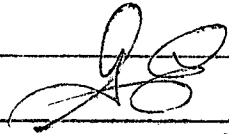


This Permit  
has BEEN Closed out

The project was PUT  
ON Hold Per the  
Company

A handwritten signature in black ink, appearing to be 'JG' or similar, written in a cursive style.

3/15/17

**SENDER: COMPLETE THIS SECTION**

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

1. Article Addressed to:

(15-354)  
Louise & Stokes Jr Hurst  
502 West Main St  
West Union, WV 26456

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature *Deborah L. Wyckoff*  Agent  Addressee  
 X Deborah L. Wyckoff

B. Received by (Printed Name) *Deborah L. Wyckoff* C. Date of Delivery *5/4/15*

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

3. Service Type  
 Certified Mail®  Priority Mail Express™  
 Registered  Return Receipt for Merchandise  
 Insured Mail  Collect on Delivery

4. Restricted Delivery? (Extra Fee)  Yes

2. Article Number (Transfer from service label) **7014 0150 0001 7356 8303**

PS Form 3811, July 2013 Domestic Return Receipt

**SENDER: COMPLETE THIS SECTION**

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

1. Article Addressed to:

(15-354)  
Roy K & Creolam Nicholson  
RT 1 Box 14  
New Milton, Wv 26411

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature *Creola M. Nicholson*  Agent  Addressee  
 X Creola M. Nicholson

B. Received by (Printed Name) *Creola Nicholson* C. Date of Delivery *5-2-15*

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

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

4. Restricted Delivery? (Extra Fee)  Yes

2. Article Number (Transfer from service label) **7014 0150 0001 7356 8679**

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

0150 0150 0001 7356 8303

**U.S. Postal Service™**  
**CERTIFIED MAIL™ RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

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

**OFFICIAL USE**

Postage	\$ .48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	
<b>Total</b>	<b>6.48</b>

Postmark *WEST UNION, WV APR 30 2015*  
 USPS 26456-9998

(15-354)  
Sammy L & Shirley Jane Hogue  
Star Route 83 Box 1  
Ellenboro, WV 26346

For Instructions

0150 0150 0001 7356 8679

**U.S. Postal Service™**  
**CERTIFIED MAIL™ RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

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

**OFFICIAL USE**

Postage	\$ .48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	
<b>Total</b>	<b>6.48</b>

Postmark *WEST UNION, WV APR 30 2015*  
 USPS 26456-9998

(15-354)  
Milton Dean Nicholson  
RT 1 Box 68  
New Milton, Wv 26411

Reverse for Instructions

7014 0150 0001 7356 8655

U.S. Postal Service  
**CERTIFIED MAIL RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

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

**OFFICIAL USE**

Postage	\$ .48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	
6.48	

(15-354)  
 Donovan L & Pamela S Nicholson  
 RT 1 Box 43C  
 New Milton, WV 26411

WEST UNION, WV  
 APR 30 2015  
 USPS 26456-9998

See reverse for instructions

7014 0150 0001 7356 8652

U.S. Postal Service  
**CERTIFIED MAIL RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

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

**OFFICIAL USE**

Postage	\$ .48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	
6.48	

(15-354)  
 Arthur F & Claudiah Dilger  
 RT 1 Box 67  
 New Milton, WV 26411

WEST UNION, WV  
 APR 30 2015  
 USPS 26456-9998

See reverse for instructions

7014 0150 0001 7356 8679

U.S. Postal Service  
**CERTIFIED MAIL RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

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

**OFFICIAL USE**

Postage	\$ .48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	
6.48	

(15-354)  
 Roy K & Creolam Nicholson  
 RT 1 Box 14  
 New Milton, WV 26411

WEST UNION, WV  
 APR 30 2015  
 USPS 26456-9998

See reverse for instructions

7014 0150 0001 7356 7818

U.S. Postal Service  
**CERTIFIED MAIL RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

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

**OFFICIAL USE**

Postage	\$ .48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	6.48
6.48	

(15-354)  
 Stokes A Hurst (et al)  
 Rt 1 Box 35  
 New Milton, WV 26411

WEST UNION, WV  
 APR 30 2015  
 Postmark Here  
 USPS 26456-9998

See Reverse for Instructions

7014 0150 0001 7356 7825

U.S. Postal Service  
**CERTIFIED MAIL RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

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

**OFFICIAL USE**

Postage	\$ .48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	6.48
6.48	

(15-354)  
 Michael D, Richard P, & Robert L Fluharty  
 7715 Dam 4 Rd  
 Williamsport, MD 21795

WEST UNION, WV  
 APR 30 2015  
 USPS 26456-9998

See reverse for instructions

7014 0150 0001 7356 8300

U.S. Postal Service  
**CERTIFIED MAIL RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

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

**OFFICIAL USE**

Postage	\$ .48
Certified Fee	3.30
Return Receipt Fee (Endorsement Required)	2.70
Restricted Delivery Fee (Endorsement Required)	
6.48	

(15-354)  
 Louise & Stokes Jr Hurst  
 502 West Main St  
 West Union, WV 26456

WEST UNION, WV  
 APR 30 2015  
 USPS 26456-9998

Reverse for Instructions

**SENDER: COMPLETE THIS SECTION**

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

1. Article Addressed to:

(15-354)

Michael D, Richard P, &amp; Robert L Fluharty

~~7715 Dam 4 Rd,~~~~Williamsport, MD 21795~~18044 Norman Dr  
Fairplay MD 21733

2. Article Number

(Transfer from service label)

7014 0150 0001 7356 7825

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature

 
 Agent Addressee

B. Received by (Printed Name)

C. Fluharty

C. Date of Delivery

D. Is delivery address different from item 1?  Yes  
If YES, enter delivery address below:  No18044 Norman Rd  
Fairplay MD 21733

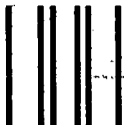
Service Type

 Certified Mail Express Mail Registered Return Receipt for Merchandise Insured Mail C.O.D.

4. Restricted Delivery? (Extra Fee)

 Yes

UNITED STATES POSTAL SERVICE



First-Class Mail  
Postage & Fees Paid  
USPS  
Permit No. G-10

NO 212

NOV 14 1995

PM 10 1

- Sender: Please print your name, address, and ZIP+4 in this box •



DoddridgeCounty FPM  
118 East Street STE 102  
West Union, WV 26456-1262

**SENDER: COMPLETE THIS SECTION**

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

1. Article Addressed to:

(15-354)

Milton Dean Nicholson

RT 1 Box 68

New Milton, Wv 26411

2. Article Number

*(Transfer from service label)*

7014 0150 0001 7356 8648

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature

X Milton D. Nicholson

 Agent Addressee

B. Received by (Printed Name)

MILTON D. Nicholson

C. Date of Delivery

5-2-15

D. Is delivery address different from item 1?  Yes

If YES, enter delivery address below:

 No

3. Service Type

 Certified Mail Express Mail Registered Return Receipt for Merchandise Insured Mail C.O.D.

4. Restricted Delivery? (Extra Fee)

 Yes

UNITED STATES POSTAL SERVICE

CHARLESTON  
WV 250

02 MAY '15

PM 2 1



First-Class Mail  
Postage & Fees Paid  
USPS  
Permit No. G-10

• Sender: Please print your name, address, and ZIP+4 in this box •



DoddridgeCounty FPM  
118 East Street STE 102  
West Union, WV 26456-1262

**SENDER: COMPLETE THIS SECTION**

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

1. Article Addressed to:

(15-354)  
 Arthur F & Claudiah Dilger  
 RT 1 Box 67  
 New Milton, WV 26411

2. Article Number

*(Transfer from service label)*

7014 0150 0001 7356 8662

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature

X

 Agent AddresseeB. Received by (*Printed Name*)

C. Date of Delivery

5-2-15

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

3. Service Type

 Certified Mail Express Mail Registered Return Receipt for Merchandise Insured Mail C.O.D.4. Restricted Delivery? (*Extra Fee*) Yes



UNITED STATES POSTAL SERVICE

CHARLESTON

WV 250

02 MAY '15



First-Class Mail  
Postage & Fees Paid  
USPS  
Permit No. G-10

PM 1 L

- Sender: Please print your name, address, and ZIP+4 in this box •



DoddridgeCounty FPM  
118 East Street STE 102  
West Union, WV 26456-1262

**SENDER: COMPLETE THIS SECTION**

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

1. Article Addressed to:

(15-354)  
 Sammy L & Shirley Jane Hogue  
 Star Route 83 Box 1  
 Ellenboro, WV 26346

2. Article Number

*(Transfer from service label)*

7014 0150 0001 7356 8310

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature

X *Sammy L Hogue*  Agent  
 Addressee

B. Received by (Printed Name)

*Sammy Hogue*

C. Date of Delivery

*5-2*

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

3. Service Type

- Certified Mail®  Priority Mail Express™  
 Registered  Return Receipt for Merchandise  
 Insured Mail  Collect on Delivery

4. Restricted Delivery? (Extra Fee)

 Yes

UNITED STATES POSTAL SERVICE

WV 250

02 MAY '15



First-Class Mail  
Postage & Fees Paid  
USPS  
Permit No. G-10

PM 2 L

- Sender: Please print your name, address, and ZIP+4® in this box•



Doddridge County FPM  
118 East Street STE 102  
West Union, WV 26456-1262

**SENDER: COMPLETE THIS SECTION**

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

1. Article Addressed to:

(15-354)  
 Stokes A Hurst (et al)  
 Rt 1 Box 35  
 New Milton, WV 26411

2. Article Number

(Transfer from service label)

7014 0150 0001 7356 7818

**COMPLETE THIS SECTION ON DELIVERY**A. Signature<sup>6</sup>

X *Blenn J. Wyczkoff*

 Agent Addressee

B. Received by (Printed Name)

Blenn J. Wyczkoff

C. Date of Delivery

5-2-15

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

3. Service Type

 Certified Mail Express Mail Registered Return Receipt for Merchandise Insured Mail C.O.D.

4. Restricted Delivery? (Extra Fee)

 Yes

UNITED STATES POSTAL SERVICE

COVINGTON  
MAY 25  
02 MAY '15  
PM 11



First-Class Mail  
Postage & Fees Paid  
USPS  
Permit No. G-10

• Sender: Please print your name, address, and ZIP+4 in this box •



DoddridgeCounty FPM  
118 East Street STE 102  
West Union, WV 26456-1262

**SENDER: COMPLETE THIS SECTION**

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

1. Article Addressed to:

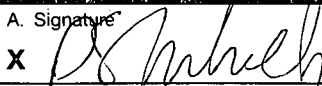
(15-354)  
 Donovan L & Pamela S Nicholson  
 RT 1 Box 43C  
 New Milton, WV 26411

2. Article Number

*(Transfer from service label)***COMPLETE THIS SECTION ON DELIVERY**

A. Signature

X

 Agent AddresseeB. Received by (*Printed Name*)

PAM NICHOLSON

C. Date of Delivery

5-2-13

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

3. Service Type

 Certified Mail Express Mail Registered Return Receipt for Merchandise Insured Mail C.O.D.4. Restricted Delivery? (*Extra Fee*) Yes

7014 0150 0001 7356 8655

UNITED STATES POSTAL SERVICE

WV 250

02 MAY '15

PN 21



First-Class Mail  
Postage & Fees Paid  
USPS  
Permit No. G-10

- Sender: Please print your name, address, and ZIP+4 in this box •



DoddridgeCounty FPM  
118 East Street STE 102  
West Union, WV 26456-1262



ANTERO RESOURCES CORPORATION  
1615 WYNKOOP STREET  
DENVER, COLORADO 80202

Vendor Name	Vendor No.	Date	Check Number	Check Total
DODDRIDGE COUNTY COMMISSION	43312	Apr-28-2015	89623	\$500.00

VOUCHER	VENDOR INV #	INV DATE	TOTAL AMOUNT	PRIOR PMTS & DISCOUNTS	NET AMOUNT
04-AP-17129	KAD4272015PR	04/27/15	500.00	0.00	500.00
PORTO RICO RD UPGRADE					
TOTAL INVOICES PAID					500.00

FILED

2015 MAY 21 PM 2:32

COUNTY CLERK  
DODDRIDGE COUNTY, WV

# 15-354

Porto Rico Road Upgrade  
(CR 54/1)

DETACH AND RETAIN FOR TAX PURPOSES

## Doddridge County, West Virginia

RECEIPT NO: 4948

DATE: 2015/06/18

FROM: ANTERO

AMOUNT: \$ 500.00

FIVE HUNDRED DOLLARS AND 00 CENTS

FOR: FLOOD PLAIN BLD PERMIT 15-354  
PORTO RICO RD UPGRADE CR 54/1

00000089623 FP-BUILDING PERMITS

020-318

TOTAL: \$500.00

MICHAEL HEADLEY

SHERIFF & TREASURER

PMS

CLERK



TRANSACTION REPORT

P. 01

MAY-01-2015 FRI 01:51 PM

FOR: DODDRIDGE CO. CLERK

304 873 1840

SEND

DATE	START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#	DP
MAY-01	01:51 PM	3048731600	26"	1	FAX TX	OK	544	
TOTAL :						26S	PAGES:	1

Legal Advertisement:

Doddridge County

Floodplain Permit Application

Please take notice that on the 22<sup>nd</sup> day of April, 2015

Antero Resources

filed an application for a Floodplain Permit to develop land located at or about:

New Milton District

39.205934N/80.703037W to 39.191090N/80.742314W

Permit #15-354 Porto Rico Road Upgrade (CR 54/1)

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 April 25, 2015, delivered to:

Clerk of the County Court

118 E. Court Street, West Union, WV 26456

Beth A Rogers, Doddridge County Clerk

Edwin L. "Bo" Wriston, Doddridge County Flood Plain Manager

May 12

Legal Advertisement:  
Doddridge County  
Floodplain Permit Application

Please take notice that on the 22<sup>nd</sup> day of April, 2015

**Antero Resources**

filed an application for a Floodplain Permit to develop land located at or about:

**New Milton District**

**39.205934N/80.703037W to 39.191090N/80.742314W**

**Permit #15-354 Porto Rico Road Upgrade (CR 54/1)**

*W. Diant & Cateel*

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 ~~April 25~~ <sup>May 12</sup>, 2015, delivered to:

Clerk of the County Court

118 E. Court Street, West Union, WV 26456

Beth A Rogers, Doddridge County Clerk

Edwin L. "Bo" Wriston, Doddridge County Flood Plain Manager

~~NEEDS CHECK FORWARDED.~~

~~NEEDS HARD COPY.~~

AWAITING ADDITIONAL

PERMITS.

