



# Floodplain Development Permit

## Doddridge County, WV Floodplain Management

This permit gives approval for the development/ project listed that impacts the FEMA-designated floodplain and/or floodway of Doddridge County, WV, pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance. This permit must be posted at the site of work as to be clearly visible, and must remain posted during entirety of development.

**Permit: #17-446**

***West End Connector to Markwest Tie-In Buried Gasline***

**Date Approved: March 13, 2017**

**Expires: March 13, 2018**

**Issued to: Antero Midstream, LLC**

**POC: Rachel Grzybek  
304-842-4008**

**Company Address: 535 White Oaks Blvd., Bridgeport, WV 26330**

**Project Address: Buckeye Creek**

**Firm: 54017C0140C**

**Lat/Long: 39.275235N, 80.689515W  
39.275722N, 80.688637W**

**Purpose of development: installation of gas pipeline**

**Issued by: George C. Eidel, CFM, OEM Director/Doddridge County FPM (or designee)**

**Date: March 13, 2017**

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For additional information regarding this permit, please contact  
Doddridge County Floodplain Manager at 304.873.2631, or via email at  
doddridgecountyfpm@gmail.com  
118 East Court Street; West Union, WV 26456

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ANTERO MIDSTREAM  
1615 WYNKOOP STREET  
DENVER, COLORADO 80202

Vendor Name <b>DODDRIDGE COUNTY COMMISSION</b>	Vendor No. <b>43312</b>	Date <b>Feb-09-2017</b>	Check Number <b>105863</b>	Check Total <b>\$500.00</b>
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INV #	INV DATE	DESCRIPTION	AMOUNT	DISCOUNTS	NET AMOUNT
MR2817	02/08/17	FLOODPLAIN PERMIT - WEC TO MARKWEST	500.00	0.00	500.00

17-446

COPY

TOTAL INVOICES PAID ==> 500.00 0.00 500.00

DETACH AND RETAIN FOR TAX PURPOSES

THIS CHECK HAS A COLORED FACE ON WHITE STOCK AND AN ARTIFICIAL WATERMARK ON THE BACK



ANTERO MIDSTREAM  
1615 WYNKOOP STREET  
DENVER, COLORADO 80202

**Wells Fargo**  
Denver, CO

Check No. **105863**

11-24  
412

800 - AP ACCT WELLS FARGO

Void After 90 Days

CHECK NUMBER	DATE	PAY EXACTLY
105863	Feb-09-2017	\$500.00

PAY EXACTLY **\$500dols00cts**  
Five Hundred Dollars and Zero Cents

TO  
THE  
ORDER  
OF

DODDRIDGE COUNTY COMMISSION  
BETH A ROGERS, CLERK~118 EAST COURT STREET~ROOM 10  
2  
WEST UNION, WV 26456

COPY

*[Handwritten Signature]*

⑈ 105863 ⑈ ⑆04 1203824⑆ 9657481710⑈



ANTERO MIDSTREAM  
1615 WYNKOOP STREET  
DENVER, COLORADO 80202

Vendor Name	Vendor No.	Date	Check Number	Check Total
DODDRIDGE COUNTY COMMISSION	43312	Feb-09-2017	105863	\$500.00

INV #	INV DATE	DESCRIPTION	AMOUNT	DISCOUNTS	NET AMOUNT
MR2817	02/08/17	FLOODPLAIN PERMIT - WEC TO MARKWEST	500.00	0.00	500.00

17-446

## Doddridge County, West Virginia

RECEIPT NO: 8484

DATE: 2017/02/14

FROM: ANTERO MIDSTREAM

AMOUNT: \$ 500.00

FIVE HUNDRED DOLLARS AND 00 CENTS

FOR: #17-446 WEC TO MARKWEST

00000105863 FP-BUILDING PERMITS

020-318

TOTAL: \$500.00

MICHAEL HEADLEY  
SHERIFF & TREASURER

MEC  
CLERK

Customer Copy

TOTAL INVOICES PAID =====>

500.00

0.00

500.00

DETACH AND RETAIN FOR TAX PURPOSES



## **Doddridge County Floodplain Permits**

(Week of February 20, 2017)

Please take notice that on the **7th** day of **February, 2017**, **Antero Midstream, LLC** filed an application for a Floodplain Permit **#17-446** to develop land located at or about **80.688935W, 39.275116N, Buckeye Creek**. The Application is on file with the Clerk of the County Court and may be inspected or copied during regular business hours. Any interested persons who desire to comment shall present the same in writing by **March 13, 2017** (20 calendar days after the announcement at the regularly scheduled Doddridge County Commission Meeting) delivered to the Clerk of the County Court at 108 Court Street Ste. 1, West Union, WV 26456. **This project is West End Connector to Markwest Tie-In Buried Gasline.**

 **Antero**  
Midstream Partners LP  
Antero Midstream, LLC  
535 White Oaks Blvd  
Bridgeport, WV 26330  
Office 304.842.4100  
Fax 304.842.4102

February 2, 2017

Doddridge County Commission  
Attn: George Eidel, Doddridge County Floodplain Manager  
118 East Court Street, Room 102  
West Union, WV 26456

Mr. Eidel:

Antero Midstream LLC would like to submit a Doddridge County Floodplain permit application for our ***West End Connector to Markwest Tie-In Buried Gasline*** project. Our project is located in Doddridge County beginning at approximate coordinates 39.275235N, 80.689515W and continues to approximate coordinates 39.275722N, 80.688637W. Per the FIRM Map #54017C0140C this location is in the floodplain.

Attached you will find the following:

- Doddridge County Floodplain Permit Application
- No-Rise Certificate
- WV Flood Tool Map
- FIRM Maps
- Design Plan

If you have any questions please feel free to contact me at (304) 842-4008.

Thank you in advance for your consideration.

Sincerely,



Rachel Grzybek  
Environmental Specialist II  
Floodplain Engineer  
Antero Resources Corporation



Permit# 17-446  
Project Name: West End Connector to Markwest Tie-In Buried Gasline  
Permittees Name: Antero Midstream, LLC

## **Doddridge County, WV**

### **Floodplain Development Permit Application**

This document is to be used for projects that impact/potentially impact the FEMA—designated floodplain and/or floodway of Doddridge County, WV pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance.

#### **SECTION 1: GENERAL PROVISIONS (APPLICANT TO READ AND SIGN)**

1. No work may start until a permit is issued.
2. The permit may be revoked if any false statements are made herein.
3. If revoked, all work must cease until permit is re-issued.
4. Development shall not be used or occupied until a Certificate of Compliance is issued.
5. The permit will expire if no work is commenced within six months of issuance.
6. Applicant is hereby informed that other permits may be required to fulfill local, state, and federal requirements.
7. Applicant hereby gives consent to the Floodplain Administrator/Manager or his/her representative to make inspections to verify compliance.
8. I THE APPLICANT CERTIFY THAT ALL STATEMENTS HEREIN AND IN ATTACHMENTS TO THIS APPLICATION ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE.

APPLICANT'S SIGNATURE

Bryan G. [Signature]

DATE

2-2-17

Doddridge County Commercial/Industrial  
Floodplain Development Permit Application

**Applicant Information:**

*Please provide all pertinent data.*

<b>Applicant Information</b>		
<b>Responsible Company Name: Antero Midstream, LLC.</b>		
<b>Corporate Mailing Address: 1615 Wynkoop Street</b>		
<b>City: Denver</b>	<b>State: CO</b>	<b>Zip: 80202</b>
<b>Corporate Point of Contact (POC):</b>		
<b>Corporate POC Title:</b>		
<b>Corporate POC Primary Phone:</b>		
<b>Corporate POC Primary Email:</b>		
<b>Corporate FEIN:</b>	<b>Corporate DUNS:</b>	
<b>Corporate Website: <a href="http://www.anteroresources.com">www.anteroresources.com</a></b>		
<b>Local Mailing Address: 535 White Oaks Boulevard</b>		
<b>City: Bridgeport</b>	<b>State: WV</b>	<b>Zip: 26330</b>
<b>Local Project Manager (PM):</b>		
<b>Local PM Primary Phone:</b>		
<b>Local PM Secondary Phone:</b>		
<b>Local PM Primary Email:</b>		
<b>Person Filing Application: Rachel Grzybek</b>		
<b>Applicant Title: Environmental Specialist II</b>		
<b>Applicant Primary Phone: (304) 842-4008</b>		
<b>Applicant Secondary Phone: (304) 641-2396</b>		
<b>Applicant Primary Email: <a href="mailto:rgrzybek@anteroresources.com">rgrzybek@anteroresources.com</a></b>		





Doddridge County Commercial/Industrial  
Floodplain Development Permit Application

**Proposed Development:**

*Please check all elements of the proposed project that apply.*

**DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)**

**A. STRUCTURAL DEVELOPMENT**

<u>ACTIVITY</u>		<u>STRUCTURAL TYPE</u>	
<input checked="" type="checkbox"/>	New Structure	<input type="checkbox"/>	Residential (1 – 4 Family)
<input type="checkbox"/>	Addition	<input type="checkbox"/>	Residential (more than 4 Family)
<input type="checkbox"/>	Alteration	<input type="checkbox"/>	Non-residential (floodproofing)
<input type="checkbox"/>	Relocation	<input type="checkbox"/>	Combined Use (res. & com.)
<input type="checkbox"/>	Demolition	<input type="checkbox"/>	Replacement
<input type="checkbox"/>	Manufactured/Mobil Home		

**B. OTHER DEVELOPMENT ACTIVITIES:**

- Fill                     Mining                     Drilling                     Pipelining
- Grading
- Excavation (except for STRUCTURAL DEVELOPMENT checked above)
- Watercourse Alteration (including dredging and channel modification)
- Drainage Improvements (including culvert work)
- Road, Street, or Bridge Construction
- Subdivision (including new expansion)
- Individual Water or Sewer System
- Other (please specify)

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Doddridge County Commercial/Industrial  
Floodplain Development Permit Application

**Development Site/Property Information:**

*Please provide physical description of the site/property, along with pertinent ownership (surface and mineral rights) data as applicable. Attach appropriate maps from the WV Flood Tool showing location of proposed development. Use additional copies of this page if development spans multiple property boundaries. Designate each property by number (i.e. Property 1 of 1, Property 2 of 7, etc.)*

**Property Designation: 1 of 1**

<b>Site/Property Information:</b>		
<b>Legal Description: BUCKEYE 178.48 AC</b>		
<b>Physical Address/911 Address: Off United States Route 50</b>		
<b>Decimal Latitude/Longitude: 39.275094° N, 80.688828° W</b>		
<b>DMS Latitude/Longitude: 39° 16' 30.34" N, 80° 41' 19.78" W</b>		
<b>District: 3 - Grant</b>	<b>Map: 19</b>	<b>Parcel: 31</b>
<b>Land Book Description:</b>		
<b>Deed Book Reference: Book 346, Page 457</b>		
<b>Tax Map Reference: 09-03-0019-00031-0000</b>		
<b>Existing Buildings/Use of Property: MarkWest's Sherwood Facility is located on this property.</b>		

<b>Floodplain Location Data: (to be completed by Floodplain Manager or designee)</b>			
<b>Community:</b>	<b>Number:</b>	<b>Panel:</b>	<b>Suffix:</b>
<b>Location (Lat/Long):</b>		<b>Approximate Elevation:</b>	
		<b>Estimated BFE:</b>	
<b>Is the development in the floodway?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No		<b>Is the development in the floodplain?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Zone: _____</b>	
<b>Notes:</b>			

Doddridge County Commercial/Industrial  
Floodplain Development Permit Application

**Property Owner Data:**

*Please provide data on current site/property landowner(s), both surface and mineral rights (as applicable). Use additional copies of this page as needed. Designate each page in relation to each property listed above.*

<b>Property Designation: 1 of 1</b>
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<b>Property Owner Data:</b>		
<b>Name of Primary Owner (PO): MARKWEST LIBERTY MIDSTREAM &amp; RESOURCES LLC</b>		
<b>PO Address: 1515 ARAPAHOE ST TOWER 1 STE 1</b>		
<b>City: Denver</b>	<b>State: CO</b>	<b>Zip: 80202</b>
<b>PO Primary Phone:</b>		
<b>PO Secondary Phone:</b>		
<b>PO Primary Email: 7015 3430 0001 1569 6821</b>		

<b>Surface Rights Owner Data:</b>		
<b>Name of Primary Owner (PO):</b>		
<b>PO Address:</b>		
<b>City:</b>	<b>State:</b>	<b>Zip:</b>
<b>PO Primary Phone:</b>		
<b>PO Secondary Phone:</b>		
<b>PO Primary Email:</b>		

<b>Mineral Rights Owner Data: (As Applicable)</b>		
<b>Name of Primary Owner (PO):</b>		
<b>PO Address:</b>		
<b>City:</b>	<b>State:</b>	<b>Zip:</b>
<b>PO Primary Phone:</b>		
<b>PO Secondary Phone:</b>		
<b>PO Primary Email:</b>		

Doddridge County Commercial/Industrial  
Floodplain Development Permit Application

**Contractor Data:**

*Please provide all pertinent data for contractors and sub---contractors that may be participating in this project. Use additional copies of this page as needed. Designate each page in relation to each property listed above.*

**Property Designation:** \_\_\_ of \_\_\_

<b>Contractor/Sub-Contractor (C/SC) Information:</b>		
C/SC Company Name:		
C/SC WV License Number:		
C/SC FEIN:	C/SC DUNS:	
Local C/SC Point of Contact (POC):		
Local C/SC POC Title:		
C/SC Mailing Address:		
City:	State:	Zip-Code:
Local C/SC Office Phone:		
Local C/SC POC Phone:		
Local C/SC POC E-Mail:		

<b>Engineer Firm Information:</b>		
Engineer Firm Name:		
Engineer WV License Number:		
Engineer Firm FEIN:	Engineer Firm DUNS:	
Engineer Firm Primary Point of Contact (POC):		
Engineer Firm Primary POC Title:		
Engineer Firm Mailing Address:		
City:	State:	Zip-Code:
Engineer Firm Office Phone:		
Engineer Firm Primary POC Phone:		
Engineer Firm Primary POC E-Mail:		

### Adjacent and/or Affected Landowners Data

Please provide data for all adjacent and/or affected surface owners (both up and down stream) whose property may be impacted by proposed development as demonstrated by a floodplain study or survey. Use additional copies of this page as needed.

