**Planning and Zoning Department**
616 Germantown Pike, Lafayette Hill, PA 19444-1821
484-594-2625
www.whitemarshTWP.org

Subdivision and Land Development Cover Page for SLD # 12-15

Project Name: 60 Flourtown Road, LLC

Address: 60 Flourtown Road

Date: September 20, 2021

Status: Under Review

Updates:

Zoning Ordinance Compliance Review Letter - January 31, 2022
Township Engineer Review Letter - January 31, 2022 Township Engineer Review Response - December 7, 2022
Fire Marshal Review Memo - December 9, 2022
Township Engineer Review Letter - January 9, 2023

# FINAL PLAN

PREPARED FOR

# 100 FLOURTOWN ROAD

SITUATED IN

## WHITEMARSH TOWNSHIP
## MONTGOMERY COUNTY, PENNSYLVANIA

**PLAN DATE: MAY 18, 2020**
**LAST REVISED: JULY 2, 2020**

INDEX OF SHEETS


| SHEET No. | TITLE |
|---|---|
| 1 | COVER SHEET |
| 2 | RECORD PLAN |
| 3 | EXISTING FEATURES PLAN |
| 4 | SITE IMPROVEMENTS PLAN |
| 5 | SANITARY SEWER PLAN & PROFILE |
| 6 | CONSTRUCTION DETAILS |

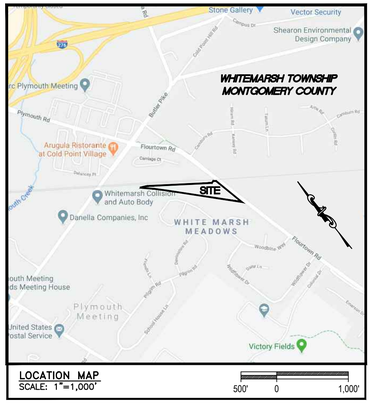

## APPLICANT / OWNER OF RECORD

60 FLOURTOWN ROAD, LLC
343 MILITIA HILL ROAD
FORT WASHINGTON, PA 19034

## SITE LOCATION

60 FLOURTOWN ROAD
PLYMOUTH MEETING, PA 19462

BLOCK: 021 UNIT: 009
PARID: 65-00-08005-01-2
DEED BOOK: 5906 PAGE 2517




LOCATION MAP
SCALE: 1"=1,000'

500' 0 1,000'

PLAN NOTATION

ALL DOCUMENTS PREPARED BY ROBERT E. BLUE CONSULTING ENGINEERS, P.C. ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR USE BY OWNER OR OTHERS ON EXTENSIONS OF THE PROJECT OR ANY OTHER PROJECT. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY ROBERT E. BLUE CONSULTING ENGINEERS, P.C. FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO ROBERT E. BLUE CONSULTING ENGINEERS, P.C. AND OWNER'S USE OF PLANS SHALL BE DEEMED AN AGREEMENT TO INDEMNIFY AND HOLD HARMLESS ROBERT E. BLUE CONSULTING ENGINEERS, P.C. FROM ALL CLAIMS, DAMAGES, LOSSES, AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.


**robert e. blue**
**consulting engineers, p.c.**
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com


COMMONWEALTH OF PENNSYLVANIA
COUNTY OF MONTGOMERY

ON THE _____ DAY OF _____ 20____ BEFORE ME, THE UNDERSIGNED OFFICER, A NOTARY PUBLIC, PERSONALLY APPEARED _____ KNOWN TO ME OR SATISFACTORILY PROVEN TO BE THE _____ OF _____, WHOSE NAME IS SUBSCRIBED TO THE WITHIN INSTRUMENT, AND ACKNOWLEDGED THAT HE/SHE EXECUTED THE SAME ON BEHALF OF THE CORPORATION FOR THE PURPOSES THEREIN CONTAINED.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL.

_____
NOTARY PUBLIC MY COMMISSION EXPIRES

## OWNER'S CERTIFICATION

I (WE), _____, HEREBY CERTIFY THAT I (WE) ARE THE OWNER(S) OF THE LAND HEREIN DEVELOPED, AND THAT WE CONSENT TO THE APPROVAL OF THIS PLAN THAT HAS BEEN GRANTED AND THAT I (WE) DESIRE THE SAME TO BE RECORDED.

OWNER(S): _____

_____

DATE: _____

## PLANNING COMMISSION APPROVAL

APPROVED BY THE WHITEMARSH TOWNSHIP PLANNING COMMISSION THIS _____ DAY OF _____, 20____.

_____
SECRETARY, WHITEMARSH TOWNSHIP PLANNING COMMISSION

## BOARD OF SUPERVISORS APPROVAL

APPROVED BY THE BOARD OF SUPERVISORS OF WHITEMARSH TOWNSHIP ON THIS _____ DAY OF _____, 20____.

_____
CHAIRMAN

_____
SECRETARY

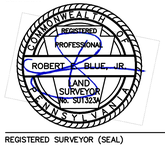
## TOWNSHIP ENGINEER APPROVAL

APPROVED BY THE TOWNSHIP ENGINEER ON THIS _____ DAY OF _____, 20____.

_____
TOWNSHIP ENGINEER

## SURVEYOR'S CERTIFICATION

I, ROBERT E. BLUE, PLS, AS A DULY LICENSED PROFESSIONAL LAND SURVEYOR IN THE COMMONWEALTH OF PENNSYLVANIA, HEREBY CERTIFY THAT THE DATA SHOWN ON THIS DRAWING, OBTAINED UNDER MY SUPERVISION, IS AN ACCURATE AND COMPLETE REPRESENTATION OF WHAT WAS CONSTRUCTED IN THE FIELD AS OF OCTOBER 4, 2019 AND THAT THE PHYSICAL FEATURES, DIMENSIONS AND ELEVATIONS SHOWN ARE CORRECT.




_____
REGISTERED SURVEYOR (SEAL) DATE

## MONTGOMERY COUNTY RECORDER OF DEEDS

RECORDED THIS _____ DAY OF _____ 20____ IN THE OFFICE FOR THE RECORDING OF DEEDS, ETC., IN AND FOR THE COUNTY OF MONTGOMERY OF NORRISTOWN, PENNSYLVANIA, IN PLAN FILE CASE _____ D.B. NO._____ PAGE _____.

M.C.P.C. APPROVAL BLOCK
RECORDER

MCPC NO. _____

PROCESSED AND REVIEWED. REPORT BY THE MONTGOMERY COUNTY PLANNING COMMISSION IN ACCORDANCE WITH THE MUNICIPALITIES PLANNING CODE.

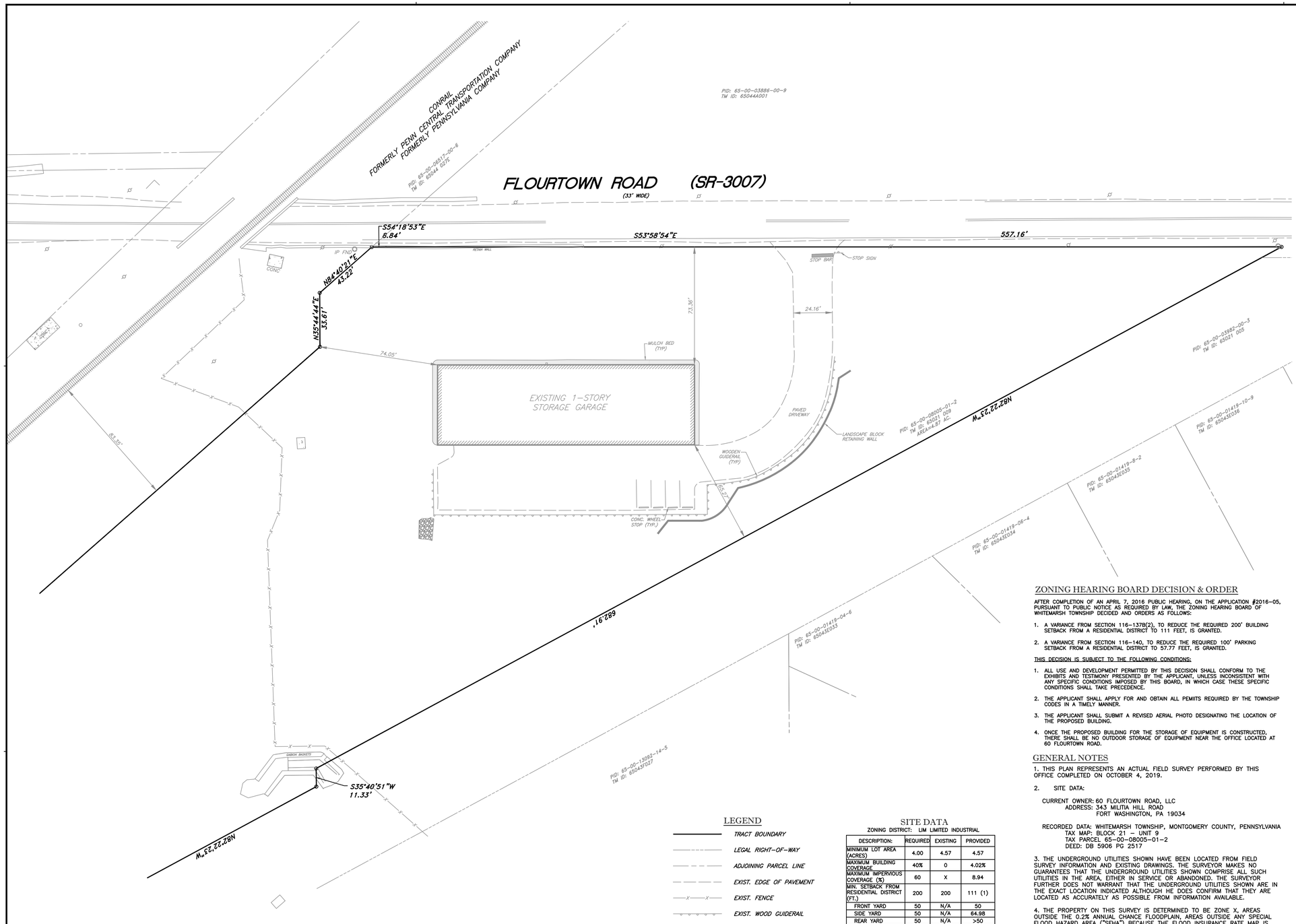
CERTIFIED THIS DATE _____

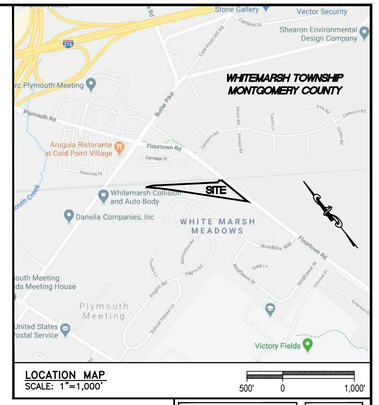
_____
FOR THE DIRECTOR
MONTGOMERY COUNTY PLANNING COMMISSION


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LAST SAVED: M:\Proj\2081-1\dwg\Sht1\FINAL PLAN SUBMISSION 01 COVER-2081-1.dwg ON: 7/6/2020 2:56 PM

| JOB No. 2081-1 | SHEET No. 1 OF 6 |
|---|---|




LOCATION MAP
SCALE: 1"=1,000'
500' 0 1,000'

## LEGEND

- TRACT BOUNDARY
- LEGAL RIGHT-OF-WAY
- ADJOINING PARCEL LINE
- EXIST. EDGE OF PAVEMENT
- EXIST. FENCE
- EXIST. WOOD GUIDERAIL
- EXIST. WALL
- EXIST. RAILROAD TRACKS
- EXIST. CONC. CURB
- EXIST. BUILDING
- EXIST. MULCH BED
- EXIST. UTILITY POLE

## SITE DATA

ZONING DISTRICT: LIM LIMITED INDUSTRIAL

| DESCRIPTION: | REQUIRED | EXISTING | PROVIDED |
|---|---|---|---|
| MINIMUM LOT AREA (ACRES) | 4.00 | 4.57 | 4.57 |
| MAXIMUM BUILDING COVERAGE | 40% | 0 | 4.02% |
| MAXIMUM IMPERVIOUS COVERAGE (%) | 60 | X | 8.94 |
| MIN. SETBACK FROM RESIDENTIAL DISTRICT (FT.) | 200 | 200 | 111 (1) |
| FRONT YARD | 50 | N/A | 50 |
| SIDE YARD | 50 | N/A | 64.98 |
| REAR YARD | 50 | N/A | >50 |
| PARK SETBACK FROM RESIDENTIAL | 100 (2) | N/A | 57.77(2) |
| REQUIRED PARKING SPACES | SEE BELOW (3) | N/A | 4 (3) |
| MAXIMUM BUILDING HEIGHT (FT) | 35 | N/A | 35d0'0" |
| (1) REQUIRED DISTANCE OF 200 FT. FROM RESIDENTIAL DISTRICT PROVIDES NO USABLE BUILDING AREA. VARIANCE GRANTED. | | | |
| (2) REQUIRED A DISTANCE OF 100 FT. FROM RESIDENTIAL DISTRICT. VARIANCE GRANTED. | | | |
| (3) 1 PARKING SPACE PER 2 EMPLOYEES: MAXIMUM EMPLOYEES 8 / 2 = 4 PARKING SPACES. | | | |

811 Know what's below. Call before you dig.

PENNSYLVANIA ONE CALL
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BEFORE YOU DIG

CONTRACTORS ARE REQUIRED TO CONTACT UTILITY USERS NOT LESS THAN 3 DAYS NOR MORE THAN 10 DAYS PRIOR TO BEGINNING ANY EXCAVATION OR DEMOLITION WORK. INFORMATION ON THESE PLANS CONCERNING UTILITIES IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

SERIAL #: 20180611638 DATE: MARCH 17, 2018

## REQUESTED WAIVERS

THE APPLICANT RESPECTFULLY REQUESTS WAIVERS FROM THE FOLLOWING WHITEMARSH TOWNSHIP SUBDIVISION AND LAND DEVELOPMENT ORDINANCE SECTIONS:

1. §105-22-B(2): SEDIMENTATION AND EROSION CONTROL PLAN PURSUANT TO THE WHITEMARSH TOWNSHIP GRADING ORDINANCE. *SITE CONSTRUCTION HAS BEEN COMPLETED AND THE SITE HAS BEEN STABILIZED IN CONFORMANCE WITH APPROVED PRELIMINARY PLANS.*
2. §105-22-B(4): LANDSCAPE PLAN SHOWING PROPOSED PLANTING SCHEDULE INDICATING THE LOCATIONS, SPECIES AND SIZES OF PLANTINGS AS REQUIRED BY §§ 105-39, 105-48 AND 105-54. *PLANTINGS HAVE BEEN INSTALLED PER THE LANDSCAPING PLAN IN THE APPROVED PRELIMINARY PLAN SET.*
3. §105-22-B(5)(b): STREET PROFILES. *STREETS ARE NOT PROPOSED IN THIS PROJECT.*
4. §105-22-B(5)(c): STREET CROSS-SECTIONS. *DRIVEWAYS HAVE BEEN CONSTRUCTED IN CONFORMANCE WITH APPROVED PRELIMINARY PLANS.*
5. §105-22-B(5)(e): STORM SEWER PROFILES. *THE STORM SEWER HAS BEEN CONSTRUCTED AND SHOWN PER THE AS-BUILT SURVEY ON THE EXISTING FEATURES PLAN (SHT. 03).*
6. §105-22-B(10): FINAL RESOURCE IMPACT AND CONSERVATION PLAN (THE "FINAL IMPACT PLAN").
7. §105-22-B(11): COMMON OPEN SPACE OWNERSHIP AND MANAGEMENT PLAN. *OPEN SPACE IS NOT PROPOSED FOR THIS SITE.*

## ZONING HEARING BOARD DECISION & ORDER

AFTER COMPLETION OF AN APRIL 7, 2016 PUBLIC HEARING, ON THE APPLICATION #2016-05, PURSUANT TO PUBLIC NOTICE AS REQUIRED BY LAW, THE ZONING HEARING BOARD OF WHITEMARSH TOWNSHIP DECIDED AND ORDERS AS FOLLOWS:

1. A VARIANCE FROM SECTION 116-137B(2), TO REDUCE THE REQUIRED 200' BUILDING SETBACK FROM A RESIDENTIAL DISTRICT TO 111 FEET, IS GRANTED.
2. A VARIANCE FROM SECTION 116-140, TO REDUCE THE REQUIRED 100' PARKING SETBACK FROM A RESIDENTIAL DISTRICT TO 57.77 FEET, IS GRANTED.

THIS DECISION IS SUBJECT TO THE FOLLOWING CONDITIONS:

1. ALL USE AND DEVELOPMENT PERMITTED BY THIS DECISION SHALL CONFORM TO THE EXHIBITS AND TESTIMONY PRESENTED BY THE APPLICANT, UNLESS INCONSISTENT WITH ANY SPECIFIC CONDITIONS IMPOSED BY THIS BOARD, IN WHICH CASE THESE SPECIFIC CONDITIONS SHALL TAKE PRECEDENCE.
2. THE APPLICANT SHALL APPLY FOR AND OBTAIN ALL PERMITS REQUIRED BY THE TOWNSHIP CODES IN A TIMELY MANNER.
3. THE APPLICANT SHALL SUBMIT A REVISED AERIAL PHOTO DESIGNATING THE LOCATION OF THE PROPOSED BUILDING.
4. ONCE THE PROPOSED BUILDING FOR THE STORAGE OF EQUIPMENT IS CONSTRUCTED, THERE SHALL BE NO OUTDOOR STORAGE OF EQUIPMENT NEAR THE OFFICE LOCATED AT 60 FLOURTOWN ROAD.

## GENERAL NOTES

1. THIS PLAN REPRESENTS AN ACTUAL FIELD SURVEY PERFORMED BY THIS OFFICE COMPLETED ON OCTOBER 4, 2019.

2. SITE DATA:

CURRENT OWNER: 60 FLOURTOWN ROAD, LLC
ADDRESS: 343 MILITIA HILL ROAD
FORT WASHINGTON, PA 19034

RECORDED DATA: WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA
TAX MAP: BLOCK 21 - UNIT 9
TAX PARCEL 65-00-08005-01-2
DEED: DB 5906 PG 2517

3. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CONFIRM THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

4. THE PROPERTY ON THIS SURVEY IS DETERMINED TO BE ZONE X, AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AREAS OUTSIDE ANY SPECIAL FLOOD HAZARD AREA ("SFHA") BECAUSE THE FLOOD INSURANCE RATE MAP IS NOT PRINTED, BUT CAN BE IDENTIFIED AS PANEL 357 OF 451, COMMUNITY NUMBER 420712, MAP NUMBER 42091C0357G, BEARING AN EFFECTIVE DATE OF MARCH 2, 2016. THE DATUM FOR THIS FIRM MAPS IN THIS AREA IS NAVD88.

5. THE VERTICAL DATUM FOR THIS SITE IS NAVD 1988 BASED ON GPS OBSERVATIONS.
6. PA ONE CALL 20180611638; DATED MARCH 17, 2018

7. NET AREA (TO LEGAL R/W) = 4.57 Ac.

8. THE CLIENT HAS PROVIDED A TITLE REPORT PREPARED BY FIRST AMERICAN TITLE INSURANCE COMPANY, FILE NO. 5011442-02622984E, (NO EFFECTIVE DATE ON POLICY).

9. PLAN REFERENCES:

A.) A PLAN AND CAD FILE ENTITLED "FLOURTOWN ROAD" BY WOODROW & ASSOCIATES, INC. DATED AUGUST 19, 2015; LAST REVISED MARCH 10, 2017.

B.) "DRAWINGS FOR CONSTRUCTION OF STATE ROUTE 0006 SECTION 292" FROM STA. 190+00 TO STA. 216+00, SHEETS 6 AND 7 OF 42, PREPARED BY DISTRICT 6-0 PLANS UNIT FOR THE COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION, APPROVED MAY 23, 1990.

10. ALL MATERIALS USED AND CONSTRUCTION METHODS EMPLOYED SHALL BE IN ACCORDANCE WITH WHITEMARSH TOWNSHIP AUTHORITY STANDARD SPECIFICATION FOR SANITARY SEWER FACILITIES.

## WAIVERS GRANTED

THE FOLLOWING WAIVER REQUESTS WERE GRANTED BY THE WHITEMARSH TOWNSHIP BOARD OF SUPERVISORS ON JANUARY 26, 2017:

1. §105-21(B)(1)(j): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT SUBMIT A COMPLETE OUTLINE SURVEY TIED TO ALL ADJACENT INTERSECTIONS AND AREAS, TO ALLOW THE EXISTING FEATURES PLAN THAT WAS SUBMITTED AS PART OF THIS PROJECT TO MEET THIS REQUIREMENT.
2. §105-22-B(1)(n): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT SUBMIT A COMPLETE SURVEY OUTLINING EXISTING PRINCIPAL BUILDINGS AND DRIVEWAYS ON ALL ADJACENT PARCELS, SEWER LINES, STORM DRAINS, CULVERTS, BRIDGES, UTILITY EASEMENTS AND ALL OTHER FEATURES WITHIN 500 FEET OF THE SITE, TO ALLOW THOSE FEATURES TO BE SHOWN WITHIN 100 FEET OF THE SITE.
3. §105-21.1(K)(2): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PAY A TRAFFIC IMPACT FEE.
4. §105-30(A): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE CURB, SIDEWALK AND A TREE ZONE ALONG FLOURTOWN ROAD.
5. §105-30(B): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE ADDITIONAL WIDENING OF FLOURTOWN ROAD.
6. §105-38(B)(2): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE A 25-FOOT WIDE DRIVEWAY, TO ALLOW A 24-FOOT WIDE DRIVEWAY.
7. §105-38(F): RELIEF FROM THE REQUIREMENT THAT ALL PARKING AREAS BE CONFINED BY CURBING, TO ALLOW THE USE OF CONCRETE WHEEL STOPS.
8. §105-46(A): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE CURBS.
9. §105-47(A): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE SIDEWALKS.
10. §105-53(D): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT DEDICATE LAND FOR PARK AND RECREATION USE OR PAY A FEE-IN-LIEU OF SUCH DEDICATION. THIS WAIVER IS SPECIFICALLY CONDITIONED ON THE APPLICANT GRANTING THE TOWNSHIP A CONSERVATION EASEMENT OVER THE UNDEVELOPED PORTION OF THE PROPERTY, THE EXACT GEOGRAPHIC EXTENT OF WHICH SHALL BE DETERMINED BY THE TOWNSHIP IN CONSULTATION WITH THE APPLICANT.
11. §55-4(U)(5) [CHAPTER 55-WHITEMARSH TOWNSHIP CODE]: RELIEF FROM THE REQUIREMENT THAT THE APPLICANT REPLACE TREES PURSUANT TO THE TREE PRESERVATION, PROTECTION AND REPLACEMENT REQUIREMENTS, TO ALLOW THE APPLICANT TO COMPLY WITH THE RECOMMENDATIONS OF THE SHADE TREE COMMISSION SET FORTH IN EXHIBIT "E" AND EXHIBIT "F" HERETO.
12. §II(E)(2)(g)(v) [RESOLUTION #2004-8; CHAPTER 58-WHITEMARSH TOWNSHIP CODE]: RELIEF FROM THE REQUIREMENT THAT THE MINIMUM PIPE DIAMETER FOR STORM SEWER IS 18" IN DIAMETER TO ALLOW THE USE OF A 10" DIAMETER STORM SEWER PIPE FOR THE BASIN OUTLET PIPE.

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — ROBERT E. BLUE, JR. — ENGINEER No. PE26169-E

ROBERT E. BLUE JR. (DATE)
LICENSE NO. 26169-E

PROFESSIONAL LAND SURVEYOR

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — ROBERT E. BLUE, JR. — LAND SURVEYOR No. SU1323A

ROBERT E. BLUE JR. (DATE)
LICENSE NO. SU1323A

| REVISIONS |
|---|
| 1.) 07/02/20: REV. PER CLIENT ATTORNEY REVIEW/ COMMENT |


1. ALL DRAWINGS, DESIGNS & WORK, & ALL CONCEPTS & PRINCIPLES, & ARRANGEMENTS OF SERVICE AS RESPECTIVELY PREPARED, FURNISHED OR PERFORMED BY R. E. BLUE, CONSULTING ENGINEERS, P.C. ("ROBERT E. BLUE, CONSULTING ENGINEERS, P.C." OR "R. E. BLUE, P.C."), ARE AND SHALL REMAIN THE PROPERTY OF ROBERT E. BLUE, CONSULTING ENGINEERS, P.C. AND SHALL NOT BE USED BY OR DISCLOSED TO ANYONE EXCEPT ROBERT E. BLUE, CONSULTING ENGINEERS, P.C., OR FOR USE ON ANY OTHER PROJECT OR EXTENSION TO THIS PROJECT, EXCEPT BY AGREEMENT IN WRITING AND WITH APPROPRIATE COMPENSATION TO ROBERT E. BLUE, CONSULTING ENGINEERS, P.C. AND UNLESS ROBERT E. BLUE, CONSULTING ENGINEERS, P.C. IS ADEQUATELY PROTECTED FROM LIABILITY FOR IMPROPER USE, REUSE, ALTERATION OR DISCLOSURE, WHETHER BY OMISSION, ACCIDENT, LEGEND, AND OTHERWISE.



robert e. blue
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1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com


RECORD PLAN

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

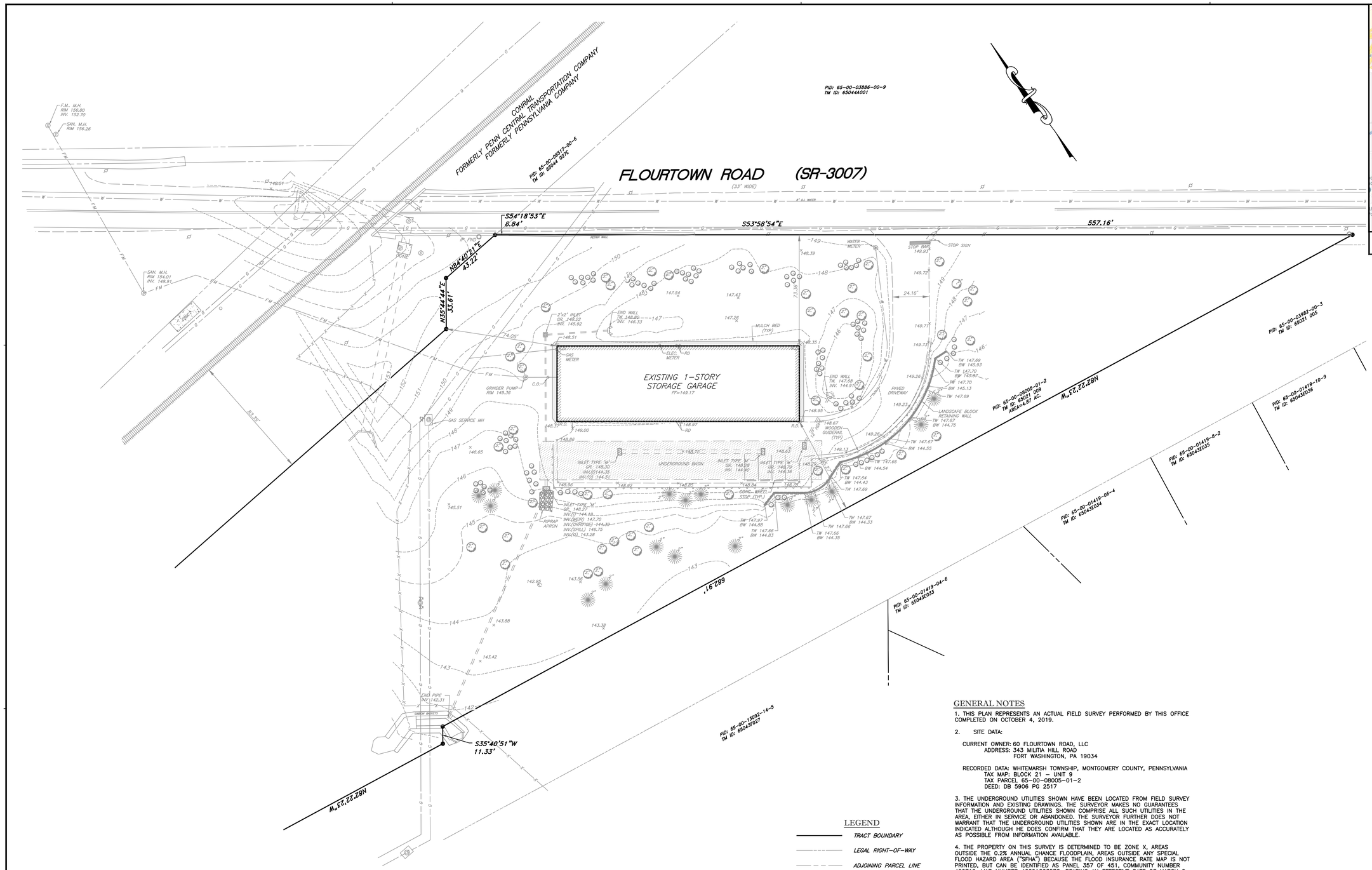
PREPARED FOR
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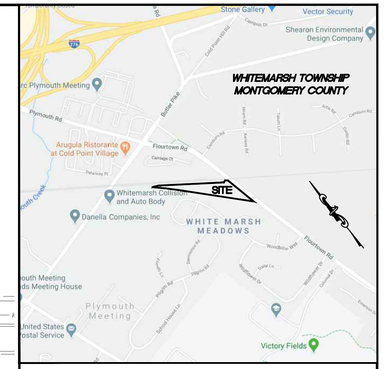
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| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RJN | REB | 1"=30' |
| DATE: | JOB NUMBER: | SHEET NUMBER: |
| 05-18-2020 | 2081-1E | 2 of 6 |

LAST SAVED: M:\Proj\2081-1\Dwg\Site\PANE PLAN SUBMISSION 02 RECORD-2081-1.dwg ON 7/6/2020 4:48 PM




LOCATION MAP
SCALE: 1"=1,000'
500' 0 1,000'

REVISIONS
1.) 07/02/20: REV. PER CLIENT ATTORNEY REVIEW/ COMMENT

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robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

GRAPHIC SCALE
0 30 60 120 150

LEGEND

- TRACT BOUNDARY
- LEGAL RIGHT-OF-WAY
- ADJOINING PARCEL LINE
- EXIST. EDGE OF PAVEMENT
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DIAL 8-1-1 or 1-800-242-1776
BEFORE YOU DIG

CONTRACTORS ARE REQUIRED TO CONTACT UTILITY USERS NOT LESS THAN 3 DAYS NOR MORE THAN 10 DAYS PRIOR TO BEGINNING ANY EXCAVATION OR DEMOLITION WORK. INFORMATION ON THESE PLANS CONCERNING UTILITIES IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

SERIAL #: 20180611638 DATE: MARCH 17, 2018

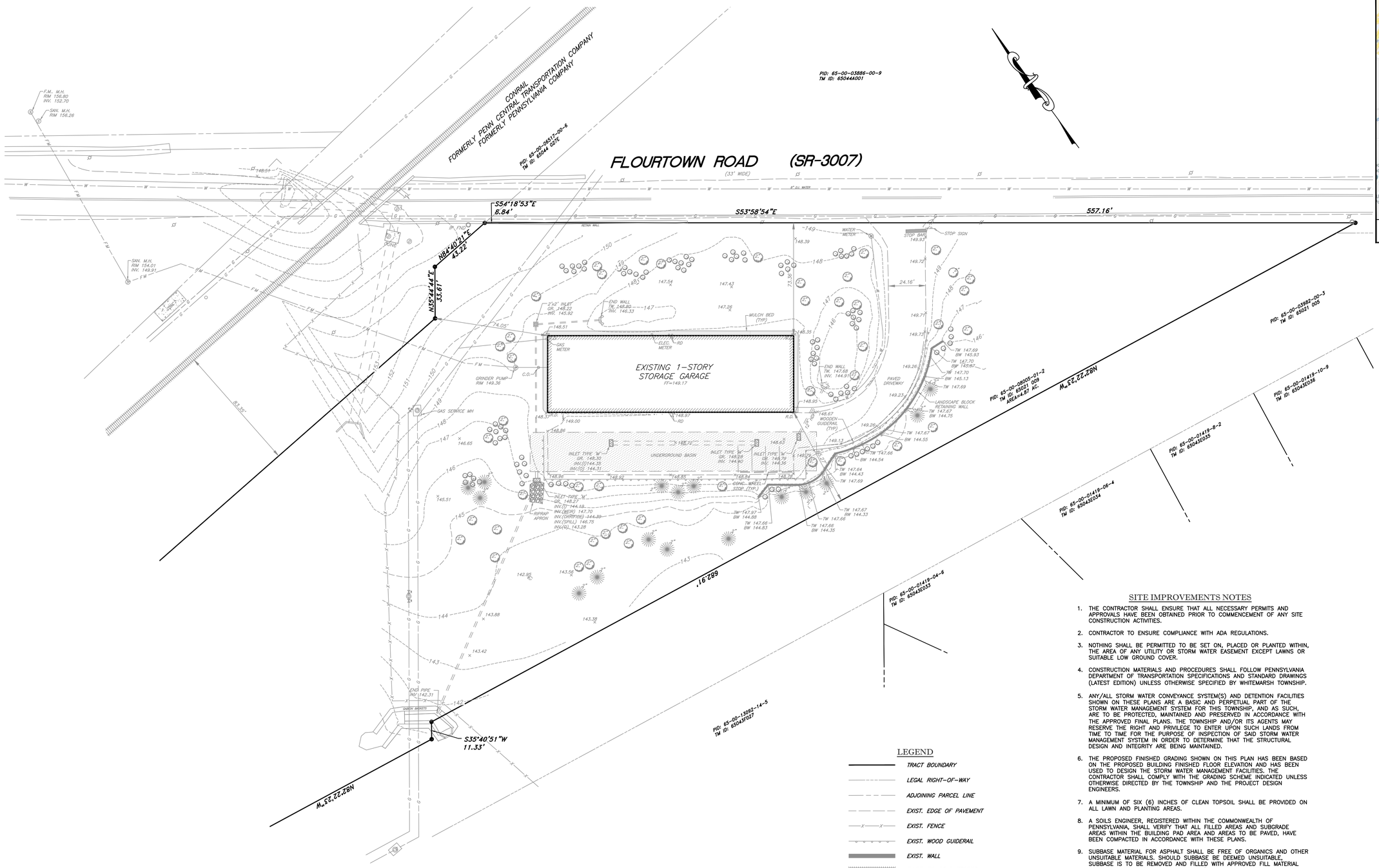
EXISTING FEATURES PLAN

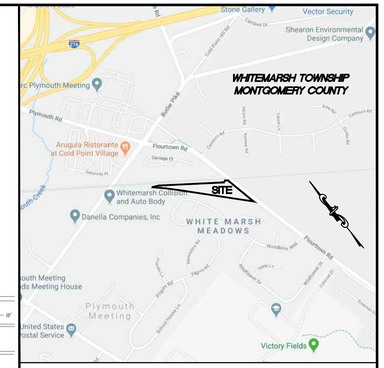
100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RJN | REB | 1"=30' |
| DATE: 05-18-2020 | JOB NUMBER: 2081-1E | SHEET NUMBER: 3 of 6 |

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LOCATION MAP
SCALE: 1"=1,000'

500' 0 1,000'

## LEGEND

- TRACT BOUNDARY
- LEGAL RIGHT-OF-WAY
- ADJOINING PARCEL LINE
- EXIST. EDGE OF PAVEMENT
- EXIST. FENCE
- EXIST. WOOD GUIDERAIL
- EXIST. WALL
- EXIST. RAILROAD TRACKS
- EXIST. CONC. CURB
- EXIST. BUILDING
- EXIST. MULCH BED
- EXIST. UTILITY POLE

## SITE IMPROVEMENTS NOTES

1. THE CONTRACTOR SHALL ENSURE THAT ALL NECESSARY PERMITS AND APPROVALS HAVE BEEN OBTAINED PRIOR TO COMMENCEMENT OF ANY SITE CONSTRUCTION ACTIVITIES.
2. CONTRACTOR TO ENSURE COMPLIANCE WITH ADA REGULATIONS.
3. NOTHING SHALL BE PERMITTED TO BE SET ON, PLACED OR PLANTED WITHIN, THE AREA OF ANY UTILITY OR STORM WATER EASEMENT EXCEPT LAWNS OR SUITABLE LOW GROUND COVER.
4. CONSTRUCTION MATERIALS AND PROCEDURES SHALL FOLLOW PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND STANDARD DRAWINGS (LATEST EDITION) UNLESS OTHERWISE SPECIFIED BY WHITEMARSH TOWNSHIP.
5. ANY/ALL STORM WATER CONVEYANCE SYSTEM(S) AND DETENTION FACILITIES SHOWN ON THESE PLANS ARE A BASIC AND PERPETUAL PART OF THE STORM WATER MANAGEMENT SYSTEM FOR THIS TOWNSHIP, AND AS SUCH, ARE TO BE PROTECTED, MAINTAINED AND PRESERVED IN ACCORDANCE WITH THE APPROVED FINAL PLANS. THE TOWNSHIP AND/OR ITS AGENTS MAY RESERVE THE RIGHT AND PRIVILEGE TO ENTER UPON SUCH LANDS FROM TIME TO TIME FOR THE PURPOSE OF INSPECTION OF SAID STORM WATER MANAGEMENT SYSTEM IN ORDER TO DETERMINE THAT THE STRUCTURAL DESIGN AND INTEGRITY ARE BEING MAINTAINED.
6. THE PROPOSED FINISHED GRADING SHOWN ON THIS PLAN HAS BEEN BASED ON THE PROPOSED BUILDING FINISHED FLOOR ELEVATION AND HAS BEEN USED TO DESIGN THE STORM WATER MANAGEMENT FACILITIES. THE CONTRACTOR SHALL COMPLY WITH THE GRADING SCHEME INDICATED UNLESS OTHERWISE DIRECTED BY THE TOWNSHIP AND THE PROJECT DESIGN ENGINEERS.
7. A MINIMUM OF SIX (6) INCHES OF CLEAN TOPSOIL SHALL BE PROVIDED ON ALL LAWN AND PLANTING AREAS.
8. A SOILS ENGINEER, REGISTERED WITHIN THE COMMONWEALTH OF PENNSYLVANIA, SHALL VERIFY THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING PAD AREA AND AREAS TO BE PAVED, HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS.
9. SUBBASE MATERIAL FOR 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).
10. THE MINIMUM SLOPE IN GRASSED AREAS SHALL NOT BE LESS THAN 2% AND THE MINIMUM IN PAVED AREAS SHALL NOT BE LESS THAN 1%. ALL ELECTRIC, TELEPHONE AND COMMUNICATIONS SERVICE FACILITIES. BOTH MAIN AND SERVICE LINES, SHALL BE PROVIDED BY UNDERGROUND CABLES, INSTALLED IN ACCORDANCE WITH THE PREVAILING STANDARDS AND PRACTICES OF THE UTILITY AND OTHER COMPANIES PROVIDING SUCH SERVICE.
11. THIS PLAN IS SUBJECT TO REVIEW AND APPROVAL OF THE WHITEMARSH TOWNSHIP SHADE TREE COMMISSION PRIOR TO ANY TREE REMOVAL ON SITE.

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ROBERT E. BLUE, JR.
ENGINEER
No. PE026169-E

ROBERT E. BLUE JR. (DATE)
LICENSE NO. 26169-E

811 Know what's below. Call before you dig.

PENNSYLVANIA ONE CALL
DIAL 8-1-1 or 1-800-242-1776
BEFORE YOU DIG

CONTRACTORS ARE REQUIRED TO CONTACT UTILITY USERS NOT LESS THAN 3 DAYS NOR MORE THAN 10 DAYS PRIOR TO BEGINNING ANY EXCAVATION OR DEMOLITION WORK. INFORMATION ON THESE PLANS CONCERNING UTILITIES IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

SERIAL #: 20180611638 DATE: MARCH 17, 2018

| REVISIONS |
|---|
| 1) 07/02/20: REV. PER CLIENT ATTORNEY REVIEW COMMENT |

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robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

GRAPHIC SCALE
0 30 60 120 150

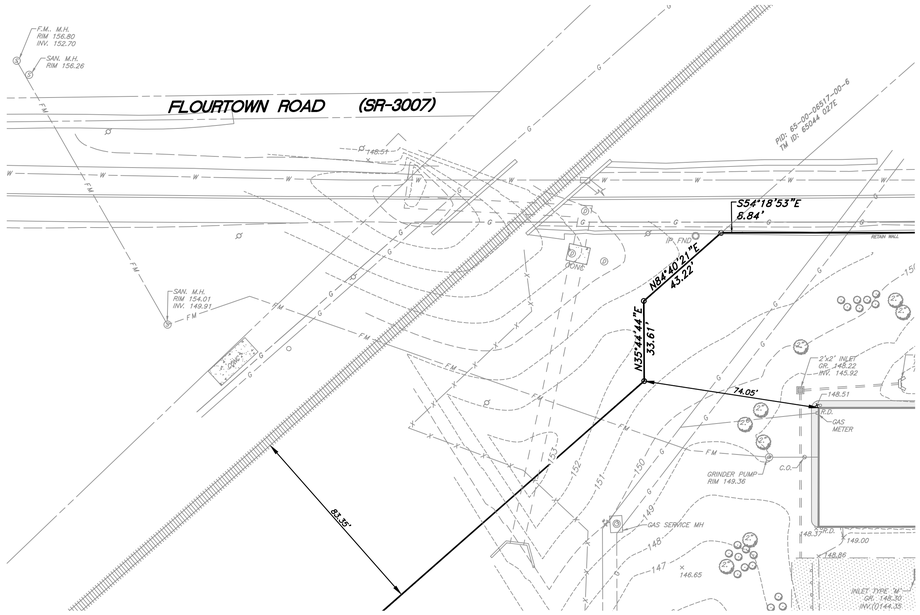
SITE IMPROVEMENTS PLAN

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RJN | REB | 1"=30' |
| DATE: 05-18-2020 | JOB NUMBER: 2081-1E | SHEET NUMBER: 4 of 6 |

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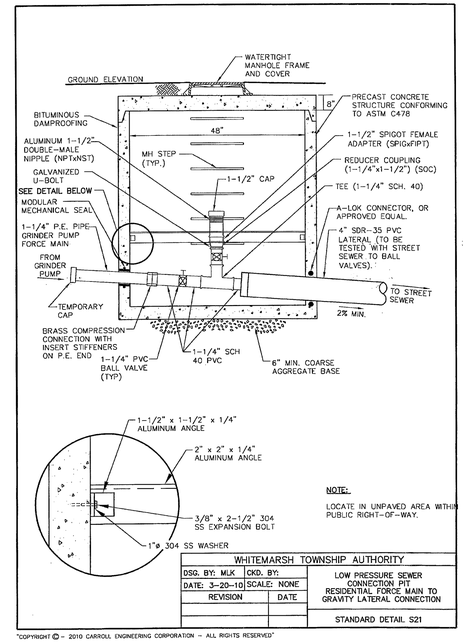



PLAN VIEW: OFF-SITE SANITARY SEWER FORCEMAIN MANHOLE TO ON-SITE GRINDER PUMP

SCALE: 1"=40'

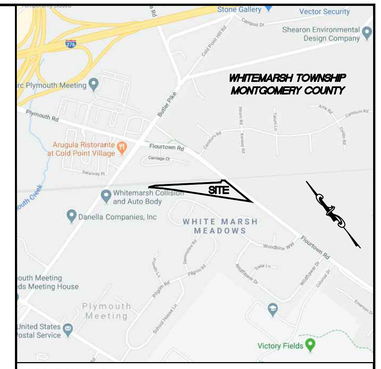
## LEGEND

- EXISTING STORM INLET TYPE 'M'
- EXISTING STORM MANHOLE
- EXISTING 2'x2' YARD DRAIN
- EXISTING CONC. ENDWALL
- R.D. EXISTING ROOF DRAIN
- EXISTING WATER METER
- EXISTING GAS SERVICE MANHOLE
- EXISTING GAS VALVE
- EXISTING GAS METER
- EXISTING ELECTRIC METER
- EXISTING GRINDER PUMP
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING UTILITY POLE
- EXISTING DECIDUOUS TREE
- EXISTING EVERGREEN TREE
- EXISTING SIGN
- 149.00 SPOT ELEVATION
- EXISTING CONTOUR (1 FT. INTERVAL)
- EXISTING CONTOUR (5 FT. INTERVAL)
- W EXISTING WATER PIPE
- G EXISTING GAS PIPE
- SAN EXISTING SANITARY SEWER
- FM EXISTING SANITARY FORCEMAIN
- EXISTING STORM SEWER
- EXISTING TIMBER GUIDERAIL
- EXISTING BUILDING




| WHITEMARSH TOWNSHIP AUTHORITY | | |
|---|---|---|
| DSG. BY: MLK | CKD. BY: | LOW PRESSURE SEWER CONNECTION PIT RESIDENTIAL FORCE MAIN TO GRAVITY LATERAL CONNECTION |
| DATE: 3-20-10 | SCALE: NONE | |
| REVISION | DATE | |
| | | STANDARD DETAIL S21 |

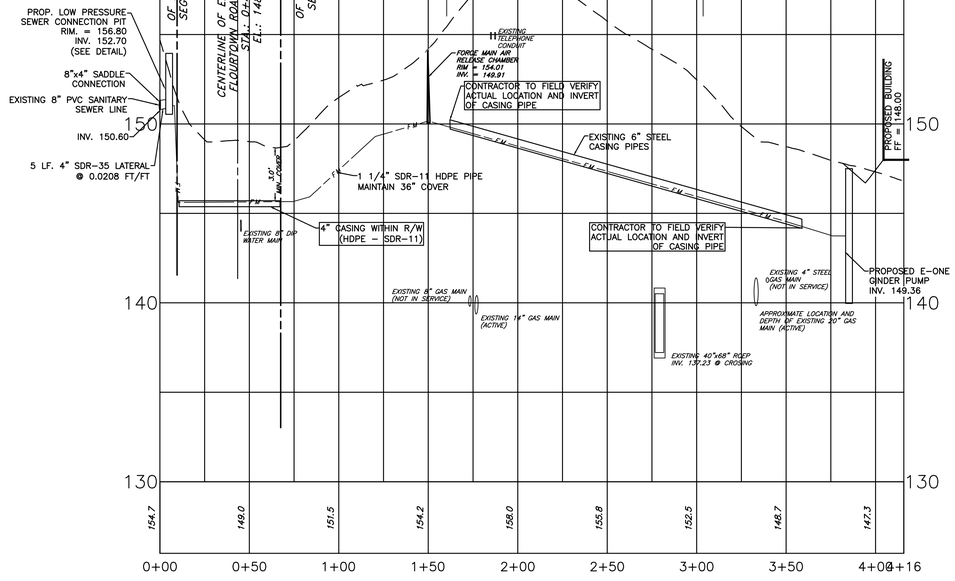
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LOCATION MAP
SCALE: 1"=1,000'
500' 0 1,000'

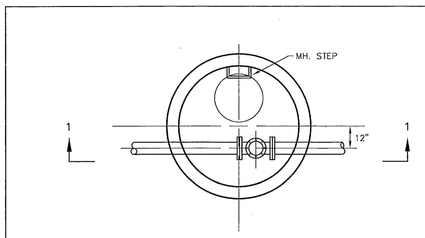
| REVISIONS |
|---|
| 1) 07/02/20: REV. PER CLIENT ATTORNEY REVIEW/ COMMENT |

1. ALL MANHOLES PROVIDED & INSTALLED BY L.M.E. CONSTRUCTION ASSOCIATES, L.L.C. REPRESENTATIVES OF SERVICE ARE RIGHT OF WAY, PUBLIC, PRIVATE, NOT REVISED, OR PRIVATE PROJECT OF ANY KIND, AND INCLUDING ANY AND ALL PERSONS OR PROPERTY IN ANY MANNER, BY REASON OF THE OPERATIONS OF THE CONTRACTOR, SUBCONTRACTOR, AGENTS, EMPLOYEES, OR ANY OTHER PERSONS ENGAGED IN THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER, ENGINEER, AND ALL OF THEIR CONSULTANTS, AGENTS, AND EMPLOYEES FROM AND AGAINST ALL CLAIMS, DAMAGES, LOSSES, AND EXPENSES, DIRECTLY OR INDIRECTLY CAUSED BY, OR RESULTING FROM, THE PERFORMANCE OF THE WORK.

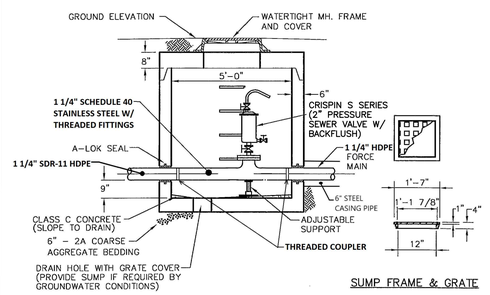



PROFILE VIEW: OFF-SITE SANITARY SEWER FORCEMAIN MANHOLE TO ON-SITE GRINDER PUMP

SCALE: 1"=40' (HORIZ.)
1"=4' (VERT.)




PLAN SECTION

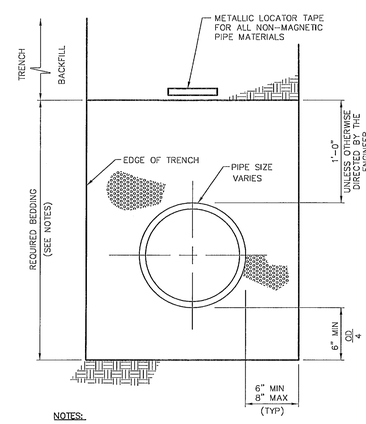



SECTION 1-1

SUMP FRAME & GRATE

| WHITEMARSH TOWNSHIP AUTHORITY | | |
|---|---|---|
| DSG. BY: MLK | CKD. BY: | FORCE MAIN AIR RELEASE CHAMBER |
| DATE: 3-20-10 | SCALE: NONE | |
| REVISION | DATE | |
| | | STANDARD DETAIL S15 |

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NOTES:

1. AASHTO NO. 8 COARSE AGGREGATE FOR PVC PIPE.
2. PADOT 2A COARSE AGGREGATE FOR DUCTILE IRON PIPE.
3. SCREENINGS OR TYPE B #3 FINE AGGREGATE FOR COPPER PIPE.

| WHITEMARSH TOWNSHIP AUTHORITY | | |
|---|---|---|
| DSG. BY: MLK | CKD. BY: | STANDARD PIPE BEDDING |
| DATE: 3-20-10 | SCALE: NONE | |
| REVISION | DATE | |
| | | STANDARD DETAIL M1 |

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PROFESSIONAL LAND SURVEYOR

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT E. BLUE, JR. LAND SURVEYOR No. SU1323A

ROBERT E. BLUE JR. (DATE)
LICENSE NO. SU1323A

FORCEMAIN PLAN & PROFILE

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

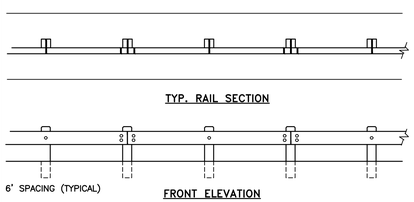
PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

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consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

| DRAWN BY: | CHECKED BY: | SCALE: |
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| RJN | SDM | AS NOTED |
| DATE: | JOB NUMBER: | SHEET NUMBER: |
| 01-27-2020 | 2081-1E | 5 of 6 |

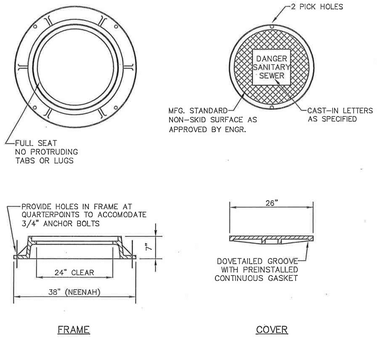
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NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS.
2. DO NOT SCALE DRAWINGS.
3. IF TOP OF SLOPE IS CLOSER THAN 24" INCREASE POST LENGTH TO 7.0'.
4. DRIVE POSTS OR AUGER, BACKFILL WITH NATIVE SOIL AND COMACT EVERY 12".
5. ALL TIMBER #1 S4S SOUTHERN PINE, PRESSURE TREATED: AWPA–C14, WOOD FOR USE IN HIGHWAY CONSTRUCTION.
6. TYP. POST: 8"x8"x6' – TYP. RAIL: 4"x12"x11' 11/12"
7. FASTENERS: ASTM A307; A242; F436 TYPE 3; A563 DH3.
8. SPLICE PLATE & PLATE WASHER ASTM–A588.
9. UNDER EACH BOLT HEAD ON FACE OF RAIL INSTALL ONE 7/8" WASHER.

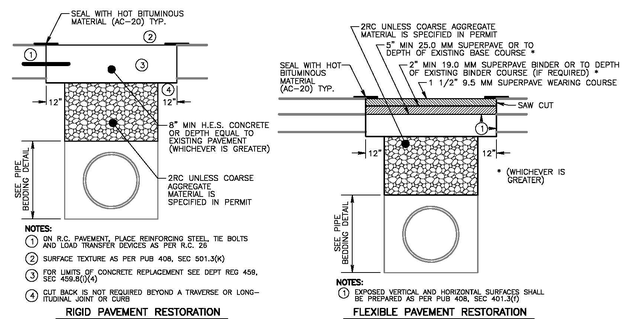
## TIMBER GUIDERAIL DETAIL
(NOT TO SCALE)




NOTES:

1. ALL MATERIALS TO BE GRAY CAST IRON ASTM A–48.
2. FRAME AND COVER SHALL BE FOR HEAVY DUTY TRAFFIC, AASHTO HS–20.
3. PROVIDE FOUR (4) ANCHOR BOLTS, 3/4" DIA. MINIMUM.
4. THE FOLLOWING MANUFACTURER'S STANDARD CASTING, OR APPROVED EQUAL, SHALL BE USED.
   NEENAH FOUNDRY CO. ——— PATTERN R–1642.

## STANDARD MANHOLE FRAME & COVER
(NOT TO SCALE)




NOTES:
1. ON R.C. PAVEMENT, PLACE REINFORCING STEEL, TIE BOLTS AND LOAD TRANSFER DEVICES AS PER R.C. 25
2. SURFACE TEXTURE AS PER PUB 408, SEC 501.3(K)
3. FOR LIMITS OF CONCRETE REPLACEMENT SEE DEPT REG 459, SEC 459.8(0)(4)
4. CUT BACK IS NOT REQUIRED BEYOND A TRAVERSE OR LONGITUDINAL JOINT OR CURB

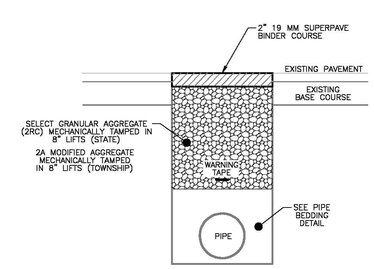
## RIGID PAVEMENT RESTORATION

NOTES:
1. EXPOSED VERTICAL AND HORIZONTAL SURFACES SHALL BE PREPARED AS PER PUB 408, SEC 401.3(I)

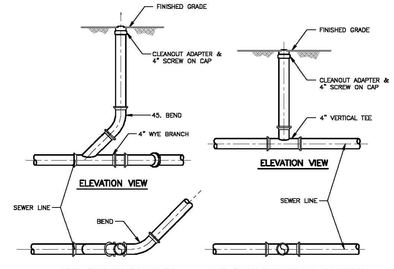
## FLEXIBLE PAVEMENT RESTORATION

NOTES:
1. ALL RESTORATION TO BE IN ACCORDANCE WITH PENNDOT PUB 408/94 AND PA CODE TITLE 67 CHAPTER 459.
2. SPECIAL CONDITIONS OF OCCUPANCY PERMIT MAY SUPERCEED THIS DETAIL.

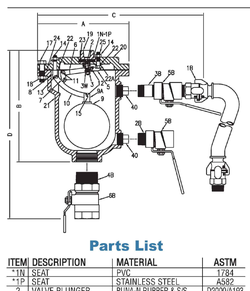
## TRENCH RESTORATION
## PERMANENT PAVEMENT - STATE HIGHWAY
(NOT TO SCALE)




## TEMPORARY PAVEMENT SECTION
## STATE & TOWNSHIP ROADS
(NOT TO SCALE)




## SANITARY CLEAN–OUT DETAILS
(NOT TO SCALE)




## Parts List

| ITEM | DESCRIPTION | MATERIAL | ASTM |
|---|---|---|---|
| *1N | SEAT | PVC | 1784 |
| *1P | SEAT | STAINLESS STEEL | A582 |
| 2 | VALVE PLUNGER | BUNA-N RUBBER & SS | D2000/A193 |
| 3 | PLUNGER NUT | STAINLESS STEEL | A194 |
| 3W | LOCK WASHER | STAINLESS STEEL | A240 |
| 5 | VALVE FULCRUM | STAINLESS STEEL | A582 |
| 6 | VALVE LEVER | STAINLESS STEEL | A582 |
| 7 | LINK | STAINLESS STEEL | A240 |
| 8 | BALL FULCRUM | STAINLESS STEEL | A582 |
| 9 | BALL FLOAT | STAINLESS STEEL | A240 |
| 9A | FLOAT ROD | STAINLESS STEEL | A582 |
| 10 | BALL LEVER | STAINLESS STEEL | A240 |
| 11 | BEARING PIN | STAINLESS STEEL | A582 |
| 12 | BEARING PIN | STAINLESS STEEL | A582 |
| 13 | BEARING PIN | STAINLESS STEEL | A582 |
| 14 | NUT | STEEL | A563 |
| 15 | COTTER PIN | STAINLESS STEEL | A493 |
| 17 | BOLT | STEEL | A307 |
| 18 | NUT | STEEL | A563 |
| 19 | TOP | CAST IRON | A126 CL.B |
| 20 | FLANGE | CAST IRON | A126 CL.B |
| 21 | BODY | CAST IRON | A126 CL.B |
| 22 | FULCRUM WASHER | FIBER | D710 |
| 22A | FULCRUM WASHER | FIBER | D710 |
| 23 | SEAT GASKET | BUNA-N RUBBER | D2000 |
| 24 | FLANGE GASKET | ARMSTRONG N-8092 | N/A |
| 25 | BOLT | STAINLESS STEEL | A193 |
| *40 | FLUSH PLUG | CAST IRON | A126 CL.B |
| | **OPTIONAL BACK FLUSH COMPONENTS** | | |
| *1B | HOSE ASSEMBLY | CAD. PLT. STEEL & RUBBER | N/A |
| *2B | NIPPLE | STEEL | A53 |
| *3B | NIPPLE | STEEL | A53 |
| *4B | NIPPLE | STEEL | A53 |
| *5B | BALL VALVE | BRASS | N/A |
| *6B | BALL VALVE | BRASS | N/A |

## Specifications

The Pressure Sewer Air Release Valve(s) shall be installed at high points in the line, or at points selected by the engineer, to vent the accumulation of air and other gases with the line under pressure.

The valve(s) shall be of the long body design and shall have a _____" orifice with an adjustable Buna-N rubber valve and a sealing face of PVC. The valve(s) shall operate at _____ PSIG, and be capable of passing _____ SCFM of air.

They shall also be _____" NPT screwed or ANSI Class (125, 250) flanged connection. They shall have a cast iron body, top and flange, where required, and a stainless steel trim.

The valve(s) shall be Crispin Model _____ Pressure Sewer Valve(s) as manufactured by Crispin-Multiplex Manufacturing Co., Berwick, PA.

**Option**: The valve(s) shall be supplied with back flushing attachments so that the interior body can be flushed periodically for proper operation.

**Option**: The valve(s) shall be a Short Body Pressure Sewer Valve with an overall height not to exceed 12 1/4".

**Option**: Where pressures are greater than 300 PSIG, the valve(s) shall be ANSI Class _____ flanged inlet connection, and shall have a (steel, stainless steel, or ductile iron) body, top and inlet flange.

Standard operating pressure for Crispin Air Valves is 20 to 150 PSIG. Please check one of the following if your operating needs differ:

____ 2 to 40 PSIG ____ 151 to 300 PSIG

** Parts are interchangeable and optional at customer's request*

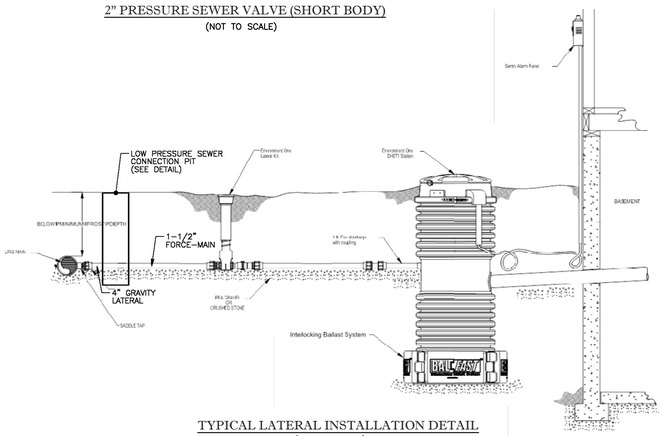
## Size Specifications

| MODEL | INLET SIZE | OUTLET SIZE | A | B | C | D | WHT. |
|---|---|---|---|---|---|---|---|
| S20S | 2" NPT | 0.50" NPT | 10.25 | 12.50 | | | 54 |
| S20SB | 2" NPT | 0.50" NPT | | | 14.75 | 17.50 | 66 |

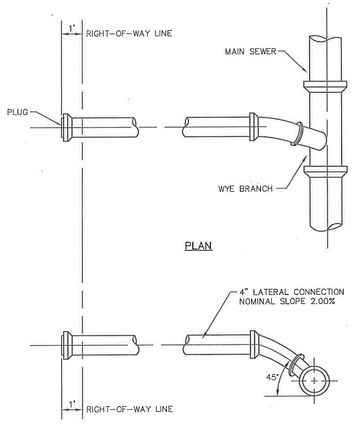
## Orifice Options

| DIAMETER | MAX. PRES. | DISCHARGE RATE |
|---|---|---|
| 1/4 | 150 PSIG | 97.5 SCFM |
| 1/8 | 300 PSIG | 46.7 SCFM |

## 2" PRESSURE SEWER VALVE (SHORT BODY)
(NOT TO SCALE)

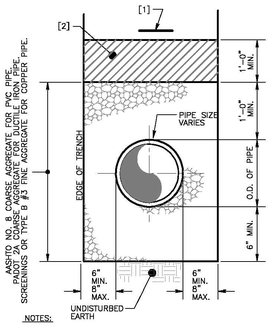



## TYPICAL LATERAL INSTALLATION DETAIL
(NOT TO SCALE)




NOTE:
PROVIDE 6" LATERAL CONNECTION WHEN SERVICING COMMERCIAL BUILDINGS AND MULTI–FAMILY DWELLING UNITS.

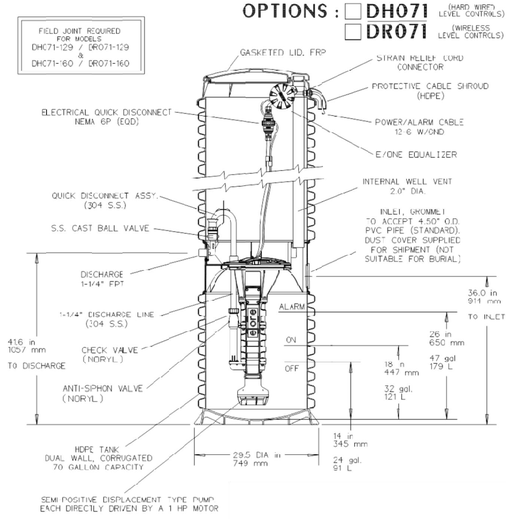
## SHALLOW LATERAL CONNECTION
(NOT TO SCALE)



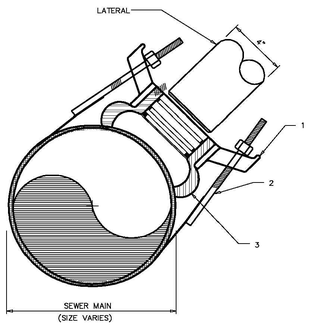

NOTES:
[1] EARLY WARNING TAPE SHALL BE TWO (2) INCH WIDE GREEN COLORED, METALLIC LINED PRINTED PLASTIC TAPE WITH THE WORDS "CAUTION BURIED SEWER LINE BELOW" STENCILED ON TAPE EVERY TWO (2) FEET. (USED IN PVC PIPE BEDDING)

[2] HAND TAMPED BACKFILL AS SPECIFIED. (2A MODIFIED STONE UNDER ALL ROADWAYS, DRIVEWAYS & PARKING LOTS)

## STANDARD SANITARY SEWER
## PIPE BEDDING DETAIL
(NOT TO SCALE)




## GRINDER PUMP DETAIL
(NOT TO SCALE)




NOTES:

MATERIALS:

1 SADDLE CASTING: DUCTILE IRON ASTM 536–80 GRADE 65–45–12 PROTECTED WITH CORROSION RESISTANT PAINT.

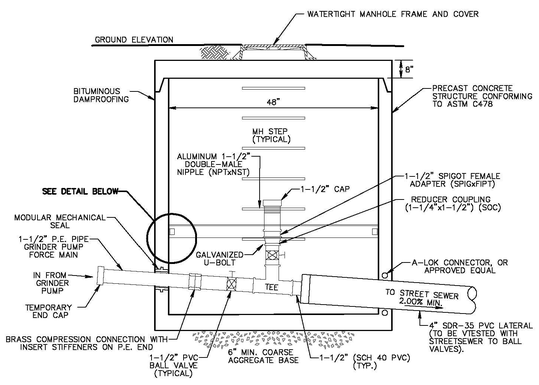
2 STAINLESS STEEL 304 ADJUSTABLE STRAP; BOLTS, NUTS AND WASHERS 1/2" –N.C. ROLL THREAD TEFLON COATED. 3 1/2" WIDE BAND TO SPREAD CLAMP .FORCE OUT ON PIPE.

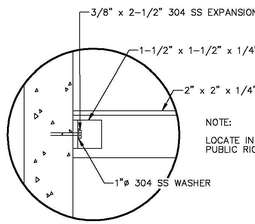
3 GASKET: VIRGIN SBR COMPOUNDED FOR SEWER SERVICE. MEETS ASTM D–2000 .3 BA715.

4 SADDLE TO BE INSTALLED AT THE 10:00 OR 2:00 POSITION ON EXISTING MAIN.

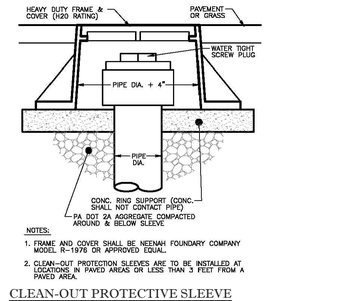
5 STYLE CB SEWER SADDLE MANUFACTURED BY: ROMAC INDUSTRIES, INC.

## SEWER SADDLE DETAIL
(NOT TO SCALE)



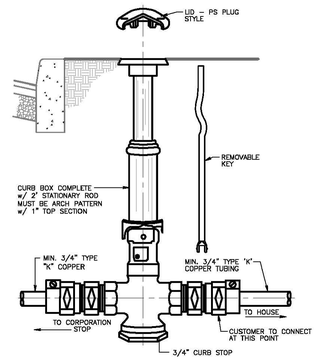




## LOW PRESSURE SEWER CONNECTION PIT - RESIDENTIAL
## FORCEMAIN TO GRAVITY LATERAL CONNECTION
(NOT TO SCALE)




NOTES:
1. FRAME AND COVER SHALL BE NEENAH FOUNDARY COMPANY MODEL R–1976 OR APPROVED EQUAL.
2. CLEAN–OUT PROTECTION SLEEVES ARE TO BE INSTALLED AT LOCATIONS IN PAVED AREAS OR LESS THAN 3 FEET FROM A PAVED AREA.

## CLEAN–OUT PROTECTIVE SLEEVE
(NOT TO SCALE)




## CURB STOP DETAIL
(NOT TO SCALE)

REVISIONS
1.) REVISED PER CLIENT ATTORNEY'S REVIEW & COMMENT

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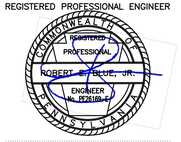
robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)–277–9441 fax: (610)–277–9897
www.robertblue.com email: rblue@robertblue.com

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CONSTRUCTION DETAILS
100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

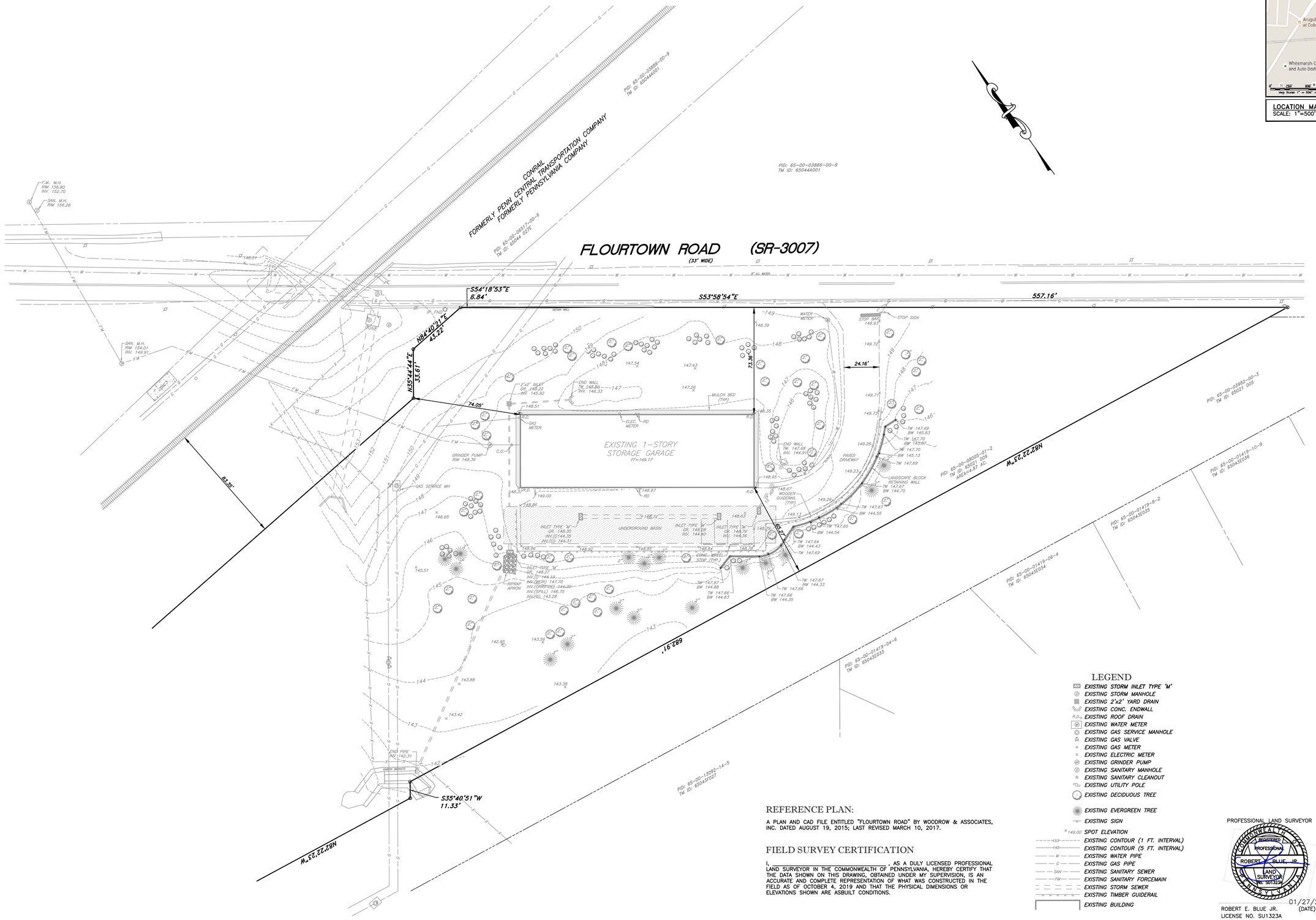
REGISTERED PROFESSIONAL ENGINEER

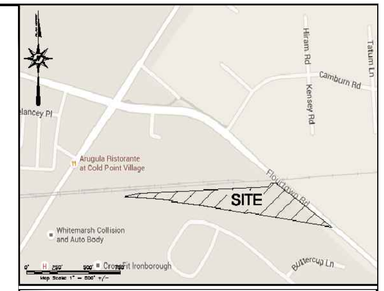



ROBERT E. BLUE JR. (DATE)
LICENSE NO. 26169–E

| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RJN | REB | NO SCALE |
| DATE: | JOB NUMBER: | SHEET NUMBER: |
| 05–18–2020 | 2081–1E | 6 of 6 |

LAST SAVED: M:\Proj\2081–1\dwg\Sheet\PAVE_PLAN_SUBMISSION\08_DETAILS.dwg ON 7/22/2020 5:17 PM




LOCATION MAP
SCALE: 1"=500'

## LEGEND

- EXISTING STORM INLET TYPE 'M'
- EXISTING STORM MANHOLE
- EXISTING 2'x2' YARD DRAIN
- EXISTING CONC. ENDWALL
- R.D. EXISTING ROOF DRAIN
- EXISTING WATER METER
- EXISTING GAS SERVICE MANHOLE
- EXISTING GAS VALVE
- EXISTING GAS METER
- EXISTING ELECTRIC METER
- EXISTING GRINDER PUMP
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING UTILITY POLE
- EXISTING DECIDUOUS TREE
- EXISTING EVERGREEN TREE
- EXISTING SIGN
- 149.00 SPOT ELEVATION
- 153 EXISTING CONTOUR (1 FT. INTERVAL)
- 145 EXISTING CONTOUR (5 FT. INTERVAL)
- W EXISTING WATER PIPE
- G EXISTING GAS PIPE
- SAN EXISTING SANITARY SEWER
- FM EXISTING SANITARY FORCEMAIN
- EXISTING STORM SEWER
- EXISTING TIMBER GUIDERAIL
- EXISTING BUILDING

## REFERENCE PLAN:

A PLAN AND CAD FILE ENTITLED "FLOURTOWN ROAD" BY WOODROW & ASSOCIATES, INC. DATED AUGUST 19, 2015; LAST REVISED MARCH 10, 2017.

## FIELD SURVEY CERTIFICATION

I, _____, AS A DULY LICENSED PROFESSIONAL LAND SURVEYOR IN THE COMMONWEALTH OF PENNSYLVANIA, HEREBY CERTIFY THAT THE DATA SHOWN ON THIS DRAWING, OBTAINED UNDER MY SUPERVISION, IS AN ACCURATE AND COMPLETE REPRESENTATION OF WHAT WAS CONSTRUCTED IN THE FIELD AS OF OCTOBER 4, 2019 AND THAT THE PHYSICAL DIMENSIONS OR ELEVATIONS SHOWN ARE ASBUILT CONDITIONS.

PROFESSIONAL LAND SURVEYOR

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ROBERT E. BLUE, JR.
LAND SURVEYOR
No. SU1323A

01/27/20
(DATE)

ROBERT E. BLUE JR.
LICENSE NO. SU1323A

REVISIONS

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robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

GRAPHIC SCALE
0 30 60 120 150

FINAL ASBUILT PLAN

# 100 FLOURTOWN ROAD

WHITEMARSH TOWNSHIP
Mmontgomery COUNTY
PENNSYLVANIA

PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RJN | SDM | 1"=30' |
| DATE: 01-27-2020 | JOB NUMBER: 2081-1E | SHEET NUMBER: 1of1 |

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**WHITEMARSH TOWNSHIP**
**SUBDIVISION and/or LAND DEVELOPMENT APPLICATION**

**The applicant, or applicant's authorized agent, for the Township to accept submission of the application, must complete each Application item and each Application Submission Checklist item.**

Application Type: (check one)
☐ Minor Subdivision ☐ Minor Land Development
☐ Major Subdivision ☒ Major Land Development
☐ Land Development Waiver

Plan Type:
☐ Sketch ☐ Preliminary ☒ Final

INSERT "N/A" FOR NOT APPLICABLE WHERE APPROPRIATE

**Name of Subdivision/Land Development:** 100 Flourtown Road

**Location of Subdivision/Land Development:** 100 Flourtown Road
(~~Primary Access Roadway Name~~)

**Between:** Butler Pike (Roadway Name) and Flourtown Road (Roadway Name)

**Number of Parcels:** 1 **Block Number(s):** 021 **Unit Number(s):** 009

**Parcel Number(s):** 65-00-08005-01-2

**Acreage:** 4.8724 **Total Lots Proposed:** 1 **Zoning District:** LIM

Water Service Proposed: ☒ Public ☐ Private Sewer Service Proposed: ☒ Public ☐ Private

**Applicant Name:** 60 Flourtown Road LLC **Contact Name:** Glenn Van Eerden

Phone #: (215) 591-3510 Fax #: Email: glenn@vecc.net

Address: PO Box 206, Fort Washington, PA 19034

**Owner of Record Name (If Different):**

Phone #: Fax #: Email:

Address:

**Engineer Name:** Robert E. Blue, Jr. **Firm Name:** Robert E. Blue Consulting Engineers

Phone #: (610) 277-9441; ext 16 Fax #: Email: rblue@robertblue.com

Address: 1149 Skippack Pike Blue Bell, Pa 19422

Fees and plans showing all public improvements are submitted with this application. Any additional plan information required by the Township Engineer will be submitted to the Director of Planning and Zoning for distribution. The undersigned applicant agrees to comply with all the provisions of Chapter 105 of the Code of the Township of Whitemarsh, as amended, and agrees to obtain all necessary permits in connection with the proposed subdivision and/ or land development.

Whitemarsh Township employees, or township-authorized agents, are hereby granted permission to enter upon the land, if necessary, for site inspections.

Original preliminary and/or original final subdivision and/or land development applications submitted by 4:00pm on the last business day of the month will be reviewed by the Whitemarsh Township Planning Commission at a regular meeting two (2) months following the date of submission or other appropriate meeting date depending upon the results of Township reviews.

I hereby certify, as the undersigned applicant, that I am familiar with the provisions of: [1] Chapter 105, "Subdivision and Land Development", [2] Chapter 58, "Grading, Erosion Control, Stormwater Management and Best Management Practices", and [3] Chapter 55, "Tree Protection Standards" of the Code of the Township of Whitemarsh, as amended, and, to the best of my knowledge and belief, this application and the submitted plans conform to those provisions.

**Date of Submission:** September 15, 2021

Signature: 

(Original Signature must be submitted)

**Printed Name:** Neil Andrew Stein, Esquire
Attorney for Applicant

**I, (name)** Neil Andrew Stein, Esquire **(title)** Attorney for Applicant of

**(entity submitting application)** Kaplin, Stewart Meloff, Reiter & Stein, PC do hereby affirm

that I am authorized by the applicant to affix my signature to this application.

**Date:** September 15, 2021 Signature: 

(Original Signature must be submitted)

**WHITEMARSH TOWNSHIP**
**SUBDIVISION and/or LAND DEVELOPMENT**
**TIME WAIVER FORM**

Date: September 15, 2021

Granted to: Whitemarsh Township Board of Supervisors

Name of Subdivision and/or Land Development: 100 Flourtown Road

On or about, September 15, 2021 , I/we submitted for official filing the above-reference application.

Notwithstanding any contrary provision of the Pennsylvania Municipalities Planning Code or the Code of the Township of Whitemarsh, this letter will serve as notice to Whitemarsh Township that the requirement that action be taken on this application within ninety (90) days is hereby waived, without limitation as to time. This waiver is granted to permit us to make revisions to the application during the application review process.

Further, with the understanding that this waiver is voluntarily given and will be relied upon by Whitemarsh Township, I/we will give Whitemarsh Township written notice (by certified mail or recognized overnight carrier) should we determine that limiting the time of the review process becomes necessary. Whitemarsh Township shall then have ninety (90) days from receipt of such written notice in which to act upon the application.

This waver is not transferable or assignable by the Applicants and shall apply to any and all revised submissions made in relation to the above-referenced application.

I/we represent that I/we have been duly authorized to execute this waiver on behalf of the Applicant.

Date: September 15, 2021

Signature: 

(Original Signature must be submitted)

Printed Name: Neil A. Stein, Esq., Attorney for Applicant

Firm Name: Kaplin, Stewart Meloff, Reiter & Stein, PC
(if applicable)

Title: Shareholder
(if applicable)

**WHITEMARSH TOWNSHIP**
**REQUEST FOR MODIFICATION (WAIVER) OF**
**SUBDIVISION and/or LAND DEVELOPMENT ORDINANCE REQUIREMENTS**

Pursuant to § 512.1.(b) of the Pennsylvania Municipalities Planning Code, all requests for a modification shall be in writing and shall accompany and be a part of the application for development. The request shall state in full the grounds and facts of unreasonableness or hardship on which the request is based, the provision or provisions of the ordinance involved and the minimum modification necessary.

**Check the appropriate line:**

☒ No modification (or waiver) of the Whitemarsh Township Subdivision and Land Development Ordinance is requested (all waivers were granted at preliminary approval)

☐ I/we hereby request the following modification[s] (or waiver[s]) of the Whitemarsh Township Subdivision and Land Development Ordinance. (The request must identify the applicable Section[s] of the Ordinance, modification[s] requested, and facts of unreasonableness or hardship upon which the request is made; attach additional sheets if necessary).

**Name of Subdivision and/or Land Development:** 100 Flourtown Road

**Date:** September 15, 2021 Signature: _____

(Original Signature must be submitted)

# WHITEMARSH TOWNSHIP

**To:** Charlie L. Guttenplan, Director of Planning & Zoning/Zoning Officer

**From:** NICHOLAS W. WEAVER, FIRE MARSHAL

**Subject:** **SLD #12-15 60 Flourtown Road, LLC 60 Flourtown Road**

**Date:** September 27, 2021

**cc:**

This application is approved with no comments.

**Nicholas W. Weaver**
**Fire Marshal**
616 Germantown Pike
Lafayette Hill, PA 19444
Phone: 610-825-3535 ext. 2614
Email: nweaver@whitemarshtwp.org

# UPDATES

Whitemarsh TOWNSHIP
616 GERMANTOWN PIKE - LAFAYETTE HILL, PA 19444-1821
TEL: 610-825-3535 FAX: 610-825-9416
www.whitemarshtwp.org

BOARD of SUPERVISORS
Laura Boyle Nester – Chair
Fran McCusker – Vice Chair
Vincent Manuele
Jacy Toll
Patrice Turenne

Richard L. Mellor, Jr.
Township Manager

January 31, 2022

60 Flourtown Road, LLC
c/o Glenn Van Eerden
P.O. Box 206
Fort Washington, PA 19034

**RE: SLD#12-15 / 100 Flourtown Road, Plymouth Meeting, PA**
**One-story Storage Garage & Associated Improvements**
**Zoning Ordinance Compliance Review Letter**

Dear Mr. Van Eerden:

As requested, we have reviewed final plans for the above referenced Final Land Development Plan submission, based on plans prepared by Robert E. Blue Consulting Engineers, P.C. dated May 18, 2020 and last revised July 2, 2020. For this project, final plan approval is being requested subsequent to the installation of all improvements (including the proposed garage building) in accordance with provisions of Section 509.a. of the PA Municipalities Planning Code.

1. §116-14. The Record plan must be revised to show the Zoning District Boundary Lines in compliance with the Township Zoning Map.

2. §116-18. The plans show newly constructed sanitary sewerage facilities which are located outside of the boundary lines of the subject property. The plans cannot be approved until all structures and/or uses for the lot(s) are located entirely within the property boundaries or easements or some other legal agreement is established to permit this arrangement.

3. §116-22. The plans must be revised to include a note which states that the permanent removal of topsoil from land within the Township is prohibited.

4. §116-28.A.(2) The applicant shall furnish a letter from the appropriate authority indicating that public water is being provided to the garage building.

5. §116-29. The applicant shall provide a letter from the Whitemarsh Township Authority indicating that public sanitary sewer service is being provide to the garage building.

6. §116-137.B.(2) The applicant has obtained a variance from the requirements of this section of the ordinance which states that no building or structure within the Limited Industrial District may be erected closer than 200 feet to any residential district, to allow a reduction to 111 feet. The Record Plan must be revised to include a dimension indicating the 111 feet setback.

7. §116-138. The applicant shall provide a copy of the Highway Occupancy Permit secured for access to the development; confirmation of approval for improvements, if any, required by PennDOT, must also be provided.

8. §116-140. The applicant has obtained a variance from the requirements of this section of the ordinance which states that no parking area shall be closer than 100 feet to a residential district, to allow a reduction to 57.77 feet. The Record Plan must be revised to include a dimension indicating the 57.77 feet setback.

9. §116-143.A.(8) The applicant obtained recommendations from the Shade Tree Commission which were included by reference in Resolution #2017-04 approved January 26, 2017 granting conditional preliminary plan approval. Those recommendations and the subsequent waiver granted by said resolution from Section 55-4.B.(5) provided some flexibility as to planting on-site, planting in other locations in the Township, and/or paying a fee in lieu of replacement plantings. The costs for said fees was agreed to via an e-mail from Neil A. Stein, Esq., on behalf of the applicant dated December 16, 2016 and later confirmed in a letter to me from Mr. Stein, dated January 6, 2017. The applicant must document if/how the landscaping obligations based on these documents have been addressed. There is no indication if the landscaping shown on the submitted plans includes any replacement plantings and/or if fees have been paid.

10. §116-184.G. All parking shall conform to the requirements of the Whitemarsh Township Fire Prevention Code as acted and amended. The Whitemarsh Township Fire Marshal has reviewed the plan and has given it his approval (see enclosed memo of September 27, 2021).

Should you have any questions, please do not hesitate to contact me.

Very truly yours,

Charles L. Guttenplan, AICP
Director of Planning and Zoning/Zoning Officer

Enclosure: Fire Marshal Memo September 27, 2021

cc: Richard L. Mellor, Jr., Township Manager
Robert A. Sztubinski, B.C.O., Director of Building and Codes
Nick Weaver, Fire Marshal
Sean P. Kilkenny, Esq., Township Solicitor
Krista Heinrich, P.E., Township Engineer
Robert E. Blue, Jr., Robert E. Blue Consulting Engineers, Applicant's Engineer
Neil Andrew Stein, Esq., Applicant's Attorney

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

January 31, 2022

File No. 20-02001

Mr. Richard L. Mellor, Jr., Township Manager
Whitemarsh Township Municipal Building
616 Germantown Pike
Lafayette Hill, PA 19444

Reference: Final Plan Review
100 Flourtown Road (60 Flourtown Road, LLC)
Whitemarsh Township, Montgomery County, Pennsylvania
SLD #12-15

Dear Mr. Mellor:

As requested, we have reviewed plans for the above referenced Subdivision, prepared by Robert E. Blue Consulting Engineers, P.C. dated May 18, 2020 and last revised July 2, 2020. The following comments are offered for your consideration:

**SUBDIVISION AND LAND DEVELOPMENT ORDINANCE**

| | Section | Description |
|---|---|---|
| 1. | 105-21(B)(1)(n) | The plans must be revised in accordance with Section C.9.b of Resolution 2017-04, which granted a waiver from the requirements of this section of the ordinance conditioned that the plans show existing principal buildings (and their respective uses), and driveways on the adjacent peripheral strip: sewers lines, storm drains, culverts, bridges, utility easements, quarries, railroads, and other significant man-made features within 100 feet of and within the site, including properties across streets. |
| 2. | 105-21(B)(7) | Proposed landscaping must be shown on the plans, including existing vegetation to be removed or preserved, and the proposed planting schedule indicating the locations species and sizes of plantings as required by Sections 105-39, 105-48, 105-52 and Chapter 55. |
| 3. | 105-21(B)(10)(a) | The applicant shall submit a letter from the appropriate municipal authority indicating the availability of public sanitary sewer services. |
| 4. | 105-21(B)(10)(b) | The applicant shall submit a letter from the appropriate municipal authority indicating the availability of central water supply. |

| | Section | Description |
|---|---|---|

5. 105-22(B)(9) This section of the ordinance requires the plans be as stipulated in § 105-21 consistent with the terms of preliminary plan approval and modified as necessary to reflect the proposal for final approval. It should be noted that the Preliminary Plan Approval granted in accordance with Resolution 2017-04 was based on a plan set consisting of 12 Sheets, where the current submission consists of 6 Sheets.

6. 105-23(B)(1) [d](1) The Record plan must be revised to show the Zoning District Boundary Lines in compliance with the Township Zoning Map.

7. 105-23(B)(4)(g) The Waivers Granted List on the Record Plan must be revised in accordance with the following:
   - reference the associated Resolution number (2017-04).
   - Note 2 must reference Section 105-21(B)(1)(n) instead of Section 105-22(B)(1)(n).
   - List the Waiver granted from Section 105-(B)(1)(o)[10]
   - Note 11 must reference Section 55-4(B)(5) instead of Section 55-4(IJ)(5).

8. 105-24(B)(3)(d) The area of the plan allocated for the signature of the Township Engineer must appear as follows:

   Township Engineer Review
   Reviewed by the Township Engineer on this_____day of _____, 20_____

   _____
   TOWNSHIP ENGINEER

9. 105-28(I) The applicant shall provide a copy of the Highway Occupancy Permit secured for access to the development; confirmation of approval for improvements, if any required by PennDOT, must also be provided.

10. 105-37 The plans must be revised to demonstrate compliance with the sight distance requirements of this section of the ordinance and/or the required sight distances contained in the most current revision of Pennsylvania Code Title 67 Chapter 441, whichever is more restrictive.
    The following table indicates the minimum sight distance required for the three forms of sight distance on the various street types:

| | Street Classification | | | |
|---|---|---|---|---|
| Sight Distance | Arterial (feet) | Major Collector (feet) | Minor Collector (feet) | Court or Local (feet) |
| Stopping | 350 | 275 | 275 | 200 |
| Passing | To be determined by Township Engineer, in accordance with accepted engineering standards | | | |
| Intersections | 750 | 600 | 550 | 400 |

11. 105-38(U) All common parking areas shall be adequately lighted during after-dark operating hours and all lights shall be located on raised parking islands, not on the parking surface. A Lighting Plan which indicates an adequate level of illumination in all parking areas must be submitted to the Township.

12. 105-39(A) This section of the ordinance requires that all parking areas shall have at least one tree of three inches minimum caliper for every two parking spaces provided.

| | Section | Description |
|---|---|---|
| 13. | 105-42(A) | No subdivision or land development plan shall be approved unless there has been an erosion and sedimentation control plan approved by the Township Engineer consistent with the requirements of Chapter 58 of the Whitemarsh Township Code, entitled 'Grading, Erosion Control, Stormwater Management and Best Management Practices'. |
| 14. | 105-45 | The plans appear to show newly constructed sanitary sewerage facilities which are located outside of the boundary lines of the subject property. The plans cannot be approved until all structures and/or uses for the lot(s) are located entirely within the property boundaries or easements or some other agreement is established to permit the encroachments. |
| 15. | 105-52 | Buffer yards are required between land developments and along existing streets to soften visual impact, to screen glare, and to create a visual barrier between conflicting land uses. The plans must be revised to provide a table detailing the buffer yard requirements, in accordance with Section 105-52.B as well as the actual buffers provided. |
| 16. | 105-53(D) | The plans must be revised in accordance with Section C.9.b of Resolution 2017-04, which granted a waiver from the requirements of this section of the ordinance conditioned that the Applicant grant a Conservation Easement over the undeveloped portion of the property. |
| 17. | 105-76 | The applicant must obtain a letter of approval from the Township Fire Marshal in order to ensure that adequate fire protection is provided. Additionally, the applicant must provide evidence in sufficient detail to demonstrate that a minimum vertical clearance of 13'-6" is provided along the access roadway, as required by Exhibit "D" of Resolution 2017-04. |
| 18. | 105-76(B) | Water mains shall be designed with adequate capacity and appropriately spaced fire hydrants for fire-fighting purposes pursuant to the specifications of the Middle Department Association of Fire Underwriters Review, and approval by the Township Engineer and the Township Fire Marshal is required in order to ensure that adequate fire protection is provided. The applicant must obtain a letter of approval from the Township Fire Marshal. |
| 19. | 105-78(C), 105-79 | The applicant must obtain the approval of the Whitemarsh Township Authority with regard to proposed sanitary sewerage facilities. No public sewer system shall be constructed until plans and specifications have been submitted to the Department of Environmental Protection and the Whitemarsh Authority and approved in accordance with existing laws. |
| 20. | 105-81 | All electric, telephone and communication service facilities, both main and service lines, shall be provided by underground cables, installed in accordance with the prevailing standards and practices of the utility and other companies providing such service. Final plans shall show locations of all utilities and shall be coordinated with landscaping. |
| 21. | 105-83(E) | No Removal of a tree shall be permitted unless the applicant obtains a recommendation from the Shade Tree Commission based on a tree survey and removal plan submitted in accordance with Chapter 55 of the Whitemarsh Township Code. |

**GRADING, EROSION CONTROL, STORMWATER MANAGEMENT AND BEST MANAGEMENT PRACTICES ORDINANCE:**

The plans will be reviewed for grading, erosion & sedimentation control, stormwater management and best management practices following the submission of an Erosion and Sedimentation Control Plan and Stormwater Management Calculations. Please note that we have incorporated selected applicable comments related to the requirements of Chapter 58 and Resolution 2004-8 of the Whitemarsh Township Code into this review to provide the applicant guidance in the preparation of future plan submissions. These comments do not fully address stormwater management or erosion control on the site.

| | Section | Description |
|---|---|---|
| 22. | 58-4(B)(4) | The applicant must submit plans and supporting calculations detailing proposed stormwater drainage and stormwater management systems required by regulations adopted pursuant to this chapter. |
| 23. | 58-4(D)(1) | Since the limit of disturbance is greater than one acre, the applicant must obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Pennsylvania Department of Environmental Protection. A copy of the Permit must be submitted to the Township. |
| 24. | 58-5(B)(1)(f) | The plans must show all physical features, including flood hazard boundaries, sinkholes, streams, existing drainage courses and areas of natural vegetation to be preserved. |
| 25. | 58-8(B) | Stormwater facilities shall be accessible to permit periodic maintenance and an access easement shall be provided to permit such access. The following blanket stormwater easement note, must be added to the plan:<br>*'Stormwater facilities shall be owned and maintained by the property owner in perpetuity. The property owner shall provide a blanket stormwater access easement to the Township for the purpose of access to the stormwater facilities. If, in the judgment of the Township Engineer, the owner has failed to maintain the stormwater facilities in such a manner as to ensure their proper functioning, the Township after providing a written notice, shall have the right to enter upon the lands of the owner and to make any repairs as may be necessary to the stormwater facilities to ensure that such facilities function and perform in accordance with the design specifications. Any and all costs incurred by the Township for such repairs and/or maintenance shall be paid in full by the owner. A lien or liens may be placed against the property if the owner fails to remit payment within sixty (60) days.'* |
| 26. | 58-11(H)(1) | The property owner shall sign an operations and maintenance agreement with the Township addressing stormwater BMPs that are to be privately owned. |

**RESOLUTION 2004-8:**

| | Section | Description |
|---|---|---|
| 27. | I(A)(1) | No changes shall be made in the contour of the land and no grading, excavation, removal nor destruction of the topsoil, trees or other vegetative cover shall be commenced, until such time that a plan for minimizing erosion and sedimentation has been reviewed by the Township Engineer. |

| | Section | Description |
|---|---|---|
| 28. | I(C)(1)(b) | Detailed plans and calculations, including all factors of safety, for all retaining walls that are prepared, signed and sealed by a professional engineer licensed in the Commonwealth of Pennsylvania must be submitted to the Township for review. Constructible details and elevation views of all proposed retaining walls must be provided. |
| 29. | II(B)(8) | The applicant must submit a stormwater management report which includes design computations for all stormwater BMPs. |
| 30. | II(C)(1) | All earth disturbance activities shall limit the rate of stormwater runoff so that no greater runoff is permitted from any point on the site than that of the site at its maximum development potential in its natural condition of the same frequency storm, except where deemed necessary by the Township Engineer. Where farm, field, or disturbed earth is the existing condition, meadow shall be used as the starting basis for such calculations, regardless of the actual conditions. |
| 31. | II(E)(2)(g)(iv) | The plans must be revised demonstrate compliance with Section C.9.11.a of Resolution 2017-04, which granted relief from the requirements of this section of the ordinance conditioned that the minimum pipe size is 10” diameter. |
| 32. | II(E)(2)(g)(viii) | The plans must be revised in order to demonstrate compliance with the requirements of this section of the ordinance, which requires that storm pipes have a minimum 18-inch depth of cover over the top of the pipe. |
| 33. | II(F)(3)(d)(4)[d] | The applicant must provide the required soils evaluation of the project site conducted to determine the suitability of infiltration BMPs. The evaluation shall be performed by a Registered Professional Engineer experienced in geotechnical engineering or a Certified Professional Soil Scientist and at a minimum, address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and subgrade stability. |
| 34. | II(F)(3)(d)(4)[e][3] | There must be a minimum depth of 48 inches between the bottom of any infiltration BMP and the seasonal high-water table and/or bedrock (limiting zones). The applicant shall verify the required clearances are provided. |
| 35. | II(F)(3)(d)(4)[g] | Any infiltration BMP shall be capable of completely infiltrating the impounded water within 96 hours. The applicant should verify the required infiltration is provided by the use of on site perc tests at the proposed seepage pit locations. |

**CHAPTER 55 - TREE PROTECTION STANDARDS**

| | Section | Description |
|---|---|---|
| 36. | 55-4(A) | A Tree Survey Plan prepared in accordance with the requirements contained in this section of the ordinance must be submitted to the Township. The tree survey plan shall be reviewed by the Shade Tree Commission in a public meeting. |
| 37. | 55-4(B)(2) | This section of the ordinance requires a pre-construction conference with the Township Shade Tree Commission prior to start of construction. |

| | Section | Description |
|---|---|---|
| 38. | 55-4(B)(5) | The applicant must provide evidence in sufficient detail to demonstrate the condition of Section C.10.a of Resolution 2017-04 was met, which required the removal of invasive honeysuckle on the site. |
| 39. | 55-4(B)(5) | The plans must be revised in accordance with Section C.5 of Resolution 2017-04, which requires compliance with the recommendations of the Shade Tree Commission as set forth in memorandums attached as Exhibits 'E' and "F'; which recommend "the applicant adhere to the landscape plan recommended at the August, 2016 Shade Tree Commission meeting, but have a more in depth discussion with the Township staff,… the Township's Consulting Arborist, and other representatives as necessary to come up with a plan on what would be planted on site at 60 Flourtown Road and what would be planted elsewhere. In the event that the applicant would like to provide funding for the landscaping rather than planting the landscaping directly, that the applicant, Township Staff and the Township Arborist work together to calculate the costs associated with the material and labor associated with the landscaping". |
| 40. | 55-4(B)(6)(a) | This section of the ordinance requires that every tree determined to be living and healthy, with a DBH of 6 inches or greater and which is designated to be removed or which is destroyed, shall be replaced with one or more new shade trees of a type approved by the Township with a trunk diameter of not less than 3 inches in caliper. The total caliper of replacement trees, measured at 6 inches above the ground line, shall equal or exceed the DBH of the tree removed. |
| 41. | 55-4(B)(6)(c) | Replacement trees shall be planted in addition to the trees required by planting requirements otherwise set forth in the Subdivision and Land Development Code. |

Any future submission of the design plans for this project must be accompanied by a letter, prepared by the applicant's engineer, which addresses each of the comments contained in this report. Should you have any questions regarding this matter, please do not hesitate to contact me at this office.

Sincerely,

Krista Heinrich, P.E.
Township Engineer
Gilmore & Associates, Inc.

cc: Mr. Charles L. Guttenplan, AICP – Director of Planning and Zoning
Mr. Sean Kilkenny, Esq.; The Law Offices of Sean Kilkenny, LLC – Township Solicitor *(via email)*
Mr. Sean Halbom – Assistant Township Manager
Mr. Robert A. Sztubinski, B.C.O. – Director of Building & Codes
Mr. Nick Weaver – Fire Marshal
Mr. Glenn Van Eerden, 60 Flourtown Road LLC – Owner/Applicant
Mr. Robert E. Blue, Jr., PE, PLS– Applicant's Consultant
Mr. Neil Andrew Stein, Esquire – Applicant's Attorney

robert e. blue consulting engineers, p.c.

December 6, 2022

Mr. Richard Mellor, Jr.
Township Manager
Whitemarsh Township
616 Germantown Pike
Lafayette Hill, PA 19444

**Re: 100 Flourtown Road**
**Waiver Request List**
**Township of Whitemarsh, Montgomery County, Pennsylvania**
**REB #2081-3**

Dear Mr. Mellor:

On behalf of our client, 60 Flourtown Road, LLC, the following information is being submitted as part of the Final Plan Approval for the property situated at 100 Flourtown Road in Plymouth Meeting, PA. We are requesting a Waiver from the following sections of the Township's Subdivision and Land Development Ordinance:

1. **§55-4(B)(5): The plan must be in accordance with section C.5 of Resolution 2017-04.**

   Site construction has been completed and the site has been stabilized in conformance with approved Preliminary Plans.

2. **§55-4(b)(6)(a): Replacement of existing trees based on "living & healthy" status.**

   At this time, both Site construction and tree replacement have been completed.

3. **§55-4(b)(6)(c): Replacement of existing trees in conformance with Subdivision & Land Development Ordinance.**

   At this time, both Site construction and tree replacement have been completed.

4. **§58-11(h)(1): The property owner shall sign an operations and maintenance agreement with the Township addressing stormwater BMPs that are to be privately owned.**


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5. **§105-22-b(2): Sedimentation and Erosion Control Plan pursuant to the Whitemarsh Township Grading Ordinance.**

   Site construction has been completed and the site has been stabilized in conformance with approved Preliminary Plans.

6. **§105-22-b(4): Landscape Plan showing proposed planting schedule indicating the locations, species and sizes of plantings as required by §§ 105-39, 105-48 and 105-54.**

   Plantings have been installed per the Landscaping Plan in the approved Preliminary Plan set.

7. **§105-22-b(5)(b): Street profiles.**

   Streets are not proposed in this project.

8. **§105-22-b(5)(c): Street cross-sections.**

   The driveway has been constructed in conformance with approved Preliminary Plans.

9. **§105-22-b(5)(e): Storm sewer profiles.**

   The storm sewer has been constructed and shown per the As-built survey on the Existing Features Plan (sht. 03).

10. **§105-22-b(10): final resource impact and conservation plan (The "Final Impact Plan").**

11. **§105-22-b(11): Common Open Space Ownership and Management Plan.**

    Open Space is not proposed for this site.

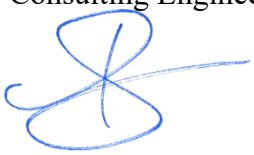
12. **§105-39(a): All parking areas shall have at least one tree of three inches minimum caliper for every two parking spaces provided.**

    Requesting relief to permit 2-inch caliper trees.

Thank you for your consideration.

Sincerely,

Robert E. Blue, Consulting Engineers, P.C.



By: _____
Robert E. Blue Jr., P.E., P.L.S., President

Cc: Client (email only)
REB File #2081-3

robert e. blue consulting engineers, p.c.

December 7, 2022

Ms. Krista Heinrich, P.E.
Gilmore & Associates, Inc.
65 East Butler Avenue, Suite 100
New Britain, PA 18901

**Re: 100 Flourtown Road**
**Final Plan Review**
**Township of Whitemarsh, Montgomery County, Pennsylvania**
**G&A #12-15**
**REB #2081-3**

Dear Ms. Heinrich:

On behalf of our client, 60 Flourtown Road, LLC, the following information is being submitted in support of the Final Plan for the project located at 100 Flourtown Road. The revisions incorporated comments from the following review letter:

- Final Plan Review letter (SLD #12-15): prepared by Gilmore & Associates, Inc., dated January 31, 2022.

