

# FLOOD DAMAGE REPAIRS FOR THE AUDENREID MINE TUNNEL ABANDONED MINE DRAINAGE REMEDIATION PROJECT LOCATED IN EAST UNION TOWNSHIP, SCHUYLKILL COUNTY, PA

**ACT 187 UNDERGROUND UTILITY PROTECTION ACT**

- RETTEW ASSOCIATES, INC. HEREBY STATES THAT, PURSUANT TO THE PROVISIONS OF ACT NO. 287 OF 1974, AS AMENDED BY ACT 187 OF 1996, OF THE PENNSYLVANIA LEGISLATURE, IT HAS PERFORMED THE FOLLOWING PREPARING AND DESIGNING OF THE ABANDONED MINE DRAINAGE REMEDIATION PROJECT AND THE POLITICAL SUBDIVISION(S) SHOWN ON THE DRAWINGS:
1. PURSUANT TO SECTION 4, CLAUSE (2) OF SAID ACT, RETTEW ASSOCIATES, INC. REQUESTS PERMITS AND USERS OF INFORMATION, THE INFORMATION PROVIDED BY THE ONE CALL SYSTEM NOTIFICATION, THE FINAL DESIGN IS TO BE COMPLETED.
  2. PURSUANT TO SECTION 4, CLAUSE (3) OF SAID ACT, RETTEW ASSOCIATES, INC. REQUESTS PERMITS AND USERS OF INFORMATION, THE INFORMATION PROVIDED BY THE ONE CALL SYSTEM NOTIFICATION, WHERE EXCAVATION IS TO BE PERFORMED.
  3. PURSUANT TO SECTION 4, CLAUSE (1) OF SAID ACT, RETTEW ASSOCIATES, INC. HAS SHOWN UPON THESE DRAWINGS THE POSITION AND TYPE OF EACH LINE, AS DERIVED PURSUANT TO THE REQUEST BY THE REQUIRED SYSTEM, (2), THE PHONE NUMBER PROVIDED BY THE REQUIRED SYSTEM, (1), THE PHONE NUMBER, AND THE USER'S DESIGNATED OFFICE ADDRESS AND PHONE NUMBER AS SHOWN SAID ACT, REFERRED TO IN SECTION 4, CLAUSE (3) OF SAID ACT.
- AND RETTEW ASSOCIATES, INC. DOES NOT MAKE ANY REPRESENTATION, WARRANTY, ASSURANCE OR GUARANTEE THAT THE INFORMATION RECEIVED PURSUANT TO SAID REQUEST AND AS REFLECTED ON THESE DRAWINGS IS CORRECT OR ACCURATE, BUT RETTEW ASSOCIATES, INC. IS REFLECTING OF THE SAID ACT NO. 187 OF DECEMBER 19, 1996, TO THE REQUIREMENTS OF THE SAID SYSTEM SERIAL NO. NOTIFICATION BY RETTEW ASSOCIATES, INC. DATE: 6/29/07

**PA1**  
**CALL BEFORE YOU DIG!**  
 PENNSYLVANIA LAW REQUIRES  
 SYSTEM, INC.  
 CONSULTING ENGINEERS AND SURVEYORS  
 DAYS IN ADVANCE BEFORE ANY DIG  
 1-800-242-1776

**UTILITIES RESPONDED:**

STATE TOWNSHIP MUNICIPAL AUTHORITY  
 575 ALLE STREET  
 NEW PHILADELPHIA, PA. 179591218  
 CONTACT: MICHAEL E BURDA

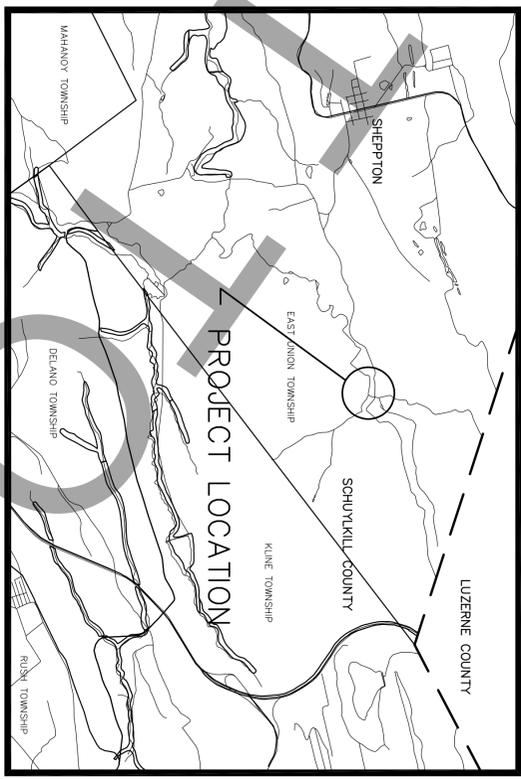
P.R. ELECTRIC UTILITIES CORPORATION  
 1000 W. MARKET STREET  
 MONTICELLO, PA. 17241  
 CONTACT: THOMAS BOOTH

SUNOCO PIPELINE, L.P.  
 1000 W. MARKET STREET  
 SHIRAZ SPRING, PA. 19608  
 CONTACT: ONE CALL DEPARTMENT

VERIZON PENNSYLVANIA, INC.  
 1000 W. MARKET STREET  
 HARRISBURG, PA. 17101  
 CONTACT: THERESA D BEATTY

**SHEET INDEX**

- SHT. 1 COVER
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- SHT. 5 TUNNEL AREA PROFILE
- SHT. 6 CULVERT DETAILS
- SHT. 7 TUNNEL AREA REPAIR E&S PLAN
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- SHT. 9 DETAILS SHEET
- SHT. 10 DETAILS SHEET
- SHT. 11 DETAILS SHEET



LOCATION MAP  
 APPROXIMATE SCALE: 1"=4000'

**GENERAL NOTES**

1. BENCHMARK - TRAVELER POINT R-10 LOCATED APPROXIMATELY 400' SOUTHWEST OF HILL ROAD CULVERT. ELEVATION 1204.50' DATUM AND 88' ELEVATION - 1191.15' DATUM NUMBER.
2. ALL EXISTING UTILITIES HAVE BEEN SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION.
3. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL ABOVE GROUND AND BELOW GROUND UTILITIES AND STRUCTURES AND WILL BE RESPONSIBLE FOR THE PROTECTION OF THESE UTILITIES AND STRUCTURES AT ALL TIMES.
4. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE AND ANY DAMAGE CAUSED SHALL BE REPAIRED IMMEDIATELY AND COMPLETED AT HIS EXPENSE.
5. THE PLAN LOCATIONS AND DIMENSIONS SHALL BE STRICTLY ADHERED TO THROUGHOUT THE PROJECT. ANY DEVIATIONS SHALL BE SUBJECT TO THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN AND CARRY OUT ANY PERMITS RELATED TO THE CONSTRUCTION SHOWN ON THESE PLANS ON THE JOB SITE AT ALL TIMES.
6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON THE PROJECT SITE PRIOR TO CONSTRUCTION.
7. THE CONTRACTOR SHALL VERIFY ALL UTILITIES REMOVED PER ACT 187 FOR VERIFICATION AND LOCATION OF UTILITIES PRIOR TO CONSTRUCTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL JOB SITE SAFETY INCLUDING TRAFFIC CONTROL, TRENCH BARRICADING, COVERING, SHIELDING AND SHORING.
9. ALL BRIMS AND IMPROVEMENTS SHALL BE CONSTRUCTED IN 6" LIFTS AND COMPACTED TO 95% PROCTOR DENSITY.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ACCESS TO ADJACENT PROPERTIES, P&G & GUN CLUB, PCA CORPORATION, AND QUADSTONE PARTNERS, LP.
11. ALL NON-CALCULATED AGGREGATE UTILIZED ON SITE SHALL MEET SPECIFICATION SET FORTH IN PERIODIC PUBLICATION 409/2003. CERTIFICATION WILL BE REQUIRED FOR QUALITY AND CLASSIFICATION OF ALL AGGREGATE.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL FOR ALL UNUTILIZED MATERIAL ON THE SITE.
13. ALL CLAY MATERIAL SHALL BE COMPACTED TO ELIMINATE SETTLE.
14. MATERIAL FOR CONSTRUCTION OF BRIMS SHALL BE CLEAN, FILL FREE OF 10. THROUGH EQUIPMENT SHALL BE MAINTAINED ON SITE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REPAIR ANY DAMAGE CAUSED BY SUCH EQUIPMENT.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING BLUE NOB NOB & GUN CLUB, PCA CORPORATION, QUADSTONE PARTNERS, LP, RETTEW ASSOCIATES, INC. AND SCHUYLKILL CONSERVATION DISTRICT (PH 717) 100 WORKING DAYS PRIOR TO THE START OF CONSTRUCTION.

