 10,887 cf  
 Primary=2.66 cfs 10,887 cf

**Total Runoff Area = 106,174 sf Runoff Volume = 24,087 cf Average Runoff Depth = 2.72"**  
**95.70% Pervious = 101,608 sf 4.30% Impervious = 4,566 sf**

**Summary for Subcatchment 1S: E1**

Runoff = 2.95 cfs @ 12.20 hrs, Volume= 12,083 cf, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 25-Year Rainfall=6.40"

Area (sf)	CN	Description
50,804	65	Woods/grass comb., Fair, HSG B
* 1,845	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
53,087	66	Weighted Average
50,804		95.70% Pervious Area
2,283		4.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 14S: PD-1**

Runoff = 2.66 cfs @ 12.20 hrs, Volume= 10,887 cf, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 25-Year Rainfall=6.40"

Area (sf)	CN	Description
46,019	65	Woods/grass comb., Fair, HSG B
* 1,373	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
47,830	66	Weighted Average
46,019		96.21% Pervious Area
1,811		3.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 15S: PD-2**

Runoff = 0.37 cfs @ 12.08 hrs, Volume= 1,117 cf, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 25-Year Rainfall=6.40"

Area (sf)	CN	Description
4,785	61	>75% Grass cover, Good, HSG B
* 472	98	Existing Roof
5,257	64	Weighted Average
4,785		91.02% Pervious Area
472		8.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Pond 9P: (12) Cultec 100**

Inflow Area = 5,257 sf, 8.98% Impervious, Inflow Depth > 2.55" for 25-Year event  
 Inflow = 0.37 cfs @ 12.08 hrs, Volume= 1,117 cf  
 Outflow = 0.15 cfs @ 12.33 hrs, Volume= 1,117 cf, Atten= 59%, Lag= 15.2 min  
 Discarded = 0.15 cfs @ 12.33 hrs, Volume= 1,117 cf  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 502.16' @ 12.33 hrs Surf.Area= 375 sf Storage= 133 cf

Plug-Flow detention time= 4.3 min calculated for 1,117 cf (100% of inflow)  
 Center-of-Mass det. time= 4.2 min ( 851.6 - 847.4 )

Volume	Invert	Avail.Storage	Storage Description
#1A	501.46'	238 cf	<b>15.00'W x 25.00'L x 2.04'H Field A</b> 766 cf Overall - 171 cf Embedded = 594 cf x 40.0% Voids
#2A	501.96'	171 cf	<b>Cultec C-100HD x 12 Inside #1</b> Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 4 rows
		409 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	502.50'	<b>6.0" Vert. Outlet Pipe</b> C= 0.600
#2	Device 1	502.50'	<b>3.0" Vert. Control Outlet X 4.00</b> C= 0.600
#3	Device 1	503.20'	<b>6.0" Horiz. Overflow</b> C= 0.600 Limited to weir flow at low heads
#4	Discarded	501.46'	<b>15.000 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.15 cfs @ 12.33 hrs HW=502.16' (Free Discharge)  
 ↳ **4=Exfiltration** (Exfiltration Controls 0.15 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=501.46' (Free Discharge)  
 ↳ **1=Outlet Pipe** ( Controls 0.00 cfs)  
 ↳ **2=Control Outlet** ( Controls 0.00 cfs)  
 ↳ **3=Overflow** ( Controls 0.00 cfs)

**Pond 9P: (12) Cultec 100 - Chamber Wizard Field A**

**Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)**

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf  
 Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap  
 Row Length Adjustment= +0.50' x 1.86 sf x 4 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

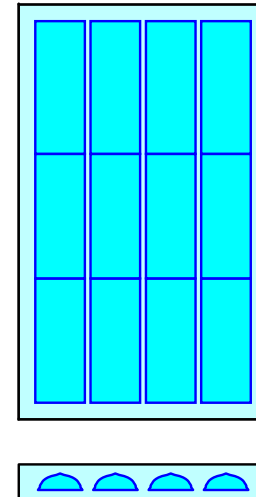
3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00'  
 Base Length  
 4 Rows x 36.0" Wide + 4.0" Spacing x 3 + 12.0" Side Stone x 2 = 15.00' Base Width  
 6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

12 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 4 Rows = 171.3 cf Chamber Storage