<b>Adjacent Property Owner Data: Upstream</b>		
Name of Primary Owner (PO): MARKWEST LIBERTY MIDSTREAM & RESOURCES LLC		
Physical Address: 1515 ARAPAHOE ST TOWER 1 STE		
City: Denver	State: CO	Zip: 80202
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

<b>Adjacent Property Owner Data: Upstream</b>		
Name of Primary Owner (PO):		
Physical Address:		
City:	State:	Zip:
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

<b>Adjacent Property Owner Data: Downstream</b>		
Name of Primary Owner (PO): D&M POWELL LLC		
Physical Address: 304 Stuart Street		
City: West Union	State: WV	Zip: 26456
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email: 7015 3430 0001 1569 6814		

<b>Adjacent Property Owner Data: Downstream</b>		
Name of Primary Owner (PO):		
Physical Address:		
City:	State:	Zip:
PO Primary Phone:		
PO Secondary Phone:		
PO Primary Email:		

## Site Plan

**A Site Plan is an accurate and detailed map of the proposed development for this project.** It shows the size, shape, location and special features of the project property, and the size and location of any development planned to the property, especially as that development will impact the floodplain and/or floodway. Site plans show what currently exists on the project property, and any changes or improvements you are proposing to make. **A certified and licensed engineering firm should complete site plans.**

### **A SITE PLAN MUST CONTAIN THE FOLLOWING INFORMATION:**

1. Legal description of the parcel, north arrow and scale
2. All property lines and their dimensions
3. Names of adjacent roads, location of driveways
4. Location of sloughs, tributaries, streams, rivers, wetlands, ponds, and lakes, with setbacks indicated, and including FEMA floodplain data based on most updated FIRM.
5. Location, size, shape of all buildings, existing and proposed, with elevation of lowest floor indicated.
6. Location and dimensions of existing or proposed on-site sewage systems.
7. Location of all propane tanks, fuel tanks or other liquid storage tanks whether above ground or below ground level.
8. Location and dimensions of any proposed pipeline placement(s) into floodplain/floodway.
9. Location and dimensions of any roadway development into floodplain/floodway. *(Includes initial development access roads)*
10. Location and dimensions of any bridge and/or culvert development into floodplain/floodway.
11. Location and dimensions of any storage yard or facility into the floodplain/floodway.
12. Location of any existing utilities and/or proposed utility placement and/or displacement.
13. Location, dimensions and depth of any existing or proposed fill on site.
14. A survey showing the **existing ground elevations** of at least location on the building site. **ELEVATION NOTE:** All vertical datum will reference either NGVD 29 or NAVD 88. Assumed datum will not be acceptable unless the property is located in an area where vertical datum has not been published. For those areas where vertical datum has not been established, a site plan with contours, elevations using assumed datum, high water marks and existing water levels of sloughs, rivers, lakes or streams and proposed lowest floor elevation.

## **Applicant**

*Please read print name, sign and date below:*

- I certify that I am authorized to submit this application for the primary project developer.
- I certify that the information included in this application is to the best of my knowledge true and complete.
- I certify that all required Federal, State, and local permits required by law and/or ordinance for the above described development of this project have been properly attained, are current and valid, and must be presented with this application before a Doddridge County Floodplain Permit may be issued.
- I understand that if in the course of the development project additional permits become required that were not needed during the initial proposal, the primary developer must notify the Doddridge County Floodplain Manager within 48 hours of such need, and that a "Stop Work" order may be issued for all project work directly impacting the floodplain or floodway, until such time the required additional permits are acquired.
- I understand that once the floodplain permit is submitted, the application will be entered into official public record at the next regularly scheduled Doddridge County Commission meeting after the date of submittal.
- I understand that from the date of submittal of the fully completed permit application, the Doddridge County Floodplain Manager has ninety (90) days to make a determination to either grant or deny said permit application. During this approval period, the Doddridge County Floodplain Manager may, at his or her discretion, conduct a review and/or additional study of provided documentation by means of an independent engineering firm. All costs associated with said review and/or study must be reimbursed to the County before issuance of approved permit.
- I understand that during the approval period, the Doddridge County Floodplain Manager of designee may at his or her discretion conduct site visits and document conditions of proposed development pursuant to the permit application.
- I understand that once the Floodplain Permit is granted, the permit will be entered into official public record at the next scheduled Doddridge County Commission meeting after the date of issuance. Appeals to the permit may be made no later than twenty (20) days after said issuance. If a valid appeal is submitted, as determined by the Doddridge County Floodplain Manager, a "Stop Work" order will be issued for all project development directly involving the floodplain or floodway. A public hearing by the Doddridge County Appeals Board will be scheduled no less than ten (10) days after the next regularly scheduled Doddridge County Commission meeting.
- I understand that all decisions of the Doddridge County Appeals Board shall be final.
- I understand issuance of a Floodplain Permit authorizes me to proceed with construction as proposed. A Certificate of Compliance is required upon substantial completion of the project.
- In signing this application, the primary developer hereby grants the Doddridge County Floodplain Manager or designee the right to enter onto the above—described location to inspect the development work proposed, in progress, and/or completed.
- I understand that if I do not follow exactly the site—plan submitted and approved by this permit that a "Stop Work" order may be issued by the Wirt County Floodplain Manager and that I must stop all construction immediately until discrepancies of actual work vs. proposed work is resolved.

Applicant Signature:  Date: 2-2-19

Applicant Printed Name: Brian Guarners



February 2, 2017

Doddridge County Commission  
Attn: George Eidel, Doddridge County Floodplain Manager  
118 East Court Street, Room 102  
West Union, WV 26456

Subject: Antero Midstream, LLC.  
WEC to MarkWest Tie-in Gas Line Project  
No-Rise Certificate  
Doddridge County, West Virginia  
CEC Project 170-559

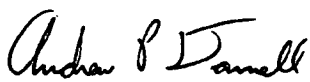
Civil & Environmental Consultants, Inc. (CEC) is pleased to evaluate the potential floodplain impacts for the above referenced project on behalf of Antero Midstream, LLC., 535 White Oaks Blvd, Bridgeport, WV 26330.

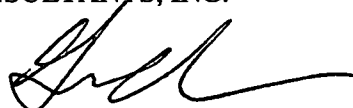
Antero Midstream, LLC. proposes to install approximately 500 linear feet of 24" SCH 40 gas line. The pipeline will be installed by placing pipe supports along the gasline, which will involve excavation at each foundation location in order to install the concrete foundation that supports various structural steel elements. All work is to be done within the Buckeye Creek Zone A Flood Hazard Area, as shown on the Flood Insurance Rate Map for Doddridge County, Map #54017C0140C with a map revised date of October 4, 2011. However, the pipeline will be installed on a site that was previously developed and permitted by MarkWest. Therefore, the installation of the gasline will not adversely impact the existing base flood elevation of Buckeye Creek.

This no-rise certificate is provided in support of the floodplain development permit application. Your time and effort in reviewing this floodplain development permit application is appreciated. Please feel free to contact me at 304-933-3119 or via e-mail at [glinder@cecinc.com](mailto:glinder@cecinc.com) or contact Ms. Rachel Grzybek at 304-842-4008 or via e-mail at [rgrzybek@anteroresources.com](mailto:rgrzybek@anteroresources.com) if you have questions or need additional information.

Respectfully submitted,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

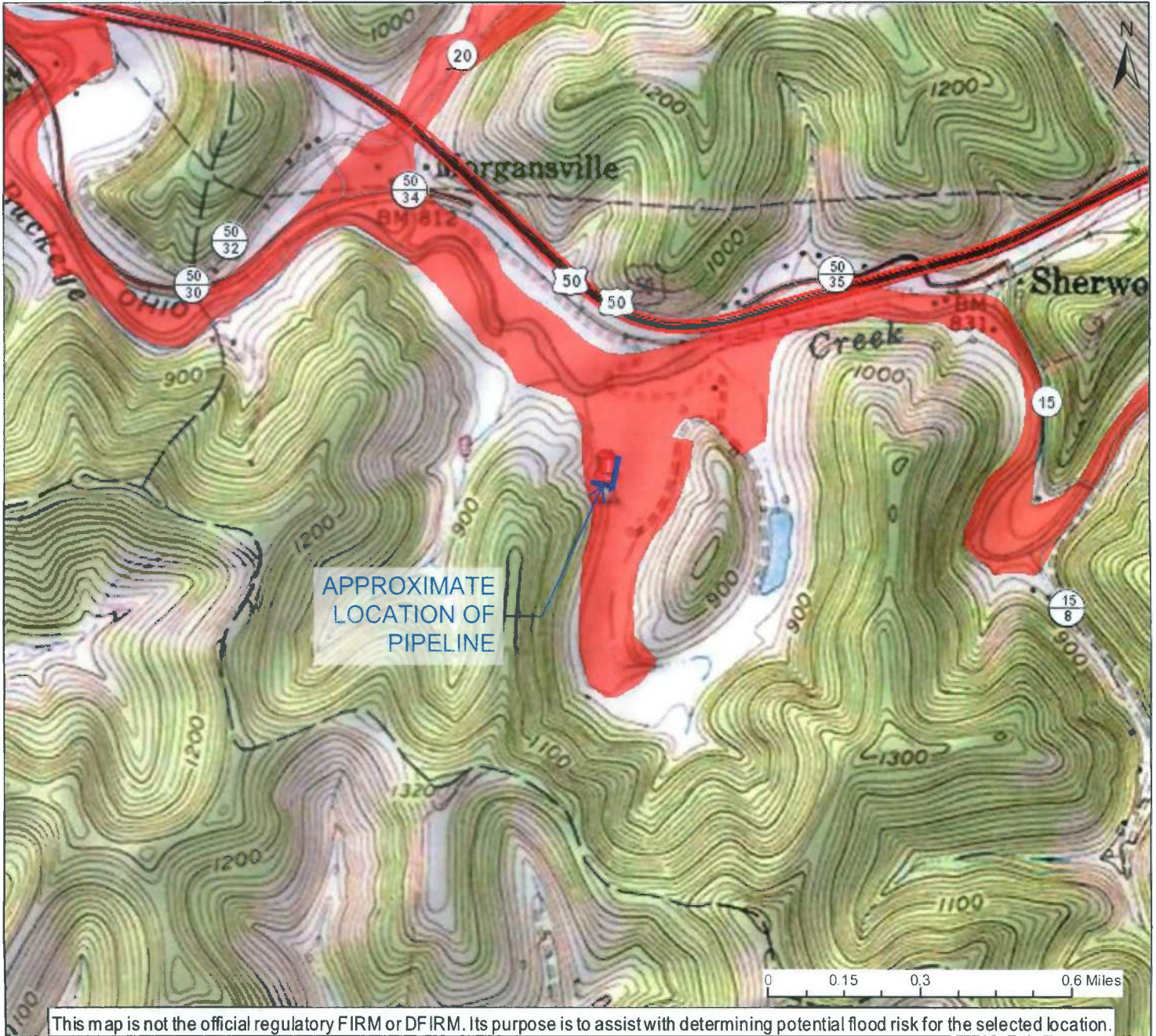
  
Andrew P. Darnell, E.I.  
Assistant Project Manager

  
Greg S. Linder, P.E.  
Senior Project Manager





# WEC to MarkWest Tie-In Gas Line



This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location.

**User Notes:**  
AFE #: Pending

Map created on January 30, 2017

**Flood Hazard Area:**  
Flood Hazard Area: Location is WITHIN the FEMA 100-year floodplain.

**FEMA Issued Flood Map:** 54017C0140C

**Watershed (HUC8):** Little Musringum-Middle Island (

**Elevation:** About 807 ft

**Location (long, lat):** (80.688935 W,39.275116 N)

**Location (UTM 17N):** (526831, 4347352)

**Contacts:** Doddridge

**CRS Information:** N/A

**Parcel Number:**

- Flood Hazard Zone
- Flood Point of Interest

**Disclaimer:**

The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. To obtain more detailed information in areas where Base Flood Elevations have been determined, users are encouraged to consult the latest Flood Profile data contained in the official flood insurance study. These studies are available online at [www.msc.fema.gov](http://www.msc.fema.gov). WV Flood Tool (<http://www.MapWV.gov/flood>) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3.
- 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.

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature  
 X *Carie Ann White*  Agent  Addressee

B. Received by (Printed Name) \_\_\_\_\_ C. Date of Delivery  
 \_\_\_\_\_ 2-13-17

Address different from item 1?  Yes  
 or delivery address below:  No

**Markwest Liberty Midsteam & Resources, LLC**  
 1515 Arapahoe St. Tower 1 STE  
 Denver, CO 80202



9590 9402 1888 6104 9699 65

2. Article Number (Transfer from service label)

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

3. Service Type

<input type="checkbox"/> Adult Signature	<input type="checkbox"/> Priority Mail Express®
<input type="checkbox"/> Adult Signature Restricted Delivery	<input type="checkbox"/> Registered Mail™
<input type="checkbox"/> Certified Mail®	<input type="checkbox"/> Registered Mail Restricted Delivery
<input type="checkbox"/> Certified Mail Restricted Delivery	<input type="checkbox"/> Return Receipt for Merchandise
<input type="checkbox"/> Collect on Delivery	<input type="checkbox"/> Signature Confirmation™
<input type="checkbox"/> Collect on Delivery Restricted Delivery	<input type="checkbox"/> Signature Confirmation Restricted Delivery
<input type="checkbox"/> Insured Mail	
<input type="checkbox"/> Insured Mail Restricted Delivery (over \$500)	

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3.
- 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.