Waiting ON ARMY CORP  
of ENGINEERS



**Antero Resources**  
535 White Oaks Blvd.  
Bridgeport, WV 26330  
Office 304.842.4100  
Fax 304.842.4102

April 22, 2015

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

Mr. Wriston:

Antero Resources Corporation (Antero) would like to submit a Doddridge County Floodplain permit application for our Porto Rico Road Upgrade (CR 54/1). Our project is located in Doddridge County, New Milton District where the road upgrade will be begin at coordinates 39.205934 N, 80.703037 W and will continue to the Helen Hines Pad at coordinates 39.191090 N, 80.742314 W. Per the FIRM Map #54017C0230C, this location is in the floodplain.

Attached you will find the following:

- Doddridge County Floodplain Permit Application
- Surface Owner Information
- Design Plans
- HEC-RAS study
- FIRM Map
- WV Flood Tool Map

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

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Rachel Grzybek".

Rachel Grzybek  
Floodplain Engineer  
Antero Resources Corporation

Enclosures

## DODDRIDGE COUNTY FLOODPLAIN DEVELOPMENT PERMIT APPLICATION

### 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 \_\_\_\_\_



DATE 4/22/15

### SECTION 2: PROPOSE DEVELOPMENT (TO BE COMPLETED BY APPLICANT).

**IF THE APPLICANT IS NOT A NATURAL PERSON, THE NAME, ADDRESS, AND TELEPHONE NUMBER OF A NATURAL PERSON WHO SHALL BE APPOINTED BY THE APPLICANT TO RECEIVE NOTICE PURSUANT TO ANY PROVISION OF THE CURRENT DODDRIDGE COUNTY FLOODPLAIN ORDINANCE.**

APPLICANT'S NAME: Randy Klobberdanz

ADDRESS: 1615 Wynkoop Street, Denver, CO 80202

TELEPHONE NUMBER: (303) 357-7310

**BUILDER'S NAME:** Antero Resources Corporation  
**ADDRESS:** 1615 Wynkoop Strett, Denver, CO 80202  
**TELEPHONE NUMBER:** (303)-357-7310

**ENGINEER'S NAME:** Jackson Surveying Inc.  
**ADDRESS:** 677 W. Main St, Clarksburg, WV 26301  
**TELEPHONE NUMBER:** (304) 623-5851

**PROJECT LOCATION:**

**NAME OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT)** Please see Surface Owner Table  
**ADDRESS OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT)** Please see Surface Owner Table  
**DISTRICT:** \_\_\_\_\_  
**DATE/FROM WHOM PROPERTY**  
**PURCHASED:** \_\_\_\_\_  
**LAND BOOK DESCRIPTION:** Please see Surface Owner Table  
**DEED BOOK REFERENCE:** Please see Surface Owner Table  
**TAX MAP REFERENCE:** Please see Surface Owner Table  
**EXISTING BUILDINGS/USES OF PROPERTY:** None  
**NAME OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT**  
**PROPERTY** Please see Surface Owner Table  
**ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE**  
**SUBJECT PROPERTY** \_\_\_\_\_

To avoid delay in processing the application, please provide enough information to easily identify the project location.

**DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)**  
**A. STRUCTURAL DEVELOPMENT**

**ACTIVITY**

**STRUCTURAL TYPE**

- |                                     |                         |                          |                                  |
|-------------------------------------|-------------------------|--------------------------|----------------------------------|
| <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:**

- |                          |      |                          |        |                          |          |                          |            |
|--------------------------|------|--------------------------|--------|--------------------------|----------|--------------------------|------------|
| <input type="checkbox"/> | Fill | <input type="checkbox"/> | Mining | <input type="checkbox"/> | Drilling | <input type="checkbox"/> | Pipelining |
|--------------------------|------|--------------------------|--------|--------------------------|----------|--------------------------|------------|
- Grading
- Excavation (except for STRUCTURAL DEVELOPMENT checked above)
- Watercourse Altercation (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)
- 

**C. STANDARD SITE PLAN OR SKETCH**

- 1. SUBMIT ALL STANDARD SITE PLANS, IF ANY HAVE BEEN PREPARED.**
- 2. IF STANDARD SITE PLANS HAVE NOT BEEN PREPARED:**  
SKETCH ON A SEPARATE 8 ½ X 11 INCH SHEET OF PAPER THE SHAPE AND LOCATION OF THE LOT. SHOW THE LOCATION OF THE INTENDED CONSTRUCTION OR LAND USE INDICATING BUILDING SETBACKS, SIZE & HEIGHT. IDENTIFY EXISTING BUILDINGS, STRUCTURES OR LAND USES ON THE PROPERTY.
- 3. SIGN AND DATE THE SKETCH.**

**ACTUAL TOTAL CONSTRUCTION COSTS OF THE COMPLETE DEVELOPMENT IRRESPECTIVE OF WHETHER ALL OR ANY PART OF THE SUBJECT PROPOSED CONSTRUCTION PROJECT IS WITHIN THE FLOODPLAIN \$ 51,226**

**D. ADJACENT AND/OR AFFECTED LANDOWNERS:**

**1. NAME AND ADDRESS OF ALL OWNERS OF SURFACE TRACTS ADJACENT TO THE AREA OF THE SURFACE TRACT (UP & DOWN STREAM) UPON WHICH THE PROPOSED ACTIVITY WILL OCCUR AND ALL OTHER SURFACE OWNERS UP & DOWN STREAM) WHO OWN PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY (IF ONE HAS BEEN COMPLETED).**

**NAME:** Please see attached landowner \_\_\_\_\_

**ADDRESS:** information \_\_\_\_\_  
 \_\_\_\_\_

**NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_  
 \_\_\_\_\_

**NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_  
 \_\_\_\_\_

**NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_  
 \_\_\_\_\_

**1. NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON ANY ADJACENT PROPERTY AT THE TIME THE FLOODPLAIN PERMIT APPLICATION IS FILED AND THE NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN ANY HOME ON ANY PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY.**

**NAME:** Please see attached landowner \_\_\_\_\_

**ADDRESS:** information \_\_\_\_\_  
 \_\_\_\_\_

**NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_  
 \_\_\_\_\_

**NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_  
 \_\_\_\_\_

**NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_  
 \_\_\_\_\_

**E. CONFIRMATION FORM**

**THE APPLICANT ACKNOWLEDGES, AGREES, AND CONFIRMS THAT HE/IT WILL PAY WITHIN 30 DAYS OF RECEIPT OF INVOICE BY THE COUNTY FOR ALL EXPENSES RELATIVE TO THE PERMIT APPLICATION PROCESS GREATER THAN THE REQUIRED DEPOSIT FOR EXPENSES INCLUDING:**

- (A) PERSONAL SERVICE OF PROCESS BY THE DODDRIDGE COUNTY SHERIFF AT THE RATES PERMITTED BY LAW FOR SUCH SERVICE.
- (B) SERVICE BY CERTIFIED MAIL RETURN RECEIPT REQUESTED.
- (C) PUBLICATION.

**Property Owner Table-Doddridge County Floodplain Permit  
Antero Resources Corporation-Porto Rico Road Upgrade**

<b>Property Owner Name</b>	<b>Mailing Address</b>	<b>Parcel ID</b>	<b>Deed Book Reference</b>
<b>Host Properties-Inside Floodplain</b>			
Fluharty Michael D, Richard P & Robert L	7715 Dam 4 Rd, Williamsport, MD 21795	6-11-8	Book 256, Page 678
Hurst Stokes A Et Al	Rt 1 Box 35, New Milton, WV 26411	6-11-10	Book SF9, Page 172
Hogue Sammy L & Shirley Jane	Star Route 83 Box 1, Ellenboro, WV 26346	6-12-9	Book 0186, Page 0546
Hurst Stokes Jr & Louise	502 West Main St, West Union, WV 26456	6-12-12	Book 0131, Page 0297
Hurst Stokes Jr	502 West Main St, West Union, WV 26456	6-12-12.2	Book AP26, Page 429
Nicholson Roy K & Creolam	Rt 1 Box 14, New Milton, WV 26411	6-12-13	Book 0187, Page 0572
<b>Properties Abutting Host Properties-Inside Floodplain</b>			
Dilger Arthur F & Claudiaiah	Rt 1 Box 67, New Milton, WV 26411	6-12-12.1	Book 232, Page 167
Nicholson Roy K & Creolam	Rt 1 Box 14, New Milton, WV 26411	6-12-14	Book 0187, Page 0572
Nicholson Donovan L & Pamela S	Rt 1 Box 43 C, New Milton, WV 26411	6-12-14.1	Book 224, Page 212
Nicholson Roy K	Rt 1 Box 14, New Milton, WV 26411	6-12-29	Book 229, Page 379
Nicholson Milton Dean	Rt 1 Box 68, New Milton, WV 26411	6-12-30	Book 229, Page 382
Hurst Stokes Jr	502 W Main St, West Union, WV 26456	6-12-41	Book AP26, Page 429



- (D) COURT REPORTING SERVICES AT ANY HEARINGS REQUESTED BY THE APPLICANT.
- (E) CONSULTANTS AND/OR HEARING EXPERTS UTILIZED BY DODDRIDGE COUNTY FLOODPLAIN ADMINISTRATOR/MANAGER OR FLOODPLAIN APPEALS BOARD FOR REVIEW OF MATERIALS AND/OR TESTIMONY REGARDING THE EFFICACY OF GRANTING OR DENYING THE APPLICANT'S FLOODPLAIN PERMIT.

NAME (PRINT): Randy Kloberdanz

SIGNATURE:  DATE: 4/22/15

After completing SECTION 2, APPLICANT should submit form to Floodplain Administrator/Manager or his/her representative for review.

**SECTION 3: FLOODPLAIN DETERMINATION (to be completed by Floodplain Administrator/Manager or his/her representative)**

**THE PROPOSED DEVELOPMENT:**

THE PROPOSED DEVELOPMENT IS LOCATED ON:

FIRM Panel: \_\_\_\_\_

Dated: \_\_\_\_\_

Is **NOT** located in a Specific Flood Hazard Area (Notify applicant that the application review is complete and **NO FLOODPLAIN DEVELOPMENT PERMIT IS REQUIRED**).

Is located in Special Flood Hazard Area.  
 FIRM zone designation \_\_\_\_\_  
 100-Year flood elevation is: \_\_\_\_\_ NGVD (MSL)

Unavailable

The proposed development is located in a floodway.  
 FBFM Panel No. \_\_\_\_\_ Dated \_\_\_\_\_

See section 4 for additional instructions.

SIGNED \_\_\_\_\_

DATE \_\_\_\_\_

**SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by Floodplain Administrator/Manager or his/her representative)**

The applicant must submit the documents checked below before the application can be processed.

- A plan showing the location of all existing structures, water bodies, adjacent roads, lot dimensions and proposed development.
  
- Development plans, drawn to scale, and specifications, including where applicable: details for anchoring structures, storage tanks, proposed elevation of lowest floor, (including basement or crawl space), types of water resistant materials used below the first floor, details of flood proffing of utilities located below the first floor and details of enclosures below the first floor. Also \_\_\_\_\_  
\_\_\_\_\_
  
- Subdivision or other development plans (If the subdivision or development exceeds 50 lots or 5 acres, whichever is the lesser, the applicant must provide 100-year flood elevations if they are not otherwise available).
  
- Plans showing the extent of watercourse relocation and/or landform alterations.
  
- Top of new fill elevation \_\_\_\_\_ Ft. NGVD (MSL).  
For floodproofing structures applicant must attach certification from registered engineer or architect.
  
- Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood. A copy of all data and calculations supporting this finding must also be submitted.
  
- Manufactured homes located in a floodplain area must have a West Virginia Contractor's License and a Manufactured Home Installation License as required by the Federal Emergency Management Agency (FEMA).

Other:

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**SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Administrator/Manager or his/her representative)**

I have determined that the proposed activity (**type is or is not**) in conformance with provisions of the Floodplain Ordinance adopted by the County Commission of Doddridge County on May 21, 2013. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_

If the Floodplain Administrator/Manager found that the above was not in conformance with the provisions of the Doddridge County Floodplain Ordinance and/or denied that application, the applicant may complete an appealing process below.

APPEALS:   Appealed to the County Commission of Doddridge County?  Yes  No  
Hearing Date: \_\_\_\_\_  
County Commission Decision - Approved    Yes    No

CONDITIONS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION 6: AS-BUILT ELEVATIONS (To be submitted by APPLICANT before Certificate of Compliance is issued).**

The following information must be provided for project structures. This section must be completed by a registered professional engineer or a licensed land surveyor (or attach a certification to this application).

COMPLETE 1 OR 2 BELOW:

- 1 Actual (As-Built) Elevation of the top of the lowest floor (including basement or crawl space is \_\_\_\_\_ FT. NGVD (MSL)
- 2 Actual (As Built) elevation of floodproofing is \_\_\_\_\_ FT. NGVD (MSL)

**Note: Any work performed prior to submittal of the above information is at risk of the applicant.**

**SECTION 7: COMPLIANCE ACTION (To be completed by the Floodplain Administrator/Manager or his/her representative).**

The Floodplain Administrator/Manager or his/her representative will complete this section as applicable based on inspection of the project to ensure compliance with the Doddridge County Floodplain Ordinance.

