BOARD OF COMMISSIONERS

AGENDA *Amended 11/6/2021*

Monday, November 8, 2021 - 6:30 pm

Pledge of Allegiance
Notice of Executive Session
1. Public Participation

2. Consent Agenda
   a) Disbursement Review & Approval
   b) Approval of minutes of the Board of Commissioners Meeting of September 30, 2021, and October 18, 2021.
   c) Resolution 2021-134 - Authorization to apply for Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance Program, Building Resilient Infrastructure and Communities (BRIC), for the South Wayne Municipal Parking Lot Flood Reduction Project in the amount up to $2,390,182.50 (25% non-federal matching funds are required for this Grant) by Meliora Design and appointment of Township Manager William White as the Township's authorized agent for administration and execution of all necessary documents for federal and state funding from FEMA and Pennsylvania Emergency Management Agency (PEMA)
   d) Resolution 2021-132 - Authorizing the Appointment of Township's Independent CPA Firm for Auditing Services for years 2021, 2022, and 2023
   e) Resolution 2021-BPT -01 - Authorizing the Settlement of Business Tax Matter

3. Committee Reports
   A. 904 Drexel Lane - Waiver of the Infiltration Requirements of the Stormwater Management Ordinance
   B. 75 Tyler Lane, Ardrossan Estates, Board of Commissioners Approval of Proposed House Location
   C. 2022 Budget Legislation
      a. Ordinance 2021-16 - (***Introduction***) Introduction of the Final 2022 Comprehensive Budget by setting the Township Real Estate Tax Millage Rate and adopting appropriations for 2022
      b. Ordinance 2021-17 - (***Introduction***) Introduction of the 2022 Sanitary Sewer and Stormwater Fees
      c. Ordinance 2021-18 - (***Introduction***) Introduction of the Consolidated Fee Schedule for the Township, Effective January 1, 2022
   D. Bond Refunding Legislation:
      a. Ordinance 2021-12 (***Adoption***) – Authorizing the advance refunding of the Series 2013B in the aggregate principal amount not to exceed $15,500,000
      b. Resolution 2021-131 – Reimbursement Resolution – Authorizing Reimbursement of Stormwater Project Expenditures in Advance of Financing
   E. Ordinance 2021-13 – (***Introduction***) – Radnor Business Privilege and Mercantile Tax Ordinance Amendment to permit rounding to nearest dollar
   F. Resolution 2021-129 – Authorizing the Payment of Change Orders #4 and #6 through #16 to Road-Con, Inc. for the Radnor TAP Trail Project for a Total of $160,099.01

G. Resolution 2021-130 - Radnor Trail Extension Environmental Testing and Evaluation for Arsenic, in the Amount of $55,480

~~H. Motion to terminate Fern Valley Farm License Agreement, (originally authorized by Resolution 2015-51 - Fern Valley Farm License Agreement - - - Rye, Quarry, Wheeler Tracts, Ardrossan development). (Requested by Commissioner Booker) *Tabled from 10/25/2021 meeting*~~ *Removed from Agenda 11/6/2021*

4. Reports of Standing Committees
5. Old Business
   a) West Wayne Cemetery Discussion – Funding for fence repairs (Commissioner Abel)
6. New Business
7. Public Participation
8. Adjournment

Meeting Notice

There will be a Regular Board of Commissioners meeting held on Monday, November 8, 2021, beginning at 6:30 PM in the Radnorshire Room of the Radnor Township Building, 301 Iven Avenue Wayne, PA 19087. The Meeting will be streamed live on the Radnor Township YouTube Channel https://www.youtube.com/channel/UCvh6jeMQTvo3ojCTh8wZkbA

Public Participation

RADNOR TOWNSHIP
DISBURSEMENTS SUMMARY
November 8, 2021

The table below summarizes the accounts payable disbursements made since the last public meeting held on October 25, 2021. As approved by the Board, the Administration is now making bi-weekly accounts payable disbursement batches and publishing those lists on the Township's web site at the following link. Please refer to those files for a detailed listing of the amounts paid by vendor by account code. Also, please visit the Open Finance program to view the Township's Checkbook, where all vendor payments are available.

Link: http://radnor.com/728/Disbursements-List

Fund (Fund Number)	2021-10B October 15, 2021	2021-10C October 21, 2021	2021-10D October 29, 2021	Total
General Fund (01)	$285,572.82	$463,742.65	$81,833.33	$831,148.80
Sewer Fund (02)	462,569.95	7,685.97	2,208.68	472,464.60
Storm Sewer Management (04)	0.00	8,846.80	0.00	8,846.80
Capital Improvement Fund (05)	0.00	8,373.51	7,498.00	15,871.51
OPEB Fund (08)	0.00	121,278.44	0.00	121,278.44
Escrow Fund (10)	0.00	0.00	33,453.07	33,453.07
Investigation Fund (12)	178.40	0.00	0.00	178.40
Comm. Shade Tree Fund (15)	0.00	300.00	0.00	300.00
The Willows Fund (23)	0.00	375.14	0.00	375.14
GOB19 Project Fund (502)	0.00	6,110.00	1,660.00	7,770.00
Total Accounts Payable Disbursements	**$748,321.17**	**$616,712.51**	**$126,653.08**	**$1,491,686.76**
Grand Total	**$748,321.17**	**$616,712.51**	**$126,653.08**	**$1,491,686.76**

In addition to the accounts payable checks, the Township also makes various electronic payments including payroll, debt service, credit card purchases and fees from time to time which are not reflected in the attached table.

The Administration has adopted various internal control and processing procedures to ensure that amounts obligated are within the budgetary limits established by the Board of Commissioners. Those procedures are monitored daily by members of the Finance Department and responsible employees of the various departments. The amounts included in the table above have been scrutinized as part of the internal control and processing procedures and have obtained the required approvals prior to disbursement.

If you should have any questions, please contact the Finance Department.

Respectfully Submitted,

Robert V. Tate, Jr.
Finance Director

TOWNSHIP OF RADNOR
Minutes of the Special Board of Commissioners Meeting of September 30, 2021

The Radnor Township Board of Commissioners met via Zoom at approximately 6:40 pm

Commissioners Present
Jack Larkin, President *Moira Mulroney, Vice President* *Lisa Borowski*
Cathy Agnew *Sean Farhy* *Richard Booker* *Jake Abel*

Also Present: *William White, Township Manager, Robert Tate, Director of Finance, Amy Lacey, Assistant Director of Finance, Tammy Cohen, Director of Parks and Community Programming, Steve Norcini, Township Engineer, Ricky Foster, Jr., Public Works Director, Peggy Hagan, Executive Assistant to the Township Manager.*

Not Present*:*

President Larkin called the meeting to order and led the assembly in the Pledge of Allegiance.

1. Public Participation

Jim Higgins – Former Commissioner – He is concerned about children playing on the playground equipment in the heat and the need for sunshades. He also asked about the funds from the 2015 Bond Ordinance.

2. Community Organizations Funding

Bill White, Township Manager, thanked the Board for taking the time to meet on the budget. Bob Tate, Director of Finance, spoke on Community Organizations Funding, Capital and OPEB Funding.

Mr. Tate presented the 2021 Approved Budget amounts and the 2022 requested amounts, along with a tie-in to mileage, noting the mileage tie in is a potential concept for carving out specific funds for Community Organizations.

There was discussion among Commissioners and Staff. The discussion included breaking out the Fire Companies and Library from the Community Groups, placing the community funding mileage on the real estate tax bill, money available in the budget to fund community organizations, 501c3 funding history, setting aside the Fire Companies, Senior Center and Library and have a scaled approach to decreasing funding to 501c3s, Federal Funding received, appreciation for the amount of detail sent in by the organizations with their requests, discussion on forgiving the Wayne Art Center debt to allow them to borrow on their asset and not have to come to the Township for future funding, incorporating other 501c3s with a competitive process and committee for selection process similar to a grant process.

Public Participation

Jane Gardner – Wayne Art Center - She noted that the ask for $100,000 for the roof can be deferred.

Eamon Brazunas - Radnor Fire Company – He spoke on the funding and noted the additional $74,000 requested includes $20,000 for capital items and $54,000 to fund 1/3 of the cost for 2 full-time positions that are dedicated to firefighting. The full-time positions were acquired with a four-year grant.

Danny Kincade – Bryn Mawr Fire Company - He stated that they submitted an incorrect number for funding, the number originally submitted was $183,036 and should have been $213,000.

There was further discussion among Commissioners and Staff with a note to Staff to keep last year's community organization numbers in the working budget until a decision has been made on the funding for 2022.

3. Capital Funding Discussion

Bill White, Township Manager, presented types of capital, departmental, general, sanitary sewer, and stormwater, possible funding concepts, and 2022 recommendations addressing immediate needs.

There was discussion among Commissioners and Staff including the hiring of staff to do facility maintenance, setting parameters and criterial to vet and prioritize projects, projects including Township facilities, and Odorisio Park comfort station.

4. OPEB Funding Discussion

Bob Tate acknowledged the work CARFAC has done to tackle the OPEB challenge. Jay Osterholm, CARFAC member, spoke on the OPEB process and did not want to give a recommendation until they receive all information necessary from the actuary. There was discussion among Commissioners, Mr. Osterholm, and Staff.

5. Public Participation

None

Adjournment

There being no further business, the regular meeting adjourned on a motion duly made and seconded.

Respectfully submitted.

Peggy Hagan

TOWNSHIP OF RADNOR
Minutes of the Regular Board of Commissioners Meeting of October 18, 2021

The Radnor Township Board of Commissioners met via Zoom at approximately 6:52 pm
https://www.youtube.com/watch?v=ySL-8_7k5kg&t=5597s

Commissioners Present
Jack Larkin, President Moira Mulroney, Vice President Lisa Borowski
Cathy Agnew Sean Farhy Richard Booker Jake Abel

Also Present: *William White, Township Manager, Colby Grim, Township Solicitor, Robert Tate, Director of Finance, Steve Norcini, Township Engineer, Roger Phillips, Engineer, Damon Drummond, Traffic Engineer, Ricky Foster, Jr., Public Works Director, Molly Gallagher, Public Information Officer, Peggy Hagan, Executive Assistant to the Township Manager.*

President Larkin called the meeting to order and led the assembly in the Pledge of Allegiance.

President Larkin gave Notice of an Executive Session, held prior to the October 18, 2021 Board of Commissioners Meeting, to discuss personnel and real estate issues.

1. Public Participation

Heather Gill – She had rebuttal remarks to Commissioner Agnew's comments from the September 13, 2021, Board of Commissioners Meeting. She spoke in approval of Resolution 2021-25, presented photos, and spoke on an incident at Porch Fest on September 11, 2021.

Kate Hart – 520 Meadowbrook Circle – She completed Ms. Gill's statement.

Bryan Johnson of 227 Radnor Street Road – He spoke on the Concordia Development and is in favor. He also spoke on the Development process to include architectural features and design.

Matt Marshall – He spoke on interaction of Concordia Group and the neighborhood. Would like neighborhood interaction for all future developments. He also spoke on the intensity of the Board of Commissioners on specific items.

Angie Mitchell, owner of Garrett Hill Ale House and Flip and Bailey's – She commented on the proposed Garrett Hill Overlay district changes. She is asking for Outdoor Dining in Garrett Hill.

Dan Sherry – He spoke on President Larkin's meeting procedure and Commissioner Farhy's response to it.

Angela Kennedy of 526 Highland Court – She spoke on funding for refurbishing Odorisio Park.

Sumanth Joseph – He described how his neighbor was approached to get signatures for a petition.

Clark Engle – 346 Conestoga Road – He spoke on Commissioner Agnew's behavior at Porch Fest.

2. Consent Agenda

a) Disbursement Review & Approval

b) Approval of Minutes of the Board of Commissioners Meeting of September 13, 20, 21, 2021

c) HARB 2021-18 - 201 Walnut Avenue – New Garage

d) HARB 2021-19 – 319 St Davids Road – Garage Door Replacement with Framed Opening also includes New Main Door

e) ~~Resolution 2021-112 – Adopting a Volunteer Firefighter Tax Credit Program~~

f) Motion to Authorize the receipt of sealed bids for the purchase of gasoline and diesel fuel for 2022

g) Resolution 2021-114 - Authorizing the Engineering Department to Receive Sealed Bids for the Malin Road Culvert Replacement Project

h) Resolution 2021-115 - Authorizing the Engineering Department to Receive Sealed Bids for the Gulph Creek (at 210 Gulph Creek Road) Bank Restoration Project

i) Resolution 2021-117 - Appointing Douglas Meder, SEO as Primary Sewage Enforcement Officer and James Bevin, SEO [Herbert E. MacCombie Jr., PE, Consulting Engineers] as Alternate Sewage Enforcement Officer

President Larkin asked if any Commissioners would like to remove and item(s) from the Consent Agenda. Commissioners Borowski, Booker, and Farhy asked for item 2 e) to be removed from the Consent Agenda.

e) Resolution 2021-112 – Adopting a Volunteer Firefighter Tax Credit Program

President Larkin moved to approve Resolution 2021-112, seconded by Commissioner Borowski.

Bill White, spoke on the Resolution and its incentive for Volunteers. Township Staff worked with Radnor, Bryn Mawr, and Broomall Fire Chiefs. The program is a stipend not a tax credit program.

There was discussion among Commissioners and Staff. Commissioner Larkin called the vote, the motion passed 6 to 1 with Commissioner Booker against.

President Larkin moved to approve the balance of the Consent Agenda, items 2 a), b), c), d), f), g), h), i), seconded by Commissioner Mulroney. The motion passed unanimously.

3. Committee Reports

*A. Ordinance 2021-09 – **(Adoption)** - Concordia (Eagle and Radnor Rd) – Zoning Map Amendment (Advertised Public Hearing)*

B. Resolution 2021-99 – Concordia (Eagle and Radnor Rd) – Request of Preliminary/Final Land Development Plan

David Falcone, Saul Ewing, spoke on the Zoning Map Amendment and the request for Preliminary/Final Land Development Plan.

President Larkin asked to discuss Ordinance 2021-09 and Resolution 2021-99 at the same time and allow for public comment on both.

There was discussion among Commissioners and Staff, including discussion of future stormwater maintenance, installation of sidewalk, tree(s) planting, effect on School District, traffic study, installation of a trail, moving lots 4 and 5 to align with lot 3, and sidewalk/bridge installation.

Public Comment

Brian Johnson – 227 Radnor Street Road – He thanked Concordia for working with the neighbors and noted there is a consensus that it is a good plan. He would like the Commissioners to consider maintaining architecture within the Township.

Patty Conlin – 250 Radnor Street Road – She appreciates all the work Concordia has done with the neighbors.

Matt Marshall – 228 Walnut Ave – He would like the Commissioners to consider the name of the street so as to not create confusion, consider donating bushes and trees to Township parks, strict adherence to construction regulations and hours of construction, installation of a 4 to 6 ft wind screen, and to consider a trail to Walnut Avenue. He also spoke on the need to change the notice parameters.

Baron Gemmer – He applauds Concordia for reaching out to neighbors and spoke on the possibility of a by-right trail.

President Larkin moved to amend the Land Development Application adding the condition, that has been agreed to by the Applicant, to move lots 4 and to 5 to align with lot 3, seconded by Commissioner Borowski. The motion passed 7-0.

There was continued discussion among Commissioners, Applicant, and Staff.

Commissioner Booker moved to add a condition to adding a hiking trail be placed on the site, location to be determined, seconded by Commissioner Farhy. The motion failed 2-5 with Commissioners Larkin, Borowski, Mulroney, Abel, and Agnew against.

The Board asked the Applicant to explore putting a trail on the site, the Applicant agreed.

Public Comment

Matt Marshall - He spoke on Ardrossan and the lack of public access and a trail. He also spoke

on construction dust from project.

Dan Sherry – Spoke on an article written about Ardrossan and the lack of public access.

Patty Conlin – She stated the neighbors would like the bridge expanded with the sidewalk built into it.

President Larkin called the vote for the Adoption of Ordinance 2021-09, which was approved with a vote of 6-1, with Commissioner Booker against.

The Applicant asked for a waiver or credit from the Parks and Recreation Fee in that the sidewalk installation be in lieu of the Parks and Recreation Fee or a credit. There was discussion among Commissioners, Applicant, and Staff.

Commissioner Booker moved to table the land development application, seconded by Commissioner Farhy. The motion failed 3-4 with Commissioners Larkin, Borowski, Mulroney and Agnew against.

There was continued discussion among Commissioners, Applicant, and Staff.

President Larkin called the vote to approve Resolution 2021-99, the vote passed 6-1 with Commissioner Booker against.

C. Bond Refunding Opportunity

a. Ordinance 2021-12 (Introduction) – Authorizing the advance refunding of the Series 2013B in the aggregate principal amount not to exceed $15,500,000

Commissioner Larkin moved to Introduce Ordinance 2021-12, seconded by Commissioner Borowski.

Bob Tate, Director of Finance, spoke on Ordinance 2021-12 and Resolutions 2021-123 and Resolution 2021-124. There was discussion among Commissioners and Staff.

President Larkin called the vote, the motion to Introduce Ordinance 2021-12 passed 5-0 with Commissioners Mulroney and Abel of the dais.

b. Resolution 2021-123– Engaging PFM to provide financial consulting services for the advance refunding of the Series 2013B Bonds

President Larkin moved to approve Resolution 2021-123, seconded by Commissioner Borowoski. There was discussion among Commissioners and Bond Counsel, and Staff.

President Larkin called the vote, the motion passed 6-1 with Commissioner Abel off the dais.

c. Resolution 2021-124 – Engaging Cozen O'Connor as Bond Counsel for the advance refunding of the Series 2013B Bonds

President Larkin moved to approve Resolution 2021-124, seconded by Commissioner Borowski.

President Larkin called the vote, the motion 6-1 with Commissioner Abel off the dais.

D. 904 Drexel Lane -Waiver of the Stormwater Management Ordinance

The Applicant's Engineer spoke on the request for waiver. There was discussion among Commissioners, Applicant, and Staff.

Commissioner Mulroney moved to table, seconded by Commissioner Booker. The motion to table passed 6-1 with Commissioner Farhy against.

E. 123 Hickory Lane – Waiver of the Stormwater Management Ordinance

Andrew Allen, contractor for Applicant, spoke on the request for waiver. There was discussion among Commissioners, Applicant, and Staff.

Commissioner Booker moved to table, seconded by Commissioner Mulroney. The motion passed 5-2 with Commissioners Farhy and Larkin against.

*F. Ordinance 2021-07 – (**Adoption**) – Amending Chapter 280 of the Radnor Township Code, Zoning Ordinance, by permitting an increase in building height in the Garrett Hill Neighborhood (GH-N) and Garrett Hill Garrett Avenue (GH-GA) Districts. In addition, outdoor dining would be permitted in the Garrett Hill Conestoga Road (GH-CR) District.*

President Larkin moved to adopt Ordinance 2021-07, seconded by Commissioner Farhy.

Commissioner Farhy spoke on the Ordinance and communication/transparency with the neighbors. There was discussion among Commissioners and Staff.

It being 10:59 pm, President Larkin moved to extend the meeting thirty minutes, seconded by Commissioner Mulroney. The motion passed unanimously.

Public Comment

Sara Pilling – She spoke on the background on Garrett Avenue

Dan Sherry – He spoke on Commissioner's Farhy data collection and the comments of the other Commissioners relating to the emails they received.

Roberta Winters – She spoke on petition submitted and list of shared values.

President Larkin called the vote, the motion failed 3-4 with Commissioners Larkin, Mulroney, Borowski, and Booker against**.**

*G. Ordinance 2021-11 – **(Adoption)** - Approving the First Amendment to Land Lease Agreement Between the Township of Radnor and Cellco Partnership D/B/A Verizon Wireless*

President Larkin moved to extend the meeting 30 minutes, seconded by Commissioner Mulroney. The motion passed 7-0.

Bob Tate, Director of Finance, introduced Steve Giancristoforo who spoke on the amendment to the Land Lease between Radnor Township and Cellco Partnership D/B/A Verizon Wireless. There was discussion among Commissioners and Staff.

President Larkin called the vote, the motion passed 6-1 with Commissioner Booker against.

H. Resolution 2021-125 – Resolution of Admonishment and Censure of Interim Commissioner, Catherine Agnew

Commissioner Booker moved to approve Resolution 2021-123, seconded by Commissioner Abel.

Commissioner Booker stated that the Resolution was brought to him by Heather Gill. He spoke on the incident at Porch Fest. Commissioner Agnew responded to Commissioner Bookers comments. There was discussion among Commissioners.

Public Comment

Heather Gill – Stated she did not know the Porch Fest rules and spoke on Commissioner Agnew's behavior.

At 11:58 pm President Larkin moved to extend the meeting, seconded by Commissioner Booker. The motion passed 7-0.

Sue McFarland Metzger - She spoke in support of Cathy Agnew and Porch Fest.

Dan Sherry – He spoke on Commissioners behavior and speaking when there is a conflict of interest.

Annie Webb – She said the Porch Fest incident was a neighborhood disagreement and is

disappointed it was brought to the Board of Commissioners.

Angie Mitchell - Flip and Baileys – She was upset that the Garrett Hill Overlay changes were not adopted.

Commissioner Abel moved to watch a video of the incident at Porch Fest, seconded by Commissioner Booker. The motion failed for lack of majority.

Commissioner Able moved to table the item, the motion failed for lack of a second.

President Larkin called the vote, the motion failed 4-1 with Commissioner Booker against, and Commissioner Abel abstaining.

4. Reports of Standing Committees

None

5. Old Business

Commissioner Booker asked about OPEB funding and the report CARFAC requested. Bill White, Township Manager, noted the information was requested of the actuary. Commissioner Booker asked to put the item under Old Business for the October 25, 2021 meeting.

6. New Business

a. PECO contractor incident. (Commissioner Farhy)

Commissioner Farhy asked that the item be tabled to the October 25, 2021 meeting.

7. Public Participation

Dan Sherry – He commented on alleged misconduct of Commissioners.

There being no further business, the regular meeting adjourned on a motion duly made and seconded.

Respectfully submitted.

Peggy Hagan

DESIGNATION OF AGENT

RESOLUTION 2021-134

BE IT RESOLVED BOARD OF COMMISSIONERS **OF** RADNOR TOWNSHIP
(Governing Body) **(Public Entity)**

THAT WILLIAM M WHITE, TOWNSHIP MANAGER
(Name) **(Title)**

is hereby authorized to execute for and in behalf of

RADNOR TOWNSHIP, DELWARE COUNTY,

a public entity established under the laws of the Commonwealth of Pennsylvania, all required forms and documents for the purpose of obtaining financial assistance for the Hazard Mitigation Grant Program (HMGP) or the Pre-Disaster Mitigation (PDM) program under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288 as amended by Public Law 100-707) or the Flood Mitigation Assistance (FMA) program, Repetitive Flood Claims (RFC) program or Severe Repetitive Loss (SRL) program under the National Flood Insurance Act of 1968 (42 U.S.C. 4001 et seq), National Flood Insurance Reform Act of 1994 (Public Law 103-325) and the Flood Insurance Reform Act of 2004 (Public Law 108-264), as pertains to federal mitigation grant programs indicated below (check all that apply):

☐ HMGP ☒ PDM/BRIC ☐ FMA ☐ RFC ☐ SRL

Passed and approved this 8TH day of NOVEMBER, 2021.

CERTIFICATION

I, JACK LARKIN, duly appointed and PRESIDENT
(Name) (Title)

of RADNOR TOWNSHIP, do hereby certify that the above is a true and correct copy of
(Public Entity)

a resolution passed and approved by the BOARD OF COMMISSIONERS
(Governing Body)

of RADNOR TOWNSHIP on the 8TH day of NOVEMBER 2021.

(Signature) (Official Position) (Date)

Radnor Township

PROPOSED LEGISLATION

DATE: October 29, 2021

TO: Board of Commissioners

FROM: Stephen F. Norcini, P.E., Township Engineer

LEGISLATION: Resolution 2021-134 -Authorization to apply for Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance Program, Building Resilient Infrastructure and Communities (BRIC), for the South Wayne Municipal Parking Lot Flood Reduction Project ("Project") in the amount up to $2,390,182.50 (25% non-federal matching funds are required for this Grant) and the appointment of Township Manager William White as the Township's authorized agent for administration and execution of all necessary documents for federal and state funding from FEMA and Pennsylvania Emergency Management Agency (PEMA). Township Staff will administer and prepare the necessary grant documentation in cooperation with Meliora Design (the Architectural Firm designing, administrating, and overseeing of the planning and development of the Project) and will coordinate the project if approved by the Board of Commissioners and subsequent granting authorities.

LEGISLATIVE HISTORY: This is the first legislative action associated with this grant application.

PURPOSE AND EXPLANATION: Radnor Township has the opportunity to execute a grant application through the FEMA Hazard Mitigation Assistance Program for FY 2021, specifically Building Resilient Infrastructure and Communities program, due to the scope and nature of the severe flooding in the South Wayne Area of the Township.

The proposed project will reduce localized flooding, including the construction of a subsurface stormwater management system (SMS) under an existing parking lot located within the Wayne residential community as well as the construction of a stormwater conveyance system (SCS) connecting an existing pipe network to new inlets and pipes so that the system can convey the runoff to an existing, under-utilized SMS a short distance away. The parking lot will be revitalized to include safety amenities such as lighting, landscape, safe access from both Township and PennDOT streets, and driveways with curbing typical of most municipal parking lots. Driveway aprons, curbs and an inlet in front of the firehouse will be improved and provide further control of stormwater flow.

FISCAL IMPACT: There is no direct fiscal impact or financial obligation to authorizing the execution of a grant application to FEMA for the Project. The Township will only accept the terms of the proposed BRIC grant, in the event that it is awarded, upon approval by the Board of Commissioners at a future meeting. The Township will be requesting $2,390,182.50 from FEMA; if awarded, it is anticipated that the BRIC Grant would require a 25% match of the total project cost in the amount of $796,727.50. The anticipated total project cost is $3,186,910.00.

RECOMMENDED ACTION: The Administration respectfully requests the Board to approve Resolution #2021-134 authorizing the execution of a Building Resilient Infrastructure and Communities grant through the FEMA Hazard Mitigation Assistance Program for South Wayne Municipal Parking Lot Flood Reduction Project and the appointment of Township Manager William White as the Township's authorized agent for administration and execution of all necessary documents.

RESOLUTION NO. 2021-132

A RESOLUTION OF THE TOWNSHIP OF RADNOR, DELAWARE COUNTY, COMMONWEALTH OF PENNSYLVANIA, AUTHORIZING THE SELECTION OF ZELENKOFSKE AXELROD LLC AS THE CERTIFIED PUBLIC ACCOUNTING FIRM FOR THE YEARS 2021, 2022 AND 2023

WHEREAS, the Radnor Home Rule Charter Chapter §7.13 requires [in part] that "The Board of Commissioners shall provide for an independent annual audit of township receipts, expenditures, accounts and reports by Pennsylvania certified public accountant or a certified public accounting firm…"; and

WHEREAS, the Township solicited for and received qualifications from three different public accounting firms; and

WHEREAS, the Administration and the Audit Subcommittee of the Citizens Audit Review and Financial Advisory Committee (CARFAC) have reviewed the qualifications and recommend the selection of Zelenkofske Axelrod LLC (ZA) for the audit years 2021, 2022, and 2023.

NOW, THEREFORE, be it ***RESOLVED*** by the Board of Commissioners of Radnor Township does hereby authorize the selection of Zelenkofske Axelrod LLC to serve as independent auditors for Radnor Township for the audit years 2021, 2022, and 2023 at the following annual prices inclusive of the cost of a Federal Single Audit as federal grant revenues will exceed $500,000 for 2021 and expected for 2022.

	2021	**2022**	**2023**
ZA Audit Fees	$32,000	$32,000	$30,000

SO RESOLVED, at a duly convened meeting of the Board of Commissioners of Radnor Township conducted on this 8th day of November, 2021**.**

RADNOR TOWNSHIP

BY: _____

Name: Jack Larkin
Title: President

ATTEST: _____

Name: William M. White
Title: Township Manager / Secretary

Radnor Township

PROPOSED LEGISLATION

DATE: November 8, 2021

TO: **Board of Commissioners**

FROM: **Robert V. Tate, Jr.,** Finance Director

LEGISLATION: A resolution authorizing the Board of Commissioners to select Zelenkofske Axelrod LLC as the Township's independent auditors for the audit years 2021, 2022 and 2023.

PURPOSE AND EXPLANATION: Radnor Township Home Rule Charter Chapter §7.13, requires that "The Board shall provide for an independent annual audit of township receipts, expenditures, accounts and reports by a Pennsylvania certified public accountant or certified public accounting firm…" Chapter §7.13 also mandates that "The Board shall review the work of such auditor annually and, at intervals not to exceed three (3) years, shall obtain proposals for future audits from at least two (2)other qualified firms for comparison with the incumbent auditor's proposal."

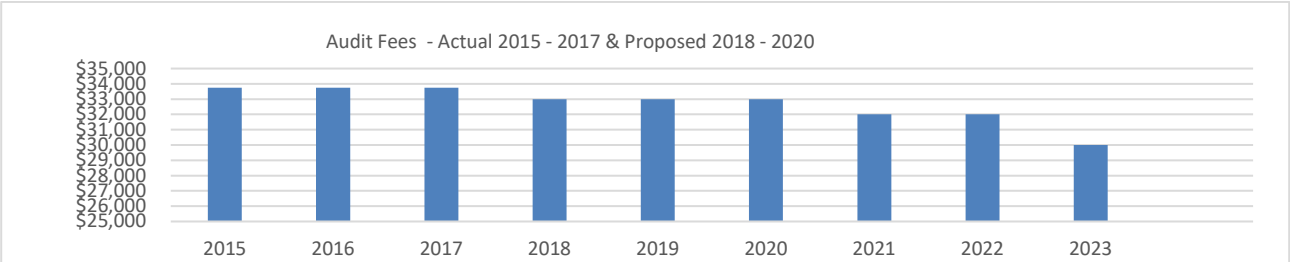
At the Board's direction, the Administration solicited for Proposals from qualified accounting firms. The Township received three proposals that were due on September 24, 2021. The Administration worked with Ed Caine, the CARFAC audit subcommittee representative, to review all proposals, discuss and evaluate the responses from each of the firms and conduct follow up calls to get clarity on elements of the bid that may have not been clear in the respondents proposals.

The Administration and CARFAC audit subcommittee, after a thorough review of the proposals by the CPA firms that submitted based upon the Township's RFP. After a full review of the qualifications, the fee proposed and experience working with a number of the firms, it is our unanimous recommendation that Zelenkofske Axelrod LLC (ZA) be retained for the next three years.

FISCAL IMPACT: The engagement is proposed at amounts shown below along with the amounts paid during the prior engagement period:

	Prior Engagement – Actual			Prior Engagement - Actual			Next Engagement - Proposed		
	2015	2016	2017	2018	2019	2020	2021	2022	2023
Audit Fees	$33,750	$33,750	$33,750	$33,000	$33,000	$33,000	32,000	32,000	30,000

(note: Years 2021 and 2022 include a Federal Single Audit)



RECOMMENDED ACTION: The Administration respectfully requests the Board to adopt this Resolution at the November 8, 2021 Board of Commissioner Meeting.

Radnor Township

PROPOSED LEGISLATION

DATE: November 8, 2021

TO: **Board of Commissioners**

FROM: **Robert V. Tate, Jr.,** Finance Director

LEGISLATION: A motion authorizing the settlement agreement "2021-BPT-01" in the amount of $110,500.

LEGISLATIVE HISTORY: Beginning in 2010, the Township implemented a policy that requires Board approval of all settlement agreements relating to Act 511 tax cases to help bring as much transparency to the process as legally allowed. Please note that:

> Radnor Township may enter into a settlement agreement concerning a business tax assessment. The agreement may (1) establish a mutual understanding of certain issues, such as prospective taxability and calculation of tax; (2) compromise an assessment amount; and/or (3) avoid or end litigation. If an agreement involves an assessment of more than $3,000, the Board of Commissioners must consider it at a public meeting.
>
> The Pennsylvania Local Taxpayers Bill of Rights Act (Act 50 of 1998) prohibits disclosure of any confidential taxpayer information (except for official purposes or as provided by law). Confidential taxpayer information is defined as any information acquired by the Township as a result of any audit, tax return, report, investigation, hearing or verification. Punishments for unlawful disclosure may include a $2,500 fine, imprisonment for one year and, if the offender is an officer or employee of a taxing authority, dismissal from office or discharge from employment.
>
> For these reasons, the Township will not disclose any confidential taxpayer information in connection with a settlement agreement of a business tax assessment.

PURPOSE AND EXPLANATION: The Administration and Act 511 auditors and attorneys have worked together with the taxpayer over the past several months to develop a settlement that is beneficial to the Township by addressing three concerns: (1) that the tax laws of the Township are recognized and followed, (2) that the settlement results in a fair assessment of the tax liability, and (3) take into consideration the cost of further legal action in light of the amount of tax revenue owed (i.e. the cost vs. benefit analysis).

FISCAL IMPACT: The Taxpayer has agreed to pay $110,500 to resolve all outstanding issues relating to the BPT liability for tax, interest and penalty for all tax years included in the settlement agreement. The taxpayer will pay the full amount of $110,500 on or before December 15, 2021 following the approval of the settlement agreement being authorized by the Board of Commissioners.

RECOMMENDED ACTION: The Administration respectfully requests the Board of Commissioners to pass the motion authorizing the Tax Settlement Agreement at the November 8, 2021 regular Board of Commissioner meeting.

RADNOR TOWNSHIP

ENGINEERING DEPARTMENT

Memorandum

To: Radnor Township Board of Commissioners

From: Stephen F. Norcini, PE, Township Engineer

CC: William M. White, Township Manager

Date: November 2, 2021

904 Drexel Lane – Stormwater Waiver Request, GP #204215

The applicant is proposing to construct a 4,769 SF single-family dwelling, 606 SF of walkways, 2,197 SF of patios/decks, and a 2,341 SF driveway, for a total of 9,913 square feet of new impervious surface at 904 Drexel Lane.

The applicant's lot does not meet the Township's infiltration requirements, in fact infiltration is zero. The Stormwater Management Ordinance requires the applicant to request a waiver from the Commissioners when they are unable to provide groundwater infiltration.

The applicant appeared before the Board of Commissioners at the October 25th Board meeting. At that time, the Commissioners requested that the applicant provide additional measures to mitigate their inability to infiltrate runoff. The applicant has made considerable changes to the plan [attached] and will present said plan to the Commissioners.

301 IVEN AVENUE, WAYNE PA 19087
T 610-688-5600, EXT. 130

YOHN ENGINEERING, LLC
555 Second Avenue, Suite B-205
Collegeville, PA 19426-3674
610-489-4580
www.yohnengineering.com

August 24, 2021

Mr. Stephen F. Norcini, PE
Radnor Township
301 Iven Avenue
Wayne, PA 19087

RE: 904 Drexel Lane – Stormwater Management Permit Plans **File No. 17-086**
Radnor Township, Delaware County

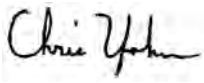
Mr. Norcini,

In conjunction with a Stormwater Management Permit at the above referenced site the Applicant would like to request a waiver of the following code section:

- §245-22 - To provide groundwater recharge – Double Ring Infiltrometer Testing was performed in several locations on the site in order to verify the characteristics of the existing soils and limiting zones. Tests indicated a limiting zone at 1 to 4 feet deep due to mottling and zero infiltration, which was unfortunately, likely, due to the proximity to Meadowbrook Run, which traverses west of the site as well as the associated floodplain. Due to the shallow limiting zone, a rain garden is proposed and although infiltrating the net 2-year volume was unachievable, ½ inch over the proposed impervious was provided below the lowest orifice. Additionally, the Applicant is proposing the installation of four shade trees not required by the Shade Tree Commission in order to provide additional water quality on the site.

Please call with any questions or concerns or if you require any additional information.

Regards,
Yohn Engineering, LLC



Christopher C. Yohn, P.E., CPESC
17086L01_RT.docx

Impervious Surface

Complete the impervious surface table (required).

Location: 904 Drexel Lane

Project Description: Single Family Dwelling

Gross Lot Area 58,999 **Sq. Ft.**

To be Completed by Radnor Township

Permit Number: _____

Submission Date: _____

Shade Tree Approval Date: _____

Final Approval Date: _____

Zoning Approval: _____
Zoning Officer

Grading Permit Approval: _____
Township Engineer

Complete All Yellow Fields						
Cover Type	Existing Area (square feet)	Percentage of existing impervious surface area of your lot	Area of Impervious Removed (square feet)	Area of Added Impervious Cover (square feet)	Total Area (square feet)	Percentage of total impervious surface of your lot, as proposed
Building	2662		2662	4769	4769	
Walkway/sidewalk	343		343	606	606	
Patios, decks	0		0	2197	2197	
Driveway	1871		1871	2341	2341	
Other	528		528	0	0	
Total	5404	9.2 %	5404	9913	9913	18.4 %

Estimated Cubic Yards of Dirt Involved 2000 **Will this fill be taken off site** ___**Yes** ✓ **No**

Number of trees to be removed (over 6" in diameter) 3 **Is Property in Historical District** ___**Yes** ✓ **No**

Place a check in the box of the Zoning District applicable to your lot. (required)

Zoning Table								
Zoning District	Maximum Impervious Cover (%)		Zoning District	Maximum Impervious Cover (%)		Zoning District	Maximum Impervious Cover (%)	
R-1	22	✓	CO 2,3 stories	50		GH_CR	95	
R-2	30		C1	60		GH-BC	50	
R-3	35		C-2	70		GH-OS	15	
R-4	40		C-3	65		WBOD	NA	
R-5 Semi/2 family detached	40		PI	45		PB	55	
R-5 Multi Dwelling	36		PA	50		PLO	55	
R-6	70		GH-N	60		FC	NA	
R-IA	30		GH-GA	80		PLU	45	

Serial Number: 2021–104–5311

CALL BEFORE YOU DIG!

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Pennsylvania One Call System, Inc.
1–800–242–1776

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REFERENCE PLANS:
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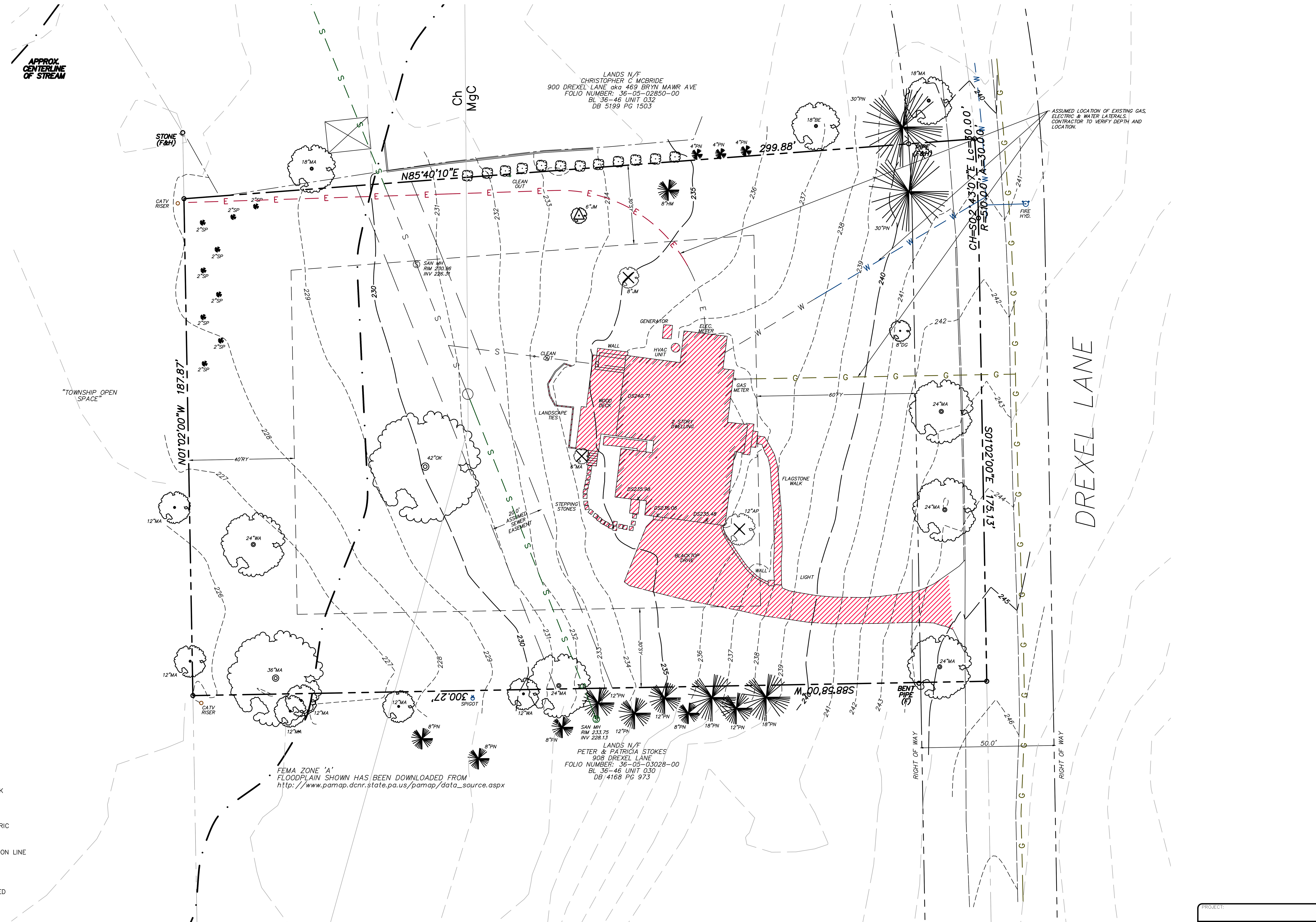

LOCATION MAP
SCALE: 1" = 2,000'

ZONING DATA R1:(SINGLE FAMILY DISTRICT)	REQUIRED
MINIMUM LOT AREA PER FAMILY	1.0 AC
MINIMUM LOT WIDTH	120 FT
MINIMUM FRONT YARD	60 FT
MINIMUM SIDE YARD EACH	25 FT
MINIMUM SIDE YARD AGGREGATE	60 FT
MINIMUM REAR YARD	40 FT
MAXIMUM BUILDING HEIGHT	35 FT
MAXIMUM BUILDING COVERAGE	15%
MAXIMUM IMPERVIOUS COVERAGE	22%

FOR MORE DETAILED INFORMATION REFER TO THE ZONING CODE OF RADNOR TOWNSHIP, LATEST EDITION.

EXISTING LOT DATA:

RECORD OWNER:	MARK & LILIAN WANG 904 DREXEL LANE BRYN MAWR, PA 19010
PARCEL ID:	36–05–03029–00
TAXMAP ID:	36–46–031
DEED BOOK & PAGE NO:	5170 & 1043
GROSS LOT AREA:	58,999 SF (1.3544 AC)
NET LOT AREA:	53,888 SF (1.2371 AC)

EXISTING IMPERVIOUS COVERAGE:

BUILDING	2,662 SF (4.5%)
WALKWAY/SIDEWALK	343 SF
PATIOS, DECKS	0 SF
DRIVEWAY	1,871 SF
OTHER	528 SF
TOTAL	5,404 SF (9.2%)

LINETYPE LEGEND
- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING BUILDING SETBACK
- X — EXISTING FENCE
- 379 — EXISTING 1' CONTOUR
- 380 — EXISTING 5' CONTOUR
- // — EXISTING OVERHEAD ELECTRIC
- E — EXISTING ELECTRIC LINE
- G — EXISTING GAS LINE
- T/C — EXISTING TELECOMMUNICATION LINE
- W — EXISTING WATER LINE
- S — EXISTING SANITARY LINE
- ST — EXISTING STORM PIPES
- IMPERVIOUS TO BE REMOVED
- 14%–20% SLOPES
- >20% SLOPES

SOILS INFORMATION					
SYMBOL	NAME	%SLOPE	HYDROLOGIC GROUP	DEPTH TO SH WATER	DEPTH TO BEDROCK
Ch	CHEWACLA SILT LOAM	NOT RATED	B	1.50	6.6+
MgC	MANOR LOAM	8 TO 15 PERCENT SLOPES	B	6.6+	7.11

NOTES: IF THE PROPOSED EROSION AND SEDIMENTATION CONTROL MEASURES ARE INSTALLED AND MAINTAINED PROPERLY, NO UNFORESEEN SOIL LIMITATIONS OR PROBLEMS ARE LIKELY. NEVERTHELESS, IF A PROBLEM DOES DEVELOP, THE DEVELOPER MUST TEMPORARILY SEED AND MULCH THE DISTURBED AREA. SUITABLE TOPSOIL SHALL BE IMPORTED TO SITE IF INADEQUATE QUANTITIES OF SUITABLE TOPSOIL EXIST ON SITE. ADEQUACY OF SOIL TO BE DETERMINED BY SITE GEOTECHNICAL ENGINEER IN CONJUNCTION WITH THE LANDSCAPE ARCHITECT. SOIL AMENDMENTS SHALL BE ADDED AS REQUIRED. ALL UNSUITABLE MATERIAL SHALL BE DISPOSED OF PROPERLY. SITE GEOTECHNICAL ENGINEER SHALL ALSO BE CONSULTED DURING WINTER GRADING OPERATIONS.

TREES TO BE REMOVED:
6" MAPLE 8" JAPANESE MAPLE 12" APPLE

TREE REPLACEMENT FORMULA:

6 – 18 INCH DBH REMOVED	=	1 REPLACEMENT TREE
19 – 29 INCH DBH REMOVED	=	3 REPLACEMENT TREES, 2 BEING LARGE CANOPY TREES
30 INCH DBH & GREATER REMOVED	=	6 REPLACEMENT TREES, 4 BEING LARGE CANOPY TREES

TOTAL TREES BEING REMOVED:

6 – 18 INCH DBH	=	3
19 – 29 INCH DBH	=	0
30 INCH DBH & GREATER	=	0
TOTAL	=	3

REPLACEMENT TREES REQUIRED:

6 – 18 INCH DBH	=	3 TREES X 1	= 0 REPLACEMENT TREES
19 – 29 INCH DBH	=	0 TREE X 3	= 0 REPLACEMENT TREES
30 INCH DBH & GREATER	=	0 TREES X 6	= 0 REPLACEMENT TREES
TOTAL			= 0 REPLACEMENT TREES

NO REPLACEMENT TREES ARE REQUIRED BECAUSE LESS THAN SIX TREES ARE PROPOSED TO BE REMOVED.

SHOULD ANY ADDITIONAL TREES BE REMOVED, ADDITIONAL REPLACEMENT TREES SHALL BE PROVIDED IN ACCORDANCE WITH THE RADNOR TOWNSHIP ORDINANCE No. 2012–05.

SCALE: 1" = 20'

REV	DATE	COMMENTS
3	10/26/21	STORM
2	08/24/21	TWP ENG
1	08/16/21	TWP ENG

SEAL: COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL CHRISTOPHER C. YOHN ENGINEER PE073703

PROJECT: SINGLE FAMILY DWELLING
PROJECT ADDRESS: 904 DREXEL LANE, BRYN MAWR, PA 19010
MUNICIPALITY: RADNOR TOWNSHIP
COUNTY: DELAWARE COUNTY
PLAN SET: STORMWATER MANAGEMENT PERMIT PLAN SET
SHEET NAME: EXISTING CONDITIONS / DEMOLITION PLAN

PREPARED FOR:
OWNER / APPLICANT
MARK & LILIAN WANG
904 DREXEL LANE
BRYN MAWR, PA 19010

DATE:	JUNE 15, 2021
SCALE:	1" = 20'
ONE CALL NUMBER:	2021–104–5311
DRAWN BY:	CCY
PROJECT NUMBER:	17–086

PREPARED BY:
YOHN ENGINEERING, LLC
555 SECOND AVENUE, SUITE B–205
COLLEGEVILLE, PA 19426
610–489–4580
WWW.YOHNENGINEERING.COM

YOHN Engineering, LLC

Serial Number: 2021-104-5311

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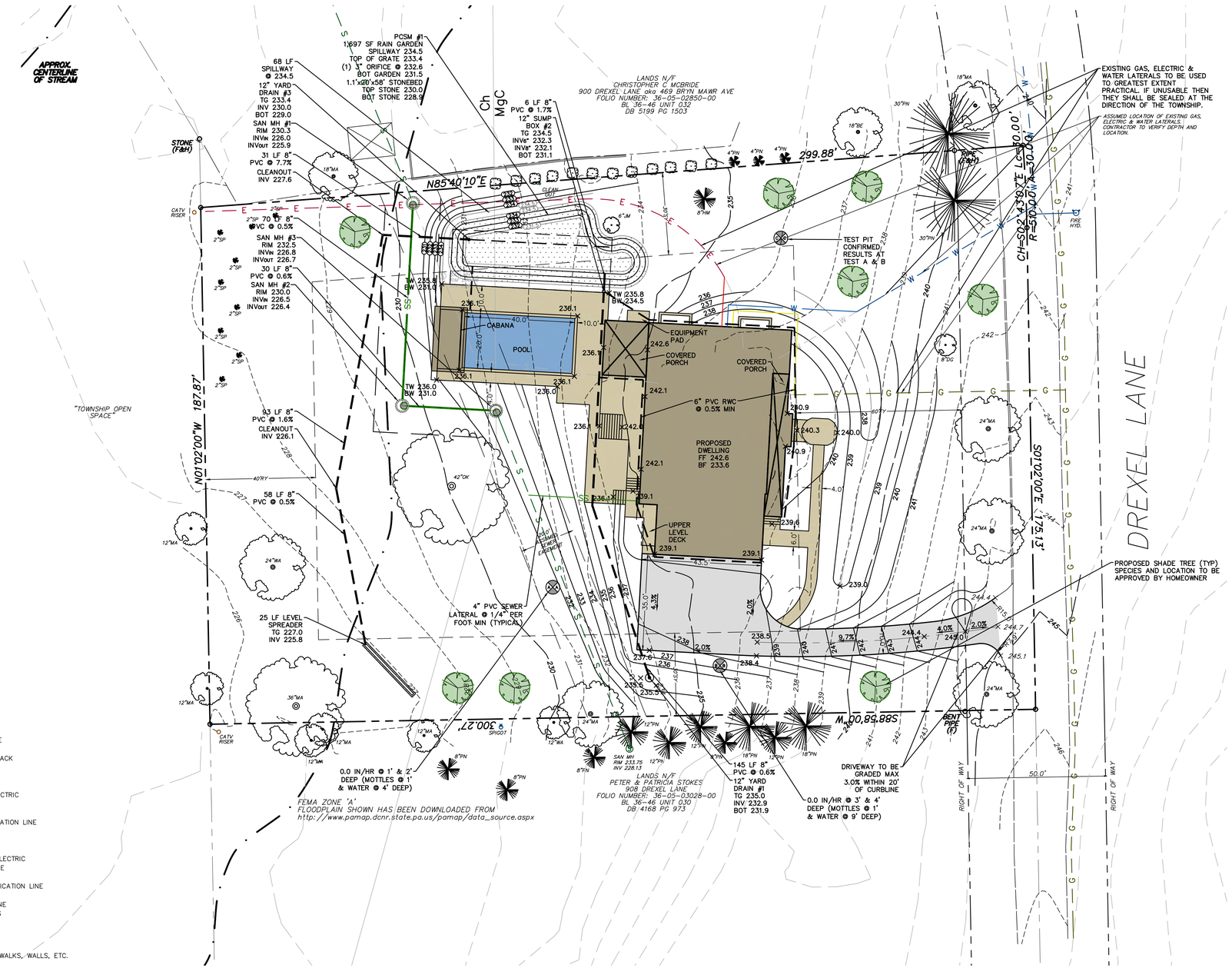

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- EXISTING ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING WATER LINE
- EXISTING SANITARY LINE
- EXISTING STORM PIPES
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- PROPOSED ELECTRIC LINE
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- PROPOSED WATER LINE
- PROPOSED SANITARY LINE
- PROPOSED STORM PIPES
- PROPOSED BUILDING
- PROPOSED DRIVEWAY
- PROPOSED IMPERVIOUS WALKS, WALLS, ETC.

SOILS INFORMATION					
SYMBOL	NAME	%SLOPE	HYDROLOGIC GROUP	DEPTH TO SH WATER	DEPTH TO BEDROCK
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LOCATION MAP
SCALE: 1" = 2,000'

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MINIMUM SIDE YARD EACH	25 FT	54.3 FT
MINIMUM SIDE YARD AGGREGATE	60 FT	110.0 FT
MINIMUM REAR YARD	40 FT	145.4 FT
MAXIMUM BUILDING HEIGHT	35 FT	<35.0 FT
MAXIMUM BUILDING COVERAGE	15%	8.1%
MAXIMUM IMPERVIOUS COVERAGE	22%	18.4%

FOR MORE DETAILED INFORMATION REFER TO THE ZONING CODE OF RADNOR TOWNSHIP, LATEST EDITION.

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WALKWAY/SIDEWALK	343 SF
PATIOS, DECKS	0 SF
DRIVEWAY	1,871 SF
OTHER	528 SF
TOTAL	5,404 SF (9.2%)

PROPOSED IMPERVIOUS COVERAGE:

BUILDING	4,769 SF (8.1%)
WALKWAY/SIDEWALK	606 SF
PATIOS, DECKS	2,197 SF
DRIVEWAY	2,341 SF
OTHER	0 SF
TOTAL	9,913 SF (18.4%)
NET INCREASE	4,474 SF (7.6%)
MAXIMUM IMPERVIOUS	12,980 SF (22.0%)

GENERAL NOTES:

1. THE INTENT OF THIS PLAN IS TO ILLUSTRATE THE CONSTRUCTION OF A NEW SINGLE FAMILY RESIDENCE.
2. THE STORMWATER MANAGEMENT FACILITIES HAVE BEEN DESIGNED FOR THE PROPOSED IMPERVIOUS COVERAGE (9,913 SF), FUTURE IMPERVIOUS (748 SF), AND IMPERVIOUS WITHIN THE RIGHT OF WAY (168 SF).
3. THE RESPONSIBILITY FOR THE CONTINUED MAINTENANCE AND OPERATION OF THE STORMWATER MANAGEMENT SYSTEMS AND OTHER ASSOCIATED FACILITIES WILL BE THE OBLIGATION OF THE PROPERTY OWNER.
4. THE DEVELOPMENT WILL BE SERVICED BY A NEW GRAVITY SEWER LATERAL THAT CONNECTS TO THE EXISTING PUBLIC SEWER IN THE REAR YARD AND THE EXISTING PRIVATE WATER LATERAL THAT CONNECTS TO THE EXISTING AQUA WATER MAIN WITHIN DREXEL LANE.
5. ALL ROOF DRAINS SHALL BE CONNECTED TO THE PROPOSED STORMWATER MANAGEMENT SYSTEM.

AVERAGE BUILDING GRADE CALCULATIONS:

ELEV	ELEV	AVERAGE	LENGTH	PRODUCT
239.10	239.10	239.10	68.0	16258.80
239.10	242.10	240.60	4.6	1106.76
242.10	242.10	242.10	53.0	12831.30
236.10	236.10	236.10	20.9	4934.49
235.00	235.00	235.00	15.0	3525.00
235.00	238.00	236.50	14.9	3523.85
238.00	239.00	238.50	37.1	8848.35
239.00	240.00	239.50	4.9	1173.55
240.00	240.90	240.45	29.4	7069.23
241.50	241.50	241.50	8.0	1932.00
240.90	239.60	240.25	30.1	7231.53
241.50	241.50	241.50	6.1	1473.15
241.50	239.60	240.55	2.8	673.54
239.60	239.10	239.35	13.3	3183.36
TOTAL:			308.1	7376.4.9
AVERAGE GRADE:				239.42

ARCHITECTURAL PLANS SHALL BE COORDINATED WITH AND MUST COMPLY WITH THE GRADING PROPOSED WITH THIS APPLICATION.

WAIVER REQUEST:

§245-22 – PROVIDE GROUNDWATER RECHARGE – THE RAIN GARDEN HAS BEEN DESIGNED TO PROVIDE THE REQUIRED WATER QUALITY AND REV VOLUME BELOW THE LOWEST OUTLET.

I HEREBY CERTIFY, THAT TO THE BEST OF MY KNOWLEDGE, THE DRAINAGE PLAN MEETS ALL DESIGN REQUIREMENTS AND CRITERIA OF THE RADNOR TOWNSHIP STORMWATER MANAGEMENT ORDINANCE.

10/26/21

CHRISTOPHER C. YOHN, P.E., CPESC — DATE

0 20' 40'

SCALE: 1" = 20'

REV	DATE	COMMENTS
3	10/26/21	STORM
2	08/24/21	TWP ENG
1	08/16/21	TWP ENG

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SEAL:

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
CHRISTOPHER C. YOHN
ENGINEER
PE073703

PROJECT: SINGLE FAMILY DWELLING

PROJECT ADDRESS: 904 DREXEL LANE, BRYN MAWR, PA 19010

MUNICIPALITY: RADNOR TOWNSHIP

COUNTY: DELAWARE COUNTY

PLAN SET: STORMWATER MANAGEMENT PERMIT PLAN SET

SHEET NAME: POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

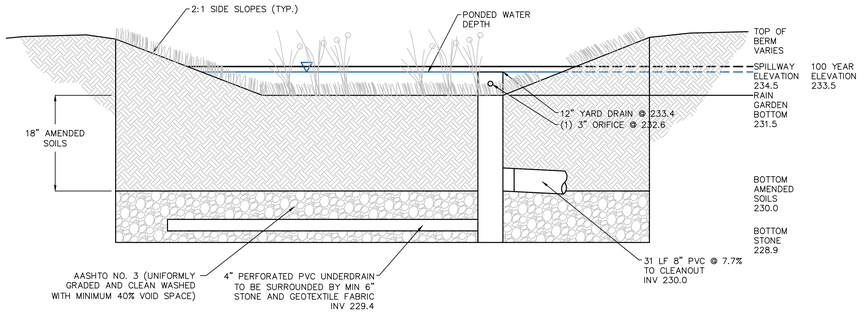
PREPARED FOR:
OWNER / APPLICANT
MARK & LILIAN WANG
904 DREXEL LANE
BRYN MAWR, PA 19010

DATE:	JUNE 15, 2021
SCALE:	1" = 20'
ONE CALL NUMBER:	2021-104-5311
DRAWN BY:	CCY
PROJECT NUMBER:	17-086

PREPARED BY:
YOHN ENGINEERING, LLC
555 SECOND AVENUE, SUITE B-205
COLLEGEVILLE, PA 19426
610-489-4580
WWW.YOHNENGINEERING.COM

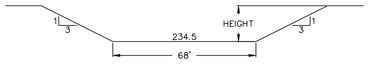
YOHN Engineering, LLC

SHEET: 2 OF 5



RAIN GARDEN DETAIL

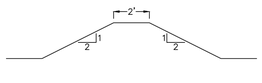
NOT TO SCALE



*THE SPILLWAY SHALL BE LINED WITH TURF REINFORCEMENT MATTING.

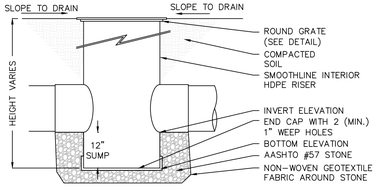
RAIN GARDEN OVERFLOW DETAIL

NOT TO SCALE



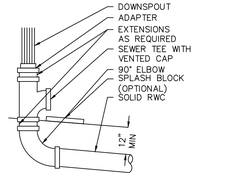
RAIN GARDEN BERM DETAIL

NOT TO SCALE



YARD DRAIN DETAIL (OR APPROVED EQUAL)

NOT TO SCALE

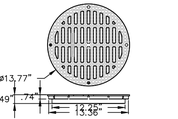


DOWNSPOUT CONNECTION DETAIL

NOT TO SCALE

CONSTRUCTION NOTES:

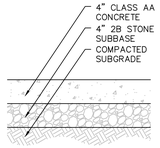
1. THE CONTRACTOR SHALL VERIFY ALL DEPTHS AND LOCATIONS OF EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCIES WITH THE PLANS FOUND IN THE FIELD SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE OWNER AND ENGINEER.
2. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL APPLY FOR AND SECURE ALL PROPER PERMITS FROM THE APPROPRIATE AUTHORITIES.
3. A HIGHWAY PERMIT IS REQUIRED FOR ALL WORK WITHIN THE RIGHT OF WAY FROM THE RADNOR TOWNSHIP PUBLIC WORKS DEPARTMENT.
4. A SEWER PERMIT IS REQUIRED FOR THE CONNECTION OF THE SEWER LATERAL FROM THE RADNOR TOWNSHIP PUBLIC WORKS DEPARTMENT.
5. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE RADNOR TOWNSHIP STANDARDS.
6. ALL EXCAVATIONS AND PEOPLE ENTERING EXCAVATIONS OR OTHER BELOW GRADE STRUCTURES SHALL COMPLY WITH OSHA REQUIREMENTS.
7. THE OWNER AND ENGINEER ARE NOT RESPONSIBLE FOR THE CONTRACTOR'S MEANS AND METHODS OF CONSTRUCTION.
8. ANY EXISTING UTILITIES, PAVEMENT, CURBS, SIDEWALKS, STRUCTURES, TREES, ETC., NOT PLANNED FOR REPAIR OR REMOVAL THAT ARE DAMAGED OR REMOVED SHALL BE REPAIRED OR REPLACED AT CONTRACTOR'S EXPENSE.
9. ALL PVC STORMWATER PIPES SHALL BE SDR 35 OR GREATER.
10. ALL HDPE STORMWATER PIPES SHALL BE SMOOTHLINE INTERIOR.
11. ALL HCMP SHALL BE ALUMINUM OR ALUMINIZED STEEL.
12. ALL STORMWATER FITTINGS SHALL BE WATERTIGHT.
13. GEOTEXTILE FABRIC (PERMEABLE FILTER FABRIC) SHALL BE CLASS 1 NON-WOVEN AND SHALL COMPLY WITH PENNDOT SPECIFICATIONS.
14. STONE WITHIN THE STORMWATER MANAGEMENT SYSTEM SHALL BE CLEAN-WASHED, UNIFORMLY GRADED AGGREGATE WITH MINIMUM 40% VOID SPACE.
15. BASEMENT WALLS WITHIN 20' OF SWALES SHALL BE WATERPROOFED.
16. ALL YARD DRAINS SHALL BE GRADED IN A 12" MINIMUM SUMP CONDITION.
17. ALL HDPE STORMWATER PIPES SHALL BE SMOOTHLINE INTERIOR.
18. ALL YARD DRAINS AND SUMP BOXES SHALL INCLUDE A 12" MINIMUM SUMP BELOW THE LOWEST INVERT ELEVATION.
19. CLEANOUTS ARE REQUIRED AT ALL CHANGES IN SLOPE OR DIRECTION.
20. ALL RAINWATER CONDUCTOR (RWC) PIPING SHALL BE DIRECTED TO UNDERGROUND STORMWATER MANAGEMENT SYSTEM.
21. PIPE PERFORATIONS SHALL BE NOT LESS THAN 5/16 INCH IN DIAMETER AND PROVIDE AN OPENING AREA NOT LESS THAN 3.31 SQUARE INCHES PER SQUARE FOOT OF PIPE SURFACE.
22. THERE SHALL BE NO GRADING WITHIN 3' OF THE PROPERTY LINE.
23. IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE SECTION 1804.3 SITE GRADING, THE GROUND IMMEDIATELY ADJACENT TO THE FOUNDATION SHALL BE SLOPED AWAY FROM THE BUILDING AT A SLOPE OF NOT LESS THAN FIVE (5%) PERCENT FOR A MINIMUM DISTANCE OF 10 FEET MEASURED PERPENDICULAR TO THE FACE OF THE WALL. IF PHYSICAL OBSTRUCTIONS OR LOT LINES PROHIBIT 10 FEET OF HORIZONTAL DISTANCE, A FIVE (5%) PERCENT SLOPE SHALL BE PROVIDED TO AN APPROVED ALTERNATIVE METHOD OF DIVERTING WATER AWAY FROM THE FOUNDATION. SWALES USED FOR THIS PURPOSE SHALL BE SLOPED A MINIMUM OF TWO (2%) PERCENT WHERE LOCATED WITHIN 10 FEET OF THE BUILDING FOUNDATION. IMPERVIOUS SURFACES WITHIN 10 FEET OF THE BUILDING FOUNDATION SHALL BE SLOPED A MINIMUM OF TWO (2%) PERCENT AWAY FROM THE BUILDING.
24. THE EXCAVATION OUTSIDE THE FOUNDATION SHALL BE BACKFILLED WITH SOIL THAT IS FREE OF ORGANIC MATERIAL, CONSTRUCTION DEBRIS, COBBLES AND BOULDERS OR WITH A CONTROLLED LOW-STRENGTH MATERIAL (CLSM). THE BACKFILL SHALL BE PLACED IN LIFTS AND COMPACTED IN A MANNER THAT DOES NOT DAMAGE THE FOUNDATION OR THE WATERPROOFING OR DAMPPROOFING MATERIAL.
25. THE PROCEDURE USED TO ESTABLISH THE FINAL GROUND LEVEL ADJACENT TO THE FOUNDATION SHALL ACCOUNT FOR ADDITIONAL SETTLEMENT OF THE BACKFILL.
26. STAIRS AND RAILINGS (IF REQUIRED) SHALL BE IN ACCORDANCE WITH THE RADNOR TOWNSHIP STANDARDS.
27.



POLYLOK 12" GRATE
PART NO. 3017-G
MATERIAL – POLYPROPYLENE
COLOR – BLACK & GREEN
OPEN AREA – 35 SQ. IN.
FLOW RATE – 45.85 GPM

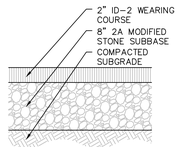
12" GRATE DETAIL (OR EQUAL)

NOT TO SCALE



CONCRETE CROSS SECTION

NOT TO SCALE



DRIVEWAY CROSS SECTION

NOT TO SCALE

RAIN GARDEN BERM CONSTRUCTION:
AREA UNDER BERM SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO A DEPTH OF TWO FEET PRIOR TO ANY PLACEMENT AND COMPACTION OF EARTHEN FILL. FILL MATERIAL FOR THE EMBANKMENTS SHALL BE FREE OF ROOTS, OR OTHER WOODY VEGETATION, ORGANIC MATERIAL, LARGE STONES, AND OTHER OBJECTIONABLE MATERIALS. THE EMBANKMENT SHALL BE COMPACTED IN LAYERED LIFTS OF NOT MORE THAN 6 TO 9 IN. THE MAXIMUM ROCK SIZE SHALL BE NO GREATER THAN 2/3 THE LIFT THICKNESS. UPON COMPLETION, THE EMBANKMENT SHALL BE SEEDED OR OTHERWISE STABILIZED ACCORDING TO THE SPECIFICATIONS OF THE E&S PLAN DRAWINGS. TREES SHALL NOT BE PLANTED ON THE EMBANKMENT.

POST CONSTRUCTION STORMWATER MANAGEMENT INSTALLATION:

1. THE EXISTING SUBGRADE UNDER THE RAIN GARDEN AREAS SHOULD NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO INSTALLATION.
2. STABILIZE GRADING WITHIN THE LIMIT OF DISTURBANCE EXCEPT WITHIN THE RAIN GARDEN AREA.
3. EXCAVATE RAIN GARDEN TO PROPOSED INVERT DEPTH AND SCARIFY THE EXISTING SOIL SURFACES. DO NOT COMPACT IN-SITU SOILS. WHERE EROSION OF SUBGRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING, THIS MATERIAL SHOULD BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES WITH A YORK RAKE (OR EQUIVALENT) AND LIGHT TRACTOR. ALL FINE GRADING SHOULD BE DONE BY HAND. ALL RAIN GARDEN BOTTOMS SHOULD BE AT LEVEL GRADE.
4. SITE PLANTING SOIL SHALL BE NATIVE ONSITE SOILS CAPABLE OF SUPPORTING A HEALTHY VEGETATIVE COVER. SOILS SHOULD BE AMENDED WITH A COMPOSTED ORGANIC MATERIAL. A TYPICAL ORGANIC AMENDED SOIL IS COMBINED WITH 5-10% ORGANIC MATERIAL (COMPOST), AND 70-80% SOIL BASE (PREFERABLY TOPSOIL). PLANTING SOIL SHOULD BE APPROXIMATELY 4 INCHES DEEPER THAN THE BOTTOM OF THE LARGEST ROOT BALL.
5. THE MODIFIED SOILS / PLANTING MIX SHALL BE PLACED IMMEDIATELY AFTER APPROVAL OF SUBGRADE PREPARATION. OVERFILLING IS RECOMMENDED TO ACCOUNT FOR SETTLEMENT. LIGHT HAND TAMPING IS ACCEPTABLE IF NECESSARY.
6. PRESOAK THE PLANTING SOIL PRIOR TO PLANTING VEGETATION TO AID IN SETTLEMENT.
9. SPREAD ERNST ERNMX-180 RAIN GARDEN MIX (OR EQUAL) TO SUPPLIER'S RECOMMENDATIONS AND ONLY FROM MID-MARCH THROUGH THE END OF JUNE OR FROM MID-SEPTEMBER THROUGH MID-NOVEMBER.
10. COMPLETE FINAL GRADING TO ACHIEVE PROPOSED DESIGN ELEVATIONS, LEAVING SPACE FOR UPPER LAYER OF COMPOST, MULCH OR TOPSOIL.
11. INSTALL 2-3" SHREDDED HARDWOOD MULCH (MINIMUM AGE 6 MONTHS,) LEAF COMPOST MULCH OR OTHER COMPARABLE PRODUCT UNIFORMLY IMMEDIATELY AFTER RAIN GARDEN IS SEEDED WITH RAIN GARDEN MIX. DO NOT APPLY MULCH IN AREAS WHERE GROUND COVER IS TO BE GRASS OR WHERE COVER WILL BE ESTABLISHED BY SEEDING. WOOD CHIPS SHOULD BE AVOIDED AS THEY TEND TO FLOAT DURING INUNDATION PERIODS.
12. WATER VEGETATION AT THE END OF EACH DAY FOR TWO WEEKS AFTER PLANTING IS COMPLETED. WHILE VEGETATION IS BEING ESTABLISHED, PRUNING AND WEEDING MAY BE REQUIRED.
13. CONTRACTOR SHOULD PROVIDE A ONE-YEAR 80% CARE AND REPLACEMENT WARRANTY FOR ALL PLANTING BEGINNING AFTER INSTALLATION AND INSPECTION OF ALL PLANTS.

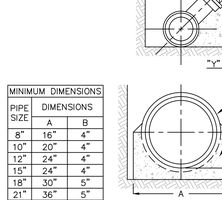
STORMWATER MANAGEMENT OPERATION AND MAINTENANCE PROCEDURES:
RESPONSIBLE PARTY:
MARK & LILIAN WANG

A. THE RESPONSIBILITY FOR THE INSTALLATION, MAINTENANCE AND OPERATION OF THE STORMWATER MANAGEMENT SYSTEM AND OTHER ASSOCIATED FACILITIES DURING CONSTRUCTION SHALL BE THE OBLIGATION OF THE CONTRACTOR.
B. THE RESPONSIBILITY FOR THE CONTINUED MAINTENANCE AND OPERATION OF THE STORMWATER MANAGEMENT SYSTEM AND OTHER ASSOCIATED FACILITIES SHALL BE THE OBLIGATION OF THE PROPERTY OWNER.
C. THE PERMITTED STORMWATER CONTROLS AND BMP'S ARE FIXTURES OF THE PROPERTY THAT CAN BE ALTERED OR REMOVED ONLY AFTER APPROVAL BY THE TOWNSHIP.

1. THE POST CONSTRUCTION STORMWATER MANAGEMENT SYSTEM MUST BE INSPECTED FOR ROUTINE MAINTENANCE A MINIMUM OF TWO TIMES A YEAR, ONCE IN THE EARLY SPRING AND ONCE IN THE FALL AFTER THE MAJORITY OF THE LEAVES HAVE FALLEN.
2. VISUAL OBSERVATIONS OF THE GROUND SURFACE TO DETECT PONDING OF WATER OR GROUND SETTLEMENTS THAT WOULD PREVENT RUNOFF FROM ENTERING INLETS AS DESIGNED MUST BE MADE. THE DRAINAGE AREAS DESIGNED FOR THE SYSTEM MUST BE MAINTAINED. ADJUSTMENTS TO THE GRADING OR INLETS MUST BE MADE TO ENSURE THAT THE SYSTEM IS FUNCTIONING AS DESIGNED. SMALL SINKHOLES CAN BE REPAIRED EASILY BY FILLING WITH TOPSOIL AND MAY BE THE RESULT OF SETTLEMENT OF THE SOIL. LARGER SINKHOLES OR SINKHOLES THAT REAPPEAR IN THE SAME LOCATION MAY INDICATE A BREACH IN THE GEOTEXTILE LINER, INLET BOX STRUCTURE, PIPE CONNECTION OR A BREAK IN A STORM CONVEYANCE LINE. THESE TYPES OF SINKHOLES MUST BE EXCAVATED AND THE FAILURE IDENTIFIED AND REPAIRED IMMEDIATELY IN ORDER TO PREVENT SOIL FROM ENTERING THE POST CONSTRUCTION STORMWATER MANAGEMENT SYSTEM AND CLOGGING IT OR REDUCING THE CAPACITY OF THE BMP FOR RECHARGE OF RUNOFF.
3. ALL SEDIMENT TRAPS AND INLETS MUST BE VISUALLY INSPECTED SEVERAL TIMES A YEAR FOR ACCUMULATED SOIL AND DEBRIS. INLET GRATES MUST BE KEPT FREE OF LEAVES, STICKS, MULCH, AND OTHER LAWN DEBRIS OR TRASH THAT WOULD PREVENT INFLOW OF RUNOFF. SUMPS IN SEDIMENT TRAPS OR INLET BOTTOMS MUST HAVE ACCUMULATED SEDIMENT REMOVED TO ENSURE DESIGN CAPACITY SUFFICIENT TO TRAP SEDIMENT AND DEBRIS FROM ENTERING ANY SEEPAGE BED. ANY WEEP HOLES IN THE BOTTOM OF THE INLETS OR SEDIMENT TRAP SHOULD BE CLEARED TO ALLOW WATER TO SEEP OUT.
4. ONCE A YEAR, THE POST CONSTRUCTION STORMWATER MANAGEMENT SYSTEM MUST BE INSPECTED TO DETERMINE OF IT IS DRAINING WITHIN THE REQUIRED TIME PERIOD (USUALLY TWENTY-FOUR HOURS.) THE INSPECTION PORT SHALL BE OPENED AT LEAST TWENTY-FOUR HOURS FOLLOWING A STORM AND THE LEVEL OF WATER IN THE BED NOTED. VENTED CLEAN-OUTS MUST BE CHECKED TO ENSURE OPENINGS ARE CLEAR. ADJUSTMENTS TO THE CLEAN-OUTS MUST BE MADE IF SOIL OR OTHER LAWN DEBRIS IS OBSERVED TO BE ENTERING THE SYSTEM.
5. RAIN GARDEN: SHALL BE INSPECTED 72 HOURS FOLLOWING ALL RAIN EVENTS EXCEEDING 1" OF RAINFALL. IF STANDING WATER IS VISIBLE AT THAT TIME WITHIN THE RAIN GARDEN, THE RAIN GARDEN MUST BE EXCAVATED AND RECONSTRUCTED TO OBTAIN AN INFILTRATION RATE APPROVED BY TRAPPE BOROUGH.
6. RAIN GARDEN MAINTENANCE:

- DETRITUS MAY ALSO NEED TO BE REMOVED EVERY YEAR. PERENNIAL PLANTINGS MAY BE CUT DOWN AT THE END OF THE GROWING SEASON.
- MULCH SHOULD BE RE-SPREAD WHEN EROSION IS EVIDENT AND BE REPLENISHED AS NEEDED. ONCE EVERY 2 TO 3 YEARS THE ENTIRE AREA MAY REQUIRE MULCH REPLACEMENT.
- BIORETENTION AREAS SHOULD BE INSPECTED AT LEAST TWO TIMES PER YEAR FOR SEDIMENT BUILDUP, EROSION, VEGETATIVE CONDITIONS, ETC.
- DURING PERIODS OF EXTENDED DROUGHT, BIORETENTION AREAS MAY REQUIRE WATERING.
- TREES AND SHRUBS SHOULD BE INSPECTED TWICE PER YEAR TO EVALUATE HEALTH.

7. ANY CLEAN-OUT, INLET OR LEVEL SPREADER THAT HAS BEEN DAMAGED BY LAWN EQUIPMENT MUST BE REPAIRED OR REPLACED. CLEAN-OUTS THAT BECOME BURIED SHOULD BE RAISED TO GRADE. THE CONFIGURATION MUST NOT ALLOW SOIL OR OTHER DEBRIS TO CLOG THE COLLECTION PIPE. ALL COLLECTION PIPES MUST BE CHECKED ANNUALLY TO ENSURE THEY ARE FLOWING FREELY. IF THE COLLECTION PIPES BECOME CLOGGED, JET CLEANING MUST BE PERFORMED AT THE CLEANOUT-OUTS. ADDITIMED PROTECTION MUST BE MADE AT THE SEDIMENT TRAP DURING JET CLEANING TO ENSURE THAT DEBRIS IS NOT TRANSMITTED TO THE SEEPAGE BED.
8. SMALL TREES THAT BEGIN TO GROW IN THE VICINITY OF SEEPAGE BEDS OR STRUCTURES MUST BE REMOVED TO ENSURE THAT THE ROOTS DO NOT PUNCTURE THE FILTER FABRIC OF THE SEEPAGE BED OR DAMAGE ANY STORMWATER COLLECTION/CONVEYANCE STRUCTURE.
9. ROOF GUTTER SYSTEMS THAT ARE INTEGRAL WITH THE SEEPAGE BED MUST BE FUNCTIONAL. REPAIRS TO GUTTERS THAT BECOME SEPARATED, SAG OR OTHERWISE DO NOT FUNCTION AS DESIGNED MUST BE MADE.
10. PREVENTATIVE MAINTENANCE WOULD INCLUDE REMOVAL OF LEAVES FROM GUTTER SYSTEMS AND LAWN AREAS AS SOON AS POSSIBLE TO AVOID CONTAMINATION OF CLOGGING OF THE SYSTEM. LOCATING LANDSCAPE-MULCHED AREAS AWAY FROM CONCENTRATED RUNOFF AREAS OR SWALES THAT COULD WASH MULCH INTO INLET OR LEVEL SPREADER IS RECOMMENDED.



NOTES:
1. NO REDUCTION IN SIZE FROM HOUSE TO SEWER.
2. NO STORM SEWER OR SURFACE WATER OF ANY NATURE SHALL BE PERMITTED TO ENTER THE SANITARY SYSTEM.
3. CONCRETE ENCASEMENT MAY BE REQUIRED AT THE DIRECTION OF THE TOWNSHIP.

SEWER VENT AND TRAP DETAIL

NOT TO SCALE

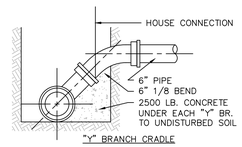
48" PRECAST SANITARY SEWER MANHOLE DETAIL

NOT TO SCALE

NOTES:
1. MODIFIED STONE MAY BE REQUIRED FOR THE FULL HEIGHT OF THE TRENCH.
2. ADDITIONAL PREPARATIONS MAY BE REQUIRED BY SITE AND SOIL CONDITIONS.
3. BACKFILL MUST BE COMPACTED IN 12" MAX LIFTS. THE TOWNSHIP ENGINEER MAY REQUIRE SUBMITTAL OF COMPACTION TEST RESULTS.

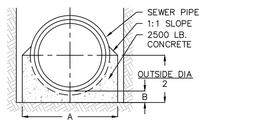
TRENCH AND ROADWAY RESTORATION DETAIL

NOT TO SCALE



"Y" BRANCH CRADLE

MINIMUM DIMENSIONS		
PIPE SIZE	DIMENSIONS	
	A	B
8"	16"	4"
10"	20"	4"
12"	24"	4"
15"	24"	4"
18"	30"	5"
21"	36"	5"
24"	42"	6"
30"	48"	6"



NOTE: TO BE USED AS DIRECTED BY THE TOWNSHIP ENGINEER.

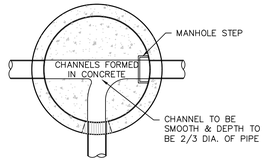
CONCRETE CRADLE

SANITARY SEWER CRADLE CONNECTION (IN EARTH)

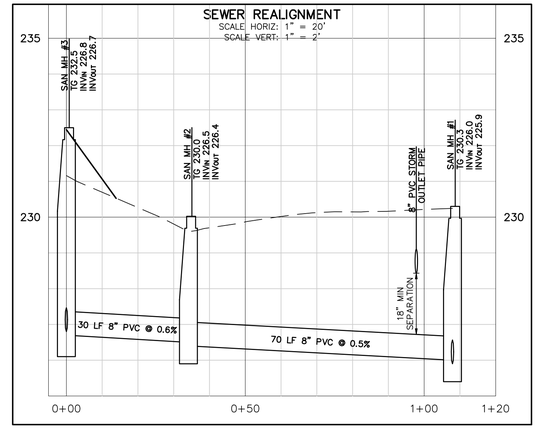
NOT TO SCALE

PIPE PERFORATION SPECIFICATIONS		
PIPE SIZE	HOLES PER LINEAR FOOT (⅝" HOLES)	HOLES PER LINEAR FOOT (¾" HOLES)
6"	68	12
8"	90	16
10"	113	20
12"	136	24
15"	169	30
18"	203	36
24"	271	48
30"	339	60
36"	407	72
48"	542	96
60"	678	120
72"	813	144

NOTE: PIPE PERFORATIONS SHALL BE NOT LESS THAN 5/16 INCH IN DIAMETER AND PROVIDE AN OPENING AREA NOT LESS THAN 3.31 SQUARE INCHES PER SQUARE FOOT OF PIPE SURFACE.



SANITARY SEWER NOTES:
1. THE CONTRACTOR IS TO VERIFY THE EXISTING SANITARY LINES BEFORE CONSTRUCTION.
2. EXFILTRATION TESTS TO BE PERFORMED ON ALL 8" SANITARY SEWER LINES IN ACCORDANCE WITH PA DEPARTMENT OF ENVIRONMENTAL PROTECTION.
3. CONSTRUCTION IN ACCORDANCE WITH TOWNSHIP STANDARDS AND SPECIFICATIONS.



REV	DATE	COMMENTS
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2	08/24/21	TWP ENG
1	08/16/21	TWP ENG

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SEAL:

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
CHRISTOPHER C. YOHN
ENGINEER
PE073703

PROJECT: SINGLE FAMILY DWELLING

PROJECT ADDRESS: 904 DREXEL LANE, BRYN MAWR, PA 19010

MUNICIPALITY: RADNOR TOWNSHIP | COUNTY: DELAWARE COUNTY

PLAN SET: STORMWATER MANAGEMENT PERMIT PLAN SET

SHEET NAME: POST CONSTRUCTION STORMWATER MANAGEMENT NOTES AND DETAILS

PREPARED FOR:
OWNER / APPLICANT
MARK & LILIAN WANG
904 DREXEL LANE
BRYN MAWR, PA 19010

DATE:	JUNE 15, 2021
SCALE:	NO SCALE
ONE CALL NUMBER:	2021-104-5311
DRAWN BY:	CCY
PROJECT NUMBER:	17-086

PREPARED BY:
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YOHN Engineering, LLC

SHEET: 3 OF 5

Serial Number: 2021-104-5311

CALL BEFORE YOU DIG!

PENNSYLVANIA LAW REQUIRES 3 WORKING DAYS NOTICE FOR CONSTRUCTION PHASE AND 10 WORKING DAYS IN DESIGN STAGE-STOP CALL

Pennsylvania One Call System, Inc.

1-800-242-1776

ALL LOCATIONS OF EXISTING UTILITIES, SHOWN ON THIS PLAN, HAVE BEEN DEVELOPED FROM FIELD LOCATIONS OF VISIBLE ABOVE GROUND UTILITY STRUCTURES AND INFORMATION FURNISHED BY THE UTILITY COMPANIES.

ALL LOCATIONS SHOULD BE CONSIDERED APPROXIMATE. COMPLETENESS OR ACCURACY OF THE LOCATIONS AND DEPTH OF ALL STRUCTURES CANNOT BE GUARANTEED. CONTRACTORS MUST VERIFY ALL LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES AND FACILITIES BEFORE THE START OF ANY WORK.

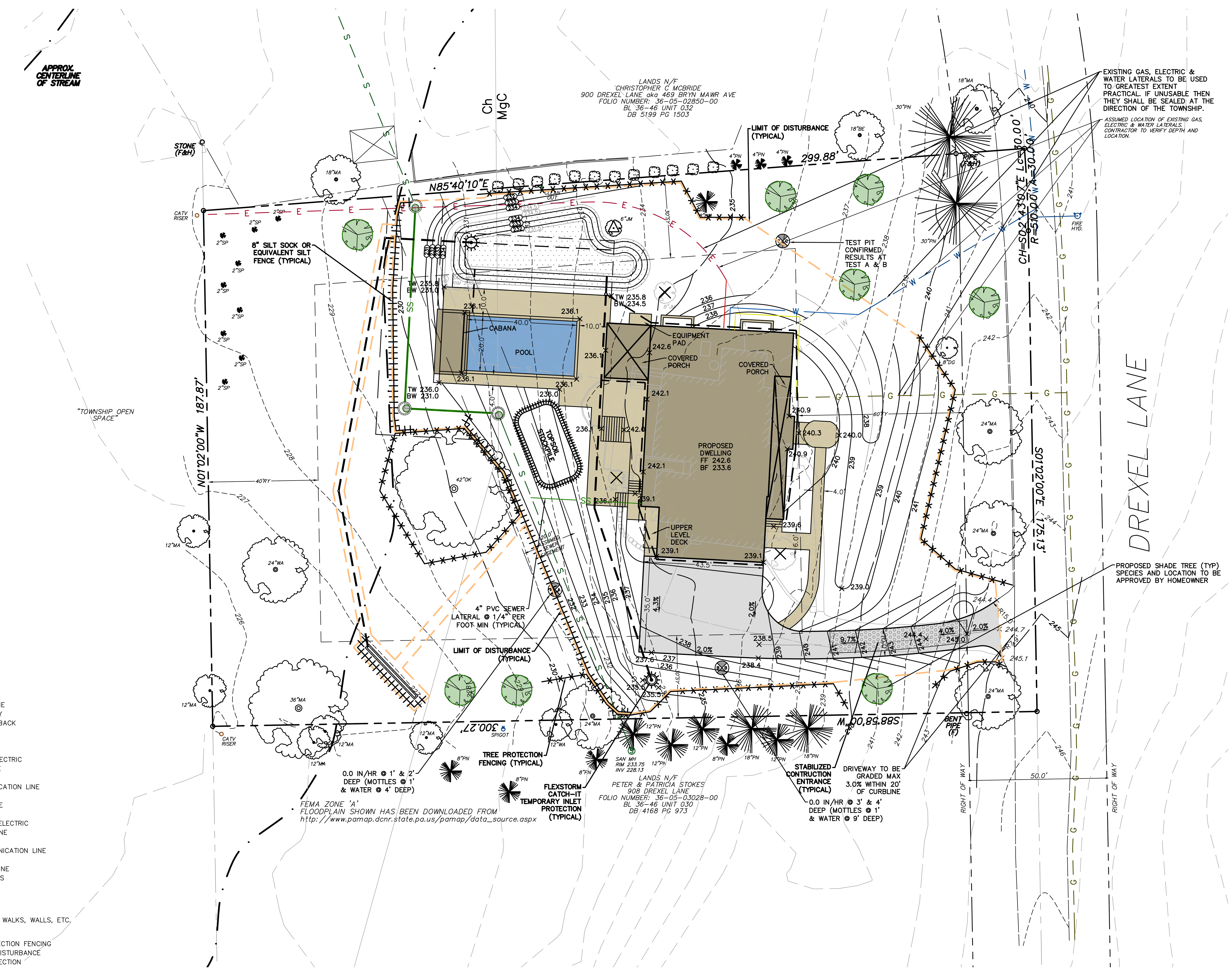
AS PER ACT 187 HOUSE BILL 2627, BEFORE THE START OF ANY EXCAVATION WORK THE CONTRACTOR SHALL NOTIFY THE AFFECTED UTILITY COMPANIES THROUGH THE PENNSYLVANIA "ONE CALL SYSTEM" 1-800-242-1776 THREE DAYS PRIOR TO THE START OF ANY EXCAVATION. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO THE START OF ANY CONSTRUCTION.