**LEGEND:**

EXISTING	PROPOSED
UTILITY LINE/POLE	UTILITY LINE/POLE
GAS LINE /GATE VALVE & BOX	GAS LINE /GATE VALVE & BOX
WATER LINE/H/O, VALVE	WATER LINE/H/O, VALVE
SEWER LINE/MANHOLE	SEWER LINE/MANHOLE
STORM LINE/INLET/ENDWALL	STORM LINE/INLET/ENDWALL
CONDUIT	CONDUIT
ADJUNCTION/PROPERTY LINE	ADJUNCTION/PROPERTY LINE
UNDERGROUND ELECTRICAL	UNDERGROUND ELECTRICAL
OVERHEAD ELECTRICAL	OVERHEAD ELECTRICAL
EASEMENT LINE	EASEMENT LINE
RIGHT-OF-WAY LINE	RIGHT-OF-WAY LINE
BOUNDARY LINE	BOUNDARY LINE
CENTERLINE	CENTERLINE
EDGE OF PAVEMENT	EDGE OF PAVEMENT
DRIVEWAY	DRIVEWAY
SILT FENCE	SILT FENCE
FENCE	FENCE
WOODS LINE	WOODS LINE
GUY WIRE	GUY WIRE
TREE	TREE
SHRUB	SHRUB
MAIL BOX	MAIL BOX
SIGN	SIGN

**FLOOD DAMAGE REPAIRS  
FOR THE  
AUDENREID MINE TUNNEL  
ABANDONED MINE DRAINAGE REMEDIATION PROJECT**

**COVER SHEET**

EAST UNION TOWNSHIP      SCHUYLKILL COUNTY, PA

**RETTEW**

RETTEW Associates, Inc.  
 950 E. Main Street, Suite #220  
 Schuylkill Haven, PA 17972  
 Phone (570) 385-2270 • Fax (570) 385-2217  
 Email: rettetw@rettetw.com Website: www.rettetw.com

Engineers • Planners • Surveyors • Landscape Architects  
Environmental Consultants

CLIENT

**SCHUYLKILL CONSERVATION DISTRICT**  
 1206 AG CENTER DRIVE  
 POTTSVILLE, PA 17901-9733

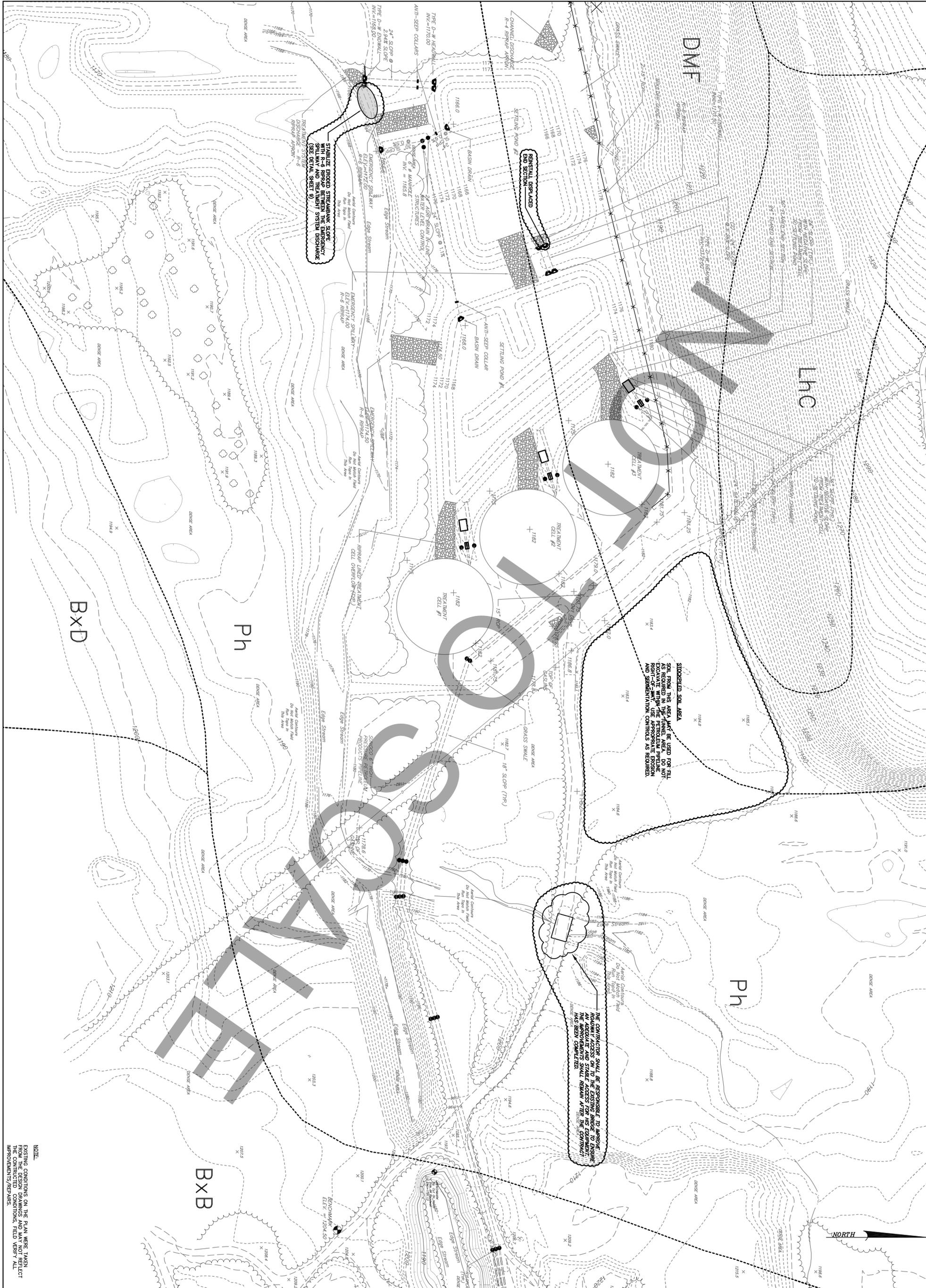
SCALE  
AS NOTED

MANAGER: CLAYTON E. BUBECK, P.E.	SURV. CHIEF: CHD BY: CEB	FIELDBOOK NO. DATA COLLECTOR	FOR RETTEW ASSOCIATES BY:
DESIGN BY: CH	CHKD BY: CEB	DRAWN BY: CH/SBT	CHD BY: CEB
DRAWING REFERENCE: N: 06-106-03883-003; C: 06-EE/06-03883-003-Cover.dwg		XREFS:	

NO.	DATE	REVISION

ISSUED FOR BIDDING

DATE: JUNE 29, 2007  
 SHEET NO. 1 OF 11  
 DWS, NO. 06-03883-003



STABILIZE BROOD STREAMING SCOPES WITH R-6 RIPRAP BETWEEN THE EMERGENCY SPILLWAY AND TREATMENT SYSTEM (SEE DETAIL SHEET 9)

DO NOT USE SOIL FROM STOCKPILED SOIL AREA FOR FILL AS REQUIRED IN THE TUNNEL AREA. DO NOT ESCALATE WITHIN THE PERMITTED ELEVATION AND SEMI-ANNUAL CONTROLS AS REQUIRED.

STOCKPILED SOIL AREA  
SOIL FROM THIS AREA MUST BE USED FOR FILL AS REQUIRED IN THE TUNNEL AREA. DO NOT ESCALATE WITHIN THE PERMITTED ELEVATION AND SEMI-ANNUAL CONTROLS AS REQUIRED.

THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN AN ADEQUATE AND STABLE ACCESS FOR HIS EQUIPMENT. THE IMPROVEMENTS SHALL REMAIN AFTER THE CONTRACT HAS BEEN COMPLETED.

BxD

Ph

Ph

BxB

NOTE:  
EXISTING CONDITIONS ON THE PLAN WERE TAKEN FROM THE DESIGN EXAMINATIONS AND MAY NOT REFLECT THE CONSTRUCTED CONDITIONS. FIELD VERIFY ALL IMPROVEMENTS/REPAIRS.

**FLOOD DAMAGE REPAIRS**  
FOR THE  
**AUDENREID MINE TUNNEL**  
ABANDONED MINE DRAINAGE REMEDIATION PROJECT  
TREATMENT AREA/MISCELLANEOUS REPAIRS  
EAST UNION TOWNSHIP      SCHUYLKILL COUNTY, PA

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CLIENT  
**SCHUYLKILL CONSERVATION DISTRICT**  
1206 AG CENTER DRIVE  
POTTSVILLE, PA 17901-9733

SCALE  
0    25    50    1" = 50'    100    150

MANAGER: CLAYTON E. BUBECK, P.E.	SURV. CHIEF: CH	FIELDBOOK NO. DATA COLLECTOR
DESIGN BY: CEB	CHKD BY: CH/SBT	DRAWN BY: CH/SBT
DRAWING REFERENCE: N:\06\06-03883-003\Cad\EE\06-03883-003-Site_plan.dwg	CHKD BY: CEB	CHKD BY: CEB
XREFS:		

FOR RETTEW ASSOCIATES BY:

**CHRISTINE HALDEAN**  
ENGINEER  
PE03813

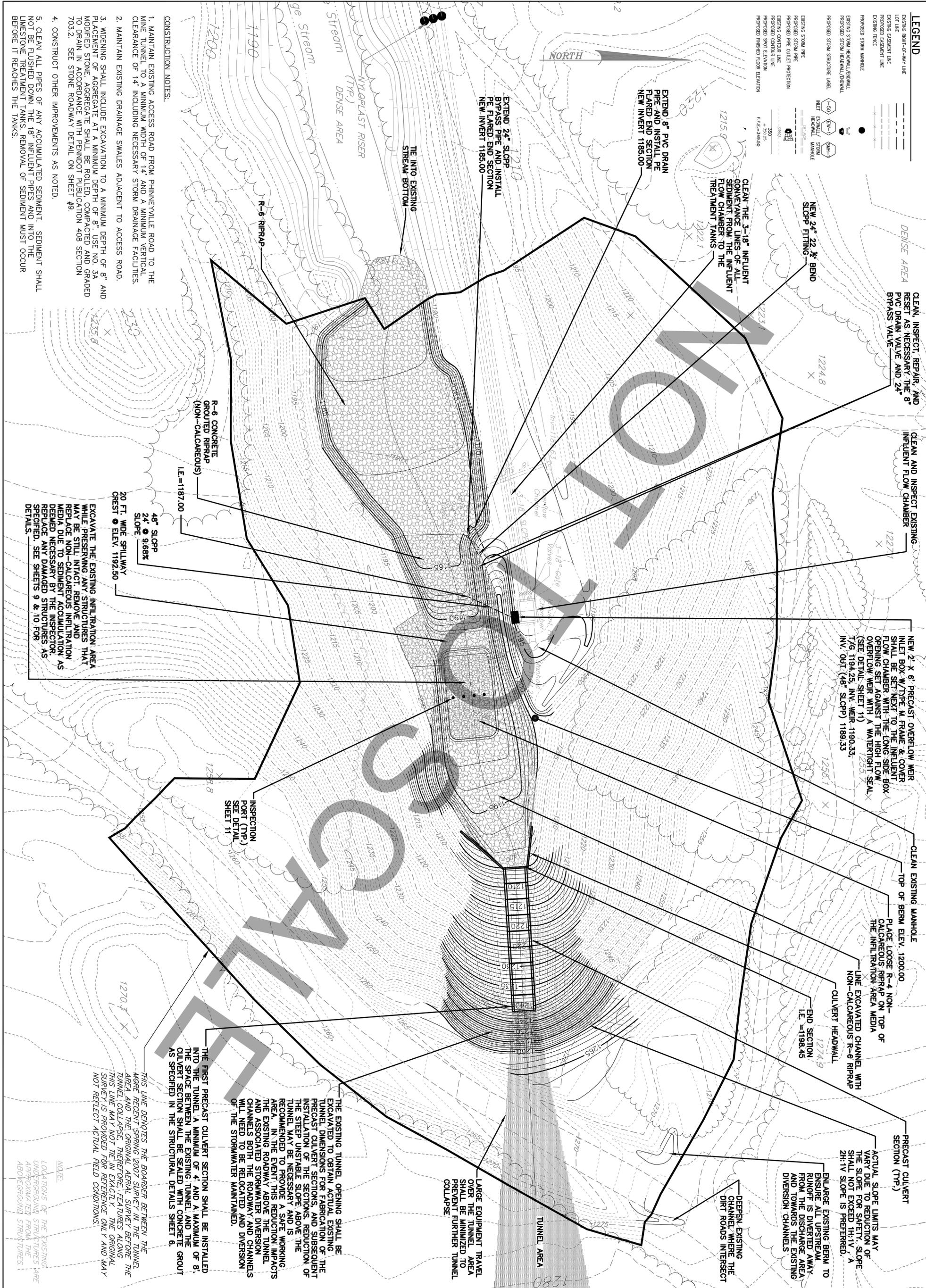
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ISSUED FOR BIDDING



**LEGEND**

- EXISTING RIGHT-OF-WAY LINE
- LOT LINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING FENCE
- PROPOSED STORM MANHOLE
- EXISTING STORM HEADWALL/TUNNEL
- PROPOSED STORM HEADWALL/TUNNEL
- EXISTING STORM STRUCTURE LABEL
- NET RIPPAP/STORM HEADWALL
- NET RIPPAP/STORM MANHOLE
- EXISTING STORM PIPE
- PROPOSED STORM PIPE
- PROPOSED PIPE QUILITY PROTECTION
- EXISTING CONTROL LINE
- PROPOSED CONTROL LINE
- PROPOSED SPOT ELEVATION
- PROPOSED FINISHED FLOOR ELEVATION



**CONSTRUCTION NOTES:**

1. MAINTAIN EXISTING ACCESS ROAD FROM PHINNEYVILLE ROAD TO THE MINE TUNNEL TO A MINIMUM WIDTH OF 14' AND A MINIMUM VERTICAL CLEARANCE OF 14' INCLUDING NECESSARY STORM DRAINAGE FACILITIES.
2. MAINTAIN EXISTING DRAINAGE SWALES ADJACENT TO ACCESS ROAD.
3. WIDENING SHALL INCLUDE EXCAVATION TO A MINIMUM DEPTH OF 8" AND PLACEMENT OF AGGREGATE AT A MINIMUM DEPTH OF 8". USE NO. 3A MODIFIED STONE. AGGREGATE SHALL BE ROLLED, COMPACTED AND GRADED TO DRAIN IN ACCORDANCE WITH PENNDOT PUBLICATION 408 SECTION 703.2. SEE STONE ROADWAY DETAIL ON SHEET #9.
4. CONSTRUCT OTHER IMPROVEMENTS AS NOTED.
5. CLEAN ALL PIPES OF ANY ACCUMULATED SEDIMENT. SEDIMENT SHALL NOT BE FLUSHED DOWN THE 18" INFLUENT PIPES AND INTO THE LIMESTONE TREATMENT TANKS. REMOVAL OF SEDIMENT MUST OCCUR BEFORE IT REACHES THE TANKS.

**EXCAVATE THE EXISTING INFILTRATION AREA WHILE PRESERVING ANY STRUCTURES THAT MAY BE STILL INTACT. REMOVE AND REPLACED WITH NON-CALCAREOUS INFILTRATION MEDIA DUE TO SEDIMENT ACCUMULATION AS DEEMED NECESSARY BY THE INSPECTOR. REPLACE ANY DAMAGED STRUCTURES AS SPECIFIED. SEE SHEETS 9 & 10 FOR DETAILS.**

**INSPECTION PORT (TYP.) SEE DETAIL SHEET 11**

THIS LINE DENOTES THE BORDER BETWEEN THE MORE RECENT SPRING 2007 SURVEY IN THE TUNNEL AREA AND THE ORIGINAL AERIAL SURVEY BEFORE THE TUNNEL COLLAPSE. THEREFORE, FEATURES ALONG THIS LINE MAY NOT BE IN EXACTLY THE ORIGINAL SURVEY IS PROVIDED FOR REFERENCE ONLY AND MAY NOT REFLECT ACTUAL FIELD CONDITIONS.

THE FIRST PRECAST CULVERT SECTION SHALL BE INSTALLED INTO THE TUNNEL A MINIMUM OF 4' AND A MAXIMUM OF 8'. THE SPACE BETWEEN THE EXISTING TUNNEL AND THE CULVERT SECTION SHALL BE SEALED WITH CONCRETE GROUT AS SPECIFIED IN THE STRUCTURAL DETAILS SHEET 6.

THE EXISTING TUNNEL OPENING SHALL BE EXCAVATED TO OBTAIN ACTUAL EXISTING TUNNEL DIMENSIONS FOR FABRICATION OF THE PRECAST CULVERT SECTIONS, AND SUBSEQUENT INSTALLATION OF THE SECTIONS. REDUCTION OF THE STEEP UNSTABLE SLOPE ABOVE THE TUNNEL MAY BE NECESSARY AND IS RECOMMENDED TO PROVIDE A SAFE WORKING AREA. IN THE EVENT THIS REDUCTION IMPACTS THE EXISTING ROADWAY ABOVE THE TUNNEL AND ASSOCIATED STORMWATER DIVERSION CHANNELS BOTH THE ROADWAY AND CHANNELS WILL NEED TO BE RELOCATED AND DIVERSION OF THE STORMWATER MAINTAINED.

LARGE EQUIPMENT TRAVEL OVER THE TUNNEL AREA SHALL BE MINIMIZED TO PREVENT FURTHER TUNNEL COLLAPSE.

DEEPEN EXISTING THE CHANNEL WHERE THE DIRT ROADS INTERSECT

ENLARGE EXISTING BERM TO ENSURE ALL UPSTREAM RUNOFF IS DIVERTED AWAY FROM THE DISCHARGE AREA AND TOWARDS THE EXISTING DIVERSION CHANNELS

PRECAST CULVERT SECTION (TYP.)

ACTUAL SLOPE LIMITS MAY VARY DUE TO REDUCTION OF SLOPE. SLOPE SHALL NOT EXCEED 1H:1V. A 2H:1V SLOPE IS PREFERRED.

