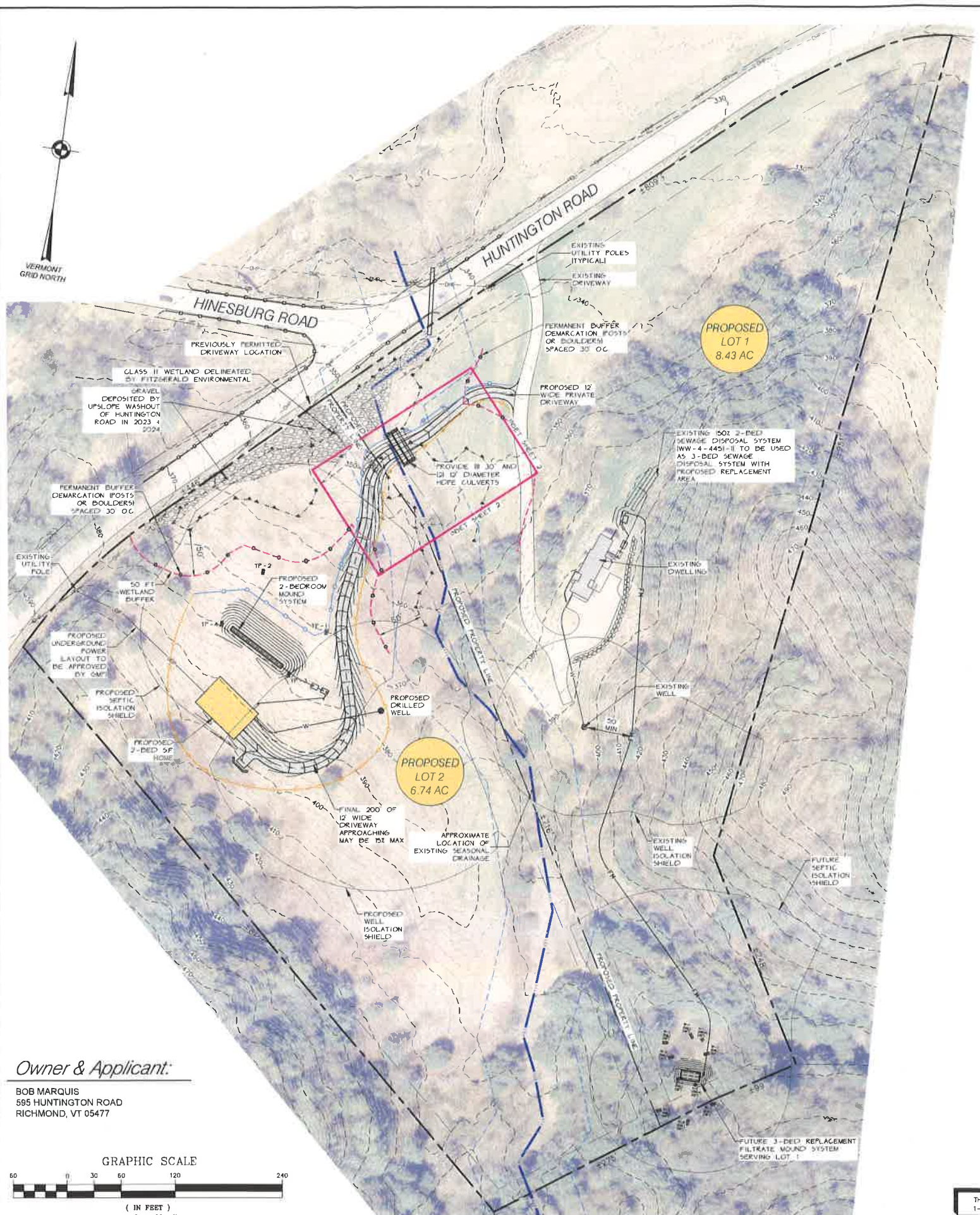
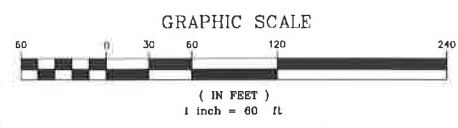


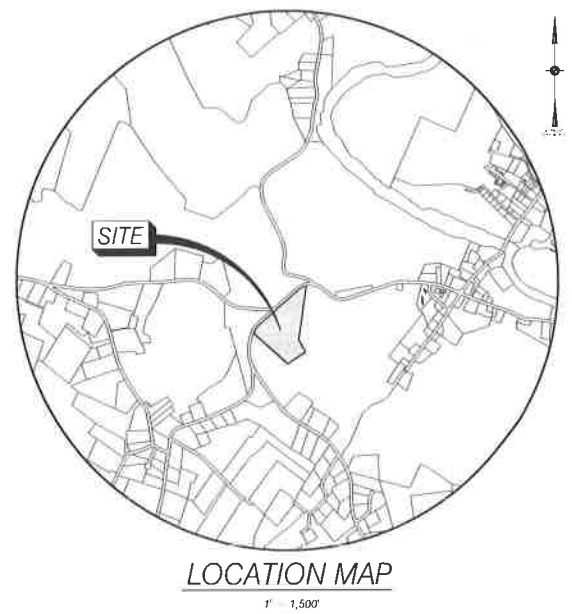


Owner & Applicant:
BOB MARQUIS
595 HUNTINGTON ROAD
RICHMOND, VT 05477



LEGEND

- PROJECT BOUNDARY
- ABUTTER PROPERTY LINE
- PROPOSED PROPERTY LINE
- EXISTING CONTOUR
- SETBACKS
- EXISTING STREAM
- 50 FT STREAM BUFFER
- EXISTING UTILITY POLE + OVERHEAD WIRE
- EXISTING GUARDRAIL
- DELINEATED WETLAND
- 50' WETLAND BUFFER
- SILT FENCE/LIMITS OF DISTURBANCE
- CONSTRUCTION TAPE / LIMITS OF DISTURBANCE
- PROPOSED BUILDING
- WETLAND BUFFER IMPACT
- CLASS II WETLAND IMPACT



ZONING INFORMATION

PARCEL ID: HU0515 (15.17 ACRES)
ZONED: AGRICULTURAL / RESIDENTIAL (AR)

DIMENSIONAL REQUIREMENTS:

MINIMUM LOT SIZE (ACRES)	1
MINIMUM LOT FRONTAGE (FT)	100
MAXIMUM LOT COVERAGE	30%

ACTUAL LOT DATA:

ACTUAL LOT SIZE (ACRES)	15.17
ACTUAL LOT FRONTAGE (FT)	1255
EXISTING LOT COVERAGE	19%

PROPOSED LOT DATA:

PROPOSED LOT SIZE (ACRES)	18.8
PROPOSED LOT FRONTAGE (FT)	850
PROPOSED LOT COVERAGE	13.42

SETBACKS:

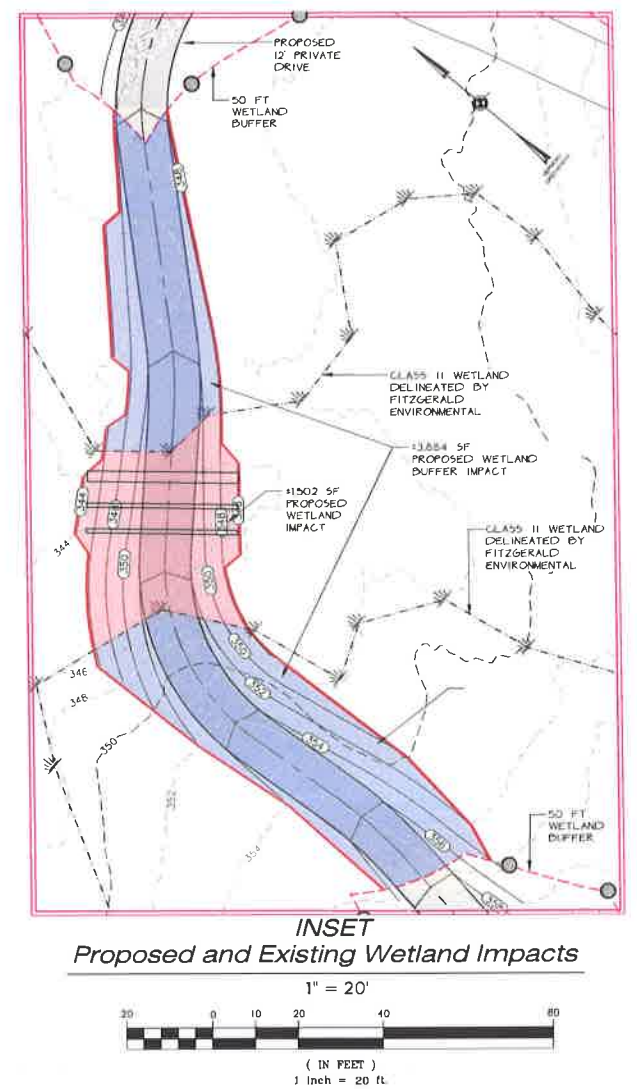
	REQUIRED	EXISTING
FRONT YARD (FT)	30	218.3
SIDE YARD (FT)	20	213.6/507.1
REAR YARD (FT)	20	315.9

PROPOSED SETBACKS:

	LOT 1	LOT 2
FRONT YARD (FT)	>30	>30
SIDE YARD (FT)	>20	>20
REAR YARD (FT)	>20	>20

IMPERVIOUS:

EXISTING LOT 1	13,050 SF = 0.3 AC
PROPOSED LOT 2	8,600 SF = 0.2 AC



THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-888-DIG-SAFE PRIOR TO ANY EXCAVATION



DATE: 08/24/2024	REVISION: 1	BY: JON
DESIGN: O'LEARY-BURKE CIVIL ASSOCIATES, PLC	RECORD DRAWING	DATE: 8/24/2024
DRAWN: O'LEARY-BURKE CIVIL ASSOCIATES, PLC	PRELIMINARY	FILE: 2024-08-24
CHECKED: O'LEARY-BURKE CIVIL ASSOCIATES, PLC	SKETCH/CONCEPT	PLAN SHEET # 1
SCALE: SHOWN AS 60 & 20		

595 HUNTINGTON ROAD

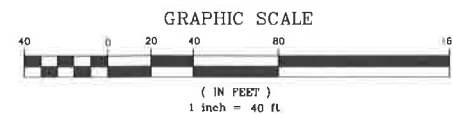
Richmond Vermont

60-SCALE OVERALL SITE PLAN



1. THE DRILLED WELL(S) CONSTRUCTION, LOCATION, DISINFECTION AND TESTING SHALL BE IN ACCORDANCE WITH THE STATE OF VERMONT - WATER SUPPLY
2. THE BASIS OF DESIGN FOR THE PROPOSED DRILLED WELLS IS:
 - A. AVG. DAY DEMAND : 280 GPD (2 BEDROOM)
 - B. MAX. DAY DEMAND : 280 GPD/720 MLN/DAY = 0.39 GPM
 - C. INSTANTANEOUS PEAK DEMAND: 5 GPM X 1 UNIT = 5 GPM
 - D. SOURCE CAPACITY: TO BE DETERMINED
 - E. STORAGE CAPACITY: SIZE TO BE DETERMINED BASED ON WELL YIELD OF REQUESTED
 - F. PUMP CAPACITY AT HOUSE: 1 LOT @ 0.5 GPM = 5 GPM MINIMUM
 - G. OPERATING PRESSURE RANGE: 40 - 60 PSI AT PRESSURE SWITCH

ROADWAY, PARKING	25 FEET
DRIVES, < 3 RESIDENCES	10 FEET
SEWAGE PIPING / TANKS	50 FEET
PROPERTY LINE	10 FEET
SURFACE WATER	10 FEET
BUILDINGS	5 FEET
SEWAGE SYSTEM:	
DOWNSLOPE WELL	200 FEET
UPSLOPE WELL	100 FEET



GRADATION REQUIREMENTS		
MATERIAL	SIEM SIZE	PERCENT (%) PASSING
CRUSHED GRAVEL FOR SUBBASE VT SPEC 704.05	2"	100 %
	1 1/2"	90-100 %
	#4	30-60 %
	#100	0-12 %
	#200	0-5 %

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 10'

THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT
1-888-DIG-SAFE PRIOR TO ANY EXCAVATION.



DATE	REVISION	BY
SUBJECT	☐ RECORD DRAWING ☐ PRELIMINARY ☐ FINAL ☐ SKETCH/CONCEPT	DATE 5/19/26 JMB
DESIGN	GRTJFW	DATE 2023.40 JMB
DESIGN	GRTJFW/JMB	DATE 2023.40 JMB
CHECKED	KGM	DATE 2023.40 JMB
SCALE	1" = 20' HORIZONTAL (N/A) 1" = 50' VERTICAL (N/A) 1" = 10' (SEE NOTES)	DATE 2023.40 JMB
SHOWING		DATE 2023.40 JMB

GENERAL EPSC SPECIFICATIONS

GENERAL SITE INSPECTIONS SHALL BE CONDUCTED IN ACCORDANCE WITH SUBPART 2.2.1 OF THE GENERAL PERMIT FOR ALL AREAS THAT HAVE BEEN DISTURBED AND ARE NOT YET FINALLY STABILIZED AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS, IMMEDIATELY BEFORE ANY STORMWATER RUNOFF PRODUCING EVENT, AND DAILY DURING THE WINTER CONSTRUCTION PERIOD (OCTOBER 15 THROUGH APRIL 15). UPON INSPECTION, ANY EROSION PREVENTION AND SEDIMENT CONTROL MEASURE THAT IS NOT INSTALLED PROPERLY, IN NEED OF MAINTENANCE, OR NOT EFFECTIVELY PREVENTING SEDIMENT LADEN DISCHARGES SHALL BE CORRECTED BEFORE THE NEXT RUNOFF PRODUCING EVENT. IN ADDITION:

- IN ACCORDANCE WITH SUBPART 2.2.3 OF THE GENERAL PERMIT, IF DEWATERING ACTIVITIES ARE OCCURRING, THE PERMITTEE SHALL DAILY DURING DEWATERING ACTIVITIES INSPECT THE DEWATERING DEVICE TO ENSURE PROPER SEDIMENT CONTROL AND THE PERMITTEE SHALL COMPLETE DAILY SAMPLING REQUIREMENTS, USING A TURBIDITY METER, AT ALL POINTS WHERE DEWATERING WATER IS DISCHARGED.
- IF VISIBLY DISCOLORED STORMWATER RUNS OFF THE CONSTRUCTION SITE OR DISCHARGES TO WATERS OF THE STATE, THE PERMITTEE SHALL TAKE IMMEDIATE CORRECTIVE ACTION TO INSPECT AND MAINTAIN EXISTING BEST MANAGEMENT PRACTICES (BMPs), AND TO INSTALL SUPPLEMENTAL BMPs NECESSARY TO MINIMIZE AND PREVENT THE DISCHARGE.
- AFTER COMPLETION OF THE CORRECTIVE ACTION, THERE CONTINUES TO BE A DISCHARGE OF DISCOLORED STORMWATER FROM THE CONSTRUCTION SITE TO WATERS OF THE STATE, THE PERMITTEE SHALL NOTIFY DEC BY SUBMITTING A DISCHARGE REPORT IN ACCORDANCE WITH SUBPART 2.2.2 OF THE COP WITHIN 24 HOURS OF DISCOVERING THE DISCHARGE.