REFERENCE PLANS:

1. TOPOGRAPHIC SURVEY PLAN PREPARED FOR MARK & LILIAN WANG BY JEFFREY P. TURNER, P.L.S., COLLEGEVILLE, PA, DATED JANUARY 11, 2018. PLAN NO. D-36-46-031.
2. ARCHITECTURAL PLANS PREPARED BY R.A. HOFFMAN ARCHITECTS DATED AUGUST 17, 2018. PROJECT NO 201784.
3. LIDAR TOPOGRAPHY AND OTHER GIS INFORMATION OBTAINED ELECTRONICALLY FROM SHAPE FILES DISTRIBUTED BY DELAWARE VALLEY REGIONAL PLANNING COMMISSION. FILES WERE OBTAINED VIA WWW.PASDA.PSU.EDU.
4. AERIAL PHOTOGRAPH OBTAINED FROM THE MICROSOFT CORPORATION BING MAPS.
5. SOILS INFORMATION VIA THE NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY (WEBSOILSURVEY.SC.EGOV.USDA.GOV.)

REFERENCE PLAN #1 NOTES:

1. OUTLINE DESCRIPTION AND LOCATION SHOWN IN ACCORDANCE WITH ACTUAL FIELD INSTRUMENT SURVEY CONDUCTED UPON THE GROUNDS BY JEFFREY P TURNER, PLS FROM VARIOUS DEEDS AND PLANS OF RECORD; SURVEY WAS PREFORMED WITHOUT THE BENEFIT OF A TITLE REPORT; PROPERTY MAY BE SUBJECT TO CERTAIN RIGHTS OF OTHERS.
2. THIS SURVEY IS NOT TO BE USED FOR TREE REMOVAL ALONG PROPERTY LINES. TREE LOCATIONS ARE APPROXIMATE. FOR TREE REMOVAL PURPOSES, PROPERTY LINES MUST BE FIELD MARKED WITH STAKES SET TO ESTABLISH EXACT TREE OWNERSHIP.
3. CONTOURS PLOTTED FROM FIELD RUN SURVEY. GPS CONTROL PERFORMED ONSITE TO ESTABLISH BENCHMARK. DATUM NAD83/NAVD88.
4. THERE IS AN IDENTIFIABLE FLOOD PLAIN AREAS WITHIN THE PROJECT SITE AS ILLUSTRATED ON COMMUNITY PANEL NUMBER 420428-0039F OF THE FLOOD INSURANCE RATE MAP AS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY FOR THE TOWNSHIP OF RADNOR, PENNSYLVANIA. FLOODPLAIN SHOWN HAS BEEN DOWNLOADED FROM HTTP://WWW.PAMAP.DCNR.STATE.PA.US/PAMAP/DATA_SOURCE.ASPX
5. EXISTING SUBSURFACE UTILITY INFORMATION INDICATED IS BASED UPON VISUAL FIELD INSPECTION BY JEFFERY P. TURNER, PLS. SUCH INFORMATION CONCERNING THE SIZE, LOCATION, DEPTH, QUANTITY, ETC. OF SUBSURFACE UTILITIES IS APPROXIMATE IN NATURE AND HAS BEEN OBTAINED AS A SUPPLEMENT TO THE SITE SURVEY. THE INFORMATION PROVIDED IS REPRESENTATIVE OF SUBSURFACE CONDITIONS ONLY AT LOCATIONS AND DEPTHS WHERE SUCH INFORMATION WAS OBTAINED. THERE IS NO EXPRESSED OR IMPLIED AGREEMENT THAT UTILITY SIZE, LOCATION, DEPTH, QUANTITY, ETC. AS SHOWN EXISTS BETWEEN EXPLORED LOCATIONS. ACCORDINGLY, UTILITY INFORMATION SHOWN SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. IT IS INCUMBENT UPON THE CONTRACTOR TO VERIFY THE SIZE, LOCATION, DEPTH, QUANTITY, ETC. OF ALL UTILITIES BEFORE EXCAVATION.



LOCATION MAP
SCALE: 1" = 2,000'

DISTURBED AREA: 29,000± SF (0.67 AC)
UNDISTURBED AREA: 30,000± SF (0.69 AC)

CONSTRUCTION TIMING AND SEQUENCE NOTES:

1. THE TOWNSHIP ENGINEER SHALL BE NOTIFIED FOLLOWING THE INSTALLATION OF PROTECTIVE BARRIERS AND 48 HOURS PRIOR TO THE START OF EARTHMOVING ACTIVITIES AS WELL AS 48 HOURS PRIOR TO THE INSTALLATION OF THE PERVIOUS WALKWAYS AND STORMWATER MANAGEMENT SYSTEM AND ASSOCIATED FACILITIES.
2. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE OF CONSTRUCTION. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.

CONSTRUCTION TIMING AND SEQUENCE:

1. ANTICIPATED START OF CONSTRUCTION: AUGUST 2021.
2. INSTALL THE TREE PROTECTION FENCING AND SILT FENCE OR COMPOST FILTER SOCKS AND NOTIFY TOWNSHIP FOR APPROVAL AND 48 HOURS PRIOR TO THE START OF EARTHMOVING ACTIVITIES.
3. INSTALL THE STABILIZED CONSTRUCTION ENTRANCE. ALL CONSTRUCTION VEHICLES SHALL UTILIZE THIS ENTRANCE TO EXIT THE SITE.
4. STRIP TOPSOIL AND STOCKPILE FOR FUTURE USE. SURROUND STOCKPILE WITH SILT FENCE AND IMMEDIATELY STABILIZE.
5. BEGIN REMOVAL OF ALL FEATURES DESIGNATED TO BE REMOVED AND CLEAR AND GRUB THE SITE WITHIN THE LIMITS OF DISTURBANCE. UPON TEMPORARY CESSATION OF AN EARTH DISTURBANCE OR ANY STAGE OR PHASE OF AN ACTIVITY WHERE A CESSATION OF EARTH DISTURBANCE ACTIVITIES EXCEED 4 DAYS, THE SITE SHALL BE IMMEDIATELY SEEDED, MULCHED OR OTHERWISE PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION PENDING FUTURE EARTH DISTURBANCE ACTIVITIES.
6. CONCURRENT WITH REMOVALS, ROUGH GRADE THE SITE. ANY WATER PUMPED FROM WORK AREAS SHALL BE TREATED FOR SEDIMENT REMOVAL PRIOR TO DISCHARGING TO A SURFACE WATER THROUGH THE USE OF A PUMPED WATER FILTER BAG OR OTHER APPROVED DEVICE.
7. INSTALL THE SITES UTILITIES AND THE STONE BASE FOR THE DRIVEWAY.
8. CONCURRENT WITH UTILITIES AND DRIVEWAY STONE, BEGIN BUILDING CONSTRUCTION.
9. ONCE THE ROOF IS COMPLETE, INSTALL RAINWATER CONDUCTOR PIPING, INLETS, SUMP BOX AND ASSOCIATED PIPING.
10. FINAL GRADE THE SITE AND INSTALL THE WALKWAYS AND FINAL PAVING. NEWLY GRADED SLOPES OF OVER TWENTY-FIVE (25%) PERCENT MUST BE STABILIZED WITH SOD OR JUTE NETTING AND SEED.
11. SPREAD TOPSOIL, SEED AND IMMEDIATELY STABILIZE.
12. UPON SITE STABILIZATION INSTALL THE POST CONSTRUCTION STORMWATER MANAGEMENT FACILITIES. NOTIFY THE TOWNSHIP ENGINEER 48 HOURS PRIOR TO THE INSTALLATION OF THE STORMWATER MANAGEMENT SYSTEMS AND ASSOCIATED FACILITIES. THE STORMWATER MANAGEMENT SYSTEMS SHALL NOT RECEIVE RUNOFF WITHOUT THE PRIOR APPROVAL FROM THE TOWNSHIP ENGINEER AND UNTIL THE ENTIRE DRAINAGE AREA CONTRIBUTORY HAS ACHIEVED FINAL STABILIZATION.
13. REMOVE THE EROSION AND SEDIMENTATION CONTROLS AND IMMEDIATELY STABILIZE DENUDED AREAS. PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION. CUT AND FILL SLOPES SHALL BE CAPABLE OF RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.
14. ANTICIPATED END OF CONSTRUCTION: AUGUST 2022.

LINETYPE LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- EXISTING BUILDING SETBACK
- EXISTING FENCE
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- EXISTING OVERHEAD ELECTRIC
- EXISTING ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING TELECOMMUNICATION LINE
- EXISTING WATER LINE
- EXISTING SANITARY LINE
- EXISTING STORM PIPES
- PROPOSED OVERHEAD ELECTRIC
- PROPOSED ELECTRIC LINE
- PROPOSED GAS LINE
- PROPOSED TELECOMMUNICATION LINE
- PROPOSED WATER LINE
- PROPOSED SANITARY LINE
- PROPOSED STORM PIPES
- PROPOSED BUILDING
- PROPOSED DRIVEWAY
- PROPOSED IMPERVIOUS WALKS, WALLS, ETC.
- PROPOSED SILT SOCK
- PROPOSED TREE PROTECTION FENCING
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED INLET PROTECTION

SOILS INFORMATION					
SYMBOL	NAME	%SLOPE	HYDROLOGIC GROUP	DEPTH TO SH WATER	DEPTH TO BEDROCK
Ch	CHEWACLA SILT LOAM	NOT RATED	B	1.50	6.6+
MgC	MANOR LOAM	8 TO 15 PERCENT SLOPES	B	6.6+	7.11

NOTES: IF THE PROPOSED EROSION AND SEDIMENTATION CONTROL MEASURES ARE INSTALLED AND MAINTAINED PROPERLY, NO UNFORESEEN SOIL LIMITATIONS OR PROBLEMS ARE LIKELY. NEVERTHELESS, IF A PROBLEM DOES DEVELOP, THE DEVELOPER MUST TEMPORARILY SEED AND MULCH THE DISTURBED AREA. SUITABLE TOPSOIL SHALL BE IMPORTED TO SITE IF INADEQUATE QUANTITIES OF SUITABLE TOPSOIL EXIST ON SITE. ADEQUACY OF SOIL TO BE DETERMINED BY SITE GEOTECHNICAL ENGINEER IN CONJUNCTION WITH THE LANDSCAPE ARCHITECT. SOIL AMENDMENTS SHALL BE ADDED AS REQUIRED. ALL UNSUITABLE MATERIAL SHALL BE DISPOSED OF PROPERLY. SITE GEOTECHNICAL ENGINEER SHALL ALSO BE CONSULTED DURING WINTER GRADING OPERATIONS.

REV	DATE	COMMENTS
3	10/26/21	STORM
2	08/24/21	TWP ENG
1	08/16/21	TWP ENG

SEAL: COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL CHRISTOPHER C. YOHN ENGINEER PE073703

PROJECT: SINGLE FAMILY DWELLING

PROJECT ADDRESS: 904 DREXEL LANE, BRYN MAWR, PA 19010

MUNICIPALITY: RADNOR TOWNSHIP — COUNTY: DELAWARE COUNTY

PLAN SET: STORMWATER MANAGEMENT PERMIT PLAN SET

SHEET NAME: EROSION AND SEDIMENTATION CONTROL PLAN

PREPARED FOR: OWNER / APPLICANT MARK & LILIAN WANG 904 DREXEL LANE BRYN MAWR, PA 19010

DATE: JUNE 15, 2021
SCALE: 1" = 20'
ONE CALL NUMBER: 2021-104-5311
DRAWN BY: CCY
PROJECT NUMBER: 17-086

PREPARED BY: YOHN ENGINEERING, LLC 555 SECOND AVENUE, SUITE B-205 COLLEGEVILLE, PA 19426 610-489-4580 WWW.YOHNENGINEERING.COM

YOHN Engineering, LLC

STANDARD E&S PLAN NOTES:
1. ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING AS WELL AS CUTS AND FILLS SHALL BE DONE IN ACCORDANCE WITH THE APPROVED E&S PLAN. A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.
2. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.
3. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE MUNICIPALITY PRIOR TO IMPLEMENTATION.
4. AREAS TO BE FILLED ARE TO BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL.
5. CLEARING, GRUBBING, AND TOPSOIL STRIPPING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. GENERAL SITE CLEARING, GRUBBING AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&S BMPS SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&S PLAN.
6. AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND FENCED OFF BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.
7. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN MAPS(S) IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. EACH STOCKPILE SHALL BE PROTECTED IN THE MANNER SHOWN ON THE PLAN DRAWINGS. STOCKPILE HEIGHTS SHALL NOT EXCEED 15 FEET. STOCKPILE SLOPES SHALL BE 2H:1V OR FLATTER.
8. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION AND NOTIFY THE MUNICIPALITY.
9. ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1, AND 287.1 ET. SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE.
10. ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&S PLAN APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED.
11. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY MATERIAL BROUGHT ON SITE IS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE PROPERTY OWNER FOR ANY FILL MATERIAL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE BUT QUALIFYING AS CLEAN FILL DUE TO ANALYTICAL TESTING.
12. ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.
13. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS SHALL BE MAINTAINED PROPERLY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING MUST BE PERFORMED IMMEDIATELY. IF THE E&S BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
14. SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE BY THE END OF EACH WORK DAY AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEPT INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.
15. ALL SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS.
16. AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES - 6 TO 12 INCHES ON COMPACTED SOILS - PRIOR TO PLACEMENT OF TOPSOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 6 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING.
17. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
18. ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.
19. FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
20. FROZEN MATERIALS OR SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILLS.
21. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
22. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.
23. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY UPON REACHING FINISHED GRADE. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED. SEEDED AREAS WITHIN 50 FEET OF A SURFACE WATER, OR AS OTHERWISE SHOWN ON THE PLAN DRAWINGS, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.
24. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE IN ANY AREA OR SUBAREA OF THE PROJECT, THE OPERATOR SHALL STABILIZE ALL DISTURBED AREAS. DURING NON-GERMINATING MONTHS, MULCH OR PROTECTIVE BLANKETING SHALL BE APPLIED AS DESCRIBED IN THE PLAN. AREAS NOT AT FINISHED GRADE, WHICH WILL BE REACTIVATED WITHIN 1 YEAR, MAY BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION SPECIFICATIONS. THOSE AREAS WHICH WILL NOT BE REACTIVATED WITHIN 1 YEAR SHALL BE STABILIZED IN ACCORDANCE WITH THE PERMANENT STABILIZATION SPECIFICATIONS.
25. PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION. CUT AND FILL SLOPES SHALL BE CAPABLE OF RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.
26. E&S BMPS SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THEY ARE REPLACED BY ANOTHER BMP APPROVED BY THE MUNICIPALITY.
27. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE MUNICIPALITY FOR AN INSPECTION PRIOR TO REMOVAL/CONVERSION OF THE E&S BMPS.
28. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORMWATER MANAGEMENT BMPS. AREAS DISTURBED DURING REMOVAL OR CONVERSION OF THE BMPS SHALL BE STABILIZED IMMEDIATELY. IN ORDER TO ENSURE RAPID REVEGETATION OF DISTURBED AREAS, SUCH REMOVAL/CONVERSIONS ARE TO BE DONE ONLY DURING THE GERMINATING SEASON.
29. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONTACT THE MUNICIPALITY TO SCHEDULE A FINAL INSPECTION.
30. FAILURE TO CORRECTLY INSTALL E&S BMPS, FAILURE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE, OR FAILURE TO TAKE IMMEDIATE CORRECTIVE ACTION TO RESOLVE FAILURE OF E&S BMPS MAY RESULT IN ADMINISTRATIVE, CIVIL, AND/OR CRIMINAL PENALTIES BEING INSTITUTED BY THE DEPARTMENT AS DEFINED IN SECTION 602 OF THE PENNSYLVANIA CLEAN STREAMS LAW. THE CLEAN STREAMS LAW PROVIDES FOR UP TO $10,000 PER DAY IN CIVIL PENALTIES, UP TO $10,000 IN SUMMARY CRIMINAL PENALTIES, AND UP TO $25,000 IN MISDEMEANOR CRIMINAL PENALTIES FOR EACH VIOLATION.
31. CONCRETE WASH WATER SHALL BE HANDLED IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS. IN NO CASE SHALL IT BE ALLOWED TO ENTER ANY SURFACE WATERS OR GROUNDWATER SYSTEMS.
32. SEDIMENT BASINS AND/OR TRAPS SHALL BE KEPT FREE OF ALL CONSTRUCTION WASTE, WASH WATER, AND OTHER DEBRIS HAVING POTENTIAL TO CLOG THE BASIN/TRAP OUTLET STRUCTURES AND/OR POLLUTE THE SURFACE WATERS.
33. SEDIMENT BASINS AND/OR TRAPS SHALL BE PROTECTED FROM UNAUTHORIZED ACTS BY THIRD PARTIES.
34. ANY DAMAGE THAT OCCURS IN WHOLE OR IN PART AS A RESULT OF BASIN OR TRAP DISCHARGE SHALL BE IMMEDIATELY REPAIRED BY THE PERMITTEE IN A PERMANENT MANNER SATISFACTORY TO THE MUNICIPALITY, LOCAL CONSERVATION DISTRICT, AND THE OWNER OF THE DAMAGED PROPERTY.
35. SOD OR EROSION CONTROL BLANKETING SHALL BE INSTALLED ON ALL SLOPES 4H:1V OR STEEPER, WITHIN 50 FEET OF A SURFACE WATER AND ON ALL OTHER DISTURBED AREAS SPECIFIED ON THE PLAN MAPS AND/OR DETAIL SHEETS.
36. HAY OR STRAW MULCH MUST BE APPLIED AT 3.0 TONS PER ACRE.
37. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.
38. GRADING AND EARTHMOVING OPERATIONS SHALL BE MINIMIZED DURING THE PERIOD FROM NOVEMBER 15 TO APRIL 1 WHEN RE-VEGETATION OF EXPOSED GROUND SURFACES IS DIFFICULT. MULCH, STRAW, STONE AND/OR SOD SHALL BE USED TO STABILIZE ALL AREAS DENUDED DURING THIS TIME PERIOD.
39. THE RUNOFF CROSSING TO THE ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASE OF THE PROJECT SHALL BE MANAGED SO THAT THE WATER QUALITY / QUANTITY IMPACT IS MINIMIZED TO THE ADJACENT PROPERTIES. ADDITIONAL DIVERSION BERMS, STONED CONSTRUCTION STAGING AREAS, AND INLETS/PIPING SHALL BE PROVIDED AS NECESSARY / DIRECTED IN ORDER TO ENSURE ACCEPTABLE CONDITIONS DURING THE CONSTRUCTION PHASE.
40. ALL TOPSOIL SHALL REMAIN ONSITE UNLESS OTHERWISE DIRECTED BY THE OWNER.
41. FILL MATERIAL AND TOPSOIL STOCKPILES AND ACCESS TO THEM SHALL NOT BE LOCATED WITHIN THE DRIPLINE OF EXISTING TREES.
42. THE MAXIMUM TIME OF EXPOSURE FOR BARE SOIL AREAS SHALL BE TWENTY (20) DAYS BEFORE STABILIZATION MEASURES ARE IMPLEMENTED.

CLEAN FILL AND ENVIRONMENTAL DUE DILIGENCE NOTES:
1. IF THE SITE WILL HAVE EXCESS FILL THAT WILL NEED TO BE EXPORTED TO AN OFF SITE LOCATION, THE RESPONSIBILITY OF CLEAN FILL DETERMINATION AND ENVIRONMENTAL DUE DILIGENCE RESTS ON THE APPLICANT. IF ALL CUT AND FILL MATERIALS WILL BE USED ON THE SITE, A CLEAN FILL DETERMINATION IS NOT REQUIRED BY THE OPERATOR UNLESS THERE IS A BELIEF THAT A SPILL OR RELEASE OF REGULATED SUBSTANCE OCCURRED ON SITE.
2. APPLICANTS AND/OR OPERATORS MUST USE ENVIRONMENTAL DUE DILIGENCE TO ENSURE THAT THE FILL MATERIAL ASSOCIATED WITH THE PROJECT QUALIFIES AS CLEAN FILL. ALL FILL MATERIAL MUST BE USED IN ACCORDANCE WITH THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL," DOCUMENT NUMBER 258-2182-773. A COPY OF THIS POLICY IS AVAILABLE ONLINE AS WWW. DEPWEB.STATE.PA.US
3. CLEAN FILL IS DEFINED AS: UNCONTAMINATED, NON-WATER SOLUBLE, NON-DECOMPOSABLE, INERT, SOLID MATERIAL. THE TERM INCLUDES SOIL, ROCK, STONE, DREDGED MATERIAL, USED ASPHALT, AND BRICK, BLOCK OR CONCRETE FROM CONSTRUCTION AND DEMOLITION ACTIVITIES THAT IS SEPARATE FROM OTHER WASTE AND IS RECOGNIZABLE AS SUCH. THE TERM DOES NOT INCLUDE MATERIALS PLACED IN OR ON THE WATERS OF THE COMMONWEALTH UNLESS OTHERWISE AUTHORIZED. (THE TERM "USED ASPHALT" DOES NOT INCLUDE MILLED ASPHALT OR ASPHALT THAT HAS BEEN PROCESSED FOR RE-USE).
4. CLEAN FILL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE: FILL MATERIALS AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE STILL QUALIFIES AS CLEAN FILL PROVIDED THE TESTING REVEALS THAT THE FILL MATERIAL CONTAINS CONCENTRATIONS OF REGULATED SUBSTANCES THAT ARE BELOW THE RESIDENTIAL LIMITS IN TABLES FP-1A AND FP-1B FOUND IN THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".
5. ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE FORM FP-001 TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIAL AS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE OWNER OF THE PROPERTY RECEIVING THE FILL. A COPY OF FORM FP-001 CAN BE FOUND AT THE END OF THESE INSTRUCTIONS.
6. ENVIRONMENTAL DUE DILIGENCE: INVESTIGATIVE TECHNIQUES, INCLUDING, BUT NOT LIMITED TO, VISUAL PROPERTY INSPECTIONS, ELECTRONIC DATA BASE SEARCHES, REVIEW OF PROPERTY OWNERSHIP, REVIEW OF PROPERTY USE HISTORY, SANBORN MAPS, ENVIRONMENTAL QUESTIONNAIRES, TRANSACTION SCREENS, ANALYTICAL TESTING, ENVIRONMENTAL ASSESSMENTS OR AUDITS. ANALYTICAL TESTING IS NOT A REQUIRED PART OF DUE DILIGENCE UNLESS VISUAL INSPECTION AND/OR REVIEW OF THE PAST LAND USE OF THE PROPERTY INDICATES THAT THE FILL MAY HAVE BEEN SUBJECTED TO A SPILL OR RELEASE OF REGULATED SUBSTANCE. IF THE FILL MAY HAVE BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE, IT MUST BE TESTED TO DETERMINE IF IT QUALIFIES AS CLEAN FILL. TESTING SHOULD BE PERFORMED IN ACCORDANCE WITH APPENDIX A OF THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL."
7. FILL MATERIAL THAT DOES NOT QUALIFY AS CLEAN FILL IS REGULATED FILL. REGULATED FILL IS WASTE AND MUST BE MANAGED IN ACCORDANCE WITH THE DEPARTMENT'S MUNICIPAL OR RESIDUAL WASTE REGULATIONS BASED ON 25 PA. CODE CHAPTERS 287 RESIDUAL WASTE MANAGEMENT OR 271 MUNICIPAL WASTE MANAGEMENT, WHICHEVER IS APPLICABLE.

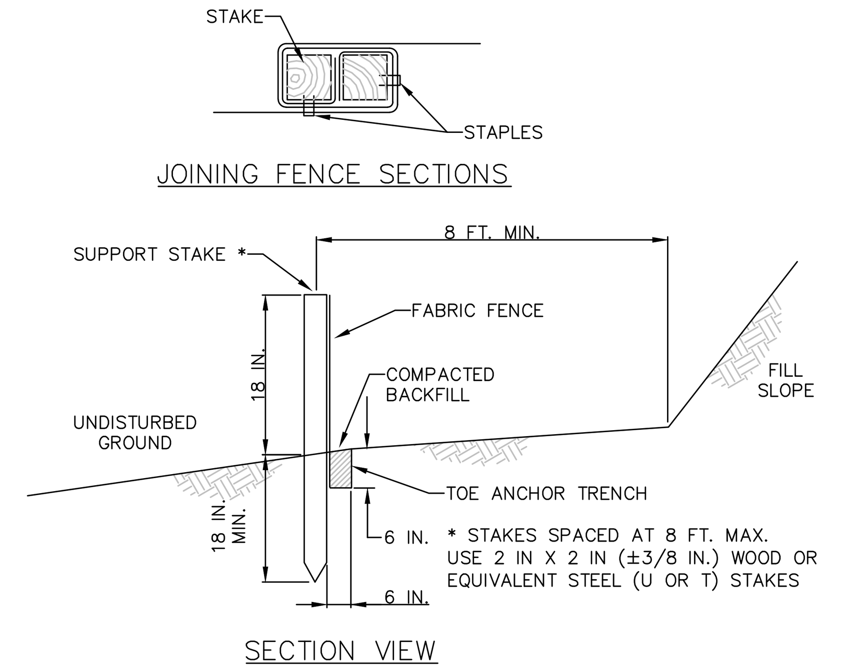
TOPSOIL APPLICATION:
1. GRADED AREAS SHOULD BE SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES TO PERMIT BONDING OF THE TOPSOIL TO THE SURFACE AREAS AND TO PROVIDE A ROUGHENED SURFACE TO PREVENT TOPSOIL FROM SLIDING DOWN SLOPE.
2. TOPSOIL SHOULD BE UNIFORMLY DISTRIBUTED ACROSS THE DISTURBED AREA TO A DEPTH OF 4 TO 8 INCHES MINIMUM - 2 INCHES ON FILL OUTSLOPES. SPREADING SHOULD BE DONE IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL PREPARATION OR TILLAGE. IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOIL PLACEMENT SHOULD BE CORRECTED IN ORDER TO PREVENT FORMATION OF DEPRESSIONS UNLESS SUCH DEPRESSIONS ARE PART OF THE PCSM PLAN.
3. TOPSOIL SHOULD NOT BE PLACED WHILE THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION. COMPACTED SOILS SHOULD BE SCARIFIED 6 TO 12 INCHES ALONG CONTOUR WHEREVER POSSIBLE PRIOR TO SEEDING.

TURFGRASS ESTABLISHMENT:
SOIL TESTING
1. A SOIL TEST TO DETERMINE LIME AND FERILIZER REQUIREMENTS PROVIDES THE BEST GUIDE FOR PROPER TURFGRASS ESTABLISHMENT.
ROUGH-GRADING
1. REMOVE ALL DEBRIS, INCLUDING LARGE STONES.
2. TILL SOIL AND BRING AREA TO ROUGH-GRADE PRIOR TO LIMING OR FERTILIZATION.
3. WHERE TOPSOIL IS TO BE REPLACED OR BROUGHT IN, FIRST ROUGH-GRADE THE AREA TO THE CONTOUR OF THE FINISHED GRADE TO FACILITATE UNIFORM DISTRIBUTION OF TOPSOIL.
LIMING
1. WHERE A TEST HAS BEEN MADE, BROADCAST AND WORK INTO A 4 TO 6-INCH SOIL DEPTH TO MEET THE REQUIREMENT SHOWN BY THE TEST.
2. WHERE LIME REQUIREMENT EXCEEDS 200 LBS. PER 1,000 SF, APPLY ONE HALF THE TOTAL REQUIREMENT, TILL, APPLY THE REMAINING ONE HALF, AND RETILL.
3. WHERE A TEST IS NOT AVAILABLE, BROADCAST AND WORK INTO A 4 TO 6-INCH SOIL DEPTH A MINIMUM OF 100 LBS. PER 1,000 SF.
BASIC FERTILIZATION
1. WHERE A TEST HAS BEEN MADE, BROADCAST THE RECOMMENDED FERTILIZER AND WORK INTO THE SOIL TO A 4 TO 6-INCH DEPTH.
2. WHERE A TEST HAS NOT BEEN MADE, BROADCAST AND WORK INTO THE SOIL TO A 4 TO 6-INCH DEPTH 25 TO 35 LBS. OF 0-46-0 FERTILIZER OR EQUIVALENT PER 1,000 SF.
SOIL AMENDMENTS
1. WHERE A TEST INDICATES THE SOIL HAS A LOW ORGANIC MATTER CONTENT, WORK THE RECOMMENDED ORGANIC MATTER INTO THE SOIL TO A 2 TO 4-INCH DEPTH BEFORE APPLYING THE STARTER FERTILIZER.
2. REED SEDGE PEAT, MOSS PEAT, OR A COMBINATION OF THE TWO MATERIALS IS RECOMMENDED AS A SOURCE OF ORGANIC MATTER.
TILLAGE
1. TILL SEEDBED TO A 4 TO 6-INCH DEPTH MAKING SURE THE LIMESTONE (IF REQUIRED), AMENDMENTS (IF REQUIRED) AND THE BASIC FERTILIZER ARE UNIFORMLY MIXED THROUGHOUT THE SOIL PROFILE. POCKETS OF LIMESTONE, AMENDMENTS OR FERTILIZER MUST BE AVOIDED.
FINISH-GRADING
1. RAKE AREA TO FINISH-GRADE PRIOR TO SEEDING. LIGHT ROLLING WILL INDICATE ANY LOW SPOTS OR OTHER IRREGULARITIES OF THE AREA.
STARTER FERTILIZATION
1. IMMEDIATELY PRIOR TO SEEDING, BROADCAST AND WORK INTO THE TOP INCH OF SOIL 40 LBS. OF A 10-5-5, 10-6-4 OR 25 LBS. OF A 16-8-8 FERTILIZER OR THE EQUIVALENT PER 1,000 SF. THE FERTILIZER MUST BE TURF GRADE, HAVING AN APPROXIMATE 2-1-1 RATIO AND CONTAINING 35 PERCENT OR MORE OF THE TOTAL NITROGEN AS WATER INSOLUBLE OR ORGANIC NITROGEN.
SEEDING
1. LATE SUMMER TO EARLY FALL IS THE BEST TIME FOR SEEDING PERMANENT TURFGRASS.
2. SOW RECOMMENDED SEED MIXTURE ADAPTED TO USE AND CLIMATIC CONDITIONS OF THE AREA.
3. DIVIDE TOTAL SEED QUANTITY INTO TWO EQUAL LOTS, SOWING ONE LOT IN ONE DIRECTION AND THE SECOND LOT AT RIGHT ANGLES TO THE FIRST WITH A MECHANICAL SEEDER OR SPREADER.
COVER SEED
1. RAKE LIGHTLY OR DRAG AREA TO COVER SEED NO DEEPER THAN ¼ IN.
SEED-SOIL CONTACT
1. ROLL LIGHTLY TO FIRM SOIL AROUND SEED.
MULCHING
1. MULCH SEEDED AREA WITH CLEAN STRAW OR MARSH HAY AT 3.0 TONS PER ACRE. LIGHT MULCHES (SOME SOIL SHOWING THROUGH MULCH) MAY BE LEFT ON THE AREA TO DECOMPOSE. HEAVY MULCHES (COMPLETE SOIL COVERAGE) SHOULD BE REMOVED FROM THE AREA WITHIN A FEW DAYS AFTER SEED GERMINATION.

PERMANENT SEED MIXTURES		
SPECIES	% OF MIXTURE	SEED RATE
SUNNY AREAS AND WELL-DRAINED SOILS		
KENTUCKY BLUEGRASS	100%	2-3 LB/1,000 SF
KENTUCKY BLUEGRASS PERENNIAL RYEGRASS	80-90% 10-20%	3-4 LB/1,000 SF
KENTUCKY BLUEGRASS FINE FESCUES PERENNIAL RYEGRASS	40-60% 30-40% 10-20%	3-4 LB/1,000 SF
TURF-TYPE TALL FESCUE	100%	6-8 LB/1,000 SF
TURF-TYPE PERENNIAL RYEGRASS	100%	4-5 LB/1,000 SF
PARTIALLY SHADED AREAS		
FINE FESCUES KENTUCKY BLUEGRASS PERENNIAL RYEGRASS	40-50% 40-50% 10-20%	4 LB/1,000 SF
FINE FESCUES	100%	4-5 LB/1,000 SF
TURF-TYPE TALL FESCUE	100%	6-8 LB/1,000 SF
HEAVY SHADE, WELL-DRAINED SOILS		
FINE FESCUES	100%	4-5 LB/1,000 SF
HEAVY SHADE, POORLY-DRAINED SOILS		
ROUGH BLUEGRASS	100%	2-3 LB/1,000 SF

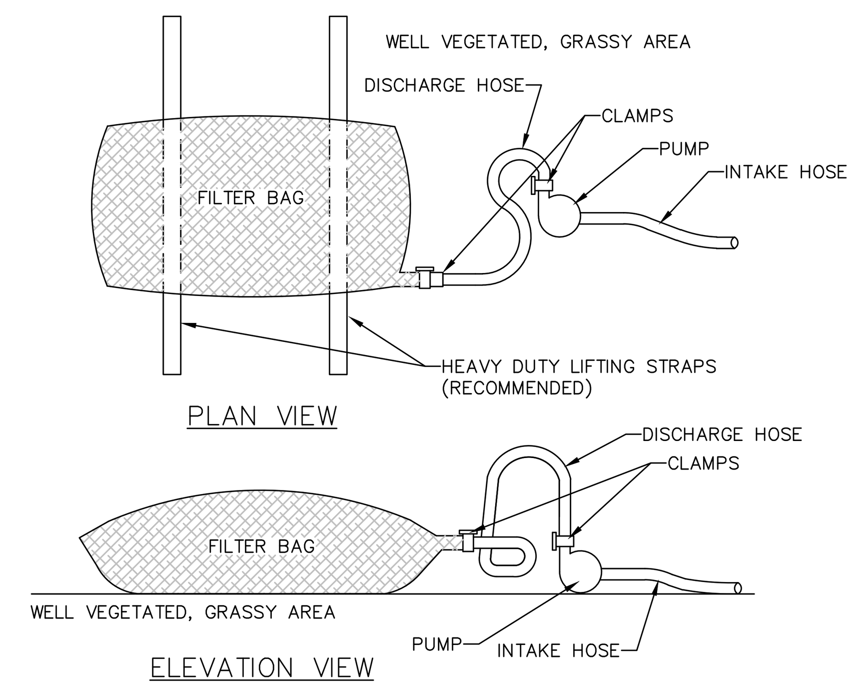
TEMPORARY SEED MIXTURE		
SPECIES	% OF MIXTURE	SEED RATE
ANNUAL OR ITALIAN RYEGRASS	100%	4-5 LB/1,000 SF

SEED MIXTURE NOTES:
1. SEEDING AND TURFGRASS INFORMATION TAKEN FROM THE PENN STATE COLLEGE OF AGRICULTURAL SCIENCES. FOR ADDITIONAL INFORMATION REFER TO HTTP://PLANTSCIENCE.PSU.EDU/RESEARCH/CENTERS/TURF.
2. THE PERCENTAGE OF WEED SEEDS SHOULD NOT EXCEED 1.0% BY WEIGHT IN THE CONTAINER. GOOD QUALITY GRASS SEED USUALLY CONTAINS NO MORE THAN 0.5% WEED SEEDS.
3. SEEDS OR SEED MIXTURES CONTAINING TIMOTHY, MEADOW FESCUE, ORCHARDGRASS, TALL OATGRASS, ANNUAL RYEGRASS OR CLOVER ARE GENERALLY NOT SUGGESTED FOR TURFGRASS USE.
4. ALL SEEDING RATES IN THIS PUBLICATION ARE IN POUNDS PER 1000 SQUARE FEET. IF CONVERTING TO AN ACRE BASIS, MULTIPLY BY 43.
5. IT IS SUGGESTED THAT 3-5 VARIETIES OF KENTUCKY BLUEGRASS BE USED IN THE BLEND OR MIXTURE.
6. WHEREVER SEED AND MULCH IS APPLIED BY HYDROSEEDING METHODS, THE SEED AND MULCH SHOULD BE APPLIED IN SEPARATE APPLICATIONS WITH THE SEED BEING APPLIED FIRST AND THE MULCH SPRAYED ON TOP OF THE SEED.
7. IN CRITICAL AREAS (E.G. ADJACENT TO OR WITHIN 50 FEET OF STREAMS, PONDS, OR WETLANDS) A PROTECTIVE BLANKET SHOULD BE PROVIDED FOR ALL SEEDED AREAS.



NOTES:
1. FABRIC SHALL HAVE THE MINIMUM PROPERTIES AS SHOWN IN TABLE 4.3 OF THE PA DEP EROSION CONTROL MANUAL.
2. FABRIC WIDTH SHALL BE 30 IN. MINIMUM. STAKES SHALL BE HARDWOOD OR EQUIVALENT STEEL (U OR T) STAKES.
3. SILT FENCE SHALL BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE FENCE SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH HALF THE ABOVE GROUND HEIGHT OF THE FENCE.
5. ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET (STANDARD CONSTRUCTION DETAIL # 4-6).
6. FENCE SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN TRIBUTARY AREA IS PERMANENTLY STABILIZED.

STANDARD CONSTRUCTION DETAIL #4-7
STANDARD SILT FENCE (18" HIGH)
NOT TO SCALE

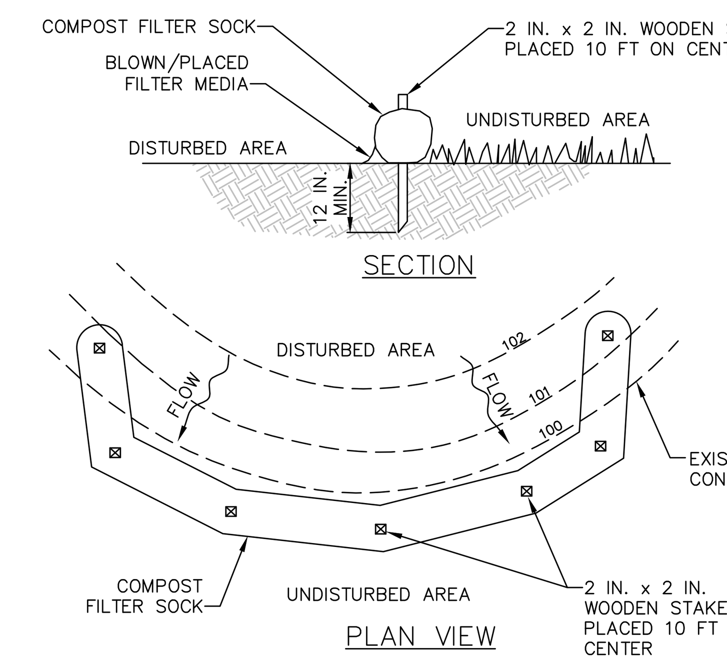


NOTES:
1. LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

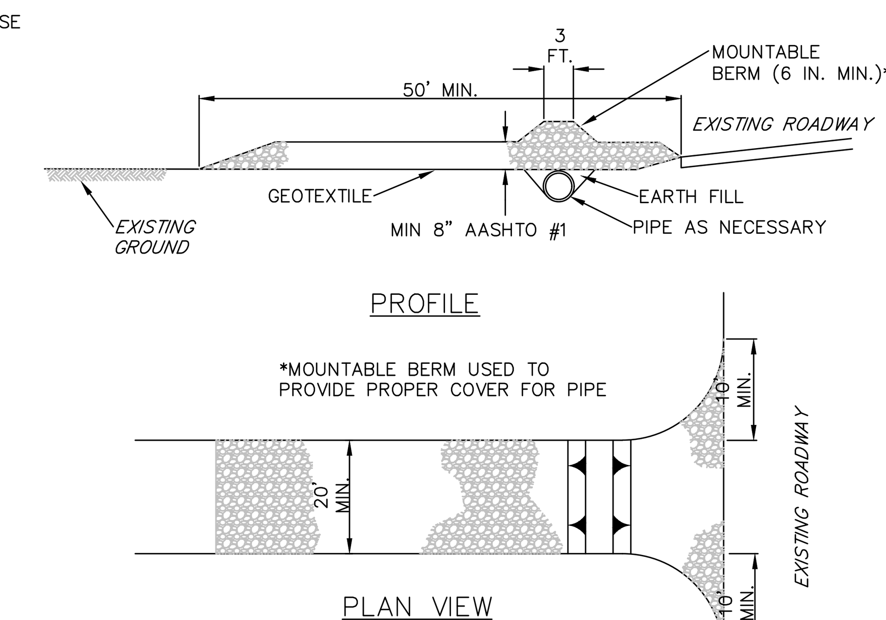
2. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.
3. BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.
4. NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.
6. THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.
7. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

STANDARD CONSTRUCTION DETAIL #3-16
PUMPED WATER FILTER BAG
NOT TO SCALE



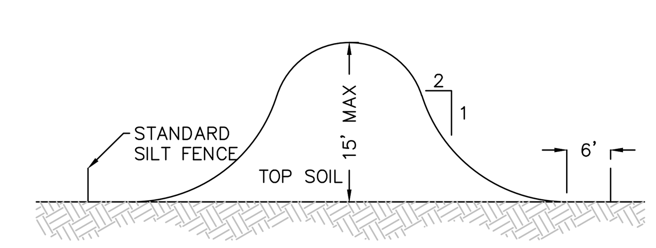
NOTES:
1. SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.
2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
6. BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

STANDARD CONSTRUCTION DETAIL #4-1
COMPOST FILTER SOCK
NOT TO SCALE



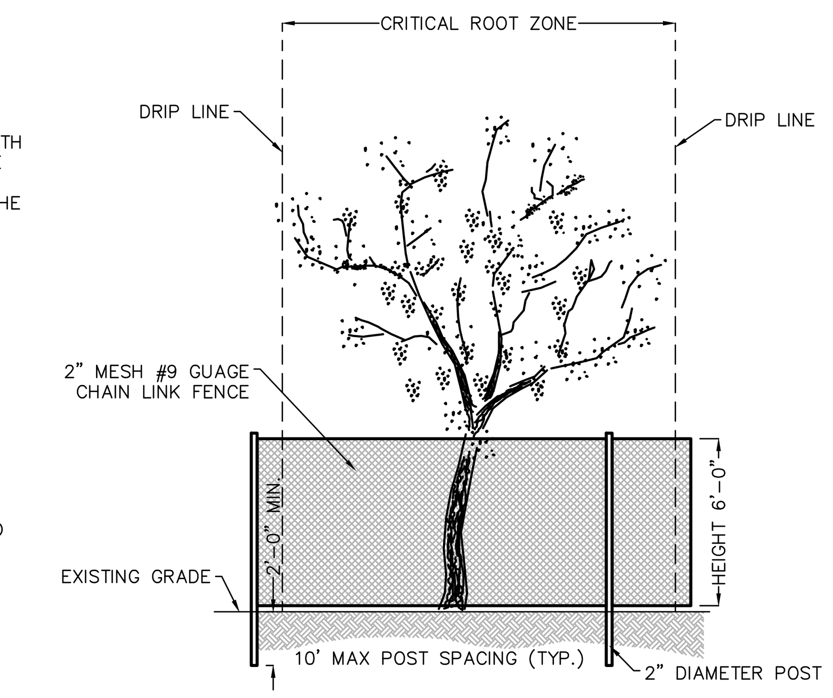
NOTES:
1. REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.
2. RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.
3. MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.
4. MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

STANDARD CONSTRUCTION DETAIL #3-1
ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE

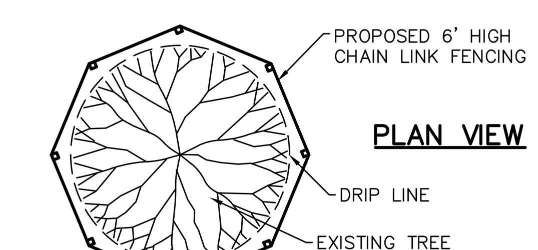


NOTES:
1. SILT FENCE MUST COMPLETELY ENCIRCLE STOCKPILES
2. TOPSOIL SHALL NOT BE REMOVED FROM THE DEVELOPMENT SITE OR USED AS FILL.
3. TOPSOIL SHALL BE REMOVED FROM THE AREAS OF CONSTRUCTION AND STORED SEPARATELY.
4. TOPSOIL SHALL BE STABILIZED TO MINIMIZE EROSION DURING STORAGE.
5. UPON COMPLETION OF CONSTRUCTION, THE TOPSOIL SHALL BE UNIFORMLY REDISTRIBUTED ON THE SITE.

TYPICAL SOIL STOCKPILE CROSS SECTION
NOT TO SCALE

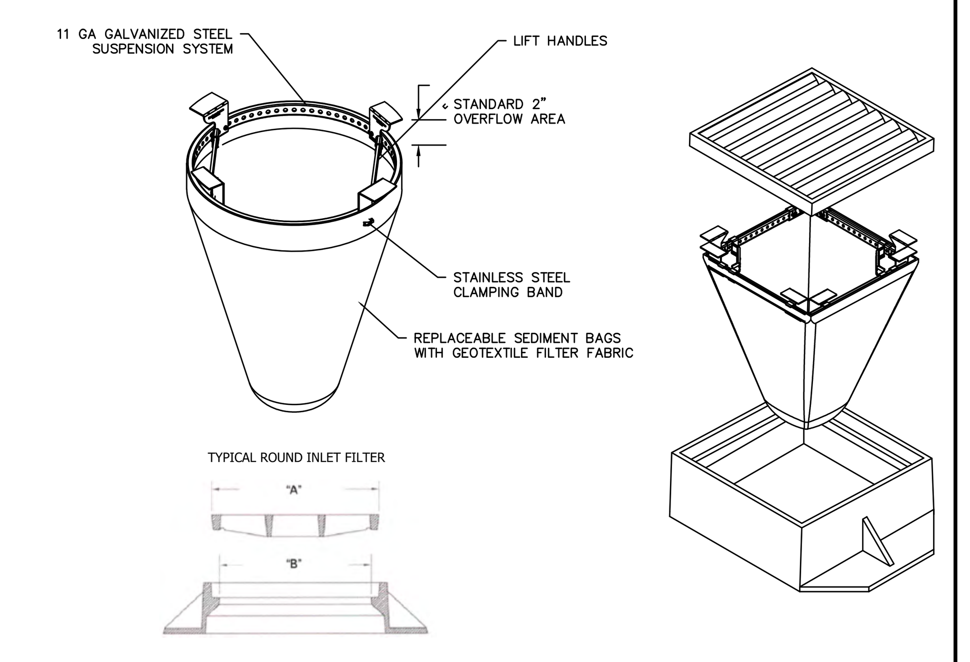


DO NOT:
A. ALLOW RUN OFF OF SPILLAGE OF DAMAGING MATERIALS INTO THE AREA BELOW ANY TREE CANOPY.
B. STORE MATERIALS, STOCKPILE SOIL, OR PARK OR DRIVE VEHICLES WITHIN THE TPZ.
C. CUT, BREAK, SKIN, OR BRUISE ROOTS, BRANCHES OR TRUNKS WITHOUT FIRST OBTAINING AUTHORIZATION FROM THE CONSULTING ARBORIST.
D. ALLOW FIRES UNDER AND ADJACENT TO TREES.
E. DISCHARGE EXHAUST INTO FOLIAGE.
F. SECURE CABLE, CHAIN, OR ROPE TO TREES OR SHRUBS.
G. TRENCH, DIG, OR OTHERWISE EXCAVATE WITHIN THE DRIPLINE OR TPZ OF THE TREE(S) WITHOUT FIRST OBTAINING AUTHORIZATION FROM THE CONSULTING ARBORIST.
H. APPLY SOIL STERILANTS UNDER PAVEMENT NEAR EXISTING TREES.



TREE PROTECTION SPECIFICATIONS:
I. A 4" LAYER OF COARSE MULCH OR WOODCHIPS IS TO BE PLACED BENEATH THE DRIPLINE OF THE PROTECTED TREES. MULCH IS TO BE KEPT 12" FROM THE TRUNK.
II. A PROTECTIVE BARRIER OF 6' CHAIN LINK FENCING SHALL BE INSTALLED AROUND THE DRIPLINE OF PROTECTED TREE(S). THE FENCING CAN BE MOVED WITHIN THE DRIPLINE IF AUTHORIZED BY THE CONSULTING ARBORIST BUT NOT CLOSER THAN 2' FROM THE TRUNK OF ANY TREE. FENCE POSTS SHALL BE 2.0" IN DIAMETER AND ARE TO BE DRIVEN 2' INTO THE GROUND. THE DISTANCE BETWEEN POSTS SHALL NOT BE MORE THAN 10'. THIS ENCLOSED AREA IS THE TREE PROTECTION ZONE (TPZ).
III. MOVABLE BARRIERS OF CHAIN LINK FENCING SECURED TO CEMENT BLOCKS CAN BE SUBSTITUTED FOR "FIXED" FENCING IF THE CONSULTING ARBORIST AGREES THAT THE FENCING WILL HAVE TO BE MOVED TO ACCOMMODATE CERTAIN PHASES OF CONSTRUCTION. THE BUILDER MAY NOT MOVE THE FENCE WITHOUT AUTHORIZATION FROM THE CONSULTING ARBORIST.
IV. WHERE THE CONSULTING ARBORIST HAS DETERMINED THAT TREE PROTECTION FENCING WILL INTERFERE WITH THE SAFETY OF WORK CREWS, TREE WRAP MAY BE USED AS AN ALTERNATIVE FORM OF TREE PROTECTION. WOODEN SLATS AT LEAST ONE INCH THICK ARE TO BE BOUND SECURELY, EDGE TO EDGE, AROUND THE TRUNK. A SINGLE LAYER OR MORE OF ORANGE PLASTIC CONSTRUCTION FENCING IS TO BE WRAPPED AND SECURED AROUND THE OUTSIDE OF THE WOODEN SLATS. MAJOR SCAFFOLD LIMBS MAY REQUIRE PROTECTION AS DETERMINED BY THE CONSULTING ARBORIST. STRAW WADDLE MAY ALSO BE USED AS A TRUNK WRAP BY COILING THE WADDLE AROUND THE TRUNK UP TO A MINIMUM HEIGHT OF SIX FEET FROM GRADE. A SINGLE LAYER OR MORE OF ORANGE PLASTIC CONSTRUCTION FENCING IS TO BE WRAPPED AND SECURED AROUND THE STRAW WADDLE.

TREE PROTECTION DETAIL
NOT TO SCALE



NOTES:
1. ALL FRAMING IS CONSTRUCTED OF CORROSION RESISTANT STEEL (ZINC PLATED OR GALVANIZED) FOR 7 YEAR MINIMUM SERVICE LIFE.
2. UPON ORDERING CONFIRMATION OF THE DOT CALLOUT, PRECAST OR CASTING MAKE AND MODEL, OR DETAILED DIMENSIONAL FORMS MUST BE PROVIDED TO CONFIGURE AND ASSEMBLE YOUR CUSTOMIZED FLEXSTORM INLET FILTER. PART NUMBER ALONE IS NOT SUFFICIENT.
3. FOR WRITTEN SPECIFICATIONS AND MAINTENANCE GUIDELINES VISIT WWW.INLETFILTERS.COM

FLEXSTORM CATCH IT (OR EQUAL)
NOT TO SCALE

INSTALLATION INSTRUCTIONS:
1. REMOVE THE GRATE FROM THE CASTING OR CONCRETE DRAINAGE STRUCTURE.
2. CLEAN THE LEDGE (LIP) OF THE CASTING FRAME OR DRAINAGE STRUCTURE TO ENSURE IT IS FREE OF STONE AND DIRT.
3. DROP IN THE FLEXSTORM INLET FILTER THROUGH THE CLEAR OPENING AND BE SURE THE SUSPENSION HANGERS REST FIRMLY ON THE INSIDE LEDGE (LIP) OF THE CASTING.
4. REPLACE THE GRATE AND CONFIRM IT IS ELEVATED NO MORE THAN 1/8", WHICH IS THE THICKNESS OF THE STEEL HANGERS.

FREQUENCY OF INSPECTIONS:
1. CONSTRUCTION SITE INSPECTION SHOULD OCCUR FOLLOWING EACH ½" OR MORE RAIN EVENT.
2. POST CONSTRUCTION INSPECTIONS SHOULD OCCUR THREE TIMES PER YEAR (EVERY FOUR MONTHS) IN AREAS WITH YEAR ROUND RAINFALL AND THREE TIMES PER YEAR (EVERY THREE MONTHS) IN AREAS WITH RAINY SEASONS BEFORE AND AFTER SNOWFALL SEASON.
3. INDUSTRIAL APPLICATION SITE INSPECTIONS (LOADING RAMPS, WASH RACKS, MAINTENANCE FACILITIES) SHOULD OCCUR ON A REGULARLY SCHEDULED BASIS NO LESS THAN THREE TIMES PER YEAR.

MAINTENANCE GUIDELINES:
1. EMPTY THE SEDIMENT BAG IF MORE THAN HALF FILLED WITH SEDIMENT AND DEBRIS, OR AS DIRECTED BY THE ENGINEER.
2. REMOVE THE GRATE, ENGAGE THE LIFTING BARS OR HANDLES WITH THE FLEXSTORM REMOVAL TOOL, AND LIFT FROM THE DRAINAGE STRUCTURE.
3. DISPOSE OF THE SEDIMENT OR DEBRIS AS DIRECTED BY THE ENGINEER OR MAINTENANCE CONTRACT IN ACCORDANCE WITH EPA GUIDELINES.
4. AS AN ALTERNATIVE, AN INDUSTRIAL VACUUM MAY BE USED TO COLLECT THE ACCUMULATED SEDIMENT.
5. REMOVE ANY CAKED ON SILT FROM THE SEDIMENT BAG AND REVERSE FLUSH THE BAG WITH MEDIUM SPRAY FOR OPTIMAL FILTRATION.
6. REPLACE THE BAG IF TORN OR PUNCTURED TO ½" DIAMETER OR GREATER ON THE LOWER HALF OF THE BAG.
7. POST CONSTRUCTION PC BAGS MAINT: AT 50% SATURATION, THE AVERAGE 2' X 2' ADSORB-IT LINED PC FILTER WILL RETAIN APPROXIMATELY 75 OZ (4.2 LBS) OF OIL AND SHOULD BE SERVICED. IT CAN BE CENTRIFUGED OR PASSED THROUGH A WRINGER TO RECOVER THE OILS, AND THE FABRIC REUSED WITH 85% TO 90% EFFICACY. IT MAY ALSO BE RECYCLED FOR ITS FUEL VALUE THROUGH WASTE TO ENERGY INCINERATION.
8. MYCELX SKIMMER POUCHES: THE SKIMMERS START YELLOW IN COLOR AND WILL GRADUALLY TURN BROWN AS THEY BECOME SATURATED, INDICATING TIME FOR REPLACEMENT. EACH MYCELX SKIMMER POUCH WILL ABSORB APPROXIMATELY 89 OZ (5 LBS) OF OIL BEFORE REQUIRING REPLACEMENT.
9. DISPOSE OF ALL OIL CONTAMINATED PRODUCTS IN ACCORDANCE WITH EPA GUIDELINES.

SEDIMENT BAG REPLACEMENT:
1. REMOVE THE BAG BY LOOSENING OR CUTTING OFF THE CLAMPING BAND.
2. TAKE THE NEW SEDIMENT BAG, WHICH IS EQUIPPED WITH A STAINLESS STEEL WORM DRIVE CLAMPING BAND, AND USE A SCREW DRIVER TO TIGHTEN THE BAG AROUND THE FRAME CHANNEL.
3. ENSURE THE BAG IS SECURE AND THAT THERE IS NO SLACK AROUND THE PERIMETER OF THE BAND.

REV	DATE	COMMENTS
3	10/26/21	STORM
2	08/24/21	TWP ENG
1	08/16/21	TWP ENG

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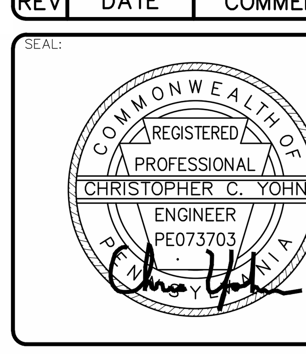
SEAL:


PROJECT: SINGLE FAMILY DWELLING
PROJECT ADDRESS: 904 DREXEL LANE, BRYN MAWR, PA 19010
MUNICIPALITY: RADNOR TOWNSHIP
COUNTY: DELAWARE COUNTY
PLAN SET: STORMWATER MANAGEMENT PERMIT PLAN SET
SHEET NAME: EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS

PREPARED FOR:
OWNER / APPLICANT
MARK & LILIAN WANG
904 DREXEL LANE
BRYN MAWR, PA 19010

DATE:	JUNE 15, 2021
SCALE:	NO SCALE
ONE CALL NUMBER:	2021-104-5311
DRAWN BY:	CCY
PROJECT NUMBER:	17-086

PREPARED BY:
YOHN ENGINEERING, LLC
555 SECOND AVENUE, SUITE B-205
COLLEGEVILLE, PA 19426
610-489-4580
WWW.YOHNENGINEERING.COM

YOHN Engineering, LLC

POST CONSTRUCTION STORMWATER MANAGEMENT CALCULATIONS

904 DREXEL LANE

RADNOR TOWNSHIP, DELAWARE COUNTY

JUNE 15, 2021
REVISED AUGUST 16, 2021
REVISED OCTOBER 26, 2021

FILE # 17-086

YOHN ENGINEERING, LLC
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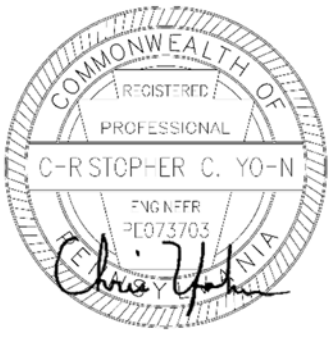


Stormwater Management Narrative

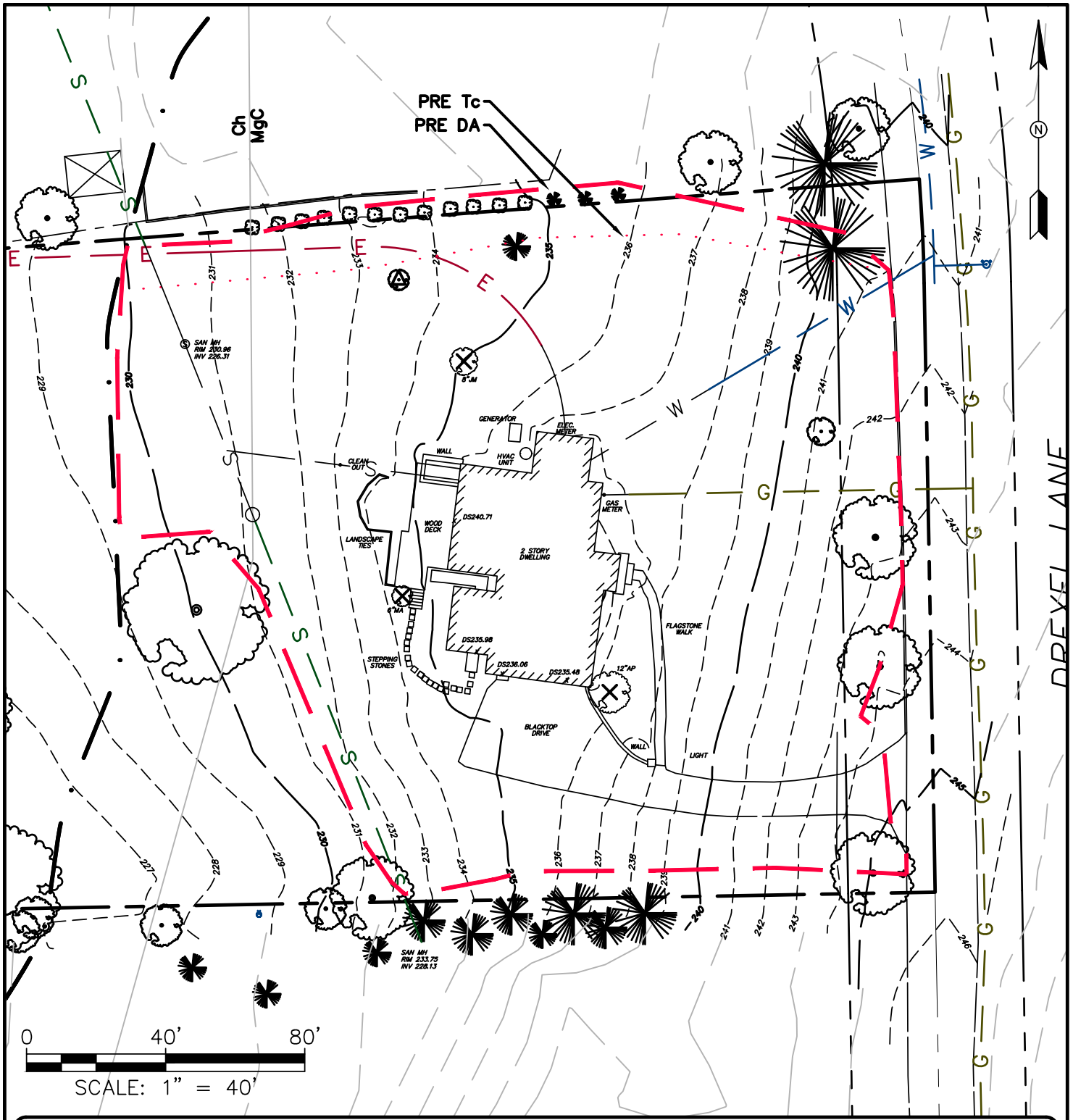
A new home, pool, cabana, driveway, walks, walls, etc. is proposed at Drexel Lane in Bryn Mawr, PA 19010. The property is a 1.4 acre lot within Radnor Township, Delaware County. The property is developed with a residence and associated driveway, walls, walks, etc. The Applicant proposes to remove the existing residence and associated impervious and construct a new home, pool, caban, driveway, walls, walks, etc. In accordance with the Stormwater Management Permit requirements and the Stormwater Management Ordinance of the Township code, the following are stormwater management calculations for the increased impervious coverage associated with the proposed development.

The site is located in the Darby-Cobbs Watershed District B-2. As a result, several stormwater requirements shall be met:

- Provide Groundwater Recharge Volume in accordance with §245-22.
    - The increase in the runoff volume for the 2-year storm event shall be infiltrated into the ground as calculated using the SCS Method where feasible.
    - The Rev volume shall be provided for individual PCSMs.
- Provide Water Quality Volume in accordance with Section §245-23.
- Provide Peak Rate Control in accordance with Section §245-25.
    - The 2-year post development runoff rate shall be reduced to the 1-year predevelopment rate utilizing the Rational Method.
    - The 5-year post development runoff rate shall be reduced to the 2-year predevelopment rate utilizing the Rational Method.
    - The 10-year post development runoff rate shall be reduced to the 5-year predevelopment rate utilizing the Rational Method.
    - The 25-year post development runoff rate shall be reduced to the 5-year predevelopment rate utilizing the Rational Method.
    - The 50-year post development runoff rate shall be reduced to the 25-year predevelopment rate utilizing the Rational Method.
    - The 100-year post development runoff rates shall be reduced to the 100-year predevelopment rates utilizing the Rational Method.

The required rate and volume controls have been provided for the site through the use of a rain garden and stonebed located in the side yard. Overflow from the system is to a level spreader. Due to the provided rate and volume controls and the location of the discharge, we do not believe the proposed development will adversely affect adjacent properties or existing Township stormwater facilities.

Double Ring Infiltrometer Testing was performed in several locations on the site in order to verify the characteristics of the existing soils and limiting zones. Tests indicated a limiting zone at 1 to 4 feet deep due to mottling and zero infiltration, which was unfortunately, likely, due to the proximity to Meadowbrook Run, which traverses west of the site as well as the associated floodplain. Due to the shallow limiting zone, a rain garden is proposed and although infiltrating the net 2-year volume was unachievable, 1 inch over the proposed impervious was provided below the lowest orifice and the remaining volume required to meet the 2 year volume requirement has been provided below the rain garden soil in a stonebed designed per the DEP Managed Release Concept. The Applicant is seeking a waiver of §245-22 to not provide the net 2-year volume. The following calculations demonstrate compliance with the requirements noted above.



SHEET NAME:	PRE-DEVELOPMENT DRAINAGE AREA MAP
PROJECT ADDRESS:	904 DREXEL LANE, BRYN MAWR, PA 19010
MUNICIPALITY:	RADNOR TOWNSHIP
COUNTY:	DELAWARE COUNTY

PREPARED BY:
YOHN ENGINEERING, LLC
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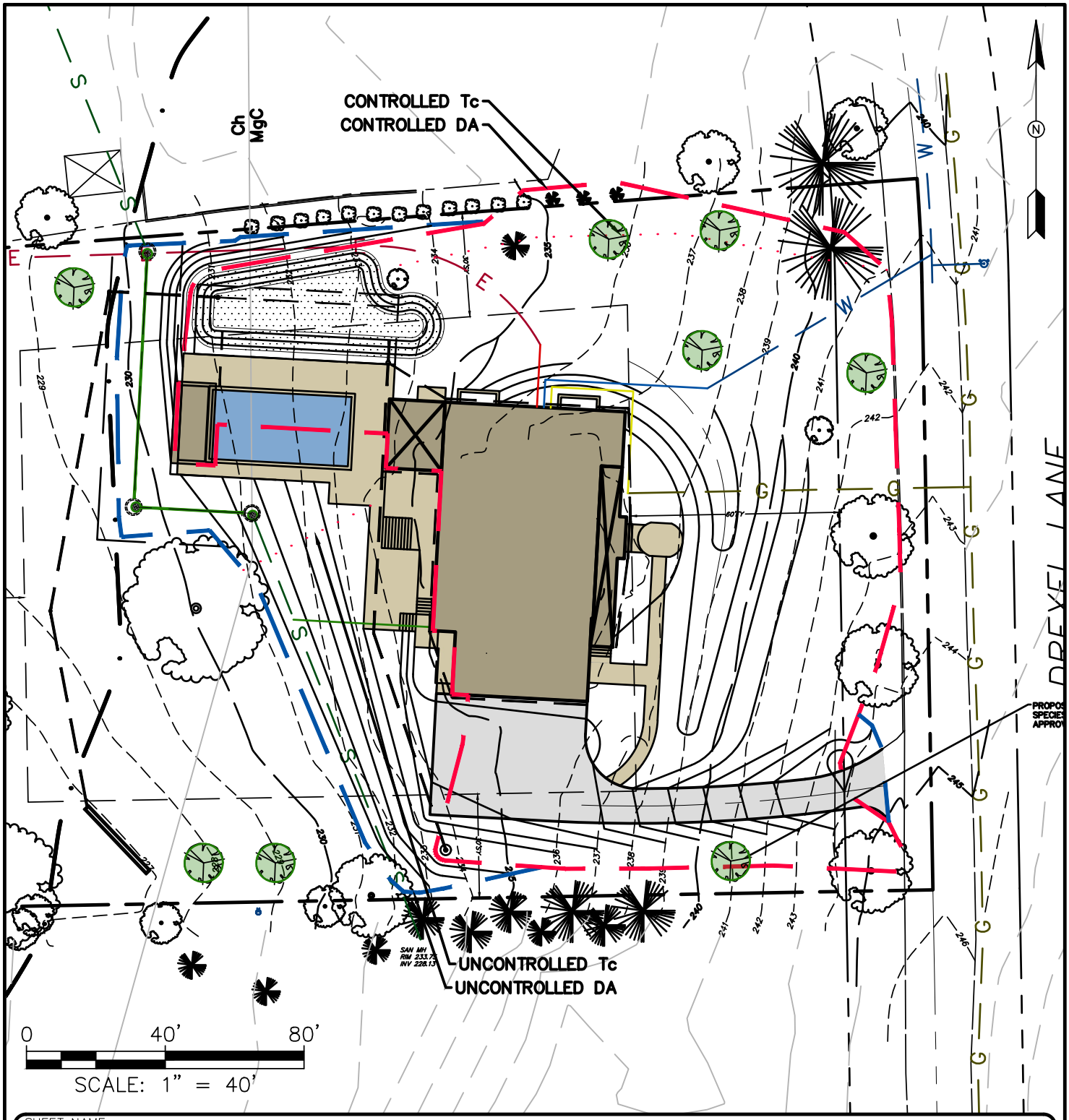
PREPARED FOR:	MARK & LILIAN WANG 904 DREXEL LANE BRYN MAWR, PA 19010
DATE:	OCTOBER 26, 2021
PROJECT NUMBER:	17-086



SHEET NAME:	POST-DEVELOPMENT DRAINAGE AREA MAP
PROJECT ADDRESS:	904 DREXEL LANE, BRYN MAWR, PA 19010
MUNICIPALITY:	RADNOR TOWNSHIP
COUNTY:	DELAWARE COUNTY

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PREPARED FOR:	MARK & LILIAN WANG 904 DREXEL LANE BRYN MAWR, PA 19010
DATE:	OCTOBER 26, 2021
PROJECT NUMBER:	17-086

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Date:	October 26, 2021		
Project:	904 Drexel Lane	File No.:	17-086
Municipality:	Radnor Township	County:	Delaware

RUNOFF RATE CONTROL SUMMARY

Watershed:	Darby and Cobbs Creek
Watershed District:	B-2
Runoff Calculation Method:	Rational Method

PRE-DEVELOPMENT RUNOFF RATES

	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Entire Watershed (CFS):	**1.206**	**1.388**	**1.598**	**1.810**	**2.021**	**2.263**	**2.534**

PEAK ALLOWABLE RUNOFF RATES

	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Event or Percent Reduction:	1-Year	1-Year	2-Year	5-Year	5-Year	10-Year	100-Year
Entire Watershed (CFS):	**1.206**	**1.206**	**1.388**	**1.598**	**1.598**	**1.810**	**2.534**

POST-DEVELOPMENT RUNOFF RATES

	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Controlled Area Routed:	0.007	0.054	0.106	0.137	0.160	0.183	0.387
Uncontrolled Areas:	0.332	0.382	0.440	0.498	0.556	0.623	0.698
Entire Watershed (CFS):	**0.332**	**0.382**	**0.440**	**0.498**	**0.556**	**0.623**	**0.724**
NET DECREASE (CFS):	0.874	1.006	1.158	1.312	1.465	1.640	1.810
PERCENT REDUCTION:	72%	72%	72%	72%	72%	72%	71%

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RUNOFF RATE CONTROL SUMMARY

Watershed:	Darby and Cobbs Creek
Watershed District:	B-2
Runoff Calculation Method:	Rational Method

PRE-DEVELOPMENT RUNOFF RATES

	200-Year	500-Year	1,000-Year
Entire Watershed (CFS):	**2.585**	**2.728**	**2.831**

PEAK ALLOWABLE RUNOFF RATES

	200-Year	500-Year	1,000-Year
Event or Percent Reduction:	200-Year	500-Year	1,000-Year
Entire Watershed (CFS):	**2.585**	**2.728**	**2.831**

POST-DEVELOPMENT RUNOFF RATES

	200-Year	500-Year	1,000-Year
Controlled Area Routed:	1.478	1.638	1.746
Uncontrolled Areas:	0.712	0.751	0.780
Entire Watershed (CFS):	**1.905**	**2.119**	**2.263**
NET DECREASE (CFS):	0.680	0.609	0.568
PERCENT REDUCTION:	26%	22%	20%

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Municipality:	Radnor Township	County:	Delaware

DRAINAGE AREA AND WEIGHTED C CALCULATIONS

Development Condition: Pre — Through Subarea: Entire Watershed

Cover	Type	C	Area (SF)	Area (AC)	
Meadow - Good Condition	B	0.20	0	0.000	0.0%
Lawn - Good Condition	B	0.25	30949	0.710	84.7%
Impervious	-	0.99	5591	0.128	15.3%
TOTAL:		**0.36**	**36540**	**0.839**	100.0%

Development Condition: Post — Through Subarea: Controlled #1

Cover	Type	C	Area (SF)	Area (AC)	
Lawn - Good Condition	B	0.25	19812	0.455	70.9%
Impervious	-	0.99	8115	0.186	29.1%
Future Impervious	-	0.99	0	0.000	0.0%
TOTAL:		**0.47**	**27927**	**0.641**	100.0%

Development Condition: Post — Through Subarea: Uncontrolled

Cover	Type	C	Area (SF)	Area (AC)	
Lawn - Good Condition	B	0.25	6648	0.153	77.2%
Impervious	-	0.99	1965	0.045	22.8%
Future Impervious	-	0.99	0	0.000	0.0%
TOTAL:		**0.42**	**8613**	**0.198**	100.0%

Development Condition: Post — Through Subarea: Entire Watershed

Cover	Type	C	Area (SF)	Area (AC)	
Lawn - Good Condition	B	0.25	26460	0.607	72.4%
Impervious	-	0.99	10080	0.231	27.6%
Future Impervious	-	0.99	0	0.000	0.0%
TOTAL:		**0.45**	**36540**	**0.839**	100.0%

*Includes 167 SF of impervious within the Right of Way

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Municipality:	Radnor Township	County:	Delaware

TIME OF CONCENTRATION / TRAVEL TIME CALCULATIONS

Development Condition:	PRE						
Through Subarea:	ENTIRE WATERSHED						
Surface Description:	Pasture						
Flow Length (FT):	222						222
Watercourse Slope (%):	5%						
Average Velocity (FPS):	0.8						
Travel Time (MIN):	4.6	0.0	0.0	0.0	0.0	0.0	4.6

Development Condition:	POST						
Through Subarea:	CONTROLLED						
Surface Description:	Pasture						
Flow Length (FT):	158						158
Watercourse Slope (%):	5%						
Average Velocity (FPS):	0.8						
Travel Time (MIN):	3.3	0.0	0.0	0.0	0.0	0.0	3.3

Development Condition:	POST						
Through Subarea:	UNCONTROLLED						
Surface Description:	Pasture						
Flow Length (FT):	41						41
Watercourse Slope (%):	12%						
Average Velocity (FPS):	0.8						
Travel Time (MIN):	0.9	0.0	0.0	0.0	0.0	0.0	0.9

TABLE 10.2.2 RECOMMENDED AVERAGE VELOCITIES OF OVERLAND FLOW FOR DETERMINING TIME OF CONCENTRATION (FROM PENNDOT DESIGN MANUAL PART 2 - PUBLICATION 13M - AUGUST 2009 EDITION

DESCRIPTION	SLOPE (%)						
	0-3	4-7	8-10	11-15	16-20	21-25	26-30
	VELOCITIES (ft/s)						
Woodland	0.5	1.0	1.5	1.7	2.0	2.7	3.5
Pasture	0.8	1.5	2.2	2.6	3.0	4.1	4.5
Pavement	5.0	12.0	15.5	18.0	-	-	-

*To be conservative, use minimum Tc = 5 minutes

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Municipality:	Radnor Township	County:	Delaware

RUNOFF VOLUME CALCULATIONS

Rainfall: 2 Year 3.36 Inches Through Subarea: PCSM #1

PRE-DEVELOPMENT DRAINAGE AREA

Cover Type	Soil Type	Area (SF)	Area (AC)	CN	S	Q Runoff (IN)	Runoff Volume (CF)
Meadow - Good Condition	B	32067	0.736	58	7.241	0.399	1067
Lawn - Good Condition	B	0	0.000	61	6.393	0.511	0
Impervious (80% TBR)	-	4473	0.103	98	0.204	3.127	1166
TOTAL:		36540	0.839				**2233**

POST-DEVELOPMENT DRAINAGE AREA

Cover Type	Soil Type	Area (SF)	Area (AC)	CN	S	Q Runoff (IN)	Runoff Volume (CF)
Lawn - Good Condition	B	26460	0.607	61	6.393	0.511	1127
Impervious	-	10080	0.231	98	0.204	3.127	2627
Future Impervious	-	0	0.000	98	0.204	3.127	0
TOTAL:		36540	0.839				**3754**

NET INCREASE:	**1521**
Volume Provided (RG):	1021
Volume Provided (SB):	510
TOTAL:	**1531**

Double Ring Infiltrometer Testing was performed in several locations on the site in order to verify the characteristics of the existing soils and limiting zones. Tests indicated a limiting zone at 1 to 4 feet deep due to mottling and zero infiltration, which was unfortunately, likely, due to the proximity to Meadowbrook Run, which traverses west of the site as well as the associated floodplain. Due to the shallow limiting zone, a rain garden is proposed and although infiltrating the net 2-year volume was unachievable, 1 inch over the proposed impervious was provided below the lowest orifice and the remaining volume required to meet the 2 year volume requirement has been provided below the rain garden soil in a stonebed designed per the DEP Managed Release Concept. The Applicant is seeking a waiver of §245-22 to not provide the net 2-year volume.

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Project:	904 Drexel Lane	File No.:	17-086
Municipality:	Radnor Township	County:	Delaware

WATER QUALITY VOLUME CALCULATIONS

Water Quality Formula: P * Rv * A / 12

P is design Rainfall amount:	1	(IN)
A is Drainage Area:	36540	(SF)
	0.839	(AC)
Rv is 0.05 + 0.009 * I:	0.298	
I is percent Impervious:	27.6	(%)
WQ:	**908**	(CF)

REV VOLUME CALCULATIONS

Rev Formula: I * Impervious Area / 12

I is design Infiltration amount:	1	(IN)
Impervious Increase:	10080	(SF)
Rev:	**840**	(CF)
Volume Provided (RG):	**1021**	(CF)
Volume Provided (SB):	**510**	(CF)
Total:	**1531**	(CF)

Double Ring Infiltrometer Testing was performed in several locations on the site in order to verify the characteristics of the existing soils and limiting zones. Tests indicated a limiting zone at 1 to 4 feet deep due to mottling and zero infiltration, which was unfortunately, likely, due to the proximity to Meadowbrook Run, which traverses west of the site as well as the associated floodplain. Due to the shallow limiting zone, a rain garden is proposed and although infiltrating the net 2-year volume was unachievable, 1 inch over the proposed impervious was provided below the lowest orifice and the remaining volume required to meet the 2 year volume requirement has been provided below the rain garden soil in a stonebed designed per the DEP Managed Release Concept. The Applicant is seeking a waiver of §245-22 to not provide the net 2-year volume.

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PIPE CAPACITY CALCULATIONS

DRAINAGE AREA:	Half Roof					
Rainfall:	100	Year	Intensity:		8.2	IN/HR
Impervious Area:	2245	SF	C:		0.95	
Pervious Area:	0	SF	C:		0.35	
Total Drainage Area:	2245	SF	Weighted C:		0.95	
			Q:		**0.40**	CFS
6 IN	PVC	@	0.5%	MIN =	**0.47**	CFS

DRAINAGE AREA:	Yard Drain #1					
Rainfall:	100	Year	Intensity:		8.2	IN/HR
Impervious Area:	2110	SF	C:		0.95	
Pervious Area:	2119	SF	C:		0.35	
Total Drainage Area:	4229	SF	Weighted C:		0.65	
			Q:		**0.52**	CFS
8 IN	PVC	@	0.5%	MIN =	**1.01**	CFS

DRAINAGE AREA:	Sump Box #2					
Rainfall:	100	Year	Intensity:		8.2	IN/HR
Impervious Area:	4490	SF	C:		0.95	
Pervious Area:	0	SF	C:		0.35	
Total Drainage Area:	4490	SF	Weighted C:		0.95	
			Q:		**0.80**	CFS
Total Flow (Overland plus YD#1):			Q:		**1.32**	CFS
8 IN	PVC	@	1.0%	MIN =	**1.43**	CFS

DELAWARE VALLEY
SEPTIC • SEWER • STORM

504 Eagle Road, Suite B, Springfield, PA 19064
Office # 610-789-0739 – Fax # 610-789-0963

dvs@delvalseptics.com
www.delvalseptics.com

Mark And Lilian Wang
904 Drexel Lane
Bryn Mawr, PA 19010

September 25, 2018

Re: Storm Water Testing

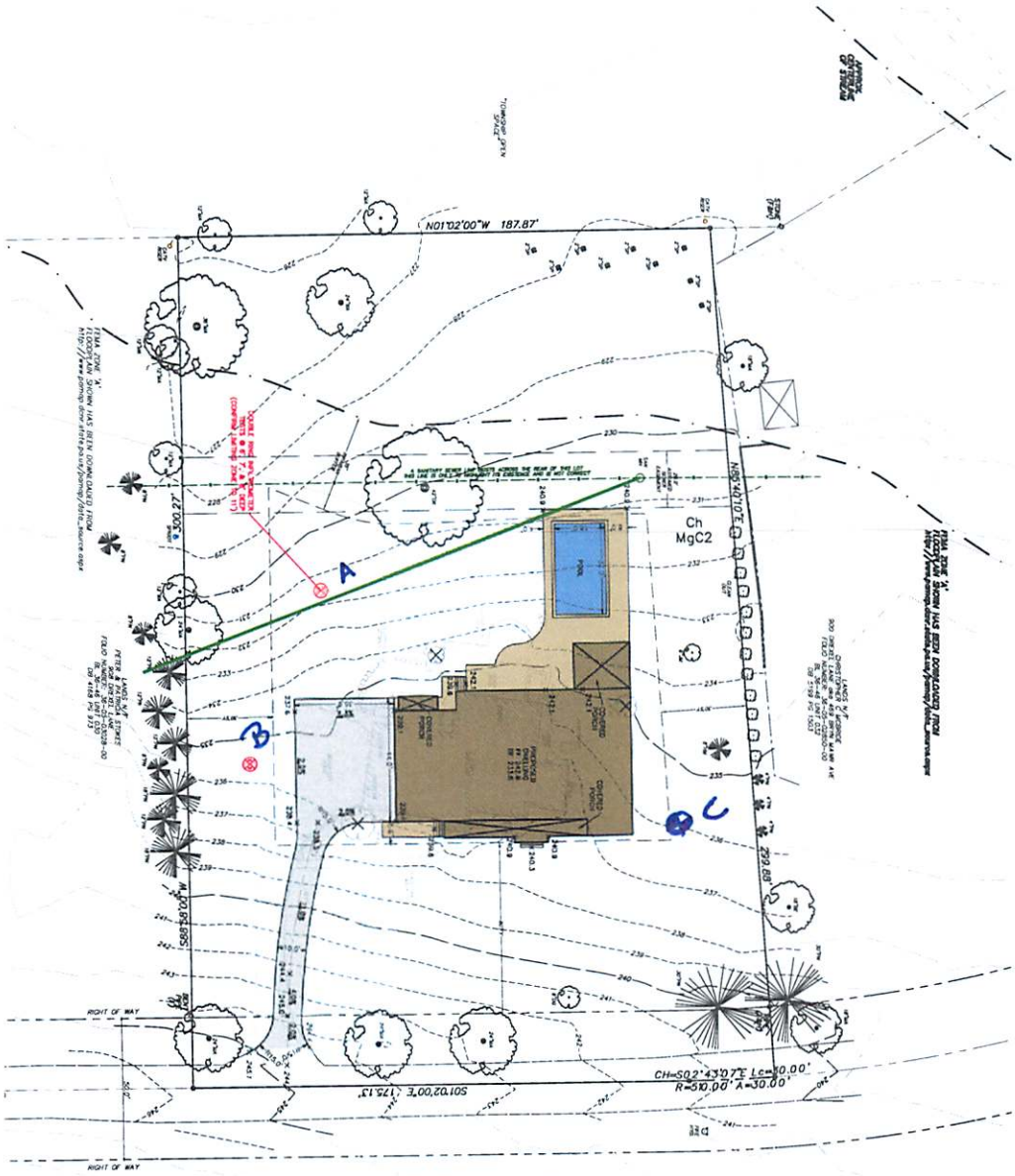
Test Area A – Mottled wet soil from 1' down to 4'. Ground water at 4'. Tested at 1' and 2' both were zero over an hour.

Test Area B – Mottled wet soil starting at 1'. Ground water at 9'. Tested at 3' and 4' both were zero over an hour.

Test Area C – Hand dug down to 4'. Same soil as two other areas on property.

Sincerely,

David DiGregorio
Managing Member


N01°02'00"W 187.87'
Ch
MgC2
A
B
C
RIGHT OF WAY
RIGHT OF WAY
DREXEL LANE

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Delaware County, Pennsylvania

May 18, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:625 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

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 Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:20,000.

