Application of Pennsylvania-American Water Company for Acquisition of the Wastewater Assets of East Coventry Township
66 Pa. C.S. §1329
Application Filing Checklist – Water/Wastewater

Docket No. A-2025-3053487

20. Proof of Compliance. Provide proof of compliance with applicable design, construction and operation standards of DEP or of the county health department, or both, including:

b. For **wastewater** system acquisitions, provide copies of the water quality management and National Pollution Discharge Elimination System (NPDES) permits for the utility plant.

RESPONSE: b. Attached are copies of permits provided by East Coventry as **Appendix A-20-b.** Additional wastewater permits may be identified going forward. Copies of any additional wastewater permits located will be provided.

#	PERMIT TYPE	PERMIT NO.	FACILITY NAME
1	WQ Management Permit Internal Review and Recommendations	1524405	Villages at Fricks Lock
2	WQ Management Permit	1506412	North Coventry Municipal Authority WWTF
3	WQ Management Permit	1503417	Coventry Meadows Sewer Extension
4	WQ Management Permit	1506412	East Cedarville Road/Earl Drive/Buckwalter Road Sanitary Sewer Ext

No. 1

Permit No.: 1524405

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

June 7, 2024

Jacqueline Erixxon
East Coventry Township Chester County
P O Box 689
Devon, PA 19333-0689

Re: WQM Permit - Sewage
Villages At Fricks Lock
Permit No. 1524405
Authorization ID No. 1485957
East Coventry Township, Chester County

Dear Jacqueline Erixxon:

Your Water Quality Management (WQM) permit is enclosed. You must comply with all Standard and Special Conditions attached to this Permit. Construction must be done in accordance with the permit application and all supporting documentation. Please review the permit conditions and the supporting documentation submitted with your application before starting construction.

Please note that you are responsible for securing all other required permits, approvals and/or registrations associated with the project, if applicable, under Chapters 102 (erosion and sedimentation control), 105 (stream obstructions and encroachments) and 106 (floodplains) of DEP's regulations. Construction may not proceed until all other required permits have been obtained.

Enclosed is the "Water Quality Management Post Construction Certification" form. A Pennsylvania-registered Professional Engineer must sign and complete this form prior to startup of the facilities. You or your authorized representative must also sign the form. This certification and other post-construction documentation must be submitted to DEP within 30 days of completion of the project and must be received by DEP prior to commencing operation of the facilities.

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board), pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board
Rachel Carson State Office Building, Second Floor
400 Market Street
P.O. Box 8457
Harrisburg, PA 17105-8457

TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800-654-5984.

Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at http://ehb.courtapps.com or by contacting the Secretary to the Board at 717-787-3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717-787-3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

During construction or upon completing construction, please contact Christian French at 484-250-5178 or chfrench@pa.gov so that an inspection of the facilities may be conducted, at DEP's discretion.

Sincerely,

Thomas L. Magge

Thomas L. Magge
Environmental Program Manager
Clean Water Program

Enclosures

cc: East Coventry Township
Chester County Planning Commission
Chester County Health Department
Operations Section
Blake Romanowski – Ebert Engineering, Inc.
File

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SOUTHEAST REGIONAL OFFICE
CLEAN WATER PROGRAM

WATER QUALITY MANAGEMENT PERMIT INTERNAL REVIEW AND RECOMMENDATIONS

Application Type	**New**	Application No.	**1524405**
Facility Type	**Sewage**	APS ID	**1114215**
WQM Type	**Pump Station and Collection System**	Authorization ID	**1485957**

Applicant and Facility Information

Applicant Name	**East Coventry Township Chester County**	Facility Name	**Villages At Fricks Lock**
Applicant Address	P O Box 689	Facility Address	855 Springdale Drive
	Devon, PA 19333-0689		Exton, PA 19341-2852
Applicant Contact	Jacqueline Erixxon	Facility Contact	Joseph Samolewicz
Applicant Phone	610-517-1284	Facility Phone	
Client ID	74504	Site ID	869288
SIC Code	**NAIC 236117**	Municipality	East Coventry Township
SIC Description	**NAIC: New Housing For-Sale Builders**	County	Chester
PA Bulletin Date			

Purpose of Application: Proposed pump station, collection system, and force main serving proposed residential subdivision

Internal Review and Recommendations

The Village at Fricks Lock is located between Fricks Lock Road, Sanatoga Road, and Schuylkill Road in East Coventry Township, Chester County. The developer is proposing a residential subdivision consisting of one hundred fifty-five (155) single family homes. The proposed method of sewage disposal for the Village at Fricks Lock is the connection to the existing East Coventry Township public sanitary sewer system. Wastewater will be conveyed to the North Coventry Township Municipal Authority's Wastewater Treatment Plant.

The wastewater generated by the proposed subdivision will be conveyed by a proposed gravity collection system to a proposed on-site pump station. The homes will be connected to the gravity collection system through individual sanitary sewer laterals. The proposed onsite pump station will be in the southeast corner of the housing development. From the proposed onsite pump station, wastewater will be pumped through a proposed force main northwest through the site where it will then go west on Fricks Lock Road and North on Schuylkill Road (SR 724) where it will discharge into a proposed sanitary manhole at the adjacent the entrance of Towpath Park. East Coventry Township owns and operates the existing gravity sanitary sewer within East Coventry Township. Wastewater will be conveyed through the existing East Coventry Township public sanitary sewer system to the North Coventry Township sanitary sewer system. Wastewater will ultimately be treated and discharged at the North Coventry Township Municipal Authority's Wastewater Treatment Plant under existing NPDES Permit No. PA0025437.

The pump station is also designed to accept flows from approximately fifteen (15) neighboring residential properties. East Coventry Township defines flow per edu to be equal to 262.5 gpd/edu. The total project sewage flow is estimated to be 44,625 gpd. (170 EDUs x 262.5 gpd/EDU).

Approve	Return	Deny	Signatures	Date
X			Christian French Christian French / Environmental Engineering Specialist	May 31, 2024
X			Pravin Patel Pravin C. Patel / Environmental Engineer Manager	05/31/2024
X			Thomas L. Magge Thomas L. Magge / Program Manager	06/06/2024

Internal Review and Recommendations
Act 14 notifications were sent to East Coventry Township and Chester County on March 19, 2024. Act 537 Sewage Facilities Planning approval was received May 6, 2024.

3850-PM-BCW0015d 3/2016
Permit

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

WATER QUALITY MANAGEMENT PERMIT

PERMIT NO. 1524405

AMENDMENT NO. _____

APS ID. 1114215

AUTH. ID. 1485957

A. PERMITTEE (Name and Address): CLIENT ID#: **74504** **East Coventry Township Chester County** **P O Box 689** **Devon, PA 19333-0689**	B. PROJECT/FACILITY (Name): **Villages At Fricks Lock**
C. LOCATION (Municipality, County): **East Coventry Township, Chester County**	SITE ID#: **869288**

D. This permit approves the construction of sewage facilities consisting of:

Collection system, pump station, force main, and sanitary manhole serving Village at Fricks Lock residential development of 155 single family homes, projected to generate sewage flow of 44,625 GPD. The proposed method of sewage disposal for the Village at Fricks Lock is the connection to the existing East Coventry Township public sanitary sewer system. Wastewater will be conveyed to the North Coventry Township Municipal Authority's Wastewater Treatment Plant.

Pump Stations: **Village at Fricks Lock PS**	Manure Storage:	Sewage Treatment Facility:
Design Capacity: **255** GPM	Volume: _____ MG	Annual Average Flow: _____ MGD
	Freeboard: _____ inches	Design Hydraulic Capacity: _____ MGD
		Design Organic Capacity: _____ lb/day

E. APPROVAL GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING:

1. **New Permits:** All construction, operations and procedures shall be in accordance with the Water Quality Management Permit application dated 0**5/12/2024**, its supporting documentation and addendums dated _____, which are hereby made a part of this permit.

   Amendments: All construction, operations and procedures shall be in accordance with the Water Quality Management Permit Amendment application dated _____ and its supporting documentation and addendums dated _____, which are hereby made a part of this amendment.

   Except for any herein approved modifications, all terms, conditions, supporting documentation and addendums approved under Water Quality Management Permit No. _____ dated _____ shall remain in effect.

   Transfers: Water Quality Management Permit No. _____ dated _____ and conditions, supporting documentation and addendums are also made part of this transfer.

2. Permit Conditions Relating to Sewerage are attached and made part of this permit.
3. Special Conditions _____ are attached and made part of this permit.

F. THE AUTHORITY GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING FURTHER QUALIFICATIONS:

1. If there is a conflict between the application or its supporting documents and amendments and the attached conditions, the attached conditions shall apply.
2. Failure to comply with the rules and regulations of DEP or with the terms or conditions of this permit shall void the authority given to the permittee by the issuance of this permit.
3. This permit is issued pursuant to the Clean Streams Law Act of June 22, 1937, P.L. 1987, as amended 35 P.S. §691.1 *et seq*. Issuance of this permit shall not relieve the permittee of any responsibility under any other law.
4. This permit shall expire on _____. The permittee shall submit an application to renew the permit no later than 180 days prior to the permit expiration date.

PERMIT ISSUED: **06/07/2024**

BY: Thomas L. Magge

TITLE: **Thomas L. Magge**
Clean Water Program Manager
Southeast Regional Office

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

PERMIT CONDITIONS RELATING TO SEWERAGE

For use in Water Quality Management Permits

(Check boxes that apply)

General

☒ 1. The Department of Environmental Protection (DEP) considers the licensed Professional Engineer whose seal is affixed to the design documents to be fully responsible for the adequacy of all aspects of the facility design.

☒ 2. The permittee shall adopt and enforce an ordinance requiring the abandonment of privies, cesspools or similar receptacles for human waste and onlot sewage disposal systems on the premises of occupied structures accessible to public sewers. All such structures must be connected to the public sewers.

☒ 3. The outfall sewer or drain shall be extended to the low water mark of the receiving body of water. Where necessary to ensure proper mixing and waste assimilation, an outfall sewer or drain may be extended with appurtenances below the low water mark and into the bed of a navigable stream provided that the permittee has secured an easement, right-of-way, license or lease from DEP in accordance with Section 15 of the Dam Safety and Encroachments Act, the Act of November 26, 1978, P.L. 1375, as amended.

☒ 4. The approval is specifically made contingent on the permittee acquiring all necessary property rights, by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures in, along or across private property with full rights of ingress, egress and regress.

☒ 5. When construction of the approved sewerage facilities is completed and before they are placed in operation, the permittee shall notify DEP in writing so that a DEP representative may inspect the facilities.

☒ 6. The approval of the plans, and the authority granted in this permit, if not specifically extended, shall cease and be null and void 5 years from the issuance date of this permit unless construction or modification of the facilities covered by this permit has begun on or before the fifth anniversary of the permit date.

☒ 7. If, at any time, the sewerage facilities covered by this permit create a public nuisance, including but not limited to, causing malodors or causing environmental harm to waters of the Commonwealth, DEP may require the permittee to adopt appropriate remedial measures to abate the nuisance or harm.

☒ 8. If, after the issuance of this permit, DEP approves a municipal sewage facilities official plan or an amendment to an official plan under Act 537 (Pennsylvania Sewage Facilities Act, the Act of January 24, 1966, P.L. 1535 as amended) in which sewage from the herein approved facilities will be treated and disposed of at other planned facilities, the permittee shall, upon notification from the municipality or DEP, provide for the conveyance of its sewage to the planned facilities, abandon use and decommission the herein approved facilities including the proper disposal of solids, and notify DEP accordingly. The permittee shall adhere to schedules in the approved official plan, amendments to the plan, or other agreements between the permittee and municipality. This permit shall then, upon notice from DEP, terminate and become null and void and shall be relinquished to DEP.

☒ 9. This permit does not relieve the permittee of its obligations to comply with all federal, interstate, state or local laws, ordinances and regulations applicable to the sewerage facilities.

☒ 10. This permit does not give any real or personal property rights or grant any exclusive privileges, nor shall it be construed to grant or confirm any right, easement or interest in, on, to or over any lands which belong to the Commonwealth.

☒ 11. The authority granted by this permit is subject to all effluent requirements, monitoring requirements and other conditions as set forth in the NPDES Permit and all subsequent amendments and renewals. No discharge is authorized from these facilities unless approved by an NPDES Permit.

Construction

☒ 12. This permit is issued under the authorization of The Clean Streams Law and 25 Pa. Code Chapter 91. The permittee shall obtain all necessary permits, approvals and/or registrations under 25 Pa. Code Chapters 102, 105 and 106 prior to commencing construction of the facilities authorized by this permit, as applicable. The permittee should contact the DEP office that issued this permit if there are any questions concerning the applicability of additional permits.

☒ 13. The facilities shall be constructed under the supervision of a Pennsylvania licensed Professional Engineer in accordance with the approved reports, plans and specifications.

☒ 14. A Pennsylvania licensed Professional Engineer shall certify that construction of the permitted facilities was completed in accordance with the application and design plans submitted to DEP, using the "Post Construction Certification" form (3800-PM-WSFR0179a). It is the permittee's responsibility to ensure that a Professional Engineer is on-site to provide the necessary oversight and/or inspections to certify the facilities. The certification must be submitted to DEP before the facility is placed in operation. As-built drawings, photographs (if available) and a description of all deviations from the application and design plans must be submitted to DEP within 30 days of certification.

☒ 15. Manhole inverts shall be formed to facilitate the flow of the sewage and to prevent the stranding of sewage solids. The manhole structure shall be built to prevent undue infiltration, entrance of street wash or grit and provide safe access to facilitate manhole maintenance activities.

☒ 16. The local Waterways Conservation Officer of the Pennsylvania Fish and Boat Commission (PFBC) shall be notified when the construction of any stream crossing and/or outfall is started and completed. A written permit must be secured from the PFBC if the use of explosives in any waterways is required and the permittee shall notify the local Waterways Conservation Officer when explosives are to be used.

Operation and Maintenance

☒ 17. The permittee shall maintain records of "as-built" plans showing all the treatment facilities as actually constructed together with facility operation and maintenance (O&M) manuals and any other relevant information that may be required. Upon request, the "as-built" plans and O&M manuals shall be filed with DEP.

☒ 18. The sewers shall have adequate foundation support as soil conditions require. Trenches shall be back-filled to ensure that sewers will have proper structural stability, with minimum settling and adequate protection against breakage. Concrete used in connection with these sewers shall be protected from damage by water, freezing, drying or other harmful conditions until cured.

☒ 19. Stormwater from roofs, foundation drains, basement drains or other sources shall not be admitted directly to the sanitary sewers.

☒ 20. The approved sewers shall be maintained in good condition, kept free of deposits by flushing or other cleaning methods and repaired when necessary.

☒ 21. The sewerage facilities shall be properly operated and maintained to perform as designed.

☒ 22. The attention of the permittee is called to the highly explosive nature of certain gases generated by the digestion of sewage solids when these gases are mixed in proper proportions with air and to the highly toxic character of certain gases arising from such digestion or from sewage in poorly ventilated compartments or sewers. Therefore, at all places throughout the sewerage facilities where hazard of fire, explosion or danger from toxic gases may occur, the permittee shall post conspicuous permanent and legible warnings. The permittee shall instruct all employees concerning the aforesaid hazards, first aid and emergency methods of meeting such hazards and shall make all necessary equipment and material accessible.

☒ 23. An operator certified in accordance with the Water and Wastewater Systems Operator Certification Act of February 21, 2002, 63 P.S. §§1001, *et seq*. shall operate the sewage treatment plant.

☒ 24. The permittee shall properly control any industrial waste discharged into its sewerage system by regulating the rate and quality of such discharge, requiring necessary pretreatment and excluding industrial waste, if necessary, to protect the integrity or operation of the permittee's sewerage system.

☒ 25. There shall be no physical connection between a public water supply system and a sewer or appurtenance to it which would permit the passage of any sewage or polluted water into the potable water supply. No water pipe shall pass through or come in contact with any part of a sewer manhole.

☒ 26. All connections to the approved sanitary sewers must be in accordance with the official Act 537 Plan and, if applicable, a corrective action plan as contained in the approved Title 25 Pa. Code Chapter 94 Municipal Wasteload Management Annual Report.

☒ 27. Collected screenings, slurries, sludge and other solids shall be handled and disposed of in compliance with Title 25 Pa. Code Chapters 271, 273, 275, 283 and 285 (related to permits and requirements for land filling, land application, incineration and storage of sewage sludge), Federal Regulations 40 CFR 257 and the Federal Clean Water Act and its amendments.

3800-PM-WSFR0179a 9/2005
Post Construction Certification

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

WATER QUALITY MANAGEMENT
POST CONSTRUCTION CERTIFICATION

PERMITTEE IDENTIFIER	
Permittee	East Coventry Township Chester County
Municipality	East Coventry Township
County	Chester
WQM Permit No.	1524405
Facility Type	Sewage

All of the above information should be taken directly from the Water Quality Management Permit.

CERTIFICATION

This certification must be completed and returned to the permits section of the DEP's regional office issuing the WQM permit within 30 days of completion of the project and received by DEP prior to operation, and if requested, as-built drawings, photographs (if available) and a discussion of any DEP-approved deviations from the design plans during construction.

I, being a Registered Professional Engineer in Pennsylvania, do hereby certify to the best of my knowledge and belief, based upon personal observation and interviews, that the above facility approved under the Water Quality Management Permit has been constructed in accordance with the plans, specifications and modifications approved by DEP.

Construction Completion Date (MM/DD/YYYY): _____

	Professional Engineer
	Name _____ (Please Print or Type)
	Signature
	Date
	License Expiration Date
	Firm or Agency
	Telephone
	Permittee or Authorized Representative
	Name _____ (Please Print or Type)
	Signature
Engineer's Seal	Title
	Telephone

No. 2

Permit No.: 1506412

Records Management Request Form

Check Box	Action	Family ID*	Folder ID
☐	Changes to existing family/folder		
☐	Create a new family*	n/a	
☒	Add new folder to and existing family	238567	
☐	Delete folder		

*Family ID=Primary Facility record ID in RMS

Family Info: Family Name: _____

Site Address: _____

City: _____

State: _____

Zip: _____

Municipality: East Coventry Twp

County: Chester

Program: WQ

Breakdown:	(026 SEW*)	011 IW	073 SW	158 Biosolids	MS4
File type:	Confidential**	Confidential**	Confidential**	Permit	NPDES
	DMR***	DMR***	Permit		Operations
	NPDES	NPDES			
	Operations	Operations			
	(WQM Permits)	WQM Permits			

Permit #: 1506412 (No extensions,ex. A1, T1) File start date: _____

For new files, place attached documents in: _____ file.

Cross Reference:

File Comments: E. Cedarville Rd / Earl Dr. / Buckwalter Rd. Sanitary Sew Ext

Authorized signature: Stephanie Clark date: 3/9/07

* For SRSTP, only create NPDES or WQM Permits
**Not generally created for new projects
*** Create for NPDES and WQM with land application
Old ins/dmr/op= DMR (place inspections in Operations file) Recycle DMRs after 6 years
Old Corres/339= Operations (fiche files after 6 years)
Old Permits/94=WQM Permits (fiche files after 6 years)

8000-PM-IT0001 Rev 06/07/2002

FORM

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

Related ID#s (If Known)

Client ID# 74504
Site ID# 623461
Facility ID#
APS ID# ~~341961~~
Auth ID# ~~359537~~

DEP USE ONLY
Date Received & General Notes

CLIENT INFORMATION

DEP Client ID#	Client Type / Code
	MUNI

Organization Name or Registered Fictitious Name	Employer ID# (EIN)	Dun & Bradstreet ID#
East Coventry Township	23-6000285	

Individual Last Name	First Name	MI	Suffix	SSN

Additional Individual Last Name	First Name	MI	Suffix	SSN

Mailing Address Line 1	Mailing Address Line 2
855 Ellis Woods Road	

Address Last Line – City	State	ZIP+4	Country
Pottstown	PA	19465	United States

Client Contact Last Name	First Name	MI	Suffix
Preston	Robert	F.	

Client Contact Title	Phone	Ext
Chairman, Board of Supervisors	610-495-5443	

Email Address	FAX
	610-495-9925

SITE INFORMATION

DEP Site ID#	Site Name
	East Cedarville Road / Earl Drive / Buckwalter Road Sanitary Sewer Extension

EPA ID#

Estimated Number of Employees to be Present at Site

Description of Site
Sanitary Sewer Extension within the existing road right-of-ways and within off road easements.

County Name	Municipality	City	Boro	Twp	State
Chester	East Coventry	☐	☐	☒	PA
County Name	Municipality	City	Boro	Twp	State
		☐	☐	☐	

Site Location Line 1	Site Location Line 2
East Cedarville Road / Earl Drive Area	Buckwalter Road Area

Site Location Last Line – City	State	ZIP+4
Pottstown	PA	19465

Detailed Written Directions to Site
See Attached Location Map

Site Contact Last Name	First Name	MI	Suffix
Preston	Robert	F.	

Site Contact Title	Site Contact Firm
Chairman, Board of Supervisors	East Coventry Township

Mailing Address Line 1	Mailing Address Line 2
855 Ellis Woods Road	

Mailing Address Last Line – City	State	ZIP+4
Pottstown	PA	19465

Phone	Ext	FAX	Email Address
610-495-5443		610-495-9925	

8000-PM-IT0001 Rev 06/07/2002

NAICS Codes (Two- & Three-Digit Codes – List All That Apply) **6-Digit Code** (Optional)
22

Client to Site Relationship
OWN

FACILITY INFORMATION

Modification of Existing Facility	Yes	No
1. Will this project modify an existing facility, system, or activity?	☐	☒
2. Will this project involve an addition to an existing facility, system, or activity?	☒	☐

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	DEP Fac ID#		Facility Type	DEP Fac ID#
☐	Air Emission Plant		☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	MineDrainageTrmt/LandRecyProjLocation	
☐	Coal Ash Beneficial Use Operation		☐	Municipal Waste Operation	
☐	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☐	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☐	Dam Location		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Anthracite		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Bituminous		☐	Residual Waste Operation	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Storage Tank Location	
☐	Encroachment Location (water, wetland)		☒	Water Pollution Control Facility	
☐	Erosion & Sediment Control Facility		☐	Water Resource	
☐	Explosive Storage Location		☐	Other:	

Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
Approx. Center of Project Area	40	12	42	75	37	34

Horizontal Accuracy Measure Feet --or-- Meters

Horizontal Reference Datum Code
- ☒ North American Datum of 1927
- ☐ North American Datum of 1983
- ☐ World Geodetic System of 1984

Horizontal Collection Method Code ITPMP

Reference Point Code CTROD

Altitude Feet --or-- Meters

Altitude Datum Name
- ☒ The National Geodetic Vertical Datum of 1929
- ☐ The North American Vertical Datum of 1988 (NAVD88)

Altitude (Vertical) Location Datum Collection Method Code

Geometric Type Code POINT

Data Collection Date December 2005

Source Map Scale Number 1 Inch(es) = 2000 Feet
--or-- Centimeter(s) = Meters

PROJECT INFORMATION

Project Name
East Cedarville Road / Earl Drive / Buckwalter Road Sanitary Sewer Extension

Project Description
See Attached Project Description

Project Consultant Last Name	First Name	MI	Suffix
Dingman	William	K.	P.E.

Project Consultant Title	Consulting Firm
Vice President	EDM Consultants, Inc.

Mailing Address Line 1	Mailing Address Line 2
1101 South Broad Street	P.O. Box 1545

Address Last Line – City	State	ZIP+4
Lansdale	PA	19446

Phone	Ext	FAX	Email Address
315-393-0670	20	21-393-0652	bill@edmconsultantsinc.com

8000-PM-IT0001 Rev 06/07/2002

Time Schedules To Be Determined	Project Milestone (Optional)

1. **Is this application for an authorization type on the list of authorizations affected by the land use policy?** ☒ Yes ☐ No
   Note: If "Yes", you must complete the following Land Use Information section, unless exempted by Questions 2 or 3 below.
   If "No", skip Questions 2 & 3 below as well as the following Land Use Information section.
   For referenced list, see Appendix A attached to the GIF Instructions.

2. **For an Air program authorization only. All other authorizations continue with Question 3 below. Will the permit authorize the construction of facilities outside an existing permitted area?** ☐ Yes ☒ No
   Note: If "Yes", you must complete the following Land Use Information section unless exempted by Question 3 below.
   If "No", skip Question 3 below as well as the following Land Use Information section.

3. **Have you attached or submitted municipal and county 'Early Opt Out' approval letters for the project?** ☐ Yes ☒ No
   Note: If "Yes" to Question 3, skip the following Land Use Information section. This should only be checked "Yes" if applicant is choosing the early opt-out option. Required approval letters described in the GIF Checklist and Instructions should be attached.
   If "No" to Question 3, continue with the following Land Use Information section.

LAND USE INFORMATION

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1.	Is there a municipal comprehensive plan(s)?	☒ Yes	☐ No	
2.	Is there a county comprehensive plan(s)?	☒ Yes	☐ No	
3.	Is there a multi-municipal or multi-county comprehensive plan?	☐ Yes	☒ No	
4.	Is the proposed project consistent with these plans? If no plan(s) exists, answer "Yes".	☒ Yes	☐ No	
5.	Is there a municipal zoning ordinance(s)?	☒ Yes	☐ No	
6.	Is there a joint municipal zoning ordinance(s)?	☐ Yes	☒ No	
7.	Will the proposed project require a zoning approval (e.g., special exception, conditional approval, re-zoning, variance)? If zoning approval has already been received, attach documentation.	☐ Yes	☒ No	
8.	Are any zoning ordinances that are applicable to this project currently the subject of any type of legal proceeding?	☐ Yes	☒ No	
9.	Will the project be located on a site that has been or is being remediated under DEP's Land Recycling Program?	☐ Yes	☒ No	
10.	Will the project result in reclamation of abandoned mine lands through re-mining or as part of DEP's Reclaim PA Program?	☐ Yes	☒ No	
11.	Will the project be located in an agricultural security area or an area protected under an agricultural conservation easement?	☐ Yes	☒ No	
12.	Will the project be located in a Keystone Opportunity Zone or Enterprise Development Area?	☐ Yes	☒ No	
13.	Will the project be located in a Designated Growth Area as defined by the Municipalities Planning Code?	☒ Yes	☐ No	

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 and the accompanying Cultural Resource Notice Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	Is this a coal mining project? If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0. (DEP Use/48y1)	☐	Yes	☐	No
1.1	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day? (DEP Use/4x70)	☐	Yes	☐	No
1.2	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year? (DEP Use/4x70)	☐	Yes	☐	No
1.3	Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used? (DEP Use/4x70)	☐	Yes	☐	No
1.4	For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters? (DEP Use/4x62)	☐	Yes	☐	No
1.5	Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet? (DEP Use/3140)	☐	Yes	☐	No
1.6	Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well? (DEP Use/4z41)	☐	Yes	☐	No
2.0	Is this a non-coal (industrial minerals) mining project? If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0. (DEP Use/48y1)	☐	Yes	☐	No
2.1	Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel? (DEP Use/4x70)	☐	Yes	☐	No
2.2	Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials? (DEP Use/4x70)	☐	Yes	☐	No
2.3	Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)? (DEP Use/4x70)	☐	Yes	☐	No
2.4	For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters? (DEP Use/4x62)	☐	Yes	☐	No
2.5	Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet? (DEP Use/3140)	☐	Yes	☐	No

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3.0	**Will your project, activity, or authorization have anything to do with a well related to oil or gas production, site development for such activity, or the waste from such a well?** If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0. (DEP Use/4z41)	☐	Yes	☒	No
3.1	**Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?** (DEP Use/4z41)	☐	Yes	☐	No
3.2	**Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system?** If "Yes", discuss in *Project Description*. (DEP Use/4z41)	☐	Yes	☐	No
3.3	**Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?** (DEP Use/4z41)	☐	Yes	☐	No
4.0	**Will the project involve a construction activity that results in earth disturbance?** If "Yes", specify the total disturbed acreage. (DEP Use/4x66)	☒	Yes	☐	No
	4.0.1 Total Disturbed Acreage > 5.0 - for installation of sewer mains and one pump station				
5.0	**Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?** (DEP Use/4x66)	☒	Yes	☐	No
6.0	**Will the project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?** If "Yes", discuss in *Project Description*. (DEP Use/4x62)	☐	Yes	☒	No
7.0	**Will the project involve the construction and operation of industrial waste treatment facilities?** (DEP Use/4x62)	☐	Yes	☒	No
8.0	**Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations?** If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable. (DEP Use/4x62)	☒	Yes	☐	No
	8.0.1 Estimated Proposed Flow (gal/day) 90 GPM Sanitary Sewer Pump Station				
9.0	**Was sewage planning submitted and approved?** If "Yes", attach the Act 537 approval letter unless the submitted application is actually requesting Act 537 approval (Approval required prior to 105/NPDES approval). (DEP Use/4x61)	☒	Yes	☐	No
	9.0.1 Is Act 537 Approval Letter attached?	☒	Yes	☐	No
10.0	**Is this project for the beneficial use of biosolids for land application within Pennsylvania?** If "Yes" indicate how much (i.e. gallons or dry tons per year). (DEP Use/4X62)	☐	Yes	☒	No
	10.0.1 Gallons Per Year (residential septage)				
	10.0.2 Dry Tons Per Year (biosolids)				
11.0	**Does the project involve construction, modification or removal of a dam?** If "Yes", identify the dam. (DEP Use/3140)	☐	Yes	☒	No
	11.0.1 Dam Name				
12.0	**Will the project interfere with the flow from, or otherwise impact, a dam?** If "Yes", identify the dam. (DEP Use/3140)	☐	Yes	☒	No
	12.0.1 Dam Name				
13.0	**Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?** If "Yes", identify each type of emission followed by the amount of that emission. (DEP Use/4x70)	☐	Yes	☒	No
	13.0.1 Enter all types & amounts of emissions; separate each set with semicolons.				

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14.0	**Is an on-site drinking water supply (well), other than individual house wells, proposed for your project?** If "Yes", indicate total number of people served and/or the total number of connections served, if applicable. Also, check all proposed sub-facilities. (DEP Use/4x81)	☐	Yes	☒	No
	14.0.1 Number of Persons Served				
	14.0.2 Number of Employee/Guests				
	14.0.3 Number of Connections				
	14.0.4 Sub-Fac: Distribution System	☐	Yes	☐	No
	14.0.5 Sub-Fac: Water Treatment Plant	☐	Yes	☐	No
	14.0.6 Sub-Fac: Source	☐	Yes	☐	No
	14.0.7 Sub-Fac: Pump Station	☐	Yes	☐	No
	14.0.8 Sub-Fac: Entry Point	☐	Yes	☐	No
	14.0.9 Sub-Fac: Transmission Main	☐	Yes	☐	No
	14.0.10 Sub-Fac: Storage Facility	☐	Yes	☐	No
15.0	**Will your project involve purchasing water in bulk, excluding during the construction period?** If "Yes, name the provider. Also, indicate the daily number of employees or guests served. (DEP Use/4x81)	☐	Yes	☒	No
	15.0.1 Provider's Name				
	15.0.2 Number of Employees/Guests				
16.0	**Is your project to be served by public water supply?** If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project. (DEP Use/4x81)	☐	Yes	☒	No
	16.0.1 Supplier's Name				
	16.0.2 Letter of Approval from Supplier is Attached	☐	Yes	☒	No
17.0	**Will this project involve a new or increased drinking water withdrawal from a stream or other water body?** If "Yes", provide name of stream. (DEP Use/4x81)	☐	Yes	☒	No
	17.0.1 Stream Name				
18.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste?** If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed. (DEP/Use4x32)	☐	Yes	☒	No
	18.0.1 Type & Amount				
19.0	**Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities?** (DEP Use/48y1)	☐	Yes	☒	No
20.0	**Does your project involve installation of a field constructed underground storage tank?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	☐	Yes	☒	No
	20.0.1 Enter all substances & capacity of each; separate each set with semicolons.				
21.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	☐	Yes	☒	No
	21.0.1 Enter all substances & capacity of each; separate each set with semicolons.				
22.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	☐	Yes	☒	No
	22.0.1 Enter all substances & capacity of each; separate each set with semicolons.				

23.0	**Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	☐	Yes	☒	No
23.0.1	**Enter all substances & capacity of each; separate each set with semicolons.**				

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Type or Print Name William K. Dingman, P.E.

William K. Dingman — **Signature**

Vice President, EDM Consultants, Inc. — **Title**

2/21/06 — **Date**

SECTION B

NARRATIVE

East Cedarville Road / Earl Drive / Buckwalter Road
Sanitary Sewer Extension
East Coventry Township, Chester County
Project Narrative

On behalf of East Coventry Township, Chester County, Pennsylvania, EDM Consultants, Inc. is preparing plans for the design and construction of the East Cedarville Road / Earl Drive / Buckwalter Road Sanitary Sewer Extension. The following narrative describes this sanitary sewer extension project.

East Coventry Township located in Chester County, Pennsylvania is having plans prepared for the construction of the East Cedarville Road / Earl Drive Sanitary Sewer Extension. This sanitary sewer extension will include the installation of approximately 20,000 LF of sanitary sewer pipe within the existing cartway of East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schoolhouse Road, Harley Road, Saw Mill Road and Buckwalter Road. This project will also include the installation of approximately 2,000 LF of sanitary sewer pipe across open land within easements located between Buckwalter Road and the Pigeon Creek. The project will also include the construction of a sanitary sewer pumping station located along Saw Mill Road at a point approximately 500 feet east of Harley Road. The sanitary sewer extension is being constructed to provide public sanitary sewer service to approximately 250 existing properties located along the above mentioned roads. The total acreage of the project is approximately 19.5 acres with all 19.5 acres being disturbed with the installation of the sanitary sewer pipe and pumping station.

There are no existing buildings over forty years old that will be impacted by the construction of this sanitary sewer extension project. The installation of the sanitary sewer pipe will be within the existing roads except for the portion between Buckwalter Road and the Pigeon Creek.

The project will include minor stream/drainage ditch crossings of an unnamed tributary to the Pigeon Creek. These stream crossings will be completed utilizing the most up to date methods for stream crossing construction. The stream crossings will be completed in a timely manner and every precaution will be taken to prevent sediment laden water from entering the unnamed tributary to the Pigeon Creek. All areas disturbed during the installation of the sanitary sewer extension will restored to an equal to or better than their pre-disturbed condition.

East Cedarville Road / Earl Drive Sanitary Sewer Extension
East Coventry Township
Chester County, Pennsylvania

Sanitary Sewer Stream Crossing Number 1 Narrative (Tributary to Pigeon Creek)

East Coventry Township, Chester County, Pennsylvania is designing a sanitary sewer extension of the existing sanitary sewer system to serve the existing homes located within the East Cedarville Road, Earl Drive and Buckwalter Road areas of the township with public sanitary sewer service.

The sanitary sewer extension will include the installation of 8 inch and 10 inch diameter sanitary sewer pipes within the existing right-of-ways of the above mentioned roads and within off road easements obtained by East Coventry Township through private property. The off road portion of the sanitary sewer extension will include one minor stream crossing of an unnamed tributary to the Pigeon Creek with an 8 inch diameter sanitary sewer pipe. This crossing will take place at the narrowest section of the stream based on topography and design requirements in an area designated as Waters of the United States. There are no areas delineated as wetlands affected by the sanitary sewer pipe crossing the stream.

The procedure for constructing the sanitary sewer stream crossing will be as follows;

1. The contractor will install temporary coffer dams upstream and downstream of the proposed stream crossing location to create a dry work area. The contractor will bypass pump the stream around the work area

2. The contractor will excavate and stockpile the existing streambed material so that it can be replaced on the streambed when the sanitary sewer crossing is completed. The contractor should take care to stockpile the material in an area where it will not be mixed with topsoil or other material.

3. The contractor will excavate and stockpile the topsoil from the stream banks adjacent to the stream crossing. This topsoil should be stockpiled outside the limits of the stream and protected to prevent the topsoil from entering the stream.

3. The contractor shall excavate to the required depth and install the sanitary sewer pipe. The excavated trench material shall be stored outside the stream so that it may be used to backfill the trench upon completion of the pipe installation. The sanitary sewer pipe shall be encased in concrete and shall have a minimum of three (3) feet of cover over the concrete encasement. The minimum depth of cover over the concrete encasement may be reduced to one (1) foot if the installation is in rock.

4. The contractor shall then backfill the sanitary sewer trench with the material removed from the trench during the excavation. The contractor shall install trench plugs constructed of clay material at each end of the stream crossing trench to prevent the stream from flowing along the pipe or altering the flow rate.

5. The contractor shall then restore the stream crossing area. The stream crossing will be restored to its respective pre-disturbance or better condition. The stockpiled excavated streambed material shall be replaced on the disturbed streambed to a minimum 12 inch depth. Should additional streambed stabilization be required, the streambed should be lined with a clean stone local to the disturbed area. The stream banks should be graded and restored with a vegetative cover. The application of the stockpiled topsoil will provide re-establishment of the original species. In addition it is recommended that the disturbed stream banks be seeded with red top (agrostis alba) at a rate of two (2) pounds per acre to provide immediate soil stabilization and a non-competitive cover crop with good wildlife value.

6. The contractor shall remove the temporary coffer dams beginning downstream and working upstream. The contractor shall remove the pumps and allow the stream to flow freely.

7. The contractor shall restore, reseed and mulch all disturbed areas adjacent to the stream crossing location.

/002_StreamXingNarr

Pennsylvania Department of Environmental Protection
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

OCT 0 8 2003

OCT 1 5 2003

Southeast Regional Office

610-832-6130
Fax: 610-832-6133

Casey LaLonde, Manager
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

Re: Act 537 Plan Update
APS Id. 349961, AUTH Id. 359537
East Coventry Township
Chester County

Dear Mr. LaLonde:

We have completed our review of your municipality's updated official sewage facilities plan entitled East Coventry Township Wastewater Collection and Treatment Special Study, as prepared by Motley Engineering Co., Inc. and Arro Consulting, Inc. The plan is dated November, 2000, revised March 28, 2002, September 12, 2002, January 24, 2003 and June 17, 2003. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the plan is hereby granted. The plan provides for the following:

1. The establishment of a public sewer service area tributary to the North Coventry Municipal Authority's Wastewater Treatment Facility. A total of 510,000 gallons per day annual average flow will ultimately be conveyed to the North Coventry Municipal Authority's sewerage facilities. This service area is depicted on Figure 2, Planning Areas, revised by Arro Consulting, Inc. on May 8, 2002.

   Section 7.7 of the draft intermunicipal agreement provided with the submission allows East Coventry Township to initially purchase a maximum of 650 EDUs (195,000 gpd) capacity in the North Coventry Municipal Authority's Wastewater Treatment Facility. Pursuant to Section 7.9 of the agreement, East Coventry Township will be permitted to purchase a maximum of 800 EDUs (240,000 gpd) of capacity once the Township has funded the construction and remaining non-construction costs associated with the expansion of the North Coventry Municipal Authority's Wastewater Treatment Facility. East Coventry Township will be allowed to purchase a maximum of 1,700 EDUs (510,000 gpd) of capacity once the expansion of the North Coventry Municipal Authority's Wastewater Treatment Facility has been completed.



Pennsylvania Department of Environmental Protection
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

OCT 0 8 2003

OCT 1 5 2003

Southeast Regional Office

610-832-6130
Fax: 610-832-6133

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OCT 0 8 2003

Casey LaLonde, Manager -2-

2. The construction of four new, municipally owned sewage pumping stations and appurtenant force mains and gravity sewers. These facilities are depicted on the February 19, 2003 plan entitled Northern Service Area Phase I Sewer System, prepared by Arro Consulting, Inc. These pump stations will have the following capacities and service areas:

   a. Pump Station No. 1 will convey 510,000 gallons per day annual average flows from the new East Coventry Township public sewer service area to sewerage facilities owned by the North Coventry Municipal Authority.

   b. Pump Station No. 2 will have a capacity of 5,775 gallons per day annual average flow and will serve 22 units from the Wood Crest Estates Subdivision (a.k.a. Strutynski, Jr. Tract).

   c. Pump Station No. 3 will have a capacity of 106,575 gallons per day annual average flow and will serve 380 units from the Coventry Meadows Subdivision (a.k.a. Burkhart-Elliott Tract), Lot 16 of the Heather Glen Subdivision (a.k.a. Domin-Allison/Miller Tract) and 25 existing houses along Old Schuylkill Road.

   d. Pump Station No. 4 will have a capacity of 21,788 gallons per day annual average flow and will serve 61 units from the Creekview Subdivision (a.k.a. Soltys/Strutynski, Sr. Tract) and 22 units from the Wood Crest Estates Subdivision (a.k.a. Strutynski, Jr. Tract).

This approval is conditioned on the following:

1. East Coventry Township must submit a finalized, signed copy of the Agreement by and among East Coventry Township, North Coventry Township and the North Coventry Municipal Authority, which allows East Coventry Township to purchase sewage treatment capacity in the North Coventry Municipal Authority's Wastewater Treatment Facility.

2. Planning module submissions for East Coventry Township projects tributary to the North Coventry Municipal Authority's Wastewater Treatment Facility must demonstrate their consistency with the intermunicipal agreement referenced in Condition No. 1 above.

3. North Coventry Township currently has no sewage facilities planning in place to allow for the treatment of sewage flows from East Coventry Township at the North Coventry Municipal Authority's Wastewater Treatment Facility. Therefore, any planning modules for East Coventry Township projects tributary to that facility must also be adopted by

OCT 0 8 2003

Casey LaLonde, Manager -3-

North Coventry Township as revisions to that municipality's official sewage facilities plan prior to their submission to the Department. This requirement will remain in effect until North Coventry Township receives sewage facilities planning approval for the expansion of the North Coventry Municipal Authority's Wastewater Treatment Facility to accept the 510,000 gpd total proposed flow from East Coventry Township. North Coventry Township must receive Act 537 planning approval and the Authority must obtain all necessary Department permits prior to this expansion.

If you have any questions, please contact Elizabeth Mahoney of this office.

Sincerely,

James Newbold, P.E.
Regional Manager
Water Management

cc: Chester County Planning Commission
Chester County Health Department
Mr. Flaharty
North Coventry Township
North Coventry Municipal Authority
Ms. Mahoney
Ms. Moore
Ms. Grant
RCSOB, 11th Floor, Sewage Facilities, Attn.: John McHale
Planning Section
Re 30

3930-PM-WM0500 Rev. 6/2006

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERSHED MANAGEMENT
WATER OBSTRUCTION AND ENCROACHMENT

SINGLE AND COMPLETE PROJECT SCREENING

Please complete this Screening Form before completing the General Permit Registration Form

The following questionnaire must be completed as part of your General Permit Registration in order to determine if your proposed project is presented as a single and complete project and eligible for Federal authorization under the PASPGP-3 process. The term "Project", for the purposes of this form, is defined as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. All components of the overall project shall be considered as one project for the purpose of completing this form. For linear projects, all impacts to waters and wetlands, associated with the entire overall project, should be added together and the sum viewed as impacts associated with the "Project".

Applicant Name: EAST COVENTRY TOWNSHIP

YES	NO		
☐	☒	1.	Does this project involve the temporary and/or permanent discharge of dredged and/or fill material, or the excavation of greater than one acre of waters and/or wetlands? Included in this calculation are the areas directly and indirectly affected by the work, including the area of waters and/or wetlands filled, drained and/or flooded as a result of the project. If you check NO, proceed to Question 2.
☐	☒	2.	In addition to this general permit, will this project require an Individual Water Obstruction and Encroachment Permit, Dam Permit or an Environmental Assessment for a non-jurisdictional dam? If you check NO, proceed to Question 3. If you check YES, do not continue with the General Permit Registration, contact the DEP Regional Office. All project impacts will be reviewed as part of the individual Chapter 105 permit application.
☐	☒	3.	Will the construction of the activity that requires this general permit result in other impacts to water resources that require other federal Section 10 or Section 404 permits issued by the U.S. Army Corps of Engineers? In addition to this general permit, will this project require the registration of other general permits, or are there impacts to water resources that would qualify for a waiver of permit requirements at Chapter 105.12. If you check NO, proceed to Question 4. If you check YES, indicate all impacts to water resources including potentially waived activities, on a sketch plan on the page provided or on a separate site plan if available. Submit all required General Permit Registrations for review and processing as a single and complete project. Depending on the scope of your project, your permit registration may be forwarded to the U.S. Army Corps of Engineers for a separate federal review.
☐	☒	4.	Does this project, including previously authorized activities involving the temporary and/or permanent discharge of dredged or fill material, or the excavation of wetlands and/or waters of the United States which would directly or indirectly, individually or cumulatively, involve the discharge of dredged or fill material to more than 250 linear feet of stream or 0.25 acres of wetlands? If you check NO, proceed to Question 5. If you check YES, your project will be sent to the U.S. Army Corps of Engineers for a separate federal review.
☐	☒	5.	Has any work associated with your project been previously authorized by the Corps or DEP? If you check YES, please check the appropriate box(s) and include the authorization or permit number(s) and the date of issuance(s) with your application/registration form(s). ☐ Corps Nationwide Permit _____ ☐ Corps Individual Permit _____ ☐ Corps Pennsylvania State Programmatic General Permit _____ ☐ DEP General Permit _____ ☐ DEP Individual Permit _____ ☐ DEP Dam Permit _____ ☐ DEP Waiver of Permit Requirements _____

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATERSHED MANAGEMENT
WATER OBSTRUCTION AND ENCROACHMENT

DEP USE ONLY
Acknowledged Date _____
GP _____
GP _____
GP _____
PASPGP-3 Authorization included:
☐ YES ☐ NO

GENERAL PERMIT REGISTRATION

CHAPTER 105 GENERAL PERMITS
PLEASE CHECK ALL THAT APPLY:

- ☐ GP-1 – Fish Habitat Enhancement Structures
- ☐ GP-2 – Small Docks & Boat Launching Ramps
  Please check one of the boxes below if utilizing GP-2, (See Part 1, Section C):
  - ☐ private recreational dock
  - ☐ public access facility
  - ☐ public service facility
  - ☐ other private or commercial facility
- ☐ GP-3 – Bank Rehabilitation, Bank Protection & Gravel Bar Removal
- ☐ GP-4 – Intake and Outfall Structures
- ☒ GP-5 – Utility Line Stream Crossing
- ☐ GP-6 – Agricultural Crossings & Ramps
- ☐ GP-7 – Minor Road Crossings
- ☒ GP-8 – Temporary Road Crossings
- ☐ GP-9 – Agricultural Activities
- ☐ Activity Related to Oil and Gas Exploration and Production

SECTION A. APPLICANT INFORMATION

Check One: ☒ New Permit ☐ Transfer of Existing Permit – complete Sections A, C & E and transfer form - 3930-PM-WM0016

Applicant Name			
EAST COVENTRY TOWNSHIP			
Contact Person Last Name	**First Name**	**MI**	**Telephone**
LALONDE	CASEY		(610) 495-5443
Mailing Address	**City**	**State**	**Zip + 4**
855 ELLIS WOODS ROAD	POTTSTOWN	PA	19465
Email Address			

SECTION B. CONSULTANT (if different than above) ☐ N/A

Consultant - Last Name	First Name	MI	
WRIGLEY	GEORGE	R	
Consulting Firm			
EDM CONSULTANTS, INC.			
Mailing Address	**City**	**State**	**Zip + 4**
POST OFFICE BOX 1545	LANSDALE	PA	19446
Telephone	**FAX**	**Email**	
(215)393-0670	(215) 393-0652		

SECTION C. PROJECT INFORMATION

Project Name E. CEDARVILLE RD. / EARL DR. / BUCKWALTER RD. AREA SANITARY SEWER EXTENSION

Site Location	City	State	Zip + 4
E. CEDARVILLE RD. AT SCHOOLHOUSE RD.	POTTSTOWN	PA	19465

Municipality	City	Borough	Township	County
EAST COVENTRY TOWNSHIP	☐	☐	☒	CHESTER

How many acres of earth disturbance will occur as a result of this project?
☒ Less than one acre ☐ 1-5 acres ☐ 5 acres or more

Detailed Written Directions to Project Site:

ROUTE 724 AT SCHOOLHOUSE ROAD THEN 1 MILE SOUTH ON SCHOOLHOUSE RD. TO E. CEDARVILLE RD. AT SCHOOLHOUSE RD.

Project Description (briefly describe your project):

INSTALLATION OF SANITARY SEWER PIPE AND MANHOLES IN AND ALONG ROADWAYS AND THROUGH RIGHT-OF-WAYS. PROJECT ALSO INCLUDES THE CONSTRUCTION OF A SINGLE MUNICIPAL PUMP STATION AND SEVERAL RESIDENTIAL GRINDER PUMPS.

SECTION D. COMPLIANCE REVIEW

Yes ☐ No ☒ Is the applicant (owner and/or operator) currently in violation of any permits issued by the Department?

If yes, please provide:

1. Permit Number: _____
2. Nature of the violation (if any): _____
3. Status of violation (i.e., schedule for compliance, etc.): _____

SECTION E. CERTIFICATION

I certify that the information provided in this permit registration is true and correct to the best of my knowledge and information.

_____ 7/12/06

Signature of Permittee
(Person Responsible for Installation, Operation and Maintenance of Authorized Activity)

Date

Casey LaLonde, Manager

Type or Print Name

PA Fish and Boat Commission Approval (for GP-1 only)

_____ _____

Signature Date

SECTION F. REGISTRATION CHECKLIST

In order to register to use this General Permit, provide the following information to DEP or the delegated County Conservation District:

- ☒ I (we) have notified the Municipality and County.
- ☒ Completed Permit Registration Form.
- ☒ Completed Single & Complete Project Questionnaire.
- ☒ LOCATION MAP. An 8 ½" by 11" photocopy of a portion of the U.S.G.S. 7 ½ Minute Quadrangle Map with the project site marked
- ☒ Sketch plan or other site drawing that provides the necessary information.
- ☒ Project cross-section drawing (where required). (General Permits 2, 3, 4, 5, 6, 7 and 8)
- ☒ Completed copy of a PNDI Form with initialed Search Receipt.
- ☒ Color photographs. (General Permit 3 only)
- ☒ PA Fish and Boat Commission approval. (General Permit 1 only)

- ☒ Bog Turtle Habitat Screening Form (where required). This screening is required for General Permits 5, 6, 7, 8, and 9 which may impact wetlands in the following counties: Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill (Swatara Creek Watershed) and York

  **(See June 20, 2006 Pa Fish & Boat Clearance letter)

- ☐ N/A

For activities which permanently impact wetlands (General Permit No. 7 Minor Road Crossing):

- ☒ N/A
- ☐ A wetland delineation with completed 1987 Corps of Engineers Wetland Delineation Manual data forms.
- ☐ If wetland impacts are greater than 0.05 acres, a wetland replacement plan in accordance with the Department's replacement criteria which provides wetland replacement at a one to one acre ratio.

If wetland replacement onsite is not feasible:

- ☐ A check, number _____, in the amount of $_____ payable to the National Fish and Wildlife Foundation, Project 95-096 as compensatory mitigation for _____ acres of impact in wetlands, in accordance with the PADEP Wetland Replacement Project.

Fee Schedule -	Deminimus impact less than or equal to .05 acre	-	$ 0.00
	Greater than .05 acre to .10 acre	-	$500.00
	Greater than .10 acre to .20 acre	-	$1,000.00
	Greater than .20 acre to .25 acre	-	$2,500.00

AN ACKNOWLEDGED COPY OF THIS GENERAL PERMIT AND THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE DURING CONSTRUCTION.

3930-PM-WM0500 Rev. 6/2006

REGISTRATION FORM
(continued)

EAST COVENTRY TOWNSHIP
Applicant Name

SKETCH PLAN

To ensure the sketch plan is complete, include the following on the site plan in the immediate vicinity of the project. (√ all that apply)

YES	N/A		YES	N/A	
☒	☐	Stream Impacts with Dimensions Total Length 25 Total sq. ft. 250	☒	☐	Stream Name Tributary of Pigeon Creek
			☒	☐	Chapter 93 Stream Designation HQ-TSF
☒	☐	Wetland Impacts Total 750 sq. ft.	☒	☐	Location of Property Lines Relative to the Project
			☒	☐	Existing Utilities
☐	☒	Wetland Acreage Onsite _____	☒	☐	Proposed Utilities
☒	☐	Stream Limits and Flow Direction	☒	☐	Existing Buildings, Roadways, Other Structures
☐	☒	Floodway Limits (if known)	☒	☐	Proposed Buildings, Roadways, Other Structures
☒	☐	Limits of Earth Disturbance Associated with this Activity	☒	☐	Other Waters (i.e. pond, lakes)

Scale 1" = _____ ft.

3930-PM-WM0500 Rev. 6/2006

REGISTRATION FORM
(continued)

EAST COVENTRY TOWNSHIP
Applicant Name

PROJECT
CROSS SECTIONS AND PLAN VIEWS

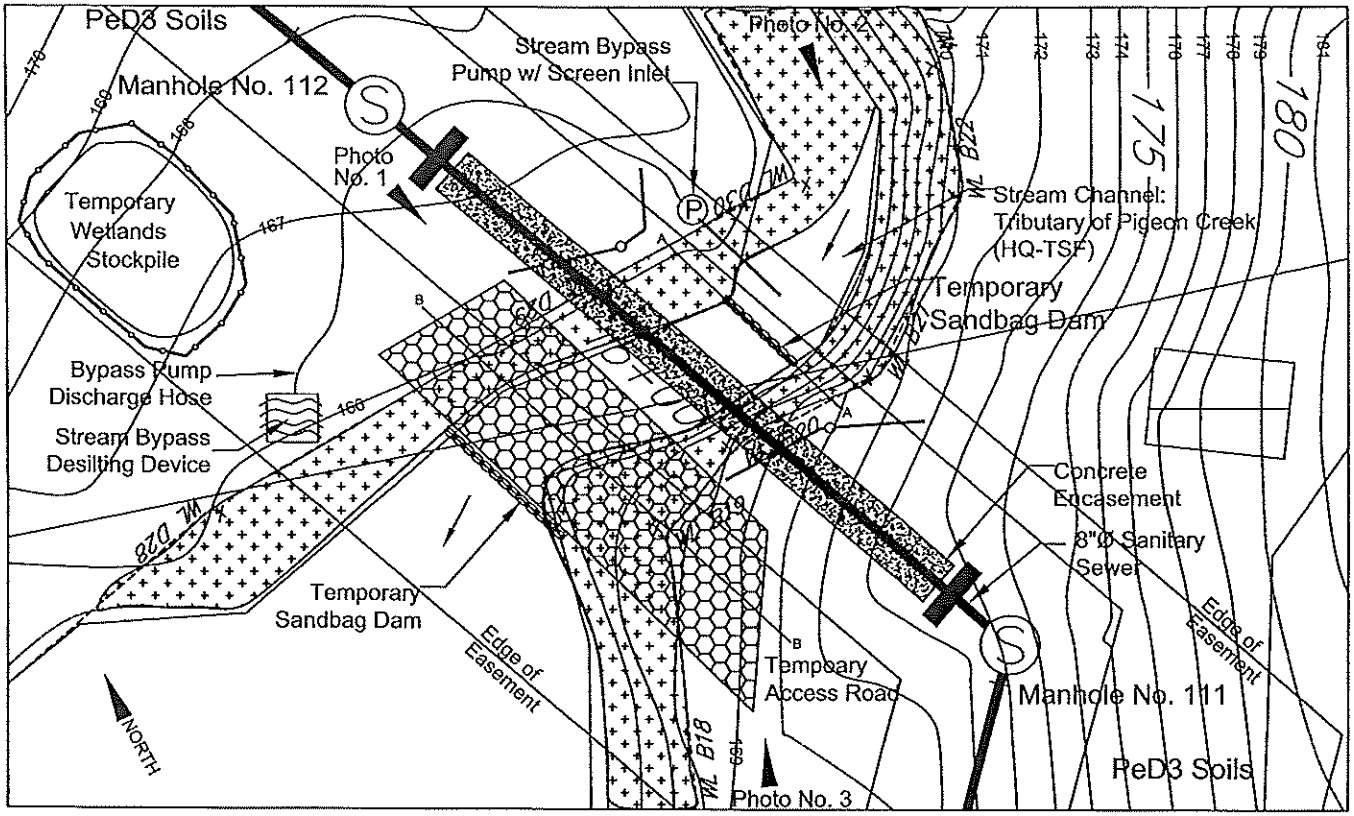
Required for General Permits 2, 3, 4, 5, 6, 7 and 8

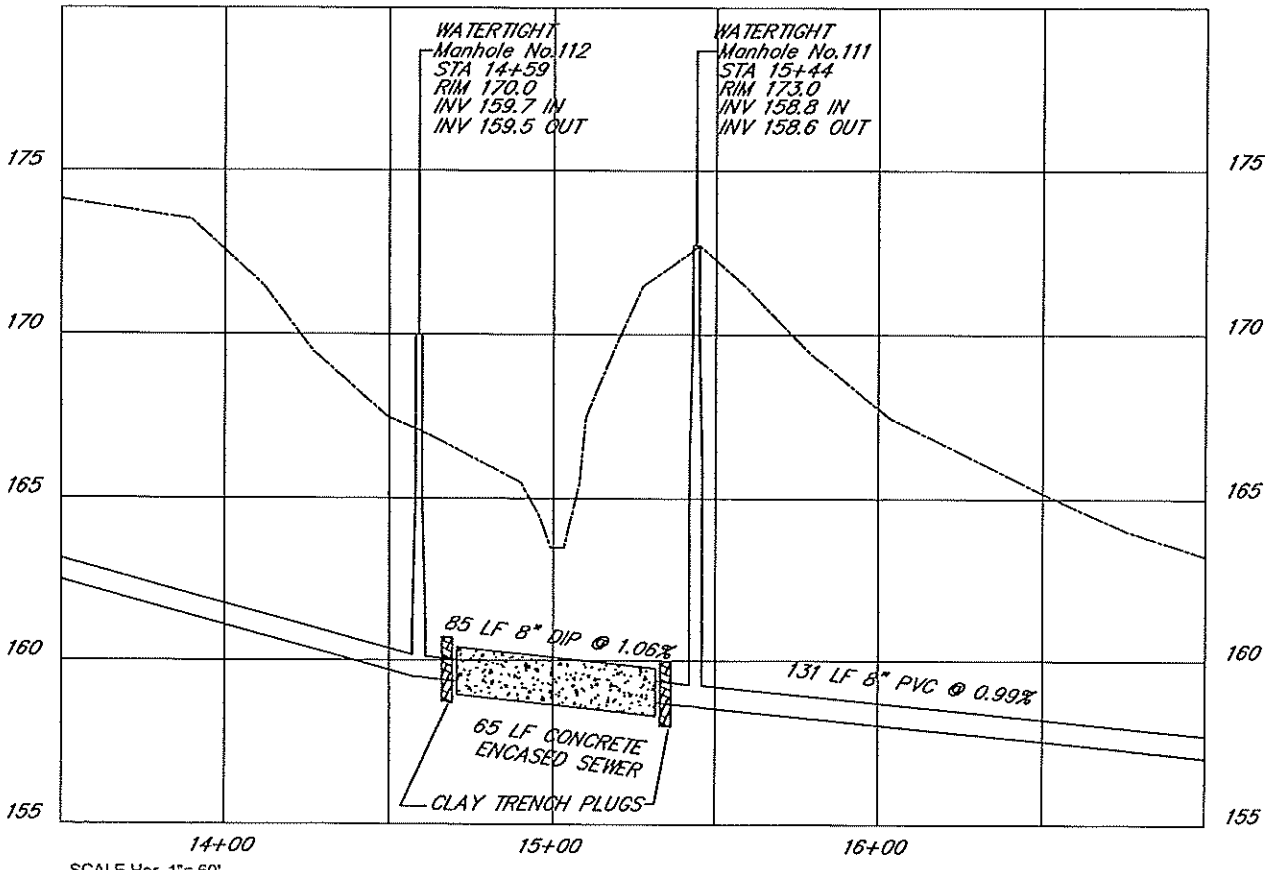
Provide a cross section and plan view of the project (see sample drawings attached to the permits) showing the dimensions of the waterway opening, area of fill materials used, and other pertinent information necessary to accurately depict the scope of your project.

SEE ATTACHED DOCUMENTATION

B.D.W.M. GP-5

UTILITY LINE STREAM CROSSING



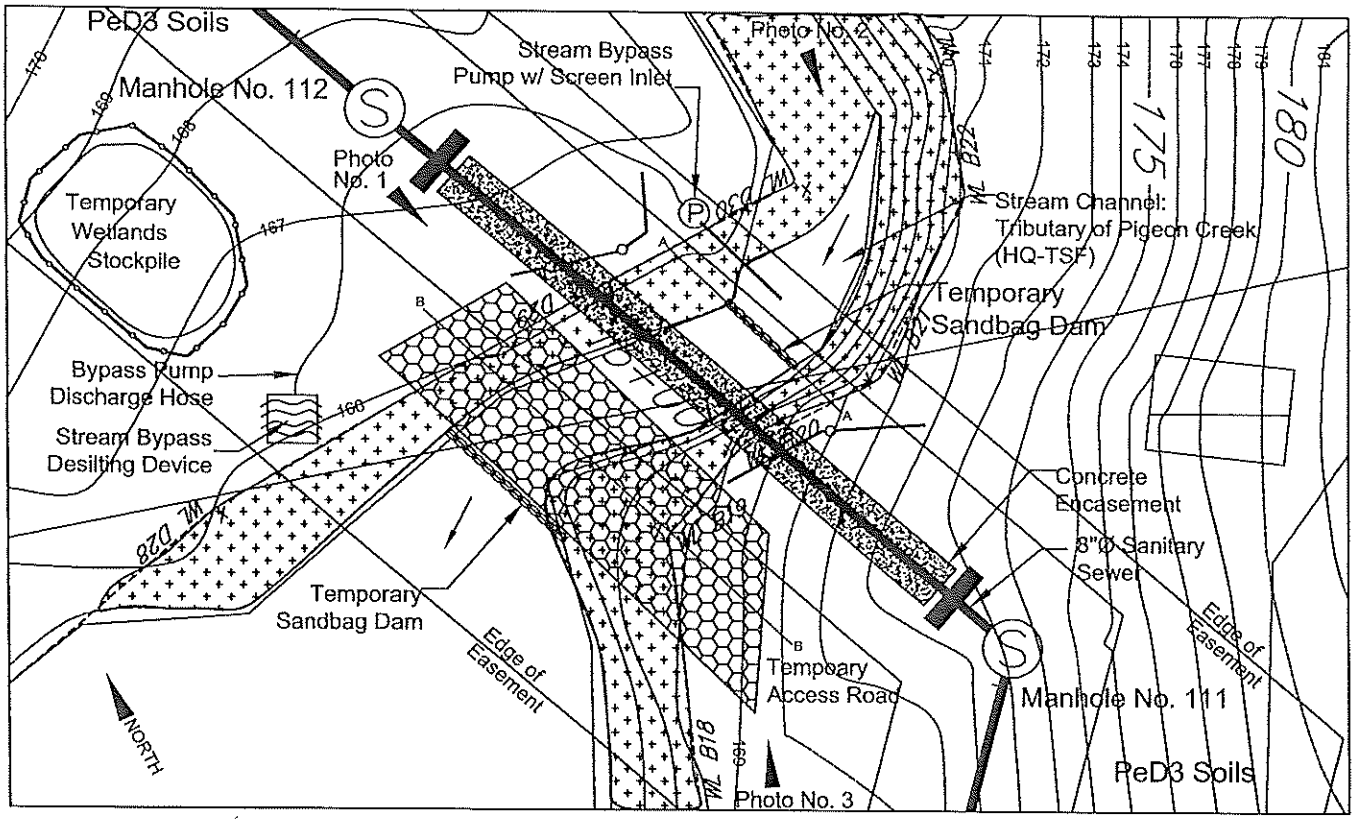


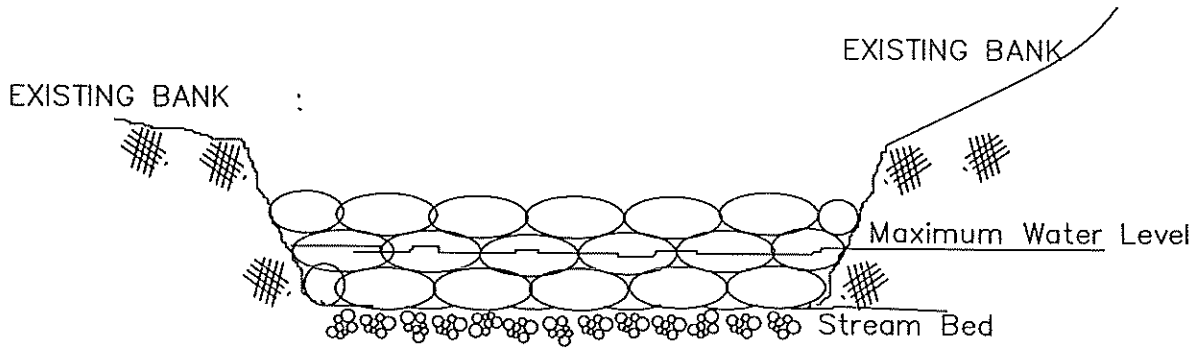
SCALE Hor. 1"= 60'
SCALE Ver. 1"= 6'

SEWER PROFILE AT STREAM CROSSING

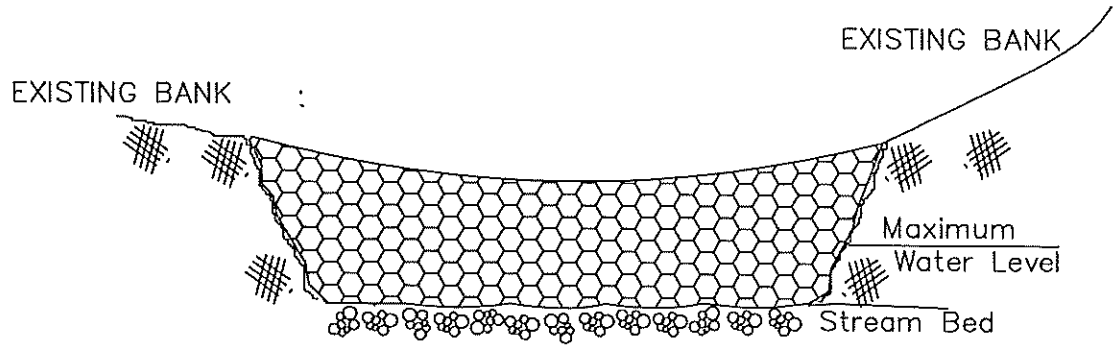
EAST COVENTRY TOWNSHIP
E.CEDARVILLE RD. / EARL DR/ BUCKWALTER RD.
AREAS SANITARY SEWER EXTENSION

B.D.W.M. GP-8
TEMPORARY ROAD CROSSING





SECTION A–A SANDBAG DAM
(Typical For Downstream & Upstream)



SECTION B–B ACCESS ROAD CROSSING

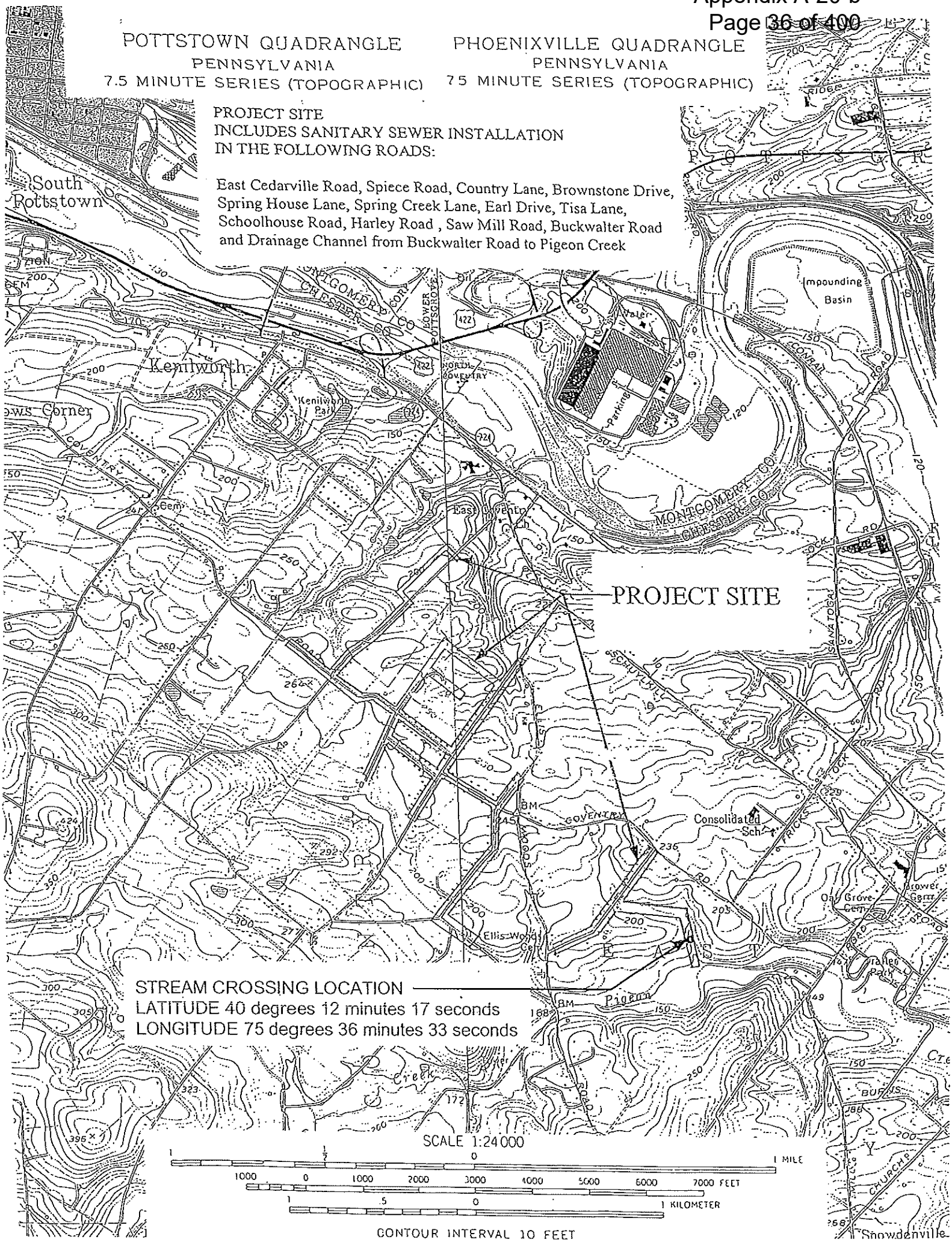
EAST COVENTRY TOWNSHIP
E.CEDARVILLE RD. / EARL DR/ BUCKWALTER RD.
AREAS SANITARY SEWER EXTENSION

POTTSTOWN QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

PHOENIXVILLE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

PROJECT SITE
INCLUDES SANITARY SEWER INSTALLATION
IN THE FOLLOWING ROADS:

East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schoolhouse Road, Harley Road , Saw Mill Road, Buckwalter Road and Drainage Channel from Buckwalter Road to Pigeon Creek





PHOTOGRAPH NO. 1

ON EAST SIDE OF CREEK LOOKING WEST ACROSS UN-NAMED BRANCH OF PIGEON CREEK. (March 8, 2006)

EAST COVENTRY TOWNSHIP – E.CEDARVILLE RD. / EARL DR. / BUCKWALTER RD. AREAS SANITARY SEWER EXTENSION



PHOTOGRAPH NO. 2

IN UN-NAMED BRANCH OF PIGEON CREEK LOOKING SOUTH AT PROPOSED SEWER UTILITY CROSSING. (March 8, 2006)

EAST COVENTRY TOWNSHIP – E.CEDARVILLE RD. / EARL DR. / BUCKWALTER RD. AREAS SANITARY SEWER EXTENSION



PHOTOGRAPH NO. 3

IN UN-NAMED BRANCH OF PIGEON CREEK LOOKING NORTH AT PROPOSED SEWER UTILITY CROSSING. (March 8, 2006)

EAST COVENTRY TOWNSHIP – E.CEDARVILLE RD. / EARL DR. / BUCKWALTER RD. AREAS SANITARY SEWER EXTENSION

JAN 06 '06 11:03 FR BUREAU OF FORESTRY 717 783 5109 TO 912153930652 P.01/01

Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry

January 5, 2006

Michael Coyne
EDM Consultants, Inc.
FAX: 215-393-0652 (hard copy will NOT follow)

Pennsylvania Natural Diversity Inventory Review, PNDI 018463
Sanitary Sewer Extension
East Coventry Twp., Chester County

Dear Mr. Coyne,

This responds to your request about a Pennsylvania Natural Diversity Inventory (PNDI) ER Tool "Potential Impact" or a species of special concern impact review. We screened this project for potential impacts to species and resources of special concern under the Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

☒ ***NO PROJECT IMPACT ANTICIPATED***

☐ PNDI records indicate that no known occurrences of species or resources of special concern under DCNR's jurisdiction occur in the vicinity of the project. Therefore, we do not anticipate the project referenced above will impact plants, natural communities, terrestrial invertebrates and geologic features of special concern. No further coordination with DCNR is needed for this project.

☒ PNDI records indicate special concern species or resources are located in the vicinity of the project. However, based on the information submitted to us concerning the nature of the project, the immediate location, and our detailed resource information, we determined that no impact is likely. No further coordination with DCNR is needed for this project.

☐ ***POTENTIAL PROJECT IMPACT - UNDER FURTHER REVIEW***
Based on our PNDI map review we determined potential impacts to species and/or resources of special concern. This project has been passed on to our review committee. The committee will contact the applicant/consultant directly if more information is needed to assess the project's potential impacts. Response time is typically less than a month after the date on this notification.

COMMENTS:

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

This finding applies to impacts to plants, natural communities, terrestrial invertebrates and geologic features only. To complete your review of state and federally-listed species of special concern, please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission has been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Ellen M. Shultzabarger, Environmental Review Specialist, PNHP
DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ c-eshultza@state.pa.us

Pennsylvania Natural Diversity Inventory
Project Planning & Environmental Review Form

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: East Coventry Township (Casey LaLonde, Township Manager)
Address: 855 Ellis Woods Road Pottstown, PA 19465
Phone Number: 610-495-5443 Fax Number: 610-495-9925

Contact Person Information - if different from applicant

Name: EDM Consultants, Inc. (William K. Dingman, P.E.)
Address: 1101 S. Broad St, P.O. Box 1545 Lansdale, PA 19446
Phone Number: 215-393-0670 Fax Number: 215-393-0652

Project Information

Project Name: East Cedarville Road/Earl Drive Sanitary Sewer Extension
Project Location: See Attached USGS Map
Municipality: East Coventry Twp. County: Chester County
☒ Attach a copy of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.
U.S.G.S. Quad Name: Pottstown And Phoenixville

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions)
Install approximately 20,000 LF of sanitary sewer pipe within the cartway of existing streets in the township. Install approximately 2,600 LF of sanitary sewer pipe within easements between Buckwalter Road and the Pigeon Creek. Construct a sanitary sewer pumping station on Saw Mill Road approximately 500 feet east of Harley Road.

Total Acres of Property: 19.5 Acreage to be Impacted: 19.5

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes ☐ No ☒
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project? Yes ☒ ±10 Feet No ☐
3. Are wetlands located in or within 300 feet of the project area? Yes ☒ No ☐ If No, is this the result of a wetland delineation?

If you have a "PNDI Project Environmental Review Receipt" with potential impacts, please send a receipt copy, this completed form, and a USGS Quad Map to the agency/agencies noted on the receipt. If you are unable to generate a PNDI Receipt because you do not have Internet access, complete this form, attach a USGS Quad Map, and send them to your local DEP or County Conservation District. For review of a "Large Project," please send form and map to all the agencies listed below. See page 2 for more information.

Dept. of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105
fax: 717-772-0271

PA Fish and Boat Commission
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
fax 814-359-5175

PA Game Commission
Bureau of Land Management
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
fax: 717-787-6957

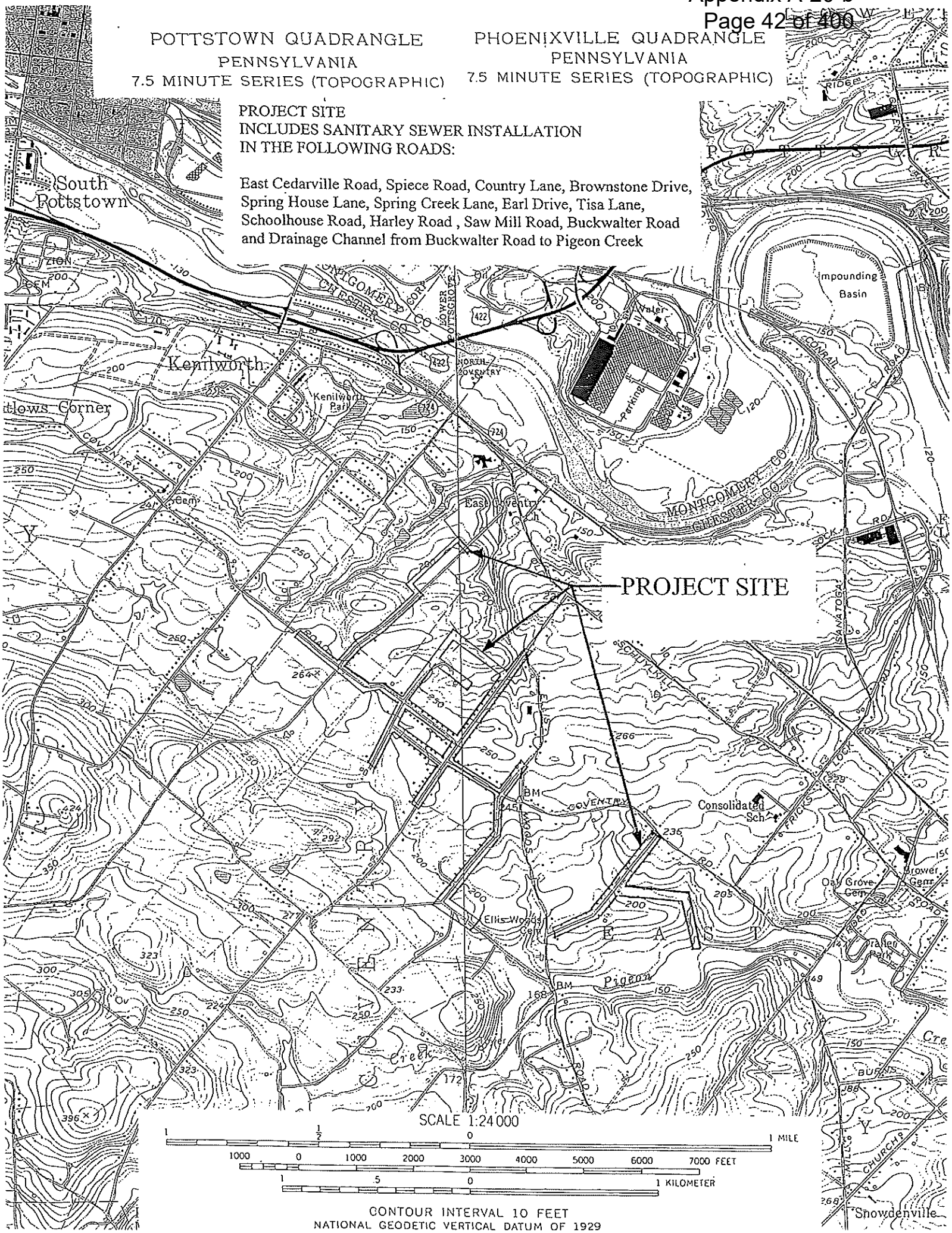
US Fish and Wildlife Service
Endangered Species Biologist
315 South Allen St., Suite 322
State College, PA 16801
no faxes please

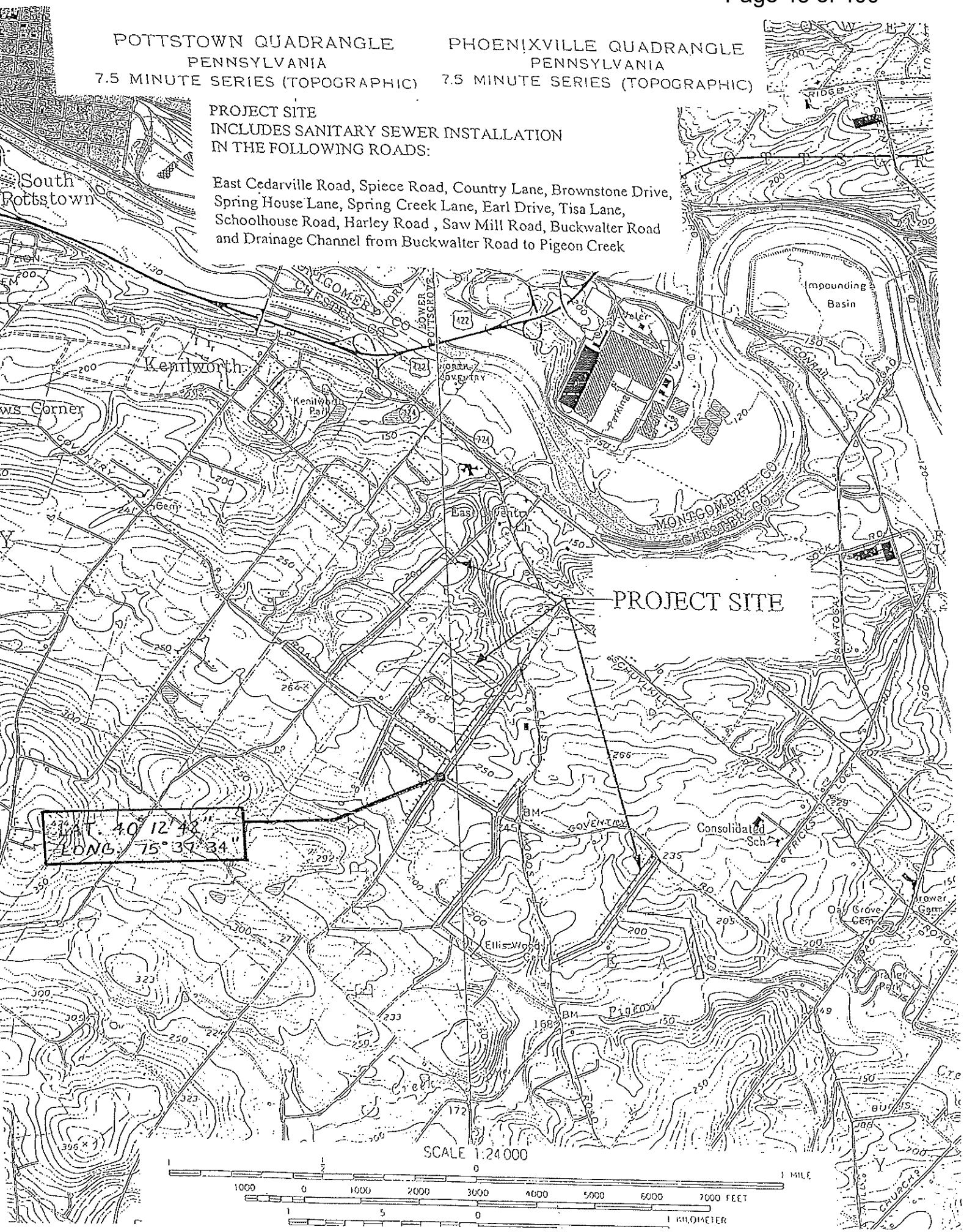
POTTSTOWN QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

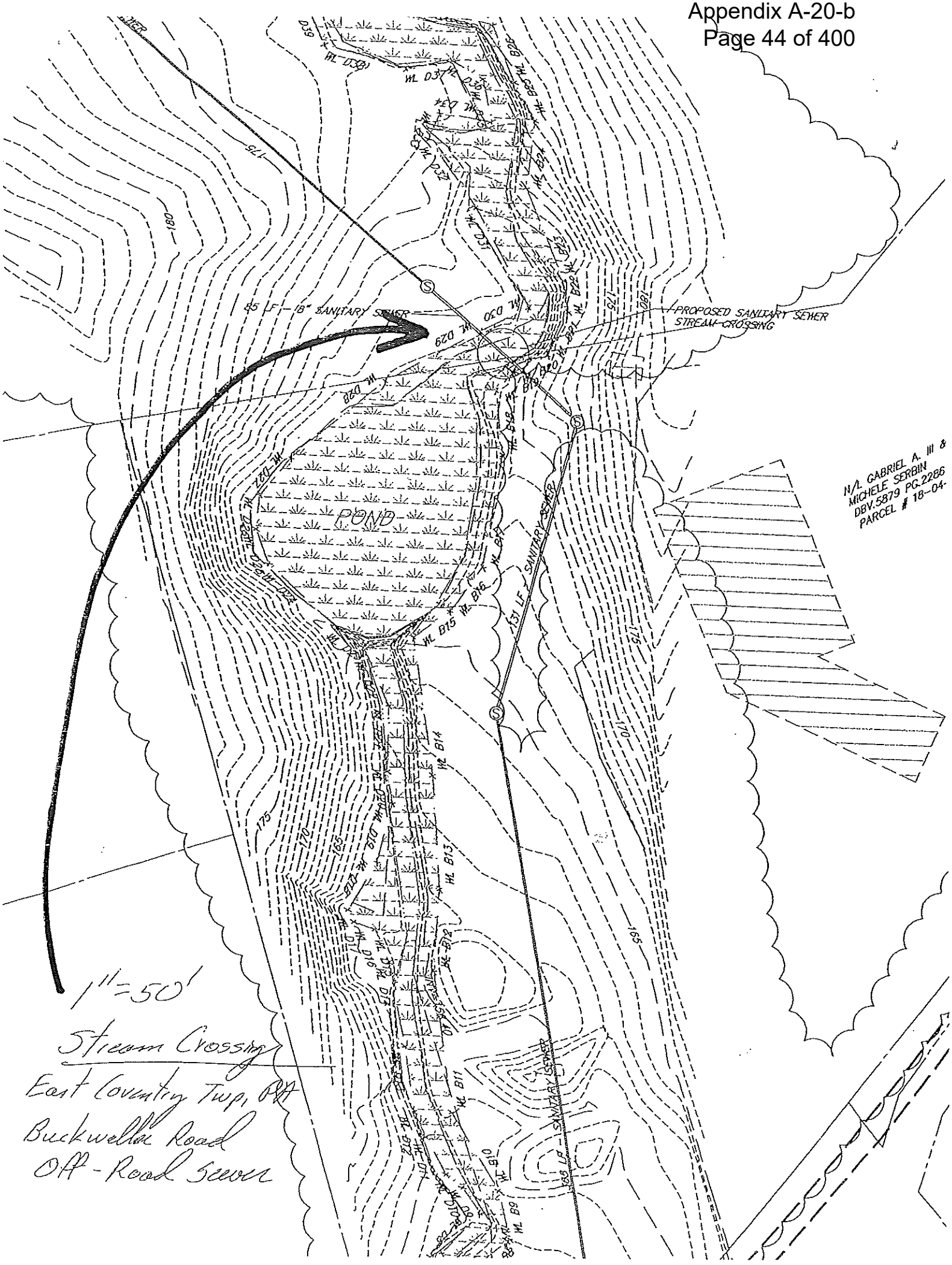
PHOENIXVILLE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

PROJECT SITE
INCLUDES SANITARY SEWER INSTALLATION
IN THE FOLLOWING ROADS:

East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schoolhouse Road, Harley Road , Saw Mill Road, Buckwalter Road and Drainage Channel from Buckwalter Road to Pigeon Creek




POTTSTOWN QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
PHOENIXVILLE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)
PROJECT SITE
INCLUDES SANITARY SEWER INSTALLATION
IN THE FOLLOWING ROADS:
East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schoolhouse Road, Harley Road , Saw Mill Road, Buckwalter Road and Drainage Channel from Buckwalter Road to Pigeon Creek
PROJECT SITE
LAT. 40° 12' 43"
LONG. 75° 37' 34"
Impounding Basin
Kenilworth
South Pottstown
Consolidated Sch
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER



1" = 50'

Stream Crossing

East Coventry Twp, PA

Buckwalter Road

Off-Road Sewer

Pennsylvania Fish & Boat Commission

established 1866

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
(814) 359-5237 Fax: (814) 359-5175

RECEIVED
JUN 23 2006
EDM CONSULTANTS

June 20, 2006

IN REPLY REFER TO
SIR #21314

MICHAEL COYNE
EDM CONSULTANTS
1101 SOUTH BROAD STREET
SUITE 200
LANSDALE, PA 19446

Re: **Secondary Species Impact Review**
Bog Turtle and Red-Bellied Turtle Additional Information
EAST CEDARVILLE ROAD / EARL DRIVE SANITARY SEWER EXTENSION
EAST COVENTRY Township/Borough, CHESTER County, Pennsylvania

Dear Mr. COYNE:

I have reviewed your recent correspondence regarding the above referenced project and its potential to adversely impact the bog turtle, (*Glyptemys muhlenbergii*, PA endangered, federally listed as threatened) and the red-bellied turtle, (*Pseudemys rubriventris*, PA threatened). Per my request, you supplied additional information and photographs of the project site. According to the additional information, the vegetation and soils are not consistent with wetlands known to support bog turtles and waterways, wetlands, and soils on the project site are not consistent with those known to support red-bellied turtles. Therefore, I conclude that the project site habitat is not suitable for bog turtles or red-bellied turtles and I do not foresee the proposed project resulting in adverse impacts these two turtle species or any other rare or protected species under Pennsylvania Fish and Boat Commission jurisdiction.

Note that this office performed no field inspection of the project area. Consequently, comments in this letter are not meant to address other issues or concerns that might arise concerning matters under Pennsylvania Fish and Boat Commission jurisdiction or that of other authorities. Thank you for your cooperation and attention to this matter of threatened and endangered species conservation.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/RTM/ma

c: B. Dershem, USFWS

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA GAME COMMISSION
2001 ELMERTON AVENUE, HARRISBURG, PA 17110-9797

December 14, 2005

RECEIVED
DEC 23 2005
EDM CONSULTANTS

Mr. Michael R. Coyne
EDM Consultants, Inc.
P.O. Box 1545
Lansdale, PA 19446

In re: E. Cedarville Road / Earl Dr. Sanitary Sewer Extension
File # 213-002 (1.00)
East Coventry Township, Chester County, PA

Dear Mr. Coyne:

This is in response to your letter dated November 4, 2005, regarding the potential impacts of your project on special concern species of birds or mammals and State Game Lands.

Our office review has determined that your project should not cause any adverse impacts to any special concern species of birds or mammals. No State Game Lands are located close enough that any impacts to them are anticipated. However, this determination may be reconsidered if project plans change or extend beyond the present study area, or if additional information becomes available on state-listed species or State Game Lands.

If you have any questions, please contact me at (717) 783-5957.

Very truly yours,

James R. Leigey

James R. Leigey
Wildlife Impact Review Coordinator
Division of Environmental
Planning and Habitat Protection
Bureau of Land Management

Cc: File

MAR-17-06 FRI 10:22 AM USFWS PA FIELD OFFICE FAX NO. 8142340748 P.01

213.002 (100)

PNDI # N/A USFWS Project # 2006-0297

U.S. FISH AND WILDLIFE SERVICE

315 South Allen Street, Suite 322, State College, PA 16801

This responds to your inquiry about a PNDI Internet Database search that resulted in a potential conflict with a federally listed, proposed or candidate species.

PROJECT LOCATION INFORMATION

County: Chester

Township: East Coventry

Quad: Phoenixville

MISC INFORMATION

Date of PNDI search: N/A

Date received by FWS: 3-7-06

Project Type (FWS code #): NT - sewer / water lines

Status: ☑ IC ☐ IP FA: ☐ none ☑ UND ☐ _____

USFWS COMMENTS ☑ FAXED ☐ MAILED

To: William Bingman

Fax #: 215-393-6652

Affiliation: EDM Consultants

SPECIFIC PROJECT: East Cedarville Rd. / Beaver Drive Sewer Extension

FISH AND WILDLIFE SERVICE COMMENT(s):

_1_ *NOT LIKELY TO ADVERSELY AFFECT*

The federally listed bog turtle occurs or may occur in or near the project area. However, based on our review of the information provided, including the project description and location (and your digital photos which showed potential bog turtle habitat), no adverse effects to this species are likely to occur. If there is any change in the location, scale, scope, layout or design of the project, further consultation or coordination with the Service will be necessary.

___ This response supersedes our comments of _____, based on our review of the additional project information that was submitted to us on _____.

The above determination is valid for two years from the date of this letter. In addition, this response relates only to federally listed, proposed, and candidate species under our jurisdiction, based on an office review of the proposed project's location and anticipated impacts. No field inspection of the project area has been conducted by this office. Consequently, comments on this form are not to be construed as addressing other Service concerns under the Fish and Wildlife Coordination Act or other authorities. *Please reference the above PNDI # and USFWS Project # in any future correspondence regarding this project.*

This review was conducted by the biologist listed below. He/she can be contacted at 814-234-4090.