THE PERMITTEE IS REQUIRED TO CONTINUE PERFORMING ALL GENERAL AND DISCHARGE INSPECTIONS UNTIL COVERAGE UNDER THIS PERMIT IS TERMINATED IN ACCORDANCE WITH SUBPART 5.5 OR EXPIRES.

ALL AREAS OF EARTH DISTURBANCE, INCLUDING SOIL STOCKPILES, MUST HAVE TEMPORARY OR FINAL STABILIZATION WITHIN 14 DAYS OF THE INITIAL DISTURBANCE. AFTER THIS TIME, DISTURBED AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED IN ADVANCE OF ANY RUNOFF PRODUCING EVENT.

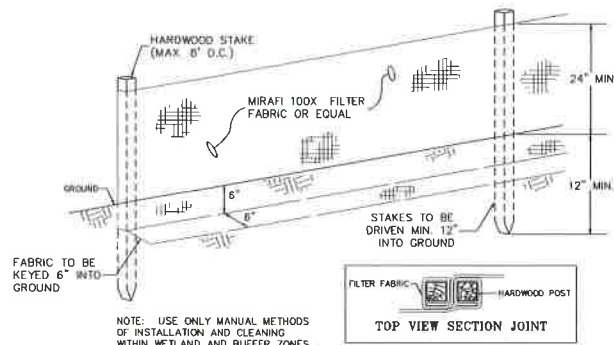
FOR CONSTRUCTION TO OCCUR DURING THE WINTER MONTHS (OCTOBER 15 - APRIL 15) REFERENCE THE LOW RISK HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL.

WINTER GUIDELINES FOR EROSION PREVENTION & SEDIMENT CONTROL (OCTOBER 15-APRIL 15)

- ALL DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- ALL SILT FENCE OR OTHER PRACTICES REQUIRING EARTH DISTURBANCE SHALL BE IN PLACE PRIOR TO GROUND FREEZING.
- WHEN MULCH IS REQUIRED FOR STABILIZATION DOUBLE THE STANDARD RATE SHALL BE APPLIED.
- TO ENSURE COVER OF DISTURBED SOIL IN ADVANCE OF A MELT EVENT, AREAS OF DISTURBED SOIL MUST BE STABILIZED AT THE END OF EACH WORK DAY, WITH THE FOLLOWING EXCEPTIONS:
 - IF NO PRECIPITATION WITHIN 24 HOURS IS FORECAST AND WORK WILL RESUME IN THE SAME DISTURBED AREA WITHIN 24 HOURS, DAILY STABILIZATION IS NOT NECESSARY.
 - DISTURBED AREAS THAT COLLECT AND RETAIN RUNOFF, SUCH AS HOUSE FOUNDATIONS OR OPEN UTILITY TRENCHES.
 - PERFORMING DRILLING AND BLASTING WHERE SITE IS IN A DEPRESSION AND STORMWATER IS TRAPPED.
- PRIOR TO STABILIZATION SNOW AND ICE MUST BE REMOVED TO DEPTH OF NO LESS THAN 1 IN.
- ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED WITHIN 48 HOURS OF BEING BROUGHT TO FINISH GRADE.
- DURING WINTER EROSION, MULCH SHALL BE APPLIED AT DOUBLE THE RATE OR NETTING OR OTHER APPROACH SHALL BE USED TO PREVENT REMOVAL BY WIND.

GENERAL NOTES :

- THE PURPOSE OF THESE PLANS IS TO:
 - MINIMIZE THE AREA OF DISTURBED SOILS AND TO MINIMIZE THE DURATION THAT ANY AREAS ARE LEFT OPEN.
 - ISOLATE THE AREAS OF DISTURBANCE TO PREVENT AND CONTROL EROSION CAUSED BY RUN-OFF.
 - CONTROL THE AMOUNTS OF SEDIMENT THAT MAY RESULT FROM ANY SITE EROSION.
- A COPY OF THE CONSTRUCTION GENERAL PERMIT AND A SET OF THE PLANS WILL BE AVAILABLE AT THE JOB TRAILER ON-SITE.
- THE ON-SITE COORDINATOR SHALL INSPECT AND KEEP A WRITTEN RECORD OF THE EROSION AND SEDIMENT CONTROL STRUCTURES AND MEASURES AT A MINIMUM OF ONCE A WEEK AND ALSO WITHIN 24 HOURS OF ANY STORM EVENT THAT DISCHARGES RUN-OFF FROM THE SITE.
- THE ON-SITE COORDINATOR SHALL KEEP A WRITTEN RECORD OF EROSION CONTROL INSPECTIONS AND ANY MONITORING DATA FOR A MINIMUM OF THREE (3) YEARS FOLLOWING COMPLETION OF CONSTRUCTION.
- REFER TO THE EROSION CONTROL PLAN SET FOR DETAILS AND SPECIFICATIONS.

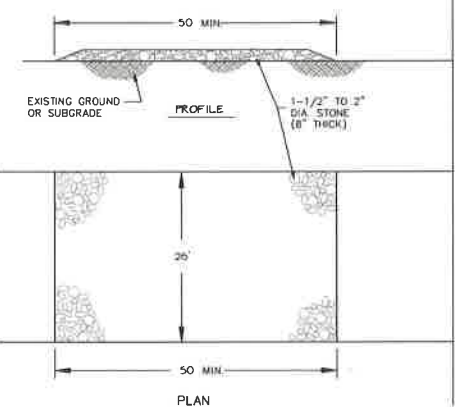


SILT FENCE DETAIL

NTS

LEGEND

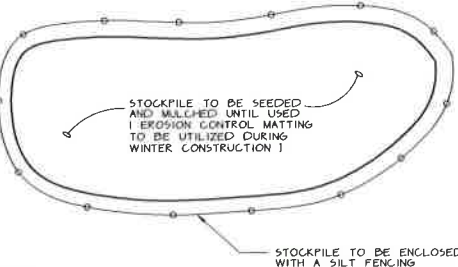
- PROJECT BOUNDARY
- ADJUTTER PROPERTY LINE
- PROPOSED PROPERTY LINE
- EXISTING CONTOUR
- SETBACKS
- EXISTING STREAM
- 50 FT STREAM BUFFER
- EXISTING UTILITY POLE + OVERHEAD WIRE
- EXISTING GUARDRAIL
- DELINEATED WETLAND
- 50' WETLAND BUFFER
- SILT FENCE/LIMITS OF DISTURBANCE
- CONSTRUCTION TAPE / LIMITS OF DISTURBANCE
- PROPOSED BUILDING



- NOTES:
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS-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 TRACKED, SPILLED, OR WASHED ONTO PUBLIC RIGHTS-OF-WAY SHALL BE REMOVED IMMEDIATELY BY CONTRACTOR.
 - THE USE OF CALCIUM CHLORIDE OR WATER MAY BE NECESSARY TO CONTROL DUST DURING THE SUMMER.
 - PROVIDE APPROPRIATE TRANSITION BETWEEN STABILIZED CONSTRUCTION ENTRANCE AND PUBLIC RIGHT-OF-WAY.

STABILIZED CONSTRUCTION ENTRANCE

NTS

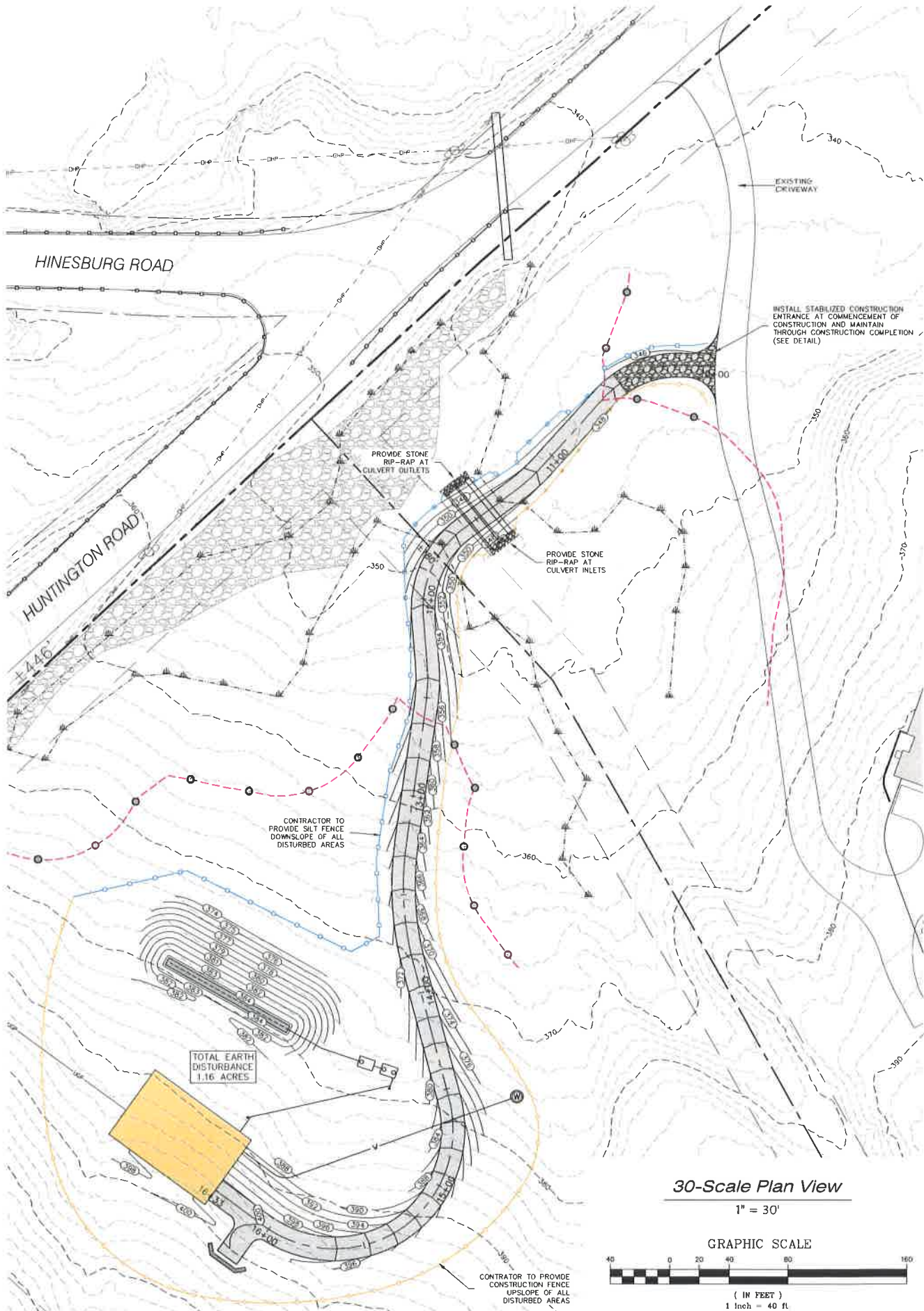


- REQUIREMENTS:
- SEDIMENT CONTROL PRACTICES SHALL BE PLACED AROUND THE PERIMETER OF THE STOCKPILE (SUCH AS SILT FENCE, EROSION CONTROL BERM, STRAW WATLES, ETC.).
 - A DESIGNATED ACCESS POINT SHALL BE ESTABLISHED ON THE UPGRADIENT SIDE OF THE STOCKPILE.
 - THE STOCKPILE MUST BE STABILIZED (UTILIZING SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, OR ROLLED EROSION CONTROL PRODUCTS (RECP)).
 - SOILS STOCKPILED FOR AN EXTENDED PERIOD SHOULD BE SEEDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (WITHIN 14 DAYS).
 - USE OF MULCH OR RECPs ONLY IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME.

- MAINTENANCE:
- INSPECT STOCKPILES AND UTILIZED BMPs PERIODICALLY FOR CONDITION AND EFFECTIVENESS. AREAS PRODUCING SEDIMENT SHOULD BE REMEDIATED IMMEDIATELY.
 - WHEN TEMPORARY REMOVAL OF A PERIMETER BMP IS NECESSARY TO ACCESS A STOCKPILE, ENSURE BMPs ARE REINSTALLED IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAIL.
 - WHEN THE STOCKPILE IS NO LONGER NEEDED, PROPERLY DISPOSE OF EXCESS MATERIALS AND REVEGETATE OR OTHERWISE STABILIZE THE GROUND SURFACE WHERE THE STOCKPILE WAS LOCATED.

TEMPORARY TOPSOIL STOCKPILE

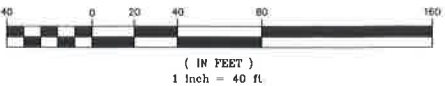
NTS



30-Scale Plan View

1" = 30'

GRAPHIC SCALE



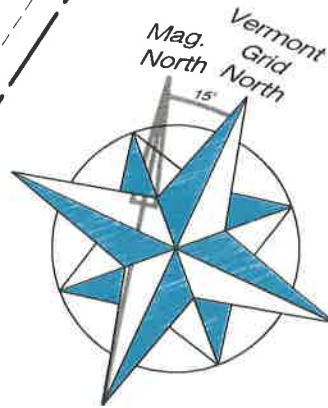
THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-888-DIGSAFE PRIOR TO ANY EXCAVATION.



DATE: 03/20/2024	REVISION: REVISED FOR STATE DIGSAFE PERMIT APPLICATION	BY: RCM
SURVEY: OBCA	RECORD DRAWING: [] PRELIMINARY: [] SKETCH/CONCEPT: []	DATE: 3-19-24
DESIGN: GRT/PLH		APP: JWP
DRAWN: GRT/PLH		2022-45
CHECKED: ALUM		FILE: 2022-45-510
SCALE: SHOWN 60' & 20'		PLAN SHEET #
O'LEARY-BURKE CIVIL ASSOCIATES, PLC.		5
595 HUNTINGTON ROAD		
Richmond Vermont		
EPSC PLAN		
DETAILS & SPECIFICATIONS		

Approved by the Development Review Board of the Town of Richmond
Vermont, on the _____ day of _____, 20____, subject
to all requirements and conditions of said approval. Signed this
_____ day of _____, 20____, by
Chair _____

Town of Richmond Received for Record
A.D. _____
at _____ o'clock _____ minutes _____ M
and recorded in _____
attest _____
Town Clerk



Survey Notes

- The survey is based upon research performed in the Richmond Town Land Records and the following plats and plans:
a. Final Plat-Administrative Subdivision, New Lot-Berry Parcel, Peggy M. Farr Revocable Trust, prepared by Krebs & Lansing Consulting Engineers, Inc., dated July 13, 2016, and filed in side 144 of the Town of Richmond Land Records.
- Bearings are based on Vermont Grid Zone 4400, computed from RTK GPS observations made on June 24, 2022 and April 6, 2026 from a Trimble R10 unit with differential corrections from CORS VRS Station. Datum utilized is NAD 83(2011) epoch 2010.0, NAVD 88 (geoid12b). Field surveys completed April 6, 2026.
- Survey methods employed (total station/GPS) and the resulting error of closure/precision ratio, meet or exceed minimum precision requirements for Urban Surveys as outlined in "Standards for the Practice of Land Surveying" adopted by the Vermont Board of Land Surveyors, effective 01/31/2013.
- There may be additional easements, restrictions, and/or reservations not shown hereon that may or may not be found in the Town of Richmond Land Records.
- This plat is for the depiction of boundaries based upon V.S.A. Title 26 Chapter 45 section 2502 (3) and (4). Any information identified graphically or noted on this plat which is outside the scope and expertise of a Vermont Licensed Land Surveyor as outlined in the statutes herein referenced to, is not warranted to be correct and is not covered by the certification contained hereon.
- This plat is for the identification of boundary lines of Robert & Doreen Marquis. Other information is shown for both illustrative purposes and to offer assistance in the conclusions reached by this survey. Only the Boundary lines of Robert & Doreen Marquis are certified to, all others not warranted to be correct and are subject to revisions.
- This survey depicts the property lines of Robert & Doreen Marquis based upon record research conducted by Joseph R. Flynn, L.S.
- Right of Way for Huntington Road is based on existing field evidence and plat reference 1a.
- Valid for recording only if stamped in the left margin with: This is an Original Mylar, signed, dated and stamped with blue ink containing the Licensed Land Surveyors Seal.
- The Town of Richmond Subdivision Application requires certain zoning and engineering elements be depicted on the plat for approval. Those elements are not covered or certified to due to being outside the scope and expertise of a licensed land surveyor as defined in V.S.A. Title 26 Chapter 45 Section 2502 (4) & (5).
- Please see Overall Site Plan, 60 Scale for 595 Huntington Road for Wellands and Stream buffers.