This letter shall serve as the response letter and includes how the concerns are addressed. The comments from the review letter are indicated in italics with the response in **bold**. The plans have been updated as follows:

*SUBDIVISION AND LAND DEVELOPMENT ORDINANCE*

1. *105-21 (8)(1 )(n)*
   *The plans must be revised in accordance with Section C.9.b of Resolution 2017-04, which granted a waiver from the requirements of this section of the ordinance conditioned that the plans show existing principal buildings (and their respective uses), and driveways on the adjacent peripheral strip: sewers lines, storm drains, culverts, bridges, utility easements, quarries, railroads, and other significant man-made features within 100 feet of and within the site, including properties across streets.*

   **RESPONSE: Listed under "Waivers Granted" (#2) on Sheet 2. An Aerial Plan has been added to the plan set for reference.**

2. *105-21 (8)(7)*
   *Proposed landscaping must be shown on the plans, including existing vegetation to be removed or preserved, and the proposed planting schedule indicating the locations species and sizes of plantings as required by Sections 105-39, 105-48, 105- 52 and Chapter 55.*

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**RESPONSE: Asbuilt locations have been shown on the plan. A Waiver has been requested and listed on Sheet 2.**

3. *105-21 (8)(1 0)(a)*
*The applicant shall submit a letter from the appropriate municipal authority indicating the availability of public sanitary sewer services.*

**RESPONSE: The project is presently connected to public water / public sewer. Asbuilt lateral locations are shown on the plan.**

4. *105-21(8)(10)(b)*
*The applicant shall submit a letter from the appropriate municipal authority indicating he availability of central water supply.*

**RESPONSE: A "Will-Serve" Letter from Aqua America is included with this re-submission. The project is presently connected to public water. Asbuilt lateral locations are shown on the plan.**

5. *105-22(8)(9)*
*This section of the ordinance requires the plans be as stipulated in § 105-21 consistent with the terms of preliminary plan approval and modified as necessary to reflect the proposal for final approval. It should be noted that the Preliminary Plan Approval granted in accordance with Resolution 2017-04 was based on a plan set consisting of 12 Sheets, where the current submission consists of 6 Sheets.*

**RESPONSE: Acknowledged.**

6. *105-23(B)(1)[d](1)*
*The Record plan must be revised to show the Zoning District Boundary Lines in compliance with the Township Zoning Map.*

**RESPONSE: Zoning District boundaries and district labeling are now shown on the Plan as directed.**

7. *105-23(8)(4 )(g)*
*The Waivers Granted List on the Record Plan must be revised in accordance with the following:*

- *reference the associated Resolution number (2017-04).*

  **RESPONSE: Complied.**

- *Note 2 must reference Section 105-21(B)(1)(n) instead of Section 105- 22(8)(1 )(n).*

  **RESPONSE: Complied.**

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
ph:610.277.9441 fx: 610.277.9897



- *List the Waiver granted from Section 105-(B)(1 )(o)[10]*

  **RESPONSE: Complied. (We assume this comment contains a typographical error and should read: 105-21(B)(1 )(o)[10] )**

- *Note 11 must reference Section 55-4(6)(5) instead of Section 55-4(1J)(5).*

  **RESPONSE: Complied.**

8. *105-24(B)(3 )(d)*
   *The area of the plan allocated for the signature of the Township Engineer must appear as follows:*

   *Township Engineer Review*
   *Reviewed by the Township Engineer on this____ day of ___, 20___*

   _____
   *TOWNSHIP ENGINEER*

   **RESPONSE: The Township Engineer certification has been corrected.**

9. *105-28(1)*
   *The applicant shall provide a copy of the Highway Occupancy Permit secured for access to the development; confirmation of approval for improvements, if any required by PennDOT, must also be provided.*

   **RESPONSE: An issued Highway Occupancy Permit submitted by Woodrow & Associates is included with this re-submission.**

10. *105-37*
    *The plans must be revised to demonstrate compliance with the sight distance requirements of this section of the ordinance and/or the required sight distances contained in the most current revision of Pennsylvania Code Title 67 Chapter 441, whichever is more restrictive. The following table indicates the minimum sight distance required for the three forms of sight distance on the various street types:*

| | Street Classification | | | |
|---|---|---|---|---|
| Sight Distance | Arterial (feet) | Major Collector (feet) | Minor Collector (feet) | Court or Local (feet) |
| Stopping | 350 | 275 | 275 | 200 |
| Passing | To be determined by Township Engineer, in accordance with accepted engineering standards | | | |
| Intersections | 750 | 600 | 550 | 400 |

**RESPONSE: Sight Distance data is now shown on Sheet 2.**

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
ph:610.277.9441 fx: 610.277.9897



11. *105-38(U)*
*All common parking areas shall be adequately lighted during after-dark operating hours and all lights shall be located on raised parking islands, not on the parking surface. A Lighting Plan which indicates an adequate level of illumination in all parking areas must be submitted to the Township.*

**RESPONSE: Lighting provided via exterior wall-mounted fixtures. Please note, lighting is for security only as no employees are on-site in the evening.**

12. *105-39(A)*
*This section of the ordinance requires that all parking areas shall have at least one tree of three inches minimum caliper for every two parking spaces provided.*

**RESPONSE: A Waiver has been requested; Sheet 2, Request #8.**

13. *105-42(A)*
*No subdivision or land development plan shall be approved unless there has been an erosion and sedimentation control plan approved by the Township Engineer consistent with the requirements of Chapter 58 of the Whitemarsh Township Code, entitled 'Grading, Erosion Control, Stormwater Management and Best Management Practices'.*

**RESPONSE: Proposed Erosion Control measures were shown on a plan by Woodrow & Associates, Inc., last revised 05-16-2016. The W&A set is included with this re-submission. The project has been constructed and has stabilized.**

14. *105-45*
*The plans appear to show newly constructed sanitary sewerage facilities which are located outside of the boundary lines of the subject property. The plans cannot be approved until all structures and/or uses for the lot(s) are located entirely within the property boundaries or easements or some other agreement is established to permit the encroachments.*

**RESPONSE: The adjacent property and the subject property are both owned by "60 Flourtown Road, LLC", and as such, are privately owned and maintained.**

15. *105-52*
*Buffer yards are required between land developments and along existing streets to soften visual impact, to screen glare, and to create a visual barrier between conflicting land uses. The plans must be revised to provide a table detailing the buffer yard requirements, in accordance with Section 105-52.B as well as the actual buffers provided.*

**RESPONSE: The Landscape & Lighting Plan and associated Detail Sheets created by the previous design engineer (Woodrow & Associates, Inc.) are included with this resubmission. Notes and chart on the W&A plan speak to buffer yards, etc. The Robert E. Blue, PC plan (Sheet 5) shows asbuilt locations of new plantings. The Aerial plan by Robert E. Blue, P.C. (Sheet 4) provides locations of existing / surrounding vegetation.**

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
ph:610.277.9441 fx: 610.277.9897



16. *105-53(D)*
*The plans must be revised in accordance with Section C.9.b of Resolution 2017-04, which granted a waiver from the requirements of this section of the ordinance conditioned that the Applicant grant a Conservation Easement over the undeveloped portion of the property.*

**RESPONSE: Waiver Granted; see listing of Granted Waivers on Sheet 2.**

17. *105-76*
*The applicant must obtain a letter of approval from the Township Fire Marshal in order to ensure that adequate fire protection is provided. Additionally, the applicant must provide evidence in sufficient detail to demonstrate that a minimum vertical clearance of 13'-6" is provided along the access roadway, as required by Exhibit "D" of Resolution 2017-04.*

**RESPONSE: A copy of the Fire Marshal letter of approval, dated September 27, 2021, is included in this submission.**

18. *105-76(8)*
*Water mains shall be designed with adequate capacity and appropriately spaced fire hydrants for fire-fighting purposes pursuant to the specifications of the Middle Department Association of Fire Underwriters Review, and approval by the Township Engineer and the Township Fire Marshal is required in order to ensure that adequate fire protection is provided. The applicant must obtain a letter of approval from the Township Fire Marshal.*

**RESPONSE: An Approval Letter from the Fire Marshal is included with this re-submission.**

19. *105-78(C), 105-79*
*The applicant must obtain the approval of the Whitemarsh Township Authority with regard to proposed sanitary sewerage facilities. No public sewer system shall be constructed until plans and specifications have been submitted to the Department of Environmental Protection and the Whitemarsh Authority and approved in accordance with existing laws.*

**RESPONSE: A DEP Letter of Exemption is included in this resubmission.**

20. *105-81*
*All electric, telephone and communication service facilities, both main and service lines, shall be provided by underground cables, installed in accordance with the prevailing standards and practices of the utility and other companies providing such service. Final plans shall show locations of all utilities and shall be coordinated with landscaping.*

**RESPONSE: An electrical wire was installed overhead by the Utility company in the front of the property (see photo). We are prepared to file a Waiver request if required by the Township.**

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
ph:610.277.9441 fx: 610.277.9897





21. *105-83(E)*
*No Removal of a tree shall be permitted unless the applicant obtains a recommendation from the Shade Tree Commission based on a tree survey and removal plan submitted in accordance with Chapter 55 of the Whitemarsh Township Code.*

**RESPONSE: The Landscape & Lighting Plan and associated Detail Sheets created by the previous design engineer (Woodrow & Associates, Inc.) are included with this resubmission. The Robert E. Blue P.C. Asbuilt plans provide locations of new plantings.**

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
ph:610.277.9441 fx: 610.277.9897



*GRADING, EROSION CONTROL, STORMWATER MANAGEMENT AND BEST MANAGEMENT PRACTICES ORDINANCE:*

*The plans will be reviewed for grading, erosion & sedimentation control, stormwater management and best management practices following the submission of an Erosion and Sedimentation Control Plan and Stormwater Management Calculations. Please note that we have incorporated selected applicable comments related to the requirements of Chapter 58 and Resolution 2004-8 of the Whitemarsh Township Code into this review to provide the applicant guidance in the preparation of future plan submissions. These comments do not fully address stormwater management or erosion control on the site.*

22. *58-4(B)(4)*
    *The applicant must submit plans and supporting calculations detailing proposed stormwater drainage and stormwater management systems required by regulations adopted pursuant to this chapter.*

    **RESPONSE: Stormwater drainage and stormwater management systems documentation is included with this re-submission. Refer to the Robert E. Blue P.C. asbuilt plans (included with this submission) for locations for stormwater facilities.**

23. *58-4(D)(1)*
    *Since the limit of disturbance is greater than one acre, the applicant must obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Pennsylvania Department of Environmental Protection. A copy of the Permit must be submitted to the Township.*

    **RESPONSE: Per a Woodrow & Associates, Inc. response letter dated May 25, 2016, this comment is addressed as follows: "With the new design concept, the proposed LOD has been reduced to 0.92 Acres and is no longer subject to the NPDES permit."**

24. *58-5(8)(1 )(f)*
    *The plans must show all physical features, including flood hazard boundaries, sinkholes, streams, existing drainage courses and areas of natural vegetation to be preserved.*

    **RESPONSE: Included with this re-submission is a plan entitled "Overall Existing Features Plan" by Woodrow & Associates, Sheet #3, which shows the existing features for the entire project parcel. An Aerial Plan showing surrounding existing features has been added to the Robert E. Blue P.C. plan set.**

25. *58-8(8)*
    *Stormwater facilities shall be accessible to permit periodic maintenance and an access easement shall be provided to permit such access. The following blanket stormwater easement note, must be added to the plan:*

*"Stormwater facilities shall be owned and maintained by the property owner in perpetuity. The property owner shall provide a blanket stormwater access easement to the Township for the purpose of access to the stormwater facilities. If, in the judgment of the Township Engineer, the owner has failed to maintain the stormwater facilities in such a manner as to ensure their proper functioning, the Township after providing a written notice, shall have the right to enter upon the lands of the owner and to make any repairs as may be necessary to the stonnwater facilities to ensure that such facilities function and perform in accordance with the design specifications. Any and all costs incurred by the Township for such repairs and/or maintenance shall be paid in full by the owner. A lien or liens may be placed against the property if the owner fails to remit payment within sixty (60) days."*

**RESPONSE: The specified note has been added as a stand-alone note on Sheet 2.**

26. *58-11 (H)(1)*
*The property owner shall sign an operations and maintenance agreement with the Township addressing stormwater BMPs that are to be privately owned.*

**RESPONSE: Waiver Requested.**

*RESOLUTION 2004-8:*

27. *l(A)(1)*
*No changes shall be made in the contour of the land and no grading, excavation, removal nor destruction of the topsoil, trees or other vegetative cover shall be commenced, until such time that a plan for minimizing erosion and sedimentation has been reviewed by the Township Engineer.*

**RESPONSE: Vegetation has been established; a Waiver has been requested.**

28. *l(C)(1 )(b)*
*Detailed plans and calculations, including all factors of safety, for all retaining walls that are prepared, signed and sealed by a professional engineer licensed in the Commonwealth of Pennsylvania must be submitted to the Township for review. Constructible details and elevation views of all proposed retaining walls must be provided.*

**RESPONSE: Wall design plans & calculations narrative by Earth Engineering Incorporated is included with this re-submission.**

29. *11(8)(8)*
*The applicant must submit a stormwater management report which includes design computations for all stormwater BMPs.*

**RESPONSE: Woodrow & Associates, Inc. Stormwater Report is included in this re-submission.**

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
ph:610.277.9441 fx: 610.277.9897



30. *ll(C)(1)*
*All earth disturbance activities shall limit the rate of stormwater runoff so that no greater runoff is permitted from any point on the site than that of the site at its maximum development potential in its natural condition of the same frequency storm, except where deemed necessary by the Township Engineer. Where farm, field, or disturbed earth is the existing condition, meadow shall be used as the starting basis for such calculations, regardless of the actual conditions.*

**RESPONSE: Woodrow & Associates, Inc. Stormwater Report is included in this re-submission.**

31. *ll(E)(2)(g)(iv)*
*The plans must be revised demonstrate compliance with Section C.9.11.a of Resolution 2017-04, which granted relief from the requirements of this section of the ordinance conditioned that the minimum pipe size is 1 0" diameter.*

**RESPONSE: A Granted Waiver has been listed on Sheet 2.**

32. *ll(E)(2)(g)(viii)*
*The plans must be revised in order to demonstrate compliance with the requirements of this section of the ordinance, which requires that storm pipes have a minimum 18-inch depth of cover over the top of the pipe.*

**RESPONSE: Included with this re-submission is a plan entitled "Site Improvements Plan" by Woodrow & Associates, Sheet #5, which shows stormwater structure and piping schedules detailing pipe inverts and slopes.**

33. *ll(F)(3)(d)(4)[d]*
*The applicant must provide the required soils evaluation of the project site conducted to determine the suitability of infiltration BMPs. The evaluation shall be performed by a Registered Professional Engineer experienced in geotechnical engineering or a Certified Professional Soil Scientist and at a minimum, address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and subgrade stability.*

**RESPONSE: A Soils Report and Wetland Delineation Report by Cedarville Engineering Group is included with this re-submission.**

34. *ll(F)(3)(d)(4)[e][3]*
*There must be a minimum depth of 48 inches between the bottom of any infiltration BMP and the seasonal high-water table and/or bedrock (limiting zones). The applicant shall verify the required clearances are provided.*

**RESPONSE: A Soils Report and Wetland Delineation Report by Cedarville Engineering Group is included with this re-submission.**

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
ph:610.277.9441 fx: 610.277.9897



35. *ll(F)(3)(d)(4 )[g]*
*Any infiltration BMP shall be capable of completely infiltrating the impounded water within 96 hours. The applicant should verify the required infiltration is provided by the use of on site perc tests at the proposed seepage pit locations*

**RESPONSE: A Soils Report and Wetland Delineation Report by Cedarville Engineering Group is included with this re-submission.**

*CHAPTER 55 - TREE PROTECTION STANDARDS*

36. *55-4(A)*
*A Tree Survey Plan prepared in accordance with the requirements contained in this section of the ordinance must be submitted to the Township. The tree survey plan shall be reviewed by the Shade Tree Commission in a public meeting.*

**RESPONSE: Included with this re-submission is a plan entitled "Partial Existing Features Plan" by Woodrow & Associates, Sheet #4, which shows surveyed tree locations and a "Tree Removal Data" chart. Additionally refer to Aerial Plan (Sht 4) within the Robert E. Blue P.C. asbuilt plan set.**

37. *55-4(B)(2)*
*This section of the ordinance requires a pre-construction conference with the Township Shade Tree Commission prior to start of construction.*

**RESPONSE: Construction has been completed. We can find no documentation that the required conference has taken place.**

38. *55-4(B)(5)*
*The applicant must provide evidence in sufficient detail to demonstrate the condition of Section C.10.a of Resolution 2017-04 was met, which required the removal of invasive honeysuckle on the site.*

**RESPONSE: A plan entitled "Site Landscaping Design Plan" (Sheet #7) created by the previous design engineer (Woodrow & Associates, Inc.) is included with this resubmission. Refer to note #12 regarding the removal of invasive plant material. Additionally, asbuilt survey site photos are included with this resubmission.**

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
ph:610.277.9441 fx: 610.277.9897



39. *55-4(8)(5)*
*The plans must be revised in accordance with Section C.5 of Resolution 2017-04, which requires compliance with the recommendations of the Shade Tree Commission as set forth in memorandums attached as Exhibits 'E' and "F"; which recommend "the applicant adhere to the landscape plan recommended at the August, 2016 Shade Tree Commission meeting, but have a more in depth discussion with the Township staff, ... the Township's Consulting Arborist, and other representatives as necessary to come up with a plan on what would be planted on site at 60 Flourtown Road and what would be planted elsewhere. In the event that the applicant would like to provide funding for the landscaping rather than planting the landscaping directly, that the applicant, Township Staff and the Township Arborist work together to calculate the costs associated with the material and labor associated with the landscaping".*

**RESPONSE: A Waiver has been requested.**

40. *55-4(B)(6)(a)*
*This section of the ordinance requires that every tree determined to be living and healthy, with a DBH of 6 inches or greater and which is designated to be removed or which is destroyed, shall be replaced with one or more new shade trees of a type approved by the Township with a trunk diameter of not less than 3 inches in caliper. The total caliper of replacement trees, measured at 6 inches above the ground line, shall equal or exceed the DBH of the tree removed.*

**RESPONSE: A Waiver has been requested.**

41. *55-4(B)(6)(c)*
*Replacement trees shall be planted in addition to the trees required by planting requirements otherwise set forth in the Subdivision and Land Development Code.*

**RESPONSE: A Waiver has been requested.**

Should you require any additional information, please contact me at (610) 277-9441 or rblue@robertblue.com.

Sincerely,



**Robert E. Blue Jr., P.E., P.L.S.**
President
Robert E. Blue Consulting Engineers, P.C.

Cc: Richard J. Nagle, Robert E. Blue Engineers
Charles L. Guttenplan, Director of Planning and Zoning
Glenn Van Eerden, Applicant
Neil Stein, Esquire, Applicant's Attorney
REB File #2081-3

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
ph:610.277.9441 fx: 610.277.9897

robert e. blue consulting engineers, p.c.

December 7, 2022

Mr. Charles L. Guttenplan, AICP
Director of Planning & Zoning
Whitemarsh Township
616 Germantown Avenue
Lafayette Hill, PA 19444

**Re: 100 Flourtown Road (SLD #12-15)**
**Final Plan Submission**
**Township of Whitemarsh, Montgomery County, Pennsylvania**

Dear Mr. Guttenplan:

On behalf of our client, 60 Flourtown Road, LLC, the submission package that accompanies this letter seeks to obtain **Final Plan Approval** for the completely constructed project located at 100 Flourtown Road. The project had previously received Preliminary Plan Approval from the Township. The submission package included with this submission is in response to a Gilmore & Associates, Inc. review letter dated January 31, 2022.

The project was originally designed by Woodrow & Associates, Inc. in 2016. The W&A Plan received Preliminary Approval and the required Permits were obtained. Construction was completed in or about 2019 and Robert E. Blue P.C. was retained to complete an As-built Survey Plan to serve as "Final Plan" and pursue Final Plan Approval. This Robert E. Blue P.C. As-built Survey Plan (dated 05/18/2020) was submitted to the Township Engineer for review & approval.

We are in receipt of the G&A review letter dated January 31, 2022, and have revised the Plan (revised 12/07/2022) and compiled the requested support documentation, Permits, easement documentation, etc. requested by G&A. During this process, we have added Waiver requests to the Record Plan and have included a Waiver Request letter in this resubmission.

Should you require any additional information, please contact me at (610) 277-9441 or rblue@robertblue.com.

Sincerely,

**Robert E. Blue Jr., P.E., P.L.S.**
President
Robert E. Blue Consulting Engineers, P.C.

# FINAL PLAN

PREPARED FOR

# 100 FLOURTOWN ROAD

SITUATED IN

## WHITEMARSH TOWNSHIP
## MONTGOMERY COUNTY, PENNSYLVANIA

**PLAN DATE: MAY 18, 2020**
**LAST REVISED: DECEMBER 6, 2022**

INDEX OF SHEETS


| SHEET No. | TITLE |
|---|---|
| 1 | COVER SHEET |
| 2 | RECORD PLAN |
| 3 | EXISTING FEATURES PLAN |
| 4 | AERIAL PLAN |
| 5 | SITE IMPROVEMENTS PLAN |
| 6 | SANITARY SEWER PLAN & PROFILE |
| 7 | CONSTRUCTION DETAILS |

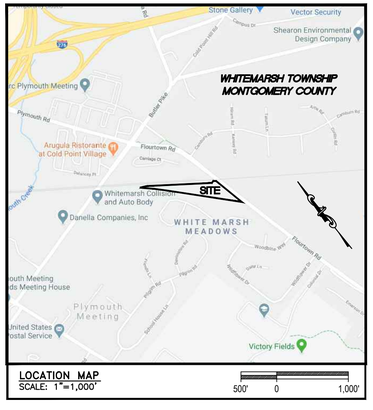

## APPLICANT / OWNER OF RECORD

60 FLOURTOWN ROAD, LLC
343 MILITIA HILL ROAD
FORT WASHINGTON, PA 19034

## SITE LOCATION

100 FLOURTOWN ROAD
PLYMOUTH MEETING, PA 19462

BLOCK: 021 UNIT: 009
PARID: 65-00-08005-01-2
DEED BOOK: 5906 PAGE 2517




## COMMONWEALTH OF PENNSYLVANIA
## COUNTY OF MONTGOMERY

ON THE _____ DAY OF _____ 20____ BEFORE ME, THE UNDERSIGNED OFFICER, A NOTARY PUBLIC, PERSONALLY APPEARED _____ KNOWN TO ME OR SATISFACTORILY PROVEN TO BE THE _____ OF _____, WHOSE NAME IS SUBSCRIBED TO THE WITHIN INSTRUMENT, AND ACKNOWLEDGED THAT HE/SHE EXECUTED THE SAME ON BEHALF OF THE CORPORATION FOR THE PURPOSES THEREIN CONTAINED.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL.

_____
NOTARY PUBLIC MY COMMISSION EXPIRES

## OWNER'S CERTIFICATION

I (WE), _____, HEREBY CERTIFY THAT I (WE) ARE THE OWNER(S) OF THE LAND HEREIN DEVELOPED, AND THAT WE CONSENT TO THE APPROVAL OF THIS PLAN THAT HAS BEEN GRANTED AND THAT I (WE) DESIRE THE SAME TO BE RECORDED.

OWNER(S): _____

_____

DATE: _____

## PLANNING COMMISSION APPROVAL

APPROVED BY THE WHITEMARSH TOWNSHIP PLANNING COMMISSION THIS _____ DAY OF _____, 20____.

_____
SECRETARY, WHITEMARSH TOWNSHIP PLANNING COMMISSION

## BOARD OF SUPERVISORS APPROVAL

APPROVED BY THE BOARD OF SUPERVISORS OF WHITEMARSH TOWNSHIP ON THIS _____ DAY OF _____ 20____.

_____
CHAIRMAN

_____
SECRETARY

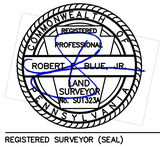
## TOWNSHIP ENGINEER REVIEW

REVIEWED BY THE TOWNSHIP ENGINEER ON THIS _____ DAY OF _____, 20____.

_____
TOWNSHIP ENGINEER

## SURVEYOR'S CERTIFICATION

I, ROBERT E. BLUE, PLS, AS A DULY LICENSED PROFESSIONAL LAND SURVEYOR IN THE COMMONWEALTH OF PENNSYLVANIA, HEREBY CERTIFY THAT THE DATA SHOWN ON THIS DRAWING, OBTAINED UNDER MY SUPERVISION, IS AN ACCURATE AND COMPLETE REPRESENTATION OF WHAT WAS CONSTRUCTED IN THE FIELD AS OF OCTOBER 4, 2019 AND THAT THE PHYSICAL FEATURES, DIMENSIONS AND ELEVATIONS SHOWN ARE CORRECT.




_____
REGISTERED SURVEYOR (SEAL) DATE

## MONTGOMERY COUNTY RECORDER OF DEEDS

RECORDED THIS _____ DAY OF _____ 20____ IN THE OFFICE FOR THE RECORDING OF DEEDS, ETC., IN AND FOR THE COUNTY OF MONTGOMERY OF NORRISTOWN, PENNSYLVANIA, IN PLAN FILE CASE _____ D.B. NO._____ PAGE _____.

_____
RECORDER

MCPC NO. _____

PROCESSED AND REVIEWED. REPORT BY THE MONTGOMERY COUNTY PLANNING COMMISSION IN ACCORDANCE WITH THE MUNICIPALITIES PLANNING CODE.

CERTIFIED THIS DATE _____

_____
FOR THE DIRECTOR
MONTGOMERY COUNTY PLANNING COMMISSION


**robert e. blue**
**consulting engineers, p.c.**
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

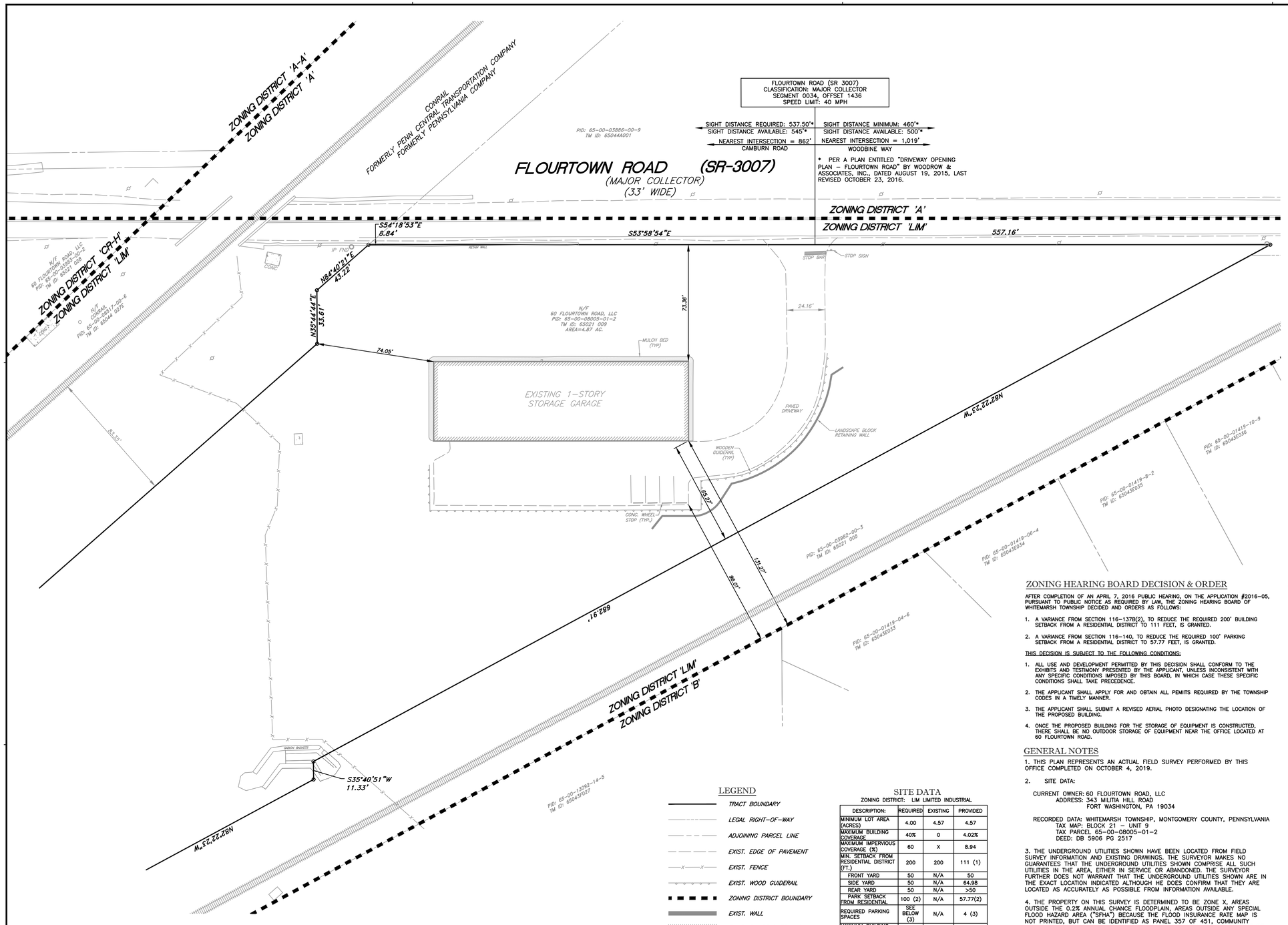

PLAN NOTATION

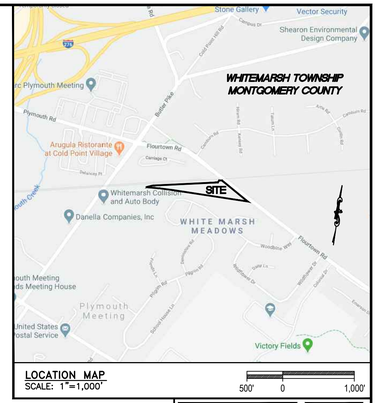
ALL DOCUMENTS PREPARED BY ROBERT E. BLUE CONSULTING ENGINEERS, P.C. ARE INSTRUMENTS OF SERVICE IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR USE BY OWNER OR OTHERS ON EXTENSIONS OF THE PROJECT OR ANY OTHER PROJECT. ANY REUSE WITHOUT WRITTEN VERIFICATION OR ADAPTATION BY ROBERT E. BLUE CONSULTING ENGINEERS, P.C. FOR THE SPECIFIC PURPOSE INTENDED WILL BE AT OWNER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO ROBERT E. BLUE CONSULTING ENGINEERS, P.C. AND OWNER'S USE OF PLANS SHALL BE DEEMED AN AGREEMENT TO INDEMNIFY AND HOLD HARMLESS ROBERT E. BLUE CONSULTING ENGINEERS, P.C. FROM ALL CLAIMS, DAMAGES, LOSSES, AND EXPENSES ARISING OUT OF OR RESULTING THEREFROM.


COPYRIGHT © 2019 ROBERT E. BLUE, CONSULTING ENGINEERS, P.C.



LAST SAVED: ah [Proj]:2081-1 [dwg]:Cover\PLNG PLAN SUBMISSION\01 COVER-2081-1.dwg ON 12/6/2022 11:37 AM




LOCATION MAP
SCALE: 1"=1,000'

500' 0 1,000'

## REQUESTED WAIVERS

THE APPLICANT RESPECTFULLY REQUESTS WAIVERS FROM THE FOLLOWING WHITEMARSH TOWNSHIP SUBDIVISION AND LAND DEVELOPMENT ORDINANCE SECTIONS:

1. §55-4(B)(5): THE PLAN MUST BE IN ACCORDANCE WITH SECTION C.5 OF RESOLUTION 2017-04. *SITE CONSTRUCTION HAS BEEN COMPLETED AND THE SITE HAS BEEN STABILIZED IN CONFORMANCE WITH APPROVED PRELIMINARY PLANS.*
2. §55-4(B)(6)(a): REPLACEMENT OF EXISTING TREES BASED ON "LIVING & HEALTHY" STATUS. *SITE CONSTRUCTION HAS BEEN COMPLETED AND TREE REPLACEMENT HAS BEEN COMPLETED.*
3. §55-4(B)(6)(c): REPLACEMENT OF EXISTING TREES IN CONFORMANCE WITH SUBDIVISION & LAND DEVELOPMENT ORDINANCE. *SITE CONSTRUCTION HAS BEEN COMPLETED AND TREE REPLACEMENT HAS BEEN COMPLETED.*
4. §58-11(H)(1): THE PROPERTY OWNER SHALL SIGN AN OPERATIONS AND MAINTENANCE AGREEMENT WITH THE TOWNSHIP ADDRESSING STORMWATER BMPS THAT ARE TO BE PRIVATELY OWNED.
5. §105-22-B(2): SEDIMENTATION AND EROSION CONTROL PLAN PURSUANT TO THE WHITEMARSH TOWNSHIP GRADING ORDINANCE. *SITE CONSTRUCTION HAS BEEN COMPLETED AND THE SITE HAS BEEN STABILIZED IN CONFORMANCE WITH APPROVED PRELIMINARY PLANS.*
6. §105-22-B(4): LANDSCAPE PLAN SHOWING PROPOSED PLANTING SCHEDULE INDICATING THE LOCATIONS, SPECIES AND SIZES OF PLANTINGS AS REQUIRED BY §§ 105-39, 105-48 AND 105-54. *PLANTINGS HAVE BEEN INSTALLED PER THE LANDSCAPING PLAN IN THE APPROVED PRELIMINARY PLAN SET.*
7. §105-22-B(5)(b): STREET PROFILES. *STREETS ARE NOT PROPOSED IN THIS PROJECT.*
8. §105-22-B(5)(c): STREET CROSS-SECTIONS. *DRIVEWAYS HAVE BEEN CONSTRUCTED IN CONFORMANCE WITH APPROVED PRELIMINARY PLANS.*
9. §105-22-B(5)(e): STORM SEWER PROFILES. *THE STORM SEWER HAS BEEN CONSTRUCTED AND SHOWN PER THE AS-BUILT SURVEY ON THE EXISTING FEATURES PLAN (SHT. 03).*
10. §105-22-B(10): FINAL RESOURCE IMPACT AND CONSERVATION PLAN (THE 'FINAL IMPACT PLAN').
11. §105-22-B(11): COMMON OPEN SPACE OWNERSHIP AND MANAGEMENT PLAN. *OPEN SPACE IS NOT PROPOSED FOR THIS SITE.*
12. §105-39(A): ALL PARKING AREAS SHALL HAVE AT LEAST ONE TREE OF THREE INCHES MINIMUM CALIPER FOR EVERY TWO PARKING SPACES PROVIDED. *REQUESTING RELIEF TO PERMIT 2 INCH CALIPER TREES.*

## ZONING HEARING BOARD DECISION & ORDER

AFTER COMPLETION OF AN APRIL 7, 2016 PUBLIC HEARING, ON THE APPLICATION #2016-05, PURSUANT TO PUBLIC NOTICE AS REQUIRED BY LAW, THE ZONING HEARING BOARD OF WHITEMARSH TOWNSHIP DECIDED AND ORDERS AS FOLLOWS:

1. A VARIANCE FROM SECTION 116-1378(2), TO REDUCE THE REQUIRED 200' BUILDING SETBACK FROM A RESIDENTIAL DISTRICT TO 111 FEET, IS GRANTED.
2. A VARIANCE FROM SECTION 116-140, TO REDUCE THE REQUIRED 100' PARKING SETBACK FROM A RESIDENTIAL DISTRICT TO 57.77 FEET, IS GRANTED.

THIS DECISION IS SUBJECT TO THE FOLLOWING CONDITIONS:

1. ALL USE AND DEVELOPMENT PERMITTED BY THIS DECISION SHALL CONFORM TO THE EXHIBITS AND TESTIMONY PRESENTED BY THE APPLICANT, UNLESS INCONSISTENT WITH ANY SPECIFIC CONDITIONS IMPOSED BY THIS BOARD, IN WHICH CASE THESE SPECIFIC CONDITIONS SHALL TAKE PRECEDENCE.
2. THE APPLICANT SHALL APPLY FOR AND OBTAIN ALL PERMITS REQUIRED BY THE TOWNSHIP CODES IN A TIMELY MANNER.
3. THE APPLICANT SHALL SUBMIT A REVISED AERIAL PHOTO DESIGNATING THE LOCATION OF THE PROPOSED BUILDING.
4. ONCE THE PROPOSED BUILDING FOR THE STORAGE OF EQUIPMENT IS CONSTRUCTED, THERE SHALL BE NO OUTDOOR STORAGE OF EQUIPMENT NEAR THE OFFICE LOCATED AT 60 FLOURTOWN ROAD.

## GENERAL NOTES

1. THIS PLAN REPRESENTS AN ACTUAL FIELD SURVEY PERFORMED BY THIS OFFICE COMPLETED ON OCTOBER 4, 2019.

2. SITE DATA:

CURRENT OWNER: 60 FLOURTOWN ROAD, LLC
ADDRESS: 343 MILITIA HILL ROAD
FORT WASHINGTON, PA 19034

RECORDED DATA: WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA
TAX MAP: BLOCK 21 – UNIT 9
TAX PARCEL 65-00-08005-01-2
DEED: DB 5906 PG 2517

3. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CONFIRM THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

4. THE PROPERTY ON THIS SURVEY IS DETERMINED TO BE ZONE X, AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AREAS OUTSIDE ANY SPECIAL FLOOD HAZARD AREA ("SFHA") BECAUSE THE FLOOD INSURANCE RATE MAP IS NOT PRINTED, BUT CAN BE IDENTIFIED AS PANEL 357 OF 451, COMMUNITY NUMBER 420712, MAP NUMBER 42091C0357G, BEARING AN EFFECTIVE DATE OF MARCH 2, 2016. THE DATUM FOR THIS FIRM MAPS IN THIS AREA IS NAVD88.

5. THE VERTICAL DATUM FOR THIS SITE IS NAVD 1988 BASED ON GPS OBSERVATIONS.
6. PA ONE CALL 20180611638; DATED MARCH 17, 2018

7. NET AREA (TO LEGAL R/W) = 4.57 Ac.

8. THE CLIENT HAS PROVIDED A TITLE REPORT PREPARED BY FIRST AMERICAN TITLE INSURANCE COMPANY, FILE NO. 5011442-02622984E, (NO EFFECTIVE DATE ON POLIC).

9. PLAN REFERENCES:

A.) A PLAN AND CAD FILE ENTITLED "FLOURTOWN ROAD" BY WOODROW & ASSOCIATES, INC. DATED AUGUST 19, 2015; LAST REVISED MARCH 10, 2017.

B.) "DRAWINGS FOR CONSTRUCTION OF STATE ROUTE 0006 SECTION 292" FROM STA. 190+00 TO STA. 216+00, SHEETS 6 AND 7 OF 42, PREPARED BY DISTRICT 4-0 PLANS UNIT FOR THE COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION, APPROVED MAY 23, 1990.

10. ALL MATERIALS USED AND CONSTRUCTION METHODS EMPLOYED SHALL BE IN ACCORDANCE WITH WHITEMARSH TOWNSHIP AUTHORITY STANDARD SPECIFICATION FOR SANITARY SEWER FACILITIES.

## WAIVERS GRANTED

THE FOLLOWING WAIVER REQUESTS WERE GRANTED IN ASSOCIATION WITH RESOLUTION NO. (2017-04) BY THE WHITEMARSH TOWNSHIP BOARD OF SUPERVISORS ON JANUARY 26, 2017:

1. §105-21(B)(1)(j): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT SUBMIT A COMPLETE OUTLINE SURVEY TIED TO ALL ADJACENT INTERSECTIONS AND AREAS, TO ALLOW THE EXISTING FEATURES PLAN THAT WAS SUBMITTED AS PART OF THIS PROJECT TO MEET THIS REQUIREMENT.
2. §105-21(B)(1)(n): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT SUBMIT A COMPLETE SURVEY OUTLINING EXISTING PRINCIPAL BUILDINGS AND DRIVEWAYS ON ALL ADJACENT PARCELS, SEWER LINES, STORM DRAINS, CULVERTS, BRIDGES, UTILITY EASEMENTS AND ALL OTHER FEATURES WITHIN 500 FEET OF THE SITE, TO ALLOW THOSE FEATURES TO BE SHOWN WITHIN 100 FEET OF THE SITE.
3. §105-21(B)(1)(o)[10]: RELIEF FROM THE REQUIREMENT TO SHOW MONUMENTS ON THE PLAN.
4. §105-21.1(K)(2): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PAY A TRAFFIC IMPACT FEE.
5. §105-30(A): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE CURB, SIDEWALK AND A TREE ZONE ALONG FLOURTOWN ROAD.
6. §105-30(B): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE ADDITIONAL WIDENING OF FLOURTOWN ROAD.
7. §105-38(B)(2): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE A 25-FOOT WIDE DRIVEWAY, TO ALLOW A 24-FOOT WIDE DRIVEWAY.
8. §105-38(F): RELIEF FROM THE REQUIREMENT THAT ALL PARKING AREAS BE CONFINED BY CURBING, TO ALLOW THE USE OF CONCRETE WHEEL STOPS.
9. §105-46(A): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE CURBS.
10. §105-47(A): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT PROVIDE SIDEWALKS.
11. §105-53(D): RELIEF FROM THE REQUIREMENT THAT THE APPLICANT DEDICATE LAND FOR PARK AND RECREATION USE OR PAY A FEE-IN-LIEU OF SUCH DEDICATION. THIS WAIVER IS SPECIFICALLY CONDITIONED ON THE APPLICANT GRANTING THE TOWNSHIP A CONSERVATION EASEMENT OVER THE UNDEVELOPED PORTION OF THE PROPERTY, THE EXACT GEOGRAPHIC EXTENT OF WHICH SHALL BE DETERMINED BY THE TOWNSHIP IN CONSULTATION WITH THE APPLICANT.
12. §55-4(B)(5) [CHAPTER 55-WHITEMARSH TOWNSHIP CODE]: RELIEF FROM THE REQUIREMENT THAT THE APPLICANT REPLACE TREES PURSUANT TO THE TREE PRESERVATION, PROTECTION AND REPLACEMENT REQUIREMENTS, TO ALLOW THE APPLICANT TO COMPLY WITH THE RECOMMENDATIONS OF THE SHADE TREE COMMISSION SET FORTH IN EXHIBIT "E" AND EXHIBIT "F" HERETO.
13. §8(E)(2)(g)(v) [RESOLUTION #2004-8; CHAPTER 58-WHITEMARSH TOWNSHIP CODE]: RELIEF FROM THE REQUIREMENT THAT THE MINIMUM PIPE DIAMETER FOR STORM SEWER IS 18" IN DIAMETER TO ALLOW THE USE OF A 10" DIAMETER STORM SEWER PIPE FOR THE BASIN OUTLET PIPE.

## LEGEND

- TRACT BOUNDARY
- LEGAL RIGHT-OF-WAY
- ADJOINING PARCEL LINE
- EXIST. EDGE OF PAVEMENT
- EXIST. FENCE
- EXIST. WOOD GUIDERAIL
- ZONING DISTRICT BOUNDARY
- EXIST. WALL
- EXIST. RAILROAD TRACKS
- EXIST. CONC. CURB
- EXIST. BUILDING
- EXIST. MULCH BED
- EXIST. UTILITY POLE

## SITE DATA

ZONING DISTRICT: LIM LIMITED INDUSTRIAL

| DESCRIPTION: | REQUIRED | EXISTING | PROVIDED |
|---|---|---|---|
| MINIMUM LOT AREA (ACRES) | 4.00 | 4.57 | 4.57 |
| MAXIMUM BUILDING COVERAGE | 40% | 0 | 4.02% |
| MAXIMUM IMPERVIOUS COVERAGE (%) | 60 | X | 8.94 |
| MIN. SETBACK FROM RESIDENTIAL DISTRICT (FT.) | 200 | 200 | 111 (1) |
| FRONT YARD | 50 | N/A | 50 |
| SIDE YARD | 50 | N/A | 64.98 |
| REAR YARD | 50 | N/A | >50 |
| PARK SETBACK FROM RESIDENTIAL | 100 (2) | N/A | 57.77(2) |
| REQUIRED PARKING SPACES | SEE BELOW (3) | N/A | 4 (3) |
| MAXIMUM BUILDING HEIGHT (FT) | 35 | N/A | 35±0"0" |

(1) REQUIRED DISTANCE OF 200 FT. FROM RESIDENTIAL DISTRICT PROVIDES NO USABLE BUILDING AREA. VARIANCE GRANTED.
(2) REQUIRED A DISTANCE OF 100 FT. FROM RESIDENTIAL DISTRICT. VARIANCE GRANTED.
(3) 1 PARKING SPACE PER 2 EMPLOYEES: MAXIMUM EMPLOYEES 8 / 2 = 4 PARKING SPACES.

## STORMWATER FACILITIES EASEMENT NOTE:

STORMWATER FACILITIES SHALL BE OWNED AND MAINTAINED BY THE PROPERTY OWNER IN PERPETUITY. THE PROPERTY OWNER SHALL PROVIDE A BLANKET STORMWATER ACCESS EASEMENT TO THE TOWNSHIP FOR THE PURPOSE OF ACCESS TO THE STORMWATER FACILITIES. IF, IN THE JUDGMENT OF THE TOWNSHIP ENGINEER, THE OWNER HAS FAILED TO MAINTAIN THE STORMWATER FACILITIES IN SUCH A MANNER AS TO ENSURE THEIR PROPER FUNCTIONING, THE TOWNSHIP AFTER PROVIDING A WRITTEN NOTICE, SHALL HAVE THE RIGHT TO ENTER UPON THE LANDS OF THE OWNER AND TO MAKE ANY REPAIRS AS MAY BE NECESSARY TO THE STORMWATER FACILITIES TO ENSURE THAT SUCH FACILITIES FUNCTION AND PERFORM IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS. ANY AND ALL COSTS INCURRED BY THE TOWNSHIP FOR SUCH REPAIRS AND/OR MAINTENANCE SHALL BE PAID IN FULL BY THE OWNER. A LIEN OR LIENS MAY BE PLACED AGAINST THE PROPERTY IF THE OWNER FAILS TO REMIT PAYMENT WITHIN SIXTY (60) DAYS.

811 Know what's below. Call before you dig.

PENNSYLVANIA ONE CALL
DIAL 8-1-1 or 1-800-242-1776
BEFORE YOU DIG

CONTRACTORS ARE REQUIRED TO CONTACT UTILITY USERS NOT LESS THAN 3 DAYS NOR MORE THAN 10 DAYS PRIOR TO BEGINNING ANY EXCAVATION OR DEMOLITION WORK. INFORMATION ON THESE PLANS CONCERNING UTILITIES IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

SERIAL #: 20180611638 DATE: MARCH 17, 2018

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — ROBERT E. BLUE, JR. — ENGINEER No. PE061644 — PENNSYLVANIA

ROBERT E. BLUE JR. (DATE)
LICENSE NO. 26169-E

PROFESSIONAL LAND SURVEYOR

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — ROBERT E. BLUE, JR. — LAND SURVEYOR No. SU1323A — PENNSYLVANIA

ROBERT E. BLUE JR. (DATE)
LICENSE NO. SU1323A

| REVISIONS |
|---|
| 1.) 07/07/22: PEL, PRD, STORMCEPT REVIEW / COMMENTS |
| 2.) 12/08/22: REVISED PER CAM, TWP, DATED 01-31-2022 |

1. ALL DIMENSIONS & BEARINGS ARE BASED ON THE DEFINITIONS OF SERVICE AS RECITED IN THE PENNSYLVANIA ONE CALL SYSTEM, INC. ACT 287 OF 1974 AS AMENDED BY ACT 121 OF 2008. THE PENNSYLVANIA ONE CALL SYSTEM, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN ON THIS PLAN. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE PENNSYLVANIA ONE CALL SYSTEM, INC. AT 1-800-242-1776 OR 811 AT LEAST THREE BUSINESS DAYS, EXCLUDING SATURDAY, SUNDAY, OR ANY DAY OF OBSERVED HOLIDAY, PRIOR TO EXCAVATION OR DEMOLITION.

RECORD PLAN

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

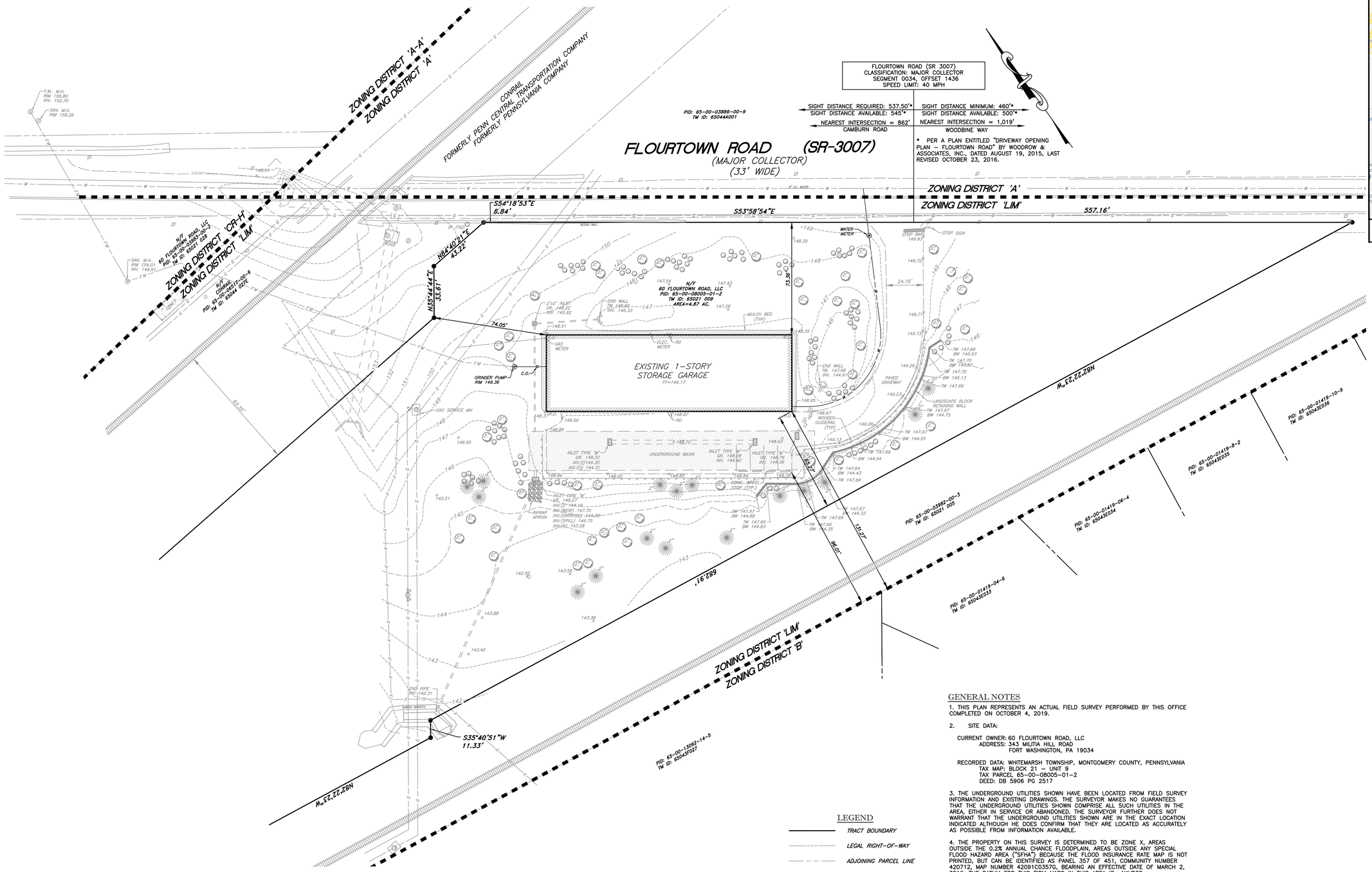
robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

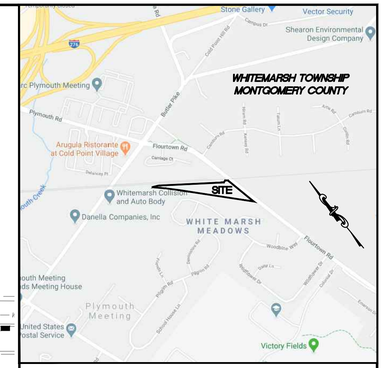
GRAPHIC SCALE
0 30 60 120 150

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| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RJN | REB | 1"=30' |
| DATE: | JOB NUMBER: | SHEET NUMBER: |
| 05-18-2020 | 2081-1E | 2 of 7 |

LAST SAVED: M:\Proj\2081-1\dwg\Site\PRM_PLAN SUBMISSION\02 RECORD-2081-1.dwg on 12/6/2022 4:04 PM




LOCATION MAP
SCALE: 1"=1,000'
500' 0 1,000'

REVISIONS
1) 07/02/20; REV. PER TOWNSHIP REVIEW COMMENTS
2) 12/08/22; REVISED PER CAM LTR. DATED 01-31-2022

1. THE MAPPING PRESENTED IS INTENDED TO DEPICT THE APPROXIMATE RELATIVE LOCATION OF PROPERTY BOUNDARIES AND THE APPROXIMATE LOCATION OF EXISTING STRUCTURES AND FEATURES WITH RESPECT TO THE PROPERTY BOUNDARIES AS DETERMINED BY A FIELD SURVEY PERFORMED BY THE SURVEYOR. THE MAPPING IS NOT INTENDED TO BE USED FOR ANY OTHER PURPOSE, AND IT IS INCOMPLETE WITHOUT THE ACCOMPANYING REPORT, PLANS AND OTHER DOCUMENTS PREPARED BY THE SURVEYOR. ANY USE OF THE MAPPING BY ANY PARTY FOR ANY PURPOSE OTHER THAN AS STATED ABOVE IS AT THE SOLE RISK OF SUCH PARTY. 2. ROBERT E. BLUE, CONSULTING ENGINEERS, P.C. EXPRESSLY DISCLAIMS ANY AND ALL LIABILITY FOR ANY ERRORS, OMISSIONS OR INACCURACIES IN THE MAPPING, INCLUDING, WITHOUT LIMITATION, DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, PUNITIVE OR SPECIAL DAMAGES, WHETHER ARISING IN CONTRACT, TORT OR OTHERWISE, EVEN IF ROBERT E. BLUE, CONSULTING ENGINEERS, P.C. OR ITS AGENTS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, ARISING OUT OF OR RELATING TO THE MAPPING.

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

GRAPHIC SCALE
0 30 60 120 150

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EXISTING FEATURES PLAN

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RJN | REB | 1"=30' |
| DATE: 05-18-2020 | JOB NUMBER: 2081-1E | SHEET NUMBER: 3 of 7 |

LAST SAVED: M:\Proj\2081-1\dwg\Sets\FINAL PLAN SUBMISSION\03 EXIST-2081-1.dwg ON 12/6/2022 4:03 PM

811 Know what's below. Call before you dig.

PENNSYLVANIA ONE CALL
DIAL 8-1-1 or 1-800-242-1776
BEFORE YOU DIG

CONTRACTORS ARE REQUIRED TO CONTACT UTILITY USERS NOT LESS THAN 3 DAYS NOR MORE THAN 10 DAYS PRIOR TO BEGINNING ANY EXCAVATION OR DEMOLITION WORK. INFORMATION ON THESE PLANS CONCERNING UTILITIES IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

SERIAL #: 20180611638 DATE: MARCH 17, 2018

## LEGEND

- TRACT BOUNDARY
- LEGAL RIGHT-OF-WAY
- ADJOINING PARCEL LINE
- EXIST. EDGE OF PAVEMENT
- EXIST. FENCE
- EXIST. WOOD GUIDERAIL
- ZONING DISTRICT BOUNDARY
- EXIST. WALL
- EXIST. RAILROAD TRACKS
- EXIST. CONC. CURB
- EXIST. BUILDING
- EXIST. MULCH BED
- EXIST. UTILITY POLE

## GENERAL NOTES

1. THIS PLAN REPRESENTS AN ACTUAL FIELD SURVEY PERFORMED BY THIS OFFICE COMPLETED ON OCTOBER 4, 2019.

2. SITE DATA:

CURRENT OWNER: 60 FLOURTOWN ROAD, LLC
ADDRESS: 343 MILITIA HILL ROAD
FORT WASHINGTON, PA 19034

RECORDED DATA: WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA
TAX MAP: BLOCK 21 — UNIT 9
TAX PARCEL 65-00-08005-01-2
DEED: DB 5906 PG 2517

3. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CONFIRM THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

4. THE PROPERTY ON THIS SURVEY IS DETERMINED TO BE ZONE X, AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AREAS OUTSIDE ANY SPECIAL FLOOD HAZARD AREA ("SFHA") BECAUSE THE FLOOD INSURANCE RATE MAP IS NOT PRINTED, BUT CAN BE IDENTIFIED AS PANEL 357 OF 451, COMMUNITY NUMBER 420712, MAP NUMBER 42091C0357G, BEARING AN EFFECTIVE DATE OF MARCH 2, 2016. THE DATUM FOR THIS FIRM MAPS IN THIS AREA IS NAVD88.

5. THE VERTICAL DATUM FOR THIS SITE IS NAVD 1988 BASED ON GPS OBSERVATIONS.
6. PA ONE CALL 20180611638; DATED MARCH 17, 2018

7. NET AREA (TO LEGAL R/W) = 4.57 Ac.

8. THE CLIENT HAS PROVIDED A TITLE REPORT PREPARED BY FIRST AMERICAN TITLE INSURANCE COMPANY, FILE NO. 5011442-02622984E, (NO EFFECTIVE DATE ON POLICY).

9. PLAN REFERENCES:

A.) A PLAN AND CAD FILE ENTITLED "FLOURTOWN ROAD" BY WOODROW & ASSOCIATES, INC. DATED AUGUST 19, 2015; LAST REVISED MARCH 10, 2017.

B.) "DRAWINGS FOR CONSTRUCTION OF STATE ROUTE 0006 SECTION 292" FROM STA. 190+00 TO STA. 216+00, SHEETS 6 AND 7 OF 42, PREPARED BY DISTRICT 4-0 PLANS UNIT FOR THE COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION, APPROVED MAY 23, 1990.

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — ROBERT E. BLUE, JR. — ENGINEER No. PE026189-E

ROBERT E. BLUE JR. (DATE)
LICENSE NO. 26169-E

PROFESSIONAL LAND SURVEYOR

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — ROBERT E. BLUE, JR. — LAND SURVEYOR No. SU1323W

ROBERT E. BLUE JR. (DATE)
LICENSE NO. SU1323A



ROBERT E. BLUE JR.
LICENSE NO. 26169-E

REGISTERED PROFESSIONAL ENGINEER

(DATE)

EXISTING FEATURES PLAN

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR

100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

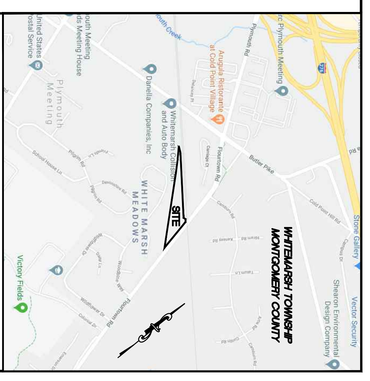

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1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com


GRAPHIC SCALE
0 100 200 300 400

| REVISIONS |
|---|
| 1.) 07/02/20; REV. PER CLIENT ATTORNEY REVIEW/ COMMENT |
| 2.) 12/06/22; REVISED PER G&A LTR. DATED 01-31-2022 |


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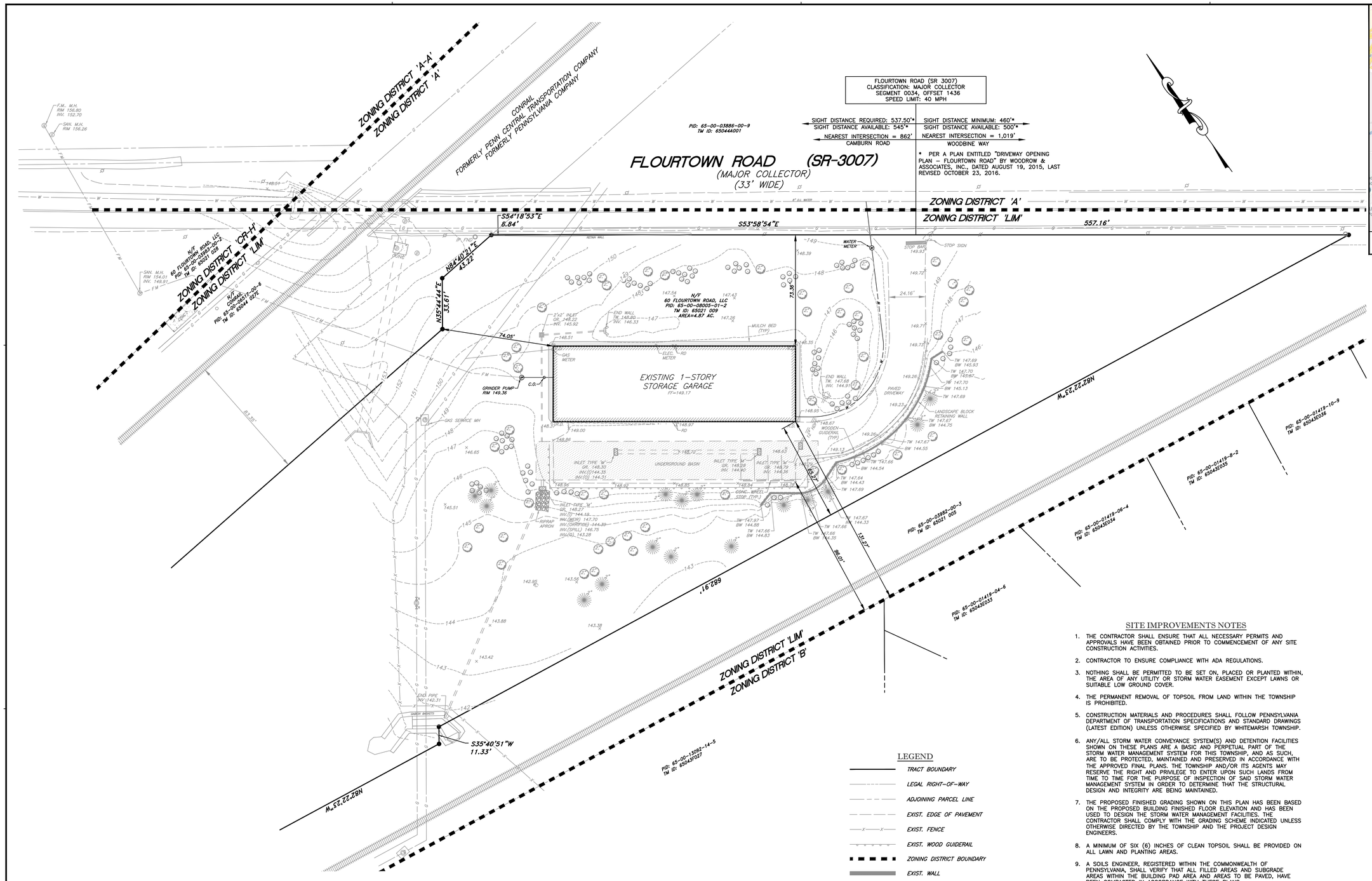

LOCATION MAP
SCALE: 1"=1,000'

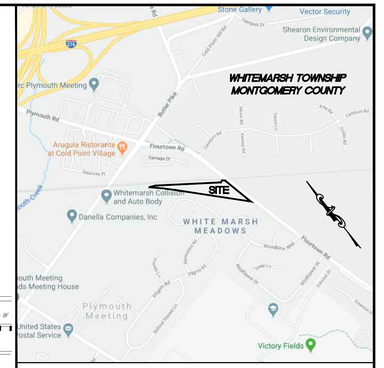



| | |
|---|---|
| DATE: 10-18-2020 | DRAWN BY: RJN |
| JOB NUMBER: 2081-1E | CHECKED BY: REB |
| SHEET NUMBER: 4 of 7 | SCALE: 1"=100' |




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LOCATION MAP
SCALE: 1"=1,000'
500' 0 1,000'

## LEGEND

- TRACT BOUNDARY
- LEGAL RIGHT-OF-WAY
- ADJOINING PARCEL LINE
- EXIST. EDGE OF PAVEMENT
- EXIST. FENCE
- EXIST. WOOD GUIDERAIL
- ZONING DISTRICT BOUNDARY
- EXIST. WALL
- EXIST. RAILROAD TRACKS
- EXIST. CONC. CURB
- EXIST. BUILDING
- EXIST. MULCH BED
- EXIST. UTILITY POLE

## SITE IMPROVEMENTS NOTES

1. THE CONTRACTOR SHALL ENSURE THAT ALL NECESSARY PERMITS AND APPROVALS HAVE BEEN OBTAINED PRIOR TO COMMENCEMENT OF ANY SITE CONSTRUCTION ACTIVITIES.
2. CONTRACTOR TO ENSURE COMPLIANCE WITH ADA REGULATIONS.
3. NOTHING SHALL BE PERMITTED TO BE SET ON, PLACED OR PLANTED WITHIN, THE AREA OF ANY UTILITY OR STORM WATER EASEMENT EXCEPT LAWNS OR SUITABLE LOW GROUND COVER.
4. THE PERMANENT REMOVAL OF TOPSOIL FROM LAND WITHIN THE TOWNSHIP IS PROHIBITED.
5. CONSTRUCTION MATERIALS AND PROCEDURES SHALL FOLLOW PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND STANDARD DRAWINGS (LATEST EDITION) UNLESS OTHERWISE SPECIFIED BY WHITEMARSH TOWNSHIP.
6. ANY/ALL STORM WATER CONVEYANCE SYSTEM(S) AND DETENTION FACILITIES SHOWN ON THESE PLANS ARE A BASIC AND PERPETUAL PART OF THE STORM WATER MANAGEMENT SYSTEM FOR THIS TOWNSHIP, AND AS SUCH, ARE TO BE PROTECTED, MAINTAINED AND PRESERVED IN ACCORDANCE WITH THE APPROVED FINAL PLANS. THE TOWNSHIP AND/OR ITS AGENTS MAY RESERVE THE RIGHT AND PRIVILEGE TO ENTER UPON SUCH LANDS FROM TIME TO TIME FOR THE PURPOSE OF INSPECTION OF SAID STORM WATER MANAGEMENT SYSTEM IN ORDER TO DETERMINE THAT THE STRUCTURAL DESIGN AND INTEGRITY ARE BEING MAINTAINED.
7. THE PROPOSED FINISHED GRADING SHOWN ON THIS PLAN HAS BEEN BASED ON THE PROPOSED BUILDING FINISHED FLOOR ELEVATION AND HAS BEEN USED TO DESIGN THE STORM WATER MANAGEMENT FACILITIES. THE CONTRACTOR SHALL COMPLY WITH THE GRADING SCHEME INDICATED UNLESS OTHERWISE DIRECTED BY THE TOWNSHIP AND THE PROJECT DESIGN ENGINEERS.
8. A MINIMUM OF SIX (6) INCHES OF CLEAN TOPSOIL SHALL BE PROVIDED ON ALL LAWN AND PLANTING AREAS.
9. A SOILS ENGINEER, REGISTERED WITHIN THE COMMONWEALTH OF PENNSYLVANIA, SHALL VERIFY THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING PAD AREA AND AREAS TO BE PAVED, HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS.
10. SUBBASE MATERIAL FOR 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).
11. THE MINIMUM SLOPE IN GRASSED AREAS SHALL NOT BE LESS THAN 2% AND THE MINIMUM IN PAVED AREAS SHALL NOT BE LESS THAN 1%. ALL ELECTRIC, TELEPHONE AND COMMUNICATIONS SERVICE FACILITIES, BOTH MAIN AND SERVICE LINES, SHALL BE PROVIDED BY UNDERGROUND CABLES, INSTALLED IN ACCORDANCE WITH THE PREVAILING STANDARDS AND PRACTICES OF THE UTILITY AND OTHER COMPANIES PROVIDING SUCH SERVICE.
12. THIS PLAN IS SUBJECT TO REVIEW AND APPROVAL OF THE WHITEMARSH TOWNSHIP SHADE TREE COMMISSION PRIOR TO ANY TREE REMOVAL ON SITE.

811 Know what's below. Call before you dig.

PENNSYLVANIA ONE CALL
DIAL 8-1-1 or 1-800-242-1776
BEFORE YOU DIG

CONTRACTORS ARE REQUIRED TO CONTACT UTILITY USERS NOT LESS THAN 3 DAYS NOR MORE THAN 10 DAYS PRIOR TO BEGINNING ANY EXCAVATION OR DEMOLITION WORK. INFORMATION ON THESE PLANS CONCERNING UTILITIES IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

SERIAL #: 20180611638 DATE: MARCH 17, 2018

REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ROBERT E. BLUE, JR.
ENGINEER
No. PE026169-E

ROBERT E. BLUE JR. (DATE)
LICENSE NO. 26169-E

| REVISIONS |
|---|
| 1) 07/02/20; REV. PER TOWNSHIP REVIEW COMMENTS |
| 2) 09/11/20; REVISED PER TWP AND GAA REVIEW LETTERS |


ALL DRAWINGS, WRITINGS & WORKS IN CONNECTION THEREWITH, A.S. INSTRUMENTS OF SERVICE, AS DEFINED IN THE ARCHITECTURAL WORKS COPYRIGHT PROTECTION ACT OF 1990, ARE AND SHALL REMAIN THE PROPERTY OF R. E. BLUE CONSULTING ENGINEERS, P.C. WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THEY ARE NOT TO BE USED BY THE OWNER OR OTHERS ON EXTENSIONS OF THIS PROJECT OR ON ANY OTHER PROJECT WITHOUT THE WRITTEN AGREEMENT OF R. E. BLUE CONSULTING ENGINEERS, P.C. AND WITHOUT THE APPROPRIATE COMPENSATION TO ROBERT E. BLUE CONSULTING ENGINEERS, P.C. ANY UNAUTHORIZED USE OF THESE DRAWINGS, WRITINGS OR WORKS SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO R. E. BLUE CONSULTING ENGINEERS, P.C. AND USER SHALL INDEMNIFY R. E. BLUE CONSULTING ENGINEERS, P.C. AGAINST ALL DAMAGES, LOSSES, AND EXPENSES ARISING OUT OF OR IN CONNECTION WITH SUCH UNAUTHORIZED USE.



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tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com


GRAPHIC SCALE
0 30 60 120 150

SITE IMPROVEMENTS PLAN

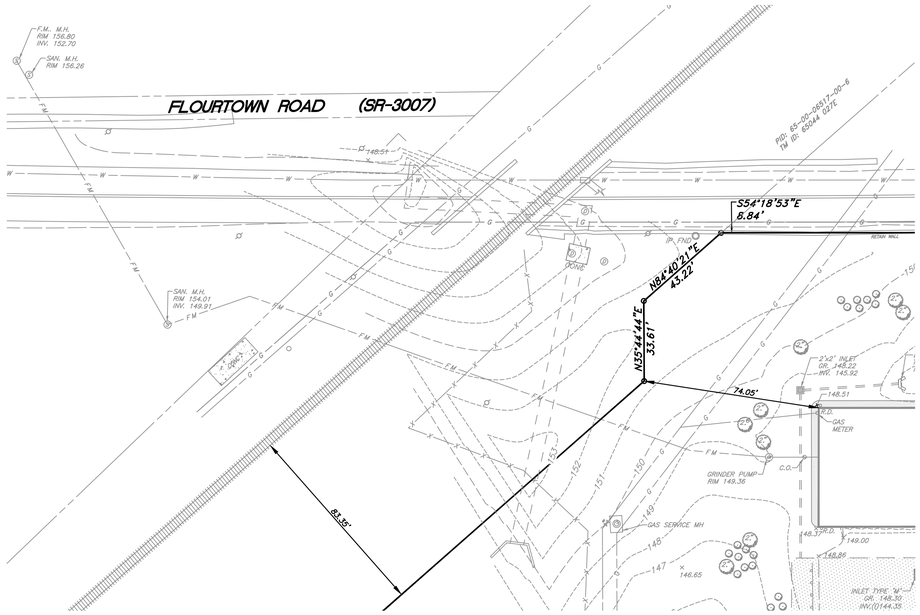
100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RJN | REB | 1"=30' |
| DATE: 05-18-2020 | JOB NUMBER: 2081-1E | SHEET NUMBER: 5 of 7 |


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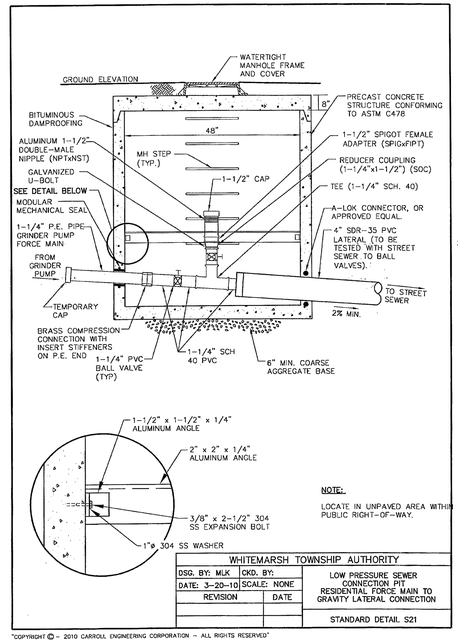



PLAN VIEW: OFF-SITE SANITARY SEWER FORCEMAIN MANHOLE TO ON-SITE GRINDER PUMP

SCALE: 1"=40'

## LEGEND

- EXISTING STORM INLET TYPE 'M'
- EXISTING STORM MANHOLE
- EXISTING 2'x2' YARD DRAIN
- EXISTING CONC. ENDWALL
- R.D. EXISTING ROOF DRAIN
- EXISTING WATER METER
- EXISTING GAS SERVICE MANHOLE
- EXISTING GAS VALVE
- EXISTING GAS METER
- EXISTING ELECTRIC METER
- EXISTING GRINDER PUMP
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING UTILITY POLE
- EXISTING DECIDUOUS TREE
- EXISTING EVERGREEN TREE
- EXISTING SIGN
- 149.00 SPOT ELEVATION
- 153 EXISTING CONTOUR (1 FT. INTERVAL)
- 145 EXISTING CONTOUR (5 FT. INTERVAL)
- W EXISTING WATER PIPE
- G EXISTING GAS PIPE
- SAN EXISTING SANITARY SEWER
- FM EXISTING SANITARY FORCEMAIN
- EXISTING STORM SEWER
- EXISTING TIMBER GUIDERAIL
- EXISTING BUILDING

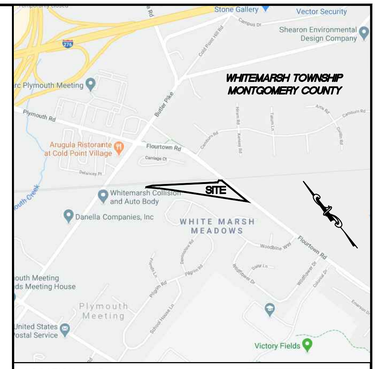



NOTE:

LOCATE IN UNPAVED AREA WITHIN PUBLIC RIGHT-OF-WAY.

| WHITEMARSH TOWNSHIP AUTHORITY | | |
|---|---|---|
| DSG. BY: MLK | CKD. BY: | LOW PRESSURE SEWER CONNECTION PIT RESIDENTIAL FORCE MAIN TO GRAVITY LATERAL CONNECTION |
| DATE: 3-20-10 | SCALE: NONE | |
| REVISION | DATE | |
| | | STANDARD DETAIL S21 |

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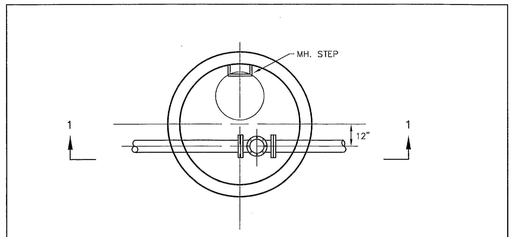

LOCATION MAP

SCALE: 1"=1,000'

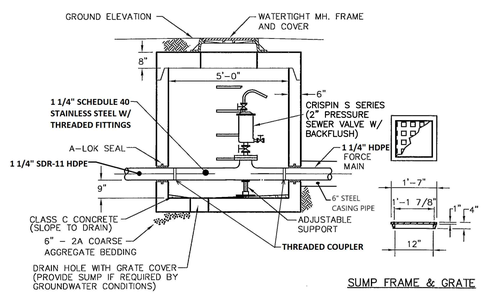
500' 0 1,000'

| REVISIONS |
|---|
| 1) 07/02/20: REV. PER TWP AND GAA REVIEW LETTERS |
| 2) 05/11/22: REVISED PER TWP AND GAA REVIEW LETTERS |

1. ALL MANHOLES SHALL BE WATERTIGHT. ALL CONNECTIONS OF SERVICE LATERALS TO MANHOLES SHALL BE WATERTIGHT.
2. THE CONTRACTOR SHALL NOTIFY THE PENNSYLVANIA ONE-CALL SYSTEM, INC. AND ALL UTILITY COMPANIES OF THE PROPOSED EXCAVATION AT LEAST THREE (3) BUSINESS DAYS PRIOR TO THE START OF EXCAVATION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND SHALL REPAIR ANY DAMAGE DURING CONSTRUCTION AT NO EXPENSE TO THE OWNER.
4. ALL EXCAVATION, BACKFILL, COMPACTION, AND PAVING SHALL CONFORM TO PENNDOT PUBLICATION 408, LATEST EDITION.




PLAN SECTION

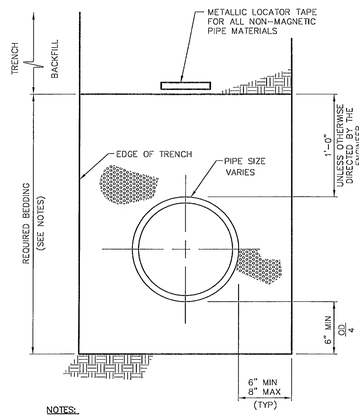



SECTION 1-1

SUMP FRAME & GRATE

| WHITEMARSH TOWNSHIP AUTHORITY | | |
|---|---|---|
| DSG. BY: MLK | CKD. BY: | FORCE MAIN AIR RELEASE CHAMBER |
| DATE: 3-20-10 | SCALE: NONE | |
| REVISION | DATE | |
| | | STANDARD DETAIL S15 |

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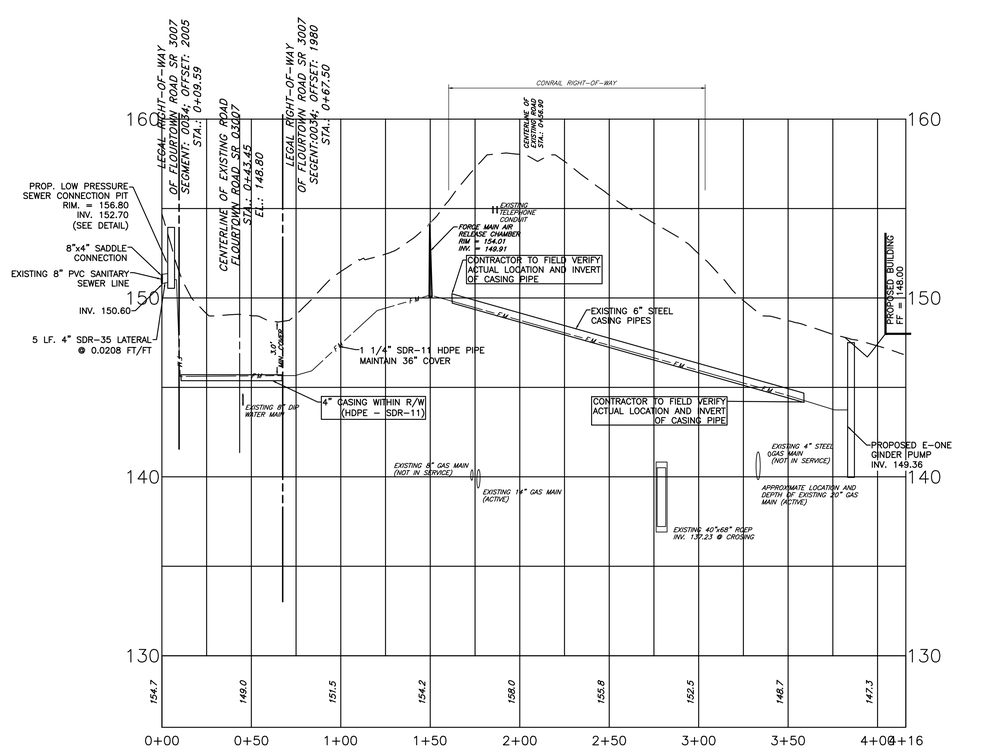



NOTES:

1. AASHTO NO. 8 COARSE AGGREGATE FOR PVC PIPE.
2. PADOT 2A COARSE AGGREGATE FOR DUCTILE IRON PIPE.
3. SCREENINGS OR TYPE B #3 FINE AGGREGATE FOR COPPER PIPE.

| WHITEMARSH TOWNSHIP AUTHORITY | | |
|---|---|---|
| DSG. BY: MLK | CKD. BY: | STANDARD PIPE BEDDING |
| DATE: 3-20-10 | SCALE: NONE | |
| REVISION | DATE | |
| | | STANDARD DETAIL M1 |

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PROFILE VIEW: OFF-SITE SANITARY SEWER FORCEMAIN MANHOLE TO ON-SITE GRINDER PUMP

SCALE: 1"=40' (HORIZ.)
1"=4' (VERT.)

PROFESSIONAL LAND SURVEYOR

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT E. BLUE, JR. LAND SURVEYOR No. SU1323A

ROBERT E. BLUE JR. (DATE)
LICENSE NO. SU1323A

FORCEMAIN PLAN & PROFILE

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

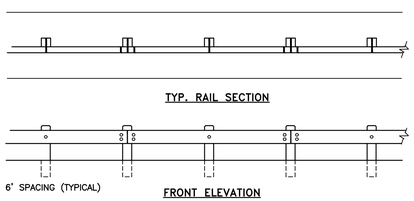
PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

| DRAWN BY: RJN | CHECKED BY: SDM | SCALE: AS NOTED |
|---|---|---|
| DATE: 01-27-2020 | JOB NUMBER: 2081-1E | SHEET NUMBER: 6 of 7 |

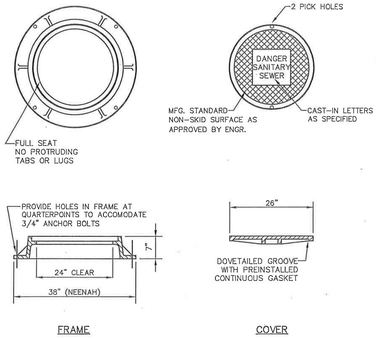
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NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS.
2. DO NOT SCALE DRAWINGS.
3. IF TOP OF SLOPE IS CLOSER THAN 24" INCREASE POST LENGTH TO 7.0'.
4. DRIVE POSTS OR AUGER, BACKFILL WITH NATIVE SOIL AND COMACT EVERY 12".
5. ALL TIMBER #1 S4S SOUTHERN PINE, PRESSURE TREATED: AWPA–C14, WOOD FOR USE IN HIGHWAY CONSTRUCTION.
6. TYP. POST: 8"x8"x6' – TYP. RAIL: 4"x12"x11' 11/12"
7. FASTENERS: ASTM A307; A242; F436 TYPE 3; A563 DH3.
8. SPLICE PLATE & PLATE WASHER ASTM–A588.
9. UNDER EACH BOLT HEAD ON FACE OF RAIL INSTALL ONE 7/8" WASHER.

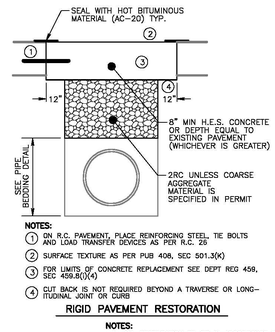
TIMBER GUIDERAIL DETAIL
(NOT TO SCALE)

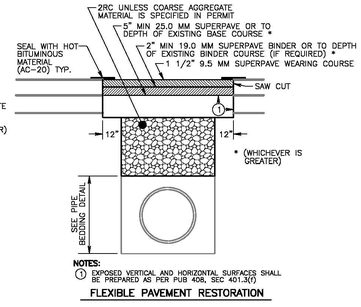



NOTES:

1. ALL MATERIALS TO BE GRAY CAST IRON ASTM A–48.
2. FRAME AND COVER SHALL BE FOR HEAVY DUTY TRAFFIC, AASHTO HS–20.
3. PROVIDE FOUR (4) ANCHOR BOLTS, 3/4" DIA. MINIMUM.
4. THE FOLLOWING MANUFACTURER'S STANDARD CASTING, OR APPROVED EQUAL, SHALL BE USED.
   NEENAH FOUNDRY CO. ——— PATTERN R–1642.

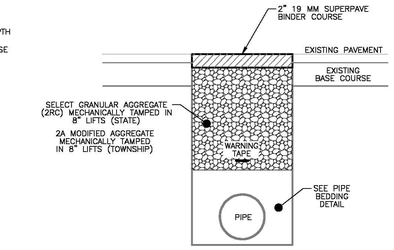
STANDARD MANHOLE FRAME & COVER
(NOT TO SCALE)



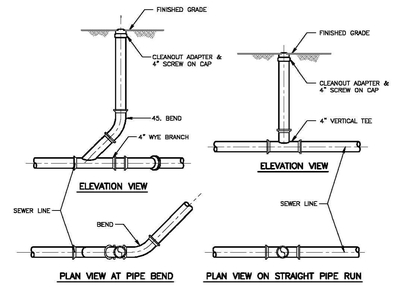




NOTES:
1. ALL RESTORATION TO BE IN ACCORDANCE WITH PENNDOT PUB 408/94 AND PA CODE TITLE 67 CHAPTER 459.
2. SPECIAL CONDITIONS OF OCCUPANCY PERMIT MAY SUPERCEED THIS DETAIL.

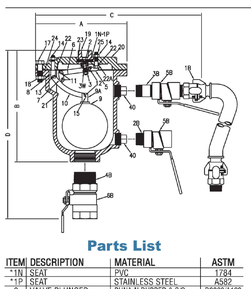
TRENCH RESTORATION
PERMANENT PAVEMENT - STATE HIGHWAY
(NOT TO SCALE)




TEMPORARY PAVEMENT SECTION
STATE & TOWNSHIP ROADS
(NOT TO SCALE)




SANITARY CLEAN–OUT DETAILS
(NOT TO SCALE)




## Specifications

The Pressure Sewer Air Release Valve(s) shall be installed at high points in the line, or at points selected by the engineer, to vent the accumulation of air and other gases with the line under pressure.

The valve(s) shall be of the long body design and shall have a _____" orifice with an adjustable Buna–N rubber valve and a sealing face of PVC. The valve(s) shall operate at _____ PSIG, and be capable of passing _____ SCFM of air.

They shall also be _____" NPT screwed or ANSI Class (125, 250) flanged connection. They shall have a cast iron body, top and flange, where required, and a stainless steel trim.

The valve(s) shall be Crispin Model _____ Pressure Sewer Valve(s) as manufactured by Crispin–Multiplex Manufacturing Co., Berwick, PA.

**Option**: The valve(s) shall be supplied with back flushing attachments so that the interior body can be flushed periodically for proper operation.

**Option**: The valve(s) shall be a Short Body Pressure Sewer Valve with an overall height not to exceed 12 1/4".

**Option**: Where pressures are greater than 300 PSIG, the valve(s) shall be ANSI Class _____ flanged inlet connection, and shall have a (steel, stainless steel, or ductile iron) body, top and inlet flange.

Standard operating pressure for Crispin Air Valves is 20 to 150 PSIG. Please check one of the following if your operating needs differ:

____ 2 to 40 PSIG ____ 151 to 300 PSIG

** Parts are interchangeable and optional at customer's request*

## Parts List

| ITEM | DESCRIPTION | MATERIAL | ASTM |
|---|---|---|---|
| *1N | SEAT | PVC | 1784 |
| *1P | SEAT | STAINLESS STEEL | A582 |
| 2 | VALVE PLUNGER | BUNA-N RUBBER & SS | D2000/A193 |
| 3 | PLUNGER NUT | STAINLESS STEEL | A194 |
| 3W | LOCK WASHER | STAINLESS STEEL | A240 |
| 5 | VALVE FULCRUM | STAINLESS STEEL | A582 |
| 6 | VALVE LEVER | STAINLESS STEEL | A582 |
| 7 | LINK | STAINLESS STEEL | A240 |
| 8 | BALL FULCRUM | STAINLESS STEEL | A582 |
| 9 | BALL FLOAT | STAINLESS STEEL | A240 |
| 9A | FLOAT ROD | STAINLESS STEEL | A582 |
| 10 | BALL LEVER | STAINLESS STEEL | A240 |
| 11 | BEARING PIN | STAINLESS STEEL | A582 |
| 12 | BEARING PIN | STAINLESS STEEL | A582 |
| 13 | BEARING PIN | STAINLESS STEEL | A582 |
| 14 | NUT | STEEL | A563 |
| 15 | COTTER PIN | STAINLESS STEEL | A493 |
| 17 | BOLT | STEEL | A307 |
| 18 | NUT | STEEL | A563 |
| 19 | TOP | CAST IRON | A126 CL.B |
| 20 | FLANGE | CAST IRON | A126 CL.B |
| 21 | BODY | CAST IRON | A126 CL.B |
| 22 | FULCRUM WASHER | FIBER | D710 |
| 22A | FULCRUM WASHER | FIBER | D710 |
| 23 | SEAT GASKET | BUNA-N RUBBER | D2000 |
| 24 | FLANGE GASKET | ARMSTRONG N-8092 | N/A |
| 25 | BOLT | STAINLESS STEEL | A193 |
| *40 | FLUSH PLUG | CAST IRON | A126 CL.B |
| | **OPTIONAL BACK FLUSH COMPONENTS** | | |
| *1B | HOSE ASSEMBLY | CAD. PLT. STEEL & RUBBER | N/A |
| *2B | NIPPLE | STEEL | A53 |
| *3B | NIPPLE | STEEL | A53 |
| *4B | NIPPLE | STEEL | A53 |
| *5B | BALL VALVE | BRASS | N/A |
| *6B | BALL VALVE | BRASS | N/A |

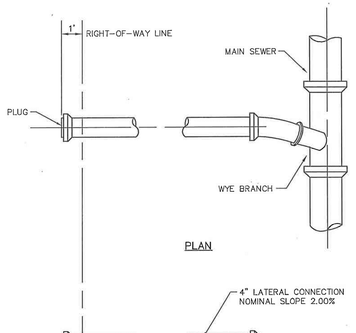
## Size Specifications

| MODEL | INLET SIZE | OUTLET SIZE | A | B | C | D | WHT. |
|---|---|---|---|---|---|---|---|
| S20S | 2" NPT | 0.50" NPT | 10.25 | 12.50 | | | 54 |
| S20SB | 2" NPT | 0.50" NPT | | | | | 74.75 |

## Orifice Options

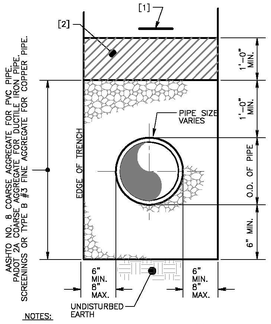
| DIAMETER | MAX. PRES. | DISCHARGE RATE |
|---|---|---|
| 1/4 | 150 PSIG | 97.5 SCFM |
| 1/8 | 300 PSIG | 46.7 SCFM |

2" PRESSURE SEWER VALVE (SHORT BODY)
(NOT TO SCALE)

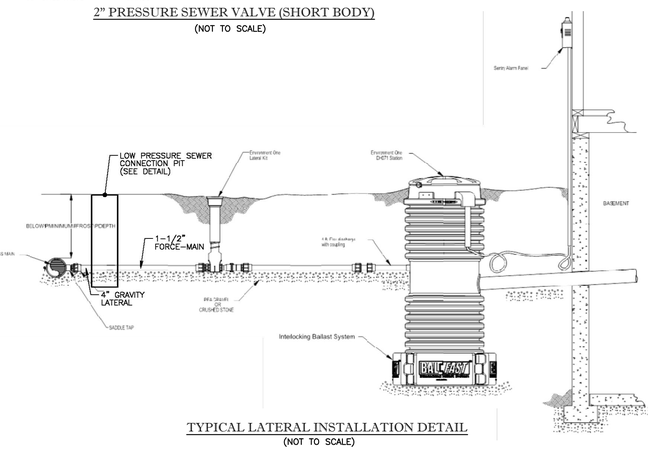



NOTE:
PROVIDE 6" LATERAL CONNECTION WHEN SERVICING COMMERCIAL BUILDINGS AND MULTI–FAMILY DWELLING UNITS.

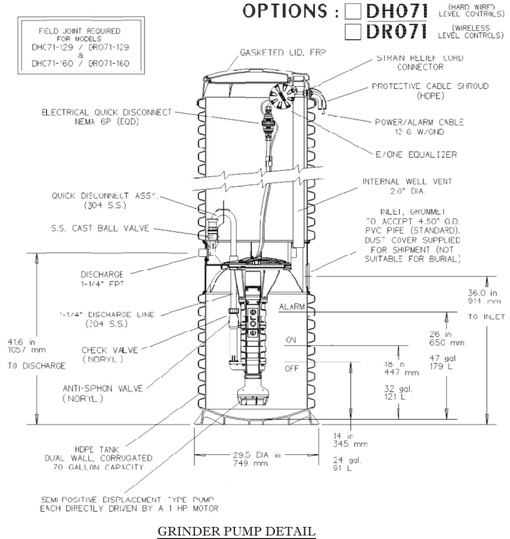
SHALLOW LATERAL CONNECTION
(NOT TO SCALE)



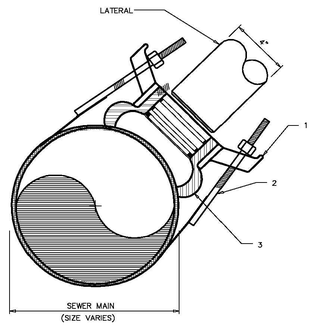

STANDARD SANITARY SEWER
PIPE BEDDING DETAIL
(NOT TO SCALE)




TYPICAL LATERAL INSTALLATION DETAIL
(NOT TO SCALE)




GRINDER PUMP DETAIL
(NOT TO SCALE)




NOTES:

MATERIALS:

1 SADDLE CASTING: DUCTILE IRON ASTM 536–80 GRADE 65–45–12 PROTECTED WITH CORROSION RESISTANT PAINT.

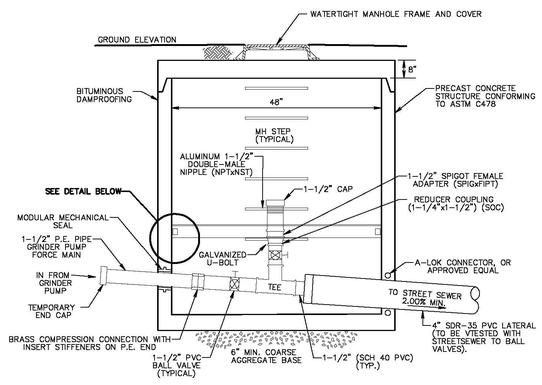
2 STAINLESS STEEL 304 ADJUSTABLE STRAP: BOLTS, NUTS AND WASHERS 1/2" –N.C. ROLL THREAD TEFLON COATED. 3 1/2" WIDE BAND TO SPREAD CLAMP .FORCE OUT ON PIPE.

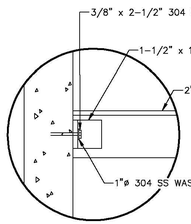
3 GASKET: VIRGIN SBR COMPOUNDED FOR SEWER SERVICE. MEETS ASTM D–2000 .3 BA715.

4 SADDLE TO BE INSTALLED AT THE 10:00 OR 2:00 POSITION ON EXISTING MAIN.

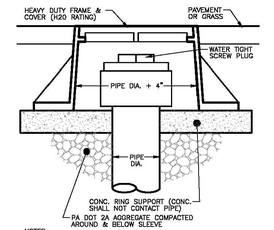
5 STYLE CB SEWER SADDLE MANUFACTURED BY: ROMAC INDUSTRIES, INC.

SEWER SADDLE DETAIL
(NOT TO SCALE)



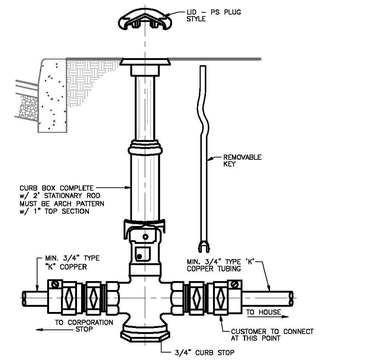




LOW PRESSURE SEWER CONNECTION PIT - RESIDENTIAL
FORCEMAIN TO GRAVITY LATERAL CONNECTION
(NOT TO SCALE)



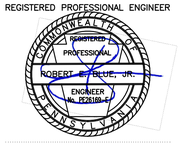

NOTES:
1. FRAME AND COVER SHALL BE NEENAH FOUNDARY COMPANY MODEL R–1976 OR APPROVED EQUAL.
2. CLEAN–OUT PROTECTION SLEEVES ARE TO BE INSTALLED AT LOCATIONS IN PAVED AREAS OR LESS THAN 3 FEET FROM A PAVED AREA.

CLEAN–OUT PROTECTIVE SLEEVE
(NOT TO SCALE)




CURB STOP DETAIL
(NOT TO SCALE)

REGISTERED PROFESSIONAL ENGINEER




ROBERT E. BLUE JR. (DATE)
LICENSE NO. 26169–E

| REVISIONS |
|---|
| 1) 07/02/20: REV. PER TWP AND DER REVIEW COMMENTS |
| 2) 05/11/22: REVISED PER TWP AND SMA REVIEW LETTERS. |


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robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)–277–9441 fax: (610)–277–9897
www.robertblue.com email: rblue@robertblue.com


CONSTRUCTION DETAILS

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR
100 FLOURTOWN ROAD
343 MILITIA HILL ROAD
FT. WASHINGTON, PA 19034

| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RJN | REB | NO SCALE |
| DATE: | JOB NUMBER: | SHEET NUMBER: |
| 05–18–2020 | 2081–1E | 7 of 7 |


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EARTH ENGINEERING INCORPORATED
*Geotechnical Engineers & Geologists*

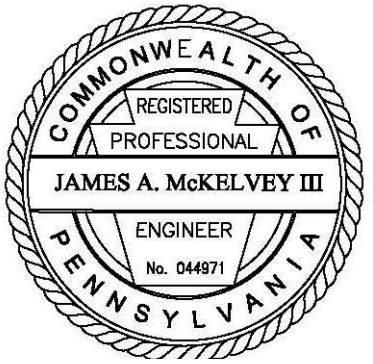
# ANCHOR VERTICA RETAINING WALL SYSTEM

## Design Calculations

**Prepared for**

## 60 FLOURTOWN ROAD

## WHTIEMARSH TOWNSHIP, MONTGOMERTY COUNTY, PENNSYLVANIA




**EEI PROJECT NO. 29268.02**

**VOLUME 1 OF 1**

**Revision 0: OCTOBER 30, 2017**

*Corporate Headquarters*
115 W Germantown Pike, Suite 200
East Norriton, PA 19401
(610) 277-0880 FAX 277-0878
eei@earthengineering.com

*Southern New Jersey*
403 Commerce Lane
West Berlin, NJ 08091
(856) 768-1001 FAX 768-1144

*Central Pennsylvania*
5010 Ritter Road, Suite 116
Mechanicsburg, PA 17055
(717) 697-5701 FAX 697-5702

*Lehigh Valley*
149 Main Street
Emmaus, PA 18049
(610) 967-4540 FAX 967-4488
www.earthengineering.com

# WALL ABSTRACT – 60 FLOURTOWN ROAD

WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PENNYSLVANIA

**WALL 1**

This wall is retaining embankment for the parking area south of the proposed storage garage. Wall 1 has a length of 169.50 feet, spanning from station 0+00.00 to station 1+69.50. The wall has a height ranging from 2.33 feet to 3.67 feet.

---

The soil to be used in construction of the retaining wall is assumed to be on-site soils. EEI used the following soil parameters for the design: the internal angle of friction used for the foundation, retained, and reinforced soils assumed to be 28 degrees and the unit weight was assumed to be 120 pcf.