_/_ Jennifer Dombroskie (x 242) ___ Bonnie Dershem (x 234) ___ Robert Anderson (x 228)

_N_ Pamela Shellenberger (x241)

SIGNATURE: Cindy L. Talbot DATE: 3-16-06

for Supervisor, Pennsylvania Field Office

EDM CONSULTANTS, INC.
1101 South Broad Street, Suite 200, P. O. Box 1545, Lansdale, PA 19446
Phone (215) 393-0670 Fax (215) 393-0652

CERTIFIED MAIL
Return Receipt Requested

February 21, 2006

Chester County Board of Commissioners
2 N. High Street, Suite 512
P.O. Box 2748
West Chester, PA 19380-0991

RE: Notification of Permit Applications
East Cedarville Road/Earl Drive/Buckwalter Road Sanitary Sewer Extension
East Coventry Township
Chester County, Pennsylvania

FILE: 213-002 (1.00)

Dear Sir or Madam:

The purpose of this notice is to inform you of East Coventry Township's intent to submit the following permit applications to the Pennsylvania Department of Environmental Protection (PaDEP) for the East Cedarville Road/Earl Drive/Buckwalter Road Sanitary Sewer Extension project:

1. Individual NPDES for Stormwater Discharges Associated with Construction
2. Water Quality Management Part II Permit for Sanitary Sewer Extensions and Pumping Stations
3. Joint Permit For A Pennsylvania Water Obstruction And Encroachment Permit Application And A U.S. Army Corps Of Engineers Section 404 Permit Application N/A

The project consists of the installation of approximately 20,000 LF of 8" and 10" diameter sanitary sewer pipe within the existing road right-of-way of East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schollhouse Road, Harley Road, Saw Mill Road and Buckwalter Road. The project will also include the installation of approximately 2,000 LF of 8" diameter sanitary sewer pipe across open land within easements between Buckwalter Road and the Pigeon Creek. The project will also include the construction of a sanitary sewer pumping station located adjacent to Saw Mill Road at a point approximately 500 feet east of Harley Road. The name, address and telephone number of the applicant for the project is as follows:

East Coventry Township
855 Ellis Woods Road
Pottstown, Pennsylvania 19465
610-495-5443

The project is located in East Coventry Township, Chester County, Pennsylvania.

Section 1905-A of the Commonwealth Administrative Code, as amended by Act 14, requires that each applicant for a PaDEP permit must give written notice to the municipality and the county in which the permitted activity is located. The written notices shall be received by the municipality and county at least thirty (30) days before the Department may issue or deny the permit.

"Act 67 and 68, which amended the Municipalities Planning Code to support sound land use practices and planning efforts, direct state agencies to consider comprehensive plans and zoning ordinances when reviewing applications for permitting of facilities or infrastructure, and specify that state agencies may rely upon comprehensive plans and zoning ordinances under certain conditions as described in Sections 619.2 and 1105 of the Municipalities Planning Code. Enclosed is a General Information Form (GIF) we have completed for this project. PaDEP invites you to review the attached GIF and comment on the land use aspects of this project; please be specific to PaDEP when identifying any areas of conflict. If you wish to submit comments for the PaDEP to consider in a land use review of this project, you must respond within thirty (30) days to the PaDEP regional office listed below. If there are no land use comments received by the end of the comment period, PaDEP will assume that there are no substantive land use conflicts and proceed with the normal application review process."

Please submit any comments concerning this project within thirty (30) days from date of receipt of this letter to the Pennsylvania Department of Environmental Protection, Southeast Regional Office, 2 East Main Street, Norristown, Pennsylvania 19401.

Very truly yours,

EDM CONSULTANTS, INC.

Michael R. Coyne

Michael R. Coyne

MRC/khr

Enclosure

\002_act14_chesterco

213-002

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Chester County Board of Commissioners
2 N. High St. Suite 512
PO Box 2746
West Chester, PA 19380-0991

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X
☐ Agent
☐ Address

B. Received by (Printed Name) C. Date of Delive

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

CHESTER PA 19380-9998 FEB 23 2006 USPS

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchand
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7005 0390 0001 9832 0502

PS Form 3811, February 2004 Domestic Return Receipt

EDM CONSULTANTS, INC.
1101 South Broad Street, Suite 200, P. O. Box 1545, Lansdale, PA 19446
Phone (215) 393-0670
Fax (215) 393-0652

CERTIFIED MAIL
Return Receipt Requested

February 21, 2006

Mr. Casey LaLonde, Manager
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

RE: Notification of Permit Applications
East Cedarville Road/Earl Drive/Buckwalter Road Sanitary Sewer Extension
East Coventry Township
Chester County, Pennsylvania

FILE: 213-002 (1.00)

Dear Sir or Madam:

The purpose of this notice is to inform you of East Coventry Township's intent to submit the following permit applications to the Pennsylvania Department of Environmental Protection (PaDEP) for the East Cedarville Road/Earl Drive/Buckwalter Road Sanitary Sewer Extension project:

1. Individual NPDES for Stormwater Discharges Associated with Construction
2. Water Quality Management Part II Permit for Sanitary Sewer Extensions and Pumping Stations
3. Joint Permit For A Pennsylvania Water Obstruction And Encroachment Permit Application And A U.S. Army Corps Of Engineers Section 404 Permit Application N/A

The project consists of the installation of approximately 20,000 LF of 8" and 10" diameter sanitary sewer pipe within the existing road right-of-way of East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schollhouse Road, Harley Road, Saw Mill Road and Buckwalter Road. The project will also include the installation of approximately 2,000 LF of 8" diameter sanitary sewer pipe across open land within easements between Buckwalter Road and the Pigeon Creek. The project will also include the construction of a sanitary sewer pumping station located adjacent to Saw Mill Road at a point approximately 500 feet east of Harley Road. The name, address and telephone number of the applicant for the project is as follows:

East Coventry Township
855 Ellis Woods Road
Pottstown, Pennsylvania 19465
610-495-5443

The project is located in East Coventry Township, Chester County, Pennsylvania.

Section 1905-A of the Commonwealth Administrative Code, as amended by Act 14, requires that each applicant for a PaDEP permit must give written notice to the municipality and the county in which the permitted activity is located. The written notices shall be received by the municipality and county at least thirty (30) days before the Department may issue or deny the permit.

"Act 67 and 68, which amended the Municipalities Planning Code to support sound land use practices and planning efforts, direct state agencies to consider comprehensive plans and zoning ordinances when reviewing applications for permitting of facilities or infrastructure, and specify that state agencies may rely upon comprehensive plans and zoning ordinances under certain conditions as described in Sections 619.2 and 1105 of the Municipalities Planning Code. Enclosed is a General Information Form (GIF) we have completed for this project. PaDEP invites you to review the attached GIF and comment on the land use aspects of this project; please be specific to PaDEP when identifying any areas of conflict. If you wish to submit comments for the PaDEP to consider in a land use review of this project, you must respond within thirty (30) days to the PaDEP regional office listed below. If there are no land use comments received by the end of the comment period, PaDEP will assume that there are no substantive land use conflicts and proceed with the normal application review process."

Please submit any comments concerning this project within thirty (30) days from date of receipt of this letter to the Pennsylvania Department of Environmental Protection, Southeast Regional Office, 2 East Main Street, Norristown, Pennsylvania 19401.

Very truly yours,

EDM CONSULTANTS, INC.

Michael R. Coyne

Michael R. Coyne

MRC/khr

Enclosure

\002_act14_eastcovtwp

213-002

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Casey LaLonde, Manager
East Coventry Township
855 Ellis Woods Rd.
Pottstown, PA 19465

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Margaret Ulmer ☐ Agent ☐ Address

B. Received by (Printed Name) C. Date of Deliv

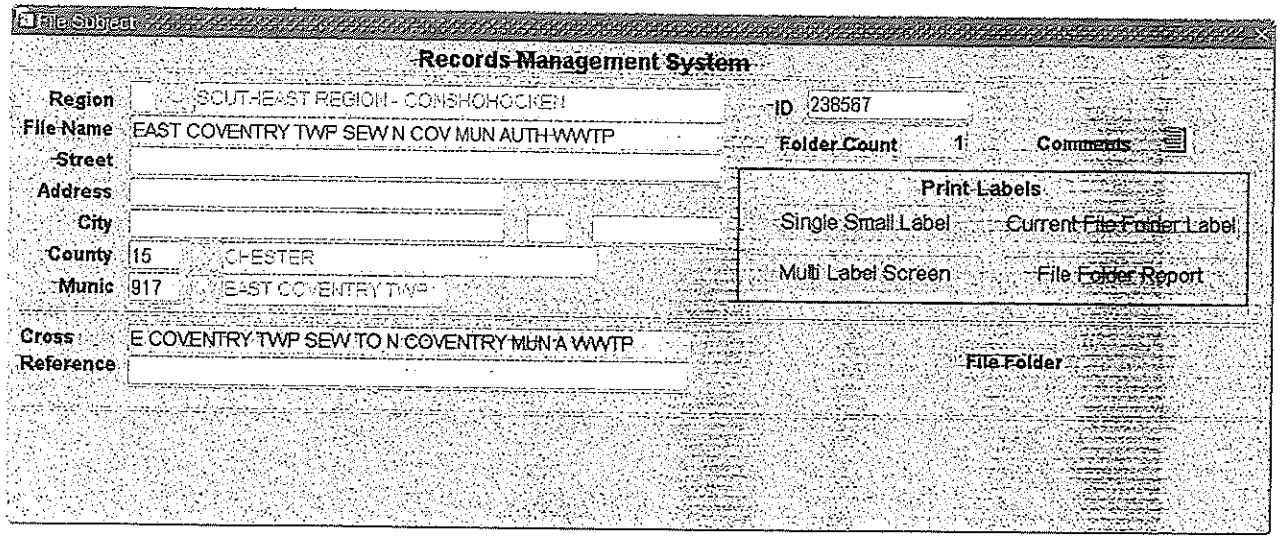
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchand
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service label)

PS Form 3811, February 2004 Domestic Return Receipt


File Subject
Records Management System
Region
SOUTHEAST REGION - CONSHOHOCKEN
File Name
EAST COVENTRY TWP SEW N COV MUN AUTH WWTP
Street
Address
City
County
15
CHESTER
Munic
917
EAST COVENTRY TWP
Cross Reference
E COVENTRY TWP SEW TO N COVENTRY MUN A WWTP
ID
238587
Folder Count
1
Comments
Print Labels
Single Small Label
Current File Folder Label
Multi Label Screen
File Folder Report
File Folder

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401
September 7, 2006

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

Mr. Robert Preston, Chairman
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

Re: North Coventry Municipal Authority WWTF
Application No. 1506412
File Type: Permit
East Coventry Township
Chester County

Dear Mr. Preston:

Your permit is enclosed.

You must comply with all Standard and Special Conditions attached to this permit. Construction must be done in accordance with the permit application and all supporting documentation. Please review the permit conditions and the supporting documentation submitted with your application before starting construction.

Enclosed is the "Sewage and Industrial Wastewater Facilities Construction Certification" form. A Pennsylvania-registered Professional Engineer must sign and complete this form prior to startup of the facilities (see Special Conditions). You or your authorized representative must also sign the form. This certification and other post-construction documentation must be submitted to the Department within 30 days following startup of the facilities.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717-787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717-787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717-787-3483) FOR MORE INFORMATION.

If you have any questions, please call Mr. Andrew Haneiko at 484-250-5183.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Water Management

Enclosures

cc: Mr. William Dingman, P.E.
Operations Section
Mr. Sheckler
Re 30 (joh06wqm)219-10a

3800-PM-WSWM0015 Rev. 6/2004
Permit

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

PERMIT NO. 1506412
AMENDMENT NO. _____
APS ID 589407
AUTH ID 640789

WATER QUALITY MANAGEMENT PERMIT

A. PERMITTEE (Name and Address): CLIENT ID#: 74504
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

B. PRIMARY FACILITY (Name):
North Coventry Municipal Authority WWTF

C. LOCATION (Municipality, County):
East Coventry Township
Chester County

SITE ID#:
623461

D. **This permit approves the construction of sewerage facilities consisting of:**

Approximately 22,000 LF of 8" gravity sewer, approximately 2,550 LF of 4" force main, approximately 1,890 LF of 2" low pressure force main, and a 10,500 GPD pump station.

Pump Stations: 1	Manure Storage:	Industrial Wastewater/Sewage Treatment Facility:
Design Capacity: 30.6 GPM	Volume _____ MG	Annual Average Flow: _____ MGD
Average Annual Flow: 10,500 GPD	Freeboard: _____ inches	Design Hydraulic Capacity: _____ MGD
		Design Organic Capacity: _____ lb/day

E. APPROVAL GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING:

1. **New Permits:** All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit application dated 07/10/06, its supporting documentation, and addendums dated _____, which are hereby made a part of this permit.

   Amendments: All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit Amendment application dated _____and its supporting documentation, and addendums dated _____, which are hereby made a part of this amendment.

   Except for any herein approved modifications, all terms, conditions, supporting documentation and addendums approved under Water Quality Management Permit No. _____ shall remain in effect.

   Transfers: Water Quality Management Permit No._____ and conditions, supporting documentation and addendums are also made part of this transfer.

2. **Permit Conditions Relating to sewerage** are attached and made part of this permit.

3. Special Conditions numbered _____ are attached and made part of this permit.

F. THE AUTHORITY GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING FURTHER QUALIFICATIONS:

1. If there is a conflict between the application or its supporting documents and amendments and the attached conditions, the attached conditions shall apply.

2. Failure to comply with the rules and regulations of DEP or with the terms or conditions of this permit shall void the authority given to the permittee by the issuance of this permit.

3. This permit is issued pursuant to the Clean Streams Law Act of June 22, 1937, P.L. 1987, as amended 35 P.S. §691.1 *et seq.* Issuance of this permit shall not relieve the permittee of any responsibility under any other law.

PERMIT ISSUED:
September 7, 2006

BY: _____

TITLE: Water Management Program Manager

Re 30 (joh06wqm)219-10

3800-FM-WSWM0405 10/2004

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

ENGINEERING INTERNAL REVIEW AND RECOMMENDATIONS

Name of Applicant:	eFACTS APS ID Number:	Application Number:
East Coventry Township	589407	1506412

Project Location:

East Cedarville Road, Earl Drive, Buckwalter Road
East Coventry Township
Chester County

Brief Description of Project and Discussion (use additional sheets if necessary):

The applicant request approval to construct a sanitary sewer extension to provide public sanitary sewer service to 250 existing properties. The project will consist of installation of approx. 20,000 LF of pipe within existing cart ways, and 2,000 LF of pipe across open land within easements. Three section of 2" low pressure force main will be installed, the homes in these areas will have Simplex grinder pumps. The project will also include a pump station and approx. 2,550 LF of associated 4" force main. The pump station will consist of two 20 hp submersible pumps each rated at 120 gpm @ 118 TDH. The average flow to the pump station will be 10,500 gpd. The conveyance system will discharge an average daily flow of 84,000 gpd to the North Coventry Municipal Authority WWTP.

Approval from the 102 and 105 programs are currently being processed.

Notifications:
Act 537 Approval – 10/08/2003
Act 14 – Chester County Board of Commissioners on 02/23/2006
East Coventry Township on 02/23/2006

All plans and specifications appear to be consistent with the Departments Domestic Wastewater Facilities Manual.

RECOMMENDATION AND ACTION

Approve	Return	Deny	Signature	Date
☑	☐	☐	Reviewer	8/16/2006
☒	☐	☐	Chief, Technical Services	8/16/06
☑	☐	☐	Program Manager	8/18/06

Hydrogeology IR & R Attached? ☐ Yes ☑ No
Soils IR & R Attached? ☐ Yes ☑ No

Re 30 WP

3800-PM-WSWM0015a Rev. 6/2004
Conditions Sewerage

Permit No. 1506412

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

PERMIT CONDITIONS RELATING TO SEWERAGE

For use in Water Quality Management Permits

(Place a √ in the box that applies)

General

☒ 1. Consistent with the Department of Environmental Protection's (DEP) technical guidance document *Conducting Technical Reviews of Water Quality Management Permit Wastewater Treatment Facilities* (DEP ID: 362-2000-007) available on DEP's website at www.dep.state.pa.us. DEP considers the registered Professional Engineer whose seal is affixed to the design documents to be fully responsible for the adequacy of all aspects of the facility design.

☒ 2. The permittee shall adopt and enforce an ordinance requiring the abandonment of privies, cesspools or similar receptacles for human waste and onlot sewage disposal systems on the premises of occupied structures accessible to public sewers. All such structures must be connected to the public sewers.

☐ 3. The outfall sewer or drain shall be extended to the low water mark of the receiving body of water. Where necessary to ensure proper mixing and waste assimilation, an outfall sewer or drain may be extended with appurtenances below the low water mark and into the bed of a navigable stream provided that the permittee has secured an easement, right-of-way, license or lease from DEP in accordance with Section 15 of the Dam Safety and Encroachments Act, the Act of November 26, 1978, P.L. 1375, as amended.

☒ 4. The approval is specifically made contingent on the permittee acquiring all necessary property rights, by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures in, along or across private property with full rights of ingress, egress and regress.

☐ 5. When construction of the approved sewerage facilities is completed and before they are placed in operation, the permittee shall notify DEP in writing so that a DEP representative may inspect the facilities.

☒ 6. If, at any time, the sewerage facilities covered by this permit create a public nuisance, including but not limited to, causing malodors or causing environmental harm to waters of the Commonwealth, DEP may require the permittee to adopt appropriate remedial measures to abate the nuisance or harm.

☐ 7. This permit authorizes the construction and operation of the proposed sewerage facilities until such time as facilities for conveyance and treatment at a more suitable location are installed and capable of receiving and treating the permittee's sewage. Such facilities must be in accordance with the applicable municipal official plan adopted pursuant to Section 5 of the Pennsylvania Sewage Facilities Act, the Act of January 24, 1966, P.L. 1535 as amended. When such municipal sewerage facilities become available, the permittee shall provide for the conveyance of the sewage to these sewerage facilities, abandon the use of these approved facilities and notify DEP accordingly. This permit shall then, upon notice from DEP, terminate and become null and void and shall be relinquished to DEP.

☒ 8. This permit does not relieve the permittee of its obligations to comply with all federal, interstate, state or local laws, ordinances and regulations applicable to the sewerage facilities.

☒ 9. This permit does not give any real or personal property rights or grant any exclusive privileges, nor shall it be construed to grant or confirm any right, easement or interest in, on, to or over any lands which belong to the Commonwealth.

☐ 10. The authority granted by this permit is subject to all effluent requirements, monitoring requirements and other conditions as set forth in NPDES Permit No. **PA**_____ and all subsequent amendments and renewals. No discharge is authorized from these facilities unless approved by an NPDES Permit.

Construction

☐ 11. An Erosion and Sedimentation (E&S) Plan must be developed prior to construction of the permitted facility, pursuant to Title 25 Pa. Code Chapter 102, and implemented during and after the earth disturbance activity.

If the activity involves 5 or more acres of earth disturbance, or from 1 to 5 acres of earth disturbance with a point source discharge to surface waters of the Commonwealth, an NPDES permit for the Discharge of Stormwater Associated with Construction Activity is required.

In addition to the state NPDES permitting requirements, some municipalities, through local ordinances, require the E&S Control Plan to be reviewed and approved by the local County Conservation District office prior to

construction. For specific information regarding E&S control planning approval and NPDES permitting requirements, please contact your local County Conservation District office.

☒ 12. The facilities shall be constructed under the supervision of a Pennsylvania registered Professional Engineer in accordance with the approved reports, plans and specifications.

☒ 13. A Pennsylvania registered Professional Engineer shall certify that construction of the permitted facilities was completed in accordance with the application and design plans submitted to DEP, using "Post Construction Certification" (3800-PM-WSWM0179a). It is the permittee's responsibility to ensure that a Professional Engineer is on-site to provide the necessary oversight and/or inspections to certify the facilities. The certification must be submitted to DEP before the facility is placed in operation. If requested, "as-built" drawings, photographs (if available) and a description of any DEP-approved deviations from the application and design plans must be submitted to DEP within 30 days of certification.

☒ 14. Manhole inverts shall be formed to facilitate the flow of the sewage and to prevent the stranding of sewage solids. The manhole structure shall be built to prevent undue infiltration, entrance of street wash or grit and provide safe access to facilitate manhole maintenance activities.

☒ 15. The local Waterways Conservation Officer of the Pennsylvania Fish and Boat Commission (PFBC) shall be notified when the construction of any stream crossing and/or outfall is started and completed. A written permit must be secured from the PFBC if the use of explosives in any waterways is required and the permittee shall notify the local Waterways Conservation Officer when explosives are to be used.

Operation and Maintenance

☒ 16. The permittee shall maintain records of "as-built" plans showing all the treatment facilities as actually constructed together with facility operation and maintenance (O&M) manuals and any other relevant information that may be required. Upon request, the "as-built" plans and O&M manuals shall be filed with DEP.

☒ 17. The sewers shall have adequate foundation support as soil conditions require. Trenches shall be back-filled to ensure that sewers will have proper structural stability, with minimum settling and adequate protection against breakage. Concrete used in connection with these sewers shall be protected from damage by water, freezing, drying or other harmful conditions until cured.

☐ 18. Stormwater from roofs, foundation drains, basement drains or other sources shall not be admitted directly to the sanitary sewers.

☒ 19. The approved sewers shall be maintained in good condition, kept free of deposits by flushing or other cleaning methods and repaired when necessary.

☐ 20. The sewerage facilities shall be properly operated and maintained to perform as designed.

☒ 21. The attention of the permittee is called to the highly explosive nature of certain gases generated by the digestion of sewage solids when these gases are mixed in proper proportions with air and to the highly toxic character of certain gases arising from such digestion or from sewage in poorly ventilated compartments or sewers. Therefore, at all places throughout the sewerage facilities where hazard of fire, explosion or danger from toxic gases may occur, the permittee shall post conspicuous permanent and legible warnings. The permittee shall instruct all employees concerning the aforesaid hazards, first aid and emergency methods of meeting such hazards and shall make all necessary equipment and material accessible.

☐ 22. An operator certified in accordance with the Water and Wastewater Systems Operator Certification Act of February 21, 2002, 63 P.S. §§1001, *et seq.* shall operate the sewage treatment plant.

☐ 23. The permittee shall properly control any industrial waste discharged into its sewerage system by regulating the rate and quality of such discharge, requiring necessary pretreatment and excluding industrial waste, if necessary, to protect the integrity or operation of the permittee's sewerage system.

☒ 24. There shall be no physical connection between a public water supply system and a sewer or appurtenance to it which would permit the passage of any sewage or polluted water into the potable water supply. No water pipe shall pass through or come in contact with any part of a sewer manhole.

☐ 25. All connections to the approved sanitary sewers must be in accordance with the corrective action plan as contained in the approved Title 25 Pa. Code Chapter 94 Municipal Wasteload Management Annual Report.

☐ 26. Collected screenings, slurries, sludge and other solids shall be handled and disposed of in compliance with Title 25 Pa. Code Chapters 271, 273, 275, 283 and 285 (related to permits and requirements for land filling, land application, incineration and storage of sewage sludge), Federal Regulations 40 CFR 257 and the Federal Clean Water Act and its amendments.

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401
August 4, 2006

Southeast Regional Office

Phone: 484-250-5940
Fax: 484-250-5943

Mr. Robert F. Preston, Chairman
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

Re: East Coventry Township
Application No. 1506412
APS ID No. 589407, AUTH ID No. 640789
East Coventry Township
Chester County

Dear Mr. Preston:

Regarding your recently submitted permit application for construction of the East Cedarville Road/Earl Drive/Buckwalter Road sanitary sewer extension, please note the following regarding PERMIT COORDINATION.

Permit applications are sent to other regulatory programs within the Department of Environmental Protection (Department) to determine if other permits are required for the activity being proposed. The activity you are proposing will require permits or prior approval from the following program(s):

PROGRAM/CONCERNS	CONTACT	NUMBER
Watershed Management/Water Allocation	Ms. Carrie Traver	484-250-5158

Please contact the above regarding their concern(s).

Your project has been assigned APS ID No. 589407. PLEASE REFERENCE THIS NUMBER IN ALL FUTURE CORRESPONDENCE AND SUBMISSIONS TO THE DEPARTMENT ON THIS PROJECT.

For additional questions about your application, please contact Mr. Andrew Haneiko at 484-250-5183 and refer to the above application number.

Sincerely,

John J. Kennedy, P.E.
Assistant Director
Southeast Regional Office

cc: East Coventry Township
Chester County Health Department
Mr. William K. Dingman, P.E. – EDM Consultants, Inc.
Water Management
Mr. Sheckler
Re 30 (joh06)216-1

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401
August 2, 2006

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

Mr. Robert Preston
855 Ellis Woods Road
Pottstown, PA 19465

Re: East Coventry Township – Sewer Extension
Application No. 1506412
APS No. 589407, AUTH No. 640789
East Coventry Township
Chester County

Dear Mr. Preston:

On July 13, 2006, the Department of Environmental Protection (DEP) received the above referenced application for construction of the East Cedarville Road/Earl Drive/Buckwalter Road sanitary sewer extension.

Permit applications undergo a series of reviews before a final decision is rendered by DEP. We have reviewed your application in order to determine whether it contains the information, plans, fees, and other documents necessary for administrative completeness. Your application is ***administratively complete*** and will be processed for technical review. You will be notified in writing or by phone if additional information is required before a technical decision can be reached.

You will be contacted in the near future if any other permits or approvals are needed in conjunction with the above application. Please refer to the enclosed permit process information sheet for questions concerning the permitting process. For questions about your application, please call me at 484-250-5183.

Sincerely,

Andrew Haneiko
Permits Specialist
Water Management

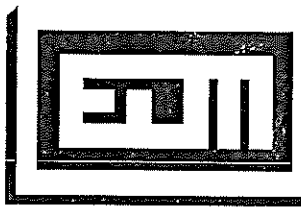
Enclosures: Permit Process Information

cc: Mr. Dingman, P.E.
Mr. Sheckler
Re 30 (AR06WQM)214-10

WATER QUALITY MANAGEMENT
PART II PERMIT - SEWERAGE
APPLICATION

EAST COVENTRY TOWNSHIP
East Cedarville Rd./Earl Drive/ Buckwalter Rd.
SANITARY SEWER EXTENSION

JULY 2006



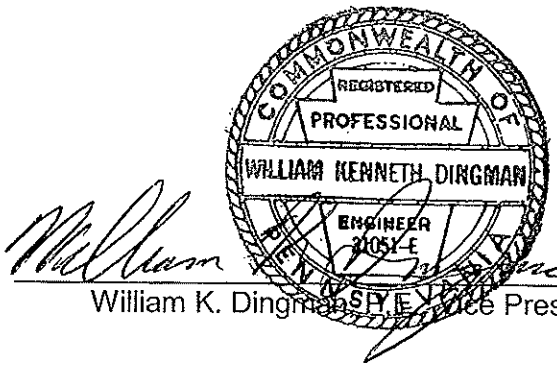
CONSULTANTS, INC.

Application For Sewerage Permit

East Cedarville Rd./Earl Drive/Buckwalter Rd.
Sanitary sewer Extension

East Coventry Township
Chester County, PA

July 2006



William K. Dingman, P.E., Vice President

EDM CONSULTANTS, INC.
1101 South Broad Street, Suite 200
P.O. Box 1545
Lansdale, PA 19446
(215) 393-0670

Permit Application

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	Design Report
Section B	Narrative
Section C	Notices and Approvals
Section D	Location Map
Section E	Construction Specifications
Section F	Permit Plans (Bound Separately)

SECTION A

PERMIT APPLICATION

3800-PM-WSFR0400c 9/2005
Checklist

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

CHECKLIST FOR WATER QUALITY MANAGEMENT PERMIT

APPLICANT'S √ CHECKLIST	
APPLICANT NAME	East Coventry Township

Check the following list to make sure that you have included all the required information. Place a checkmark in the column provided for all items completed and/or provided. Failure to provide all of the requested information will delay the processing of the application.

ENCLOSE THIS CHECKLIST WITH YOUR APPLICATION FORM.

		Check √ If Included	DEP Use Only
1.	General Information Form (GIF).	☒	
2.	Appropriate application fee.	☒	
3.	Two (2) copies (original and 1 copy) of application, design module(s), and accompanying drawings and plans.	☒	
	a. Certification and proper signatures.	☒	
	b. Engineer's professional seal.	☒	
	c. *Design Engineer's Report*	☒	
	d. Properly notarized (original).	☒	
	e. Additional copy for Delaware River Basin or Erie and Allegheny counties (if required).	☐	
4.	Supplemental Information:		
	a. General Layout Diagram.	☐	
	b. Sizes, Capacities and Dimensions Diagram.	☐	
5.	Design Modules.	☒	
6.	Topographic map with appropriate details.	☒	
7.	Act 14 Notification.	☒	
8.	Act 537 Approval (if required).	☒	
9.	Acts 67, 68 and 127 Notification (IW and Manure Storage Facilities only).	☐	
10.	Proof of Public Notification (IW and Manure Storage Facilities only)	☐	
11.	DRBC Notification (if required).	☐	
12.	Other (specify): Clearances PNDI, USFWS, PA GAME, PA FISH & BOAT	☒	

3800-PM-WSFR0400b 9/2005
Permit Application

Applicant Name: East Coventry Township

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

APPLICATION FOR WATER QUALITY MANAGEMENT PERMIT

Before completing this form, read the step-by-step instructions provided in this application package.

Related ID#s (If Known)		DEP USE ONLY
Client ID# _____	APS ID# 349961	Date Received & General Notes
Site ID# _____	Auth ID# 359537	
Facility ID# _____		

APPLICANT IDENTIFIER

Applicant Name: East Coventry Township

Current Mailing Address: 855 Ellis Woods Road Pottstown, PA 19465

Current Phone Number: (610) 495-544

FACILITY TYPE (Check all appropriate boxes below)

- ☐ Treatment Plant Summary – Module 1
- ☒ Sewer System – Module 2
- ☐ Flow Equalization and Grit Chambers – Module 3
- ☐ Screening and Settling – Module 4
- ☐ Trickling Filters and Aeration – Module 5
- ☐ Chemical Treatment – Module 6
- ☐ Rapid Sand Filters – Module 7
- ☐ Other Filters and Disinfection – Module 8
- ☐ Aerobic Digestion Tanks – Module 9
- ☐ Anaerobic Digestion – Module 10
- ☐ Sludge Filters and Centrifuges – Module 11
- ☐ Sludge Drying Beds – Module 12
- ☒ Stream Encroachment and Crossings – Module 13
- ☐ Spray Irrigation – Module 14
- ☐ Industrial Wastewater Treatment Facility – Module 15
- ☐ Small Flow Treatment Facility – Module 16
- ☒ Sewer Extensions – Module 17
- ☐ Manure Storage Facilities – Module 18
- ☐ Supplementary Geology and Groundwater Information – Module 19
- ☐ Impoundments – Module 20
- ☐ Sequencing Batch Reactor – Module 21
- ☒ Pump Stations – Module 22

COMPLIANCE HISTORY REVIEW

Is/was the facility owner or operator in violation of any DEP regulation, permit, order or schedule of compliance at this or any other facility? ☐ Yes ☒ No

If "Yes," list each permit, order and schedule of compliance and provide compliance status. Use additional sheets to provide information on all permits.

Permit Program	Permit No.
Brief Description of Noncompliance	

Steps Taken to Achieve Compliance	Date(s) Compliance Achieved

Current Compliance Status ☒ In Compliance ☐ In Noncompliance

3800-PM-WSFR0400b 9/2005
Permit Application

Applicant Name: East Coventry Township

CERTIFICATION (Check appropriate box below.)

I certify under penalty of law that I

☒ am the applicant
☐ am an officer or official of the applicant
☐ have the authority to make this application (attach delegation of signatory authority) and that the plans, reports and documents designated and attached here with part of the application are true and correct to the best of my knowledge and belief.

Robert F. Preston	Chairman, East Cov. Twp. Board of Supervisors
Name (type or print legibly)	Official Title
Signature	July 10, 2006
	Date

(Use corporate or professional seal as appropriate.)

Taken, sworn and subscribed before me, this 10TH day of JULY 20 06

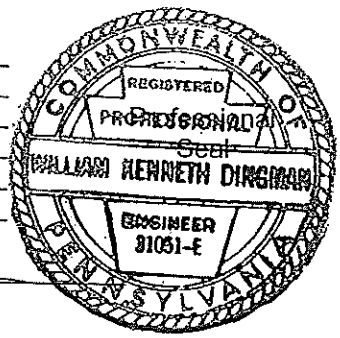
Notary Seal

Notarial Seal
Bonnie L Frisco, Notary Public
East Coventry Twp., Chester County
My Commission Expires Mar. 18, 2007
Member, Pennsylvania Association Of Notaries

REGISTERED PROFESSIONAL ENGINEER

This is to certify that I have personally reviewed all engineering information contained in the accompanying modules, drawings, specifications and other documents which are part of this application and that I have found it to be of good engineering quality, true and correct, and is in conformance with the requirements of the Department of Environmental Protection (DEP), and it does not, to the best of my knowledge, withhold information that is pertinent to a determination of compliance with the requirements of DEP.

Name of Design Engineer: William K. Dingman, P.E.
Design Firm: EDM Consultants, Inc
Mailing Address: 1101 South Broad Street
Lansadle, PA 19446
Telephone Number: (215) 393-0670
E-mail Address: bill@edmconsultantsinc.com



Signature of Professional Engineer

NOTICE: It is an offense under Pennsylvania Criminal Code to affirm a false statement in documents submitted to DEP.

DEP will consider the registered professional engineer whose seal is affixed to design documents to be fully responsible for the adequacy of all aspects of facility designs. The application and supporting documentation submitted for sewerage projects will be reviewed to ensure general consistency with good engineering practices, and the applicable design guidelines of DEP.

3800-PM-WSFR0400e 9/2005
Module 2

Applicant Name: EAst Coventry Township

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

SEWER SYSTEM
MODULE 2

APPLICANT NAME	EAst Coventry Township		
SEWER SYSTEM			
1. CLASS OF CONSTRUCTION: ☒ NEW SYSTEM ☐ REPLACEMENT OF EXISTING SYSTEM ☒ SANITARY			
If other than a new system, list the WQM permit number ammended by this application.			
2. List the WQM permit number of the sewer to which this system connects.			1503417
3. List the WQM permit number of the treatment facility receiving flow from this system.			1596411
4. What is the reserve capacity of the most limiting component between this connection and the treatment facility?			301,575 gpd AADF
5. INITIAL POPULATION: 625		DESIGN YEAR POPULATION: 800	
6. DESIGN FLOW DATA:			
a. Laterals and Submain Sewers	(GPCD)	262.5 gpd/EDU 320 EDU for Design Year Flow = 84,000 gpd	
b. Interceptors	(GPCD)	N/A	
c. Average Daily Flow	(mgd)	84,000 gpd	
d. Infiltration/Inflow (I/I)	(mgd)	0	
e. Industrial Waste Flow	(mgd)	0	
f. Total Average Design Flow	(mgd)	84,000 gpd	
g. Maximum Expected Flowrate (Peak Instantaneous)	(mgd)	352,800 gpd @ a Peaking Factor of 4.2	
7. GENERAL INFORMATION:			
a. Describe measures taken to reduce I/I in the system including leakage test and reference applicable portion of the specifications. System will be tested per Section 5 of the specifications			
b. Describe any overflows within the system. None			
c. If applicable, describe capacity of receiving sewers and pumping station. The Phase I interceptors and pump styations were designed for the these existing homes per the PADEP approved Act 537 Plan			

3800-PM-WSFR0400p 9/2005
Module 13

Applicant Name: East Coventry Township

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

STREAM ENCROACHMENT AND CROSSINGS MODULE 13

APPLICANT NAME	East Coventry Township

GENERAL

For encroachment permits for stream crossings and outfall structures contact the Soils and Waterways Section in the regional office. Include a copy of the permit or application with this module. Also, answer the questions below.

STREAM CROSSINGS

1. Please justify the need for each stream crossing including evaluation of alternatives to minimize the number of crossings.

   The sewer cossings have been minimized to one crossing at the narrowest point of the stream

2. What measures will be taken to ensure the sewer crossing under a stream will be rendered thoroughly watertight and remain in alignment?

   The eight inch ductile iron pipe will be concrete encased, pressured tested and have clay trench plugs at each end of of the stream crossing.

3. For any sewer without the required cover (1 foot in rock and 3 feet in other material), please explain why such cover is not provided and what measures are to be taken to minimize the erosion threat at the crossing location and the aesthetics of the permanent sewer crossing.

   The ductile iron pipe has 3.7 feet of cover and is encased in concrete.

4. Note how manholes along the stream will be made watertight if the top elevation is below the 100-year flood plain.

   Manholes along stream are set two feet above finish grade and are equipped with watertight bolt down lids.

5. List crossings by stream name and sheet numbers in plans. Provide extra set of plan sheets only with stream crossing.

   Stream crossing number 1, across a tributary of the Pigeon Creek (See Sheet 23).

HEADWALLS/OUTFALLS

1. Explain how the headwall/outfall structure will be constructed to minimize downstream and/or bank erosion and achieve complete mixing of the treated effluent with the stream flow within a short distance.

2. Identify stream by name, show design of outfall/headwall on plan sheet and provide an extra copy.

3800-PM-WSFR0400t 9/2005
Module 17

Applicant Name: East Coventry Township

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

SEWER EXTENSIONS
MODULE 17

APPLICANT NAME	East Coventry Township

PROJECT INFORMATION

If the project is associated with existing or proposed residential or industrial development, complete the following:

Name of Development: Existing homes in East Coventry Township
Type of Development: Residential
Number of Units: 250 Existing Properties Project Acreage 19.5

BASIS OF DESIGN

Design Year: 2025 | Design Population: 800

SEWER SYSTEM

1. CLASS OF CONSTRUCTION ☒ NEW SYSTEM ☐ REPLACEMENT OF EXISTING SYSTEMS ☒ SANITARY
2. INITIAL POPULATION 625 DESIGN YEAR POPULATION 800
3. List the WQM permit number of the sewer to which this system connects.
4. List the WQM permit number of the treatment facility receiving flow from this system.
5. What is the reserve capacity of the most limiting component between this connection and the treatment facility?
6. LOCATION

USGS Quadrangle Name: Pottstown

Latitude/Longitude of Connection Point	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
Project Center	40	12	42	75	37	34

7. DESIGN FLOW DATA

a.	Laterals and Submain Sewers	(GPCD)	262.5 gpd / EDU
b.	Average Daily Flow	(mgd)	84,000 gpd
c.	Infiltration/Inflow (I/I)	(mgd)	0
d.	Industrial Waste Flow	(mgd)	0
e.	Total Average Design Flow	(mgd)	84,000 gpd
f.	Maximum Expected Flowrate (Peak Instantaneous)	(mgd)	352,800 gpd

8. Describe measures taken to minimize I/I in the system including leakage test and reference applicable portion of the specifications.

System tested per Section 5 of the specifications.

3800-PM-WSFR0400y 9/2005
Module 22

Applicant Name: East Coventry Township

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

PUMP STATIONS
MODULE 22

APPLICANT NAME	East Coventry Township

PUMP STATION (Submit separate module for each pump station.)

1. PUMP STATION NAME: Saw Mill Road Sanitary Sewer Pump Station
2. List the WQM permit number of the sewer to which this system connects. 1503417
3. List the WQM permit number of the treatment facility receiving flow from this system. 1596411
4. What is the reserve capacity of the most limiting component between this connection and the treatment facility? 301,575 gpd AADF
5. LOCATION (street name, etc.): Saw Mill Road near Harley Road

USGS Quadrangle Name: Pottstown

Latitude/Longitude of Pump Station	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
Pottstown	40	12	15	75	37	30
Latitude/Longitude of Connection Point	**Latitude**			**Longitude**		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
Phoenixville	40	12	30	75	37	25

6. TYPE (e.g., conventional, suction lift, ejector or submersible): Submersible
7. INITIAL POPULATION TO BE SERVED: 15 EDU FUTURE POPULATION TO BE SERVED: 40 EDU
   DESIGN YEAR: 2025
8. DESIGN INFORMATION:

	AVG (mgd)	MAX (Peak Instantaneous) (mgd)
a. Domestic Flowrate (based on design population to be served)	0.0105	0.0441
b. Industrial Flowrate	--	--
c. Infiltration/Inflow (I/I) Rate	included in a.	--
d. Design Flowrate	0.0105	0.0441

e. Effective Wet Well Capacity	(gal)	183 to 732
f. Detention Time	(min)	25 to 100
g. Design Average Velocity in Force Main	(fps)	3
h. Total Dynamic Head (Pump Station + Force Main)	Static Head	84.5 ft
	Friction Loss	33.5 ft
	TDH	118 ft
i. Diameter of Force Main		4 inches

9. Describe the proposed project with respect to the 100-year flood elevation, ventilation, emergency power provision and alarm system.
   a. The top of the Wet Well and Valve Chamber are at least 7 feet above the 100-year flood elevation of 177. The floor of the Control Building is 184.50.
   b. Forced automatic mechanical ventilation sized for 30 air changes/hour has been provided for the Wet Well.
   c. A diesel-powered generator with an automatic transfer switch has been provided. The generator is sized to power all loads at the site.
   d. An alarm dialer that annunciates various alarms indicated in the engineering report has been provided.

3800-PM-WSFR0400y 9/2005
Module 22

Applicant Name: East Coventry Township

PUMPS

LIST ALL THE PUMPS IN THE PUMPING STATION

NUMBER OF IDENTICAL PUMPS	Describe Pump Use	Type of Pump	Check Columns That Apply To Each Pump								Pump Capacity	
			EXISTING	PROPOSED	VARIABLE SPEED	CONSTANT SPEED	AUTOMATIC CONTROL	MANUAL CONTROL	PNEUMATIC EJECTOR	STANDBY	gpm	TDH (ft)
1	Pump Raw Sewage	Submersible	☐	☒	☐	☒	☒	☐	☐	☐	120	118
1	Pump Raw Sewage	Submersible	☐	☒	☐	☒	☒	☐	☐	☒	120	118
			☐	☐	☐	☐	☐	☐	☐	☐		
			☐	☐	☐	☐	☐	☐	☐	☐		
			☐	☐	☐	☐	☐	☐	☐	☐		
			☐	☐	☐	☐	☐	☐	☐	☐		
			☐	☐	☐	☐	☐	☐	☐	☐		
			☐	☐	☐	☐	☐	☐	☐	☐		
			☐	☐	☐	☐	☐	☐	☐	☐		

8000-PM-IT0001 Rev 06/07/2002

FORM

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

Related ID#s (If Known)		DEP USE ONLY
Client ID# 74504	APS ID# 349961	Date Received & General Notes
Site ID# 683761	Auth ID# 359537	
Facility ID#		

CLIENT INFORMATION

DEP Client ID#	Client Type / Code
	MUNI

Organization Name or Registered Fictitious Name	Employer ID# (EIN)	Dun & Bradstreet ID#
East Coventry Township	23-6000285	

Individual Last Name	First Name	MI	Suffix	SSN

Additional Individual Last Name	First Name	MI	Suffix	SSN

Mailing Address Line 1	Mailing Address Line 2
855 Ellis Woods Road	

Address Last Line – City	State	ZIP+4	Country
Pottstown	PA	19465	United States

Client Contact Last Name	First Name	MI	Suffix
Preston	Robert	F.	

Client Contact Title	Phone	Ext
Chairman, Board of Supervisors	610-495-5443	

Email Address	FAX
	610-495-9925

SITE INFORMATION

DEP Site ID#	Site Name
	East Cedarville Road / Earl Drive / Buckwalter Road Sanitary Sewer Extension

EPA ID#	Estimated Number of Employees to be Present at Site

Description of Site
Sanitary Sewer Extension within the existing road right-of-ways and within off road easements.

County Name	Municipality	City	Boro	Twp	State
Chester	East Coventry	☐	☐	☒	PA
County Name	Municipality	City	Boro	Twp	State
		☐	☐	☐	

Site Location Line 1	Site Location Line 2
East Cedarville Road / Earl Drive Area	Buckwalter Road Area

Site Location Last Line – City	State	ZIP+4
Pottstown	PA	19465

Detailed Written Directions to Site
See Attached Location Map

Site Contact Last Name	First Name	MI	Suffix
Preston	Robert	F.	

Site Contact Title	Site Contact Firm
Chairman, Board of Supervisors	East Coventry Township

Mailing Address Line 1	Mailing Address Line 2
855 Ellis Woods Road	

Mailing Address Last Line – City	State	ZIP+4
Pottstown	PA	19465

Phone	Ext	FAX	Email Address
610-495-5443		610-495-9925	

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NAICS Codes (Two- & Three-Digit Codes – List All That Apply) **6-Digit Code** (Optional)
22

Client to Site Relationship
OWN

FACILITY INFORMATION

Modification of Existing Facility

		Yes	No
1.	**Will this project modify an existing facility, system, or activity?**	☐	☒
2.	**Will this project involve an addition to an existing facility, system, or activity?**	☒	☐

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	DEP Fac ID#		Facility Type	DEP Fac ID#
☐	Air Emission Plant		☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	MineDrainageTrmt/LandRecyProjLocation	
☐	Coal Ash Beneficial Use Operation		☐	Municipal Waste Operation	
☐	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☐	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☐	Dam Location		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Anthracite		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Bituminous		☐	Residual Waste Operation	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Storage Tank Location	
☐	Encroachment Location (water, wetland)		☒	Water Pollution Control Facility	
☐	Erosion & Sediment Control Facility		☐	Water Resource	
☐	Explosive Storage Location		☐	Other:	

Latitude/Longitude Point of Origin	**Latitude**			**Longitude**		
	Degrees	**Minutes**	**Seconds**	**Degrees**	**Minutes**	**Seconds**
Approx. Center of Project Area	40	12	42	75	37	34

Horizontal Accuracy Measure Feet --or-- Meters

Horizontal Reference Datum Code
- ☒ North American Datum of 1927
- ☐ North American Datum of 1983
- ☐ World Geodetic System of 1984

Horizontal Collection Method Code ITPMP

Reference Point Code CTROD

Altitude Feet --or-- Meters

Altitude Datum Name
- ☒ The National Geodetic Vertical Datum of 1929
- ☐ The North American Vertical Datum of 1988 (NAVD88)

Altitude (Vertical) Location Datum Collection Method Code

Geometric Type Code POINT

Data Collection Date December 2005

Source Map Scale Number 1 Inch(es) = 2000 Feet
--or-- Centimeter(s) = Meters

PROJECT INFORMATION

Project Name
East Cedarville Road / Earl Drive / Buckwalter Road Sanitary Sewer Extension

Project Description
See Attached Project Description

Project Consultant Last Name	**First Name**	**MI**	**Suffix**
Dingman	William	K.	P.E.

Project Consultant Title Vice President

Consulting Firm EDM Consultants, Inc.

Mailing Address Line 1 1101 South Broad Street

Mailing Address Line 2 P.O. Box 1545

Address Last Line – City Lansdale

State PA

ZIP+4 19446

Phone	**Ext**	**FAX**	**Email Address**
315-393-0670	20	21-393-0652	bill@edmconsultantsinc.com

Time Schedules To Be Determined	Project Milestone (Optional)

1.	**Is this application for an authorization type on the list of authorizations affected by the land use policy?**	☒	Yes	☐	No
	Note: If "Yes", you must complete the following Land Use Information section, unless exempted by Questions 2 or 3 below. If "No", skip Questions 2 & 3 below as well as the following Land Use Information section. For referenced list, see Appendix A attached to the GIF Instructions.				
2.	**For an Air program authorization only. All other authorizations continue with Question 3 below. Will the permit authorize the construction of facilities outside an existing permitted area?**	☐	Yes	☒	No
	Note: If "Yes", you must complete the following Land Use Information section unless exempted by Question 3 below. If "No", skip Question 3 below as well as the following Land Use Information section.				
3.	**Have you attached or submitted municipal and county 'Early Opt Out' approval letters for the project?**	☐	Yes	☒	No
	Note: If "Yes" to Question 3, skip the following Land Use Information section. This should only be checked "Yes" if applicant is choosing the early opt-out option. Required approval letters described in the GIF Checklist and Instructions should be attached. If "No" to Question 3, continue with the following Land Use Information section.				

LAND USE INFORMATION

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1.	**Is there a municipal comprehensive plan(s)?**	☒	Yes	☐	No
2.	**Is there a county comprehensive plan(s)?**	☒	Yes	☐	No
3.	**Is there a multi-municipal or multi-county comprehensive plan?**	☐	Yes	☒	No
4.	**Is the proposed project consistent with these plans?** If no plan(s) exists, answer "Yes".	☒	Yes	☐	No
5.	**Is there a municipal zoning ordinance(s)?**	☒	Yes	☐	No
6.	**Is there a joint municipal zoning ordinance(s)?**	☐	Yes	☒	No
7.	**Will the proposed project require a zoning approval (e.g., special exception, conditional approval, re-zoning, variance)?** If zoning approval has already been received, attach documentation.	☐	Yes	☒	No
8.	**Are any zoning ordinances that are applicable to this project currently the subject of any type of legal proceeding?**	☐	Yes	☒	No
9.	**Will the project be located on a site that has been or is being remediated under DEP's Land Recycling Program?**	☐	Yes	☒	No
10.	**Will the project result in reclamation of abandoned mine lands through re-mining or as part of DEP's Reclaim PA Program?**	☐	Yes	☒	No
11.	**Will the project be located in an agricultural security area or an area protected under an agricultural conservation easement?**	☐	Yes	☒	No
12.	**Will the project be located in a Keystone Opportunity Zone or Enterprise Development Area?**	☐	Yes	☒	No
13.	**Will the project be located in a Designated Growth Area as defined by the Municipalities Planning Code?**	☒	Yes	☐	No

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 and the accompanying Cultural Resource Notice Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	**Is this a coal mining project?** If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0. (DEP Use/48y1)	☐	Yes	☐	No
1.1	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?** (DEP Use/4x70)	☐	Yes	☐	No
1.2	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?** (DEP Use/4x70)	☐	Yes	☐	No
1.3	**Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?** (DEP Use/4x70)	☐	Yes	☐	No
1.4	**For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?** (DEP Use/4x62)	☐	Yes	☐	No
1.5	**Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?** (DEP Use/3140)	☐	Yes	☐	No
1.6	**Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?** (DEP Use/4z41)	☐	Yes	☐	No
2.0	**Is this a non-coal (industrial minerals) mining project?** If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0. (DEP Use/48y1)	☐	Yes	☐	No
2.1	**Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?** (DEP Use/4x70)	☐	Yes	☐	No
2.2	**Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?** (DEP Use/4x70)	☐	Yes	☐	No
2.3	**Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?** (DEP Use/4x70)	☐	Yes	☐	No
2.4	**For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?** (DEP Use/4x62)	☐	Yes	☐	No
2.5	**Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?** (DEP Use/3140)	☐	Yes	☐	No

3.0	**Will your project, activity, or authorization have anything to do with a well related to oil or gas production, site development for such activity, or the waste from such a well?** If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0. (DEP Use/4z41)	☐	Yes	☒	No
3.1	**Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?** (DEP Use/4z41)	☐	Yes	☐	No
3.2	**Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system?** If "Yes", discuss in *Project Description*. (DEP Use/4z41)	☐	Yes	☐	No
3.3	**Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?** (DEP Use/4z41)	☐	Yes	☐	No
4.0	**Will the project involve a construction activity that results in earth disturbance?** If "Yes", specify the total disturbed acreage. (DEP Use/4x66)	☒	Yes	☐	No
	4.0.1 Total Disturbed Acreage > 5.0 - for installation of sewer mains and one pump station				
5.0	**Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?** (DEP Use/4x66)	☒	Yes	☐	No
6.0	**Will the project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?** If "Yes", discuss in *Project Description*. (DEP Use/4x62)	☐	Yes	☒	No
7.0	**Will the project involve the construction and operation of industrial waste treatment facilities?** (DEP Use/4x62)	☐	Yes	☒	No
8.0	**Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations?** If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable. (DEP Use/4x62)	☒	Yes	☐	No
	8.0.1 Estimated Proposed Flow (gal/day) 90 GPM Sanitary Sewer Pump Station				
9.0	**Was sewage planning submitted and approved?** If "Yes", attach the Act 537 approval letter unless the submitted application is actually requesting Act 537 approval (Approval required prior to 105/NPDES approval). (DEP Use/4x61)	☒	Yes	☐	No
	9.0.1 Is Act 537 Approval Letter attached?	☒	Yes	☐	No
10.0	**Is this project for the beneficial use of biosolids for land application within Pennsylvania?** If "Yes" indicate how much (i.e. gallons or dry tons per year). (DEP Use/4X62)	☐	Yes	☒	No
	10.0.1 Gallons Per Year (residential septage)				
	10.0.2 Dry Tons Per Year (biosolids)				
11.0	**Does the project involve construction, modification or removal of a dam?** If "Yes", identify the dam. (DEP Use/3140)	☐	Yes	☒	No
	11.0.1 Dam Name				
12.0	**Will the project interfere with the flow from, or otherwise impact, a dam?** If "Yes", identify the dam. (DEP Use/3140)	☐	Yes	☒	No
	12.0.1 Dam Name				
13.0	**Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?** If "Yes", identify each type of emission followed by the amount of that emission. (DEP Use/4x70)	☐	Yes	☒	No
	13.0.1 Enter all types & amounts of emissions; separate each set with semicolons.				

14.0	**Is an on-site drinking water supply (well), other than individual house wells, proposed for your project?** If "Yes", indicate total number of people served and/or the total number of connections served, if applicable. Also, check all proposed sub-facilities. (DEP Use/4x81)	☐	Yes	☒	No
14.0.1	**Number of Persons Served**				
14.0.2	**Number of Employee/Guests**				
14.0.3	**Number of Connections**				
14.0.4	**Sub-Fac: Distribution System**	☐	Yes	☐	No
14.0.5	**Sub-Fac: Water Treatment Plant**	☐	Yes	☐	No
14.0.6	**Sub-Fac: Source**	☐	Yes	☐	No
14.0.7	**Sub-Fac: Pump Station**	☐	Yes	☐	No
14.0.8	**Sub-Fac: Entry Point**	☐	Yes	☐	No
14.0.9	**Sub-Fac: Transmission Main**	☐	Yes	☐	No
14.0.10	**Sub-Fac: Storage Facility**	☐	Yes	☐	No
15.0	**Will your project involve purchasing water in bulk, excluding during the construction period?** If "Yes, name the provider. Also, indicate the daily number of employees or guests served. (DEP Use/4x81)	☐	Yes	☒	No
15.0.1	**Provider's Name**				
15.0.2	**Number of Employees/Guests**				
16.0	**Is your project to be served by public water supply?** If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project. (DEP Use/4x81)	☐	Yes	☒	No
16.0.1	**Supplier's Name**				
16.0.2	**Letter of Approval from Supplier is Attached**	☐	Yes	☒	No
17.0	**Will this project involve a new or increased drinking water withdrawal from a stream or other water body?** If "Yes", provide name of stream. (DEP Use/4x81)	☐	Yes	☒	No
17.0.1	**Stream Name**				
18.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste?** If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed. (DEP/Use4x32)	☐	Yes	☒	No
18.0.1	**Type & Amount**				
19.0	**Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities?** (DEP Use/48y1)	☐	Yes	☒	No
20.0	**Does your project involve installation of a field constructed underground storage tank?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	☐	Yes	☒	No
20.0.1	**Enter all substances & capacity of each; separate each set with semicolons.**				
21.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	☐	Yes	☒	No
21.0.1	**Enter all substances & capacity of each; separate each set with semicolons.**				
22.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	☐	Yes	☒	No
22.0.1	**Enter all substances & capacity of each; separate each set with semicolons.**				

23.0	**Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	☐	Yes	☒ No
23.0.1	**Enter all substances & capacity of each; separate each set with semicolons.**			

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Type or Print Name William K. Dingman, P.E.

William K Dingman — **Signature**

Vice President, EDM Consultants, Inc. — **Title**

2/21/06 — **Date**

DESIGN REPORT

FOR THE

EAST COVENTRY TOWNSHIP
PHASE II
SANITARY SEWER SYSTEM

PROJECT DESCRIPTION

On behalf of East Coventry Township, Chester County, Pennsylvania, EDM Consultants, Inc. has prepared plans for the design and construction of the East Cedarville Road / Earl Drive / Buckwalter Road Sanitary Sewer Extension. The following narrative describes this sanitary sewer extension project.

This sanitary sewer extension will include the installation of approximately 20,000 LF of sanitary sewer pipe within the existing cart way of East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schoolhouse Road, Harley Road, Saw Mill Road and Buckwalter Road. This project will also include the installation of approximately 2,000 LF of sanitary sewer pipe across open land within easements located between Buckwalter Road and the Pigeon Creek. The project will also include the construction of a sanitary sewer pumping station located along Saw Mill Road at a point approximately 500 feet east of Harley Road. The sanitary sewer extension is being constructed to provide public sanitary sewer service to approximately 250 existing properties located along the above mentioned roads. The total acreage of the project is approximately 19.5 acres with all 19.5 acres being disturbed with the installation of the sanitary sewer pipe and pumping station.

The installation of the sanitary sewer pipe will be within the existing roads except for the portion between Buckwalter Road and the Pigeon Creek.

The project will include one minor stream crossing of an unnamed tributary to the Pigeon Creek. The stream crossing will be completed utilizing the most up to date methods for stream crossing construction. The stream crossing will be completed in a timely manner and every precaution will be taken to prevent sediment laden water from entering the unnamed tributary to the Pigeon Creek. All areas disturbed during the installation of the sanitary sewer extension will restored to an equal to or better than their pre-disturbed condition.

SEWER DESIGN

The Township uses a design flow of 262.5 gpd per EDU. This design flow together with a peaking factor of 4.2 has been utilized in the system design. The gravity sewers have been designed at a slope equal to or greater than the PADEP minimum allowable

slopes. The maximum number of homes using any one eight inch collection sewer is 115 homes. The sewers connect to the Phase I Interceptor at three different locations. The sewers will be constructed in accordance with the Standard Township Specifications and drawings as included in the permit application.

PUMP STATION DESIGN (Saw Mill Road)

The proposed pump station site is located on the southwest side of Saw Mill Road approximately 500 LF southeast of the intersection of Saw Mill and Harley Roads in East Coventry Township. The pump station is designed to ultimately serve 40 EDUs from a portion of the proposed sewer system with 15 EDUs initially being served. Upon completion, the pump station will be owned and operated by East Coventry Township.

The flow from the pump station will be pumped through approximately 2550 LF of 4" force main to Manhole No. 10 of the proposed sewer system located on Harley Road.

The average daily flow to the pump station for 40 EDUs is estimated to be 10,500 gpd. In accordance with the Department's requirement of utilizing a peaking factor of 4.2 for the peak hourly flow for average daily flows of 100,000 gpd or less, the estimated peak hourly flow to the pump station is estimated to be 44,100 gpd or 30.6 gpm.

For intermittent pump operation and especially in long force mains, scouring velocities of from 3 to 5 fps are considered good practice to ensure pickup and transportation of deposited solids that result when the pumps are not in operation. A design flow rate of 120 gpm that will produce a force main velocity of 3 fps in a 4" pipe was selected as the basis of design. This flow rate results in a system TDH of 118 feet when using a friction factor of C=120. If a friction factor of C=140 were considered the TDH would be reduced by approximately 7 feet. A copy of the force main system curve and the performance curves of the selected Fairbanks-Morse and KSB submersible pumps are attached at the end of the report.

The pump station site contains the following major items:

- Wet Well/Pump Station
- Valve and Meter Chamber
- Control Building

The design features of each of the items are as follows:

A. Wet Well/Pump Station

1. The Wet Well/Pump Station houses two (2) 20 hp submersible pumps each with a rating of 120 gpm @ 118 feet TDH when operating at a speed of 1760 RPM. Unfortunately because of the low flow and high head condition, pump efficiencies are poor because the operating point is close to the shutoff head for the pump. Also, because the design point is far left of the best efficiency point (BEP), high unbalanced shaft forces and vibration will occur in standard

submersible pumps with enclosed non-clog impellers. To combat this problem, two (2) types of pumps are considered:

a. A Fairbanks-Morse pump with a circular volute and center discharge to minimize the unbalanced forces.

b. A KSB, Inc. pump with a recessed vortex type impeller that can operate almost anywhere along its performance curve without experiencing unbalanced forces or vibration.

1. Specific features of the pump station are as follows:

a. A removable grinder has been provided at the inlet to the station. The grinder has been provided with stainless steel guide rails to permit removal of the grinder without entering the station, automatic controls and a hydraulic drive motor. The grinder can be completely submerged without experiencing damage. A remote hydraulic power pack installed in the Control Building has been specified to power the grinder.

b. A submersible, diaphragm type level sensor has been provided in the pump station for automatic pump control via a solid-state controller. A backup pump control system utilizing floats and intrinsically safe relays has also been specified in the event a problem develops with the sensor or controller.

c. An extreme wet well alarm float that is independent of the Pump Control Panel will be installed at the crown of the influent sewer. The alarm float will be connected to an alarm dialer. The Pump Control Panel has its own high and low level alarms.

d. Motor moisture and high temperature sensors have been provided in the automatic control system for each pump.

e. A seven (7') foot square (inside dimension) wet well has been specified that will yield 366 gallons of volume per vertical foot. With an average flow rate of 10,500 gpd, the following detention times will occur with the wet well draw downs indicated. It is to be noted that the drawdown or pump operating levels can be easily changed at the pump control panel without entering the wet well. To combat potential odor problems that can result from long wet well detention times, an odor control chemical storage/feed system has been specified to be installed in the Control Building.

Drawdown (feet)	Detention Time (Minutes)
0.5	25
1.0	50
1.25	62.5
1.50	75
1.75	87.5
2.0	100

f. Each pump motor is rated for continuous duty and up to ten (10) starts per hour. The following minimum cycle times (the time from start to start) and starts per hour result with the wet well draw downs indicated:

Drawdown (feet)	Minimum Cycle Time (Minutes)	No. of Starts/Hr.
0.5	6.1	9.83
1.0	12.2	4.91
1.25	15.2	3.94
1.50	18.3	3.28
1.75	21.3	2.82
2.0	24.4	2.46

Under normal operation, the lead pump will be automatically alternated after each pump cycle. Considering this, the normal number of starts per hour for each pump will be one half of that indicated above. From the calculated detention and cycle

times, it is evident that the size of the wet well selected was based on the equipment and items to be installed in the wet well and not on detention time or starts/hour.

g. Each pump is furnished with a 4" suction and a non-clog impeller that is capable of passing a 3" sphere.

h. Positive automatic mechanical ventilation has been provided for the wet well. The fan will be activated by a timer or when the access hatch to the wet well is opened. The fan has been sized to provide thirty (30) air changes/hour (ACH) at the pump off level.

Underside of Top Slab	-	EL 185.0
Pump Off Level	-	EL 159.50
Air Space Volume	-	1250 Cubic Feet
Fan Rating for 30 ACH	-	625 cfm

i. Aluminum hatches with a 'Safe-Hatch' provision have been provided for the removal of each pump. The 'Safe-Hatch' provides fall-through protection when the hatch doors are open.

j. Access to the wet well has been provided by the installation of a fiberglass ladder and a platform located above the high water alarm level.

A. Valve and Meter Chamber

1. A 6'-0" wide X 11'-0" long precast concrete chamber has been specified to house the following items:

a. A ¾" manual vent for each pump.

b. A diaphragm-protected pressure gauge for each pump.

c. A 4" air-cushioned check valve for each pump.

d. A 4" resilient-seated NRS gate valve for each pump.

e. A 4" magnetic flow meter with remote signal converter.

f. Two (2) 4" valved bypass pump connections to allow for the pumping from the wet well to the force main utilizing an engine-driven pump and temporary discharge hose/piping.

g. A 4" force main isolation valve.

h. Two (2) insulated aluminum access hatches with permanently installed ladders.

i. Gravity vents.

j. Automatically-controlled sump pump that discharges to the wet well.

A. Control Building

1. A masonry Control Building with the following three (3) rooms will be provided adjacent to the Valve and Meter Chamber:

   a. Generator/Control Room.

   b. Chemical Room.

   c. Toilet Room.

2. The Generator/Control Room will house the following items:

   a. Diesel-powered generator with integral fuel tank sub-base w/rupture basin.

   b. Automatic transfer switch.

   c. Main electric circuit breaker.

   d. Pump Control Panel w/pump starters.

   e. Magmeter signal converter and circular chart recorder.

   f. Automatic alarm dialer.

   g. Sewage grinder hydraulic power pack and control panel.

   h. Fan and fan controls.

i. Building power distribution equipment.

j. Electric unit heaters.

k. Intake and exhaust ventilation louvers.

2. The Chemical Room will house the following equipment:

a. A 550-gallon tank to store the chemical Bioxide for odor control purposes. Bioxide is considered a non-hazardous material and is not on the EPA CERCLA list of hazardous substances.

b. Two (2) chemical feed pumps.

c. Control Panel.

d. Two (2) ½ chemical feed tubes that will convey the chemical to the wet well.

e. Fan and louver.

f. Electric unit heater.

g. Hydropnuematic tank for well pump control.

Pump Station Site

The pump station site has been provided with the following items:

1. Fourteen (14') foot paved access road with turnaround.

2. Eight (8') foot high security fence.

3. Potable water well and yard hydrant.

4. Site lighting.

Alarms

The following alarms will be automatically transmitted to the personnel responsible for the operation and maintenance of the pump station:

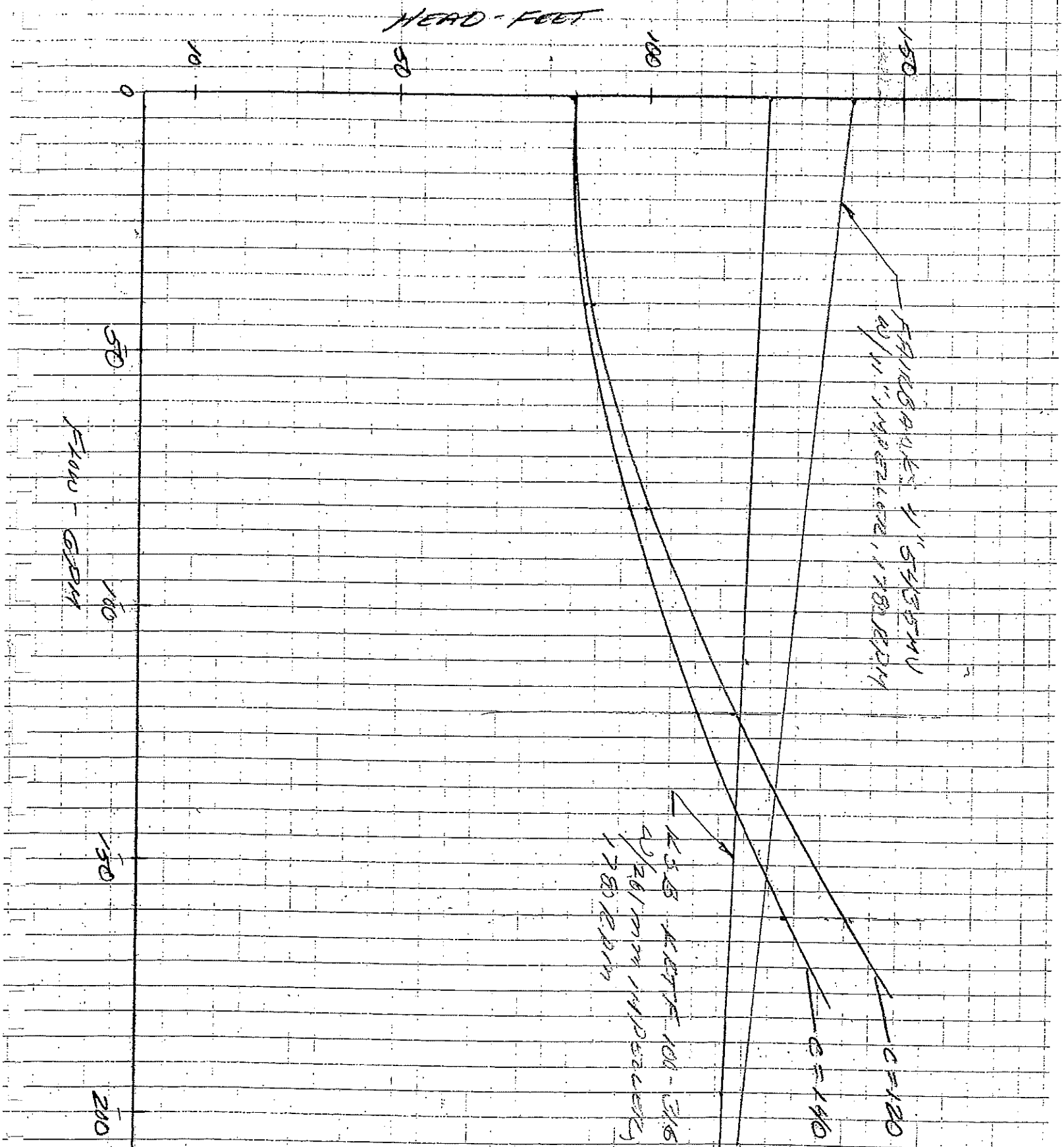
1. High Water Elevation.
2. Extreme High Water Elevation.
3. Low Water Elevation.
4. Loss of Power.
5. Pump No. 1 High Temperature/Overload.
6. Pump No. 2 High Temperature/Overload.
7. Pump No. 1 Seal Failure.
8. Pump No. 2 Seal Failure.
9. Generator Failure/Loss of Power.
10. Transfer Switch Failure.
11. Comminutor Failure.
12. Loss of Control Signal.

COMPUTATION SHEET

EDM CONSULTANTS, INC.
1901 S. BROAD ST., SUITE 200, LANSDALE, PA 19446
PHONE (215) 393-0870 FAX (215) 393-0882

SHEET NUMBER 3 OF 3
DATE 7/4/06
JOB NUMBER 223-002
COMPUTED BY RSS CHECKED BY

PROJECT EAST COVENTRY TWP
DESCRIPTION SAMMIL P.S

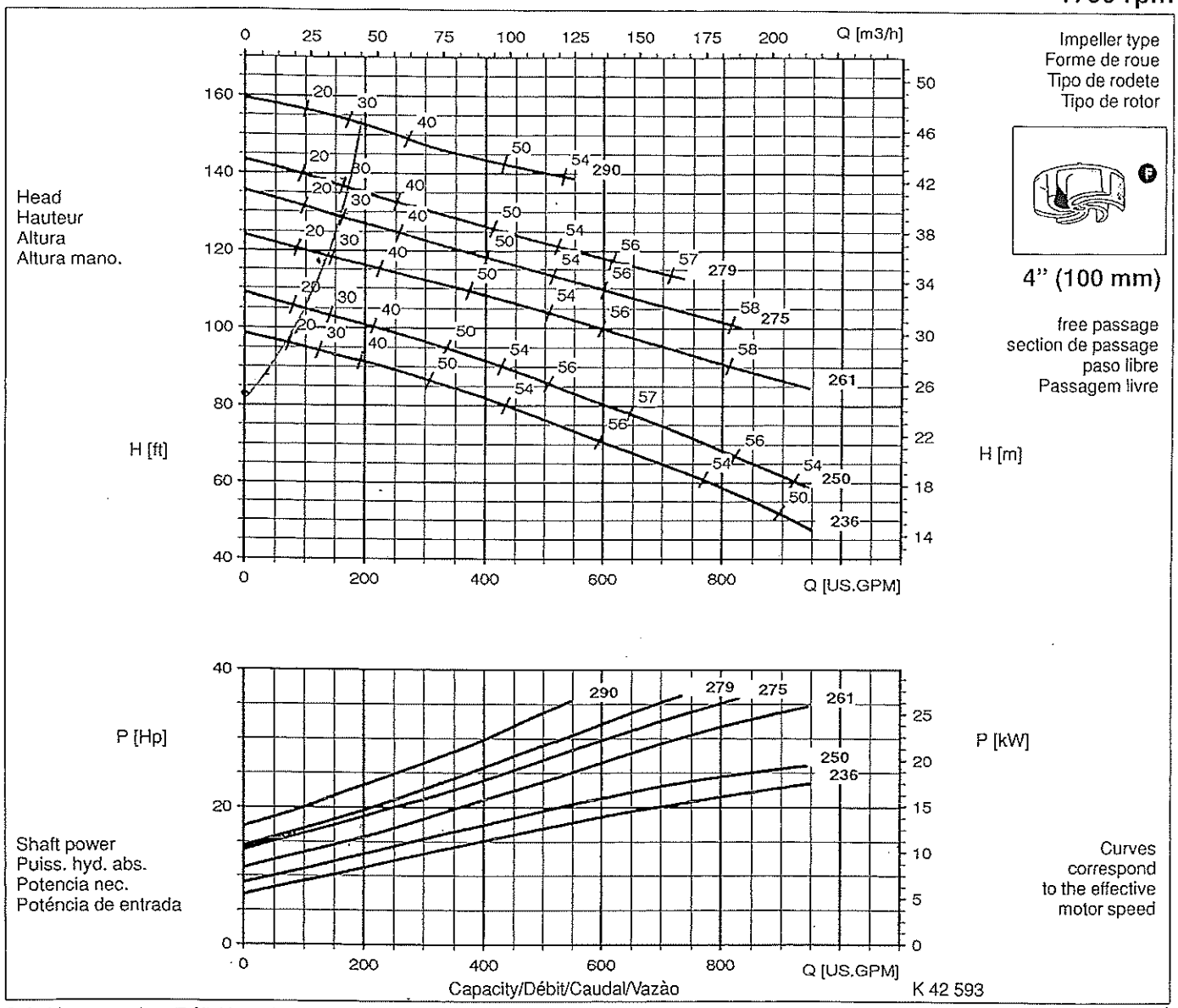


RATING 120 gpm @ 118 20 hp motor & 261 mm imp. KRT

KSB

KRT F 100-316 / ...

1750 rpm



Suitable motor sizes/Définition taille moteur/Tamaños de motor aplicables/Tamanhos apropriados de motores

MOTOR RATING Material G/G1/G2/GH/H Hp (kW)	MOTOR RATING Material C1/C2 Hp (kW)	MAX. LIQUID TEMP. °F (°C)	MOTOR CODE
15 (11.5)	15 (11.5)	104 (40)	11 4 U 11 4 X (FM)
		140 (60)	16 4 W 16 4 Z (FM)
20 (16)	20 (16)	104 (40)	16 4 U 16 4 X (FM)
		140 (60)	23 4 W 23 4 Z (FM)

MOTOR RATING Material G/G1/G2/GH/H Hp (kW)	MOTOR RATING Material C1/C2 Hp (kW)	MAX. LIQUID TEMP. °F (°C)	MOTOR CODE
28 (21)	25 (19)	104 (40)	23 4 U 23 4 X (FM)
31 (23)	28 (21)	140 (60)	29 4W 29 4 Z (FM)
36 (27)	34 (25)	104 (40)	29 4 U 29 4 X (FM)

(FM) = Explosionproof to Class I, Division 1, Groups C & D
(Explosionproof according to IEC 79 (EEx d II B) on request).

4" 5435 MV SUBMERSIBLE 1780 RPM

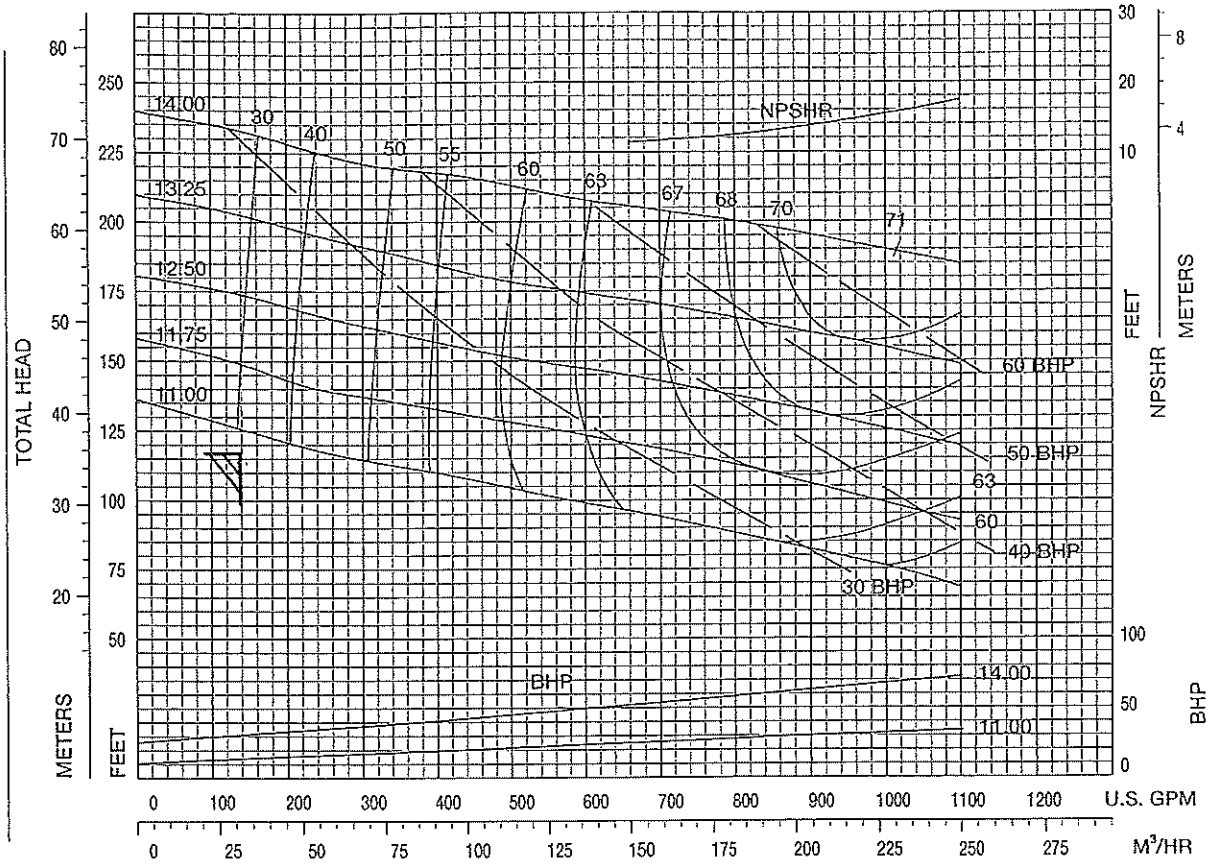
NO. OF VANES
2

SUCTION SIZE
4"

IMPELLER
T4E1E

INLET AREA
35.65 SQ.IN.

MAX. SPHERE
3"



5" 5436 MT, W, WD SUBMERSIBLE 1780 RPM

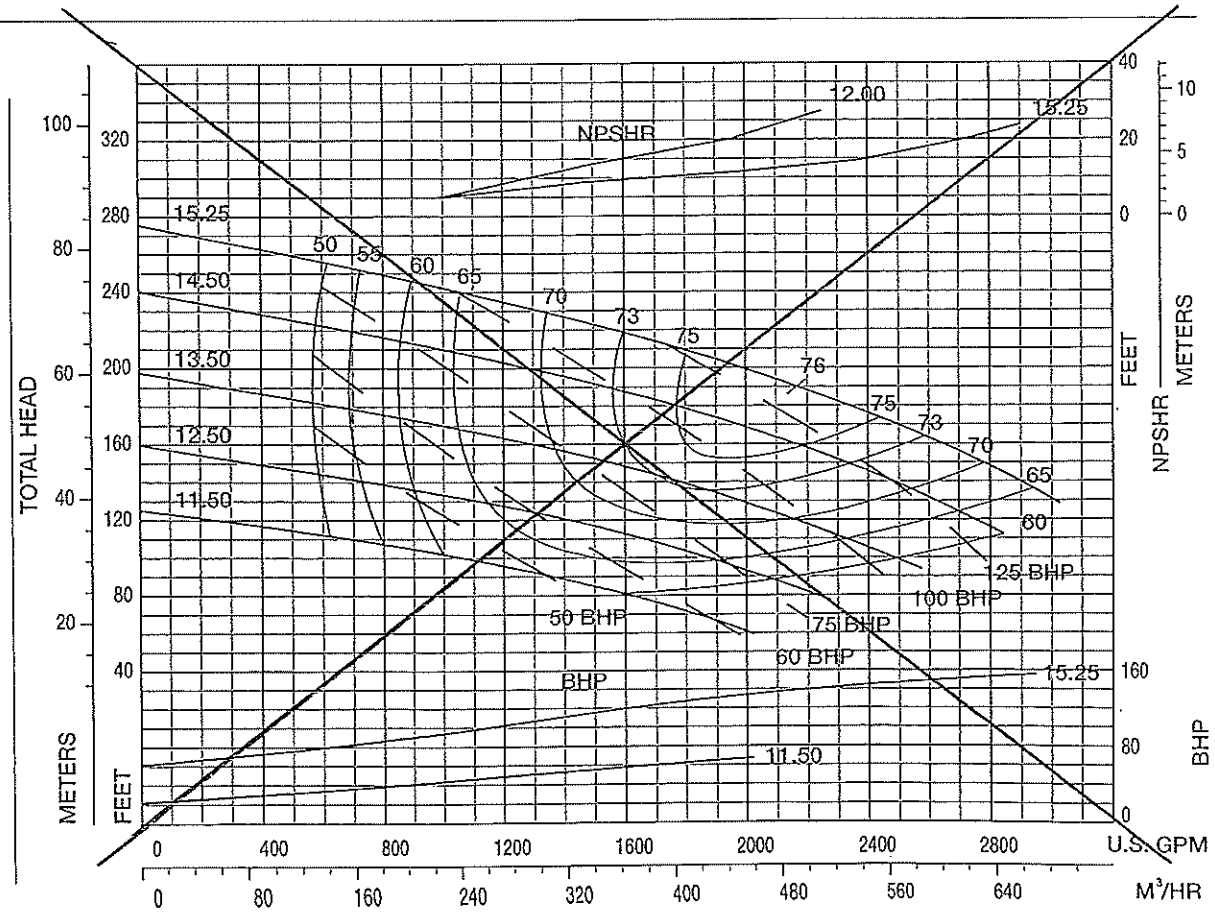
NO. OF VANES
2

SUCTION SIZE
8"
(WD: 8" OR 10")

IMPELLER
T5D1AS

INLET AREA
52.05 SQ.IN.

MAX. SPHERE
3"



SECTION B

NARRATIVE

East Cedarville Road / Earl Drive / Buckwalter Road
Sanitary Sewer Extension
East Coventry Township, Chester County
Project Narrative

On behalf of East Coventry Township, Chester County, Pennsylvania, EDM Consultants, Inc. is preparing plans for the design and construction of the East Cedarville Road / Earl Drive / Buckwalter Road Sanitary Sewer Extension. The following narrative describes this sanitary sewer extension project.

East Coventry Township located in Chester County, Pennsylvania is having plans prepared for the construction of the East Cedarville Road / Earl Drive Sanitary Sewer Extension. This sanitary sewer extension will include the installation of approximately 20,000 LF of sanitary sewer pipe within the existing cartway of East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schoolhouse Road, Harley Road, Saw Mill Road and Buckwalter Road. This project will also include the installation of approximately 2,000 LF of sanitary sewer pipe across open land within easements located between Buckwalter Road and the Pigeon Creek. The project will also include the construction of a sanitary sewer pumping station located along Saw Mill Road at a point approximately 500 feet east of Harley Road. The sanitary sewer extension is being constructed to provide public sanitary sewer service to approximately 250 existing properties located along the above mentioned roads. The total acreage of the project is approximately 19.5 acres with all 19.5 acres being disturbed with the installation of the sanitary sewer pipe and pumping station.

There are no existing buildings over forty years old that will be impacted by the construction of this sanitary sewer extension project. The installation of the sanitary sewer pipe will be within the existing roads except for the portion between Buckwalter Road and the Pigeon Creek.

The project will include minor stream/drainage ditch crossings of an unnamed tributary to the Pigeon Creek. These stream crossings will be completed utilizing the most up to date methods for stream crossing construction. The stream crossings will be completed in a timely manner and every precaution will be taken to prevent sediment laden water from entering the unnamed tributary to the Pigeon Creek. All areas disturbed during the installation of the sanitary sewer extension will restored to an equal to or better than their pre-disturbed condition.

East Cedarville Road / Earl Drive Sanitary Sewer Extension
East Coventry Township
Chester County, Pennsylvania

Sanitary Sewer Stream Crossing Number 1 Narrative (Tributary to Pigeon Creek)

East Coventry Township, Chester County, Pennsylvania is designing a sanitary sewer extension of the existing sanitary sewer system to serve the existing homes located within the East Cedarville Road, Earl Drive and Buckwalter Road areas of the township with public sanitary sewer service.

The sanitary sewer extension will include the installation of 8 inch and 10 inch diameter sanitary sewer pipes within the existing right-of-ways of the above mentioned roads and within off road easements obtained by East Coventry Township through private property. The off road portion of the sanitary sewer extension will include one minor stream crossing of an unnamed tributary to the Pigeon Creek with an 8 inch diameter sanitary sewer pipe. This crossing will take place at the narrowest section of the stream based on topography and design requirements in an area designated as Waters of the United States. There are no areas delineated as wetlands affected by the sanitary sewer pipe crossing the stream.

The procedure for constructing the sanitary sewer stream crossing will be as follows;

1. The contractor will install temporary coffer dams upstream and downstream of the proposed stream crossing location to create a dry work area. The contractor will bypass pump the stream around the work area

2. The contractor will excavate and stockpile the existing streambed material so that it can be replaced on the streambed when the sanitary sewer crossing is completed. The contractor should take care to stockpile the material in an area where it will not be mixed with topsoil or other material.

3. The contractor will excavate and stockpile the topsoil from the stream banks adjacent to the stream crossing. This topsoil should be stockpiled outside the limits of the stream and protected to prevent the topsoil from entering the stream.

3. The contractor shall excavate to the required depth and install the sanitary sewer pipe. The excavated trench material shall be stored outside the stream so that it may be used to backfill the trench upon completion of the pipe installation. The sanitary sewer pipe shall be encased in concrete and shall have a minimum of three (3) feet of cover over the concrete encasement. The minimum depth of cover over the concrete encasement may be reduced to one (1) foot if the installation is in rock.

4. The contractor shall then backfill the sanitary sewer trench with the material removed from the trench during the excavation. The contractor shall install trench plugs constructed of clay material at each end of the stream crossing trench to prevent the stream from flowing along the pipe or altering the flow rate.

5. The contractor shall then restore the stream crossing area. The stream crossing will be restored to its respective pre-disturbance or better condition. The stockpiled excavated streambed material shall be replaced on the disturbed streambed to a minimum 12 inch depth. Should additional streambed stabilization be required, the streambed should be lined with a clean stone local to the disturbed area. The stream banks should be graded and restored with a vegetative cover. The application of the stockpiled topsoil will provide re-establishment of the original species. In addition it is recommended that the disturbed stream banks be seeded with red top (agrostis alba) at a rate of two (2) pounds per acre to provide immediate soil stabilization and a non-competitive cover crop with good wildlife value.

6. The contractor shall remove the temporary coffer dams beginning downstream and working upstream. The contractor shall remove the pumps and allow the stream to flow freely.

7. The contractor shall restore, reseed and mulch all disturbed areas adjacent to the stream crossing location.

/002_StreamXingNarr

SECTION C

NOTICES & APPROVALS

1. Act 537 Planning Approval Letter

2. Act 14 Letters to the Township and County

3. Chester County Conservation District Application (In Process)

4. Agency Clearance Letters
   PNDI
   USFWS
   PA Game Commission
   PA Fish & Boat Commission



Pennsylvania Department of Environmental Protection
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

OCT 0 8 2003

OCT 1 5 2003

Southeast Regional Office

610-832-6130
Fax: 610-832-6133

Casey LaLonde, Manager
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

Re: Act 537 Plan Update
APS Id. 349961, AUTH Id. 359537
East Coventry Township
Chester County

Dear Mr. LaLonde:

We have completed our review of your municipality's updated official sewage facilities plan entitled East Coventry Township Wastewater Collection and Treatment Special Study, as prepared by Motley Engineering Co., Inc. and Arro Consulting, Inc. The plan is dated November, 2000, revised March 28, 2002, September 12, 2002, January 24, 2003 and June 17, 2003. The review was conducted in accordance with the provisions of the Pennsylvania Sewage Facilities Act.

Approval of the plan is hereby granted. The plan provides for the following:

1. The establishment of a public sewer service area tributary to the North Coventry Municipal Authority's Wastewater Treatment Facility. A total of 510,000 gallons per day annual average flow will ultimately be conveyed to the North Coventry Municipal Authority's sewerage facilities. This service area is depicted on Figure 2, Planning Areas, revised by Arro Consulting, Inc. on May 8, 2002.

   Section 7.7 of the draft intermunicipal agreement provided with the submission allows East Coventry Township to initially purchase a maximum of 650 EDUs (195,000 gpd) capacity in the North Coventry Municipal Authority's Wastewater Treatment Facility. Pursuant to Section 7.9 of the agreement, East Coventry Township will be permitted to purchase a maximum of 800 EDUs (240,000 gpd) of capacity once the Township has funded the construction and remaining non-construction costs associated with the expansion of the North Coventry Municipal Authority's Wastewater Treatment Facility. East Coventry Township will be allowed to purchase a maximum of 1,700 EDUs (510,000 gpd) of capacity once the expansion of the North Coventry Municipal Authority's Wastewater Treatment Facility has been completed.

OCT 0 8 2003

2. The construction of four new, municipally owned sewage pumping stations and appurtenant force mains and gravity sewers. These facilities are depicted on the February 19, 2003 plan entitled Northern Service Area Phase I Sewer System, prepared by Arro Consulting, Inc. These pump stations will have the following capacities and service areas:

   a. Pump Station No. 1 will convey 510,000 gallons per day annual average flows from the new East Coventry Township public sewer service area to sewerage facilities owned by the North Coventry Municipal Authority.

   b. Pump Station No. 2 will have a capacity of 5,775 gallons per day annual average flow and will serve 22 units from the Wood Crest Estates Subdivision (a.k.a. Strutynski, Jr. Tract).

   c. Pump Station No. 3 will have a capacity of 106,575 gallons per day annual average flow and will serve 380 units from the Coventry Meadows Subdivision (a.k.a. Burkhart-Elliott Tract), Lot 16 of the Heather Glen Subdivision (a.k.a. Domin-Allison/Miller Tract) and 25 existing houses along Old Schuylkill Road.

   d. Pump Station No. 4 will have a capacity of 21,788 gallons per day annual average flow and will serve 61 units from the Creekview Subdivision (a.k.a. Soltys/Strutynski, Sr. Tract) and 22 units from the Wood Crest Estates Subdivision (a.k.a. Strutynski, Jr. Tract).

This approval is conditioned on the following:

1. East Coventry Township must submit a finalized, signed copy of the Agreement by and among East Coventry Township, North Coventry Township and the North Coventry Municipal Authority, which allows East Coventry Township to purchase sewage treatment capacity in the North Coventry Municipal Authority's Wastewater Treatment Facility.

2. Planning module submissions for East Coventry Township projects tributary to the North Coventry Municipal Authority's Wastewater Treatment Facility must demonstrate their consistency with the intermunicipal agreement referenced in Condition No. 1 above.

3. North Coventry Township currently has no sewage facilities planning in place to allow for the treatment of sewage flows from East Coventry Township at the North Coventry Municipal Authority's Wastewater Treatment Facility. Therefore, any planning modules for East Coventry Township projects tributary to that facility must also be adopted by

OCT 0 8 2003

Casey LaLonde, Manager -3-

North Coventry Township as revisions to that municipality's official sewage facilities plan prior to their submission to the Department. This requirement will remain in effect until North Coventry Township receives sewage facilities planning approval for the expansion of the North Coventry Municipal Authority's Wastewater Treatment Facility to accept the 510,000 gpd total proposed flow from East Coventry Township. North Coventry Township must receive Act 537 planning approval and the Authority must obtain all necessary Department permits prior to this expansion.

If you have any questions, please contact Elizabeth Mahoney of this office.

Sincerely,

James Newbold, P.E.
Regional Manager
Water Management

cc: Chester County Planning Commission
Chester County Health Department
Mr. Flaharty
North Coventry Township
North Coventry Municipal Authority
Ms. Mahoney
Ms. Moore
Ms. Grant
RCSOB, 11th Floor, Sewage Facilities, Attn.: John McHale
Planning Section
Re 30

EDM CONSULTANTS, INC.
1101 South Broad Street, Suite 200, P. O. Box 1545, Lansdale, PA 19446
Phone (215) 393-0670 Fax (215) 393-0652

CERTIFIED MAIL
Return Receipt Requested

February 21, 2006

Chester County Board of Commissioners
2 N. High Street, Suite 512
P.O. Box 2748
West Chester, PA 19380-0991

RE: Notification of Permit Applications
East Cedarville Road/Earl Drive/Buckwalter Road Sanitary Sewer Extension
East Coventry Township
Chester County, Pennsylvania

FILE: 213-002 (1.00)

Dear Sir or Madam:

The purpose of this notice is to inform you of East Coventry Township's intent to submit the following permit applications to the Pennsylvania Department of Environmental Protection (PaDEP) for the East Cedarville Road/Earl Drive/Buckwalter Road Sanitary Sewer Extension project:

1. Individual NPDES for Stormwater Discharges Associated with Construction
2. Water Quality Management Part II Permit for Sanitary Sewer Extensions and Pumping Stations
3. Joint Permit For A Pennsylvania Water Obstruction And Encroachment Permit Application And A U.S. Army Corps Of Engineers Section 404 Permit Application N/A

The project consists of the installation of approximately 20,000 LF of 8" and 10" diameter sanitary sewer pipe within the existing road right-of-way of East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schollhouse Road, Harley Road, Saw Mill Road and Buckwalter Road. The project will also include the installation of approximately 2,000 LF of 8" diameter sanitary sewer pipe across open land within easements between Buckwalter Road and the Pigeon Creek. The project will also include the construction of a sanitary sewer pumping station located adjacent to Saw Mill Road at a point approximately 500 feet east of Harley Road. The name, address and telephone number of the applicant for the project is as follows:

East Coventry Township
855 Ellis Woods Road
Pottstown, Pennsylvania 19465
610-495-5443

The project is located in East Coventry Township, Chester County, Pennsylvania.