CULVERT HEADWALL

LINE EXCAVATED CHANNEL WITH NON-CALCAREOUS R-6 RIPPAP

PLACE LOOSE R-4 NON-CALCAREOUS RIPPAP ON TOP OF THE INFILTRATION AREA MEDIA

TOP OF BERM ELEV. 1200.00

CLEAN AND INSPECT EXISTING INFILUENT FLOW CHAMBER

CLEAN, INSPECT, REPAIR, AND RESET AS NECESSARY THE 8" PVC DRAIN VALVE AND 24" PVC DRAIN VALVE

CLEAN THE 3-18" INFLUENT GOVERNANCE LINES OF ALL SEDIMENT FROM THE INFLUENT FLOW CHAMBER TO THE TREATMENT TANKS

NEW 2' X 6' PRECAST OVERFLOW WEIR INLET BOX W/TYPE M FRAME & COVER SHALL BE SET NEXT TO THE INFLUENT FLOW CHAMBER WITH THE LONG SIDE BOX OPENING SET AGAINST THE HIGH FLOW OPENING WITH A WATER-TIGHT SEAL. (SEE DETAIL SHEET 11) 1/8" 1194.25, INV. WEIR 1180.33, INV. OUT (48" SLOPE) 1189.33

NEW 24" 22 1/2" BEND SLOPP FITTING

EXTEND 8" PVC DRAIN PIPE AND INSTALL PE FLARED END SECTION NEW INVERT 1185.00

EXTEND 24" SLOPP BYPASS PIPE AND INSTALL PE FLARED END SECTION NEW INVERT 1185.00

THE INTO EXISTING STREAM BOTTOM

R-6 RIPPAP

R-6 CONCRETE RIPPAP (NON-CALCAREOUS)

48" SLOPP 24" @ 9.68% SLOPE

20 FT. WIDE SPILLWAY CREST @ ELEV. 1192.50

SCALE 1" = 20'

CLIENT SCHUYLKILL CONSERVATION DISTRICT 1206 AG CENTER DRIVE POTTSVILLE, PA 17901-9733

MANAGER: CLAYTON E. BUBECK, P.E.  
DESIGN BY: CH  
DRAWING REFERENCE: N:\06\06-03883-003\Cad\EE\06-03883-003-Proposed.dwg  
XREFS:

NO.	DATE	REVISION

FLOOD DAMAGE REPAIRS  
FOR THE  
**AUDENREID MINE TUNNEL**  
ABANDONED MINE DRAINAGE REMEDIATION PROJECT  
TUNNEL AREA REPAIR PLAN  
EAST UNION TOWNSHIP SCHUYLKILL COUNTY, PA

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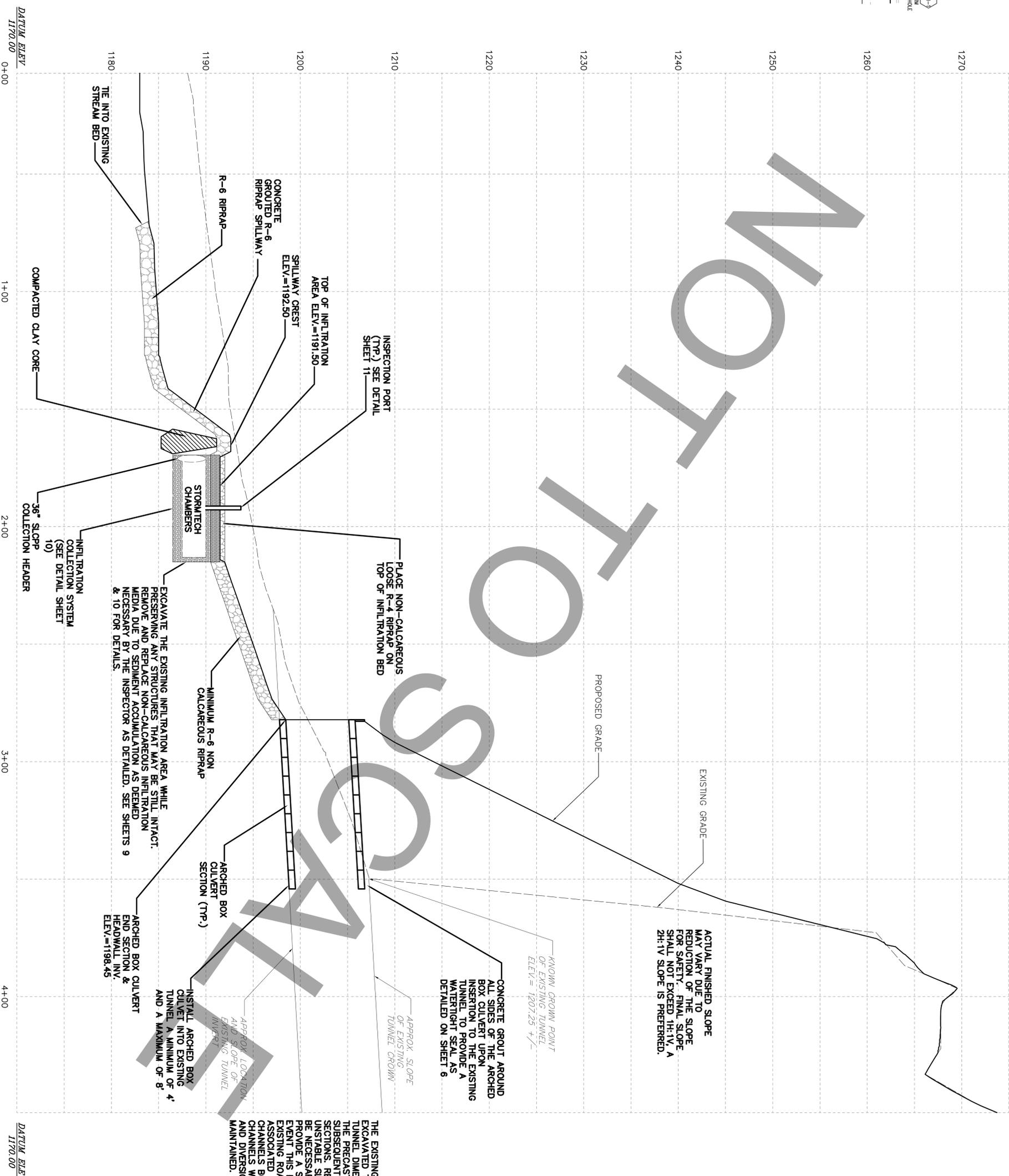
FOR RETTEW ASSOCIATES BY:  
REGISTERED PROFESSIONAL ENGINEER  
CHRISTINE HALDEMAN  
PE028153

NO.	DATE	REVISION

ISSUED FOR BIDDING

**LEGEND**

- EXISTING RIGHT-OF-WAY LINE
- LOT LINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING FENCE
- PROPOSED STORM MANHOLE
- EXISTING STORM HEADWALL/ROWALL
- PROPOSED STORM HEADWALL/ROWALL
- PROPOSED STORM STRUCTURE LABEL
- EXISTING STORM PIPE
- PROPOSED STORM PIPE
- PROPOSED PIPE OUTLET PROTECTION
- EXISTING CONDUIT LINE
- PROPOSED CONDUIT LINE
- PROPOSED SPOT ELEVATION
- PROPOSED FINISHED FLOOR ELEVATION



ACTUAL FINISHED SLOPE MAY VARY DUE TO REDUCTION OF THE SLOPE FOR SAFETY. FINAL SLOPE SHALL NOT EXCEED 1H:1V. A 2H:1V SLOPE IS PREFERRED.

CONCRETE GROUT AROUND ALL SIDES OF THE ARCHED BOX CULVERT UPON INSERTION TO THE EXISTING TUNNEL TO PROVIDE A WATER TIGHT SEAL AS DETAILED ON SHEET 6

THE EXISTING TUNNEL OPENING SHALL BE EXCAVATED TO OBTAIN ACTUAL EXISTING TUNNEL DIMENSIONS FOR FABRICATION OF THE PRECAST CULVERT SECTIONS, AND SUBSEQUENT INSTALLATION OF THE STEEP UNSTABLE SLOPE ABOVE THE TUNNEL MAY BE NECESSARY AND IS RECOMMENDED TO PROVIDE A SAFE WORKING AREA. IN THE EVENT THIS REDUCTION IMPACTS THE EXISTING ROADWAY ABOVE THE TUNNEL AND ASSOCIATED STORMWATER DIVERSION CHANNELS BOTH THE ROADWAY AND CHANNELS WILL NEED TO BE RELOCATED AND DIVERSION OF THE STORMWATER MAINTAINED.

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 FOR THE  
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 TUNNEL AREA PROFILE  
 EAST UNION TOWNSHIP      SCHUYLKILL COUNTY, PA

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 1206 AG CENTER DRIVE  
 POTTSVILLE, PA 17901-9733

SCALE  
 1" = 20'  
 0' 10' 20' 40' 60'

MANAGER: CLAYTON E. BUBECK, P.E.  
 DESIGN BY: CH  
 DRAWING REFERENCE: N:\06\06-03883-003\Cad\EE\06-03883-003-Proposed.dwg  
 XREFS:

SURV. CHIEF: FIELDBOOK NO. DATA COLLECTOR  
 CHKD BY: CH/CEB  
 DRAWN BY: CH/SBT  
 CHKD BY: CEB

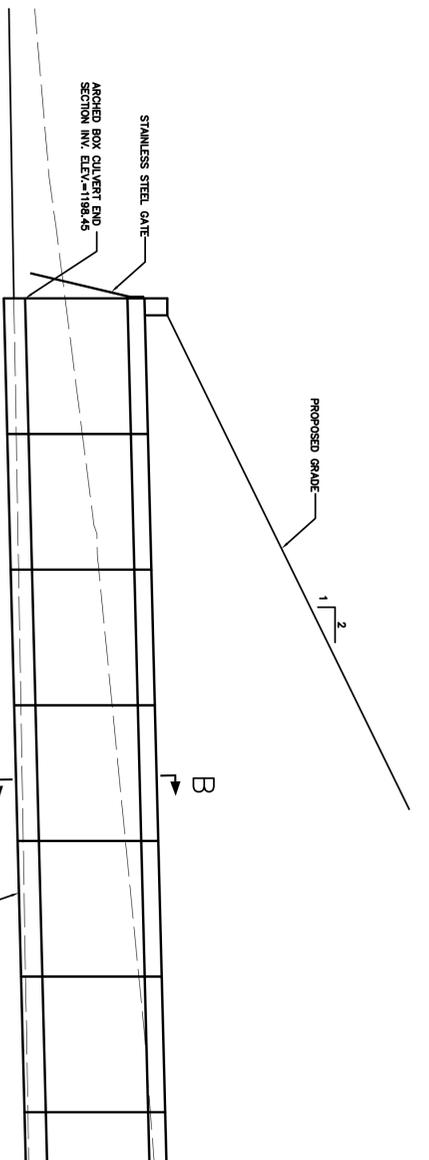
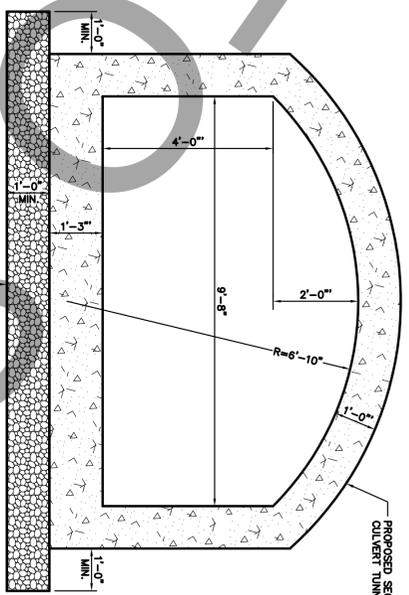
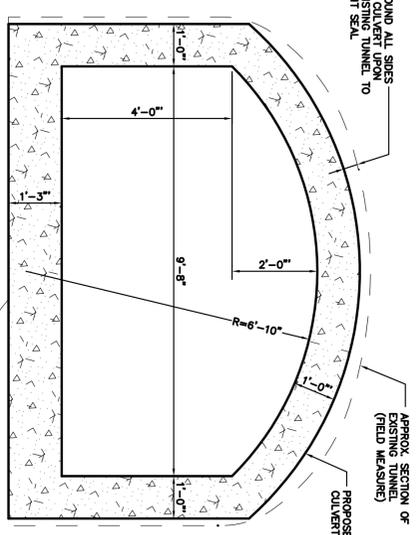
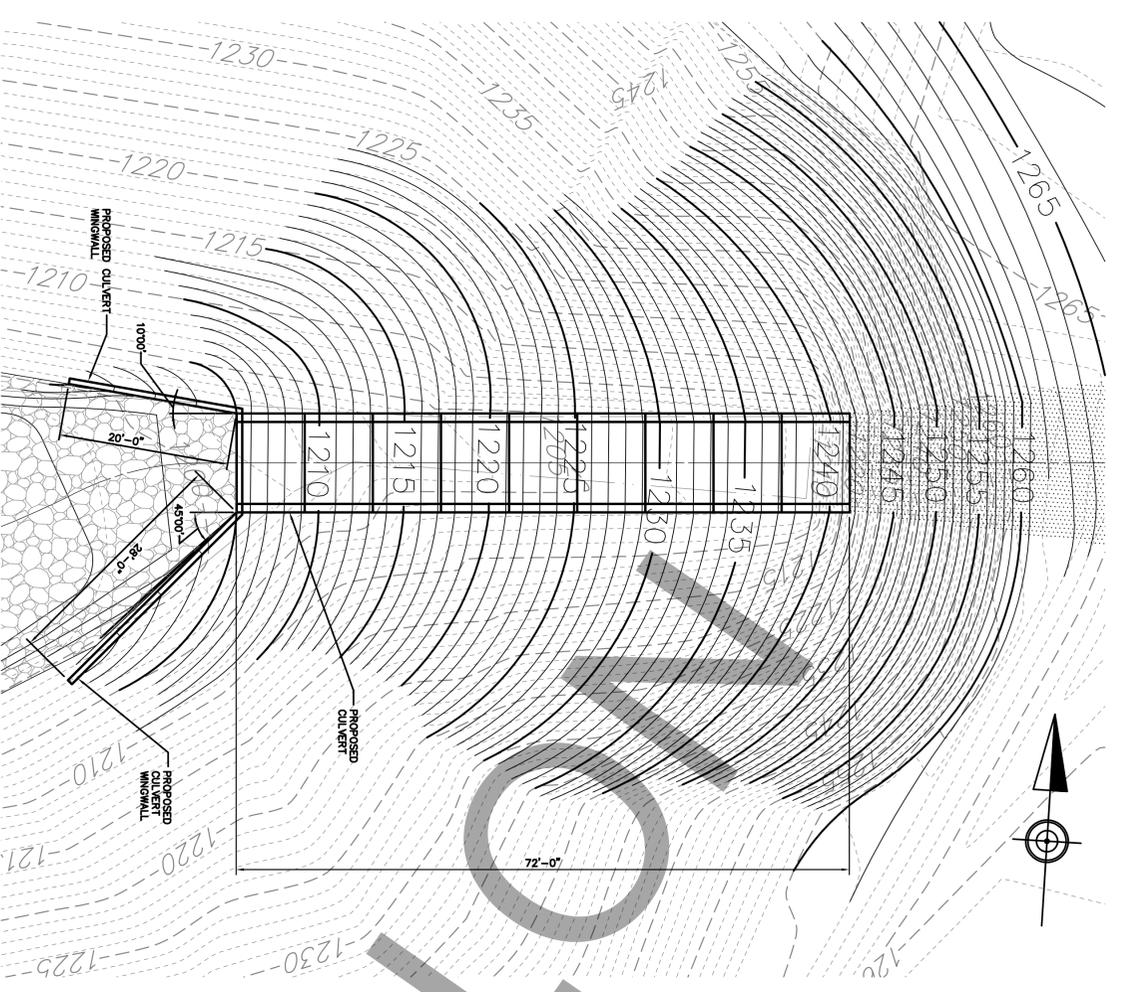
FOR RETTEW ASSOCIATES BY:  
  
 CHRISTINE HALDEMAN  
 ENGINEER  
 PD073813

NO.	DATE	REVISION

ISSUED FOR BIDDING

**GENERAL NOTES**

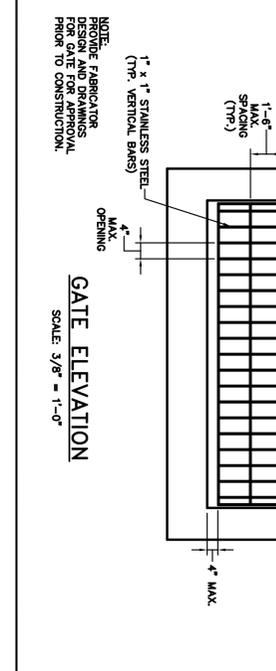
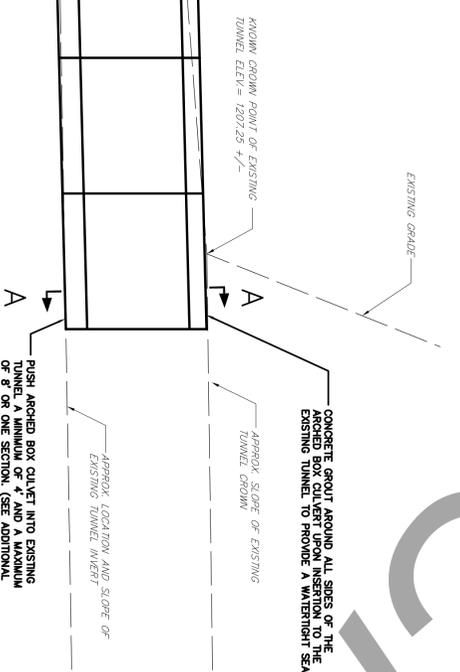
1. PROVIDE MATERIALS AND PERFORM WORK IN GENERAL ACCORDANCE WITH PROVISIONS IN PENNDOT PUBLICATION 409/2003 AND CONTACT SPECIAL DESIGNER FOR ANY QUESTIONS.
2. PROVIDE A MINIMUM DEPTH OF 3'-6" FROM FINISHED GROUND TO THE BOTTOM OF THE FOOTING FOR FROST PROTECTION ALONG THE WINGWALLS.
3. PROVIDE 6" COARSE AGGREGATE BASE UNDER WINGWALLS ONLY.
4. FOOTINGS TO BEAR ON UNDISTURBED SOIL OR CONTROLLED, COMPACTED, SPRINGING MATERIAL. THE SOIL BEARING PRESSURE SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER. THE SOIL BEARING PRESSURE SHOULD BE VERIFIED BY THE ASSUMED TO BE FOUND TO BE ADEQUATE FOR THE DESIGN. THE SOIL BEARING PRESSURE SHOULD BE VERIFIED BY THE ASSUMED TO BE FOUND TO BE ADEQUATE FOR THE DESIGN.