Safety Factors for the wall design are in accordance with NCMA, and are as follows:

| | | |
|---|---|---|
| Internal | | |
| | Pullout - | 1.50 |
| | Overstress - | 1.00 |
| | Facing Shear - | 1.50 |
| External | | |
| | Bearing capacity - | 2.00 |
| | Overturning - | 2.00 |
| | Base sliding - | 1.50 |

Design Reduction Factors for geogrid reinforcement are based on manufacturer's information are as follows:

***Installation Damage***

1.10

***Durability***

1.10

***Creep***

1.58

*Attachments:*

A Internal Stability Calculations

B. Global Stability Calculations

# INTERNAL STABILITY CALCULATIONS

# WALL 1

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

# NCMA DESIGN METHOD
# 60 Flourtown Road

## PROJECT IDENTIFICATION

Title: 60 Flourtown Road
Project Number: 29268.02
Client: Napoli Construction, LLC
Designer: KGM
Station Number: 1 & 5

**Description:**

**Company's information:**

Name: Earth Engineering Inc.
Street: 115 W Germantown Pike
Suite 200
East Norriton, PA 19401
Telephone #: (610) 277-0880
Fax #:
E-Mail:

**Original file path and name:** G:\PROJECTS\29000\29268.02 - 60 Flourtown Road - Design.....
.....EW\Section 1 & 5.BEN

**Original date and time of creating this file:** Mon Aug 21 16:50:36 2017

**PROGRAM MODE:** ANALYSIS
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.


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## SOIL DATA

REINFORCED SOIL

| | | |
|---|---|---|
| Unit weight, | $\gamma$ | 120.0 lb/ft $^3$ |
| Design value of internal angle of friction, | $\phi$ | 28.0 ° |

RETAINED SOIL

| | | |
|---|---|---|
| Unit weight, | $\gamma$ | 120.0 lb/ft $^3$ |
| Design value of internal angle of friction, | $\phi$ | 28.0 ° |

FOUNDATION SOIL (Considered as an equivalent uniform soil)

| | | |
|---|---|---|
| Equivalent unit weight, | $\gamma_{equiv.}$ | 120.0 lb/ft $^3$ |
| Equivalent internal angle of friction, | $\phi_{equiv.}$ | 28.0 ° |
| Equivalent cohesion, | $c_{equiv.}$ | 0.0 lb/ft $^2$ |

Water table does not affect bearing capacity

## LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.3803
Inclination of internal slip plane, $\psi$ = 46.63°.
Ka (external stability) = 0.3813

## BEARING CAPACITY

Bearing capacity coefficients (calculated by MSEW): Nc = 25.80 N $\gamma$ = 16.72

## SEISMICITY

Not Applicable

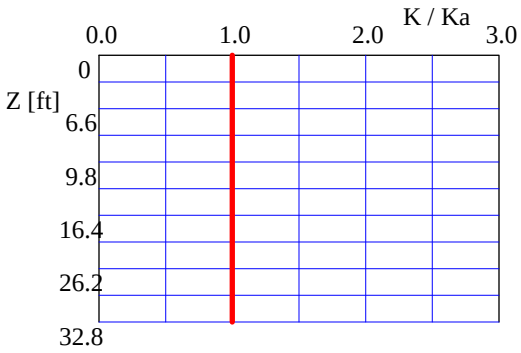

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## INPUT DATA: Geogrids (Analysis)

| D A T A | Geogrid type #1 | Geogrid type #2 | Geogrid type #3 | Geogrid type #4 | Geogrid type #5 |
|---|---|---|---|---|---|
| Tult [lb/ft] | 3500.0 | | | | |
| Durability reduction factor, RFd | 1.10 | | | | |
| Installation-damage reduction factor, RFid | 1.10 | | | | |
| Creep reduction factor, RFc | 1.47 | N/A | N/A | N/A | N/A |
| Fs-overall for strength | N/A | | | | |
| Coverage ratio, Rc | 1.000 | | | | |
| Cds = tan(ro) / tan(Phi.reinforced) | 0.87 | | | | |
| Ci | 0.80 | N/A | N/A | N/A | N/A |

### Variation of Lateral Earth Pressure Coefficient With Depth

| Z | K / Ka |
|---|---|
| 0 ft | 1.00 |
| 3.3 ft | 1.00 |
| 6.6 ft | 1.00 |
| 9.8 ft | 1.00 |
| 13.1 ft | 1.00 |
| 16.4 ft | 1.00 |
| 19.7 ft | 1.00 |



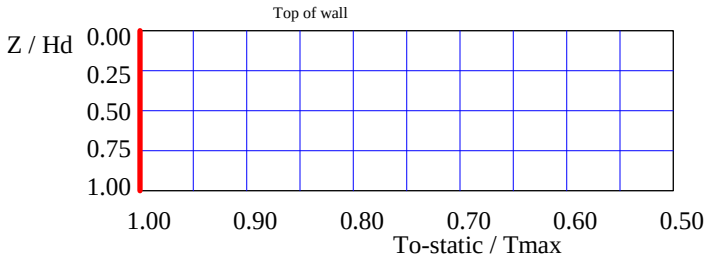


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## INPUT DATA: Facia and Connection (Analysis)

FACIA type: Facing enabling frictional connection of reinforcement (e.g., modular concrete blocks, gabions)
Depth/height of block is 0.92/0.67 ft. Horizontal distance to Center of Gravity of block is 0.46 ft.
Average unit weight of block is $\gamma_f$ = 120.00 lb/ft $^3$

| Z / Hd | To-static / Tmax |
|---|---|
| 0.00 | 1.00 |
| 0.25 | 1.00 |
| 0.50 | 1.00 |
| 0.75 | 1.00 |
| 1.00 | 1.00 |




### Peak Strength Criterion

| Geogrid Type #1 Weight of blocks | (1) (2) Tultconn | Geogrid Type #2 Weight of blocks | Tultconn | Geogrid Type #3 Weight of blocks | Tultconn | Geogrid Type #4 Weight of blocks | Tultconn | Geogrid Type #5 Weight of blocks | Tultconn |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 970.37 | | | | | | | | |
| 1430.4 | 1830.58 | N/A | | N/A | | N/A | | N/A | |
| 2500.0 | 1890.60 | | | | | | | | |

### Service Strength Criterion @ 3/4"

| Geogrid Type #1 Weight of blocks | (3) Tconn @ 3/4" | Geogrid Type #2 Weight of blocks | Tconn @ 3/4" | Geogrid Type #3 Weight of blocks | Tconn @ 3/4" | Geogrid Type #4 Weight of blocks | Tconn @ 3/4" | Geogrid Type #5 Weight of blocks | Tconn @ 3/4" |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 930.37 | | | | | | | | |
| 1430.4 | 1830.58 | N/A | | N/A | | N/A | | N/A | |
| 2500.0 | 1890.60 | | | | | | | | |

### Ultimate Strength Criterion

| Weight of blocks | Vu (4) |
|---|---|
| 0.0 | 1145.36 |
| 1854.6 | 2800.89 |

### Service Strength Criterion

| Weight of blocks | Vu' (5) |
|---|---|
| 0.0 | 1145.36 |
| 1854.6 | 2800.89 |

(1) (2) (3) (4) (5) Weight of blocks, Tultconn., Tconn@3/4", Vu and Vu' are in [lb/ft]

| D A T A (for connection only) | Type #1 | Type #2 | Type #3 | Type #4 | Type #5 |
|---|---|---|---|---|---|
| Product Name | Mirafi 3X.. | N/A | N/A | N/A | N/A |
| Durability reduction factor, RFd | 1.00 | N/A | N/A | N/A | N/A |
| Creep reduction factor, RFc | 1.00 | N/A | N/A | N/A | N/A |
| Overall factor of safety: connection break, Fs | N/A | N/A | N/A | N/A | N/A |
| Overall factor of safety: connection pullout, Fs | N/A | N/A | N/A | N/A | N/A |


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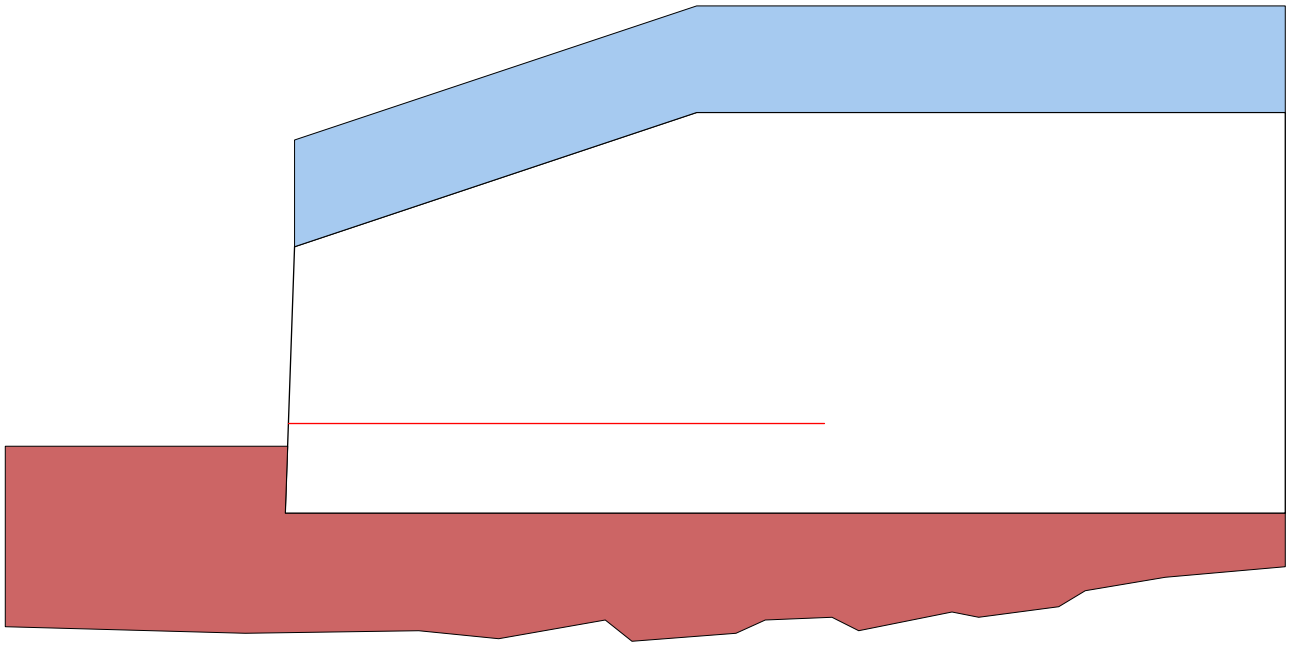
## INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

| | | | |
|---|---|---|---|
| Design height, Hd | 1.99 | [ft] | { Embedded depth is E = 0.50 ft, and height above top of finished bottom grade is H = 1.49 ft } |
| Batter, ω | 2.0 | [deg] | |
| Backslope, β | 18.4 | [deg] | |
| Backslope rise | 1.0 | [ft] | Broken back equivalent angle, I = 14.10° |

U N I F O R M S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 150.0 [lb/ft ²]

## ANALYZED REINFORCEMENT LAYOUT:



## SCALE:





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## ANALYSIS: CALCULATED FACTORS (Static conditions)

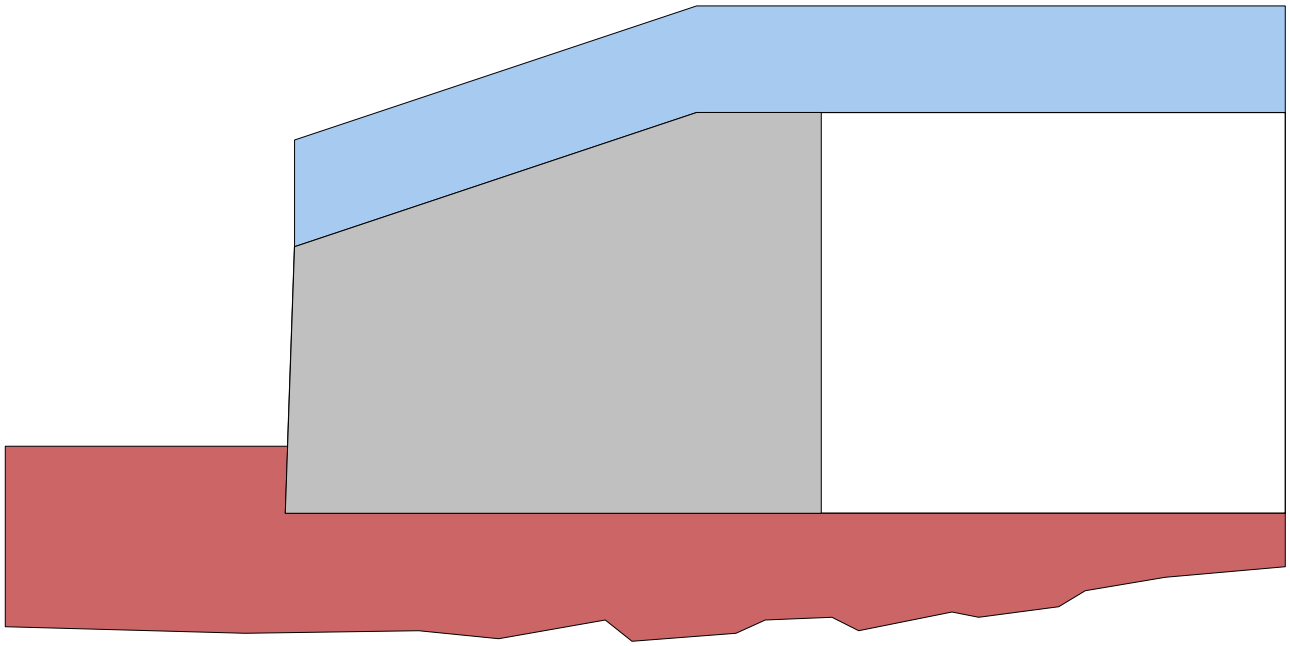
Bearing capacity, Fs = 9.61, Meyerhof stress = 471 lb/ft².
Foundation Interface: Direct sliding, Fs = 1.964, Eccentricity, e/L = -0.0145, Fs-overturning = 7.21

| GEOGRID | | | | CONNECTION | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Elevation [ft] | Length [ft] | Type # | Fs @ 3/4" [service criterion] | Fs-peak [failure criterion] | Fs-overall [geogrid strength] | Geogrid strength Fs | Pullout resistance Fs | Direct sliding Fs | Eccentricity e/L | Product name |
| 1 | 0.67 | 4.00 | 1 | 5.23 | 5.42 | 10.07 | 10.075 | 2.478 | 7.118 | -0.0653 | Mirafi 3XT.. |


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## BEARING CAPACITY for GIVEN LAYOUT

| | STATIC | SEISMIC | UNITS |
|---|---|---|---|
| (Water table does not affect bearing capacity) | | | |
| Ultimate bearing capacity, q-ult | 4523 | N/A | [lb/ft ²] |
| Meyerhof stress, $\sigma_V$ | 470.9 | N/A | [lb/ft ²] |
| Eccentricity, e | -0.19 | N/A | [ft] |
| Eccentricity, e/L | -0.046 | N/A | |
| Fs calculated | 9.61 | N/A | |
| Base length | 4.00 | N/A | [ft] |



SCALE:





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## RESULTS for STRENGTH

| # | Geogrid Elevation [ft] | Tavailable [lb/ft] | Tmax [lb/ft] | Tmd [lb/ft] | Specified minimum Fs-overall static | Actual calculated Fs-overall static | Specified minimum Fs-overall seismic | Actual calculated Fs-overall seismic | Product name |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.67 | 1968 | 195.32 | N/A | N/A | 10.075 | N/A | N/A | Mirafi 3XT.. |

## RESULTS for PULLOUT

NOTE: Uniform live load is not included in calculating the overburden pressure used to assess pullout resistance.

| # | Geogrid Elevation [ft] | Coverage Ratio | Tmax [lb/ft] | Tmd [lb/ft] | Le [ft] (see NOTE) | La [ft] | Avail.Static Pullout, Pr [lb/ft] | Specified Static Fs | Actual Static Fs | Avail.Seism. Pullout, Pr [lb/ft] | Specified Seismic Fs | Actual Seismic Fs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.67 | 1.000 | 195.3 | N/A | 2.47 | 0.61 | 484.0 | N/A | 2.478 | N/A | N/A | N/A |


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EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

# NCMA DESIGN METHOD
# 60 Flourtown Road

## PROJECT IDENTIFICATION

Title: 60 Flourtown Road
Project Number: 29268.02
Client: Napoli Construction, LLC
Designer: KGM
Station Number: 2 & 4

**Description:**

**Company's information:**

Name: Earth Engineering Inc.
Street: 115 W Germantown Pike
Suite 200
East Norriton, PA 19401
Telephone #: (610) 277-0880
Fax #:
E-Mail:

**Original file path and name:** G:\PROJECTS\29000\29268.02 - 60 Flourtown Road - Design.....
.....EW\Section 2 & 4.BEN
**Original date and time of creating this file:** Mon Aug 21 16:50:36 2017

**PROGRAM MODE:** ANALYSIS
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.


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## SOIL DATA

REINFORCED SOIL

| | | |
|---|---|---|
| Unit weight, | $\gamma$ | 120.0 lb/ft $^3$ |
| Design value of internal angle of friction, | $\phi$ | 28.0 ° |

RETAINED SOIL

| | | |
|---|---|---|
| Unit weight, | $\gamma$ | 120.0 lb/ft $^3$ |
| Design value of internal angle of friction, | $\phi$ | 28.0 ° |

FOUNDATION SOIL (Considered as an equivalent uniform soil)

| | | |
|---|---|---|
| Equivalent unit weight, | $\gamma_{equiv.}$ | 120.0 lb/ft $^3$ |
| Equivalent internal angle of friction, | $\phi_{equiv.}$ | 28.0 ° |
| Equivalent cohesion, | $c_{equiv.}$ | 0.0 lb/ft $^2$ |

Water table does not affect bearing capacity

## LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.3570
Inclination of internal slip plane, $\psi$ = 46.63°.
Ka (external stability) = 0.3564

## BEARING CAPACITY

Bearing capacity coefficients (calculated by MSEW): Nc = 25.80 N $\gamma$ = 16.72

## SEISMICITY

Not Applicable

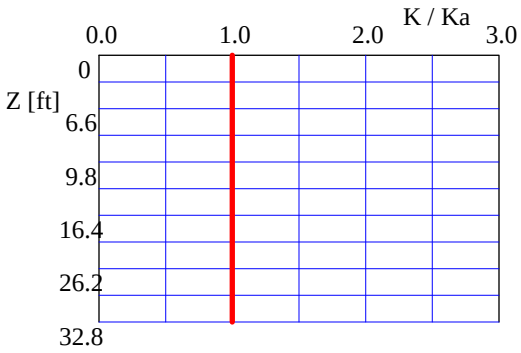

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## INPUT DATA: Geogrids (Analysis)

| D A T A | Geogrid type #1 | Geogrid type #2 | Geogrid type #3 | Geogrid type #4 | Geogrid type #5 |
|---|---|---|---|---|---|
| Tult [lb/ft] | 3500.0 | | | | |
| Durability reduction factor, RFd | 1.10 | | | | |
| Installation-damage reduction factor, RFid | 1.10 | | | | |
| Creep reduction factor, RFc | 1.47 | N/A | N/A | N/A | N/A |
| Fs-overall for strength | N/A | | | | |
| Coverage ratio, Rc | 1.000 | | | | |
| Cds = tan(ro) / tan(Phi.reinforced) | 0.87 | | | | |
| Ci | 0.80 | N/A | N/A | N/A | N/A |

### Variation of Lateral Earth Pressure Coefficient With Depth

| Z | K / Ka |
|---|---|
| 0 ft | 1.00 |
| 3.3 ft | 1.00 |
| 6.6 ft | 1.00 |
| 9.8 ft | 1.00 |
| 13.1 ft | 1.00 |
| 16.4 ft | 1.00 |
| 19.7 ft | 1.00 |



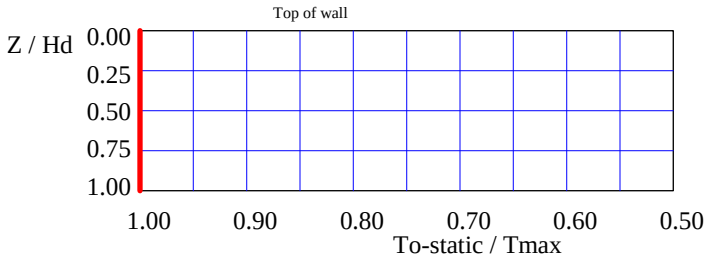


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## INPUT DATA: Facia and Connection (Analysis)

FACIA type: Facing enabling frictional connection of reinforcement (e.g., modular concrete blocks, gabions)
Depth/height of block is 0.92/0.67 ft. Horizontal distance to Center of Gravity of block is 0.46 ft.
Average unit weight of block is $\gamma_f$ = 120.00 lb/ft $^3$

| Z / Hd | To-static / Tmax |
|---|---|
| 0.00 | 1.00 |
| 0.25 | 1.00 |
| 0.50 | 1.00 |
| 0.75 | 1.00 |
| 1.00 | 1.00 |




### Peak Strength Criterion

| Geogrid Type #1 Weight of blocks | (1) (2) Tultconn | Geogrid Type #2 Weight of blocks | Tultconn | Geogrid Type #3 Weight of blocks | Tultconn | Geogrid Type #4 Weight of blocks | Tultconn | Geogrid Type #5 Weight of blocks | Tultconn |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 970.37 | | | | | | | | |
| 1430.4 | 1830.58 | N/A | | N/A | | N/A | | N/A | |
| 2500.0 | 1890.60 | | | | | | | | |

### Service Strength Criterion @ 3/4"

| Geogrid Type #1 (3) Weight of blocks | Tconn @ 3/4" | Geogrid Type #2 Weight of blocks | Tconn @ 3/4" | Geogrid Type #3 Weight of blocks | Tconn @ 3/4" | Geogrid Type #4 Weight of blocks | Tconn @ 3/4" | Geogrid Type #5 Weight of blocks | Tconn @ 3/4" |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 930.37 | | | | | | | | |
| 1430.4 | 1830.58 | N/A | | N/A | | N/A | | N/A | |
| 2500.0 | 1890.60 | | | | | | | | |

### Ultimate Strength Criterion

| Weight of blocks | Vu (4) |
|---|---|
| 0.0 | 1145.36 |
| 1854.6 | 2800.89 |

### Service Strength Criterion

| Weight of blocks | Vu' (5) |
|---|---|
| 0.0 | 1145.36 |
| 1854.6 | 2800.89 |

(1) (2) (3) (4) (5) Weight of blocks, Tultconn., Tconn@3/4", Vu and Vu' are in [lb/ft]

| D A T A (for connection only) | Type #1 | Type #2 | Type #3 | Type #4 | Type #5 |
|---|---|---|---|---|---|
| Product Name | Mirafi 3X.. | N/A | N/A | N/A | N/A |
| Durability reduction factor, RFd | 1.00 | N/A | N/A | N/A | N/A |
| Creep reduction factor, RFc | 1.00 | N/A | N/A | N/A | N/A |
| Overall factor of safety: connection break, Fs | N/A | N/A | N/A | N/A | N/A |
| Overall factor of safety: connection pullout, Fs | N/A | N/A | N/A | N/A | N/A |


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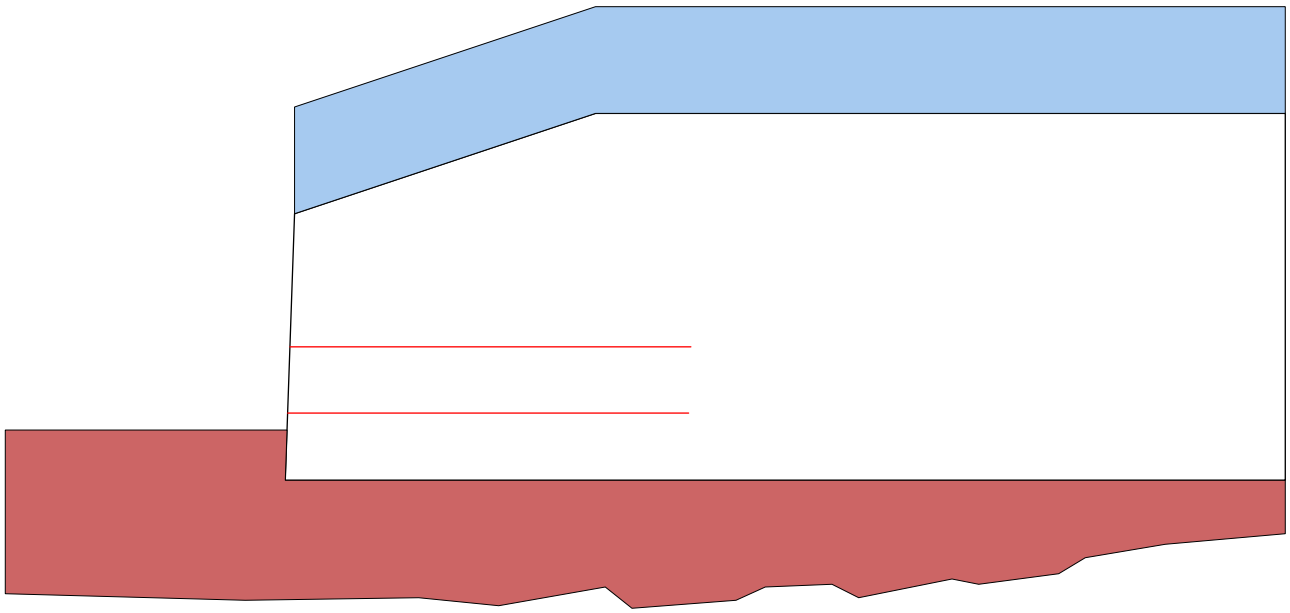
## INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

| | | | |
|---|---|---|---|
| Design height, Hd | 2.66 | [ft] | { Embedded depth is E = 0.50 ft, and height above top of finished bottom grade is H = 2.16 ft } |
| Batter, ω | 2.0 | [deg] | |
| Backslope, β | 18.4 | [deg] | |
| Backslope rise | 1.0 | [ft] | Broken back equivalent angle, I = 10.65° |

U N I F O R M S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 150.0 [lb/ft ²]

## ANALYZED REINFORCEMENT LAYOUT:



## SCALE:





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## RESULTS for STRENGTH

| # | Geogrid Elevation [ft] | Tavailable [lb/ft] | Tmax [lb/ft] | Tmd [lb/ft] | Specified minimum Fs-overall static | Actual calculated Fs-overall static | Specified minimum Fs-overall seismic | Actual calculated Fs-overall seismic | Product name |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.67 | 1968 | 139.95 | N/A | N/A | 14.061 | N/A | N/A | Mirafi 3XT.. |
| 2 | 1.33 | 1968 | 141.70 | N/A | N/A | 13.886 | N/A | N/A | Mirafi 3XT.. |

## RESULTS for PULLOUT

NOTE: Uniform live load is not included in calculating the overburden pressure used to assess pullout resistance.

| # | Geogrid Elevation [ft] | Coverage Ratio | Tmax [lb/ft] | Tmd [lb/ft] | Le [ft] (see NOTE) | La [ft] | Avail.Static Pullout, Pr [lb/ft] | Specified Static Fs | Actual Static Fs | Avail.Seism. Pullout, Pr [lb/ft] | Specified Seismic Fs | Actual Seismic Fs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.67 | 1.000 | 139.9 | N/A | 2.47 | 0.61 | 651.1 | N/A | 4.652 | N/A | N/A | N/A |
| 2 | 1.33 | 1.000 | 141.7 | N/A | 1.87 | 1.21 | 387.3 | N/A | 2.733 | N/A | N/A | N/A |


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## RESULTS for CONNECTION (static conditions)

| # | Geogrid Elevation [ft] | Connection force, To [lb/ft] | FS - Bulging Peak | FS - Bulging Deformation | Available connection strength, Tcl-failure criterion [lb/ft] | Available connection strength, Tcs-service criterion [lb/ft] | Available Geogrid strength, Tavailable [lb/ft] | Fs-overall connection peak Specified | Fs-overall connection peak Actual | Fs-overall connection service Specified | Fs-overall connection service Actual | Fs-overall Geogrid strength Specified | Fs-overall Geogrid strength Actual | Product name |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.67 | 140 | 32.21 | 32.21 | 1102 | 1069 | 1968 | N/A | 7.88 | N/A | 7.64 | N/A | 14.06 | Mirafi 3XT.. |
| 2 | 1.33 | 142 | 12.21 | 12.21 | 1059 | 1023 | 1968 | N/A | 7.47 | N/A | 7.22 | N/A | 13.89 | Mirafi 3XT.. |


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EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

# NCMA DESIGN METHOD
# 60 Flourtown Road

## PROJECT IDENTIFICATION

Title: 60 Flourtown Road
Project Number: 29268.02
Client: Napoli Construction, LLC
Designer: KGM
Station Number: 3

**Description:**

**Company's information:**

Name: Earth Engineering Inc.
Street: 115 W Germantown Pike
Suite 200
East Norriton, PA 19401
Telephone #: (610) 277-0880
Fax #:
E-Mail:

**Original file path and name:** G:\PROJECTS\29000\29268.02 - 60 Flourtown Road - Design.....
.....)\MSEW\Section 3.BEN

**Original date and time of creating this file:** Mon Aug 21 16:50:36 2017

**PROGRAM MODE:** ANALYSIS
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.


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## SOIL DATA

REINFORCED SOIL

| | | |
|---|---|---|
| Unit weight, | $\gamma$ | 120.0 lb/ft $^3$ |
| Design value of internal angle of friction, | $\phi$ | 28.0 ° |

RETAINED SOIL

| | | |
|---|---|---|
| Unit weight, | $\gamma$ | 120.0 lb/ft $^3$ |
| Design value of internal angle of friction, | $\phi$ | 28.0 ° |

FOUNDATION SOIL (Considered as an equivalent uniform soil)

| | | |
|---|---|---|
| Equivalent unit weight, | $\gamma_{equiv.}$ | 120.0 lb/ft $^3$ |
| Equivalent internal angle of friction, | $\phi_{equiv.}$ | 28.0 ° |
| Equivalent cohesion, | $c_{equiv.}$ | 0.0 lb/ft $^2$ |

Water table does not affect bearing capacity

## LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.3450
Inclination of internal slip plane, $\psi$ = 46.63°.
Ka (external stability) = 0.3437

## BEARING CAPACITY

Bearing capacity coefficients (calculated by MSEW): Nc = 25.80 N $\gamma$ = 16.72

## SEISMICITY

Not Applicable

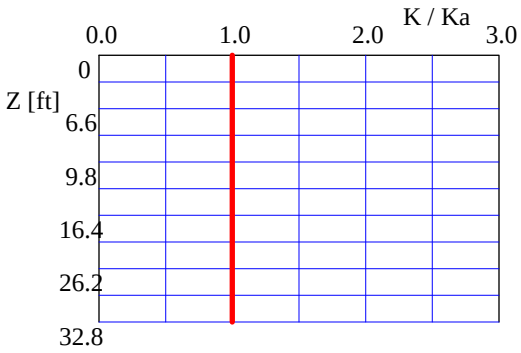

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## INPUT DATA: Geogrids (Analysis)

| D A T A | Geogrid type #1 | Geogrid type #2 | Geogrid type #3 | Geogrid type #4 | Geogrid type #5 |
|---|---|---|---|---|---|
| Tult [lb/ft] | 3500.0 | | | | |
| Durability reduction factor, RFd | 1.10 | | | | |
| Installation-damage reduction factor, RFid | 1.10 | | | | |
| Creep reduction factor, RFc | 1.47 | N/A | N/A | N/A | N/A |
| Fs-overall for strength | N/A | | | | |
| Coverage ratio, Rc | 1.000 | | | | |
| Cds = tan(ro) / tan(Phi.reinforced) | 0.87 | | | | |
| Ci | 0.80 | N/A | N/A | N/A | N/A |

### Variation of Lateral Earth Pressure Coefficient With Depth

| Z | K / Ka |
|---|---|
| 0 ft | 1.00 |
| 3.3 ft | 1.00 |
| 6.6 ft | 1.00 |
| 9.8 ft | 1.00 |
| 13.1 ft | 1.00 |
| 16.4 ft | 1.00 |
| 19.7 ft | 1.00 |



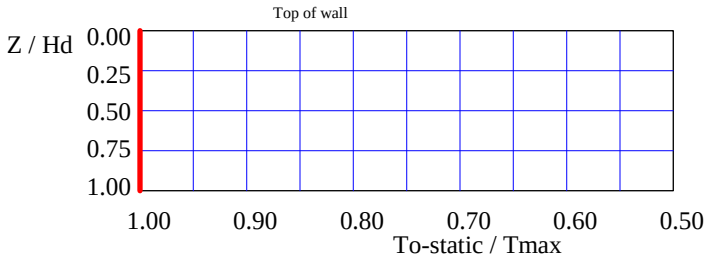


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## INPUT DATA: Facia and Connection (Analysis)

FACIA type: Facing enabling frictional connection of reinforcement (e.g., modular concrete blocks, gabions)
Depth/height of block is 0.92/0.67 ft. Horizontal distance to Center of Gravity of block is 0.46 ft.
Average unit weight of block is $\gamma_f$ = 120.00 lb/ft $^3$

| Z / Hd | To-static / Tmax |
|---|---|
| 0.00 | 1.00 |
| 0.25 | 1.00 |
| 0.50 | 1.00 |
| 0.75 | 1.00 |
| 1.00 | 1.00 |




### Peak Strength Criterion

| Geogrid Type #1 Weight of blocks | (1) Tultconn (2) | Geogrid Type #2 Weight of blocks | Tultconn | Geogrid Type #3 Weight of blocks | Tultconn | Geogrid Type #4 Weight of blocks | Tultconn | Geogrid Type #5 Weight of blocks | Tultconn |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 970.37 | | | | | | | | |
| 1430.4 | 1830.58 | N/A | | N/A | | N/A | | N/A | |
| 2500.0 | 1890.60 | | | | | | | | |

### Service Strength Criterion @ 3/4"

| Geogrid Type #1 Weight of blocks | (3) Tconn @ 3/4" | Geogrid Type #2 Weight of blocks | Tconn @ 3/4" | Geogrid Type #3 Weight of blocks | Tconn @ 3/4" | Geogrid Type #4 Weight of blocks | Tconn @ 3/4" | Geogrid Type #5 Weight of blocks | Tconn @ 3/4" |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 930.37 | | | | | | | | |
| 1430.4 | 1830.58 | N/A | | N/A | | N/A | | N/A | |
| 2500.0 | 1890.60 | | | | | | | | |

### Ultimate Strength Criterion

| Weight of blocks | Vu (4) |
|---|---|
| 0.0 | 1145.36 |
| 1854.6 | 2800.89 |

### Service Strength Criterion

| Weight of blocks | Vu' (5) |
|---|---|
| 0.0 | 1145.36 |
| 1854.6 | 2800.89 |

(1) (2) (3) (4) (5) Weight of blocks, Tultconn., Tconn@3/4", Vu and Vu' are in [lb/ft]

| D A T A (for connection only) | Type #1 | Type #2 | Type #3 | Type #4 | Type #5 |
|---|---|---|---|---|---|
| Product Name | Mirafi 3X.. | N/A | N/A | N/A | N/A |
| Durability reduction factor, RFd | 1.00 | N/A | N/A | N/A | N/A |
| Creep reduction factor, RFc | 1.00 | N/A | N/A | N/A | N/A |
| Overall factor of safety: connection break, Fs | N/A | N/A | N/A | N/A | N/A |
| Overall factor of safety: connection pullout, Fs | N/A | N/A | N/A | N/A | N/A |


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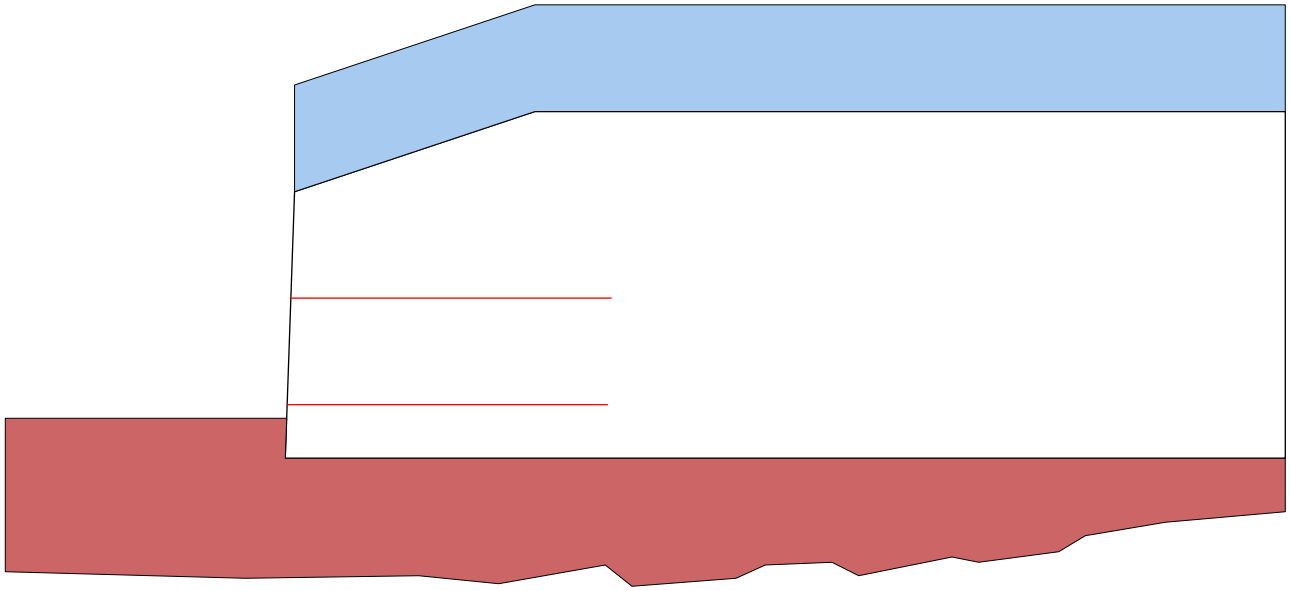
## INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

| | | | |
|---|---|---|---|
| Design height, Hd | 3.33 | [ft] | { Embedded depth is E = 0.50 ft, and height above top of finished bottom grade is H = 2.83 ft } |
| Batter, ω | 2.0 | [deg] | |
| Backslope, β | 18.4 | [deg] | |
| Backslope rise | 1.0 | [ft] | Broken back equivalent angle, I = 8.54° |

U N I F O R M S U R C H A R G E

Uniformly distributed dead load is 0.0 [lb/ft ²], and live load is 150.0 [lb/ft ²]

## ANALYZED REINFORCEMENT LAYOUT:



## SCALE:

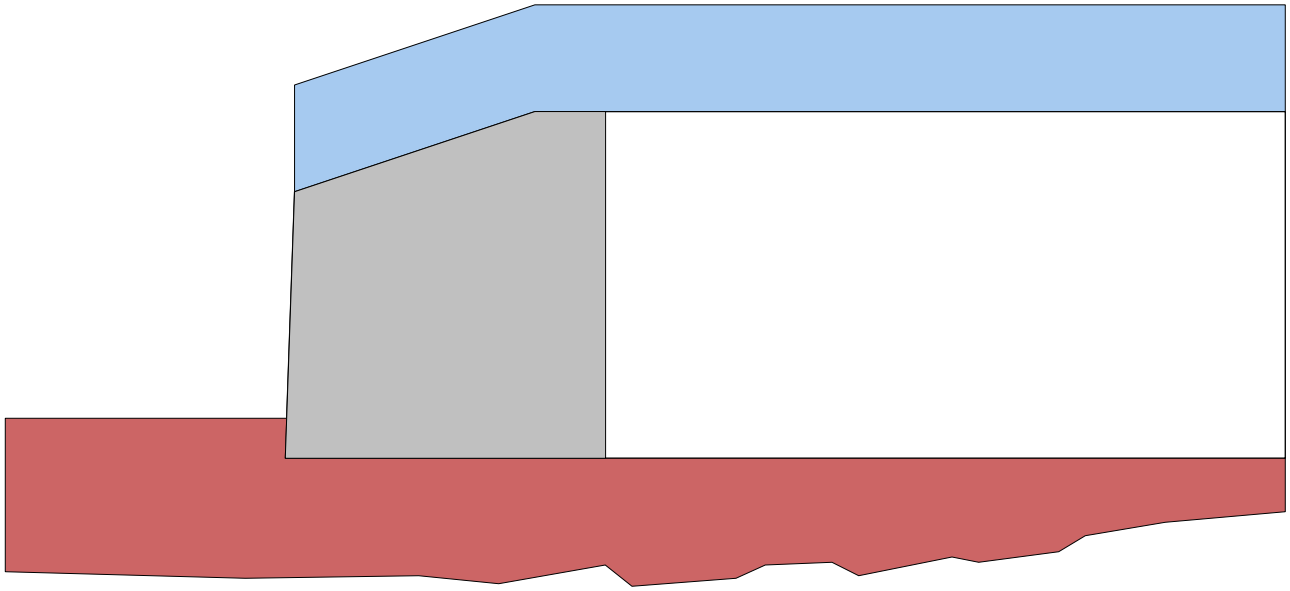
0 2 4 6 [ft]


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## BEARING CAPACITY for GIVEN LAYOUT

| | STATIC | SEISMIC | UNITS |
|---|---|---|---|
| (Water table does not affect bearing capacity) | | | |
| Ultimate bearing capacity, q-ult | 4786 | N/A | [lb/ft ²] |
| Meyerhof stress, $\sigma_V$ | 603.0 | N/A | [lb/ft ²] |
| Eccentricity, e | 0.05 | N/A | [ft] |
| Eccentricity, e/L | 0.014 | N/A | |
| Fs calculated | 7.94 | N/A | |
| Base length | 4.00 | N/A | [ft] |



SCALE:

0 2 4 6 [ft]


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## RESULTS for STRENGTH

| # | Geogrid Elevation [ft] | Tavailable [lb/ft] | Tmax [lb/ft] | Tmd [lb/ft] | Specified minimum Fs-overall static | Actual calculated Fs-overall static | Specified minimum Fs-overall seismic | Actual calculated Fs-overall seismic | Product name |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.67 | 1968 | 207.17 | N/A | N/A | 9.498 | N/A | N/A | Mirafi 3XT.. |
| 2 | 2.00 | 1968 | 177.85 | N/A | N/A | 11.064 | N/A | N/A | Mirafi 3XT.. |

## RESULTS for PULLOUT

NOTE: Uniform live load is not included in calculating the overburden pressure used to assess pullout resistance.

| # | Geogrid Elevation [ft] | Coverage Ratio | Tmax [lb/ft] | Tmd [lb/ft] | Le [ft] (see NOTE) | La [ft] | Avail.Static Pullout, Pr [lb/ft] | Specified Static Fs | Actual Static Fs | Avail.Seism. Pullout, Pr [lb/ft] | Specified Seismic Fs | Actual Seismic Fs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.67 | 1.000 | 207.2 | N/A | 2.47 | 0.61 | 818.1 | N/A | 3.949 | N/A | N/A | N/A |
| 2 | 2.00 | 1.000 | 177.8 | N/A | 1.26 | 1.82 | 274.1 | N/A | 1.541 | N/A | N/A | N/A |


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## RESULTS for CONNECTION (static conditions)

| # | Geogrid Elevation [ft] | Connection force, To [lb/ft] | FS - Bulging | | Available connection strength, Tcl-failure criterion [lb/ft] | Available connection strength, Tcs-service criterion [lb/ft] | Available Geogrid strength, Tavailable [lb/ft] | Fs-overall connection peak | | Fs-overall connection service | | Fs-overall Geogrid strength | | Product name |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Peak | Deformation | | | | Specified | Actual | Specified | Actual | Specified | Actual | |
| 1 | 0.67 | 207 | 14.92 | 14.92 | 1147 | 1115 | 1968 | N/A | 5.54 | N/A | 5.38 | N/A | 9.50 | Mirafi 3XT.. |
| 2 | 2.00 | 178 | 12.63 | 12.63 | 1059 | 1023 | 1968 | N/A | 5.95 | N/A | 5.75 | N/A | 11.06 | Mirafi 3XT.. |


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# GLOBAL STABILITY CALCULATIONS

# WALL 1

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

# 60 Flourtown Road

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## PROJECT IDENTIFICATION

Title: 60 Flourtown Road
Project Number: 29268.02 -
Client: Napoli Construction, LLC
Designer: KGM
Station Number: 2

**Description:**

**Company's information:**

Name: Earth Engineering Inc.
Street: 115 W Germantown Pike
Suite 200
East Norriton, PA 19401
Telephone #: (610) 277-0880
Fax #:
E-Mail:

**Original file path and name:** G:\PROJECT ..... ions\Rev 0 (Initial Submittal)\RESSA\Section 2.MSE
**Original date and time of creating this file:** Thu Sep 07 11:57:26 2017

**PROGRAM MODE:** ANALYSIS of a Complex Slope using GEOSYNTHETIC as reinforcing material.


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## INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

### SOIL DATA

| ========== Soil Layer #: ========== | Unit weight, $\gamma$ [lb/ft $^3$] | Internal angle of friction, $\phi$ [deg.] | Cohesion, c [lb/ft $^2$] |
|---|---|---|---|
| ....1..... | 120.0 | 28.0 | 0.0 |
| ....2..... | 130.0 | 36.0 | 0.0 |

### REINFORCEMENT

| Reinforcement Type # | Geosynthetic Designated Name | Ultimate Strength, Tult [lb/ft] | Reduction Factor for Installation Damage, RFid | Reduction Factor for Durability, RFd | Reduction Factor for Creep, RFc | Coverage Ratio, Rc |
|---|---|---|---|---|---|---|
| 1 | Mirafi 3XT | 3500.00 | 1.10 | 1.10 | 1.58 | 1.00 |

| Interaction Parameters | | == Direct Sliding == | | ==== Pullout ==== | |
|---|---|---|---|---|---|
| Type # | Geosynthetic Designated Name | Cds-phi | Cds-c | Ci | Alpha |
| 1 | Mirafi 3XT | 0.80 | 0.00 | 0.80 | 0.80 |

Relative Orientation of Reinforcement Force, ROR = 0.00. Assigned Factor of Safety to resist pullout, Fs-po = 1.50
Design method for Global Stability: Comprehensive Bishop.

### WATER

Water is not present

### SEISMICITY

Not Applicable


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## DRAWING OF SPECIFIED GEOMETRY - COMPLEX - Quick Input

-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.

### GEOMETRY

Soil profile contains 2 layers (see details in next page)

### UNIFORM SURCHARGE

Load Q1 = 150.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 133.50 and ends at X1e = 138.50 [ft].
Load Q2 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X2s = 138.50 and ends at X2e = 155.00 [ft].
Surcharge load, Q3.....None

### STRIP LOAD

.....None.....




SCALE:

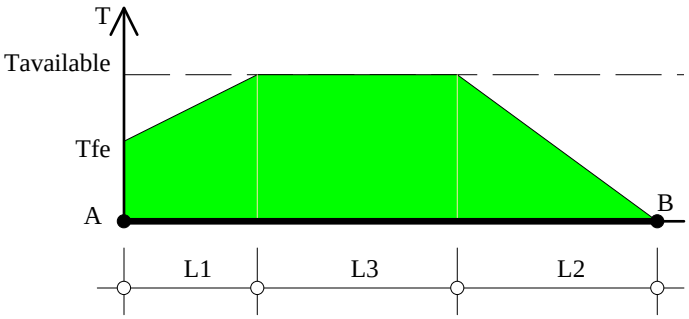
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## DISTRIBUTION OF AVAILABLE STRENGTH ALONG EACH REINFORCEMENT LAYER




A = Front-end of reinforcement (at face of slope)
B = Rear-end of reinforcement
AB = L1 + L2 + L3 = Embedded length of reinforcement

Tavailable = Long-term strength of reinforcement
Tfe = Available front-end strength (e.g., connection to facing)

L1 = Front-end 'pullout' length
L2 = Rear-end pullout length
Tavailable prevails along L3

Factor of safety on resistance to pullout on either end of reinforcement, Fs-po = 1.50

| Reinforcement Layer # | Designated Name | Height Relative to Toe [ft] | L [ft] | L1 [ft] | L2 [ft] | L3 [ft] | Tfe [lb/ft] | Tavailable [lb/ft] |
|---|---|---|---|---|---|---|---|---|
| 1 | Mirafi 3XT | 0.00 | 4.00 | 0.00 | 4.00 | 0.00 | 497.13 | 497.13 (*) |
| 2 | Mirafi 3XT | 0.67 | 4.00 | 0.00 | 4.00 | 0.00 | 354.06 | 354.06 (*) |

(*) This Tavailable is dictated by the pullout resistance capacity, which is smaller than the long-term strength of the reinforcement that is related to its specified ultimate strength


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## RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.) The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

**Critical circles for each exit point (considering all specified entry points)**

| Exit Point # | Exit Point (X, Y) [ft] | | Entry Point (X, Y) [ft] | | Critical Circle (Xc, Yc, R) [ft] | | | Fs | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 109.68 | 144.06 | 145.68 | 147.00 | 122.17 | 212.99 | 70.06 | 3.70 | |
| 2 | 110.70 | 144.05 | 145.68 | 147.00 | 122.70 | 210.57 | 67.60 | 3.57 | |
| 3 | 111.72 | 144.03 | 145.68 | 147.00 | 123.23 | 208.17 | 65.16 | 3.48 | |
| 4 | 112.60 | 144.07 | 143.65 | 147.00 | 124.04 | 188.79 | 46.16 | 3.39 | |
| 5 | 113.62 | 144.05 | 143.65 | 147.00 | 124.56 | 187.04 | 44.35 | 3.27 | |
| 6 | 114.74 | 144.01 | 143.65 | 147.00 | 124.85 | 187.56 | 44.71 | 3.14 | |
| 7 | 115.66 | 144.02 | 143.65 | 147.00 | 125.38 | 185.70 | 42.80 | 3.02 | |
| 8 | 116.67 | 144.01 | 143.65 | 147.00 | 125.91 | 183.86 | 40.90 | 2.92 | |
| 9 | 117.43 | 144.05 | 143.65 | 147.00 | 126.20 | 184.14 | 41.04 | 2.83 | |
| 10 | 118.49 | 144.03 | 143.65 | 147.00 | 126.74 | 182.18 | 39.04 | 2.74 | |
| 11 | 119.57 | 144.00 | 141.62 | 147.00 | 127.63 | 167.36 | 24.71 | 2.63 | |
| 12 | 120.46 | 144.03 | 141.62 | 147.00 | 128.02 | 167.02 | 24.20 | 2.52 | |
| 13 | 121.39 | 144.04 | 141.62 | 147.00 | 128.55 | 165.70 | 22.82 | 2.42 | |
| 14 | 122.36 | 144.03 | 141.62 | 147.00 | 128.95 | 165.24 | 22.21 | 2.33 | |
| 15 | 123.36 | 144.02 | 141.62 | 147.00 | 129.49 | 163.87 | 20.78 | 2.26 | |
| 16 | 124.24 | 144.04 | 141.62 | 147.00 | 129.90 | 163.29 | 20.06 | 2.17 | |
| 17 | 125.20 | 144.06 | 141.62 | 147.00 | 130.33 | 162.69 | 19.33 | 2.12 | |
| 18 | 126.19 | 144.12 | 139.59 | 147.00 | 130.89 | 154.91 | 11.76 | 2.05 | |
| 19 | 127.19 | 144.16 | 139.59 | 147.00 | 131.38 | 154.37 | 11.03 | 1.96 | |
| 20 | 128.14 | 144.23 | 139.59 | 147.00 | 131.81 | 154.10 | 10.53 | 1.91 | |
| 21 | 129.12 | 144.28 | 139.59 | 147.00 | 132.54 | 152.62 | 9.02 | 1.87 | |
| 22 | 130.09 | 144.33 | 139.59 | 147.00 | 132.61 | 153.60 | 9.61 | 1.85 | |
| 23 | 131.05 | 144.39 | 139.59 | 147.00 | 133.47 | 151.74 | 7.74 | 1.79 | OK |
| 24 | 131.97 | 144.47 | 139.59 | 147.00 | 134.27 | 150.27 | 6.24 | 1.89 | |
| 25 | 133.00 | 144.50 | 141.62 | 147.00 | 134.97 | 153.80 | 9.51 | 2.26 | |

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.


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EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

# 60 Flourtown Road

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Title: 60 Flourtown Road
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Client: Napoli Construction, LLC
Designer: KGM
Station Number: 3

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Telephone #: (610) 277-0880
Fax #:
E-Mail:

**Original file path and name:** G:\PROJECT ..... ions\Rev 0 (Initial Submittal)\RESSA\Section 3.MSE
**Original date and time of creating this file:** Thu Sep 07 11:57:26 2017

**PROGRAM MODE:** ANALYSIS of a Complex Slope using GEOSYNTHETIC as reinforcing material.


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## DRAWING OF SPECIFIED GEOMETRY - COMPLEX - Quick Input

-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.

### GEOMETRY

Soil profile contains 3 layers (see details in next page)

### UNIFORM SURCHARGE

Load Q1 = 150.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 133.50 and ends at X1e = 150.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

### STRIP LOAD

.....None.....




SCALE:

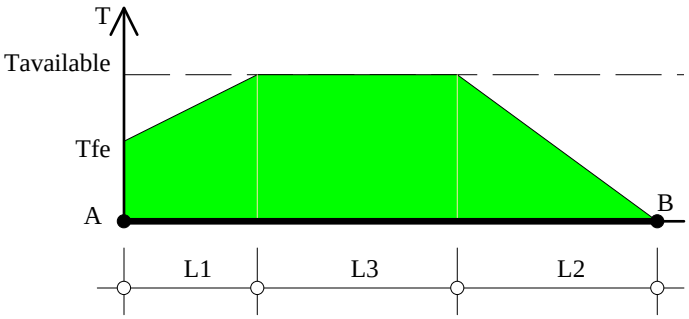
0 2 4 6 8 10[ft]


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## DISTRIBUTION OF AVAILABLE STRENGTH ALONG EACH REINFORCEMENT LAYER




A = Front-end of reinforcement (at face of slope)
B = Rear-end of reinforcement
AB = L1 + L2 + L3 = Embedded length of reinforcement

Tavailable = Long-term strength of reinforcement
Tfe = Available front-end strength (e.g., connection to facing)

L1 = Front-end 'pullout' length
L2 = Rear-end pullout length
Tavailable prevails along L3

Factor of safety on resistance to pullout on either end of reinforcement, Fs-po = 1.50

| Reinforcement Layer # | Designated Name | Height Relative to Toe [ft] | L [ft] | L1 [ft] | L2 [ft] | L3 [ft] | Tfe [lb/ft] | Tavailable [lb/ft] |
|---|---|---|---|---|---|---|---|---|
| 1 | Mirafi 3XT | 0.00 | 4.00 | 0.00 | 4.00 | 0.00 | 712.56 | 712.56 (*) |
| 2 | Mirafi 3XT | 1.33 | 4.00 | 0.00 | 4.00 | 0.00 | 427.96 | 427.96 (*) |

(*) This Tavailable is dictated by the pullout resistance capacity, which is smaller than the long-term strength of the reinforcement that is related to its specified ultimate strength


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## RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.) The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

**Critical circles for each entry point (considering all specified exit points)**

| Entry Point # | Entry Point (X, Y) [ft] | | Exit Point (X, Y) [ft] | | Critical Circle (Xc, Yc, R) [ft] | | | Fs | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 133.00 | 144.50 | 133.00 | 144.50 | 133.00 | 144.50 | 0.00 | N/A | #10 - Overhanging Cliff |
| 2 | 135.53 | 147.92 | 125.29 | 144.07 | 129.68 | 147.94 | 5.85 | 2.96 | |
| 3 | 137.56 | 148.00 | 129.07 | 144.33 | 132.37 | 148.36 | 5.21 | 1.51 | |
| 4 | 139.59 | 148.00 | 128.14 | 144.24 | 132.22 | 151.15 | 8.02 | 1.51 | OK |
| 5 | 141.62 | 148.00 | 127.19 | 144.16 | 131.68 | 156.32 | 12.96 | 1.69 | |
| 6 | 143.65 | 148.00 | 125.27 | 144.04 | 130.46 | 164.58 | 21.19 | 2.02 | |
| 7 | 145.68 | 148.00 | 123.29 | 144.05 | 131.60 | 162.39 | 20.13 | 2.27 | |
| 8 | 147.71 | 148.00 | 123.35 | 144.03 | 132.52 | 164.46 | 22.39 | 2.52 | |
| 9 | 149.74 | 148.00 | 122.27 | 144.08 | 132.94 | 167.54 | 25.77 | 2.76 | |
| 10 | 151.77 | 148.00 | 120.50 | 144.02 | 132.73 | 172.72 | 31.20 | 3.11 | |
| 11 | 153.80 | 148.00 | 118.61 | 144.01 | 132.67 | 177.10 | 35.96 | 3.45 | |
| 12 | 155.83 | 148.00 | 117.44 | 144.09 | 132.98 | 181.91 | 40.89 | 3.79 | |
| 13 | 157.86 | 148.00 | 117.62 | 144.02 | 133.78 | 185.99 | 44.97 | 4.13 | |
| 14 | 159.89 | 148.00 | 115.54 | 144.08 | 133.92 | 188.98 | 48.51 | 4.47 | |
| 15 | 161.92 | 148.00 | 113.55 | 144.11 | 133.73 | 195.83 | 55.52 | 4.81 | |
| 16 | 163.95 | 148.00 | 112.45 | 144.15 | 133.81 | 204.79 | 64.29 | 5.14 | |
| 17 | 165.98 | 148.00 | 110.56 | 144.14 | 133.79 | 210.31 | 70.13 | 5.47 | |
| 18 | 168.01 | 148.00 | 110.79 | 144.06 | 134.99 | 210.03 | 70.27 | 5.80 | |
| 19 | 170.04 | 148.00 | 109.72 | 144.09 | 135.02 | 221.00 | 80.97 | 6.13 | |
| 20 | 172.07 | 148.00 | 109.94 | 144.02 | 136.25 | 220.23 | 80.62 | 6.47 | |
| 21 | 174.09 | 148.00 | 109.55 | 144.15 | 136.99 | 227.06 | 87.34 | 6.82 | |
| 22 | 176.12 | 148.00 | 109.76 | 144.08 | 137.97 | 230.10 | 90.53 | 7.17 | |
| 23 | 178.15 | 148.00 | 109.97 | 144.01 | 138.96 | 233.14 | 93.73 | 7.53 | |
| 24 | 180.18 | 148.00 | 109.51 | 144.15 | 139.67 | 241.06 | 101.49 | 7.90 | |
| 25 | 182.21 | 148.00 | 109.70 | 144.09 | 140.66 | 244.29 | 104.87 | 8.27 | |

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.


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## RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.) The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

**Critical circles for each exit point (considering all specified entry points)**

| Exit Point # | Exit Point (X, Y) [ft] | | Entry Point (X, Y) [ft] | | Critical Circle (Xc, Yc, R) [ft] | | | Fs | STATUS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 109.78 | 144.08 | 143.65 | 148.00 | 122.86 | 179.34 | 37.61 | 2.91 | |
| 2 | 110.79 | 144.06 | 143.65 | 148.00 | 123.38 | 178.12 | 36.31 | 2.81 | |
| 3 | 111.79 | 144.04 | 143.65 | 148.00 | 123.89 | 176.90 | 35.01 | 2.72 | |
| 4 | 112.57 | 144.11 | 143.65 | 148.00 | 124.23 | 176.99 | 34.89 | 2.64 | |
| 5 | 113.59 | 144.09 | 143.65 | 148.00 | 124.76 | 175.72 | 33.55 | 2.54 | |
| 6 | 114.70 | 144.04 | 141.62 | 148.00 | 125.40 | 164.82 | 23.37 | 2.46 | |
| 7 | 115.69 | 144.03 | 141.62 | 148.00 | 125.91 | 163.94 | 22.38 | 2.35 | |
| 8 | 116.70 | 144.01 | 141.62 | 148.00 | 126.32 | 163.71 | 21.93 | 2.26 | |
| 9 | 117.49 | 144.09 | 141.62 | 148.00 | 126.84 | 162.81 | 20.92 | 2.16 | |
| 10 | 118.54 | 144.04 | 141.62 | 148.00 | 127.36 | 161.90 | 19.92 | 2.08 | |
| 11 | 119.39 | 144.09 | 141.62 | 148.00 | 127.78 | 161.57 | 19.39 | 2.00 | |
| 12 | 120.49 | 144.02 | 141.62 | 148.00 | 128.30 | 160.65 | 18.37 | 1.93 | |
| 13 | 121.41 | 144.04 | 141.62 | 148.00 | 128.73 | 160.24 | 17.78 | 1.86 | |
| 14 | 122.42 | 144.02 | 139.59 | 148.00 | 128.96 | 154.83 | 12.63 | 1.81 | |
| 15 | 123.29 | 144.08 | 139.59 | 148.00 | 129.56 | 153.84 | 11.60 | 1.73 | |
| 16 | 124.37 | 144.00 | 139.59 | 148.00 | 130.03 | 153.42 | 10.99 | 1.66 | |
| 17 | 125.24 | 144.08 | 139.59 | 148.00 | 130.58 | 152.76 | 10.19 | 1.60 | |
| 18 | 126.22 | 144.12 | 139.59 | 148.00 | 131.14 | 152.15 | 9.42 | 1.55 | |
| 19 | 127.12 | 144.21 | 139.59 | 148.00 | 131.64 | 151.75 | 8.79 | 1.52 | |
| 20 | 128.14 | 144.24 | 139.59 | 148.00 | 132.22 | 151.15 | 8.02 | 1.51 . | OK |
| 21 | 129.07 | 144.33 | 137.56 | 148.00 | 132.37 | 148.36 | 5.21 | 1.51 | |
| 22 | 130.04 | 144.38 | 137.56 | 148.00 | 132.88 | 148.11 | 4.69 | 1.55 | |
| 23 | 131.08 | 144.38 | 139.59 | 148.00 | 133.77 | 149.88 | 6.12 | 1.72 | |
| 24 | 132.01 | 144.45 | 139.59 | 148.00 | 134.33 | 149.36 | 5.43 | 1.99 | |
| 25 | 133.00 | 144.50 | 141.62 | 148.00 | 134.91 | 152.17 | 7.90 | 2.48 | |

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.


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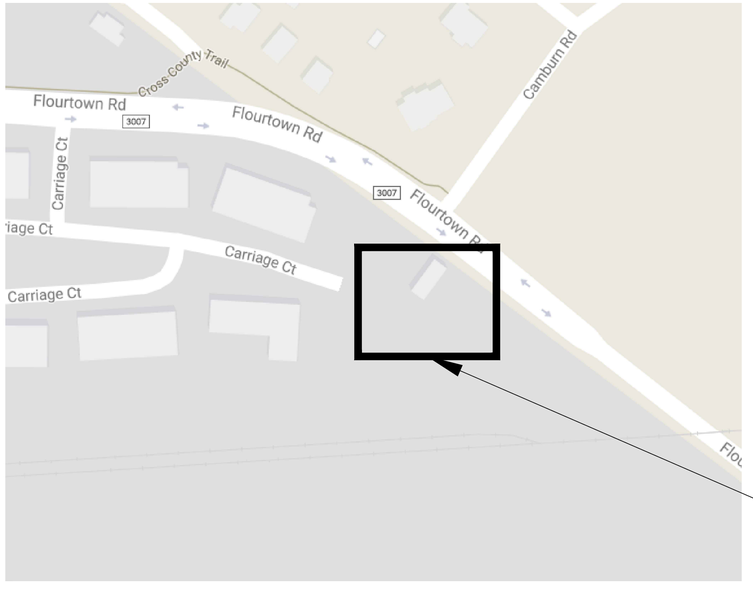
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# CONSTRUCTION DRAWINGS
## FOR
# ANCHOR VERTICA RETAINING WALL SYSTEM
# WALL 1
# 60 FLOURTOWN ROAD
# WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA

---

## OCTOBER 30, 2017




***SHEET INDEX***


1. TITLE SHEET
2. CONSTRUCTION SPECIFICATIONS
3. SITE PLAN
4. WALL 1 - PROFILE, QUANTITY TABLE, & CROSS SECTIONS
5. CONSTRUCTION DETAILS


PENNSYLVANIA ONE CALL SYSTEM, INC. 1-800-242-1776 STOP-CALL BEFORE YOU DIG!

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**EARTH ENGINEERING INCORPORATED**
*Geotechnical Engineers & Geologists*
CERTIFICATE OF AUTHORIZATION NO.24GA28045000

*Corporate Headquarters*
**115 W Germantown Pike, Ste. 200**
**East Norriton, PA 19401**
**(610) 277-0880 FAX 277-0878**

*Lehigh Valley Office*
149 Main Street
Emmaus, PA 18049
(610) 967-4540 FAX 967-4488

*Southern New Jersey Office*
403 Commerce Lane
West Berlin, NJ 08091
(856) 768-1001 FAX 768-1144

*Central Pennsylvania Office*
5010 Ritter Road, Suite 116
Mechanicsburg, PA 17055
(717) 697-5701 FAX 697-5702


Napoli Construction, LLC
P.O. Box 513
Suite 16
West Deptford, NJ 08086
Phone: (856)-202-5816

| NO | DATE | REVISION |
|---|---|---|
| 0 | 10/30/17 | Initial Submittal |
| | | |
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| | | |
| | | |
| | | |

# CONSTRUCTION SPECIFICATIONS

## SECTION 01 - CONCRETE MODULAR RETAINING WALLS

PART 1: GENERAL

1.01 DESCRIPTION

A. Work includes preparing foundation soil, furnishing and installing the leveling pad, masonry units, cap units, drainage fill, backfill, and all appurtenant materials to the lines and grades designated on the drawings.

1.02 RELATED WORK

A. Section 02 – Geogrid Soil Reinforcement

1.03 REFERENCE STANDARDS

A. NCMA Design Manual for Segmental Retaining Walls

B. ASTM C1372–99 Standard Specifications for Segmental Retaining Wall Units

1.04 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall check the materials upon delivery to assure that the proper materials have been received.

B. The Contractor shall prevent excessive mud, wet cement, epoxy and like materials, which may affix themselves, from coming in contact with the masonry units

C. The Contractor shall protect the materials from damage. Damaged material shall NOT be incorporated into the retaining wall structures.

1.05 SUBMITTALS

A. Product Data – Latest edition of the manufacturer's material specifications, color and texture availability, installation instructions and general recommendations.

B. Certifications – Upon completion, the Contractor shall provide to the Owner daily reports and a letter from the Geotechnical Inspection Agency verifying that all elements of the retaining wall system were installed in accordance with the drawings. The Township and Township Engineer are to be copied on all wall certifications of wall construction.

1.06 QUALITY ASSURANCE

A. The inspection of the retaining wall construction is an integral part of this design and therefore must be conducted by a Geotechnical Inspection Agency supervised by a Professional Engineer, registered in the Commonwealth of Pennsylvania and qualified in BOTH geotechnical engineering and segmental retaining wall construction.

B. Soil testing and inspection services for quality control testing during earthwork operations shall include, at a minimum: detailed documentation of compaction testing results, correct geogrid placement (orientation, length and elevation) and proper installation of the wall drainage system.

C. Soils shall be classified by the test procedures outlined in ASTM D2487 and moisture density relationships shall be established in accordance with ASTM D698. The results of the test(s) shall be reviewed by the Geotechnical Inspection Agency prior to use of the material.

D. Frequency of testing shall be one (1) ASTM D2487 test and one (1) ASTM D698 test for every 1,500 $yd^3$ per source of material.

E. Frequency of testing of foundation soils shall be one(1) ASTM D2487 test and one (1) ASTM D698 test for every 500 linear feet of wall, or one (1) per wall whichever is greater. Additional soil testing should be performed should foundation soils vary within a particular wall.

F. Detailed records shall be maintained by the Geotechnical Inspection Agency documenting grid placement, compaction, and proper drainage installation. Compaction testing shall be performed at a minimum frequency of one per every 1,000 square feet per lift or every one hundred linear feet of wall per lift, which ever is greater. Tests shall be in accordance with ASTM D1556 or ASTM D2922 and D3017. If the tests indicate that the required density has not been obtained, the material shall be recompacted or removed and replaced as necessary.

PART 2: PRODUCTS

2.01 MASONRY UNITS

G. Masonry wall units shall be Anchor Vertica Retaining Wall Units manufactured by an approved Anchor Wall System licensee.

H. Concrete for masonry units shall have a minimum net 28 day compressive strength of 3000 psi. The concrete shall have a maximum moisture absorption of 7.0%.

I. Exterior dimensions may vary in accordance with ASTM C1372–99 (Max. +/– 1/16"). Masonry wall units shall have a minimum of 1.0 SF of face area each.

J. Masonry wall units shall have angled sides capable of concave and convex alignment curves with a minimum radius of 7.5 feet.

K. Units shall be manufactured to allow to be interlocked as to provide a minimum 2.0° wall batter.

L. Cap units shall have the material properties of masonry wall units and have a minimum thickness of 4 inches.

M. Color and texture shall be as selected by Owner or Architect from the manufacturer's standard selection.

2.02 BASE LEVELING PAD MATERIAL

A. Material for base leveling shall be size 2A aggregate as specified in PENNDOT 208.

2.03 UNIT FILL AND DRAINAGE STONE

A. Unit fill and drainage stone shall be size AASHTO No. 57 course aggregate as specified in PENNDOT Pub. 408.

2.04 REINFORCED SOILS

A. Suitable soils used for reinforced soil shall be GW, GP, GM SW, SP or SM as classified by the United Soil Classification System, in accordance with ASTM D2487. The largest particles shall be no more than 2 inches in diameter.

B. Unsuitable soils shall not be used in the construction of the retaining wall. Unsuitable soils shall be MH, ML, CL, CH, OL, OH and PT or combination of these materials or include deleterious materials including construction debris, wood glass, ash, organic materials or soils not maintained within 2 percent of optimum moisture content at the time of compaction, frozen clumps of soil, snow or ice as determined by the Geotechnical Inspection Agency.

C. The plasiticity index and liquid limit of the fine fraction of reinforced backfill shall be less than 6 and 40, respectively, when tested in accordance with ASTM D4318.

D. Reinforced backfill shall satisfy the following criteria:

| Sieve Size | % Passing |
|---|---|
| 2 inch | 100 |
| No. 4 | 20–100 |
| No. 40 | 0–60 |
| No. 200 | 0–45 |

2.05 FOUNDATION SOIL

A. Foundation soil within 2ft of subgrade surface shall not contain OL, OH and PT, SC or combination of these materials or include deleterious materials including construction debris, wood glass, ash, organic materials or soils not maintained within 2 percent of optimum moisture content at the time of compaction, frozen clumps of soil, snow, or ice as determined by the Geotechnical Inspection Agency.

2.06 DRAINAGE PIPE

A. Drainage pipe shall be 4 inch diameter perforated corrugated polyethylene pipe.

2.07 GEOTEXTILE

A. Type 1: Mirafi S800 needle–punched non–woven geotextile or approved equivalent.

PART 3: EXECUTION

3.01 EXCAVATION

A. Wall location indicated on the plan does not include batter and the bottom of the wall shall be adjusted to accommodate the setback in the masonry units.

B. The Contractor shall excavate to the lines and grades shown on the construction drawings. Over excavation costs WILL NOT be paid by the Owner. Additional compacted fill and/or additional wall system components required for replacement of over excavated material will be provided at the Contractor's expense.

C. Perform earthwork complying with federal, state and local regulations including 29 CFR 1926.651.

D. Protect existing utilities, sidewalks, structures, pavements, and other facilities to remain free from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

3.02 FOUNDATION AND PREPARATION

A. Foundation soil shall be excavated as required for the leveling pad dimensions and geogrid areas as shown on the drawings or as directed by the Design Engineer.

B. Foundation soil shall be examined by the Geotechnical Inspection Agency to confirm that the actual foundation soil meets the requirements defined in Paragraph 2.05. Unsuitable soils shall be removed and replaced with acceptable material.

C. Over excavated areas shall be filled with approved, compacted backfill material.

D. Foundation soil shall be compacted to 95% of the material's maximum dry density as determined by ASTM D698 and shall be visibly stable.

E. Backfill shall not be placed on a soil which contains frozen material, or which has been subjected to freeze–thaw action. This prohibition encompasses all subgrade types, including the natural ground, all prepared subgrades and all layers of previously placed and compacted earth fill which become the subgrade for successive layers of earth fill. All material that freezes or has been subjected to freeze–thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, winter shutdowns, or earthwork operations, shall be removed to a depth that is acceptable to the Geotechnical Inspection Agency and replaced with new material. Alternatively, the material will be thawed, dried, reworked, and recompacted to the specified criteria before additional material is placed. The Geotechnical Inspection Agency will determine when placement of fill shall cease due to cold weather. The Geotechnical Inspection Agency may elect to use average daily air temperatures, and/or physical observation of the soils for his determination.

3.03 BASE LEVELING PAD

A. Leveling pad materials shall be placed as shown on the drawings to a minimum thickness of 6 inches and to the width shown on the drawings.

B. Material shall be compacted so as to provide a level hard surface on which to place the first course of masonry wall units. Compaction effort shall be provided until material is densely compacted and visibly stable.

C. Leveling pad shall be prepared to provide complete contact with the first course of masonry wall units.

3.04 MASONRY WALL UNIT INSTALLATION

A. Provide fall protection as required to comply with 29 CFR 1926.501.

B. The first course of masonry wall units shall be placed in full contact with the base leveling pad. The units shall be checked for level and alignment. The first course is the most important to provide accurate and acceptable results.

C. Masonry wall units shall be placed side by side for the full length of the wall alignment.

D. Successive courses shall be placed to create a running bond pattern with the edge of all units being approximately aligned with the middle of the unit in the course below/above it.

E. As appropriate, where the wall changes elevation, units can be stepped with the grade or turned into the embankment with a convex return end. Provide the appropriate amount of buried units on a compacted leveling pad in the area of the convex return end.

3.05 CAP INSTALLATION

A. Permanently connect cap units to the wall units with continuous beads of construction adhesive or epoxy. Backfill and compact to finish grade.

B. Cap units may need to be cut to obtain the proper fit.

C. Use non–angled straight–sided cap units in tangent sections of wall(s).

3.06 CONSTRUCTION TOLERANCES

A. Installation of masonry wall face shall be within all the following tolerances:

1. Vertical control from plan: +/– 1.25 inches over a 10ft. distance, 3 inches maximum.
2. Horizontal location control from plan:
   a. Straight lines: +/– 1.25 inches over a 10 ft. distance, 3 inches maximum.
   b. Straight and radius corner locations: +/– 1.0 ft.
   c. Curves and serpentine radius: +/– 2.0 ft.
3. Rotation of the wall face during construction:
   a. Maximum 2.0 degrees from established wall batter.
   b. Maximum, +/– 10.0% from total established horizontal setback.
4. Bulging: +/– 1.00 inches over a 10 ft. distance.

### *Design Soil Parameters*

The following reinforced, retained & foundation soil parameters are assumed:

| | |
|---|---|
| $\gamma$ = 120 pcf | moist unit weight |
| $\varphi$ = 28° | internal angle of friction |
| c = 0 psf | cohesion has been only used in global stability analyses. |

Soil Materials shall satisfy the requirements stipulated in paragraph 2.04 and 2.05.

EEI must be notified of any discrepancies before the Contractor proceeds with the work.

## SECTION 02 : GEOGRID SOIL REINFORCEMENT

PART 1: GENERAL

1.01 DESCRIPTION

A. Work includes furnishing geogrid and all appurtenant materials required for the construction of the geogrid reinforced soil retaining wall as shown on the drawings.

1.02 RELATED WORK

A. Section 01– Concrete Modular Retaining Wall.

1.03 REFERENCE STANDARDS

A. See the specific geogrid manufacturer's reference standards.

B. Design Reduction Factors

(1) Durability = 1.10

(2) Installation Damage = 1.10

(3) Creep = 1.58

1.04 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall check the geogrid upon delivery to confirm that the proper materials have been received.

B. Geogrid shall be stored above –20° F.

C. The Contractor shall prevent excessive mud, wet cement, epoxy and like materials, which may affix themselves to the geogrid, from coming into contact with the geogrid material.

D. Rolled geogrid material may be laid flat or stood on end for storage.

1.05 SUBMITTALS

A. Product Data – Latest edition of the manufacturer's material specifications, installation instructions and general recommendations.

PART 2: PRODUCTS

2.01 GEOGRID

A. Geogrid shall be polyester woven fiber materials, specifically fabricated for use as soil reinforcement.

B. Geogrid shall be the type as shown on the drawings.

C. Mirafi 3XT, as manufactured by TenCate Geosynthetics, shall have a long term allowable strength of 1832 lbs/ft. when determined by using the reduction factors specified in Paragraph 1.03B.

PART 3: EXECUTION

3.01 WALL ERECTION

A. Wall erection shall be as specified Section 01.

3.02 GEOGRID INSTALLATION

A. The geogrid soil reinforcement shall be laid horizontally on compacted backfill with the strong direction perpendicular to the wall fascia and placed fully to the front of the masonry wall unit. The subsequent overlying source shall be place atop the previously place course binding the geogrid between the masonry wall units.

B. No geogrid splices permitted.

C. Slack in the geogrid at the wall unit connections shall be removed.

D. The geogrid shall be laid at the proper elevation and orientation as shown on the drawings or as directed by the Design Engineer.

E. Correct orientation (roll direction) of the geogrid shall be verified by the Contractor and the Geotechnical Inspection Agency.

F. Pretension the geogrid by pulling a secured section taut; eliminating loose folds. Stake or secure the back edge of the geogrid prior to and during backfill and compaction.

G. Follow the manufacturer's guidelines relative to overlap requirements of uniaxial geogrids. Minimum soil thickness between overlapping geogrids shall be three (3") inches.

3.03 FILL PLACEMENT

A. Backfill material shall be placed in maximum 8–inch lifts and compacted to 95% of the material's maximum dry density as determined by ASTM D698

B. Backfill shall be placed, spread and compacted in such a manner that minimizes the development of slack or loss of geogrid pretensioning.

C. Only hand–operated compaction equipment shall be allowed within 3 feet of the back surface of the masonry wall units.

D. Backfill shall be placed from the wall rearward into the embankment such that the geogrid remains taut.

E. Tracked construction equipment shall not be operated directly on the geogrid. A minimum backfill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid, or displacing the wall.

F. Rubber–tired equipment may pass over the geogrid reinforcement at slow speeds, less than 10 miles/hr. Sudden braking and sharp turning shall be avoided.

3.04 GEOGRID PENETRATIONS

A. In areas where posts or similar obstructions extend down through the upper geogrid(s), the geogrids shall be slit perpendicularly to the wall face and the form slid through, with the geogrid lapping upward around the form.

B. In the case of steel I–beam posts, the post may be driven through the geogrid at the discretion of the Design Engineer.

C. Under no circumstance shall an auger be used to penetrate the geogrid.

D. Should there be any conflicts between the geogrid and other on–site entities (i.e. storm water structures, light standards, property line, etc.) that are not addressed in the drawings, contact the Design Engineer for specific instructions.

The Segmental Retaining Wall Design meets or exceeds the following Safety Factors:

Internal Stability

| | |
|---|---|
| FS (pullout) = | 1.50 |
| FS (overstress) = | 1.50 |
| FS (facing shear) = | 1.50 |

External Stability

| | |
|---|---|
| FS (bearing capacity) = | 2.00 |
| FS (overturning) = | 2.00 |
| FS (base sliding) = | 1.50 |
| FS (connection strength) = | 1.50 |

Live Load – 150 psf –Used for Internal Stability
150/250 psf – Used for Global Stability

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES A. McKELVEY III
ENGINEER
No. 044931

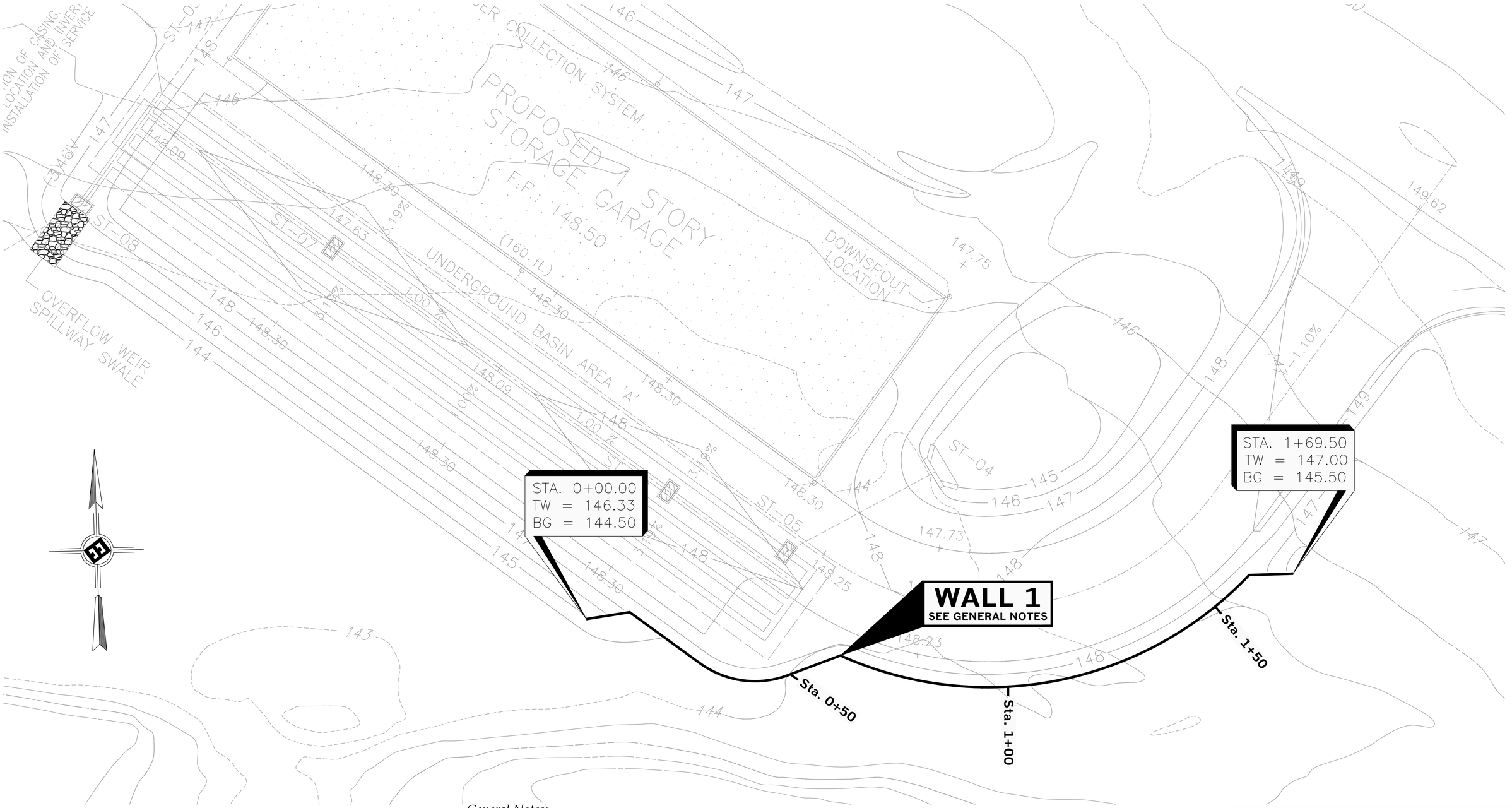
EARTH ENGINEERING INCORPORATED

| No. | Date | Description | By |
|---|---|---|---|
| 0 | 10/30/17 | INITIAL SUBMITTAL | KGM |


EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists
115 W Germantown Pike
East Norriton, PA 19401
(610) 277–0880
FAX (610) 277–0878
www.earthengineering.com


**ANCHOR VERTICA RETAINING WALL SYSTEM**
**CONSTRUCTION SPECIFICATIONS**
PREPARED FOR
**60 FLOURTOWN ROAD**
PLYMOUTH MEETING PENNSYLVANIA

| Scale: | Date: | Drawn By: | Checked By: |
|---|---|---|---|
| N.T.S. | 10/30/17 | KGM | PFM |
| Drawing Number: 29268.02–D–102 | | Approved By: JAM | Sheet No. 2 of 5 |




The inspection of the retaining wall construction is an integral part of this design and therefore must be conducted by qualified personnel working under the direct supervision of a Professional Engineer registered in the Commonwealth of Pennsylvania and qualified in both geotechnical engineering and geogrid reinforced wall construction. Failure to verify soil types, compaction performance and general earthwork criteria as well as the installation of all specified wall elements relieves EEI of any and all responsibility for the performance of the wall shown on these drawings.

*General Notes:*

1. Site features, utilities and general wall locations are located on this plan set based on information taken from Woodrow & Associates, Inc. "Site Improvement Plans" electronically provided to EEI in on October 20, 2017. EEI has taken reasonable measures to reflect accurate locations of these features base upon the information provided. However, EEI cannot verify the accuracy or completeness of the location of these features.
2. Wall location indicated on the plan view is top of the wall and does not include batter.
3. All plan dimensions, quantities and elevations must be field verified by the contractor prior to construction. EEI must be notified of any discrepancies before the contractor proceeds with the work.
4. Wall stationing is measured along the front face of the wall at top.

**SITE PLAN**

10 8 6 4 2 0 10 20 30

GRAPHIC SCALE: 1" = 10'

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — JAMES A. McKELVEY III — No. 044921

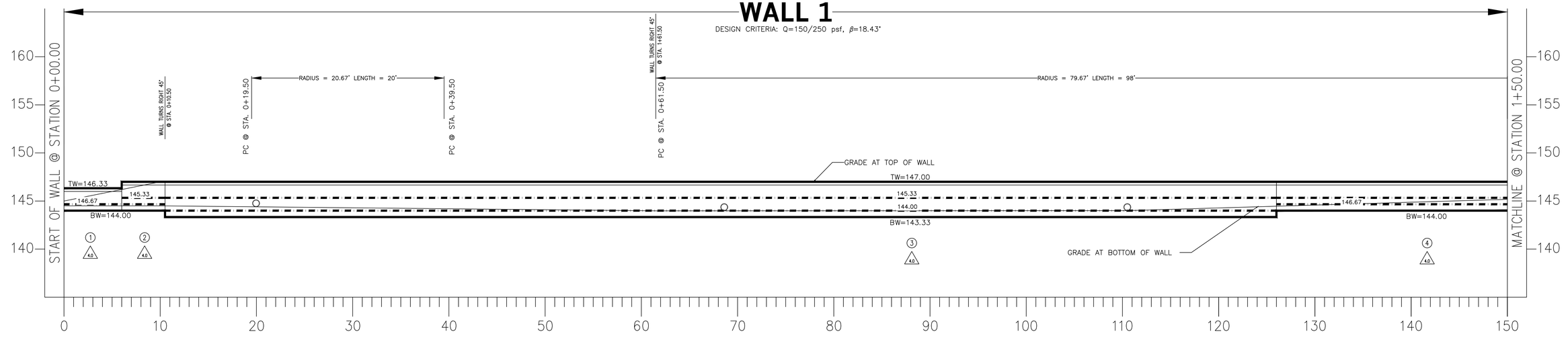
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| No. | Date | Description | By |
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| 0 | 10/30/17 | INITIAL SUBMITTAL | KGM |


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115 W Germantown Pike
East Norriton, PA 19401
(610) 277-0880
FAX (610) 277-0878
www.earthengineering.com

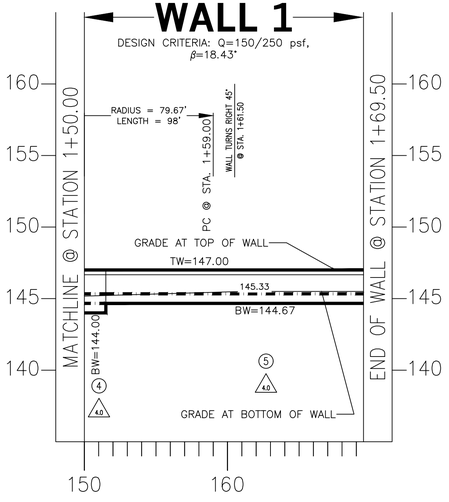

**ANCHOR VERTICA RETAINING WALL SYSTEM**
**SITE PLAN**
PREPARED FOR
**60 FLOURTOWN ROAD**
PLYMOUTH MEETING PENNSYLVANIA

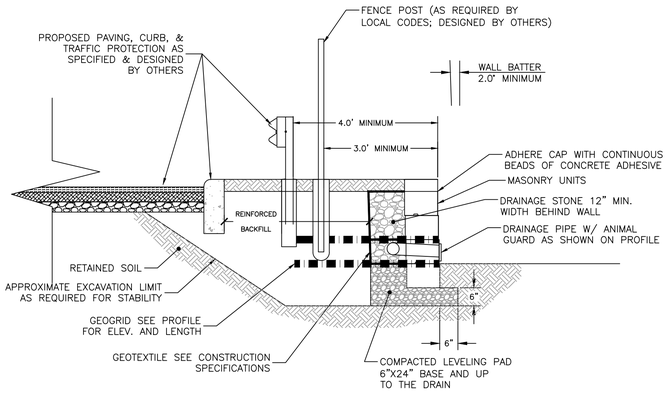
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| 1" = 10' | 10/30/17 | KGM | PFM |
| Drawing Number: 29268.02-D-103 | | Approved By: JAM | Sheet No. 3 of 5 |




## WALL PROFILE

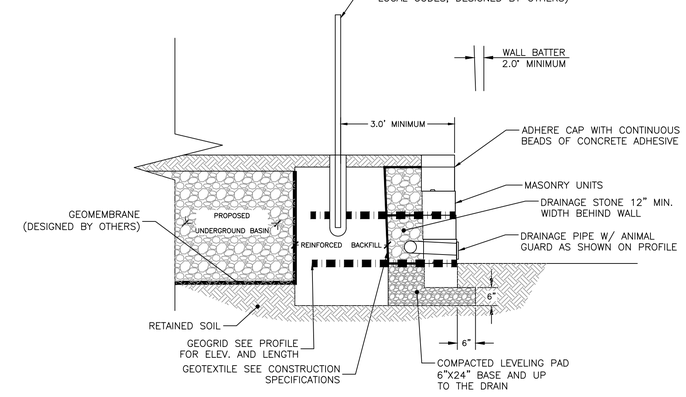
GRAPHIC SCALE: 1" = 5'




## WALL 1 TYPICAL CROSS SECTION

SCALE N.T.S.




## WALL 1 STA. 0+45.00 CROSS SECTION

SCALE N.T.S.

## LEGEND

| | |
|---|---|
| TW | Top of Wall |
| BW | Bottom of Wall |
| - - - - | Mirafi 3XT Geogrid |
| ③ | Wall Section |
| 4.0 | Geogrid Length |
| ——— | Wall Outline |
| o | Drainage Pipe Outlet |

## QUANTITY TABLE - WALL 1

| WALL | SECTION | TOP OF WALL (ELE-FT) | BOTTOM OF WALL (ELE-FT) | SECTION HEIGHT (FT) | SECTION BATTER (FT) | SECTION LENGTH (FT) | SECTION AREA (SF) | GRID LENGTH MIRAFI 3XT (FT) | NUMBER OF MIRAFI 3XT LAYERS | MIRAFI 3XT QUANTITY (SY) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 146.33 | 144.00 | 2.33 | 0.08 | 6.00 | 14 | 4.0 | 1 | 3 |
| 1 | 2 | 147.00 | 144.00 | 3.00 | 0.10 | 4.50 | 14 | 4.0 | 2 | 4 |
| 1 | 3 | 147.00 | 143.33 | 3.67 | 0.13 | 115.50 | 424 | 4.0 | 2 | 103 |
| 1 | 4 | 147.00 | 144.00 | 3.00 | 0.10 | 25.50 | 77 | 4.0 | 2 | 23 |
| 1 | 5 | 147.00 | 144.67 | 2.33 | 0.08 | 18.00 | 42 | 4.0 | 1 | 8 |

| | | | | | |
|---|---|---|---|---|---|
| Length of Wall: | 169.50 | FT | Leveling Pad Material: | 9 | BCY |
| Total Gross Area of Wall: | 571 | SF | Drainage Aggregate: | 22 | BCY |
| Area of Cap Units: | 43 | SF | Reinforced Backfill: | 85 | BCY |
| Total Net Area of Wall: | 528 | SF | | | |
| Total MIRAFI 3XT: | 141 | SY | | | |

Reinforced backfill measured from drainage aggregate to edge of geogrid to top of wall
All quantites rounded up to nearest unit

C3LP6

**CONTRACTOR SHALL VERIFY QUANTITIES PRIOR TO CONSTRUCTION.**

## *Construction Notes:*

1. AREAS OF THE WALL WHERE THE UNDERGROUND BASIN IS WITHIN 10.0' OF THE FACE OF THE WALL, SHALL BE CONSTRUCTED SIMULTANEOUSLY WITH THE UNDERGROUND BASIN. THE DIFFERENCE IN ELEVATION BETWEEN THE UNDERGROUND BASIN AND THE WALL SHALL BE NO MORE THAN 2.0' AT ANYTIME DURING CONSTRUCTION.
2. SEE CIVIL DRAWING FOR BASIN COMPONENTS INCLUDING GEOMEMBRANE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES A. McKELVEY III
ENGINEER
No. 044971

EARTH ENGINEERING INCORPORATED

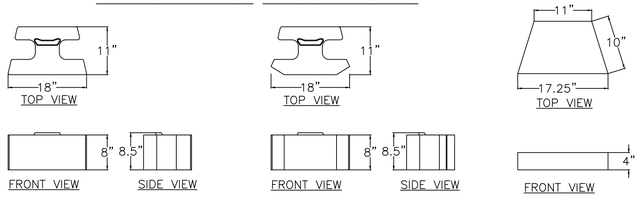
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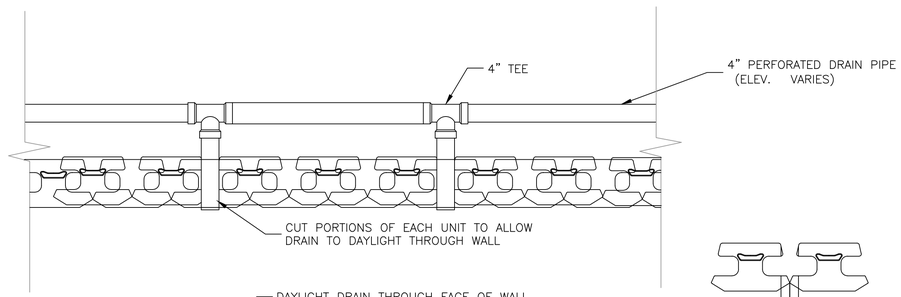

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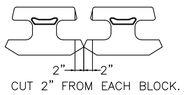

**ANCHOR VERTICA RETAINING WALL SYSTEM**
**WALL 1 - PROFILE, CROSS SECTION, & QUANTITY TABLE**
PREPARED FOR
**60 FLOURTOWN ROAD**
PLYMOUTH MEETING PENNSYLVANIA

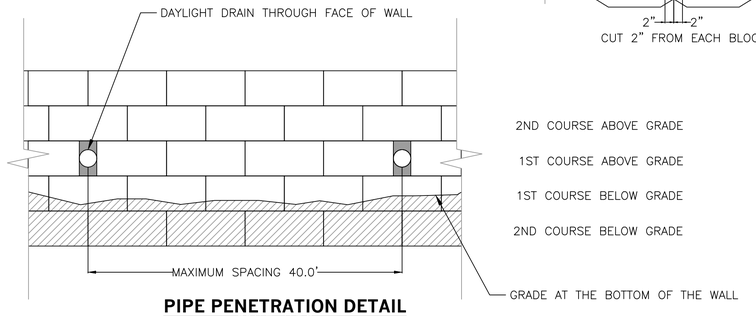
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| AS SHOWN | 10/30/17 | KGM | PFM |
| Drawing Number: 29268.02-D-104 | | Approved By: JAM | Sheet No. 4 of 5 |

## ANCHOR VERTICA® MASONRY UNITS

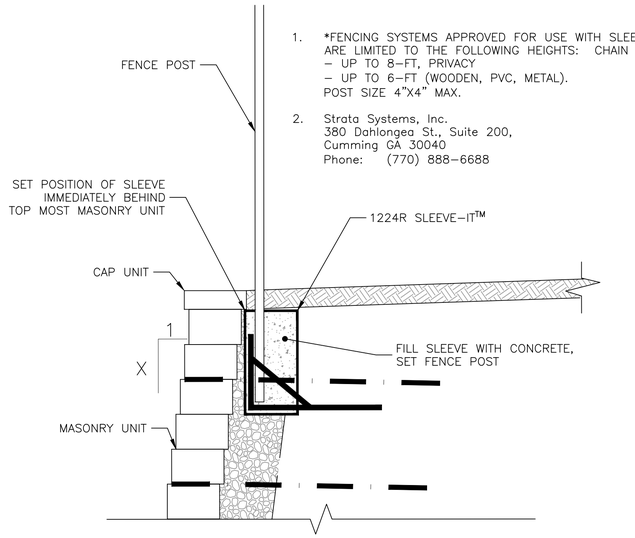


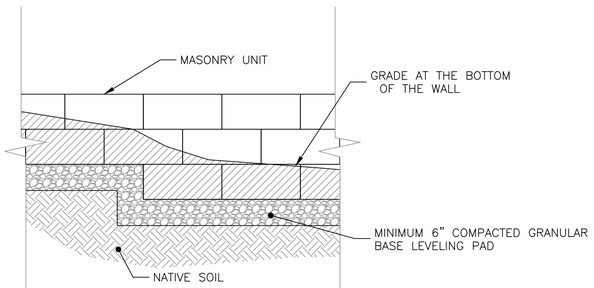



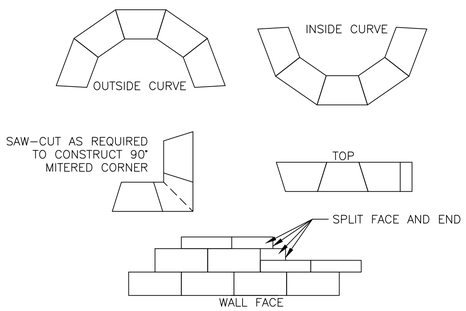

## PIPE PENETRATION DETAIL
SCALE: N.T.S




## ALTERNATE FENCING DETAIL
## INSTALLTION USING 1224R SLEEVE-IT™
SCALE: N.T.S

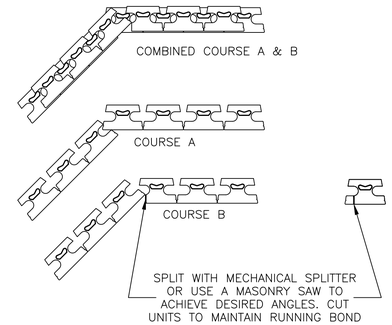



## MASONRY UNIT STEP DETAIL
SCALE: N.T.S



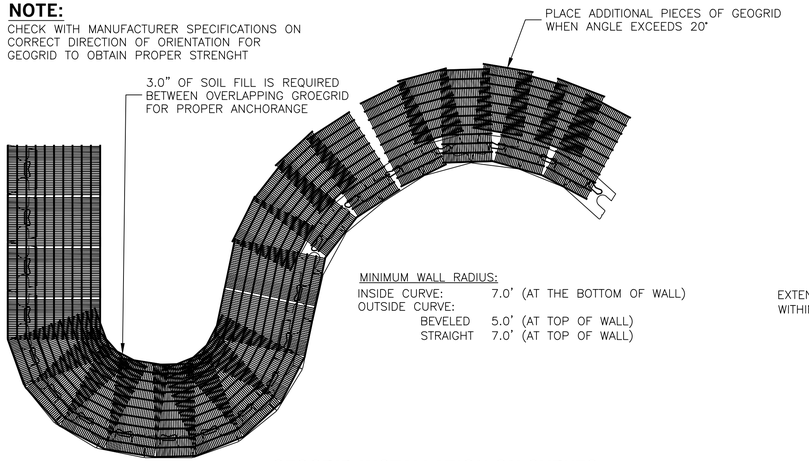

1. ALWAYS START CAPPING WALL FROM THE LOWEST ELEVATION.
2. LAY OUT CAPS PRIOR TO USING ADHESIVE.
3. CUT CAPS TO FIT. VARIOUS COMBINATIONS OF LONG– AND SHORT–CAP FACES WILL BE NECESSARY FOR RADII GREATER THAN THE MINIMUM.
4. ALTERNATE SHORT– AND LONG–CAP FACES EVERY OTHER CAP TO ACHIEVE A STRAIGHT ROW OF CAPS.
5. USE EXTERIOR–GRADE CONSTRUCTION ADHESIVE TO SECURE CAPS.

## ANCHOR VERTICA® CAP DETAIL
SCALE: N.T.S

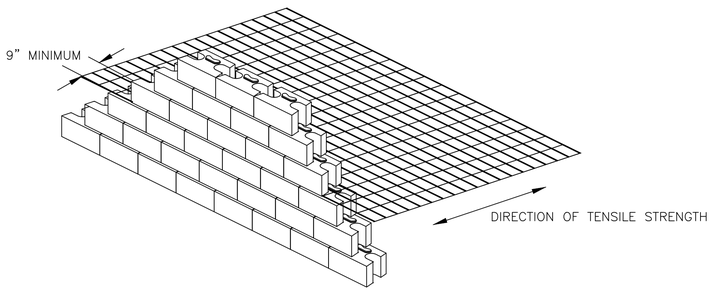


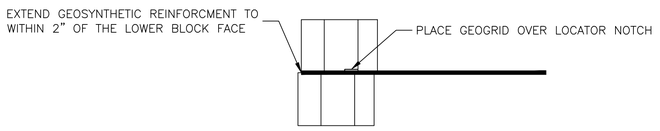

## ANCHOR VERTICA®- BEVELED/STRAIGHT UNITS
## TYPICAL 45° INSIDE CORNERS
SCALE: N.T.S

**NOTE:**
CHECK WITH MANUFACTURER SPECIFICATIONS ON CORRECT DIRECTION OF ORIENTATION FOR GEOGRID TO OBTAIN PROPER STRENGHT




## GEOGRID INSTALLATION ON CURVES
SCALE: N.T.S




## ANCHOR VERTICA®
## GEOSYNTHETIC REINFORCMENT
SCALE: N.T.S

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES A. McKELVEY III
ENGINEER
No. 044917

EARTH ENGINEERING INCORPORATED

| No. | Date | Description | By |
|---|---|---|---|
| 0 | 10/30/17 | INITIAL SUBMITTAL | KGM |


EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists
115 W Germantown Pike
East Norriton, PA 19401
(610) 277–0880
FAX (610) 277–0878
www.earthengineering.com


**ANCHOR VERTICA RETAINING WALL SYSTEM**
**CONSTRUCTION DETAILS**
PREPARED FOR
**60 FLOURTOWN ROAD**
PLYMOUTH MEETING PENNSYLVANIA

| Scale: | Date: | Drawn By: | Checked By: |
|---|---|---|---|
| N.T.S. | 10/30/17 | KGM | PFM |
| Drawing Number: 29268.02–D–105 | | Approved By: JAM | Sheet No. 5 of 5 |

***Prepared By and Return To***:
Neil Andrew Stein, Esquire
Union Meeting Corporate Center
910 Harvest Drive, Suite #200
P.O. Box 3037
Blue Bell, Pennsylvania 19422

***Property***:
62 Flourtown Road (Parcel #65-00-03983-00-2)

**DECLARATION OF SANITARY SEWER EASEMENT DECLARATION**

**THIS DECLARATION OF SANITARY SEWER EASEMENT** is made effective as of this _____day of_____, 2018, by **60 FLOURTOWN ROAD, LLC**, a Pennsylvania limited liability company (**"Declarant"**).

**BACKGROUND**

A. Declarant is the owner of a certain parcel or parcels of law of approximately 58,000 square feet situate in Whitemarsh Township, Montgomery County, Pennsylvania, as more particularly described as Montgomery County Tax Parcel Number 65-00-03983-00-2 (the **"Declarant's Property"**).

B. Declarant desires to subject the Declarant's Property to a perpetual sanitary sewer easement of twenty feet (20') in width (the **"Easement"**) in, over and under a portion of the Declarant's Property (the **"Easement Area"**) as depicted on a plan entitled "Proposed Sanitary Sewer Easement Plan", prepared by Robert E. Blue Consulting Engineers, P.C., attached hereto as ***Exhibit "A"*** and made a part hereof and made a part hereof and as also described in ***Exhibit "B"*** attached hereto and made a part thereof.

C. The purpose of the Easement is to allow for the construction and continued maintenance of a new sanitary sewer line (the **"New Line"**) within the Easement Area, which New Line will connect to an existing sanitary sewer manhole and line owned by the Whitemarsh Township Authority (the **"Easement Purposes"**).

**NOW, THEREFORE**, in consideration of the mutual covenants and Declarations contained herein, the Declarant, intending to be legally bound hereby, provides as follows:

1. **EASEMENT**. Declarant hereby creates, grants and declares for itself and its successors and assigns, a perpetual right and easement to establish and maintain in, over and under the Easement Area for the Easement Purposes, a perpetual right and privilege of ingress, egress and regress over the Easement Area for construction, reconstruction, maintenance, repair and replacement of the New Line and any elements thereof.

2. **MAINTENANCE OF EASEMENT AREAS**. Throughout the term of the Easement, the Declarant, at Declarant's sole cost and expense, shall maintain, except as otherwise provided herein, the New Line, in good order and condition and in accordance with all applicable governmental requirements and regulations.

3. **NO OBSTRUCTION**. At no time shall Declarant, or Declarant's successors or assigns, erect any fence, barrier or other permanent obstruction at or upon the perimeter boundaries or elsewhere upon the Declarant's Property, so as to deny or to otherwise impair reasonable and necessary access to the Easement Area. Notwithstanding the foregoing, this Declaration shall be non-exclusive as to the surface of the Easement Area. The Declarant, its successors and assigns, may use the surface of the Easement Area for any use not inconsistent with the purpose of the Easement.

4. **GENERAL PROVISIONS**.

A. **Binding Effect**. This Declaration shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, executors, successors, administrators and assigns.

B. **Recording**. This Declaration shall be recorded in the Office of the Recorder of Deeds of Montgomery County, Pennsylvania, by any party hereto. All recording fees, taxes and all other costs and expenses of recordation shall be borne by Declarant.

C. **Mortgage Subordination**. Any mortgage or deed of trust affecting any portion of the Declarant's Property shall at all times be subject and subordinate to the terms of this Declaration. Any party foreclosing any mortgage or deed of trust, or acquiring title by deed in lieu of foreclosure or trustee's sale shall acquire title subject to all of the terms and provisions of this Declaration.

D. **Modification**. This Declaration shall be recorded and may not be amended, modified, or terminated at any time except by a written document, executed and acknowledged by the Declarant or its successors or assigns.

E. **Running with the Land**. The rights, easements and covenants established herein shall run with, and be appurtenant to, title to the Declarant's Property and the Declarant's Property and shall be a burden upon and run with the title to the Declarant's Property.

G. **Invalidity**. If any provision of this Declaration, or portion thereof, shall be held invalid, inoperative or unenforceable, the remainder of this Declaration, or the application of such provision or portion thereof to any other persons or circumstances, shall not be affected thereby.

H. **Governing Law**. This Declaration shall be construed in accordance with the laws of the Commonwealth of Pennsylvania without regard to conflict of laws provisions.

I. **Term**. This Declaration and the easements, rights, obligations and liabilities created hereby shall be perpetual in term to the extent permitted by law.

J. **Non-Dedication**. Nothing contained in this Declaration shall be deemed to be a gift or dedication of any portion of the Declarant's Property to the general public or for any public use or purpose whatsoever and nothing in this Declaration, expressed or implied, shall confer upon any person, other than the Declarant, and its successors and assigns, any rights or remedies under or by reason of this Declaration. Notwithstanding, the Declarant may assign all of its right, title and interest in and to the Easement to the Whitemarsh Sewer Authority. Provided, however, that the Declarant, at its sole cost and expense, shall continue to be responsible for maintenance of the surface of the Easement Area.

**IN WITNESS WHEREOF**, the Declarant has caused this Declaration to be executed the day and year first above written.

**DECLARANT**:
**60 FLOURTOWN ROAD, LLC**,
a Pennsylvania limited liability company

_____
Witness

By:_____
**GLENN VAN EERDEN,**
**MANAGING MEMBER**

**COMMONWEALTH OF PENNSYLVANIA :**
**SS.**
**COUNTY OF MONTGOMERY :**

On this, the _____ day of _____ 2018, before me, the undersigned notary public, personally appeared Glenn Van Eerden who acknowledged himself to be the Managing Member of 60 Flourtown Road, LLC, a Pennsylvania limited liability company and that he, as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

_____
NOTARY PUBLIC
(Notarial Seal)
My Commission Expires:

***EXHIBIT "A"***
***EASEMENT AREA PLAN***
***ATTACHED***

| LINE TABLE FOR UTILITY EASEMENT | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| A1 | N40°17'17"E | 10.00' |
| A2 | S49°42'43"E | 24.23' |
| A3 | S40°17'17"W | 10.00' |
| A4 | N49°42'43"W | 24.23' |
| | TOTAL AREA = | 242 S.F. |

***EXHIBIT "B"***
***EASEMENT AREA DESCRIPTION***
***[ATTACHED]***

robert e. blue consulting engineers, p.c.

60 Flourtown Road, LLC
343 Militia Hill Road
Fort Washington, PA 19034

April 30, 2018

Project 2081-1

Description of a Utility Easement
On 62 Flourtown Road (Block 21 Unit 28)
In Favor of 60 Flourtown Road (Block 21 Unit 9)

ALL THAT CERTAIN tract or parcel of ground situate in the Township of Whitemarsh, County of Montgomery, Commonwealth of Pennsylvania, shown on a "Utility Easement Exhibit" prepared by Robert E. Blue, Consulting Engineers, P.C., Blue Bell, PA, dated January 17, 2018, bounded and described as follows:

BEGINNING at a point being a corner of a Utility Easement, said point being located along the centerline of Flourtown Road (SR 3007), said point being measured from the centerline intersection of said Flourtown Road (60 feet wide) and Camburn Road (50 feet wide), the following three (3) courses and distances:

1. Along and near the centerline of said Flourtown Road South 54 degrees 31 minutes 37 seconds East, a distance of 86.61 feet to a point;

2. Continuing along same centerline, South 54 degrees 25 minutes 15 seconds East, a distance of 220.25 feet to a point;

3. South 35 degrees 34 minutes 45 seconds West, a distance of 16.50 feet to the point of beginning;

Thence from said point of beginning, along the Southwesterly legal right-of-way of Flourtown Road, continuing South 54 degrees 25 minutes 15 seconds East, a distance of 43.92 feet to a point;

Thence, leaving the Southwesterly right-of-way of Flourtown Road, South 34 degrees 56 minutes 45 seconds East, a distance of 65.86 feet to a point, said point being located along the lands N/F of Conrail;

Thence, along the Northerly lands of Conrail, South 82 degrees 16 minutes 21 seconds West, a distance of 22.49 feet to a point;

Thence North 34 degrees 56 minutes 45 seconds West, a distance of 91.75 feet to a point,

Thence North 10 degrees 44 minutes 15 seconds East, a distance of 7.49 feet to a point, said point being the first mentioned point and place of beginning;

robert e. blue consulting engineers, p.c.

60 Flourtown Road, LLC
343 Militia Hill Road
Fort Washington, PA 19034

April 30, 2018

CONTAINING 1,725 square feet or 0.0396 acres of land, more or less.

M-945P (6/12)

pennsylvania
DEPARTMENT OF TRANSPORTATION

# Highway Occupancy Permit

Permit No.: **06092107**

| Name and Address of Permittee: | | |
|---|---|---|
| 60 Flourtown Road LLC<br>60 Flourtown Road<br>Plymouth Meeting, PA 19462 | County: Montgomery | Issue Date: 3/7/2017 |
| | County Contact No.: (610) 275-1409 | Expiration Date: **3/7/2018** |
| | Issuing District Office: 6-0 | Application No.: 118318 |
| | District Contact No.: (610) 205-6795 | Account No.: |
| | Municipalities: Whitemarsh Township | Permit Fee: 50.00 |

*Immediately upon completion of the work Permittee shall notify the permit office where application was made. Subject to all the conditions, restrictions, and regulations prescribed by the Pennsylvania Department of Transportation, (see in particular 67 Pa. Code, Chapter 212, 441 and 459 and State Highway Law, 36 P.S. Section 670 - 411, 420 and 421 ) and subject to the plans, special conditions, or restrictions herein set forth or attached hereto. This permit shall be located at the work site and shall be available for inspection by any police officer or Department representative.*

| **Location and Description of Work** | | | Permit No.: **06092107** |
|---|---|---|---|
| 1 of 1 | State Route #:<br>Segment(s):<br>Offset(s): | 3007<br>From 0010 To 0034<br>From 0000 To 3174 | 521: Install Low Volume Driveway |

| **Permit Conditions** | Permit No.: **06092107** |
|---|---|
| 1 of 8 | CONTRACTOR MUST NOTIFY PENNDOT PRESS OFFICE,AT 610-205-6797,A MINIMUM OF FOUR WORKING DAYS.PRIOR TO CLOSING TRAVEL LANE(S)ONLY. JLS |
| 2 of 8 | construct new driveway for proposed storage garage and parking lot. |
| 3 of 8 | NOTIFY THE TRAFFIC MANAGEMENT CENTER AT 610-205-6934 PRIOR TO SETTING UP ANY LANE CLOSURES OR RESTRICTIONS, AND WHEN THE CLOSURE/RESTRICTION IS REMOVED. |
| 4 of 8 | CONTACT COUNTY PERMIT INSPECTOR AT LEAST 3 WORK DAYS PRIOR TO START OF WORK AT 610-275-1409. |
| 5 of 8 | A CERTIFICATE OF INSURANCE SHALL BE SUBMITTED TO THE DEPT. BY THE PERMITTEE OR ITS CONTRACTOR 30 DAYS PRIOR TO START OF WORK. |
| 6 of 8 | RESTORATION SECURITY SHALL BE SUBMITTED TO THE DEPARTMENT AT LEAST 30 DAYS PRIOR TO START OF WORK. NO WORK MAY BE PERFORMED UNTIL SECURITY IS APPROVED. |
| 7 of 8 | AN INSPECTOR, WHEN AVAILABLE, WILL BE ASSIGNED ON MORE THAN A SPOT INSPECTION BASIS. PERMITTEE WILL BE CHARGED ALL INSPECTION COSTS INCURRED BY THE DEPARTMENT. |
| 8 of 8 | NO LANES MAY BE RESTRICTED BETWEEN THE HOURS OF 6:00 AMTO 9:00 AM OR BETWEEN THE HOURS OF 3:00 PM TO 6:00 PM. |

This space is intentionally left blank

pennsylvania
DEPARTMENT OF TRANSPORTATION

# Highway Occupancy Permit

Permit No.: **06092107**

| | |
|---|---|
| **Acknowledgement of Completion**<br>Permit work has been completed:<br><br>Date:<br><br>By: | Leslie S. Richards<br>Secretary of Transportation<br><br>Kenneth B. McClain<br>District Executive |

# WHITEMARSH TOWNSHIP

**To:** Charlie L. Guttenplan, Director of Planning & Zoning/Zoning Officer

**From:** NICHOLAS W. WEAVER, FIRE MARSHAL

**Subject:** **SLD #12-15 60 Flourtown Road, LLC 60 Flourtown Road**

**Date:** September 27, 2021

**cc:**

This application is approved with no comments.

**Nicholas W. Weaver**
**Fire Marshal**
616 Germantown Pike
Lafayette Hill, PA 19444
Phone: 610-825-3535 ext. 2614
Email: nweaver@whitemarshtwp.org

EARTH ENGINEERING INCORPORATED
*Geotechnical Engineers & Geologists*

# REPORT OF GEOTECHNICAL INVESTIGATION

## 60 FLOURTOWN ROAD
## WHITEMARSH TOWNSHIP
## MONTGOMERY COUNTY, PENNSYLVANIA

**Prepared For:**

**Napoli Construction**
**PO Box 513**
**West Deptford, NJ 08086**

**EEI Project No. 29268.00**

**December 16, 2016**

***Corporate Headquarters***
**115 W Germantown Pike, Suite 200**
**East Norriton, PA 19401**
**(610) 277-0880 FAX 277-0878**
*eei@earthengineering.com*

*Southern New Jersey*
(856) 768-1001 FAX 768-1144

*Central Pennsylvania*
(717) 697-5701 FAX 697-5702

*Lehigh Valley*
(610) 967-4540 FAX 967-4488

*www.earthengineering.com*

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# I. INTRODUCTION

## A. PROJECT OBJECTIVE AND SCOPE OF WORK

At the request of Napoli Construction, Earth Engineering Incorporated (EEI) has completed a geotechnical investigation for a single story building to be constructed at the site located at 60 Flourtown Road, in Whitemarsh Township, Pennsylvania. The objective of the investigation was to evaluate the subsurface conditions within the proposed construction area.