Section 1905-A of the Commonwealth Administrative Code, as amended by Act 14, requires that each applicant for a PaDEP permit must give written notice to the municipality and the county in which the permitted activity is located. The written notices shall be received by the municipality and county at least thirty (30) days before the Department may issue or deny the permit.

"Act 67 and 68, which amended the Municipalities Planning Code to support sound land use practices and planning efforts, direct state agencies to consider comprehensive plans and zoning ordinances when reviewing applications for permitting of facilities or infrastructure, and specify that state agencies may rely upon comprehensive plans and zoning ordinances under certain conditions as described in Sections 619.2 and 1105 of the Municipalities Planning Code. Enclosed is a General Information Form (GIF) we have completed for this project. PaDEP invites you to review the attached GIF and comment on the land use aspects of this project; please be specific to PaDEP when identifying any areas of conflict. If you wish to submit comments for the PaDEP to consider in a land use review of this project, you must respond within thirty (30) days to the PaDEP regional office listed below. If there are no land use comments received by the end of the comment period, PaDEP will assume that there are no substantive land use conflicts and proceed with the normal application review process."

Please submit any comments concerning this project within thirty (30) days from date of receipt of this letter to the Pennsylvania Department of Environmental Protection, Southeast Regional Office, 2 East Main Street, Norristown, Pennsylvania 19401.

Very truly yours,

EDM CONSULTANTS, INC.

Michael R. Coyne

Michael R. Coyne

MRC/khr

Enclosure

\002_act14_chesterco

213-002

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Chester County Board of Commissioners
2 N. High St., Suite 512
PO Box 2746
West Chester, PA 19380-0991

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Address

B. Received by (Printed Name) C. Date of Delive

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

WEST CHESTER PA 19380-9998 FEB 23 2006 USPS

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchand
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service label) 7005 0390 0001 9832 0502

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-

EDM CONSULTANTS, INC.
1101 South Broad Street, Suite 200, P. O. Box 1545, Lansdale, PA 19446
Phone (215) 393-0670 Fax (215) 393-0652

CERTIFIED MAIL
Return Receipt Requested

February 21, 2006

Mr. Casey LaLonde, Manager
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

RE: Notification of Permit Applications
East Cedarville Road/Earl Drive/Buckwalter Road Sanitary Sewer Extension
East Coventry Township
Chester County, Pennsylvania

FILE: 213-002 (1.00)

Dear Sir or Madam:

The purpose of this notice is to inform you of East Coventry Township's intent to submit the following permit applications to the Pennsylvania Department of Environmental Protection (PaDEP) for the East Cedarville Road/Earl Drive/Buckwalter Road Sanitary Sewer Extension project:

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855 Ellis Woods Road
Pottstown, Pennsylvania 19465
610-495-5443

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Please submit any comments concerning this project within thirty (30) days from date of receipt of this letter to the Pennsylvania Department of Environmental Protection, Southeast Regional Office, 2 East Main Street, Norristown, Pennsylvania 19401.

Very truly yours,

EDM CONSULTANTS, INC.

Michael R. Coyne

Michael R. Coyne

MRC/khr

Enclosure

\002_act14_eastcovtwp

213-002

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Casey LaLonde, Manager
East Coventry Township
855 Ellis Woods Rd.
Pottstown, PA 19465

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Margaret Ulmer ☐ Agent ☐ Address

B. Received by (Printed Name) C. Date of Deliv

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchand
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service label)

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1

Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry

January 5, 2006

Michael Coyne
EDM Consultants, Inc.
FAX: 215-393-0652 (hard copy will NOT follow)

Pennsylvania Natural Diversity Inventory Review, PNDI 018463
Sanitary Sewer Extension
East Coventry Twp., Chester County

Dear Mr. Coyne,

This responds to your request about a Pennsylvania Natural Diversity Inventory (PNDI) ER Tool "Potential Impact" or a species of special concern impact review. We screened this project for potential impacts to species and resources of special concern under the Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

☒ ***NO PROJECT IMPACT ANTICIPATED***

☐ PNDI records indicate that no known occurrences of species or resources of special concern under DCNR's jurisdiction occur in the vicinity of the project. Therefore, we do not anticipate the project referenced above will impact plants, natural communities, terrestrial invertebrates and geologic features of special concern. No further coordination with DCNR is needed for this project.

☒ PNDI records indicate special concern species or resources are located in the vicinity of the project. However, based on the information submitted to us concerning the nature of the project, the immediate location, and our detailed resource information, we determined that no impact is likely. No further coordination with DCNR is needed for this project.

☐ ***POTENTIAL PROJECT IMPACT - UNDER FURTHER REVIEW***
Based on our PNDI map review we determined potential impacts to species and/or resources of special concern. This project has been passed on to our review committee. The committee will contact the applicant/consultant directly if more information is needed to assess the project's potential impacts. Response time is typically less than a month after the date on this notification.

COMMENTS:

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

This finding applies to impacts to plants, natural communities, terrestrial invertebrates and geologic features only. To complete your review of state and federally-listed species of special concern, please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission has been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Ellen M. Shultzabarger, Environmental Review Specialist, PNHP
DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ c-eshultza@state.pa.us

PNDI # N/A USFWS Project # 2006-0297

U.S. FISH AND WILDLIFE SERVICE

315 South Allen Street, Suite 322, State College, PA 16801

This responds to your inquiry about a PNDI Internet Database search that resulted in a potential conflict with a federally listed, proposed or candidate species.

PROJECT LOCATION INFORMATION

County: CHESTER

Township: EAST COVENTRY

Quad: PHOENIXVILLE

MISC INFORMATION

Date of PNDI search: N/A

Date received by FWS: 3-7-06

Project Type (FWS code #): NT - sewer/water lines

Status: ☑ IC ☐ IP FA: ☐ none ☑ UND ☐ _____

USFWS COMMENTS ☑ FAXED ☐ MAILED

To: WILLIAM BINGMAN

Fax #: 215-393-6652

Affiliation: EDM CONSULTANTS

SPECIFIC PROJECT: EAST COVENTRY RD. / EAGLE DRIVE SEWER EXTENSION

FISH AND WILDLIFE SERVICE COMMENT(s):

_/_ *NOT LIKELY TO ADVERSELY AFFECT*

The federally listed BOG TURTLE occurs or may occur in or near the project area. However, based on our review of the information provided, including the project description and location (AND YOUR DIGITAL PHOTOS WHICH SHOWED POTENTIAL BOG TURTLE HABITAT), no adverse effects to this species are likely to occur. If there is any change in the location, scale, scope, layout or design of the project, further consultation or coordination with the Service will be necessary.

___ This response supersedes our comments of _____, based on our review of the additional project information that was submitted to us on _____.

The above determination is valid for two years from the date of this letter. In addition, this response relates only to federally listed, proposed, and candidate species under our jurisdiction, based on an office review of the proposed project's location and anticipated impacts. No field inspection of the project area has been conducted by this office. Consequently, comments on this form are not to be construed as addressing other Service concerns under the Fish and Wildlife Coordination Act or other authorities. *Please reference the above PNDI # and USFWS Project # in any future correspondence regarding this project.*

This review was conducted by the biologist listed below. He/she can be contacted at 814-234-4090.

_/_ Jennifer Dombroskie (x 242) ___ Bonnie Dershem (x 234) ___ Robert Anderson (x 228)

_/_ Pamela Shellenberger (x241)

SIGNATURE: Cindy L. Elliott DATE: 3-16-06

for Supervisor, Pennsylvania Field Office

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA GAME COMMISSION
2001 ELMERTON AVENUE, HARRISBURG, PA 17110-9797

December 14, 2005

RECEIVED
DEC 23 2005
EDM CONSULTANTS

Mr. Michael R. Coyne
EDM Consultants, Inc.
P.O. Box 1545
Lansdale, PA 19446

In re: E. Cedarville Road / Earl Dr. Sanitary Sewer Extension
File # 213-002 (1.00)
East Coventry Township, Chester County, PA

Dear Mr. Coyne:

This is in response to your letter dated November 4, 2005, regarding the potential impacts of your project on special concern species of birds or mammals and State Game Lands.

Our office review has determined that your project should not cause any adverse impacts to any special concern species of birds or mammals. No State Game Lands are located close enough that any impacts to them are anticipated. However, this determination may be reconsidered if project plans change or extend beyond the present study area, or if additional information becomes available on state-listed species or State Game Lands.

If you have any questions, please contact me at (717) 783-5957.

Very truly yours,

James R. Leigey

James R. Leigey
Wildlife Impact Review Coordinator
Division of Environmental
Planning and Habitat Protection
Bureau of Land Management

Cc: File

Pennsylvania Fish & Boat Commission

established 1866

RECEIVED
JUN 23 2006
EDM CONSULTANTS

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
(814) 359-5237 Fax: (814) 359-5175

June 20, 2006

IN REPLY REFER TO
SIR #21314

MICHAEL COYNE
EDM CONSULTANTS
1101 SOUTH BROAD STREET
SUITE 200
LANSDALE, PA 19446

Re: Secondary Species Impact Review
Bog Turtle and Red-Bellied Turtle Additional Information
EAST CEDARVILLE ROAD / EARL DRIVE SANITARY SEWER EXTENSION
EAST COVENTRY Township/Borough, CHESTER County, Pennsylvania

Dear Mr. COYNE:

I have reviewed your recent correspondence regarding the above referenced project and its potential to adversely impact the bog turtle, (*Glyptemys muhlenbergii*, PA endangered, federally listed as threatened) and the red-bellied turtle, (*Pseudemys rubriventris*, PA threatened). Per my request, you supplied additional information and photographs of the project site. According to the additional information, the vegetation and soils are not consistent with wetlands known to support bog turtles and waterways, wetlands, and soils on the project site are not consistent with those known to support red-bellied turtles. Therefore, I conclude that the project site habitat is not suitable for bog turtles or red-bellied turtles and I do not foresee the proposed project resulting in adverse impacts these two turtle species or any other rare or protected species under Pennsylvania Fish and Boat Commission jurisdiction.

Note that this office performed no field inspection of the project area. Consequently, comments in this letter are not meant to address other issues or concerns that might arise concerning matters under Pennsylvania Fish and Boat Commission jurisdiction or that of other authorities. Thank you for your cooperation and attention to this matter of threatened and endangered species conservation.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/RTM/ma

c: B. Dershem, USFWS

SECTION D

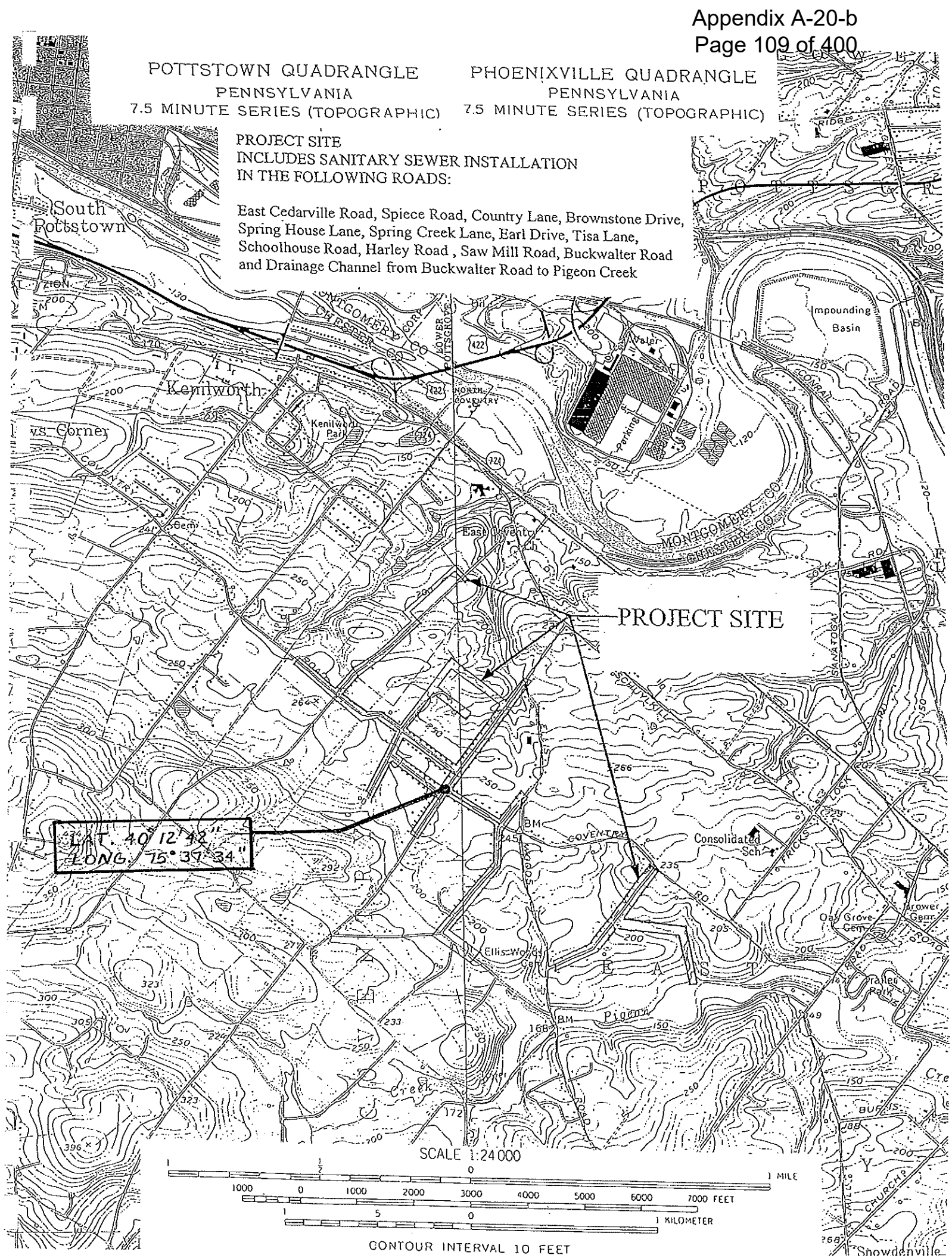
LOCATION MAP

POTTSTOWN QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

PHOENIXVILLE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

PROJECT SITE
INCLUDES SANITARY SEWER INSTALLATION
IN THE FOLLOWING ROADS:

East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schoolhouse Road, Harley Road , Saw Mill Road, Buckwalter Road and Drainage Channel from Buckwalter Road to Pigeon Creek

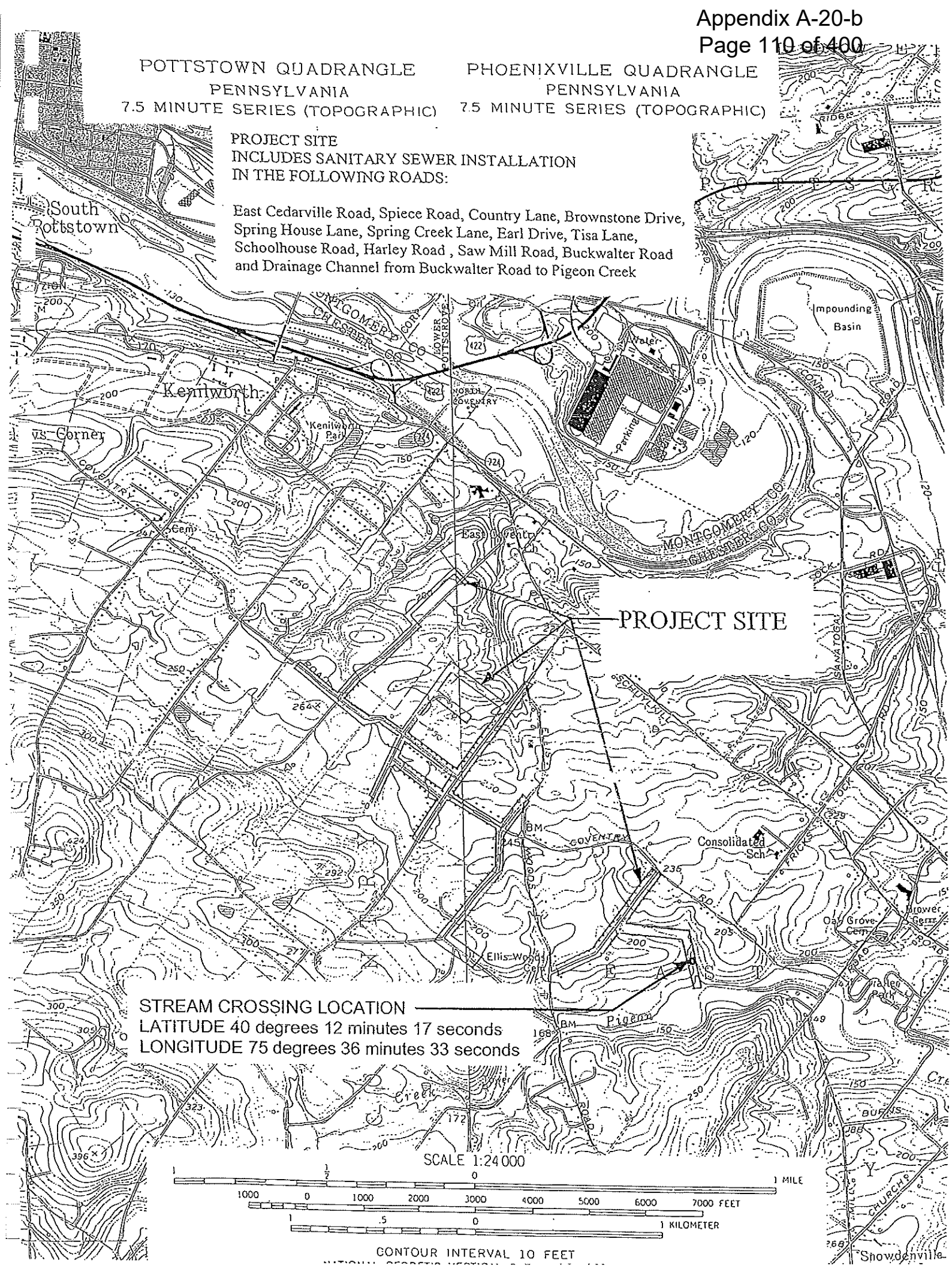


POTTSTOWN QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

PHOENIXVILLE QUADRANGLE
PENNSYLVANIA
7.5 MINUTE SERIES (TOPOGRAPHIC)

PROJECT SITE
INCLUDES SANITARY SEWER INSTALLATION
IN THE FOLLOWING ROADS:

East Cedarville Road, Spiece Road, Country Lane, Brownstone Drive, Spring House Lane, Spring Creek Lane, Earl Drive, Tisa Lane, Schoolhouse Road, Harley Road , Saw Mill Road, Buckwalter Road and Drainage Channel from Buckwalter Road to Pigeon Creek



SECTION E

CONSTRUCTION SPECIFICATIONS

TECHNICAL SPECIFICATIONS FOR CONSTRUCTION OF SANITARY SEWERS AND APPURTENANCES

EAST COVENTRY TOWNSHIP
855 Ellis Woods Road
Pottstown, PA 19465

Revised: February 24, 2004

ARRO #5222.01

ARRO Consulting, Inc.
649 North Lewis Road, Suite 100
Limerick, PA 19468
Phone: 610-495-0303
Fax: 610-495-5855

TECHNICAL SPECIFICATIONS FOR CONSTRUCTION OF SANITARY SEWERS AND APPURTENANCES EAST COVENTRY TOWNSHIP

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TECHNICAL SPECIFICATIONS FOR CONSTRUCTION OF SANITARY SEWERS AND APPURTENANCES EAST COVENTRY TOWNSHIP

SECTION 1 GENERAL CONDITIONS

1.1 Scope

A. These Technical Specifications for Construction of Sanitary Sewers and Appurtenances (hereinafter referred to as ~Technical Specifications") cover the requirements for extensions of and connections to the Township Public Sewer System. All extensions and connections shall be completed in accordance with these Technical Specifications and the Commonwealth of Pennsylvania ~Domestic Wastewater Facilities Manual," latest revision. The work shall include furnishing of all plans, labor, new materials, equipment, supplies, transportation, fuel, and power and performing all work as required by these Technical Specifications, including such detail drawings as may be required to prosecute the work. The work shall be executed in a workmanlike manner by qualified, careful, and experienced professionals and laborers.

B. The Township reserves the right to establish special supplemental requirements for any given extension or connection based upon unique features of the specific project, recent changes in standard operating and construction practices which may not be reflected within these Technical Specifications, or for any other legal or administrative reasons which the Township may identify.

C. The Developer is the party who is ultimately accountable to the Township for all work and responsible for all work regardless if the work is performed by the Developer's Consultant or Contractor. This condition is implied throughout these Technical Specifications.

D. The Developer, Consultant and Contractor shall obtain a copy of these Technical Specifications from the Township and comply with these documents.

1.2 Definitions

A. The following definitions shall be applicable in these Technical Specifications:

1. *Building*: A building is a structure built, erected and framed of component structural parts designed for the housing, shelter, enclosure or support of persons, animals or property of any kind.

2. *Building Sewer*: That part of a sewer system extending from a structure to the sewer lateral. The term may also be referred to as ~service line."

3. *Cellar Drain*: A protected and trapped drain for the purpose of conveying spent waters from the basement of a dwelling, factory, laboratory, workshop, or other Building, but excluding any drainage resulting from rain water, springs, wells, or other ground or surface water or building leakage.

4. *Construction Details*: Those details that have been prepared by the Engineer and approved by the Township, and are included in these Technical Specifications to show general and typical construction requirements. The term may also be referred to as ˜Standard Details."

5. *Consultant*: Any individual, partnership, or corporation providing consulting services to the Developer.

6. *Contractor*: Any individual, partnership, or corporation performing sewer construction work for the Developer.

7. *Developer*: Any equitable owner, landowner, agent of such landowner, or tenant with the permission of such landowner, who makes or who causes to make a subdivision of land and/or a land development, or who constructs, or causes to be constructed a sanitary sewer extension or sanitary sewerage facilities.

8. *Developer's Construction Drawings*: Those drawings prepared by the Developer or his consultant and approved by the Township to show the detailed design of the specific project including plan layout and design details.

9. *Engineer*: The appointed Engineer that represents the Township. The term may also include a construction observer employed by the Engineer.

10. *Extender*: Shall mean the Developer and/or the Contractor.

11. *Lateral*: That part of the sewer system extending from a sewer main, located in the street right-of-way or off-street easement, to the structure-side of the building sewer serving an improved property. If there are to be no improvements on the property, the ˜lateral" shall mean that part of the sewer system extending from said sewer main to the right-of-way or easement line for future connection to the building sewer, if and when said property is improved.

12. *Natural Outlet*: Any outlet into a watercourse, ditch, pond, lake or other body of surface or groundwater.

13. *Or Equal*: Equality of equipment or products versus those specified, as determined by and at the sole discretion of the Engineer. The term may also be referred to as ˜or approved equal."

14. *Professional Engineer*: An individual licensed and registered under the laws of the Commonwealth of Pennsylvania to engage in the practice of engineering.

15. *Professional Land Surveyor*: An individual licensed and registered under the laws of the Commonwealth of Pennsylvania to engage in the practice of surveying.

16. *Subdivision*: The division or redivision of a lot, tract, or parcel of land by any means into two or more lots, tracts, parcels, or other divisions of land.

17. *Township*: Township of East Coventry, Chester County, Pennsylvania.

18. *Vent Pipe*: Shall mean any pipe extended vertically from a sewer to provide ventilation for the building sewer or lateral.

19. *Work*: Labor, services, materials, and equipment as required for the successful completion of the project.

1.3 Fittings and Coordination of Work

The Developer shall be responsible for the proper fitting of all work and for the coordination of the operations of all trades, subcontractors, or material men engaged upon this project. The Developer shall be prepared to guarantee to each of his subcontractors the locations and measurements, which they may be required for the fitting of their work to all surrounding work.

1.4 Superintendence by Contractor

At all times during which work is being performed under or affecting this project, the Contractor shall keep a competent superintendent acceptable to the Township constantly on the site from the commencement of work until the completion thereof, who shall be constantly in touch with work and in all interlocking contracts affected thereby. The superintendent shall, in the absence of the Contractor, see that the instructions of the Engineer are carried out and all directions given such superintendent shall be as binding as if given to the Contractor.

The Developer shall have available at all times, including non-working hours, weekends, and holidays, an emergency maintenance crew and a Person of authority and responsibility to act in cases of emergency, such as flooding, cave-ins, or other unsafe conditions, resulting from construction activities. The Developer shall submit to the Township all the names, addresses and telephone numbers of the emergency crew supervisor(s) prior to beginning construction operations. The Developer shall be responsible for costs resulting from such emergency work.

The Developer is responsible for all costs incurred for any emergency work performed by the Township or others on the Developer's behalf.

1.5 Permits, Licenses and Taxes

The Developer shall give all notice required by and comply with all applicable laws, ordinances, and codes of the Local government. All construction work and/or utility installations shall comply with all applicable ordinances, and codes including all written waivers. Before installing any work, the Developer shall examine the Technical Specifications for compliance with applicable ordinances and codes and shall immediately report any discrepancy to the Township. Where the requirements of the Technical Specifications fail to comply with such applicable ordinances or codes, the Township may adjust the Technical Specifications to conform to such ordinances or codes (unless waivers in writing covering the difference have been granted by the governing body or department). Should the Developer fail to observe the foregoing provisions and proceed with the construction and/or install any sewage facility varying with any applicable Ordinance or code, including any written waivers (not withstanding the fact that such installation is in compliance with the Technical Specifications) the Developer shall remove such work without cost to the Township.

The Developer shall at his own expense, secure and pay to the appropriate regulatory agencies the fees, or charges for all permits required by the regulatory agencies.

Permits for the opening and/or occupation of Township or State roads shall be obtained by the Developer. All inspection fees and/or any charges shall be borne by the Developer, whether same is billed directly to him or to the Township.

Whenever the proposed construction requires a sales, consumers use, or other similar tax, the Developer shall pay for the same.

No Township permit will be waived for the Developer.

1.6 Protection of Work and Property

The Developer shall provide adequate protection against injury or loss arising in connection with the project for all his work and the property of the Township. The Developer shall make good any such damage, injury or loss. The Developer shall adequately protect adjacent property as provided by law. The Developer shall provide facilities for protection required by public authority or local conditions as passageways, guard fences, lights, etc.

The Developer shall preserve and protect all trees, shrubs and grass on or adjacent to the site which do not reasonably interfere with the construction as may be determined by the Township or Engineer, and the Developer shall be responsible for all unauthorized cutting or damaging to trees and shrubs, including damage due to careless operation of equipment, stockpiling of materials or tracking of grass areas by equipment. The Developer shall remove only those trees designated by the Engineer to be removed.

1.7 Temporary Provision for Public Travel

The Developer shall perform his work in such a manner as to interfere as little as possible with the use of intersecting roads or adjoining property. No excavation shall be left open or other obstruction allowed to remain longer than is absolutely necessary; and the Developer shall provide all safeguards and temporary passageways that may be necessary for the convenience and protection of all persons using said property either day or night.

It shall be the duty of the Contractor, at all times, to maintain crossings, walks, sidewalks, and streets open to traffic and in a satisfactory condition, and to keep all fire hydrants, valves, fire alarm boxes, and letter boxes accessible for trenches, a timber bridge at least three feet in width and equipped with side railings shall be provided. When the excavated material will encroach upon sidewalks or private property, planking shall be placed in order to keep the sidewalk or private property clear of excavated material.

Maintenance and protection of traffic on Township Streets and State Highways shall be in strict accordance with PennDOT 408 Specifications, Section 900; Pennsylvania Title 67, Chapter 211; and, Pennsylvania Title 67, Chapter 203. The Contractor shall modify the sign locations daily in order to protect that section of Street to be disturbed during that same day.

No road shall be blocked for traffic for longer than one (1) hour in any direction unless approved in writing by the Township Supervisors or PennDOT. There shall be no lane restrictions in Township Streets or State Highways between the hours of 6:00 am and 9:00 am, and between the hours of 3:00 pm and 6:00 pm.

1.8 Shop Drawings

The Developer shall check and verify all field measurements and shall submit with such promptness as to cause no delay in his own work four (4) copies, checked and approved by him, of all shop or setting drawings and schedules required for the work of the various trades. The Engineer shall check and approve, with reasonable promptness, such schedules and drawings only for compliance, with the information given in the Technical Specifications. The Developer shall make any corrections required by the Engineer, file with the Engineer two copies and furnish such other copies as may be needed. The Engineer's approval of such drawings or schedules shall not relieve the Developer from responsibility for deviations from the Technical Specifications, unless the Developer has in writing called the Engineer's attention to such deviations at the time of submission, and secured the Engineer's written approval, nor shall it relieve the Developer from responsibility for errors in shop drawings or schedules.

1.9 Use of Premises

The Developer shall confine his equipment, storage of materials, and construction operations to the Project Limits as prescribed by ordinances or permits, or as may be directed by the Township, and shall not unreasonably encumber the site or public rights of way with his materials and construction equipment.

The Developer shall comply with all reasonable instructions of the Township and the ordinances and codes of the local government regarding signs, advertising, traffic, fires, explosives, danger signals, and barricades. PennDOT flagging shall be required for all work on existing roads within the Township without exception.

1.10 Materials and Workmanship

Unless otherwise specifically provided, all workmanship, equipment, materials and articles incorporated in the work shall be new and the best grade of the respective kinds of their purpose. Where equipment, materials, articles, or workmanship are referred to in the Technical Specifications as ˜Equal to" any particular standard, the Engineer shall decide the question of equality.

Materials specified by reference to the number or symbols of a specific standard, such as an A.S.T.M. Specification, a Federal Specification or other similar standard, shall comply with the requirements in the latest revision thereof and any amendment or supplement thereto except as limited to type, class or grade, or modified in such reference. The standards referred to, except as modified in the Technical Specifications, shall have full force and effect as though printed herein.

1.11 Samples, Certificates and Tests

The Developer shall submit all material or equipment samples, certificates, affidavits, etc., as called for in the contract documents or required by the Engineer, promptly. No such materials or equipment shall be manufactured or delivered to the site, except at the Developer's own risk, until the required samples or certificates have been approved in writing by the Engineer. Each sample submitted by the Developer shall carry a label giving the name of the Developer (or Contractor), the project for which it is intended, and the name of the producer. The accompanying certificates or letter from the Developer shall state that the sample complies with the Technical Specifications, shall give the name and brand of the product, its place of origin, the name and address of the producer and all specifications or other detailed information which will assist the Engineer in passing upon the acceptability of the sample promptly. It shall also include a statement that all materials or equipment furnished for use in the project, will comply with the samples and/or certified statements.

After actual deliveries, the Engineer will have such check tests made as he deems necessary in each instance and may reject materials and equipment and accessories for cause, even though such materials and articles have been given general approval. If

materials, equipment or accessories, which fail to meet check tests, have been incorporated in the work, the Engineer will have the right to cause their removal and replacement by proper materials or to demand and secure such reparation by the Developer as is equitable.

1.12 Changes in Equipment and/or Materials

In these Technical Specifications and on accompanying drawings, there are specified and shown certain pieces of equipment and/or materials which are deemed most suitable for service anticipated. This is not done to eliminate other equipment and material equally as good and efficient. Should Contractor desire to use some other make of equipment or material, he shall submit to the Engineer a written request for such change and in same shall state advantage to the Township. Determination as to whether or not such change will be permitted rests solely with the Engineer.

1.13 Warranty of Title

No material, supplies, or equipment for the work shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Developer shall warrant good title to all materials, supplies, and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances, constructed or placed thereon by him to the Township free from any claim, liens, or charges. Neither the Developer nor any person, firm or corporation furnishing any material or labor for any work shall have the right to a lien upon any improvement or appurtenance thereon.

1.14 The Township's Right to Do Work

If the Developer should neglect to prosecute the work properly, the Township may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the Developer's escrow funds.

1.15 Engineer's Status

The Engineer shall be the Township's representative during the construction period. The Engineer will make periodic visits to the site to be generally familiarized with the progress and quality of the work and to determine in general if the work is proceeding in accordance with the Technical Specifications. The Engineer will not be required to make exhaustive or continuous onsite inspections to check the quality or quantity of the work and will not be responsible for the Developer's failure to carry out the construction work in accordance with the Technical Specifications and construction drawings. During such visits and on the basis of observations while at the site, the Engineer will keep the Township informed of the progress of the work of Contractor, and may condemn work as failure to adhere to the Technical Specifications and/or construction drawings. The Engineer shall have authority to reject the work whenever such rejection may be

necessary in his reasonable opinion to insure the proper completion of the project.

1.16 Safety and Health Regulations (OSHA)

The Developer and Contractor are responsible to and shall comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Heath Act of 1970 (PL-91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL-91-54). All work must be in compliance with State and Federal occupational health and safety regulations. Neither the Engineer nor the Township is responsible for enforcement of OSHA regulations.

1.17 Progress Schedule

The Developer shall submit for approval immediately after execution of the Contract, a carefully prepared Progress Schedule, showing the proposed dates of starting and completing each of the various sections of work.

1.18 Location of Utilities

The Contractor will be held responsible for locating, in advance of the facilities to be built under this contract, all underground structures, such as water and gas mains; water and gas services; storm sewers and telephone and electric conduits, etc., which may be encountered during the constructing operation. He shall either dig test holes to determine the position of the underground structures, or he shall arrange with the Owners of such underground structures to assign a representative to mark the locations.

The existence and location of underground utilities as indicated on any plans of the Township are presented merely to serve as a notification that such utilities do exist in the general proximity of the work. Any utilities not shown, or not located as shown, shall not be cause of the Contractor to deny responsibility for their protection and/or repair during construction.

A. The Contractor shall notify all utility companies in advance of construction to include requesting the utilities to be located in accordance with Pennsylvania One Call Act 287/187/38 (1-800-242-1776) and cooperate with agents of these companies during the progress of the work. During the course of his work, if the Contractor damages any of the aforementioned utilities, he shall immediately follow the procedure of emergency action and repair as established at his own expense.

B. Whenever the Contractor, during the progress of the excavation, uncovers service pipes or lines, which because of injury or age are in poor condition, he shall immediately notify the proper authority in order that steps may be taken for replacement or repair. Locations of repairs, and the procedures of repairs that have been made shall be documented by the Contractor.

C. The Contractor shall sustain in their places and protect from direct or indirect injury, all pipes, conduits, tracts, walls, Buildings, and other structures or property in the vicinity of his work, whether above or below the ground, or that may appear in the trench.

1.19 Observation of Work

The Township and/or Engineer may appoint such person(s) as they deem necessary to observe, at any time, materials and equipment furnished and work done. The Engineer shall be notified of the time and place of all work performed in sufficient time to allow arrangements for the assignment of construction observers. Neither the surveillance of the work, nor the presence or absence of a construction observer shall relieve the Developer of any of his obligations of making his work conform to the intent of the Technical Specifications and construction drawings. The Township's construction observers shall be authorized to observe all work done and materials furnished. Such inspection may extend to all or any part of the work and to the preparation or manufacture of the materials to be used. Construction observers will be stationed on the work to report to the Engineer as to the progress of the work and the manner in which it is being performed; to report whenever it appears that the materials furnished and work performed by the Contractor fail to fulfill the requirements of the Technical Specifications, and to call to the attention of the Developer/Contractor any such failure or other default, but no surveillance or any failure to observe, at any time or place, shall relieve the Contractor from any obligation to perform all work strictly in accordance with the requirements of the Technical Specifications. In case of any dispute arising between the Contractor and any construction observer as to materials furnished or the manner of performing the work, the construction observer shall have the authority to reject materials or suspend the work until the question at issue can be referred to and decided on by the Engineer. The construction observers shall not be authorized to revoke, alter, enlarge, relax or release any requirements of the Technical Specifications, nor to approve or accept any portion of work, or to issue instructions contrary to the Technical Specifications. Construction observers shall in no case act as foreman or perform other duties for the Contractor, nor interfere with the management of the work by the latter. Any instructions that the construction observers may give the Contractor shall in no way be construed as releasing the Contractor from fulfilling the terms of the Technical Specifications.

1.20 Use of Explosives

The use of mechanical surface impact equipment or drilling and hydraulic rock splitting equipment to remove rock shall be employed by the Contractor to the greatest extent possible. If no other means of rock removal are viable, the Contractor may employ the use of the explosives method (blasting).

Contractor shall take complete responsibility for rock removal by the explosives method including any and all damages or injuries resulting from blasting operations. Blasting shall not be permitted within a radius of 200 feet from any structure or building, or within a 300-foot radius from any gas pipeline, and in no case closer to any gas pipeline than is

permitted by the gas utility company.

1.21 Lines, Grades and Construction Surveying

The Contractor/Developer shall be responsible for the stakeout for the construction of the project. The Contractor shall provide all surveying required to layout the construction work from horizontal and vertical reference points. The Contractor shall provide all engineering personnel, materials, equipment and labor required to stakeout the baselines and/or centerlines and all offset lines and grades.

On jobs where the Contractor intends to use a laser he shall either provide offset stakes at a minimum of 100' intervals and use them to spot check his grades, or provide a level, rod and level operator to spot check his grades.

1.22 As-Built Plans

Extender shall provide the Township with one (1) set of reproducible (Mylar) and three (3) sets of paper prints of the As-Built Plans after the As-Built Plans have been reviewed and approved by the Township. As-Built Plans shall also be delivered to the Township on compact disc as follows:

A. Regardless of the projection and datum utilized for the approved subdivision and/or land development plan, As-Built Plans shall be projected in the State Plane Pennsylvania South Coordinate System, NAD83, utilizing the National Geodetic Vertical Datum of 1988 for consistency with Chester County and Township GIS (Geographic Information System) data.

B. Digital spatial data shall be fully compatible with AutoCAD 2000 or earlier versions. Files must be provided in the AutoCAD data exchange (.dxf) format. ArcInfo data submission is acceptable in the .e00 format providing the data is determined to be acceptable. All submitted data is subject to review and approval prior to acceptance.

C. The data shall be provided in an uncompressed format on a standard compact disc compatible with the Windows 95, 98, 00, and NT operating systems.

1.23 Required Easement Width

The minimum easement width for sanitary sewers at a depth of eight feet (8') and over, as measured from finished grade to the bottom of pipe, shall be thirty feet (30'). The minimum easement width for sanitary sewers at a depth of less than eight feet (8'), as measured from finished grade to the bottom of pipe, shall be twenty feet (20'). The minimum easement width for a sewer line located within the same easement as one or more other sewer lines, or other utility or utilities, shall be thirty feet (30'); however, sufficient easement width shall be furnished to provide adequate separation distance between utilities as specified in Section 4 herein.

1.24 Testing

Testing of sanitary sewerage facilities shall be completed as described elsewhere in the Technical Specifications. The testing forms located in Appendix 1 of the Technical Specifications are incorporated herein by reference.

1.25 Standard Details

The Standard Details located in Appendix 2 of the Technical Specifications are incorporated herein by reference.

1.26 Soil Erosion and Sedimentation Pollution Control

The Township is located in a specially protected high quality or exceptional value watershed. As such, extreme care should be exercised in all disturbance activities to prevent degradation to the Waters of the Commonwealth, and upon completion or temporary cessation of earth disturbance activities, the project site shall be immediately stabilized with the appropriate temporary or permanent stabilization. Slopes greater than 3:1 shall utilize erosion control blanket stabilization.

SECTION 2 TRENCH PREPARATION AND EXCAVATION

2.1 General Requirements

A. Perform sheeting and shoring as required by Federal, State, and local laws and regulations and as otherwise required to protect workers, the public, and adjacent structure, utilities, and other aboveground and belowground facilities.

B. Excavation of every description and of whatever substances encountered shall be performed in accordance with all applicable Federal, State, and Local requirements.

C. Stripping, Storing and Restoring Surface Items: The Extender shall remove all paving, sub-paving, curbing, gutters, brick, paving block, granite curbing, flagging or other similar materials, and grub and clear the surface over the area to be excavated. He shall properly store and preserve such materials that may be required for future use in restoring the surface. The Extender shall be responsible for any loss of damage to said materials because of careless removal or neglectful or wasteful storage, disposal, or use of the materials.

D. Restoration: The Extender shall restore all shrubbery, fences, poles, or other property and surface structures removed or disturbed as a part of the work, to a condition equal to or better than that before the work began, furnishing all labor and materials incidental thereto.

E. Width of Trench: Pipe trenches shall be sufficiently true in alignment to permit the pipe to be laid in the approximate center of the trench. The trench shall be wide enough to provide a free working space on each side of the pipe. However, in no case shall the trench, from 6 inches below the bottom of pipe to 12 inches above the crown of the pipe, be wider than the pipe nominal diameter plus 12 inches on each side of the pipe.

F. Length of Trench:

1. No trench shall be opened more than 100 feet in advance of the pipelines laid.

2. The Extender shall limit all trench openings to a distance commensurate with all rules of safety.

3. If the work is stopped either totally or partially, the Extender shall refill the trench and temporarily repave over the same and the trench shall not be opened until he is ready to proceed with the construction of the pipeline.

4. The length of open trench shall not exceed what the Extender can complete within that working day.

5. All trench openings shall be covered for travel or filled to grade (and properly compacted) at the end of each day.

G. Pumping and Draining: The Extender shall remove by pumping, draining, or otherwise, any water which may accumulate in the trenches and other excavations and shall build all dams and do all other work necessary to keep the trenches or other excavation as free from water as possible. Pumped water shall be discharged to a sediment removal facility approved by the Engineer and County Conservation District.

H. Accommodations of Drainage: The Extender shall keep gutters, sewers, drains, and ditches open at all times so that the flow of storm or other waters shall not be obstructed. If the material excavated from the trenches must temporarily extend over gutters, sewers, drains or ditches, it shall be the duty of the Extender to plank or bridge over the gutters so that the flow of water is not impeded.

I. Maintenance of Traffic:

1. Work shall be conducted so as to cause a minimum of inconvenience to pedestrian and vehicular traffic and to private and public properties along the line of work. It shall be the duty of the Extender, at all times, to maintain crossings, walks, sidewalks, and streets open to traffic and in a satisfactory condition, and to keep all fire hydrants, valves, fire alarm boxes, and letter boxes accessible for use. Whenever it is necessary to maintain pedestrian traffic over open trenches, a timber bridge at least three feet in width and equipped with side railings shall be provided. When the excavated material will encroach upon sidewalks or private property, planking shall be placed in order to keep the sidewalk or private property clear of excavated material.

2. Maintenance and protection of traffic on Township Streets and State Highways shall be in strict accordance with Penn DOT 408 Specifications, Section 900; Pennsylvania Title 67, Chapter 211; and, Pennsylvania Title 67, Chapter 203. The Extender shall modify the sign locations daily in order to protect that section of Street to be disturbed during that same day.

3. Vehicular traffic shall not be blocked for more than one (1) hour in any one direction.

J. Caution in Excavation: The Extender shall proceed with caution in the excavation and preparation of the trench so that the exact location of underground structures, both known and unknown, may be determined, and shall be held responsible for the repair of such structures when broken or otherwise damaged due to carelessness on his part.

K. Protection of Utilities, Property and Structures: The existence and location of underground utilities as indicated on any plans of the Township are presented merely to serve as a notification that such utilities do exist in the general proximity of the work. Any utilities not shown, or not located as shown, shall not be cause of the Extender to deny responsibility for their protection and/or repair during construction.

1. The Extender shall notify all utility companies in advance of construction to include requesting the utilities to be located in accordance with Pennsylvania One Call Act 287/187/38 (1-800-242-1776) and cooperate with agents of these companies during the progress of the work. Procedures for emergency action and repairs to utilities shall be established with the utility company prior to commencement of the work. During the course of his work, if the Extender damages any of the aforementioned utilities, he shall immediately follow the procedure of emergency action and repair as established at his own expense.

2. Whenever the Extender, during the progress of the excavation, uncovers service pipes or lines, which because of injury or age are in poor condition, he shall immediately notify the proper utility owner in order that steps may be taken for replacement or repair. Locations of repairs, and the procedures of repairs that have been made shall be by the Extender.

3. The Extender shall sustain in their places and protect from direct or indirect injury, all pipes, conduits, tracks, walls, Buildings, and other structures or property in the vicinity of his work, whether above or below the ground, or that may appear in the trench.

L. Excavation in Fill: Pipes shall not be permitted to be laid in fill. Pipes shall be laid in virgin earth only.

M. Sinkholes: When a sinkhole is discovered immediately, during, and after excavation the Township must be notified. Remediation of the sinkhole will proceed under the supervision of a geotechnical Professional Engineer, registered in the Commonwealth of Pennsylvania.

2.2 Stream Crossings

A. Construct stream crossing in accordance with an approved Stream Crossing Plan and an approved Sedimentation and Erosion Control Plan. Obtain all Federal, State, and Local permits.

B. Make all necessary provisions for coffer damming, dewatering, and removal of excess excavated material.

C. Maintain the flow in the stream at all times.

D. Construct stream crossings as shown in the Standard Details. Encase pipe to limits shown on the Standard Detail with Penn DOT 408 Class A concrete. The vertical distance between top of concrete and the lowest point in the streambed shall be no less than 36 inches.

E. Where rock is encountered in the stream crossings, do not use forms to construct the concrete encasement. Place concrete on firm rock below the pipe to provide a firm bond between the encasement and the rock. Where concrete encasement to the dimensions shown in the Standard Details is entirely in rock, the vertical distance between top of encasement and the lowest point in the stream bed may be 12 inches, but no less.

2.3 Boring, Jacking, and Tunneling

A. General: Installation of pipe lines shall be by open-cut methods unless boring, jacking, and/or tunneling is approved or required by the Engineer, Penn DOT, railroad company, or other entity having jurisdiction over a particular location where a pipe line is being installed. Prior to the start of such construction, complete plans and specifications shall be submitted to and approved by the appropriate entity.

B. Casing Pipe Materials:

1. *Steel Casing Pipe*: ASTM A53 or other suitable steel meeting the approval of the appropriate entity.

   a) 35,000-psi minimum yield strength.
   b) Full circumference welded joints.
   c) Asphalt coated.
   d) Minimum wall thickness: 0.375 inch.
   e) Steel casing pipe shall be at least 6 inches in diameter larger than the outside diameter of the carrier pipe bell, or as required by the owner of the right-of-way, the entity issuing the permit, or the Township.
   f) Smooth wall steel pipes with a nominal diameter of over 54 inches will not be permitted for use as casing pipe.

2. *Casing Spacer*:

   a) The Extender shall furnish and install casing spacers meeting the following specifications:

      1) Split ring band with minimum of two runners on each half of the band.
      2) Band material: 14-gage hot rolled and pickled carbon steel with epoxy coating.
      3) Band liner: 0.090-inch thick PVC.
      4) Riser material: 10-gage carbon steel with epoxy coating.
      5) Runner material: UHMW polyethylene.

6) Studs, nuts, and washers: Type 304 stainless steel.
7) Acceptable manufacturer: Advanced Products and Systems, Inc. (APS) Model SI, Material Specification C1.

3. *Casing End Seals*: Synthetic rubber with Type 304 stainless steel bands; APS Model AC or AW.

4. The type of casing spacer shown in the Standard Details will also be approved for use on gravity sewers.

SECTION 3 PIPE BEDDING, TRENCH BACKFILL, AND GENERAL PIPE INSTALLATION REQUIREMENTS

3.1 Bedding

A. The trench shall be excavated to a depth of six (6) inches below the outside diameter of the pipe barrel, or deeper if so specified or required due to stability of subsurface material. The resultant subgrade shall be undisturbed, as approved by the Engineer. The bedding shall then be prepared by placing thoroughly compacted 2B (AASHTO No. 57) coarse aggregate (¾", clean and rounded) in 4-inch (uncompacted thickness) lifts to the bottom of the pipe. Bedding material shall be deposited in the trench for the full width below and on each side of the pipe and shall be brought up along the each side of the pipe, to the pipe centerline, uniformly to avoid displacing the pipe. Bedding material shall be compacted by tamping or approved mechanical methods. Bedding shall provide uniform and continuous bearing and support for the pipe at every point between pipe section ends. Pea gravel and river run shall not be acceptable bedding materials.

B. Special Bedding:

1. *Concrete Encasement*: If concrete encasement is required, the trench shall be excavated to a depth of six (6) inches below the outside of the barrel of pipes 24-inches in diameter or less and nine (9) inches below the outside of the barrel of pipes larger than 24-inches in diameter. Two (2) #5 steel reinforcing rods shall be required on the top and bottom of the concrete encasement.

2. *Unstable Subgrade*: Where the bottom of the trench at subgrade is found to be unstable or to include ashes, cinders, any type of refuse, vegetable, or other organic material, or large pieces or fragments of inorganic material, the Extender shall excavate and remove such unsuitable material to an approved width and depth. The unstable subgrade excavation shall be backfilled with 2B aggregate compacted in maximum 4-inch thick layers and compacted.

3. *Sinkholes*: Where a sinkhole is found during construction, the Engineer shall be notified immediately. Remediation of the sinkhole shall be under the guidance of a geotechnical Professional Engineer, registered in the Commonwealth of Pennsylvania.

3.2 Backfilling

A. General: Backfilling shall not be done in freezing weather except by permission of the Engineer, and it shall not be done with frozen material. Do not backfill when the material already in the trench is frozen.

B. Initial Backfill Over Pipe: From the centerline of the pipe and fittings to a depth of one (1) foot above the top of the pipe, the trench shall be backfilled by hand or by approved mechanical methods with 2B clean aggregate. The Extender shall use special care in placing this portion of the backfill so as to avoid damaging or moving the pipe. The backfill shall be compacted in 4" (uncompacted thickness) lifts.

C. Final Backfill:

1. *Aggregate Backfill to Restoration Depth (Existing Roads)*: From one (1) foot above the top of the pipe to restoration depth, the trench shall be backfilled with Penn DOT 2A or 2RC aggregate material, subject to limitations specified, and compacted (in 4" loose lifts with mechanical tamper or 8" loose lifts if vibratory equipment is used) to 100% of the determined dry weight density. Any consolidation method utilizing water such as jetting or puddling shall not be permitted. Consolidation shall proceed from the center of the trench to the sides to prevent arching.

2. *Backfill Material to Restoration Depth (Lawn/Agricultural Areas)*: From one (1) foot above the top of the pipe to restoration depth, the trench shall be backfilled by hand or by approved mechanical methods. Backfill in this section of the trench shall be excavated material approved by the Engineer and containing no stones larger than four (4) inches in maximum dimension. A maximum of 20% of the backfill volume may be stones if the stones are evenly distributed within the material. Excavated material shall be free of organic material, refuse, and frozen materials subject to limitations specified and shall be compacted in 4" loose lifts with mechanical tamper or 8" loose lifts if vibratory equipment is used. Any consolidation method utilizing water, such as jetting or puddling shall not be permitted. Consolidation shall proceed from the center of the trench to the sides to prevent arching.

3. *Compaction*:

a) *Within State Highway Right-of-Way*: All trench backfill operations within State Highway right-of-way will be subject to inspection by representatives of the Commonwealth of Pennsylvania, Department of Transportation, and the work must be performed in accordance with the requirements of that Department. The Extender shall have no claim to the Township even though such requirements may entail more labor or services than the methods herein described. Use mechanical tampers or trench rollers to compact final backfill materials in trench refill operations to produce a density of backfill at the bottom of each layer of not less than 100 percent of maximum lab density as determined by ASTM D698 or as determined by Penn DOT requirements. The Extender shall employ the services of a Professional Geotechnical Engineer, registered in the Commonwealth of Pennsylvania, to perform field determinations of density in accordance with ASTM D1556 or in accordance with Penn DOT requirements.

b) *Existing Township Roads and New Roads:* Use mechanical tampers or trench rollers to compact backfill materials in trench refill operations to produce a density of backfill at the bottom of each layer of not less than 95 percent of maximum lab density as determined by ASTM D698. The Extender shall employ the services of a Professional Geotechnical Engineer, registered in the Commonwealth of Pennsylvania, to perform field determinations of density in accordance with ASTM D1556.

c) *Lawns, Meadows, and Cultivated Fields:* Use mechanical tampers or trench rollers to compact backfill materials in trench refill operations to produce a density of backfill at the bottom of each layer of not less than 90 percent of maximum lab density as determined by ASTM D698.

3.3 General Pipe Installation Requirements

A. Variations: The Township reserves the right to vary the line and/or grade from that shown on the submitted drawings for the pipe lines and to vary the location of fittings and valves when such changes may be necessary or advantageous. No claims for cost compensation will be allowed for changes in location or grade except as such changes are made after trenching has been done.

B. Sewers on Steep Slopes: Sewers on 15 percent slope or greater shall be anchored securely with concrete anchors or equal, spaced as follows:

1. Not over 36 feet center to center on grades 15 percent and up to 35 percent.

2. Not over 25 feet center to center on grades 35 percent and up to 50 percent.

3. Not over 16 feet center to center on grades 50 percent and over.

C. Handling of Materials into Trench: Proper implements, tools and facilities satisfactory to the Township shall be provided and used by the Extender for the safe and convenient prosecution of the work. All pipe, fittings, joining materials, etc. shall be carefully lowered into the trench piece by piece by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to sewer line materials and/or workmen. Under no circumstances shall such materials be dropped or dumped into the trench.

D. Pipe Clearance in Rocks: Ledge rock, boulders and large stones shall be removed to provide a clearance of at least 6 inches below and on each side of all pipe, bells, and fittings for pipes 24 inches in diameter or less, and 9 inches for pipes larger than 24 inches in diameter. The specified minimum clearances are the minimum clear distances, which will be permitted between any part of the pipe and/or fitting being laid and any part, protection or point of such rock, boulder or stone.

E. Concrete Encasement:

1. *Preparation*: Prior to the formation of the cradle or encasement, temporary supports consisting of timber wedges and solid concrete bricks or cap blocks shall be used to support the pipe in place. Temporary supports shall have minimum dimensions and shall support the pipe at not more than two locations, one at the bottom of the barrel of the pipe adjacent to the shoulder of the socket and the other near the spigot end. Two (2) #5 steel reinforcing rods shall be required on the top and bottom of the concrete encasement.

2. *Placing*: After joining of the pipe has been completed, concrete shall be uniformly poured beneath and on both sides of the pipe. The concrete shall be wet enough during placement to permit its flow, without excessive prodding, to all required points around the pipe surface. The width of cradle shall be such as to fill completely the trench width. In case of extremely wide trenches, concrete encasement may be confined above the top of the pipe to a narrower width but in no case shall it be less than the width of trench required for the size of pipe being used.

3. Before depositing concrete, the space within the limits of the pour shall have been cleared of all debris and water. Water shall not be allowed to rise adjacent to, or flow over, concrete for at least 24 hours. Concrete shall be protected from the direct rays of the sun and kept moist, by a method acceptable to the Township, for a period of seven days or until backfilling is begun. In no case shall backfilling begin within 24 hours of the time of placing, and the Township shall have strict control of the rate of backfilling.

F. Hammer Test: Ductile iron pipe and iron fittings shall be inspected for defects and while suspended above grade, be rung with a light hammer to detect cracks.

G. Cleaning Pipe and Fittings: All lumps, blisters and excess coating shall be removed from the bell and spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire brushed and wiped clean and dry and free from oil and grease before the pipe is laid.

H. Laying Pipe: Every precaution shall be taken to prevent foreign material from entering the pipe while the pipe is being placed in the trench. If the pipe-laying crew cannot put the pipe into the trench and in place without allowing earth into it, the Township may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is to be made into the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe. After placing a length of pipe in the trench, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved aggregate material tamped under it except at the joints. Pipe and fittings that do not allow a sufficient and uniform space for joints shall be removed

and replaced with pipe and fittings of proper dimensions to insure such uniform space.

1. Precautions shall be taken to prevent dirt from entering the joint space.

2. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Township. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

I. Cutting Pipe: The cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner, without damage to the pipe, so as to leave a smooth end at right angles to the axis of the pipe.

J. Permissible Deflection of Joints: If deflection is required, make after joint is assembled. The amount of deflection shall not exceed the maximum limits as specified in the AWWA C600 and C900.

K. Unsuitable Conditions for Laying Pipe: No pipe shall be laid in water or when, in the opinion of the Engineer, trench conditions are unsuitable.

L. Pipe Joining:

1. *Mechanical Joints*: The spigot end of the pipe shall be centrally located in the bell so that the rubber gasket is evenly seated.

   a) All loose rust or foreign matter shall be removed from the inside surfaces of the bell and outside surface of the spigot prior to assembly. Bolts shall be tightened uniformly with a ratchet wrench so as to affect the joint seal. The normal ranges of bolt torque to be applied are:

Bolt Size (Inches)	Torque-Ft. Lbs.
⅝	45 - 60
¾	75 - 90
1	100 - 120

   b) If effective sealing is not attained at the maximum torque indicated above, the joint shall be disassembled and reassembled after thorough cleaning.

2. *Push-On Type Joints*: Make joints as recommended by the manufacturer so as to affect the joint seal.

3.4 Guarantees

A. New Township Roads: Dedication of new Township roads within a development shall not be within two years of the installation of the sewer within the roadway. The Extender shall guarantee his work for two (2) years from the date of substantial completion of the sewer for all areas backfilled with suitable excavated material. The date of substantial completion shall be established by the Engineer.

B. Lawns, Meadows and Cultivated Fields: The Extender shall guarantee his work for one (1) year form the date of substantial completion of the sewer. The date of substantial completion shall be established by the Engineer.

SECTION 4 SEPARATION OF SEWERS AND OTHER UTILITIES

4.1 Horizontal Separation

A. Potable Water Lines:

1. Do not install any sewer line closer than 10 feet horizontally to any potable water line.

2. Where site conditions prohibit the 10-foot separation, a sewer may be laid closer than 10' to a water main if:

   a. It is laid in a separate trench; of if

   b. It is laid in the same trench, with the water main located at one side of a bench of undisturbed earth; and if

   c. In either case the elevation of the top (crown) of the sewer is at least 18 inches below the bottom (invert) of the water main.

B. Other Utilities

1. Other underground utilities, including but not limited to storm sewers, gas mains, and electric, shall not be located within six (6) feet of the centerline of the sanitary sewer.

2. Where site conditions prohibit the 6-foot separation, alternative sanitary sewer routing must be approved by the Engineer.

4.2 Vertical Separation

A. Potable Water Lines:

1. Where a sewer line must cross under a potable water line, install the sewer line so that the top of the sewer line is at least 18 inches below the bottom of the potable water line. Maintain the 18-inch vertical separation for at least 10 feet on either side of the potable water line as measured perpendicularly from the potable water line. Provide structural support for the potable water line so that the pipe does not settle or deflect during or after completion of construction.

2. Where the sewer line cannot be located to meet the requirements specified in Section 4.2.A.1 above, proceed as follows:

   a. Relocate the potable water line to provide the 18-inch separation from top of sewer line to bottom of water line, for a minimum distance of 10 feet on either side of the sewer line as measured perpendicularly from the sewer line.

b. Center one full length (minimum 18 feet) of potable water pipe over the sewer line so that the water line joints will be as far from the sewer line as possible.

c. Construct the relocated water line of AWWA C151 Special Class 52 ductile iron pipe with push-on joints or mechanical joints.

d. Provide adequate structural support for the potable water line so that the pipe does not settle or deflect during or after completion of construction.

e. Construct the sewer line for a minimum distance of 10 feet on either side of the potable water line, as measured perpendicularly from the water line, of AWWA C151 Special Class 52 ductile iron pipe with mechanical joints.

f. Prior to backfilling of the pipes, pressure test both the potable water line and the sewer line to assure that any joint within 12 feet of the crossing point, as measured perpendicularly from one pipe to the other pipe, will not leak.

B. Other Utilities

1. Other underground utilities, including but not limited to storm sewers, gas mains and electric, shall not be located within 12 inches (measured from edge of sewer pipe to edge of utility line) of the sanitary sewer.

2. Where site conditions prohibit the 12-inch separation, alternative sanitary sewer routing must be approved by the Engineer; or, utility lines may be rerouted if feasible.

4.3 Exceptions to Separation Requirements

Where a sewer line must cross over a potable water line or the separation requirements as specified above in Sections 4.1 and 4.2 cannot be met, contact the Engineer to determine materials, details, and extent of concrete encasement for pipes.

4.4 Depth of Cover

Provide minimum cover of 4 feet from top of pipe to finished grade, unless otherwise approved by the Engineer.

SECTION 5 GRAVITY SEWERS

5.1 Materials

A. General: All materials shall be new, manufactured within one (1) year prior to date of installation.

B. Pipe Joints: For pipe joints, use rubber gaskets suitable for conveying domestic sewage.

C. Ductile Iron Pipe: Ductile iron cement lined pipe shall be in full accord with ANSI A21.50 and ANSI A21.51, Latest Edition, for the material class or pressure designated and AWWA C150, Latest Edition, for wall thickness.

1. Minimum diameter shall be 8 inches.

2. Minimum thickness shall be Special Class 52.

3. Factory coat outside of pipe and fittings with NSF approved epoxy. Coating shall not be less than 20 mil dry film thickness.

4. Iron fittings shall be ductile iron or gray iron and shall be in full accord with the standard specification set forth in ANSI 21.10. Fittings larger than 48-inches shall be in full accordance with AWWA C100 Class B.

5. Joints shall be of the push-on type or mechanical joint type in full accord with ANSI A21.10 for all pipes except at changes in alignment, valves, or other conditions requiring restraints.

6. Inside of pipe shall be factory coated with NSF approved epoxy material. Coating shall not be less than 20 mil dry film thickness.

D. Polyvinyl Chloride Sewer Pipe: PVC pipe and fittings up to and including 15" diameter shall be manufactured in accordance with ASTM D3034 "Specifications for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings" having a minimum wall thickness equal to SDR-35 (Standard Diameter Ratio) as noted in Table 1 of the ASTM Specification. PVC pipe and fittings between 18" and 21" in diameter shall be manufactured in accordance with ASTM F679 "Specifications for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings" having a minimum wall thickness equal to T-1 as noted in Table 1 of the ASTM Specification. PVC pipe and fittings between 24" and 36" in diameter shall be manufactured in accordance with ASTM F794 "Poly (Vinyl Chloride) (PVC), Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter" and ASTM F949 "Polyvinyl Chloride (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings", and shall be Ultra-Corr PVC Gravity Sewer Pipe as manufactured by Uponor ETI Company, or equal.

1. Minimum diameter shall be 8 inches.

2. Fittings shall conform to same ASTM standard as for pipe.

3. Joints shall be push-on with elastomeric gasket, ASTM D3212; and, ASTM F477 for gasket specifications.

E. PVC Waterstop for Use at Connection to Existing Manholes: Gasket-type waterstop composed of virgin polyvinyl chloride (PVC) such as manufactured by Fernco Joint Sealer Co., CMA Waterstop as distributed by The General Engineering Company, or equal.

F. Flexible Pipe Coupling: Clamped design with virgin PVC coupling and two (2) type 305 stainless steel bands, such as manufactured by Fernco Joint Sealer Company, or equal.

G. Manhole Materials:

1. *General*: All pre-cast manhole components shall meet the requirements of ASTM C478 unless otherwise specified below.

   a) *Acceptable Manufacturers*:
      1) Terre Hill Concrete Products.
      2) Monarch.
      3) Or Equal.

2. *Precast manhole bases*: Precast manhole bases shall have flexible watertight joints at the point of entry of any sewer pipe into the manhole. The rubber compression gasket materials shall conform to ASTM C361 or ASTM C443. The gaskets shall be cast into the manhole base to become an integral part of the concrete. The gaskets shall be A-Lok Rubberman, Dura-Seal III as manufactured by Dura Tech Inc., Dual Seal II as supplied by Terre Hill Concrete Products, or equal.

3. *Precast concrete manhole components*: Concrete shall have a compressive strength of not less than 4,000 psi at 28 days (tests shall be in accordance with ASTM C39) with Type II cement. Manholes shall be reinforced both vertically and horizontally.

4. *Cast-in-place manhole components*: Concrete shall have a compressive strength of not less than 4,000 psi at 28 days (tests shall be in accordance with ASTM C39). Aggregates shall be of quality, gradation and proportions as approved by the Township after submission of test results on the design mix. Each cubic yard of concrete shall contain no less than six (6) bags of Portland cement. Slump of concrete shall not exceed 4 inches. Ready-mixed concrete shall conform to

ASTM C94. Portland Cement shall conform to ASTM C150, Type II. Manholes shall be reinforced both vertically and horizontally.

5. *Manhole Steps*: No. 4 Grade 60 steel reinforcing rod encapsulated in copolymer polypropylene compound conforming to ASTM D4101; M.A. Industries, Inc., or equal. The distance between rungs shall be 12 inches. The rungs shall have end lugs to prevent side slippage, and shall have a minimum clear rung width of 12 inches. The step surface shall be non-slip. The steps shall be protected from dissimilar materials in accordance with ASTM C478, Latest Revision.

   a) Manhole steps shall be positioned in the manhole in such a manner so as to permit easy entrance and exit from the manhole and so as not to conflict with any pipes, valves, or benches.

   b) Manhole steps shall be grouted in place using a non-shrink, non-metallic grout.

   c) The use of polypropylene inserts to secure the manhole steps shall not be permitted, nor shall the use of epoxy to secure the steps.

H. Non-Shrink, Non-Metallic Grout: Ready-mix product such as Sonogrout by Sonneborn, Masterflow 713 Grout by Master Builders, Darex Non-Metallic Grout by W. R. Grace and Company, F-100 by Sauereisen Cement Company, Five Star by U. S. Grout Corporation, or equal.

I. Preformed Plastic Sealing Compound: Fed. Spec. SS-S-210A, AASHTO M-198B ASTM C-990, rubber base compound, and shipped protected in a removable two-piece wrapper. Size cross-section of rope form to provide squeeze-out of material around entire interior and exterior circumference when joint is complete.

   1. *Acceptable Manufacturers*: Henry Company BUTYL-NEK, or approved equal.

J. Coatings:

   1. Prepare surfaces to be coated in accordance with the written instructions of the coating manufacturer, including cleaning, sandblasting, or acid etching as necessary.

   2. Coat precast components at the factory.

   3. *Interior and Exterior Surface Coatings*: Use NSF approved epoxy, 20-mil dry film thickness. Interior color shall be white. Exterior color shall be beige.

   4. An interior plastic liner (in lieu of interior surface coating) shall be provided on all force main discharge manholes, the next 5 manholes downstream of the force main discharge manhole, and in other manholes as directed by the Engineer.

Interior plastic liner shall provide a continuous, impermeable lining to shield precast concrete against deterioration caused by corrosive atmosphere. Interior plastic liner shall be AGRU Sure Grip Liner and GU-Base Liner as manufactured by Terre Hill Concrete Products. Channels, Bench and all penetrations through liner shall receive factor applied corrosion resistant coating.

K. Manhole Frame and Cover: Gray iron castings with built-in o-ring seal conforming to ASTM A48, minimum Class No. 30, designed for AASHTO Highway Loading HS-25. Provide castings of uniform quality, free from blowholes, porosity, hard spots, shrinkage distortion or other defects. Frame and cover design and dimensions shall be as shown in the Standard Details. Standard frame and cover shall be Cat. No. 1040 as manufactured by East Jordan Iron Works, Inc. Within 100-year floodplains and any other areas designated by the Engineer, watertight frame and covers shall be required. Watertight frames and covers shall be Cat. No. 1040 "Watertite" as manufactured by East Jordan Iron Works, Inc. Where directed by the Engineer in non-street areas, the top of rim elevation shall be set above finished grade.

1. *Finish*: Bearing surfaces shall be machined to prevent rocking and rattling under traffic.

2. *Frame Hold-down Bolts*: J or L shape with standard coarse thread ends, ASTM A307, four per frame.

L. Watertight Manhole Insert:

1. *General*: Manhole inserts shall be required in all manholes fit with a standard (as opposed to watertight) frame and cover. The manhole insert shall be manufactured from corrosion proof material suitable for atmospheres associated with wastewater collection systems.

2. *Material*: The insert shall be made from High Density Polyethylene Copolymer material that meets ASTM Specification Designation D 1248 Class A, Category 5, Type III. (The insert shall have a minimum impact brittleness temperature of 105°F or less.) The thickness shall be a uniform 1/8 inch or greater. The insert shall be manufactured to the dimensions as shown on the Drawings to allow easy installation within the manhole frame. The insert shall be fit with a nylon-lifting strap for removal.

3. *Venting*: The insert shall have a system of relieving pressure from the manhole or relieving a vacuum in the manhole. The venting system shall contain NO moving parts, which could be affected by grit accumulations, nor have any parts subject to corrosion. The venting system shall not allow water to completely fill the insert, which during freezing weather could freeze and lift the manhole cover.

4. *Manufacturer*: The insert shall be manufactured by Parson Environmental Products, Inc., or equal.

5. *Odor Control*: In areas where odor control is a concern, a special insert shall be utilized in lieu of a watertight insert when directed by the Engineer. The special insert shall be Odoreater Manhole Insert as manufactured by Parson Environmental Products, Inc. The associated carbon canister shall be replaced at maximum 6-month intervals or at intervals recommended by the manufacturer for the specific application, whichever is more stringent.

M. Precast Grade Rings: Leveling and adjusting units of 3-inches or 4-inches thickness of materials and constructions as specified previously. Factory cast grade rings with hold down boltholes matching location of same in manhole frame. Design must provide for full bearing of manhole frame.

N. Underground Warning Tape:

1. Printed polyethylene tape, 3 inches minimum wide, magnetic for PVC pipe, green for sanitary sewers, 1-inch minimum lettering, printed with name of utility buried below, and suitable for installation in all soil types. Tape shall be placed above all sewers (refer to the Standard Details).

O. Deep Manholes: All manholes greater than or equal to 20' in depth, measured from the top of rim elevation to the invert out elevation, shall be provided with a landing (FRP grating) at the midpoint elevation. The Engineer, prior to installation, shall approve the landing and associated mounting hardware.

P. Stubs: Where directed by the Engineer, manhole shall be fit with a plugged pipe stub (diameter and invert elevation to be determined by the Engineer) to accommodate future connections.

5.2 Installation

A. General: Grade of pipe and distance between manholes must meet all requirements in the most recent edition of the Commonwealth of Pennsylvania "Domestic Wastewater Facilities Manual" unless noted otherwise in these Technical Specifications. All pipe shall be laid to a uniform line and grade between manholes, bell ends upgrade, with a firm and even bearing along the barrel of the pipe, close joints, and smooth invert. The spigot end of the pipe shall be centered in, shoved tight and secured against the bell of the previously laid pipe. The interior of each pipe section shall be cleaned of all excess joint and foreign material before the next pipe is laid. The pipe shall be laid in the aggregate materials as specified. Pipe laying shall commence at the lowest point and proceed upgrade. At the close of each day's work, and at such other times when pipe is not being laid, the open end of the pipe shall be protected with a close

fitting stopper. Installation and joint assembly of plastic pipe shall in accordance with ASTM D 2321 for PVC pipe and AWWA C600 for ductile iron pipe.

B. Construction Control: The Contractor shall provide at least three grade boards in advance of pipe laying at all times at intervals not exceeding fifty (50) feet and stretch a line parallel with the grade line. From this line, the trench and every pipe laid shall be tested as to grade and alignment. Base lines and controlling elevations established for the construction of the work shall be preserved and kept uncovered so that they can be examined at any time.

1. The use of laser equipment shall be permitted. Grade boards as specified will not be required if a laser is used.

2. Regardless of control used, the Contractor shall provide alternative verification of grade as work progresses. Pipe not laid to proper line and grade will be removed and reconstructed at the Contractor's expense.

C. Manholes: Manholes shall be placed at each change of grade, size and alignment of the pipe, and at all intersections. Terminal cleanouts will not be acceptable.

D. Construction Requirements:

1. Sanitary sewers shall not be placed in fill. Sanitary sewers shall be installed in virgin earth and trenches shall be restored as shown in the Standard Details.

2. Sanitary sewers shall not be installed within six (6) feet of electric and gas lines.

3. Contractor shall install, cap, bury, and mark drainage pipe in trenches where springs are encountered.

5.3 Testing

A. Alignment: After the sewers have been laid and backfilled, a light shall be flashed between manholes or manhole locations to determine whether the alignment of the sewer is true and whether any pipe has been displaced, broken or otherwise damaged subsequent to laying. This test will again be conducted before final acceptance of the sewer. Each section (manhole to manhole) of sewer shall show a good light circle throughout its length and any and all defects shall be corrected by the Extender, to the satisfaction of the Township, before the work shall proceed and before acceptance shall be made.

1. Mandrel testing will be required in addition to the lamp testing unless waived by the Township. Refer to Paragraph 5.3.E of this Section for the applicable requirements.

B. General Requirements for Leakage Testing:

1. Perform leakage tests after backfilling, no sooner than five days after backfilling.

2. At the Extender's option, preliminary leakage tests (for Extender's information only) may be performed before backfilling provided that:

   a) There is no conflict with other Specification Sections that require that no more than a specified length of trench is open at any time.

   b) All pipe (sewer mains and service laterals) is sufficiently restrained to prevent movement during the testing process.

   c) Tests for pipeline acceptance are also made after backfilling.

C. Air Test for Leakage:

1. *Air Testing*: The Contractor shall test each section of sewer between manholes and all laterals to the limit of this contract using low-pressure air. Testing shall not be performed, until all backfilling has been completed. The Contractor may, at his option, test the section of sewer for his own purposes, prior to completion of backfilling; however, the requirements of this subsection shall not be deemed to be completed until the lines have been tested after the backfilling has been completed and trench settlement has been minimized. The costs of any testing incurred prior to authorization from the Engineer after backfilling has been completed shall be borne by the Contractor.

2. A minimum of two minutes shall be provided to allow equilibrium of the air temperature with pipe wall before test readings shall commence. The rate of air loss shall be determined by measuring the time interval required for the average internal pressure to decrease by 1.0 psig.

3. The initial test pressure to be developed in the sewer and laterals shall be determined as follows:

   a) For depths six (6) feet or less, the internal pressure shall not be less than 6.0 psig.

   b) For depths greater than six (6) feet, the internal pressure in psig shall be calculated as the sum of 3.5 plus the maximum height in feet divided by 2.3 between the invert of the sewer and the existing ground surface in the section of sewer to be tested. (For example, if the maximum height were determined to be 9.2 feet, the added pressure would be 4.0 psig. The initial test pressure in the sewer would then be 7.5 psig. The allowable drop would be to 6.5 psig within the time indicated elsewhere in this subsection.)

c) In no case shall the test pressure in the sewers or laterals be greater than the maximum internal differential joint pressure recommended by the manufacturer of the pipe. The minimum test pressure shall be 6.0 psig.

4. The pipe shall be considered acceptable if the air loss rate does not exceed 0.0030 cubic feet per minute per square foot of internal pipe surface when tested at the initial pressure previously defined in this subsection. The time for the air pressure to decrease 1.0 psig shall not be less than the time indicated in the following table:

Pipe Diameter	Minutes	Seconds
6"	2	55
8"	3	57
10"	4	43
12"	5	5
15"	7	5
18"	8	30
21"	9	50
24"	11	20
27"	12	45
30"	14	10
36"	17	00
42"	19	50
48"	22	40

5. If the above rates of leakage are exceeded, the Contractor shall, at his expense, determine source of leakage and make all necessary corrections and retest.

6. The Contractor shall submit to the Engineer for approval the detailed test procedure and list of test equipment he proposes to use prior to testing.

D. Infiltration:

1. After the air testing described in the preceding Section 5.3.C has been completed by the Extender and prior to the use of the sewer by sewerage, regardless of any indications of the test results made by the Township, the Township reserves the right to perform field investigations, prior to final written acceptance of each sewer section by the Township and/or during the warranty period, to establish the leakage of groundwater into the sewer and laterals. The cost of these investigations shall be borne by the Extender.

2. Should the leakage exceed 50 gallons per day per inch diameter per mile of pipe for any section, the Contractor shall, at the direction of the Township, and at no cost to the Township, perform any additional testing or corrective work required to reduce the infiltration in each manhole run from those lines installed by the Contractor to less than 50 gallons per day per inch diameter per mile of pipe. This

leakage applies to each manhole run separately and should not be construed to mean total leakage in the total system. The scope of this corrective work shall include, but not be limited to, cleaning, televising and testing the sewer and laterals to the limits installed by the Contractor, to include testing and grouting of joints, excavation and replacement of faulty or damaged portions of the work, and all final restoration.

E. Deflection Testing of PVC Pipe:

1. Perform deflection test a minimum of 30 days after completion of backfilling on the pipe section to be tested.

2. Use a mandrel with a diameter equal to 95 percent of the actual inside diameter of the pipe. Do not use mechanical pulling devices to move the mandrel through the pipe.

3. Adjustable mandrels will not be acceptable for use in deflection testing.

4. Pipe section will be accepted if deflection does not exceed 5 percent of the actual inside pipe diameter at any point in the section under test.

F. Vacuum Testing of Manhole:

1. Vacuum testing of all manholes is required. Prior to testing manholes, thoroughly clean such and seal openings, both to complete satisfaction of the Township. Seal openings using properly sized plugs. Perform testing with frames and covers installed. The joint between the manhole and the manhole frame shall be included in the test.

   a) Perform vacuum testing in accordance with the testing equipment manufacturers written instructions.

   b) Draw a vacuum of 10 inches of mercury and close the valves.

   c) Consider manhole acceptable when vacuum does not drop below 9 inches of mercury for the following manhole sizes and times:

      1) 4-foot diameter - 60 seconds.
      2) 5-foot diameter - 75 seconds.
      3) 6 foot diameter - 90 seconds

2. If any manhole fails to pass the vacuum test, the Extender shall determine at his own expense the source or sources of leakage. The Extender shall repair or replace all defective materials and/or workmanship and shall conduct such additional retests as required to demonstrate that the manhole meets the requirements, at his own expense and at no cost to the Township. All materials

and methods used to repair the manholes shall meet with the approval of the Township.

G. Closed Circuit Television Inspection

1. Closed circuit television inspection of all sewer piping is required. Television inspection shall be performed no sooner than thirty days after backfilling.

2. The Contractor shall provide a complete closed circuit television system consisting of but not limited to the following items:

   a. Van-type viewing room, mounted therein being camera controls, heating and air conditioning facilities, communication facilities, and monitoring facilities that provide clean and visible pictures of the work being performed.

   b. Television and video and grouting equipment capable of accurately measuring distances inside the sewer.

   c. An independent power source.

   d. A color, radial view camera with the ability to view into laterals and to view the complete pipe circumference. The camera shall include a lighting system to allow illumination of lateral sewer connections.

   e. For the inspection of sewer mains and laterals with bends and size restrictions, a mini, flexible camera shall be used. The camera shall be able to view the complete pipe circumference and shall include a lighting system that illuminates the entire pipe circumference and lateral connections.

   f. Prior to view tape televising, the pipe shall be televised to determine that the line is sufficiently clean. The contractor is responsible for providing an unobstructed view of no less than 75% of the pipe interior.

   g. Videotapes used shall be high quality VHS type V.C.R. tapes.
   h. During video taping, the contractor shall supply the following audio information:

      1) Day, month, year and time.
      2) Location of manholes using nearest street intersection and Township manhole numbering.
      3) Descriptions for the condition of all manholes, laterals, leaking joints, breaks and other problem areas.

i. During videotaping, the contractor shall provide the following screen display information, which shall be located on the screen so as to provide an unobstructed view:

1) Month, day, year
2) Job number
3) Manhole Number _____ to Number _____
4) Linear footage
5) Weather conditions at time of videotaping.

H. Acceptance: Observation of successful testing of manholes or sewers by the Township does not constitute acceptance of the system or any portion thereof. Only upon final inspection by the Engineer and upon written acceptance for same will the system or portion thereof be considered acceptable. Upon such acceptance, the warranty period will commence. If, during this final inspection, any irregularities are observed, the condition must be corrected at the Extender's expense prior to acceptance.

SECTION 6 GRAVITY LATERAL SEWERS AND SERVICE LINES

6.1 Materials

A. Pipe: Sewer pipe materials underground shall be Class 52 ductile iron pipe (4" minimum) conforming to ANSI A 21.51 or AWWA C151 latest edition from the building wall to where two feet of contact length with undisturbed earth can be achieved. A ductile iron (Class 52) "P" trap with vent at a distance of at least ten feet from the building shall be installed. A cleanout made from four-inch (4") minimum ductile iron pipe (Class 52) pipe shall be provided at the transition between the four inch (4") ductile iron service line and PVC (SDR 35, ASTM D3034) service line, and also at the transition between the PVC service line and the six inch (6") PVC (SDR 35, ASTM D3034) lateral at the Right-of-Way or Sewer Easement line. All PVC piping shall have push-on joints with elastomeric gaskets. ASTM D3212 solvent welded PVC pipe is prohibited underground. Refer to the Standard Details for further detail.

B. Pipe Plugs: Designed for permanent installation and removable. Obtain plugs for various types of pipe used from the respective pipe manufacturer.

C. Wye Connections: Wye connections are to be used for lateral connections on new sewer lines.

6.2 Installation

A. Fittings (risers, bends, wyes, and plugs) and service pipe shall be furnished and installed in strict accordance with these Technical Specifications and any and all practices and precautions required above for the gravity Sanitary Sewers are equally applicable to the Lateral Sewers and Service Lines. The Extender shall place a 2"x 2" wooden marker at the end of each Lateral Sewer unless connecting directly to an existing Service Line. The marker shall be one piece and may not be constructed from two or more smaller pieces. The marker shall extend from the Lateral Sewer invert to 24 inches above grade. A PVC-compatible mechanical joint (MJ) cap or plug shall be installed at the end of the lateral.

B. If rock is encountered during the installation of a Lateral Sewer, the Extender shall construct the Lateral Sewer to provide a minimum "rock-free" distance of one foot beyond the end of the Lateral Sewer. No Lateral Sewer shall be "butted" against rock.

C. All Lateral Sewers and Service Lines shall be installed with a minimum grade of ¼"/ft. A straight alignment shall be maintained where possible. A minimum cover of four feet (4') shall be maintained to prevent crushing and freezing of the pipe, unless the Engineer approves a lesser minimum cover.

D. No trench shall be backfilled until the Lateral Sewer or Service Line has been visually inspected and approved by the Engineer and/or Township Code Enforcement Officer (refer to the Standard Details for pipe bedding and backfill).

E. Trap: A main or intercepting trap shall be installed as shown in the Standard Details.

F. The Engineer reserves the right to test each Service Line prior to approval by the Township Code Enforcement Officer. The test shall be witnessed by an agent of the Township and the Service Line shall not be deemed acceptable until said Service Line has satisfactorily passed the test hereinafter described. All costs of testing and any subsequent test(s), including equipment, material, water or labor required shall be the responsibility of the Owner.

1. The Service Line shall be tested by plugging the line at the Service Connection (point of connection with the Lateral Sewer) and by plugging the line at its point of connection with the Building. All risers, vents, plugs and cleanouts shall be adequately blocked, plugged or supported to withstand the pressure associated with the test. The test shall be made by either air or water. In either case, the test shall be designed to provide a residual pressure of 5.0 psi throughout the length of the Service Line.

2. The test shall be made by attaching a water pump or air compressor testing apparatus to any suitable opening and after closing and supporting all other inlets and outlets to the Service Line, forcing air or water into the Service Line until there is a uniform gauge pressure of 5.0 psi. The Service Line shall be deemed acceptable if this pressure is maintained for 15 minutes without the introduction of additional water or air.

3. Care shall be taken that the pressures generated by the test do not exceed the pipe manufacturer's recommendations.

G. Lateral Sewers shall be tested in accordance with the procedures specified in Section 5 for gravity Sanitary Sewers. However, in the case of a new Lateral Sewer tying into an existing gravity sewer main, the Lateral Sewer shall be tested concurrently with the Service Line in accordance with Subsection F above.

H. The following requirements shall be applicable for that portion of a Service Line installed within the paved portion of Street rights-of-way and it shall be the responsibility of the Owner of the Improved Property served to require his plumber or contractor to adhere to these requirements.

1. The trench shall be thoroughly compacted using mechanical tamping equipment.

2. The trench area shall be graded to conform to existing grade.

3. No surplus excavated materials or debris shall be piled or stored in this area.

4. All Street surfaces that are disturbed or damaged by the Owner or his plumber or contractor shall be properly repaired at the Owner's cost.

5. Subsequent settlement of the Street resulting from improper construction practices shall be promptly repaired at the Owner's cost.

6. In no case, shall the sewer lateral be installed at a higher elevation than any potable water service within 18-inches.

7. In no case, shall a sewer lateral be installed within a 24-inch radius of any other utility, except for potable water lines, in which case a minimum separation of ten (10) feet is required.

8. If the Owner or his plumber or contractor fails to comply with any of the requirements of this Subsection H, then after reasonable notice to the Owner, the Township may proceed on its own to make any necessary corrections or repairs so that the aforesaid requirements are fulfilled. If the Township does so repair, then the Owner of the Improved Property shall be liable to the Township for the entire cost of such repairs and said cost will be included in the Owner's next quarterly billing for sewer services.

9. Only one (1) drop lateral connection may be employed in any single lateral.

6.3 Special Conditions and Requirements

A. Unless otherwise authorized by the Engineer or Township Code Enforcement Officer, cleanouts shall be provided in each Service Line at fifty (50) foot intervals.

B. Cleanouts shall be constructed using Wye or Tee-Wye fittings in the run of the pipe with a 45-degree bend (1/8 bend) and riser to the ground surface. The riser shall be provided with a standard four-inch (4") screw type ferrule.

C. Where the Service Line and the Lateral Sewer are both of the same size pipe, Service Connections shall be made by properly joining the spigot end of the Service Line with the bell end of the Lateral Sewer. This connection shall be approved by the Engineer.

D. If the Service Line and Lateral Sewer are of unlike materials or sizes, the Service Connection shall be made with a fitting of PVC elastomeric sleeve or a flexible coupling or reducing coupling with stainless steel straps suitable for the type and size of pipe to be connected (Fernco Coupling, or approved equal). Sealing with grout or mastic will in no circumstances be permitted.

E. All Service Connections to Sewers shall be made at the terminus of the Lateral Sewer unless the Engineer specifically authorizes otherwise.

F. When no Lateral Sewer was previously constructed, the connection to the Sewer main and the construction of the Lateral Sewer from the Sewer main to the edge of the right-of-way or sewer easement line shall be made by the Owner at the cost of the Owner, under the inspection of the Engineer and/or Township Code Enforcement Officer.

G. Basement floor drains shall not be connected in any manner to the Sewer System. The Township will not be responsible for any damage that may result from basements being flooded via floor drains due to the stoppage of sewers.

H. All cleanouts and traps shall be located as shown in the Standard Details.

I. According to field conditions, vertical risers shall be utilized when directed by the Engineer. Vertical riser lateral connections shall be in accordance with the Standard Details.

SECTION 7 FORCE MAINS

7.1 Materials

A. Ductile Iron Pipe: Use ductile iron pipe conforming to ANSI A21.51 or AWWA C151, Latest Edition, for the material class or pressure designated and ANSI A21.50 AWWA C150, Latest Edition, for wall thickness. Minimum wall thickness shall be Class 52 except where flanged pipe is required. Use Special Class 53 pipe where flanged connections are required. AWWA rated C900 PVC may be substituted for pipe 4-inches or greater in diameter where approved by the Engineer.

1. *Corrosion-Resistant Linings*: Ductile iron pipe and fittings shall be lined (interior) with a corrosion-resistant ceramic-epoxy lining. The lining material shall be an amine-cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. Interior lining shall be U.S. Pipe PROTECTO 401, or approved equal.

2. *Fittings*: Ductile or gray iron in accordance with the requirements set forth in ANSI A21.10 or AWWA C110, Latest Edition. All fittings shall be minimum Class 250 with corrosion-resistant lining and joints as required for pipe restraint. Iron fittings to be enclosed in pits, vaults, or manholes shall be of the short-body flanged type in order to minimize the size of the pits, vaults, and manholes.

3. *Joints*: Push-on type or mechanical joint type in accordance with ANSI A21.11 or AWWA C111, for all pipe except at changes in alignment, valves, tees, caps, and plugs not restrained with thrust blocking.

   a) Joints requiring pipe restraint and not restrained with thrust blocking shall be Lok-Type or TR Flex as manufactured by U. S. Pipe; Super-Lock as manufactured by Clow; Lok-Fast as manufactured by American Pipe; Snap-Lok or locked mechanical joint as manufactured by Griffin; Locked mechanical joint as manufactured by Atlantic State; or approved equal.

   b) In addition to restrained joints, adequate tie rods shall be provided to develop full joint restraint and must extend to the adjacent fitting or joint as approved by the Engineer.

   c) Mechanical joint retainer glands shall not be used. Only ductile or SDR-8 Mega-lug style joint glands or approved equal shall be required.

   d) Prior to construction, joint restraint system details shall be submitted for Township's review and approval.

B. Air Valves: The Township reserves the right to require air valves, of any one of the following types, at any location in the force main.

1. *Sewage Air Release Valve*: Designed to automatically release air, gas or vapor under pressure during system operation. Valve design shall feature long body and float stem components so that the operating mechanism is kept free from contact with sewage during operation. Valve construction shall be as follows:

   a) *Maximum Working Pressure Rating*: 150 psi.

   b) *Valve Body and Cover*: Cast iron, ASTM A48, Class 35.

   c) *Discharge Orifice Seat, Mechanism and Valve Stem*: Stainless Steel.

   d) *Orifice Button*: Stainless steel and Buna-N, Nitrile Rubber ASTM SB800.

   e) *Mechanism Lever Pins and Float*: High strength stainless steel, ASTM A240.

   f) *Backflushing and Cleaning Accessories*: Factory assembled to the valve and consisting of a shut-off valve at bottom inlet, a blow-off valve near the bottom of the valve body, quick disconnect couplings and shut-off valve at top of valve, and a 5-foot section of rubber hose with quick disconnect coupling.

   g) *Acceptable Manufacturers*:
      1) APCO.
      2) Golden Anderson.
      3) Val-Matic Valve and Manufacturing Corp.
      4) Or Equal.

2. *Sewage Air and Vacuum Valve*: Designed to automatically exhaust large quantities of air during the filling of a system and to allow air to re-enter the system during draining or when a vacuum occurs. Valve design shall feature long body and float stem components so that the operating mechanism is kept free from contact with sewage during operation. Valve construction shall be as follows:

   a) *Minimum Working Pressure Rating*: 150 psi.

   b) *Valve Body and Cover*: Cast iron, ASTM A48, Class 35.

   c) *Float Stem and Guide*: Bronze, ASTM B584.

   d) *Floats*: Stainless Steel, ASTM A240.

   e) *Orifice Seat*: Buna-N, Nitrile Rubber, ASTM SB800.

   f) *Backflushing and Cleaning Accessories*: Factory assembled to the valve and consisting of an inlet shut-off valve, a 1-inch blow-off valve near the bottom of the valve body, quick disconnect couplings and a ½-shut-off valve at the

top of valve, and a 5-foot section of rubber hose with quick disconnect coupling.

g) *Acceptable Manufacturers*:
1) APCO.
2) Golden Anderson.
3) Val-Matic Valve and Manufacturing Corp.
4) Or Equal.

3. *Sewage Combination Air Release Valves*: Consisting of an air release valve and an air and vacuum valve factory piped into a compact assembly. The combination assembly shall automatically release air, gas or vapor under system operating pressure and shall also allow air to re-enter the system during draining or when a vacuum occurs. Combination valve designs shall feature long bodies and float stem components so that the operating mechanisms are kept free from contact with sewage during operation. Valve construction shall be as follows:

a) *Maximum Working Pressure Rating*: 75 psi.

b) *Valve Bodies and Covers*: Cast iron, ASTM A48, Class 35.

c) *Air Release Valve Discharge Orifice Seat, Mechanism and Valve Stem*: Stainless Steel.

d) *Air Release Valve Orifice Button*: Stainless Steel and Buna-N, Nitrile Rubber, ASTM SB800.

e) *Air Release Valve Mechanism Lever Pins and Float*: High strength stainless steel, ASTM A240.

f) *Air and Vacuum Valve Float Stem and Guide*: Bronze, ASTM B584.

g) *Air and Vacuum Valve Floats*: Stainless Steel, ASTM A240.

h) *Air and Vacuum Valve Orifice Seat*: Buna-N, Nitrile Rubber, ASTM SB800.

i) *Backflushing and Cleaning Accessories*: Factory assembled to the combination valves and consisting of two inlet shut-off valves, two blow-off valves, two clear water inlet valves, and a 5-foot section of rubber hose and quick disconnect couplings.

j) *Acceptable Manufacturers*:
1) APCO.
2) Golden Anderson.
3) Val-Matic Valve and Manufacturing Corp.
4) Or Equal.

C. Underground Warning Tape:

1. Printed polyethylene tape, 3 inches minimum width, magnetic for PVC pipe, green for force mains, one-inch minimum lettering, printed with name of utility buried below, and suitable for installation in all soil types. Tape must be placed above all force mains (reference Standard Details).

D. Cleanouts:

1. Cleanouts shall be constructed as shown in the Standard Details. Valves shall be installed in each cleanout manhole.

E. Valves and Appurtenances:

1. *Valves*: Valves shall be installed on force main at locations shown in the Standard Details and as required by the Engineer.

