

**WETLANDS DELINEATED**  
 A. NOTES FOR UNNAMED TRIBUTARY WETLANDS DELINEATED:  
 WETLANDS DELINEATED CAME FROM A PLAN TITLE: "WETLAND DELINEATED PLAN," PROJECT: "CUMRU TOWNSHIP FIRE STATION PROJECT, CUMRU TOWNSHIP, BERKS COUNTY, PENNSYLVANIA," BY: VORTEX ENVIRONMENTAL, INC., 2819-1 WILLOW STREET PIKE NORTH, WILLOW STREET, PA 17584, PROJECT NUMBER: 172-002-16, DATED: AUGUST 9, 2016.  
 INFORMATION FROM ABOVE PLAN:  
 1. NOTES:  
 a. WETLANDS DELINEATED BY VORTEX ENVIRONMENTAL, INC. ON FEBRUARY 22, AND MARCH 24, 2019 USING THE UNITED STATES ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, 1987, AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: EASTERN MOUNTAINS AND PIEDMONT REGION - VERSION 2.0 (APRIL 2012).  
 b. WETLANDS, BOUNDARY, PROPERTY, AND TOPOGRAPHIC INFORMATION TAKEN FROM AN EXISTING CONDITIONS PLAN FROM THE CUMRU TOWNSHIP FIRE STATION PROJECT, UNDATED.  
 2. WETLAND CLASSIFICATIONS:  
 a. PEM1 - PALLUSTRINE, EMERGENT, PRESISTENT  
 b. R4SB5 - REIVERINE, INTERITENT, STREAMBED, MUD  
 3. WETLAND SUMMARY: WETLAND (PEM1) 0.36 ACRE (ON SITE)  
 B. PROJECT SITE:  
 WETLANDS DELINEATED BY A.D. MARBLE FOR THE CUMRU TOWNSHIP PROJECT, TITLE "UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY", DATED MAY 4, 2021. THREE WETLANDS WERE IDENTIFIED WITHIN THE PROJECT STUDY AREA.  
 1. NOTES FROM "A.D. MARBLE, AQUATIC RESOURCE - PERMIT ENVIRONMENTAL FACTS SHEET":  
 WETLAND CLASSIFICATIONS:  
 a. WETLANDS 1 AND 2 ARE PALUSTRINE EMERGENT (PEM) WETLANDS  
 b. WETLANDS 3 IS CLASSIFIED AS PEM HABITAT, BUT TRANSITIONS TO PALUSTRINE SCRUB-SHRUB (PSS) HABITAT OUTSIDE THE PROJECT STUDY AREA.  
 2. WETLANDS SUMMARY: WETLAND 1 & 2 (PEM) AND WETLANDS 3 (PSS) - 0.065 AC.

PCSM SITE PLAN  
 Scale: 1" = 100'

**LEGEND**

D	LIMIT OF DISTURBANCE & NPDES BOUNDARY	542	EXISTING CONTOUR
S	EXISTING GAS MAIN	542	PROPOSED CONTOUR
S	EXISTING SANITARY SEWER	---	EXISTING STORMWATER PIPE
---	TOWNSHIP RIGHT OF WAY LINE	---	PROPOSED STORMWATER PIPE
S	PROPOSED SANITARY SEWER	---	PROPOSED STORMWATER INLET
W	PROPOSED WATER MAIN	---	PROPOSED STORMWATER STRUCTURE NUMBER
G	PROPOSED GAS MAIN	---	SANITARY MANHOLE
---	EXISTING EDGE OF PAVING	---	GAS CURB STOP
WS	WATERSHED BOUNDARY LINE	---	WATER CURB STOP
(101)	DRAWING #	---	WATER VALVE
+	EXISTING SIGN	---	SANITARY CLEAN OUT
+	CONNECT TO EXISTING	---	FIRE HYDRANT
		---	GAS VALVE

**POST-CONSTRUCTION STORMWATER MANAGEMENT (PCSM) LEGEND**

D	LIMIT OF DISTURBANCE	---	RIPRAP
---	FLOODWAY BOUNDARY	---	EROSION CONTROL MATTING
---	SOIL BOUNDARY	---	TEMPORARY SEEDING STABILIZATION
NaC	SOIL TYPE	---	FINAL SEEDING STABILIZATION
PH #2	PHASE #2 WORK AREA		

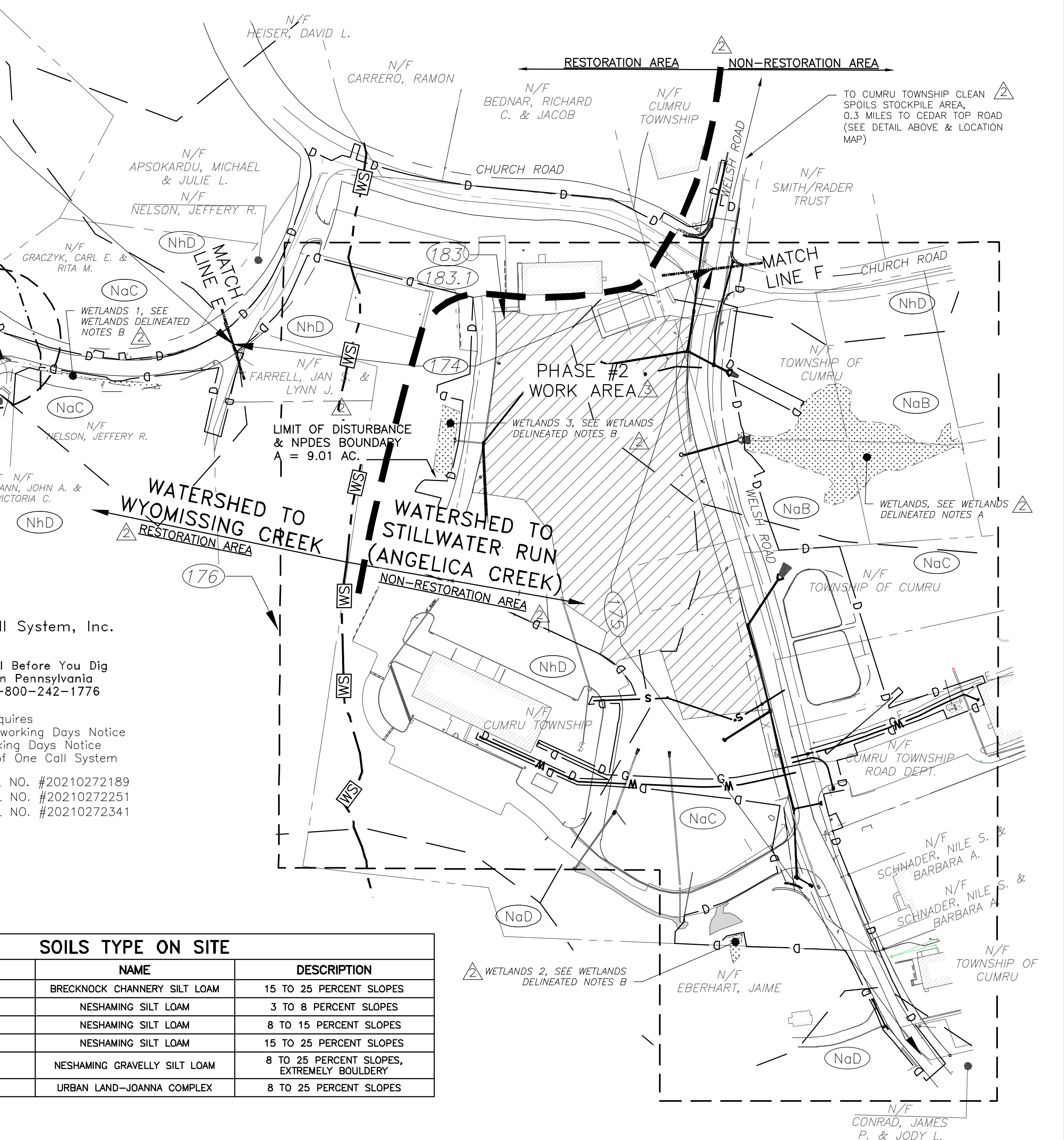
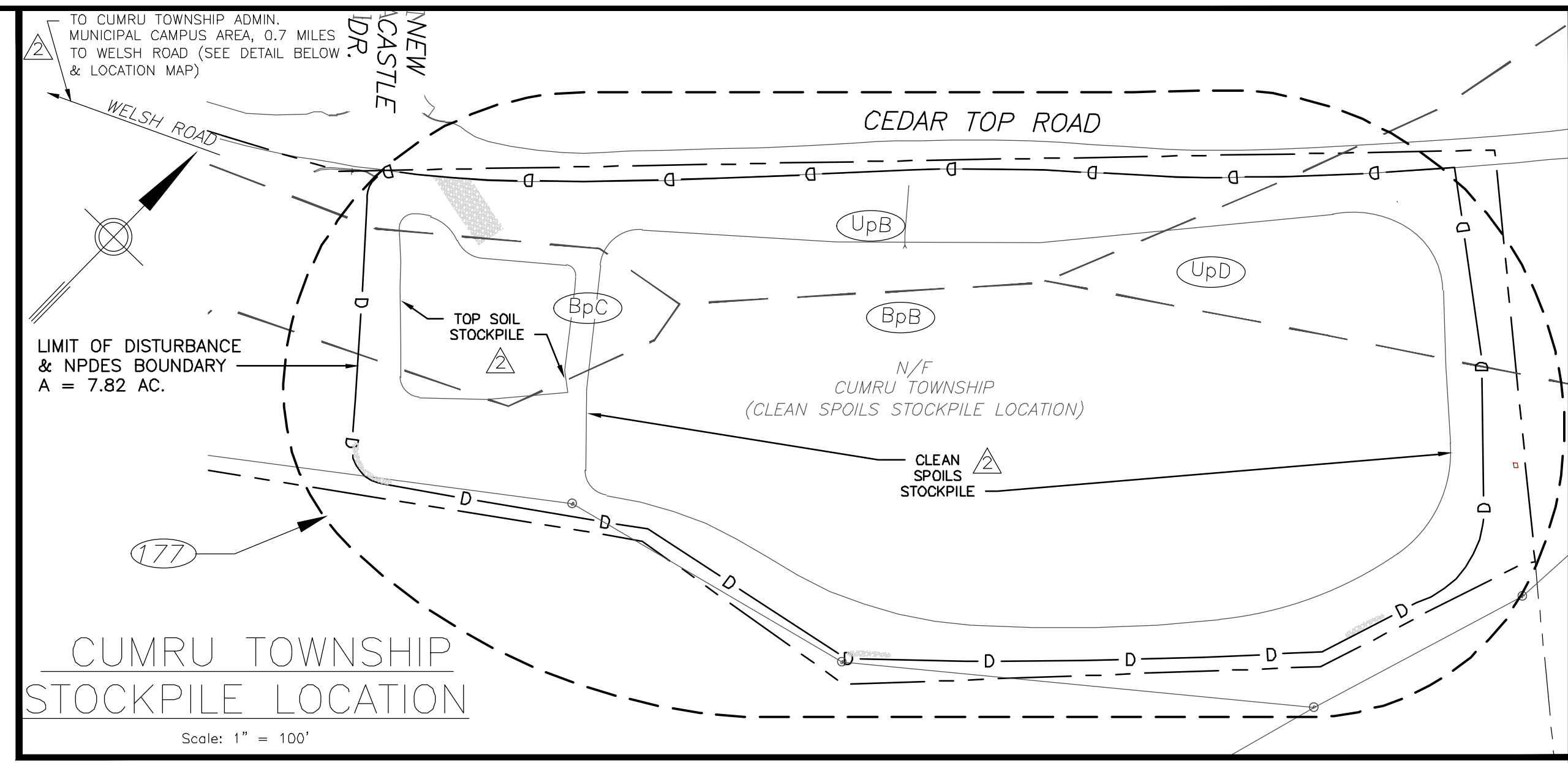
**PA CHAPTER 93**  
 1. WYOMISSING CREEK  
 STREAM USE DESCRIPTION: HQ (HIGH QUALITY WATERS), CWF (COLD WATER FISH), MF (MIGRATORY FISH), IT IS A HQ DESIGNATED WATERSHED.  
 2. ANGELICA CREEK  
 STREAM USE DESCRIPTION: CWF (COLD WATER FISH), MF (MIGRATORY FISH), IT IS NOT A HQ OR EV DESIGNATED WATERSHED.

Pennsylvania One Call System, Inc.  
 Call Before You Dig in Pennsylvania  
 1-800-242-1776

State Law Requires  
 Construction Phase: Three working Days Notice  
 Design Phase: Ten working Days Notice  
 Facility Owners: Member of One Call System  
 SERIAL NO. #20210272169, SERIAL NO. #20210272189  
 SERIAL NO. #20210272250, SERIAL NO. #20210272251  
 SERIAL NO. #20210272292, SERIAL NO. #20210272341

**SOILS TYPE ON SITE**

LEGEND	NAME	DESCRIPTION
BpD	BRECKNOCK CHANNERY SILT LOAM	15 TO 25 PERCENT SLOPES
NaB	NESHAMING SILT LOAM	3 TO 8 PERCENT SLOPES
NaC	NESHAMING SILT LOAM	8 TO 15 PERCENT SLOPES
NaD	NESHAMING SILT LOAM	15 TO 25 PERCENT SLOPES
NhD	NESHAMING GRAVELLY SILT LOAM	8 TO 25 PERCENT SLOPES, EXTREMELY BOULDERY
UpD	URBAN LAND-JOANNA COMPLEX	8 TO 25 PERCENT SLOPES

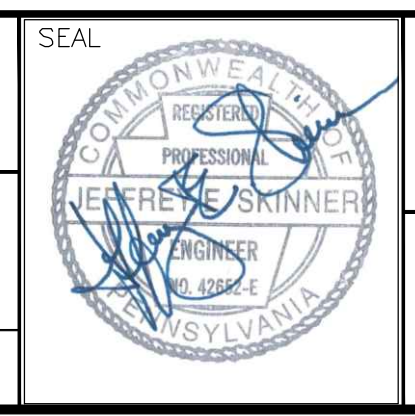


NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
1	NPDES PERMIT #PAD060047, PHASE #2 SUBMISSION	04-20-23	JES		
2	REVISED DRAWING PER DEP LETTER, 4/12/21	04/16/21	JES		
3	GENERAL REVISION	3/11/21	JES		



920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

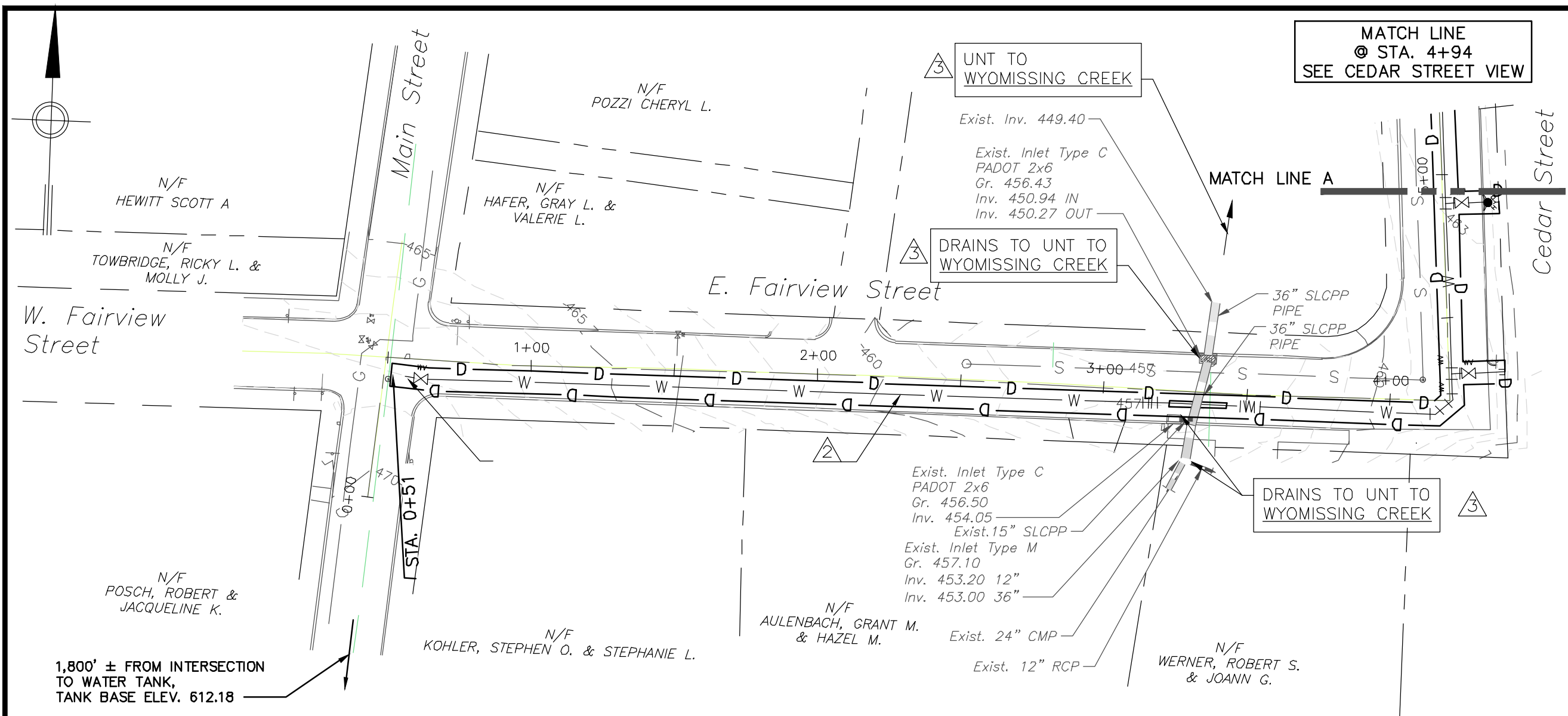
DESIGN ENGR.	GTA	APPROVED
DRAWN BY	RC	
PROJECT ENGR.	JES	APPROVED
PROJECT MGR.	JES	
CHECKED BY	JES	DATE 08/31/20



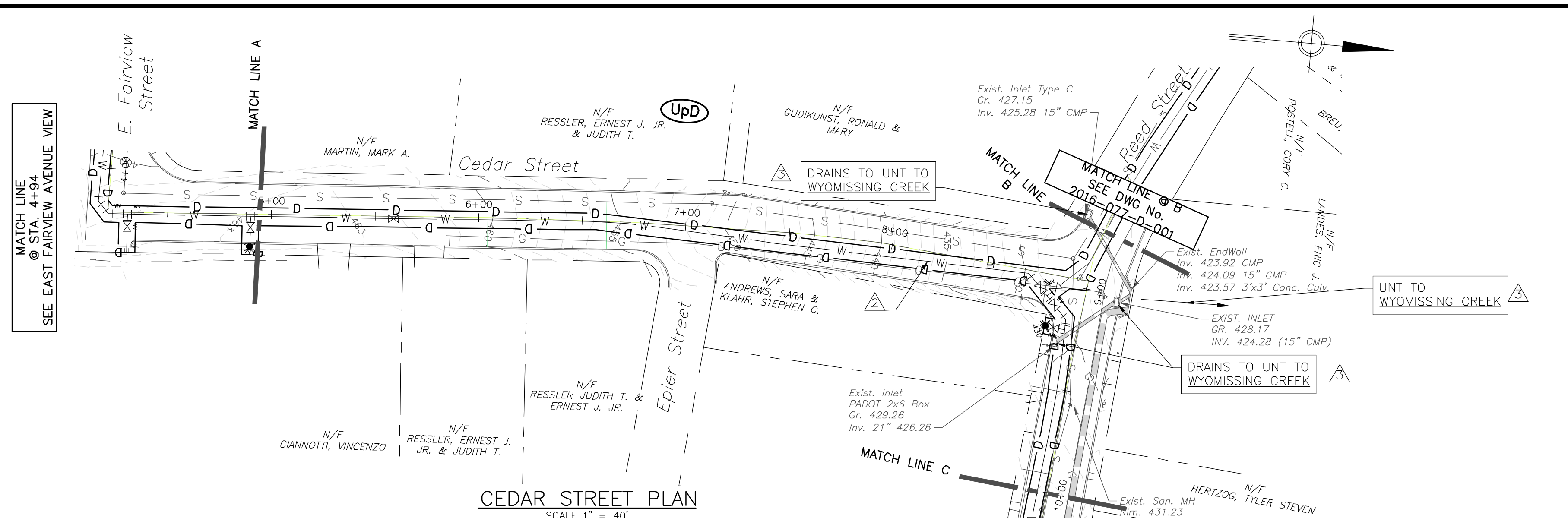
<b>CUMRU TOWNSHIP</b> BERKS COUNTY, PENNSYLVANIA		SCALE	AS NOTES
UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY			PROJECT NO. Z057000415
POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN PROJECT PCSM NOTES, LEGEND & MAP			DRAWING NO. 170
			SHEET OF

REGISTERED PROFESSIONAL ENGINEER

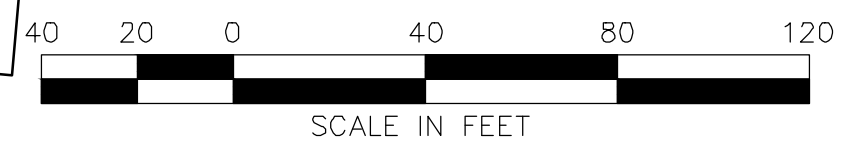
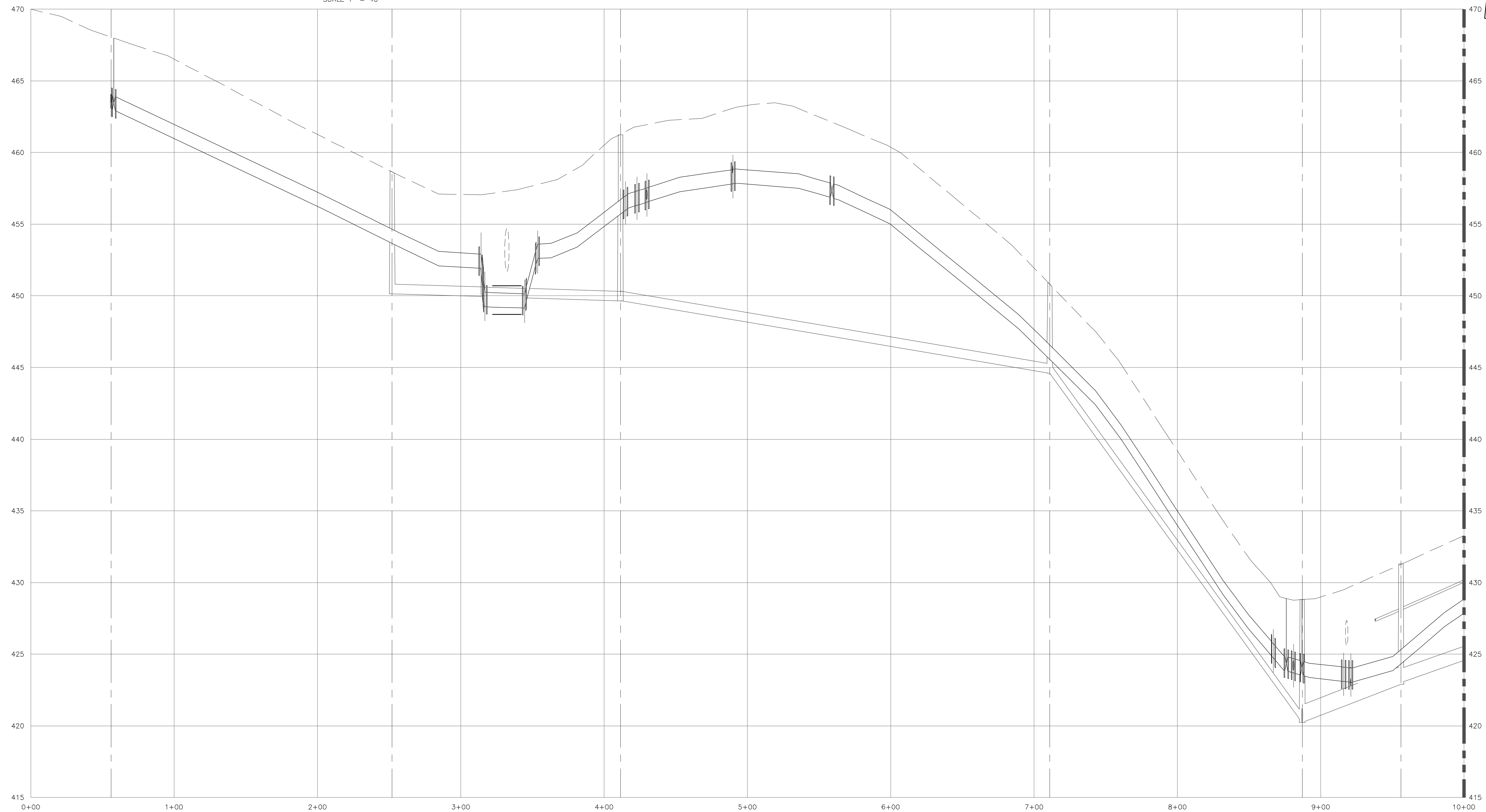




**EAST FAIRVIEW STREET PLAN**  
SCALE 1" = 40'



**CEDAR STREET PLAN**  
SCALE 1" = 40'

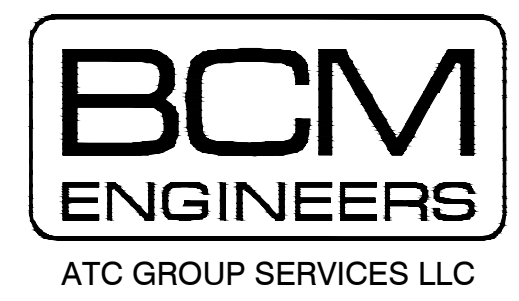


**SOIL TYPE**  
UpD - URBAN LAND-JOANNA COMPLEX, 8 TO 25 PERCENT SLOPES

**Pennsylvania One Call System, Inc.**  
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1-800-242-1776  
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SERIAL NO. #20210272250, SERIAL NO. #20210272251  
SERIAL NO. #20210272292, SERIAL NO. #20210272341

- NOTES:**
- FOR GENERAL NOTES SEE DWG. #100.
  - THE PCSM NOTES, LEGEND AND MAP, SEE DWG. #170.
  - STORMWATER STRUCTURE DATA SHOWN ON DRAWING #180.
  - REFER DRAWING #101 FOR CONSTRUCTION PLAN.
  - REFER DRAWING #151 FOR EROSION AND SEDIMENTATION CONTROL PLAN.

NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
1	REVISED DRAWING PER DEP LETTER,	6/23/21	JES	06/23/21	
2	REVISED DRAWING PER DEP LETTER,	4/12/21	JES	04/16/21	
3	GENERAL REVISIONS	3/11/21	JES	3/12/21	ISSUE FOR BIDS



ATC GROUP SERVICES LLC  
920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

DESIGN ENGR.	GTA	APPROVED
DRAWN BY	RC	
PROJECT ENGR.	JES	APPROVED
PROJECT MGR.	JES	
CHECKED BY	JFB	DATE 08/31/20

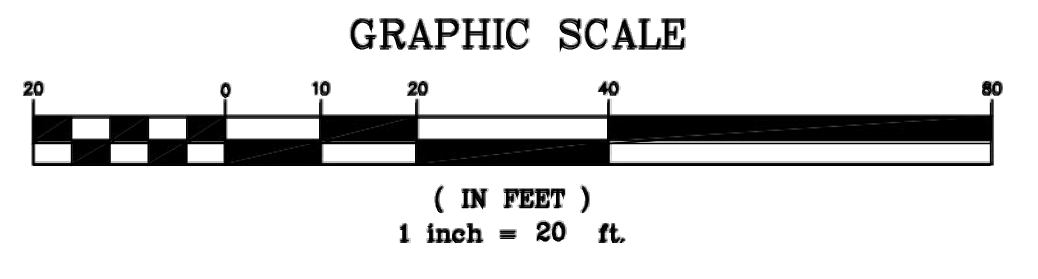
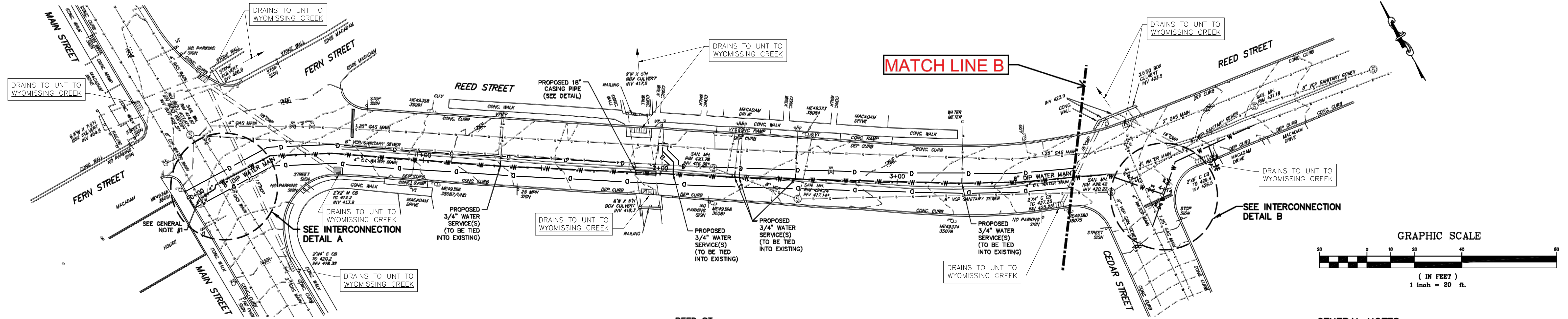


**CUMRU TOWNSHIP**  
**BERKS COUNTY, PENNSYLVANIA**  
UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS  
CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY  
POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN  
WATER MAIN INSTALLATION - STA. 0+40 TO 10+00  
EAST FAIRVIEW STREET AND CEDAR STREET

SCALE	AS NOTED
PROJECT NO.	Z057000415
DRAWING NO.	171
SHEET	OF

REGISTERED PROFESSIONAL ENGINEER





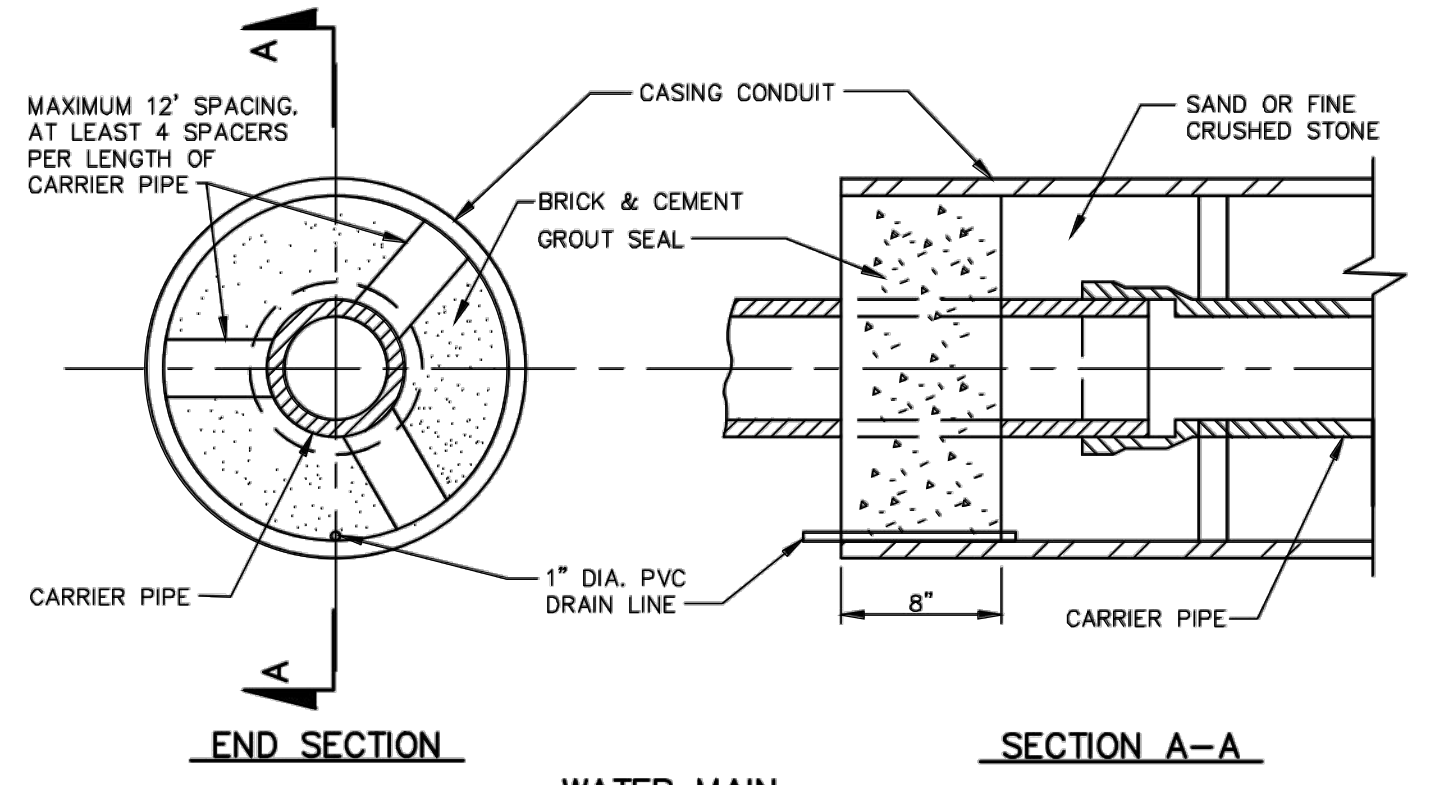
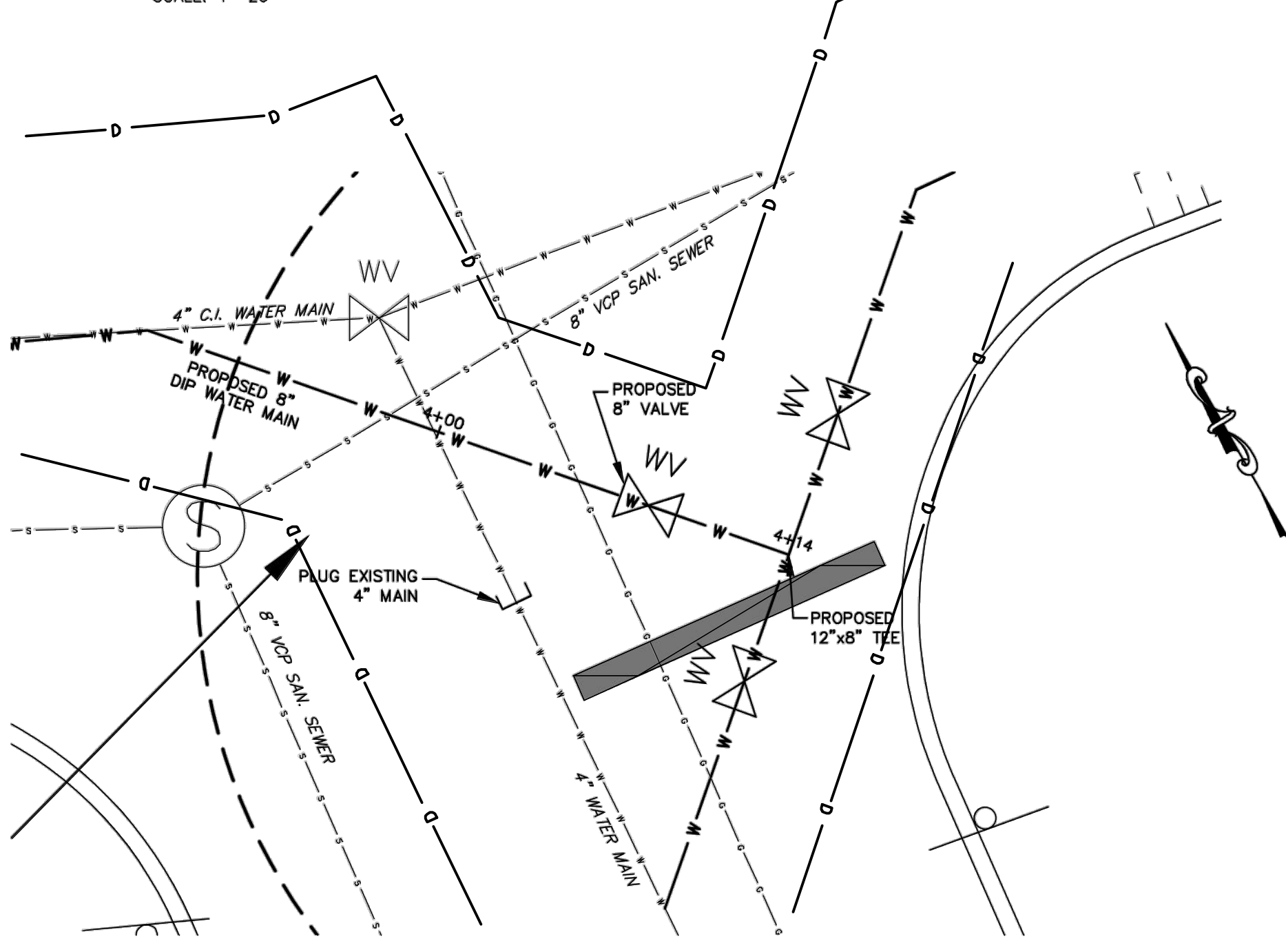
**PLAN NOTE**

\* - SANITARY SEWER INVERT DEPTHS PER BOROUGH SANITARY SEWER SYSTEM PLANS, DATED 3/24/60.

**GENERAL NOTES**

- EXPLORATORY DIGS MIGHT BE NEEDED AT MAIN STREET CONNECTION DUE TO APPROXIMATE DEPTH AND LOCATION FROM MAIN STREET WATER MAIN REPLACEMENT CONSTRUCTION PLANS.
- PROVIDE BACKFLOW PREVENTION FOR THE ENTIRE TEMPORARY MAIN. TEMPORARY MAIN SHALL BE CONNECTED TO THE FIRE HYDRANT AFTER IT IS INSTALLED AND TESTED.

**REED ST. (MAIN ST. TO CEDAR ST. STA. 0+00 TO 4+14) PROPOSED WATER MAIN PLAN**  
SCALE: 1"=20'



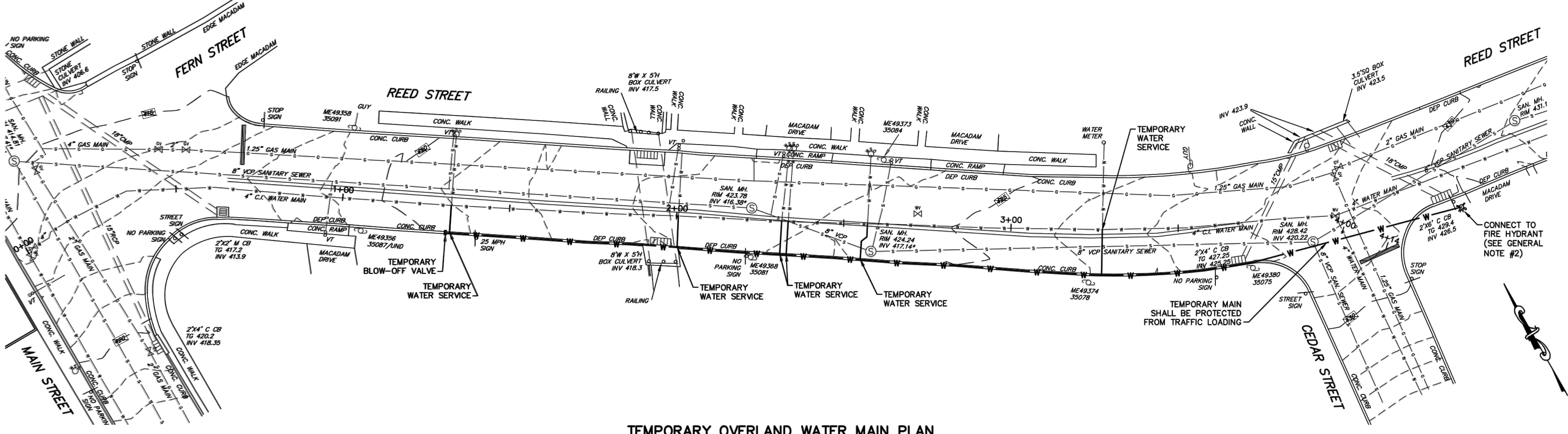
WATER MAIN DIAMETER	MINIMUM STEEL CASING DIAMETER	MINIMUM CASING THICKNESS
LESS THAN 6"	12" OD	0.250"
6", 8", AND 10"	18" OD	0.312"
12" AND 14"	24" OD	0.375"
18" AND 18"	30" OD	0.500"
20" AND 24"	36" OD	0.500"

- NOTES:**
- PREMANUFACTURED CASING SPACERS ARE REQUIRED EXCEPT IN SPECIAL CIRCUMSTANCES. REFER TO SPECIFICATIONS.
  - CASING SPACERS SHALL BE STAINLESS STEEL WITH NEOPRENE LINER AND POLYMER PLASTIC REFUSER.
  - CONTRACTOR MAY INSTALL TUNNEL LINER PLATE, WITH APPROVAL OF THE ENGINEER, AS AN ACCEPTABLE CASING CONDUIT. REFER TO SPECIFICATIONS.

**CARRIER PIPE AND CASING CONDUIT INSTALLATION DETAIL**

I, STEVEN K. HOFFMAN, DO HEREBY CERTIFY PURSUANT TO PENALTIES OF 18 PA. C.S.A. SEC. 4904 TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THE INFORMATION CONTAINED IN THE ACCOMPANYING PLANS, SPECIFICATIONS, AND REPORTS HAS BEEN PREPARED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE, IS TRUE AND CORRECT, AND IS IN CONFORMANCE WITH CHAPTER 105 OF THE RULES AND REGULATIONS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

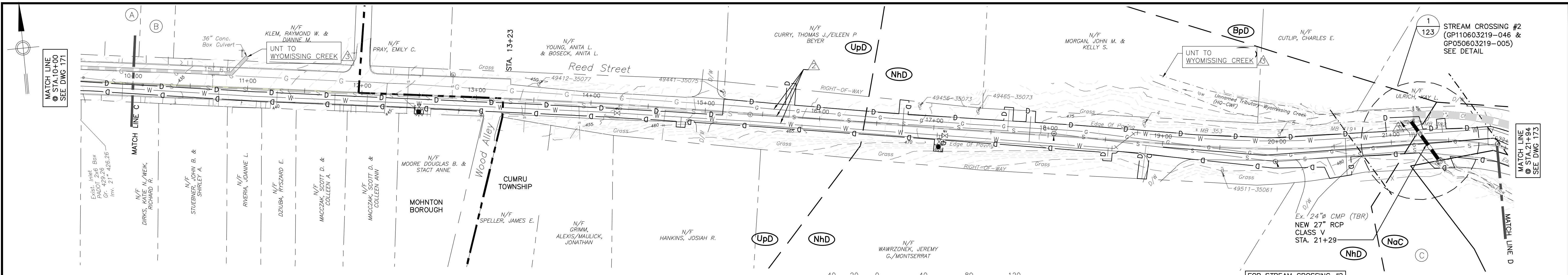
**POST CONSTRUCTION STORMWATER MANAGEMENT PLAN**



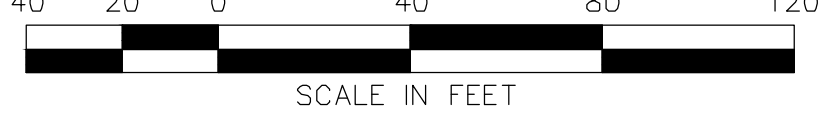
**TEMPORARY OVERLAND WATER MAIN PLAN**  
SCALE: 1"=20'

<b>BOROUGH OF SHILLINGTON</b> 2 EAST LANCASTER AVENUE, SHILLINGTON, PA 19607	
<b>REED STREET WATER MAIN REPLACEMENT</b>	
<b>PROPOSED WATER MAIN PLAN &amp; INTERCONNECTION DETAILS</b>	
MOHNTON BOROUGH, BERKS COUNTY, PENNSYLVANIA	
2. 3/8/21 REVISE TEMP. OVERLAND	
1. 11/4/20 PER BCCD REVIEW	
NO. DATE REVISIONS	75 COMMERCE DRIVE WYOMISSING, PA 19610-1038 PHONE: 610-375-8822 FAX: 610-375-8977 www.greatvalleyconsultants.com
<b>GVC GREAT VALLEY CONSULTANTS</b> ENGINEERS • ARCHITECTS • PLANNERS • SURVEYORS • CONSULTANTS	
DRAFTED BY: JRM	AS NOTED 9/11/20
CHECKED BY:	SCALE DATE
APPROVALS:	2016-077-D-001
DRAWING NUMBER	





REED STREET VIEW  
SCALE = 40'



FOR STREAM CROSSING #2

Structure/Activity unique identifier (Permit-Crossing Activity)	Aquatic Resource Type	Latitude old na83	Longitude old na83	Waters Name	PA Code Chapter 93 Designation	Work Proposed	DEP Impact Type temp/perp	Watercourse Impact Bank to top of Bank Length and Width	Floodway Impact Area Top of Bank Landward Length and Width	Wetland Impact Area Length and Width
GP-11-2-1P	Intermit.	40.282442	-75.975459	UNT to Wyomissing Creek	HQ-CWF	Stream Culvert Replacement	PERM.	45' x 2.5'		
GP-11-2-1T	Intermit.	40.282442	-75.975459	UNT to Wyomissing Creek	HQ-CWF	Excavation for Stream Culvert Replacement	TEMP.	23' x 3'	23' x 10'	
GP-11-2-2P	Intermit.	40.282442	-75.975459	UNT to Wyomissing Creek	HQ-CWF	Sanitary Sewer Replacement	PERM.	1' x 2'	1' x 117'	
GP-11-2-2T	Intermit.	40.282442	-75.975459	UNT to Wyomissing Creek	HQ-CWF	Excavation for Sanitary Sewer Replacement	TEMP.	3' x 2'	3' x 117'	
GP-5-2-3P	Intermit.	40.282442	-75.975459	UNT to Wyomissing Creek	HQ-CWF	New Water Pipe	PERM.	0.25' x 2'	0.25' x 117'	
GP-5-2-3T	Intermit.	40.282442	-75.975459	UNT to Wyomissing Creek	HQ-CWF	Excavation for New Water Pipe	TEMP.	3' x 2'	3' x 117'	
GP-5-2-4P	Intermit.	40.282442	-75.975459	UNT to Wyomissing Creek	HQ-CWF	New Gas Pipe	PERM.	0.25' x 2'	0.25' x 117'	
GP-5-2-4T	Intermit.	40.282442	-75.975459	UNT to Wyomissing Creek	HQ-CWF	Excavation for New Gas Pipe	TEMP.	1' x 2'	1' x 117'	

SOIL TYPE

- NaC - NESHAMINY SILT LOAM, 8 TO 15 PERCENT SLOPES
- NhD - NESHAMINY GRAVELLY SILT LOAM, 8 TO 25 PERCENT SLOPES, EXTREMELY BOULDERY
- UpD - URBAN LAND-JOANNA COMPLEX, 8 TO 25 PERCENT SLOPES

PROPERTY OWNERS:

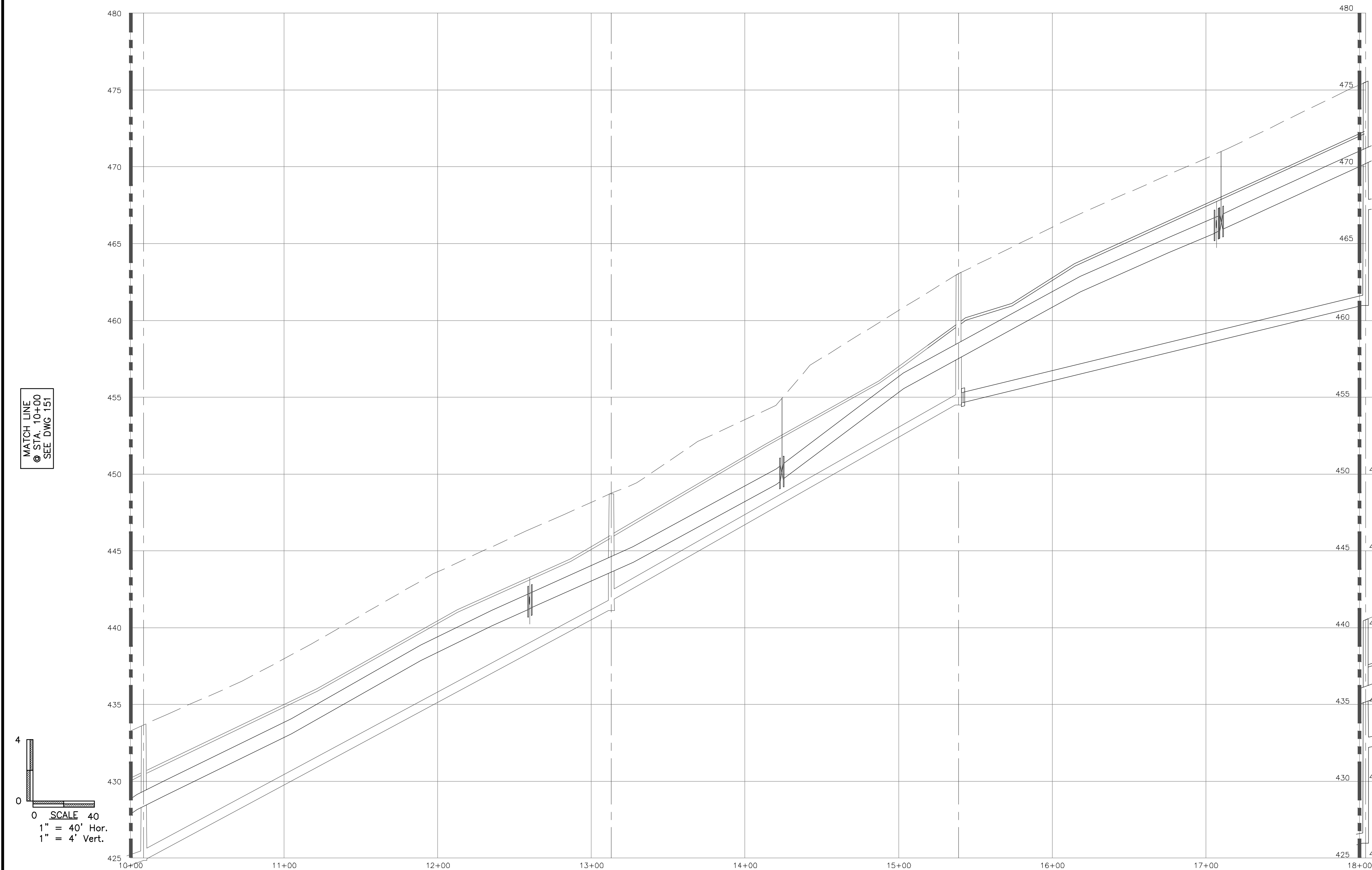
- (A) N/F HERTZOG, TYLER STEVEN
- (B) N/F KLEM, RAYMOND W. & DIANNE
- (C) N/F SHRIVER, MATTHEW J. & MELISSA J.