Based on the encountered conditions and the results of the testing performed for this project, EEI has developed geotechnical recommendations to aid in the foundation design for the proposed building, as well as general earthwork and construction guidelines for the development of the site.

This study was performed in general accordance with EEI proposal BB-14223R. The scope of work conducted for this investigation included a geologic site evaluation, a test boring investigation, laboratory testing and geotechnical engineering analysis of the data obtained. This report presents the results of the field and laboratory investigations and documents our recommendations regarding the geotechnical engineering aspects of this project.

## B. SITE DESCRIPTION

The subject site is located on the southwest corner of the intersection of Flourtown Road and the Norfolk Southern Railway at 60 Flourtown Road, Whitemarsh Township, Montgomery County, Pennsylvania. The triangular shaped property is bordered to the northwest by the railroad, to the northeast by Flourtown Road and to the south by residential properties. The majority of the site is currently wooded with the exception of the proposed construction area on the eastern half of the site. The area the proposed building and driveway consists of predominantly bare or exposed earth. A ballast stone access drive extends from Flourtown Road through the proposed building area. Additionally, a large soil stockpile is situated on the west side of the proposed building. Several overhead and underground utilities exist throughout portions of the site, although the exact locations of the underground utilities were not known at the time of the field investigation. Utilities include, but are not limited to, storm sewer, sanitary sewer, gas, water, telecommunications, and electricity. Figure 1 on the following page depict the approximate site boundaries on an aerial image.




FIGURE 1 – AERIAL VIEW OF SITE
Source: 40.06'26.06" N 75.16'04.01" W. **Google Earth**. Image Date: May 24, 2016. Accessed: December 13, 2016.

In general, the proposed construction area slopes gently downward from the northwest to the southeast. According to the topographic information shown on the existing conditions plan provided by the Civil Engineer, the maximum relief across the study area is approximately six (6) feet. This relief corresponds to elevations across the site ranging from approximately 149.0 to 143.0 feet. *Plate 1*, included in the Appendix, shows the general location of the site on a topographic map of the area.

### C. PROJECT DESCRIPTION

The proposed development includes construction of a new approximately 8,000 square foot single story pole barn structure. According to the provided plans, the proposed building measures 160 feet long and 50 feet wide. The structure will incorporate slab-on-grade construction with no basement (below-grade) space and a finished floor elevation of 148.5 feet.

As discussed with Napoli Construction, the foundation will consist of 1 foot thick and 2 feet wide strip footings. A 6 foot 4 inch tall masonry block wall will support the pole building posts, paneling and truss system. Structural loads were not provided for EEI's consideration. However, based on similar previously completed projects, EEI has assumed that the maximum wall loads will not exceed 4 kips per lineal foot.

Based upon the existing site grades in relation to the proposed finished grade elevations, it appears that fill placement of up to 4.5 feet will be required to achieve the final grades. Minor excavations will be required to facilitate foundation construction and underground utility installation.

## II. FIELD INVESTIGATION, OBSERVATIONS, AND DATA

### A. SUBSURFACE INVESTIGATION

Four standard penetration test borings, designated within this report as B-1 through B-4, were conducted to explore the subsurface conditions at the site. The approximate boring locations with respect to the proposed building footprint and existing features are shown on the *Testing Location Plan, Drawing Number 29268.00-A-101* included in the *Appendix* section of this report. The borings were completed on Friday, December 2, 2016, by TRC Companies, Inc. of Cinnaminson, New Jersey using an Acker XLS track-mounted drill rig. The test borings were field located by EEI at the time of the investigation using proposed development plans and offset building corner stakes that were previously placed by others. The ground surface elevation at each boring location was surveyed by EEI in field by utilizing a gas manhole rim on the west side of the site as a reference point. The elevation of this feature is noted on project plans as 149.35 feet.

The borings were advanced using 2-inch outer-diameter, split-barrel (spoon) samplers and 3-¼ inch inner-diameter hollow-stem augers. Split-barrel sampling was conducted with an auto-trip safety hammer. The borings were conducted in accordance with ASTM Standard D1586. Standard Penetration Test (SPT) values were recorded for each sample. The SPT values, which are a measure of soil density and consistency, are the number of blows required to drive the 2-inch outer diameter split-barrel sampler 1 foot using a 140-pound weight dropped 30 inches. The number of blows required to advance the sampler over the 12-inch interval from 6 to 18 inches is considered the "N" value, or the SPT value.

Boring Logs, which provide sample depths, descriptions of the materials encountered and sampling data, are included in the *Appendix* of this report. The information presented on these logs was used to generate *Boring Profiles* that graphically represent the subsurface conditions encountered at each boring location. The *Boring Profiles* are also included in the *Appendix* for reference.

## B. GEOTECHNICAL LABORATORY TESTING

Two (2) representative samples of the soil recovered from the field investigation were submitted for laboratory testing. The laboratory testing conducted on these samples consisted of classification, in accordance with ASTM standard D2487-92, to verify visual classifications and to establish engineering parameters required for analyses. The tests performed included: Particle Size Analysis (ASTM D422), Atterberg Limits Determination (ASTM D4318) Natural Moisture Content (ASTM D2216). A Unified Soil Classification System (USCS) Group Symbol and ASTM Group Name have been assigned to the soil based upon the laboratory testing. The results of the laboratory testing conducted are presented in Table I. Gradation curves, graphically and numerically depicting the results of the analyses, are included in the Appendix of this report.

**TABLE I**
**LABORATORY CLASSIFICATION TEST RESULTS**

| | | |
|---|---|---|
| **Sample Location** | B-1 & B-3 | B-4 |
| **Sample Number** | S-2 & S-1 | S-3 and S-5 |
| **Sample Depths (feet)** | 4.0 to 6.0 & 0.0 to 2.0 | 4.0 – 6.0 & 8.0 – 10.0 |
| **Stratum** | Stratum I | Stratum II |
| **Liquid Limit (LL)** | 39 | Non-plastic |
| **Plastic Limit (PL)** | 25 | Non-plastic |
| **Plasticity Index (PI)** | 14 | Non-plastic |
| **Natural Moisture Content (%)** | 19.0 | 20.8 |
| **Percent Passing #200 Sieve** | 67.3 | 43.6 |
| **USCS Group Symbol** | CL | SM |
| **ASTM Group Name** | Sandy lean CLAY | Silty SAND |

## C. PUBLISHED GEOLOGICAL INFORMATION

Published data presented by the United States Geologic Survey and the Pennsylvania Geologic Survey was reviewed for topographic and geologic conditions at the Site. The site lies within the Lowland Section of the Piedmont Province. The Piedmont Lowland Section consists of broad, moderately dissected valleys separated by broad low hills. This topographic section developed primarily on limestone and dolomite rock, and, karst topography is common. *Plate 1*, included in the *Appendix* of this report, shows the general location of the site on a topographic map of the area.

The site is underlain by the Ledger geologic formation (geologic symbol of Cl) with pockets of the Pennsauken (geologic symbol of Tpb) and Patapsco (geologic symbol of Kp)

unconsolidated formations of sand and clay overlying the Ledger formation just south of the site. *Plate 2*, included in the *Appendix* of this report, shows the general location of the site on a geologic map of the area. As noted in the Commonwealth of Pennsylvania, Topographical and Geologic Survey, *Engineering Characteristics of the Rocks of Pennsylvania,* Fourth (4th) series, revised 1982, the Ledger Formation is composed of light-gray, pure, coarsely crystalline dolomite and limestone. The rock of this formation is moderately well bedded and displays well developed, irregularly spaced jointing. The rock is moderately resistant to weathering and often pinnacled. Fracturing is often vertical and open. These open vertical fractures provide a conduit for surface water which may result in dissolution of the carbonaceous rock and ultimately the development of sinkholes. The excavation of this rock is considered difficult in comparison to other rock types.

It is noted that the limestone and dolomite of the Ledger Formation are carbonate rocks. Carbonate rock is susceptible to dissolution when exposed to water, particularly slightly acidic water. Some features commonly associated with carbonate geology are very soft and moist soil conditions, sinkholes, and voids within the bedrock.

EEI reviewed mapping of the vicinity of the site published by Pennsylvania Department of Conservation and Natural Resources (DCNR) to ascertain the potential for sinkhole activity. The reviewed mapping included *Sinkholes and Karst-Related Features of Montgomery County, Pennsylvania*, *Norristown Quadrangle, Open File Report 93-02*, dated 1993. This map is a compilation of information based on the study aerial photographs, reports of sinkhole occurrences and field reconnaissance. Therefore, karst features may exist in the field that are not depicted on this map. This map should not be considered as all-inclusive but instead as a general idea of the potential for karst conditions. *Plate 3*, included in the *Appendix*, depicts the site in relation to the mapped karst features and the density. The stated mapping indicates a sinkhole near the south edge of the site and two additional sinkholes within 0.5 mile of the site. Twelve (12) closed depressions are indicated within a 0.5 mile radius of the site.

## III. STRATIFICATION AND SUBSURFACE CONDITIONS

### A. SOIL STRATA

The soil samples obtained during the field investigation were examined and classified by EEI, both in the field and in the laboratory. Based upon the field observations and the laboratory testing conducted, a generalized subsurface profile for this site was developed.

EEI identified and characterized four (4) naturally occurring strata within the proposed building footprint. A surficial layer of stone aggregate that ranges from 0.2 to 2.0 feet thick was encountered at test locations B-1, B-3 and B-4.

Profiles which depict the boring information are included in the *Appendix*. Detailed descriptions and data regarding the subsurface conditions are shown on the *Boring Logs*, also in the *Appendix*. A general description of the materials encountered is provided in the following subsections.

**STRATUM I: Fine Grained Residual Soil**

The soils designated as Stratum I are described as silty clay to sandy lean clay. Stratum I soils were encountered at borings B-1 at a depth of 4.5 to 6.0 feet and B-3 at a depth of 0.2 to 2.0 feet. Based on laboratory classification, the USCS Group Symbol for samples of this material is *CL*. The corresponding ASTM Group Name is *sandy lean CLAY.*

The SPT values recorded during the sampling of this stratum were 24 and 43 blows per foot of penetration. Based on these values, the consistency of the Stratum I soil is very stiff. These materials were encountered in a moist state during the field investigation. The natural moisture content for selected samples of this stratum measured 19.0%.

**STRATUM II: Fine to Coarse Grained Residual Soil**

The soils designated as Stratum II are described as silt with clay to silty sand with gravel. Stratum II soils were encountered at all four boring locations and begin either at the surface or beneath the surficial stone aggregate and Stratum I soils at a depth of 0.2 to 2.0 feet and extend down to underlying strata at depths of 3.8 feet to 18.0 feet below grade. Based on laboratory classification, the USCS Group Symbol for samples of this material is *SM*. The corresponding ASTM Group Name is *silty SAND.*

The SPT values recorded during the sampling of representative portions of this soil ranged from 7 to 39 blows per foot of penetration. Blow counts of greater than 50 blows per foot were encountered at the surface of boring location B-1. However, the elevated blow count was due to coarse fragments at or near the surface and are not representative of Stratum II. Based on these values, the relative density of the Stratum II soils ranges from loose to dense. These materials were encountered in a moist state during the field investigation. The natural moisture content for selected samples of this stratum measured 20.3%.

**STRATUM III: Decomposed Limestone**

The soils designated as Stratum III consist of highly weathered or decomposed limestone that is described as silty clay to silty sand with gravel. Stratum III soils were encountered at boring locations B-3 and B-4 from beneath the Stratum II soil at 13.0 to 18.0 feet below grade and extend down to the bottom of the borings at 20.0 feet to 26.0 feet below grade, respectively.

The SPT values recorded during the sampling of representative portions of this soil ranged from 2 to 20 blows per foot of penetration. Based on these values, the relative density of the Stratum III soils ranges from very loose to medium dense. On average, these materials are loose. The very loose to loose portions of the decomposed limestone are indicative of sinkhole conditions. These materials were encountered in a moist to wet state during the field investigation.

**STRATUM IV: Weathered Limestone**

The materials designated as Stratum IV consist of weathered limestone that is described as silty sand to clay and rock fragments. Stratum IV was encountered at boring locations B-1 and B-2. This stratum extends to auger refusal depths of 11.7 feet at B-1 and to the bottom of boring location B-2 at 20.0 feet below grade.

The SPT values recorded during the sampling of this soil ranged from 36 to blows per foot of penetration to greater than 50 blows per foot of penetration. Based on these values, the relative density of Stratum III is dense to very dense. These materials were encountered in a moist state during the field investigation.

### B. BEDROCK

Bedrock, defined as auger refusal, was encountered at location boring location B-1 at a depth of 11.7 feet below grade. Rock fragments recovered during drilling through the weathered parent rock confirm that the site is underlain by limestone of the Ledger formation.

### C. GROUNDWATER

Groundwater was encountered at boring location B-4. Upon completion of the boring, the borehole was dry. However, after a lapse of approximately 1 hour the depth to groundwater measured 20.0 feet below grade. It should be noted that groundwater observations were made at the time of the subsurface investigation and that the groundwater table elevation may fluctuate with daily, seasonal, and climatic variations.

## IV. GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

### A. GEOTECHNICAL ANALYSIS

EEI has completed a geotechnical analyses in order to provide foundation design recommendations. The analyses are based on the conditions encountered in the field and laboratory analyses. EEI has evaluated the subsurface conditions and provides the following soil parameters utilized for foundation analyses in the following table.

| TABLE II<br>GEOTECHNICAL SOIL PROPERTIES | | | |
|---|---|---|---|
| **Stratum** | Stratum I | Stratum II/III | Stratum IV |
| **Moist Unit Weight - $\gamma_m$ (pcf)** | 110 | 115 | 120 |
| **Effective Stress Angle of Internal Friction - $\phi'$ (deg)** | 30 | 28 | 34 |
| **Cohesion – c (psf)** | 0 | 0 | 0 |

### B. FOUNDATION RECOMMENDATIONS

EEI has analyzed the available information regarding the proposed development and construction, as well as the subsurface conditions encountered at the site. The results of the field study, supported by laboratory testing, revealed that the general geotechnical cross-section at the site typically consists of very stiff Stratum I and medium dense to dense Stratum II residual soils with localized zones of loose Stratum II soils in the upper 2 feet. The residual Stratum I and Stratum II soils are situated above very dense Stratum IV Weathered Limestone at 3.8 to 6.0 feet below existing grade on the west half of the building and very loose to loose Stratum II Decomposed Limestone at 13.0 to 18.0 feet below existing grade on the east half of the proposed building footprint.

For frost heave considerations, the exterior wall foundations are recommended to be placed at least 3 feet below the exterior grade. At the proposed finished floor elevation of 148.5 feet, the anticipated bottom of footing elevation is 145.5 feet. At these grades, the building foundations will bear on placed structural fill, very stiff Stratum I soil and loose to medium dense Stratum II soils. Following confirmation of a firm and stable subbase, these materials are considered generally suitable for support of the proposed structure.

Localized zones of potentially unstable Stratum II soils were observed by EEI within the proposed building area at boring location B-2 during the field investigation, and are expected to be encountered during excavations required for foundation installation. Since structural fill will be required to achieve final grades in this area, these localized loose or unstable zones will be identified and densified during site preparation. Following completion of site preparation activities, the subgrade soils should be visually evaluated and the structural stability should be verified. Areas deemed soft or unstable due to elevated moisture content can be scarified, dried in-place, and densified in-place. If densification measures prove ineffective, unstable areas can be undercut to firm residual soils and/or stabilized. Localized over-excavation of moist Stratum II

soils to a firm and stable base may be required to achieve an allowable bearing capacity. Proper sloping and benching techniques would be required, as described in the *Excavation Methods* section of this report, if over-excavations approach unsafe depths. The extent of the undercutting/stabilization and confirmation of a stable subgrade should be determined in the field by a representative of the Geotechnical Engineer of Record. Following verification of suitable bearing material, the over-excavation may be backfilled and replaced with structural fill, as outlined in the *Fill and Compaction* section of this report, or lean concrete up to the originally proposed foundation bottom elevation. Alternately, the foundation base can be lowered to an approved soil bearing elevation.

Utilizing the assumed maximum structural loads, stiff Stratum I and medium dense to dense Stratum I soils, and/or properly placed and compacted structural fill are considered suitable for the support of the proposed building with a standard strip foundation system. The following foundation system and soil bearing capacity recommendations, in addition to those discussed above, are provided by EEI assuming that the procedures and specifications stated herein are followed.

1. A foundation system consisting of strip footings is recommended for support of the proposed building contingent upon proper completion of the procedures recommended within this report.

2. EEI recommends that the foundations for the proposed building be designed for an allowable bearing capacity of 3,000 pounds per square foot bearing on stiff Stratum I soils, medium dense to dense Stratum II soils, and/or properly placed structural fill. **Foundations shall not bear on or above any soft/unstable materials.**

3. Strip footings shall be minimum of 18 for shear considerations. At the time of this report, the planned strip footing width was 24 inches.

4. Supported by approved subgrade materials and/or properly placed structural fill, total settlements are expected to be less than 1 inch, and differential settlements are expected to be less than 0.5 inches. These settlements were calculated utilizing a maximum wall load of 4.0 kips per linear foot, and a bearing pressure of 3,000 pounds per square foot. In the event that the foundation loads exceed these values, EEI should be informed to review and revise these recommendations, as necessary.

5. The bottom of exterior footings and footings in unheated areas should be placed at least thirty-six (36) inches below the final exterior grade for protection from frost heave. Interior footings to be located within heated areas should be installed to a minimum depth of twenty-four (24) inches below the final finished floor elevation.

6. All footing bottoms should be compacted, dry, and completely cleaned of soft/loose material or debris immediately prior to the placement of concrete.

7. The actual bearing conditions of the soil at the footing bottom elevation should be confirmed in the field during excavation by inspection under the supervision of a Professional Engineer qualified in Geotechnical Engineering.

### C. FLOOR SLAB RECOMMENDATIONS

The in- situ soils are generally suitable for structural support of a floor slab for the proposed building. During the Site Preparation procedures and again once the site is brought to floor subgrade elevation, the floor slab area should be proof rolled utilizing a minimum 10-ton smooth steel drum roller. The purpose of the proof rolling is to reveal loose or unstable soils. Mitigation of loose unstable areas should be completed with the guidance and supervision of the Geotechnical Engineer of Record.

EEI recommends the installation of a minimum 4-inch thick aggregate base course prior to constructing the floor slabs, according to the approved architectural detail. The base course should consist of gravel or crushed stone meeting the gradation requirements for PennDOT No. 2B (AASHTO #57) coarse aggregate, or equivalent. Once placed, vehicle and equipment travel on the stone base course should be restricted.

From a geotechnical standpoint, a vapor barrier membrane is not needed since the site does not have shallow groundwater based on the boring data. The need for a vapor barrier membrane depends on the floor covering and/or humidity control in the proposed building space. Refer to appropriate documentation from the Portland Cement Association (PCA) for guidance on the need and placement of a vapor barrier membrane. According to the PCA, the location of the vapor barrier membrane would depend on when the slab construction is completed with respect to placement of a water tight roofing system. There is some debate in the industry on the use and location of the vapor barrier membrane with respect to the stone base course. Regardless, these issues are not of a geotechnical nature. Therefore, EEI recommends that the need for and location of the vapor barrier be evaluated by the Architect and/or Structural Engineer, accordingly.

### D. SINKHOLE FORMATION

The site has the potential for the formation of karst features including the development of sinkholes based on the bedrock type. The risk and potential severity of sinkhole related problems at the site can be reduced by taking precautions within the design phase, as well as during and following construction. It is recommended that the construction schedule be such that site exposure be limited in duration, and scheduled for dry seasons. The following list includes

example procedures which have been shown to reduce the frequency and severity of sinkholes resulting from construction activity.

- Utmost care must be taken to prevent collection and drainage of surface water into excavated or low-lying areas of the site during the excavation and construction of roadways, ramps, or structures. This may be done by constructing earth berms, dikes, or diversion ditches around open excavations or otherwise preventing the collection and ponding of water in low-lying areas. Typically, excavations should not be made during predicted periods of precipitation. Excavations should be filled as soon as practical, especially before weekends or periods of inactivity.
- The soil situated above a zone of solution activity is usually soft and wet. Therefore, it is important to locate areas exhibiting these conditions wherever they may exist or be encountered. Any soft/loose or unusually moist soil should be excavated and the extent of the unstable conditions be determined. Remedial measures should then be undertaken as necessary.
- The base of all excavations in carbonate areas should be inspected for soft or unusually moist conditions. A visual inspection of the excavated surface during proof rolling, as well as probes of the soil at regular intervals, is recommended. Any soft/loose or unusually moist soil should be further excavated and the extent of the unstable conditions be determined. Remedial measures should then be undertaken as necessary.
- Swales, drainage ditches and/or basins are particularly vulnerable to sinkhole development during periods of heavy rainfall. The same is true of outlet locations for drainage pipes. These areas should be lined with impermeable liners to prevent infiltration of water.
- If utilized, stormwater infiltration facilities will increase the risk of future sinkhole development at the site and are generally not recommended.
- Sinkhole repair is dependent on the location and type of sinkhole. The proper stabilization and repair of sinkholes or other areas exhibiting solution activity is critical and should be performed under the direction of the Geotechnical Engineer of Record.
- Watertight seals should be provided at all water bearing utility line connections.
- Surficial grades should provide positive drainage away from building areas. In addition, subgrades, beneath larger fill areas, slabs, sidewalks and pavements, should also provide positive drainage away from building areas.
- For smaller excavated areas, such as footing excavations, positive drainage may not be possible because of the size of the area. In these smaller areas, it is recommended that the on-site silt soil be used for backfill. In such cases, the excavation should not be backfilled with a free-draining material, since the free-draining material would act as a retention area for surficial waters to collect.
- All roof drains should be watertight, and outflow should be piped away from the building and directed to the on-site stormwater management systems.

### E. SITE PREPARATION METHODS

Prior to the installation of the foundation system, the site should be proofrolled to confirm that the stability of the surface is sufficient to support the concrete for the structural slab. Once the surface is proofrolled until deemed stable, the site should be brought to floor subgrade elevation with structural fill placed in accordance with the recommendations presented in the *Fill and Compaction* section of this report. EEI recommends that all construction areas, including those that will be excavated to achieve the planned subgrade elevation, be proofrolled immediately before the placement of any structural fill and/or the placement of subbase stone, and again before the installation of concrete. Such preparations will allow soft and weak areas to be observed and remediated before slab construction.

The site should be graded during development to convey surface runoff away from construction. The work areas should be sealed by rolling on a daily basis to promote runoff. Careful grading and management of surface water runoff will help minimize disturbance of the subgrade.

### F. EXCAVATION METHODS

Based on the existing grades compared to the proposed construction details, EEI estimates that minimal excavations will be required to achieve the final grades within the proposed development area. Additional excavations will be required to facilitate foundation construction and underground utility installation. As a result, the required excavations will occur predominately within the Stratum I and Stratum II soils. These materials, should be easy to excavate using conventional equipment and techniques. However, Stratum IV very dense weathered rock was encountered depths of 3.8 to 6.0 feet at borings locations B-2 and B-1, respectively. Excavations that extend into Stratum IV very dense weathered rock during trench excavation will be difficult using a standard backhoe. Improved excavation rates will be realized utilizing a late model high-powered track-mounted excavator. Trench excavation within these very dense materials may also require rock excavation equipment such as hydraulic hammering, splitting, or other rock removal techniques.

Rock excavation is not anticipated. However, pinnacled limestone rock was encountered at a depth of 11.7 feet below existing grade at boring location B-1. If shallow rock is encountered that requires excavation, EEI does not recommend blasting because the site is underlain by carbonate bedrock. Blasting rock may propagate sinkholes and can also weaken the structure of the subsurface in adjacent areas.

Excavations must be sloped, benched, or shored to prevent collapse during the soil excavation and provide a safe working environment. Sloping, benching, or shoring of all construction excavation should be conducted in accordance with established Occupational Safety and Health Administration (OSHA) guidelines. The actual excavation slopes, benching, or shoring should be determined prior to construction and verified in the field by a qualified Engineer based on the required depth of cuts and soil types encountered.

The recommendations outlined herein are provided for planning purposes only, and the contractor will remain the entity in "Responsible Charge" of all health and safety on the site. If underpinning or shoring is determined to be required, EEI should be contacted so that proper design of such measures.

## G. FILL AND COMPACTION

### 1. Fill Criteria

Fill material that supports foundations or provides lateral support for retaining walls is considered structural fill. Structural fill needs to be considered *"clean fill"* according to PA DEP Management of Fill Policy (Document No. 258-2182-773), and free of organic matter, ash, cinders, frozen materials, and demolition debris including brick fragments. As previously noted, a large soil stockpile currently occupies the west side of the proposed building footprint. These materials have not been evaluated by EEI for use as structural fill.

Any exported materials from this site will require comprehensive analysis and possibly disposal as a residual waste material. The samples obtained while drilling within the existing soil Stratum I and Stratum II soils appear suitable for reuse as structural fill. However, the suitability of this material for use as structural fill should be confirmed during construction when a larger sampling can be made available.

Care should be taken to minimize the amount of water infiltration of fill soils while stored at the site. Materials stockpiled for use as structural fill should be covered to prevent water infiltration. Aeration and drying of excessively moist soils are best accomplished during the warm, dry, summer months. Soils that cannot be sufficiently dried should be placed in non-structural areas or removed from the site.

Any **imported** *structural fill* or load bearing soil should meet the project specifications and meet the following criteria:

- Materials meeting the definition of *"clean fill"* according to PA DEP Management of Fill Policy (Document No. 258-2182-773).
- Free of organic matter, ash, cinders, frozen materials, and demolition debris.

- Particle size distribution that is well graded.
- Plasticity index should be less than 10.
- No rock fragments larger than 3 inches, less than 30 percent by weight larger than 0.75 inches, and less than 30 percent by weight smaller than the No. 200 sieve.

The above criteria are provided as a general guideline for soil materials imported to the site. Soil materials that become available for use as a structural fill should be submitted to the Geotechnical Engineer of Record for evaluation before they are imported to the site.

**2. Compaction Criteria**

Structural fill should be placed in horizontal lifts not exceeding 8 inches in loose thickness and compacted with a smooth drum roller with a minimum static weight of 10 tons. Structural fill should be placed in horizontal lifts of 6 inches loose thickness where compaction by hand-operated equipment is necessary. The optimum lift thickness and number of repetitions necessary to achieve the required percentage compaction values should be determined in the field with test passes of the chosen compaction equipment under the guidance and observation of the Geotechnical Engineer of Record. In accordance with project plans, fill material for foundation and slab support should be placed at, or deviate nominally from, the optimum moisture content as determined in accordance with ASTM Standard D698 (Standard Proctor) or ASTM Standard D1557 (Modified Proctor) and compacted to a minimum of dry density as indicated in the following table.

**TABLE III**
**COMPACTION CRITERIA**

| Fill Area | Percent of Maximum Dry Density Per ASTM Standard D698 (Standard Proctor) | Percent of Maximum Dry Density Per ASTM Standard D1557 (Modified Proctor) |
|---|---|---|
| Foundation and Floor Slab | 98 | 95 |
| Paved Areas and Sidewalks | 98 | 95 |
| Nonstructural | 92 | 90 |

**H. SITE SEISMIC CONDITIONS**

According to the 2009 International Building Code (IBC Section 1615.1.1 Site Class Definitions) and the information obtained from the geotechnical field investigation, the average properties in the top 100 feet of soil/rock correspond to Site Class C. Therefore, Site Class C

conditions should be applied for the seismic design of the proposed structure assuming that the procedures stated within this report are followed.

## V. CONSTRUCTION QUALITY CONTROL

Earthwork procedures and foundation placement activities are critical to the success of the project. The quality of these activities is an integral part of the development of this Site and directly affects the validity of the recommendations presented in this report. Based on EEI's past experience, the most effective and economical earthwork inspection is obtained through the presence of a qualified representative of the Geotechnical Engineer of Record during earthwork activities. EEI recommends that these activities be examined, tested, and confirmed by the Geotechnical Engineer of Record. During the construction phase, the Geotechnical Engineer of Record should be familiar with the content and the intent of this report. Based on EEI's experience, continuity of the Geotechnical Engineer of Record from design to construction provides a more successful project.

## VI. LIMITATIONS

The conclusions and recommendations presented in this report are based on the subsurface data collected, details stated in this report, and the assumption that the subsurface conditions do not deviate from those disclosed by the data acquisition activities performed. Should conditions arise which differ from those specifically stated herein, our office should be notified immediately so that our recommendations can be reviewed and revised, if necessary.

The data and conclusions contained in this report are based upon available information obtained for the site and observations made in the field. Discrepancies or inaccuracies regarding any data provided are not the responsibility of EEI. EEI further assumes no responsibility or liability for environmentally hazardous materials, which are the responsibility of the site owners, adjacent property owners, or other persons or entities.

This report has been prepared in order to assist the client for the proposed construction. However, it must be noted that the field investigation was limited to the site as indicated on the *Boring Location Plan*. This investigation did not include site elements such as any proposed utilities, stormwater structures, retaining walls and pavements.

The procedures followed during the subsurface exploration, and the analyses and conclusions contained herein, have followed generally accepted practices of geotechnical engineering and environmental testing. EEI provides no other warranties, either expressed or implied, as to the professional advice provided under the terms of EEI's agreement and included

in this report. The conclusions and recommendations presented in this report are based on the assumption that recognized proper construction practices will be followed throughout construction, and that a Professional Engineer qualified in Geotechnical Engineering, such as EEI, will be retained to oversee critical earthwork operations. If subsurface conditions substantially deviate during construction from those described in this report, EEI should be contacted promptly.

EEI emphasizes that this geotechnical and environmental analysis was made for the construction of a proposed home at 60 Flourtown Road, Plymouth Township, Pennsylvania. EEI does not assume any responsibility for the use of this report in generating a foundation design for a site other than the one specifically addressed in this report or for any other purpose.

Respectfully submitted,
***EARTH ENGINEERING INCORPORATED***




A. Nathaniel Hadley, SEO
Project Manager

Patrick M. McNamara, P.E.
Director – Geotechnical Investigation

APPENDIX

PLATE 1 -TOPOGRAPHIC MAP
PLATE 2 -GEOLOGIC MAP
PLATE 3 – KARST-RELATED FEATURES MAP
BORING LOCATION PLAN
BORING PROFILES
BORING LOGS
LABORATORY TESTING

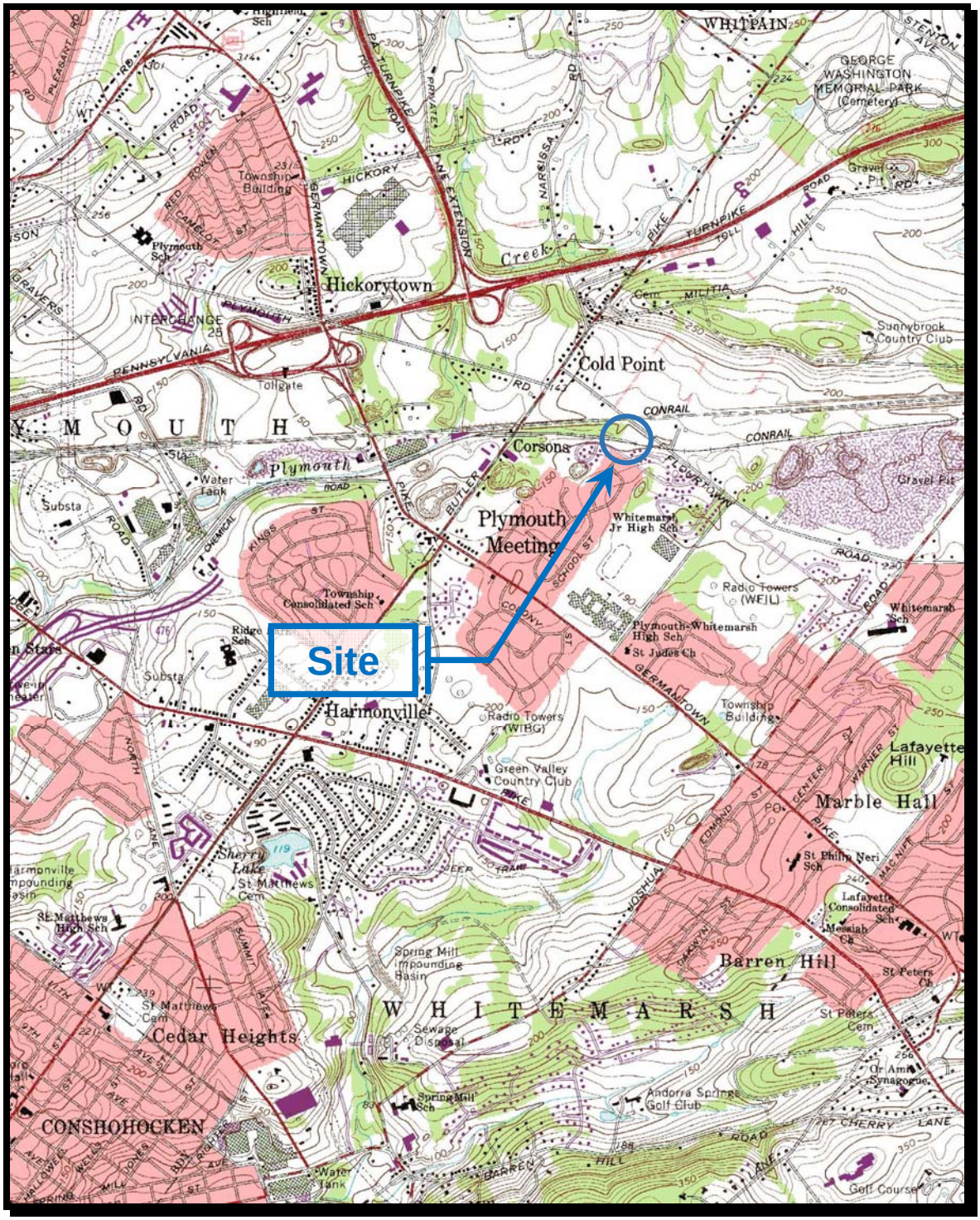



**PLATE 1 – TOPOGRAPHIC MAP OF SITE**

Reprinted from the United States Department of the Interior Geological Survey, Topographic Maps of Pennsylvania, Norristown, PA Quadrangle, Photorevised 1983

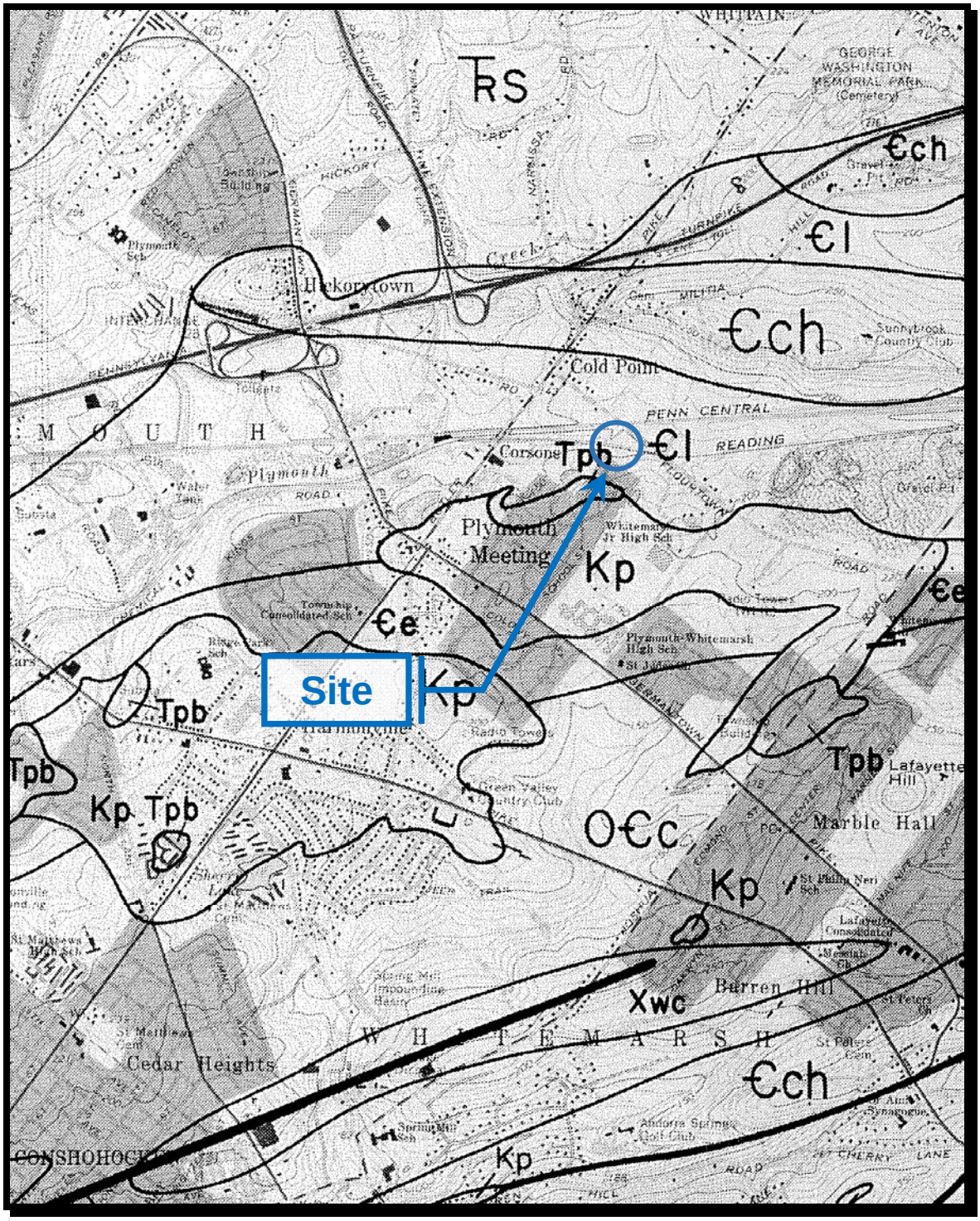



**PLATE 2 - GEOLOGIC MAP OF SITE**

Reprinted from the Pennsylvania Geological Survey, Atlas of Preliminary Geologic Quadrangle Maps of Pennsylvania, Norristown, PA Quadrangle, 1978

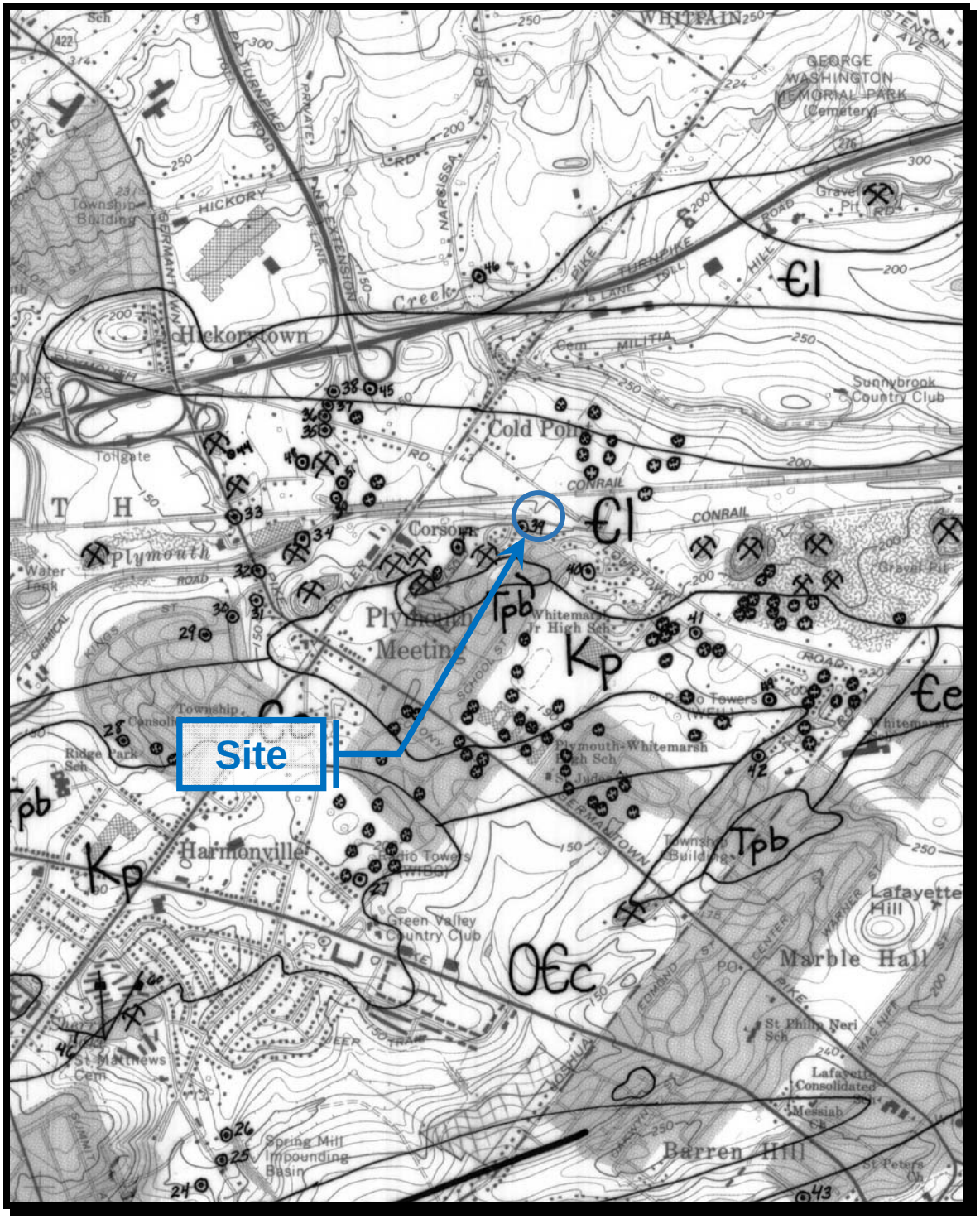
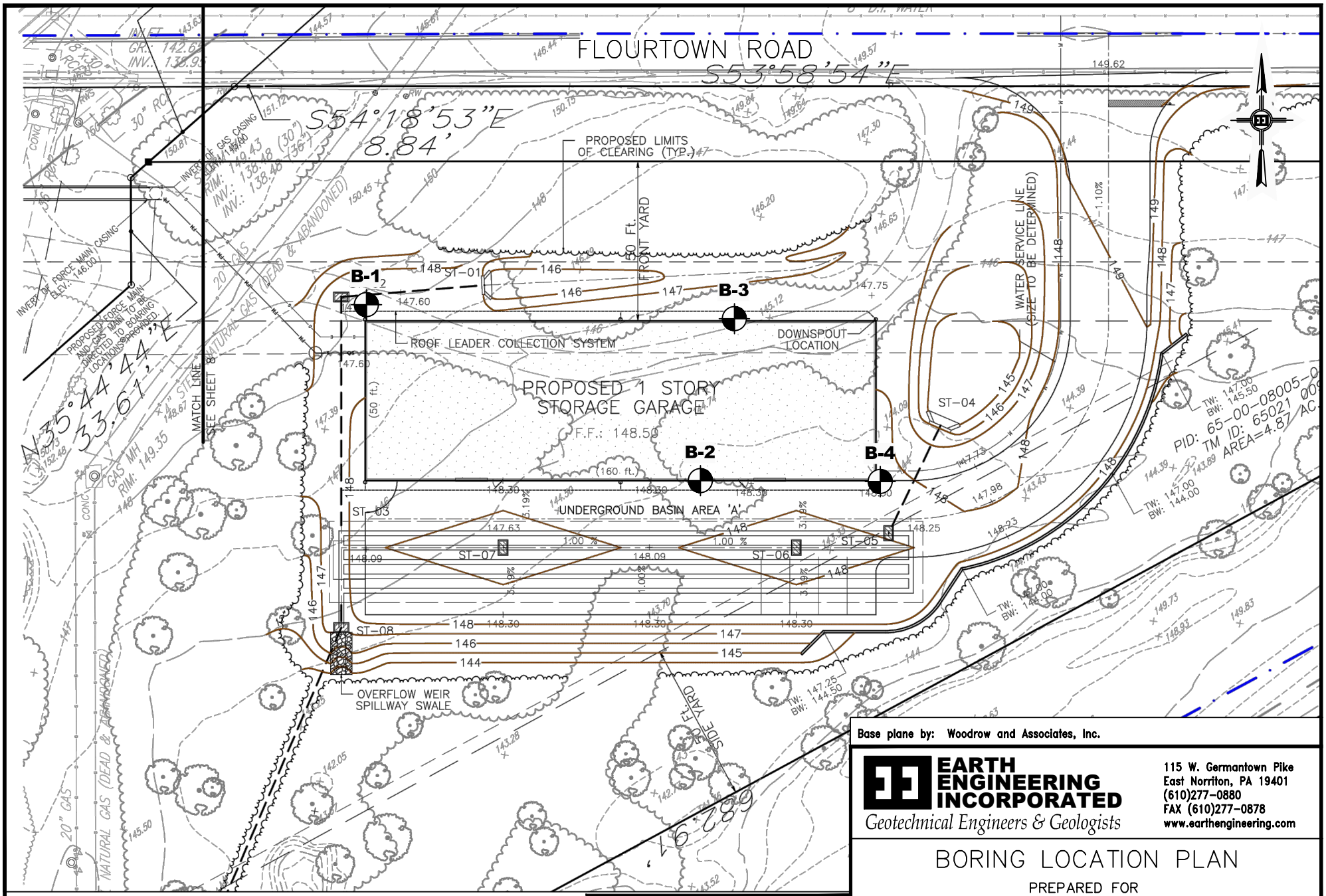



**PLATE 3 – KARST-RELATED FEATURES GEOLOGIC MAP OF SITE**

Reprinted from the Pennsylvania Geologic Survey Open-File Report: 9302, titled *Sinkholes and Karst-Related Features of Montgomery County, Pennsylvania*, USGS Norristown Quadrangle, prepared by W. E. Kochanov, 1993.




40 20 0 40 80

GRAPHIC SCALE: 1" = 40'

KEY:

APPROXIMATE BORING LOCATION

Base plane by: Woodrow and Associates, Inc.


EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

115 W. Germantown Pike
East Norriton, PA 19401
(610)277-0880
FAX (610)277-0878
www.earthengineering.com

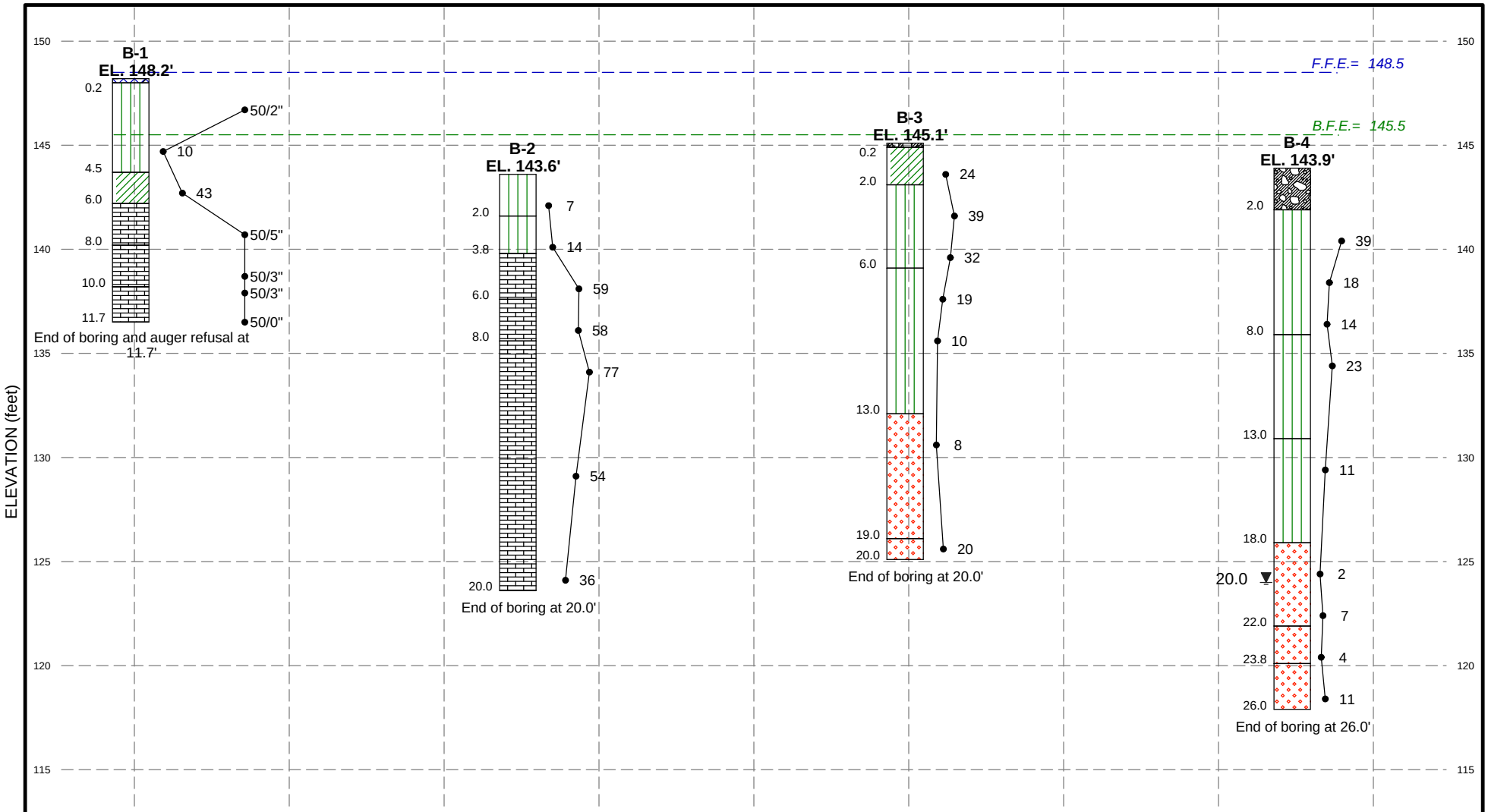

# BORING LOCATION PLAN

PREPARED FOR

## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP MONTGOMERY COUNTY PENNSYLVANIA

| | | | |
|---|---|---|---|
| Scale: 1" = 40' | Date: 12/08/2016 | Drawn By: ANH | Checked By: PMM |
| Drawing Number: 29268.00-A-101 | | Approved By: PMM | Sheet No. 1 OF 1 |




## Lithology Graphics

- FILL
- STONE AGGREGATE
- STRATUM I: Silty clay
- STRATUM II: Silt with clay to silty sand with trace gravel
- STRATUM III: Silty clay to silty sand with gravel (Decomposed Limestone)
- STRATUM IV: Very dense weathered limestone rock and silty sand to clay

Initial Groundwater Level

Subsequent Groundwater Level

*F.F.E.= Finished Floor Elevation*

*B.F.E.= Bottom of Footing Elevation*

EARTH ENGINEERING INCORPORATED

*Geotechnical Engineers & Geologists*

# BORING PROFILES

**PREPARED FOR**

**60 FLOURTOWN ROAD, PLYMOUTH MEETING**

PLYMOUTH TOWNSHIP, MONTGOMERY COUNTY, PA

| Project Number: 29268.00 | Date: 12/16/2016 | SHEET: 1 |
|---|---|---|

EARTH ENGINEERING INCORPORATED
*Geotechnical Engineers & Geologists*

# *BORING LOG*

BORING NO. **B-1**
SHEET **1** OF **1**
DATE: START **12/2/16**
END **12/2/16**
SURFACE ELEV. (FT) **148.2**

PROJECT NAME **60 Flourtown Road, Plymouth Meeting**
PROJECT LOCATION **Plymouth Township, Montgomery County, PA**
PROJECT NUMBER **29268.00**
INSPECTOR NAME **B. Mosser**
EQUIPMENT USED **Acker Soil XLS Track rig**
DRILLER NAME/COMPANY **Steve B./TRC**
DRILLING METHODS **auto hammer, 6" OD HSA**
AUGER: SIZE: **3.2"** ; AUGER DEPTH: **11.7'** ; WATER: DEPTH: **DRY** TIME: **0.25 hr** DATE: **12/2/2016**
CHECKED BY: ; DATE: DEPTH: **DRY** TIME: **4 hr** DATE: **12/2/2016**
NOT ENCOUNTERED ☐

| DEPTH (FT) | SAMPLE NO./ TYPE/CORE RUN | BLOWS/0.5 FT. ON SAMPLER | RECOVERY (Ft.) | RECOVERY(%) / RQD (%) | USCS / AASHTO | $H_2O$ CONTENT | GRAPHIC LOG | DESCRIPTION (DEPTH / ELEVATION) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | S-1 | 50/2" | 0.2' | 10 / - | sm | m | | 0.2 / 148.0 Silty sand with gravel, medium brown to dark brown | 0.0 to 0.2': Some gravel is reactive with HCl |
| 2.0 | S-2 | 2 5 5 7 | 1.7' | 85 / - | ml | m | | Silt with clay, medium brown to orange brown | |
| 4.0 | S-3 | 20 18 25 26 | 2.0' | 100 / - | cl | m | | 4.5 / 143.7 Silty clay with gravel, orange brown to medium brown | 4.0': Some quartz gravel, not reactive with HCl |
| 6.0 | S-4 | 50/5" | 0.4' | 20 / - | sm | m | | 6.0 / 142.2 Rock and silty sand, trace gravel, medium brown to orange brown | 6.0': Hard drilling to 11.7' |
| 8.0 | S-5 | 50/3" | 0.3' | 15 / - | ml | m | | 8.0 / 140.2 Rock and silt with clay, orange brown | |
| 10.0 | S-6 | 50/3" | 0.3' | 100 / - | sm | m | | 10.0 / 138.2 Rock and silty sand with gravel, light brown | 10.0': Gravel is reactive with HCl |
| 10.3 | S-7 | 50/0" | 0.0' | | | NA | | 11.7 / 136.5 | 11.7 End of boring with auger refusal at 11.7'. |
| 11.7 | | | | | | | | | |

** D = DRY, M = MOIST, W = WET

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*Geotechnical Engineers & Geologists*

# *BORING LOG*

BORING NO. **B-2**
SHEET **1** OF **1**
DATE: START **12/2/16**
END **12/2/16**
SURFACE ELEV. (FT) **143.6**

PROJECT NAME **60 Flourtown Road, Plymouth Meeting**
PROJECT LOCATION **Plymouth Township, Montgomery County, PA**
PROJECT NUMBER **29268.00**
INSPECTOR NAME **B. Mosser**
EQUIPMENT USED **Acker Soil XLS Track rig**
DRILLER NAME/COMPANY **Sean W./TRC**
DRILLING METHODS **auto hammer, 6" OD HSA**
AUGER: SIZE: **3.2"** ; AUGER DEPTH: **20.0'** ; WATER: DEPTH: **DRY** TIME: **0.25 hr** DATE: **12/2/2016**
CHECKED BY: ; DATE: DEPTH: **DRY** TIME: **0.5 hr** DATE: **12/2/2016**
NOT ENCOUNTERED ☐

| DEPTH (FT) | SAMPLE NO./ TYPE/CORE RUN | BLOWS/0.5 FT. ON SAMPLER | RECOVERY (Ft.) | RECOVERY(%) / RQD (%) | USCS / AASHTO | $H_2O$ CONTENT | GRAPHIC LOG | DESCRIPTION (DEPTH / ELEVATION) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | S-1 | 5 3 4 5 | 1.0' | 50 - | ml | m | | Sandy silt with gravel, medium brown | |
| 2.0 | | | | | | | | 2.0 / 141.6 | |
| | S-2 | 4 4 10 31 | 1.4' | 70 - | ml | m | | Silt with some sand and clay, gray brown to orange brown | 3.8': Gravel is not reactive with HCl |
| 4.0 | | | | | | | | 3.8 / 139.8 | |
| | S-3 | 22 31 28 39 | 1.0' | 50 - | sm | m | | Silty sand with gravel, orange brown | 4.0' -6.0': Quartz gravel |
| 6.0 | | | | | | | | 6.0 / 137.6 | |
| | S-4 | 31 36 22 13 | 1.3' | 65 - | ml | m | | Sandy silt with gravel, orange brown | |
| 8.0 | | | | | | | | 8.0 / 135.6 | |
| | S-5 | 21 40 37 49 | 1.0' | 50 - | sm | m | | Silty sand with gravel, orange brown | |
| 10.0 | | | | | | | | | |
| 13.0 | | | | | | | | | |
| | S-6 | 18 23 31 28 | 1.7' | 85 - | sm | m | | | |
| 15.0 | | | | | | | | | |
| 18.0 | | | | | | | | | |
| | S-7 | 10 18 18 15 | 2.0' | 100 - | sm | m | | | |
| 20.0 | | | | | | | | 20.0 / 123.6 | |

** D = DRY, M = MOIST, W = WET

EARTH ENGINEERING INCORPORATED
*Geotechnical Engineers & Geologists*

# *BORING LOG*

BORING NO. **B-3**
SHEET **1** OF **1**
DATE: START **12/2/16**
END **12/2/16**
SURFACE ELEV. (FT) **145.1**

PROJECT NAME **60 Flourtown Road, Plymouth Meeting**
PROJECT LOCATION **Plymouth Township, Montgomery County, PA**
PROJECT NUMBER **29268.00**
INSPECTOR NAME **B. Mosser**
EQUIPMENT USED **Acker Soil XLS Track rig**
DRILLER NAME/COMPANY **Sean W./TRC**
DRILLING METHODS **auto hammer, 6" OD HSA**
AUGER: SIZE: **3.2"** ; AUGER DEPTH: **20.0'** ; WATER: DEPTH: **DRY** TIME: **0.25 hr** DATE: **12/2/2016**
CHECKED BY: ; DATE: DEPTH: **DRY** TIME: **3 hr** DATE: **12/2/2016**
NOT ENCOUNTERED ☐

| DEPTH (FT) | SAMPLE NO./ TYPE/CORE RUN | BLOWS/0.5 FT. ON SAMPLER | RECOVERY (Ft.) | RECOVERY(%) / RQD (%) | USCS / AASHTO | $H_2O$ CONTENT | GRAPHIC LOG | DESCRIPTION (DEPTH / ELEVATION) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | S-1 | 6 17 7 4 | 0.3' | 15 - | cl | m | | 0.2 / 144.9 Asphalt and stone aggregate<br>Silty clay, orange brown to medium brown | |
| 2.0 | S-2 | 24 17 22 38 | 2.0' | 100 - | ml | m | | 2.0 / 143.1 Silt with varying amounts of sand and gravel, light brown to medium brown to orange brown | |
| 4.0 | S-3 | 7 19 13 10 | 1.3' | 65 - | mls | m | | | 4.0': Gravel is mostly quartz, not reactive with HCl |
| 6.0 | S-4 | 11 10 9 13 | 1.7' | 85 - | mls | m | | 6.0 / 139.1 Silty sand with gravel, orange brown, light brown, red | 7.0'-7.5': Light brown silt seam |
| 8.0 | S-5 | 5 5 5 7 | 0.0' | 0 - | | NA | | | |
| 10.0 | | | | | | | | | |
| 13.0 | S-6 | 4 4 4 6 | 2.0' | 100 - | cl | m | | 13.0 / 132.1 Silty clay, orange brown with some black (Decomposed Limestone) | |
| 15.0 | | | | | | | | | |
| 18.0 | S-7 | 7 10 10 10 | 2.0' | 100 - | sm | m | | 19.0 / 126.1 Sand with trace gravel, orange brown<br>20.0 / 125.1 (Decomposed Limestone) | |
| 20.0 | | | | | | | | | |

** D = DRY, M = MOIST, W = WET

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*Geotechnical Engineers & Geologists*

# *BORING LOG*

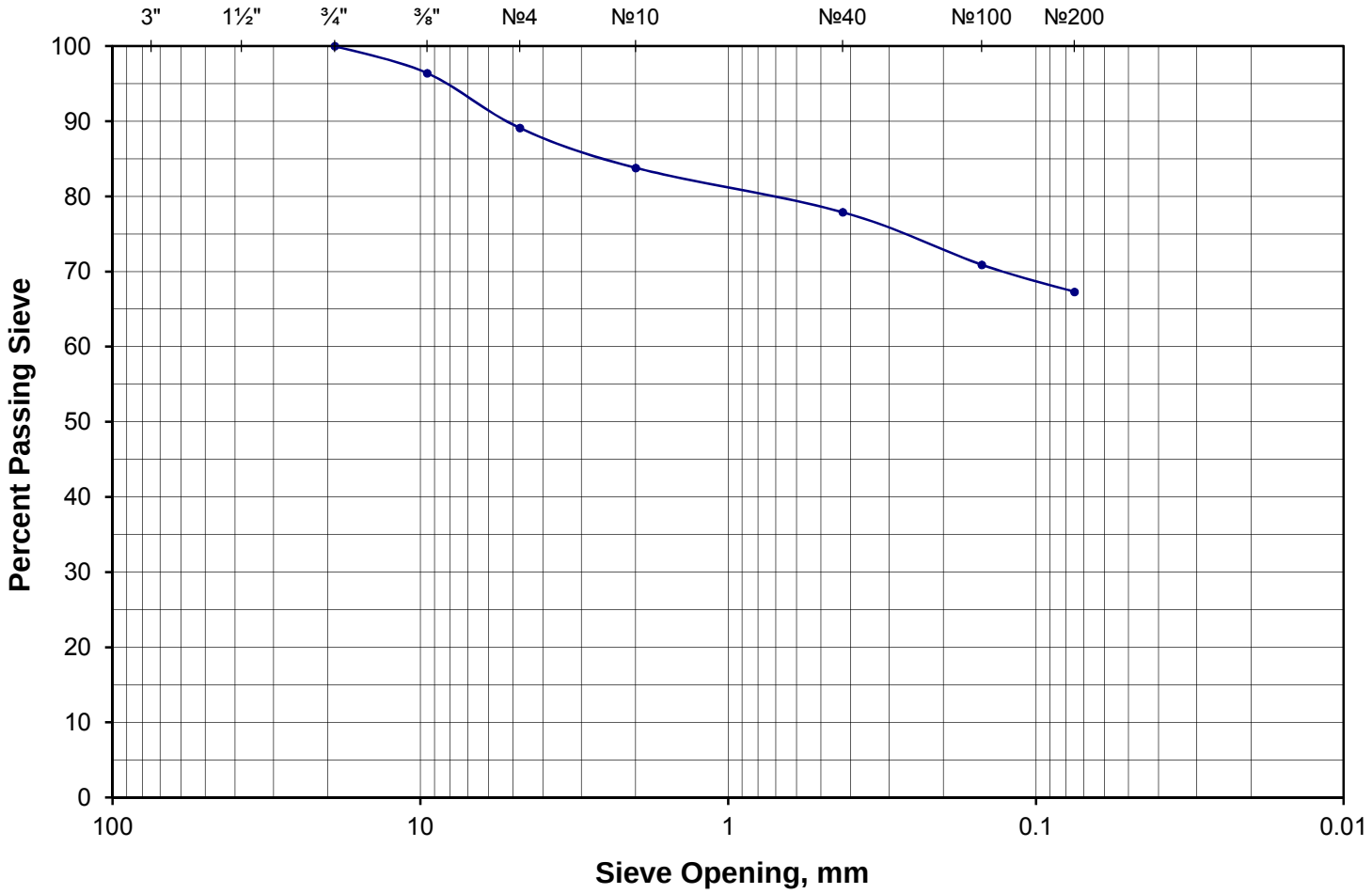
BORING NO. **B-4**
SHEET **1** OF **1**
DATE: START **12/2/16**
END **12/2/16**
SURFACE ELEV. (FT) **143.9**

PROJECT NAME **60 Flourtown Road, Plymouth Meeting**
PROJECT LOCATION **Plymouth Township, Montgomery County, PA**
PROJECT NUMBER **29268.00**
INSPECTOR NAME **B. Mosser**
EQUIPMENT USED **Acker Soil XLS Track rig**
DRILLER NAME/COMPANY **Sean W./TRC**
DRILLING METHODS **auto hammer, 6" OD HSA**
AUGER: SIZE: **3.2"** ; AUGER DEPTH: **26.0'** ; WATER: DEPTH: **DRY** TIME: **0.25 hr** DATE: **12/2/2016**
CHECKED BY: ; DATE: DEPTH: **20.0'** TIME: **1 hr** DATE: **12/2/2016**
NOT ENCOUNTERED ☐

| DEPTH (FT) | SAMPLE NO./ TYPE/CORE RUN | BLOWS/0.5 FT. ON SAMPLER | RECOVERY (Ft.) | RECOVERY(%) / RQD (%) | USCS / AASHTO | $H_2O$ CONTENT | GRAPHIC LOG | DESCRIPTION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | DEPTH ELEVATION | |
| 2.0 | | | | | | | | #4 ballast<br>2.0 141.9 | Auger through ballast to 2.0'. Start sampling at 2.0' |
| 4.0 | S-1 | 29<br>20<br>19<br>17 | 1.0' | 50<br>- | sm | w/m | | Sand with gravel, orange brown to medium brown | 2.0'-4.0': Ponded water at surface |
| 6.0 | S-2 | 9<br>9<br>9<br>8 | 0.4' | 20<br>- | sm | w | | | |
| 8.0 | S-3 | 7<br>7<br>7<br>9 | 0.0' | 0<br>- | | NA | | 8.0 135.9 | |
| 10.0 | S-4 | 8<br>8<br>15<br>13 | 0.2' | 10<br>- | sm | m | | Sand with trace gravel and clay, orange brown to medium brown | |
| 13.0 | | | | | | | | 13.0 130.9 | |
| 15.0 | S-5 | 5<br>6<br>5<br>6 | 1.5' | 75<br>- | ml | m | | Sandy silt with clay and trace gravel, medium brown to orange brown | |
| 18.0 | | | | | | | | 18.0 125.9 | |
| 20.0 | S-6 | 1<br>1<br>1<br>2 | 0.1' | 5<br>- | sm | m | | Silty sand, orange brown (Decomposed Limestone) | 18.0': Inside of spoon is wet |
| 22.0 | S-7 | WOH<br>4<br>3<br>2 | 0.0' | 0<br>- | | NA | | 22.0 121.9 | 20.0': White to orange brown in color |
| 24.0 | S-8 | 1<br>2<br>2<br>1 | 1.5' | 75<br>- | cl | m | | Silty clay, dark brown (Decomposed Limestone)<br>23.8 120.1 | |
| 26.0 | S-9 | 3<br>5<br>6<br>6 | 1.7' | 85<br>- | ml | m | | Sandy silt, dark brown to orange brown (Decomposed Limestone)<br>26.0 117.9 | |

** D = DRY, M = MOIST, W = WET

# Particle Size Analysis of Soils




**As-rec'd water content:** 19.0 moist **Odor:** NR

**% Gravel:** 10.9 **Coarse:** 0.0 **Fine:** 10.9

**% Sand:** 21.8 **Coarse:** 5.3 **Medium:** 5.9 **Fine:** 10.6

**Gravel description:** red-brown, subangular to angular

**Sand description:** red-brown, subangular to subrounded

**Consistency:** firm **Hardness:** soft

**Cementation:** moderate **Dry Strength:** medium

**Structure:** homogeneous **Dilatency:** slow

**Reaction to HCl:** NR **Toughness:** medium

**USCS Classification:** CL, sandy lean clay

**AASHTO Classification:** A-6

**Project:** 29268.00 - 60 Flourtown Rd.

**Client:**

**Sample:** B-3, S-1; B-1, S-3

**Depth:** 0'-2' and 4'-6'

**Description:** Brown sandy lean clay

| Particle Size | | | | |
|---|---|---|---|---|
| US Standard Sieve Size | | | Diameter, | % Finer |
| GRAVEL | Coarse | 3" | 75 | |
| | | 1½" | 38.1 | |
| | | ¾" | 19.0 | 100.0 |
| | Fine | ⅜" | 9.5 | 96.4 |
| | | № 4 | 4.75 | 89.1 |
| SAND | Coarse | № 10 | 2.00 | 83.8 |
| | Medium | № 40 | 0.425 | 77.9 |
| | Fine | № 100 | 0.150 | 70.9 |
| | | № 200 | 0.075 | 67.3 |
| Hydrometer Analysis | | Clay Size | 0.005 | NR |
| | | Colloids | 0.001 | NR |

| | | | |
|---|---|---|---|
| **$G_s$:** NR | **$C_u$:** N/A | **$C_c$:** N/A | |
| **LL:** 39 | **PL:** 25 | **PI:** 14 | |

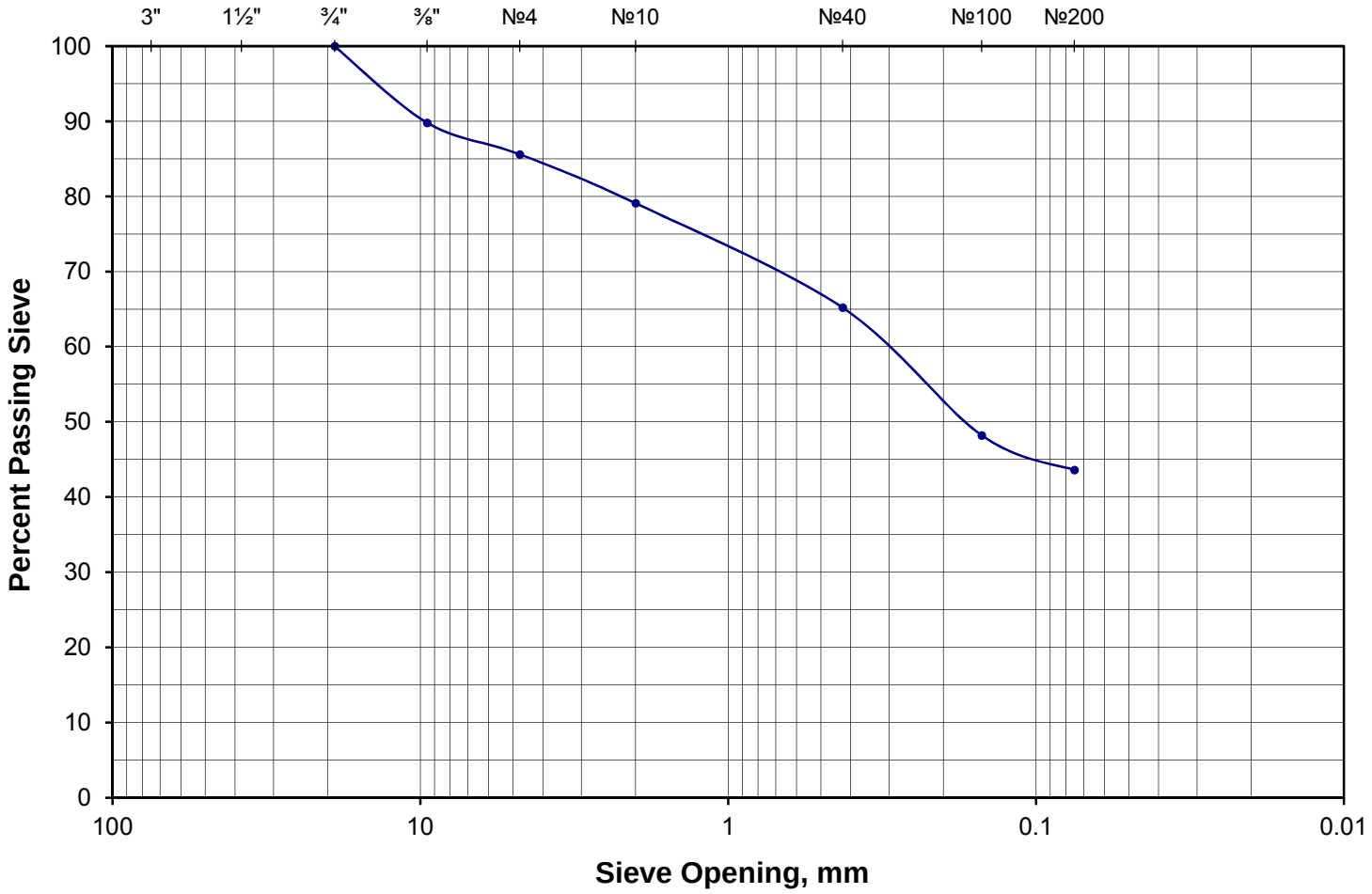

EARTH ENGINEERING INCORPORATED
*Geotechnical Engineers & Geologists*
5010 Ritter Road, Suite 116
Mechanicsburg, PA 17055
*tel* 717-697-5701 *fax* 717-697-5702

Corporate Headquarters 610-277-0880
Southern NJ 856-768-1001
Lehigh Valley 610-967-4540


**Remarks:** **Stratum I**

**Classification of Soils, ASTM D 2487-00 / D 2488-00**

# Particle Size Analysis of Soils




**As-rec'd water content:** 20.8 moist **Odor:** NR

**% Gravel:** 14.4 **Coarse:** 0.0 **Fine:** 14.4

**% Sand:** 42.0 **Coarse:** 6.5 **Medium:** 13.9 **Fine:** 21.6

**Gravel description:** red-brown, subangular to angular

**Sand description:** red-brown, subangular to subrounded

**Consistency:** soft **Hardness:** soft

**Cementation:** weak **Dry Strength:** medium

**Structure:** homogeneous **Dilatency:** slow

**Reaction to HCl:** NR **Toughness:** medium

**USCS Classification:** SM, silty sand

**AASHTO Classification:** A-4

**Project:** 29268.00 - 60 Flourtown Rd.

**Client:**

**Sample:** B-4 S-2 S-4

**Depth:** 4'-6' and 8'-10'

**Description:** Brown silty sand with gravel

**Particle Size**

| US Standard Sieve Size | | | Diameter, | % Finer |
|---|---|---|---|---|
| GRAVEL | Coarse | 3" | 75 | |
| | | 1½" | 38.1 | |
| | | ¾" | 19.0 | 100.0 |
| | Fine | ⅜" | 9.5 | 89.8 |
| | | № 4 | 4.75 | 85.6 |
| SAND | Coarse | № 10 | 2.00 | 79.1 |
| | Medium | № 40 | 0.425 | 65.2 |
| | Fine | № 100 | 0.150 | 48.2 |
| | | № 200 | 0.075 | 43.6 |
| Hydrometer Analysis | | Clay Size | 0.005 | NR |
| | | Colloids | 0.001 | NR |

**$G_s$:** NR **$C_u$:** N/A **$C_c$:** N/A

**LL:** NP **PL:** NP **PI:** NP


EARTH ENGINEERING INCORPORATED
*Geotechnical Engineers & Geologists*
5010 Ritter Road, Suite 116
Mechanicsburg, PA 17055
*tel* 717-697-5701 *fax* 717-697-5702

Corporate Headquarters 610-277-0880
Southern NJ 856-768-1001
Lehigh Valley 610-967-4540


**Remarks:** **Stratum II**

**Classification of Soils, ASTM D 2487-00 / D 2488-00**

# *60 FLOURTOWN ROAD*

## *POST-CONSTRUCTION STORMWATER MANAGEMENT REPORT*

***PREPARED FOR:***

***Flourtown Road***
*c/o Glen Van Eerden*
*343 Militia Hill Road*
*Fort Washington, PA 19034*

***PREPARED BY:***

***Woodrow & Associates, Inc.***
*1108 North Bethlehem Pike, Suite 5*
*Lower Gwynedd, PA 19002*
*Phone: (215) 542-5648*

***PROJECT No. 15-0415-D***

***DATE: MAY 2016***

# ***60 Flourtown Road***
# ***Post-Construction Stormwater Management Report***
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***Section A:*** ***Narrative***

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***b. Post-development Areas***

- ***Post Development By-pass Subarea 'A'***
- ***Post Development Basin Area 'A'***

***Section D:*** ***Stormwater Management Design***

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***b. 1 through100-year Storm Design***

***Section E:*** ***100-year Storm Sewer Design Calculations***

***a. Haestad StormCAD 100-year Storm Analysis***

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# ***Section A:***

## *a. Narrative:*

# 60 FLOURTOWN ROAD
# POST-CONSTRUCTION STORMWATER MANAGEMENT REPORT NARRATIVE

## Project Description

The applicant, 60 Flourtown Road LLC, is proposing the development of a tract of land located on the southwestern side of the Railroad Crossing Bridge on Flourtown Road situate in Whitemarsh Township, Montgomery County, Pennsylvania. The project site, located on a 4.8724 acre parcel, will consist of a new 8,000 s.f. storage facility, an access drive and parking area to service the site and an underground impervious lined detention facility to regulate post construction flows to predevelopment runoff rates.

In addition to the above mentioned, a storm sewer system collection system has been designed to convey flows to the proposed underground detention facility shown on these plans.

The site will be served by both public sewer and water from the appropriate authorities. A grinder pump and low pressure force main will be installed to accommodate sewage generated from the site where it will be ran through conduit previously installed in conjunction with the raising of the bridge.

## Existing Conditions

The majority of the subject parcel in its existing condition is meadow and heavily wooded in some areas of the site. The site consists of a large ban of steep slopes as shown on the overall Existing Features Plan totaling roughly 48% of the site area as noted on the Land Development Plan. These steep slopes are located in the most portion of the site and will not be impacted by proposed development.

The subject parcel topographically falls south to north across the site from the formerly Plymouth Branch of Reading Company abandoned railroad right of way. Where it is collected by a swale and culvert located on the north western portion of the site in the vicinity of the Railroad Brdige Crossing.

Existing utilities consist of a septic field and well water service.

## Soils within the analyzed watershed area

Watershed soils consist of the following:

| | | |
|---|---|---|
| LeA | Lawrenceville silt loam | 0 to 3 percent slopes |
| UgB | Urban Land | 0 to 8 percent slopes |
| UudB | Udorthents Limestone Complex | 0 to 8 percent slopes |

On-site soils indicated above are taken from the USDA NRCS Web Soil Survey conducted during the month of May 2016.

**Soils Resolutions**

**Winter Grading –** Contractor to ensure proper stabilization. Methods to include, seeding and mulching at the recommended rates and where necessary the placement of an approved erosion control blanket.

**Road Fill –** Contractor to ensure all fill used for roadway construction is placed and compacted in appropriate lifts. Should material not be suitable for roadway construction the contractor may import suitable material from an area within the permitted area.

**Topsoil –** Contractor to ensure proper stabilization. Methods to include, seeding and mulching at the recommended rates and where necessary the placement of an approved erosion control blanket.

Contractor shall consider soils testing to ensure topsoil is suitable to produce and sustain proper growth. Should the topsoil be lacking of the nutrients to produce growth the contractor shall consider applying lime and/or fertilizers at the rates recommended by the project landscape consultant and/or M.C.C.D.

Topsoil may be imported from an area within the permitted area proven to be suitable.

**Ponds, Dikes and Levees Embankments –** Contractor to ensure all fill used for basin embankment construction is places and compacted in appropriate lifts. Should material not be suitable for basin construction the contractor may import suitable material from an area within the permitted area.

Contractor to ensure proper stabilization. Methods to include, seeding and mulching at the recommended rates and where necessary the placement of an approved erosion control blanket.

**Terraces, diversions and waterways –** Contractor to ensure all earthwork associated with swales, diversion berms and/or watercourses is adequately stabilized with an approved erosion and sediment control blanket and/or seeding and mulching applied at the recommended rates.

Should erosion continue the contractor shall consult the design engineer, the M.C.C.D. and take appropriate measures to correct the problems. Corrective measure may include but are not limited to the following:
Additional seeding and mulching, the placement of sod, armoring the channel with a stronger stabilization blanket, or the placement of rip-rap.

**Proposed Conditions**

As mentioned above, the applicant, 60 Flourtown Road LLC, is proposing the development of a tract of land located on the southwestern side of the Railroad Crossing Bridge on Flourtown Road situate in Whitemarsh Township, Montgomery County, Pennsylvania. The project site, located on a 4.8724 acre parcel, will consist of a new 8,000 s.f. storage facility, an access drive and parking area to service the site and an underground impervious lined detention facility to regulate post construction flows to predevelopment runoff rates.

In addition to the above mentioned, a storm sewer system collection system has been designed to convey flows to the proposed underground detention facility shown on these plans.

The site will be served by both public sewer and water from the appropriate authorities. A grinder pump and low pressure force main will be installed to accommodate sewage generated from the site where it will be ran through conduit previously installed in conjunction with the raising of the bridge.

Per Pennsylvania Department of Environmental Protection requirements, the proposed project shall:

- Preserve the integrity of stream channels and maintain and protect the physical, biological, and chemical qualities of the receiving stream.
- Prevent an increase in the rate of stormwater runoff to the greatest extent possible.
- Minimize any potential increase in stormwater runoff volume to the greatest extent possible.
- Minimize impervious areas to the greatest extent possible.
- Maximize the protection of existing drainage features and existing vegetation to the greatest extent possible.
- Minimize land clearing and grading to the greatest extent possible.
- Minimize soil compaction to the greatest extent possible.
- Outline the appropriate control measures to prevent and/or minimize the generation of increased stormwater runoff.

The use of the above outlined BMP's shall also help slow and cool runoff, decreasing the possibility of any adverse thermal impacts to offsite waters.

**Design Methodology**

The Post-Construction Stormwater Management Plan has been designed by the staff of Woodrow & Associates, Inc. under the direction of Timothy P. Woodrow, P.E.. Mr. Woodrow is a graduate of Penn State where he received a B.S. degree in Civil Engineering. Mr. Woodrow has attended several Department of Environmental Protection and Conservation District Workshops and Seminars. This plan has been prepared in accordance with all applicable Chapter 102 and PA-DEP Best Management Practices standards and specification for controlling stormwater runoff.

The Whitemarsh Township Subdivision and Land Development Ordinance was reviewed for applicable sections for Storm Water Management. Through the review of the above mentioned Ordinance, it was determined that it would be necessary to control the 1 thru 100 year Storm events to their respective predevelopment rates. The Storm Water Management Report for this project was prepared using the DeKalb Method within the Hydroflow2007 program.

A drainage area of 1.2021 acres was analyzed both in Predevelopment and Post Development conditions. All areas of impervious surface will be captured, managed and released at a rate less than the Predevelopment rates. All Post Development runoff generated as part of this design is captured and conveyed to the proposed underground system as shown on these plans through a proposed collection system, and roof leader collection system.

**Summary and Conclusions**

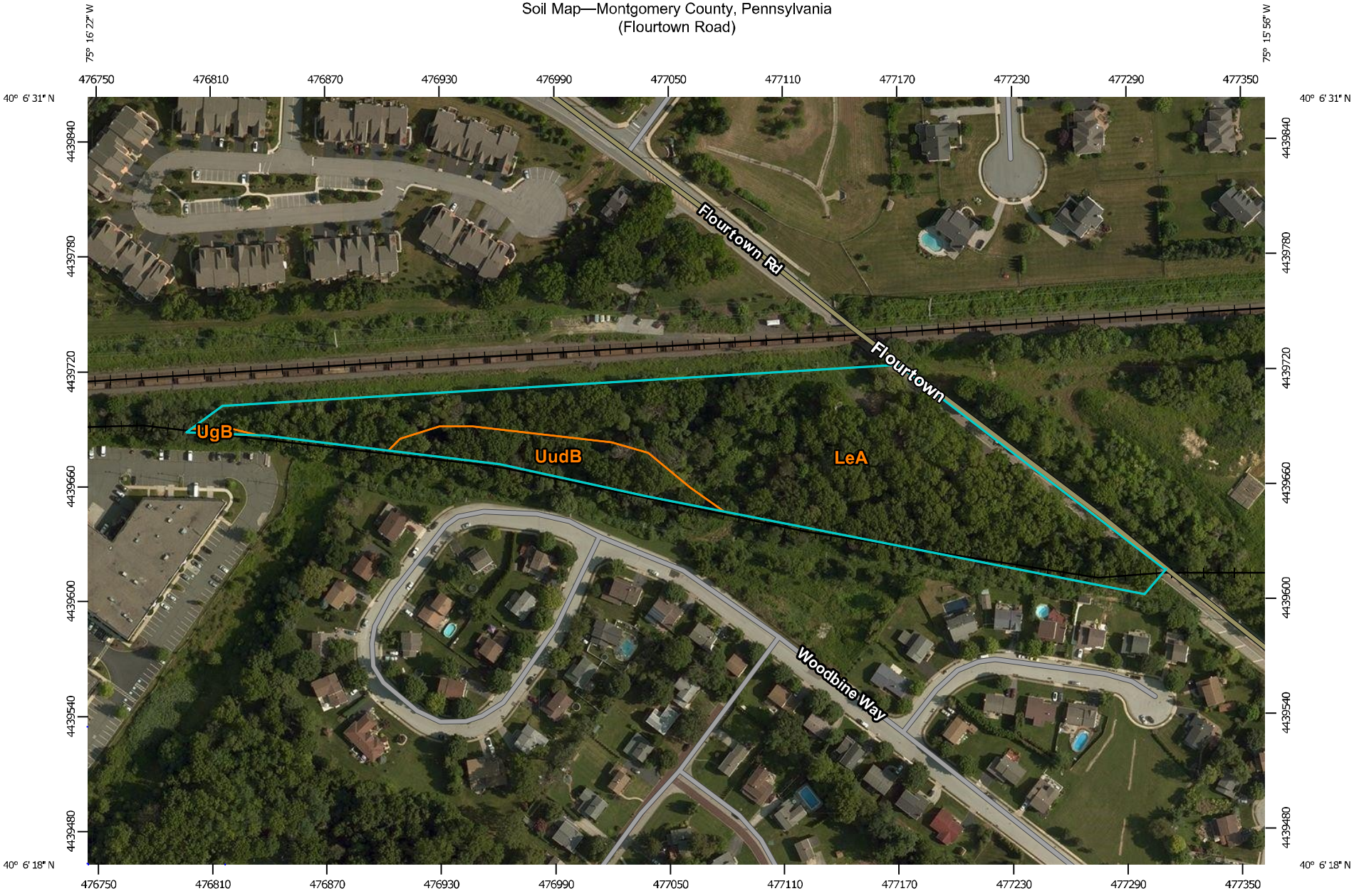
Hydrologic and hydraulic calculations and analysis were performed as required to ensure that the proposed development design is in conformance with Whitemarsh Township design criteria and standard engineering practice. The performed analysis appears in the following sections of this report; from which the following can be asserted:

1. The construction of the proposed underground basin system will perform as required to capture and retain the increase in the 100-year storm event.

In conclusion, from a Storm Water Management perspective, the proposed development can be constructed without any adverse impact to adjoining and downstream properties.

## *b. Soils Map/Report of Site:*

Soil Map—Montgomery County, Pennsylvania
(Flourtown Road)




Map Scale: 1:2,820 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 40 80 160 240

Feet
0 100 200 400 600

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

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil 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 1:12,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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: Montgomery County, Pennsylvania
Survey Area Data: Version 7, Sep 19, 2014

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

Date(s) aerial images were photographed: Jul 17, 2014—Aug 14, 2014

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

# Map Unit Legend

| Montgomery County, Pennsylvania (PA091) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| LeA | Lawrenceville silt loam, 0 to 3 percent slopes | 5.6 | 88.3% |
| UgB | Urban land, 0 to 8 percent slopes | 0.0 | 0.3% |
| UudB | Urban land-Udorthents, limestone complex, 0 to 8 percent slopes | 0.7 | 11.4% |
| **Totals for Area of Interest** | | **6.4** | **100.0%** |

# ***Section B:***

# ***Summary of Peak Flows:***

***60 Flourtown Road***
***Summary of Peak Flows***

***Predevelopment:***

| ***Storm Year:*** | ***Sub-area 'A'*** ***c.f.s.*** | ***Total Site*** ***c.f.s.*** |
|---|---|---|
| ***1*** | *0.419* | *0.419* |
| ***2*** | *0.740* | *0.740* |
| ***10*** | *1.042* | *1.042* |
| ***25*** | *1.227* | *1.227* |
| ***50*** | *1.385* | *1.385* |
| ***100*** | *1.637* | *1.637* |

***Post Development By-pass:***

| | | |
|---|---|---|
| ***1*** | *0.217* | *0.217* |
| ***2*** | *0.332* | *0.332* |
| ***10*** | *0.433* | *0.433* |
| ***25*** | *0.493* | *0.493* |
| ***50*** | *0.549* | *0.549* |
| ***100*** | *0.607* | *0.607* |

***Maximum Allowable Discharge:***

| | |
|---|---|
| ***1*** | *0.202* |
| ***2*** | *0.408* |
| ***10*** | *0.609* |
| ***25*** | *0.734* |
| ***50*** | *0.836* |
| ***100*** | *1.030* |

***Actual Routed Basin Outflow:***

| | ***Basin 'A'*** | ***Total*** |
|---|---|---|
| ***1*** | *0.182* | *0.18* |
| ***2*** | *0.359* | *0.36* |
| ***10*** | *0.575* | *0.58* |
| ***25*** | *0.682* | *0.68* |
| ***50*** | *0.758* | *0.76* |
| ***100*** | *0.871* | *0.87* |

***Net Reduction:***

| | | |
|---|---|---|
| ***1*** | *0.020* | *0.02* |
| ***2*** | *0.049* | *0.05* |
| ***10*** | *0.034* | *0.03* |
| ***25*** | *0.052* | *0.05* |
| ***50*** | *0.078* | *0.08* |
| ***100*** | *0.159* | *0.16* |

# ***Section C:***

# ***Weighted Runoff & Time of Concentration Calculations:***

## *a. Predevelopment:*

***Project Name: 60 Flourtown Road***
***Project Number: 15-0415-D***
***Project Location: Whitemarsh Township***

## *Runoff Coefficient Calculations for Rational Method*

***Drainage Area/Subarea identification:*** *Predevelopment Subarea 'A'*

| ***Ground Cover*** | ***Coefficient ( A )*** | ***Area in Acres ( B )*** | ***Sum ( C )*** |
|---|---|---|---|
| *On-site:* | | | |
| *Meadow* | *0.25* | *2.4156* | *0.6039* |
| | | | |
| *Offsite:* | | | |
| | | | |
| *Offsite Roadway* | *0.90* | *0.0223* | *0.02007* |
| | | | |
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| | | | |
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| | | | |
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| | | | |
| | | | |
| | | | |
| | ***Totals:*** | *2.4379* | *0.62397* |

$$Wc = \frac{(C)}{(B)} \quad or \quad \frac{0.62397}{2.4379} \quad \mathbf{0.2559}$$

*Use weighted Coefficient of :* ***0.26***

Project Name: Van Eerden Coatings By: R.J.J. Date: 10/5/2015

Project Location: Whitemarsh Township Chkd: Date:

Circle One: **Present** Developed — Predevelopment Subarea 'A'

Circle One: **Tc** Tt through Subarea

***Sheet flow*** (Applicable to Tc only)

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Segment ID | | A-B | | |
| 1) | Surface Description | | | Wooded | | |
| 2) | Manning's roughness coeff., **n** | | | 0.40 | | |
| 3) | Flow Length, **L** (Total $\leq$ 150 ft.) | | ft. | 145 | | |
| 4) | Two-yr, 24 hr. rainfall, $P_2$ | | in. | 3.3 | | |
| 5) | Land Slope, **s** | | ft/ft | 0.0361 | | |
| 6) | $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ | Compute $T_t$ | hr. | 0.375 | | 0.375 |

***Shallow Concentrated Flow***

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Segment ID | | | | |
| 7) | Surface description (paved or unpaved) | | | | | |
| 8) | Flow length, **L** | | ft. | | | |
| 9) | Watercourse slope, **s** | | ft/ft | | | |
| 10) | Average velocity, **V** | | ft/s | | 0.000 | |
| 11) | $T_t = \frac{L}{3600\ V}$ | Compute $T_t$ | hr. | | | 0.000 |

***Channel Flow***

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Segment ID | | n/a | | |
| 12) | Cross sectional flow area, **a** | | $ft^2$ | | | |
| 13) | Wetted perimeter, $p_w$ | | ft | | | |
| 14) | Hydraulic radius, r = a/ pw | Compute **r** | ft | | | |
| 15) | Channel slope, **s** | | ft/ft | | | |
| 16) | Manning's roughness coeff., **n** | | | | | |
| 17) | $V = 1.49\ r^{2/3}\ s^{1/2}/n$ | | ft/s | | | |
| 18) | Flow Length, **L** | | ft/s | | | |
| 19) | $T_t = L / (3600\ V)$ | Compute $T_t$ | hr | | | 0.000 |
| 20) | Watershed or subarea $T_c$ or $T_t$ ( Add 6 + 11 + 19) | | | | hr. | **0.375** |
| | | | | | min. | 22.48 |

***Note:*** Say Tc = 22.5 Minutes.

## *b. Post-development Areas:*

***Project Name: 60 Flourtown Road***
***Project Number: 15-0415-D***
***Project Location: Whitemarsh Township***

## *Runoff Coefficient Calculations for Rational Method*

***Drainage Area/Subarea identification:*** *Post Dev. By-pass Subarea 'A'*

| ***Ground Cover*** | ***Coefficient ( A )*** | ***Area in Acres ( B )*** | ***Sum ( C )*** |
|---|---|---|---|
| *On-site:* | | | |
| *Lawn* | *0.35* | *0.2167* | *0.075845* |
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| | | | |
| | ***Totals:*** | *0.2167* | *0.075845* |

*Wc =* $\frac{(C)}{(B)}$ *or* $\frac{0.075845}{0.2167}$ ***0.3500***

*Use weighted Coefficient of :* ***0.35***

Project Name: Van Eerden Coatings By: R.J.J. Date: 10/5/2015

Project Location: Whitemarsh Township Chkd: Date:

Circle One: Present **Developed** Post Dev. By-pass Subarea 'A'

Circle One: **Tc** Tt through Subarea

***Sheet flow*** (Applicable to Tc only)

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Segment ID | | | | |
| 1) | Surface Description | | | | | |
| 2) | Manning's roughness coeff., **n** | | | | | |
| 3) | Flow Length, **L** (Total $\leq$ 150 ft.) | ft. | | | | |
| 4) | Two-yr, 24 hr. rainfall, $P_2$ | in. | | | | |
| 5) | Land Slope, **s** | ft/ft | | | | |
| 6) | $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute $T_t$ | hr. | | | | 0.000 |

***Shallow Concentrated Flow***

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Segment ID | | | | |
| 7) | Surface description (paved or unpaved) | | | | | |
| 8) | Flow length, **L** | ft. | | | | |
| 9) | Watercourse slope, **s** | ft/ft | | | | |
| 10) | Average velocity, **V** | ft/s | | | 0.000 | |
| 11) | $T_t = \frac{L}{3600\ V}$ Compute $T_t$ | hr. | | | | 0.000 |

***Channel Flow***

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Segment ID | n/a | | | |
| 12) | Cross sectional flow area, **a** | $ft^2$ | | | | |
| 13) | Wetted perimeter, $p_w$ | ft | | | | |
| 14) | Hydraulic radius, r = a/ pw Compute **r** | ft | | | | |
| 15) | Channel slope, **s** | ft/ft | | | | |
| 16) | Manning's roughness coeff., **n** | | | | | |
| 17) | $V = 1.49\ r^{2/3}\ s^{1/2}/n$ | ft/s | | | | |
| 18) | Flow Length, **L** | ft/s | | | | |
| 19) | $T_t = L / (3600\ V)$ Compute $T_t$ | hr | | | | 0.000 |
| 20) | Watershed or subarea $T_c$ or $T_t$ ( Add 6 + 11 + 19) | | | | hr. | **0.000** |
| | | | | | min. | 0.00 |

***Note:*** Assume 6.0 min. Tc for By-pass Area

***Project Name: 60 Flourtown Road***
***Project Number: 15-0415-D***
***Project Location: Whitemarsh Township***

## *Runoff Coefficient Calculations for Rational Method*

***Drainage Area/Subarea identification:*** *Post Dev. Basin Area 'A'*

| ***Ground Cover*** | ***Coefficient ( A )*** | ***Area in Acres ( B )*** | ***Sum ( C )*** |
|---|---|---|---|
| *On-site:* | | | |
| *Meadow/Wooded* | *0.25* | *0.2167* | *0.0542* |
| *Lawn* | *0.35* | *0.2574* | *0.0901* |
| *Impervious* | *0.90* | *0.4271* | *0.3844* |
| | | | |
| *Offsite:* | | | |
| *Roadway* | *0.90* | *0.0223* | *0.0201* |
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| | | | |
| | ***Totals:*** | *0.9235* | *0.548725* |

*Wc =* $\frac{(C)}{(B)}$ *or* $\frac{0.548725}{0.9235}$ ***0.5942***

*Use weighted Coefficient of :* ***0.59***

Project Name: Van Eerden Coatings By: R.J.J. Date: 10/5/2015

Project Location: Whitemarsh Township Chkd: Date:

Circle One: Present **Developed** Post Dev. Basin Area 'A'

Circle One: **Tc** Tt through Subarea

***Sheet flow*** (Applicable to Tc only)

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Segment ID | A-B | | |
| 1) | Surface Description | | Wooded | | |
| 2) | Manning's roughness coeff., **n** | | 0.4 | | |
| 3) | Flow Length, **L** (Total $\leq$ 150 ft.) | ft. | 110 | | |
| 4) | Two-yr, 24 hr. rainfall, $P_2$ | in. | 3.3 | | |
| 5) | Land Slope, **s** | ft/ft | 0.041 | | |
| 6) | $T_t = \frac{0.007\ (nL)^{0.8}}{P_2^{0.5}\ s^{0.4}}$ Compute $T_t$ | hr. | 0.285 | | 0.285 |

***Shallow Concentrated Flow***

| | | | | | |
|---|---|---|---|---|---|
| | Segment ID | | | | |
| 7) | Surface description (paved or unpaved) | | | | |
| 8) | Flow length, **L** | ft. | | | |
| 9) | Watercourse slope, **s** | ft/ft | | | |
| 10) | Average velocity, **V** | ft/s | 0.000 | 0.000 | |
| 11) | $T_t = \frac{L}{3600\ V}$ Compute $T_t$ | hr. | | | 0.000 |

***Channel Flow***

| | | | | | |
|---|---|---|---|---|---|
| | Segment ID | | n/a | | |
| 12) | Cross sectional flow area, **a** | $ft^2$ | | | |
| 13) | Wetted perimeter, $p_w$ | ft | | | |
| 14) | Hydraulic radius, r = a/ pw Compute **r** | ft | | | |
| 15) | Channel slope, **s** | ft/ft | | | |
| 16) | Manning's roughness coeff., **n** | | | | |
| 17) | $V = 1.49\ r^{2/3}\ s^{1/2}/n$ | ft/s | 5.00 | | |
| 18) | Flow Length, **L** | ft/s | 36 | | |
| 19) | $T_t = L / (3600\ V)$ Compute $T_t$ | hr | 0.002 | | 0.002 |
| 20) | Watershed or subarea $T_c$ or $T_t$ ( Add 6 + 11 + 19) | | | hr. | **0.287** |
| | | | | min. | 17.25 |

***Note:*** Say Tc = 17.0 Minutes.

# ***Section D:***

# ***Stormwater Management Design:***

## *a. Pipe & Stone Volume Computations:*

***Project Name:*** ***60 Flourtown Road***
***Location:*** ***Whitemarsh Township***

## *PIPE & STONE BASIN VOLUME CALCULATION*

***Basin Name:***

| *Elevation:* | *Difference:* | *Pipe Volume:* | *Stone Volume:* | *Total C.F.* |
|---|---|---|---|---|
| *143.55* | *0.00* | *0.00* | *0.00* | *0.00* |
| *143.85* | *0.30* | *232.00* | *476.36* | *708.36* |
| *144.15* | *0.60* | *608.00* | *895.12* | *1503.12* |
| *144.45* | *0.90* | *1020.00* | *1299.48* | *2319.48* |
| *144.75* | *1.20* | *1396.00* | *1718.24* | *3114.24* |
| *145.05* | *1.50* | *1628.00* | *2194.60* | *3822.60* |
| *145.55* | *2.00* | *1628.00* | *3143.20* | *4771.20* |
| *146.55* | *3.00* | *1628.00* | *5040.40* | *6668.40* |

| | |
|---|---|
| ***Trench Length:*** | *186* |
| ***Quanity:*** | *5* |
| ***Pipe Lenth:*** | *180* |
| ***Pipe diameter:*** | *18"* |
| ***Pipe Slope:*** | *0.00%* |
| ***Trench Width:*** | *25.5* |
| ***Stone Voids:*** | *0.4* |

## *b. 1 through 100 Year Storm Design:*

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15-0415d.gpw

Hydraflow Hydrographs by Intelisolve v9.1

Wednesday, May 25, 2016


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# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

| 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 | Dekalb | 0.419 | 1 | 110 | 1,155 | ---- | ------ | ------ | Predevelopment Subarea 'A' |
| 2 | Dekalb | 0.217 | 1 | 30 | 234 | ---- | ------ | ------ | Post Dev. By-pass Subarea 'A' |
| 3 | Dekalb | 0.914 | 1 | 85 | 2,789 | ---- | ------ | ------ | Post Dev. Basin Area 'A' |
| 5 | Reservoir | 0.182 | 1 | 134 | 2,755 | 3 | 144.27 | 1,818 | U.B. 'A' Routings |

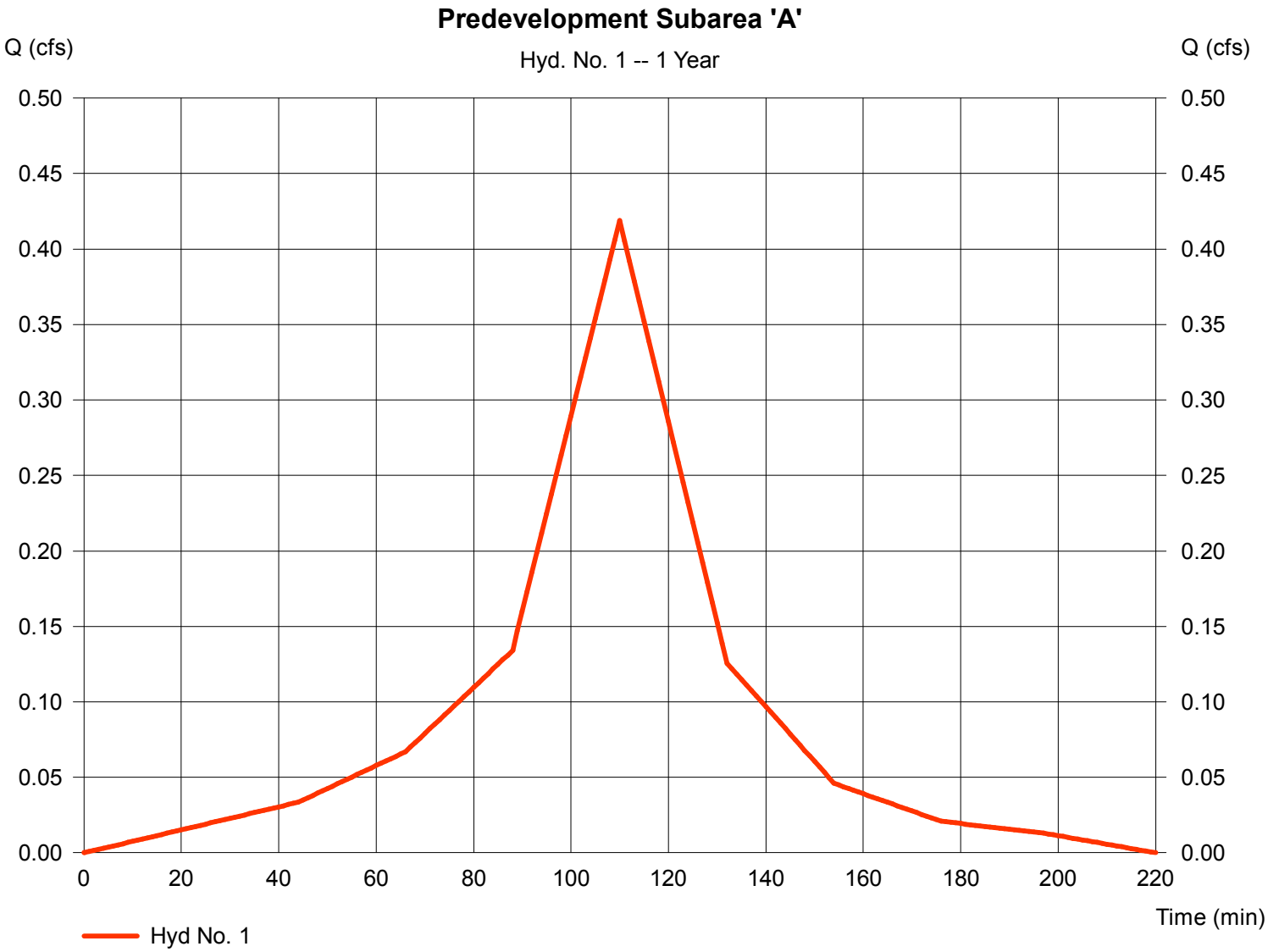
# Hydrograph Report



## Hyd. No. 1

Predevelopment Subarea 'A'

| | | | |
|---|---|---|---|
| Hydrograph type | = Dekalb | Peak discharge | = 0.419 cfs |
| Storm frequency | = 1 yrs | Time to peak | = 110 min |
| Time interval | = 1 min | Hyd. volume | = 1,155 cuft |
| Drainage area | = 1.202 ac | Runoff coeff. | = 0.26 |
| Intensity | = 1.340 in/hr | Tc by User | = 22.00 min |
| IDF Curve | = PennDOTRegion5.idf | Asc/Rec limb fact | = n/a |



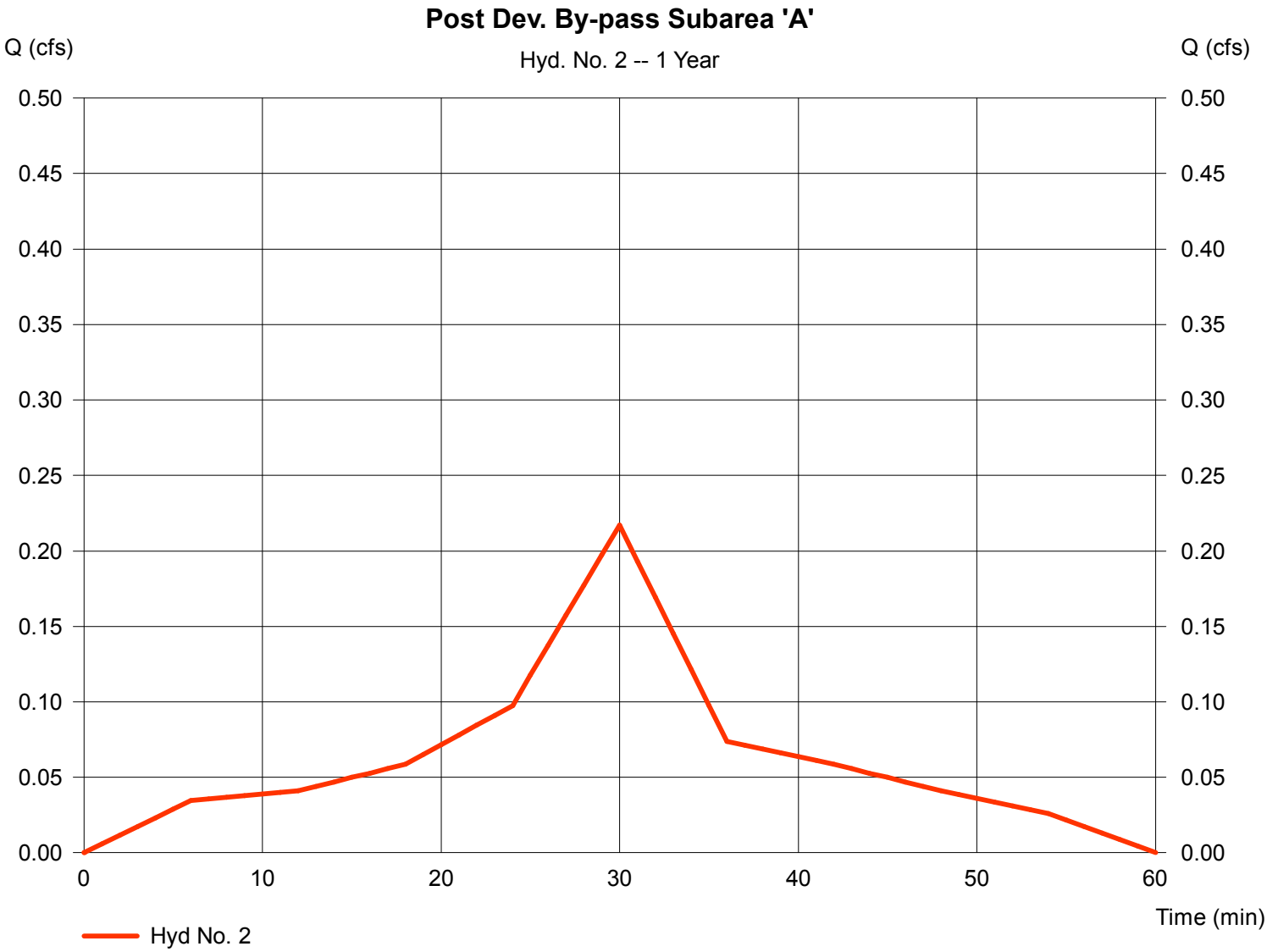
# Hydrograph Report



## Hyd. No. 2

Post Dev. By-pass Subarea 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 0.217 cfs |
| Storm frequency | = | 1 yrs | Time to peak | = | 30 min |
| Time interval | = | 1 min | Hyd. volume | = | 234 cuft |
| Drainage area | = | 0.217 ac | Runoff coeff. | = | 0.35 |
| Intensity | = | 2.861 in/hr | Tc by User | = | 6.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



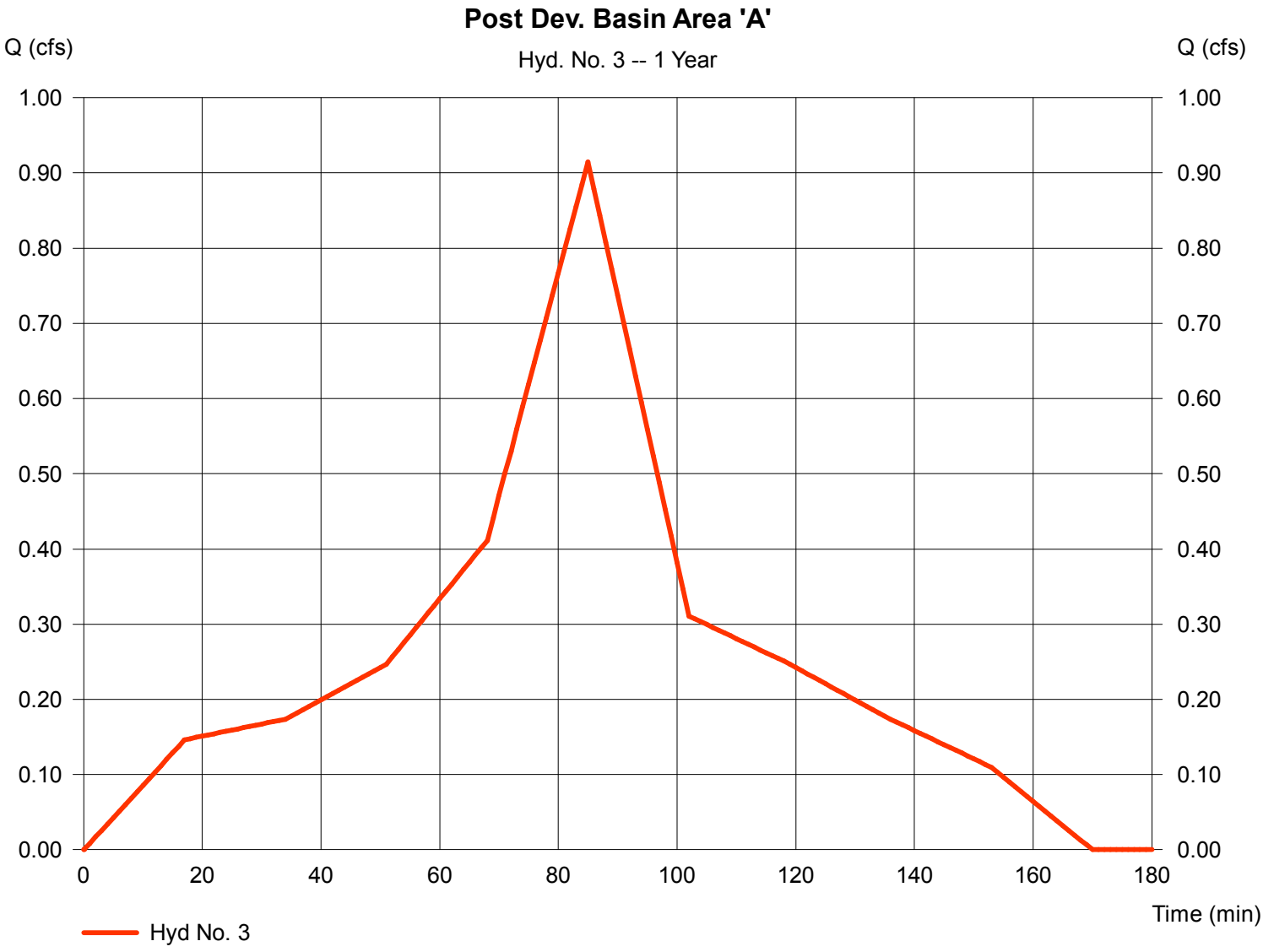
# Hydrograph Report



## Hyd. No. 3

Post Dev. Basin Area 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 0.914 cfs |
| Storm frequency | = | 1 yrs | Time to peak | = | 85 min |
| Time interval | = | 1 min | Hyd. volume | = | 2,789 cuft |
| Drainage area | = | 0.985 ac | Runoff coeff. | = | 0.59 |
| Intensity | = | 1.573 in/hr | Tc by User | = | 17.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



# Hydrograph Report

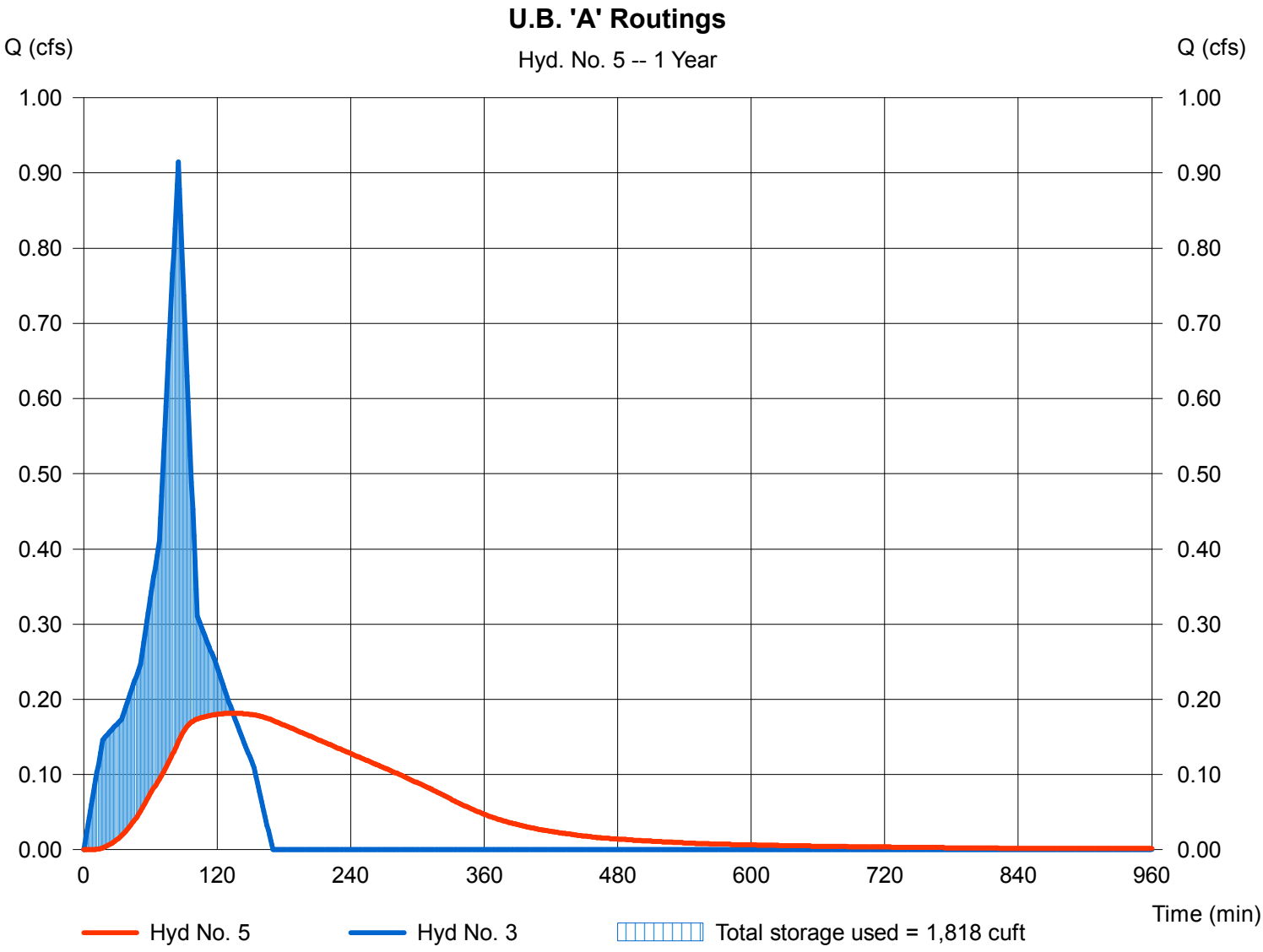


## Hyd. No. 5

U.B. 'A' Routings

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 0.182 cfs |
| Storm frequency | = | 1 yrs | Time to peak | = | 134 min |
| Time interval | = | 1 min | Hyd. volume | = | 2,755 cuft |
| Inflow hyd. No. | = | 3 - Post Dev. Basin Area 'A' | Max. Elevation | = | 144.27 ft |
| Reservoir name | = | Underground Basin 'A' | Max. Storage | = | 1,818 cuft |

Storage Indication method used.