2. *Plug Valves*: Valves installed in valve/cleanout pits shall be actuated with a quarter turn type hand lever. Buried valves shall be actuated with an underground actuator through a cast iron valve box. Plug valves shall be non-lubricated eccentric plug valves as manufactured by DeZurik, Keystone, or Miliken.

   a) Valves shall open left (counter-clockwise).

   b) Buried valves shall have 2-inch square cast iron operating nuts. Each valve shall also be supplied with a roadway type valve box.

   c) Buried valves shall be supplied with mechanical joint end connections.

   d) Valves located in vaults, pits, or manholes shall have flanged ends.

3. Gate Valves (3"-12" in diameter):

   a) Non-Rising stem type when installed underground and rising stem type otherwise.

   b) Valve stem seal of such design that allows replacement of O-rings with valve under pressure in the fully open position.

   c) Iron body, bronze mounted with resilient-seated wedge conforming to AWWA C 509.

   d) Resilient seat of Styrene Butadiene SBR or Urethane Rubber bonded to cast iron wedge.

e) Stem seals of O-ring type.

f) Buried valves equipped with 2-inch square operating nut and open counter-clockwise. Handwheel operator in vaults.

g) Exterior to be asphalt varnish or epoxy coated; interior ferrous metal parts to be epoxy coated, AWWA C 550.

h) Acceptable Manufacturers: American Flow Control, or approved equal.

4. *Valve Boxes*: Standard 5-¼ inch cast iron extension roadway type valve boxes shall be installed over buried valves. Screw threads shall be cast integrally with box wall. Welded screw threads are not acceptable.

7.2 Installation

A. Pipe Installation:

1. *General*: All pipe shall be laid and maintained to the required lines and grades with fittings and valves at the required locations, spigots centered in bells, and all valves plumb. Pipe laying shall commence at the lowest point and proceed upgrade.

2. *Depth*: All force mains shall be buried at a minimum depth of 4 feet, measured from finished grade to the top of pipe.

3. *Construction Control*: During the installation of a force main, the pipe shall be laid at a constantly increasing grade to each high point, air valve, or point of discharge. The Extender shall provide sufficient construction control to assure that there are no sags in the force main which could tend to accumulate air other than at the high points. Failure to comply with this requirement shall necessitate that the Extender take remedial steps to correct this situation. All associated costs shall be borne by the Extender.

4. *Cleaning Pipe and Fittings*: All lumps, blisters and excess coal tar coating shall be removed from the bell and spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean and dry and free from oil and grease before the pipe is laid.

5. *Laying Pipe*: Every precaution shall be taken to prevent foreign material from entering the pipe while the pipe is being placed in the trench. If the pipe-laying crew cannot put the pipe into the trench and in place without allowing earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and let there until the connection is to be made into the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe.

After placing a length of pipe in the trench, the spigot end shall be centered in the bell or coupling and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it except at the joints. Pipe and fittings, which do not allow a sufficient and uniform space for joints, shall be removed and replaced with pipe and fittings of proper dimensions to ensure such uniform space.

6. *Jointing Ductile Iron Pipe*:

   a) Mechanical Joints: The spigot end of the pipe shall be centrally located in the bell so that the rubber gasket is evenly seated. All loose rust or foreign matter shall be removed from the inside surfaces of the bell and outside surface of the spigot prior to assembly. Bolts shall be tightened uniformly with a ratchet wrench so as to affect the joint seal. The normal range of bolt torques to be applied are:

Bolt Size (Inches)	Torque-Ft. Lbs.
⅝	45 - 60
¾	75 - 90
1	100 - 120

   If effective sealing is not attained at the maximum torque indicated above, the joint shall be disassembled and reassembled after thorough cleaning.

   b) Push-On Type Joints: Make joints as recommended by the manufacturer so as to affect the joint seal.

7. *Joining PVC Pipe*: Make joints as recommended by the manufacturer so as to affect the joint seal.

B. Anchorage:

1. *Concrete Thrust Blocks*: Provide concrete thrust blocks for all fittings, and at all locations where horizontal and/or vertical deflections are made in the joints of the piping. Only by authorization of the Township.

2. *Reaction Backing*: Reaction backing shall be Penn DOT Class C concrete. Backing shall be placed between solid ground and the fitting to be anchored. The backing shall, unless otherwise indicated or directed, be so placed that the pipe and fitting joints will be accessible for repair.

3. *Metal Harness*: Metal harness of tie rods of adequate strength to prevent movement shall be used. Steel rods or clamps shall be type 304 stainless steel.

4. *Anchorage for Bends*: All bends deflecting 11.25 degrees or more on force mains 6 inches in diameter or greater shall be provided with a thrust restraint system to prevent movement.

   a) Either a restrained joint pipe or thrust block system (only by authorization of the Township) will be permitted.

   b) Only a thrust block system will be used for PVC pipe.

   c) Suitable metal rods shall be used only as directed by the Engineer.

   d) Mechanical joint retainer glands shall not be used to obtain a restrained joint.

C. Cleanout Installation: Cleanout manholes shall be installed every 2,000' and/or at low points, unless otherwise directed by the Engineer.

D. Setting Fittings and Valves:

1. *General*: Valves and fittings shall be set and jointed to pipe in the manner specified previously for cleaning, laying, and jointing pipe.

2. Provide a concrete manhole for every air release, air and vacuum, and combination air release and air and vacuum valve. Manholes shall meet the required specified above for gravity Sanitary Sewers. The manholes shall be constructed to permit valve repairs and afford protection to the valve and pipe from impact where they pass through the manhole walls. All valves and fittings shall be supported by saddles. The saddles shall be continuous under all valves and fittings within the valve manholes.

7.3 Tests

A. Hydrostatic Tests:

1. *Pressure Test*: After the pipe has been laid and backfilled as specified, all newly laid pipe or any valved section thereof, shall be subjected to a hydrostatic pressure of 150 psi or 50% in excess of the normal working pressure, whichever is greater. Where any section of a main is provided with concrete reaction backing, the hydrostatic pressure test shall not be made until at least thirty days have elapsed after the concrete reaction backing was installed.

   a) *Duration of Test*: Two hours.

   b) *Procedure*: Each section of pipe shall be slowly filled with water and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to

the Engineer. The pump, pipe connections, and all necessary apparatus including gauges, shall be furnished by the Extender. The Extender will make all taps into the pipe, and furnish all necessary assistance for conducting the tests.

c) *Expelling Air Before Test*: Before applying the specified test pressure, all air shall be expelled from the pipe. If permanent air vents are not located at all high points, the Extender shall make the necessary taps at such points before the test is made. After the test has been completed, the Extender shall insert plugs at the tapping points.

d) *Examination Under Pressure*: Any cracks or defective pipes, fittings, or valves discovered in consequence of this pressure test, shall be removed and replaced by the Extender with sound material, and the test shall be repeated until satisfactory to the Engineer.

2. *Leakage Test*: A leakage test shall be conducted concurrently with the pressure test. The Extender will furnish laboratory calibrated test gauge and measuring device, and all necessary assistance to conduct the test.

a) *Leakage Definition*: Leakage is defined as the quantity of water that must be supplied into the newly laid pipe, or any valve section thereof, to maintain pressure within 5 psi of the specified leakage test pressure after the pipe has been filled with water and the air expelled.

b) *Permitted Leakage*: No pipe installed will be accepted until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

in which "L" equals the allowable leakage in gallons per hour; "S" is the length of pipeline tested in feet; "D" is the nominal diameter of the pipe, in inches, and "P" is the average test pressure during the leakage test, in pounds per square inch gauge. (The allowable leakage according to the formula is equivalent to 11.65 U. S. Gal. per 24 hours per mile of pipe per inch nominal diameter, for pipe in 18-foot lengths evaluated on a pressure basis of 150 psi). When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gallon per hour per inch of nominal valve size shall be allowed. There shall be no additional leakage allowed for service connections.

c) The Engineer will record both the makeup water and pressure at one-half hour intervals during the test period.

d) Should any test of pipe laid disclose leakage greater than that specified above, the Extender should, at his own expense, locate, repair, and replace the defective joints, pipe, or fittings until the leakage is within the specified allowance.

3. *Common Requirements*:

a) *Township Presence*: The Engineer shall monitor the pressure and leakage tests. The Extender shall notify the Engineer of the test day at least 48 hours (2 working days) in advance.

b) If testing fails to meet the test requirements, the Extender shall pay for all additional engineering personnel testing time.

c) *Weather*: No testing will be authorized unless air temperature is 35 degrees Fahrenheit or higher.

d) *Acceptance*: Observation of successful testing of force mains by the Engineer does not constitute acceptance of the system or any portion thereof. Upon completion of any determined portion of a total system, and successful testing thereof, the Engineer may recommend final acceptance to the Engineer. Only upon final inspection by the Engineer and upon written acceptance for same will the system or portion thereof be considered acceptable. Upon such acceptance, the warranty period shall commence. If, during this final inspection, any irregularities are observed, the condition must be corrected at the Extender's expense prior to acceptance.

SECTION 8 LOW PRESSURE SEWER SYSTEMS

8.1 Materials

A. Ductile Iron Pipe: Use ductile iron pipe conforming to ANSI A21.51 or AWWA C151, Latest Edition, for the material class or pressure designated and ANSI A21.50 AWWA C150, Latest Edition, for wall thickness. Minimum wall thickness shall be Class 50 for 6-inch diameter and Class 51 for 3-inch and 4-inch diameter pipe except as may be required for flanged pipe or restrained joints. Use Special Class 53 pipe where flanged connections are required. AWWA rated SDR 21 PVC may be substituted where approved by the Engineer.

1. *Corrosion-Resistant Linings*: Ductile iron pipe and fittings shall be lined (interior) with a corrosion-resistant ceramic-epoxy lining. The lining material shall be an amine-cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. Interior lining shall be U.S. Pipe PROTECTO 401, or approved equal.

2. *Fittings*: Ductile or gray iron in accordance with the requirements set forth in ANSI A21.10 or AWWA C110, Latest Edition. All fittings shall be minimum Class 250 with cement lining and joints as required for pipe restraint. Iron fittings to be enclosed in pits, vaults, or manholes shall be of the short-body flanged type in order to minimize the size of the pits, vaults, and manholes.

3. *Joints*: Push-on type or mechanical joint type in accordance with ANSI A21.11 or AWWA C111, for all pipe except at changes in alignment, valves, tees, caps, and plugs not restrained with thrust blocking.

   a) Joints requiring pipe restraint and not restrained with thrust blocking shall be Lok-Type or TR Flex as manufactured by U. S. Pipe; Super-Lock as manufactured by Clow; Lok-Fast as manufactured by American Pipe; Snap-Lok or locked mechanical joint as manufactured by Griffin; Locked mechanical joint as manufactured by Atlantic State; or approved equal.

   b) In addition to restrained joints, adequate tie rods shall be provided to develop full joint restraint and must extend to the adjacent fitting or joint as approved by the Township.

   c) Mechanical joint retainer glands shall not be used. Only ductile or SDR-8 Mega-lug style joint glands or approved equal shall be required.

   d) Prior to construction, joint restraint system details shall be submitted for Township's review and approval.

B. Polyvinyl Chloride Pipe and Fittings (PVC):

1. *4-inches and Greater Diameter*: PVC pipe conforming to AWWA C 900 for working pressure of 200 psi.

   a) Fittings: As specified for Ductile Iron Pipe.

2. *Less than 4-inches Diameter*: PVC pipe conforming to ASTM D2241, SDR-21 except 1.5-inch pipe shall be SDR-26.

   a) Fittings: Compatible PVC fittings as recommended by pipe manufacturers, and of same Class as the pipe.

3. *Joints*: Push-on type conforming to ASTM D3139.

   a) Solvent weld joints permitted only for special situations as approved by Engineer (e.g. bored service line highway crossings).

   b) PVC pipe joints shall be restrained at changes in alignment, valves, tees, caps, and plugs with thrust blocking.

   c) Split retainer flanges shall not be used in place of thrust blocks.

   d) Proposed joint restraint system shall be submitted for Engineer's review and approval.

C. Air Valves: The Township reserves the right to require air valves, of any one of the following types, at any location in the force main.

1. *Sewage Air Release Valve*: Designed to automatically release air, gas or vapor under pressure during system operation. Valve design shall feature long body and float stem components so that the operating mechanism is kept free from contact with sewage during operation. Valve construction shall be as follows:

   a) *Maximum Working Pressure Rating*: 150 psi.

   b) *Valve Body and Cover*: Cast iron, ASTM A48, Class 35.

   c) *Discharge Orifice Seat, Mechanism and Valve Stem*: Stainless Steel.

   d) *Orifice Button*: Stainless steel and Buna-N, Nitrile Rubber ASTM SB800.

   e) *Mechanism Lever Pins and Float*: High strength stainless steel, ASTM A240.

   f) *Backflushing and Cleaning Accessories*: Factory assembled to the valve and consisting of a shut-off valve at bottom inlet, a blow-off valve near the bottom

of the valve body, quick disconnect couplings and shut-off valve at top of valve, and a 5-foot section of rubber hose with quick disconnect coupling.

g) *Acceptable Manufacturers*:
   1) Val-Matic Valve and Manufacturing Corp.; Model No. 48 BWA.
   2) Or Equal.

2. *Sewage Air and Vacuum Valve*: Designed to automatically exhaust large quantities of air during the filling of a system and to allow air to re-enter the system during draining or when a vacuum occurs. Valve design shall feature long body and float stem components so that the operating mechanism is kept free from contact with sewage during operation. Valve construction shall be as follows:

   a) *Minimum Working Pressure Rating*: 150 psi.

   b) *Valve Body and Cover*: Cast iron, ASTM A48, Class 35.

   c) *Float Stem and Guide*: Bronze, ASTM B584.

   d) *Floats*: Stainless Steel, ASTM A240.

   e) *Orifice Seat*: Buna-N, Nitrile Rubber, ASTM SB800.

   f) *Backflushing and Cleaning Accessories*: Factory assembled to the valve and consisting of an inlet shut-off valve, a 1-inch blow-off valve near the bottom of the valve body, quick disconnect couplings and a ½-shut-off valve at the top of valve, and a 5-foot section of rubber hose with quick disconnect coupling.

   g) *Acceptable Manufacturers*:
      1) Val-Matic Valve and Manufacturing Corp.; Model No. 300 Series.
      2) Or Equal.

3. *Sewage Combination Air Release Valves*: Consisting of an air release valve and an air and vacuum valve factory piped into a compact assembly. The combination assembly shall automatically release air, gas or vapor under system operating pressure and shall also allow air to re-enter the system during draining or when a vacuum occurs. Combination valve designs shall feature long bodies and float stem components so that the operating mechanisms are kept free from contact with sewage during operation. Valve construction shall be as follows:

   a) *Maximum Working Pressure Rating*: 75 psi.

   b) *Valve Bodies and Covers*: Cast iron, ASTM A48, Class 35.

c) *Air Release Valve Discharge Orifice Seat, Mechanism and Valve Stem*: Stainless Steel.

d) *Air Release Valve Orifice Button*: Stainless Steel and Buna-N, Nitrile Rubber, ASTM SB800.

e) *Air Release Valve Mechanism Lever Pins and Float*: High strength stainless steel, ASTM A240.

f) *Air and Vacuum Valve Float Stem and Guide*: Bronze, ASTM B584.

g) *Air and Vacuum Valve Floats*: Stainless Steel, ASTM A240.

h) *Air and Vacuum Valve Orifice Seat*: Buna-N, Nitrile Rubber, ASTM SB800.

i) *Backflushing and Cleaning Accessories*: Factory assembled to the combination valves and consisting of two inlet shut-off valves, two blow-off valves, two clear water inlet valves, and a 5-foot section of rubber hose and quick disconnect couplings.

j) *Acceptable Manufacturers*:
   1) Val-Matic Valve and Manufacturing Corp.; Model No. 48 or 49/300 Series.
   2) Or Equal.

D. Underground Warning Tape:

1. Printed polyethylene tape, 3 inches minimum width, magnetic for PVC pipe, green for force mains, one-inch minimum lettering, printed with name of utility buried below, and suitable for installation in all soil types. Tape must be placed above all force mains (reference Standard Details).

E. Cleanouts:

1. Cleanouts shall be constructed as shown in Standard Details No. 15 and 16. Valves shall be installed in each cleanout manhole.

F. Valves and Appurtenances:

1. *Valves*: Valves shall be installed on force main at locations shown in the Standard Details and as required by the Township.

2. *Ball or Plug Valves*: Valves installed in valve/cleanout pits shall be actuated with a quarter turn type hand lever. Buried valves shall be actuated with an underground actuator through a cast iron valve box. Ball valves on individual

properties shall be oriented with the seat in place for pressure. Valves 3-inch and larger shall be flanged end Dresser, Series 800, X-Centric, or equal. Valves 2-inch and 2½ inch shall be flanged end DeZurik, Eccentric, or equal. One and one-half inch valves shall be screwed end DeZurik, Eccentric, or equal.

a) Valves shall open left (counter-clockwise).

b) Buried valves shall have 2-inch square cast iron operating nuts. Each valve shall also be supplied with a roadway type valve box.

c) Buried valves shall be supplied with mechanical joint end connections.

d) Valves located in vaults, pits, or manholes shall have flanged ends.

3. *Valve Boxes*: Standard 5-1/4-inch cast iron extension roadway type valve boxes shall be installed over buried valves and service line cleanouts in accordance with AWWA C500. Screw threads shall be cast integrally with box wall. Welded screw threads are not acceptable.

8.2 Installation

A. Pipe Installation:

1. *General*: All pipe shall be laid and maintained to the required lines and grades with fittings and valves at the required locations, spigots centered in bells, and all valves plumb. Pipe laying shall commence at the lowest point and proceed upgrade.

2. *Depth*: All low pressure force mains shall be buried at a minimum depth of 4 feet, measured from finished grade to the top of pipe.

3. *Construction Control*: During the installation of a force main, the pipe shall be laid at a constantly increasing grade to each high point, air valve, or point of discharge. The Extender shall provide sufficient construction control to assure that there are no sags in the force main which could tend to accumulate air other than at the high points. Failure to comply with this requirement shall necessitate that the Extender take remedial steps to correct this situation. All associated costs shall be borne by the Extender.

4. *Cleaning Pipe and Fittings*: All lumps, blisters and excess coal tar coating shall be removed from the bell and spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean and dry and free from oil and grease before the pipe is laid.

5. *Laying Pipe*: Every precaution shall be taken to prevent foreign material from entering the pipe while the pipe is being placed in the trench. If the pipe-laying crew cannot put the pipe into the trench and in place without allowing earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and let there until the connection is to be made into the adjacent pipe. During laying operations, no debris, tools, clothing or other material shall be placed in the pipe. After placing a length of pipe in the trench, the spigot end shall be centered in the bell or coupling and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it except at the joints. Pipe and fittings, which do not allow a sufficient and uniform space for joints, shall be removed and replaced with pipe and fittings of proper dimensions to ensure such uniform space.

6. *Jointing Ductile Iron Pipe*:

   a) Mechanical Joints: The spigot end of the pipe shall be centrally located in the bell so that the rubber gasket is evenly seated. All loose rust or foreign matter shall be removed from the inside surfaces of the bell and outside surface of the spigot prior to assembly. Bolts shall be tightened uniformly with a ratchet wrench so as to affect the joint seal. The normal range of bolt torques to be applied are:

Bolt Size (Inches)	Torque-Ft. Lbs.
5/8	45 - 60
3/4	75 - 90
1	100 - 120

   If effective sealing is not attained at the maximum torque indicated above, the joint shall be disassembled and reassembled after thorough cleaning.

   b) Push-On Type Joints: Make joints as recommended by the manufacturer so as to affect the joint seal.

7. *Joining PVC Pipe*: Make joints as recommended by the manufacturer so as to affect the joint seal.

B. Service Connections

1. *General*: Service connections to PVC and ductile iron pipe over 3-inch diameter shall be made by a fitting approved by the Engineer.

2. Service connections shall be made by installing tee fittings of compatible material and the same class as the low-pressure sewer main.

C. Setting Fittings And Valves

1. *General*: Valves and fittings shall be set and jointed to pipe in the manner specified previously for cleaning, laying and jointing pipe.

2. Provide a precast concrete manhole for every air release and vacuum valve meeting the requirements for manholes as previously specified. The manholes shall be constructed to permit valve repairs and afford protection to the valve and pipe from impact where they pass through the manhole walls. All valves and fittings shall be supported by saddles as indicated on the Drawings. The saddles shall be continuous under all valves and fittings within the valve manholes.

D. Anchorage:

1. *Concrete Thrust Blocks*: Provide concrete thrust blocks for all fittings, and at all locations where horizontal and/or vertical deflections are made in the joints of the piping. Only by authorization of the Township.

2. *Reaction Backing*: Reaction backing shall be Penn DOT Class C concrete. Backing shall be placed between solid ground and the fitting to be anchored. The backing shall, unless otherwise indicated or directed, be so placed that the pipe and fitting joints will be accessible for repair.

3. *Metal Harness*: Metal harness of tie rods of adequate strength to prevent movement shall be used. Steel rods or clamps shall be type 304 stainless steel.

4. *Anchorage for Bends*: All bends deflecting 11.25 degrees or more on force mains 6 inches in diameter or greater shall be provided with a thrust restraint system to prevent movement.

   a) Either a restrained joint pipe or thrust block system (only by authorization of the Township) will be permitted.

   b) Only a thrust block system will be used for PVC pipe.

   c) Suitable metal rods shall be used only as directed by the Engineer.

   d) Mechanical joint retainer glands shall not be used to obtain a restrained joint.

E. Cleanout Installation: Cleanout manholes shall be provided at each dead end and at 500-foot intervals (maximum) on long stretches of force main. Terminal cleanout manholes shall be used on all dead ends and at other locations as required by the Township.

8.3 Tests

A. Hydrostatic Tests:

1. *Pressure Test*: After the pipe has been laid and backfilled as specified, all newly laid pipe or any valved section thereof, shall be subjected to a hydrostatic pressure of 150 psi or 50% in excess of the normal working pressure, whichever is greater. Where any section of a main is provided with concrete reaction backing, the hydrostatic pressure test shall not be made until at least five days have elapsed after the concrete reaction backing was installed. If high early strength cement is used in the concrete reaction backing, the hydrostatic pressure test shall not be made until at least two days have elapsed.

   a) *Duration of Test*: Two hours.

   b) *Procedure*: Each section of pipe shall be slowly filled with water and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Township. The pump, pipe connections, and all necessary apparatus including gauges, shall be furnished by the Extender. The Extender will make all taps into the pipe, and furnish all necessary assistance for conducting the tests.

   c) *Expelling Air Before Test*: Before applying the specified test pressure, all air shall be expelled from the pipe. If permanent air vents are not located at all high points, the Extender shall make the necessary taps at such points before the test is made. After the test has been completed, the Extender shall insert plugs at the tapping points.

   d) *Examination Under Pressure*: Any cracks or defective pipes, fittings, or valves discovered in consequence of this pressure test, shall be removed and replaced by the Extender with sound material, and the test shall be repeated until satisfactory to the Township.

2. *Leakage Test*: A leakage test shall be conducted concurrently with the pressure test. The Extender will furnish laboratory calibrated test gauge and measuring device, and all necessary assistance to conduct the test.

   a) *Leakage Definition*: Leakage is defined as the quantity of water that must be supplied into the newly laid pipe, or any valve section thereof, to maintain pressure within 5 psi of the specified leakage test pressure after the pipe has been filled with water and the air expelled.

b) *Permitted Leakage*: No pipe installed will be accepted until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

in which "L" equals the allowable leakage in gallons per hour; "S" is the length of pipeline tested in feet; "D" is the nominal diameter of the pipe, in inches, and "P" is the average test pressure during the leakage test, in pounds per square inch gauge. (The allowable leakage according to the formula is equivalent to 11.65 U. S. Gal. per 24 hours per mile of pipe per inch nominal diameter, for pipe in 18-foot lengths evaluated on a pressure basis of 150 psi). When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gallon per hour per inch of nominal valve size shall be allowed. There shall be no additional leakage allowed for service connections.

c) The Township will record both the makeup water and pressure at one-half hour intervals during the test period.

d) Should any test of pipe laid disclose leakage greater than that specified above, the Extender should, at his own expense, locate, repair, and replace the defective joints, pipe, or fittings until the leakage is within the specified allowance.

3. *Common Requirements*:

a) *Township Presence*: The Township or Engineer shall monitor the pressure and leakage tests. The Extender shall notify the Township of the test day at least 48 hours (2 working days) in advance.

b) If testing fails to meet the test requirements, the Extender shall pay for all additional engineering personnel testing time.

c) *Weather*: No testing will be authorized unless air temperature is 35 degrees Fahrenheit or higher.

d) *Acceptance*: Observation of successful testing of force mains by the Township does not constitute acceptance of the system or any portion thereof. Upon completion of any determined portion of a total system, and successful testing thereof, the Engineer may recommend final acceptance to the Township. Only upon final inspection by the Township and upon written acceptance for same will the system or portion thereof be considered acceptable. Upon such acceptance, the warranty period shall commence. If, during this final inspection, any irregularities are observed, the condition must be corrected at the Extender's expense prior to acceptance.

SECTION 9 RESTORATION AND CLEAN-UP OF SURFACE

9.1 Replacement of Property

The Extender shall restore (unless otherwise stipulated) all sidewalks, curbing, gutters, shrubbery, fences, poles, sod, markings, traffic lines, or other property and surface structures removed or disturbed as a part of the work to a condition equal to that before the work began, furnishing all labor and materials incidental thereto.

9.2 Pavement Restoration:

Restoration of State Highways shall be in accordance with Pennsylvania rules and regulations, Penn DOT requirements, and the provisions of the highway occupancy permit. Restoration of Township Streets and other paved surfaces shall be in accordance with the requirements of the Township.

9.3 Seeding Restoration

A. Lawn Restoration Materials:

1. *Permanent Seed Mixture*: Penn DOT 408, Section 804, Formula B.

   a) *Kentucky Bluegrass Mixture*; a combination of improved certified varieties with no one variety exceeding 25 percent of the total Blue Grass component: 50 percent by weight.

   b) *Creeping Red Fescue or Chewings Fescue*: 30 percent by weight.

   c) *Perennial Ryegrass Mixture*; a combination of improved certified varieties with no one variety exceeding 50 percent of the total Ryegrass component: 20 percent by weight.

2. *Temporary Seed Mixture*: Penn DOT 408, Section 804, Formula E. Annual Ryegrass: 100 percent.

3. Provide seed that complies with the Pennsylvania Seed Act of 1965, Act No. 187, and regulations of the Pennsylvania Department of Agriculture, Bureau of Plant Industry.

4. *Lime*: Pulverized agricultural limestone; Penn DOT 408, Section 804.

5. *Mulching Material*: Oat or wheat straw, dry, free from weeds and foreign matters detrimental to plant life. Hay or chopped cornstalks are not acceptable.

6. *Mulching Material*: Wood cellulose fiber, free of growth or germination inhibiting ingredients.

7. *Planting Fertilizer*: Dry formulation of 10-20-20 analysis; Penn DOT 408, Section 804.

8. *Slow-Release Nitrogen Fertilizer*: Dry formulation of 38-0-0 ureaform.

9. *Water*: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

B. Restoration of Lawns, Pastures, Meadows, and Cultivated Fields:

1. *General*:

a) Topsoil shall be free from subsoil, brush, weeds, or other litter, clay lumps and stones, but may contain decaying vegetable matter.

b) Comply with laws and regulations related to Sediment and Erosion Control.

c) Seed shall be not more than two years old. Germination tests of seeds shall be made not more than six months prior to seeding. Do not use seed that has become wet, moldy, or otherwise damaged.

d) Submit all seed mixture formulas to the Township for approval prior to seeding.

e) The Extender shall be responsible for seeding all areas of bare soil, which result from his construction operations, and for producing a stand of grass in all seeded areas. Erosion, drought, or any other condition will not relieve the Extender of this requirement.

2. *Lawns*:

a) Prior to construction, strip and stockpile the full depth of existing topsoil, but no less than six inches, from all areas to be disturbed.

b) Scarify top of trench backfill to minimum depth of two inches before placing topsoil.

c) Use stockpiled topsoil to bring the trench area to final grade.

d) If stockpiled topsoil is not sufficient to provide at least six inches of topsoil over area to be restored, import sufficient topsoil to provide such coverage.

e) Use topsoil in relatively dry state. Place during dry weather.

f) Fine grade topsoil eliminating rough or low areas.

g) Remove stone, roots, grass, weeds, debris, and foreign material from topsoil while spreading.

h) Manually spread topsoil around trees, plants, building, and paving to prevent damage.

i) Lightly compact placed topsoil. Use roller weighing no more than 120 pounds per foot of roller width.

j) Remove surplus subsoil and topsoil from site.

k) Leave stockpile area and site clean and raked, ready to receive landscaping.

l) *Grading tolerance*: Finished surface of topsoil shall not deviate by more than 1/2 inch up or down from a straight edge or stringline placed across the trench and held on existing grade on both sides of the trench.

m) Apply lime at the rate of 800 pounds per 1,000 sq. yd.

n) Do no apply fertilizer sooner than three days after lime application.

o) Apply planting fertilizer at the rate recommended by manufacturer. Apply fertilizer after raking topsoil smooth and prior to roller compaction. Do not apply fertilizer at the same time or with the same machine as will be used to apply seed.

p) After spreading of fertilizer is complete, apply peat moss to a depth of ¼-inch over the area to be seeded.

q) Mix lime, fertilizer, and peat moss thoroughly into the upper two inches of topsoil.

r) Lightly water to aid the dispersion of fertilizer.

s) Apply seed at a rate of 21 lbs. per 1,000 sq. yd evenly in two intersecting directions. Rake in lightly. Do not seed area in excess of that which can be mulched on same day.

t) *Planting season*: March 15 to June 1 and August 1 to October 15. Areas in which trench backfilling operations are completed in other time periods shall be seeded with annual Ryegrass (Penn DOT 408, Section 804, Formula E at the rate of 10 lbs. per 1,000 sq. yd. to provide temporary protection. Permanent seeding shall then be applied later during the specified periods.

u) Do not sow seed immediately following rain, when ground is too dry, or during windy periods.

v) Roll seeded area with roller not exceeding 120 lbs. per foot of roller width.

w) Immediately following seeding and compacting, apply mulch at the rate of 1,200 pounds per 1,000 sq. yd. for straw or 320 pounds per 1,000 sq. yd. for wood cellulose fiber.

x) If straw is used for mulch, anchor straw with emulsified asphalt binder or other material approved by Engineer.

y) Apply water with a fine spray immediately after each area has been mulched.

z) At completion of Extender's work, apply slow-release nitrogen fertilizer to all seeded areas at the rate of 50 lbs. per 1,000 sq. yd.

aa) Re-seed areas that show bare spots prior to expiration of the Extender's warranty period.

3. *Pasture and Meadows*:

a) Prior to construction, strip and stockpile the full depth of the existing topsoil, but no less than 12 inches, from all areas to be disturbed. Use stockpiled topsoil to bring the trench area to final grade.

b) Remove all crushed stone and construction debris from the disturbed area.

c) *Planting season*: Perform seeding no later than the start of the next planting season following completion of trench backfilling. The planting season shall be as established by the U. S. Agricultural Service for the area of construction.

d) *Seed mixture*:
   1) Timothy: 18%
   2) Orchard Grass (Pennlate or Pennmeade): 46%
   3) Redtop: 18%
   4) Kentucky Bluegrass: 18%

e) Spread the seed using an approved seeding procedure at the rate of 22 to 25 pounds per acre.

4. *Cultivated Fields*:

a) Prior to construction, strip and stockpile the full depth of existing topsoil, but no less than 12 inches, from all areas to be disturbed.

b) Upon completion of construction, remove all crushed stone and other construction debris.

c) Use stockpiled topsoil to bring the trench area to final grade.

d) Scarify to minimum depth of 10 inches all areas that have been compacted as a result of construction operations.

SECTION 10 CLEAN-UP AND MAINTENANCE DURING CONSTRUCTION WORK

10.1 Clean-Up

During construction, surfaces of all areas including, but not limited to, Streets and driveways shall be maintained on a daily basis to produce a safe, desirable, and convenient condition.

A. Streets shall be swept and flushed after trench backfilling, and re-cleaned as dust, mud, stones, and debris caused by the work, or related to the work, again accumulates.

B. Failure of the Extender to perform this work shall be cause for the Engineer to order the work to be done by others and to charge all costs to the Extender.

C. During construction, Contractor is required to provide the necessary materials and equipment to maintain dust control.

10.2 Repair or Correction of Unsatisfactory Conditions

Any subnormal or dangerous condition caused by the work, on any surface, shall be repaired and/or corrected within two hours of observation or notification of its existence. If repairs are not made with this two-hour period, the Township shall cause to have the work completed and the resulting cost will be charged to the Extender.

10.3 Temporary Pavement

The Engineer and/or PennDOT may require that the Extender construct temporary pavement until conditions are suitable for placement of permanent pavement. The Extender shall continuously maintain temporary pavement until it is replaced with permanent pavement.

APPENDICES

APPENDIX 1

Sewer Testing Forms

LIST OF SEWER TESTING FORMS

Form Name	Form No.
Sewer Force Main Pressure Test Report	1
Gravity Sewer Test Report	2
Manhole Vacuum Test Report	3
Lateral Locations	4
Volumetric Wet Well Drawdown Test	5
Sewer Service Line Installation	6

ARRO

East Coventry Township

Gravity Sewer Test Report

Development: _____ Drawing No.: _____ Sheet No. _____ of _____

Contractor: _____ Observed By: _____ Proj. No. _____

From MH No.	To MH No.	Length Tested (L.F.)	Max. Depth (feet)	Lamp Test Passed		Televised Date	Mandrel Test Pass Date	Pressure Test					Result
				Initial Test Date	Final Test Date			Time		PSIG Start	PSIG End	PSIG Loss	
								Start	End				

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Page 185 of 400

East Coventry Township

Manhole Vacuum Test Report

Development: _____ Drawing No.: _____ Sheet No. _____

Contractor: _____ Inspected By: _____ Proj. No. _____

Manhole	Date	Time		Vacuum (inches of Hg)			Result	
		Start	Stop	Start	Stop	Loss	Pass	Fail

ARRO

East Coventry Township

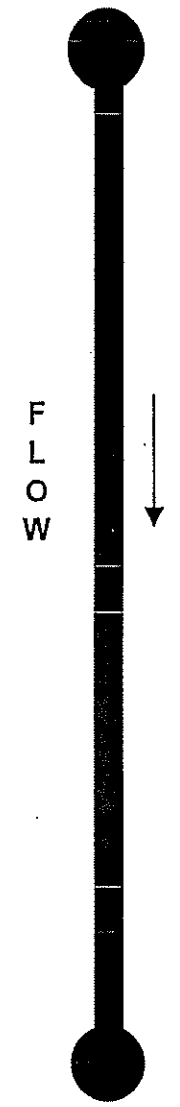
Lateral Locations

Development: _____ Proj. No. _____

Contractor: _____

Material: _____ Distance: _____ Slope: _____

Street Name: _____ In a Right-of-Way: _____

Lot	Depth	Length	Station	Manhole No. ____	Station	Length	Depth	Lot
								

Observer: _____ Drawing No.: _____

Prepared By: _____

EAST COVENTRY TOWNSHIP
Volumetric Wet Well Drawdown Test

Development: _____ Project No.: _____

Contractor: _____ Date: _____

Name of Pump Station: _____ Computed By: _____

Type of Station:

Wet Well/Dry Well _____ Submersible _____ Suction Lift _____

Wet Well Dimensions (FT.):

Length: _____ Width: _____ Diameter: _____

Volume/Vertical Foot: _____ Cubic Feet

Volume/Vertical Foot: _____ Gallons

PUMP NO. _____

Test No. 1	Test No. 2	Test No. 3
Wet Well Level	**Wet Well Level**	**Wet Well Level**
Start _____	Start _____	Start _____
End _____	End _____	End _____
Volume _____	Volume _____	Volume _____
Time _____	Time _____	Time _____
Flow Rate (GPM) _____	**Flow Rate (GPM)** _____	**Flow Rate (GPM)** _____
Rated Pump Capacity (GPM) _____	**Rated Pump Capacity (GPM)** _____	**Rated Pump Capacity (GPM)** _____

ARRO

East Coventry Township

Sewer Service Line Installation

Development: _____ Date: _____

Contractor: _____ Drawing No.: _____

Street Name: _____ Lot Number: _____

Type and size of service line: _____

Sleeve through wall? ☐ Yes ☐ No

Connector used: _____

Slope of line at least ¼" per foot? ☐ Yes ☐ No

Cleanout under 50' from building? ☐ Yes ☐ No

6" 2B stone under pipe? ☐ Yes ☐ No

12" 2B stone over pipe? ☐ Yes ☐ No

Cleanout and vent in place? ☐ Yes ☐ No

Feet from house to vent and cleanout: _____

Job Foreman/Plumber: _____

Depth of service line at house: _____

Length of service line: _____

Air test: 5 psi Start time: _____ Stop time: _____ Result: _____

Observed by: _____

APPENDIX 2

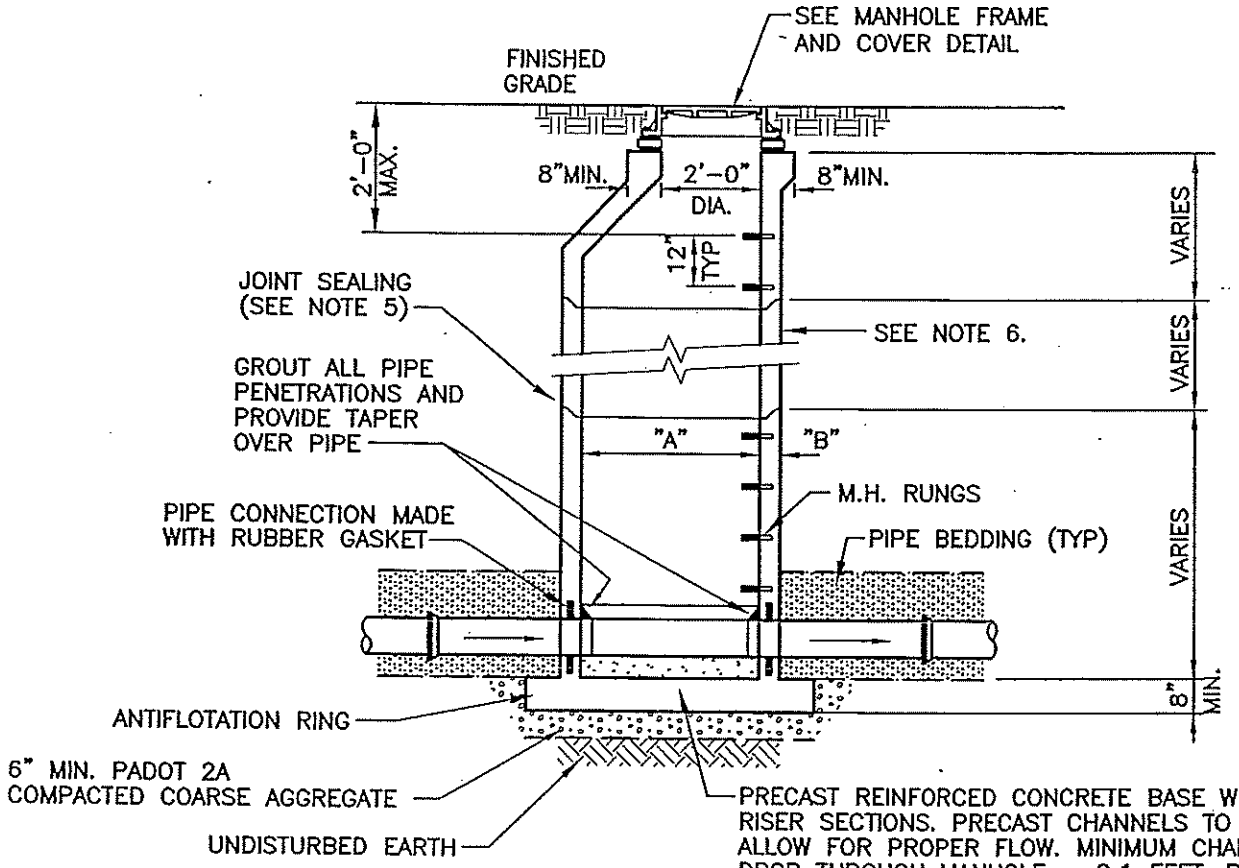
Standard Details

LIST OF STANDARD DETAILS

Detail	Detail No.
Precast Manhole Detail	1
Standard Manhole Frame & Cover	2
Precast Manhole w/ Force Main Discharge	3
Standard Casing Cradle	4
Manhole Details N Drop Connection	5
Trench Restoration N Existing Roads	6A
Trench Restoration N New Roads	6B
Trench Restoration N Lawn/Agricultural Areas	6C
Air Release Valve Vault (Force Main Only)	7
Valve & Cleanout Manhole	8
Horizontal and Vertical Up Restraint Thrust Block Detail N Elbows	9
Horizontal Restraint Thrust Block Detail - Tees	10
Vertical Down Restraint Thrust Block Detail - Elbows	11
Simplex Grinder Pump Detail N Plumbing	12
Typical Stream Crossing	13
Concrete Encasement	14
Force Main Cleanout for Manhole Type 1	15
Force Main Cleanout for Manhole Type 2	16
Lateral Sewer & Service Line Installation	17
Typical Dimensional Sketch of New Lateral	18
Typical Dimensioning of New Utility Installation	19
Metering/Sampling Facility N Site Plan	20A
Metering/Sampling Facility N Sectional Plan	20B
Metering/Sampling Facility N Sections	20C
Vertical Riser Lateral Connection	21
Trench Plug Detail	22
Typical Protection Post	23
Potable Water Yard Hydrant	24

NOTES:

1. ADJUST TO GRADE WITH CONCRETE GRADE RINGS (MAXIMUM VERTICAL ADJUSTMENT 6"). SEE FRAME & COVER DETAILS.
2. MECHANICALLY VIBRATED PRECAST CONCRETE SHALL CONFORM TO A.S.T.M. SPEC. C-478.
3. FOR MANHOLES WHERE TOP OF RIM TO INVERT DISTANCE IS LESS THAN 5'-0", USE FLAT TOP MANHOLE IN LIEU OF CONE TOP.
4. FILL ALL LIFTING HOLES WITH NON-SHRINK GROUT.
5. PROVIDE 2 RINGS OF PREFORMED BUTYL RUBBER SEALING COMPOUND (INSIDE & OUTSIDE) AT ALL MANHOLE JOINTS.
6. COAT INTERIOR & EXTERIOR WITH NSF APPROVED EPOXY, 20-MIL DFT (TYP.)
   INTERIOR COLOR: WHITE
   EXTERIOR COLOR: BEIGE



PIPE DIA.	DIMENSIONS	
	"A"	"B" (MIN.)
8"-15"	4'-0"	5"
18"-21"	5'-0"	6"
24"-36"	6'-0"	7"

SECTION

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

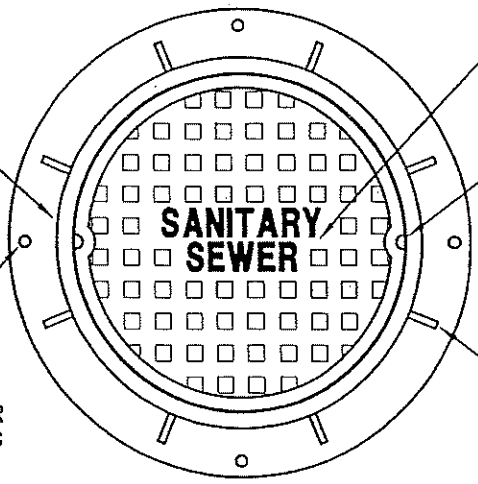
PRECAST MANHOLE DETAIL

ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 1

DWG. NAME 5222SD01



HEAVY DUTY CAST IRON FRAME AND COVER SUITABLE FOR AASHTO HS25 LOADING

2" RAISED LETTER FLUSH W/ LID SURFACE

CONCEALED PICK HOLE (2 REQUIRED)

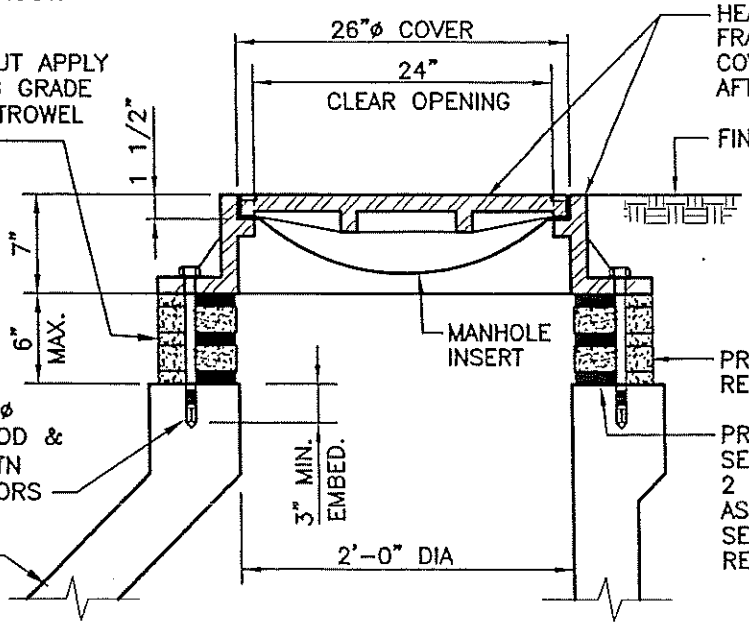
(4) 7/8"ø BOLT HOLES

GUSSETS (MINIMUM 6 REQUIRED)

NOTES:

1. ANCHOR BOLT HOLES SHALL BE DRILLED WITH A PERCUSSION OR ROTARY HAMMER DRILL UTILIZING A CARBIDE DRILL BIT. CORE DRILLING, OR ROTATIONAL ONLY DRILLING, OF ANY KIND, IS NOT ALLOWED.
2. FRAME ANCHORS SHALL BE TIGHTENED PRIOR TO CURING OF NON-SHRINK GROUT.

COVER PATTERN



NON-SHRINK GROUT APPLY PRIOR TO PLACING GRADE RINGS & FRAME, TROWEL EDGE (TYPICAL)

HEAVY DUTY CAST IRON FRAME AND COVER - COVER TO BE FLUSH AFTER INSERT PLACED.

FINISHED GRADE

MANHOLE INSERT

PRECAST GRADE RING AS REQUIRED (MAXIMUM OF 2)

(4) INSERTS W/ 3/4"ø STN STL THREADED ROD & NUT OR (4) 3/4"ø STN STL EXPANSION ANCHORS

PREFORMED BUTYL RUBBER SEALING COMPOUND - 2 STRIPS WIDE, THICKNESS AS REQD FOR COMPLETE SEALING, IF LEVELING REQD (TYP)

MANHOLE RISER CONE SECTION

NOTES:

1. STANDARD MH FRAME & COVER SHALL BE CAT. NO. 1040 AS MANUFACTURED BY EAST JORDAN IRON WORKS, INC.
2. WATERTIGHT FRAME & COVER SHALL BE CAT. NO. 1040 "WATERTITE" AS MANUFACTURED BY EAST JORDAN IRON WORKS, INC.
3. MANHOLE INSERT NOT REQUIRED FOR WATERTIGHT MH. FRAME & COVER.
4. FRAME & COVER SHALL BE DESIGNED FOR AASHTO HS-25 LOADING.

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

STANDARD MANHOLE FRAME & COVER

ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

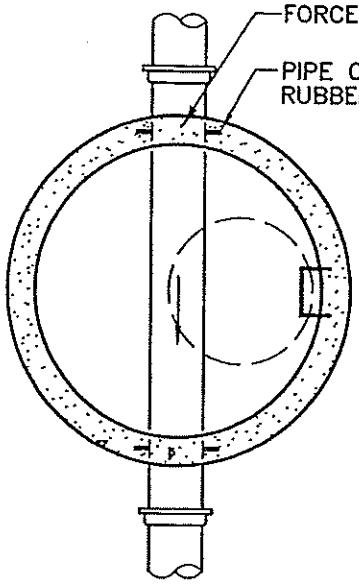
DATE: JUNE 2002

DETAIL: 2

DW. NAME 5222SD02

NOTES:

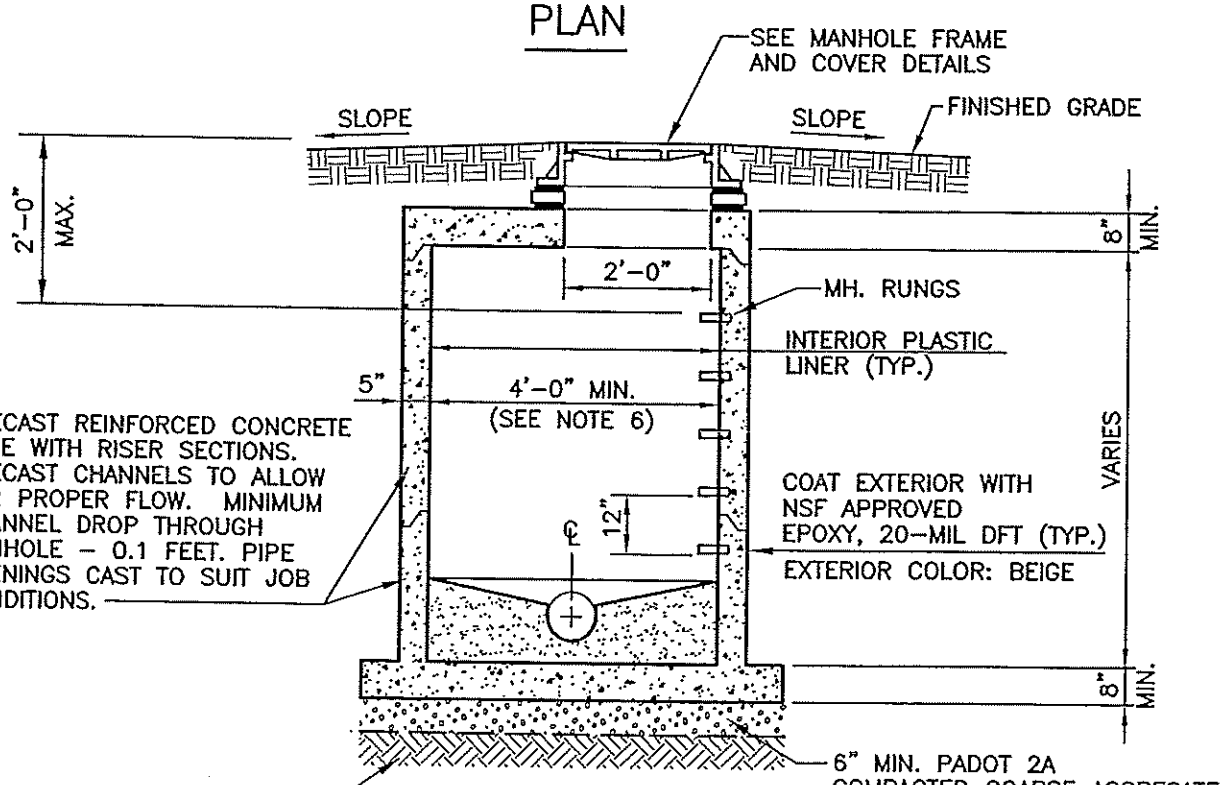
1. ADJUST TO GRADE WITH CONC. GRADE RINGS (MAX. VERT. ADJUST. 6"). SEE FRAME & COVER DETAIL.
2. MECHANICALLY VIBRATED PRECAST CONC. SHALL CONFORM TO A.S.T.M. C-478.
3. SEAL ALL JOINTS INSIDE & OUTSIDE WITH PREFORMED BUTYL RUBBER SEALING COMPOUND.
4. FILL ALL LIFTING HOLES WITH NON-SHRINK GROUT.
5. INTERIOR PLASTIC LINER TO PROVIDE CONTINUOUS, IMPERMEABLE LINING TO SHIELD PRECAST CONC. AGAINST DETERIORATION CAUSED BY CORROSIVE ATMOSPHERE.



NOTES: (CONT'D)

6. INSIDE DIAMETER DETERMINED BY PIPE SIZE & CONFIGURATION IN MANHOLE. SEE PRECAST MANHOLE DETAIL.
7. CHANNELS, BENCH AND ALL PENETRATIONS THROUGH LINER SHALL RECEIVE FACTORY APPLIED CORROSION RESISTANT COATING.
8. INTERIOR LINER SHALL BE AGRU SURE GRIP LINER & GU-BASE LINER AS MANUFACTURED BY TERRE HILL CONCRETE PRODUCTS.

PLAN



SECTION

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

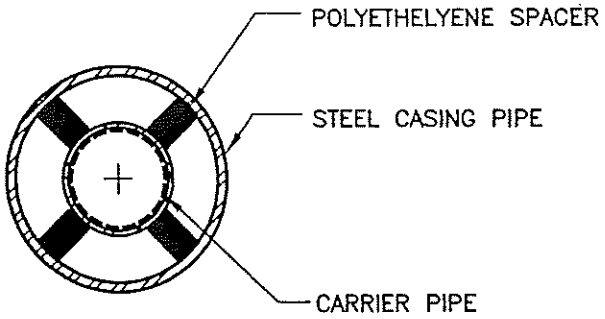
PRECAST MANHOLE W/ FORCE MAIN DISCHARGE

ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

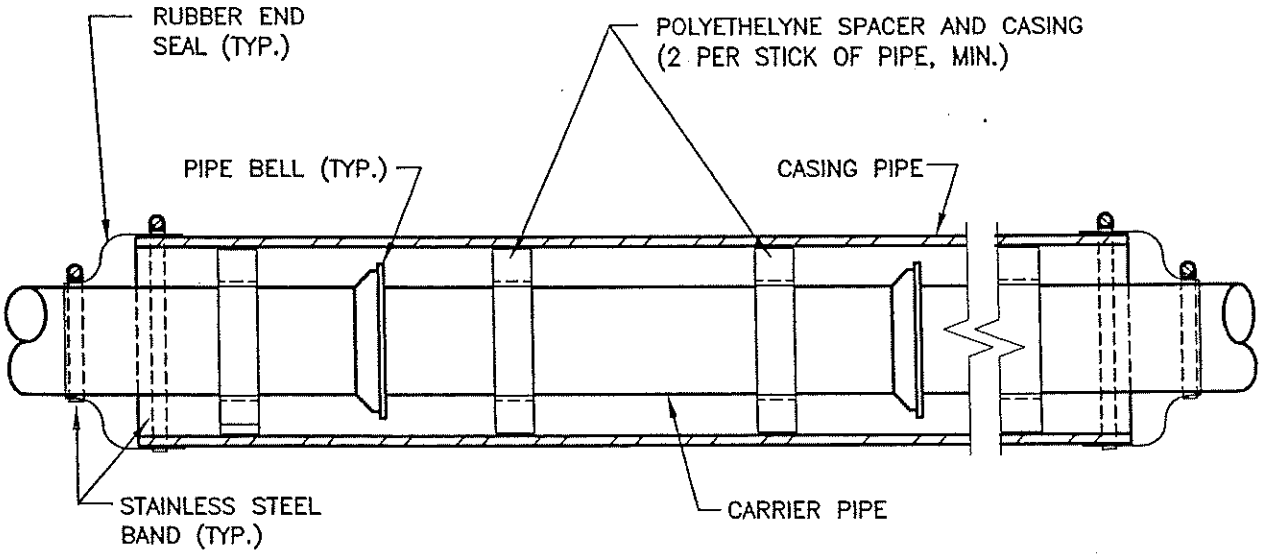
DATE: JUNE 2002

DETAIL: 3

DWG. NAME 5222SD03



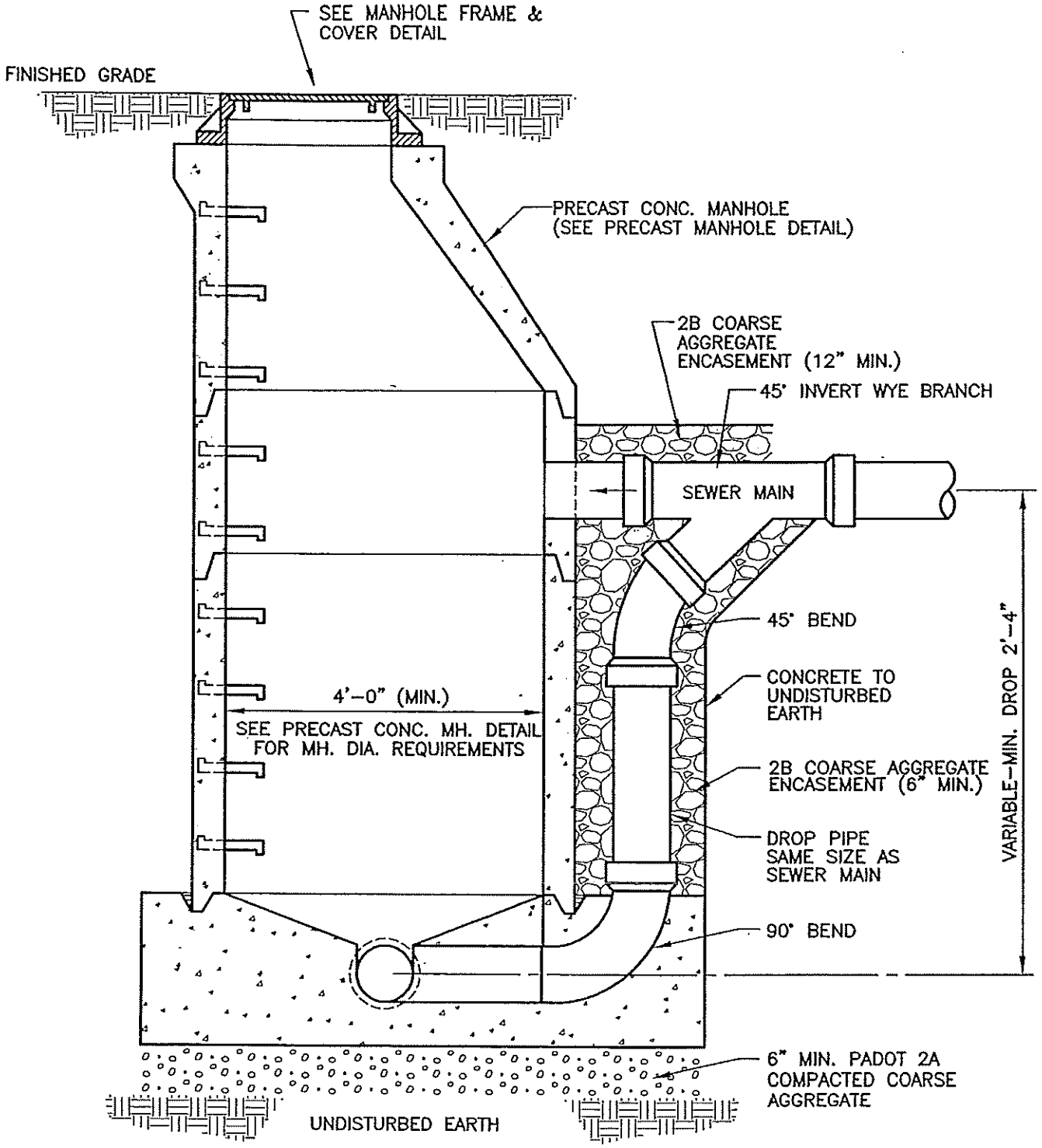
SECTION



ELEVATION

		EAST COVENTRY TOWNSHIP	ARRO Consulting, Inc. Suite 100, 649 North Lewis Road Limerick, Pennsylvania 19468 Tel 610.495.0303
		STANDARD DETAIL - SEWER SYSTEM	
1	2/9/04	**STANDARD CASING CRADLE**	DATE: JUNE 2002
REVISION	DATE		DETAIL: 4

DWG. NAME 5222SD04



1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

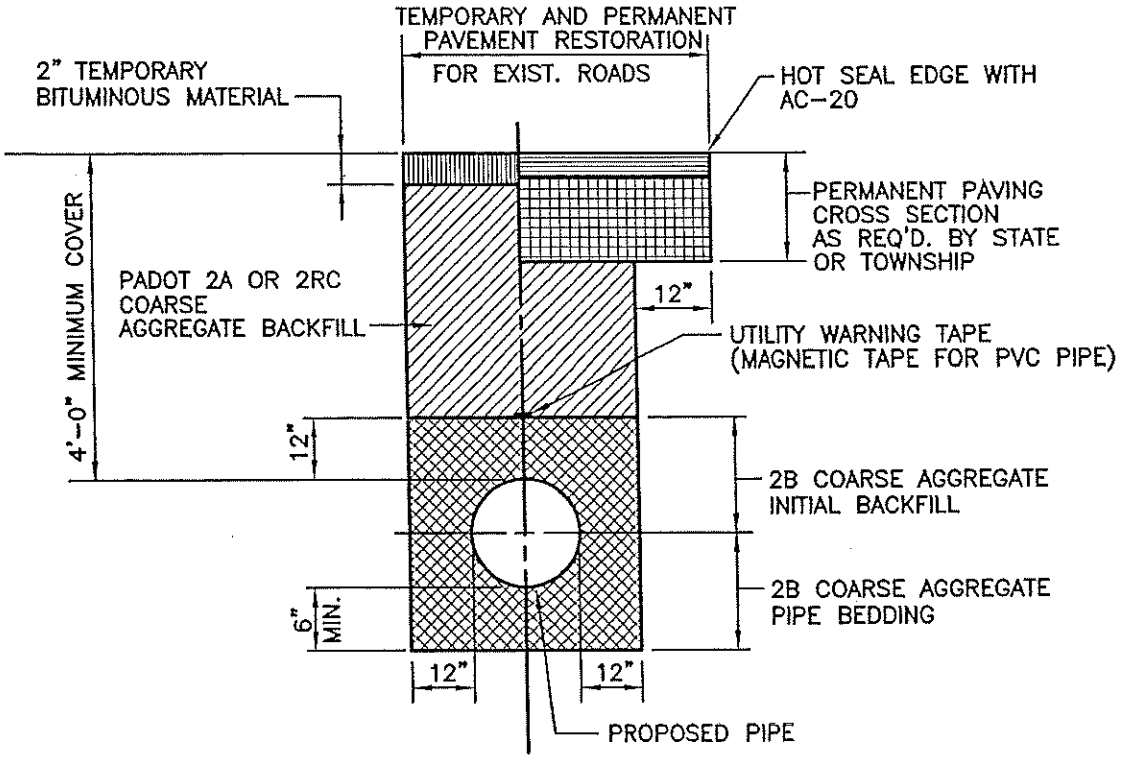
MANHOLE DETAILS
DROP CONNECTION

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Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 5

DWG. NAME 5222SD05



(TYPICAL FOR EXISTING STATE HIGHWAYS, TOWNSHIP ROADS, SHOULDERS & DRIVEWAYS)

NOTE: IF THERE IS A CONFLICT BETWEEN STATE ROAD RESTORATION REQUIREMENTS AND THIS DETAIL, THE STATE ROAD RESTORATION REQUIREMENTS SHALL PREVAIL.

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL

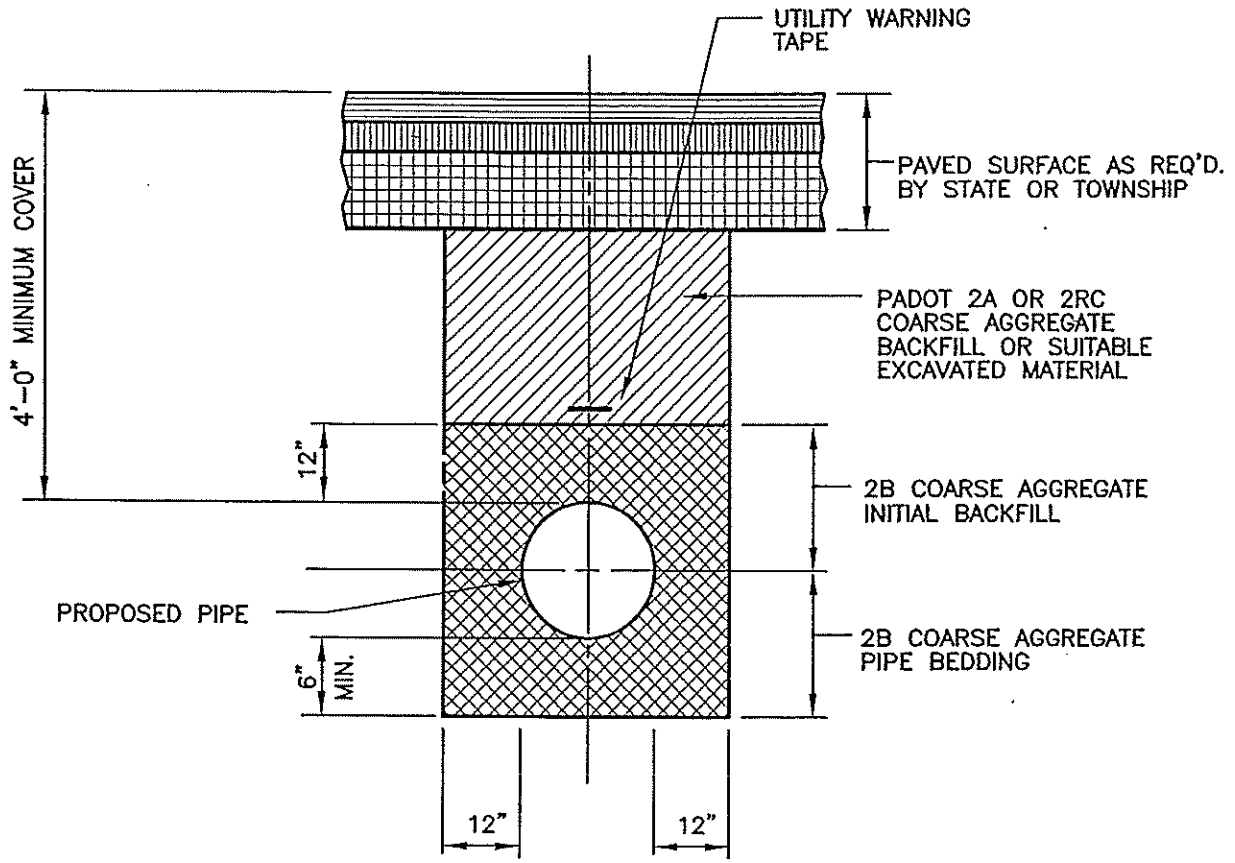
TRENCH RESTORATION EXISTING ROADS

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Limerick, Pennsylvania 19468
Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 6A

DWG. NAME 5222SD06A



1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL

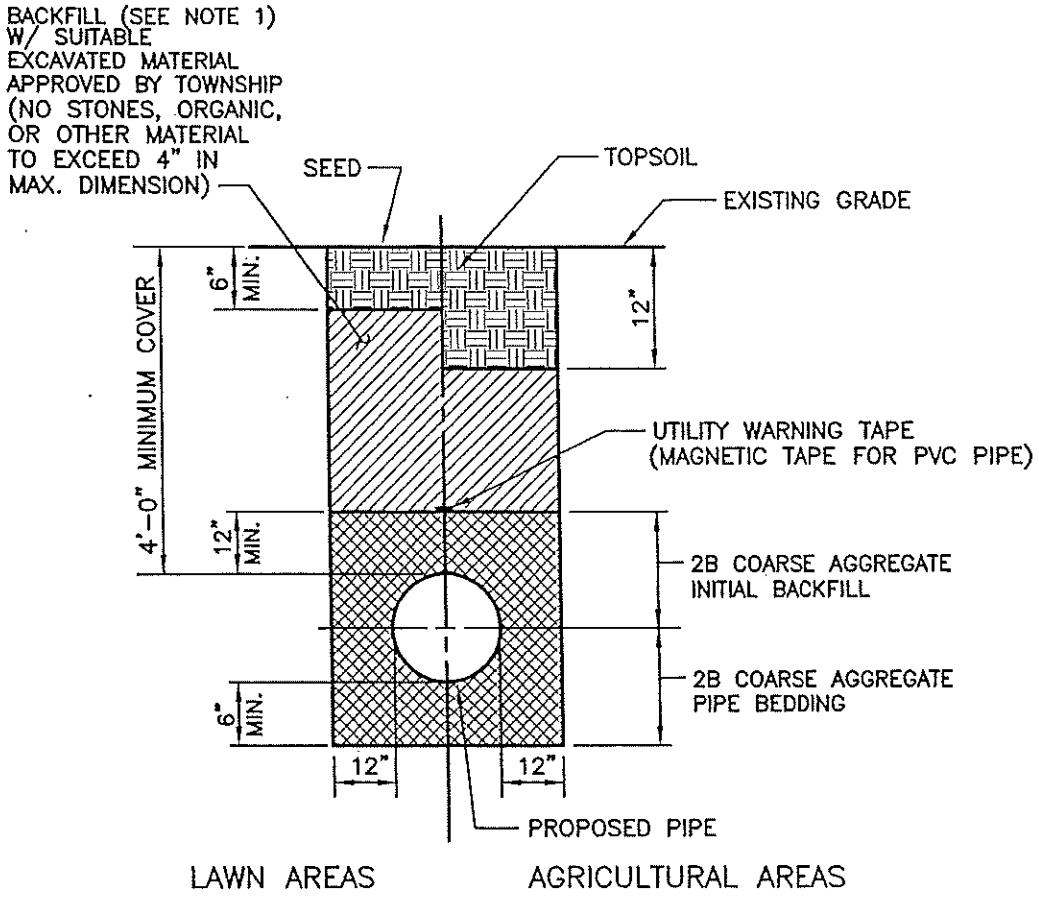
TRENCH RESTORATION NEW ROADS

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Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 6B

DWG. NAME 5222SD06B

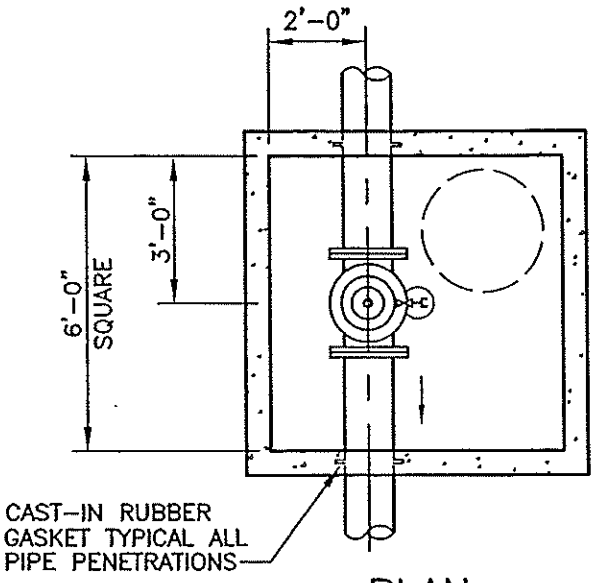


NOTE:

1. IF EDGE OF TRENCH IS LESS THAN 3' OFF THE EDGE OF PAVING OF A STATE ROAD, THEN BACKFILL MATERIAL SHALL BE PADOT 2A OR 2RC.

		EAST COVENTRY TOWNSHIP	ARRO Consulting, Inc. Suite 100, 649 North Lewis Road Limerick, Pennsylvania 19468 Tel 610.495.0303
		STANDARD DETAIL	
1	2/9/04	**TRENCH RESTORATION LAWN/AGRICULTURAL AREAS**	DATE: JUNE 2002
REVISION	DATE		DETAIL: 6C

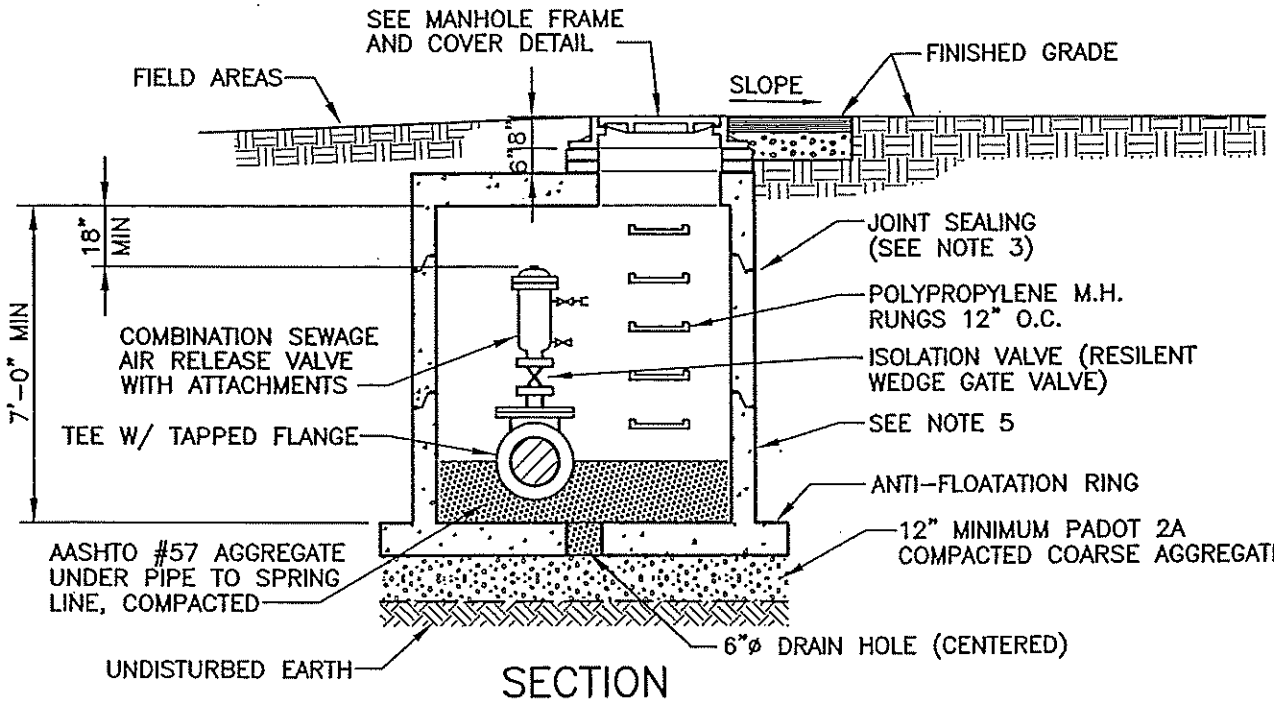
DWG. NAME 5222SD06C



PLAN

NOTES:

1. ADJUST TO GRADE WITH CONCRETE GRADE RINGS (MAXIMUM VERTICAL ADJUSTMENT 6"). SEE FRAME & COVER DETAIL.
2. MECHANICALLY VIBRATED PRECAST CONCRETE SHALL CONFORM TO A.S.T.M. SPEC. C-478.
3. PROVIDE 2 RINGS OF PREFORMED BUTYL RUBBER SEALING COMPOUND (INSIDE & OUTSIDE) AT ALL MANHOLE JOINTS.
4. FILL ALL LIFTING HOLES WITH NON-SHRINK GROUT.
5. COAT INTERIOR & EXTERIOR WITH NSF APPROVED EPOXY, 20-MIL DFT (TYP.)
   INTERIOR COLOR: WHITE
   EXTERIOR COLOR: BEIGE



SECTION

SPECIAL NOTE: DEPTH OF MAIN MUST BE INCREASED FROM THE 4'-0" STANDARD TO ALLOW FOR INSTALLATION OF THE AIR RELEASE VALVE WITH 18 INCH MINIMUM CLEARANCE. THE PIPE SHALL BE CONTINUOUSLY RISING WITH THE AIR RELEASE VALVE AT THE HIGHEST ELEVATION POINT IN THE PIPING.

1	2/9/04
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EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

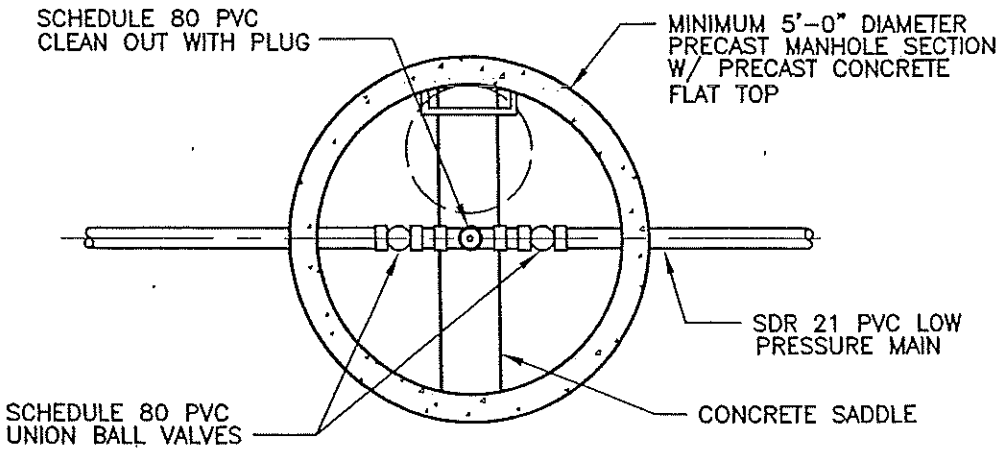
AIR RELEASE VALVE VAULT (FORCE MAIN ONLY)

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Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

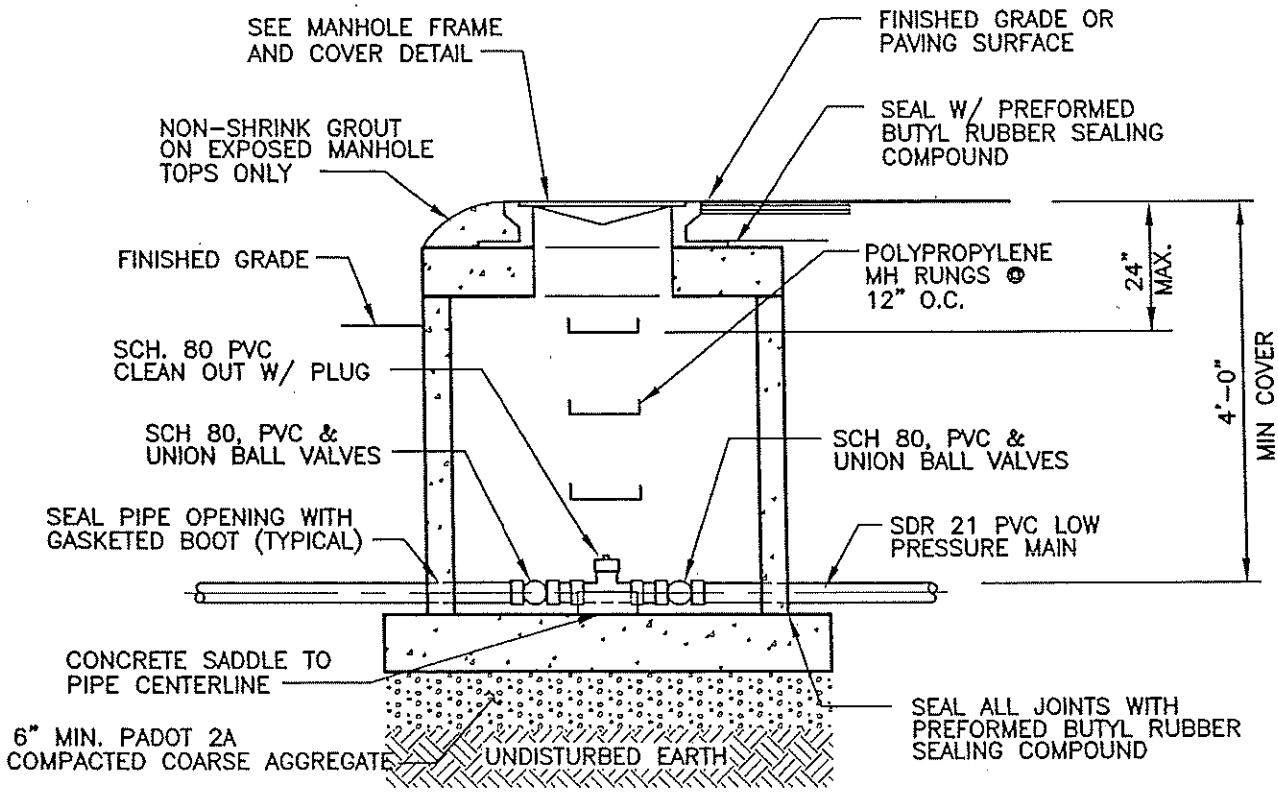
DATE: JUNE 2002

DETAIL: 7

DWG. NAME 5222SD07



PLAN



SECTION

NOTE:

ALL PIPE AND FITTINGS BETWEEN VALVES SHALL BE SCHEDULE 80 PVC

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

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Tel 610.495.0303

VALVE & CLEANOUT MANHOLE

DATE: JUNE 2002

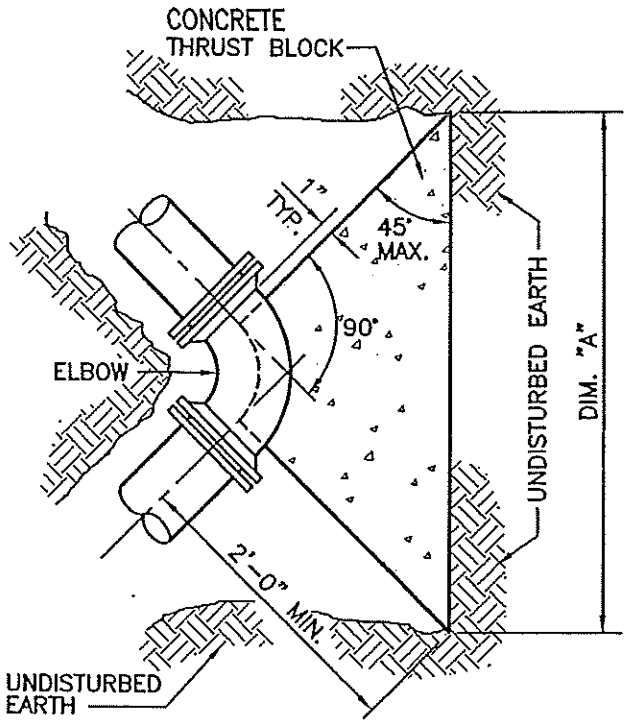
DETAIL: 8

DWG. NAME 5222SD08

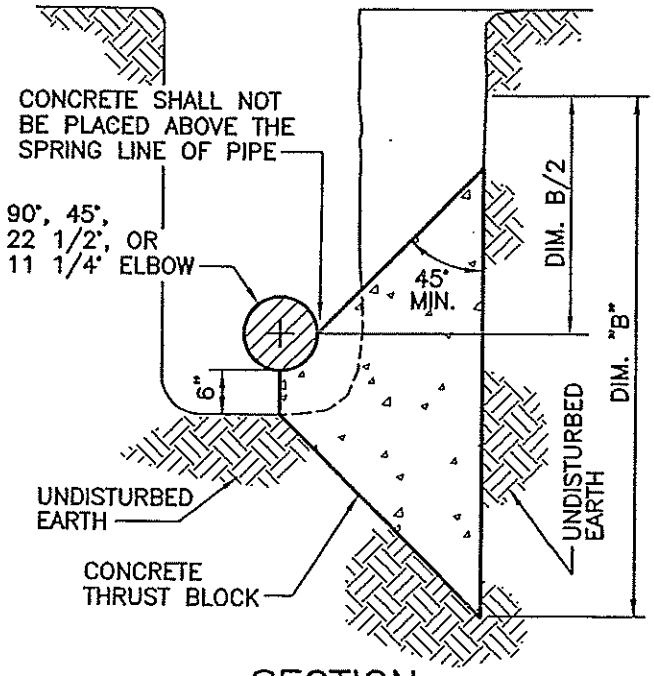
THRUST BLOCK DIMENSION SCHEDULE – ELBOWS(*)					
PIPE DIAM.	DIM.	ELBOW DEFLECTION ANGLE			
		11 1/4°	22 1/2°	45°	90°
1 1/2" THRU 4"	A	12"	18"	24"	24"
	B	12"	12"	12"	18"
6"	A	18"	24"	30"	42"
	B	12"	18"	24"	30"
8"	A	24"	24"	42"	60"
	B	12"	24"	30"	36"
12"	A	30"	42"	54"	90"
	B	24"	30"	36"	48"

(*) THRUST BLOCK DESIGN BASED ON THE MINIMUM SOIL HORIZONTAL BEARING STRENGTH OF 3000 PSF AND 150 PSI WORKING PRESSURE PLUS 50% WATER HAMMER ALLOWANCE.

FOR PIPE SIZES GREATER THAN 12", SUBMIT ENGINEERING CALCULATIONS TO VERIFY PROPOSED THRUST BLOCK SIZES.



PLAN



SECTION

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

HORIZ. & VERT. UP RESTRAINT THRUST BLOCK DETAIL-ELBOWS

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Tel 610.495.0303

DATE: JUNE 2002

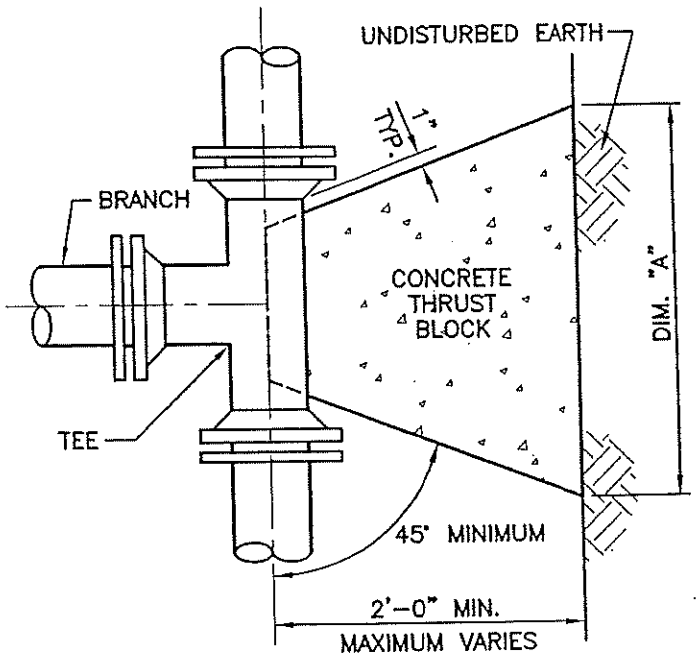
DETAIL: 9

DWG. NAME 5222SD09

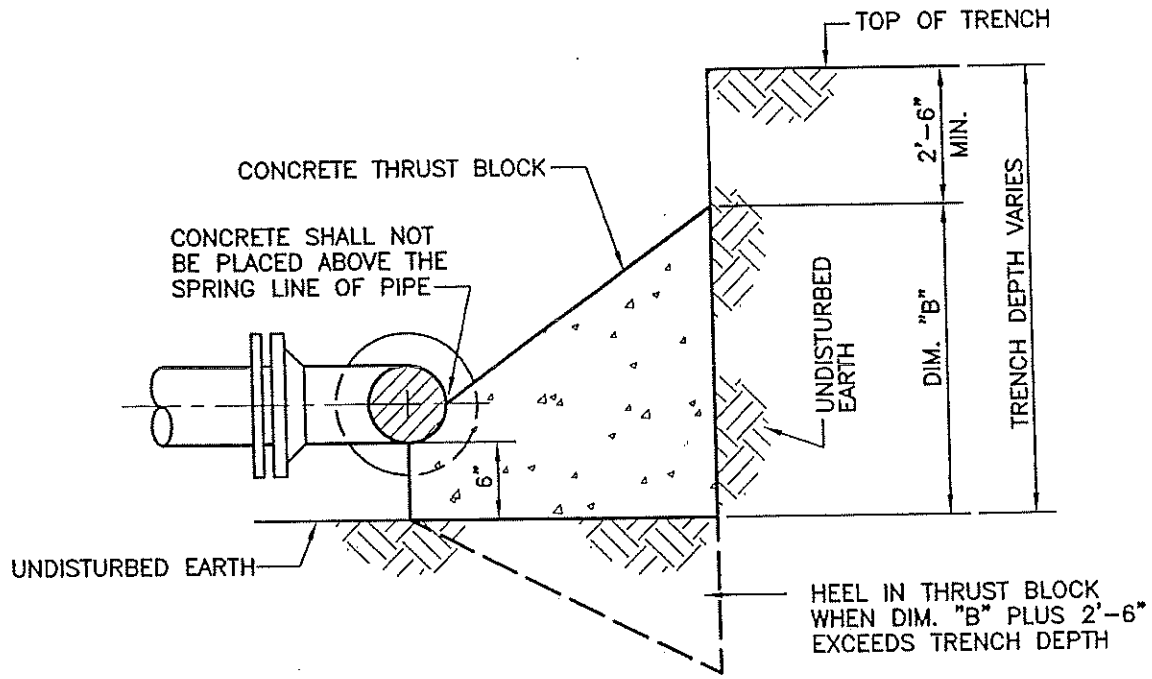
THRUST BLOCK DIMENSION SCHEDULE – ELBOWS(*)				
DIM.	BRANCH SIZE			
	1 1/2" – 4"	6"	8"	12"
A	36"	42"	60"	96"
B	18"	24"	30"	42"

(*) THRUST BLOCK DESIGN BASED ON THE MINIMUM SOIL HORIZONTAL BEARING STRENGTH OF 3000 PSF AND 150 PSI WORKING PRESSURE PLUS 50% WATER HAMMER ALLOWANCE.

FOR PIPE SIZES GREATER THAN 12", SUBMIT ENGINEERING CALCULATIONS TO VERIFY PROPOSED THRUST BLOCK SIZES.



PLAN



SECTION

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

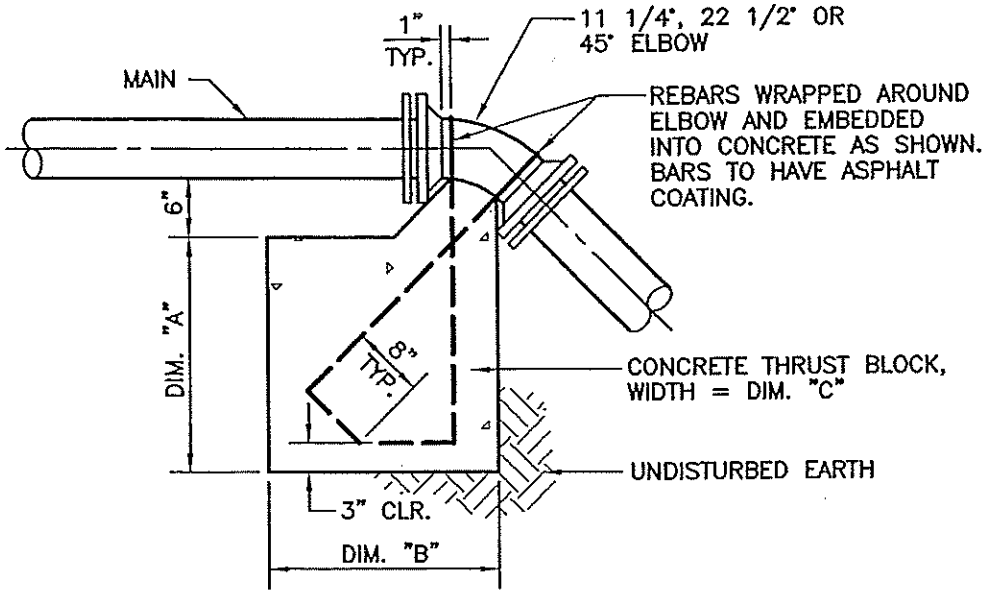
HORIZONTAL RESTRAINT THRUST BLOCK DETAIL-TEES

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Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 10

DWG. NAME 5222SD10



SECTION

THRUST BLOCK DIMENSION SCHEDULE – VERTICAL ELBOWS(*)
(DUCTILE IRON PIPE)

DIM.	1 1/2" – 6" 11 1/4°	8" 11 1/4°	12" 11 1/4°	1 1/2" – 6" 22 1/2°	8" 22 1/2°	12" 22 1/2°	1 1/2" – 6" 45°	8" 45°	12" 45°
A	12"	18"	36"	18"	36"	54"	36"	48"	54"
B	18"	24"	36"	24"	36"	48"	36"	48"	54"
C	18"	24"	24"	24"	24"	30"	24"	30"	48"
REBAR	#4	#4	#6	#4	#4	#6	#4	#4	#6

(*) THRUST BLOCK DESIGN BASED ON THE MINIMUM SOIL HORIZONTAL BEARING STRENGTH OF 3000 PSF AND 150 PSI WORKING PRESSURE PLUS 50% WATER HAMMER ALLOWANCE.

FOR PIPE SIZES GREATER THAN 12", SUBMIT ENGINEERING CALCULATIONS TO VERIFY PROPOSED THRUST BLOCK SIZES.