Pennsylvania One Call System, Inc.  
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State Law Requires  
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Design Phase: Ten working Days Notice  
Facility Owners: Member of One Call System  
SERIAL NO. #20210272169, SERIAL NO. #20210272189  
SERIAL NO. #20210272250, SERIAL NO. #20210272251  
SERIAL NO. #20210272292, SERIAL NO. #20210272341

NOTES:

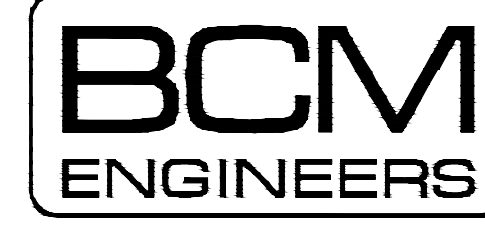
- FOR GENERAL NOTES SEE DWG. #100.
- THE PCSM NOTES, LEGEND AND MAP, SEE DWG. #170.
- STORMWATER STRUCTURE DATA SHOWN ON DRAWING #180.
- REFER DRAWING #102 FOR CONSTRUCTION PLAN.
- REFER DRAWING #152 FOR EROSION AND SEDIMENTATION CONTROL PLAN.



SCALE 40'  
1" = 40' Hor.  
1" = 4' Vert.

STREAM CROSSING #2  
(GP110603219-046)  
SEE DETAIL

NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
	REVISED DRAWING PER DEP LETTER,	6/23/21	JES	6/23/21	
	REVISED DRAWING PER DEP LETTER,	4/12/21	JES	4/12/21	
	GENERAL REVISIONS	3/11/21	JES	3/12/21	ISSUE FOR BIDS



ATC GROUP SERVICES LLC

920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

DESIGN ENGR.	GTA	APPROVED
DRAWN BY	RC	
PROJECT ENGR.	JES	APPROVED
PROJECT MGR.	JES	
CHECKED BY	JFB	DATE 08/31/20

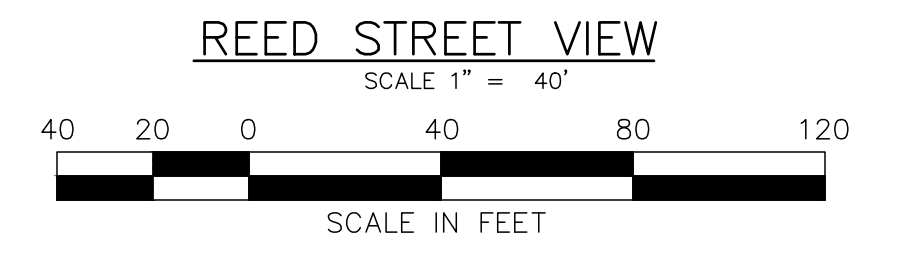
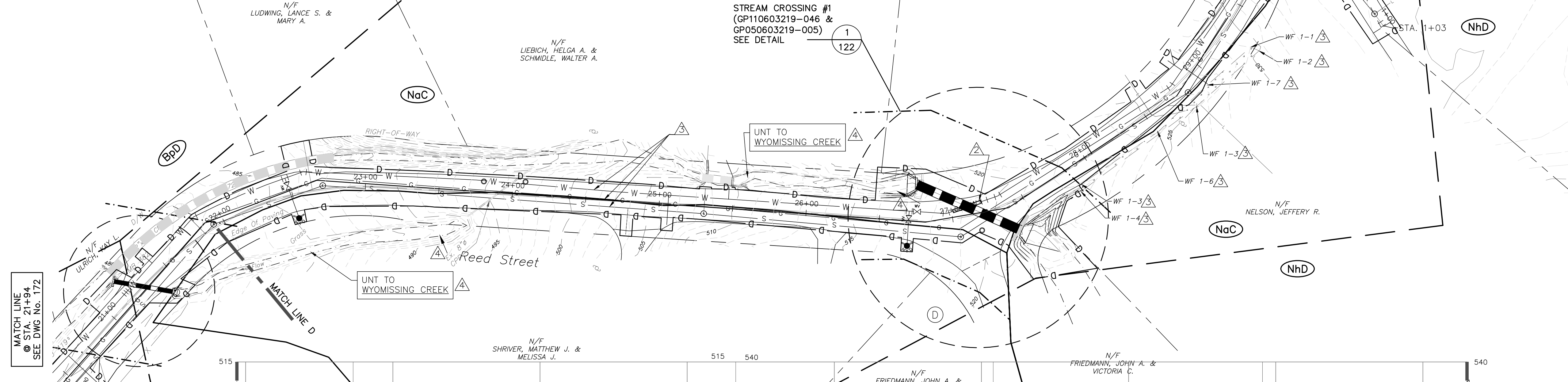


<b>CUMRU TOWNSHIP</b> <b>BERKS COUNTY, PENNSYLVANIA</b>		SCALE	AS NOTED
UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY		PROJECT NO.	Z057000415
POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN		DRAWING NO.	172
UTILITIES INSTALLATION AND REPLACEMENT - STA. 10+00 TO 21+94 REED STREET		SHEET	OF

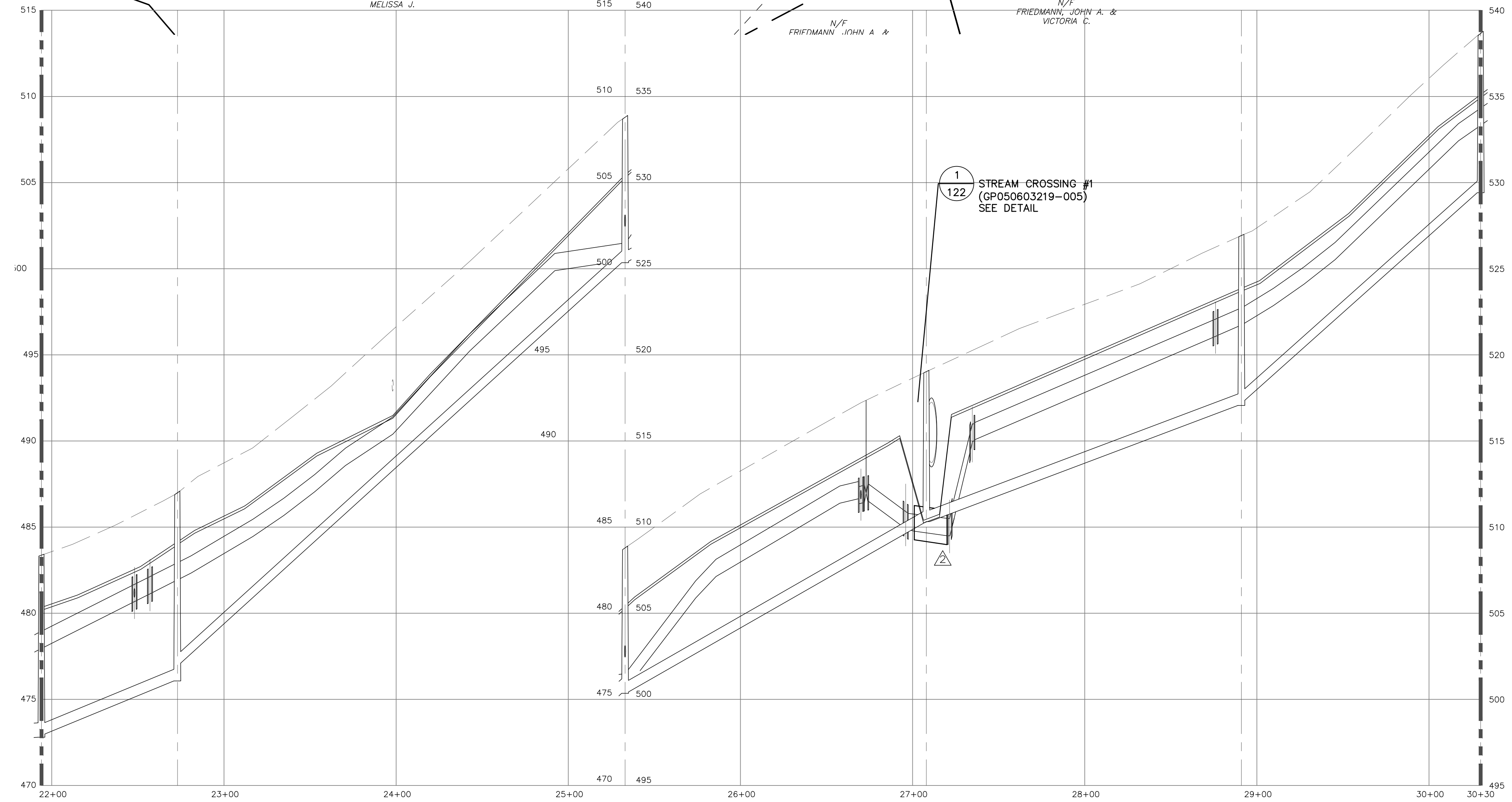


FOR STREAM CROSSING #1

Structure/Activity unique identifier (Permit Crossing Activity)	Aquatic Resource Type	Latitude dd nad83	Longitude dd nad83	Waters Name	PA Code Chapter 93 Designation	Work Proposed	DEP Impact Type temp/perm	Watercourse Impact Top of Bank to top of Bank Length and Width	Floodway Impact Area Top of Bank Landward Length and Width	Wetland Impact AREA Length and Width
GP-11-1-1P	Intermit.	40.282616	-75.973678	UNT to Wyomissing Creek	HQ-CWF	Stream Culvert Replacement	PERM.	123' x 9'		
GP-11-1-1T	Intermit.	40.282616	-75.973678	UNT to Wyomissing Creek	HQ-CWF	Excavation for Stream Culvert	TEMP.	148' x 11'	148' x 14'	
GP-11-1-2P	Intermit.	40.282616	-75.973678	UNT to Wyomissing Creek	HQ-CWF	Sanitary Sewer Replacement	PERM.	1' x 8'	1' x 130'	
GP-11-1-2T	Intermit.	40.282616	-75.973678	UNT to Wyomissing Creek	HQ-CWF	Excavation for Sanitary Sewer Replacement	TEMP.	3' x 8'	3' x 130'	
GP-5-1-3P	Intermit.	40.282616	-75.973678	UNT to Wyomissing Creek	HQ-CWF	New Water Pipe	PERM.	0.75' x 8'	0.75' x 130'	
GP-5-1-3T	Intermit.	40.282616	-75.973678	UNT to Wyomissing Creek	HQ-CWF	Excavation for New Water Pipe	TEMP.	3' x 8'	3' x 130'	
GP-5-1-4P	Intermit.	40.282616	-75.973678	UNT to Wyomissing Creek	HQ-CWF	New Gas Pipe	PERM.	0.25' x 8'	0.25' x 130'	
GP-5-1-4T	Intermit.	40.282616	-75.973678	UNT to Wyomissing Creek	HQ-CWF	Excavation for New Gas Pipe	TEMP.	1' x 8'	1' x 130'	



PROPERTY OWNERS:  
 (D) N/F FRIEDMANN, JOHN A. & VICTORIA C.



- NOTES:
- FOR GENERAL NOTES SEE DWG. #100.
  - THE PCSM NOTES, LEGEND AND MAP, SEE DWG. #170.
  - STORMWATER STRUCTURE DATA SHOWN ON DRAWING #180.
  - REFER DRAWING #103 FOR CONSTRUCTION PLAN.
  - REFER DRAWING #153 FOR EROSION AND SEDIMENTATION CONTROL PLAN.

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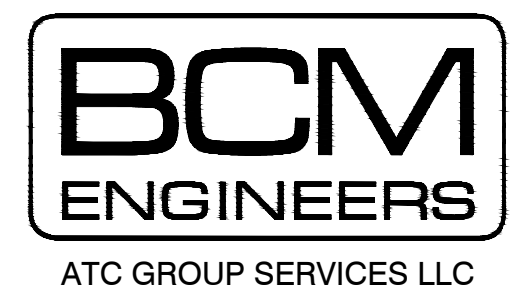
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 SERIAL NO. #20210272250, SERIAL NO. #20210272251  
 SERIAL NO. #20210272292, SERIAL NO. #20210272341

SOIL TYPE  
 UpD - URBAN LAND-JOANNA COMPLEX, 8 TO 25 PERCENT SLOPES  
 NHD - NESHAMINY GRAVELLY SILT LOAM, 8 TO 25 PERCENT SLOPES, EXTREMELY BOULDERY  
 NaC - NESHAMINY SILT LOAM, 8 TO 15 PERCENT SLOPES

REED STREET PROFILE  
 SCALE: V. 1" = 8'  
 H. 1" = 40'

NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
1	REVISED DRAWING PER DEP LETTER, 6/23/21	06/23/21	JES		
2	REVISED DRAWING PER DEP LETTER, 4/12/21	04/16/21	JES		
3	ADDED CASING PIPE TO WATER MAIN UNDER CULVERT	4/2/21	JES	4/6/21	ADDENDUM #1
4	GENERAL REVISIONS	3/11/21	JES	3/12/21	ISSUE FOR BIDS



ATC GROUP SERVICES LLC  
 920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

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DRAWN BY	RC		
PROJECT ENGR.	JES	APPROVED	
PROJECT MGR.	JES		
CHECKED BY	JFB	DATE	08/31/20



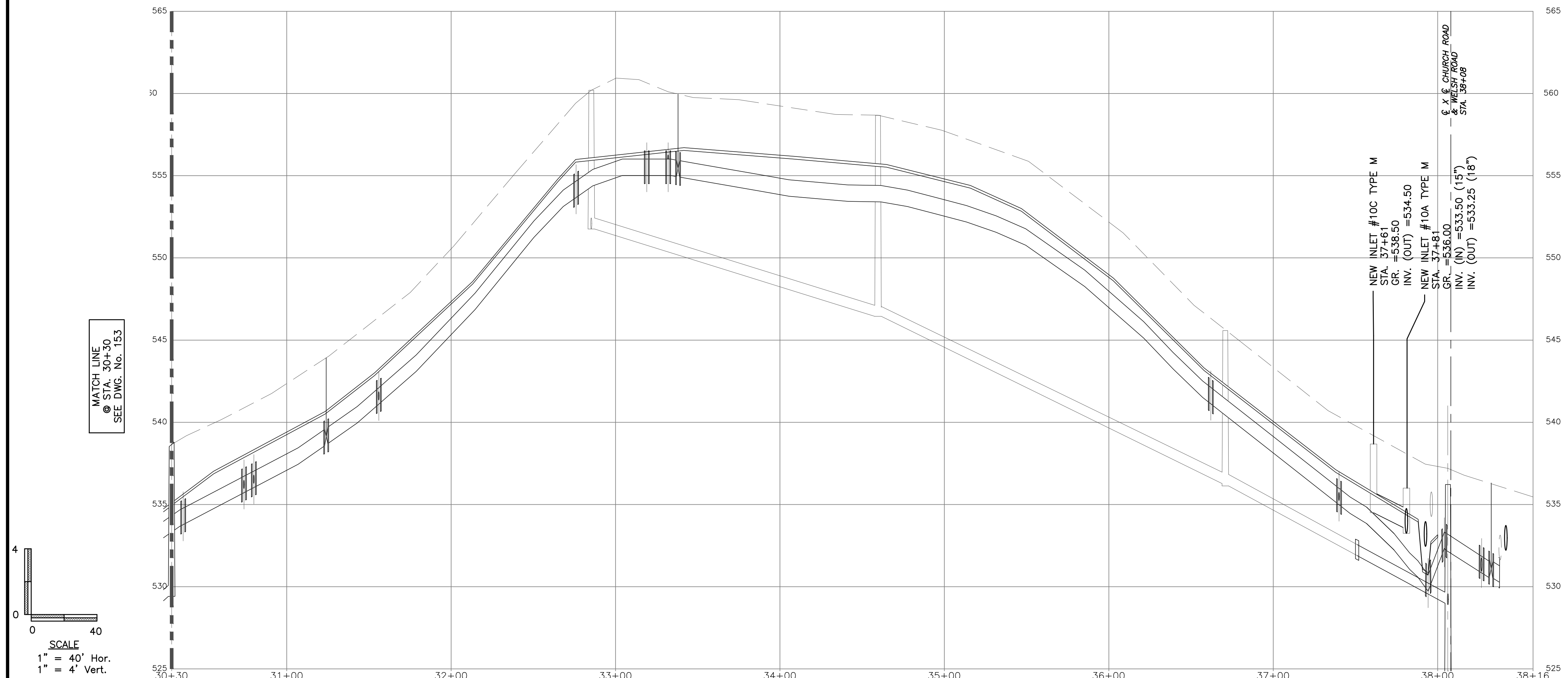
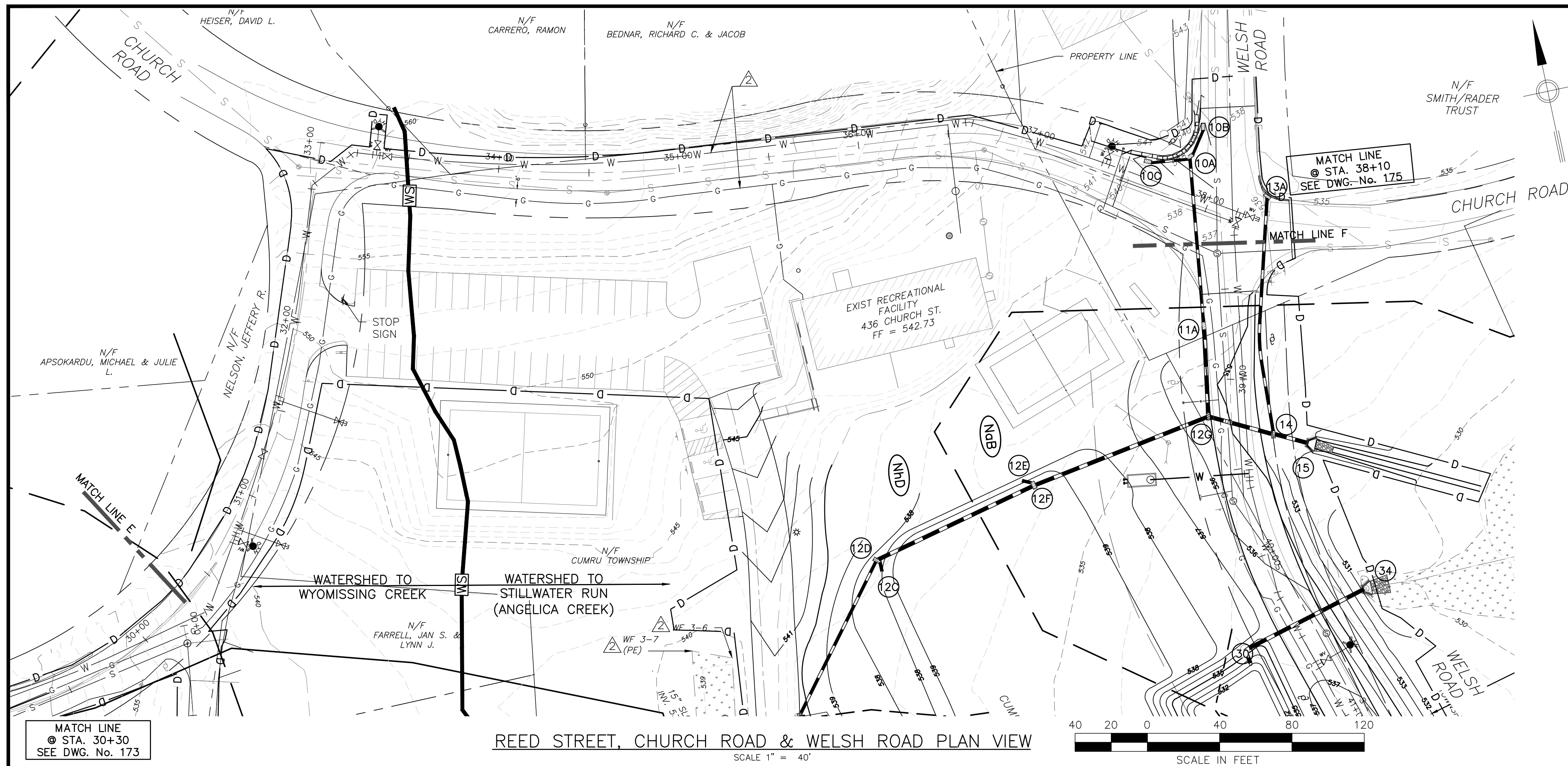
**CUMRU TOWNSHIP**  
**BERKS COUNTY, PENNSYLVANIA**  
 UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS  
 CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY

POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN  
 UTILITIES INSTALLATION AND REPLACEMENT - STA. 21+94 TO 30+30  
 REED STREET

SCALE	AS NOTED
PROJECT NO.	Z057000415
DRAWING NO.	173
SHEET	OF

REGISTERED PROFESSIONAL ENGINEER





- NOTES:
1. FOR GENERAL NOTES SEE DWG. #100.
  2. THE PCSM NOTES, LEGEND AND MAP, SEE DWG. #170.
  3. STORMWATER STRUCTURE DATA SHOWN ON DRAWING #180.
  4. REFER DRAWING #104 FOR CONSTRUCTION PLAN.
  5. REFER DRAWING #154 FOR EROSION AND SEDIMENTATION CONTROL PLAN.

Pennsylvania One Call System, Inc.



Call Before You Dig  
in Pennsylvania  
1-800-242-1776

State Law Requires  
Construction Phase: Three working Days Notice  
Design Phase: Ten working Days Notice  
Facility Owners: Member of One Call System

SERIAL NO. #20210272169, SERIAL NO. #20210272189  
SERIAL NO. #20210272250, SERIAL NO. #20210272251  
SERIAL NO. #20210272292, SERIAL NO. #20210272341

**SOIL TYPE**

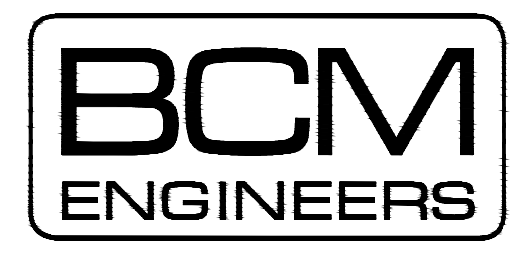
UpD - URBAN LAND-JOANNA COMPLEX, 8 TO 25 PERCENT SLOPES

NhD - NESHAMINY GRAVELLY SILT LOAM, 8 TO 25 PERCENT SLOPES, EXTREMELY BOULDERY

NaC - NESHAMINY SILT LOAM, 8 TO 15 PERCENT SLOPES

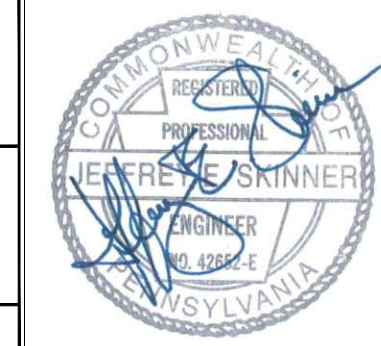
REED STREET, CHURCH ROAD & WELSH ROAD PROFILE

NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
1	REVISED DRAWING PER DEP LETTER, 4/12/21	04/16/21	JES		
2	GENERAL REVISIONS	3/11/21	JES	3/12/21	ISSUE FOR BIDS



ATC GROUP SERVICES LLC  
920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

DESIGN ENGR.	GTA	APPROVED
DRAWN BY	RC	
PROJECT ENGR.	JES	APPROVED
PROJECT MGR.	JES	
CHECKED BY	JFB	DATE 08/31/20



**CUMRU TOWNSHIP**  
**BERKS COUNTY, PENNSYLVANIA**

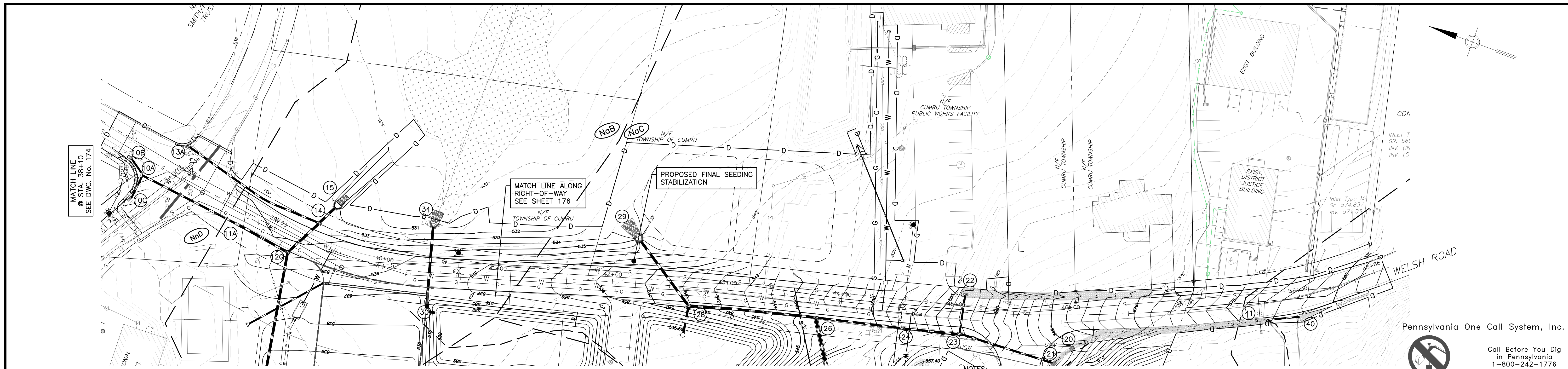
UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS  
CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY

POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN  
UTILITIES INSTALLATION AND REPLACEMENT - STA 30+30 TO 38+10  
REED STREET AND CHURCH ROAD

SCALE	AS NOTED
PROJECT NO.	Z057000415
DRAWING NO.	174
SHEET	OF

REGISTERED PROFESSIONAL ENGINEER

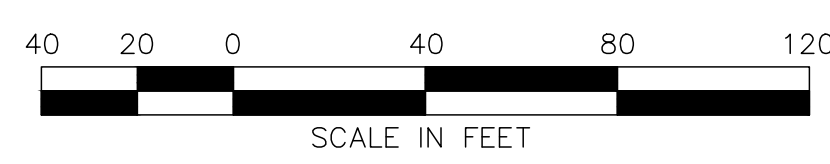




MATCH LINE  
@ STA. 38+10  
SEE DWG. No. 174

MATCH LINE ALONG  
RIGHT-OF-WAY  
SEE SHEET 176

PROPOSED FINAL SEEDING  
STABILIZATION



WELSH ROAD VIEW  
SCALE = 40'

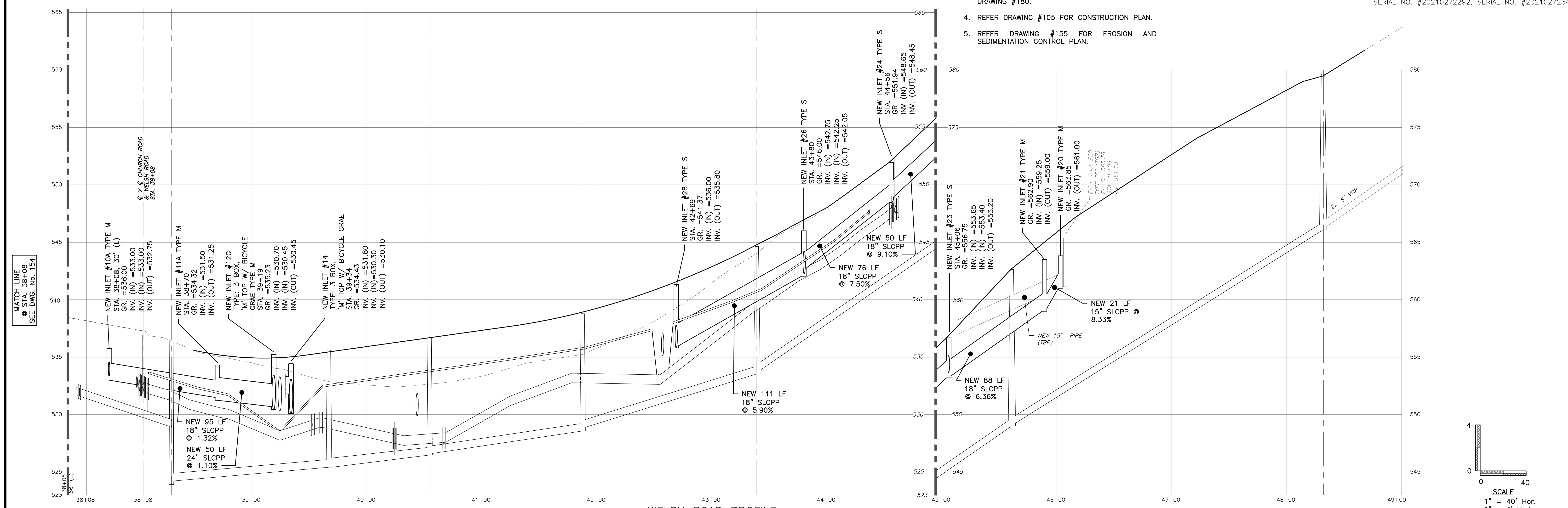
- NOTES:
- FOR GENERAL NOTES SEE DWG. #100.
  - THE PCSM NOTES, LEGEND AND MAP, SEE DWG. #170.
  - STORMWATER STRUCTURE DATA SHOWN ON DRAWING #180.
  - REFER DRAWING #105 FOR CONSTRUCTION PLAN.
  - REFER DRAWING #155 FOR EROSION AND SEDIMENTATION CONTROL PLAN.

SOIL TYPE  
UpD - URBAN LAND-JOANNA COMPLEX, 8 TO 25 PERCENT SLOPES  
NhD - NESHAMINY GRAVELLY SILT LOAM, 8 TO 25 PERCENT SLOPES, EXTREMELY BOULDERY  
NaC - NESHAMINY SILT LOAM, 8 TO 15 PERCENT SLOPES

Pennsylvania One Call System, Inc.  
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In Pennsylvania  
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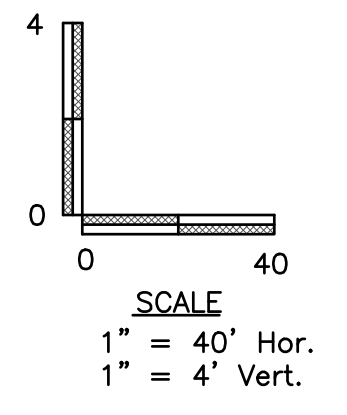
State Law Requires  
Construction Phase: Three working Days Notice  
Design Phase: Ten working Days Notice  
Facility Owners: Member of One Call System

SERIAL NO. #20210272169, SERIAL NO. #20210272189  
SERIAL NO. #20210272250, SERIAL NO. #20210272251  
SERIAL NO. #20210272292, SERIAL NO. #20210272341

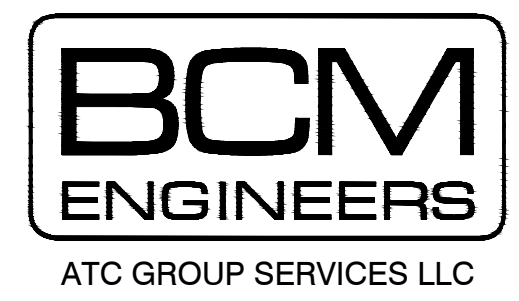


MATCH LINE  
@ STA. 38+08  
SEE DWG. No. 154

WELSH ROAD PROFILE  
SCALE: V. 1" = 4'  
H. 1" = 40'



NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
1	REVISED DRAWING PER DEP LETTER, 4/12/21	04/16/21	JES		
2	GENERAL REVISIONS	3/11/21	JES	3/12/21	ISSUE FOR BIDS



920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

DESIGN ENGR.	GTA	APPROVED	
DRAWN BY	RC	APPROVED	
PROJECT ENGR.	JES	APPROVED	
PROJECT MGR.	JES	APPROVED	
CHECKED BY	JFB	DATE	08/31/20



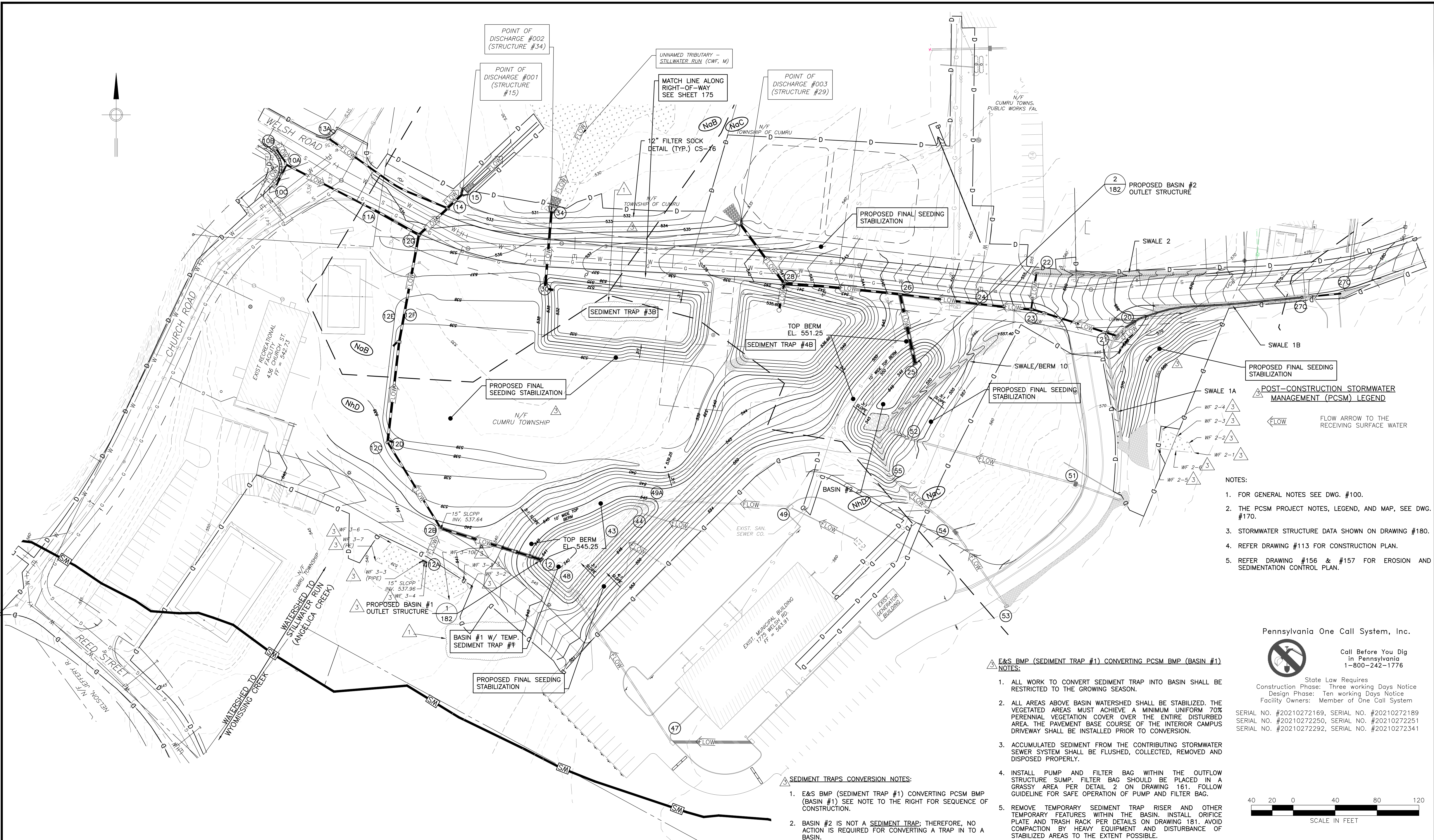
**CUMRU TOWNSHIP**  
**BERKS COUNTY, PENNSYLVANIA**

UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS  
CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY

POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN  
UTILITIES, ROADWAY AND DRAINAGE IMPROVEMENTS - STA. 38+10 TO 48+68  
WELSH ROAD

SCALE	AS NOTED
PROJECT NO.	Z057000415
DRAWING NO.	175
SHEET	OF





**POST-CONSTRUCTION STORMWATER MANAGEMENT (PCSM) LEGEND**

← FLOW → FLOW ARROW TO THE RECEIVING SURFACE WATER

**NOTES:**

- FOR GENERAL NOTES SEE DWG. #100.
- THE PCSM PROJECT NOTES, LEGEND, AND MAP, SEE DWG. #170.
- STORMWATER STRUCTURE DATA SHOWN ON DRAWING #180.
- REFER DRAWING #113 FOR CONSTRUCTION PLAN.
- REFER DRAWING #156 & #157 FOR EROSION AND SEDIMENTATION CONTROL PLAN.

Pennsylvania One Call System, Inc.



Call Before You Dig  
in Pennsylvania  
1-800-242-1776

State Law Requires  
Construction Phase: Three working Days Notice  
Design Phase: Ten working Days Notice  
Facility Owners: Member of One Call System

SERIAL NO. #20210272169, SERIAL NO. #20210272189  
SERIAL NO. #20210272250, SERIAL NO. #20210272251  
SERIAL NO. #20210272292, SERIAL NO. #20210272341

**E&S BMP (SEDIMENT TRAP #1) CONVERTING PCSM BMP (BASIN #1) NOTES:**

- ALL WORK TO CONVERT SEDIMENT TRAP INTO BASIN SHALL BE RESTRICTED TO THE GROWING SEASON.
- ALL AREAS ABOVE BASIN WATERSHED SHALL BE STABILIZED. THE VEGETATED AREAS MUST ACHIEVE A MINIMUM UNIFORM 70% PERENNIAL VEGETATION COVER OVER THE ENTIRE DISTURBED AREA. THE PAVEMENT BASE COURSE OF THE INTERIOR CAMPUS DRIVEWAY SHALL BE INSTALLED PRIOR TO CONVERSION.
- ACCUMULATED SEDIMENT FROM THE CONTRIBUTING STORMWATER SEWER SYSTEM SHALL BE FLUSHED, COLLECTED, REMOVED AND DISPOSED PROPERLY.
- INSTALL PUMP AND FILTER BAG WITHIN THE OUTFLOW STRUCTURE. PUMP AND FILTER BAG SHOULD BE PLACED IN A GRASSY AREA PER DETAIL 2 ON DRAWING 181. FOLLOW GUIDELINE FOR SAFE OPERATION OF PUMP AND FILTER BAG.
- REMOVE TEMPORARY SEDIMENT TRAP RISER AND OTHER TEMPORARY FEATURES WITHIN THE BASIN. INSTALL ORIFICE PLATE AND TRASH RACK PER DETAILS ON DRAWING 181. AVOID COMPACTION BY HEAVY EQUIPMENT AND DISTURBANCE OF STABILIZED AREAS TO THE EXTENT POSSIBLE.
- RE-STABILIZED DISTURBED AREAS WITHIN THE BASIN.
- REMOVE PUMP AND FILTER BAG ONCE THE BASIN HAS ACHIEVED FINAL STABILIZATION.

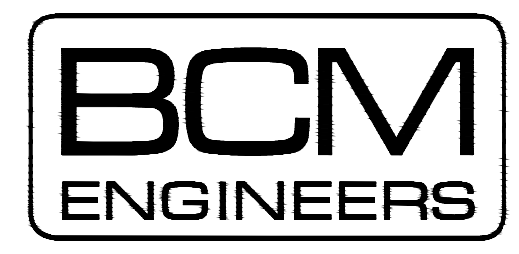
**SEDIMENT TRAPS CONVERSION NOTES:**

- E&S BMP (SEDIMENT TRAP #1) CONVERTING PCSM BMP (BASIN #1) SEE NOTE TO THE RIGHT FOR SEQUENCE OF CONSTRUCTION.
- BASIN #2 IS NOT A SEDIMENT TRAP; THEREFORE, NO ACTION IS REQUIRED FOR CONVERTING A TRAP IN TO A BASIN.
- SEDIMENT TRAP #3A & #3B AND SEDIMENT TRAP #4A & #4B IS NOT BEING CONVERTING IN TO A BASIN UNTIL CONSTRUCTION OF THE FIREHOUSE BUILDING BY OTHERS.