Subject Parcel

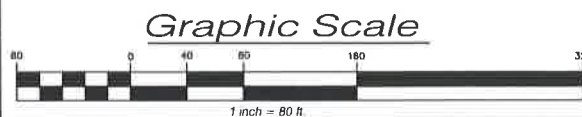
Robert & Doreen Marquis
Book 236 Page 271
Recorded August 22, 2016
Parcel HU0595
SPAN: 519-163-11954
Total Area = 15.17 Acres

Zoning Information

Parcel ID: HU0595
Parcel Area: 15.17 Acres Zoned
Agricultural/Residential (AR) Dimensional Requirements
Minimum Lot Area: 1 Acre
Minimum Lot Frontage: 100 ft Maximum
Allowed coverage: 30%
Setbacks
Required Front: 30
Side: 20
Rear: 20
Impervious
Existing (Lot 1) 13,050 sq ft = 0.3 ac
Proposed (Lot 2) 8,600 sq ft = 0.2 ac

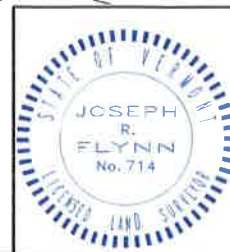
Legend

- Boundary Line
- New Property Line
- Abutter Line
- Easement Line
- Setback Line
- Overhead Utility Line
- Barbed Wire Fence
- Found Iron Pipe/Rebar
- Set Rebar
- Utility/Guywire



I hereby certify that the information shown hereon is correct to the best of my knowledge and belief and is based upon a collaboration of pertinent deeds, plats, parcel evidence, other recorded evidence and evidence collected based on actual field survey. This plat was prepared in accordance with and complies with Vermont Statute Title 27, § 1403. (a) through (e).

Joseph R. Flynn, L.S. 714
Dated May 19th, 2026



DATE	REVISION
SURVEY OBCA	☐ RECORD DRAWING ☐ PRELIMINARY
DESIGN OBCA	☒ FINAL ☐ SKETCH/CONCEPT
DRAWN JRF	
CHECKED BWC	
SCALE 1"=80'	

Subdivision Plat Lands of Robert & Doreen Marquis 595 Huntington Road - Richmond, Vermont	
BY DATE 05/19/2026 JOB# 2022-40 FILE 2022-40 PLAT PLAN SHEET 1 PL1	

BREAKDOWN OF FEES

ZONING FEES:

ACCESS PERMIT:

DRB:

\$ 450

R.O.W. FEES

FIRE IMPACT

WATER EXCAVATION:

\$ 60

RECORDING FEES:

\$ 510

TOTAL:

3985

CHECK NUMBER:

NOTES:

For SB 2026-002

(6 re: HUOSQS)



FINAL SUBDIVISION APPLICATION

Permit # SB 2026-002
Parcel ID: HU0595

Please review the Richmond Zoning & Subdivision Regulations and provide all the information requested in this application. For information contact the Zoning Administrative Officer at 802-434-2430. Other federal, state and local permits or approvals may additionally be required, it is the duty of the applicant to obtain all relevant and applicable approvals. To inquire about State permits contact the State Permit Specialist at 802-477-2241.

Application Date: 7/24/26 Physical Address of Property: 595 Huntington Road
Total acreage of Subdivision: 15.17 Acres Subdivision Name: Marquis 2-Lot Subdivision
Number of lots: New 1 Existing 1 Total lots 2
Advisor Name (if applicable): Karl Marchessault, P.E. Property Owner Name: Bob Marquis
Advisor Mailing Address: O'Leary-Burke Civil Associates, PLC Owner Mailing Address: _____
13 Corporate Drive 595 Huntington Road
Essex Junction, VT 05452 Richmond, VT 05477
Phone: (802)-878-9990 Phone: (802)-922-7488
Email: karlm@olearyburke.com Email: bobbymarquis@gmail.com

The final subdivision plat shall be consistent in all respects to the layout as approved by the DRB for Preliminary Subdivision. The final plat shall be drawn to a scale of not more than two-hundred (200) feet to the inch, and shall show:

- SUBDIVISION name or identifying title, the name of the municipality, the name and address of the owner of record of the property, and of the SUBDIVIDER (if different), the name, registration number and seal of the registered land surveyor, the boundaries of the SUBDIVISION and its general location in relation to existing roads or other landmarks, scale, date, magnetic north, with true north declination and legend;
- Road names and lines, pedestrian ways, recreational trails, LOTS, reservations, easements and areas to be dedicated to public use, if any;
- The location, bearing length of every road line, LOT line and boundary line. All locations should be tied to known reference points such as road intersections;
- The length of all straight lines, the deflection angles, radii, length of curves, tangent distances and bearings for each road;
- All public open space for which offers of dedication are made by the SUBDIVIDER, and those spaces for which title is reserved by the SUBDIVIDER;
- LOTS within the SUBDIVISION numbered sequentially (any reserved land shall have the highest number). Below each LOT number, with the LOT boundaries, the following shall be listed: the acreage, new parcel ID number, and building envelope to contain all proposed primary structures.
- The location of any zoning overlay district(s) applicable to the proposed SUBDIVISION;
- Location of well shields on all LOTS;
- Location of all improvements referred to in ARTICLE VI, landscaping, utility poles, and rough grading and other devices for draining the area within the SUBDIVISION;
- Locations of proposed MONUMENTS at all right-of-way intersections and at all points of curvature (P.C) and points of tangency (PT) on both sides of any road lines, and at any other critical points in the road lines as will enable a land surveyor to correctly stake out any LOT in the SUBDIVISION;
- Names of all SUBDIVISIONS immediately adjacent and the names of ADJOINING PROPERTY OWNERS; and
- SUBDIVISION location map.

Along with the FINAL SUBDIVISION **PLAT**, the SUBDIVIDER shall submit to the Town a set of materials that constitute a FINAL SUBDIVISION **PLAN**, which shall include the following information:

- Location and envelope area of wastewater disposal system(s) including primary and any required replacement areas, and a letter from the wastewater disposal system designer stating that all such systems will be designed and constructed in conformance with all applicable state regulations and standards;
- For lots that require a State Wastewater or Subdivision permit, a copy of any permit for on-site sewage systems from the Vermont Agency of Natural Resources;
- Location of and envelope area of all existing and proposed sources of potable water and wastewater system(s);
- Location and design of all of the considerations and improvements referred to in Article V (Planning Standards) and Article VI (Required Improvements and Design Standards);
- Identification and methods of protection of natural features or site elements (i.e., streams, ponds, wetlands, flood plain, forest stands, established LARGE ANIMAL HABITAT, rock outcroppings, etc.);
- Typical cross sections and proposed grading of roadways;
- Designs of any bridges or culverts which may be required on the SUBDIVISION;
- A signed statement reciting:
 - A) the location, type and length of any proposed road or roads. All roads shall be designed to the specification in SECTION 600 of these Subdivision Regulations;
 - B) the nature and extent of any recreational features, open spaces, parks, or playgrounds to be provided, if any, and intended to be dedicated to the Town.
- Contour of finish grades at five (5) foot intervals if finished grade varies from existing grade by five (5) feet or more, except that contours at two (2) foot intervals shall be shown in areas where wastewater disposal systems are to be located;
- At the discretion of the DRB, letters from the Chittenden East School District Superintendent, the Richmond Police Chief, the head of Richmond Rescue, and the Richmond Fire Chief indication their assessment of the impact of the proposed SUBDIVISION on the provision of school, police, rescue or fire protection services, or letters from others on relevant issues;
- Any other documents required by the DRB as a result of SKETCH PLAN, PRELIMINARY SUBDIVISION OR FINAL SUBDIVISION ;

Submittal Materials:

- Three copies of a complete Final Subdivision Application that includes: One 24"x36" and three reduced (11"x17") prints of plat and plan.
- Submit fee based on the Richmond Fee Schedule and made payable to the Town of Richmond.
- The Subdivider shall submit one set of stamped envelopes addressed to all owners of contiguous property, including properties directly across any road or right-of-way from the proposed subdivision.

I hereby give my assurance that the above information is complete, accurate, and included in this submittal.

Gwen A. Magnus
Signed by Landowner or agent (a letter of authorization must accompany submittal if agent signs)

7/13/26
Date

— DO NOT WRITE BELOW THIS LINE—OFFICE USE ONLY—DO NOT WRITE BELOW THIS LINE—OFFICE USE ONLY—DO NOT WRITE BELOW THIS LINE—OFFICE USE ONLY —

Notices sent to adjoining landowners (date): 7/24/26 DRB Hearing Date: 8/12/26

Comments: _____ Zoning Fee: \$ 510, Check # 3985

Zoning Administrative Officer signature: Darrell DePaul Date: 7/24/26



O'Leary-Burke Civil Associates, PLC

CIVIL ENGINEERING REGULATORY AND PERMIT PREPARATION LAND SURVEYING CONSTRUCTION SERVICES LAND USE PLANNING

July 13th, 2026

Dante DeNault
Zoning Administrator
203 Bridge St.
P.O. Box 285
Richmond, VT 05477

RE: Marquis 2-Lot Subdivision
Final Subdivision Application
595 Huntington Road, Richmond, VT 05477

Dear Dante:

We are writing on behalf of Bob & Doreen Marquis to request scheduling with the Development Review Board for the attached final subdivision application at 595 Huntington Road. The project proposes a 2-lot subdivision of the existing 15.17-acre parcel within the Agricultural/Residential (AR) Zoning District. Proposed Lot 1 will total 8.43 acres and proposed Lot 2 will total 6.74 acres. The project received preliminary subdivision approval at the Development Review Board meeting on June 10th, 2026 with the condition that a drainage plan that complies with the subdivision regulations be submitted.

The project has obtained a Wetlands Permit for the proposed impacts associated with the proposed driveway. Three (3) culverts of varying size are proposed to maintain hydrology across the floodplain and maintain the seasonal water course. Please see the attached memo prepared by Fitzgerald Environmental Associates concluding that the proposed 30" HDPE culvert is appropriately sized for up to the 100-year storm. The 100-year storm event will only utilize 43% of the culvert's total capacity, which does not include the additional two (2) proposed 12" culverts. All runoff from the site will flow downhill to the existing seasonal drainageway and wetland area.

A Wastewater System and Potable Water Supply Permit has been applied for (WW-4-4451-2). Please find the Designer Signature Sheet signed by Graham Tidman, P.E. attached, which should suffice as the letter from wastewater system designer stating the system is designed and will be constructed in conformance with all applicable state regulations and standards.

A Stormwater Construction General Permit (9020) application has been submitted to the state for authorization to discharge stormwater runoff from construction activities. Total proposed earth disturbance for the project is 1.16 acres and a total of 0.24 acres of new impervious area is proposed.

All proposed private infrastructure is in compliance with the Town of Richmond subdivision regulations, zoning regulations, and public works specifications.

Please find the following information attached:

1. Three (3) copies of a complete Final Subdivision Application that includes:
 - One (1) 24" x 36" site plan & one (1) 24" x 36" plat
 - Three (3) 11" x 17" site plans & three (3) 11" x 17" plats
2. Final Subdivision Application & Checklist;
3. Fitzgerald Environmental Memo;
4. One set of stamped envelopes addressed to each adjoining property owner;
5. Fee of \$510.00 made out to the town of Richmond;

If you have any questions or need additional information, please let me know.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Karl Marchessault', with a long, sweeping horizontal flourish extending to the right.

Karl Marchessault, P.E.



Planning & Zoning Office
Town of Richmond P.O. Box 285
Richmond, VT 05477
(802) 434-2430
tmachia@richmondvt.gov
www.richmondvt.gov

Final Subdivision Checklist:

This checklist is intended to help you provide the necessary information for your final subdivision review. Please ensure that you submit all of the information listed below. If you have any questions, please contact the Richmond Zoning Department.

Final Subdivision Plat Information	
Application requirements for final subdivision review per section 420.2 1-13 of the Richmond Subdivision Regulations	Check if Complete
All of the information required for a Preliminary Subdivision plat (420.2)	✓
Subdivision name or identifying title (420.2.1)	✓
Name of the municipality (420.2.1)	✓
Name and address of the owner of record (420.2.1)	✓
Name of the subdivider if different from the owner of record (420.2.1)	N/A
Map scale shall be 1 inch equals 200 feet or less (420.2.1)	✓
True north declination and legend (420.2.1)	✓
The name, location and widths of existing roads (420.2.2)	✓
The length of all straight lines, deflection angles, radii, length of curves, tangent distances and bearing of each road (420.2.3-4)	N/A
All public open spaces for which an offer of dedication have been made (420.2.5)	N/A
Lots within the subdivision require sequential numbering, any remaining land must be given the higher number (420.2.6)	✓
Lots listed on plat need to note lot number, acreage, and parcel ID number (420.2.6)	✓
Building envelope containing all proposed structures(420.2.6)	✓

Location of easements on all lots if applicable(420.2.9)	✓
Names of property owners adjacent to the proposed subdivision (420.2.12)	✓
Subdivision location map using a USGS map (420.2.13)	✓

Supporting Plan Set	
Application requirements for final subdivision review per section 420.3 1-11 of the Richmond Subdvsnion Regulations	Check if Complete
Location and envelope area of wastewater disposal system (420.3.1)	✓
Location of envelope area for proposed sources of potable water (420.3.2)	✓
Locations of bridges, drains, drainage ways or culverts (420.3.2)	✓
Location of building setbacks (420.3.)	✓
Name of subdivider if different (420.3.2)	N/A
Proposed lot lines with dimensions (420.3.2)	✓
Planned location of buildings	✓
Stream and wetland buffer zones, if applicable	✓
Overlay district applicable to the subdivision	N/A
Layout of the subdivision showing roads pedestrian rights of way and recreational trails	N/A
Identification and methods of protection of natural features or site elements (i.e., streams, ponds, wetlands, flood plain, forest stands, established large animal habitat, rock outcroppings, etc. if applicable) (420.3.7.b)	✓
Typical cross sections and proposed grading of roadways (420.3.8)	✓
Designs of any bridges or culverts which may be required on the Subdivision (420.3.10)	✓

Supporting Documents	
Applications for final subdivision review need the following supporting documents	Check if Complete
Final subdivision application	✓
Narrative	✓
Letter from wastewater system engineer	✓
Overlay district the property is located in if applicable	N/A
Wastewater/ water plan	✓
Utilities plan	✓
A signed statement reciting noting that all roads shall be designed to the specifications in Section 600 of the Subdivision Regulations	N/A
A signed statement reciting the nature and extent of any recreational features, open spaces, parks, or playgrounds to be provided, if any, and whether or not and under what conditions they are intended to be dedicated to the town	N/A
A letter from a professional engineer stating that all proposed public and private infrastructure is in compliance with these subdivision regulations and other standards established by the town of Richmond such as zoning regulations, public works specifications or other standards	✓
1 full size 24 x36 plans	✓
3 copies 11 x17 of subdivision application, final subdivision plat, final subdivision plan, supporting documentation listed above	✓

Department of Environmental Conservation

Wastewater System & Potable Water Supply Permit Application

Consultant/Designer Signature Sheet

Instructions:

The Submission Number and Version of the online application form being signed **must** be entered in the field below.