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: Delaware County, Pennsylvania
Survey Area Data: Version 18, Jun 5, 2020

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

Date(s) aerial images were photographed: May 26, 2019—Jul 10, 2019

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ch	Chewacla silt loam	0.5	34.3%
MgC	Manor loam, 8 to 15 percent slopes	0.9	65.7%
Totals for Area of Interest		**1.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Delaware County, Pennsylvania

Ch—Chewacla silt loam

Map Unit Setting

National map unit symbol: 121dy
Elevation: 200 to 600 feet
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 54 to 57 degrees F
Frost-free period: 140 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Chewacla and similar soils: 85 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chewacla

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 60 inches: silt loam
H3 - 60 to 64 inches: stratified sand to silt

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Available water capacity: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Hydric soil rating: No

Minor Components

Congaree

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope, tread

Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Wehadkee

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

MgC—Manor loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tkpw
Elevation: 50 to 1,080 feet
Mean annual precipitation: 35 to 50 inches
Mean annual air temperature: 48 to 57 degrees F
Frost-free period: 150 to 220 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Manor and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Manor

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from mica schist

Typical profile

A1 - 0 to 2 inches: loam
A2 - 2 to 6 inches: sandy loam
Bw1 - 6 to 13 inches: fine sandy loam
Bw2 - 13 to 22 inches: fine sandy loam
C1 - 22 to 30 inches: fine sandy loam
C2 - 30 to 44 inches: channery coarse sand
C3 - 44 to 53 inches: loamy sand
C4 - 53 to 83 inches: channery loamy sand
Cr - 83 to 108 inches: bedrock
R - 108 to 138 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 59 to 100 inches to paralithic bedrock; 100 to 128 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.07 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Mt. airy

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Glenville

Percent of map unit: 5 percent
Landform: Drainageways, swales
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Blocktown

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope, interfluve, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

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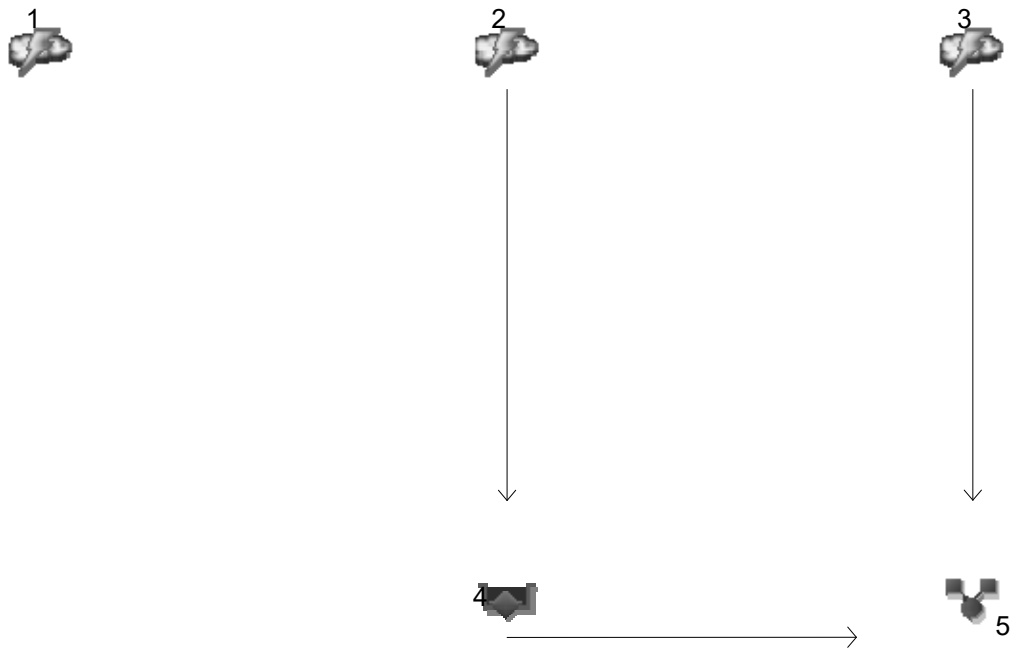
Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	Rational	PRE - ENTIRE WATERSHED
2	Rational	CONTROLLED
3	Rational	UNCONTROLLED
4	Reservoir	PCSM ROUTED
5	Combine	POST - ENTIRE WATERSHED

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Rational	------	1.206	1.388	-------	1.598	1.810	2.021	2.263	2.534	PRE - ENTIRE WATERSHED
2	Rational	------	1.178	1.355	-------	1.560	1.767	1.973	2.209	2.474	CONTROLLED
3	Rational	------	0.332	0.382	-------	0.440	0.498	0.556	0.623	0.698	UNCONTROLLED
4	Reservoir	2	0.007	0.054	-------	0.106	0.137	0.160	0.183	0.387	PCSM ROUTED
5	Combine	3, 4	0.332	0.382	-------	0.440	0.498	0.556	0.623	0.724	POST - ENTIRE WATERSHED

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

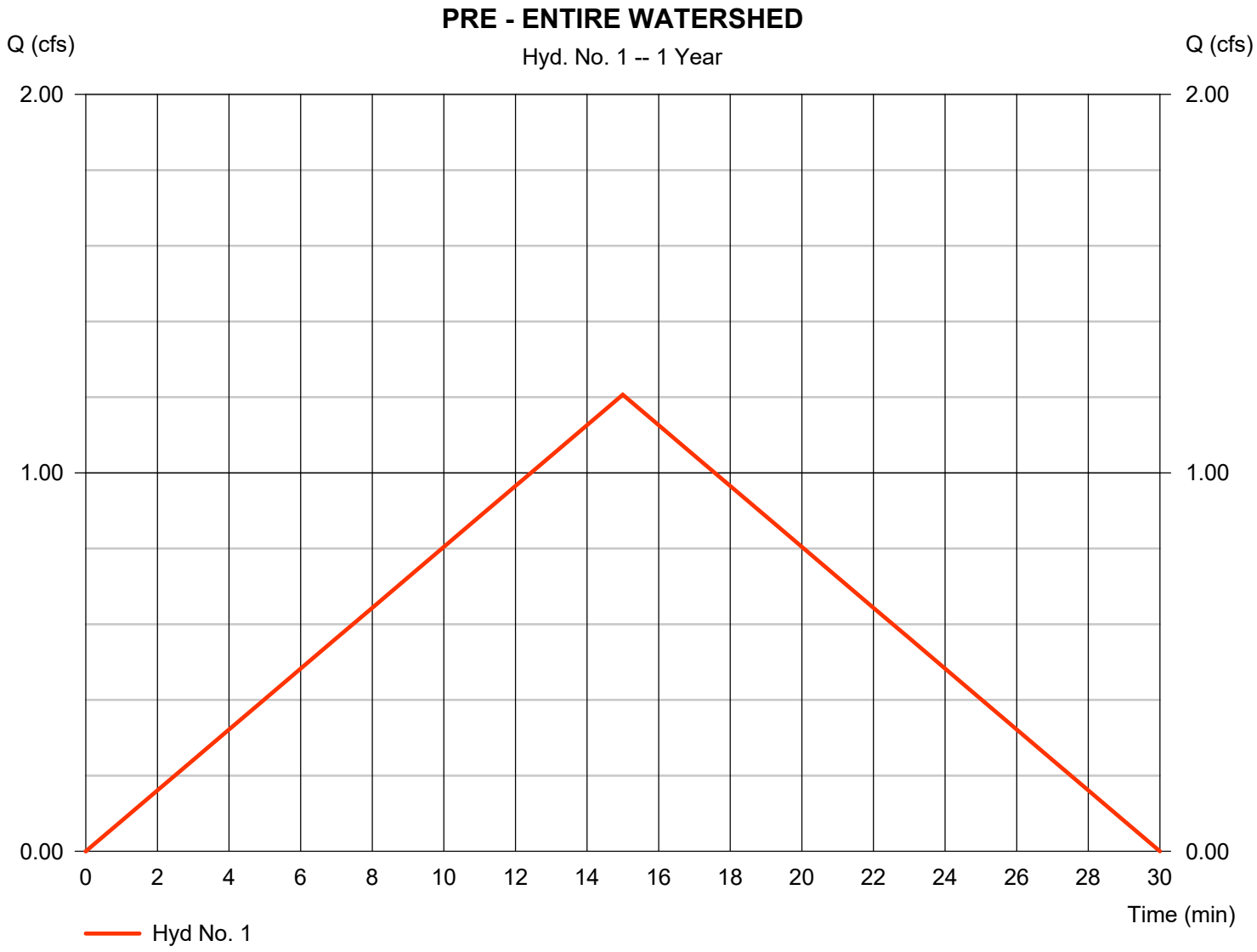
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	1.206	1	15	1,086	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	1.178	1	15	1,060	------	------	------	CONTROLLED
3	Rational	0.332	1	15	299	------	------	------	UNCONTROLLED
4	Reservoir	0.007	1	30	34	2	232.64	1,059	PCSM ROUTED
5	Combine	0.332	1	15	333	3, 4	------	------	POST - ENTIRE WATERSHED

Hydrograph Report

Hyd. No. 1

PRE - ENTIRE WATERSHED

Hydrograph type	=	Rational	Peak discharge	=	1.206 cfs
Storm frequency	=	1 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,086 cuft
Drainage area	=	0.839 ac	Runoff coeff.	=	0.36
Intensity	=	3.994 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

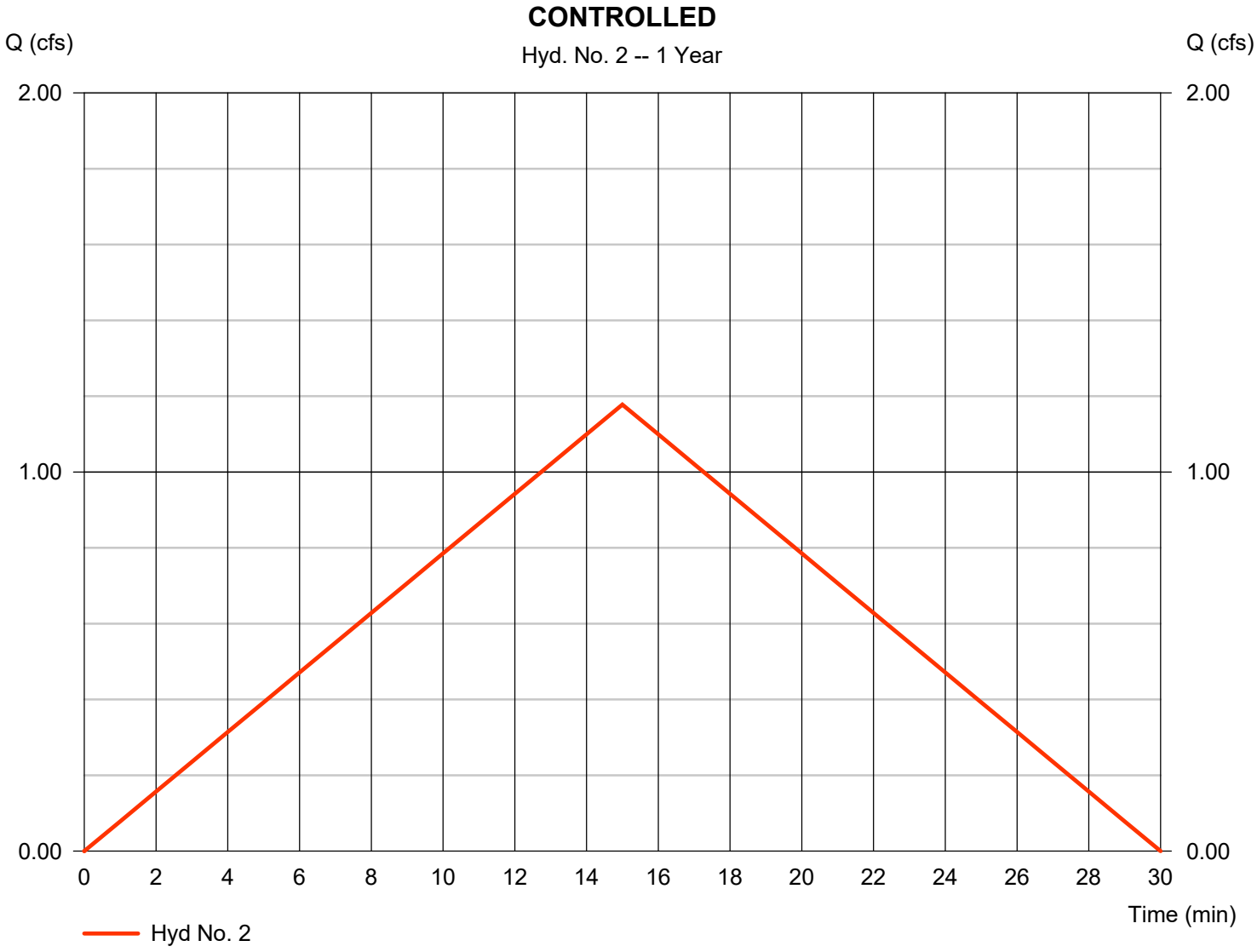


Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	1.178 cfs
Storm frequency	=	1 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,060 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	3.994 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.332 cfs
Storm frequency	=	1 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	299 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	3.994 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

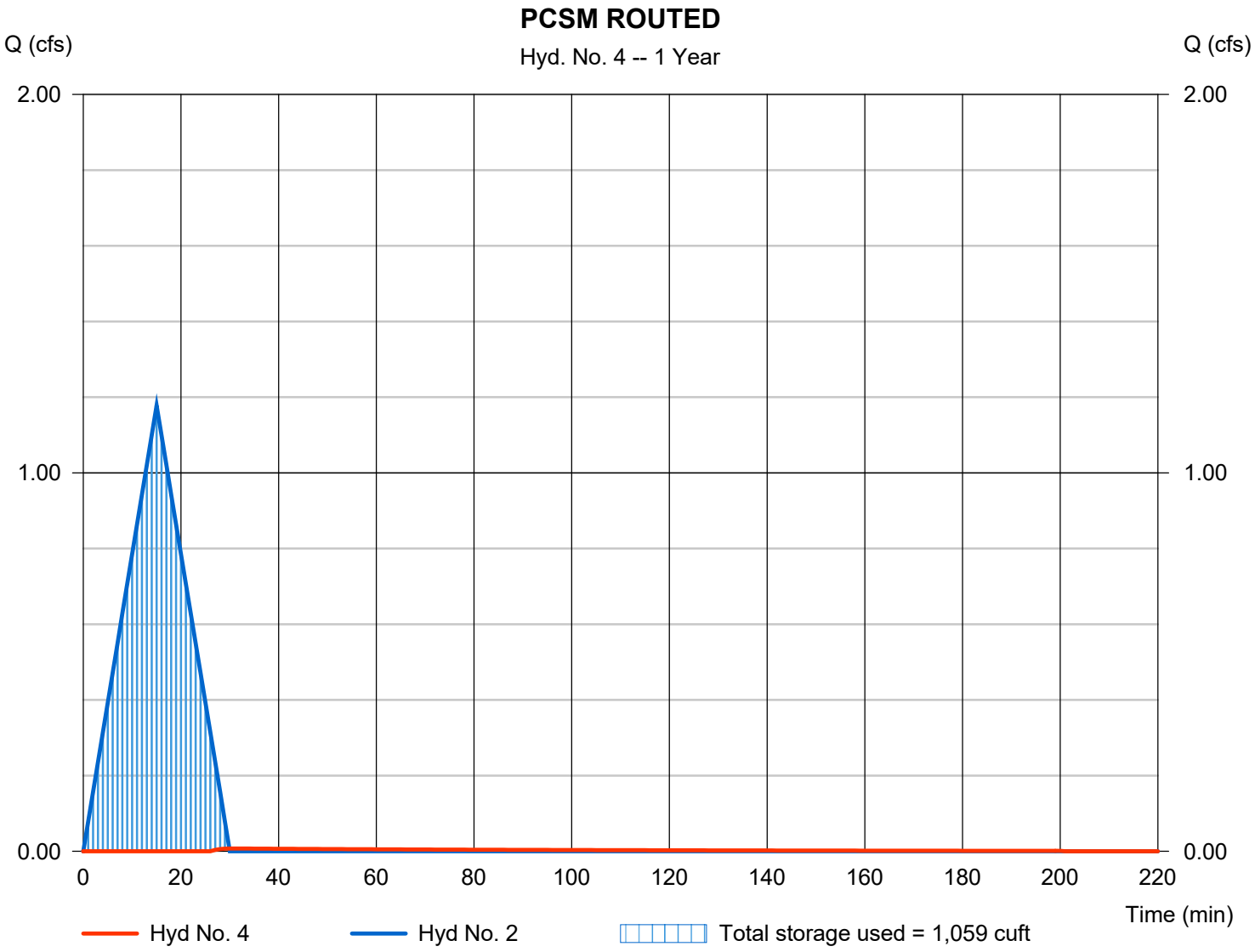
Hydrograph Report

Hyd. No. 4

PCSM ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.007 cfs
Storm frequency	=	1 yrs	Time to peak	=	30 min
Time interval	=	1 min	Hyd. volume	=	34 cuft
Inflow hyd. No.	=	2 - CONTROLLED	Max. Elevation	=	232.64 ft
Reservoir name	=	PCSM	Max. Storage	=	1,059 cuft

Storage Indication method used.



Pond No. 1 - PCSM

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 231.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	231.50	732	0	0
0.50	232.00	877	402	402
1.50	233.00	1,186	1,032	1,434
2.50	234.00	1,520	1,353	2,787
3.00	234.50	1,697	804	3,591

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 8.00	3.00	0.00	0.00
Span (in)	= 8.00	3.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 230.00	232.60	0.00	0.00
Length (ft)	= 31.00	0.00	0.00	0.00
Slope (%)	= 7.70	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.14	68.00	0.00	0.00
Crest El. (ft)	= 233.40	234.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Ciplti	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	231.50	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.05	40	231.55	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	80	231.60	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.15	121	231.65	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.20	161	231.70	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.25	201	231.75	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.30	241	231.80	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.35	282	231.85	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.40	322	231.90	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.45	362	231.95	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.50	402	232.00	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.60	505	232.10	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.70	609	232.20	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.80	712	232.30	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.90	815	232.40	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
1.00	918	232.50	1.82 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
1.10	1,021	232.60	1.82 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.000
1.20	1,124	232.70	1.82 ic	0.02 ic	---	---	0.00	0.00	---	---	---	---	0.020
1.30	1,227	232.80	1.82 ic	0.06 ic	---	---	0.00	0.00	---	---	---	---	0.064
1.40	1,331	232.90	1.82 ic	0.10 ic	---	---	0.00	0.00	---	---	---	---	0.099
1.50	1,434	233.00	1.82 ic	0.12 ic	---	---	0.00	0.00	---	---	---	---	0.124
1.60	1,569	233.10	1.82 ic	0.14 ic	---	---	0.00	0.00	---	---	---	---	0.145
1.70	1,704	233.20	1.82 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.163
1.80	1,840	233.30	1.82 ic	0.18 ic	---	---	0.00	0.00	---	---	---	---	0.179
1.90	1,975	233.40	1.82 ic	0.19 ic	---	---	0.00	0.00	---	---	---	---	0.194
2.00	2,110	233.50	1.82 ic	0.21 ic	---	---	0.33	0.00	---	---	---	---	0.539
2.10	2,246	233.60	1.82 ic	0.22 ic	---	---	0.94	0.00	---	---	---	---	1.157
2.20	2,381	233.70	1.95 ic	0.23 ic	---	---	1.72	0.00	---	---	---	---	1.952
2.30	2,516	233.80	2.83 ic	0.19 ic	---	---	2.65	0.00	---	---	---	---	2.833
2.40	2,651	233.90	2.83 ic	0.20 ic	---	---	2.34 ic	0.00	---	---	---	---	2.546
2.50	2,787	234.00	2.82 ic	0.22 ic	---	---	2.57 ic	0.00	---	---	---	---	2.784
2.55	2,867	234.05	2.88 ic	0.21 ic	---	---	2.67 ic	0.00	---	---	---	---	2.880
2.60	2,948	234.10	3.22 ic	0.07 ic	---	---	3.15 s	0.00	---	---	---	---	3.224
2.65	3,028	234.15	3.25 ic	0.06 ic	---	---	3.19 s	0.00	---	---	---	---	3.252
2.70	3,108	234.20	3.28 ic	0.06 ic	---	---	3.22 s	0.00	---	---	---	---	3.277
2.75	3,189	234.25	3.30 ic	0.05 ic	---	---	3.25 s	0.00	---	---	---	---	3.302
2.80	3,269	234.30	3.33 ic	0.05 ic	---	---	3.28 s	0.00	---	---	---	---	3.328
2.85	3,350	234.35	3.35 ic	0.05 ic	---	---	3.30 s	0.00	---	---	---	---	3.351

Continues on next page...

PCSM

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.90	3,430	234.40	3.37 ic	0.04 ic	---	---	3.33 s	0.00	---	---	---	---	3.373
2.95	3,511	234.45	3.40 ic	0.04 ic	---	---	3.35 s	0.00	---	---	---	---	3.395
3.00	3,591	234.50	3.42 ic	0.04 ic	---	---	3.38 s	0.00	---	---	---	---	3.418

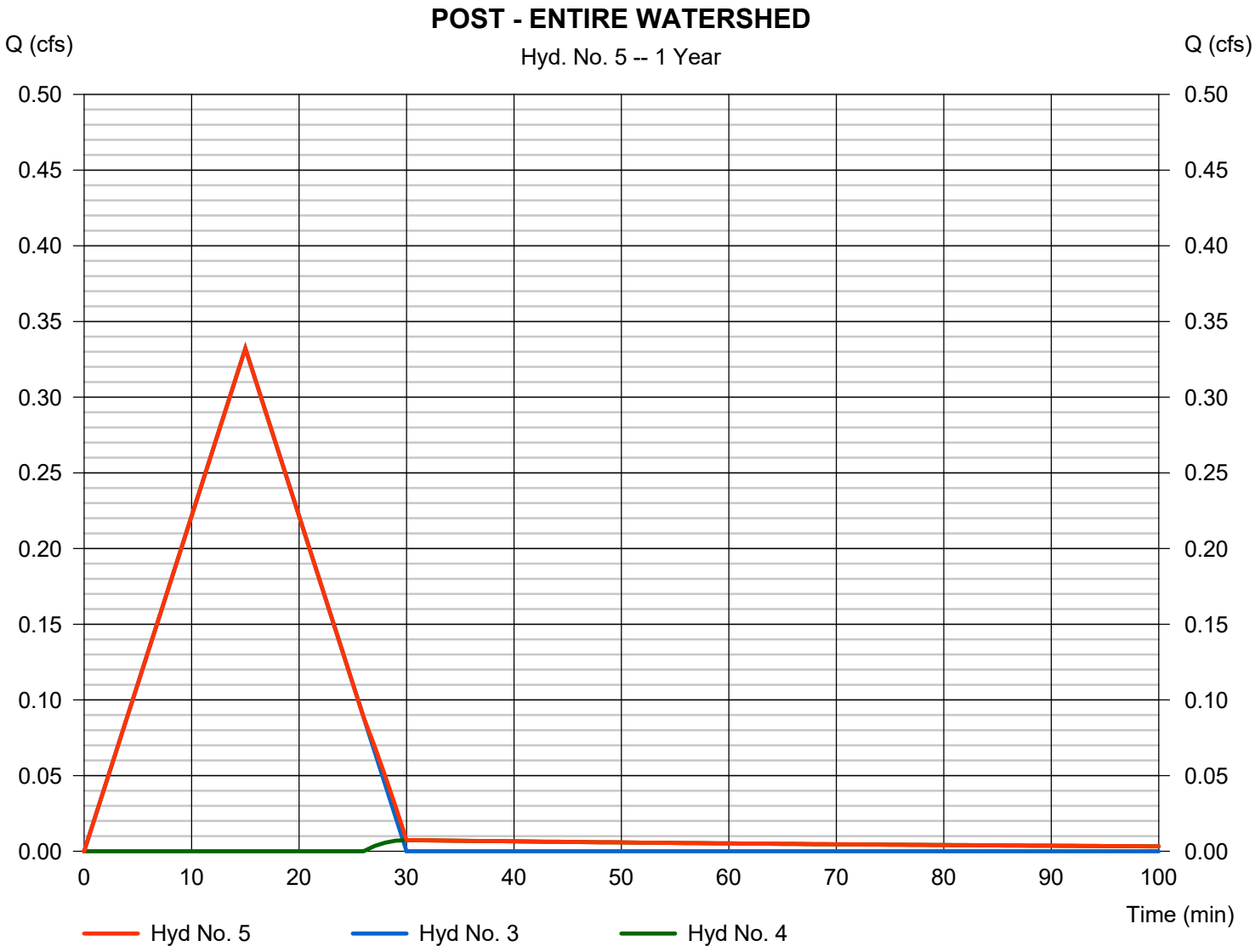
...End

Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	= Combine	Peak discharge	= 0.332 cfs
Storm frequency	= 1 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 333 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 0.198 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

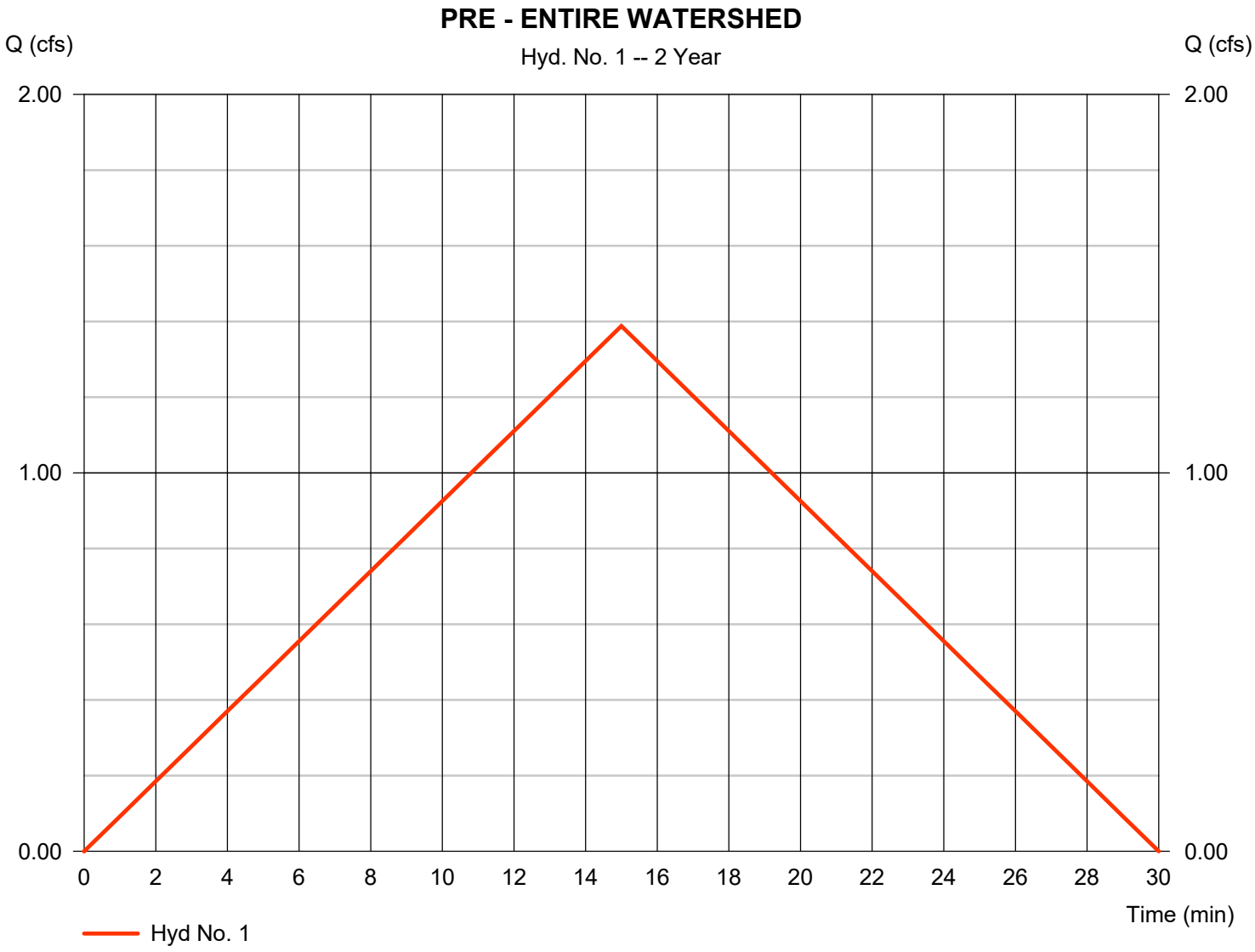
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	1.388	1	15	1,249	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	1.355	1	15	1,220	------	------	------	CONTROLLED
3	Rational	0.382	1	15	344	------	------	------	UNCONTROLLED
4	Reservoir	0.054	1	29	193	2	232.78	1,203	PCSM ROUTED
5	Combine	0.382	1	15	537	3, 4	------	------	POST - ENTIRE WATERSHED

Hydrograph Report

Hyd. No. 1

PRE - ENTIRE WATERSHED

Hydrograph type	=	Rational	Peak discharge	=	1.388 cfs
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,249 cuft
Drainage area	=	0.839 ac	Runoff coeff.	=	0.36
Intensity	=	4.596 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

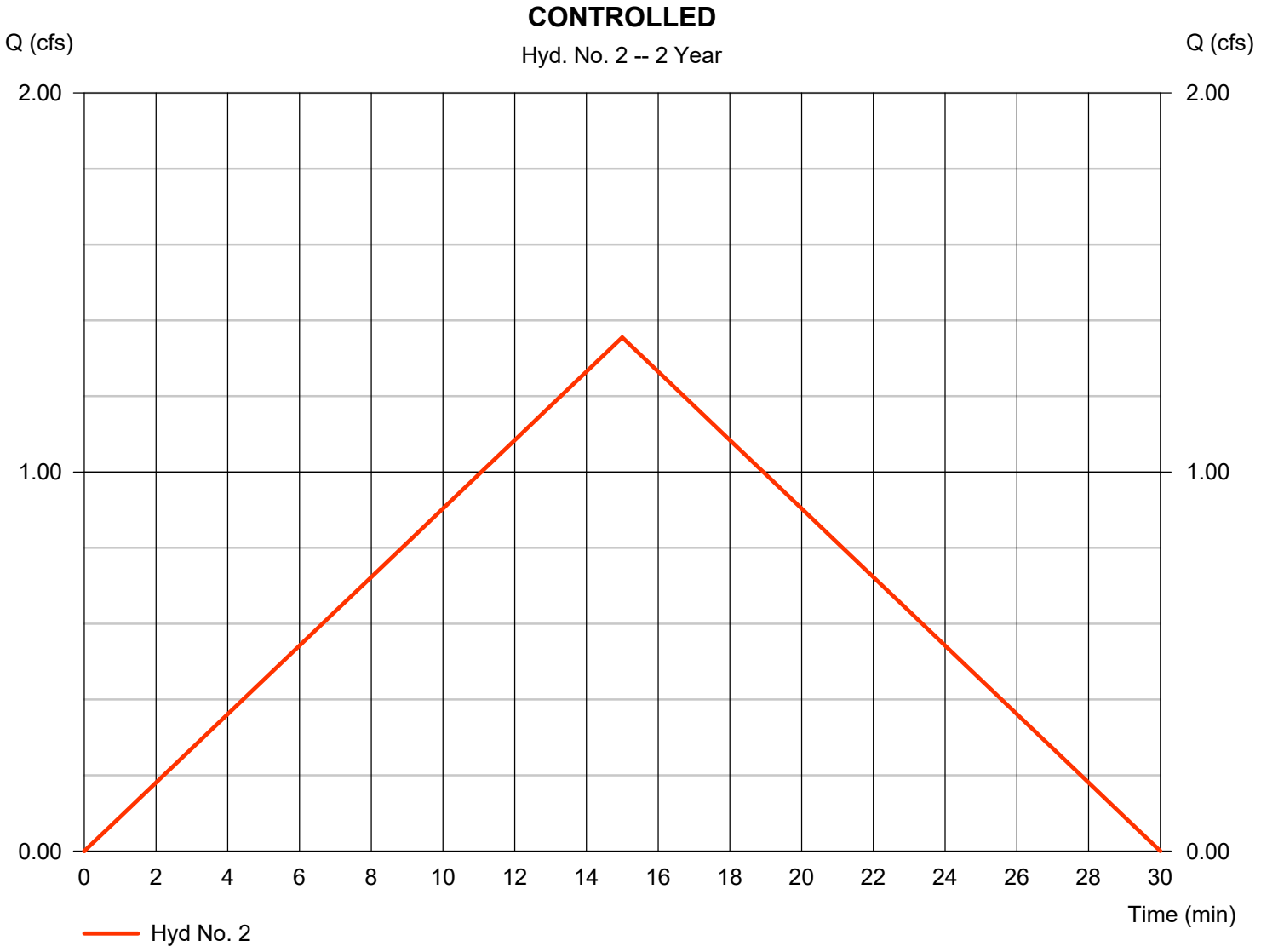


Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	1.355 cfs
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,220 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	4.596 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.382 cfs
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	344 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	4.596 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

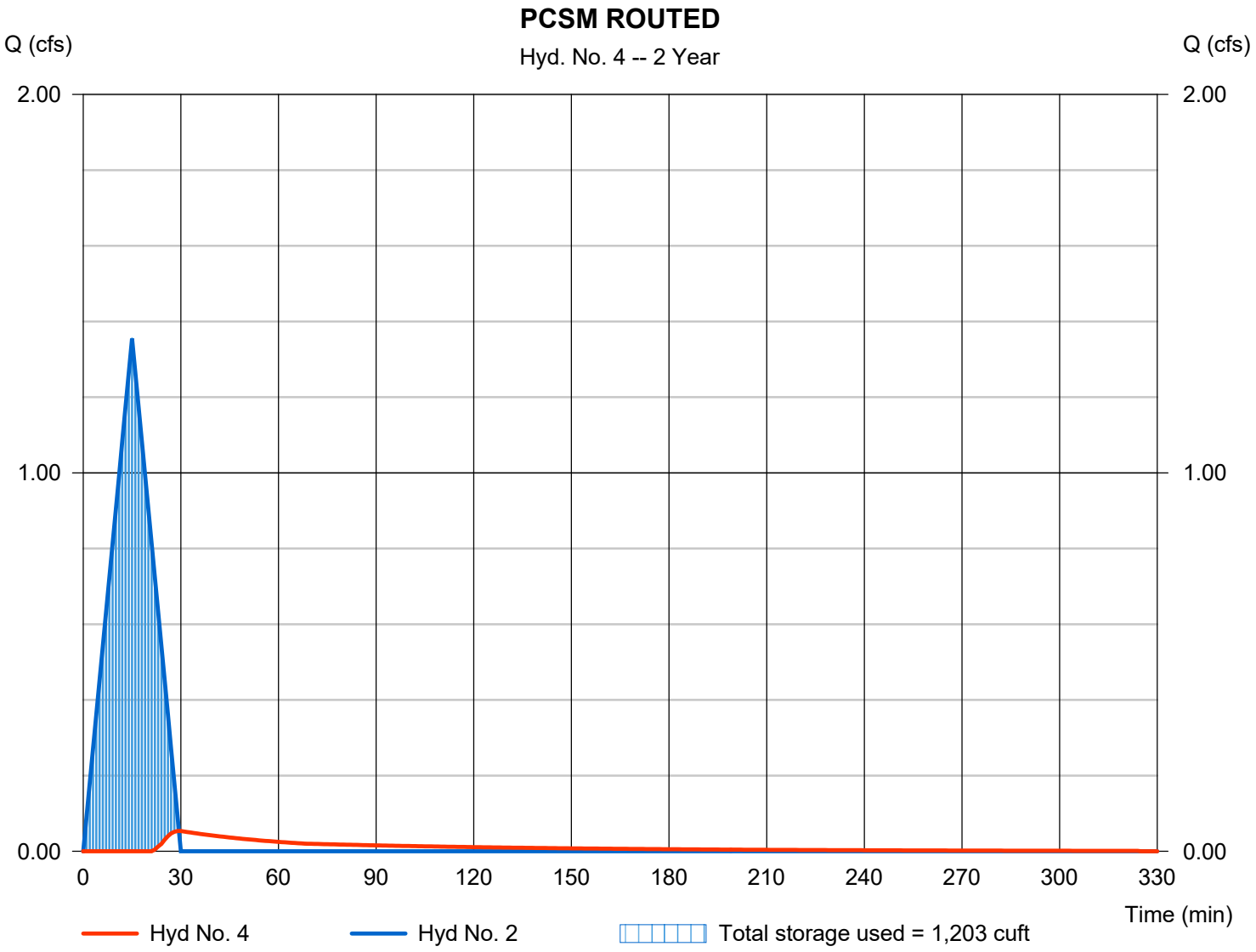
Hydrograph Report

Hyd. No. 4

PCSM ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.054 cfs
Storm frequency	=	2 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	193 cuft
Inflow hyd. No.	=	2 - CONTROLLED	Max. Elevation	=	232.78 ft
Reservoir name	=	PCSM	Max. Storage	=	1,203 cuft

Storage Indication method used.

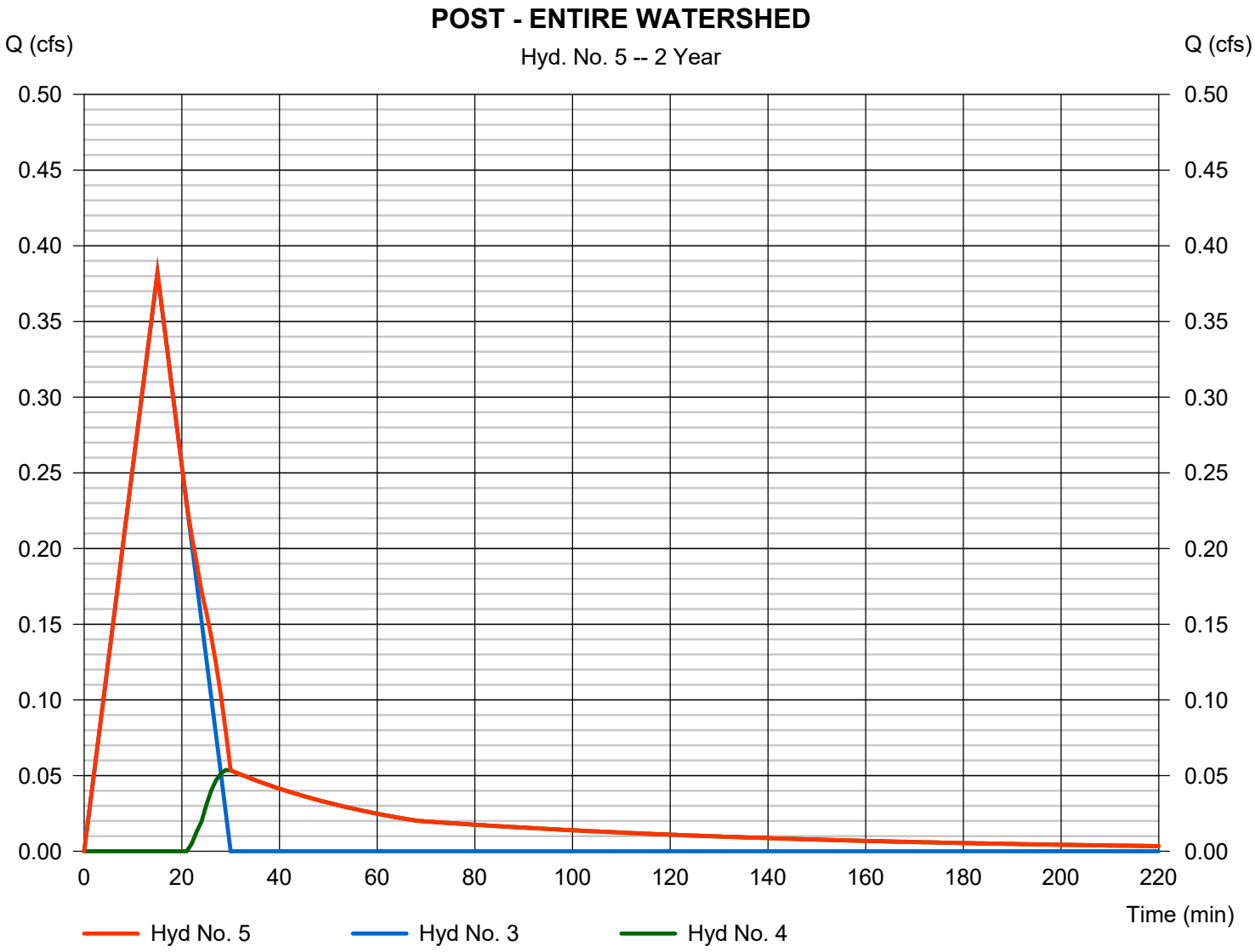


Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	= Combine	Peak discharge	= 0.382 cfs
Storm frequency	= 2 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 537 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 0.198 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	1.598	1	15	1,438	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	1.560	1	15	1,404	------	------	------	CONTROLLED
3	Rational	0.440	1	15	396	------	------	------	UNCONTROLLED
4	Reservoir	0.106	1	29	378	2	232.93	1,359	PCSM ROUTED
5	Combine	0.440	1	15	774	3, 4	------	------	POST - ENTIRE WATERSHED

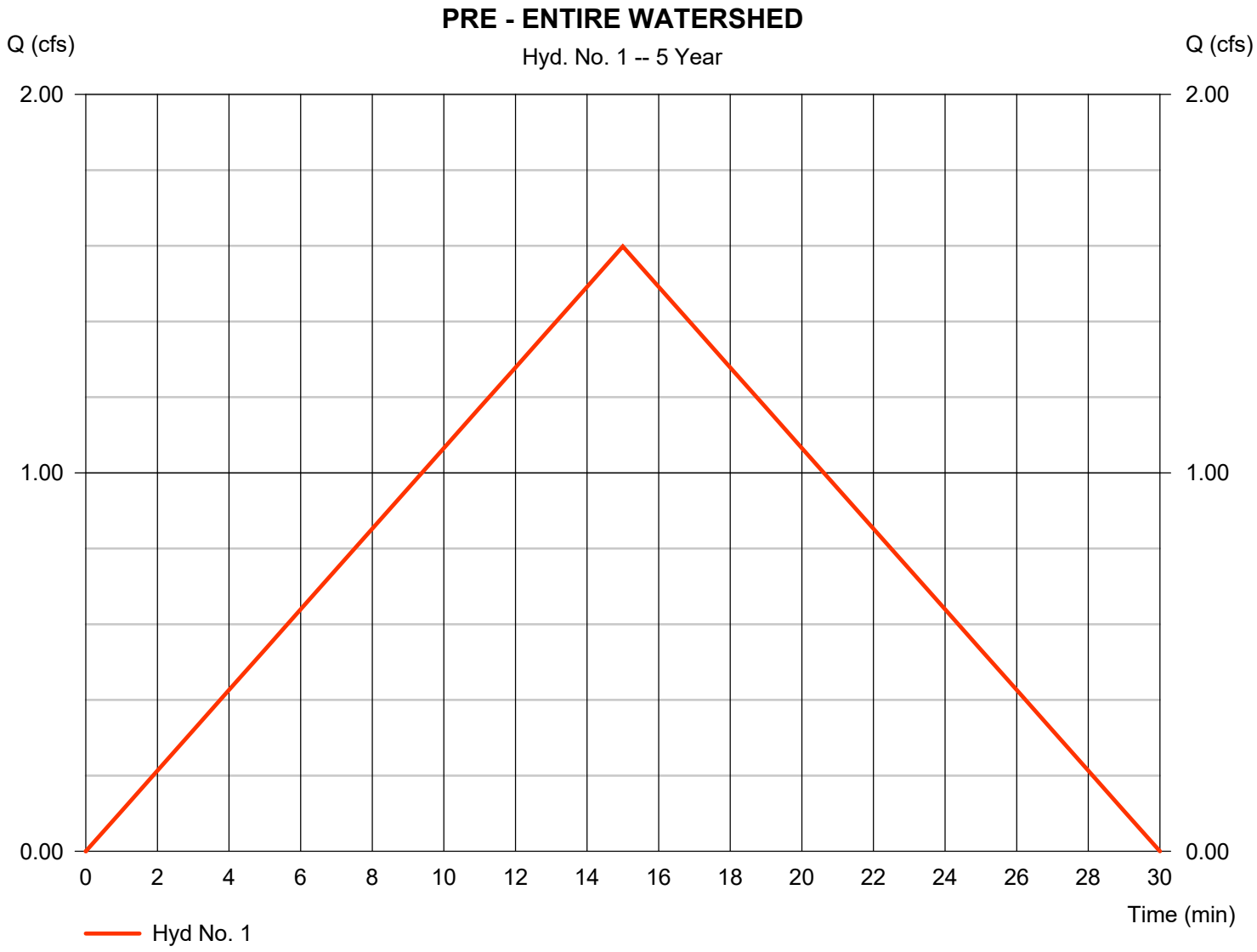
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 10 / 26 / 2021

Hyd. No. 1

PRE - ENTIRE WATERSHED

Hydrograph type	= Rational	Peak discharge	= 1.598 cfs
Storm frequency	= 5 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 1,438 cuft
Drainage area	= 0.839 ac	Runoff coeff.	= 0.36
Intensity	= 5.291 in/hr	Tc by User	= 5.00 min
IDF Curve	= Region 5.IDF	Asc/Rec limb fact	= 3/3

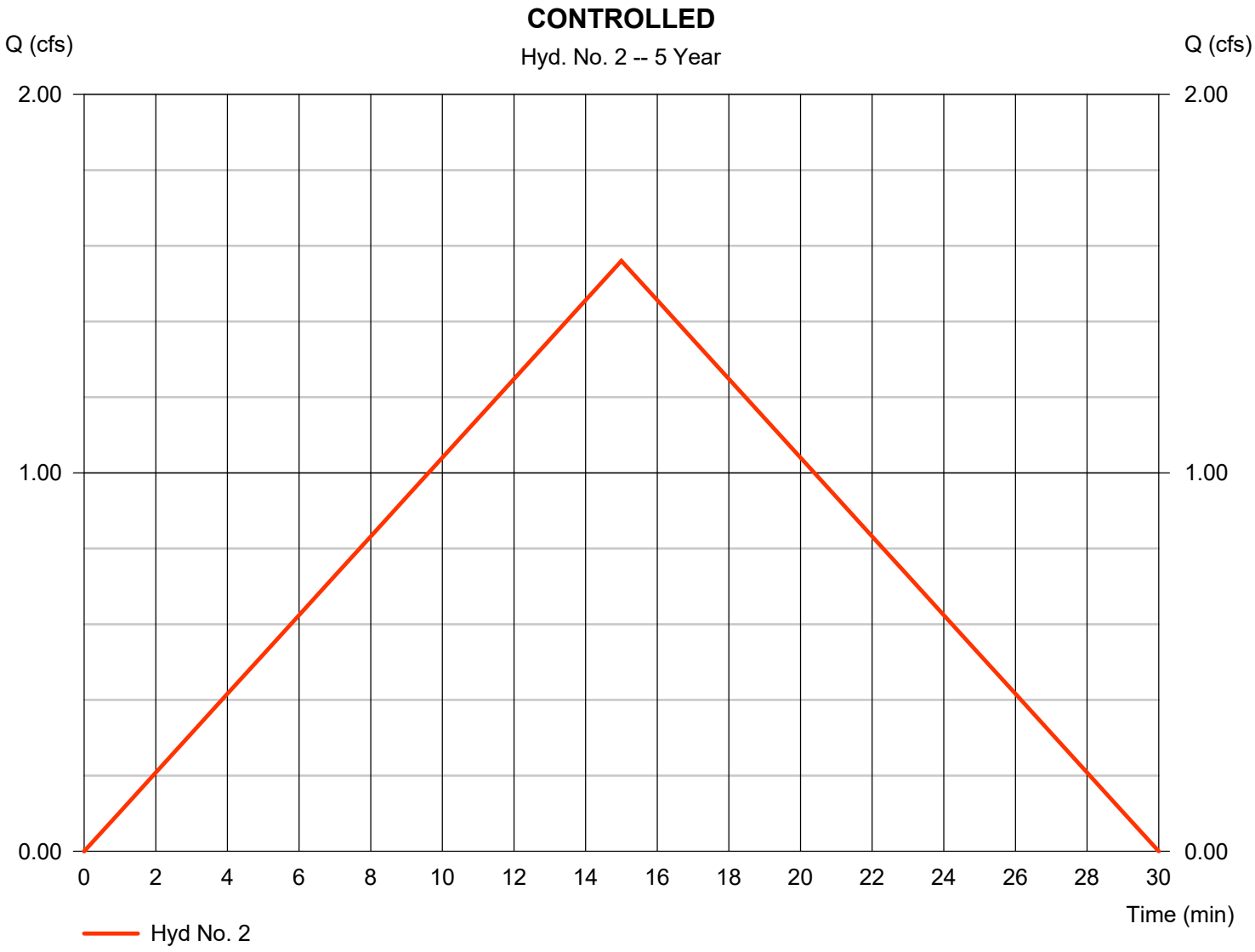


Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	1.560 cfs
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,404 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	5.291 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.440 cfs
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	396 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	5.291 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

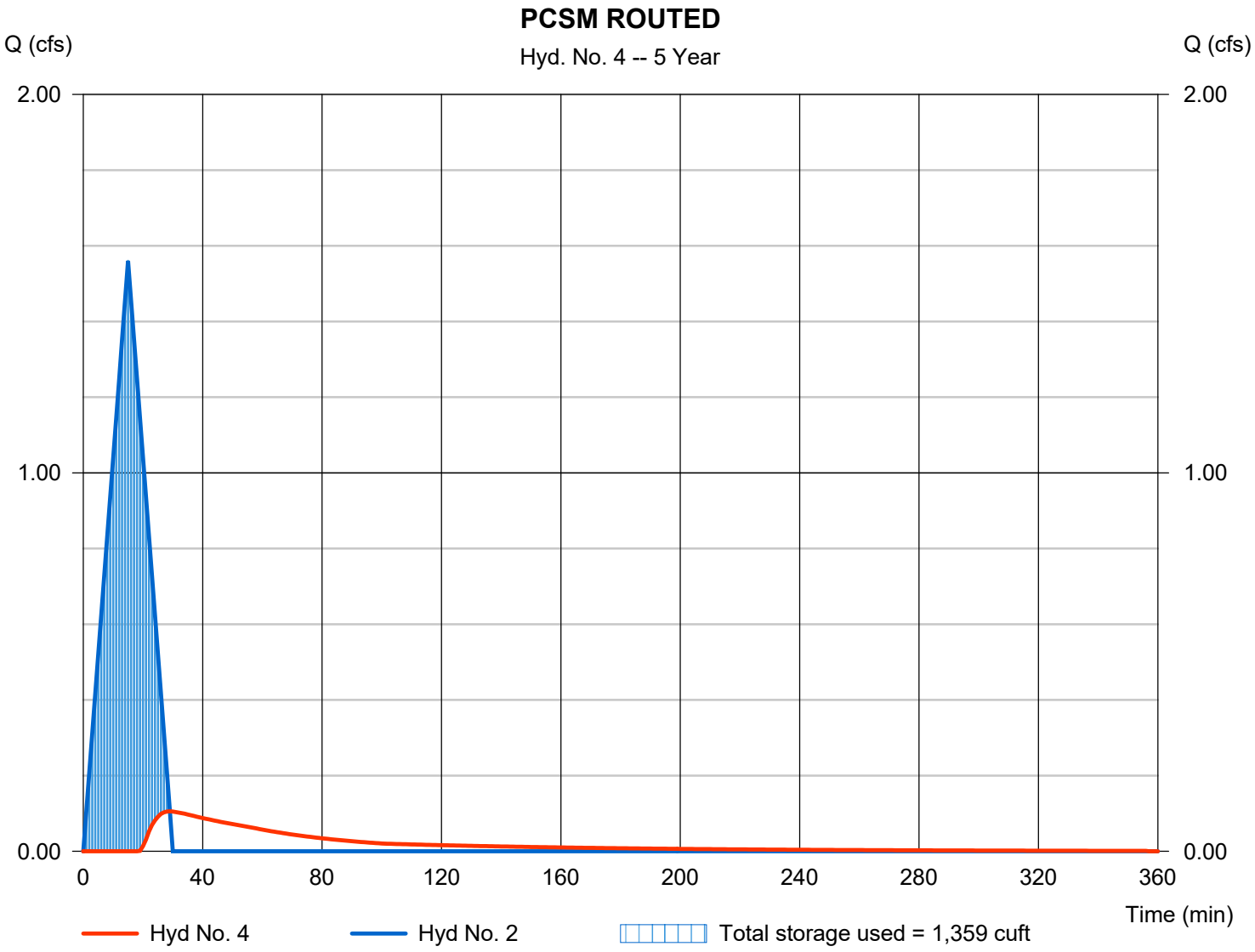
Hydrograph Report

Hyd. No. 4

PCSM ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.106 cfs
Storm frequency	=	5 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	378 cuft
Inflow hyd. No.	=	2 - CONTROLLED	Max. Elevation	=	232.93 ft
Reservoir name	=	PCSM	Max. Storage	=	1,359 cuft

Storage Indication method used.

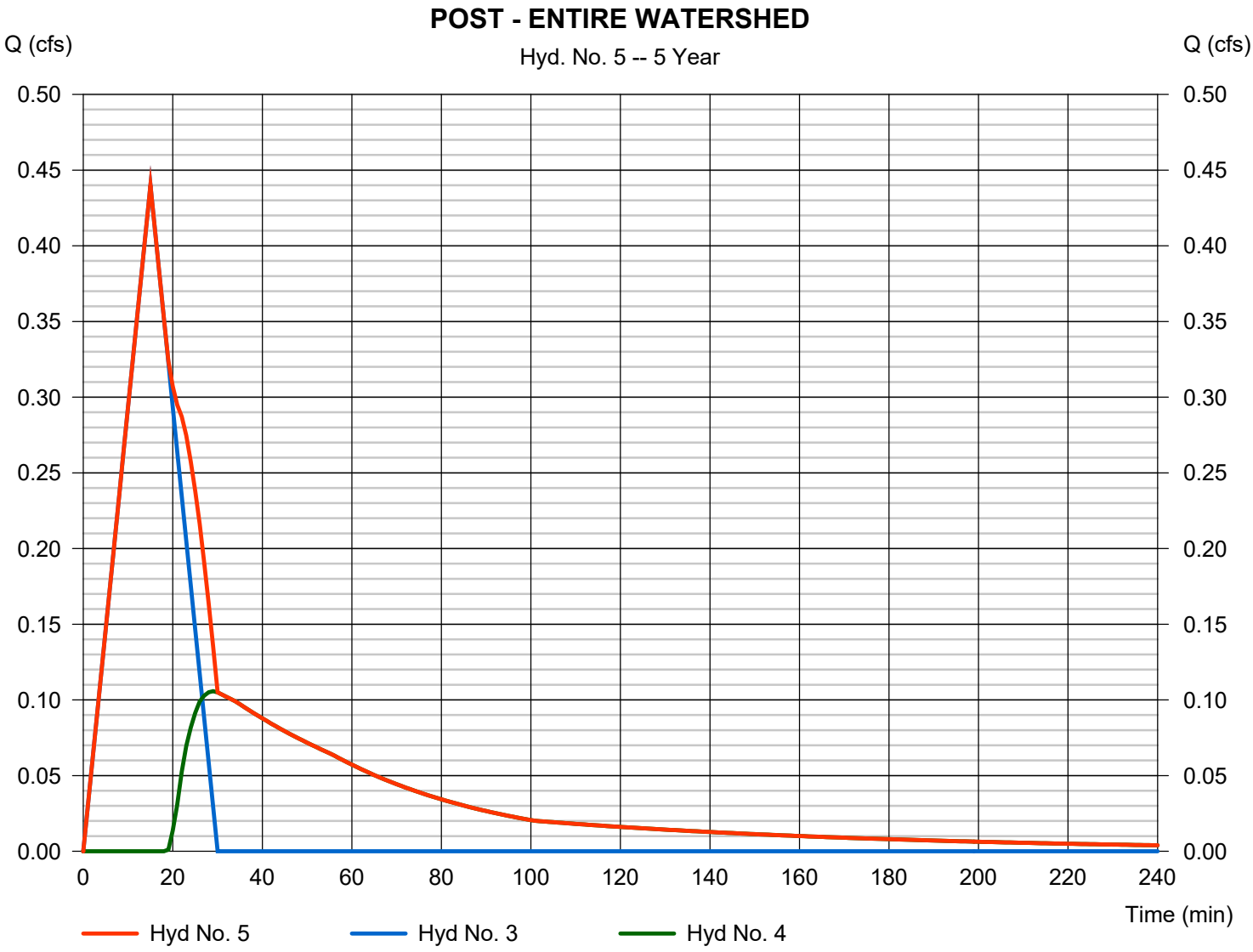


Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	=	Combine	Peak discharge	=	0.440 cfs
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	774 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	0.198 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

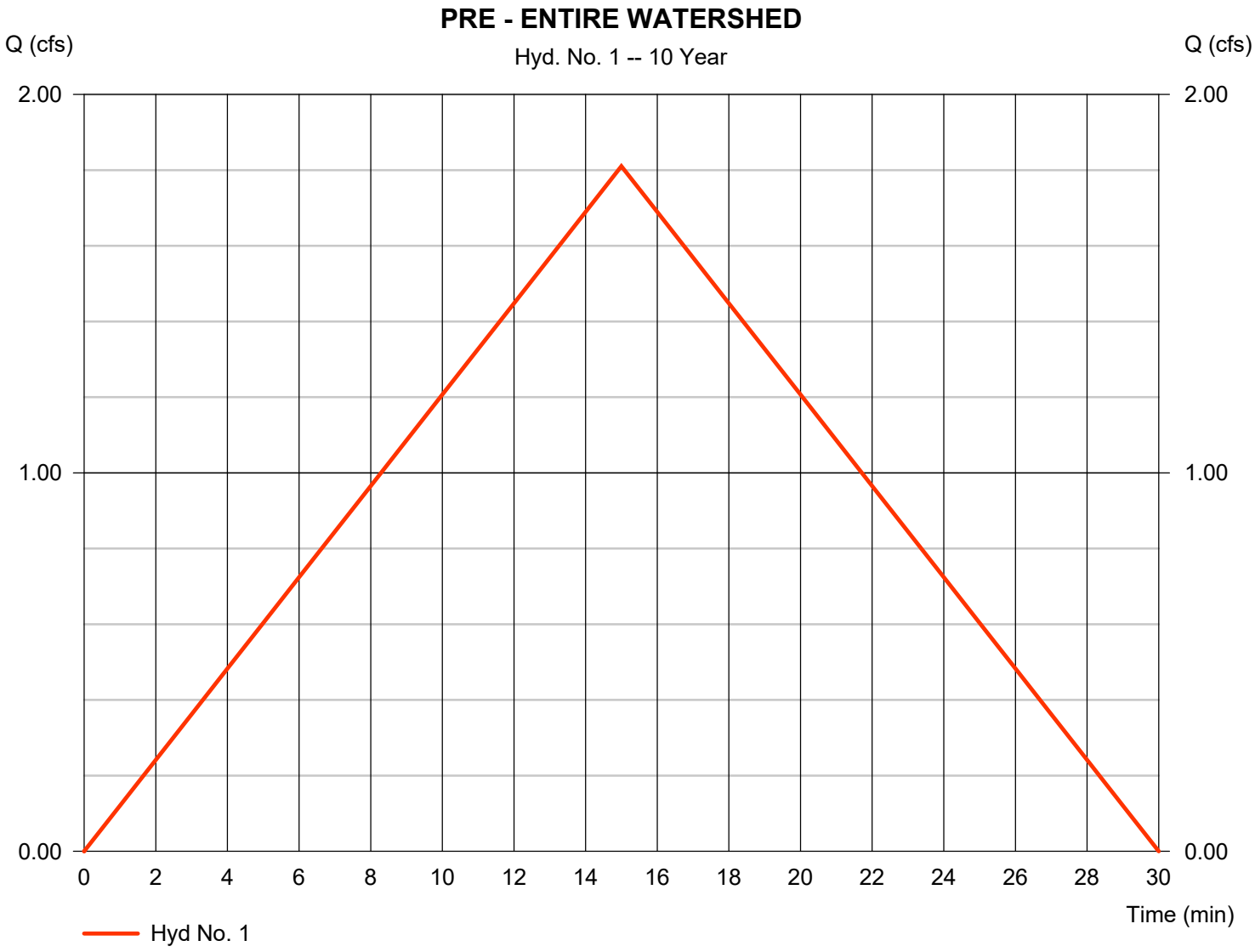
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	1.810	1	15	1,629	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	1.767	1	15	1,590	------	------	------	CONTROLLED
3	Rational	0.498	1	15	449	------	------	------	UNCONTROLLED
4	Reservoir	0.137	1	29	564	2	233.06	1,518	PCSM ROUTED
5	Combine	0.498	1	15	1,013	3, 4	------	------	POST - ENTIRE WATERSHED

Hydrograph Report

Hyd. No. 1

PRE - ENTIRE WATERSHED

Hydrograph type	=	Rational	Peak discharge	=	1.810 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,629 cuft
Drainage area	=	0.839 ac	Runoff coeff.	=	0.36
Intensity	=	5.993 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

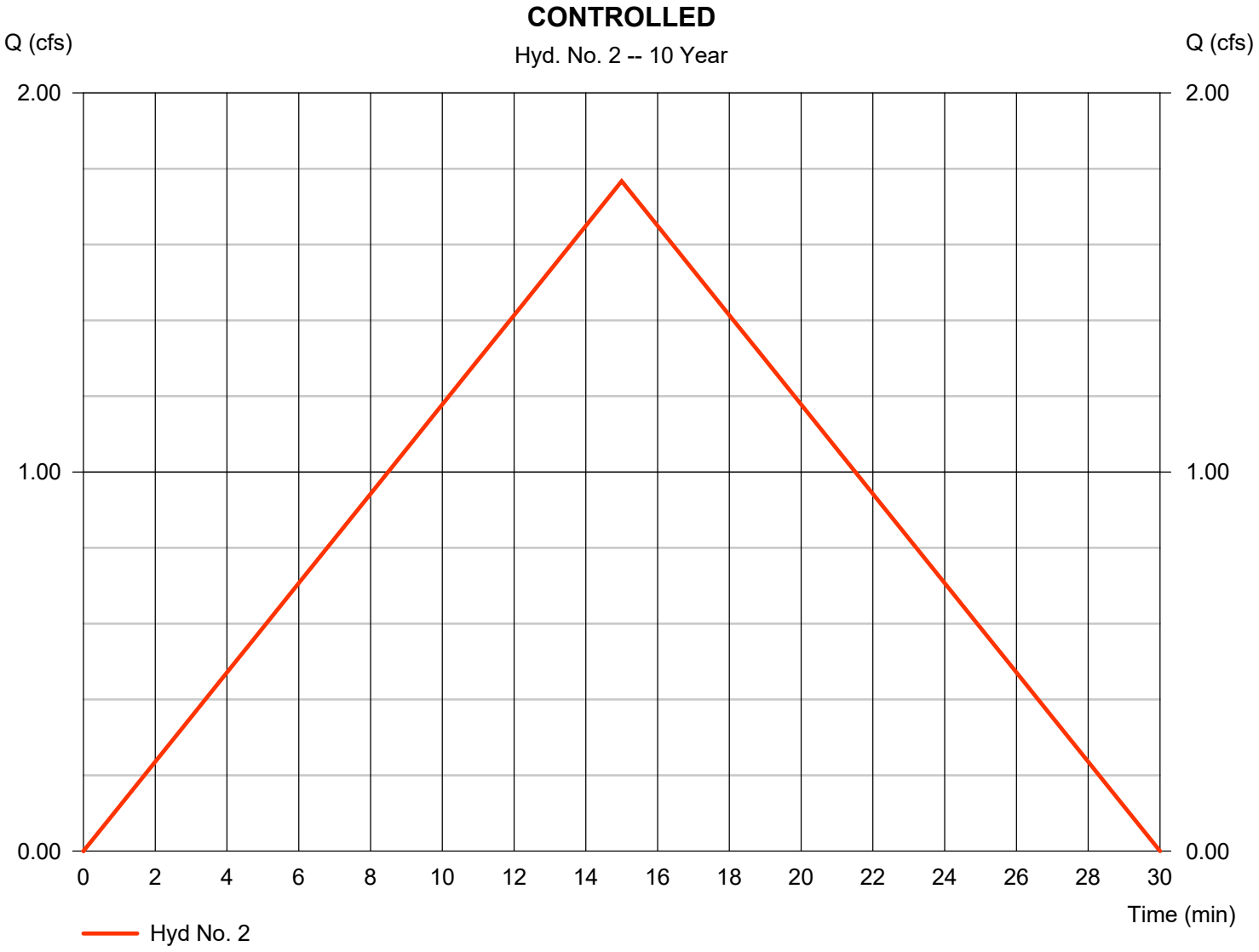


Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	1.767 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,590 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	5.993 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.498 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	449 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	5.993 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

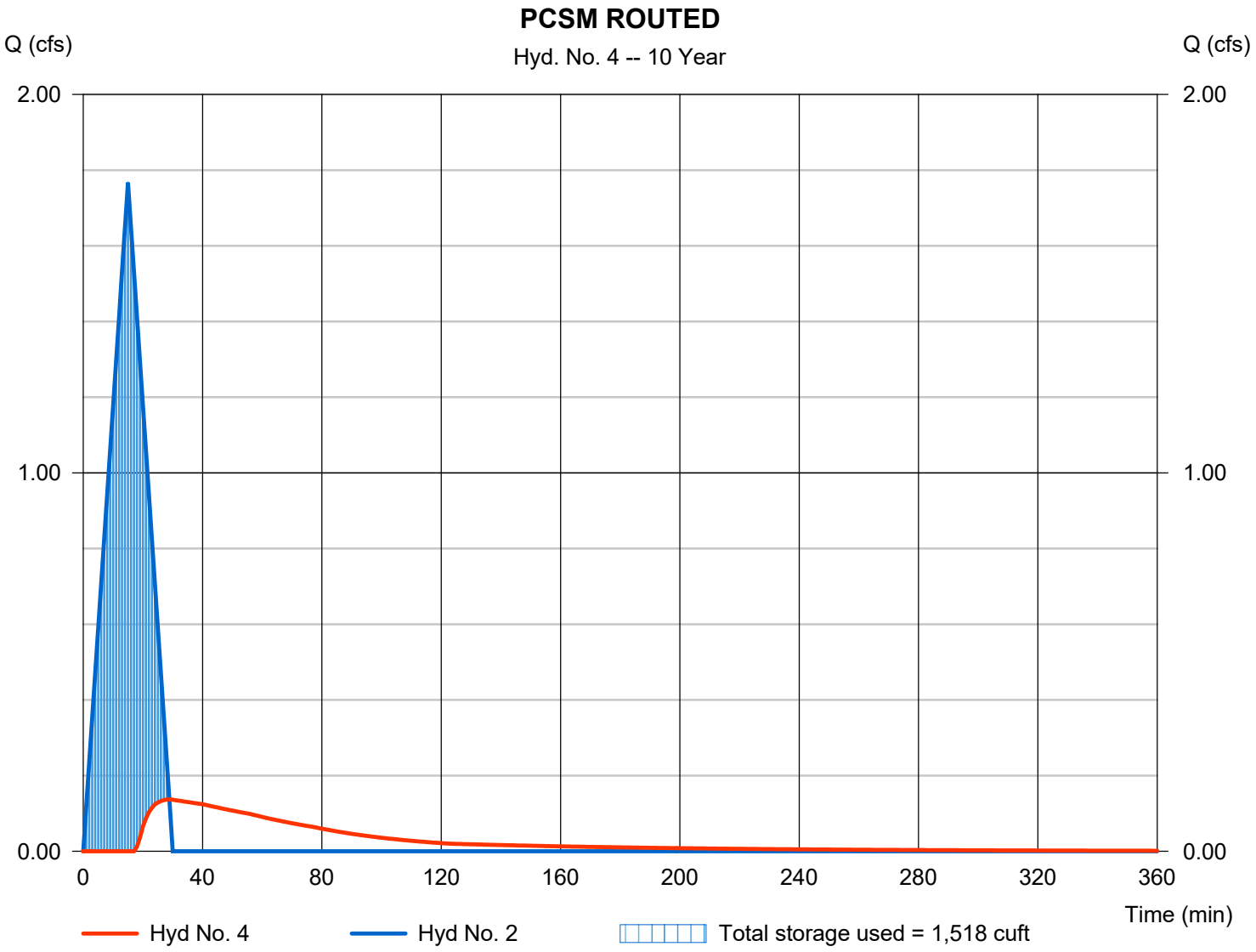
Hydrograph Report

Hyd. No. 4

PCSM ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.137 cfs
Storm frequency	=	10 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	564 cuft
Inflow hyd. No.	=	2 - CONTROLLED	Max. Elevation	=	233.06 ft
Reservoir name	=	PCSM	Max. Storage	=	1,518 cuft

Storage Indication method used.

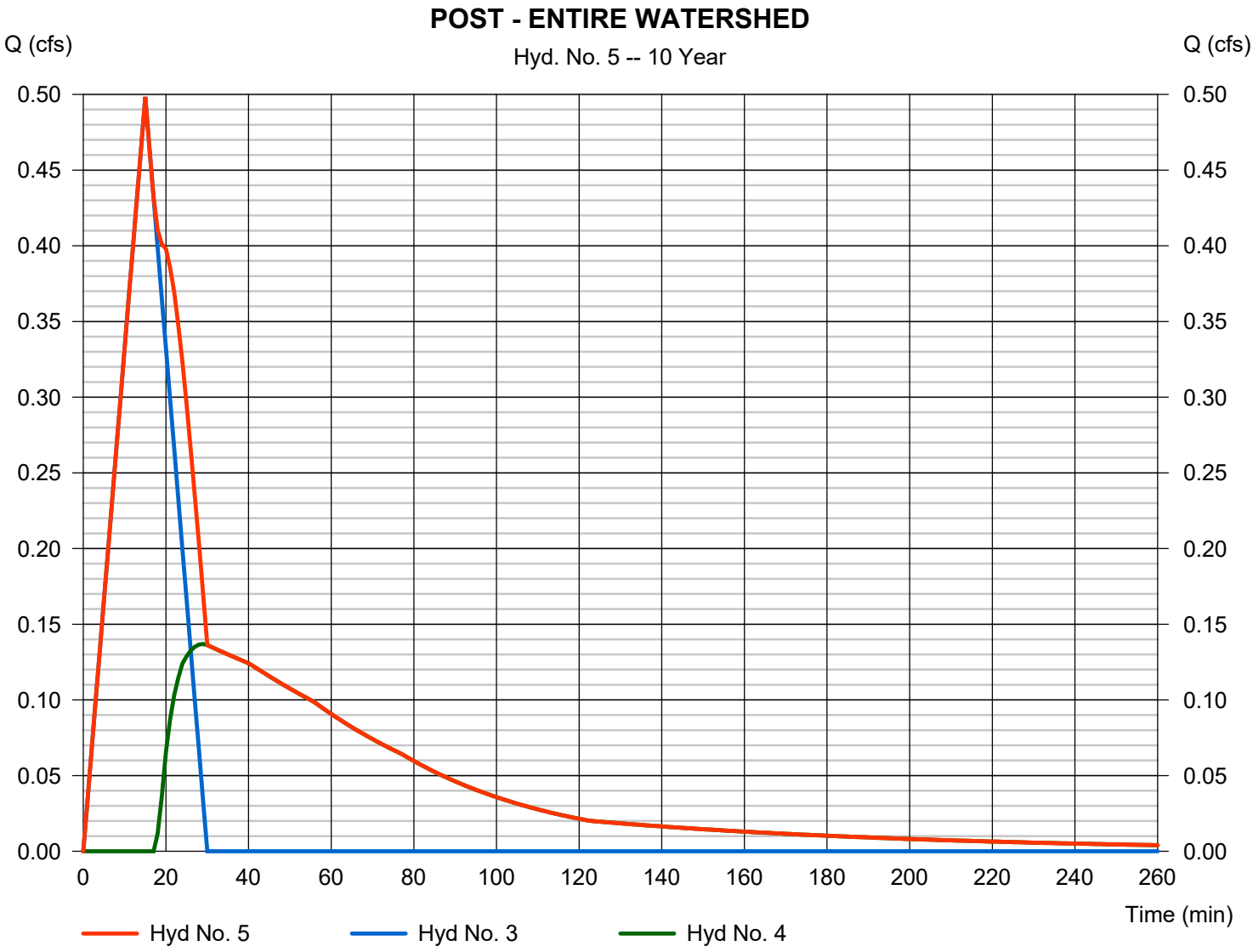


Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	=	Combine	Peak discharge	=	0.498 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,013 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	0.198 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	2.021	1	15	1,819	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	1.973	1	15	1,776	------	------	------	CONTROLLED
3	Rational	0.556	1	15	501	------	------	------	UNCONTROLLED
4	Reservoir	0.160	1	29	750	2	233.18	1,681	PCSM ROUTED
5	Combine	0.556	1	15	1,250	3, 4	------	------	POST - ENTIRE WATERSHED

Hydrograph Report

Hyd. No. 1

PRE - ENTIRE WATERSHED

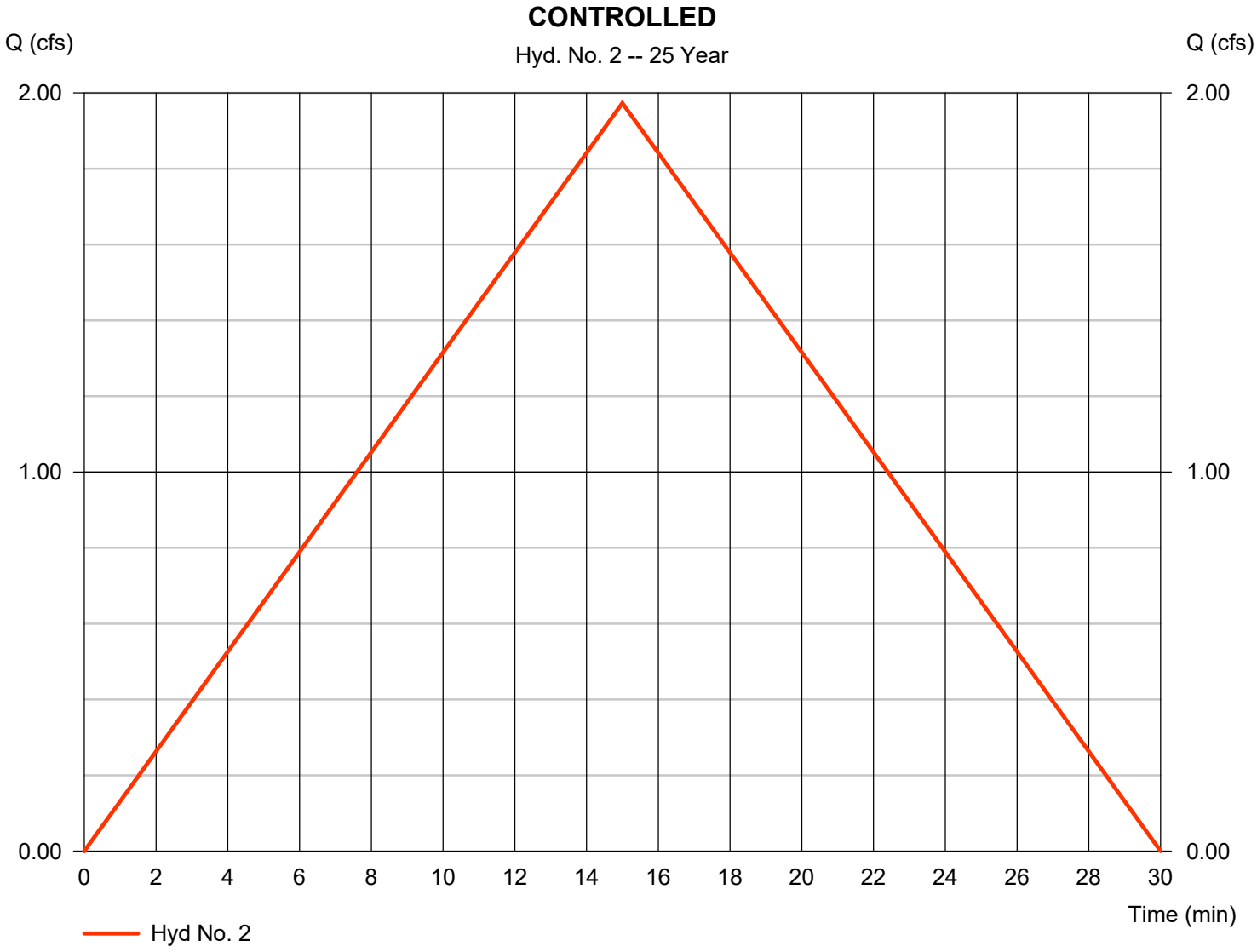
Hydrograph type	=	Rational	Peak discharge	=	2.021 cfs
Storm frequency	=	25 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,819 cuft
Drainage area	=	0.839 ac	Runoff coeff.	=	0.36
Intensity	=	6.692 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	1.973 cfs
Storm frequency	=	25 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,776 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	6.692 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.556 cfs
Storm frequency	=	25 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	501 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	6.692 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

Hydrograph Report

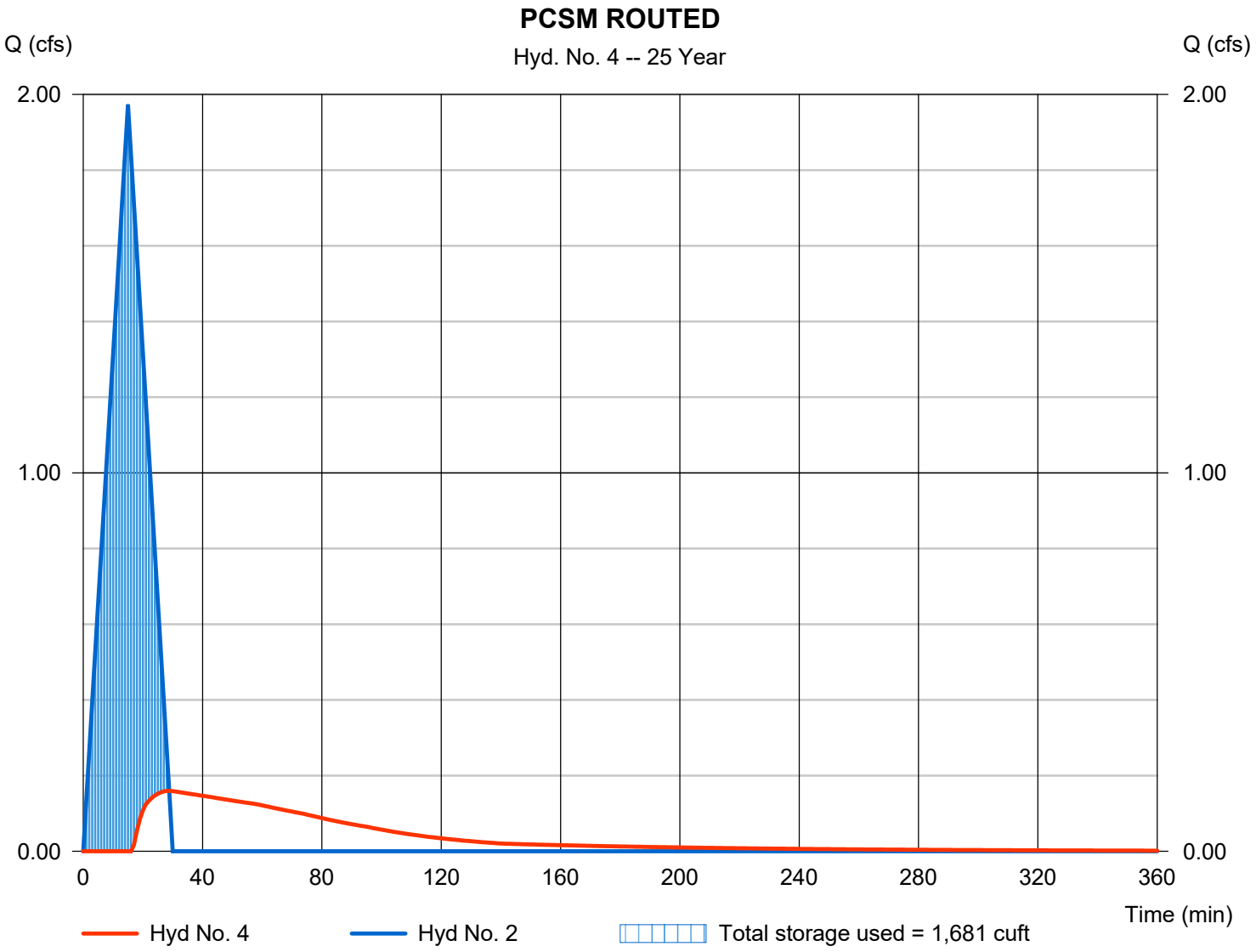
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 10 / 26 / 2021

Hyd. No. 4

PCSM ROUTED

Hydrograph type	= Reservoir	Peak discharge	= 0.160 cfs
Storm frequency	= 25 yrs	Time to peak	= 29 min
Time interval	= 1 min	Hyd. volume	= 750 cuft
Inflow hyd. No.	= 2 - CONTROLLED	Max. Elevation	= 233.18 ft
Reservoir name	= PCSM	Max. Storage	= 1,681 cuft

Storage Indication method used.

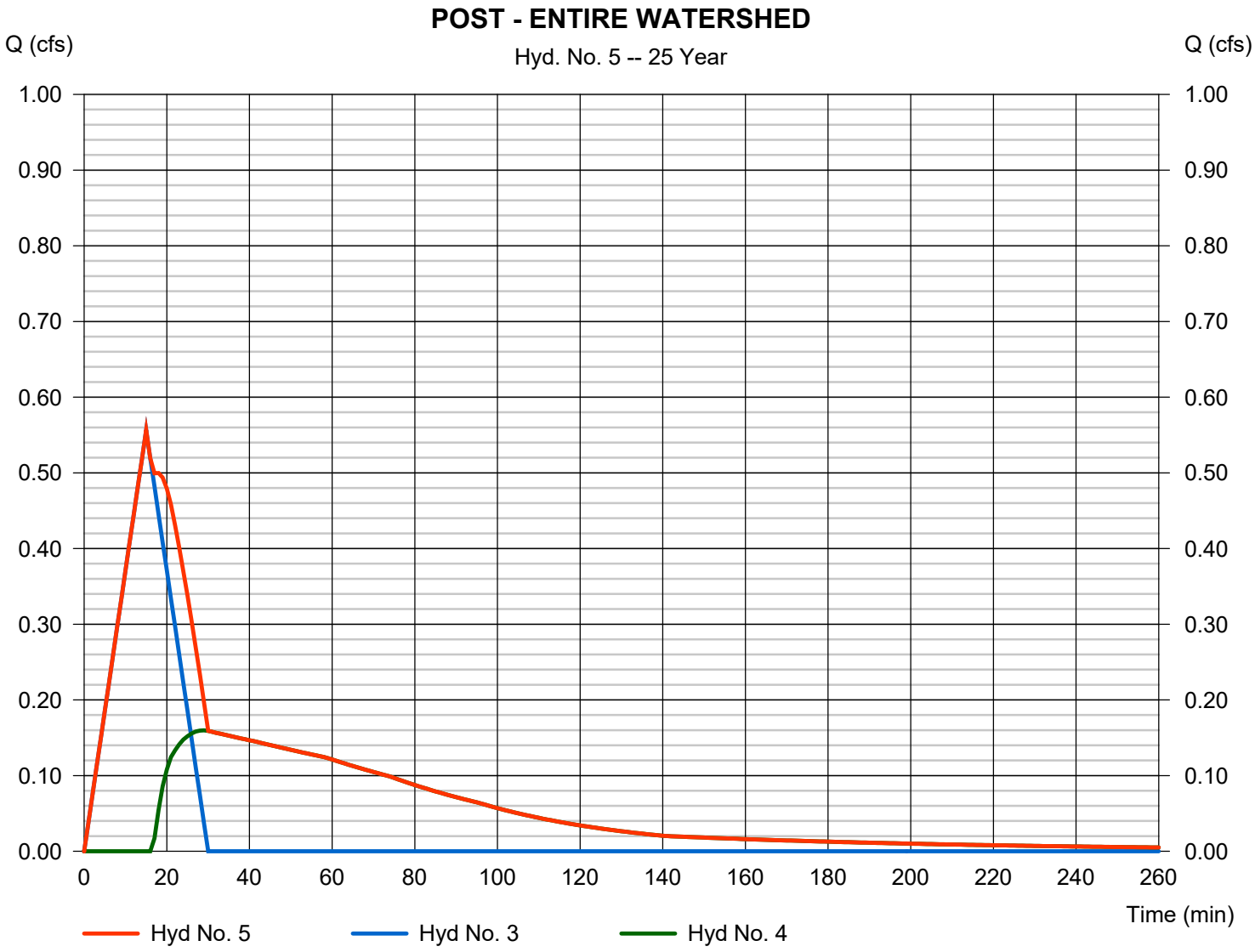


Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	= Combine	Peak discharge	= 0.556 cfs
Storm frequency	= 25 yrs	Time to peak	= 15 min
Time interval	= 1 min	Hyd. volume	= 1,250 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 0.198 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	2.263	1	15	2,036	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	2.209	1	15	1,988	------	------	------	CONTROLLED
3	Rational	0.623	1	15	561	------	------	------	UNCONTROLLED
4	Reservoir	0.183	1	29	962	2	233.32	1,870	PCSM ROUTED
5	Combine	0.623	1	15	1,523	3, 4	------	------	POST - ENTIRE WATERSHED

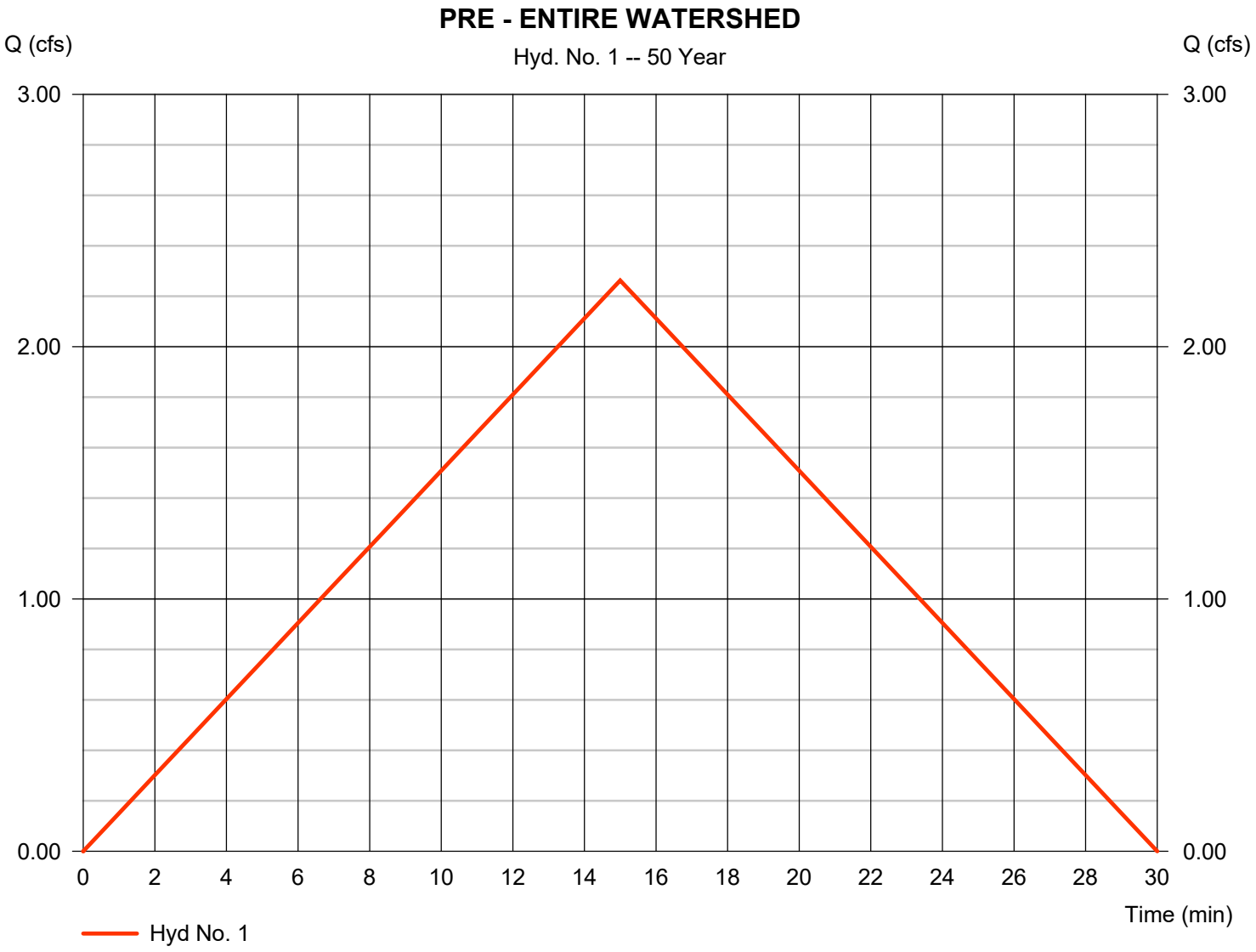
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 10 / 26 / 2021

Hyd. No. 1

PRE - ENTIRE WATERSHED

Hydrograph type	=	Rational	Peak discharge	=	2.263 cfs
Storm frequency	=	50 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	2,036 cuft
Drainage area	=	0.839 ac	Runoff coeff.	=	0.36
Intensity	=	7.492 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

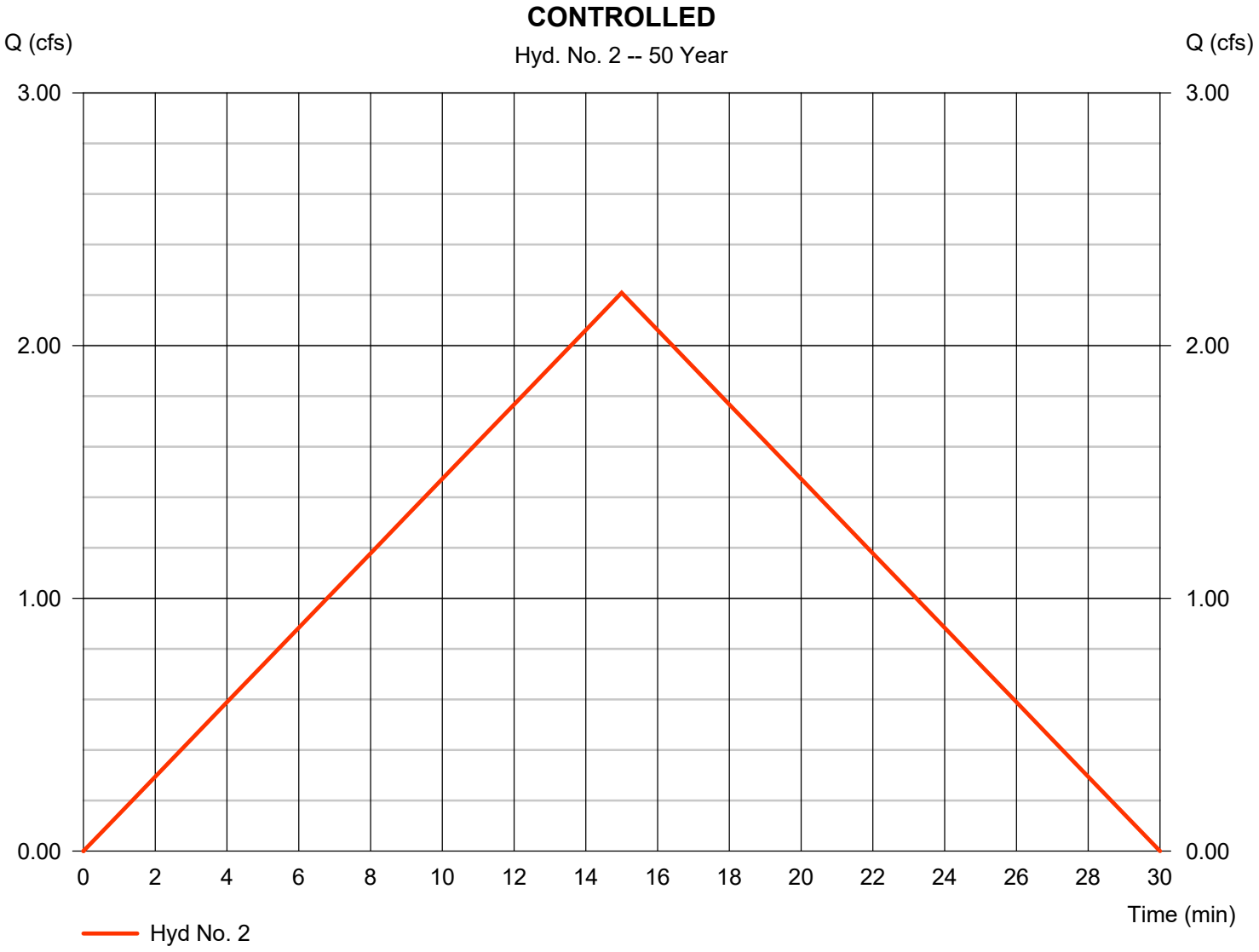


Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	2.209 cfs
Storm frequency	=	50 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,988 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	7.492 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.623 cfs
Storm frequency	=	50 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	561 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	7.492 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

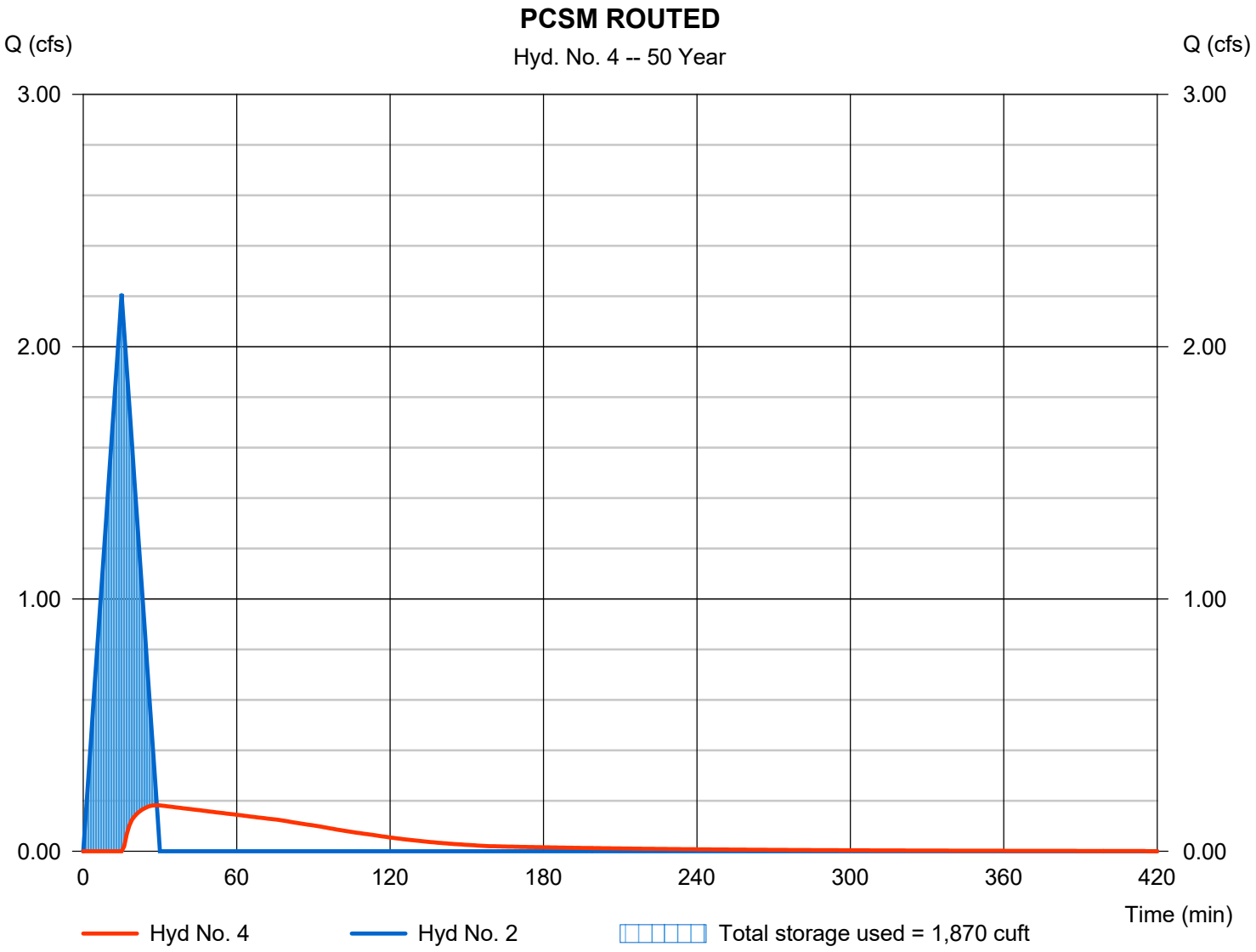
Hydrograph Report

Hyd. No. 4

PCSM ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.183 cfs
Storm frequency	=	50 yrs	Time to peak	=	29 min
Time interval	=	1 min	Hyd. volume	=	962 cuft
Inflow hyd. No.	=	2 - CONTROLLED	Max. Elevation	=	233.32 ft
Reservoir name	=	PCSM	Max. Storage	=	1,870 cuft

Storage Indication method used.