765.6 cf Field - 171.3 cf Chambers = 594.4 cf Stone x 40.0% Voids = 237.7 cf Stone Storage

Chamber Storage + Stone Storage = 409.0 cf = 0.009 af  
 Overall Storage Efficiency = 53.4%  
 Overall System Size = 25.00' x 15.00' x 2.04'

12 Chambers  
 28.4 cy Field  
 22.0 cy Stone





Stage-Area-Storage for Pond 9P: (12) Cultec 100

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
501.46	375	0	502.50	458	227
501.48	377	3	502.52	460	232
501.50	378	6	502.54	461	238
501.52	380	9	502.56	463	243
501.54	381	12	502.58	465	248
501.56	383	15	502.60	466	253
501.58	385	18	502.62	468	258
501.60	386	21	502.64	469	263
501.62	388	24	502.66	471	268
501.64	389	27	502.68	473	273
501.66	391	30	502.70	474	278
501.68	393	33	502.72	476	282
501.70	394	36	502.74	477	287
501.72	396	39	502.76	479	291
501.74	397	42	502.78	481	295
501.76	399	45	502.80	482	300
501.78	401	48	502.82	484	304
501.80	402	51	502.84	485	308
501.82	404	54	502.86	487	311
501.84	405	57	502.88	489	315
501.86	407	60	502.90	490	318
501.88	409	63	502.92	492	322
501.90	410	66	502.94	493	325
501.92	412	69	502.96	495	328
501.94	413	72	502.98	497	331
501.96	415	75	503.00	498	334
501.98	417	81	503.02	500	337
502.00	418	87	503.04	501	340
502.02	420	93	503.06	503	343
502.04	421	99	503.08	505	346
502.06	423	104	503.10	506	349
502.08	425	110	503.12	508	352
502.10	426	116	503.14	509	355
502.12	428	122	503.16	511	358
502.14	429	127	503.18	513	361
502.16	431	133	503.20	514	364
502.18	433	139	503.22	516	367
502.20	434	144	503.24	517	370
502.22	436	150	503.26	519	373
502.24	437	156	503.28	521	376
502.26	439	161	503.30	522	379
502.28	441	167	503.32	524	382
502.30	442	173	503.34	525	385
502.32	444	178	503.36	527	388
502.34	445	184	503.38	529	391
502.36	447	189	503.40	530	394
502.38	449	195	503.42	532	397
502.40	450	200	503.44	533	400
502.42	452	206	503.46	535	403
502.44	453	211	503.48	537	406
502.46	455	217	503.50	538	409
502.48	457	222			

Summary for Link 6L: POI A

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 2.73" for 25-Year event  
 Inflow = 2.95 cfs @ 12.20 hrs, Volume= 12,083 cf  
 Primary = 2.95 cfs @ 12.20 hrs, Volume= 12,083 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 13L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 2.46" for 25-Year event  
Inflow = 2.66 cfs @ 12.20 hrs, Volume= 10,887 cf  
Primary = 2.66 cfs @ 12.20 hrs, Volume= 10,887 cf, Atten= 0%, Lag= 0.0 min

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

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

**Subcatchment1S: E1** Runoff Area=53,087 sf 4.30% Impervious Runoff Depth>3.67"  
Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=4.01 cfs 16,239 cf

**Subcatchment14S: PD-1** Runoff Area=47,830 sf 3.79% Impervious Runoff Depth>3.67"  
Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=3.62 cfs 14,631 cf

**Subcatchment15S: PD-2** Runoff Area=5,257 sf 8.98% Impervious Runoff Depth>3.46"  
Tc=5.0 min CN=64 Runoff=0.50 cfs 1,516 cf

**Pond 9P: (12) Cultec 100** Peak Elev=502.58' Storage=249 cf Inflow=0.50 cfs 1,516 cf  
Discarded=0.16 cfs 1,502 cf Primary=0.02 cfs 14 cf Outflow=0.18 cfs 1,516 cf

**Link 6L: POI A** Inflow=4.01 cfs 16,239 cf  
Primary=4.01 cfs 16,239 cf

**Link 13L: POI A** Inflow=3.62 cfs 14,644 cf  
Primary=3.62 cfs 14,644 cf

**Total Runoff Area = 106,174 sf Runoff Volume = 32,386 cf Average Runoff Depth = 3.66"**  
**95.70% Pervious = 101,608 sf 4.30% Impervious = 4,566 sf**