- FOUNDATION NOTES**
1. PROVIDE A MINIMUM DEPTH OF 3'-6" FROM FINISHED GROUND TO THE BOTTOM OF THE FOOTING FOR FROST PROTECTION ALONG THE WINGWALLS.
  2. PROVIDE 6" COARSE AGGREGATE BASE UNDER WINGWALLS ONLY.
  3. FOOTINGS TO BEAR ON UNDISTURBED SOIL OR CONTROLLED, COMPACTED, SPRINGING MATERIAL. THE SOIL BEARING PRESSURE SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER. THE SOIL BEARING PRESSURE SHOULD BE VERIFIED BY THE ASSUMED TO BE FOUND TO BE ADEQUATE FOR THE DESIGN. THE SOIL BEARING PRESSURE SHOULD BE VERIFIED BY THE ASSUMED TO BE FOUND TO BE ADEQUATE FOR THE DESIGN.
- PROFILE ALONG CULVERT CENTERLINE**  
SCALE: 1" = 5'

**CULVERT SECTION A-A**  
SCALE 1/2" = 1'-0"

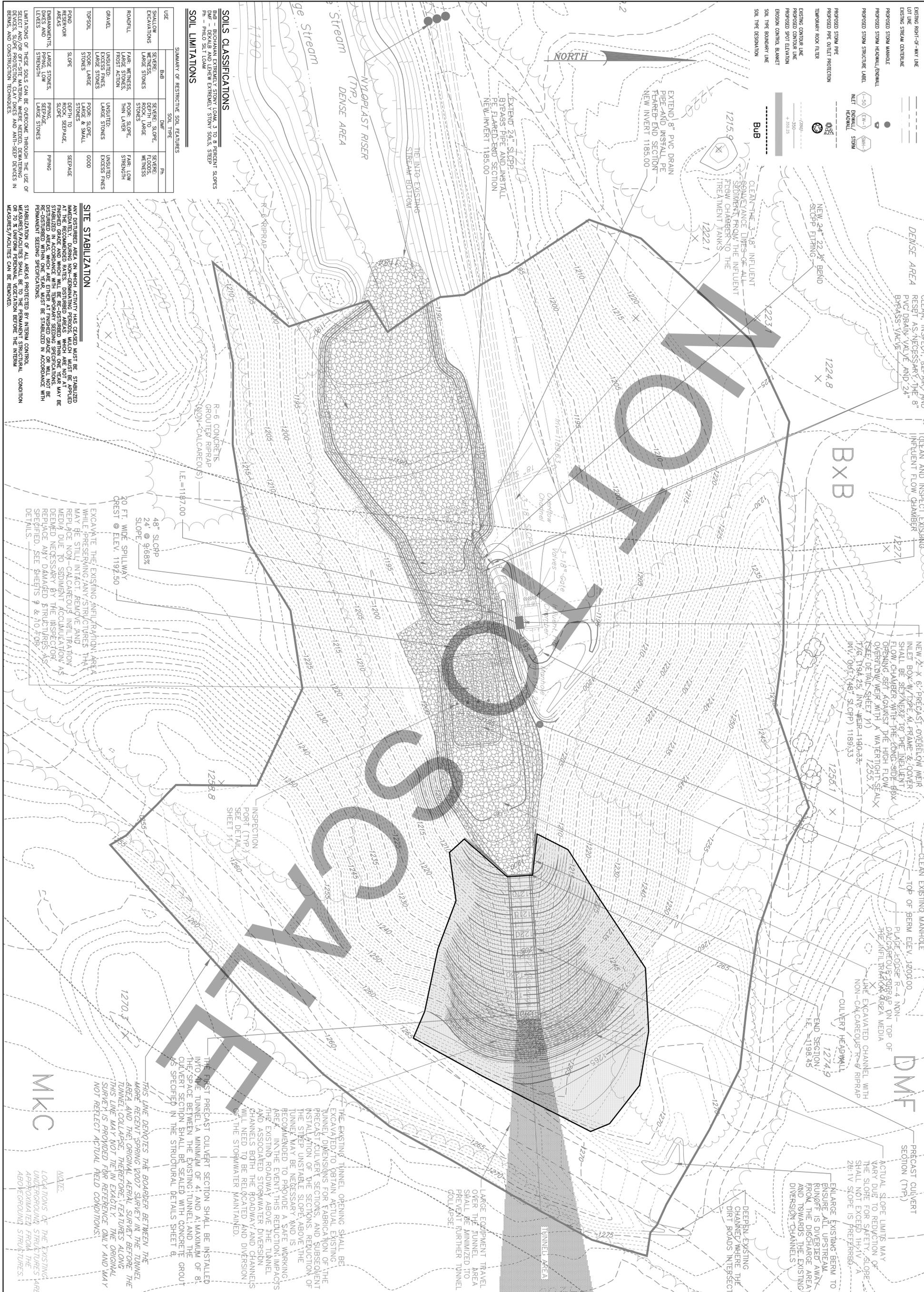
**CULVERT SECTION B-B**  
SCALE 1/2" = 1'-0"



<p><b>RETTEW</b> RETTEW Associates, Inc. 950 E. Main Street, Suite #220 Schuylkill Haven, PA 17972 Phone (570) 385-2270 • Fax (570) 385-2217 Email: rette@rette.com Website: www.rette.com</p>		<p>CLIENT <b>SCHUYLKILL CONSERVATION DISTRICT</b> 1206 AG CENTER DRIVE POTTSVILLE, PA 17901-9733</p>		<p>MANAGER: CLAYTON E. BUBECK, P.E. DESIGN BY: DAR CHKD BY: QDR DRAWN BY: MLH CHKD BY: DAR</p>		<p>SURV. CHIEF: FIELDBOOK NO. DATA COLLECTOR DRAWING REFERENCE: N:\06\06-03883-003\Cad\Culvert\06-03883-003-Culvert-Details.dwg</p>		<p>FOR RETTEW ASSOCIATES BY: <b>CHRISTINE HALDEMAN</b> ENGINEER PE#28153</p>	
<p>FLOOD DAMAGE REPAIRS FOR THE <b>AUDENREID MINE TUNNEL</b> ABANDONED MINE DRAINAGE REMEDIATION PROJECT CULVERT DETAILS EAST UNION TOWNSHIP SCHUYLKILL COUNTY, PA</p>		<p>SCALE AS NOTED</p>		<p>NO. DATE REVISION</p>		<p>ISSUED FOR BIDDING</p>		<p>DATE: JUNE 29, 2007 SHEET NO. 6 OF 11 DWG. NO. 06-03883-003</p>	

**LEGEND**

- EXISTING RIGHT-OF-WAY LINE
- LOT LINE
- EXISTING STREAM CENTERLINE
- PROPOSED STORM MANHOLE
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED STORM STRUCTURE LABEL
- PROPOSED STORM STRUCTURE LABEL
- PROPOSED STORM PIPE
- PROPOSED PIPE OUTLET PROTECTION
- TEMPORARY ROCK FILTER
- EXISTING CONTROL LINE
- PROPOSED CONTROL LINE
- PROPOSED SPOT ELEVATION
- EROSION CONTROL BLANKET
- SOIL THE BOUNDARY LINE
- SOIL THE BOUNDARY LINE



**SOILS CLASSIFICATIONS**  
 B-B - BURGESS EXTREMELY STONY LOAM, 3 TO 8 PERCENT SLOPES  
 Ph - PHLO SILT LOAM  
**SOIL LIMITATIONS**

USE	BBB	SOIL TYPE	PH
SHALLOW EXCAVATIONS	SEVERE SLOPE, LARGE STONES	SEVERE SLOPE, ROCK, LARGE STONES	SEVERE WEENESS
ROADFILL	FAIR WEENESS, LARGE STONES, FROST ACTION	POOR SLOPE, THIN LAYER	FAIR, LOW STRENGTH
GRAVEL	UNSATURATED, LARGE STONES	UNSATURATED, LARGE STONES	UNSATURATED, EXCESS FINES
TOPSOIL	POOR, LARGE STONES	POOR SLOPE, LARGE & SMALL STONES	GOOD
ROAD SURFACE AREAS	SLOPE	DEPTH TO STONES	SEEPAGE
EMBANKMENTS, DICES AND LEAVES	LARGE STONES, PILING, LOW STRENGTH	DEPTH TO STONES	SEEPAGE
			PILING

**SITE STABILIZATION**  
 ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED MUST BE STABILIZED IMMEDIATELY. DURING NON-GERMINATING PERIODS, WHICH MUST BE APPLIED TO FINISHED GRADE AND WHICH WILL BE DISTURBED WITHIN ONE YEAR MAY BE STABILIZED IN ACCORDANCE WITH TEMPORARY SEEDING SPECIFICATIONS. DISTURBED AREAS, WHICH ARE EITHER A FINISHED GRADE OR WILL NOT BE DISTURBED, MUST BE STABILIZED IN ACCORDANCE WITH PERMANENT SEEDING SPECIFICATIONS.

STABILIZATION OF ALL AREAS PROTECTED BY INTERNAL CONTROL MEASURES/FACILITIES SHALL BE TO THE PERMANENT STRUCTURAL CONDITION OR 70% UNIFORM PERMANENT VEGETATION BEFORE THE INTERNAL MEASURES/FACILITIES CAN BE REMOVED.

EXCAVATE THE EXISTING INFILTRATION AREA WHILE PRESERVING ANY STRUCTURES THAT MAY BE STILL INTACT. REMOVE AND REPLACE NON-CALCAREOUS INFILTRATION MEDIA DUE TO SEDIMENT ACCUMULATION AS DEEMED NECESSARY BY THE INSPECTOR. REPLACE ANY DAMAGED STRUCTURES AS SPECIFIED. SEE SHEETS 9 & 10 FOR DETAILS.

48" SLOPP  
 24 @ 9:58%  
 20 FT. WIDE SPILLWAY  
 CREST @ ELEV. 1192.50

INSPECTION  
 PORT (TRP)  
 SEE DETAIL  
 SHEET 11

THE FIRST PRECAST CULVERT SECTION SHALL BE INSTALLED INTO THE TUNNEL A MINIMUM OF 4' AND A MAXIMUM OF 8'. THE SPACE BETWEEN THE EXISTING TUNNEL AND THE CULVERT SECTION SHALL BE SEALED WITH CONCRETE GROUT AS SPECIFIED IN THE STRUCTURAL DETAILS SHEET 8.