PROPOSED CUMRU TOWNSHIP LOT  
SCALE 1" = 40'



NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
△	REVISED DRAWING PER DEP LETTER, 4/12/21	04/16/21	JES		
△	GENERAL REVISIONS	3/11/21	JES		
△	BCCD REVIEW LETTER, DATED 10/01/2020	10/01/2020	JES	3/12/21	ISSUE FOR BIDS



ATC GROUP SERVICES LLC  
920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

DESIGN ENGR.	GTA	APPROVED	
DRAWN BY	RC		
PROJECT ENGR.	JES	APPROVED	
PROJECT MGR.	JES		
CHECKED BY	JFB	DATE	08/31/20

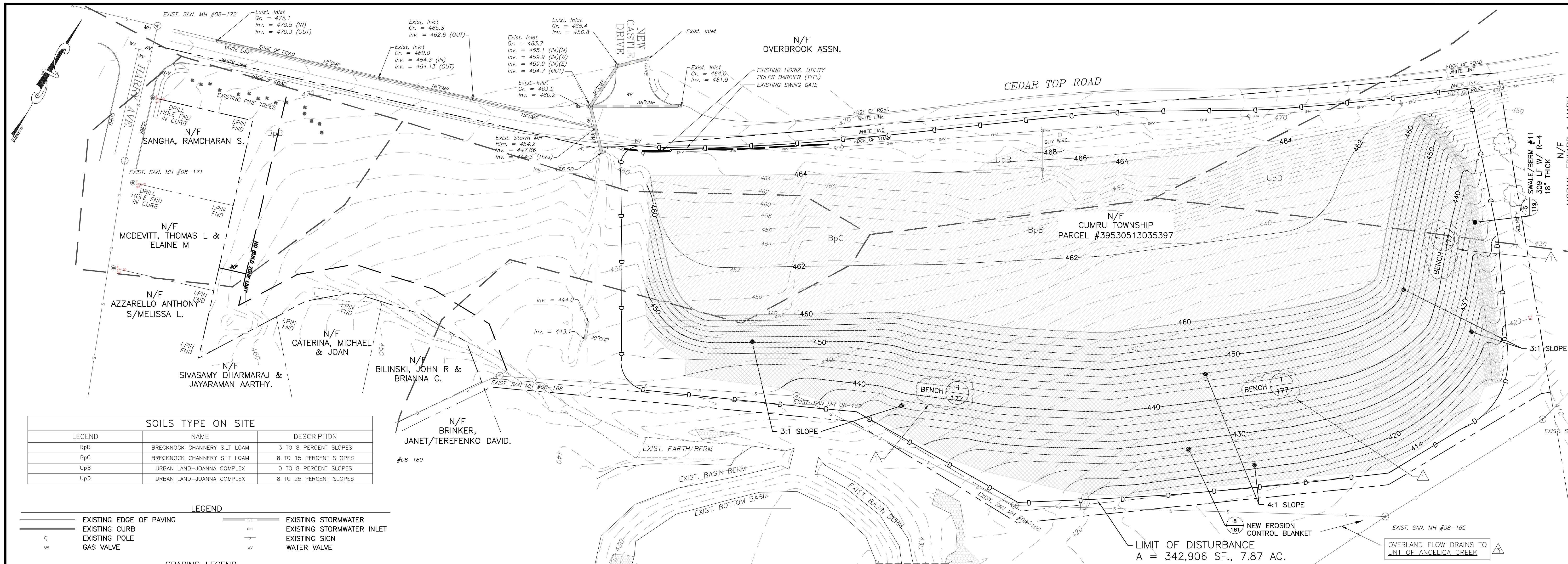


**CUMRU TOWNSHIP**  
**BERKS COUNTY, PENNSYLVANIA**  
UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS  
CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY  
POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN  
DRAINAGE AND GRADING  
CUMRU TOWNSHIP MUNICIPAL CAMPUS

SCALE	AS NOTED
PROJECT NO.	Z057000415
DRAWING NO.	176
SHEET	OF

REGISTERED PROFESSIONAL ENGINEER





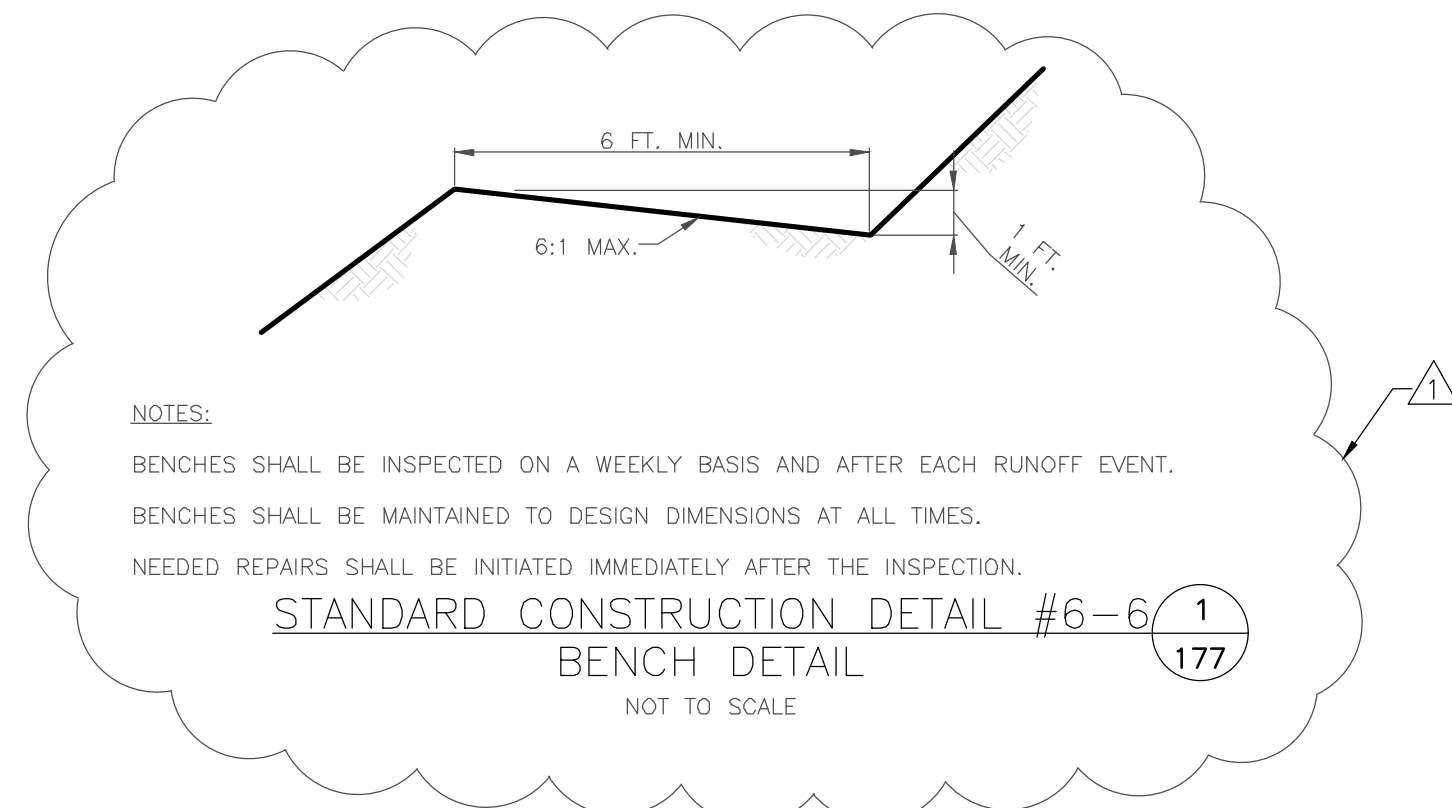
SOILS TYPE ON SITE		
LEGEND	NAME	DESCRIPTION
BpB	BRECKNOCK CHANNERY SILT LOAM	3 TO 8 PERCENT SLOPES
BpC	BRECKNOCK CHANNERY SILT LOAM	8 TO 15 PERCENT SLOPES
UpB	URBAN LAND-JOANNA COMPLEX	0 TO 8 PERCENT SLOPES
UpD	URBAN LAND-JOANNA COMPLEX	8 TO 25 PERCENT SLOPES

LEGEND			
	EXISTING EDGE OF PAVING		EXISTING STORMWATER INLET
	EXISTING CURB		EXISTING STORMWATER INLET
	EXISTING POLE		EXISTING SIGN
	GAS VALVE		WATER VALVE

GRADING LEGEND			
	LIMIT OF DISTURBANCE		FINAL SEEDING
	SOIL BOUNDARY		NEW EROSION CONTROL BLANKET
	SOIL TYPE		

- NOTES:**
- FOR GENERAL NOTES SEE DWG. #100.
  - THE PCSM PROJECT NOTES, LEGEND AND MAP, SEE DWG. #170.
  - REFER DRAWING #116 FOR CONSTRUCTION PLAN.
  - REFER DRAWING #158 FOR EROSION AND SEDIMENTATION CONTROL PLAN.



NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
1	REVISED DRAWING PER DEP LETTER, 6/23/21	06/23/21	JES		
2	GENERAL REVISIONS	03/11/21	JES		
3	BCCD REVIEW LETTER, DATED 10/01/2020	10/01/2020	JES	3/12/21	ISSUE FOR BIDS

**BCM ENGINEERS**  
ATC GROUP SERVICES LLC

920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

DESIGN ENGR.	RC	APPROVED	
DRAWN BY	RC		
PROJECT ENGR.	JES	APPROVED	
PROJECT MGR.	JES		
CHECKED BY	JFB	DATE	08/31/20



**CUMRU TOWNSHIP**  
**BERKS COUNTY, PENNSYLVANIA**

UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS  
CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY

POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN  
DRAINAGE AND GRADING  
CUMRU TOWNSHIP CLEAN SPOILS STOCKPILE LOCATION

SCALE	1" = 50'
PROJECT NO.	Z057000415
DRAWING NO.	177
SHEET	OF

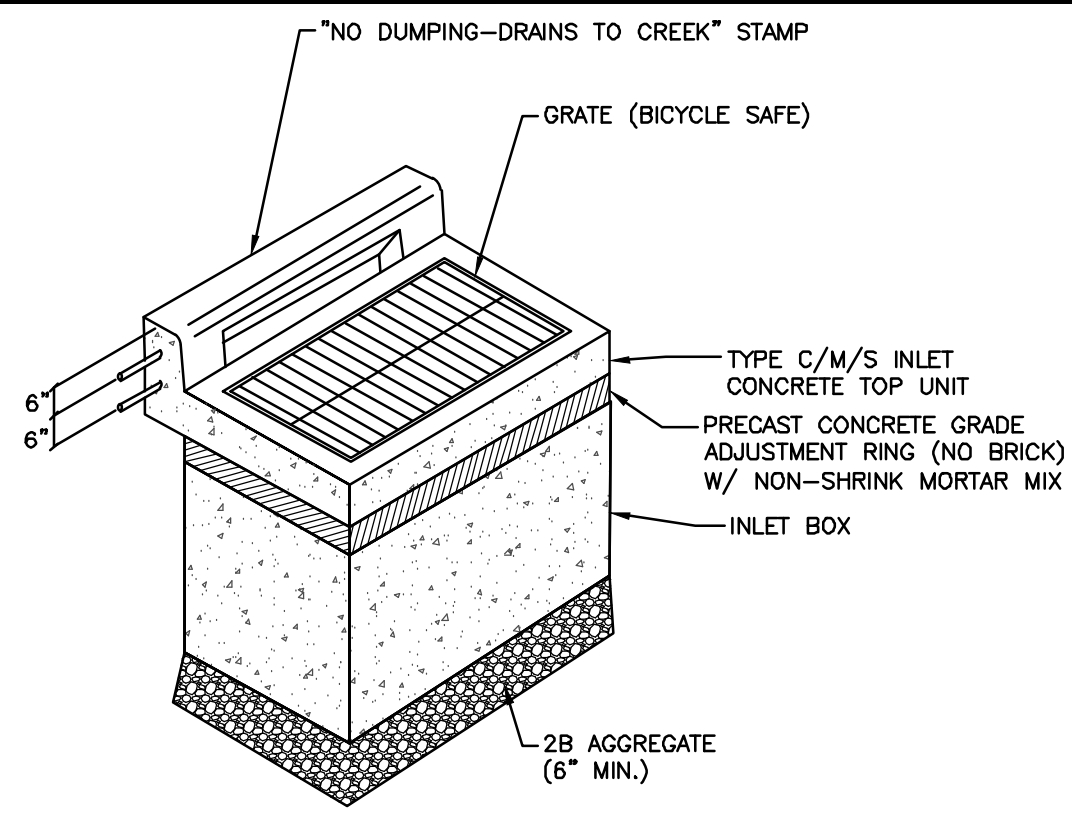








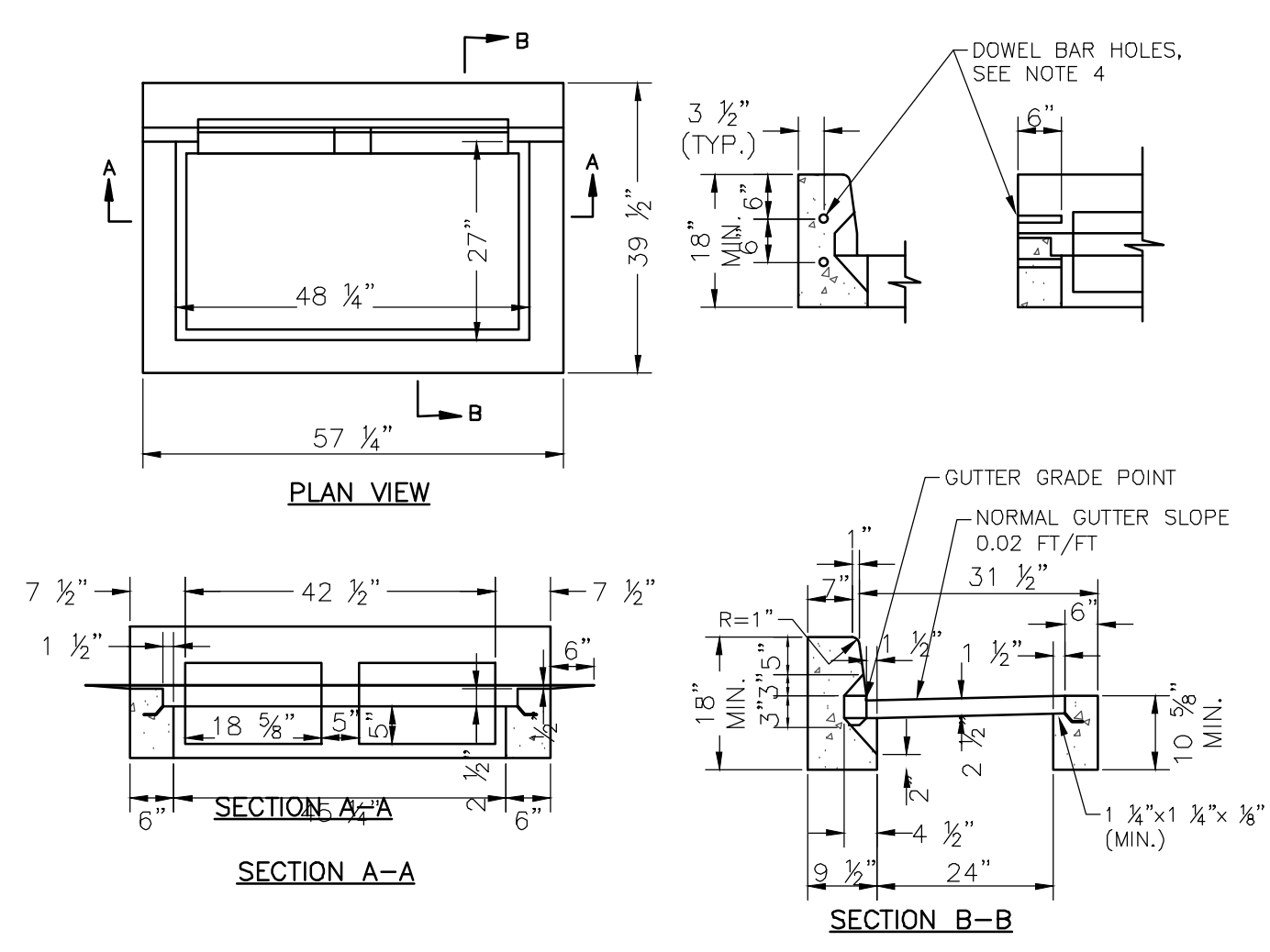




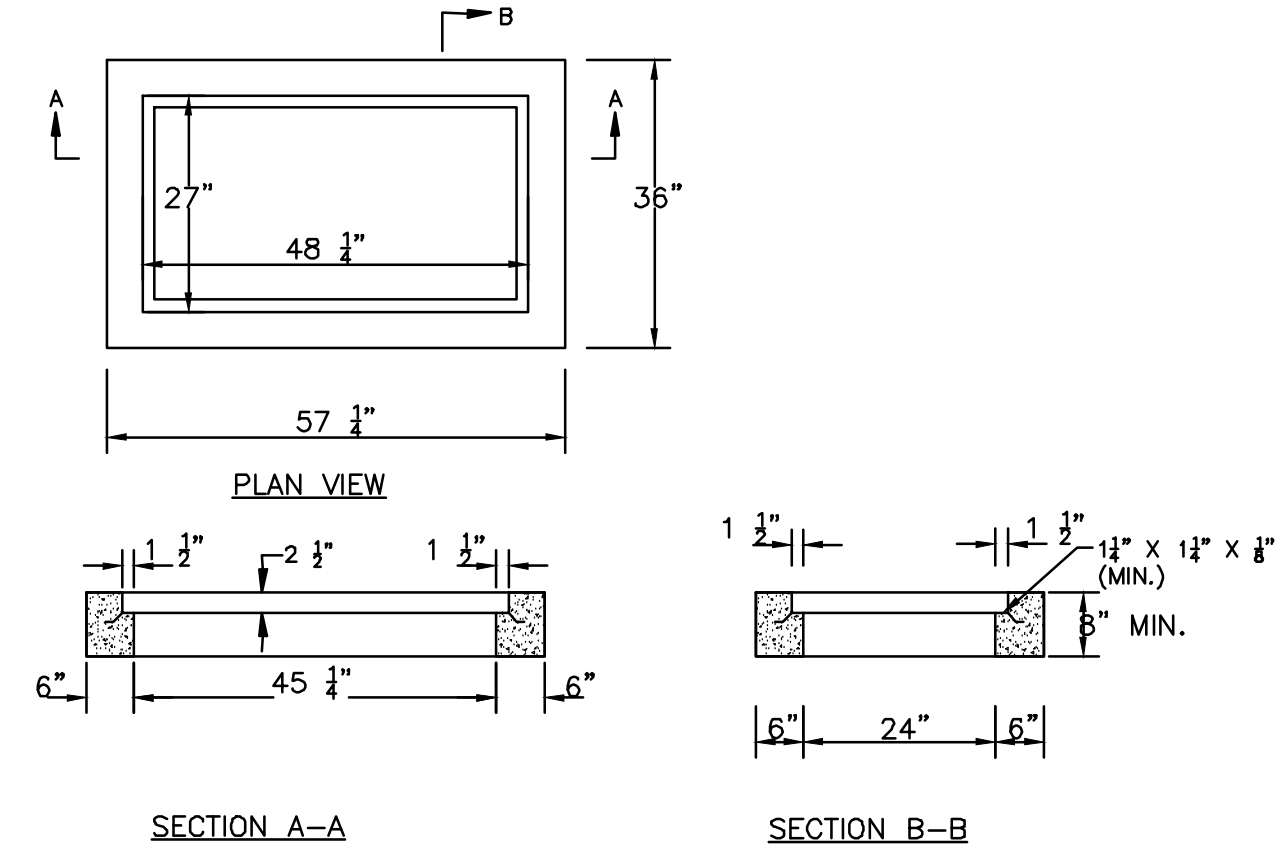
**INSTALLATION NOTES:**

- CONSTRUCTION IN ACCORDANCE WITH REQUIREMENTS OF PUB. 40B, SEC 605 FOR INLET ASSEMBLIES
- GRADE ADJUSTMENT SHALL BE PRECAST CONCRETE CONSTRUCTION (NO RED BRICK OR MASONRY BRICK)
- "NO DUMPING-DRAINS TO CREEK" TO BE STAMPED IN INLET TOP.
- GRATE TO BE BICYCLE SAFE.

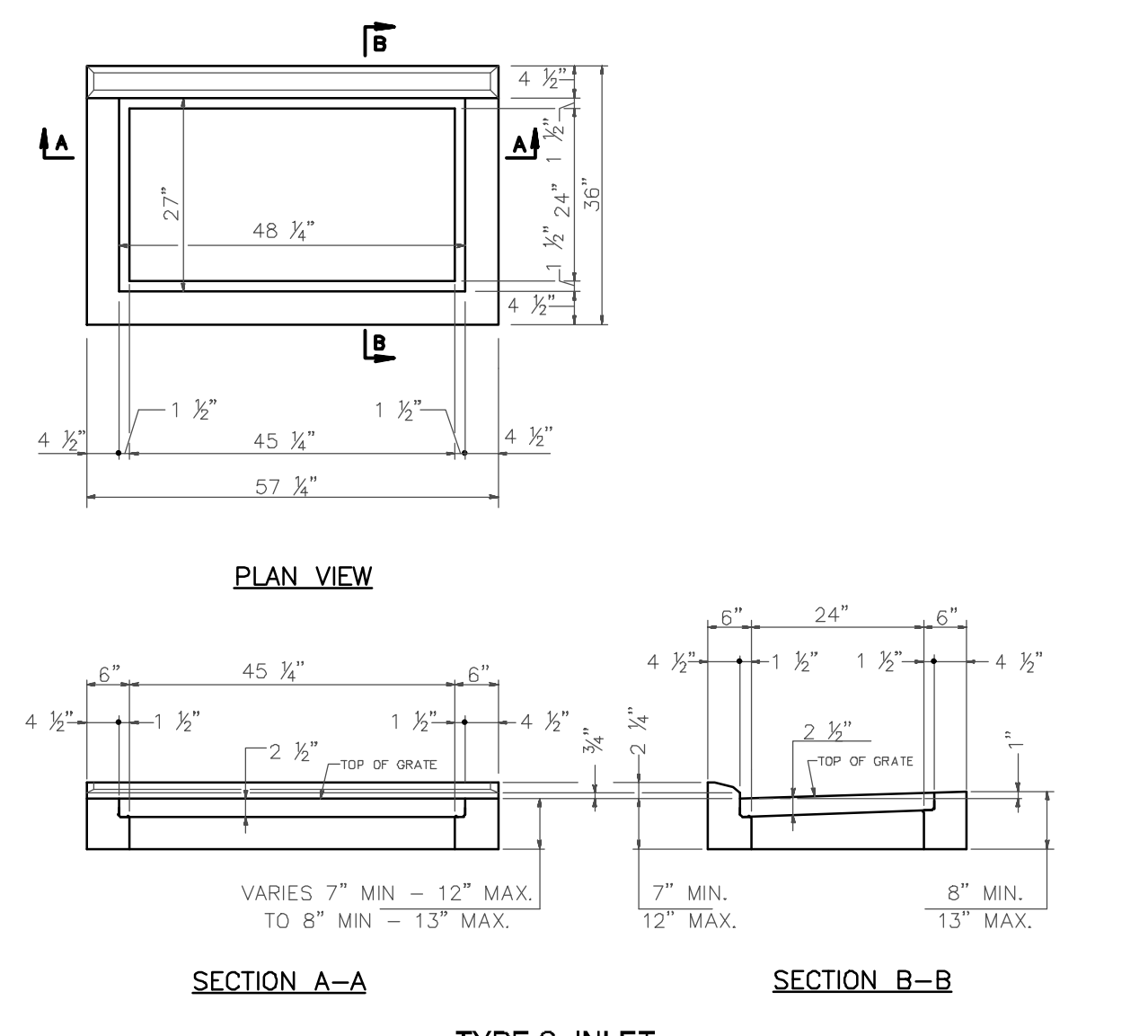
**PRECAST STORM INLET - TYPE C/M/S**



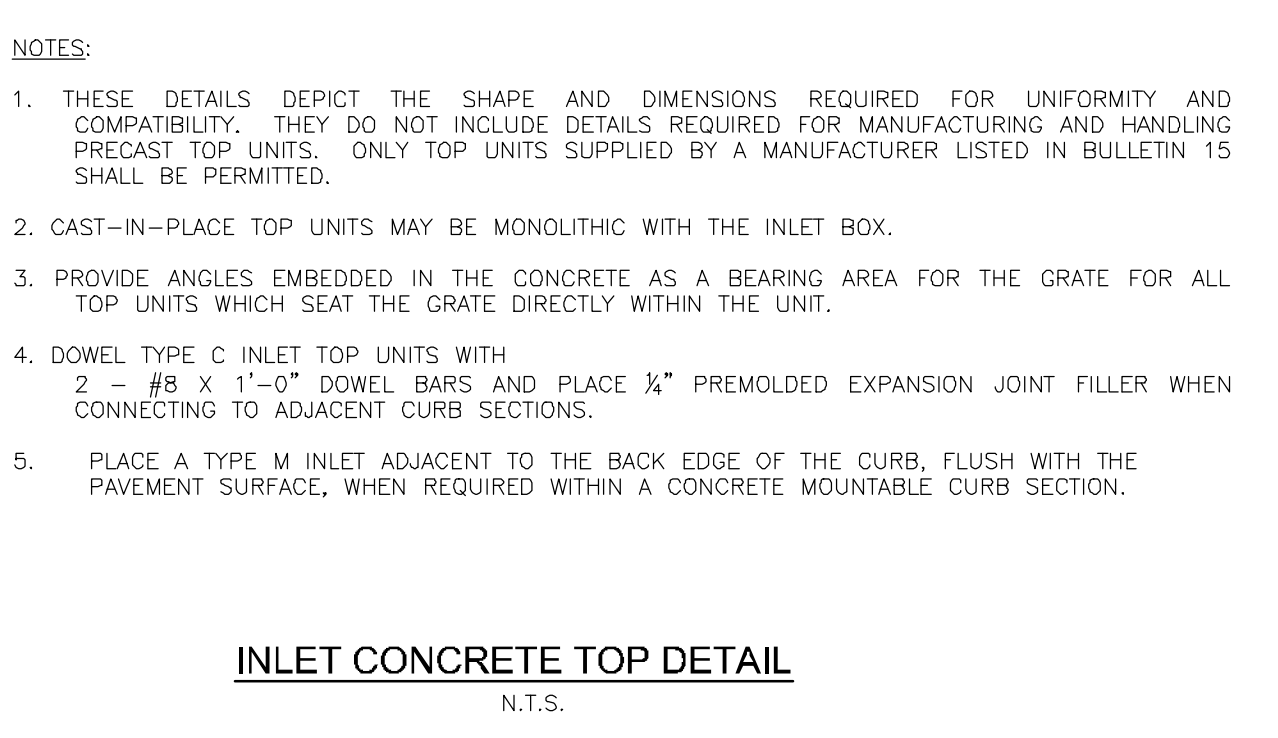
**TYPE C INLET**



**TYPE M INLET**

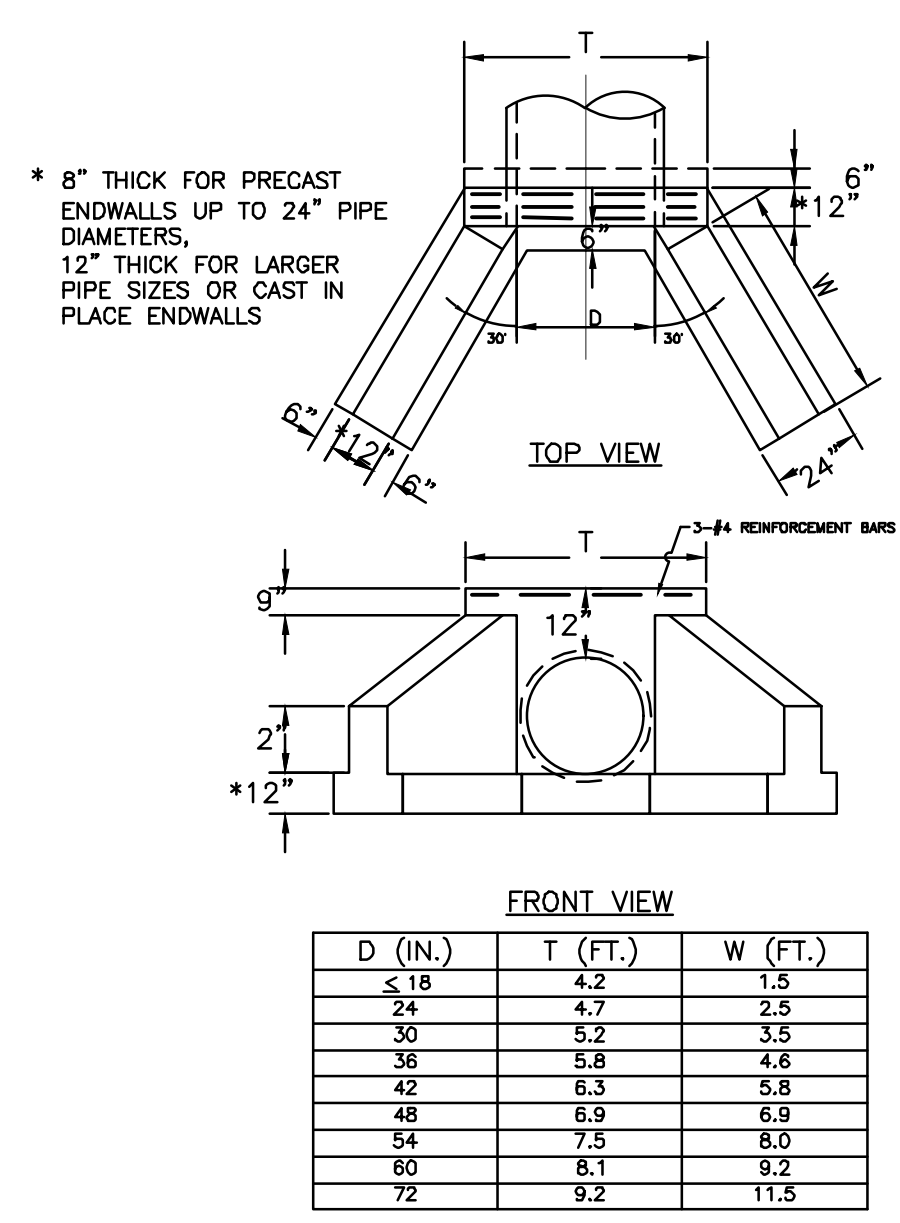


**TYPE S INLET**



- NOTES:**
- THESE DETAILS DEPICT THE SHAPE AND DIMENSIONS REQUIRED FOR UNIFORMITY AND COMPATIBILITY. THEY DO NOT INCLUDE DETAILS REQUIRED FOR MANUFACTURING AND HANDLING PRECAST TOP UNITS. ONLY TOP UNITS SUPPLIED BY A MANUFACTURER LISTED IN BULLETIN 15 SHALL BE PERMITTED.
  - CAST-IN-PLACE TOP UNITS MAY BE MONOLITHIC WITH THE INLET BOX.
  - PROVIDE ANGLES EMBEDDED IN THE CONCRETE AS A BEARING AREA FOR THE GRATE FOR ALL TOP UNITS WHICH SEAT THE GRATE DIRECTLY WITHIN THE UNIT.
  - DOWEL TYPE C INLET TOP UNITS WITH 2 - #8 X 1'-0" DOWEL BARS AND PLACE 1/2" PREMOLDED EXPANSION JOINT FILLER WHEN CONNECTING TO ADJACENT CURB SECTIONS.
  - PLACE A TYPE M INLET ADJACENT TO THE BACK EDGE OF THE CURB, FLUSH WITH THE PAVEMENT SURFACE, WHEN REQUIRED WITHIN A CONCRETE MOUNTABLE CURB SECTION.

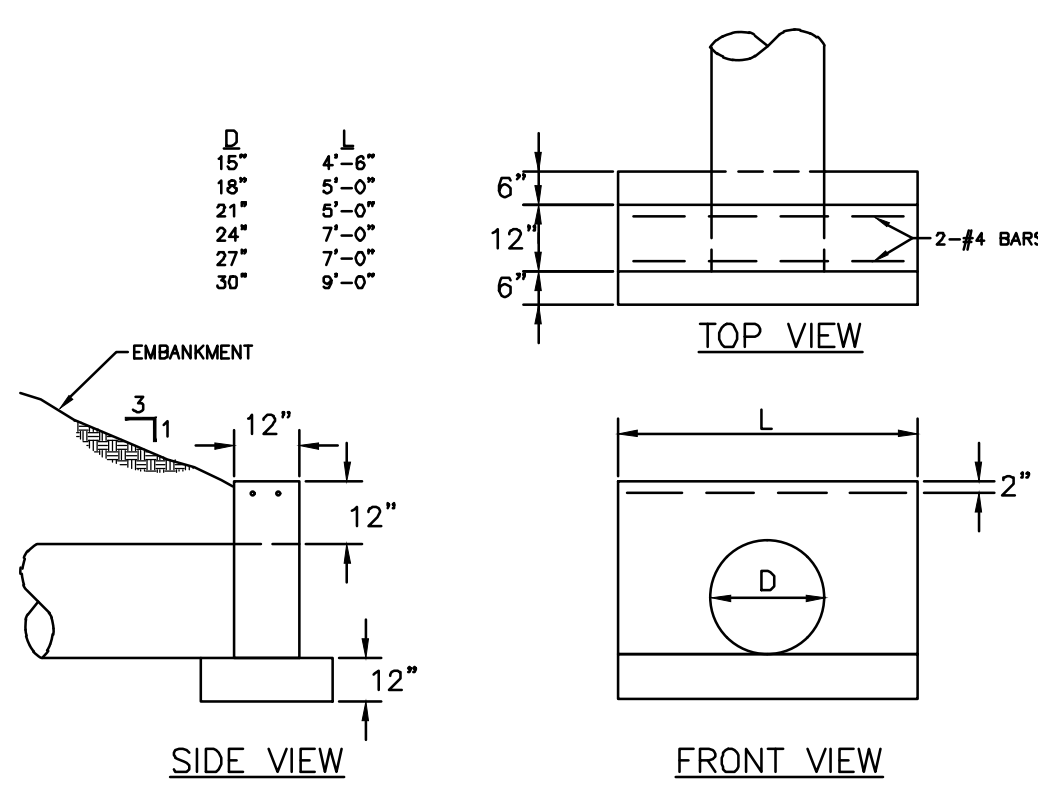
**INLET CONCRETE TOP DETAIL**  
N.T.S.



D (IN.)	T (FT.)	W (FT.)
18	4.2	1.5
24	4.7	2.5
30	5.2	3.5
36	5.8	4.5
42	6.3	5.8
48	6.9	6.9
54	7.5	8.0
60	8.1	9.2
72	9.2	11.5

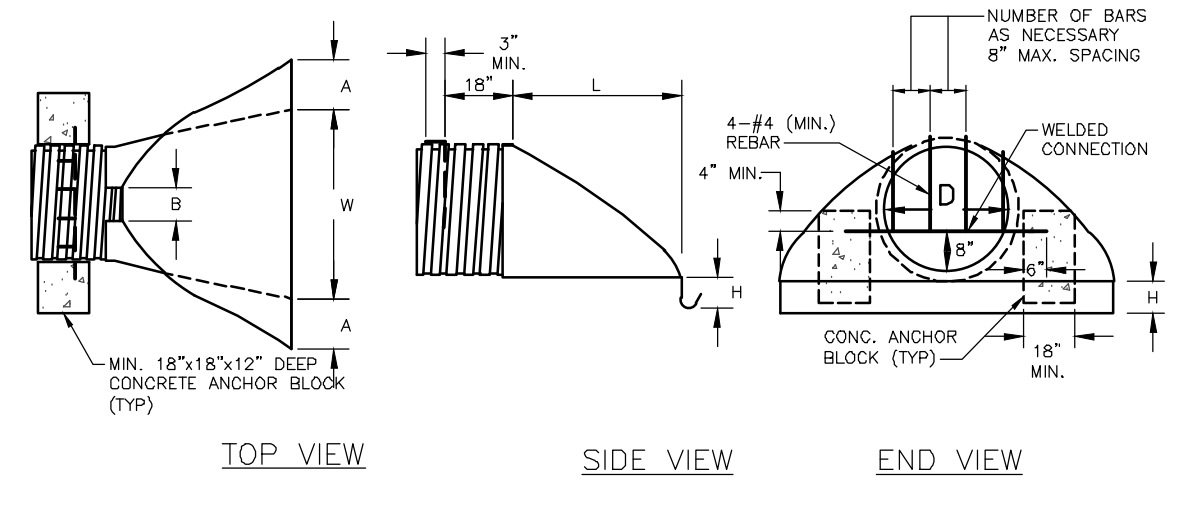
- NOTES:**
- DIMENSION NOT SHOWN SHALL BE EQUAL TO THOSE REQUIRED BY PENNDOT AS SHOWN IN THE STANDARDS FOR ROADWAY CONSTRUCTION.
  - OTHER SIZES TO BE APPROVED BY CUMRU TOWNSHIP

**PADOT TYPE 'DW' ENDWALL / HEADWALL DETAIL**  
ENDWALL #1, #15, #29 + HEADWALLS #2 #4  
N.T.S.

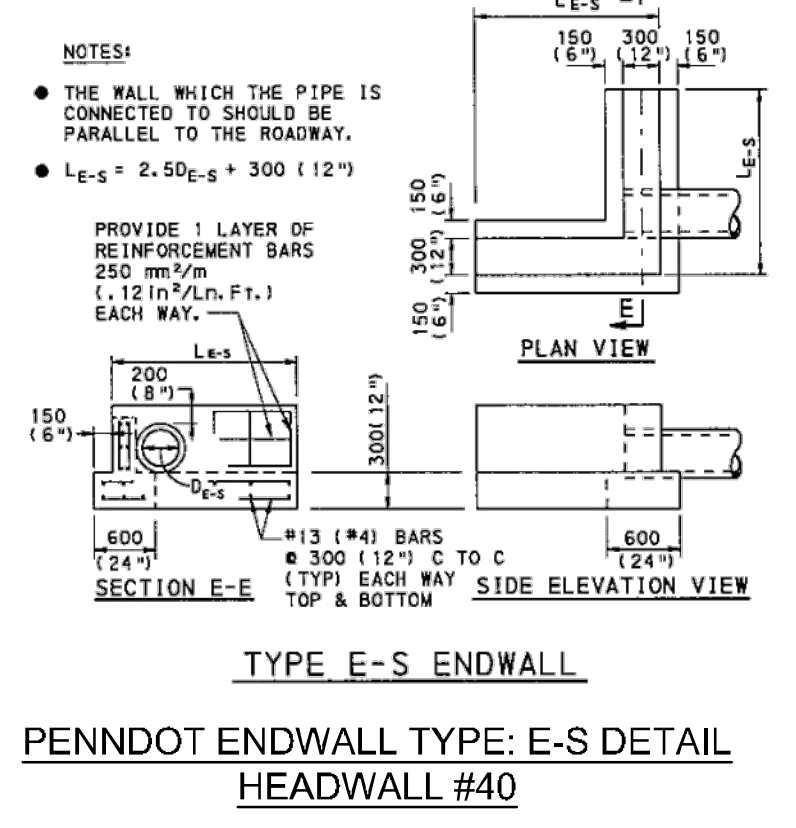


**PADOT TYPE 'D' ENDWALL DETAIL**  
ENDWALL #3  
N.T.S.

PIPE DIAMETER	PART NO.	DIMENSIONS (INCHES)			
		A(±)	B MAX	H(1±)	W(2±)
12" & 15"	1210NP	6.5	10	6.5	25
18"	1810NP	7.5	15	6.5	32
24"	2410NP	7.5	18	6.5	36
30"	3010NP	10.5	N/A	7.0	53
36"	3610NP	10.5	N/A	7.0	53



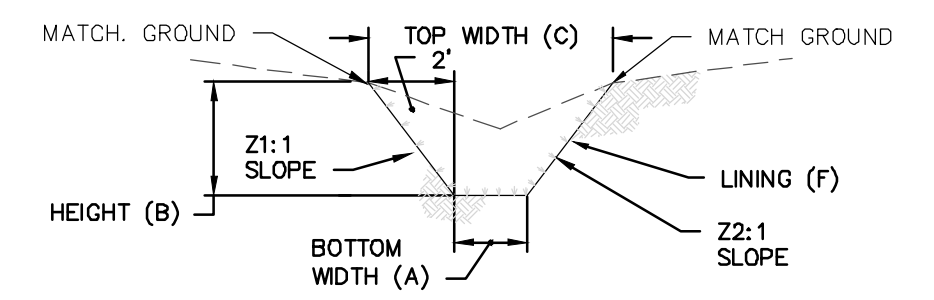
**STANDARD STORMWATER FLARED END DETAIL**



**PENNDOT ENDWALL TYPE: E-S DETAIL**  
HEADWALL #40

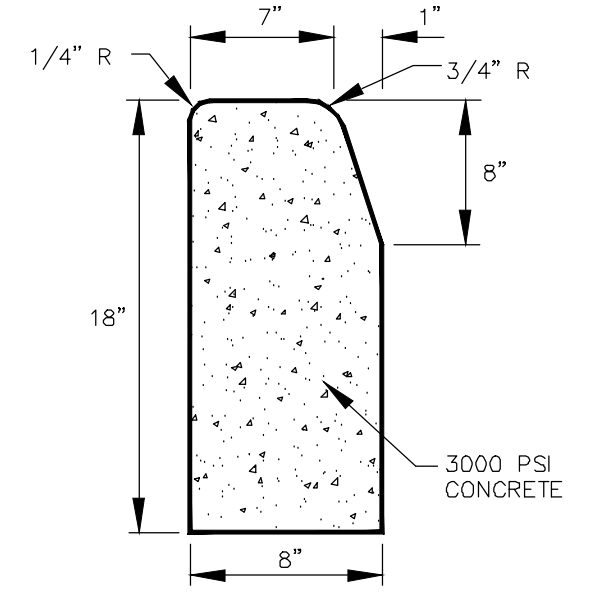
SWALE/BERM DIMENSIONS								
SWALE No.	BOTTOM WIDTH (A)	HEIGHT OF SWALE (B)	TOP WIDTH (C)	SIDE SLOPE Z1 (D)	SIDE SLOPE Z2 (E)	SIDE SLOPE Z3 (F)	LINING (G)	THICKNESS
10	1.5	1	9.5	4	4	4	R-4	18"
11	1.5	1	7.5	3	3	4	R-4	18"

**PROPOSED SWALE/BERM #10 & #11 DETAIL**  
N.T.S.

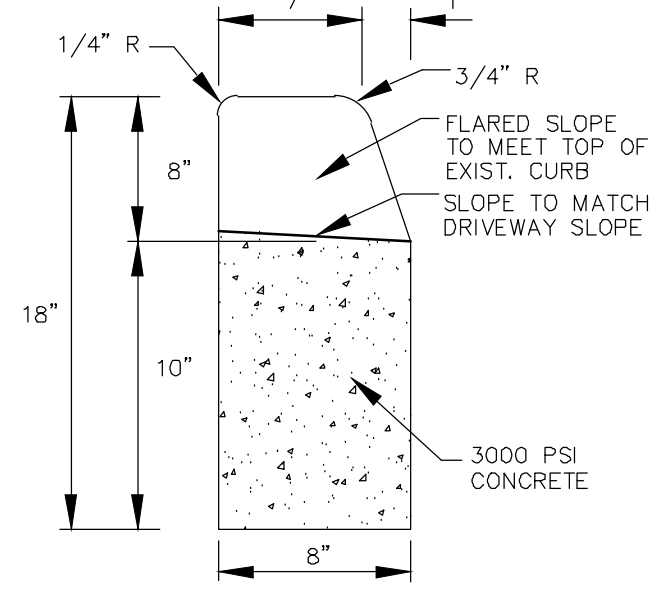


SWALE DIMENSIONS							
SWALE No.	BOTTOM WIDTH (A)	HEIGHT OF SWALE (B)	TOP WIDTH (C)	SIDE SLOPE Z1 (D)	SIDE SLOPE Z2 (E)	LINING (F)	THICKNESS
3	2.0	1.0	8.0	3	3	GRASS - LEGUME	NA
4	3.0	2.0	15.0	3	3	GRASS - LEGUME	NA
6A	1.0	1.0	7.0	3	3	GRASS - LEGUME	NA
6B	1.0	1.0	7.0	3	3	R-4	18"

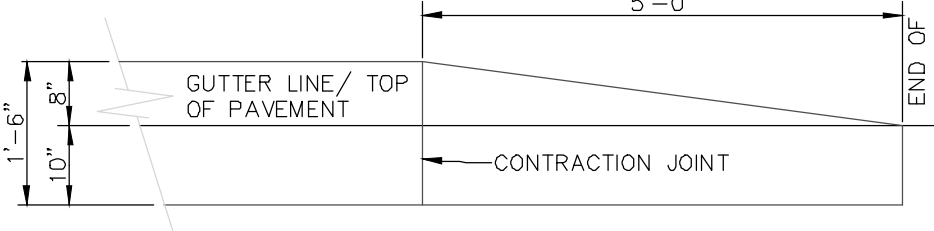
**PROPOSED SWALE #3 & #4 DETAIL**  
N.T.S.



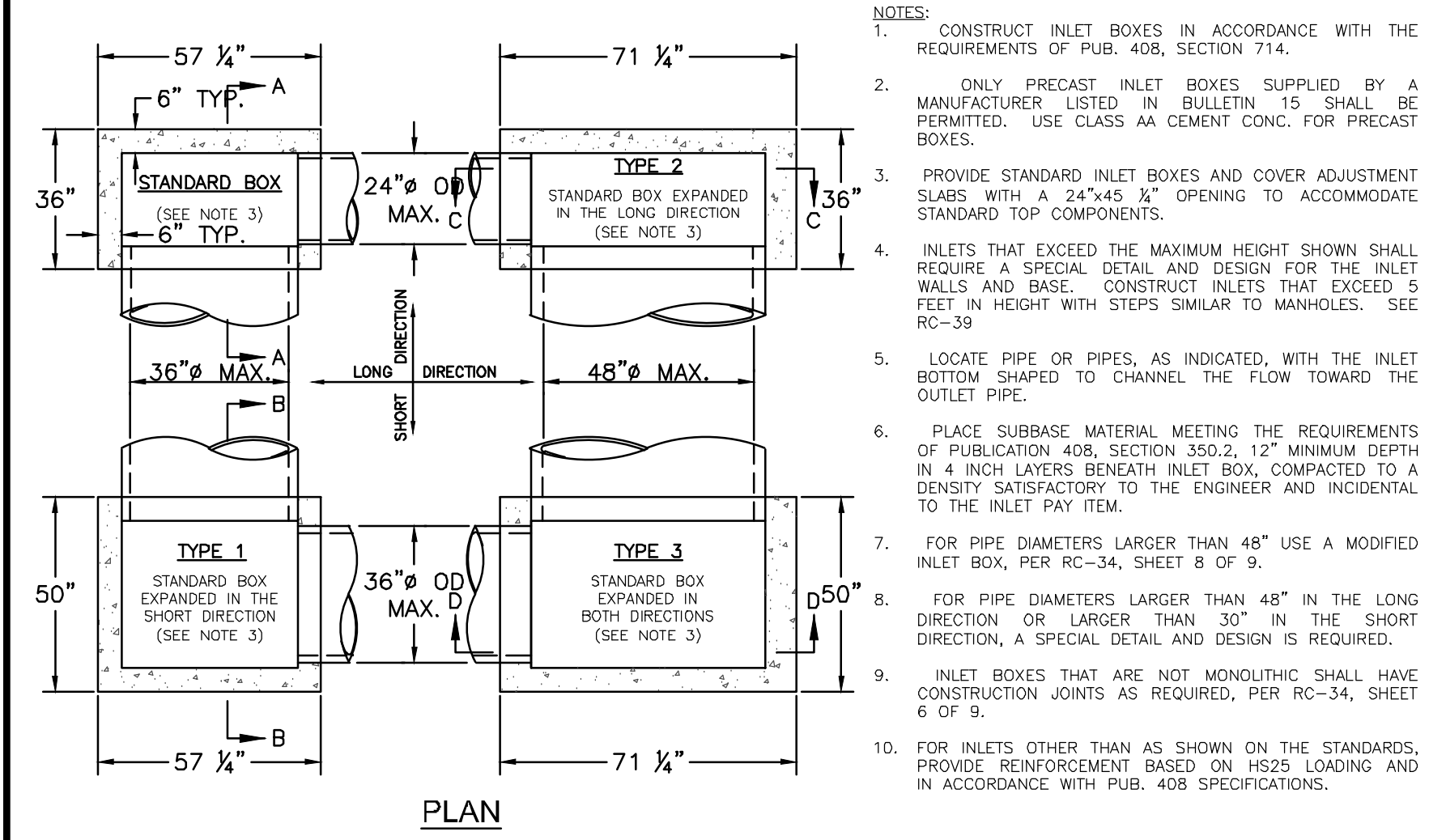
**CONCRETE CURB**  
(IF REQUIRED)  
N.T.S.