**INSPECTIONS:**

DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
DEFICIENCIES ?      Y/N

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION 8: CERTIFICATE OF COMPLIANCE (To be completed by Floodplain Administrator/Manager or his/her representative).**

Certificate of Compliance issued: DATE: \_\_\_\_\_ BY: \_\_\_\_\_

**CERTIFICATE OF COMPLIANCE  
FOR DEVELOPMENT IN SPECIAL FLOOD HAZARD AREA  
(OWNER MUST RETAIN)**

**PERMIT NUMBER:** \_\_\_\_\_

**PERMIT DATE:** \_\_\_\_\_

**PURPOSE –**

**CONSTRUCTION LOCATION:** \_\_\_\_\_

**OWNER'S ADDRESS:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**THE FOLLOWING MUST BE COMPLETED BY THE FLOODPLAIN  
ADMINISTRATOR/MANAGER OR HIS/HER AGENT.**

**COMPLIANCE IS HEREBY CERTIFIED WITH THE REQUIREMENT OF THE  
FLOODPLAIN ORDINANCE ADOPTED BY THE COUNTY COMMISSION OF  
DODDRIDGE COUNTY ON MAY 21, 2013.**

**SIGNED** \_\_\_\_\_ **DATE** \_\_\_\_\_

West Virginia  
 Department of Transportation  
 Division of Highways  
 Upgrade For WV. Sec. Rte. 13, 54, and 54  
 (New Milton District, Doddridge County)

**ANTERO RESOURCES - HINES PAD**

March 31, 2015

Project Length: STA. 0+00 to STA. 148+90 (2.82 Miles)

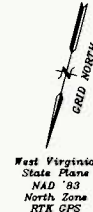
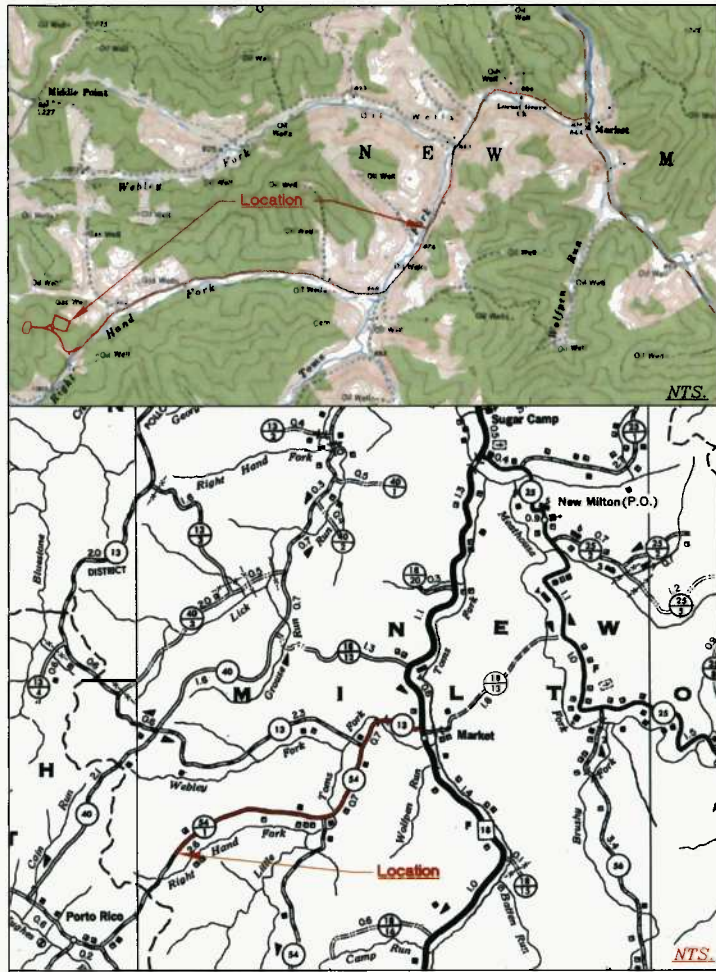
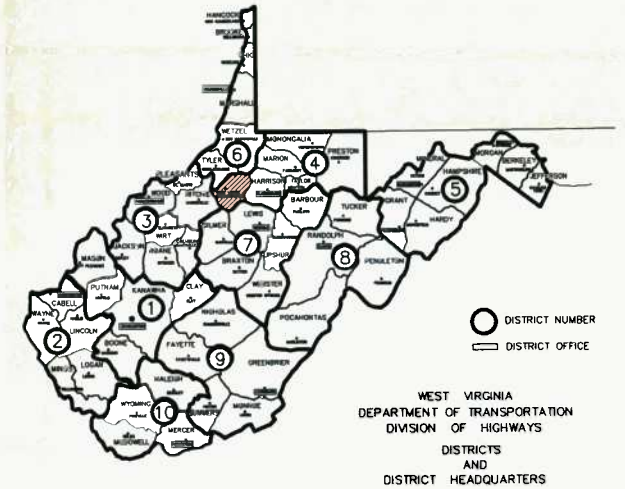
STA. 0+00 to 38+15 Subgrade Failure Repair, 1½" Asphalt Wearing Course, Crusher Run Shoulders (As Needed)

STA. 38+15 to 69+50 6" Crusher Run, 3" Asphalt Base Course, 1½" Asphalt Wearing Course, Crusher Run Shoulders

STA. 69+50 to 148+90 Full Depth Reclamation, 3" Asphalt Base Course, 1½" Asphalt Wearing Course, Crusher Run Shoulder

**NOTE:** Upgrade will consist of culvert extension/replacement, new box culverts, bank excavation, road widening, shoulder stabilization and road surface improvement.

**ENGINEERING NOTES:**  
 It is always the goal of Antero Resources to upgrade the state highways to allow construction and drilling equipment to safely enter and exit the work site while providing access to residences with a limited amount of disruption to their schedules. Safety is always the governing consideration when making construction upgrade decisions. When designing upgrades of this nature, it is difficult to anticipate all of the work which may be required to meet this goal. Each section of the roadway is examined daily by the project engineer. The contractor, a representative from Antero Resources and the DDM inspector assigned to the project together, this construction management team assesses the roadway condition and makes decisions for the best way to proceed with the upgrade. Generally, the upgrade will be to improve drainage and increase the road surface width. Drainage will be maintained on whichever side of the road it is presently located. Ditches will be cleaned, graded and maintained at their present location and capacity. Occasionally a ditch will be moved somewhat to accommodate the required road width. Any stone placed in a ditch will be temporary and will be removed upon completion. If the construction team determines that full depth reclamation (FDR) is required, then that section will be scarified to a depth of 12" and cement applied at a rate determined by the geo-technical engineer. Erosion and sediment control will be maintained through the use of check dams, silt socks and concurrent seeding and mulching. Traffic control will be used during working hours and appropriate signage used throughout the project area. Dust control will be used as needed.



Revision:  
 Added Note for Step Block Wall 5-20-15  
 Added Asphalt Changed Box Culvert 5-29-15

All Property Boundaries are based on current deeds and field evidence collected with Sub-Meter GPS

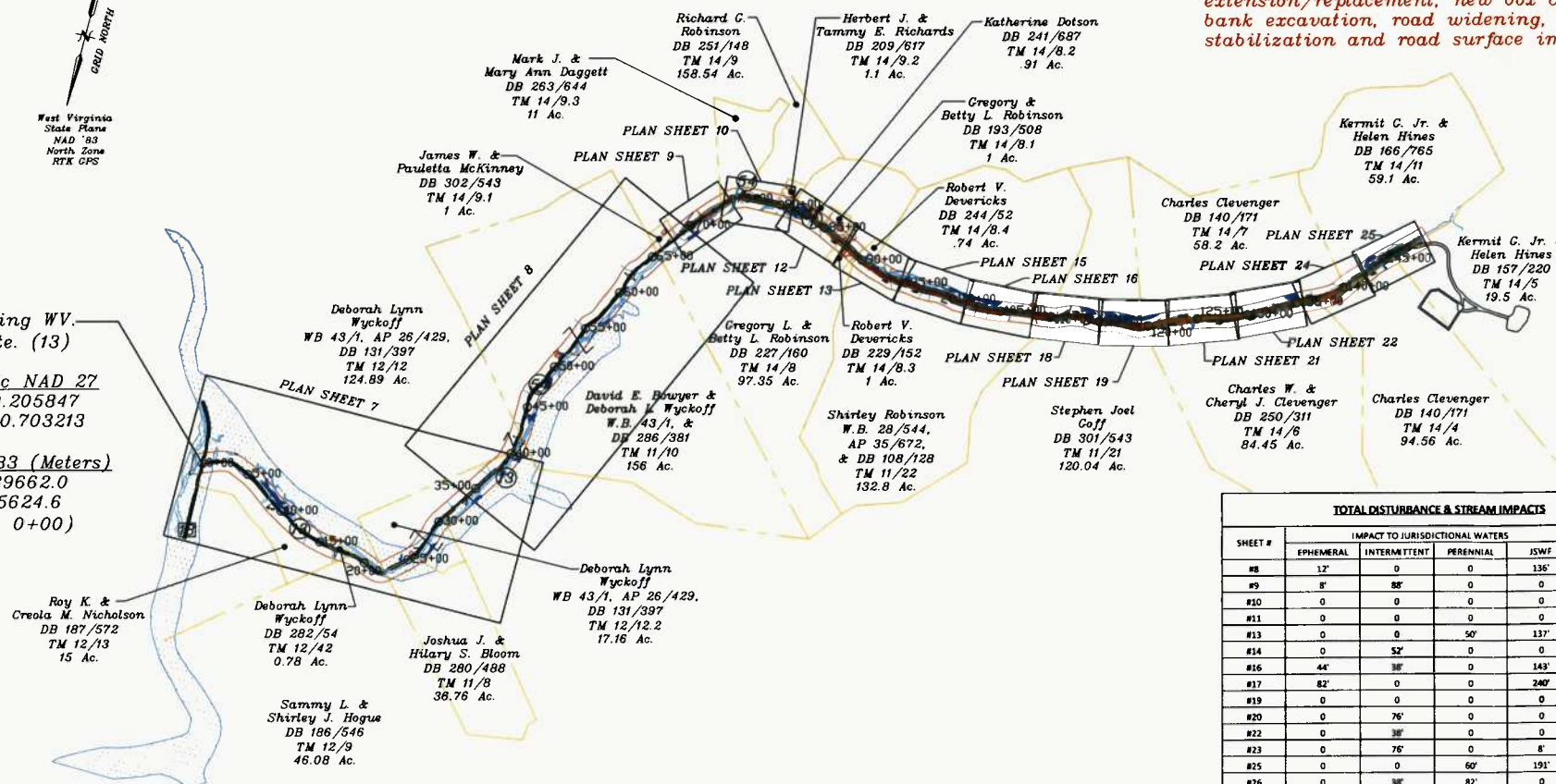
NOTE: Stream & Wetland information from report prepared by GAI, dated 04-07-2015 except as noted and may not match field locations.

FLOOD PLAIN INFORMATION FROM FEMA MAP PANEL #64017C0230C, Dated 10-4-2011

FLOOD PLAIN AREA

AREA of INTEREST

Beginning WV. Sec. Rte. (13)  
 Geographic NAD 27  
 Lat.: 39.205847  
 Long.: 80.703213  
 UTM NAD 83 (Meters)  
 N: 4339662.0  
 E: 525624.6  
 (@ Sta. 0+00)



Sheet	Description
1	Cover
2	Notes & Details
3	Details
4	Details
5	Details
6	Details
7	Details
8	Plan
9	Plan
10	Plan
11	Plan
12	Cross Sections
13	Plan
14	Plan
15	Cross Sections
16	Plan
17	Plan
18	Cross Sections
19	Plan
20	Plan
21	Cross Sections
22	Plan
23	Plan
24	Cross Sections
25	Plan
26	Plan
27	Cross Sections

SHEET #	IMPACT TO JURISDICTIONAL WATERS				DISTURBANCE
	EPHEMERAL	INTERMITTENT	PERENNIAL	JSWT	
#8	12'	0'	0'	136'	0.16 Ac.
#9	8'	0'	0'	0'	0.03 Ac.
#10	0'	0'	0'	0'	0.25 Ac.
#11	0'	0'	0'	0'	0.49 Ac.
#13	0'	0'	50'	137'	0.41 Ac.
#14	0'	52'	0'	0'	0.53 Ac.
#16	44'	38'	0'	143'	0.68 Ac.
#17	82'	0'	0'	240'	0.54 Ac.
#19	0'	0'	0'	0'	0.53 Ac.
#20	0'	76'	0'	0'	0.50 Ac.
#22	0'	38'	0'	0'	0.48 Ac.
#23	0'	76'	0'	8'	0.37 Ac.
#25	0'	0'	60'	191'	0.41 Ac.
#26	0'	38'	82'	0'	0.52 Ac.
TOTALS:	146'	406'	192'	855'	5.90 Ac.

TOTAL TREE REMOVAL\* (INCLUDES INDIVIDUAL) 0.73 Ac.