**D & M Powell LLC**  
 304 Stuart Street  
 West Union, WV 26456

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature  
 X *Jenns Powell*  Agent  Addressee

B. Received by (Printed Name) \_\_\_\_\_ C. Date of Delivery  
 \_\_\_\_\_ 2-11-17

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

*124 Stuart St  
 West Union WV*



9590 9402 1888 6104 9699 58

2. Article Number (Transfer from service label)

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

3. Service Type

<input type="checkbox"/> Adult Signature	<input type="checkbox"/> Priority Mail Express®
<input type="checkbox"/> Adult Signature Restricted Delivery	<input type="checkbox"/> Registered Mail™
<input type="checkbox"/> Certified Mail®	<input type="checkbox"/> Registered Mail Restricted Delivery
<input type="checkbox"/> Certified Mail Restricted Delivery	<input type="checkbox"/> Return Receipt for Merchandise
<input type="checkbox"/> Collect on Delivery	<input type="checkbox"/> Signature Confirmation™
<input type="checkbox"/> Collect on Delivery Restricted Delivery	<input type="checkbox"/> Signature Confirmation Restricted Delivery
<input type="checkbox"/> Insured Mail	
<input type="checkbox"/> Insured Mail Restricted Delivery (over \$500)	

**U.S. Postal Service™  
 CERTIFIED MAIL® RECEIPT**

Domestic Mail Only  
 For delivery information, visit our website at [www.usps.com](http://www.usps.com)

**OFFICIAL USE**

Certified Mail Fee \$ **3.45**

Extra Services & Fees (check box, add fee as appropriate)

<input checked="" type="checkbox"/> Return Receipt (hardcopy)	\$ 2.80
<input type="checkbox"/> Return Receipt (electronic)	\$
<input type="checkbox"/> Certified Mail Restricted Delivery	\$
<input type="checkbox"/> Adult Signature Required	\$
<input type="checkbox"/> Adult Signature Restricted Delivery	\$

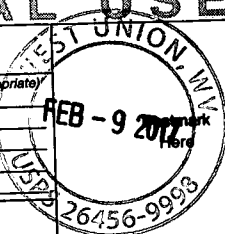
Postage \$ **.49**

Total Postage and Fees \$ **6.74**

Sent To \_\_\_\_\_

Street and Apt. No., or PO Box No. \_\_\_\_\_

City, State, ZIP+4® \_\_\_\_\_



**U.S. Postal Service™  
 CERTIFIED MAIL® RECEIPT**

Domestic Mail Only  
 For delivery information, visit our website at [www.usps.com](http://www.usps.com)

Certified Mail Fee \$ **3.45**

Extra Services & Fees (check box, add fee as appropriate)

<input checked="" type="checkbox"/> Return Receipt (hardcopy)	\$ 2.80
<input type="checkbox"/> Return Receipt (electronic)	\$
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<input type="checkbox"/> Adult Signature Restricted Delivery	\$

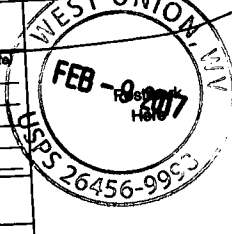
Postage \$ **.49**

Total Postage and Fees \$ **6.74**

Sent To \_\_\_\_\_

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City, State, ZIP+4® \_\_\_\_\_



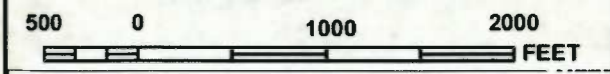


**DODDRIDGE COUNTY  
UNINCORPORATED AREAS  
540024**

JOINS PANEL 0145



MAP SCALE 1" = 1000'



**NATIONAL FLOOD INSURANCE PROGRAM**

**PANEL 0140C**

**FIRM**  
FLOOD INSURANCE RATE MAP  
**DODDRIDGE COUNTY,  
WEST VIRGINIA  
AND INCORPORATED AREAS**

**PANEL 140 OF 325**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0140	C

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER  
54017C0140C  
MAP REVISED  
OCTOBER 4, 2011**

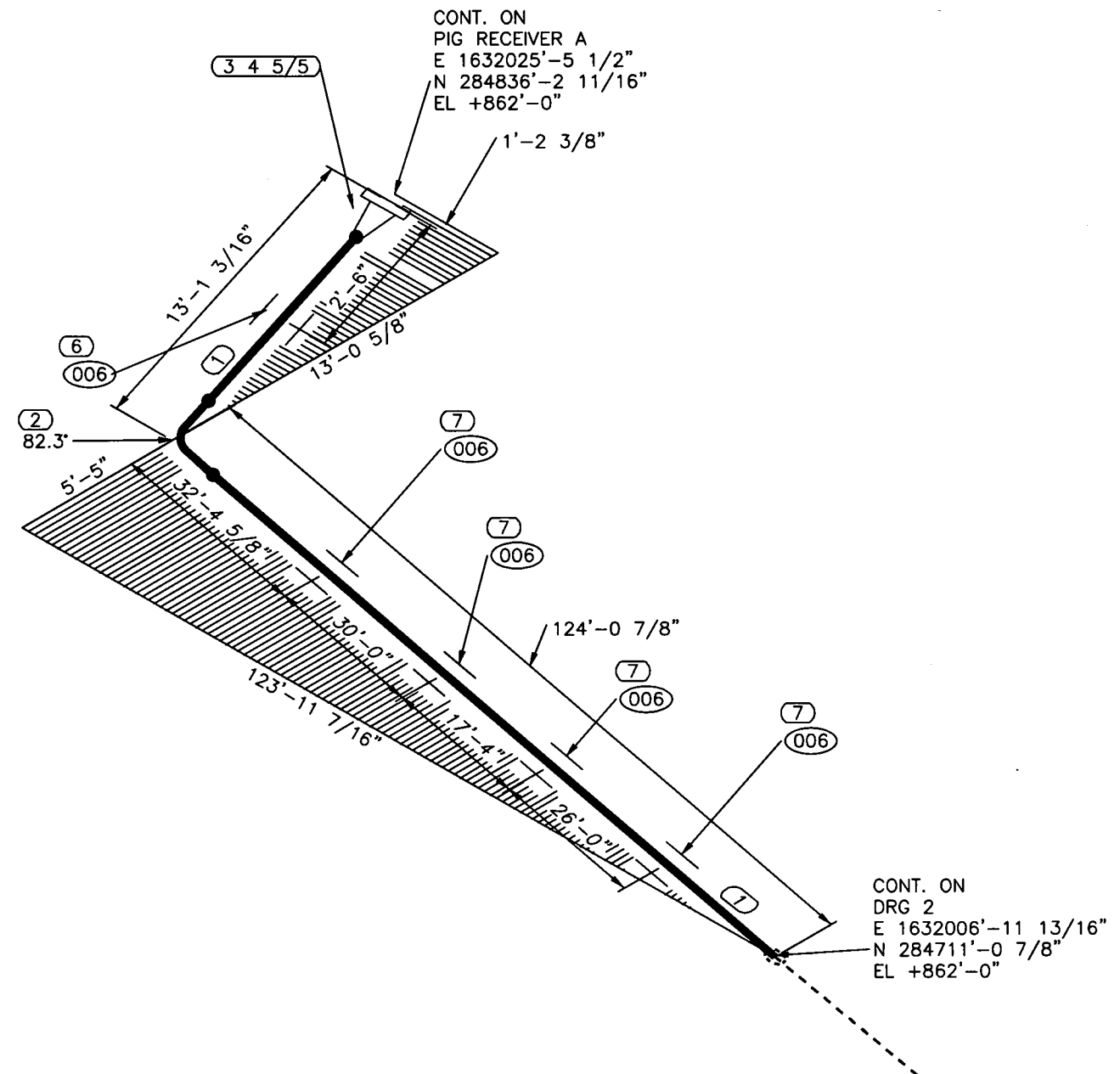
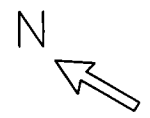
Federal Emergency Management Agency

285000 FT

280000 FT

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)





MARK	SIZE	DESCRIPTION	QTY
1	24	PIPE, SCH 40, API 5L GR X-52, ERW	119'1"
2	24	TRIMMED 90 LR ELL, 5 DIA, BW, SCH 40, ASTM A860 GR WPHY 65 (82.26)	1
3	24	FLG WELD NECK, 600LB, RF, BORE SCH 40, ASTM A694 GR WPHY 52	1
4	24	GASKET, 600LB, 1/8" THK, FLEXITALLIC SPIRAL WOUND, 304SS, W/FLEXITE SUPER FILLER, CS GUIDE RING	1
5	1 7/8X13	(24) STUD BOLTS W/ NUTS, ASTM A193/194 GR B7/2H	2
6	24	U-BOLT GUIDE 006	1
7	24	U-BOLT GUIDE 006 W/E-Z LINE I-ROD U-BOLT	4

**NOTE:**

1) CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD BEFORE FABRICATION AND ERECTION OF PIPING AND SUPPORTS.



PROJECT NUMBER: 10-5736

NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	ENG. APP'D	PROCESS APP'D	DIRECTOR APP'D
A	ISSUED FOR BID	01/27/17	PVL	-			

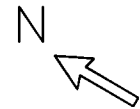
**MARKWEST**  
MarkWest Energy Partners, L.P.

PIPING ISOMETRIC  
**SHERWOOD PROCESSING FACILITY  
ANTERO INLET PIPELINE PIPING**

DODDRIDGE                      SHERWOOD                      WEST VIRGINIA

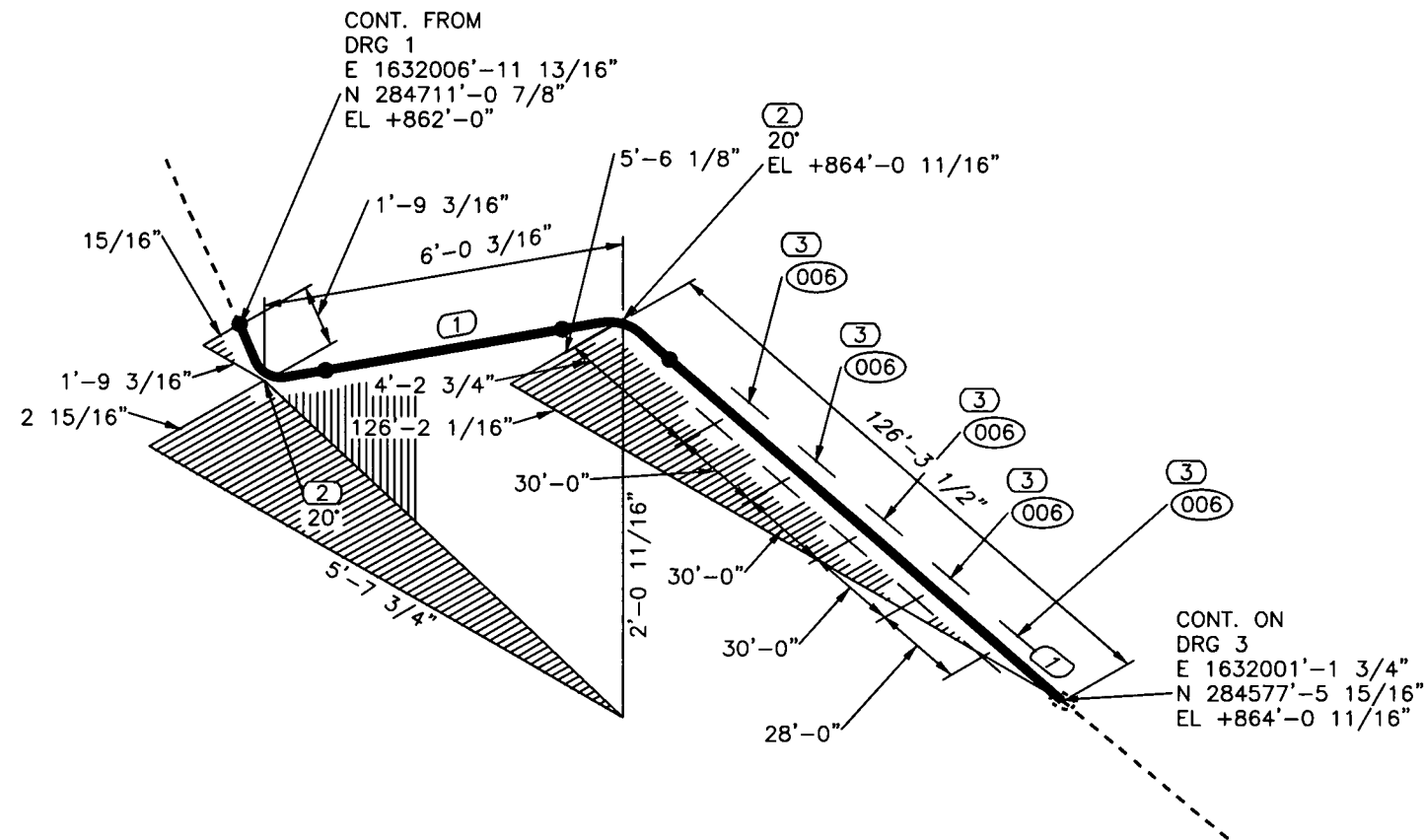
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ENG. APP.:	DATE:
PROCESS APP.:	DATE:
DIRECTOR APP.:	DATE:
SCALE: NTS	CAD. FILE: CAD
DRAWING NO. SH-ISO-7053	SHEET 1 / 8
	REV. A

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BILL OF MATERIAL

MARK	SIZE	DESCRIPTION	QTY
1	24	PIPE, SCH 40, API 5L GR X-52, ERW	127'1"
2	24	TRIMMED 45 ELL, 5DIA, BW, SCH 40, ASTM A860 GR WPHY 65 (20.00)	2
3	24	U-BOLT GUIDE 006 W/E-Z LINE I-ROD U-BOLT	5



NOTE:

1) CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD BEFORE FABRICATION AND ERECTION OF PIPING AND SUPPORTS.