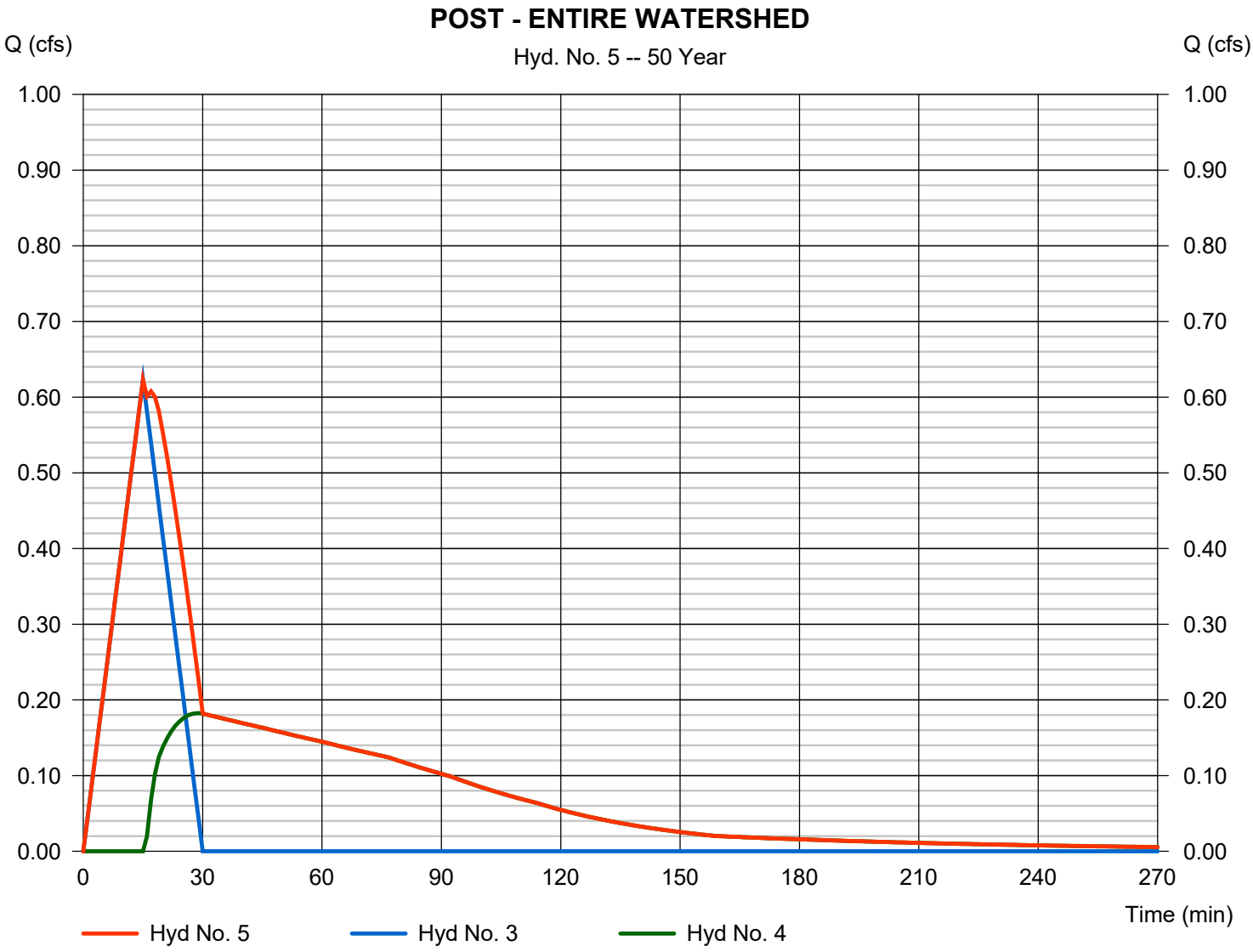


Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	=	Combine	Peak discharge	=	0.623 cfs
Storm frequency	=	50 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	1,523 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	0.198 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

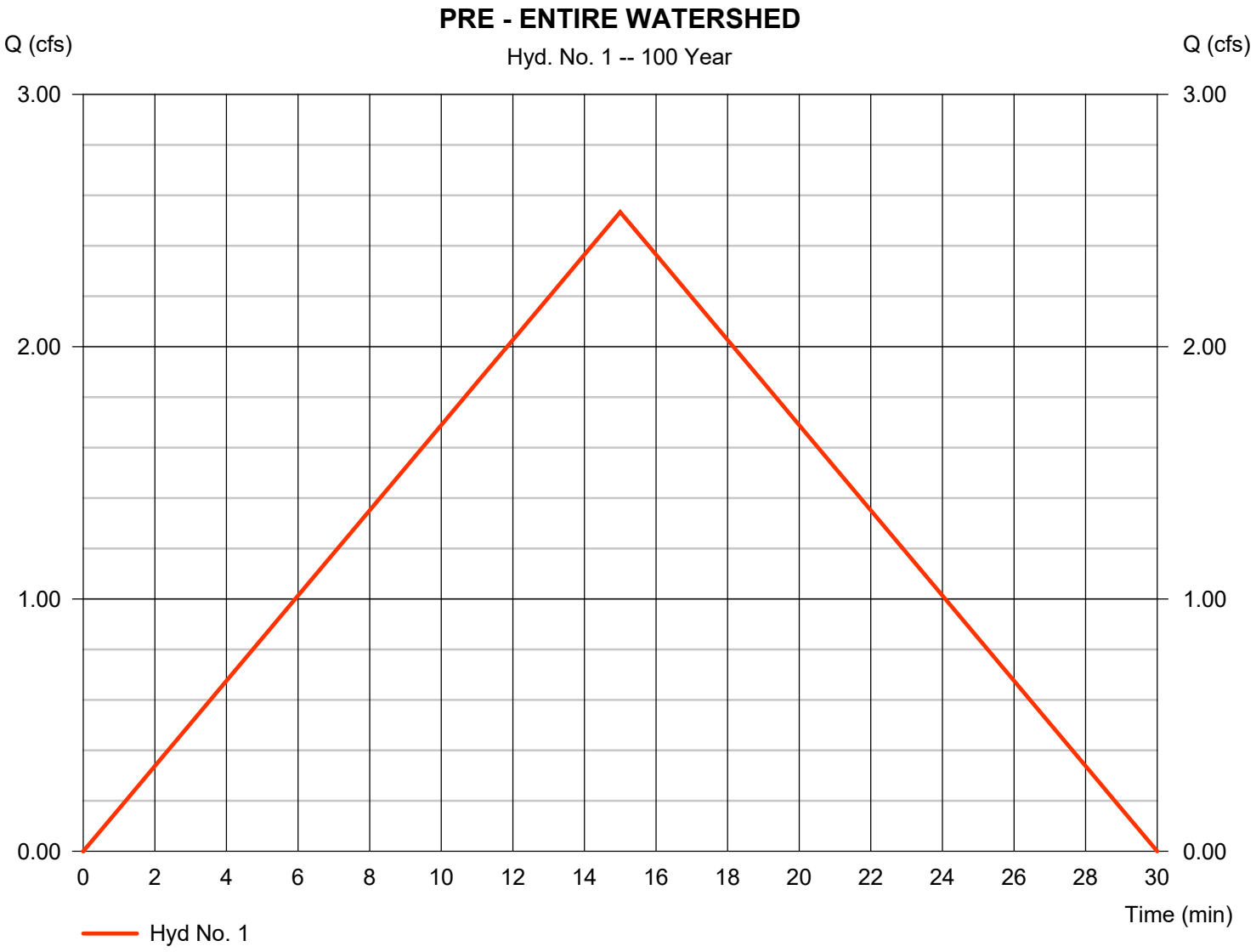
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	2.534	1	15	2,280	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	2.474	1	15	2,226	------	------	------	CONTROLLED
3	Rational	0.698	1	15	628	------	------	------	UNCONTROLLED
4	Reservoir	0.387	1	28	1,200	2	233.46	2,051	PCSM ROUTED
5	Combine	0.724	1	16	1,828	3, 4	------	------	POST - ENTIRE WATERSHED

Hydrograph Report

Hyd. No. 1

PRE - ENTIRE WATERSHED

Hydrograph type	=	Rational	Peak discharge	=	2.534 cfs
Storm frequency	=	100 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	2,280 cuft
Drainage area	=	0.839 ac	Runoff coeff.	=	0.36
Intensity	=	8.389 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

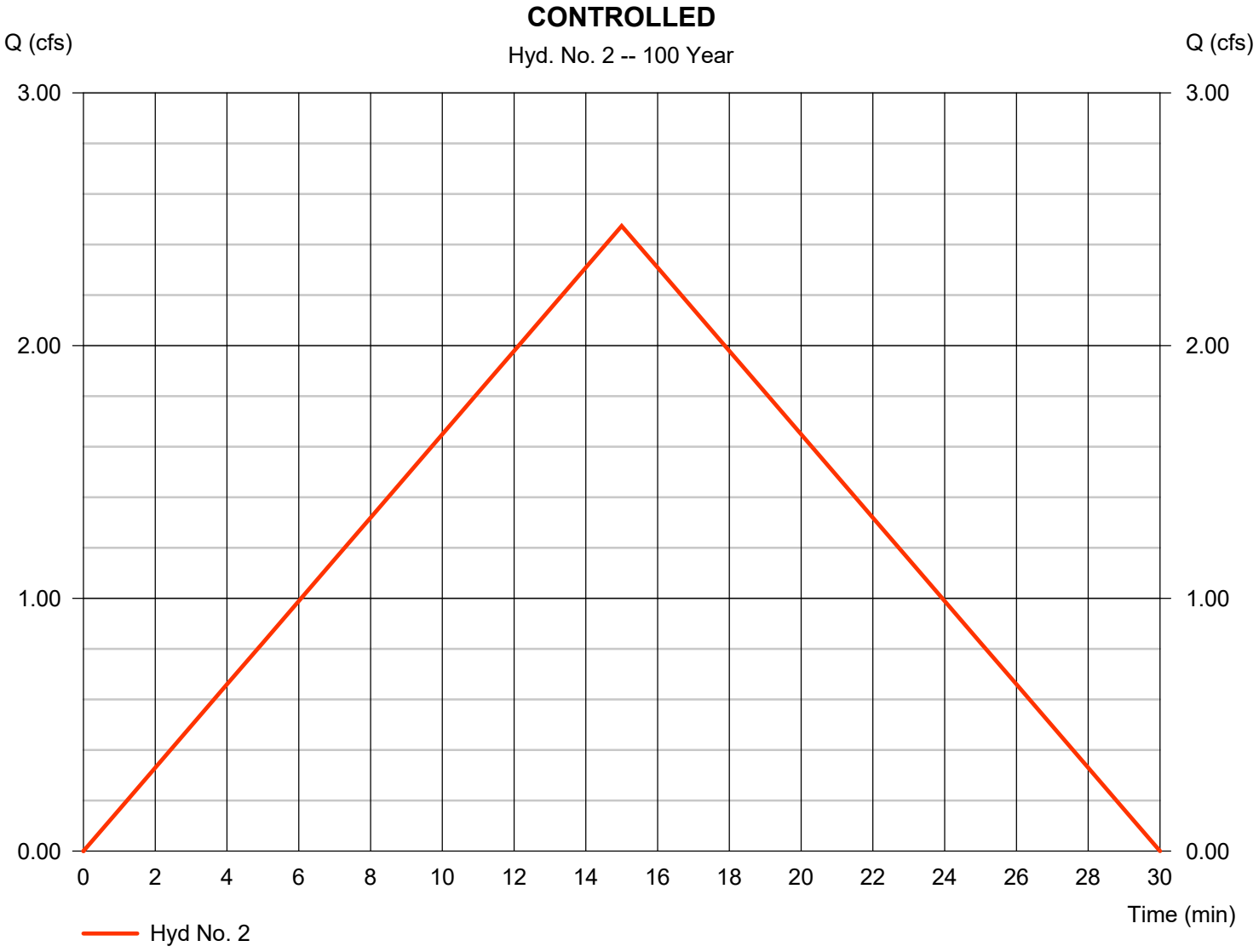


Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	2.474 cfs
Storm frequency	=	100 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	2,226 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	8.389 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.698 cfs
Storm frequency	=	100 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	628 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	8.389 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5.IDF	Asc/Rec limb fact	=	3/3

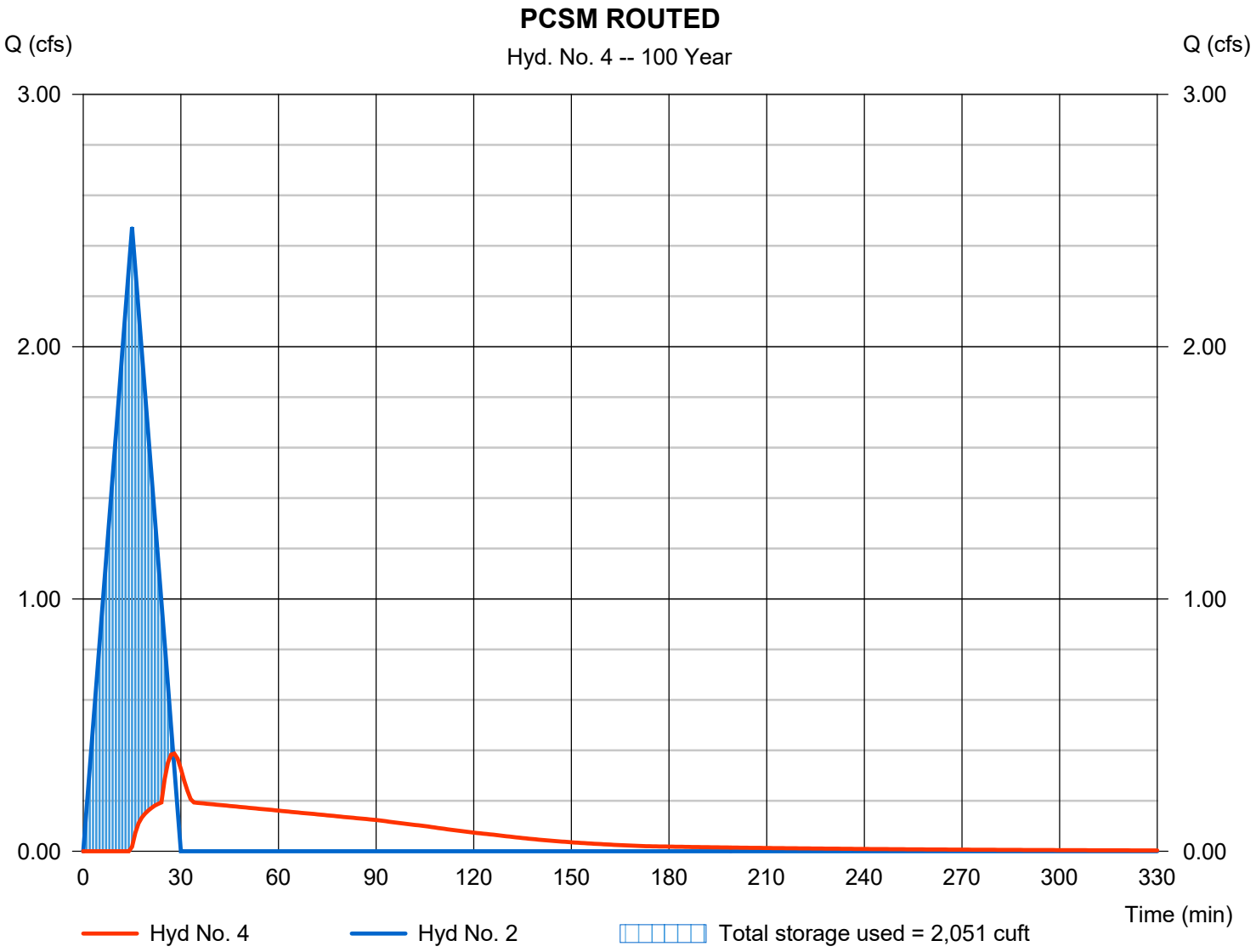
Hydrograph Report

Hyd. No. 4

PCSM ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	0.387 cfs
Storm frequency	=	100 yrs	Time to peak	=	28 min
Time interval	=	1 min	Hyd. volume	=	1,200 cuft
Inflow hyd. No.	=	2 - CONTROLLED	Max. Elevation	=	233.46 ft
Reservoir name	=	PCSM	Max. Storage	=	2,051 cuft

Storage Indication method used.

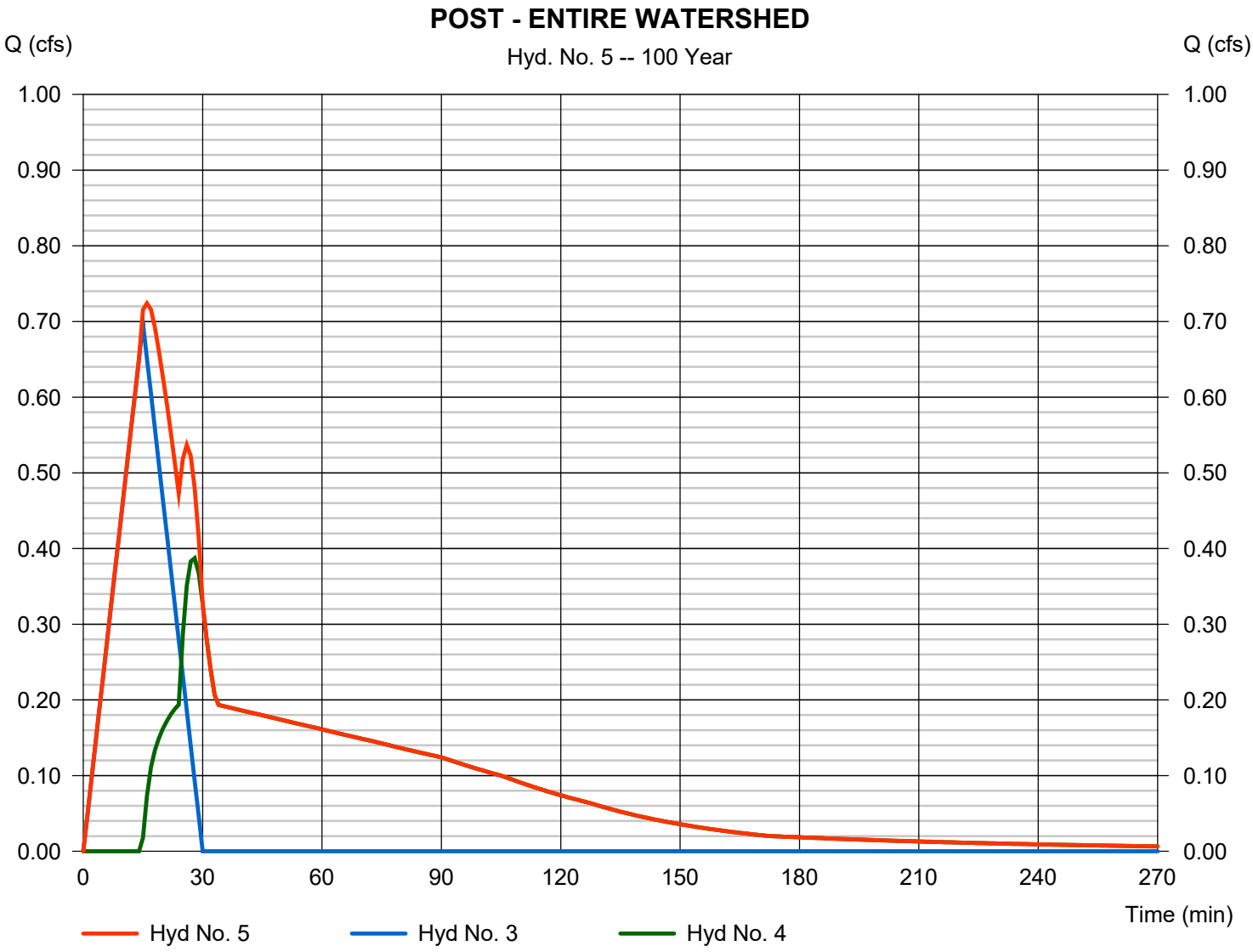


Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	=	Combine	Peak discharge	=	0.724 cfs
Storm frequency	=	100 yrs	Time to peak	=	16 min
Time interval	=	1 min	Hyd. volume	=	1,828 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	0.198 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	22.1293	5.9000	0.7167	--------
2	65.5692	13.4000	0.9127	--------
3	0.0000	0.0000	0.0000	--------
5	26.5614	6.1000	0.6703	--------
10	27.5380	5.9000	0.6384	--------
25	28.9539	5.8000	0.6156	--------
50	78.9131	13.8000	0.8026	--------
100	61.8249	11.8000	0.7079	--------

File name: Region 5.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	3.99	3.05	2.51	2.15	1.89	1.70	1.55	1.43	1.32	1.24	1.16	1.10
2	4.60	3.69	3.09	2.67	2.35	2.10	1.90	1.74	1.60	1.49	1.39	1.30
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.29	4.12	3.44	2.98	2.65	2.40	2.20	2.04	1.90	1.79	1.69	1.60
10	5.99	4.71	3.96	3.45	3.08	2.80	2.58	2.39	2.24	2.11	2.00	1.90
25	6.69	5.29	4.47	3.91	3.51	3.20	2.95	2.75	2.58	2.43	2.31	2.20
50	7.49	6.20	5.32	4.68	4.19	3.80	3.48	3.22	3.00	2.81	2.64	2.50
100	8.39	6.98	6.03	5.34	4.82	4.40	4.06	3.78	3.54	3.34	3.16	3.00

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.80	3.30	0.00	4.20	5.00	6.00	7.20	8.40
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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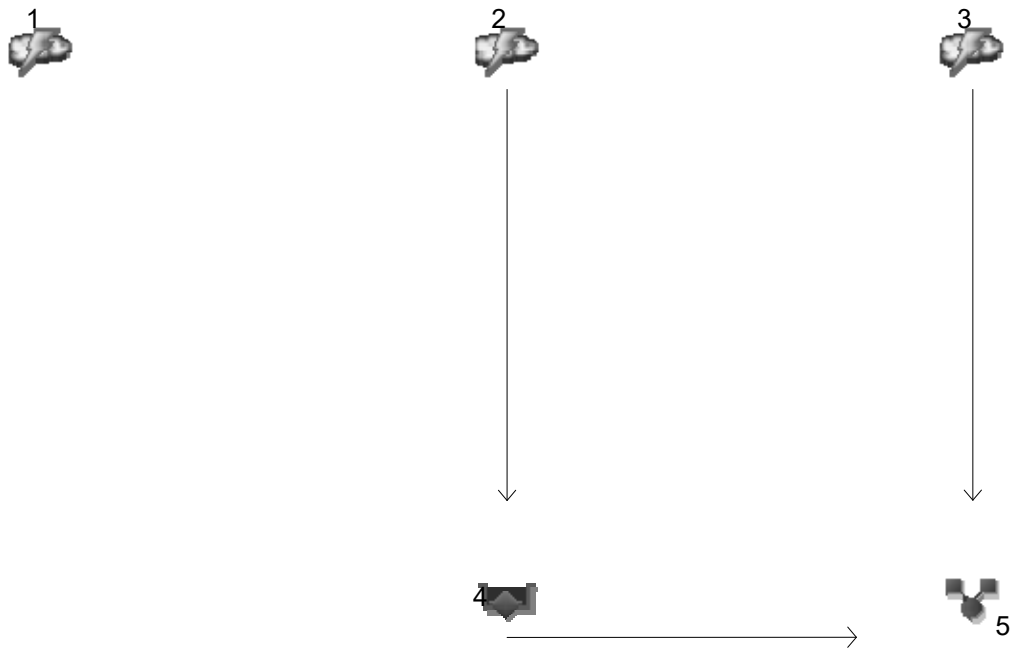
Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	Rational	PRE - ENTIRE WATERSHED
2	Rational	CONTROLLED
3	Rational	UNCONTROLLED
4	Reservoir	PCSM ROUTED
5	Combine	POST - ENTIRE WATERSHED

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Rational	------	0.000	2.585	-------	2.728	2.831	0.000	0.000	0.000	PRE - ENTIRE WATERSHED
2	Rational	------	0.000	2.524	-------	2.664	2.764	0.000	0.000	0.000	CONTROLLED
3	Rational	------	0.000	0.712	-------	0.751	0.780	0.000	0.000	0.000	UNCONTROLLED
4	Reservoir	2	0.000	1.478	-------	1.638	1.746	0.000	0.000	0.000	PCSM ROUTED
5	Combine	3, 4	0.000	1.905	-------	2.119	2.263	0.000	0.000	0.000	POST - ENTIRE WATERSHED

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

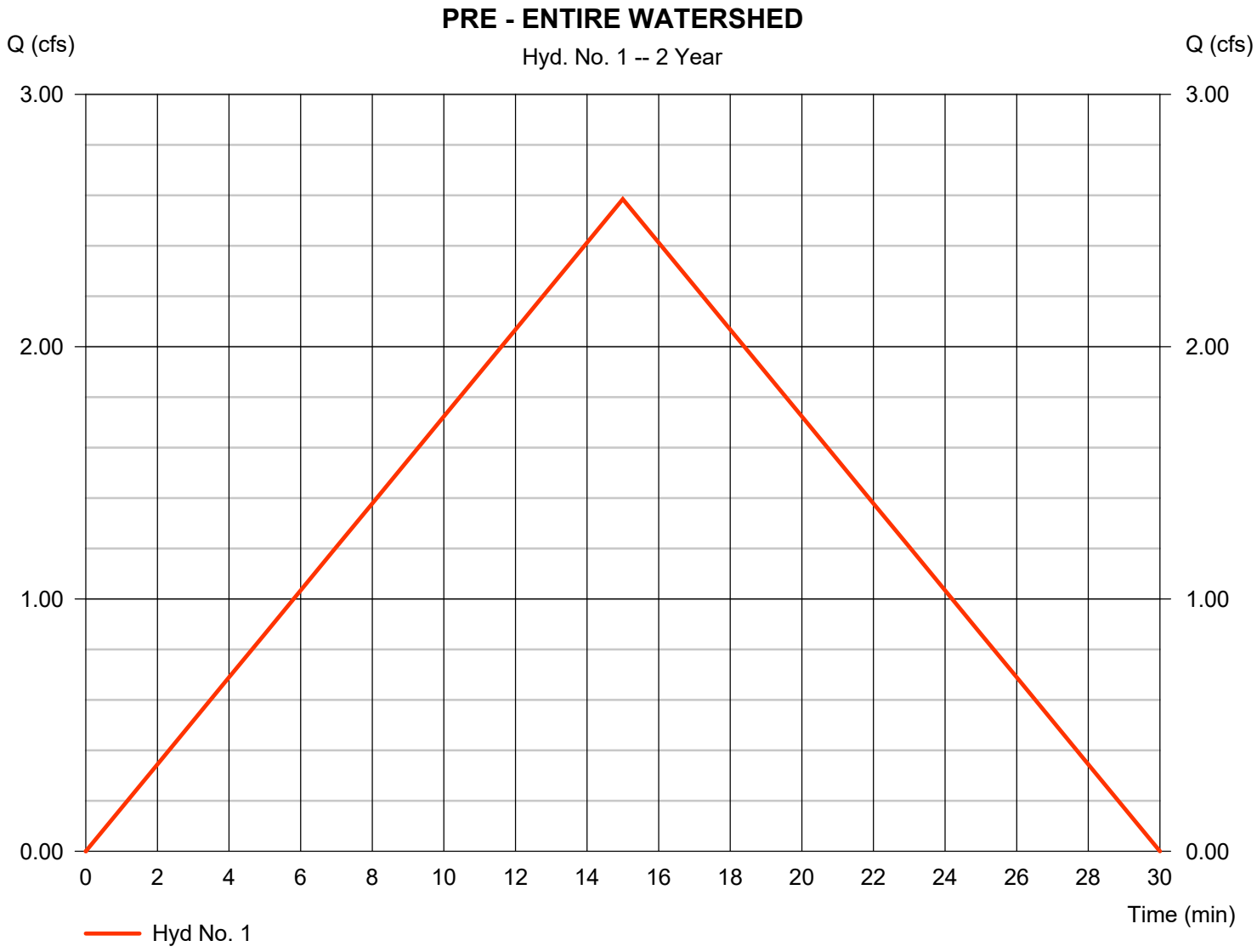
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	2.585	1	15	2,326	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	2.524	1	15	2,271	------	------	------	CONTROLLED
3	Rational	0.712	1	15	641	------	------	------	UNCONTROLLED
4	Reservoir	1.478	1	21	1,305	2	233.45	1,482	PCSM ROUTED
5	Combine	1.905	1	21	1,946	3, 4	------	------	POST - ENTIRE WATERSHED

Hydrograph Report

Hyd. No. 1

PRE - ENTIRE WATERSHED

Hydrograph type	=	Rational	Peak discharge	=	2.585 cfs
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	2,326 cuft
Drainage area	=	0.839 ac	Runoff coeff.	=	0.36
Intensity	=	8.558 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5 200 & 500.IDF	Asc/Rec limb fact	=	3/3

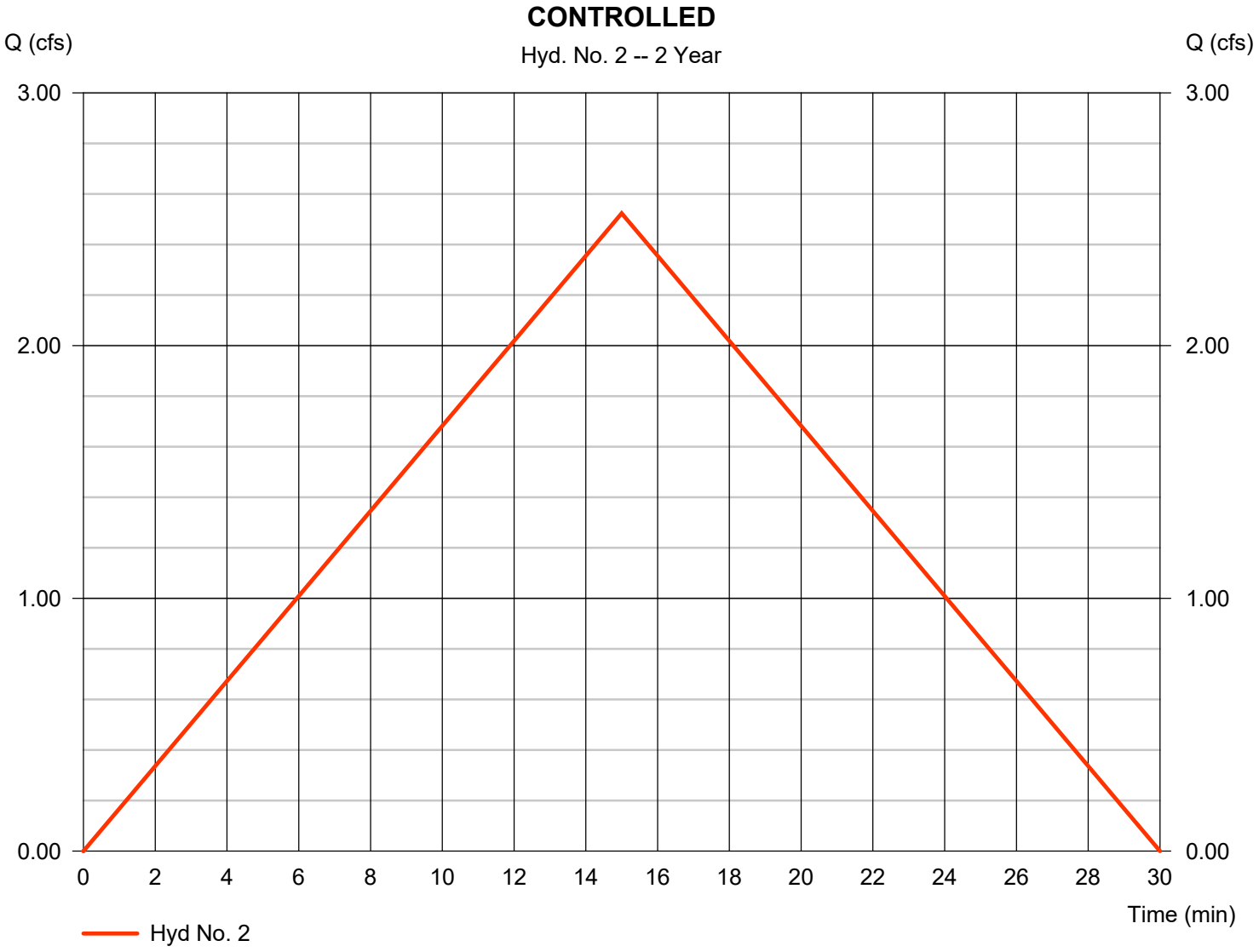


Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	2.524 cfs
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	2,271 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	8.558 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5 200 & 500.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.712 cfs
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	641 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	8.558 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5 200 & 500.IDF	Asc/Rec limb fact	=	3/3

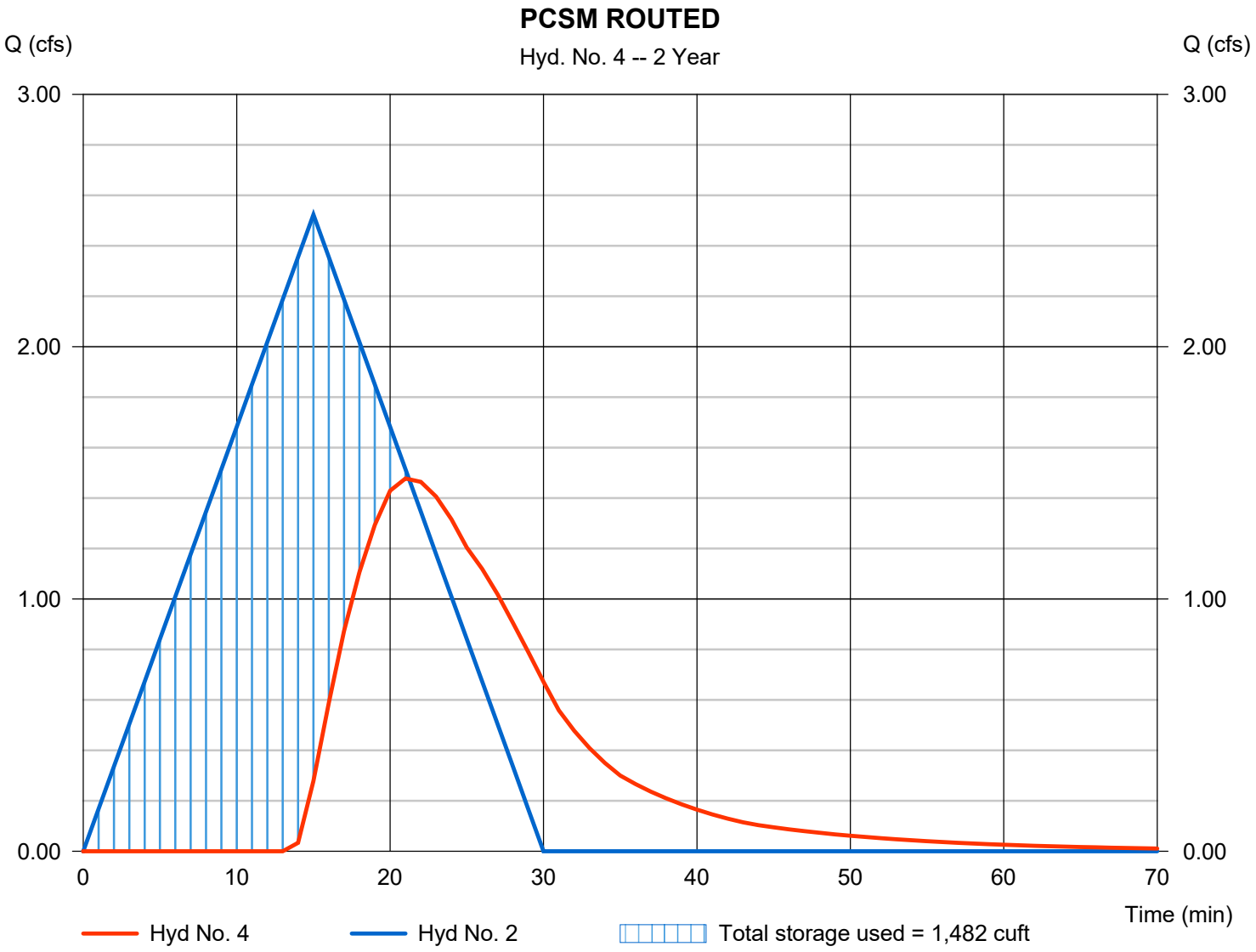
Hydrograph Report

Hyd. No. 4

PCSM ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	1.478 cfs
Storm frequency	=	2 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	1,305 cuft
Inflow hyd. No.	=	2 - CONTROLLED	Max. Elevation	=	233.45 ft
Reservoir name	=	PCSM	Max. Storage	=	1,482 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - PCSM

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 231.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	231.50	533	0	0
0.50	232.00	636	292	292
1.50	233.00	859	748	1,040
2.50	234.00	1,108	984	2,023
3.00	234.50	1,242	588	2,611

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 8.00	6.00	0.00	0.00
Span (in)	= 8.00	12.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 230.50	232.90	0.00	0.00
Length (ft)	= 220.00	0.00	0.00	0.00
Slope (%)	= 2.10	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 3.14	68.00	0.00	0.00
Crest El. (ft)	= 233.40	234.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Ciplti	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	231.50	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.05	29	231.55	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.10	58	231.60	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.15	88	231.65	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.20	117	231.70	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.25	146	231.75	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.30	175	231.80	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.35	205	231.85	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.40	234	231.90	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.45	263	231.95	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.50	292	232.00	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.60	367	232.10	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.70	442	232.20	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.80	517	232.30	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
0.90	591	232.40	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
1.00	666	232.50	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
1.10	741	232.60	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
1.20	816	232.70	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
1.30	890	232.80	1.37 ic	0.00	---	---	0.00	0.00	---	---	---	---	0.000
1.40	965	232.90	1.37 ic	0.00 ic	---	---	0.00	0.00	---	---	---	---	0.000
1.50	1,040	233.00	1.37 ic	0.11 ic	---	---	0.00	0.00	---	---	---	---	0.108
1.60	1,138	233.10	1.37 ic	0.30 ic	---	---	0.00	0.00	---	---	---	---	0.305
1.70	1,236	233.20	1.37 ic	0.56 ic	---	---	0.00	0.00	---	---	---	---	0.560
1.80	1,335	233.30	1.37 ic	0.86 ic	---	---	0.00	0.00	---	---	---	---	0.861
1.90	1,433	233.40	1.37 ic	1.20 ic	---	---	0.00	0.00	---	---	---	---	1.204
2.00	1,532	233.50	1.76 ic	1.42 ic	---	---	0.33	0.00	---	---	---	---	1.755
2.10	1,630	233.60	2.02 oc	1.08 ic	---	---	0.94	0.00	---	---	---	---	2.019
2.20	1,728	233.70	2.05 oc	0.77 ic	---	---	1.28 s	0.00	---	---	---	---	2.048
2.30	1,827	233.80	2.07 oc	0.59 ic	---	---	1.47 s	0.00	---	---	---	---	2.068
2.40	1,925	233.90	2.09 oc	0.48 ic	---	---	1.61 s	0.00	---	---	---	---	2.085
2.50	2,023	234.00	2.10 oc	0.39 ic	---	---	1.71 s	0.00	---	---	---	---	2.100
2.55	2,082	234.05	2.11 oc	0.36 ic	---	---	1.75 s	0.00	---	---	---	---	2.106
2.60	2,141	234.10	2.12 oc	0.33 ic	---	---	1.78 s	0.00	---	---	---	---	2.117
2.65	2,200	234.15	2.12 oc	0.31 ic	---	---	1.81 s	0.00	---	---	---	---	2.121
2.70	2,258	234.20	2.13 oc	0.29 ic	---	---	1.84 s	0.00	---	---	---	---	2.129
2.75	2,317	234.25	2.14 oc	0.27 ic	---	---	1.87 s	0.00	---	---	---	---	2.139
2.80	2,376	234.30	2.15 oc	0.25 ic	---	---	1.89 s	0.00	---	---	---	---	2.140
2.85	2,435	234.35	2.15 oc	0.23 ic	---	---	1.92 s	0.00	---	---	---	---	2.153

Continues on next page...

PCSM

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.90	2,493	234.40	2.16 oc	0.22 ic	---	---	1.94 s	0.00	---	---	---	---	2.157
2.95	2,552	234.45	2.17 oc	0.21 ic	---	---	1.96 s	0.00	---	---	---	---	2.165
3.00	2,611	234.50	2.17 oc	0.20 ic	---	---	1.97 s	0.00	---	---	---	---	2.165

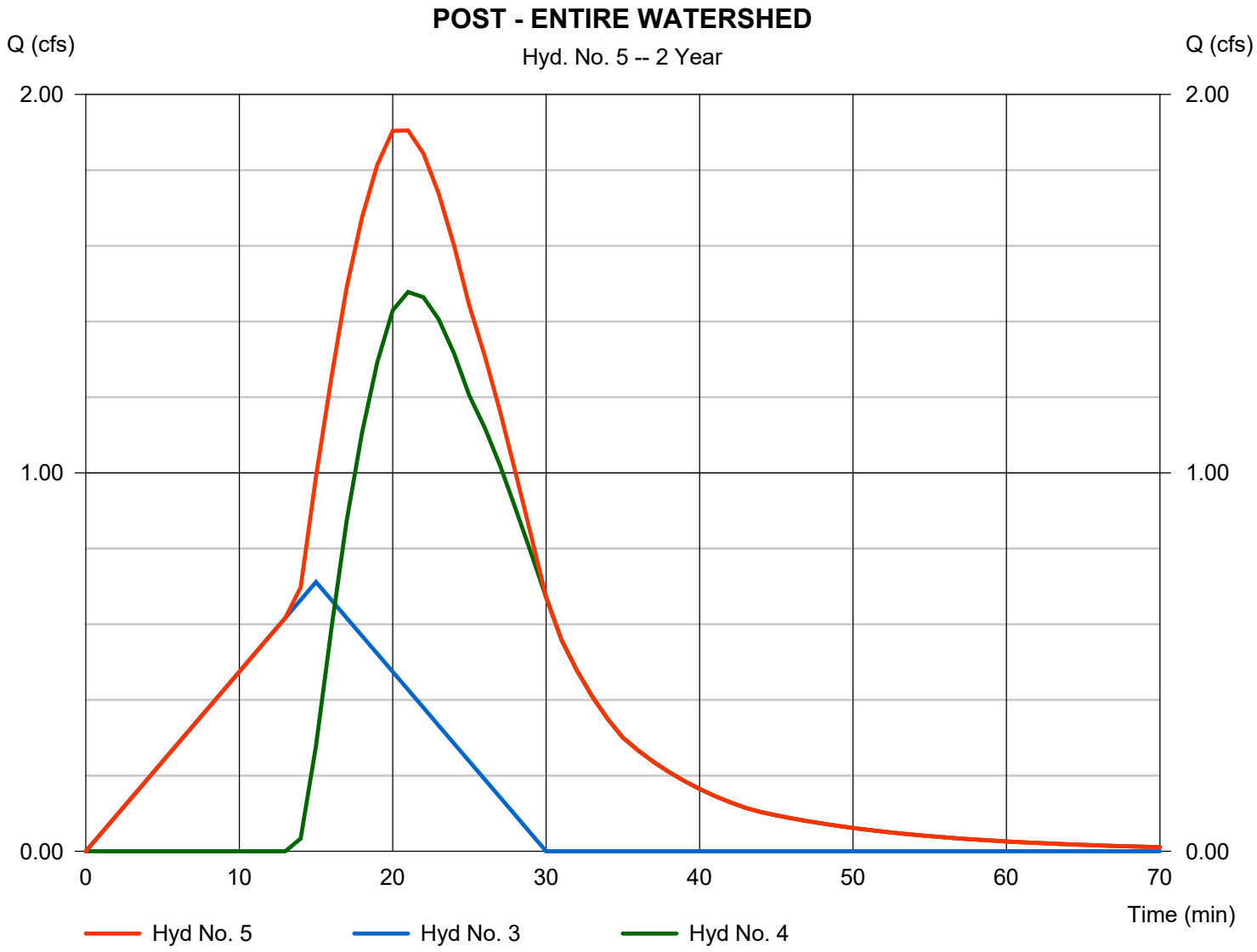
...End

Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	= Combine	Peak discharge	= 1.905 cfs
Storm frequency	= 2 yrs	Time to peak	= 21 min
Time interval	= 1 min	Hyd. volume	= 1,946 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 0.198 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

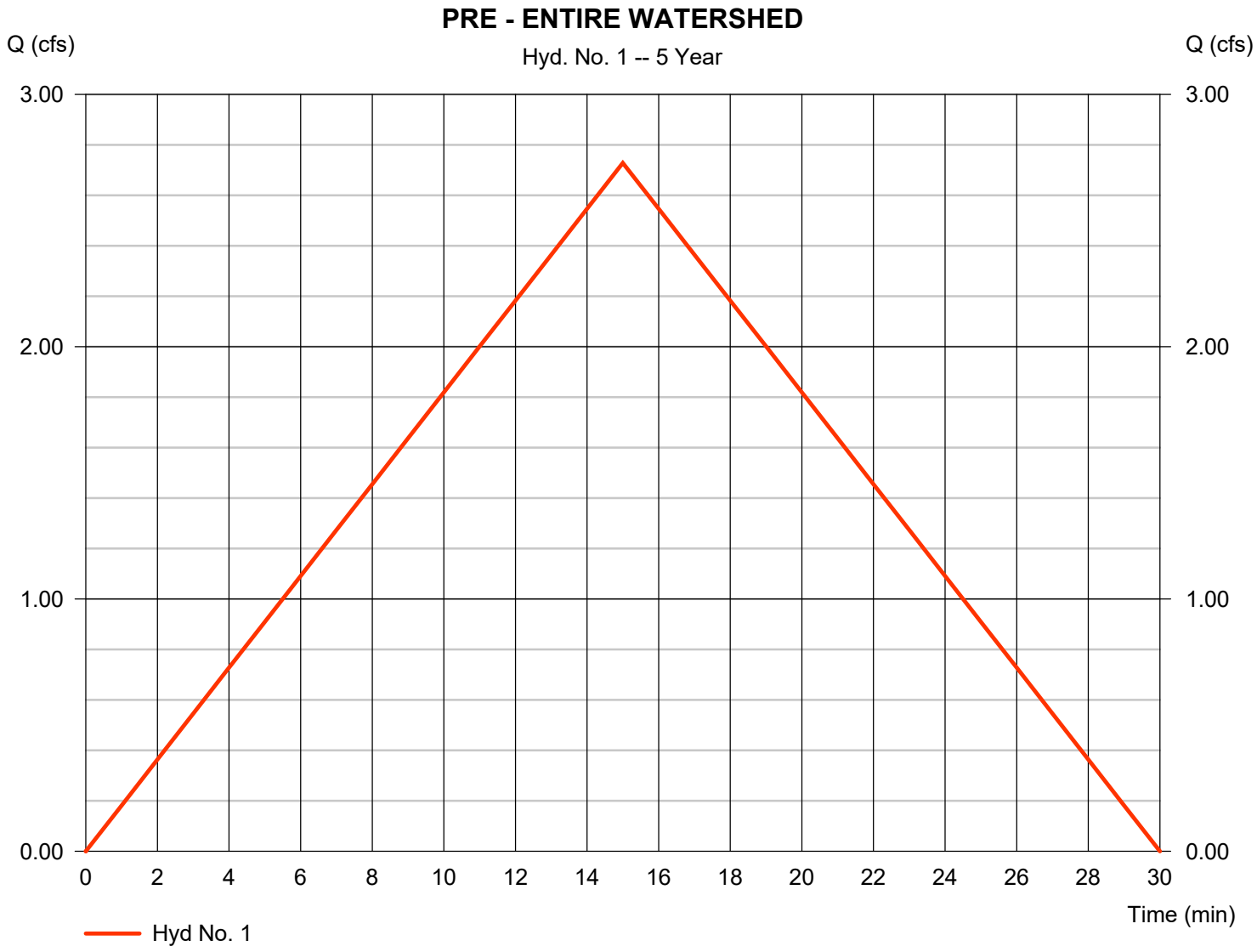
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	2.728	1	15	2,456	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	2.664	1	15	2,397	------	------	------	CONTROLLED
3	Rational	0.751	1	15	676	------	------	------	UNCONTROLLED
4	Reservoir	1.638	1	21	1,432	2	233.48	1,511	PCSM ROUTED
5	Combine	2.119	1	20	2,108	3, 4	------	------	POST - ENTIRE WATERSHED

Hydrograph Report

Hyd. No. 1

PRE - ENTIRE WATERSHED

Hydrograph type	=	Rational	Peak discharge	=	2.728 cfs
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	2,456 cuft
Drainage area	=	0.839 ac	Runoff coeff.	=	0.36
Intensity	=	9.033 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5 200 & 500.IDF	Asc/Rec limb fact	=	3/3

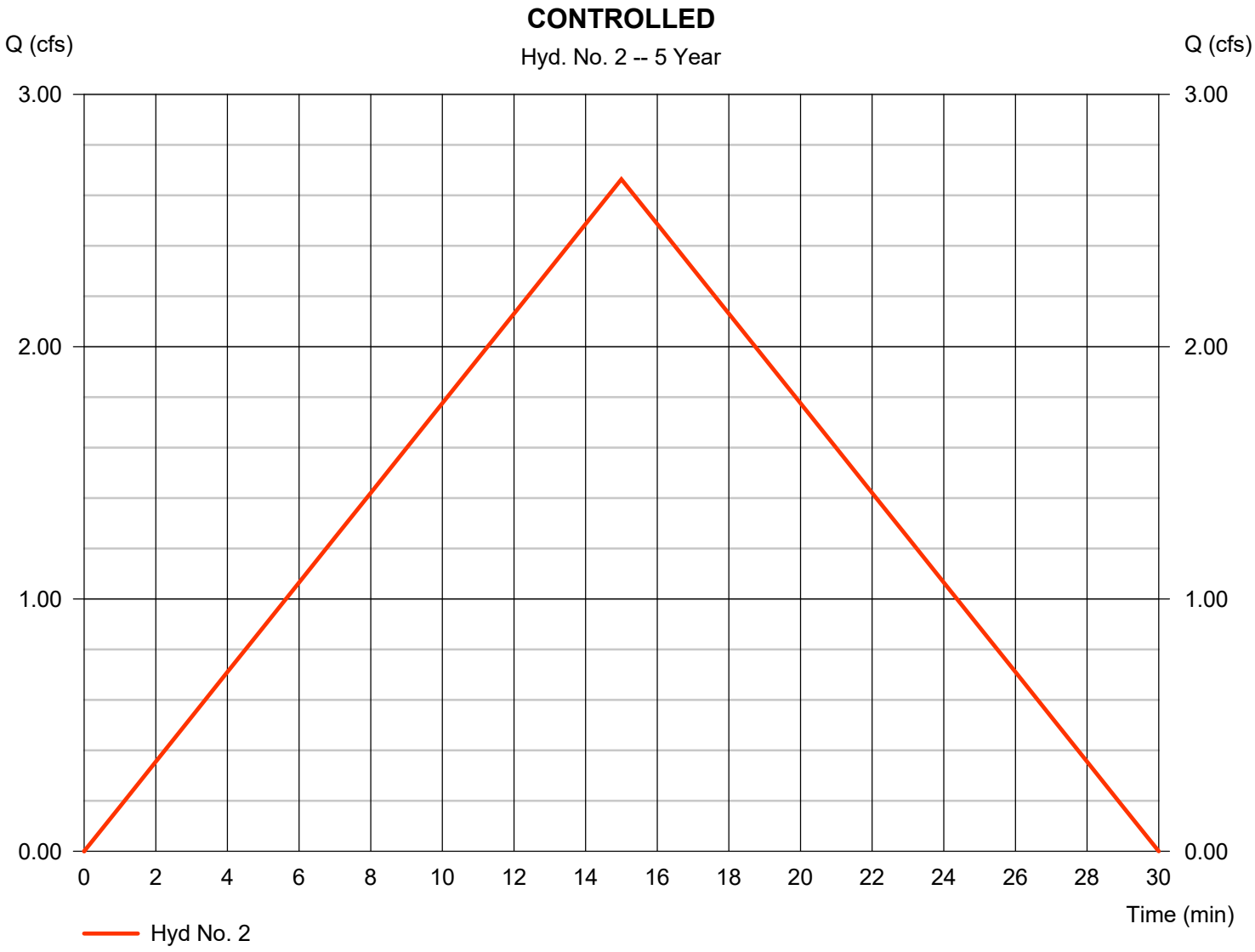


Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	2.664 cfs
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	2,397 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	9.033 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5 200 & 500.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.751 cfs
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	676 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	9.033 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5 200 & 500.IDF	Asc/Rec limb fact	=	3/3

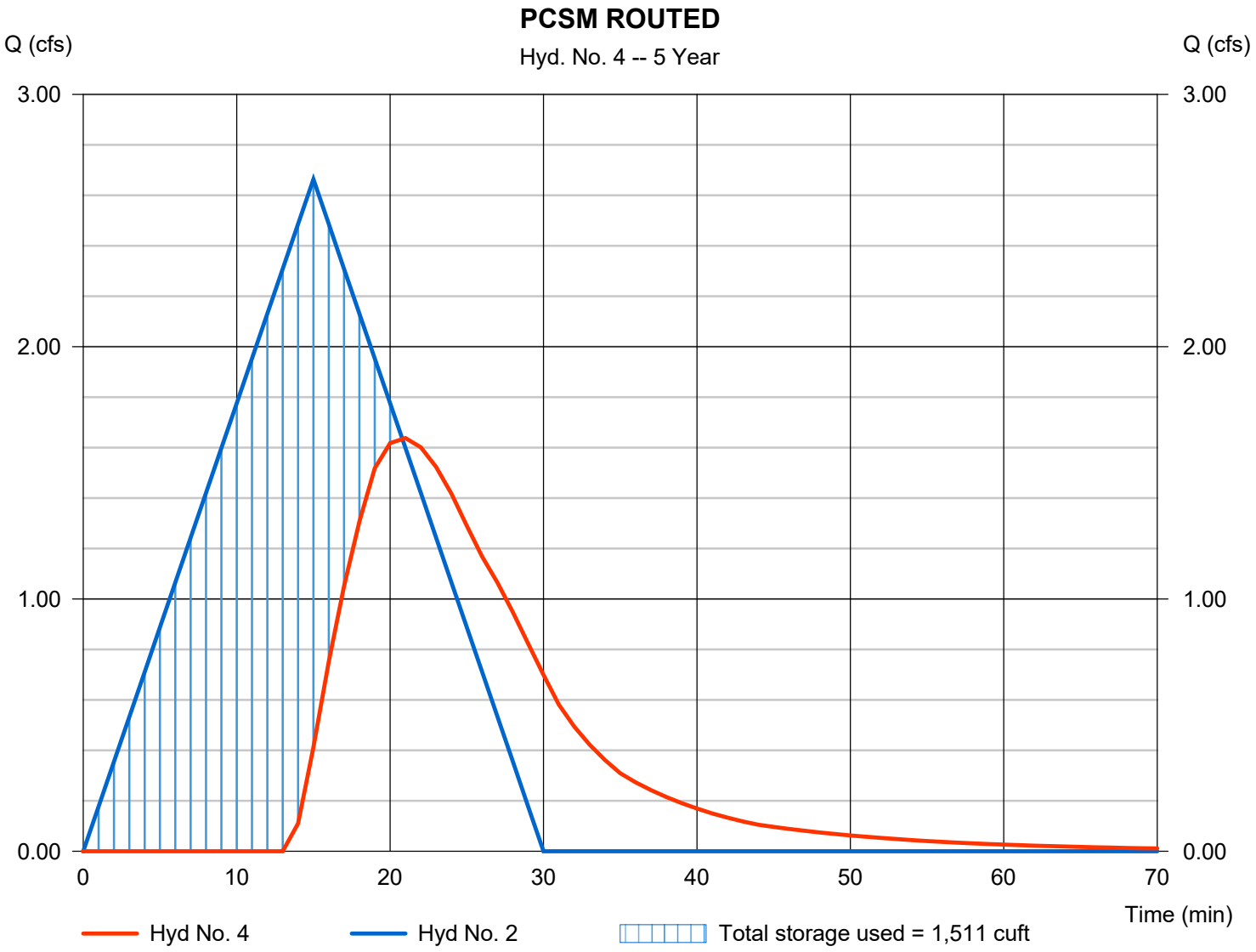
Hydrograph Report

Hyd. No. 4

PCSM ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	1.638 cfs
Storm frequency	=	5 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	1,432 cuft
Inflow hyd. No.	=	2 - CONTROLLED	Max. Elevation	=	233.48 ft
Reservoir name	=	PCSM	Max. Storage	=	1,511 cuft

Storage Indication method used.

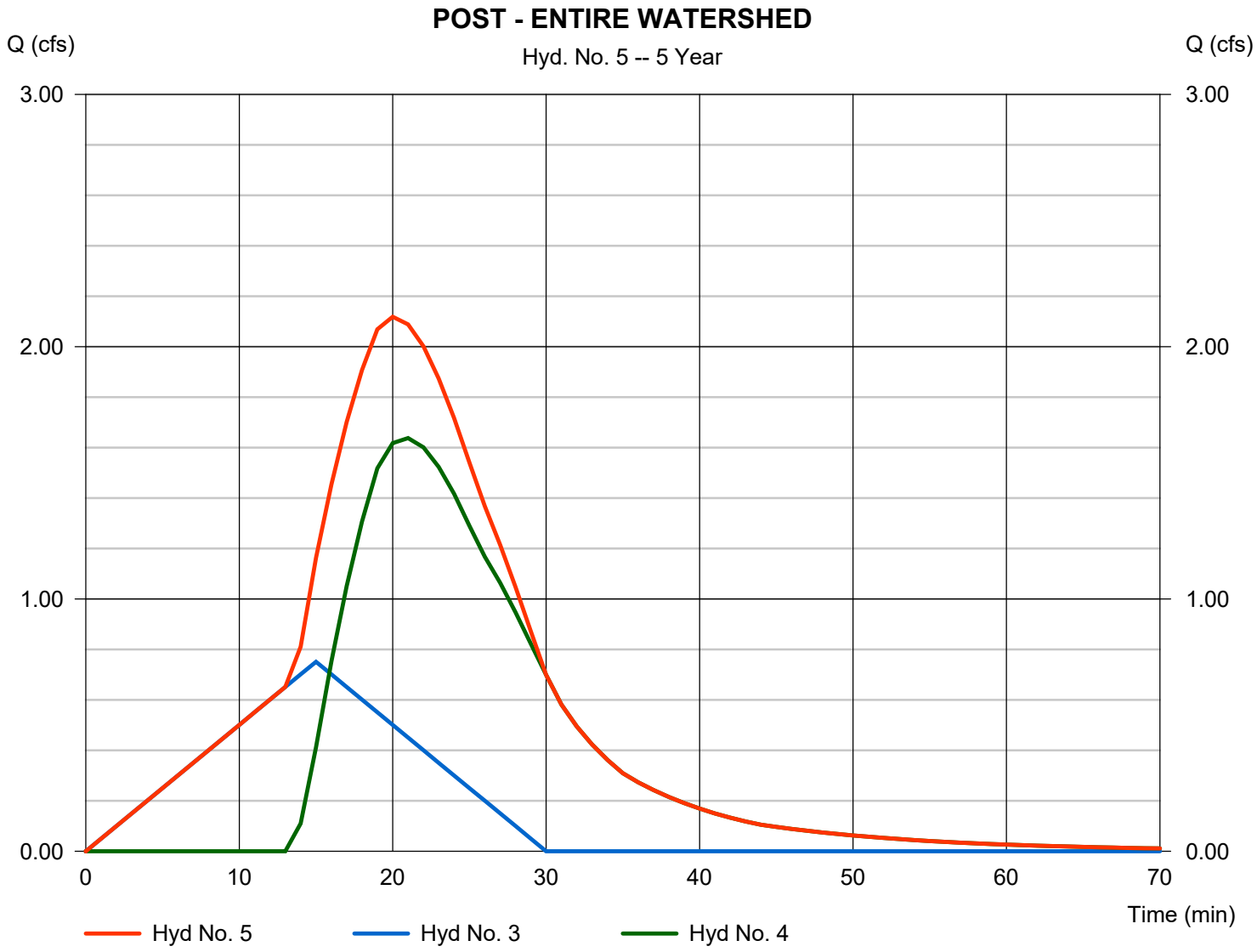


Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	= Combine	Peak discharge	= 2.119 cfs
Storm frequency	= 5 yrs	Time to peak	= 20 min
Time interval	= 1 min	Hyd. volume	= 2,108 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 0.198 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

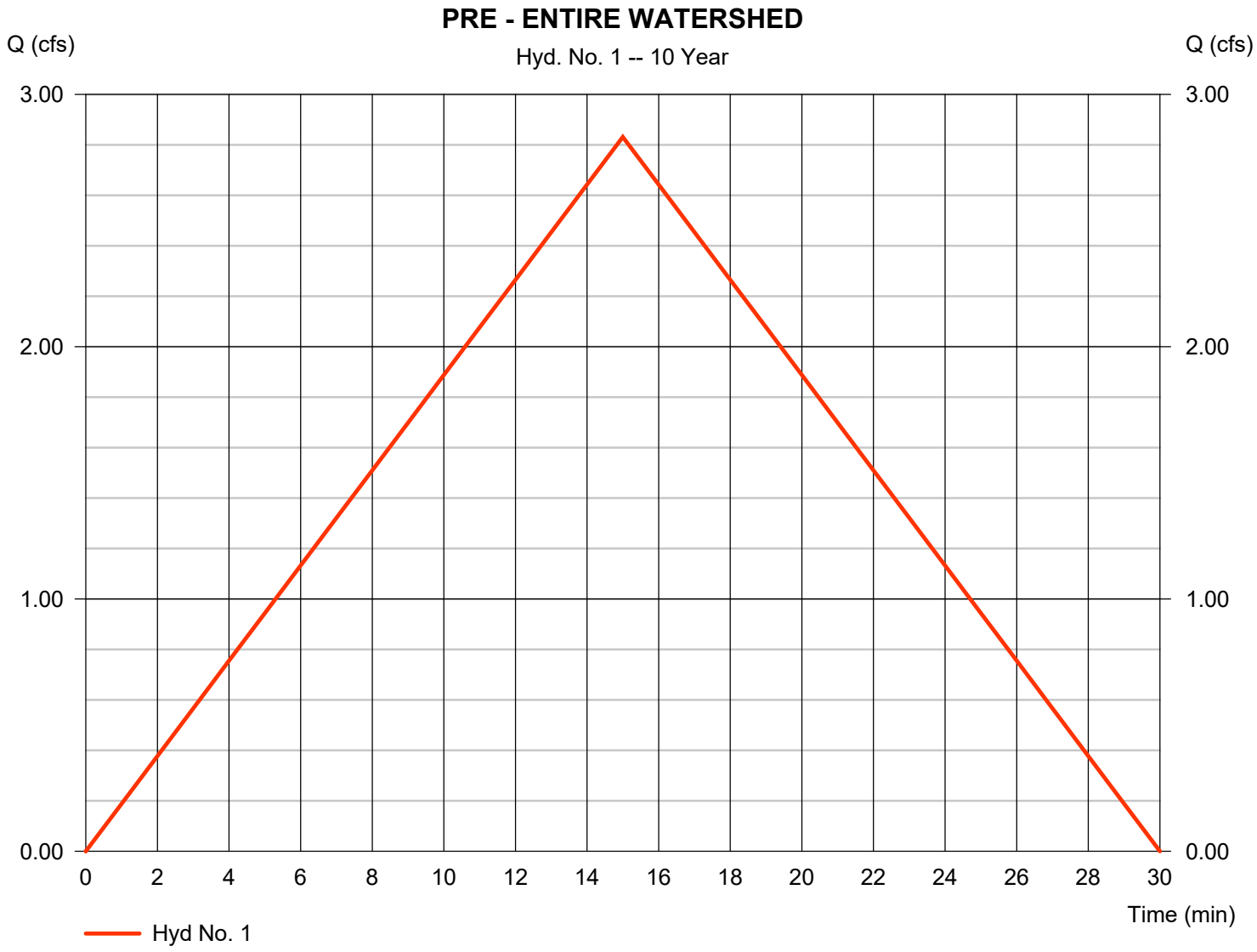
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	2.831	1	15	2,548	------	------	------	PRE - ENTIRE WATERSHED
2	Rational	2.764	1	15	2,488	------	------	------	CONTROLLED
3	Rational	0.780	1	15	702	------	------	------	UNCONTROLLED
4	Reservoir	1.746	1	21	1,522	2	233.50	1,530	PCSM ROUTED
5	Combine	2.263	1	20	2,224	3, 4	------	------	POST - ENTIRE WATERSHED

Hydrograph Report

Hyd. No. 1

PRE - ENTIRE WATERSHED

Hydrograph type	=	Rational	Peak discharge	=	2.831 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	2,548 cuft
Drainage area	=	0.839 ac	Runoff coeff.	=	0.36
Intensity	=	9.374 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5 200 & 500.IDF	Asc/Rec limb fact	=	3/3

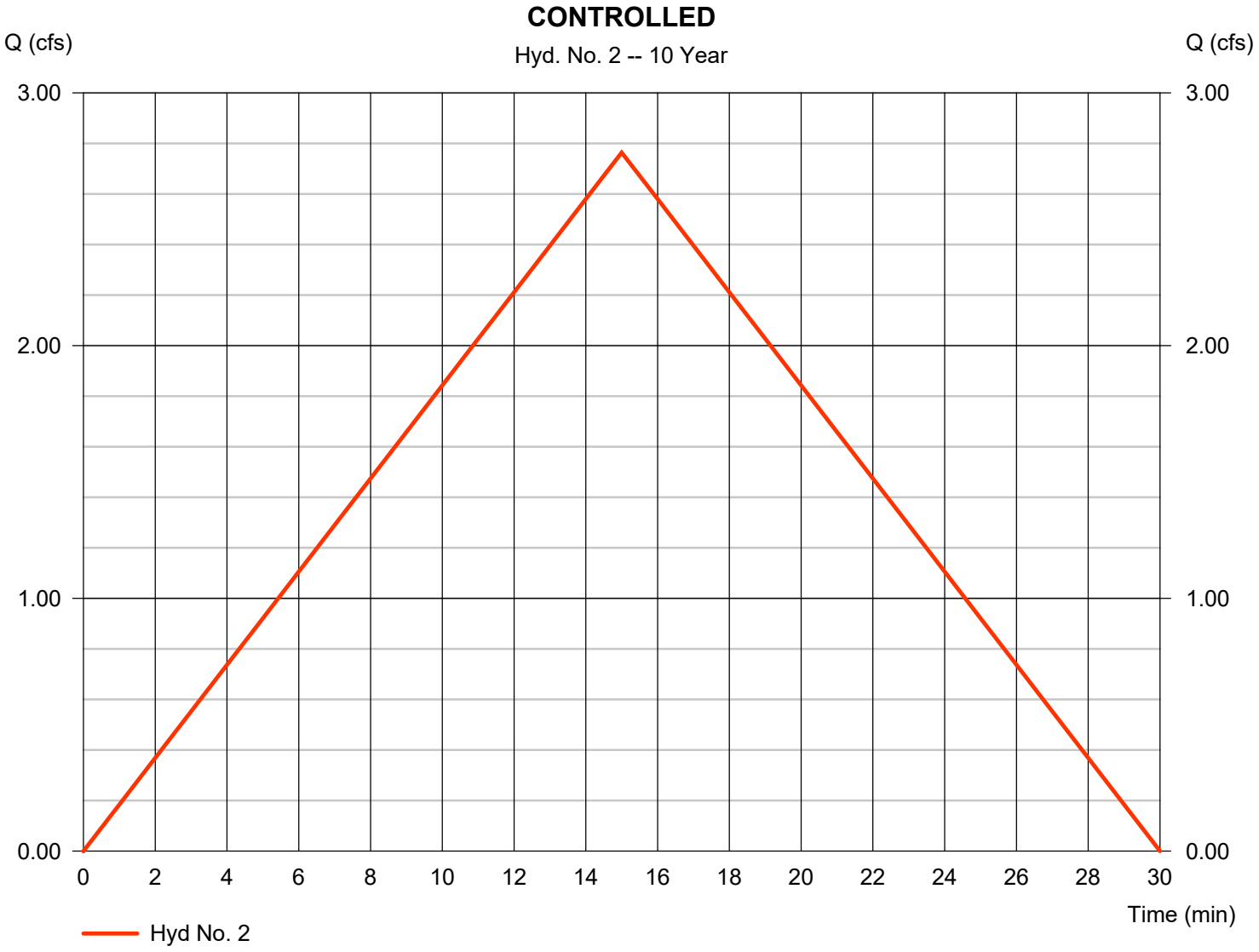


Hydrograph Report

Hyd. No. 2

CONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	2.764 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	2,488 cuft
Drainage area	=	0.641 ac	Runoff coeff.	=	0.46
Intensity	=	9.374 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5 200 & 500.IDF	Asc/Rec limb fact	=	3/3



Hydrograph Report

Hyd. No. 3

UNCONTROLLED

Hydrograph type	=	Rational	Peak discharge	=	0.780 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	702 cuft
Drainage area	=	0.198 ac	Runoff coeff.	=	0.42
Intensity	=	9.374 in/hr	Tc by User	=	5.00 min
IDF Curve	=	Region 5 200 & 500.IDF	Asc/Rec limb fact	=	3/3

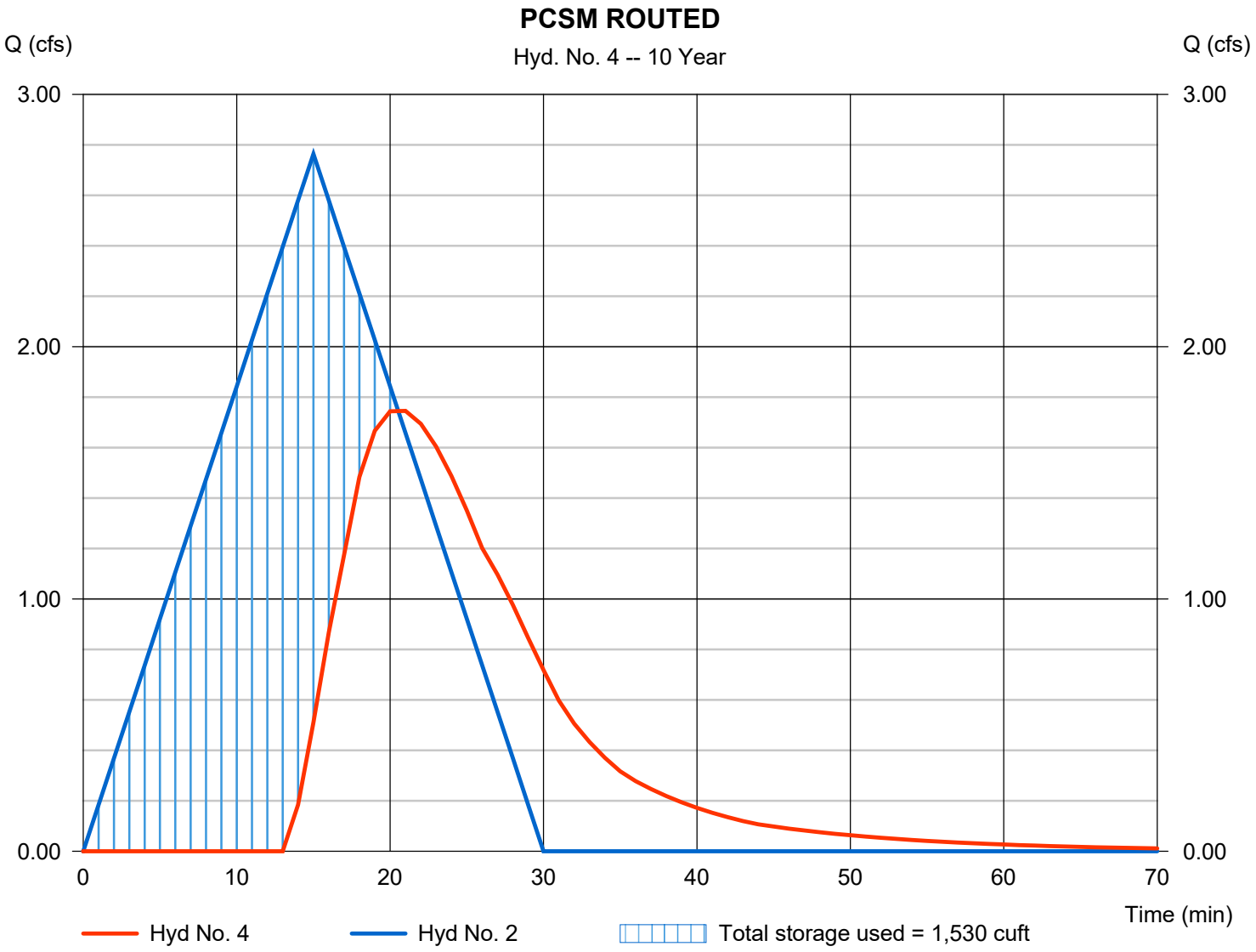
Hydrograph Report

Hyd. No. 4

PCSM ROUTED

Hydrograph type	=	Reservoir	Peak discharge	=	1.746 cfs
Storm frequency	=	10 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	1,522 cuft
Inflow hyd. No.	=	2 - CONTROLLED	Max. Elevation	=	233.50 ft
Reservoir name	=	PCSM	Max. Storage	=	1,530 cuft

Storage Indication method used.

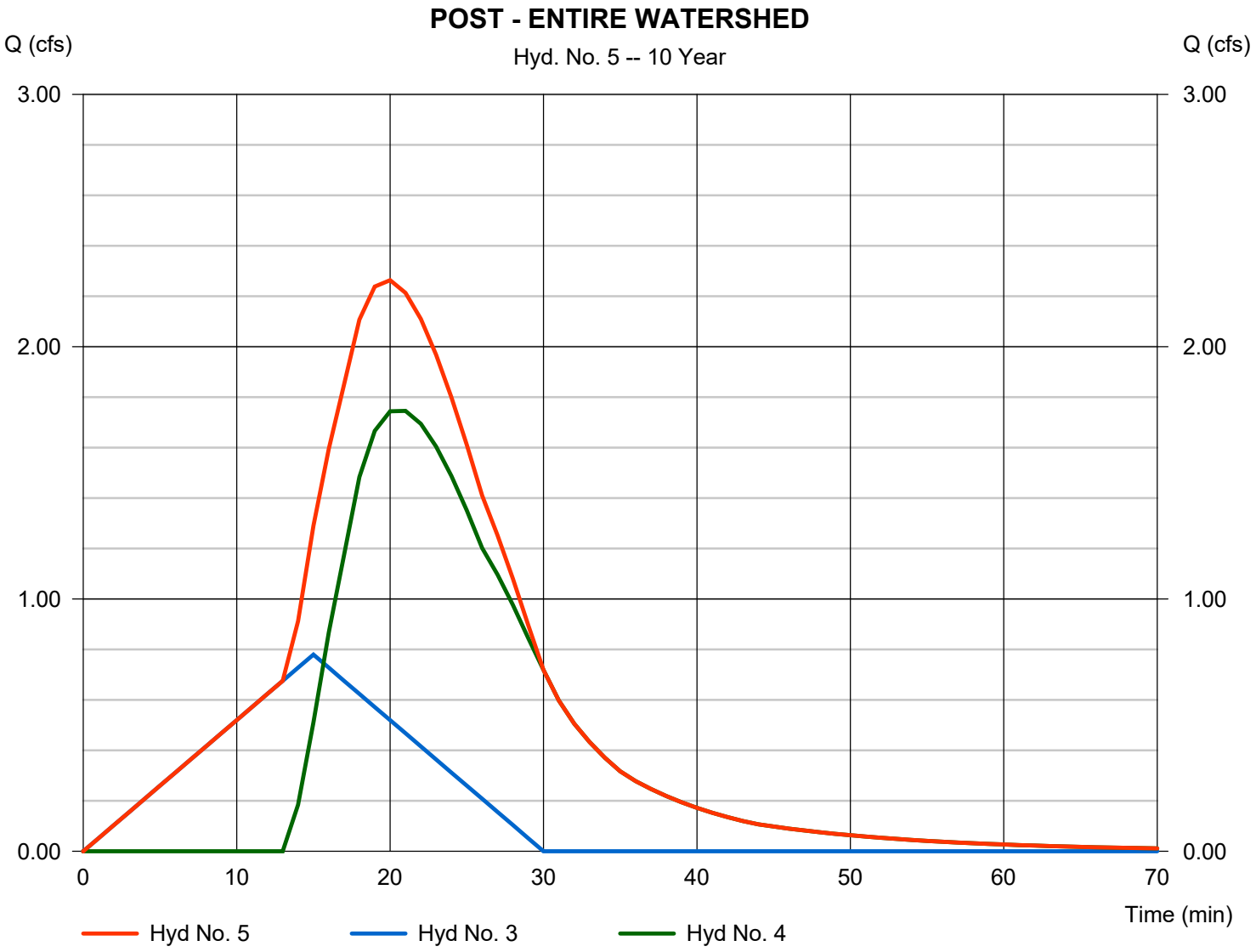


Hydrograph Report

Hyd. No. 5

POST - ENTIRE WATERSHED

Hydrograph type	=	Combine	Peak discharge	=	2.263 cfs
Storm frequency	=	10 yrs	Time to peak	=	20 min
Time interval	=	1 min	Hyd. volume	=	2,224 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	0.198 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	41.1081	8.0000	0.6118	--------
3	0.0000	0.0000	0.0000	--------
5	35.2719	6.6000	0.5558	--------
10	31.0581	5.4000	0.5115	--------
25	0.0000	0.0000	0.0000	--------
50	0.0000	0.0000	0.0000	--------
100	0.0000	0.0000	0.0000	--------

File name: Region 5 200 & 500.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	8.56	7.01	6.04	5.35	4.84	4.44	4.12	3.85	3.62	3.43	3.26	3.11
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	9.03	7.40	6.39	5.70	5.18	4.77	4.44	4.17	3.94	3.74	3.57	3.42
10	9.37	7.67	6.64	5.94	5.42	5.01	4.68	4.41	4.18	3.98	3.81	3.66
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Tc = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.80	3.30	0.00	4.20	5.00	6.00	7.20	8.40
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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17086 200 & 500.gpw

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RADNOR TOWNSHIP

ENGINEERING DEPARTMENT

Memorandum

To: Radnor Township Board of Commissioners

From: Stephen F. Norcini, PE, Township Engineer

CC: William M. White, Township Manager

Date: November 2, 2021

75 Tyler Lane, Ardrossan Estates, Board of Commissioners Approval of Proposed House Location

Please find attached the grading permit plan for 75 Tyler Lane. It is noted on the Ardrossan Subdivision plan that new construction on lots 3-2 through 3-10 shall provide maximum protection of the Darby-Paoli/Newtown Rd viewshed and that the BoC shall approve the ultimate placement of proposed buildings on these lots. The house proposed for 75 Tyler Lane falls into this category.

The Zoning for the lot dictates the maximum height of the structure; the Board of Commissioners is to approve the horizontal location of the proposed house.

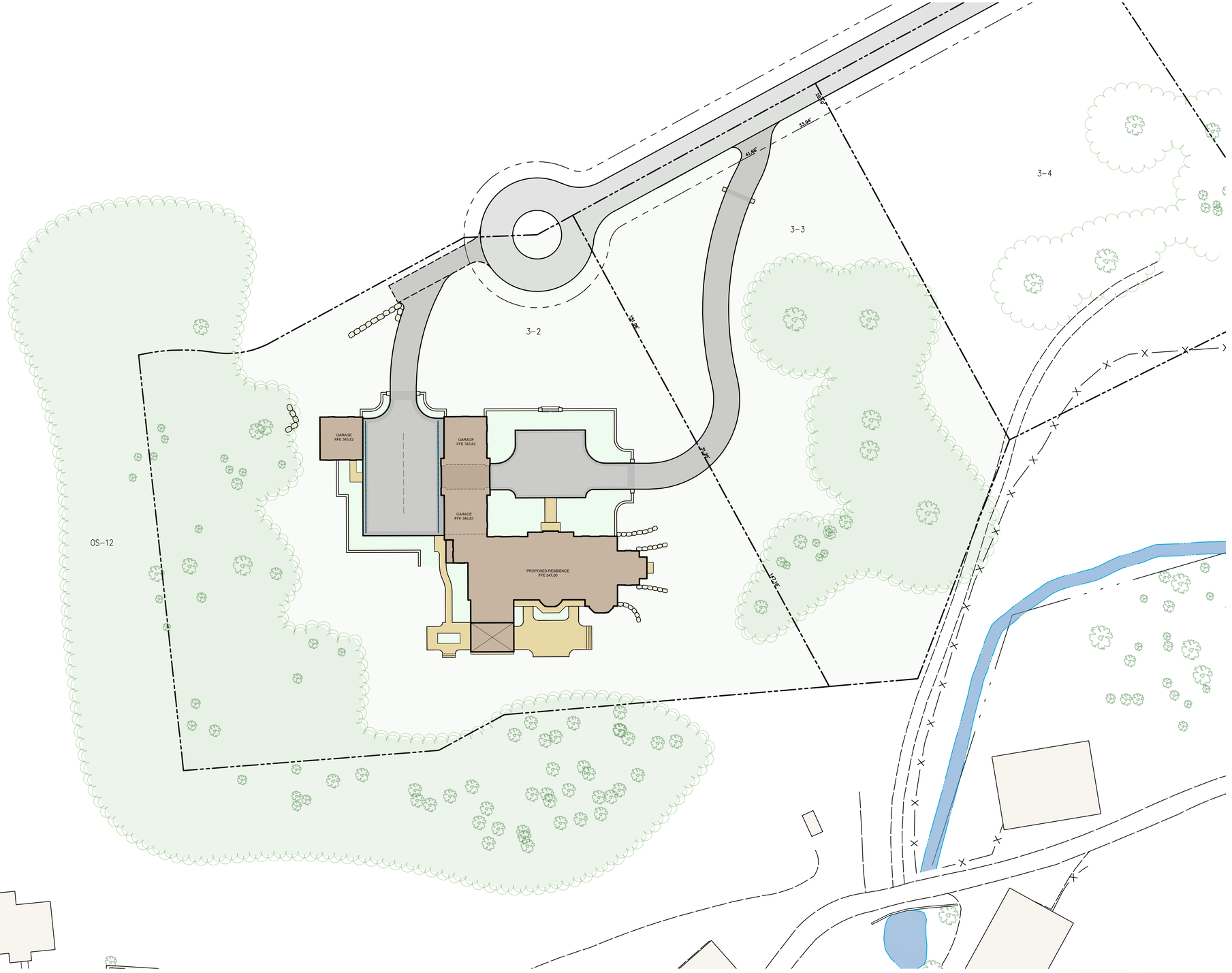
301 IVEN AVENUE, WAYNE PA 19087
T 610-688-5600, EXT. 130

THE MARR RESIDENCE

AT

75 TYLER LANE

RADNOR TOWNSHIP | DELAWARE COUNTY



SCHOCK GROUP LLC

1958 BUTLER PIKE, SUITE 200
CONSHOHOCKEN, PA 19428
610.590.7373 | SCHOCKGROUP.COM

REGISTERED PROFESSIONAL
DAVID R. FIORELLO
ENGINEER
PE027479E

LOCATIONS OF EXISTING UTILITIES ON THIS PLAN HAVE BEEN PLOTTED FROM AVAILABLE DATA AND ARE APPROXIMATE. ANY OMISSION OF UTILITY STRUCTURES AND INFORMATION FURNISHED BY THE APPROXIMATE REPAIRING, COST OF REPAIRING, ALL DAMAGES CAUSED BY SAID OMISSIONS SHALL BE BORNE BY THE CONTRACTOR. THE EXACT LOCATIONS AND DEPTH OF ALL STRUCTURES CANNOT BE GUARANTEED.