**CONCRETE DEPRESSED CURB**  
(IF REQUIRED)  
N.T.S.

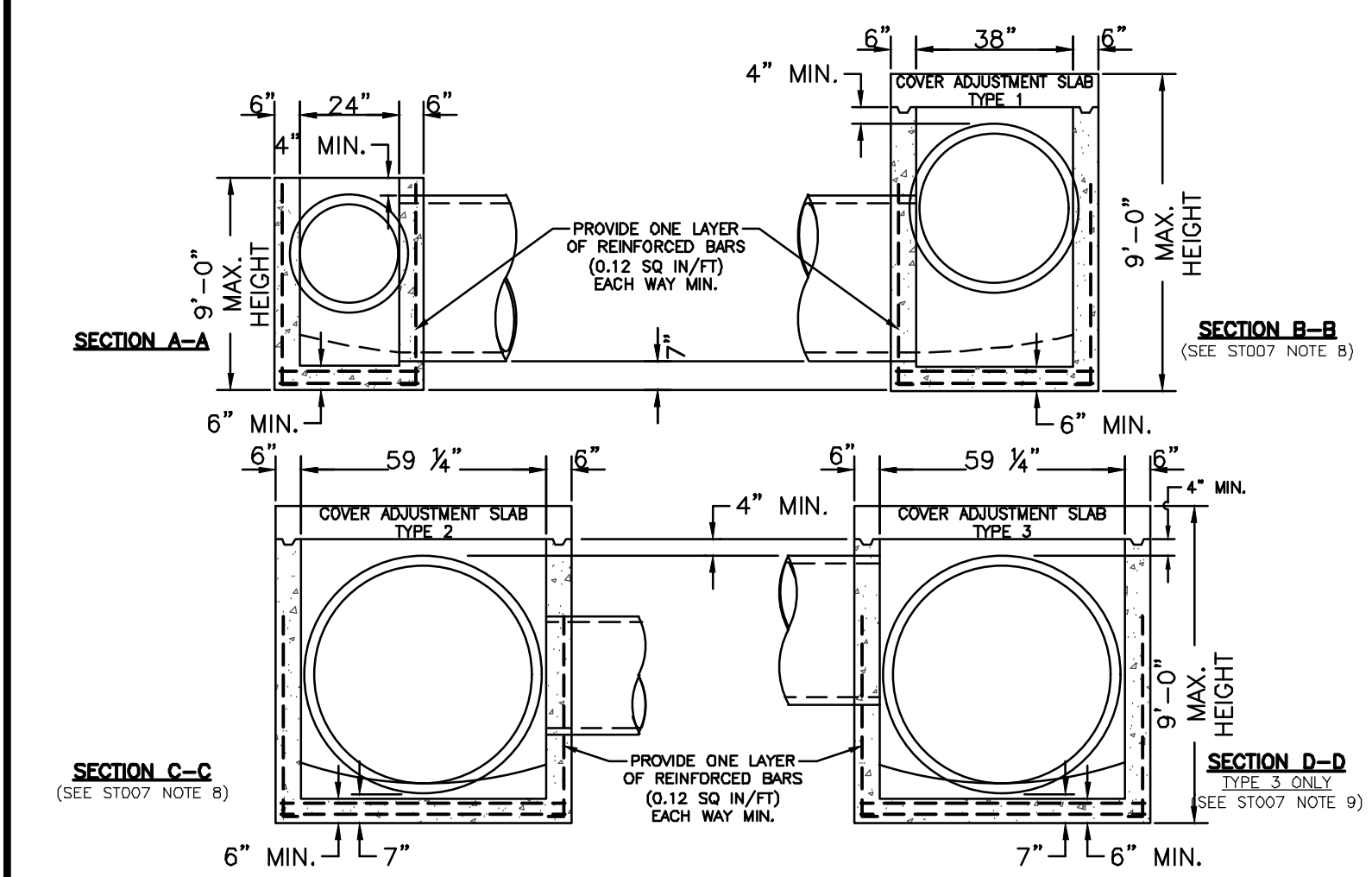


**CURB TAPER DETAIL**  
N.T.S.



**STANDARD PRECAST CONCRETE INLET BOXES DETAILS**

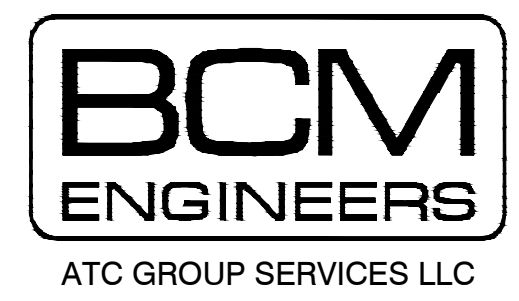
- NOTES:**
- CONSTRUCT INLET BOXES IN ACCORDANCE WITH THE REQUIREMENTS OF PUB. 40B, SECTION 714.
  - ONLY PRECAST INLET BOXES SUPPLIED BY A MANUFACTURER LISTED IN BULLETIN 15 SHALL BE PERMITTED. USE CLASS AA CEMENT CONC. FOR PRECAST BOXES.
  - PROVIDE STANDARD INLET BOXES AND COVER ADJUSTMENT SLABS WITH A 24"x45" OPENING TO ACCOMMODATE STANDARD TOP COMPONENTS.
  - INLETS THAT EXCEED THE MAXIMUM HEIGHT SHOWN SHALL REQUIRE A SPECIAL DETAIL AND DESIGN FOR THE INLET WALLS AND BASE. CONSTRUCT INLETS THAT EXCEED 5 FEET IN HEIGHT WITH STEPS SIMILAR TO MANHOLES. SEE RC-39
  - LOCATE PIPE OR PIPES, AS INDICATED, WITH THE INLET BOTTOM SHARPED TO CHANNEL THE FLOW TOWARD THE OUTLET PIPE.
  - PLACE SUBBASE MATERIAL MEETING THE REQUIREMENTS OF PUBLICATION 40B, SECTION 350.2, 12" MINIMUM DEPTH IN 4 INCH LAYERS BENEATH INLET BOX, COMPACTED TO A DENSITY SATISFACTORY TO THE ENGINEER AND INCIDENTAL TO THE INLET PAY ITEM.
  - FOR PIPE DIAMETERS LARGER THAN 48" USE A MODIFIED INLET BOX, PER RC-34, SHEET 8 OF 9.
  - FOR PIPE DIAMETERS LARGER THAN 48" IN THE LONG DIRECTION OR LARGER THAN 30" IN THE SHORT DIRECTION, A SPECIAL DETAIL AND DESIGN IS REQUIRED.
  - INLET BOXES THAT ARE NOT MONOLITHIC SHALL HAVE CONSTRUCTION JOINTS AS REQUIRED, PER RC-34, SHEET 6 OF 9.
  - FOR INLETS OTHER THAN AS SHOWN ON THE STANDARDS, PROVIDE REINFORCEMENT BASED ON HS25 LOADING AND IN ACCORDANCE WITH PUB. 40B SPECIFICATIONS.



**PRECAST STORM INSTALLATION INLET - TYPE C/M/S**  
N.T.S.

- NOTES:**
- #4 BARS 12" C TO C (TYP) EACH WAY TOP & BOTTOM OR 0.20 SQ IN/FT W.W.F. (6" MAX. SPACING)

NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
	GENERAL REVISIONS	3/11/21	JES	3/12/21	ISSUE FOR BIDS



920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

DESIGN ENGR.	JES	APPROVED	
DRAWN BY	RC		
PROJECT ENGR.	JES	APPROVED	
PROJECT MGR.	JES		
CHECKED BY	JES	DATE	08/31/20



**CUMRU TOWNSHIP**  
**BERKS COUNTY, PENNSYLVANIA**

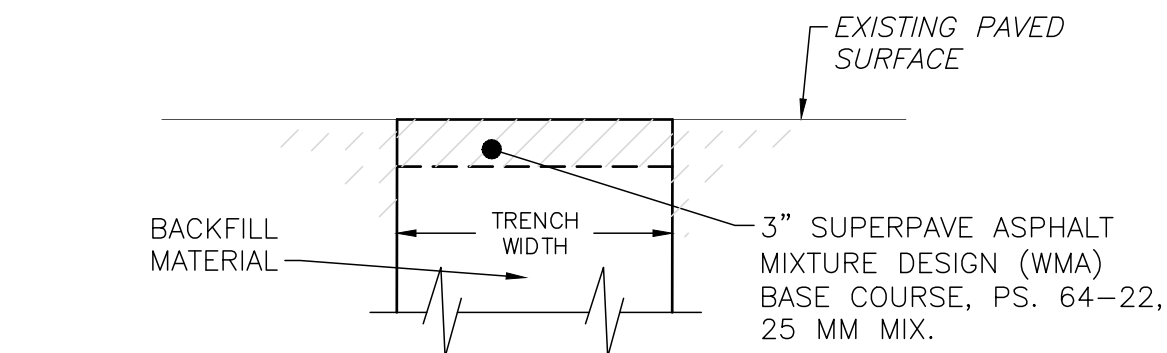
UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS  
CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY

POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN  
DETAILS  
DRAINAGE SYSTEM INSTALLATION

SCALE: AS NOTED  
PROJECT NO.: Z057000415  
DRAWING NO.: 180  
SHEET: OF

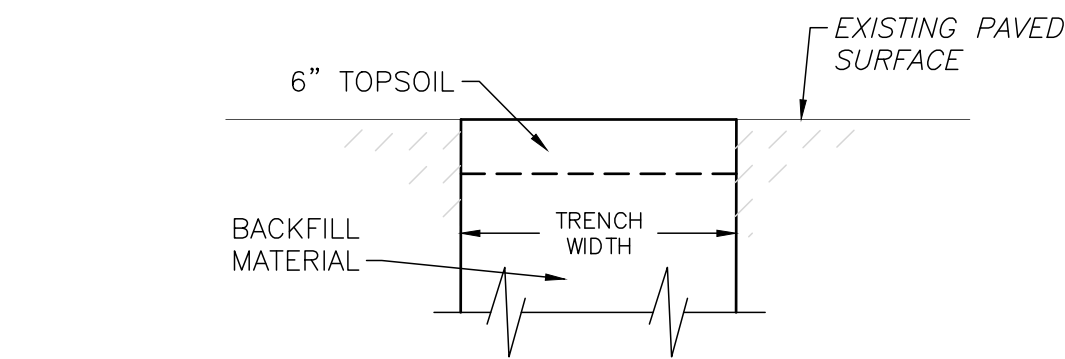
REGISTERED PROFESSIONAL ENGINEER





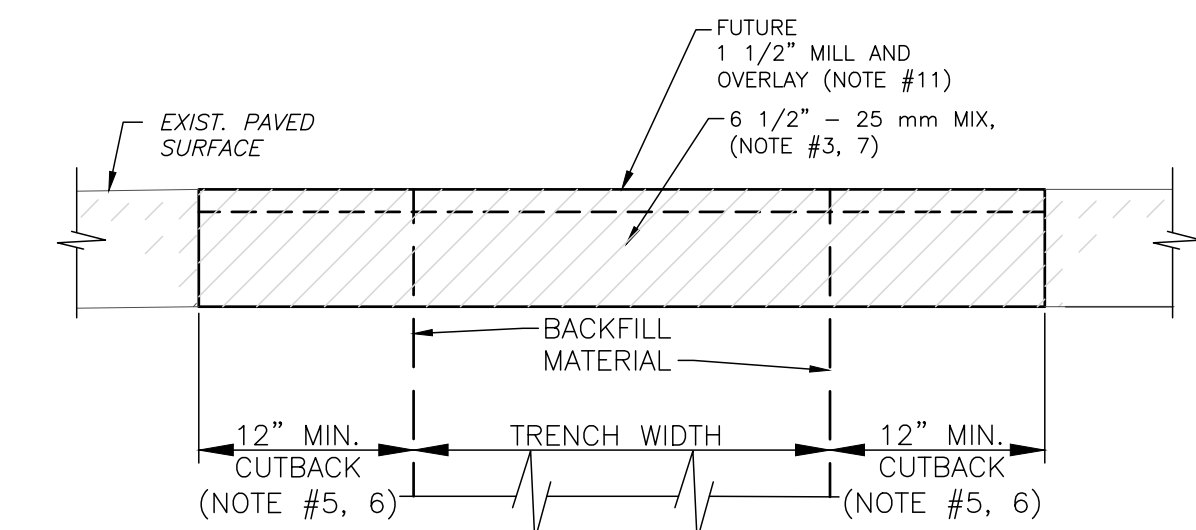
**TEMPORARY TRENCH RESTORATION - PAVED AREAS**

NOT TO SCALE



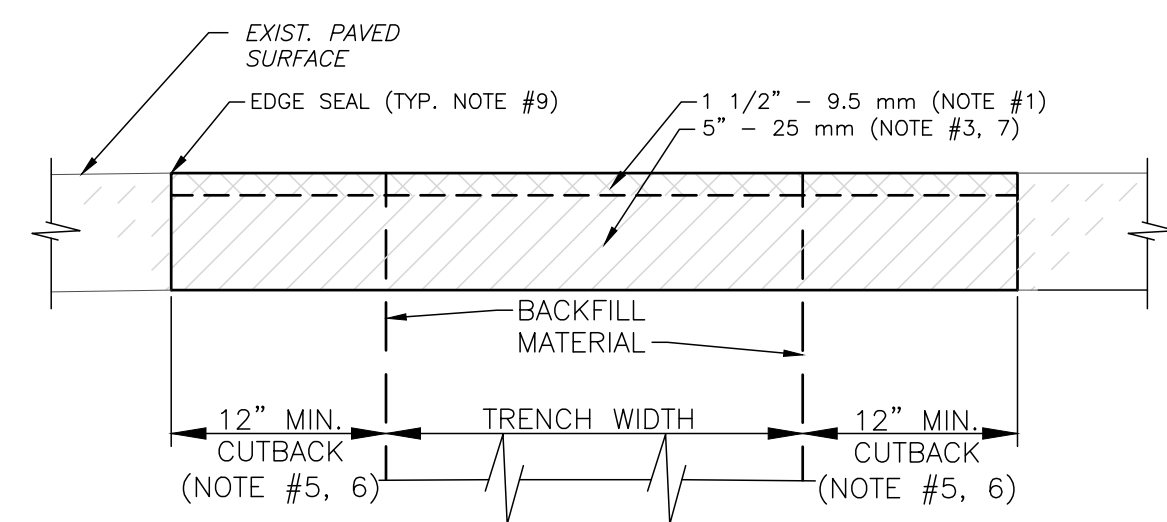
**TRENCH RESTORATION - UNPAVED AREAS**

NOT TO SCALE



**SEMI-PERMANENT TRENCH RESTORATION**

NOT TO SCALE



**PERMANENT TRENCH RESTORATION**

NOT TO SCALE

**NOTES:**

- 9.5 MM MIX SUPERPAVE ASPHALT MIXTURE DESIGN (WMA), WEARING COURSE, PG. 64-22, 3 TO 30 MILLION ESALS, DESIGN LEVEL 75 GYRATIONS.
- 19.0 MM MIX SUPERPAVE ASPHALT MIXTURE DESIGN (WMA), BINDER COURSE, PG. 64-22, 3 TO 30 MILLION ESALS, DESIGN LEVEL 75 GYRATIONS.
- 25.0 MM MIX SUPERPAVE ASPHALT MIXTURE DESIGN (WMA), BASE COURSE, PG. 64-22, 3 TO 30 MILLION ESALS, DESIGN LEVEL 75 GYRATIONS.
- 2A MODIFIED AGGREGATE SUBBASE, COMPACTED TO 100% OF THE MAXIMUM DRY-WEIGHT DENSITY.
- SUBGRADE TOPSOIL, LARGE ROCKS, AND OTHER TYPES OF LOW QUALITY, UNSUITABLE SOIL SHALL BE REMOVED AND REPLACED. THE EXPOSED SURFACE SHALL BE COMPACTED WITH SUITABLE EQUIPMENT (MINIMUM 10-TON ROLLER). SUBGRADE COMPACTION SHOULD BE TO A DRY DENSITY OF AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY.
- MINIMUM 1' PAVEMENT CUTBACK, EXCAVATE EXISTING AND TEMPORARY PAVEMENT AND MATERIAL TO REQUIRED ELEVATION. RECOMPACT EXPOSED SUBGRADE, TACK COAT ALL VERTICAL PAVEMENT EDGES.
- EXCAVATE AND REMOVE EXISTING PAVEMENT AND MATERIAL TO REQUIRED ELEVATION. RECOMPACT EXPOSED SUBGRADE. TACK COAT ALL EXPOSED VERTICAL EDGES.
- INSTALL ONLY BASE COURSE AND BINDER COURSE IN ONE DAY.
- SEAL ALL EDGE JOINTS WITH EXISTING PAVEMENTS, CURBS, DRAINAGE AND UTILITY STRUCTURES.
- REPLACE AND REINSTALL ALL PAVEMENT MARKINGS.
- FUTURE 1 1/2" MILLING AND OVERLAY BY OTHERS (B.O.) - NOT IN CONTRACT
- PROVIDE TEMPORARY PAVING TRANSITION FOR VEHICLE TRAFFIC BETWEEN EXISTING PAVEMENT ELEVATION AND PAVEMENT NOT AT FINAL ELEVATION.
- WELSH ROAD AND DRIVEWAY WEARING COURSE BY OTHERS (B.O.) - NOT IN CONTRACT.

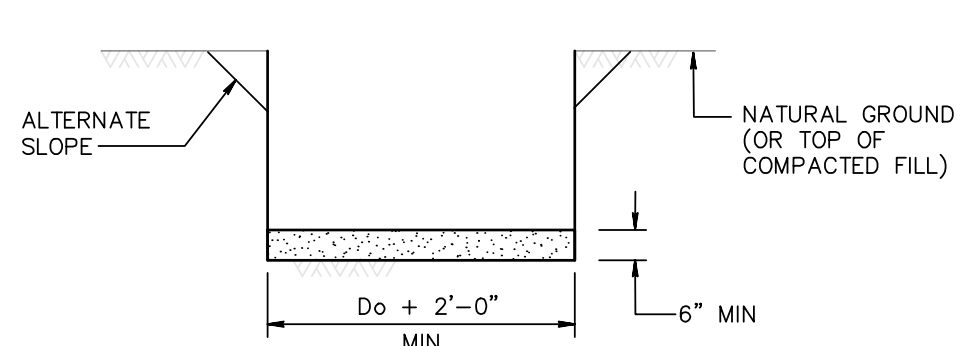
**CONSTRUCTION DETAILS BELOW COVER THE FOLLOWING CONDITIONS:**

- PIPE LYING ON TOP OF THE NATURAL GROUND, ROCK OR COMPACTED (97% SPD) FILL.
- THE EXISTING GROUND IS BETWEEN THE TOP AND THE BOTTOM OF THE PROPOSED PIPE AND THE PIPE IS TO BE COVERED WITH EARTH FILL.
- THE TOP OF PIPE IS BELOW THE LEVEL OF THE NATURAL GROUND OR COMPACTED FILL (TO MINIMUM 97% SPD) AND TO BE COVERED WITH EARTH FILL TO HEIGHTS ABOVE THE NATURAL GROUND.

STEP 1 : REMOVE TOPSOIL (COMPRESSIBLE LAYER, FOR EXAMPLE, ORGANIC MATERIAL) TO A WIDTH EQUAL TO 5 OUTSIDE DIAMETERS OF THE PIPE IN ALL FILL CONDITIONS ABOVE (A),(B)&(C). ALSO IF SPECIFIED ON THE CONTRACT DRAWING, UNDERCUT FOR THE DEPTH BELOW THE BEDDING AS SHOWN BY DESIGN (MAKE MIN WIDTH 3 DIAMETERS OF PIPE).

STEP 2 : CONSTRUCT THE EMBANKMENT TO 4'-0" ABOVE THE TOP OF PIPE OR TO THE SUBGRADE ELEVATION, WHICHEVER IS LESS. FOR PIPES 72" OR GREATER SEE NOTE 1.

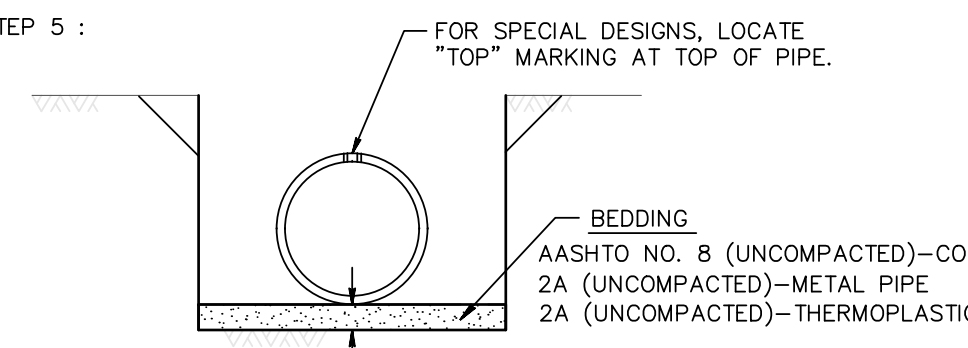
STEP 3 : EXCAVATE THE TRENCH TO THE WIDTH OF THE OUTSIDE DIAMETER OF THE PIPE PLUS 2'-0" AND CREATE AN APPROPRIATE BEDDING 6" DEEP.



STEP 4 : THROUGH ROCK, OR HARD SHALE, OR IN AREAS OF UNDERCUT, PROVIDE 6"+0" INCH/FT OF, Do+4'-0", BELOW FOR CONCRETE PIPE. IF THIS EXCAVATION IS FOR THE INTENDED BOTTOM ELEVATION OF THE PIPE, 12" MAX.

NOTE: IF UNSUITABLE MATERIAL IS FOUND, UNDERCUT AS DIRECTED AND BACKFILL WITH SUITABLE MATERIAL TO BOTTOM OF BEDDING ELEVATION. (UNLESS OTHERWISE SPECIFIED.)

LAY PIPE ON APPROPRIATE BEDDING.

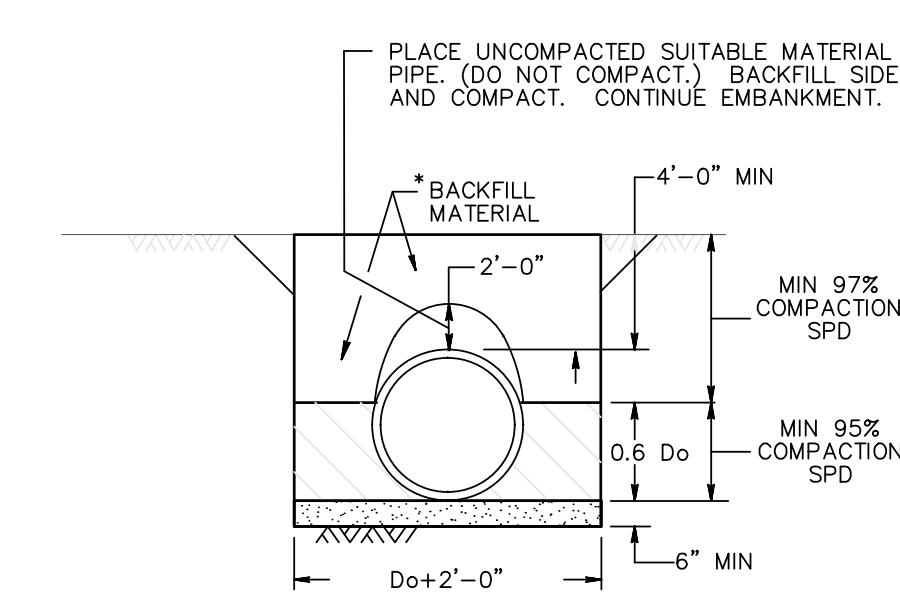


:FOR THERMOPLASTIC PIPE, SEE STEP 6C.

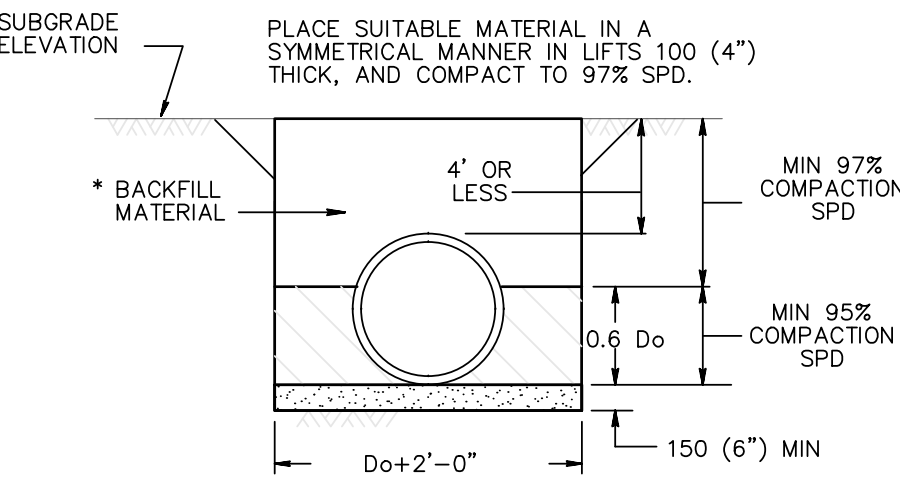
STEP 6 :FOR CONCRETE PIPE, SEE STEP 6A.

**CONCRETE PIPE**

STEP 6A : PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 4" THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 0.6 Do. COMPACT TO 95% SPD. TEST THE SIDE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH SECTION 601.



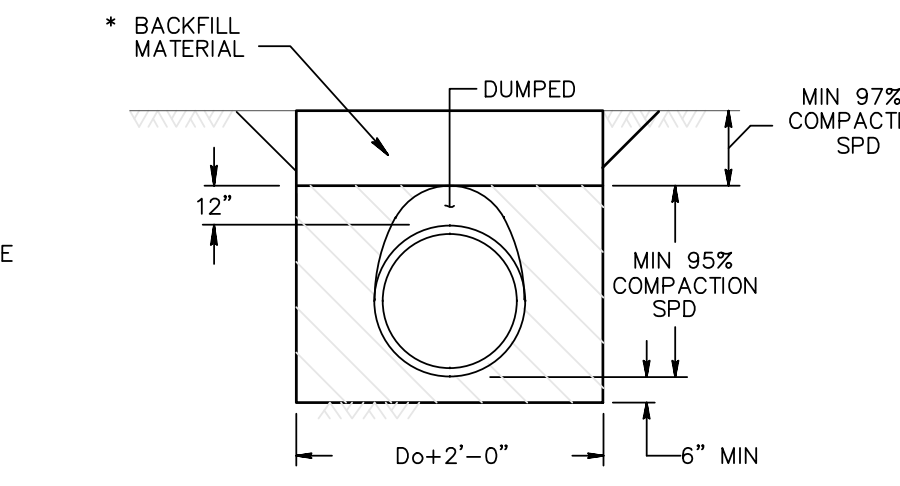
DEEP FILLS OVER 4'-0"



SHALLOW FILLS 4'-0" AND LESS

**STEP 6B: THERMOPLASTIC PIPE (PVC, HDPE, SLCPP)**

PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 4" THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 12" ABOVE TOP OF PIPE. COMPACT TO 95% SPD. TEST THE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH SECTION 601.



THERMOPLASTIC PIPE

**LEGEND**

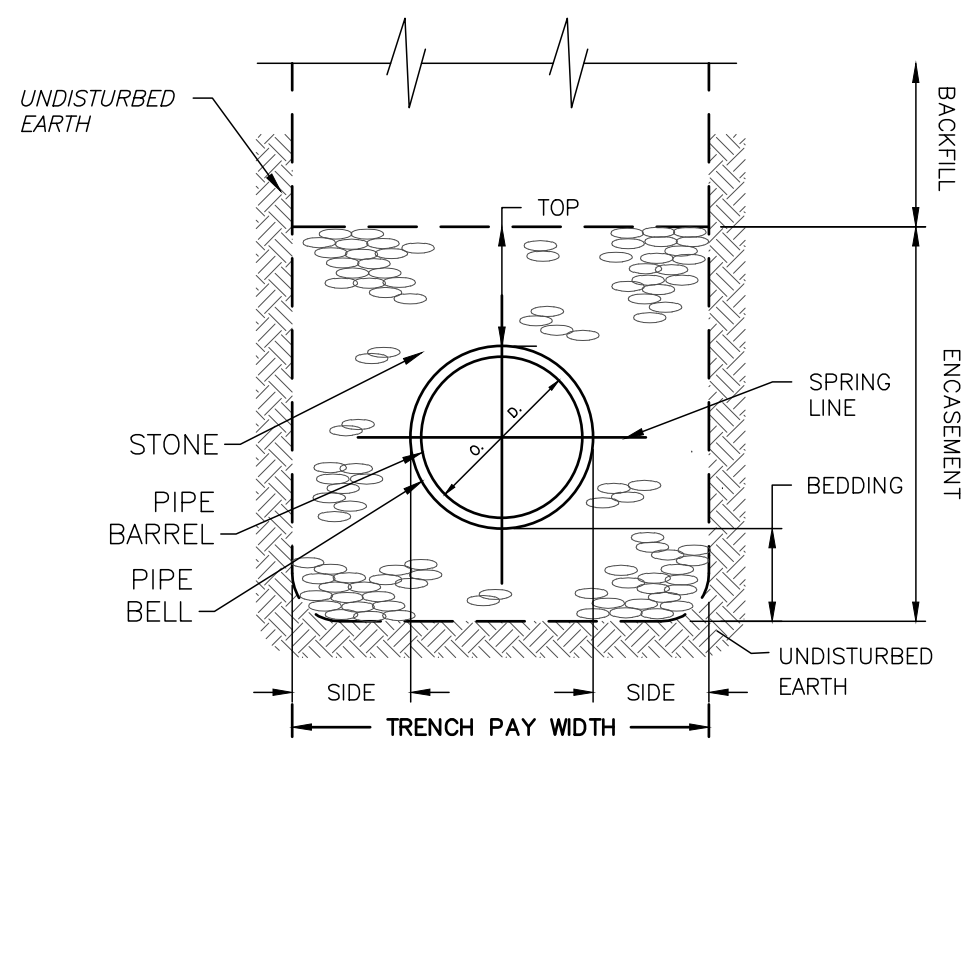
- Do = OUTSIDE DIAMETER OF PIPE
- SPD = STANDARD PROCTOR DENSITY
- ID = INSIDE DIAMETER
- AGGREGATE FOR BEDDING (AASHTO NO. 8), UNCOMPACTED
- COARSE AGGREGATE (2A/2B)

**STORMWATER PIPE INSTALLATION PROCEDURES**

NOT TO SCALE

Pipe	Pipe Encasement				Warning Tape	Trench Backfill Material		
	Bedding	Sides	Top	Stone		ROW	Pavement	Gross
<b>Water</b>								
DIP (6" Dia. or Greater)	6"	8"	12"	PennDOT #2A	No	PennDOT #2A	PennDOT #2A	Suitable Material
Copper (2" Dia. or Less)	4"	4"	4"	PennDOT #1B	No	PennDOT #2A	PennDOT #2A	Suitable Material
<b>Sanitary Sewer</b>								
PVC	6"	8"	12"	PennDOT #2B	No	PennDOT #2A	PennDOT #2A	Suitable Material
<b>Gas</b>								
HDPE (2" OF less)	6"	6"	6"	AASHTO #10	Yes	PennDOT #2A	PennDOT #2A	Suitable Material
<b>Stormwater (Refer to Stormwater Pipe Installation Procedures)</b>								
RCP (12" or Greater)	6"	12"	0"	AASHTO #8 - Bed PennDOT #2A - Side	No	PennDOT #2A	PennDOT #2A	Suitable Material
SLCPP (12" or Greater)	6"	12"	12"	PennDOT #2A	No	PennDOT #2A	PennDOT #2A	Suitable Material
SLCPP (Perforated)	6"	12"	0"	PennDOT #2A	No	PennDOT #2B	PennDOT #2B	PennDOT #2B
PVC	6"	6"	6"	PennDOT #2B	No	PennDOT #2A	PennDOT #2A	Suitable Material
<b>Electric</b>								
PVC (2" or Less)	2"	2"	2"	Sand	Yes	PennDOT #2A	PennDOT #2A	Suitable Material

- Notes:**
- Pipe encasement material to be 3,000 psi concrete where notes on plan.
  - DIP to be wrapped in plastic prior to concrete encasement.
  - Plastic pipe to be concrete encased to spigline, then after a minimum of 24 hours, concrete encasement is to be completed.
  - Warning tape to be magnetic and appropriately labeled for utility installed directly below.
  - Warning tape to be installed approximately 12" below final grade.



**PIPE ENCASEMENT & BACKFILL DETAIL**

NOT TO SCALE

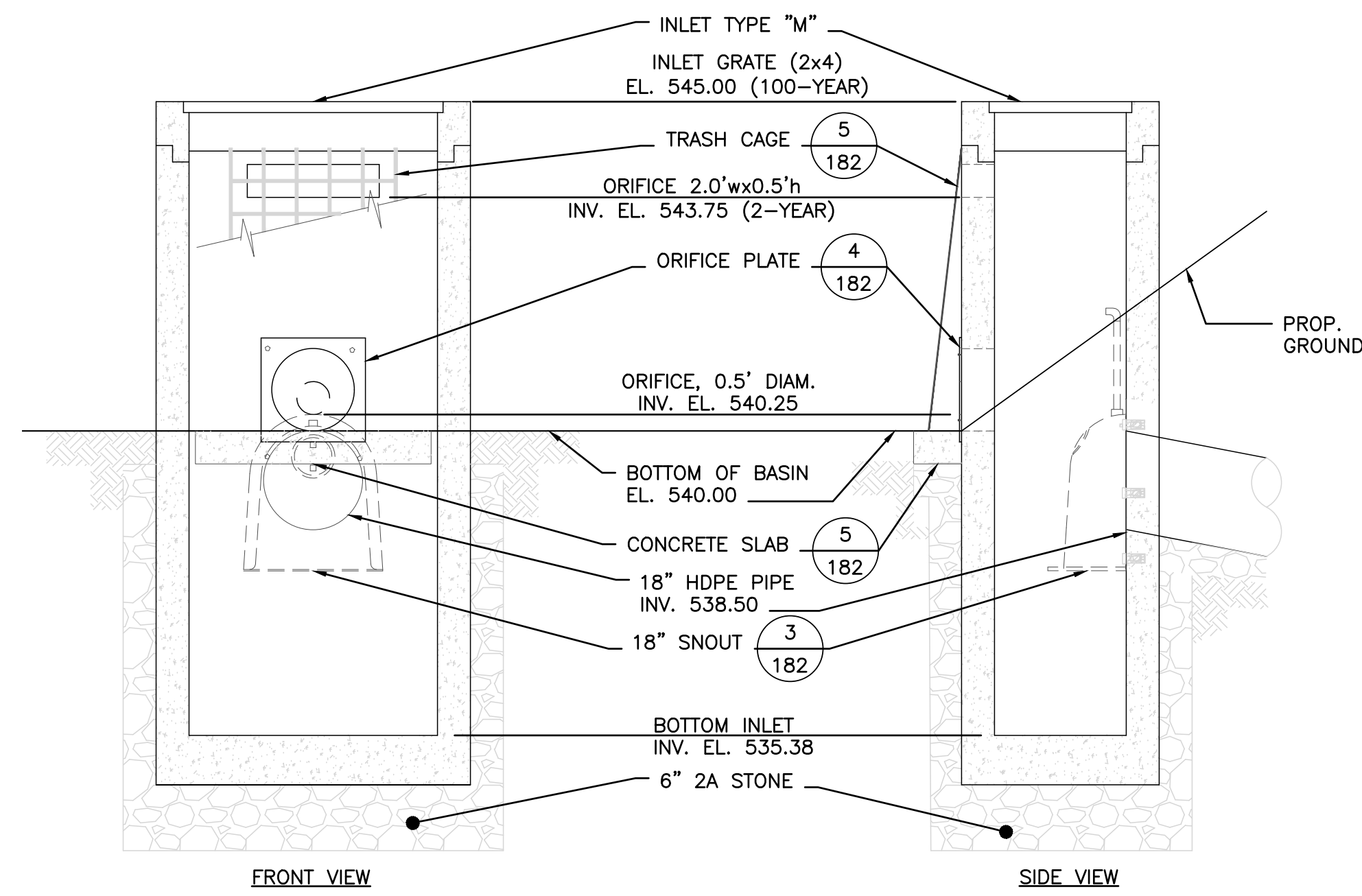
STORMWATER STRUCTURE DATA				
INLET #	STATUS	TOP	INVERT	STRUCTURE TYPE
1	NEW - ADD		STREAM CROSSING 1, INV. = 512.98	ENDWALL - TYPE: D-W, 76"x48"
2	NEW - ADD		STREAM CROSSING 1, INV. = 514.59	ENDWALL - TYPE: D-W, 76"x48"
3	NEW - ADD		STREAM CROSSING 2, INV. = 476.42	ENDWALL - TYPE: D, 21"
4	NEW - ADD		STREAM CROSSING 2, INV. = 477.56	ENDWALL - TYPE: D-W, 21"
10	EXIST. - REMOVE	GR = 536.43	INV. (OUT) = 534.89 (21" SLCPP)	INLET - TYPE: "M"
10A	NEW - ADD	GR = 536.00	INV. (IN) = 533.50 (15" SLCPP), INV. (IN) = 533.50 (15" SLCPP), INV. (OUT) = 532.75 (18" SLCPP)	INLET - TYPE: "M"
10B	NEW - ADD	GR = 537.25	INV. (OUT) = 534.50 (15" SLCPP)	INLET - TYPE: "S"
10C	NEW - ADD	GR = 538.50	INV. (OUT) = 534.50 (15" SLCPP)	INLET - TYPE: "S"
11	EXIST. - REMOVE	GR = 534.32	INV. (IN) = 532.06 (21" SLCPP), INV. (OUT) = 532.06 (24" SLCPP)	INLET - TYPE: "M"
11A	NEW - ADD	GR = 534.32	INV. (IN) = 531.50 (18" SLCPP), INV. (OUT) = 531.25 (24" SLCPP)	INLET - TYPE: "M"
12	NEW - ADD	GR = 545.00	BASIN #1 OUTLET STRUCTURE, SEE DETAIL 1, DWG 120, INV. (OUT) = 538.50 (15" SLCPP)	INLET - TYPE: "M"
12A	EXIST. - REMAIN		INV. (IN) = 537.96 (15" UNK MATERIAL)	END OF PIPE - N/A
12B	EXIST. - REMAIN		INV. (OUT) = 537.64 (15" SLCPP)	END OF PIPE - N/A
12B	NEW - ADD	GR = 540.50	INV. (IN) = 535.75 (18" SLCPP), INV. (IN) = 537.64 (EXIST. 15" UNK MATERIAL), INV. (OUT) = 535.55 (18" SLCPP)	INLET - TYPE: "M"
12C	NEW - ADD		INV. = 533.70 (18" SLCPP)	STUB PIPE - TYPE: "END CAP"
12D	NEW - ADD	GR = 537.00 (540.00)	INV. (IN) = 533.65 (18" SLCPP), INV. (IN) = 533.65 (18" SLCPP), INV. (OUT) = 533.15 (24" SLCPP)	INLET - TYPE: "M"
12E	NEW - ADD		INV. = 533.03 (18" SLCPP)	STUB PIPE - TYPE: "END CAP"
12F	NEW - ADD	GR = 540.05	INV. (IN) = 533.00 (18" SLCPP), INV. (IN) = 532.50 (24" SLCPP), INV. (OUT) = 532.97 (24" SLCPP)	INLET - TYPE: "M"
12G	NEW - ADD	GR = 535.23	INV. (IN) = 530.70 (24" SLCPP), INV. (IN) = 530.45 (24" SLCPP), INV. (OUT) = 530.45 (36" SLCPP)	INLET - TYPE 3 BOX: "M"
13	EXIST. - REMOVE	GR = 535.54	INV. = 533.54 (UNK MATERIAL)	INLET - TYPE: "M"
13A	NEW - ADD	GR = 535.50	INV. (OUT) = 532.50 (18" SLCPP)	INLET - TYPE: "C"
14	NEW - ADD	GR = 534.43	INV. (IN) = 531.80 (18" SLCPP), INV. (IN) = 530.30 (36" SLCPP), INV. (OUT) = 530.10 (36" SLCPP)	INLET - TYPE 3 BOX: "M"
15	NEW - ADD	TW = 534.50	INV. (OUT) = 530.00 (36" SLCPP)	ENDWALL - TYPE: D-W, 36"
20	NEW - ADD	GR = 563.85	INV. (OUT) = 561.00 (15" SLCPP)	INLET - TYPE: "M"
20A	EXIST. - REMOVE	GR = 535.38	INV. = 561.13 (15" SLCPP)	INLET - TYPE: "C"
20B	EXIST. - REMOVE		INV. = 556.98 (15" SLCPP)	END OF PIPE - N/A
21	NEW - ADD	GR = 562.90	INV. (IN) = 559.25 (15" SLCPP), INV. (OUT) = 559.00 (18" SLCPP)	INLET - TYPE: "M"
22	NEW - ADD	GR = 557.50	INV. (OUT) = 554.00 (15" SLCPP)	INLET - TYPE: "M"
23	NEW - ADD	GR = 556.75	INV. (IN) = 553.65 (15" SLCPP), INV. (IN) = 553.40 (18" SLCPP), INV. (OUT) = 553.20 (18" SLCPP)	INLET - TYPE: "S"
24	NEW - ADD	GR = 551.94	INV. (IN) = 548.65 (18" SLCPP), INV. (OUT) = 548.45 (18" SLCPP)	INLET - TYPE: "S"
25	NEW - ADD	GR = 549.25	INV. (IN) = 546.65 (18" SLCPP), INV. (IN) = 546.65 (18" SLCPP), INV. (OUT) = 545.00 (24" SLCPP)	INLET - TYPE: "M"
26	NEW - ADD	GR = 546.00	INV. (IN) = 542.75 (18" SLCPP), INV. (IN) = 542.25 (24" SLCPP), INV. (OUT) = 542.05 (24" SLCPP)	INLET - TYPE: "S"
27A	EXIST. - REMOVE	GR = 547.36	INV. (IN) = 544.96 (18"), INV. (IN) = 544.96 (18"), INV. (OUT) = 544.06	INLET - TYPE: "M"
28A	EXIST. - REMOVE	GR = 539.00	INV. = 535.39 (15" UNK MATERIAL)	INLET - TYPE: C
28	NEW - ADD	GR = 541.37	INV. (IN) = 536.00 (24" SLCPP), INV. (OUT) = 535.80 (24" SLCPP)	INLET - TYPE: "S"
29	NEW - ADD	TW = 537.25	INV. (OUT) = 534.00 (24" SLCPP)	ENDWALL - TYPE: D-W, 24"
30	NEW - ADD	GR = 537.50	INV. (IN) = SEE DETAIL DWG. 162, INV. (OUT) = 530.50 (24" SLCPP)	INLET - TYPE 3 BOX: "M"
31	EXIST. - REMOVE	GR = 532.92	INV. (OUT) = 530.17 (24" SLCPP)	INLET - TYPE: "M"
34	EXIST. - REMAIN	TW = 531.70	INV. (OUT) = 528.27 (24" SLCPP TO BE REPLACED)	ENDWALL - TYPE: D-W, 24"
38A	EXIST. - REMOVE		INV. = 577.24 (15")	ENDWALL - TYPE: E-S, 15"
40	NEW - ADD	TW = 578.49	INV. (IN) = 577.24 (15" SLCPP)	ENDWALL - TYPE: E-S, 15"
38B	EXIST. - REMOVE		INV. = 574.28 (15")	END OF PIPE - N/A
41	NEW - ADD		INV. (OUT) = 575.89 (15" SLCPP)	15" FLARE END SECT.
43	NEW - ADD		INV. = 542.0+/- (6" PVC) (MATCH PROP. GRADE)	END OF PIPE - N/A
43A	NEW - ADD		INV. = 541.42 (6" PVC)	6" FLARE END SECT.
44	NEW - ADD		INV. = 542.0+/- (6" PVC) (MATCH PROP. GRADE)	END OF PIPE - N/A
44A	NEW - ADD		INV. = 541.46 (6" PVC)	6" FLARE END SECT.
45	EXIST. - REMOVE	GR = 542.71	2 - 5" ORIFICE = 541.76, 6" ORIFICE = 539.19, INV. (OUT) = 539.31	INLET - TYPE: "M"
46	EXIST. - REMOVE		INV. = 538.39	ENDWALL - TYPE: D-W, 15"
47	EXIST. - REMAIN	GR = 555.38	INV. (OUT) = 551.49 (15" SLCPP)	INLET - TYPE: "C"
48	NEW - ADD		INV. (OUT) = 546.63 (15" SLCPP CUT)	15" FLARE END SECT.
48A	EXIST. - REMOVE		INV. = 545.60 (15" ADS)	ENDWALL - TYPE: D-W, 15"
49	EXIST. - REMAIN	GR = 555.42	INV. (IN) = 552.72, INV. (OUT) = 552.32 (15" ADS)	INLET - TYPE: "M"

STORMWATER STRUCTURE DATA					
INLET #	STATUS	TOP	INVERT	STRUCTURE TYPE	
49A	NEW - ADD		INV. (OUT) = 545.12 (15" ADS CUT)	15" FLARE END SECT.	
50	EXIST. - REMAIN		INV. (OUT) = 544.14 (15" SLCPP)	END OF PIPE - N/A	
51	EXIST. - REMAIN		INV. (OUT) = 571.13 (15" SLCPP)	END OF PIPE - N/A	
52	NEW - ADD		INV. (OUT) = 565.95 (18" PIPE)	INLET - TYPE: "M"	
53	EXIST. - REMAIN	GR = 569.94	INV. (IN) = 567.64 (15" PIPE)	INLET - TYPE: "M"	
54	EXIST. - REMAIN		INV. (OUT) = 560.72	END OF PIPE - N/A	
55	NEW - ADD		INV. (OUT) = 563.73 (18" PIPE CUT)	18" FLARE END SECT.	