PROJECT NUMBER: 10-5736

NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	ENG. APP'D	PROCESS APP'D	DIRECTOR APP'D
A	ISSUED FOR BID	01/27/17	PVL	-			

# MARKWEST

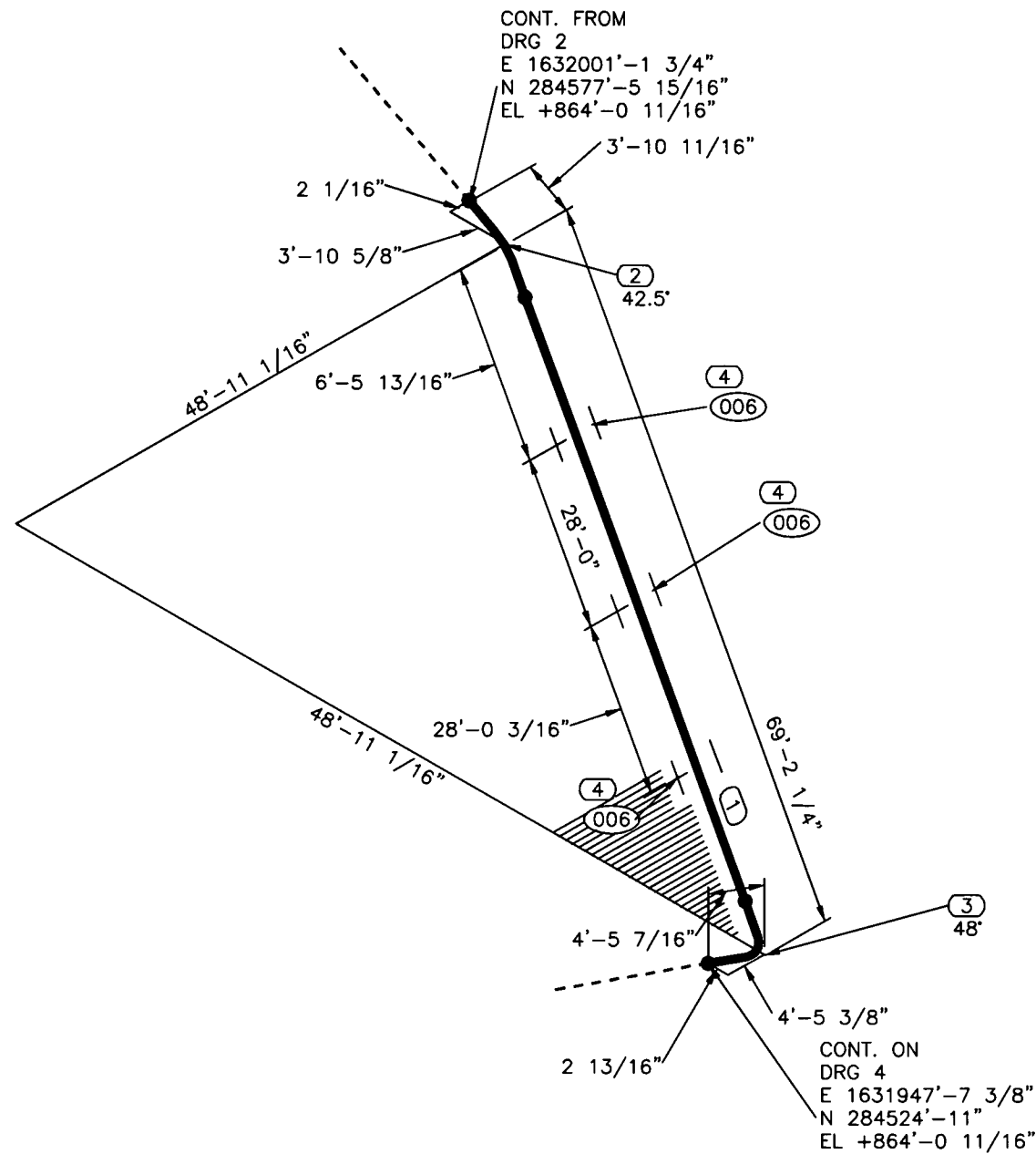
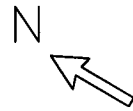
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PIPING ISOMETRIC

SHERWOOD PROCESSING FACILITY  
ANTERO INLET PIPELINE PIPING

DODDRIDGE SHERWOOD WEST VIRGINIA

A.F.E.	AFE	
DRAWN:	PVL	DATE: 01/23/17
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ENG. APP.:		DATE:
PROCESS APP.:		DATE:
DIRECTOR APP.:		DATE:
SCALE:	NTS	CAD. FILE: CAD
DRAWING NO.	SH-ISO-7053	SHEET 2 / 8
		REV. A



BILL OF MATERIAL			
MARK	SIZE	DESCRIPTION	QTY
1	24	PIPE, SCH 40, API 5L GR X-52, ERW	60'11"
2	24	TRIMMED 45 ELL, 5DIA, BW, SCH 40, ASTM A860 GR WPHY 65 (42.49)	1
3	24	TRIMMED 90 LR ELL, 5 DIA, BW, SCH 40, ASTM A860 GR WPHY 65 (48.00)	1
4	24	U-BOLT GUIDE 006 W/E-Z LINE I-ROD U-BOLT	3

**NOTE:**

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PROJECT NUMBER: 10-5736

NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	ENG. APP'D	PROCESS APP'D	DIRECTOR APP'D
A	ISSUED FOR BID	01/27/17	PVL	-			

**MARKWEST**

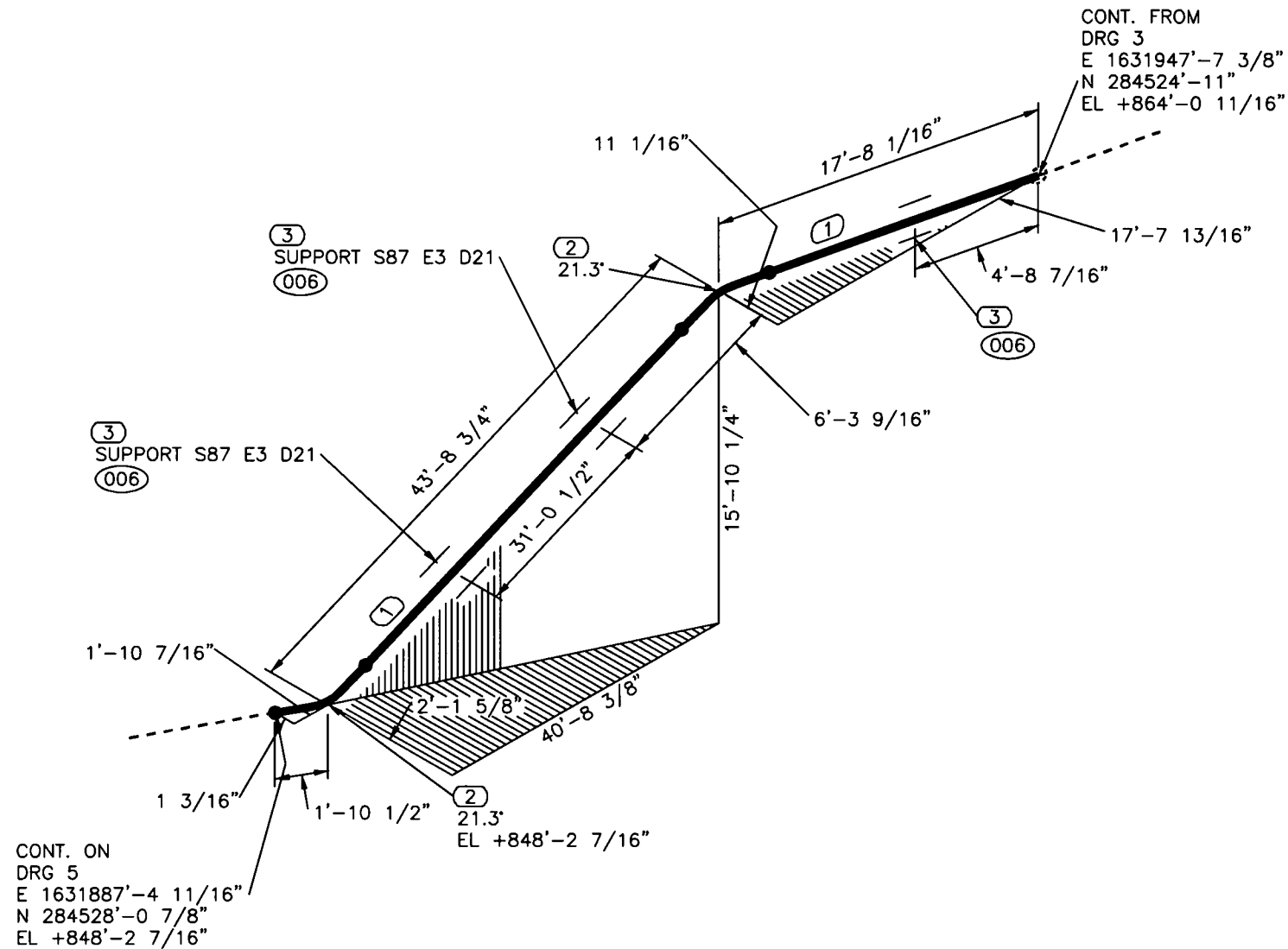
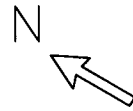
MarkWest Energy Partners, L.P.

PIPING ISOMETRIC

**SHERWOOD PROCESSING FACILITY  
ANTERO INLET PIPELINE PIPING**

DODDRIDGE SHERWOOD WEST VIRGINIA

A.F.E.	AFE	
DRAWN:	PVL	DATE: 01/23/17
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ENG. APP.:		DATE:
PROCESS APP.:		DATE:
DIRECTOR APP.:		DATE:
SCALE:	NTS	CAD. FILE: CAD
DRAWING NO.	SH-ISO-7053	SHEET 3 / 8
		REV. A



MARK	SIZE	DESCRIPTION	QTY
1	24	PIPE, SCH 40, API 5L GR X-52, ERW	55'10"
2	24	TRIMMED 45 ELL, 5DIA, BW, SCH 40, ASTM A860 GR WPHY 65 (21.26)	2
3	24	U-BOLT GUIDE 006 W/E-Z LINE I-ROD U-BOLT	3

**NOTE:**

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PROJECT NUMBER: 10-5736

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PROCESS APP.:		DATE:
DIRECTOR APP.:		DATE:
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DRAWING NO.	SH-ISO-7053	SHEET 4 / 8 REV. A

# MARKWEST

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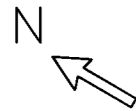
PIPING ISOMETRIC

**SHERWOOD PROCESSING FACILITY  
ANTERO INLET PIPELINE PIPING**

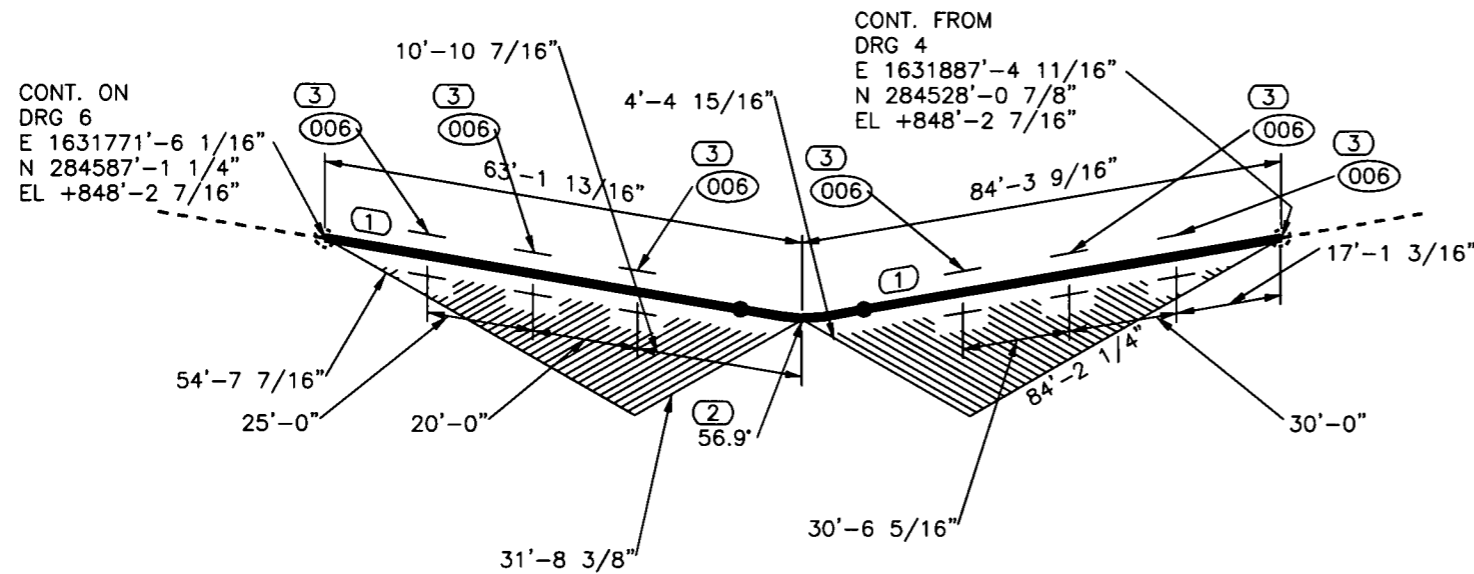
DODDRIDGE SHERWOOD WEST VIRGINIA

NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	ENG. APP'D	PROCESS APP'D	DIRECTOR APP'D
A	ISSUED FOR BID	01/27/17	PVL	-			





BILL OF MATERIAL			
MARK	SIZE	DESCRIPTION	QTY
1	24	PIPE, SCH 40, API 5L GR X-52, ERW	136'8"
2	24	TRIMMED 90 LR ELL, 5 DIA, BW, SCH 40, ASTM A860 GR WPHY 65 (56.87)	1
3	24	U-BOLT GUIDE 006 W/E-Z LINE I-ROD U-BOLT	6



**NOTE:**

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PROJECT NUMBER: 10-5736

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DRAWN:	PVL	DATE: 01/23/17
CHECK:	-	DATE: -
ENG. APP.:		DATE:
PROCESS APP.:		DATE:
DIRECTOR APP.:		DATE:
SCALE:	NTS	CAD. FILE: CAD
DRAWING NO.	SH-ISO-7053	SHEET 5 / 8 REV. A

NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	ENG. APP'D	PROCESS APP'D	DIRECTOR APP'D
A	ISSUED FOR BID	01/27/17	PVL	-			

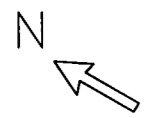
**MARKWEST**

MarkWest Energy Partners, L.P.