Hand Signatures - This signature sheet can be downloaded, printed, signed by hand, and then scanned and uploaded to the **Signatures** section of the online application form.

Digital Signatures - This signature sheet can be signed using the certificate-based digital signature capability available in Adobe Acrobat/Reader (or other PDF software with similar capability) and then uploaded to the **Signatures** section of the online application form. If this sheet contains one or more digital signatures, it **must** be uploaded in a format that does not compromise the ability to click on the applied signature and validate it. The digital signature applied must include the signer's full name, email address, and the date and time of signing. Because the Signature Sheet needs to be submitted in a format that allows the signatures to be validated, a Signature Sheet cannot contain both digital and hand signatures.

Note: If you digitally sign this sheet, please don't enter a date in the Signature Date field. The date and time must be included in the digital signature that is applied as described above.

ANR Online Submission Number & Version

ANR Online Submission Number and Version (for example: #20J-65KQ-R1ZF, version 1)

HQP-HWXM-MTDON, version 1

Consultant(s)/Designer(s) Certification
Consultant/Designer Certification & Copyright License

"I hereby certify that in the exercise of my reasonable professional judgment, the design-related information submitted with this application is true and correct, and that the design included in this application for a permit complies with the Vermont Wastewater System and Potable Water Supply Rules and the Vermont Water Supply Rules.

As the individual who prepared this application, including all documents that are marked as copyrighted, I hereby grant a non-exclusive, limited license to the State to allow the documents to be available for public review and copying in order to properly implement and operate the permitting programs for Wastewater Systems and Potable Water Supplies, and for no other purposes. As a condition to this license, the State agrees that it will not make any changes to such documents, nor will the State delete any copyright notices on such documents."

WW/WS Designer

Consultant/Designer Role

Graham Tidman

Print Consultant/Designer Name



Consultant/Designer Signature

7/6/26

Signature Date

Consultant/Designer Role

Print Consultant/Designer Name

Consultant/Designer Signature

Signature Date



Fitzgerald Environmental Associates, LLC.

Applied Watershed Science & Ecology

MEMORANDUM

To: Town of Richmond
From: Evan Fitzgerald, PE, CPESC, CFM and Jake Campbell
Re: Marquis Driveway Culvert Hydrologic Modeling
Date: July 24, 2026

This memorandum summarizes Fitzgerald Environmental Associates' (FEA) hydrologic analysis of a stream crossing associated with a proposed driveway at 595 Huntington Road in Richmond, Vermont and an existing Town-owned culvert under Huntington Road downstream of the proposed crossing. FEA evaluated the watershed characteristics using standard methods, including watershed delineation using LiDAR data from 2023 and rainfall-runoff analysis using the NRCS TR-20 method in HydroCAD (Version 10.00-26). The proposed culvert watershed has an area of 19.69 acres and the existing culvert watershed has an area of 25.79 acres. Both watersheds are primarily forested with dominant soil hydrogroups of B and D. The stream, which is conveyed by both crossings, is intermittent. See a map of the watersheds in the **Attachment**.

Precipitation data for the 2, 5, 10, 25, 50, and 100-year 24-hour storms was collected from the NOAA Atlas 14 database and used in the NRCS TR-20 analysis in HydroCAD. See **Table 1** for rainfall data and culvert peak flows and the **Attachment** for full HydroCAD results. For all storms and both stream crossing structures, the additional impervious created by the proposed driveway and residence did not substantially increase peak flows (increases less than 1 cfs).

Table 1: Culvert Peak Flows by Storm

Storm (24-hour)	Rainfall (in)	Peak Flow (cfs)	
		Proposed Private Culvert	Existing Town Culvert
2-year	2.36	7.01	8.77
5-year	2.97	12.39	15.50
10-year	3.48	18.05	22.64
25-year	4.17	27.00	34.00
50-year	4.69	34.58	43.52
100-year	5.25	43.15	54.43

The proposed culvert is a 30" HDPE with a slope of 5% and a length of 45'. Inlet and outlet invert elevations were based on the final site plans for the proposed driveway, prepared by O'Leary-Burke Civil Associates. Based on our modeling, the culvert is appropriately sized for all modeled storms. The capacity of the proposed culvert is 99.36 cfs and the peak flow during the 100-year storm is 43.15, which is approximately 43% of the culvert's total capacity. In addition, the culvert size conforms with the VTDEC's Culvert Sizing Guidance for Intermittent Streams.

The existing culvert under Huntington Road is a 42" CMP with a slope of 8.9% and a length of 110'. Inlet and outlet invert elevations were based on 2023 LiDAR data. Based on our modeling, the culvert is appropriately sized for all modeled storms. The capacity of the existing culvert is 63.63 cfs and the peak flow during the 100-year storm is 54.43 cfs, which is approximately 85% of the culvert's total capacity.

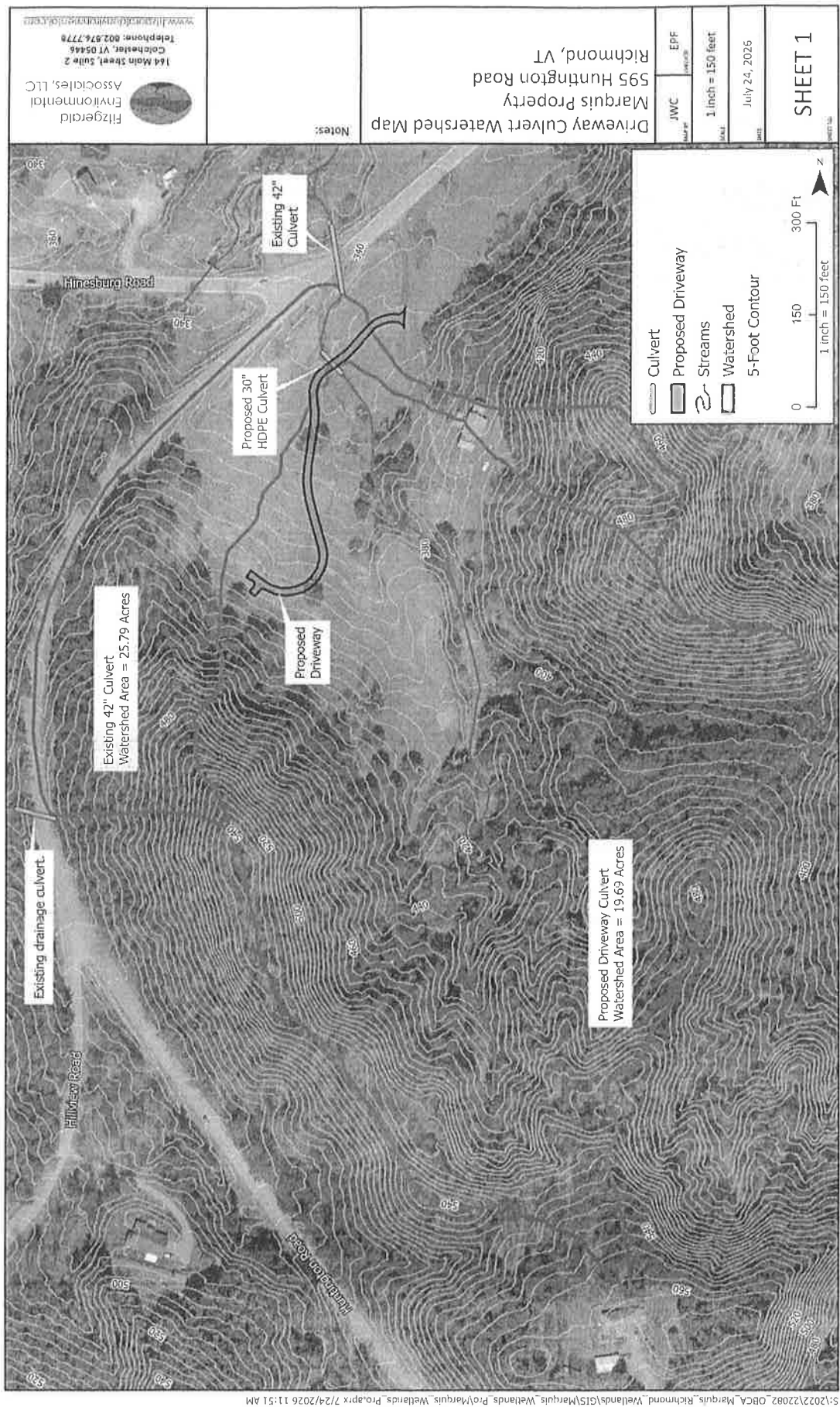
Attachment

Attachment Page 1: Watershed Map

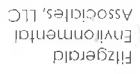
Attachment Pages 2-25: Full HydroCAD Results



ATTACHMENT



164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldassociates.com



Notes:

Driveaway Culvert Watershed Map
Marquis Property
595 Huntington Road
Richmond, VT

JWC
EPF

1 inch = 150 feet

July 24, 2026

SHEET 1

Summary for Subcatchment 1S: Proposed Culvert Watershed

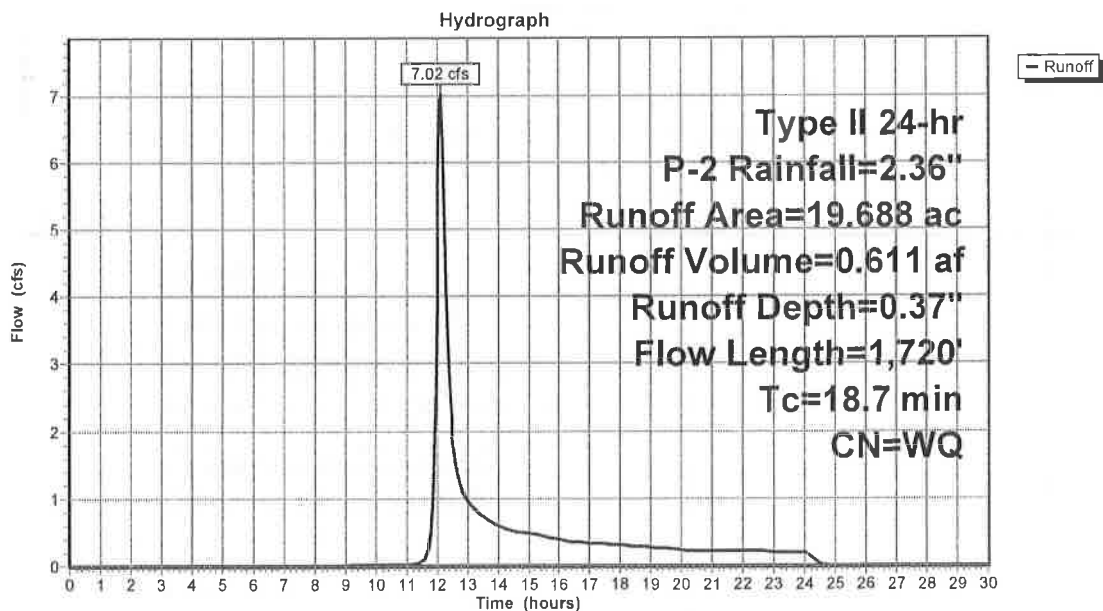
Runoff = 7.02 cfs @ 12.13 hrs, Volume= 0.611 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type II 24-hr P-2 Rainfall=2.36"

Area (ac)	CN	Description
0.186	48	Brush, Good, HSG B
4.237	73	Brush, Good, HSG D
0.469	30	Woods, Good, HSG A
7.887	55	Woods, Good, HSG B
6.732	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.166	98	Water Surface, HSG D
19.688		Weighted Average
19.511		99.10% Pervious Area
0.177		0.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
18.7	1,720	Total			

Subcatchment 1S: Proposed Culvert Watershed



Summary for Subcatchment 4S: Huntington Road Culvert Watershed

Runoff = 8.80 cfs @ 12.14 hrs, Volume= 0.791 af, Depth= 0.37"

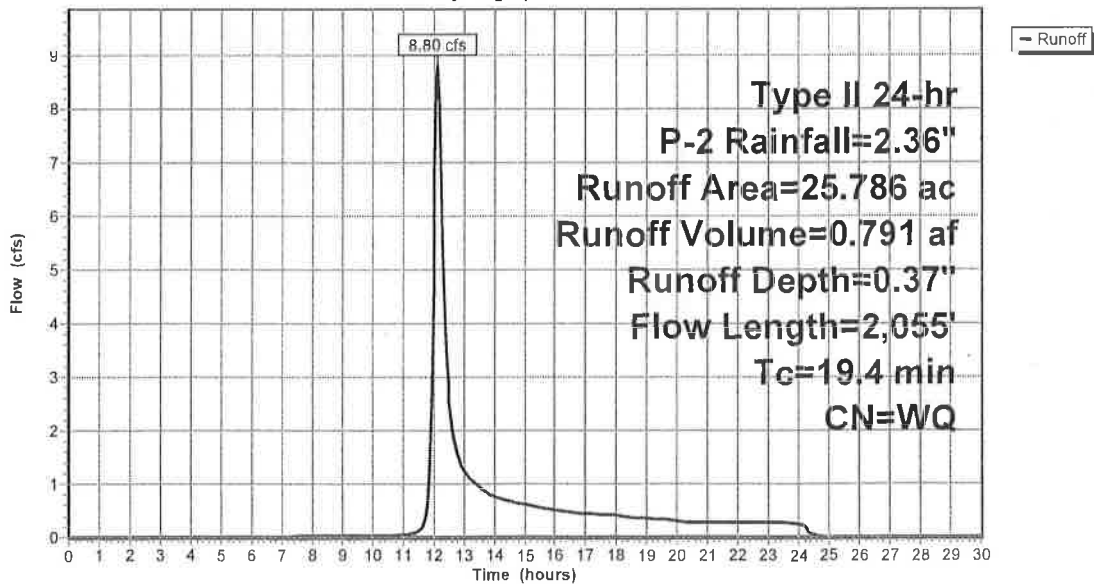
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type II 24-hr P-2 Rainfall=2.36"

Area (ac)	CN	Description
0.233	48	Brush, Good, HSG B
6.241	73	Brush, Good, HSG D
0.457	30	Woods, Good, HSG A
10.903	55	Woods, Good, HSG B
7.569	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.205	98	Water Surface, HSG D
0.053	98	Paved parking, HSG B
0.114	98	Paved parking, HSG D
25.786		Weighted Average
25.403		98.51% Pervious Area
0.383		1.49% Impervious Area

1c (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
0.0	45	0.0500	24.29	119.23	Pipe Channel, CMP_Round 30" 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.010 PVC, smooth interior
0.7	290	0.0300	7.05	75.24	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
19.4	2,055	Total			

Subcatchment 4S: Huntington Road Culvert Watershed

Hydrograph



Marquis_HydroCAD

Prepared by Fitzgerald Environmental Associates

HydroCAD® 10.00-26 s/n 06129 © 2020 HydroCAD Software Solutions LLC

Marquis Driveway Culvert
Type II 24-hr P-2 Rainfall=2.36"