**Summary for Subcatchment 1S: E1**

Runoff = 4.01 cfs @ 12.20 hrs, Volume= 16,239 cf, Depth> 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 50-Year Rainfall=7.60"

Area (sf)	CN	Description
50,804	65	Woods/grass comb., Fair, HSG B
* 1,845	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
53,087	66	Weighted Average
50,804		95.70% Pervious Area
2,283		4.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 14S: PD-1**

Runoff = 3.62 cfs @ 12.20 hrs, Volume= 14,631 cf, Depth> 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 50-Year Rainfall=7.60"

Area (sf)	CN	Description
46,019	65	Woods/grass comb., Fair, HSG B
* 1,373	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
47,830	66	Weighted Average
46,019		96.21% Pervious Area
1,811		3.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 15S: PD-2**

Runoff = 0.50 cfs @ 12.08 hrs, Volume= 1,516 cf, Depth> 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 50-Year Rainfall=7.60"

Area (sf)	CN	Description
4,785	61	>75% Grass cover, Good, HSG B
* 472	98	Existing Roof
5,257	64	Weighted Average
4,785		91.02% Pervious Area
472		8.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>

**Summary for Pond 9P: (12) Cultec 100**

Inflow Area = 5,257 sf, 8.98% Impervious, Inflow Depth > 3.46" for 50-Year event  
 Inflow = 0.50 cfs @ 12.08 hrs, Volume= 1,516 cf  
 Outflow = 0.18 cfs @ 12.36 hrs, Volume= 1,516 cf, Atten= 64%, Lag= 17.2 min  
 Discarded = 0.16 cfs @ 12.36 hrs, Volume= 1,502 cf  
 Primary = 0.02 cfs @ 12.36 hrs, Volume= 14 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 502.58' @ 12.36 hrs Surf.Area= 375 sf Storage= 249 cf

Plug-Flow detention time= 7.9 min calculated for 1,516 cf (100% of inflow)  
 Center-of-Mass det. time= 7.8 min ( 846.3 - 838.4 )

Volume	Invert	Avail.Storage	Storage Description
#1A	501.46'	238 cf	<b>15.00'W x 25.00'L x 2.04'H Field A</b> 766 cf Overall - 171 cf Embedded = 594 cf x 40.0% Voids
#2A	501.96'	171 cf	<b>Cultec C-100HD</b> x 12 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 4 rows
		409 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	502.50'	<b>6.0" Vert. Outlet Pipe</b> C= 0.600
#2	Device 1	502.50'	<b>3.0" Vert. Control Outlet X 4.00</b> C= 0.600
#3	Device 1	503.20'	<b>6.0" Horiz. Overflow</b> C= 0.600 Limited to weir flow at low heads
#4	Discarded	501.46'	<b>15.000 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.16 cfs @ 12.36 hrs HW=502.58' (Free Discharge)  
 ↳ **4=Exfiltration** (Exfiltration Controls 0.16 cfs)

**Primary OutFlow** Max=0.02 cfs @ 12.36 hrs HW=502.58' (Free Discharge)  
 ↳ **1=Outlet Pipe** (Orifice Controls 0.02 cfs @ 0.99 fps)  
 ↳ **2=Control Outlet** (Passes 0.02 cfs of 0.06 cfs potential flow)  
 ↳ **3=Overflow** ( Controls 0.00 cfs)

**Pond 9P: (12) Cultec 100 - Chamber Wizard Field A**

**Chamber Model = Cultec C-100HD (Cultec Contactor®100HD)**

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf  
 Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap  
 Row Length Adjustment= +0.50' x 1.86 sf x 4 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00'

Base Length

4 Rows x 36.0" Wide + 4.0" Spacing x 3 + 12.0" Side Stone x 2 = 15.00' Base Width

6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

12 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 4 Rows = 171.3 cf Chamber Storage

