

# Orr&Reno

Maureen D. Smith  
msmith@orr-reno.com  
Direct Dial 603.223.9166  
Direct Fax 603.223.9066  
Admitted in NH, MD and select Federal Courts

April 27, 2015

**Via Electronic Mail and Hand Delivery**

Martin P. Honigberg, Chairman  
New Hampshire Site Evaluation Committee  
**C/O: Jane Murray, NH Department of Environmental Services**  
29 Hazen Drive  
Concord, NH 03301-2429

**Re: SEC Docket No: 1998-02  
Granite Ridge Energy, LLC Cooling Water Pipeline Realignment**

Dear Ms. Murray:

On behalf of Granite Ridge Energy, LLC, we enclose ~~Submission of As-Built Plans for~~  
~~Cooling Water Pipeline~~ along with one (1) copy of the April 2015 Record Drawing in 11 x 17  
format.

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

Thank you for your assistance with this matter.

Sincerely,



Maureen D. Smith

MDS/eac

cc: Michael Iacopino, Esq. (via email)  
Ridgely Mauck, P.E., NHDES (via email)  
Peter Roth, Esq., NHAGO (via email)

1301631\_1

STATE OF NEW HAMPSHIRE  
SITE EVALUATION COMMITTEE

IN RE: GRANITE RIDGE ENERGY, LLC  
DOCKET NO. 98-02

SUBMISSION OF AS-BUILT PLANS FOR COOLING WATER PIPELINE

NOW COMES Granite Ridge Energy, LLC ("GRE"), by and through its attorneys, Orr & Reno, P.A., and respectfully states as follows:

1. By letter dated December 5, 2014, the Committee's Chairman stated that a proposed realignment of GRE's cooling water line adjacent to Pettengill Road required no further action by the Committee, as contemplated by the original Certificate and accompanying delegation of authority for minor modifications. The Chairman also directed GRE to provide monthly updates to the Committee generally outlining the progress of the modifications and to file as-built plans upon completion of construction.

2. As required by the Committee's December 5, 2014 correspondence requiring the filing of an as-built plan upon completion of modifications to alignment of the cooling water pipeline, GRE hereby submits the April 2015 Record Drawing for the modification, as constructed.

Respectfully submitted,

Granite Ridge Energy, LLC  
By Its Attorneys,

Dated: April 27, 2015



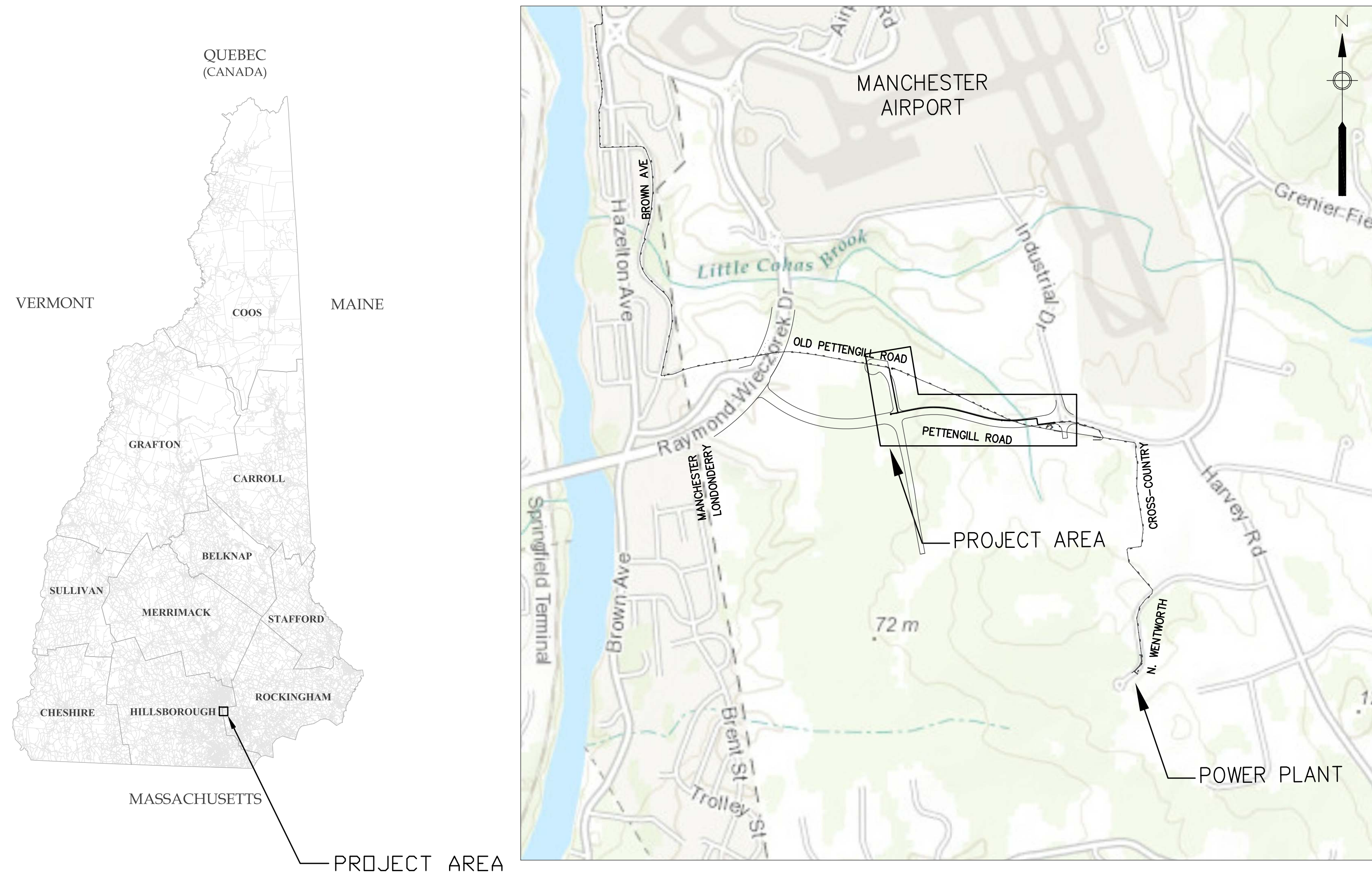
Maureen D. Smith, NH Bar # 4857  
Orr & Reno, P.A.  
45 South Main Street  
P.O. Box 3550  
Concord, NH 03302-3550  
Telephone: (603) 223-9166  
Email: [msmith@orr-reno.com](mailto:msmith@orr-reno.com)

# GRANITE RIDGE ENERGY, LLC.

## COOLING WATER PIPELINE RELOCATION

### PETTENGILL ROAD

#### NOVEMBER 2014



**LOCATION PLAN**

SCALE: 1 IN. = 1,000 FT

**AECOM**  
 AECOM TECHNICAL SERVICES, INC.  
 701 EDgewater DRIVE  
 WAKEFIELD, MA 01880  
 PHONE (781) 246-5200

**RECORD DRAWING**

NOTE: This record drawing has been prepared based on modifying the design drawings to incorporate documented changes made during the construction. While reasonable efforts have been made to ensure accuracy and completeness, the location, size and configuration of the work should be field verified prior to any re-use of this information.

**APRIL 2015**

# GENERAL NOTES

1. BASEMAP INFORMATION, INCLUDING THE PROPOSED ROADWAY DESIGN, TOPOGRAPHIC INFORMATION AND UTILITIES RECEIVED FROM THE TOWN OF LONDONDERRY CONSTRUCTION PLANS TITLED "PLANS OF PROPOSED PETTENGILL ROAD IMPROVEMENTS" DATED DECEMBER 21, 2009, PREPARED BY STANTEC, AUBURN, NEW HAMPSHIRE.
2. ALL ELEVATIONS BASED ON USGS MEAN SEA LEVEL DATUM DATED 1929 (NGVD 29). ELEVATIONS ARE IN FEET.
3. HORIZONTAL DATUM IS NAD83 NH STATE PLANE COORDINATE SYSTEM.
4. EXISTING TREES, BUSHES, AND SHRUBS SHALL BE PROTECTED BY CONTRACTOR FROM ALL DAMAGE UNLESS IN DIRECT CONFLICT WITH PROPOSED STRUCTURES, ROADWAYS, OR PATHS. NO TREES OR TREE LIMBS ALONG THE ENTIRE ROUTE OF CONSTRUCTION ON PUBLIC WAYS SHALL BE CUT UNLESS DIRECTED BY THE ENGINEER.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING CONDITIONS AT THE SITE.
6. UNPAVED AREAS DISTURBED BY THE CONTRACTOR SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS.
7. PROPERTY LINES AND RIGHTS-OF-WAY WHERE SHOWN ARE APPROXIMATE AND INTENDED FOR GENERAL INFORMATION ONLY.
8. THE ENGINEER MAY DIRECT THE CONTRACTOR TO VARY THE PROPOSED WORK DURING CONSTRUCTION TO MEET EXISTING CONDITIONS.
9. EXCAVATION OF ANY TYPE SHALL BE ACCOMPLISHED IN SUCH A MANNER THAT UNDERGROUND UTILITIES OR STRUCTURES ARE NOT DAMAGED.
10. ALL AREAS DISTURBED BY CONSTRUCTION IN OR OUTSIDE THE PROJECT AREA SHALL BE RETURNED TO THEIR ORIGINAL CONDITION OR BETTER.
11. THE CONTRACTOR SHALL DIG TEST PITS TO LOCATE THE EXISTING COOLING WATER PIPELINE TO DETERMINE THE LOCATION AND DEPTH OF EXISTING UNDERGROUND UTILITIES. ANY CONFLICTS NOTED IN PROPOSED CONSTRUCTION SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
12. THE CONTRACTOR SHALL FILL AND GRADE AREAS ADJACENT TO NEW CONSTRUCTION FOR POSITIVE DRAINAGE AS DIRECTED BY THE ENGINEER.
13. FOR ABBREVIATIONS SEE THIS SHEET.
14. THE CONTRACTOR SHALL ERECT EROSION CONTROL CHECKS PRIOR TO COMMENCING ANY EXCAVATION OR STORAGE OF BACKFILL MATERIAL ON-SITE. REFER TO SPECIFICATIONS AND DETAILS.
15. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE LOCATION AND ACTIVITIES OF HIS FORCES WITH THE OWNER, ENGINEER AND ADJUTING PROPERTY OWNERS TO MINIMIZE INTERFERENCE WITH EXISTING FACILITIES AND OPERATIONS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
16. ALL AREAS OF EXCAVATION, BACKFILL, FILL AND GRADING SHALL BE RETURNED TO THE ORIGINAL GRADE UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
17. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES AND SHALL PROVIDE ALL NECESSARY CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE AND STRENGTH TO PREVENT ACCESS TO ALL OPEN EXCAVATIONS AT THE COMPLETION OF EACH DAYS WORK. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
18. STOCKPILING OF CONSTRUCTION MATERIALS WITHIN 100 FT. OF WATERWAYS IS PROHIBITED.
19. THE CONTRACTOR SHALL CONFINE WORK TO WITHIN THE LIMITS OF THE RIGHT OF WAY UNLESS OTHERWISE INDICATED.
20. UNDERGROUND UTILITIES AS SHOWN ARE APPROXIMATE ONLY. ADDITIONAL UTILITIES MAY BE PRESENT. THE CONTRACTOR SHALL DETERMINE THE ACCURATE LOCATIONS OF THE UTILITIES SHOWN AND THE POSSIBLE EXISTENCE OF OTHER UNDERGROUND UTILITIES. CONTRACTOR SHALL CALL "DIG SAFE" (1-888-344-7233) AND EACH UTILITY OWNER AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.

# ABBREVIATIONS

BIT CONC.	BITUMINOUS CONCRETE
BOT.	BOTTOM
CAROW	CONTROLLED ACCESS RIGHT OF WAY
CB	CATCH BASIN
CI	CAST IRON
CW	COOLING WATER
DI	DUCTILE IRON
DIA	DIAMETER
EL.	ELEVATION
ELL	ELLBOW
GRE	GRANITE RIDGE ENERGY
HDPE	HIGH DENSITY POLYETHYLENE
HDD	HORIZONTAL DIRECTIONAL DRILLING
ID	INSIDE DIAMETER
INV.	INVERT
MH	MANHOLE
MJ	MECHANICAL JOINT
NHDOT	NEW HAMPSHIRE DEPT. OF TRANSPORTATION
OD	OUTSIDE DIAMETER
PROP. PVC	PROPOSED POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
S	SLOPE
SDR	STANDARD DIMENSION RATIO
STA.	STATION
TYP	TYPICAL
W	CITY WATER
W.L.	WATER LEVEL

# EXISTING

	WATER
	FENCE
	SPOT ELEVATION
	CONTOUR
	EXISTING STRUCTURE
	RETAINING WALL
	DRAIN MANHOLE
	CATCH BASIN
	WATER MANHOLE
	GUARD RAIL
	PROPERTY LINE / ROW
	UTILITY POLE
	WATER GATE VALVE
	PARKING METER
	VALVE
	FIRE HYDRANT
	LIGHT POLE
	WATER PIPE
	OVERHEAD UTILITY WIRE
	EXISTING TREE
	MONITORING WELL
	TEST BORING LOCATION

# LEGEND:

## PROPOSED

	COOLING WATER PIPELINE
	VACUUM RELIEF VALVE & MANHOLE
	STATION
	GATE VALVE
	CONCRETE BOUND

# INDEX OF DRAWINGS

## GENERAL

- G-1 COVER SHEET
- G-2 LEGEND, ABBREVIATIONS, GENERAL NOTES, & INDEX OF DRAWINGS
- G-3 KEY PLAN

## CIVIL

- C-1 PLAN AND PROFILE - STA. 0+00 - 6+00
- C-2 PLAN AND PROFILE - STA. 6+00 - 15+00
- C-3 PLAN AND PROFILE - STA. 15+00 - 22+00
- C-4 PLAN AND PROFILE - STA. 22+00 - 26+09
- C-5 STANDARD DETAILS I
- C-6 STANDARD DETAILS II
- C-7 STANDARD DETAILS III