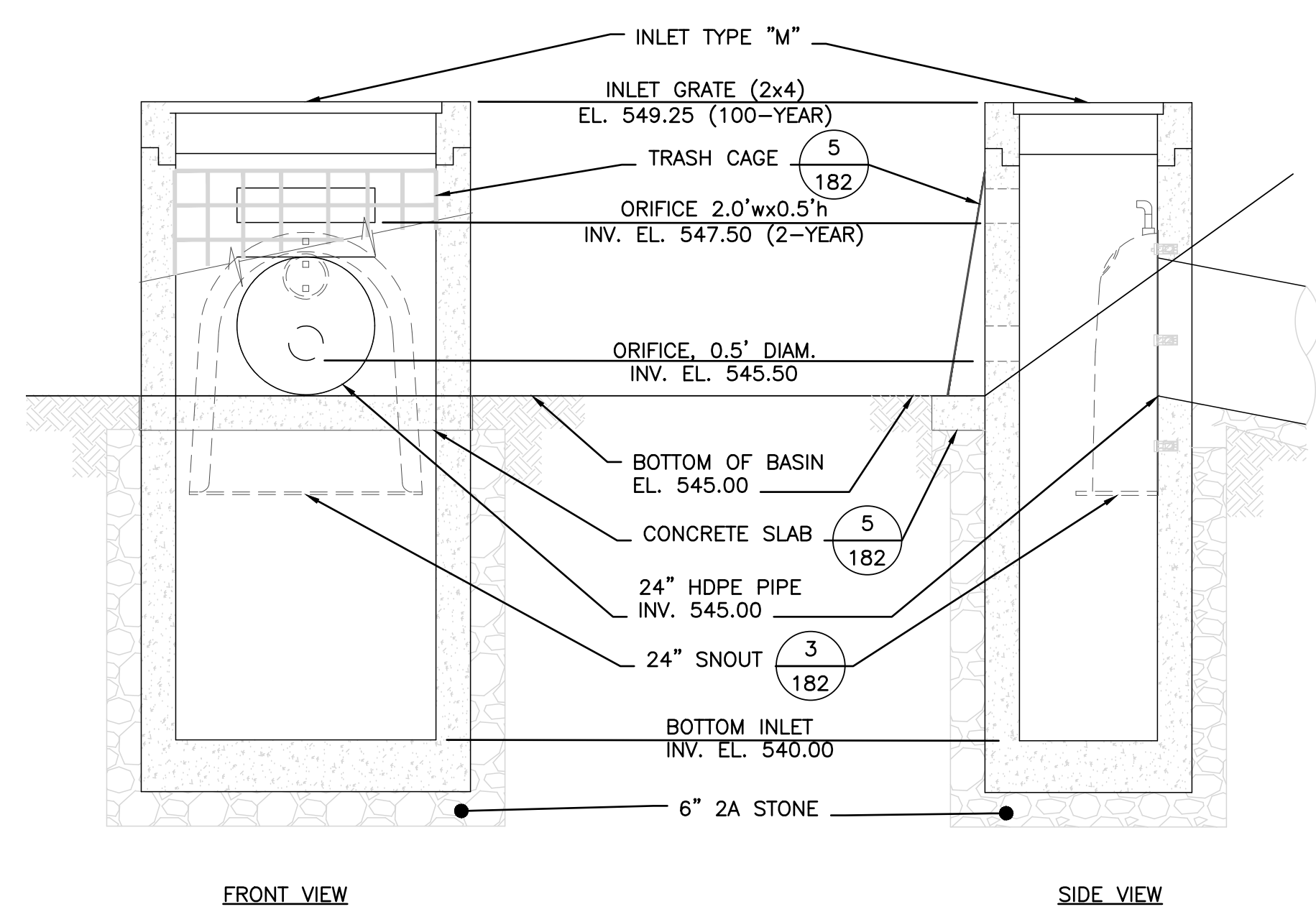
  

STORMWATER PIPE DATA						
START/END STRUCTURES	STATUS	LENGTH (FT)	SLOPE (%)	SIZE (")	MATERIAL	
2	1	NEW - ADD	78	3.24	76x48	ERCP CLASS V
4	3	NEW - ADD	42	2.7	27	RCR CLASS V
10	11	EXIST. - REMOVE	90	3.14	18	NFV
10B	10A	NEW - ADD	18	5.56	15	SLCPP
10C	10A	NEW - ADD	23	4.35	15	SLCPP
10A	11A	NEW - ADD	95	1.25	18	SLCPP
11	12	EXIST. - REMOVE	162	1.17	24	NFV
11A	12G	NEW - ADD	50	1.22	24	SLCPP
12	12B	NEW - ADD	97	2.55	18	SLCPP
12A	12B	EXIST. - REMAIN	35	1.5	15	NFV
12B	12D	NEW - ADD	93	2.45	18	SLCPP
12C	12D	NEW - ADD	5	0.5	18	SLCPP
12D	12F	NEW - ADD	105	0.65	24	SLCPP
12E	12F	NEW - ADD	5	0.5	18	SLCPP
12F	12G	NEW - ADD	104	0.8	24	SLCPP
12G	14	NEW - ADD	30	0.5	36	SLCPP
13	14	EXIST. - REMOVE	137+/-	1.5+/-	UNK	NFV
13A	14	NEW - ADD	133	0.53	18	SLCPP
14	15	NEW - ADD	20	0.5	36	SLCPP
20A	20B	EXIST. - REMOVE	94	4.41	15	NFV
20	21	NEW - ADD	21	8.33	15	SLCPP
21	23	NEW - ADD	88	6.36	18	SLCPP
22	23	NEW - ADD	35	1	15	SLCPP
23						

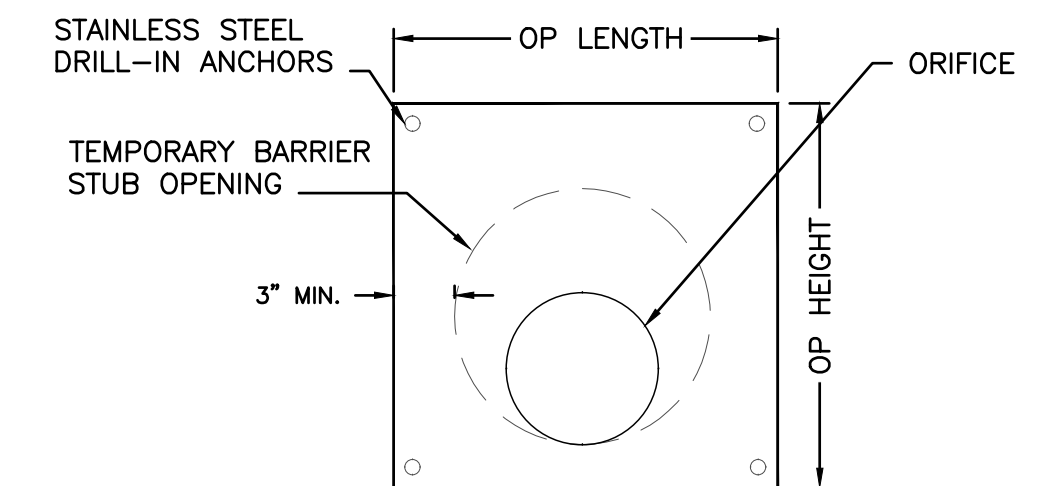




**BASIN #1 OUTLET STRUCTURE #12** (1) (182)  
NOT TO SCALE



**BASIN #2 (MS4) OUTLET STRUCTURE #25** (2) (182)  
NOT TO SCALE

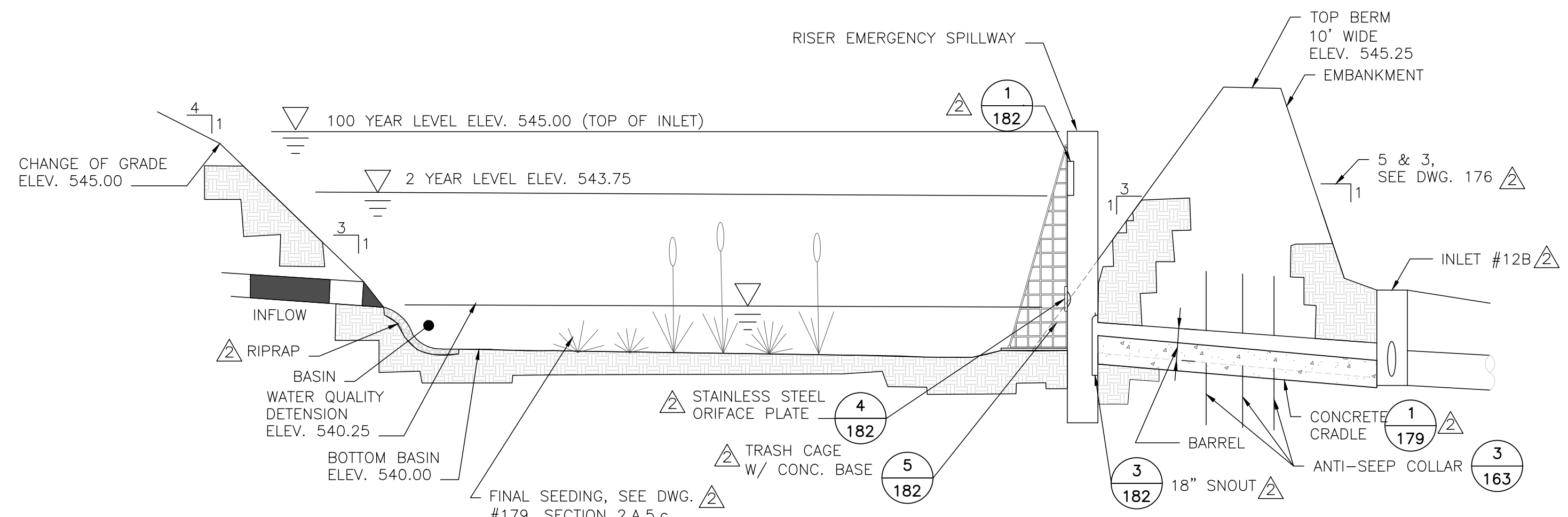
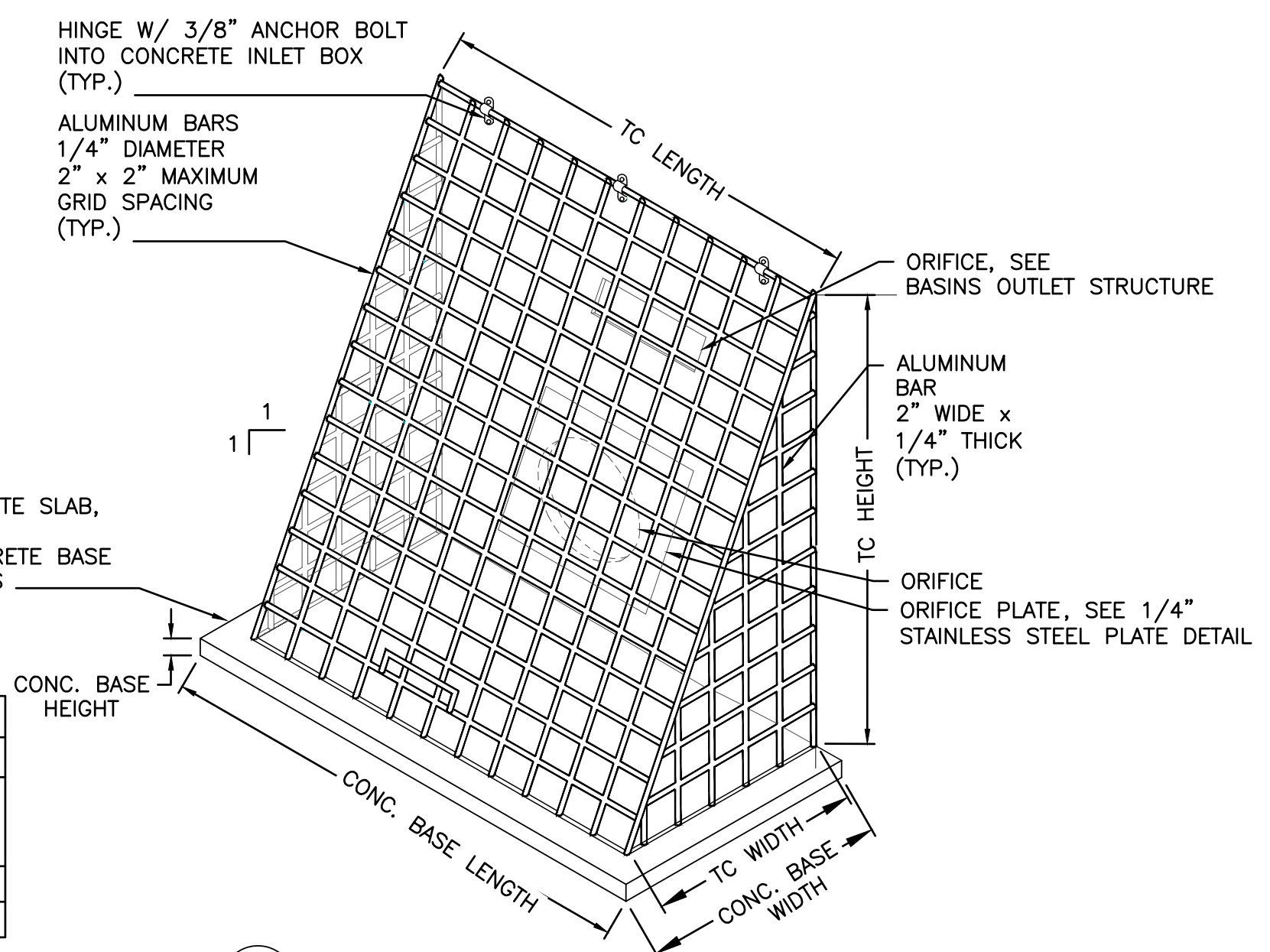


LOCATION	BASIN'S PLATE				
	LENGTH (FT.)	HEIGHT (FT.)	ORIFICE OPENING (FT.)	ORIFICE ELEV. (FT.)	TEMPORARY BARREL OPEN (FT.)
BASIN #1 (#12)	1.75	1.75	0.50 DIAM.	540.25	1.25 DIAM.

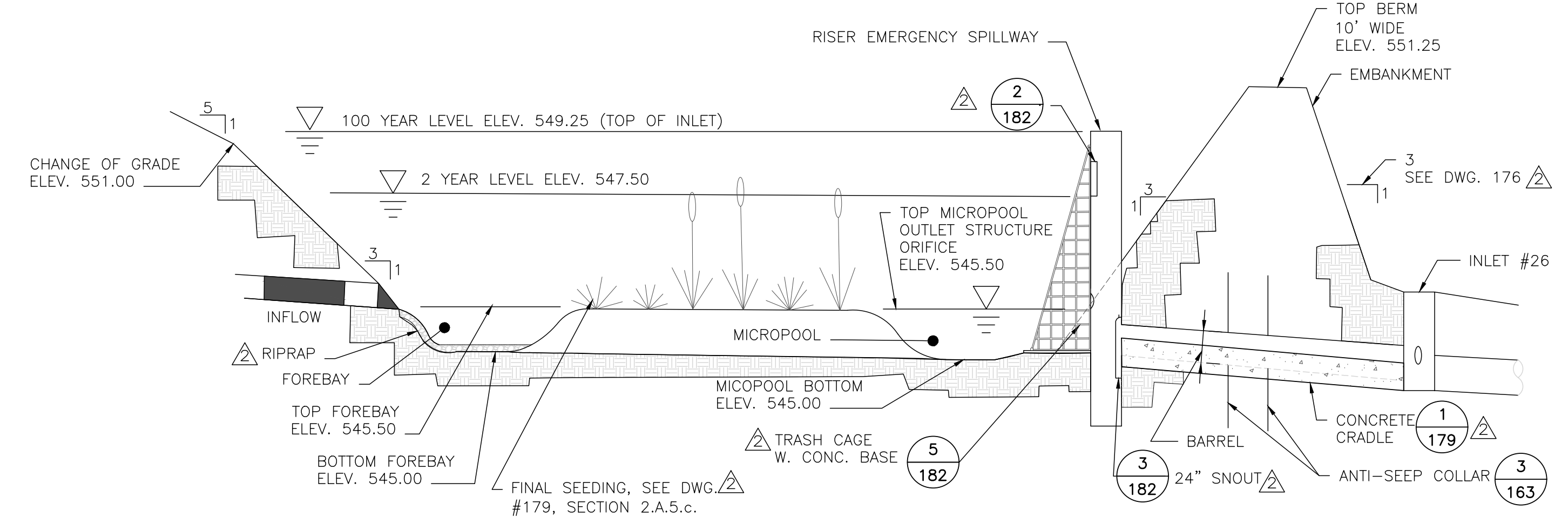
**1/4\"/>**

LOCATION	BASIN'S TRASH RACK CAGE AND CONCRETE BASE					
	TRASH CAGE (TC)			CONCRETE BASE DIMENSIONS		
	LENGTH (FT.)	HEIGHT (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	HEIGHT (FT.)
BASIN #1 (#12)	2.58	4.75	4.75	3.58	5.25	0.50
BASIN #2 (#25)	3.83	3.5	3.5	4.83	4	0.50

**TRASH CAGE** (5) (182)  
NOT TO SCALE



**BASIN #1 (INLET #12)** (6) (182)  
NOT TO SCALE



**BASIN #2 (MS4)** (7) (182)  
NOT TO SCALE

**CONFIGURATION DETAIL**

**TYPICAL INSTALLATION**

**NOTES:**

- ALL HOODS AND TRAPS FOR CATCH BASINS AND WATER QUALITY STRUCTURES SHALL BE AS MANUFACTURED BY BEST MANAGEMENT PRODUCTS, INC. 9 MATHEWS DRIVE, UNIT A1-42, EAST HADDAM, CT 06423. TOLL FREE: (800) 544-8008 OR (888) 434-0277. FAX: (877) 434-2197. WEB SITE: www.bmpinc.com OR PRE-APPROVED EQUAL.
- ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125\"/>
- ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT PIPE AND ELBOW AS DRAWN. (SEE CONFIGURATION DETAIL).
- THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION (SNOUT SIZE ALWAYS LARGER THAN PIPE SIZE).
- THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A MINIMUM DISTANCE EQUAL TO 1/2 THE OUTLET PIPE DIAMETER WITH A MINIMUM DISTANCE OF 6\"/>
- THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3\"/>
- THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL AND PIPE SHALL BE FINISHED FLUSH TO WALL.
- ALL STRUCTURE JOINTS SHALL BE WATERTIGHT.
- THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3\"/>
- INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT. INSTALLATION KIT SHALL INCLUDE: A. INSTALLATION INSTRUCTIONS B. PVC ANTI-SIPHON VENT PIPE AND ADAPTER C. OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING D. 3/8\"/>

**HOOD SPECIFICATION FOR CATCH BASINS AND WATER QUALITY STRUCTURES**

DESCRIPTION	DATE	SCALE
OIL-DEBRIS HOOD SPECIFICATION AND INSTALLATION (TYPICAL)	09/08/18	NONE

US Patent # 6126817, 7951294, 7857966, 8512556  
Canada Patent # 2285146, 2690156, 2690159 others pending

**18\"/>**

NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
1	REVISED DRAWING PER DEP LETTER, 4/12/21	04/16/21	JES		
2	GENERAL REVISIONS	3/11/21	JES	3/12/21	ISSUE FOR BIDS

**BCM ENGINEERS**  
ATC GROUP SERVICES LLC  
920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

DESIGN ENGR.	JES	APPROVED
DRAWN BY	RC	
PROJECT ENGR.	JES	APPROVED
PROJECT MGR.	JES	
CHECKED BY	JES	DATE 08/31/20

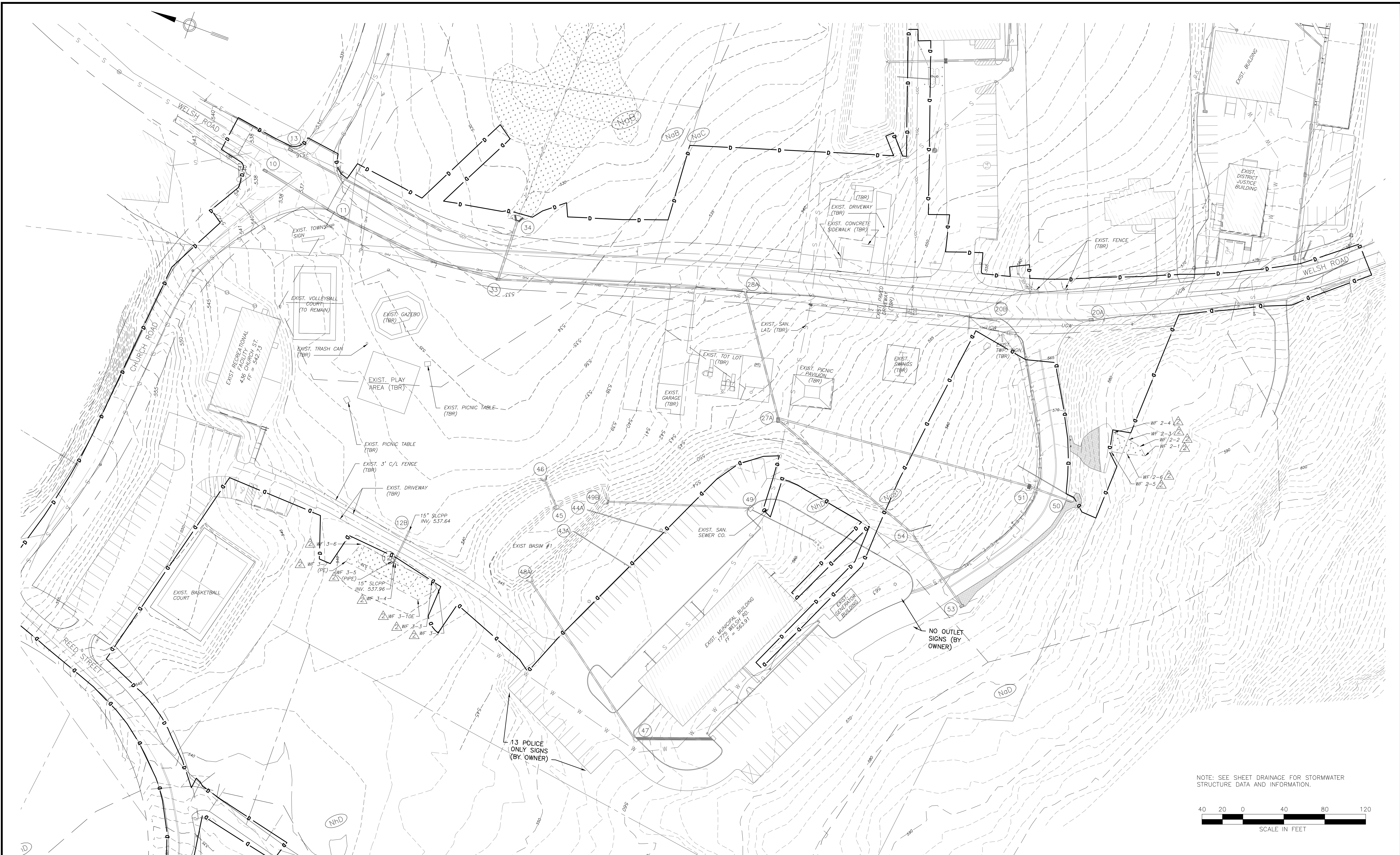
**CUMRU TOWNSHIP**  
BERKS COUNTY, PENNSYLVANIA  
UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS  
CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY

POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN  
DETAILS  
DRAINAGE SYSTEM INSTALLATION

SCALE: AS NOTED  
PROJECT NO.: Z057000415  
DRAWING NO.: 182  
SHEET: OF

REGISTERED PROFESSIONAL ENGINEER

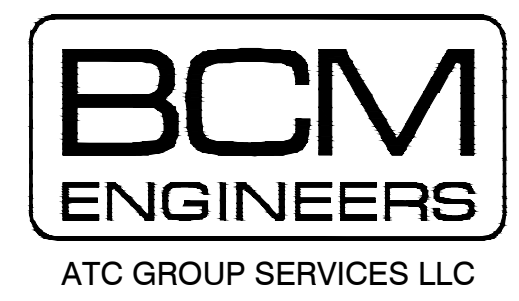




NOTE: SEE SHEET DRAINAGE FOR STORMWATER STRUCTURE DATA AND INFORMATION.

SCALE IN FEET

NO.	REVISIONS	DATE	ENGR.	DATE	ISSUED FOR
1	REVISED DRAWING PER DEP LETTER, 4/12/21	04/16/21	JES		
2	GENERAL REVISIONS	3/11/21	JES	3/12/21	ISSUE FOR BIDS



920 Germantown Pike, Suite 200 Plymouth Meeting, PA 19462

DESIGN ENGR.	GTA	APPROVED	
DRAWN BY	RC		
PROJECT ENGR.	JES	APPROVED	
PROJECT MGR.	JES		
CHECKED BY	JFB	DATE	08/31/20



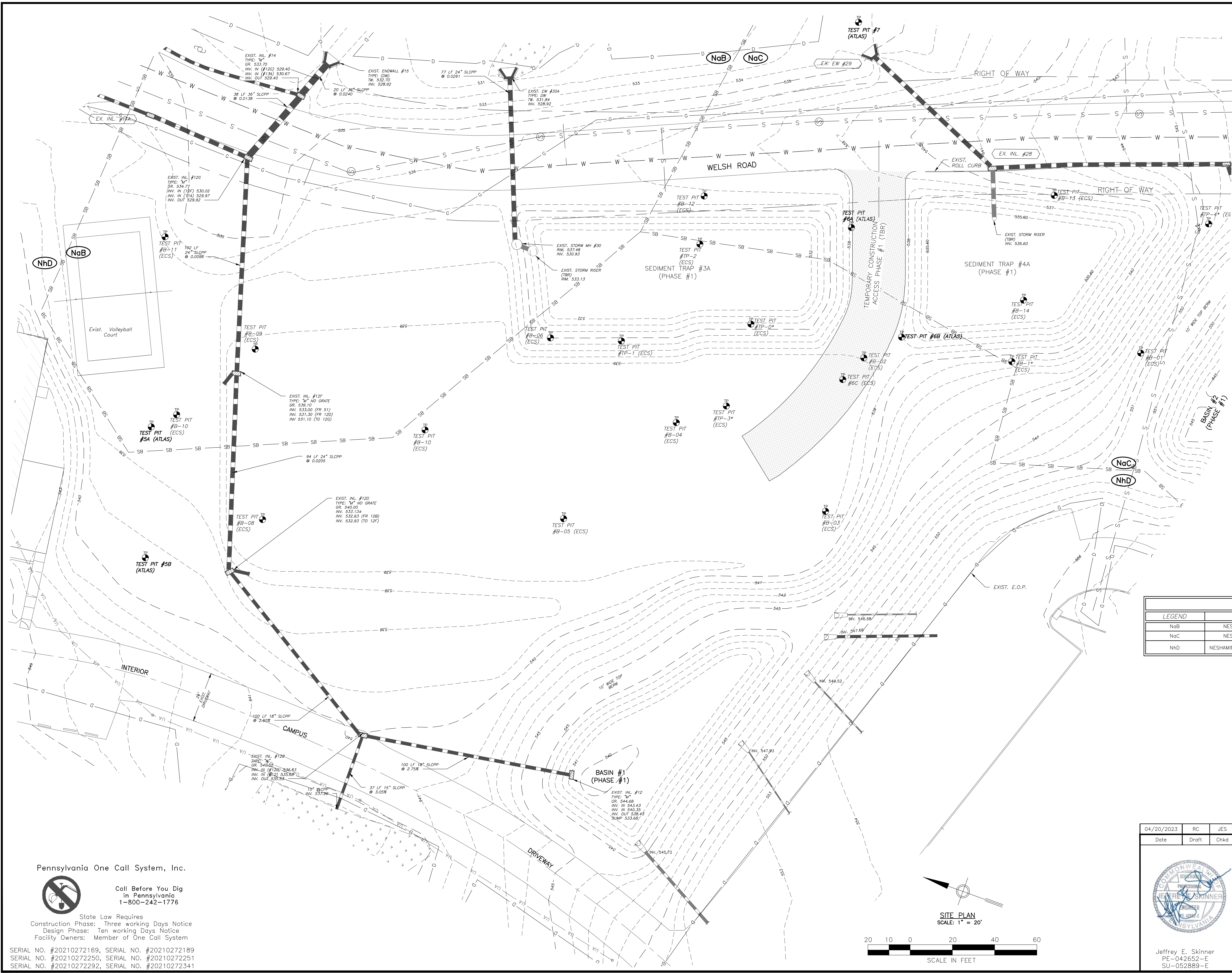
**CUMRU TOWNSHIP**  
**BERKS COUNTY, PENNSYLVANIA**  
 UTILITIES INSTALLATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS  
 CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY

EXISTING FEATURES AND DEMOLITION PLAN  
 CUMRU TOWNSHIP MUNICIPAL CAMPUS

SCALE	AS NOTED
PROJECT NO.	Z057000415
DRAWING NO.	190
SHEET	OF

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SOIL TEST PIT INDEX:  
 ATLAS - TESTED  
 ECS - TESTED

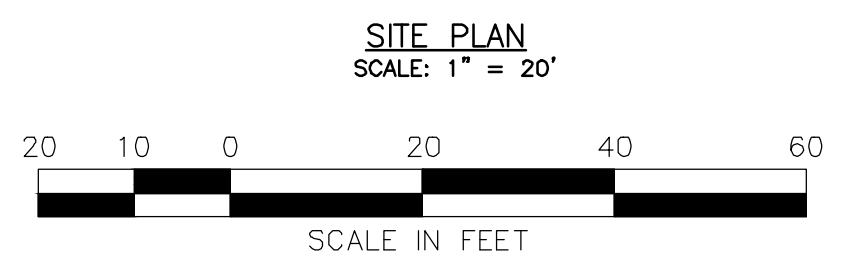
SOILS TYPE ON SITE		
LEGEND	NAME	DESCRIPTION
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NaC	NESHAMINY SILT LOAM	8 TO 15 PERCENT SLOPES
NhD	NESHAMINY GRAVELLY SILT LOAM	8 TO 25 PERCENT SLOPES, EXTREMELY BOULDERY

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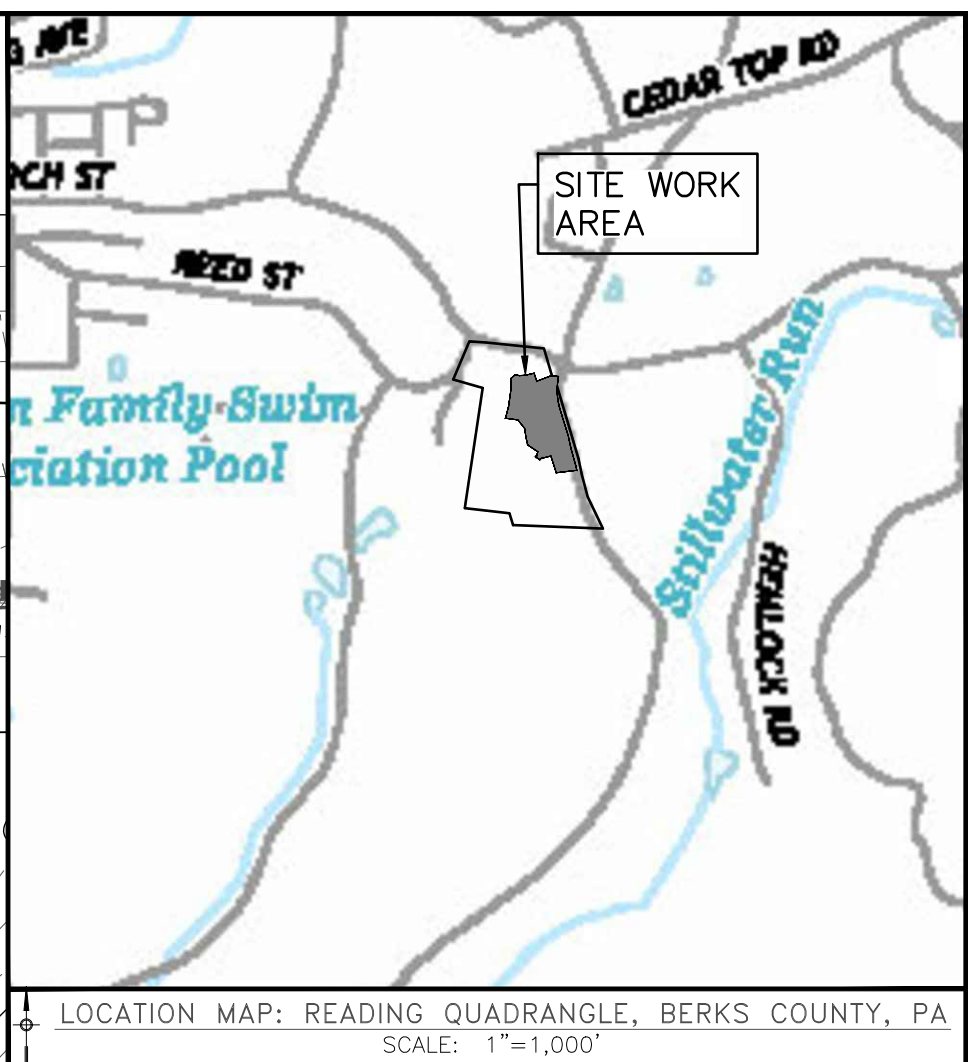
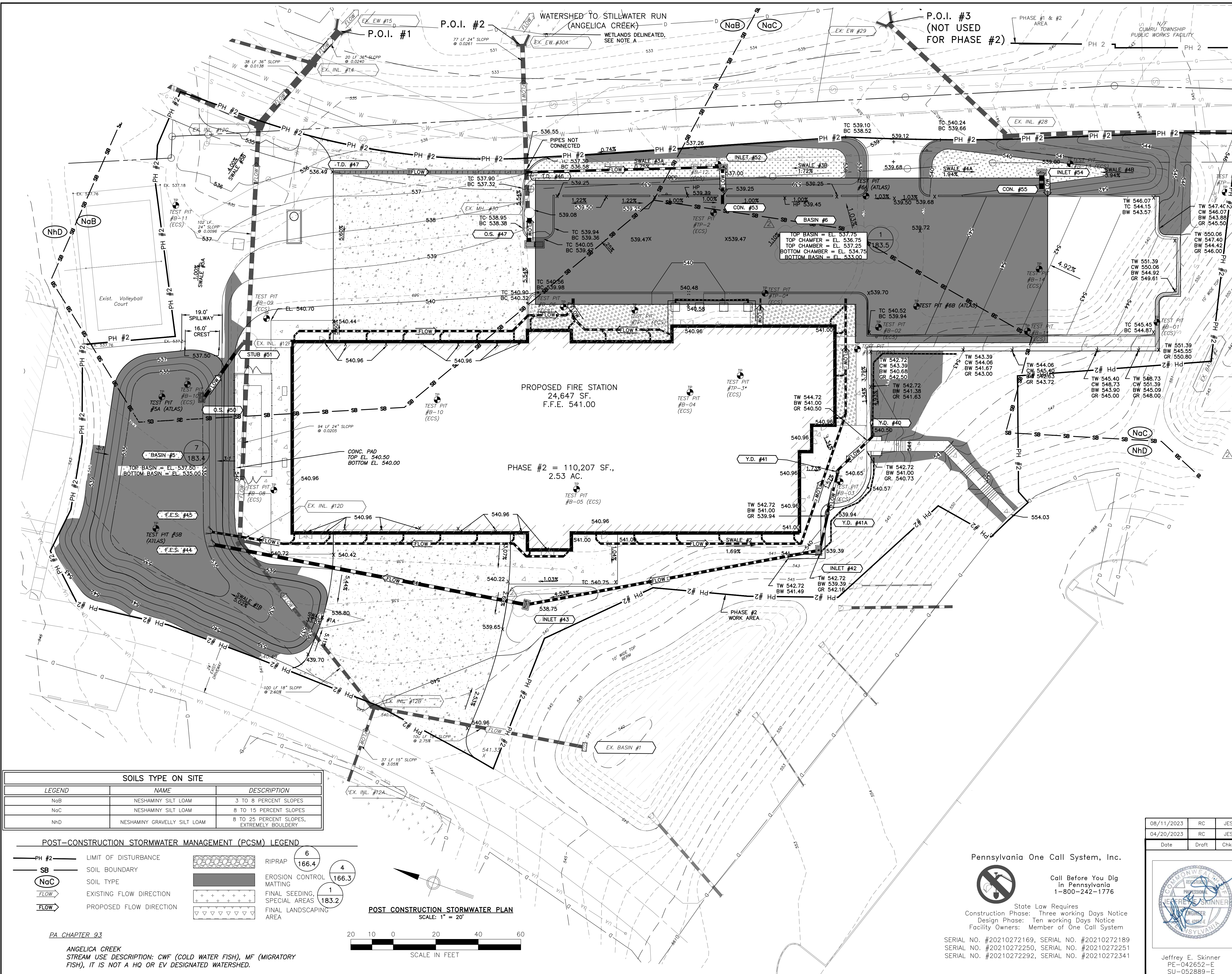
State Law Requires  
 Construction Phase: Three working Days Notice  
 Design Phase: Ten working Days Notice  
 Facility Owners: Member of One Call System

SERIAL NO. #20210272189, SERIAL NO. #20210272189  
 SERIAL NO. #20210272250, SERIAL NO. #20210272251  
 SERIAL NO. #20210272292, SERIAL NO. #20210272341

04/20/2023	RC	JES	NPDES PERMIT #PAD060047, PHASE #2 SUBMISSION
Date	Draft	Chkd	
			
<b>EXISTING FEATURES PLAN</b> <b>CUMRU FIRE DEPARTMENT NEW BUILDING</b> Prepared For: <b>TOWNSHIP OF CUMRU</b> Situate In: <b>CUMRU TOWNSHIP, BERKS CO., PA.</b>			
Jeffrey E. Skinner PE-042652-E SU-052889-E			PROJECT #: Z057000538 DRAWING #: 147 SHEET #: 3 OF 28







**WETLANDS DELINEATED**  
 A. NOTES FOR UNNAMED TRIBUTARY WETLANDS DELINEATED:  
 WETLANDS DELINEATED CAME FROM A PLAN TITLE: "WETLAND DELINEATED PLAN," PROJECT: CUMRU TOWNSHIP FIRE STATION PROJECT, CUMRU TOWNSHIP, BERKS COUNTY, PENNSYLVANIA," BY: VORTEX ENVIRONMENTAL, INC., 2818-1 WILLOW STREET PIKE NORTH, WILLOW STREET, PA 17584, PROJECT NUMBER: 172-002-16, DATED: AUGUST 9, 2016.  
 INFORMATION FROM ABOVE PLAN:  
 1. NOTES:  
 a. WETLANDS DELINEATED BY VORTEX ENVIRONMENTAL, INC. ON FEBRUARY 22, AND MARCH 24, 2019 USING THE UNITED STATES ARMY CORPS OF ENGINEERS WETLAND Delineation MANUAL, 1987, AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND Delineation MANUAL: EASTERN MOUNTAINS AND Piedmont Region - Version 2.0 (APRIL 2012).  
 b. WETLANDS, BOUNDARY, PROPERTY, AND TOPOGRAPHIC INFORMATION TAKEN FROM AN EXISTING CONDITIONS PLAN FROM THE CUMRU TOWNSHIP FIRE STATION PROJECT, UNDATED.  
 2. WETLAND CLASSIFICATIONS:  
 a. PEM1 - PALUSTRINE, EMERGENT, PERSISTENT  
 b. RASBS - REVERNE, INTERMITTENT, STREAMBED, MUD  
 3. WETLAND SUMMARY: WETLAND (PEM1) 0.36 ACRE (ON SITE)  
 B. PROJECT SITE:  
 WETLANDS DELINEATED BY A.D. MARBLE FOR THE CUMRU TOWNSHIP PROJECT, TITLE UTILITIES INSULATION AND REPLACEMENT, ROADWAY AND DRAINAGE IMPROVEMENTS CUMRU TOWNSHIP MUNICIPAL CAMPUS AND VICINITY, DATED MAY 4, 2021. THREE WETLANDS WERE IDENTIFIED WITHIN THE PROJECT STUDY AREA.  
 1. NOTES FROM A.D. MARBLE, AQUATIC RESOURCE - PERMIT ENVIRONMENTAL FACTS SHEET:  
 WETLAND CLASSIFICATIONS:  
 a. WETLANDS 1 AND 2 ARE PALUSTRINE EMERGENT (PEM) WETLANDS  
 b. WETLANDS 3 IS CLASSIFIED AS PEM HABITAT, BUT TRANSITIONS TO PALUSTRINE SCRUB-SHRUB (PSS) HABITAT OUTSIDE THE PROJECT STUDY AREA.  
 2. WETLAND SUMMARY: WETLAND 1 & 2 (PEM) AND WETLANDS 3 (PSS) - 0.065 AC.

**E&S BMP (SEDIMENT TRAPS #3A & #4A) CONVERTING TO PCSM BMP (BASIN #6) NOTES:**  
 1. ALL WORK TO CONVERT SEDIMENT TRAPS INTO BASIN #6 & SWALES #3A/B & #4A/B SHALL BE RESTRICTED TO THE GROWING SEASON.  
 2. ALL AREAS ABOVE BASIN WATERHEAD SHALL BE STABILIZED. THE VEGETATED AREAS MUST ACHIEVE A MINIMUM UNIFORM 70% PERENNIAL VEGETATION COVER OVER THE ENTIRE DISTURBED AREA. THE PAVEMENT BASE COURSE OF THE INTERIOR CAMPUS DRIVEWAY SHALL BE INSTALLED PRIOR TO CONVERSION.  
 3. INSTALL PUMP AND FILTER BAG WITHIN THE OUTFLOW STRUCTURE SUMMP. FILTER BAG SHOULD BE PLACED IN A GRASSY AREA. FOLLOW GUIDELINE FOR SAFE OPERATION OF PUMP AND FILTER BAG.  
 4. ACCUMULATED SEDIMENT FROM THE CONTRIBUTING AREA SHALL BE COLLECTED, REMOVED AND DISPOSED PROPERLY.  
 5. REMOVE PUMP & FILTER BAG, TEMPORARY SEDIMENT TRAP RISER AND OTHER TEMPORARY FEATURES WITHIN THE TRAPS. AVOID COMPACTION BY HEAVY EQUIPMENT AND DISTURBANCE OF STABILIZED AREAS TO THE EXTENT POSSIBLE.  
 6. FILL THE SEDIMENT TRAPS WITH STONE UP TO THE BOTTOM ELEVATION OF BASIN #6.

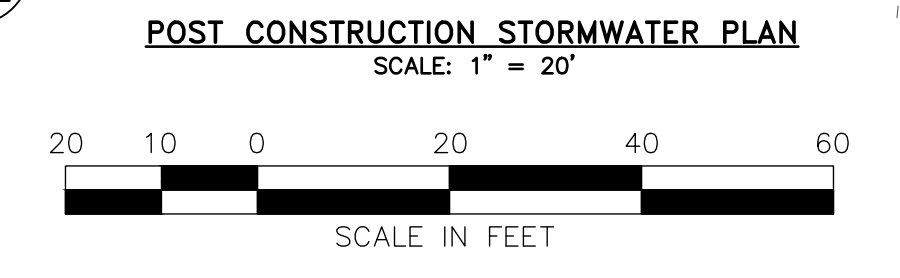
**SOILS TYPE ON SITE**

LEGEND	NAME	DESCRIPTION
NaB	NESHAMINY SILT LOAM	3 TO 8 PERCENT SLOPES
NaC	NESHAMINY SILT LOAM	8 TO 15 PERCENT SLOPES
NhD	NESHAMINY GRAVELLY SILT LOAM	8 TO 25 PERCENT SLOPES, EXTREMELY BOULDERY

**POST-CONSTRUCTION STORMWATER MANAGEMENT (PCSM) LEGEND**

PH #2	LIMIT OF DISTURBANCE	RIPRAP
SB	SOIL BOUNDARY	EROSION CONTROL MATTING
NaC	SOIL TYPE	FINAL SEEDING, SPECIAL AREAS
FLOW	EXISTING FLOW DIRECTION	FINAL LANDSCAPING AREA
FLOW	PROPOSED FLOW DIRECTION	

PA CHAPTER 93  
 ANGELICA CREEK  
 STREAM USE DESCRIPTION: CWF (COLD WATER FISH), MF (MIGRATORY FISH), IT IS NOT A HQ OR EV DESIGNATED WATERSHED.