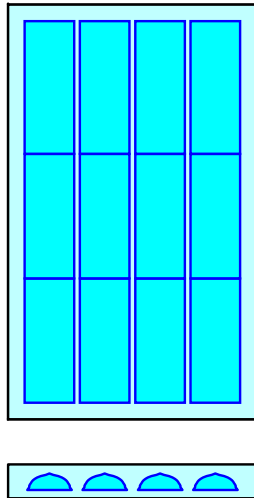
765.6 cf Field - 171.3 cf Chambers = 594.4 cf Stone x 40.0% Voids = 237.7 cf Stone Storage

Chamber Storage + Stone Storage = 409.0 cf = 0.009 af

Overall Storage Efficiency = 53.4%

Overall System Size = 25.00' x 15.00' x 2.04'

12 Chambers  
 28.4 cy Field  
 22.0 cy Stone



**Stage-Area-Storage for Pond 9P: (12) Cultec 100**

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
501.46	375	0	502.50	458	227
501.48	377	3	502.52	460	232
501.50	378	6	502.54	461	238
501.52	380	9	502.56	463	243
501.54	381	12	502.58	465	248
501.56	383	15	502.60	466	253
501.58	385	18	502.62	468	258
501.60	386	21	502.64	469	263
501.62	388	24	502.66	471	268
501.64	389	27	502.68	473	273
501.66	391	30	502.70	474	278
501.68	393	33	502.72	476	282
501.70	394	36	502.74	477	287
501.72	396	39	502.76	479	291
501.74	397	42	502.78	481	295
501.76	399	45	502.80	482	300
501.78	401	48	502.82	484	304
501.80	402	51	502.84	485	308
501.82	404	54	502.86	487	311
501.84	405	57	502.88	489	315
501.86	407	60	502.90	490	318
501.88	409	63	502.92	492	322
501.90	410	66	502.94	493	325
501.92	412	69	502.96	495	328
501.94	413	72	502.98	497	331
501.96	415	75	503.00	498	334
501.98	417	81	503.02	500	337
502.00	418	87	503.04	501	340
502.02	420	93	503.06	503	343
502.04	421	99	503.08	505	346
502.06	423	104	503.10	506	349
502.08	425	110	503.12	508	352
502.10	426	116	503.14	509	355
502.12	428	122	503.16	511	358
502.14	429	127	503.18	513	361
502.16	431	133	503.20	514	364
502.18	433	139	503.22	516	367
502.20	434	144	503.24	517	370
502.22	436	150	503.26	519	373
502.24	437	156	503.28	521	376
502.26	439	161	503.30	522	379
502.28	441	167	503.32	524	382
502.30	442	173	503.34	525	385
502.32	444	178	503.36	527	388
502.34	445	184	503.38	529	391
502.36	447	189	503.40	530	394
502.38	449	195	503.42	532	397
502.40	450	200	503.44	533	400
502.42	452	206	503.46	535	403
502.44	453	211	503.48	537	406
502.46	455	217	503.50	538	409
502.48	457	222			

**Summary for Link 6L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 3.67" for 50-Year event  
Inflow = 4.01 cfs @ 12.20 hrs, Volume= 16,239 cf  
Primary = 4.01 cfs @ 12.20 hrs, Volume= 16,239 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 13L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 3.31" for 50-Year event  
Inflow = 3.62 cfs @ 12.20 hrs, Volume= 14,644 cf  
Primary = 3.62 cfs @ 12.20 hrs, Volume= 14,644 cf, Atten= 0%, Lag= 0.0 min

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

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

**Subcatchment1S: E1** Runoff Area=53,087 sf 4.30% Impervious Runoff Depth>4.91"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=5.40 cfs 21,725 cf

**Subcatchment14S: PD-1** Runoff Area=47,830 sf 3.79% Impervious Runoff Depth>4.91"  
 Flow Length=500' Slope=0.0800 '/' Tc=14.5 min CN=66 Runoff=4.86 cfs 19,574 cf

**Subcatchment15S: PD-2** Runoff Area=5,257 sf 8.98% Impervious Runoff Depth>4.67"  
 Tc=5.0 min CN=64 Runoff=0.69 cfs 2,047 cf

**Pond 9P: (12) Cultec 100** Peak Elev=502.81' Storage=301 cf Inflow=0.69 cfs 2,047 cf  
 Discarded=0.17 cfs 1,839 cf Primary=0.24 cfs 207 cf Outflow=0.41 cfs 2,046 cf