**WEST VIRGINIA 811**  
 CALL BEFORE YOU DIG!  
 Dial 811 or 800.245.4848  
 www.WV811.com

DENNIS L. FISHER  
 REGISTERED  
 No. 8884  
 STATE OF WEST VIRGINIA  
 PROFESSIONAL ENGINEER

Dennis L. Fisher RPE 8884  
 Date: 05-28-2015

DLF.  
 Dennis L. Fisher, RPE  
 PO Box 281  
 Philippi, WV 26416  
 Cell: 304-677-4129  
 E-Mail: Fisher.Engineering@gmx.com



Jackson Surveying Inc.  
 Cover  
 Road Upgrade  
 Sheet 1 of 27  
 Doddridge Co., WV Sec. Routes 13, 54, & 54

**General Construction Notes:**

1. Best Management Practices shall be utilized for erosion and sediment control. The most effective method is concurrent seeding and mulching. Compost Filter Sock shall be installed in areas down slope of construction where adequate brush filter strips cannot be maintained. Rock check dams or sumps shall be installed at culvert inlets unless otherwise dictated upon the plans.

2. The contractor shall contact West Virginia 811 prior to any disturbance.

3. The attached drawings show existing and proposed grades and dimensions on which the estimated quantities are based. These grades and dimensions may need to be adjusted during construction to meet field conditions. If any adjustment is needed beyond a reasonable conformance with the drawings, the contractor shall contact the engineer.

4. Clearing and grubbing shall be in conformance with Section 201 of the current WVDOH Specifications. All other earthwork shall be in conformance with Section 207 of the current WVDOH Specifications. All brush and non marketable timber shall be chipped or burned.

5. Stockpile topsoil and protect for use in regrading the disturbed areas prior to seeding and mulching.

6. If subgrade is unsuitable, the exposed surface shall be compacted until a relatively unyielding surface is achieved.

7. Surface water and subsurface water shall be prevented from flowing into the disturbed areas during construction

8. Fill shall be placed in uniform twelve (8) inch lifts and compacted with appropriate equipment to a proctor density of 95%.

9. Any imported fill shall be approved by engineer prior to placement.

10. Prevent surfaced water and subsurface water from flowing into excavations and flooding the work. Remove water from excavations to prevent softening of foundation soils and creating soil changes detrimental to the stability of subgrades. Provide and maintain pumps, sumps, sustain and discharge lines and other dewatering system components necessary to convey water away from the site. Convey water removed from excavations to collections or to runoff areas. During periods of inclement weather, temporary slope drains may be utilized as necessary.

11. In areas to receive fill and at the final cut subgrade, proof roll and compact the exposed ground surface following clearing and grubbing and any required excavation with a minimum of four passes of an approved compactor and obtain at least the density required for a suitable impoundment pit foundation and as indicated below. Proof rolling shall be under the observation of the Engineer as described herein. Immediately following the completion of excavation to proposed subgrades in cut areas, proof rolling shall be performed as specified. Any areas which deflect, rut or pump under the loaded dump truck shall be undercut and replaced with compacted fill material or stone base course as directed by the Engineer. Proof rolling methods shall be as follow:

a. After the subgrade has been completed the subgrade shall then be proof rolled. The coverage areas and methods will be identified by the Engineer;

b. The equipment shall be operated at a speed that the Engineer can comfortably and slowly walk along side the equipment.;

c. If it becomes necessary to take corrective action, such as but not limited to underdrain installation, undercut, and backfill of an unsuitable material, and aeration of excessive wet material in areas that have been proof rolled. These areas shall be proof rolled again following the the completion of the necessary corrections.

12. Photographic documentation shall include DAILY photos of before, during and after conditions of all constructions activities.

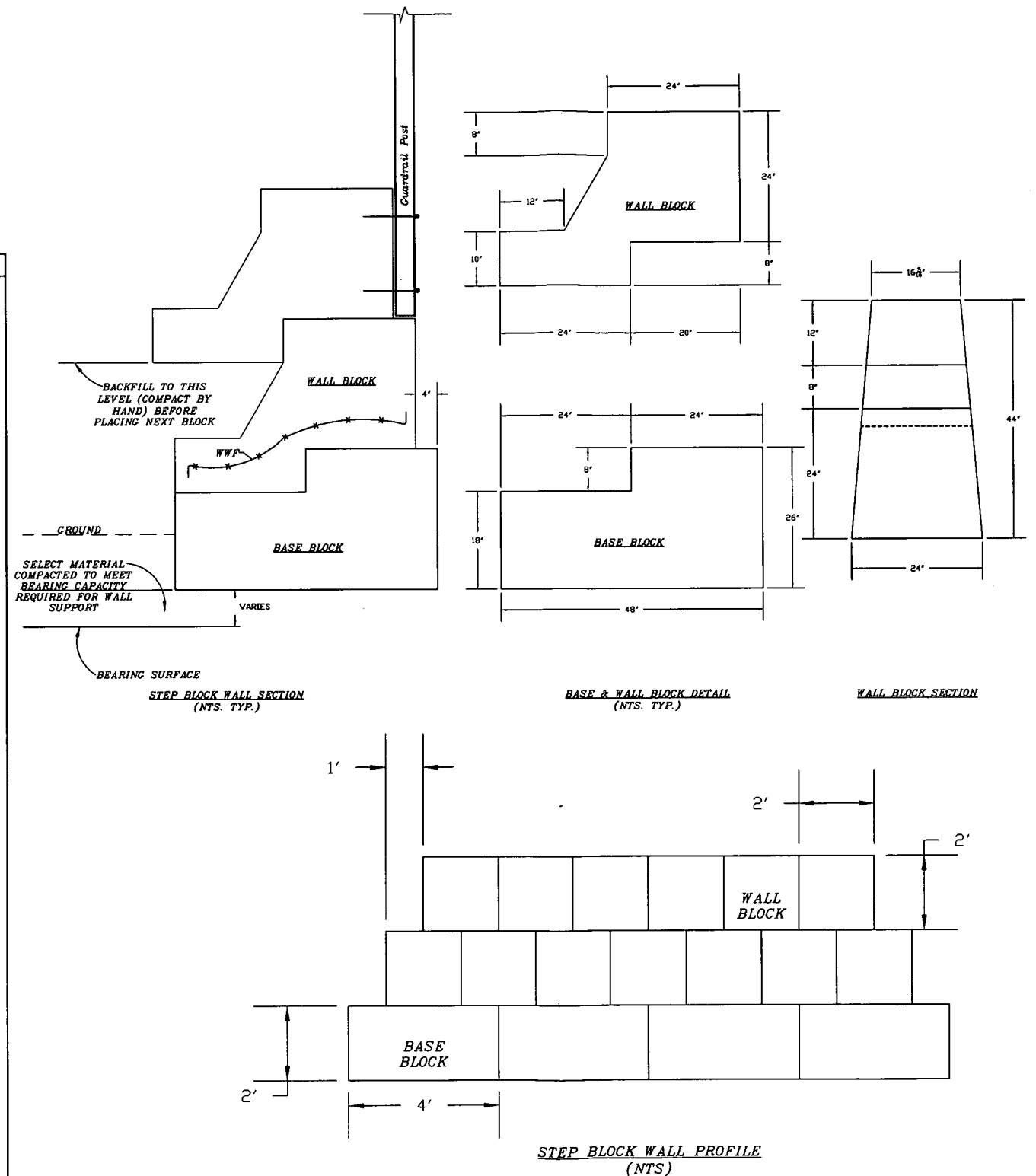
13. Existing and proposed culverts shall have adequate cover of 1/2 diameter (12" minimum). Adequate cover shall consist of select fill or asphalt overlay. If adequate cover is not possible, contractor shall protect culvert with timber mats or steel plates.

14. All new culverts shall be installed such that the entrance and exit are below stream level, 4" for HDPE culverts and 6" for box culverts.

15. There is no average daily traffic information for this road. The AOT is estimated to be between 20-30 vehicles/day exclusive of proposed gas utility traffic during drilling operations.

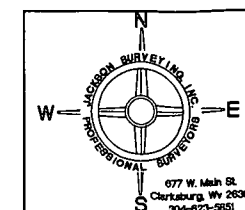
NOTE: ALL WORK (PERFORMED WITHIN THE EXISTING DOH RIGHT OF WAY OR WITHIN THE PROPOSED DOH RIGHT OF WAY) AS SHOWN ON THESE DRAWINGS SHALL CONFORM TO THE WV DOH STANDARD SPECIFICATION FOR ROADS AND BRIDGES AND ANY UPDATED SUPPLEMENTAL SPECIFICATIONS PER TABLE BELOW:

WV DOH Section	Description
201	Clearing & Grubbing
207	Excavation & Embankment
211	Borrow Excavation
212	Structure, Rock, & Wet Excavation
217	Special Rock Fill
218	Slope & Foundation Protection
228	Subgrade Preparation
229	Shoulders & Ditches
240	Cleaning Culverts, Inlets & Manholes
307	Crushed Aggregate Base Course
311	Open Graded Free Draining Base Course
401	Hot-Mix Asphalt Base, Wearing, & Patching & Leveling Courses
402	Hot-Mix Asphalt Skid Resistant Pavement
405	Surface Treatments
408	Tack Coat
412	Winter Grade Asphalt Patching Mixture
415	Removing Existing Pavement Surface
501	Portland Cement Concrete Pavement
502	Approach Slabs
503	Sealing Joints & Cracks In Concrete Pavement
504	Bituminous Underseal For Concrete Pavement
506	Concrete Pavement Repair
507	Crack & Pothole Repair
508	Diamond Grinding
509	Re-Sawing & Sealing Longitudinal Concrete Pavement Joints
510	Re-Sealing Transverse Concrete Pavement Joints
512	Concrete Slab Stabilization
601	Structural Concrete
602	Reinforced Steel
603	Prestressed Concrete Members
604	Pipe Culverts
606	Underdrains
607	Guardrail
623	Pneumatically Applied Mortar
624	Preformed Elastomeric Joint Sealer
626	Retaining Wall Systems
633	Concrete Cutter, Invert Pipe Cutter, or Dumped Rock Cutter
634	Concrete Cribbing
636	Maintaining Traffic
642	Temporary Pollution Control
645	Reinforcing Slopes
651	Furnishing & Placing Topsoil
652	Seeding & Mulching
655	Matting for Erosion Control
663	Pavement Markings
701	Hydraulic Cement
702	Fine Aggregate
703	Course Aggregate
704	Stone & Crushed Aggregate
705	Asphalt Materials
707	Concrete Admixtures, Curing & Coating Materials
708	Joint Materials
709	Metals
710	Wood Materials
712	Guardrail & Fence
713	Metal Pipe
714	Concrete, Clay, Fiber & Plastic Pipe
715	Miscellaneous Materials
716	Embankment & Subgrade Material
717	Compaction Control of Base Course Material

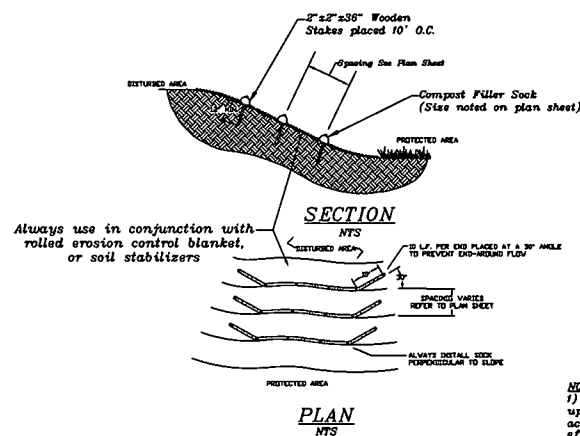


SHOULDER STABILIZATION STA. 147+29 TO 147+89

**DLF.**  
Dennis L. Fisher, RPE  
PO Box 281  
Phillippi, WV 26416  
Cell: 304-677-4129  
E-Mail: Fisher.Engineering@gmz.com

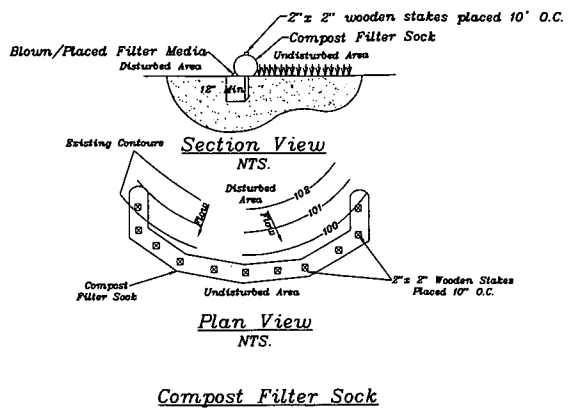


Jackson Surveying Inc.  
Notes  
Road Upgrade  
Sheet 2 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 64



**Slope Drainage Break Detail**  
(Not to Scale)

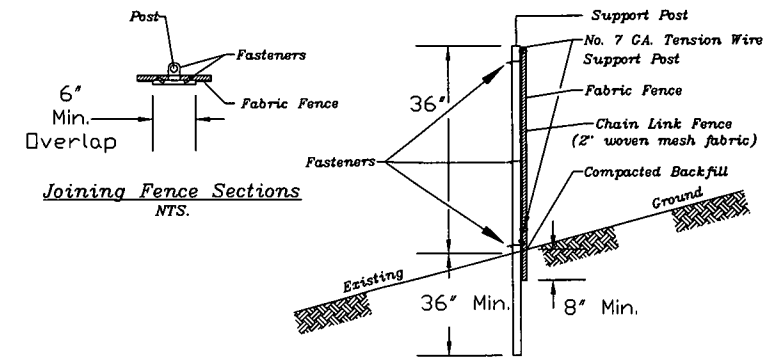
- NOTES:**
- 1) Remove sediment from the upslope side of the sock when accumulation has reached 1/2 of effective height.
  - 2) Loose filler media may be backfilled on the upslope side of the Sock to enhance performance.