REVISION	DATE
1	2/9/04

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

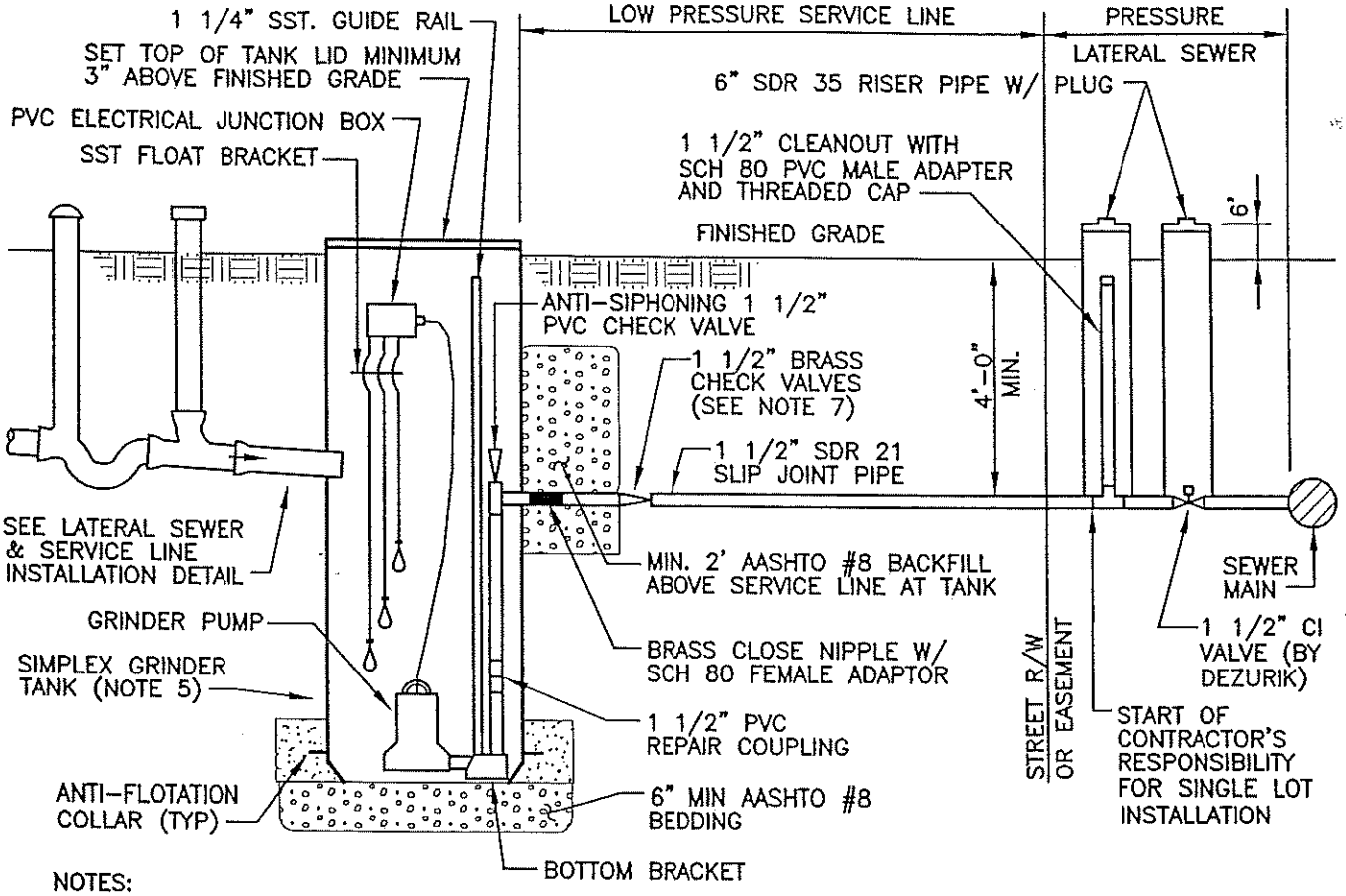
VERTICAL DOWN RESTRAINT THRUST BLOCK DETAIL-ELBOWS

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Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 11

DWG. NAME 5222SD11



NOTES:

1. ALL PLUMBING INSIDE GRINDER TANK & BETWEEN THE OUTER TANK WALL & THE BRASS CHECK VALVE SHALL BE 1 1/2" SCH 80 PVC PIPE.
2. UNLESS OTHERWISE NOTED ALL ADAPTERS SHALL BE SCH 80 PVC (GLUE JOINTS WHERE APPLICABLE).
3. METALLIC DETECTION TAPE SHALL BE PLACED ABOVE LOW PRESSURE SERVICE LINE, MAX. 2' BELOW FINISHED GRADE.
4. ALL STRUCTURAL SUPPORTS, ANGLES, NUTS, BOLTS, WASHERS AND LAGS USED INSIDE THE TANK SHALL BE 316 STAINLESS STEEL.
5. 3/4 YARD (MIN) OF CONC. SHALL BE PLACED AROUND THE ANTI-FLOTATION COLLAR OF FIBERGLASS GRINDER TANKS TO PREVENT FLOTATION. CONCRETE SHALL EXTEND 1' ABOVE THE COLLAR & TO THE LIMITS OF EXCAVATION. NO CONC. SHALL BE PLACED BETWEEN THE TANK BEDDING & THE HORIZONTAL BOTTOM OF THE TANK.
6. BRASS CHECK VALVES SHALL BE BEDDED ON UNDISTURBED SOIL.
7. PROVIDE TWO (2) CHECK VALVES IN SERIES BETWEEN GRINDER PUMP & CLEANOUT WHEN DISCHARGING TO A LOW PRESSURE SEWER OR FORCE MAIN.
8. PRESSURE LATERAL SEWER, WHEN CONNECTING TO A GRAVITY SEWER SYSTEM, SHALL CONNECT AT A MANHOLE WHENEVER POSSIBLE AS DIRECTED BY THE ENGINEER. MANHOLE PENETRATIONS SHALL BE WATERTIGHT. THE PRESSURE LATERAL SHALL BE EXTENDED INSIDE THE MANHOLE TO THE BENCH WITH A 90° BEND. A FLOW CHANNEL SHALL BE PROPERLY FORMED IN THE MANHOLE BENCH TO ACCOMMODATE THE PRESSURE SEWER LATERAL. THE PROPOSED DESIGN SHALL BE APPROVED BY THE ENGINEER.

1	2/9/04
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EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

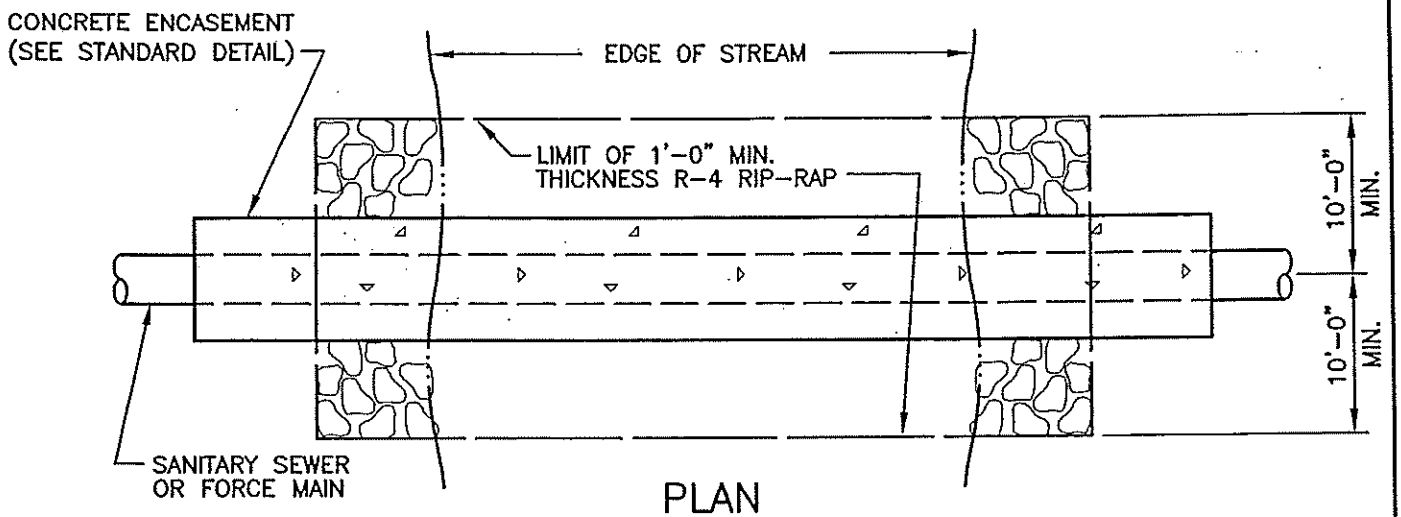
SIMPLEX GRINDER PUMP DETAIL-PLUMBING

ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

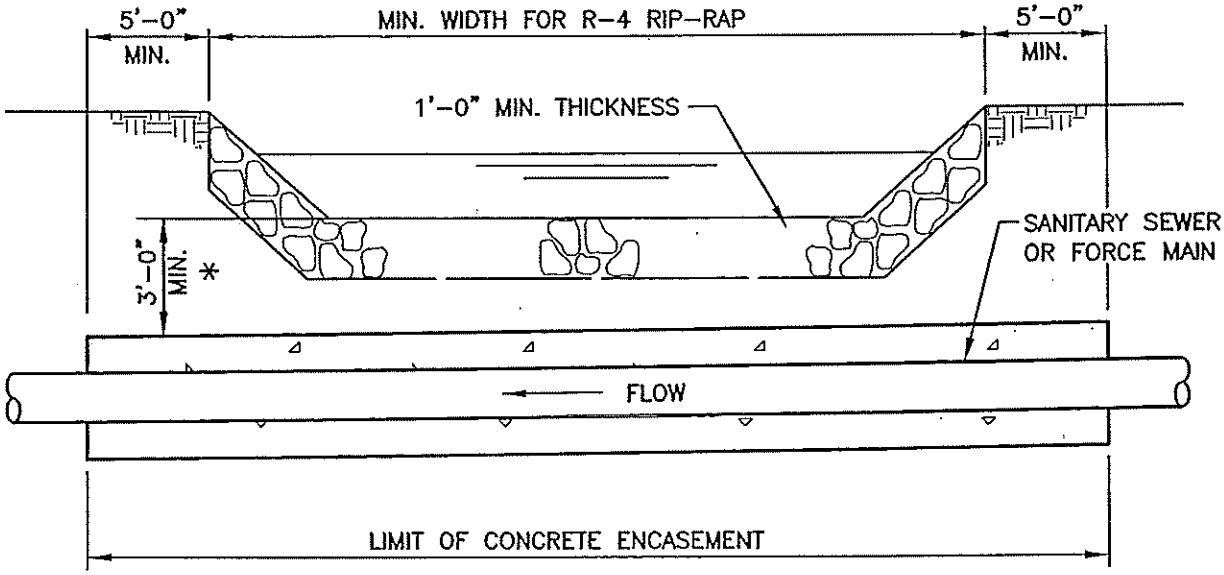
DATE: JUNE 2002

DETAIL: 12

DWG. NAME 5222SD12



PLAN



SECTION

NOTES:

ALL STREAM CROSSINGS SHALL BE IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE CHESTER COUNTY CONSERVATION DISTRICT.

* 1'-0" MIN. IN ROCK.

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EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

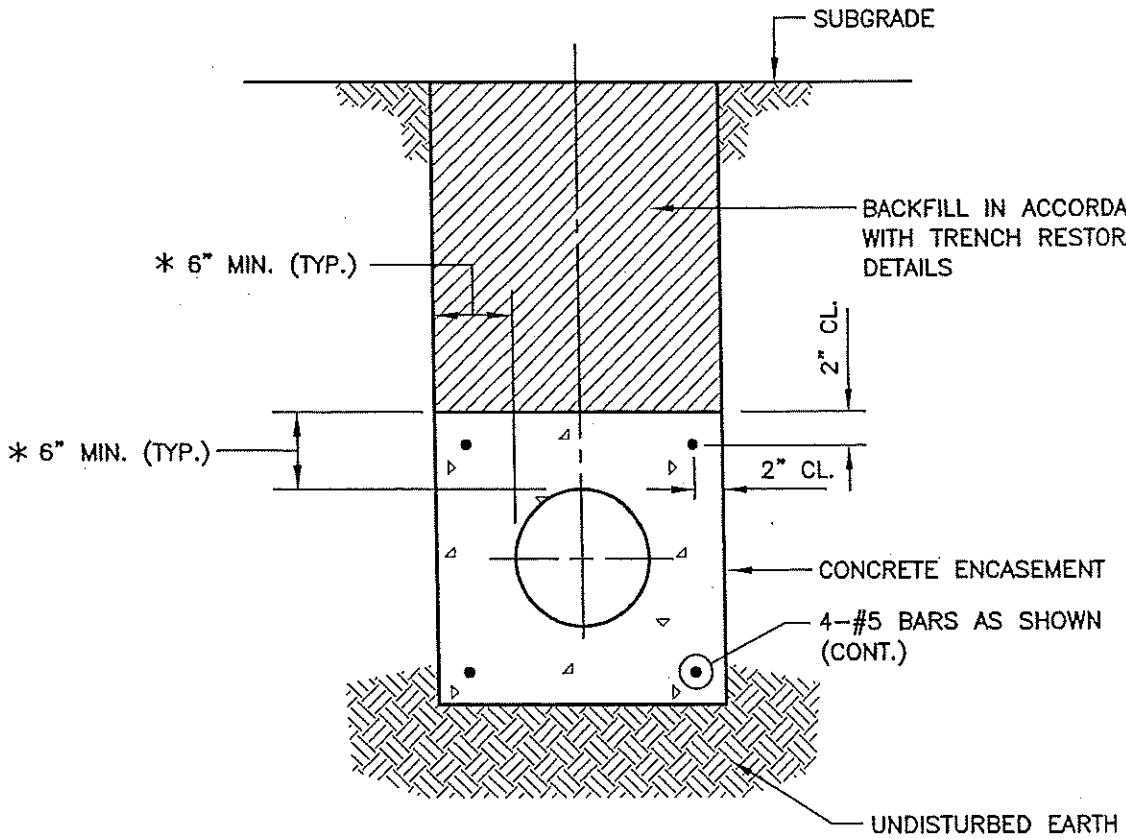
TYPICAL STREAM CROSSING

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Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 13

DWG. NAME 5222SD13



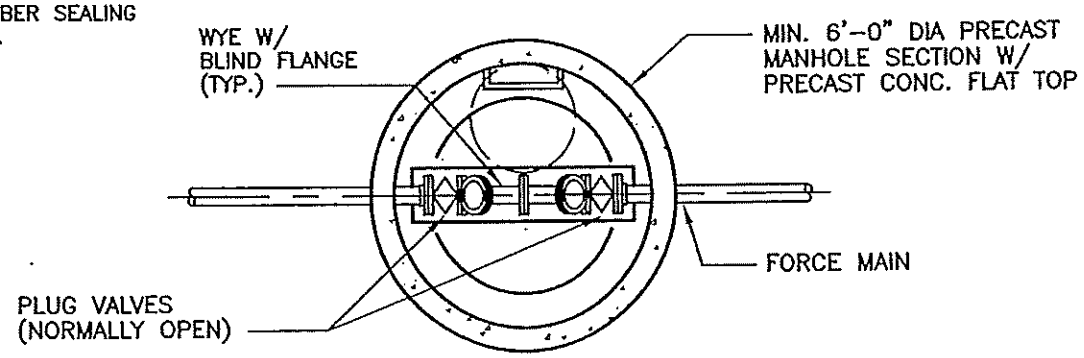
* 6" MINIMUM THICKNESS FOR PIPES UP TO 24 INCHES DIAMETER.
9" MINIMUM THICKNESS FOR PIPES 24 INCHES DIAMETER AND GREATER.

		EAST COVENTRY TOWNSHIP	ARRO Consulting, Inc. Suite 100, 649 North Lewis Road Limerick, Pennsylvania 19468 Tel 610.495.0303
		STANDARD DETAIL - SEWER SYSTEM	
1	2/9/04	**CONCRETE ENCASEMENT**	DATE: JUNE 2002
REVISION	DATE		DETAIL: 14

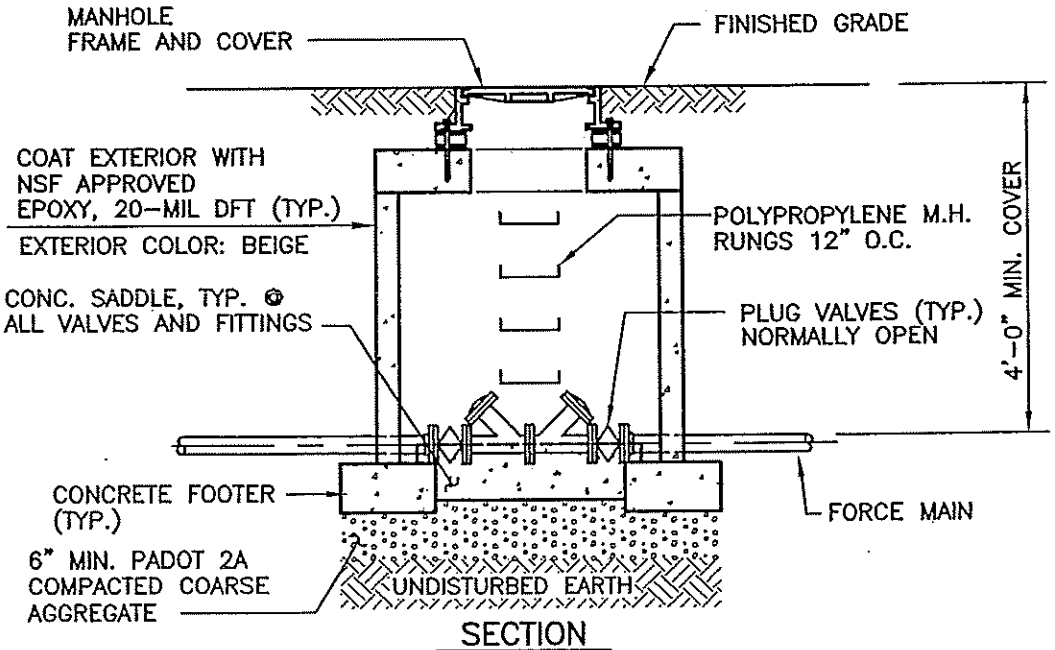
DWG. NAME 5222SD14

NOTES:

1. ADJUST TO GRADE WITH CONC. GRADE RINGS (MAX. VERT. ADJUST. 6"). SEE FRAME & COVER DETAIL.
2. MECHANICALLY VIBRATED PRECAST CONC. SHALL CONFORM TO A.S.T.M. C-478.
3. SEAL ALL JOINTS INSIDE & OUTSIDE WITH PREFORMED BUTYL RUBBER SEALING COMPOUND.



PLAN



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EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

FORCE MAIN CLEANOUT FOR MANHOLE TYPE 1

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Tel 610.495.0303

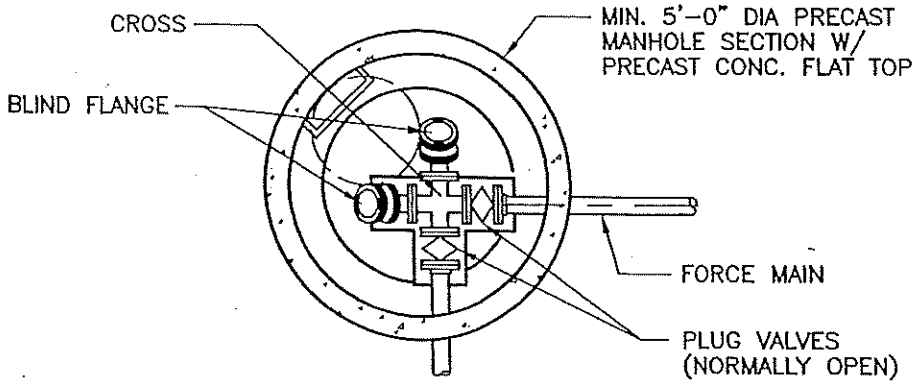
DATE: JUNE 2002

DETAIL: 15

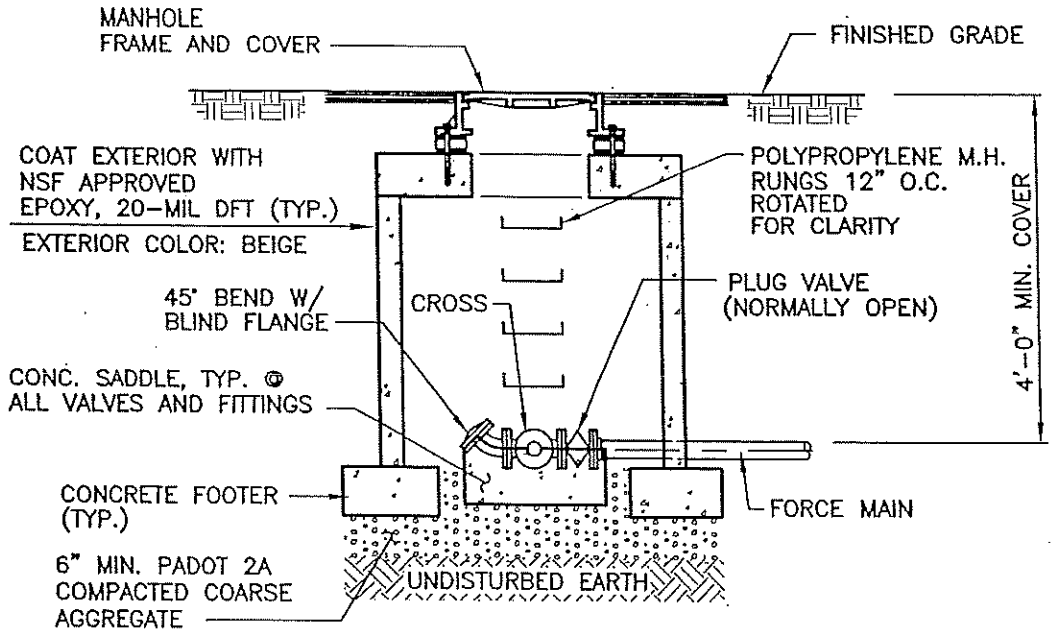
DWG. NAME 5222SD15

NOTES:

1. ADJUST TO GRADE WITH CONC. GRADE RINGS (MAX. VERT. ADJUST. 6"). SEE FRAME & COVER DETAIL.
2. MECHANICALLY VIBRATED PRECAST CONC. SHALL CONFORM TO A.S.T.M. C-478.
3. SEAL ALL JOINTS INSIDE & OUTSIDE WITH PREFORMED BUTYL RUBBER SEALING COMPOUND.



PLAN



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1	2/9/04
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EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

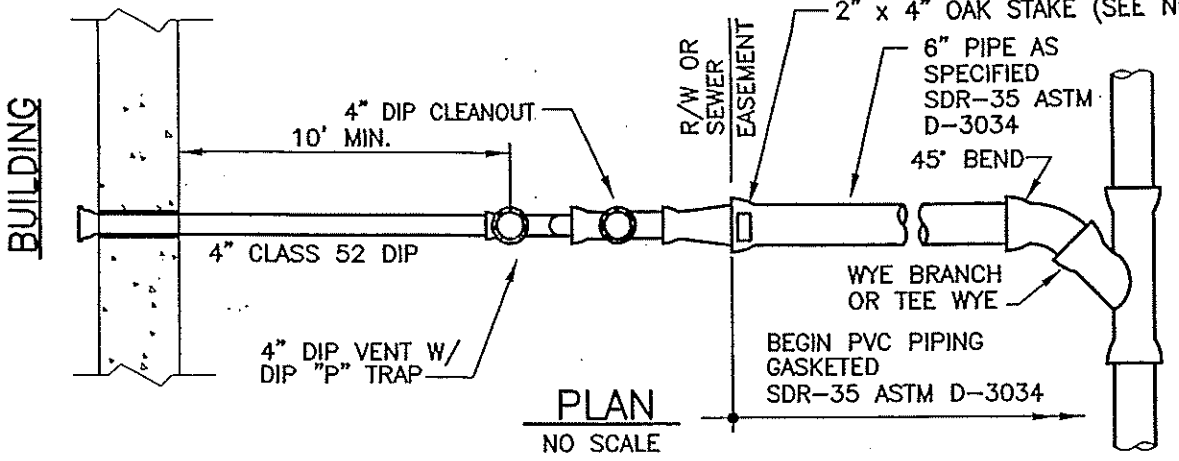
FORCE MAIN CLEANOUT FOR MANHOLE TYPE 2

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Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 16

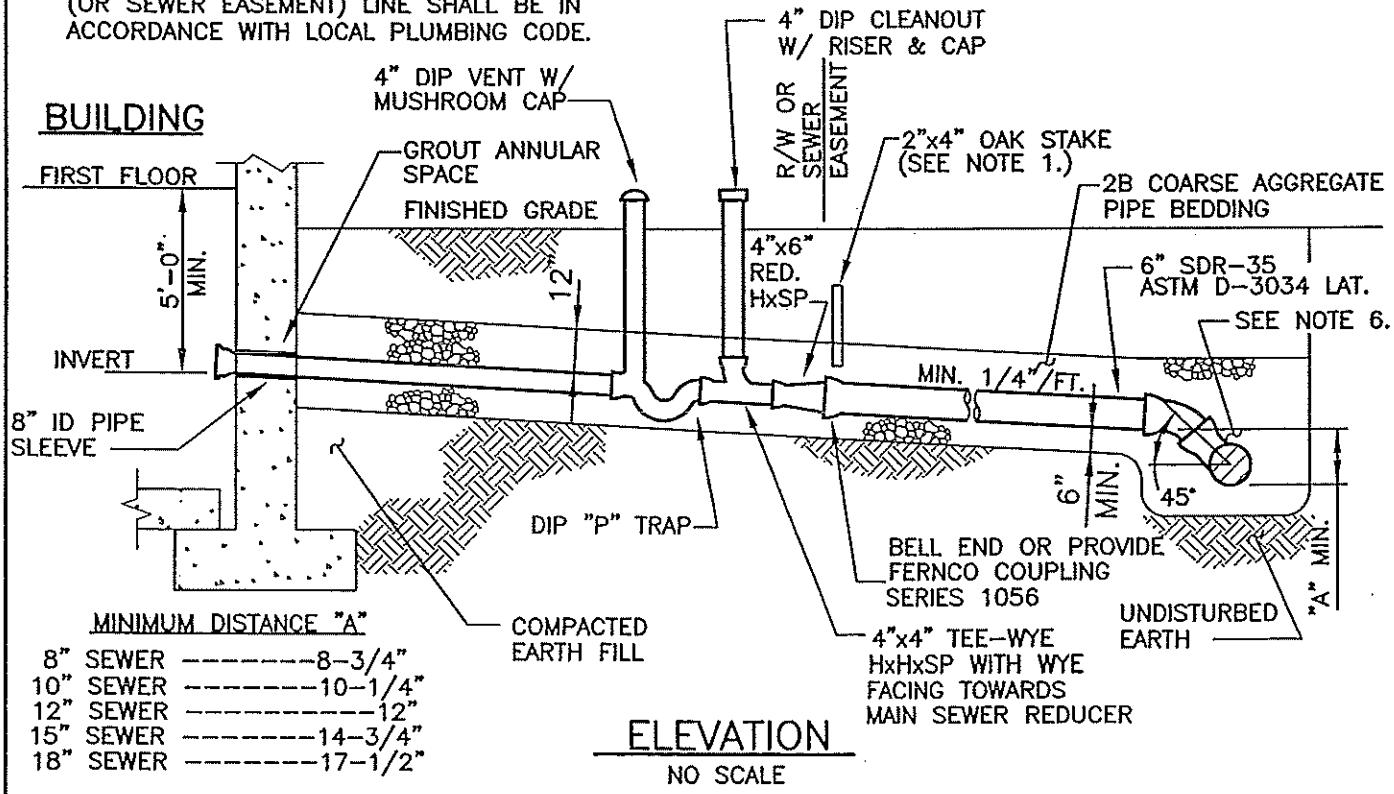
DWG. NAME 5222SD16



PLAN
NO SCALE

NOTES:

1. END OF ALL LATERALS ARE TO BE PLUGGED & MARKED WITH A 2"x4" OAK STAKE, THE TOP TO REMAIN 12"± BELOW GRADE.
2. 4" LATERAL CONNECTION SHOWN AS A MIN., LARGER SIZE PIPE MAY BE USED IF REQUIRED & CONSISTENT WITH THE DETAILED DESIGN.
3. IN NO CASE SHALL INVERT OF HOUSE CONNECTION BE LESS THAN 4'-0" BELOW FINISHED GRADE.
4. PIPE & FITTINGS INSTALLED FROM BLDG. TO R/W (OR SEWER EASEMENT) LINE SHALL BE IN ACCORDANCE WITH LOCAL PLUMBING CODE.
5. CLEANOUTS SHALL BE SPACED AT 50' MAX. BETWEEN THE CLEANOUT SHOWN & THE R/W (OR SEWER EASEMENT) LINE.
6. ACCORDING TO FIELD CONDITIONS, VERTICAL RISER (SEE STANDARD DETAIL) SHALL BE UTILIZED WHEN DIRECTED BY THE ENGINEER.



MINIMUM DISTANCE "A"

8" SEWER	8-3/4"
10" SEWER	10-1/4"
12" SEWER	12"
15" SEWER	14-3/4"
18" SEWER	17-1/2"

ELEVATION
NO SCALE

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

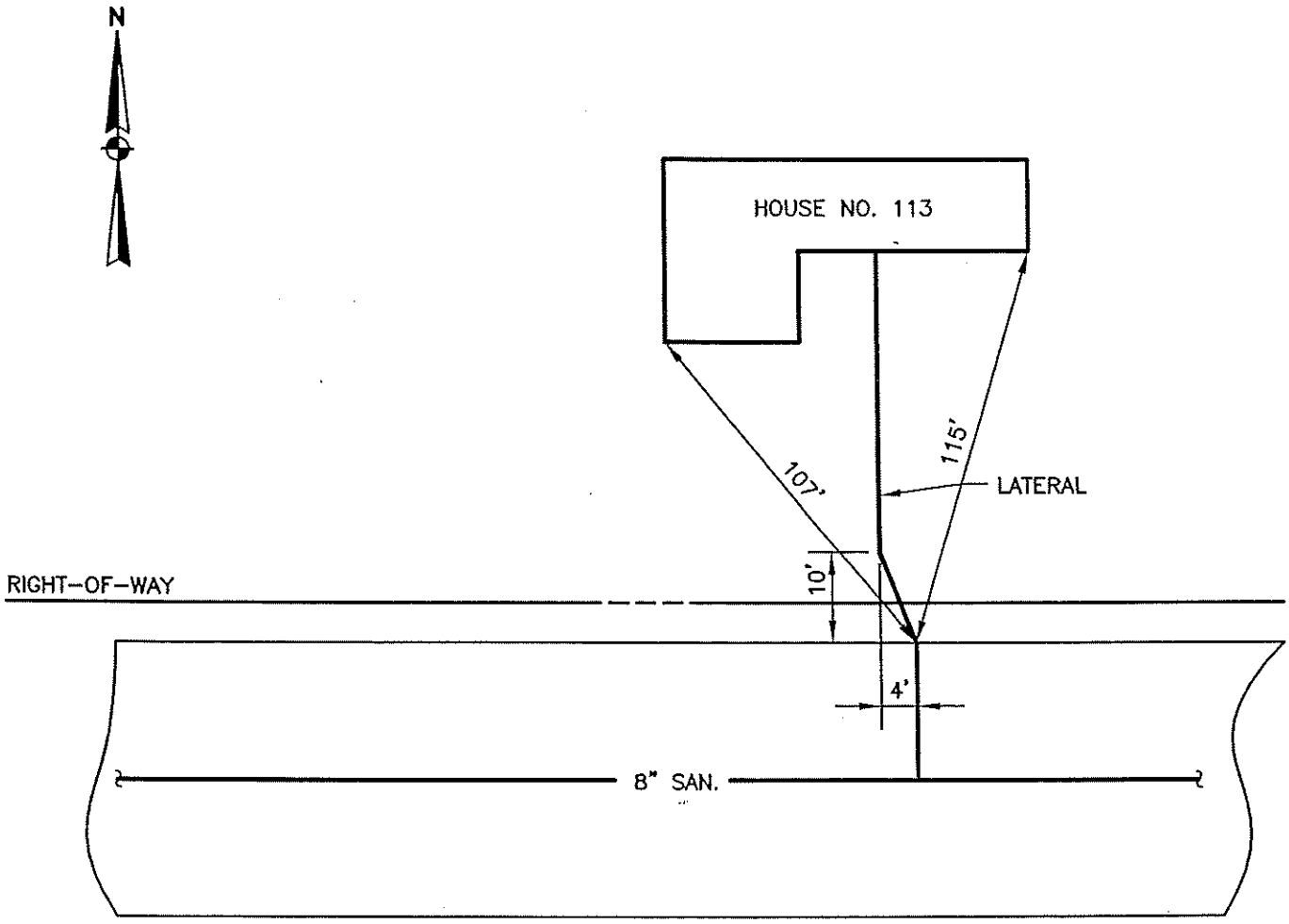
LATERAL SEWER & SERVICE LINE INSTALLATION

ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 17

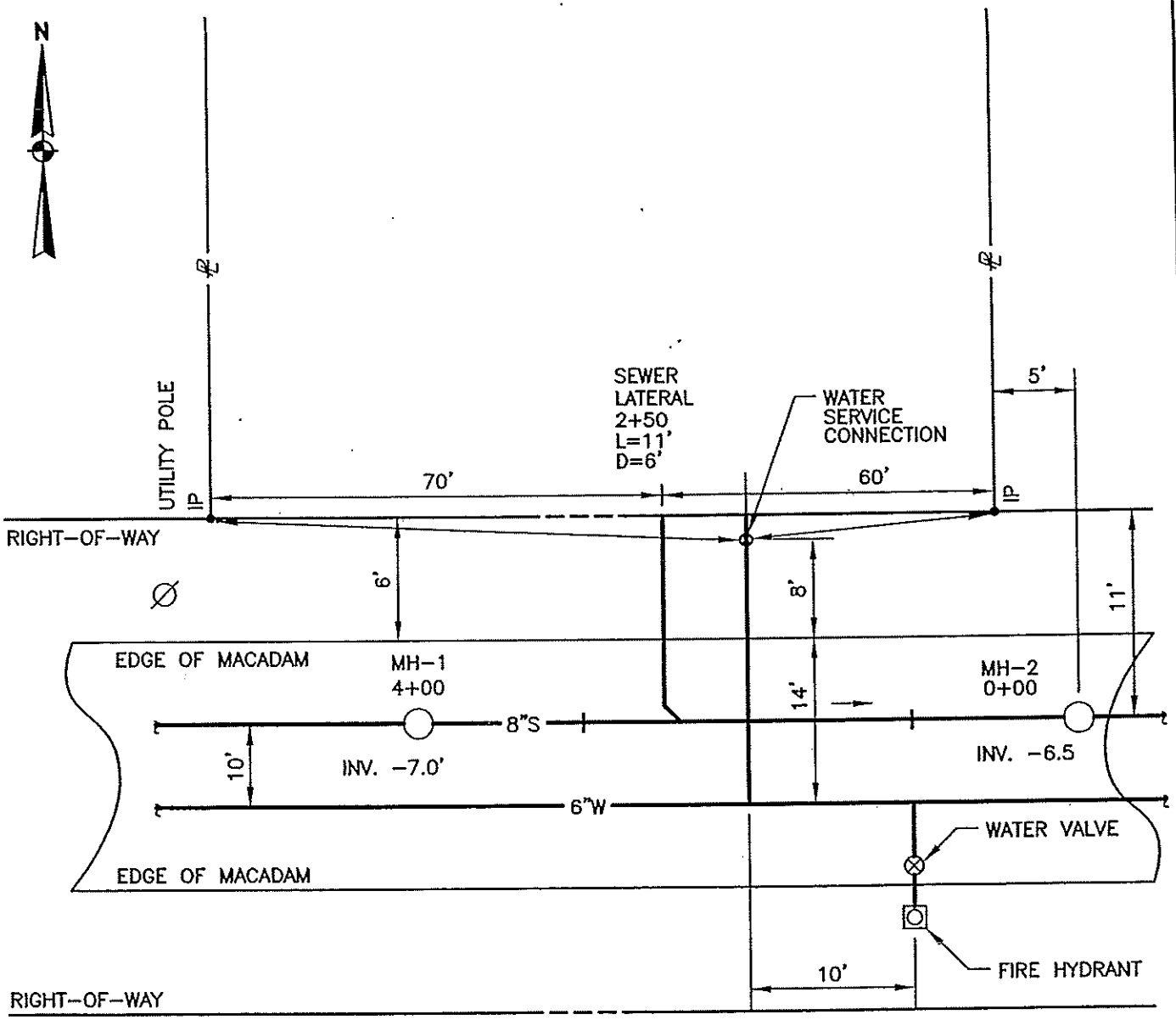
DWG. NAME 5222SD17



STREET/ROAD NAME

		EAST COVENTRY TOWNSHIP	ARRO Consulting, Inc.
		STANDARD DETAIL - SEWER SYSTEM	Suite 100, 649 North Lewis Road Limerick, Pennsylvania 19468 Tel 610.495.0303
1	2/9/04	**TYPICAL DIMENSIONAL SKETCH OF NEW LATERAL**	DATE: JUNE 2002
REVISION	DATE		DETAIL: 18

DWG. NAME 5222SD18



STREET/ROAD NAME

MH-1 TO MH-2
TOTAL LENGTH = 400 L.F.

NOTES:

1. DIMENSIONS OF WATER AND SEWER UTILITIES SHALL BE PROVIDED ON A FULL SET OF APPROVED AS-BUILT PLANS.
2. AS A MINIMUM, LOCATE SERVICE LINE AND CURB BOX FROM TWO PROPERTY PINS AND ANY OTHER AVAILABLE PERMANENT STRUCTURES.

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

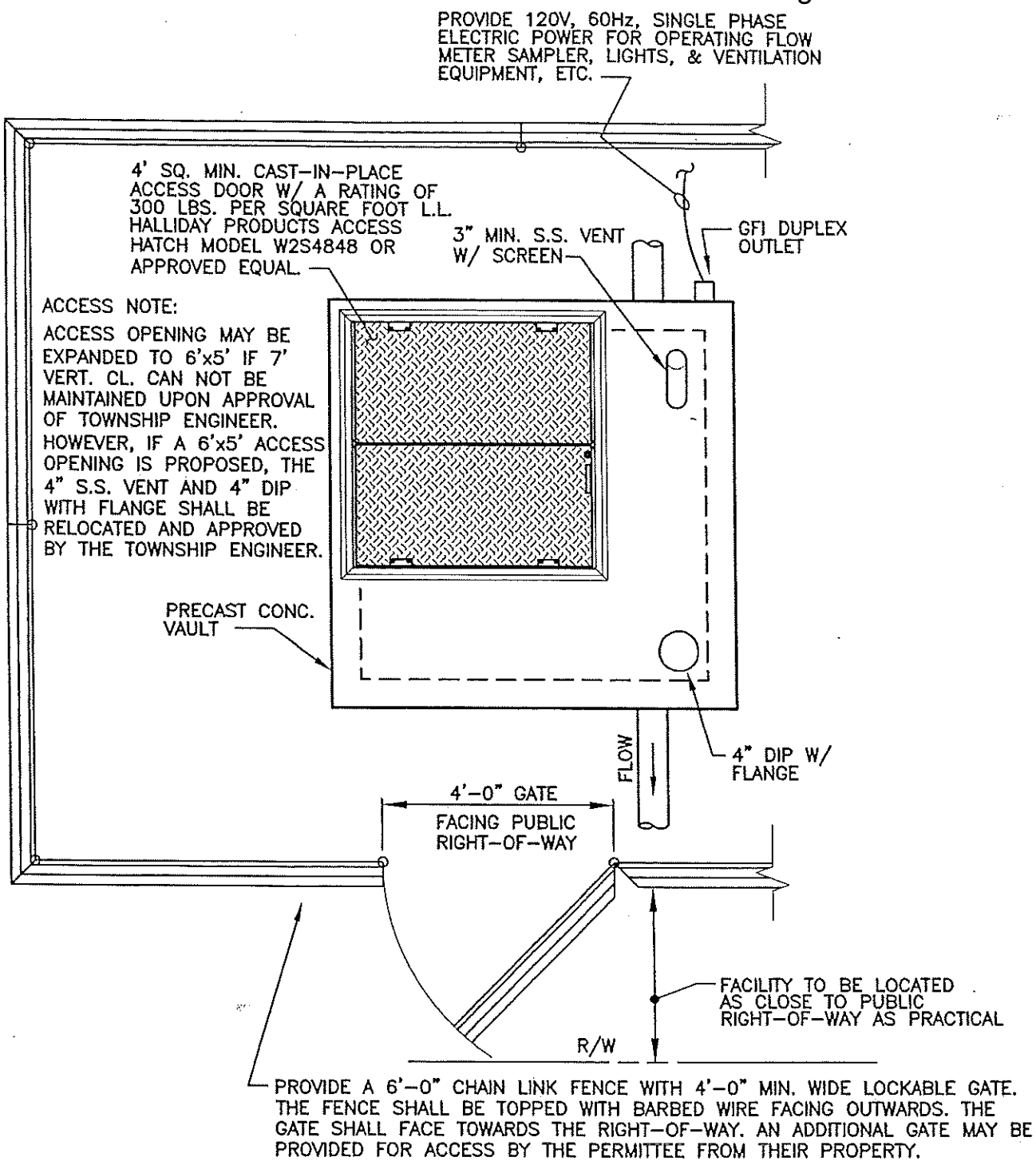
ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

TYPICAL DIMENSIONING OF NEW UTILITY INSTALLATION

DATE: JUNE 2002

DETAIL: 19

DWG. NAME 5222SD19



SITE PLAN

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

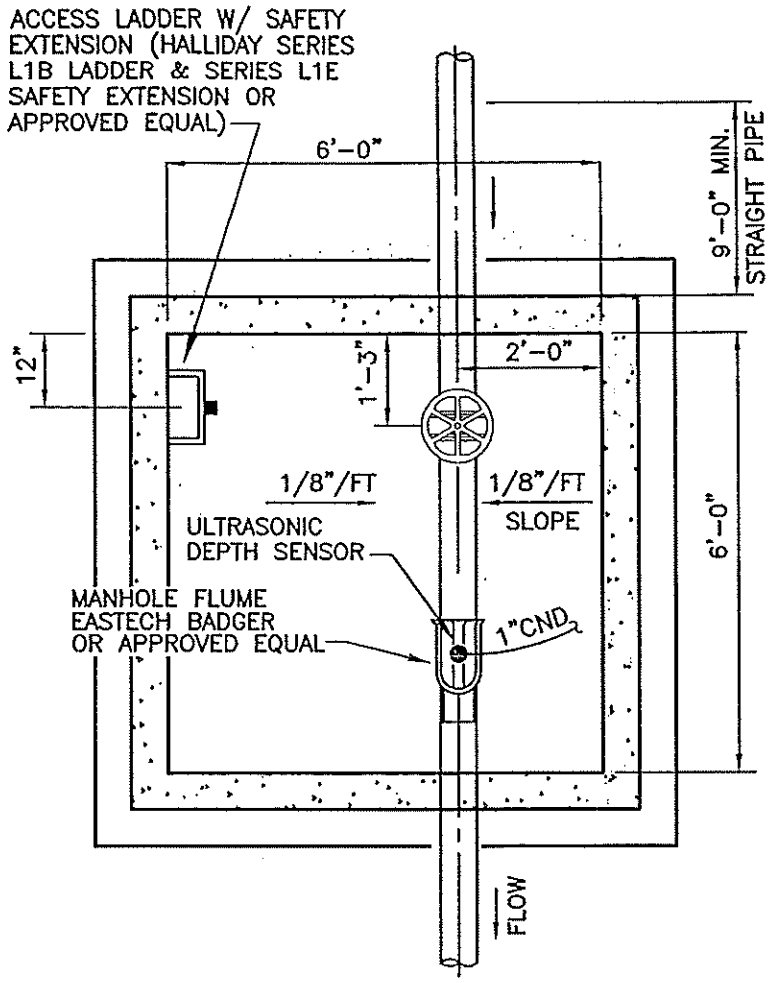
METERING/SAMPLING FACILITY SITE PLAN

ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

DATE: JUNE 2002

DETAIL: 20A

DWG. NAME 5222SD20A



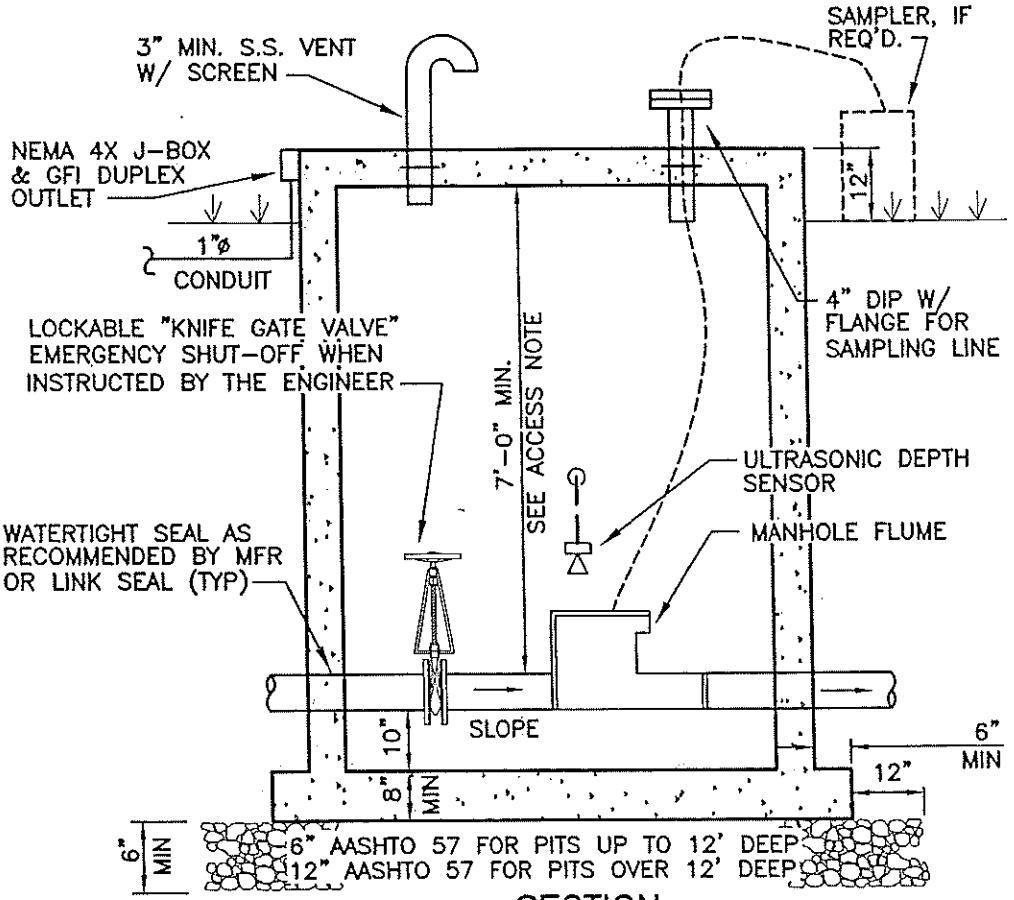
SECTIONAL PLAN

NOTES:

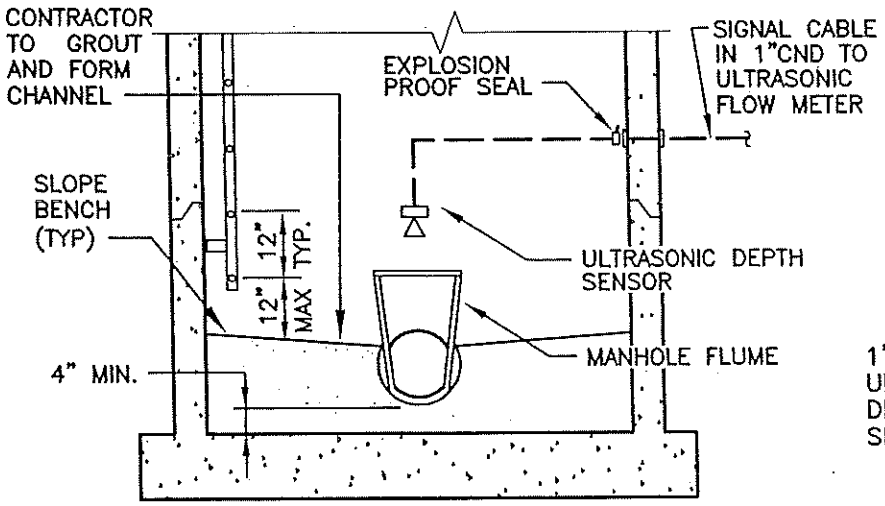
1. THE METERING/SAMPLING FACILITY SHALL BE DESIGNED TO CONFORM TO THE LATEST PA DEP REGULATIONS, GUIDELINES & APPROPRIATE CODES.
2. THE TOWNSHIP ENGINEER SHALL REVIEW & APPROVE THE PROPOSED DESIGN OF THE METERING/SAMPLING FACILITY PRIOR TO CONSTRUCTION.
3. PRECAST CONCRETE VAULT SHALL CONFORM TO SECTION 11.6.F UNLESS OTHERWISE SPECIFIED. THE INTERIOR & EXTERIOR SHALL BE COATED WITH NSF APPROVED EPOXY, 20 MIL DFT.
4. METERING EQUIPMENT SHALL BE REQUIRED FOR INDIVIDUAL DISCHARGERS WITH DAILY AVERAGE FLOWS GREATER THAN 12,500 GPD, OR FOR SUBDIVISIONS THAT GENERATE DAILY AVERAGE FLOWS GREATER THAN 12,500 GPD THAT DO NOT ENTER ON-SITE PUMPING STATIONS, OR AT OTHER LOCATIONS AS DETERMINED BY THE TOWNSHIP ENGINEER.

		EAST COVENTRY TOWNSHIP	ARRO Consulting, Inc.
		STANDARD DETAIL - SEWER SYSTEM	Suite 100, 649 North Lewis Road Limerick, Pennsylvania 19468 Tel 610.495.0303
1	2/9/04	**METERING/SAMPLING FACILITY SECTIONAL PLAN**	DATE: JUNE 2002
REVISION	DATE		DETAIL: 20B

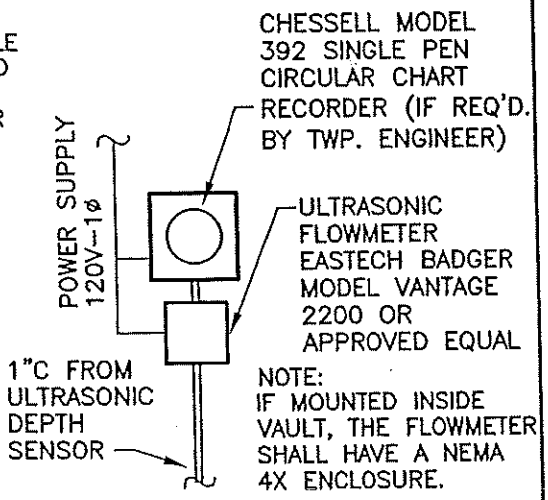
DWG. NAME 5222SD20B



SECTION



SECTION



FLOW METER ELEVATION

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

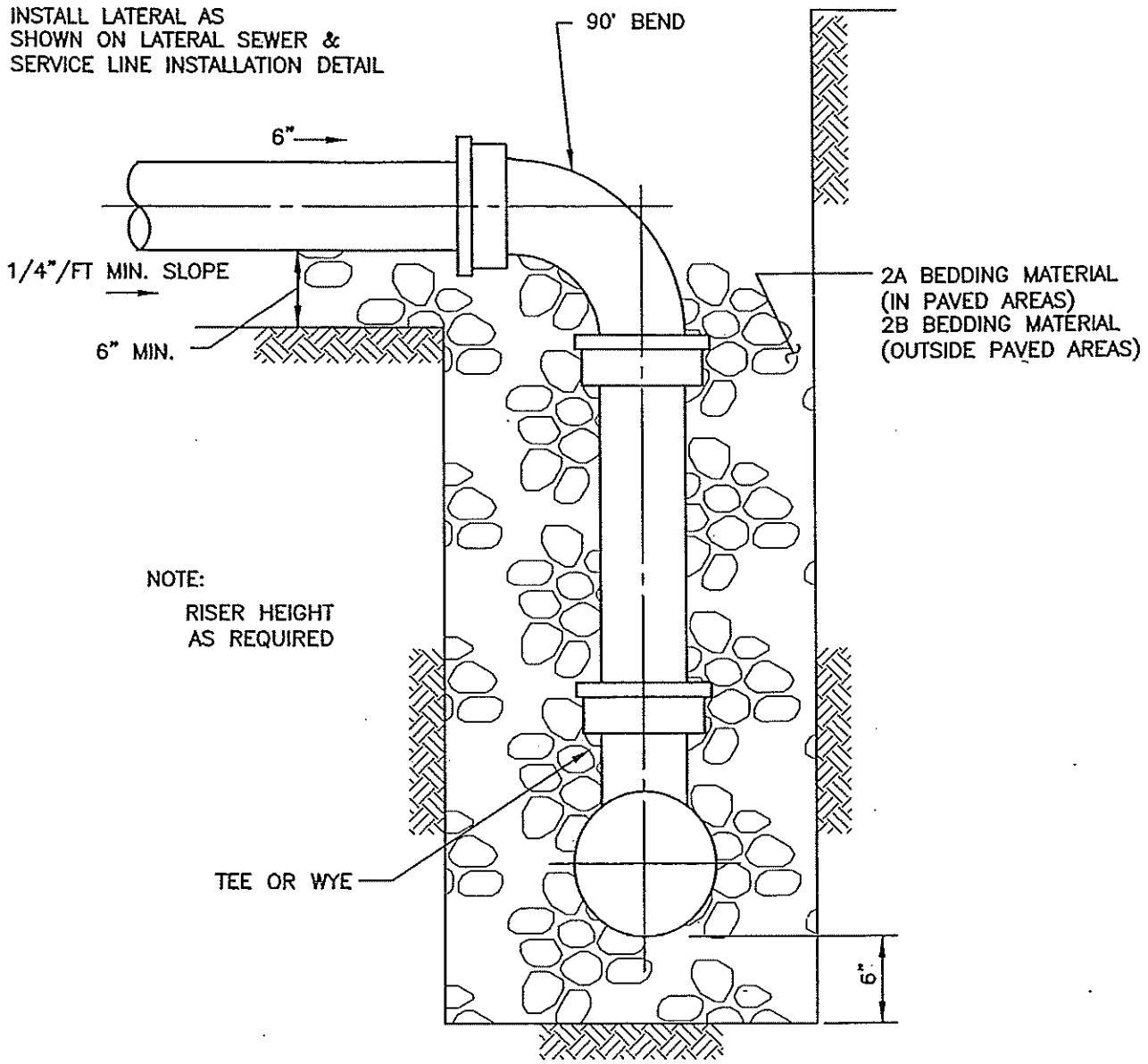
METERING/SAMPLING FACILITY SECTIONS

ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

DATE: JUNE 2002

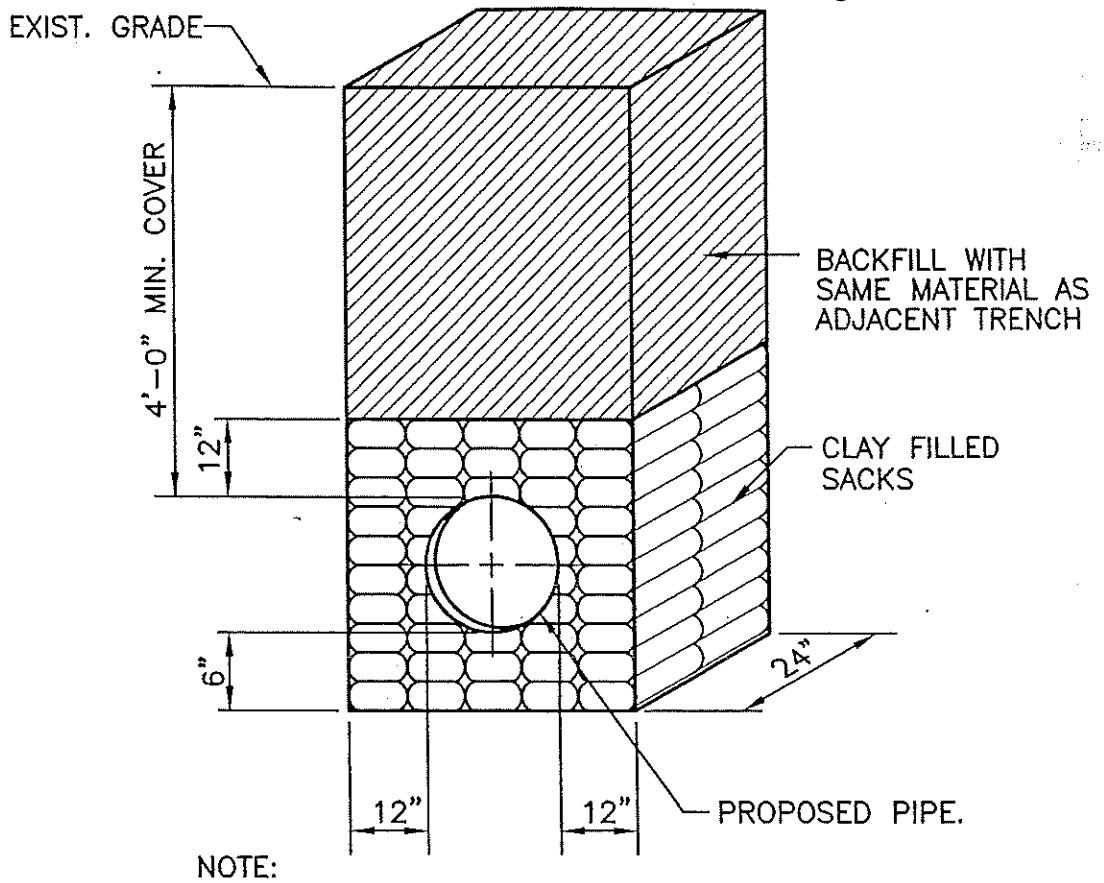
DETAIL: 20C

DWG. NAME 5222SD20C



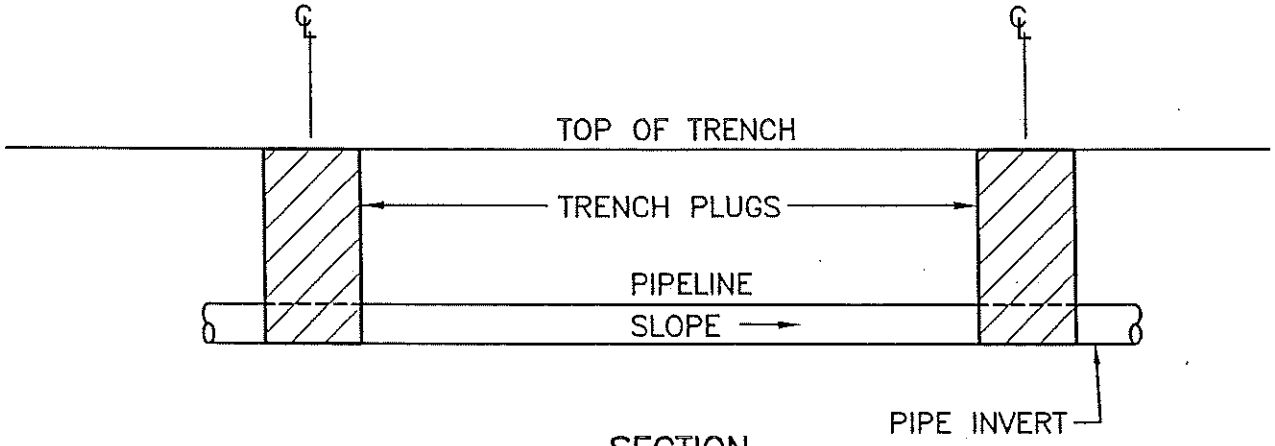
		EAST COVENTRY TOWNSHIP	ARRO Consulting, Inc. Suite 100, 649 North Lewis Road Limerick, Pennsylvania 19468 Tel 610.495.0303
		STANDARD DETAIL - SEWER SYSTEM	
1	2/9/04	**VERTICAL RISER LATERAL CONNECTION**	DATE: FEBRUARY 2004
REVISION	DATE		DETAIL: 21

DWG. NAME 5222SD21



NOTE:
TRENCH PLUG TO BE PLACED AT BOTH SIDES OF ALL STREAM CROSSINGS.

ELEVATION



SECTION

1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

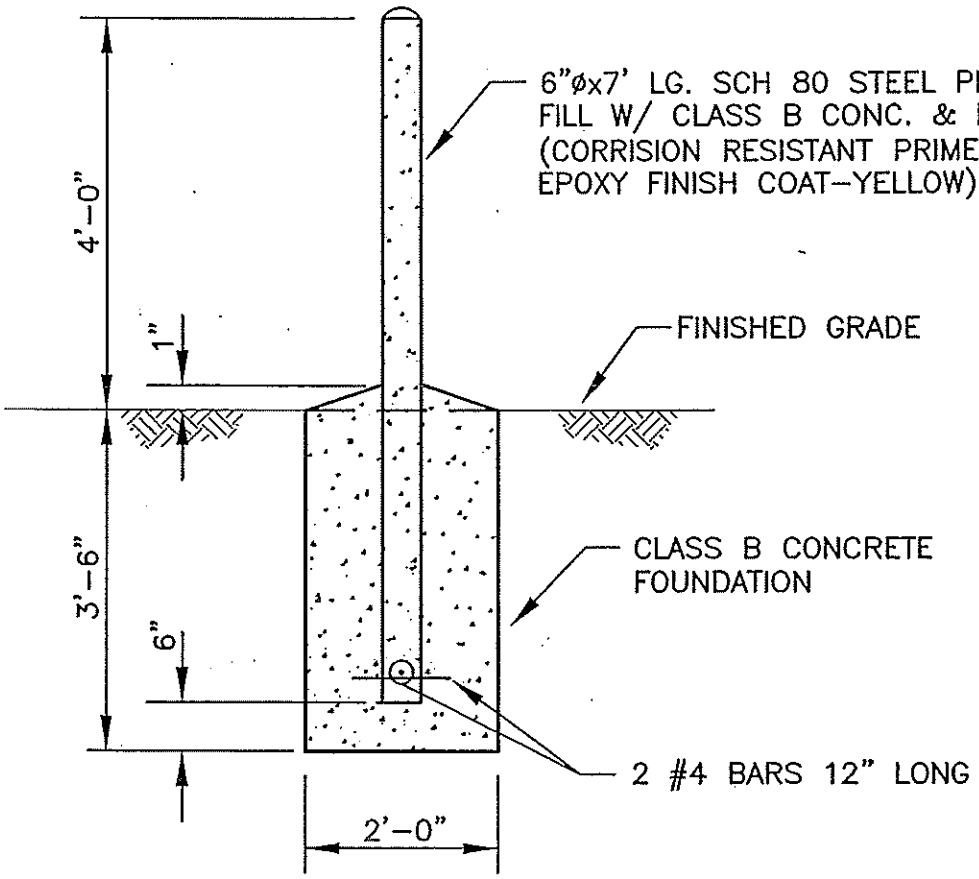
TRENCH PLUG DETAIL

ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

DATE: FEBRUARY 2004

DETAIL: 22

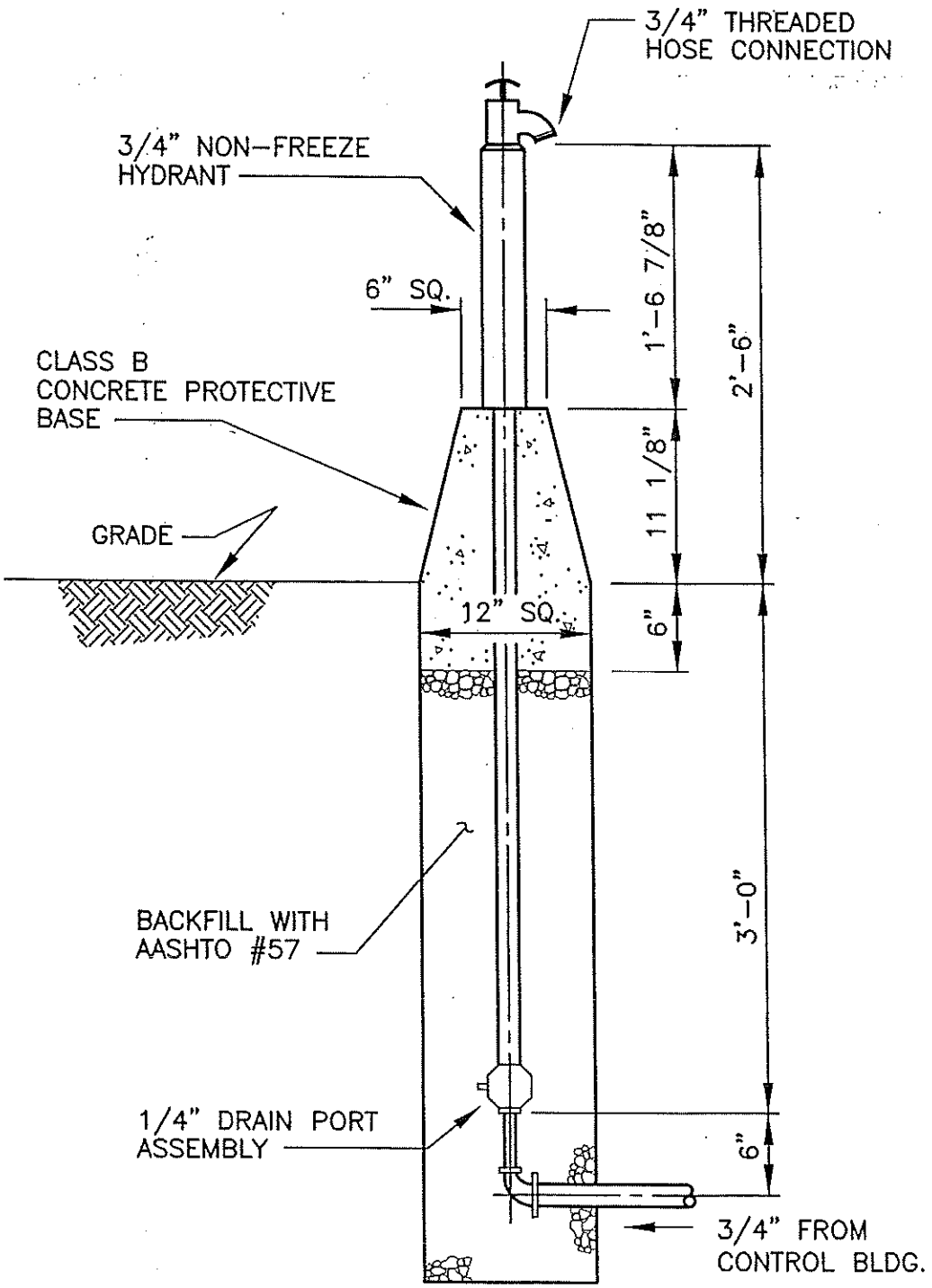
DWG. NAME 5222SD22



NOTE:
PLACE AS SHOWN ON DWGS.

		EAST COVENTRY TOWNSHIP	ARRO Consulting, Inc.
		STANDARD DETAIL - SEWER SYSTEM	Suite 100, 649 North Lewis Road Limerick, Pennsylvania 19468 Tel 610.495.0303
1	2/9/04	**TYPICAL PROTECTION POST**	DATE: FEBRUARY 2004
REVISION	DATE		DETAIL: 23

DWG. NAME 5222SD23



1	2/9/04
REVISION	DATE

EAST COVENTRY TOWNSHIP

STANDARD DETAIL - SEWER SYSTEM

POTABLE WATER YARD HYDRANT

ARRO Consulting, Inc.
Suite 100, 649 North Lewis Road
Limerick, Pennsylvania 19468
Tel 610.495.0303

DATE: FEBRUARY 2004

DETAIL: 24

DWG. NAME 5222SD24

SECTION 03420

PRECAST CONCRETE PUMP STATION AND
VALVE AND METER CHAMBER

PART 1 GENERAL

1.01 SCOPE

A. Description of Work

1. Furnish all labor, material, and equipment for the construction and installation of the precast concrete pump station and valve and meter chamber as shown on the Plans for the Saw Mill Road Pump Station.

2. Each unit shall be complete with the imbedded items as indicated on the Plans.

3. Each structure shall be constructed to the length, width and height as shown on the Plans.

B. Work and Components Included (But Not Limited to):

1. Pump Station (7'-0" X 7'-0" inside dimension)

2. Valve and Meter Chamber (6'-0" X 11'-0" inside dimension)

1.02 Related Work Specified Elsewhere

A. Piping - SECTION 11010, PIPING AND SEWERS

B. Pumps - SECTION 11040, RAW SEWAGE PUMPS

C. Excavation and Backfill - SECTION 02215, EARTHWORK

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and instructions for manufactured materials and products. Include manufacturer's certifications and laboratory test reports as required.

B. Shop Drawings: Submit shop drawings showing complete information for fabrication and installation of precast concrete units. Indicate member dimensions and cross-section; location, size and type of reinforcement, including special reinforcement and lifting devices necessary for handling and erection.

C. Indicate layout, dimensions and identification of each precast unit corresponding to sequence and procedure of installation. Indicate welded connections by AWS standard symbols. Detail inserts, connections, and joints, including accessories and construction at opening in precast units.

D. Mix Designs: Submit written reports of proposed concrete mix as specified in PART 2 of this Section.

SECTION 03420

PRECAST CONCRETE PUMP STATION AND
VALVE AND METER CHAMBER

E. Provide location and details of anchorage devices that are to be embedded in other construction. Furnish templates if required for accurate placement.

F. Include erection procedure for precast units and sequence of erection.

G. Provide complete design calculations prepared and sealed by a registered professional engineer licensed to practice in the Commonwealth of Pennsylvania. Shop drawings shall also be sealed by a registered professional engineer licensed to practice in the Commonwealth of Pennsylvania. The design must meet the requirements of the latest edition of both ACI 318 and ACI 350, whichever is more stringent.

H. The Engineer's review does not relieve the Contractor of his design responsibility.

1.04 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except as otherwise indicated:

1. ACI 301-89 "Specifications for Structural Concrete for Buildings"

2. ACI 318-89 "Building Code Requirements for Reinforced Concrete", with modifications as recommended by ACI 350

3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice"

4. ACI 350R-89 "Environmental Engineering Concrete Structures"

B. Fabricator Qualifications: Firms which have five (5) years successful experience in fabrication of precast concrete units similar to units required for this project will be acceptable. Fabricator must have sufficient production capacity to produce required units without causing delay in work.

C. Fabrication Qualifications: Produce precast concrete units at fabricating plant engaged primarily in manufacturing of similar units, unless plant fabrication or delivery to project site is impractical.

D. If units are not produced at precast concrete fabricating plant, maintain procedures and conditions for quality control which are equivalent to plant production.

E. Precast concrete structures shall be as designed and fabricated by Dutchland, Inc. or approved equal.

SECTION 03420

PRECAST CONCRETE PUMP STATION AND
VALVE AND METER CHAMBER

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver precast concrete units to project site in such quantities and at such times to assure continuity of installation. Store units at project site to prevent cracking, distortion, staining, or other physical damage, and so that markings are visible. Lift and support units at designated lift points.

PART 2 PRODUCTS

2.01 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A615, Grade 60, unless otherwise indicated.

B. Steel Wire: ASTM A82, plain, cold-drawn, steel.

C. Welded Wire Fabric: ASTM A185.

D. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing, complying with CRSI recommendations.

1. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

2.02 CONCRETE MATERIALS

A. Portland Cement: ASTM C150, Type II.

B. Use only one brand and type of cement throughout project.

C. Aggregates: ASTM C33, and as herein specified. Provide aggregates from a single source for exposed concrete.

D. Water: Potable.

E. Air-Entraining Admixture: ASTM C260.

F. Water-Reducing Admixture: Refer to SECTION 03300.

2.03 CONNECTION MATERIALS

A. Steel Plates: Structural quality, hot-rolled carbon steel, ASTM A283, Grade C.

B. Steel Shapes: ASTM A36.

C. Anchor Bolts: Stainless steel bolts, hexagon nuts and stainless steel washers.

SECTION 03420

PRECAST CONCRETE PUMP STATION AND
VALVE AND METER CHAMBER

2.04 GROUT MATERIALS

A. Cement Grout: Portland cement, ASTM C150, Type II, and clean, natural sand, ASTM C404. Mix at ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum water required for placement and hydration.

B. Non-metallic Shrinkage-Resistant Grout: Pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents, complying with CRD-C621.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

a. Euco N.S.; Euclid Chemical Co.

b. Set Non-Shrink; Set Products, Inc.

2.05 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for each type of concrete required.

B. Design mixes may be prepared by independent testing facility or by qualified precast manufacturing plant personnel, at precast manufacturer's option.

C. Proportion mixes by either laboratory trail batch or field experience methods, using materials to be employed on the project for each type of concrete required, complying with ACI 318.

1. Produce standard weight concrete consisting of specified portland cement, aggregates, admixtures, and water to produce a minimum compressive strength of 5000 psi at 28 days.

2. Cure compression test cylinders using same methods as used for precast concrete work.

D. Submit written reports to Engineer of proposed mix for each type of concrete at least 15 days prior to start of precast unit production. Do not begin concrete production until the mixes and evaluations have been reviewed by Engineer.

E. Adjustment to Concrete Mixes: Mix design adjustments may be requested when characteristics of materials, job conditions, weather, test results, or other circumstances warrant. Laboratory test data for revised mix designs and strength results must be submitted to and accepted by Engineer before using in the work.

SECTION 03420

PRECAST CONCRETE PUMP STATION AND
VALVE AND METER CHAMBER

F. Admixtures:

1. Use air-entraining admixture in concrete, unless otherwise indicated.

2. Use water-reducing admixtures in strict compliance with manufacturer's directions. Admixtures to increase cement dispersion, or provide increased workability for low-slump concrete, may be used subject to Engineer acceptance.

3. Use amounts as recommended by admixture manufacturer for climatic conditions prevailing at time of placing. Adjust quantities of admixtures as required to maintain quality control.

2.06 FABRICATION

A. General: Fabricate precast concrete units complying with manufacturing and testing procedures, quality control recommendations, and dimensional tolerances of PCI MNL-116, and as specified for types of units required.

B. Built-in Anchorages: Accurately position built-in anchorage devices and secure to formwork. Locate anchorages where they do not affect position of main reinforcement or placing of concrete.

C. Cast-in holes for openings larger than 4" diameter or 6" square in accordance with final shop drawings. Other smaller holes will be field cut by trades requiring them, as acceptable to Engineer.

D. Place concrete in a continuous operation to prevent formation of seams or planes of weakness in precast units, complying with requirements of ACI 304. Thoroughly consolidate placed concrete by internal and external vibration without dislocation or damage to reinforcement and built-in items.

E. Identification: Provide permanent markings to identify pick-up points and orientation in structure, complying with markings indicated on final shop drawings. Imprint date of casting on each precast unit on a surface which will not show in finished structure.

F. Curing by low-pressure steam, by steam vapor, by radiant heat and moisture, or other similar process may be employed to accelerate concrete hardening and to reduce curing time.

G. Finish of Formed Surfaces: Provide finishes for formed surfaces of precast concrete as indicated for each type of unit, and as follows:

SECTION 03420

PRECAST CONCRETE PUMP STATION AND
VALVE AND METER CHAMBER

1. Surfaces that are below grade: Normal plant run finish produced in forms that impart a smooth finish to concrete. Small surface holes caused by air bubbles, normal form joint marks, and minor chips and spalls will be tolerated, but no major or unsightly imperfections, honeycomb, or structural defects will be permitted.

2. Surfaces that are exposed: Remove fins and large protrusions and fill large holes. Rub or grind ragged edges. Holes to be true, well-defined surfaces. All above grade exposed edges to be chamfered.

H. Finish of Unformed Surfaces: Apply trowel finish to unformed surfaces unless otherwise indicated. Consolidate concrete, bring to proper level with straightedge, float, and trowel to a smooth uniform finish.

1. Apply scratch finish to precast units which will receive concrete topping after installation. Following initial strikeoff, transversely scarify surface to provide ridges approximately 1/4" deep.

I. The structure bottom and first section of wall shall be monolithic. No joint shall be provided at the intersection of the wall and floor.

J. The structure top slab and top wall section shall be monolithic. No joint shall be provided at the intersection of the top slab and wall.

K. Each precast module shall be provided with formed male and female joints to insure accurate joint surfaces and tolerance for a watertight seal. All joints between adjoining precast modules shall be primed at the factory and sealed when modules are set in the field utilizing a vulcanized butyl rubber compound sealant conforming to AASHTO M-198 (latest revision). Sealant shall be "Conseal CS-102" as manufactured by Concrete Sealants, New Carlisle, Ohio or equivalent.

L. The manufacturer shall coordinate with other trades for installation of items to be cast-in pre-cast units.

2.07 DESIGN

A. Each structure shall be designed to adequately and safely support all live and dead loads to which the structure will be subjected, and to withstand all conditions which may be encountered.

B. Design calculations shall verify that the structures have been designed to withstand the burial depth, submergence due to flooding if applicable, and the dead and live loads anticipated for the station. The structures shall have adequate wall, floor and roof thickness and steel reinforcement sufficient for the depth of burial shown on the Drawings.

SECTION 03420

PRECAST CONCRETE PUMP STATION AND
VALVE AND METER CHAMBER

C. Design computations for uplift forces shall contain a minimum factor of safety of 1.15. When required for counter-flotation, as determined by the buoyancy calculations, the structures shall be designed with a "hold-down" system to satisfactorily withstand uplift pressures exerted on the chambers. The Contractor shall furnish and install stainless steel anchor bolts, washers, and nuts for connection of the precast concrete units to the cast-in-place concrete base pad, utilizing stainless steel angle clips.

D. Roof slab/ceiling designs shall account for the loads imposed on the slab by the weight of pumps or other equipment that will be lifted from their positions for maintenance purposes by lifting hooks or other hoisting equipment installed in the slab.

2.08 SOURCE QUALITY CONTROL

A. The Owner may employ a separate testing laboratory to evaluate precast manufacturer's quality control and testing methods.

B. The precast manufacturer shall allow Owner's testing facility access to materials storage areas, concrete production equipment and concrete placement and curing facilities. Cooperate with Owner's testing laboratory and provide samples of materials and concrete mixes as may be requested for additional testing and evaluation.

C. Dimensional Tolerances: Units having dimensions smaller or greater than required, and outside specified tolerance limits, will be subject to additional testing as herein specified.

D. Precast units having dimensions greater than required will be rejected if appearance or function of the structure is adversely affected, or if large dimensions interfere with other construction. Repair, or remove and replace rejected units as required to meet construction conditions.

E. Strength of Units: The strength of precast concrete units will be considered potentially deficient if the manufacturing processes fail to comply with any of the requirements which may affect the strength of the precast units, including the following conditions.

1. Failure to meet compressive strength tests requirements.

2. Reinforcement, and pre-tensioning and detensioning of tendons prestressed concrete not conforming to specified fabrication requirements.

3. Concrete curing, and protection of precast units against extremes in temperature, not as specified.

4. Precast units damaged during handling and erection.

F. Testing Precast Units: When there is evidence that strength of precast concrete units does not meet specification requirements, the concrete testing service shall take cores drilled from hardened concrete for compressive strength determination, complying with ASTM C42 and as follows:

1. Take at least three (3) representative cores from precast units of suspect strength, from locations directed by Engineer.

2. Test cores in a saturated-surface-dry condition per ACI 318 if concrete will be wet during use of completed structure.

3. Test cores in an air-dry condition per ACI 318 if concrete will be dry during use of completed structure.

4. Strength of concrete for each series of cores will be considered satisfactory if their average compressive strength is at least 85 percent of 28 day design compressive strength.

5. Test results will be made in writing on same day that tests are made, with copies to Engineer, Contractor, and precast manufacturer, name of concrete testing service, identification letter, name, and type of member or members represented by core tests, design compressive strength compression breaking strength and type of break (corrected for length-diameter ratio), direction of applied load to core with respect to horizontal plan of concrete as place, and moisture condition of core at time of bearing.

G. Patching: Where core test results are satisfactory and precast units are acceptable for use in work, fill core holes solid with patching mortar, and finish to match adjacent concrete surfaces.

H. Defective Work: Precast concrete units which do not conform to specified requirements, including strength, tolerances and finishes, shall be replaced with precast concrete units that meet requirements of this Section. Contractor shall also be responsible for cost of corrections to other work affected by or resulting from correction to precast concrete work.

2.09 PROTECTIVE COATINGS

A. A coal tar epoxy as specified in SECTION 09900 shall be applied to the exterior of all structures to within one (1) foot of finished grade.

B. The interior of the pump station and valve and meter chamber shall be painted with a white epoxy coating in accordance with SECTION 09900.

SECTION 03420

PRECAST CONCRETE PUMP STATION AND
VALVE AND METER CHAMBER

PART 3 EXECUTION

3.01 INSTALLATION

A. All structures shall be installed to grade, level, plumb and in accordance with the manufacturer's directions. Variations from plumb shall be 1/4" in any 10 ft. of length and a maximum of 3/4" for entire length. Variations from level or grade shall be + 1/4" in any 10 ft. of length and + 3/4" for entire length.

B. All structures shall be installed on a minimum 8" thick compacted crushed stone base.

3.02 HYDROSTATIC TESTING

A. Prior to backfilling, each structure shall be hydrostatically tested.

B. All wall penetrations shall be sealed and the structure filled with water to within one (1) foot from the top.

C. The water shall not be removed for a minimum of 48 hours unless otherwise instructed by the Engineer.

D. Watertightness shall be defined as the absence of any damp or wet areas with discernable flow.

E. If the flow of water is detected, the structure shall be drained, the repairs made and the test repeated at no additional cost to the Owner until satisfactory completion of the test.

F. All leakage tests and required repairs shall be included in the scope of work and no extras will be allowed for this work.

G. The method and materials for repairs shall be approved by the Engineer prior to the start of any repair work. All leaks and defective areas shall be cut or chipped and patched. No feathered edges or surface patches will be allowed.

3.03 BACKFILLING

A. The structure shall be backfilled in accordance with the requirements of SECTION 02215.

**** END OF SECTION ****

SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

PART 1 GENERAL

1.01 SCOPE

A. Description of Work

1. The Manufacturer shall comply with the requirements set forth under this Section when furnishing equipment.

2. In all cases of conflict between this Section and detailed Mechanical Equipment Specifications, the detailed Specifications shall govern but only to the extent of such conflict.

3. The work in this Contract includes:

a. Shipping the equipment to the site.

b. All supervision and services as required for installation and operation of all equipment.

c. The Manufacturer's attention is called to the fact that the presence of a manufacturer's name in a Section of these specifications does not relieve the Manufacturer from meeting the detailed mechanical and performance requirements set forth in that specification.

B. Related Work Specified Elsewhere

1. The provisions of the General Conditions, as well as all other Sections of these Specifications where appropriate, apply equally to all Specification Sections in Division 11.

1.02 EQUIPMENT MANUFACTURER'S SERVICE REPRESENTATIVE

A. Installation Assistance

1. Any equipment that will require Equipment Manufacturer's Service Representative for the purpose of assisting and directing the installation, adjustment and initial operation, is noted in the specific Specification Section. The cost of this service shall be included in the Contract Price.

2. The following items must be completed as a part of the installation assistance:

a. Installation.

b. Calibration, adjustment, etc.

c. Energize equipment.

d. Mechanical shakedown.

e. Deficiency correction.

f. Compliance with applicable performance specification.

g. Provide certification from the Manufacturer's Service Representative that the installation and operation is in complete compliance with the Manufacturer's recommendations and Engineer's requirements by completing a copy of the equipment certification.

3. Operator instruction/training shall not be undertaken during installation, but only as stated under Paragraph "C" below.

4. Upon completion of project, the Manufacturer will forward to the Owner all required equipment certifications.

a. Copy of Equipment Certification Form is attached at the end of this Section.

B. Process Start-up and/or Process Stabilization and Balancing Assistance

1. Equipment that requires process Start-up and/or process stabilization and balancing assistance is noted in the Specification Section. The cost of this service shall be included in the Contract Price.

2. For such equipment the Manufacturer's Service Representative is required to be on hand during either process Start-up or process stabilization and balancing for the period of time determined by the Engineer. The Representative shall make all necessary field adjustments.

C. Operating Instructions and/or Operator Training

1. Equipment that requires operating instructions and/or training for the Plant Operators is noted in the specific Specification Section. The cost of this service shall be included in the Contract Price.

2. The Manufacturer shall arrange through the Equipment Manufacturer's Service Representative, or other qualified individual, to adequately instruct designated employees of the Owner in the operation and care of the equipment. During this training period instructions shall be provided on proper safety measures to be taken during operation of equipment. The training period is to be integrated by the Owner with overall training.

3. A letter of certification shall be submitted to the Engineer from the Manufacturer's Service Representative upon completion of the plant visit indicating that the plant personnel have been instructed in the proper use of the equipment.

1.03 QUALIFICATIONS OF MANUFACTURERS

A. The Manufacturer shall submit all information as the Engineer may consider necessary to determine the ability of the Manufacturer to supply the equipment as required by these Special Provisions.

B. Service facilities and stock of spare parts for the equipment supplied shall be readily available and evidence of compliance with this requirement shall be presented when working drawings and descriptions of the equipment are submitted for approval.

C. If the Owner shall deem it necessary, and shall so order, repairs to damaged parts or replacement of them, shall be undertaken after service of notice. If the Manufacturer unnecessarily delays or fails to make the ordered repairs or replacements within the time specified, or if any repairs or replacements are of such nature as not to admit the delay incident to the service of a notice, then the Engineer may repair or make good such damage or cause the same to be repaired and made good, at the cost and expense of the Manufacturer.

D. If the Owner puts any equipment to the use for which it is installed previous to the acceptance of all work under the contract, the one (1) year warranty period for such equipment shall be calculated from the time when such use begins.

E. For equipment having less than five (5) years of satisfactory experience, elsewhere, the Manufacturer shall submit reports of tests to substantiate, to the satisfaction of the Engineer, that such equipment has been successfully demonstrated to be satisfactory for the purpose for which it is proposed to be used. The test reports shall be supplemented with substantiating data to indicate that the proposed equipment will perform adequately the duties imposed by the general design, is made of materials equally suited to the environment as those in the equipment specified, and is suited for the same use and capable of performing the same functions as the equipment specified.

1.04 WORKING DRAWINGS

A. The Manufacturer shall submit for approval by the Engineer, complete working detail, assembly, and installation drawings and catalog data. No work shall be done on manufacture or fabrication of equipment to be furnished until the Engineer's approval of the working drawings and other data has been obtained.

B. Data to be submitted shall include descriptive catalog data, certified dimension prints of equipment and bases, motor drawings, and complete characteristics curves.

C. Within thirty (30) days after the date of award of contract, the Contractor shall submit to the Engineer for approval a complete list of proposed manufacturers for all equipment and materials to be used. Complete and separate manufacturers' lists shall be submitted for each Mechanical and Equipment Section of the Specifications. No consideration will be given to partial or incomplete lists. After approval of each manufacturer's list, detailed shop drawings and/or material lists shall be submitted.

1.05 INSTRUCTION MANUALS

A. The Manufacturer shall furnish instruction manuals covering operation and maintenance of all equipment furnished. Manuals shall be complete with manufacturer's brochures; drawings; cuts; data sheets; wiring diagrams; lubrication schedules; maintenance procedures; parts lists; name, address and telephone number of local sales representative, and any other necessary data. All parts shall be numbered or otherwise clearly identified to facilitate ordering of replacements.

B. The Manufacturer shall furnish parts drawings of all equipment including minor parts and subassemblies, in such detail as will permit disassembly of each piece of equipment for maintenance. Parts drawings shall show such fabrication and assembly details as are required to permit disassembly and assembly of the equipment.

1.06 TOOLS AND SPARE PARTS

A. Each piece of equipment shall be furnished with a dozen lot assortment of keys, bolts, nuts, lock washers, and pins, in tagged sacks. Each piece of equipment having shear pins shall be furnished with two dozen shear pins of each size used, in tagged sacks. Each piece of equipment having leather or rubber washers shall be furnished with two extra washers of each size and material required.

B. The Manufacturer shall furnish, with each piece of equipment, the complete set of tools normally furnished by the manufacturer for the servicing of the equipment and all required special tools required for operation and maintenance of the equipment.

C. Each major piece of equipment, as specified or determined by the Engineer, shall be furnished with the spare parts listed in these Specifications for the equipment, or if no such list is provided, with the standard sets of spare parts recommended by the manufacturer of the equipment. The recommended list of spare parts shall be submitted to the Engineer for approval, prior to the delivery of the equipment.

D. All spare parts shall be plainly tagged and marked for identifications and reordering. They shall be treated with suitable preservatives, wrapped, and packaged to provide adequate protection during storage.

SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

1.07 IDENTIFICATION NAMEPLATES

A. Each piece of equipment shall be provided with a substantial brass, stainless steel or plastic nameplate, securely fastened in a conspicuous place and clearly inscribed with the Equipment Manufacturer's name, year of manufacture, serial number, and principal rating data. These nameplates shall not be painted.

1.08 SPECIFIED EQUIPMENT AND MATERIALS

A. If a Manufacturer proposes to substitute materials or equipment as "or equal" to those specified, it shall be the Contractor's responsibility to furnish complete, specific, detailed information from the manufacturer or supplier of the material or equipment he proposes to furnish, in which the requirements of the contract specifications are shown to be met. This shall consist of a point-by-point comparison of the equipment specified under the contract and that proposed to be substituted by the Contractor. The burden of responsibility in furnishing this information is with the Contractor. If incomplete or irrelevant data is submitted as evidence of compliance with this Section of the Specifications, the data will be returned to the Contractor and the request for approval will be denied.

B. The Manufacturer is reminded that space requirements to operate and size of equipment are as important as performance requirements and materials of construction. The Contractor shall be responsible for all costs including Engineers evaluation, redesign, if necessary, extra piping, valves, and other appurtenances in the approval of an "or equal" or substitute item.

1.09 GUARANTEES

A. All mechanical equipment to be furnished under this contract shall be free from all defects. After all tests called for in the Specifications are made, an acceptance test will be run on all mechanical equipment at the expense of the Contractor within thirty (30) days after the equipment is placed in service. Should this test show that the equipment does not fully meet the guarantee included in the contract, the Manufacturer shall, at his own expense, make such corrections as may be necessary to the fulfillment of the contract. The Manufacturer further agrees that the apparatus to be furnished shall be guaranteed for a minimum period of one (1) year, unless specified for a longer period in the detailed specifications for the various items to be furnished and installed from the date the plant is put in operation, and any defects which may develop within this period shall be replaced or repaired by the Manufacturer without expense to the Owner.

SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

PART 2 PRODUCTS

2.01 DESIGN CRITERIA

A. The Manufacturer is liable for any changes in design necessitated by any equipment manufacturer's requirements, which differ from those shown or specified in the Contract Documents.

2.02 QUALITY OF EQUIPMENT

A. Equipment and appurtenances shall be designed in conformity with ANSI, ASME, IEEE, NEMA, AGMA, and other generally accepted applicable standards. They shall be of high quality construction and designed to withstand all stresses that may occur during fabrication, testing, transportation, installation, and all conditions or operations. All moving parts shall be adequately protected from wear by the use of bearings, bushings or other approved means. Provisions shall be made for adequate lubrication with readily accessible devices.

B. Machinery parts shall conform to the dimensions shown on the working drawings within allowable tolerances. The corresponding parts of identical machines shall be made interchangeable. Ample clearance shall be provided for repairs, inspection and adjustment. Protruding members such as joints, corners and gear covers shall be finished in appearance. All exposed welds shall be ground smooth and the corners of structural shapes shall be rounded or chamfered.

C. All equipment furnished and installed shall be equipped with suitable and approved safety guards and devices as required for the safety of the public and operating personnel. Such guards and safety devices shall be in accordance with ANSI B15.1 - "Safety Code for Mechanical Power-Transmission Apparatus" as well as the safety requirements of all other applicable local, state, and federal laws and regulations, including those of the Federal Occupational Safety and Health Administration. Where the said ANSI standard is incompatible with other applicable local, state, and federal laws and regulations, said governmental laws and regulations shall prevail.

2.03 ELECTRIC MOTORS

A. All electric motors furnished to drive mechanical equipment shall conform to the design, construction and performance requirements defined in SECTION 11006, ELECTRIC MOTORS, and shall suit the characteristics of the available electric service.

B. Motors shall be factory installed where applicable by the equipment manufacturer.

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MECHANICAL EQUIPMENT - GENERAL

2.04 ANCHOR BOLTS

A. The Equipment Manufacturer shall provide anchor bolts of the proper size for all equipment specified under this Division of the Specifications. These anchor bolts, nuts and washers shall be hot stainless steel unless specified otherwise in the equipment Specification.

B. All anchors and accessories required to be set in the concrete, shall be accurately set and maintained in position by the Contractor. Anchor bolts shall be so set as to provide not less than one and one half full threads above the nuts.

2.05 PROTECTIVE COATINGS

A. All machined surfaces and shafting shall be cleaned and protected from corrosion by the proper type and amount of coating necessary to assure protection during shipment and prior to installation.

B. Oil lubricated gears, bearings, etc. are to be shipped with an oil soluble protective coating as recommended by the Equipment Manufacturer.

2.06 STANDARDIZATION OF GREASE FITTINGS

A. The grease fittings on all mechanical equipment shall be such that they can be serviced with a single type of grease gun. Fittings shall be of the "Alemite" button head type, Zurn, or equal, unless otherwise stated in the detailed equipment specifications.