Printed 7/17/2026

Page 11

Summary for Reach 3R: Proposed 30" HDPE

Inflow Area = 19.688 ac, 0.90% Impervious, Inflow Depth = 0.37" for P-2 event
Inflow = 7.02 cfs @ 12.13 hrs, Volume= 0.611 af
Outflow = 7.01 cfs @ 12.14 hrs, Volume= 0.611 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 11.67 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 3.59 fps, Avg. Travel Time= 0.2 min

Peak Storage= 27 cf @ 12.13 hrs

Average Depth at Peak Storage= 0.45'

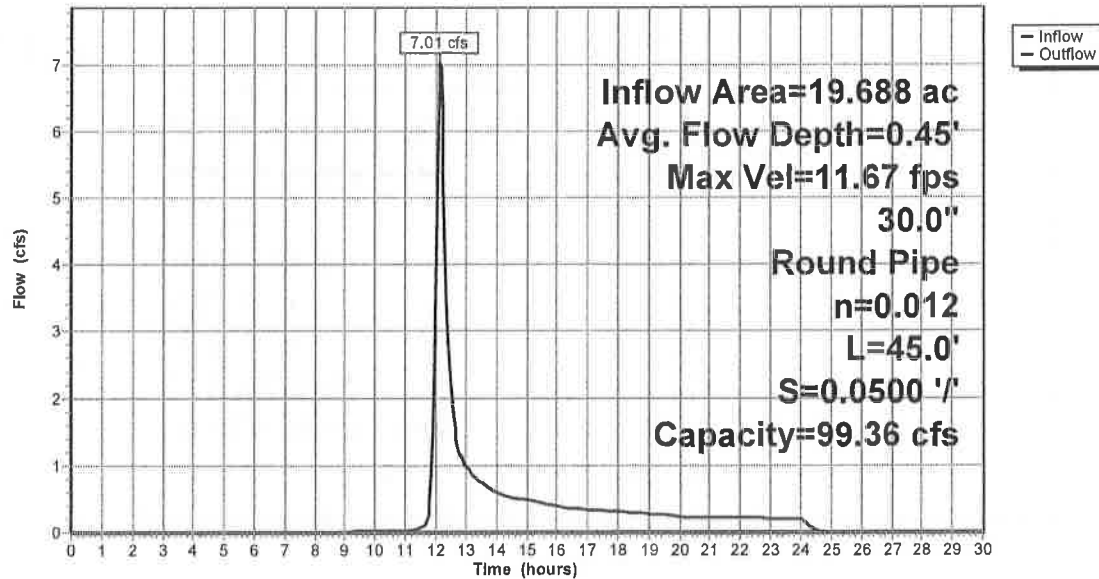
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 99.36 cfs

30.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

Length= 45.0' Slope= 0.0500 1'

Inlet Invert= 345.72', Outlet Invert= 343.47'

**Reach 3R: Proposed 30" HDPE****Hydrograph**

Summary for Reach 5R: Existing 42" Culvert (Huntington Road)

Inflow Area = 25.786 ac, 1.49% Impervious, Inflow Depth = 0.37" for P-2 event
 Inflow = 8.80 cfs @ 12.14 hrs, Volume= 0.791 af
 Outflow = 8.77 cfs @ 12.15 hrs, Volume= 0.791 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 9.11 fps, Min. Travel Time= 0.2 min

Avg. Velocity = 2.79 fps, Avg. Travel Time= 0.7 min

Peak Storage= 106 cf @ 12.14 hrs

Average Depth at Peak Storage= 0.63'

Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 63.63 cfs

30.0" Round Pipe

n= 0.025 Corrugated metal

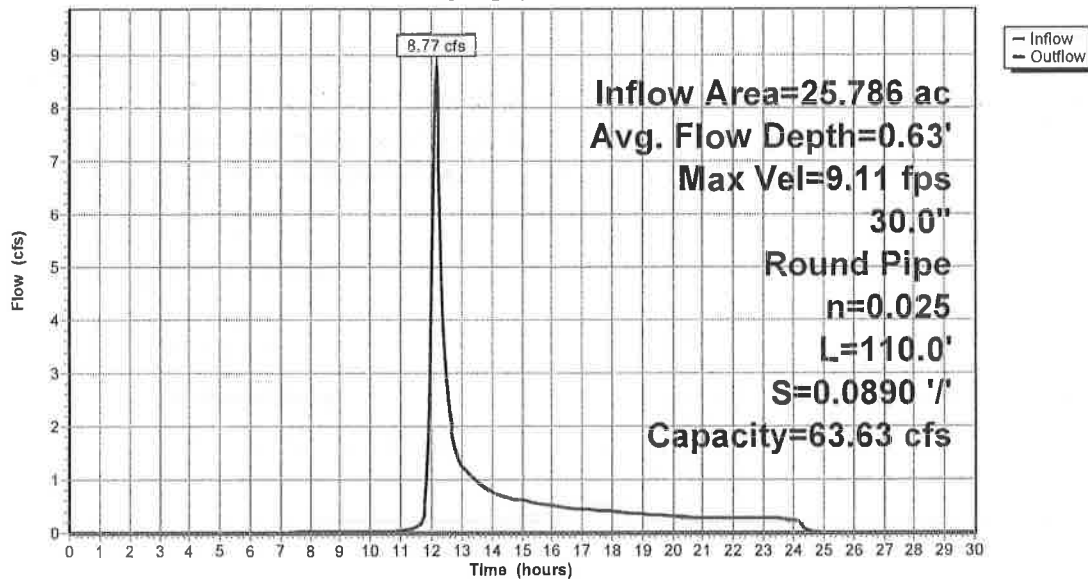
Length= 110.0' Slope= 0.0890 '/'

Inlet Invert= 334.87', Outlet Invert= 325.08'



Reach 5R: Existing 42" Culvert (Huntington Road)

Hydrograph



Marquis_HydroCAD

Prepared by Fitzgerald Environmental Associates

HydroCAD® 10.00-26 s/n 06129 © 2020 HydroCAD Software Solutions LLC

Marquis Driveway Culvert

Type II 24-hr P-5 Rainfall=2.97"

Printed 7/17/2026

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Summary for Subcatchment 1S: Proposed Culvert Watershed

Runoff = 12.40 cfs @ 12.13 hrs, Volume= 1.050 af, Depth= 0.64"

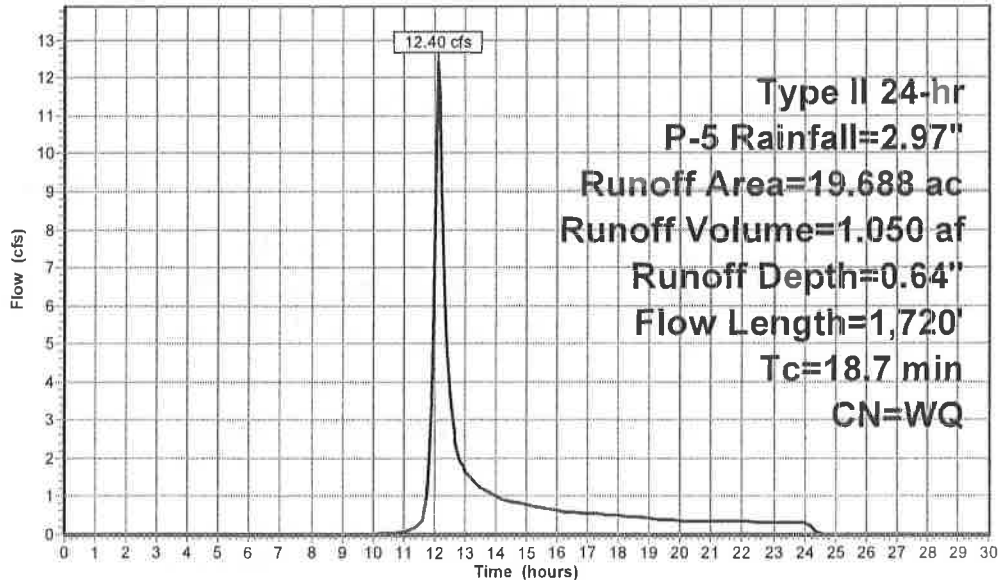
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-5 Rainfall=2.97"

Area (ac)	CN	Description
0.186	48	Brush, Good, HSG B
4.237	73	Brush, Good, HSG D
0.469	30	Woods, Good, HSG A
7.887	55	Woods, Good, HSG B
6.732	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.166	98	Water Surface, HSG D
19.688		Weighted Average
19.511		99.10% Pervious Area
0.177		0.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
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0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
18.7	1,720	Total			

Subcatchment 1S: Proposed Culvert Watershed

Hydrograph



Marquis_HydroCAD

Prepared by Fitzgerald Environmental Associates

HydroCAD® 10.00-26 s/n 06129 © 2020 HydroCAD Software Solutions LLC

Marquis Driveway Culvert

Type II 24-hr P-5 Rainfall=2.97"

Printed 7/17/2026

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Summary for Subcatchment 4S: Huntington Road Culvert Watershed

Runoff = 15.55 cfs @ 12.14 hrs, Volume= 1,357 af, Depth= 0.63"

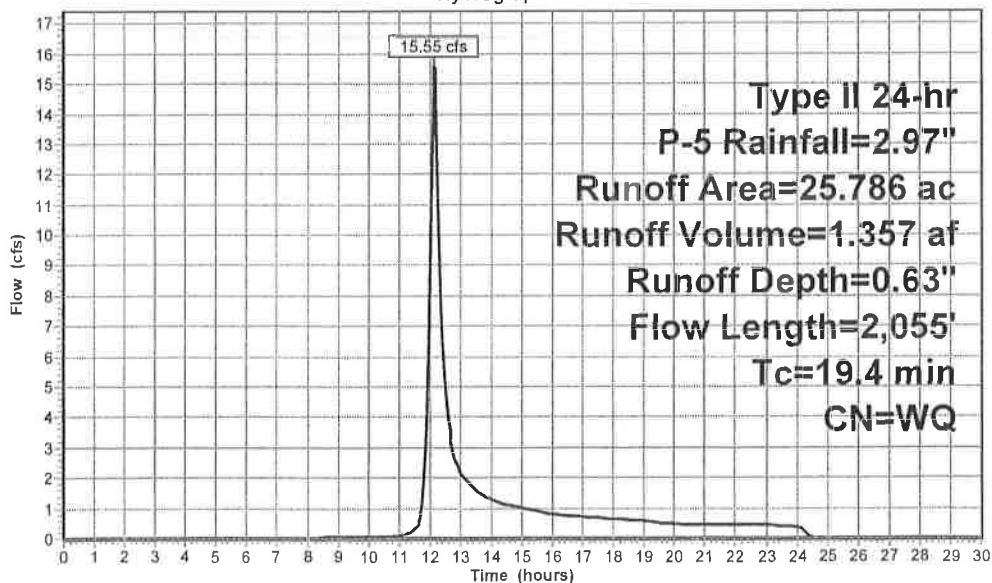
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-5 Rainfall=2.97"

Area (ac)	CN	Description
0.233	48	Brush, Good, HSG B
6.241	73	Brush, Good, HSG D
0.457	30	Woods, Good, HSG A
10.903	55	Woods, Good, HSG B
7.569	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.205	98	Water Surface, HSG D
0.053	98	Paved parking, HSG B
0.114	98	Paved parking, HSG D
25.786		Weighted Average
25.403		98.51% Pervious Area
0.383		1.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
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1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
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0.0	45	0.0500	24.29	119.23	Pipe Channel, CMP_Round 30" 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.010 PVC, smooth interior
0.7	290	0.0300	7.05	75.24	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
19.4	2,055	Total			

Subcatchment 4S: Huntington Road Culvert Watershed

Hydrograph



Summary for Reach 3R: Proposed 30" HDPE

Inflow Area = 19.688 ac, 0.90% Impervious, Inflow Depth = 0.64" for P-5 event
 Inflow = 12.40 cfs @ 12.13 hrs, Volume= 1.050 af
 Outflow = 12.39 cfs @ 12.13 hrs, Volume= 1.050 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 13.77 fps, Min. Travel Time= 0.1 min

Avg. Velocity= 4.05 fps, Avg. Travel Time= 0.2 min

Peak Storage= 40 cf @ 12.13 hrs

Average Depth at Peak Storage= 0.60'

Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 99.36 cfs

30.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

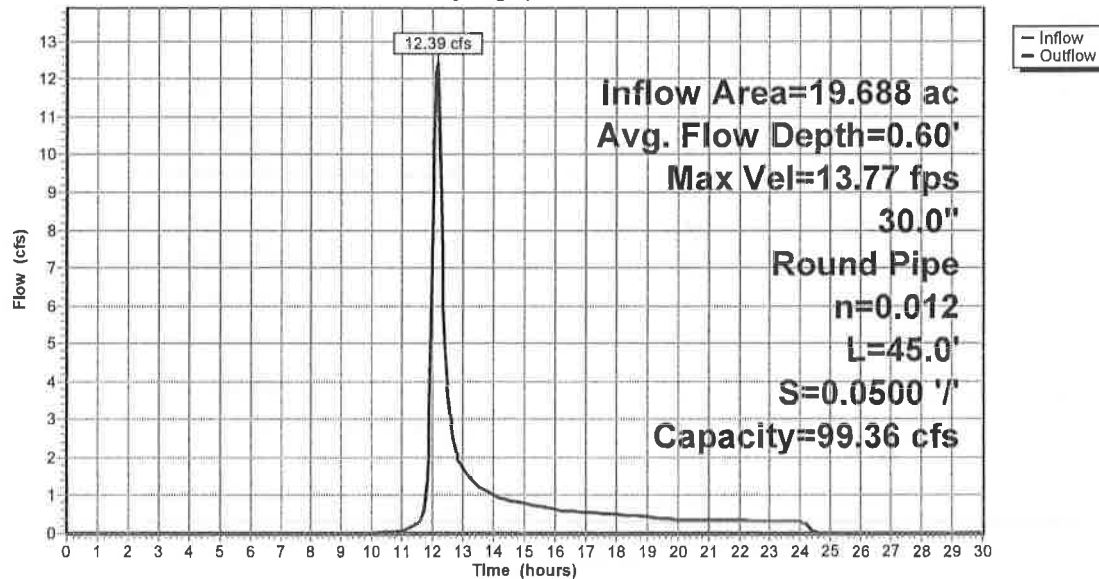
Length= 45.0' Slope= 0.0500 '/'

Inlet Invert= 345.72', Outlet Invert= 343.47'



Reach 3R: Proposed 30" HDPE

Hydrograph



Marquis_HydroCAD

Prepared by Fitzgerald Environmental Associates

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Marquis Driveway Culvert

Type II 24-hr P-5 Rainfall=2.97"

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Summary for Reach 5R: Existing 42" Culvert (Huntington Road)

Inflow Area = 25.786 ac, 1.49% Impervious, Inflow Depth = 0.63" for P-5 event
Inflow = 15.55 cfs @ 12.14 hrs, Volume= 1.357 af
Outflow = 15.50 cfs @ 12.14 hrs, Volume= 1.357 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 10.70 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 3.18 fps, Avg. Travel Time= 0.6 min

Peak Storage= 160 cf @ 12.14 hrs

Average Depth at Peak Storage= 0.84'

Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 63.63 cfs

30.0" Round Pipe

n= 0.025 Corrugated metal

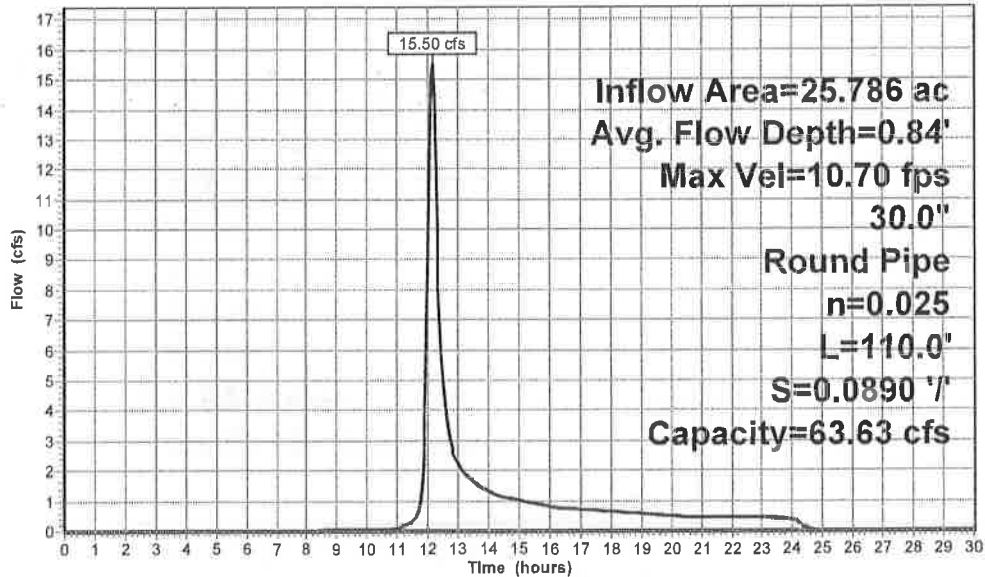
Length= 110.0' Slope= 0.0890 '/'

Inlet Invert= 334.87', Outlet Invert= 325.08'



Reach 5R: Existing 42" Culvert (Huntington Road)

Hydrograph



Marquis_HydroCAD

Prepared by Fitzgerald Environmental Associates

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Marquis Driveway Culvert

Type II 24-hr P-10 Rainfall=3.48"

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Summary for Subcatchment 1S: Proposed Culvert Watershed

Runoff = 18.07 cfs @ 12.13 hrs, Volume= 1.479 af, Depth= 0.90"

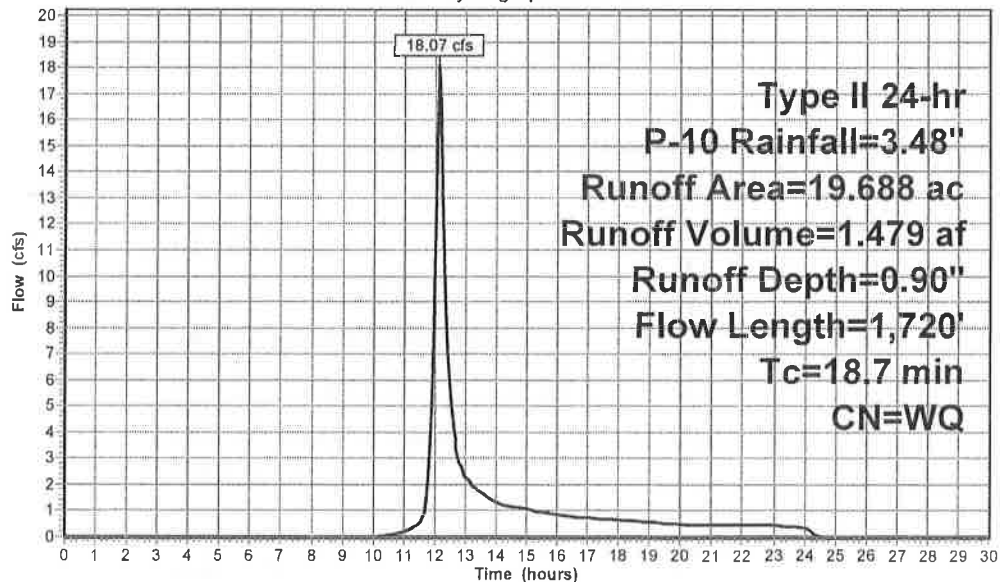
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-10 Rainfall=3.48"

Area (ac)	CN	Description
0.186	48	Brush, Good, HSG B
4.237	73	Brush, Good, HSG D
0.469	30	Woods, Good, HSG A
7.887	55	Woods, Good, HSG B
6.732	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.166	98	Water Surface, HSG D
19.688		Weighted Average
19.511		99.10% Pervious Area
0.177		0.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
18.7	1,720	Total			

Subcatchment 1S: Proposed Culvert Watershed

Hydrograph



Marquis_HydroCAD

Prepared by Fitzgerald Environmental Associates

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Marquis Driveway Culvert

Type II 24-hr P-10 Rainfall=3.48"

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Summary for Subcatchment 4S: Huntington Road Culvert Watershed

Runoff = 22.70 cfs @ 12.14 hrs, Volume= 1.914 af, Depth= 0.89"

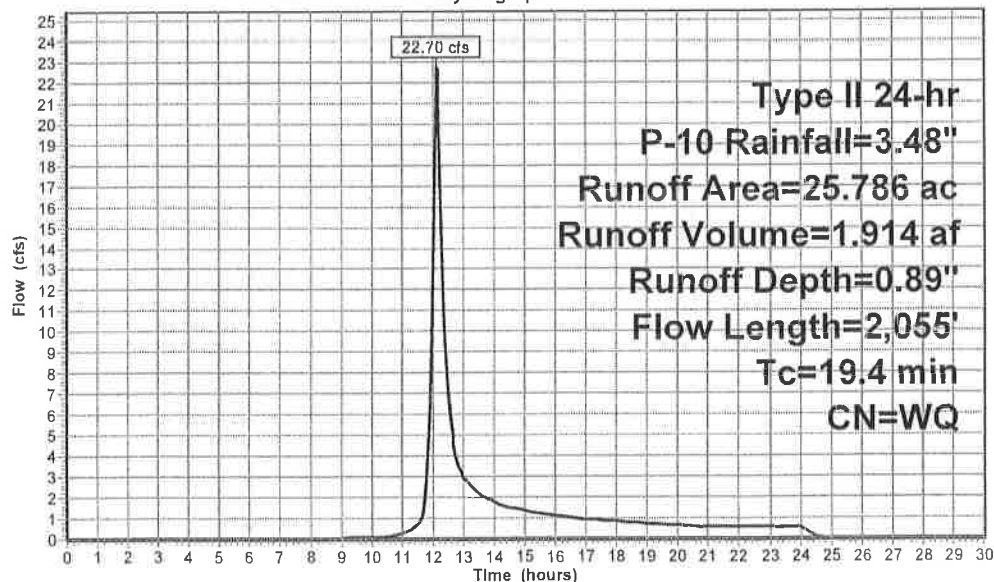
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-10 Rainfall=3.48"

Area (ac)	CN	Description
0.233	48	Brush, Good, HSG B
6.241	73	Brush, Good, HSG D
0.457	30	Woods, Good, HSG A
10.903	55	Woods, Good, HSG B
7.569	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.205	98	Water Surface, HSG D
0.053	98	Paved parking, HSG B
0.114	98	Paved parking, HSG D
25.786		Weighted Average
25.403		98.51% Pervious Area
0.383		1.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
0.0	45	0.0500	24.29	119.23	Pipe Channel, CMP_Round 30" 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.010 PVC, smooth interior
0.7	290	0.0300	7.05	75.24	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
19.4	2,055	Total			

Subcatchment 4S: Huntington Road Culvert Watershed

Hydrograph



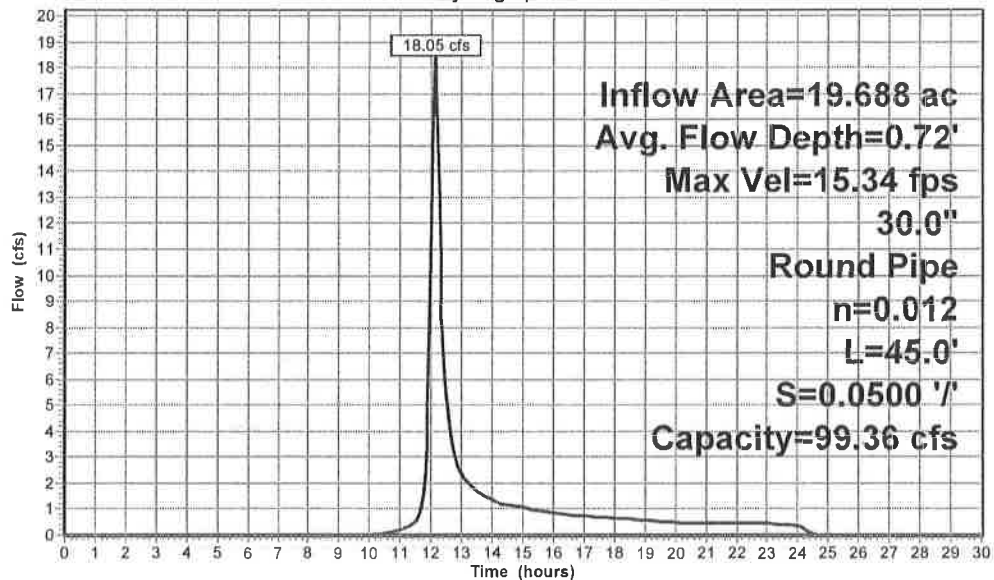
Summary for Reach 3R: Proposed 30" HDPE

Inflow Area = 19.688 ac, 0.90% Impervious, Inflow Depth = 0.90" for P-10 event
 Inflow = 18.07 cfs @ 12.13 hrs, Volume= 1.479 af
 Outflow = 18.05 cfs @ 12.13 hrs, Volume= 1.479 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 15.34 fps, Min. Travel Time= 0.0 min
 Avg. Velocity = 4.40 fps, Avg. Travel Time= 0.2 min

Peak Storage= 53 cf @ 12.13 hrs
 Average Depth at Peak Storage= 0.72'
 Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 99.36 cfs

30.0" Round Pipe
 n= 0.012 Corrugated PP, smooth interior
 Length= 45.0' Slope= 0.0500 '/'
 Inlet Invert= 345.72', Outlet Invert= 343.47'

**Reach 3R: Proposed 30" HDPE****Hydrograph**

Marquis HydroCAD

Prepared by Fitzgerald Environmental Associates

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Marquis Driveway Culvert
Type II 24-hr P-10 Rainfall=3.48"

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Summary for Reach 5R: Existing 42" Culvert (Huntington Road)

Inflow Area = 25.786 ac, 1.49% Impervious, Inflow Depth = 0.89" for P-10 event
Inflow = 22.70 cfs @ 12.14 hrs, Volume = 1.914 af
Outflow = 22.64 cfs @ 12.14 hrs, Volume = 1.914 af, Atten = 0%, Lag = 0.3 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-30.00 hrs, dt = 0.05 hrs

Max. Velocity = 11.87 fps, Min. Travel Time = 0.2 min

Avg. Velocity = 3.47 fps, Avg. Travel Time = 0.5 min

Peak Storage = 210 cf @ 12.14 hrs

Average Depth at Peak Storage = 1.03'

Bank-Full Depth = 2.50' Flow Area = 4.9 sf, Capacity = 63.63 cfs

30.0" Round Pipe

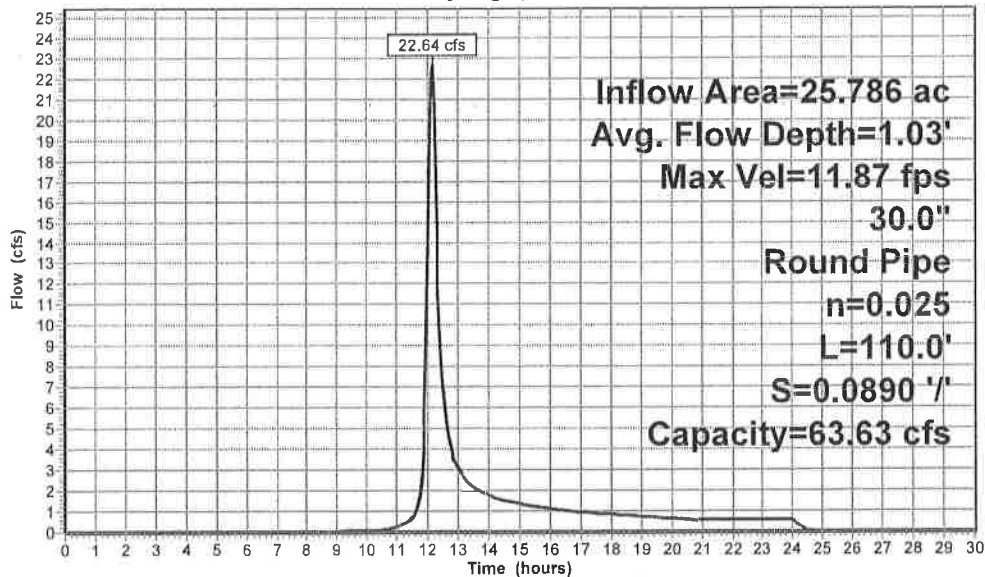
n = 0.025 Corrugated metal

Length = 110.0' Slope = 0.0890 1'

Inlet Invert = 334.87', Outlet Invert = 325.08'

**Reach 5R: Existing 42" Culvert (Huntington Road)**

Hydrograph



Marquis_HydroCAD

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Marquis Driveway Culvert
Type II 24-hr P-25 Rainfall=4.17"
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Summary for Subcatchment 1S: Proposed Culvert Watershed

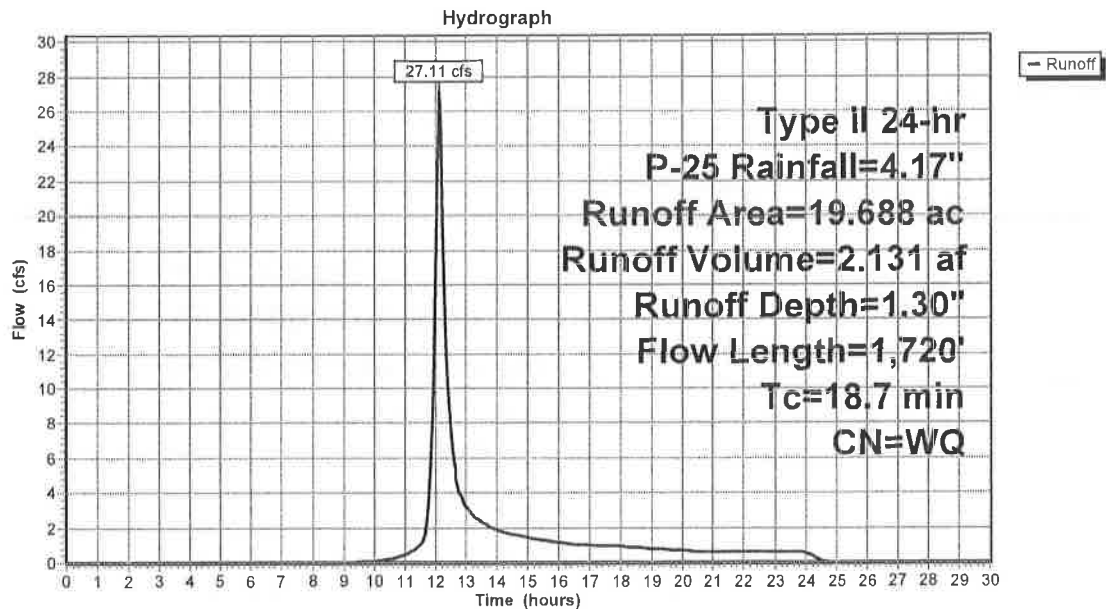
Runoff = 27.11 cfs @ 12.12 hrs, Volume= 2.131 af, Depth= 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-25 Rainfall=4.17"