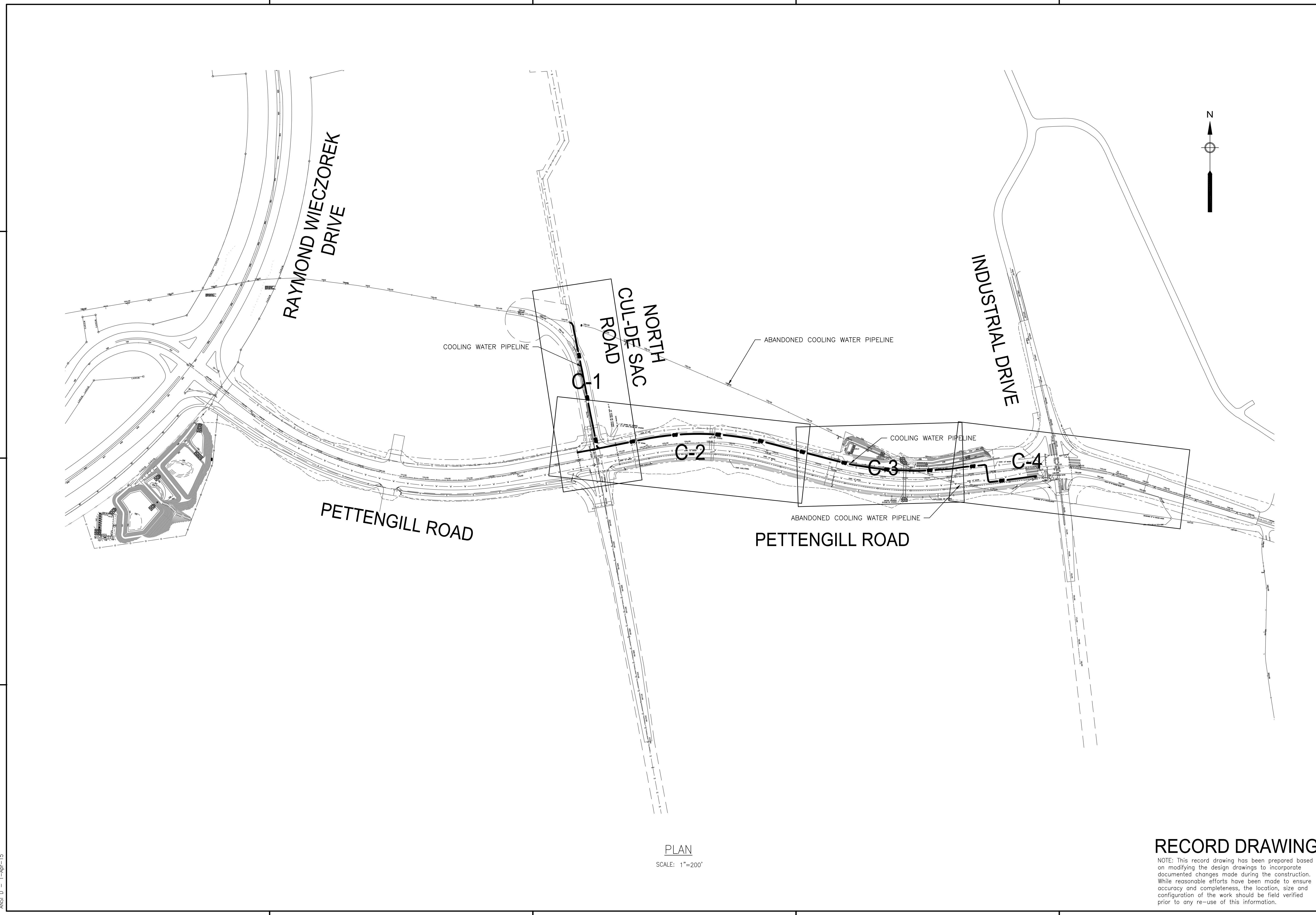
# RECORD DRAWING

NOTE: This record drawing has been prepared based on modifying the design drawings to incorporate documented changes made during the construction. While reasonable efforts have been made to ensure accuracy and completeness, the location, size and configuration of the work should be field verified prior to any re-use of this information.

 <small>AECOM TECHNICAL SERVICES, INC.          100 WASHINGTON STREET, SUITE 200          WAREHOUSES, MA 01890          PHONE (978) 246-6200</small>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">REVISIONS</th> <th style="width: 50%;">DESCRIPTION</th> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">4/15</td> </tr> <tr> <td style="text-align: center;">MARK</td> <td style="text-align: center;">DATE</td> </tr> <tr> <td style="text-align: center;">MLR</td> <td style="text-align: center;">HGF</td> </tr> <tr> <td style="text-align: center;">CHECKED</td> <td style="text-align: center;">MADE BY</td> </tr> <tr> <td style="text-align: center;">REVISED FOR RECORD DRAWING</td> <td style="text-align: center;">DESCRIPTION</td> </tr> </table>	REVISIONS	DESCRIPTION	1	4/15	MARK	DATE	MLR	HGF	CHECKED	MADE BY	REVISED FOR RECORD DRAWING	DESCRIPTION				
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>PROJECT NO:</td> <td>60190332</td> </tr> <tr> <td>CAD DWG FILE:</td> <td>G-2</td> </tr> <tr> <td>DESIGNED BY:</td> <td>MLR</td> </tr> <tr> <td>DRAWN BY:</td> <td>MLR</td> </tr> <tr> <td>DEPT CHECK:</td> <td>RBA</td> </tr> <tr> <td>PROJ CHECK:</td> <td>JFF</td> </tr> <tr> <td>DATE:</td> <td>NOVEMBER 2014</td> </tr> <tr> <td>SCALE:</td> <td>AS NOTED</td> </tr> </table>		PROJECT NO:	60190332	CAD DWG FILE:	G-2	DESIGNED BY:	MLR	DRAWN BY:	MLR	DEPT CHECK:	RBA	PROJ CHECK:	JFF	DATE:	NOVEMBER 2014	SCALE:	AS NOTED
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PROJ CHECK:	JFF																
DATE:	NOVEMBER 2014																
SCALE:	AS NOTED																
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ANSI D - 1-Apr-15



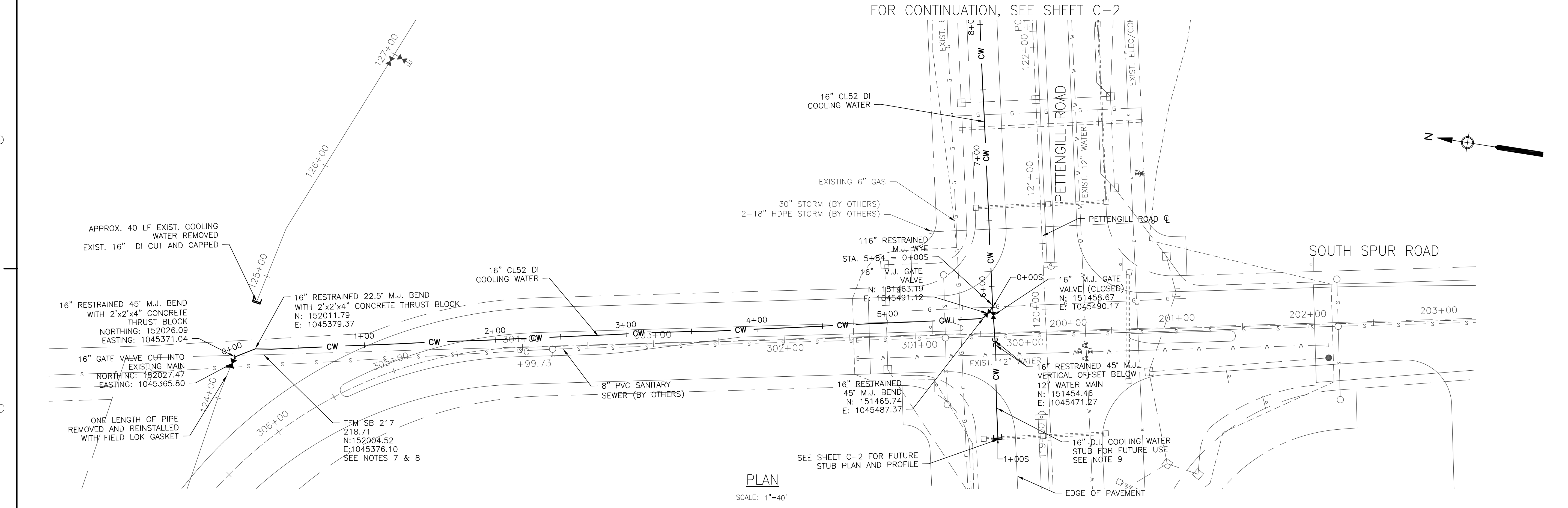
PLAN  
 SCALE: 1"=200'

**RECORD DRAWING**

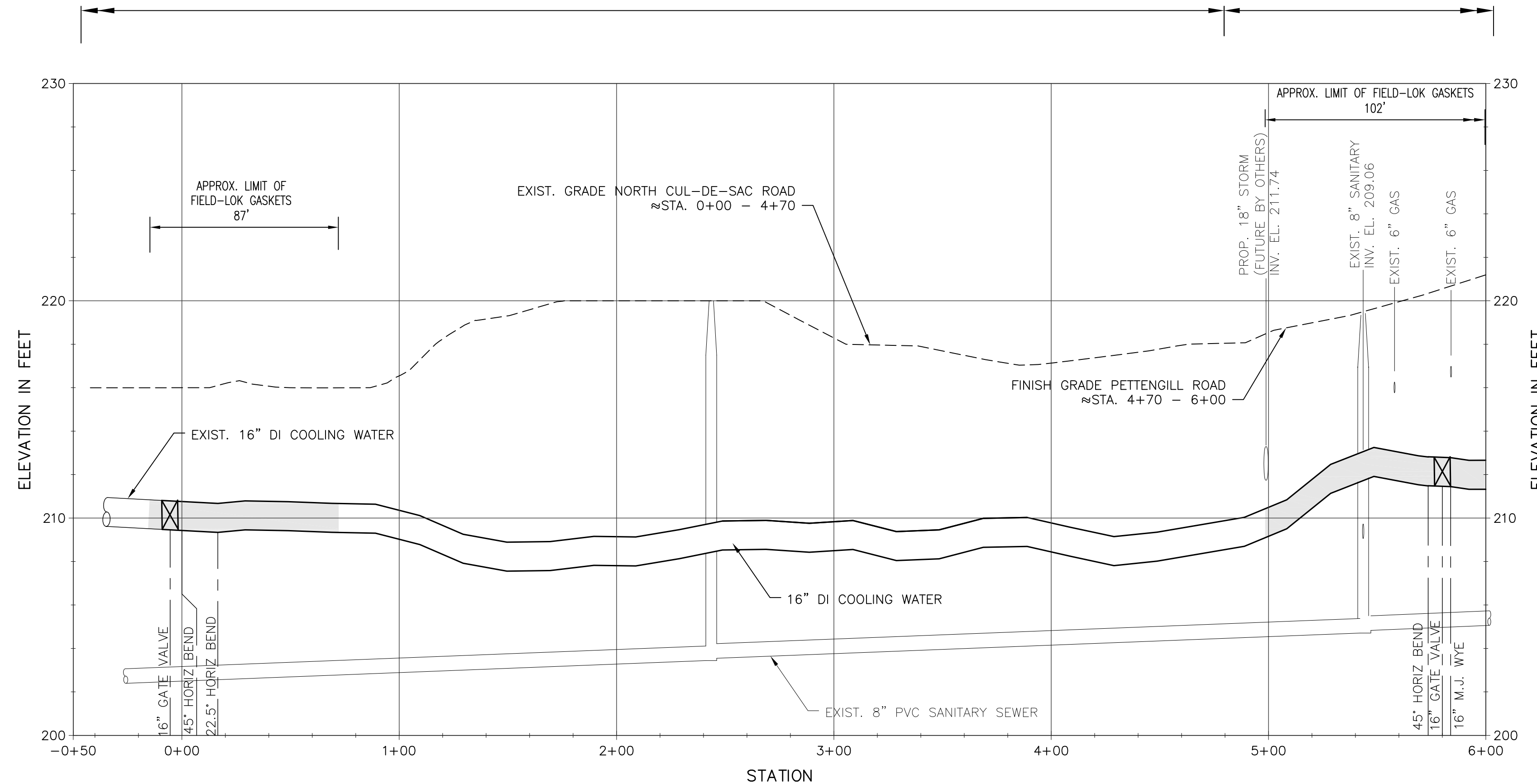
NOTE: This record drawing has been prepared based on modifying the design drawings to incorporate documented changes made during the construction. While reasonable efforts have been made to ensure accuracy and completeness, the location, size and configuration of the work should be field verified prior to any re-use of this information.