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 1-800-242-1776  
 State Law Requires  
 Construction Phase: Three working Days Notice  
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 SERIAL NO. #20210272169, SERIAL NO. #20210272189  
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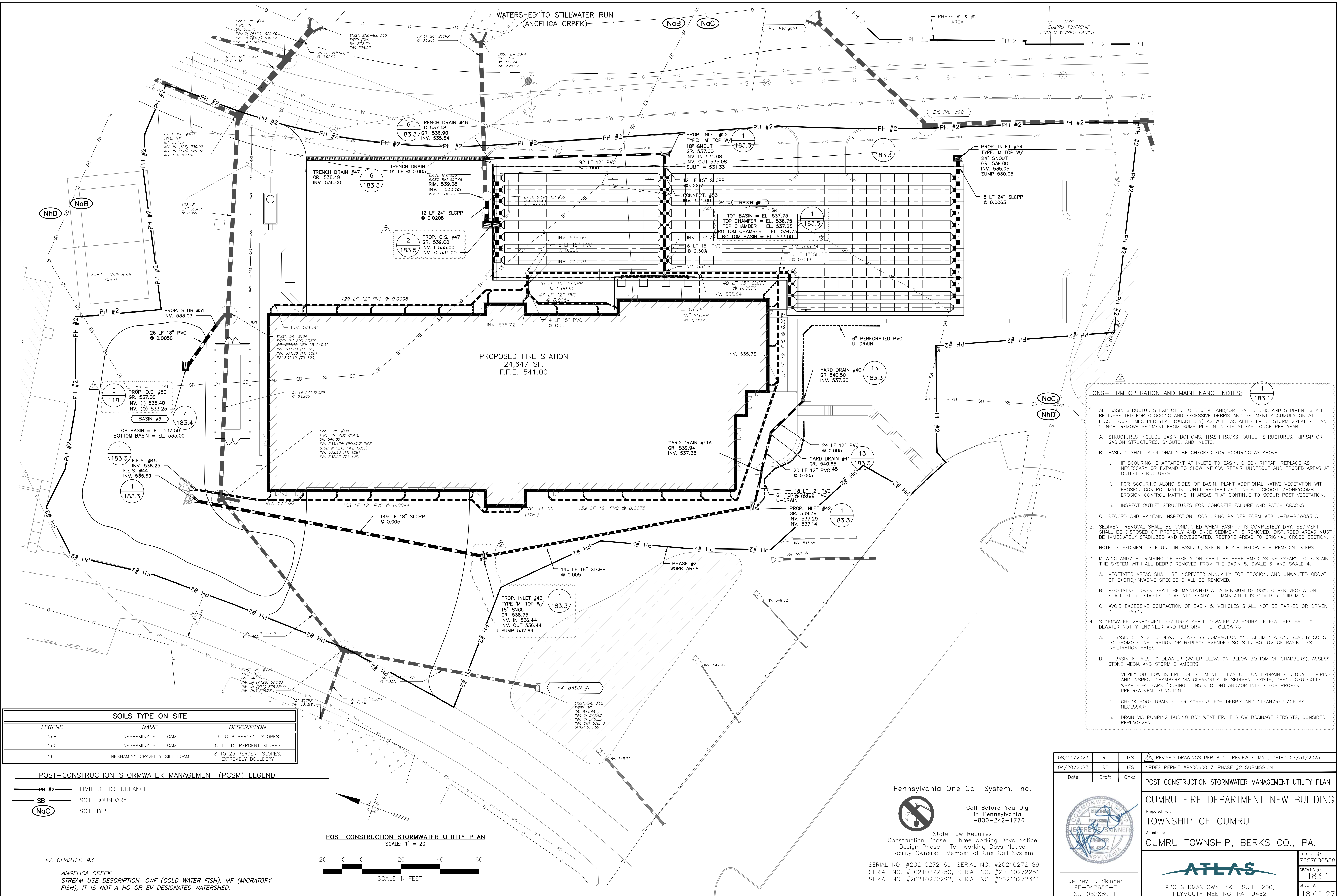
08/11/2023	RC	JES	REVISED DRAWINGS PER BCCD REVIEW E-MAIL, DATED 07/31/2023.
04/20/2023	RC	JES	NPDES PERMIT #PAD060047, PHASE #2 SUBMISSION
Date	Draft	Chkd	

POST-CONSTRUCTION STORMWATER MANAGEMENT GRADING PLAN  
 CUMRU FIRE DEPARTMENT NEW BUILDING  
 Prepared For:  
 TOWNSHIP OF CUMRU  
 Situated In:  
 CUMRU TOWNSHIP, BERKS CO., PA.  
 PROJECT #:  
 Z057000538  
 DRAWING #:  
 183  
 SHEET #:  
 17 OF 27

Jeffrey E. Skinner  
 PE-042652-E  
 SU-052889-E

ATLAS  
 920 GERMANTOWN PIKE, SUITE 200,  
 PLYMOUTH MEETING, PA 19462





PROPOSED FIRE STATION  
24,647 SF.  
F.F.E. 541.00

- LONG-TERM OPERATION AND MAINTENANCE NOTES:**
- ALL BASIN STRUCTURES EXPECTED TO RECEIVE AND/OR TRAP DEBRIS AND SEDIMENT SHALL BE INSPECTED FOR CLOGGING AND EXCESSIVE DEBRIS AND SEDIMENT ACCUMULATION AT LEAST FOUR TIMES PER YEAR (QUARTERLY) AS WELL AS AFTER EVERY STORM GREATER THAN 1 INCH. REMOVE SEDIMENT FROM SUMP PITS IN INLETS ATLEAST ONCE PER YEAR.
    - STRUCTURES INCLUDE BASIN BOTTOMS, TRASH RACKS, OUTLET STRUCTURES, RIPRAP OR GABION STRUCTURES, SNOUTS, AND INLETS.
    - BASIN 5 SHALL ADDITIONALLY BE CHECKED FOR SCOURING AS ABOVE
      - IF SCOURING IS APPARENT AT INLETS TO BASIN, CHECK RIPRAP, REPLACE AS NECESSARY OR EXPAND TO SLOW INFLOW. REPAIR UNDERCUT AND ERODED AREAS AT OUTLET STRUCTURES.
      - FOR SCOURING ALONG SIDES OF BASIN, PLANT ADDITIONAL NATIVE VEGETATION WITH EROSION CONTROL MATTING UNTIL RESTABILIZED. INSTALL GEOCELL/HONEYCOMB EROSION CONTROL MATTING IN AREAS THAT CONTINUE TO SCOUR POST VEGETATION.
      - INSPECT OUTLET STRUCTURES FOR CONCRETE FAILURE AND PATCH CRACKS.
  - RECORD AND MAINTAIN INSPECTION LOGS USING PA DEP FORM #3800-FM-BCW0531A
  - SEDIMENT REMOVAL SHALL BE CONDUCTED WHEN BASIN 5 IS COMPLETELY DRY. SEDIMENT SHALL BE DISPOSED OF PROPERLY AND ONCE SEDIMENT IS REMOVED, DISTURBED AREAS MUST BE IMMEDIATELY STABILIZED AND REVEGETATED, RESTORE AREAS TO ORIGINAL CROSS SECTION.
 

NOTE: IF SEDIMENT IS FOUND IN BASIN 6, SEE NOTE 4.B. BELOW FOR REMEDIAL STEPS.

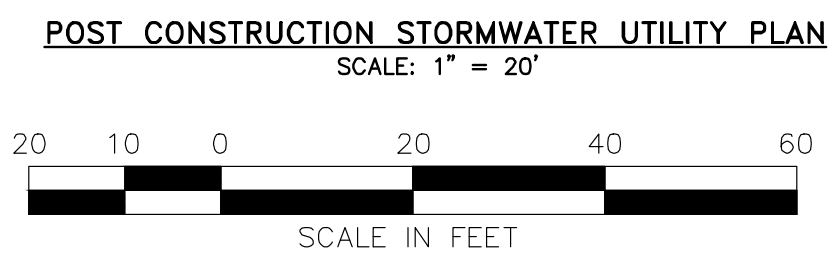
    - VEGETATED AREAS SHALL BE INSPECTED ANNUALLY FOR EROSION, AND UNWANTED GROWTH OF EXOTIC/INVASIVE SPECIES SHALL BE REMOVED.
    - VEGETATIVE COVER SHALL BE MAINTAINED AT A MINIMUM OF 95%. COVER VEGETATION SHALL BE REESTABLISHED AS NECESSARY TO MAINTAIN THIS COVER REQUIREMENT.
    - AVOID EXCESSIVE COMPACTION OF BASIN 5. VEHICLES SHALL NOT BE PARKED OR DRIVEN IN THE BASIN.
  - STORMWATER MANAGEMENT FEATURES SHALL DEWATER 72 HOURS. IF FEATURES FAIL TO DEWATER NOTIFY ENGINEER AND PERFORM THE FOLLOWING.
    - IF BASIN 5 FAILS TO DEWATER, ASSESS COMPACTION AND SEDIMENTATION. SCARIFY SOILS TO PROMOTE INFILTRATION OR REPLACE AMENDED SOILS IN BOTTOM OF BASIN. TEST INFILTRATION RATES.
    - IF BASIN 6 FAILS TO DEWATER (WATER ELEVATION BELOW BOTTOM OF CHAMBERS), ASSESS STONE MEDIA AND STORM CHAMBERS.
      - VERIFY OUTFLOW IS FREE OF SEDIMENT. CLEAN OUT UNDERDRAIN PERFORATED PIPING AND INSPECT CHAMBERS VIA CLEANOUTS. IF SEDIMENT EXISTS, CHECK GEOTEXTILE WRAP FOR TEARS (DURING CONSTRUCTION) AND/OR INLETS FOR PROPER PRETREATMENT FUNCTION.
      - CHECK ROOF DRAIN FILTER SCREENS FOR DEBRIS AND CLEAN/REPLACE AS NECESSARY.
      - DRAIN VIA PUMP DURING DRY WEATHER. IF SLOW DRAINAGE PERSISTS, CONSIDER REPLACEMENT.

**SOILS TYPE ON SITE**

LEGEND	NAME	DESCRIPTION
NaB	NESHAMINY SILT LOAM	3 TO 8 PERCENT SLOPES
NaC	NESHAMINY SILT LOAM	8 TO 15 PERCENT SLOPES
NhD	NESHAMINY GRAVELLY SILT LOAM	8 TO 25 PERCENT SLOPES, EXTREMELY BOULDERY

- POST-CONSTRUCTION STORMWATER MANAGEMENT (PCSM) LEGEND**
- PH #2 LIMIT OF DISTURBANCE
  - SB SOIL BOUNDARY
  - NaC SOIL TYPE

PA CHAPTER 93  
ANGELICA CREEK  
STREAM USE DESCRIPTION: CWF (COLD WATER FISH), MF (MIGRATORY FISH), IT IS NOT A HQ OR EV DESIGNATED WATERSHED.



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State Law Requires  
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Facility Owners: Member of One Call System

SERIAL NO. #20210272169, SERIAL NO. #20210272189  
SERIAL NO. #20210272250, SERIAL NO. #20210272251  
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04/20/2023	RC	JES	NPDES PERMIT #PAD060047, PHASE #2 SUBMISSION
Date	Draft	Chkd	

**POST CONSTRUCTION STORMWATER MANAGEMENT UTILITY PLAN**

CUMRU FIRE DEPARTMENT NEW BUILDING

Prepared For:  
TOWNSHIP OF CUMRU

Situate In:  
CUMRU TOWNSHIP, BERKS CO., PA.

PROJECT #: 2057000538  
DRAWING #: 183.1  
SHEET #: 18 OF 27

Jeffrey E. Skinner  
PE-042652-E  
SU-052889-E

920 GERMANTOWN PIKE, SUITE 200,  
PLYMOUTH MEETING, PA 19462



PREPAREDNESS, PREVENTION AND CONTINGENCY PLAN NOTES

This plan is part of the NPDES permit application for the discharge of stormwater associated with construction activities and the related Erosion and Sediment Control Plan. It is required to comply with Chapter 101.3(b) of the Rules and Regulations of the Pennsylvania Department of Environmental Protection, and conditions under the NPDES permit.

- 1. Name of Permittee: Cumru Township
Name of Co-permittee (contractor): TBD
2. Name of Project: Reed Street Utility Extension
3. Project Location: Mohnton, Berks County, PA
4. List name(s) and telephone number(s) of responsible Cumru Township officials to be contacted in case of emergency (to be confirmed at pre-construction meeting):
5. List name and telephone number of the following:
6. Notification to the following agencies must be made immediately in the event of a spill of any polluting substances.
7. List name and telephone number of any downstream water users, including drinking water supplies, industrial intakes and agricultural uses.

8. General Description of Construction Activity.
Re-grading and realignment of Welsh Road. Replace sanitary and storm sewers along Welsh Road and sanitary from border of Mohnton Borough along Reed Street. Extension of gas on water main from intersection of Main Street and Fairview Ave. to Welsh Road.

- 9. Material and Waste Inventory
A. Pesticides and herbicides\*
B. Fertilizer\*
C. Other chemicals, such as paints, detergents, acids for cleaning, solvents, soil additives, concrete curing compounds\*
D. Petroleum based products

Note: It is not anticipated that gasoline, diesel fuel, lubricating oils, etc. will be stored onsite. Heavy equipment will typically be serviced periodically by fuel trucks on an as-needed basis.

- 10. List the types and quantities of absorbent materials used for spill mitigation that are stored on premises.
11. During concrete work, steps shall be taken to assure that no pollution enters waterways.
12. Particular attention shall be given to equipment refueling operations.
13. The site shall be inspected daily for evidence of existing or potential spills or leaks, vandalism, and the condition and quantity of cleanup materials.
14. Material Management Practices.

- The following material management practices shall be used to reduce the risk of spills or other accidental discharge of materials and substances to storm water runoff:
A. Good Housekeeping:
B. Hazardous Products:
15. Product-Specific Practices

- The following product-specific practices shall be followed onsite:
A. Petroleum Products:
B. Fertilizers:
C. Chemical/Paints:
D. Concrete Truck Washout Materials:

- 16. Spill Prevention Practices

In addition to the good housekeeping and material management practices described above, the following practices shall be followed for spill prevention and cleanup:

- The manufacturer's recommended methods for spill cleanup shall be clearly posted, and site personnel shall be trained in the proper information on the location of spill prevention and cleanup supplies.
• Materials and the equipment necessary for spill cleanup shall be kept onsite.
• All spills shall be cleaned up immediately after discovery.
• The spill area shall be kept well ventilated and personnel shall wear appropriate protective clothing to prevent contact with a hazardous substance.
• All spills of toxic or hazardous material, regardless of the size of the spill, shall be reported immediately via text, email or in writing to the Engineer, the Owner, and the appropriate local and State government agencies.
• The spill prevention plan shall be revised to include measures to prevent any type of spill from recurring, and to confirm how to clean up the spill if there is another one.
• The contractor's site superintendent responsible for the day-to-day site operations shall be the project's spill prevention and cleanup coordinator.
• Site Security
• All construction and site activities shall be performed in accordance with the specifications and plans approved by the appropriate governmental authorities.

POST-CONSTRUCTION STORMWATER MANAGEMENT (PCSM) PLAN NARRATIVE

General PCSM planning and design §102.8(f)(8)
The Post Construction Stormwater Management Plans for the project are labeled as "Post Construction Stormwater Management Plans" and are the final site construction plans.

This construction and restoration project proposes no change of use, no land subdivision and no land development, as the utilities will be underground within the existing road right-of-way. There are no new buildings as part of Phase 1, although construction is considered in a later phase. No new impervious areas are proposed with Phase 1 of the project.
Documentation that the PCSM Plan was prepared by a person trained and experienced in PCSM design methods and techniques applicable to the size and scope of the project is provided in ATTACHMENT G.

Phase 1 of the project includes plans to realize storm swales along Welsh Road, enlarge and rehabilitate stormwater management basins on the Township Campus, and regrade parts of the township campus in preparation for the new fire station to be constructed within a later phase. No new impervious areas are proposed with Phase 1 of the project.
New impervious areas are proposed with Phase 2 of the project. New stormwater sources providing an increase in stormwater runoff volume include the aforementioned fire station building, the fire station driveways, and the fire station parking lot.
No new impervious areas are proposed with Phase 1 of the project. Only impervious areas are those that are to be restored as part of the utilities install and replacement.

Existing vegetation is protected by maintaining the smallest possible limit of disturbance. Existing drainage features are to be utilized and revitalized as part of the project, specifically the drainage swale along Welsh Road between the township building driveway and the location of the future fire station driveway and the stormwater management basin located to the north of the township building within the road right-of-way and placing the new water line within the existing right-of-way.
No wooded areas need to be cleared, as the areas are already open fields. Areas to be regraded include along Welsh Road to raise the low point and to realign a section where a building is to be removed, and within the township campus to prepare the new foundation for the proposed fire station. Clearing and grading has been further minimized by replacing the sanitary sewer in place within the road right-of-way and placing the new water line within the existing right-of-way.

The limits of disturbance are shown on the drawings. Construction equipment paths are also provided. Construction equipment will not be allowed to travel on surfaces that have been newly restored with native vegetation and ground cover, thereby minimizing soil compaction.

Existing topographic features of the project site and the immediate surrounding area §102.8(f)(1)
The topography of the project site is shown on the site drawings, by use of contours at one foot intervals.
A USGS quadrangle map is provided on the drawings.
The types of ground cover are labeled on the drawings.
Types, depth, slope, locations and limitations of the soils and geologic formations §102.8(f)(2)
The maps of soil types and limits related to the project were identified using the NRCS Web Soil Survey website. The soil survey map pertained to the project and is in ATTACHMENT E, attached to the E&S Narrative, and is shown on the drawings. Per the PADEP E&S Chapter 102 Manual, Appendix E, soil use limitations and their resolutions provided.
Soil borings were completed within the township campus. The results of those borings are included in ATTACHMENT P. Infiltration tests were completed by ECS in 2018 and additional tests by Atlas in 2023.

There are no apparent, naturally occurring geologic formations or soil conditions having the potential to cause pollution during typical construction earth-disturbance activities.
Characteristics of the project site, including the past, present and proposed land uses and the proposed alteration to the project site §102.8(f)(3)
The limit of disturbance is shown on the drawings. The limit of disturbance is the NPDES permit boundary.
The total area of disturbance for the project is approximately 17.36 acres of which 16.83 acres will be disturbed. Phase 2 consists of changes to 2.53 acres within the disturbance area from Phase 1. Continued disturbance in other permitted areas is expected.

The existing topography and ground cover will be restored as closely as possible to pre-disturbance conditions in street areas outside of the section of Welsh Road that, as noted on the plan, will be regraded to an elevation three feet higher during Phase 1. Phase 2 includes changes to topography to the township campus to accommodate the new fire station, parking lot, and stormwater management basins.
There are proposed plan to construct a fire station within the bounds of the project area during Phase 2. Plans contained in Phase 1 are made in this in mind, most notably, the regrading of Welsh Road to prevent damage to the fire trucks entering and exiting the station.
There is one new proposed post construction stormwater management best management practices in Phase 1 of the project. Phase 2 introduces two new PCSM BMPs, an infiltration basin, installed beneath the new fire station and the recreation center, and an infiltration gallery (stormwater detention basin), installed beneath the parking lot of the new fire station.

Net change in volume and rate of stormwater §102.8(f)(4)
The Design storms used for the calculations are listed in the Existing and Proposed Stormwater Runoff TR-20 Analysis Output via HydroCAD for Phases 1 and 2 (ATTACHMENT K and L) as well as the TR-20 Analysis Input Parameter Summary for Phase 1 (ATTACHMENT I).
The pre- and post-construction hydrology runoff rate and volume are identified for each drainage area of the entire project site in the TR-20 Analysis Output for Existing and Proposed conditions via HydroCAD for Phases 1 and 2 (ATTACHMENT K and L) and TR-20 Analysis Output Comparison for Phases 1 and 2 (ATTACHMENT J).
The net change in runoff rate and volume are identified for each drainage area of the entire project site in the Existing and Proposed Stormwater Runoff TR-20 Analysis Outputs via HydroCAD for Phases 1 and 2 (ATTACHMENT K and L).
The summary table in the NOI is consistent with the calculations provided (ATTACHMENT I through L).
Documentation summarizing the alternative approach's design criteria for rate, volume, and water quality are not applicable. An alternative approach was not utilized.

Receiving surface waters §102.8(f)(5)
Existing streams, wetlands, floodways, and watercourses, as applicable, are shown and labeled on the drawings.
The designated use of the receiving stream basin, the Wyomissing Creek and Angelica Creek, per the PADEP Chapter 93 classification, is HQ-CWF (High Quality - Cold Water Fishes), MF (Migratory Fishes) and CWF, MF respectively. There is no existing use listed.
The west side of the project site is located within a high quality (HQ) watershed, Wyomissing Creek. A boundary line has been drawn on the plans. All actions on the west side can be classified as restoration.
There are no hydric soils listed per the NRCS Web Soil Survey though. NoB and NoC - both Neshaminy silt loams of different slopes have hydric elements to them. There are wetlands to the east of the project site, per the NWI website, and a wetlands investigation was conducted. Wetlands are delineated on the plans. They are located outside the limit of disturbance.

Written Description of the PCSM BMPs §102.8(f)(6)
There is one new proposed permanent post-construction stormwater management best management practices, a stormwater detention basin, during Phase 1. Phase 2 introduces two new permanent PCSM BMPs, an infiltration basin and a stormwater detention basin. The basins are visible and labeled on the plans. Details for the basins, including the outlet structures and profiles including key elevations and features of the outlets, are present on the plans. Existing permanent PCSM BMPs are also labeled on the plans including details for the retrofit of the existing basin.
Specifications for final stabilization are shown on the plans. Final stabilization is considered 70% vegetative cover or better. There is one PCSM BMP and one existing PCSM BMP shown on the plans. Details for the changes to the existing PCSM BMP and for the new PCSM BMP are included on the plans.
BMPs include the use of a proprietary technology, the Snout and StormKeeper arches. Manufacturer specifications for install and requirements for proper function are on the plans.

Sequence of PCSM BMP implementation or installation §102.8(f)(7)
There are permanent PCSM BMPs, Basin #1 and Basin #2 during Phase 1, and Basin #5 and Basin #6 during Phase 2. As required, a complete and site specific installation is shown on the drawings. A sequence of construction are included for the proposed changes to the existing permanent PCSM BMPs Basin #1 and for the install of new Basin #2 during Phase 1 and Basin #5 during Phase 2. Basins #3 and #4 are temporary installs during Phase 1 and will be replaced by underground stormwater storage facilities, Basin #6, during construction of the proposed fire station in Phase 2.
There is a new permanent PCSM BMPs so the requirement that the sequence for the individual BMP installation is shown on the plans is applicable. Sequence of PCSM BMPs for the modification of the permanent PCSM BMPs is shown on the plans.
There is a new permanent PCSM BMPs so the requirement that critical stages when a licensed professional oversee the

installation of the BMPs are shown on the drawings is applicable. Critical stages when a licensed professional oversee the modification of the existing permanent PCSM BMPs are shown on the plans.

Supporting calculations §102.8(f)(8)
Worksheets were not used to design a PCSM BMP. They are therefore not applicable or included.
Worksheets were not used to design permanent PCSM BMPs therefore the requirement that figures contained on the worksheets are consistent with the Application are not applicable and are not provided.
Calculations for all drainage areas and Points of Interest (POI) are contained in ATTACHMENTS (J-L) in the appropriate Phase appendices to the PCSM Narrative.
TR-20 stormwater methodology was used for runoff rate calculations in compliance with 102.8(g)(2)(i-iii) and 102.8(g)(3)(i-ii). TR-55 stormwater methodology was used for runoff volume in 102.8(g)(2)(ii-iii) and 102.8(g)(3)(i-ii). Demonstration that rate, volume, and water quality requirements were met is given in TR-20 Analysis Output Comparisons (ATTACHMENT J). The stormwater management best management practices are not infiltration based, dewatering time analysis is not applicable or included.
The routing analysis to demonstrate peak control for the required storms is contained within the Proposed Stormwater Runoff TR-20 Analysis Output (ATTACHMENT J) for Phase 1, and is demonstrated in the calculations for both Phases in the HydroCAD models (ATTACHMENT L). These results are summarized in the PA DEP PCSM Spreadsheets.

Plan drawings §102.8(f)(9)
A map of tributary areas in Phase 1 is shown on the Drainage Area Map (ATTACHMENT O) and a Drainage Area Map in the plan set for Phase 2. Drainage areas for Phase 1 are broken down by land use category in TR-20 Analysis Input Parameter Summary (ATTACHMENT I).
The existing stormwater discharge points will be retained and are shown on the drawings. Points of interest correspond to stormwater discharge points.
The PCSM Plan is consistent with the E&S Plan in relation to proposed contours, improvements, soils, wetlands, floodways, streams, and discharge locations.
Construction details for the native planting, vegetative restoration and stabilization are provided on the drawings.
Post Construction Stormwater Management Best Management Practices dimensions and elevations of the BMPs are consistent with the calculations and site soil testing.

Long-term operation and maintenance schedule §102.8(f)(10)
Long-term operation and maintenance schedule including inspection, repair, and replacement for the proposed PCSM BMPs are shown on the drawings.
Stormwater management basin Long-term operation, maintenance, and inspection:
• Inspect inlet and outlet structure seasonally and after every major storm event
o Repair/replace any damaged or non-functioning snout
• Remove and dispose of any debris and accumulated sediment in inlets or on basin bottoms
• In case of standing water, verify soil compaction and replace substrate or clean underdrain via cleanout.
• After every runoff event, check for scouring:
o If scouring appears at inlets to basin, check riprap and replace or expand to slow inflow. Repair undercut and eroded areas at outlet structures.
o For scouring along around sides of basin, plant additional native vegetation with erosion control matting until re-stabilized. Install geocell/honeycomb erosion control matting in areas that continue to scour after adding vegetation.
• Inspect outlet structure for concrete failure after every runoff event. Patch cracks.
Native Planting Long-term operation, maintenance, and inspection:
• Seasonal mowing
• Yearly inspection and re-seeding

Recycling or disposal of materials §102.8(f)(11)
Anticipated construction wastes will be soil rock, earth materials, concrete, asphalt pavement and other materials normally associated with heavy utility construction. Typical construction equipment wastes are listed on the Preparedness, Prevention and Contingency (PPC) Plan.
Instructions to the contractor for the proper offsite disposal of exported fill materials per PADEP's "Management of Fill" document 258-2182-773 are provided in the notes on the drawings.

Instructions to the contractor for the proper recycling/offsite disposal of other materials are provided in the notes on the drawings and on the Preparedness, Prevention and Contingency (PPC) Plan.

Geologic formations or soil conditions §102.8(f)(12)
There are no known geologic or other soil conditions that have the potential to cause pollution during construction.
Instructions for proper handling and/or disposal of excess construction materials or materials that could cause pollution are provided in the notes on the drawings and on the Preparedness, Prevention and Contingency (PPC) Plan.
No typical details are required or provided, other than the written instructions for proper recycling/disposal of materials which could cause pollution.

There are no anticipated specific materials, other than construction materials, that might cause pollution. Construction materials will typically be located within the limit of disturbance area as shown on the drawings.

Potential thermal impacts §102.8(f)(13)
There are no new potential thermal impacts post construction during Phase 1
In Phase 2, low potential thermal impacts are present post-construction due to an increase in impervious ground cover. Thermal impacts of stormwater runoff from the project site are avoided, minimized, and mitigated by the use of low slope pipes to slow flows, grassy swales to assist with cooling, detention and infiltration in basins, and slow discharge to reduce potential for thermal load transmission.

Riparian forest buffer management plan §102.8(f)(14)
A riparian forest buffer management plan is not required as this project meets criterion for exceptions in accordance with 102.14(d); a riparian buffer is not shown on the drawings.
Phase 1 of the project meets the requirements for granting of a waiver listed in the following sections of Chapter 102.14 subsection (d):
102.14(d)(1)(v) Work along Welsh Road includes road maintenance activities, plans are in place to maintain existing riparian buffer as undisturbed to the extent practicable. This is done by not extending the limit of disturbance into the riparian buffer.
102.14(d)(1)(vi) Majority of the work consists of maintenance of existing pipelines and utilities beneath the road. Plans are in place to avoid disturbing existing riparian buffer the extent practicable by not extending the limit of disturbance into the existing riparian buffers.

102.14(d)(2)(i) - The project addresses periodic sanitary sewer overflows into the Angelica Creek from a manhole in Woodcrest Ave on Point of Connection Interceptor 8 to the Reading Treatment Plant, to meet a Federal Consent Order. This will strive to abate the threat to public health and safety caused by the overflows.
102.14(d)(2)(ii) - Construction along Reed Street includes replacement of two existing culvert structures.
Phase 2 of the project meets the following waiver requirements:
102.14(d)(1)(i) A project site located greater than 150 feet (45.7 meters) from a river, stream, creek, lake, pond or reservoir.
A waiver may also be optionally granted by DEP under the following heading:
102.14(d)(2)(v) Redevelopment projects which may include brownfields or use of other vacant land and property within a developed area for further construction or development.

The drainage basin is listed as impaired by siltation, total suspended solids, and turbidity. There is no TMDL status of the receiving stream, (unnamed tributary to Angelica Creek, listed on the eMap PA website.
No buffer offsets are required. A checklist for functional equivalency is not required.

FINAL SEEDING 183.2
A. GENERAL
1. NO MORE THAN 15.00 SQUARE FEET OF DISTURBED AREA SHALL ACHIEVE FINAL GRADE BEFORE STABILIZATION BY VEGETATIVE COVER WITH SEEDING AND MULCHING.
2. AFTER THE CONSTRUCTION PHASE IS COMPLETE, PERMANENT VEGETATION ON THE AREAS THAT HAVE BEEN DISTURBED SHALL BE REESTABLISHED AS RAPIDLY AS POSSIBLE IF THE COMPLETION OF THE CONSTRUCTION ACTIVITIES DOES NOT COINCIDE WITH A SEASON IN WHICH PERMANENT VEGETATION CAN BE STARTED. AN INTERIM OR TEMPORARY PROGRAM IS REQUIRED. THIS SHALL INCLUDE SOIL STABILIZATION, MULCHING OR THE ESTABLISHMENT OF FILTER STRIPS. IN ANY CASE, SEDIMENT AND EROSION CONTROLS SHALL BE INSTALLED PROMPTLY AND THEIR MAINTENANCE ASSURED.
3. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM OF 70% UNIFORM PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING OR OTHER MOVEMENTS.
4. AT A MINIMUM PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED BY PROVIDING THE FOLLOWING:
a. FERTILIZER: 500 LBS PER ACRE OF 10-20-20, OR EQUIVALENT.
b. LIMESTONE: SHALL BE AN AGRICULTURAL GRADE LIME STONE EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDES, AND APPLIED AT THE RATE OF 4 TONS PER ACRE.
c. PERMANENT SEEDING (MINIMUM REQUIREMENTS) SHALL BE AS FOLLOWS:

LAWN SEED
Kentucky bluegrass (2 or more varieties - none greater than 25% of total) 50 90 80 .20
Pennfene Perennial Rye Grass 20 95 90 0.15
Penlnwal and Fescue 30 98 85 0.25
Special Areas - swales, diversion channels, and occasional water flow areas.
Kentuck 31 Tall Fescue 80 98 85 0.25
Pennfene Perennial Rye Grass 20 95 90 .15

- B. MAINTENANCE
1. INSPECTION SHALL BE MADE AT FREQUENT INTERVALS AND AFTER EACH STORM EVENT TO DETECT ANY IMPAIRMENT IN THE ABILITY OF THE EROSION CONTROL FACILITIES, INSTALLED AS PART OF THIS PLAN, TO CONTINUE TO FUNCTION EFFECTIVELY.
2. THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND ANY STANDARD CONDITIONS RELATING TO SOIL EROSION AND SEDIMENT CONTROL, ISSUED AS PART OF ANY PERMITS, SHALL BE AVAILABLE AT THE IMMEDIATE SITE OF CONSTRUCTION ACTIVITY AT ALL TIMES.
3. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENTATION CONTROLS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTION OF ALL EROSION AND SEDIMENTATION CONTROLS AFTER EACH STORM EVENT AND ON A WEEKLY BASIS. ALL PREVENTIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RETENING MUST BE PERFORMED IMMEDIATELY.

LONG-TERM OPERATION AND MAINTENANCE NOTES: SEE DWG. 183.2 183.1

- SEQUENCE OF EARTH MOVING RELATED ACTIVITY 2 183.2
1. Pre-Construction Stage:
a. Field-marks limits of disturbance and environmentally sensitive areas.
b. At least 7 days prior to starting any earth disturbance activities (including clear and grubbing), the Owner and/or Operator shall invite all Contractors, the Landowner, appropriate Municipal Officials, the E&S plan preparer, the PCSM plan preparer, and a representative from the Bucks County Conservation District to an on-site reconstruction meeting.
c. Upon installation or stabilization of all perimeter sediment control BMP's and at least 3 days prior to proceeding with the bulk earth disturbance activities, the permittee of co-permittee shall provide notification to the department or authorized conservation district.
d. At least 3 days prior to starting any earth disturbance activities, or expanding into an area previously unmarked, the Pennsylvania One Call System Inc. shall be notified at 1-800-242-1776 for the location of existing underground utilities.
e. All earth disturbance activities shall proceed in accordance with the sequence provided on the plans. Deviation from the sequence must be approved by the Bucks County Conservation District or by the department prior to implementation. Each step of sequence shall be completed before proceeding to the next step, except where noted.

- 2. Construction Activity
a. Convert the existing 150 foot Rock Construction Access #1 to Rock Construction Access with Wash Rock.
b. Install Rock Construction Access #2 with Wash Rock and Concrete Washouts, see drawing.
c. Access to site's E&S BMPs, see drawings for work areas.
i. Install Compost Filter Sack as depicted on the plan.
ii. Install Inlet Protection per plan.
iii. Install Orange Construction Fence around the basins per plan.
d. Site Operation for earthwork.
i. Bring the proposed Building pad grades to the proper elevation. Construction new Building.
ii. All building materials and wastes must be removed from the site and recycled or disposed of in accordance with the Pennsylvania Department of Environmental Protection's Solid Waste Management Regulations at 25pa. Code §271.1 et seq., §271.1 et seq., and §287.1 et seq. No building material or wastes or unused building materials shall be burned, buried, dumped, or discharged at the site.

- iii. Install all building utilities, see "note \*\*" below.
iv. Critical Stage: remove sediment traps by grading the areas to the proposed grade. Sediment trap #3A becomes swale #3A/B and part of basin #6 and sediment trap #4A becomes swale #4A/B and part of basin #6. See dwg. #183 notes on converting sediment traps into basin 6.
v. Critical Stage: Construct basin #5 and basin #6. Stabilize basin #5 steep slope with E&S blankets. Additional notes detailing Basin #5 & Basin #6 construction shown on dwgs. 183.4 & 183.6.
vi. Install stormwater inlets and pipes. Install Inlet Protection on all new inlets and stabilize areas. See "note \*\*" below.
vii. Construct all swales and stabilize with temporary seeding.
viii. Construction proposed parking lot wall.
ix. Final grade site and stabilize with temporary seeding; Construction new sidewalk and proposed walls. Install subsurface binder course on parking lot and all driveways. Then install parking lot and driveways with binder course.

- e. Permanent stabilization stage:
i. Replacement of top soil (4-6 inches) and install all permanent vegetation requirements.
ii. Permanent seeding and mulch all areas. An area shall be considered to have achieved final stabilization when it has a minimum of 70% uniform perennial vegetative cover or other permanent non-vegetative cover with density sufficient to resist accelerated surface erosion and subsurface characteristics sufficient to resist sliding or other movements. Topsoil shall be replaced to predevelopment depths or to a minimum depth of 6 inches, whichever is greater. It is also recommended that soil tests be performed in order to determine actual lime and fertilizer needs instead of providing a generic application rate.
iii. Clean binder course of parking lot and all driveway surfaces and install wearing course on all surfaces.
3. Removal/Conversion of temporary sediment pollution controls stage:
a. Prior to removal of the E&S bmp's, the Berks County Conservation District shall be contacted. The district may require a site inspection prior to the conversion or removal of BMP's.
b. Remove all E&S BMPs when the work area is at a minimum of 70% uniform perennial vegetative cover or trench backfill paving is complete.
c. Remove all filter sock and other temporary soil erosion and sediment control facilities after all areas have been permanently stabilized. Areas disturbed during removal of the controls must be stabilized immediately. An area shall be considered to have achieved final stabilization when it has a minimum of 70% uniform perennial vegetative cover or other permanent non-vegetative cover with density sufficient to resist accelerated surface erosion and subsurface characteristics sufficient to resist sliding or other movements. Topsoil shall be replaced to predevelopment depths or to a minimum depth of 6 inches, whichever is greater. It is also recommended that soil tests be performed in order to determine actual lime and fertilizer needs instead of providing a generic application rate.
d. Within 30 days after the completion of earth disturbance activities authorized by this permit, including the permanent stabilization of the site and proper installation of PCSM BMPs in accordance with the approved PCSM Plans, or upon submission if NOT sooner, the permittee shall file with the department or authorized conservation district a statement signed by a licensed professional and by the permittee certifying that work has been performed in accordance with the terms and conditions of the permit and the work approved erosion and sedimentation and post construction stormwater management plans. Completion certificated are needed to ensure that all is performed in accordance with the terms and conditions of the permit and the approved E&S and PCSM Plans.

Note: Critical Stage, the design engineer shall be on site.

Note \*: "The total length of excavated trench open at any one time should not be greater than the total length of the utility line that can be placed in the trench and back-filled in one working day. No more than 50 lineal feet of open trench should exist when utility line installation ceases at the end of the workday. Soil supplements, seed and mulch must be applied according to 25 Pa. Code §102.22. (Fog 283 of E&S Manual)."

08/11/2023 RC JES REVISED DRAWINGS PER BCCD REVIEW E-MAIL, DATED 07/31/2023.
04/20/2023 RC JES NPDES PERMIT #PAD060047, PHASE #2 SUBMISSION
Date Draft Chkd
POST CONSTRUCTION STORMWATER MANAGEMENT NOTES
CUMRU FIRE DEPARTMENT NEW BUILDING
Prepared For:
TOWNSHIP OF CUMRU
Situate In:
CUMRU TOWNSHIP, BERKS CO., PA.
PROJECT #: 2057000538
DRAWING #: 183.2
SHEET #: 19 Of 27
Jeffrey E. Skinner
PE-042652-E
SU-052889-E
820 GERMANTOWN PIKE, SUITE 200, PLYMOUTH MEETING, PA 19462







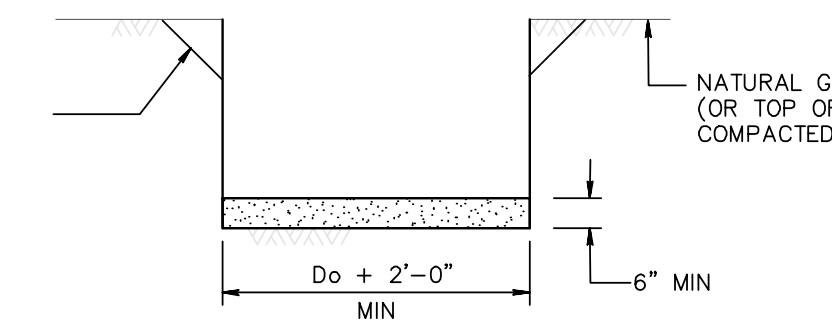
CONSTRUCTION DETAILS BELOW COVER THE FOLLOWING CONDITIONS:

- (A) PIPE LYING ON TOP OF THE NATURAL GROUND, ROCK OR COMPACTED (97% SPD) FILL.
- (B) THE EXISTING GROUND IS BETWEEN THE TOP AND THE BOTTOM OF THE PROPOSED PIPE AND THE PIPE IS TO BE COVERED WITH EARTH FILL.
- (C) THE TOP OF PIPE IS BELOW THE LEVEL OF THE NATURAL GROUND OR COMPACTED FILL (TO MINIMUM 97% SPD) AND TO BE COVERED WITH EARTH FILL TO HEIGHTS ABOVE THE NATURAL GROUND.

STEP 1: REMOVE TOPSOIL (COMPRESSIBLE LAYER, FOR EXAMPLE, ORGANIC MATERIAL) TO A WIDTH EQUAL TO 5 OUTSIDE DIAMETERS OF THE PIPE IN ALL FILL CONDITIONS ABOVE (A),(B)&(C). ALSO IF SPECIFIED ON THE CONTRACT DRAWING, UNDERCUT FOR THE DEPTH BELOW THE BEDDING AS SHOWN BY DESIGN (MAKE MIN WIDTH 3 DIAMETERS OF PIPE).

STEP 2: CONSTRUCT THE EMBANKMENT TO 4'-0" ABOVE THE TOP OF PIPE OR TO THE SUBGRADE ELEVATION, WHICHEVER IS LESS. FOR PIPES 72" OR GREATER SEE NOTE 1.

STEP 3: EXCAVATE THE TRENCH TO THE WIDTH OF THE OUTSIDE DIAMETER OF THE PIPE PLUS 2'-0" AND CREATE AN APPROPRIATE BEDDING 6" DEEP.

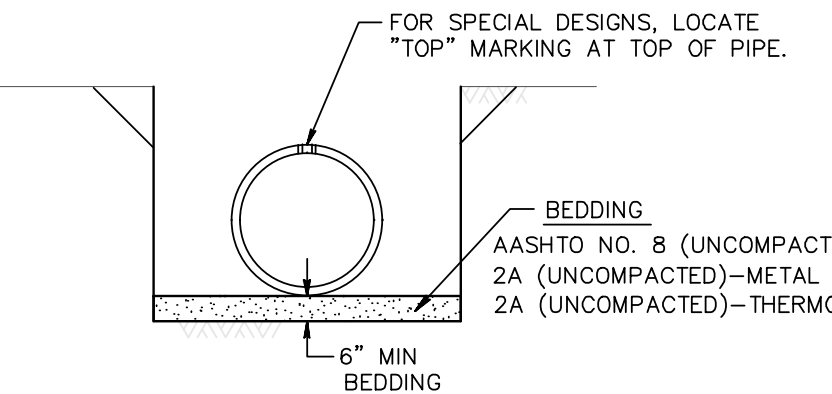


THOROUGH ROCK, OR HARD SHALE, OR IN AREAS OF UNDERCUT, PROVIDE 6"x6" INCH/FT OF, Do+4'-0", BELOW.

STEP 4: FOR CONCRETE PIPE, IF THIS EXCAVATION IS THE INTENDED BOTTOM ELEVATION OF THE PIPE, 12" MAX.

NOTE: IF UNSUITABLE MATERIAL IS FOUND, UNDERCUT AS DIRECTED AND BACKFILL WITH SUITABLE MATERIAL TO BOTTOM OF BEDDING ELEVATION. (UNLESS OTHERWISE SPECIFIED.)

LAY PIPE ON APPROPRIATE BEDDING.



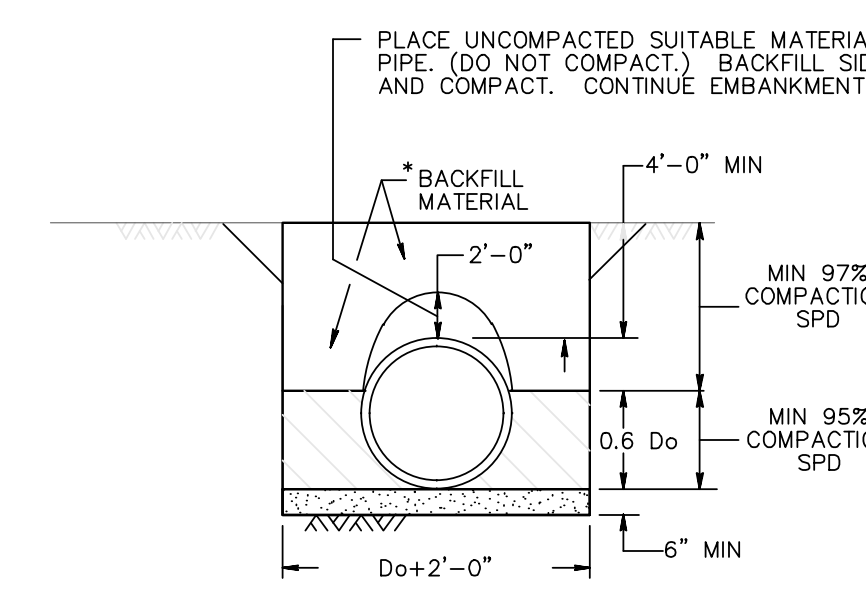
:FOR THERMOPLASTIC PIPE, SEE STEP 6B.

STEP 6: FOR CONCRETE PIPE, SEE STEP 6A.

CONCRETE PIPE

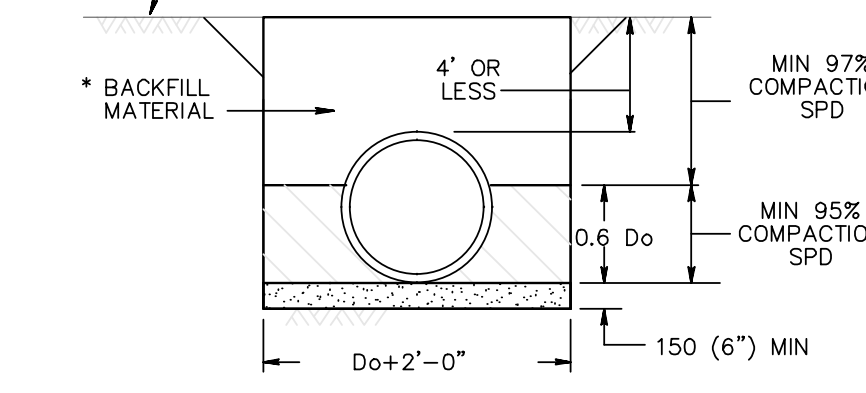
STEP 6A:

PLACE 2A COARSE AGGREGATE MATERIAL IN LIFTS 4" THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 0.6 Do. COMPACT TO 95% SPD. TEST THE SIDE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH SECTION 601.



DEEP FILLS OVER 4'-0"

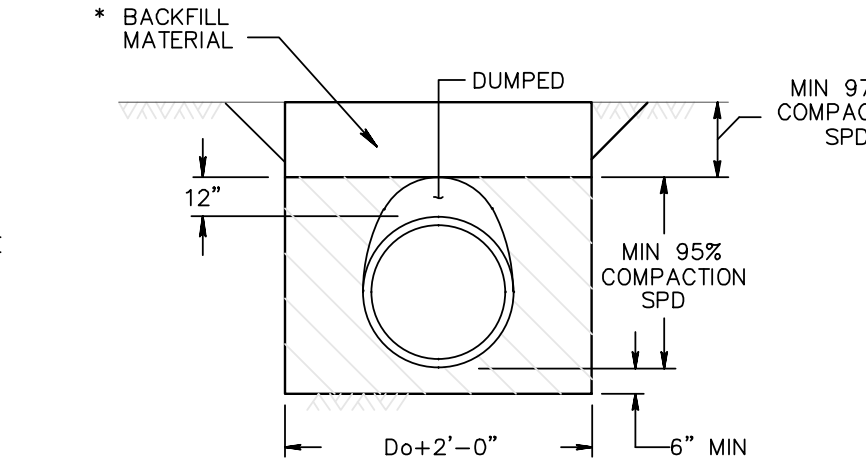
PLACE SUITABLE MATERIAL IN A SYMMETRICAL MANNER IN LIFTS 100 (4") THICK, AND COMPACT TO 97% SPD.



SHALLOW FILLS 4'-0" AND LESS

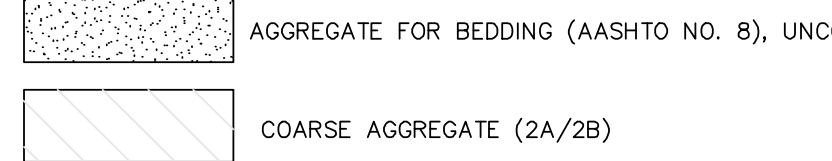
STEP 6B: THERMOPLASTIC PIPE (PVC, HDPE, SLCPP)

PLACE 2A COARSE AGGREGATE MATERIAL IN LIFTS 4" THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 12" ABOVE TOP OF PIPE. COMPACT TO 95% SPD. TEST THE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH SECTION 601.