CONTRACTORS MUST VERIFY ALL LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES BEFORE STARTING ANY WORK.

BEFORE STARTING ANY WORK THE CONTRACTOR SHALL NOTIFY ALL ELECTRIC UTILITY COMPANIES THROUGH THE PA ONE CALL SYSTEM AND ANY OTHER UTILITY COMPANIES NOT PART OF PA ONE CALL.

COVER SHEET

GRADING PERMIT PLAN

PROJECT PHASE:

PROJECT NAME:

THE MARR RESIDENCE - 75 & 73 TYLER LANE

RADNOR TOWNSHIP • DELAWARE COUNTY • PENNSYLVANIA

REV.	DATE	DESCRIPTION

CLIENT:
CHRISTOPHER & KATHLEEN MARR
43 HARRISON DRIVE
NEWTOWN SQUARE, PA 19073

DRAWN BY:	TED
CHECKED BY:	DRF
CHECK ALL:	
SCALE:	1" = 30'
DATE:	AUGUST 11, 2021
REVISED:	
FILE NO.:	1144
SHEET NO.:	1 OF 10

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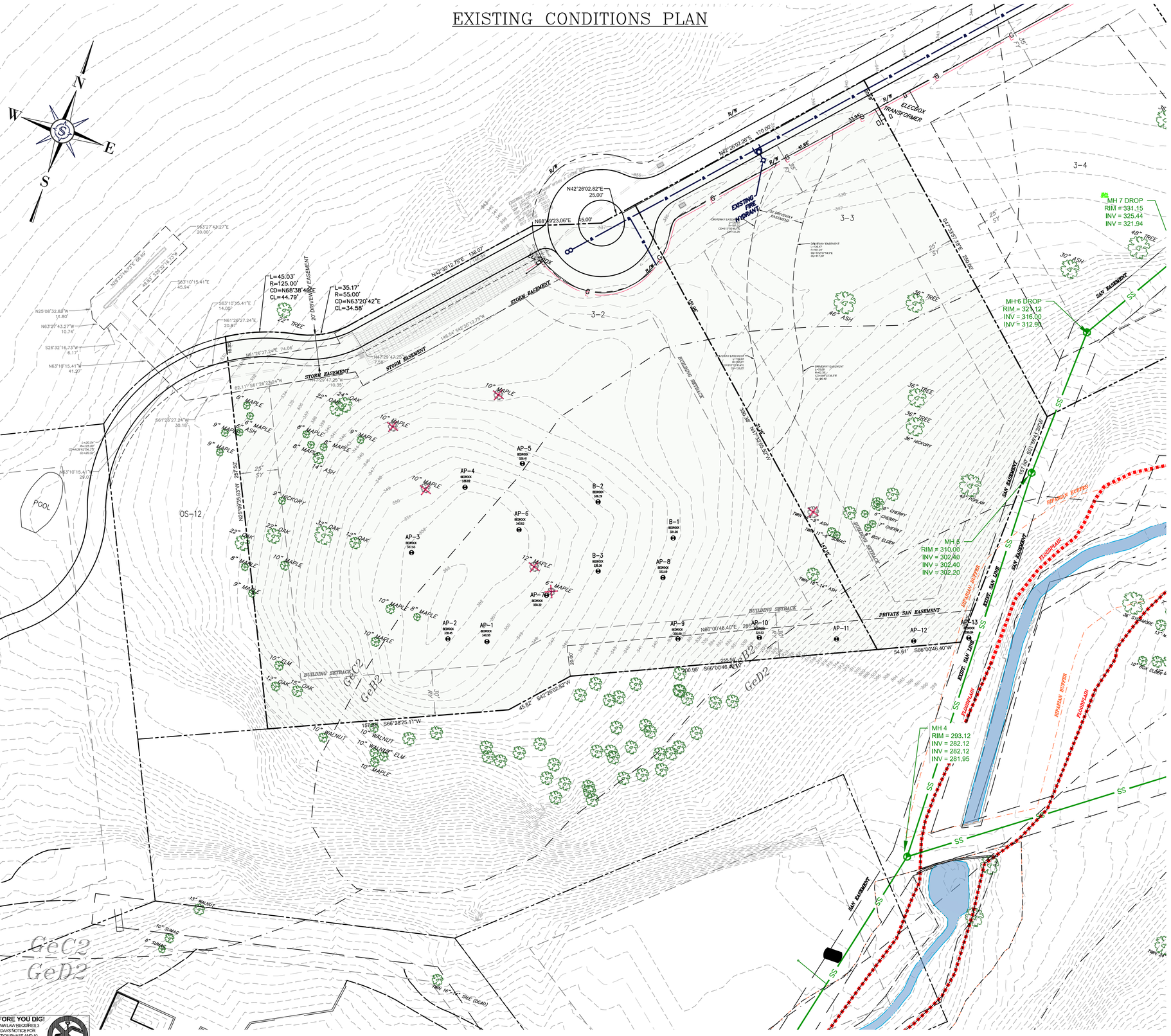
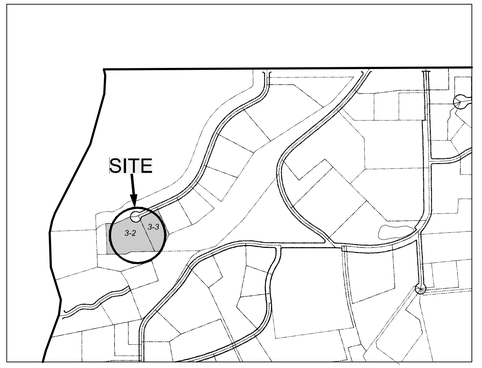
C:\SHARESPOINT\SCHOCKGROUP\FILES - DOCUMENTS\PROJECTS-1144\DRAWINGS\SC-1-144

EXISTING CONDITIONS PLAN





LOCATION MAP
SCALE: 1" = 600'

ZONING DISTRICT AC RESIDENTIAL DISTRICT

AREA:	2 AC
LOT WIDTH:	80' AT BSBL
BUILDING AREA:	15% MAX
FRONT YARD:	60 FT
SIDE YARD:	50 FT MIN, 40 FT NON-RESIDENTIAL BUILDINGS.
REAR YARD:	60FT

NOTE: THIS SITE TO BE DEVELOPED UNDER DENSITY MODIFICATION REGULATIONS PERMITTED UNDER ARTICLE XIX OF THE RADNOR TOWNSHIP ZONING CODE:

MINIMUM TRACT AREA:	20 AC
PERIMETER BUILDING SETBACK:	75 FT FROM RIGHT OF WAY 50 FT FROM ADJACENT PROPERTY
FRONT YARD:	35 FT FROM OUTSIDE EDGE OF CURB
SIDE YARD:	25 FT
REAR YARD:	30 FT

LOT DATA:

GROSS AREA - LOT 3-2	95,455 SF (2.191 AC)
GROSS AREA - LOT 3-3	53,201 SF (1.221 AC)

EXISTING IMPERVIOUS COVER:

LOT 3-2	0 SF
LOT 3-3	0 SF

LOT 3-2 IMPERVIOUS SURFACES

DWELLING:	7,231 S.F.
PORCH	62 S.F.
DETACHED GARAGE	696 S.F.
SITE DRIVEWAY	8,300 S.F.
LOT 5-1 DRIVEWAY	2,624 S.F.
CURBING	199 S.F.
MASONRY WALLS	442 S.F.
BOULDER WALLS	348 S.F.
WALKS/STEPS	349 S.F.
SIDE PATIO/WALK	626 S.F.
REAR PATIO/TERRACE	1,213 S.F.
TOTAL	22,090 S.F.

LOT 3-3 IMPERVIOUS SURFACES

DRIVEWAY	3,113 S.F.
MASONRY WALLS	12 S.F.
TOTAL	3,125 S.F.

GENERAL NOTES

1. OWNER/APPLICANT:
   CHRISTOPHER & KATHLEEN MARR
   43 HARRISON DRIVE
   NEWTOWN SQUARE, PA 19073
2. LOT BOUNDARY INFORMATION TAKEN FROM A PLAN ENTITLED "LOT LINE CHANGE PLAN, LOTS 3-2, 3-3, 3-4, 3-5 & OS-8A - THE ARDROSSAN FARM" PREPARED BY MOMENEE, INC., DATED OCTOBER 30, 2020, FILE # 19-139.
3. TOPOGRAPHIC INFORMATION TAKEN FROM A PLAN ENTITLED "EXISTING CONDITIONS/SITE PLAN - LOTS 3-2 THROUGH 3-5" PREPARED BY MOMENEE AND ASSOCIATES INC., DATED DECEMBER 12, 2019, FILE # 19-139
4. VERTICAL DATUM: APPROXIMATE USGS DATUM.
5. PUBLIC SANITARY SEWER SERVICE AND PUBLIC DOMESTIC WATER SERVICE ARE BEING PROVIDED FOR THIS LOT.
6. THE INTENT OF THIS PLAN IS TO DEPICT THE CONSTRUCTION OF A NEW SINGLE FAMILY DWELLING WITH ASSOCIATED SITE IMPROVEMENTS ON LOT 3-2 AND A SECONDARY DRIVEWAY ACCESS TO LOT 3-2 THROUGH LOT 3-3.
7. THE STORMWATER MANAGEMENT FACILITIES ARE DESIGNED FOR AN IMPERVIOUS COVER ON SITE OF UP TO 40,577 SF. THIS ACCOUNTS FOR THE PROPOSED AMOUNT OF 37,327 SF PLUS AN ADDITIONAL 3,250 SF FOR POSSIBLE FUTURE DEVELOPMENT. IF THIS IMPERVIOUS COVER IS DEVELOPED, 250 SF MAY BE DIRECTED TO PCSM SYSTEM #1N, 500 SF MAY BE DIRECTED TO PCSM SYSTEM #1S, 2,000 SF MAY BE DIRECTED TO PCSM SYSTEM #4, AND 500 SF MAY BE DIRECTED TO PCSM SYSTEM #3. A SEPARATE GRADING PERMIT SUBMISSION WILL BE REQUIRED FOR ANY FUTURE IMPERVIOUS INSTALLED AFTER THE CLOSE OF THIS PROJECT.
8. THE MAINTENANCE OF THE ON-SITE STORMWATER MANAGEMENT FACILITIES IS THE RESPONSIBILITY OF THE OWNER.

EXISTING FEATURES TO REMAIN LINETYPE LEGEND

- PROPERTY LINE
- ADJOINER PROPERTY LINE
- EASEMENT LINE
- RIGHT-OF-WAY LINE
- BUILDING SETBACK
- CONCRETE EDGE
- ASPHALT EDGE
- BUILDING
- CURB
- X — FENCE LINE
- OVERHEAD ELECTRIC
- E — ELECTRIC LINE
- G — GAS LINE
- T/C — TELECOM LINE
- W — WATER LINE
- SS — SANITARY LINE
- ST — EXISTING STORM PIPES
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- DECIDUOUS TREE

SCHOCK GROUP LLC
1958 BUTLER PIKE, SUITE 200
CONSHOHOCKEN, PA 19428
610.590.7373 | SCHOCKGROUP.COM

REGISTERED PROFESSIONAL
DAVID R. FIORELLO
ENGINEER
PE027479E

LOCATIONS OF EXISTING UTILITIES ON THIS PLAN HAVE BEEN COMPILED FROM AVAILABLE RECORDS AND/OR FIELD LOCATIONS OF UTILITY STRUCTURES, AND INFORMATION FURNISHED BY THE RESPECTIVE UTILITY COMPANIES. ALL EXISTING UTILITIES SHOULD BE CONSIDERED APPROXIMATE AND NOT NECESSARILY ALL INCLUSIVE. THE EXACT LOCATIONS AND DEPTH OF ALL STRUCTURES CANNOT BE GUARANTEED.

CONTRACTORS MUST VERIFY ALL LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES BEFORE STARTING ANY WORK.

BEFORE STARTING ANY WORK THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITY COMPANIES THROUGH THE PA ONE CALL SYSTEM AT LEAST THREE (3) BUT LESS THAN TEN (10) DAYS PRIOR TO THE START OF ANY WORK.

EXISTING CONDITIONS SITE PLAN

GRADING PERMIT PLAN

PROJECT NAME: THE MARR RESIDENCE - 75 & 73 TYLER LANE

PROJECT NAME: RADNOR TOWNSHIP • DELAWARE COUNTY • PENNSYLVANIA

REV.	DATE	DESCRIPTION

CLIENT:
CHRISTOPHER & KATHLEEN MARR
43 HARRISON DRIVE
NEWTOWN SQUARE, PA 19073

DRAWN BY:	TED
CHECKED BY:	DRF
CHECKED:	
SCALE:	1" = 30'
DATE:	AUGUST 11, 2021
REVISED:	
FILE NO.:	1144
SHEET NO.:	2 OF 10

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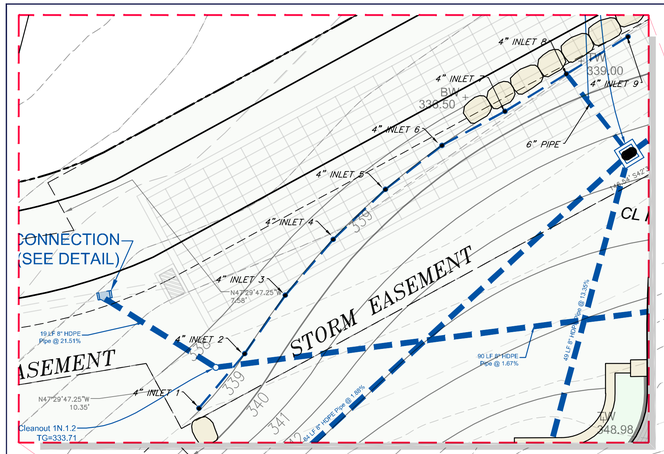
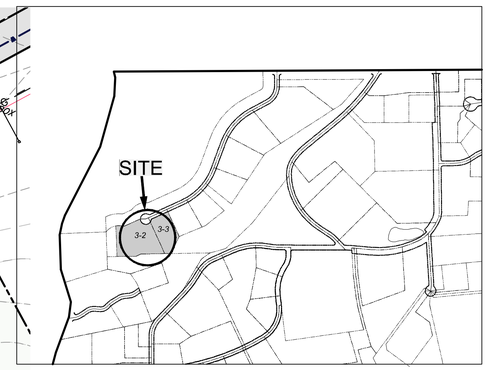
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN





LOCATION MAP
SCALE: 1" = 600'

LOT DATA:

GROSS AREA - LOT 3-2	95,455 SF (2.191 AC)
GROSS AREA - LOT 3-3	53,201 SF (1.221 AC)

EXISTING IMPERVIOUS COVER:

LOT 3-2	0 SF
LOT 3-3	0 SF

LOT 3-2 IMPERVIOUS SURFACES

DWELLING:	7,231 S.F.
PORCH	62 S.F.
DETACHED GARAGE	696 S.F.
SITE DRIVEWAY	8,300 S.F.
LOT 5-1 DRIVEWAY	2,624 S.F.
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MASONRY WALLS	442 S.F.
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WALKS/STEPS	349 S.F.
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TOTAL	22,090 S.F.

LOT 3-3 IMPERVIOUS SURFACES

DRIVEWAY	3,113 S.F.
MASONRY WALLS	12 S.F.
TOTAL	3,125 S.F.

STORMWATER MANAGEMENT FACILITY MAINTENANCE PLAN

THE STORMWATER MANAGEMENT SYSTEM ON THIS LOT CONSISTS OF FIVE SUBSURFACE DETENTION/RECHARGE BASINS. THE BASINS ARE COMPRISED OF HIGH DENSITY PLASTIC CRATE TYPE STRUCTURES WITHIN A STONE BED SURROUNDED BY FILTER FABRIC. AN INTERNAL CONTROL RISER ALLOWS CONTROLLED DISCHARGE OF FLOWS FROM THE SYSTEMS. WATER RUNOFF IS DIRECTED TO THE INFILTRATION BEDS VIA A ROOF RAINWATER COLLECTION SYSTEM, SERIES OF INLETS, AND PIPING WHICH CAPTURE AND COLLECT RUNOFF FROM THE NEW BUILDING, DRIVEWAY, PATIOS, WALKS, AND SOME OTHER AREAS ON THE PROPERTY. THE INLETS ARE PROVIDED WITH A ONE FOOT SUMP BELOW THE INLET AND OUTLET PIPES SO THAT DEBRIS CAN BE COLLECTED PRIOR TO FLOWING INTO THE SUBSURFACE INFILTRATION BEDS.

THE SYSTEMS ARE DESIGNED TO PROMOTE GROUNDWATER RECHARGE. A CONTROL STRUCTURE WITHIN THE SYSTEMS DISCHARGE TO A LEVEL SPREADER WHERE IT MAY BE DISSIPATED TO GRADE IN AN UN-CONCENTRATED MANNER. AN ACCESS MANHOLE IS PROVIDED AT THE CONTROL STRUCTURE TO FACILITATE ACCESS AND MAINTENANCE OF THE SYSTEM. THE SYSTEM IS PROVIDED WITH ACCESS PORTS TO ENABLE INSPECTION AND FLUSHING OF THE SYSTEMS.

THE RESPONSIBILITY FOR THE CONTINUED OPERATION AND MAINTENANCE OF THE STORMWATER MANAGEMENT FACILITIES ON THIS LOT IS THAT OF THE PROPERTY OWNER.

MAINTENANCE OF THE FACILITIES SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

1. THE OWNER, OCCUPANT, TENANT OR OTHER USER OF THE PROPERTY SHALL NOT IMPEDE THE FLOW OF WATER DRAINING TO THE STORMWATER MANAGEMENT BASIN.

2. ALL ROOF DOWNSPOUTS, INLETS, CURB OPENINGS AND OTHER WATER WAYS SHALL BE KEPT OPEN AND OPERATION TO PASS THE FLOW OF WATER TO THE BASIN AS INTENDED.

3. GRASS AND LANDSCAPING IN THE VICINITY OF ALL INLETS SHALL BE KEPT TRIM AND FREE FROM DEBRIS ACCUMULATION, AND DOWNSPOUTS AND INLETS SHALL BE KEPT FREE OF OBSTRUCTIONS THAT COULD BLOCK THE FREE FLOW OF WATER TO AND WITHIN THEM.

4. INLET SUMPS SHALL BE CLEANED OF ACCUMULATED DEBRIS BEFORE ANY DEBRIS CAN BE DISCHARGED INTO THE SYSTEMS. INLET STRUCTURES SHALL BE INSPECTED AT LEAST MONTHLY TO INSURE THAT THEY ARE CLEAN AND REMAIN OPERATIONAL.

5. SUBSURFACE PIPES SHALL BE INSPECTED ON AN ANNUAL BASIS TO INSURE THAT THEY ARE CLEAN AND OPERATIONAL. ANY ACCUMULATED DEBRIS AND SILT SHALL BE REMOVED IN A TIMELY MANER. THE SUBSURFACE PIPES SHALL BE KEPT FREE OF OBSTRUCTIONS THAT COULD BLOCK THE FREE FLOW OF WATER WITHIN THEM

6. PROMPT REMEDIAL MEASURES ARE TO BE TAKEN IN THE EVENT OF ANY BLOCKAGE OR MALFUNCTION OF THE SYSTEM.

THE OWNER, OCCUPANT, TENANT OR OTHER USER OF THE PROPERTY SHALL NOT TAKE ANY MEASURES TO DISRUPT OR IN ANY WAY IMPAIR THE EFFECTIVENESS OF THE BASIN OR ITS CONTROLS. THIS INCLUDES ALTERATION OF GRADES IN ANY MANNER THAT WOULD DIVERT RUNOFF AWAY FROM INLET COLLECTION POINTS.

INFILTRATION BMP NOTES:

1) INFILTRATION BMP FILTER FABRIC AND STONE SHOULD BE KEPT CLEAN OF SOIL/SEDIMENT DURING THE INSTALLATION PROCESS. IF INSPECTION INDICATES THAT SOIL SEDIMENT HAS ENTERED ANY OF THE INFILTRATION SEEPAGE BEDS, APPROPRIATE MEASURES (i.e. CLEANING THE SOIL/SEDIMENT FROM FABRIC, STONE, BED ETC., AND OR REPLACEMENT OF THE FABRIC AND STONE) SHOULD BE ADDRESSED.

2) ALL STONE FOR THE CONSTRUCTION OF THE INFILTRATION BMP SHOULD BE UNIFORMLY GRADED AND CLEAN WASHED AGGREGATE.

3) THE BOTTOM OF ALL INFILTRATION BMPs SHALL BE UNDISTURBED OR UNCOMPACTED SUBGRADE.

4) INFLOW AND OUTFLOW POINTS INTO THE INDIVIDUAL ON-LOT SYSTEM SHOULD BE KEPT CLEAR OF LEAVES AND OTHER DEBRIS. ANY LEAVES AND DEBRIS WILL NEGATIVELY IMPACT THE PERFORMANCE OF THE SYSTEM. ALL DOWNSPOUTS AND OVERFLOW PIPES SHOULD BE KEPT IN GOOD WORKING ORDER.

5) AFTER THE INFILTRATION BED IS COMPLETELY INSTALLED, ALL HEAVY CONSTRUCTION EQUIPMENT SHALL BE RESTRICTED FROM THE INFILTRATION BEDS TO ELIMINATE IMPACTS WHICH MAY COMPROMISE IT IN THE EVENT ANY IMPACTS COMPROMISE THE FUNCTIONALITY OF THE INFILTRATION BEDS, IT MUST BE IMMEDIATELY REPAIRED OR REPLACED TO DESIGN SPECIFICATIONS.

I, _____, ACKNOWLEDGE THAT ANY REVISION TO THE APPROVED DRAINAGE PLAN MUST BE APPROVED BY THE MUNICIPALITY.

I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE THE EXISTING CONDITIONS ARE AS SHOWN AND THAT THIS DRAINAGE PLAN COMPLIES WITH ALL THE DESIGN STANDARDS AND CRITERIA OF THE RADNOR TOWNSHIP STORMWATER MANAGEMENT ORDINANCE.

DAVID R. FIORELLO, P.E. — 08-17-21 DATE

LINETYPE LEGEND

- PROPERTY LINE
- EASEMENT LINE
- RIGHT-OF-WAY LINE
- BUILDING SETBACK
- CONCRETE EDGE
- PROPOSED DRIVEWAY EDGE
- BUILDING
- PROPOSED CURB
- PROPOSED CONCRETE
- EXISTING ROAD TO REMAIN
- SOILS LINE
- FENCE LINE
- OVERHEAD ELECTRIC
- ELECTRIC LINE
- GAS LINE
- TELECOM LINE
- WATER LINE
- SANITARY LINE
- EXISTING STORM PIPES
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- PROPOSED GRADE LINES
- BUILDING
- CONCRETE SIDEWALK
- WALLS
- ASPHALT
- LANDSCAPE

SYMBOL LEGEND

- TG TOP OF GRATE ELEV.
- INV. INVERT ELEVATION
- TW TOP OF WALL ELEV.
- BW BOTTOM OF WALL ELEV.
- TBC TOP BACK OF CURB ELEV.
- BC BOTTOM BACK OF CURB ELEV.
- CONCRETE MONUMENT
- SANITARY MANHOLE
- WATER VALVE
- BOLLARD
- CLEANOUT
- STORM MANHOLE
- ELECTRIC BOX
- FIRE HYDRANT
- FIRE VALVE
- GAS VALVE
- DECIDUOUS TREE
- STORM INLET
- TELEPHONE BOX
- GAS METER
- ELECTRIC MANHOLE
- POSTED SIGN
- LIGHT POLE

CALL BEFORE YOU DIG!
PENNSYLVANIA LAW REQUIRES 3 WORKING DAYS NOTICE FOR CONSTRUCTION PHASE AND 10 WORKING DAYS IN DESIGN STAGE
STOP AND CALL
PENNSYLVANIA ONE CALL SYSTEM, INC.
1-800-242-1776

SCALE: 1" = 20'
20 0 20 40 80

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1958 BUTLER PIKE, SUITE 200
CONSHOHOCKEN, PA 19428
610.560.7373 | SCHOCKGROUP.COM

REGISTERED PROFESSIONAL
DAVID R. FIORELLO
ENGINEER
PE027479E

LOCATIONS OF EXISTING UTILITIES ON THIS PLAN HAVE BEEN DETERMINED FROM AVAILABLE RECORDS AND FIELD LOCATIONS OF UTILITY STRUCTURES AND INFORMATION FURNISHED BY THE APPROPRIATE AUTHORITIES. THE CONTRACTOR SHALL CONFIRM THE LOCATIONS AND DEPTH OF ALL STRUCTURES CANNOT BE GUARANTEED.

CONTRACTORS MUST VERIFY ALL LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES BEFORE STARTING ANY WORK.

BEFORE STARTING ANY WORK THE CONTRACTOR SHALL NOTIFY ALL PARTICIPATING UTILITY COMPANIES THROUGH THE PA ONE CALL SYSTEM AND NOTIFY EACH COMPANY 72 HRS. BEFORE THE START OF ANY WORK.

REV. | DATE | DESCRIPTION

PROJECT STAGE: POST CONSTRUCTION STORMWATER PLAN
PROJECT NAME: GRADING PERMIT PLAN

THE MARR RESIDENCE - 75 & 73 TYLER LANE

RADNOR TOWNSHIP • DELAWARE COUNTY • PENNSYLVANIA

CLIENT
CHRISTOPHER & KATHLEEN MARR
43 HARRISON DRIVE
NEWTOWN SQUARE, PA 19073

DRAWN BY:	TED
CHECKED BY:	DRF
CHECK HALL:	
SCALE:	1" = 20'
DATE:	AUGUST 11, 2021
REVISED:	
FILE NO.:	1144
SHEET NO.:	3 OF 10

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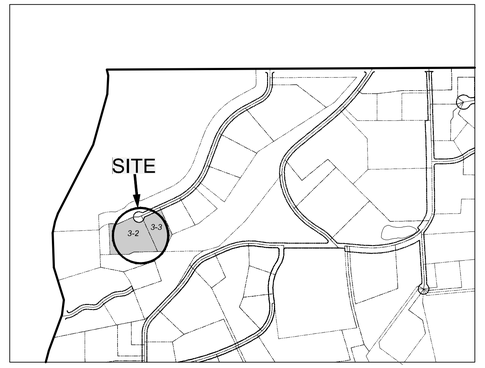
GRADING & UTILITIES PLAN



LOCATION MAP
SCALE: 1" = 600'

SOILS INFORMATION

NAME	% SLOPE	DEPTH TO S.H. WATER	DEPTH TO BEDROCK	ERODIBILITY	HYDRO SOIL GROUP	LIMITATIONS
GeB2 Glenelg Channery Silt Loam	3-8	6.6+	6.6+	Moderate	B	Moderate
GeC2 Glenelg Channery Silt Loam	8-15	6.6+	6.6+	Moderate	B	Moderate
GeD2 Glenelg Channery Silt Loam	25-35	6.6+	6.6+	Moderate	B	Moderate

NOTES: IF THE PROPOSED EROSION AND SEDIMENTATION CONTROL MEASURES ARE INSTALLED AND MAINTAINED PROPERLY, NO UNFORESEEN SOIL LIMITATIONS OR PROBLEMS ARE LIKELY. NEVERTHELESS, IF A PROBLEM DOES DEVELOP, THE DEVELOPER MUST TEMPORARILY SEED AND MULCH THE DISTURBED AREA. SUITABLE TOPSOIL SHALL BE IMPORTED TO SITE IF INADEQUATE QUANTITIES OF SUITABLE TOPSOIL EXIST ON SITE. ADEQUACY OF SOIL TO BE DETERMINED BY SITE GEOTECHNICAL ENGINEER IN CONJUNCTION WITH THE LANDSCAPE ARCHITECT. SOIL AMENDMENTS SHALL BE ADDED AS REQUIRED. ALL UNSUITABLE MATERIAL SHALL BE DISPOSED OF PROPERLY. SITE GEOTECHNICAL ENGINEER SHALL ALSO BE CONSULTED DURING WINTER GRADING OPERATIONS.

LINETYPE LEGEND

- PROPERTY LINE
- EASEMENT LINE
- RIGHT-OF-WAY LINE
- BUILDING SETBACK
- CONCRETE EDGE
- PROPOSED DRIVEWAY EDGE
- BUILDING
- PROPOSED CURB
- PROPOSED CONCRETE
- EXISTING ROAD TO REMAIN
- SOILS LINE
- FENCE LINE
- OVERHEAD ELECTRIC
- ELECTRIC LINE
- GAS LINE
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- WATER LINE
- SANITARY LINE
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- IRON PIN
- CONCRETE MONUMENT
- SANITARY MANHOLE
- WATER VALVE
- BOLLARD
- CLEANOUT
- STORM MANHOLE
- AC UNIT
- ELECTRIC BOX
- FIRE HYDRANT
- FIRE VALVE
- GAS VALVE
- DECIDUOUS TREE
- STORM INLET
- TELEPHONE BOX
- GAS METER
- ELECTRIC MANHOLE
- POSTED SIGN
- PARKING SPACE COUNT
- HANDICAP PARKING SPACE
- LIGHT POLE

ZONING DISTRICT AC RESIDENTIAL DISTRICT

AREA:	2 AC
LOT WIDTH:	80' AT BSBL
BUILDING AREA:	15% MAX
FRONT YARD:	60 FT
SIDE YARD:	50 FT MIN, 40 FT NON-RESIDENTIAL BUILDINGS.
REAR YARD:	60FT

NOTE: THIS SITE TO BE DEVELOPED UNDER DENSITY MODIFICATION REGULATIONS PERMITTED UNDER ARTICLE XIX OF THE RADNOR TOWNSHIP ZONING CODE:

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GROSS AREA - LOT 3-3	53,201 SF (1.221 AC)

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LOT 3-2	0 SF
LOT 3-3	0 SF

LOT 3-2 IMPERVIOUS SURFACES

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PORCH	62 S.F.
DETACHED GARAGE	696 S.F.
SITE DRIVEWAY	8,300 S.F.
LOT 5-1 DRIVEWAY	2,624 S.F.
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BOULDER WALLS	348 S.F.
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TOTAL	22,090 S.F.

LOT 3-3 IMPERVIOUS SURFACES

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MASONRY WALLS	12 S.F
TOTAL	3,125 S.F.

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REGISTERED PROFESSIONAL
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PE027479E

LOCATIONS OF EXISTING UTILITIES ON THIS PLAN HAVE BEEN ACCUMULATED FROM AVAILABLE RECORDS AND FIELD SURVEY. ALL UTILITY STRUCTURES AND INFORMATION FURNISHED BY THE APPROPRIATE COMPANIES. THE CONTRACTOR SHALL CONFIRM THE LOCATIONS AND DEPTH OF ALL STRUCTURES CANNOT BE GUARANTEED.

CONTRACTORS MUST VERIFY ALL LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES BEFORE STARTING ANY WORK.

BEFORE STARTING ANY WORK THE CONTRACTOR SHALL NOTIFY ALL PARTICIPATING UTILITY COMPANIES THROUGH THE PA ONE CALL SYSTEM (1-800-242-1776) AT LEAST THREE DAYS PRIOR TO THE START OF ANY WORK.

GRADING AND UTILITIES PLAN

GRADING PERMIT PLAN

PROJECT STAGE:

PROJECT NAME:

THE MARR RESIDENCE - 75 & 73 TYLER LANE

RADNOR TOWNSHIP * DELAWARE COUNTY * PENNSYLVANIA

REV.	DATE	DESCRIPTION

CLIENT
CHRISTOPHER & KATHLEEN MARR
43 HARRISON DRIVE
NEWTOWN SQUARE, PA 19073

DRAWN BY:	TED
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DATE:	AUGUST 11, 2021
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FILE NO.:	1144
SHEET NO.:	4 OF 10

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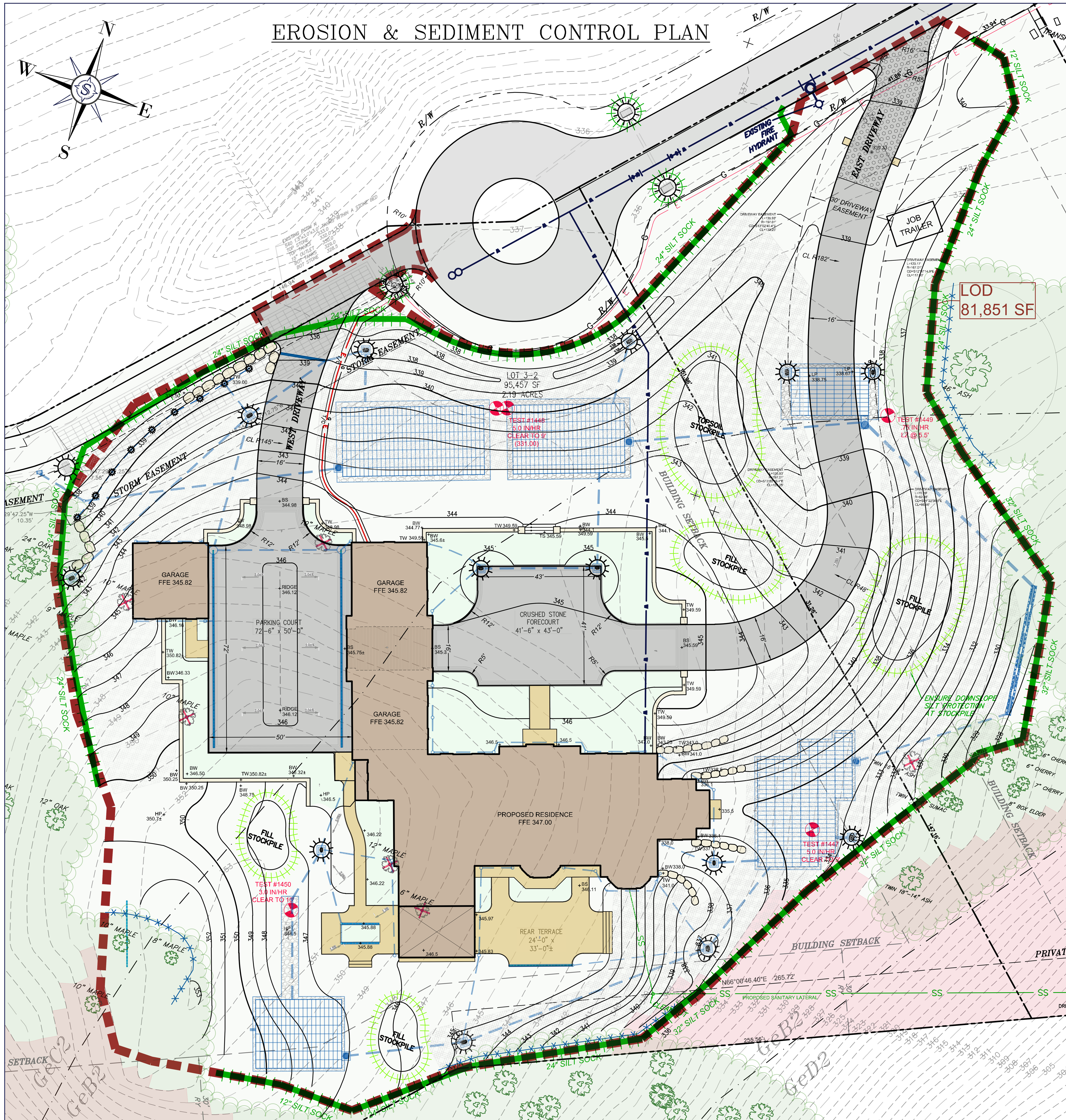
EROSION & SEDIMENT CONTROL PLAN



EROSION AND SEDIMENTATION CONTROL PLAN

DISTURBED AREA 82,000 SF± (1.88 AC)

SCALE: 1" = 20'

SOILS INFORMATION

NAME	% SLOPE	DEPTH TO S. H. WATER	DEPTH TO BEDROCK	ERODIBILITY	HYDRO SOIL GROUP	LIMITATIONS
GeB2 Glenelg Channery Silt Loam	3-8	6.6+	6.6+	Moderate	B	Moderate
GeC2 Glenelg Channery Silt Loam	8-15	6.6+	6.6+	Moderate	B	Moderate
GeD2 Glenelg Channery Silt Loam	25-35	6.6+	6.6+	Moderate	B	Moderate

PROPOSED LINETYPE LEGEND

- 378 PROPOSED CONTOUR LINE
- FLAGSTONE EDGE
- WALL
- BUILDING OR ROOF
- DRIVEWAY
- DRIVEWAY PATTERNING
- CONCRETE EDGE (WALKS, WALLS)
- STORMWATER PIPE
- COMPOST FILTER SOCK
- TREE PROTECTION FENCING
- LIMIT OF DISTURBANCE
- EROSION CONTROL BLANKET
- CONSTRUCTION ENTRANCE
- INLET PROTECTION

NOTES:

1) NEWLY GRADED SLOPES TWENTY FIVE PERCENT (25% OR GREATER) SHALL BE SODDED OR STABILIZED WITH EROSION CONTROL NETTING.

2) GEOTEXTILE FABRIC SHALL BE CLASS 1. GEOTEXTILE FABRIC IN ACCORDANCE WITH PENNDOT SPECIFICATION FROM 408. THE TYPE AND/OR THICKNESS SHALL BE DUPONT TYPAR #3401, AMOCO PROPEX #4545 OR APPROVED EQUAL OR AS OTHERWISE INDICATED ON THE PLAN.

3) TO ALL AREA WHICH REMAIN DISTURBED FOR MORE THAN 4 DAYS AND WILL BE SUBJECT TO THE ACTION OF EARTHMOVING AND OTHER EQUIPMENT, APPLY A MULCH (WOODCHIP–20 TONS PER ACRE; HAY OR STRAW–3 TONS PER ACRE). ALL OTHER DISTURBED AREAS REMAINING OPEN FOR MORE THAN 4 DAYS SHALL BE TEMPORARILY SEEDED AND MULCHED.

4) SHOULD UNFORESEEN EROSIVE CONDITIONS DEVELOP DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE ACTION TO REMEDY SUCH CONDITIONS AND TO PREVENT DAMAGE TO ADJACENT PROPERTIES AS A RESULT OF INCREASED RUNOFF/AND OR SEDIMENT DISPLACEMENT. STOCKPILES OF WOODCHIPS, HAY BALES, CRUSHED STONE AND OTHER MULCHES SHALL BE HELD IN READINESS TO DEAL IMMEDIATELY WITH EMERGENCY PROBLEMS OF EROSION.

5) THE CONTRACTOR SHALL, BY SCHEDULING THE CONSTRUCTION, UTILIZE NEW PLANTINGS AND PROPERLY INSTALL EROSION CONTROL FENCING, HAY BALES AND OTHER EROSION CONTROL MEASURES TO MINIMIZE EROSION DAMAGE.

6) ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED AND WHICH WILL REMAIN EXPOSED FOR MORE THAN 4 DAYS MUST BE SEEDED AND MULCHED IMMEDIATELY. DURING NON–GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE RECOMMENDED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURED WITHIN ONE YEAR MAY BE SEEDED AND MULCHED WITH A QUICK GROWING TEMPORARY SEEDING MIXTURE AND MULCH. DISTURBED AREAS WHICH ARE EITHER AT FINISHED GRADE OR WILL NOT BE REDISTURED WITHIN ONE YEAR MUST BE SEEDED AND MULCHED WITH A PERMANENT SEED MIXTURE AND MULCH. DIVERSIONS, CHANNELS, SEDIMENTATION BASINS, SEDIMENT TRAPS, AND STOCKPILES MUST BE SEEDED AND MULCHED IMMEDIATELY.

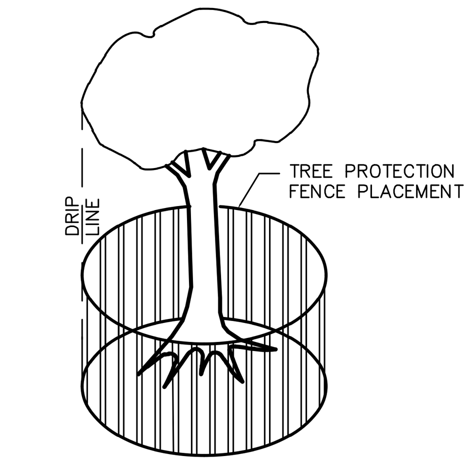
7) A ROUTINE "END–OF–DAY–CHECK" SHALL BE MADE DURING CONSTRUCTION TO MAKE SURE THAT ALL CONTROL MEASURES ARE WORKING PROPERLY. ALL PERSONS ENGAGED IN LAND DISTURBANCE ACTIVITIES SHALL DESIGN, IMPLEMENT, AND MAINTAIN CONTROL MEASURES WHICH PREVENT ACCELERATED EROSION AND SEDIMENTATION. THERE SHALL BE NO ADVERSE DISCHARGE OF THE SEDIMENT OR OTHER SOLID MATERIALS FROM THE SITE AS THE RESULT OF STORMWATER RUNOFF.

8) TEMPORARY EROSION CONTROL MEASURES MAY BE REMOVED ONLY AFTER THE CONSTRUCTION AREA AND CONTAINED SILT IS STABILIZED AND THE LAWN AREA ESTABLISHED.

9) IF THE PROPOSED EROSION AND SEDIMENTATION CONTROL MEASURES ARE INSTALLED AND MAINTAINED PROPERLY, NO UNFORESEEN SOIL LIMITATIONS OR PROBLEMS ARE LIKELY. NEVERTHELESS, IF A PROBLEM DOES DEVELOP, THE DEVELOPER MUST TEMPORARILY SEED AND MULCH THE DISTURBED AREA. SUITABLE TOPSOIL SHALL BE IMPORTED TO SITE IF INADEQUATE QUANTITIES OF SUITABLE TOPSOIL EXIST ON SITE. ADEQUACY OF SOIL TO BE DETERMINED BY SITE GEOTECHNICAL ENGINEER IN CONJUNCTION WITH THE LANDSCAPE ARCHITECT. SOIL AMENDMENTS SHALL BE ADDED AS REQUIRED. ALL UNSUITABLE MATERIAL SHALL BE DISPOSED OF PROPERLY. SITE GEOTECHNICAL ENGINEER SHALL ALSO BE CONSULTED DURING WINTER GRADING OPERATIONS.

CARE OF EXISTING TREES:

1. TREE PROTECTION FENCING SHALL BE INSTALLED TO PROTECT ALL EXISTING TREES FROM DAMAGE DUE TO LANDSCAPE OPERATIONS, OPERATIONS BY OTHER CONTRACTORS AND TRADES, AND OTHERS. MAINTAIN PROTECTION FENCING FOR THE DURATION OF PROJECT.
2. SELECTIVELY PRUNE EXISTING TREES AT THE EDGE OF ALL TREE PROTECTION ZONES, AND OTHER EXISTING TREES AFFECTED BY CONSTRUCTION, UNDER LANDSCAPE ARCHITECT'S DIRECTION. REMOVE SUCKER SHOOTS, DEAD, RUBBING AND DAMAGED BRANCHES.
3. ANY EXCAVATION NEAR ADJACENT ROOT SYSTEMS WILL REQUIRE ROOT PRUNING OF AFFECTED TREE(S).
4. FERTILIZE PRUNED EXISTING TREES WITH 3 TO 4 LBS. OF LIQUID FERTILIZER PER 1,000 SQUARE FEET OF DRIP AREA, OR, 5 GALLONS OF LIQUID FERTILIZER PER CALIPER INCH OF TRUNK DIAMETER.
5. FERTILIZE IN EARLY SPRING BEFORE GROWTH BEGINS.
6. FERTILIZE BEGINNING 2' FROM TRUNK AT INTERVALS 2' TO 3' ON CENTER IN A GRID–LIKE PATTERN TO A DEPTH OF 6–18" WITHIN THE DRIPLINE AND BEYOND WHERE POSSIBLE. INJECTION FERTILIZATION METHOD SHALL BE ACCEPTABLE SUBJECT TO LANDSCAPE ARCHITECT'S APPROVAL.



TREE PROTECTION FENCE PLACEMENT

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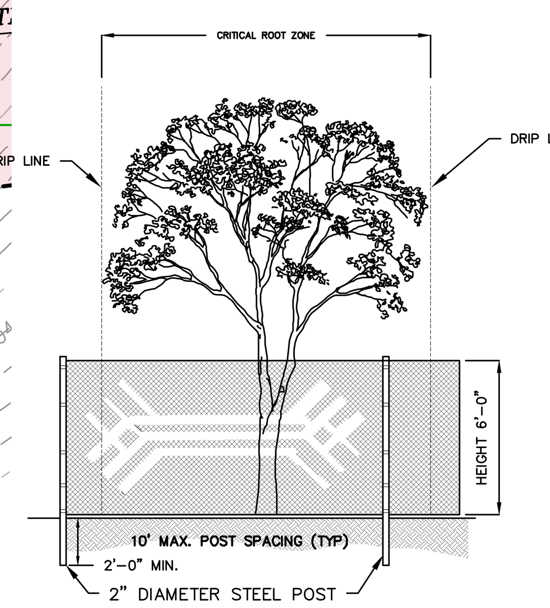
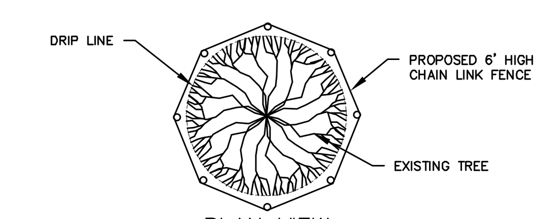
ALL WOODY VEGETATION TO BE RETAINED WITHIN 25 FEET OF A BUILDING SITE, PARKING AREA, DRIVEWAY OR OTHER PROPOSED IMPROVEMENT SHALL BE PROTECTED FROM EQUIPMENT DAMAGE BY FENCING OR OTHER EFFECTIVE BARRIERS APPROVED BY THE TOWNSHIP ENGINEER AND/OR ARBORIST. FENCING OR BARRIERS SHALL BE PLACED AS MUCH AS IS PRACTICAL AT THE DRIPLINE. LOCATION MAY BE ALTERED TO AVOID INTERFERENCE WITH PROPOSED GRADING AND IMPROVEMENTS AS SHOWN ON THE PLANS. BARRIER LOCATION SHALL BE SUBJECT TO APPROVAL BY THE TOWNSHIP ENGINEER AND/OR ARBORIST.





PLAN VIEW

NTS

TREE PROTECTION SPECIFICATIONS

I. A 4" LAYER OF COARSE MULCH OR WOODCHIPS IS TO BE PLACED BENEATH THE DRIPLINE OF THE PROTECTED TREES. MULCH IS TO BE KEPT 12" FROM THE TRUNK.

II. A PROTECTIVE BARRIER OF 6' CHAIN LINK FENCING SHALL BE INSTALLED AROUND THE DRIPLINE OF PROTECTED TREE(S). THE FENCING CAN BE MOVED WITHIN THE DRIPLINE IF AUTHORIZED BY THE CONSULTING ARBORIST BUT NOT CLOSER THAN 2' INTO THE GROUND. FENCE POSTS SHALL BE 2.0" IN DIAMETER AND ARE TO BE DRIVEN 2' INTO THE GROUND. THE DISTANCE BETWEEN POSTS SHALL NOT BE MORE THAN 10'. THIS ENCLOSED AREA IS THE TREE PROTECTION ZONE (TPZ).

III. MOVABLE BARRIERS OF CHAIN LINK FENCING SECURED TO CEMENT BLOCKS CAN BE SUBSTITUTED FOR "FIXED" FENCING IF THE CONSULTING ARBORIST AGREE THAT THE FENCING WILL HAVE TO BE MOVED TO ACCOMMODATE CERTAIN PHASES OF CONSTRUCTION. THE BUILDER MAY NOT MOVE THE FENCE WITHOUT AUTHORIZATION FROM THE CONSULTING ARBORIST.

IV. WHERE THE CONSULTING ARBORIST HAS DETERMINED THAT TREE PROTECTION FENCING WILL INTERFERE WITH THE SAFETY OF WORK CREWS, TREE WRAP MAY BE USED AS AN ALTERNATIVE FORM OF TREE PROTECTION. WOODEN SLATS AT LEAST ONE INCH THICK ARE TO BE BOUND SECURELY, EDGE TO EDGE, AROUND THE TRUNK. A SINGLE LAYER OR MORE OF ORANGE PLASTIC CONSTRUCTION FENCING IS TO BE WRAPPED AND SECURED AROUND THE OUTSIDE OF THE WOODEN SLATS. MAJOR SCAFFOLD LIMBS MAY REQUIRE PROTECTION AS DETERMINED BY THE CONSULTING ARBORIST. STRAW WADDLE MAY ALSO BE USED AS A TRUNK WRAP BY COILING THE WADDLE AROUND THE TRUNK UP TO A MINIMUM HEIGHT OF SIX FEET FROM GRADE. A SINGLE LAYER OR MORE OF ORANGE PLASTIC CONSTRUCTION FENCING IS TO BE WRAPPED AND SECURED AROUND THE STRAW WADDLE.

DO NOT:

A. ALLOW RUNOFF OF SPILLAGE DAMAGING MATERIALS INTO THE AREA BELOW ANY TREE CANOPY.
B. STORE MATERIALS, STOCKPILE SOIL, OR PARK OR DRIVE VEHICLES WITHIN THE TREE PROTECTION ZONE.
C. CUT, BREAK SKIN, OR BRUISE ROOTS, BRANCHES, OR TRUNKS WITHOUT FIRST OBTAINING AUTHORIZATION FROM THE CONSULTING ARBORIST.
D. ALLOW FIRES UNDER AND ADJACENT TO TREES.
E. DISCHARGE EXHAUST INTO FOLIAGE.
F. SECURE CABLE, CHAIN, OR ROPE TO TREES OR SHRUBS.
G. TRENCH, DIG, OR OTHERWISE EXCAVATE WITHIN THE DRIPLINE OR PROTECTION ZONE OF THE TREE(S) WITHOUT FIRST OBTAINING AUTHORIZATION FROM THE CONSULTING ARBORIST.
H. APPLY SOIL STERILANTS UNDER PAVEMENT NEAR EXISTING TREES.

TREE PROTECTION DETAIL

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CONSTRUCTION SEQUENCING:

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.

AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING THE CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PCSM PLAN, AND A REPRESENTATIVE FROM THE COUNTY CONSERVATION DISTRICT FOR AN ON–SITE PRE–CONSTRUCTION MEETING.

CONSTRUCTION BEGINS. ANTICIPATED DATE: OCTOBER 2021

1. INSTALL SILT SOCKS, TREE PROTECTION BARRIER FENCING, SEDIMENT FILTERS AND INLET PROTECTION AS INDICATED ON PLAN. SILT FENCING SHALL BE INSTALLED UP–SLOPE OF CONSTRUCTION FENCING. NOTE: ADDITIONAL SEDIMENT BARRIERS SHALL BE INSTALLED DOWNGRADE OF ANY DISTURBANCE AREAS AS NEEDED THROUGHOUT THE ENTIRE PROJECT.
2. INSTALL STABILIZED CONSTRUCTION ENTRANCE AS SHOWN ON THE PLANS ON THE EAST DRIVEWAY. THIS ENTRANCE MUST BE UTILIZED BY ALL CONSTRUCTION VEHICLES ENTERING/EXITING THE SITE.
3. PRIOR TO EARTH DISTURBANCE, NOTIFY THE TOWNSHIP ENGINEER THAT CONSTRUCTION IS GOING TO BEGIN.
4. ONCE THE EROSION AND SEDIMENT CONTROLS ARE IN PLACE AND FUNCTIONING, STRIP TOPSOIL AND STOCKPILE SUITABLE MATERIAL. UNSUITABLE MATERIAL SHALL BE DISPOSED OF PROPERLY. SURROUND STOCKPILE WITH SILT FENCE. TEMPORARILY SEED ALL STOCKPILED TOPSOIL TO ESTABLISH TEMPORARY VEGETATIVE COVER.
5. ROUGH GRADE THE SITE. PERFORM ANY ROCK REMOVAL PROCEDURES AS NEEDED. INSTALL ANY PIPING THAT IS TO BE UNDER SIGNIFICANT FILL AREAS TO REDUCE TRENCH DEPTHS, SUCH AS THE OUTLET PIPE FROM BASIN 1N.
6. INSTALL BASE COURSE FOR NEW DRIVEWAY AREAS AS FEASIBLE. INSTALL SITE UTILITIES AS NECESSARY.
7. UTILIZE THE EAST DRIVEWAY FOR CONSTRUCTION ACCESS TO MINIMIZE TRAFFIC OVER THE CUL–DE–SAC BULB AT THE END OF TYLER LANE. INSTALL CONSTRUCTION ENTRANCE ALONG EAST DRIVEWAY ENSURING THAT THE SWALE FOR TYLER LANE IS ABLE TO FLOW PAST WITHOUT BACKING UP INTO THE ROADWAY.
8. EXCAVATE AREA FOR NEW BUILDING, STOCKPILE EXCAVATED MATERIAL AND SURROUND WITH SILT FENCE.
9. POUR FOOTINGS AND CONSTRUCT FOUNDATIONS FOR NEW BUILDINGS. BACKFILL FOUNDATIONS UPON COMPLETION AND ROUGH GRADE AREA AROUND BUILDING. ANY GRADED OR DISTURBED AREA MUST BE TEMPORARILY SEEDED IF NO FURTHER EARTH MOVING IS ANTICIPATED IMMEDIATELY.
10. **CRITICAL STAGE –** INSTALL BASIN 4 PRIOR TO INSTALLATION OF RETAINING WALLS OR PATIOS THAT WOULD LIMIT EQUIPMENT ACCESS TO THAT AREA. ONCE BASIN 4 IS INSTALLED SURROUND STORMTANK/R–TANK AREA WITH CONSTRUCTION FENCING TO PREVENT SOIL STOCKPILES AND HEAVY EQUIPMENT FROM SITTING ON NEWLY INSTALLED STORMTANK/R–TANK.
    - 10.1. THE TOWNSHIP ENGINEER SHALL BE NOTIFIED 48 HOURS PRIOR TO THE INSTALLATION OF THE SYSTEMS. THE INFILTRATION SYSTEM SHALL NOT RECEIVE RUNOFF UNTIL THE ENTIRE AREA CONTRIBUTORY TO THE INFILTRATION BMP HAS ACHIEVED FINAL STABILIZATION.
    - 10.2. EXCAVATE TO THE BOTTOM OF THE PERMANENT SYSTEM AS INDICATED ON THE PLANS. INSTALL GEOTEXTILE FABRIC, SYSTEM BEDDING AND TANK SYSTEM AS INDICATED ON THE PLANS. INSTALLATION OF THE STONE SHALL BE CHECKED BY THE DESIGN OR SITE ENGINEER PRIOR TO INSTALLATION INTO THE INFILTRATION BMPS TO ENSURE THAT IT IS CLEAN WASHED STONE. IN THE EVENT THAT SEDIMENT ENTERS OR CLOGS THE INFILTRATION BMP APPROPRIATE MEASURES SHALL BE TAKEN (I.E. CLEANING THE SOIL/SEDIMENT FROM THE FABRIC, STONE, BED, ETC. AND OR REPLACEMENT OF THE FABRIC AND STONE). IF GROUNDWATER OR BEDROCK IS FOUND DURING THE EXCAVATION OF THE TANK SYSTEM, THE ENGINEER SHALL BE CONSULTED TO DETERMINE THE NECESSARY MEASURES THAT SHOULD BE TAKEN. THE BOTTOM OF ALL INFILTRATION BMPS SHALL BE UNDISTURBED OR UNCOMPACTED SUBGRADE. CONNECT SYSTEMS TO THE PROPOSED LEVEL SPREADERS. CONNECT THE INLETS TO SYSTEMS AS SHOWN ON THE PLANS.
11. CONCURRENT WITH THE BUILDING CONSTRUCTION, CONSTRUCT RETAINING WALLS, PATIO, COURTYARD, AND OTHER SITE FEATURES.
12. FINAL GRADE THE SITE AND INSTALL REMAINDER OF UTILITIES. INSTALL THE ROOF RAINWATER COLLECTION SYSTEM, INLETS, AND THE ASSOCIATED CONVEYANCE PIPING. INSTALL INLET PROTECTION ON ALL NEW INLETS. ALL INLETS AND STORM PIPING MUST BE BLOCKED FROM RECEIVING ANY WATERS UNTIL SITE IS STABILIZED. SEDIMENT FILTER BAGS SHALL BE UTILIZED AND ANY PIPES LEADING FROM AN INLET TO A BMP BASIN MUST BE COVERED WITH PLYWOOD TO PREVENT FLOW INTO THE BMP SYSTEMS UNTIL SITE STABILIZATION.
13. CONTINUE WITH BUILDING CONSTRUCTION.
14. INSPECT SEDIMENT BARRIERS FREQUENTLY, ESPECIALLY AFTER HEAVY STORMS. REPLACE AND REPAIR SEDIMENT BARRIERS AS NECESSARY.
15. **CRITICAL STAGE –** EXCAVATE FOR AND INSTALL THE PERMANENT STORM WATER SYSTEMS #1N, 1S, 2, 3 4 (IF NOT INSTALLED EARLIER), AND THE LEVEL SPREADER.
    - 15.1. THE TOWNSHIP ENGINEER SHALL BE NOTIFIED 48 HOURS PRIOR TO THE INSTALLATION OF THE SYSTEMS. THE INFILTRATION SYSTEM SHALL NOT RECEIVE RUNOFF UNTIL THE ENTIRE AREA CONTRIBUTORY TO THE INFILTRATION BMP HAS ACHIEVED FINAL STABILIZATION.
    - 15.2. EXCAVATE TO THE BOTTOM OF THE PERMANENT SYSTEM AS INDICATED ON THE PLANS. INSTALL GEOTEXTILE FABRIC, SYSTEM BEDDING AND TANK SYSTEM AS INDICATED ON THE PLANS. INSTALLATION OF THE STONE SHALL BE CHECKED BY THE DESIGN OR SITE ENGINEER PRIOR TO INSTALLATION INTO THE INFILTRATION BMPS TO ENSURE THAT IT IS CLEAN WASHED STONE. IN THE EVENT THAT SEDIMENT ENTERS OR CLOGS THE INFILTRATION BMP APPROPRIATE MEASURES SHALL BE TAKEN (I.E. CLEANING THE SOIL/SEDIMENT FROM THE FABRIC, STONE, BED, ETC. AND OR REPLACEMENT OF THE FABRIC AND STONE). IF GROUNDWATER OR BEDROCK IS FOUND DURING THE EXCAVATION OF THE TANK SYSTEM, THE ENGINEER SHALL BE CONSULTED TO DETERMINE THE NECESSARY MEASURES THAT SHOULD BE TAKEN. THE BOTTOM OF ALL INFILTRATION BMPS SHALL BE UNDISTURBED OR UNCOMPACTED SUBGRADE. CONNECT SYSTEMS TO THE PROPOSED LEVEL SPREADERS. CONNECT THE INLETS TO SYSTEMS AS SHOWN ON THE PLANS.
    - 15.3. ALL BED BOTTOMS SHALL BE LEVEL AFTER GRADING.
    - 15.4. PRIOR TO INFILTRATION BED GRADING AND PLACEMENT OF GEOTEXTILE, UP–GRADIENT AREAS SHALL BE SUFFICIENTLY STABILIZED TO PREVENT THE WASHING OF SEDIMENT INTO THE RECHARGE AREAS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT THE DEPOSITION OF SEDIMENT OR SEDIMENT–LADEN WATERS INTO THE INFILTRATION STRUCTURES AFTER FINAL GRADING.
    - 15.5. IF BEDROCK IS ENCOUNTERED AT ANY TIME DURING EXCAVATION OF THE INFILTRATION BED, EXCAVATION IS TO BE DISCONTINUED IN THE AFFECTED AREA AND THE OWNER AND ENGINEER NOTIFIED AT ONCE.
    - 15.6. PLACE GEOTEXTILE IN ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDATIONS. ADJACENT STRIPS OF GEOTEXTILE SHALL OVERLAP A MINIMUM OF TWO FEET. SECURE FABRIC AT LEAST FOUR (4) FEET OUTSIDE OF BED AND TAKE STEPS NECESSARY TO PREVENT ANY SEDIMENT FROM ENTERING TRENCH.
    - 15.7. AGGREGATE SHALL BE CLEAN WITH A WASH LOSS OF NO MORE THAN 0.5 PERCENT. INSTALLATION OF THE STONE SHOULD BE CHECKED BY THE DESIGN OR SITE ENGINEER PRIOR TO INSTALLATION INTO THE INFILTRATION BMP TO ENSURE THAT IT IS CLEAN WASHED STONE. AGGREGATE THAT DOES NOT MEET THIS CRITERION WILL BE REMOVED AT NO EXTRA COST TO THE OWNER AND THE BEDS RESTORED TO THE OWNER'S SATISFACTION.
    - 15.8. FOLLOWING PLACEMENT OF BED AGGREGATE, THE GEOTEXTILE SHALL BE FOLDED OVERTOP THE BED, WITH APPROPRIATE FABRIC OVERLAP, TO PROTECT FROM SEDIMENT WASHOUT ALONG BED EDGES. TOPSOIL (OR APPROPRIATE MATERIAL SPECIFIED BY PARTICULAR DESIGN) WILL BE USED TO FILL ABOVE THE BED TO THE SPECIFIED HEIGHT.
    - 15.9. DURING THE INSTALLATION OF BASIN 2, A TEMPORARY ENTRY PATH MAY BE CONSTRUCTION TO DIRECT CONSTRUCTION TRAFFIC AROUND THE BASIN INSTALLATION AREA. ENSURE ADEQUATE COVER IS PROVIDED OVER STORMTANK/R–TANK SYSTEM OF 1FT OF STONE, 1FT OF COMPACTED FILL, AND 6" OF BASE COURSE PRIOR TO CONSTRUCTION TRAFFIC RESUMING OVER THE INSTALLED BASIN.
16. INSTALL REMAINDER OF STONE BASE COURSE ON NEW DRIVEWAY AREAS, AND COMPLETE CONSTRUCTION OF THE NEW WALLS AND OTHER SITE IMPROVEMENTS.
17. SPREAD STOCKPILED TOPSOIL AROUND HOUSE AND ALL DISTURBED AREAS. SEED ALL GRADED AREAS TO RE–ESTABLISH VEGETATION. STABILIZED SLOPES IN EXCESS OF 4:1 AND THE AREAS DOWN SLOPE FROM THE PROPOSED LEVEL SPREADER WITH SOD OR NETTING AND MULCH.
18. UNTIL THE SITE IS STABILIZED ALL EROSION AND SEDIMENTATION CONTROLS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENTATION CONTROLS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK; INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING, AND RENETTING, MUST BE PERFORMED IMMEDIATELY.
19. NOTE: NO E&S CONTROLS CAN BE TAKEN OUT UNTIL INSPECTION AND APPROVAL BY A DCCD REPRESENTATIVE AND THE TOWNSHIP ENGINEER'S OFFICE. PLYWOOD COVERING SHALL REMAIN OVER PIPES LEADING TO BMP BASINS UNTIL FINAL STABILIZATION OF THE CONTRIBUTING AREAS IS ACHIEVED.
20. FINAL GRADE DENUDED AREAS, SPREAD STOCKPILED TOPSOIL AND SEED GRADED AREAS TO REESTABLISH PERMANENT VEGETATION. STABILIZE SLOPES IN EXCESS OF 4:1 WITH SOD OR EROSION CONTROL NETTING AND MULCH.
21. REMOVE EXCAVATED MATERIALS NOT REQUIRED FOR FINAL CONSTRUCTION FROM SITE AND DISPOSE OF THEM IN AN APPROVED MANNER.
22. NOTIFY THE DELAWARE COUNTY CONSERVATION DISTRICT FOR THE REMOVAL OF THE SEDIMENT BARRIERS FOR INSPECTION AND APPROVAL. UPON THE RE–ESTABLISHMENT OF VEGETATION ON ALL DENUDED AREAS, REMOVE ALL SEDIMENT BARRIERS. THE SITE WILL BE CONSIDERED TO BE PERMANENTLY STABILIZED WHEN ALL PERMANENT CONTROL MEASURES/FACILITIES HAVE BEEN COMPLETED AND ARE OPERATIONAL, TEMPORARY CONTROL MEASURES/FACILTIES REMOVED, AND UNIFORM EROSION RESISTANT VEGETATION IS ESTABLISHED TO THE POINT WHERE THE SURFACE SOIL IS CAPABLE OF RESISTING EROSION DURING RUNOFF EVENTS. THE STANDARD FOR THIS VEGETATIVE COVER WILL BE UNIFORM COVERAGE OR DENSITY OF 70% ACROSS THE DISTURBED AREA.
23. UPON CONTRIBUTING AREA STABILIZATION, REMOVE PLYWOOD FROM ALL INLETS AND REMOVE SEDIMENT FILTER BAGS. SEDIMENT FILTER BAGS MAY CONTINUE TO BE UTILIZED IN MULCHED AND LANDSCAPE AREAS FOR UP TO 1 YEAR AFTER CONSTRUCTION, AT WHICH TIME THEY SHALL BE REMOVED PERMANENTLY TO ENSURE PROPER SURFACE WATERS COLLECTION.
24. PLANT REQUIRED TREES AND INSTALL FINAL LANDSCAPE FEATURES AND HARDSCAPE MATERIALS.
25. IMMEDIATELY STABILIZE AND SEED ANY AREAS DISTURBED BY THE REMOVAL OF SEDIMENT BARRIERS.
26. CONSTRUCTION FINISHED. ANTICIPATED DATE: 2022.

SCHOCK GROUP LLC
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CONSHOHOCKEN, PA 19428
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REGISTERED PROFESSIONAL ENGINEER
DAVID R. FIORELLO
PE027479E

EROSION AND SEDIMENT CONTROL PLAN

GRADING PERMIT PLAN

THE MARR RESIDENCE - 75 & 73 TYLER LANE

RADNOR TOWNSHIP • DELAWARE COUNTY • PENNSYLVANIA

REV.	DATE	DESCRIPTION

CLIENT:
CHRISTOPHER & KATHLEEN MARR
43 HARRISON DRIVE
NEWTOWN SQUARE, PA 19073

DRAWN BY: TED
CHECKED BY: DRF
ONE-CALL:
SCALE: 1" = 20'
DATE: AUGUST 11, 2021
REVISED:
FILE NO. 1144

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CONSTRUCTION NOTES:

GEOTEXTILE FABRIC SHALL BE CLEAN NON-WOVEN GEOTEXTILE (PERMEABLE FILTER FABRIC) CLASS 1 AND SHALL BE IN ACCORDANCE WITH PADOT SPECIFICATION FROM 408. THE TYPE AND/OR THICKNESS SHALL BE DUPONT TYPAR #3401, AMOCO PROPEX #4545 OR APPROVED EQUAL OR AS OTHERWISE INDICATED ON THE PLAN.

1. ALL STONE USED FOR THE CONSTRUCTION OF THE INFILTRATION BMP SHALL BE UNIFORMLY GRADED, CLEAN, AND WASHED CRUSHED STONE AGGREGATE MEETING PENNDOT/AASHTO #3 SPECIFICATIONS.

2. ALL PERSONS ENTERING ACTIVE TANKS, MANHOLES, INLETS, ETC. MUST COMPLY WITH OSHA REQUIREMENTS FOR ENTRY INTO CONFINED SPACES.

3. RAIN WATER CONDUCTORS ARE TO COLLECT ALL ROOF RUNOFF AND CONVEY IT TO THE APPROPRIATE STORMWATER MANAGEMENT FACILITY.

4. CLEANOUTS ARE REQUIRED AT ALL CHANGES IN DIRECTION OF THE ROOF DRAINS AND SANITARY SEWER LATERALS.

5. ALL SEEPAGE BEDS SHALL BE INSTALLED WITH A MINIMUM SEPARATION DISTANCE OF 10 FEET FROM ALL BASEMENT WALLS.
6. ALL CMP AND HCMP SHALL BE ALUMINUM OR ALUMINIZED STEEL.
7. ALL HDPE PIPE SHALL BE SMOOTH INTERIOR FLOW.
8. ALL PVC PIPE SHALL BE SDR 35.
9. THE RISER CONNECTIONS IN THE STORMWATER MANAGEMENT SYSTEM SHALL BE WATERTIGHT. REFER TO DETAILS.

10. PERFORATIONS FOR SHALL SATISFY AASHTO DESIGNATION M36/M 36M-90 FOR CLASS 2 PERFORATIONS. THE PERFORATIONS SHALL BE CIRCULAR HOLES WITH NOMINAL DIAMETERS OF 5/16 TO 3/8 INCH. THE PERFORATIONS SHALL BE UNIFORMLY SPACED AROUND THE FULL PERIPHERY OF THE PIPE. THE PERFORATIONS SHALL PROVIDE AN OPENING AREA OF NOT LESS THAN 3.3 SQ. IN. PER SQ. FT. OF PIPE SURFACE BASED ON NOMINAL DIAMETER AND LENGTH OF PIPE.

11. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PLANS AND OTHER DOCUMENTS BY ALL OF THE PERMITTING AUTHORITIES.

12. THE OWNER/CONTRACTOR SHALL BE FAMILIAR WITH AND RESPONSIBLE FOR ANY/ALL CERTIFICATIONS, INSPECTIONS, ETC. REQUIRED BY ALL GOVERNING JURISDICTIONAL AGENCIES DURING AND AFTER CONSTRUCTION FOR SIGN-OFF AND CERTIFICATE OF OCCUPANCY ISSUANCE, INCLUDING BUT NOT LIMITED TO PROCUREMENT OF SERVICES, SCHEDULING OF FIELD OBSERVATIONS AND COORDINATION WITH THE REPRESENTATIVES OF THE PERMITTING AGENCIES. CONTRACTOR IS RESPONSIBLE TO COORDINATE CERTIFICATIONS, SIGN-OFFS, ETC. NECESSARY FOR JOB SITE CLOSEOUT AND ISSUANCE OF CERTIFICATE OF OCCUPANCY.

13. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE REQUIREMENTS AND STANDARDS OF THE LOCAL GOVERNING AUTHORITY.

14. THESE PLANS ARE BASED ON INFORMATION PROVIDED TO OUR OFFICE AT THE TIME OF PLAN PREPARATION. CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS AND NOTIFY OUR OFFICE IF ACTUAL SITE CONDITIONS DIFFER FROM THAT SHOWN ON THE PLAN, OR IF THE PROPOSED WORK WOULD BE INHIBITED BY ANY OTHER SITE FEATURES.

15. ALL DIMENSIONS SHOWN ON THE PLANS SHALL BE FIELD-VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION. NO EXTRA COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR WORK HAVING TO BE REDONE DUE TO DIMENSIONS OR GRADES SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.

16. DEBRIS SHALL NOT BE BURIED ON THE SUBJECT SITE. ALL EXCAVATED MATERIAL AND DEBRIS (SOLID WASTE) SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL TOWNSHIP, COUNTY, STATE AND FEDERAL LAWS AND APPLICABLE CODES. CONTRACTOR SHALL PROPERLY REMOVE & DISPOSE OF HAZARDOUS/UNSUITABLE MATERIAL OFF-SITE IN ACCORDANCE WITH ALL APPLICABLE CODES, ORDINANCES & LAWS.

17. CONTRACTOR IS RESPONSIBLE FOR ALL SHORING REQUIRED DURING EXCAVATION AND SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT OSHA STANDARDS, AS WELL AS ADDITIONAL PROVISIONS TO ASSURE STABILITY OF CONTINUOUS STRUCTURES, AS FIELD CONDITIONS DICTATE.

18. CONTRACTOR IS TO EXERCISE EXTREME CARE WHEN PERFORMING ANY WORK ACTIVITIES ADJACENT TO PAVEMENT, STRUCTURE, ETC. TO REMAIN. CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING THE APPROPRIATE MEASURES AS NECESSARY TO ENSURE THE STRUCTURAL STABILITY OF SIDEWALKS AND PAVEMENT TO REMAIN, AND PROVIDE A SAFE WORK AREA.

19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL REPLACE ALL SIGNAL INTERCONNECT CABLE, CONDUITS AND ANY UNDERGROUND ACCESSORY EQUIPMENT DAMAGED DURING CONSTRUCTION.

20. CONTRACTOR IS RESPONSIBLE FOR REPAIRING THE DAMAGE DONE TO ANY EXISTING ITEM DURING CONSTRUCTION SUCH AS BUT NOT LIMITED TO DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIR SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS. CONTRACTOR IS RESPONSIBLE TO DOCUMENT ALL EXISTING DAMAGE NOTIFY CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION START.

21. ALL CONCRETE SHALL HAVE THE MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS AS INDICATED IN SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS, DETAILS AND/OR GEOTECHNICAL REPORT.

22. ENGINEER NOT RESPONSIBLE FOR CONSTRUCTION METHODS/MEANS FOR COMPLETION OF THE WORK DEPICTED ON THESE PLANS NOR ANY CONFLICTS/SCOPE REVISIONS WHICH RESULT FROM SAME. CONTRACTOR RESPONSIBLE FOR DETERMINING METHODS/MEANS FOR COMPLETION OF THE WORK PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND NOTIFICATION OF OWNER AND ENGINEER OF RECORD WHEN A CONFLICT IS IDENTIFIED.

23. ENGINEER OF RECORD HEREIN IS NOT RESPONSIBLE FOR JOB SITE SAFETY, NOR HAS HE BEEN RETAINED FOR SUCH PURPOSES.

24. SITE GRADING SHALL BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND ANY RECOMMENDATIONS PROVIDED BY THE OWNER'S GEOTECHNICAL ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND REPLACING ANY SOFT, YIELDING OR UNSUITABLE MATERIALS AND REPLACING WITH SUITABLE MATERIALS AS SPECIFIED IN THE SOILS REPORT. ALL EXCAVATED OR FILLED AREAS SHALL BE COMPACTED TO 95% OF MODIFIED PROCTOR MAXIMUM DENSITY PER A.S.T.M. TEST D-1557. MOISTURE CONTENT AT TIME OF PLACEMENT SHALL BE NO MORE THAN 2% ABOVE NOR 3% BELOW OPTIMUM. CONTRACTOR SHALL SUBMIT A COMPACTION REPORT PREPARED BY A QUALIFIED SOILS ENGINEER, REGISTERED WITHIN THE STATE WHERE THE WORK IS PERFORMED, VERIFYING THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING PAD, FIELDS AND AREAS TO BE PAVED HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS AND SPECS AND THE RECOMMENDATIONS SET FORTH IN THE SOILS REPORT.

25. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING TOPOGRAPHIC INFORMATION AND UTILITY INVERT ELEVATIONS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO ENSURE 0.75% MIN. SLOPE AGAINST ANY AND ALL CURBS, ISLANDS AND GUTTERS, AND 1.0% MIN. ON GRAVEL, TO PREVENT PONDING. ANY DISCREPANCIES THAT MAY AFFECT THE PUBLIC SAFETY OR PROJECT COST, MUST BE IDENTIFIED TO THE ENGINEER IN WRITING IMMEDIATELY. PROCEEDING WITH CONSTRUCTION WITH DESIGN DISCREPANCIES IS DONE SO AT THE CONTRACTOR'S OWN RISK.

26. LOCATION OF ALL EXISTING AND PROPOSED SERVICES ARE APPROXIMATE AND MUST BE CONFIRMED INDEPENDENTLY WITH LOCAL UTILITY COMPANIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION. SANITARY SEWER AND ALL OTHER UTILITY SERVICE CONNECTION POINTS SHALL BE CONFIRMED INDEPENDENTLY BY THE CONTRACTOR IN FIELD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ALL DISCREPANCIES SHALL BE REPORTED IMMEDIATELY IN WRITING TO THE ENGINEER. CONSTRUCTION SHALL COMMENCE BEGINNING AT THE LOWEST INVERT (POINT OF CONNECTION) AND PROGRESS UP GRADIENT. INTERFACE POINTS (CROSSINGS) WITH EXISTING UNDERGROUND INSTALLATIONS SHALL BE FIELD-VERIFIED BY TEST PIT PRIOR TO COMMENCEMENT OF CONSTRUCTION.

27. IN CASE OF DISCREPANCIES BETWEEN PLANS, THE SITE PLAN WILL SUPERCEDE IN ALL CASES. NOTIFY ENGINEER OF RECORD OF ANY CONFLICT.

28. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY UTILITY "ONE-CALL" NUMBER 72 HOURS PRIOR TO ANY EXCAVATION ON THIS SITE. CONTRACTOR SHALL ALSO NOTIFY LOCAL WATER & SEWER DEPARTMENTS TO MARK OUT THEIR UTILITIES.

29. SUBBASE MATERIAL FOR SIDEWALKS, CURB, OR ASPHALT SHALL BE FREE OF ORGANICS AND OTHER UNSUITABLE MATERIALS. SHOULD SUBBASE BE DEEMED UNSUITABLE, SUBBASE IS TO BE REMOVED AND FILLED WITH APPROVED FILL MATERIAL COMPACTED TO 95% OPTIMUM DENSITY (AS DETERMINED BY MODIFIED PROCTOR METHOD). NO UNSUITABLE MATERIAL IS TO BE USED IN ANY PORTION OF THE PAVED AREA OF CONSTRUCTION. REMOVE ANY SUBGRADE THAT CANNOT BE PROPERLY COMPACTED AND THAT IS UNSUITABLE MATERIAL. UNDERCUTTING AND/OR SUBGRADE STABILIZATION MAY BE REQUIRED.

30. ALL DRAINAGE STRUCTURES SHALL BE PRE-CAST.

31. ALL DRAINAGE STRUCTURES AND STORM SEWER PIPES SHALL MEET HEAVY-DUTY TRAFFIC (H20) LOADING AND BE INSTALLED ACCORDINGLY.

32. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.

33. GENERAL CONTRACTOR SHALL HAVE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER THIS SITE PRIOR TO COMMENCING CONSTRUCTION.

34. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL FIELD ELEVATIONS PRIOR TO CONSTRUCTION. IF THERE ARE ANY DISCREPANCIES BETWEEN THE ACTUAL FIELD ELEVATIONS AND ELEVATIONS SHOWN IN THE PRELIMINARY/FINAL SUBDIVISION PLANS, THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE OWNER. NEITHER MOMENEE AND ASSOCIATES INC., NOR MOMENEE SURVEY GROUP ARE RESPONSIBLE FOR DESIGN ISSUES THAT MAY ARISE DUE TO DISCREPANCIES BETWEEN ACTUAL SITE ELEVATIONS AND EXISTING AND/OR PROPOSED ELEVATIONS SHOWN IN THE FINAL SUBDIVISION PLANS FOR THIS PROPERTY.

35. GAS AND ELECTRIC SERVICES TO BE DESIGNED IN COORDINATION WITH PECO CONSTRUCTION. ALL ELECTRIC AND GAS CONSTRUCTION SHALL BE IN ACCORDANCE WITH PER PECO SPECIFICATIONS.

36. ALL PROPOSED UTILITY SERVICES SHALL BE INSTALLED UNDERGROUND.

37. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH PENNDOT PUBLICATION 408 AND RC STANDARDS (LATEST ADDITIONS).

38. CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT HANDICAP ACCESSIBLE SPACES AND LOADING AREAS MAINTAIN A 2% MAXIMUM SLOPE IN ALL DIRECTIONS AND THAT HANDICAP CURB RAMPS MEET THE LATEST ADA REQUIREMENTS FOR ACCESSIBILITY.

CONSTRUCTION TIMING AND SEQUENCE GENERAL NOTES:

1. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES (INCLUDING CLEARING AND GRUBBING), THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, AND A REPRESENTATIVE FROM THE DELAWARE COUNTY CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.

2. UPON INSTALLATION OR STABILIZATION OF ALL PERIMETER SEDIMENT CONTROL BMPS AND AT LEAST 3 DAYS PRIOR TO PROCEEDING WITH THE BULK EARTH DISTURBANCE ACTIVITIES, THE PERMITTEE OR CO-PERMITTEE SHALL PROVIDE NOTIFICATION TO THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT.

3. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.

4. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED BY THE DELAWARE COUNTY CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION. EACH STEP OF THE SEQUENCE SHALL BE COMPLETED BEFORE PROCEEDING TO THE NEXT STEP, EXCEPT WHERE NOTED.

5. THE CONTRACTOR SHALL MINIMIZE THE EXTENT AND DURATION OF EARTH DISTURBANCE TO THE EXTENT FEASIBLE BY STAGING CONSTRUCTION ACTIVITIES, WHERE POSSIBLE, ONLY DISTURBING AREAS NEEDED FOR EACH STAGE AND IMMEDIATELY STABILIZING AREAS WHERE CONSTRUCTION HAS CEASED.

GENERAL E&S PLANNING AND DESIGN:

THE EROSION AND SEDIMENTATION CONTROL PLAN IS DESIGNED IN ORDER TO DEMONSTRATE THAT THE FOLLOWING CRITERIA HAVE BEEN ATTAINED:

- THE E&S PLAN MINIMIZES THE EXTENT AND DURATION OF EARTH DISTURBANCE TO THE EXTENT POSSIBLE, BY LOCATING THE EROSION CONTROLS WITHIN AREAS THAT WILL ALREADY BE DISTURBED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS AND BECAUSE THE CONSTRUCTION SEQUENCE HAS BEEN PREPARED TO LIMIT THE DURATION OF EARTH DISTURBANCE. THE INTENT OF THE PROPOSED DEVELOPMENT IS TO BE A LOW IMPACT DEVELOPMENT TO MINIMIZE THE AMOUNT OF TOTAL EARTH DISTURBANCE AS MUCH AS FEASIBLE. THE CONTRACTOR SHALL MINIMIZE THE DURATION OF EARTH DISTURBANCE TO THE EXTENT FEASIBLE.
- THE E&S PLAN MAXIMIZES PROTECTION OF EXISTING DRAINAGE FEATURES AND VEGETATION BY LOCATING THE EROSION CONTROLS WITHIN AREAS THAT WILL ALREADY BE DISTURBED FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS AND BY MAINTAINING THE SURROUNDING VIABLE VEGETATION TO THE EXTENT FEASIBLE. THE PROPOSED SITE LAYOUT HAS BEEN DESIGNED TO AVOID DISTURBANCE OF THE EXISTING DRAINAGE FEATURES AND TO PROTECT THE EXISTING VEGETATION.
- E&S PLAN MINIMIZES SOIL COMPACTION - THE TYPE OF EQUIPMENT USED DURING CONSTRUCTION SHALL NOT CAUSE UNDUE COMPACTION AND TRAFFIC OVER DISTURBED AREAS SHALL BE KEPT AT A MINIMUM IN ORDER TO MINIMIZE SOIL COMPACTION.
- THE E&S PLAN UTILIZES OTHER MEASURES OR CONTROLS THAT PREVENT OR MINIMIZE GENERATION OF INCREASED STORMWATER RUNOFF BY OVERSIZING THE FILTER SOCK WHERE FEASIBLE, PROPOSING THE INSTALLATION OF THE STORMWATER FACILITIES AND NEW LANDSCAPING, ETC. AS SOON AS FEASIBLE.
- THE CONTRACTOR SHALL UTILIZE PROPER HANDLING AND/OR DISPOSAL OF ALL MATERIALS WHICH COULD CAUSE POLLUTION.
- WHERE POTENTIAL THERMAL IMPACTS TO SURFACE WATERS EXIST, APPROPRIATE MEASURES SHALL BE TAKEN TO AVOID/MINIMIZE/OR MITIGATE THESE IMPACTS INCLUDING BUT NOT LIMITED TO MINIMIZING IMPERVIOUS AREAS, MINIMIZING THE EXTENT AND DURATION OF SITE DISTURBANCE, PROTECTING EXISTING SHADE TREES, INSTALLING NEW PLANTINGS AS SOON AS FEASIBLE, MAXIMIZING VEGETATED SWALES, MINIMIZING DENUDED AND CONCRETE CHANNELS AND MAXIMIZING DETENTION FACILITY AREAS WHICH MINIMIZE POOL DEPTHS.

MAINTENANCE OF TEMPORARY SEDIMENTATION CONTROL:

A ROUTINE "END OF DAY CHECK" SHALL BE MADE DURING CONSTRUCTION TO MAKE SURE THAT ALL CONTROL MEASURES ARE WORKING PROPERLY. ALL PERSONS ENGAGED IN LAND DISTURBANCE ACTIVITIES SHALL PREVENT ACCELERATED EROSION AND SEDIMENTATION. THERE SHALL BE NO ADVERSE DISCHARGE OF THE SEDIMENT OR OTHER SOLID MATERIALS FROM THE SITE AS A RESULT OF STORMWATER RUNOFF.

UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS SHALL BE MAINTAINED PROPERLY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING MUST BE PERFORMED IMMEDIATELY. IF THE E&S BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.

WHERE BMP'S ARE FOUND TO FAIL TO ALLEVIATE EROSION ON SEDIMENT POLLUTION THE PERMITTEE OR CO-PERMITTEE SHALL INCLUDE THE FOLLOWING INFORMATION:

A. THE LOCATION AND SEVERITY OF THE BMP'S FAILURE AND ANY POLLUTION EVENTS.
B. ALL STEPS TAKEN TO, REDUCE, ELIMINATE AND PREVENT THE RECURRENCE OF THE NON-COMPLIANCE.
C. THE TIME FRAME TO CORRECT THE NON-COMPLIANCE, INCLUDING THE EXACT DATES WHEN THE ACTIVITY WILL RETURN TO COMPLIANCE.

1. STABILIZED CONSTRUCTION ENTRANCE: THE STABILIZED CONSTRUCTION ENTRANCES ARE TO BE CONSTRUCTED PER THE DETAIL. THICKNESS WILL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL WILL BE MAINTAINED ON THE SITE FOR THIS PURPOSE. AT THE END OF EACH CONSTRUCTION DAY, ALL SEDIMENT DEPOSITED ON PUBLIC ROADWAYS WILL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE.

2. SILT SOCKS: SILT SOCKS SHALL BE INSTALLED PER THE DETAIL. SEDIMENT SHALL BE REMOVED FROM SILT SOCKS WHEN IT REACHES 1/2 THE FENCE HEIGHT OR AS DIRECTED BY THE CONSERVATION DISTRICT OR TOWNSHIP ENGINEER. SILT SOCKS WHICH HAVE BEEN UNDERMINED OR TOPPED WILL BE REPLACED WITH ROCK FILTER OUTLETS IMMEDIATELY.

3. ROCK FILTER OUTLETS: ROCK FILTER OUTLETS SHALL BE INSTALLED PER THE DETAIL. SEDIMENT SHALL BE REMOVED FROM BEHIND ROCK FILTER OUTLET AFTER EACH STORM EVENT. WHEN STONE BECOMES CLOGGED WITH SEDIMENT, THE ROCK FILTER OUTLET SHALL BE REPLACED WITH CLEAN STONE.

4. INLET PROTECTION: INLET PROTECTION SHALL BE CONSTRUCTED PER THE DETAIL AND CLEANED AFTER EACH STORM EVENT OR AS DIRECTED BY THE CONSERVATION DISTRICT OR TOWNSHIP ENGINEER.

5. SWALES: ALL SWALES MUST BE TEMPORARY LINED WITH CURLEX TO ALLOW VEGETATION TO ESTABLISH. IF VEGETATION CAN NOT GROW THEN THAT AREA MUST BE SODDED.

6. SEDIMENT DISPOSAL: SILT REMOVED FROM TEMPORARY SEDIMENT CONTROL STRUCTURES SHALL BE DISPOSED OF ON-SITE IN LANDSCAPED AREAS LOCATED OUTSIDE OF FLOOD PLAINS, WETLANDS, STEEP SLOPES AND DRAINAGE SWALES.