## Pond No. 3 - Underground Basin 'A'

### Pond Data

**Pond storage is based on user-defined values.**

### Stage / Storage Table

| Stage (ft) | Elevation (ft) | Contour area (sqft) | Incr. Storage (cuft) | Total storage (cuft) |
|---|---|---|---|---|
| 0.00 | 143.55 | n/a | 0 | 0 |
| 0.30 | 143.85 | n/a | 708 | 708 |
| 0.60 | 144.15 | n/a | 795 | 1,503 |
| 0.90 | 144.45 | n/a | 816 | 2,319 |
| 1.20 | 144.75 | n/a | 795 | 3,114 |
| 1.50 | 145.05 | n/a | 708 | 3,823 |
| 2.00 | 145.55 | n/a | 949 | 4,771 |
| 3.00 | 146.55 | n/a | 1,897 | 6,668 |

### Culvert / Orifice Structures

| | [A] | [B] | [C] | [PrfRsr] |
|---|---|---|---|---|
| **Rise (in)** | = 12.00 | 3.00 | 3.75 | 0.00 |
| **Span (in)** | = 12.00 | 3.00 | 3.75 | 0.00 |
| **No. Barrels** | = 1 | 1 | 1 | 0 |
| **Invert El. (ft)** | = 142.64 | 143.55 | 144.50 | 0.00 |
| **Length (ft)** | = 175.00 | 0.00 | 0.00 | 0.00 |
| **Slope (%)** | = 0.50 | 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 | Yes | No |

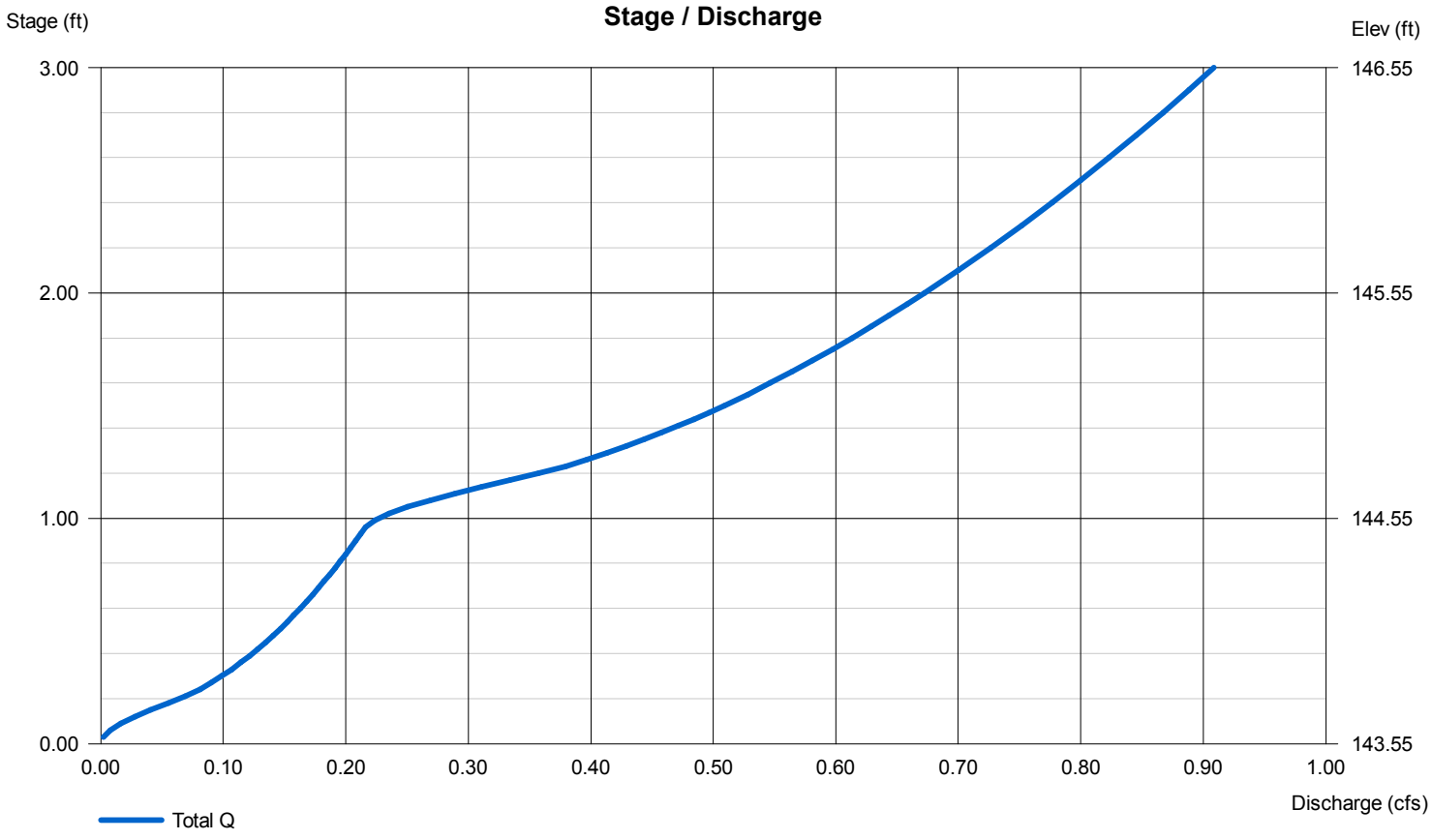
### Weir Structures

| | [A] | [B] | [C] | [D] |
|---|---|---|---|---|
| **Crest Len (ft)** | = 0.00 | 0.00 | 0.00 | 0.00 |
| **Crest El. (ft)** | = 0.00 | 0.00 | 0.00 | 0.00 |
| **Weir Coeff.** | = 3.33 | 3.33 | 3.33 | 3.33 |
| **Weir Type** | = --- | --- | --- | --- |
| **Multi-Stage** | = No | No | No | No |

**Exfil.(in/hr)** = 0.000 (by Wet area)

**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).



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

| 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 | Dekalb | 0.740 | 1 | 110 | 2,041 | ---- | ------ | ------ | Predevelopment Subarea 'A' |
| 2 | Dekalb | 0.332 | 1 | 30 | 357 | ---- | ------ | ------ | Post Dev. By-pass Subarea 'A' |
| 3 | Dekalb | 1.575 | 1 | 85 | 4,803 | ---- | ------ | ------ | Post Dev. Basin Area 'A' |
| 5 | Reservoir | 0.359 | 1 | 128 | 4,769 | 3 | 144.75 | 3,121 | U.B. 'A' Routings |

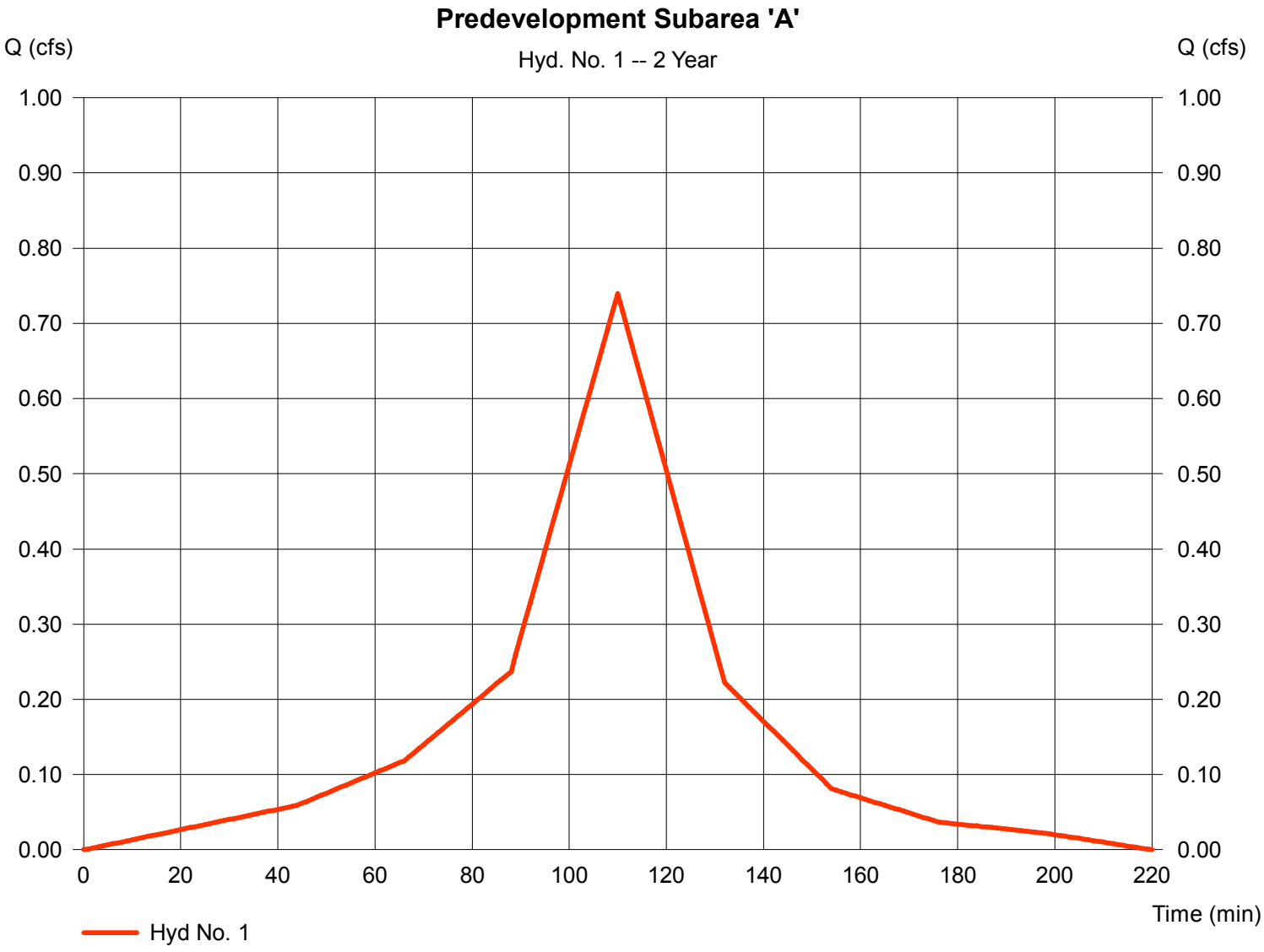
# Hydrograph Report



## Hyd. No. 1

Predevelopment Subarea 'A'

| | | | |
|---|---|---|---|
| Hydrograph type | = Dekalb | Peak discharge | = 0.740 cfs |
| Storm frequency | = 2 yrs | Time to peak | = 110 min |
| Time interval | = 1 min | Hyd. volume | = 2,041 cuft |
| Drainage area | = 1.202 ac | Runoff coeff. | = 0.26 |
| Intensity | = 2.367 in/hr | Tc by User | = 22.00 min |
| IDF Curve | = PennDOTRegion5.idf | Asc/Rec limb fact | = n/a |



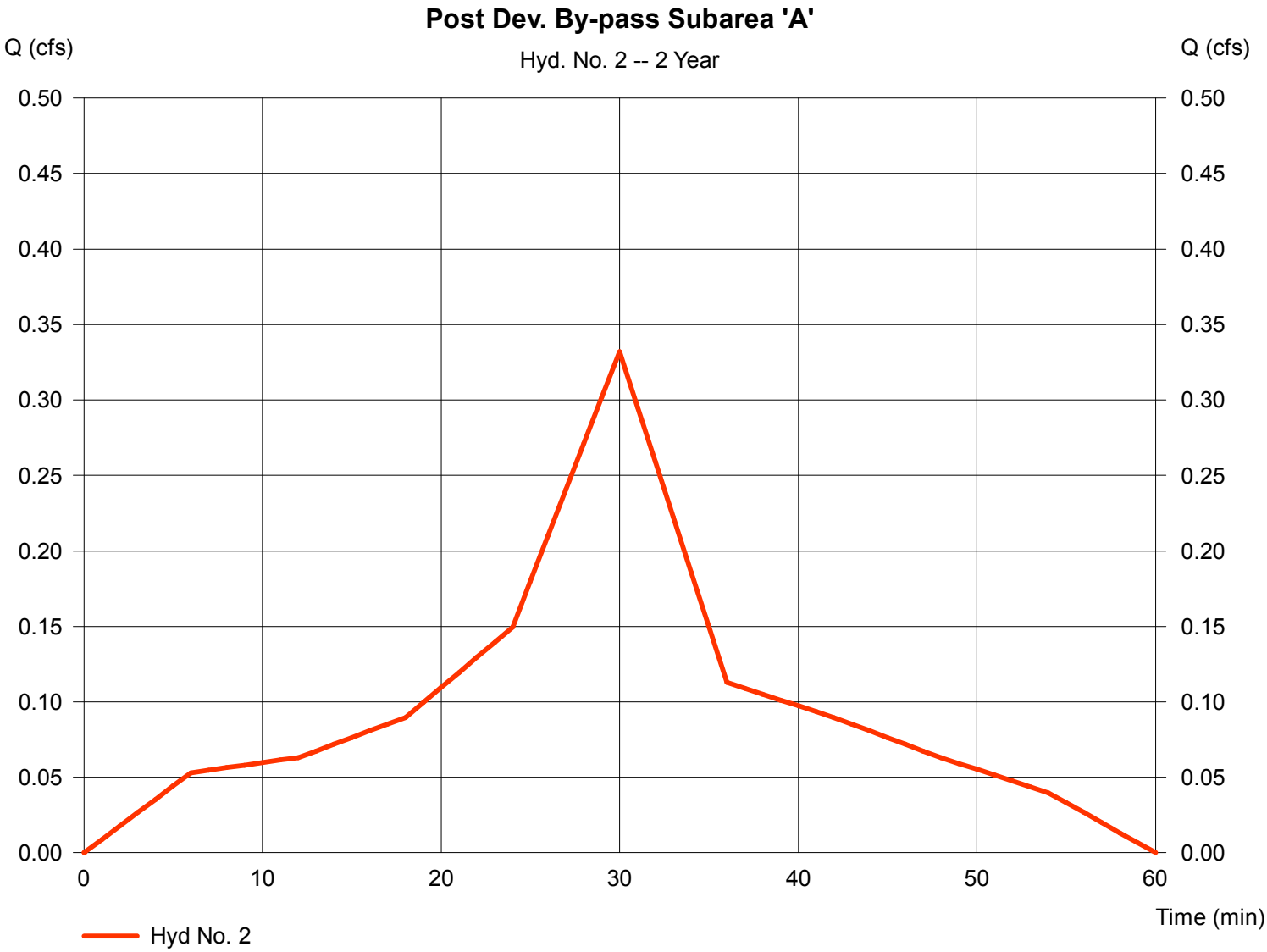
# Hydrograph Report



## Hyd. No. 2

Post Dev. By-pass Subarea 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 0.332 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 30 min |
| Time interval | = | 1 min | Hyd. volume | = | 357 cuft |
| Drainage area | = | 0.217 ac | Runoff coeff. | = | 0.35 |
| Intensity | = | 4.378 in/hr | Tc by User | = | 6.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



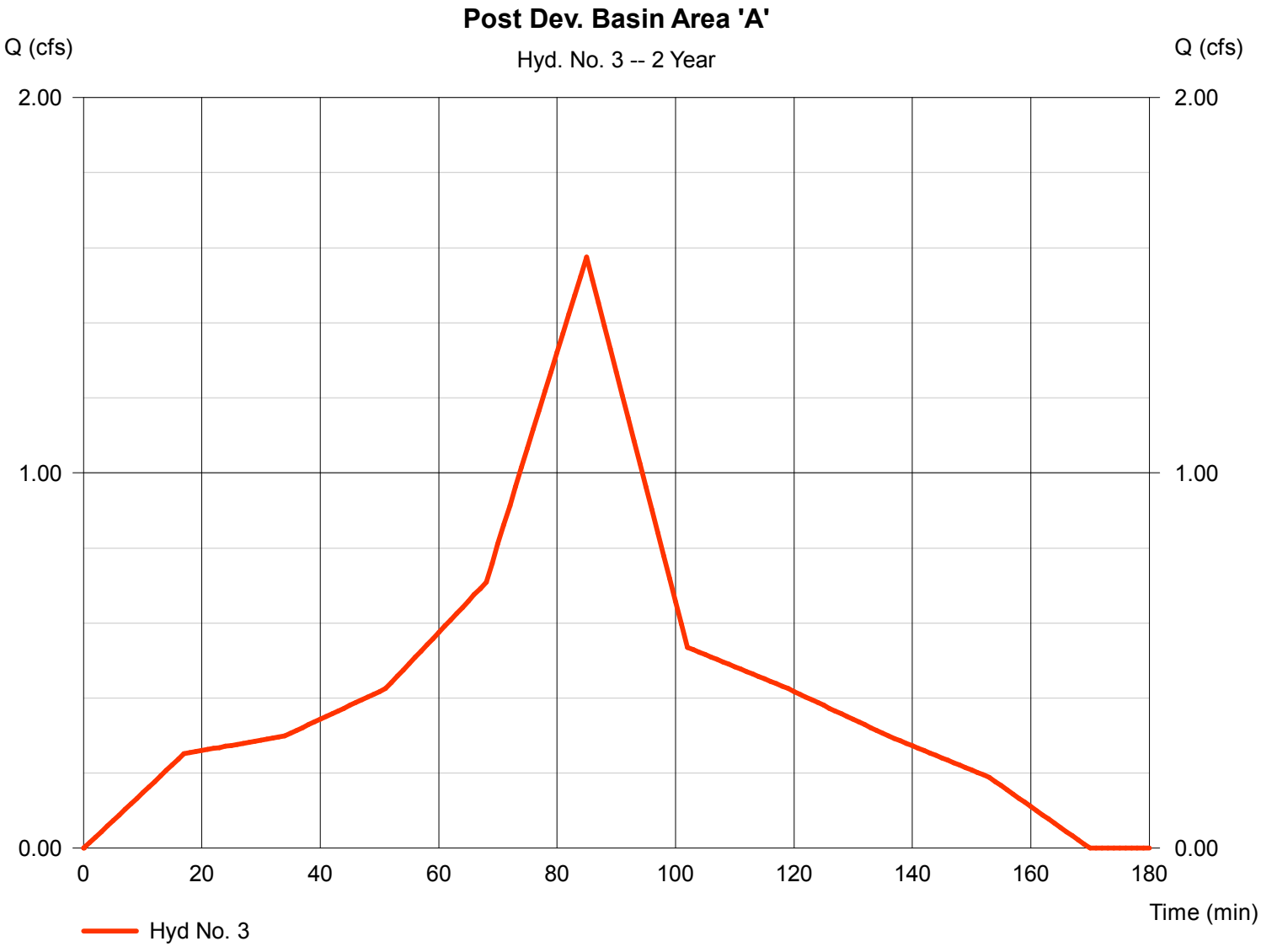
# Hydrograph Report



## Hyd. No. 3

Post Dev. Basin Area 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 1.575 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 85 min |
| Time interval | = | 1 min | Hyd. volume | = | 4,803 cuft |
| Drainage area | = | 0.985 ac | Runoff coeff. | = | 0.59 |
| Intensity | = | 2.709 in/hr | Tc by User | = | 17.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



# Hydrograph Report

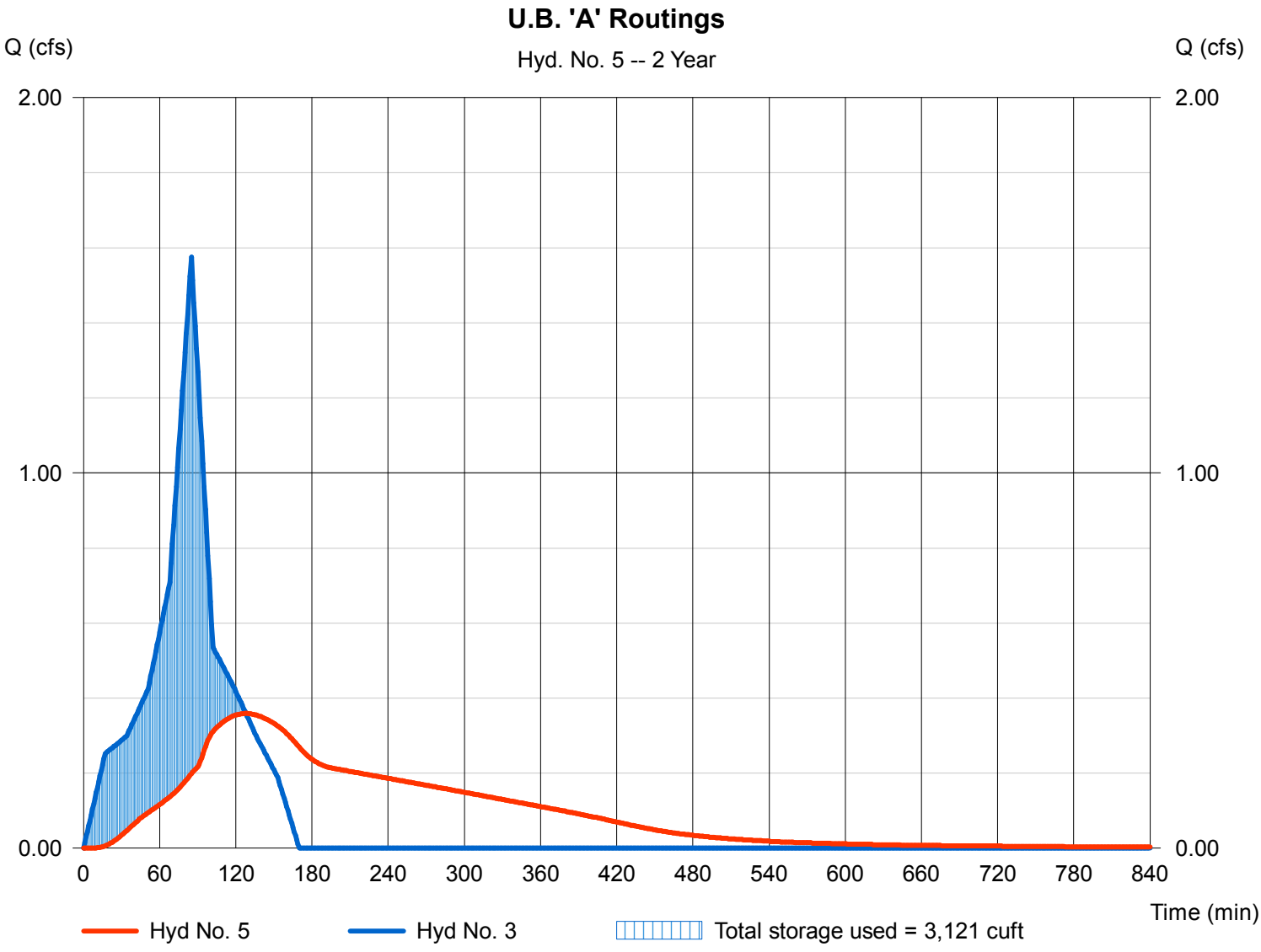


## Hyd. No. 5

U.B. 'A' Routings

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 0.359 cfs |
| Storm frequency | = | 2 yrs | Time to peak | = | 128 min |
| Time interval | = | 1 min | Hyd. volume | = | 4,769 cuft |
| Inflow hyd. No. | = | 3 - Post Dev. Basin Area 'A' | Max. Elevation | = | 144.75 ft |
| Reservoir name | = | Underground Basin 'A' | Max. Storage | = | 3,121 cuft |

Storage Indication method used.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

| 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 | Dekalb | 1.042 | 1 | 110 | 2,876 | ---- | ------ | ------ | Predevelopment Subarea 'A' |
| 2 | Dekalb | 0.433 | 1 | 30 | 466 | ---- | ------ | ------ | Post Dev. By-pass Subarea 'A' |
| 3 | Dekalb | 2.214 | 1 | 85 | 6,752 | ---- | ------ | ------ | Post Dev. Basin Area 'A' |
| 5 | Reservoir | 0.575 | 1 | 121 | 6,718 | 3 | 145.23 | 4,166 | U.B. 'A' Routings |

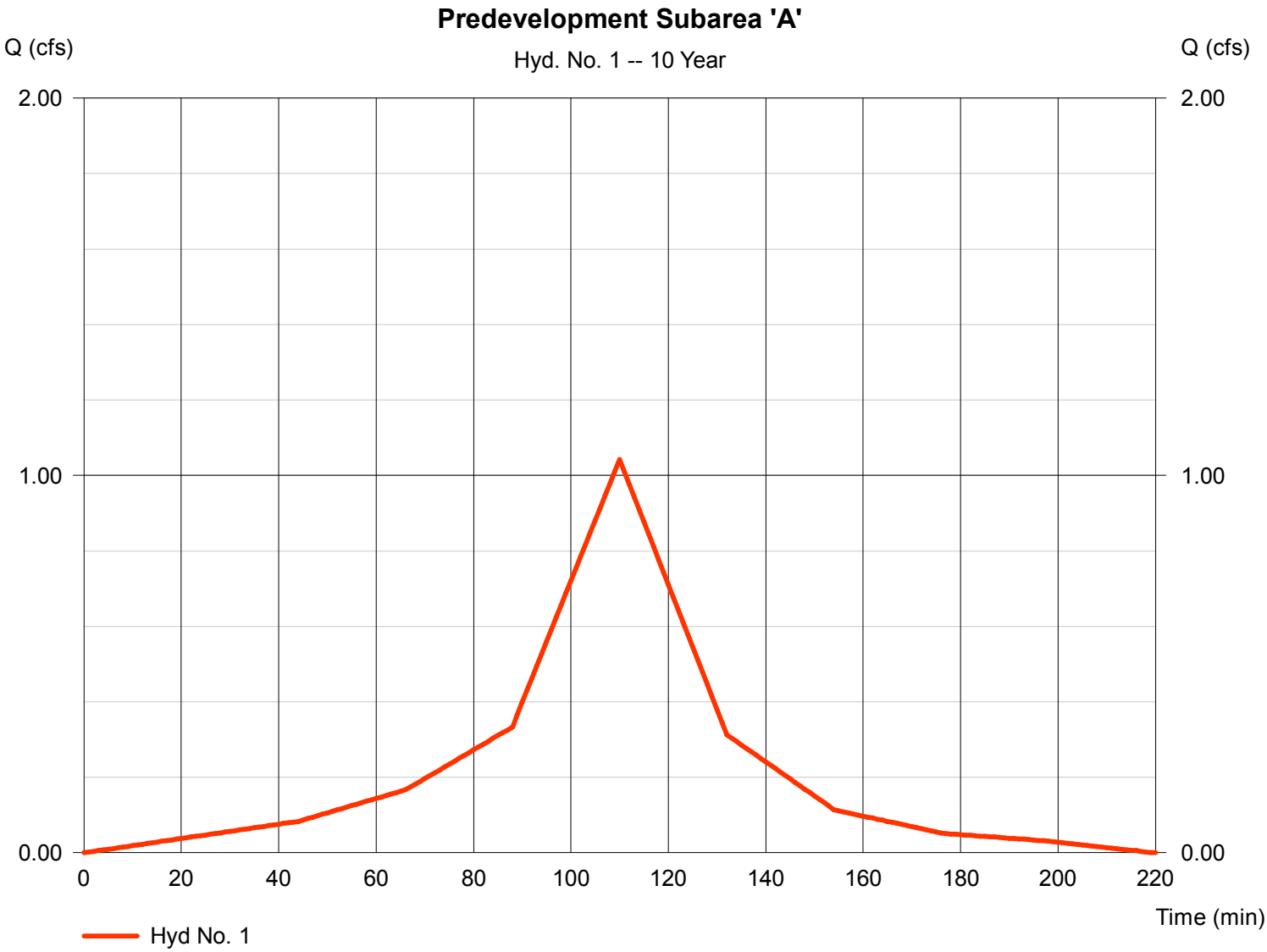
# Hydrograph Report



## Hyd. No. 1

Predevelopment Subarea 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 1.042 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 110 min |
| Time interval | = | 1 min | Hyd. volume | = | 2,876 cuft |
| Drainage area | = | 1.202 ac | Runoff coeff. | = | 0.26 |
| Intensity | = | 3.335 in/hr | Tc by User | = | 22.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



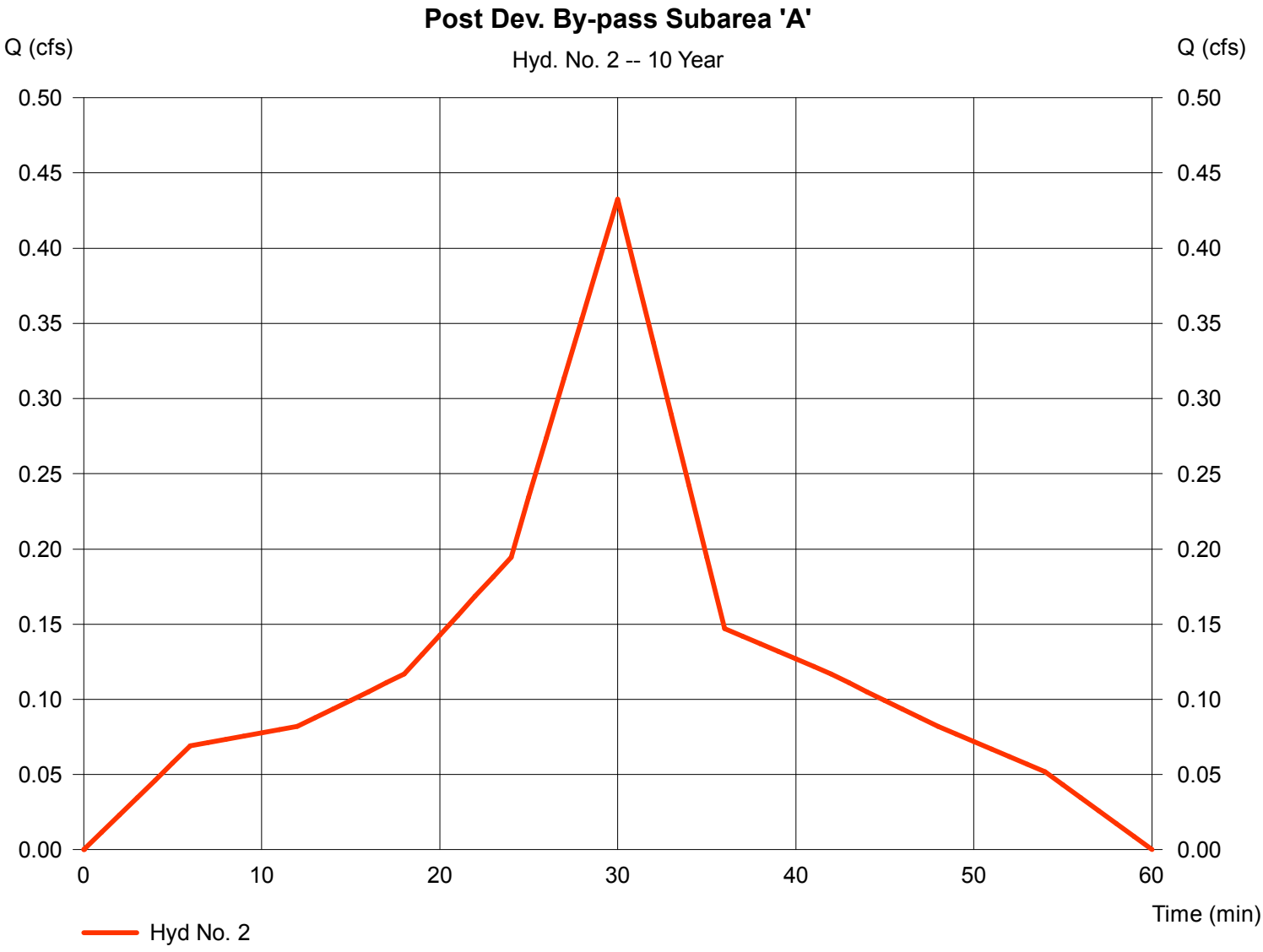
# Hydrograph Report



## Hyd. No. 2

Post Dev. By-pass Subarea 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 0.433 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 30 min |
| Time interval | = | 1 min | Hyd. volume | = | 466 cuft |
| Drainage area | = | 0.217 ac | Runoff coeff. | = | 0.35 |
| Intensity | = | 5.702 in/hr | Tc by User | = | 6.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



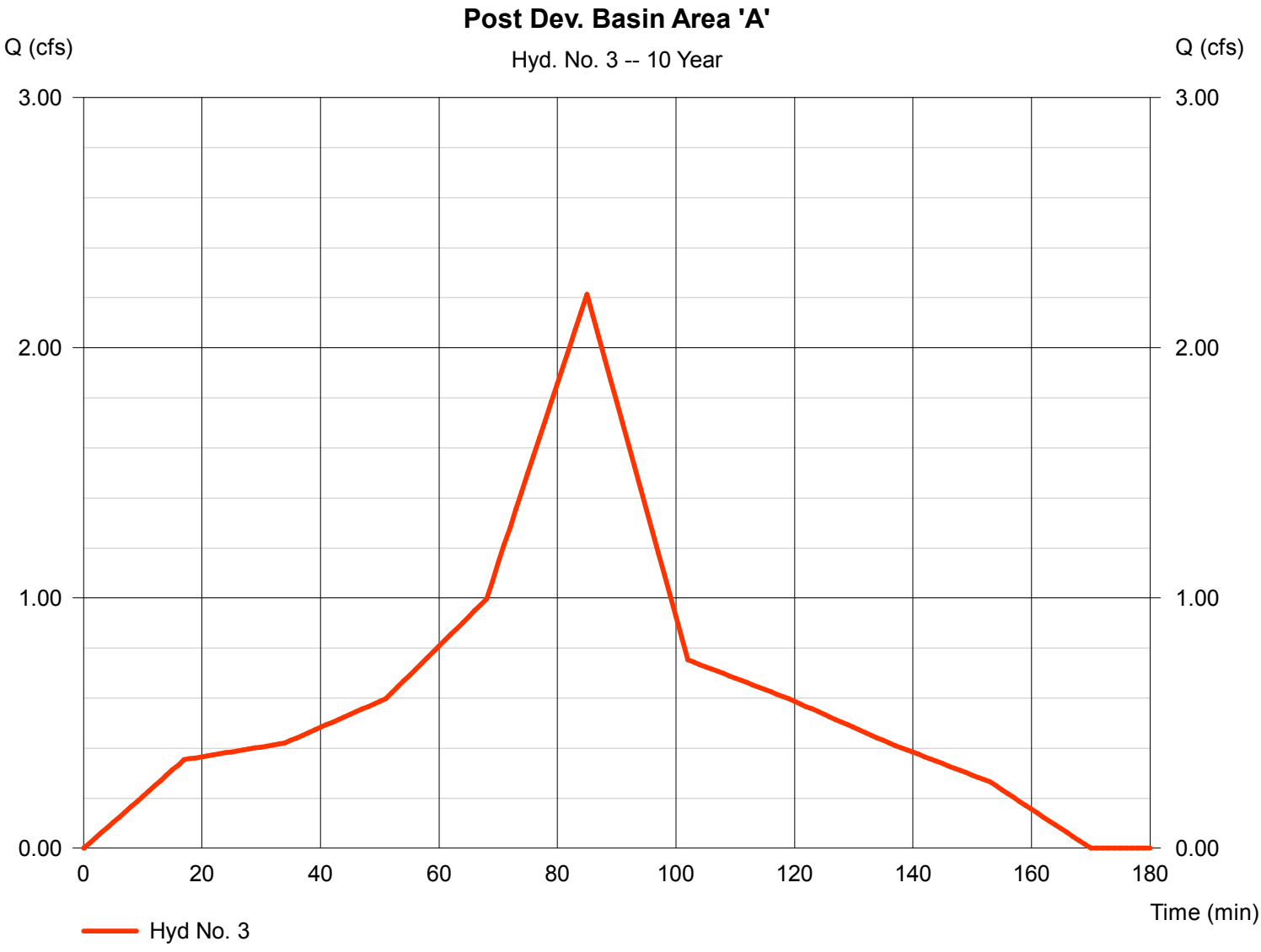
# Hydrograph Report



## Hyd. No. 3

Post Dev. Basin Area 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 2.214 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 85 min |
| Time interval | = | 1 min | Hyd. volume | = | 6,752 cuft |
| Drainage area | = | 0.985 ac | Runoff coeff. | = | 0.59 |
| Intensity | = | 3.808 in/hr | Tc by User | = | 17.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



# Hydrograph Report

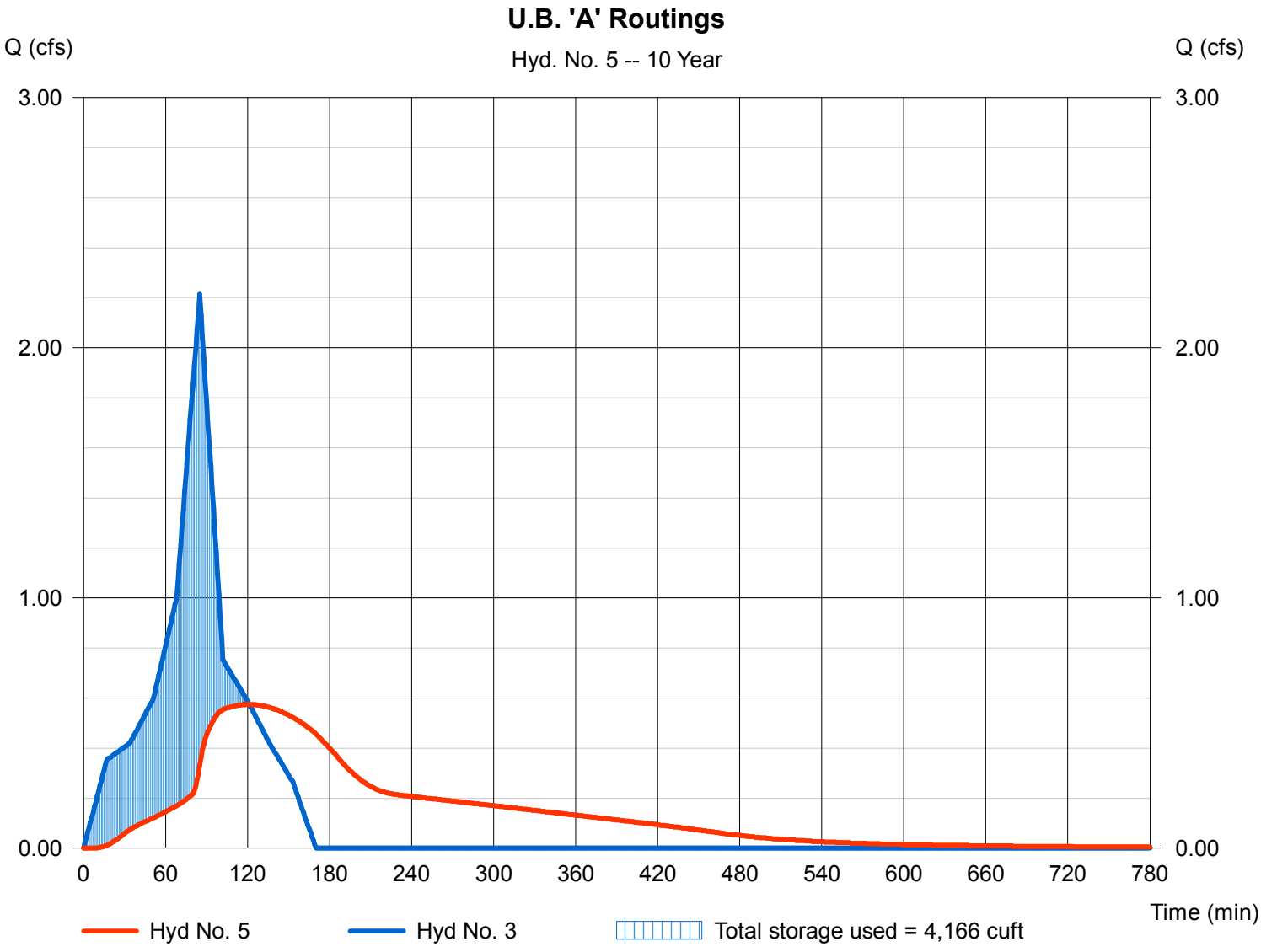


## Hyd. No. 5

U.B. 'A' Routings

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 0.575 cfs |
| Storm frequency | = | 10 yrs | Time to peak | = | 121 min |
| Time interval | = | 1 min | Hyd. volume | = | 6,718 cuft |
| Inflow hyd. No. | = | 3 - Post Dev. Basin Area 'A' | Max. Elevation | = | 145.23 ft |
| Reservoir name | = | Underground Basin 'A' | Max. Storage | = | 4,166 cuft |

Storage Indication method used.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

| 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 | Dekalb | 1.227 | 1 | 110 | 3,385 | ---- | ------ | ------ | Predevelopment Subarea 'A' |
| 2 | Dekalb | 0.493 | 1 | 30 | 531 | ---- | ------ | ------ | Post Dev. By-pass Subarea 'A' |
| 3 | Dekalb | 2.597 | 1 | 85 | 7,920 | ---- | ------ | ------ | Post Dev. Basin Area 'A' |
| 5 | Reservoir | 0.682 | 1 | 121 | 7,886 | 3 | 145.58 | 4,837 | U.B. 'A' Routings |

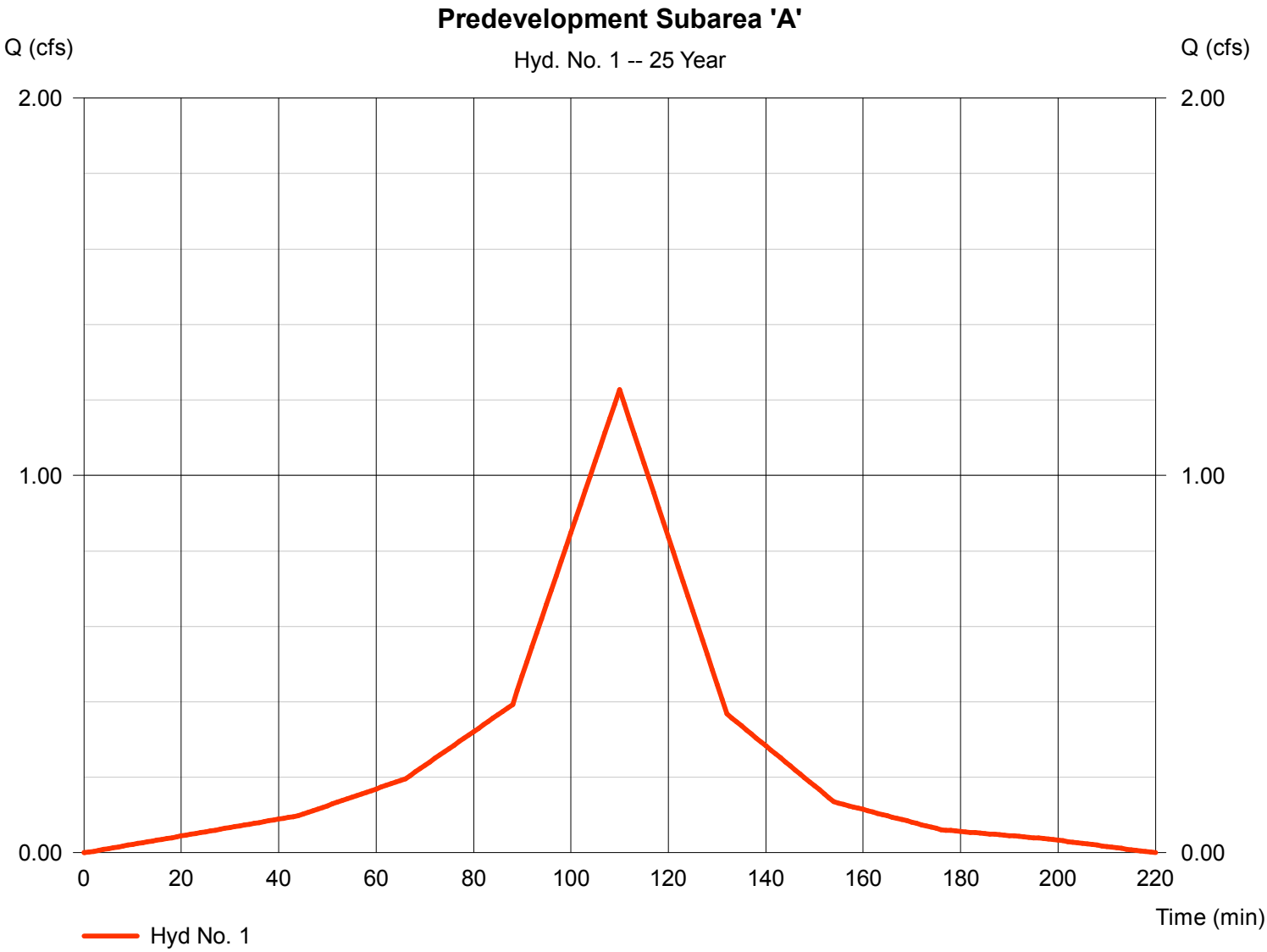
# Hydrograph Report



## Hyd. No. 1

Predevelopment Subarea 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 1.227 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 110 min |
| Time interval | = | 1 min | Hyd. volume | = | 3,385 cuft |
| Drainage area | = | 1.202 ac | Runoff coeff. | = | 0.26 |
| Intensity | = | 3.926 in/hr | Tc by User | = | 22.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



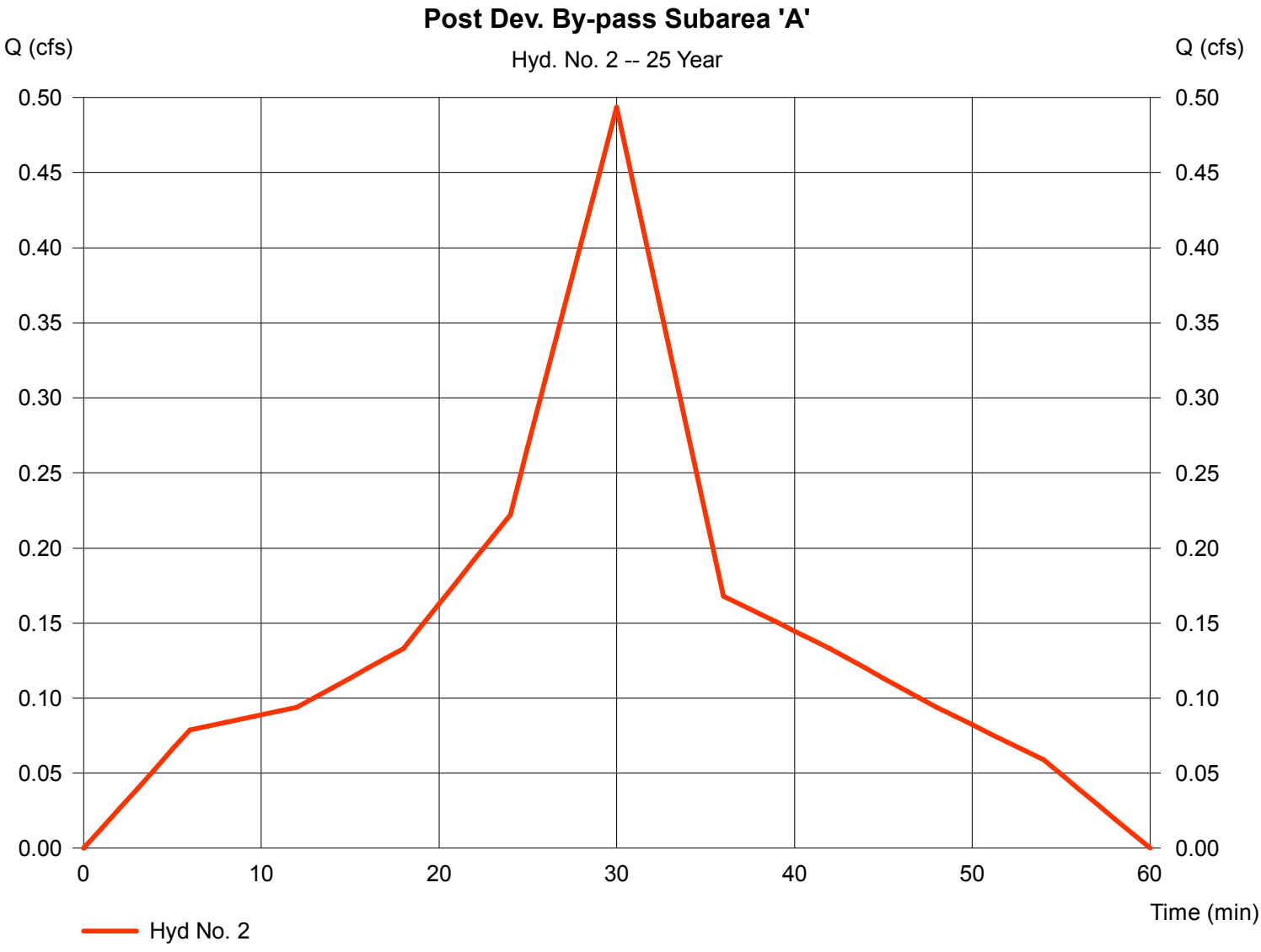
# Hydrograph Report



## Hyd. No. 2

Post Dev. By-pass Subarea 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 0.493 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 30 min |
| Time interval | = | 1 min | Hyd. volume | = | 531 cuft |
| Drainage area | = | 0.217 ac | Runoff coeff. | = | 0.35 |
| Intensity | = | 6.505 in/hr | Tc by User | = | 6.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



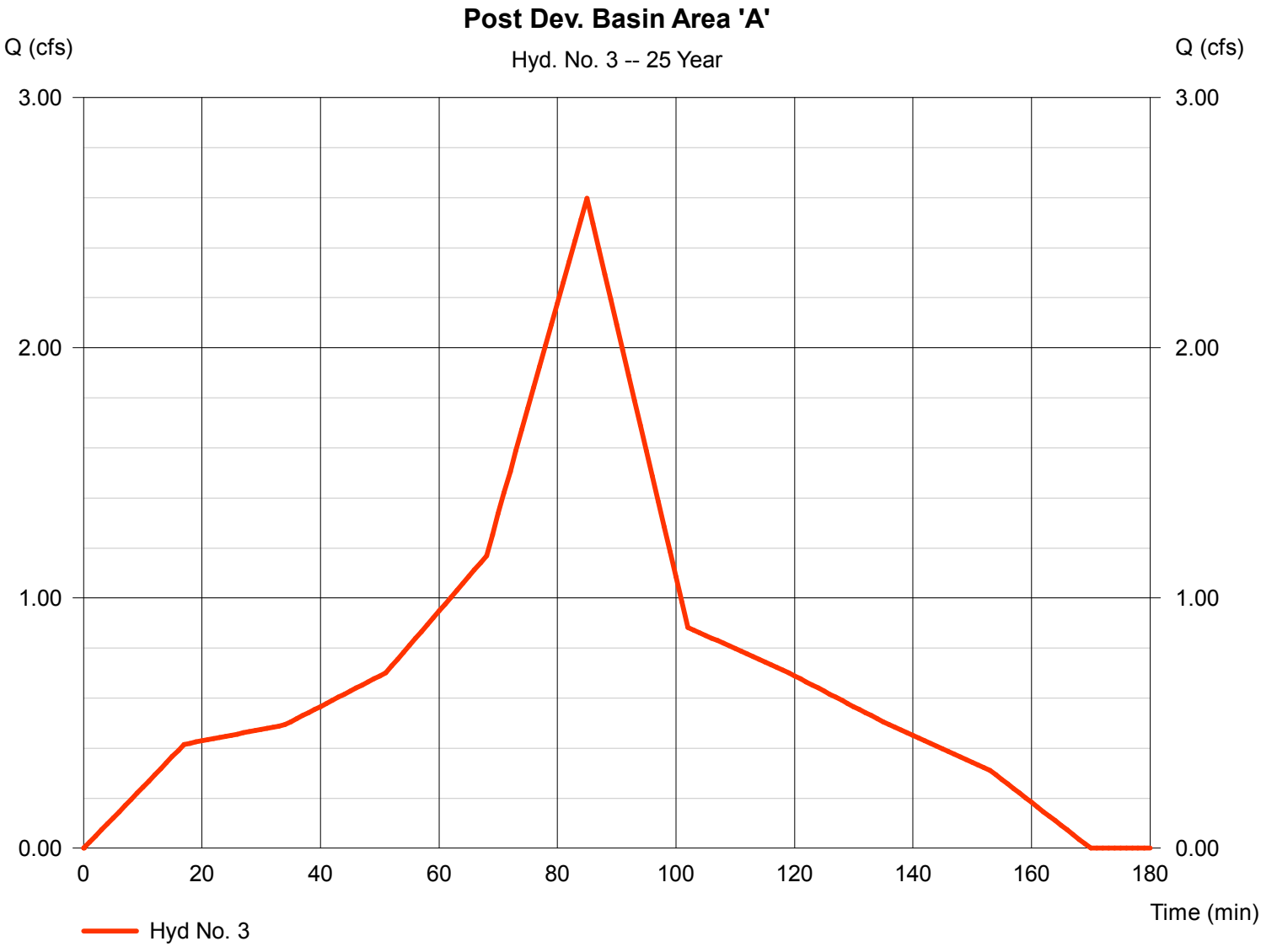
# Hydrograph Report



## Hyd. No. 3

Post Dev. Basin Area 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 2.597 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 85 min |
| Time interval | = | 1 min | Hyd. volume | = | 7,920 cuft |
| Drainage area | = | 0.985 ac | Runoff coeff. | = | 0.59 |
| Intensity | = | 4.467 in/hr | Tc by User | = | 17.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



# Hydrograph Report

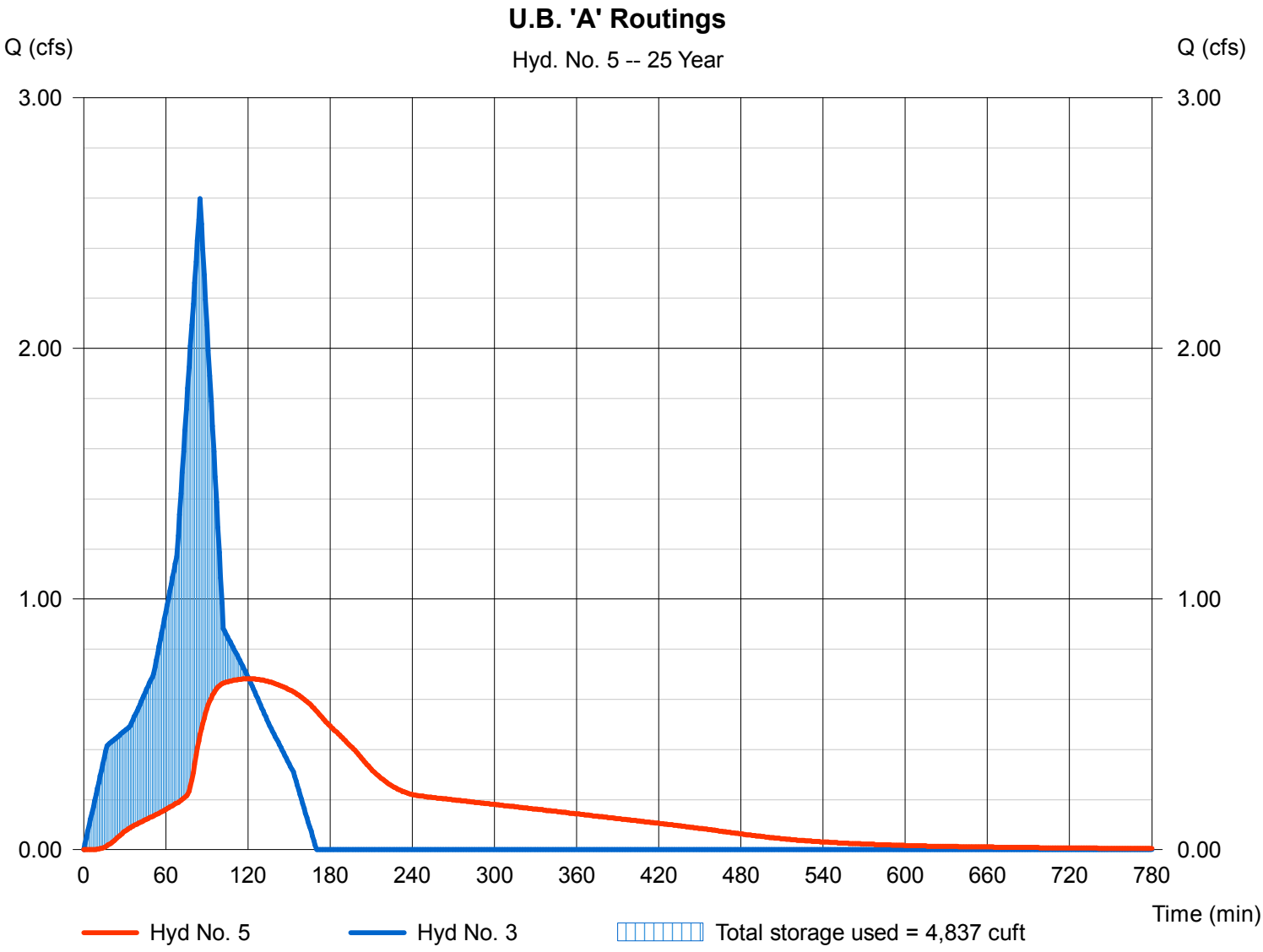


## Hyd. No. 5

U.B. 'A' Routings

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 0.682 cfs |
| Storm frequency | = | 25 yrs | Time to peak | = | 121 min |
| Time interval | = | 1 min | Hyd. volume | = | 7,886 cuft |
| Inflow hyd. No. | = | 3 - Post Dev. Basin Area 'A' | Max. Elevation | = | 145.58 ft |
| Reservoir name | = | Underground Basin 'A' | Max. Storage | = | 4,837 cuft |

Storage Indication method used.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

| 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 | Dekalb | 1.385 | 1 | 110 | 3,820 | ---- | ------ | ------ | Predevelopment Subarea 'A' |
| 2 | Dekalb | 0.549 | 1 | 30 | 591 | ---- | ------ | ------ | Post Dev. By-pass Subarea 'A' |
| 3 | Dekalb | 2.899 | 1 | 85 | 8,841 | ---- | ------ | ------ | Post Dev. Basin Area 'A' |
| 5 | Reservoir | 0.758 | 1 | 121 | 8,807 | 3 | 145.87 | 5,383 | U.B. 'A' Routings |

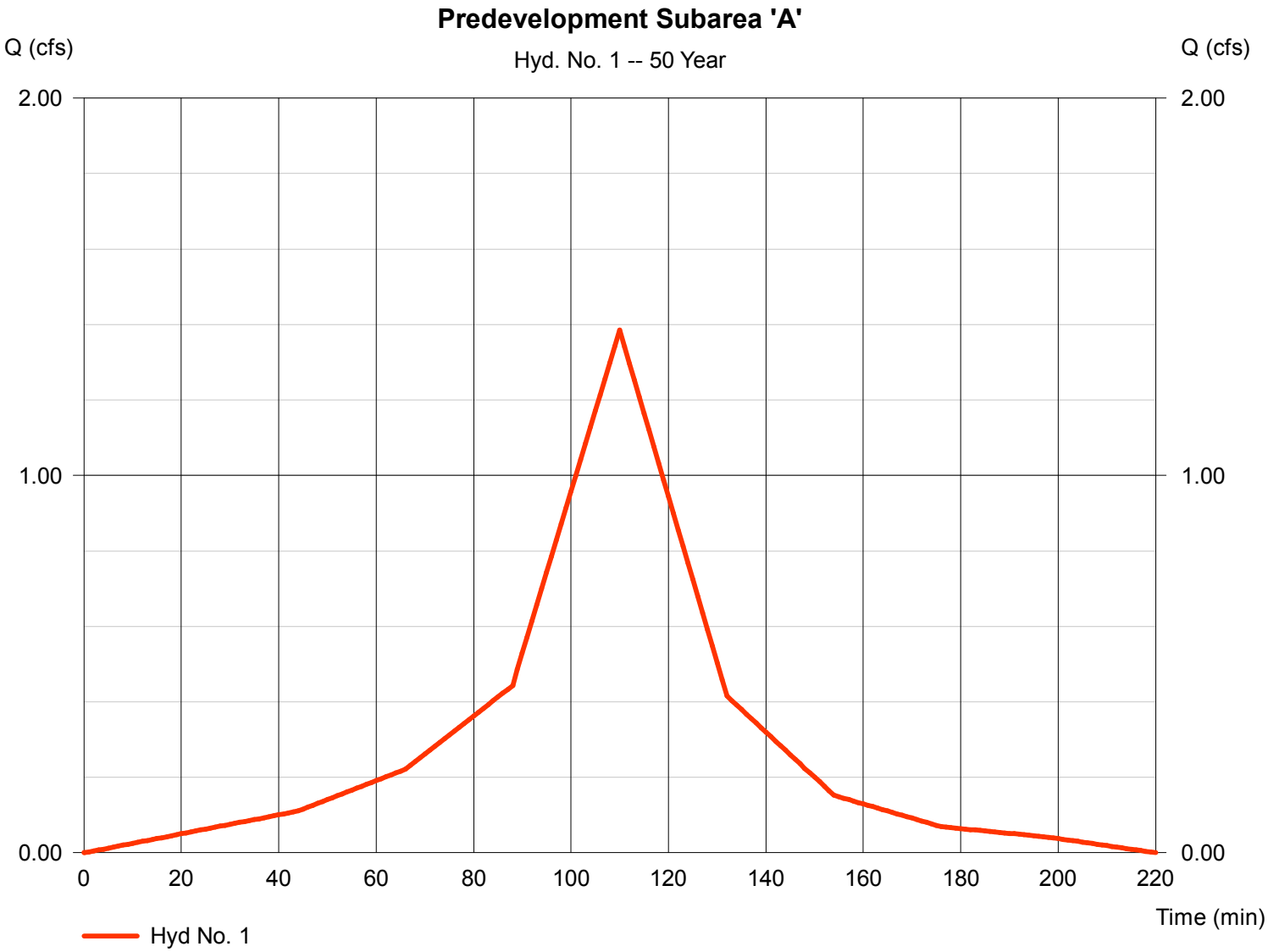
# Hydrograph Report



## Hyd. No. 1

Predevelopment Subarea 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 1.385 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 110 min |
| Time interval | = | 1 min | Hyd. volume | = | 3,820 cuft |
| Drainage area | = | 1.202 ac | Runoff coeff. | = | 0.26 |
| Intensity | = | 4.431 in/hr | Tc by User | = | 22.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



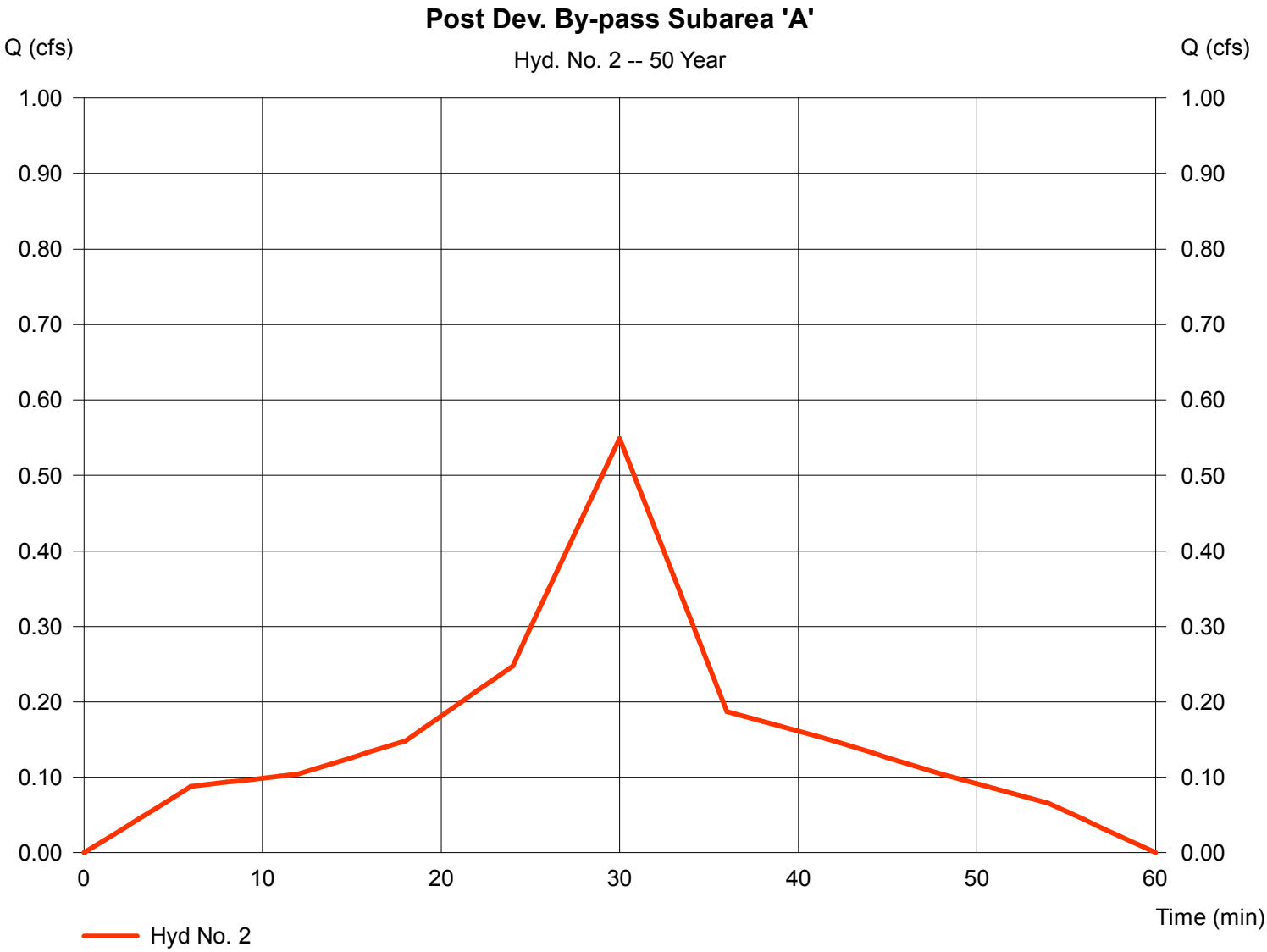
# Hydrograph Report



## Hyd. No. 2

Post Dev. By-pass Subarea 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 0.549 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 30 min |
| Time interval | = | 1 min | Hyd. volume | = | 591 cuft |
| Drainage area | = | 0.217 ac | Runoff coeff. | = | 0.35 |
| Intensity | = | 7.241 in/hr | Tc by User | = | 6.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



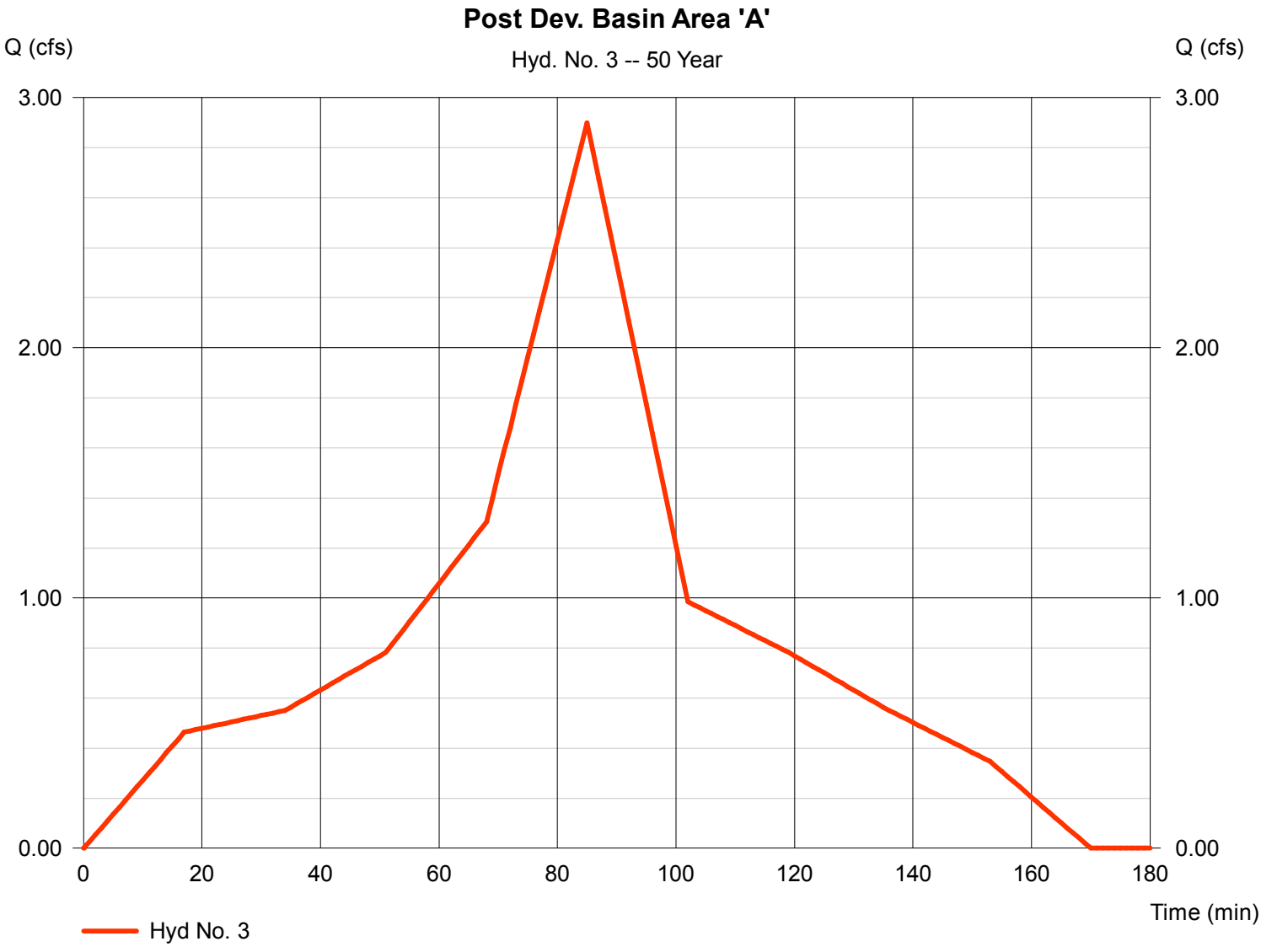
# Hydrograph Report



## Hyd. No. 3

Post Dev. Basin Area 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 2.899 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 85 min |
| Time interval | = | 1 min | Hyd. volume | = | 8,841 cuft |
| Drainage area | = | 0.985 ac | Runoff coeff. | = | 0.59 |
| Intensity | = | 4.986 in/hr | Tc by User | = | 17.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



# Hydrograph Report

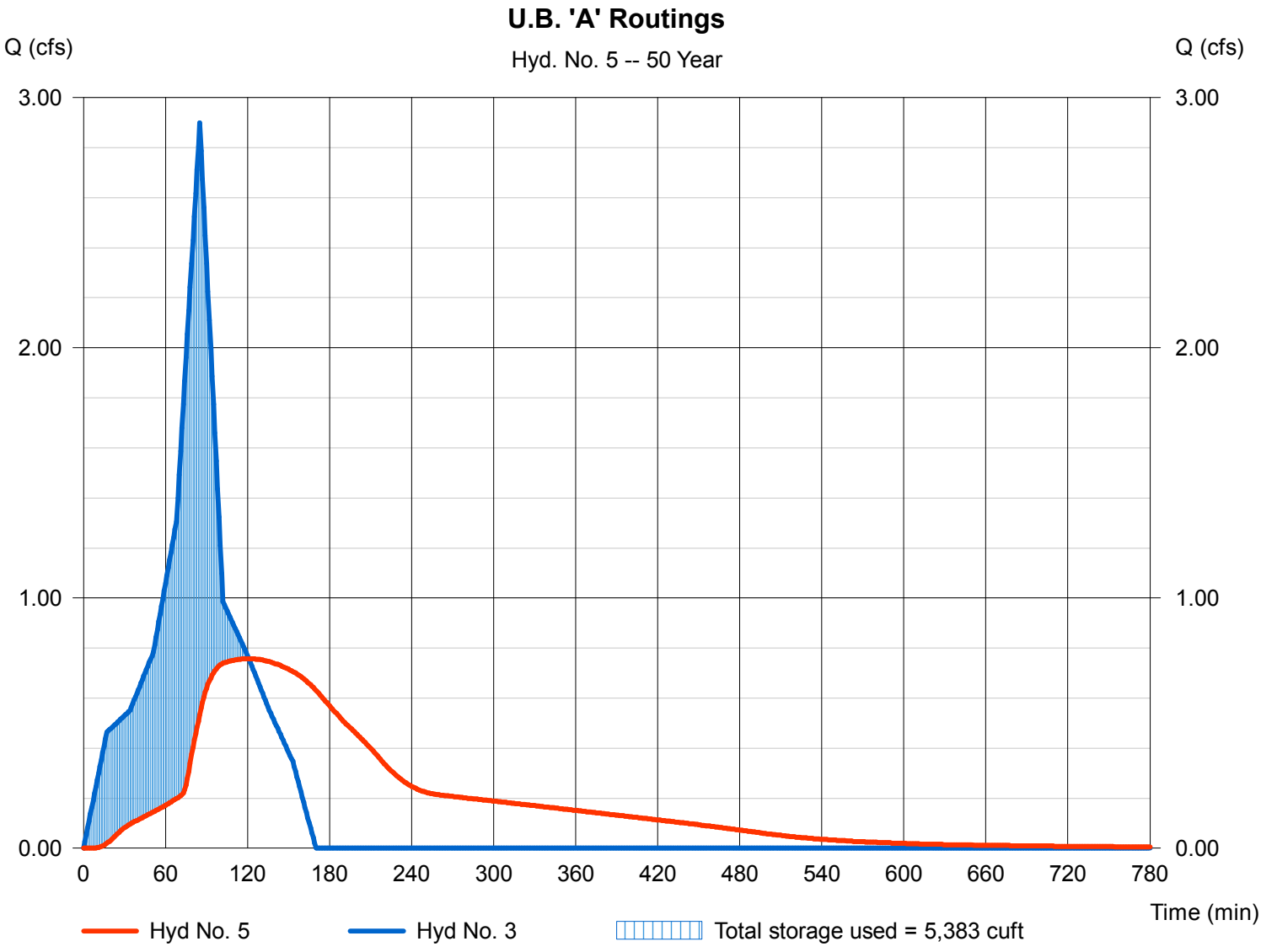


## Hyd. No. 5

U.B. 'A' Routings

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 0.758 cfs |
| Storm frequency | = | 50 yrs | Time to peak | = | 121 min |
| Time interval | = | 1 min | Hyd. volume | = | 8,807 cuft |
| Inflow hyd. No. | = | 3 - Post Dev. Basin Area 'A' | Max. Elevation | = | 145.87 ft |
| Reservoir name | = | Underground Basin 'A' | Max. Storage | = | 5,383 cuft |

Storage Indication method used.



# Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

| 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 | Dekalb | 1.637 | 1 | 110 | 4,517 | ---- | ------ | ------ | Predevelopment Subarea 'A' |
| 2 | Dekalb | 0.607 | 1 | 30 | 654 | ---- | ------ | ------ | Post Dev. By-pass Subarea 'A' |
| 3 | Dekalb | 3.404 | 1 | 85 | 10,381 | ---- | ------ | ------ | Post Dev. Basin Area 'A' |
| 5 | Reservoir | 0.871 | 1 | 122 | 10,347 | 3 | 146.37 | 6,324 | U.B. 'A' Routings |

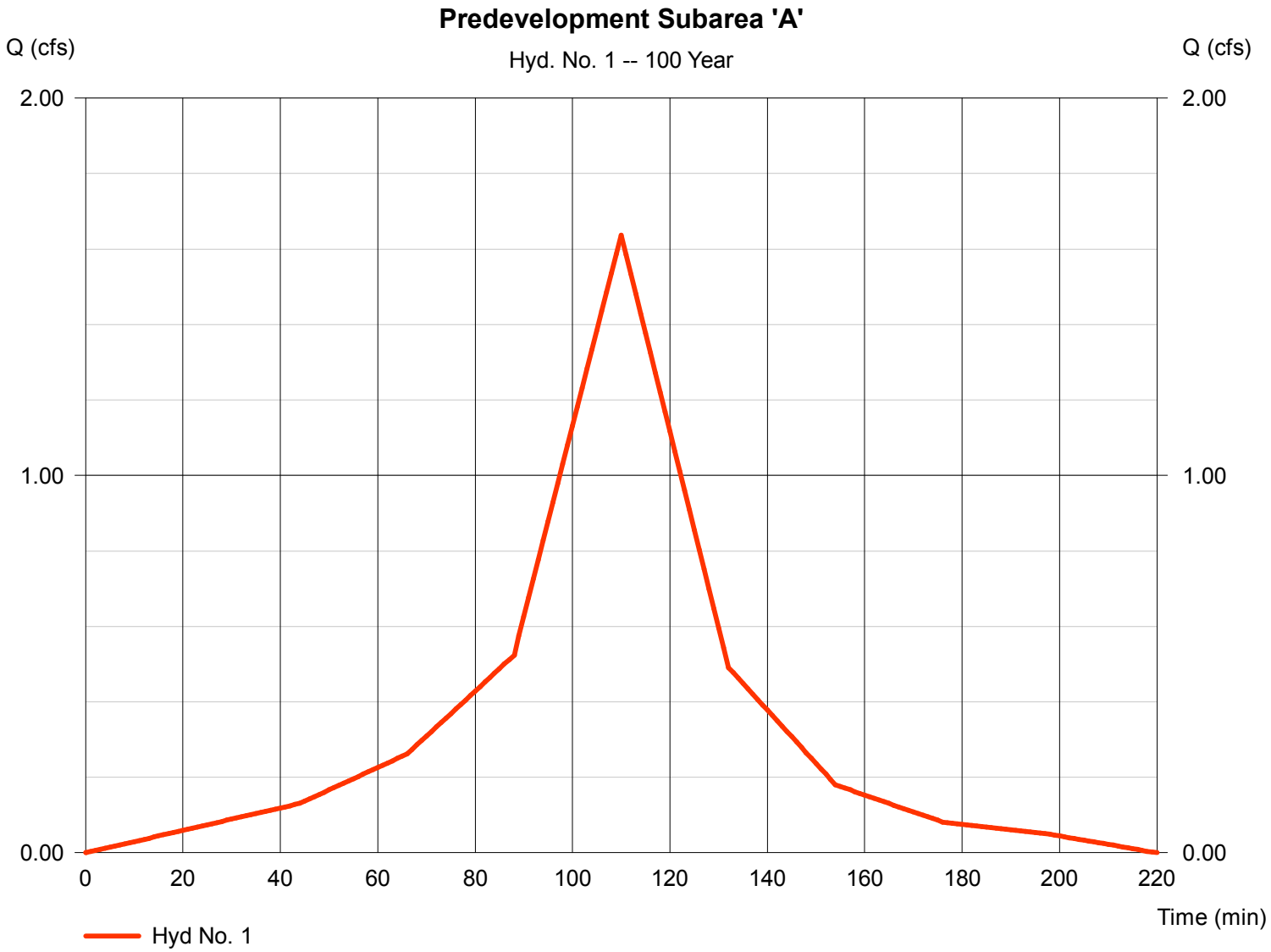
# Hydrograph Report



## Hyd. No. 1

Predevelopment Subarea 'A'

| | | | |
|---|---|---|---|
| Hydrograph type | = Dekalb | Peak discharge | = 1.637 cfs |
| Storm frequency | = 100 yrs | Time to peak | = 110 min |
| Time interval | = 1 min | Hyd. volume | = 4,517 cuft |
| Drainage area | = 1.202 ac | Runoff coeff. | = 0.26 |
| Intensity | = 5.239 in/hr | Tc by User | = 22.00 min |
| IDF Curve | = PennDOTRegion5.idf | Asc/Rec limb fact | = n/a |



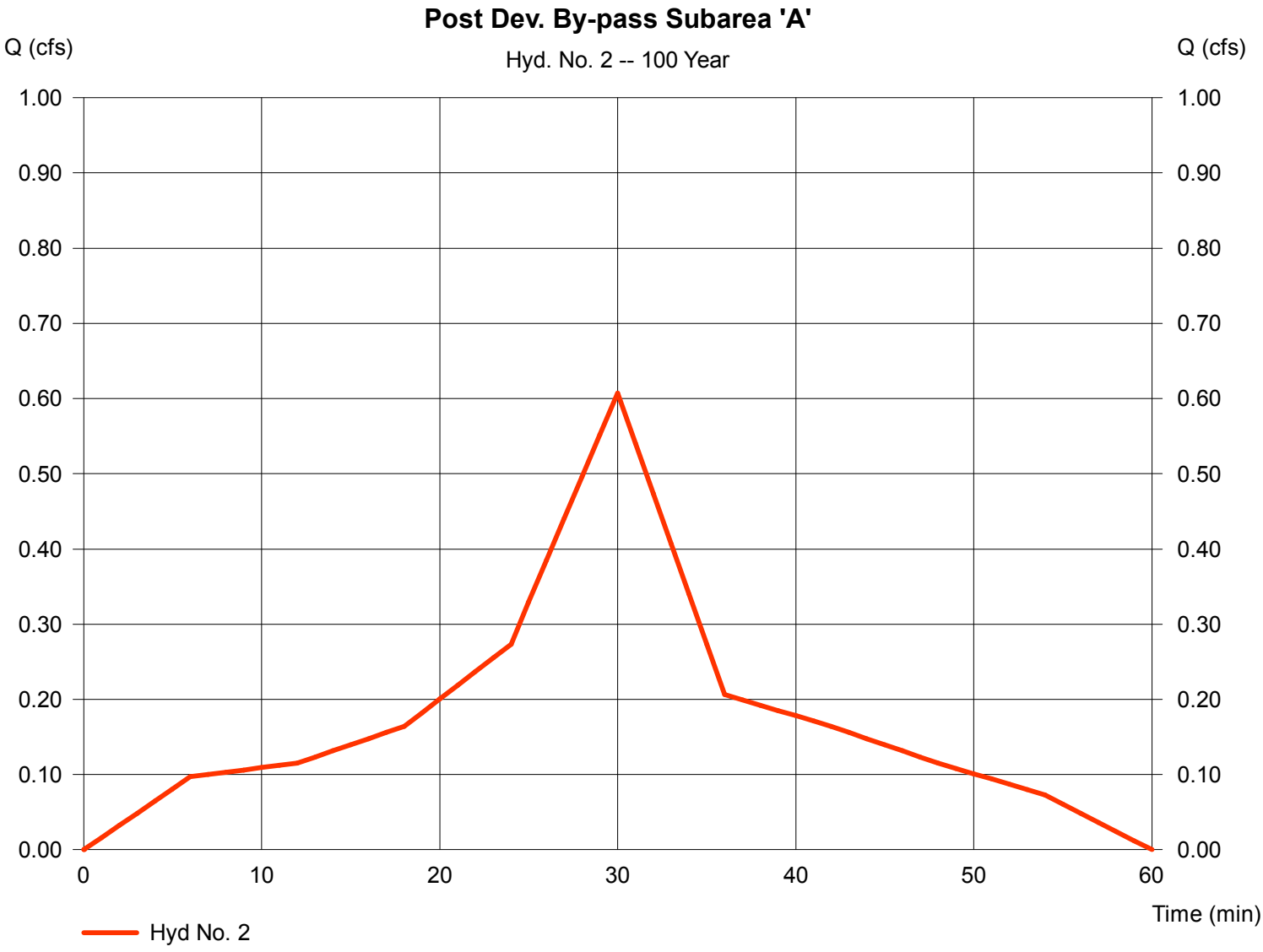
# Hydrograph Report



## Hyd. No. 2

Post Dev. By-pass Subarea 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 0.607 cfs |
| Storm frequency | = | 100 yrs | Time to peak | = | 30 min |
| Time interval | = | 1 min | Hyd. volume | = | 654 cuft |
| Drainage area | = | 0.217 ac | Runoff coeff. | = | 0.35 |
| Intensity | = | 8.009 in/hr | Tc by User | = | 6.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



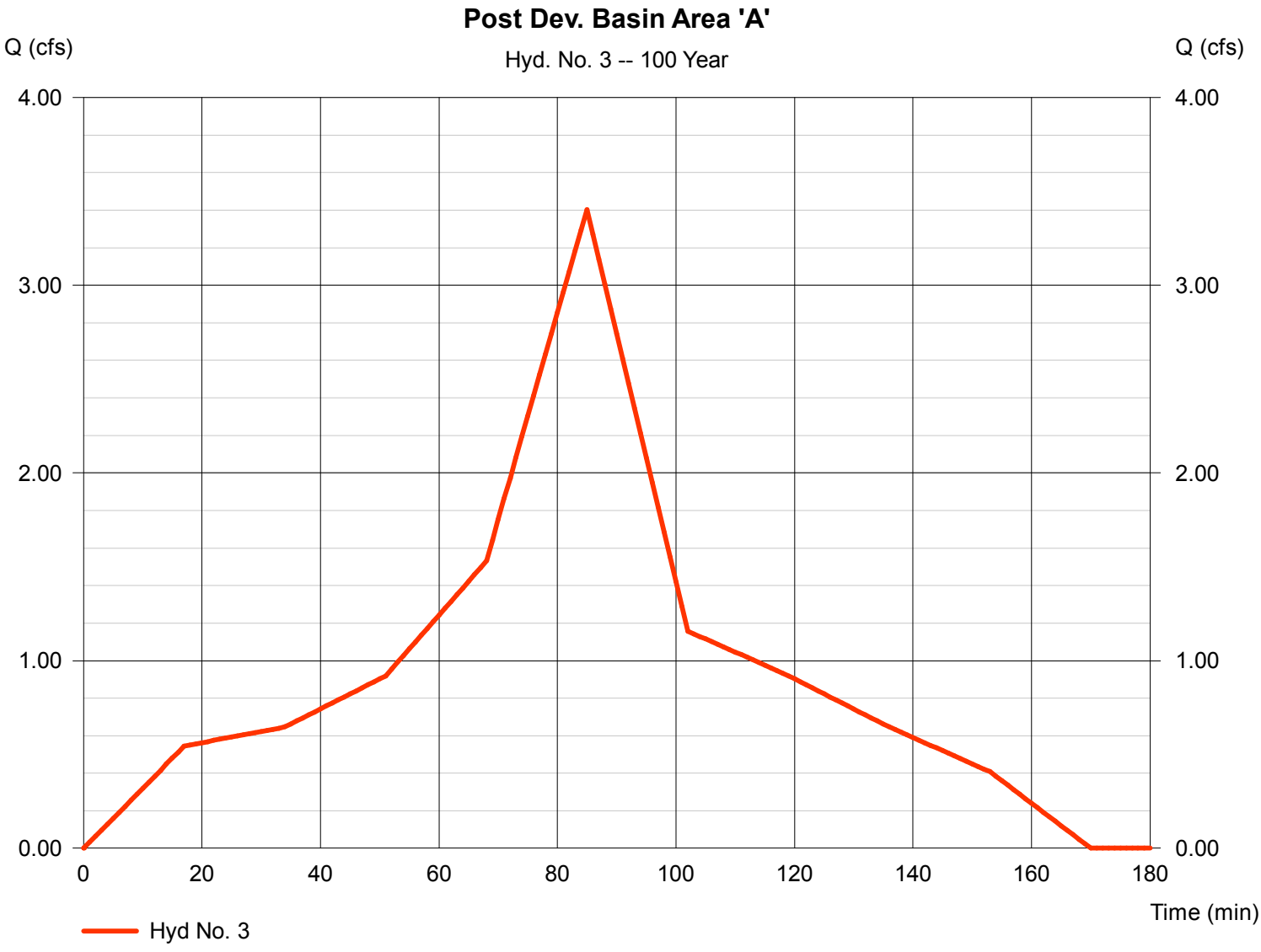
# Hydrograph Report



## Hyd. No. 3

Post Dev. Basin Area 'A'

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Dekalb | Peak discharge | = | 3.404 cfs |
| Storm frequency | = | 100 yrs | Time to peak | = | 85 min |
| Time interval | = | 1 min | Hyd. volume | = | 10,381 cuft |
| Drainage area | = | 0.985 ac | Runoff coeff. | = | 0.59 |
| Intensity | = | 5.855 in/hr | Tc by User | = | 17.00 min |
| IDF Curve | = | PennDOTRegion5.idf | Asc/Rec limb fact | = | n/a |



# Hydrograph Report

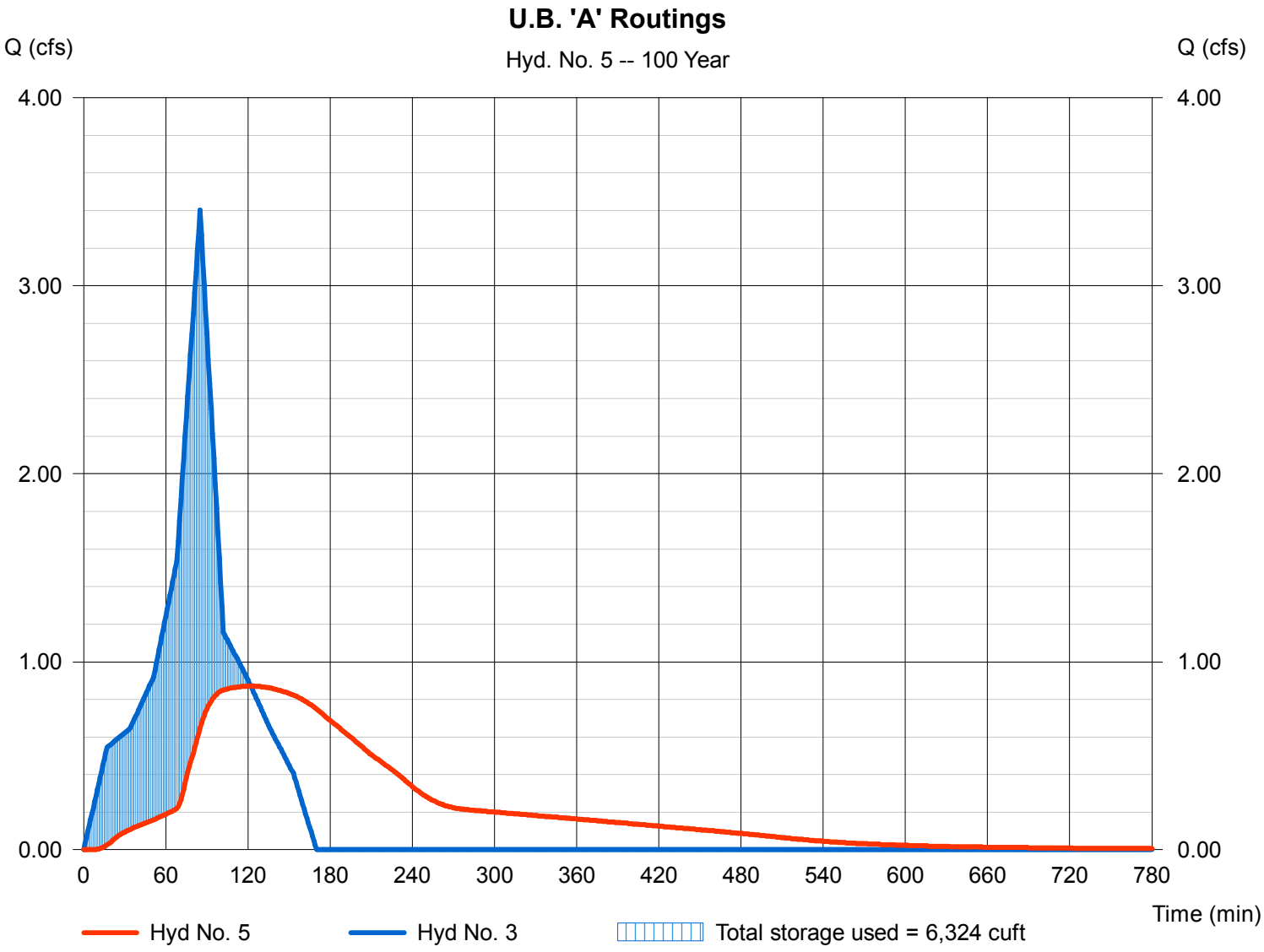


## Hyd. No. 5

U.B. 'A' Routings

| | | | | | |
|---|---|---|---|---|---|
| Hydrograph type | = | Reservoir | Peak discharge | = | 0.871 cfs |
| Storm frequency | = | 100 yrs | Time to peak | = | 122 min |
| Time interval | = | 1 min | Hyd. volume | = | 10,347 cuft |
| Inflow hyd. No. | = | 3 - Post Dev. Basin Area 'A' | Max. Elevation | = | 146.37 ft |
| Reservoir name | = | Underground Basin 'A' | Max. Storage | = | 6,324 cuft |

Storage Indication method used.



# Hydraflow Rainfall Report



| Return Period (Yrs) | Intensity-Duration-Frequency Equation Coefficients (FHA) | | | |
|---|---|---|---|---|
| | B | D | E | (N/A) |
| 1 | 11.5724 | 1.8000 | 0.6803 | -------- |
| 2 | 16.9729 | 3.2000 | 0.6105 | -------- |
| 3 | 0.0000 | 0.0000 | 0.0000 | -------- |
| 5 | 25.3184 | 5.4000 | 0.6606 | -------- |
| 10 | 54.7383 | 10.8000 | 0.8016 | -------- |
| 25 | 92.8341 | 14.6000 | 0.8787 | -------- |
| 50 | 41.8042 | 8.4000 | 0.6573 | -------- |
| 100 | 116.5471 | 18.3000 | 0.8393 | -------- |

File name: PennDOTRegion5.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 | 3.14 | 2.16 | 1.70 | 1.42 | 1.24 | 1.10 | 1.00 | 0.91 | 0.85 | 0.79 | 0.74 | 0.70 |
| 2 | 4.70 | 3.51 | 2.89 | 2.49 | 2.21 | 2.00 | 1.84 | 1.70 | 1.59 | 1.50 | 1.42 | 1.35 |
| 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 | 5.39 | 4.16 | 3.45 | 2.99 | 2.65 | 2.40 | 2.20 | 2.04 | 1.90 | 1.79 | 1.69 | 1.60 |
| 10 | 5.99 | 4.81 | 4.04 | 3.51 | 3.11 | 2.80 | 2.55 | 2.35 | 2.18 | 2.03 | 1.91 | 1.80 |
| 25 | 6.80 | 5.57 | 4.73 | 4.12 | 3.66 | 3.30 | 3.01 | 2.76 | 2.56 | 2.38 | 2.23 | 2.10 |
| 50 | 7.59 | 6.16 | 5.26 | 4.63 | 4.16 | 3.80 | 3.51 | 3.26 | 3.06 | 2.88 | 2.73 | 2.60 |
| 100 | 8.30 | 7.05 | 6.15 | 5.47 | 4.93 | 4.50 | 4.14 | 3.84 | 3.59 | 3.36 | 3.17 | 3.00 |

Tc = time in minutes. Values may exceed 60.