**Compost Filter Sock**

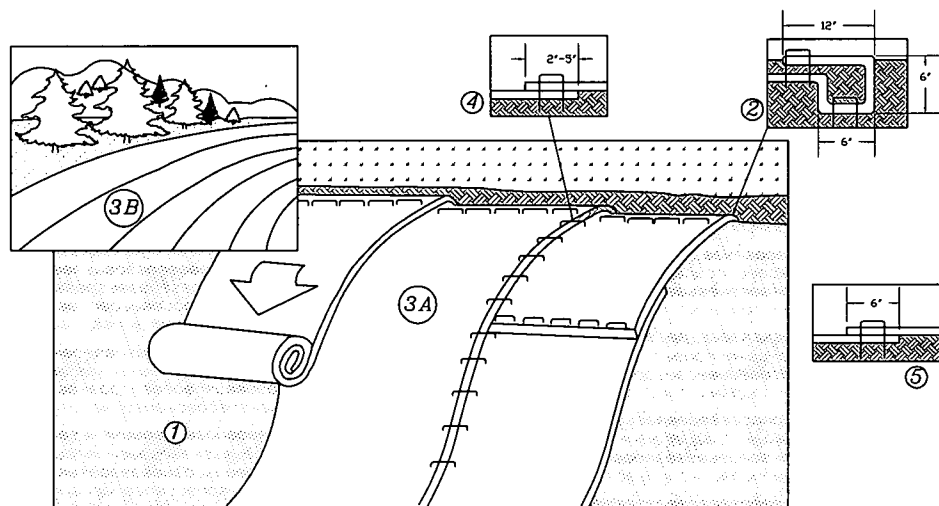
Compost shall meet the following standards:

Organic Matter Content	80%-100% (dry weight basis)
Organic Fraction	Fibrous & elongated
pH	5.5-8.0
Moisture Content	35% - 55%
Particle Size	90% pass through 1" screen
Saltable Salt Concentration	5.0 dS Maximum



**Standard Construction Detail**  
**Super Filter Fabric Fence**

- \*Post spaced @ 10' max. Use 2.5" dia. galvanized or aluminum post.
- \*\*Chain Link to Post Fasteners spaced @ 14" max. Use No. 8 Ga. aluminum wire or No. 9 galvanized steel pre-formed clips. Chain Link to Tension Wire Fasteners spaced @ 60" max. Use No. 10 Ga. galvanized steel wire. Fabric to Chain Fasteners spaced @ 24" max.  $\frac{1}{2}$  to  $\frac{1}{2}$ .
- No. 7 Ga. Tension Wire installed horizontally at top and bottom of chain link fence.
- Filter Fabric Fence must be placed at existing level grade. Both ends of the barrier must be extended at least 8 feet upslope at 45 degrees to the main barrier alignment.
- Sediment must be removed when accumulations reach 1/2 the above ground height of the fence.



- NOTES:**
1. Prepare soil before installing rolled erosion control products (RECP's), including any necessary application of lime, fertilizer, and seed.
  2. Begin at the top of the slope by anchoring the RECP's in a 6" Deep X 6" Wide Trench with approximately 12" of RECP's extended beyond the Up-Slope portion of the trench. Anchor the RECP's with a row of staples/stakes approximately 12" apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to compacted soil and fold remaining 12" portion of RECP's back over seed and compacted soil. Secure RECP's over compacted soil with a row of staples/stakes spaced approximately 12" apart across the the width of the RECP's.
  3. Roll the RECP's (A.) down or (B.) horizontally across the slope. RECP's will unroll with appropriate side against the soil surface. All RECP's must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staples pattern guide. When using the DOT system, staples/stakes should be placed through each of the colored dots corresponding to the appropriate staple pattern.
  4. The edge of parallel RECP's must be stapled with approximately 2"-5" overlap depending on RECP's type.
  5. Consecutive RECP's spliced down the slope must be placed end over end (shingle style) with an approximate 6" overlap. Staple through overlapped area, approximately 12" apart across entire RECP's width.

**NOTE:**  
\* In loose soil conditions, the use of staple or stake lengths greater than 6" may be necessary to properly secure the ECP's.

**Erosion Control Blanket-Slope Installation**  
Scale: NTS.

Species/Mixture	Seeding Rate (lbs/acre)	Soil Drainage Preference	pH Range
KY Bluegrass/ Redtop/ Ladino Clover or Birdsfoot Trefoil	20 3 2/10	Well - Mod. Well	5.5 - 7.5
Timothy/ Alfalfa	5 12	Well - Mod. Well	6.5 - 8.0
Timothy/ Birdsfoot Trefoil	5 8	Well - Poorly	5.5 - 7.5/8
Orchardgrass/ Ladino Clover/ Redtop	10 2 3	Well - Mod. Well	5.5 - 7.5
Orchardgrass/ Perennial Ryegrass/ Creeping Red Fescua/ Perennial Ryegrass	10 10 30 10	Well - Mod. Well	5.5 - 7.5
Orchardgrass or Kentucky Bluegrass	20	Well - Mod. Well	6.0 - 7.5
Birdsfoot Trefoil/ Redtop/ Orchardgrass	10 5 20	Well - Mod. Well	5.5 - 7.6
Lathco Flat Pea/ Perennial Ryegrass/ Lathco Flat Pea/ Orchardgrass	30 20 30 20	Well - Mod. Well	5.5 - 7.6

Table IV-5 Lime and Fertilizer Application Table

pH of Soil	Lime in Tons Per Acre	Fertilizer, lbs. per Acre	10-20-20-or Equivalent
Above 6.0	2	500	
5.0 to 6.0	3	500	
Below 5.0	4	500	

The pH can be determined with a portable pH testing kit or by sending the soil samples to a soil testing laboratory. When 4 tons of lime per acre are applied it must be incorporated into the soil by disking, backtilling or treading up and down the slope.

Table IV-6 Mulch Materials Rates and Uses

Material	Minimum Rates Per Acre	Coverage	Remarks
Hay or Straw	2 to 3 Tons 100 to 150 Bales	Cover 75% to 90% of Surface	Subject to Wind blowing or washing unless tied down
Wood Fiber	1000 to 1500 lbs	Cover all Disturbed Areas	For Hydroseeding
Pulp Fiber			
Wood-Cellulose			
Recirculated Paper			

Table IV-1 Recommended seeding dates for permanent and temporary cover unless otherwise specified.

Planting Dates	Suitability
March 1 - April 15 and August 1 - October 1	Best seeding periods
April 15 - August 1	HIGH RISK - moisture stress likely
October 1 - Dec. 1	HIGH RISK - Freeze damage to young seedlings
Dec. 1 - March 1	Good seeding period. Dormant seeding.

Table 2. Acceptable fertilization recommendation in absence of a soil test.

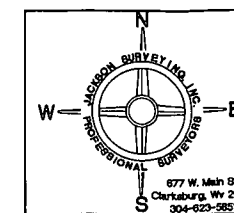
Species	N (lbs/acre)	P205 (lbs/acre)	K2O (lbs/acre)	Example Rate (per acre)
Cool Season Grass	40	60	80	400 lbs. 10-20-20
CS Grass & Legume	30	60	60	300 lbs. 10-20-20
Temporary Cover	40	40	40	200 lbs. 19-19-19

Table 3. Temporary cover suitable for establishment in West Virginia.

Species	Seeding Rate (lbs/acre)	Optimum Seeding Dates	Drainage	pH Range
Annual Ryegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Poorly	5.5 - 7.5
Field Bromegrass	40	3/1 - 6/15 or 8/15 - 9/15	Well - Mod. Well	6.0 - 7.0
Spring Oats	96	3/1 - 6/15	Well - Poorly	5.5 - 7.0
Sudangrass	40	5/15 - 8/15	Well - Poorly	5.5 - 7.5
Winter Rye	168	8/15 - 10/15	Well - Poorly	5.5 - 7.5
Winter Wheat	160	8/15 - 11/15	Well - Mod. Well	5.5 - 7.0
Japanese Millet	30	8/15 - 8/15	Well	4.5 - 7.0
Redtop	5	3/1 - 6/15	Well	4.0 - 7.5
Annual Ryegrass	28	3/1 - 6/15	Well - Poorly	5.5 - 7.5
Spring Oats	64	3/1 - 6/15	Well - Poorly	5.5 - 7.5

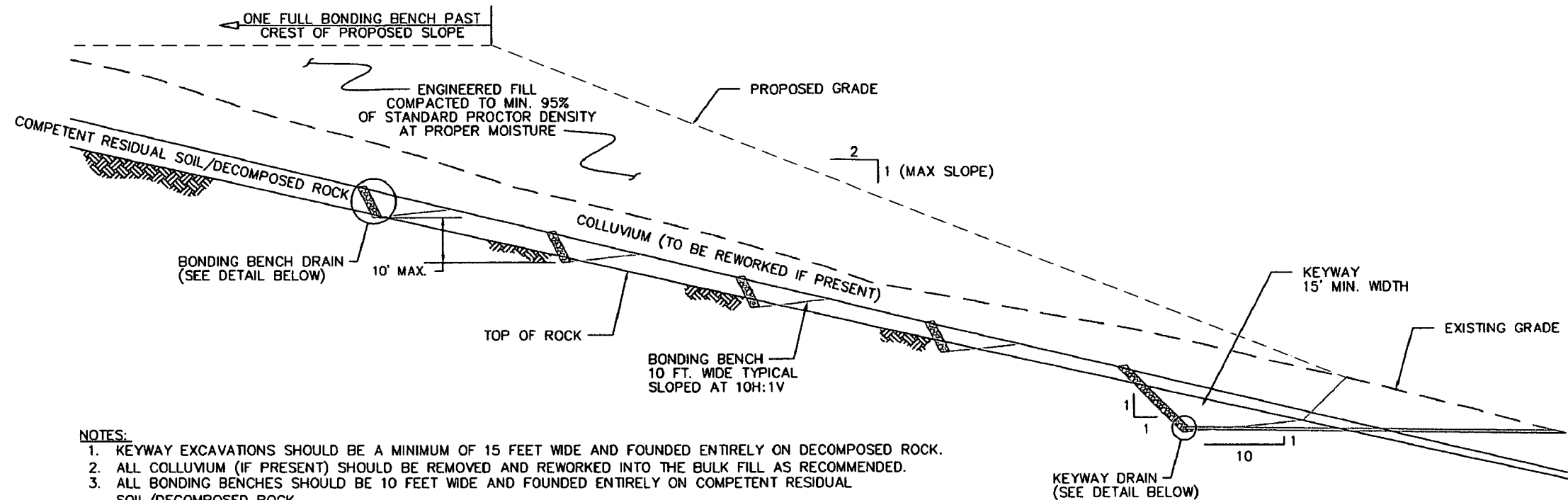
NOTE: These rates should be increased by 50% if planted April 15 - August 1 and October 1 - March 1.

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**Jackson Surveying Inc.**  
Details  
Road Upgrade  
Sheet 3 of 27  
Doddridge Co., WV Sec. Routes 13, 5A, & 5B

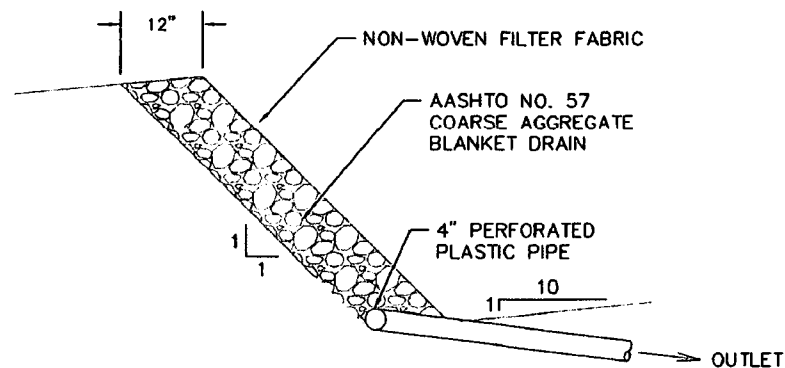




**NOTES:**

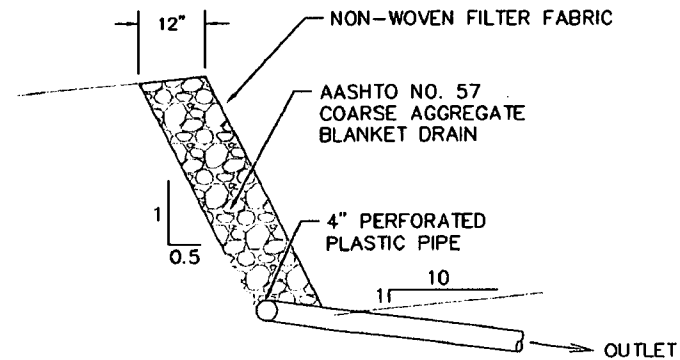
1. KEYWAY EXCAVATIONS SHOULD BE A MINIMUM OF 15 FEET WIDE AND FOUNDED ENTIRELY ON DECOMPOSED ROCK.
2. ALL COLLUVIUM (IF PRESENT) SHOULD BE REMOVED AND REWORKED INTO THE BULK FILL AS RECOMMENDED.
3. ALL BONDING BENCHES SHOULD BE 10 FEET WIDE AND FOUNDED ENTIRELY ON COMPETENT RESIDUAL SOIL/DECOMPOSED ROCK.
4. WHERE SAFETY CONCERNS PROHIBIT INSTALLATION OF KEYWAY OR BONDING BENCH DRAINS AS SHOWN, SUBSTITUTE ALTERNATE DRAIN DETAIL.