7. DUST CONTROL: DUST AND OTHER PARTICLES SHALL BE KEPT WITHIN TOLERABLE LIMITS BY USING WATER. APPLICATION SHALL BE AS NEEDED OR AS DIRECTED BY THE TOWNSHIP ENGINEER OR THE CONSERVATION DISTRICT. USE OF CALCIUM CHLORIDE OR OTHER SIMILAR APPROVED AGENTS SHALL BE LIMITED TO ONLY THOSE PARTICULAR SITUATIONS IN WHICH PERIODIC CLEANING AND/OR WETTING IS NOT FEASIBLE DUE TO CONDITIONS CAUSED BY WEATHER, TRAFFIC, ETC.

8. AIR POLLUTION: BURNING OF TREES, STUMPS, CUTTINGS, AND OTHER PERISHABLE MATERIALS WILL NOT BE PERMITTED UNLESS SPECIFICALLY ALLOWED BY THE MUNICIPALITY. THE PROVISIONS OF THE PENNSYLVANIA AIR POLLUTION CONTROL ACT, JANUARY 8, 1990, AS AMENDED TO DATE, WILL GOVERN AND ARE A PART OF THIS PLAN BY REFERENCE.

9. STREET SWEEPING/VACUUMING - STREET SWEEPING WILL BE PROVIDED TO REMOVE LARGER DEBRIS AND SMALLER PARTICULATE POLLUTANTS, PREVENTING THIS MATERIAL FROM WASHING INTO RECEIVING WATERWAYS/WATERBODIES.

EROSION AND SEDIMENT CONTROL NOTES:

1. STOCKPILE HEIGHTS MUST NOT EXCEED 15 FEET. STOCKPILE SLOPES MUST BE 2: 1 OR FLATTER.

2. THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED.

3. UNTIL THE SITE ACHIEVES FINAL STABILIZATION, THE PERMITTEE AND COPERMITTEE SHALL ASSURE THAT THE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED, OPERATED, AND MAINTAINED PROPERLY AND COMPLETELY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL BEST MANAGEMENT PRACTICE FACILITIES AND MAINTAIN AND MAKE AVAILABLE TO THE DELAWARE COUNTY CONSERVATION DISTRICT COMPLETE, WRITTEN INSPECTION LOGS OF ALL THOSE INSPECTIONS. ALL MAINTENANCE WORK, INCLUDING CLEANING, REPAIR, REPLACEMENT, REGARDING, RESEEDING, AND RESTABILIZATION SHALL BE PERFORMED IMMEDIATELY.

4. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

5. BEFORE INITIATING ANY REVISIONS TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E&S CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE DELAWARE COUNTY CONSERVATION DISTRICT.

6. THE OPERATOR SHALL ASSURE THAT AN EROSION AND SEDIMENT CONTROL PLAN HAS BEEN PREPARED, APPROVED BY THE APPROPRIATE CONSERVATION DISTRICT, AND IS BEING IMPLEMENTED AND MAINTAINED FOR ALL SOIL AND/OR ROCK SPOIL AND BORROW AREAS, REGARDLESS OF THEIR LOCATIONS.

7. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG DISCHARGING OVER NON-DISTURBED AREAS.

8. THE CONTRACTOR IS ADVISED TO BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS OF THE APPENDIX 64, EROSION CONTROL RULES AND REGULATIONS, TITLE 25, PART 1, DEPARTMENT OF ENVIRONMENTAL PROTECTION, SUBPART C, PROTECTION OF NATURAL RESOURCES, ARTICLE III, WATER RESOURCES, CHAPTER 102, EROSION CONTROL.

9. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.

10. ONLY LIMITED DISTURBANCE WILL BE PERMITTED TO PROVIDE ACCESS TO THE SEDIMENT TRAPS/BMPS AND TEMPORARY DIVERSION BERMS FOR GRADING AND ACQUIRING BORROW TO CONSTRUCT THOSE BMP'S.

11. EROSION AND SEDIMENT BMP'S MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THE TRIBUTARY AREAS OF THOSE BMP'S.

12. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMP CONTROLS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMP'S MUST BE STABILIZED IMMEDIATELY.

13. THE PERMITTEE OR CO-PERMITTEE SHALL CONTACT THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT AT LEAST SEVEN DAYS BEFORE CONSTRUCTION IS TO BEGIN TO DETERMINE IF A PRECONSTRUCTION CONFERENCE IS REQUIRED. THE PERMITTEE, CO_PERMITTEE, AND OTHERS UNDERTAKING THE EARTH DISTURBANCE ACTIVITY SHALL ATTEND A PRECONSTRUCTION CONFERENCE WHEN REQUESTED BY THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT. THE PERMITTEE OR CO-PERMITTEE MUST BRING A COPY OF THEIR NPDES PERMIT, A COPY OF THE STAMPED PLAN FROM THE CONSERVATION DISTRICT, AND ALL ASSOCIATED DEPARTMENT APPROVALS/PERMITS WHICH MUST BE AVAILABLE AT THE CONFERENCE UPON REQUEST. ALSO, AT LEAST 3 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INCORPORATED AT 1-800-242-1776 FOR BURIED UTILITIES LOCATIONS.

14. UPON THE INSTALLATION OR STABILIZATION OF ALL PERIMETER SEDIMENT CONTROL BMPS AND AT LEAST 3 DAYS PRIOR TO PROCEEDING WITH THE BULK EARTH DISTURBANCE ACTIVITIES, THE PERMITTEE OR CO-PERMITTEE SHALL PROVIDE NOTIFICATION TO THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT.

15. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE.

16. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE OPERATOR SHALL STABILIZE ANY AREAS DISTURBED BY THE ACTIVITIES. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES.
17. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN ONE YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTURBED WITHIN ONE YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.

18. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.

19. PERMITTEES AND CO_PERMITTEES ARE RESPONSIBLE FOR ENSURING THAT A LICENSED PROFESSIONAL HAVE OVERSIGHT RESPONSIBILITIES FOR THE DESIGN AND PROPER INSTALLATION OF BMPS IDENTIFIED IN THE PCSM PLAN PRIOR TO THE SUBMISSION OF THE NOT FOR THIS PERMIT. THE LICENSED PROFESSIONAL SHALL CERTIFY THAT THE BMPS IDENTIFIED IN THE PLAN HAVE BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED PLAN. THE INSTALLATION SCHEDULE OF PCSM BMPS AND MAINTENANCE REQUIREMENTS CONTAINED WITHIN THE APPROVED PCSM PLAN MUST BE FOLLOWED; AND FAILURE TO COMPLY WITH THE INSTALLATION SCHEDULE IS A VIOLATION OF THIS PERMIT, THE CLEAN STREAMS LAW, AND THE CLEAN WATER ACT.

20. SEDIMENT MUST BE REMOVED FROM STORM WATER INLET PROTECTION AFTER EACH RUNOFF EVENT.

21. HAY OR STRAW MULCH MUST BE APPLIED AT 3.0 TONS PER ACRE.

22. SOD, MULCH WITH MULCH CONTROL NETTING, OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 4:1 OR STEEPER.

23. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.

24. INSPECT SEDIMENT BARRIERS FREQUENTLY, ESPECIALLY AFTER HEAVY STORMS. REPLACE AND REPAIR SEDIMENT BARRIERS AS NECESSARY.

25. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMP'S MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT CONTROL BMP'S AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING, AND RENETTING, MUST BE DONE IMMEDIATELY. IF EROSION AND SEDIMENT CONTROL BMP'S FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMP'S, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.

26. SEDIMENT REMOVED FROM BMP'S SHALL BE DISPOSED OF IN LANDSCAPE AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED, OR PLACED IN TOPSOIL STOCKPILES.
27. THE OPERATOR SHALL REMOVE FROM THIS SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1 ET SEQ. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THIS SITE.

28. AN E&S PLAN SHALL BE SUBMITTED TO THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT AND IMPLEMENTED FOR ALL SPOIL AND BORROW AREAS, REGARDLESS OF THEIR LOCATION.

29. THE SITE'S RECEIVING WATERCOURSE IS WIG-WAM RUN, A TRIBUTARY TO DARBY CREEK; THE CHAPTER 93 CLASSIFICATION IS CWF

30. UPON COMPLETION OR TEMPORARY CESSATION OF THE EARTH DISTURBANCE ACTIVITY THE PROJECT SITE SHALL BE IMMEDIATELY STABILIZED IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL (E&S MANUAL), COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION NO. 363-2134-008, APRIL 2000, AS AMENDED AND UPDATED. EROSION AND SEDIMENT CONTROL BMPS SHALL BE IMPLEMENTED AND MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED AND PCSM BMPS ARE OPERATIONAL.

31. TOPSOIL TAKEN FROM CONSTRUCTION AREAS SHALL BE SEEDED WITH VEGETATIVE COVER AND STOCKPILED FOR RE-USE IN FINISH GRADING.

32. CRUSHED STONE BASE COURSE TO BE PLACED ON DRIVEWAYS AS SOON AS POSSIBLE AFTER GRADING TO PREVENT EROSION OF SUBGRADE.

33. THE CONTRACTOR SHALL, BY SCHEDULING THE CONSTRUCTION, UTILIZE NEW PLANTINGS AND PROPERLY INSTALL EROSION CONTROL FENCING, HAY BALES AND OTHER EROSION CONTROL MEASURES TO MINIMIZE EROSION DAMAGE.
34. ALL CONSTRUCTION VEHICLES MUST PASS THROUGH A STABILIZED CONSTRUCTION ENTRANCE BEFORE LEAVING THE SITE.

35. PROVIDE CONSTRUCTION FENCING AS NECESSARY TO SECURE THE CONSTRUCTION SITE FROM UNAUTHORIZED ACCESS.
36. GRADING AND EARTHMOVING OPERATIONS SHALL BE MINIMIZED DURING THE PERIOD FROM NOVEMBER 15 TO APRIL 1 WHEN RE-VEGETATION OF EXPOSED GROUND SURFACE IS DIFFICULT. MULCH, STRAW, STONE AND/OR SOD SHALL BE USED TO STABILIZE ALL AREAS DENUDED DURING THIS TIME PERIOD.

37. THE RUNOFF CROSSING TO THE ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASE OF THE PROJECT SHALL BE MANAGED SO THAT THE WATER QUALITY / QUANTITY IMPACT IS MINIMIZED TO THE ADJACENT PROPERTIES. ADDITIONAL DIVERSION BERMS, STONED CONSTRUCTION STAGING AREAS, AND INLETS/PIPING SHALL BE PROVIDED AS NECESSARY / DIRECTED IN ORDER TO ENSURE ACCEPTABLE CONDITIONS DURING THE CONSTRUCTION PHASE.

MONITORING, INSPECTION, AND REPORTING REQUIREMENTS:

VISUAL INSPECTIONS

THE PERMITTEE AND CO_PERMITTEE(S) MUST ENSURE THAT VISUAL SITE INSPECTIONS ARE CONDUCTED WEEKLY, AND WITHIN 24 HOURS AFTER EACH MEASURABLE RAINFALL EVENT THROUGHOUT THE DURATION OF CONSTRUCTION AND UNTIL THE RECEIPT AND ACKNOWLEDGEMENT OF THE NOT BY THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT. THE VISUAL SITE INSPECTIONS AND REPORTS SHALL BE COMPLETED IN A FORMAT PROVIDED BY THE DEPARTMENT, AND CONDUCTED BY QUALIFIED PERSONNEL, TRAINED AND EXPERIENCED IN EROSION AND SEDIMENT CONTROL, TO ASCERTAIN THAT E&S BMPS AND PCSM BMPS ARE PROPERLY CONSTRUCTED AND MAINTAINED TO EFFECTIVELY MINIMIZE POLLUTION TO THE WATERS OF THIS COMMONWEALTH. A WRITTEN REPORT OF EACH INSPECTION SHALL BE KEPT AND INCLUDE AT A MINIMUM:
(1) A SUMMARY OF SITE CONDITIONS, E&S BMP AND PCSM BMP, IMPLEMENTATION AND MAINTENANCE AND COMPLIANCE ACTIONS; AND
(2) THE DATE, TIME, NAME AND SIGNATURE OF THE PERSON CONDUCTING THE INSPECTION.

NONCOMPLIANCE REPORTING

WHERE E&S, PCSM OR PPC BMPS ARE FOUND TO BE INOPERATIVE OR INEFFECTIVE DURING AN INSPECTION, OR ANY OTHER TIME, THE PERMITTEE AND CO_PERMITTEE(S) SHALL, WITHIN 24 HOURS, CONTACT THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT, BY PHONE OR PERSONAL CONTACT, FOLLOWED BY THE SUBMISSION OF A WRITTEN REPORT WITHIN 5 DAYS OF THE INITIAL CONTACT. NONCOMPLIANCE REPORTS SHALL INCLUDE THE FOLLOWING INFORMATION:
(1) ANY CONDITION ON THE PROJECT SITE WHICH MAY ENDANGER PUBLIC HEALTH, SAFETY, OR THE ENVIRONMENT, OR INVOLVE INCIDENTS WHICH CAUSE OR THREATEN POLLUTION;
(2) THE PERIOD OF NONCOMPLIANCE, INCLUDING EXACT DATES AND TIMES AND/OR ANTICIPATED TIME WHEN THE ACTIVITY WILL RETURN TO COMPLIANCE;
(3) STEPS BEING TAKEN TO REDUCE, ELIMINATE, AND PREVENT RECURRENCE OF THE NONCOMPLIANCE; AND
(4) THE DATE OR SCHEDULE OF DATES, AND IDENTIFYING REMEDIES FOR CORRECTING NONCOMPLIANCE CONDITIONS.

REDUCTION, LOSS, OR FAILURE OF THE BMPS

UPON REDUCTION, LOSS, OR FAILURE OF THE BMPS, THE PERMITTEE AND CO_PERMITTEE SHALL TAKE IMMEDIATE ACTION TO RESTORE THE BMPS OR PROVIDE AN ALTERNATIVE METHOD OF TREATMENT. SUCH RESTORED BMPS OR ALTERNATIVE TREATMENT SHALL BE AT LEAST AS EFFECTIVE AS THE ORIGINAL BMPS.

TERMINATION OF COVERAGE

NOTE: UPON PERMANENT STABILIZATION OF EARTH DISTURBANCE ACTIVITIES ASSOCIATED WITH CONSTRUCTION ACTIVITY THAT ARE AUTHORIZED BY THIS PERMIT AND WHEN BMPS IDENTIFIED IN THE PCSM PLAN HAVE BEEN PROPERLY INSTALLED, THE PERMITTEE AND/OR CO_PERMITTEE OF THE FACILITY MUST SUBMIT A NOT FORM THAT IS SIGNED IN ACCORDANCE WITH PART B, SECTION I.C, SIGNATORY REQUIREMENTS, OF THIS PERMIT. ALL LETTERS CERTIFYING DISCHARGE TERMINATION ARE TO BE SENT TO THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT. THE NOT MUST CONTAIN THE FOLLOWING INFORMATION: FACILITY NAME, ADDRESS, AND LOCATION, OPERATOR NAME AND ADDRESS, PERMIT NUMBER, IDENTIFICATION AND PROOF OF ACKNOWLEDGEMENT FROM THE PERSON(S) WHO WILL BE RESPONSIBLE FOR OPERATION AND MAINTENANCE OF THE PCSM BMPS IN ACCORDANCE WITH THE APPROVED PCSM PLAN, AND THE REASON FOR PERMIT TERMINATION. UNTIL THE PERMITEE HAS RECEIVED WRITTEN ACKNOWLEDGEMENT OF THE NOT, THE PERMITTEE WILL REMAIN RESPONSIBLE FOR OPERATING AND MAINTAINING ALL E&S BMPS AND PCSM BMPS ON THE PROJECT SITE AND WILL BE RESPONSIBLE FOR VIOLATIONS OCCURRING ON THE PROJECT SITE.

COMPLETION CERTIFICATE AND FINAL PLANS

WITHIN 30 DAYS AFTER THE COMPLETION OF EARTH DISTURBANCE ACTIVITIES AUTHORIZED BY THIS PERMIT, INCLUDING THE PERMANENT STABILIZATION OF THE SITE AND PROPER INSTALLATION OF PCSM BMPS IN ACCORDANCE WITH THE APPROVED PCSM PLAN, OR UPON SUBMISSION OF THE NOT IF SOONER, THE PERMITTEE SHALL FILE WITH THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT A STATEMENT SIGNED BY A LICENSED PROFESSIONAL AND BY THE PERMITTEE CERTIFYING THAT WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THIS PERMIT AND THE APPROVED E&S AND PCSM PLANS.

PLACING TOPSOIL OR TOPSOIL MIXTURE:

PREPARATION OF AREAS TO BE TOPSOILED

GRADE THE AREAS TO BE COVERED BY TOPSOIL. USING ACCEPTABLE METHODS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE PLACING THE TOPSOIL. REMOVE STONES AND OTHER FOREIGN MATERIAL 2 INCHES OR LARGER IN DIMENSION. REMOVE AND SATISFACTORILY DISPOSE OF UNSUITABLE AND SURPLUS MATERIAL.

PLACING AND SPREADING TOPSOIL

PLACE TOPSOIL ON THE PREPARED AREAS AND, UNLESS OTHERWISE INDICATED, SPREAD AND COMPACT TO A 4-INCH UNIFORM DEPTH ± 1 1/2 INCHES. COMPACT WITH A ROLLER WEIGHING NOT OVER 120 POUNDS PER FOOT WIDTH OF ROLLER OR BY OTHER ACCEPTABLE METHODS, AS DIRECTED. REMOVE OVERDEPTH TOPSOIL, UNLESS OTHERWISE AGREED UPON IN WRITING. DO NOT PLACE TOPSOIL IN A WET OR FROZEN CONDITION.

SEEDING SPECIFICATIONS:

WHERE DENUDED AREAS ARE DESIRED TO BE LAWN:
1. PERFORM ALL CULTURAL OPERATION AT RIGHT ANGLES TO THE SLOPE.
2. APPLY LIME ACCORDING TO TEST OR AT THE RATE OF 25 LBS. OF GROUND LIMESTONE PER 1,000 SQ. FT.
3. APPLY FERTILIZER ACCORDING TO SOIL TEST OR WORK IN DEEPLY 20 LBS. OF 0-20-20 OR EQUIVALENT PER 1,000 SQ. FT. AND AT THE TIME OF SEEDING, WORK INTO THE SURFACE 10 LBS. OF 10-10-10 OR EQUIVALENT PER 1,000 SQ. FT. OR OTHER APPROVED MIXTURE.
4. SMOOTH AND FIRM SEEDED PRIOR TO SEEDING.
5. SEED USING A MIXTURE OF 60% PENNSTAR KENTUCKY BLUEGRASS, 30% PENNLAWN RED FESCUE AND 10% PENNFINE PERENNIAL RYEGRASS AT THE RATE OF FIVE (5) POUNDS PER 1,000 SQ. FT. OR OTHER APPROVED MIXTURE.
6. COVER GRASS AND LEGUME SEEDS WITH 1/4" OF SOIL WITH SOIL EQUIPMENT, MULCH (RATE OF 3 TONS PER ACRE).
7. MOW AS REQUIRED.
8. WHERE SLOPES EXCEED 25% JUTE NETTING OR OTHER APPROVED (EQUAL) SLOPE STABILIZATION MEASURES SHALL BE UTILIZED. IN ADDITION, THE SEEDING SPECIFICATIONS FOR STEEP SLOPES SHALL BE INCREASED TO INCLUDE 3 LBS/1,000 SQ. FT. OF ANNUAL RYEGRASS FOR RAPID VEGETAL ESTABLISHMENT.

RECYCLING OR DISPOSAL OF MATERIALS:

THE OPERATOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1 ET SEQ., AND 287.1 ET SEQ. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THE SITE.

CONSTRUCTION/DEMOLITION WASTE —SOLID WASTE RESULTING FROM THE CONSTRUCTION OR DEMOLITION OF BUILDINGS AND OTHER STRUCTURES, INCLUDING, BUT NOT LIMITED TO, WOOD, PLASTER, METALS, ASPHALTIC SUBSTANCES, BRICKS, BLOCK AND UNSEGREGATED CONCRETE. THE TERM DOES NOT INCLUDE THE FOLLOWING IF THEY ARE SEPARATE FROM OTHER WASTE AND ARE USED AS CLEAN FILL:

(I) UNCONTAMINATED SOIL, ROCK, STONE, GRAVEL, BRICK AND BLOCK, CONCRETE AND USED ASPHALT; AND

(II) WASTE FROM LAND CLEARING, GRUBBING AND EXCAVATION, INCLUDING TREES, BRUSH, STUMPS AND VEGETATIVE MATERIAL.

MANAGEMENT OF CONSTRUCTION AND DEMOLITION WASTE

SALVAGING - BY DEFINITION, MATERIALS SALVAGED FOR USE IN THEIR INTENDED FUNCTION ARE NOT WASTES. EXAMPLES INCLUDE: BATHROOM FIXTURES, CEILING PANELS, DOORS, FLOORING, LIGHTING FIXTURES, WINDOWS, ETC.

SOURCE SEPARATED RECYCLABLE MATERIALS ARE ALSO NOT WASTES. FOR CONSTRUCTION, RENOVATION AND DEMOLITION ACTIVITIES THIS INCLUDES: CARDBOARD, GLASS, METALS, PAPER AND PLASTICS.

ALL CONCRETE TRUCKS SHALL UTILIZE THE CONCRETE WASHOUT AREA AS INDICATED ON THE EROSION & SEDIMENT CONTROL PLAN FOR CLEANING OUT TRUCKS. ACCUMULATED MATERIAL SHALL BE DISPOSED OF PROPERLY IN ACCORDANCE WITH THE REGULATIONS NOTED ABOVE.

IN THE EVENT A POLLUTION INCIDENT OCCURS WHICH CAUSES OR THREATENS TO CAUSE SURFACE OR GROUNDWATER POLLUTION, THE OWNER SHALL:
(1) PROMPTLY NOTIFY THE DEPARTMENT BY TELEPHONE OF THE LOCATION AND NATURE OF THE DANGER,
(2) NOTIFY ALL KNOWN DOWNSTREAM USERS OF THE WATER,
(3) IMMEDIATELY TAKE ALL NECESSARY STEPS TO PREVENT INJURY TO PROPERTY AND DOWNSTREAM USERS, AND PROTECT WATERS FROM POLLUTION OR DANGER OF POLLUTION,
(4) REMOVE ANY CONTAMINATION FROM AFFECTED GROUND OR SURFACE WATER TO THE EXTENT REQUIRED BY THE DEPARTMENT.

CLEAN FILL REQUIREMENTS:

IF THE SITE WILL NEED TO IMPORT OR EXPORT MATERIAL FROM THE SITE, THE RESPONSIBILITY FOR PERFORMING ENVIRONMENTAL DUE DILIGENCE AND DETERMINATION OF CLEAN FILL WILL REST WITH THE APPLICANT.

CLEAN FILL IS DEFINED AS: UNCONTAMINATED, NON-WATER SOLUBLE, NON-DECOMPOSABLE, INERT, SOLID MATERIAL. THE TERM INCLUDES SOIL, ROCK, STONE, DREDGED MATERIAL, USED ASPHALT, AND BRICK, BLOCK OR CONCRETE FROM CONSTRUCTION AND DEMOLITION ACTIVITIES THAT IS SEPARATE FROM OTHER WASTE AND IS RECOGNIZABLE AS SUCH. THE TERM DOES NOT INCLUDE MATERIALS PLACED IN OR ON THE WATERS OF THE COMMONWEALTH UNLESS OTHERWISE AUTHORIZED. (THE TERM "USED ASPHALT" DOES NOT INCLUDE MILLED ASPHALT OR ASPHALT THAT HAS BEEN PROCESSED FOR RE-USE).

CLEAN FILL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE: FILL MATERIALS AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE STILL QUALIFIES AS CLEAN FILL PROVIDED THE TESTING REVEALS THAT THE FILL MATERIAL CONTAINS CONCENTRATIONS OF REGULATED SUBSTANCES THAT ARE BELOW THE RESIDENTIAL LIMITS IN TABLES FP-1a AND FP-1b FOUND IN THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".
ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE FORM FP-001 TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIAL AS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE OWNER OF THE PROPERTY RECEIVING THE FILL. A COPY OF FORM FP-001 CAN BE FOUND AT THE END OF THESE INSTRUCTIONS.

ENVIRONMENTAL DUE DILIGENCE: THE APPLICANT MUST PERFORM ENVIRONMENTAL DUE DILIGENCE TO DETERMINE IF THE FILL MATERIALS ASSOCIATED WITH THE PROJECT QUALIFY AS CLEAN FILL. ENVIRONMENTAL DUE DILIGENCE IS DEFINED AS: INVESTIGATIVE TECHNIQUES, INCLUDING, BUT NOT LIMITED TO, VISUAL PROPERTY INSPECTIONS, ELECTRONIC DATA BASE SEARCHES, REVIEW OF PROPERTY OWNERSHIP, REVIEW OF PROPERTY USE HISTORY, SANBORN MAPS, ENVIRONMENTAL QUESTIONNAIRES, TRANSACTION SCREENS, ANALYTICAL TESTING, ENVIRONMENTAL ASSESSMENTS OR AUDITS.

ANALYTICAL TESTING IS NOT A REQUIRED PART OF DUE DILIGENCE UNLESS VISUAL INSPECTION AND/OR REVIEW OF THE PAST LAND USE OF THE PROPERTY INDICATES THAT THE FILL MAY HAVE BEEN SUBJECTED TO A SPILL OR RELEASE OF REGULATED SUBSTANCE. IF THE FILL MAY HAVE BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE, IT MUST BE TESTED TO DETERMINE IF IT QUALIFIES AS CLEAN FILL. TESTING SHOULD BE PERFORMED IN ACCORDANCE WITH APPENDIX A OF THE DEPARTMENT'S *"MANAGEMENT OF FILL"*.

FILL MATERIAL THAT DOES NOT QUALIFY AS CLEAN FILL IS REGULATED FILL.
REGULATED FILL IS WASTE AND MUST BE MANAGED IN ACCORDANCE WITH THE DEPARTMENT'S MUNICIPAL OR RESIDUAL WASTE REGULATIONS BASED ON 25 PA. CODE CHAPTERS 287 RESIDUAL WASTE MANAGEMENT OR 271 MUNICIPAL WASTE MANAGEMENT, WHICHEVER IS APPLICABLE. THESE REGULATIONS ARE AVAILABLE ON LINE AT WWW.PACODE.COM.

SOIL AMENDMENT	PERMANENT SEEDING APPLICATION RATE MIN.			NOTES
	PER ACRE	PER 1,000 SQ. FT.	PER 1,000 SQ. YD.	
AGRICULTURAL LIME	6 TONS	240 LB.	2,480 LB.	OR AS PER SOIL TEST; MAY NOT BE REQUIRED IN AGRICULTURAL FIELDS
10-10-20 FERTILIZER	1,000 LB	25 LB.	210 LB.	OR AS PER SOIL TEST; MAY NOT BE REQUIRED IN AGRICULTURAL FIELDS
	TEMPORARY SEEDING APPLICATION RATE MIN.			
AGRICULTURAL LIME	1 TON	40 LB.	410 LB.	TYPICALLY NOT REQUIRED FOR TOPSOIL
10-10-10 FERTILIZER	500 LB	12.5 LB	100 LB.	TYPICALLY NOT REQUIRED FOR TOPSOIL

MULCH TYPE	APPLICATION RATE MIN.			NOTES
	PER ACRE	PER 1,000 SQ. FT.	PER 1,000 SQ. YD.	
STRAW	3 TONS	140 LB.	1,240 LB.	EITHER WHEAT OR OAT STRAW, FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
HAY	3 TONS	140 LB.	1,240 LB.	TIMOTHY, MIXED CLOVER AND TIMOTHY OR OTHER NATIVE FORAGE GRASSES
WOOD CHIPS	4-6 TONS	185 - 275 LB.	1,650 - 2,500 LB.	MAY PREVENT GERMINATION OF GRASSES AND LEGUMES
HYDROMULCH	1 TON	47 LB.	415 LB.	SEE LIMITATIONS ABOVE

HYDROSEEDING SPECIFICATIONS:

DEFINITION: STABILIZING SEDIMENT PRODUCING AND SEVERELY ERODED AREAS BY ESTABLISHING PERMANENT GRASS COVER.

PURPOSE: TO PROVIDE PERMANENT VEGETATIVE COVER TO CONTROL RAPID RUN-OFF AND EROSION.

PROCEDURE: SURFACE TO BE HYDRO-SEEDED SHALL BE CLEANED OF ALL DEBRIS AND OTHER MATTER HARMFUL TO UNIFORM GERMINATES. A WATER-SLURRY MIXTURE COMPOSED OF THE BELOW MENTIONED "MATERIALS" SHALL BE SPRAYED UNIFORMLY OVER THE AREAS TO BE HYDRO-SEEEDED.

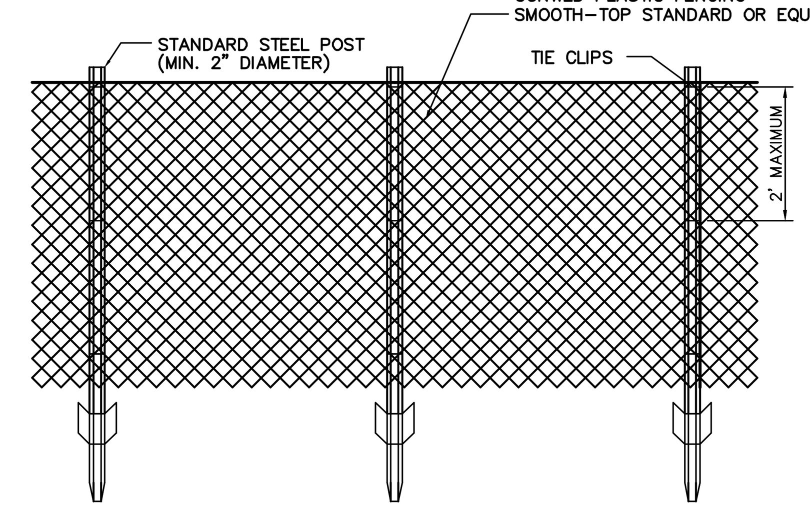
MATERIALS:

PERMANENT SEEDING

NAME	DESCRIPTION	APPLICATION RATE (PER ACRE)
1) SEED MIXTURE % BY WEIGHT	60% PENNSTAR KENTUCKY BLUEGRASS	130 LBS
	30% PENNLAWN RED RESCUE	
	10% PENNFINE PERRENIAL RYEGRASS	
2) COMMERCIAL FERTILIZER	10/20/2020	1,000 LBS
3) LIME	GROUND AGRICULTURAL LIMESTONE (MAY BE APPLIED SEPARATELY)	2 TONS
4) MULCH	HAY OR STRAW	3 TONS
5) SOIL STABILIZER	TERRA TACK OR EQUIVALENT	20 LBS

TEMPORARY SEEDING

1) SEED	ANNUAL RYEGRASS (95% PURE)	40 LBS
2) COMMERCIAL FERTILIZER	5-5-5	1,000 LBS
3) LIME	GROUND AGRICULTURAL LIMESTONE (MAY BE APPLIED SEPARATELY)	1 TON
4) MULCH	HAY OR STRAW	3 TONS



TEMPORARY CONSTRUCTION FENCING
N.T.S.

SCHOCK GROUP LLC
1958 BUTLER PIKE, SUITE 200
CONSHOHOCKEN, PA 19428
610.590.7373 | SCHOCKGROUP.COM

REGISTERED PROFESSIONAL DAVID R. FIORELLO ENGINEER PE027479E

LOCATIONS OF EXISTING UTILITIES ON THIS PLAN HAVE BEEN DEVELOPED FROM FIELD OBSERVATIONS OF ABOVE GROUND UTILITY STRUCTURES AND INFORMATION FURNISHED BY THE UTILITY COMPANY. LOCATIONS SHOULD BE CONSIDERED APPROXIMATE. COMPLETENESS OR ACCURACY OF THE LOCATIONS AND DEPTH OF ALL STRUCTURES CANNOT BE GUARANTEED.

CONTRACTORS MUST VERIFY ALL LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. BEFORE STARTING ANY WORK THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITY COMPANIES THROUGH THE PA ONE CALL SYSTEM THREE DAYS PRIOR TO THE START OF ANY WORK.

CONSTRUCTION NOTES & STANDARD PROCEDURES

GRADING PERMIT PLAN

THE MARR RESIDENCE - 75 & 73 TYLER LANE

RADNOR TOWNSHIP * DELAWARE COUNTY * PENNSYLVANIA

REV.	DATE	DESCRIPTION

CLIENT: CHRISTOPHER & KATHLEEN MARR
43 HARRISON DRIVE
NEWTOWN SQUARE, PA 19073

DRAWN BY: TED
CHECKED BY: DRF
SCALE: 1" = 20'
DATE: AUGUST 11, 2021
FILE NO. 1144
SHEET NO. 6 OF 10

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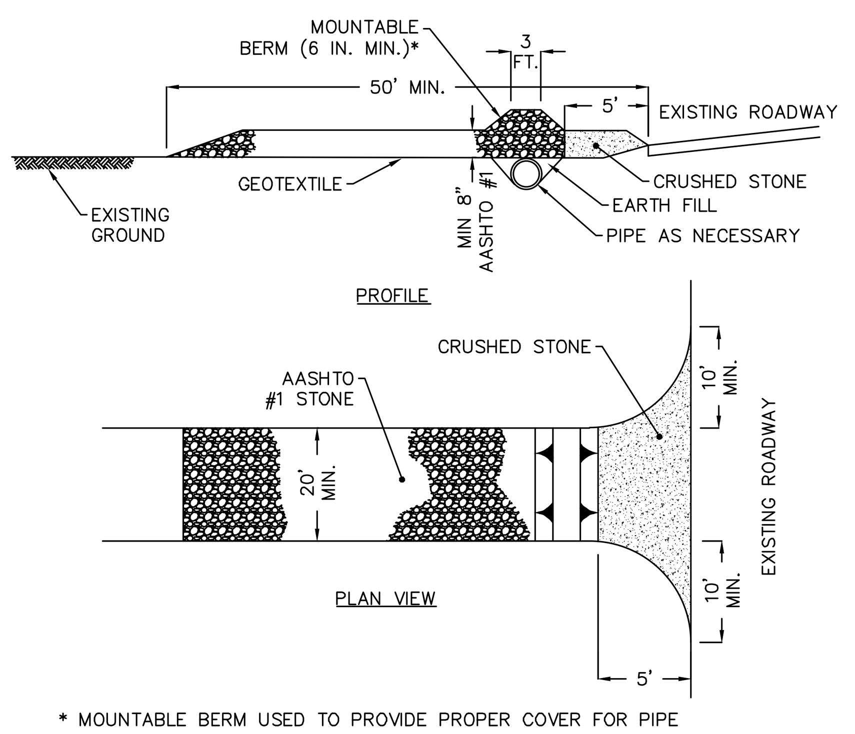


* MOUNTABLE BERM USED TO PROVIDE PROPER COVER FOR PIPE

MODIFIED CONSTRUCTION DETAIL #3-1
ROCK CONSTRUCTION ENTRANCE

NOT TO SCALE

NOTES:

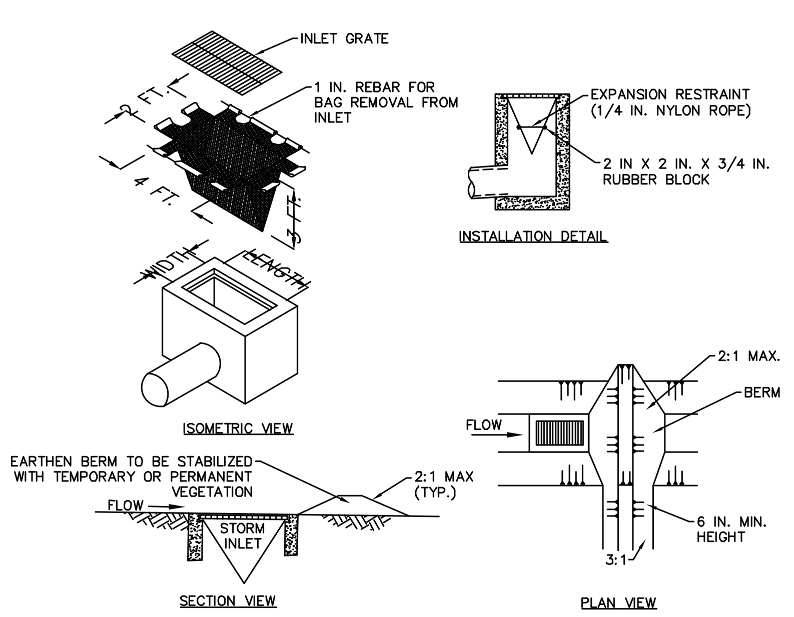
REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.

AASHTO #1 STONE SHALL BE INSTALLED STARTING 5' FROM THE CARTWAY, CRUSHED STONE SHALL BE INSTALLED IN BETWEEN THE AASHTO #1 STONE AND CARTWAY.

RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.

MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.

MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.



NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM ON ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAIN PERMANENTLY.

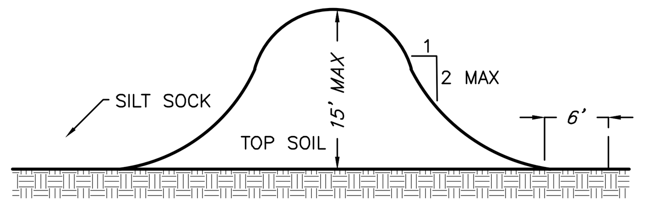
AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

STANDARD CONSTRUCTION DETAIL #4-16
FILTER BAG INLET PROTECTION - TYPE M INLET

NOT TO SCALE



TYPICAL SOIL STOCKPILE CROSS SECTION

NTS

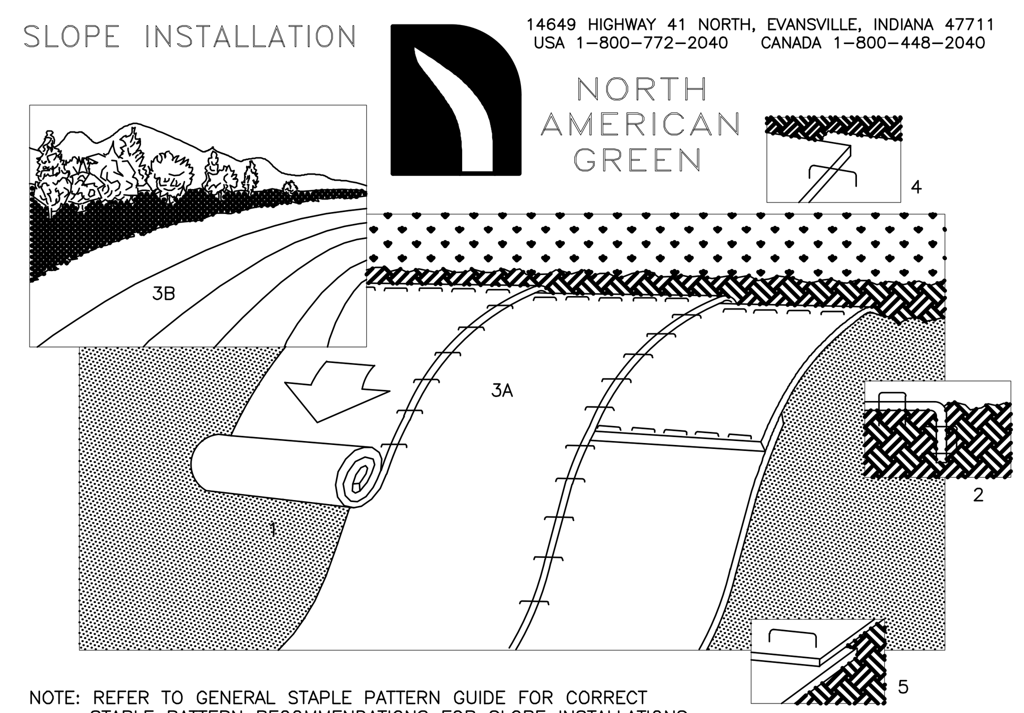
NOTE: SILT SOCK MUST COMPLETELY ENCIRCLE STOCKPILES

NOTE: TOPSOIL SHALL NOT BE REMOVED FROM THE DEVELOPMENT SITE OR USED AS FILL. TOPSOIL SHALL BE REMOVED FROM THE AREAS OF CONSTRUCTION AND STORED SEPARATELY THE TOPSOIL SHALL BE STABILIZED TO MINIMIZE EROSION DURING STORAGE. UPON COMPLETION OF CONSTRUCTION, THE TOPSOIL SHALL BE UNIFORMLY REDISTRIBUTED ON THE SITE.

SLOPE INSTALLATION

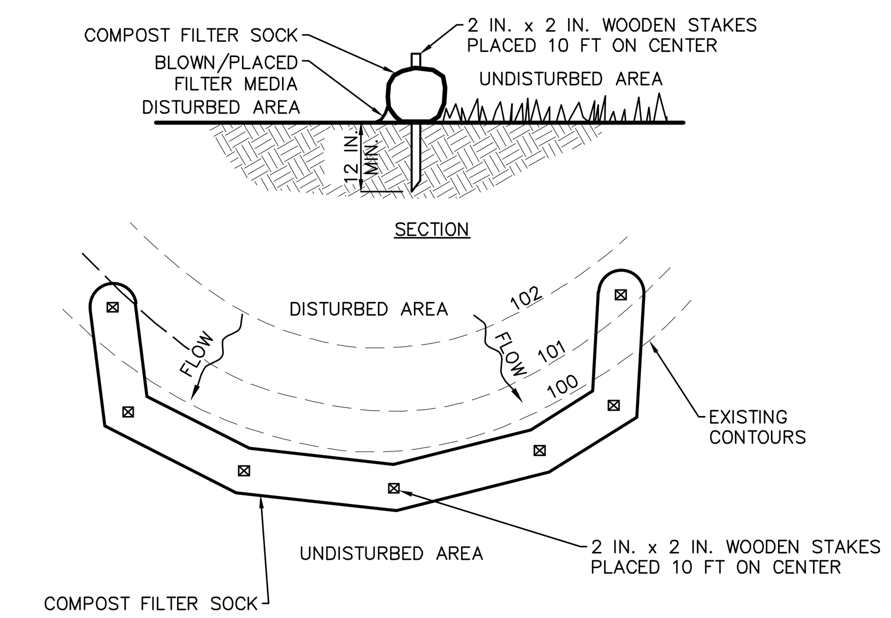
14649 HIGHWAY 41 NORTH, EVANSVILLE, INDIANA 47711
USA 1-800-772-2040 CANADA 1-800-448-2040

NORTH AMERICAN GREEN



NOTE: REFER TO GENERAL STAPLE PATTERN GUIDE FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 4" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.



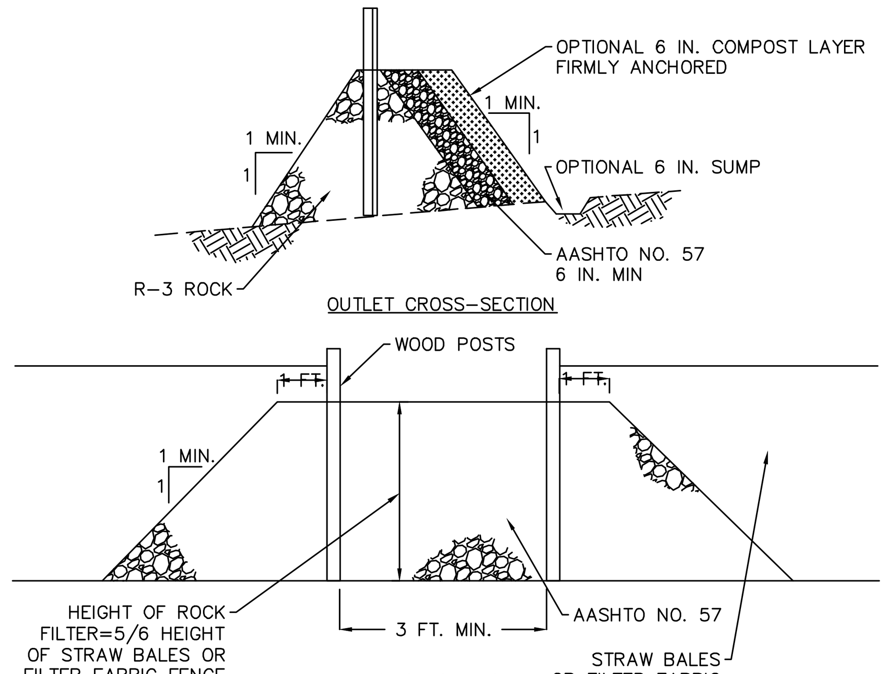
PLAN VIEW

NOT TO SCALE

NOTES:
1. SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.
2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
6. BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

STANDARD CONSTRUCTION DETAIL #4-1
COMPOST FILTER SOCK

NOT TO SCALE



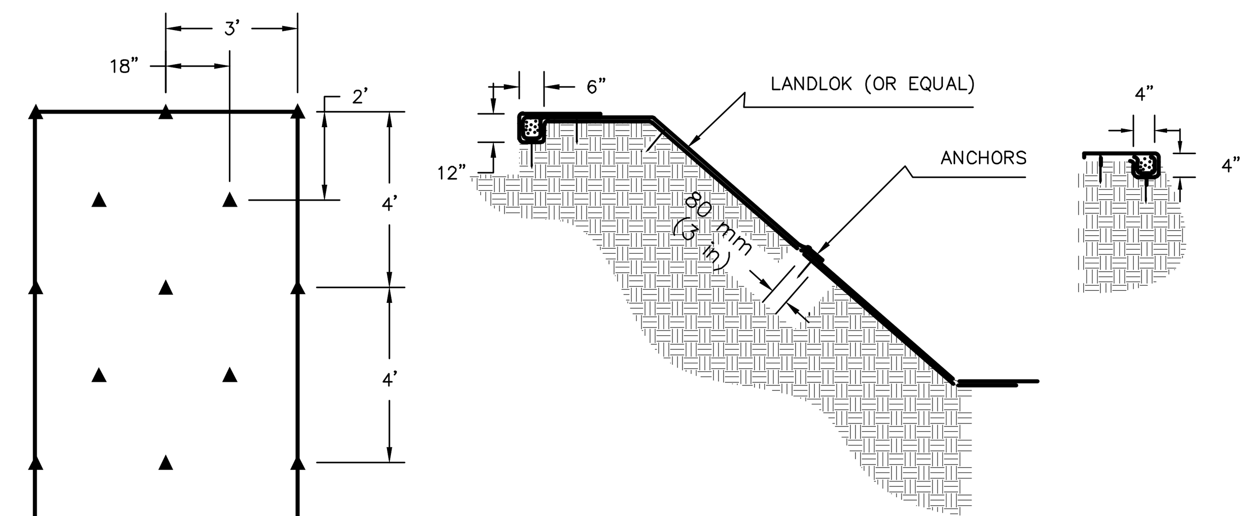
NOTES:

A ROCK FILTER OUTLET SHALL BE INSTALLED WHERE FAILURE OF A SILT FENCE OR STRAW BALE BARRIER HAS OCCURRED DUE TO CONCENTRATED FLOW. ANCHORED COMPOST LAYER SHALL BE USED ON UPSLOPE FACE IN HQ AND EV WATERSHEDS.

SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.

STANDARD CONSTRUCTION DETAIL #4-6
ROCK FILTER OUTLET

NOT TO SCALE



TYPICAL SLOPE CROSS-SECTION

NTS

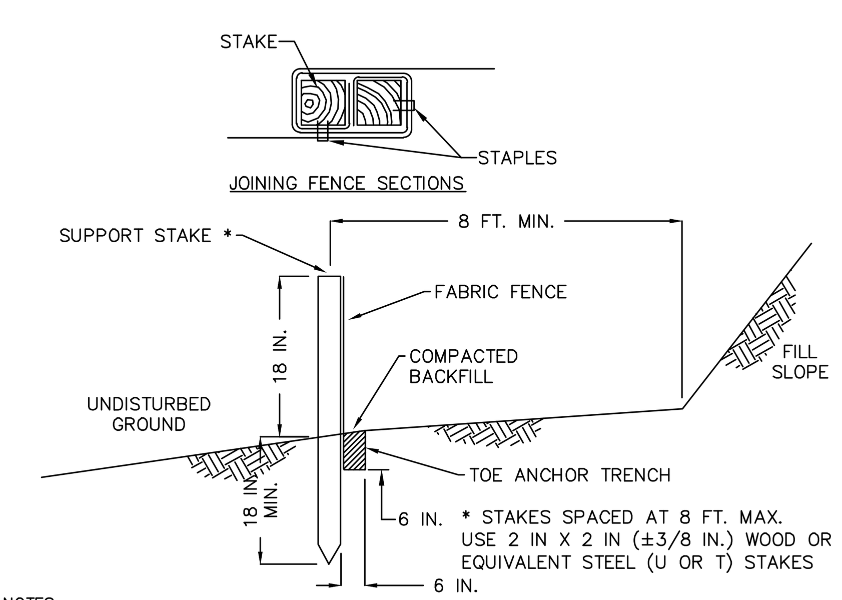
NOTES:
1. INSTALL LANDLOK OR PYRAMAT TURF REINFORCEMENT MATS (OR EQUAL) AND SOIL FILL (OPTIONAL).
2. PREPARE SOIL BEFORE INSTALLING MATS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED, UNLESS USING BLANKET THAT IS PRESEEDED (THEN FOLLOW MANUFACTURERS SPECIFICATIONS).
3. BEGIN AT TOP OF SLOPE BY ANCHORING T.R.M. IN TRENCH AS INDICATED IN THE DETAIL, BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
4. ROLL THE T.R.M.'s EITHER DOWN VERTICALLY OR HORIZONTALLY ACROSS THE SLOPE.
5. THE EDGES OF PARALLEL T.R.M.'s MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
6. WHEN T.R.M.'s MUST BE SPLICED DOWN THE SLOPE, PLACE T.R.M. END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 4" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
7. U-SHAPED WIRE STAPLES, METAL GEOTEXTILE PINS, TRIANGULAR WOODEN OR PLASTIC STAKES CAN BE USED TO ANCHOR T.R.M.'s TO FINISHED GRADE.

COMPOST SOCK FABRIC MINIMUM SPECIFICATIONS

MATERIAL TYPE	3 MIL HDPE	5 MIL HDPE	5 MIL HDPE	MULTI-FILAMENT POLYPROPYLENE (MFPP)	HEAVY DUTY MULTI-FILAMENT POLYPROPYLENE (HDMFPP)
MATERIAL CHARACTERSTICS	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE	BIO-DEGRADABLE	PHOTO-DEGRADABLE	PHOTO-DEGRADABLE
SOCK DIAMETERS	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
MESH OPENING	3/8"	3/8"	3/8"	3/8"	1/8"
TENSILE STRENGTH		26 PSI	26 PSI	44 PSI	202 PSI
ULTRAVIOLET STABILITY % ORIGINAL STRENGTH (ASTM G-155)	23% AT 1000 HR.	23% AT 1000 HR.		100% AT 1000 HR.	100% AT 1000 HR.
MINIMUM FUNTIONAL LONGEVITY	6 MONTHS	9 MONTHS	6 MONTHS	1 YEAR	2 YEARS
TWO-PLY SYSTEMS					
INNER CONTAINMENT NETTING			HDPE BIAXIAL NET		
			CONTINUOUSLY WOUND		
			FUSION-WELDING JUNCTURES		
			3/4"x3/4" MAX. APERTURE SIZE		
OUTER FILTRATION MESH			COMPOSITE POLYPROPYLENE FABRIC (WOVEN LAYER AND NON-WOVEN FLEECE MECHANICALLY FUSED VIA NEEDLE PUNCH)		
			3/16" MAX. APERTURE SIZE		
SOCK FABRICS COMPOSED OF BURLAP MAY BE USED ON PROJECTS LASTING 6 MONTHS OR LESS.					

COMPOST STANDARDS

ORGANIC MATTER CONTENT	80% - 100% (DRY WEIGHT BASIS)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5 - 8.0
MOISTURE CONTENT	35% - 55%
PARTICLE SIZE	98% PASS THROUGH 1" SCREEN
SOLUBLE SALT CONCENTRATION	5.0 dS/m (mmhos/cm) MAXIMUM



SECTION VIEW

NOTES:

FABRIC SHALL HAVE THE MINIMUM PROPERTIES AS SHOWN IN TABLE 4.3 OF THE PA DEP EROSION CONTROL MANUAL.

FABRIC WIDTH SHALL BE 30 IN. MINIMUM. STAKES SHALL BE HARDWOOD OR EQUIVALENT STEEL (U OR T) STAKES.

SILT FENCE SHALL BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE FENCE SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.

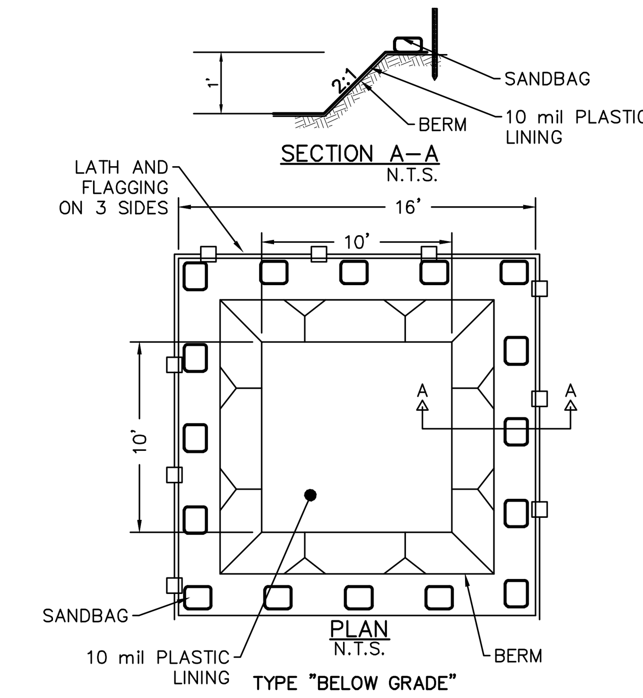
SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH HALF THE ABOVE GROUND HEIGHT OF THE FENCE.

ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET (STANDARD CONSTRUCTION DETAIL # 4-6).

FENCE SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN TRIBUTARY AREA IS PERMANENTLY STABILIZED.

STANDARD CONSTRUCTION DETAIL #4-7
STANDARD SILT FENCE (18" HIGH)

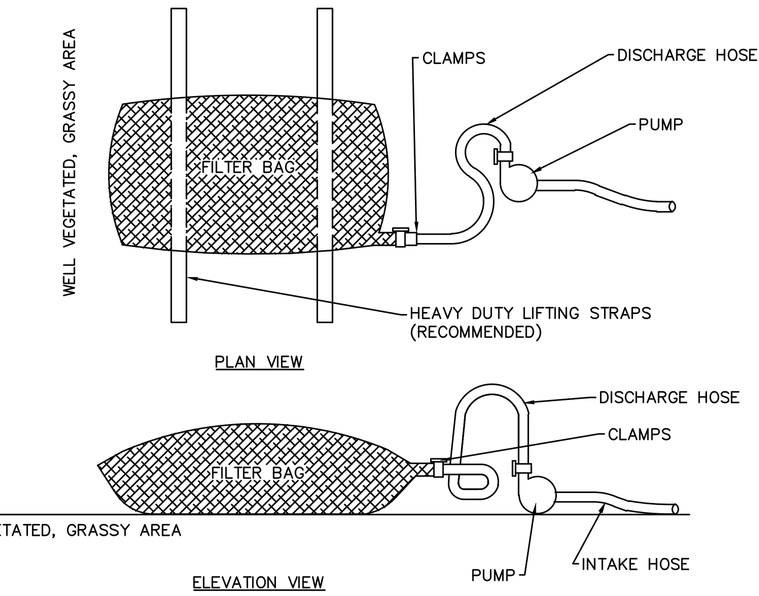
NOT TO SCALE



10'X10' CONCRETE WASHOUT

N.T.S.

NOTES:
1. ACTUAL LAYOUT DETERMINED IN THE FIELD



NOTES:

ELEVATION VIEW

LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.

NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.

THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

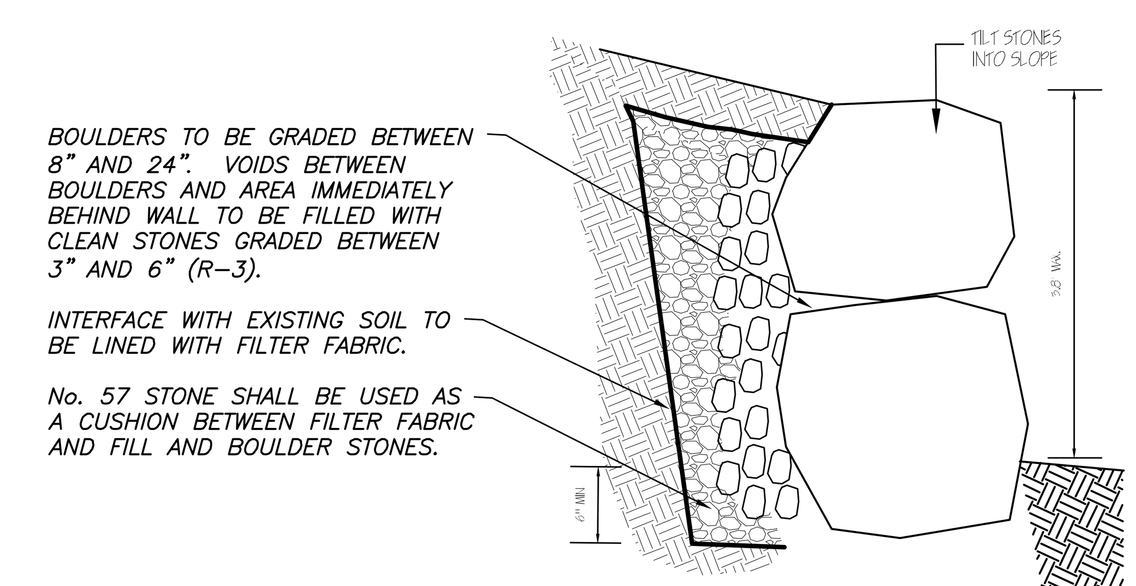
STANDARD CONSTRUCTION DETAIL #3-16
PUMPED WATER FILTER BAG

NOT TO SCALE

BOULDERS TO BE GRADED BETWEEN 8" AND 24". VOIDS BETWEEN BOULDERS AND AREA IMMEDIATELY BEHIND WALL TO BE FILLED WITH CLEAN STONES GRADED BETWEEN 3" AND 6" (R-3).

INTERFACE WITH EXISTING SOIL TO BE LINED WITH FILTER FABRIC.

No. 57 STONE SHALL BE USED AS A CUSHION BETWEEN FILTER FABRIC AND FILL AND BOULDER STONES.



BOULDER WALL

SCHOCK GROUP LLC
1958 BUTLER PIKE, SUITE 200
CONSHOHOCKEN, PA 19428
610.590.7373 | SCHOCKGROUP.COM

REGISTERED PROFESSIONAL ENGINEER
DAVID R. FIORELLO
PE027479E

EROSION & SEDIMENT CONTROL DETAILS
GRADING PERMIT PLAN
THE MARR RESIDENCE - 75 & 73 TYLER LANE
RADNOR TOWNSHIP • DELAWARE COUNTY • PENNSYLVANIA

REV.	DATE	DESCRIPTION

CLIENT: CHRISTOPHER & KATHLEEN MARR
43 HARRISON DRIVE
NEWTOWN SQUARE, PA 19073

DRAWN BY: TED
CHECKED BY: DRF
SCALE: 1" = 20'
DATE: AUGUST 11, 2021
FILE NO.: 1144
SHEET NO.: 7 OF 10

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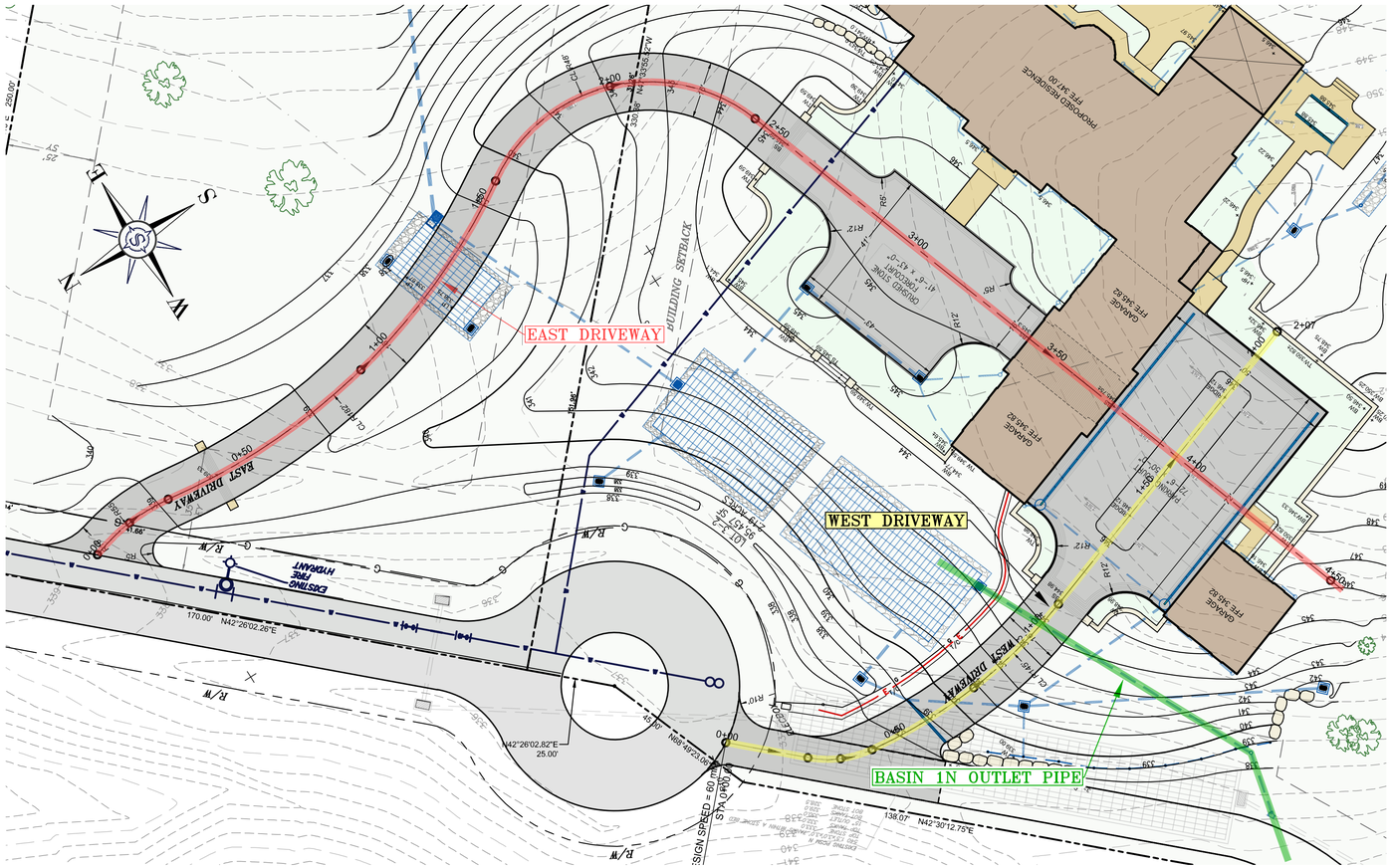

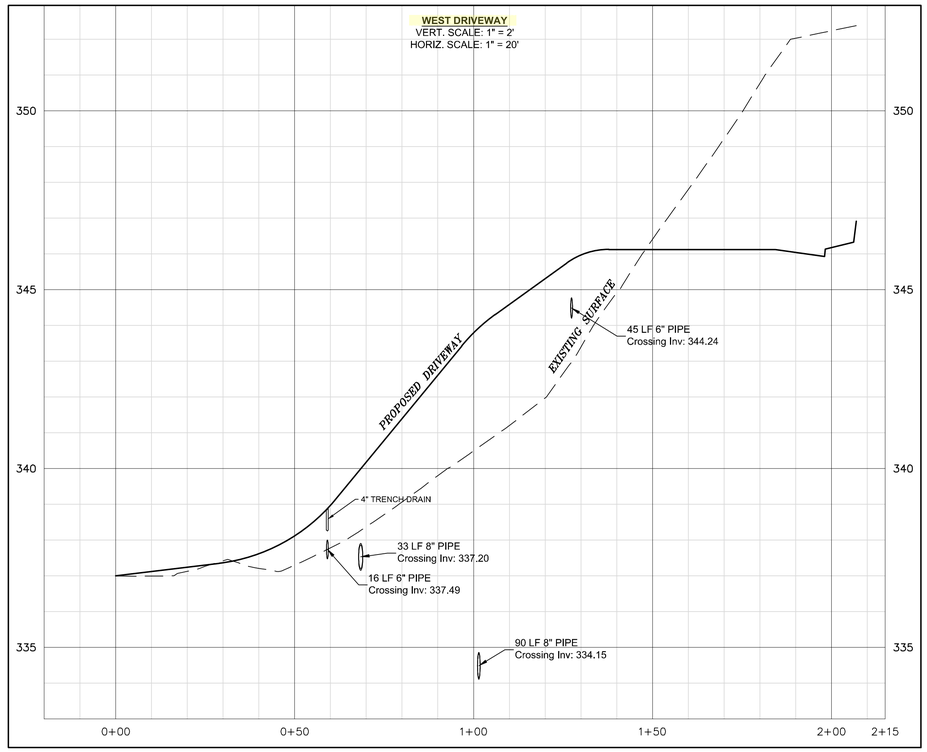

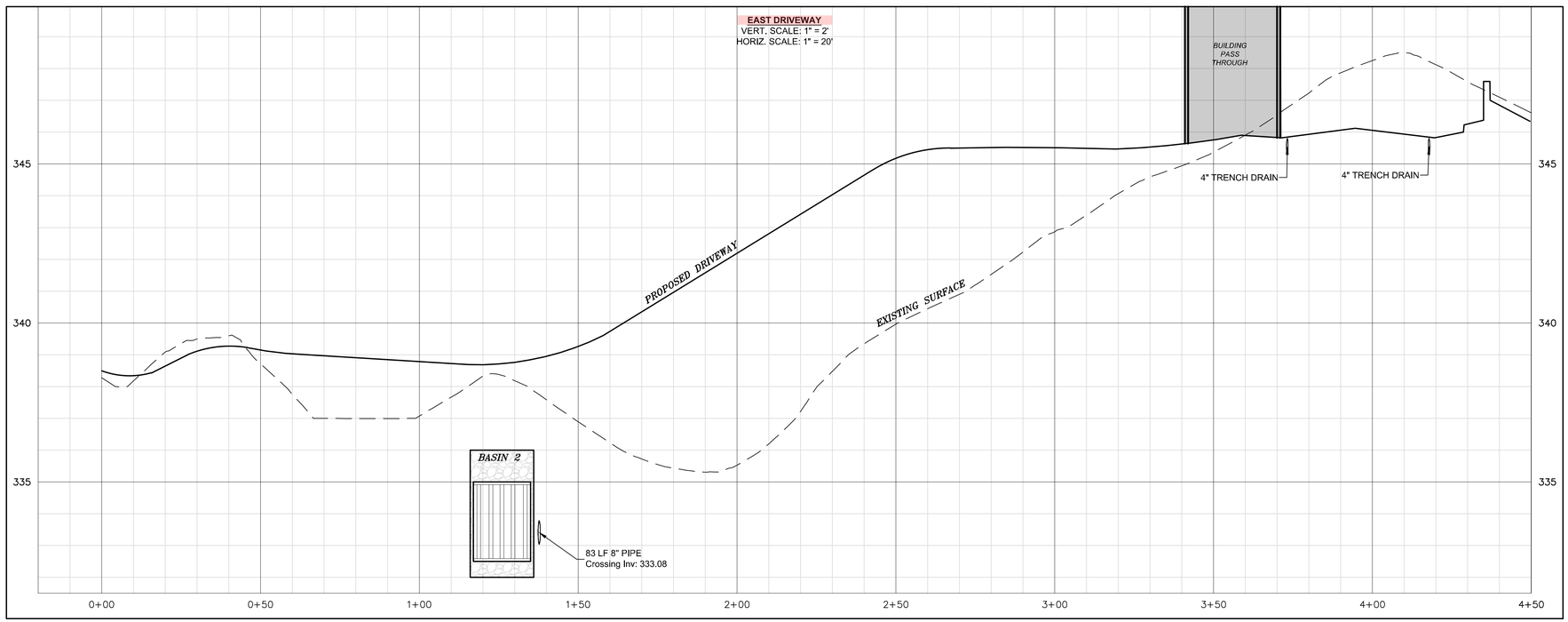

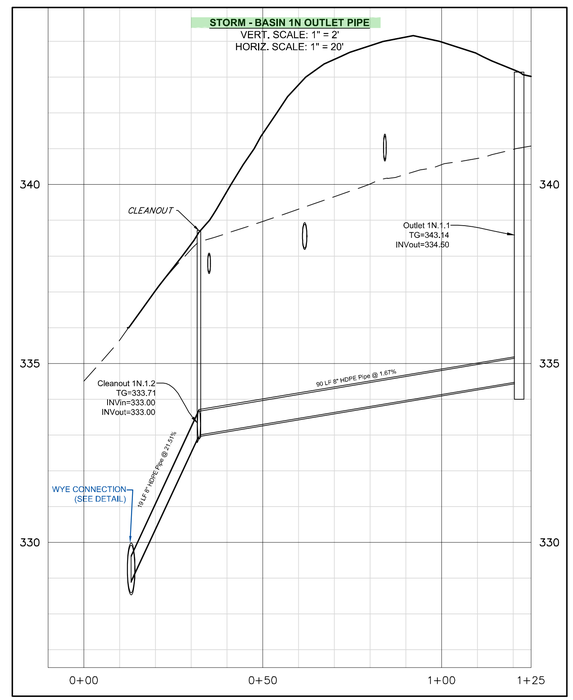

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CONSHOHOCKEN, PA 19428
610.560.7373 | SCHOCKGROUP.COM

REGISTERED PROFESSIONAL
DAVID R. FIORELLO
ENGINEER
PE027479E

LOCATIONS OF EXISTING UTILITIES ON THIS PLAN HAVE BEEN DEVELOPED FROM FIELD LOCATIONS OF VISIBLE ABOVE GROUND UTILITY STRUCTURES AND INFORMATION FURNISHED BY THE UTILITY COMPANIES. ALL LOCATIONS SHOULD BE CONSIDERED APPROXIMATE. COMPLETENESS OR ACCURACY OF THE LOCATIONS AND DEPTH OF ALL STRUCTURES CANNOT BE GUARANTEED.

CONTRACTORS MUST VERIFY ALL LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES BEFORE STARTING ANY WORK.

BEFORE STARTING ANY WORK THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITY COMPANIES THROUGH THE PA ONE CALL SYSTEM THREE DAYS PRIOR TO THE START OF ANY WORK.

CONSTRUCTION PROFILES

GRADING PERMIT PLAN

PROJECT STAGE:

PROJECT NAME:

THE MARR RESIDENCE - 75 & 73 TYLER LANE

RADNOR TOWNSHIP * DELAWARE COUNTY * PENNSYLVANIA

REV.	DATE	DESCRIPTION

CLIENT:
CHRISTOPHER & KATHLEEN MARR
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SHEET NO.: 8 OF 10

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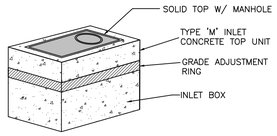
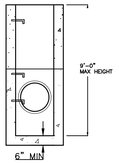
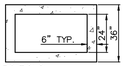
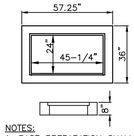


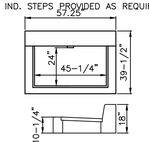
SUMP BOX TOP





SPECIFICATIONS:
- CONCRETE STRENGTH: 4000 PSI MIN @ 28 DAYS
- REINFORCING STEEL: CONFORMS TO ASTM A615 & A185
- TOP AND PIPES TO BE GROUTED IN PLACE ON SITE BY CONTRACTOR
- DESIGN: TRAFFIC LOADS, HS-20 LOADING
- SPECIAL ORDERS ARE PROVIDED WITH HOLES TO MEET REQUIREMENTS
- M.A. IND. STEPS PROVIDED AS REQUIRED

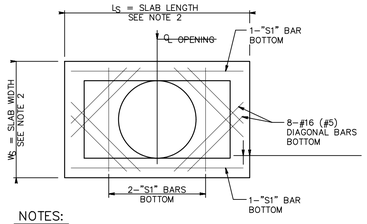




NOTES:
1. BASE PREPARATION SHALL BE A MINIMUM OF 6" OF COMPACTED 2A SUBBASE MATERIAL.
2. PROVIDE STRUCTURAL STEEL GRATES WITH TYPE 'C' & 'M' INLET TOPS.
3. PROVIDE ALL INLET BOTTOMS WITH 1' SUMP AND HOLES TO DRAIN INLET BOTTOM.
4. INSTALL NEW TYPE 'C' INLET TOP UNIT AND NEW BICYCLE SAFE STRUCTURAL STEEL GRATE ON EXISTING INLET AND PROPOSED INLET ALONG PROPERTY FRONTAGE ON LANCASTER AVENUE, MATCH EXISTING ROAD GRADES.
5. INLET GRATES TO BE DEPRESSED 1" AT BACK UNLESS NOTED OTHERWISE
6. COAT ALL SURFACES WITH ANTI-SPALLING COMPOUND.
7. MORTAR GROUT INLET FRAME TO BASIN.
8. AN 8" MAXIMUM LEVELING COURSE MAY BE USED WITH PRECAST INLETS.
9. INLET BOX CONSTRUCTION AS PER PENN-DOT SPECIFICATIONS.
10. CONCRETE BLOCK CONSTRUCTION IS NOT ALLOWED.
11. CAST IN PLACE CONCRETE, PRECAST CONCRETE, AND BRICK ARE THE ONLY APPROVED METHODS OF INLET BOX CONSTRUCTION.

BASIN 2 OUTLET BOX DETAIL

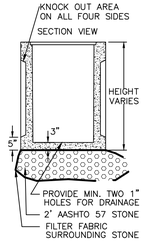
N.T.S.



NOTES:

1. OUT TO OUT DIMENSIONS OF TOP SLABS TO MATCH SIZE OF INLET BOX.

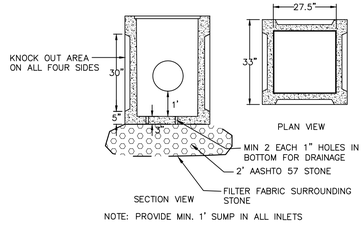
FOR STANDARD INLET BOX



2' x 2' YARD DRAIN

(NON-TRAFFIC BEARING)

Manufactured by
MODERN CONCRETE
or other NPCA certified plant

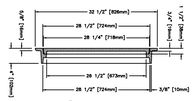


NOTE: PROVIDE MIN. 1' SUMP IN ALL INLETS

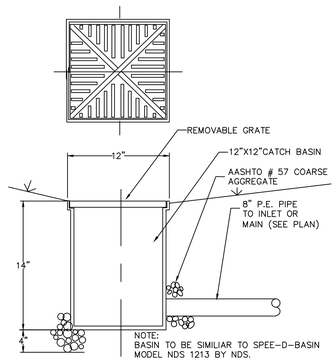
2' x 2' SUMP BOX

(NON-TRAFFIC BEARING)

Manufactured by
MODERN CONCRETE SEPTIC TANK CO.
or other NPCA certified plant



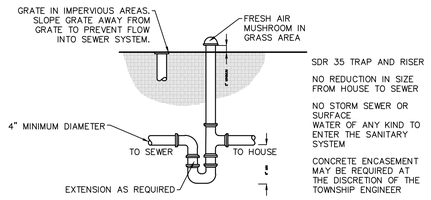
30" ACCESS MANHOLE
R-5900-G
FRAME AND LID



12"x12" INLET DETAILS

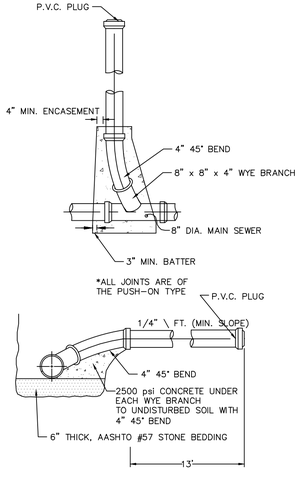
N.T.S.

INLETS #12,13



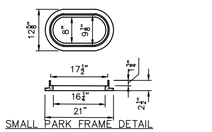
SANITARY SEWER VENT

N.T.S.



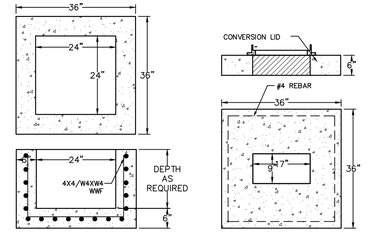
WYE BRANCH CONNECTION

N.T.S.



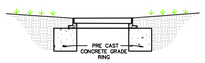
SMALL PARK FRAME DETAIL

SMALL PARK GRATE DETAIL



24" x 24" INLET BOX DETAIL

CONVERSION LID DETAIL

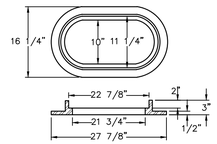


LAWN CONDITION PLACEMENT (TYP.)

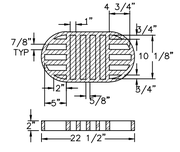
SPECIFICATIONS
- GRAY IRON MEETS OR EXCEEDS ASTM A48 CLASS 30 B
- MINIMUM CONCRETE STRENGTH 2750 PSI @28 DAYS (PENNDOT CLASS AA)
- 1 1/2" MINIMUM CONCRETE COVER (ALL REINFORCEMENT)
- STEEL REINFORCEMENT MEETS ASTM A615 (0.12 IN^2/FT EACH WAY)
- MATERIAL AND WORKSMANSHIP IN ACCORDANCE WITH PENNDOT PUB. 408
- LOCATION OF PIPE OPENINGS AS REQUIRED

SMALL PARK INLET DETAIL

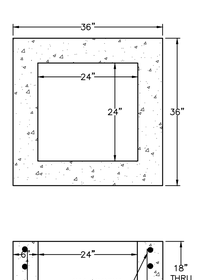
N.T.S.



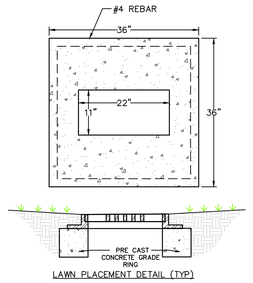
LARGE PARK FRAME DETAIL



LARGE PARK GRATE DETAIL



24" x 24" INLET BOX DETAIL



LAWN PLACEMENT DETAIL (TYP)

CONVERSION LID DETAIL

SPECIFICATIONS
- GRAY IRON MEETS OR EXCEEDS ASTM A48 CLASS 30 B
- MINIMUM CONCRETE STRENGTH 2750 PSI @28 DAYS (PENNDOT CLASS AA)
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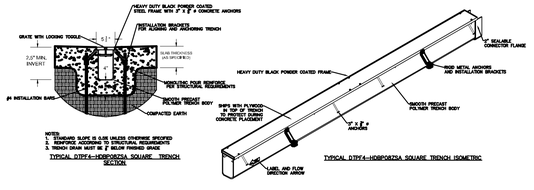
- STEEL REINFORCEMENT MEETS ASTM A615 (0.12 IN^2/FT EACH WAY)
- MATERIAL AND WORKSMANSHIP IN ACCORDANCE WITH PENNDOT PUB. 408
- LOCATION OF PIPE OPENINGS AS REQUIRED

LARGE PARK INLET DETAIL

N.T.S.



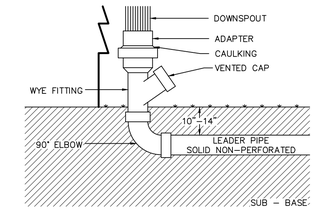
NOTES:
1. STANDARD SLOPE IS 0.5% UNLESS OTHERWISE SPECIFIED
2. TRENCH DRAIN MUST BE 2" BELOW FINISHED GRADE

TYPICAL DTP24-HDBPO8Z5A SQUARE TRENCH SECTION

TRENCH DRAIN DETAIL

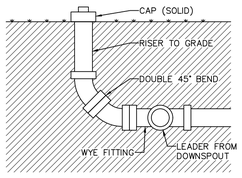
N.T.S

OR EQUIV. TRENCH DRAIN SYSTEM



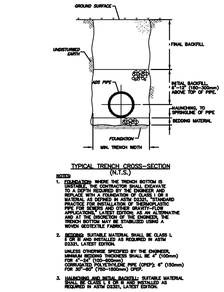
DOWNSPOUT DETAIL

N.T.S.



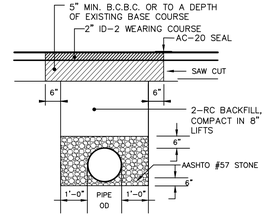
TERMINAL CLEANOUT (TYPICAL)

N.T.S.



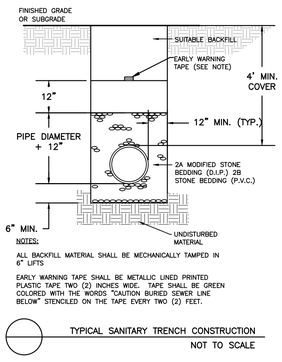
NOTES
1. EXCAVATION: WHERE THE TRENCH BOTTOM IS IN ROCK, SHALE, OR STONY MATERIAL, IT SHALL BE EXCAVATED TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH 6" FOUNDATION AS CLASS I OR II MATERIAL. WHERE UNSTABLE MATERIAL IS ENCOUNTERED TRENCHES TO BE EXCAVATED TO PROVIDE FOR REMOVAL OF THE UNSTABLE MATERIAL AND TO PROVIDE FOR PROPER BEDDING AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A BOVED GEOTEXTILE FABRIC.
2. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AS SPECIFIED OR REQUIRED IN ASTM D2321, LATEST EDITION.
UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, THE MINIMUM BEDDING SHALL BE 4" (100mm) FOR 24"-30" (600-750mm) CORRUGATED POLYETHYLENE PIPE (CPEP) & 6" (150mm) FOR 32"-60" (750-1500mm) CPEP.
3. BACKFILLING AND FINAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AS SPECIFIED OR REQUIRED BY ASTM D2321, LATEST EDITION.

PIPE TRENCH CROSS-SECTION



RADNOR TOWNSHIP ROAD RESTORATION

N.T.S.

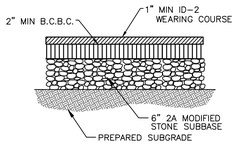


NOTES:
ALL BACKFILL MATERIAL SHALL BE MECHANICALLY TAMPED IN 6" LIFTS

EARLY WARNING TAPE SHALL BE METALLIC LINED PRINTED PLASTIC TAPE TWO (2) INCHES WIDE. TAPE SHALL BE GREEN COLORED WITH THE WORDS "CAUTION BURIED SEWER LINE BELOW" STENCILED ON THE TAPE EVERY TWO (2) FEET.

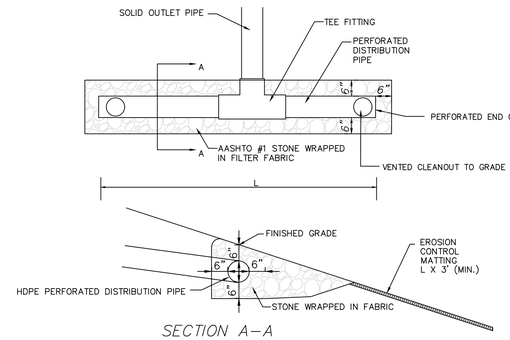
TYPICAL SANITARY TRENCH CONSTRUCTION

NOT TO SCALE



DRIVEWAY CROSS SECTION

N.T.S.



SECTION A-A

LEVEL SPREADER DETAIL

N.T.S.

LEVEL SPREADER #	10-YEAR Q	LENGTH "L"	DISTRIBUTION PIPE	DISTANCE TO STREAM*
3.7.1	0.85 CFS	38'	15" HDPE	170' (WIG WAM)

*DISTANCE TO NEAREST STREAM

LEVEL SPREADER TABLE

SCHOCK GROUP LLC
1958 BUTLER PIKE, SUITE 200
CONSHOHOCKEN, PA 19428
610.560.7373 | SCHOCKGROUP.COM

REGISTERED PROFESSIONAL
DAVID R. FIORELLO
ENGINEER
PE032479E

LOCATIONS OF EXISTING UTILITIES ON THIS PLAN HAVE BEEN PLOTTED FROM AVAILABLE RECORDS AND FIELD SURVEYS. THE UTILITY STRUCTURES AND INFORMATION FURNISHED BY THE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL CONSIDER THE LOCATIONS AND DEPTH OF ALL STRUCTURES CANNOT BE GUARANTEED.

CONTRACTORS MUST VERIFY ALL LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES BEFORE STARTING ANY WORK.

BEFORE STARTING ANY WORK THE CONTRACTOR SHALL NOTIFY ALL PARTICIPATING UTILITY COMPANIES THROUGH THE PA ONE CALL SYSTEM AT LEAST TWO WORKING DAYS PRIOR TO THE START OF ANY WORK.

GENERAL CONSTRUCTION DETAILS

GRADING PERMIT PLAN

THE MARR RESIDENCE - 75 & 73 TYLER LANE

RADNOR TOWNSHIP * DELAWARE COUNTY * PENNSYLVANIA

REV.	DATE	DESCRIPTION

CLIENT:
CHRISTOPHER & KATHLEEN MARR
43 HARRISON DRIVE
NEWTOWN SQUARE, PA 19073

DRAWN BY: TED
CHECKED BY: DRF
CHECK ALL:
SCALE: 1" = 20'
DATE: AUGUST 11, 2021
REVISED:
FILE NO.: 1144
SHEET NO.: 9 OF 10

© SCHOCK GROUP LLC, 20210819.090921
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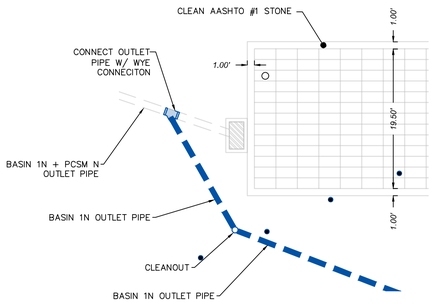
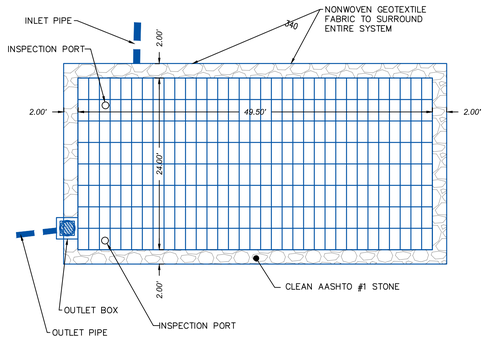
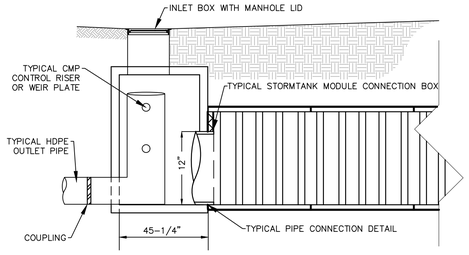


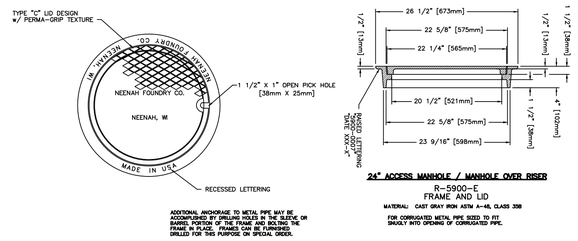
PCSM 1N DETAIL OUTLET PIPE CONNECTION



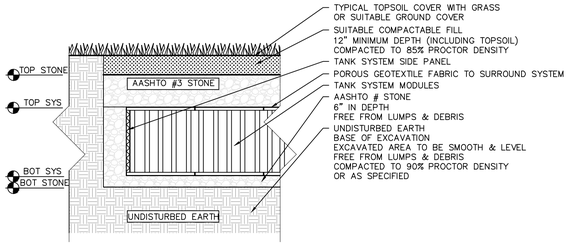
BASIN 1N DETAIL
1.5'(W)x3.0'(L)x3.0'(D) ST-36 STORMTANK CHAMBERS IN A STONE BED
2.0' OF STONE ON ALL SIDES OF SYSTEM
0.5' OF STONE BENEATH SYSTEM (334.00)
1.0' OF STONE ON TOP OF SYSTEM



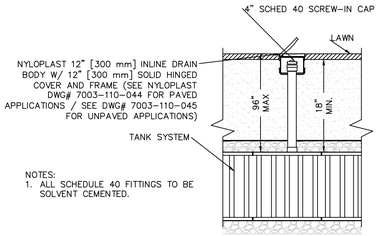
TYPICAL OUTLET STRUCTURE CONNECTION
N.T.S.