2.07 LUBRICATION

A. Unless otherwise specified, the Manufacturer shall furnish and use, for each piece of equipment, the type of lubricant recommended by the manufacturer of the equipment. The Manufacturer shall furnish a schedule, in triplicate, listing the type, frequency of application, and the manufacturer of the lubricant for each piece of equipment. At the time for acceptance of the installation by the Owner, the Manufacturer shall furnish six month supply of each type of lubricant.

2.08 PIPING AND APPURTENANCES FOR GAGES

A. All gages shall be provided with stop cocks and with valved branches for test connections. Test branches shall be closed with removable caps. All gages and gage piping shall be suitably supported.

2.09 SCHEMATIC WIRING DIAGRAMS

A. In addition to working drawings furnished, the Manufacturer shall furnish comprehensive schematic diagrams showing the wiring for each individual piece of equipment and all interconnecting wiring.

2.10 SHOP TESTS

A. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function, or special requirements are specified, shall be tested in the shop of the manufacturer in a manner that shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents. Tests in accordance with the test codes of the ASME, NEMA, and other applicable standards shall be conducted.

B. No equipment shall be shipped to the work until the Manufacturer has been notified by the Engineer in writing that the results of the shop tests are acceptable.

C. When the Specifications require witnessed shop tests at the point of manufacture, only tests made in the presence of the Engineer or his representative will be accepted. The Manufacturer shall notify the Engineer, by written notice, ten (10) days in advance of the time when the equipment will be ready for the witnessed shop tests. This notification shall include a diagram of the testing set-up and a list of the instruments the manufacturer proposes to use for the tests. All instruments shall be of ranges suitable for the quantities to be measured, with approved laboratory calibration. Five (5) copies of witnessed shop tests data and interpreted results thereof accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company shall be forwarded to the Engineer for approval.

D. When the Specifications do not require witnessed shop tests of equipment at the point of manufacture, or when witnessed shop tests specified in the Specifications are waived by the Engineer, five (5) copies of the manufacturer's actual test data and the interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company, shall be forwarded to the Engineer for approval.

2.11 PREPARATION FOR SHIPMENT

A. Fabricated sub-assemblies, if any, shall be shipped in convenient sections as permitted by carrier regulations and shall be properly match-marked for ease of field erection.

2.12 MANUFACTURER-FURNISHED CONTROL PANELS

A. General Requirements: Provide control panels completely factory-assembled, factory-wired, and factory-tested, requiring only connections from field devices, terminal cabinets, and other control panels to terminal blocks. Individual panel components shall be as specified herein, and shall also be wired to terminal blocks. All door-mounted components shall have the same NEMA rating as the panel.

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B. Enclosure: Unless otherwise specified, provide a heavy-duty, wall mounted or free-standing NEMA 4X enclosure constructed of brushed Type 316 and 316L (for welded components) with Type 316 stainless steel hardware for housing the sub-panels and electrical equipment Enclosure doors shall have a continuous piano hinged, shall be fully gasketed, and shall have a 3-point latching mechanism operated by an oil-tight key-locking handle. Latching rods to have rollers for ease of closing. Provide enclosure with stainless steel collar studs to mount sub-panels and terminals. Fabricate enclosure with stiffeners as required for structural integrity. Provided enclosure with an integral print pocket on the inside face of the door.

1. Dimensions: Select panel dimensions to provide easy access to internal components, to accommodate additional components if required, and to dissipate heat from electrical components.

2. Cutouts: Cut, punch, or drill openings for switches, lights, and other door-mounted components, and smoothly finish panel penetrations by deburring and rounding the edges.

3. Sub-Panels: Provide bolt-on type, enamel or epoxy painted panels.

4. Equipment Mounting: Attach components by drilled and tapped holes and stainless steel fasteners. Mount components in a neat and orderly manner to facilitate identification and servicing. Use mounting rails wherever possible. Install components no closer than two (2) inches from wireway.

5. Nameplate: Provide engraved laminated phenolic nameplate as specified herein to identify panel, and individual panel controls and devices. Nameplate size and legend shall be as approved by the Engineer. Coordinate with the Owner to determine the naming of the control panel prior to fabrication of the control panel nameplate.

6. Temperature and Humidity Control: Provide an anti-condensation enclosure heater to minimize condensation and to maintain the minimum equipment operating temperature within the enclosure. Provide a drain plug in the bottom of the enclosure to allow condensation to drain. Drain plug shall be similar to type ECDB manufactured by Appleton Electric. Provide an exhaust fan in large floor mounted enclosures to increase air circulation and minimize internal enclosure temperature rise. Control Panel Manufacturer shall be responsible for maintaining a temperature and humidity environment inside the enclosure that is within the operating limits of the enclosed electronic equipment.

7. Wiring Diagrams: Provide the panel with full-size wiring diagrams, in plastic sheet protectors within in the print pocket.

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MECHANICAL EQUIPMENT - GENERAL

8. Acceptable Manufacturers:

   a. Hoffman Engineering Co.

   b. Rittal Inc.

   c. Or approved equal.

C. Stepdown Control Transformer: Provide premium quality, dry type transformer for converting 460-volt primary supply to 120-volt secondary output for powering control circuits, power supplies, indicating lights, and related 120-volt requirements.

1. Insulation: Insulating materials shall be in accordance with NEMA ST20 standards for a 220 degrees Celsius UL component recognized insulation system and designed to limit temperature rise to 80 degrees Celsius above 40 degrees Celsius ambient.

2. Coils: Continuous wound copper construction and impregnated with non-hygroscopic, thermosetting varnish.

3. Cores: High-grade, non-aging silicon steel with high magnetic permeability, low hysteresis and eddy current losses, and magnetic flux densities well below saturation.

4. Core/Coil Assembly: Clamp core together with structural steel angles. Bolt completed core/coil to base of enclosure but isolate from enclosure by rubber, vibration absorbing mounts. Assure there is no metal-to-metal contact between core/coil and the enclosure.

5. Enclosure: Heavy-gauge steel with ventilation openings. Enclosure shall be degreased, cleaned, phosphatized and primed before application of enamel finish coat.

6. Grounding: Visibly ground core to ground bus by means of a flexible connector sized in accordance with NEMA and NEC standards.

7. Acceptable Manufacturers:

   a. Sorgel by Square D.

   b. Or approved equal.

D. Contactors: Provide UL listed, continuous duty, multipole, electrically operated, magnetically held type contactors with arc shields and barriers, and replaceable contacts at front of case. Contactors shall be used for multi switching of 1/2 to 3/4 HP loads at 120 VAC where overload protection is provided elsewhere. Coil voltage shall be 120 VAC unless otherwise indicated on the Drawings.

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MECHANICAL EQUIPMENT - GENERAL

1. Spare parts:

   a. Provide one set of spare contacts for each type of contactor.

2. Manufacturers:

   a. Square D.

   b. Allen Bradley.

   c. Or approved equal.

E. Fuses: Current limiting type sized in accordance with NEC. Submit fuse schedule with shop drawing.

1. Non-Motor Loads: Use Limitron fast-acting, single-element type.

2. Motor and Transformer Loads: Use Fusetron dual-element, time-delay type, UL Class RKI.

F. Circuit Breakers: Molded case type with overcenter, trip free, toggle type operating mechanism, quick-make, quick-break action and positive handle indication. Two and three pole breakers shall be of common trip type. Operating handles shall assume center position when tripped. Breakers shall have a push-to-test feature for testing and exercising trip mechanics. Interrupting capacity of breakers shall not be less than 22,000 RMS symmetrical amperes.

1. Combination Starter Units: Each circuit breaker shall have an adjustable instantaneous magnetic-only trip element. A single magnetic adjustment shall simultaneously set the magnetic trip level of each individual pole. Adjustment continuous throughout the trip range. Circuit Breakers shall be padlockable.

2. Manufacturers:

   a. Square D Model QOU.

   b. Allen Bradley.

   c. Westinghouse.

   d. Or approved equal.

G. Terminal Boards: Provide one-piece molded plastic terminal and power distribution boards with screw-type terminals and barriers rated for 600 volts.

1. Terminals: Double-sided type with removable covers for safety.

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2. Shorting Bars: Provide shorting bars for terminal points for transformer leads.

3. Terminal Centers: Group terminal blocks in same location and provide separate centers (groups) for AC wired devices and DC wired devices.

4. Identification: Clearly identify terminal by numbers.

5. Spares: Provide ten percent spare terminal boards.

6. Manufacturers:

   a. Phoenix Type UK4.

   b. Allen Bradley.

   c. Weidmuler.

   d. Or approved equal

H. Relays: Provide industrial grade relays for control circuit switching with field convertible contacts rated for 10 amperes at 120 VAC. Coils to operate on 120 VAC and not require more than 180 volt-ampere-in-rush or 25 volt-ampere seal power. At a minimum, contact arrangement shall be DPDT with pilot light. Relays shall plug into an 8 or 11 pin tubular single tier screw terminal.

1. Provide relays for screw-terminal interface with the wiring.

2. Mount relays so terminal connections are clearly visible and terminals are readily accessible.

3. Provide ten percent (10%) spares for each type of relay, but not less than one (1) of each type.

4. Manufacturers:

   a. IDEC.

   b. OMRON.

   c. Square D.

   d. Or approved equal.

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I. Time Delay Relays: Provide knob-adjustable, three-position slide switch type, delay relays capable of selecting three time ranges and adjusting the timing interval for on or off delay timing functions. Provide square, rail-mounted base and plug-in relay with polycarbonate case, CMOS logic circuits, transient protection and DPDT Form C contact rated for 10 amps at 120 V AC.

1. Acceptable Manufacturers:

a. Eagle Signal Controls.

b. Time Mark Corp.

c. Diversified Electronics Inc.

d. Or approved equal.

J. Transient Voltage Surge Suppressors (TVSS): Provide wired-in TVSS devices to protect all microprocessor-based components and equipment power supplies, instrumentation, and data acquisition/control boards from voltage transients. Provide TVSS devices on all control and instrumentation lines. TVSS device shall be designated UL Standard 1499 (July 1987 Revision).

1. Zone A

a. All 4 to 20 mA analog signals shall be protected by common mode suppressor diodes.

(1) Suppressor diode clamping voltage shall not exceed 1.8 times operating voltage.

(2) Diodes shall be premounted in double level terminal blocks. Terminal blocks shall be provided with knife disconnects to allow user to monitor and test loops without removing wires, or breaking the loop.

(3) All loop power supplies must have the negative lead grounded to allow discharge of overvoltages.

(4) Acceptable Manufacturers:

(a) Phoenix Contact Type UKK5-M

(b) Or approved equal.

b. All telephone, modem, and data communications shall be protected by full common mode, and normal mode protection techniques to include metal oxide varisters, surge suppressors diode, gas discharge surge suppressors and coil/chokes. Module shall be in-line (series) connected for telephone and/or data-line (Computer) equipment protection. Unit shall be rated for a nominal operating voltage of 25 volts and a maximum operating current of 160 milliamps. Units shall be wired for terminal connect of line and load side wiring. (Products supplied with pigtail leads shall be furnished with field installable terminal strip).

(1) Acceptable Manufacturers:

(a) Telephone Protective Unit

1) MCG Electronics Inc. DLP Series.

2) LEA Dynatech TE-PS Series.

3) Or approved equal.

(b) Data-Line Protective Unit

1) MCG Electronics Inc. DLP Series.

2) LEA Dynatech TE-DB25 Series.

3) Or approved equal.

c. All discrete signals shall be protected by full common mode, and normal mode protection techniques to include metal oxide varisters, surge suppressors diode, gas discharge surge suppressors and coil/chokes. Module shall be in-line (series) connected equipment protection. Units shall be wired for terminal connect of line and load side wiring. (Products supplied with pigtail leads shall be furnished with field installable terminal strip).

(1) Acceptable Manufacturers:

(a) MCG Electronics Inc. DLP Series.

(b) Or approved equal.

2. Zone B

a. Not Used.

3. Zone C

a. Type: Active and passive multiple component, hybrid-circuit design of the cross-over current configuration to provide high-speed transient response, high energy dissipation, clamping harmonics elimination, and noise filtration.

(1) Features: Provide TVSS with the following features.

(a) Tight clamping and sine wave tracking.

(b) Low stress, non-degrading semi-conductor circuit technology.

(c) EMI/RFI rejection circuitry.

(d) Brown-out protection.

(e) Internal fusing.

(f) Voltage smoothing.

(g) Normal mode protection (line-to-neutral power transfer potential).

(h) Common mode protection (line-to-ground and neutral-to-ground power transfer potentials).

(i) Mode LED shall indicate TVSS is active and operating properly. Failure of the mode LED indicate line power failure or that the TVSS circuit has failed

(j) Fault LED shall indicate unit is wired in reverse polarity or ground fault condition exists.

(2) Performance: Provide TVSS meeting the following performance criteria based on ANSI/IEEE C62.41-1980 and C62.45-1987.

(a) Rated Single Pulse Transient Energy: 300 Joules normal mode and 280 Joules common made at 10 micro-second rise by 1,000 micro-second half-life.

(b) Maximum Single Pulse Transient Current: 26,000 amperes normal mode and 22,000 amperes common mode at 8 micro-second rise by 20 micro-second half-life.

(c) Noise Rejection: 60 to 70 (-) decibels normal mode and 50 to 60 (-) decibels common mode at 50 to 150 ohms and 5K to 5M Hz.

(d) Category A Ringwave Clamping Voltage: 200 V peak normal mode and 350 V peak common mode at 6 KV, 500 A and 100 KHz.

(e) Category B Ringwave Clamping Voltage: 230 V peak normal mode and 250 V peak common mode at 6 KV, 500 A, 100 KHz.

(f) Category B Bi-Wave Impulse Clamping Voltage: 380 V peak normal mode and 400 V peak common mode at 6 KV over 1.2 micro-second rise by 50 micro-second half-life, and 3 KA over 8 micro-second rise by 20 micro-second half-life.

(g) Response Time: Instantaneous (continuously active) normal mode and less than 5 nanoseconds common mode.

(h) Operating Temperature Range: 0 degrees C to 40 degrees C.

(i) Acceptable TVSS Manufacturer:

1) Series 51000-WM by Leviton Inc.

2) Or approved equal.

K. Wiring: Route wiring groups in neatly harnessed horizontal and vertical runs with maximum bundle size of two (2)inches within PVC wireways. Provide sufficient wire length to allow ample movement of slide out devices and ample flexure for component maintenance or replacement. Panel wiring shall conform to NEC and JIC standards.

1. PVC Coated Galvanized Conduit: Galvanized conduit, prior to coating, shall conform to Fed. Spec. WW-C-581D. Each conduit shall bear the UL label.

a. Prepared conduit coated inside and out with a heat polymerizing lacquer, such as an epoxyacrylic, to approximately 0.005 inch thick as final preparation for liquid plastic coating. The liquid plastic coating bonded to conduit the full length, except the threads, at thickness between 0.035 inch and 0.045 inch. Plastic coating shall have 3500 PSI tensile strength.

b. Plastic couplings, having a plastic sleeve extending one pipe diameter or two inches (whichever is less) beyond the end of the coupling, factory furnished with each conduit length.

c. Junction boxes shall be NEMA 4X Type 304 stainless steel or FRP, with stainless steel hardware.

2. Conductors: Provide UL listed stranded conductors of 98 percent conductivity copper with extruded thermoplastic polyvinyl chloride, flame resistant insulation rated for 600 volts with UL VW-1 flame test rating. Provide conductors of proper ampacity and gauge per equipment ratings and in accordance with the provisions of NEC Article 310; except for the following:

a. Wire sizes No. 12 AWG minimum through No. 8 AWG shall be type MTW, 90 degrees C minimum.

b. Wire sized No. 6 AWG and larger shall be type THHN/THWN, 90 degrees C minimum.

c. Minimum wire gauge for power circuit conductors shall be No. 12 AWG.

d. Acceptable Manufacturer:

(1) Type MTW: Vulkor Wire and Cable, or equivalent.

(2) Type THHN/THWN: Okonite Company, or equivalent.

3. Control Conductors: Provide UL listed stranded conductors of 98 percent conductivity copper per ANSI/ASTM B 33 with Type SIS (VW-1), thermoset, chemically cross-linked polyethylene, flame resistant insulation rated for 600 volts with UL VW-1 flame test rating. Minimum wire size shall be No. 14 AWG. Provide control conductors manufactured by Vulkor Wire and Cable, or equivalent.

4. Shielded Instrumentation Cable: Provide cable fabricated using stranded tin coated copper conductors with polyvinyl chloride (PVC) insulation and black polyurethane jacket.

a. Shielding shall be 100 percent utilizing aluminum/polyester/aluminum foil incorporating a tinned copper drain wire.

b. Cable shall be provided with Nylon rip cored for ease of jacket stripping.

c. Cable shall be ultraviolet light stabilized, have excellent resistance to oils, solvents, fuels and water, and pass the UL-VW-1 flame test.

d. Cable style shall be 20234 having a 600-volt insulation. Gauge and number of conductors to be as indicated on the Contract Drawings with minimum gauge of No. 16 AWG.

e. Acceptable Manufacturers:

(1) Alpha Corporation, Suprashield-Guard 2.

(2) Belden Corporation.

(3) Eaton Corporation.

(4) West Penn.

5. Termination: Terminate wires individually at numbered terminal blocks with crimp type, preinsulated, ring-tongue or locking-fork lugs.

6. Identification: Color-code wiring and identify each wire with correct wire number from electrical shop drawings and mark each wire by hot-stamped PVC sleeve.

7. Isolation: Run AC and DC wiring separately.

a. Run AC and DC wiring separately.

b. To avoid inductive pickup power wiring or control wiring shall have a maximum possible separation from analog signal wiring. A practical distance is not less than six (6) inches. If power wiring has to cross the signal wiring the crossing should be as close to a right angle as possible.

8. Wiring color-code: Wall wiring shall conform to the following color code:

a. 120 VAC power wires 1 phase i.e. lights, heaters – black hot and white neutral.

b. 120 VAC control wires – red.

c. 120 VAC externally powered – yellow.

d. 24 VDC – blue.

e. Ground – green.

f. 2-conductor shielded cables to have black +, white –

9. Where wire is required to flex often (i.e. around door hinges) high strand wire shall be used.

L. Panel Control Power Switch: Provide panel-mounted, heavy duty, full-size, 30.5 mm, oil-tight, corrosion-resistant industrial type ON/OFF switch to energize or de-energize all control circuits for the system by disconnecting 120 VAC supply power. Switch to be rated for 20 amps.

M. Selector Switches: Selector switches shall be 30.5 mm, heavy duty, water-tight, corrosion-resistant, non-illuminated. Switches shall have double-break silver contacts rated for 10 amps at 120 VAC. Provide maintained contacts unless otherwise indicated on the Contract Drawings. Provide auxiliary contact blocks where indicated on the Contract Drawings or in the Description of Operation. Provide legend plates for each switch. Units shall be single hole mounted.

1. Spare Parts:

a. (Not used).

2. Acceptable Manufacturers:

a. Square D Type K (NEMA 12), Type SK (NEMA 4).

b. Allen Bradley.

c. Cutler Hammer.

d. Or approved equal.

N. Emergency Stop Pushbutton: Provide a heavy-duty, water-tight corrosion-resistant, 30.5 mm, industrial type pushbutton with double-break silver maintain contacts rated for 10 amps at 120 VAC with a 2 1/4-inch red mushroom knob for emergency shutdown of the equipment controlled from the control panel.

O. START/STOP and OPEN/CLOSE Pushbuttons: Provide heavy-duty, water-tight, full-size, 30.5 mm, corrosion-resistant, industrial type pushbuttons with double-break silver momentary contacts rated for 10 amps at 120 VAC. Pushbuttons shall be maintained-type contacts. Pushbuttons shall be single-hole mounted with button color RED for START or OPEN and GREEN for STOP or CLOSE. Provide legend plates for each pushbutton.

1. Acceptable Manufacturers:

a. Square D Type (NEMA 12), Type SK (NEMA 4).

b. Allen Bradley.

c. Cutler Hammer.

d. Or approved equal.

P. Jog Pushbuttons: Provide heavy-duty, water-tight, full-size, 30.5 mm, corrosion-resistant, industrial type pushbuttons with spring-return contacts rated for 10 amps at 120 VAC. Pushbuttons shall be single-hole mounted, with button color yellow. The spring-return jog pushbutton shall energize the equipment only while the pushbutton is manually depressed. Provide legend plates for each pushbutton.

Q. Indicating Lights: Provide heavy-duty, water-tight, corrosion-resistant, full-size, 30.5 mm, push to test, industrial type operating status lights for each equipment component. Lights shall be transformer type with LED lamp. Lights shall be grouped with associated control pushbutton or selector switch. Lights shall have screwed-on prismatic lenses. Provide legend plates for each pilot light.

1. Control Panel Power On: White.

2. Equipment Item On or Open: Red.

3. Equipment Item Off or Closed: Green.

4. Equipment Alarm or Failure: Red.

5. Spare Parts:

   a. Provide one (1) spare lenses of each color.

   b. Provide one (1) spare lamp for each pilot light.

6. Acceptable Manufacturers:

   a. Square D Type (NEMA 12), Type SK (NEMA 4).

   b. Allen Bradley.

   c. Cutler Hammer.

   d. Or approved equal.

SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

R. SCR Speed Control Potentiometers: Provide industrial-duty, precision 10-turn, wirewound, 2 watts (minimum), corrosion and moisture resistant potentiometers with impedance rating (ohms) compatible with associated SCR or signal transmitter. Potentiometers shall have plus/minus 10 percent resistance tolerance, operating temperature range from minus 55 degrees C to 125 degrees C, 1/4 inch metal shaft with stops, and 1-inch diameter (minimum) digital readout dial calibrated from 0 to 999 digits. Provide Combo III Series, Model DA-20-10 potentiometers manufactured by ETI Systems.

S. Signal Transmitters: Provide totally encapsulated, fused, 120 VAC powered transmitters with integral 24 VDC regulated power supply to potentiometer which converts variable-resistance inputs to an isolated 4 to 20 ma DC output signal proportional to the position of the potentiometer wiper. Units shall include base-plate mount, terminal strip, and zero and span adjustments on the face of the transmitter. Provide transmitter equivalent to Model ST-4110 by Foxboro/Jordan.

T. Digital Current-Loop Meters: Provide panel-mounted, programmable, two-wire, LSI unichip designed, current loop-powered meters which convert 4 to 20 mA DC signal input to the specified process units.

1. Input: 4-20 mA DC linear process signal.

2. Power Requirement: Less than 3.3 VDC from current-loop voltage.

3. Electrical Connections: Rear-mounted terminal block.

4. Programmability: Four program switches and two vernier potentiometers to calibrate meter for various zero offsets and scale factors.

5. Update Rate: Three readings per second.

6. Case: Spring-retained, NEMA 4X, glass-reinforced polyester.

7. Display: 0.6 inch high LCD.

8. Readout Indication: XXX.X.

9. Accuracy: Plus/minus 1/2 percent of rate.

10. Equipment Meter Ranges: Verify the final rate for each equipment item based on the final signal transmission range from the approved shop drawings.

11. Acceptable Meter: Model CM-1 TB by Non-Linear Systems Inc.

SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

U. Enclosure Heater: Provide a thermostatically controlled, 120 VAC strip-heater to prevent condensation in the enclosure. Heating element to be 1 1/2-inch wide by 3/8-inch thick with aluminized steel sheath, MgO-based insulation, and coiled nickel-chrome element wire. Size heater to maintain enclosure temperature above dew point. Mount heater on subpanel using Type 304 stainless steel bolts and offset heater from panel by double netting.

1. Acceptable Manufacturer; Strip Heater: Watlow; Series 375.

V. Combination Linestarters: Full voltage, reduced voltage (autotransformer start) or reversing. Starters of single or two-speed design.

1. Starters of electrically held, electrically operated, three pole design assemblies with arc extinguishing characteristics and silver-to-silver renewable contacts shall be provided with control panels for all motor loads. Starters and their respective disconnects shall be installed in individual locking enclosures. Starters shall be equipped with provisions for adding a minimum of four normally open, or normally closed, electrical interlocks and overload relays of three-pole bi-metallic type.

2. Circuit breakers of the magnetic trip type and having an interrupting capacity of not less than 22,000 RMS symmetrical amperes shall be provided for all motor starters. The position of the external operating handle shall clearly indicate whether the breakers are in the ON, OFF or TRIPPED position. For control panels enclosing one combination starter, the circuit breaker ON/OFF HANDLE shall be mechanically interlocked with door latch of control panels to prevent access to the control panel interior unless the disconnect circuit breaker is in the OFF position. Padlocking facilities shall be provided to positively lock circuit breaker in the OFF position with from one to three padlocks with the control panel door open or closed. For control panels enclosing more than one combination starter, each circuit breaker disconnect shall be padlockable with from one to three padlocks with the control panel door opened or closed. For SAFETY purposes, all control power transformers and circuits shall be designed and connected to ensure that all control power is removed from a motor whenever the Circuit Breaker for that motor is: OFF, TRIPPED or LOCKED OUT. Control power transformers and circuits shall be designed and connected to ensure that control power is NOT removed from other motors whose Circuit Breakers are not: OFF, TRIPPED or LOCKED OUT.

3. Operating and Indicating Devices:

   a. Control Voltage: 120 volts, using individual control transformers. Control transformers shall have a capacity of 100 V.A. in addition to the capacity required to operate external solenoids, relays, alarms, and such other control voltage components, as indicated on the Drawings.

   b. Service Voltage: 480 volts, three phase, three wire, 60 Hertz.

W. Elapsed Time Meter: Provide time totalizer with synchronous motor, which drives a set of digit readout wheels including a 1/10 digit.

1. Electrical Ratings: 120 volt, single phase, 60 Hertz.

2. Time Range: 0 to 99,999 hours-non reset

3. Acceptable Manufacturers:

   a. Eagle Signal Industrial Controls; HK Series.

   b. Or approved equal.

X. Control Potentiometers: Provide standard three-wire with an output of 4-20 mA. The unit shall be panel mountable with high output current. The power supply for the unit shall be rated 120 VAC

1. Acceptable manufacturers:

   a. Moore Industries Inc., Model PTT.

   b. Or approved equal.

Y. Digital Indicating Display Units:

1. General requirements: All suppliers of control panels shall provide digital display units in association with this section.

2. Display units shall be microprocessor based with a 6-character red LED display.

3. Display shall take as input a 4-20 mA signal. It shall have scalable linearized retransmission capability for supplying an isolated 4-20 mA output (max 600 ohm).

4. The indicator shall display the respective process variable along with the engineering units defined in the respective specification.

5. Indicator shall have LED indications of high, low, deviation, or rate-of-change alarms.

6. Indicator shall have two relay contact outputs.

7. Indicator shall be 1/8 DIN size mounting, 120 VAC powered, and withstand an ambient temperature of 2 - 55 deg C.

Z. Programmable Logic Controller (PLC): Programmable Logic Controller Requirements are as follows.

1. Provide process system remote control panels with PLC suitable for the logic functions to be performed. PLC shall have a communications card installed. The PLC shall be installed with a minimum of 2 spare rack slots for future I/O modules. Provide as a minimum 30% spare I/O of each type as a percentage of total I/O available for use for each type.

2. The PLC components shall be provided by one supplier who shall provide equipment and appurtenances and shall be responsible to the Contractor for satisfactory operation of the entire system. Substitutions on functions specified will not be accepted.

3. The PLC equipment provided under this Project must be completely compatible with the existing equipment in the existing facility.

4. Each PLC shall be provided with a separate portable programming device for field use in editing the PLC software routines and data files.

5. The Contractor shall be responsible for all startup, programming, testing and integration services required to successfully integrate the PLC. This work shall include providing the field services of factory representatives as required.

6. Mount relays, lights and wire associated with the PLC as indicated on the Drawings.

7. PLC Programming: Provide programming software and all soft and hard keys associated with programming software.

8. The Contractor shall be responsible for a finished working system at checkout that conforms to the sequence of operations as defined in the Specifications and Drawings. All system functionality shall be demonstrated in the presence of the Engineer for local and remote control.

9. PLC Power Supply: The PLC's power supply should be sized to accommodate a full rack of I/O. All I/O points, whether utilized or spare, shall be wired back to terminal blocks contained within the PLC panel. No direct wiring from field device to rack-mounted PLC modules is permitted. Inputs and outputs, at a minimum, shall be protected by fuses as shown on the drawings.

10. Operator Interface: If operator interface systems are used, provide any related development software and hard or soft keys.

11. Any licenses or usage agreements shall be paid for by the Contractor and be property of the Owner. All such licenses or usage agreements shall be permanently in the name of the Owner and shall not require any additional fees for their use or for obtaining "patches" for the software.

12. Acceptable Manufacturers:

    a. General Electric Company (GE) Fanuc Automation Series 90-30 PLCs.

    b. Allen-Bradley (A-B) SLC 500 Series PLCs.

    c. Square-D/Schneider Electric Modicon Series PLCs.

    d. Or approved equal.

AA. Nameplates and Legend Plates: Provide engraved, laminated phenolic nameplates and legend plates as specified in this Section to identify the panel and each component mounted on the face of the panel, and in accordance with the following. Nameplates and legend plates shall have a white field with black upper-case Gothic legend characters. Nameplate and legend plate legend wording and layout shall be as approved by the Engineer.

1. All nameplates, legend plates, labels and tags shall conform to ISA Recommended Practice publication ISA-RP60.6.

2. Nameplates: Nameplates shall be used to display basic information including function.

    a. Enclosure identification nameplate shall have legend characters of f 3/4-inch minimum height.

    b. Individual panel components shall be shall have legend characters of 1/8-inch minimum height with 3/64-inch space between lines.

c. For NEMA 1 and 12 enclosures, Type 316 stainless steel screws shall be used to attach nameplates. For other enclosures, attach nameplates with cyanoacrylate adhesive, or equal. In no case shall the fastening of a nameplate to an enclosure interfere with or damage the rating of an enclosure.

d. Abbreviations shall conform to Appendix B of ISA Recommended Practice publication ISA-RP60.6.

e. Margins shall conform to the following:

(1) With holes:

(a)	Top/bottom	1/16-inch minimum
(b)	Sides left/right	5/16-inch minimum

(2) Without holes:

(a)	Top/bottom	1/16-inch minimum
(b)	Sides left/right	1/8-inch minimum

3. Legend Plates: Legend plates shall be used to display basic functions of push buttons, selector switches and pilot lights.

a. Legend plates shall have legend characters of 1/8-inch minimum height with 3/64-inch space between lines.

b. Legend plates shall be held to the enclosure by the ring nuts used to hold the operator in place.

c. All legend plates for a particular panel shall be of the same size and shape.

BB. Grounding: Two copper ground buses shall be supplied with each enclosure. One ground bus shall be electrically bonded to the panel and shall be used to ground all equipment. The other ground bus shall be an isolated ground bus and shall be use to ground the drain wire of analog signal wiring. No more than 5 drain wires shall be jumpered together before being run to the isolated ground bus. The isolated ground bus shall be connected to the non-isolated grounded bus with one piece of 10 gauge wire.

CC. Alternating Relays: Relays shall be socket mounted, designed to alternate activation between 2 outputs. The output contacts shall be rated 10 A at 240 VAC resistive. The relays shall have a selector switch for alternate, lead, or lag operation.

SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

1. Spare Parts:

   a. Provide ten percent (10%), but not less then one (1), of each type.

2. Manufacturers:

   a. Crouzet, JRS series.

   b. Macromatic.

   c. Or approved equal.

DD. Three-Phase Voltage Monitor: The monitor shall be capable of protecting a three phase motor by detecting phase loss on a loaded motor, low voltage on all phases, very low voltage or phase loss of any single phase, and phase reversal. The line voltage trip point shall be adjustable. The monitor shall have a SPDT output relay rated 10 A at 240 VAC resistive. The monitor shall require a maintained fault for more than 2 seconds before tripping. The monitor shall automatically reset after the fault clears. The unit shall be socket mountable.

1. Spare Parts:

   a. Provide ten percent (10%), but not less then one (1), of each type.

2. Acceptable Manufacturers:

   a. Ametek National Controls Corp.

   b. Automatic Timing and Controls.

   c. Macromatic.

   d. Or approved equal.

EE. Signal Isolators: Provide isolators in the control panels for 4 to 20 mA signals where signals are divided or where required to prevent ground loop problems, i.e., 4 wire transmitter with grounded signal common or loading problems. Isolators shall be modular design to allow easy replacement of the unit.

1. Spare parts:

   a. Provide 4 spare isolators of each type.

2. Acceptable Manufacturers:

   a. AGM.

   b. Action Instruments.

c. Yokogawa JUXTA J series.

d. Or approved equal.

FF. Intrinsically Safe Barriers: Barriers shall limit the available voltage and current to intrinsically safe devices mounted in hazardous areas. Power source shall be located on the non-hazardous side of the barrier. Barriers shall be DIN rail mountable. Discrete logic signals shall use a fully isolated barrier with relay output. Analog 4-20 mA signals shall provide a loop power supply and galvanically isolated output.

1. Spare Parts:

a. Provide ten percent (10%), but not less then two (2), of each type.

2. Acceptable Manufacturers:

a. Cooper Crouse-Hinds

b. Endress+Hauser, model RN221N

c. Or approved equal.

GG. Alarm Horns: Alarm horns shall be flush mounted as indicated on the Drawings. Voltage rating shall be 120 VAC. Provide adjustable three to five minute timer to silence the horn automatically.

1. Spare parts:

a. (Not used).

2. Manufacturers:

a. Federal Signal Model 350.

b. Panalarm.

c. Or approved equal.

HH. Analog Signal Summator: Summator shall accept up to four (4) 4-20 mA analog signals and output one (1) 4-20 mA analog signal. The summator shall allow a user settable weighting of each input signal into the sum. The summator shall have an operating temperature range of 0 to 60 degrees C or greater. The inputs, outputs, and power supply shall all be isolated from each other.

1. Spare parts:

a. Provide one (1) summator of each type.

2. Acceptable Manufacturers:

   a. Acromag.

   b. Or approved equal.

II. Twenty-four Volt DC Power Supplies: Provide DC power supplies as required to power instruments requiring external power. Power supplies shall convert 120 VAC, 60 hertz power to DC power. Output, overvoltage, and overcurrent protective devices shall be provided with the power supply to protect the instruments from damage due to power supply failure and to protect the power supply from damage due to external failure. Power supplies shall be sized to handle required load plus a minimum of 25 percent for additional future load.

1. Spare parts:

   a. Provide one (1) spare power supply equal to the current rating of the largest power supply provided.

2. Acceptable Manufacturers:

   a. Power One.

   b. Acopian.

   c. Or approved equal.

JJ. Pneumatic Power Relays: Relays shall be designed for multiple switching of 1/4 to 1/3 HP motors at 120 VAC. Coil voltage shall be 120 VAC unless otherwise indicated on the Drawings.

1. Spare Parts:

   a. Provide ten percent, but not less than one of each type.

2. Acceptable Manufacturers.

   a. Square D.

   b. Joslyn Clark.

   c. Potter Brumfield.

   d. Or approved equal.

SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

PART 3 EXECUTION

3.01 LUBRICATION

A. The Manufacturer shall thoroughly lubricate all equipment in accordance with the Equipment Manufacturer's instructions. Lubricating oils and greases shall be of type and viscosity as recommended by the Equipment Manufacturer.

B. All lubricants shall be furnished by the Manufacturer.

C. All systems requiring oil lubrication for gears, bearings, etc., are to be flushed with oil as recommended by the Equipment Manufacturer. This includes all gears, bearings, etc., regardless of whether they have been shipped with or without oil soluble protective coatings.

D. Following flushing, oil lubricated systems shall be filled with "run-in" oil as recommended by the Equipment Manufacturer. The equipment shall be "run-in" at the no-load condition for a minimum period of two (2) hours. Following "run-in" and inspection, the equipment is to be drained and flushed again with flushing oil as recommended by the Equipment Manufacturer.

E. The schedule for the above procedures is to be submitted for review by the Engineer at least two (2) weeks prior to the selected procedure starting date. At this time inspection details can be worked out.

3.02 EXPERT SUPERVISION

A. The Manufacturer shall provide the services of a Factory Engineer of the manufacturer to supervise the installation of equipment.

B. After the installation of the equipment has been competed, a Factory Engineer shall inspect and supervise the preliminary field tests and adjustments. The Manufacturer shall submit duplicate copies certified by the Factory Engineer of his inspection, test, and adjustment report. The report shall include detailed descriptions of the items inspected, test performed, quantitative results obtained, and a record of the adjustments made. The report shall include a certificate that the equipment conforms to the contract requirements and is ready for permanent operation. The Manufacturer shall arrange to have the Factory Engineer present when the final field tests are made to instruct the personnel of the Owner in the operation of the equipment.

3.03 FINAL FIELD TESTS

A. Upon completion of all the work and prior to final payment, all equipment and appliances will be subjected to final field tests to prove that the equipment and appliances are properly installed, meet their operating cycles and are free from defects such as overheating, overloading, undue vibration, or other injurious defects. The final field tests will be witnessed by the Engineer and, when ordered, they shall also be witnessed by the Factory Engineer. The Manufacturer shall furnish all labor, lubricants, materials, equipment, and instruments necessary for the tests. Until final field tests are acceptable to the Engineer, the Manufacturer shall make all necessary changes, adjustments, and replacements at his own expense.

3.04 DAMAGE DURING TESTS AND INSTRUCTION PERIODS

A. The Manufacturer shall be fully responsible for proper operation of equipment during tests and instruction periods and he shall neither have nor make any claim for damage which may occur to equipment prior to the time when the Owner conditionally accepts the equipment.

3.05 ELIMINATION OF NOISE AND VIBRATION

A. All apparatus herein specified shall operate without objectionable noise and vibration. In the event that the operation of any apparatus installed under these Specifications produces noise or vibration which in the opinion of the Engineer is abnormal, excessive or objectionable, the Contractor shall at his own expense make such changes in the apparatus as may be necessary to stop such objectionable noise or vibration. Should a noise or vibration be transmitted through any pipe, or by a portion of the building, from apparatus installed under this contract, in such a manner that in the opinion of the Engineer it is objectionable, the Contractor shall at his own expense install such rubber spool type couplings or vibration eliminators and make such changes in, or additions to, the installation as may be necessary to prevent the transmission of such noises or vibration.

3.06 EQUIPMENT REJECTION

A. If at any time an inspection, test or analysis of equipment reveals faulty design, inferior or defective materials, poor workmanship, excessive wear, or non-conformity with the requirements of the Contract Documents, such equipment will be rejected and shall be replaced with satisfactory work at the Manufacturer's expense.

SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

3.07 PACKING

A. All equipment and spare parts requiring packing shall be turned over to the Owner newly packed with the packing recommended by the manufacturer of the equipment. The Manufacturer shall furnish a schedule, in triplicate, listing the type and manufacturer of the packing recommended for each piece of equipment. He shall also furnish sufficient packing to repack each piece of equipment once.

3.08 SUBMISSION OF THE MANUFACTURER'S CERTIFICATES

A. The Manufacturer shall submit Manufacturer's Certificates for the equipment furnished and installed under this Contract.

B. Such Manufacturer's Certificates shall state that the equipment has been installed under either the continuous or periodical supervision of the manufacturer's authorized representative, that it has been adjusted and initially operated in the presence of the manufacturer's authorized representative, and that it is operating in accordance with the specified requirements to the manufacturer's satisfaction.

C. As related to his obtaining of the Manufacturer's Certificates, the Manufacturer shall include in his contract price the cost of furnishing competent and experienced engineers or superintendents who shall represent the manufacturers of the equipment in conformity with the Contract Documents. After the equipment is placed in permanent operation by the Owner, such engineers or superintendents shall make all adjustments and tests required to prove that such equipment is in proper and satisfactory operating condition, and meets the requirements for issuing the "Manufacturer's Certificate".

3.09 ACCEPTANCE OF EQUIPMENT BY THE OWNER

A. After the equipment has satisfied all of the above conditions, the Manufacturer shall notify the Engineer and shall, at such time as agreed upon, demonstrate to his satisfaction that the equipment is ready for operation. The equipment shall then be designated as "accepted" and the Owner will be responsible for all further maintenance and operation of same.

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SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

PART 4 - EQUIPMENT CERTIFICATION

EQUIPMENT CERTIFICATION

Owner:_____ Date: _____

Project: _____

Contract No.: _____ For the _____

Work performed by _____
(Contractor)

Specification Section No: _____ Title: _____

On _____, _____
(date) (Name[s] of Service Representative[s])

representing _____ visited
(Equipment Manufacturer)

_____ for the
(Name of Project)

purpose of certifying the installation and operation of:

Equipment Name Tag No.

_____

_____

_____

_____

I/we certify that the installation and operation of the above equipment, except as noted below, is in complete compliance with the Manufacturer's recommendations and Engineer's requirements.

SECTION 11000

MECHANICAL EQUIPMENT - GENERAL

The installation and operation of the following equipment does not comply with the Manufacturer's recommendations and Engineer's requirements.

Equipment Tag No. Reason for Non Certification

_____

_____

_____

_____

_____

_____

Signature _____

Title _____

Company _____

**** END OF SECTION ****

SECTION 11010

PIPING AND SEWERS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. The Contractor shall furnish, install, test, disinfect where appropriate, and place in satisfactory operation all piping complete with accessories and appurtenances as shown on the Contract Drawings, as specified herein or as required for a complete and functional piping system.

B. All pipe materials used for permanent installation shall be new.

C. It is to be noted that in the relatively small piping systems, the Drawings do not necessarily show all fittings, offsets, unions, hangers, supports, etc. All such items shall be furnished and installed, however, as required for complete and satisfactory installation of the equipment shown, and for ease of disassembly for any required maintenance.

D. The Contractor shall verify all dimensions of valves, special castings and fittings, pipe, equipment, etc., so that all the pipe work performed will fit together properly and will conform to the arrangements shown on the Drawings. In selecting laying lengths of fittings, the Contractor shall be guided by the dimensions of equipment to which connections are made and by the indicated dimensions on the Contract Drawings. All pipe and specials shall be accurate to the dimensions shown. Hubs, spigots, and flanges shall be at right angles to the axis of the opening, and openings shall be at the exact angle specified.

E. Piping Items Included (But Not Limited To):

1. Piping & pipe joints
2. Wall pipes or sleeves
3. Pipe testing

F. Related Work Specified Elsewhere

1. The provisions of this Section are a direct extension of SECTION 11000, MECHANICAL EQUIPMENT - GENERAL, and although set forth only once within the Specifications, shall apply equally to this Section.

2. Concrete Work - Division 3 - CONCRETE

3. Valves - SECTION 11020, VALVES AND APPURTENANCES

4. Pipe Couplings - SECTION 11400, PIPE COUPLINGS

5. Pipe Supports - SECTION 11410, PIPE HANGERS AND SUPPORTS

SECTION 11010

PIPING AND SEWERS

1.02 SUBMITTALS

A. Operating instructions, manuals and shop drawings shall be submitted in accordance with SECTION 11000, MECHANICAL EQUIPMENT - GENERAL.

B. Submit to the Engineer for his review, fully detailed shop drawings and/or legible catalog cuts of all items included within this Section. Submit working drawings of piping systems in accordance with Section 1.03.

C. All tests on materials referred to within this Section shall be made by a recognized and accepted testing laboratory at the Contractor's expense. Tests shall be made in accordance with ASTM or Federal Specification requirements, and certified copies of all test reports shall be submitted to the Engineer.

1.03 WORKING DRAWINGS

A. No material shall be delivered, fabricated or erected at the job site until the working drawings have been approved. Unapproved materials will not be included for payment in any estimate.

B. Working drawings shall be made to a scale of not less than 1/4-inch equals one foot indicating layout in plan and elevation as may be required to clearly show all the pipe and fittings for pipe lines 3" and larger in size.

The drawings shall be completely dimensioned and show connections to equipment with references to approved working drawings of such equipment. The drawings shall include a complete schedule of pipe, fittings and specials with mark numbers on the schedules and on the drawings corresponding to the mark numbers which will be on the pipe and fittings when delivered to the job site. Special castings shall be clearly detailed showing all pertinent dimensions.

1.04 AS-BUILT DRAWINGS

A. At the end of the Contract, the Contractor shall provide the Engineer with four (4) sets of prints showing dimensioned locations of all underground piping and structures and changes made from the Contract Drawings together with one (1) set of reproducibles of the "mylar" type.

B. The Contractor shall provide the Engineer with four (4) sets of prints for each interior piping system showing all equipment and valves. Drawings shall show numbers and/or letters for each valve. One (1) copy of these drawings, or a separate simplified schematic diagram for each system, on which all equipment is shown and all valves are identified by number or letter, shall be framed, glazed and mounted in the area designated by the Engineer.

SECTION 11010

PIPING AND SEWERS

1.05 CERTIFICATION OF WELDERS

A. All shop and field welding under this Contract for steel piping and other piping systems shall be done by experienced operators who are skillful and have had experience in the method and materials used. All welders shall be qualified as specified in the ASME Code for Unfired Pressure Vessels, Paragraph U-70.

B. For field welding, the Contractor shall submit to the Engineer for his review and approval a certified statement, from an approved testing agency, for each welder he proposes to use for welded piping. Each certified statement shall indicate that the welder has within six months from proposed employment on this project been successfully qualified under the requirements of Section IX of the ASME Boiler Construction Code. All certificates and qualifications shall be at the Contractor's expense.

The Engineer will return the certified statements to the Contractor for retention on job in the Contractor's field office. Any work installed by an individual who has not been qualified by the testing agency and approved by the Engineer shall be removed by the Contractor and shall be replaced with work installed by qualified and approved welders at the Contractor's expense.

1.06 GUARANTEE AND WARRANTY

A. The equipment shall be unconditionally guaranteed to meet or exceed the design criteria detailed in PART 2 of this Specification.

B. See SECTION 11000, MECHANICAL EQUIPMENT - GENERAL for other requirements.

PART 2 PRODUCTS

2.01 PIPE SCHEDULE

A. The pipe type and material have been shown on the Plans.

B. Alternate pipe materials will be considered on a case by case basis. For substitutions, the Contractor shall comply with the provisions of SECTION 11000 for "or equal" approval requirements.

SECTION 11010

PIPING AND SEWERS

2.02 DUCTILE IRON PIPE

A. General

1. D.I. pressure pipe shall be made of ductile iron of good quality and of such character as shall make the metal castings strong, tough and of even grain and soft enough to satisfactorily permit drilling, tapping, and cutting. All piping shall be smooth, free from scale, lumps, blisters, and sand holes and defects of every nature that make it unfit for the use intended. All piping shall be straight and shall be true circles in section with its inner and outer surfaces concentric. No plugging, filling, burning-in or welding shall be allowed. All piping shall be subject to inspection and approval by the Engineer upon delivery, and no broken, cracked, misshapen, or otherwise damaged or unsatisfactory piping will be accepted.

2. Each piece of pressure ductile iron pipe shall have the weight and class designation conspicuously painted on it as near as possible to the flange or bell end of the pipe and these designations shall be clearly legible.

3. Wherever ductile iron pipe is specified or shown as having a spigot end, plain end will be acceptable unless otherwise specifically noted.

4. Where required or shown, the Contractor shall provide ductile iron specials. Specials shall, in general, consist of spool pieces, less than standard lengths of flanged, nonstandard fittings. The specials shall conform in material, thickness, and finish to the pipe in which they are installed. Tapped reinforced bosses shall be provided as an integral part of fittings, when shown or specified.

5. Lead or caulked joints will not be permitted on process pressure piping. Flanged or grooved joint coupling will be used.

6. Flanges may be cast integrally with ductile iron pipe or screwed-on type flanges may be used. Pipe compound on the manufacturer's recommendations shall be used at each threaded joint for flanges.

7. All wall castings for process piping shall be ductile cast iron flanged or plain end interior and mechanical joint exterior unless shown otherwise. Flashes and mechanical joint hubs shall be flush with the wall surface and shall be drilled and tapped for flange or gland bolts. Castings shall be provided with integral water stops.

B. Ductile iron pipe fittings shall be mechanical joint or flanged, as specified. Flexible joints shall be used for outside pipe and flanged joints shall be used for inside pipe except as otherwise shown. Flexible joint pipe shall be mechanical joint, or push-on joint.

SECTION 11010

PIPING AND SEWERS

1. Pipe Barrel - All ductile iron pipe barrels shall conform to ANSI A21.6 or A21.8.

2. Wall Thickness - Wall thickness of pipe barrels shall conform to the following unless indicated otherwise on the Plans:

Pipe Size	Thickness Class
3" to 12"	53
14" & larger	52
12" & smaller under concrete floor area	54

3. Flanged Pipe and Fittings

   a. All flanged ductile iron fittings shall be manufactured in accordance with and shall meet the requirements of ANSI A21.10.

   b. Wall castings shall conform to AWWA C100. Wall castings in sizes 12" and smaller shall be Class 54, and in sizes 14" and larger shall be Class 52.

   c. Flanged ductile iron pipe approximately 12" or less in length shall have flanges cast solidly to the pipe barrel. Flanges on ductile iron pipe longer than 12" in length shall be of the screw type. Pipe threads shall be of such length that, with flanges screwed home, the end of the pipe shall project beyond the face line of the flange. Flange and pipe shall then be faced to give a flush finish to the pipe and the flange surface shall be normal to the axis of the pipe. Ductile iron flanges shall be of such design that flange neck completely covers the threaded portion of the pipe to protect against corrosion. Faces of all flanges on ductile iron pipe shall be coated with white lead immediately after they have been faced and drilled. Faces of flanges on fittings shall be coated with coal tar pitch paint, or otherwise protected against corrosion, after machined.

   d. All flanged ductile iron pipe and fittings shall be faced and drilled in accordance with ANSI Class 125, B16.1 Standard, unless special drilling is called for or required. Where cap bolts or studs are required, flanges shall be drilled and tapped accordingly.

   e. Flange bolt holes on each end of flanged pipe and fittings shall accurately straddle the same horizontal and vertical centerlines, unless special drilling is called for or required.

f. All pipe with screw type flanges shall be assembled, faced and drilled at the point of manufacture or by a pipe fabricator specializing in this work, unless otherwise approved by the Engineer.

g. All ductile iron blind flanges and companion flanges shall be furnished in accordance with ANSI B16.1. All regular or eccentric reducing flanges shall be furnished to the thickness of and drilled to the template of the regular companion flange of corresponding outside diameter.

h. All flanged joints shall be thoroughly bolted with through, stud, or cap bolts of required size. Gaskets shall be full faced, 1/16-inch thick. Gasket dimensions shall conform to ANSI B12.21. For sludge gas lines, gaskets shall be cut from neoprene sheet packing equal to Style No. 37010 black Durometer 70, as manufactured by Uniroyal Inc., or approved equal. For all other pipe lines, gaskets shall be red rubber gaskets equal to Rainbow Style No. 9 as manufactured by Uniroyal Inc., or approved equal. Gaskets used in air lines shall have a minimum temperature rating of 300° F.

i. Except as otherwise specified or indicated on the Plans, all machine bolts, stud bolts and cap bolts shall be made from alloy steel complying with ASTM A193, Grade B7, or ASTM A490 and all nuts shall be made from alloy steel complying with ASTM A194, Grade 2 or 2H.

j. All bolt heads and nuts shall be semifinished, hexagonal in shape, and in accordance with the dimensions for the heavy series of ANSI B18.2. Bolt threads shall conform to ANSI B1.1, Coarse Thread Series, Class 2A. Steel bolts and nuts shall be aluminized after the threads are cut. All threads after plating shall be well fitting and sound. Aluminizing shall be in accordance with the accepted practice. Flanges or couplings that are submerged or buried shall be bolted with ANSI Type 304 bolts and AISI Type 316 nuts. Connecting flanges shall be in proper position and alignment and no external force shall be used to bring them properly together.

4. Mechanical Joint or Push-on Joint Pipe and Fittings

a. The mechanical joint and push-on joint shall meet the requirements of ANSI A21.11, except as modified herein.

b. The mechanical joint ductile iron fittings to be used in conjunction with the mechanical joint pipe herein specified shall meet the requirements of ANSI A21.10, with mechanical joints meeting the requirements of these Specifications.

c. Thrust Blocks as specified in Paragraph 3.06 or restrained type mechanical joints shall be used for plugs, caps or fittings in pressure service as directed by the Engineer. When mechanical joint restraint is utilized, restraint shall be incorporated in the design of the follower gland. The restraint mechanism shall consist of a plurality of individually activated gripping surfaces to maximize restraint capability. Glands shall be manufactured of ductile iron conforming to ASTM A536-80. The gland shall be such that it can replace the standardized mechanical joint gland and can be used with the standardized mechanical joint bell conforming to ANSI/AWWA A21.53/C153 of latest revision. Twist-off nuts, sized same as tee-head bolts, shall be used to insure proper actuating of restraining devices. The restraining glands shall have a pressure rating equal to that of the pipe on which it is used and shall be EBAA Iron Inc. Megalug or equal.

d. Ductile iron pipe fittings to be used in conjunction with push-on joint ductile iron pipe herein specified shall be furnished with all bell ends unless shown otherwise on the Plans, and shall be mechanical joint fittings as specified herein for mechanical joint pipe.

e. Restrained type push-on joints, in addition to the above requirements, shall be the Lok-Tyton joints as manufactured by United States Pipe and Foundry Company, or approved equal.

f. Mechanical joint gaskets shall be of rubber of such quality that they will be unaffected by the liquid or gases with which they will come in contact. Gaskets used in air lines shall have a minimum temperature rating of 300° F. Gland bolts for mechanical joints shall be of high-strength, corrosion-resistant alloy with tee-head and hex nut.

g. Jointing of mechanical joint pipe and fittings shall be done in accordance with the requirements of Section 9b of AWWA C600, and also in accordance with the "Notes on Method of Installation" included at the end of ANSI A21.11.

h. Installation of push-on joint ductile iron pipe and fittings shall be done strictly in accordance with the recommendations of the manufacturer of the pipe.

5. Grooved Joint Pipe and Fittings

a. Ends for grooved joint pipe and fittings shall be grooved to meet the requirements of the manufacturer of the couplings furnished. Mechanical grooved pipe couplings and fittings as manufactured by Victaulic Company of America shall be used where shown on the Contract Drawings.

b. Ductile iron pipe barrels shall conform to the requirements of ANSI Specification A21.51, or the latest revision and AWWA Specification C151 or the latest revision.

c. Grooved end ductile iron pipe shall conform to AWWA C606-78, or the latest revision, for rigid grooving dimensions. Flexible grooved joints may be used for certain design considerations as shown on drawings or detailed elsewhere in these specifications.

d. Fittings shall conform to the requirements of ANSI A21.10 or AWWA C110, or the latest revision, with the exception of the end preparation. End preparation shall be a radius grooved configuration conforming to Victaulic Company of America's recommendation for rigid joints.

e. Couplings shall be as specified under SECTION 11400, PIPE COUPLINGS.

f. Transition flanges, Victaulic Style 341/342, shall be used to facilitate connection from grooved pipe or fittings to 125# ductile iron flanged valves, pump, pipe, fittings, or other equipment. The transition flanges shall be malleable iron conforming to ASTM A47 or ductile iron conforming to ASTM A536. Gaskets shall have properties as designated by ASTM D2000 and shall be suitable for the required service.

g. Pipe Preparation

(1) Grooving - Grooving Dimensions shall conform to AWWA Standard C606-78, or the latest revision.

(2) Assembly

(a) Pipe ends shall be clean and free from indentations, projections and roll marks in the area from pipe end to groove for proper gasket sealing.

(b) The gasket style and elastomeric material (grade) shall be verified as suitable for the intended service as specified.

(c) A thin, uniform coat of Victaulic Lubricant shall be applied by brush or by hand by: 1) brushing lubricant on the gasket lips (ID) and the entire exterior of the gasket; 2) brushing lubricant on the pipe ends around the entire pipe circumference.

(d) The gasket shall be placed over one pipe end, the pipe ends aligned and brought together and the gasket positioned between the grooves on each pipe end.

(e) The housing shall be assembled over the gasket with the housing key section engaging both grooves. The bolts shall be inserted, nuts started and uniformly tightened until the housing bolt pads are firmly together, metal-to-metal.

6. Shop Tests - A ring test shall be made on not less than two (2%) percent of the number of pipe of each size of ductile iron pipe, for each thickness class, except that not less than one test nor more than five tests for each size and thickness class shall be required. The Contractor shall notify the Engineer and Testing Laboratory a minimum of ten days prior to the date of testing so that the test may be witnessed.

7. Pipe Tappings

a. Where shown on the Contract Drawings, or required, ductile iron pipe and fittings shall be drilled and tapped to provide for connecting of screwed piping. All holes shall be drilled accurately at right angles to the axis of any pipe or fitting.

b. Whenever the wall thickness of the pipe or fitting to be tapped is such that it will not permit enough threads equal to, or greater than, the normal engagement of Standard Pipe Threads, ANSI B2.1, the Contractor shall furnish such ductile iron pipe or fitting with cast-on bosses suitable for drilling and tapping. Such connections shall be made to pit cast pipe or to fittings. Where necessary, a piece of pit cast pipe shall be installed in the line for this purpose.

c. In lieu of providing bosses on pipe, Dresser Style 360 or Rockwell Style 239 stainless steel full circle clamps with a tapped outlet may be used with the approval of the Engineer. Approval for the use of the coupling will be on a case by case basis.

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8. Cement Lining

   a. The interior of all ductile iron pipe and fittings that are not glass-lined, shall be cement lined.

   b. Cement mortar lining for ductile iron pipe and fittings shall conform to AWWA C104 and ANSI A21.4. Linings shall be full standard thickness.

9. Glass Lining

   a. The class of pipe and type of fitting shall be as described previously for ductile iron pipe. The glass lining shall be 0.008" to 0.012" thick, equal to SG-14 as manufactured by Ervite Corporation, Erie, Pennsylvania; Ceramic Coating Company, Newport, Kentucky; Permutit, Paramus, New Jersey, or approved equal.

   b. The glass shall be especially formulated with bond promoting constituents so the high temperature will develop a strong chemical bond between the glass and metal. This bond shall be sufficient to permit a strain in the metal of 0.001 in/in. (the yield point of carbon steel) without damage to the glass.

   c. The glass shall have a hardness of approximately 400 on the Knoop scale or 5.5 on the Mohs scale. It shall be resistant to corrosion between pH3 and pH10 at 125° F. It shall withstand an instantaneous thermal shock of 300° F. differential.

2.03 CAST IRON SOIL PIPE AND FITTINGS

A. All cast iron soil pipe and fittings shall be "extra heavy" and shall conform to ANSI 40.1 and ASTM 74. Pipe and fittings shall be coated on the exterior with coal tar enamel. Compression rubber joint gaskets shall conform to ASTM C564.

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2.04 STEEL PIPE

A. General

1. The finish of all fittings shall match the finish of the piping in which they are installed, unless specified otherwise. Steel pipe 2-1/2" and larger may be welded at the option of the Contractor unless the method of joining is specified elsewhere or shown on the Contract Drawings. Steel pipe 8" and larger may be welded at the option of the Contractor. Steel welding fittings shall have a centerline radius 1.5 X diameter conforming to ANSI B16.9, latest edition. Drain piping for air conditioning coils, drip pans, etc., shall be threaded steel pipe with galvanized cast iron drainage fittings.

2. Nipples shall be extra heavy and of same material as piping system in which they are installed. Close nipples are not acceptable.

3. Malleable iron ground joint unions, brass to iron seat, of approved make, shall be used on all connections, up to and including 2" in diameter, to risers, appliances, equipment, etc., and flanged connections for piping 2-1/2" and larger.

4. Wherever the sizes of pipes are reduced, the fittings shall be made to suit these changes without the use of bushings. Where reducers are used in straight lines without fittings, they shall be eccentric reducers except on water mains.

5. All flanges shall come fairly face to face, the pipe in perfect line, the pipes shall not be sprung to make a joint. Gaskets for flanged joints shall be as specified under "Joints". All joints shall be neatly made and with great care.

6. Tees may be formed by welding nozzles onto the mains, except that no branch smaller than 1-1/2" may be so welded. Factory made saddle type welding fittings, tapped for the proper size of pipe, may be used in lieu of nozzles for all sizes of branch pipes. Factory made welding fittings shall be used for elbows and reducing fittings. The use of mitered joints and field made reducers will not be permitted. Flanged valves are to be used in welded pipelines.

7. All process equipment including pumps, heaters, flow meters, and valves shall have flanged connections.

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8. All process piping shall be shop coated in accordance with SECTION 09900, PAINTING. Field welding will not be permitted on piping smaller than 24" except for flanges at ends of pipe where the coating shall be repaired after welding. Piping 24" and larger may be field welded provided coating at joint is repaired after welding. Shop welding will be permitted providing coating is applied in the shop after welding.

9. Shop welded manifolds will be permitted provided the same flexibility as to removing individual valves or equipment is maintained as if cast flanged fittings were used. It shall not be necessary to remove an entire manifold in order to remove one valve.

10. Welded manifolds and connections, where used, shall be constructed using shaped nipples for 2" to 12" pipe sizes for 2" to 24" header size or saddles may be used.

11. All welded fittings shall be smooth radius welding fittings. The use of bevels or mitered, pieced elbows will not be permitted unless approved by the Engineer in writing.

B. Steel pipe shall conform to the following standards: For sizes up to and including 12" nominal diameter - ASTM A53 and ASTM A120. For sizes from 14" O.D. up to, but not including 30" - ASTM A139 and ASTM A155.

C. Steel pipe shall be Schedule 40 unless otherwise noted on the Contract Drawings.

D. Fittings for diameter of 3" and smaller shall be standard malleable iron flat band screwed fittings for working pressures to 150 lbs. except if otherwise noted. Expansion devices shall be properly adjusted so that the pipe lines be air, gas or watertight during expansion and contraction. Piping shall be screwed together with an application of Master Metallic Compound, manufactured by James K. Harbison Co., or other approved equal compound. Malleable iron unions shall be used in each pipe system for ease in assembly and disassembly of the pipe lines.

E. Steel butt welding fittings for 4" diameter and larger shall be long radius patterns and for standard weight pipe Schedule 40, except where noted otherwise. Welding fittings shall be as manufactured by Crane Co., Taylor Forge Co. or an approved equal. Welding fittings shall be as manufactured by Crane Co., Taylor Forge Co., or approved equal. Welding fittings shall have chamfered ends. Field cut pipe shall have ends chamfered after cutting and reaming. Welds shall be accomplished using "back up" spacer rings between ends, each weld-ring shall be equal to that manufactured by Tube Turn Co., Type 96G, or approved equal.

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F. Flanges shall have parallel faces; the connecting faces shall be machined true. Except where special drillings may be necessary, or where otherwise called for, all flanges shall be drilled in accordance with the ANSI standard flanges B16.1 template. Where tap and stud bolts are required the flanges shall be tapped. All threads shall be clean cut, tapered and smooth. Fittings with right or left head threads shall be used where required.

G. Grooved Joint Pipe and Fittings

1. Ends for grooved joint pipe and fittings shall be grooved to meet the requirements of the manufacturer of the Couplings furnished. Mechanical grooved pipe couplings and fittings as manufactured by Victaulic Company of America shall be used where shown on the Contract Drawings.

2. Fittings shall be of grooved or shouldered end design to accept grooved mechanical couplings without field preparation.

Malleable Iron	-	ASTM A47
Ductile Iron	-	ASTM A536
Fabricated Steel	-	ASTM A53, 3/4"- 1 1/2" Type F, 2"-20" Type E or S, Grade B
Steel	-	ASTM A234 (A-106, Grade B) (14"-24" 45 & 90 Elbows)

3. Flanges for connecting flanged components into a grooved system shall be Victaulic Vic-Flanges. Flanges shall conform to 125# cast iron and #150 steel bolt hole alignment.

Steel Pipe	-	Vic-Flanges for steel pipe shall be Style 741 in sizes 2"-12" and Style 742 in sizes 14"-24"
Materials	-	Malleable Iron ASTM A47 Ductile Iron ASTM A536

4. Pipe nipples shall conform to the following schedule:

3/4"- 1 1/2"	-	Carbon steel SCH40, conforming to ASTM A53, Type F
2"- 6"	-	Carbon steel SCH40, conforming to ASTM A53, Type E or S, Grade B

8"-12"	-	Carbon steel SCH30, conforming to ASTM A53, Type E or S, Grade B
14"-24"	-	Carbon steel, 0.375 wall, conforming to ASTM A53, Type E or S, Grade B

5. The pipe ends shall be clean and free from indentations, projections and roll marks in the area from pipe end to groove for proper gasket sealing. The dimensions should be according to the standard cut groove or roll groove specifications as recommended by Victaulic.

6. In galvanized steel piping systems, the couplings and flange adaptors shall be hot-dipped galvanized.

7. Stainless steel coupling bolts shall be used in submerged, buried and exposed exterior joints.

2.05 COPPER TUBING

A. Copper tubing shall conform to ASTM B88, Standard for Seamless Copper Water Tube. Copper tubing for exterior use shall be type K. For interior use, the copper tubing shall be type L unless shown otherwise on the plans. Nominal lengths of hard copper tubing shall be in straight lengths of approximately 20 feet, unless otherwise specified.

B. Fittings for exterior use shall be compression fittings of brass for copper tubes conforming to ANSI B16.26. Couplings shall be MacDonald Mfg. Co. 4758-22. Fittings for interior use shall be wrought copper and bronze solder joint fittings conforming to ANSI B16.22. Solder for jointing shall be 95/5 tin-antimony or brazing alloys with melting temperature above 1,000 degrees F. Flux shall be as specified by the solder manufacturer.

2.06 PVC PIPE AND FITTINGS (2" AND SMALLER)

A. Where PVC pipe is called for in these Special Provisions or on the Contract Drawings, it shall be rigid unplasticized polyvinyl chloride pipe conforming to standard iron pipe sizes. PVC pipe shall conform to the requirements to ASTM D1785 for Type I, Grade 1; Type I, Grade 2 and Type II, Grade 1 as well as to the requirements of Commercial Standard CS207. All PVC pipe shall be produced by a continuous extrusion process employing a prime grade of unplasticized polyvinyl chloride compound which shall meet or surpass all requirements for Type I, Grade 1, and Type II, Grade 1 PVC of the "Specification for Rigid Poly (vinyl) Chloride Compounds" ASTM D1784. The pipe shall be characterized by the high chemical resistance of Type II, Grade 1 PVC and by the high impact resistance design of 2000 PSI, as recommended by the Hydrostatic Design Stress Committee of the Plastics Pipe Institute.

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All PVC pipe used in potable water lines shall bear the seal of approval of the National Sanitation Foundation. All exterior PVC pipe that will be subject to sunlight exposure after installation shall be of the ultraviolet stabilized type and shall be white. PVC pipe shall be TD-3 PVC pipe as manufactured by Precision Polymers Inc., Rockaway, New Jersey, or approved equal.

B. Schedule 40 PVC pipe shall be used only where recessed socket type fittings and valves are fabricated into the completed piping systems by chemical welding. Threading of Schedule 40 pipe will not be permitted.

C. Schedule 80 PVC pipe shall be used where threaded fittings and valves are fabricated into the completed piping system. Flange fittings or valves where shown or required shall have companion flanges of the threaded type on the pipe side of these connections.

D. Schedule 120 PVC pipe shall be flanged or threaded.

E. Fittings:

1. Fittings used with PVC pipe shall have all the physical properties and characteristics of the pipe specified above. Each fitting shall be extruded to the high uniform quality and strength and to the proper size required in the fabricated systems.

2. Recessed socket type fittings shall be of the long radius patterns and shall have wall thicknesses and strength equal to those of Schedule 40 pipe. Sockets shall have a deep uniform cylindrical bore so that the OD of the pipe engages the socket and the fittings with proper clearance for chemical welding.

3. Threaded fittings shall be of the long radius patterns and shall be of equal wall thickness and strength as for Schedule 80 or Schedule 120 pipe. Threads shall be recessed and cut to the threading standards of the ANSI B2.1.

4. Flange fittings shall have wall thickness and strength equal to those of Schedule 80 or Schedule 120 pipe, and shall have faces scored for semi-rigid gaskets of not more than 1/8" thick material. Gasket material shall be the same as for the pipe and shall have reinforced shoulders under the bolt and nut heads. Bolts shall be square headed machine bolts with hexagon nuts, and they shall be of corrosion resistant metal or of galvanized steel.

F. Except as otherwise specified, all pipe joints shall be solvent welded using tetrahydrofurane cement, or other cement as recommended and supplied by the manufacturer, and the cementing shall be performed in accordance with the manufacturer's recommendations. Pipes shall be cut square and all surfaces shall be clean and dry.

G. All pipe shall be threaded where required for installation of valves and connections to equipment. PVC unions shall be installed in the pipeline adjacent to all valves and equipment connections, and at reasonable intervals along the run of the pipe, to permit disassembly.

H. Where PVC pipe crosses over surfaces that will have high operating temperatures, the PVC pipe shall be protected by an air space or other means so that the temperature at the surface of the PVC pipe shall not exceed 140°F. at any time. No PVC pipe shall be installed closer than six inches to any surface that will have an operating temperature in excess of 140°F.

I. Provisions shall be made for expansion in all PVC pipe. Buried pipe shall be snaked from side to side in the trench to provide one additional foot per 100 feet. In snaking, the center of the bends shall be located halfway between couplings. Pipe in trenches shall be laid on a 6" sand bed and shall be covered with a minimum of six inches of sand prior to completing the trench backfill in accordance with SECTION 02215, EARTHWORK. Straight runs of pipe that are not buried shall be provided with one expansion coupling for runs between 20 feet and 60 feet in length, and for straight runs greater than 60 feet or fraction thereof. An expansion coupling shall be installed at each building expansion joint. The expansion couplings shall have a minimum travel of 4-1/2" and shall be installed with the coupling opened to one-half its travel. The pipe shall be anchored in an approved manner on one side of each expansion coupling. Where an unanchored section of pipe has a bend at the end, the pipe shall also be anchored at the bend. Expansion couplings shall be Heavy Duty Type Machined Expansion Joints with socket ends for Schedule 80 pipe as manufactured by Plastinetics Inc., Fairfield, New Jersey, or approved equal.

J. In buried installations, metallic backed PVC warning tape shall be installed in the trench 18" atop the pipe.

2.07 INSTRUMENT AND CONTROL PIPING

A. All materials incorporated in the final work shall comply with the latest issue of the following specifications, but in all cases instrument tubing shall be furnished in accordance with ANSI B31.1, Code for Pressure Piping.

Copper Tubing, Type 122	ASTM B68 and B75
Copper Pipe, Seamless Tubing	ASTM B75
Copper Pipe, Solder-Joint Fittings	ASTM B16.22
Cast Bronze Solder-Joint Fittings for Copper Pipe	ANSI B16.18

B. All piping shall be fabricated and installed by skilled and qualified craftsmen in accordance with specified methods, manufacturer's recommendations, and standard practices. Workmen shall be provided with suitable tools and appliances, adequate scaffolding, and protective devices.

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C. Flared ends and threaded ends shall be protected. Great care shall be taken during handling and erection to prevent damage to these parts. Should any part become damaged, it shall not be used and the end shall be cut off, making sure that the tube is cut square across the end to allow the end to be joined properly.

Piping shall not obstruct openings, passageways, hoistways, and dismantling spaces.

Piping connected to equipment shall be supported completely independent of the equipment. Pipe supports shall be installed as specified herein. Piping passing through walls and floors shall be installed in sleeves.

D. Screwed joints - Pipe threads shall be cut and conform to ANSI B2.1. Pipe shall be accurately cut to length and reamed to full diameter. Joints shall be made up with an approved joint compound applied to the male threads only. Valves and fittings shall be made up with care to insure that there is no distortion or damage to these parts.

E. Flared Tubing and Fittings - Copper tubing shall have SAE 45° flare. Fittings shall be of two piece construction and shall be either extruded from solid brass parts or parts machined from solid brass.

1. Copper tubing, 200 PSIG and below. The application of a compression ring may be used.

2. Copper tubing above 200 PSIG. Fittings shall have an inverted flare. In limited space application and in all other case, standard long nut shall be used as the union connection.

2.08 PVC BURIED GRAVITY AND PRESSURE PIPE (DR 18)

A. The PVC Pipe shall meet the requirements of AWWA C900, "Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inches through 12 inches for Water" and shall be furnished in cast iron pipe equivalent outside diameters with rubber-gasketed separate couplings as listed in that standard. The pipe shall have a pressure rating of 150 PSI and shall be furnished in 20 foot laying lengths. Each length of PVC pipe shall pass a hydrostatic integrity test at the factory at four (4) times the pressure class of the pipe for five (5) seconds. Each rubber-gasketed coupling shall pass a hydrostatic integrity test at the factory at four (4) times the pressure class of the coupling for five (5) seconds. Pipe and couplings shall not fail when subjected to the following tests that are outlined in AWWA C900: sustained pressure, burst pressure, flattening and extrusion quality.

B. Fittings and sleeves used with the pipe shall be ductile iron mechanical joint meeting the requirements of Paragraph 2.02B4. All fittings shall be mechanically restrained in accordance with Paragraph 2.02B4c.

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C. Metallic-backed PVC warning tape shall be installed 18" atop and continuously along the pipe.

2.09 GRIT DISCHARGE PIPING

A. Scope

1. All 4" Grit Pipe and Fittings from the discharge of each grit pump to the inlet of Grit Cyclone mounted atop the Grit Washer shall be ceramic epoxy-lined ductile iron.

2. All pipes shall be Class 53 ductile iron pipe with grooved ends or flanges where indicated and manufactured in accordance with ANSI/AWWA C 151/A 21-51.

3. All fittings shall be long radius and shall have grooved ends or flanges where indicated and shall be as manufactured by Victaulic.

4. Pipe couplings shall be hot-dipped galvanized Victaulic Style 75 or 341 with stainless steel bolts.

5. The ceramic epoxy lining shall be SP-2000-M as provided by Vitco Co. or approved equal.

B. Preparation of the Metal for Processing

1. All product is to be blasted using steel grit media. Sand blasting is not acceptable due to the dust contamination residue associated with it.

2. The entire interior surface of the item to be SP-2000-M lined shall be struck with the blast media via compressed air nozzles to sufficiently remove any rust, scale or oxides.

3. Acceptable appearance of steel product shall be that of a near white metal or SSPC – SP 10 surface condition.

4. Ductile iron shall exhibit a light gray color with only slight darker grey "staining" permissible.

C. Application of the SP-2000-M Ceramic Epoxy Lining on Pipe

1. Application of the SP-2000-M shall begin within 8 hours of completion of the blast preparation. If any surface flash rusting is present, the item must be re-blasted.

2. Pipe must be rotated during spray application to avoid sagging or "candle waxing" of the lining. Rotation shall continue until lining is capable of "hanging" to the pipe wall without sagging or running.

3. Application area must be dry, free from excess dust and temperatures should not be less than 50 degrees F.

4. Application in the bell and spigot areas should be limited to 10-15 mils to avoid restriction that will cause difficulty with insertion of the spigot end into the bell or that may interfere with proper gasket function.

D. Application of the SP-2000-M Ceramic Epoxy Lining on Fittings

1. Application of the SP-2000-M Ceramic Epoxy on fittings shall be done in the same manner as pipe, the only exception being that the fittings are not rotating. Instead, the fittings are hand rotated approximately 180 degrees every 5-10 minutes to avoid sagging of the lining.

2. The rotating procedure will continue for approximately ½ hour, or until the lining is cured sufficiently to "hang" without sagging or running.

3. Application area must be dry, free from excess dust and temperatures should not be less than 50 degrees F.

4. Lining material should not be applied to flange faces. Application in the bell and spigot areas should be limited to 10-15 mils to avoid restriction that will cause difficulty with proper insertion of the spigot end into the bell or that may interfere with proper gasket function.

E. Lining Material: The lining material shall be a true amine cured hybrid novolac epoxy material containing a minimum of 40% by volume ceramic filler. The lining material must meet or exceed all of the following:

1. Abrasion Resistance – Per ASTM D4060-90 test method: Using CS-17 wheels with a 1,000 gram load for 1,000 cycles. Weight loss yields less than .33 grams.

2. Adhesion – ASTM D4541: Adhesion shall be greater than 2,000 psi.

3. Cathodic Disbondment – ASTM G9587 (1.5 volts @ 77 degrees F.): Results will yield no more than 0.5 mm disbondment after a 30-day test.

4. Dielectric Strength – Per ASTM D149-91 shall be higher than 600 volts per mil.

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5. Immersion Resistance/Testing

   a. 50% sulfuric acid, no effect after 2 years
   b. 25% sodium hydroxide, 140 degrees F., no effect after 2 years
   c. Distilled water, 160 degrees F., no effect after 2 years
   d. Tap water, 120 degrees F., no undercutting after 2 years

6. Impact Resistance – ASTM D2794-92 shall be 120- in. lbs. or greater.

7. Permeability – A permeability rating of 0.00 when tested according to the procedure described in method "A" of ASTM E96-93, Procedure A, with a test duration of 30 days.

8. Salt Spray – ASTM B117-85, results of 0.00 undercutting after 2 years.

9. Shore D Hardness – ASTM D2240, shall be grater than 75.

F. Inspection

   1. The lining and/or coating thickness shall be checked using a magnetic thickness gauge. The thickness testing shall be done using the method outlined in SSPC PA-2 "Film Thickness Rating". Finished dry film thickness shall be 60 mils nominal, 55 mils minimum in the barrel of the pipe, and 6 mils minimum, 10 mils maximum in the bell and 6" of the spigot end. To maintain proper system integrity, the lining material used in the bell and on the spigot ends shall be the same material as applied to the pipe barrel. A standard prime paint or bituminous paint applied to the bell and spigot ends is NOT acceptable.

   2. The lining shall be tested for pinholes and other discontinuities according to the requirements of accepted industry standards, including:

      a. ASTM D5162-01
      b. NACE RP0188-99
      c. SSPC Vol. 1, Paragraph XIV

      According to these listed standards, "linings applied at a thickness greater than 20 mils (.020") should be tested for discontinuities or holidays using a high voltage test unit. Voltage setting should be 100 times the lining thickness, or 100-125 volts per mil of thickness". There, the recommended test voltage shall be a minimum of 6,000 volts for the pipe barrel. The bell and spigot areas shall be tested using a low voltage, non-destructive wet sponge holiday detection device. Any defects shall be repaired and re-tested prior to shipment. When documentation of testing is required, it must be stated in the specifications or on the

customer's purchase order at the time the order is placed. When testing is not required either by the project specifications, or by the customer's purchase order, standard in-house quality control procedures will be applicable.

3. Each pipe joint and/or fitting shall be marked with the date of application of the lining and/or coating system along with its numeric sequence of application on that date and records will be maintained by the applicator of work performed.

G. Certification

1. The applicator must supply a letter of certification attesting to the fact that the surface preparation, application of the lining material, and testing of the lining is in strict accordance with the specification and that the lining material meets all performance requirements. Applicator must also certify that they have a minimum 5 years experience in the application of high performance coatings and linings.

2. The standard of quality is SP-2000-M Ceramic Epoxy, a **true** amine cured hybrid novolac epoxy lining material or approved equal.

H. Handling

1. Pipe and fittings must be handled only from the outside. No forks, chains, straps, hooks, etc. shall come in contact with the inside of the pipe and/or fittings. Pipe and/or fittings that have been coated on the outside with the Ceramic Epoxy material shall not be handled with any metallic lifting devices such as forks, chains, cables, etc. Only nylon straps or similar lifting devices are to be used.

2. Any damaged areas should be thoroughly cleaned to remove any grease or dirt, then repairs should be made using the same material as was originally applied to the pipe or fitting using the available repair kits.

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2.10 STAINLESS STEEL PIPE AND FITTINGS (2-INCH AND LARGER)

A. General

1. Shop fabricated stainless steel piping shall be used where indicated on the plans.

2. The contractor shall furnish all materials, tools, equipment, transportation, labor, supervision and incidentals required to supply, store, install, clean, and test the shop fabricated stainless steel pipe and fittings as shown on the drawings and as specified herein.

B. Qualifications

1. All shop fabricated stainless steel pipe and fittings shall be furnished by a single manufacturer who is experienced, reputable and qualified in the manufacture and fabrication of the items to be furnished. The pipe and fittings shall be shop fabricated and field installed in accordance with common industry wide practices and methods and shall comply with these specifications. Pipe and fittings shall be as manufactured and fabricated by Felker Brothers, Marshfield, WI, Douglas Brothers, Portland, Maine or approved equal.

C. Submittals

1. The contractor shall submit for review and approval piping layouts, schedules, shop fabrication drawings, specifications, catalog cuts and other data necessary to show conformance of the complete piping systems to these specifications. The contractors submittal shall include dimensions, fittings, locations of equipment, valves, and appurtenances, joint locations and details, types and locations of supports, coordination with all other work and existing conditions, and all other pertinent technical specifications for the piping systems to be furnished.

2. Shop fabrication drawings shall show alloys, diameters, pipe wall thicknesses, flanges and other joint preparation details, dimensions, fittings and other appurtenances to be supplied.

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D. Materials

1. Pipe and Fittings

a. Pipe shall be manufactured from ASTM A240 annealed and pickled sheets and plates in accordance with ASTM A778 in type 316L stainless steel. Pipe shall be manufactured to nominal pipe sizes as listed in ANSI B36.19, Table 2, and shall be SCH 10S with the following wall thicknesses:

Nominal Pipe Size (IN.)	Actual O.D. (IN.)	Nominal Wall Thickness (IN.)
3	3.500	0.120
4	4.500	0.120
6	6.625	0.134
8	8.625	0.148
10	10.750	0.165
12	12.750	0.180

b. Fittings shall be butt weld type manufactured in accordance with ASTM A774 of the same raw material and in the same thicknesses as the pipe. Long radius elbows up to 18" diameter shall be die-formed and smoothflow; i.e. centerline to end of elbow equals 1.5 times the nominal pipe size. All short radius, special radius, and reducing elbows and long radius elbows greater than 18" diameter shall be of mitered construction with at least five (5) miter sections for 90 degree bends, three (3) mitered sections for 45 and 60 degree bends, and two (2) mitered sections for 30 degree and smaller bends. Reducers shall be straight tapered, cone type. Tees, crosses, laterals and wyes shall be shop fabricated from pipe.

c. The finish on the raw material, manufactured to ASTM A240 shall be No. 1, HRAP (hot rolled annealed and pickled) or better. The finish on the completed pipe and fittings shall be as specified in ASTM A778 and A774, respectively.

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2. Flanges

a. Flanged pipe ends shall be made up of type 316L stainless steel slip-on plate flanges. Rolled angle face rings with a hot dipped galvanized ductile iron back-up flange drilled to ANSI 16.1 Class 125 standard may be used when indicated on the plans. The angle face ring thickness shall be equal to or greater than the wall of the pipe or fitting to which it is welded and it shall be continuously welded on both sides to the pipe or fittings. The angle leg shall not interfere with the flange bolt holes. The back-up flanges shall be supplied with the following nominal thicknesses:

Nom. Pipe Size (IN.)	Flange Thickness (IN)
2 ½ - 3	1/2
4	9/16
6 - 10	5/8
12 - 16	3/4

b. Plate flanges shall have the following nominal thicknesses:

Nom. Pipe Size (IN.)	Flange Thickness (IN)
2 - 8	1/2
10 - 14	5/8
16	3/4

3. Couplings

a. The piping shall be shop prepared for the pipe couplings indicated on the plans.

b. For sleeve type couplings, the pipe shall be plain end with external weld heads ground smooth to insure proper seating.

c. For split type Victaulic couplings, the pipe or fitting ends shall be roll grooved to the manufacturer's specifications. Where roll grooving is impractical, the pipe shall have heavy wall machine grooved pipe nipples or machined ring collars fully welded to the pipe or fitting. Nipples shall be taper bored to the I.D. of the adjoining pipe to allow full weld penetration. Collars shall be welded on both sides to the piping. Nipples and collars shall be of the same alloy as the piping.

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4. Threaded Connections

   a. Threaded pipe, gauge or instrument connections shall be made using stainless steel 150-pound threaded half couplings conforming to ASTM A182 or ASTM A276, shop welded to the pipe at the locations shown on the drawings.

5. Joints

   a. Flanges shall be provided as a minimum at all flanged valves, meters, couplings, and other equipment. Couplings will be provided as shown on the drawings.

   b. Pipe and fitting spools shall be shop fabricated to the fullest extent possible. Pipe spools shall be provided with joints as shown on the drawings for special handling, installation, and/or disassembly requirements.

6. Bolting

   a. All flange or coupling bolts shall be 316 stainless steel.

E. Fabrication and Installation

1. After the manufacture of individual stainless steel fittings and pipe lengths, they shall be pickled by immersion in a tank containing an ambient nitric hydrofluoric acid solution made up from Oakite Deoxidizer SS, or equal, and monitored to generally maintain a 25% or higher solution by volume of water. The duration of immersion shall be 15 to 20 minutes and may be supplemented by manually scrubbing or brushing with non-metallic pads or stainless steel wire brushes. The acid treatment shall be followed by immersion in a rinse water tank, followed if necessary by a spray rinse. The stainless steel products shall then be allowed to air dry to achieve passivation.

2. Welding of pipe spools shall be performed using welders and procedures qualified in accordance with ASME Section IX. Piping with wall thicknesses up to and including 11 gauge (0.125") shall be welded with the TIG (GTAW) process. Heavier walls shall be beveled according to procedure, root pass welded with the TIG (GTAW), and have subsequent weld passes performed using the TIG (GTAW), MIG (GMAW), or Metallic

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Arc (SMAW) process. Filler metal of equal or superior ELC grades only shall be added to all welds to provide a cross section at the weld equal to or greater than the parent metal. Weld deposit shall be smooth and evenly distributed; weld reinforcement shall be as follows:

Wall Thickness	Weld Reinforcement (Max.)	
	I.D.	O.D.
Up to 12 Ga. (0.109")	1/16"	3/32"
11 Ga. (0.125") to 3/16" Pl.	3/32"	1/8"
1/4" Plate and Larger	1/8"	3/16"

Concavity, undercut, cracks or crevices shall not be allowed. Butt welds shall have full penetration to the interior surface, and inert argon gas shielding shall be provided to the interior and exterior of the joint. Angle face rings shall be continuously welded on both sides to pipe or fitting. Exterior welds, such as the back side of face rings or flanges and structural attachments, may be welded by the MIG (GMAW) or Metallic Arc (SMAW) process; however, care must be taken to avoid melting through to the interior surface on very light walls. Excessive weld deposits, slag, spatter and projections shall be removed by grinding. Welds on gasket surfaces shall be ground smooth.

3. Spools shall be fabricated to the "Pipe Fabrication Institute" fabricating tolerances ES-3 (1981).

4. After shop fabrication into pipe spools, exterior welds shall be manually scrubbed or brushed with non-metallic pads or stainless steel wire brushes to remove weld discoloration, rinsed with clean water and allowed to air dry.

5. All fabricated piping shall have openings plugged and flanges secured for storage and/or transport after fabrication. All fabricated piping shall be piece marked with identifying numbers or codes, which correspond to the contractor's layout and installation drawings. The marks will be located on the spools at opposite ends and 180 degrees apart.

6. The piping supplier during manufacturing, fabrication and handling stages, and the contractor during handling and installation stages, shall use extreme care to avoid the contact of any ferrous materials with the stainless steel piping. All saws, drills, files, wire brushes, etc. shall be used for stainless steel piping only. Pipe storage and fabrication racks shall be non-ferrous or stainless steel or rubber lined. Nylon slings or straps or alloy chains or cable shall be used for handling stainless steel piping. After installation, the contractor shall wash and rinse all foreign matter from the piping surface. If rusting of embedded iron occurs, the contractor shall pickle the affected surface with Oakite Deoxidizer SS or equal, scrub with stainless steel brushes and rinse clean.

7. After installation, identifying spool piece marks shall be removed with paint thinner or solvents and the entire stainless steel surface shall be washed with detergent and rinsed clean.

8. After installation, the piping system shall be tested by the contractor.

2.11 STAINLESS STEEL UTILITY WATER PIPING IN THE PRELIMINARY TREATMENT BUILDING (1" AND SMALLER)

A. The pipe and fittings shall be Vic-Press™ 316 as manufactured by Victaulic Company of America.

B. Pipe: ASTM A312, Type 316/316L, Schedule 5S, .065 wall, full finish annealed pipe with polished OD, certified for use with Vic-Press 316™ couplings and fittings.

C. Fittings: Precision cold drawn stainless steel, Type 316/316L, complete with synthetic rubber EPDM O-rings with hydrocarbons to +300 degrees F.

1. Flange Adapters: ANSI Class 150 flange adapter, Van Stone type with stainless steel back-up flange and Vic-Press 316™ ends, Victaulic 566.

2. Unions: Threaded union 316/316L stainless steel, with Vic-Press 316™ ends, Victaulic Style 585.

D. Installation:

1. Install in accordance with manufacturer's latest recommendations. Follow the instructions listed in the latest Victaulic I-500 assembly manual.

2. Pipe shall be square cut, plus or minus 0.030-inch, properly deburred and cleaned.

3. Pipe ends shall be marked at the required location to ensure full insertion into the coupling or fitting during assembly.

4. Use a Victaulic "PFT" series tool with the proper sized jaw for pressing.

PART 3 EXECUTION

3.01 PAINTING AND MARKING

A. The exterior of cast iron, ductile iron and steel pipes and fittings that will be buried in the ground shall be given one coat of a bituminous paint meeting the requirements of Sections 6-8.1 and 6-8.3 of AWWA C106.

B. The exterior of all other cast iron, ductile iron, steel pipes, PVC and copper, and fittings shall be painted in accordance with the Specifications for Protective Coatings.

C. All painting work shall be performed in accordance with the Specifications for Protective Coatings.

D. All exposed interior and exterior pipe installed shall be marked for proper identification. The pipe markers shall conform completely with "The Scheme for Identification of Piping Systems (ANSI A13.1-1975). The markers shall be custom formed to snap-on and completely encircle the pipe with substantial overlap. Marker shall come as one piece with nothing to assemble, be sealed with a tough, clear, outdoor grade acrylic plastic that resists weather and repels dirt and shall provide 360° visibility. The markers shall be as manufactured by Setmark, New Haven, CT, or equal.

3.02 PIPE LAYING AND INSTALLATION

A. All pipe and fittings shall be installed to the lines and elevations shown or ordered by the Engineer. Suitable tools and equipment shall be used for proper handling, storing, and laying of pipes and fittings. In order to avoid damage to the interior coatings of pipe, lifting hooks or bars shall not be inserted therein. Each pipe and fitting shall be checked for defects and injuries as laying proceeds. Imperfect pipe materials shall be rejected and removed from the work. Pipe found to be defective after laying shall be removed and replaced by undamaged material at no additional cost to the Owner. All damaged and rejected pipe shall be removed from the plant site immediately. The interior of the pipe shall be cleaned of dirt, and other deleterious materials and kept clean, as the next section of pipe is laid. During the progress of the work, the exposed ends of the pipe shall be provided with approved temporary covers fitted to the pipe so as to exclude undesirable matter. The Contractor shall verify the dimensions of all valves, fittings, pipe equipment, etc., so that all the pipe work performed will fit together properly and will conform to the arrangement as shown on the Contract Drawings.

B. Where pipe must be cut to fit as closing pieces, such cuts shall be evenly and squarely made in a workmanlike manner with approved equipment. Injury to coatings shall be satisfactorily repaired.

C. Unless otherwise specified, handling and laying of buried cast iron pipe shall comply with the methods described in Section 3 of the "Handbook of Cast Iron Pipe" of the Cast Iron Pipe Research Association, using method "F" and bedding material for pipe installation.

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D. Where cast iron or ductile iron mechanical joint or push-on joint is used, the Contractor shall furnish and install concrete thrust blocks, tie rods, or other approved means for preventing movement at joints, bends, tees, and valves as shown on the Contract Drawings or ordered by the Engineer. Joints shall be installed in accordance with the recommendations of the manufacturer. Joints shall be thoroughly brushed with a wire brush to remove all loose rust or foreign material. Brush soapy water over the joint surfaces and over the gasket. Tighten bolts uniformly, using only torque-limit wrenches to avoid overstressing the bolts.

E. In lieu of using thrust blocks or harnessing to anchor fittings the Contractor may use mechanical joint retainer glands. The mechanical joint retainer glands shall be installed at all joints within 36 feet from each side of the fitting using mechanical joint pipe.

F. Ductile iron pipe joints and fittings on gravity lines and pressure lines, located within and above the excavated area around a structure shall be restrained with mechanical joint retainer glands. The retainer glands shall be installed at all joints 20 feet beyond the limit of the structural excavation.

G. In fill area or in areas of overexcavation around a structure; pipes shall be supported on concrete piers designed for the Contractor by a registered professional engineer. The design calculations for the pipe supports shall be reviewed by the Engineer prior to being installed.

H. Cast iron flanged pipe shall be assembled with 1/16-inch full face gaskets. Nuts shall be tightened uniformly using only torque-limiting wrenches to avoid overstressing the bolts.

I. In general, all pipe, other than cast iron, shall be laid in accordance with the requirements of ASTM C12 using bedding materials as shown on the Contract Drawings and/or specified elsewhere herein. Joints shall be made in accordance with the recommendations of the manufacturer.

J. Unless otherwise permitted, all finished joints, of all kinds of pipe, shall be left exposed for inspection and acceptance by the Engineer.

K. Plates in finished areas. All exposed vertical pipes passing through floors shall be provided with floor plates and, where ceiling through finished walls shall be provided with wall plates. All plates shall be securely fastened to the pipe or to the sleeves. Plates shall be chromium plated.