**Link 6L: POI A** Inflow=5.40 cfs 21,725 cf  
 Primary=5.40 cfs 21,725 cf

**Link 13L: POI A** Inflow=5.09 cfs 19,781 cf  
 Primary=5.09 cfs 19,781 cf

**Total Runoff Area = 106,174 sf Runoff Volume = 43,345 cf Average Runoff Depth = 4.90"**  
**95.70% Pervious = 101,608 sf 4.30% Impervious = 4,566 sf**

**Summary for Subcatchment 1S: E1**

Runoff = 5.40 cfs @ 12.20 hrs, Volume= 21,725 cf, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 100-Year Rainfall=9.10"

Area (sf)	CN	Description
50,804	65	Woods/grass comb., Fair, HSG B
* 1,845	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
53,087	66	Weighted Average
50,804		95.70% Pervious Area
2,283		4.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 14S: PD-1**

Runoff = 4.86 cfs @ 12.20 hrs, Volume= 19,574 cf, Depth> 4.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 100-Year Rainfall=9.10"

Area (sf)	CN	Description
46,019	65	Woods/grass comb., Fair, HSG B
* 1,373	98	Existing Dwelling
* 273	98	Existing Deck
* 165	98	Existing Patio
47,830	66	Weighted Average
46,019		96.21% Pervious Area
1,811		3.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	75	0.0800	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.40"
5.0	425	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.5	500	Total			

**Summary for Subcatchment 15S: PD-2**

Runoff = 0.69 cfs @ 12.08 hrs, Volume= 2,047 cf, Depth> 4.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Type III 24-hr 100-Year Rainfall=9.10"

Area (sf)	CN	Description
4,785	61	>75% Grass cover, Good, HSG B
* 472	98	Existing Roof
5,257	64	Weighted Average
4,785		91.02% Pervious Area
472		8.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					<b>Direct Entry,</b>



**Summary for Pond 9P: (12) Cultec 100**

Inflow Area = 5,257 sf, 8.98% Impervious, Inflow Depth > 4.67" for 100-Year event  
 Inflow = 0.69 cfs @ 12.08 hrs, Volume= 2,047 cf  
 Outflow = 0.41 cfs @ 12.18 hrs, Volume= 2,046 cf, Atten= 40%, Lag= 6.1 min  
 Discarded = 0.17 cfs @ 12.18 hrs, Volume= 1,839 cf  
 Primary = 0.24 cfs @ 12.18 hrs, Volume= 207 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs  
 Peak Elev= 502.81' @ 12.18 hrs Surf.Area= 375 sf Storage= 301 cf

Plug-Flow detention time= 7.8 min calculated for 2,046 cf (100% of inflow)  
 Center-of-Mass det. time= 7.8 min ( 837.5 - 829.8 )

Volume	Invert	Avail.Storage	Storage Description
#1A	501.46'	238 cf	<b>15.00'W x 25.00'L x 2.04'H Field A</b> 766 cf Overall - 171 cf Embedded = 594 cf x 40.0% Voids
#2A	501.96'	171 cf	<b>Cultec C-100HD</b> x 12 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 4 rows
		409 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	502.50'	<b>6.0" Vert. Outlet Pipe</b> C= 0.600
#2	Device 1	502.50'	<b>3.0" Vert. Control Outlet X 4.00</b> C= 0.600
#3	Device 1	503.20'	<b>6.0" Horiz. Overflow</b> C= 0.600 Limited to weir flow at low heads
#4	Discarded	501.46'	<b>15.000 in/hr Exfiltration over Wetted area</b>

**Discarded OutFlow** Max=0.17 cfs @ 12.18 hrs HW=502.81' (Free Discharge)  
 ↳ **4=Exfiltration** (Exfiltration Controls 0.17 cfs)

**Primary OutFlow** Max=0.24 cfs @ 12.18 hrs HW=502.81' (Free Discharge)  
 ↳ **1=Outlet Pipe** (Orifice Controls 0.24 cfs @ 1.89 fps)  
 ↳ **2=Control Outlet** (Passes 0.24 cfs of 0.40 cfs potential flow)  
 ↳ **3=Overflow** ( Controls 0.00 cfs)

**Pond 9P: (12) Cultec 100 - Chamber Wizard Field A**

**Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)**

Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf  
 Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap  
 Row Length Adjustment= +0.50' x 1.86 sf x 4 rows