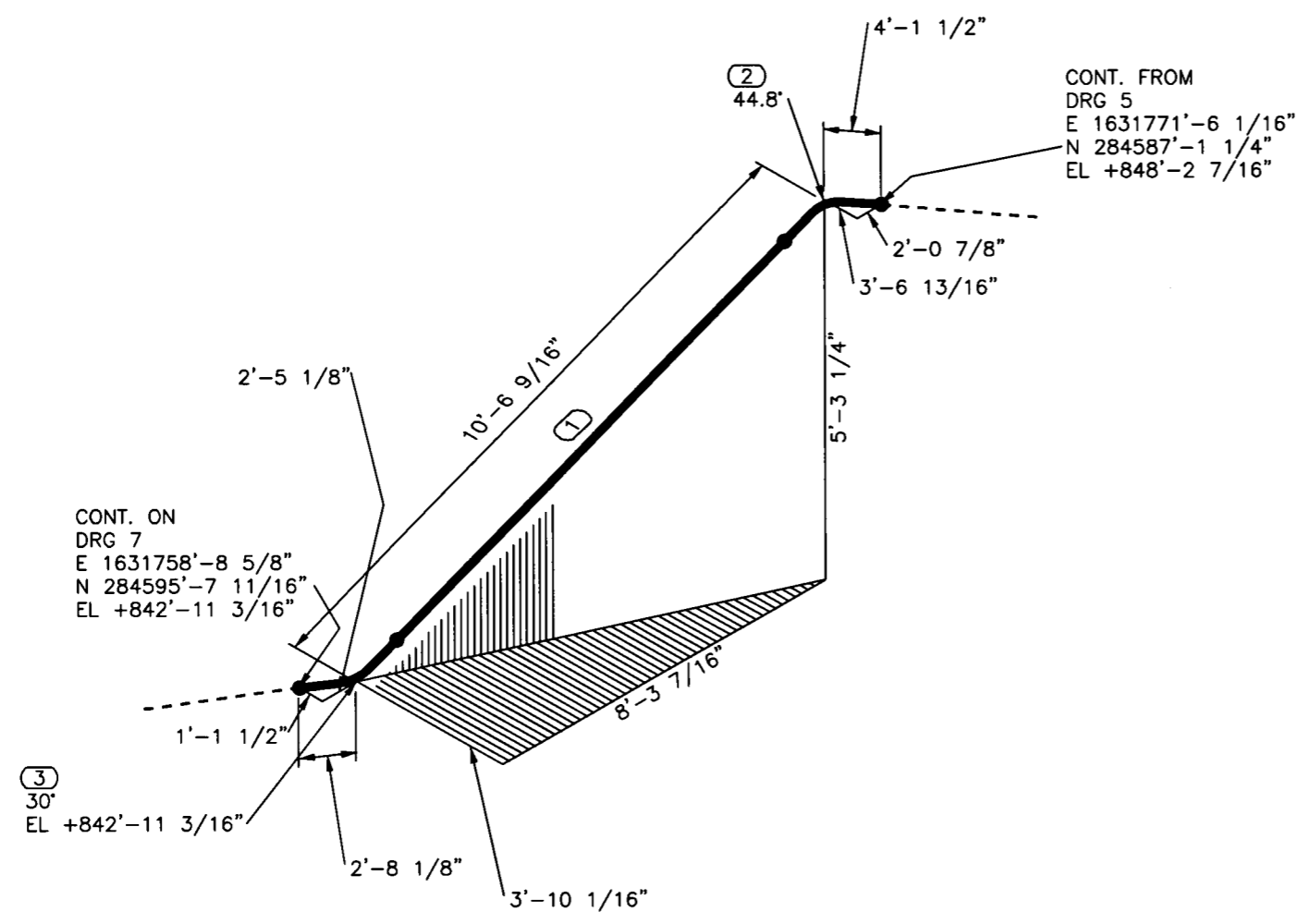
PIPING ISOMETRIC

**SHERWOOD PROCESSING FACILITY  
ANTERO INLET PIPELINE PIPING**

DODDRIDGE SHERWOOD WEST VIRGINIA



BILL OF MATERIAL			
MARK	SIZE	DESCRIPTION	QTY
1	24	PIPE, SCH 40, API 5L GR X-52, ERW	3'9"
2	24	45 ELL, 5DIA, BW, SCH 40, ASTM A860 GR WPHY 65	1
3	24	TRIMMED 45 ELL, 5DIA, BW, SCH 40, ASTM A860 GR WPHY 65 (30.00)	1



CONT. FROM  
DRG 5  
E 1631771'-6 1/16"  
N 284587'-1 1/4"  
EL +848'-2 7/16"

CONT. ON  
DRG 7  
E 1631758'-8 5/8"  
N 284595'-7 11/16"  
EL +842'-11 3/16"

**NOTE:**

1) CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD BEFORE FABRICATION AND ERECTION OF PIPING AND SUPPORTS.



PROJECT NUMBER: 10-5736

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MarkWest Energy Partners, L.P.

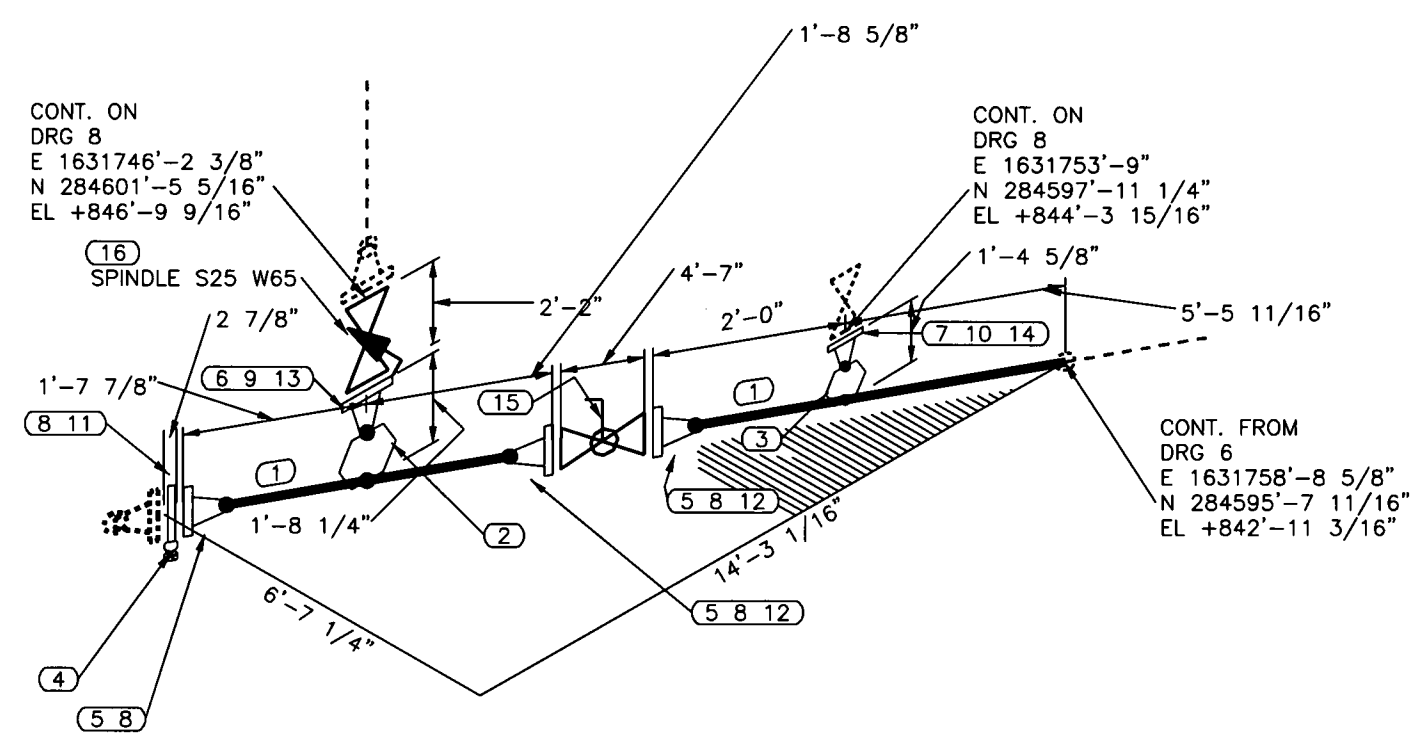
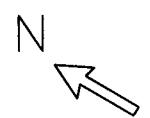
PIPING ISOMETRIC  
**SHERWOOD PROCESSING FACILITY  
ANTERO INLET PIPELINE PIPING**

DODDRIDGE SHERWOOD WEST VIRGINIA

NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	ENG. APP'D	PROCESS APP'D	DIRECTOR APP'D
A	ISSUED FOR BID	01/27/17	PVL	-			

A.F.E.	AFE	
DRAWN:	PVL	DATE: 01/23/17
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ENG. APP.:		DATE:
PROCESS APP.:		DATE:
DIRECTOR APP.:		DATE:
SCALE:	NTS	CAD. FILE: CAD
DRAWING NO.	SH-ISO-7053	SHEET 6 / 8
		REV. A

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CONT. ON  
DRG 8  
E 1631746'-2 3/8"  
N 284601'-5 5/16"  
EL +846'-9 9/16"

CONT. ON  
DRG 8  
E 1631753'-9"  
N 284597'-11 1/4"  
EL +844'-3 15/16"

CONT. FROM  
DRG 6  
E 1631758'-8 5/8"  
N 284595'-7 11/16"  
EL +842'-11 3/16"

BILL OF MATERIAL

MARK	SIZE	DESCRIPTION	QTY
1	24	PIPE, SCH 40, API 5L GR X-52, ERW	8'10"
2	24X8	WELD-O-LET, BW, SCH 40, ASTM A860 GR WPHY 52	1
3	24X2	WELD-O-LET, BW, SCH XS, ASTM A860 GR WPHY 52	1
4	24	SPECTACLE BLIND, 600LB, ASTM A105	1
5	24	FLG WELD NECK, 600LB, RF, BORE SCH 40, ASTM A694 GR WPHY 52	3
6	8	FLG WELD NECK, 600LB, RF, BORE SCH 40, ASTM A694 GR WPHY 42	1
7	2	FLG WELD NECK, 600LB, RF, BORE SCH XS, ASTM A105	1
8	24	GASKET, 600LB, 1/8" THK	4
9	8	GASKET, 600LB, 1/8" THK, FLEXITALLIC SPIRAL WOUND, 304SS, W/FLEXITE SUPER FILLER, CS GUIDE RING	1
10	2	GASKET, 600LB, 1/8" THK	1
11	1 7/8X15 3/4	(24) STUD BOLTS W/ NUTS, ASTM A193/194 GR B7/2H	1
12	1 7/8X13	(24) STUD BOLTS W/ NUTS, ASTM A193/194 GR B7/2H	2
13	1 1/8X7 3/4	(12) STUD BOLTS W/ NUTS, ASTM A193/194 GR B7/2H	1
14	5/8X4 1/2	(8) STUD BOLTS W/ NUTS, ASTM A193/194 GR B7/2H	1
15	24	BALL VALVE, FLG, 600LB	1
16	8	PLUG VALVE, FLG, 600LB	1

NOTE:

1) CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD BEFORE FABRICATION AND ERECTION OF PIPING AND SUPPORTS.