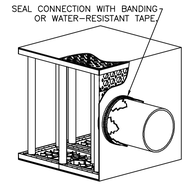
STORMWATER MANHOLE DETAILS
N.T.S.



TYPICAL SYSTEM CROSS SECTION
N.T.S.

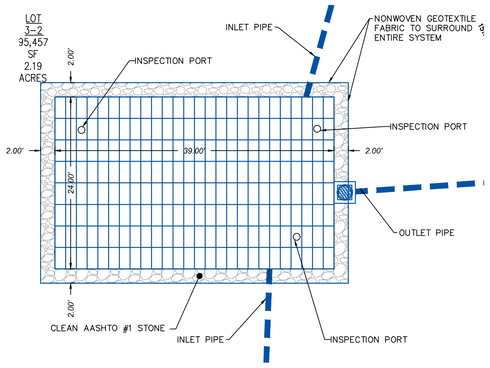


INSPECTION PORT DETAIL
N.T.S.

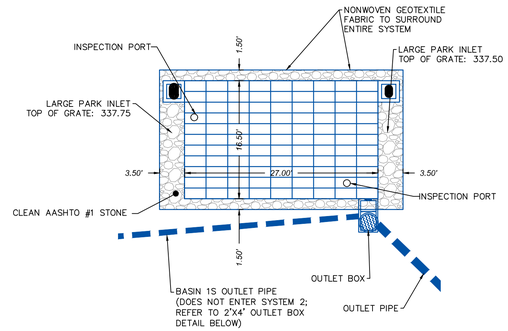


PIPE CONNECTION DETAIL
N.T.S.

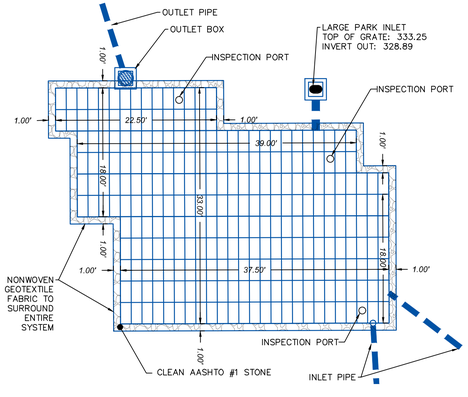
	Outlet Pipe		Main overflow		Orifice 1			Orifice 2			
PCSM Name	Size	Invert	Plate	Invert	Size	Number	Invert	Size	Number	Invert	Outlet Box
PCSM N	12	334	18	336.75	6	1	335.5	6	2	336.5	NS
Basin 1N	15	334	18	336.75	12	1	335	6	2	336	NS
Basin 1S	12	334	18	337.5	4	1	336	6	2	336.5	NS
Basin 2	8	332	18	335	4	1	333.5	8	2	334	2x4
Basin 3	12	328	18	332	4	1	330	4	2	331.25	NS
Basin 4	10	341	18	344	4	1	342.5	-	-	-	2x2



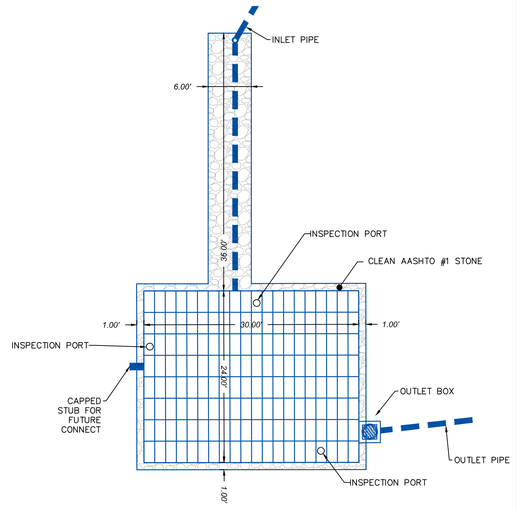
BASIN 1S DETAIL
1.5'(W)x3.0'(L)x3.0'(D) ST-36 STORMTANK CHAMBERS IN A STONE BED
208 CHAMBERS TOTAL
2.0' OF STONE ON EITHER SIDE OF SYSTEM
0.5' OF STONE BENEATH SYSTEM (334.00)
1.0' OF STONE ON TOP OF SYSTEM (337.50)



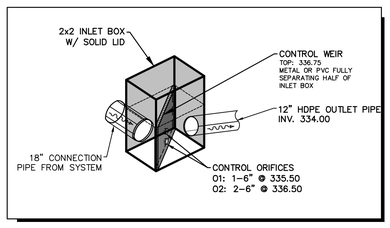
BASIN 2 DETAIL
1.5'(W)x3.0'(L)x3.0'(D) ST-36 STORMTANK CHAMBERS IN A STONE BED
99 CHAMBERS TOTAL
1.5' OF STONE ON NORTHERN/SOUTHERN SIDES OF SYSTEM
3.5' OF STONE ON EASTERN/WESTERN SIDES OF SYSTEM
0.5' OF STONE BENEATH SYSTEM (332.00)
1.0' OF STONE ON TOP OF SYSTEM (336.00)



BASIN 3 DETAIL
1.5'(W)x3.0'(L)x3.0'(D) ST-36 STORMTANK CHAMBERS IN A STONE BED
265 CHAMBERS TOTAL
1.0' OF STONE ON ALL SIDES OF SYSTEM
0.5' OF STONE BENEATH SYSTEM (328.00)
0.5' OF STONE ON TOP OF SYSTEM (332.00)

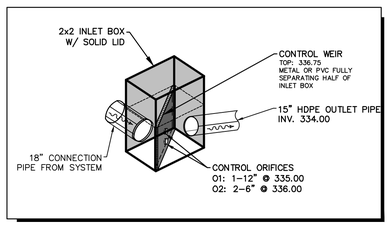


BASIN 4 DETAIL
1.5'(W)x3.0'(L)x2.5'(D) ST-30 STORMTANK CHAMBERS IN A STONE BED
1.0' OF STONE ON ALL SIDES OF SYSTEM
0.5' OF STONE BENEATH SYSTEM (342.00)
1.0' OF STONE ON TOP OF SYSTEM (346.00)



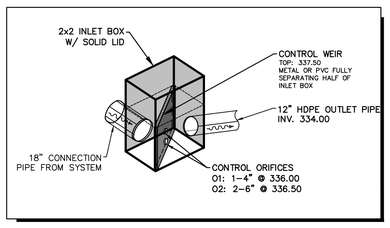
2FTx2FT PCSM N WEIR OUTLET BOX DETAIL
N.T.S.

NOTE: AN 18" RISER PIPE CAN BE USED IN LIEU OF WEIR PLATE, WITH ORIFICES AT SAME ELEVATIONS. CONSULT DESIGN ENGINEER FOR DETAILS.



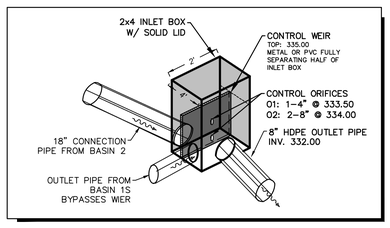
2FTx2FT BASIN 1N WEIR OUTLET BOX DETAIL
N.T.S.

NOTE: AN 18" RISER PIPE CAN BE USED IN LIEU OF WEIR PLATE, WITH ORIFICES AT SAME ELEVATIONS. CONSULT DESIGN ENGINEER FOR DETAILS.

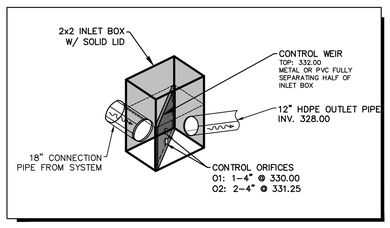


2FTx2FT 1S WEIR OUTLET BOX DETAIL
N.T.S.

NOTE: AN 18" RISER PIPE CAN BE USED IN LIEU OF WEIR PLATE, WITH ORIFICES AT SAME ELEVATIONS. CONSULT DESIGN ENGINEER FOR DETAILS.

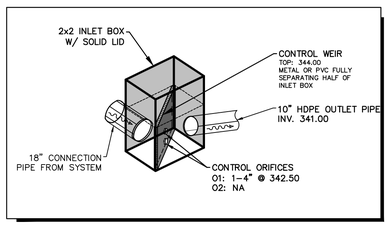


2FTx4FT BASIN 2 WEIR OUTLET BOX DETAIL
N.T.S.



2FTx2FT BASIN 3 WEIR OUTLET BOX DETAIL
N.T.S.

NOTE: AN 18" RISER PIPE CAN BE USED IN LIEU OF WEIR PLATE, WITH ORIFICES AT SAME ELEVATIONS. CONSULT DESIGN ENGINEER FOR DETAILS.



2FTx2FT BASIN 4 WEIR OUTLET BOX DETAIL
N.T.S.

NOTE: AN 18" RISER PIPE CAN BE USED IN LIEU OF WEIR PLATE, WITH ORIFICES AT SAME ELEVATIONS. CONSULT DESIGN ENGINEER FOR DETAILS.

SCHOCK GROUP LLC
1958 BUTLER PIKE, SUITE 200
CONSHOHOCKEN, PA 19428
610.560.7373 | SCHOCKGROUP.COM

REGISTERED PROFESSIONAL
DAVID R. FIORELLO
ENGINEER
PE027479E

LOCATIONS OF EXISTING UTILITIES ON THIS PLAN HAVE BEEN PREPARED FROM INFORMATION OBTAINED FROM THE RESPECTIVE UTILITY STRUCTURES AND INFORMATION FURNISHED BY THE UTILITY COMPANIES. THE CONTRACTOR SHALL CONSIDER THE APPROXIMATE LOCATIONS SHOWN ON THE PLANS AS BEING ACCURATE LOCATIONS AND DEPTH OF ALL STRUCTURES CANNOT BE GUARANTEED.
CONTRACTORS MUST VERIFY ALL LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES BEFORE STARTING ANY WORK.
BEFORE STARTING ANY WORK THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITY COMPANIES THROUGH THE PA ONE CALL SYSTEM AT 811 OR 1-800-242-1776 AT LEAST THREE (3) BUT NOT MORE THAN TEN (10) WORKING DAYS PRIOR TO THE START OF ANY WORK.

STORM WATER CONSTRUCTION DETAILS
GRADING PERMIT PLAN

THE MARR RESIDENCE - 75 & 73 TYLER LANE

RADNOR TOWNSHIP * DELAWARE COUNTY * PENNSYLVANIA

PROJECT STAGE:
PROJECT NAME:

REV.	DATE	DESCRIPTION

CLIENT:
CHRISTOPHER & KATHLEEN MARR
43 HARRISON DRIVE
NEWTOWN SQUARE, PA 19073

DRAWN BY: TED
CHECKED BY: DRF
CHECKED ALL:
SCALE: 1" = 20'
DATE: AUGUST 11, 2021
REVISED:
FILE NO.: 1144
SHEET NO.: 10 OF 10

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ORDINANCE NO. 2021-16
FISCAL YEAR 2022 TAX LEVY

AN ORDINANCE OF THE TOWNSHIP OF RADNOR, DELAWARE COUNTY, COMMONWEALTH OF PENNSYLVANIA, ADOPTING A FINAL COMPREHENSIVE BUDGET FOR FISCAL YEAR 2022, AND ESTABLISHING THE TOWNSHIP MILLAGE RATE

The Board of Commissioners of Radnor Township, Delaware County, Pennsylvania, hereby ENACTS and ORDAINS, as follows:

Section 1. That the Final 2022 Budget, referenced as the Board Approved Comprehensive Budget (version 1) attached hereto and incorporated herein, dated November 8, 2021, is hereby adopted setting forth all proposed revenues and appropriations for all Township funds for fiscal year 2022.

Section 2. The total tax millage rate for 2022 shall be 2.3637 mills and is allocated as follows:

Township Operational / Capital tax levy	2.3050 mills
Debt Service tax levy	0.0587 mills (established in 2016)
Total tax levy 2022	**2.3637 mills**

Section 4. That all other permit, service and user fees for fiscal year 2022 shall be set by Ordinance 2021-18 and shall be subject to further amendment by the Board of Commissioners.

Section 5. Repealer. All ordinance or parts of ordinances which are inconsistent herewith are hereby repealed.

Section 6. Severability. If any section, paragraph, sub-section, clause or provision of this Ordinance shall be declared invalid or unconstitutional by a court of competent jurisdiction, such decision shall not affect the validity of this Ordinance as a whole or any part thereof other than that portion specifically declared invalid.

Section 7. Effective Date. This Ordinance shall become effective in accordance with the Radnor Township Home Rule Charter.

ENACTED AND ORDAINED this 8th day of November, 2021

RADNOR TOWNSHIP

By: _____
Name: Jack Larkin
Title: President

ATTEST: _____
Name: William M. White
Title: Township Manager / Secretary

BUDGET PLACEHOLDER

The 2022 Township Manager Recommended Budget was posted to the Township's website on Wednesday, October 6, 2021. Please visit www.radnor.com and look for the 2022 Budget link on the home page.

ORDINANCE NO. 2021-17
FISCAL YEAR 2022 SEWER RENT RATE

AN ORDINANCE OF THE TOWNSHIP OF RADNOR, DELAWARE COUNTY, COMMONWEALTH OF PENNSYLVANIA, ESTABLISHING THE TOWNSHIP SANITARY SEWER RENT FOR 2022

The Board of Commissioners of Radnor Township, Delaware County, Pennsylvania, hereby ENACTS and ORDAINS, as follows:

Section 1. That the Final 2022 Budget, referenced as the Board Approved Comprehensive Budget (version 1) incorporated in Ordinance 2021-16, dated November 8, 2021, sets forth all proposed revenues and appropriations for all Township funds for fiscal year 2022.

Section 2. The Sanitary Sewer Fund (#002) revenues included in the Final 2022 Budget are estimated based on the billing and collection of a sanitary sewer user fee calculated as a rate times water consumption, provided by Aqua, PA annually.

Section 3. The annual sewer service charges for all real property within the Township shall be set at the amount of $8.90 per 1,000 gallons of water used in the year 2021 as certified by Aqua.

Section 4. Repealer. All ordinance or parts of ordinances which are inconsistent herewith are hereby repealed.

Section 5. Severability. If any section, paragraph, sub-section, clause or provision of this Ordinance shall be declared invalid or unconstitutional by a court of competent jurisdiction, such decision shall not affect the validity of this Ordinance as a whole or any part thereof other than that portion specifically declared invalid.

Section 6. Effective Date. This Ordinance shall become effective in accordance with the Radnor Township Home Rule Charter.

ENACTED AND ORDAINED this 8th day of November, 2021

RADNOR TOWNSHIP

By: _____
Name: Jack Larkin
Title: President

ATTEST: _____
Name: William M. White
Title: Township Manager / Secretary

ORDINANCE NO. 2021-18

AN ORDINANCE OF RADNOR TOWNSHIP, DELAWARE COUNTY, PENNSYLVANIA, AMENDING CHAPTER 162 BY ADOPTING THE CONSOLIDATED FEE SCHEDULE FOR CALENDAR YEAR 2022

Section 1. The Township of Radnor incurs costs and expenses in processing various permits and licenses through its various departments.

Section 2. Section §104-7 False Alarms updated with Ordinance 2017-03 and the Fee Schedule is amended to reflect the corresponding fees.

Section 3. The Pennsylvania Municipalities Planning Code authorizes reasonable and necessary charges by the Township's professional consultants based upon its schedule established by ordinance or resolution.

NOW, THEREFORE, it is hereby ***ENACTED*** and ***ORDAINED*** that the Board of Commissioners of Radnor Township hereby adopts the attached 2022 Consolidated Fee Schedule effective January 1, 2022, and all ordinances or resolutions which are inconsistent are hereby repealed.

BE IT FURTHER ENACTED and ***ORDAINED*** that any revisions to the 2022 Consolidated Fee Schedule may be amended or revised by subsequent resolution of the Board of Commissioners.

ENACTED AND ORDAINED this 22nd day of November, A.D., 2022.

RADNOR TOWNSHIP

By: _____
Name: Jack Larkin
Title: President

ATTEST: _____
Name: William M. White
Title: Township Manager / Secretary

Radnor Township

PROPOSED LEGISLATION

DATE: November 8, 2021

TO: **Board of Commissioners**

FROM: Robert V. Tate, Jr., Finance Director

LEGISLATION: Ordinance 2021-18 Adopting the Consolidated Fee Schedule (Chapter §162) for 2022

LEGISLATIVE HISTORY: Chapter §162 requires the Township to adopt a consolidated fee schedule. The last Fee Schedule Ordinance was adopted in December 2020, effective January 1, 2021. This Ordinance will replace the existing fee schedule in its entirety, effective January 1, 2022.

PURPOSE AND EXPLANATION: This Ordinance will replace the existing fee schedule in its entirety upon adoption, with the following highlights:

1. The Fee Schedule is not directly linked to the 2022 budget. The Ordinances will be considered at the same time, but that is more of a function of the calendar than any connection between the two processes.

2. Fee changes are highlighted in yellow and noted in each of the sections of the Fee Schedule under "Fee Change Narrative"

FISCAL IMPACT: There is no direct fiscal impact in passing this fee schedule.

RECOMMENDED ACTION: The Administration respectfully recommends that the Board introduce Ordinance 2021-18 at the November 8th meeting, with an anticipated adoption at the November 22nd meeting, making the replacement Consolidated Fee Schedule effective January 1, 2022.

2022 CONSOLIDATED FEE SCHEDULE

Introduced | November 8, 2021
Adoption | ***Planned for November 22, 2021***

RADNOR TOWNSHIP, PA 301 Iven Ave, Wayne, PA 19087

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Department **Page Number**

Community Development 2
Engineering 11
Finance / Administration 14
Information Technology 15
Parks and Recreation 17
Police 20
Public Works 22

Appendix

A. Professional Service Hourly Rates 23

Fee Description	2021	2022
Community Development Department		
Chapter 120 | Bathing Places		
License Fees – Swimming Pool (outdoor)	$300.00 per pool	$300.00 per pool
License Fees – Swimming Pool (indoor)	$350.00 per pool	$350.00 per pool
License Fees – Spa	$250.00 per pool	$250.00 per pool
License Fees – Wading	$200.00 per pool	$200.00 per pool
Chapter 125 | Building Construction		
General Contractor's License (annual)	$50.00	$50.00
RESIDENTIAL		
New one and two-family dwelling	$20.00 / $1,000.00	$20.00 / $1,000.00
Additions, alterations, repairs, demolition, etc.	$20.00 / $1,000.00	$20.00 / $1,000.00
COMMERCIAL - Commercial, institution, public land use, recreation, multi-family		
New buildings and fire suppression systems	$30.00 / $1,000 up to $50,000 $20.00 / $1,000 for each additional 1,000	$30.00 / $1,000 up to $50,000 $20.00 / $1,000 for each additional 1,000
Additions, alterations, repairs, demolition, to existing buildings and fire suppression systems	$50.00 / first $1,000, $25.00 / $1,000 for each additional $1,000	$50.00 / first $1,000, $25.00 / $1,000 for each additional $1,000
Signs, to include: window, awning, wall, marquee, freestanding (new or replacement)	$20.00 / $1,000.00	$20.00 / $1,000.00
Certificate of Occupancy – Residential (new)	$50.00	$50.00
Certificate of Occupancy – Non-Residential (new)	$100.00	$100.00
Zoning Permit – Fences, Accessory Structures less than 200 sq.ft., Agricultural Buildings, Propane Tanks	$75.00	$75.00
Home Occupation – Traffic	$150.00	$150.00
Home Occupation – Non-Traffic	$100.00	$100.00
Zoning Compliance	$100.00	$100.00

Fee Description	2021	2022
Chapter 150 |Design and Review Board		
Permit for Temporary banner (max 30 days)	$50.00	$50.00
DRB Application Fees for signs	$100.00	$100.00
DRB Application Fees for telecommunication antennas	$200.00	$200.00
DRB Application Fees for façade change	$100.00	$100.00
DRB Application Fee for new building	$200.00	$200.00
DRB Application Fees for building additions and accessory structures	$200.00	$200.00
DRB Application Fees for Outdoor Dining application (furnishings and accessories)	$100.00	$100.00
Fee Change Narrative: n/a		
Chapter 156 | Electrical		
Electrician's License (annual)	$50.00	$50.00
Electrical Inspection Agency License	$100.00	$100.00
Electrical Permit Fee	$20.00 / $1,000 or fraction thereof	$20.00 / $1,000 or fraction thereof
Low voltage / voice data / alarm	$20.00 / $1,000 or fraction thereof	$20.00 / $1,000 or fraction thereof
Wind / solar electric	$20.00 / $1,000 or fraction thereof	$20.00 / $1,000 or fraction thereof
Plan review – 3rd Party Contract Fee	$75.00 / hour	$75.00 / hour
Chapter 166 | Fire Prevention		
Bon Fire Permit - For institutional use only (each permit)	$100.00	$100.00
Fireworks Permit	$500.00	$500.00
Blasting Permit – Residential	$150.00	$150.00
Blasting Permit – Non-Residential	$150.00	$150.00
Fire Marshall Report - Residential	$50.00	$50.00
Fire Marshall Report – Non-Residential	$100.00	$100.00
Storage Tanks – Repairs and alterations	$50.00 / tank	$50.00 / tank
Storage Tanks – Abandonment or Removal	$200.00 / tank	$200.00 / tank
Storage Tanks – Installation	$200.00 / tank	$200.00 / tank
Fee Change Narrative:		

Fee Description	2021	2022
Chapter 170 | Food Establishment Fees		
Indoor Dining:		
License and Inspection Fee for seats: 0-30 seats	$200.00	$200.00
License and Inspection Fee for seats: 31-70 seats	$250.00	$250.00
License and Inspection Fee for seats: 71-110 seats	$350.00	$350.00
License and Inspection Fee for seats: 111-150 seats	$425.00	$425.00
License and Inspection Fee for seats: 151-190 seats	$475.00	$475.00
License and Inspection Fee for seats: 191-230 seats	$525.00	$525.00
License and Inspection Fee for seats: 231-300 seats	$625.00	$625.00
License and Inspection Fee for seats: 301 seats and over	$725.00	$725.00
License and Inspection Fee for floor area (sq ft): 0-1,500	$150.00	$150.00
License and Inspection Fee for floor area (sq ft): 1,501 – 2,500	$200.00	$200.00
License and Inspection Fee for floor area (sq ft): 2,501 – 5,000	$275.00	$275.00
License and Inspection Fee for floor area (sq ft): 5,001 – 7,500	$350.00	$350.00
License and Inspection Fee for floor area (sq ft): 7,501 – 10,000	$450.00	$450.00
License and Inspection Fee for floor area (sq ft): 10,001 – 15,000	$575.00	$575.00
License and Inspection Fee for floor area (sq ft): 15,000 and over	$725.00	$725.00
License Fee for selling ice cream from a motor vehicle (excludes vendors requiring Department of Agriculture approval	$100.00	$100.00
Food Vendor (mobile and vendors requiring Department of Agriculture approval)	$200.00	$200.00
Temporary Food Establishment	$125.00	$125.00
Special Event Sponsor Fee	$250.00	$250.00
Plan Review – Food Establishment	$150.00 / initial review	$150.00 / initial review
Plan Review – Resubmitting Plans	$75.00	$75.00
Re-inspection for a failed inspection	50% of initial fee	50% of initial fee
Annual Outdoor Dining Renewal	$150.00	$150.00
Indoor Dinning Application Renewal Late Fee	75% of license fee	75% of license fee
Outdoor Dining Application Renewal Late Fee	$70.00	$70.00

Fee Description	2021	2022
Chapter 178 | Historical and Architectural Review Board ("HARB")		
Application to HARB	$50.00	$50.00
Chapter 195 | Mechanical		
HVAC License Annual (air cond., heating & refrig., mchs.)	$50.00	$50.00
RESIDENTIAL – one and two-family		
Geothermal / HVAC systems	$100.00	$100.00
Replace, modify or relocate duct work	$50.00	$50.00
Water Well or Non-Potable Water, Irrigation	$100.00	$100.00
Solar Mechanical/Plumbing	$150.00	$150.00
Add, modify or extend radiant/baseboard or other hydro-mechanical systems	$50.00	$50.00
New or replacement central heating systems	$15.00 first 10,000 BTUs, $5.00 each additional 10,000 BTU's	$15.00 first 10,000 BTUs, $5.00 each additional 10,000 BTU's
New or replacement air cond. central systems	$100.00	$100.00
New or replacement heat pump	$100.00	$100.00
All well driven or mechanical water supply systems for geothermal HVAC systems	$100.00	$100.00
Solar Mechanical / Plumbing	$150.00	$150.00
COMMERCIAL - Commercial, institution, public land use, recreation, multi-family		
Geothermal/HVAC system wells: 0-10 wells	$200.00	$200.00
Geothermal/HVAC system wells: 11-30 wells	$350.00	$350.00
Geothermal/HVAC system wells: 31 or more	$500.00	$500.00
New or replacement central heating system (regardless of fuel source, including duct work)	$30.00 for 10,000 BTUs, $10.00 each additional 10,000 BTU's (fee capped at 1,000,000 BTU's)	$30.00 for 10,000 BTUs, $10.00 each additional 10,000 BTU's (fee capped at 1,000,000 BTU's)
New or replacement air cond. systems incl. duct work	$30.00 for 10,000 BTUs, $10.00 each additional 10,000 BTU's (fee capped at 1,000,000 BTU's)	$30.00 for 10,000 BTUs, $10.00 each additional 10,000 BTU's (fee capped at 1,000,000 BTU's)

Fee Description	2021	2022
New or replacement heat pump incl. duct work	$30.00 for 10,000 BTUs, $10.00 each additional 10,000 BTU's	$30.00 for 10,000 BTUs, $10.00 each additional 10,000 BTU's
Replace, modify or relocate duct work	$20.00 for each $1,000, or portion of cost	$20.00 for each $1,000 or portion of cost
Refrigeration units (incl. walk in boxes, other units with remote compressors)	$20.00 first ton or portion thereof, $10.00 each additional ton, or portion thereof	$20.00 first ton or portion thereof, $10.00 each additional ton, or portion thereof
Solar Mechanical/Plumbing	$175.00	$175.00
Water Wells or Non-Potable Water Wells	$100.00	$100.00
Chapter 218 | Plumbing		
Plumber License (annual)	$50.00	$50.00
RESIDENTIAL - one and two family		
New work, alterations, additions, and repairs	$75.00 for more than 5 fixtures, $5.00 each additional fixture	$75.00 for more than 5 fixtures, $5.00 each additional fixture
Alterations/additions/repairs one fixture (minimum fee)	$35.00	$35.00
Pipe Repair	$75.00	$75.00
Exterior lateral sewer connection or repair	$150.00	$150.00
Interior main drain alteration or replacement (which includes stack vent)	$75.00	$75.00
Garbage grinders and dishwashers (new installation or replacement)	$15.00 Each	$15.00 Each
All gas and electric appliances needing gas or plumbing piping	$75.00 for first unit, $15.00 for each additional	$75.00 for first unit, $15.00 for each additional
Water service (new or replacement)	$75.00	$75.00
Domestic hot water heater (new or replacement)	$20.00	$20.00

Fee Description	2021	2022
Sewer ejection pump (new or replacement, not incl. connections.)	$50.00 pump capacity 21 gal/min, $150.00 pump capacity > 21 gal/min	$50.00 pump capacity 21 gal/min, $150.00 pump capacity > 21 gal/min
Sewer grinder pumps and pit (E-One System)	$300.00	$300.00
COMMERCIAL - Commercial, institution, public land use, recreation, multi-family		
New work, alt., additions not exceeding 5 fixtures	$75.00, $5.00 each additional fixture	$75.00, $5.00 each additional fixture
External lateral sewer connection or repair main drain or sewer connection (new)	$150.00	$150.00
Pipe Repair	$100.00	$100.00
Garbage grinders and dishwashers (new installation or replacement)	$30.00 Each	$30.00 Each
Main interior drain replacement, alterations or repair (incl. stack vent)	$75.00	$75.00
Sewer ejection pump (new or replacement)	$50.00, pump capacity <= 21 gal/min., $300.00, pump capacity > 21 gal/min.	$50.00, pump capacity <= 21 gal/min., $300.00, pump capacity > 21 gal/min.
All gas and elect. Appl. Requiring plumbing or mech. Install. (new or replacement, incl. gas piping)	$75.00 for first unit, $15.00 for each additional	$75.00 for first unit, $15.00 for each additional
Water service (new or replacement)	$100.00	$100.00
Each hot water heater (new or replacement)	$75.00	$75.00
Interceptors & separators (new or replacement)	$75.00	$75.00
Sewer grinder pumps new or replacement	$500.00	$500.00
Fee Change Narrative: n/a		

Chapter 226 | Rental Housing		
Rental Housing Permits	$60.00 Each Unit (1-10) $40.00 Each Additional Unit	$60.00 Each Unit (1-10) $40.00 Each Additional Unit
Rental Housing Appeals Board	$2,500.00	$2,500.00

Fee Description	2021	2022
	plus $500 for each subsequent hearing	plus $500 for each subsequent hearing
Re-inspection after 2nd failed inspection	$100.00	$100.00
Application Late Fee:		
July 1st to July 31st	$100.00	$100.00
On or After August 1st	$150.00	$150.00

Chapter 280 | Zoning Hearing Board		
Application fees for Zoning Hearing Board: One and two family dwellings, Rooming house, multi-family	$550.00 plus $275 for each add'l hearing	$550.00 plus $275 for each add'l hearing
Application fees for Zoning Hearing Board: Non-res. uses (incl. comm., planned, institutional, and public land use)	$900.00 plus $450 for each add'l hearing	$900.00 plus $450 for each add'l hearing
Application fees for Zoning Hearing Board: Challenge to the validity of map or ordinance	$7,500.00 plus $450 for each add'l hearing	$7,500.00 plus $450 for each add'l hearing
Application fees to Board of Commissioners: Application to amend zoning map/ord.	$1,500.00 plus $750 for each add'l hearing	$1,500.00 plus $750 for each add'l hearing
Application fees to Board of Commissioners: Application for conditional use	$1,500.00 plus $750 for each add'l hearing	$1,500.00 plus $750 for each add'l hearing
Application fees to Board of Commissioners: Curative Amendment	$7,500.00 plus $750 for each add'l hearing	$7,500.00 plus $750 for each add'l hearing
Appeals from Zoning Officer or Township Engineer – Residential	$550.00 plus $275 for each add'l hearing	$550.00 plus $275 for each add'l hearing
Appeals from Zoning Officer or Township Engineer – Non-Residential	$900.00 plus $450 for each add'l hearing	$900.00 plus $450 for each add'l hearing

Fee Description	2021	2022
Fee for postponement of a public hearing when requested following publication of the required legal notice.	$200.00	$200.00
Zoning Books	$30.00	$30.00
Other Community Development		
Code Appeals Application Fee – Building, Electrical, Fire Prevention, Mechanical, Plumbing, Property Maintenance	$750.00	$750.00
Inter-municipal Transfer of Liquor License	$1,500.00 plus $750 for each additional hearing	$1,500.00 plus $750 for each additional hearing
PA State Assessed Training Fee, Building, Plumbing, Mechanical, Electrical	$4.50 / permit	$4.50 / permit
Administration of PA state Assessed Training Fee	$2.00 / permit	$2.00 / permit
Zoning Maps	$15.00	$15.00
Plan Review Fee (Payment is due when the permit is issued)	$95.00	$95.00
Code Official Overtime Rate	$100.00 / hour	$100.00 / hour
Administrative Refund Fee	$10% or $30.00, whichever is greater	$10% or $30.00, whichever is greater
Dormitory Inspection Fee	$24.00 / room	$24.00 / room
Appeal of Health Enforcement Notice to Board of Health:		
Single Family Residential	$550.00	$550.00
Multi-Family Residential and Non-Residential'	$900.00	$900.00
Residential Change in Contractor | New one and two-family dwelling	10% of existing permit fee or $20.00, whichever is greater	10% of existing permit fee or $20.00, whichever is greater
Change in Contractor: Commercial, institution, public land use, recreation, multi-family buildings and fire suppression systems	10% of existing permit fee or $50.00 minimum, whichever is greater	10% of existing permit fee or $50.00 minimum, whichever is greater
Fee for work without permits	$200 const. cost up to $10,000 $330 const. cost $10,000 to $25,000 $650 const. cost $25,000 to $50,000 $1,250 const cost over $50,000	$200 const. cost up to $10,000 $330 const. cost $10,000 to $25,000 $650 const. cost $25,000 to $50,000 $1,250 const cost over $50,000

Fee Description	2021	2022
Re-inspection after 2nd failed Residential inspections for: Blasting, Footing, Foundation, Backfill, Slab, Rough, Framing, Energy, Drywall, Sprinkler, Rough In/Duct Testing, Underslab, Rough In, Shower Pan, Sewer Lateral (New Construction), Water Service (New Construction), Steel/Bonding & Final/Barrier (pools), Wire/Flashing/Barrier (stucco), Final	$100	$100
Re-inspection after 2nd failed Commercial inspections for: Footing, Foundation, Backfill, Slab, Rough, Framing, Above Ceiling, Energy, Close Up/Drywall, Sprinkler, Alarm, Rough In/Duct Testing, Underslab, Rough In, Shower Pan, Sewer Lateral (New Construction), Water Service (New Construction), Wire/Flashing/Barrier (stucco), Steel/Bonding & Final/Barrier (pools), Final	$200	$200
Fee Change Narrative: n/a		

Fee Description	2021	2022
Engineering Department		
Grading Permit		
Shed Permit Fee - to be used for installation or replacement of a storage shed only	$120.00	$120.00
Grading Permit Application Minor (<500 SF **NEW** Impervious or disturbance) This permit is for smaller projects where construction is less than 500 SF of new impervious surface or site disturbance. There is a $50 permit application fee. Plan review, and inspection cost is $460. *Should the cost of reviews and/or inspections exceed $460, the applicant will be required to pay the overage before the project is approved. A Certificate of Occupancy will not be issued unless all improvements are installed, inspected, and approved by the Township.	Permit Application Fee $50 Plan review & inspection $460*	Permit Application Fee $50 Plan review & inspection $460*
Grading Permit Application (500 SF < **NEW** Impervious or Disturbance < 1,500SF) This application is to be used when **NEW** impervious is greater than 500 SF, but less than 1,500 SF. A groundwater recharge system is required to mitigate this amount of **NEW** impervious. The permit application fee is $50. Plan reviews, and inspections cost is $1,450. No escrow is required for the improvements; a Certificate of Occupancy will not be issued unless all improvements are installed, inspected, and approved by the Township. The applicant is required to pay all cost overages; i.e. if the balance of the account, after deducting current review fees is less than $500, the applicant will be required to deposit additional funds to keep the balance at $1,500. All unused funds will be inspection and approval of the project.	Permit Application Fee $50 Plan review and inspections $1,450* .	Permit Application Fee $50 Plan review and inspections $1,450*
Stormwater Management Permit Application (for projects with >1,500 **NEW** impervious or disturbance) The cost of the permit application fee is $50. A professional services (PSA) account will be funded by the applicant with a balance of $3,000. The review process, inspections, SWM Agreement, legal, and other communications will be billed per the attached fee schedule, and reimbursed by the applicant funded PSA. For single lot construction, an escrow for non-dedicated improvements is not required; a Certificate of Occupancy will not be issued unless all improvements are installed, inspected, and approved by the Township. An escrow account will be required for improvements dedicated to the Township. Professional Services Account Required. The applicant is required to pay all cost overages; upon the balance of the PSA reaching $1,000, applicant will be required to deposit appropriate funds to keep balance at $3,000. All unused funds will be returned to the applicant upon completion of project.	Permit Application Fee $50 Professional Service Agreement $3,000	Permit Application Fee $50 Professional Service Agreement $3,000

Fee Description	2021	2022
Subdivision / Land Development ("SALDO")		
Sketch Plan, Reverse Subdivision, Lot line Change, Lot Consolidation. The application fee is $50. This application requires a $3,950 professional services (engineering, legal) account. Upon the balance of the PSA reaching $1,000, applicant will be required to deposit appropriate funds to keep balance at $4,000. All unused funds will be returned to the applicant upon completion of project. A signed deposit slip is required at the time of application submission	Application Fee $50 Professional Services Agreement $3,950	Application Fee $50 Professional Services Agreement $3,950
ALL LAND DEVELOPMENT (minor, major, multi-family, etc.) . The permit application fee is $50. The professional services account fee is $16,950. All reviews and legal invoices are billed against the PSA; when the balance of the PSA falls to $5,000, the applicant is required to deposit funds to achieve a balance of $10,000 in the PSA account. All unused funds will be returned to the applicant upon completion of project. *All reviews and legal invoices are billed against the PSA; when the balance of the PSA falls to $5,000, the applicant is required to deposit funds to achieve a balance of $10,000 in the PSA account. All unused funds will be returned to the applicant upon completion of project.	Application Fee $50 Professional Services Account $16,950* .	Application Fee $50 Professional Services Account $16,950*
Inspections of Improvements Increase based on the service agreement contracts for consultants, approved by the Board of Commissioners in 2020, and staff salary increases.	Inspection by staff inspector-$90/hr. All others, see rates in Appendix A	Inspection by staff inspector-$90/hr. All others, see rates in Appendix A
Review of Development Plans, including legal, SWM agreements, developer agreements, escrow review, financial security agreements, by staff, consultants, and/or solicitor. Increase based on the service agreement contracts for consultants, approved by the Board of Commissioners in 2020, and staff salary increases.	See rates in Appendix A	See rates in Appendix A
Transfer of Real Estate Fee	$150.00 / property	$150.00 / property
Transfer of Real Estate Fee – Expedited in **14 calendar days** or less	$300/property	$300/property

Fee Description	2021	2022
Sewage Enforcement		
Sewage Enforcement Officer Permits	$750.00 per application (includes inspection)	$750.00 per application (includes inspection)
Sewage Enforcement Officer Permits (additional perc test)	$350.00	$350.00
Sewage Enforcement Officer Permits (repairs to existing system)	$300.00	$300.00
Other Engineering		
Sidewalk Replacement Permit Fee	1 – 10 Blocks | $50.00/permit 11 – 20 Blocks | $100.0/permit 21+ Blocks | $125.00/permit	1 – 10 Blocks | $50.00/permit 11 – 20 Blocks | $100.0/permit 21+ Blocks | $125.00/permit
Transfer of Real Estate – Sidewalk Block Escrow	n/a	$300 per block
Clearing Permits | If inspections are required, they will be charged in accordance with Appendix A.	$250/acre (minimum fee is $250)	$250/acre (minimum fee is $250)
Plotter Services		
8.5" x 11" or 9" x 12"	$1.50 (b/w) | $5.00 (color)	$1.50 (b/w) | $5.00 (color)
11" x 14"	$3.00 (b/w) | $9.00 (color)	$3.00 (b/w) | $9.00 (color)
11" x 17" or 12" x 18"	$10.00 (b/w) | $12.00 (color)	$10.00 (b/w) | $12.00 (color)
17" x 22" or 18" x 24"	$15.00 (b/w) | $18.00 (color)	$15.00 (b/w) | $18.00 (color)
22" x 34" or 24" x 36"	$20.00 (b/w) | $22.00 (color)	$20.00 (b/w) | $22.00 (color)
34" x 44" or 36" x 48"	$22.00 (b/w) | $35.00 (color)	$22.00 (b/w) | $35.00 (color)

Fee Description	2021	2022
Stormwater and Sanitary Sewer Fees		
Sanitary Sewer Rent	$7.85 per 1,000 gallons' water used	$7.85 per 1,000 gallons' water used
Sanitary Sewer Rent Delinquent Charges	1% monthly beginning June 1 through March 1 applied on the full outstanding balance from the previous month	1% monthly beginning June 1 through March 1 applied on the full outstanding balance from the previous month
Stormwater Fee	$29.00 per unit	$29.00 per unit
Stormwater Fee Delinquent Charges	0.5% monthly beginning March 1 through December 1 applied on the full outstanding balance from the previous month	0.5% monthly beginning March 1 through December 1 applied on the full outstanding balance from the previous month
Sanitary or Stormwater Certification Fee	$7.50	$7.50
Expedited Sanitary or Stormwater Certification Fee Surcharge (if request submitted within 48 hours of desired date / time)	$20.00	$20.00
Sanitary Sewer Connection Fee | New Residential	$850.00	$850.00
Sanitary Sewer Connection Fee | New Commercial	$1,250.00	$1,250.00
Sanitary Sewer Connection Fee | New Multi-family (0-10 units)	$500.00 per unit	$500.00 per unit
Sanitary Sewer Connection Fee | New Multi-family (11 or more units)	$400.00 per unit	$400.00 per unit
Minimum Sewer Service Charge	$65.00	$65.00
Filing of Lien (to include, but not limited to, Sanitary Sewer Rent, Stormwater Fee, or Property Maintenance Costs)	$125.00 Attorney Fee $18.50 Filing Fee	$125.00 Attorney Fee $18.50 Filing Fee
Writ of Scire Facias (for delinquent accounts)	$100.00 Attorney Fee $22.50 Filing Fee	$100.00 Attorney Fee $22.50 Filing Fee
Entering of Judgement (for delinquent accounts)	$150.00 Attorney Fee $13.50 Filing Fee	$150.00 Attorney Fee $13.50 Filing Fee

Fee Description	2021	2022
Sheriff Sale	Actual Cost	Actual Cost
Other Finance Department		
Business Privilege and Mercantile License Fee	$10.00	$10.00
Postage | Non-Residential	Actual Cost	Actual Cost
Returned Check	$50.00	$50.00
Refund Fee	10% per refund, with a minimum of $10.00	10% per refund, with a minimum of $10.00
Public Document Copy Charges (Right-to-know Requests)	$0.25 per one sided page	$0.25 per one sided page
Public Document CD Creation Charges (Right-to-know Requests)	$5.00 each	$5.00 each
Certification of Record (Right-to-know Requests)	$1.00	$1.00
Elected Treasurer		
Real Estate Certification Fee	$25.00	$25.00
Expedited Real Estate Certification Fee	$30.00	$30.00
Information Technology		
Room Rentals		
General: The Township offers three (x3) conference rooms for rental. Rates double on Saturday, Sunday, and Township holidays. Contact Township for Conference Room and Equipment Rental policy and room availability. Please see the *Information Technology Policy for Rental and Use of Township Conference Rooms & Equipment* for fee waiver opportunities.		
Friends Meeting Room (ground floor) – capacity 40	$50.00 per hour	$50.00 per hour
Radnorshire Room (first floor) – capacity 125	$100.00 per hour	$100.00 per hour
Radnorshire Room (first floor) – capacity 125 - Tenant rental	$250.00 per hour	$250.00 per hour
Powys Room (first floor) – capacity 15	$35.00 per hour	$35.00 per hour

Fee Description	2021	2022
Hourly Equipment and Staffing Fees		
General: Conference rooms offer additional equipment features such as a podium, microphones, special seating configurations, additional tables, A/V equipment, TV/DVD/VCR and wireless internet. A/V equipment rentals require staffing, a minimum of two (x2) hour charge, and rates double after four (x4) hours. Contact Township for Conference Room and Equipment Rental policy and staffing availability.		
IT Staff Member (as needed)	$50.00 /hour	$50.00 /hour
Room setup and breakdown (for equipment, configuration, etc.)	$50.00 /hour	$50.00 /hour
Room cleanup (trash, non-requested setup, etc.)	$100.00 /hour	$100.00 /hour
Podium (Radnorshire room only – no microphone)	$0.00	$0.00
Microphones – 21 conference room and 1 podium microphones	$50.00 /hour	$50.00 /hour
Wireless Microphones – 2 handhelds and 2 lavalieres (combo of any 2)	$30.00 /hour	$30.00 /hour
Projectors – 2 HD DLP Projectors	$70.00 /hour (each)	$70.00 /hour (each)
Monitors – 13 LCD monitors for viewing projections/DVD/VCR	$20.00 /hour	$20.00 /hour
Document Camera – View hard docs on large screens	$60.00 /hour	$60.00 /hour
DVD/VCR	$15.00 /hour	$15.00 /hour
Laptop Use	$40.00 /hour	$40.00 /hour
DVD Copy – Recording event on DVD (limit 1)	$15.00 /hour	$15.00 /hour
Digital Format – Recording event in other digital format (limit 1)	$15.00 /hour	$15.00 /hour
Portable Projector	$50.00 /hour	$50.00 /hour
50” Plasma TV Usage	$70.00 /hour	$70.00 /hour
Graphics – Character generated graphics inserted on screen	$10.00 /hour	$10.00 /hour
Package Fees		
General: Conference rooms, A/V equipment and staffing rentals are available as a package rental. Package rentals require staffing, a minimum of two (x2) hour charge and rates double after four (x4) hours. Contact Township for Conference Room and Equipment Rental Policy and staffing availability.		
Powys Room Only – 50” Plasma and laptop	$100.00 per hour	$100.00 per hour
Radnorshire Room (no recording) – Microphones, laptop, projector, setup and breakdown	$250.00 per hour	$250.00 per hour
Radnorshire Room (recording) – Microphones, laptop, projector, DVD recording, setup and breakdown	$350.00 per hour	$350.00 per hour

Fee Description	2021	2022
Film and Video Production Fees		
General: The film and video production permit is designed to provide effective coordination of events, including the filming and videotaping of television, film, commercial, non-profit, and feature productions.		
Film and video production permit	$250.00 per production	$250.00 per production
Parks and Recreation		
General Programming and Events		
Programming and event fees are determined and allocated on an ongoing basis as they are planned. Specific programming and event identification remains under continual development, generally on a seasonal basis and once applicable direct costs are determined. Fees for those specific programs and events are set to cover the direct costs along with attempting to recover the associated overhead for the corresponding program or event. In the majority of circumstances, the direct costs of programming and events are not incurred unless the proceeds collected cover those costs. The Recreation Department determines the fees for programming and events on an ongoing basis throughout the developmental process.		
Administrative Fees		
Refund Fee	10% of the total fee paid, or a minimum of $10.00 charge	10% of the total fee paid, or a minimum of $10.00 charge
Non-Resident Program or Event Participation Fee	$30.00 per person per registrant	$30.00 per person per registrant
Parks, Picnic Areas, Fields, and Facilities		
Fenimore Woods & Clem Macrone Park Pavilion Rental	$75.00 Resident $150.00 Non-Resident/Companies	$75.00 Resident $150.00 Non-Resident/Companies
Picnic | Court | Park Area Rentals	$55.00 Resident $100.00 Non-Resident / Companies	$55.00 Resident $100.00 Non-Resident / Companies
Photo Permit for Township Park Grounds	$75.00 per hour $100.00 Non-Resident / Companies per hour	$75.00 per hour $100.00 Non-Resident / Companies per hour

Fee Description	2021	2022
Field Permitting Fee (to cover the permitting costs for athletic fields)	$60.00 per field/ Three-hour usage $100.00 per field/ Three-hour usage for Non-Resident / Companies	$75.00 per field/ Three-hour usage $125.00 per field/ Three-hour usage for Non-Resident / Companies
Adult League Team Field Permit	$100.00 per season Not-to-exceed 10-week period	$200.00 per season per team Not-to-exceed 10-weeks
Field Permitting Fee – For-Profit /Restricted Groups, Private Educational Institutions, Organizations or Programs [Field Permitting fees do not apply to Radnor Community Youth Sports Organizations that include Radnor Soccer Club, Radnor Wayne Little League and Radnor Girls/Boys Lacrosse.] [Exceptions for this fee will consist of Radnor Township Restricted Groups, Private Educational Institutions, Organizations or Programs that provide the Township with the equivalent usage of its facility.]	$15.00 per person per season Not-to-exceed 10-week period	$15.00 per person per season Not-to-exceed 10-week period
Radnor Memorial Park Turf Field Permit Fee: [Fee was originally developed and structured within the Radnor Memorial Turf/Agnes Irwin School Lease Agreement.] • Radnor Residents / Radnor Non-Profit Organizations or Programs • Radnor Private Educational Institutions, Organizations or Programs • Non-Radnor Residents / Non-Radnor Non-Profit Organizations, Educational Institutions, or Programs • For-Profit Businesses or Non-Resident Groups [The above fees do not apply to Radnor Community Youth Sports Organizations that include Radnor Soccer Club, Radnor Wayne Little League and Radnor Girls/Boys Lacrosse.] Radnor Memorial Park Turf Field Lights Fee	$75.00 per Three-Hour usage $75.00 per hour $125.00 per hour $175.00 per hour $18.00 per hour	$75.00 per Three-Hour usage $75.00 per hour $125.00 per hour $175.00 per hour $18.00 per hour

Fee Description	2021	2022
Advertising Fee (applicable to the Department Seasonal Recreation Brochure)		
Business Card Advertising in Brochure	$200.00 per Advertisement	$200.00 per Advertisement
Single Edition Publication | Business Card Advertising in Township / Department Publication for Commercial Business	$225.00 per Advertisement	$225.00 per Advertisement
Single Edition Publication - ¼ page Advertising in Township/Department Publication for Commercial Business	$450.00 per Advertisement	$450.00 per Advertisement
Single Edition Publication - ½ page Advertising in Township/Department Publication for Commercial Business	$650.00 per Advertisement	$650.00 per Advertisement
Single Edition – Full-page Advertising in Township/Department Publication for Commercial Business (does not include inside front or back cover)	$950.00 per Advertisement	$950.00 per Advertisement
Township Website Advertising	$600.00 for 3 Months $2,200.00 for 1 year	$600.00 for 3 Months $2,200.00 for 1 year
License Fee Advertising Banner for Encke Fields	$2,000.00 per Field	$2,000.00 per Field
Radnor Activity Center ("RAC") at Sulpizio Gym Permit Fees		
Full Gymnasium Rentals		
• Radnor Residents / Radnor Non-Profit Organizations or Programs [The above fees do not apply to Radnor Community Youth Sports Organization that include the Radnor Youth Basketball League, Radnor Soccer Club, Radnor Wayne Little League and Radnor Girls/Boys Lacrosse]	$60.00 per hour	$60.00 per hour
• Radnor Township Community Youth Sports Organizations operating as non-profit entities only (New fee in 2017)	$15.00 per hour	$15.00 per hour
• Radnor Township Community Youth Sports Organizations – For-profit contracted vendors operating on behalf of the non-profit Community Youth Sports Organization (New fee in 2017)	$35.00 per hour	$35.00 per hour
• Non-Radnor Residents / Non-Radnor Non-Profit Organizations or Groups	$110.00 per hour	$110.00 per hour
• Radnor Township Businesses, Educational Institutions, Organizations, or Programs	$110.00 per hour	$110.00 per hour
• Non-Radnor Businesses, Educational Institutions, Organizations, or Program	$200.00 per hour	$200.00 per hour
Birthday Party / Gymnasium: 2-hour party with event leader and party room	$300.00 Resident $350.00 Non-Resident	$300.00 Resident $350.00 Non-Resident
RAC: Room Add-on Fee to Gym Rental	$25.00 flat fee	$25.00 flat fee
Fee Change Narrative: n/a		

Fee Description	2021	2022
Police Department		
General Fees		
Alarm Registration Fee	$100.00	$100.00
Accident Report Fee	$15.00	$15.00
Fingerprinting Fee	$30.00 for 1/$20.00 per additional card	$30.00 for 1/$20.00 per additional card
Picture Fee	$30.00 each	$30.00 each
Incident Report Fee	As allowed per PA Right-to-Know	As allowed per PA Right-to-Know
Parking Permit Fee | Residential Permits	$25.00 Residential $75.00 Non-Residential $10.00 Senior Citizens $5.00 Temporary Parking Per Day	$25.00 Residential $75.00 Non-Residential $10.00 Senior Citizens $5.00 Temporary Parking Per Day
Parking Permit Fee | Louella Park and Walk	$190.00 Half Year $375.00 Full Year	$190.00 Half Year $375.00 Full Year
Meter Bag Fee/Parking Space Reservation	$10.00 per day per parking space	$15.00 per day per parking space
Request for Placement of Temporary "No Parking" Signs	$25.00 Flat Fee	$25.00 Flat Fee
Peddling and Solicitation Fee	$110.00	$110.00
Extra Duty Fee | Detail Rate	1.70 X Patrolman Overtime Rate	1.70 X Patrolman Overtime Rate
Police Vehicle at Location Fee (owner request)	$25.00 per hour per vehicle	$25.00 per hour per vehicle
Video Tape / DVD Fee	$75.00 per copy	$75.00 per copy
Records Check Fee	$30.00 Written $15.00 Verbal	$30.00 Written $15.00 Verbal
Police Service Fee | Notarized Document	$45.00 per service	$45.00 per service
Expungement Letter Fee	$100.00	$100.00
K9 Services (Note: This only applies to non-emergency calls for service)	During Shift | $100.00 per hour 2 or 4-hour minimum at P.D. discretion	During Shift | $100.00 per hour 2 or 4-hour minimum at P.D. discretion

Fee Description	2021	2022
K9 Services (Note: This only applies to non-emergency calls for service) (continued)	Non-Shift | Paid at Detail Rate (above) 2 or 4-hour minimum at P.D. discretion	Non-Shift | Paid at Detail Rate (above) 2 or 4-hour minimum at P.D. discretion
False Alarms Fine	2nd False Activation $25.00 | 3rd False Activation $75.00 | 4th and Subsequent False Activations $125.00	2nd False Activation $25.00 | 3rd False Activation $75.00 | 4th and Subsequent False Activations $125.00
Parking Fine – Late Fee If Radnor Township has not received payment for a violation within five days after the date of violation, a late fee addition to the fine will be assessed. Failure to pay this fine and/or late fee within 30 days of the violation will result in issuance of a summons and prosecution before a District Justice	$25.00 additional for late payments	$25.00 additional for late payments
Parked Over the Line at a Meter	$20.00	$20.00
Backed into meter space	$20.00	$20.00
Beyond Time (Meter Feeding)	$20.00	$20.00
Overtime Parking	$20.00	$20.00
Where signs Prohibit Parking	$20.00	$20.00
In Front of a Private Drive	$25.00	$25.00
On a Cross Walk	$20.00	$20.00
Double Parked	$25.00	$25.00
Not Parallel with Curb	$20.00	$20.00
Facing Against Traffic	$15.00	$15.00
On a Sidewalk	$25.00	$25.00
Within 15 Feet of a Fire Hydrant	$25.00	$25.00
Within 25 Feet of an Intersection	$20.00	$20.00
Parked During Snow Removal	$25.00	$25.00
Obstructing Traffic	$20.00	$20.00
Handicap Parking	$150.00	$150.00
Other Parking Violation	$20.00	$20.00
Violation of Fire Marshal	$25.00	$25.00

Fee Description	2021	2022
Fee Change Narrative:		

The ticket prices, with the exception of Meter/Kiosk, Parked Over the Line at Meter, Meter Feeding and Handicapped violations, haven't changed or been updated since 2004.

Public Works Department		
General Fees		
Road Opening Permit The applicant will be required to set up a Professional Services Account with the Township to cover the cost of inspections, legal, compaction testing, and items, as required. Opening balance of the PSA is $15,000,	$150.00 per 100 ft cut (permit fee only).	$150.00 per 100 ft cut (permit fee only).
Bulk Trash Collection	$75.00 | Less than 5 items or 150 lbs Add'l $25.00 each additional 5 items over 150 lbs Add'l $25.00 each item over 150 lbs Add'l $10.00 each item with Freon Add'l $5.00 each item with Propane	$75.00 | Less than 5 items or 150 lbs Add'l $25.00 each additional 5 items over 150 lbs Add'l $25.00 each item over 150 lbs Add'l $10.00 each item with Freon Add'l $5.00 each item with Propane
Recycling Can Replacement	$30.00 per can	$30.00 per can
Rear Yard Trash Collection (single and multi-family units with less than 9 attached units)	$500.00 per house/unit per year	$500.00 per house/unit per year
Rear Yard Trash Collection (multi-family units with greater than 9 attached units)	$275.00 per unit per year	$275.00 per unit per year

Appendix A

Professional Services Hourly Rates

Township Staff	
Township Manager	$125.00 per hour
Police Superintendent	$140.00 per hour
Assistant Township Manager & Finance Director	$120.00 per hour
Engineer	$113.00 per hour
Police Lieutenant	$120.00 per hour
Community Development Director	$90.00 per hour
Recreational Programming Director	$90.00 per hour
Public Works Director	$90.00 per hour
Engineering Inspector	$90.00 per hour
Information Technology	$65.00 per hour
Gannett Fleming, Inc.	
Senior Project -Manager	$175.00 per hour
Project Engineer	$130.00 per hour
Staff Engineer	$120.00 per hour
Engineering Technician	$105.00 per hour
Field Technician	$90.00 per hour
Clerical	$70.00 per hour
Specialty Engineers, Scientists and Planners (as needed)	TBD
QCI, Inc.	
Field Inspector (Civil)	$80.00 per hour
Owner's Representative (Clerk of the Works)	$87 per hour
Contract Administrator	$118.50 per hour
Construction Engineer, PE	$133 per hour
Clerical	$61.00 per hour
Document Controller	$71.50 per hour
Gilmore & Associates, Inc.	
Principal III	$160 per hour
Principal II	$150 per hour
Principal I	$145 per hour
Consulting Professional V	$140 per hour
Consulting Professional IV	$135 per hour
Consulting Professional III	$130 per hour
Consulting Professional II	$125 per hour

Consulting Professional I	$120 per hour
Design Technician V	$115 per hour
Design Technician IV	$105 per hour
Design Technician III	$100 per hour
Design Technician II	$95 per hour
Design Technician I	$90 per hour
Construction Representative III	$110 per hour
Construction Representatives II	$100 per hour
Construction Representatives I	$90 per hour
Surveying Crew	$150 per hour
Project Assistant	$85 per hour
Grim, Biehn & Thatcher	
Township Solicitor	$190 per hour

ORDINANCE 2021-___

TOWNSHIP OF RADNOR
Delaware County, Pennsylvania

AN ORDINANCE AUTHORIZING THE INCURRENCE BY THE TOWNSHIP OF RADNOR OF NONELECTORAL DEBT BY THE ISSUANCE OF GENERAL OBLIGATION BONDS, SERIES A OF 2021 (FEDERALLY TAXABLE) IN AN AGGREGATE PRINCIPAL AMOUNT NOT TO EXCEED $15,500,000 FOR THE PURPOSE OF PROVIDING FUNDS TO ADVANCE REFUND ALL OR A PORTION OF THE TOWNSHIP'S OUTSTANDING GENERAL OBLIGATION NOTES, SERIES B OF 2013 (TAX-EXEMPT) AND TO PAY THE COSTS OF ISSUANCE OF THE BONDS; AUTHORIZING THE PREPARATION AND FILING OF A DEBT STATEMENT AND OTHER DOCUMENTATION; PROVIDING FOR THE ADVANCE REFUNDING OF THE DEBT BEING REFUNDED AND AUTHORIZING A PLEDGE AND ESCROW AGREEMENT FOR SUCH PURPOSE; COVENANTING TO CREATE A SINKING FUND AND TO BUDGET, APPROPRIATE AND PAY DEBT SERVICE ON THE BONDS; PLEDGING THE FULL FAITH, CREDIT AND TAXING POWER OF THE TOWNSHIP FOR THE PROMPT AND FULL PAYMENT OF THE BONDS; SETTING FORTH THE SUBSTANTIAL FORM OF THE BONDS; SETTING FORTH THE STATED PRINCIPAL MATURITY OR SINKING FUND REDEMPTION DATES AND MAXIMUM PRINCIPAL AMOUNTS, MAXIMUM INTEREST RATES AND INTEREST PAYMENT DATES, PLACE OF PAYMENT, SINKING FUND PROVISIONS AND OTHER DETAILS OF THE BONDS; APPROVING THE CONTENT AND FORM OF A PRELIMINARY OFFICIAL STATEMENT AND AUTHORIZING THE DISTRIBUTION THEREOF AND AUTHORIZING THE PREPARATION, EXECUTION AND DELIVERY OF AN OFFICIAL STATEMENT; AUTHORIZING THE EXECUTION OF A PAYING AGENT AGREEMENT AND A CONTINUING DISCLOSURE AGREEMENT OR SUPPLEMENT; FINDING THAT A PRIVATE NEGOTIATED SALE OF THE BONDS IS IN THE BEST FINANCIAL INTEREST OF THE TOWNSHIP; ACCEPTING A PROPOSAL FOR THE PURCHASE OF THE BONDS WITHIN CERTAIN PARAMETERS; APPOINTING A PAYING AGENT AND SINKING FUND DEPOSITORY; AND AUTHORIZING OTHER NECESSARY ACTION.

WHEREAS, pursuant to the Local Government Unit Debt Act, 53 Pa. Cons. Stat. §8001 *et seq.* (the "Act"), the Township of Radnor, Delaware County, Pennsylvania (the "Township") may incur indebtedness for the purpose of refunding prior indebtedness; and

WHEREAS, on June 13, 2013, the Township issued nonelectoral debt evidenced by its $14,350,000 principal amount General Obligation Notes, Series B of 2013 (Tax-Exempt) (DCED Approval No. GON-13061003, June 10, 2013) (the "2013B Notes"), which were issued to (i) advance refund the Township's General Obligation Bonds, Series of 2004 (the "2004 Bonds"); and (ii) fund the costs and expenses of issuing the 2013B Notes; and

WHEREAS, the 2004 Bonds were issued to (i) currently refund the Township's General Obligation Note, Series of 2003 (the "2003 Note"); (ii) fund the construction and renovation of the Township Municipal Building and various capital projects; (iii) make loans to the Wayne Art

Center (the "Art Center") and the Radnor Memorial Library (the "Library"); and (iv) fund the costs and expenses of issuing the 2004 Bonds; and

WHEREAS, the Township has determined to undertake a refinancing to achieve debt service savings (the "Refunding Program") consisting of the advance refunding of all or a portion of the outstanding 2013B Notes, in the outstanding principal amount of $12,845,000 (the notes being so refunded, all of which are nonelectoral debt, are referred to herein as the "Refunded Notes"); and

WHEREAS, the Township proposes to issue its General Obligation Bonds, Series A of 2021 (Federally Taxable) (the "Bonds") in the maximum aggregate principal amount of $15,500,000 to provide funds to finance (i) the advance refunding of the Refunded Notes; and (ii) the payment of the costs and expenses of issuing the Bonds; and

WHEREAS, the Board of Commissioners of the Township (the "Board") has determined that the net savings to be generated by the Refunding Program (the "Required Savings") must be equal to at least three percent (3.0%) of the principal amount of the Refunded Notes ; and

WHEREAS, the Board has considered the possible manners of sale provided for in the Act with respect to the sale of the Bonds, such manners of sale being at public sale or private sale by negotiation or upon invitation; and

WHEREAS, the Township has determined that it is in the best financial interest of the Township to sell the Bonds at private negotiated sale, and the Township has received a proposal for the purchase of the Bonds (the "Purchase Proposal") from Boenning & Scattergood, Inc., of West Conshohocken, Pennsylvania (the "Underwriter"), containing the financial parameters for, and conditions to, the underwriting and issuance of the Bonds (the "Parameters"), which will be supplemented by an addendum to the Purchase Proposal (the "Addendum") containing the final terms of the Bonds, consistent with the Parameters and the Required Savings; and

WHEREAS, the Board desires to approve the issuance of the Bonds, approve the Refunding Program, and accept the Purchase Proposal of the Underwriter; and

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of the Township of Radnor and IT IS HEREBY RESOLVED, as follows:

1. Authorization of the Refunding Program and Incurrence of Indebtedness; and Purpose of the Refunding Program. The Township hereby approves the Refunding Program as described in the preambles to this Ordinance, and shall incur indebtedness, pursuant to the Act, in an aggregate principal amount not to exceed $15,500,000 to finance the costs of the Refunding Program and the costs and expenses of issuing the Bonds.

It is hereby determined and set forth that the purpose of the Refunding Program is to reduce the total debt service that would otherwise be payable on the Refunded Notes over the life of the issue. Attached hereto as **Exhibit B** and made a part hereof is the schedule of the estimated debt service savings in connection with the refinancing of the Refunded Notes computed in accordance with Section 8242(b) of the Act.

The 2013B Notes were issued to (i) advance refund the 2004 Bonds; and (ii) fund the costs and expenses of issuing the 2013B Notes

The 2004 Bonds were issued to (i) currently refund the 2003 Note; (ii) fund the construction and renovation of the Township Municipal Building and various capital projects; (iii) make loans to the Art Center (the "2004 Art Center Loan") and the Library (the "Library Loan"); and (iv) fund the costs and expenses of issuing the 2004 Bonds.

The 2003 Note was issued to finance the cost of construction and acquisitions of various capital improvements for the Township facilities. The estimated useful lives of the projects financed with the proceeds of the 2003 Note was determined by the Township to be 29.21 years, which is currently 11.21 years.

The estimated useful life of the construction and renovation of the Township Municipal Building and various capital projects financed with the proceeds of the 2004 Bonds was determined by the Township to be thirty-five (35) years, which is currently eighteen (18) years.

The estimated useful life of the project financed from the 2004 Art Center Loan, which loan was financed with the proceeds of the 2004 Bonds, was determined to be thirty (30) years, which is currently thirteen (13) years.

The estimated useful life of the project financed from the Library Loan, which loan was financed with the proceeds of the 2004 Bonds, was determined to be twenty-five (25) years, which is currently eight (8) years.

A portion of the proceeds of the 2004 Bonds allocable to the Library Loan was returned to the Township and repurposed for Township purposes. The ordinance of the Township authorizing the issuance of the 2013B Notes amended the original purpose for which the such portion of the 2004 Bonds were originally issued to include the financing of various parking lot and building improvements at the Township Municipal Building, including, but not limited to, installing an expanded parking field (approx. 25 additional spaces) on the site as well as internal building improvements including the construction of new walls, electrical wiring, network connections, and other necessary appurtenances to accommodate the relocation of the Police Administration to the ground floor of the building (the "Repurposed Funds Projects"). The estimated useful lives of the Repurposed Funds Projects were determined to be not less than the estimated useful life of the projects that were to be financed with the Library Loan, which was twenty-five (25) years. The remaining useful lives of the Repurposed Funds Projects is currently at least eight (8) years.

The Township further determined that the 2004 Bonds and the 2013B Notes were scheduled to mature in accordance with the limitations set forth in the Act.

The realistic estimated useful lives of the projects described above were determined at the time of issuance of the 2003 Note and the 2004 Bonds and, with respect to the Repurposes Funds Projects, the 2013B Notes. Such determinations are hereby ratified and confirmed, and the principal amount of the Bonds equal to the separate cost of the portions of such projects having an unexpired shorter useful lives than the period during which the Bonds will be outstanding have been scheduled to mature prior to the end of such useful life and the balance prior to the end of the

longest unexpired useful life. The maturities of the Bonds will not extend beyond the final maturity of the 2013B Notes.

2. Authorization of Issuance of the Bonds. The Township shall issue, pursuant to the Act and this Ordinance, its General Obligation Bonds, Series A of 2021 (Federally Taxable), in a maximum aggregate principal amount not to exceed $15,500,000, in order to provide funds for and toward the costs of the Refunding Program and paying the costs of issuing the Bonds as authorized and provided in Section 1 hereof. The Township reserves the right to issue the Bonds in an amount less than the maximum principal amount authorized hereunder and to cancel any unused authorization hereunder in accordance with the terms of the Act. The Bonds may be issued in one or more separate series, at any one time or from time to time, and if issued in more than one series, each series shall be appropriately designated by year and specific series name. In the event the Bonds are issued from time to time, all authorizations and approvals set forth herein shall extend to such additional documents and actions of the type expressly authorized and approved herein with respect to such additional series of Bonds, including, but not limited to, additional Preliminary Official Statements, Official Statements, Addendums, Continuing Disclosure Agreements, Paying Agent agreements, and sinking funds as necessary in connection with the issuance of such series of Bonds.

3. Type of Indebtedness. The indebtedness evidenced by the Bonds is nonelectoral debt.

4. Execution of Debt Statement; Bonds and Other Documents. The President or Vice President of the Board and the Secretary of the Township and their successors are hereby authorized and directed to file the Debt Statement required by Section 8110 of the Act, to execute and deliver the Bonds in the name and on behalf of the Township and to take all other action required by the Act or this Ordinance in order to effect the issuance of the Bonds. Said officers or any of them are further authorized to apply to the Department of Community and Economic Development for approval of the debt herein authorized and to file with such application a transcript of the proceedings including a certified copy of this Ordinance, the Debt Statement, a Borrowing Base Certificate signed by the appropriate officials of the Township or by the accountants of the Township responsible for auditing its financial affairs, and to take any and all such further action and to execute and deliver such other documents as may be necessary or proper to comply with all requirements of the Act or to carry out the intent and purpose of this Ordinance. Said officers and their successors are further hereby authorized if, in their opinion, it is advisable to do so, to prepare and file such statements and documents as may be required by Sections 8024 or 8026 of the Act in order to qualify all or any portion of the existing indebtedness of the Township or of the Bonds as subsidized debt or self-liquidating debt.

5. Type of Bonds. The Bonds when issued will be general obligation bonds.

6. Covenant to Pay Debt Service - Pledge of Taxing Power. The Township hereby covenants with the registered owners of the Bonds: (a) that the Township will include in its budget for each fiscal year for the life of the Bonds, the amount of the debt service on the Bonds issued hereunder which will be payable in each such fiscal year so long as the Bonds shall remain outstanding; (b) that the Township shall appropriate from its general revenues such amounts to the payment of such debt service; (c) that the Township shall duly and punctually pay or cause to be

paid from the Sinking Fund (as hereinafter defined) or any of its other revenues or funds the principal of every Bond and the interest thereon at the dates and places and in the manner stated in the Bonds according to the true intent and meaning thereof; and (d) for such budgeting, appropriation and payment the Township hereby pledges its full faith, credit and taxing power. This covenant shall be specifically enforceable. The maximum amounts to be budgeted, appropriated and paid pursuant to the foregoing covenants shall not exceed those set forth in **Exhibit C** attached hereto and made a part hereof which are hereby incorporated in the foregoing covenant with the same effect as if the same were specified in the text of such covenant.

7. Form of Bonds. The Bonds shall be substantially in the form set forth in **Exhibit A** hereto, with appropriate omissions, insertions and variations.

8. Terms of Bonds. The Bonds shall be issued in fully registered form, in the denomination of $5,000 or any integral multiple thereof and shall be dated the date of issuance thereof or such other date as the Township and the Underwriter shall agree. The Bonds shall be issued in an aggregate principal amount not to exceed $15,500,000. The interest rates on the Bonds shall not exceed five and a half percent (5.500%) per annum. No yield on the Bonds for any stated maturity date in the last two-thirds of the period of the Bonds may be less than that stated for the immediately preceding year. The Bonds shall mature or be subject to sinking fund redemption in annual principal amounts not to exceed the maximum principal amount for each fiscal year as set forth in **Exhibit C** hereto.

The Bonds are being amortized so that the debt service on all outstanding debt of the Township following the issuance of the Bonds will be brought more nearly into an overall level annual debt service plan.

The principal of the Bonds shall be payable in lawful money of the United States of America at the corporate trust office of U.S. Bank National Association, in Philadelphia Pennsylvania, which is hereby appointed paying agent and registrar for the Bonds and the sinking fund depository (the "Paying Agent"). Interest on the Bonds shall be payable in the manner provided in the form of Bonds set forth in **Exhibit A** hereto.

9. Redemption of Bonds. The Bonds shall be subject to redemption prior to maturity, at the option of the Township, as a whole or in part from time to time, in any order of maturity or portion of a maturity as selected by the Township, on a date not earlier than the eighth (8th) anniversary of the issuance of such Bonds, or any date thereafter upon payment of a redemption price of 100% of principal amount plus interest accrued to the redemption date. If any of the Bonds are to be issued and delivered as term bonds, (i) such term bonds shall be subject to mandatory sinking fund redemption on such date or dates and in such principal amount or amounts as shall be necessary to conform to the principal retirement schedule set forth in **Exhibit C** hereto and (ii) in lieu of such mandatory sinking fund redemption, the Paying Agent, with the approval of the Township, may purchase from money in the Sinking Fund, at a price not to exceed the principal amount thereof plus accrued interest, or the Township may tender to the Paying Agent, all or part of the Bonds subject to being drawn for redemption in any such year

If less than an entire year's maturity of Bonds is to be redeemed at any particular time, such Bonds so to be called for redemption shall be chosen by lot by the Paying Agent.

In the event that a portion, but not all of the term bonds are redeemed pursuant to optional redemption, then the principal amount of any remaining mandatory sinking fund redemptions and the final maturity applicable to such term bonds shall be proportionately reduced (subject to the Paying Agent making such adjustments as it deems necessary to be able to affect future redemptions of such Bonds in authorized denominations) unless the Township directs an alternate reduction of such mandatory sinking fund redemptions and final maturity.

For the purpose of selection of Bonds for redemption, any Bond of a denomination greater than $5,000 shall be treated as representing such number of separate Bonds, each of the denomination of $5,000, as is obtained by dividing the actual principal amount of such Bond by $5,000. Any Bond which is to be redeemed only in part shall be surrendered at the corporate trust office of the Paying Agent in Philadelphia, Pennsylvania, together with a duly executed instrument of transfer in form satisfactory to the Paying Agent, and the registered owner of such Bond shall receive, without service charge, a new Bond or Bonds, of any authorized denomination as requested by such registered owner in aggregate principal amount equal to and in exchange for the unredeemed portion of the principal of the Bond so surrendered.

On the date designated for redemption, and upon deposit with the Paying Agent of funds sufficient for payment of the principal of and accrued interest on the Bonds called for redemption, interest on the Bonds or portions thereof so called for redemption shall cease to accrue and the Bonds or portions thereof so called for redemption shall cease to be entitled to any benefit of security hereunder, and registered owners of the Bonds so called for redemption shall have no rights with respect to the Bonds or portions thereof so called for redemption, except to receive payment of the principal of and accrued interest on the Bonds so called for redemption to the date fixed for redemption.

Notice of any redemption shall be given by first class mail, postage prepaid, mailed by the Paying Agent not less than 20 or more than 60 days before the redemption date to the registered owners of the Bonds at their addresses as they appear on the bond register maintained by the Paying Agent. Such notice shall also be filed by the Paying Agent with the Municipal Securities Rulemaking Board. Such notice shall be given in the name of the Township, shall identify the Bonds to be redeemed (and, in the case of a partial redemption of any Bonds, the respective principal amounts thereof to be redeemed), shall specify the redemption date and the redemption price, and shall state that on the redemption date the Bonds called for redemption will be payable at the corporate trust office of the Paying Agent in Philadelphia, Pennsylvania and that from the date of redemption interest will cease to accrue. The Paying Agent shall use "CUSIP" numbers (if then generally in use) in notices of redemption as a convenience to Bond owners, provided that any such redemption notice shall state that no representation is made as to the correctness of such numbers either as printed on the Bonds or as contained in any notice of redemption and that reliance may be placed only on the identification numbers prefixed "R-" printed on the Bonds. Failure to mail any notice of redemption, or any defect therein, or in the mailing thereof, with respect to any Bond shall not affect the validity of any proceeding for redemption of other Bonds so called for redemption.

With respect to any optional redemption of the Bonds, if at the time of mailing such notice of redemption, the Township shall not have deposited with the Paying Agent monies sufficient to redeem all the Bonds called for redemption, such notice may state that it is conditional, that is,

subject to the deposit of the redemption monies with the Paying Agent not later than the redemption date, and such notice shall be of no effect unless such monies are so deposited.

10. Appointment of Securities Depository. The Depository Trust Company, New York, New York ("DTC"), shall act as securities depository for the Bonds on behalf of the firms which participate in the DTC book-entry system ("DTC Participants"). The ownership of one fully registered Bond for each maturity of the Bonds will be registered in the name of Cede & Co., as nominee for DTC. Each Bond certificate will be in the aggregate principal amount of such maturity. The Township shall cause the Bonds to be delivered to DTC or the Paying Agent, as custodian for DTC, on or before the date of issuance of the Bonds.

Pursuant to the book-entry only system, any person for whom a DTC Participant acquires an interest in the Bonds (the "Beneficial Owner") will not receive bond certificates and will not be the registered owner thereof. Ownership interest in the Bonds may be purchased by or through DTC Participants. Each DTC Participant will receive a credit balance in the records of DTC in the amount of such DTC Participant's interest in the Bonds, which will be confirmed in accordance with DTC's standard procedures. Receipt by the Beneficial Owners (through any DTC Participant) of timely payment of principal, premium, if any, and interest on the Bonds, is subject to DTC making such payment to DTC Participants and such DTC Participants making payment to Beneficial Owners. Neither the Township nor the Paying Agent will have any direct responsibility or obligation to such DTC Participants or the persons for whom they act as nominees for any failure of DTC to act or make any payment with respect to the Bonds.

The Township is authorized to execute such documents as may be necessary or desirable in connection with DTC's services as securities depository including a blanket letter of representation obligating the Township to give certain notices to DTC and to meet certain requirements relating to Bond payments.

If DTC determines to discontinue providing its services as securities depository with respect to the Bonds at any time, the Township officials then holding the offices set forth in Section 4 of this Ordinance are hereby authorized to designate a successor securities depository or to deliver certificates to or upon the order of the registered owners of the Bonds.

The Township shall give notice or cause the Paying Agent to give notice, to DTC in accordance with the Blanket Letter of Representations for the redemption or other retirement of all of the Bonds. The Township will provide for the form of notice. Upon receipt of such notice, DTC will forward the notice to the DTC Participants for subsequent forwarding of such notice to the Beneficial Owners of the Bonds. The Township will pay the customary charges for such mailing.

11. Sale of Bonds. The Bonds shall be sold at private sale by negotiation as hereinafter set forth in Section 14. After due consideration, the Board hereby finds and determines, on the basis of all available information, that a private negotiated sale of the Bonds is in the best financial interest of the Township.

12. Creation of and Deposits in Sinking Fund. The Township covenants that there shall be and there is hereby established and that it shall hereafter maintain a sinking fund

designated “Sinking Fund - General Obligation Bonds, Series A of 2021 (Federally Taxable)” for the Bonds (the “Sinking Fund”) to be held by the Paying Agent (or such substitute or successor Paying Agent which shall hereafter be appointed in accordance with the provisions of the Act) in the name of the Township, but subject to withdrawal only by the Paying Agent.

The Township covenants and agrees to deposit in such Sinking Fund no later than each Interest Payment Date (as defined in the form of the Bonds attached hereto), the debt service payable on the Bonds on such dates, which shall not exceed the maximum amounts set forth in **Exhibit C** attached hereto, or such greater or lesser amount as at the time shall be sufficient to pay principal of and interest on the Bonds becoming due on each such date.

Pending application to the purpose for which such Sinking Fund is established, the President or Vice President of the Board is hereby authorized and directed to cause the monies therein to be invested or deposited and insured or secured as permitted and required by Section 8224 of the Act. All income received on such deposits or investments of monies in such Sinking Fund during each applicable period shall be added to such Sinking Fund and shall be credited against the deposit next required to be made in such Sinking Fund.

The Paying Agent is hereby authorized and directed, without further action by the Township, to pay from such Sinking Fund the principal of and interest on the Bonds as the same become due and payable in accordance with the terms thereof and the Township hereby covenants that such monies, to the extent required, will be applied to such purpose.

All monies deposited in the Sinking Fund for the payment of the Bonds which have not been claimed by the registered owners thereof after two years from the date when payment is due, except where such monies are held for the payment of outstanding checks, drafts or other instruments of the Paying Agent, shall be returned to the Township. Nothing contained herein shall relieve the Township of its liability to the registered owners of the unpresented Bonds.

13. No Taxes Assumed. The Township shall not assume the payment of any tax or taxes in consideration of the purchase of the Bonds.

14. Award and Sale of Bonds. The Township hereby awards and sells the Bonds to the Underwriter at a price of no less than ninety percent (90%) and no more than one hundred twenty percent (120%) of the principal amount of the Bonds (including original issue discount or premium and the underwriter’s discount) plus accrued interest from the dated date of the Bonds to the date of delivery and in accordance with the other terms and conditions contained or incorporated in the Purchase Proposal of the Underwriter dated November 8, 2021 which is hereby approved and accepted. The underwriter’s discount for the Bonds shall not exceed 0.70% of the principal amount of the Bonds. A copy of said Purchase Proposal shall be attached to this Ordinance and lodged with the official minutes of this meeting and is hereby incorporated herein by reference. The proper officers of the Township are hereby authorized and directed to endorse the acceptance of the Township on said Purchase Proposal and to deliver executed copies thereof to the Underwriter. The Township Manager or the Director of Finance is authorized to accept the Addendum to the Purchase Proposal setting forth the final terms of the Bonds within the Parameters set forth in this Ordinance, and at such time as the Required Savings are achieved in

the case of Bonds issued for the Refunding Program. The Required Savings must be equal to at least three percent (3.0%) of the principal amount of the Refunded Notes.

15. Contract with Paying Agent. The proper officers of the Township are authorized to contract with U.S. Bank National Association, Philadelphia, Pennsylvania, in connection with the performance of its duties as the Paying Agent and Sinking Fund Depository on usual and customary terms, including an agreement to observe and comply with the provisions of this Ordinance and of the Act.

16. Redemption of Refunded Notes. The Township shall enter into a Pledge and Escrow Agreement (the "Pledge Agreement") with the paying agent for the Refunded Notes, U.S. Bank National Association, Philadelphia, Pennsylvania (the "Escrow Agent"), providing, among other things for: (a) the certification to the Escrow Agent of the amounts required to pay the principal and interest on the Refunded Notes to the date of maturity or redemption; (b) the deposit with the Escrow Agent of amounts which, together with the interest thereon, will meet such requirements; (c) the irrevocable pledge of all amounts and investments held under the Pledge Agreement for the payment of the Refunded Notes to the date of maturity or redemption and the application of the principal of and interest on the investments to such purposes. The Pledge Agreement shall be in form and substance as approved by the signing officers of the Township. The President or Vice President and the Secretary or Assistant Secretary of the Township are hereby authorized and directed to execute such Pledge Agreement and to deliver the same to the Escrow Agent on behalf of the Township and to appoint a verification agent as required in connection with the Pledge Agreement and the refunding of the Refunded Notes.

The Township hereby calls the Refunded Notes for redemption on July 15, 2023, subject to the issuance of the Bonds.

The officers of the Township are hereby authorized and directed to execute all documents and to take such other action as may be necessary or advisable to effect the refunding, redemption and payment of the Refunded Notes. Upon redemption of the Refunded Notes, any excess moneys shall be transferred by the Escrow Agent to the Paying Agent, and the Paying Agent shall deposit the same in the Sinking Fund for the Bonds.

The Township hereby authorizes the Escrow Agent, the Financial Advisor, the Underwriter or their respective representatives to subscribe for U.S. Treasury State and Local Government Series Securities, or to purchase such other obligations as further determined by the Township and set forth in the Pledge Agreement, for deposit into the escrow account under the Pledge Agreement.

17. Execution and Authentication of Bonds. As provided in Section 4, the Bonds shall be executed by the President or the Vice President of the Board and the Secretary of the Township and each such execution shall be by manual or facsimile signature. If any officer whose signature appears on the Bonds shall cease to hold such office before the actual delivery date of the Bonds, such signature shall nevertheless be valid and sufficient for all purposes as if such person had remained in such office until the actual delivery date of the Bonds. The Bonds shall be authenticated by the manual signature of an authorized representative of the Paying Agent.

18. Application of Bond Proceeds. The purchase price for the Bonds, and any accrued interest payable by the Underwriter, shall be paid by the Underwriter to the Paying Agent on behalf of the Township. Upon receipt of the purchase price for the Bonds, including interest thereon accrued to the date of delivery, if any, the Paying Agent shall deposit the same in a settlement account. From the settlement account, the Paying Agent shall pay, or establish reserves for payment of, the costs and expenses of the financing, and shall deposit certain of the proceeds of Bonds with the Escrow Agent, and the proper officers of the Township are authorized to direct the Paying Agent to pay such amounts on behalf of the Township and to make such deposits, all as set forth in written directions to the Paying Agent.

19. Approval of Official Statement. The Township hereby approves and "deems final" the Preliminary Official Statement for the Bonds for purposes of United States Securities and Exchange Commission Rule 15c2-12. A final Official Statement containing the final terms of the Bonds, shall be prepared and delivered to the Underwriter within seven (7) business days from the date of establishment of the final terms of the Bonds, and the Township hereby approves the use thereof in connection with the public offering and sale of the Bonds.

20. Continuing Disclosure. The Township hereby authorizes and directs the appropriate officers to execute and deliver a Continuing Disclosure Agreement or a supplement to an existing Continuing Disclosure Agreement of the Township (the "Continuing Disclosure Agreement") if and to the extent required by law. The Township further covenants and agrees that it will comply with and carry out all of the provisions of the Continuing Disclosure Agreement. Notwithstanding any other provision of this Ordinance, failure of the Township to comply with the Continuing Disclosure Agreement shall not be considered an event of default hereunder or under the Bonds; however, the Paying Agent, any Participating Underwriter (as defined in the Continuing Disclosure Agreement), or any Bondholder may take such actions as may be necessary and appropriate, including seeking specific performance by court order, to cause the Township to comply with its obligations under this Section.

21. Covenant to Pledge Sufficient Funds. The Township hereby covenants and agrees that, concurrently with the issuance of and payment for the Bonds:

1. The Township will have irrevocably pledged with the Escrow Agent, amounts sufficient, together with interest, if any, to be earned thereon, to pay: all interest on the Refunded Notes to the date of redemption thereof; and the principal of the Refunded Notes at the date of redemption thereof so that the Refunded Notes will no longer be outstanding under the Act; and

2. Said Escrow Agent will have invested the monies required by any escrow agreement or directions in accordance with the terms thereof.

22. Officers Authorized to Act. For the purpose of expediting the closing and the issuance and delivery of the Bonds, or in the event that the President of the Board or the Secretary of the Township shall be absent or otherwise unavailable for the purpose of executing documents, or for the purpose of taking any other action which they or any of them may be authorized to take pursuant to this Ordinance, the Vice President of the Board or the Assistant Secretary of the

Township, respectively, are hereby authorized and directed to execute documents, or otherwise to act on behalf of the Township in their stead.

23. Contract with Bond Owners. This Ordinance constitutes a contract with the registered owners of the Bonds outstanding hereunder and shall be enforceable in accordance with the provisions of the laws of the Commonwealth of Pennsylvania.

24. Binding Effect of Covenants and Agreements. All covenants, obligations and agreements of the Township set forth in this Ordinance and in the documents authorized hereby shall be deemed to be the covenants, obligations and agreements of the Township to the full extent authorized or permitted by law, and all such covenants, obligations and agreements shall be binding upon the Township and its successors from time to time and upon any board or body to which any powers or duties affecting the same shall be transferred by or in accordance with law. Except as otherwise provided in this Ordinance, all rights, powers and privileges conferred and duties and liabilities imposed upon the Township or the members thereof by the provisions of this Ordinance or the documents authorized hereby shall be exercised or performed, by such members, officers or other representatives of the Township as may be required or permitted by law to exercise or perform the same. No covenant, obligation or agreement herein contained or contained in any documents authorized hereby shall be deemed to be a covenant, obligation or agreement of any commissioner, officer, agent or employee of the Township in his or her individual capacity and neither the Commissioners of the Township nor any officer executing the other documents authorized by this Ordinance shall be liable personally thereunder or be subject to any personal liability or accountability by reason of the execution and delivery thereof.

25. Bond Counsel. The Township hereby appoints Cozen O'Connor to act as Bond Counsel to the Township with respect to the transactions contemplated by this Ordinance.