<b>AECOM</b> <small>AECOM TECHNICAL SERVICES, INC.          100 WASHINGTON STREET          WAREHOUSES, MA 01890          PHONE (978) 246-2000</small>		MARK 1	DATE 4/15	MADE BY MLR	CHECKED BY HGF	REVISIONS REVISED FOR RECORD DRAWING
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GRANITE RIDGE ENERGY, LLC. COOLING WATER PIPELINE RELOCATION-PETTENGILL ROAD						
<b>KEY PLAN</b> GENERAL						
PROJECT NO: 60190332 CAD DWG FILE: G-3		DESIGNED BY: MLR DRAWN BY: MLR DEPT CHECK: RBA PROJ CHECK: JFF				
DATE: NOVEMBER 2014 SCALE: AS NOTED		<b>G-3</b>				

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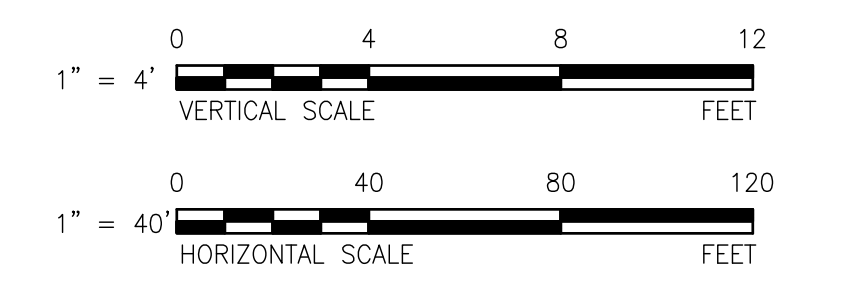


**PLAN**  
 SCALE: 1"=40'



**PROFILE**  
 SCALE: 1"=40' HORIZ  
 1"=4' VERT

- NOTES:**
- FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET G-2
  - CONTRACTOR TO COORDINATE FINAL TIE IN TO EXISTING LINE WITH SCHEDULED GRE PLANT SHUTDOWN.
  - CONTRACTOR SHALL MAKE PROVISIONS FOR DRAINING OF EXISTING COOLING WATER LINE PRIOR TO FINAL CUT IN OF NEW PIPING. SEE SPECIFICATIONS FOR DETAILS ON ANTICIPATED VOLUME OF WATER TO BE PROPERLY DISPOSED OF.
  - ALL UTILITIES BY OTHERS.
  - AFTER RELOCATED COOLING WATER HAS BEEN TESTED, ACCEPTED AND PLACED IN SERVICE, ABANDON EXISTING COOLING WATER IN PLACE. PRIOR TO ABANDONMENT, DRAIN EXISTING COOLING WATER PIPELINE PRIOR TO CUTTING AND CAPPING. THE CONTRACTOR SHALL NOT DISCHARGE COOLING WATER ONTO THE GROUND DURING THE WORK. ANY RESIDUAL COOLING WATER SHALL BE ADEQUATELY MANAGED AND PROPERLY DISPOSED OF IN ACCORDANCE WITH SPECIFICATION SECTION 01010.
  - ROCK PROBING AND TEST PITS PERFORMED ALONG ALIGNMENT BY CONTINENTAL PAVING, INC.
  - INFORMATION REGARDING THE LOCATION OF "TFM BOUND 217" WAS PROVIDED BY JOHN O'NEIL, LLC. THE POINT IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND ITS ACCURACY IS NOT GUARANTEED. VERTICAL DATUM ASSOCIATED WITH THIS POINT IS UNKNOWN AND MAY NOT CORRESPOND WITH ELEVATIONS SHOWN ON THIS PLAN ON NGVD29 DATUM.
  - TFM SB 217 DISTURBED PRIOR TO START OF COOLING WATER CONSTRUCTION DURING SANITARY SEWER CONSTRUCTION.
  - COOLING WATER STUB FOR FUTURE USE EXTENDED OUTSIDE OF THE PAVED AREA AT THE DIRECTION OF THE TOWN OF LONDONDERRY.
  - FIELD CHANGE MADE DURING CONSTRUCTION ELIMINATING THE USE OF TAPPING SLEEVE AT STA. 0+00.



**RECORD DRAWING**

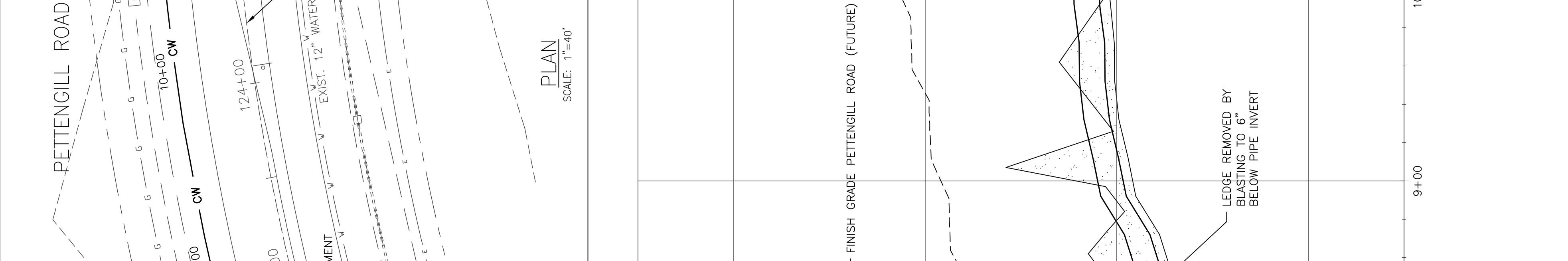
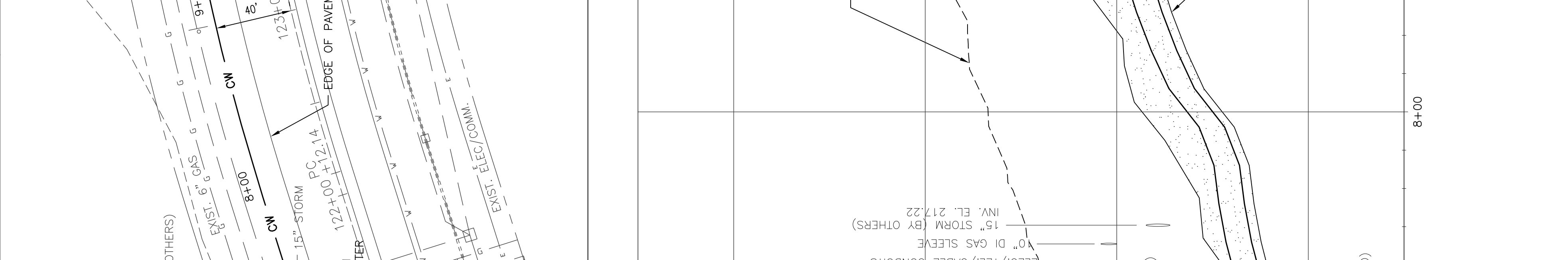
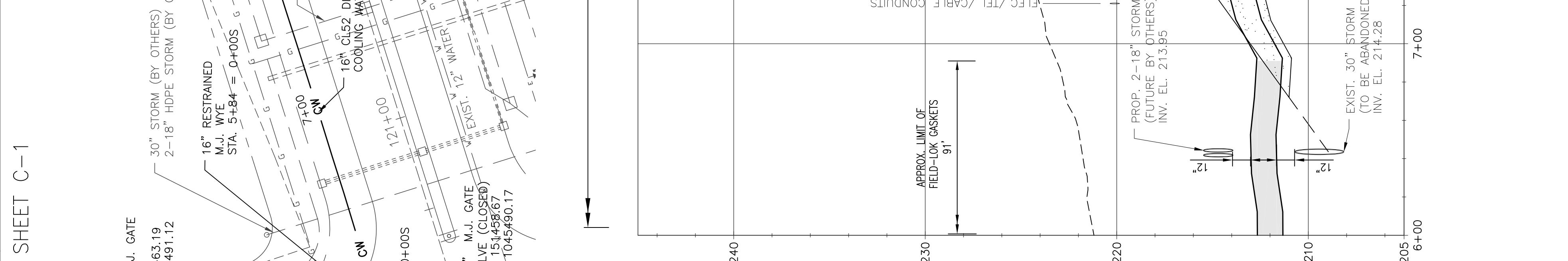
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<b>AECOM</b>	AECOM TECHNICAL SERVICES, INC. WATERBURY, MA 01802 PHONE (978) 246-2500	
	PROJECT NO: 60190332	CAD DWG FILE: C-1
GRANITE RIDGE ENERGY, LLC. COOLING WATER PIPELINE RELOCATION-PETTENGILL ROAD <b>PLAN AND PROFILE - STA. 0+10 - 6+00</b> CIVIL	DESIGNED BY: MLR	REVISED FOR RECORD DRAWING
	DRAWN BY: MLR	DESCRIPTION
	DEPT CHECK: RBA	MARK
	PROJ CHECK: JFF	DATE
	DATE: NOVEMBER 2014	REVISIONS
	SCALE: AS NOTED	
		<b>C-1</b>

PROJECT NO:	60190332
CAD DWG FILE:	C-2
DESIGNED BY:	MLR
DRAWN BY:	MLR
DEPT CHECK:	RBA
PROJ CHECK:	JFF
DATE:	NOVEMBER 2014
SCALE:	AS NOTED
<b>C-2</b>	

<b>RECORD DRAWING</b>	
NOTE: This record drawing has been prepared based on modifying the design drawings to incorporate the field data. While reasonable efforts have been made to ensure accuracy and completeness, the location, size and configuration of the work should be field verified prior to any re-use of this information.	
<b>PROFILE</b>	1"=40' HORIZ SCALE: 1"=4' VERT

<b>NOTES:</b>	
1.	FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET G-2.
2.	ALL UTILITIES PREPARED BY OTHERS.
3.	ROCK PROBING AND TEST PITS PERFORMED BY THE CONTRACTOR TO DETERMINE COOLING WATER STUB FOR FUTURE USE EXTENDED OUTSIDE OF THE PAVED AREA AT THE DIRECTION OF THE TOWN OF LONDONDERRY.



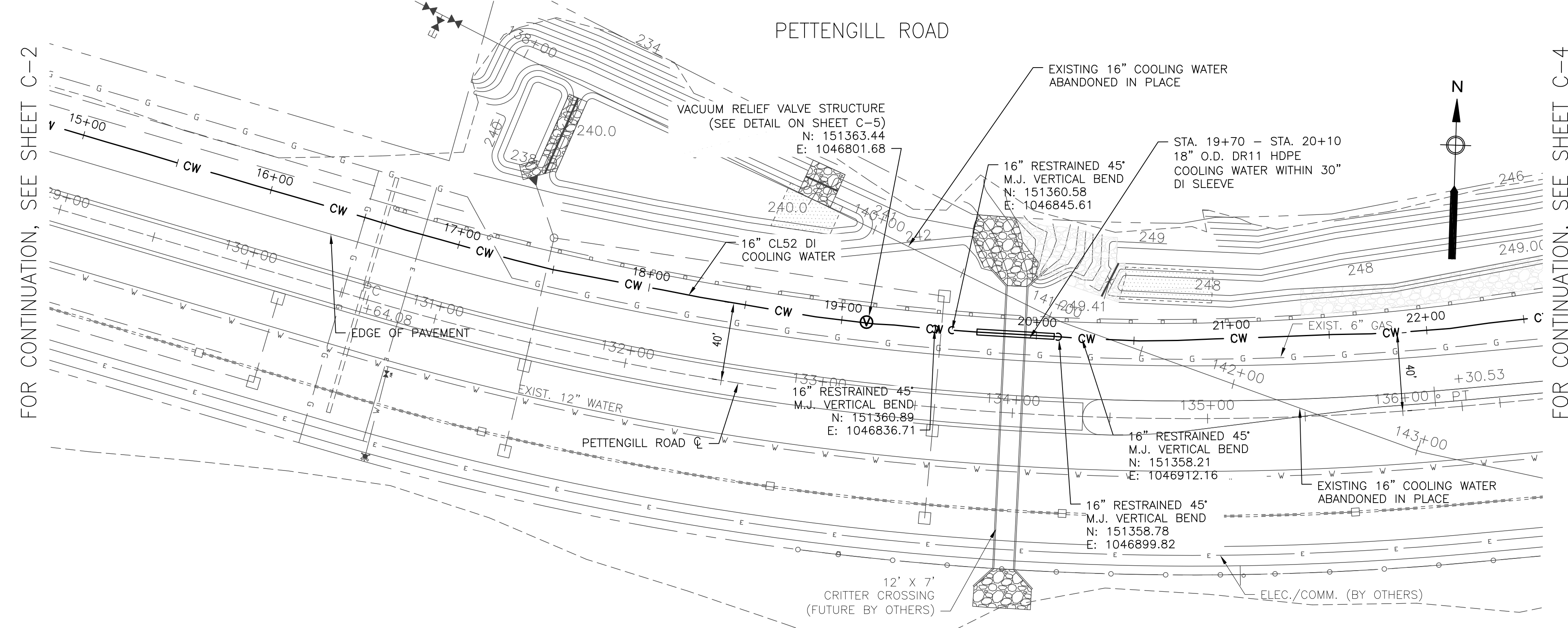
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2	12/14	HGF	MLR
DESCRIPTION			
UTILITY CONFLICT ADJUSTMENTS			
REVISED FOR RECORD DRAWING			
REVISIONS			