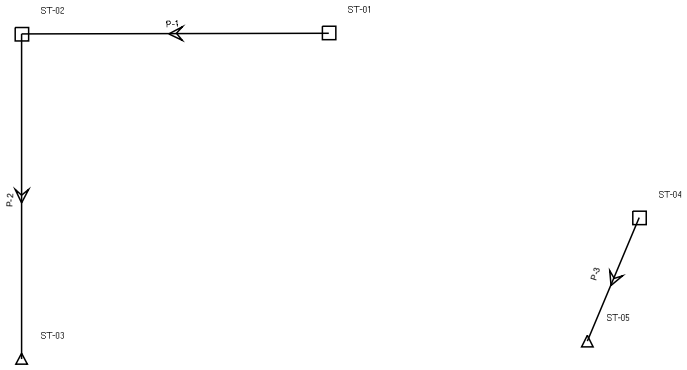
Precip. file name: Philadelphia.pcp

| 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 | 2.64 | 3.36 | 0.00 | 4.32 | 5.28 | 6.24 | 7.20 | 8.40 |
| SCS 6-Hr | 1.86 | 2.28 | 0.00 | 2.82 | 3.36 | 3.90 | 4.62 | 5.40 |
| 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 |

# ***Section E:***

# ***100-year Storm Sewer Design Calculations***

# Scenario: Base



# Calculation Executive Summary

| Scenario Summary | |
|---|---|
| Label | Base |

| Calculation Executive Summary | |
|---|---|
| | >>>> Info: Subsurface Network Root: ST-03<br>>>>> Info: Subsurface Analysis iterations: 2<br>>>>> Info: Convergence was achieved. |
| Subnetwork Results | |
| | >>>> Info: Subsurface Network Root: ST-05<br>>>>> Info: Subsurface Analysis iterations: 2<br>>>>> Info: Convergence was achieved. |

| Storm Events Executive Summary | | | |
|---|---|---|---|
| Rainfall Alternative Label | Base Rainfall Runoff | Return Event | 100 years |
| Global Storm Event | PennDOT Reg 5 - 100 Year | | |

# Calculation Detailed Summary

| Element Details | | | |
|---|---|---|---|
| ID | 13 | Notes | |
| Label | Base Calculation Options | | |

| Hydraulic Summary | | | |
|---|---|---|---|
| Flow Profile Method | Backwater Analysis | Average Velocity Method | Actual Uniform Flow Velocity |
| Number of Flow Profile Steps | 5 | Minimum Structure Headloss | 0.50 ft |
| Hydraulic Grade Convergence Test | 0.001 ft | Minimum Time of Concentration | 5.000 min |

| Inlets | | | |
|---|---|---|---|
| Neglect Side Flow? | False | Active Components for Combination Inlets In Sag | Grate and Curb |
| Neglect Gutter Cross Slope For Side Flow? | True | Active Components for Combination Inlets on Grade | Grate and Curb |

| HEC-22 | | | |
|---|---|---|---|
| Elevations Considered Equal Within | 0.50 ft | Depressed Unsubmerged | 1.000 |
| Consider Non-Piped Plunging Flow | False | Half Bench Submerged | 0.950 |
| Flat Submerged | 1.000 | Half Bench Unsubmerged | 0.150 |
| Flat Unsubmerged | 1.000 | Full Bench Submerged | 0.750 |
| Depressed Submerged | 1.000 | Full Bench Unsubmerged | 0.070 |

| AASHTO | | | |
|---|---|---|---|
| Expansion, Ke | 0.350 | Shaping Adjustment, Cs | 0.500 |
| Contraction, Kc | 0.250 | Non-Piped Flow Adjustment, Cn | 1.300 |

## Bend Angle vs. Bend Loss Curve

| Bend Angle (degrees) | Bend Loss Coefficient, Kb |
|---|---|
| 0.00 | 0.000 |
| 15.00 | 0.190 |
| 30.00 | 0.350 |
| 45.00 | 0.470 |
| 60.00 | 0.560 |
| 75.00 | 0.640 |
| 90.00 | 0.700 |

| Generic Structure Loss | | | |
|---|---|---|---|
| Governing Upstream Pipe Selection Method | Pipe with Maximum QV | | |

# Calculation Detailed Summary

## Catchment Summary

| Label | Area (acres) | Time of Concentration (min) | Rational C | Catchment CA (acres) | Catchment Intensity (in/h) | Catchment Rational Flow (ft³/s) |
|---|---|---|---|---|---|---|
| A-1 | 0.332 | 5.000 | 0.350 | 0.116 | 8.300 | 0.97 |
| A-2 | 0.054 | 5.000 | 0.350 | 0.019 | 8.300 | 0.16 |
| A-3 | 0.256 | 5.000 | 0.620 | 0.159 | 8.300 | 1.33 |

## Conduit Summary

| Label | Conduit Description | Conduit Shape | Branch ID | Subnetwork Outfall | Flow (Link) (ft³/s) | Velocity (Average) (ft/s) | Hydraulic Grade Line (In) (ft) | Hydraulic Grade Line (Out) (ft) | Depth (In Link) (ft) | Depth (Out Link) (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| P-1 | Circular Pipe - 10.0 in | Circular Pipe | 2 | ST-03 | 0.97 | 1.78 | 146.96 | 146.91 | 1.76 | 2.16 |
| P-2 | Circular Pipe - 12.0 in | Circular Pipe | 2 | ST-03 | 1.11 | 1.42 | 146.41 | 146.37 | 1.83 | 2.57 |
| P-3 | Circular Pipe - 12.0 in | Circular Pipe | 1 | ST-05 | 1.33 | 1.69 | 146.40 | 146.37 | 2.40 | 2.57 |

## Node Summary

| Label | Element Type | Subnetwork Outfall | Flow (Total Surface) (ft³/s) | Flow (Total Out) (ft³/s) | Elevation (Ground) (ft) | Elevation (Invert) (ft) | Energy Grade Line (In Node) (ft) | Energy Grade Line (Out Node) (ft) |
|---|---|---|---|---|---|---|---|---|
| ST-01 | Catch Basin | ST-03 | 0.97 | 0.97 | 147.60 | 145.20 | 147.51 | 147.01 |
| ST-02 | Catch Basin | ST-03 | 0.16 | 1.11 | 147.40 | 144.58 | 146.96 | 146.44 |
| ST-04 | Catch Basin | ST-05 | 1.33 | 1.33 | 147.50 | 144.00 | 146.94 | 146.44 |

## Inlet Summary

| Label | Inlet Type | Catalog Inlet Type | Catalog Inlet | Flow (Total Intercepted) (ft³/s) |
|---|---|---|---|---|
| ST-01 | (N/A) | (N/A) | (N/A) | 0.97 |
| ST-02 | (N/A) | (N/A) | (N/A) | 0.16 |

# Calculation Detailed Summary

## Inlet Summary

| Label | Inlet Type | Catalog Inlet Type | Catalog Inlet | Flow (Total Intercepted) (ft³/s) |
|---|---|---|---|---|
| ST-04 | (N/A) | (N/A) | (N/A) | 1.33 |

| Flow (Total Bypassed) (ft³/s) | Bypass Target | Capture Efficiency (Calculated) (%) | Gutter Depth (in) | Gutter Spread (ft) |
|---|---|---|---|---|
| 0.00 | (N/A) | 100.0 | 0.0 | 0.0 |
| 0.00 | (N/A) | 100.0 | 0.0 | 0.0 |
| 0.00 | (N/A) | 100.0 | 0.0 | 0.0 |

# Conduit FlexTable: Woodrow Base Sheet (15-0415D.stc)

| -Node- Upstream Downstream | Upstream Inlet Area (acres) | Upstream Inlet C | Upstream CA (acres) | Upstream Rational Flow ($ft^3/s$) | Upstream Flow Time (min) |
|---|---|---|---|---|---|
| ST-01 | 0.332 | 0.350 | 0.116 | 0.97 | 5.000 |
| ST-02 | | | | | |
| ST-02 | 0.054 | 0.350 | 0.135 | 1.11 | 5.421 |
| ST-03 | | | | | |
| ST-04 | 0.256 | 0.620 | 0.159 | 1.33 | 5.000 |
| ST-05 | | | | | |

| System Intensity (in/h) | System Rational Flow ($ft^3/s$) | Manning's n | Length (User Defined) (ft) | Diameter (in) | Slope (ft/ft) |
|---|---|---|---|---|---|
| 8.300 | 0.97 | 0.010 | 45.0 | 10.0 | 0.0100 |
| 8.174 | 1.11 | 0.010 | 72.0 | 12.0 | 0.0108 |
| 8.300 | 1.33 | 0.010 | 37.0 | 12.0 | 0.0054 |

| Velocity (Average) (ft/s) | Capacity (Full Flow) ($ft^3/s$) | Invert (Upstream) (ft) | Invert (Downstream) (ft) |
|---|---|---|---|
| 1.78 | 2.85 | 145.20 | 144.75 |
| 1.42 | 4.82 | 144.58 | 143.80 |
| 1.69 | 3.41 | 144.00 | 143.80 |

# ***Section F:***

# ***Operation and Maintenance Notes:***

## Post-Construction Maintenance Program:

The applicant, its assigns shall be responsible for the maintenance and care of the yard drain collection system and Seepage Bed.

### BMP Operation and Maintenance Notes:

- During the construction phase of the project, the permittee shall be responsible for the proper construction, stabilization and maintenance of all erosion and sedimentation control measures. The permittee shall also be responsible for the proper construction, operation and maintenance of all post construction stormwater management BMPs identified in the PCSWM plan. The applicant, its assigns will assume responsibility for the operation and maintenance responsibilities of all post construction stormwater management BMPs.

- All inspections of post construction stormwater management BMPs shall be performed by the appointed representative of the Township. The operation and maintenance requirements for the post construction stormwater management BMPs proposed for this project include the following:

**Maintenance of the storm sewer collection system: (After each runoff event)**

- The owner, its assigns shall be responsible to ensure that the storm sewer collection and lawn drain system is free and clear of any debris. The system shall be inspected after each runoff event and cleaned if required.

**Maintenance of the underground detention facilities: (After each runoff event)**

- The owner, its assigns shall be responsible to ensure that the underground detention facilities are free and clear of any debris. The system shall be inspected after each runoff event and cleaned if required. Quarterly flushing of the system shall be done to ensure the system is free and clear of any sediment and debris.

**Maintenance of the downspout & roof leader collection system: (After each runoff event)**

- The owner, its assigns shall be responsible to ensure that the downspout and roof leader collection system is free and clear of any debris. The system shall be inspected after each runoff event and cleaned if required. Quarterly flushing of the system shall be done to ensure the system is free and clear of any sediment and debris.

16-4556.00

**Cynthia McLaughlin**

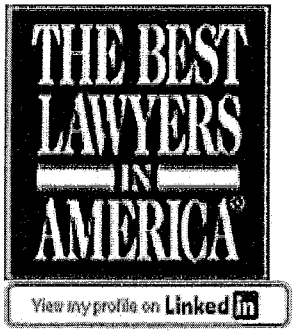
**From:** Neil A. Stein <NStein@kaplaw.com>
**Sent:** Wednesday, January 10, 2018 3:38 PM
**To:** Glenn Van Eerden (glenn@vecc.net); Mark Altrogge
**Cc:** Cynthia McLaughlin
**Subject:** Sewer Easement Agreement - Montgomery County and 60 Flourtown LLC.DOCX [KS-IMAN_BB.FID723165]
**Attachments:** Sewer Easement Agreement - Montgomery County and 60 Flourtown LLC.pdf

Attached is the revised Sanitary Sewer Easement for Montgomery County. I am now addressing the second easement.

Neil Andrew Stein, Esquire
nstein@kaplaw.com
Direct Dial: (610) 941-2469
Direct Fax: (610) 684-2029
See My Mobile Business Card

*My Assistant:*
Ms. Danielle Gosciniak
dgosciniak@kaplaw.com
Direct Dial: (610) 941-2586

Kaplin Stewart Meloff Reiter & Stein, PC
Union Meeting Corporate Center
910 Harvest Drive, Box 3037
Blue Bell, Pennsylvania 19422
www.kaplaw.com



***Prepared By and Return To:***
Neil Andrew Stein, Esquire
Union Meeting Corporate Center
910 Harvest Drive, Suite #200
P.O. Box 3037
Blue Bell, Pennsylvania 19422

***Property:***
Flourtown Road (Parcel #65-00-03982-00-3)
100 Flourtown Road (Parcel #65-00-08005-01-2)

## SANITARY SEWER EASEMENT AGREEMENT

**THIS SANITARY SEWER EASEMENT AGREEMENT** is made effective as of this _____day of _____, 2018, by and between **MONTGOMERY COUNTY BOARD OF COMMISSIONERS** ("**Grantor**") and **60 FLOURTOWN ROAD, LLC**, a Pennsylvania limited liability company ("**Grantee**").

## BACKGROUND

A. Grantor is the owner of a certain parcel or parcels of law of approximately 5.8 acres situate in Whitemarsh Township, Montgomery County, Pennsylvania, more particularly described as Montgomery County Tax Parcel Number ***65-00-08005-11-1***(the "**Grantor's Property**").

B. Grantee is the owner of a parcel of land adjoining the Grantor's Property, known as 100 Flourtown Road, containing approximately 5.53 acres situate in Whitemarsh Township, Montgomery County, Pennsylvania (the "**Grantee's Property**"), more particularly described as Montgomery County Tax Parcel Number ***65-00-08005-01-2***, upon which Grantee intends to construct a storage facility (the "**Project**").

C. Grantor desires to grant to Grantee, its successors and assigns, a perpetual easement (the "**Easement**") in, over and under a portion of the Grantor's Property (the "**Easement Area**") as depicted on a plan entitled "Proposed Sanitary Sewer Easement Plan", prepared by Robert E. Blue Consulting Engineers, P.C., attached hereto as ***Exhibit "A"***and made a part hereof and made a part hereof and as also described in ***Exhibit "B"*** attached hereto and made a part thereof.

D. Grantee desires to obtain the Easement to permit (the "**Easement Purposes**") the construction and continued maintenance of a new sanitary sewer line (the "**New Line**") within the Easement Area, which New Line will connect to an existing sanitary sewer manhole and line owned by the Whitemarsh Township Authority.

**NOW, THEREFORE**, in consideration of the mutual covenants and agreements contained herein, the parties, intending to be legally bound hereby, provide as follows:

1. **EASEMENT**. Grantor hereby creates, grants and declares in favor of Grantee, its successors and assigns, a perpetual right and easement to establish and maintain in, over and under the Easement Area for the Easement Purposes, a perpetual right and privilege of ingress, egress and regress over the Easement Area for construction, reconstruction, maintenance, repair and replacement of the New Line and any elements thereof. Grantee shall bear all costs and expenses involved in constructing and maintaining the New Line in the Easement Area. Grantor shall have the right to relocate the Easement Area from time to time, at Grantor's sole cost and expense, provided that sanitary sewer service to the Project is not interrupted, altered or diminished in any manner.

2. **MAINTENANCE OF EASEMENT AREAS**. Throughout the term of this Easement Agreement, the Grantee, at Grantee's sole cost and expense, shall maintain, except as otherwise provided herein, the New Line, in good order and condition and in accordance with all applicable governmental requirements and regulations. Provided, however, that the Grantor, at its sole cost and expense, shall continue to be responsible for maintenance of the surface of the Easement Area.

3. **RESTORATION**. Grantee shall immediately restore the Easement Area to at least its condition prior to any work or other activity conducted by Grantee, its successors, licensees, lessees, contractors or assigns, and its agents and employees, in, over or under the Easement Area. Provided, however, that except for the Grantee's restoration obligations set forth herein, the Grantor, at its sole cost and expense, shall be responsible for maintenance of the surface of the Easement Area.

4. **NO OBSTRUCTION**. At no time shall Grantor, or Grantor's successors or assigns, erect any fence, barrier or other permanent obstruction at or upon the perimeter boundaries or elsewhere upon the Grantor's Property so as to deny or to otherwise impair reasonable and necessary access of Grantee to the Easement Area. Notwithstanding the foregoing, the grant of the Easement by the Grantor shall be non-exclusive as to the surface of the Easement Area. The Grantor, its successors and assigns, may use the surface of the Easement Area for any use not inconsistent with the purpose of the Easement (which shall include Grantor may still use the surface of the easement area for a bike/pedestrian path, but that placement of any improvement would not impair or impact the subsurface utility line being installed by the Grantee) and may plant trees, shrubs, or similar landscaping on the surface of the Easement Area, with the express understanding that the Grantee, its successors and assigns, shall have no liability for any damage or removal of such landscaping as may be necessary to perform required repairs to or replacement of the New Line.

5. **INSURANCE AND INDEMNIFICATION.**

A. **Liability; Indemnification.** Grantee shall indemnify, defend and hold harmless Grantor and any one claiming through Grantor (except for loss or damage resulting from tortuous acts or omissions or resulting from the violation of this Easement Agreement) from and against any damages, liability, actions, claims and expenses (including without limitation, reasonable attorney's fees and costs) in connection with loss of life, personal injury and/or property damage arising from or out of the construction, operation or maintenance of the New Line.

B. **Liability Insurance.** Grantee shall maintain or cause to be maintained at its own expense, general commercial liability insurance insuring against claims on account of loss of life, bodily injury or property damage that may arise from, or be occasioned by the condition, use or occupancy of the Easement Area. Such insurance shall be carried by a reputable insurance company or companies qualified to do business in the Commonwealth of Pennsylvania, reasonably satisfactory to the Grantor, and having limits for loss of life or bodily injury in the amounts of not less than One Million Dollars ($1,000,000.00) for each person and One Million Dollars ($1,000,000.00) for each occurrence and One Million Dollars ($1,000,000.00) for property damage for each occurrence. Within five (5) days of written request by the Grantor or within ten (10) days of the scheduled expiration date of the then current certificate, Grantee shall furnish to Grantor certification of insurance evidencing the existence of the insurance to be carried. Any such insurance certification shall provide that coverage shall not be canceled without at least thirty (30) days prior written notice of cancellation to the certificate holder and any additional insured. Should Grantee fail to obtain and maintain the coverage required by the terms of this Agreement, upon five (5) days prior written notice, Grantor shall have the right to obtain such coverage and to invoice the Grantee for one hundred ten percent (110%) of the cost thereof.

6. **RIGHTS IN THE EVENT OF DEFAULT.**

A. **Events of Default.** As used in this ***Paragraph 6***, an event of default ("**Event of Default**") hereunder shall occur if either party violates, or fails to perform or otherwise breaches any non-monetary covenant or condition herein contained or any other obligation imposed herein upon such party and such default shall continue and not be remedied by that party within thirty (30) days after notice thereof, or if such default be of a nature so as not to be subject to cure within such thirty (30) day period, provided such default is curable, if there continues a failure to promptly commence and diligently prosecute a cure to completion within ninety (90) days after written notice thereof.

B. **Remedies.** If either Grantor or Grantee violates any of the terms of this Agreement and an Event of Default is declared, subject to applicable notice and cure provisions (a **"Defaulting Party"**), the other Party (the **"Non-Defaulting Party"**) shall be entitled, in addition to all other rights and remedies available at law or in equity, to recover actual and consequential damages from the Defaulting Party as a result of such breach, including attorneys' fees and court costs, and, acknowledging that there may be no adequate remedy at law, the Non-Defaulting Party shall have the right to enjoin any violation of this Agreement or seek equitable relief to compel the Defaulting Party to comply with its obligations under this Agreement.

7. **GENERAL PROVISIONS.**

A. **Binding Effect.** This Easement Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, executors, successors, administrators and assigns.

B. **Recording.** This Easement Agreement shall be recorded in the Office of the Recorder of Deeds of Montgomery County, Pennsylvania, by any party hereto. All recording fees, taxes and all other costs and expenses of recordation shall be borne by Grantee.

C. **Mortgage Subordination.** Any mortgage or deed of trust affecting any portion of the Grantor's Property shall at all times be subject and subordinate to the terms of this Agreement. Any party foreclosing any mortgage or deed of trust, or acquiring title by deed in lieu of foreclosure or trustee's sale shall acquire title subject to all of the terms and provisions of this Agreement.

D. **Modification.** This Easement Agreement shall be recorded and may not be amended, modified, or terminated at any time except by an agreement in writing, executed and acknowledged by the parties or their successors or assigns.

E. **Running with the Land.** The rights, easements and covenants established herein shall run with, and be appurtenant to, title to the Grantor's Property and the Grantee's Property and shall be a burden upon and run with the title to the Grantor's Property.

F. **Notices.** Any notice, report or demand required, permitted or desired to be given under this Easement Agreement shall be in writing and shall be deemed to have been sufficiently given or served for all purposes if it is delivered (i) personally or, (ii) by overnight courier prepaid by the sender or, (iii) mailed by registered or certified mail, return receipt requested, postage prepaid to the parties at such address as the respective parties may from time to time designate by like notice. Each such notice shall be effective upon being delivered, or upon refusal of delivery.

G. **Invalidity**. If any provision of this Easement Agreement, or portion thereof, shall be held invalid, inoperative or unenforceable, the remainder of this Easement Agreement, or the application of such provision or portion thereof to any other persons or circumstances, shall not be affected thereby.

H. **Governing Law**. This Easement Agreement shall be construed in accordance with the laws of the Commonwealth of Pennsylvania without regard to conflict of laws provisions.

I. **Headings**. The Article headings in this Easement Agreement are for convenience only, shall in no way define or limit the scope or content of this Easement Agreement and shall not be considered in any construction or interpretation of this Easement Agreement or any part hereof.

J. **Term**. This Easement Agreement and the easements, rights, obligations and liabilities created hereby shall be perpetual in term to the extent permitted by law.

K. **Counterparts**. This Agreement may be executed in several counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument.

L. **Non-Dedication**. Nothing contained in this Agreement shall be deemed to be a gift or dedication of any portion of the Parcels to the general public or for any public use or purpose whatsoever and nothing in this Agreement, expressed or implied, shall confer upon any person, other than the Grantor, the Grantee and their successors and assigns, any rights or remedies under or by reason of this Agreement. Notwithstanding, the Grantee may assign all of its right, title and interest in and to this Easement to the Whitemarsh Sewer Authority.

M. **No Joint Venture**. Nothing in this Declaration shall be construed to make the Grantor and the Grantee partners or joint venturers or render either Grantor or Grantee liable for the debts or obligations of the other.

**IN WITNESS WHEREOF**, the parties hereto have caused this Agreement to be executed the day and year first above written.

***SIGNATURES COMMENCE ON THE FOLLOWING PAGE***

***ATTEST***:

_____

_____
Witness

**GRANTOR**:
**COUNTY OF MONTGOMERY**
By: **ITS BOARD OF COMMISSIONERS**

By:_____

**GRANTEE**:
**60 FLOURTOWN ROAD, LLC**,
a Pennsylvania limited liability company

By:_____
**GLENN VAN EERDEN,**
**MANAGING MEMBER**

**COMMONWEALTH OF PENNSYLVANIA** :
**SS.**
**COUNTY OF MONTGOMERY** :

On this, the _____ day of _____ 2018, before me, the undersigned notary public, personally appeared Glenn Van Eerden who acknowledged himself to be the Managing Member of 60 Flourtown Road, LLC, a Pennsylvania limited liability company and that he, as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

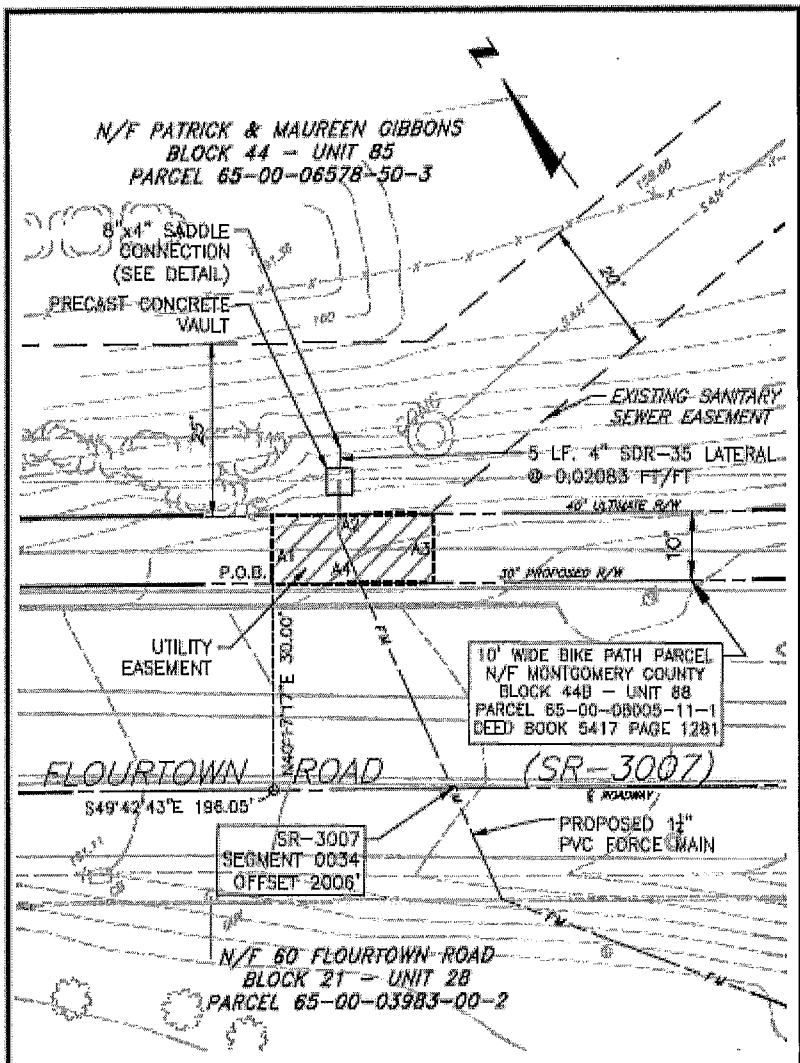
_____
NOTARY PUBLIC
(Notarial Seal)
My Commission Expires:

**COMMONWEALTH OF PENNSYLVANIA** :
SS.
**COUNTY OF MONTGOMERY** :

On this, the _____ day of _____, 2018, before me, the undersigned notary public, personally appeared _____ who acknowledged himself/herself to be the _____of the Board of Commissioners of the County of Montgomery and that he/she, as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

_____
NOTARY PUBLIC
(Notarial Seal)
My Commission Expires:

*EXHIBIT "A"*
*EASEMENT AREA PLAN*
*ATTACHED*




| LINE TABLE FOR UTILITY EASEMENT | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| A1 | N40°17'17"E | 10.00' |
| A2 | S49°42'43"E | 24.23' |
| A3 | S40°17'17"W | 10.00' |
| A4 | N49°42'43"W | 24.23' |
| | TOTAL AREA = | 242 S.F. |

COMMONWEALTH OF PENNSYLVANIA
ROBERT E. BLUE, JR.
LICENSED PROFESSIONAL LAND SURVEYOR

UTILITY EASEMENT EXHIBIT
100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR
60 FLOURTOWN ROAD, LLC
343 MILITIA HILL ROAD
FORT WASHINGTON, PA 19034

REVISIONS

DRAWN BY: DGM
CHECKED BY: REB
DATE: 08-02-2017
JOB NUMBER: 2081-1
SCALE: 1"=20'
SHEET NUMBER: 1 of 1

GRAPHIC SCALE
0 20 40 60 80

robert e. blue
consulting engineers, p.e.
1148 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9444 fax: (610)-277-6897
www.robertblue.com email: rblue@robertblue.com

Last Saved By: Greg Schaefer 8/1/2017 11:41 AM
File Name: I:\Projects\2081-1 Utility Easement Exhibit.dwg

*EXHIBIT "B"*
*EASEMENT AREA DESCRIPTION*
*[ATTACHED]*

robert e. blue consulting engineers, p.c.

60 Flourtown Road, LLC
343 Militia Hill Road
Fort Washington, PA 19034

September 15, 2017

Project 2081-1

Description of a Utility Easement
On Lands of Montgomery County Bike Path (Block 44B Unit 88)
In Favor of 60 Flourtown Road (Block 21 Unit 28)

ALL THAT CERTAIN tract or parcel of ground situate in the Township of Whitemarsh, County of Montgomery, Commonwealth of Pennsylvania, shown on a "Utility Easement Exhibit" prepared by Robert E. Blue, Consulting Engineers, P.C., Blue Bell, PA, dated August 22, 2017, bounded and described as follows:

BEGINNING at a point being a corner of a Utility Easement, said point being located along the northeasterly existing right of way line of Flourtown Road (SR 3007), 30 feet from centerline, and also along the lands now or formerly of Montgomery County Bike Path (Block 44B Unit 88), said point being measured from the centerline intersection of said Flourtown Road (60 feet wide) and Cambram Road (50 feet wide), the following three (3) courses and distances:

1. Along and near the centerline of said Flourtown Road South 49 degrees 49 minutes 05 seconds East, a distance of 86.61 feet to a point;

2. Continuing along same centerline, South 49 degrees 42 minutes 43 seconds West, a distance of 196.05 feet to a point;

3. North 40 degrees 17 minutes 17 seconds East, a distance of 30.00 feet to the point of beginning;

THENCE from said point of beginning, continuing North 40 degrees 17 minutes 17 seconds East and crossing the said Montgomery County Bike Path Parcel, a distance of 10.00 feet to a point;

Thence along the common dividing line between lands now or formerly of Patrick & Maureen Gibbons (Block 44 Unit 85) and lands now or formerly of said Montgomery County Bike Path Parcel, South 49 degrees 42 minutes 43 seconds East, a distance of 24.23 feet to a point;

Thence crossing the Montgomery County Bike Path Parcel, South 40 degrees 17 minutes 17 seconds West, a distance of 10.00 feet to a point;

Thence along the southeasterly side of the said Montgomery County Bike Path Parcel, North 49 degrees 42 minutes 43 seconds West, a distance of 24.23 feet to a point, said point being the first mentioned point and place of beginning;

CONTAINING 242 square feet or 0.0056 acres of land, more or less.

CIVIL ENGINEERS ▪ LAND SURVEYORS ▪ SITE PLANNERS
1140 Skippack Pike, Blue Bell, Pennsylvania 19422 ▪ telephone 610-277-8941 ▪ facsimile 610-277-8597
www.robertblue.com ▪ e-mail: rblue@robertblue.com

*Prepared By and Return To*:
Neil Andrew Stein, Esquire
Union Meeting Corporate Center
910 Harvest Drive, Suite #200
P.O. Box 3037
Blue Bell, Pennsylvania 19422

*Property*:
Flourtown Road (Parcel #65-00-08005-11-1)
100 Flourtown Road (Parcel #65-00-08005-01-2)

## SANITARY SEWER EASEMENT AGREEMENT

**THIS SANITARY SEWER EASEMENT AGREEMENT** is made effective as of this _____day of _____, 2018, by and between **MONTGOMERY COUNTY** ("Grantor") and **60 FLOURTOWN ROAD, LLC**, a Pennsylvania limited liability company ("Grantee").

## BACKGROUND

A. Grantor is the owner of a certain parcel or parcels of law of approximately 5.8 acres situate in Whitemarsh Township, Montgomery County, Pennsylvania, more particularly described as Montgomery County Tax Parcel Number ***65-00-08005-11-1***(the "Grantor's Property").

B. Grantee is the owner of a parcel of land adjoining the Grantor's Property, known as 100 Flourtown Road, containing approximately 5.53 acres situate in Whitemarsh Township, Montgomery County, Pennsylvania (the "**Grantee's Property**"), more particularly described as Montgomery County Tax Parcel Number ***65-00-08005-01-2***, upon which Grantee intends to construct a storage facility (the "**Project**").

C. Grantor desires to grant to Grantee, its successors and assigns, a perpetual easement (the "**Easement**") in, over and under a portion of the Grantor's Property (the "**Easement Area**") as depicted on a plan entitled "Proposed Sanitary Sewer Easement Plan", prepared by Robert E. Blue Consulting Engineers, P.C., attached hereto as ***Exhibit "A"*** and made a part hereof and made a part hereof and as also described in ***Exhibit "B"*** attached hereto and made a part thereof.

D. Grantee desires to obtain the Easement to permit (the "**Easement Purposes**") the construction and continued maintenance of a new sanitary sewer line (the "**New Line**") within the Easement Area, which New Line will connect to an existing sanitary sewer manhole and line owned by the Whitemarsh Township Authority.

**NOW, THEREFORE**, in consideration of the mutual covenants and agreements contained herein, the parties, intending to be legally bound hereby, provide as follows:

1. **EASEMENT**. Grantor hereby creates, grants and declares in favor of Grantee, its successors and assigns, a perpetual right and easement to establish and maintain in, over and under the Easement Area for the Easement Purposes, a perpetual right and privilege of ingress, egress and regress over the Easement Area for construction, reconstruction, maintenance, repair and replacement of the New Line and any elements thereof. Grantee shall bear all costs and expenses involved in constructing and maintaining the New Line in the Easement Area. Grantor shall have the right to relocate the Easement Area from time to time, at Grantor's sole cost and expense, provided that sanitary sewer service to the Project is not interrupted, altered or diminished in any manner.

2. **MAINTENANCE OF EASEMENT AREAS**. Throughout the term of this Easement Agreement, the Grantee, at Grantee's sole cost and expense, shall maintain, except as otherwise provided herein, the New Line, in good order and condition and in accordance with all applicable governmental requirements and regulations. Provided, however, that the Grantor, at its sole cost and expense, shall continue to be responsible for maintenance of the surface of the Easement Area.

3. **RESTORATION**. Grantee shall immediately restore the Easement Area to at least its condition prior to any work or other activity conducted by Grantee, its successors, licensees, lessees, contractors or assigns, and its agents and employees, in, over or under the Easement Area for the initial installation of the water line and for any disturbance caused by future required repairs to or replacement of the New Line. Provided, however, that except for the Grantee's restoration obligations set forth herein, the Grantor, at its sole cost and expense, shall be responsible for maintenance of the surface of the Easement Area.

4. **NO OBSTRUCTION**. At no time shall Grantor, or Grantor's successors or assigns, erect any fence, barrier or other permanent obstruction at or upon the perimeter boundaries or elsewhere upon the Grantor's Property so as to deny or to otherwise impair reasonable and necessary access of Grantee to the Easement Area. Notwithstanding the foregoing, the grant of the Easement by the Grantor shall be non-exclusive as to the surface of the Easement Area. The Grantor, its successors and assigns, may use the surface of the Easement Area for any use not inconsistent with the purpose of the Easement (which shall include Grantor may still use the surface of the easement area for a bike/pedestrian path, but that placement of any improvement would not impair or impact the subsurface utility line being installed by the Grantee) and may plant trees, shrubs, or similar landscaping on the surface of the Easement Area.

5. INSURANCE AND INDEMNIFICATION.

A. Liability; Indemnification. Grantee shall indemnify, defend and hold harmless Grantor and any one claiming through Grantor (except for loss or damage resulting from tortuous acts or omissions or resulting from the violation of this Easement Agreement) from and against any damages, liability, actions, claims and expenses (including without limitation, reasonable attorney's fees and costs) in connection with loss of life, personal injury and/or property damage arising from or out of the construction, operation or maintenance of the New Line.

B. Liability Insurance. Grantee shall maintain or cause to be maintained at its own expense, general commercial liability insurance insuring against claims on account of loss of life, bodily injury or property damage that may arise from, or be occasioned by the condition, use or occupancy of the Easement Area. Such insurance shall be carried by a reputable insurance company or companies qualified to do business in the Commonwealth of Pennsylvania, reasonably satisfactory to the Grantor, and having limits in the amounts of not less than One Million Dollars ($1,000,000.00) for each occurrence, Two Million Dollars ($2,000,000.00) general aggregate, Two Million Dollars ($2,000,000.00) products/completed operations aggregate, and One Million Dollars ($1,000,000.00) for personal/advertising injury. Within five (5) days of written request by the Grantor or within ten (10) days of the scheduled expiration date of the then current certificate, Grantee shall furnish to Grantor certification of insurance evidencing the existence of the insurance to be carried. Any such insurance certification shall provide that coverage shall not be canceled without at least thirty (30) days prior written notice of cancellation to the certificate holder and any additional insured. Should Grantee fail to obtain and maintain the coverage required by the terms of this Agreement, upon five (5) days prior written notice, Grantor shall have the right to obtain such coverage and to invoice the Grantee for one hundred ten percent (110%) of the cost thereof.

6. RIGHTS IN THE EVENT OF DEFAULT.

A. Events of Default. As used in this *Paragraph 6*, an event of default ("Event of Default") hereunder shall occur if either party violates, or fails to perform or otherwise breaches any non-monetary covenant or condition herein contained or any other obligation imposed herein upon such party and such default shall continue and not be remedied by that party within thirty (30) days after notice thereof, or if such default be of a nature so as not to be subject to cure within such thirty (30) day period, provided such default is curable, if there continues a failure to promptly commence and diligently prosecute a cure to completion within ninety (90) days after written notice thereof.

B. Remedies. If either Grantor or Grantee violates any of the terms of this Agreement and an Event of Default is declared, subject to applicable notice and cure provisions (a "Defaulting Party"), the other Party (the "Non-Defaulting Party") shall be entitled, in addition to all other rights and remedies available at law or in equity, to recover actual and consequential damages from the Defaulting Party as a result of such breach, including attorneys' fees and court costs, and, acknowledging that there may be no adequate remedy at law, the Non-Defaulting Party shall have the right to enjoin any violation of this Agreement or seek equitable relief to compel the Defaulting Party to comply with its obligations under this Agreement.

7. GENERAL PROVISIONS.

A. Binding Effect. This Easement Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, executors, successors, administrators and assigns.

B. Recording. This Easement Agreement shall be recorded in the Office of the Recorder of Deeds of Montgomery County, Pennsylvania, by any party hereto. All recording fees, taxes and all other costs and expenses of recordation shall be borne by Grantee.

C. Mortgage Subordination. Any mortgage or deed of trust affecting any portion of the Grantor's Property shall at all times be subject and subordinate to the terms of this Agreement. Any party foreclosing any mortgage or deed of trust, or acquiring title by deed in lieu of foreclosure or trustee's sale shall acquire title subject to all of the terms and provisions of this Agreement.

D. Modification. This Easement Agreement shall be recorded and may not be amended, modified, or terminated at any time except by an agreement in writing, executed and acknowledged by the parties or their successors or assigns.

E. Running with the Land. The rights, easements and covenants established herein shall run with, and be appurtenant to, title to the Grantor's Property and the Grantee's Property and shall be a burden upon and run with the title to the Grantor's Property.

F. Notices. Any notice, report or demand required, permitted or desired to be given under this Easement Agreement shall be in writing and shall be deemed to have been sufficiently given or served for all purposes if it is delivered (i) personally or, (ii) by overnight courier prepaid by the sender or, (iii) mailed by registered or certified mail, return receipt requested, postage prepaid to the parties at such address as the respective parties may from time to time designate by like notice. Each such notice shall be effective upon being delivered, or upon refusal of delivery.

G. Invalidity. If any provision of this Easement Agreement, or portion thereof, shall be held invalid, inoperative or unenforceable, the remainder of this Easement Agreement, or the application of such provision or portion thereof to any other persons or circumstances, shall not be affected thereby.

H. Governing Law. This Easement Agreement shall be construed in accordance with the laws of the Commonwealth of Pennsylvania without regard to conflict of laws provisions.

I. Headings. The Article headings in this Easement Agreement are for convenience only, shall in no way define or limit the scope or content of this Easement Agreement and shall not be considered in any construction or interpretation of this Easement Agreement or any part hereof.

J. Term. This Easement Agreement and the easements, rights, obligations and liabilities created hereby shall be perpetual in term to the extent permitted by law.

K. Counterparts. This Agreement may be executed in several counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument.

L. Non-Dedication. Nothing contained in this Agreement shall be deemed to be a gift or dedication of any portion of the Parcels to the general public or for any public use or purpose whatsoever and nothing in this Agreement, expressed or implied, shall confer upon any person, other than the Grantor, the Grantee and their successors and assigns, any rights or remedies under or by reason of this Agreement. Notwithstanding, the Grantee may assign all of its right, title and interest in and to this Easement to the Whitemarsh Sewer Authority.

M. No Joint Venture. Nothing in this Declaration shall be construed to make the Grantor and the Grantee partners or joint venturers or render either Grantor or Grantee liable for the debts or obligations of the other.

**IN WITNESS WHEREOF**, the parties hereto have caused this Agreement to be executed the day and year first above written.

*SIGNATURES COMMENCE ON THE FOLLOWING PAGE*

GRANTOR:
COUNTY OF MONTGOMERY

*ATTEST*:

Witness

By: _____
LEE SOLTYSIAK
CHIEF OPERATING OFFICER

GRANTEE:
60 FLOURTOWN ROAD, LLC,
a Pennsylvania limited liability company

Witness

By: _____
GLENN VAN EERDEN,
MANAGING MEMBER

**APPROVED AS TO FORM**

**Montgomery County Solicitor's Office**

COMMONWEALTH OF PENNSYLVANIA :
SS.
COUNTY OF MONTGOMERY :

On this, the _____ day of _____ 2018, before me, the undersigned notary public, personally appeared Glenn Van Eerden who acknowledged himself to be the Managing Member of 60 Flourtown Road, LLC, a Pennsylvania limited liability company and that he, as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

_____
NOTARY PUBLIC
(Notarial Seal)
My Commission Expires:

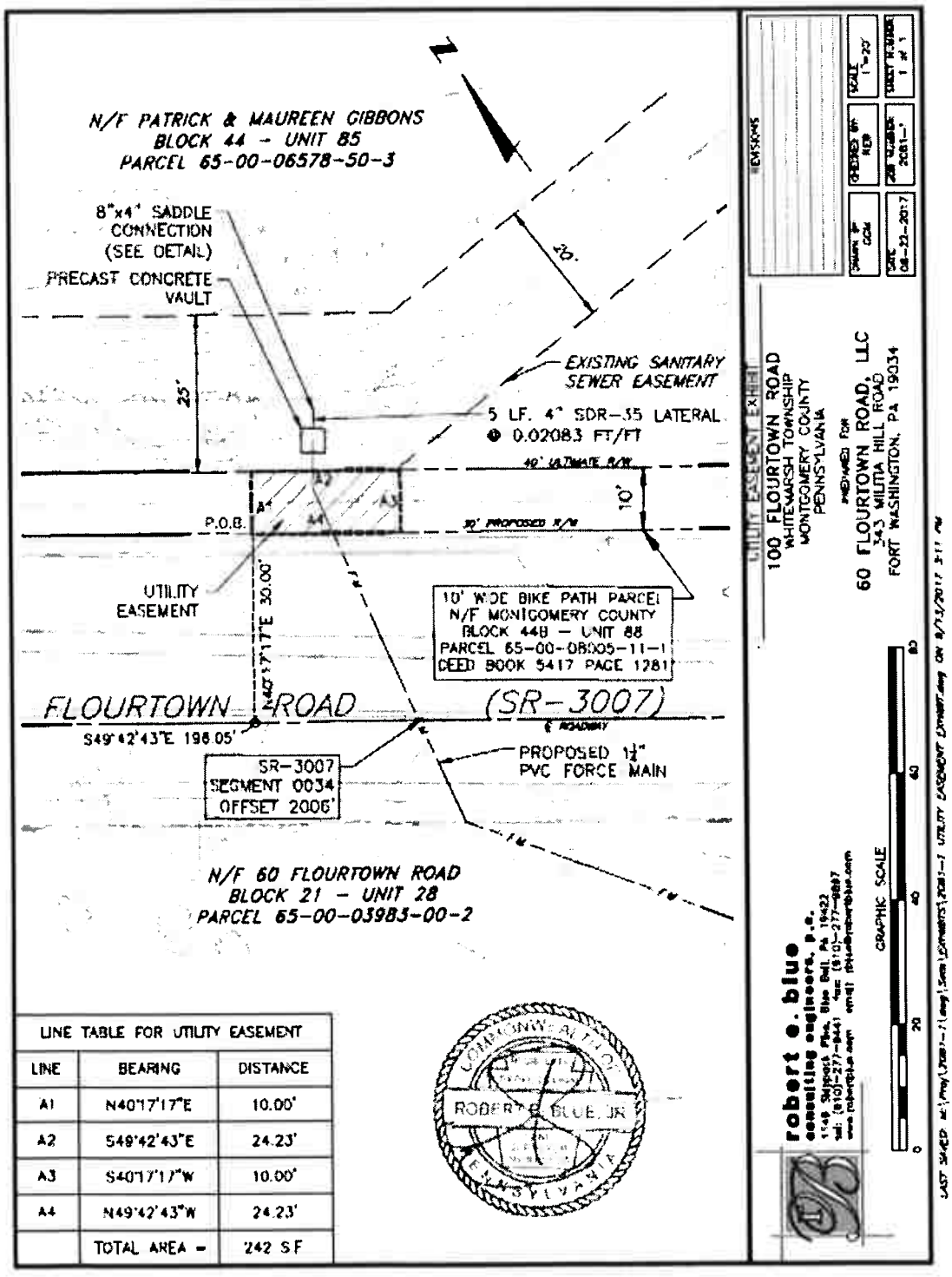
COMMONWEALTH OF PENNSYLVANIA :
SS.
COUNTY OF MONTGOMERY :

On this, the 13th day of August, 2018, before me, the undersigned notary public, personally appeared Lee A. Soltysiak who acknowledged himself/herself to be the Chief Operating Officer of the County of Montgomery and that he/she, as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

Bethany A. Christman
NOTARY PUBLIC
(Notarial Seal)
My Commission Expires:

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Bethany A. Christman, Notary Public
Norristown Boro, Montgomery County
My Commission Expires June 14, 2021
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

*EXHIBIT "A"*
*EASEMENT AREA PLAN*
*ATTACHED*




| LINE TABLE FOR UTILITY EASEMENT | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| A1 | N40°17'17"E | 10.00' |
| A2 | S49°42'43"E | 24.23' |
| A3 | S40°17'17"W | 10.00' |
| A4 | N49°42'43"W | 24.23' |
| | TOTAL AREA = | 242 S.F. |

*EXHIBIT "B"*
*EASEMENT AREA DESCRIPTION*
*[ATTACHED]*

robert e. blue consulting engineers, p.c.

60 Flourtown Road, LLC
343 Militia Hill Road
Fort Washington, PA 19034

September 13, 2017

Project 2081-1

Description of a Utility Easement
On Lands of Montgomery County Bike Path (Block 44B Unit 88)
In Favor of 60 Flourtown Road (Block 21 Unit 28)

ALL THAT CERTAIN tract or parcel of ground situate in the Township of Whitemarsh, County of Montgomery, Commonwealth of Pennsylvania, shown on a "Utility Easement Exhibit" prepared by Robert E. Blue, Consulting Engineers, P.C., Blue Bell, PA, dated August 22, 2017, bounded and described as follows:

BEGINNING at a point being a corner of a Utility Easement, said point being located along the northeasterly existing right of way line of Flourtown Road (SR 3007), 30 feet from centerline, and also along the lands now or formerly of Montgomery County Bike Path (Block 44B Unit 88), said point being measured from the centerline intersection of said Flourtown Road (60 feet wide) and Cambrun Road (50 feet wide), the following three (3) courses and distances:

1. Along and near the centerline of said Flourtown Road South 49 degrees 49 minutes 05 seconds East, a distance of 86.61 feet to a point;

2. Continuing along same centerline, South 49 degrees 42 minutes 43 seconds West, a distance of 196.05 feet to a point;

3. North 40 degrees 17 minutes 17 seconds East, a distance of 30.00 feet to the point of beginning;

THENCE from said point of beginning, continuing North 40 degrees 17 minutes 17 seconds East and crossing the said Montgomery County Bike Path Parcel, a distance of 10.00 feet to a point;

Thence along the common dividing line between lands now or formerly of Patrick & Maureen Gibbons (Block 44 Unit 85) and lands now or formerly of said Montgomery County Bike Path Parcel, South 49 degrees 42 minutes 43 seconds East, a distance of 24.23 feet to a point;

Thence crossing the Montgomery County Bike Path Parcel, South 40 degrees 17 minutes 17 seconds West, a distance of 10.00 feet to a point;

Thence along the southwesterly side of the said Montgomery County Bike Path Parcel, North 49 degrees 42 minutes 43 seconds West, a distance of 24.23 feet to a point, said point being the first mentioned point and place of beginning.

CONTAINING 242 square feet or 0.0056 acres of land, more or less.

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 Montgomery County, Pennsylvania

## 60 Flourtown Rd, Plymouth Mtg




May 10, 2017

# 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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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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: 1:3,430 if printed on A landscape (11" x 8.5") sheet.

N

0 50 100 200 300 Meters

0 150 300 600 900 Feet

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 1:12,000.

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

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

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

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

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

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

Soil Survey Area: Montgomery County, Pennsylvania
Survey Area Data: Version 10, Sep 19, 2016

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

Date(s) aerial images were photographed: Jul 17, 2014—Aug 14, 2014

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

# Map Unit Legend

| Montgomery County, Pennsylvania (PA091) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| LeA | Lawrenceville silt loam, 0 to 3 percent slopes | 6.5 | 79.4% |
| UgB | Urban land, 0 to 8 percent slopes | 0.0 | 0.2% |
| UudB | Urban land-Udorthents, limestone complex, 0 to 8 percent slopes | 1.7 | 20.4% |
| **Totals for Area of Interest** | | **8.1** | **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.

# Montgomery County, Pennsylvania

## LeA—Lawrenceville silt loam, 0 to 3 percent slopes

### Map Unit Setting

*National map unit symbol:* l54w
*Elevation:* 200 to 1,600 feet
*Mean annual precipitation:* 38 to 48 inches
*Mean annual air temperature:* 50 to 57 degrees F
*Frost-free period:* 140 to 200 days
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Lawrenceville and similar soils:* 81 percent
*Minor components:* 19 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Lawrenceville

#### Setting

*Landform:* Depressions, upland slopes
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Base slope
*Down-slope shape:* Linear, concave
*Across-slope shape:* Linear, concave
*Parent material:* Loess over residuum weathered from shale and siltstone

#### Typical profile

*Ap - 0 to 12 inches:* silt loam
*Bt - 12 to 26 inches:* silt loam
*Bx - 26 to 47 inches:* silt loam
*C - 47 to 75 inches:* silt loam

#### Properties and qualities

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* 24 to 38 inches to fragipan; 48 to 99 inches to lithic bedrock
*Natural drainage class:* Moderately well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)
*Depth to water table:* About 18 to 36 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* Low (about 4.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 2w
*Hydrologic Soil Group:* C
*Hydric soil rating:* No

### Minor Components

#### Lansdale

*Percent of map unit:* 13 percent

*Landform:* Hillsides
*Landform position (two-dimensional):* Summit, shoulder, backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Doylestown**

*Percent of map unit:* 4 percent
*Landform:* Drainageways
*Landform position (two-dimensional):* Toeslope, footslope, backslope
*Landform position (three-dimensional):* Head slope
*Down-slope shape:* Concave, linear
*Across-slope shape:* Linear, concave
*Hydric soil rating:* Yes

**Chalfont**

*Percent of map unit:* 2 percent
*Landform:* Upland slopes
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Concave, linear
*Across-slope shape:* Linear, concave
*Hydric soil rating:* No

## UgB—Urban land, 0 to 8 percent slopes

**Map Unit Setting**

*National map unit symbol:* 2dtyq
*Elevation:* 800 to 1,500 feet
*Mean annual precipitation:* 36 to 46 inches
*Mean annual air temperature:* 41 to 62 degrees F
*Frost-free period:* 130 to 170 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Urban land:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Urban Land**

**Setting**

*Parent material:* Pavement, buildings and other artifically covered areas human transported material

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 8s
*Hydric soil rating:* No

**Minor Components**

**Udorthents, unstable fill**
*Percent of map unit:* 10 percent
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## UudB—Urban land-Udorthents, limestone complex, 0 to 8 percent slopes

**Map Unit Setting**
*National map unit symbol:* 2dtz5
*Elevation:* 300 to 1,000 feet
*Mean annual precipitation:* 36 to 50 inches
*Mean annual air temperature:* 46 to 57 degrees F
*Frost-free period:* 140 to 200 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**
*Urban land:* 80 percent
*Udorthents, limestone, and similar soils:* 15 percent
*Minor components:* 5 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Urban Land**

**Setting**
*Landform:* Hills, valleys
*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope
*Landform position (three-dimensional):* Interfluve, side slope, nose slope, head slope
*Down-slope shape:* Linear, convex
*Across-slope shape:* Convex, linear
*Parent material:* Pavement, buildings and other artifically covered areas

**Typical profile**
*C - 0 to 6 inches:* variable

**Properties and qualities**
*Slope:* 0 to 8 percent
*Depth to restrictive feature:* 10 to 99 inches to lithic bedrock
*Available water storage in profile:* Very low (about 0.0 inches)

**Interpretive groups**
*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 8s
*Hydric soil rating:* No

### Description of Udorthents, Limestone

#### Setting

*Landform:* Hills, valleys
*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope
*Landform position (three-dimensional):* Interfluve, side slope, nose slope, head slope
*Down-slope shape:* Linear, convex
*Across-slope shape:* Convex, linear
*Parent material:* Graded areas of argillaceous limestone

#### Typical profile

*A/B - 0 to 6 inches:* clay loam
*C - 6 to 60 inches:* clay

#### Properties and qualities

*Slope:* 0 to 8 percent
*Depth to restrictive feature:* 20 to 99 inches to lithic bedrock
*Natural drainage class:* Moderately well drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 6 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water storage in profile:* High (about 10.2 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* C/D
*Hydric soil rating:* No

### Minor Components

#### Duffield

*Percent of map unit:* 5 percent
*Landform:* Hills
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Interfluve
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

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**CEDARVILLE Engineering Group, LLC**
**1218 Kimberton Road · Suite 200**
**PO Box 72 · Chester Springs, PA 19425**
**610-827-9200 (office) 610-827-9201 (fax)**

February 20th, 2013

Napoli Construction, LLC
282 Night Hawk Circle
Thorofare, NJ 08086

Attn: Tom Napoli

RE: Soil Report for Stormwater Management and Wetland Delineation Reconfirmation
Flourtown Road Tract
Whitemarsh Township, Montgomery County, PA
Job #: NAP-13-005

Dear Tom;

Cedarville Engineering Group, LLC (Cedarville) has conducted detailed soil testing at the above-referenced site. The purpose of this testing was to collect information regarding the underlying soils potential for incorporating stormwater recharge. This report serves to document the methods and results of the soil permeability testing at the above referenced site.

## SITE BACKGROUND

### Geology

The site is underlain by the Ledger Formation, which consists of Cambrian-Age dolomite. This is a carbonate formation.

According to the Pennsylvania DEP *emapPA* website, there are three documented sinkholes within the Woodbine Way subdivision, immediately south of this site. The closest documented sinkhole is between 200 and 300 feet away.

### Soils

The soils on the property are mapped as the Lawrenceville series, which consist of very deep moderately well drained soils that formed in wind-blown loess overlying residual limestone soils.

### Utilities and Rights of Way

On its southern property boundary, there is evidence of an old rail bed, which presumably was a spur line to the quarry on the north side of Flourtown Road.

There is a gas line easement that runs parallel to the flagged stormwater channel, just west of the proposed project area. Within this gas easement, there is approximately 30 feet of exposed overlying a stormwater channel.

In the western portion of the property (west of the flagged stormwater channel), there evidence of stabilization mesh and level grading, indicating that this area may have undergone past attempts at stabilization.

Zoning

The site is zoned as LIM – Limited Industrial District.

# SOIL EVALUATION

## METHODS

Soil Evaluation

Soil testing was conducted on February 14th, 2013. Two (2) backhoe excavated test pits were advanced in areas proposed for stormwater recharge. The soils were described and classified at each test location. Additionally, permeability tests were conducted utilizing the double-ring infiltrometer method. All double-ring permeability testing was conducted in accordance with the PA DEP *Stormwater Best Management Practices Manual*. Included with this report are the individual soil profile descriptions and permeability test sheets for each test location.

Steve Busby, of T&M Associates was present on-site, witnessing this investigation.

## RESULTS

Fill Classification

There was between 8 and 10 inches of fill material in the project area. The fill material consisted of subsoil, and was clean of debris or deleterious materials.

Soil Classification

According to the Web Soil Survey of Montgomery County, the soils in the area of investigation were mapped as the Lawrenceville series. The soils encountered during this investigation would be classified as the Duffield Series. The Duffield series consists of very deep, well drained soils that formed in the Cambrian Age limestone and dolomite. These soils are well drained.

Soil Wetness

There was no evidence of redoximorphic features (drainage mottling) at either of the test locations. These soils are well drained.

Rock-Limiting Layer

There was no evidence of a rock limiting layer within 48 inches of the permeability test depth at either of the test locations. These soils are very deep.

Permeability

The measured permeability rates are shown in the table below. Permeability rates ranged from 1.00 to 3.00 in/hr. These soils would be considered to have moderate permeability.

| Test Location | Permeability Test Depth (in) | Permeability Rate (in/hr) |
|---|---|---|
| 1 | 40 | 3.00 |
| 2 | 42 | 1.00 |

Limiting Factors for Stormwater Recharge

The factors that affect the ability of the soil to accommodate stormwater recharge are similar to those utilized for on-site sewage disposal. The following list of site conditions and constraints is taken from Protocol 2 – Infiltration System Guidelines of Appendix C of the *PA Stormwater Best Management Practices Manual.*

1. SITE CONDITIONS and CONSTRAINTS

a) It is desirable to **maintain a 2-foot clearance above regularly occurring seasonally high water table.** This reduces the likelihood that temporary groundwater mounding will affect the system, and allows sufficient distance of water movement through the soil to allow adequate pollutant removal. Some minor exceptions for very shallow systems and on grade systems, filter strips, buffers, etc.

b) **Maintain a minimum depth to bedrock of 2-feet to assure adequate pollutant removal.** In special circumstances, filter media may be employed to remove pollutants if adequate soil mantle does not exist.

c) It is desired that **soils underlying infiltration devices should have infiltration rates between 0.1 and 10 inches per hour**, which in most development programs should result in reasonably sized infiltration systems. Where soil permeability is extremely low, infiltration may still be possible but the surface area required could be large, and other volume reduction methods may be warranted. Undisturbed Hydrologic Soil Groups B and C often fall within this range and cover most of the state. Soils with rates in excess of 6.0 inches per hour may require an additional soil buffer (such as an organic layer over the bed bottom) if the Cation Exchange Capacity (CEC) is less than 5 and pollutant loading is expected to be significant. In carbonate soils, excessively rapid drainage may increase the risk of sinkhole formation, and some compaction or additional soil may be appropriate.

Based on these criteria alone, this site would be considered suitable for stormwater recharge.

Karst Conditions

Karst conditions were observed on this property. The area immediately to the southwest of the proposed basin area is a sinkhole. There was visual evidence during this site investigation that this sinkhole is active and expanding. The presence of this sinkhole would preclude this location from being used for stormwater recharge.

[For more detailed analysis of this sinkhole, an investigation by a Pennsylvania licensed Professional Geologist (P.G.) would be required.]

Based on these karst conditions, this site would not be considered suitable for stormwater recharge. Should a stormwater basin be required, it is recommended that it is lined with bentonite or an

impermeable geotextile barrier. Additionally, stabilization is recommended for the expanding sinkhole area to prevent any further expansion.

### SUMMARY

In summary, the soils were evaluated at two locations to determine their feasibility for incorporating stormwater recharge. The soils encountered during this investigation would be classified as the Duffield series.

The measured permeability rates ranged from 1.00 to 3.00 in/hr. However, the site is located adjacent to an active sinkhole. It is recommended that, should a stormwater basin be required, it is lined with bentonite or an impermeable geotextile liner.

## WETLAND EVALUATION

### METHODS

Soil Evaluation

The property was investigated to confirm the presence/absence of regulated wetlands or Waters of the United States on the property that were previously delineated during an earlier investigation. This wetlands determination was conducted using guidelines outlined in the "Corps of Engineers Wetlands Delineation Manual" (Department of the Army, 1987) Routine Determination Methodology in addition to the Corps of Engineers "Eastern Mountains and Piedmont Regional Supplement" (2012).

Steve Busby, of T&M Associates was present on-site, witnessing this determination.

### RESULTS

The results of this determination confirm the previously delineation. There delineated areas are essentially a stormwater channel, being fed from stormwater outfalls from both the Woodbine Way subdivision to the South and the Camburn Road subdivision North of Flourtown road.

The delineated areas would not be classified as wetlands or Waters of the United States. These areas would be classified as Waters of the Commonwealth.

Riparian Buffer

The purpose of a riparian buffer is to provide a level of protection between land development and the resulting potential pollutants (sediment, water, debris, etc.) to the stream channel. Between the existing delineated channel and the proposed land development is a large gas pipeline. The gas pipeline consists of disturbed soils and provides a man-made barrier against any potential impacts on the delineated channel. Because of the gas pipeline that is present as a barrier between the proposed land development and the delineated channel, there will be no impacts from the development to the channel; thus the riparian buffer should not be applicable for this site.

## SUMMARY

The delineated areas were confirmed during this site investigation as Waters of the Commonwealth. The delineated areas are channels created from stormwater management facilities to both the South and North of the site. Immediately to the East of the channel is a gas pipeline. This pipeline acts as a man-made barrier to the stream and negates the need for a riparian buffer to be applied to this site.

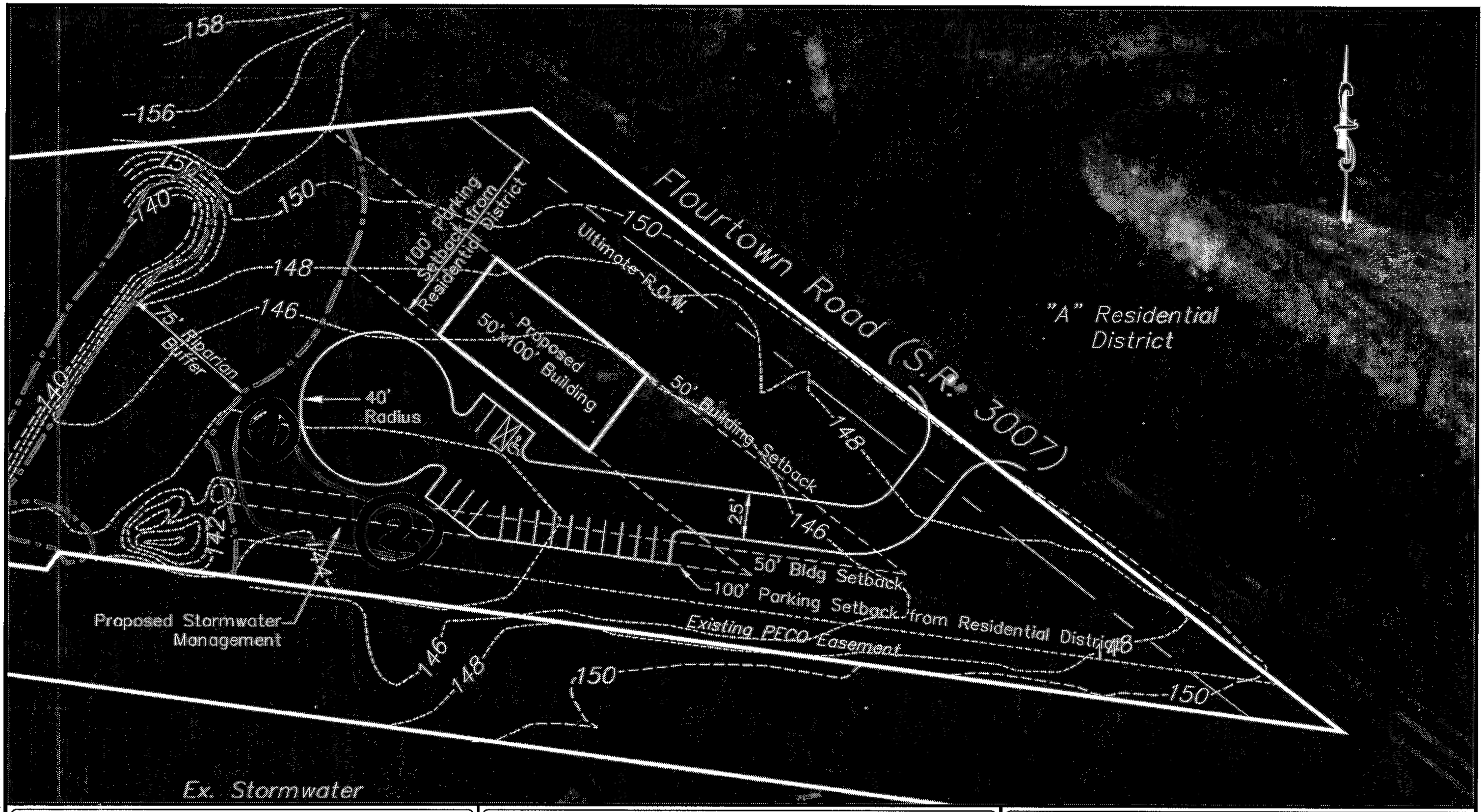
Please do not hesitate to call with any questions.

Best Regards,
CEDARVILLE Engineering Group, LLC



**Stephen Dadio, CPSS**
Senior Project Manager

Attachments




DATE:

DAVID J. FLEMING, P.E.

| Drawing Name: | Drawn | Designed | Checked | Released |
|---|---|---|---|---|
| r-basemap.dwg | DJD | | | |

# CONCEPTUAL LAYOUT EXHIBIT
# WHITEMARSH TRACT

SITUATED IN
WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA


BIRDSALL SERVICES GROUP
ENGINEERS & CONSULTANTS

1101 Laurel Oak Road, Suite 160
Voorhees, NJ 08043
NJ Certificate of Authorization No. 24GA28060600

Tel.: 856.783.1900
Fax.: 856.783.2100
WWW.BIRDSALL.COM


| Job No. | Date | Scale:(H) 1"=50' (V) N.A. | 1 OF 1 |
|---|---|---|---|
| 02126101000 | 11/26/2012 | | |


Plotted: 11/28/12 – 2:26 PM, By: ddomen
File: M:\Voorhees\Jobs\Napoli Construction\02126101000\Dwg\r-basemap.dwg, ---> Exhibit-50
Copyright Birdsall Services Group, Inc., 2012

# Soil Profile Description Sheet

Project Name: Flourtown Road, Whitemarsh Township

Date: 12/14/2012

Project Number: NAP-13-005

Tested by: Stephen Dadio, CPSS/CPSC

Test Location: Proposed Basin Area

Witnessed by: _____

**Test Pit #:** 1

**Soil mapped:** Lawrenceville (LeA)

**Soil classified:** Duffield Taxadjunct (DuA)

**Taxonomic class:** Fine-loamy, mixed, active, mesic Ultic Hapludalfs

**LIMITING ZONES**

**Depth to Redoximorphic Features:** Not Encountered

**Depth to Rock:** Not Encountered

| Horizon | Depth (inches) | Color | Texture | Rock Fragments | | Structure | | | Moist Consistence | Redoximorphic Features | | | Boundary |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Size | Quantity (%) | Grade | Size | Type | | Abundance | Size | Contrast | |
| Fill | 0-10 | 10YR 6/6 | silt loam | | | 1 | m | gr | very friable | | | | abrupt/smooth |
| Ap | 10-21 | 10YR 4/3 | gravelly silt loam | gravels | 15 | 1 | m | gr | very friable | | | | abrupt/smooth |
| Bt1 | 21-42 | 10YR 4/6 | gravelly silt loam | gravels | 20 | 2 | m | sbk | friable | | | | clear/wavy |
| 2Bt2 | 42-63 | 5YR 4/6 | gravelly silt loam | gravels | 20 | 2 | m | sbk | friable | | | | clear/wavy |
| 2C | 63-90 | 7.5YR 4/6 | very gravelly silt loam | gravels | 35 | 0 | | m | very friable | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**Notes:**

**Legend**

**Structure**

| *Grade* | *Size* | | |
|---|---|---|---|
| 0-Structureless | vf-very fine | abk-angular blocky | sbk-subangular blocky |
| 1-Weak | f-fine | gr-granular | sg-single-grained |
| 2-Moderate | m-medium | m-massive | |
| 3-Strong | co-coarse | pl-platy | |
| | vc-very coarse | pr-prismatic | |

# Soil Profile Description Sheet

Project Name: Flourtown Road, Whitemarsh Township

Date: 12/14/2012

Project Number: NAP-13-005

Tested by: Stephen Dadio, CPSS/CPSC

Test Location: Proposed Basin Area

Witnessed by: _____

Test Pit #: 2

**Soil mapped:** Lawrenceville (LeA)

**Soil classified:** Duffield Taxadjunct (DuA)

**Taxonomic class:** Fine-loamy, mixed, active, mesic Ultic Hapludalfs

LIMITING ZONES

**Depth to Redoximorphic Features:** Not Encountered

**Depth to Rock:** Not Encountered

| Horizon | Depth (inches) | Color | Texture | Rock Fragments | | Structure | | | Moist Consistence | Redoximorphic Features | | | Boundary |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Size | Quantity (%) | Grade | Size | Type | | Abundance | Size | Contrast | |
| Fill | 0-8 | 10YR 6/6 | silt loam | | | 1 | m | pl | very friable | | | | abrupt/smooth |
| Ap | 8-20 | 10YR 4/3 | silt loam | | | 1 | m | gr | very friable | | | | abrupt/smooth |
| Bt1 | 20-39 | 10YR 4/4 | silt loam | gravels | 10 | 2 | m | sbk | friable | | | | clear/wavy |
| 2Bt2 | 39-60 | 7.5YR 4/6 | gravelly silt loam | gravels | 15 | 2 | m | sbk | friable | | | | abrupt/wavy |
| 2C | 60-90 | 10YR 4/4 | very gravelly loam | gravels | 40 | 0 | | m | very friable | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**Notes:**

**Legend**

**Structure**

| *Grade* | *Size* | | |
|---|---|---|---|
| 0-Structureless | vf-very fine | abk-angular blocky | sbk-subangular blocky |
| 1-Weak | f-fine | gr-granular | sg-single-grained |
| 2-Moderate | m-medium | m-massive | |
| 3-Strong | co-coarse | pl-platy | |
| | vc-very coarse | pr-prismatic | |

# Double Ring Infiltrometer
# Hydraulic Conductivity Calulations

Project Name: Flourtown Road, Whitemarsh Township

Project Number: NAP-13-005 Date: 2/14/2013

Test Location: 1 Tested by: Steve Dadio

| Trial Number | Start/ End | Time | Elasped Time (min) | Depth drop (in) |
|---|---|---|---|---|
| 1 | S | | Pre-Soak 1 | > 2 |
| | E | | | |
| 2 | S | | Pre-Soak 2 | > 2 |
| | E | | | |
| 3 | S | | 10 | 0.75 |
| | E | | | |
| 4 | S | | 10 | 0.75 |
| | E | | | |
| 5 | S | | 10 | 0.50 |
| | E | | | |
| 6 | S | | 10 | 0.500 |
| | E | | | |
| 7 | S | | | |
| | E | | | |
| 8 | S | | | |
| | E | | | |
| 9 | S | | | |
| | E | | | |
| 10 | S | | | |
| | E | | | |
| TOTAL | | | 40 | 2.5 |

| | |
|---|---|
| Testing Depth (in) | 40 |
| Initial Depth of Water (in) | 6 |
| Final Drop (in) | 0.500 |
| Total Time (min) | 10 |

**Hydraulic Conductivity (K) 3.00 in/hr**

# Double Ring Infiltrometer
# Hydraulic Conductivity Calulations

Project Name: Flourtown Road, Whitemarsh Township

Project Number: NAP-13-005 Date: 2/14/2013

Test Location: 2 Tested by: Steve Dadio

| Trial Number | Start/ End | Time | Elasped Time (min) | Depth drop (in) |
|---|---|---|---|---|
| 1 | S | | Pre-Soak 1 | <2 |
| | E | | | |
| 2 | S | | Pre-Soak 2 | <2 |
| | E | | | |
| 3 | S | | 30 | 0.50 |
| | E | | | |
| 4 | S | | 30 | 0.50 |
| | E | | | |
| 5 | S | | 30 | 0.50 |
| | E | | | |
| 6 | S | | 30 | 0.500 |
| | E | | | |
| 7 | S | | | |
| | E | | | |
| 8 | S | | | |
| | E | | | |
| 9 | S | | | |
| | E | | | |
| 10 | S | | | |
| | E | | | |
| | | TOTAL | 120 | 2 |

| | |
|---|---|
| Testing Depth (in) | 42 |
| Initial Depth of Water (in) | 6 |
| Final Drop (in) | 0.500 |
| Total Time (min) | 30 |

**Hydraulic Conductivity (K) 1.00 in/hr**

# FLOURTOWN ROAD

## PRELIMINARY / FINAL LAND DEVELOPMENT

### WHITEMARSH TOWNSHIP
### MONTGOMERY COUNTY – PENNSYLVANIA

PROJECT SHEET INDEX:


| SHEET No.: | SHEET DESCRIPTION: |
|---|---|
| 1 of 14 | COVER – INDEX SHEET |
| 2 of 14 | LAND DEVELOPMENT – RECORD PLAN |
| 3 of 14 | OVERALL EXISTING FEATURES PLAN |
| 4 of 14 | PARTIAL EXISTING FEATURES PLAN |
| 5 of 14 | SITE IMPROVEMENTS PLAN |
| 6 of 14 | SITE UTILITY PLAN |
| 7 of 14 | SITE LANDSCAPING DESIGN PLAN |
| 8 of 14 | SITE LIGHTING DESIGN PLAN |
| 9 of 14 | EROSION and SEDIMENTATION CONTROL PLAN |
| 10 of 14 | EROSION and SEDIMENTATION CONTROL NOTES |
| 11 of 14 | EROSION and SEDIMENTATION CONTROL DETAILS |
| 12 of 14 | POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) PLAN |
| 13 of 14 | CONSTRUCTION DETAILS – SHEET 'A' |
| 14 of 14 | CONSTRUCTION DETAILS – SHEET 'B' |


PROJECT APPLICANT:


**FLOURTOWN ROAD**
c/o Glenn Van Eerden
343 Militia Hill Road
Fort Washington, PA 19034
Phone: (610) 983 – 0488


PROJECT CONSULTANTS:

Civil Engineering:


***WOODROW & ASSOC., INC.***
Municipal / Civil Consulting Engineers
1108 North Bethlemhem Pike – Suite 5
Lower Gwynedd, Pennsylvania 19002
Phone: (215) 542 – 5648

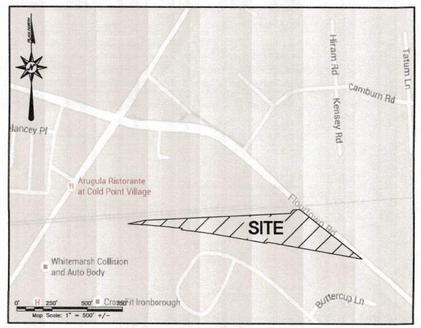

LANDSCAPING CONSULTANT:


***INFOCUS DESIGN***
7715 Crittendon Street #343
Philadelphia, Pennsylvania 19118
Phone: (267) 336 – 7411


COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TIMOTHY P. WOODROW
ENGINEER
39735
PENNSYLVANIA

| | |
|---|---|
| File Name: | G:\2015\15-0415D\15-0415D.pro |
| Date: | AUGUST 19, 2015 |
| Last Rev: | May 19, 2016 |
| Scale: | AS NOTED |
| Job No: | 15-0415-D |
| Layer List: | Sht01_Cover |
| Sheet No.: | 1 of 14 |

Project No: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:07)




LOCATION MAP

# GENERAL PLAN NOTES

**BASE EXISTING FEATURES AND SURVEY NOTES:**

1. The project site is identified as: Record Owner: 60 Flourtown Road, LLC
   Site Address: 343 Militia Hill Road, Fort Washington, PA 19034
   Parcel ID: 65-00-08005-01-2 / Block 021 Unit 009
   D.B.: 5906 Pg: 2517
   Gross Area: 4.8724 Acres
2. Outbound and topographic survey information illustrated on this plan has been taken from a plan entitled "Boundary and Topographic Survey " prepared by Delaware Valley Data Collection, LLC dated February 12, 2013 and last revised on April 28, 2015.
3. There has been no field investigation performed to verify any existence of any wetlands, waters of the U.S. or Commonwealth or Alluvial Soils at the time of the site survey.
4. All persons digging on this site shall comply with the requirements of Section 5 of PA Act 287 as amended by PA Act 181. State law requires a three (3) business day notice prior to any digging (does not include state holidays or weekends). Dial 8–1–1 or go to www.paonecall.org.
5. Existing subsurface utility information illustrated on these plans were based upon visual field locations obtained as part of site survey operations. Information pertaining to; size, location, depth, etc. of subsurface utilities is approximate in nature and has been obtained as an aid for the project design. The information provided is representative of subsurface conditions only at locations and depths where such information was available. There is no expressed or implied agreement that subsurface utility connections exist between explored locations. Accordingly, utility information shown should not be relied upon for construction purposes. It is incumbent upon the contractor to verify subsurface utilities prior to excavation.
6. This site is located within Flood Plain Zone 'X' (areas determined to be outside the 0.2% annual chance floodplain) as illustrated on Community Panel Number 42091C0357G, effective date March 2, 2016 as prepared by the Federal Emergency Management Agency. No computational floodplain study has been performed for this plan.

**BASE DEVELOPMENT NOTES:**

7. The contractor shall ensure that all necessary permits and approvals have been obtained prior to commencement of any site construction activities.
8. Erosion and sedimentation control measures shall be in place and functional prior to any earth disturbance or grading work.
9. Legal rights–of–way width are per deed information. Ultimate rights–of–way width were derived from municipal ordinances. The area between the project Title Line and the Ultimate Rights–of–Way is/are offered in perpetuity for dedication to the agency having jurisdiction over said right–of–way at time of dedication.
10. Contractor to ensure compliance with ADA regulations.
11. A holding tank is being proposed to serve the Sanitary sewer needs of the proposed use.
12. Nothing shall be permitted to be set on, placed or planted within, the area of any utility or storm water easement except lawns or suitable low ground cover.
13. Construction materials and procedures shall follow Pennsylvania Department of Transportation Specifications and Standard Drawings (latest edition).
14. Stormwater facilities shall be owned and maintained by the property owner in perpetuity. The property owner shall provide a blanket stormwater access easement to the Township for the purpose of access to the stormwater facilities. If, in the judgement of the Township Engineer, the owner has failed to maintain the stormwater facilities in such a manner as to ensure their proper functioning, the Township after providing a written notice, shall have the right to enter upon the lands of the owner and to make any repairs as may be necessary to the stormwater facilities to ensure that such facilities function and perform in accordance with the design specifications. Any and all costs incurred by the Township for such repairs and/or maintenance shall be paid in full by the owner. A lien or liens may be placed against the property if the owner fails to remit payment within (60) days.
15. Construction materials and procedures shall follow Pennsylvania Department of Transportation Specifications and Standard Drawings (latest edition).
16. A blanket easement is hereby offered to Whitemarsh Township for the purpose of inspection of the underground detention basin system shown on these plans.
17. The property owner shall sign an operations and maintenance agreement with the Township addressing Stormwater BMP's that are privately owned.
18. An As–Built Survey of all stormwater BMP's must be submitted to the Township in paper and (dwg) formats.
19. No changes in shall be made in contour of the land and no grading,excavation removal nor disturbance of topsoil, trees or other vegitative cover shall be commenced, until such time that a plan for minimizing erosion and sedimentation has been reviewed by the Township Engineer.
20. During the period of earth disturbance, runoff shall be controlled prior to entering any proposed storm sewer structure and/or underground system to ensure the proposed detention basin system will remain free and clear of sediment laden water that will cause siltation of the stone voids.

## ZONING and SITE DATA SCHEDULE

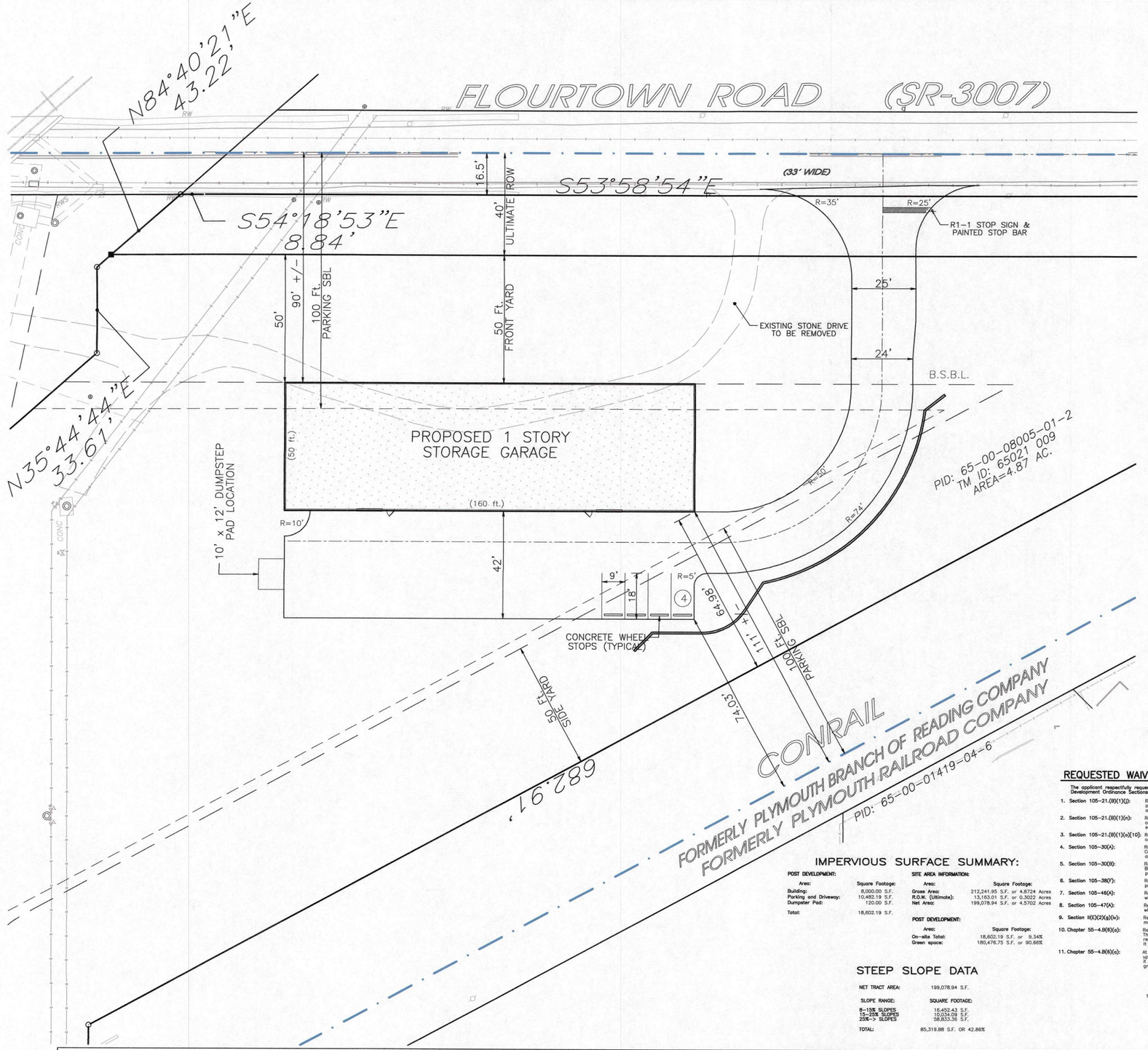
**Zoning District: LIM Limited Industriol District**

| Item | Section | Requirement | Plan Provided |
|---|---|---|---|
| Permitted Use | 116–144.A.(14) | Parking or garage, for pleasure or commercial vehicles | |
| Minimum Lot Area | 116–137.A | 4.00 Acres | 4.5702 Acres |
| Maximum Bldg Coverage | 116–137.B.(1) | 40% | 4.02% |
| Maximum Impervious Coverage | | 60% | 8.94% |
| Min. Setback from Residential District | 116–137.B.(2) | 200 Ft. | 90 Ft. [1] |
| Yard Requirements: | | | |
| Front Yard | 116–137.(4) | 50 Ft. | 50 Ft. |
| Side Yard | 116–137.(5) | 50 Ft. | 64.98 Ft. |
| Rear Yard | 116–137.B.(7) | 50 Ft. | > 50 Ft. |
| Maximum Building Height | 116–137.C.(1) | 35 Ft. | < 35 Ft. |
| Parking Setback from Residential | 116–140 | 100 Ft. [2] | 57.77 [2] |
| Required Parking Quantity | 116–184.D.(7) | See Below [3] | See Below [3] |

[1] Required distance of 200 Ft. from Residential Districts provides no usable building area. Variance Granted.
[2] Requires a distance of 100 Ft. from Residential District. Variance Granted.
[3] 1 space/2 employees: Maximum employees 8 / 2 = 4 Spaces

## PLAN LEGEND

- *Tract Boundary Line*
- *Legal Right–of–Way Line*
- *Existing Roadway Centerline*
- *Mapped Wetlands Limits*
- *Existing Drive / Paving Limit*




## REQUESTED WAIVERS:

The applicant respectfully requests waivers from the following Whitemarsh Township Subdivision and Land Development Ordinance Sections.

1. Section 105–21.(B)(1)(j): Requires a complete outline survey tied to all adjacent intersections and areas. The existing features shown on this plan have been derived from an aerial survey with field locations shown by others.
2. Section 105–21.(B)(1)(n): Requires a complete survey outlining existing principle buildings and driveways on all adjacent parcels, sewer lines, storm drains, culverts bridges, utility easements and all other features with 500 ft. whereas only 100 ft is shown.
3. Section 105–21.(B)(1)(o)(10): Requires monumentation at all corners of the outbound, whereas this application only proposed them along the Ultimate Right of Way.
4. Section 105–30(A): Requires instalation of curb, sidewalks and a tree zone along all Major Collectors whereas none is proposed. Existing trees and vegitation to remain along existing frontage.
5. Section 105–30(B): Requires additional right of way and/or cartway width if required by the Board of Supervisors, whereas no road widening or improvements are being proposed.
6. Section 105–38(F): Requires that all parking area be confined by curbing, where as none is proposed. Concrete wheel stops are shown for the spaces.
7. Section 105–46(A): Requires curbing be provided in all subdivisions and land developments, where as none is proposed.
8. Section 105–47(A): Requires sidewalk be provided in all subdivisions and land developments, where as none is proposed.
9. Section II(E)(2)(a)(iv): Requires a minimum pipe diameter of 18" for storm sewer, where as a minimum diameter of 10" is proposed.
10. Chapter 55–4.B(6)(a): Requires replacement trees totaling the number of caliper inches removed. The plan proposes the removal 894 caliper inches to be reduced to a replacement of 35% or 313 caliper inches. It should be noted that the site it should be noted that the site area is entirely wooded.
11. Chapter 55–4.B(6)(a): At the August 2, 2016 STC meeting additional relief was recommended based upon a site meeting held with Denny Metz and Rachel Sclan Vehey, where it was determined to maintain the same number of replacement tree/shrub/ground cover shown for the 35% but at a reduced size in height and caliper.

6 – replacement equivalents from rain garden seeding (18 caliper inches).
30 – shade trees at 2 caliper inches (60 total caliper inches equivalent).
18 – evergreen at 4–5 feet in height (9 total caliper inches equivalent).
23 – ornamental trees at 6 feet in height(11.5) caliper inches equivalent).
163 – Shrubs at 18–24" in height.

## IMPERVIOUS SURFACE SUMMARY:

**POST DEVELOPMENT:**

| Area: | Square Footage: |
|---|---|
| Building: | 8,000.00 S.F. |
| Parking and Driveway: | 10,482.19 S.F. |
| Dumpster Pad: | 120.00 S.F. |
| Total: | 18,602.19 S.F. |

**SITE AREA INFORMATION:**

| Area: | Square Footage: |
|---|---|
| Gross Area: | 212,241.95 S.F. or 4.8724 Acres |
| R.O.W. (Ultimate): | 13,163.01 S.F. or 0.3022 Acres |
| Net Area: | 199,078.94 S.F. or 4.5702 Acres |

**POST DEVELOPMENT:**

| Area: | Square Footage: |
|---|---|
| On–site Total: | 18,602.19 S.F. or 9.34% |
| Green space: | 180,476.75 S.F. or 90.66% |

## STEEP SLOPE DATA

NET TRACT AREA: 199,078.94 S.F.

| SLOPE RANGE: | SQUARE FOOTAGE: |
|---|---|
| 8–15% SLOPES | 16,452.43 S.F. |
| 15–25% SLOPES | 10,034.09 S.F. |
| 25%–> SLOPES | 58,833.36 S.F. |
| TOTAL: | 85,319.88 S.F. OR 42.86% |

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF MONTGOMERY

On this, the _____ day of _____, 20___, before me, the undersigned Officer, personally appeared _____, known to me (or satisfactorily proven) to be the persons whose names are subscribed to the within instrument, and acknowledged that same for the purposes therein contained.

In witness whereof, I hereunto set my hand and official seal.

Owner(s): _____

Notary Public: _____

My commission expires on: _____

**OWNER'S CERTIFICATE**

We, _____, hereby certify that we are the owners of the land herein subdivided and that we consent to the approval of this plan that has been granted and that I desire the same to be Recorded.

Owner(s): _____

Date Signed: _____

**PLANNING COMMISSION**

Reviewed this, the _____ day of _____, 20___, by the Planning Commission of Whitemarsh Township, Montgomery County, PA.

ATTEST: _____ Date Signed: _____
Signature, Chairman

**BOARD OF SUPERVISORS**

Approved on this, the _____ day of _____, 20___, by the Board of Supervisors of Whitemarsh Township, Montgomery County, PA.

ATTEST: _____ Date Signed: _____
Signature, Chairman

_____ Date Signed: _____
Signature, Secretary

(Township Notary Seal) _____

**TOWNSHIP ENGINEER**

Reviewed by the Township Engineer of Whitemarsh Township, Montgomery County, PA

ATTEST: _____ Date Signed: _____
Township Engineer

**SURVEYOR'S CERTIFICATION**

I, KEVIN R. GIBBONS, P.L.S. , do hereby certify that I am a Registered Professional Surveyor, licensed in compliance with the laws of the Commonwealth of Pennsylvania; that this plan correctly represents a survey made by myself or under my supervision and that all dimensional and geodetic details shown are correct.

_____ Date Signed: _____
Signature

LIC. No: 044550–E

**RECORDER OF DEEDS**

Recorded in the Montgomery County Court House this _____ day of _____, 20_____ in Plan Book _____ Page _____.

Recorder of Deeds: _____

Township File No.:

MCPC No.:

PROCESSED and REVIEWED. A report has been prepared by the Montgomery County Planning Commission in accordance with the Municipalities Planning Code.

Certified this date: _____

_____
For the Director
Montgomery County Planning Commission

REVISIONS

| No.: | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 08/05/16 | REVISED PER STC COMMENTS |
| 1 | 05/19/16 | REVISED PER T&M REVIEW LETTER DATED 1/29/2016 |

TIMOTHY P. WOODROW, REGISTERED PROFESSIONAL ENGINEER, No. 049552

SCALE IN FEET (1" = 20'–0")

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PLAN NORTH

Parcel Information: 65–00–08005–01–2 Map: 2017 Pg: 2517 D.B.: 5906
Gross Area: 4.8724 Acres
Limit RW: N/A
Limit RW: 0.3022 Acres
NET Area: 4.5702 Acres

Owner of Equitable Owner: **60 Flourtown Road, LLC** c/o Glenn Van Eerden 343 Militia Hill Road Fort Washington, PA 19034

Applicant: **60 Flourtown Road, LLC** c/o Glenn Van Eerden 343 Militia Hill Road Fort Washington, PA 19034

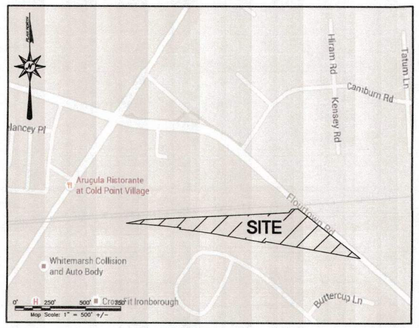
PRELIMINARY / FINAL PLAN

# LAND DEVELOPMENT PLAN
## FLOURTOWN ROAD
WHITEMARSH TOWNSHIP – MONTGOMERY COUNTY – PENNSYLVANIA

**WOODROW & ASSOCIATES, INC.**
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1168 North Bethlehem Pike Spring House, PA 19002
Phone: (215) 542–5648 Fax: (215) 542–5679
Web: www.woodrowinc.com

Layer List: Sht02_Record
Plan Date: AUGUST 19, 2015
Job No: 15–0415–D
Design Mgr: R.J.J.
Proj. Mgr: T.P.W.
Sheet No: 2 of 14

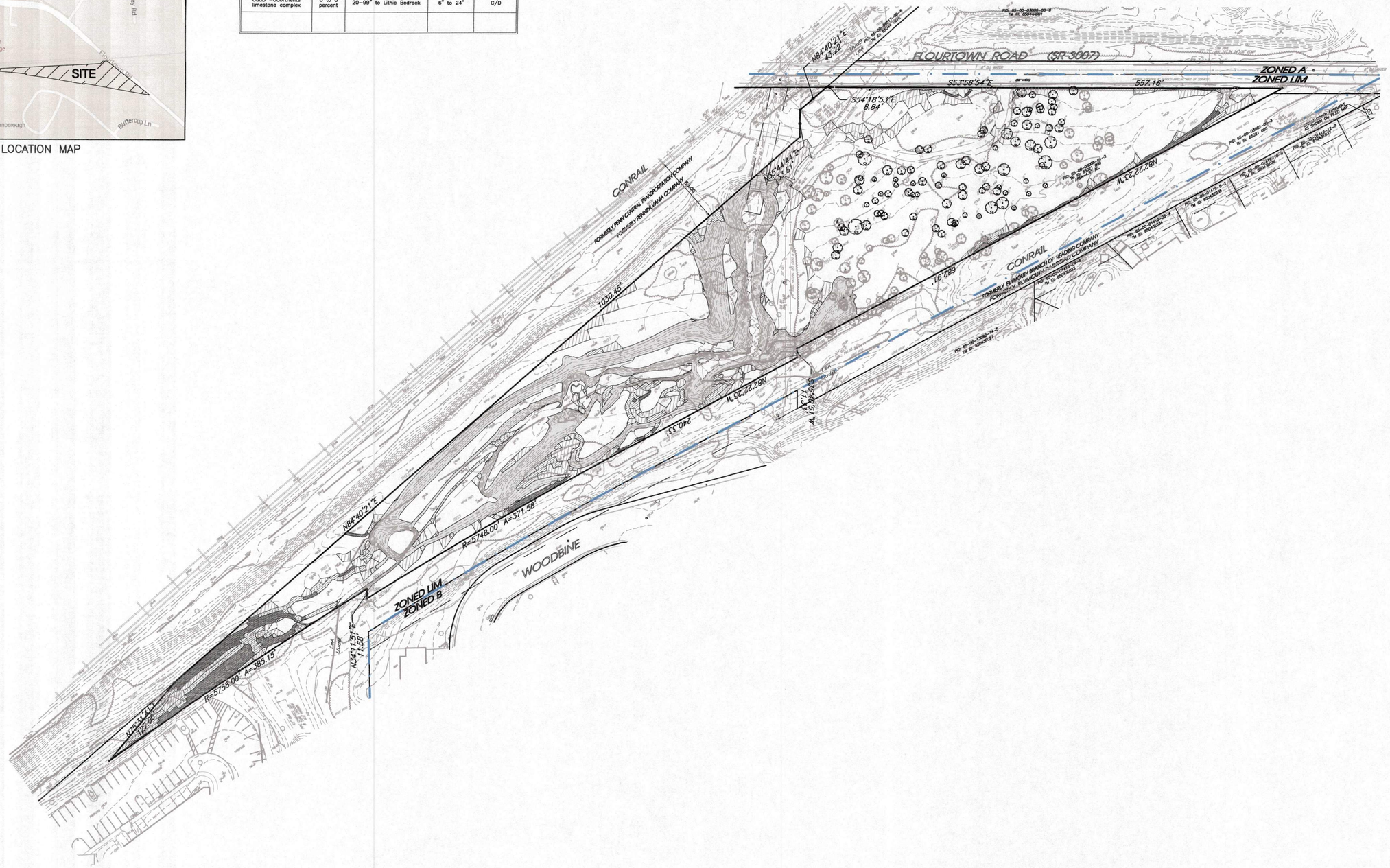
Project No: 15–0415–D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:06)




LOCATION MAP

## PROJECT SOILS DATA

| Soils Type: | Slopes: | Depth to Restrictive Feature: | Depth to Water Table: | Hydrologic Soil Group: |
|---|---|---|---|---|
| LeA Lawrenceville silt loam | 0 to 3 percent | 24"–38" to Fragipan 48"–99" to Lithic Bedrock | 18" to 36" | C |
| UgB Urban land | 0 to 8 percent | Unknown | Unknown | C |
| UudB —Udorthents limestone complex | 0 to 8 percent | 20–99" to Lithic Bedrock | 6" to 24" | C/D |
| | | | | |




## PLAN FEATURES LEGEND

- Tract Boundary Line
- Legal Right-of-Way Line
- Existing Roadway Centerline
- Mapped Wetlands Limits
- Supplemental Contour
- Index Contour
- Existing Soil Series Limits
- Existing Drive / Paving Limit
- Existing Vegetation Limit
- Existing Storm Sewer Piping
- Existing Sanitary Sewer Piping
- Existing Gas Main
- Existing Water Main / Service
- Existing Overhead Utility Wires
- Existing Underground Telephone
- Existing Fence Line

REVISIONS

| No.: | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 05/19/16 | REVISED PER T&M REVIEW LETTER DATED 1/20/2016 |
| | 05/05/16 | REVISED PER SITE COMMENTS |

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — KEVIN R. GIBBONS — LAND SURVEYOR — No. 044000-E

SCALE IN FEET (1" = 60'-0")

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PLAN NORTH

Record or Equitable Owner: 60 Flourtown Road, LLC c/o Glenn Von Eecden 43 Limekiln Road Fort Washington, PA 19034

Applicant: 60 Flourtown Road, LLC c/o Glenn Von Eecden 43 Limekiln Road Fort Washington, PA 19034

Parcel Information: 65-00-08009-01-2 Deed Book: 5806 Pg: 2517 D.B.: 5806 Pg: 2517

Gross Area: 4.8724 Acres
Limit Dev: 0.3222 Acres
LDE Area: 0 Acres
NET Area: 4.3702 Acres

PRELIMINARY / FINAL PLAN

# OVERALL EXISTING FEATURES PLAN

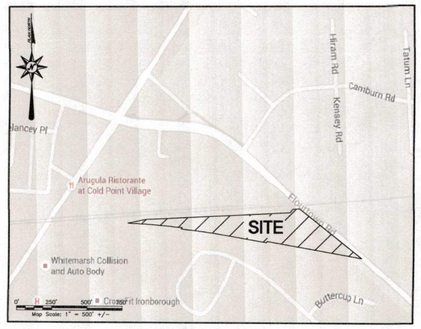
## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP – MONTGOMERY COUNTY – PENNSYLVANIA

WOODROW & ASSOCIATES, INC.
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1100 North Bethlehem Pike, Suite 2-C, Spring House, PA 19002
Phone: (215) 542-5648 Fax: (215) 542-5679
Web: www.Woodrowinc.com

Layer List: Sht03_ExFea-60
Plan Date: AUGUST 19, 2015
Job No: 15-0415-D
Design Mgr: R.J.J.
Proj. Mgr: T.P.W.
Sheet No: 3 of 14

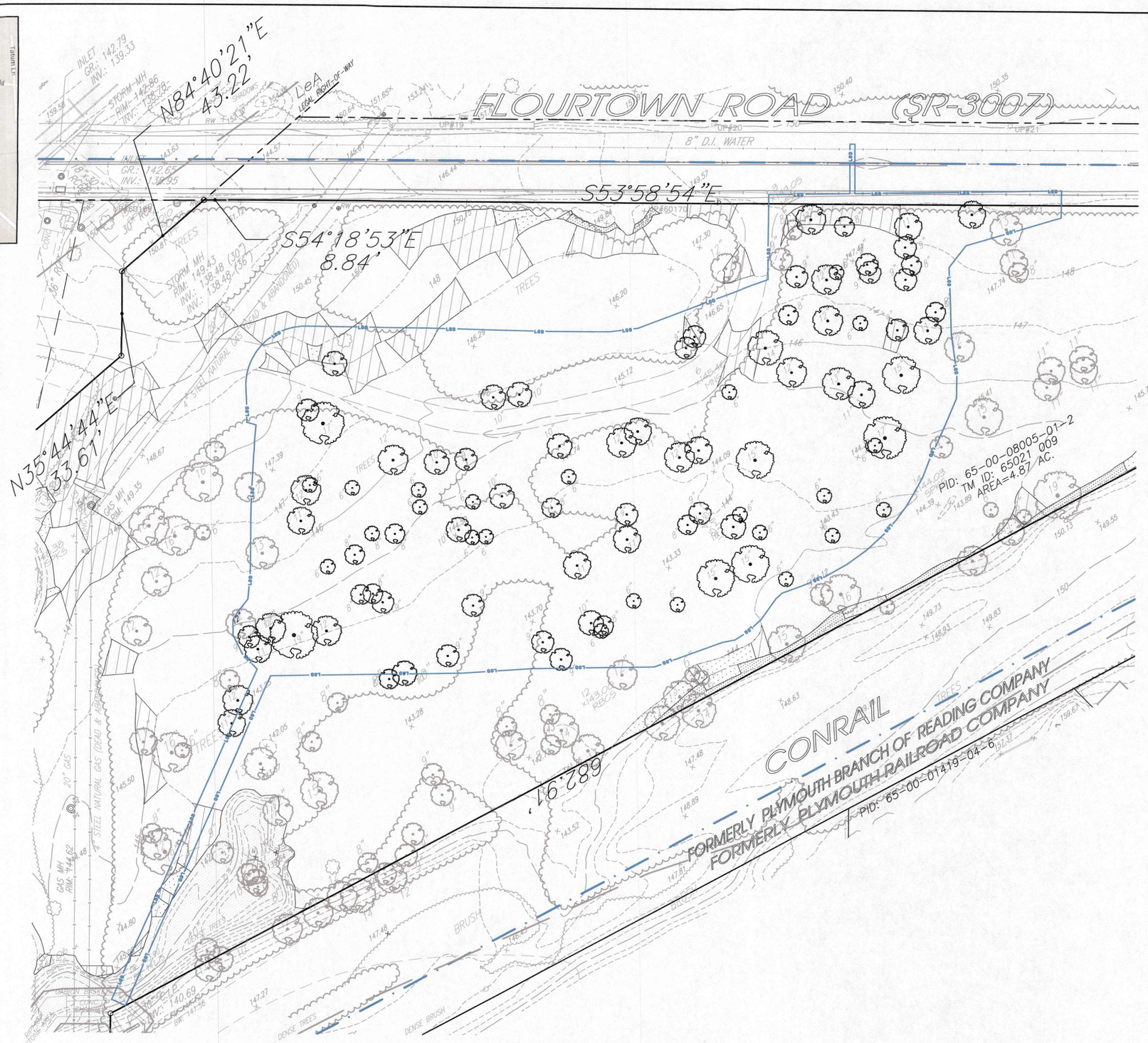
Project No: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:08)




LOCATION MAP

## TREE REMOVAL DATA

| NUMBER: | DIAMTER INCHES: | TOTAL INCHES: |
|---|---|---|
| (22) | 6" DIA. | 132" DIA. |
| (13) | 8" DIA. | 104" DIA. |
| (17) | 9" DIA. | 153" DIA. |
| (10) | 10" DIA. | 100" DIA. |
| (11) | 11" DIA. | 121" DIA. |
| (12) | 12" DIA. | 144" DIA. |
| (1) | 13" DIA. | 13" DIA. |
| (1) | 14" DIA. | 14" DIA. |
| (4) | 15" DIA. | 60" DIA. |
| (2) | 17" DIA. | 34" DIA. |
| (1) | 19" DIA. | 19" DIA. |
| TOTALS: (94) | | 894 CAL. INCHES |




## PLAN FEATURES LEGEND

- Tract Boundary Line
- Legal Right-of-Way Line
- Existing Roadway Centerline
- Mapped Wetlands Limits
- Supplemental Contour
- Index Contour
- Existing Soil Series Limits
- Existing Drive / Paving Limit
- Existing Vegetation Limit
- Existing Storm Sewer Piping
- Existing Sanitary Sewer Piping
- Existing Gas Main
- Existing Water Main / Service
- Existing Overhead Utility Wires
- Existing Underground Telephone
- Existing Fence Line

Project No.: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Mar 10, 2017 (14:27)

| No.: | DATE: | DESCRIPTION: |
|---|---|---|
| 6 | 03/15/17 | REVISED PER CARROLL ENGINEERING SANITARY AUTHORITY REVIEW LETTER DATED 3/1/17 |
| 5 | 11/28/16 | REVISED PER AUTHORITIES COMMENTS |
| 4 | 11/14/16 | REVISED PER PENNDOT HOP COMMENTS & PHONE CN: 10/25/2016 |
| 3 | 10/13/16 | REVISED PER PENNDOT HOP COMMENTS & PHONE CN: 10/12/2016 |
| 2 | 09/05/16 | REVISED PER STC COMMENTS |
| 1 | 07/19/16 | REVISED PER T&M REVIEW LETTER DATED 7/20/2016 |

REVISIONS

REGISTERED PROFESSIONAL
KEVIN R. GIBBONS
LAND SURVEYOR
No. 044694-E

SCALE IN FEET (1" = 20'-0")
0' 20' 40'
20'

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PLAN NORTH

Parcel Information:
65-00-08005-01-2
Block 021 Unit 009
D.B.: 5906 Pg: 2517

Gross Area: 4.8724 Acres
Less R/W: 0.3223 Acres
Net Area: 4.5501 Acres

Record or Equitable Owner:
60 Flourtown Road, LLC
c/o Glenn Von Erden
143 Militia Hill Road
Fort Washington, PA 19034

Applicant:
60 Flourtown Road, LLC
c/o Glenn Von Erden
143 Militia Hill Road
Fort Washington, PA 19034

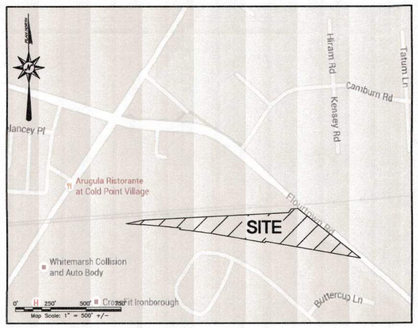
PRELIMINARY / FINAL PLAN

# PARTIAL EXISTING FEATURES PLAN
## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP - MONTGOMERY COUNTY - PENNSYLVANIA

WOODROW & ASSOCIATES, INC.
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1108 North Bethlehem Pike / Suite 5 - Upper Gwynedd - PA 19002
Phone: (215) 542-9545 Fax: (215) 542-5879
Web: www.Woodrowinc.com

Layer List: Sht04_ExFea-40
Plan Date: AUGUST 19, 2015
Job No: 15-0415-D
Design Mgr: J.A.G.
Proj. Mgr: T.P.W.
Sheet No: 4 of 15




LOCATION MAP

# GENERAL PLAN NOTES

Refer to the Record Plan (Sheet 1) for 'BASE EXISTING FEATURES AND SURVEY NOTES' and 'BASE DEVELOPMENT NOTES'

BASE CONSTRUCTION DESIGN NOTES:

1. The contractor shall ensure that all necessary permits and approvals have been obtained prior to commencement of any site construction activities.
2. Erosion and sedimentation control measures shall be in place and functional prior to any earth disturbance or grading work.
3. Contractor to ensure compliance with ADA regulations.
4. Nothing shall be permitted to be set on, placed or planted within, the area of any utility or storm water easement except lawns or suitable low ground cover.
5. Construction materials and procedures shall follow Pennsylvania Department of Transportation Specifications and Standard Drawings (latest edition).
6. Any/all storm water conveyance system(s) and detention facilities shown on these plans are a basic and perpetual part of the storm water management system for this Township, and as such, are to be protected, maintained and preserved in accordance with the approved final plans. The Township and/or its agents may reserve the right and privilege to enter upon such lands from time to time for the purpose of inspection of said storm water management system in order to determine that the structural design and integrity are being maintained.
7. The proposed finished grading shown on this plan has been based on the proposed building(s) finished floor elevations and has been used to design the storm water management facilities. The contractor shall comply with the grading scheme indicated unless otherwise approved by the Township and the Project design engineers.
8. A minimum of six (6) inches of clean topsoil shall be provided on all lawn and planting areas.
9. Site grading shall be performed in accordance with these plans. The contractor shall be responsible for removing and replacing all soft, yielding or unsuitable materials and replacing with suitable materials. 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 area and areas to be paved have been compacted in accordance with these plans.
10. 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).
11. The minimum slope in grassed areas shall not be less than 2% and the minimum in paved areas shall not be less than 1.
12. Erosion control matting shall be provided on all earth slopes at 3:1 or greater.
13. All electric, telephone and communications service facilities, both main and service lines, shall be provided by underground cables, installed in accordance with the prevailing standards and practices of the utility and other companies providing such service.
14. This plan is subject to review and approval of the Whitemarsh Township Shade Tree Commission prior to any tree removal on site.
15. A Pre Construction meeting with the Township Shade Tree Commission prior to the start of construction.