THERMOPLASTIC PIPE

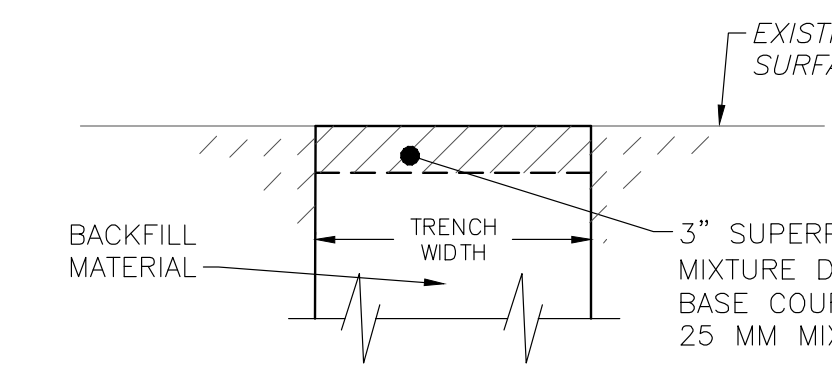
LEGEND



Do = OUTSIDE DIAMETER OF PIPE  
SPD = STANDARD PROCTOR DENSITY  
ID = INSIDE DIAMETER

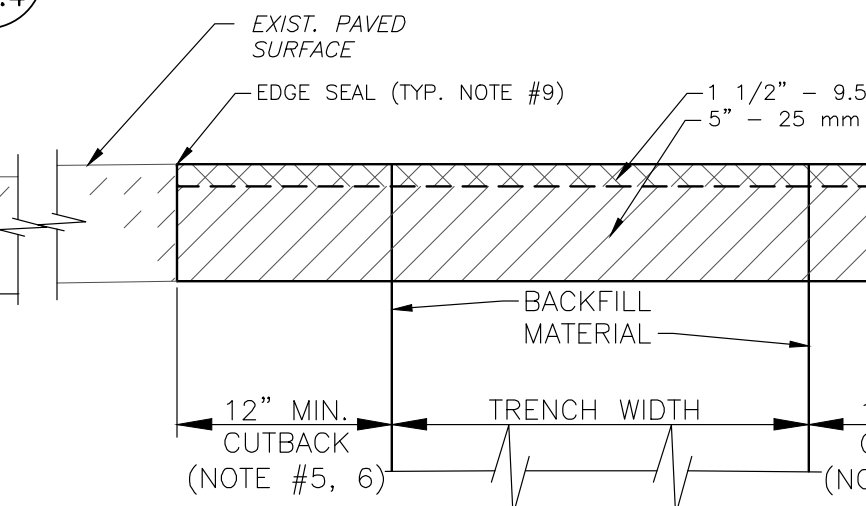
STORMWATER PIPE INSTALLATION PROCEDURES

NOT TO SCALE



TRENCH RESTORATION - UNPAVED AREAS

NOT TO SCALE



SEMI-PERMANENT TRENCH RESTORATION

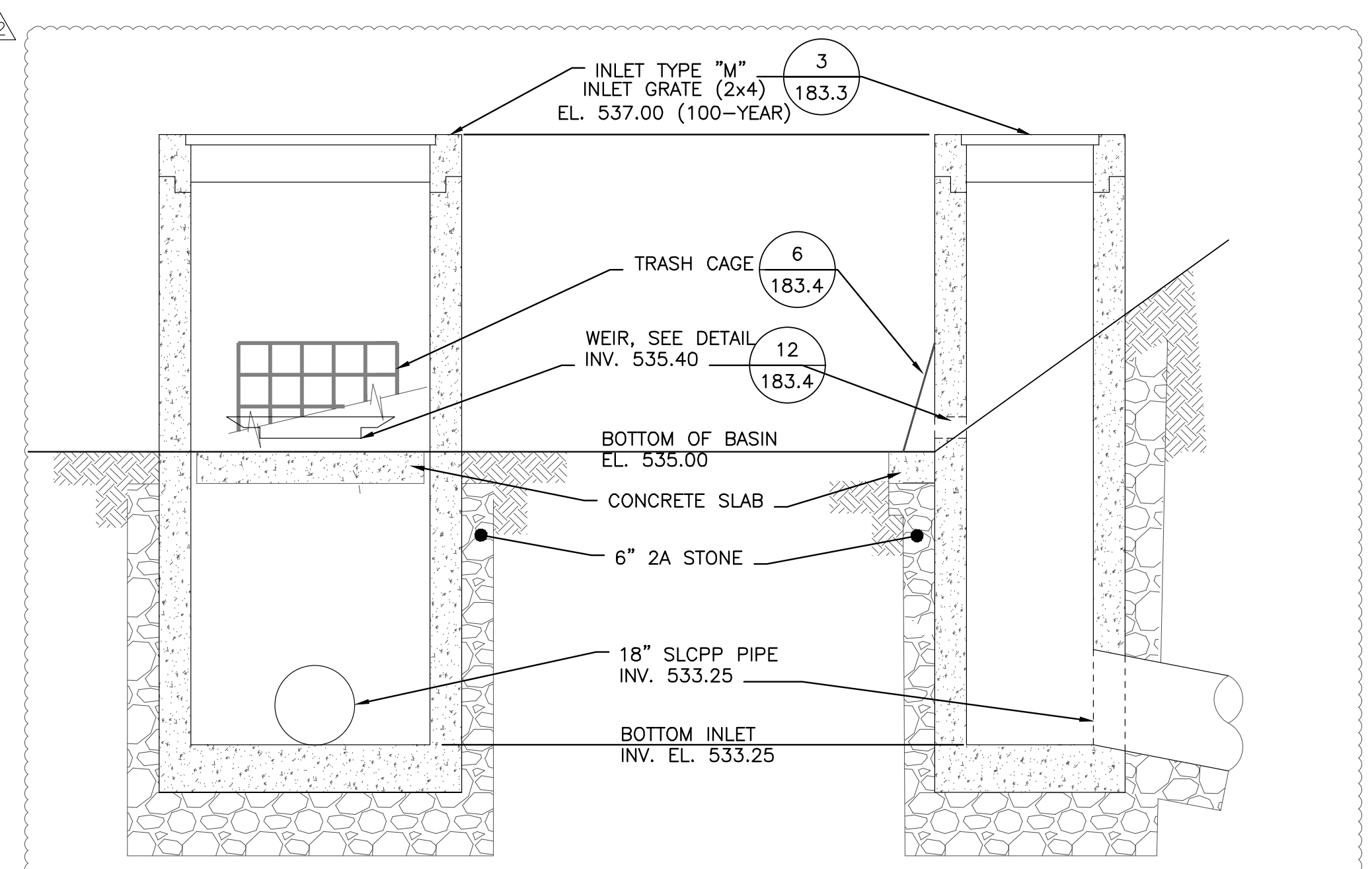
NOT TO SCALE

- 9.5 MM MIX SUPERPAVE ASPHALT MIXTURE DESIGN (WMA), WEARING COURSE, PG. 64-22, 3 TO 30 MILLION ESALS, DESIGN LEVEL 75 GYRATIONS.
- 19.0 MM MIX SUPERPAVE ASPHALT MIXTURE DESIGN (WMA), BINDER COURSE, PG. 64-22, 3 TO 30 MILLION ESALS, DESIGN LEVEL 75 GYRATIONS.
- 25.0 MM MIX SUPERPAVE ASPHALT MIXTURE DESIGN (WMA), BASE COURSE, PG. 64-22, 3 TO 30 MILLION ESALS, DESIGN LEVEL 75 GYRATIONS.
- 2A MODIFIED AGGREGATE SUBBASE, COMPACTED TO 100% OF THE MAXIMUM DRY-WEIGHT DENSITY.
- SUBGRADE TOPSOIL, LARGE ROCKS, AND OTHER TYPES OF LOW QUALITY, UNSUITABLE SOIL SHALL BE REMOVED AND REPLACED. THE EXPOSED SURFACE SHALL BE COMPACTED WITH SUITABLE

PERMANENT TRENCH RESTORATION

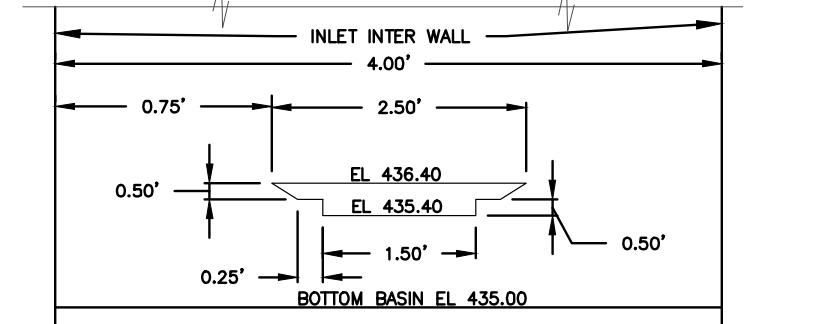
NOT TO SCALE

- EQUIPMENT (MINIMUM 10-TON ROLLER). SUBGRADE COMPACTATION SHOULD BE TO A DRY DENSITY OF AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698).
- MINIMUM 1" PAVEMENT CUTBACK. EXCAVATE EXISTING AND TEMPORARY PAVEMENT AND MATERIAL TO REQUIRED ELEVATION. RECOMPACT EXPOSED SUBGRADE. TACK COAT ALL VERTICAL PAVEMENT EDGES.
- EXCAVATE AND REMOVE EXISTING PAVEMENT AND MATERIAL TO REQUIRED ELEVATION. RECOMPACT EXPOSED SUBGRADE. TACK COAT ALL EXPOSED VERTICAL EDGES.
- INSTALL ONLY BASE COURSE AND BINDER COURSE IN ONE DAY.
- SEAL ALL EDGE JOINTS WITH EXISTING PAVEMENTS, CURBS, DRAINAGE AND UTILITY STRUCTURES.
- REPLACE AND REINSTALL ALL PAVEMENT MARKINGS.
- 1 1/2" MILLING AND OVERLAY.
- PROVIDE TEMPORARY PAVING TRANSITION FOR VEHICLE TRAFFIC BETWEEN EXISTING PAVEMENT ELEVATION AND PAVEMENT NOT AT FINAL ELEVATION.



STORMWATER BASIN #5 OUTLET DETAIL

183.4



STORMWATER BASIN #5 WEIR DETAIL

12 183.4

Construction Sequence For Basin #5 and All Swales

- Begin vegetated basin construction only when the upgradient temporary erosion and sediment control measures are in place. Vegetated basin should be constructed and stabilized early in the construction schedule, preferably before mass earthwork and paving increase the rate and volume of runoff.
- Remove the top soil and storage as it is show on the plan.
- Rough grade the vegetated basin. Equipment shall avoid excessive compaction and/or land disturbance. Excavating equipment should operate from the side of the basin and never on the bottom of the basin. No compacted soil is needed.
- Install outlet structure and pipe as it show on the plan.
- Fine grade the vegetated basin. Accurate grading is crucial for basin. Even the smallest nonconformities may compromise flow conditions.
- Seed, vegetate and install protective lining as per approved plans and according to final planting list. Plant the basin at a time of the year when successful establishment without irrigation is most likely. However, temporary irrigation may be needed in periods of little rain or drought. Vegetation should be established as soon as possible to prevent erosion and scour.
- Once all tributary areas are sufficiently stabilized, remove temporary erosion and sediment controls. It is very important that the basin be stabilized before receiving upland stormwater flow.

6. Follow maintenance guidelines, as discussed below.

Note: If a vegetated basin is used for runoff conveyance during construction, it should be regraded and reseeded immediately after construction and stabilization has occurred. Any damaged areas should be fully restored to ensure future functionality of the basin.

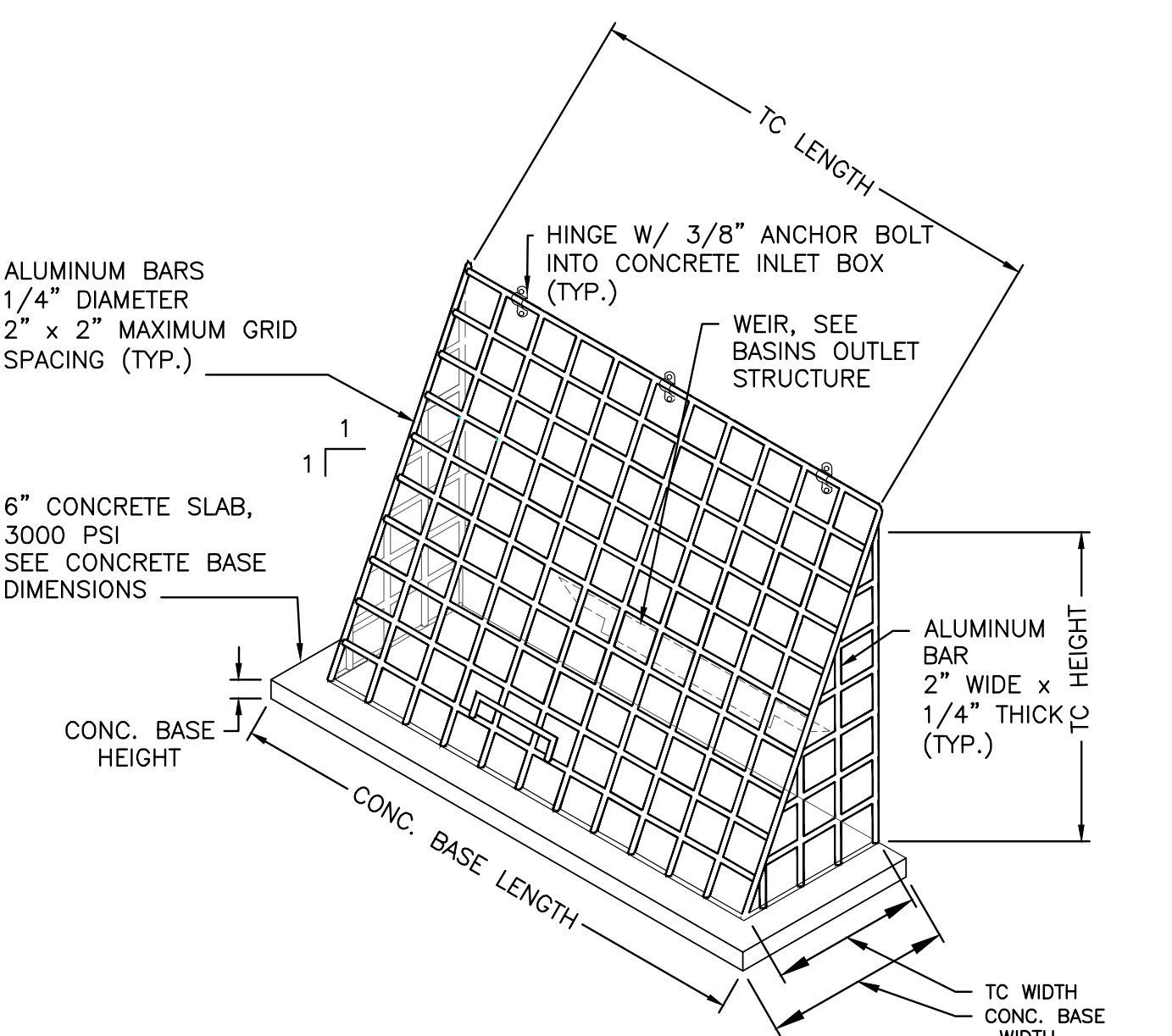
Maintenance Issues

- Compared to other stormwater management measures, the required upkeep of vegetated basin is relatively low. In general, maintenance strategies for basin focus on sustaining the hydraulic and pollutant removal efficiency of the basin, as well as maintaining a dense vegetative cover. Experience has proven that proper maintenance activities ensure the functionality of vegetated basin for many years. The following schedule of inspection and maintenance activities is recommended:
- Maintenance activities to be done annually and within 48 hours after every major storm event (> 1 inch rainfall depth):
- Inspect and correct erosion problems, damage to vegetation, and sediment and debris accumulation (address when > 3 inches at any spot or covering vegetation)
  - Inspect vegetation on side slopes for erosion and formation of rills or gullies, correct as needed
  - Inspect for pools of standing water; dewater and discharge to an approved location and restore to design grade
  - Mow and trim vegetation to ensure safety, aesthetics, proper basin operation, or to suppress weeds and invasive vegetation; dispose of cuttings in a local composting facility; mow only when basin is dry to avoid rutting
  - Inspect for litter; remove prior to mowing
  - Inspect for uniformity in cross-section and longitudinal slope, correct as needed

- Inspect basin's inlet (curb cuts, pipes, etc.) and outlet for signs of erosion or blockage, correct as needed

Maintenance activities to be done as needed:

- Plant alternative grass species in the event of unsuccessful establishment
- Reseed bare areas; install appropriate erosion control measures when native soil is exposed or erosion are forming
- Rototill and replant basin if draw down time is more than 72 hours
- Inspect and correct of altered water flow (channelization, obstructions, erosion, etc.) are identified
- Water during dry periods, fertilize, and apply pesticide only when absolutely necessary
- Most of the above maintenance activities are reasonably within the ability of individual owner. More intensive basin (i.e. more substantial vegetation, etc.) may warrant more intensive maintenance duties and should be vested with a responsible agency. A legally binding and enforceable maintenance agreement between the facility owner and the local review authority might be warranted to ensure sustained maintenance execution. Winter conditions also necessitate additional maintenance concerns, which include the following:
  - Inspect basin immediately after the spring melt, remove residuals (e.g. sand) and replace damaged vegetation without disturbing remaining vegetation.
  - If roadside or parking lot runoff is directed to the basin, mulching and/or soil aeration/manipulation may be required in the spring to restore soil structure and moisture capacity and to reduce the impacts of deicing agents.
  - Use nontoxic, organic deicing agents, applied either as blended, magnesium chloride-based liquid products or as pretreated salt.
  - Use salt-tolerant vegetation in basin.



BASIN'S TRASH RACK CAGE AND CONCRETE BASE

LOCATION	TRASH CAGE (TC)			CONCRETE BASE DIMENSIONS		
	LENGTH (FT.)	HEIGHT (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	HEIGHT (FT.)
BASIN #5 (#50)	3.77	1.50	1.00	4.77	1.50	0.50

TRASH CAGE

NOT TO SCALE

6 183.4

Amendment Soil

183.4

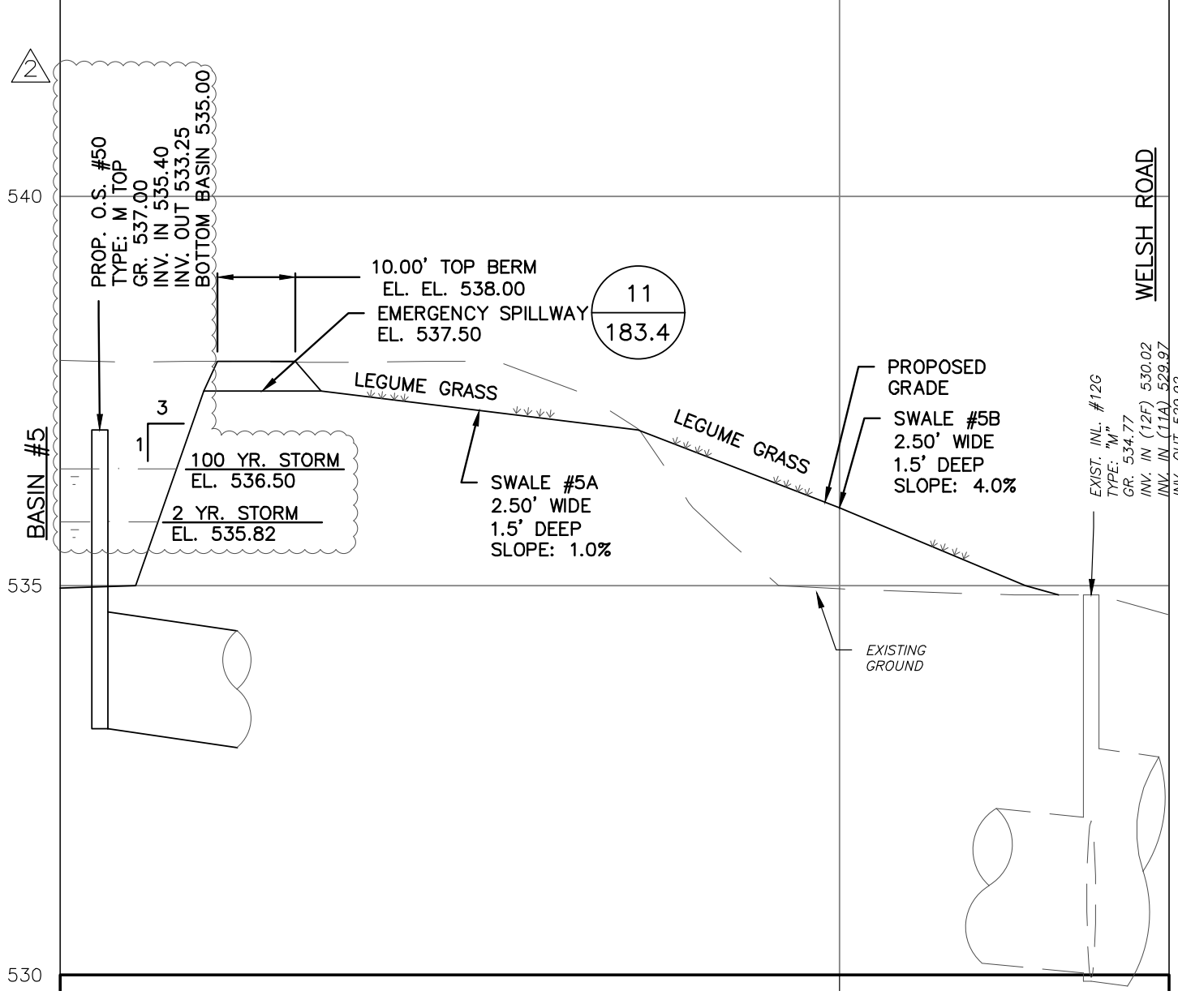
Construction Sequence  
All construction should be completed and stabilized before beginning soil restoration.

Maintenance Issues

The soil restoration process may need to be repeated over time, due to compaction by use and/or setting.

COMPOST SOIL AMENDMENT INSTALLATION

- Amended soil to meet PADEP requirement of 20-30% organic content, clay content <10%, and Ph between 5.5 and 6.5.
- Spread 2-3 inches of approved compost on existing soil. Till added soil into existing soil with a rotary tiller that is set to a depth of 6 inches. Add an additional 4 inches of approved compost to bring the area up to grade.
- After permanent planting/seeding, 2-3 inches of compost blanket will be applied to a areas not protected by grass or other plants



BASIN #5 EMERGENCY SPILLWAY & INLET EMERGENCY FLOW

NOT TO SCALE

PROPOSED EMERGENCY BASIN #5 SPILLWAY PROFILE

SCALE: V. 1" = 2'  
H. 1" = 20'

08/11/2023	RC	JES	REVISED DRAWINGS PER BCCD REVIEW E-MAIL, DATED 07/31/2023.
04/20/2023	RC	JES	NPDES PERMIT #PAD060047, PHASE #2 SUBMISSION
Date	Draft	Chkd	

POST CONSTRUCTION STORMWATER MANAGEMENT BASIN #5 DETAILS

CUMRU FIRE DEPARTMENT NEW BUILDING

Prepared For:  
TOWNSHIP OF CUMRU

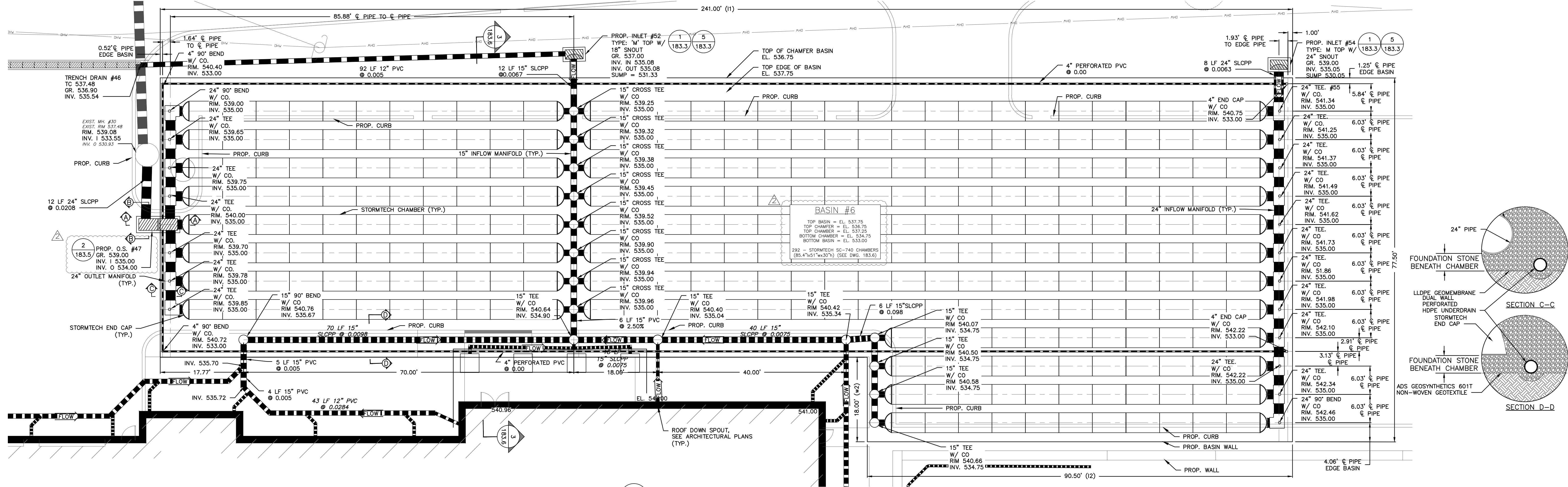
Situate In:  
CUMRU TOWNSHIP, BERKS CO., PA.

PROJECT #: 2057000538  
DRAWING #: 183.4  
SHEET #: 21 Of 27

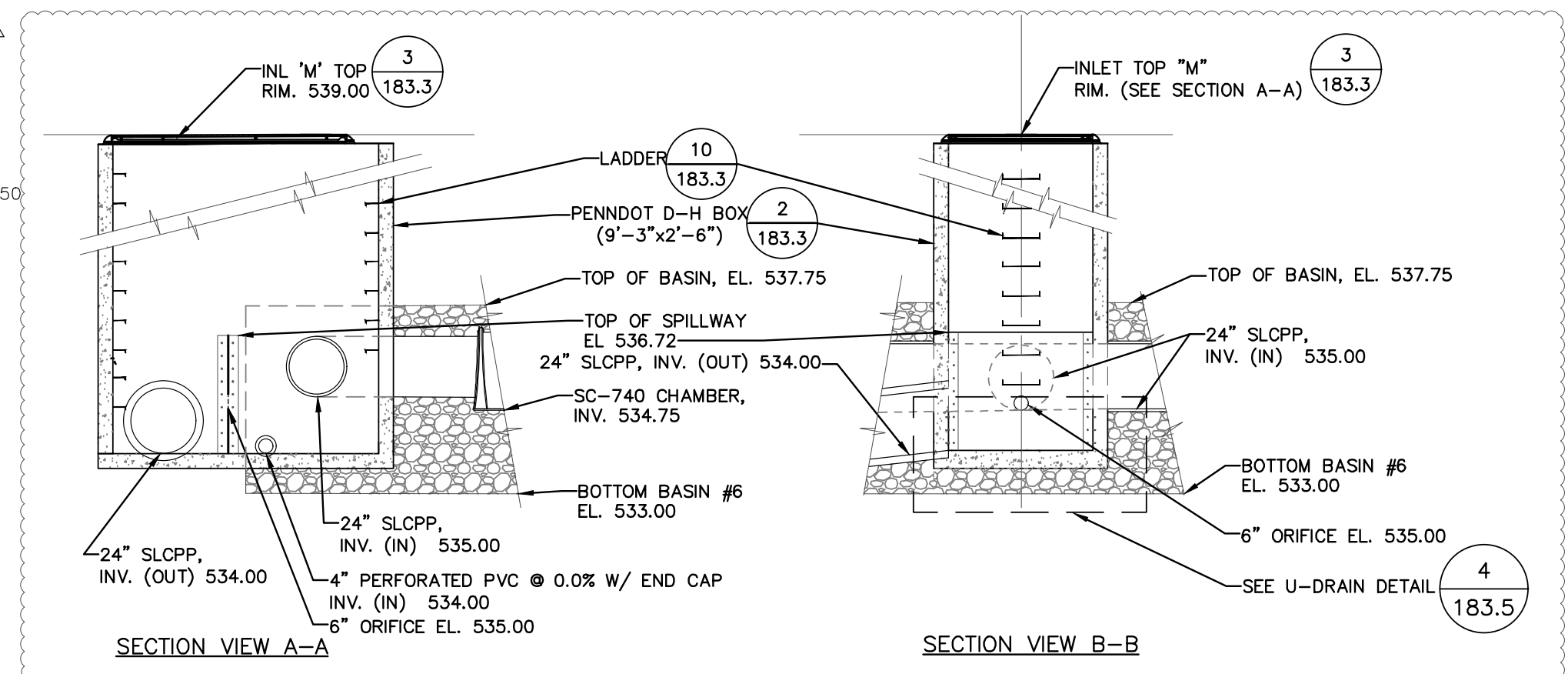
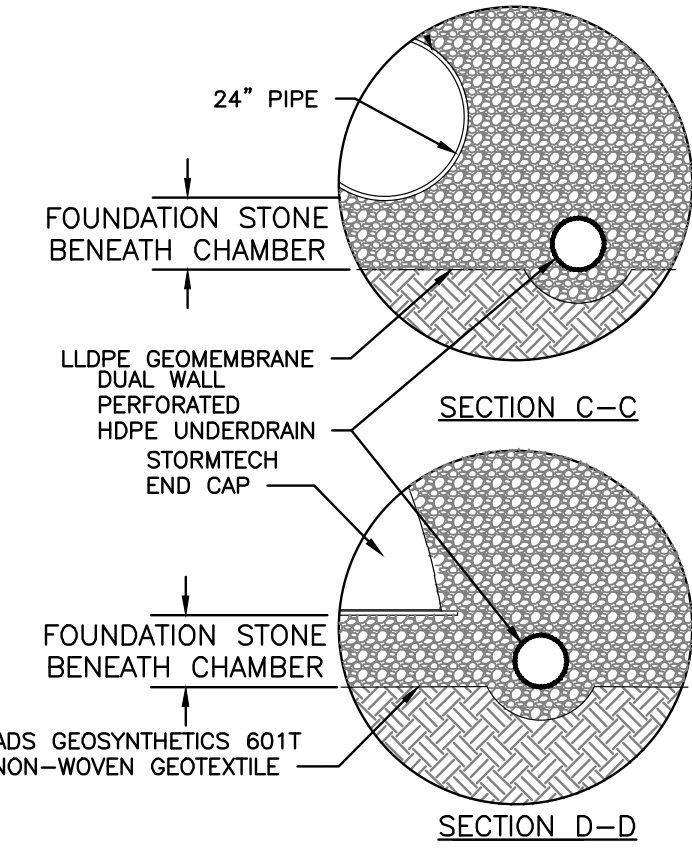
Jeffrey E. Skinner  
PE-042652-E  
SU-052888-E

920 GERMANTOWN PIKE, SUITE 200,  
PLYMOUTH MEETING, PA 19462

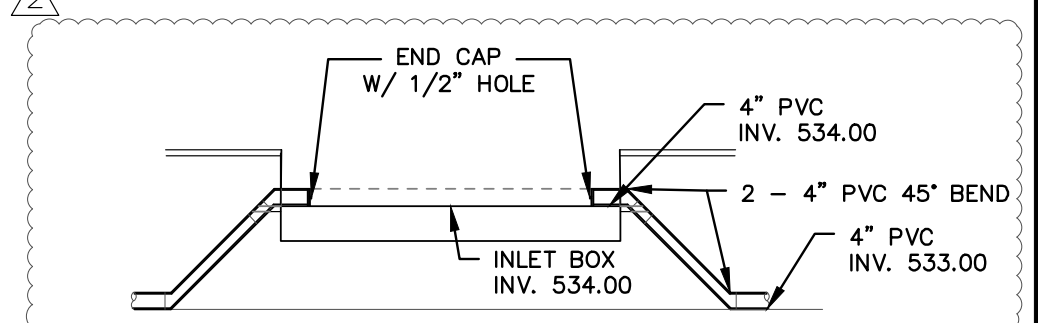




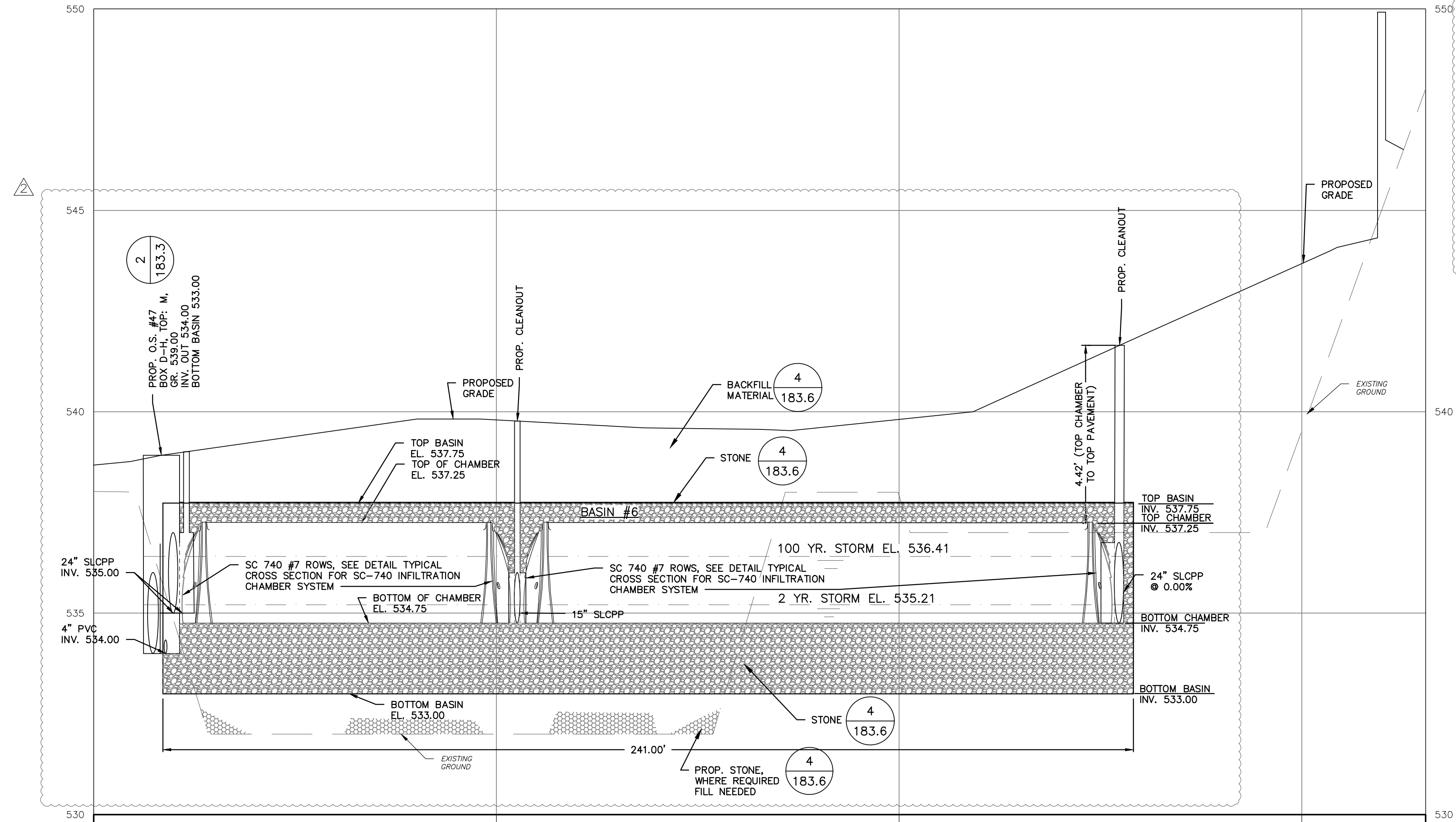
**BASIN #6 PLAN**  
SCALE: 1" = 10'  
183.5



**BASIN #6 OUTLET STRUCTURAL (OS #47) DETAIL**  
N.T.S.  
183.5



**BASIN #6 U-DRAIN & OUTLET STRUCTURAL (OS #47) DETAIL**  
N.T.S.  
183.5



**BASIN #6 PROFILE**  
SCALE: V. 1" = 2'  
H. 1" = 20'  
183.5

- BASIN #6 NOTES:**
1. STORAGE SWM BASIN #6 TRENCH [(241.00'(11)) x (59.59'(w1)) x (3.50' (h)) (8 ROWS) + (90.50' (I2)) x (18.00' (w2)) x (3.5' (h)) (4 ROWS) SEE PLAN]
  2. 292 CHAMBERS - SC 740 CHAMBER (SEE BASIN #6 PLAN)
  3. 4" PERFORATION PVC PIPES
  4. SC 740 CHAMBER END CAPS W/ 15" SLOPP WELDED STUB
  5. SC 740 CHAMBER END CAPS W/ 24" SLOPP WELDED STUB
  6. 15" CROSS TEES W/ 6" RISER
  7. 15" TEES W/ 6" RISER
  8. 15" 90° BENDS W/ 6" RISER
  9. 15" SLOPP (CUT LENGTH DETERMINED BY CONTRACTOR)
  10. 15"x24" REDUCER
  11. 24" TEES W/ 6" RISER
  12. 24" 90° BENDS W/ 6" RISER
  13. 24" SLOPP (CUT LENGTH DETERMINED BY CONTRACTOR)
  14. 15" SOIL-TIGHT COUPLER
  15. 24" SOIL-TIGHT COUPLER
  16. 5/8" ALUM. WEIR PLATE W/ ORIFICE CUT IN
  17. 4 - ALUM. L4"x4"x3/8", EACH SIDE (TYP.)
  18. (3) 3/8" S.S. ADHESIVE ANCHORS (TYP.) @ 12" MAX. C/C, 3 1/2" EMBED.
  19. 2 - HAND LIFT: 1/2" @ ALUM., SMOOTH BAR (WELDED TO PLATE)

08/11/2023	RC	JES	REVISED DRAWINGS PER BCCD REVIEW E-MAIL, DATED 07/31/2023.
04/20/2023	RC	JES	NPDES PERMIT #PAD060047, PHASE #2 SUBMISSION
Date	Draft	Chkd	

**POST CONSTRUCTION STORMWATER MANAGEMENT BASIN #6 DETAIL**

CUMRU FIRE DEPARTMENT NEW BUILDING

Prepared For:  
**TOWNSHIP OF CUMRU**

Situate In:  
**CUMRU TOWNSHIP, BERKS CO., PA.**

PROJECT #:  
2057000538

DRAWING #:  
183.5

SHEET #:  
22 Of 27

**ATLAS**  
920 GERMANTOWN PIKE, SUITE 200,  
PLYMOUTH MEETING, PA 19462

Jeffrey E. Skinner  
PE-042652-E  
SU-052889-E



**SC-740 STORMTECH CHAMBER SPECIFICATIONS**

- CHAMBERS SHALL BE STORMTECH SC-740.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE AND NO INTERNAL SUPPORTS THAT WOULD IMPURE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE ASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE ASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION DESIGN TRUCK".
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT SHALL BE CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE ASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE TEST DOWND CRIMP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-190S MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

183.6

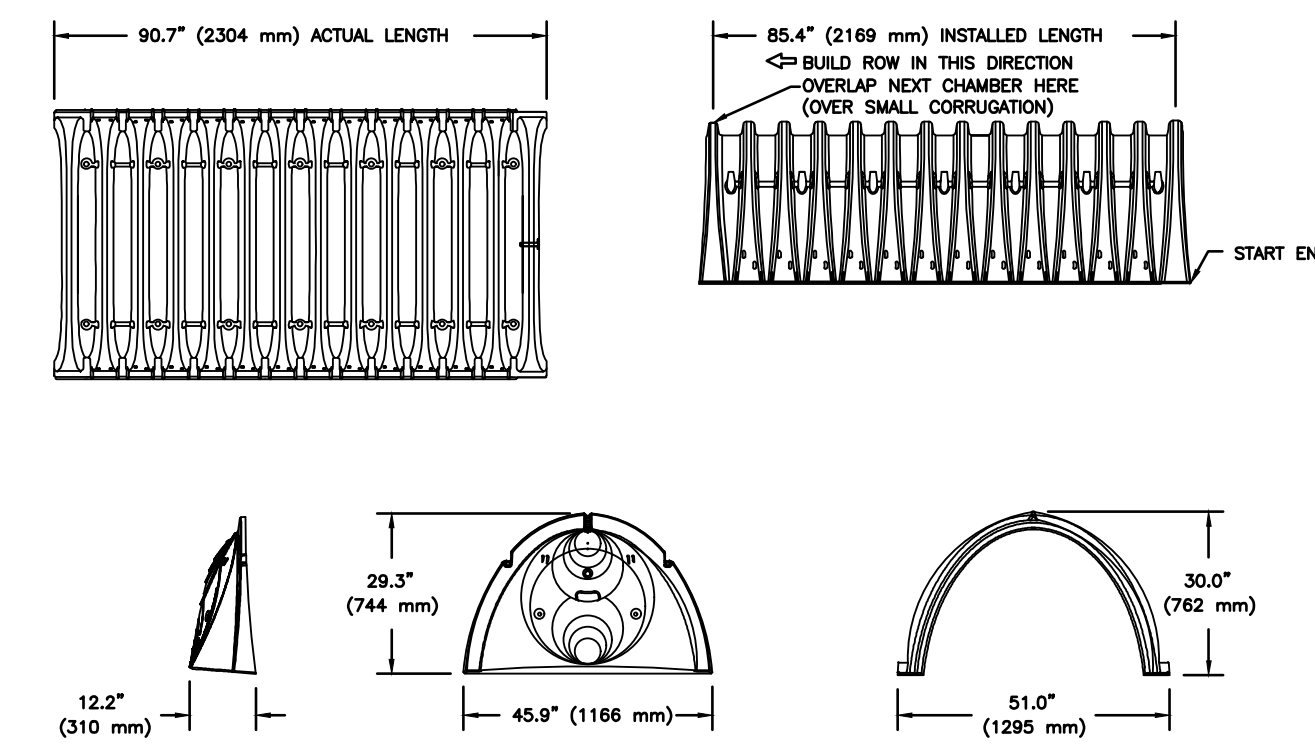
**IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM**

- STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLER.
- STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - LONGEST SHORTEST LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4"-2" (20-50 mm).
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "TLESDORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

**NOTES FOR CONSTRUCTION EQUIPMENT**

- STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
  - NO EQUIPMENT IS ALLOWED ON BAKE CHAMBERS.
  - NO RUBBER TIRE LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNLESS PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
  - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING. USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



**NOMINAL CHAMBER SPECIFICATIONS**

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4" (1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET (1.30 m <sup>3</sup> )
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET (2.12 m <sup>3</sup> )
WEIGHT	75.0 lbs (33.9 kg)

\*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"  
 PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"  
 PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"  
 PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPEDT / SC740EPEDTPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPEDB / SC740EPEDBPC	8" (200 mm)	12.2" (310 mm)	18.5" (470 mm)	0.5" (13 mm)
SC740EPEDR / SC740EPEDRPC	8" (200 mm)	12.2" (310 mm)	14.8" (376 mm)	0.6" (15 mm)
SC740EPIOT / SC740EPIOTPC	10" (250 mm)	13.4" (340 mm)	---	0.7" (18 mm)
SC740EPIOB / SC740EPIOBPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPI12T / SC740EPI12TPC	12" (300 mm)	14.7" (373 mm)	9.0" (229 mm)	1.2" (30 mm)
SC740EPI15B / SC740EPI15BPC	15" (375 mm)	18.4" (467 mm)	---	1.3" (33 mm)
SC740EPI18T / SC740EPI18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPI18B / SC740EPI18BPC	24" (600 mm)	18.5" (470 mm)	---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)
SC740EPE24BR*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EPE24B/SC740EPE24BR ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

\* FOR THE SC740EPE24B/SC740EPE24BR THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

**SC-740 TECHNICAL SPECIFICATIONS**

**CONSTRUCTION SEQUENCE FOR BASIN #6 NOTES:**

- CHAMBER SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S LATEST INSTALLATION GUIDELINES.
- FOUNDATIONS: TRENCH BOTTOMS WITH UNSTABLE OR UNYIELDING MATERIAL SHALL BE EXCAVATED TO A DEPTH DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE MATERIAL FOR UNSTABLE MATERIALS. GEOTEXTILE MAY BE USED TO STABILIZE THE TRENCH BOTTOM, IF DIRECTED BY THE ENGINEER. THE DESIGN ENGINEER IS RESPONSIBLE FOR VERIFYING FOUNDATION SUITABILITY.
- GEOTEXTILE: A 6oz. NON-WOVEN GEOTEXTILE FILTER FABRIC (AASHTO M288 CLASS 2) SHOULD BE USED TO PREVENT SOIL FROM MIGRATING INTO THE INITIAL BACKFILL MATERIAL. THE NON-WOVEN GEOTEXTILE FILTER FABRIC TO BE INSTALLED ALL AROUND THE BASIN #6. ALL SEAMS SHOULD HAVE 2 FOOT OVERLAPPING OF GEOTEXTILE MATERIAL.
- BEDDING: SUITABLE MATERIAL SHALL BE A 3/4" - 2" INCH, CLEAN, CRUST ANGULAR STONE, OR AASHTO M43 SIZES (3, 357, 4, 467, 5, 56,57) WITH CLEAN, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION, e.g., CLEAN, CRUSHED, ANGULAR #3 (ASHTO M43) STONE. MINIMUM BEDDING THICKNESS SHALL BE 6 INCHES. COMPACTION SHOULD BE DONE IN LIFTS OF NO MORE THEN 9 INCHES TO A DENSITY OF 95% STANDARD PROCTOR DENSITY.
- EMBEDMENT BACKFILL: SUITABLE MATERIAL SHALL BE 3/4" - 2" INCH, CLEAN, CRUSHED ANGULAR STONE, OR AASHTO M43 SIZES (3, 357, 4, 467, 5, 56,57) WITH CLEAN, CRUSHED, ANGULAR STONE ADDED TO THE GRADATION, e.g., CLEAN, CRUSHED, ANGULAR #3 (ASHTO M43) STONE. EMBEDMENT BACKFILL SHALL EXTEND FROM TOP OF BEDDING TO NOT LESS THAN 6 INCHES ABOVE THE TOP OF THE CHAMBER. NO COMPACTION IS REQUIRED BUT AN EFFORT SHOULD BE MADE TO HAND KNIFE STONE INTO ALL CORRUGATIONS.