**KEYWAY AND BENCH PROFILE**  
N.T.S.



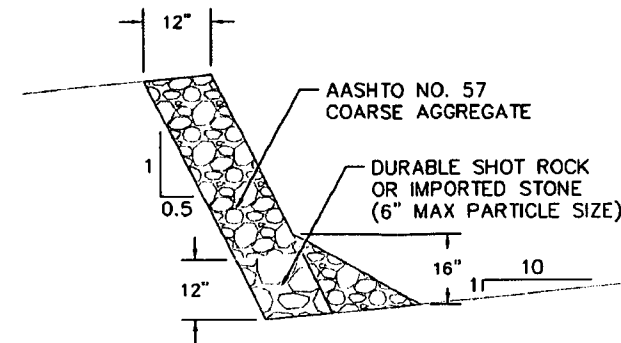
\*OUTLETS AT 100 FT. CENTERS MAX. OR AS DEEMED NECESSARY

**KEYWAY DRAIN DETAIL**  
N.T.S.



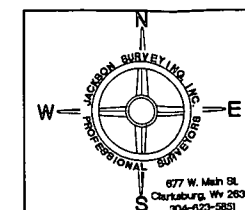
\*SLOPE OUTLET TO PROVIDE POSITIVE DRAINAGE TO SLOPE FACE  
\*OUTLETS AT 250 FT. CENTERS MAX. OR AS DEEMED NECESSARY

**BONDING BENCH DRAIN DETAIL**  
N.T.S.

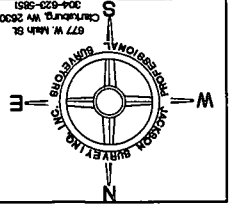


**ALTERNATE KEYWAY/BONDING BENCH DRAIN DETAIL**  
N.T.S.

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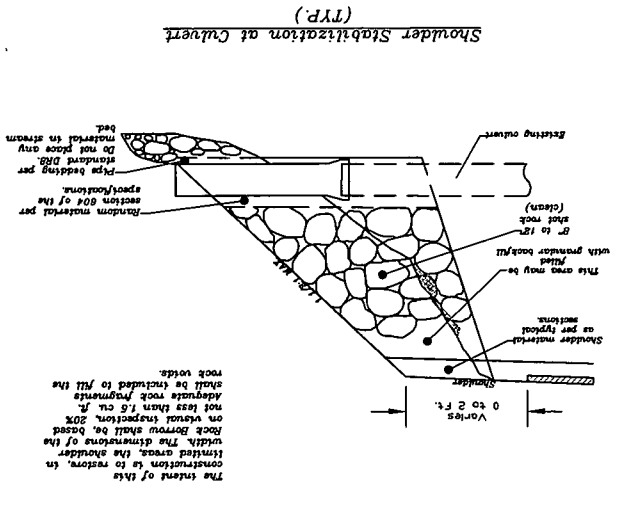
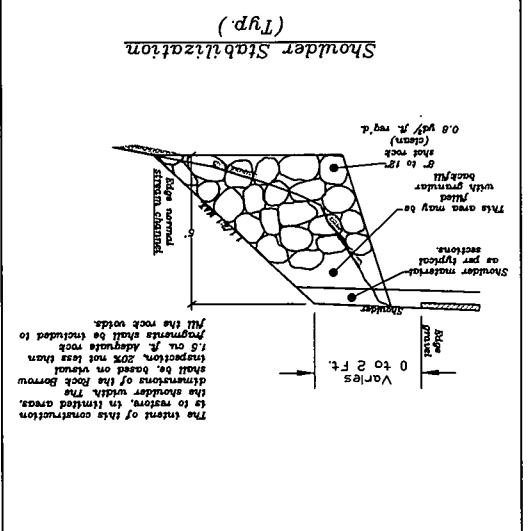
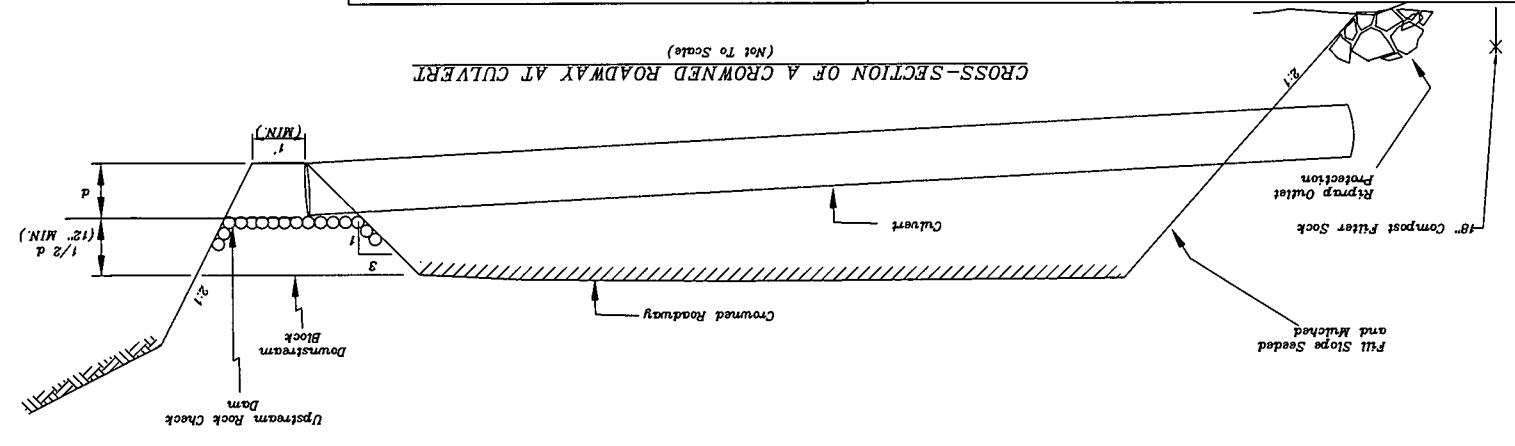
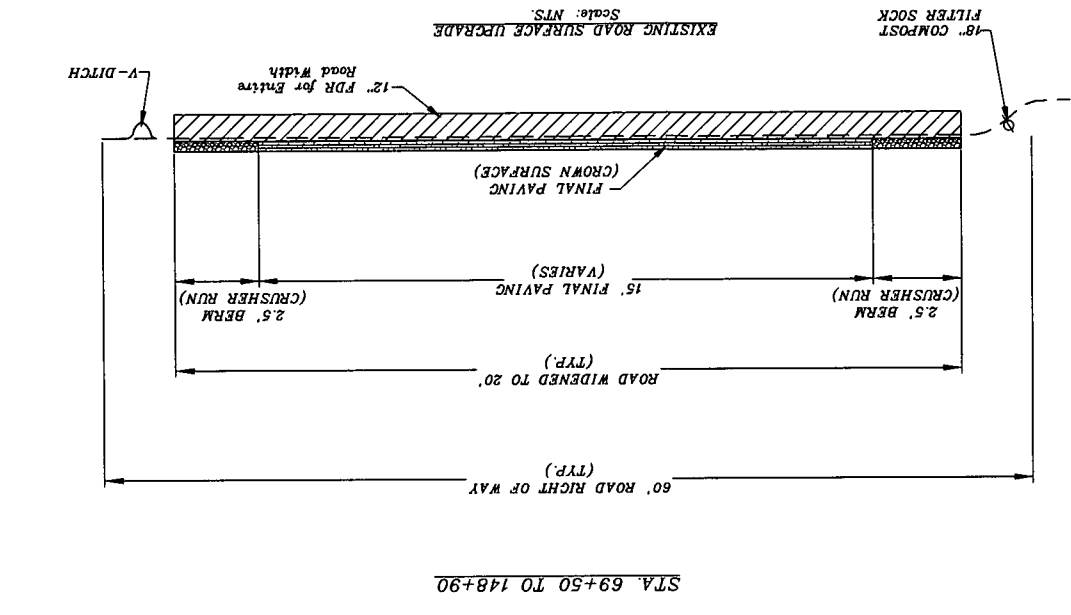


Jackson Surveying Inc.  
Details  
Road Upgrade  
Sheet 4 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 64



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NOTE: FOR FULL DEPTH RECLAMATION, THE ROAD SURFACE WILL BE SCARIFIED TO A DEPTH OF 12". CEMENT APPLIED AT A RATE DETERMINED BY THE GEO-TECHNICAL ENGINEER & FINAL PAVEMENT WILL BE 3" BASE AND 1 1/2" WEARING.



**CUT SECTIONS FOR BEDROCK**

**TABLE FOR DESIGN OF CUT SECTIONS THROUGH BEDROCK AND OVERBURDEN**

TYPE OF BEDROCK	HEIGHT OF CUT BENCHES IN FEET	WIDTH OF BACKSLOPE RATIO	HEIGHT BETWEEN BENCHES IN FEET		H <sub>1</sub> / H <sub>2</sub> (min)	W <sub>1</sub> / W <sub>2</sub> (min)	S <sub>1</sub> / S <sub>2</sub> (min)
			10	10-20			
1. Medium hard to hard limestone and sandstone	under 50	10-20	3/4:1	1/6:1	1/6:1	1/6:1	---
	over 50	10-20	3/4:1	1/6:1			
2. Soft sandstone, medium hard shale, soft limestone, or combination	under 25	10-20	1:1	1/1:1	1/1:1	1/1:1	---
	over 25	10-20	1:1	1/1:1			
3. Soft shale, sandstone, or limestone	under 25	10-20	1:1	1/1:1	1/1:1	1/1:1	---
	over 25	10-20	1:1	1/1:1			
4. Soft shale	under 25	10-20	1/1:1	1/1:1	1/1:1	1/1:1	---
	over 25	10-20	1/1:1	1/1:1			

NOTE: SEE NARRATIVE AND FIGURES FOR DETAILS.

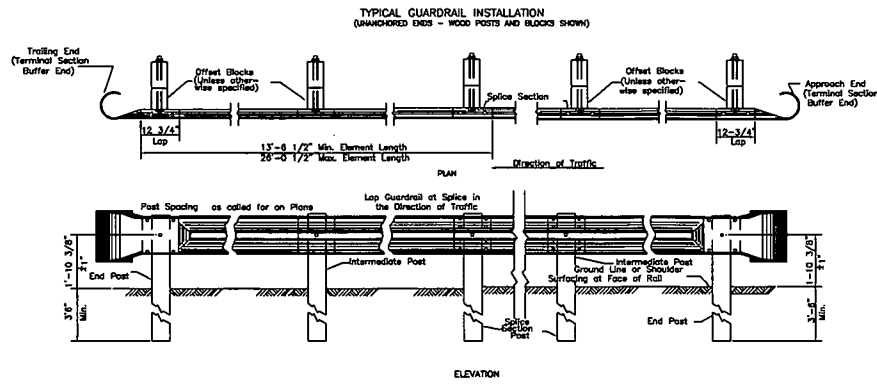
1. For Types 3 and 4, five feet may be added to H<sub>1</sub> when a 4-foot wide roadway ditch is used. Use a minimum 4-foot roadway ditch for Type 1 when H<sub>1</sub> is over 25 feet.

2. Rocks classified as aerial should have benches designed as follows: When the benches above the bench is 25 feet or less, use a minimum 15-foot wide bench. When the bench is greater than 25 feet use a minimum 20-foot wide bench. Lower standards may be used on individually determined cases.

**SHOULDER STABILIZATION ALTERNATIVE**  
 STA. 147+29 TO 147+89

**Bin Block Wall**  
 Select material compacted to meet bearing capacity required for wall support.

**Gabion Retaining Wall**  
 Select material compacted to meet bearing capacity required for wall support.



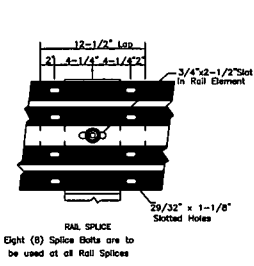
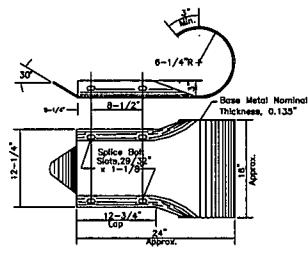
**NOTES**

Guardrail shall be secured to the blocks, posts and other elements by 5/8" dia. bolts and nuts conforming to the details herein and to the requirements of 712.4 of the Standard Specifications. Nuts shall conform to ASTM A563, Grade A or better.

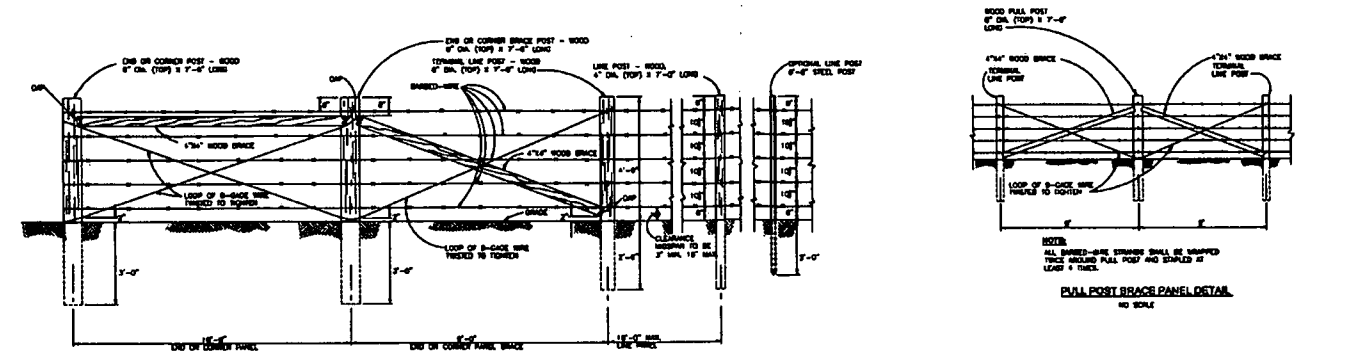
Approach and Trailing End Treatments shall be as shown or specified on the Plans or directed by the Engineer. Approach and trailing ends shall be anchored unless otherwise specified on the Plans; the specific anchor terminal to be utilized shall be as shown or specified.

The pay quantity of guardrail will be the Linear Feet of guardrail measured along the face of the rail from center to center of end posts. Cost of the Terminal Section Buffer End shall be included in the cost of the Guardrail.