## STORMWATER STRUCTURE SCHEDULE

Structure No: ST-01
Type: Std. DW-Headwall
Loc: Rear of Building
T.W.: 147.28
Inv: 145.20 (10" Out)

Structure No: ST-02
Type: Std. 2'x2' Yard Inlet
Loc: Rear of Building
Gr.: 147.40
Inv.: 144.75 (10" In)
Inv.: 144.58 (12" Out)

Structure No: ST-03
Type: ADS Manifold
Loc.: Basin Area
Inv.: 143.80 (12" In)
Inv.: 143.55 (18" Basin)

Structure No: ST-04
Type: Std. DW-Headwall
Loc: Drive Area
T.W.: 146.00
Inv: 144.00 (12" Out)

Structure No: ST-05
Type: Std. Box w/"M" Cap
Loc: Parking Area
Gr.: 148.10
Inv.: 143.80 (12" In)
Inv.: 143.55 (18" Basin)

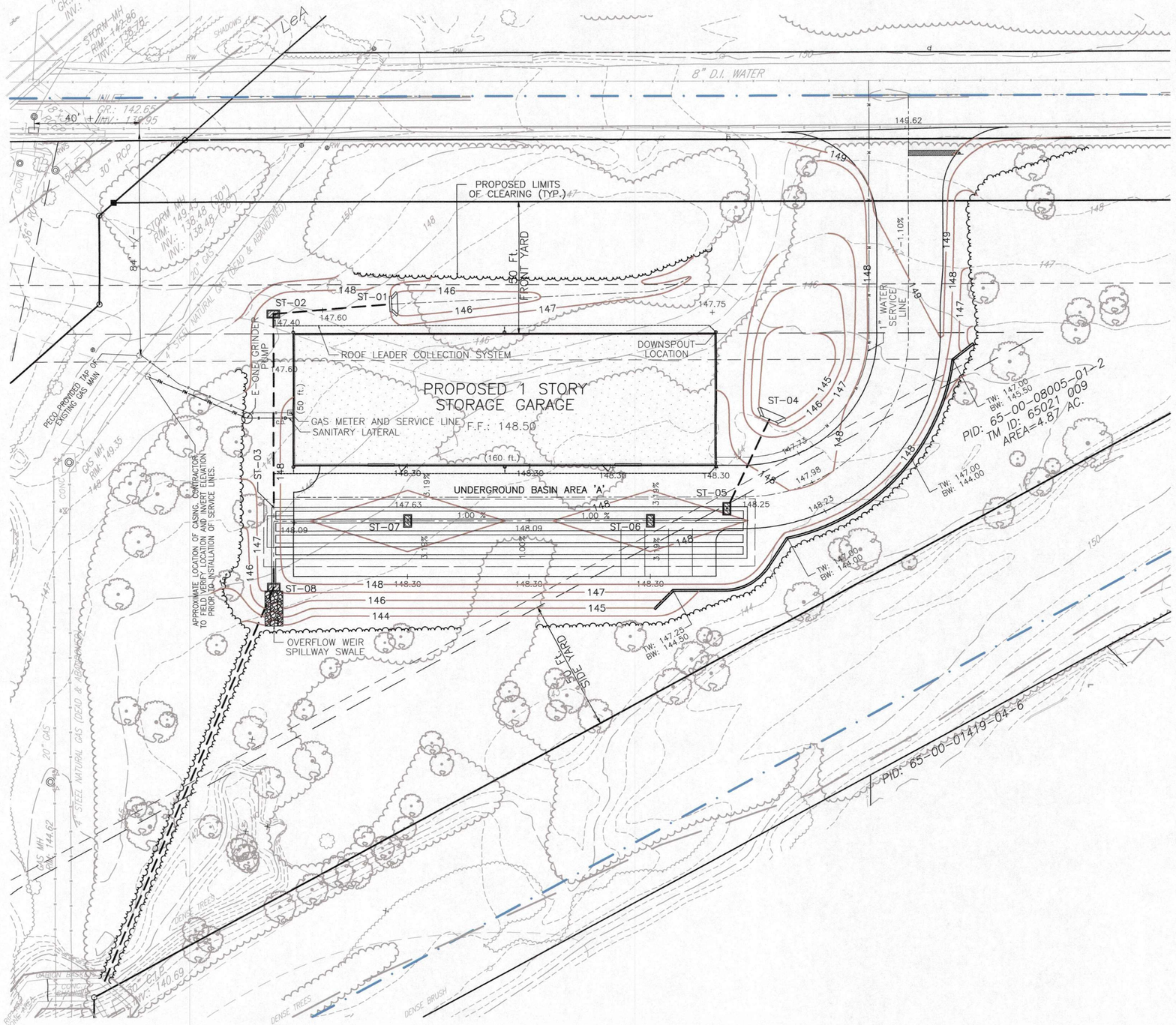
Structure No: ST-06
Type: Std. Box w/"M" Cap
Loc: Parking Area
Gr.: 147.63
Inv.: 143.55 (18" Basin)

Structure No: ST-07
Type: Std. Box w/"M" Cap
Loc: Parking Area
Gr.: 147.63
Inv.: 143.55 (18" Basin)

Structure No: ST-08
Type: Mod. Box w/"M" Cap
Loc: Basin Outlet
Gr.: 147.50
Inv.: 146.00 (Overflow Weir)
Inv.: 143.55 (3" C.O.)
Inv.: 143.55 (18" Basin)
Inv.: 144.50 (3.75" C.O.)
Inv.: 142.64 (12" Out)

## STORMWATER PIPING SCHEDULE

| From: | To: | Length (L.F.): | Pipe Dia. (in): | Pipe Material: | Slope (Percent): |
|---|---|---|---|---|---|
| ST-01 | ST-02 | 45 | 10" | ADS (N-12) | 1.00% |
| ST-02 | ST-03 | 72 | 12" | ADS (N-12) | 1.08% |
| ST-04 | ST-05 | 37 | 12" | ADS (N-12) | 0.56% |
| ST-07 | ST-08 | 162 | 12" | ADS (N-12) | 0.55% |




## PLAN FEATURES LEGEND

- Tract Boundary Line
- Legal Right-of-Way Line
- Existing Roadway Centerline
- Mapped Wetlands Limits
- Supplemental Contour
- Index Contour
- Existing Soil Series Limits
- Existing Drive / Paving Limit
- Existing Vegetation Limit
- Existing Storm Sewer Piping
- Existing Sanitary Sewer Piping
- Existing Gas Main
- Existing Water Main / Service
- Existing Overhead Utility Wires
- Existing Underground Telephone
- Existing Fence Line
- Proposed Contour
- Proposed Storm Sewer
- Proposed Sanitary Lateral
- Proposed Low Pressure Force Main
- Proposed Gas Service Line
- Proposed Roof Leader Collection System
- Proposed Limits of Clearing

Project No: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:09)

REVISIONS

| No. | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 08/05/15 | REVISED PER STC COMMENTS |
| 2 | 09/02/15 | REVISED PER TWP REVIEW LETTER DATED 1/20/2016 |

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — TIMOTHY P. WOODROW — ENGINEER — No. 036726-E

SCALE IN FEET (1" = 20'-0") 40' 20' 0' 20'

PLAN NORTH

THESE PLANS ARE PRELIMINARY & NOT FOR CONSTRUCTION. THESE PLANS ARE NOT TO BE USED FOR PERMIT PURPOSES.
THIS PLAN HAS BEEN PREPARED SPECIFICALLY FOR THE APPLICANT NAMED HEREIN AND IS NOT TO BE USED BY ANY OTHER PERSON FOR DUPLICATION OR USE WITHOUT THE WRITTEN CONSENT OF WOODROW & ASSOCIATES, INC. IS EXPRESSLY PROHIBITED BY LAW.
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Parcel Information:
65-00-08005-01-2
Block 021 Unit 009
D.B.: 5906 Pg: 2517

Gross Area: 4.8724 Acres
Lot Inc: 0.3022 Acres
Net Area: 4.5702 Acres

Record or Equitable Owner:
60 Flourtown Road, LLC
c/o Glenn Von Epsten
543 Millia Hill Road
Fort Washington, PA 19034

Applicant:
60 Flourtown Road, LLC
c/o Glenn Von Epsten
543 Millia Hill Road
Fort Washington, PA 19034

PRELIMINARY / FINAL PLAN

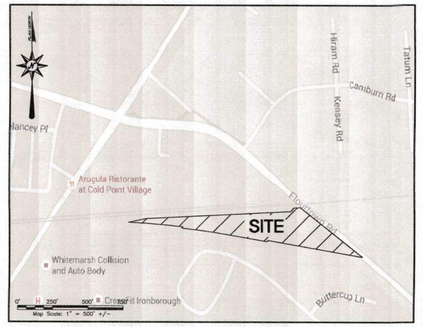
# SITE IMPROVEMENTS PLAN

## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP - MONTGOMERY COUNTY - PENNSYLVANIA

WOODROW & ASSOCIATES, INC.
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1109 North Bethlehem Pike / Suite 3 - Lower Gwynedd - PA 19002
Phone: (215) 542-9446 Fax: (215) 542-5679
www.woodrowassoc.com

Layer List: Sht05_Grading
Plan Date: AUGUST 19, 2015
Job No: 15-0415-D
Design Mgr: R.J.J.
Proj. Mgr: T.P.W.
Sheet No: 5 of 14




LOCATION MAP

## GENERAL PLAN NOTES

Refer to the Record Plan (Sheet 1) for 'BASE EXISTING FEATURES AND SURVEY NOTES' and 'BASE DEVELOPMENT NOTES'

BASE CONSTRUCTION DESIGN NOTES:

1. The contractor shall ensure that all necessary permits and approvals have been obtained prior to commencement of any site construction activities.
2. Erosion and sedimentation control measures shall be in place and functional prior to any earth disturbance or grading work.
3. Contractor to ensure compliance with ADA regulations.
4. Nothing shall be permitted to be set on, placed or planted within, the area of any utility or storm water easement except lawns or suitable low ground cover.
5. Construction materials and procedures shall follow Pennsylvania Department of Transportation Specifications and Standard Drawings (latest edition).
6. Any/all storm water conveyance system(s) and detention facilities shown on these plans are a basic and perpetual part of the storm water management system for this Township, and as such, are to be protected, maintained and preserved in accordance with the approved final plans. The Township and/or its agents may reserve the right and privilege to enter upon such lands from time to time for the purpose of inspection of said storm water management system in order to determine that the structural design and integrity are being maintained.
7. The proposed finished grading shown on this plan has been based on the proposed building(s) finished floor elevations and has been used to design the storm water management facilities. The contractor shall comply with the grading scheme indicated unless otherwise approved by the Township and the Project design engineers.
8. A minimum of six (6) inches of clean topsoil shall be provided on all lawn and planting areas.
9. Site grading shall be performed in accordance with these plans. The contractor shall be responsible for removing and replacing all soft, yielding or unsuitable materials and replacing with suitable materials. 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 area and areas to be paved have been compacted in accordance with these plans.
10. 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).
11. The minimum slope in grassed areas shall not be less than 2% and the minimum in paved areas shall not be less than 1.
12. Erosion control matting shall be provided on all earth slopes at 3:1 or greater.
13. All electric, telephone and communications service facilities, both main and service lines, shall be provided by underground cables, installed in accordance with the prevailing standards and practices of the utility and other companies providing such service.
14. This plan is subject to review and approval of the Whitemarsh Township Shade Tree Commission prior to any tree removal on site.
15. A Pre Construction meeting with the Township Shade Tree Commission prior to the start of construction.

## STORMWATER STRUCTURE SCHEDULE

Structure No: ST-01
Type: Std. DW-Headwall
Loc: Rear of Building
T.W.: 147.28
Inv: 145.20 (10" Out)

Structure No: ST-02
Type: Std. 2'x2' Yard Inlet
Loc: Rear of Building
Gr.: 147.40
Inv.: 144.75 (10" In)
Inv.: 144.58 (12" Out)

Structure No: ST-03
Type: ADS Manifold
Loc.: Basin Area
Inv.: 143.80 (12" In)
Inv.: 143.55 (18" Basin)

Structure No: ST-04
Type: Std. DW-Headwall
Loc: Drive Area
T.W.: 146.00
Inv: 144.00 (12" Out)

Structure No: ST-05
Type: Std. Box w/"M" Cap
Loc: Parking Area
Gr.: 148.10'
Inv.: 143.80 (12" In)
Inv.: 143.55 (18" Basin)

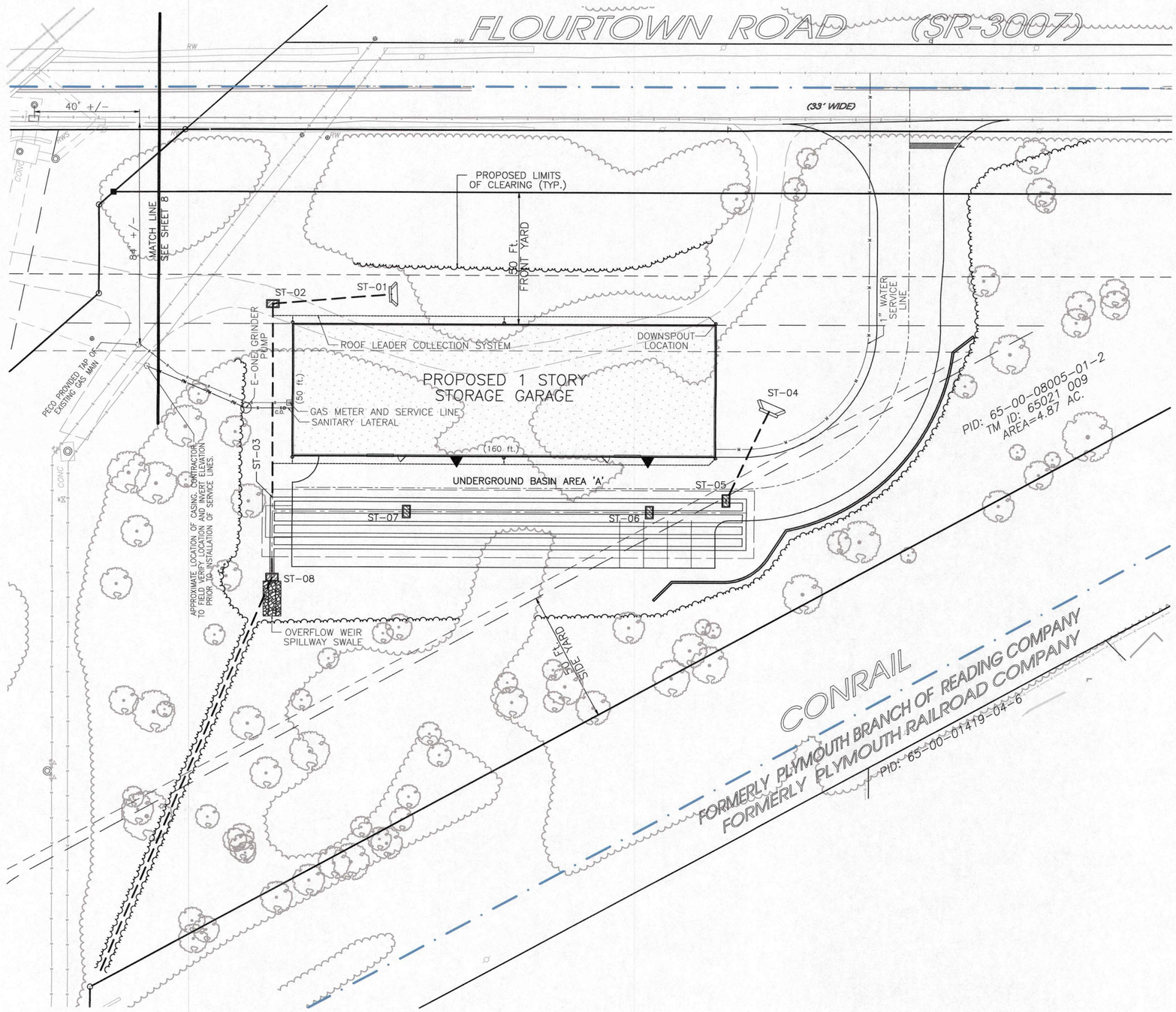
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Type: Std. Box w/"M" Cap
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Loc: Basin Outlet
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## PLAN FEATURES LEGEND

- Tract Boundary Line
- Legal Right-of-Way Line
- Existing Roadway Centerline
- Mapped Wetlands Limits
- Supplemental Contour
- Index Contour
- Existing Soil Series Limits
- Existing Drive / Paving Limit
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- Proposed Storm Sewer
- Proposed Sanitary Lateral
- Proposed Low Pressure Force Main
- Proposed Gas Service Line
- Proposed Roof Leader Collection System
- Proposed Limits of Clearing

REVISIONS

| No.: | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 08/03/16 | REVISED PER STC COMMENTS |
| 2 | 09/07/16 | REVISED PER TEAM REVIEW LETTER DATED 1/20/2016 |

TIMOTHY P. WOODROW ENGINEER No. 036375-E REGISTERED PROFESSIONAL

SCALE IN FEET (1" = 20'-0")

THIS PLAN HAS BEEN PREPARED SPECIFICALLY FOR THE APPLICANT NAMED HEREIN AND IS NOT TO BE USED IN WHOLE OR IN PART FOR ANY OTHER APPLICATION OR FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN CONSENT OF WOODROW & ASSOCIATES, INC. IS PROHIBITED BY LAW.
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PLAN NORTH

Parcel Information: 65-00-08005-01-2, Block 021, Unit 009, D.B.: 5906, Pg: 2517
Deed Area: 4.8724 Ac/Ac, Legal Area: 4.8722 Acres, NET Area: 4.3702 Acres

Record or Equitable Owner: **60 Flourtown Road, LLC**, c/o Glenn Von Eerden, 343 Militia Hill Road, Fort Washington, PA 19034

Applicant: **60 Flourtown Road, LLC**, c/o Glenn Von Eerden, 343 Militia Hill Road, Fort Washington, PA 19034

PRELIMINARY / FINAL PLAN

# SITE UTILITY PLAN

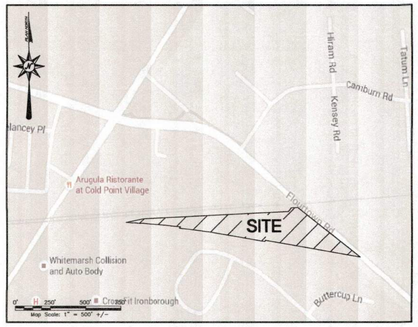
## *FLOURTOWN ROAD*

WHITEMARSH TOWNSHIP - MONTGOMERY COUNTY - PENNSYLVANIA

**WOODROW & ASSOCIATES, INC.**
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1108 North Bethlehem Pike - Suite 5 Lower Gwynedd — PA 19002
Phone: (215) 542-9646 Fax: (215) 542-8979
Web: www.Woodrowinc.com

Layer List: Sht06_Utility
Plan Date: AUGUST 19, 2015
Job No: 15-0415-D
Design Mgr: R.J.J.
Proj. Mgr: T.P.W.
Sheet No: 6 of 14

Project No: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep. 7, 2016 (16:10)




LOCATION MAP

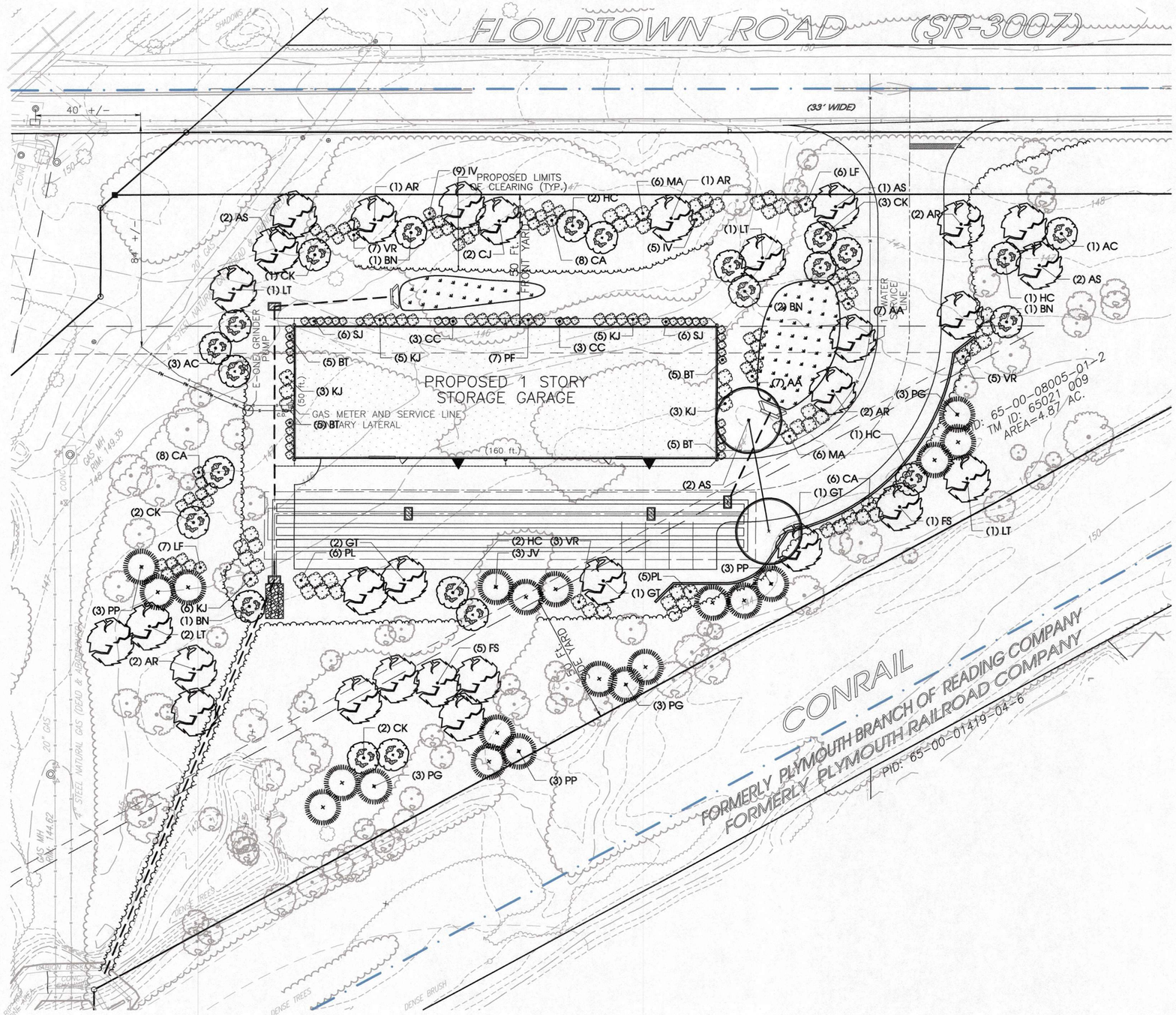
**SITE LANDSCAPING NOTES:**

1. All topsoil shall be a minimum 4" in all sod areas and 8" in tree, shrub and groundcover beds, including parking lot island beds.
2. All landscape and grass areas are to be hand raked and left clear of all stones, rock, construction debris and any unsuitable materials.
3. Landscape contractor will locate all underground utilities prior to any excavation and planting installation.
4. All proposed landscaping to be nursery grown, typical of their species or variety. They are to have normal vigorous root systems, free from defects and infections and in accordance with ANSI Z60.1.
5. All proposed plantings should be installed per standards of the "American Association of Nurserymen" and state nursery/ landscape associations with regard to planting, pit size, backfill mixture, staking and guying.
6. All planting containers and baskets shall be removed during planting. All plants shall be set plumb and positioned so that the top of the root collar matches, or is no more than two (2") inches above, finished grade. Replace amended backfill in 6-inch layers and compact backfill to eliminate voids. Contractor shall provide a four-inch high earthen watering saucer along the perimeter of each planting pit. Contractor shall water newly planted vegetation prior to mulching planting pit. All voids shall be filled and settling mitigated as required. Aluminum edging shall be installed around all planting areas to delineate between different landscape materials.
7. After initial watering and prior to mulching, contractor shall apply herbicides and pre-emergent herbicides as required to eliminate any weed seeds or plants present on root ball.
8. All planting beds shall be mulched with double ground hardwood mulch at a depth of 2-3".
9. Seedbed Preparation:
   a. Apply limestone and fertilizer according to soil tests or fertilizer may be applied at the rate of 260 pounds per acre or 6 pounds per 1000 square feet using 10-20-10 or equivalent. In addition, 300 pounds 4-1-2 per acre or equivalent of slow release nitrogen may be used in lieu of topdressing.
   b. Work lime and fertilizer into the soil as practical to a depth of 4-inches with a disc, spring tooth harrow or other suitable equipment. The final harrowing or disking operation should be parallel to the general contour. Continue tillage until a reasonable uniform, fine seedbed is prepared. All but clay or silty soils and coarse sands should be rolled to firm the seedbed wherever feasible.
   c. Inspect seedbed just before seeding. If traffic has left the topsoil compacted, the area must be retilled and firmed as outlined below.
   d. Grass seeding mixture and application rate:

| Percentage of total weight | Application Rate | Seed Type | Minimum Germination Allowed |
|---|---|---|---|
| 60 % | 5-7 lbs/1000 Sq. Ft. | "REBEL" Tall Fescue | 90-97 |
| 35 % | | "YORKTOWN" Perennial Rye | 90-98 |
| 5 % | | "STREEKER" Redtop | 90-92 |

   e. In areas designated as sod, fescue sod is to be installed on minimum 4" topsoil. Areas to be sodded are to be prepared as noted above for seeded areas.
10. Plant material shall be guaranteed for one year from the date of substantial completeness. The contractor shall replace plants, dead, unhealthy, dying or damaged through loss of branches and/or foliage. Lawns that are not in good condition at the end of the guarantee period shall be repaired until a good lawn results.

    *It is understood that the owner shall assume responsibility for watering all plant material and lawn area beginning with the date of substantial completeness.*
11. Applicant shall schedule pre-clearing site visit with a representative of the Township Shade Tree Commission and project Landscape Architect prior to any additional clearing.
12. Applicant responsible for the clearing of invasive, understory plant material including removal of vines from existing trees to remain.
13. Exact locations of replacement trees within open areas are subject to change to avoid conflict with existing plant material to remain.
14. Applicant received waivers to exceed maximum substitution types.




PLAN FEATURES LEGEND

- Tract Boundary Line
- Legal Right-of-Way Line
- Existing Roadway Centerline
- Municipal Boundary Line
- Zoning District Boundary
- Supplemental Contour (2' Interval)
- Index Contour (10' Interval)
- Existing Soil Series Limits
- Mapped Wetlands Limit
- Existing Storm Sewer Piping
- Existing Sanitary Sewer Piping
- Existing Gas Main
- Existing Water Main / Service
- Existing Overhead Utility Wires
- Existing Fence Line
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- Proposed Storm Sewer
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- Proposed Roof Leader Collection System
- Proposed Limits of Clearing

REVISIONS

| No. | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 09/03/15 | REVISED PER STC COMMENTS |
| 2 | 02/19/16 | REVISED PER T&M REVIEW LETTER DATED 1/25/2016 |

RACHEL SOLAN WANG
REGISTERED LANDSCAPE ARCHITECT
REGISTRATION NUMBER: LA001472

SCALE IN FEET (1" = 20'-0")

ONLY PLANS INCORPORATING A RAISED PROFESSIONAL SEAL ARE CONSIDERED TO BE OFFICIAL AND LEGALLY BINDING DOCUMENTS. THIS PLAN HAS BEEN PREPARED SPECIFICALLY FOR THE APPLICANT AND PROJECT DESCRIBED HEREIN. ANY MODIFICATION, REVISION, OR REUSE OF THIS PLAN WITHOUT THE EXPRESS WRITTEN CONSENT OF WOODROW & ASSOCIATES, INC. IS PROHIBITED BY LAW.
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PLAN NORTH

Parcel Information:
60-00-08005-01-2
Block: 0001 Unit: 0001
D.B.: 5906 Pg: 2517

| | |
|---|---|
| Gross Area: | 4.8724 Acres |
| Dedication (ROW): | 0.1022 Acres |
| Net Area: | 4.5702 Acres |

Record or Equitable Owner:
60 Flourtown Road, LLC
c/o Glenn Von Tersten
543 Glenn Mill Road
Fort Washington, PA 19034

Applicant:
60 Flourtown Road, LLC
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543 Glenn Mill Road
Fort Washington, PA 19034

PRELIMINARY / FINAL PLAN

# SITE LANDSCAPING DESIGN PLAN

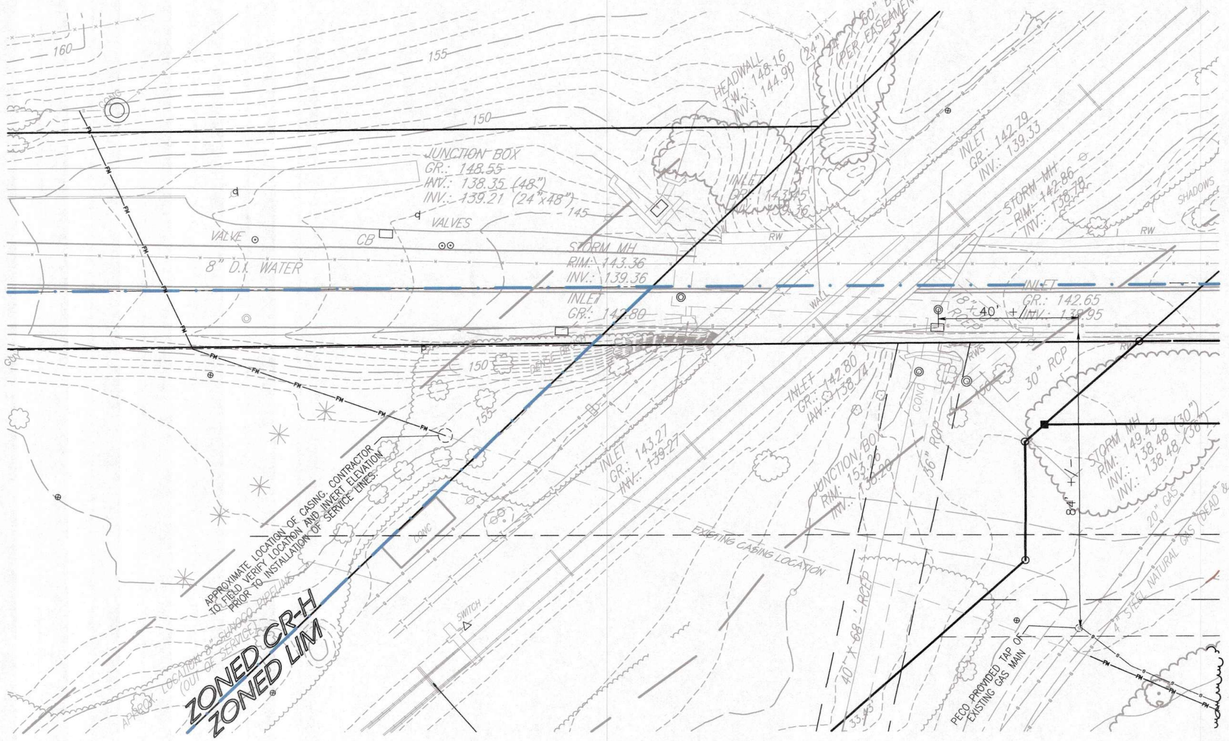
## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP - MONTGOMERY COUNTY - PENNSYLVANIA

WOODROW & ASSOCIATES, INC.
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1100 North Wood Avenue, Suite 2, Linwood, PA 19061
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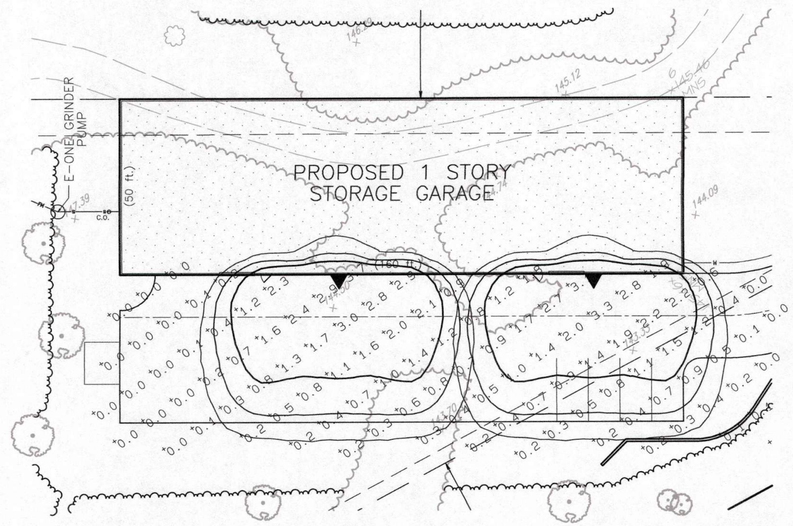
Layer List: Sht07_Landcape
Plan Date: AUGUST 19, 2015
Job No: 15-0415-D
Design Mgr: J.A.G.
Proj. Mgr: T.P.W.
Sheet No: 7 of 14

Project No. 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:10)




## UTILITY SERVICE EXTENSION DETAIL

SCALE: 1" = 20'




## LIGHTING DETAIL

SCALE: 1" = 20'

LUMINAIRE SCHEDULE – EATON LIGHTING (formerly Cooper Lighting)

| Symbol | Qty | Fixture Name | Catalog Number | IES File | Lumens | LLF | Watts | Mounting Height |
|---|---|---|---|---|---|---|---|---|
| ▼ | 2 | Galleon Wall Luminaire | GWC-AE-01-LED-E1-SL4 | GWC-AE-01-LED-E1-SL4.ies | 5203 | 1.0 | 58.2 | 14' |

ADDITIONAL RELIEF WAS GRANTED BY THE SHADE TREE COMMISSION ON 8/2/16 TO ALLOW REDUCTION OF PLANT MATERIAL SIZES. THE QUANTITY OF PLANT MATERIAL REMAINS THE SAME AS PROVIDED FOR THE INITIAL WAIVER TO PROVIDE 35% OF THE REQUIRED REPLACEMENT TREES. (SEE SHADE TREE COMMISSION NOTES)

## LANDSCAPING REQUIREMENTS

| Item | Requirement | Provided |
|---|---|---|
| SALDO Sect. 105-39 Parking Area Landscape | One (1), 3" caliper tree per 2 spaces. 4 parking spaces/ 2 = 2 trees | 2 Shade trees |
| SALDO Sect. 105-48 Street Trees | One (1), 3" caliper tree per 45'<br>Flourtown Rd. (less drive access) = 512'<br>512/45 = 12 trees | Existing trees |
| SALDO Sect. 105-52 Buffer Yards | Class "B" Buffer – Option 3<br>1 Evergreen tree per 15' +<br>1 Evergreen shrubs per 8'<br><br>35' of disturbed area<br>35/15 = 3 Evergreen trees<br>35/8 = 5 Evergreen shrubs<br><br>Remaining property perimeter satisfied by existing vegetation. | 3 Evergreen trees<br>5 Evergreen shrubs |
| Chapter 55 Tree Protection Standards | Every tree determined to be living and healthy, with a DBH of six inches or greater that is removed or destroyed, shall be replaced with one or more new shade trees, min. 3" caliper. Total caliper of replacement trees shall equal or exceed the DBH of the tree(s) removed.<br><br>Total caliper inches removed = 894<br>894/3 = 298 Replacement trees (3" caliper)<br><br>7/5/16: WAIVER GRANTED TO PROVIDE 35% OF REQUIRED = 313<br>313/3 = 104 Replacement Trees<br><br>8/2/16: ADDITIONAL RELIEF GRANTED TO PROVIDE SAME AMOUNT OF PLANT MATERIAL AT SMALLER SIZES. | 30 Shade Trees<br>18 Evergreen Trees<br>23 Ornamental Trees<br>163 Shrubs |
| | Total Plantings Provided | 32 Shade Trees<br>23 Evergreen Trees<br>23 Ornamental Trees<br>168 Shrubs |

## PLANTING SCHEDULE

| Plan Symbol | Quantity | Botanical Name | Common Name | Minimum Planting Caliper | Planting Spread | Minimum Planting Height | Remarks |
|---|---|---|---|---|---|---|---|
| AR | 8 | Acer rubrum | Red Maple | 1 1/2 – 2" | 4–5' | 8–10' | B&B/ CONT. |
| AS | 7 | Acer saccharum | Sugar Maple | 1 1/2 – 2" | 4–5' | 8–10' | B&B/ CONT. |
| CJ | 2 | Cercidiphyllum japonicum | Katsura Tree | 1 1/2 – 2" | 4–5' | 8–10' | B&B/ CONT. |
| FS | 6 | Fagus sylvatica | European Beech | 1 1/2 – 2" | 4–5' | 8–10' | B&B/ CONT. |
| GT | 4 | Gleditsia triacanthos var. inermis | Thornless Honey Locust | 1 1/2 – 2" | 4–5' | 8–10' | B&B/ CONT. |
| LT | 5 | Liriodendron tulipifera | Tulip Tree | 1 1/2 – 2" | 4–5' | 8–10' | B&B/ CONT. |
| | | | | | | | |
| JV | 3 | Juniperus virginiana | Eastern Red Cedar | – | 2–3' | 4–5' | B&B/ CONT. |
| PG | 9 | Picea glauca | White Spruce | – | 2–3' | 4–5' | B&B/ CONT. |
| PP | 9 | Picea pungens | Colorado Blue Spruce | – | 2–3' | 4–5' | B&B/ CONT. |
| | | | | | | | |
| AC | 4 | Amelanchier canadensis | Shadbush | – | 3–4' | 6–8' | B&B/ CONT., multi-stem (5 stems) |
| BN | 5 | Betula nigra | River Birch | – | 3–4' | 6–8' | B&B/ CONT., multi-stem (3 stems) |
| CK | 8 | Cornus kousa | Chinese Dogwood | – | 3–4' | 6–8' | B&B/ CONT. |
| HC | 6 | Halesia carolina | Carolina Silverbell | – | 3–4' | 6–8' | B&B/ CONT. |
| | | | | | | | |
| AA | 14 | Aronia arbutifolia | Red Chokeberry | – | – | min 18" | CONT |
| BT | 20 | Berberis thunbergii | Barberry | – | – | min 18" | CONT |
| CA | 22 | Cornus alba | Red Twigged Dogwood | – | – | min 18" | CONT |
| CC | 6 | Caryopteris clandonensis | Blue Mist Shrub | – | – | min 18" | CONT |
| IV | 14 | Ilex verticillata | Winterberry | – | – | min 18" | CONT |
| KJ | 22 | Kerria japonica | Japanese Kerria | – | – | min 18" | CONT |
| LF | 13 | Leucothoe fontanesiana | Drooping Leucothoe | – | – | min 18" | CONT |
| MA | 12 | Mahonia aquifolium | Oregon Grape Holly | – | – | min 18" | CONT |
| PF | 7 | Potentilla fruticosa | Bush Cinquefoil | – | – | min 18" | CONT |
| PL | 11 | Prunus laurocerasus 'Schipkaensis' | Schip Laurel | – | – | min 18" | CONT |
| SJ | 12 | Skimmia japonica | Japanese Skimmia | – | – | min 18" | CONT |
| VR | 15 | Viburnum rhytidophyllum | Leatherleaf Viburnum | – | – | min 18" | CONT |
| | | | | | | | |
| | | | | | | | |

## SHADE TREE COMMISSION NOTES:

August Meeting (8/2/16):
Motion made by Karen Nemeth, seconded by Dave D' Amore. The STC made a recommendation that the Applicant update the replacement schedule to the following in order to maintain the same number of replacement trees/ shrubs/ groundcovers, but reduce the size of the trees/ shrubs/ groundcovers:
- 6 replacement equivalents from the rain garden seeding (18 caliper inches equivalent)
- 30 shade trees at 2 caliper inches (60 total caliper inches equivalent)
- 18 evergreens at 4–5 feet in height (9 total caliper inches equivalent)
- 23 ornamental trees at 6 feet in height (11.5 total caliper inches equivalent)
- 163 shrubs at 18"–24" in height

July Meeting (7/5/16):
Motion made by Dave D'Amore, seconded by Steve Ziegler, the STC made a recommentation to allow for the Applicant to exceed the maximum allowed substitution for shade trees (utilizing evergreens, shrubs, minor flowering/decorative, etc) as specified in the ordinance in order to replace as much of the removed trees as possible on site. This motion was approved unanimously.

Motion made by Leigh Ashbrook, seconded by Dave D'Amore, the STC made a recommendation that the Applicant remove all invasive honeysuckle shrubs on site and utilize the spaces that the removal of the honeysuckle shrubs create for planting replacement trees. This motion was approved unanimously.

Motion made by Dave D'Amore, seconded by Leigh Ashbrook, the STC made a recommendation that the Applicant be granted a maximum of 65% waiver for the replacement of the 894 removed caliper inches, requiring the Applicant to provide the Township an updated landscape plan showing a replanting schedule of 35% replacement (313 caliper inches). If the Applicant cannot attain a 35% replacement schedule showing a total of 313 caliper inches of replacement due to space constraints, the Township's Consulting Arborist shall confirm that the site does not allow for the replacement of 313 caliper inches due to space constraints. This motion was approved unanimously.

REVISIONS

| No. | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 09/09/16 | REVISED PER STC COMMENTS |
| 1 | 07/19/16 | REVISED PER T&M REVIEW LETTER DATED 7/20/2016 |

PENNSYLVANIA
RACHEL SOLAN WAGG
REGISTRATION NUMBER (AD1157)
REGISTERED LANDSCAPE ARCHITECT

SCALE IN FEET (1" = 20'-0")
20' 0' 20' 40'

ONLY PLANS INCORPORATING A RAISED PROFESSIONAL SEAL ARE CONSIDERED TO BE OFFICIAL AND RELIED UPON BY THE USER.
THIS PLAN HAS BEEN PREPARED SPECIFICALLY FOR THE APPLICANT NAMED HEREON, AND IS NOT TO BE USED BY ANY OTHER PARTY WITHOUT THE WRITTEN CONSENT OF WOODROW & ASSOCIATES, INC.
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PLAN NORTH

Parcel Information: 65-00-08005-01-2 Block 021 Unit 009 D.B.: 5988 Pg. 2517

Gross Area: 4.8724 Acres
Legal R/W: N/A
Legal Area: 0.3022 Acres
NET Area: 4.5702 Acres

Record or Equitable Owner: 60 Flourtown Road, LLC c/o Glenn Van Exrden 340 Militia Hill Road Fort Washington, PA 19034

Applicant: 60 Flourtown Road, LLC c/o Glenn Van Exrden 340 Militia Hill Road Fort Washington, PA 19034

PRELIMINARY / FINAL PLAN

# SITE LIGHTING DESIGN PLAN

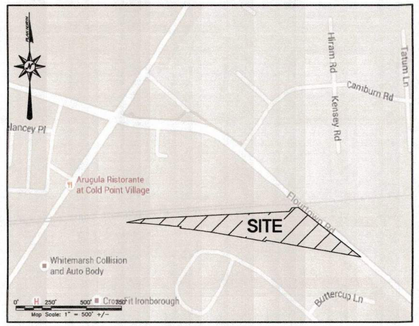
## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP – MONTGOMERY COUNTY – PENNSYLVANIA

WOODROW & ASSOCIATES, INC.
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1108 North Bethlehem Pike / Suite 5 – Lower Gwynedd – PA 19002
Phone: (215) 542-9090 Fax: (215) 542-9919
Web: www.Woodrowinc.com

Layer List: Sht08_Lighting
Plan Date: AUGUST 19, 2015
Job No: 15-0415-D
Design Mgr: J.A.G.
Proj. Mgr: T.P.W.
Sheet No: 8 of 14

Project No: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:13)




LOCATION MAP

## GENERAL - PLAN NOTES

SEE RECORD PLAN FOR ALL EXISTING FEATURES AND GENERAL DEVELOPMENT NOTES.

**EROSION CONTROL DESIGN:**

1. The Erosion & Sedimentation Control Plan shall minimize the extent and duration of earth disturbance to the greatest extent possible by outlining an efficient construction sequence to complete the proposed improvements as quickly as possible while utilizing the following Erosion and Sedimentation Controls, as shown and detailed on the plan, to minimize any sediment-laden runoff during construction; Rock Construction Entrance, 18" Silt Fence, 8" Compost Sock and North American Green DS-75S.
2. The Erosion & Sedimentation Control Plan shall maximize protection of existing drainage features and vegetation to the greatest extent possible by outlining the Limit of Disturbance to avoid impact to any natural drainage features such as the existing on-site drainage channel.
3. The Erosion & Sedimentation Control Plan shall minimize soil compaction to the greatest extent possible by minimizing traffic within the area of any utilized Sediment Basin, Sediment Trap, or similar BMP once it is constructed and functioning in an effort to preserve natural infiltration rates for Post-Construction conversion. Soil compaction shall also be avoided by loosening the subsoil to a depth of 3 to 5 inches to permit the bonding of topsoil to the surface areas and scarification of 6 to 12 inches for compacted soils prior to seeding. Fencing off of infiltration areas may be implemented as noted on the plans or in the provided Construction Sequence.
4. The Erosion & Sedimentation Control Plan outlines controls to prevent and/or minimize the generation of increased stormwater through the use of a Perforated Riser Pipe within the Sediment Basin (if applicable), to capture, slow, and cool runoff while allowing the natural infiltration properties in the soil in this location.
5. Any proposed impervious areas, Rooftops, Pavement and Sidewalk areas, Etc., have the potential to increase thermal impacts to the watershed. Through the use of the proposed BMPs identified on the Plan and specifications for this Project, runoff is captured, slowed, and cooled to the greatest extent possible; thereby reducing the potential for thermal impacts to the watershed as much as possible.
6. There are no naturally occurring geologic conditions on-site that could potentially cause pollution. All Erosion and Sedimentation Controls (Sedimentation Basin(s), Compost Socks, Etc.) are proposed around the project site in an effort to minimize any construction related pollution from leaving the site.
7. If bedrock is encountered during the construction of the proposed BMPs, the project engineer shall be consulted to ensure that the proposed BMPs will still function as designed.
8. Sediment-laden runoff is an anticipated construction waste.

## MAINTENANCE PROGRAM for EROSION & SEDIMENT CONTROL MEASURES

All Erosion and Sediment Control Measures require inspection and maintenance as specified below. A written report shall be compiled and kept on-site at all times outlining any necessary maintenance and repair that has been performed on the Erosion & Sediment Control Measures. The report shall be updated weekly and after each runoff event requiring BMP inspection. The owners, their successors, or its assigns, shall assume all responsibility for the cost associated with the inspection, cleaning of the system(s), engineering fees and ultimately any costs associated with the required repairs and/or replacement of said facilities.

**TEMPORARY ROCK CONSTRUCTION ENTRANCE:** (CONSTANT 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.

**PUMPED WATER FILTER BAG:** (DAILY MAINTENANCE)

Filter bags shall be inspected daily. If any problem is detected, pumping shall cease immediately and not resume until the problem is corrected.

**COMPOST SOCK CONCRETE WASHOUT AREA:** (DAILY MAINTENANCE)

1. All concrete washout facilities should be inspected daily. Damaged or leaking washouts should be deactivated and repaired or replaced immediately.
2. Accumulated materials should be removed when they reach 75% capacity.
3. Plastic liners should be replaced with each cleaning of the washout facility.

**ROCK FILTER OUTLET:** (DAILY MAINTENANCE)

Sediment shall be removed when accumulations reach 1/3 the height of the outlet.

**SILT FENCE:** (WEEKLY MAINTENANCE & AFTER EACH RUNOFF EVENT)

Silt fence should be inspected weekly and after each runoff event. Needed repairs should be initiated immediately after the inspection. Sediment shall be removed when accumulations reach half the aboveground height of the fence.

**FILTER BAG INLET PROTECTION:** (WEEKLY MAINTENANCE & AFTER EACH RUNOFF EVENT)

1. Inlet filter bags should be inspected on a weekly basis and after each runoff event. Filter bags should be cleaned and/or replaced when the bag is half full or when flow capacity has been reduced so as to cause flooding or bypassing the inlet. Accumulated sediment should be disposed in the approved manner. Bags that will be reused should be rinsed at a location where the rinse water will enter a sediment trap or sediment basin. Damaged filter bags should be replaced.
2. Needed repairs should be initiated immediately after the inspection.

**RIPRAP APRON:** (WEEKLY MAINTENANCE & AFTER EACH RUNOFF EVENT)

All aprons shall be inspected at least weekly and after each runoff event. Displaced riprap within the apron shall be replaced immediately.

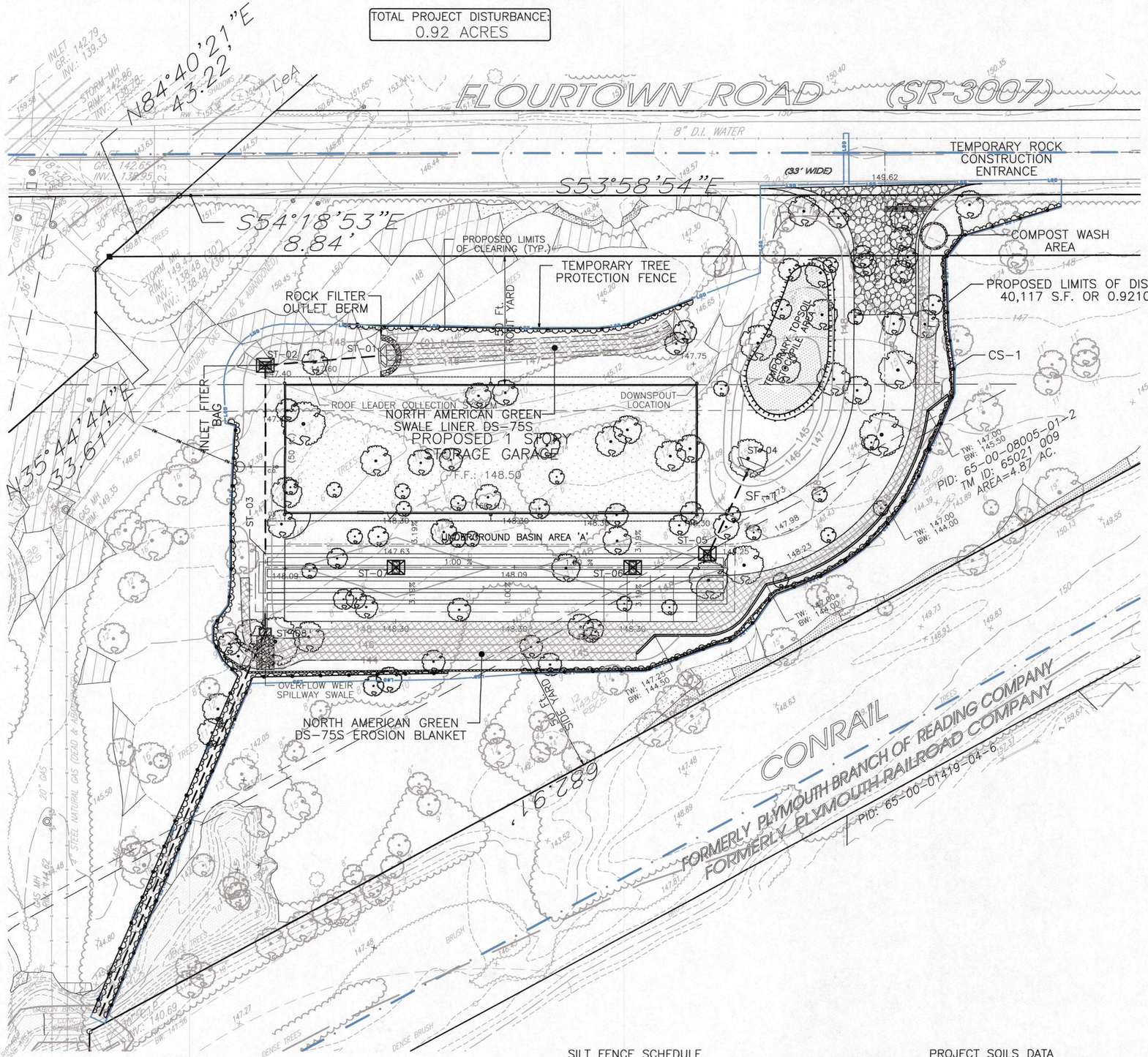
**EROSION CONTROL BLANKET:** (WEEKLY MAINTENANCE & AFTER EACH RUNOFF EVENT)

Blanketed areas shall be inspected weekly and after each runoff event until perennial vegetation is established to a minimum uniform 70% coverage throughout the blanketed area. Damaged or displaced blankets shall be resotred or replaced within 4 calendar days.

**COMPOST FILTER SOCK:** (WEEKLY MAINTENANCE & AFTER EACH RUNOFF EVENT)

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. Bio-degradable silfter socks shall be replaced after 6 months; photodegradable socks after 1 year. Polypropylene socks shall be replaced according to manufacturer's specifications.

TOTAL PROJECT DISTURBANCE: 0.92 ACRES




## SILT FENCE SCHEDULE

| Fence No. | Location | Fence Type | Slope Length Above Fence | Slope % Above Fence | Fence Length (L.F.) |
|---|---|---|---|---|---|
| SF-1 | STOCKPILE AREA | REINFORCED 30" | N/A | 33% | 140 |
| | | | | | |
| CS-1 | ADJACENT TO DRIVE & PARKING | 12" COMPOST SOCK | 250 FT. | 3.00% +/- | 405 |
| | | | | | |
| | | | | | |

## PROJECT SOILS DATA

| Soils Type: | Slopes: | Depth to Restrictive Feature: | Depth to Water Table: | Hydrologic Soil Group: |
|---|---|---|---|---|
| LeA Lawrenceville silt loam | 0 to 3 percent | 24"-38" to Fragipan 48"-99" to Lithic Bedrock | 18" to 36" | C |
| UgB Urban land | 0 to 8 percent | Unknown | Unknown | C |
| UudB -Udorthents limestone complex | 0 to 8 percent | 20-99" to Lithic Bedrock | 6" to 24" | C/D |
| | | | | |

## PLAN LEGEND

- Tract Boundary Line
- Legal Right-of-Way Line
- Existing Roadway Centerline
- Mapped Wetlands Limits
- Existing Topographic Contours
- Existing Soil Series Limits
- Existing Drive / Paving Limit
- Existing Vegetation Limit
- Existing Storm Sewer Piping
- Existing Sanitary Sewer Piping
- Existing Gas Main
- Existing Water Main / Service
- Existing Overhead Utility Wires
- Existing Underground Telephone
- Existing Fence Line
- Proposed Contour
- Temporary Erosion Control Grading
- Tree Protection Fencing
- Temp Compost Filter Sock
- Temp Filter Fabric Fencing
- LOD — Limits of Disturbance (NPDES Boundary)
- Drainage Area Boundary to BMPs

PENNSYLVANIA ONE CALL SYSTEM INC. 1-800-242-1776 DIAL 811 BEFORE YOU DIG!

CALL 1-800-242-1776
PROJECT SERIAL NUMBER FOR DESIGN: 20152860068-000
Month October, 2015

| No. | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 09/20/16 | REVISED PER STC COMMENTS |
| 1 | 02/19/16 | REVISED PER T&M REVIEW LETTER DATED 1/29/2016 |

REVISIONS

REGISTERED PROFESSIONAL TIMOTHY P. WOODROW ENGINEER No. 19875-E

SCALE IN FEET (1" = 20'-0")

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PLAN NORTH

Parcel or Exhibition Parcel:
60 Flourtown Road, LLC
c/o Glenn Von Eerden
1100 Northwestern Drive
Fort Washington, PA 19034

Parcel Information:
65-00-08005-01-2
Deed Book: Vol. 5917
D.B.: 5906 Pg:

| | |
|---|---|
| Gross Area: | 4.8724 Acres |
| Land Dev. ROW: | 0.3222 Acres |
| NET Area: | 4.5702 Acres |

Applicant:
60 Flourtown Road, LLC
c/o Glenn Von Eerden
1100 Northwestern Drive
Fort Washington, PA 19034

PRELIMINARY / FINAL PLAN
EROSION and SEDIMENTATION CONTROL PLAN
*FLOURTOWN ROAD*
WHITEMARSH TOWNSHIP - MONTGOMERY COUNTY - PENNSYLVANIA

WOODROW & ASSOCIATES, INC.
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1100 Northwestern Drive, Fort Washington, PA 19002
Phone: (215) 542-5648 Fax: (215) 542-5979
Web: www.Woodrowinc.com

| | |
|---|---|
| Layer List: | Sht09_E&S Plan |
| Plan Date: | AUGUST 19, 2015 |
| Job No: | 15-0415-D |
| Design Mgr: | R.J.J. |
| Proj. Mgr: | T.P.W. |
| Sheet No: | 9 of 14 |

Project No: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:14)

# STANDARD EROSION CONTROL 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 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, the licensed professional responsible for oversight of critical stages of implementation of the PCSM plan, and a representative from the local conservation district to an on-site preconstruction meeting.
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 or 811 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 in writing from the local conservation district or by the Department prior to implementation.
5. Areas to be filled are to be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots and other objectionable material.
6. 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 the E&S plan.
7. 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.
8. Topsoil required for the establishment of vegetation shall be stockpiled at the location(s) shown on the plan map(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 35 feet. Stockpile slopes shall be 2H:1V or flatter.
9. 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 local conservation district and/or the regional office of the Department.
10. 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 25Pa. 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.
11. 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.
12. 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.
13. All pumping of water from any work area shall be done according to the procedure described in this plan, over undisturbed vegetated areas.
14. 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 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.
15. A log showing dates that E&S BMPs were inspected as well as any deficiencies found and the date they were corrected shall be maintained on the site and be made available to regulatory agency officials at the time of inspection.
16. 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.
17. All sediment removed from BMPs shall be disposed of in the manner described on the plan drawings.
18. 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 4 inches of topsoil in place prior to seeding and mulching. Fill outslopes shall have a minimum of 2 inches of topsoil
19. 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.
20. All earthen fills shall be placed in compacted layers not to exceed 9 inches in thickness.
21. 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.
22. Frozen materials or soft, mucky, or highly compressible materials shall not be incorporated into fills.
23. Fill shall not be placed on saturated or frozen surfaces.
24. Seeps or springs encountered during construction shall be handled in accordance with the standard and specification for subsurface drain or other approved method.
25. 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.
26. 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.
27. 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.
28. 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 local conservation district of the Department.
29. Upon completion of all earth disturbance activities and permanent stabilization of all disturbed areas, the owner and/or operator shall contact the local conservation district for an inspection prior to removal/conversion of the E&S BMPs.
30. After final site stabilization has been achieved, temporary erosion and sediment BMPs must be removed or converted to a 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.
31. Upon completion of all earth disturbance activities and permanent stabilization of all disturbed areas, areas, the owner and/or operator shall contact the local conservation district to schedule a final inspection.
32. 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.

**SITE SPECIFIC NOTES:**

33. 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.
34. All channels shall be kept free of obstructions including but not limited to fill, rocks, leaves, woody debris, accumulated sediment, excess vegetation, and construction material/wastes.
35. Underground utilities cutting through any active channel shall be immediately backfilled and the channel restored to its original cross-section and protective lining. Any base flow within the channel shall be conveyed past the work area in the manner described in this plan until such restoration is complete.
36. Channels having riprap, Reno mattress, or gabion linings must be sufficiently over-excavated so that the design dimensions will be provided after placement of the protective lining.
37. 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 water.
38. Erosion control blanketing shall be installed on all slopes 3H: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.
39. Fill material for embankments shall be free of roots, or other woody vegetation, organic material, large stones, and other objectionable materials. The embankment shall be compacted in maximum 8" layered lifts at 95% density.

# EROSION and SEDIMENTATION CONTROL

## I. GENERAL NOTES:

1. This Erosion and Sedimentation Control Plan was prepared by the staff of Woodrow & Associates, Inc. under the direction of Mr. Timothy P. Woodrow, P.E.

**Other BMPs:**

2. Sediment must be removed from storm water inlet protection after each runoff event.

**Temporary Stabilization and Permanent Stabilization:**

3. Straw mulch shall be applied in long strands, not chopped or finely broken.
4. The NPDES Boundary is equal to the limit of disturbance of the site and any off-site areas within the limit of disturbance that are the responsibility of the developer to install off-site facilities such as: utilities and roadways.

## II. RECEIVING WATERSHED:

The receiving watershed for this development is an unnamed tributary to the Wissahickon Creek. The Chapter 93 Classification for this receiving watershed is TSF.

## III. INTENT OF CONSERVATION PROGRAM:

The intent of this program is to prevent accelerated erosion of the exposed site soils during the construction and permanent life periods of the Development. The program requires retention of all sediments on the construction site while minimizing the impact of development on existing streams and adjacent properties.

These objectives will be achieved by minimizing exposure time of potentially erosive soils to runoff and installation of the temporary and permanent conservation practices in proper sequence with construction. The intent of this program should be understood and implemented throughout the entire development. The various construction trades should be appraised of this program and directed to prevent undue disturbance of prepared and protected surfaces.

## IV. SURFACE STABILIZATION CRITERIA:

All denuded soil surfaces including soil stockpiles that are subject to erosion shall be stabilized immediately, either temporarily or permanently. Crushed stone on pavement subgrades is considered adequate protection. Disturbed areas which are not at finished grade and which will be redisturbed within one (1) year may be stabilized with a quick growing, temporary seed mixture and mulch. During non-germination periods, mulch shall be applied at recommended rates. Germination period shall be from April 1st to June 15th and August 15th to October 15th during non-germination periods mulched areas shall be limed, fertilized, seeded and remulched immediately.

Contractor/Applicant shall assume responsibility for the maintenance and operation of all erosion and sediment control facilities.

Silt fence must be installed parallel to existing contours and constructed in level alignments. The ends of the fence must be extended a minimum of eight (8) feet up slope and at forty-five (45) degrees to the main fence alignment.

If any of the measures contained within this plan prove inadequate at removing sediment from flow prior to discharge or stabilizing of the surfaces involved, additional measures must be immediately implemented by the Contractor/Applicant to eliminate all such problems. Said measures shall be approved by the local soil conservation district.

A reserve supply of crushed stone, silt fence, temporary seed and hay bales shall be maintained on site for emergency replacement of any failing erosion and sediment control measures.

## V. EROSION CONTROL DEVICES / MAINTENANCE PROGRAM:

**STABILIZED CONSTRUCTION ENTRANCE:**

Entrances are to be constructed per Ch. 102 Standard Construction Detail #16 and the details provided with this plan set. The stabilized construction entrance(s) shall be maintained so that tire scrubbing activity does not become ineffective. Any buildup of mud or soil on the street shall be cleaned immediately by hand or mechanical sweeping.

**SILT FENCES:**

Silt fence shall be installed per Ch. 102 Standard Construction Details #19-22 and the details provided with this plan set, with rock outlets at existing and graded low points. Sediment must be removed from silt fences when it reaches 1/2 the fence height or as directed by the local soil conservation district. Silt fencing which has been undermined or over topped shall be replaced with rock filter outlets immediately.

**COMPOST FILTER SOCKS:**

Compost Socks shall be installed per Ch. 102 Standard Construction Details #4-1 and the details provided with this plan set. 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.

**STORM INLET PROTECTION:**

Inlet protection devices shall be constructed per Ch. 102 Standard Construction Details #28-32 and the details provided with this plan set. Inlet protection shall be maintained until all earthwork within the tributary drainage area has been completely stabilized.

**SEDIMENT DISPOSAL:**

Silt removed from temporary erosion and sediment control devices shall be disposed of on-site in landscaped areas located outside the 100 year flood plains, wetlands, steep slopes and drainage swales. Areas of sediment disposal shall be considered a critical vegetation area requiring immediate stablization.

Each drainage sub-area will require separate and unique erosion and sediment control measures. The contractor shall follow the specific construction sequence deemed appropriate by the local soil conservation district.

All BMP listed above require inspection weekly and after each runoff event. All required repairs and or replacement of BMP's must be done immediately.

## VI. UTILITY TRENCH EXCAVATION:

**GENERAL REQUIREMENTS:**

Exposed trench excavations have high potential for accelerated erosion and sediment pollution. Since these excavations are usually located at lower elevation along or across earth disturbance sites, open trenches serve to concentrate sediment laden runoff and convey it to site boundaries or waterways. The most important erosion and sediment pollution control consideration for trench construction is the limiting and specific scheduling of work activities.

**CONSTRUCTION REQUIREMENTS:**

Limit advance clearing and grubbing operations to a distance equal to two times the length of pipe installation that can be completed in one day.

Work crews and equipment for trenching, placement of pipe, plug construction and backfilling will be self contained and separate from clearing and work crews and site restoration and stabilization operations.

All soils excavated from the trench shall be placed on uphill side of the trench.

Limit daily trench excavation to the length of pipe placement, plug installation and backfilling that can be completed the same day.

Water which accumulates in the open trench will be completely removed by pumping before pipe placement and/or backfilling begins. Water removed from the trench shall be pumped through a filtration device.

On the day following pipe placement and trench backfilling, the disturbed area will be graded to final contours and immediately stabilized.

Soils excavated from the existing surface layer should be stockpiled separately and returned as final surface layer following trench backfilling.

## VII. FERTILIZATION, SEEDING AND MULCHING:

**TEMPORARY COVER ON DISTURBED AREAS:**

Disturbed areas not at finished grade which will be redisturbed within one (1) year may be seeded and mulched with a temporary seed cover.

**PERMANENT COVER ON DISTURBED AREAS:**

Disturbed areas which are either at finish grade or will not be redisturbed a within one (1) year period must be seeded and mulched with a permanent seed mixture.

All disturbed areas shall be stabilized immediately with a temporary seed and mulch mixture applied at the recommended rates. Site preparation of mulch and maintenance shall be performed in accordance with the Penn State University's Erosion Control & Conservation Plantings on Noncropland manual and Pennsylvania Department of Transportation publication form 408 specifications (latest edition). During nongermination periods, mulch must be applied at the recommended rates.

**MULCHING:**

All seeded areas should be mulched or blanketed to minimize the potential for failure to establish adequate vegetated cover. Mulching may also be used as a temporary stabilization of disturbed areas in non-germinating seasons. Mulch shall be applied immediately after seeding or at the termination of grading operations during non-germinating seasons.

Straw and hay mulch should be anchored or tackified immediately after application to prevent being a non-flammable mulch. A tractor-drawn implement may be used to "crimp" the straw mulch into the soil about 3 inches deep. This method should be limited to slopes no steeper than 3H:1V. The machinery shall be operated on the contour.

Polymeric and gum tackifiers mixed and applied according to manufacturer's recommendations may be used to tack mulch. Avoid application during rain and on windy days. A 24 hour curing period and a soil temperature of 45 degrees F or are typically required. Application should generally be heaviest at edges of seeded areas and at crests of ridges and banks to prevent loss. The remainder of the area shall have binder applied uniformly. Binders may only be applied after mulch is spread or sprayed onto the mulch as it is being blown onto the soil.

Synthetic binders, or chemical binders, may be used as recommended by the manufacturer to anchor mulch provided that sufficient documentation is provided to show they are non-toxic to native plant and animal species.

Mulch on slopes of 8% or steeper should be held in place with netting. Light-weight plastic, fiber, or paper nets may be stapled over the mulch according to manufacturer's recommendations.

Shredded paper hydromulch should not be used on slopes steeper than 5%. Wood fiber hydromulch may be applied on steeper slopes provided a tackifier is used. The application for any hydromulch should be 2000 lb/acre at a minimum.

**MULCH APPLICATION RATES**

| Mulch Type: | Application Rate (Min.) | | | Notes: |
|---|---|---|---|---|
| | Per Acre: | Per 1,000 S.F. | Per 1,000 S.Y. | |
| Straw | 3 tons | 140 lbs. | 1,240 lbs. | Either wheat or oat straw, free of weeds, not chopped or finely broken |
| Hay | 3 tons | 140 lbs. | 1,240 lbs. | Timothy, mixed clover and timothy or other native forage grasses |
| Wood Chips | 4-6 tons | 185-275 lbs. | 1,650-2500 lbs. | May prevent germination of grasses and legumes |
| Hydromulch | 1 ton | 47 lbs. | 415 | See limitations above |

## VIII. SEEDING SCHEDULE:

Seeding to conform to specifications outlined in Section 804 - Seeding and Soil Supplements of PADOT Publication 408/2003 (latest revision).

**TEMPORARY SEEDING SPECIFICATION - FORMULA E:**

100% ANNUAL RYEGRASS (LOLIUM MULTIFLORUM): 10.0 lbs./1,000 s.y.

**PERMANENT SEEDING SPECIFICATION - FORMULA B:**

70% Tall Fescue (Festuca Arunoinacea var., Kentucky 31): 15.0 lbs./1,000 s.y.
30% Creeping Red Fescue or Chewings Fescue: 6.0 lbs./1,000 s.y.

**SEEDING RATES FOR THE ABOVE MIXTURES:**

Spread seeds where indicated and at the rates specified above (and Table A, Pub 408, Section 804). Spread seeds within the following dates, or as otherwise indicated or directed:

- Formula B: - March 15 to June 01 / August 01 to October 15
- Formula E: - March 15 to October 15

Extend seeding dates where project conditions warrant. Apply full treatment or apply only 50% of the permanent seeding and soil supplements and apply the remaining 50% within the next seeding dates.

Place much, hay or straw immediately after seeding or within 48 hours after seeding is completed. Place hay or straw uniformly, in a continuous blanket, until seeding is completed. If directed, increase the rate of application, depending upon the material used, season, soil conditions or method of application.

**SOIL SUPPLEMENTS:**

Pulverized agricultural limestone and commercial fertilizer shall be applied to all disturbed areas which are to be seeded in both temporary and permanent conditions at the following rates:

Pulverized Agricultural Limestone: 800 lbs./1,000 s.y.
10-20-20 Analysis Commercial Fertilizer 140 lbs./1,000 s.y.
30-0-0 Ureaform Fertilizer 50 lbs./1,000 s.y.
- OR -
32-0-0 to 38-0-0 Sulfur Coated Urea Fertilizer 59 to 50 lbs./1,000 s.y.
- OR -
31-0-0 IBDU Fertilizer 61 lbs./1,000 s.y.

**ERNMX-180 RAIN GARDEN MIX**

| | | |
|---|---|---|
| 20.00% | Panicum rigidulum | Redtop Panic Grass |
| 20.00% | Schizachyrium scoparium | Little Bluestem |
| 10.00% | Elymus virginicus | Virginia Wild Rye |
| 5.00% | Carex vulpinoidea | Fox Sedge |
| 5.00% | Chasmanthium latifolium | River Oats |
| 5.00% | Echinacea purpurea | Purple Coneflower |
| 5.00% | Liatris spicata | Marsh (Dense) Blazing Star |
| 5.00% | Rudbeckia hirta | Black Eyed Susan |
| 3.00% | Monarda fistulosa | Wild Bergamot |
| 3.00% | Penstemon digitalis | Tall White Beard Tongue |
| 2.00% | Andropogon gerardii | Big Bluestem |
| 2.00% | Asclepias incarnata | Swamp Milkweed |
| 2.00% | Aster novae-angliae | New England Aster |
| 2.00% | Baptisia australis | Blue False Indigo |
| 2.00% | Geum laciniatum | Rough Avens |
| 2.00% | Senna hebecarpa | Wild Senna |
| 2.00% | Tradescantia ohiensis | Ohio Spiderwort |
| 2.00% | Verbena hastata | Blue Vervain |
| 2.00% | Zizia aurea | Golden Alexanders |
| 1.00% | Agrostis perennans | Autumn Bentgrass |

Seeding Rate: 15 lb per acre, or 1/3-1/2 lb per 1,000 sq ft

Used where water quality, wildflower beauty, and wildlife are important. This mix should only be mowed during the dormant season.

A companion crop, such as annual rye, shall be applied in conjunction with the above seed mixes to help in binding the seed to the fresh soil while it germinates.

## IX. SOILS RESOLUTIONS:

**Winter Grading:**

Contractor to ensure proper stabilization. Methods to include, seeding and mulching at the recommended rates and where necessary, the placement of an approved erosion control blanket.

**Road Fill**

Contractor to ensure all fill used for roadway construction is placed and compacted in appropriate lifts. Should material not be suitable for roadway construction the contractor may import suitable material from an area within the permitted area.

**Topsoil**

Contractor to ensure proper stabilization. Methods to include, seeding and mulching at the recommended rates and where necessary, the placement of an approved erosion control blanket.

Contractor shall consider soils testing to ensure topsoil is suitable to produce and sustain proper growth. Should the topsoil be lacking of the nutrients to produce growth the contractor shall consider applying lime and/or fertilizers at the rates recommended by the project landscape consultant and/or the local conservation district.

Topsoil may be imported from an area within the permitted area proven to be suitable.

**Ponds, Dikes and Levees Embankments**

Contractor to ensure all fill used for basin embankment construction is placed and compacted in appropriate lifts. Should material not be suitable for basin construction the contractor may import suitable material from an area within the permitted area.

Contractor to ensure proper stabilization. Methods to include, seeding and mulching at the recommended rates and where necessary the placement of an approved erosion control blanket.

**Terraces, diversions and waterways**

Contractor to ensure all earthwork associated with swales, diversion berms and/or watercourses is adequately stabilized with an approved erosion and sediment control blanket and/or seeding and mulching applied at the recommended rates.

Should erosion continue the contractor shall consult the design engineer, the local conservation district, and take appropriate measures to correct the problems. Corrective measures may include but are not limited to the following:

Additional seeding and mulching, the placement of sod, armoring the channel with a stronger stabilization blanket, or the placement of rip-rap.

## X. POST-CONSTRUCTION MAINTENANCE PROGRAM:

Post-Construction maintenance of all implemented BMP's shall include but not be limited to the following:

1. Check all vegetated areas after any runoff events to identify any areas showing accelerated erosion. If any area is identified as eroding, these areas are to be stabilized using methods described on this plan.
2. All storm structures shall be inspected and cleaned of debris annually or as necessary to maintain full capacity of the storm system.
3. Any underground detention system shall be inspected annually for debris buildup and structural integrity. If excessive debris is present the underground system shall be flushed and reinspected.

## XI. STANDARD NOTE TO COMPLY WITH NPDES CHECKLIST ITEM #2.b.xv: (#3.b.xv for an Individual NPDES Permit)

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 permittee.

1. 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 if its other waste and is recognized 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).
2. 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".
3. 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.
4. 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 policy "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 Chapter 287 Residual Waste Management or 271 Municipal Waste Management, whichever is applicable. These regulations are available on-line at www.pacode.com

## XII. MONITORING, INSPECTION, AND REPORTING REQUIREMENTS:

**Visual Inspections:**

The permittee or co-permitee(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 N.O.T. 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 BMP's and PCSM BMP's 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, name and signature of the person conducting the inspection.

**Noncompliance Reporting:**

Where E&S, PCSM or PPC BMP's 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 involved 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 BMP's:**

Upon reduction, loss or failure of the BMP's, the permittee and co-permittee shall take immediate action to restore the BMP's or provide an alternative method of treatment. Such restored BMP's or alternative treatment shall be at least as effective as the original BMP's.

**Termination of Coverage:**

N.O.T.: Upon permanent stabilization of earth disturbance activities associated with construction activity that are authorized by this permit and when BMP's identified in the PCSM Plan have been properly installed, the permittee and/or co-permitee of the facility must submit a N.O.T. form that is signed in accordance with Part B, Section 1.c, Signatory Requirements, of the NPDES permit. All letters certifying discharge termination are to be sent to the department or authorized conservation district. The N.O.T. must contain the following information: facility name, address and location, operator name and address, permit number, identification and proof of acknowledgment from the person(s) who will be responsible for the operation and maintenance of the PCSM BMP's in accordance with the approved PCSM Plan, and the reason for the permit termination. Until the permittee has recieved written acknowledgement of the N.O.T., the permittee will remain responsible for the operation and maintaining all E&S BMP's and PCSM BMP's on the project site and will be responsible for the violations occurring on the project site.

**Completion Certificate and Final Plans:**

Within 30 days after the completion of the earth disturbance activities authorized by this permit, including the permanent stabilization of the site and proper installation of PCSM BMP's in accordance with the approved PCSM Plan, or upon submission of the N.O.T., 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 the NPDES permit and the approved E&S and PCSM Plans.

**LIMITATION OF SOILS PERTAINING TO EARTHMOVING**

| SOILS NAME: | OUTBANKS CAVE | CORROSIVE TO CONCRETE/STEEL | DROUGHTY | EASILY ERODIBLE | DEPTH TO SATURATED ZONE/SEASONAL HIGH WATER TABLE | HYDRIC/HYDRIC INCLUSIONS | LOW STRENGTH LIMITATIONS | SLOW PERCOLATION | PIPING | POOR SOURCE OF TOPSOIL | FROST ACTION | SHRINK - SWELL | POTENTIAL SINKHOLE | PONDING | WETNESS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LeA Lawrenceville silt loam | X | C/S | X | X | X | X | X | X | X | | X | X | | | X |
| UgB Urban land | | | | | | | | | | | | | | | |

**GENERAL NOTES:**

1. See Erosion and Sedimentation Control Specifications Plan for soils resolutions pertaining specific site construction elements.

# CONSTRUCTION SEQUENCE

At least 7 days before starting any earth disturbance activities, the operator shall invite all contractors involved in those activities, the landowner, all appropriate municipal officials, the erosion and sediment control plan preparer, the designated Licensed Professional, and the local Conservation District to an on-site meeting. Also, at least 3 days before starting any earth disturbance activities, all contractors involved in those activities shall notify the Pennsylvania One Call Incorporated System at 811 or 1-800-242-1776 for buried utilities locations.

All earth disturbance activities shall proceed in accordance with the outlined sequence on these plans. 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.

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.

**PHASE ONE CONSTRUCTION:**

1. Install rock tire cleaning construction entrance as shown and detailed on the plans.
2. The Limits of Disturbance line or (LOD) must be clearly marked with one of the following, survey stakes, paint and ropes, construction fence, etc. prior to any disturbance activities within the designated area.

**The licensed professional shall inspect and approve the Limits of Disturbance prior to any further activity.**

3. Install all compost sock and silt fence as shown and detailed on the Erosion & Sedimentation Control Plan.
4. Install all Tree Tree Protection Fence as shown and detailed on the Erosion & Sedimentation Control Plan.
5. Clear and grub area necessary for construction. Strip and stockpile Topsoil in designated topsoil stockpile area. Seed and mulch immediately with a temporary seed mixture applied at the rates specified in the notes.
6. Rough grade site area as required for construction of proposed improvements. Begin construction of building as shown and detailed on these plans.
7. Install proposed utilities as shown on these plans. Provide a site grading as shown and begin installation of Underground Basin Area A as detailed on these plans. The contractor shall take all necessary precautions to protect the liner system during installation of the system. The system shall remain water tight.

**The licensed professional shall be present during the construction and installation of the proposed underground system.**

8. Begin installation of storm sewer collection system as detailed on these plans. Install inlet filter bags in each inlet as installed to protect the infiltration system during construction.
9. Finalize grade of the driveway subgrade and parking area install stone base course as shown and detailed on these plans.
10. Place a minimum of 6" of topsoil on all lawn and landscape areas. Seed or sod all disturbed areas immediately. Seed with a permanent seed and mulch mixture applied at the recommended rates.
11. Install landscape per landscape plan and finalize dwelling construction.
12. Vegetated areas shall be considered permanently stabilized when a uniform 70% vegetative cover of erosion resistant perennial species have been achieved, or the disturbed area is covered with an acceptable BMP which permanently minimizes accelerated erosion and sedimentation. Until such time as this standard is achieved, interim stabilization measures and temporary erosion and sediment control BMPs that are used to treat project runoff may not be removed.
13. Upon the defined stabilization the contractor shall remove all temporary erosion and sediment control measures.

| No. | DATE | DESCRIPTION: |
|---|---|---|
| 1 | 06/05/16 | REVISED PER STC COMMENTS |
| 2 | 05/19/16 | REVISED PER T&M REVIEW LETTER DATED 1/20/2016 |

REVISIONS

REGISTERED PROFESSIONAL TIMOTHY P. WOODROW ENGINEER 034835-E COMMONWEALTH OF PENNSYLVANIA

PLAN NORTH

Parcel Information: 65-00-08035-01-2 Bk-0020 Pg: 2517 D.B.: 5906

Gross Area: 4.8724 Acres
Lot Rw: 0.3022 Acres
Net Area: 4.5702 Acres

Record or Equitable Owner: 60 Flourtown Road, LLC c/o Glenn Van Ejnden 543 Millia Hill Road Fort Washington, PA 19034

Applicant: 60 Flourtown Road, LLC c/o Glenn Van Ejnden 543 Millia Hill Road Fort Washington, PA 19034

PRELIMINARY / FINAL PLAN

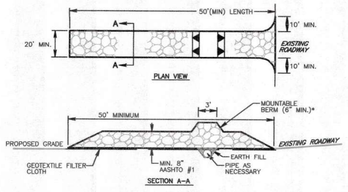
EROSION and SEDIMENTATION CONTROL SPECIFICATIONS
*FLOURTOWN ROAD*
WHITEMARSH TOWNSHIP - MONTGOMERY COUNTY - PENNSYLVANIA

WOODROW & ASSOCIATES, INC.
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1108 North Bethlehem Pike / Suite 5 - Lower Gwynedd - PA 19002
Phone: (215) 542-9419 Fax: (215) 542-9579
Web: www.woodrowassoc.com

Layer List: Sh10_E&S-Specs
Plan Date: AUGUST 19, 2015
Job No: 15-0415-D
Design Mgr: R.J.J.
Proj. Mgr: T.P.W.
Sheet No: 10 of 14

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Project No: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:15)




* MOUNTABLE BERM USED TO PROVIDE PROPER COVER FOR PIPE

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

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

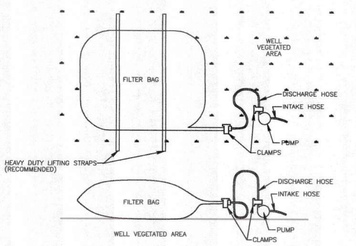
MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.

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.

(PADEP EROSION and SEDIMENT POLLUTION CONTROL PROGRAM MANUAL – MARCH 2012)
(STANDARD CONSTRUCTION DETAIL #3-1)

## ROCK CONSTRUCTION ENTRANCE

Not To Scale




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 THEN 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 GRADSY 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.

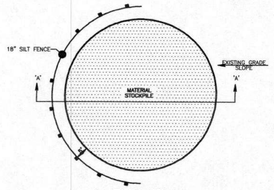
THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

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

(PADEP EROSION and SEDIMENT POLLUTION CONTROL PROGRAM MANUAL – MARCH 2012)
(STANDARD CONSTRUCTION DETAIL #3-16)

## SEDIMENT FILTER BAG FOR PUMPED WATER

Not To Scale




NOTES:

STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET.

SIDE SLOPES MUST BE NO GREATER THEN 2:1. 2 FEET HORIZONTALLY TO ONE FOOT VERTICALLY.

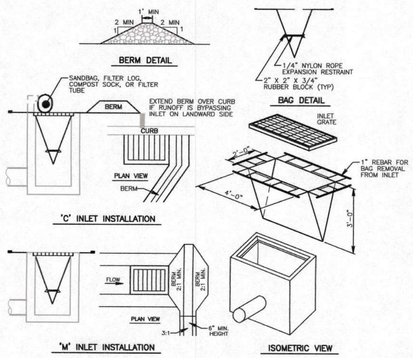
18" SILT FENCE SHALL BE INSTALLED ON THE DOWN SLOPE SIDE OF THE PROPOSED BERM AT A MINIMUM OF 5 FEET FROM THE TOE OF SLOPE.

SHOULD THE NEED ARISE WHERE ADDITIONAL STOCKPILE AREAS ARE REQUIRED THOSE AREAS MUST BE APPROVED BY THE MONTGOMERY COUNTY CONSERVATION DISTRICT.

STOCKPILE AREA MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER THE PLACEMENT OF ANY STOCKPILE MATERIAL.

## TEMPORARY STOCKPILE AREA DETAIL

Not To Scale




* ADAPTED FROM PENNDOT RC-70, 2008 EDITION

* EARTHEN BERM TO BE STABILIZED WITH TEMPORARY OR PERMANENT VEGETATION

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

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

ROLLED EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.

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.

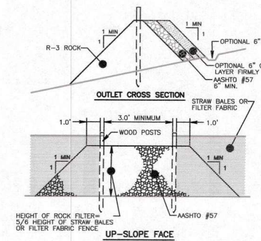
INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OF WHEN FLOW CAPACITY HAS BEEN REDUCED 50 AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE OF 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 **

(PADEP EROSION and SEDIMENT POLLUTION CONTROL PROGRAM MANUAL – MARCH 2012)
(STANDARD CONSTRUCTION DETAIL #3-10, #3-11, #3-12)

## FILTER BAG INLET PROTECTION

Not to Scale



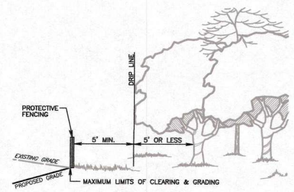

A ROCK FILTER OUTLET SHALL BE INSTALLED WHERE FAILURE OF A SILT FENCE OR STRAW BALE BARRIER HAS OCCURED DUE TO CONCENTRATED FLOW. ANCHORED COMPOST LAYER SHALL BE USED ON UPSLOPE FACE IN HQ AND EV WATERSHEDS.

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

(PADEP EROSION and SEDIMENT POLLUTION CONTROL PROGRAM MANUAL – MARCH 2012)
(STANDARD CONSTRUCTION DETAIL #4-4)

## ROCK FILTER OUTLET DETAIL

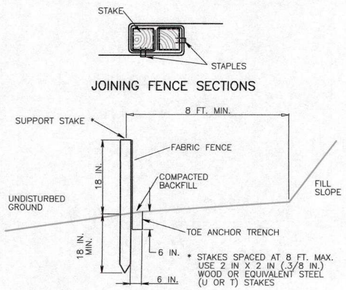
Not To Scale




WHERE DRIPLINE IS LESS THAN 5'

## CONSTRUCTION OPERATIONS RELATIVE TO PROTECTED TREES

NOT TO SCALE




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 EQUIV-ALENT 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.

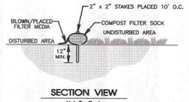
ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET (STANDARD CONSTRUCTION DETAIL # 4-6).

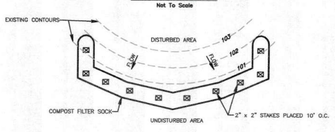
FENCE SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN TRIBUTARY AREA IS PERMANENTLY STABILIZED.

STANDARD CONSTRUCTION DETAIL #4-7

## STANDARD SILT FENCE (18" HIGH)

NOT TO SCALE




Sock fabric shall meet standards of Table 4.1 of the Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual (Technical Guidance Number 363-2134-008).

Compost shall meet standards of Table 4.2 of the Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual (Technical Guidance Number 363-2134-008).

Compost filter sock shall be placed at existing level grade. Both ends of the sock shall be extended at least 8 feet up slope at 45 degrees to the main sock alignment. Maximum slope length above any sock shall not exceed that shown on Figure 4-2 of the Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual (Technical Guidance Number 363-2134-008). Stakes may be installed immediately downslope of the sock if so specified by the manufacturer.

Traffic shall not be permitted to cross filter socks.

Accumulated sediment shall be removed when it reaches half the aboveground height of the sock and disposed in the same manner described elsewhere in the plan.

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.

Biodegradable filter socks shall be replaced after 6 months; photodegrable socks after 1 year. Polypropylene socks shall be replaced according to manufacturer's recommendations.

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.

(PADEP EROSION and SEDIMENT POLLUTION CONTROL PROGRAM MANUAL – MARCH 2012)
(STANDARD CONSTRUCTION DETAIL #4-1)

## COMPOST FILTER SOCK

Not to Scale

**TABLE 4.1**
**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 Characteristics | Photo-degradable | Photo-degradable | Bio-degradable | Photo-degradable | Photo-degradable |
| Sock Diameters | 12", 18", 24", 32" | 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 | | 28 psi | 28 psi | 44 psi | 202 psi |
| Ultraviolet Stability % Original Strength (ASTM G-155) | 33% at 1000 hr. | 23% at 1000 hr. | | 100% at 1000 hr. | 100% at 1000 hr. |
| Minimum Functional Longevity | 6 months | 9 months | 6 months | 1 year | 2 years |
| Two-ply systems | | | | | |
| Inner Containment Netting | | HDPE biaxial net | | | |
| | | Continuously wound | | | |
| | | Fusion-welded junctures | | | |
| Outer Filtration Mesh | | 3/4" x 3/4" Max. aperture size | | | |
| | | Composite Polypropylene Fabric (Woven slit film 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 | | | | | |

Filtrexx & JMD

**TABLE 4.2**
**Compost Standards**

| | |
|---|---|
| Organic Matter Content | 80% – 100% (dry weight basis) |
| Organic Portion | Fibrous and elongated |
| pH | 5.5 – 8.5 |
| Moisture Content | 30% – 55% |
| Particle Size | 98% pass through 1" screen |
| Soluble Salt Concentration | 5.0 dS/m (mmhos/cm) Maximum |

Filtrexx


REVISIONS

| No.: | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 06/05/15 | REVISED PER STC COMMENTS |
| 2 | 07/19/15 | REVISED PER T&M REVIEW LETTER DATED 7/07/2015 |



COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL TIMOTHY P. WOODROW ENGINEER No. 037215-E


0'


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N W E S PLAN NORTH


Parcel Information:
65-00-08005-01-2
Block-Unit: 1008
D.B.: 5906 Pg: 2517

Gross Area: 4.8724 Acres
Lim. Dis.: 0.3222 Acres
Net Area: 4.5502 Acres

Record or Equitable Owner:
60 Flourtown Road, LLC
c/o Glenn Van Fenten
143 Militia Hill Road
Fort Washington, PA 19034

Applicant:
60 Flourtown Road, LLC
c/o Glenn Van Fenten
143 Militia Hill Road
Fort Washington, PA 19034


PRELIMINARY / FINAL PLAN

# EROSION and SEDIMENTATION CONTROL DETAILS

## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP – MONTGOMERY COUNTY – PENNSYLVANIA


WOODROW & ASSOCIATES, INC.
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1108 North Bethlehem Pike / Suite 5 – Lower Gwynedd – PA 19002
Phone: (215) 542-9900 Fax: (215) 542-5979
www.woodrowassociates.com


Layer List: Sht11_E&S-Det

Plan Date: AUGUST 19, 2015

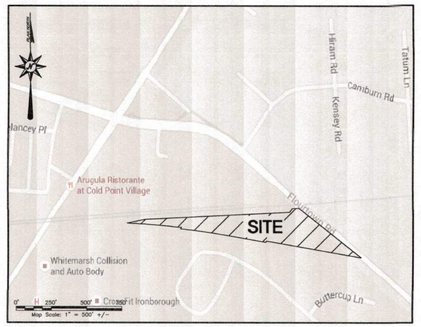
Job No: 15-0415-D

Design Mgr: R.J.J.

Proj. Mgr: T.P.W.

Sheet No: 11 of 14

Project No. 15-0415-D Project Name FLOURTOWN ROAD Print Date: Sep 7, 2015 (16:15)




LOCATION MAP

## GENERAL PLAN NOTES

SEE RECORD PLAN FOR ALL EXISTING FEATURES AND GENERAL DEVELOPMENT NOTES.

1. Sediment laden runoff is an anticipated construction waste.
2. Runoff from the project site enters the Wissahickon Creek, which is classified by Title 25 Environmental resources Chapter 93 as WWF.
3. Through the use of the proposed BMPs, the flowrate and volume of runoff has been reduced when compared to predevelopment conditions, therefore, as designed, the project site will preserve the integrity of stream channels within the watershed and help to maintain and protect the physical, biological and chemical qualities of the receiving stream.

Per PA-DEP requirements, the proposed project shall:

Preserve the integrity of stream channels and maintain and protect the physical, biological, and chemical qualities of the receiving stream through limiting disturbance to preserve the existing vegitation and constructing a Rain Garden with amended soils and plantings.

Prevent an increase in the rate of stormwater runoff to the greatest extent possible through the use of BMPs Rain Garden to capture, retain, slow, and cool runoff before releasing runoff into the existing channel.

Minimize any potential increase in stormwater runoff volume to the greatest extent possibly by capturing a majority of the project site within the proposed BMPs, where runoff shall be given the chance to infiltrate as much as possible.

Minimize impervious areas to the greatest extent possible by only constructing the areas shown.

Maximize the protection of existing drainage features and existing vegetation to the greatest extent possible by efficiently defining the Limit of Disturbance to full protect (INSERT SITE SPECIFIC INFO). The area of proposed (LIST SITE SPECIFIC INFILTRATION BMPs) shall also be protected from unnecessary compaction through the use of construction fencing to prohibit vehicles from entering this area.

Minimize land clearing and grading to the greatest extent possible by outlining an efficient Limit of Disturbance strictly to the proposed development.

Minimize soil compaction to the greatest extent possible by providing an efficient Construction Sequence to protect the (LIST SITE SPECIFIC INFILTRATION BMPs) from any unnecessary construction vehicle traffic and scarification of the subsurface prior to final BMP construction. Construction fencing shall also be used to block off the area of the (LIST INFILTRATION BMPS) until this area is to be constructed.

The proposed BMPs shown on this plan shall prevent and minimize the generation of increased stormwater runoff to the (LIST WATERS SITE DRAINS TO)

There are no naturally occuring geologic conditions on-site that could potentially cause pollution. Through the use of the proposed BMPs, a majority of the site runoff will be slowed, cooled, and treated before being released towards (LIST WATERS SITE DRAINS TO).

### SEDIMENT DISPOSAL:

Silt removed from permanent BMPs shall be disposed of on-site in landscaped areas located outside the 100 year flood plains, wetlands, steep slopes and drainage swales. Areas of sediment disposal shall be considered a critical vegetation area requiring immediate stabilization.

All BMP shown above require inspection weekly and after each runoff event. All required repairs and or replacement of BMP's must be done immediately.

### RECYCLING and DISPOSAL METHODS:

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.

## B.M.P. MAINTENANCE PROGRAM

### GENERAL NOTES:

The Underground Basin facility shown hereon is a permanent B.M.P. structure and is not to be removed altered or reconfigured in any way without the approval of the applicable municipality and/or the local County Conservation District and D.E.P.

All B.M.P.'s such as this basin and conveyance system require yearly inspection and maintenance to ensure the B.M.P.'s are functioning as designed. Maintenance of the system will include the removal of any debris and flushing of the system. An inspection report should be provided by a creditable Engineering firm under the direction of a Licensed Engineer. The owners, their successors, or its assigns, shall assume all responsibilty for the cost associated with the inspection, cleaning of the system, engineering fees and ultimately any costs associated with recommended repairs, and/or replacement of said facilities. Copies of the inspection report shall be forwarded to the applicable municipality for review and record in keeping with State regulations.

During the construction phase of the project, the permittee shall be responsible for the proper construction, stabilization, and maintenance of all erosion and sedimentation control measures. The permittee shall also be responsible for the proper construction, operation and maintenance of all post construction stormwater management BMPs identified in the PCSWM Plan. The applicant, its assigns will assume responsibility for the operation and maintenance responsibilities of all post construction stormwater management BMPs.

If at any point the Basin fails to infiltrate the storage volume within 72 hours, the remaining water shall be immediately pumped into the Basin Outlet Structure and a certified professional contacted to investigate the cause and recommend a solution to the infiltration failure.

### MAINTENANCE NOTES & SCHEDULE:

1. Maintenance of the Underground Basin: (Semi-annually)

   The Owner, its assigns shall be responsible to ensure the underground basin is free and clear of debris that would impede storage capcity within the system area or reduce outfall to the basin outlet structure. The owner shall inspect, clean and if necessary flush and vaccum the underground system to ensure it functions as per the original design.

2. Maintenance of the Basin Outlet Structures: (After each runoff event)

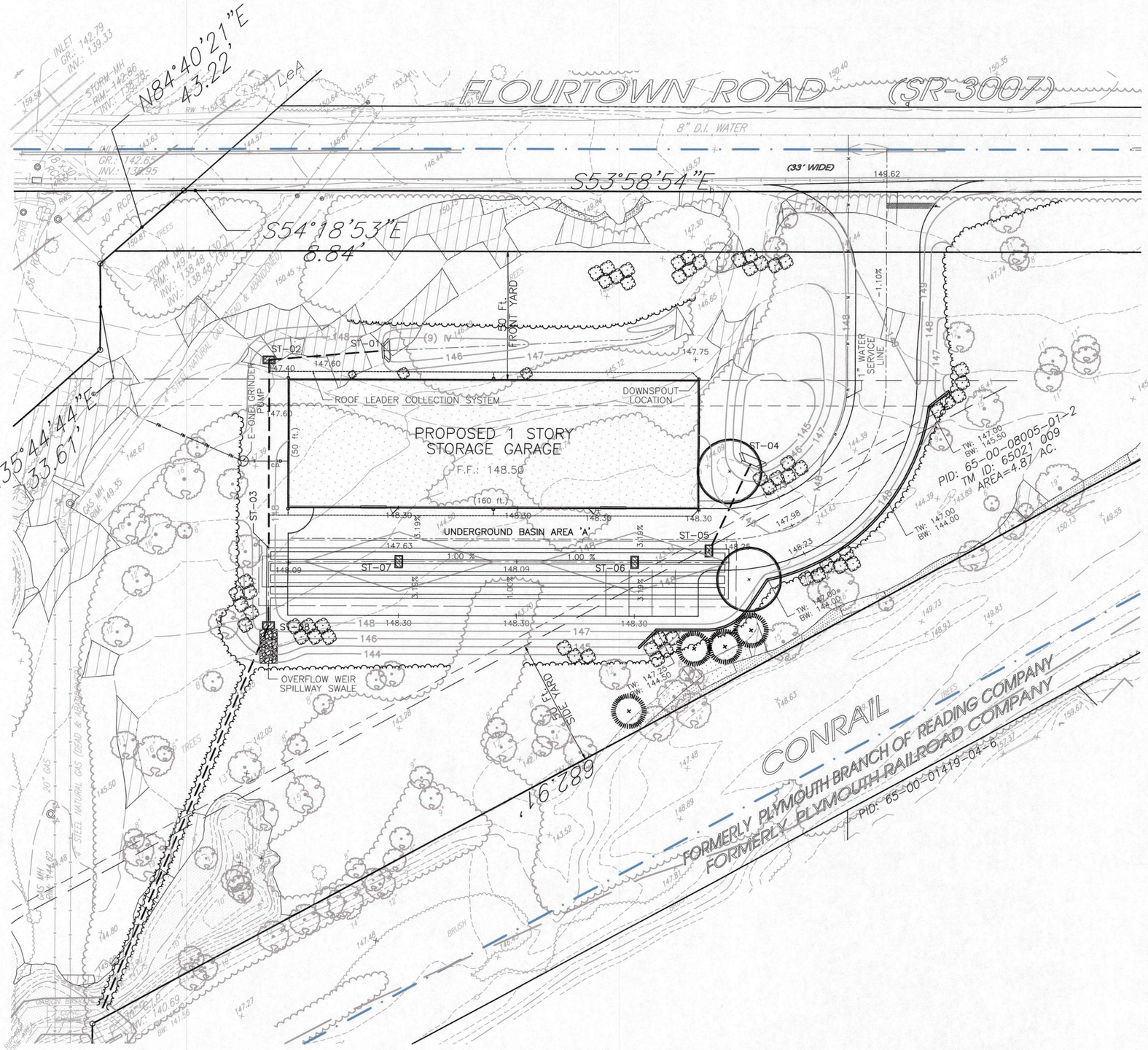
   The owner, its assigns shall be responsible to ensure that the basin outlet structure is free and clear of any debris that would impede outfall from the basin. The outlet structure shall be inspected after each runoff event and cleaned as required.

3. Maintenance of the storm sewer collection system: (After each runoff event)

   The owner, its assigns shall be responsible to ensure that the storm sewer collection and lawn drain system is free and clear of any debris. The system shall be inspected after each runoff event and cleaned if required.

4. Maintenance of the downspout & roof leader collection system: (Quarterly)

   The owner, its assigns shall be responsible to ensure that the downspout and roof leader collection system is free and clear of any debris. The system shall be inspected after each runoff event and cleaned if required. Quarterly flushing of the system shall be done to ensure the system is free and clear of any sediment and debris.




### PLAN LEGEND

- Tract Boundary Line
- Legal Right-of-Way Line
- Existing Roadway Centerline
- Mapped Wetlands Limits
- Existing Topographic Contours
- Existing Soil Series Limits
- Existing Drive / Paving Limit
- Existing Vegetation Limit
- Existing Storm Sewer Piping
- Existing Sanitary Sewer Piping
- Existing Gas Main
- Existing Water Main / Service
- Existing Overhead Utility Wires
- Existing Underground Telephone
- Existing Fence Line
- Proposed Contour
- Proposed Stormwater Piping
- LOD — Limits of Disturbance (NPDES Boundary)
- Drainage Area Boundary to BMPs
- Infiltration Testing Location

A licensed professional or the PCSM designee shall be present on-site during construction of the Rain Garden and Forebay areas to ensure proper construction sequences are followed.

LIMESTONE CERTIFICATION:

I, TIMOTHY P. WOODROW, A REGISTERED PROFESSIONAL ENGINEER OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT THE PROPOSED FACILITY IS UNDERLAIN BY LIMESTONE.

Signature: _____ Registration Number: 036735-E Date: _____

ACKNOWLEDGEMENT:

I/WE _____, ACKNOWLEDGE THAT THE STORMWATER MANAGEMENT FACILITIES SHOWN ON THESE PLANS CAN ONLY BE ALTERED OR REMOVED AFTER APPROVAL OF A REVISED PLAN BY THE APPLICABLE MUNICIPALITY. OWNER ALSO AGREES TO ALL ABOVE LISTED BMP MAINTENANCE PROGRAM REQUIREMENTS.

Signature: _____ Date: _____

REVISIONS

| No. | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 08/25/16 | REVISED PER STC COMMENTS |
| 2 | 09/26/16 | REVISED PER T&M REVIEW LETTER DATED 1/20/2016 |

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — TIMOTHY P. WOODROW — ENGINEER — No. 036735-E

SCALE IN FEET (1" = 20'-0") — 40' 20' 0' 20'

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PLAN NORTH

Parcel Information:
65-00-08005-01-2
Block: 021 Unit: 006
D.B.: 5906 Pg: 2517

Gross Area: 4.8724 Ac/Sf
Lift Rte: 0.33022 Acres
Net Area: 4.5392 Acres

Record or Equitable Owner:
60 Flourtown Road, LLC
c/o Glenn Von Epsten
343 Millig Hill Road
Fort Washington, PA 19034

Applicant:
60 Flourtown Road, LLC
c/o Glenn Von Epsten
343 Millig Hill Road
Fort Washington, PA 19034

PRELIMINARY / FINAL PLAN

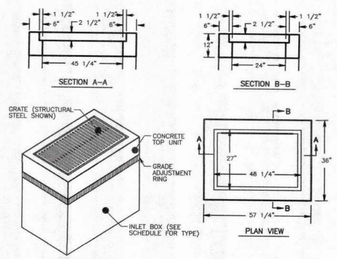
# POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) PLAN
## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP - MONTGOMERY COUNTY - PENNSYLVANIA

WOODROW & ASSOCIATES, INC.
MUNICIPAL/CIVIL CONSULTING ENGINEERS
1108 North Bethlehem Pike / Suite 5 - Lower Gwynedd - PA 19002
Phone: (215) 542-3679 Fax: (215) 542-3679
Web: www.WoodrowAssociates.com

Layer List: Sht12_PostCon
Plan Date: AUGUST 19, 2015
Job No: 15-0415-D
Design Mgr: R.J.J.
Proj. Mgr: T.P.W.
Sheet No: 12 of 14

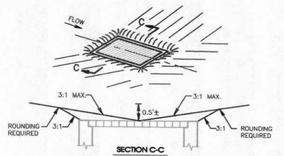
Project No. 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:16)




DETAIL FOR GENERAL REFERENCE ONLY. ACTUAL STRUCTURE TO BE IN COMPLIANCE WITH PennDOT PUB 72, RC-45M, JUN. 1, 2010 OR LATEST EDITION.