**AECOM**  
 AECOM TECHNICAL SERVICES, INC.  
 201 EXETER ROAD  
 WAREFIELD, MA 01896  
 PHONE: (781) 246-2200

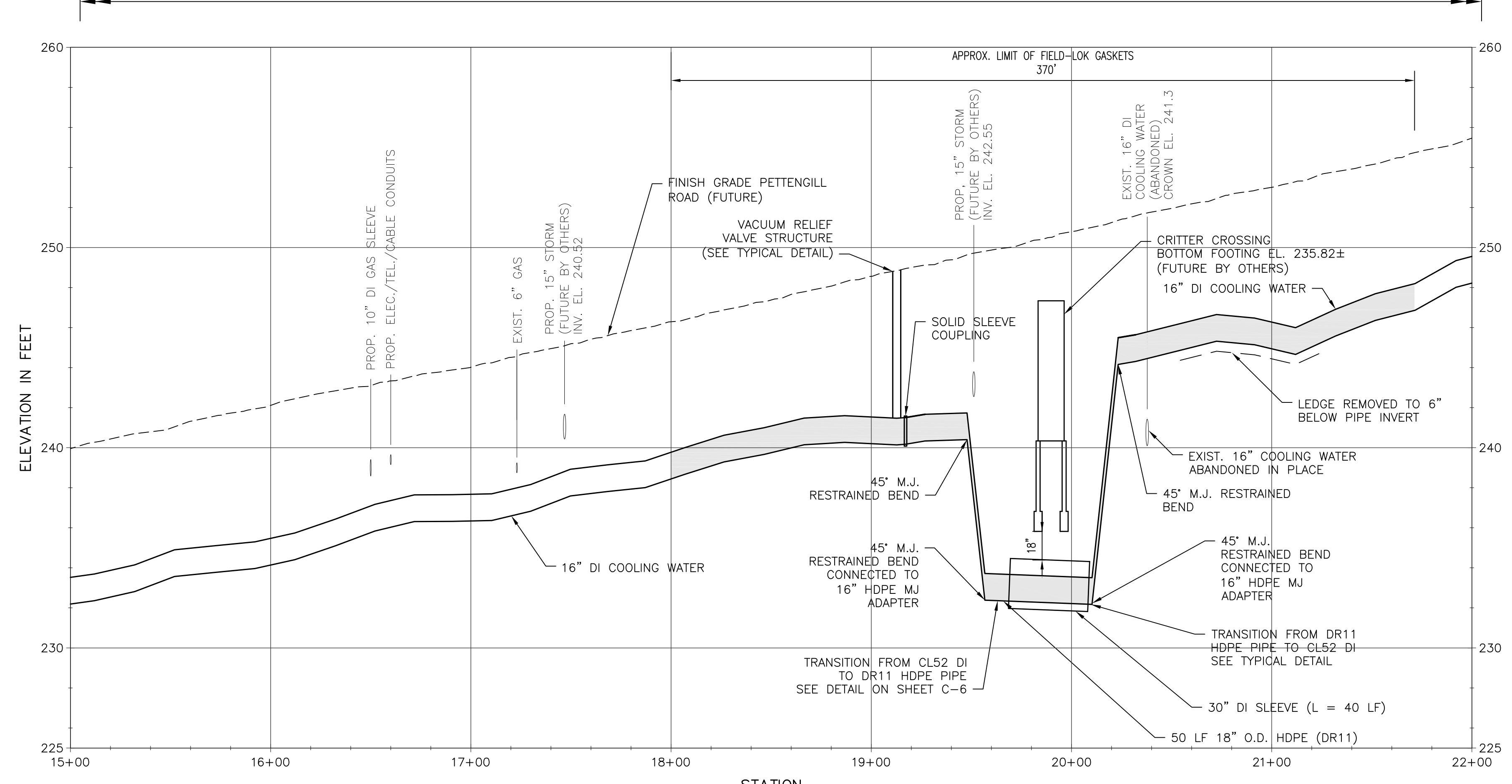
**GRANITE RIDGE ENERGY, LLC.**  
 COOLING WATER PIPELINE RELOCATION-PETTENGILL ROAD  
**PLAN AND PROFILE - STA. 6+00 - 15+00**

**CIVIL**

FOR CONTINUATION, SEE SHEET C-1  
 FOR CONTINUATION, SEE SHEET C-3



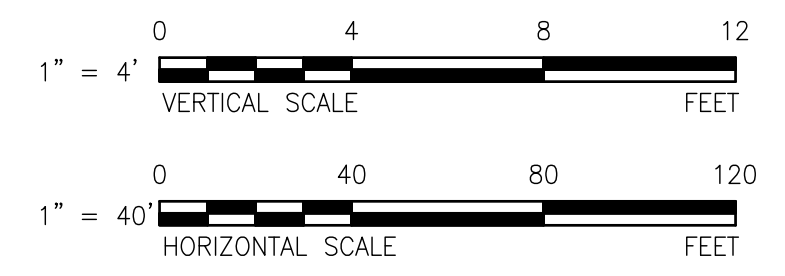
**PLAN**  
SCALE: 1"=40'



**PROFILE**  
SCALE: 1"=40' HORZ  
1"=4' VERT

**NOTES:**

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET C-2.
2. ROCK PROBING AND TEST PITS PERFORMED ALONG ALIGNMENT BY CONTINENTAL PAVING.



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REVISIONS	
MARK	DESCRIPTION
1	4/15 HGF MADE BY CHECKED
	REVISED FOR RECORD DRAWING

**AECOM**

AECOM TECHNICAL SERVICES, INC.  
MADEIRA AVENUE, SUITE 200  
WILMINGTON, MA 01890  
PHONE (978) 246-2000

GRANITE RIDGE ENERGY, LLC.  
COOLING WATER PIPELINE RELOCATION-PETTENGILL ROAD

**PLAN AND PROFILE - STA. 15+00 - 22+00**  
CIVIL

PROJECT NO:	60190332
CAD DWG FILE:	C-3
DESIGNED BY:	MLR
DRAWN BY:	MLR
DEPT CHECK:	RBA
PROJ CHECK:	JFF
DATE:	NOVEMBER 2014
SCALE:	AS NOTED

**C-3**

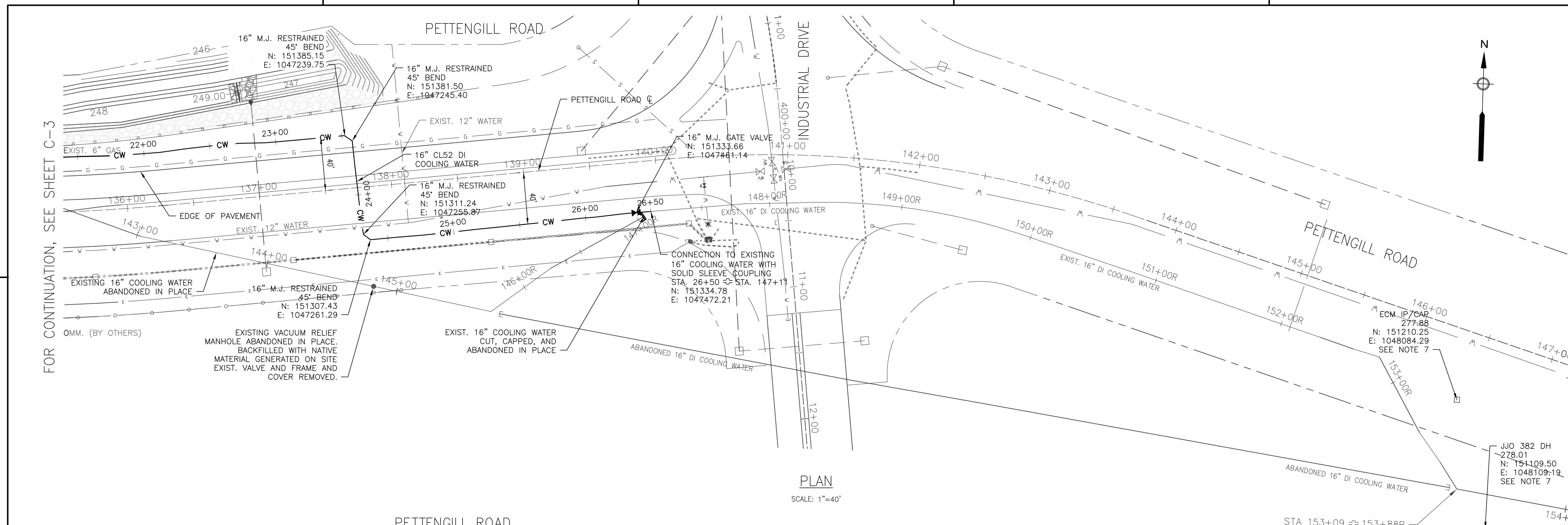
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 ANSI D - 3-Apr-15



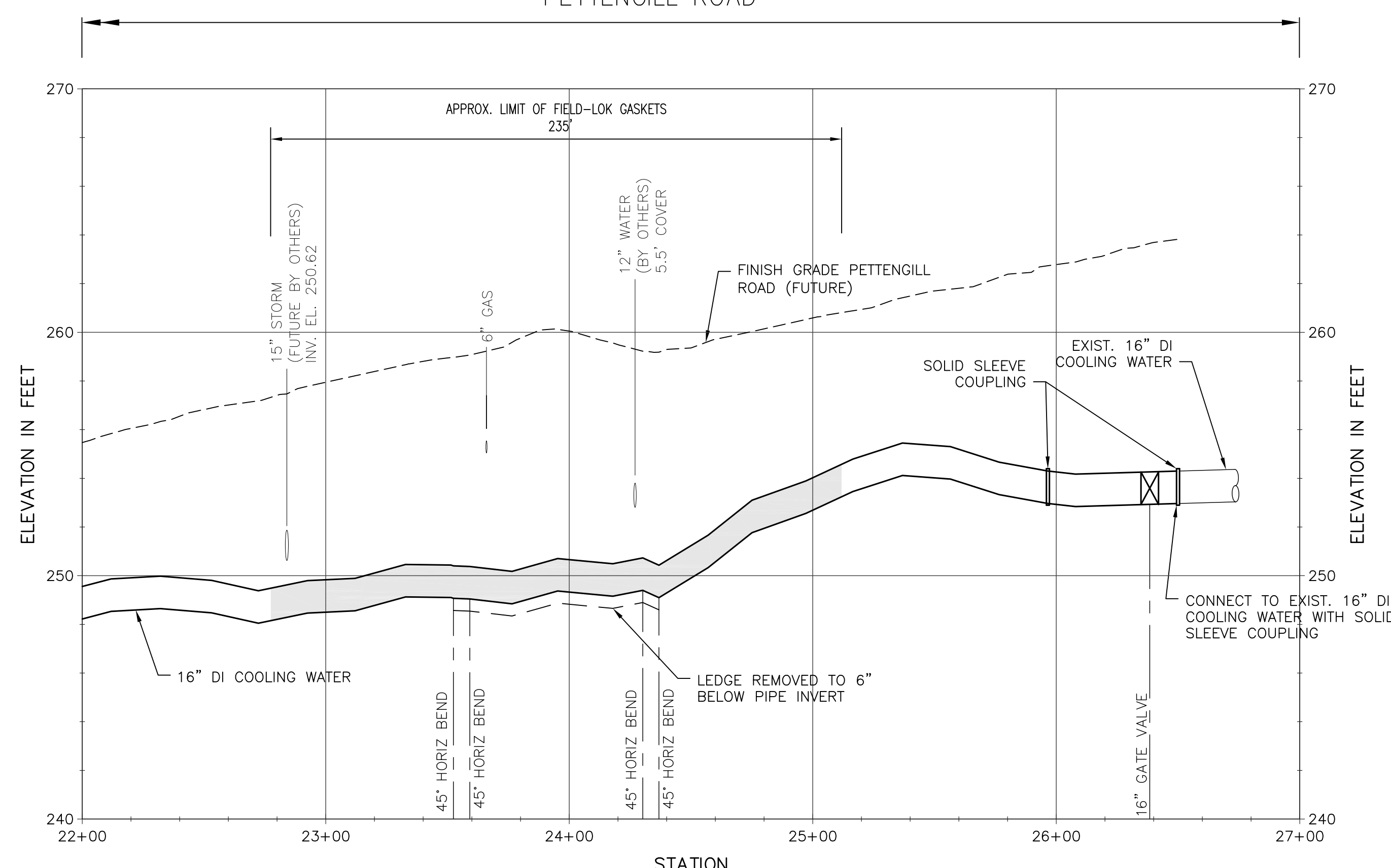
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ANSI D - 3-Apr-15

FOR CONTINUATION, SEE SHEET C-3



PLAN  
 SCALE: 1"=40'

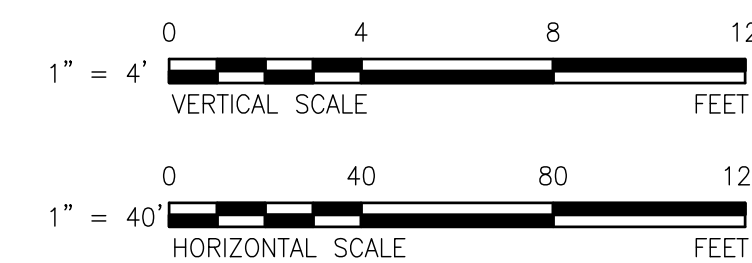


PROFILE

SCALE: 1"=40' HORZ  
 1"=4' VERT

**NOTES:**

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- ALL UTILITIES BY OTHERS.
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- ROCK PROBING AND TEST PITS PERFORMED ALONG ALIGNMENT BY CONTINENTAL PAVING.
- INFORMATION REGARDING THE LOCATION OF POINTS "ECM IP/CAP" AND "JJO 382 DH" WAS PROVIDED BY JOHN O'NEIL, LLC. THE POINT IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND ITS ACCURACY IS NOT GUARANTEED. VERTICAL DATUM ASSOCIATED WITH THIS POINT IS UNKNOWN AND MAY NOT CORRESPOND WITH ELEVATIONS SHOWN ON THIS PLAN ON NGVD29 DATUM.
- FIELD CHANGE MADE DURING CONSTRUCTION ELIMINATING THE USE OF TAPPING SLEEVE DUE TO INSTALLATION OF UTILITY POLES IN CLOSE PROXIMITY TO EXISTING PIPELINE.