THIS LINE DENOTES THE BORDER BETWEEN THE HIGHER RECENT SPRING 2007 SURVEY IN THE TUNNEL AREA AND THE ORIGINAL AERIAL SURVEY BEFORE THE TUNNEL COLLAPSE. THEREFORE, FEATURES ALONG THIS LINE MAY NOT BE IN EXACTLY THE ORIGINAL SURVEY AS PROVIDED FOR REFERENCE ONLY AND MAY NOT REFLECT ACTUAL FIELD CONDITIONS.

LOG TONS OF THE EXISTING UNDERGROUND STRUCTURES ARE APPROXIMATE FROM THE ABOVE-GROUND STRUCTURES.

**NOT TO SCALE**

FLOOD DAMAGE REPAIRS  
 FOR THE  
**AUDENREID MINE TUNNEL**  
 ABANDONED MINE DRAINAGE REMEDIATION PROJECT  
 TUNNEL AREA REPAIR E&S PLAN  
 EAST UNION TOWNSHIP      SCHUYLKILL COUNTY, PA

**RETTEW**  
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CLIENT  
**SCHUYLKILL CONSERVATION DISTRICT**  
 1206 AG CENTER DRIVE  
 POTTSVILLE, PA 17901-9733

SCALE  
 0' 10' 20' 1" = 20' 40' 60'

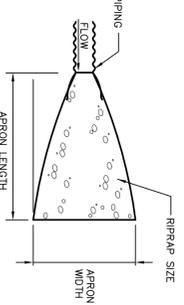
MANAGER: CLAYTON E. BUBECK, P.E.  
 DESIGN BY: CHD  
 CHKD BY: CEB  
 DRAWN BY: CH/SBT  
 DRAWING REFERENCE:  
 N:\06\06-03883-003\Cad\EE\06-03883-003-EnS.dwg  
 XREFS:

FOR RETTEW ASSOCIATES BY:  
  
 ENGINEER  
 PFD38153

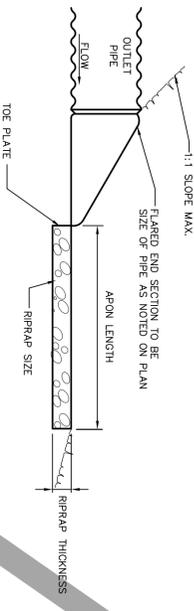
NO.	DATE	REVISION

ISSUED FOR BIDDING





PLAN



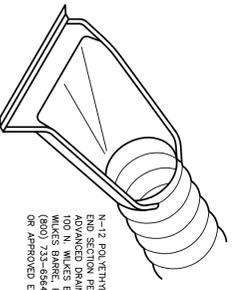
CROSS-SECTION

OUTLET	APRON LENGTH	APRON WIDTH	RRAP SIZE	RRAP THICKNESS
8" DRAIN PIPE	6'	2'-6"	R-6	30"
24" BYPASS PIPE	20'	26'	R-6	30"

- NOTES:
1. MERGE END SECTION INTO RIPRAPPED SPILLWAYS WHERE REQUIRED.
  2. SHOULD REQUIRED, SPILLWAY RIPRAP SIZE EXCEED REQUIRED OUTLET PROJECTION RIPRAP USE THE REQUIRED SPILLWAY RIPRAP.

**FLARED END SECTION OUTLET PROTECTION**

NOT TO SCALE

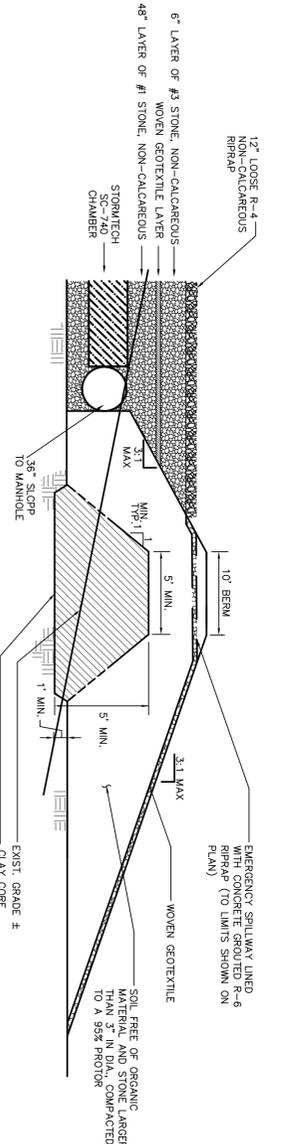


ISOMETRIC

N-12 POLYETHYLENE FLARED END SECTION MANUFACTURED BY WILKES BARRE DRAINAGE SYSTEMS, INC. 100 N. WILKES BARRE BLVD. WILKES BARRE, PA 18702 610-825-1111 OR APPROVED EQUIVALENT

**POLYETHYLENE FLARED END SECTION**

NOT TO SCALE

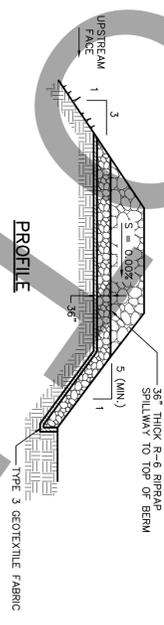


SECTION

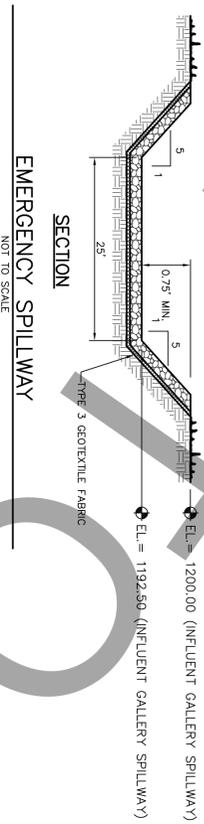
**INFILTRATION COLLECTION SYSTEM BERM**

NOT TO SCALE

NOTE: CLAY CORE SHALL BE REED INTO ALL THREE SIZES OF THE EXISTING CLAY CORE. THE CLAY USED IN THE EXISTING CLAY CORE SHALL CONSIST OF CLAY CONTAINING NO MORE THAN 15% (BY VOLUME) STONE NO LARGER THAN TWO (2) INCHES IN DIAMETER. CLAY SHALL BE PLACED IN SIX (6) INCH LIFTS AND COMPACTED BY MEANS OF A MECHANICAL TAMPER TO A MINIMUM DENSITY AT OPTIMUM MOISTURE CONTENT.

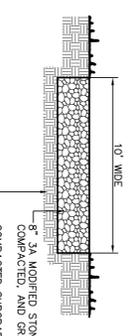


PROFILE



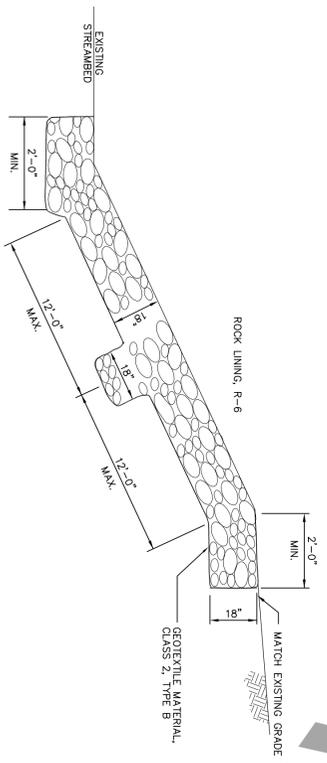
SECTION

NOT TO SCALE



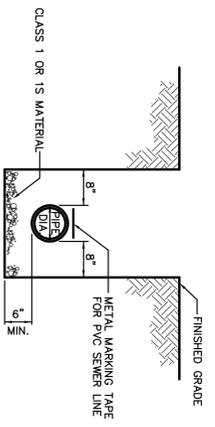
STONE ROADWAY SECTION

NOT TO SCALE



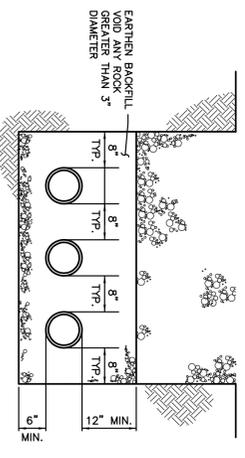
**RIPRAP STREAMBANK STABILIZATION**

NOT TO SCALE



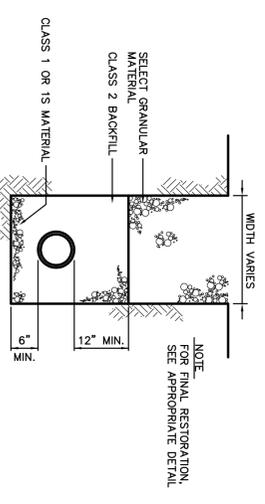
TYPICAL TRENCH DETAIL

NO SCALE



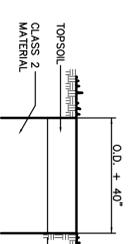
BACKFILL DETAIL FOR INTAKE AND OUTFALL PIPES

NOTE: THIS DETAIL APPLIES TO TRENCHES CONTAINING ONE, TWO, OR THREE PIPES.