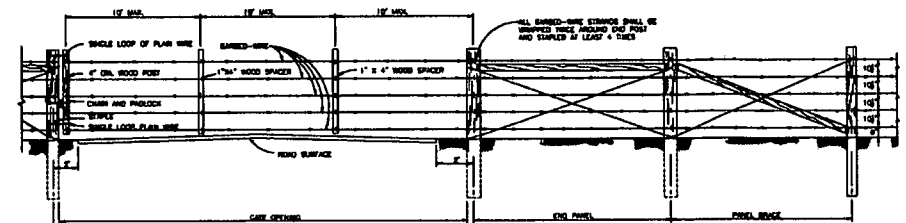
The approach slope to the face of all guardrail shall be 10:1 or flatter.



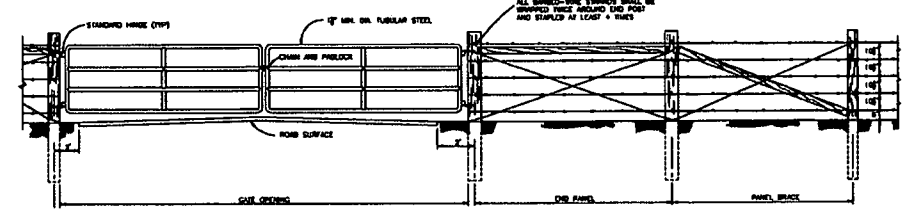
**GUARDRAIL ELEMENT**



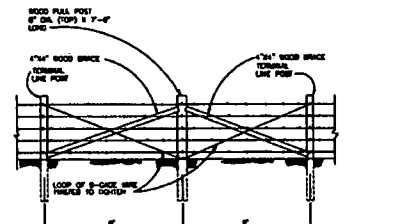
**TYPICAL LAYOUT - 4-STRAND BARBED WIRE FENCE**



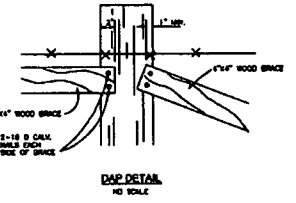
**TYPICAL BARBED-WIRE DROP GATE DETAIL**



**TYPICAL PANEL GATE DETAIL**



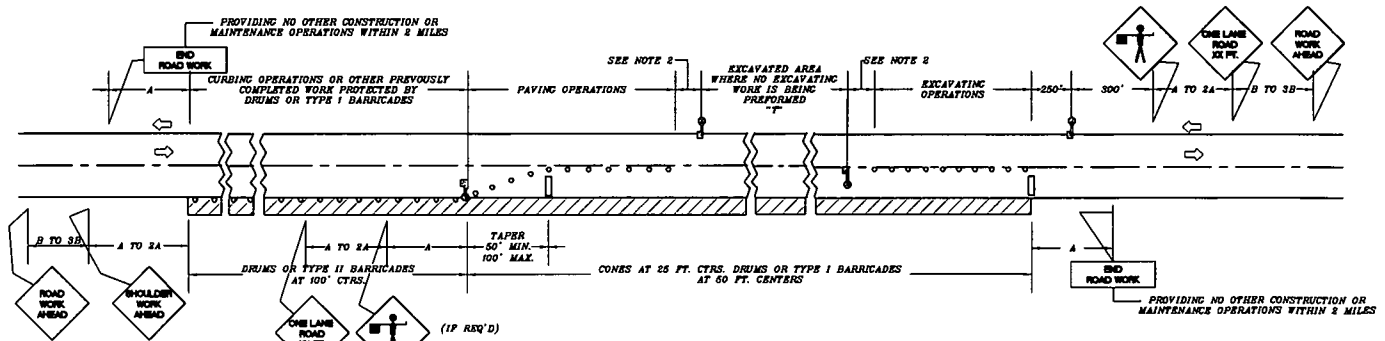
**PULL POST BRACE PANEL DETAIL**



**GATE DETAIL**

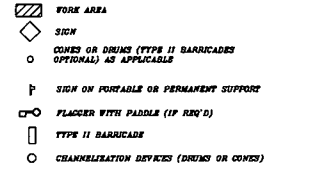
- NOTES:**
- THE BRACE OF END OF CORNER PANEL AND BRACE PANEL OF END OF PANEL IS USUALLY WHEN CLOSED ON END PANEL COMPLETELY WITH THE CORNER BRACE PANEL. ON THIS CORNER PANEL COMPLETE BRACING AND BRACING OF BRACE PANEL IS ALWAYS TO PROVIDE ACCURATE BRACING IS REQUIRED.
  - THE GATE BRACE IS USUALLY ANY STANDARD COMMERCIAL GATE THAT OPERATES ONLY IN NON-EXTREMELY COLD WEATHER BE ACCEPTABLE, SUBJECT TO APPROVAL.
  - LATCH AND PIN FOR PANEL GATE IS REQUIRED, NOT SHOWN.
- STANDARD DETAILS FOR CHAIN-LINK SECURITY FENCES AND FARM STYLE FENCES**  
**FARM STYLE 6-STRAND BARBED-WIRE FENCE DETAILS**

**TRAFFIC CONTROL**



- GENERAL NOTES**
- WHEN DISTANCE "T" EXCEEDS 1,000 FT. ADDITIONAL ONE LANE ROAD 1,000 FT. AND FLASHER SIGNS (AS NECESSARY) SHALL BE INSTALLED. THE CONES, DRUMS, OR BARRICADES MAY BE REMOVED THROUGHOUT THE "T" AREA. AN ADDITIONAL TAPER SHALL BE FORMED BY CONES OR DRUMS IN ADVANCE OF THE EXCAVATING OPERATIONS. ADDITIONAL TAPER SHALL BE REMOVED AND THE EXCAVATED AREA SHALL BE PROTECTED BY DRUMS OR TYPE II BARRICADES AT 60 FT. CENTERS.
  - MINIMUM DISTANCE TO END OF "T" WHEN "T" EXCEEDS 1,000 FT., DISTANCE SHALL BE 500 FT.
  - NO PAVING OR EXCAVATING OPERATIONS SHALL BE PERFORMED AT NIGHT UNLESS AUTHORIZED BY THE ENGINEER. WHEN THESE OPERATIONS ARE CONDUCTED ALL VEHICLES AND EQUIPMENT INCLUDING APPROPRIATE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE PAVEMENT AND THE EXCAVATED AREA SHALL BE PROTECTED BY DRUMS OR TYPE II BARRICADES AT 60-FOOT CENTERS. ROAD WORK AHEAD AND SHOULDER ROAD AHEAD SIGNS SHALL BE INSTALLED AS SHOWN TO PROTECT THE CURBING OPERATIONS. ROAD WORK AHEAD AND ROAD WORK 1,000 FT. SIGNS SHALL BE INSTALLED FOR TRAFFIC IN THE OPPOSITE DIRECTION.
  - CONSTRUCTION OPERATIONS SHALL BE CONFINED TO ONE TRAFFIC LANE AT A TIME LEAVING THE OPPOSITE TRAFFIC LANE OPEN TO TRAFFIC. AT LEAST 500 FT. OF BOTH TRAFFIC LANES SHALL BE AVAILABLE FOR TRAFFIC MOVEMENT AT ANY ONE TIME. EXCEPT FOR 1,000 FT. A COMPLETE TRAFFIC CONTROL PLAN MUST BE APPROVED FOR ANY DISTANCE EXCEPTED TO EXCEED 1,000 FT. IN LENGTH INCLUDING BOTH TAPER AND ROAD WORK AREA.
  - THE FLASHERS SHALL BE IN SCHEM OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES.
  - ALL SIGNS SHALL BE PROPERLY MOUNTED IF THE CLOSURE TIME EXCEEDS THREE DAYS.
  - WHEN A SIDE ROAD INTERSECTS THE HIGHWAY ON WHICH WORK IS BEING PERFORMED ADDITIONAL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ABOVE WARNING SIGNS, AS SHOWN ON THE PLANS, AND/OR AS DIRECTED BY THE ENGINEER.

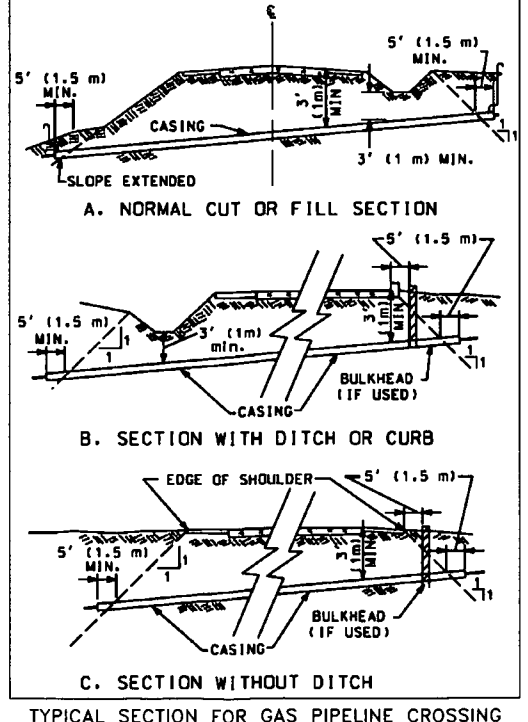
**SYMBOLS**



**SUGGESTED ADVANCE WARNING SIGN SPACING**

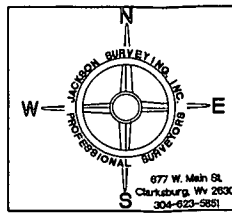
ROAD TYPE	A	B	C
URBAN (LOW SPEED)*	100	100	100
URBAN (HIGH SPEED)*	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,600	2,240

\* SPEED CATEGORY TO BE DETERMINED BY WY DOT



**TYPICAL SECTION FOR GAS PIPELINE CROSSING**

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**Jackson Surveying Inc.**  
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Road Upgrade  
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Doddridge Co., WV Sec. Routes 13, 54, & 74

Station 81+32

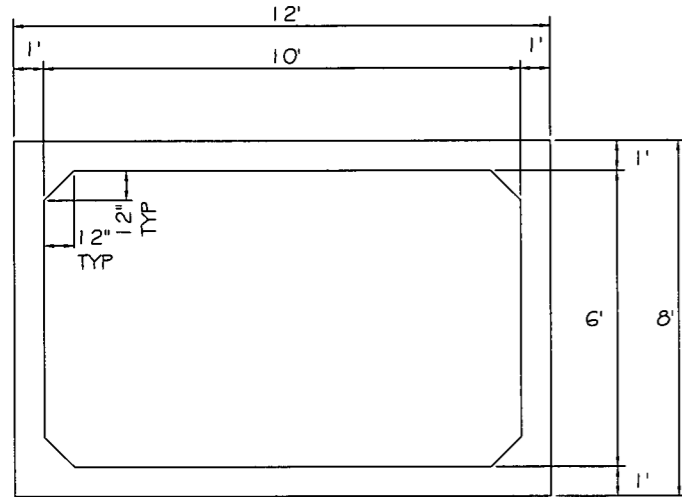


CARR CONCRETE  
A DIVISION OF COT

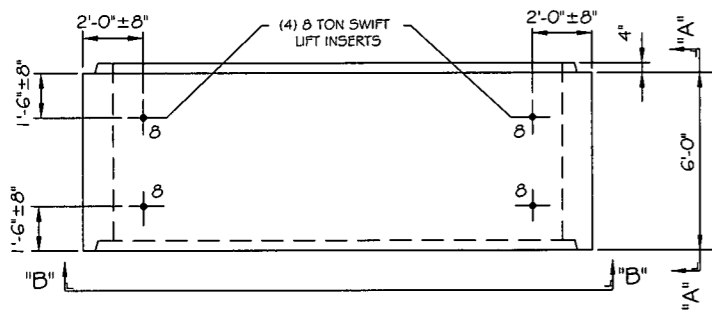
10' X 6' X 24' BOX CULVERT

JOB LOCATION: DODDRIDGE CO., WV

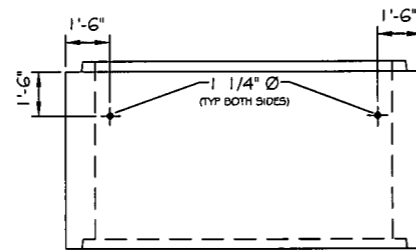
12" THK. TOP & BOTTOM  
12" THK. SIDE WALLS  
12" x 12" HAUNCHES  
(4) 8 TON SWIFT LIFTS  
(4) 1 1/4" Ø LIFTING INSERTS  
6.02 YDS. 5,000 PSI CONCRETE  
23,587 lbs. APPROX WEIGHT



ELEVATION VIEW "B-B"



PLAN VIEW



SECTION "A-A"

NTS.