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		AECOM TECHNICAL SERVICES, INC. 100 WASHINGTON STREET WILMINGTON, MA 01890 PHONE (781) 246-6200											
GRANITE RIDGE ENERGY, LLC. COOLING WATER PIPELINE RELOCATION-PETTENGILL ROAD		CIVIL											
PROJECT NO: 60190332 CAD DWG FILE: C-4 DESIGNED BY: MLR DRAWN BY: MLR DEPT CHECK: RBA PROJ CHECK: JFF		REVISIONS <table border="1"> <tr> <th>MARK</th> <th>DATE</th> <th>MADE BY</th> <th>CHECKED BY</th> <th>DESCRIPTION</th> </tr> <tr> <td>1</td> <td>4/15</td> <td>JFF</td> <td>MLR</td> <td>REVISED FOR RECORD DRAWING</td> </tr> </table>		MARK	DATE	MADE BY	CHECKED BY	DESCRIPTION	1	4/15	JFF	MLR	REVISED FOR RECORD DRAWING
MARK	DATE	MADE BY	CHECKED BY	DESCRIPTION									
1	4/15	JFF	MLR	REVISED FOR RECORD DRAWING									
PLAN AND PROFILE - STA. 22+00 - 26+50		DATE: NOVEMBER 2014 SCALE: AS NOTED											
<b>C-4</b>													

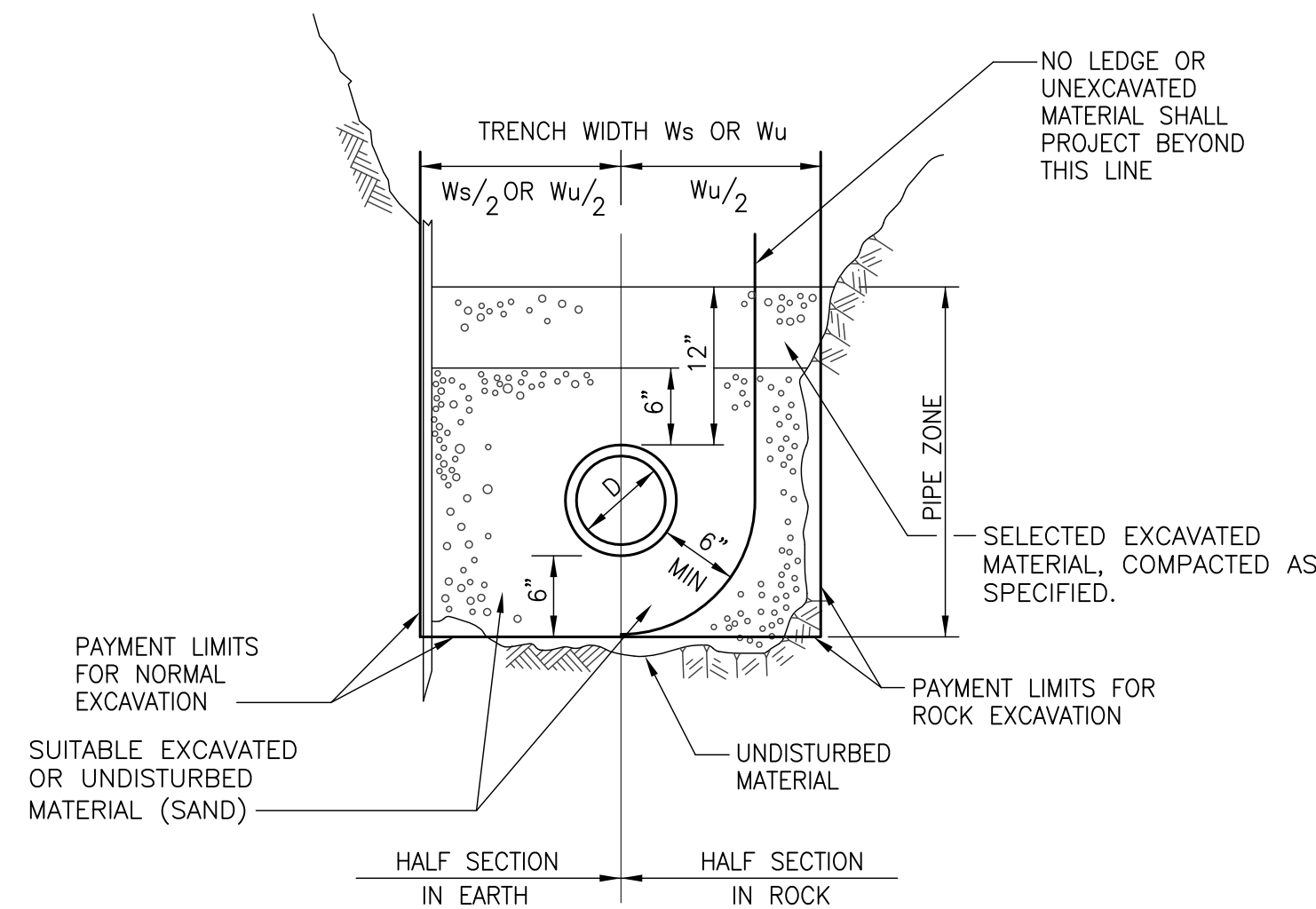
1

2

3

4

5

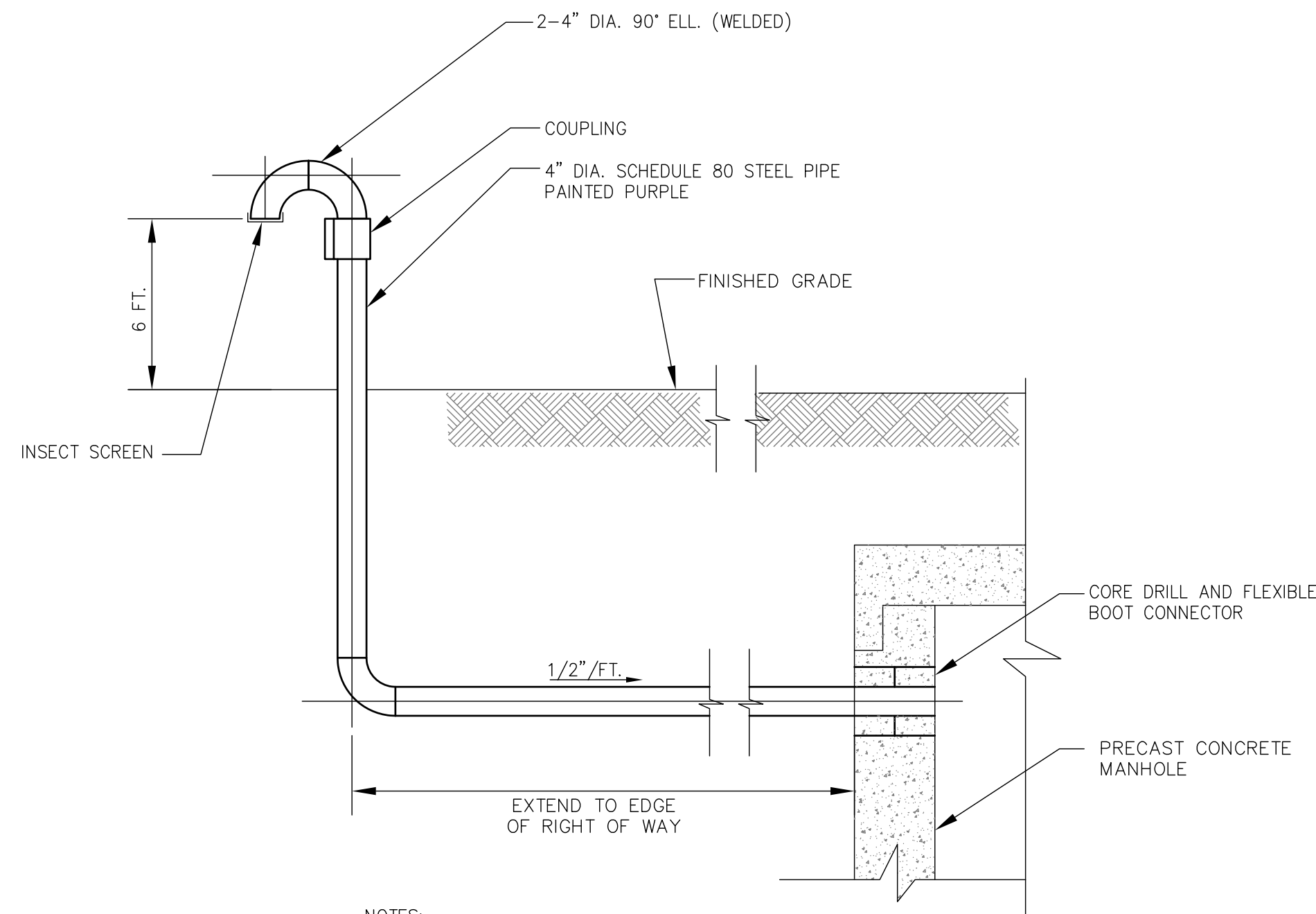


TRENCH SECTION FOR DI PIPE  
NTS

1. PIPE TRENCHES MAY BE EXCAVATED WIDER THAN TRENCH WIDTH  $W_s$  (SHEETED) OR  $W_u$  (UNSHEETED) ABOVE THE TOP OF PIPE ZONE.
2. TRENCHES SHALL NOT BE EXCAVATED BEYOND THE TRENCH WIDTH  $W_u$  BELOW THE TOP OF PIPE ZONE.
3. SHEETING MUST BE USED IF EXCAVATION AND BACKFILL, BELOW PIPEZONE, IS REQUIRED. SHEETING SHALL BE LEFT IN PLACE BELOW A LINE 1'-0" ABOVE THE TOP OF PIPE.
4. ALL ROCK WITHIN 3'-0" HORIZONTALLY OF THE ENDS OF BUILDING CONNECTIONS, BRANCHES OR STUBS AND DOWN TO A HORIZONTAL PLANE 6" BELOW THE BOTTOMS OF SUCH CONNECTIONS, BRANCHES OR STUBS, SHALL BE EXCAVATED.
5. ANY DEVIATION FROM TRENCH DETAIL IS SUBJECT TO THE APPROVAL OF THE ENGINEER.

MAXIMUM TRENCH WIDTH $W_s$ OR $W_u$ (SEE NOTES 1 & 2)		
NOMINAL PIPE DIAMETER D	$W_u$ UNSHEETED	$W_s$ SHEETED
16"	8'-0"	8'-0"

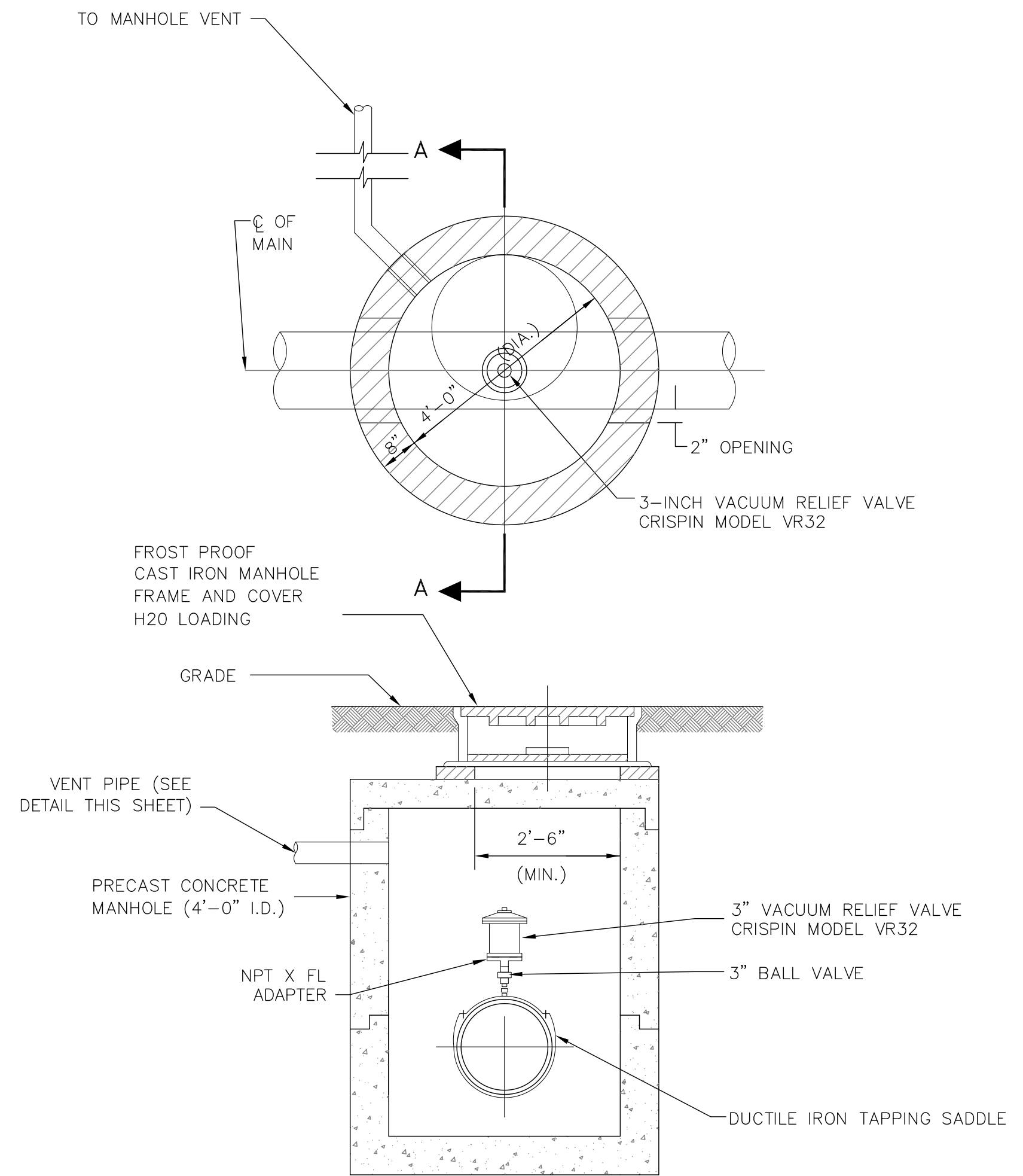
GENERAL NOTES FOR FOR PIPE TRENCHES  
NTS



NOTES:

1. REFER TO VACUUM RELIEF MANHOLE DETAIL ON THIS SHEET.
2. THE VENT SHALL BE PLACED ADJACENT TO THE MANHOLE AT THE EDGE OF THE RIGHT OF WAY.
3. FINAL VENT LOCATION NOT INSTALLED AT COMPLETION OF RECORD DRAWINGS. TO BE INSTALLED SUMMER 2015. IN CONJUNCTION WITH ROADWAY CONSTRUCTION.
4. VENT TO BE PLACED APPROXIMATELY 52' NORTH OF PETTENGILL ROAD CENTERLINE ON BACK SIDE OF FUTURE GUARD RAIL.