PROJECT NUMBER: 10-5736

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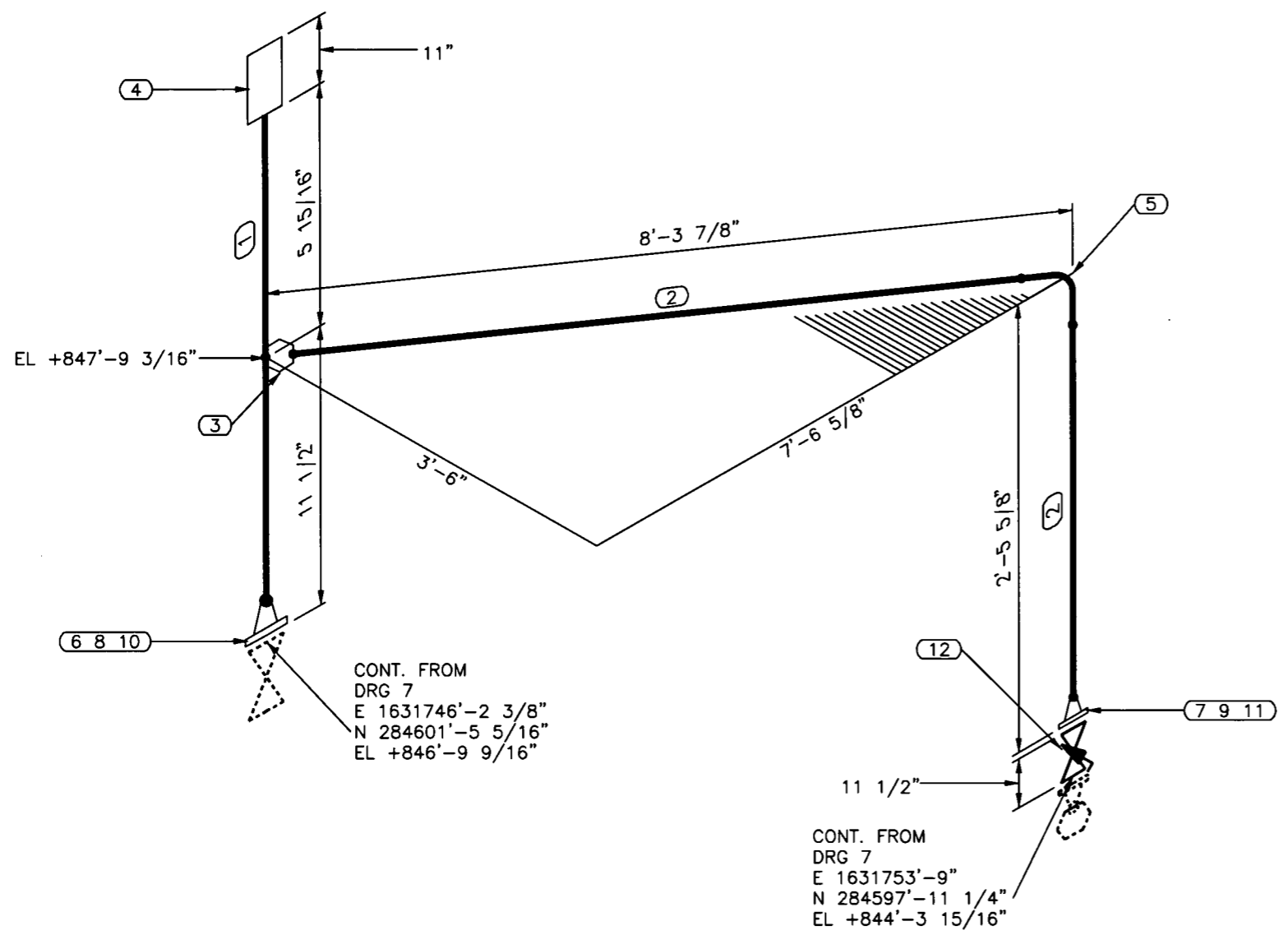
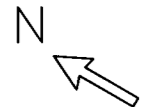
PIPING ISOMETRIC  
SHERWOOD PROCESSING FACILITY  
ANTERO INLET PIPELINE PIPING

DODDRIDGE SHERWOOD WEST VIRGINIA

NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	ENG. APP'D	PROCESS APP'D	DIRECTOR APP'D
A	ISSUED FOR BID	01/27/17	PVL	-			

A.F.E.	AFE	
DRAWN:	PVL	DATE: 01/23/17
CHECK:	-	DATE: -
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PROCESS APP.:		DATE:
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SCALE:	NTS	CAD. FILE: CAD
DRAWING NO.	SH-ISO-7053	SHEET 7 / 8
		REV. A

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**BILL OF MATERIAL**

MARK	SIZE	DESCRIPTION	QTY
1	8	PIPE, SCH 40, API 5L GR X-42, ERW	1'0"
2	2	PIPE, SMLS, SCH XS, ASTM A106 GR B	9'7"
3	8X2	WELD-O-LET, BW, SCH XS, ASTM A860 GR WPHY 52	1
4	8	CAP, YALE FIG 500	1
5	2	90 LR ELL, BW, SCH XS, ASTM A234 GR WPB	1
6	8	FLG WELD NECK, 600LB, RF, BORE SCH 40, ASTM A694 GR WPHY 42	1
7	2	FLG WELD NECK, 600LB, RF, BORE SCH XS, ASTM A105	1
8	8	GASKET, 600LB, 1/8" THK, FLEXITALLIC SPIRAL WOUND, 304SS, W/FLEXITE SUPER FILLER, CS GUIDE RING	1
9	2	GASKET, PHENOLIC ISOLATION KIT, 600LB, INCL. GASKET, SLEAVE -1:96:GASKET, PHENOLIC ISOLATION KIT	1
10	1 1/8X7 3/4	(12) STUD BOLTS W/ NUTS, ASTM A193/194 GR B7/2H	1
11	5/8X4 1/2	(8) STUD BOLTS W/ NUTS, ASTM A193/194 GR B7/2H	1
12	2	PLUG VALVE, FLG, 600LB	1

**NOTE:**

1) CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD BEFORE FABRICATION AND ERECTION OF PIPING AND SUPPORTS.



PROJECT NUMBER: 10-5736

**MARKWEST**  
MarkWest Energy Partners, L.P.

PIPING ISOMETRIC  
**SHERWOOD PROCESSING FACILITY**  
**ANTERO INLET PIPELINE PIPING**

NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	ENG. APP'D	PROCESS APP'D	DIRECTOR APP'D
A	ISSUED FOR BID	01/27/17	PVL	-			

DODDRIDGE SHERWOOD WEST VIRGINIA

A.F.E.	AFE	
DRAWN:	PVL	DATE: 01/23/17
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DIRECTOR APP.:		DATE:
SCALE:	NTS	CAD. FILE: CAD
DRAWING NO.	SH-ISO-7053	SHEET 8 / 8
		REV. A

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## STRUCTURAL STEEL GENERAL NOTES

ALL SPECIFICATIONS, CODES AND STANDARDS REFERRED TO HERE SHALL BE THE LATEST EDITION SPECIFICATIONS

- DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO:
  - THE A.I.S.C. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS - A.I.S.C. 360"
  - THE A.I.S.C. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES."
- WELDING SHALL CONFORM TO AWS D1.1 - "STRUCTURAL WELDING CODE."
- ALL HIGH STRENGTH BOLTING SHALL CONFORM TO A.I.S.C. - "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS."

### MATERIALS

- WIDE FLANGE "W & TEES" SHAPES - ASTM A992, 50 KSI MIN
- ROLLED "S," "M," "H," "C," & "L" SHAPES - ASTM A36.
- PLATES, BARS & CHECKERED PLATE - ASTM A36.
- HOLLOW STRUCTURAL TUBE SECTIONS "HSS" - ASTM A500.
- STRUCTURAL PIPE: ASTM A53, GRADE B TYPE "S" F<sub>y</sub> = 35 KSI
- GRATING: WELDED STEEL 1 1/4"x3/16" PLAIN BEARING BARS WITH A MAXIMUM 1 3/16" CENTER TO CENTER SPACING AND 1/4" CROSSBARS WITH A MAXIMUM 4" c/c SPACING. (GALVANIZED PER ASTM A123)

### SHOP AND FIELD CONNECTIONS

- GUSSET PLATES: MINIMUM 3/8" THICKNESS CONNECTION ANGLES: MINIMUM 5/16" THICKNESS
- BOLTS:
  - MAJOR CONNECTIONS: 3/4" DIAMETER ASTM A325 BOLTS, BEARING TYPE CONNECTION, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
  - MINOR CONNECTIONS: 3/4" DIAMETER ASTM A307 UNFINISHED BOLTS. (MINOR CONNECTIONS INCLUDE GIRTS, PURLINS, HANDRAIL, LADDERS AND CAGES).
  - BOLTS FOR CONNECTING GALVANIZED STRUCTURAL STEEL AND MISCELLANEOUS METAL SHALL BE CADMIUM PLATED OR GALVANIZED PER ASTM A153, INCLUDING NUTS AND WASHERS. THREADS IN NUTS SHALL BE TAPPED AFTER GALVANIZING BY FABRICATOR IF REQUIRED.
  - BOLT HOLES: ALL BOLT HOLES SHALL BE PUNCHED, DRILLED OR BURNED AND REAMED TO 13/16" DIAMETER FOR 3/4" DIAMETER BOLTS.
- BEAM CONNECTIONS: THE MINIMUM CONNECTION SHALL BE TWO 3/4" DIAMETER BOLTS IN SINGLE SHEAR OR EQUIVALENT WELD. WHEN REACTIONS ARE NOT INDICATED, THE BEAM CONNECTION SHALL BE SELECTED TO SUPPORT THE BEAM CAPACITIES GIVEN IN THE "ALLOWABLE UNIFORM LOADS IN KIP TABLES" IN PART 2 OF THE AISC MANUAL OF STEEL CONSTRUCTION (FIFTEENTH EDITION).
- BRACING CONNECTIONS: BRACING SHALL BE CONNECTED TO ALL INTERSECTING MEMBERS. TURN VERTICAL ELEMENTS OF ANGLES AND TEES DOWN. BACK TO BACK PLACEMENT OF ELEMENTS IS PROHIBITED UNLESS SPECIFICALLY INDICATED. CONNECT WEBS OF TEES TO GUSSET BY CUTTING AND CHIPPING ONE FLANGE. WHEN BRACING LOADS ARE NOT INDICATED, CONNECTION SHALL BE DESIGNED FOR THE FULL CAPACITY OF THE SECTION IN TENSION
- WELDED CONNECTIONS: ELECTRODES: ALL WELD METAL SHALL MATCH BASE METAL USING PROPER SERIES E 70XX ELECTRODES PER AWS A 5.1.

### PAINTING/GALVANIZING

- SURFACE PREPARATION, SHOP PRIMER AND SHOP/FIELD FINISH PAINTING OF STRUCTURAL AND MISCELLANEOUS STEEL SHALL BE PER PROJECT SPECIFICATION.
- GALVANIZING OF STRUCTURAL AND MISCELLANEOUS STEEL SHALL BE PER ASTM A123 AS NOTED ON THE DRAWINGS. TOUCH-UP ALL DAMAGED AREAS WITH COLD GALVANIZING COATING MATERIAL PER ASTM A780.
- SAFETY PAINTING: SHOP OR FIELD PAINT AND FIELD TOUCH-UP ALL SURFACES OF THE FOLLOWING STRUCTURAL AND MISCELLANEOUS STEEL ITEMS AS REQUIRED BY THE OWNER AND RECOMMENDED BY OSHA 1910.144 AND ANSI 253.1 WITH SAFETY COLORS: SAFETY YELLOW (CAUTION): HANDRAILS, TOE PLATES, LADDERS AND CAGES, TOP AND BOTTOM STAIR NOSINGS, SAFETY GATES, MONORAILS. ALL MONORAILS SHALL BE PAINTED SAFETY YELLOW. STENCIL MONORAIL WITH CAPACITY AND IDENTIFICATION NUMBER (IF APPLICABLE.)

## CONCRETE GENERAL NOTES

- DESIGN, MATERIAL, AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OR REVISION OF THE FOLLOWING CODES AND STANDARDS UNLESS NOTED OTHERWISE ON THE DRAWINGS OR IN THE SPECIFICATIONS:
  - THE WEST VIRGINIA BUILDING CODE 2009 AND LOCAL BUILDING CODES
  - ACI 318 - "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" BY THE AMERICAN CONCRETE INSTITUTE (ACI)
  - ACI 315 - "DETAILS AND DETAILING OF REINFORCEMENT" BY THE AMERICAN CONCRETE INSTITUTE (ACI)
  - ACI 301 - "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"
  - ACI 347R - "GUIDE TO FORMWORK FOR CONCRETE"
  - ACI 305R - "HOT WEATHER CONCRETING"
  - ACI 306R - "COLD WEATHER CONCRETING"
  - "RECOMMENDED PRACTICE FOR PLACING REINFORCING STEEL" BY THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
- CONTRACTOR SHALL FURNISH ALL MATERIAL UNLESS NOTED OTHERWISE.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS AND SHALL CONTAIN 4% TO 6% ENTRAINED AIR PER ACI 318 AND BASED ON MAXIMUM AGGREGATE SIZE.
- MATERIALS (SUBSTITUTES TO BE OWNER AND ENGINEER APPROVED)
  - ASTM C150, TYPE II-V PORTLAND CEMENT
  - CONCRETE AGGREGATE SHALL CONFORM TO THE "SPECIFICATION FOR CONCRETE AGGREGATES" (ASTM C33). MAXIMUM COARSE AGGREGATE SIZE SHALL BE 3/4 INCH.
  - WATER REDUCING AGENTS AND SUPER PLASTICIZERS ARE SUBJECT TO PRIOR APPROVAL BY THE COMPANY PROJECT ENGINEER.
  - CURING COMPOUND 1600-WHITE BY W.R. MEADOWS CO. OR APPROVED EQUAL.
  - MIXING AND DELIVERY IN ACCORDANCE WITH ASTM C-94 FOR READY MIXED CONCRETE
  - MAXIMUM SLUMP 3" AT POINT OF PLACEMENT BEFORE ADDITIVES FOR WORKABILITY ARE ADDED
- CONCRETE SHALL BE MECHANICALLY VIBRATED IN ACCORDANCE WITH ACI-309R.
- ALL REINFORCING BARS SHALL BE ASTM A-615 DEFORMED BILLET STEEL BARS GRADE 60.
- ALL WELDED WIRE REINFORCEMENT SHALL CONFORM TO ASTM-185. WELDING OR TACK WELDING OF REINFORCING BARS SHALL NOT BE PERMITTED UNLESS SPECIFICALLY NOTED ON THE DESIGN DRAWINGS.
- ALL REINFORCING SHALL BE CONTINUOUS AND SHALL BE EQUALLY SPACED UNLESS SHOWN OR NOTED OTHERWISE.
- SUPPORT AND ANCHORAGE OF THE REINFORCING IS THE RESPONSIBILITY OF THE CONTRACTOR.
- PROVIDE CORROSION RESISTANT ACCESSORIES SUCH AS PLASTIC CHAIRS OR CHAIRS WITH PLASTIC COATED TIPS IN ALL EXPOSED CONCRETE CONSTRUCTION. PRECAST CONCRETE CUBES, CONCRETE BRICK, SPECIAL PLASTIC BASE CHAIRS, OR SAND PLATES WITH CHAIRS ON TOP SHALL BE USED FOR THE SUPPORT OF REINFORCING ON GRADE (CLAY BRICK IS NOT ALLOWED)
- ALL REINFORCEMENT SHALL BE PLACED WITHIN THE TOLERANCES PERMITTED BY ACI 117-90 AND THE CRSI.
- BEFORE CONCRETE IS PLACED, CARE SHALL BE TAKEN TO ENSURE THAT ALL EMBEDDED ITEMS ARE FIRMLY AND SECURELY FASTENED IN PLACE TO PREVENT DISPLACEMENT.
- ALL ANCHOR RODS AND EMBEDDED STEEL SHALL CONFORM TO ASTM A36 UNLESS NOTED OTHERWISE.
- GROUT FOR COLUMN BASE PLATES, BEAM BEARING PLATES AND GENERAL GROUTING SHALL BE A NON-METALLIC, NON-SHRINK CEMENTITIOUS GROUT SUCH AS "MBT MASTERFLOW 555" AS MANUFACTURED BY BASF CONSTRUCTION CHEMICALS OR EQUIVALENT. GROUT FOR MACHINERY BASES SHALL BE AN EPOXY GROUT SUCH AS "MBT MASTERFLOW 648 CP" AS MANUFACTURED BY BASF CONSTRUCTION CHEMICALS OR EQUIVALENT. WHERE STEEL SHIMS HAVE BEEN USED TO SUPPORT COLUMN OR MACHINE BASES, THE SHIMS SHALL BE REMOVED AFTER THE GROUT HAS CURED AND THE RESULTING VOIDS FILLED WITH THE SAME GROUT MATERIAL.
- WATERSTOP TO BE SYNKO-FLEX PLASTIC ADHESIVE OR APPROVED EQUAL
- BOND BREAKER MATERIAL SHALL BE 30 POUND FELT PAPER.
- BONDING COMPOUND UNLESS NOTED OTHERWISE, SHALL BE "SIKADUR 32 HI-MOD" AS MANUFACTURED BY THE SIKA CORPORATION OR APPROVED EQUAL.
- ALL EXPOSED EDGES OF CONCRETE SHALL HAVE A 3/4", 45 DEGREE CHAMFER UNLESS NOTED OTHERWISE.
- CONCRETE SHALL BE FINISHED AS FOLLOWS:
  - VERTICAL SURFACES BELOW GRADE OR UNEXPOSED: ROUGH FORM
  - VERTICAL SURFACES EXPOSED: REMOVE FINIS, FILL VOIDS, THE HOLES AND SURFACE DEFECTS, WOOD FLOAT
  - HORIZONTAL SURFACES: WOOD FLOAT AND LIGHT BROOMING
- ANCHOR ROD SLEEVES SHALL BE FILLED WITH GROUT AFTER THE COLUMN OR EQUIPMENT IS IN PLACE AND THE ANCHOR RODS ALIGNED. CONTRACTOR SHALL MAKE SURE THAT THE SLEEVES ARE FREE OF DEBRIS AND WATER PRIOR TO GROUTING.
- ANCHOR RODS SHALL CONFORM TO ASTM F1554 GRADE 36. ALL ANCHOR RODS SHALL BE TIGHTENED TO SNUG-TIGHT CONDITION UNLESS NOTED OTHERWISE.
- ANCHOR RODS NUTS AND PLATE WASHERS SHALL BE GALVANIZED UNLESS NOTED OTHERWISE.
- UNLESS INDICATED OTHERWISE, ALL REINFORCEMENT LAPS, PROJECTIONS AND EMBEDMENTS SHALL BE AS SHOWN IN TABLE 1 BELOW. (CLASS B)