## PennDOT TYPE 'M' INLET TOP DETAIL

Not To Scale




## SUMPED TYPE 'M' INLET DETAIL

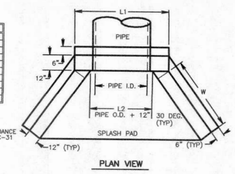
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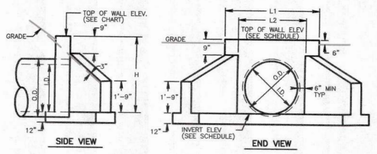
**TYPE D–W ENDWALL SCHEDULE OF DIMENSIONS**

| PIPE I.D. | L 1 | L 2 | W | H |
|---|---|---|---|---|
| 15" & 18" | 5'-4" | 3'-0" | 3'-0" | 3'-0" |
| 21" & 24" | 6'-0" | 3'-0" | 3'-0" | 3'-0" |
| 27" & 30" | 6'-4" | 4'-0" | 4'-0" | 4'-0" |
| 36" | 7'-0" | 4'-0" | 4'-0" | 4'-0" |
| 42" | 7'-7" | 5'-0" | 5'-0" | 5'-0" |
| 48" | 8'-1" | 5'-10" | 5'-0" | 5'-10" |
| 54" | 8'-8" | 6'-0" | 6'-0" | 6'-0" |
| 60" | 9'-3" | 7'-0" | 6'-0" | 7'-0" |
| 66" | 9'-11" | 7'-0" | 10'-8" | 7'-0" |
| 72" | 10'-8" | 8'-0" | 11'-8" | 8'-0" |

**GENERAL NOTES:**

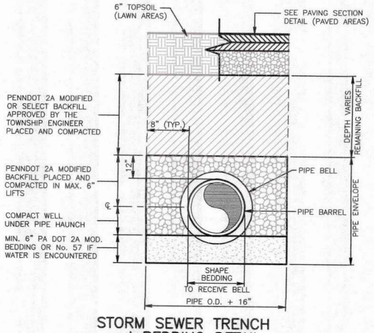
1. PROVIDE MATERIALS & WORKMANSHIP IN ACCORDANCE WITH PUB. 408, SECTION 605 AND PUB. 72, RC-31 LATEST EDITIONS.
2. USE CLASS A CONCRETE OR BETTER.
3. ENDWALL MAY BE STONE FACED AS REQUIRED.
4. FOR SPECIFIC STRUCTURE ELEVATION INFORMATION, REFER TO STRUCTURE SCHEDULE ON APPROPRIATE SHEET ATTACHED WITH THIS PLAN SET.



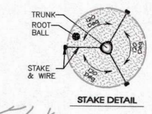

## TYPE D–W ENDWALL

Not To Scale




## STORM SEWER TRENCH and BEDDING DETAIL

Not To Scale




1. ALL STAKES SHALL BE DRIVEN OUTSIDE THE EDGE OF THE ROOT BALL.
2. ASSURE THAT THE BEARING SURFACE OF THE PROTECTIVE COVERING OF THE WIRE OR CABLE AGAINST THE TREE TRUNK IS A MINIMUM 0.5 INCH.
3. REMOVE ALL STAKING AS SOON AS THE TREE HAS GROWN SUFFICIENT ROOTS TO OVER-COME THE PROBLEM THAT REQUIRED THE TREE TO BE STAKED. STAKES SHALL BE REMOVED NO LATER THAN THE END OF THE FIRST GROWING SEASON.
4. TREES NORMALLY DO NOT NEED TO BE STAKED AND STAKING CAN BE HARMFUL TO THE TREE. STAKING SHOULD BE DONE ONLY WITH THE APPROVAL OF THE LANDSCAPE ARCH-ITECT IF IT IS EXPECTED THAT THE TREE WILL NOT BE ABLE TO SUPPORT ITSELF.
5. WIRE OR CABLE SIZES SHALL BE AS FOLLOWS:
   TREES UP TO 2.5 INCH CALIPER – 14 GAUGE
   TREES 2.5 INCH TO 3 INCH CALIPER – 12 GAUGE
6. TIGHTEN WIRE OR CABLE ONLY ENOUGH TO KEEP FROM SLIPPING. ALLOW FOR SOME TRUNK MOVEMENT. PLASTIC HOSE SHALL BE LONG ENOUGH TO ACCOMMODATE 1.5 INCH CALIPER OF TRUNK MOVEMENT.
7. TUCK ANY LOOSE ENDS OF THE WIRE OR CABLE INTO THE WIRE WRAP SO THAT NO SHARP WIRE ENDS ARE EXPOSED.

**(FOR TREES 3" CALIPER AND LESS)**

## DECIDUOUS TREE STAKING DETAIL

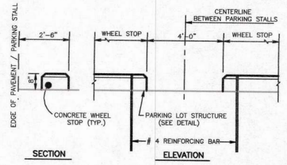
Not To Scale




1. ALL STAKES SHALL BE DRIVEN OUTSIDE THE EDGE OF THE ROOT BALL.
2. ASSURE THAT THE BEARING SURFACE OF THE PROTECTIVE COVERING OF THE WIRE OR CABLE AGAINST THE TREE TRUNK IS A MINIMUM 0.5 INCH.
3. REMOVE ALL STAKING AS SOON AS THE TREE HAS GROWN SUFFICIENT ROOTS TO OVER-COME THE PROBLEM THAT REQUIRED THE TREE TO BE STAKED. STAKES SHALL BE REMOVED NO LATER THAN THE END OF THE FIRST GROWING SEASON.
4. TREES NORMALLY DO NOT NEED TO BE STAKED AND STAKING CAN BE HARMFUL TO THE TREE. STAKING SHOULD BE DONE ONLY WITH THE APPROVAL OF THE LANDSCAPE ARCH-ITECT IF IT IS EXPECTED THAT THE TREE WILL NOT BE ABLE TO SUPPORT ITSELF.
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   TREES UP TO 2.5 INCH CALIPER – 14 GAUGE
   TREES 2.5 INCH TO 3 INCH CALIPER – 12 GAUGE
6. TIGHTEN WIRE OR CABLE ONLY ENOUGH TO KEEP FROM SLIPPING. ALLOW FOR SOME TRUNK MOVEMENT. PLASTIC HOSE SHALL BE LONG ENOUGH TO ACCOMMODATE 1.5 INCH CALIPER OF TRUNK MOVEMENT.
7. TUCK ANY LOOSE ENDS OF THE WIRE OR CABLE INTO THE WIRE WRAP SO THAT NO SHARP WIRE ENDS ARE EXPOSED.

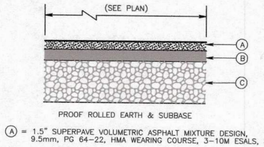
## EVERGREEN TREE STAKING DETAIL

Not To Scale




## CONCRETE WHEEL STOP

Not To Scale




PROOF ROLLED EARTH & SUBBASE

(A) = 1.5" SUPERPAVE VOLUMETRIC ASPHALT MIXTURE DESIGN, 9.5mm, PG 64–22, HMA WEARING COURSE, 3–10M ESALS, SRL–H

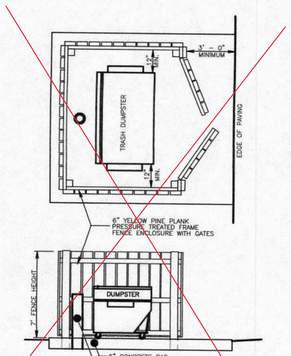
(B) = 2" SUPERPAVE VOLUMETRIC ASPHALT MIXTURE DESIGN, 25mm, PG 64–22, HMA BASE COURSE, 3–10M ESALS

(C) = 6" 2A MODIFIED SUBBASE ON GEOTEXTILE CLASS IV

1. THIS PAVING SECTION IS TO BE USED FOR ALL INTERIOR SITE UNIT DRIVEWAYS, EMERGENCY ACCESS DRIVEWAY AND FOR THE Block 44 Units 8, 33 & 42 DRIVEWAY RECONSTRUCTION.
2. SEE LOOP ROAD CROSS–SECTION DETAIL BELOW FOR INTERIOR ROADWAY AND SITE ENTRANCE PAVING SECTION.

## PROJECT PAVING SECTION

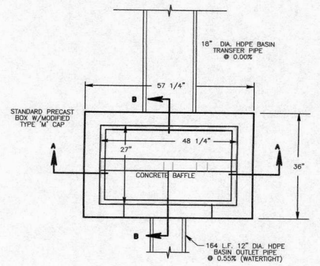
Not To Scale



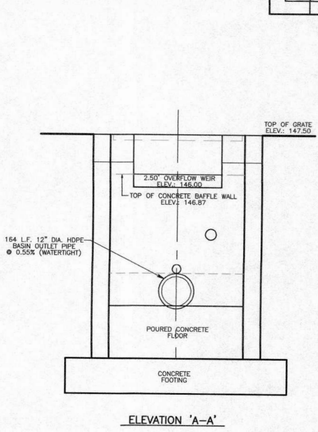

## FRAME DUMPSTER ENCLOSURE DETAIL

Not To Scale

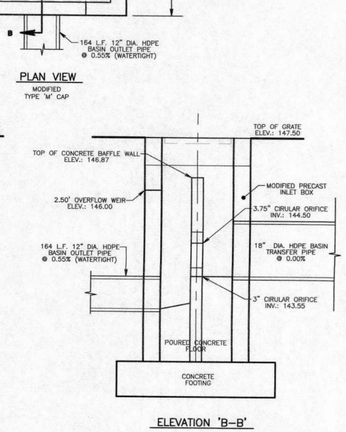
FRAME DUMPSTER ENCLOSURE DETAIL HAS BEEN REVISED. SEE ROBERT E. BLUE CONSULTING ENGINEERS, P.C., TITLE "MISCELLANEOUS DETAIL", PREPARED FOR: "60 FLOURTOWN ROAD, LLC, 343 MILITIA HILL ROAD, FORT WASHINGTON, PA 19034," DATED: 2018-06-26, REVISED: "1. 2018-09-04; ADDED DUMPSTER ENCLOSURE DETAIL", SHEET 3 OF 3.




PLAN VIEW
MODIFIED TYPE 'M' CAP



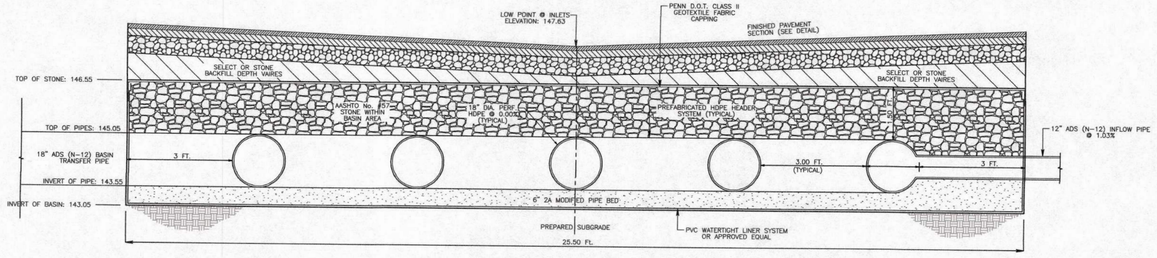

ELEVATION 'A–A'




ELEVATION 'B–B'

## UNDERGROUND BASIN 'A' – ST–10 OUTLET STRUCTURE

Not to Scale




## UNDERGROUND DETENTION BASIN AREA 'A' CROSS SECTION DETAIL

Not To Scale

Project No: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2018 (16:16)

REVISIONS

| No. | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 08/05/16 | REVISED PER STC COMMENTS |
| 1 | 05/19/16 | REVISED PER TAM REVIEW LETTER DATED 1/20/2016 |

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL TIMOTHY P. WOODROW ENGINEER PE 59038-E

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0'

N W E S PLAN NORTH

Parcel Information: BS–DO–08005–0–1–2 Inst. No.: 2016 D.B.: 5906 Pg: 2517

Gross Area: 4.8724 Acres
Lot Rw: 0.3022 Acres
Net Area: 4.5702 Acres

Record or Equitable Owner: **60 Flourtown Road, LLC** c/o Glenn Van Fenten 343 Militia Hill Road Fort Washington, PA 19034

Applicant: **60 Flourtown Road, LLC** c/o Glenn Van Fenten 343 Militia Hill Road Fort Washington, PA 19034

PRELIMINARY / FINAL PLAN

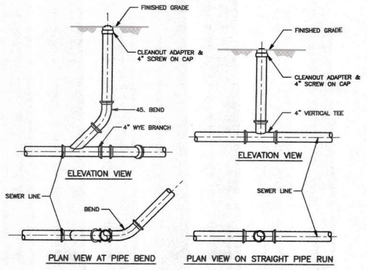
# CONSTRUCTION DETAILS – SHEET 'A'

## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP – MONTGOMERY COUNTY – PENNSYLVANIA

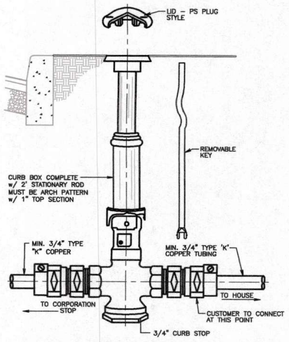
**WOODROW & ASSOCIATES, INC.**
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1108 North Bethlehem Pike / Suite 5 – Lower Gwynedd – PA 19002
Phone: (215) 542-3579 Fax: (215) 542-3579
Web: www.Woodrowinc.com

Layer List: Sht13_Details–A
Plan Date: AUGUST 19, 2015
Job No: 15–0415–D
Design Mgr: R.J.J.
Proj. Mgr: T.P.W.
Sheet No: 13 of 14



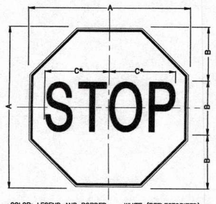

## SANITARY CLEAN-OUT DETAILS

Not To Scale




## CURB STOP DETAIL

Not to Scale



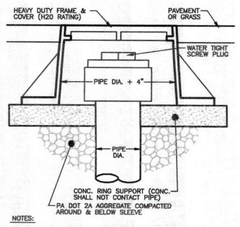

COLOR: LEGEND AND BORDER — WHITE (REFLECTORIZED)
BACKGROUND — RED (REFLECTORIZED)

| SIGN SIZE | DIMENSIONS A | B | C* | SERIES | BORDER | BLANK STUD |
|---|---|---|---|---|---|---|
| 24 x 24 | 24 | 8 | 10 | C | 3/4 | B1-24 |
| 30 x 30 | 30 | 10 | 12 1/2 | C | 3/4 | B1-30 |
| 36 x 36 | 36 | 12 | 15 | C | 1 | B1-36 |
| 48 x 48 | 48 | 16 | 20 | C | 1 1/2 | B1-48 |

* REDUCE SPACING BY 40%

## (R1-1) STOP SIGN DETAIL

Not To Scale

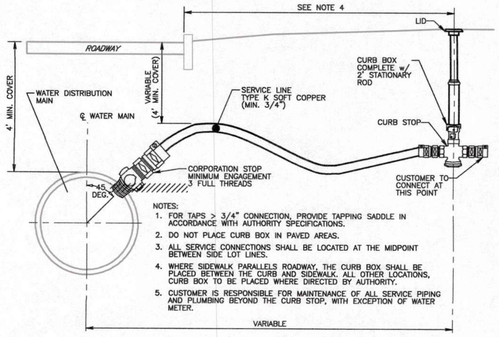



NOTES:

1. FRAME AND COVER SHALL BE NEENAH FOUNDARY COMPANY MODEL R-1978 OR APPROVED EQUAL.
2. CLEAN-OUT PROTECTION SLEEVES ARE TO BE INSTALLED AT LOCATIONS IN PAVED AREAS OR LESS THAN 3 FEET FROM A PAVED AREA.

## CLEAN-OUT PROTECTIVE SLEEVE

Not To Scale




NOTES:

1. FOR TAPS ≥ 3/4" CONNECTION, PROVIDE TAPPING SADDLE IN ACCORDANCE WITH AUTHORITY SPECIFICATIONS.
2. DO NOT PLACE CURB BOX IN PAVED AREAS.
3. ALL SERVICE CONNECTIONS SHALL BE LOCATED AT THE MIDPOINT BETWEEN SIDE LOT LINES.
4. WHERE SIDEWALK PARALLELS ROADWAY, THE CURB BOX SHALL BE PLACED BETWEEN THE CURB AND SIDEWALK. ALL OTHER LOCATIONS, CURB BOX TO BE PLACED WHERE DIRECTED BY AUTHORITY.
5. CUSTOMER IS RESPONSIBLE FOR MAINTENANCE OF ALL SERVICE PIPING AND PLUMBING BEYOND THE CURB STOP, WITH EXCEPTION OF WATER METER.

VARIABLE

## STANDARD WATER SERVICE CONNECTION

Not to Scale

Project No: 15-0415-D Project Name: FLOURTOWN ROAD Print Date: Sep 7, 2016 (16:17)

REVISIONS

| No. | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 05/25/16 | REVISED PER STC COMMENTS |
| 2 | 10/19/16 | REVISED PER TR&M REVIEW LETTER DATED 1/29/2016 |

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
TIMOTHY P. WOODROW
ENGINEER
No. 69735-E

0'

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PLAN NORTH

Parcel Information:
62-00-08005-01-2
Plan: 20107
Bk.: 5966 Pg.: 2017

| | |
|---|---|
| Gross Area: | 4.8724 Acres |
| Limit Dist. ROW: | N/A |
| Limit Dist. ROW: | 0.3022 Acres |
| NET Area: | 4.5702 Acres |

Record or Equitable Owner:
60 Flourtown Road, LLC
℄o Glenn Van Eerden
43 Lafayette Rd.
Fort Washington, PA 19034

Applicant:
60 Flourtown Road, LLC
℄o Glenn Van Eerden
43 Lafayette Rd.
Fort Washington, PA 19034

PRELIMINARY / FINAL PLAN

# CONSTRUCTION DETAILS - SHEET 'B'

## FLOURTOWN ROAD

WHITEMARSH TOWNSHIP - MONTGOMERY COUNTY - PENNSYLVANIA

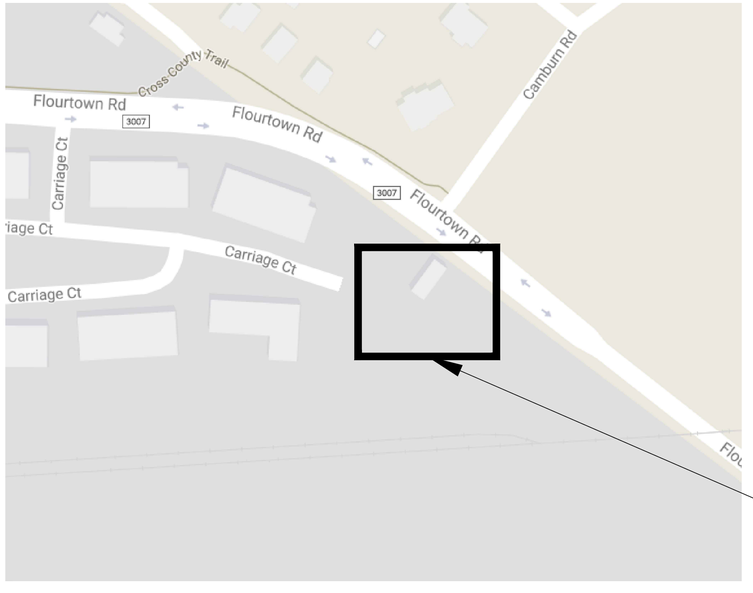
WOODROW & ASSOCIATES, INC.
MUNICIPAL / CIVIL CONSULTING ENGINEERS
1128 North Bethlehem Pike, Suite 2A, Spring House, PA 19002
Phone: (215) 542-0648 Fax: (215) 542-5679
Web: www.woodrowinc.com

Layer List: Sht14_Dets-B
Plan Date: AUGUST 19, 2015
Job No: 15-0415-D
Design Mgr: R.J.J.
Proj. Mgr: T.P.W.
Sheet No: 14 of 14

# CONSTRUCTION DRAWINGS
## FOR
# ANCHOR VERTICA RETAINING WALL SYSTEM
# WALL 1
# 60 FLOURTOWN ROAD
# WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA

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## OCTOBER 30, 2017




***SHEET INDEX***


1. TITLE SHEET
2. CONSTRUCTION SPECIFICATIONS
3. SITE PLAN
4. WALL 1 - PROFILE, QUANTITY TABLE, & CROSS SECTIONS
5. CONSTRUCTION DETAILS


PENNSYLVANIA ONE CALL SYSTEM, INC. 1-800-242-1776 STOP-CALL BEFORE YOU DIG!

BEFORE YOU DIG ANYWHERE IN PENNSYLVANIA! CALL 1-800-242-1776
ANYWHERE IN U.S. CALL 811
*NON-MEMBERS MUST BE CONTACTED DIRECTLY*
PA. ACT 121 (2008) REQUIRES THREE WORKING DAYS NOTICE TO UTILITIES BEFORE EXCAVATE, DRILL, BLAST OR DEMOLISH


**EARTH ENGINEERING INCORPORATED**
*Geotechnical Engineers & Geologists*
CERTIFICATE OF AUTHORIZATION NO.24GA28045000

*Corporate Headquarters*
**115 W Germantown Pike, Ste. 200**
**East Norriton, PA 19401**
**(610) 277-0880 FAX 277-0878**

*Lehigh Valley Office*
149 Main Street
Emmaus, PA 18049
(610) 967-4540 FAX 967-4488

*Southern New Jersey Office*
403 Commerce Lane
West Berlin, NJ 08091
(856) 768-1001 FAX 768-1144

*Central Pennsylvania Office*
5010 Ritter Road, Suite 116
Mechanicsburg, PA 17055
(717) 697-5701 FAX 697-5702


Napoli Construction, LLC
P.O. Box 513
Suite 16
West Deptford, NJ 08086
Phone: (856)-202-5816

| NO | DATE | REVISION |
|---|---|---|
| 0 | 10/30/17 | Initial Submittal |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

# CONSTRUCTION SPECIFICATIONS

## SECTION 01 - CONCRETE MODULAR RETAINING WALLS

PART 1: GENERAL

1.01 DESCRIPTION

A. Work includes preparing foundation soil, furnishing and installing the leveling pad, masonry units, cap units, drainage fill, backfill, and all appurtenant materials to the lines and grades designated on the drawings.

1.02 RELATED WORK

A. Section 02 – Geogrid Soil Reinforcement

1.03 REFERENCE STANDARDS

A. NCMA Design Manual for Segmental Retaining Walls

B. ASTM C1372–99 Standard Specifications for Segmental Retaining Wall Units

1.04 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall check the materials upon delivery to assure that the proper materials have been received.

B. The Contractor shall prevent excessive mud, wet cement, epoxy and like materials, which may affix themselves, from coming in contact with the masonry units

C. The Contractor shall protect the materials from damage. Damaged material shall NOT be incorporated into the retaining wall structures.

1.05 SUBMITTALS

A. Product Data – Latest edition of the manufacturer's material specifications, color and texture availability, installation instructions and general recommendations.

B. Certifications – Upon completion, the Contractor shall provide to the Owner daily reports and a letter from the Geotechnical Inspection Agency verifying that all elements of the retaining wall system were installed in accordance with the drawings. The Township and Township Engineer are to be copied on all wall certifications of wall construction.

1.06 QUALITY ASSURANCE

A. The inspection of the retaining wall construction is an integral part of this design and therefore must be conducted by a Geotechnical Inspection Agency supervised by a Professional Engineer, registered in the Commonwealth of Pennsylvania and qualified in BOTH geotechnical engineering and segmental retaining wall construction.

B. Soil testing and inspection services for quality control testing during earthwork operations shall include, at a minimum: detailed documentation of compaction testing results, correct geogrid placement (orientation, length and elevation) and proper installation of the wall drainage system.

C. Soils shall be classified by the test procedures outlined in ASTM D2487 and moisture density relationships shall be established in accordance with ASTM D698. The results of the test(s) shall be reviewed by the Geotechnical Inspection Agency prior to use of the material.

D. Frequency of testing shall be one (1) ASTM D2487 test and one (1) ASTM D698 test for every 1,500 $yd^3$ per source of material.

E. Frequency of testing of foundation soils shall be one(1) ASTM D2487 test and one (1) ASTM D698 test for every 500 linear feet of wall, or one (1) per wall whichever is greater. Additional soil testing should be performed should foundation soils vary within a particular wall.

F. Detailed records shall be maintained by the Geotechnical Inspection Agency documenting grid placement, compaction, and proper drainage installation. Compaction testing shall be performed at a minimum frequency of one per every 1,000 square feet per lift or every one hundred linear feet of wall per lift, which ever is greater. Tests shall be in accordance with ASTM D1556 or ASTM D2922 and D3017. If the tests indicate that the required density has not been obtained, the material shall be recompacted or removed and replaced as necessary.

PART 2: PRODUCTS

2.01 MASONRY UNITS

G. Masonry wall units shall be Anchor Vertica Retaining Wall Units manufactured by an approved Anchor Wall System licensee.

H. Concrete for masonry units shall have a minimum net 28 day compressive strength of 3000 psi. The concrete shall have a maximum moisture absorption of 7.0%.

I. Exterior dimensions may vary in accordance with ASTM C1372–99 (Max. +/– 1/16"). Masonry wall units shall have a minimum of 1.0 SF of face area each.

J. Masonry wall units shall have angled sides capable of concave and convex alignment curves with a minimum radius of 7.5 feet.

K. Units shall be manufactured to allow to be interlocked as to provide a minimum 2.0° wall batter.

L. Cap units shall have the material properties of masonry wall units and have a minimum thickness of 4 inches.

M. Color and texture shall be as selected by Owner or Architect from the manufacturer's standard selection.

2.02 BASE LEVELING PAD MATERIAL

A. Material for base leveling shall be size 2A aggregate as specified in PENNDOT 208.

2.03 UNIT FILL AND DRAINAGE STONE

A. Unit fill and drainage stone shall be size AASHTO No. 57 course aggregate as specified in PENNDOT Pub. 408.

2.04 REINFORCED SOILS

A. Suitable soils used for reinforced soil shall be GW, GP, GM SW, SP or SM as classified by the United Soil Classification System, in accordance with ASTM D2487. The largest particles shall be no more than 2 inches in diameter.

B. Unsuitable soils shall not be used in the construction of the retaining wall. Unsuitable soils shall be MH, ML, CL, CH, OL, OH and PT or combination of these materials or include deleterious materials including construction debris, wood glass, ash, organic materials or soils not maintained within 2 percent of optimum moisture content at the time of compaction, frozen clumps of soil, snow or ice as determined by the Geotechnical Inspection Agency.

C. The plasiticity index and liquid limit of the fine fraction of reinforced backfill shall be less than 6 and 40, respectively, when tested in accordance with ASTM D4318.

D. Reinforced backfill shall satisfy the following criteria:

| Sieve Size | % Passing |
|---|---|
| 2 inch | 100 |
| No. 4 | 20–100 |
| No. 40 | 0–60 |
| No. 200 | 0–45 |

2.05 FOUNDATION SOIL

A. Foundation soil within 2ft of subgrade surface shall not contain OL, OH and PT, SC or combination of these materials or include deleterious materials including construction debris, wood glass, ash, organic materials or soils not maintained within 2 percent of optimum moisture content at the time of compaction, frozen clumps of soil, snow, or ice as determined by the Geotechnical Inspection Agency.

2.06 DRAINAGE PIPE

A. Drainage pipe shall be 4 inch diameter perforated corrugated polyethylene pipe.

2.07 GEOTEXTILE

A. Type 1: Mirafi S800 needle–punched non–woven geotextile or approved equivalent.

PART 3: EXECUTION

3.01 EXCAVATION

A. Wall location indicated on the plan does not include batter and the bottom of the wall shall be adjusted to accommodate the setback in the masonry units.

B. The Contractor shall excavate to the lines and grades shown on the construction drawings. Over excavation costs WILL NOT be paid by the Owner. Additional compacted fill and/or additional wall system components required for replacement of over excavated material will be provided at the Contractor's expense.

C. Perform earthwork complying with federal, state and local regulations including 29 CFR 1926.651.

D. Protect existing utilities, sidewalks, structures, pavements, and other facilities to remain free from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

3.02 FOUNDATION AND PREPARATION

A. Foundation soil shall be excavated as required for the leveling pad dimensions and geogrid areas as shown on the drawings or as directed by the Design Engineer.

B. Foundation soil shall be examined by the Geotechnical Inspection Agency to confirm that the actual foundation soil meets the requirements defined in Paragraph 2.05. Unsuitable soils shall be removed and replaced with acceptable material.

C. Over excavated areas shall be filled with approved, compacted backfill material.

D. Foundation soil shall be compacted to 95% of the material's maximum dry density as determined by ASTM D698 and shall be visibly stable.

E. Backfill shall not be placed on a soil which contains frozen material, or which has been subjected to freeze–thaw action. This prohibition encompasses all subgrade types, including the natural ground, all prepared subgrades and all layers of previously placed and compacted earth fill which become the subgrade for successive layers of earth fill. All material that freezes or has been subjected to freeze–thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, winter shutdowns, or earthwork operations, shall be removed to a depth that is acceptable to the Geotechnical Inspection Agency and replaced with new material. Alternatively, the material will be thawed, dried, reworked, and recompacted to the specified criteria before additional material is placed. The Geotechnical Inspection Agency will determine when placement of fill shall cease due to cold weather. The Geotechnical Inspection Agency may elect to use average daily air temperatures, and/or physical observation of the soils for his determination.

3.03 BASE LEVELING PAD

A. Leveling pad materials shall be placed as shown on the drawings to a minimum thickness of 6 inches and to the width shown on the drawings.

B. Material shall be compacted so as to provide a level hard surface on which to place the first course of masonry wall units. Compaction effort shall be provided until material is densely compacted and visibly stable.

C. Leveling pad shall be prepared to provide complete contact with the first course of masonry wall units.

3.04 MASONRY WALL UNIT INSTALLATION

A. Provide fall protection as required to comply with 29 CFR 1926.501.

B. The first course of masonry wall units shall be placed in full contact with the base leveling pad. The units shall be checked for level and alignment. The first course is the most important to provide accurate and acceptable results.

C. Masonry wall units shall be placed side by side for the full length of the wall alignment.

D. Successive courses shall be placed to create a running bond pattern with the edge of all units being approximately aligned with the middle of the unit in the course below/above it.

E. As appropriate, where the wall changes elevation, units can be stepped with the grade or turned into the embankment with a convex return end. Provide the appropriate amount of buried units on a compacted leveling pad in the area of the convex return end.

3.05 CAP INSTALLATION

A. Permanently connect cap units to the wall units with continuous beads of construction adhesive or epoxy. Backfill and compact to finish grade.

B. Cap units may need to be cut to obtain the proper fit.

C. Use non–angled straight–sided cap units in tangent sections of wall(s).

3.06 CONSTRUCTION TOLERANCES

A. Installation of masonry wall face shall be within all the following tolerances:

1. Vertical control from plan: +/– 1.25 inches over a 10ft. distance, 3 inches maximum.
2. Horizontal location control from plan:
   a. Straight lines: +/– 1.25 inches over a 10 ft. distance, 3 inches maximum.
   b. Straight and radius corner locations: +/– 1.0 ft.
   c. Curves and serpentine radius: +/– 2.0 ft.
3. Rotation of the wall face during construction:
   a. Maximum 2.0 degrees from established wall batter.
   b. Maximum, +/– 10.0% from total established horizontal setback.
4. Bulging: +/– 1.00 inches over a 10 ft. distance.

### *Design Soil Parameters*

The following reinforced, retained & foundation soil parameters are assumed:

| | |
|---|---|
| $\gamma$ = 120 pcf | moist unit weight |
| $\varphi$ = 28° | internal angle of friction |
| c = 0 psf | cohesion has been only used in global stability analyses. |

Soil Materials shall satisfy the requirements stipulated in paragraph 2.04 and 2.05.

EEI must be notified of any discrepancies before the Contractor proceeds with the work.

## SECTION 02 : GEOGRID SOIL REINFORCEMENT

PART 1: GENERAL

1.01 DESCRIPTION

A. Work includes furnishing geogrid and all appurtenant materials required for the construction of the geogrid reinforced soil retaining wall as shown on the drawings.

1.02 RELATED WORK

A. Section 01– Concrete Modular Retaining Wall.

1.03 REFERENCE STANDARDS

A. See the specific geogrid manufacturer's reference standards.

B. Design Reduction Factors

(1) Durability = 1.10

(2) Installation Damage = 1.10

(3) Creep = 1.58

1.04 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall check the geogrid upon delivery to confirm that the proper materials have been received.

B. Geogrid shall be stored above –20° F.

C. The Contractor shall prevent excessive mud, wet cement, epoxy and like materials, which may affix themselves to the geogrid, from coming into contact with the geogrid material.

D. Rolled geogrid material may be laid flat or stood on end for storage.

1.05 SUBMITTALS

A. Product Data – Latest edition of the manufacturer's material specifications, installation instructions and general recommendations.

PART 2: PRODUCTS

2.01 GEOGRID

A. Geogrid shall be polyester woven fiber materials, specifically fabricated for use as soil reinforcement.

B. Geogrid shall be the type as shown on the drawings.

C. Mirafi 3XT, as manufactured by TenCate Geosynthetics, shall have a long term allowable strength of 1832 lbs/ft. when determined by using the reduction factors specified in Paragraph 1.03B.

PART 3: EXECUTION

3.01 WALL ERECTION

A. Wall erection shall be as specified Section 01.

3.02 GEOGRID INSTALLATION

A. The geogrid soil reinforcement shall be laid horizontally on compacted backfill with the strong direction perpendicular to the wall fascia and placed fully to the front of the masonry wall unit. The subsequent overlying source shall be place atop the previously place course binding the geogrid between the masonry wall units.

B. No geogrid splices permitted.

C. Slack in the geogrid at the wall unit connections shall be removed.

D. The geogrid shall be laid at the proper elevation and orientation as shown on the drawings or as directed by the Design Engineer.

E. Correct orientation (roll direction) of the geogrid shall be verified by the Contractor and the Geotechnical Inspection Agency.

F. Pretension the geogrid by pulling a secured section taut; eliminating loose folds. Stake or secure the back edge of the geogrid prior to and during backfill and compaction.

G. Follow the manufacturer's guidelines relative to overlap requirements of uniaxial geogrids. Minimum soil thickness between overlapping geogrids shall be three (3") inches.

3.03 FILL PLACEMENT

A. Backfill material shall be placed in maximum 8–inch lifts and compacted to 95% of the material's maximum dry density as determined by ASTM D698

B. Backfill shall be placed, spread and compacted in such a manner that minimizes the development of slack or loss of geogrid pretensioning.

C. Only hand–operated compaction equipment shall be allowed within 3 feet of the back surface of the masonry wall units.

D. Backfill shall be placed from the wall rearward into the embankment such that the geogrid remains taut.

E. Tracked construction equipment shall not be operated directly on the geogrid. A minimum backfill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid, or displacing the wall.

F. Rubber–tired equipment may pass over the geogrid reinforcement at slow speeds, less than 10 miles/hr. Sudden braking and sharp turning shall be avoided.

3.04 GEOGRID PENETRATIONS

A. In areas where posts or similar obstructions extend down through the upper geogrid(s), the geogrids shall be slit perpendicularly to the wall face and the form slid through, with the geogrid lapping upward around the form.

B. In the case of steel I–beam posts, the post may be driven through the geogrid at the discretion of the Design Engineer.

C. Under no circumstance shall an auger be used to penetrate the geogrid.

D. Should there be any conflicts between the geogrid and other on–site entities (i.e. storm water structures, light standards, property line, etc.) that are not addressed in the drawings, contact the Design Engineer for specific instructions.

The Segmental Retaining Wall Design meets or exceeds the following Safety Factors:

Internal Stability

| | |
|---|---|
| FS (pullout) = | 1.50 |
| FS (overstress) = | 1.50 |
| FS (facing shear) = | 1.50 |

External Stability

| | |
|---|---|
| FS (bearing capacity) = | 2.00 |
| FS (overturning) = | 2.00 |
| FS (base sliding) = | 1.50 |
| FS (connection strength) = | 1.50 |

Live Load – 150 psf –Used for Internal Stability
150/250 psf – Used for Global Stability

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES A. McKELVEY III
ENGINEER
No. 044931

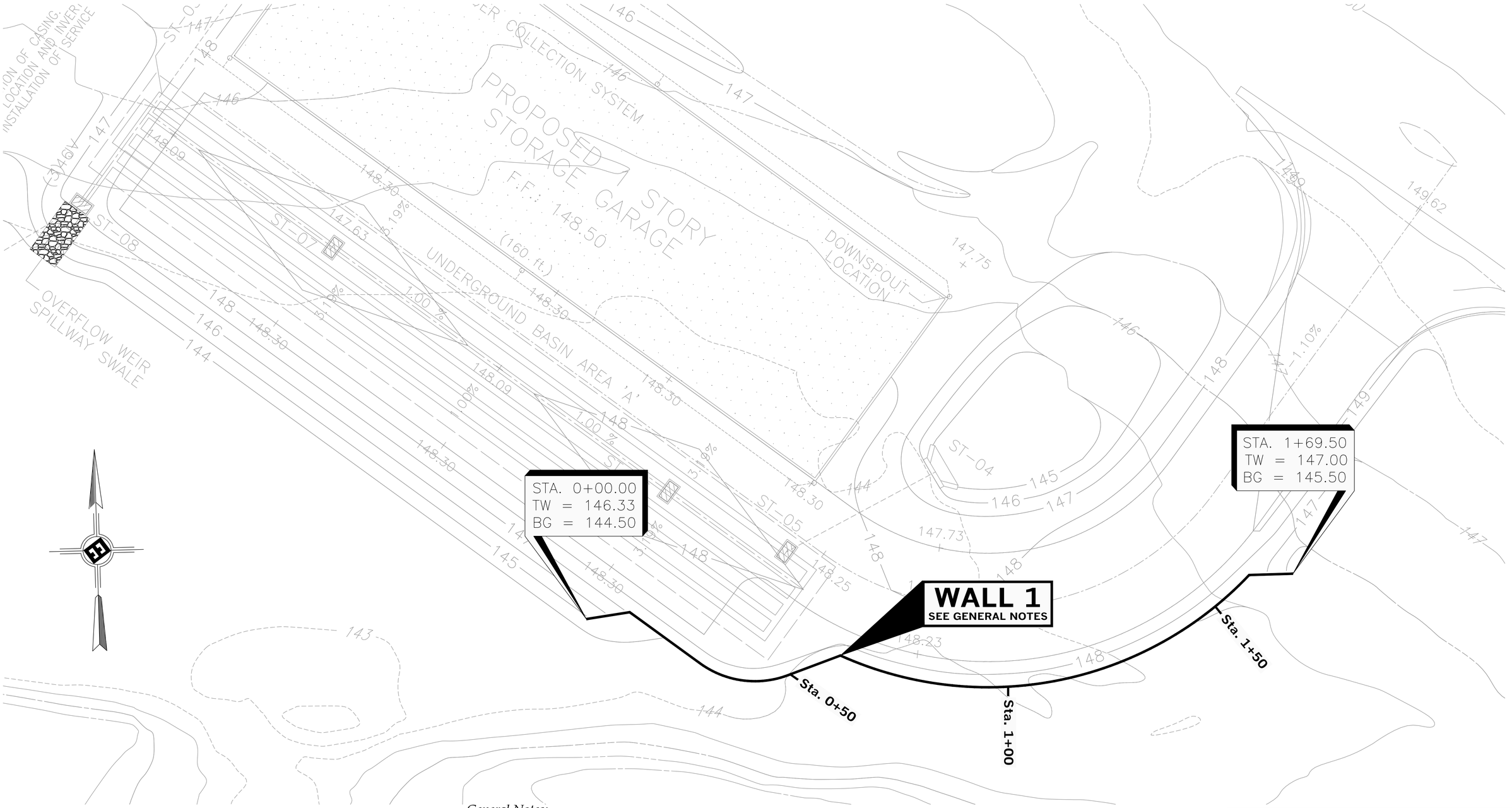
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| No. | Date | Description | By |
|---|---|---|---|
| 0 | 10/30/17 | INITIAL SUBMITTAL | KGM |


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**ANCHOR VERTICA RETAINING WALL SYSTEM**
**CONSTRUCTION SPECIFICATIONS**
PREPARED FOR
**60 FLOURTOWN ROAD**
PLYMOUTH MEETING PENNSYLVANIA

| Scale: | Date: | Drawn By: | Checked By: |
|---|---|---|---|
| N.T.S. | 10/30/17 | KGM | PFM |
| Drawing Number: 29268.02–D–102 | | Approved By: JAM | Sheet No. 2 of 5 |




The inspection of the retaining wall construction is an integral part of this design and therefore must be conducted by qualified personnel working under the direct supervision of a Professional Engineer registered in the Commonwealth of Pennsylvania and qualified in both geotechnical engineering and geogrid reinforced wall construction. Failure to verify soil types, compaction performance and general earthwork criteria as well as the installation of all specified wall elements relieves EEI of any and all responsibility for the performance of the wall shown on these drawings.

*General Notes:*

1. Site features, utilities and general wall locations are located on this plan set based on information taken from Woodrow & Associates, Inc. "Site Improvement Plans" electronically provided to EEI in on October 20, 2017. EEI has taken reasonable measures to reflect accurate locations of these features base upon the information provided. However, EEI cannot verify the accuracy or completeness of the location of these features.
2. Wall location indicated on the plan view is top of the wall and does not include batter.
3. All plan dimensions, quantities and elevations must be field verified by the contractor prior to construction. EEI must be notified of any discrepancies before the contractor proceeds with the work.
4. Wall stationing is measured along the front face of the wall at top.

**SITE PLAN**

10 8 6 4 2 0 10 20 30

GRAPHIC SCALE: 1" = 10'

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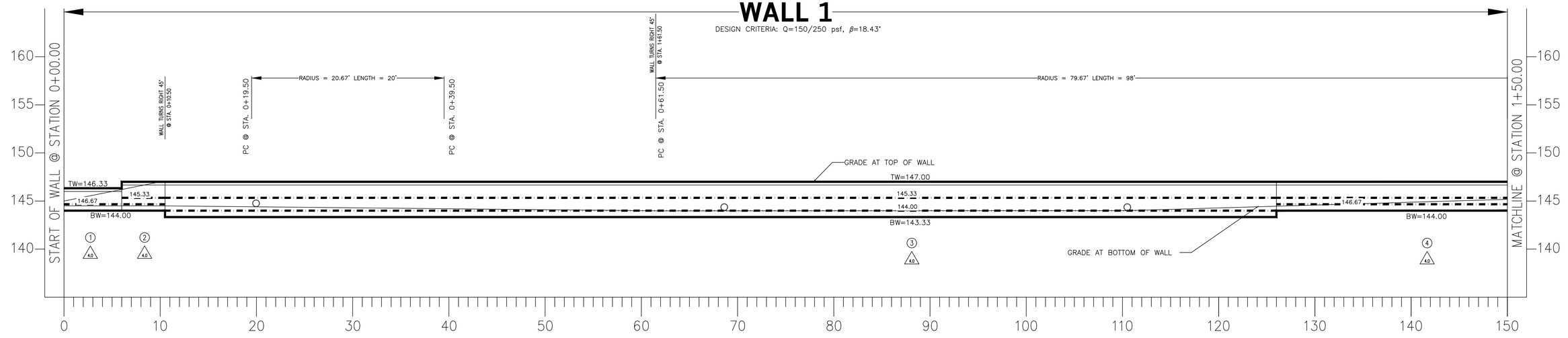
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| No. | Date | Description | By |
|---|---|---|---|
| 0 | 10/30/17 | INITIAL SUBMITTAL | KGM |


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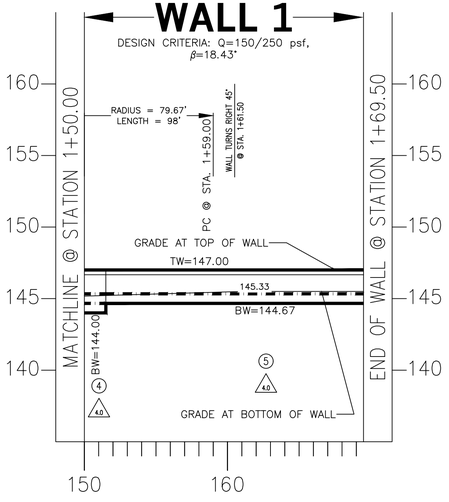

**ANCHOR VERTICA RETAINING WALL SYSTEM**
**SITE PLAN**
PREPARED FOR
**60 FLOURTOWN ROAD**
PLYMOUTH MEETING PENNSYLVANIA

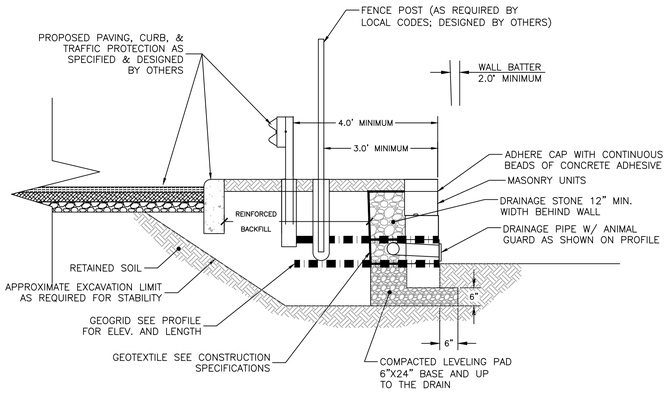
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|---|---|---|---|
| 1" = 10' | 10/30/17 | KGM | PFM |
| Drawing Number: 29268.02-D-103 | | Approved By: JAM | Sheet No. 3 of 5 |




## WALL PROFILE

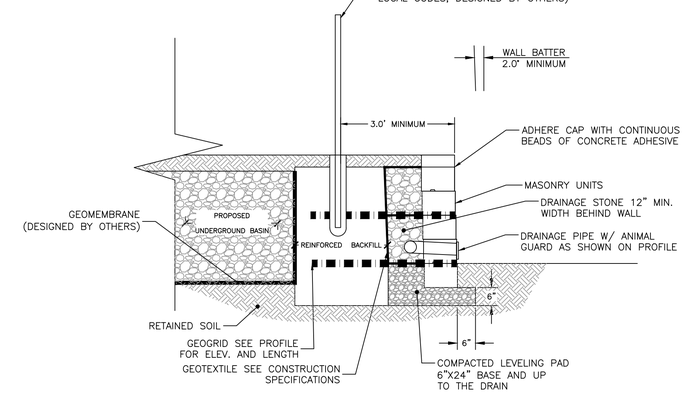
GRAPHIC SCALE: 1" = 5'




## WALL 1 TYPICAL CROSS SECTION

SCALE N.T.S.




## WALL 1 STA. 0+45.00 CROSS SECTION

SCALE N.T.S.

## LEGEND

| | |
|---|---|
| TW | Top of Wall |
| BW | Bottom of Wall |
| - - - - | Mirafi 3XT Geogrid |
| ③ | Wall Section |
| 4.0 | Geogrid Length |
| ——— | Wall Outline |
| o | Drainage Pipe Outlet |

## QUANTITY TABLE - WALL 1

| WALL | SECTION | TOP OF WALL (ELE-FT) | BOTTOM OF WALL (ELE-FT) | SECTION HEIGHT (FT) | SECTION BATTER (FT) | SECTION LENGTH (FT) | SECTION AREA (SF) | GRID LENGTH MIRAFI 3XT (FT) | NUMBER OF MIRAFI 3XT LAYERS | MIRAFI 3XT QUANTITY (SY) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 146.33 | 144.00 | 2.33 | 0.08 | 6.00 | 14 | 4.0 | 1 | 3 |
| 1 | 2 | 147.00 | 144.00 | 3.00 | 0.10 | 4.50 | 14 | 4.0 | 2 | 4 |
| 1 | 3 | 147.00 | 143.33 | 3.67 | 0.13 | 115.50 | 424 | 4.0 | 2 | 103 |
| 1 | 4 | 147.00 | 144.00 | 3.00 | 0.10 | 25.50 | 77 | 4.0 | 2 | 23 |
| 1 | 5 | 147.00 | 144.67 | 2.33 | 0.08 | 18.00 | 42 | 4.0 | 1 | 8 |

| | | | | | |
|---|---|---|---|---|---|
| Length of Wall: | 169.50 | FT | Leveling Pad Material: | 9 | BCY |
| Total Gross Area of Wall: | 571 | SF | Drainage Aggregate: | 22 | BCY |
| Area of Cap Units: | 43 | SF | Reinforced Backfill: | 85 | BCY |
| Total Net Area of Wall: | 528 | SF | | | |
| Total MIRAFI 3XT: | 141 | SY | | | |

Reinforced backfill measured from drainage aggregate to edge of geogrid to top of wall
All quantites rounded up to nearest unit

C3LP6

**CONTRACTOR SHALL VERIFY QUANTITIES PRIOR TO CONSTRUCTION.**

## *Construction Notes:*

1. AREAS OF THE WALL WHERE THE UNDERGROUND BASIN IS WITHIN 10.0' OF THE FACE OF THE WALL, SHALL BE CONSTRUCTED SIMULTANEOUSLY WITH THE UNDERGROUND BASIN. THE DIFFERENCE IN ELEVATION BETWEEN THE UNDERGROUND BASIN AND THE WALL SHALL BE NO MORE THAN 2.0' AT ANYTIME DURING CONSTRUCTION.
2. SEE CIVIL DRAWING FOR BASIN COMPONENTS INCLUDING GEOMEMBRANE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JAMES A. McKELVEY III
ENGINEER
No. 044971

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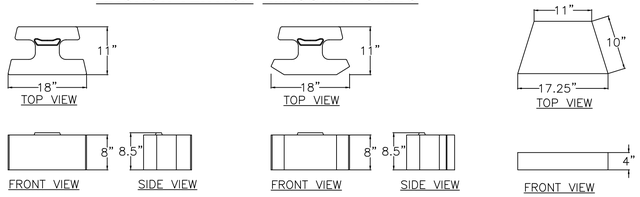
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|---|---|---|---|
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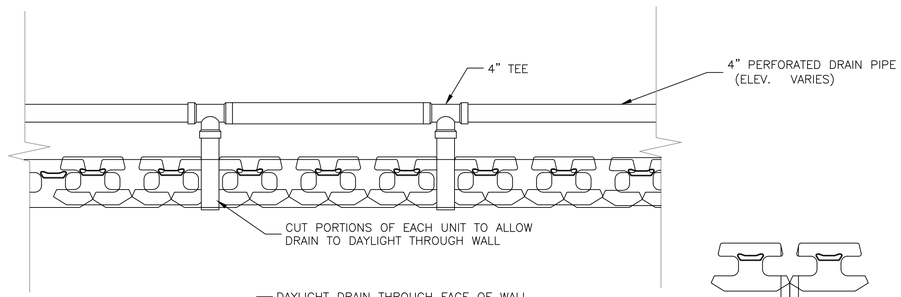

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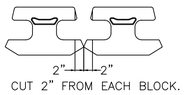

**ANCHOR VERTICA RETAINING WALL SYSTEM**
**WALL 1 - PROFILE, CROSS SECTION, & QUANTITY TABLE**
PREPARED FOR
**60 FLOURTOWN ROAD**
PLYMOUTH MEETING PENNSYLVANIA

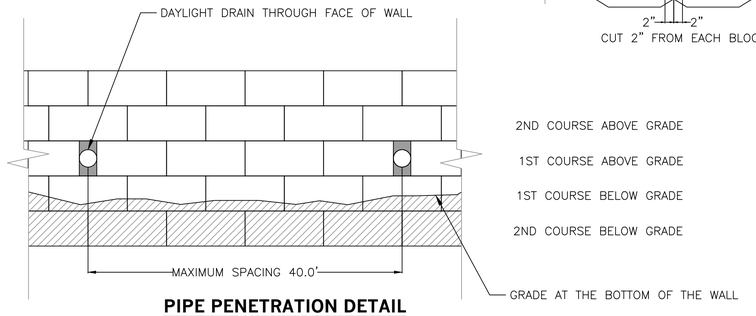
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|---|---|---|---|
| AS SHOWN | 10/30/17 | KGM | PFM |
| Drawing Number: 29268.02-D-104 | | Approved By: JAM | Sheet No. 4 of 5 |

## ANCHOR VERTICA® MASONRY UNITS

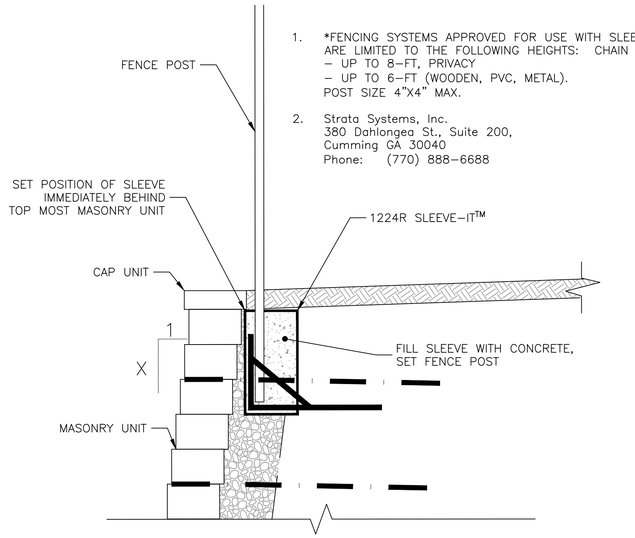


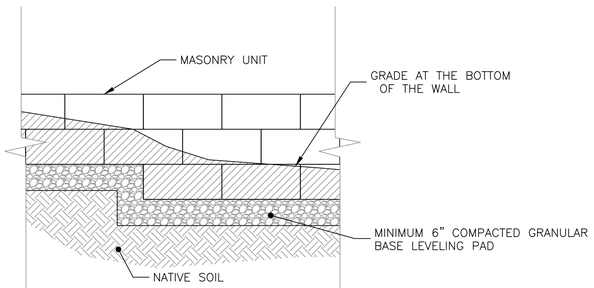



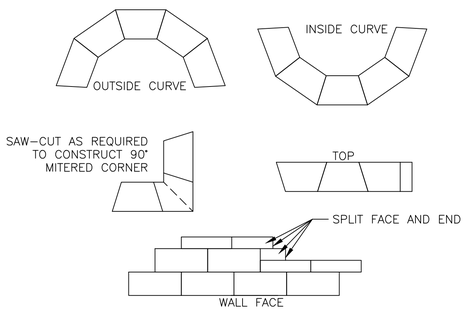

## PIPE PENETRATION DETAIL
SCALE: N.T.S




## ALTERNATE FENCING DETAIL
## INSTALLTION USING 1224R SLEEVE-IT™
SCALE: N.T.S

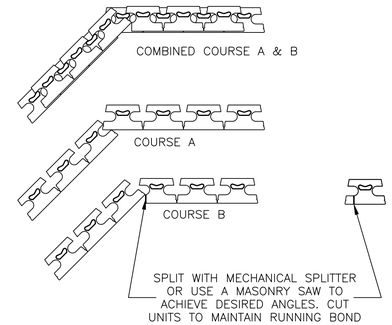



## MASONRY UNIT STEP DETAIL
SCALE: N.T.S



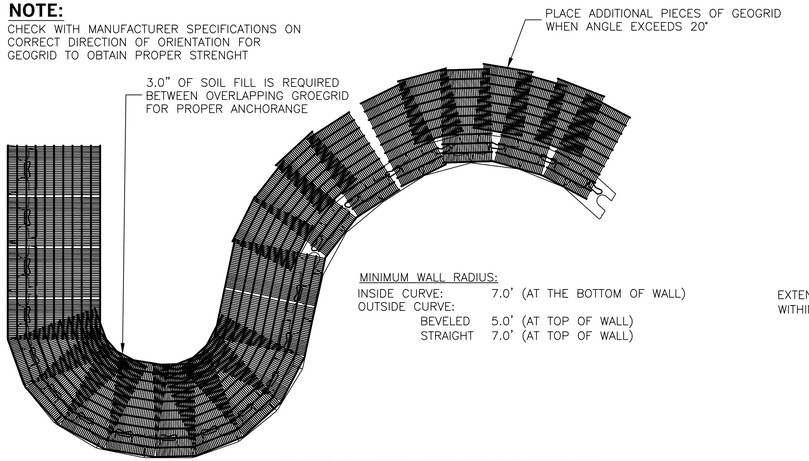

1. ALWAYS START CAPPING WALL FROM THE LOWEST ELEVATION.
2. LAY OUT CAPS PRIOR TO USING ADHESIVE.
3. CUT CAPS TO FIT. VARIOUS COMBINATIONS OF LONG– AND SHORT–CAP FACES WILL BE NECESSARY FOR RADII GREATER THAN THE MINIMUM.
4. ALTERNATE SHORT– AND LONG–CAP FACES EVERY OTHER CAP TO ACHIEVE A STRAIGHT ROW OF CAPS.
5. USE EXTERIOR–GRADE CONSTRUCTION ADHESIVE TO SECURE CAPS.

## ANCHOR VERTICA® CAP DETAIL
SCALE: N.T.S

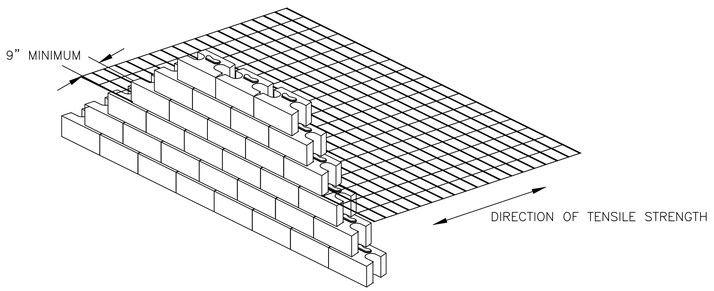


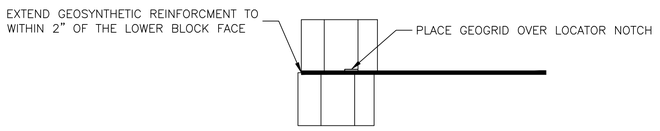

## ANCHOR VERTICA®- BEVELED/STRAIGHT UNITS
## TYPICAL 45° INSIDE CORNERS
SCALE: N.T.S

**NOTE:**
CHECK WITH MANUFACTURER SPECIFICATIONS ON CORRECT DIRECTION OF ORIENTATION FOR GEOGRID TO OBTAIN PROPER STRENGHT




## GEOGRID INSTALLATION ON CURVES
SCALE: N.T.S




## ANCHOR VERTICA®
## GEOSYNTHETIC REINFORCMENT
SCALE: N.T.S

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REGISTERED PROFESSIONAL
JAMES A. McKELVEY III
ENGINEER
No. 044917

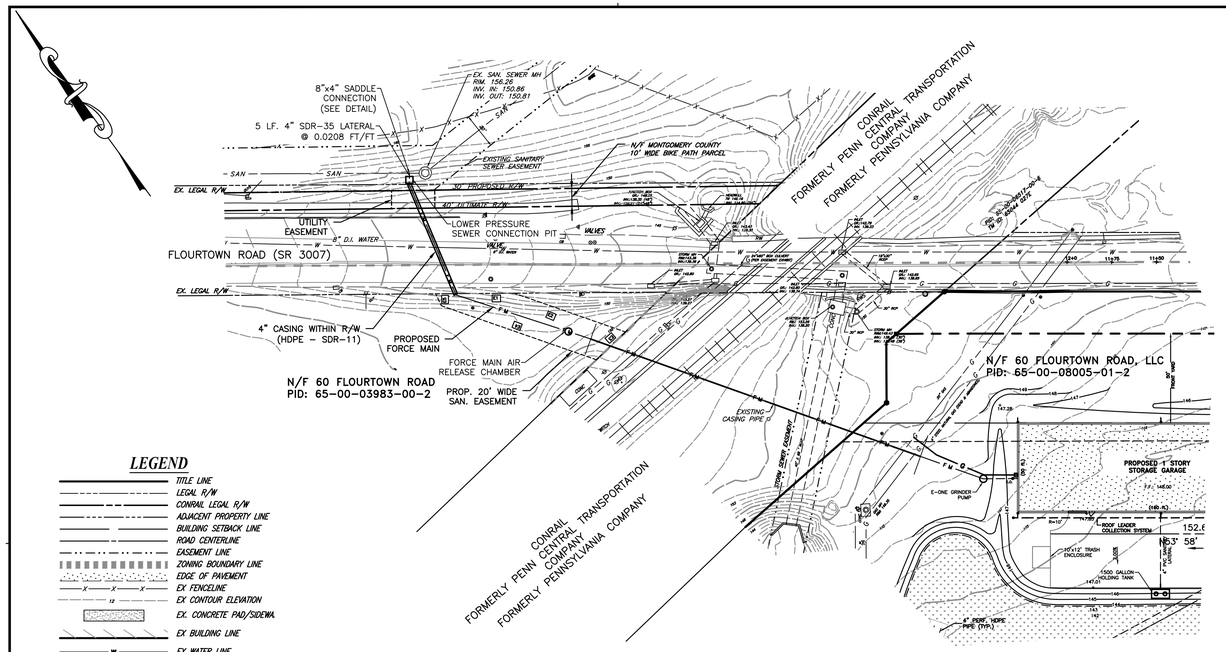
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| No. | Date | Description | By |
|---|---|---|---|
| 0 | 10/30/17 | INITIAL SUBMITTAL | KGM |


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**ANCHOR VERTICA RETAINING WALL SYSTEM**
**CONSTRUCTION DETAILS**
PREPARED FOR
**60 FLOURTOWN ROAD**
PLYMOUTH MEETING PENNSYLVANIA

| Scale: | Date: | Drawn By: | Checked By: |
|---|---|---|---|
| N.T.S. | 10/30/17 | KGM | PFM |
| Drawing Number: 29268.02–D–105 | | Approved By: JAM | Sheet No. 5 of 5 |

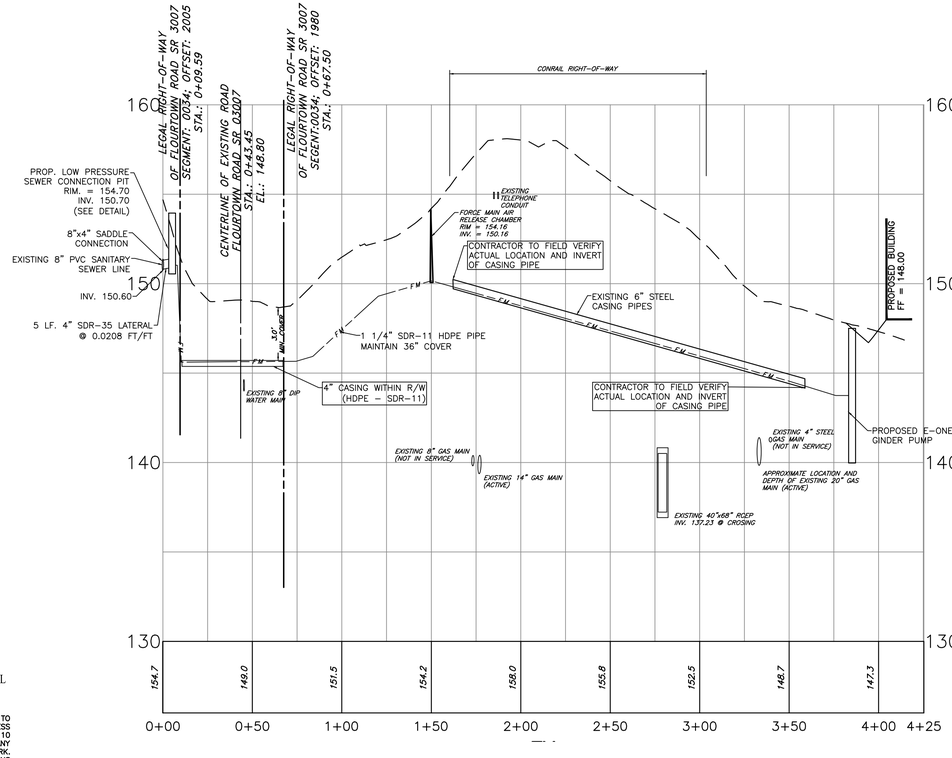



## FORCE MAIN PLAN

SCALE: 1" = 40'

## LEGEND

- TITLE LINE
- LEGAL R/W
- CONRAIL LEGAL R/W
- ADJACENT PROPERTY LINE
- BUILDING SETBACK LINE
- ROAD CENTERLINE
- EASEMENT LINE
- ZONING BOUNDARY LINE
- EDGE OF PAVEMENT
- EX. FENCELINE
- EX. CONTOUR ELEVATION
- EX. CONCRETE PAD/SIDEWA.
- EX. BUILDING LINE
- EX. WATER LINE
- EX. COMMUNICATIONS LINE
- EX. GAS LINE
- EX. ELECTRIC LINE
- EX. SANITARY SEWER w/MAN.
- EX. STORM SEWER w/MANH.
- EX. TREES (DONE BY OTHE)
- EX. TREES (TBR) (DONE BY OTHERS)
- 8-15% SLOPES
- 15-25% SLOPES
- >25% SLOPES
- PROPOSED BUILDING
- PROP. CONCRETE PAC
- PROP. DRIVEWAY
- 280 PR. CONTOUR
- * 268.46 SPOT ELEVATION
- STORMWATER PIPE W/ INLET TYPE 'C'
- SANITARY SEWER LATERAL
- GAS SERVICE
- WATER SERVICE




## FORCE MAIN PROFILE

SCALE: H. 1" = 4'
V. 1" = 40'

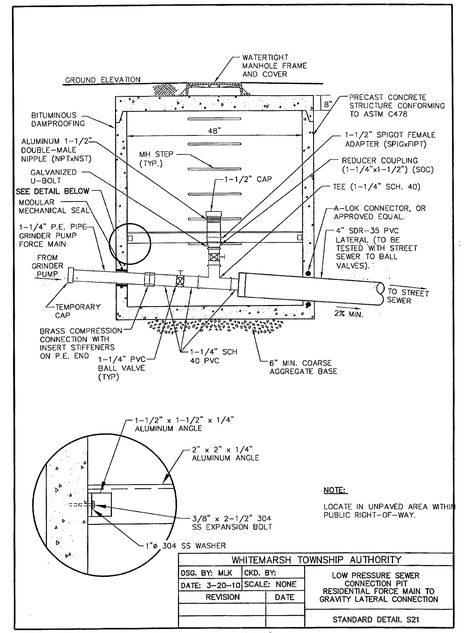
811 Know what's below. Call before you dig.

PENNSYLVANIA ONE CALL
DIAL 8-1-1 or 1-800-242-1776
BEFORE YOU DIG

CONTRACTORS ARE REQUIRED TO CONTACT UTILITY USERS NOT LESS THAN 3 DAYS NOR MORE THAN 10 DAYS PRIOR TO BEGINNING ANY EXCAVATION OR DEMOLITION WORK. INFORMATION ON THESE PLANS CONCERNING UTILITIES IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

SERIAL #: 20180611638 DATE: MARCH 2, 2018

| 20' WIDE SANITARY SEWER EASEMENT | | |
|---|---|---|
| LABLE | BEARING | DISTANCE |
| E1 | S54°25'15"E | 43.92' |
| E2 | S34°56'45"E | 65.86' |
| E3 | S82°16'21"W | 22.49' |
| E4 | N34°56'45"W | 91.75' |
| E5 | N10°44'15"E | 7.49' |
| | TOTAL AREA = 1,725 S.F. | |

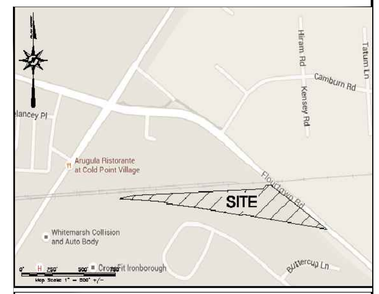



NOTE:

LOCATE IN UNPAVED AREA WITHIN PUBLIC RIGHT-OF-WAY.

| WHITEMARSH TOWNSHIP AUTHORITY | | |
|---|---|---|
| DSG. BY: MLK | CKD. BY: | LOW PRESSURE SEWER CONNECTION PIT RESIDENTIAL FORCE MAIN TO GRAVITY LATERAL CONNECTION |
| DATE: 3-20-10 | SCALE: NONE | |
| REVISION | DATE | |
| | | STANDARD DETAIL S21 |

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LOCATION MAP
SCALE:

| REVISIONS |
|---|
| 1. REVISED PER AUTHORITY REVIEW 3-16-2018 |

1. THE UNDERSIGNED IS NOT A PARTY TO ANY AGREEMENT OR RESTRICTION OF SERVICE IN RESPECT OF ALL OR ANY PART OF THE PROJECT, AND NO SUCH AGREEMENT OR RESTRICTION WILL BE ENTERED INTO WITHOUT THE PRIOR WRITTEN APPROVAL OF THE TOWNSHIP OF WHITEMARSH, AND THE UNDERSIGNED AGREES THAT ANY PROPOSAL TO SUBDIVIDE ALL OR ANY PART OF THE PROJECT, OR TO CONVEY LOTS OR UNITS BY REFERENCE TO PLANS OF THE PROJECT, WILL BE SUBJECT TO THE PRIOR APPROVAL OF THE TOWNSHIP OF WHITEMARSH.

2. ALL DRAINAGE EASEMENTS AS SHOWN ON THE PLAN SHALL BE RESERVED BY THE OWNER OF THE PROJECT, HIS HEIRS, EXECUTORS, ADMINISTRATORS, SUCCESSORS, AND ASSIGNS, AND SHALL BE BINDING UPON THEM AND ALL SUBSEQUENT OWNERS OF EACH AND EVERY LOT ON THE PLAN AND FOR THE BENEFIT OF THE TOWNSHIP OF WHITEMARSH AND SHALL BE ENFORCEABLE BY THE TOWNSHIP OF WHITEMARSH.

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GRAPHIC SCALE
0 20 40 60

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

PLAN & PROFILE FORCE MAIN

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR
60 FLOURTOWN ROAD, LLC
343 MILITIA HILL ROAD
FORT WASHINGTON, PA 19034




| WHITEMARSH TOWNSHIP AUTHORITY | | |
|---|---|---|
| DSG. BY: MLK | CKD. BY: | FORCE MAIN AIR RELEASE CHAMBER |
| DATE: 3-20-10 | SCALE: NONE | |
| REVISION | DATE | |
| | | STANDARD DETAIL S15 |

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NOTES:

1. AASHTO NO. 8 COARSE AGGREGATE FOR PVC PIPE.
2. PADOT 2A COARSE AGGREGATE FOR DUCTILE IRON PIPE.
3. SCREENINGS OR TYPE B #3 FINE AGGREGATE FOR COPPER PIPE.

| WHITEMARSH TOWNSHIP AUTHORITY | | |
|---|---|---|
| DSG. BY: MLK | CKD. BY: | STANDARD PIPE BEDDING |
| DATE: 3-20-10 | SCALE: NONE | |
| REVISION | DATE | |
| | | STANDARD DETAIL M1 |

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REGISTERED PROFESSIONAL ENGINEER

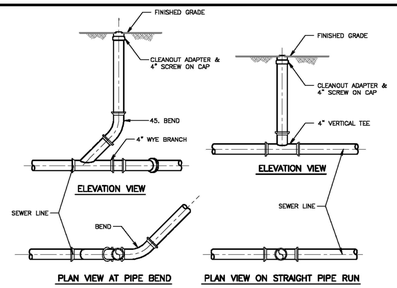
COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ROBERT E. BLUE, JR. ENGINEER No. PE026169-E

7/5/2018 (DATE)

ROBERT E. BLUE JR.
LICENSE NO. 26169-E

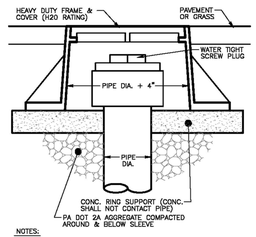
| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RBC | REB | 1"=20' |
| DATE: | JOB NUMBER: | SHEET NUMBER: |
| 06-13-2017 | 2081-1E | 1 OF 3 |

LAST SAVED: M:\Proj\2081-1\dwg\Sheets\LO\2081-1 FORCEMAIN.dwg ON 6/26/2018 2:35 PM




## SANITARY CLEAN-OUT DETAILS

Not To Scale

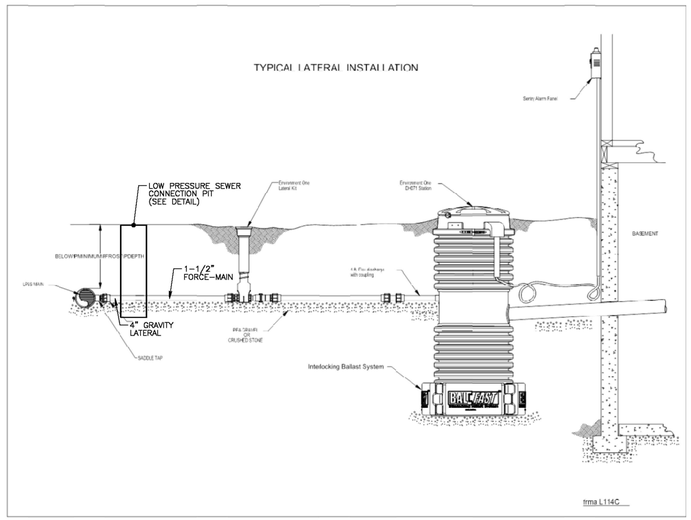


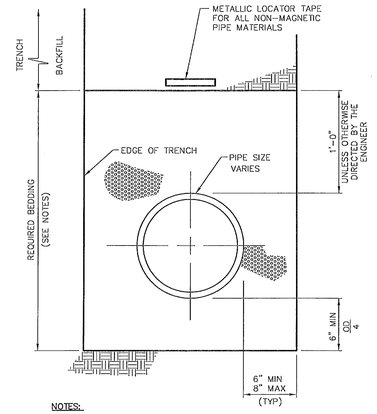

NOTES:

1. FRAME AND COVER SHALL BE NEENAH FOUNDARY COMPANY MODEL R-1976 OR APPROVED EQUAL.
2. CLEAN-OUT PROTECTION SLEEVES ARE TO BE INSTALLED AT LOCATIONS IN PAVED AREAS OR LESS THAN 3 FEET FROM A PAVED AREA.

## CLEAN-OUT PROTECTIVE SLEEVE

Not To Scale



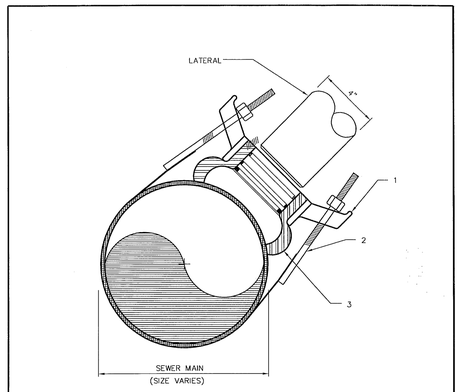




NOTES:

1. AASHTO NO. 8 COARSE AGGREGATE FOR PVC PIPE.
2. PADOT 2A COARSE AGGREGATE FOR DUCTILE IRON PIPE.
3. SCREENINGS OR TYPE B #3 FINE AGGREGATE FOR COPPER PIPE.

| WHITEMARSH TOWNSHIP AUTHORITY | | | |
|---|---|---|---|
| DSG. BY: MLK | CKD. BY: | | STANDARD PIPE BEDDING |
| DATE: 3-20-10 | SCALE: NONE | | |
| REVISION | DATE | | |
| | | | STANDARD DETAIL M1 |

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NOTES:

MATERIALS:

1 SADDLE CASTING: DUCTILE IRON ASTM 536-80 GRADE 65-45-12 PROTECTED WITH CORROSION RESISTANT PAINT.

2 STAINLESS STEEL 304 ADJUSTABLE STRAP; BOLTS, NUTS AND WASHERS 1/2" N.C. ROLL THREAD TEFLON COATED. 3 1/2" WIDE BAND TO SPREAD CLAMP FORCE OUT ON PIPE.

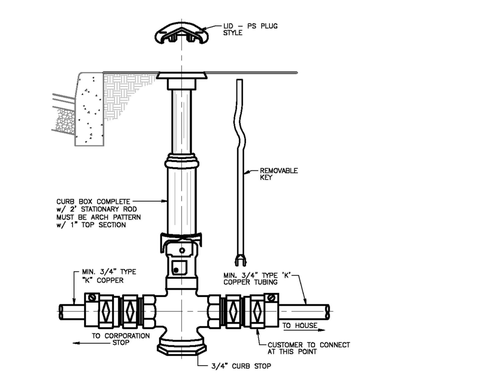
3 GASKET: VIRGIN SBR COMPOUNDED FOR SEWER SERVICE. MEETS ASTM D-2000 3 BA715.

4. SADDLE TO BE INSTALLED AT THE 10:00 OR 2:00 POSITION ON EXISTING MAIN.

5. STYLE CB SEWER SADDLE MANUFACTURED BY: ROMAC INDUSTRIES, INC.

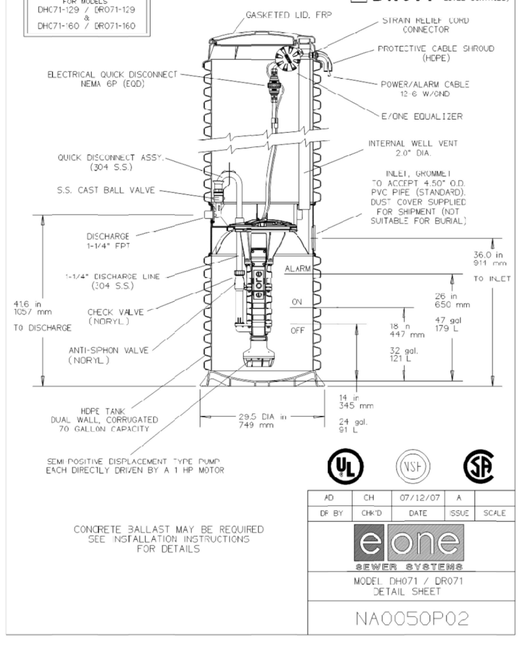
| WHITEMARSH TOWNSHIP AUTHORITY | | | |
|---|---|---|---|
| DSG. BY: MLK | CKD. BY: | | SEWER SADDLE |
| DATE: 3-20-10 | SCALE: NONE | | |
| REVISION | DATE | | |
| | | | STANDARD DETAIL S13 |

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## CURB STOP DETAIL

Not to Scale

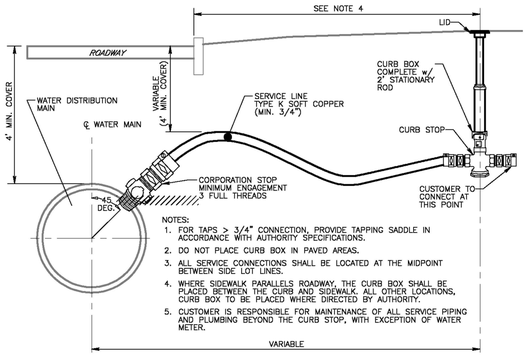



| AD | CH | 07/12/07 | A | |
|---|---|---|---|---|
| DF BY | CHK'D | DATE | ISSUE | SCALE |

e/one SEWER SYSTEMS

MODEL DH071 / DR071 DETAIL SHEET

NA0050P02

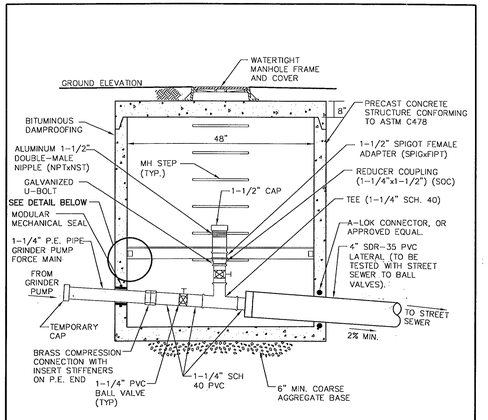


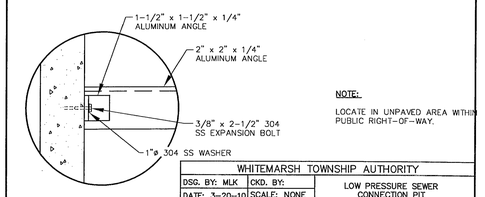

NOTES:

1. FOR TAPS > 3/4" CONNECTION, PROVIDE TAPPING SADDLE IN ACCORDANCE WITH AUTHORITY SPECIFICATIONS.
2. DO NOT PLACE CURB BOX IN PAVED AREAS.
3. ALL SERVICE CONNECTIONS SHALL BE LOCATED AT THE MIDPOINT BETWEEN SIDE LOT LINES.
4. WHERE SIDEWALK PARALLELS ROADWAY, THE CURB BOX SHALL BE PLACED BETWEEN THE CURB AND SIDEWALK. ALL OTHER LOCATIONS, CURB BOX TO BE PLACED WHERE DIRECTED BY AUTHORITY.
5. CUSTOMER IS RESPONSIBLE FOR MAINTENANCE OF ALL SERVICE PIPING AND PLUMBING BEYOND THE CURB STOP, WITH EXCEPTION OF WATER METER.

## STANDARD WATER SERVICE CONNECTION

NTS




NOTE:

LOCATE IN UNPAVED AREA WITHIN PUBLIC RIGHT-OF-WAY.

| WHITEMARSH TOWNSHIP AUTHORITY | | | |
|---|---|---|---|
| DSG. BY: MLK | CKD. BY: | | LOW PRESSURE SEWER CONNECTION PIT RESIDENTIAL FORCE MAIN TO GRAVITY LATERAL CONNECTION |
| DATE: 3-20-10 | SCALE: NONE | | |
| REVISION | DATE | | |
| | | | STANDARD DETAIL S21 |

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REGISTERED PROFESSIONAL ENGINEER

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — ROBERT E. BLUE, JR. — ENGINEER — No. PE026169-E

5/2018

ROBERT E. BLUE JR. (DATE)

LICENSE NO. 26169-E

REVISIONS

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FORCE MAIN DETAILS

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
PENNSYLVANIA

PREPARED FOR

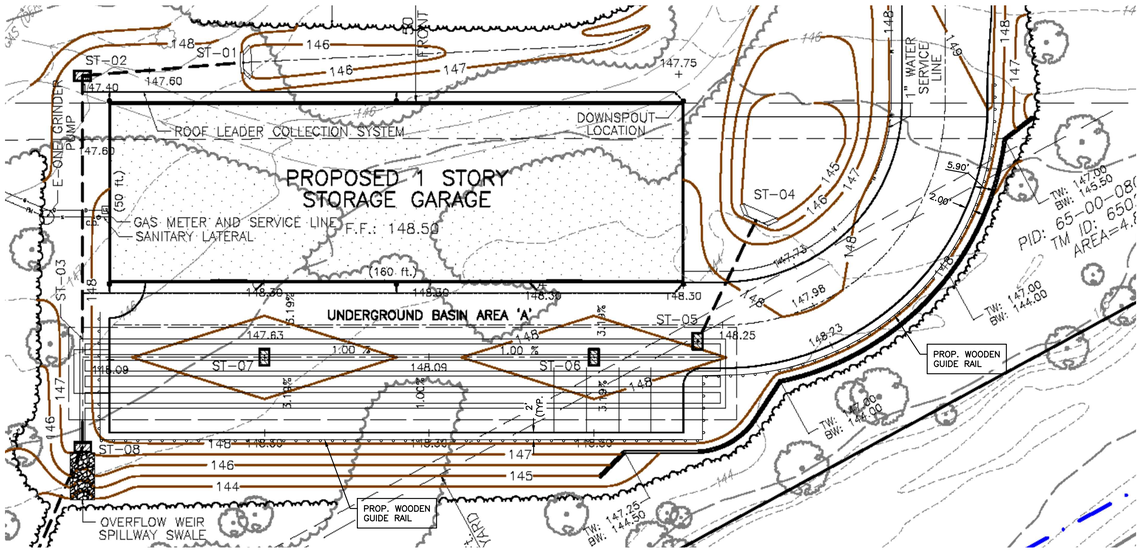
60 FLOURTOWN ROAD, LLC
343 MILITIA HILL ROAD
FORT WASHINGTON, PA 19034

robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

| DRAWN BY: RBC | CHECKED BY: REB | SCALE: AS NOTED |
|---|---|---|
| DATE: 06-13-2017 | JOB NUMBER: 2081-1E | SHEET NUMBER: 2 OF 3 |

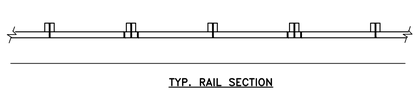
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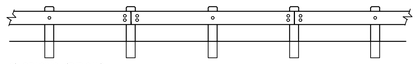



## TIMBER GUARDRAIL LAYOUT PLAN

SCALE: N.T.S.

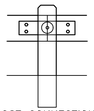


TYP. RAIL SECTION

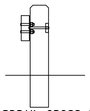


6' SPACING (TYPICAL)

FRONT ELEVATION



POST CONNECTION
NOT TO SCALE



TYP. GUARDRAIL CROSS SECTION
1:10 SLOPE OR FLATTER
NOT TO SCALE

NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURES SPECIFICATIONS.
2. DO NOT SCALE DRAWINGS.
3. IF TOP OF SLOPE IS CLOSER THAN 24" INCREASE POST LENGTH TO 7.0'.
4. DRIVE POSTS OR AUGER, BACKFILL WITH NATIVE SOIL AND COMACT EVERY 12".
5. ALL TIMBER #1 SAS SOUTHERN PINE, PRESSURE TREATED: AWPA-C14, WOOD FOR USE IN HIGHWAY CONSTRUCTION.
6. TYP. POST: 8"x8"x6' - TYP. RAIL: 4"x12"x11' 11/12"
7. FASTERNERS: ASTM A307: A242: F436 TYPE 3; A563 DH3.
8. SPLICE PLATE & PLATE WASHER ASTM-A588.
9. UNDER EACH BOLT HEAD ON FACE OF RAIL INSTALL ONE 7/8" WASHER.

## TIMBER GUARDRAIL DETAIL

SCALE: N.T.S.

**CALL BEFORE YOU DIG**
1-800-242-1776
3 DAYS NOTICE IS THE LAW
PA 1 SYSTEM, INC.

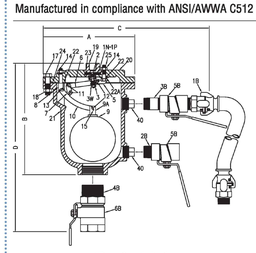
ACT 287 COMPLIANCE
SEAL #: 2018-0611638
DATED: MARCH 6, 2018

SUBMITTAL SHEET FOR S SERIES

**Submittal Sheet for Crispin S Series**

## 2" Pressure Sewer Valve (short body)

Manufactured in compliance with ANSI/AWWA C512 Date: 2016



### Specifications

The Pressure Sewer Air Release Valve(s) shall be installed at high points in the line, or at points selected by the engineer, to vent the accumulation of air and other gases with the line under pressure.

The valve(s) shall be of the long body design and shall have a _____" orifice with an adjustable Buna-N rubber valve and a sealing face of PVC. The valve(s) shall operate at _____ PSIG, and be capable of passing _____ SCFM of air.

They shall also be _____" NPT screwed or ANSI Class (125, 250) flanged connection. They shall have a cast iron body, top and flange, where required, and a stainless steel trim.

The valve(s) shall be Crispin Model _____ Pressure Sewer Valve(s) as manufactured by Crispin-Multiplex Manufacturing Co., Berwick, PA.

**Option**: The valve(s) shall be supplied with back flushing attachments so that the interior body can be flushed periodically for proper operation.

**Option**: The valve(s) shall be a Short Body Pressure Sewer Valve with an overall height not to exceed 12 1/4".

**Option**: Where pressures are greater than 300 PSIG, the valve(s) shall be ANSI Class _____ flanged inlet connection, and shall have a (steel, stainless steel, or ductile iron) body, top and inlet flange.

Standard operating pressure for Crispin Air Valves is 20 to 150 PSIG. Please check one of the following if your operating needs differ:

____ 2 to 40 PSIG ____ 151 to 300 PSIG

** Parts are interchangeable and optional at customer's request*

### Parts List

| ITEM | DESCRIPTION | MATERIAL | ASTM |
|---|---|---|---|
| *1N | SEAT | PVC | 1784 |
| *1P | SEAT | STAINLESS STEEL | A582 |
| 2 | VALVE PLUNGER | BUNA-N RUBBER & S/S | D2000/A193 |
| 3 | PLUNGER NUT | STAINLESS STEEL | A194 |
| 5W | LOCK WASHER | STAINLESS STEEL | A240 |
| 5 | VALVE FULCRUM | STAINLESS STEEL | A582 |
| 6 | VALVE LEVER | STAINLESS STEEL | A582 |
| 7 | LINK | STAINLESS STEEL | A240 |
| 8 | BALL FULCRUM | STAINLESS STEEL | A582 |
| 9 | BALL FLOAT | STAINLESS STEEL | A240 |
| 9A | FLOAT ROD | STAINLESS STEEL | A582 |
| 10 | BALL LEVER | STAINLESS STEEL | A240 |
| 11 | BEARING PIN | STAINLESS STEEL | A582 |
| 12 | BEARING PIN | STAINLESS STEEL | A582 |
| 13 | BEARING PIN | STAINLESS STEEL | A582 |
| 14 | NUT | STEEL | A563 |
| 15 | COTTER PIN | STAINLESS STEEL | A493 |
| 17 | BOLT | STEEL | A307 |
| 18 | NUT | STEEL | A563 |
| 19 | TOP | CAST IRON | A126 CL B |
| 20 | FLANGE | CAST IRON | A126 CL B |
| 21 | BODY | CAST IRON | A126 CL B |
| 22 | FULCRUM WASHER | FIBER | D710 |
| 22A | FULCRUM WASHER | FIBER | D710 |
| 23 | SEAT GASKET | BUNA-N RUBBER | D2000 |
| 24 | FLANGE GASKET | ARMSTRONG N-8092 | N/A |
| 25 | BOLT | STAINLESS STEEL | A193 |
| *40 | FLUSH PLUG | CAST IRON | A126 CL B |
| | **OPTIONAL BACK FLUSH COMPONENTS** | | |
| *1B | HOSE ASSEMBLY | CAD. PLT. STEEL& RUBBER | N/A |
| *2B | NIPPLE | STEEL | A53 |
| *3B | NIPPLE | STEEL | A53 |
| *4B | NIPPLE | STEEL | A53 |
| *5B | BALL VALVE | BRASS | N/A |
| *6B | BALL VALVE | BRASS | N/A |

### Size Specifications

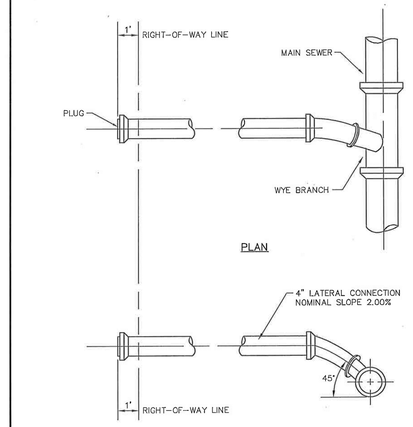
| MODEL | INLET SIZE | OUTLET SIZE | A | B | C | D | WHT. |
|---|---|---|---|---|---|---|---|
| S20S | 2" NPT | 0.50" NPT | 10.25 | 12.50 | | | 54 |
| S20SB | 2" NPT | 0.50" NPT | | | 14.75 | 17.50 | 66 |

### Orifice Options

| DIAMETER | MAX. PRES. | DISCHARGE RATE |
|---|---|---|
| 1/4 | 150 PSIG | 97.5 SCFM |
| 1/8 | 300 PSIG | 46.7 SCFM |



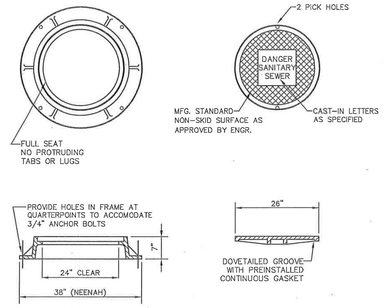
Crispin Valve, 600 Fowler Ave., Berwick, PA 18603 • 1-800-AIR-VALV • T: (570) 752-4524 • F: (570) 752-4962 • WWW.CRISPINVALVE.COM • info@crispinvalve.com




NOTE:
PROVIDE 6" LATERAL CONNECTION WHEN SERVICING COMMERCIAL BUILDINGS AND MULTI-FAMILY DWELLING UNITS.

| WHITEMARSH TOWNSHIP AUTHORITY | | | |
|---|---|---|---|
| DSG. BY: MLK | CKD. BY: | | LATERAL CONNECTION SHALLOW SEWER |
| DATE: 3-20-10 | SCALE: NONE | | |
| REVISION | DATE | | STANDARD DETAIL SS9 |
| | | | |

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NOTES:
1. ALL MATERIALS TO BE GRAY CAST IRON ASTM A-48.
2. FRAME AND COVER SHALL BE FOR HEAVY DUTY TRAFFIC, AASHTO HS-20.
3. PROVIDE FOUR (4) ANCHOR BOLTS, 3/4" DIA. MINIMUM.
4. THE FOLLOWING MANUFACTURER'S STANDARD CASTING, OR APPROVED EQUAL, SHALL BE USED.
   NEENAH FOUNDRY CO. ——— PATTERN R-1642.

| WHITEMARSH TOWNSHIP AUTHORITY | | | |
|---|---|---|---|
| DSG. BY: MLK | CKD. BY: | | STANDARD MANHOLE FRAME AND COVER |
| DATE: 3-20-10 | SCALE: NONE | | |
| REVISION | DATE | | STANDARD DETAIL SS7 |
| | | | |

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REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ROBERT E. BLUE, JR.
ENGINEER
No. PE026169-E

7/5/2018
ROBERT E. BLUE JR. (DATE)
LICENSE NO. 26169-E

REVISIONS

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robert e. blue
consulting engineers, p.c.
1149 Skippack Pike, Blue Bell, PA 19422
tel: (610)-277-9441 fax: (610)-277-9897
www.robertblue.com email: rblue@robertblue.com

MISCELLANEOUS DETAIL

100 FLOURTOWN ROAD
WHITEMARSH TOWNSHIP
MONTGOMERY
PENNSYLVANIA

PREPARED FOR
60 FLOURTOWN ROAD, LLC
343 MILITIA HILL ROAD
FORT WASHINGTON, PA 19034

| DRAWN BY: | CHECKED BY: | SCALE: |
|---|---|---|
| RBC | MFA | AS NOTED |
| DATE: 2018-06-26 | JOB NUMBER: 2081-1E | SHEET NUMBER: 3 OF 3 |

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LAST SAVED: M:\Proj\2081-1\dwg\Sheets\LOD\2081-1 MISC DETAILS.dwg ON 7/5/2018 9:12 AM

**MUNICIPAL LAND USE LETTER**

Date: August 1, 2017

To: ***60 Flourtown Road, LLC*** (Name of Applicant)

From: ***Whitemarsh Township*** Township/Borough/City

Re: ***60 Flourtown Road***

The municipality of ***Whitemarsh Township*** states that it:

__X__ has adopted a municipal ~~or multi-municipal~~ comprehensive plan.
If yes, please provide date of adoption: 2003

_____ has not adopted a municipal or multi-municipal comprehensive plan.

The municipality of ***Whitemarsh Township*** states that it:

__X__ has adopted ~~a county zoning ordinance, or~~ a municipal ~~or joint-municipal~~ zoning ordinance.
_____ has not adopted a county zoning ordinance, or a municipal or joint-municipal zoning ordinance.

*If applicable:*

The municipality of ***Whitemarsh Township*** states that its zoning ordinance is generally consistent with its municipal comprehensive plan and the county comprehensive plan.

The above referenced proposed project
_____ meets the provisions of the local zoning ordinance

If zoning approval is required for the project to proceed, the above referenced project:
__X__ has received zoning approval.
_____ has not received zoning approval.

*If the proposed project has not received zoning approval:*

What is the status of the zoning request for the proposed project? (e.g., Special Exception Approval from the Zoning Hearing Board required, Conditional Use approval from the Governing Body required)

See attached Zoning Hearing Board Decision #2016-05

Is there a legal challenge by the applicant with regard to zoning for the proposed project?

No

Name and Contact Information for Municipal Zoning Officer:

Charles L. Guttenplan, AICP 610-825-3535 ext. 2625

Whitemarsh Township, 616 Germantown Pike, Lafayette Hill, PA 19444

Additional Comments (attach additional sheets if necessary):

Submitted By:

| | |
|---|---|
| Name | Charles L. Guttenplan, AICP |
| Title | Director of Planning & Zoning/Zoning Officer |
| Contact Information (Address & Phone) | Whitemarsh Township, 616 Germantown Pike, Lafayette Hill, PA 19444<br>610-825-3535 ext. 2625 |
| Signature | |
| Date | August 1, 2017 |

**WHITEMARSH TOWNSHIP ZONING HEARING BOARD**

**DECISION AND ORDER**

APPLICATION NO.: 2016-05
APPLICANT: 60 Flourtown Road, LLC
Block 021, Unit 009
Flourtown Road
Plymouth Meeting, PA 19462
LIM – Limited Industrial District

HEARING DATE: 04/06/16
VOTE: 04/06/16
WRITTEN DECISION: 04/07/16
COPY MAILED: 04/07/16

The Applicant proposes to construct a storage garage for commercial vehicles related to a contracting business.

After completion of a public hearing on the above-referenced Application, pursuant to public notice as required by law, the Zoning Hearing Board of Whitemarsh Township decided and orders as follows:

1. A variance from Section 116-137B(2), to reduce the required 200' building setback from a residential district to 111 feet, is **GRANTED**.

2. A variance from Section 116-140, to reduce the required 100' parking setback from a residential district to 57.77 feet, is **GRANTED**.

**THIS DECISION IS SUBJECT TO THE FOLLOWING CONDITIONS:**

1. All use and development permitted by this Decision shall conform to the exhibits and testimony presented by the Applicant, unless inconsistent with any specific conditions imposed by this Board, in which case these specific conditions shall take precedence.

2. The Applicant shall apply for and obtain all permits required by the Township Codes in a timely manner.

3. The Applicant shall submit a revised aerial photo designating the location of the proposed building.

4. Once the proposed building for the storage of equipment is constructed, there shall be no outdoor storage of equipment near the office located at 60 Flourtown Road.

This Decision and Order of the Board is final and any appeal of it must be filed with the Court of Common Pleas of Montgomery County within thirty (30) days following the copy mailing date set out above.

Section 116-223 of the Zoning Ordinance provides as follows:

Expiration of granted appeals. Unless otherwise specified by the Board, all approvals granted by the Zoning Hearing Board shall automatically expire 365 days after the date of the decision unless: (1) the applicant has acted upon the approval by obtaining the required permit(s) and paying the prescribed fees for same, or (2) the Zoning Hearing Board decision is on appeal to the courts, at which point, the approval, if upheld on appeal, shall expire 365 days after final determination on appeal.

The Zoning Hearing Board may extend the expiration date of approvals for a 180 day period upon request by the applicant, provided that the applicant is, in the opinion of the Zoning Hearing Board, diligently pursuing governmental and/or regulatory approvals as required. Requests for extensions shall be in writing and submitted to the Zoning Hearing Board at least 30 days before any applicable expiration date. Only one (1) extension may be provided for any application.

**WHITEMARSH TOWNSHIP ZONING HEARING BOARD:**

Robert A. Bacine, Chair

William E. Kramer, Vice Chair

Marc Weinstein

Stanley A. Casacio

**Alternate**

James Behr

Randi Rubin




Weinstein Supply




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## WHITEMARSH TOWNSHIP

**To:** Charlie L. Guttenplan, Director of Planning & Zoning/Zoning Officer

**From:** NICHOLAS W. WEAVER, FIRE MARSHAL

**Subject:** **SLD #12-15 60 Flourtown Road, LLC 60 Flourtown Road**

**Date:** December 9, 2022

**cc:**

This application is approved with no comments.

**Nicholas W. Weaver**
**Fire Marshal**
616 Germantown Pike
Lafayette Hill, PA 19444
Phone: 610-825-3535 ext. 2614
Email: nweaver@whitemarshtwp.org

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

January 9, 2023

File No. 20-02001

Mr. Richard L. Mellor, Jr., Township Manager
Whitemarsh Township Municipal Building
616 Germantown Pike
Lafayette Hill, PA 19444

Reference: Final Plan Review
100 Flourtown Road (60 Flourtown Road, LLC)
Whitemarsh Township, Montgomery County, Pennsylvania
SLD #12-15

Dear Mr. Mellor:

As requested, we have reviewed plans for the above referenced Subdivision, prepared by Robert E. Blue Consulting Engineers, P.C. dated May 18, 2020 and last revised December 6, 2022. The following comments are offered for your consideration:

**SUMMARY OF REQUESTED RELIEF:**

| | Section | Description |
|---|---|---|
| 1. | 55-4(B)(5) | The applicant is requesting relief from the requirements of this section of the ordinance to not require compliance with Condition C.5 of Resolution 2017-04, which granted preliminary approval of the Land Development. Condition C.5 of Resolution 2017-04 granted relief from Section 55-4(B)(5), conditioned that the applicant comply with the recommendations of the Shade Tree Commission as set forth in memorandums attached as Exhibits 'E' and "F'; which recommend "the applicant adhere to the landscape plan recommended at the August, 2016 Shade Tree Commission meeting, but have a more in depth discussion with the Township staff,… the Township's Consulting Arborist, and other representatives as necessary to come up with a plan on what would be planted on site at 60 Flourtown Road and what would be planted elsewhere. In the event that the applicant would like to provide funding for the landscaping rather than planting the landscaping directly, that the applicant, Township Staff and the Township Arborist work together to calculate the costs associated with the material and labor associated with the landscaping". |
| 2. | 55-4(B)(6)(a) | The applicant is requesting relief from the requirements of this section of the ordinance which requires that every tree determined to be living and healthy, with a DBH of 6 inches or greater and which is designated to be removed or which is destroyed, shall be replaced with one or more new shade trees of a type approved by the Township with a trunk diameter of not less than 3 inches in caliper. The total caliper of replacement trees, measured at 6 inches above the ground line, shall equal or exceed the DBH of the tree removed. |

| | Section | Description |
|---|---|---|
| 3. | 55-4(B)(6)(c) | The applicant is requesting relief from the requirements of this section of the ordinance which requires that replacement trees shall be planted in addition to the trees required by planting requirements otherwise set forth in the Subdivision and Land Development Code. |
| 4. | 58-11(H)(1) | The applicant is requesting relief from the requirements of this section of the ordinance, which requires that the property owner shall sign an operations and maintenance agreement with the Township addressing stormwater BMPs that are to be privately owned. We do not recommend the granting of this waiver. |
| 5. | 105-22(B)(2) | The applicant is requesting a waiver from the requirements of this section of the ordinance, which requires the submission of a Sedimentation and Erosion Control plan pursuant to the Whitemarsh Township Grading Ordinance. A Sedimentation and Erosion Control Plan was submitted, and therefore this waiver is not required. The Sedimentation and Erosion Control Plan was submitted as a stand-alone plan, and must be incorporated into the plan set |
| 6. | 105-22(B)(4) | The applicant is requesting a waiver from the requirements of this section of the ordinance, which requires that proposed landscaping must be shown on the plans, including existing vegetation to be removed or preserved, and the proposed planting schedule indicating the locations, species, and sizes of plantings as required by Sections 105-39, 105-48 and Chapter 55. |
| 7. | 105-22(B)(5)(b) | The applicant is requesting a waiver from the requirements of this section of the ordinance, to not require street profiles. No Streets are proposed, and therefore this waiver is not required. |
| 8. | 105-22(B)(5)(c) | The applicant is requesting a waiver from the requirements of this section of the ordinance, to not require street cross sections. No Streets are proposed, and therefore this waiver is not required. |
| 9. | 105-22(B)(5)(e) | The applicant is requesting a waiver from the requirements of this section of the ordinance, to not require storm sewer profiles. We have no objection to the granting of this waiver. |
| 10. | 105-22(B)(10) | The applicant is requesting a waiver from the requirements of this section of the ordinance, to not require a Final resource impact and conservation plan, to categorize the impacts of the proposed activities and physical alterations on natural and cultural resources. |
| 11. | 105-22(B)(11) | The applicant is requesting a waiver from the requirements of this section of the ordinance, to not require the submission of a Common Open Space and Management Plan. No Open Space is proposed, and therefore this waiver is not required. |
| 12. | 105-39(A) | The applicant is requesting a waiver from the requirements of this section of the ordinance, which requires that all parking areas shall have at least one tree of three inches minimum caliper for every two parking spaces provided. The waiver is being requested to allow two-inch caliper trees, instead of three-inch caliper trees. |

| | Section | Description |
|---|---|---|
| 13. | 105-52(B)(2) | It appears a waiver is required from the requirements of this section of the ordinance which requires that all Buffer yards shall have a minimum width of 50 feet. |
| 14. | 105-81 | The applicant must obtain a waiver to permit a newly constructed overheard electric wire servicing the building. This section of the ordinance requires that all electric, telephone and communication service facilities, both main and service lines, shall be provided by underground cables. |
| 15. | II(E)(2)(g)(iv) | The plans must be revised demonstrate compliance with Section C.9.11.a of Resolution 2017-04, which granted relief from the requirements of this section of the ordinance conditioned that the minimum pipe size is 10" diameter. The applicant should request additional relief for any deviations from this requirement. |

**SUBDIVISION AND LAND DEVELOPMENT ORDINANCE**

| | Section | Description |
|---|---|---|
| 16. | 105-21(A), 105-22(B)(9), 105-42(A) | The following plans must be incorporated into the plan set and each sheet shall be numbered and shall show its relationship to the total number of sheets.<br>• Erosion & Sedimentation Control Plan<br>• Landscape Plan<br>• Post Construction Stormwater Management Plan<br>• Construction Details |
| 17. | 105-45 | The plans appear to show newly constructed sanitary sewerage facilities which are located outside of the boundary lines of the subject property. The plans cannot be approved until all structures and/or uses for the lot(s) are located entirely within the property boundaries or easements or some other agreement is established to permit the encroachments. |
| 18. | 105-53(D) | The plans must be revised in accordance with Section C.9.b of Resolution 2017-04, which granted a waiver from the requirements of this section of the ordinance conditioned that the Applicant grant a Conservation Easement over the undeveloped portion of the property. |
| 19. | 105-78(C), 105-79 | The applicant must obtain the approval of the Whitemarsh Township Authority with regard to proposed sanitary sewerage facilities. |
| 20. | 105-83(E) | No Removal of a tree shall be permitted unless the applicant obtains a recommendation from the Shade Tree Commission based on a tree survey and removal plan submitted in accordance with Chapter 55 of the Whitemarsh Township Code. |

**CHAPTER 55 - TREE PROTECTION STANDARDS**

| | Section | Description |
|---|---|---|
| 21. | 55-4(A) | This section of the ordinance requires the tree survey plan to be reviewed by the Shade Tree Commission in a public meeting. |
| 22. | 55-4(B)(5) | The applicant must provide evidence in sufficient detail to demonstrate the condition of Section C.10.a of Resolution 2017-04 was met, which required the removal of invasive honeysuckle on the site. |

Any future submission of the design plans for this project must be accompanied by a letter, prepared by the applicant's engineer, which addresses each of the comments contained in this report. Should you have any questions regarding this matter, please do not hesitate to contact me at this office.

Sincerely,

Krista Heinrich, P.E.
Township Engineer
Gilmore & Associates, Inc.

cc: Mr. Charles L. Guttenplan, AICP – Director of Planning and Zoning
Mr. Sean Kilkenny, Esq.; The Law Offices of Sean Kilkenny, LLC – Township Solicitor *(via email)*
Mr. Craig T. McAnally – Acting Assistant Township Manager
Mr. Robert A. Sztubinski, B.C.O. – Director of Building & Codes
Mr. Nick Weaver – Fire Marshal
Mr. Glenn Van Eerden, 60 Flourtown Road LLC – Owner/Applicant
Mr. Robert E. Blue, Jr., PE, PLS– Applicant's Consultant
Mr. Neil Andrew Stein, Esquire – Applicant's Attorney

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