VENTED VACCUM RELIEF MANHOLE CONNECTION  
NOT TO SCALE



NOTES:

1. PROVIDE VENT PER DETAIL THIS SHEET

VACUUM RELIEF MANHOLE DETAIL  
NOT TO SCALE

REVISIONS	DESCRIPTION
1	4/15 MLR HGF DATE MADE BY CHECKED MARK
	REVISED FOR RECORD DRAWING

**AECOM**

AECOM TECHNICAL SERVICES, INC.  
100 WATERLOO STREET, SUITE 200  
WILMINGTON, MA 01890  
PHONE (978) 246-6200

GRANITE RIDGE ENERGY, LLC.  
COOLING WATER PIPELINE RELOCATION-PETTENGILL ROAD

STANDARD DETAILS I  
CIVIL

PROJECT NO:	60190332
CAD DWG FILE:	C-5
DESIGNED BY:	MLR
DRAWN BY:	MLR
DEPT CHECK:	RBA
PROJ CHECK:	JFF
DATE:	NOVEMBER 2014
SCALE:	AS NOTED

C-5

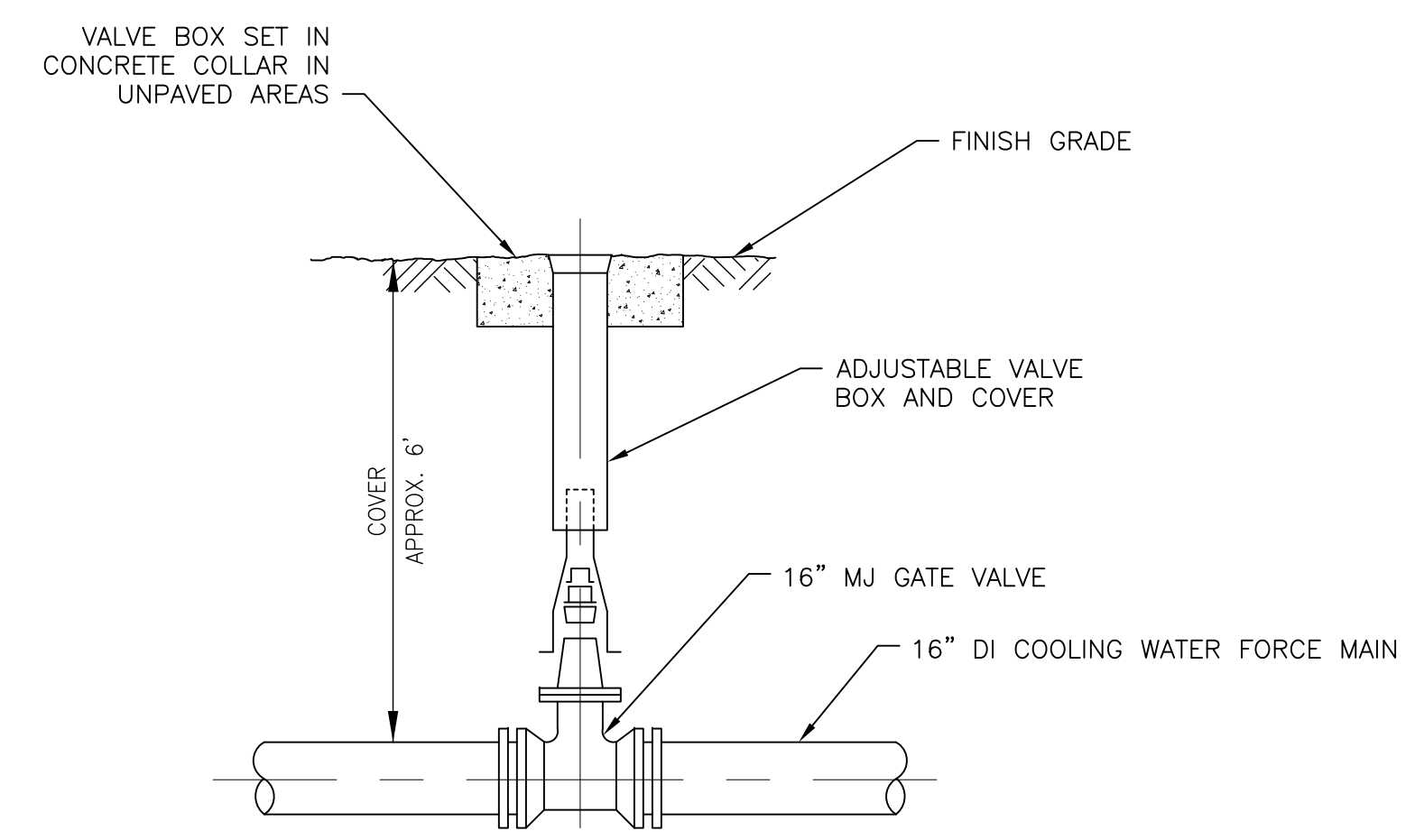
RECORD DRAWING

NOTE: This record drawing has been prepared based on modifying the design drawings to incorporate documented changes made during the construction. While reasonable efforts have been made to ensure accuracy and completeness, the location, size and configuration of the work should be field verified prior to any re-use of this information.

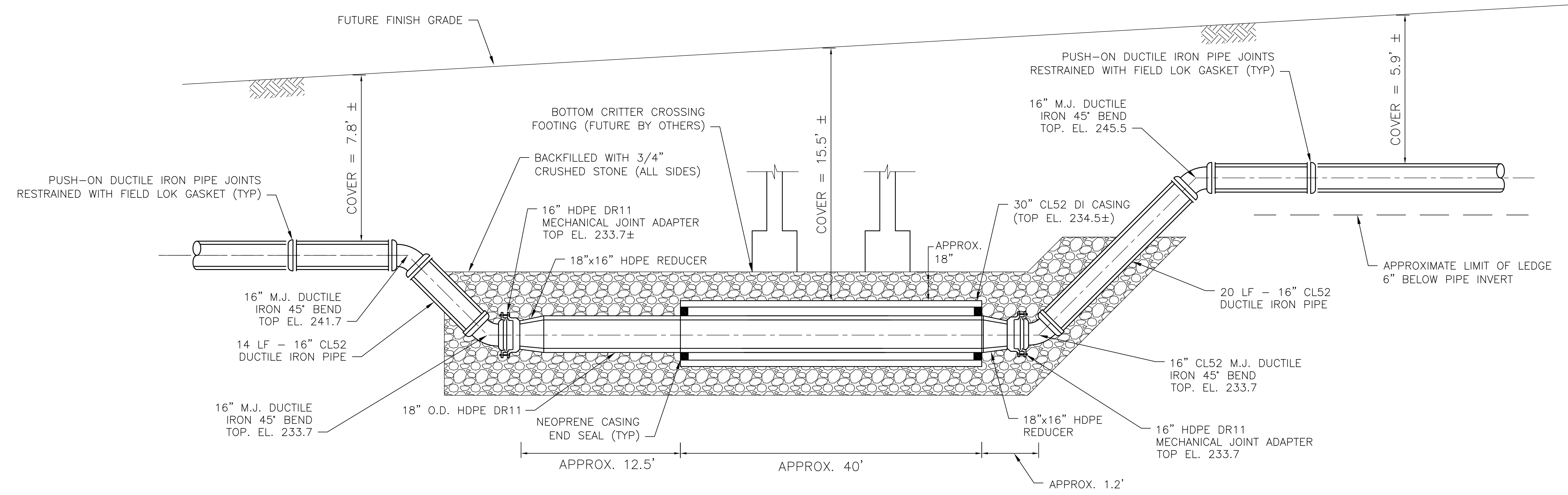
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LAST UPDATE: Friday, April 03, 2015 11:25:55 PM  
PLOT DATE: Friday, April 03, 2015 2:06:46 PM

ANSI D - 3-Apr-15

PATH/FILENAME: P:\60190332 - GRE COOLING WATER SHEETS\C-C-6.DWG  
 LAST UPDATE: Friday, April 03, 2015 11:44:49 AM  
 PLOT DATE: Friday, April 03, 2015 11:50:00 PM  
 ANSIS D - 3-Apr-15



**BURIED GATE VALVE**  
NOT TO SCALE



- NOTES:**
- ALL MECHANICAL JOINT FITTINGS RESTRAINED USING EBAA IRON SERIES 1100 MEGALUG.
  - FUTURE FINISH GRADE IS APPROXIMATE BASED ON DATA PROVIDED BY CONTINENTAL PAVING AND MAY VARY SLIGHTLY BASED ON AS BUILT CONDITIONS. ACTUAL DEPTH OF COVER MAY VARY.

**SECTION - COOLING WATER INSTALLATION BELOW CRITTER CROSSING**  
NOT TO SCALE

**RECORD DRAWING**

NOTE: This record drawing has been prepared based on modifying the design drawings to incorporate documented changes made during the construction. While reasonable efforts have been made to ensure accuracy and completeness, the location, size and configuration of the work should be field verified prior to any re-use of this information.

<p> <b>AECOM</b>  <small>AECOM TECHNICAL SERVICES, INC.          100 WASHINGTON STREET, SUITE 200          WILMINGTON, MA 01890          PHONE (978) 246-2000</small> </p>		<p>         REVISIONS          1 4/15 HGF MLR MADE BY CHECKED          MARK DATE DESCRIPTION       </p>
<p>         GRANITE RIDGE ENERGY, LLC.          COOLING WATER PIPELINE RELOCATION-PETTENGILL ROAD       </p>		<p>         PROJECT NO: 60190332          CAD DWG FILE: C-6          DESIGNED BY: MLR          DRAWN BY: MLR          DEPT CHECK: RBA          PROJ CHECK: JFF          DATE: NOVEMBER 2014          SCALE: AS NOTED       </p>
<p> <b>STANDARD DETAILS II</b>          CIVIL       </p>		<p> <b>C-6</b> </p>

MARK	DATE	MADE BY	CHECKED	DESCRIPTION
1	4/15	HGF	MLR	REVISED FOR RECORD DRAWING
REVISIONS				

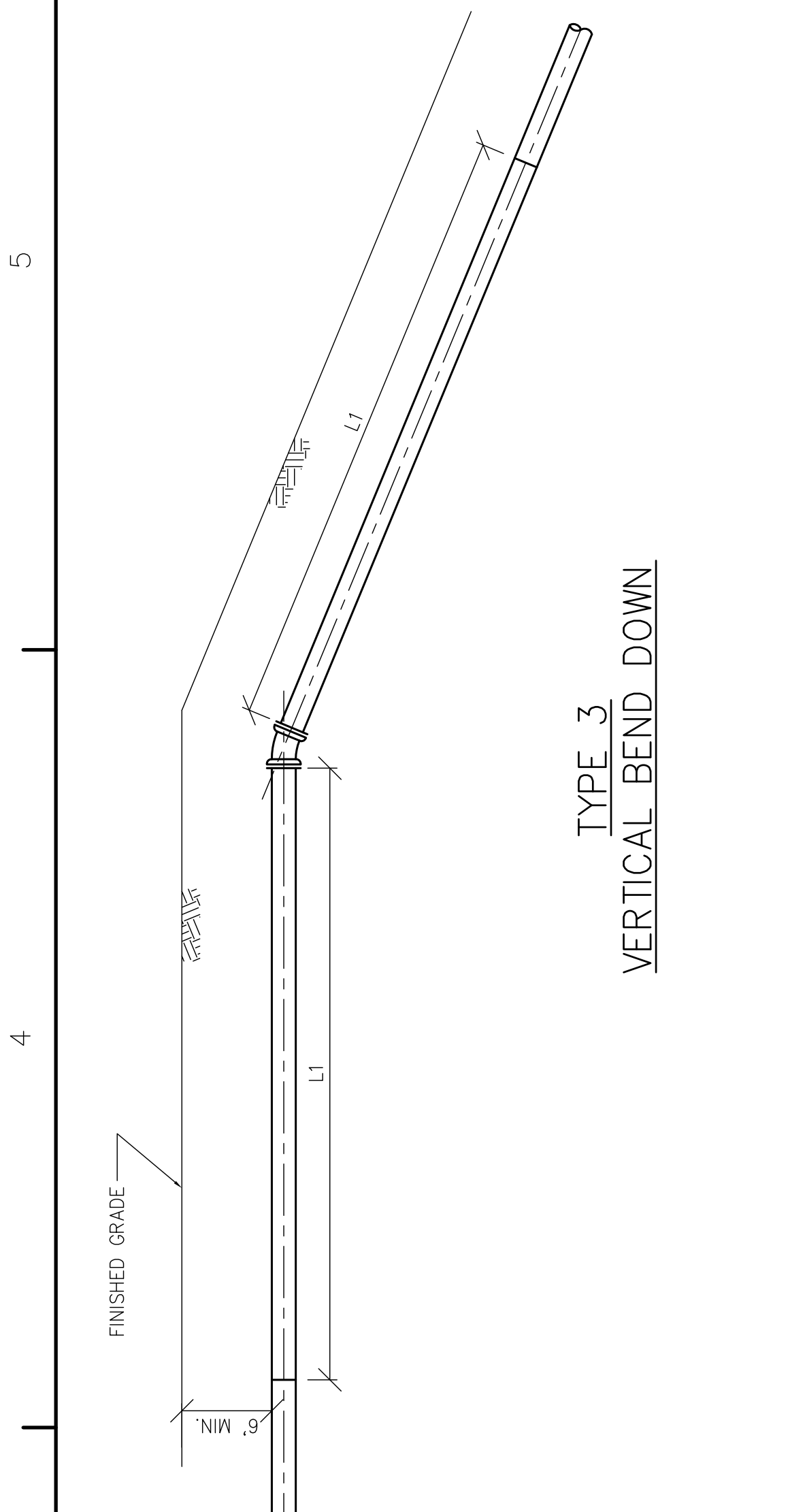
**AECOM**  
 AECOM TECHNICAL SERVICES, INC.  
 201 ESSEX STREET, SUITE 200  
 WAREHOUSES, MA 01890  
 PHONE: (781) 246-2200