BAR SIZE	#3	#4	#5	#6	#7	#8	#9	#10	#11
TOP BAR	24	32	40	48	71	80	90	101	112
OTHER BAR	19	25	31	37	54	61	69	78	86

## FOUNDATION GENERAL NOTES

- THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE SURVEY, TOPOGRAPHICAL INFORMATION AND SUB-SURFACE GEOTECHNICAL REPORT BEFORE BEGINNING CONSTRUCTION.
- FOUNDATION DESIGN IS BASED ON THE SUBSURFACE EXPLORATION AND GEOTECHNICAL REPORT: SUBSTATION EXPANSION AND DE-ETHANIZER 1, SHERWOOD GAS PROCESSING PLANT, DODDRIDGE COUNTY, WEST VIRGINIA, CEC PROJECT 110-811, SEPT. 3, 2014.
- BOTTOM OF ALL EXTERIOR FOUNDATIONS SHALL BE AT LEAST 36" INCHES BELOW FINISHED GRADE.
- THE CONTRACTOR SHALL BE THE "ENGINEER OF RECORD" FOR THE DESIGN OF ALL SHORED AND OPEN EXCAVATIONS. EXCAVATION WORK SHALL BE IN ACCORDANCE WITH ALL OSHA REGULATIONS. THE OWNER AND ENGINEER SHALL BE NOTIFIED AS SOON AS POSSIBLE IF ANY UNUSUAL SOIL CONDITIONS IN VARIANCE TO THE GEOTECHNICAL REPORT ARE ENCOUNTERED.
- METHODS FOR DEWATERING AND THE NEED TO DO SO ARE AT THE CONTRACTOR'S DISCRETION IN CONSULTATION WITH THE GEOTECHNICAL REPORT AND THE GEOTECHNICAL ENGINEER. GROUND WATER LEVELS WERE NOT ENCOUNTERED IN SUBSURFACE EXPLORATION
- THE CONTRACTOR IS TO USE CAUTION DURING EXCAVATION AND CONSTRUCTION SO AS TO NOT DISTURB EXISTING STRUCTURES.
- FOUNDATION EXCAVATIONS SHALL BE KEPT FREE OF WATER AT ALL TIMES.
- ALL STRUCTURAL FILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER.
- ALL BACKFILLING AND COMPACTION OPERATIONS SHALL BE COMPLETED UNDER THE OBSERVATION AND TESTING BY THE GEOTECHNICAL ENGINEER.
- CONTRACTOR SHALL REPLACE ANY "SOFT" AREAS WITH STRUCTURAL FILL. W. VA. 307 OR APPROVED EQ.
- FOUNDATIONS EXTENDING ACROSS A BEARING TRANSITION ZONE (SOIL TO ROCK ETC.) SHALL BE Laterally REINFORCED. CONSULT THE GEOTECHNICAL ENGINEER FOR APPROVED METHODS.

## GENERAL STRUCTURAL LOAD DESIGN CRITERIA

### DESIGN WIND LOAD

BASIC WIND SPEED (3 SECOND GUST)	120 mph
EXPOSURE CATEGORY	C
TOPOGRAPHIC FACTOR K <sub>zt</sub>	1.0
INTERNAL PRESSURE COEFFICIENT GC <sub>pi</sub>	+/- 0.18

### DESIGN EARTHQUAKE LOAD

MAPPED SPECTRAL RESPONSE COEFFICIENTS S <sub>s</sub> = 0.109g; S <sub>1</sub> = 0.058g	
SITE CLASS	D
OCCUPANCY CATEGORY	III
SEISMIC IMPORTANCE FACTOR, I	1.25
GROUND SNOW LOAD P <sub>g</sub>	25 psf

RELEASED FOR BID  
BY: PAC DATE: 1/27/17

### NOTES:

- FOR FOUNDATION LOCATION PLAN SEE DWG. SH-ST-7054A.
- FOR STRUCTURAL STEEL LOCATION PLAN SEE DWG SH-ST-7054B.



PROJECT NUMBER: 10-5736

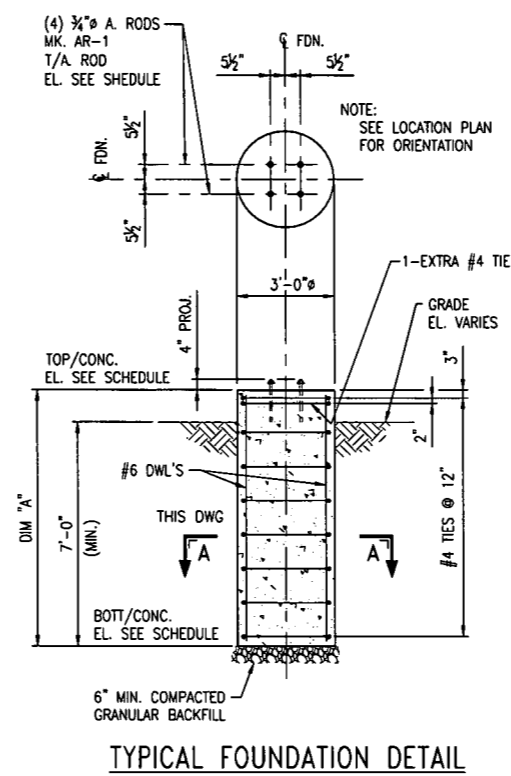
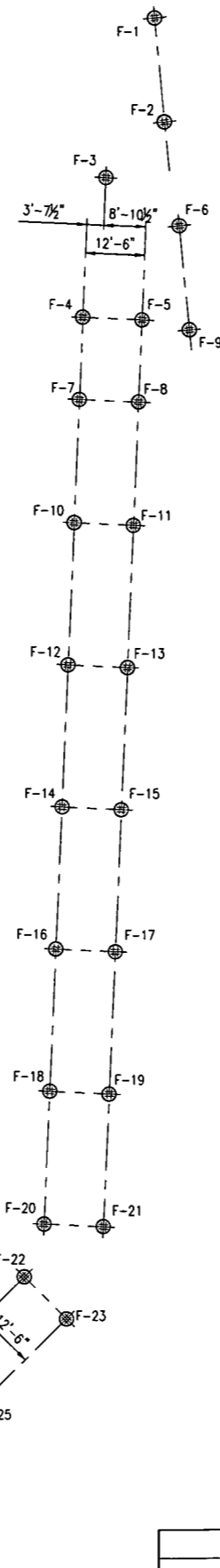
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	A	ISSUED FOR BID	1/27/17	PAC		PJP		

**MARKWEST**  
MarkWest Energy Partners, L.P.

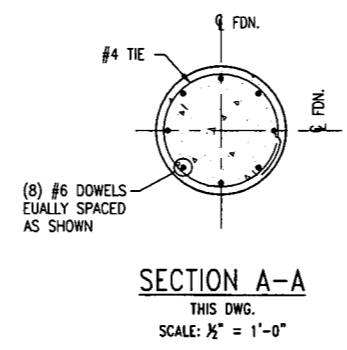
CIVIL/STRUCTURAL  
ANTERO INLET PIPELINE  
GENERAL NOTES

DODDRIDGE COUNTY SHERWOOD WEST VIRGINIA

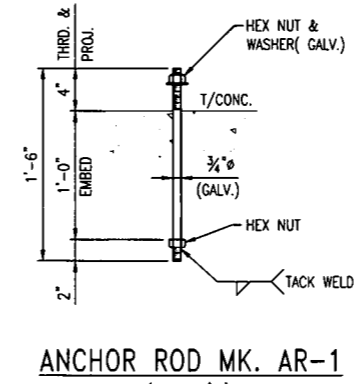
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DRAWING NO. SH-ST-7054	REV. A



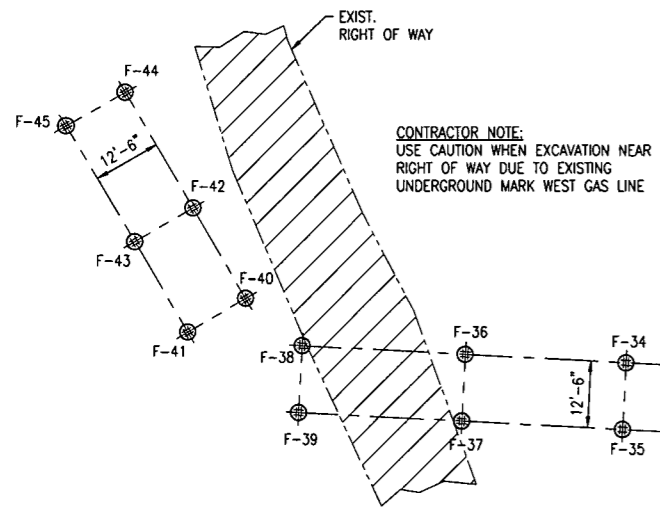
**TYPICAL FOUNDATION DETAIL**  
(45- REQ'D.)  
SCALE: 3/8" = 1'-0"