26. Further Action. The proper officers of the Township are hereby authorized and directed to take all such action, execute, deliver, file and/or record all such documents, publish all notices and otherwise comply with the provisions of this Ordinance and the Act in the name and on behalf of the Township, including, but not limited to, executing an amended and/or restated loan agreement and promissory note with the Art Center, if necessary or desirable, in connection with the issuance of the Bonds.

27. Act Applicable to Bonds. This Ordinance is enacted pursuant to, and the Bonds issued hereunder shall be subject to, the provisions of the Act and all of the mandatory provisions thereof shall apply hereunder whether or not explicitly stated herein.

28. Severability. In case any one or more of the provisions contained in this Ordinance or in any Bond shall for any reason be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision of this Ordinance or of said Bonds, and this Ordinance or said Bonds shall be construed and enforced as if such invalid, illegal or unenforceable provisions had never been contained therein.

29. Repealer. All ordinances and parts of ordinances heretofore enacted to the extent that the same are inconsistent herewith are hereby repealed.

30. **Effective Date.** This Ordinance shall take effect on the earliest date permitted by the Act.

ENACTED this 8th day of November, 2021.

(TOWNSHIP SEAL)

TOWNSHIP OF RADNOR

ATTEST

Secretary	President Board of Commissioners

EXHIBIT A

[FORM OF BOND]

UNITED STATES OF AMERICA

COMMONWEALTH OF PENNSYLVANIA

TOWNSHIP OF RADNOR

GENERAL OBLIGATION BOND, SERIES A OF 2021
(FEDERALLY TAXABLE)

No. R- $_____

INTEREST RATE	MATURITY DATE	ORIGINAL ISSUANCE DATE	CUSIP
	_____ __, ____	_____ __, 2021	

REGISTERED OWNER: CEDE & CO.

PRINCIPAL SUM: DOLLARS

Township of Radnor, Delaware County, Pennsylvania (the "Township"), a political subdivision of the Commonwealth of Pennsylvania, for value received, hereby promises to pay to the registered owner hereof on the Maturity Date set forth above the Principal Sum set forth above, unless this Bond shall have been called for redemption and payment of the redemption price shall have been made or duly provided for, and to pay interest thereon from the Original Issuance Date set forth above or the most recent Interest Payment Date to which interest has been paid or duly, provided for, semiannually on _____ __ and _____ __ of each year, commencing _____ __, 20__ (each, an "Interest Payment Date"), at the interest rate specified above, calculated on the basis of a 360-day year of twelve 30-day months until the principal sum is paid or has been provided for.

Interest is payable to the registered owner of this Bond from the Interest Payment Date next preceding the authentication date of the Bond, unless: (a) this Bond is authenticated as of an Interest Payment Date, in which event it shall bear interest from such Interest Payment Date; (b) this Bond is registered and authenticated after a Regular Record Date (hereinafter defined) and before the next succeeding Interest Payment Date, in which event it shall bear interest from such succeeding Interest Payment Date; (c) such Bond is registered and authenticated on or prior to the Regular Record Date preceding _____ __, 20__, in which event it shall bear interest from _____ __, 20__; or (d) as shown by the records of the Paying Agent interest on this Bond

shall be in default, in which event it shall bear interest from the date on which interest was last paid on this Bond.

The principal of this Bond is payable upon presentation and surrender hereof at the corporate trust office of U.S. Bank National Association, in Philadelphia, Pennsylvania (the "Paying Agent"). Interest on this Bond will be paid on each Interest Payment Date by check mailed to the person in whose name this Bond is registered on the registration books of the Township maintained by the Paying Agent, as bond registrar, at the address appearing, thereon at the close of business on the fifteenth (15th) day (whether or not a day on which the Paying Agent is open for business) next preceding such Interest Payment Date (the "Regular Record Date"). Any such interest not so timely paid or duly provided for shall cease to be payable to the person who is the registered owner hereof as of the Regular Record Date, and shall be payable to the person who is the registered owner hereof at the close of business on a Special Record Date for the payment of such defaulted interest. Such Special Record Date shall be fixed by the Paying Agent whenever monies become available for payment of the defaulted interest, and notice of the Special Record Date and payment date for such interest shall be given by first class mail to the registered owners of the Bonds not less than ten (10) days prior to the Special Record Date. Such notice shall be mailed to the persons in whose names the Bonds are registered at the close of business on the fifth (5th) day preceding the date of mailing. The principal of and interest on this Bond are payable in lawful money of the United States of America.

Notwithstanding the foregoing, so long as this Bond is registered in the name of The Depository Trust Company ("DTC") or its nominee, Cede & Co., payment of principal and interest on this Bond shall be payable in the manner and at the respective times of payment provided for in DTC's Operational Arrangements, as they may be amended from time to time.

This Bond is one of a duly authorized issue of General Obligation Bonds, Series A of 2021 (Federally Taxable), of the Township in the aggregate principal amount of $_____ (the "Bonds") issued in fully registered form in denominations of $5,000 and integral multiples of $5,000 in excess thereof, all issued in accordance with the Local Government Unit Debt Act, 53 Pa. Cons. Stat. §8001 et seq., as amended (the "Act"), and pursuant to an Ordinance of the Board of Commissioners of the Township duly enacted on November 8, 2021 (the "Ordinance") and a Paying Agent Agreement between the Township and the Paying Agent dated as of _____ __, 2021 (the "Paying Agent Agreement"). The Bonds are issued for the purpose of financing a refunding program, and paying the costs of issuing the Bonds, as described in the Ordinance.

Under the laws of the Commonwealth of Pennsylvania, this Bond and the interest thereon shall at all times be free from taxation within the Commonwealth of Pennsylvania, but this exemption shall not extend to gift, estate, succession or inheritance taxes or to any other taxes not levied or assessed directly on this Bond or the interest thereon. Profits, gains or income derived from the sale, exchange, or other disposition of this Bond are subject to state and local taxation.

The Bonds maturing on or after _____ __, 20__ are subject to redemption prior to maturity at the option of the Township as a whole or from time to time in part, in any order of maturity or portion of a maturity as selected by the Township on _____ __, 20__ or any date thereafter, upon payment of a redemption price of 100% of principal amount plus interest accrued to the redemption date. If less than an entire year's maturity of Bonds are to be redeemed at any

particular time, such Bonds so to be called for redemption shall be chosen by lot by the Paying Agent.

The Bonds stated to mature on _____ __, ____ and _____ __, ____ (the "Term Bonds") are subject to mandatory redemption prior to their stated maturity by lot by the Township from monies to be deposited in the Sinking Fund established under the Ordinance at a redemption price of 100% of the principal amount thereof plus accrued interest to the date fixed for redemption. The Township hereby covenants that it will cause the Paying Agent to select by lot, to give notice of redemption and to redeem Term Bonds at said price from monies deposited in the Sinking Fund sufficient to effect such redemption (to the extent that Term Bonds shall not have been previously purchased from said monies by the Township as permitted under the Ordinance) on _____ __ of the years, from the maturities and in the annual principal amounts set forth in the following schedule (or such lesser principal amount as shall at the time represent all Term Bonds which shall then be outstanding):

Mandatory Redemption Schedule

Redemption Date (_____ __)	Maturity From Which Selected	Principal Amount to be Redeemed or Purchased

In the event that a portion, but not all of the Term Bonds are redeemed pursuant to optional redemption, then the principal amount of any remaining mandatory sinking fund redemptions and the final maturity applicable to the Term Bonds shall be proportionately reduced (subject to the Paying Agent making such adjustments as it deems necessary to be able to affect future redemptions of such Bonds in authorized denominations) unless the Township directs an alternate reduction of such mandatory sinking fund redemptions and final maturity.

For the purpose of selection of Bonds for redemption, any Bond of a denomination greater than $5,000 shall be treated as representing such number of separate Bonds, each of the denomination of $5,000, as is obtained by dividing the actual principal amount of such Bond by $5,000. Any Bond which is to be redeemed only in part shall be surrendered at the corporate trust office of the Paying Agent in Philadelphia, Pennsylvania, together with a duly executed instrument of transfer in form satisfactory to the Paying Agent, and the registered owner of such Bond shall receive, without service charge, a new Bond or Bonds, of any authorized denomination as requested by such registered owner in aggregate principal amount equal to and in exchange for the unredeemed portion of the principal of the Bond so surrendered.

On the date designated for redemption, and upon deposit with the Paying Agent of funds sufficient for payment of the principal of and accrued interest on the Bonds called for redemption, interest on the Bonds or portions thereof so called for redemption shall cease to accrue and the Bonds or portions thereof so called for redemption shall cease to be entitled to any benefit of security hereunder, and registered owners of the Bonds so called for redemption shall have no rights with respect to the Bonds or portions thereof so called for redemption, except to receive payment of the principal of and accrued interest on the Bonds so called for redemption to the date fixed for redemption.

Notice of any redemption shall be given by first class mail, postage prepaid, mailed by the Paying Agent not less than 20 or more than 60 days before the redemption date to the registered owners of the Bonds at their addresses as they appear on the Bond register maintained by the Paying Agent. Such notice shall be given in the name of the Township, shall identify the Bonds to be redeemed (and, in the case of a partial redemption of any Bonds, the respective principal amounts thereof to be redeemed), shall specify the redemption date and the redemption price, and shall state that on the redemption date the Bonds called for redemption will be payable at the corporate trust office of the Paying Agent in Philadelphia, Pennsylvania and that from the date of redemption interest will cease to accrue. The Paying Agent shall use "CUSIP" numbers (if then generally in use) in notices of redemption as a convenience to Bond owners, provided that any such redemption notice shall state that no representation is made as to the correctness of such numbers either as printed on the Bonds or as contained in any notice of redemption and the reliance may be placed only on the identification numbers prefixed "R-" printed on the Bonds. Failure to mail any notice of redemption, or any defect therein, or in the mailing thereof, with respect to any Bond shall not affect the validity of any proceeding for redemption of other Bonds so called for redemption.

With respect to any optional redemption of the Bonds, if at the time of mailing such notice of redemption, the Township shall not have deposited with the Paying Agent monies sufficient to redeem all the Bonds called for redemption, such notice may state that it is conditional, that is, subject to the deposit of the redemption monies with the Paying Agent not later than the redemption date, and such notice shall be of no effect unless such monies are so deposited.

The Township and the Paying Agent may treat the person in whose name this Bond is registered on the Bond register maintained by the Paying Agent as the absolute owner of this Bond for all purposes and neither the Township nor the Paying Agent shall be affected by any notice to the contrary. The Bonds are being issued by means of a book-entry system, with actual bond certificates evidencing ownership of the Bonds immobilized at either DTC, New York, New York (the "Securities Depository"), or its successor as Securities Depository or with the Paying Agent, as custodian for DTC. Transfers of beneficial ownership of the Bonds shall be effected on the records of the Securities Depository and its participants pursuant to the rules and procedures established by the Securities Depository.

So long as the Bonds are issued in book-entry form, actual bond certificates are not available for distribution to the beneficial owners and the principal and interest on the Bonds are payable to Cede & Co., as nominee of the Securities Depository. Transfer of principal and interest payments to participants of the Securities Depository is the responsibility of the Securities Depository; transfers of principal and interest to beneficial owners of the Bonds by participants of the Securities Depository will be the responsibility of such participants and other nominees of beneficial owners. The Township and the Paying Agent are not responsible or liable for maintaining, supervising or reviewing the records maintained by the Securities Depository, its participants or persons acting through such participants. If the Bonds are no longer registered to a Securities Depository or its nominee, the Bonds are transferable by the registered owners thereof, subject to payment of any required tax, fee or other governmental charge, upon presentation and surrender at the corporate trust office of the Paying Agent in, Philadelphia, Pennsylvania, together with a duly executed instrument of transfer in form satisfactory to the Paying Agent. The Paying Agent shall not be required: (i) to issue, transfer or exchange any of the Bonds during a period

beginning at the close of business on the fifth (5th) day next preceding the day of selection of Bonds to be redeemed and ending at the close of business on the day on which such notice is given, or (ii) to transfer or exchange any Bond selected for redemption in whole or in part.

No recourse shall be had for the payment of the principal of or interest on this Bond, or for any claim based hereon, against any commissioner, officer or employee, past, present or future, of the Township or of any successor body, as such, either directly or through the Township or through any such successor body under any constitutional provision, statute or rule of law, or by the enforcement of any assessment or by any legal or equitable proceeding or otherwise, and all such liability of such commissioners, officers or employees is released as a condition of and as consideration for the execution and issuance of this Bond.

Whenever the due date for payment of interest on or principal of this Bond shall be a Saturday, Sunday, a legal holiday or a day on which banking institutions in the Commonwealth of Pennsylvania or in the jurisdiction in which the corporate trust or payment office of the paying agent is located are authorized or required by law or executive order to close (a "Holiday"), then the payment of such interest or principal need not be made on such date, but may be made on the succeeding day which is not a Holiday, with the same force and effect as if made on the due date for payment of principal or interest.

It is hereby certified that the approval of the Department of Community and Economic Development of the Commonwealth of Pennsylvania for the Township to issue and deliver this Bond has been duly given pursuant to the Act; that all acts, conditions and things required by the laws of the Commonwealth of Pennsylvania to exist, to have happened or to have been performed, precedent to or in the issuance of this Bond or in the creation of the debt of which this Bond is evidence, exist, have happened and have been performed in regular and due form and manner as required by law; that this Bond, together with all other indebtedness of the Township, is within every debt and other limit prescribed by the Constitution and the statutes of the Commonwealth of Pennsylvania; that the Township has established a sinking fund for the Bonds and shall deposit therein amounts sufficient to pay the principal of and interest on the Bonds as the same shall become due and payable; and that for the prompt and full payment of all obligations of this Bond, the full faith, credit and taxing power of the Township are hereby irrevocably pledged.

This Bond shall not be entitled to any benefit under the Ordinance or be valid or become obligatory for any purpose until this Bond shall have been authenticated by the Paying Agent by execution of the certificate endorsed hereon.

IN WITNESS WHEREOF, the Township of Radnor, Delaware County, Pennsylvania has caused this Bond to be signed in its name and on its behalf by the signature of the President of its Board of Commissioners and an impression of its corporate seal to be hereunto affixed, duly attested by the signature of the Secretary of the Township.

TOWNSHIP OF RADNOR

By:_____
President, Board of Commissioners

Attest:_____
Secretary

(SEAL)

AUTHENTICATION CERTIFICATE

This Bond is one of the Township of Radnor General Obligation Bonds, Series A of 2021 (Federally Taxable), described in the within mentioned Ordinance.

DATE OF AUTHENTICATION:

U.S. BANK NATIONAL ASSOCIATION,
Paying Agent

By: _____
Authorized Representative

ASSIGNMENT AND TRANSFER

FOR VALUE RECEIVED, the undersigned hereby sells, assigns and transfers unto

PLEASE INSERT SOCIAL SECURITY OR EMPLOYER IDENTIFICATION NUMBER OF ASSIGNEE

/_____/

_____

the within Bond and all rights thereunder, and hereby irrevocably constitutes and appoints

_____ attorney to transfer said Bond on the books of the within named Paying Agent, with full power of substitution in the premises.

Dated:

Signature Guaranteed by:

NOTICE: Signature(s) must be guaranteed by an eligible guarantor institution, an institution which is a participant in a Securities Transfer Association recognized signature guaranteed program.	NOTICE: The signature to this Assignment must correspond with the name as it appears upon the face of the within Bond in every particular, without alteration or enlargement or any change whatever.

_____

(Authorized Signature)

[END OF BOND FORM]

TOWNSHIP OF RADNOR

General Obligation Bonds, Series A of 2021
(Federally Taxable)

EXHIBIT B

SCHEDULE OF ESTIMATED DEBT SERVICE SAVINGS RELATED TO THE REFUNDING OF THE REFUNDED NOTES IN ACCORDANCE WITH SECTION 8242(b) OF THE ACT

Year Ending	New Debt Service		Refunded Bond Debt Service	Savings
	-	-	-	-
12/31/2022	352,655.00		393,150.00	40,495.00
12/31/2023	353,016.50		393,150.00	40,133.50
12/31/2024	1,222,232.50		1,263,150.00	40,917.50
12/31/2025	1,224,152.50		1,268,350.00	44,197.50
12/31/2026	1,226,912.50		1,266,950.00	40,037.50
12/31/2027	1,218,457.50		1,260,962.50	42,505.00
12/31/2028	1,212,129.50		1,257,012.50	44,883.00
12/31/2029	1,214,069.50		1,257,312.50	43,243.00
12/31/2030	1,188,953.50		1,229,162.50	40,209.00
12/31/2031	1,187,866.50		1,230,850.00	42,983.50
12/31/2032	1,185,298.50		1,226,400.00	41,101.50
12/31/2033	1,190,657.00		1,232,800.00	42,143.00
12/31/2034	1,183,644.00		1,227,200.00	43,556.00
Total	**$13,960,045.00**		**$14,506,450.00**	**$546,405.00**

TOWNSHIP OF RADNOR

General Obligation Bonds, Series A of 2021
(Federally Taxable)

EXHIBIT C

MAXIMUM BOND AMORTIZATION SCHEDULE

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
11/15/2021	-	-	-	-	-
01/15/2022	-	-	142,083.33	142,083.33	-
07/15/2022	1,150,000.00	5.500%	426,250.00	1,576,250.00	1,718,333.33
01/15/2023	-	-	394,625.00	394,625.00	-
07/15/2023	1,150,000.00	5.500%	394,625.00	1,544,625.00	1,939,250.00
01/15/2024	-	-	363,000.00	363,000.00	-
07/15/2024	1,150,000.00	5.500%	363,000.00	1,513,000.00	1,876,000.00
01/15/2025	-	-	331,375.00	331,375.00	-
07/15/2025	1,160,000.00	5.500%	331,375.00	1,491,375.00	1,822,750.00
01/15/2026	-	-	299,475.00	299,475.00	-
07/15/2026	1,165,000.00	5.500%	299,475.00	1,464,475.00	1,763,950.00
01/15/2027	-	-	267,437.50	267,437.50	-
07/15/2027	1,170,000.00	5.500%	267,437.50	1,437,437.50	1,704,875.00
01/15/2028	-	-	235,262.50	235,262.50	-
07/15/2028	1,200,000.00	5.500%	235,262.50	1,435,262.50	1,670,525.00
01/15/2029	-	-	202,262.50	202,262.50	-
07/15/2029	1,200,000.00	5.500%	202,262.50	1,402,262.50	1,604,525.00
01/15/2030	-	-	169,262.50	169,262.50	-
07/15/2030	1,230,000.00	5.500%	169,262.50	1,399,262.50	1,568,525.00
01/15/2031	-	-	135,437.50	135,437.50	-
07/15/2031	1,230,000.00	5.500%	135,437.50	1,365,437.50	1,500,875.00
01/15/2032	-	-	101,612.50	101,612.50	-
07/15/2032	1,230,000.00	5.500%	101,612.50	1,331,612.50	1,433,225.00
01/15/2033	-	-	67,787.50	67,787.50	-
07/15/2033	1,235,000.00	5.500%	67,787.50	1,302,787.50	1,370,575.00
01/15/2034	-	-	33,825.00	33,825.00	-
07/15/2034	1,230,000.00	5.500%	33,825.00	1,263,825.00	1,297,650.00
Total	**$15,500,000.00**	**-**	**$5,771,058.33**	**$21,271,058.33**	**-**

CERTIFICATE OF SECRETARY

The undersigned, Secretary of the Township of Radnor HEREBY CERTIFIES that:

The foregoing Ordinance authorizing the issuance of General Obligation Bonds, Series A of 2021 (Federally Taxable) of the Township was duly moved and seconded and enacted by a majority vote of all the Board of Commissioners of said Township at a duly called and convened meeting of said Board held on November 8, 2021; that public notice of said meeting was given as required by law; and that the roll of the Board of Commissioners was called and such members voted or were absent as follows:

Name	**Vote**
Jack Larkin, President	_____
Moira Mulroney, Esq., Vice President	_____
Jake Abel	_____
Catherine Agnew	_____
Richard F. Booker, Esq.	_____
Lisa Borowski	_____
Sean Farhy	_____

and that such Ordinance and the votes thereon have been duly recorded in the minutes.

WITNESS my hand and seal of the Township this 8th day of November, 2021.

_____
William M. White, Secretary

(TOWNSHIP SEAL)

TOWNSHIP OF RADNOR
(Delaware County, Pennsylvania)

RESOLUTION 2021-131

REIMBURSEMENT RESOLUTION

WHEREAS, the Township of Radnor (the "**Issuer**") expects to issue one or more series of tax-exempt obligations (collectively, the "**Tax-Exempt Obligations**") in the aggregate principal amount no to exceed $15,000,000.00 to provide funds for the costs of the acquisition, construction, reconstruction, renovation, improvement, installation and/or equipping of various storm water management infrastructure and improvement projects (the "**Project**");

WHEREAS, the Issuer expects to pay certain expenditures (the "**Reimbursement Expenditures**") in connection with the Project prior to the issuance of the Tax-Exempt Obligations for the purpose of financing costs associated with the Project on a long-term basis;

WHEREAS, the Issuer reasonably expects that certain of the proceeds of the Tax-Exempt Obligations will be used to reimburse the Reimbursement Expenditures; and

WHEREAS, this Resolution is intended to constitute a statement of "Official Intent" pursuant to Treasury Regulation §1.150-2.

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of the Township of Radnor (the "**Governing Body**") as follows:

1. The Issuer finds and determines that the foregoing recitals are true and correct.

2. In accordance with Treasury Regulation §1.150-2, the Issuer hereby states its official intent that a portion of the proceeds of the Tax-Exempt Obligations will be used to reimburse itself for Reimbursement Expenditures. This declaration does not bind the Issuer to make any expenditure, incur any indebtedness, or proceed with the Project.

3. The Issuer intends to reimburse itself for Reimbursement Expenditures through the incurrence of debt to be evidenced by the Tax-Exempt Obligations. All expenditures to be reimbursed will be capital expenditures (as defined in Treasury Regulation §1.150-1(b)) or certain other expenditures qualifying pursuant to Treasury Regulation §1.150-2(f).

4. The maximum principal amount of the Tax-Exempt Obligations expected to be issued for the Project and to reimburse the Reimbursement Expenditures is $15,000,000, including the costs of issuance of the Tax-Exempt Obligations, but exclusive of original issue discount.

5. Once the Tax-Exempt Obligations are issued, the Issuer shall allocate, or cause to be allocated, Bond proceeds to reimburse the Reimbursement Expenditures; provided that, except as permitted under Treasury Regulation §1.150-2(f), such costs to be reimbursed were paid not more than 60 days prior to the date hereof. Such allocation shall specifically identify the actual expenditure to be reimbursed and shall occur not later than 18 months after the later of (i) the date on which the expenditure is paid, or (ii) the date the Project is placed in service, but in no event more than 3 years after the expenditure is paid.

Adopted: _____, 2021

TOWNSHIP OF RADNOR
(Delaware County, Pennsylvania)

Secretary's Certificate

I hereby certify that the foregoing is a true and correct copy of a resolution adopted by a majority vote of the Governing Body of the Township of Radnor at a meeting of said Governing Body duly and regularly called and held on _____, 2021; that public notice of said meeting was given in the manner provided by law; that said resolution has been duly recorded upon the minutes of the Governing Body, has not been amended or rescinded and is in full force and effect on the date of this Certificate.

(SEAL) _____

Secretary

Dated: _____, 2021

ORDINANCE NO. 2021-13

AN ORDINANCE OF THE BOARD OF COMMISSIONERS OF THE TOWNSHIP OF RADNOR AMENDING ARTICLES II AND III OF CHAPTER 260 OF THE RADNOR TOWNSHIP CODE, RELATING TO THE MERCANTILE TAX AND THE BUSINESS PRIVILEGE TAX, TO REQUIRE ROUNDING TO THE NEAREST DOLLAR

WHEREAS, the Board of Commissioners of Radnor Township, pursuant to the authority of the Local Tax Enabling Act, 53 P.S. §6924.101, et seq., as amended, and the Radnor Township Home Rule Charter, imposes certain Mercantile and Business Privilege Taxes ("Taxes"), as stated in Chapter 260 of the Radnor Township Code (the "Tax Code"); and

WHEREAS, to improve administration of the Taxes, the Board wishes to require that all amounts of gross receipts reported and taxes calculated on the returns for the Taxes be rounded to the nearest dollar; and

WHEREAS, the Board does not desire or intend to change the subject or rate of the tax, nor shall this amendment be interpreted as changing the rate or subject of the tax;

NOW THEREFORE, IT IS HEREBY ENACTED AND ORDAINED by the Board of Commissioners of Radnor Township, as follows:

Section 1. Amendment of Section 260-26, Chapter 260, Article II of the Radnor Township Code. Section 260-26(A) shall be amended to include the following additional sentence:

> In reporting gross receipts and calculating tax due, taxpayers shall round to the nearest dollar.

Section 2. Amendment of Section 260-45, Chapter 260, Article II of the Radnor Township Code. Section 260-45(A) shall be amended to include the following additional sentence:

> In reporting gross receipts and calculating tax due, taxpayers shall round to the nearest dollar.

Section 3. This Ordinance does not, nor is it intended to, nor shall it be interpreted to, expand the subject or measure of the taxes imposed in Articles II and III.

Section 4. This Ordinance shall become effective one (1) day after enactment or upon recordation of this Ordinance within the Township's official Ordinance Book, whichever comes later.

ENACTED AND ORDAINED this 22nd day of November, 2021.

RADNOR TOWNSHIP

By: _____
Name: Jack Larkin
Title: President

ATTEST:

_____
Name: William White
Title: Township Manager / Secretary

Radnor Township

PROPOSED LEGISLATION

DATE: November 8, 2021

TO: **Board of Commissioners**

FROM: **Robert V. Tate, Jr.,** Finance Director

LEGISLATION: Ordinance 2021-13 amending Chapter 260, Taxation, Article II & III relating to the Mercantile Tax and Business Privilege Tax, to require rounding to the nearest dollar in the preparation and filing of the annual business tax returns.

LEGISLATIVE HISTORY: As currently written, Chapter 260 grants authority to the Township to collect Mercantile and Business Privilege Taxes and requires the taxpayer to account for and report the financial summary of their operations to the penny. The ordinance currently does not provide for rounding to the nearest dollar.

PURPOSE AND EXPLANATION: The Administration, in working with our Act 511 solicitor, and in support of their efforts to effectively enforce the ordinance and collect the tax, supports the enactment of this legislation which will provide for rounding to the nearest dollar and avoid de minimus discrepancies that may occur with carrying calculations to the penny.

This amendment will bring the taxing ordinance in line with IRS practices which have allowed for rounding since the early 1990's, a decision that was made to minimize the number of arithmetic errors and increase efficiency in processing tax returns, payments and refunds.

FISCAL IMPACT: In analyzing a sample of 1,752 payment transactions processed in 2021, the negative fiscal impact would have been $5.87.

RECOMMENDED ACTION: The Administration respectfully recommends that Ordinance 2021-13 be introduced on November 8, 2021 and subsequently adopted on November 22, 2021. Thank you for your consideration.

RESOLUTION NO. 2021-129

A RESOLUTION OF RADNOR TOWNSHIP, DELAWARE COUNTY, PENNSYLVANIA, AUTHORIZING THE PAYMENT OF CHANGE ORDERS #4 AND #6 THROUGH 16 TO ROAD-CON, INC. FOR THE RADNOR TAP TRAIL PROJECT FOR A TOTAL OF $160,099.01

WHEREAS, The contractor for the Radnor TAP Trail project has encountered: actual quantities of materials which are different from those in the original plans; necessary items which were omitted from the original plans; adjustments needed for unsuitable soil conditions; adjustments based on unforeseen field conditions; anticipated adjustments for items, which could not be fully quantified at the time of design; and miscellaneous balancing of quantity overruns and underruns;

WHEREAS, All of these change orders have been reviewed with contractor and the Township's contract administrator and inspector and are recommended for approval; and

WHEREAS, the total cost of the change orders, including those under consideration at this time is within the project contingency.

NOW, THEREFORE, be it ***RESOLVED*** by the Board of Commissioners of Radnor Township does hereby Authorize the Payment of Change Orders #4 and 6 through 16 to Road-Con, Inc. for the Radnor TAP Trail Project for a Total of $160,099.01.

SO RESOLVED this 8th day of November, A.D., 2021.

RADNOR TOWNSHIP

By: _____
Name: Jack Larkin
Title: President

ATTEST: _____
William M. White
Manager/Secretary

Radnor Township

PROPOSED LEGISLATION

DATE: November 2, 2021

TO: Radnor Township Board of Commissioners

FROM: Dennis P. Capella, Engineering Project Manager

CC: William M. White, Township Manager
Stephen F. Norcini, P.E., Township Engineer

LEGISLATION: **Resolution No. 2021-129: Authorizing the Payment of Change Orders #4 and 6 through 16 to Road-Con, Inc. for the Radnor TAP Trail Project for a Total of $160,099.01**

LEGISLATIVE HISTORY: The Board of Commissioners awarded the construction contract for the Radnor TAP Trail to Road-Con, Inc. at its November 23, 2020 meeting (Resolution No. 2020-141). The Board has also approved change orders at two other meetings (Resolution Nos. 2021-36 and 2021-54). The change orders under consideration at this meeting have not been before the Commissioners previously.

PURPOSE AND EXPLANATION: Other change orders have been approved through the Township Manager's approval limit of $7,500. The total amount of the change orders approved previously, including those though resolutions, is $97,779.20. Since the prior change orders, the TAP Trail contractor has encountered: actual quantities of materials which are different from those in the original plans; necessary items which were omitted from the original plans; adjustments needed for unsuitable soil conditions; adjustments based on unforeseen field conditions; anticipated adjustments for items, which could not be fully quantified at the time of design; and miscellaneous balancing of quantity overruns and underruns. All of these change orders have been reviewed and negotiated with contractor and the Township's contract administrator and inspector, and the final amount is recommended for approval. Following is the summary of the change orders under consideration by the Board at this time.

CO #	Description/Explanation	Cost
4	Additional stormwater basin cleanouts and endcaps needed from the quantity in the original bid form.	$ 3,348.96
6	Additional estate fencing needed from the quantity in the original bid form.	18,150.00
7	Asphalt quantity adjustment required for the design/build curb ramp designs.	10,760.78
8	Bark mulch needed in the landscape beds but not in the original plans.	3,200.40
9	Miscellaneous excavation overruns and underruns.	(53,298.79)
10	Additional excavation quantities resulting from unsuitable soils.	28,804.86
11	Changes required for the design/build curb ramps beyond the estimated bid amounts.	49,042.09
12	Additional Formula B seed required to stabilize disturbed areas.	7,043.71
13	Additional topsoil required due to unforeseen field conditions.	87,503.40
14	Additional corrugated metal pipe.	1,653.75
15	Custom inlet grates unaccounted for in the original plans.	3,612.63
16	Replacement of sign for Bryn Mawr Realty.	277.22
	TOTAL COST OF THE ABOVE CHANGE ORDERS	$ 160,099.01

A 15% contingency, i.e., $280,000.00, was included in the cost allocation. The total cost of the change orders to date of $257,878.21 is covered by the contingency. One more change order to address the malfunctioning of one of the stormwater management basins must still be considered, and the proposed resolution to this problem is currently under review by the Pennsylvania Department of Environmental Protection.

IMPLEMENTATION SCHEDULE: Pending Board of Commissioners approval, the Change Orders will be approved and a requisition will be entered into the financial system.

FISCAL IMPACT: The Township requested that the contingency be included in the total project cost. The primary source of funding for the TAP Trail project is from PennDOT in the amount of $1,000,000. The Township has also received grant funding through three other sources: PA Department of Conservation and Natural Resources in the amount of $500,000; PA Department of Community and Economic Development in the amount of $225,000; and Delaware County in the amount of $500,000. Total grant funding: $2,225,000.00. Township 2019 General Obligation Bond proceeds of 379,652.00 provides remaining funds for this project.

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RECOMMENDED ACTION: *Staff respectfully requests the Board of Commissioners of Radnor Township to authorize the Payment of Change Orders #4 and 6 through 16 to Road-Con, Inc. for the Radnor TAP Trail Project for a Total of $160,099.01.*

RESOLUTION NO. 2021-130

**A RESOLUTION OF RADNOR TOWNSHIP,
DELAWARE COUNTY, PENNSYLVANIA,
AUTHORIZING THE PAYMENT OF THE CHANGE ORDER FOR
ENVIRONMENTAL TESTING AND EVALUATION FOR ARSENIC FOR
THE RADNOR TRAIL EXTESNION TO
CAMPBELL THOMAS & COMPANY IN THE AMOUNT OF $55,480.**

WHEREAS, the Radnor Trail Extension is ready to proceed towards final design and construction;

WHEREAS, the project has received grants and intended proceeds from the 2019 General Obligation Bond;

WHEREAS, it is necessary to address the arsenic found in samples with the trail extension corridor;

WHEREAS, the Township has received additional grant funding for the arsenic remediation; and

WHEREAS, the Campbell Thomas & Company has submitted a proposed change order for the additionally needed testing and evaluation prior to completing design and full determination of required remediation.

NOW, THEREFORE, be it ***RESOLVED*** by the Board of Commissioners of Radnor Township does hereby authorize the Payment of the Change Order for Environmental Testing and Evaluation for Arsenic for the Radnor Trail Extension to Campbell Thomas & Company, in the Amount of $55,480.

SO RESOLVED this 8th day of November, A.D., 2021.

RADNOR TOWNSHIP

By: _____
Name: Jack Larkin
Title: President

ATTEST: _____
William M. White
Manager/Secretary

Radnor Township

PROPOSED LEGISLATION

DATE: November 2, 2021

TO: Radnor Township Board of Commissioners

FROM: Dennis P. Capella, Engineering Project Manager

CC: William M. White, Township Manager
Stephen F. Norcini, P.E., Township Engineer

LEGISLATION: **Resolution #2021-130: Authorizing the Payment of Change Order #3 for Environmental Testing and Evaluation for Arsenic for the Radnor Trail Extension to Campbell Thomas & Company, in the Amount of $55,480.**

LEGISLATIVE HISTORY: The Board of Commissioners awarded the initial engineering services contract for the Radnor Trail Extension to Campbell Thomas & Co. in 2016 (Resolution No. 2016-58) and amended it in 2020 to include full design services (Resolution No. 2020-37). Additionally, the Board authorized the application for grant funds in 2019 (Resolution No. 2019-24). The change order under consideration at this meeting has not been before the Board previously.

PURPOSE AND EXPLANATION: The design of the Radnor Trail Extension from the current terminus at Radnor Chester Road to I-476 has been progressing. However, soil samples taken in August 2020 were found to include arsenic. After consideration of various options to address this issue, the opportunity to receive Delaware County Green Ways grant funding became available, and the Township applied for grants for additional testing and for subsequent remediation. As to the remediation, the Township determined that the better approach would be to remove the contaminated soil instead of capping the contaminated area, which would require perpetual monitoring. The Township was awarded a grant for the remediation in the amount of $407,454. Current estimates for the remediation is $235,000 – 535,000, depending on the amount of soil which ultimately needs to be removed. However, the Township did not receive a grant for the additional testing. This change order, as presented in the attached proposal, will be used for that purpose.

IMPLEMENTATION SCHEDULE: Upon approval by the Board of Commissioners, a requisition will be entered into the financial system and the change order will be signed.

FISCAL IMPACT: The cost of this change order will be funded through the proceeds of the 2019 General Obligation Bond. As to the cost of the entire project, it is estimated at $672,665 in the GOB. The Township has received prior grant funding of $50,000 and $232,000 from the Commonwealth of Pennsylvania. As stated, the Delaware County grant of $407,454 will be used for anticipated remediation.

RECOMMENDED ACTION: *Staff requests the Board of Commissioners of Radnor Township to authorize the payment of this Change Order for Environmental Testing and Evaluation for Arsenic for the Radnor Trail Extension to Campbell Thomas & Company, in the Amount of $55,480.*

Radnor Township
Steve Norcini, PE, Township Engineer
301 Iven Avenue, Wayne PA 19087

Re: Proposal for Professional Services for Radnor Trail Extension 9-23-2021
Amendment for Additional Environmental Investigation and Coordination

September 23, 2021

Dear Mr. Norcini:

As you know our initial contract for Design and Construction Phase services for the Radnor Trail Extension was negotiated and executed in 2016 and renegotiated in January of 2020 due to delays caused by budget and funding. We've experienced further delays that have expanded the scope and magnitude of our services from those first two agreements, primarily due to dealing with the presence of arsenic on the site revealed testing performed in the later part of last year. Based on a review of our hours expended on the project, they have again exceeded those anticipated under the revised proposal. While some of the services of the original scope, such as completion of the final design, final PennDOT approval and bidding and construction phase services have not been completed, the time that would have been directed towards these services has been redirected to other efforts in the interest of moving the project forward that were not part of the original scope, including but not limited to the following:

- Developing approaches to determine the extent of the arsenic on the site.
- Continuing assistance with and coordination of the agreement with PennDOT.
- Consideration of design alternatives for the trail and alternate methods for addressing the arsenic.
- Assistance in dealing with PennDOT regarding funding for further testing and remediation of the arsenic.
- Continuing meetings and coordination to the present date in an effort to keep the project moving forward.

At this time, we see the work required to move the project forward to a completed trail project in six tasks:

Task 1. Delineating the full extent of the arsenic on the site and most cost effective means of remediation, potentially complete removal of contaminated soils from the site. This will require additional testing and analysis as outlined in the attached proposal from Gilmore & Associates.
Task 2. Coordination with and approvals from DEP of arsenic remediation.
Task 3. Coordinating revisions to the design for the trail extension developed as a result of the remediation.

The following tasks are NOT included at this time. Should the Township elect to move forward following the determination of the extent of the arsenic on the site, we will develop our additional costs to complete the following Tasks at that time:

Task 4. Completion of Construction Documentation with revisions as required.
Task 5. Approvals and Public Input Process. It should be that some of the approval process, and much of the Public Meeting/Property Owner Meeting process need to be repeated based on the passage of time and changes to the design.
Task 6. Bidding and Construction Phase Services.

That being said, we'd like to offer a proposal to continue to work, as we have been, with the Township now and through 2022, advancing the work of the Tasks 1 through 3 noted above, under the following terms and more specific general conditions of our original agreement dated April 26th, 2016 to work towards a completed Radnor Trail Extension. Should there be any difference between the terms and conditions of our original agreement and this amendment, the terms and conditions of this amendment shall govern. **As noted below, this proposal is being offered on an hourly labor and expense cost basis with a not to exceed cost limit. If the work proceeds smoothly or more efficiently, the fees and costs billed for services will be limited to the hours and expenses expended up to the noted cost limit.**

Details for Campbell Thomas & Co. Consultant Team's Work:

Attached are a detailed scope of work and cost proposal for the work required to complete the project at this time. They are attached as exhibits to this proposal as follows:

Exhibit A: Proposed Scope of Work Radnor Trail Extension – Approach III

Exhibit B: Project Responsibility & Costs, Radnor Trail Extension - Approach III

Compensation Details:

CT&C will be compensated on the actual hours worked at the current 2020 hourly rates, shown below, and actual reimbursable expenses for a total amount **not to exceed** $55,480.00 (Fifty-five Thousand, Four Hundred Eighty Dollars). Invoices from CT&C shall be submitted no more than on a monthly basis. Services from our consultants, as needed, will be billed as noted below.

Payment will be made by Radnor Township to CT&C within 30 days after receipt of a properly prepared invoice for work satisfactorily performed.

Contact Person for this Project:

We hope to have the opportunity to discuss this work further with you. Please feel free to call on me with any questions at my direct line, 215-985-4354, or at rthomas@campbellthomas.com

Very truly yours,

CAMPBELL THOMAS & CO.
Robert P. Thomas, AIA, Partner
Direct Line 215-985-4354 / Direct Email: <rthomas@campbellthomas.com>
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2021-2022 Hourly Rate Schedule

Compensation for preparation of hourly work will be billed based on the following hourly rates:

Partners	$160.
Project Architects	$110.
Civil Engineers	$105.
Designers / Planners	$100.
Architects Consultants	1.15 times actual cost
Reimbursable Expenses	1.2 times actual cost

cc:
Lisa Borwoski - Township Commissioner
Dennis Capella – Engineering Dept. Project Manager
Steve Norcini – Township Engineer
Melissa Conn – Purchasing and Contracts Coordinator

Exhibit A: Proposed Scope of Work Radnor Trail Extension – Approach III

Revised: 9/23/2021

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Members of the Consultant Team

Campbell Thomas & Co., Philadelphia, PA (CTC) w/ Jeff Case, PE

BCM Engineers (T. Wilson Landscape Architect), York, PA (BCM)

Gilmore & Associates (GA) – Environmental Assessment and testing

Kee Landscaping – Clearing and Grubbing to allow access for additional testing

Proposed Design Approach

Preliminary testing has shown the presence of Arsenic on the trail site. The first area is a small area in the cut about 300 feet from Radnor-Chester Rd. Most of the arsenic was found in the "fill" area of the right of way. Every sample taken along this section revealed arsenic in excess of those allowed by Act 2. Additional testing is required to determine the extent of that contaminated soils and the recommended remediation approach. The revised scope of work includes a detailed proposal from Gilmore & Associates for much of this work. This may also require revisions to the plans which are also included in this revised scope.

In regard to the areas to be further investigated for the presence of arsenic, we are continuing with the approach determined in January of 2020 that was arrived at as a means of eliminating the large, expensive culvert under Radnor-Chester Road. The 2020 approach creates a construction access from Radnor-Chester Road, within the limits of the existing 100 foot wide PennDOT r/w used for the trail. The proposed approach is to fill the cut on the east side of Radnor-Chester Road as needed to create sufficient conditions for construction access and some staging area within the r/w. Fill will be placed to create a low sloped area for access and staging to the east from the Radnor-Chester Road r/w and a ramp to the elevation of the existing rail bed. From that point the proposed trail will be constructed as originally proposed to the west limit of the I-476 r/w. With this approach the existing Radnor Trail and the trail extension are connected via an at grade crossing of Radnor-Chester Road.

Future costs related to the remediation work is based on the assumption that a construction access ramp to the site will be built from Radnor-Chester Road. In a future phase, the fill needed will be used in the final construction of the proposed trail.

Detailed Scope of Work – Revised 9/23/2021

I. Environmental Testing and Remediation Work

See the attached proposal for additional work to address site contamination prepared by Gilmore & Associates.

In addition to the fee for professional services, Gilmore & Associates has provided an estimated cost for the excavation and removal of the contaminated soils from the site. See GA proposal for further information. Such actual excavation and removal work is mentioned for purposes of understanding Gilmore & Associates' scope of professional services, but is not part of this contract led by Campbell Thomas & Co.

To prepare for the additional testing called for in Gilmore & Associates" proposal, and to provide access for testing equipment where the right-of-way has become overgrown again and where there are numerous fallen trees, Kee Landscaping will provide the necessary clearing and grubbing.

CTC as the prime consultant will coordinate the additional work of Gilmore & Associates as required.

II. Continued Meetings and Coordination

Radnor Township Trail Committee – CTC will continue to conduct monthly planning and design progress meetings with the Trail Committee. These meetings will be via ZOOM or in person at the township building during the course of the project design and construction documentation as deemed appropriate. This will include coordination with the Township Engineer.

Radnor Township Commissioners – CTC will be available to attend and present appropriate materials at one (1) of the regularly scheduled Township Commissioners' Meetings during the course of the work.

Adjacent Private Property Owners – During this phase we propose two (2) meetings with adjacent property owners to review the current status of the project and the final plan. One (1) of these meetings will be with the Radnor School District as they are the largest adjacent property owner and own the lands adjacent to the fill area that contains the contamination. We expect that the Township will take the lead in organizing, scheduling and conducting this effort. CTC will participate fully in the meetings and document the owner's concerns and the conclusions reached at the meetings.

Project Management – CTC will continue the overall management and coordination of the project for the consultant team. This includes being the primary contact for the consultant team, documenting meetings and review sessions, scheduling and managing the work of members and preparing invoices to the township.

III. Final Design and Construction Documents (NOT INCLUDED AT THIS TIME)

IV. Construction Phase Services (NOT INCLUDED AT THIS TIME)

Exhibit B: Project Responsibility & Costs -- Radnor Trail Extension - Approach III

Campbell Thomas & Co., Principal Consultant — Revised: 9/23/2021

Contact: Robert P. Thomas, AIA, Partner-in-Charge, 215-985-4354

P= Primary Responsibility
S= Secondary Responsibility
X= Participant

	Radnor Township Responsibility				Campbell Thomas & Co.					BCM Engineers		Gilmore & Assoc., Inc.		Kee Landscaping	
						Partner Admin.	Trail Architect	Civil Engineer	Planner		L'scape Architect				
	Radnor Township	Township Trail Com	Township Engineers		Responsibility	Robert P. Thomas, AIA	Harry S. Murray, NCARB	Jeff Case, PE	Doug Maisey	Responsibility	Tim Wilson, RLA	Responsibility	Environmental - REC		
Avg Hourly Rates						$ 160	$ 110	$ 105	$ 100		$ 115				
Work Element															
Meetings / Coordination															
Meetings / Coordination with Township Trail Committee		X			X	2			2						
Commissioners Meetings (1 meetings est.)		X	X		P	2									
Community Meetings / Public Review Process (1 meetings est.)	P	P	X		X	2			2						
Meetings with adjacent Property Owners (2 meetings est.)	P	P	X		X	4									
Project management & Coordination		X	X		P	4			4						
SUB TOTAL HOURS						14	0	0	8		0				
SUB TOTAL FEES						$ 2,240	$ -	$ -	$ 800		$ -				
Environmental Remediation Work															
Environmental - SEE GILMORE PROPOSAL												P	FEE		
Clearing and Grubbing for additional testing														P	FEE
CTC Coordination					S	6	3								
SUB TOTAL HOURS						6	3	0	0		0				
SUB TOTAL FEES						$ 960	$ 330	$ -	$ -		$ -				
TOTALS Hours						20	3	0	8		0				
Avg Hourly Rates						$ 160	$ 110	$ 105	$ 100		$ 115				
Fees						$ 3,200	$ 330	$ -	$ 800		$ -				$ -

Total estimated Hours and Fee	**Campbell Thomas & Company**	**Hours**	**31**	**Fee**	**$ 4,330**
Total estimated Hours and Fee	**BCM Engineers (plus 10% admin. fee)**	**Hours**	**0**	**Fee**	**$ -**
Total estimated Fee	**Kee Landscaping: *Time+Mtls Not to Exceed $8,500**	***Fee**		***Fee**	**$ 8,500**
Total estimated Fee	**Gilmore & Assoc. Inc. (plus 10% admin. Fee)**	****Fee**		****Fee**	**$ 42,350**

**Per the GA proposal , the fee shown is based on their $38,500 figure + a 10% administrative fee

Reimbursable Expenses

Note: Reimbursable expenses will be billed at 1.2 times the direct costs to CTC to cover administrative costs.
The cost below is an estimate for budgeting purposes at this time.

Estimate of Reimbursable Expenses **$ 300**

GRAND TOTAL, Fees and Reimbursable Expenses **$55,480**

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

SERVICES AGREEMENT

File No. 16-01164-03
Radnor Trail Extension Environmental Site Characterization
Radnor Trail Extension
Radnor Township, Delaware County, Pennsylvania

This Agreement is made on **September 01, 2021** by and between: **Campbell, Thomas, & Company, 1504 South Street, Philadelphia, PA 19146 (CLIENT),** and **Gilmore & Associates, Inc., Attn: Rocco Mercuri, P.G. (ENGINEER).** The parties agree as follows:

1. **Scope of Services: ENGINEER** agrees to provide the following Services:

Project Understanding

Results of a Phase II Environmental Site Assessment (ESA) conducted at the referenced property between June and August 2020 indicated the presence of arsenic concentrations in shallow soil samples at concentrations exceeding the PA Act 2 Residential Statewide Health Standards (SHS). The soil samples were collected for the characterization of one of the two identified Recognized Environmental Conditions (RECs) that was associated with historic operations of the former railway.

Due to the identified arsenic exceedances in soils, G&A recommends that this project enters the PADEP Act 2 Program to remediate arsenic-impacted soils and obtain a release of environmental liability from the PADEP after completing the soil remediation. Results of G&A Phase II ESA are included in G&A Phase II ESA report dated September 18, 2020. During a virtual meeting that occurred on July 16, 2021, G&A agreed with the Client and representatives of Radnor Township on the remedy for the identified arsenic-impacted soils which will consist of excavation and disposal of the excavated arsenic-impacted soils at a permitted facility in lieu of capping the soils with the planned pavement designed for the trail.

Prior to entering the Act 2 Program, G&A recommends completing additional site soil characterization to delineate (vertically and horizontally) all of the identified arsenic exceedances in soils following the recommended PADEP regulatory procedures. Based on G&A understanding of the topics discussed during the July 16, 2021 meeting, the current owner of the former railway property (PennDOT) will not be involved with any planned Act 2 remediation measure.

65 E. Butler Avenue | Suite 100 | New Britain, PA 18901 | **215-345-4330** | 215-345-8606
508 Corporate Drive West | Langhorne, PA 19047 | **215-369-3955** | 215-345-8606
184 W. Main Street | Suite 300 | Trappe, PA 19426 | **610-489-4949** | 610-489-8447
119 East Linden Street | Kennett Square, PA 19348 | **610-444-9006** | 610-444-7292
5100 Tilghman Street | Suite 150 | Allentown, PA 18104 | **610-366-8064** | 610-366-0433
One Penn Center at Suburban Station | 1617 JFK Boulevard | Suite 425 | Philadelphia, PA 19103 | **215-687-4246** | 215-564-1780
201 Market Street | Camden, NJ 08102 | **856-203-7447** | 856-379-3567
www.gilmore-assoc.com

The following services agreement provides the scope of work and estimated fee for providing the following additional engineering services:

- ✓ evaluate best effective remedy option for arsenic-impacted soils;
- ✓ additional site soils characterization for the vertical and horizontal delineation of arsenic exceedances in soils; and
- ✓ evaluation of pathways including direct contact and potential impacts to a tributary of Ithan Creek which runs under the culvert located on the eastern side of the former railway path;

In addition to the tasks indicated above, G&A herein notes that, with the completion of the above tasks, final PADEP closure will require the following additional tasks that are not included with this services agreement:

1. Enter the PADEP Act 2 Program;
2. Complete remediation of the identified arsenic-impacted soils;
3. Prepare for and attend a meeting with the PADEP; and
4. Prepare a Final Act 2 Report for submission to the PADEP.

The scope and cost for the above-listed four tasks will be provided to the client after completing additional site soils characterization included with this services agreement.

I. BASIC SERVICES

This proposal covers the completion of project activities under the following tasks:

Task No.	Description
1	Project Administration, Correspondence and Coordination
2	Additional Site Characterization including:
	2a Evaluate Best Effective Remedy Option for Arsenic Impacted Soils
	2b Additional Arsenic-Impacted Soil Delineation
3	Stakeout of Proposed Trail Extents

The project activities covered by this proposal are described in further detail in the following sections.

Task 1 – Project Administration, Correspondence and Coordination

This Task accounts for project management and administration activities anticipated during the timeline of this services agreement including: project management and task completeness check; internal correspondence and communications with client and other parties involved with this project; project tasks coordination.

The estimated cost for this Task is $8,900

Task 2 – Additional Site Characterization

- ✓ ***Subtask 2a – Evaluate Best Effective Remedy Option for Arsenic Impacted Soils***

This subtask accounts for G&A consulting effort conducted since the date of G&A latest proposal (October 2020) to date for the selection of the proposed remedy discussed in this services agreement. The effort included preparing and attending several conference calls and virtual meetings with the Client and representatives of Radnor Township during which G&A provided explanation of the remediation process through Act 2, potential remedy options including capping and excavation, and NPDES permit implications.

The estimated cost for this Task is $4,600.

✓ ***Subtask 2b – Additional Arsenic-Impacted Soil Delineation***

G&A proposes to define exact site boundaries which will ultimately be used during the Act 2 regulatory process associated with the Trail project. One of G&A's Phase II ESA recommendations indicates that additional soil characterization is needed to complete horizontal and vertical delineation of identified arsenic exceedances in soil. G&A proposes to advance 39 soil borings at the locations indicated in **Figure 1** for the delineation of the identified arsenic exceedances. Soil delineation samples will be collected at each soil boring according to the following rationale:

- ✓ Horizontal delineation samples:
  - One set of horizontal delineation samples will be collected for Arsenic analysis at the same depth of the identified Arsenic exceedances that is 0.5-foot to 1-foot (0.5-1) below the ground surface (bgs).
  - Two sets of horizontal delineation samples will be collected and held for Arsenic analyses at the following depths: (1.5-2); (3.5-4); and (5.5-6) bgs. These samples will only be analyzed if any of the vertical delineation samples will exceed any of the Arsenic standards.

- ✓ Vertical delineation samples:
  - One set of vertical delineation samples will be collected for Arsenic analysis one foot below the identified Arsenic exceedances said in the previous bullet. This set of vertical delineation samples will be collected at (1.5-2) bgs.
  - Two sets of horizontal delineation samples will be collected and held for Arsenic analyses at the following depths: (3.5-4) and (5.5-6). These samples will only be analyzed if any of the (1.5-2) or (3.5-4) vertical delineation samples will exceed any of the Arsenic standards.

Soil borings will be advanced by a subcontracted Geoprobe® operator.

Results of the Phase II ESA soil characterization indicated that additional soil characterization is recommended along the embankment of the eastern portion of the former railway (fill portion) to evaluate potential impacts to a tributary of Ithan Creek. G&A will collect 8 surficial soil samples along the two sides of the embankment and in correspondence of the four arsenic exceedances identified along this portion of the trail (**Figure 1**). Soil samples will be collected by G&A personnel using a hand-auger.

The estimated timeline to complete subtask 2b is two to three business days. The estimated cost for this Task is $22,300.

Task 3 – Stakeout of Proposed Trail Extents

In order to define the Act 2 Site boundaries for purposes of collecting delineation samples discussed in subtask 2b and shown in Figure 1, G&A personnel will stake the centerline of the trail (1,650 l.f. +/-) at

the PC's, PT's, 50 FT stations and changes in shoulder width along with the edge of shoulder of varying widths (approx. 100 stakes).

The estimated cost for this Task is $2,700.

II. CONDITIONS OF BASIC SERVICES

A. The client and/or the property owner will be responsible for clearing all excavation locations from any private underground utilities not identified by PA One Call. G&A will not be responsible for damage to any underground utilities not identified by the One Call or the owner.

B. Site access including vegetation clearance and tree removal will be provided by the Client as necessary.

C. Site restoration is not included in the scope of services, other than backfill of borings, as necessary.

D. It is understood that the Client will be responsible for all permit application and/or review fees required by outside agencies.

E. This Scope of Services is based on the assumption that OSHA Level D protection is sufficient to protect the workers during this field study.

IV. FEES AND METHOD OF PAYMENT

The Fee for services as outlined above is **$ 38,500** based upon acceptance of this Contract Agreement within the next 30 days

(The amounts set forth as the "Estimated Fee" for services performed shall constitute the Engineer's opinion of the effort required to complete the project as the Engineer understands it to be defined at the time of execution of this document. It is understood by Client that the actual fee for services performed may exceed the amount(s) set forth above as "Compensation." This fee is void if agreement is not signed by both parties within thirty (30) days from the date of this agreement.)

2. The Services shall be performed on the following schedule:

   Services outlined herein shall commence upon receipt of the executed Services Agreement by Client and retainer fee if applicable.

3. This Agreement shall include the Gilmore & Associates, Inc. Standard Terms and Conditions that are attached to this document.

4. The individuals executing this Agreement below agree that they are authorized to enter into this Agreement on behalf of **CLIENT** and **ENGINEER**, respectively, and **CLIENT** and **ENGINEER** agree to be bound by the terms and conditions of this Agreement.

Client's Authorized Representative:

Print & Date _____ Authorized Signature _____

Accounts Payable: ☐ **Check here if Accounts Payable information is the same as client**

(G&A's preferred method of billing is to transmit an electronic invoice in PDF format. However, if an email is not available please provide a billing address below.)

Name _____ Address _____

Email _____ Address _____

Phone _____ City, State, Zip _____

Gilmore & Associates, Inc.'s Authorized Representative:

Print & Date _____ Authorized Signature _____

PRELIMINARY DESIGN

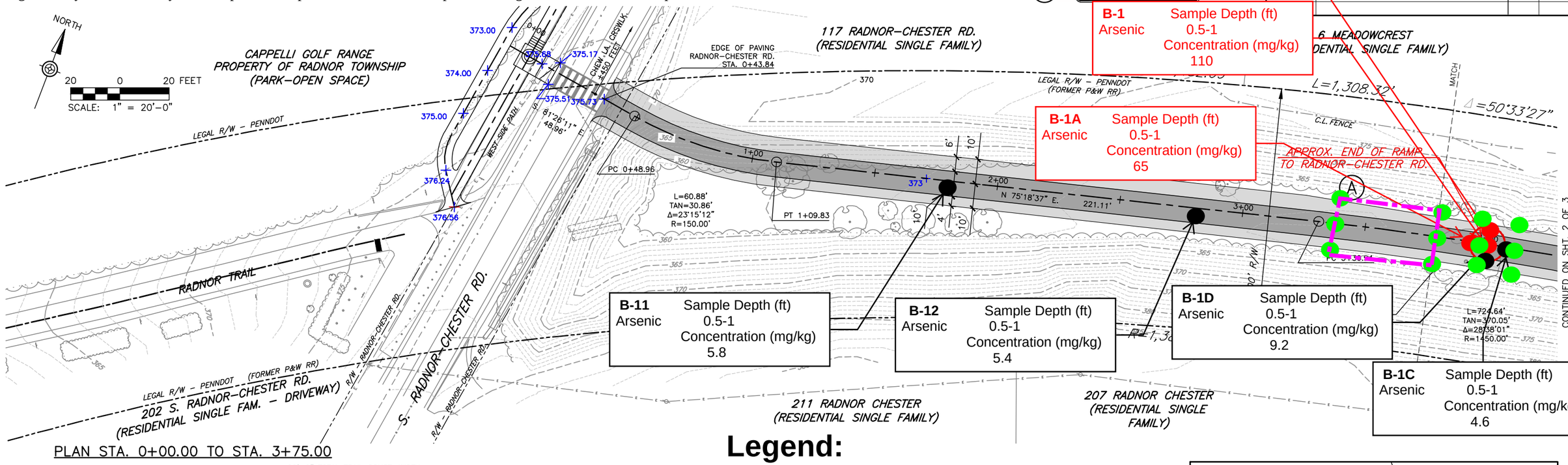
FORGE TO REFUGE TRAIL - Valley Forge National Historical Park to John Heinz National Wildlife Refuge

SECTION - RADNOR TRAIL EXTENSION, Radnor, Pennsylvania — Approximate length 1700 feet (0.32 miles)

Right of Way Owner: Pennsylvania Dept. of Transportation — Trail Development/Management: Radnor Township

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
6-0	DELAWARE	???	???	1 OF 3
	RADNOR TOWNSHIP			

REVISION NUMBER	REVISIONS	DATE	BY



B-1B Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 110

B-1 Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 110

B-1A Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 65

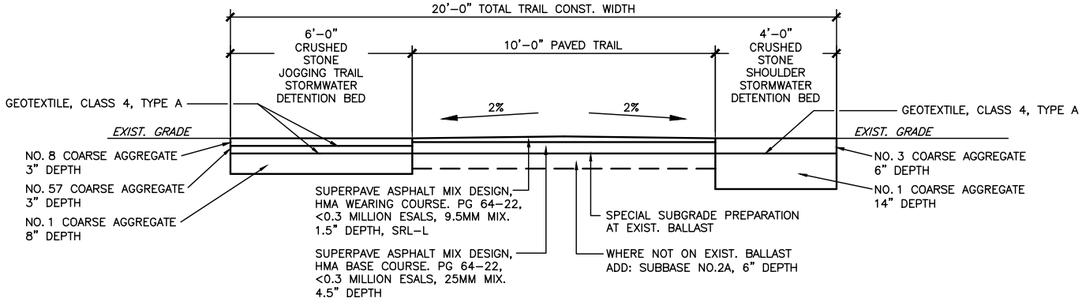
B-11 Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 5.8

B-12 Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 5.4

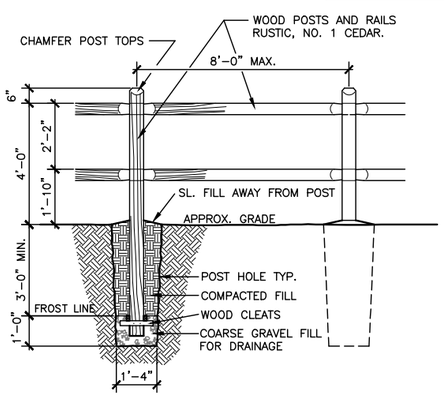
B-1D Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 9.2

B-1C Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 4.6

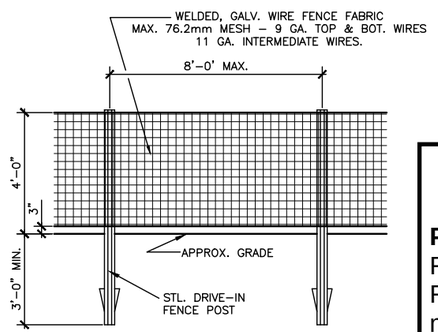
PLAN STA. 0+00.00 TO STA. 3+75.00



RADNOR TRAIL TYPICAL TRAIL CROSS-SECTION
NTS



FENCE TYPE A - WOOD SPLIT RAIL FENCE
NTS

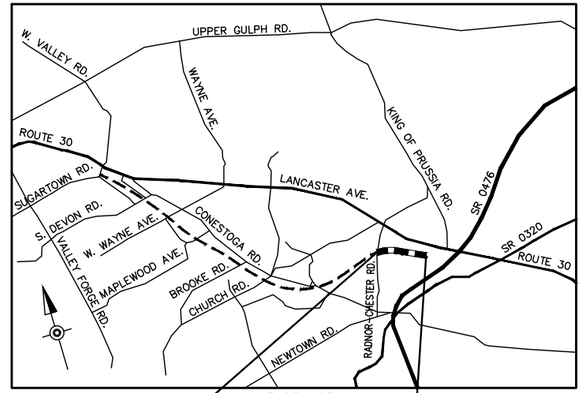


FENCE TYPE B - WIRE R/W FENCE, TYPE 2
NTS

Legend:

- New proposed soil boring location for the vertical and horizontal delineation of identified Arsenic exceedances
- New ground surface soil sample location for initial evaluation of potential impacts to the Creek
- Soil boring location with arsenic concentrations not exceeding the PA Act 2 Residential Direct Contact and Soil-to-Groundwater SHS
- Soil boring location with arsenic concentrations exceeding the PA Act 2 Residential Soil-to-Groundwater and/or Direct Contact SHS

SHS Statewide Health Standards



LOCATION MAP
SCALE IN MILES
0 0.5 MI 1 MI

STATE HIGHWAY
TOWNSHIP RD.
EXISTING RADNOR TRAIL
PROJECT LOCATION - RADNOR TRAIL EXT.

LIMIT OF WORK
STA. ?+??.??
S.R. 9900 SEC. ??
RADNOR TOWNSHIP
DELAWARE COUNTY

LIMIT OF WORK
STA. 17+08.50
S.R. 9900 SEC. ??
RADNOR TOWNSHIP
DELAWARE COUNTY

PA Act 2 Standards for Arsenic
Residential Direct Contact SHS= 12 mg/kg
Residential Soil-to-Groundwater SHS= 29 mg/kg

ATTACHMENT 2
Soil Boring Locations and Soil Sample Results

Source: C T & C Campbell Thomas & Co.
1504 South Street, Philadelphia., PA
Architure • Preservation • Community & Transportation Planning
Phone: 215-545-1076 • Website: www.campbellthomas.com

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PROGRESS PRINT - 2020-0713

PRELIMINARY DESIGN

FORGE TO REFUGE TRAIL - Valley Forge National Historical Park to John Heinz National Wildlife Refuge

SECTION - RADNOR TRAIL EXTENSION, Radnor, Pennsylvania — Approximate length 1700 feet (0.32 miles)

Right of Way Owner: Pennsylvania Dept. of Transportation — Trail Development/Management: Radnor Township

DISTRICT	COUNTY	ROUTE	SECTION	SHEET
6-0	DELAWARE	???	???	2 OF 3
RADNOR TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY

B-1 (see previous page)

B-2 Arsenic — Sample Depth (ft) 0-0.5 — Concentration (mg/kg) 1.0 U

B-3 Arsenic — Sample Depth (ft) 0-0.5 — Concentration (mg/kg) 4.1

B-4 Arsenic — Sample Depth (ft) 0-0.5 — Concentration (mg/kg) 7.6

B-5 Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 7

B-6 Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 130

B-6A Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 69

B-6B Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 60

B-6C Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 87

B-6D Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 300

B-7 Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 140

B-8 Arsenic — Sample Depth (ft) 0.5-1 / 3.5-4 — Concentration (mg/kg) 370 / 16

B-8A Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 520

B-8B Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 170

B-8C Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 450

B-8D Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 150

B-9 Arsenic — Sample Depth (ft) 0.5-1 — Concentration (mg/kg) 290

6 MEADOWCREST (RESIDENTIAL SINGLE FAMILY)

634 E. LANCASTER (RESIDENTIAL SINGLE FAMILY) HANSON PROPERTY

207 RADNOR CHESTER (RESIDENTIAL SINGLE FAMILY)

203 RADNOR CHESTER (RESIDENTIAL SINGLE FAMILY)

201 RADNOR CHESTER (RESIDENTIAL SINGLE FAMILY)

MARTHA BROWN'S WOODS – PROPERTY OF RADNOR TWP. SCHOOL DISTRICT (PARK – OPEN SPACE)

LEGAL R/W – PENNDOT (FORMER P&W RR)

REMOVE EXIST TREES WITHIN 5' FEET OF TRAIL CONST. TYPICAL.

REDUCE SHOULDER 50'

INCREASE SHOULDER 50'

STA. 5+50.00

STA. ±8+90.00 START FENCE TYPE A LENGTH ±150 FT.

STA. ±8+95.00 START FENCE TYPE A

STA. ±10+40.00 END TYPE A FENCE START FENCE TYPE 2 R/W FENCE 4'-0" HIGH

STA. ±10+75.00 END TYPE A FENCE START FENCE TYPE 2 R/W FENCE 4'-0" HIGH

TYPE 2 R/W FENCE

TRAIL ON EXIST. EMBANKMENT

APPROX. STA. 9+83

L=724.64' TAN=370.05' Δ=28°38'01" R=1450.00'

Δ=50°33'27" CH=1,266.29' BRG=S78°21'22"

Δ=50°33'27" CH=1,180.88' BRG=S78°21'22"W

S88°25'00"W 95.24' N61°08'49"W 95.24'

S 76°03'22" E 864.86'

CONTINUED FROM SHT. 1 OF 3

CONTINUED BELOW

CONTINUED FROM ABOVE

CONTINUED ON SHT. 3 OF 3

PLAN STA. 9+50.00 TO STA. 15+25.00

NORTH

20 0 20 FEET

SCALE: 1" = 20'-0"

Act 2 Standards

Non-Residential - Residential - Soil_to_Groundwater

Arsenic	61 mg/kg	12mg/kg	29mg/kg

C T & C Campbell Thomas & Co.
1504 South Street, Philadelphia., PA
Architure • Preservation • Community & Transportation Planning
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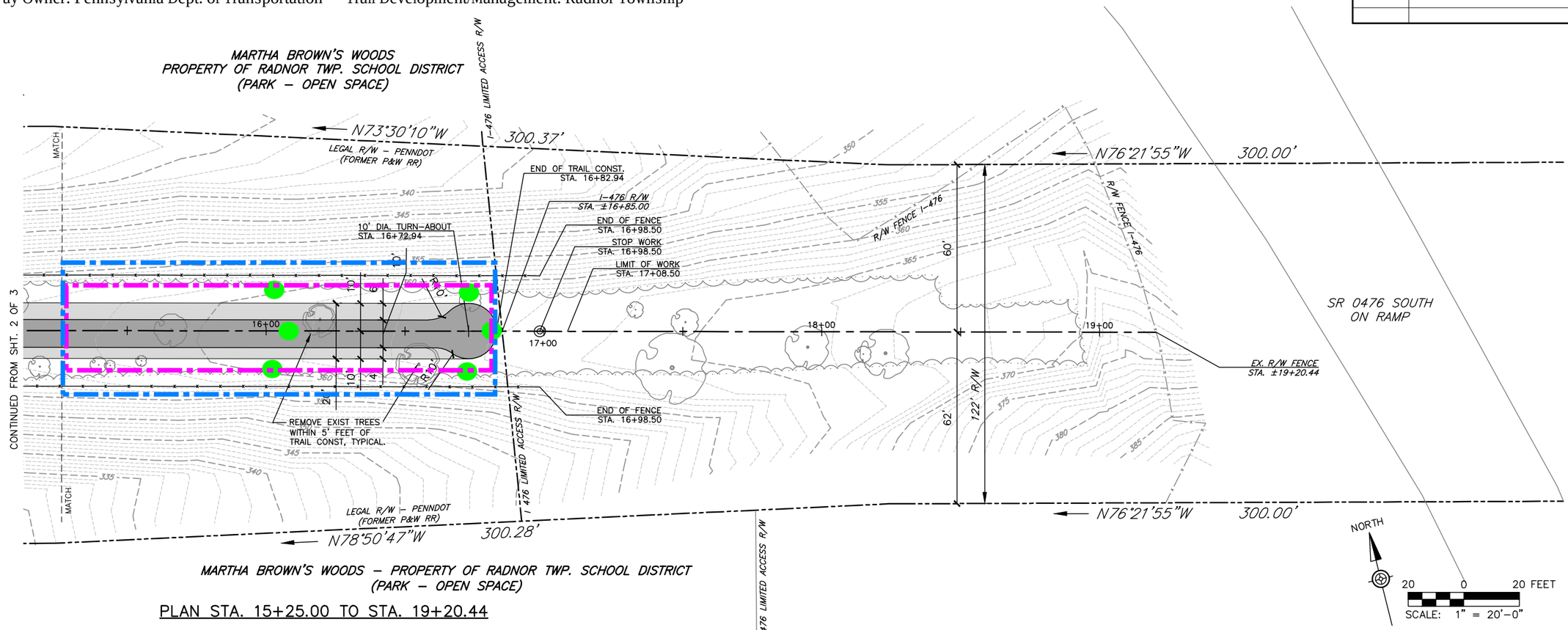

PLAN STA. 15+25.00 TO STA. 19+20.44

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GILMORE & ASSOCIATES, INC. - STANDARD TERMS AND CONDITIONS

1. DUTIES AND RESPONSIBILITIES

1.1 The Engineer (throughout these Terms and Conditions, Engineer shall include Gilmore & Associates, Inc. and its subconsultants) agrees to provide only those professional services specifically and expressly set forth in the Scope of Services portion of this Agreement. Unless specifically set forth in the Scope of Services, Engineer shall not provide any construction phase services including, but not limited to, the construction phase observation of any contractor's work. Under no circumstances shall Engineer have control over, or be in charge of, nor be responsible for, construction means, methods, techniques, sequences or procedures in connection with the work or for the contractor(s)'s safety programs or procedures at the site.

1.2 In the event that the Engineer and Client have not executed this Agreement, the Client's authorization to Engineer to proceed with the performance of the services set forth herein shall constitute acceptance by the Client of these Terms and Conditions.

2. UNDERGROUND UTILITIES AND STRUCTURES

2.1 Client agrees to advise Engineer in writing of known or suspected utilities or other underground structures or features which could affect the services to be provided and shall provide all drawings in its possession which identify underground utilities, structures or features.

2.2 Client agrees to release Engineer from any liability to Client and to hold Engineer harmless in accordance with Paragraph 11.1 where subterranean utility lines and other underground structures or features which were not identified to Engineer as required by Paragraph 2.1 have been damaged.

3. RESTRICTIONS ON USE OF DOCUMENTS

3.1 It is understood and agreed that all drawings, sketches, specifications and other documents in any form, including CADD disks, prepared under this Agreement (collectively "Documents") are instruments of Engineer's services and, as such, are, and shall remain, the property of Engineer, whether the project for which they are intended is executed or not. Client shall, upon payment of all fees and reimbursable expenses due Engineer under this Agreement, be permitted to retain reproducible copies of the final versions of those Documents necessary for the execution of the Project ("Deliverables") for information and reference only in connection with the project for which the Documents were prepared. The Documents are prepared for use on this Project only and are not appropriate for use on any other project, for additions to this Project, for completion of this Project by others (unless Engineer is adjudged in default) or for any purpose other than as defined by the Scope of Services, except by agreement in writing with the appropriate compensation to Engineer. Any use of the Documents or the information or data contained therein, in violation of this subparagraph or any alteration or modification of such Documents or the information or data contained therein, without the express written consent of Engineer is expressly prohibited. Such prohibited use is at the sole risk of the user and Engineer is released from any liability for damages arising from such use.

3.2 Client agrees that any Documents in Client's possession shall not be used and shall be returned promptly to Engineer, if Client is in default under this Agreement. Client agrees that Engineer may obtain injunctive relief to enforce this subparagraph.

3A. **ACCEPTANCE, OWNERSHIP AND USE OF ELECTRONIC APPLICATIONS (This provision shall apply *only* to any GIS System included in Exhibit "A").**

3A.1 Ownership and Use - It is understood and agreed that any and all map graphics, databases, reports, drawings, computer files, field data, notes or other documents, whether in printed form or in machine readable format created or prepared by Engineer under this Agreement are instruments of Engineer's services and, as such, are, and shall remain, the property of Engineer. However, at the end of the acceptance periods defined in Subparagraphs 3A.2 or 3A.3 and the payment of all fees and expenses due under this Agreement, Client shall have an irrevocable, non-exclusive license to use those components of the electronic applications including the map graphics and databases described in Exhibit "A" ("Deliverables") which have been delivered by Engineer pursuant to Subparagraphs 3A.2 and/or 3A.3.

3A.2 Acceptance Period for Interim Components - Upon receipt of each component part of the electronic application and the map graphics and databases at Client's facility, Client shall have a period of fifteen (15) calendar days (unless otherwise noted in Exhibit A) to review and approve the component application including the map graphics and databases. Engineer shall correct any deficiencies brought to its attention by Client at the conclusion of that fifteen (15) calendar day period. Upon the correction of any such deficiencies, Engineer shall not be responsible for making any further changes, revisions or corrections to that component of the electronic applications including the map graphics and databases and is released from liability for any deficiencies contained therein.

3A.3 Acceptance Period for Final Delivery - Upon completion of the installation of all of the electronic applications and the map graphics and databases required by this Agreement at Client's facility, Client shall have a period of fifteen (15) calendar days (unless otherwise noted in Exhibit A) to review and approve the overall operation of the applications including the map graphics and databases. This final review and approval shall not include a re-review of the individual components reviewed and approved by Client pursuant to Subparagraph 3A.2. Engineer shall correct any deficiencies in the overall operation of the applications brought to its attention by Client at the conclusion of that fifteen (15) calendar day period. Upon the correction of any such deficiencies, Engineer shall not be responsible for making any further changes, revisions or corrections to any of the electronic applications including the map graphics and databases and is released from liability for any deficiencies contained therein.

3A.4 Modification of Deliverables - Any changes, modifications, deletions or additions made to the electronic applications including the map graphics and/or databases by Client or any consultants retained by it (other than Engineer) are made at Client's sole risk and Engineer shall not have any liability for, and the Client releases Engineer from any claims or damages resulting from, such changes, modifications, deletions or additions.

4. STANDARD OF CARE

4.1 In performing the services required by this Agreement, Engineer shall use that degree of usual and customary professional skill and care ordinarily exercised by members of its profession under similar circumstances practicing in the same or similar locality. The standard of care shall exclusively be judged as of the time the services are rendered and not according to later standards. Engineer makes no expressed or implied warranty beyond its commitment to conform to this standard.

5. OBSERVATION SERVICES

5.1 If expressly required under the Scope of Services, Engineer shall visit the site at the intervals set forth in the Scope of Services to become generally familiar with the progress and quality of that portion of the work for which Engineer prepared the Deliverables to determine in general if such work is being performed in a manner indicating that such work when completed will be in accordance with the Deliverables. Engineer shall not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of such work. On the basis of on-site observations as a design professional, Engineer shall keep client informed of the progress and quality of the work. Engineer's services do not include supervision or direction of the actual work of the contractor(s), their employees, agents or subcontractors. Client agrees to notify the contractor(s) accordingly. The contractor(s) shall also be informed by Client that neither the presence of Engineer's field representative nor the observation by the Engineer shall excuse the contractor(s) for defects or omissions in his work.

5.2 Under no circumstances shall Engineer have control over, or be in charge of, nor shall it be responsible for, construction means, methods, techniques, sequences or procedures in connection with the work or for the contractor(s)'s safety programs or procedures at the site. Engineer shall not be responsible for any contractor's schedules or failure to carry out the work in accordance with the Deliverables. Engineer shall not have control over or charge of acts or omissions of any contractor, subcontractor, or their agents or employees, or of any other persons performing portions of the work.

5.3 It is further understood that the contractor(s) will be solely and completely responsible for working conditions on the job site, including safety of all persons and property during the performances of the work, and that these requirements will apply continuously and not be limited to normal working hours. Any observations at the site as set forth in Paragraph 5.1 by Engineer is not intended to include review of the adequacy of the contractor(s)'s safety measures at the construction site. The Engineer will not be held responsible for any contractor's failure to observe or comply with the Occupational Health and Safety Act of 1970 (including subsequent amendments), and regulations or standards promulgated thereunder, or any state, county, or municipal law or regulation of similar import or intent.

6. TERMINATION, SUSPENSION

6.1 This Agreement may be terminated by either party upon seven days written notice should the other party fail substantially to perform in accordance with its terms. This Agreement may be terminated by the Client upon at least seven (7) days written notice to Engineer in the event that the Project is permanently abandoned. In the event of any termination that is not the fault of Engineer, Engineer will be compensated for all services performed up to the time written notice of termination is actually received by Engineer, together with reimbursable expenses then due and reasonable Termination Expenses directly associated with the termination.

6.2 In the event of termination or suspension for more than three (3) months which occurs prior to completion of all services contemplated by the Agreement, the Engineer may complete such analyses and records as are necessary to complete his files and may also complete a report on the services performed up to the date of receipt of written notice of termination or suspension. Termination Expenses provided for above shall include all fees and costs incurred by Engineer in reporting, completed data, completing such analyses, records and reports.

7. INVOICES, PAYMENTS

7.1 Engineer will submit invoices to Client monthly and a final invoice upon completion of services.

7.2 Client shall promptly review Engineer's invoices. Any right to withhold payment based on errors or discrepancies in the invoice is waived if not identified in writing to Engineer within seven (7) days of Client's receipt of invoice. Any research required by Engineer in order to respond to questions raised regarding invoices shall be billable to Client at Engineer's standard hourly rates, if such questions are not raised within such seven (7) day period.

7.3 Payment is due upon presentation of invoice and is past due fifteen (15) days from invoice date. Client agrees to pay a service charge of one and one-half (1 ½) percent per month (18% per annum) or fraction thereof on past due payments under this Agreement.

7.4 Timely payment to the Engineer in accordance with the Terms and Conditions of this Agreement is a material consideration of this Agreement. Therefore, the Client's failure to make payments in accordance with this Agreement shall constitute substantial nonperformance and a cause for termination by Engineer. If the Client fails to make payment when due Engineer for services and expenses, the Engineer may, at its option and without prejudice to its right to terminate as described above, upon seven days written notice to the Client, suspend performance under this Agreement. Unless payment in full is received by the Engineer within seven (7) days of the date of the notice, the suspension shall take effect without further notice. Suspensions for subsequent failures to pay invoices shall not require prior notice by the Engineer. In the event of a suspension of performance, the Engineer shall have no liability to the Client

for delay or damages caused the Client because of such suspension of performance. The Client shall hold harmless, indemnify, and defend the Engineer for claims that arise due to any suspension.

7.5 It is further agreed that in the event a lien or suit is filed to enforce payment under this agreement, the Engineer will be reimbursed by the Client for all court costs and reasonable attorney's fees in addition to accrued service charges.

7.6 Unless the compensation identified in this Agreement is specifically identified as a lump sum, the amounts set forth as the "Estimated Fee" shall constitute the Engineer's best estimate of the effort required to complete the project as the Engineer understands it to be defined. For those projects involving conceptual or process development work, activities often are not fully definable in the initial planning. In any event, as the project progresses, the facts developed may dictate a change in direction, additional effort, or suspension of effort, which may alter the scope. The Engineer will inform the Client of such situation so that negotiations relating to a change in scope and an adjustment to the time of performance can be accomplished as required. If such change, additional effort, or suspension of effort results in an increase or decrease in the cost of or time required for performance of the services, whether or not changed by any change order, an equitable adjustment shall be made and this Agreement modified accordingly.

8. ASSIGNS

8.1 Neither the Client nor the Engineer may delegate, assign, or sublet, or transfer his duties or interest (including any claims that arise here) in this Agreement without written consent of the other party. Such consent shall not be unreasonably withheld.

9. LIMITATIONS ON REMEDIES

9.1 The Client shall promptly (within 24 hours) report to Engineer any defects or suspected defects in Engineer's services of which Client becomes aware, so that Engineer may take measures to minimize the consequences of such defect. Client warrants that Client will impose a similar notification requirement on all contractors retained by Client and shall require all subcontracts at any level to contain a like requirement. Engineer shall be liable for correcting defects in its services caused by its negligence. However, the failure by Client, and the Client's contractors or subcontractors to notify Engineer of such defects in a timely fashion shall relieve Engineer of the costs of remedying the defects above the sum such remedy would have cost had prompt notification been given.

9.2 If, due to Engineer's negligent error, any required item or component of the Project is omitted from the Documents, Engineer shall not be responsible for paying the cost to add such item or component to the extent that such item or component would have been otherwise necessary to the Project or otherwise adds value or betterment to the Project. Engineer shall only be liable to the extent such costs would have been avoided had engineer not been negligent. In no event, will Engineer be responsible for any cost or expense that provides betterment, upgrade or enhancement of the Project. Client's sole and exclusive remedy for such negligent omissions where no otherwise avoidable costs are incurred by Client is for Engineer to perform services necessary to correct omission without charge to Client; provided that where Engineer's fees or reimbursable expenses would have been higher had the omitted item or component been included prior to construction, Engineer shall be entitled to such increased fees and reimbursable expenses.

9.3 Notwithstanding any other provision of this Agreement, neither party shall be liable to the other for any consequential damages incurred due to the fault of the other party, regardless of the nature of the fault or whether it was committed by Client or Engineer, their employees, agents, subconsultants or subcontractors. Consequential damages include, but are not limited to, loss of use and loss of profit.

9.4 Engineer's liability for any damages due to breach of contract, error, omission, professional negligence or any other theory of liability will be limited to an amount not to exceed three times the engineer's fees under this agreement. Such limitation shall apply to the aggregate of all claims that may be brought against engineer and its subconsultants. If the client prefers not to limit the engineer's professional liability to this sum, the engineer will waive this limitation upon the client's request provided that the client agrees to pay an additional consideration for this waiver.

9.5 It is understood that the Engineer shall not be held responsible for any errors or omissions on the part of contractor, including, but not limited to, the contractor's failure to adhere to the plans and specifications regardless of whether or not the Engineer is performing observational services. This provision shall be included in the contract between the Client and his contractor(s) for this project.

10. DISPUTE RESOLUTION

10.1 All claims, disputes, and other matters in question between the Engineer and the Client arising out of, or relating to, this Agreement or the breach thereof or the services rendered by Engineer ("Dispute"), shall be resolved as follows:

10.2 A written demand for non-binding mediation, which shall specify in detail the facts of the Dispute and the relief requested, shall be submitted, within a reasonable time after the basis for the Dispute has arisen, to the party against whom the claim is brought. If the Dispute cannot be resolved by the parties within ten (10) days, the demand shall be submitted to "ADR Options" or such mediation service as the parties shall otherwise agree to retain, for good faith non-binding mediation. The Mediator's fee shall be shared equally by the parties. The party initiating the Dispute shall be liable for any filing fee.

10.3 Any Dispute between the parties that is not fully resolved by mediation within 60 days of submission to the mediation service shall be decided by litigation in a court of competent jurisdiction.

10.4 In no event shall the demand for mediation be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

10.5 In the event that Client institutes suit against the Engineer because of any Dispute and if such suit is dropped or dismissed, or if the Engineer otherwise prevails, Client agrees to reimburse the Engineer, or pay directly, any and all costs and any and all other expenses of defense, immediately following dropping or dismissal of the case or immediately upon judgment being rendered on behalf of the Engineer.

10.6 The signatories to this Agreement, agree to be, and to remain at all times, and for all purposes, without regard for any business address they may now or hereafter assume, subject to the exclusive jurisdiction of the several Courts of Common Pleas of Bucks County, Pennsylvania for all causes of action, if any, which may arise under, or incident to, the application, breach, enforcement, interpretation, performance or nonperformance of this Agreement. This Agreement and the rights and obligations of the parties hereto shall be controlled by the laws of the Commonwealth of Pennsylvania.

11. INDEMNIFICATION

11.1 To the fullest extent permitted by law, Client shall indemnify and save harmless Engineer, their subsidiaries, affiliates, officers, employees and subconsultants or such other individuals or entities who may have assisted the Engineer in the rendering of its services in connection with the Project (along with each of their shareholders, directors, officers, partners and employees) from and against any and all manner of demands, claims, liabilities, costs and expenses, including, without limitation, reasonable attorney's fees and any other defense costs arising out of any negligent conduct or breach of any provision of this Agreement by Client or any individual or entity for whose acts Client is responsible.

12. ENVIRONMENTAL

12.1 Where the scope of basic services includes storm water pollution prevention (SWPP), sedimentation or erosion control plans, specifications, procedures or related construction observation or administrative field functions, Client acknowledges that such services proposed or performed by G & A are not guaranteed to provide complete SWPP, sedimentation or erosion control, capture all run off or siltation, that any physical work is to be constructed and maintained by the Client's contractor or others and that G & A has no control over the ultimate effectiveness of any such work or procedures. Except to the extent that there were errors or omissions in the services provided by G & A, Client agrees to indemnify and hold G & A harmless from and against all claims, costs, liabilities or damages whatsoever arising from any storm water pollution, erosion, sedimentation, or discharge of silt or other deleterious substances into any waterway, wetland or woodland and any resulting charges, fines, legal action, cleanup or related costs.

13. WARRANTY OF AUTHORITY TO SIGN

13.1 The person signing this contract warrants they have authority to sign as, or on behalf of, the Client for whom or for whose benefit that Engineer's services are rendered. If such person does not have such authority, he agrees that he is personally liable for all breaches of this contract and that in any action against him for breach of such warranty a reasonable attorney fee shall be included in any judgment rendered.

14. CHOICE OF LAW

14.1 This contract will be construed in accordance with the laws of the Commonwealth of Pennsylvania.

15. SEVERABILITY

15.1 In the event that any provisions herein shall be deemed invalid or unenforceable, the other provisions hereof shall remain in the full force and effect, and binding upon the parties hereto.

16. REFERENCES

16.1 Client agrees that Engineer has authority to utilize its name as a Client and general description of the project work or service performed as references to other Clients.

17. INTEGRATION

17.1 There are no understandings or agreements concerning this project except as expressly stated herein.

18. VALIDITY

18.1 It is understood that if this Agreement is not executed by Client or accepted as set forth in Paragraph 1.2 within thirty (30) days of the date of the Agreement, Engineer reserves the right to revise or withdraw this Agreement.

19. THIRD PARTY BENEFICIARIES

19.1 Nothing contained in this Agreement shall create a contractual relationship with a cause of action in favor of a third party against either the Client or the Engineer.

20. WAIVER OF SUBROGATION

20.1 Except to the extent that such waiver would invalidate the applicable insurance coverage, the Client and Engineer waive all rights against each other and against the contractors, consultants, agents and employees of the other for damages, but only to the extent covered by property insurance during construction, except such rights as they may have to the proceeds of such insurance. Client and Engineer each shall require similar waivers from their contractors, consultants and agents.

End of Terms and Conditions Revised: 04/08/15

Reports of Standing Committees

Old Business

a) West Wayne Cemetery Discussion – Funding for fence repairs (Commissioner Abel)

New Business

Public Participation

Adjournment