Area (ac)	CN	Description
0.186	48	Brush, Good, HSG B
4.237	73	Brush, Good, HSG D
0.469	30	Woods, Good, HSG A
7.887	55	Woods, Good, HSG B
6.732	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.166	98	Water Surface, HSG D
19.688		Weighted Average
19.511		99.10% Pervious Area
0.177		0.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
18.7	1,720	Total			

Subcatchment 1S: Proposed Culvert Watershed



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Marquis Driveway Culvert

Type II 24-hr P-25 Rainfall=4.17"

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Summary for Subcatchment 4S: Huntington Road Culvert Watershed

Runoff = 34.08 cfs @ 12.13 hrs, Volume= 2.762 af, Depth= 1.29"

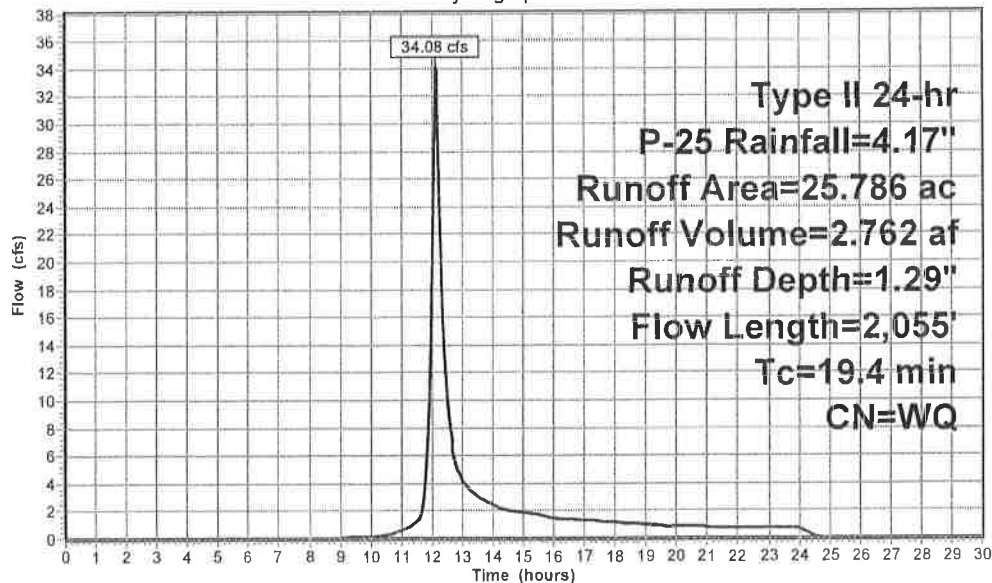
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-25 Rainfall=4.17"

Area (ac)	CN	Description
0.233	48	Brush, Good, HSG B
6.241	73	Brush, Good, HSG D
0.457	30	Woods, Good, HSG A
10.903	55	Woods, Good, HSG B
7.569	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.205	98	Water Surface, HSG D
0.053	98	Paved parking, HSG B
0.114	98	Paved parking, HSG D
25.786		Weighted Average
25.403		98.51% Pervious Area
0.383		1.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
0.0	45	0.0500	24.29	119.23	Pipe Channel, CMP_Round 30" 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.010 PVC, smooth interior
0.7	290	0.0300	7.05	75.24	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
19.4	2,055	Total			

Subcatchment 4S: Huntington Road Culvert Watershed

Hydrograph



Summary for Reach 3R: Proposed 30" HDPE

Inflow Area = 19.688 ac, 0.90% Impervious, Inflow Depth = 1.30" for P-25 event
 Inflow = 27.11 cfs @ 12.12 hrs, Volume= 2.131 af
 Outflow = 27.00 cfs @ 12.13 hrs, Volume= 2.131 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 17.16 fps, Min. Travel Time= 0.0 min

Avg. Velocity= 4.83 fps, Avg. Travel Time= 0.2 min

Peak Storage= 71 cf @ 12.12 hrs

Average Depth at Peak Storage= 0.89'

Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 99.36 cfs

30.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

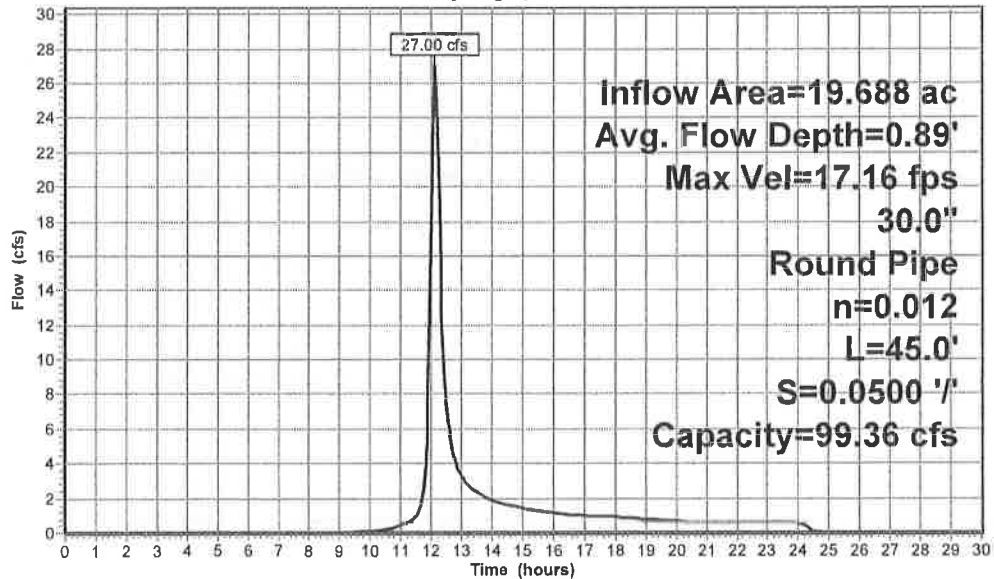
Length= 45.0' Slope= 0.0500 '/'

Inlet Invert= 345.72', Outlet Invert= 343.47'



Reach 3R: Proposed 30" HDPE

Hydrograph



Marquis HydroCAD

Prepared by Fitzgerald Environmental Associates

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Marquis Driveway Culvert
Type II 24-hr P-25 Rainfall=4.17"

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Summary for Reach 5R: Existing 42" Culvert (Huntington Road)

Inflow Area = 25.786 ac, 1.49% Impervious, Inflow Depth = 1.29" for P-25 event
Inflow = 34.08 cfs @ 12.13 hrs, Volume= 2.762 af
Outflow = 34.00 cfs @ 12.14 hrs, Volume= 2.762 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 13.17 fps, Min. Travel Time= 0.1 min

Avg. Velocity = 3.82 fps, Avg. Travel Time= 0.5 min

Peak Storage= 284 cf @ 12.14 hrs

Average Depth at Peak Storage= 1.30'

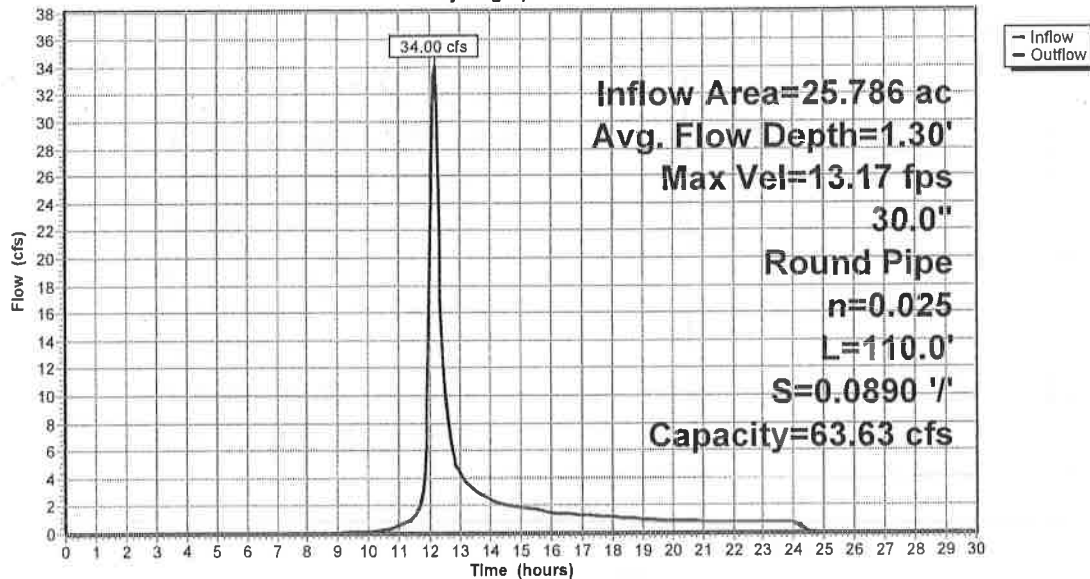
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 63.63 cfs

30.0" Round Pipe

n= 0.025 Corrugated metal

Length= 110.0' Slope= 0.0890 1'

Inlet Invert= 334.87', Outlet Invert= 325.08'

**Reach 5R: Existing 42" Culvert (Huntington Road)****Hydrograph**

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Prepared by Fitzgerald Environmental Associates

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Marquis Driveway Culvert

Type II 24-hr P-50 Rainfall=4.69"

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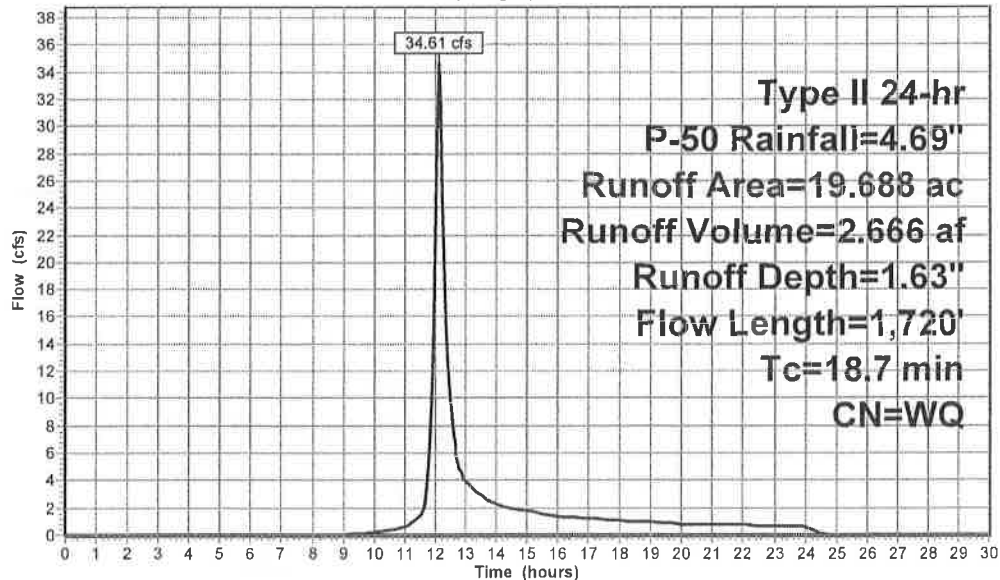
Summary for Subcatchment 1S: Proposed Culvert Watershed

Runoff = 34.61 cfs @ 12.12 hrs, Volume= 2.666 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-50 Rainfall=4.69"

Area (ac)	CN	Description
0.186	48	Brush, Good, HSG B
4.237	73	Brush, Good, HSG D
0.469	30	Woods, Good, HSG A
7.887	55	Woods, Good, HSG B
6.732	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.166	98	Water Surface, HSG D
19.688		Weighted Average
19.511		99.10% Pervious Area
0.177		0.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
18.7	1,720	Total			

Subcatchment 1S: Proposed Culvert Watershed**Hydrograph**

Summary for Subcatchment 4S: Huntington Road Culvert Watershed

Runoff = 43.61 cfs @ 12.13 hrs, Volume= 3.459 af, Depth= 1.61"

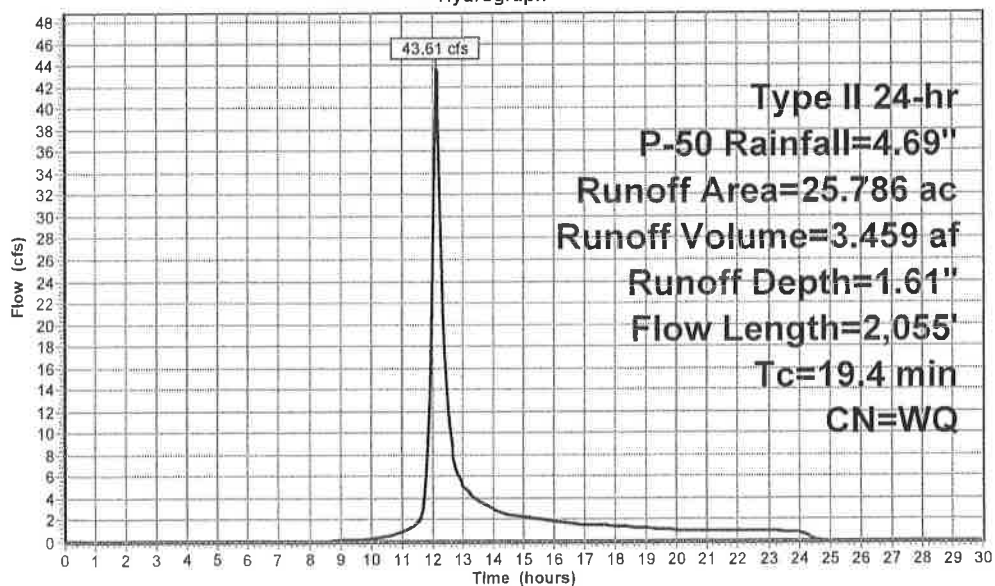
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-50 Rainfall=4.69"

Area (ac)	CN	Description
0.233	48	Brush, Good, HSG B
6.241	73	Brush, Good, HSG D
0.457	30	Woods, Good, HSG A
10.903	55	Woods, Good, HSG B
7.569	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.205	98	Water Surface, HSG D
0.053	98	Paved parking, HSG B
0.114	98	Paved parking, HSG D
25.786		Weighted Average
25.403		98.51% Pervious Area
0.383		1.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
0.0	45	0.0500	24.29	119.23	Pipe Channel, CMP_Round 30" 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.010 PVC, smooth interior
0.7	290	0.0300	7.05	75.24	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
19.4	2,055	Total			

Subcatchment 4S: Huntington Road Culvert Watershed

Hydrograph



Marquis_HydroCAD

Prepared by Fitzgerald Environmental Associates

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Marquis Driveway Culvert

Type II 24-hr P-50 Rainfall=4.69"

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Summary for Reach 3R: Proposed 30" HDPE

Inflow Area = 19.688 ac, 0.90% Impervious, Inflow Depth = 1.63" for P-50 event
Inflow = 34.61 cfs @ 12.12 hrs, Volume= 2.666 af
Outflow = 34.58 cfs @ 12.12 hrs, Volume= 2.666 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 18.36 fps, Min. Travel Time= 0.0 min