**SECTION A-A**  
THIS DWG.  
SCALE: 1/2" = 1'-0"



**ANCHOR ROD MK. AR-1**  
(180 REQ'D.)  
THIS DWG.  
SCALE: 1/2" = 1'-0"



**FOUNDATION LOCATION PLAN**  
SCALE: 1/16" = 1'-0"

FOUNDATION SCHEDULE						
FDN. MK.	NORTH COORDINATE	EAST COORDINATE	TOP/CONC. ELEVATION	BOTT/CONC. ELEVATION	TOP/A. ROD ELEVATION	DIM "A"
F-1	N. 284835.98	E. 1632022.73	EL. 859'-1 1/2"	EL. 852'-0"	EL. 859'-5 1/2"	7'-1 1/2"
F-2	N. 284814.07	E. 1632024.74	EL. 859'-1 1/2"	EL. 852'-0"	EL. 859'-5 1/2"	7'-1 1/2"
F-3	N. 284802.39	E. 1632012.35	EL. 859'-9 1/2"	EL. 849'-0"	EL. 860'-1 1/2"	10'-9 1/2"
F-4	N. 284773.03	E. 1632007.44	EL. 859'-9 1/2"	EL. 847'-0"	EL. 860'-1 1/2"	12'-9 1/2"
F-5	N. 284772.48	E. 1632019.93	EL. 859'-9 1/2"	EL. 852'-0"	EL. 860'-1 1/2"	7'-9 1/2"
F-6	N. 284792.25	E. 1632027.74	EL. 859'-1 1/2"	EL. 852'-0"	EL. 859'-5 1/2"	7'-1 1/2"
F-7	N. 284755.71	E. 1632006.69	EL. 859'-9 1/2"	EL. 847'-0"	EL. 860'-1 1/2"	12'-9 1/2"
F-8	N. 284755.17	E. 1632019.17	EL. 859'-9 1/2"	EL. 852'-0"	EL. 860'-1 1/2"	7'-9 1/2"
F-9	N. 284770.34	E. 1632029.75	EL. 859'-1 1/2"	EL. 852'-0"	EL. 859'-5 1/2"	7'-1 1/2"
F-10	N. 284729.74	E. 1632005.55	EL. 859'-9 1/2"	EL. 848'-0"	EL. 860'-1 1/2"	11'-9 1/2"
F-11	N. 284729.19	E. 1632018.04	EL. 859'-9 1/2"	EL. 852'-0"	EL. 860'-1 1/2"	7'-9 1/2"
F-12	N. 284699.76	E. 1632004.24	EL. 859'-0"	EL. 850'-0"	EL. 859'-4"	9'-0"
F-13	N. 284699.22	E. 1632016.73	EL. 861'-10"	EL. 853'-0"	EL. 862'-2"	8'-10"
F-14	N. 284669.80	E. 1632002.93	EL. 859'-0"	EL. 850'-0"	EL. 859'-4"	9'-0"
F-15	N. 284669.25	E. 1632015.42	EL. 861'-10"	EL. 853'-0"	EL. 862'-2"	8'-10"
F-16	N. 284639.82	E. 1632001.62	EL. 859'-0"	EL. 850'-0"	EL. 859'-4"	9'-0"
F-17	N. 284639.28	E. 1632014.11	EL. 861'-10"	EL. 854'-0"	EL. 862'-2"	7'-10"
F-18	N. 284609.85	E. 1632000.31	EL. 859'-0"	EL. 851'-0"	EL. 859'-4"	8'-0"
F-19	N. 284609.31	E. 1632012.80	EL. 861'-10"	EL. 854'-0"	EL. 862'-2"	7'-10"
F-20	N. 284581.88	E. 1631999.09	EL. 861'-10"	EL. 854'-0"	EL. 862'-2"	7'-10"
F-21	N. 284581.33	E. 1632011.57	EL. 861'-10"	EL. 854'-0"	EL. 862'-2"	7'-10"
F-22	N. 284570.78	E. 1631994.96	EL. 861'-10"	EL. 854'-0"	EL. 862'-2"	7'-10"
F-23	N. 284561.94	E. 1632003.80	EL. 861'-10"	EL. 854'-0"	EL. 862'-2"	7'-10"
F-24	N. 284550.94	E. 1631975.13	EL. 861'-10"	EL. 853'-0"	EL. 862'-2"	8'-10"
F-25	N. 284542.10	E. 1631983.97	EL. 861'-10"	EL. 853'-0"	EL. 862'-2"	8'-10"
F-26	N. 284530.84	E. 1631955.03	EL. 861'-10"	EL. 853'-0"	EL. 862'-2"	8'-10"
F-27	N. 284522.00	E. 1631963.80	EL. 861'-10"	EL. 853'-0"	EL. 862'-2"	8'-10"
F-28	N. 284527.42	E. 1631942.80	EL. 861'-10"	EL. 853'-0"	EL. 862'-2"	8'-10"
F-29	N. 284514.94	E. 1631942.15	EL. 861'-10"	EL. 853'-0"	EL. 862'-2"	8'-10"
F-30	N. 284528.38	E. 1631924.60	EL. 859'-1"	EL. 845'-0"	EL. 859'-5"	14'-1"
F-31	N. 284515.89	E. 1631923.95	EL. 859'-1"	EL. 843'-0"	EL. 859'-5"	16'-1"
F-32	N. 284529.89	E. 1631895.71	EL. 847'-10"	EL. 832'-0"	EL. 848'-2"	15'-10"
F-33	N. 284517.41	E. 1631895.06	EL. 847'-10"	EL. 832'-0"	EL. 848'-2"	15'-10"
F-34	N. 284531.20	E. 1631870.66	EL. 840'-0"	EL. 828'-0"	EL. 840'-4"	12'-0"
F-35	N. 284518.72	E. 1631870.00	EL. 840'-0"	EL. 828'-0"	EL. 840'-4"	12'-0"
F-36	N. 284532.77	E. 1631840.70	EL. 840'-0"	EL. 827'-0"	EL. 840'-4"	13'-0"
F-37	N. 284520.29	E. 1631840.05	EL. 840'-0"	EL. 827'-0"	EL. 840'-4"	13'-0"
F-38	N. 284534.37	E. 1631810.22	EL. 840'-0"	EL. 827'-0"	EL. 840'-4"	13'-0"
F-39	N. 284521.89	E. 1631809.57	EL. 840'-0"	EL. 829'-0"	EL. 840'-4"	11'-0"
F-40	N. 284543.21	E. 1631799.58	EL. 840'-0"	EL. 829'-0"	EL. 840'-4"	11'-0"
F-41	N. 284536.94	E. 1631788.77	EL. 846'-0"	EL. 834'-0"	EL. 846'-4"	12'-0"
F-42	N. 284560.11	E. 1631789.77	EL. 840'-0"	EL. 828'-0"	EL. 840'-4"	12'-0"
F-43	N. 284553.84	E. 1631778.95	EL. 846'-0"	EL. 834'-0"	EL. 846'-4"	12'-0"
F-44	N. 284581.73	E. 1631777.22	EL. 840'-0"	EL. 827'-0"	EL. 840'-4"	13'-0"
F-45	N. 284575.46	E. 1631766.41	EL. 840'-0"	EL. 829'-0"	EL. 840'-4"	11'-0"

RELEASED FOR BID  
BY: PAC DATE: 1/27/17

NOTES:  
1. FOR GENERAL NOTES SEE DWG. SH-ST-7054.  
2. FOR STRUCTURAL STEEL LOCATION PLAN SEE DWG SH-ST-7054B.



PROJECT NUMBER: 10-5736

NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	APP'D	ENG. APP'D	OPER. APP'D	SAFETY APP'D
A	ISSUED FOR BID	1/27/17	PAC	PIP				

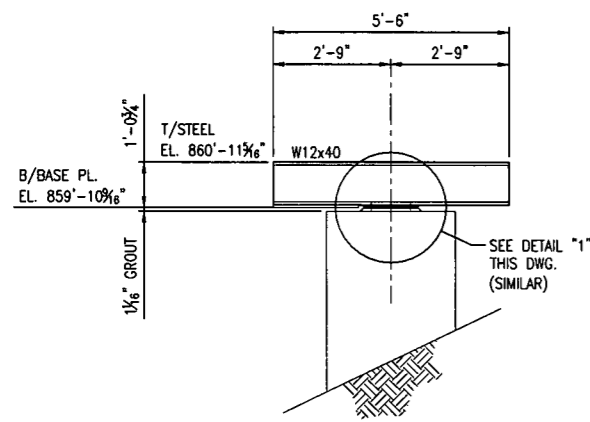


CIVIL/STRUCTURAL  
ANTERO INLET PIPELINE  
FOUNDATION-LOCATION PLAN, DETAILS & SCHEDULE  
OODORGE COUNTY SHERWOOD WEST VIRGINIA

A.F.E.	DATE
BRANN: PAC	1/3/17
CHEC: DATE	
ENG. APP: PJP	DATE
OPER. APP: DATE	
SAFETY APP: DATE	
SCALE: AS NOTED	CAD FILE: SH-ST-7054A.dwg
DRAWING NO. SH-ST-7054A	REV. A

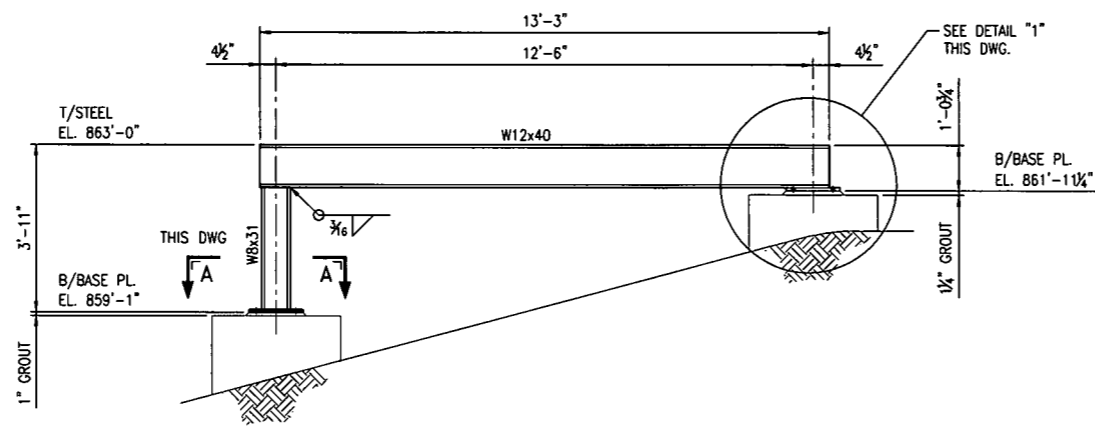
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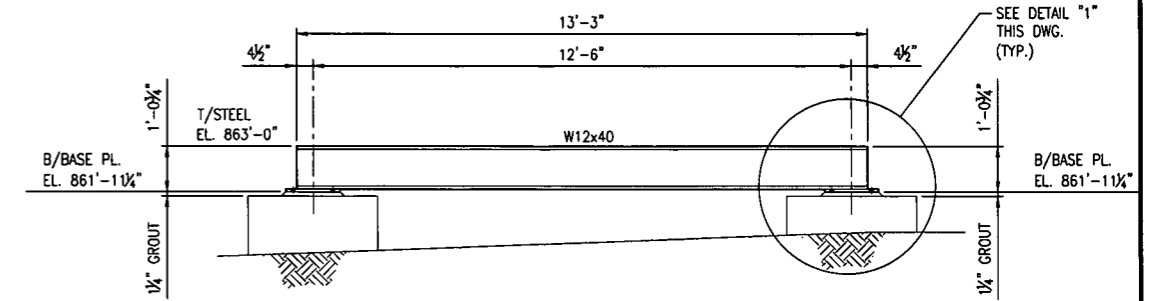
**PIPE SUPPORT DETAIL PS-1**

DWG. SH-ST-7054B  
(LOOKING NORTH)  
(ONE REQ'D.)  
SCALE: 1/2" = 1'-0"



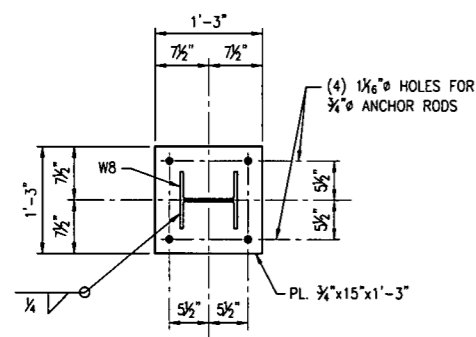
**PIPE SUPPORT DETAIL PS-2**

DWG. SH-ST-7054B  
(LOOKING NORTH)  
(4 REQ'D.)  
SCALE: 1/2" = 1'-0"



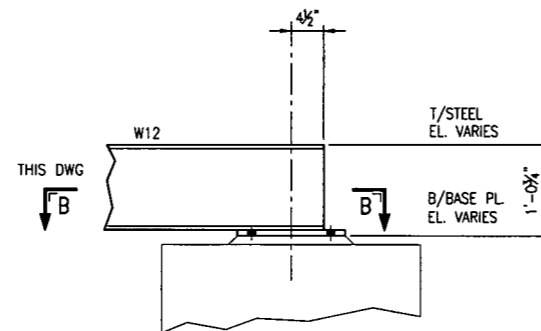
**PIPE SUPPORT DETAIL PS-3**

DWG. SH-ST-7054B  
(5 REQ'D.)  
SCALE: 1/2" = 1'-0"



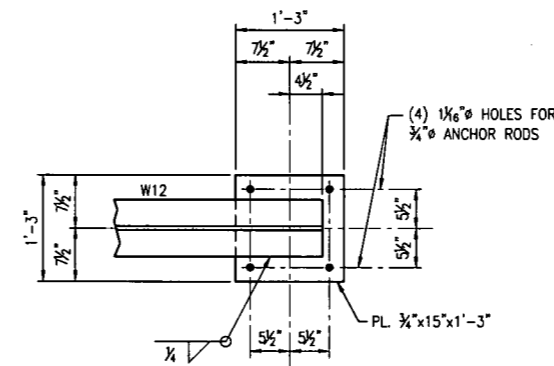
**SECTION A-A**

(DWG. SH-ST-7054BB & THIS DWG.)  
SCALE: 1" = 1'-0"



**DETAIL "1"**

(DWG. SH-ST-7054BB & THIS DWG.)  
SCALE: 1" = 1'-0"



**SECTION B-B**

(THIS DWG.)  
SCALE: 1" = 1'-0"

RELEASED FOR BID

BY: PAC

DATE: 1/27/17

**NOTES:**

- FOR GENERAL NOTES SEE DWG. SH-ST-7054.
- FOR FOUNDATION LOCATION PLAN & DETAILS SEE DWG SH-ST-7054A.
- WORK THIS DWG WITH DWG'S SH-ST-7054B & 7054BB.



PROJECT NUMBER: 10-5736

REFERENCE	NO.	REVISION-DESCRIPTION	DATE	DRAWN	CHK'D	ENG. APP'D	OPER. APP'D	SAFETY APP'D
	A	ISSUED FOR BID	1/27/17	PAC		PJP		

**MARKWEST**  
MarkWest Energy Partners, L.P.

CIVIL/STRUCTURAL  
ANTERO INLET PIPELINE  
STRUCTURAL-PIPE SUPPORT DETAILS & SECTIONS  
DOODRIDGE COUNTY SHERWOOD WEST VIRGINIA

DATE	1/11/17
DRAWN	PAC
CHECKED	PJP
OPER. APP'D	
SAFETY APP'D	
SCALE	AS NOTED
DRAWING NO.	SH-ST-7054BA
REV.	A

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