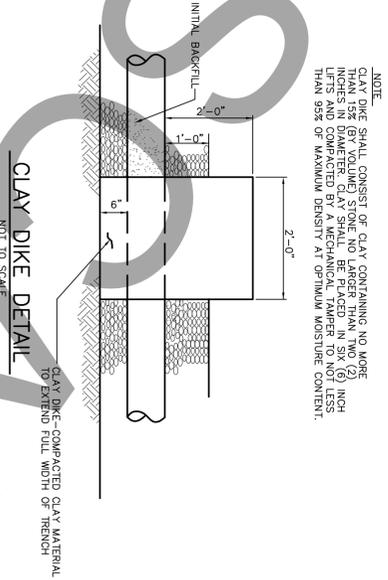
TYPICAL BACKFILL (NON-PAVED AREAS)

NO SCALE



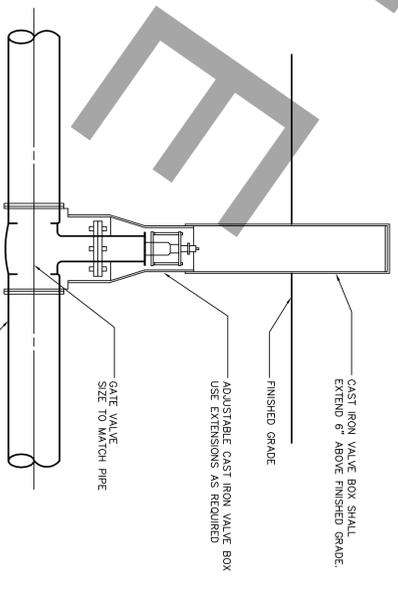
LAWN/FIELD RESTORATION

NO SCALE



CLAY DIKE DETAIL

NOT TO SCALE



TYPICAL GATE VALVE & VALVE BOX DETAIL

NOTE: IF EXTENSIONS ARE NECESSARY CONTRACTOR SHALL SET "PILING" AND ALIGN PROPERLY FOR ACCESS TO OPERATING UNIT.

NO.	DATE	REVISION

FOR RETTEW ASSOCIATES BY:

MANAGER: CLAYTON E. BUBECK, P.E.	SURV. CHIEF:	FIELDBOOK NO. DATA COLLECTOR
DESIGN BY: CH	CHKD BY: CEB	CHKD BY: CEB
DRAWING REFERENCE: N:\06\06-03883-003\Code\EE\06-03883-003-Details.dwg		
XREFS:		

CLIENT

SCHUYLKILL CONSERVATION DISTRICT  
1206 AG CENTER DRIVE  
POTTSVILLE, PA 17901-9733

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FLOOD DAMAGE REPAIRS  
FOR THE  
**AUDENREID MINE TUNNEL**  
ABANDONED MINE DRAINAGE REMEDIATION PROJECT

DETAILS SHEET

EAST UNION TOWNSHIP SCHUYLKILL COUNTY, PA

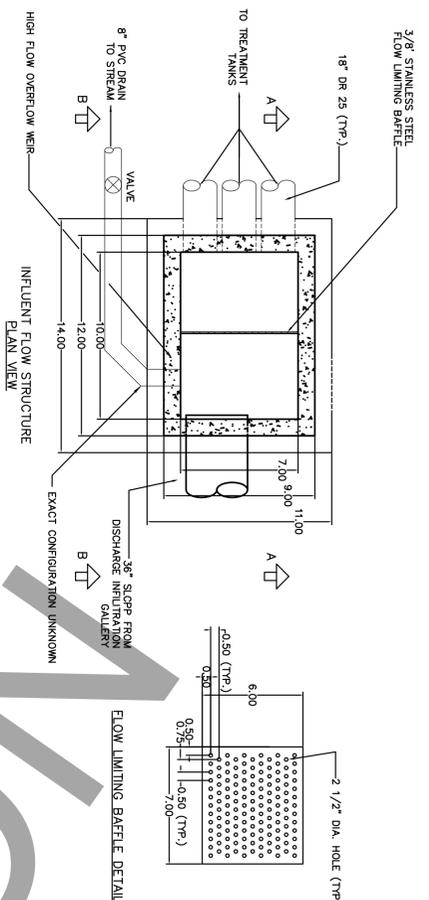
DATE: JUNE 29, 2007

SHEET NO. 9 OF 11

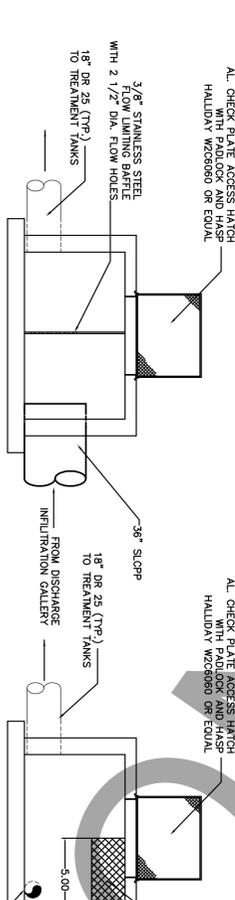
DWG. NO. 06-03883-003

ISSUED FOR BIDDING





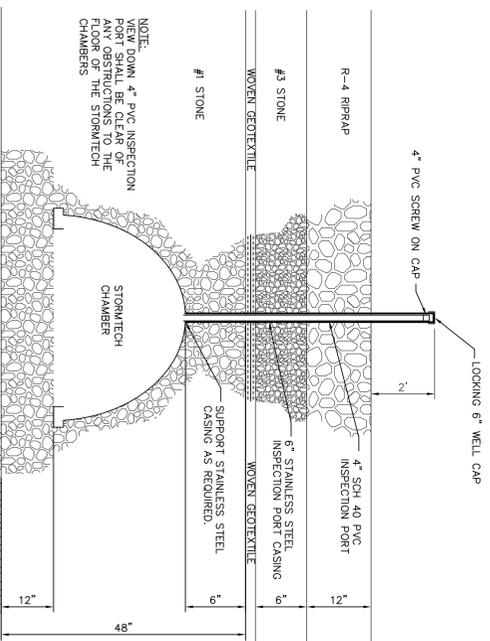
- NOTES:**
1. FLOW LIMITING Baffle SHALL BE ONE CONTINUOUS 3/8" SHEET OF 304 STAINLESS STEEL.
  2. FLOW LIMITING Baffle HOLES SHALL BE 2 1/2" DIAMETER.
  3. THE FLOW LIMITING Baffle SHALL BE ATTACHED TO THE WALLS, TOP AND BOTTOM OF THE CONCRETE STRUCTURE UTILIZING 4"x4"x1/2" 304 SS ANGLE AND SS PASTENERS.
  4. CONCRETE STRUCTURE STEEL REINFORCING DESIGN SHALL BE BY THE PRECAST MANUFACTURER. THE REINFORCING DESIGN SHALL BE APPROVED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF PENNSYLVANIA.
  5. THE ALUMINUM CHECK PLATE ACCESS HATCH SHALL BE CAST INTO THE TOP OF THE STRUCTURE AND SHALL BE HALLDAY WZ60880 OR EQUAL.
  6. COAT INTERIOR WITH EITHER PVC LINER SYSTEM OR HDPE/PP-R LINER SYSTEM AS SPECIFIED IN SPECIFICATION SECTION 02730.
  7. INSTALL 1/4" 304 SS BAR SCREEN ON HIGH FLOW OVERFLOW WEIR.



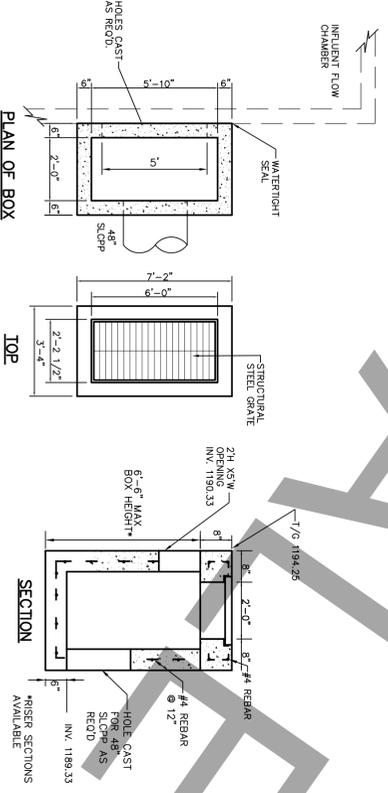
INFLUENT FLOW STRUCTURE  
ELEVATION VIEW A-A

INFLUENT FLOW STRUCTURE  
ELEVATION VIEW B-B

NOT TO SCALE - ALL DIMENSIONS IN FEET  
THIS DETAIL PROVIDED FOR REFERENCE ONLY, STRUCTURE SHOULD BE INTACT AS DEPICTED. NOTIFY INSPECTOR IF NOT AS DEPICTED. CLEAN STRUCTURE OF ANY ACCUMULATED SEDIMENT.



INSPECTION PORT DETAIL  
NOT TO SCALE



2' X 6' OVERFLOW WEIR BOX  
NOT TO SCALE

NO.	DATE	REVISION

FOR RETTEW ASSOCIATES BY:

MANAGER: CLAYTON E. BUBECK, P.E.	SURV. CHIEF:	FIELDBOOK NO. DATA COLLECTOR
DESIGN BY: CH	CHKD BY: CEB	CHKD BY: CEB
DRAWING REFERENCE: N:\06\06-03883-003\Cad\EE\06-03883-003-Details.dwg		
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SCALE  
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DETAILS SHEET

EAST UNION TOWNSHIP      SCHUYLKILL COUNTY, PA

DATE: JUNE 29, 2007  
SHEET NO. 11 OF 11  
DWG. NO. 06-03883-003

ISSUED FOR BIDDING