L. Connections between ferrous and non-ferrous piping systems. Piping systems containing ferrous and non-ferrous metals shall have couplings containing an approved dielectric separator built in to separate the system electrically. Each coupling shall be electrically tested after installation to prove its non-conducting characteristics.

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M. Wall and floor sleeves for pipes smaller than 4" shall be standard weight galvanized steel (or PVC where noted on the Drawings), conforming to ASTM A120. Sleeves passing through floors shall extend approximately 1/2" above the finished floor. Chromium-plated escutcheon plates, of a suitable pattern, shall be furnished and installed to conceal ends of all exposed pipe sleeves above the floors of finished rooms. Sleeves shall be of ample size to permit passage of pipe and insulation (where required) and allow for expansion. Sleeves installed in new concrete floors shall be provided with a water stop flange. Space between the pipe and sleeve shall be caulked with lead and jute, "Linkseals", or other methods approved by the Engineer.

N. Generally, except where otherwise noted on the Drawings, for pipes 4" and larger passing through walls, all wall castings and sleeves shall be ductile cast iron Class 54, and shall be of the shapes and sizes as shown on the Drawings and as detailed on the Drawings. Each shall be complete with water stop flange. Generally, wall castings shall be used to join to underground pipe systems from all structures; sleeves shall be used in the walls where indicated. Except as otherwise noted or shown, the wall castings shall be of lengths shown, with flare of bell flush with exterior face of wall. The end of underground cast iron pipes shall be joined into the bell end of the wall castings by means of a mechanical joint. Where sleeves are required, the space between the pipe and sleeve shall be caulked with lead and jute, "Linkseals", or other methods approved by the Engineer.

O. Where sleeves in concrete walls or floors are required, thermoplastic "Century-Line" sleeves manufactured by Thunderline Corporation may be used in lieu of steel or ductile iron sleeves. Approval of the substitution, however, will be on a case by case basis.

P. Modular Mechanical Type Seal

1. In lieu of lead-caulked joint as stated above, a modular mechanical type seal may be used as an alternative.

2. Annular space between pipe and pipe sleeve shall be sealed with modular mechanical type seal, consisting of interlocking synthetic rubber links, two pressure plates and stainless steel nuts and bolts.

3. In order to assure a watertight joint between sleeve and pipe, the installation and tightening shall be per manufacturer's recommendations. The modular mechanical type seal, if used, shall be "Linkseal" as manufactured by Thunderline Corporation, Belleville, Michigan, or equal.

4. Rubber links rated for temperatures up to 300°F. shall be used with sleeves on air lines.

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Q. Generally, the diameter of sleeves for non-insulated pipe shall be one pipe size larger than the pipe passing through the sleeve. The diameter of sleeves for insulated pipe shall be of suitable size to allow the insulation to be continuous and of full thickness. Sleeves for flanged pipe shall be of ample diameter to pass the flanges, if cast-on flanges are used; if screwed-on flanges, sleeves may be only one size larger than the pipe.

R. The Contractor will not be allowed to box out the concrete for installation of any wall castings or sleeves. Castings shall be securely fastened in place so that pouring of concrete will not disturb their position in any manner. The Contractor shall correlate with the other trades (particularly concrete work) to assure that all wall castings and wall and floor sleeves are properly set.

S. Concrete pedestals, foundations and encasements shall be placed for pipes where indicated or required. Concrete shall have a compressive strength of 3500 psi in accordance with Division 3 - CONCRETE.

T. The installation of all pipes shall be such as to allow for expansion using offsets, swing joints, expansion joints, flexible ball joints, etc., as shown or as may be necessary to prevent undue strain on piping.

U. Expansion joints 3" and larger shall be flanged end-controlled flexing stainless steel for service to 300 psi and 800°F. Joint shall be precompressed during installation if necessary to suit installation temperature. Flanges shall be 150 lb. forged type. Number of corrugations shall be as shown on the Drawings. Expansion joints shall be as manufactured by Flexonics Division, Calumet and Hecla Inc., or approved equal.

V. Expansion compensators smaller than 3" shall be stainless steel Model H, or bronze, Model HB, to suit adjacent pipe. Steel compensators shall be furnished with flanged ends, bronze with threaded ends. Expansion compensators shall be as manufactured by Flexonics Division, Calumet and Hecla Inc., or approved equal.

W. Anchors and guides shall be provided as shown on the Drawings or as required.

X. Minimum Slopes

1. Soil, waste and drainage piping shall be sloped not less than 1/8 inch-per-foot in direction of flow, unless otherwise indicated on the drawings.

2. Domestic cold, hot and recirculating water piping shall be sloped not less than one inch per 40 feet toward established low points at which hose end drain valves shall be provided.

3. Heating water piping shall be sloped not less than one inch per 40 feet toward established low points at which hose end drain valves shall be provided. Automatic air vents shall be provided.

4. Compressed air piping shall be sloped not less than one inch per 40 feet toward established low points at which base end drain valves shall be provided.

Y. Cleanout plugs and test tees shall be provided. Cleanout plugs shall be the same size as the pipe, except that cleanout plugs larger than 4" will not be required. Cleanouts installed in connection with cast iron hub and spigot pipe shall be extended to an easily accessible place, or as indicated on the Drawings. An extra heavy cast brass ferrule with countersunk tap screw cover shall be caulked into the hub of the fitting and shall be flush with the finish surface. Where cleanouts in connection with threaded pipe are indicated and are accessible, they shall be cast iron drainage tee pattern, 90-degree branch fittings with extra heavy brass screw plugs of the same size as the pipe up to and including 4". Test tees with cast iron cleanout plugs shall be installed at the foot of all soil waste and stacks and on each building drain. Cleanout plugs and test tees in finished walls and floors shall be provided with brass or nickel bronze coverplates securely fastened with countersunk screws.

Z. Where non-ferrous metallic pipe connects to any ferrous metallic pipe, an approved electrically insulated fitting shall be installed. The insulating fitting and bare piping each side of the fitting shall be field wrapped and coated.

AA. Flashing - Vent pipes shall be flashed and made watertight at the roof with not lighter than 4-lb. sheet lead. Flashing for vent pipes shall be extended up the vent pipe a minimum of six (6") inches where standard threaded cast iron or malleable iron recess roof couplings shall be installed to form counter-flashing or rain guards for the pipe. Flashings in connection with cast iron vent pipes shall be turned down into the pipe or hubs. Flashing shields shall extend not less than twelve (12") inches from the vent pipe in all directions horizontally.

3.03 ERECTION OF STEEL PIPE

A. All steel pipe shall be carefully placed to the proper lines and grades and shall run true and plumb in a manner approved by the Engineer.

B. All piping shall be installed in such manner and at such times as will require a minimum of cutting and repairing of structures. In case such cutting and repairing is necessary, it shall be done only with the permission of the Engineer. All cutting and repairing shall be performed by mechanics of the trade which originally executed the work; all repairs shall match the original condition. The cost of cutting and patching for pipe work shall be included in the lump sum or unit price bid in the Proposal.

C. The following piping practices shall be followed in the installation of all steel pipe and tubing insofar as they are applicable to each kind of pipe:

1. Full lengths of pipe shall be used wherever possible; short lengths with couplings will not be permitted.

2. All pipe shall be cut to exact length; no forcing or springing will be permitted.

3. Tool marks and unnecessary pipe threads shall be avoided. Burrs formed when cutting pipe shall be removed by reaming with a suitable tool.

4. Before installing any pipe, care shall be taken to see that the interior is clean and free of cuttings and foreign matter.

5. All changes in direction shall be made by fittings unless field bends are specifically called for.

6. Exposed piping shall be neatly arranged with all lines straight and parallel or at right angles to walls, unless otherwise shown or ordered by the Engineer. Piping shall be graded so that the entire system may be drained; globe drain valves or stop and waste valves shall be installed at all low points.

7. A sufficient number of screwed unions shall be used on steel pipe 2-1/2 inches or smaller in diameter, to permit the ready removal of any section. Unions shall be installed in all piping connections to equipment, to regulating valves, and wherever necessary to facilitate the removal of all valves, strainers and other items requiring maintenance. All screwed unions shall be of the ground joint type. No gasket unions will be permitted. Flanges on equipment or valves will be considered unions when connecting piping is provided with companion flanges.

8. Installed piping shall not interfere with the operation of doors, windows, or equipment, and shall not encroach on passageways, aisles, or equipment; not shall it interfere with the servicing or maintenance of equipment.

9. Sleeve type couplings, where called for, shall be carefully assembled with bolts drawn sufficiently tight to prevent leakage but not too tight to prevent expansion and contraction.

10. Particular care shall be taken to have all sleeves of chlorine machine rooms caulked gas tight. All sleeves passing through exterior walls shall have waterstop flanges and be caulked watertight.

3.04 HANGERS AND SUPPORTS

A. Pipe hangers and supports shall be in accordance with the Specifications for pipe hangers and supports or as shown on the Plans.

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3.05 SLEEVES AND CASTINGS

A. Unless otherwise shown on the Contract Drawings or specified herein, at all points where pipes pass through the walls or floors of any structure, the Contractor shall furnish and install suitable sleeves and castings as detailed or noted on the Contract Drawings.

3.06 THRUST BLOCKS

A. Plugs, caps, tees, and bends deflecting 22-1/2 degrees or more, either vertically or horizontally, pumped or pressure lines six (6") inches in diameter or larger shall be provided with thrust blocking, or metal tie rods and clamps or lugs, as directed. Thrust blocking shall be concrete in accordance with Division 3, having a compressive strength of not less than 3000 psi after 28 days. Blocking shall be placed between solid ground and the fitting shall be anchored to it. Unless otherwise indicated or ordered by the Engineer the base and thrust bearing surfaces of thrust blocks shall be poured directly against undisturbed earth. The sides of thrust blocks shall not be subject to thrust and may be poured against forms. The area of bearing shall be as shown on the Contract Drawings or as ordered by the Engineer. Blocking shall be placed so that the fitting joints will be accessible for repair.

3.07 RODS AND CLAMPS

A. Wherever mechanical couplings are installed, the pipe shall be tied by means of steel tie rods of a diameter not less than the size of bolts used for flanges of the pipe being tied. Spacing of tie rods shall be 180 degrees apart for two (2) tie rods or equal spacing where three (3) or more rods are used.

B. Where exterior pipes require thrust blocks but concrete cannot be placed because of space limitations, rods and clamps shall be used. Steel rods and clamps shall be protected by galvanizing or by coating with bituminous paint.

3.08 CLEANING, TESTING, AND PLACING PIPING SYSTEMS INTO OPERATION

A. At the completion of the work and prior to final acceptance, all parts of the work installed under this Section of these Specifications shall be thoroughly cleaned. All piping shall be cleaned of grease, metal cuttings, dirt, and all other foreign materials which may have entered the various systems.

B. All force mains shall be hydrostatically tested in conformance with the requirements of AWWA C600-93.

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C. Pressure Tests

1. All force mains shall be tested by the Contractor at a pressure of 50 psi in excess of normal pump discharge pressure or a minimum of 75 psi whichever is greater and approved by the Engineer before acceptance. All equipment required for testing shall be furnished by the Contractor without additional cost to the Owner. Any leaks which develop as result of the pressure test shall be repaired by the Contractor at no additional cost to the Owner, and pipes then retested. All defects revealed by the tests shall be made good with new material without cost to the Owner. Tests and repairs shall be continued until all test requirements have been met.

2. All testing of piping systems shall be completed prior to insulating and/or painting.

3. After the pipe is laid, the joints completed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping or any valved section of piping shall, unless otherwise specified, be subjected for one hour to a pressure test of the intensity specified above. Water lines shall be subjected for two hours to a hydrostatic pressure test of 120 pounds per square inch. Each valve shall be opened and closed several times during the test. Exposed pipe, joints fittings and valves shall be carefully examined during the open-trench test. Joints showing visible leakage shall be replaced or remade as necessary. Leaking rubber-gasketed joints shall be remade, using new gaskets if necessary. Cracked or defective pipe, mechanical joints, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed immediately and replaced with sound material, and the test shall be repeated with sound material, and the test shall be repeated until the test results are satisfactory.

D. Leakage Tests

1. A leakage test for force mains shall be conducted after the pressure test has been satisfactorily completed. The duration of each leakage test shall be at least two hours, and during the test the pipe shall be subjected to a 150 percent of the pump discharge pressure or a minimum of 75 psi whichever is greater. Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section thereof necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. No piping installation will be accepted until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = \frac{SDP^{1/2}}{133{,}200}$$

in which L equals the allowable leakage in gallons per hour; S is the length of pipeline tested; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gage. Should any test of pipe laid disclose leakage greater than that specified above, the defective joints shall be located and repaired until the leakage is within the specified allowance, without additional cost to the Owner.

3.09 GRAVITY SEWER TESTS

A. The Contractor shall notify the Engineer 24 hours in advance of any test to be made. Such test shall be made only in the presence of the Engineer. Except where concrete reaction backing necessitates a five day delay, pipelines jointed with rubber gaskets, mechanical or bolted joints, or couplings may be subjected to pressure, inspected, and tested for leakage at anytime after partial completion of backfill. Concrete pipe shall be filled with water for at least 24 hours before being subjected to the pressure test and subsequent leakage test.

B. After the gravity sewers have been laid and backfill placed to two (2) feet above the pipe, a light will be flashed between manholes, or if the manhole has not yet been constructed, between the location of manholes, by means of a flashlight or mirrored light, to determine whether the alignment of the main is true and whether any pipe has been displaced subsequent to laying. If alignment is correct and no other defects are disclosed, backfilling may be continued. If the test shows poor alignment of the main, misplaced pipe or other defects, such defects shall be remedied by the Contractor, to the satisfaction of the Engineer, before the work of backfilling proceeds.

C. No section of gravity sewer lines shall be tested for leakage before backfilling in that section has been completed. If this condition has been fulfilled, the sewer lines shall be tested for leakage between manholes as the work progresses, by making exfiltration tests or infiltration tests, if the latter type is directed by the Engineer, and in accordance with the following provisions:

1. Infiltration Test - Plug the upstream manhole and make measurement of the flow at the downstream manhole. Amount of leakage from the section of the sewer shall not exceed 250 gallons per one (1") inch diameter of pipe per mile in 24 hours.

2. Exfiltration Test - Basic minimum internal head of two (2') feet shall be used for exfiltration test. The leakage limit of 250 gallons/inch diameter/mile/24 hours shall apply to exfiltration tests except that an allowance of 10 percent of gallonage will be permitted for each additional two (2') feet of head over the basic two (2') feet minimum head. In the event that infiltration tests are required by the Engineer, the same leakage limit of 250 gallons/inch diameter/mile/24 hours shall apply.

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All the costs required for tests shall be paid by the Contractor and included in the lump sum bid price.

D. As an alternate to the hydrostatic test, the Low Pressure Air Test can be used. The following testing procedure shall be used for the low pressure air test unless other methods are approved by the Engineer:

1. The Contractor shall thoroughly clean and remove all debris, silt, earth, or other material from the sewer prior to air testing. The pipe is to be flushed or sprayed with water in a manner approved by the Engineer.

2. Test plugs supplied by the Contractor shall be installed within the pipe at each manhole. Each plug shall be securely braced as required.

3. The Contractor shall add air slowly to the portion of the pipe under test until the internal air pressure is raised to 4.0 psi gauge pressure plus the allowance for back pressure from groundwater.

4. As a safety precaution, no one shall be allowed in a manhole after the air pressure is increased in the sewer line. If it is suspected that the test plug may be leaking, the pressure shall be relieved first before any adjustments are made to eliminate air leakage at the plug. The Contractor may precoat the plug with a soap solution to check the plugs for leakage.

5. The equipment to be used to conduct the test must be approved by the Engineer prior to starting any testing. As a minimum, the valves, gauges and other appurtenant equipment shown in the air schematic diagram on the Drawings shall be used. All gauges, stop watches, etc. must be calibrated by a certified testing laboratory prior to the start of testing. The Engineer reserves the right to require all equipment to be recalibrated, at his discretion at no additional costs.

6. After an internal pressure of 4.0 psi plus the allowance for groundwater has been obtained, the Contractor shall allow at least two (2) minutes for the air temperature to stabilize, adding only the amount of air necessary to maintain the required pressure.

7. As the internal air pressure decreases, the time required for the pressure to drop from 3.5 psi plus the allowance for groundwater to 2.5 psi plus the allowance for groundwater will be observed and recorded. This time interval shall be compared with established standards in accordance with the given tables of time and length for various diameters of sewer. The maximum acceptable rate of air loss shall be 0.0030 cubic feet per minute per square feet of internal pipe wall surface.

8. Pipe which fails to maintain the stipulated pressure for a period greater than the approved holding time shall be deemed to have failed to pass the low pressure air test and is unsatisfactory for acceptance by the Engineer. Any sewer that fails to pass the test shall be repaired by the Contractor at his own expense. Following corrections, the sewers shall be tested again in accordance with the enumerated procedures.

9. Minimum holding time in seconds required for pressure to drop from 3-1/2 to 2-1/2 psig shall be in accordance with the Table on the next page.

3.10 WATER MAIN DISINFECTION

A. The Contractor shall take precautions during the installation of the pipeline to protect the pipe interiors, fittings and valves against contamination. Pipe delivered for construction shall be strung so as to minimize the entrance of foreign material. When pipe laying is not in progress as, for example, at the close of a day's work, all openings in the lines shall be closed by watertight plugs. Joints of all pipe in trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.

B. All newly installed water lines shall be disinfected by the Contractor, as herein defined, before water is used for domestic consumption. Water mains shall be disinfected in lengths no greater than 1,200 lineal feet. One (1) of the following two (2) methods shall be employed:

1. By fastening the required number of calcium hypochlorite tablets to the inside of every length of pipe laid, or;

2. By continually introducing a strong hypochlorite solution by means of a chemical solution or feed pump into metered fresh water introduced into the line.

a. The Tablet Method: It is only applicable if the pipeline has been laid in a sanitary manner in the judgment of the Engineer. Otherwise, the line shall be flushed and the alternate method, amplified in the section below, shall be used. The disinfection tablets of calcium hypochlorite having an available chlorine content of 70% by weight and sized to weigh 6 to 8 tablets per ounce. The tablets shall be fastened to the inside top of every length of pipe laid using a non-toxic adhesive, starting with the first and progressing as each additional length is added. The top of the pipe shall be marked by chalk to prevent rotation so that the tablets will be found at the top of the main when the pipe is in place. The number of tablets to be used per 20-foot section of pipe is tabulated below and appropriate adjustments are to be made if lengths other than 20-foot are used.

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PIPING AND SEWERS

Pipe size, inches	6	8	10	12	20	24
Tablets per 20-foot section	3	4	5	8	22	32

When the installation has been completed, the main shall be filled with water at a velocity of less than one foot (1') per second.

b. The Hypochlorite Solution Feed Method of disinfection may be employed as an alternate to the table method, and must be employed if the sanitary condition of the line is suspect by the Engineer. If the line is known to contain or has been in contact with dirty water, mud and debris, it shall first be flushed at a flushing velocity of not less than 2.5 feet per second and for a time to pass no less than 3 volumes of line water.

The preferred point of disinfection application is at the beginning of the valved section of the line where water is being introduced. Application may be made through a corporation stop, provided a boss has been provided in the pipe prior to installation of the corporation stop. The water entering the new construction shall be metered and the proportional amount of disinfectant applied at a uniform rate while the process continues. Calcium hypochlorite may be used for disinfection and its application rate shall be 0.6 lbs. or 70% strength material per 1,000 gallons of water. If the application is being made to a line that has been flushed and which contains water, the application of the disinfection solution shall be maintained until no less than 40 mg/l chlorine residual is found at the farthest end of the line.

c. Duration of the Tests: The chlorinated water shall remain in contact with the mains for a period of 24 hours or longer, and at the end of that time, water samples from the extremities of the line should indicate a chlorine residual of 50 mg/l or more. If a residual less than that value is indicated, the disinfection procedure shall be repeated. If, on the other hand, a residual of 50 mg/l or more is indicated, the system shall be drained and flushed to waste until a residual less than 1 mg/l is measured. Any time thereafter, a sample for bacteriological analysis shall be taken and submitted to a Certified Laboratory for Total Coliform analysis. The absence of these organisms shall confirm that the line is sanitary and it may be put into use subsequent to a satisfactory test. Should Coliform organisms be found present in the water, the disinfection process shall be repeated until a satisfactory test is received. A second coliform sample shall be taken twenty-four (24) hours following the first sample.

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d. Upon satisfactory completion of the disinfection of the new water mains, the line shall be flushed clean of all chlorinated water prior to placing the lines in service.

**** END OF SECTION ****

SECTION 11020

VALVES AND APPURTENANCES

PART 1 GENERAL

1.01 SCOPE

A. Description of Work

1. The Contractor shall furnish all labor, materials, equipment and incidentals required and install the test, complete and ready for operation, all valves and valve appurtenances as shown on the Contract Drawings and as specified herein.

2. Valves that are an integral part of other equipment items in this Contract are specified under the particular section of Specifications relating to such equipment and are not part of this Section.

B. The following items are included:

1. Gate Valves
2. Plug Valves
3. Butterfly Valves
4. Check Valves
5. Knife Gate Valves
6. Ball Valves
7. Diaphragm Valves
8. Solenoid Valves
9. Small Diameter Bronze Valves
10. Curb and Corporation Stops
11. Valve Boxes
12. Tapping Sleeve and Valve
13. Self-Cleaning Strainer
14. Post Hydrants

C. Related Work Specified Elsewhere

1. The provisions of this Section are a direct extension of SECTION 11000, MECHANICAL EQUIPMENT - GENERAL, and although set forth only once within the Specifications, shall apply equally to this Section.

2. Piping - SECTION 11010, PIPING AND SEWERS

3. Couplings - SECTION 11400, PIPE COUPLINGS

1.02 SUBMITTALS

A. Operating instructions, manuals and shop drawings shall be submitted in accordance with SECTION 11000, MECHANICAL EQUIPMENT - GENERAL.

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B. Submit to the Engineer for his review, fully detailed shop drawings and/or legible catalog cuts of all items included within this Section.

C. All tests on materials referred to within this Section shall be made by a recognized and accepted testing laboratory at the Contractor's expense. Tests shall be made in accordance with ASTM or Federal Specification requirements, and certified copies of all test reports shall be submitted to the Engineer.

1.03 QUALITY ASSURANCE

A. All valves of like size or type shall be manufactured by a single manufacturer.

B. The equipment furnished shall be standard products in regular production by manufacturers regularly engaged in the production of high quality equipment of this type. Where used, manufacturer's names, models and types are solely for descriptive purposes.

1.04 GUARANTEE AND WARRANTY

A. The equipment shall be unconditionally guaranteed to meet or exceed the design criteria detailed in PART 2 of this Specification.

B. See SECTION 11000, MECHANICAL EQUIPMENT - GENERAL for other requirements.

PART 2 PRODUCTS

2.01 VALVES - GENERAL

A. Valves specified herein shall have the type of ends specified or as indicated on the Contract Drawings or as required by equipment connections. As a general rule, the following shall apply:

1. Provide valves suitable to connect to adjoining piping as specified for pipe joints. Use pipe size valves.

2. Thread pipe sizes 2-inch and smaller.

3. Flange pipe sizes 2 ½-inch and larger.

4. Solder or screw to solder adaptors for copper tubing.

5. Butterfly valves 3-inch and smaller shall be provided with tapped lug bodies. Valves 4-inch and larger shall be provided with flanged ends.

B. Non-rising stem valves shall be equipped with needle-and-slot type valve position indicators.

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VALVES AND APPURTENANCES

C. Cleanouts shall be provided on gate valves for removal of foreign matter where indicated on Contract Drawings, or as required by the location of the valve in the piping system.

D. Each piece of equipment or appliance shall be separately valved so that supply and return services can be shut off and the piece of equipment or appliance removed if desired, without disturbing the piping systems. Valves shall be located so as to be easily accessible to operator of equipment.

E. All valves 2-inch and under which will be used for throttling services shall be globe type except as shown or specified otherwise. Gate valves shall be used for cutoff or stop service except as shown or specified otherwise.

F. Check valves shall be so protected by isolation valves that they may be repaired without removal from the line.

G. Valves in conjunction with nickel-plated or chromium plated piping and exposed to view shall be correspondingly nickel-plated or chromium plated.

H. All supply connections to hot water heating coils, and all other equipment requiring balancing in the heating water systems shall be provided with lock shield globe, eccentric plug, or butterfly valves for regulating water flow. Return connections shall be provided with gate, eccentric plug, or butterfly valves. One-eighth inch NPT pipe connection with stopcock shall be provided in the piping or valve bodies on each side of equipment requiring balancing for pressure gage connections.

I. All valves with centerlines 6'-0" above the floor level shall be provided with chain wheel operators.

J. All valves shall have manufacturer's name and pressure rating clearly marked on outside of body.

K. All valves and stops installed in the ground and in other unexposed locations shall have non-rising stems.

L. All valves and stops installed in the ground shall be provided with wrench nuts conforming to AWWA standard dimensions.

M. All valves and stops installed outside in the ground shall be provided with valve boxes and covers. Extension stems shall be provided so that the operating nut is no more than 12 inches below grade.

N. Unless specified otherwise, all valves shall open by turning clockwise. The direction of opening of the valve shall be indicated thereon by means of an arrow.

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VALVES AND APPURTENANCES

2.02 MATERIALS - GENERAL

A. All castings, whether of bronze, iron or steel, shall be sound and smooth, without swells, lumps, blisters, sand holes, or other imperfections, and shall be made in accordance with best foundry practice. All materials unless specifically noted otherwise, shall be of the grade and qualities established by the Specifications of the American Society for Testing and Materials listed as follows:

1.	All iron castings	A 126, Grade B
2.	All steel castings	A 216
3.	Stem bolts and nuts	B 21, Grade A - half hard
4.	Stem nut and yoke nut	B 132, Grade B
5.	Stuffing box gland	B 62) with some modifications
6.	Bushings	B 62) permissible as approved

Disc facings for gate valves shall be of metal alloy composed of 89-92 percent copper, 0.5-1.5 percent tin, 0.75-2.0 percent lead and 7-8 percent zinc.

B. All valves in submerged, buried, or outside exposed applications shall be furnished with stainless steel bolts and fasteners. All bolts used to connect the valves to adjoining piping in submerged or outside exposed applications shall be stainless steel.

2.03 GATE VALVES

A. Valves 2 1/2-Inch and Smaller

1. Gate valves 2 1/2-inch and smaller shall be rising stem, bronze body, nickel alloy disc, copper-silicon alloy stem and Kevlar packing. The valve shall be Class 200 rated for 200 lb. SP and 400 lb. WOG and shall be Lunkenheimer No. 2227 or Stockham No. B-136 or approved equal.

2. Materials of construction shall meet the following requirements:

Item	Material	ASTM Spec.
Body	Bronze	B-61
Bonnet	Bronze	B-61
Disc	Nickel Alloy Alloy 976	B-584
Seat Ring	Stainless Steel or Nickel Alloy	--
Handwheel	Malleable Iron	A-197
Stem	Copper Silicon Alloy	B-371

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3. The valves shall have the following features:

a. Bodies - Full flow design. Connecting pipe ends will not distort valve seats. Same body is used for both rising and non-rising stem valves insuring interchangeability of trims. Disc guide channels are beveled at top of body for easy assembly.

b. Bonnets - Heavy screw-in bonnet collar with ample thread engagement insures a tight body-collar joint. Wide flats to provide a firm wrench hold for disassembling valve.

c. Stems - Resistant to wear, corrosion and embrittlement. Long, accurately machined threads provide full thread contact. Heavy disc-stem connection withstands wearing action when opening valve and prevents stem failure under strain. Rising stems have a backseat surface above the stem threads where it is less exposed to scale and damage from line debris.

d. Discs for Rising Stems - Consist of solid disc faces with an integral ball and socket connection, faces readily adjust to body sear taper, insuring tight closure. Sturdy disc collar strengthens disc-stem connection. Easy to assemble and with valve wide open, the discs are drawn up into the bonnet and cannot drop off stem. Wing guides mate with channels in the body to hold the halves together and guide them during opening and closing.

e. Discs for Non-Rising Stems - Single wedge discs threaded to engage with thread on stem, raising or lowering disc as stem is turned. Threads are long enough to be fully engaged whether valve is open or closed. Disc has wing guides that mate with channels in the body.

f. Seats - Renewable. Accurately tapered to insure perfect seating of the discs.

g. Repacking - Valves are repackable under pressure when wide open. Deep stuffing box and packing nut insure firm thread engagement when fully packed. Back seats above stem threads make scale formation unlikely and provide a tight seal.

h. Hexagon Head Gland - Permits the use of a light wrench to easily loosen and raise gland.

i. Non-Slip Handwheel - Insures tight closing.

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VALVES AND APPURTENANCES

B. Valves 3-Inch to 16-Inch

1. Except as otherwise specified, gate valves 3-inch to 16-inch shall be iron body with a synthetic elastomer coated resilient seated ductile iron disc. The valve shall have seat and shell test pressures of 250 and 500 PSI, respectively and shall have a working pressure rating of 250 PSI. The valve shall meet or exceed AWWA C509-87 and C500-86 Standards. Flanged valves shall be faced drilled to the ANSI 125/150 lb. Standard. Mechanical joint ends shall meet AWWA C111-64.

2. In addition to the requirements of the AWWA Standards, the valve shall meet the following supplementary specifications:

   a. Valve body and bonnet shall be coated on all exterior and interior surfaces with a fusion bonded epoxy conforming to the requirements of AWWA Standard for Protective Coatings for Valves and Hydrants, C550-81. Manufacturer shall certify that the coating will conform to the following sections of the Standard.

      (1) Section 2 - Materials. Relating to suitability of the coating for use in a potable water system.

      (2) Section 3 - Coated Sample Testing. Relating to disbondment of blistering and impact damage.

   b. Body, bonnet and gate must be ductile iron. The bonnet bolts shall be 316 stainless steel.

   c. The valve shall be designed so that during operation, or cycling, of the valve, there is no friction or abrasion or rubbing together of gate and body that can wear away any rubber or epoxy and expose bare iron. Valve manufacturer shall provide certification from an independent testing laboratory that its valve can operate through 1000 cycles of operation at 250 psi unbalanced closing pressure and flow to open discharge without causing damage to any of the epoxy coating on body and gate and rubber coating on gate. Manufacturer shall also certify that interior epoxy coating is holiday-free.

   d. Gate shall be completely covered with rubber over all interior and exterior ferrous surfaces. The rubber shall be securely bonded to the gate body, including the part that houses the stem nut. The stem hole through the gate shall be full opening, top to bottom.

   e. The interior of the valve body shall be free of pockets or ledges where sediment or debris can collect.

f. 'O' Ring stem seal shall be replaceable with the valve under pressure in the full-open position.

g. In order to assure compliance with AWWA and other applicable standards, and access to manufacturing facilities for inspection purposes, and assure timely shipment and delivery, all valves must be manufactured, assembled and tested in plants located within the continental United States.

3. All internal parts shall be accessible without removing the main body from the pressure line. The internal diameter of the water passageway shall be at least as large as the pipe inside diameter it is intended for.

4. The gate valves shall be Metroseal 250 as manufactured by U. S. Pipe and Foundry or approved equal.

2.05 PLUG VALVES

A. Valve Construction

1. All plug valves shall be eccentric plug valves unless otherwise specified.

2. Valves shall be of the non-lubricated eccentric type with resilient faced plugs and shall be furnished with end connections as shown on the Plans. Flanged valves shall be faced and drilled to the ANSI 125/250 lb. Standard. Mechanical joint ends shall be to the AWWA Standard C111-64. Bell ends shall be to the AWWA Standard C100-55 Class B. Screwed ends shall be to the NPT Standard.

3. Port areas for valves through 20-inch shall be minimum 80% of full pipe area and port areas of 24-inch and larger valves shall be minimum 70% of full pipe area.

4. Valve bodies shall be of ASTM A126 Class B cast iron in compliance with AWWA C504 Section 2.2. Bodies in 3-inch and larger valves shall be furnished with a welded overlay seat of not less than 90% pure nickel in accordance with AWWA C507 Section 7.2. Valves utilizing resilient seats attached to the body shall not be acceptable. As per AWWA C504-80 Section 35.2 and AWWA C507-73 Section 7.2, sprayed or plated seats are not acceptable.

5. Plugs shall be of ASTM A126 Class B cast iron in compliance with AWWA C504, Section 2.2. The plug shall be of one-piece construction and shall be capable of withstanding the full pressure rating of the valve without use of additional structural reinforcing ribs that extend beyond the profile of the plug itself. Plugs shall be resilient faced with neoprene or hycar, suitable for use with sewage. Plugs with cast inlays shall not be acceptable.

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6. Valves shall be furnished with replaceable, sleeve type metal bearings conforming to AWWA C504-80, Section 3.6 and AWWA C507-73, Section 8. Bearings shall be of sintered, oil impregnated and permanently lubricated type 316 ASTM A743 Grade CF-8M or AISI Type 317L stainless steel in 1/2"-36" sizes. In valves larger than 36-inch, the upper and lower plug journals shall be fitted with ASTM A240 type 316 stainless sleeves with bearings of ASTM B30, Alloy C95400 aluminum bronze. Non-metallic bearings shall not be acceptable.

7. Valve shaft seals shall be of the multiple V-ring type and shall be externally adjustable, repackable without removing the bonnet or actuator from the valve, and repackable under pressure. Shaft seals shall conform to AWWA C504-80, Section 3.7 and AWWA C507-73, Section 10.2. All exposed nuts, bolts, springs, washers, etc., shall be stainless steel for buried or submerged valves and zinc plated for all others.

8. Valve pressure ratings shall be 175 PSI through 12" and 150 PSI for 14" through 72".

B. Operators

1. Unless shown otherwise on the Contract Drawings all plug valve actuation for valves 4-inch and larger shall be by means of a gear operator. Gear operators shall be enclosed and provided with seals on all shafts to prevent entry of water, to allow submerging of the operator, and shall be suitable for running the gears in oil. All shaft bearings shall be furnished with permanently lubricated bronze bearing bushings. Adjustable stops shall be provided. Indicators shall also be provided. Valve packing adjustments shall be accessible without disassembly of the actuator.

2. Valves and gear actuators for buried or submerged service shall have seals on all shafts and gaskets on the valve and actuator covers to prevent the entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs and washers shall be stainless steel. All gear actuators shall conform to AWWA C504-80, Section 3.8.

3. The minimum size handwheel to be provided shall be 8-inch in diameter. The maximum handwheel size shall be 12-inch in diameter for valves up to 12-inch in diameter and 16-inch for valves larger than 12-inch in size. Maximum rim pull for any valve shall be 80 lb. The actuator shall be sized to meet the application but shall be rated, as a minimum, for a 100 psi differential across the valve. Adjustable stop memory shall be provided on all valves installed on a pump discharge.

4. For valves 3-inch and smaller, lever operators with an adjustable memory stop and position indicator shall be provided.

5. Right angle gear sectors shall be provided where chainwheel operators are required and the valve is installed in the horizontal position.

6. Plug valves and actuators shall be as manufactured by Dezurik Corp. or approved equal.

2.06 BUTTERFLY VALVES

A. Butterfly Valves 3-Inch and Larger

1. Unless shown otherwise on the Contract Drawings, butterfly valves 3-inch and larger shall be flanged with handwheel actuators for interior use. For buried applications, the valves shall have mechanical joints with nut input actuators suitable for buried and submerged service. The minimum handwheel size shall be 8-inch in diameter.

2. All butterfly valves shall be of the tight closing rubber seat type with seats bonded or mechanically retained into the valve body. Valves shall have a full, uninterrupted 360° sealing surface and shall be bubble tight at rated pressure in both directions. Valves shall be designed for use in either throttling application or for very infrequent operation after extended periods of inactivity. Valves shall be in full compliance with AWWA Specification C504-80 Class 150B as specified herein.

3. All valve bodies shall be of cast iron conforming to ASTM A126 Class B or equal and with integral cast ends as required to meet application requirements.

4. All valve discs shall be streamlined and present the smallest profile possible consistent with the structural requirements of the pressure class. They shall be of offset design and material composition being ductile iron. Disc sealing edge shall have a continuous uninterrupted 360° sealing surface of Type 304 stainless steel.

5. Valve shafts shall be of Type 304 stainless steel. Shaft design shall be of thru or stub type construction with at least 1-1/2 shaft diameter engagement into the disc. Shaft to disc connection shall be a rigid, non-slip type connection.

6. Valve seats shall be Buna N material bonded or mechanically retained to the valve body. For air service, EPDM valve seats shall be provided.

7. Valve bearings shall be self-lubricating and non-corrosive and shall have a significant difference in hardness from the valve shaft.

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8. All valve actuators shall be designed as an integral part of the valve and shall meet or exceed all the requirements of AWWA C504-80. Actuators shall be of rack and pinion, worm gear or traveling nut design. All moving penetrations into the actuator shall have corrosion resistant surfaces in contract with the housing seals. All actuator types, in a given size, to be interchangeable and fastened to valves with readily accessible external bolts. All actuators must fit on the valves they are designed to operate in any mounted position or rotational direction without any special prior preparation to either the valve or the actuator. The minimum handwheel size shall be 8 inches in diameter.

9. Actuators for buried service shall be moisture sealed and watertight at water pressures up to 10 PSI and shall be permanently lubricated. Each actuator shall be provided with a ground level position indicator, The Pratt Diviner or equal.

10. Valves shall be as manufactured by Henry Pratt Co., Dezurik or approved equal.

B. Butterfly Valves 2 1/2-Inch and Smaller

1. Butterfly Valves 2 1/2-inch and smaller shall be of the drilled and tapped lug body type with lever operation. The valve shall have the following construction features:

a. Solid, one-piece 316 stainless steel shaft DISC meeting AWWA Class 75B, C504-70 & ASTM A395.

b. Two (2) piece nylon-coated, cast iron body with stainless steel bolts.

c. Double 'U' cup stem seal that is self-adjusting.

d. Heavy duty machined and corrosion resistant shaft bearings.

e. Tongue and groove seat design that provides bubble tight shutoff and full circle seating using EPDM seat material.

f. Pressure rating of valve shall be minimum 150 psi and shall be rated for bi-directional use.

2. The valves shall be as manufactured by Bray or approved equal.

C. Butterfly Valves for Air Service

1. Unless indicated otherwise, all valves in Air Service shall be lugged body and be Jamesbury Model 815-3600 or equal.

2. The valve shall feature a single flexible polymeric seat that is pressure energized to assure positive shutoff over thousands of cycles. The seat shall be designed to seal effectively regardless of the direction of flow with the lowest possible torque.

3. The valve shall feature an offset shaft and eccentric design, which shall impart a camming action to the disc. The offset design shall cause the disc to swing completely out of contact with the seat upon opening and shall permit replacement of the seat by simply removing the body insert and replacing the seat without removal of the shaft and disc.

4. At 300°F, the valve shall have a maximum rating of 215 psi.

5. The materials of construction are as follows:

	Item	Material
a.	Body	316 S.S.
b.	Insert	316 S.S.
c.	Shaft	316 S.S.
d.	Seat	TFE
e.	Shaft Bearing	316 S.S. backed TFE
f.	Spacer	316 S.S.
g.	Shaft Seal	TFE
h.	Bisc Pin	316 S.S.
I.	Handle	Malleable Iron
j.	Bearing Spacers	TFE
k.	Retaining Ring	Inconel
l.	Thrust Bearing	316 S.S.

2.07 CHECK VALVES

A. 2 1/2-Inch and Smaller

1. Valves 2 1/2-inch and smaller shall have threaded ends, bronze body, cap and disc and shall be of Y swing check design. Valves shall function in vertical or horizontal with only a slight pressure differential to open or close the disc. Discs shall be renewable and seats shall have the capability to be reground without removing the valve from the line. The disc carrier for even wear at all points of seating surfaces. The side plugs shall serve as bearings for disc carrier pins and shall be easy to replace. The valve shall have a rating of 200 lb. SP and 400 WOG. The 3-inch and smaller check valves shall be Lunkenheimer Figure 554Y or approved equal.

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B: 3-Inch and Larger

1. Check valves shall be of swing type and shall meet the material requirements of AWWA Specification C508. The valve shall be of iron body, bronze mounted, single gate for non-shock working pressure 175 PSI 2"-12", 150 PSI 14"-24" and hydrostatically tested at double the working pressure. Ends shall be flanged or mechanical joint.

2. When there is no flow through the line, the gate shall hang lightly against the seat.

3. The valve shall be so constructed that by simply unbolting and lifting off the cover, the internal working parts may easily be removed and replaced without removing the valve from the line. The valve shall be furnished with outside lever and weight.

4. Check valves shall be suitable for mounting in horizontal lines or vertical lines when water flow is up.

5. Check valves shall have stainless steel hinge pin.

6. Hinge pin shall operate in bronze support bearings (3"-12") or babbitt support bearings (14"-24").

7. The design of the valve shall provide the following features:

   a. Full clear port opening in all diameters.

   b. All working parts can be removed through the top.

   c. Wye (Y) shaped hinge to give maximum gate support.

   d. Cast iron integral stops in body prevent gate sticking in open position.

   e. Permanent cast bosses on body for tapped drains and bypasses. A tapped drain is to be provided.

   f. All working parts are bronze to bronze or bronze to stainless steel.

   g. Easily converted from plain to outside lever and weight or outside lever and spring.

   h. Outside lever and weight or outside lever and spring can be mounted on either side of assembly.

   i. Revolving gate design to equalize wear.

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8. The valve shall be manufactured by Clow; GA Industries, or approved equal.

C. Wafer Style

1. Where shown on the Contract Drawings, flangeless or wafer type of check valve shall be used. The valve shall be heavy duty provided with an external weight and level and the following features:

   a. Light weight

   b. Round port

   c. Swing style disc

   d. Adjustable/replaceable spring or lever and weight

   e. External, adjustable, replaceable spring

   f. Have a working pressure rating of 250 PSI

   g. Semi-lug wafer body style

2. Each valve shall have the following materials of construction:

	Item	Material
a.	Body	Cast Iron
b.	Disc Arm	316 SS
c.	Disc Plate	316 SS
d.	Seat Ring	316 SS
e.	Face & Seat Seas	TFE
f.	Inner & Outer Bushings	316 SS
g.	Shaft	316 SS
h.	Spring	316 SS
i.	Gland Bottom	316 SS
j.	Body Liner	Epoxy

3. The check valve shall be Figure 22 or 23 as manufactured by GA Industries or approved equal.

D. Cushioned Check Valves

1. General

   a. The Contractor shall furnish and install one (1) 16-inch flanged, air-cushioned, swing type check valve in the Valve Chamber for the Bypass Pump Station.

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2. Function

a. The function of the check valve is to open smoothly on the startup of a pump and close at a controlled rate of speed for the final pre-determined portion of its stroke, following the pump shutdown. The valve shall be capable of being installed in either a vertical or horizontal position, and shall be of the swing check design such that the hinge shaft is above the waterway.

3. Description

a. On the start-up of the pump, the check valve disc shall open in response to the flow and then afford the minimum resistance to the flow.

b. Upon the pump shutdown, the valve's counterweight shall initiate the valve closure at an unrestricted rate until the valve disc reaches the pre-selected point of closure. From this point to the final seated position the valve shall close at a controlled rate of speed. The point at which the adjustable closing speed occurs may be modified in the field. The closing speed shall also be adjustable in the field, and shall be by way of a micrometer type needle valve provided with a handle that can be locked in place after the proper setting has been determined.

c. The valve when closed shall be tight seating by way of a resilient replaceable seat against a stainless steel seat ring in the body.

4. Construction

a. The swing check valve shall be constructed with heavy cast iron or cast steel body with a stainless steel seat ring, a non-corrosive shaft for attachment of weight and lever, and complete non-corrosive shockless chamber.

b. The valve shall have a heavy-duty body shall be constructed of high-strength cast iron conforming to ASTM A126 Class B with integral flanges, faced and drilled per ANSI B16.1 Class 125 and be suitable for horizontal or vertical installation.

c. The valve body shall be of full waterway type, designed to provide a net flow area not less than the nominal inlet pipe size when swung open no more than 25 degrees. The valve shall have a replaceable stainless steel body seat.

d. Valve disc shall be cast iron and faced with a renewable resilient seat ring of rubber or other suitable material, held in place by a follower ring and stainless steel screws.

e. The disc arm shall be ductile iron or steel, suspended from and keyed to an austenitic stainless steel shaft that is completely above the waterway and supported at each end by heavy bronze bushings. The shaft shall rotate freely without the need for external lubrication. The shaft shall be sealed where it passes through the body by means of a stuffing box and adjustable packing. Simple O-ring shaft seals are not acceptable.

f. The valve shall be supplied with an outside lever and adjustable counterweight to initiate valve closure. Final closure shall be dampened by means of a single, side-mounted bronze air-cushion assembly directly mounted to the valve body on machined pads. The amount of cushioning shall be easily adjustable without the need for pre-charged air chambers. Commercial air cylinders that pivot and/or are attached with fabricated brackets are not acceptable.

5. Function

The valve shall swing open smoothly at pump start and close quickly and quietly upon pump shutdown to prevent flow reversal. When closed, the valve shall seat drop tight.

6. Start-up

a. The services of a factory representative shall be provided for each valve. The position of restricted closing and the speed of closing shall be set so that a non-slam operation is obtained.

b. The representative shall also train the owner's personnel in the operation and maintenance of the valve.

7. Manufacture

a. Each valve shall be Fig. 250-D as manufactured by GA Industries, Mars, PA or approved equal.

D. Rubber Lined Check Valves

1. Rubber lined check valves shall be installed on the grit slurry discharge piping as shown on the plans. A grit slurry of 1% to 4% solids will e discharged through the valves at a velocity of approximately 5 fps. The entire interior of the valve shall be lined with soft natural rubber.

2. The check valve shall be a lever and weight, rubber seated swing check valve. The valve shall permit flow in one direction only and shall close tightly, without slamming, when the discharge pressure exceeds the inlet pressure.

3. The valve disc shall be suspended from a non-corrosive shaft that is located completely above the waterway.

4. The valve body shall be of cast iron (ASTM A126-B) and with a cast iron disc of similar material. The hinge shaft shall be of 18-8 stainless steel with the disc arm and counterweight arm keyed thereon. The body seat shall be all stainless steel. The counterweight arm may be of the manufacturer's standard construction.

5. The hinge shaft packing gland shall be of the adjustable packing gland design employing a compression type packing. Simple O-ring shaft seals will not be accepted.

6. Manufacturer

The valve shall be GA Industries, Inc. Figure 250-DS.

2.08 STAINLESS STEEL KNIFE GATE VALVE FOR BI-DIRECTIONAL SHUT-OFF

A. The valve body shall be solid cost type 316 stainless steel with raised flange face and threaded lugs to ANSI 125/150 bolt pattern. The body bore shall be contoured for self-cleaning and have machined gate guides to support the gate for 150 psi differential pressure for the full length of the gate stroke. The chest area of the valve shall be reduced to prevent solids build-up with the height of the chest from the top of the body bore to the lower edge of the top seal not greater than 25% of the bore diameter. The gate shall be of 316 stainless steel finish ground on both faces to a 43 microinch finish and hard chrome plated. The lower radius of the gate shall have an inscribed arc of not more than 60°. The seat of the valve shall be a combination metal and resilient (viton) material with the resilient member sealing around the edge of the gate. This seat shall be mechanically retained to prevent pull-out and be easily replaced. Further, this seat shall be flush with the bottom body bore without a cavity in which material can collect to prevent gate closure. The seat shall provide for bi-directional zero leakage shut-off from 28" Hg vacuum to 150 psi differential pressure. The top seal of the valve shall be located just above the chest area of the valve and shall be of viton with TFE packing and dual UHMW polyethylene scraper blades at the lower edge of the seal to wipe the gate clean during operation. This top seal shall be repackable while in service and under full operating pressure.

B. Handwheel Operated Valves and Operating Nuts

The yoke assembly of the valve shall be solid steel four-post construction with a high strength brass stem/gate connector. The stem shall be of a non-rising design. The handwheel shall be of cast iron with the opening and closing directions cast into the top rim surface. Where indicated on the Plans, 2" operating nuts shall be provided instead of handwheels.

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C. Position Indication

The valve shall have a graduated position indication scale mechanically fastened to the yoke of the valve with a brightly colored pointer.

D. Protective Coatings

All non-stainless steel surfaces shall be painted with a minimum of two coats of a two-part vinyl chloride rubber base paint.

E. Source

The knife gate valves shall be Model VL valves as manufactured by WEY Valve, Inc., P.O. Box 1215, Nettleton, Mississippi 38858.

2.09 BALL VALVES – 2-INCH AND SMALLER

A. Brass and Steel Body Valves

1. Ball valves for installation in copper or steel piping shall be of the two-piece body, screwed end design. The valve shall have a minimum working pressure rating of 400 PSI.

2. The materials of construction of each valve shall be as follows:

	Item	Material
a.	Body	ASTM B30 Brass (for copper piping) ASTM A181 Carbon Steel (for iron piping)
b.	Ball	316 Stainless Steel
c.	Stem & Stem Nut	316 Stainless Steel
d.	Seat & Seals	TFE
e.	Compression Ring	316 Stainless Steel
f.	Body Bolts	316 Stainless Steel
g.	Hex Nut & Ground Spring	316 Stainless Steel

3. The ball valve shall be Style 21-11 or 21-22 as manufactured by Jamesbury or equal.

B. CPVC Body Valves

1. Ball valves for installation in polyvinyl chloride pipelines shall be unplasticized chlorinated polyvinyl chloride. Valve shall be of full port and double union design, and shall have the capability to rotate valve body 360°, Viton O-ring seals.

2. End connections shall be threaded or flanged where indicated on the Plans.

3. Each valve shall be Series MBV as manufactured by Plast-O-Matic Valves Inc. or approved equal and shall have the following features:

   a. Valve shaft (stem) reinforced with stainless steel rod to eliminate flexing and breakage.

   b. Dual shaft seals.

   c. Teflon® bearing on shaft; stem design is "blow-out" proof.

   d. Teflon seats energized with O-rings to eliminate wear and improve cycle life.

   e. Trunnion design to eliminate lateral ball stress and allow downstream piping to be disconnected under full line pressure.

   f. Fully concentric and mirror polished ball to assure smooth, leakproof operation.

   g. Multi-direction flow.

   h. Smooth flow path.

   i. Mounting lugs on body for piping support or easy attachment of Actuators.

2.10 CPVC BALL CHECK VALVES

A. Ball check valves for installation in polyvinylchloride pipelines shall be unplasticized chlorinated polyvinylchloride. Valves shall have double union end connections, efficient venturi design that requires less than 1/2 PSI to open or close, Viton O-ring seat and seals, CPVC ball and can operate in either the vertical or horizontal position. Valve shall be as manufactured by Hayward Industrial Products or approved equal.

B. End connections shall be threaded or flanged where indicated on the Plans.

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2.11 DIAPHRAGM VALVES

A. Valves 1/2-Inch to 2-Inch

1. Diaphragm Valves shall be of the top entry Saunders type and shall have the following body materials:

	Piping Material	Body Material
a.	Copper	Brass
b.	PVC/CPVC	CPVC
c.	Iron	Ductile Iron
d.	Steel	Carbon Steel
e.	Stainless Steel	Stainless Steel

2. All valve diaphragms shall be TFE. Valves shall be furnished with indicating handwheels. No packing glands will be required. All valves shall have bolted bonnet design and provided with stainless steel bolts and nuts.

3. End connections shall be threaded or flanged where indicated on the Plan.

4. Valves shall be as manufactured by ITT Grinnell or approved equal.

B. Valves 2 1/2-Inch and Larger

1. General

a. Diaphragm valves shall be Tru-Tech Series 100 manufactured by Tru-Tech Industries Inc., Mars, PA.

b. Diaphragm valves shall be used in the following locations and applications in this Contract:

Location	Fluid Medium	Operator
Preliminary Treatment Bldg.	1% to 4% Grit Slurry	Handwheel or Chainwheel
Equalization Tank Pipe Gallery	Screened and Degritted Sewage	Electric Actuator For Automatic Control
Equalization Tank Pipe Gallery	Screened and Degritted Sewage	2" Operating Nut with Shaft Extension and Floor Stand for Manual Control

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2. Equipment

a. Construction: The diaphragm valve shall consist of a body, diaphragm and geared handwheel operator, assembled and tested as a unit and ready for field installation.

b. Main Valve

(1) Valve Body – shall be straight thru style of ductile iron or cast iron conforming to ASTM A536, Gr. 65-45-12 or A126 Class B, with flanges drilled per ANSI B16.5 Class 150/125. The valve shall provide a substantially undiminished flow path along the axis of the valve when the diaphragm is in the full open position. It shall be of the compact design conforming to ASME/ANSI B16.10 Class 125 cast iron and Class 150 cast steel, so consequently interchangeable with most solid wedge, double disc, and resilient wedge gate valves as well as short pattern eccentric plug and ball valves.

(2) Body as standard shall be powder epoxy coated inside and out for maximum corrosion protection.

(3) For all valves used in the grit slurry application, the body shall be completely lined with natural rubber for superior abrasion resistance.

(4) Diaphragm shall be molded around a cast metal inset and shall be double studded to the compressor to positively prevent pull-out under severe operation conditions.

(5) Diaphragm shall be soft rubber for the grit applications and neoprene for the other applications.

(6) A thrust bearing (ball or roller type) shall be furnished for ease of operation.

(7) Operating diaphragm shall completely isolate all the mechanical working parts from the pipe fluid.

(8) Diaphragm shall seal bubble tight and no packing glands are permitted, to insure 0% fugitive emissions.

(9) A grease fitting shall be furnished to lubricate the operating mechanism without disassembling the valve.

(10) All wearing mechanical parts shall be able to be removed and replaced without removing the valve body from the line.

(11) The valve shall be of the rising stem type with protective closure and visual indication of whether the valve is open or closed. When a 2-inch operating nut is used, the nut shall be non-rising.

(12) The gear operator shall utilize acme threads capable of providing a minimum of 10,000 cycles at full rated line pressure.

(13) Valve to be compatible with a sealed vacuum system, up to 27 inches of mercury at sea level.

(14) All bonnet bolts shall be 316 stainless steel.

(15) All unlined valve bodies and all operators are coated inside and out with a hybrid flex/epoxy powder formulated for maximum chemical as well as weather resistance.

(16) Plastic lined valves are furnished with bodies completely encapsulated with the latest state of the art fusion bonded liner. Each valve body lining is spark tested in wetted areas to insure lining thickness and integrity.

3. Function

a. The diaphragm valve shall function to provide maximum flow in the open position, throttle in the intermediate position and shut-off bubble tight in the closed position and have smooth, easy operation even after months of non-use.

4. Equalization Tank Automatic Drain Valve

a. The valve shall comply with the above specification and be provided with an electric operated actuator. The actuator shall receive a 4-20mA signal from the set point controller specified in Section 11500, paragraph 2.03 for positioning and the actuator shall provide a 4-20mA position signal back to the controller.

b. The valve shall be 8-inch in size and shall be used to control the draining rate from the equalization tanks at a maximum constant rate of 1400 gpm and a minimum constant rate of 700 gpm at a maximum head differential of 18 feet. The manufacturer shall provide a flow or C_v vs. percent open curve for the valve. The valve shall control the flowrate without hunting and seeking.

c. The electric valve actuator shall be mounted on the valve by the valve manufacturer and tested prior to shipment.

d. Actuator

(1) General

The valve actuator shall be suitable for use on a 120 Volt, One phase, 60 Hz power supply and shall incorporate motor, integral reversing contactor, local control facilities (open/close and remote/off/local) and terminals for remote control and indication connections. The actuator must provide a local display, visible from 6-ft., of the position of the valve accurate to 1%, with or without main power. The local display shall operate for at least 30 days in an unpowered state. Selection of maintained or push-to-run control for both the local and remote open/close operation shall be provided and it shall be possible to reverse valve travel without the necessity of stopping the actuator.

(2) Actuator Sizing

The actuators shall be sized to guarantee gate closure during maximum differential pressure conditions. The safety margin of motor power available for seating and unseating the gates shall be sufficient to ensure torque switch trip at maximum valve torque with the supply voltage 10% below nominal. The electric motor shall be Class H insulated with a time rating of at least 30 minutes at 40C degrees.

(3) Actuator Requirements

The actuator as a minimum shall have the following capabilities to protect the actuator and the attached sluice and slide gates:

(a) Integral two-digit local position indication with battery backup to show gate position during power outage

(b) Instant Motor Reversal Protection

(c) Torque Switch Hammer Protection

(d) Jammed Gate Protection to prevent distortion of stem

(e) Voltage Spike Protection

(f) Electronic Torque and Position Sensing with Data Logging capabilities to assist in preventative maintenance. Data shall include torque profile, number of operations, position status, control status and statistics.

(g) Self Diagnostics and data logger shall be accessible without removal of any actuator covers. Access will be through an infrared interface compatible with PDA's and notebook computers. Interrogation software shall be supplied free of charge to plant personnel.

(4) Torque and Turns Limitation

Torque and turns limitation to be adjustable. Position setting range 0.5 to 100,000 turns with resolution to 15 degrees of actuator output. Torque shall be sensed electronically and adjustable from 40% to 100% of actuator rated output. The actual operating torque shall be displayed in a split screen display during actuator movement. It shall be possible to carry out the setting of the torque and turns limitation without removing any covers via and infrared setting tool.

(5) Remote Valve Position/Actuator Status Indication

In the event of a power failure, the discrete contacts must continue to supply remote position feedback and maintain interlock capabilities. The discrete contacts must be updated at once, even when the power supply is not present. Four contacts shall be provided which can be selected to indicate any position of the gate with each contact selectable as normally open or normally closed. The contacts shall be rated at 5A, 250V AC, 30V DC. As an alternative to providing gate position, any of the four above contacts shall be selectable to signal one of the following:

(a) Valve Open or Closed

(b) Valve Moving (Continuous or Pulsing)

(c) Motor Tripped on Torque in Mid-Travel

(d) Motor Stalled

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(e) Actuator Being Operated by Handwheel

(f) Actuator in local control

(6) Enclosure

Actuator shall be 'O' ring sealed, watertight NEMA 6 (21 ft. of water for 72 hours). NEMA 6 rating shall not be dependent on any special conduit. If the actuator does not use a separate watertight terminal compartment watertight conduit shall be required.

(7) Manufacturer

The local actuator representative shall have factory-trained personnel available to make any required field adjustments and provide training to local plant personnel. All the actuators supplied on the project shall have the features listed above and be made by the same manufacturer. The actuators shall be Rotork 'IQ' Mark 2 Series or approved equal.

2.12 GLOBE AND ANGLE VALVES (1/4" TO 2 1/2")

A. Globe and Angle Valves shall be union bonnet, screw end with interchangeable and regrindable seats and discs. The valves shall have minimum ratings 200 lb. SP and 400 WOG.

B. Materials of construction shall be as follows:

	Item	Material
1.	Body & Bonnet	ASTM B61 Steam Bronze
2.	Disc & Seat	A276 Stainless Steel Type 420F
3.	Stem	ASTM B371 Stemalloy
4.	Packing	Kevlar

C. Globe Valves shall be Lunkenheimer FIG. 73-PS or equal. Angle Valves shall be Lunkenheimer FIG 17-PS.

2.13 NEEDLE VALVES (1/4" TO 1")

A. Needle Valves shall be used where close flow regulation is required. Body style shall be either globe or angle type with threaded ends. The valves shall have minimum pressure ratings of 200 lb. SP and 400 WOG. Valve shall be repackable under pressure.

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B. Materials of construction shall be as follows:

	Item	Material
1.	Body & Bonnet	ASTM B61 Bronze
2.	Disc & Stem	ASTM B371 Alloy
3.	Packing	Kevlar

C. Needle Valves shall be Lunkenheimer FIG. 906-BS or 907-BS or Stockham B-64 or B-264.

2.14 SOLENOID VALVES

A. Solenoid Valves shall be in all respects suitable for the service specified or required and unless indicated otherwise shall be normally closed. The valves shall be of completely watertight, packless construction with a forged brass valve body, Buna N valve seat, and stainless steel internal parts. The coil, suitable for continuous duty, shall have high temperature resistant insulation and shall be suitable for operation on 120 V, single phase, 60 Hz service, unless otherwise noted. When submitting working drawings of solenoid valves for approval, the Contractor shall submit full operating data such as line size, orifice size, Cv flow factor, maximum and minimum pressure differentials and flow rate. The valves shall be Series 8200, Type 4, as manufactured by Asco, or approved equal.

2.15 CURB STOP AND CORPORATION STOPS

A. Curb stops and Corporation Stops shall have body, key, stem washer and nut constructed of bronze alloy. Stops shall be in compliance with the latest AWWA Standards. The stops shall be precision fitted and shall have individually lapped ground key stops. Each valve shall be air pressurized under water by the manufacturer to insure a tight shutoff. Corporation stops shall be Model 4701-22 and curb stops shall be 6100T as manufactured by McDonald Mfg. Co. or approved equal.

2.16 OPERATORS

A. All manually operated valves shall be provided with an Operator, which, unless otherwise shown or specified, shall be a handwheel. The operator shall be designed so that the maximum force required to crack a valve shall be 50 pounds and the maximum force required to operate a valve shall be 25 pounds.

B. All valves 4" or larger with operator centerlines 6'-0" or more off the floor shall be provided with chain wheels, as required, and chains. Chains shall extend to within 4'-0" of the floor.

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2.17 EXTENSION STEMS AND GUIDES

A. Where shown or specified, the Contractor shall furnish and install necessary extension stems, stem guides, and supporting brackets. Stem guides and brackets shall be adjustable and designed to suit field conditions. Stem shall be of an approved steel where not submerged, and of silicon bronze or AISI Type 304 stainless steel where submerged, and brackets shall be of cast iron with bronze or stainless steel bushings, bolts, and nuts. All stems shall have intermediate supports if more than eight feet long, spaced not more than eight feet apart.

2.18 VALVE BOXES AND COVER

A. A Valve Box and Cover shall be furnished and installed over each buried valve and curb stop. The valve box and cover shall be of the three piece adjustable type, and shall be the standard valve box, of the required length, as manufactured by Mueller Co. or approved equal. For buried valves, the valve box shall be 5 1/4" shaft Buffalo type H-10357, and for curb stops 2 1/2" shaft Buffalo type H-10346. The covers for the boxes shall be of the "Stay Put" type with the letter "S" cast thereon in raised letters where used on sewage and sludge lines, and "W" where used on water and utility water lines. Base size and extension piece length shall be as required for each individual size of valve and depth of bury. Extension rods and rings shall be provided on all valve boxes.

B. All buried gate valves three inch through twelve inch requiring a valve box alignment device (VBAD). The device shall be of HDPE and colored white. It shall be furnished in two pieces that will lock together under the operating nut without requiring the removal of the op nut. The device shall not affect the operation of the valve. No one-piece device will be accepted. The device shall be the BOXLOK as manufactured by Almar Molded Products, Inc., or approved equal.

2.19 TAPPING SLEEVES AND VALVES

A. The Contractor shall furnish and install where indicated on the plans a tapping sleeve and valve. Prior to ordering the sleeve, the Contractor shall test excavate at the location of the proposed wet tap and determine the existing pipe's exact location, depth, outside diameter, ovality and material of construction.

B. The tapping sleeve shall be U.S. Pipe Mechanical Joint Tapping Sleeve fabricated from ductile iron. The sleeve ends shall be standard mechanical joints. The sleeve shall be mechanically attached to the main with no caulking required. Fabricated steel sleeves or iron body sleeves using O-ring seals or gaskets are not acceptable. The sleeve shall meet the following requirements.

1. 200 psig maximum working pressure

2. Outlet flange with dimensions and drilling that comply with ANSI B16.1, Class 125 and with MSS SP-60

3. A 3/4" test plug provided on sleeve body

4. Coated inside and out with asphalt tar varnish

C. The tapping valve shall be U.S. Pipe Metroseal 250 resilient seated gate valve. The valve shall be manufactured and tested to the requirements of AWWA Standard C509-87 and C500-86 as applicable for a design working pressure of 250 psi and a test pressure of 500 psi. The pressure rating shall be cast on the outside of the valve.

In addition to the requirements of the AWWA Standards, the valve shall meet the following supplementary specifications.

1. Valve body and bonnet shall be coated on all exterior and interior surfaces with a fusion coated epoxy conforming to the requirements of AWWA Standard for Protective Coatings for Valves and Hydrants C550-81. Manufacturer shall certify that the coating will conform to the following sections of the Standard:

   a. Section 2 - Materials. Relating to suitability of the coating for use in a potable water system.

   b. Section 3 - Coated Sample Testing. Relating to dis-bondment or blistering and impact damage.

2. Body, bonnet and gate must be ductile iron.

3. The valve shall be designed so that during operation, or cycling, of the valve, there is no friction or abrasion or rubbing together of gate and body that can wear away any rubber or epoxy and expose bare iron. Valve manufacturer shall provide certification from an independent testing laboratory that its valve can operate through 1000 cycles of operation at 250 psi unbalanced closing pressure and flow to open discharge without causing damage to any of the epoxy coating on body and gate and rubber coating on gate. Manufacturer shall also certify that interior epoxy coating is holiday-free.

4. Gate shall be completely covered with rubber over all interior and exterior ferrous surfaces. The rubber shall be securely bonded to the gate body, including the part which houses the stem nut. The stem hole through the gate shall be full opening, top to bottom.

5. The interior of the valve body shall be free of pockets or ledges where sediment or debris can collect.

6. O-ring stem seal shall be replaceable with the valve under pressure in the full-open position.

7. The tapping valve shall be furnished with the tapping flange having a raised face or lip designed to engage the corresponding recess in the tapping sleeve flange in accordance with MSS SP60. Tapping valves without the raised face on the tapping flange are not permitted since they do not assure the proper alignment required to prevent damage by a misaligned shell cutter. The interior of the waterway in the body shall be full opening and capable of passing a full sized shell cutter equal to the nominal diameter of the valve.

D. Installation

1. The Contractor shall excavate the area around and adjacent to the pipe in accordance with the recommendations of the supplier of the tapping machine.

2. The tapping of the pipe shall be performed only by a contractor regularly engaged in this type of specialty work.

3. The sleeve and valve shall be installed as follows:

a. Clean the pipe thoroughly, especially in the area where the gaskets will seal.

b. Block back half of sleeve under pipe so side flanges face up.

c. Lubricate side flange O-ring gaskets, (pipe joint lubricant may be used) and lay them in the side flange grooves so an equal length of gasket extends beyond each end.

d. Place outlet half on top and bolt both halves together. Tighten side flange bolts from the center out, until iron to iron contact is obtained between the side flanges. If iron to iron contact cannot be obtained, there is an obstruction which must be removed before proceeding further. (Old pit cast pipe may have an irregular surface.) Final bolt torque should be 80-90 foot pounds.

e. With a sharp knife, cut away the excess gasket material, leaving approximately 1/8" protruding evenly into the mechanical joint gasket seat.

f. Lubricate and install the proper thickness mechanical joint gaskets for the pipe. Install the split follower rings. The parting lines of the sleeve, the mechanical joint gasket and the split follower ring should not coincide. Install bolts and nuts hand tight.

g. Rotate the sleeve to final position and tighten mechanical joint bolts alternately in pairs 180° apart to 75-90 foot pounds torque. (This torque can be attained by an average man using a 10" long wrench.)

h. Install valve, and support as required and as recommended in ANSI/AWWA C600. Install permanent concrete blocking under the valve and temporary blocking under the tapping machine. Pressure test assembly through 3/8" pipe tap on sleeve with the valve closed prior to marking the tap.

i. Install concrete thrust block and fill the entire trench with 2A modified stone.

2.20 SELF-CLEANING STRAINER

A. General

1. One (1) automatic, Self-Cleaning Strainer and Control System shall be installed on the discharge of the proposed utility water pump piping as shown on the Plans. The Strainer shall be Model ORG-040-LS with Controller Model OMNITROL 400 as manufactured by Orival, Inc., Englewood, NJ.

2. The filter shall have 4" 150# flanged inlet and outlet connections for filtering up to 350 gpm. The filter shall consist of a stainless steel fine screen, with a minimum screen area of 120 $in.^2$ and shall have 400-micron screen openings. Headloss through the clean screen shall not exceed 3 psi @ 350 gpm.

B. Automatic Self-Cleaning Rinse Cycle

1. The filter shall be completely self-cleaning, and the cleaning cycle shall be powered by line pressure only. No external pneumatic or electric motors are required, and continuous system flow shall be maintained during the rinse cycle.

2. A rinse cycle shall be initiated by the control system based on differential pressure, or by timer or by local manual action. A dirt collecting assembly shall sweep the entire screen area to remove accumulated particles and send them to a waste drain through a single 1" rinse valve.

C. Control System

1. The control system shall consist of a microprocessor-based controller housed in a water resistant enclosure, a differential pressure switch factory preset for 7 psig and a 1/8" N/O 3-way solenoid valve.

2. The controller shall operate on either 115VAC or 230VAC, 60 Hz single phase, and the voltage is selectable by the user.

3. The controller shall provide an LED to indicate filter mode Filtering, Rinsing or has a High DP that normal rinsing cannot reduce.

4. The solenoid valve shall include an LED to signify that its coil is energized, when illuminated.

2.21 POST HYDRANTS

A. General

1. Post Type Hydrants shall comply, where applicable, to AWWA Standard C-502, latest revision. Post Hydrants shall be of the compression type, with the main valve opening against the pressure and closing with the pressure. The main valve opening shall be 2 ¼" diameter Post Hydrants shall be of a dry barrel design.

B. Rating

1. Post Hydrants shall be rated at 150 psi water working pressure, tested at 300 pounds hydrostatic for structural soundness in the following manner: 300 pound hydrostatic test supplied from the inlet side, first with the main valve open for the testing of the drain valves and hydrant barrel.

C. End Configurations

1. Hydrants shall be connected to the main by a 3" mechanical joint shoe. Mechanical joint shoes shall be fitted with strapping lugs.

D. Design

1. Hydrants shall be constructed of ASTM A-126 cast iron. The main valve facing the hydrant shall be made of rubber.

2. The bottom stem threads of the main valve rods shall be fitted with a bronze acorn nut, or suitable means, for sealing the threads away from the water.

3. Changes in size or shape of the waterway shall be accomplished by means of easy curves. Exclusive of the main valve opening, the net area of the waterway of the barrel and the foot piece at the smallest part shall not be less than 120% of that of the net opening of the main valve, except for hydrants with 2" barrels.

4. Hose nozzles shall be threaded and screwed into the nozzle section and then mechanically locked to prevent turning.

5. The hose cap shall be individually chained to the hydrant.

6. The hydrant shall be so designed that when it is in place, no excavation will be required to remove the main valve and movable parts of the drain valve. Further, the hydrants shall be of the type that can be extended without excavating.

7. The operating threads of the hydrant shall be so designed as to avoid the working of any iron or steel parts against either iron or steel. The operating stem and operating nut threads shall be square or acme type.

8. Bonnet shall be weather proof, free draining, and of a type that will maintain the operating mechanism in readiness for use under freezing conditions.

9. The operating nut shall be provided with a convenient means to afford lubrication to insure ease of operating and the prevention of wear and corrosion. Hydrants shall be of dry barrel type. Hydrant shoe shall have two positive acting non-corrodible drain valves that shall drain the hydrant completely by opening when the main valve is closed, and also to close tightly when the main valve is open.

10. All like parts of hydrants of the same size and model produced by the same manufacturer shall be inter-changeable.

11. Threads on hose nozzles shall be National Standard.

12. Operating nuts and cap nuts shall conform to National Standard.

13. Bury shall be four (4') feet measuring depth from grade line to bottom of connecting pipe. The centerline of the nozzle shall be 19" ± above finished grade.

14. Hydrants shall be supplied with a 1-1½" hose nozzle. The Post Hydrant shall be M&H Style 133 or equal.

E. COATING

1. The inside of all hydrants shall be coated in accordance with AWWA Standards except for bronze and machined surfaces. Exterior on hydrant nozzle section shall be painted Fire Hydrant Red (or as specified).

2. Hydrant shoes shall have protective, thermosealing epoxy coating applied inside and out before assembly. Prior to application of coating, shoes shall be mechanically and chemically cleaned in compliance with SSPC Standards SP-5 and SP-8. Average dry film thickness of 3 mils shall be applied on interior and exterior surfaces of hydrant shoe. Coating designation to be M0601 epoxy and conform fully to AWWA C550-81, Section 3.

F. MARKING

1. Hydrants shall be marked with name of manufacturer, year of manufacture, and size.

G. Installation

1. The Contractor shall exercise care in installing hydrants. Any portion of the hydrant damaged by the Contractor shall be replaced by him at no additional cost to the Owner.

2. Hydrants shall be set in accordance with the applicable requirements of AWWA Specifications C 600-64. All work shall be done in a skillful manner by competent mechanics.

3. Hydrants shall be set on a bed of gravel or crushed stone extending the full width of the trench and from the bottom of trench to four (4") inches above drip opening. Hydrants shall be supported against horizontal movement by suitable concrete blocking against trench walls. All gravel shall be of such size as will remain on a ¾" sieve and pass a 2" sieve. All hydrants shall be set plumb and to grade.

4. The Contractor shall perform all the required tests. No backfilling shall be done without prior approval of the Engineer.

PART 3 EXECUTION

3.01 INITIATION OF INSTALLATION

A. Inspection

1. Prior to all work of this Section, the Contractor shall inspect the installation area to see that the installation may properly commence.

2. The Contractor shall verify that the installation can be made in accordance with all pertinent codes and regulations, the original design and the referenced standards.

SECTION 11020

VALVES AND APPURTENANCES

B. Discrepancies

1. In the event that the inspection reveals discrepancies, the Contractor shall notify the Engineer at once.

2. The Contractor shall not proceed with the installation in areas of discrepancy until said discrepancy is fully resolved.

3.02 INSTALLATION

A. General

1. The installation of valves shall be in accordance with the configuration shown on the Contract Drawings and Shop Drawings.

2. Valves shall be installed in accordance with the manufacturer's recommendations.

B. Testing

1. Upon completion of the installation, the Contractor shall operate all valves to show that they operate without binding or strain.

2. The pipelines in which valves are installed shall be filled with water and pressurized to the design pressure to demonstrate that the installed valves do not leak.

3. The Contractor shall correct any valve deficiencies as indicated by failure of the above tests.

3.03 PAINTING

A. All valves shall be painted with the same painting as the pipeline of which they are a part.

3.04 SIGNS

A. Each yard hydrant, wall hydrant, hose bibb, and hose valves on ends of chlorinated effluent water lines shall have a legible sign, of size approved by the Engineer, attached thereto with the words "NON-POTABLE WATER, DO NOT DRINK" lettered thereon.

SECTION 11020

VALVES AND APPURTENANCES

3.05 VALVE IDENTIFICATION

A. Each valve shall have a 2" stainless steel octagon tag with black filled characters and a stainless steel chain provided. The lettering code system shall be provided by the Owner. Valve tags shall be as manufactured by Seton Name Plate Company, New Haven, Connecticut.

**** END OF SECTION ****

SECTION 11030

PUMPING EQUIPMENT - GENERAL

PART 1 GENERAL

1.01 SCOPE

A. The work covered by this Section consists of furnishing all labor, equipment, supplies and materials and performing all work necessary for the installation of the pumping equipment, in place and ready for operation, in accordance with the details shown on the Drawings, and as hereinafter specified.

1.02 QUALITY OF MATERIAL

A. Material used in the manufacture of the equipment shall be of the best quality used for the purpose in commercial practice. Material shall be free from all defects and imperfections that might affect the serviceability of the finished product.

B. The equipment supplied under this Specification shall be essentially the standard product of the manufacturer, so that prompt and continuing service and delivery of spare parts may be secured.

1.03 SAFETY REQUIREMENTS

A. All gears, chains, couplings, projecting set screws, keys and similar rotating or reciprocating parts shall be protected in accordance with American Standards Association Safety Code for Mechanical Power-Transmission Apparatus B15.1-1953 (R1958).

1.04 DRAWINGS AND DETAILS

A. The Contract Drawings, insofar as they relate to pump and piping layout, are general and may be modified as required for the installation of the equipment specified herein, subject to approval of the Engineer. As soon as practicable, after award of contract, the Contractor shall furnish the Engineer a detailed wiring diagram, and in addition, a detailed drawing showing any necessary changes in the piping arrangement shown on the Drawings. The Drawings will be examined only for general design, general dimensions and apparent suitability and will be approved or returned for the changes desired. Such approval will not relieve the Contractor of the responsibility for furnishing equipment which will satisfactorily perform under the conditions specified.

1.05 DESCRIPTION OF EQUIPMENT

A. The Contractor shall furnish a complete description of all equipment offered under this Specification, including catalogs, cuts and pertinent engineering data, and preliminary certified performance curves based on laboratory tests of existing similar pumps. The curves shall show the capacity, head, efficiency and brake horsepower throughout the head and capacity range.

SECTION 11030

PUMPING EQUIPMENT - GENERAL

1.06 PAINTING

A. The equipment furnished under this Section of the Specifications shall receive one (1) shop coat of paint compatible with the coatings specified in SECTION 09900. The field painting shall be applied in accordance with the provisions of SECTION 09900, PAINTING.

1.07 SPARE PARTS, TOOLS AND INSTRUCTIONS

A. Tools: All necessary special wrenches and plugs for maintenance and repair of the pumps shall be furnished.

B. Parts List and Instruction Manual: Printed instructions relating to proper maintenance and repair, and parts list indicating the various parts by name, number and diagram shall be furnished in duplicate with the pumping unit.

C. Spare Parts: The Contractor shall furnish in triplicate to the Engineer, a complete list of parts and supplies for each different item of equipment installed, and a list of parts and supplies that are recommended by the manufacturer to assure efficient operation of the equipment.

D. The Contractor shall provide each pump installed with enough oil and grease for lubrication purposes during twelve (12) months of continuous operation, and one (1) box of packing or mechanical seals and one (1) set of shaft bearings for each pump furnished.

1.08 FOUNDATIONS

A. Pump Bases shall be constructed of Class A concrete to dimensions required to suit pump bedplate. Foundation bolts, as furnished by pump manufacturer, shall be installed by the Contractor, in proper position during the placement of the concrete.

B. Grout, where used in setting pumps on bases shall be non-shrink grout, Embeco 636 Grout (Formerly LL-636), by Master Builders, Philadelphia, PA, or approved equal.

1.09 PUMP CHARACTERISTIC CURVES

A. The Contractor shall furnish for approval, prior to shipment, certified characteristic curves prepared by the pump manufacturer showing results of tests for capacities, heads, efficiencies and brake horsepower throughout the entire range of the pumps being furnished. Each pump shall also be given a hydrostatic test for 150% working pressure before shipment.

SECTION 11030

PUMPING EQUIPMENT - GENERAL

1.10 NAME PLATE

A. A corrosion-resistant name plate shall be attached to each pump in a conspicuous place. The following information shall be plainly marked on the name plate: (1) name and address of pump manufacturer; (2) speed; (3) capacity and head at design point; (4) required horsepower; and (5) serial number, model number and such other information as the manufacturer may consider necessary for complete identification.

1.11 DATA SHEETS

A. Data sheets supplying the following information as appropriate for each unit of pumping equipment shall be submitted to the Engineer.

1. Name of Manufacturer
2. Type of pump
3. Number of stages and speed
4. Diameter of impeller
5. Sizes of suction and discharge
6. Type of bearing
7. Type of thrust bearing
8. Shut-off pressure
9. Impeller material
10. Diameter of shaft
11. Does pump have impeller and casing wearing rings?
12. Design capacity and head
13. Make and type of electric motor
14. Horsepower at 40oC. ambient temperature
15. Type of motor bearings
16. Net weight of complete unit
17. Guaranteed KWH consumption per 1000 gallons pumped against the total head.

SECTION 11030

PUMPING EQUIPMENT - GENERAL

1.12 EQUIPMENT DELIVERY, STORAGE, HANDLING

A. General

1. During shipment all equipment shall be braced and protected from any distortion or damage; any such distortion or damage shall be basis for rejection of the equipment.

B. Miscellaneous Parts

1. Any parts shipped separately from the largest pieces shall be contained in cartons and labeled in a manner which will assure convenient access to equipment at the storage location.

PART 2 PRODUCTS

2.01 GENERAL

A. The construction of all pumping equipment shall be in accordance with the specifications set forth in each Specification Section describing specific pumping equipment.

B. Anchor Bolts

1. Anchor bolts installed in nonsubmerged conditions (cadmium plated steel) or submerged conditions (Type 304 stainless steel), shall be furnished by the equipment manufacturer and shall be of ample size and strength for the purpose intended.

2. Anchor bolts shall be complete with nuts and sleeves and shall be of sufficient length to permit proper embedment in the foundation concrete.

2.02 CODES

A. The pumping unit shall be designed and constructed in complete accordance with the latest edition and revision of all applicable codes and regulations including the following:

1. Pressure Casings - ASME Boiler & Pressure Vessel Code, SECTION VIII, Unfired Pressure Vessels.

2. Flanges, Tapped Openings & Bosses for Pipe Threads - American Standard for Pipe Flanges and Flanged Fittings, ANSI B16.5.

3. Pipe Threads - American Standards for Pipe Threads, ANSI B2.1.

4. Screw & Bolt Threads - ANSI Standards

SECTION 11030

PUMPING EQUIPMENT - GENERAL

5. Motors - NEMA Standards

6. Materials - ANSI or ASTM Specifications

7. Tests - Standards of the Hydraulic Institute for Centrifugal or Rotary Pumps

PART 3 EXECUTION

3.01 INITIATION OF INSTALLATION

A. Inspection

1. Prior to all work of this SECTION, the Contractor shall inspect the installation areas to see that the installation may properly commence.

2. The Contractor shall verify that the installation can be made in accordance with all pertinent codes and regulations, the original design, and the referenced standards.

B. Discrepancies

1. In the event that the inspection reveals discrepancies, the Contractor shall notify the Engineer at once.

2. The Contractor shall not proceed with the installation in areas of discrepancy until said discrepancy is fully resolved.

3.02 INSTALLATION

A. General

1. The installation of pumping equipment shall be in accordance with the configuration shown on the Plans, manufacturer's templates, shop drawings and the applicable sections of the Contract Documents.

2. For pumps other than submersible sewage pumps with automatic discharge connection, the pumping equipment shall be installed in accordance with the standards of the Hydraulic Institute.

3. The anchor bolts shall be installed within a pipe sleeve to allow for adjustment. The I.D. of the sleeve shall be 2 1/2 to three times the bolt diameter. The bolt head, buried in the concrete, shall be held under the sleeve with a washer or bolt may have a hooked end to anchor into the concrete.

4. Equipment bases shall be leveled and bolted down against metal shims and the space between the base and the concrete shall be filled with the specified type of grout. Prior to grouting the baseplates of the pump and drive unit, the equipment alignment shall be checked and realigned if required.

5. After vertical pumps and motors have been aligned and tested in the field, motors shall be dowelled to motor bases and pumps shall be dowelled to the pump bases. Grout shall be installed within the pump base so that no water is retained within the base and it is channeled to a single outlet point.

6. Pumps shall be supplied with grout holes in the baseplates to allow greater reliability of grout filling beneath baseplates.

7. Piping

   a. All piping must be supported independently of the pump. The piping should always "line up" naturally with the pump flanges. NEVER DRAW THE PIPING INTO PLACE BY USE OF FORCE AT THE FLANGED SUCTION AND DISCHARGE CONNECTIONS OF THE PUMP, AS THIS MAY IMPOSE DANGEROUS STRAINS ON THE UNIT AND CAUSE MISALIGNMENT BETWEEN PUMP AND DRIVER.

   b. Piping must not be connected to the pump until the grout has thoroughly hardened and the foundation bolts, as well as driver and pump hold down bolts, have been tightened. Connect suction and discharge piping to the pump. Rotate pump shaft several times by hand to be sure there is no binding and that all parts are free. Recheck alignment. NOTE: On non-metallic pumps, use gaskets which are suitable for the flanges. Teflon envelope style is recommended.

3.03 HYDROSTATIC TESTS

A. Each pump shall be tested hydrostatically in the manufacturer's shop at a pressure equal to not less than twice the specified shutoff head or 150 pounds per square inch, whichever is greater.

B. The casings and heads shall show no undue deflection or sign of weakness under the test pressure and there shall be no sweating through porous metal or leakage through cracks or other defects.

SECTION 11030

PUMPING EQUIPMENT - GENERAL

3.04 FIELD RUNNING TESTS

A. Each pump assembly with its drive unit and auxiliary equipment shall be field tested after installation.

B. The field running tests shall not be started on any pump assembly until the manufacturer's representative is present and has completed the inspection for proper assembly, erection and alignment. The manufacturer shall supply certification of installation according to his specifications, in accordance with SECTION 11000, MECHANICAL EQUIPMENT - GENERAL - "Equipment Installation."

C. The field running tests shall be conducted by the Contractor and the manufacturer's representative and witnessed by the Engineer, and shall demonstrate compliance with the following over the full range of operating conditions:

1. That the unit has been properly installed and has no mechanical defects

2. That the unit is in proper alignment and has been properly connected

3. That the unit is free from undue vibration

4. That the unit is free from overloading or overheating

D. Test Connections and Test

1. The Contractor shall furnish for each unit suitable test connections, and fittings as hereinafter specified and shall furnish all labor, materials, and temporary instruments or equipment required to carry out satisfactorily the tests which shall fully demonstrate the capability of each unit to meet the requirements of the service for which it is to be used and demonstrate that the efficiencies area at least equal to the specified requirements.

2. Each pump shall be provided with the following fittings of bronze:

a. Petcocks for air release

b. Suction and discharge gages and gage connections and shutoffs for gages. Gages shall be at as specified in SECTION 11420.

c. Pitometer test connections, including corporation cocks on the discharge as near the body of the pumps as possible and with threads suitable for connection to standard pitometer instruments.

SECTION 11030

PUMPING EQUIPMENT - GENERAL

3.05 ACCEPTANCE

A. Final acceptance of pump assemblies shall depend upon the following:

1. Satisfactory performance in shop tests as demonstrated by the shop hydrostatic test results and the shop performance test results.

2. Satisfactory performance in the field running tests as demonstrated by its functioning within the system.

3. The Contractor's correction of any and all deficiencies.

3.06 FINAL ADJUSTMENT

A. The pump assembly shall be subjected to 24 hours of operation over the course of several days, and the alignment of the assembly shall be checked and adjusted if required. The assembly shall then be "pinned" to the base plate.

**** END OF SECTION ****

SECTION 11040

SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

PART 1 GENERAL

1.01 SCOPE

A. Description of Work

1. Provide all labor, material and equipment to furnish and install two (2) non-clog, submersible, centrifugal sewage pumps and accessory items in the seven (7') foot square wet well and one (1) wall-mounted Pump Control Panel in the Generator/Control Building for the Saw Mill Road Pump Station.

B. Work and Components Included (But Not Limited to the Following Items):

1. Pump and Motor
2. Power and Control Cables
3. Lifting Cable and Lifting Bail
4. Discharge Base
5. Guide Brackets and Cable
6. Anchor Bolts
7. Alarm Devices
8. Spare Parts
9. Pump Controller
10. Level Transducer
11. Floats

C. Related Work Specified Elsewhere

1. The provisions of this Section are a direct extension of SECTION 11000, MECHANICAL EQUIPMENT - GENERAL, and although set forth only once within the Specification, shall apply equally to this Section.
2. Piping, SECTION 11010 - PIPING AND SEWERS
3. Valves, SECTION 11020 - VALVES AND APPURTENANCES
4. Pumps, SECTION 11030 - PUMPING EQUIPMENT - GENERAL

SECTION 11040

SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

1.02 QUALIFICATIONS

A. Manufacture

1. It is the intention of the Specifications to cover minimum acceptable quality equipment for a complete installation with the exception of the motor controls, electrical work and piping requirements.

2. Part numbers or trade names are used in this Specification only to facilitate the description of the equipment and in no way implies that equal equipment of other manufacturers cannot be used.

B. Manufacturer's Experience

1. The Equipment Manufacturer shall have not less than five (5) successful years experience in the design and operation of equipment of the type specified at ten (10) installations.

C. Acceptable Manufacturers

1. Subject to compliance with the Contract Documents, the following are acceptable:

a. Raw Sewage Pump

(1) KSB - Model KRT F100-316/164X
(2) Fairbanks-Morse 4" 5435MV

2. All products, whether named as "acceptable" or proposed as "equal", must fully comply with these Specifications. If the standard product cannot be modified to meet the Specifications, then each non-compliant item must be listed as an exception in the space provided on the Bid form.

1.03 SUBMITTALS

A. Operating instructions, manuals and shop drawings shall be submitted in accordance with SECTION 11000, MECHANICAL EQUIPMENT - GENERAL.

1.04 EQUIPMENT MANUFACTURER'S SERVICE REPRESENTATIVE

A. General

1. See SECTION 11000, MECHANICAL EQUIPMENT - GENERAL, for complete requirements for the Manufacturer's Service Representative.

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SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

B. Installation Assistance

1. Provide for installation assistance for the equipment supplied.

C. Equipment Start-Up Assistance

1. Provide for equipment start-up and/or process stabilization and balancing assistance for the equipment supplied.

D. Operating Instructions and/or Operator Training

1. Provide for one (1) eight (8) hour working day total to instruct Plant Operators for the equipment supplied. The training period will be coordinated by the Owner with overall plant training.

1.05 GUARANTEE AND WARRANTY

A. The equipment shall be unconditionally guaranteed to meet or exceed the design criteria detailed in Part 2 of this Specification.

B. The manufacturer shall warrant the pump to be free of defects in workmanship and materials for a period of at least five (5) years from the date the pump has been placed into service. A copy of the warranty shall be provided with the submittal information required under Paragraph 1.03 above.

C. The pump manufacturer shall warrant the guide cable/guide rail system (including guide rails, cables and brackets) to the Owner against defects in workmanship and materials for a period of ten (10) years under normal use and service.

D. Both pump manufacturer warranties shall be in published form, and shall apply to all similar units. A copy of each warranty shall be provided to the Owner at start-up.

1.06 REFERENCED STANDARDS

A. American Iron & Steel Institute (AISI)

B. American Society for Testing and Materials (ASTM)

C. Factory Mutual (FM)

D. Hydraulic Institute Standards for Centrifugal, Rotary, and Recip Pumps (HI)

E. National Fire Protection Agency (NFPA)

F. National Electric Code (NEC)

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SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

G. National Electrical Manufacturers Association (NEMA)

H. Anti-Friction Bearing Manufacturers Association (AFBMA)

I. International Standards Organization (ISO) - ISO9001

PART 2 PRODUCTS

2.01 DESIGN CRITERIA

A. General

1. Each pump shall be complete with base, guide cable, upper guide bracket, and lifting chain. All parts of pumps and motors shall be designed of material suitable for continuous quiet operation at maximum performance without undue strain or overheating and requiring only normal maintenance.

2. The pump shall be capable of handling raw unscreened sewage, stormwater, and other similar solids-laden fluids without clogging. The discharge base and elbow shall be permanently installed in the wet well and connected to the discharge piping. The pump shall connect to the guide cable base automatically when lowered into place by a single guide system. There shall be no need for personnel to enter the wet well to remove or reinstall the pump. Connecting of the pumping unit to the guide system base shall be accomplished by a simple linear downward motion of the pump. The sliding guide bracket shall not be an integral part of the pumping unit and shall be a standard ANSI or metric flange dimension so that the base is interchangeable with other pumps and not limited to a specific pump. Sealing of the pump to the guide system base shall be accomplished by a profile gasket mechanically held in place between the pump and the sliding guide bracket. Final connection shall result in zero leakage between the pump and discharge connection flange. No portion of the pump shall bear directly on the floor of the sump. The pump with its appurtenances and cable shall be capable of continuous submergence to a depth of 65 feet.

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SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

B. PERFORMANCE REQUIREMENTS

1. The pump shall be suitable for and meet or exceed each of the following performance specifications:

a. Raw Sewage Pump

(1) Primary Operating Condition

Material to be pumped	Raw Sewage
Capacity, gpm	120
Total Dynamic Head, feet	118
Efficiency, min. %	29
Shutoff head, feet (min.)	124
Inlet diameter, inches	4
Discharge diameter, inches	4
Brake horsepower, bhp	12.3
Motor horsepower, hp @ 104°F	20
Motor speed, rpm	1760

(2) Second Operating Condition

Capacity, gpm	200
Total Dynamic Head, feet	116
Efficiency, min. %	37
Brake horsepower, bhp	15.8

(3) Air Binding

Air binding of the pump is a possibility from entrapment in the pump volute. Gas bubbles in the pump volute resulting from the freefall of sewage into the wet well or from vortexing in the wet well when the pump is operating close to its shutoff level. The pump manufacturer shall provide a 3/4" tapped hole with a plug on the nozzle of each pump that could be used, if required, as a vent. If vortexing of the wet well is a problem, the pump manufacturer/ contractor shall furnish and install fiberglass anti-vortex baffles as required.