GRANITE RIDGE ENERGY, LLC.  
 COOLING WATER PIPELINE RELOCATION-PETTENGL ROAD

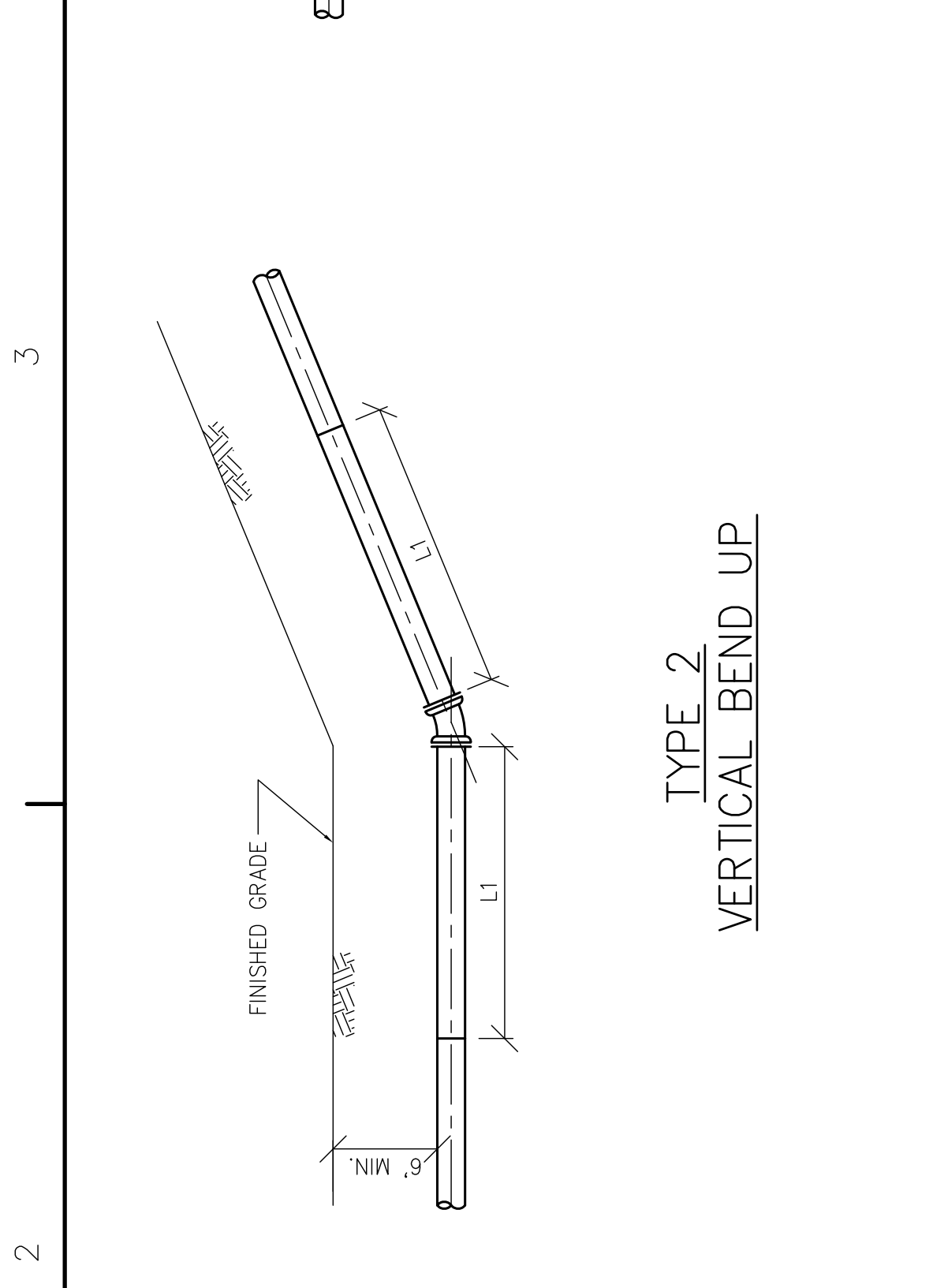
CIVIL  
**STANDARD DETAILS III**

PROJECT NO:	60190332
CAD DWG FILE:	C-7
DESIGNED BY:	MLR
DRAWN BY:	MLR
DEPT CHECK:	RBA
PROJ CHECK:	JFF
DATE:	NOVEMBER 2014
SCALE:	AS NOTED
<b>C-7</b>	

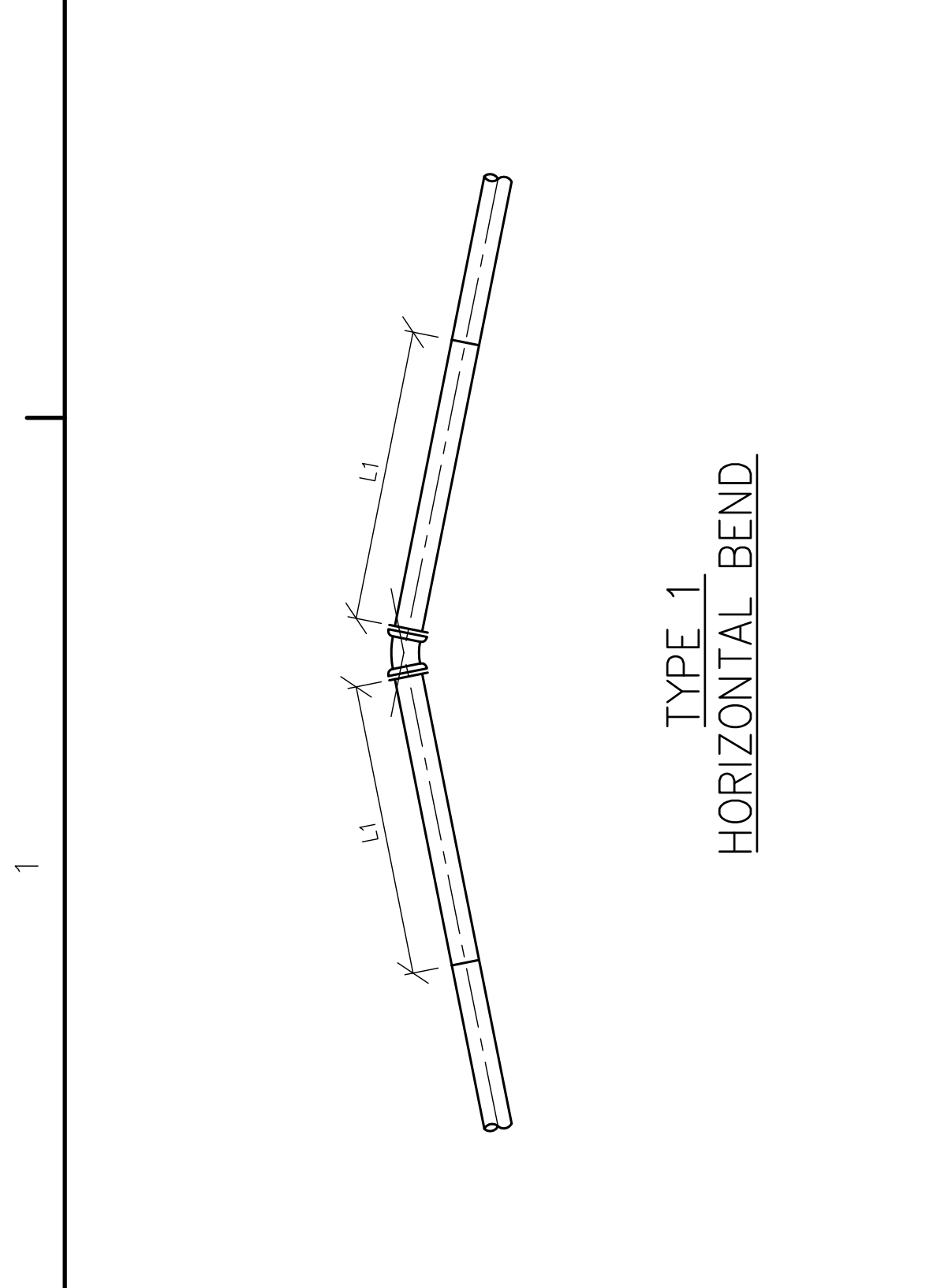
**RECORD DRAWING**  
 NOTE: This record drawing has been prepared based on modifying the design drawings to incorporate the field conditions. While reasonable efforts have been made to ensure accuracy and completeness, the location, size and configuration of the work should be field verified prior to any re-use of this information.