**INSPECTION & MAINTENANCE**

- INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
  - INSPECTION PORTS (IF PRESENT)
    - REMOVE/OPEN LID ON INLET/OUTLET INLINE DRAIN
    - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
    - USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
    - LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
    - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
  - ALL ISOLATOR PLUS ROWS
    - REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
    - USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
      - MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
      - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
    - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

- CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
  - A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
  - APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
  - VACUUM STRUCTURE SUMP AS REQUIRED

- REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

**NOTES**

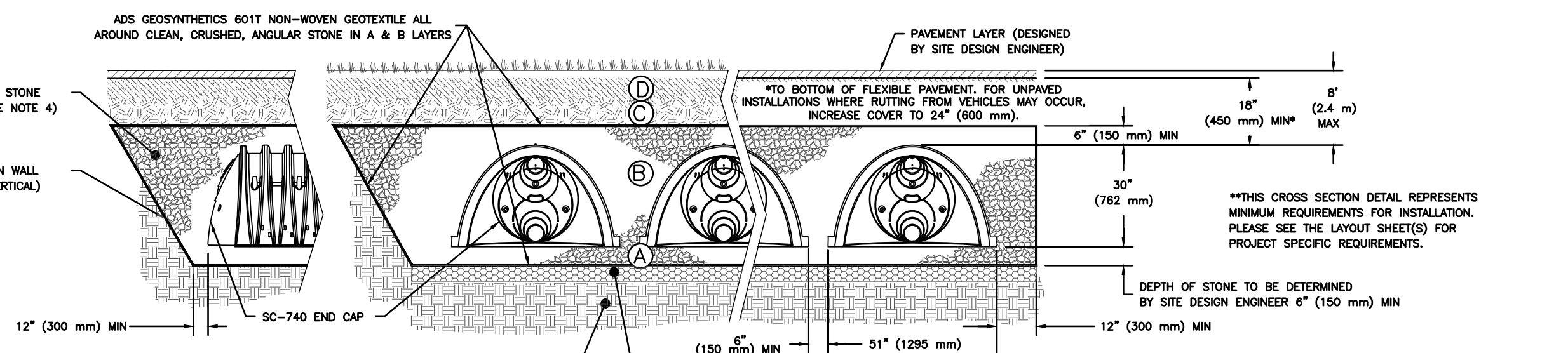
- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER LEVELS.
- CONDUCT JETTING AND VECTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

**ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS**

MATERIAL LOCATION	DESCRIPTION	CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE SUBGRADE. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STABILIZED MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBGRADE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 A-1, A-2, A-3 OR AASHTO M43 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.2,3

**PLEASE NOTE:**

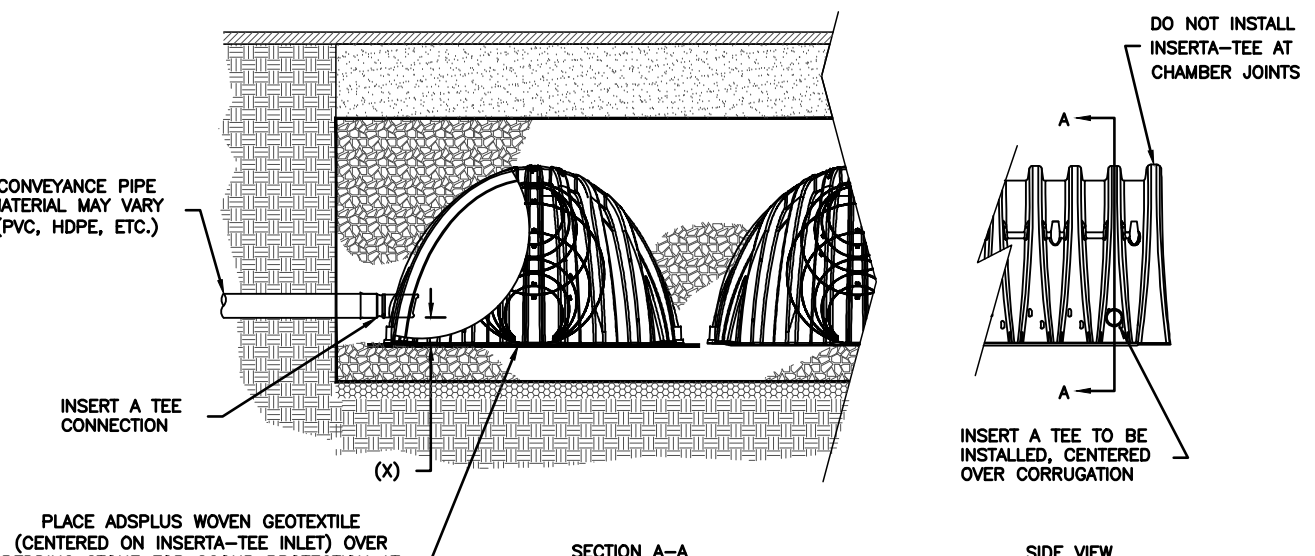
- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (ASHTO M43) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) MAX LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAVING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOLS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT<sup>2</sup> AND 6) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).

**SC-740 CROSS SECTION DETAIL**

183.6



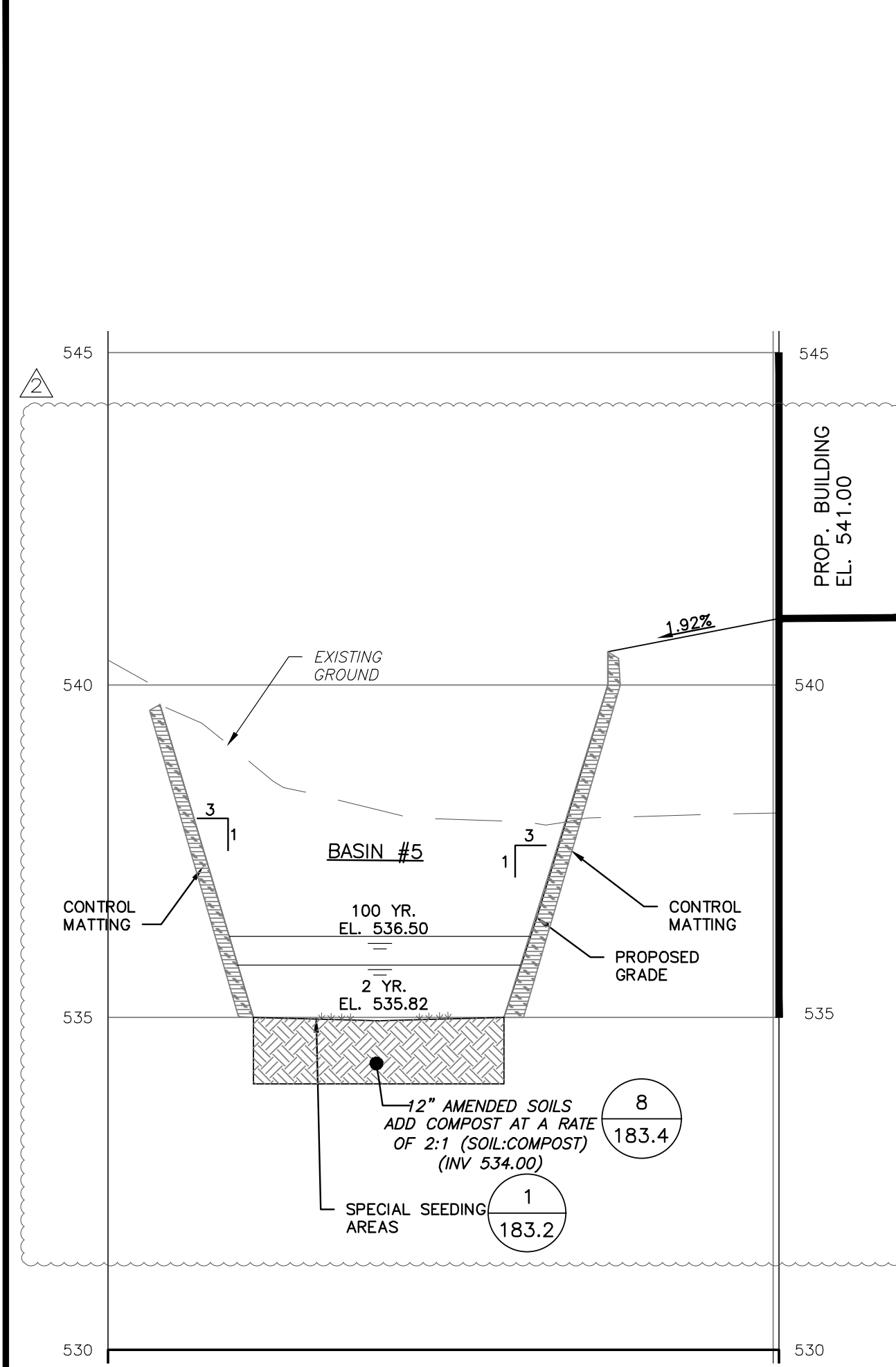
NOTE: PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.

CONTACT ADS ENGINEERING SERVICES IF INSERTA TEE INLET MUST BE RAISED AS NOT ALL INVERTS ARE POSSIBLE.

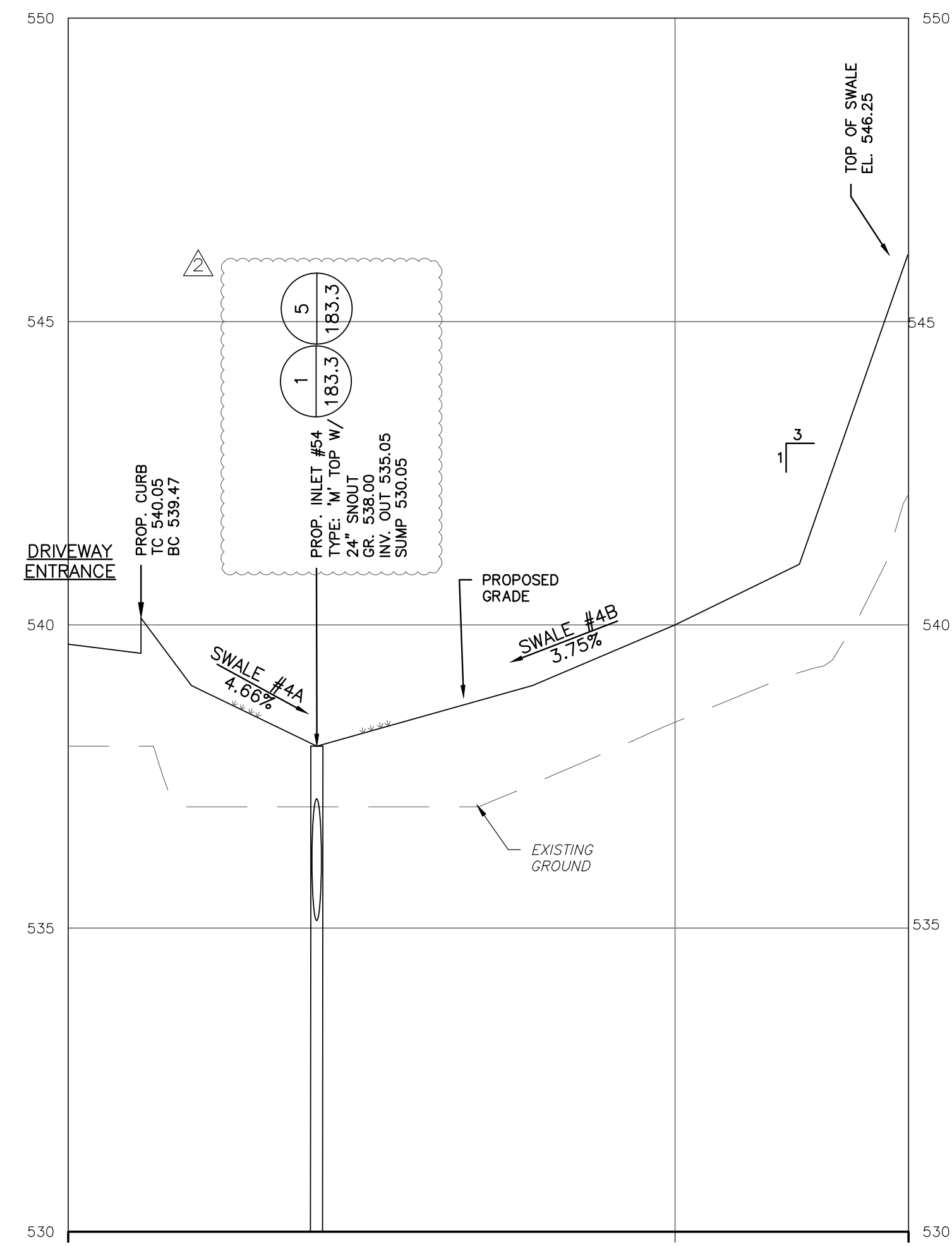
CHAMBER	MAX DIAMETER OF INSERT A TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
MC-7200	12" (300 mm)	8" (200 mm)

INSERT A TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SDR 40 IPS OR SDR 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 9

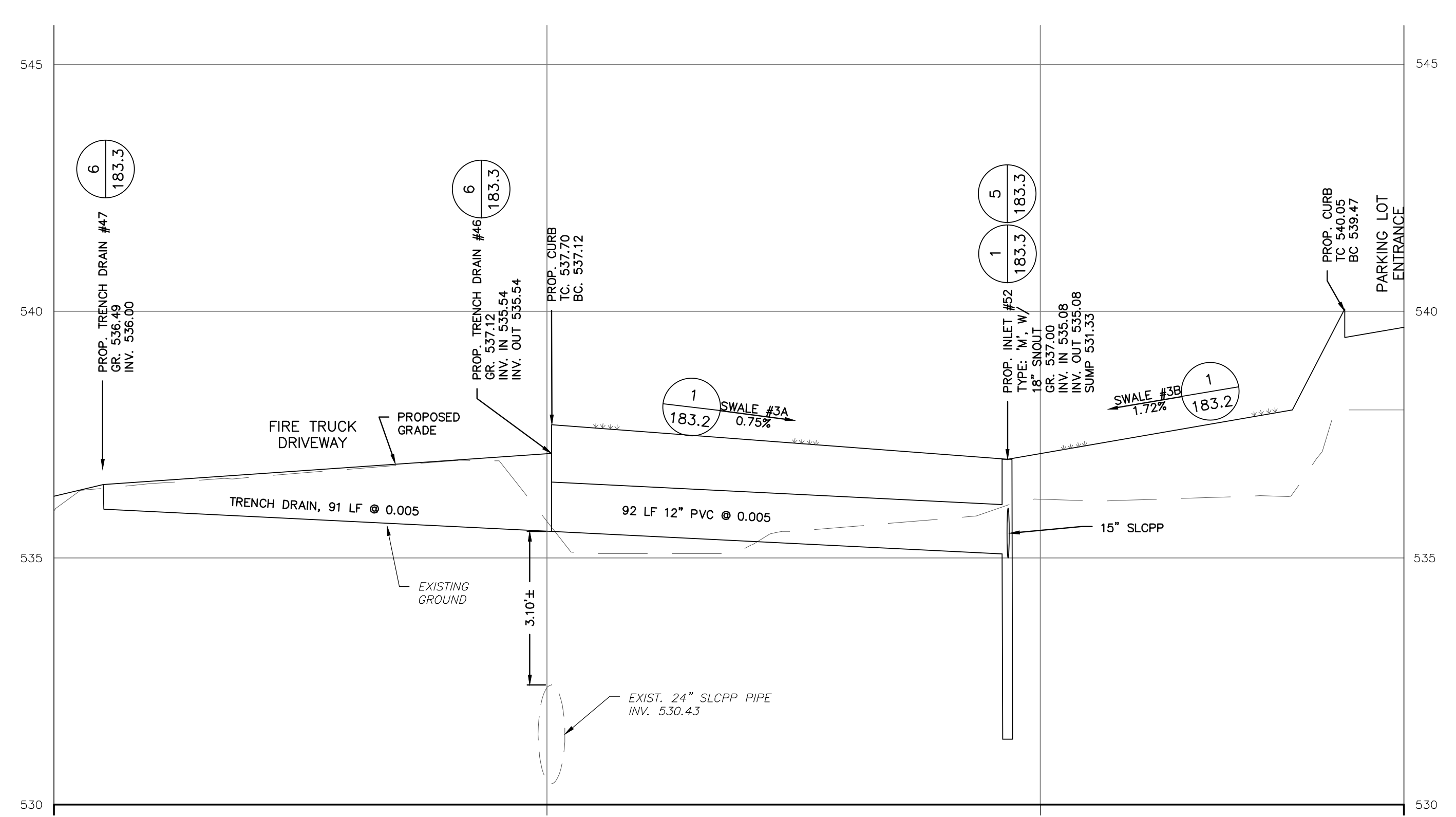




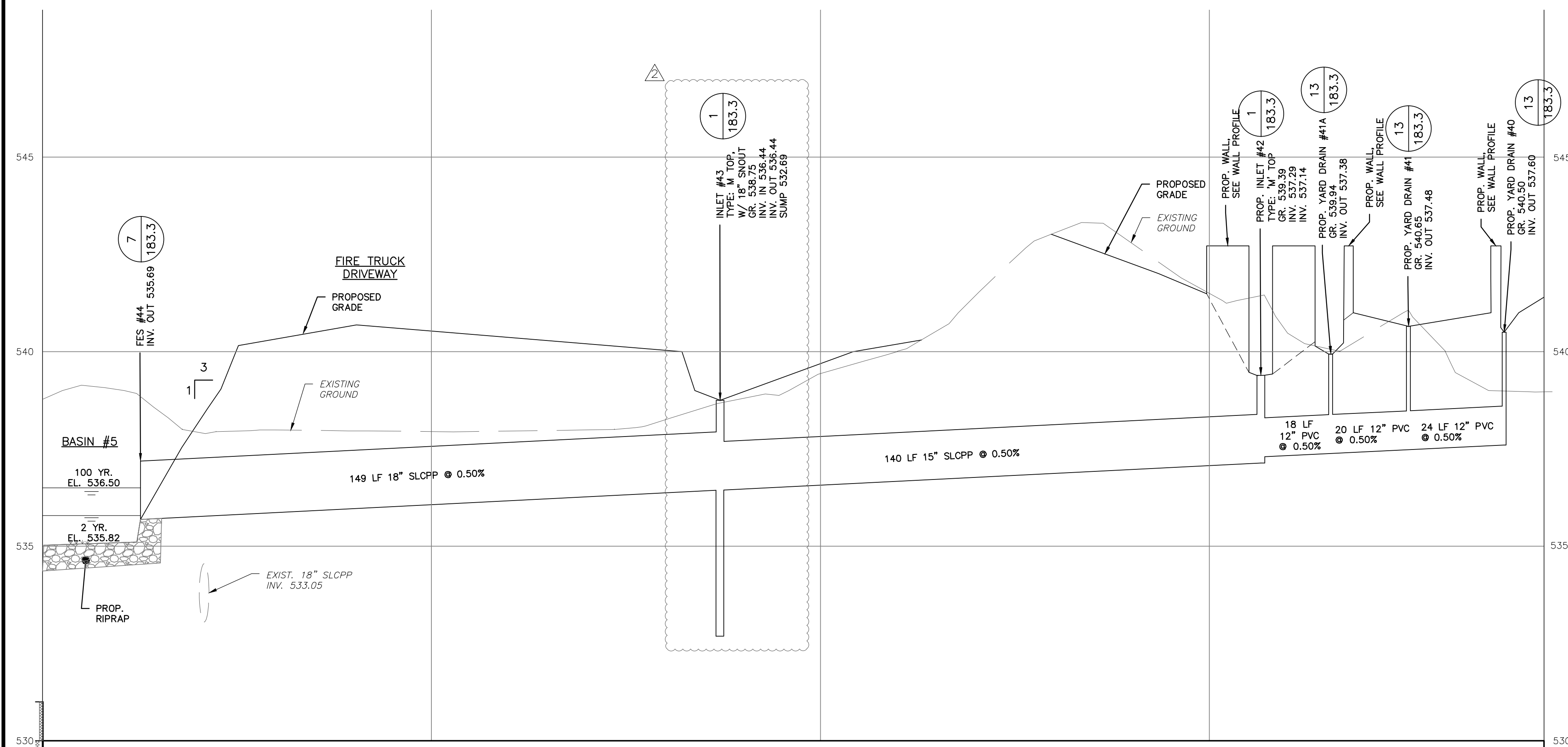
PROPOSED BASIN #5 TO CROSS SECTION PROFILE  
SCALE: V. 1" = 2'  
H. 1" = 20'



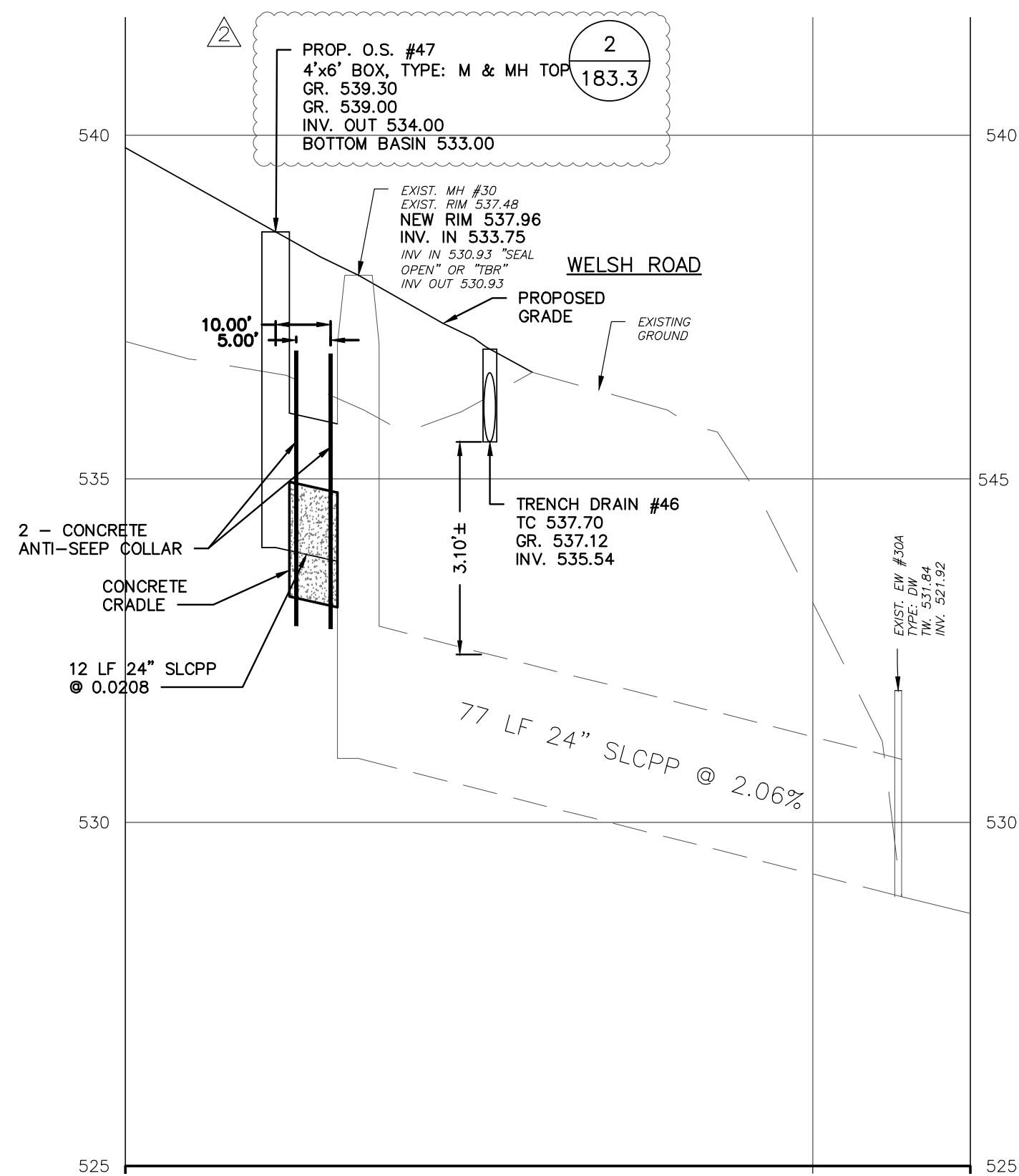
PROPOSED SWALE #4A TO SWALE #4B PROFILE  
SCALE: V. 1" = 2'  
H. 1" = 20'



PROPOSED TRENCH DRAIN TO INLET #52 PROFILE  
SCALE: V. 1" = 2'  
H. 1" = 20'



PROPOSED YARD DRAIN #40 TO BASIN #5 PROFILE  
SCALE: V. 1" = 2'  
H. 1" = 20'

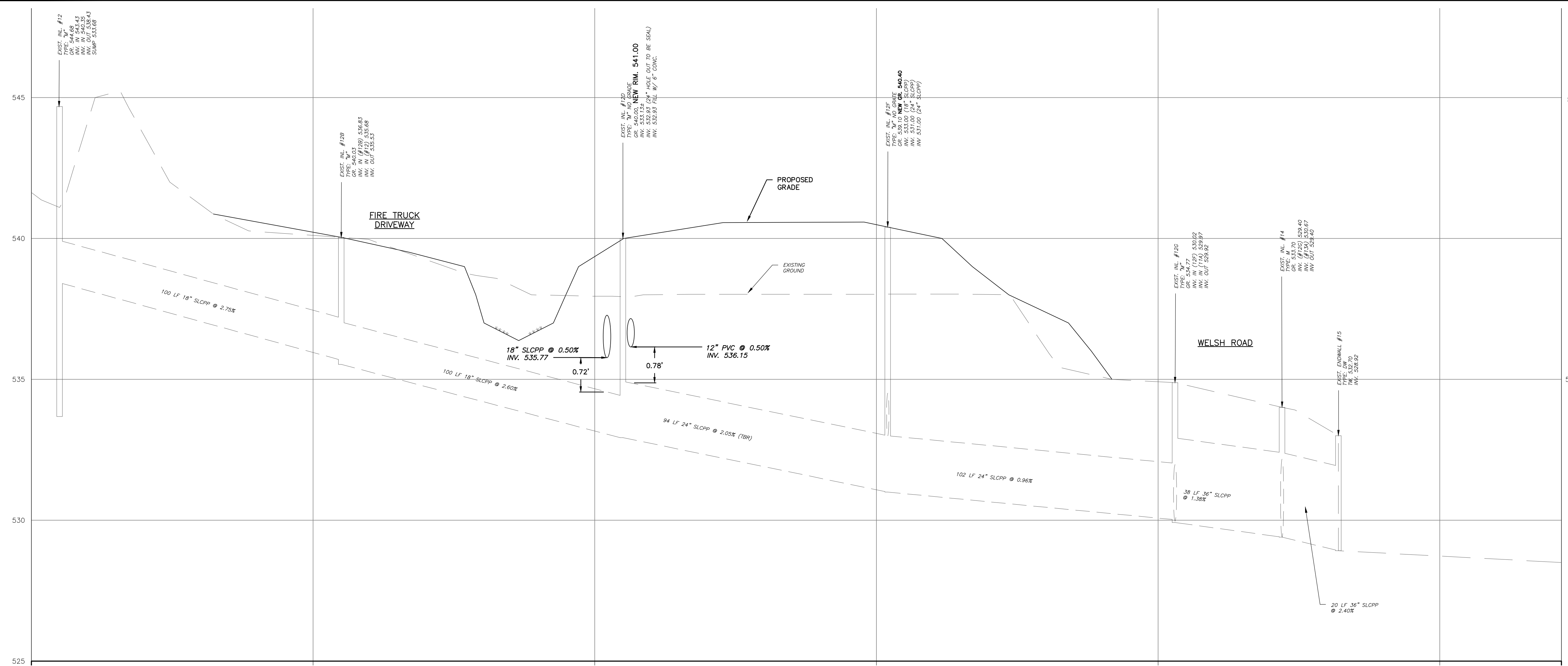


PROPOSED OS #47 TO EXIST. ENDWALL #30A PROFILE  
SCALE: V. 1" = 2'  
H. 1" = 20'

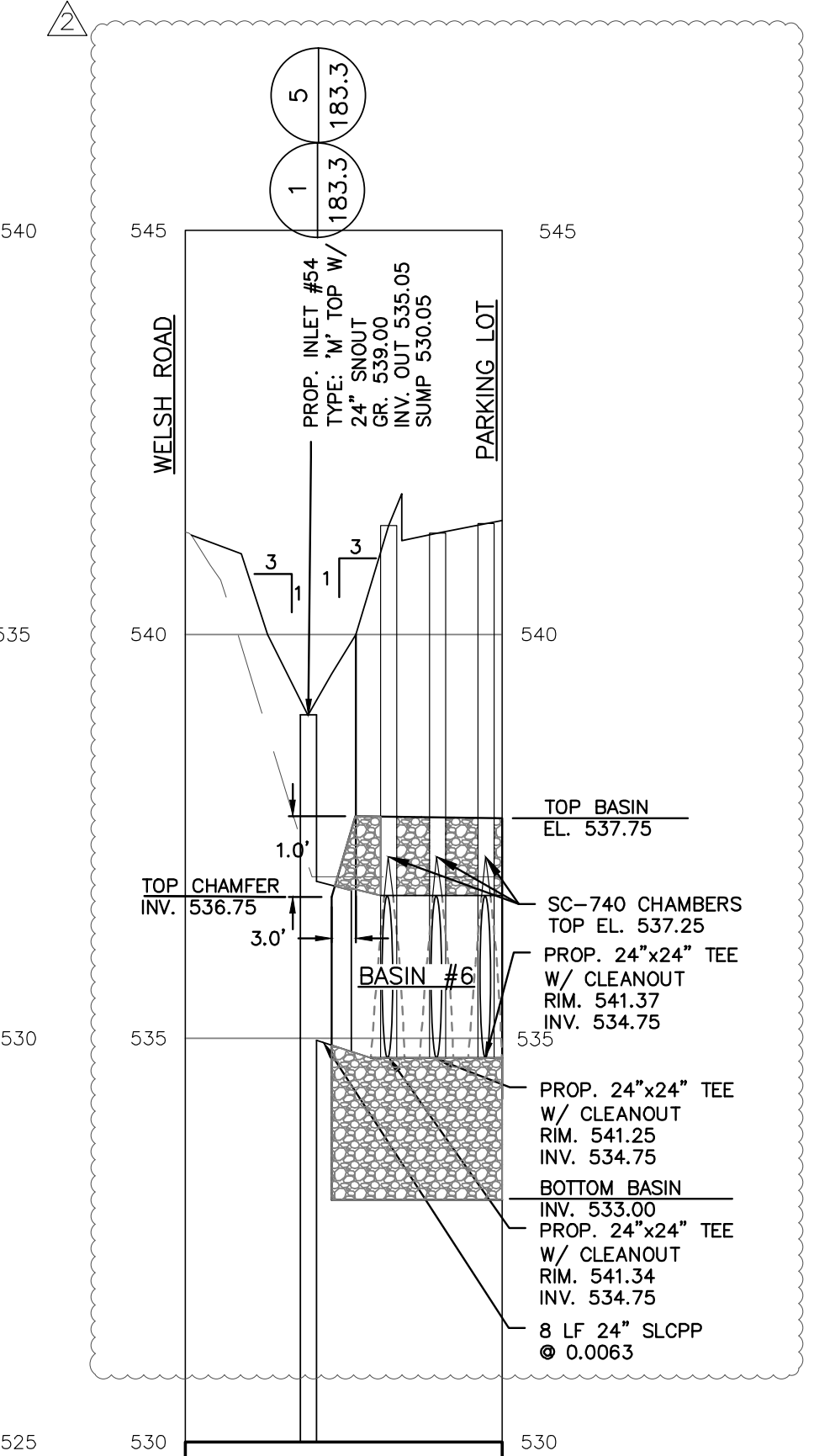
08/11/2023	RC	JES	REVISED DRAWINGS PER BCCD REVIEW E-MAIL, DATED 07/31/2023.
04/20/2023	RC	JES	NPDES PERMIT #PAD060047, PHASE #2 SUBMISSION
Date	Draft	Chkd	
<b>ATLAS</b> 920 GERMANTOWN PIKE, SUITE 200, PLYMOUTH MEETING, PA 19462			
Jeffrey E. Skinner PE-042652-E SU-052889-E			PROJECT #: Z057000538 DRAWING #: 183.7 SHEET #: 24 OF 27

POST CONSTRUCTION STORMWATER MANAGEMENT PROFILES  
 CUMRU FIRE DEPARTMENT NEW BUILDING  
 Prepared For:  
 TOWNSHIP OF CUMRU  
 Situate In:  
 CUMRU TOWNSHIP, BERKS CO., PA.

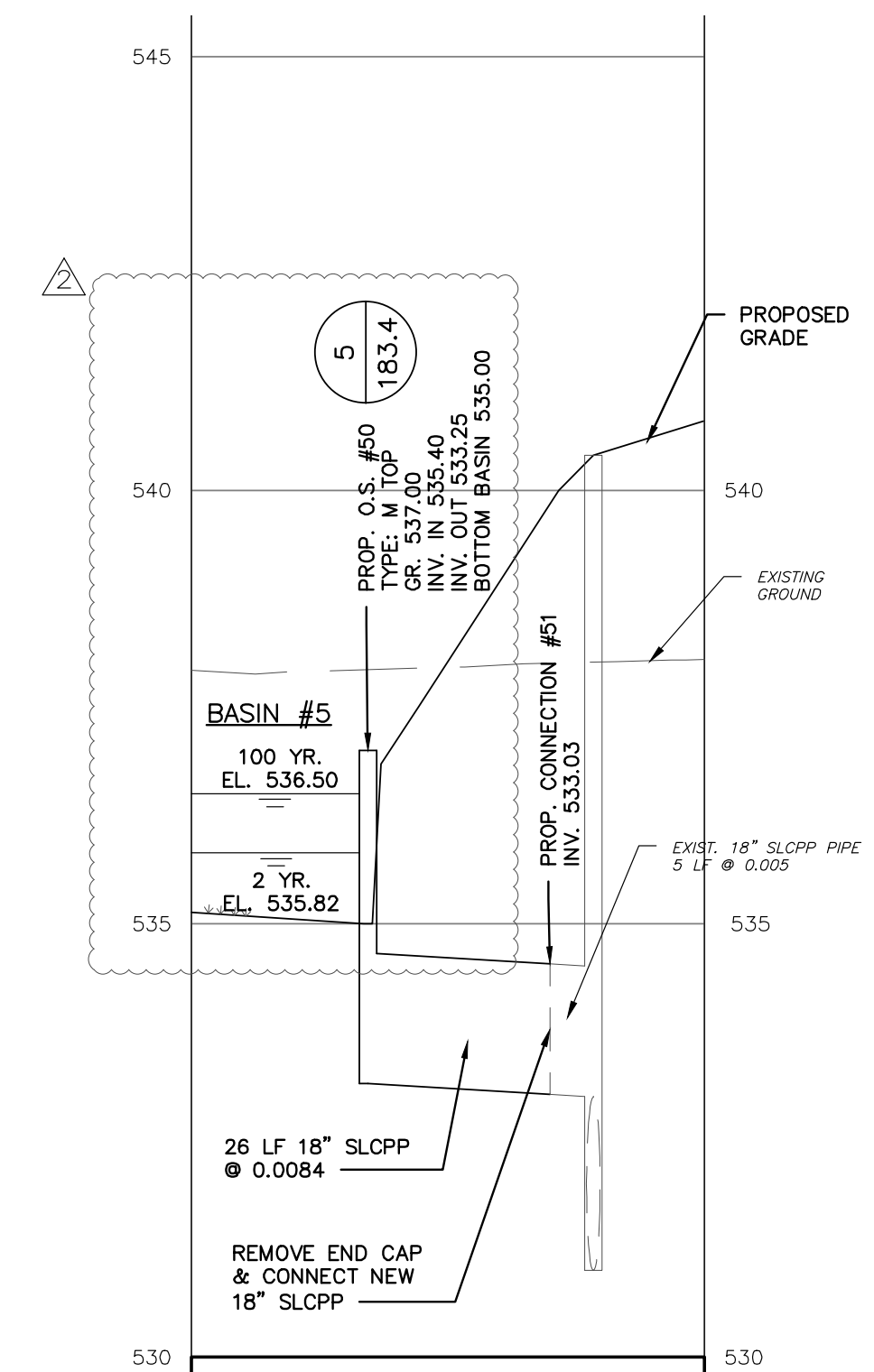
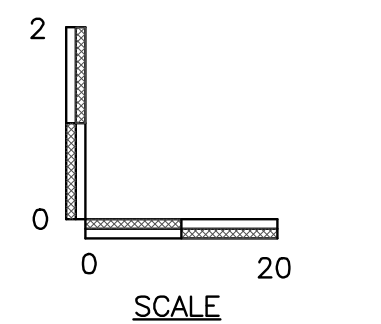




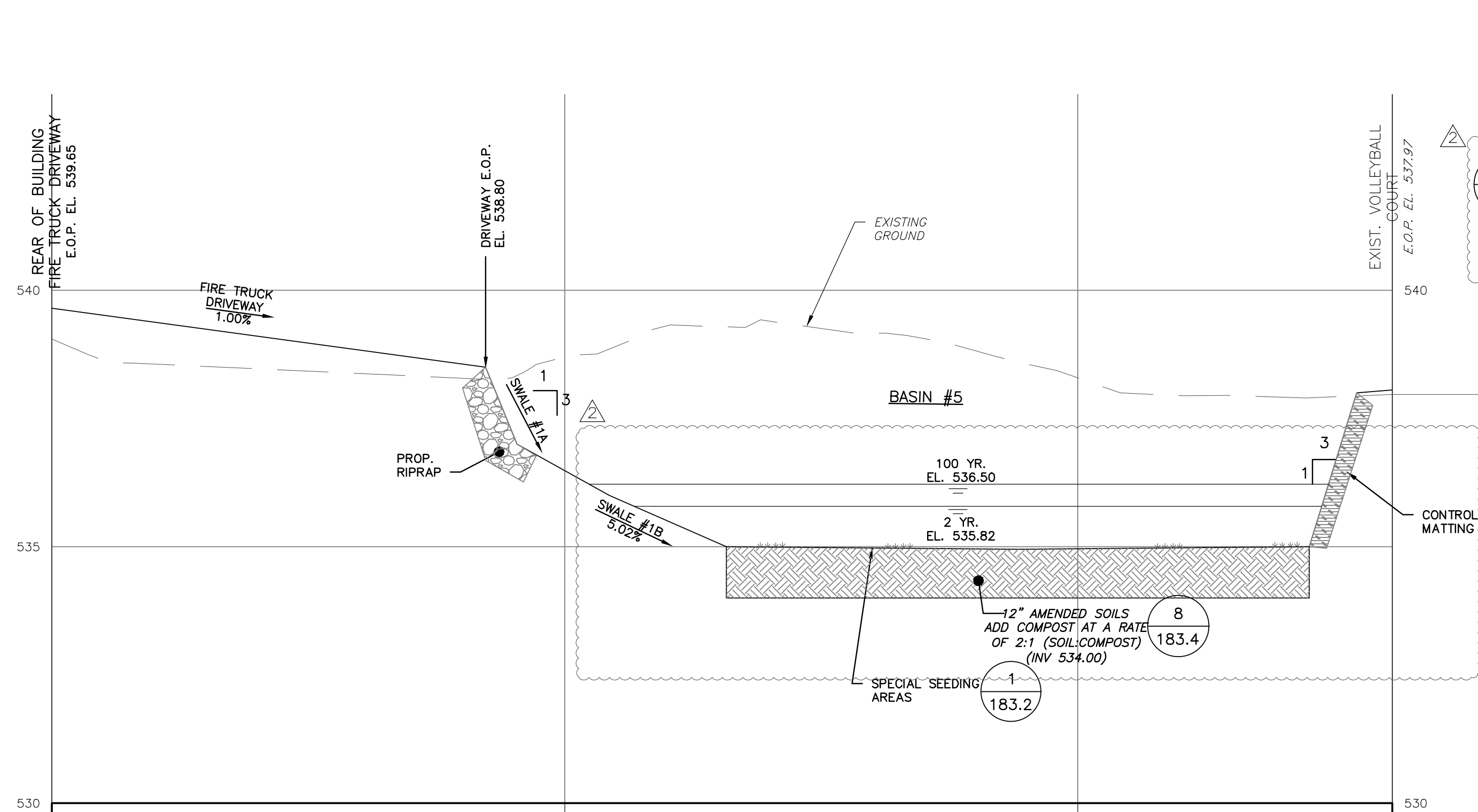
EXISTING INLET #12 TO EXISTING ENDWALL #15 (PHASE #1) PROFILE  
 SCALE: V. 1" = 2'  
 H. 1" = 20'



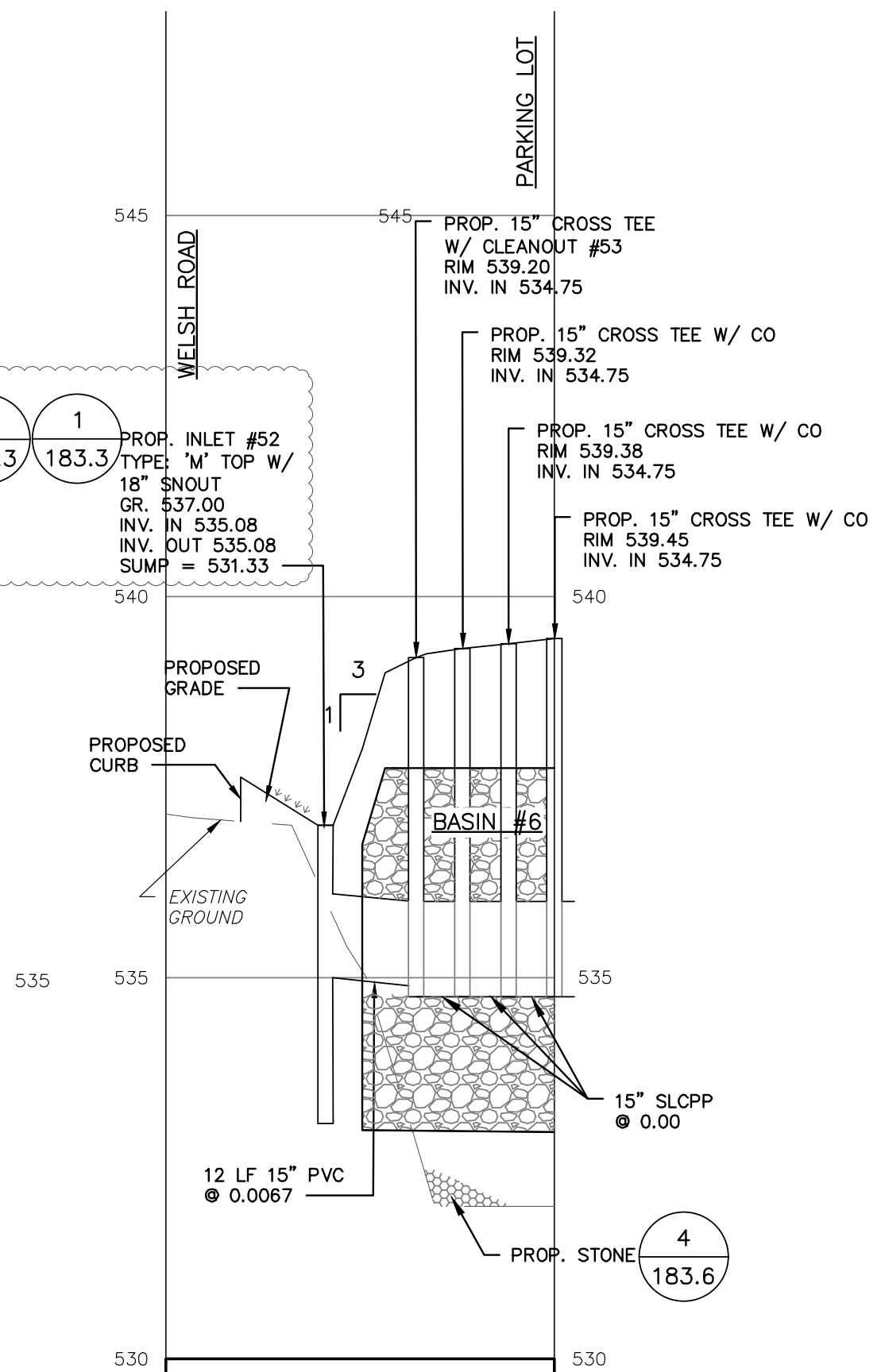
PROPOSED INLET #54 TO BASIN #6 PROFILE  
 SCALE: V. 1" = 2'  
 H. 1" = 20'



PROPOSED O.S. #50 TO EXIST. INLET #12 PROFILE  
 SCALE: V. 1" = 2'  
 H. 1" = 20'



PROPOSED REAR OF BUILDING DRIVEWAY TO BASIN #5 PROFILE  
 SCALE: V. 1" = 2'  
 H. 1" = 20'



PROPOSED INLET #52 TO BASIN #6 PROFILE  
 SCALE: V. 1" = 2'  
 H. 1" = 20'

08/11/2023	RC	JES	REVISD DRAWINGS PER BCCD REVIEW E-MAIL, DATED 07/31/2023.
04/20/2023	RC	JES	NPDES PERMIT #PAD060047, PHASE #2 SUBMISSION
Date	Draft	Chkd	

POST CONSTRUCTION STORMWATER MANAGEMENT PROFILES  
 CUMRU FIRE DEPARTMENT NEW BUILDING  
 Prepared For:  
 TOWNSHIP OF CUMRU  
 Situate In:  
 CUMRU TOWNSHIP, BERKS CO., PA.

Jeffrey E. Skinner  
 PE-042652-E  
 SU-052889-E

PROJECT #:  
 Z057000538  
 DRAWING #:  
 183.8  
 SHEET #:  
 25 OF 27

**ATLAS**  
 920 GERMANTOWN PIKE, SUITE 200,  
 PLYMOUTH MEETING, PA 19462