Avg. Velocity= 5.13 fps, Avg. Travel Time= 0.1 min

Peak Storage= 85 cf @ 12.12 hrs

Average Depth at Peak Storage= 1.02'

Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 99.36 cfs

30.0" Round Pipe

n= 0.012 Corrugated PP, smooth interior

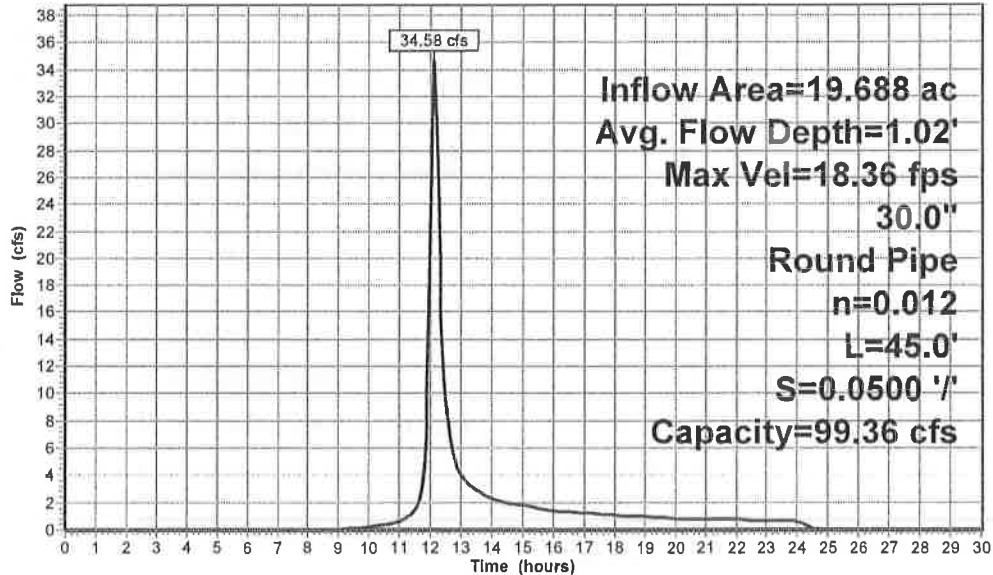
Length= 45.0' Slope= 0.0500 '/'

Inlet Invert= 345.72', Outlet Invert= 343.47'



Reach 3R: Proposed 30" HDPE

Hydrograph



Summary for Reach 5R: Existing 42" Culvert (Huntington Road)

Inflow Area = 25.786 ac, 1.49% Impervious, Inflow Depth = 1.61" for P-50 event
 Inflow = 43.61 cfs @ 12.13 hrs, Volume= 3.459 af
 Outflow = 43.52 cfs @ 12.14 hrs, Volume= 3.459 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 13.94 fps, Min. Travel Time= 0.1 min

Avg. Velocity= 4.06 fps, Avg. Travel Time= 0.5 min

Peak Storage= 344 cf @ 12.13 hrs

Average Depth at Peak Storage= 1.52'

Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 63.63 cfs

30.0" Round Pipe

n= 0.025 Corrugated metal

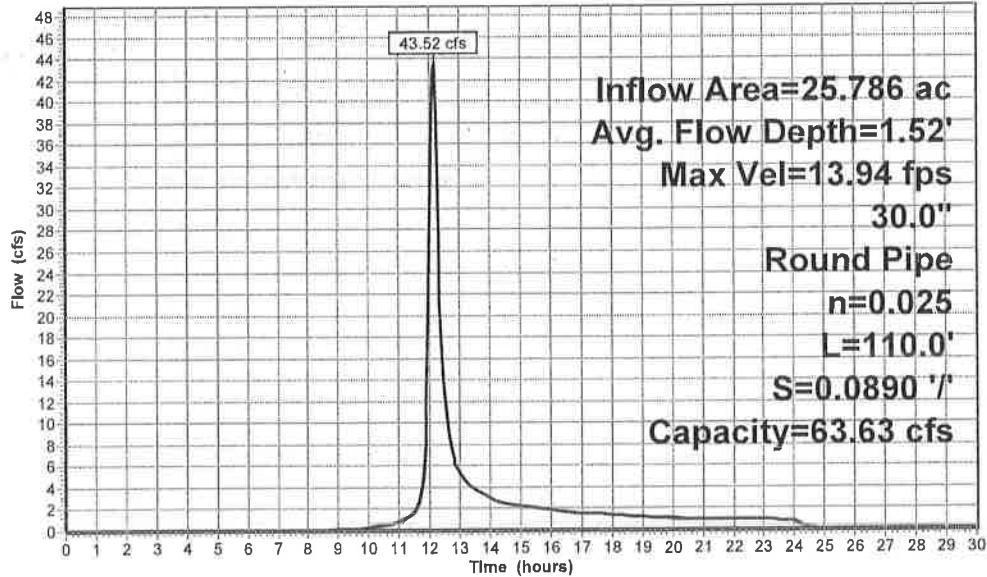
Length= 110.0' Slope= 0.0890 1'

Inlet Invert= 334.87', Outlet Invert= 325.08'



Reach 5R: Existing 42" Culvert (Huntington Road)

Hydrograph



Summary for Subcatchment 1S: Proposed Culvert Watershed

Runoff = 43.19 cfs @ 12.12 hrs, Volume= 3.277 af, Depth= 2.00"

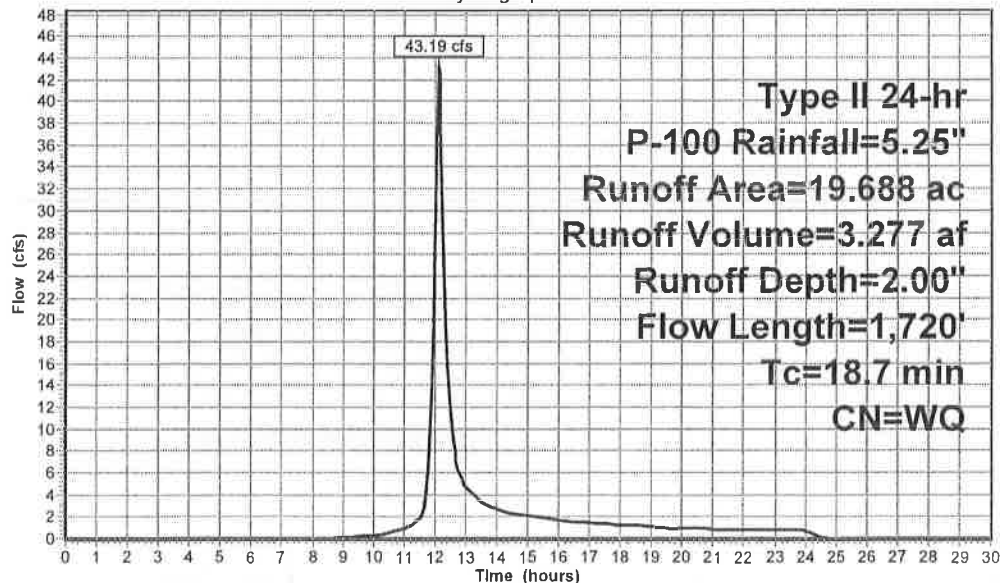
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-100 Rainfall=5.25"

Area (ac)	CN	Description
0.186	48	Brush, Good, HSG B
4.237	73	Brush, Good, HSG D
0.469	30	Woods, Good, HSG A
7.887	55	Woods, Good, HSG B
6.732	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.166	98	Water Surface, HSG D
19.688		Weighted Average
19.511		99.10% Pervious Area
0.177		0.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
18.7	1,720	Total			

Subcatchment 1S: Proposed Culvert Watershed

Hydrograph



Summary for Subcatchment 4S: Huntington Road Culvert Watershed

Runoff = 54.54 cfs @ 12.13 hrs, Volume= 4.256 af, Depth= 1.98"

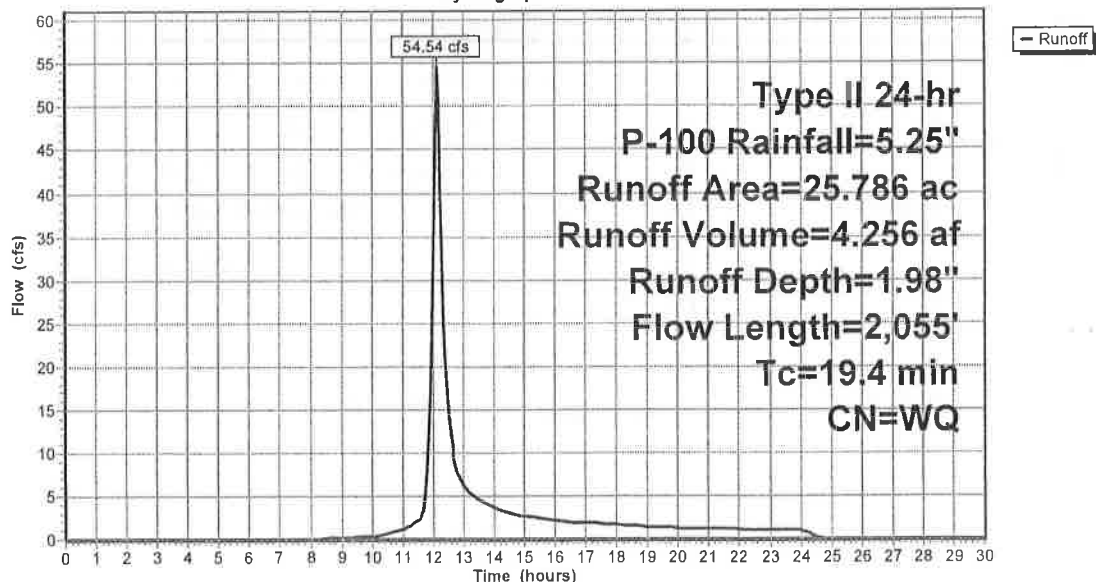
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr P-100 Rainfall=5.25"

Area (ac)	CN	Description
0.233	48	Brush, Good, HSG B
6.241	73	Brush, Good, HSG D
0.457	30	Woods, Good, HSG A
10.903	55	Woods, Good, HSG B
7.569	77	Woods, Good, HSG D
0.011	98	Water Surface, HSG B
0.205	98	Water Surface, HSG D
0.053	98	Paved parking, HSG B
0.114	98	Paved parking, HSG D
25.786		Weighted Average
25.403		98.51% Pervious Area
0.383		1.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	150	0.1600	0.17		Sheet Flow, Sheet flow through woods Woods: Light underbrush n= 0.400 P2= 2.36"
0.5	75	0.2700	2.60		Shallow Concentrated Flow, Shallow flow through woods Woodland Kv= 5.0 fps
0.1	125	0.3700	15.61	41.61	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
1.4	675	0.1000	8.11	21.63	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.4	153	0.0800	7.26	19.35	Parabolic Channel, 2ft channel cobble bottom W=2.00' D=2.00' Area=2.7 sf Perim=4.6' n= 0.040 Earth, cobble bottom, clean sides
0.5	331	0.0900	12.22	130.32	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
0.7	211	0.0600	4.99	53.20	Parabolic Channel, 4ft channel long dense weeds W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.080 Earth, long dense weeds
0.0	45	0.0500	24.29	119.23	Pipe Channel, CMP_Round 30" 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.010 PVC, smooth interior
0.7	290	0.0300	7.05	75.24	Parabolic Channel, 4ft channel cobble bottom W=4.00' D=4.00' Area=10.7 sf Perim=9.3' n= 0.040 Earth, cobble bottom, clean sides
19.4	2,055	Total			

Subcatchment 4S: Huntington Road Culvert Watershed

Hydrograph



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Marquis Driveway Culvert
Type II 24-hr P-100 Rainfall=5.25"
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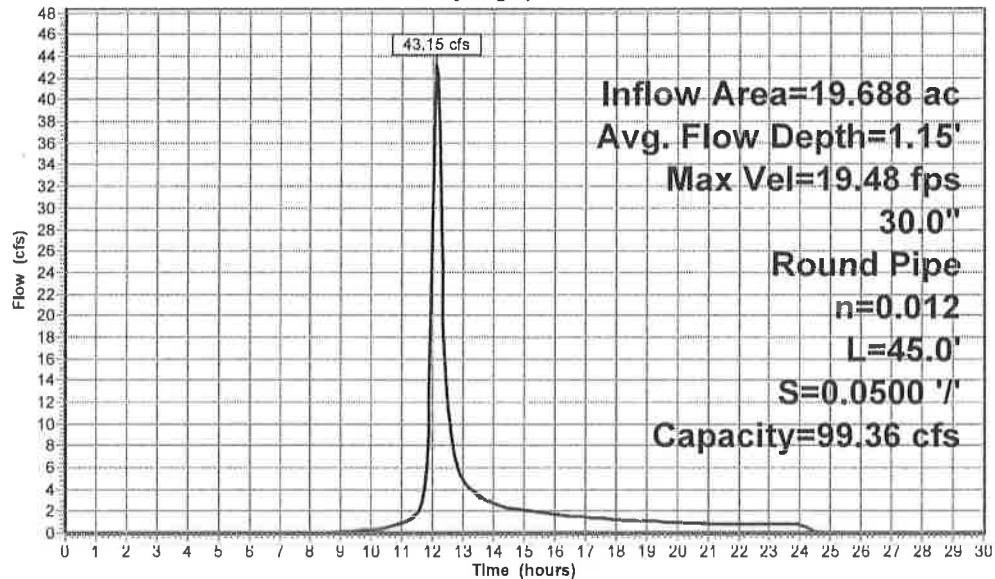
Summary for Reach 3R: Proposed 30" HDPE

Inflow Area = 19.688 ac, 0.90% Impervious, Inflow Depth = 2.00" for P-100 event
Inflow = 43.19 cfs @ 12.12 hrs, Volume= 3.277 af
Outflow = 43.15 cfs @ 12.12 hrs, Volume= 3.277 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 19.48 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 5.44 fps, Avg. Travel Time= 0.1 min

Peak Storage= 100 cf @ 12.12 hrs
Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 99.36 cfs

30.0" Round Pipe
n= 0.012 Corrugated PP, smooth interior
Length= 45.0' Slope= 0.0500 '/'
Inlet Invert= 345.72', Outlet Invert= 343.47'

**Reach 3R: Proposed 30" HDPE****Hydrograph**

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Marquis Driveway Culvert
Type II 24-hr P-100 Rainfall=5.25"
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Summary for Reach 5R: Existing 42" Culvert (Huntington Road)

Inflow Area = 25.786 ac, 1.49% Impervious, Inflow Depth = 1.98" for P-100 event
Inflow = 54.54 cfs @ 12.13 hrs, Volume= 4.256 af
Outflow = 54.43 cfs @ 12.13 hrs, Volume= 4.256 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 14.55 fps, Min. Travel Time= 0.1 min
Avg. Velocity= 4.30 fps, Avg. Travel Time= 0.4 min

Peak Storage= 412 cf @ 12.13 hrs
Average Depth at Peak Storage= 1.78'
Bank-Full Depth= 2.50' Flow Area= 4.9 sf, Capacity= 63.63 cfs

30.0" Round Pipe
n= 0.025 Corrugated metal
Length= 110.0' Slope= 0.0890 '/'
Inlet Invert= 334.87', Outlet Invert= 325.08'

**Reach 5R: Existing 42" Culvert (Huntington Road)****Hydrograph**