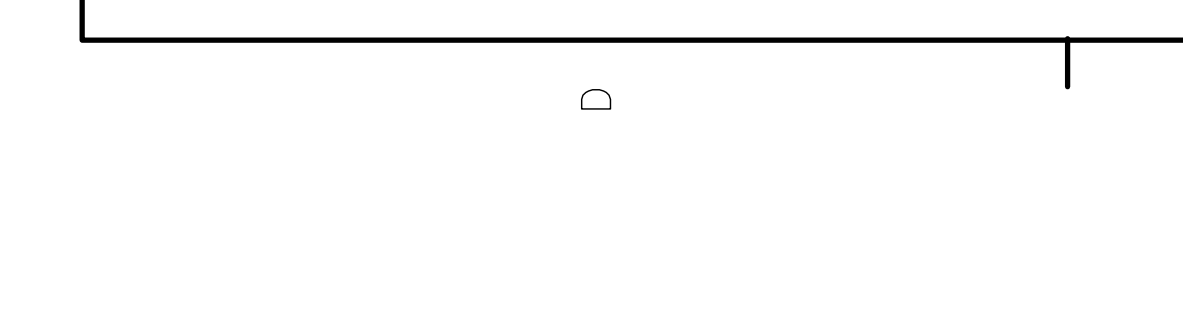
**TYPE 1**  
HORIZONTAL BEND



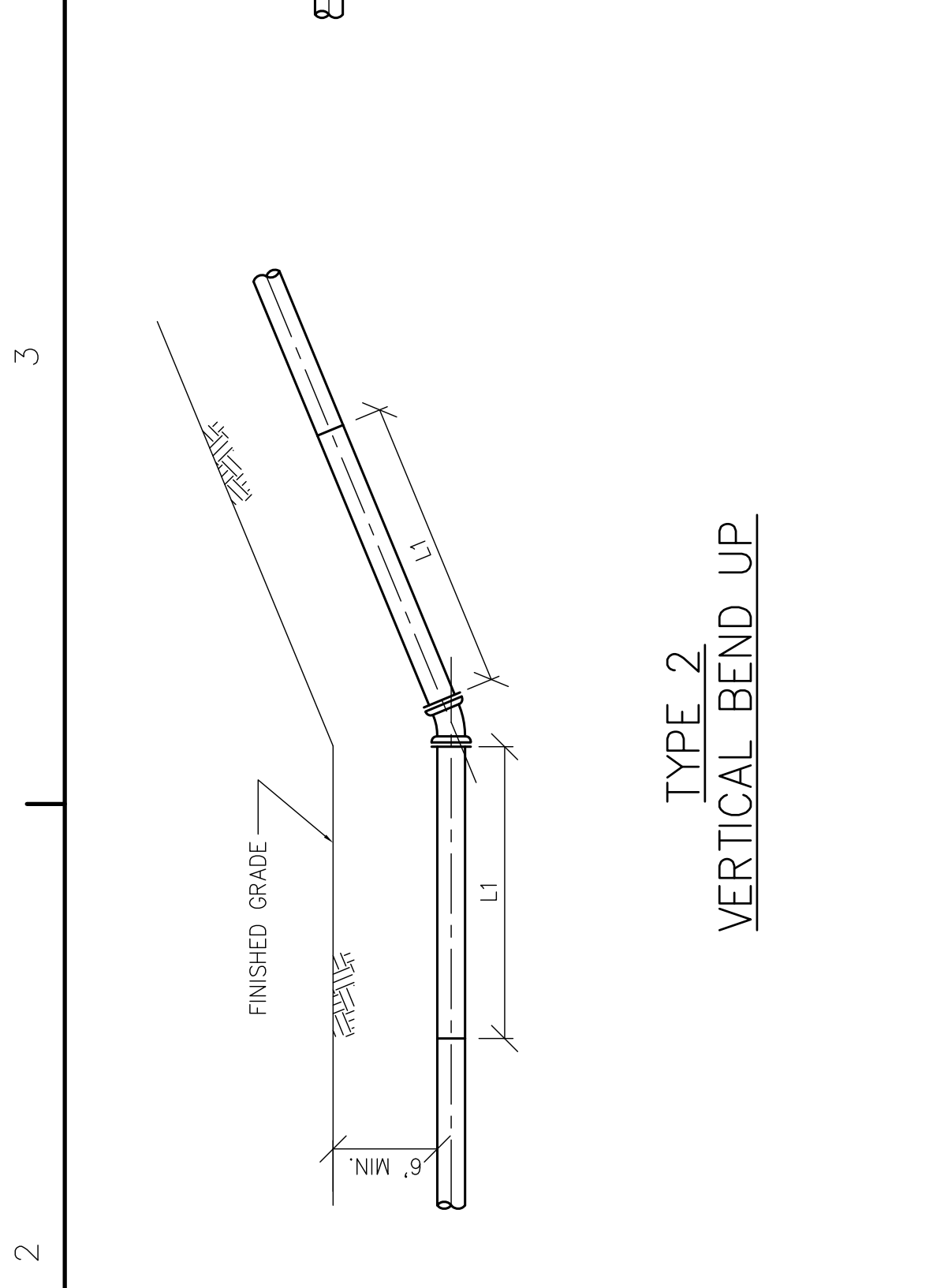
**TYPE 2**  
VERTICAL BEND UP



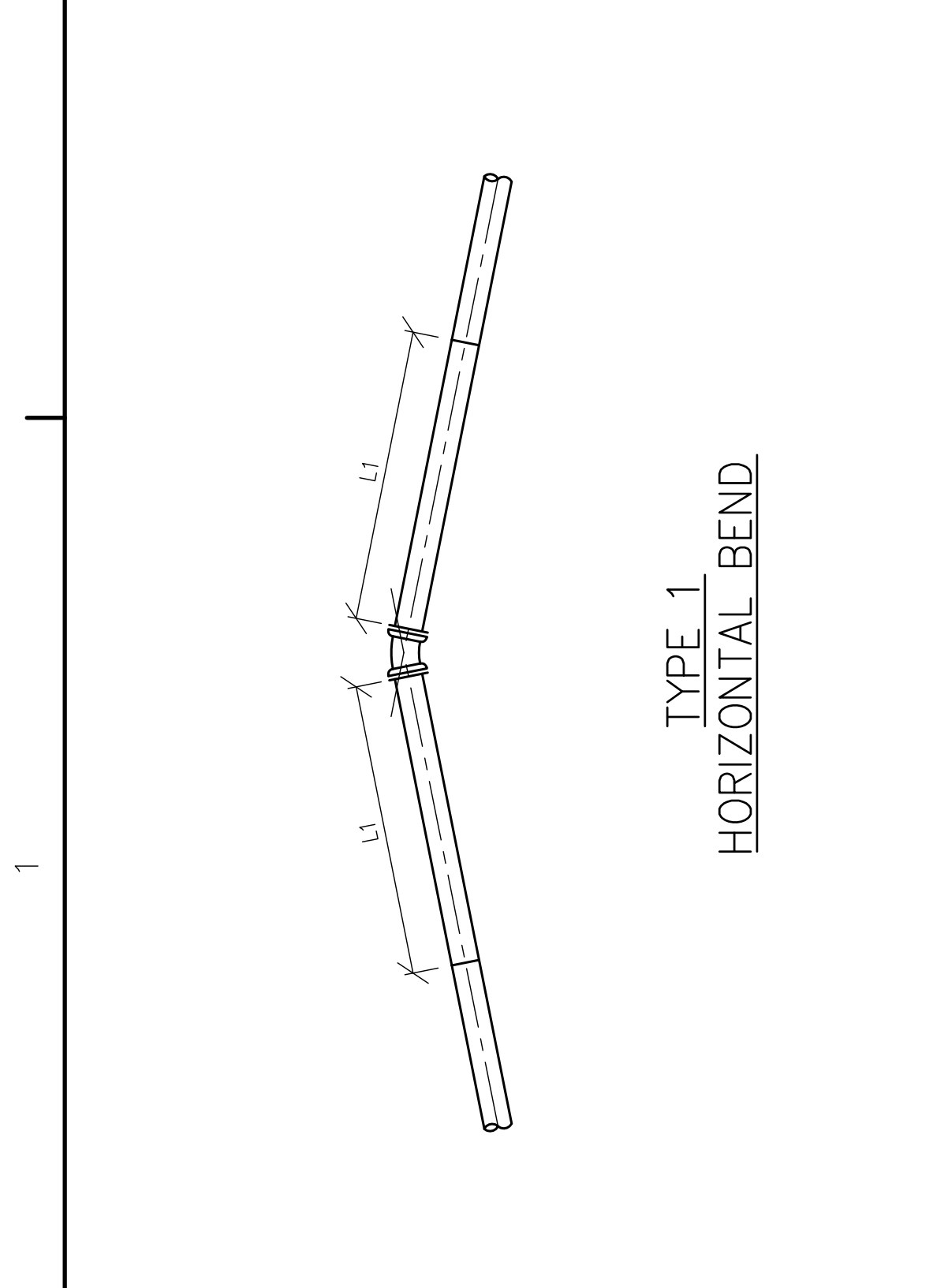
**TYPE 3**  
VERTICAL BEND DOWN



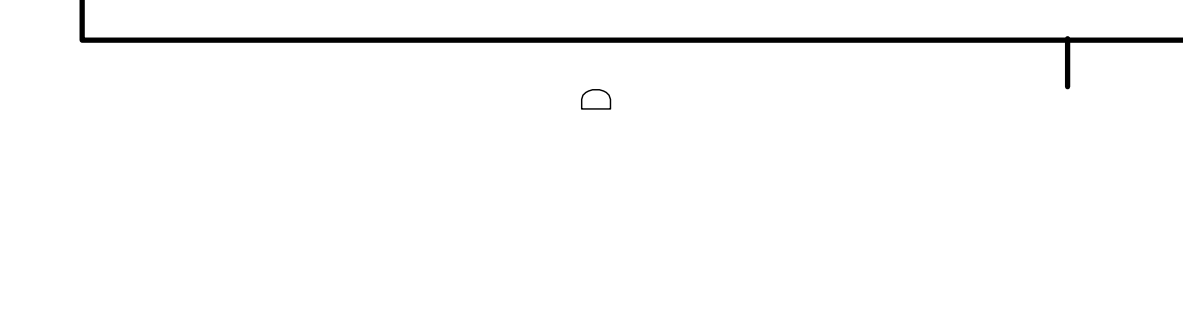
**TYPE 4**  
VERTICAL OFFSET



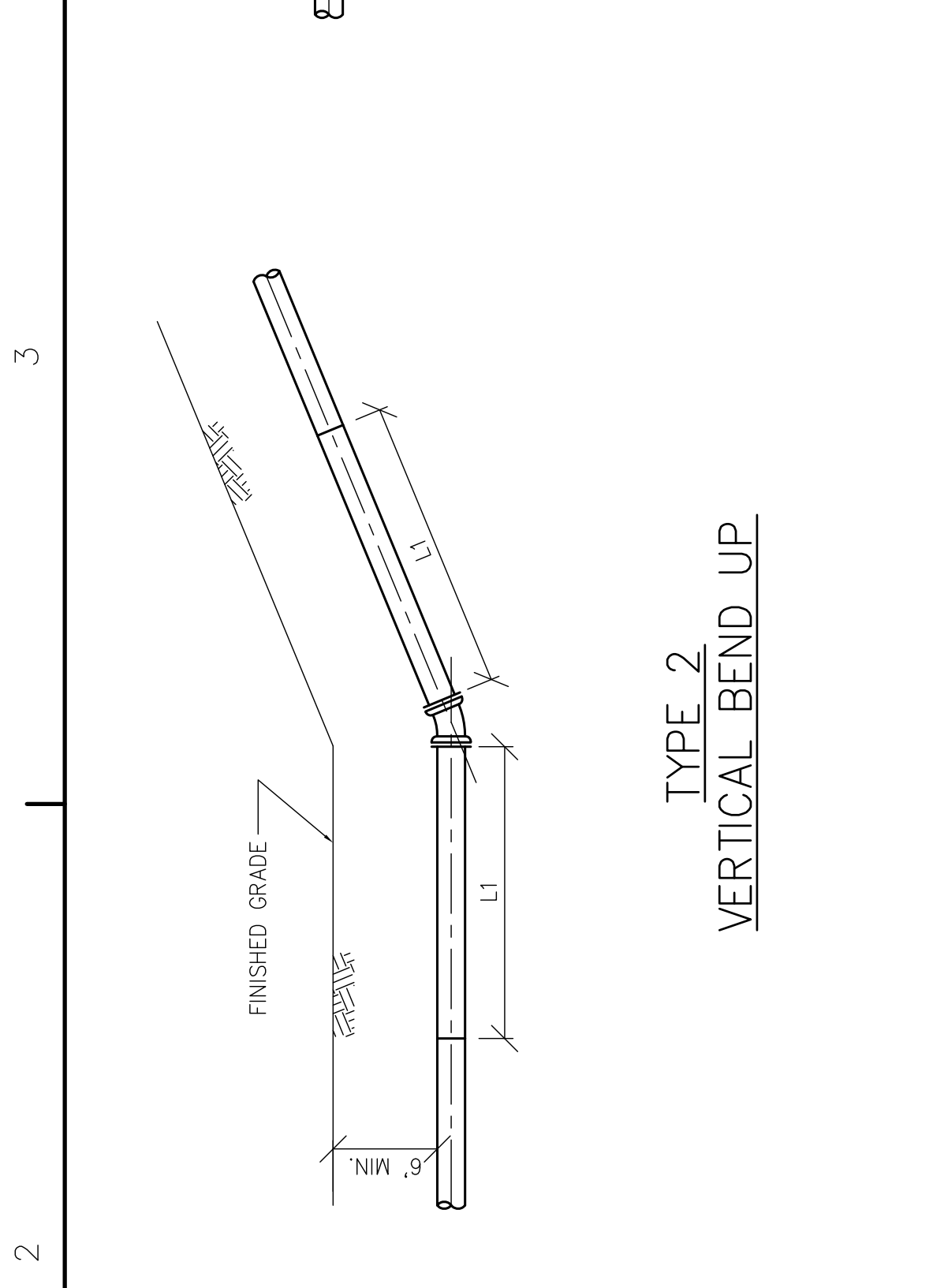
**TYPE 5**  
COMBINED VERTICAL OFFSET (UNDER)



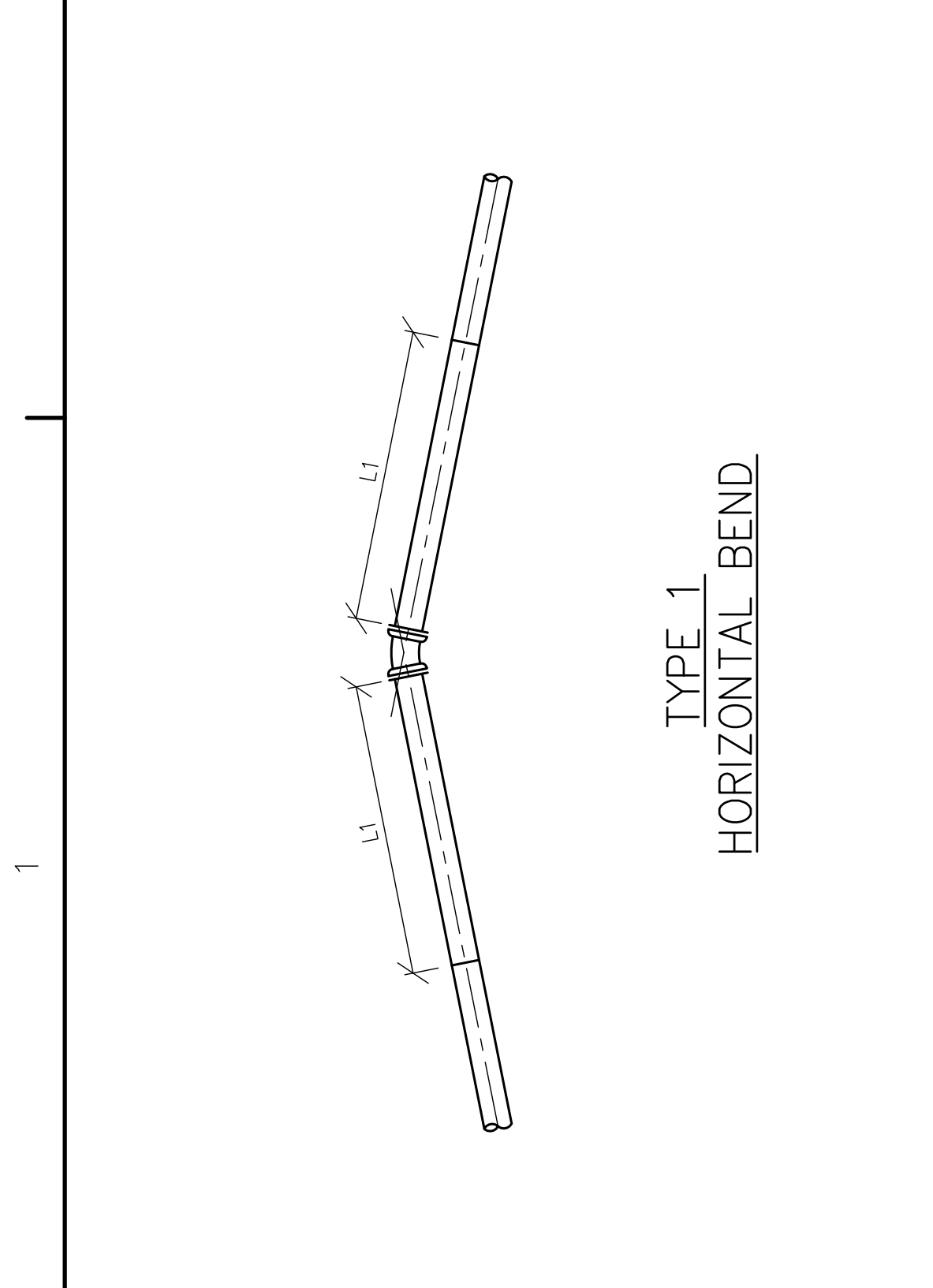
**TYPE 6**  
COMBINED VERTICAL OFFSET (OVER)



**TYPE 7**  
HORIZONTAL OFFSET



**TYPE 8**  
COMBINED HORIZONTAL BEND



**TYPE 9**  
COMBINED HORIZONTAL OFFSET

ANGLE OF BEND (DEGREES)	TYPE 1 & 2		TYPE 3		TYPE 4		TYPE 5		TYPE 6, 7, 8, & 9	
	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2
11.25	7	12	16	31	31	12	31	31	13	13
22.5	13	25	31	62	62	25	62	62	26	26
45	28	54	64	128	128	54	128	128	55	55
90	66	-	-	-	-	-	-	-	-	-

**MINIMUM RESTRAINED LENGTH FOR EACH SIDE OF BEND (FEET)**

- NOTE:
- ALL PIPE BETWEEN BENDS RESTRAINED.
  - ALL BENDS AND FITTINGS TO BE MECHANICALLY RESTRAINED USING MEGALUGS (EBBA IRON SERIES 1100). WHEN THE MINIMUM REQUIRED RESTRAINED LENGTH EXCEEDED ONE PIPE LENGTH (IE APPROX. 20 FEET) FIELD-LOK GASKETS WERE INSTALLED.

**RESTRAINED JOINT LENGTH REQUIREMENTS**

NOT TO SCALE