2.02 MATERIALS OF CONSTRUCTION

A. Pump Case: Cast Iron, ASTM A48, Class 35B

B. Motor Housing: Cast Iron, ASTM A48, Class 35B

C. Impeller: Cast Iron, ASTM A48, Class 35B

D. Intermediate Housing (Backplate): Cast Iron, ASTM A48, Class 35B

E. Discharge Base Elbow: Cast Iron, ASTM A48, Class 35B

F. Pump/Motor Shaft: Carbon Steel, ASTM A576, Gr. 1045

G. Shaft Sleeve: Stainless Steel, ASTM A276, Type 420

H. Wear Ring, case: Cast Iron, ASTM A48, minimum 200 Brinell

I. O-Rings: Nitrile Rubber (NBR)

J. Fasteners: Stainless Steel, ASTM A276, Type 316Ti

K. Lower Seal Faces: Silicon Carbide/Silicon Carbide

L. Upper Seal Faces: Hard Metal stationary/Carbon rotating

M. Guide Cables: Stainless Steel, ASTM A276, Type 316

N. Lifting Cable: Stainless Steel, ASTM A276, Type 316

O. Oil-all uses (seal lubrication, etc.): Ecologically safe, paraffin base

P. Power/Control Cable Jacket: Neoprene

Q. Lifting Bail: Stainless Steel, ASTM A276, Type 316

2.03 MAJOR COMPONENTS

A. Furnish major components (pump case, impeller, intermediate housing, motor housing) of cast material as specified with smooth surfaces devoid of blow holes and other irregularities.

B. All major castings shall be produced in the pump manufacturer's own foundry, under the manufacturer's direct supervision.

2.04 IMPELLER AND WEAR RINGS

A. The impeller shall be of gray cast iron, Class 35B, dynamically balanced, semi-open, non-clogging design capable of handling soils, fibrous materials, heavy sludge and other matter found in wastewater. The impeller shall have a back shroud only with back pump-out vanes to equalize axial thrust, and curved blades that protrude into the pump casing for maximum efficiency. The impeller will create a vortex that carries solids through the pump casing without passing through the blades. Impeller shall be capable of passing a minimum 3" diameter solid.

SECTION 11040

SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

B. Statically and dynamically balance the impeller.

C. Provide hard metal wear rings on case, of material and Brinell hardness specified in Section 2.02, to insure maximum pump/impeller life and continuing high efficiencies.

D. Do not use soft metals (i.e. bronze, 304 or 316 stainless) or elastomers as wear ring material as these are incompatible with the grit contaminate expected in the pumpage.

2.05 SHAFT

A. Provide common pump-motor shaft of sufficient size to transmit full driver output with a maximum deflection of 0.002 inches measured at the lower mechanical seal.

B. Machine the shaft of carbon steel (for maximum strength and motor efficiency) and isolate the shaft from the pumped media with a replaceable Type 420 stainless steel shaft sleeve under the lower mechanical seal. A carbon steel shaft without a stainless steel sleeve is not acceptable.

2.06 SHAFT SEAL

A. Provide two totally independent mechanical shaft seals, installed in tandem, each with its own independent spring system acting in a common direction.

B. Install the upper seal in an oil-filled chamber with drain and inspection plug (with positive anti-leak seal) for easy access from external to the pump.

C. Provide seals requiring neither routine maintenance nor adjustment, but capable of being easily inspected and replaced.

D. Provide seals which are non-proprietary in design, with replacements available from a source other than the pump manufacturer.

E. Do not provide seals with the following characteristics: conventional double mechanical seals with single or multiple springs acting in opposed direction; cartridge-type mechanical seals; seals with face materials other than those specified; seals using the impeller hub as a mounting surface.

2.07 BEARINGS

A. Furnish upper and lower bearings, single row (preferred) or double row as needed to provide a minimum B10 life of 50,000 hours at each of the specified design points. The manufacturer shall provide a certification and calculations for the expected bearing lives.

B. Provide sealed and permanently lubricated bearings.

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SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

2.08 MOTOR

A. Provide a motor which is squirrel cage, induction in design, housed in a completely watertight and air filled chamber, with a minimum 1.10 service factor and capable of 20 starts per hour. The motor shall be suitable for use on a variable frequency drive.

B. Insulate the motor stator with, at minimum, Class F insulation rated for 311 Degrees F.

C. Provide temperature protection and seal leak detection as specified in Sections 2.10 and 2.11.

D. Provide adequately rated motor with sufficient surface area for ambient only cooling without the need for oil circulation systems or submergence (cooling) jackets that circulate pumped media for motor cooling.

E. Provide motors that are capable of operating for extended periods in a dry mode without damage to motor or seals.

F. Provide motors that are designed, rated and warranted for continuous operation on VFD service.

G. Do not provide motors which contain in excess of two (2) gallons of oil (combined total for cooling and seals), or which contain other than ecologically safe paraffin base oil.

H. Provide motor that is FM listed for use in Class I Division 1 Groups C & D hazardous locations as defined by the National Electric Code for the raw sewage pump.

I. Provide a motor that has minimum efficiencies of 89% at full load and 75% full load.

J. Provide a stainless steel lifting bail attached to the top of the motor to be used for removal of the pump from the wet well.

2.09 POWER CABLE

A. Provide 40 ft. of power/control cable with each pump.

B. Provide cable suitable for submersible wastewater application, sized in accordance with NEC requirements.

C. Provide cable terminal box on side of motor housing, with cable entry sealed to insure that no entry of moisture is possible into the high-voltage motor terminal area even if the cable is damaged or severed below water level.

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SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

2.10 TEMPERATURE PROTECTION

A. Furnish temperature monitoring thermistors or bimetalics in motor windings for use in conjunction with and supplemental to external motor overload protection.

B. Arrange controls to shut down pump should any of the monitors detect high temperature and automatically reset once motor temperature returns to normal.

C. Set temperature monitors at levels recommended by pump manufacturer.

2.11 SEAL LEAK DETECTION

A. Furnish a monitoring system to signal seal leakage.

B. Provide a sensor in the motor's stator cavity which allows a control panel mounted relay to indicate leakage into the motor. Provide to the pump controller manufacturer the required relays.

C. Provide a stainless steel mechanical float in a separate leakage collection chamber to indicate prior to its penetration of the lower bearing assembly. Provide to the pump controller manufacturer the required relays.

2.12 EQUIPMENT TESTS

A. Tests shall be performed in accordance with the Test Code for Centrifugal Pumps per the Standards of the Hydraulic Institute. Tests shall be performed on the actual assembled pumps to be supplied or on duplicate previously constructed models. Tests shall cover a range from shut-off to a minimum 20% beyond specified design capacity.

B. Conduct test per above specification on all supplied pumps, generating a curve showing actual flow, head, BHP and hydraulic efficiency and submit to Owner for approval prior to shipment of the pump.

2.13 VERIFICATION OF PERFORMANCE

A. Field test the pump after installation to demonstrate satisfactory operation without excessive noise, vibration, cavitation or over-heating.

B. A pump that fails to meet any of the contract specifications will be modified, repaired or replaced at no additional cost to the Owner.

2.14 SPARE PARTS

The following spare parts shall be furnished for each pump:

A. One (1) set of mechanical seals.

B. One (1) complete set of all O-rings and gaskets.

C. One (1) set of upper and lower bearings.

2.15 PUMP CONTROLLER

A. General

1. The pump supplier shall furnish a Duplex Pump Controller and a submerged level transducer for controlling the operation of each pump based on the level in the wet well or tank.

2. The controller shall automatically start and stop the pump based on tank level. The pump shall run at a constant speed.

3. Standard features of the controller shall be as follows:

a. Microprocessor Based
b. Graphic LCD Display
c. 20 Point Linearization
d. 5 Function Keys
e. Isolate 24VDC Sensor Power
f. 4/20MA, 1-5V, 0-5V, 0-10VDC Input
g. 4 Analog Input
h. 4 Analog Output
i. 4 Digital Input
j. 4 Solid State Output
k. 4 Relay Outputs 5 AMP
l. Fully User Programmable in English
m. 'MV Net" Port RS 485 +User Port
n. Displays level in numeric and bar graph forms
o. Displays pump run status
p. Allows full user selection of all system variables
q. Monitors critical alarms (motor over temperature, etc.)
r. Monitors non-critical alarms (seal leak, etc.)
s. Monitors hand off auto selections switch position
t. Monitors pump (VFD) 'run' feedback
u. Provides digital and relay outputs for pump control, level alarm, sensor fail, pump fault and seal leak
v. Provides 4/20MA outputs for VFD speed setting and proportional control
w. Retransmits level signal
x. Provides time and date 'stamped' alarm information
y. Audible and visual alarms
z. Allows simulation of level to exercise pumps or verify operation of setpoints
aa. Records "MAX" and "MIN" process values and a graphic trend chart for trouble shooting
bb. Full diagnostic screen for all I/O

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SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

5. The controller shall be Myriad 'DPC' Duplex Pump Controller as manufactured by Sigma Controls or Micro V-Pac as manufactured by Healy Ruff.

B. Design Features

1. The Controller shall be wall mounted in a Nema 4 enclosure with a three (3) point latch.

2. The Controller shall be microprocessor based with 24 bit signed integer variables and fully user configurable through five front of panel user keys. The Controller shall display all level and alarm information on its graphical, backlit, LCD display with a resolution of 128 x 32 pixels in bitmap form. Process variables and set point information shall be displayed in digital, alpha, bargraph and trend formats.

3. All programmable parameters shall be password protected to prevent unauthorized changes. The password shall be user programmable. An 'on-board' alarm horn shall be user selectable to activate upon alarm conditions and shall be silenced with any key.

4. The following operational parameters shall be user programmable.

   a. Pump Operation – Lead On, Lead Off, Lag On, Lag Off, High Level Alarm On and Off, Low Level Alarm On and Off, Pump on Delay, Pump Off Delay.

   b. Level Display – 4/20mA, 0-5 VDC, 1-5 VDC, 1-10 VDC shall be settable for any numeric value in the input range, six full digits, selectable decimal point, engineering units and update time (filter).

   c. Analog Outputs – 4 analog outputs shall be standard and programmable for retransmission, variable speed minimum and maximum, speed versus level set points as well as engineering values.

   d. Pump Alternation – 3 modes of pump alternation shall be available: alternation off, alternate on pump cycle, alternate on time of day. When time of day is selected the alternate time shall be user programmable.

   e. Trend Screen – A diagnostic trend screen of the process variable shall be standard, trend screen time base shall be selectable over 2 minutes, 2 hours or 12 hours.

   f. Elapsed Time Meters – shall be standard for each pump and shall be operator resettable or automatically resettable at 1,000,000 hours of operation.

g. Peak and Valley Process Values – shall be recorded and shall be resettable by the operator.

C. Operation Monitoring

1. The Pump Controller shall monitor all normal operational conditions common to duplex pump control. These parameters shall be: Pump Run Feedback, Pump Hand Off Auto Selector Position, Motor Overtemperature, Seal Leak, Process Level.

2. The Controller shall provide outputs for control and alarm. For control, the unit shall provide two form 'C' relays and two 4/20mA analog signals for monitoring, it shall provide two analog retransmitted outputs of the process signal (1 scaled and 1 unscaled). Alarm outputs shall be provided for Level (High & Low), General Alarm, Primary Sensor Fail, Pump 1 Fault, Pump 2 Fault and Seal Leak. Each alarm shall be independent of other alarms.

3. The Pump Controller shall include a level simulation screen, which will allow the operator to manually manipulate the level display to confirm the operation of the various set points. The simulate screen shall default to normal operation if left unattended for 30 seconds.

4. The Controller shall be powered from 230/110 VAC or 24 VDC and will provide 100mA of DC excitation output for the level sensor and other external loads.

5. All inputs and outputs shall be optically isolated with common negative. Analog inputs and outputs shall be user selectable for 4/20mA, 0-5 VDC, 1-5 VDC and 0-10 VDC. Output relays shall be single pole double throw (SPDT) rated at 5 amps.

6. A comprehensive diagnostic screen shall be standard, which allows the operator to view the status of all analog and digital outputs in real time.

7. For SCADA and communication purposes the Controller shall contain two RS485 data ports. Controllers shall be able to be connected in a Network and communicate with each other in true peer-to-peer form, with up to 4,000 feet between nodes.

8. It is the intent of this specification that a standard device be supplied that requires no special software, programming or specialized knowledge.

SECTION 11040

SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

2.16 LEVEL SENSOR

A. The Process Level shall be measured by a hydrostatic submersible level specifically designed for use in raw sewage. The level sensor shall be Sigma Controls Series 6100 Submersible Level Sensor. The sensor shall be installed in the 4" PVC stilling well as shown on the Plans.

B. The sensor shall be a 4-20mA, two (2) wire, 15/45 VDC type with its output directly proportional t the measured liquid level over a factory calibrated range of zero to 15 feet of water.

C. The sensor shall be of the solid state head sensing type, suitable for continuous submerged operation and shall be installed in accordance with the manufacturer's directions.

D. The bottom face of the sensor shall be installed 12 inches above the floor at elevation 264.70. The sensor shall be mounted using a stainless steel cable.

E. The sensor housing shall be machined from 316 SS with a 2½ inch diameter Viton convoluted diaphragm clamped between two (2) rings to provide a watertight pressure seal.

F. A silicon oil fill liquid behind the diaphragm shall transmit the sensed pressure to a solid state isolated piezo-resistive pressure transducer which shall convert the sensed pressure to a corresponding electrical value.

G. The sensed pressure shall cause a thin silicon diaphragm to flex, inducing a strain or stress in both the diaphragm and the attached piezo-resistors. Any change in pressure shall result in a change in output reading.

H. Accuracy shall exceed + .5% of FS and both zero and span adjustments shall be available for field calibration.

I. Electrical connection shall be through a custom manufactured heavy wall polyurethane jacketed cable that does not employ a vent tube through which moisture can ingress the electrical housing.

2.17 FLOAT BACKUP SYSTEM

A. Wet well level shall be monitored and controlled by five (5) float switches with intrinsically safe barriers. Each intrinsically safe barrier shall include an input closed LED. Red LEDs shall indicate alarm input closed. Green LEDs shall indicate pump called for float input closed. An amber LED shall indicate stop float input closed.

SECTION 11040

SUBMERSIBLE RAW SEWAGE PUMPS AND CONTROLS

B. Form "C" output contacts shall be provided for high and low level alarm. Normally open contacts shall be provided for pump control. Red LEDs shall be provided to indicate alarm output on and green LEDs shall be provided to indicate pump control output on. Output contacts shall be rated for 10 amps @ 120 VAC.

C. Selector switches shall be provided to select pump sequence (1-2/Auto/2-1), simplex or duplex operation, all pumps start enable on high level. N.O. or N.C. low level float input, alarm flashing or non-flashing outputs.

D. A 0-3 minute adjustable time delay shall be provided to delay the starting of each pump. The lead pump start time delay shall be factory set at 5 seconds. The lag pump start time delay shall be factory set at 10 seconds.

E. A 0-3 minute off delay timer shall be provided to prevent the lead pump from short cycling if the low level and common stop float switch fail to close.

F. All LED, selector switch and timer functions shall be silkscreened on the chassis.

G. Upon main control failure, the back-up control system shall assume all control. When a high level float is activated the back-up controller shall come on line, it will lock-out the primary control until manually reset. A pilot light shall indicate when the back-up control system is operating. Under back-up operating conditions the pumps shall cycle between the common stop float and start lead float. If the level rises to the start lag float the lag pump shall start and run in parallel with the lead pump until the stop float opens. If the level continues to rise the high level float will close, energize the external alarm light, sound the external alarm horn and call for both pumps to start. If the level recedes past the common stop float the low level float shall open, cutout the pumps, energize the external alarm light and sound the external alarm horn. The pumps shall not restart until the level rises and closes the lead pump start float. A horn silence pushbutton shall be provided below the external alarm horn. Pressing the silence pushbutton shall silence the alarm horn and cause the external alarm light to go to a steady on state.

H. Each float shall be Anchor Scientific Inc. Roto-Float SST. Each float shall contain a mercury switch that has been inserted into a 316 S.S. Teflon coated housing and then encapsulated in epoxy. A type WRW bracket, cable weight and clamps for each float shall be provided.

**** END OF SECTION ****

SECTION F

PERMIT PLANS (Bound Separately)

Sheet No.	Title
I-1	Index Plan
1	Saw Mill Road Plan and Profile
2	Harley Road Plan and Profile
3	Harley Road Plan and Profile
4	Harley Road Plan and Profile
5	East Cedarville Road Plan and Profile
6	Schoolhouse Road Plan and Profile
7	Schoolhouse Road Plan and Profile
8	Schoolhouse Road Plan and Profile
9	Brownstone Drive Plan and Profile
10	Brownstone Drive Plan and Profile
11	Earl Drive Plan and Profile
12	Spiece Road Plan and Profile
13	Spiece Road Plan and Profile
14	Spiece Road Plan and Profile
15	Country Lane Plan and Profile
16	Country Lane Plan and Profile
17	East Cedarville Road Plan and Profile
18	East Cedarville Road Plan and Profile
19	East Cedarville Road Plan and Profile
20	Spring House Lane Plan and Profile
21	Spring Creek Lane Plan and Profile
22	Tisa Lane Plan and Profile
23	Buckwalter Road R-O-W Plan and Profile
24	Buckwalter Road R-O-W Plan and Profile
25	Buckwalter Road Plan and Profile
26	Buckwalter Road Plan and Profile
27	Buckwalter / East Cedarville Roads Plan and Profile
DET-1	Sanitary Sewer Details
P-1	Sawmill Road Pump Station Site Plan
P-2	Sawmill Road Pump Station Plan
P-3	Sawmill Road Pump Station Sections
P-4	Sawmill Road Pump Station Sections
P-3	Sawmill Road Pump Station Building Sections, Elevations & Details

DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST REGIONAL OFFICE
2 EAST MAIN STREET
NORRISTOWN, PA. 19401
SOUTHEAST REGIONAL OFFICE
WATER MANAGEMENT & WATERSHED PROGRAMS
MAIN NUMBER: (484) 250-5970
FAX NUMBER (484) 250-5971

*PLEASE CALL THE ABOVE NUMBER IF YOU ENCOUNTER PROBLEMS WITH THIS FAX

TO: BRADY FLAHARTY	FROM: ANDREW HANEIKO
COMPANY: TOWNSHIP ENGINEER	DATE: 09/26/2006
FAX NUMBER: 610-495-5855	TOTAL NO. OF PAGES INCLUDING COVER: 6
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
RE:	YOUR REFERENCE NUMBER:

X- URGENT ☑ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

cc: LHB
GCR

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401
September 7, 2006

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

Mr. Robert Preston, Chairman
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

Re: North Coventry Municipal Authority WWTF
Application No. 1506412
File Type: Permit
East Coventry Township
Chester County

Dear Mr. Preston:

Your permit is enclosed.

You must comply with all Standard and Special Conditions attached to this permit. Construction must be done in accordance with the permit application and all supporting documentation. Please review the permit conditions and the supporting documentation submitted with your application before starting construction.

Enclosed is the "Sewage and Industrial Wastewater Facilities Construction Certification" form. A Pennsylvania-registered Professional Engineer must sign and complete this form prior to startup of the facilities (see Special Conditions). You or your authorized representative must also sign the form. This certification and other post-construction documentation must be submitted to the Department within 30 days following startup of the facilities.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717-787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717-787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717-787-3483) FOR MORE INFORMATION.

If you have any questions, please call Mr. Andrew Haneiko at 484-250-5183.

Sincerely,

Jenifer Fields, P.E.
Regional Manager
Water Management

Enclosures

cc: Mr. William Dingman, P.E.
Operations Section
Mr. Sheckler
Re 30 (joh06wqm)219-10a

3800-PM-WSWM0015 Rev. 6/2004
Permit

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

PERMIT NO. 1506412
AMENDMENT NO.
APS ID 589407
AUTH ID 640789

WATER QUALITY MANAGEMENT PERMIT

A. PERMITTEE (Name and Address): CLIENT ID#: 74504
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

B. PRIMARY FACILITY (Name):
North Coventry Municipal Authority WWTF

C. LOCATION (Municipality, County):
East Coventry Township
Chester County

SITE ID#:
623461

D. **This permit approves the construction of sewerage facilities consisting of:**
Approximately 22,000 LF of 8" gravity sewer, approximately 2,550 LF of 4" force main, approximately 1,890 LF of 2" low pressure force main, and a 10,500 GPD pump station.

Pump Stations: 1	Manure Storage:	Industrial Wastewater/Sewage Treatment Facility:
Design Capacity: 30.6 GPM		Annual Average Flow: _____ MGD
Average Annual Flow: 10,500 GPD	Volume _____ MG	Design Hydraulic Capacity: _____ MGD
	Freeboard: _____ inches	Design Organic Capacity: _____ lb/day

E. APPROVAL GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING:

1. **New Permits:** All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit application dated 07/10/06, its supporting documentation, and addendums dated _____, which are hereby made a part of this permit.

   Amendments: All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit Amendment application dated _____, and its supporting documentation, and addendums dated _____, which are hereby made a part of this amendment.

   Except for any herein approved modifications, all terms, conditions, supporting documentation and addendums approved under Water Quality Management Permit No. _____ shall remain in effect.

   Transfers: Water Quality Management Permit No._____ and conditions, supporting documentation and addendums are also made part of this transfer.

2. **Permit Conditions Relating to sewerage** are attached and made part of this permit.

3. Special Conditions numbered _____ are attached and made part of this permit.

F. THE AUTHORITY GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING FURTHER QUALIFICATIONS:

1. If there is a conflict between the application or its supporting documents and amendments and the attached conditions, the attached conditions shall apply.
2. Failure to comply with the rules and regulations of DEP or with the terms or conditions of this permit shall void the authority given to the permittee by the issuance of this permit
3. This permit is issued pursuant to the Clean Streams Law Act of June 22, 1937, P.L. 1987, as amended 35 P.S. §691.1 *et seq*. Issuance of this permit shall not relieve the permittee of any responsibility under any other law.

PERMIT ISSUED:
September ', 2006

BY: _____
TITLE: Water Management Program Manager

3800-PM-WSWM0015a Rev. 6/2004
Conditions Sewerage

Permit No. 1506412

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

PERMIT CONDITIONS RELATING TO SEWERAGE

For use in Water Quality Management Permits

(Place a √ in the box that applies)

General

☒ 1. Consistent with the Department of Environmental Protection's (DEP) technical guidance document *Conducting Technical Reviews of Water Quality Management Permit Wastewater Treatment Facilities* (DEP ID: 362-2000-007) available on DEP's website at www.dep.state.pa.us. DEP considers the registered Professional Engineer whose seal is affixed to the design documents to be fully responsible for the adequacy of all aspects of the facility design.

☒ 2. The permittee shall adopt and enforce an ordinance requiring the abandonment of privies, cesspools or similar receptacles for human waste and onlot sewage disposal systems on the premises of occupied structures accessible to public sewers. All such structures must be connected to the public sewers.

☐ 3. The outfall sewer or drain shall be extended to the low water mark of the receiving body of water. Where necessary to ensure proper mixing and waste assimilation, an outfall sewer or drain may be extended with appurtenances below the low water mark and into the bed of a navigable stream provided that the permittee has secured an easement, right-of-way, license or lease from DEP in accordance with Section 15 of the Dam Safety and Encroachments Act, the Act of November 26, 1978, P.L. 1375, as amended.

☒ 4. The approval is specifically made contingent on the permittee acquiring all necessary property rights, by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures in, along or across private property with full rights of ingress, egress and regress.

☐ 5. When construction of the approved sewerage facilities is completed and before they are placed in operation, the permittee shall notify DEP in writing so that a DEP representative may inspect the facilities.

☒ 6. If, at any time, the sewerage facilities covered by this permit create a public nuisance, including but not limited to, causing malodors or causing environmental harm to waters of the Commonwealth, DEP may require the permittee to adopt appropriate remedial measures to abate the nuisance or harm.

☐ 7. This permit authorizes the construction and operation of the proposed sewerage facilities until such time as facilities for conveyance and treatment at a more suitable location are installed and capable of receiving and treating the permittee's sewage. Such facilities must be in accordance with the applicable municipal official plan adopted pursuant to Section 5 of the Pennsylvania Sewage Facilities Act, the Act of January 24, 1966, P.L. 1535 as amended. When such municipal sewerage facilities become available, the permittee shall provide for the conveyance of the sewage to these sewerage facilities, abandon the use of these approved facilities and notify DEP accordingly. This permit shall then, upon notice from DEP, terminate and become null and void and shall be relinquished to DEP.

☒ 8. This permit does not relieve the permittee of its obligations to comply with all federal, interstate, state or local laws, ordinances and regulations applicable to the sewerage facilities.

☒ 9. This permit does not give any real or personal property rights or grant any exclusive privileges, nor shall it be construed to grant or confirm any right, easement or interest in, on, to or over any lands which belong to the Commonwealth.

☐ 10. The authority granted by this permit is subject to all effluent requirements, monitoring requirements and other conditions as set forth in NPDES Permit No. **PA**_____ and all subsequent amendments and renewals. No discharge is authorized from these facilities unless approved by an NPDES Permit.

Construction

☐ 11. An Erosion and Sedimentation (E&S) Plan must be developed prior to construction of the permitted facility, pursuant to Title 25 Pa. Code Chapter 102, and implemented during and after the earth disturbance activity.

If the activity involves 5 or more acres of earth disturbance, or from 1 to 5 acres of earth disturbance with a point source discharge to surface waters of the Commonwealth, an NPDES permit for the Discharge of Stormwater Associated with Construction Activity is required.

In addition to the state NPDES permitting requirements, some municipalities, through local ordinances, require the E&S Control Plan to be reviewed and approved by the local County Conservation District office prior to

construction. For specific information regarding E&S control planning approval and NPDES permitting requirements, please contact your local County Conservation District office.

☒ 12. The facilities shall be constructed under the supervision of a Pennsylvania registered Professional Engineer in accordance with the approved reports, plans and specifications.

☒ 13. A Pennsylvania registered Professional Engineer shall certify that construction of the permitted facilities was completed in accordance with the application and design plans submitted to DEP, using "Post Construction Certification" (3800-PM-WSWM0179a). It is the permittee's responsibility to ensure that a Professional Engineer is on-site to provide the necessary oversight and/or inspections to certify the facilities. The certification must be submitted to DEP before the facility is placed in operation. If requested, "as-built" drawings, photographs (if available) and a description of any DEP-approved deviations from the application and design plans must be submitted to DEP within 30 days of certification.

☒ 14. Manhole inverts shall be formed to facilitate the flow of the sewage and to prevent the stranding of sewage solids. The manhole structure shall be built to prevent undue infiltration, entrance of street wash or grit and provide safe access to facilitate manhole maintenance activities.

☒ 15. The local Waterways Conservation Officer of the Pennsylvania Fish and Boat Commission (PFBC) shall be notified when the construction of any stream crossing and/or outfall is started and completed. A written permit must be secured from the PFBC if the use of explosives in any waterways is required and the permittee shall notify the local Waterways Conservation Officer when explosives are to be used.

Operation and Maintenance

☒ 16. The permittee shall maintain records of "as-built" plans showing all the treatment facilities as actually constructed together with facility operation and maintenance (O&M) manuals and any other relevant information that may be required. Upon request, the "as-built" plans and O&M manuals shall be filed with DEP.

☒ 17. The sewers shall have adequate foundation support as soil conditions require. Trenches shall be back-filled to ensure that sewers will have proper structural stability, with minimum settling and adequate protection against breakage. Concrete used in connection with these sewers shall be protected from damage by water, freezing, drying or other harmful conditions until cured.

☐ 18. Stormwater from roofs, foundation drains, basement drains or other sources shall not be admitted directly to the sanitary sewers.

☒ 19. The approved sewers shall be maintained in good condition, kept free of deposits by flushing or other cleaning methods and repaired when necessary.

☐ 20. The sewerage facilities shall be properly operated and maintained to perform as designed.

☒ 21. The attention of the permittee is called to the highly explosive nature of certain gases generated by the digestion of sewage solids when these gases are mixed in proper proportions with air and to the highly toxic character of certain gases arising from such digestion or from sewage in poorly ventilated compartments or sewers. Therefore, at all places throughout the sewerage facilities where hazard of fire, explosion or danger from toxic gases may occur, the permittee shall post conspicuous permanent and legible warnings. The permittee shall instruct all employees concerning the aforesaid hazards, first aid and emergency methods of meeting such hazards and shall make all necessary equipment and material accessible.

☐ 22. An operator certified in accordance with the Water and Wastewater Systems Operator Certification Act of February 21, 2002, 63 P.S. §§1001, *et seq.* shall operate the sewage treatment plant.

☐ 23. The permittee shall properly control any industrial waste discharged into its sewerage system by regulating the rate and quality of such discharge, requiring necessary pretreatment and excluding industrial waste, if necessary, to protect the integrity or operation of the permittee's sewerage system.

☒ 24. There shall be no physical connection between a public water supply system and a sewer or appurtenance to it which would permit the passage of any sewage or polluted water into the potable water supply. No water pipe shall pass through or come in contact with any part of a sewer manhole.

☐ 25. All connections to the approved sanitary sewers must be in accordance with the corrective action plan as contained in the approved Title 25 Pa. Code Chapter 94 Municipal Wasteload Management Annual Report.

☐ 26. Collected screenings, slurries, sludge and other solids shall be handled and disposed of in compliance with Title 25 Pa. Code Chapters 271, 273, 275, 283 and 285 (related to permits and requirements for land filling, land application, incineration and storage of sewage sludge), Federal Regulations 40 CFR 257 and the Federal Clean Water Act and its amendments.

No. 3

Permit No.: 1503417

Only copy available - obtained via PA Department of Environmental Microfiche Search

DEPARTMENT OF ENVIRONMENTAL PROTECTION

ENVIRONMENTAL PROTECTION

START FILE

NAME
DAT

Folder Color: GREEN
File ID#: 351330

BUREAU/DIVISION: DEP/SERO

COUNTY/MUNICIPALITY: Lee

PROGRAM: WATER MANAGEMENT Sewage

CASE NAME: Lee County Sewer Corporation

(DATE)

FILE TYPE: Wetlands

PERMIT #: 36011

NAME:
DATE: 2/1/12

2 East Main Street
Norristown, PA 19401
February 15, 2005

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

Mr. David K. Leinbach, Chairman
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

Re: Coventry Meadows Sewer Extension
SEW 1503417
File Type: Sewage WQM Part II Permit
East Coventry Township
Chester County

Dear Mr. Leinbach:

Your permit is enclosed.

You must comply with all Standard and Special Conditions attached to this Permit. Construction must be done in accordance with the permit application and all supporting documentation. Please review the permit conditions and the supporting documentation submitted with your application before starting construction.

Please take the time to complete the enclosed questionnaire and return it in the enclosed postage-paid return envelope.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457 717-787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717-787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

Mr. David K. Leinbach, Chairman

cc: Mr. Pilecki - Heritage Building Group
Mr. Burkett - Gilmore and Associates, Inc.
Chester County Health Department

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717-787-3483) FOR MORE INFORMATION.

Re (AR04)198-12B

If you have any questions, please call Mr. Ming W. Tsang at 484-250-5128.

Sincerely,

James Newbold, P.E.
Regional Manager
Water Management

Enclosures

cc: Mr. Pilecki - Heritage Building Group
Mr. Burkett - Gilmore and Associates, Inc.
Chester County Health Department
Operations Section
Water Management
Permits Chief
File
Re (AR04)198-12B

DEPARTMENT OF ENVIRONMENTAL PROTECTION

3800-PM-WSWM0016 Rev. 4/2003
Permit

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

PERMIT NO. 1503417
AMENDMENT NO.
APS ID. 517058
AUTH. ID. 546349

WATER QUALITY MANAGEMENT PERMIT

A. PERMITTEE (Name and Address) CLIENT ID# 74504
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

B. PRIMARY FACILITY (Name)
Coventry Meadows Sewer Extension

C. LOCATION (Municipality, County) SITE ID#
East Coventry Township
Chester County
623461

D. This Permit approves the Construction/Operation of Sewerage facilities consisting of:
9,567' of 8" PVC gravity sanitary main.

Pump Stations:
Permitted Capacity: 9,750 GPD

Industrial Wastewater/Sewage Treatment Facility:
Annual Average Flow: MGD
Design Hydraulic Capacity: MGD
Design Organic Capacity: lb. BOD/day

E. APPROVAL GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING:

1. **New Permits:** All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit application dated May 3, 2004, its supporting documentation, and addendums dated ___, which are hereby made a part of this permit.

Amendments: All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit Amendment application dated ____ and its supporting documentation, and addendums dated ____, which are hereby made a part of this amendment.

Except for any herein approved modifications, all terms, conditions, supporting documentation and addendums approved under Water Quality Management Permit No. ____ dated ____ shall remain in effect.

Transfers: Water Quality Management Permit No. ____ dated ____ and conditions, supporting documentation and addendums are also made part of this transfer.

2. **Permit Conditions Relating to Sewerage** are attached and made part of this permit.

3. Special Conditions numbered N/A are attached and made part of this permit.

F. THE AUTHORITY GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING FURTHER QUALIFICATIONS:

1. If there is a conflict between the application or its supporting documents and amendments and the attached conditions, the attached conditions shall apply.

2. Failure to comply with the rules and regulations of DEP or with the terms or conditions of this permit shall void the authority given to the permittee by the issuance of this permit.

3. This permit is issued pursuant to the Clean Streams Law Act of June 22, 1937, P.L. 1987, as amended 35 P.S. §691.1 *et seq.*, and/or the Dam Safety and Encroachments Act of November 26, 1978, P.L. 1375, as amended, 32 P.S. §693.1 *et seq.* Issuance of this permit shall not relieve the permittee of any responsibility under any other law.

PERMIT ISSUED: February 15, 2005

BY: [signature]

TITLE: Water Management Program Manager

Re 30 (AR04)198-12

EP-BWQ-0; Rev. 10/95

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER MANAGEMENT PROGRAM

For Department Use Only

INTERNAL REVIEW, RECOMMENDATIONS AND FACT SHEET

PRIMARY FACILITY	East Coventry Township	PROJECT LOCATION	East Coventry Township Chester County	APPLICATION NUMBER	1503417

BRIEF DESCRIPTION OF PROJECT AND DISCUSSION (Use Additional Sheets If Necessary)

The application request approval for the construction and operation of a sewage disposal via an extension of the gravity collection and conveyance system from East Coventry Township/Coventry Meadows Pump Station within the Coventry Meadows Residential Development with 379-unit townhouses and one single-family lot on a total of 75 acres.

The average daily flow to the pump station (PS-3) will be 9,750 gpd. The pump station will convey the flow via a force main through the Coventry Meadows project and the adjacent Heather Glen Residential Development, to a gravity interceptor being constructed within School House Road and Ellis Woods Road. The gravity interceptor will convey the wastewater from the East Coventry Township North Service Area – Phase I Sewer System along an unnamed tributary (to the Schuylkill River), to the North Coventry Township Authority Sewage Treatment Plant.

Sewage will be collected via 9,567 feet of 8" PVC gravity sanitary main.

Act 14 Notification:

Chester County - February 24, 2004
East Coventry Township - February 24, 2004

RECOMMENDATION AND ACTION

Approve - Issue By Region	Approve - Issue By Central Office	Refuse	Signature	Date
☒	☐	☐	Reviewing Staff	1/13/05
☒	☐	☐	Permits Section Chief	2/9/05
☒	☐	☐	Regional Manager/Water Management	2/14/05

PERMIT CONDITIONS:

1. STANDARD - (Sewerage 04/03): 1, 2, 4, 6, 8, 9, 11, 13, 16-20, 22-24

2. SPECIAL (Use Additional Sheets If Necessary) - N/A

3800-PM-WSWM0083 Rev. 1/2001
Conditions Sewerage

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

PERMIT CONDITIONS RELATING TO SEWERAGE

For use in Water Quality Management Permits

(Place a check in the box that applies)

General

☒ 1 Consistent with the Department of Environmental Protection's (DEP) technical guidance document *Conducting Technical Reviews of Water Quality Management Permit Wastewater Treatment Facilities*, DEP ID: 362-2000-007 available on DEP's website at www.dep.state.pa.us, DEP did not conduct a detailed technical review of this application. DEP considers the registered Professional Engineer whose seal is affixed to the design documents to be fully responsible for the adequacy of all aspects of the facility design.

☒ 2 The permittee shall adopt and enforce an ordinance requiring the abandonment of privies, cesspools or similar receptacles for human waste and onlot sewage disposal systems on the premises of occupied structures accessible to public sewers. All such structures must be connected to the public sewers.

☐ 3 The outfall sewer or drain shall be extended to the low water mark of the receiving body of water. Where necessary to ensure proper mixing and waste assimilation, an outfall sewer or drain may be extended with appurtenances below the low water mark and into the bed of a navigable stream provided that the permittee has secured an easement, right-of-way, license or lease from DEP in accordance with Section 15 of the Dam Safety and Encroachments Act, the Act of November 26, 1978, P.L. 1375, as amended.

☒ 4 The approval is specifically made contingent on the permittee acquiring all necessary property rights, by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures in, along, or across private property with full rights of ingress, egress and regress.

☐ 5 When construction of the approved sewerage facilities is completed and before they are placed in operation, the permittee shall notify DEP in writing so that a DEP representative may inspect the facilities.

☒ 6 If at any time, the sewerage facilities covered by this permit create a public nuisance, including but not limited to, causing malodors or causing environmental harm to waters of the Commonwealth, DEP may require the permittee to adopt appropriate remedial measures to abate the nuisance or harm.

☐ 7 This permit authorizes the construction and operation of the proposed sewerage facilities until such time as facilities for conveyance and treatment at a more suitable location are installed and capable of receiving and treating the permittee's sewage. Such facilities must be in accordance with the applicable municipal official plan adopted pursuant to Section 5 of the Pennsylvania Sewage Facilities Act, the Act of January 24, 1966, P.L. 1535 as amended. When such municipal sewerage facilities become available, the permittee shall provide for the conveyance of the sewage to these sewerage facilities, abandon the use of these approved facilities and notify DEP accordingly. This permit shall then, upon notice from DEP, terminate and become null and void, and shall be relinquished to DEP.

☒ 8 This permit does not relieve the permittee of its obligations to comply with all federal, interstate, state or local laws, ordinances and regulations applicable to the sewerage facilities.

☒ 9 This permit does not give any real or personal property rights or grant any exclusive privileges, nor shall it be construed to grant or confirm any right, easement or interest in, on, to, or over any lands which belong to the Commonwealth.

☐ 10 The authority granted by this permit is subject to all effluent requirements, monitoring requirements, and other conditions as set forth in NPDES Permit No. PA_____ and all subsequent amendments and renewals. No discharge is authorized from these facilities unless approved by an NPDES Permit.

Construction

☒ 11. The facilities shall be constructed under the supervision of a Pennsylvania registered Professional Engineer in accordance with the approved reports, plans and specifications. Any deviations from approved plans or specifications so revised should, therefore, be submitted well in advance of any construction work, which will be affected by such changes to the permit sufficient time for review and approval. Structural revisions or other minor changes not affecting capacities, flows or operations will be permitted during construction without approval. Upon request, "as-built drawings" clearly showing such alterations shall be filed with DEP at the completion of the work.

3800-PM-WSM0100 (rev. 1/2003)
Conditions Sewerage

[ ] 12. A Pennsylvania registered Professional Engineer shall certify that construction of the permitted facilities was completed in accordance with the Part II application and design plans submitted to DEP, using the enclosed "Sewage and Industrial Wastewater Facilities Construction Certification." It is the permittee's responsibility to ensure that a Professional Engineer is on site to provide the necessary oversight and/or inspections to certify the facilities. The facilities may not be placed into operation until the Professional Engineer completes the certification. The certification must be submitted to DEP within 30 days following startup of the facilities, along with as built drawings, photographs (if available), and a description of any DEP-approved deviations from the application and design plans.

[X] 13. Manhole inverts shall be formed to facilitate the flow of the sewage and to prevent the stranding of sewage solids. The whole manhole structure shall be built to prevent undue infiltration, entrance of street wash or grit and provide safe access to facilitate manhole maintenance activities.

[ ] 14. The local Waterways Conservation Officer of the Pennsylvania Fish and Boat Commission (PBC) shall be notified when the construction of any stream crossing and/or outfall is started and completed. A written permit must be secured from the PBC if the use of explosives in any waterways is required and the permittee shall notify the local Waterways Conservation Officer when explosives are to be used.

Operation and Maintenance

[ ] 15. The permittee shall maintain facility operation and maintenance (O&M) manuals at the facility and ensure proper O&M of the permitted facility. The permittee shall file the O&M manuals with DEP upon request.

[X] 16. The sewers shall have adequate foundation support as soil conditions require. Trenches shall be back-filled to ensure that sewers will have proper structural stability, with minimum settling and adequate protection against breakage. Concrete used in connection with these sewers shall be protected from damage by water, freezing, drying or other harmful conditions until cured.

[X] 17. Stormwater from roofs, foundation drains, basement drains or other sources shall not be admitted directly to the sanitary sewers.

[X] 18. The approved sewers shall be maintained in good condition, kept free of deposits by flushing or other cleaning methods and repaired when necessary.

[X] 19. The sewerage facilities shall be properly maintained so that the facility will perform as designed.

[X] 20. The attention of the permittee is called to the highly explosive nature of certain gases generated by the digestion of sewage solids when these gases are mixed in proper proportions with air and to the highly toxic character of certain gases arising from such digestion or from sewage in poorly ventilated compartments or sewers. Therefore, at all places throughout the sewerage facilities where hazard of fire, explosion or danger from toxic gases may occur, the permittee shall post conspicuous permanent and legible warnings. The permittee shall instruct all employees concerning the aforesaid hazards, first aid and emergency methods of meeting such hazards and shall make all necessary equipment and material accessible.

[ ] 21. An operator certified in accordance with the Water and Wastewater Systems Operator Certification Act of February 21, 2002, 63 P.S. §§ 1001, *et seq.* shall operate the sewage treatment plant.

[X] 22. The permittee shall properly control any industrial waste discharged into its sewerage system by regulating the rate and quality of such discharge, requiring necessary pretreatment and excluding industrial waste, if necessary, to protect the integrity or operation of the permittee's sewerage system.

[X] 23. There shall be no physical connection between a public water supply system and a sewer or appurtenance to it which would permit the passage of any sewage or polluted water into the potable water supply. No water pipe shall pass through or come in contact with any part of a sewer manhole.

[X] 24. All connections to the approved sanitary sewers must be in accordance with the corrective action plan as contained in the approved Chapter 94 Municipal Wasteload Management Annual Report.

[ ] 25. Collected screenings, slurries, sludge and other solids shall be handled and disposed of in compliance with 25 Pa Code, Chapters 271, 273, 275, 283 and 285 (related to permits and requirements for land filling, land application, incineration and storage of sewage sludge), Federal Regulations 40 CFR 257 and the Federal Clean Water Act and its amendments.

Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

MAY 04 2005

Mr. David Leinbach, Chairman
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

Re: East Coventry Township Sewers to North Coventry Municipal Authority WWTP
SEW 1503417
File Type: Permit
East Coventry Township
Chester County

Dear Mr. Leinbach:

Your permit is enclosed.

You must comply with all Standard and Special Conditions attached to this Permit. Construction must be done in accordance with the permit application and all supporting documentation. Please review the permit conditions and the supporting documentation submitted with your application before starting construction.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa. C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717-787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717-787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

Enclosures

cc: Mr. Flaharty – ARRO Consulting, Inc.
Chester County Health Department

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717-787-3483) FOR MORE INFORMATION.

Re 30 (GJE03)281-11A

If you have any questions, please call Ms. Jennifer Cunningham at 484-250-5181.

Sincerely,

James Newbold, P.E.
Regional Manager
Water Management

Enclosures

cc: Mr. Flaharty – ARRO Consulting, Inc.
Chester County Health Department
Operations Section
Water Management
Permits Chief
File
Re 30 (GJE03)281-11A

BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

AMENDMENT NO.

WATER QUALITY MANAGEMENT PERMIT

APS ID. 496713

AUTH. ID. 519756

Permitted Capacity: I. 510,000 / II. 5,775 / III. 106,575 IV. 21,788 GPDs

Annual Average Flow: MGD

Design Hydraulic Capacity: MGD

A. PERMITTEE (Name and Address) CLIENT ID#: 7 504

East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

THIS PERMIT IS SUBJECT TO THE FOLLOWING:

1. All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit application dated 7/30/2003, its supporting documentation, and addendums dated _____, which are hereby made a part of this permit.

2. All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit Amendment application dated _____ and its supporting documentation, and addendums dated _____, which are hereby made a part of this permit.

Except for any herein approved modifications, all terms, conditions, supporting documentation and addendums approved under Water Quality Management Permit No. _____ dated _____ shall remain in effect.

B. PRIMARY FACILITY (Name): lb BOD/day

East Coventry Township Sewers to North Coventry Municipal Authority WWTP

C. LOCATION (Municipality, County)

East Coventry Township
Chester County

SITE ID#: 623461

D. This permit approves the construction/operation of sewerage facilities consisting of:

Four pumping stations, approximately 10, 500 feet of force main and 7,000 feet of gravity interceptor. The system will serve five new subdivisions and a few existing homes.

Special Conditions numbered _____ are attached and made part of this permit.

THE AUTHORITY GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING FURTHER QUALIFICATIONS:

Pump Stations: I - IV

Permitted Capacity: I. 510,000 / II. 5,775 / III. 106,575 / IV. 21,788 GPDs

This permit is issued pursuant to the Clean Streams Law Act of June 22, 1937, P.L. 1987, as amended 35 P.S. §691.1 et seq., and/or the Dam Safety and Encroachments Act of November 26, 1978, P.L. 1375, as amended, 32 P.S. §693.1 et seq. Issuance of this permit shall not relieve the permittee of any responsibility under any other law.

Industrial Wastewater/Sewage Treatment Facility:

Annual Average Flow: N/A MGD

Design Hydraulic Capacity: N/A MGD

Design Organic Capacity: N/A lb BOD/day

E. APPROVAL GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING:

1. **New Permits:** All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit application dated 7/30/2003, its supporting documentation, and addendums dated _____, which are hereby made a part of this permit.

Amendments: All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit Amendment application dated _____ and its supporting documentation, and addendums dated _____, which are hereby made a part of this amendment.

Except for any herein approved modifications, all terms, conditions, supporting documentation and addendums approved under Water Quality Management Permit No. _____ dated _____ shall remain in effect.

Transfers: Water Quality Management Permit No. _____ dated _____ and conditions, supporting documentation and addendums are also made part of this transfer.

2. **Permit Conditions Relating to Sewerage/Erosion and Sediment Control** are attached and made part of this permit.

3. Special Conditions numbered _____ are attached and made part of this permit.

F. THE AUTHORITY GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING FURTHER QUALIFICATIONS:

1. If there is a conflict between the application or its supporting documents and amendments and the attached conditions, the attached conditions shall apply.

2. Failure to comply with the rules and regulations of DEP or with the terms or conditions of this permit shall void the authority given to the permittee by the issuance of this permit.

3. This permit is issued pursuant to the Clean Streams Law Act of June 22, 1937, P.L. 1987, as amended 35 P.S. §691.1 *et seq.*, and/or the Dam Safety and Encroachments Act of November 26, 1978, P.L. 1375, as amended, 32 P.S. §693.1 *et seq.* Issuance of this permit shall not relieve the permittee of any responsibility under any other law.

PERMIT ISSUED: March 8, 2004

BY: _____

TITLE: Water Management Program Manager

Re 30 (GJE03)281-11

ER-BWQ-43; Rev. 10/95

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER MANAGEMENT PROGRAM

For Department Use Only

INTERNAL REVIEW, RECOMMENDATIONS AND FACT SHEET

PRIMARY FACILITY: Coventry Mun. Auth WWTP | **PROJECT LOCATION:** East Coventry Twp. Chester County | **APPLICATION NUMBER:** 1503417

BRIEF DESCRIPTION OF PROJECT AND DISCUSSION (Use Additional Sheets If Necessary)

The applicant is requesting approval for four pump stations and associated collection system, to serve five new subdivisions as well as a few existing homes. This would include approximately 10,500 feet of force main and approximately 7,000 feet of gravity interceptor. The sewage will be conveyed to the North Coventry Municipal Authority WWTP.

All of the four pumping stations will be using submersible centrifugal wastewater pumps in precast concrete wet wells. The pump stations will also be equipped with sewage grinders. All of the stations will also have a separate meter vault with a magnetic flow meter. The control buildings will house emergency generators, various control panels, and other electrical items.

Pump Station I will be located near the North Coventry Municipal Authority WWTP. This station will be designed to handle an average daily flow of 0.510 MGD. There will be three equally sized variable speed submersible pumps. The stations will also be equipped with an activated carbon odor control system.

Pump Station II will be located in the proposed Wood Crest Estates subdivision. The pump station will be designed to handle an average daily flow of 5,775 GPD. This pump station will also have an activated carbon odor control system. There will be two equally sized constant speed submersible pumps.

Pump Station III will be located in the proposed Coventry Meadows subdivision. This site will also include a portion of the force main proposed for this project. The pumping station will be designed for an average daily flow of 106,575 GPD. There will be two equally sized constant speed submersible pumps.

CONTINUED

RECOMMENDATION AND ACTION

Approve - Issue By Region	Approve - Issue By Central Office	Refuse	Signature	Date
☒	☐	☐	Reviewing Staff Jennifer Cunningham	10-9-03
☒	☐	☐	Permits Section Chief Kathleen Dudley	10/16/03
☑	☐	☐	Regional Manager/Water Management	3/5/04

PERMIT CONDITIONS:

1. STANDARD -

2. SPECIAL (Use Additional Sheets If Necessary) -

INTERNAL REVIEW AND RECOMMENDATIONS - PAGE 2

East Coventry Twp Sewers to North Coventry Mun. Auth. WWTP **East Coventry Township Chester County** **Application No. 1503417**

(Cont'd from previous page)

Pump Station IV will be located in the proposed Creekview subdivision. The pumping station will be designed for an average daily flow of 21,788 GPD. There will be two equally sized constant speed submersible pumps at this site, along with activated carbon odor control.

The gravity interceptor is designed to handle the entire 0.510 MGD of sewage generated by all five subdivisions.

East Coventry Township received written notification on January 9, 2003 by Certified Mail regarding this application to the Department.

North Coventry Township received written notification on January 9, 2003 by Certified Mail regarding this application to the Department.

Chester County Health Department received written notification on January 10, 2003 by Certified Mail regarding this application to the Department.

Re 30 (GJE03)281-11B

3800-PM-WSWM0018a Rev. 4/2003
Conditions Erosion and Sediment Control

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

PERMIT CONDITIONS RELATING TO EROSION AND SEDIMENT CONTROL

For use in Water Quality Management Permits

(Place a √ in the box that applies)

General

☒ 1. By approval of the plans for which this permit is issued, neither the Department of Environmental Protection (DEP) nor the Commonwealth of Pennsylvania assumes any responsibility for the feasibility of the plans or the measures and facilities to be constructed thereunder.

☒ 2. If at any time the erosion and sediment control activities undertaken pursuant to this permit or other activities carried out at the location is causing or contributing to pollution of the waters of the Commonwealth, the permittee shall forthwith adopt such remedial measures as are acceptable to DEP.

☒ 3. This permit does not authorize any earth disturbance controlled or regulated by an ordinance enacted by a local municipality. Additional permits must be secured from local municipalities where earthmoving activities are covered by such local ordinances.

☒ 4. When the erosion and sediment control measures and facilities approved in this permit are completed, the permittee shall notify the County Conservation District or the DEP regional office so that a final inspection of the measures and facilities may be made.

☒ 5. The permittee shall be responsible for assuring that permit conditions are implemented in accordance with 25 Pa. Code Chapter 102.

☒ 6. The permittee shall comply with the Individual or General NPDES Permit for Stormwater Discharges Associated with Construction Activities issued by DEP or the County Conservation District.

Construction

☒ 7. The erosion control measures and facilities shall be constructed under the supervision and competent inspection of an individual trained and experienced in erosion control, in accordance with the plans, design and other data herein approved or amended and with the conditions of this permit. Control facilities shall be inspected and maintained to ensure effective control.

☒ 8. At least seven days before earthmoving will begin, the permittee, by telephone or certified mail, shall notify DEP or its designee of the date for beginning of construction and invite the County Conservation District representative to attend a pre-construction conference. The permittee shall have his erosion control plan available at the activity site at all times.

☒ 9. All earthmoving activities shall be undertaken in the manner set forth in the erosion and sediment control plan identified with this permit. Revisions to the plan shall be pre-approved by DEP or the County Conservation District.

☒ 10. All slopes, channels, ditches or any disturbed area shall be stabilized as soon as possible after the final grade or final earthmoving has been completed. Where it is not possible to permanently stabilize a disturbed area immediately after the final earthmoving has been completed or where the activity ceases for more than 20 days, interim stabilization measures shall be implemented promptly.

Operation and Maintenance

☒ 11. No stormwater, sewage or other wastes not specifically approved in this permit, shall be admitted to the erosion and sediment control facilities for which this permit is issued.

☒ 12. Sediment shall at no time be permitted to accumulate in sedimentation basins to a depth that may limit storage capacity or interfere with the facility's settling efficiency. The sediment removed shall be handled and disposed of in a manner that will not create pollution problems so that every reasonable and practical precaution is taken to prevent the said material from reaching the waters of the Commonwealth.

☒ 13. Upon completion of the project, all disturbed areas shall be stabilized to prevent accelerated erosion. Any erosion and sediment control facility required or necessary to protect areas from erosion during the stabilization period shall be maintained until stabilization is completed. Upon completion of stabilization, all unnecessary or unusable control measures and facilities shall be removed, the areas shall be graded and the soils shall be stabilized.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

PERMIT CONDITIONS RELATING TO SEWERAGE

For use in Water Quality Management Permits

(Place a √ in the box that applies)

General

☒ 1. Consistent with the Department of Environmental Protection's (DEP) technical guidance document *Conducting Technical Reviews of Water Quality Management Permit Wastewater Treatment Facilities*, DEP ID: 362-2000-007 available on DEP's website at www.dep.state.pa.us, DEP did not conduct a detailed technical review of this application. DEP considers the registered Professional Engineer whose seal is affixed to the design documents to be fully responsible for the adequacy of all aspects of the facility design.

☒ 2. The permittee shall adopt and enforce an ordinance requiring the abandonment of privies, cesspools or similar receptacles for human waste and onlot sewage disposal systems on the premises of occupied structures accessible to public sewers. All such structures must be connected to the public sewers.

☐ 3. The outfall sewer or drain shall be extended to the low water mark of the receiving body of water. Where necessary to ensure proper mixing and waste assimilation, an outfall sewer or drain may be extended with appurtenances below the low water mark and into the bed of a navigable stream provided that the permittee has secured an easement, right-of-way, license or lease from DEP in accordance with Section 15 of the Dam Safety and Encroachments Act, the Act of November 26, 1978, P.L. 1375, as amended.

☒ 4. The approval is specifically made contingent on the permittee acquiring all necessary property rights, by easement or otherwise, providing for the satisfactory construction, operation, maintenance and replacement of all sewers or sewerage structures in, along, or across private property with full rights of ingress, egress and regress.

☐ 5. When construction of the approved sewerage facilities is completed and before they are placed in operation, the permittee shall notify DEP in writing so that a DEP representative may inspect the facilities.

☒ 6. If, at any time, the sewerage facilities covered by this permit create a public nuisance, including but not limited to, causing malodors or causing environmental harm to waters of the Commonwealth, DEP may require the permittee to adopt appropriate remedial measures to abate the nuisance or harm.

☐ 7. This permit authorizes the construction and operation of the proposed sewerage facilities until such time as facilities for conveyance and treatment at a more suitable location are installed and capable of receiving and treating the permittee's sewage. Such facilities must be in accordance with the applicable municipal official plan adopted pursuant to Section 5 of the Pennsylvania Sewage Facilities Act, the Act of January 24, 1966, P.L. 1535 as amended. When such municipal sewerage facilities become available, the permittee shall provide for the conveyance of the sewage to these sewerage facilities, abandon the use of these approved facilities and notify DEP accordingly. This permit shall then, upon notice from DEP, terminate and become null and void, and shall be relinquished to DEP.

☒ 8. This permit does not relieve the permittee of its obligations to comply with all federal, interstate, state or local laws, ordinances and regulations applicable to the sewerage facilities.

☒ 9. This permit does not give any real or personal property rights or grant any exclusive privileges, nor shall it be construed to grant or confirm any right, easement or interest in, on, to, or over any lands which belong to the Commonwealth.

☐ 10. The authority granted by this permit is subject to all effluent requirements, monitoring requirements, and other conditions as set forth in NPDES Permit No. PA_____ and all subsequent amendments and renewals. No discharge is authorized from these facilities unless approved by an NPDES Permit.

Construction

☒ 11. The facilities shall be constructed under the supervision of a Pennsylvania registered Professional Engineer in accordance with the approved reports, plans and specifications. Any deviations from approved plans or specifications so revised should, therefore, be submitted well in advance of any construction work, which will be affected by such changes to the permit sufficient time for review and approval. Structural revisions or other minor changes not affecting capacities, flows or operations will be permitted during construction without approval. Upon request, "as-built drawings" clearly showing such alterations shall be filed with DEP at the completion of the work.

☐ 12. A Pennsylvania registered Professional Engineer shall certify that construction of the permitted facilities was completed in accordance with the Part II application and design plans submitted to DEP, using the enclosed "Sewage and Industrial Wastewater Facilities Construction Certification." It is the permittee's responsibility to ensure that a Professional Engineer is on-site to provide the necessary oversight and/or inspections to certify the facilities. The facilities may not be placed into operation until the Professional Engineer completes the certification. The certification must be submitted to DEP within 30 days following startup of the facilities, along with as-built drawings, photographs (if available), and a description of any DEP-approved deviations from the application and design plans.

☒ 13. Manhole inverts shall be formed to facilitate the flow of the sewage and to prevent the stranding of sewage solids. The whole manhole structure shall be built to prevent undue infiltration, entrance of street wash or grit and provide safe access to facilitate manhole maintenance activities.

☒ 14. The local Waterways Conservation Officer of the Pennsylvania Fish and Boat Commission (FBC) shall be notified when the construction of any stream crossing and/or outfall is started and completed. A written permit must be secured from the FBC if the use of explosives in any waterways is required and the permittee shall notify the local Waterways Conservation Officer when explosives are to be used.

Operation and Maintenance

☐ 15. The permittee shall maintain facility operation and maintenance (O&M) manuals at the facility and ensure proper O&M of the permitted facility. The permittee shall file the O&M manuals with DEP upon request.

☒ 16. The sewers shall have adequate foundation support as soil conditions require. Trenches shall be back-filled to ensure that sewers will have proper structural stability, with minimum settling and adequate protection against breakage. Concrete used in connection with these sewers shall be protected from damage by water, freezing, drying or other harmful conditions until cured.

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☒ 18. The approved sewers shall be maintained in good condition, kept free of deposits by flushing or other cleaning methods and repaired when necessary.

☒ 19. The sewerage facilities shall be properly maintained so that the facility will perform as designed.

☒ 20. The attention of the permittee is called to the highly explosive nature of certain gases generated by the digestion of sewage solids when these gases are mixed in proper proportions with air and to the highly toxic character of certain gases arising from such digestion or from sewage in poorly ventilated compartments or sewers. Therefore, at all places throughout the sewerage facilities where hazard of fire, explosion or danger from toxic gases may occur, the permittee shall post conspicuous permanent and legible warnings. The permittee shall instruct all employees concerning the aforesaid hazards, first aid and emergency methods of meeting such hazards and shall make all necessary equipment and material accessible.

☐ 21. An operator certified in accordance with the Water and Wastewater Systems Operator Certification Act of February 21, 2002, 63 P.S. §§ 1001, *et seq.* shall operate the sewage treatment plant.

☒ 22. The permittee shall properly control any industrial waste discharged into its sewerage system by regulating the rate and quality of such discharge, requiring necessary pretreatment and excluding industrial waste, if necessary, to protect the integrity or operation of the permittee's sewerage system.

☒ 23. There shall be no physical connection between a public water supply system and a sewer or appurtenance to it which would permit the passage of any sewage or polluted water into the potable water supply. No water pipe shall pass through or come in contact with any part of a sewer manhole.

☒ 24. All connections to the approved sanitary sewers must be in accordance with the corrective action plan as contained in the approved Chapter 94 Municipal Wasteload Management Annual Report.

☐ 25. Collected screenings, slurries, sludge and other solids shall be handled and disposed of in compliance with 25 Pa. Code, Chapters 271, 273, 275, 283 and 285 (related to permits and requirements for land filling, land application, incineration and storage of sewage sludge), Federal Regulations 40 CFR 257 and the Federal Clean Water Act and its amendments.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

Related ID#s (If Known)

Client ID# _____ APS ID# _____
Site ID# _____ Auth ID# _____
Facility ID# _____

DEP USE ONLY
Date Received & General Notes
JUL 30 2003

CLIENT INFORMATION

DEP Client ID#	**Client Type / Code**				
	MUNI				
Organization Name or Registered Fictitious Name		**Employer ID# (EIN)**	**Dun & Bradstreet ID#**		
East Coventry Township		23-6000285			
Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**	
Additional Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**	
Mailing Address Line 1		**Mailing Address Line 2**			
855 Ellis Woods Road					
Address Last Line – City	**State**	**ZIP+4**	**Country**		
Pottstown	PA	19465	USA		
Client Contact Last Name	**First Name**	**MI**	**Suffix**		
Leinbach	David	K.			
Client Contact Title		**Phone**	**Ext**		
Chairman, Board of Supervisors		610-495-5443			
Email Address		**FAX**			
		610-495-9925			

SITE INFORMATION

DEP Site ID#	**Site Name**				
	East Coventry Township				
EPA ID#	**Estimated Number of Employees to be Present at Site**	1			
Description of Site					
Township Roads; Open Fields					
County Name	**Municipality**	**City**	**Boro**	**Twp**	**State**
Chester	East Coventry	☐	☐	☒	PA
County Name	**Municipality**	**City**	**Boro**	**Twp**	**State**
Chester	East Coventry	☐	☐	☒	PA
Site Location Line 1		**Site Location Line 2**			
East Coventry Township		855 Ellis Woods Road			
Site Location Last Line – City		**State**	**ZIP+4**		
Pottstown		PA	19465		
Detailed Written Directions to Site					
See Attached ADC Map					
Site Contact Last Name	**First Name**	**MI**	**Suffix**		
Leinbach	David	K.			
Site Contact Title		**Site Contact Firm**			
Chairman; Board of Supervisors		East Coventry Township			
Mailing Address Line 1		**Mailing Address Line 2**			
855 Ellis Woods Road					
Mailing Address Last Line – City		**State**	**ZIP+4**		
Pottstown		PA	19465		
Phone	**Ext**	**FAX**	**Email Address**		
610-495-5443		610-495-9925			

NAICS Codes (Two- & Three-Digit Codes – List All That Apply) | 6-Digit Code (If Known)
22

Client to Site Relationship
OWN, OP

FACILITY INFORMATION

Modification of Existing Facility	Yes	No
1. Will this project modify an existing facility, system, or activity?	☐	☒
2. Will this project involve an addition to an existing facility, system, or activity?	☐	☒

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	DEP Fac ID#		Facility Type	DEP Fac ID#
☐	Air Emission Plant		☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	MineDrainageTrmt/LandRecyProjLocation	
☐	Coal Ash Beneficial Use Operation		☐	Municipal Waste Operation	
☒	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☒	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☐	Dam Location		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Anthracite		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Bituminous		☐	Residual Waste Operation	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Storage Tank Location	
☐	Encroachment Location (water, wetland)		☐	Water Pollution Control Facility	
☐	Erosion & Sediment Control Facility		☐	Water Resource	
☐	Explosive Storage Location		☐	Other:	

Latitude/Longitude Point of Origin	Latitude Degrees	Latitude Minutes	Latitude Seconds	Longitude Degrees	Longitude Minutes	Longitude Seconds
Approximate center of project area	40	13	3	75	36	66

Horizontal Accuracy Measure: Feet --or-- Meters

Horizontal Reference Datum Code:
- ☒ North American Datum of 1927
- ☐ North American Datum of 1983
- ☐ World Geodetic System of 1984

Horizontal Collection Method Code: ITPMP

Reference Point Code: CTROD

Altitude: Feet --or-- Meters

Altitude Datum Name:
- ☒ The National Geodetic Vertical Datum of 1929
- ☐ The North American Vertical Datum of 1988 (NAVD88)

Altitude (Vertical) Location Datum Collection Method Code

Geometric Type Code: TOPO

Data Collection Date: 8/22/02

Source Map Scale Number: 1 Inch(es) = 24,000 Feet
--or-- Centimeter(s) = Meters

PROJECT INFORMATION

Project Name
North Service Area - Phase 1 Sewer System

Project Description
See project description included with this application

Project Consultant Last Name	First Name	MI	Suffix
Flaharty	Brady	L.	

Project Consultant Title	Consulting Firm
Project Manager	ARRO Consulting, Inc.

Mailing Address Line 1	Mailing Address Line 2
649 North Lewis Road	Suite 100

Address Last Line – City	State	ZIP+4
Limerick	PA	19468-1234

Phone	Ext	FAX	Email Address
610-495-2118		610-495-5855	brady.flaharty@thearrogroup.com

Time Schedules	Project Milestone (Optional)
To be determined	

1.	Is this application for an authorization type on the list of authorizations affected by the land use policy? Note: If "Yes", you must complete the following Land Use Information section, unless exempted by Questions 2 or 3 below. If "No", skip Questions 2 & 3 below as well as the following Land Use Information section. For referenced list, see Appendix A attached to the GIF Instructions.	☒	Yes	☐	No
2.	For an Air program authorization only. All other authorizations continue with Question 3 below. Will the permit authorize the construction of facilities outside an existing permitted area? Note: If "Yes", you must complete the following Land Use Information section unless exempted by Question 3 below. If "No", skip Question 3 below as well as the following Land Use Information section.	☐	Yes	☐	No
3.	Have you attached or submitted municipal and county 'Early Opt Out' approval letters for the project? Note: If "Yes" to Question 3, skip the following Land Use Information section. This should only be checked "Yes" if applicant is choosing the early opt-out option. Required approval letters described in the GIF Checklist and Instructions should be attached. If "No" to Question 3, continue with the following Land Use Information section.	☐	Yes	☒	No

LAND USE INFORMATION

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1.	Is there a municipal comprehensive plan(s)?	☒	Yes	☐	No
2.	Is there a county comprehensive plan(s)?	☒	Yes	☐	No
3.	Is there a multi-municipal or multi-county comprehensive plan?	☐	Yes	☒	No
4.	Is the proposed project consistent with these plans? If no plan(s) exists, answer "Yes".	☒	Yes	☐	No
5.	Is there a municipal zoning ordinance(s)?	☒	Yes	☐	No
6.	Is there a joint municipal zoning ordinance(s)?	☐	Yes	☒	No
7.	Will the proposed project require a zoning approval (e.g., special exception, conditional approval, re-zoning, variance)? If zoning approval has already been received, attach documentation.	☐	Yes	☒	No
8.	Are any zoning ordinances that are applicable to this project currently the subject of any type of legal proceeding?	☐	Yes	☒	No
9.	Will the project be located on a site that has been or is being remediated under DEP's Land Recycling Program?	☐	Yes	☒	No
10.	Will the project result in reclamation of abandoned mine lands through re-mining or as part of DEP's Reclaim PA Program?	☐	Yes	☒	No
11.	Will the project be located in an agricultural security area or an area protected under an agricultural conservation easement?	☐	Yes	☒	No
12.	Will the project be located in a Keystone Opportunity Zone or Enterprise Development Area?	☐	Yes	☒	No
13.	Will the project be located in a Designated Growth Area as defined by the Municipalities Planning Code?	☒	Yes	☐	No

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 and the accompanying Cultural Resource Notice Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	Is this a coal mining project? If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0. (DEP Use/48y1)	☐ Yes	☐ No
1.1	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day? (DEP Use/4x70)	☐ Yes	☐ No
1.2	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year? (DEP Use/4x70)	☐ Yes	☐ No
1.3	Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used? (DEP Use/4x70)	☐ Yes	☐ No
1.4	For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters? (DEP Use/4x62)	☐ Yes	☐ No
1.5	Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet? (DEP Use/3140)	☐ Yes	☐ No
1.6	Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well? (DEP Use/4z41)	☐ Yes	☐ No
2.0	Is this a non-coal (industrial minerals) mining project? If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0. (DEP Use/48y1)	☐ Yes	☐ No
2.1	Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel? (DEP Use/4x70)	☐ Yes	☐ No
2.2	Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials? (DEP Use/4x70)	☐ Yes	☐ No
2.3	Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)? (DEP Use/4x70)	☐ Yes	☐ No
2.4	For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters? (DEP Use/4x62)	☐ Yes	☐ No
2.5	Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet? (DEP Use/3140)	☐ Yes	☐ No

3.0	Will your project, activity, or authorization have anything to do with a well related to oil or gas production, site development for such activity, or the waste from such a well? If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0. (DEP Use/4z41)	☐	Yes	☒	No
3.1	Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)? (DEP Use/4z41)	☐	Yes	☐	No
3.2	Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system? If "Yes", discuss in *Project Description*. (DEP Use/4z41)	☐	Yes	☐	No
3.3	Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities? (DEP Use/4z41)	☐	Yes	☐	No
4.0	Will the project involve a construction activity that results in earth disturbance? If "Yes", specify the total disturbed acreage. (DEP Use/4x66) 4.0.1 Total Disturbed Acreage 4.25 - for the installation of pump stations and sewer mains.	☒	Yes	☐	No
5.0	Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)? (DEP Use/4x66)	☒	Yes	☐	No
6.0	Will the project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system? If "Yes", discuss in *Project Description*. (DEP Use/4x62)	☐	Yes	☒	No
7.0	Will the project involve the construction and operation of industrial waste treatment facilities? (DEP Use/4x62)	☐	Yes	☒	No
8.0	Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations? If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable. (DEP Use/4x62) 8.0.1 Estimated Proposed Flow (gal/day) 0.510 MGD - See Exhibit C for more detail	☒	Yes	☐	No
9.0	Was sewage planning submitted and approved? If "Yes", attach the Act 537 approval letter unless the submitted application is actually requesting Act 537 approval (Approval required prior to 105/NPDES approval). (DEP Use/4x61) 9.0.1 Is Act 537 Approval Letter attached? See Exhibit E	☒ ☒	Yes Yes	☐ ☐	No No
10.0	Is this project for the beneficial use of biosolids for land application within Pennsylvania? If "Yes" indicate how much (i.e. gallons or dry tons per year). (DEP Use/4X62) 10.0.1 Gallons Per Year (residential septage) ---- 10.0.2 Dry Tons Per Year (biosolids) ----	☐	Yes	☒	No
11.0	Does the project involve construction, modification or removal of a dam? If "Yes", identify the dam. (DEP Use/3140) 11.0.1 Dam Name	☐	Yes	☒	No
12.0	Will the project interfere with the flow from, or otherwise impact, a dam? If "Yes", identify the dam. (DEP Use/3140) 12.0.1 Dam Name	☐	Yes	☒	No
13.0	Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)? If "Yes", identify each type of emission followed by the amount of that emission. (DEP Use/4x70) 13.0.1 Enter all types & amounts of emissions; separate each set with semicolons.	☐	Yes	☒	No

14.0	**Is an on-site drinking water supply (well), other than individual house wells, proposed for your project? If "Yes", indicate total number of people served and/or the total number of connections served, if applicable. Also, check all proposed sub-facilities. (DEP Use/4x81)**	☐	Yes	☒	No
	14.0.1 Number of Persons Served				
	14.0.2 Number of Employee/Guests				
	14.0.3 Number of Connections				
	14.0.4 Sub-Fac: Distribution System	☐	Yes	☐	No
	14.0.5 Sub-Fac: Water Treatment Plant	☐	Yes	☐	No
	14.0.6 Sub-Fac: Source	☐	Yes	☐	No
	14.0.7 Sub-Fac: Pump Station	☐	Yes	☐	No
	14.0.8 Sub-Fac: Entry Point	☐	Yes	☐	No
	14.0.9 Sub-Fac: Transmission Main	☐	Yes	☐	No
	14.0.10 Sub-Fac: Storage Facility	☐	Yes	☐	No
15.0	**Will your project involve purchasing water in bulk, excluding during the construction period? If "Yes", name the provider. Also, indicate the daily number of employees or guests served. (DEP Use/4x81)**	☐	Yes	☒	No
	15.0.1 Provider's Name				
	15.0.2 Number of Employees/Guests				
16.0	**Is your project to be served by public water supply? If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project. (DEP Use/4x81)**	☐	Yes	☒	No
	16.0.1 Supplier's Name				
	16.0.2 Letter of Approval from Supplier is Attached	☐	Yes	☐	No
17.0	**Will this project involve a new or increased drinking water withdrawal from a stream or other water body? If "Yes", provide name of stream. (DEP Use/4x81)**	☐	Yes	☒	No
	17.0.1 Stream Name				
18.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste? If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed. (DEP/Use4x32)**	☐	Yes	☒	No
	18.0.1 Type & Amount				
19.0	**Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities? (DEP Use/48y1)**	☐	Yes	☒	No
20.0	**Does your project involve installation of a field constructed underground storage tank? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)**	☐	Yes	☒	No
	20.0.1 Enter all substances & capacity of each; separate each set with semicolons.				
21.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)**	☐	Yes	☒	No
	21.0.1 Enter all substances & capacity of each; separate each set with semicolons.				
22.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)**	☐	Yes	☒	No
	22.0.1 Enter all substances & capacity of each; separate each set with semicolons.				

23.0 Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570) ☐ Yes ☒ No

23.0.1 Enter all substances & capacity of each; separate each set with semicolons.

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Type or Print Name Brady L. Flaherty, P.E.

Signature	Title	Date
	Project Manager	7/29/03

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DEP USE ONLY
Date Received

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER MANAGEMENT PROGRAM

DEP-RECEIVED
SOUTHEAST REGION
JUL 30 2003

SEWER EXTENSIONS AND PUMPING STATIONS PERMIT APPLICATION

Before completing this form, read the step-by-step instructions provided with this form.

SECTION A. APPLICANT IDENTIFIER

Applicant Name:

East Coventry Township

SECTION B. PROJECT INFORMATION

If the project is associated with existing or proposed residential or industrial development, complete the following:

Name of Development See listing on next page.

Type of Development Residential

Number of Units 794 **Project Acreage** Less than 5 acres of disturbed area *

WQM Part II Permit No. of Receiving Sewers NPDES Permit # for North Coventry WWTP - PA0025437

SECTION C. BASIS OF DESIGN

Design Year:	Design Population:
2023	5038

Subdivisions Associated with this Project:

Orchard Ridge	276 EDUs
Coventry Meadows	380 EDUs
Heather Glen	30 EDUs
Wood Crest Estates	22 EDUs
Creekview	61 EDUs
Homes along Old Schuylkill Road	25 EDUs
TOTAL (North Service Area Phase 1)	**794 EDUs**

ADDRESS: 855 Ellis Woods Road

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SECTION D. CERTIFICATION AND SIGNATURE

SWORN and subscribed to before me this 26th day of July 2003

I hereby apply for approval on (Date) July 29, 2003 to construct and operate [xxx] Sewers and Appurtenances

[xxx] Sewage pumping station(s) which ☒ does ☐ does not include stream crossing(s)/100 year floodplain location.

Notarial Seal
Bonnie L Frisco, Notary Public
East Coventry Twp., Chester County
My Commission Expires Mar. 18, 2007
Member, Pennsylvania Association Of Notaries

NOTARY

Applicant:

Affidavit: I hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and based on my inquiry of those individuals immediately responsible for obtaining the information I believe the submitted information is true, accurate and complete.

APPLICANT'S SIGNATURE:

NAME: David K. Leinbach

TITLE: Chairman: East Coventry Township Board of Supervisors

ADDRESS: 855 Ellis Woods Road

Pottstown, PA 19465

TELEPHONE NUMBER: 610-495-2118

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL BRADY L. FLAHARTY ENGINEER 55782-E NOTARY SEAL

SWORN and subscribed to before me this 26th day of JULY, 2003

DESIGNER'S SEAL AND SIGNATURE

Notarial Seal
Bonnie L Frisco, Notary Public
East Coventry Twp., Chester County
My Commission Expires Mar. 18, 2007
Member, Pennsylvania Association Of Notaries

NOTARY

Designer:

I, BRADY L. FLAHARTY, do hereby certify 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 the standards, guidelines and requirements of the Department of Environmental Protection.

DESIGNER'S NAME: Brady L. Flaharty, P.E.

NAME OF FIRM: ARRO Consulting, Inc.

ADDRESS, ZIP: 649 North Lewis Road, Suite 100

Limerick, PA 19468

TELEPHONE NUMBER: 610-495-2118

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL BRADY L. FLAHARTY ENGINEER 55782-E

DESIGNER'S SEAL AND SIGNATURE

3800-PM-W-20265 Rev. 4/2000

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER MANAGEMENT PROGRAM

WATER POLLUTION CONTROL
DESIGN MODULE

TABLE 1 – SEWER SYSTEM

1. CLASS OF CONSTRUCTION ☒ NEW SYSTEM ☐ REPLACEMENT OF EXISTING SYSTEMS ☒ SANITARY ☐ COMBINED
2. INITIAL POPULATION 0 Connected PUMP STATION (Submit separate table for each pump station) DESIGN YEAR POPULATION 5038 Connected
3. DESIGN FLOW DATA PS-1

			AVG (MGD)	MAX (Peak Instantaneous) (MGD)
(a) Laterals and Submain Sewers	(GPCD)	100		
(b) Interceptors	(GPCD)	100		
(c) Average Daily Flow	(MGD)	0.505		
(d) Infiltration/Inflow	(MGD)	0.005		
(e) Industrial Waste Flow	(MGD)	0.000		
(f) Total Average Design Flow	(MGD)	0.510		
(g) Maximum Expected Flow Rate (Peak Instantaneous)	(MGD)	1.710	0.505	1.892
			0.000	0.000
			0.005	0.018
			0.510	1.710

4. GENERAL INFORMATION:

(a) Describe measures taken to reduce I/I in the system including leakage test and reference applicable portion of the specifications.

Refer to Section 5.3 of the "Technical Specifications for the Construction of Sanitary Sewers and Appurtenances" that are a part of this application.

(b) Describe any overflows or bypasses within the system.

None

(c) If applicable, describe capacity of receiving sewers and pumping station and submit two copies of the executed intermunicipal agreement.

The intermunicipal agreement is forthcoming. It is still under review by legal counsel. A draft agreement was submitted with the 537 Plan.

TABLE 2 – PUMP STATION (Submit separate table for each pump station)

1. PUMP STATION NAME: PS-1
2. LOCATION (street name, etc.): PA State Route 724
3. TYPE (e.g. Conventional, suction lift, ejector or submersible) Submersible
4. INITIAL POPULATION TO BE SERVED: 2080 FUTURE POPULATION TO BE SERVED: 5038
   DESIGN YEAR 2023
5. DESIGN INFORMATION:

		AVG (MGD)	MAX (Peak Instantaneous) (MGD)
(a) Domestic Flow Rate (based on Design population to be served)		0.505	1.892
(b) Industrial Flow Rate		0.000	0.000
(c) Infiltration/Inflow Rate		0.005	0.018
(d) Design Flow Rate		0.510	1.710
(e) Effective Wet Well Capacity	(Gal) 2,115		
(f) Detention Time	(Min) 4.98		
(g) Design Average Velocity in Force Main	(Fps) 2 minimum		

(h) Total Dynamic (Head Pump Station + Force Main)
Static Head 36 FL
Friction Loss 97 FL
TDH 133 FL

(continued)

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER MANAGEMENT PROGRAM

WATER POLLUTION CONTROL
DESIGN MODULE

TABLE 1 – SEWER SYSTEM

1. CLASS OF CONSTRUCTION ☒ NEW SYSTEM ☐ REPLACEMENT OF EXISTING SYSTEMS ☒ SANITARY ☐ COMBINED

2. INITIAL POPULATION 0 Connected DESIGN YEAR POPULATION 8038 Connected

3. DESIGN FLOW DATA PS-2

			AVG (MGD)	MAX (Peak Instantaneous) (MGD)
(a) Laterals and Submain Sewers	(GPCD)	100		
(b) Interceptors	(GPCD)	100		
(c) Average Daily Flow	(MGD)	0.505		
(d) Infiltration/Inflow	(MGD)	0.005		
(e) Industrial Waste Flow	(MGD)	0.000		
(f) Total Average Design Flow	(MGD)	0.510		
(g) Maximum Expected Flow Rate (Peak Instantaneous)	(MGD)	1.710		
(a) Domestic Flow Rate (based on Design population to be served)			0.005275	0.022155
(b) Industrial Flow Rate			0.000000	0.000000
(c) Infiltration/Inflow Rate			0.00050	0.00210
(d) Design Flow Rate			0.005775	0.024255

4. GENERAL INFORMATION

(a) Describe measures taken to reduce I/I in the system including leakage test and reference to applicable portion of the specifications.

Refer to Section 5.3 of the "Technical Specifications for the Construction of Sanitary Sewers and Appurtenances" that are a part of this application.

(b) Describe any overflows or bypasses within the system.

None

(c) If applicable, describe capacity of receiving sewers and pumping station and submit two copies of the executed intermunicipal agreement.

The intermunicipal agreement is forthcoming. It is still under review by legal counsel. A draft agreement was submitted with the 537 Plan.

TABLE 2 – PUMP STATION (Submit separate table for each pump station)

1. PUMP STATION NAME: PS-2
2. LOCATION (street name, etc.): Ellis Woods Road
3. TYPE (e.g. Conventional, suction lift, ejector or submersible) Submersible
4. INITIAL POPULATION TO BE SERVED: 88 FUTURE POPULATION TO BE SERVED: 88
   DESIGN YEAR 2023
5. DESIGN INFORMATION

		AVG (MGD)	MAX (Peak Instantaneous) (MGD)
(a) Domestic Flow Rate (based on Design population to be served)		0.005275	0.022155
(b) Industrial Flow Rate		0.000000	0.000000
(c) Infiltration/Inflow Rate		0.00050	0.00210
(d) Design Flow Rate		0.005775	0.024255
(e) Effective Wet Well Capacity	(Gal) 105.75		
(f) Detention Time	(Min) 22		
(g) Design Average Velocity in Force Main	(Fps) 2.27		
(h) Total Dynamic (Head Pump Station + Force Main)		Static Head 31 Ft.	
		Friction Loss 11 Ft.	
		TDH 42 Ft.	

(continued)

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER MANAGEMENT PROGRAM

WATER POLLUTION CONTROL
DESIGN MODULE

TABLE 1 -- SEWER SYSTEM

1. CLASS OF CONSTRUCTION ☒ NEW SYSTEM ☐ REPLACEMENT OF EXISTING SYSTEMS ☒ SANITARY ☐ COMBINED
2. INITIAL POPULATION 0 Connected DESIGN YEAR POPULATION 3058 Connected
3. DESIGN FLOW DATA

(a) Laterals and Submain Sewers	(GPCD)	100	
(b) Interceptors	(GPCD)	100	
(c) Average Daily Flow	(MGD)	0.605	
(d) Infiltration/Inflow	(MGD)	0.005	
(e) Industrial Waste Flow	(MGD)	0.000	
(f) Total Average Design Flow	(MGD)	0.810	AVG (MGD)
(g) Maximum Expected Flow Rate (Peak Instantaneous)	(MGD)	1.710	MAX (Peak Instantaneous) (MGD)
		0.105515	0.400955
		0.000000	0.000000
		0.00106	0.00403
		0.106575	0.404985

4. GENERAL INFORMATION
   (a) Describe measures taken to reduce I/I in the system including leakage test and reference applicable portion of the specifications.
   Refer to Section 5.3 of the "Technical Specifications for the Construction of Sanitary Sewers and Appurtenances" that are a part of this application.
   (b) Describe any overflows or bypasses within the system
   None
   (c) If applicable, describe capacity of receiving sewers and pumping station and submit two copies of the executed intermunicipal agreement.
   The intermunicipal agreement is forthcoming. It is still under review by legal counsel. A draft agreement was submitted with the 537 Plan.

TABLE 2 -- PUMP STATION (Submit separate table for each pump station)

1. PUMP STATION NAME: PS-3
2. LOCATION (street name, etc.): Old Schuylkill Road
3. TYPE (e.g. Conventional, suction lift, ejector or submersible) Submersible
4. INITIAL POPULATION TO BE SERVED: 1064 FUTURE POPULATION TO BE SERVED: 1064
   DESIGN YEAR 2023
5. DESIGN INFORMATION

		AVG (MGD)	MAX (Peak Instantaneous) (MGD)
(a) Domestic Flow Rate (based on Design population to be served)		0.105515	0.400955
(b) Industrial Flow Rate		0.000000	0.000000
(c) Infiltration/Inflow Rate		0.00106	0.00403
(d) Design Flow Rate		0.106575	0.404985
(e) Effective Wet Well Capacity	(Gal) 634.48		
(f) Detention Time	(Min) 7.15		
(g) Design Average Velocity in Force Main	(Fps) 3.24		
(h) Total Dynamic (Head Pump Station + Force Main)		Static Head 28.5	Ft.
		Friction Loss 26.5	Ft.
		TDH 55	Ft.

(continued)

3800-PM-WQ0265 Rev. 4/2000

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER MANAGEMENT PROGRAM

WATER POLLUTION CONTROL
DESIGN MODULE

TABLE 1 – SEWER SYSTEM

1. CLASS OF CONSTRUCTION ☒ NEW SYSTEM ☐ REPLACEMENT OF EXISTING SYSTEMS ☒ SANITARY ☐ COMBINED

2. INITIAL POPULATION 0 Connected DESIGN YEAR POPULATION 5038 Connected

3. DESIGN FLOW DATA

			AVG (MGD)	MAX (Peak Instantaneous) (MGD)
(a) Laterals and Submain Sewers	(GPCD)	100		
(b) Interceptors	(GPCD)	100		
(c) Average Daily Flow	(MGD)	0.505		
(d) Infiltration/Inflow	(MGD)	0.005		
(e) Industrial Waste Flow	(MGD)	0.000		
(f) Total Average Design Flow	(MGD)	0.510		
(g) Maximum Expected Flow Rate (Peak Instantaneous)	(MGD)	1.710		
(a) Domestic Flow Rate (based on Design population to be served)			0.02167	0.088437
(b) Industrial Flow Rate			0.00000	0.000000
(c) Infiltration/Inflow Rate			0.000218	0.008938
(d) Design Flow Rate			0.021888	0.089331

4. GENERAL INFORMATION:

(a) Describe measures taken to reduce I/I in the system including leakage test and reference applicable portion of the specifications.

Refer to Section 5.3 of the "Technical Specifications for the Construction of Sanitary Sewers and Appurtenances" that are a part of this application.

(b) Describe any overflows or bypasses within the system.

None.

(c) If applicable, describe capacity of receiving sewers and pumping station and submit two copies of the executed intermunicipal agreement.

The intermunicipal agreement is forthcoming. It is still under review by legal counsel. A draft agreement was submitted with the 537 Plan.

TABLE 2 – PUMP STATION (Submit separate table for each pump station)

1. PUMP STATION NAME: PS-4
2. LOCATION (street name, etc.): East Cedarville Road
3. TYPE (e.g. Conventional, suction lift, ejector or submersible) Submersible
4. INITIAL POPULATION TO BE SERVED: 217 FUTURE POPULATION TO BE SERVED: 217
5. DESIGN YEAR 2023
6. DESIGN INFORMATION:

		AVG (MGD)	MAX (Peak Instantaneous) (MGD)
(a) Domestic Flow Rate (based on Design population to be served)		0.02167	0.088437
(b) Industrial Flow Rate		0.00000	0.000000
(c) Infiltration/Inflow Rate		0.000218	0.008938
(d) Design Flow Rate		0.021888	0.089331
(e) Effective Wet Well Capacity	(Gal) 317.24		
(f) Detention Time	(Min) 17.48		
(g) Design Average Velocity in Force Main	(Fps) 2.55		
(h) Total Dynamic (Head Pump Station + Force Main)	Static Head 108		Ft.
	Friction Loss 50		Ft.
	TDH 158		Ft.

(continued)

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER MANAGEMENT PROGRAM

WATER POLLUTION CONTROL DESIGN MODULE

6. GENERAL INFORMATION

(a) Describe the proposed project with respect to the 100 year flood elevation, ventilation, emergency power provision and alarm system.

Pump Stations 1, 2, 3, and 4 consist of a wetwell, valve pit, and a control building. Ventilation is in place for the control building and the wetwell. The wetwell ventilation consists of an odor control unit/system at pump stations 1, 2, and 4 and standard ventilation at pump station 3. An emergency generator will be housed in the control building of each station. The control building , odor control unit, wetwell and other structures are outside of the 100 year floodplain for all pump stations. An alarm system and site security will be in place at each station. Refer to the East Coventry Township "Technical Specifications for Construction of Sanitary Sewers and Appurtenances, that are a part of this submission, for specifics coceming site security and alarm systems.

TABLE 3 -- PUMPING FACILITIES

LIST ALL THE PUMPS IN THE PUMPING FACILITY

NUMBER OF IDENTICAL PUMPS	Describe Pump Use	Make Model and Type of Pump (Please attach pump performance curve(s)	Check Columns That Apply To Each Pump: EXISTING	PROPOSED	VARIABLE SPEED	CONSTANT SPEED	AUTOMATIC CONTROL	MANUAL CONTROL	PNEUMATIC INJECTOR	STAND BY OPERATION	Pump Capacity (GPM)	Pump Capacity TDH (FT.)
2	PS 1 discharge	Flygt CP-3201		x	x		x				600	133
1	PS 1 discharge	Flygt CP-3201		x	x		x			x	500	133
2	PS 2 discharge	Flygt CP-3057		x		x	x				50	42
2	PS 3 discharge	Flygt NP-3127		x		x	x				285	55
2	PS 4 discharge	Flygt CP-3152		x		x	x				100	158

* PS = Pump Station

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER MANAGEMENT PROGRAM

WATER POLLUTION CONTROL

MODULE 13

STREAM ENCROACHMENT

FOR DEPARTMENT USE ONLY

GENERAL

For encroachment permits for stream crossings and outfall structures contact the Bureau of Watershed Management. Include a copy of the permit or application with this module. Also, answer the questions below.

STREAM CROSSINGS See next page.

1. Please justify the need for each stream crossing including evaluation of alternatives to minimize the number of crossings.

2. What measures will be taken to insure the sewer crossing under a stream will be rendered thoroughly water tight and remain in alignment?

3. For any sewer without the required cover (1 foot in rock and 3 feet in other material), please explain why such cover is not provided and what measures are to be taken to minimize the erosion threat at the crossing location and the aesthetics of the permanent sewer crossing.

4. Note how manholes along the stream will be made watertight if the top elevation is below the 100-year flood plain.

5. List crossings by stream name and sheet numbers in plans. Provide extra set of plan sheets only with stream crossing.

HEADWALLS/OUTFALLS N/A

1. Explain how the headwall/outfall structure will be constructed to minimize downstream and/or bank erosion and achieve complete mixing of the treated effluent with the streamflow within a short distance.

2. Identify stream by name, show design of outfall/headwall on plan sheet and provide an extra copy.

Describe below all of the applicable items from the above.

No. 4

Permit No.: 1506412

3800-PM-WSWM0015 Rev. 6/2004
Permit

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT

PERMIT NO. 1506412
AMENDMENT NO. _____
APS ID 589407
AUTH ID 640789

WATER QUALITY MANAGEMENT PERMIT

A. PERMITTEE (Name and Address): CLIENT ID#: 74504
East Coventry Township
855 Ellis Woods Road
Pottstown, PA 19465

B. PRIMARY FACILITY (Name):
North Coventry Municipal Authority WWTF

C. LOCATION (Municipality, County):
East Coventry Township
Chester County

SITE ID#:
623461

D. **This permit approves the construction of sewerage facilities consisting of:**

Approximately 22,000 LF of 8" gravity sewer, approximately 2,550 LF of 4" force main, approximately 1,890 LF of 2" low pressure force main, and a 10,500 GPD pump station.

Pump Stations: 1	Manure Storage:	Industrial Wastewater/Sewage Treatment Facility:
Design Capacity: 30.6 GPM	Volume _____ MG	Annual Average Flow: _____ MGD
Average Annual Flow: 10,500 GPD	Freeboard: _____ inches	Design Hydraulic Capacity: _____ MGD
		Design Organic Capacity: _____ lb/day

E. APPROVAL GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING:

1. **New Permits:** All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit application dated 07/10/06, its supporting documentation, and addendums dated _____, which are hereby made a part of this permit.

   Amendments: All construction, operations, and procedures shall be in accordance with the Water Quality Management Permit Amendment application dated _____and its supporting documentation, and addendums dated _____, which are hereby made a part of this amendment.

   Except for any herein approved modifications, all terms, conditions, supporting documentation and addendums approved under Water Quality Management Permit No. _____ shall remain in effect.

   Transfers: Water Quality Management Permit No._____ and conditions, supporting documentation and addendums are also made part of this transfer.

2. **Permit Conditions Relating to sewerage** are attached and made part of this permit.

3. Special Conditions numbered _____ are attached and made part of this permit.

F. THE AUTHORITY GRANTED BY THIS PERMIT IS SUBJECT TO THE FOLLOWING FURTHER QUALIFICATIONS:

1. If there is a conflict between the application or its supporting documents and amendments and the attached conditions, the attached conditions shall apply.

2. Failure to comply with the rules and regulations of DEP or with the terms or conditions of this permit shall void the authority given to the permittee by the issuance of this permit.

3. This permit is issued pursuant to the Clean Streams Law Act of June 22, 1937, P.L. 1987, as amended 35 P.S. §691.1 *et seq.* Issuance of this permit shall not relieve the permittee of any responsibility under any other law.

PERMIT ISSUED:
September 7, 2006

BY: _____

TITLE: Water Management Program Manager

Re 30 (joh06wqm)219-10