36.0" Wide + 4.0" Spacing = 40.0" C-C Row Spacing

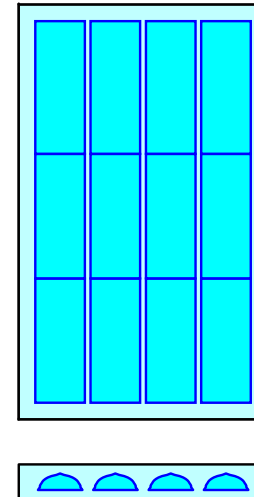
3 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 23.00' Row Length +12.0" End Stone x 2 = 25.00' Base Length  
 4 Rows x 36.0" Wide + 4.0" Spacing x 3 + 12.0" Side Stone x 2 = 15.00' Base Width  
 6.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.04' Field Height

12 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 4 Rows = 171.3 cf Chamber Storage

765.6 cf Field - 171.3 cf Chambers = 594.4 cf Stone x 40.0% Voids = 237.7 cf Stone Storage

Chamber Storage + Stone Storage = 409.0 cf = 0.009 af  
 Overall Storage Efficiency = 53.4%  
 Overall System Size = 25.00' x 15.00' x 2.04'

12 Chambers  
 28.4 cy Field  
 22.0 cy Stone



**Stage-Area-Storage for Pond 9P: (12) Cultec 100**

Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Wetted (sq-ft)	Storage (cubic-feet)
501.46	375	0	502.50	458	227
501.48	377	3	502.52	460	232
501.50	378	6	502.54	461	238
501.52	380	9	502.56	463	243
501.54	381	12	502.58	465	248
501.56	383	15	502.60	466	253
501.58	385	18	502.62	468	258
501.60	386	21	502.64	469	263
501.62	388	24	502.66	471	268
501.64	389	27	502.68	473	273
501.66	391	30	502.70	474	278
501.68	393	33	502.72	476	282
501.70	394	36	502.74	477	287
501.72	396	39	502.76	479	291
501.74	397	42	502.78	481	295
501.76	399	45	502.80	482	300
501.78	401	48	502.82	484	304
501.80	402	51	502.84	485	308
501.82	404	54	502.86	487	311
501.84	405	57	502.88	489	315
501.86	407	60	502.90	490	318
501.88	409	63	502.92	492	322
501.90	410	66	502.94	493	325
501.92	412	69	502.96	495	328
501.94	413	72	502.98	497	331
501.96	415	75	503.00	498	334
501.98	417	81	503.02	500	337
502.00	418	87	503.04	501	340
502.02	420	93	503.06	503	343
502.04	421	99	503.08	505	346
502.06	423	104	503.10	506	349
502.08	425	110	503.12	508	352
502.10	426	116	503.14	509	355
502.12	428	122	503.16	511	358
502.14	429	127	503.18	513	361
502.16	431	133	503.20	514	364
502.18	433	139	503.22	516	367
502.20	434	144	503.24	517	370
502.22	436	150	503.26	519	373
502.24	437	156	503.28	521	376
502.26	439	161	503.30	522	379
502.28	441	167	503.32	524	382
502.30	442	173	503.34	525	385
502.32	444	178	503.36	527	388
502.34	445	184	503.38	529	391
502.36	447	189	503.40	530	394
502.38	449	195	503.42	532	397
502.40	450	200	503.44	533	400
502.42	452	206	503.46	535	403
502.44	453	211	503.48	537	406
502.46	455	217	503.50	<b>538</b>	<b>409</b>
502.48	457	222			

**Summary for Link 6L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 4.91" for 100-Year event  
 Inflow = 5.40 cfs @ 12.20 hrs, Volume= 21,725 cf  
 Primary = 5.40 cfs @ 12.20 hrs, Volume= 21,725 cf, Atten= 0%, Lag= 0.0 min

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

**Summary for Link 13L: POI A**

Inflow Area = 53,087 sf, 4.30% Impervious, Inflow Depth > 4.47" for 100-Year event  
Inflow = 5.09 cfs @ 12.20 hrs, Volume= 19,781 cf  
Primary = 5.09 cfs @ 12.20 hrs, Volume= 19,781 cf, Atten= 0%, Lag= 0.0 min

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