Station 136+94

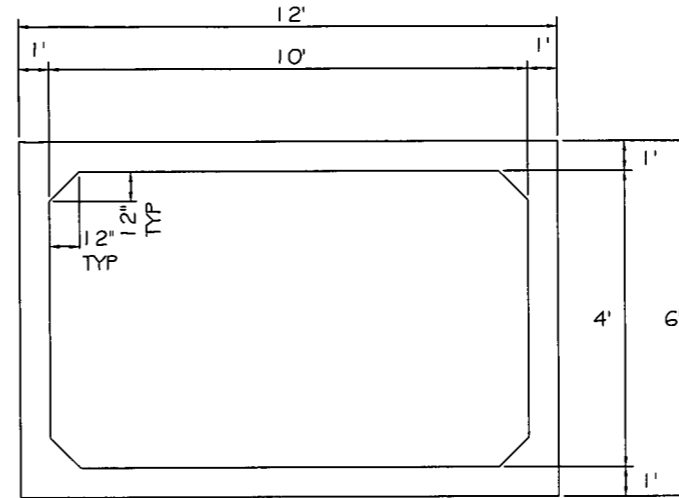


CARR CONCRETE  
A DIVISION OF COT

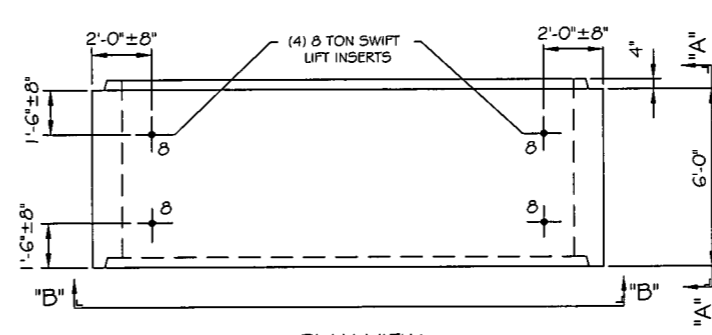
10' X 4' X 36' BOX CULVERT

JOB LOCATION: DODDRIDGE CO., WV

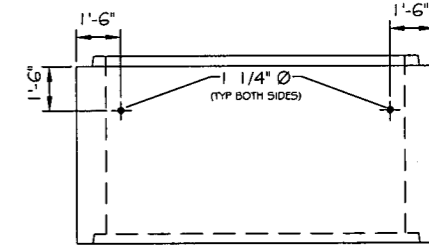
12" THK. TOP & BOTTOM  
12" THK. SIDE WALLS  
12" x 12" HAUNCHES  
(4) 8 TON SWIFT LIFTS  
(4) 1 1/4" Ø LIFTING INSERTS  
6.02 YDS. 5,000 PSI CONCRETE  
23,587 lbs. APPROX WEIGHT



ELEVATION VIEW "B-B"



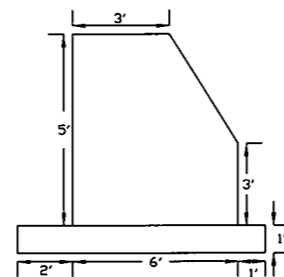
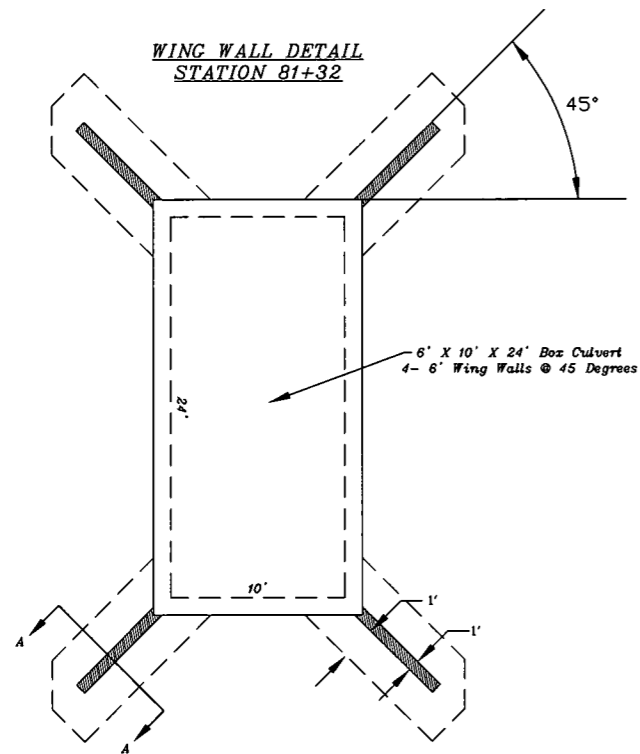
PLAN VIEW



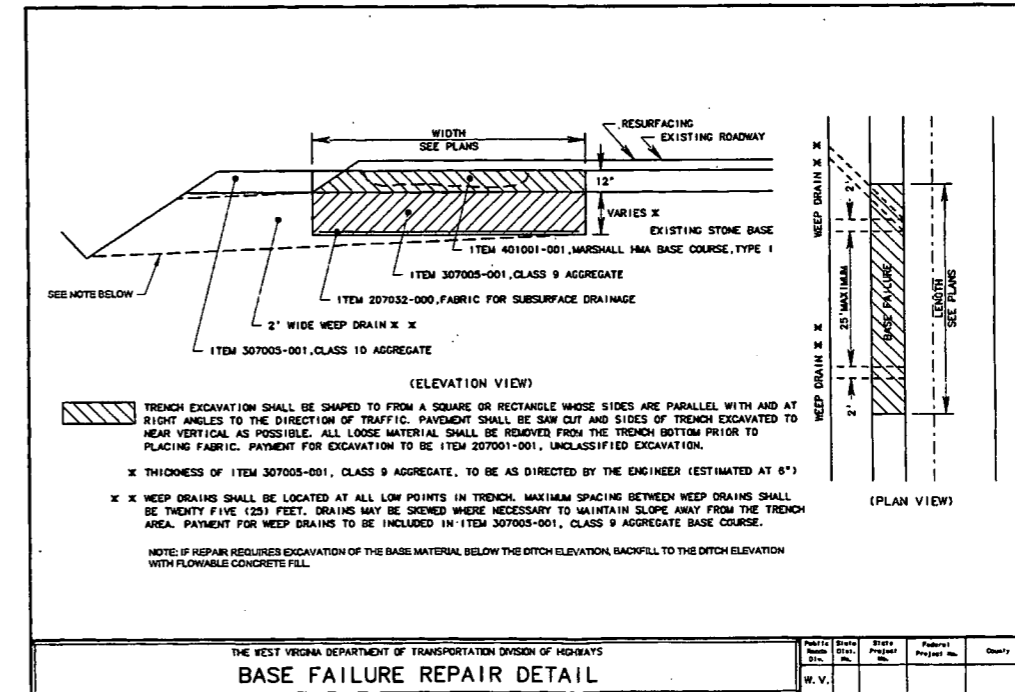
SECTION "A-A"

NTS.

WING WALL DETAIL  
STATION 81+32



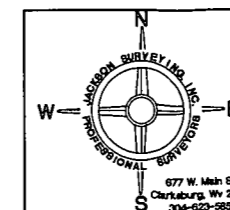
SECTION A-A



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS  
BASE FAILURE REPAIR DETAIL

Public Road	State	Dist.	Project	Subproject	County
W.V.					

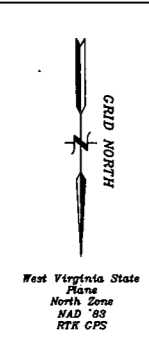
DLF.  
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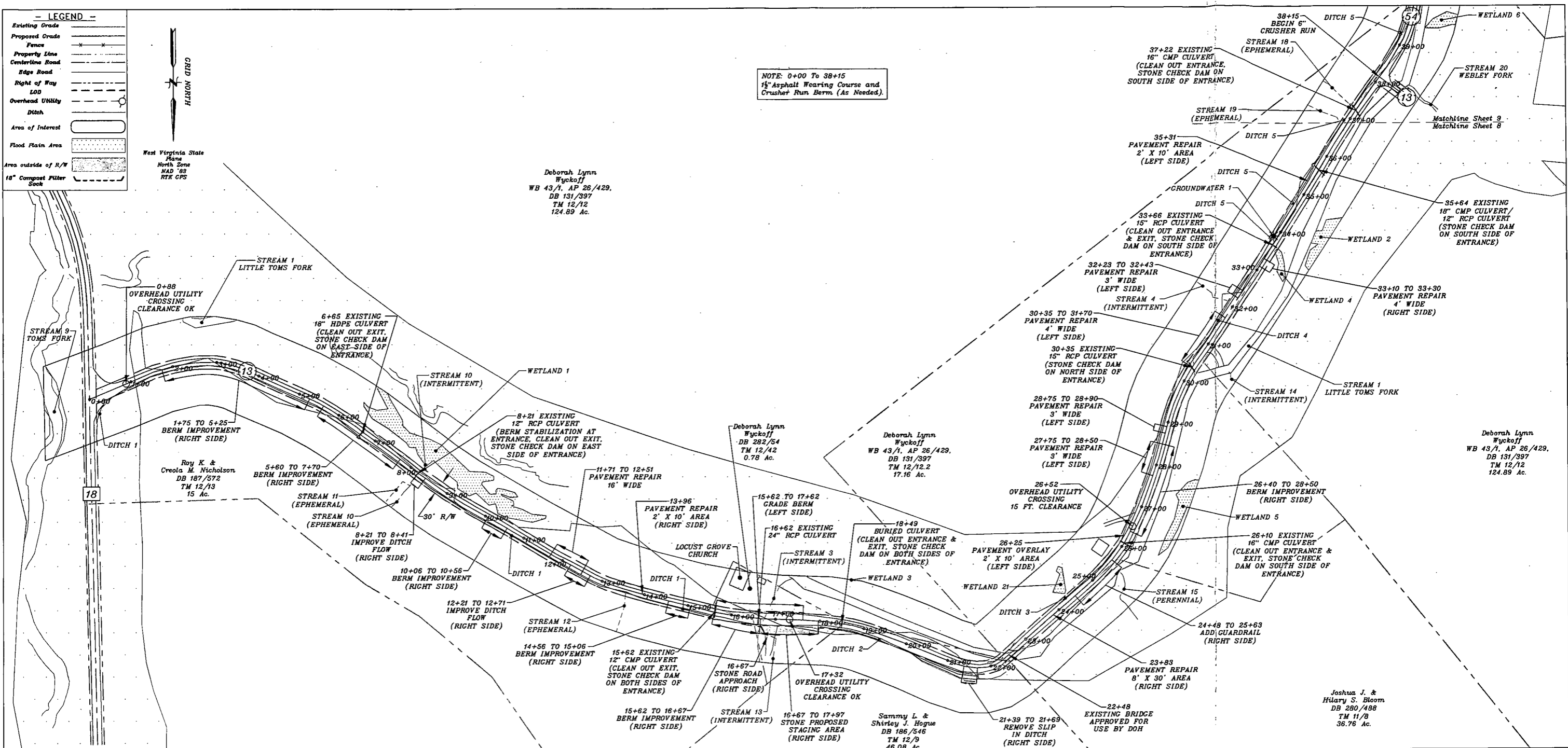
Jackson Surveying Inc.  
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Doddridge Co., WV Sec. Routes 13, 54, & 64

**- LEGEND -**

- Existing Grade
- Proposed Grade
- Fence
- Property Line
- Centerline Road
- Edge Road
- Right of Way
- LOD
- Overhead Utility
- Ditch
- Area of Interest
- Flood Plain Area
- Area outside of R/W
- 18" Compact Filter Sock



NOTE: 0+00 To 38+15  
1 1/2" Asphalt Wearing Course and  
Crusher Run Berm (As Needed).

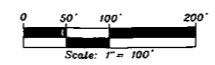


**- GAI LEGEND -**

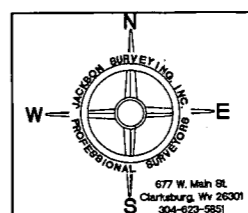
- NRPW-EPHEMERAL
- RPW INTERMITTENT
- RPW PERENNIAL
- JURISDICTIONAL STORMWATER FEATURE
- NON-JURISDICTIONAL
- PEM WETLAND
- PUB HABITAT

NJD= NON-JURISDICTIONAL FEATURES  
JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION

Station	Project	Drainage Type	Impact To Jurisdictional Water (FL)	Disturbance (Sq. Ft.)
1+75	Berm Improvement	Ditch (NJD)	0	1,050
5+60	Berm Improvement	Ditch (NJD)	0	630
6+65	18" HDPE	Ditch (NJD)	0	36
8+21	12" RCP	Stream 10 (Ephemeral)	12	36
8+21	Grade Ditch	Ditch 1 (JSWF)	20	60
10+06	Berm Improvement	Ditch 1 (JSWF)	50	150
12+21	Grade Ditch	Ditch 1 (JSWF)	50	150
14+56	Berm Improvement	Ditch (NJD)	0	150
15+62	12" CMP	Ditch (NJD)	0	36
15+62	Berm Improvement	N/A	0	315
15+62	Berm Improvement	N/A	0	600
16+67	Stone Approach	N/A	0	200
16+67	Stone Approach	N/A	0	2,600
18+49	Culvert	Ditch (NJD)	0	48
21+39	Grade Ditch	Ditch (NJD)	0	120
26+10	16" CMP	Ditch (NJD)	0	36
26+40	Berm Improvement	N/A	0	630
30+35	15" RCP	Ditch 4 (JSWF)	4	12
33+66	15" RCP	Ditch 4 (JSWF)	12	36
35+64	18" CMP	Ditch (NJD)	0	12
Total Sheet 8 Disturbed Area:			6,307 Sq. Ft.	0.16 Ac.
Stream 10 Ephemeral (12 FL)				
Ditch 1 (JSWF) (120 FL)				
Ditch 4 (JSWF) (16 FL)				



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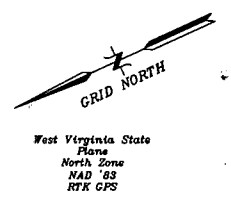


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Doddridge Co., WV Sec. Routes 13, 54, & 57

NOTE: CONTRACTOR SHALL INSTALL "CAUTION OVERHEAD UTILITY" SIGNS APPROXIMATELY 50 FEET EACH SIDE OF UTILITY (OR GROUPS OF UTILITIES) FACING THE TRAFFIC FLOW DIRECTION.  
CONTRACTOR SHALL INSTALL "SLOW-15 MPH" SIGNS AT EACH END OF PROJECT & APPROXIMATELY 2000 FEET INTERVALS THROUGH THE PROJECT AREA.

**- LEGEND -**

Existing Grade	---
Proposed Grade	---
Fence	---X---
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LOD	---
Overhead Utility	---
Ditch	---
Area of Interest	---
Flood Plain Area	---
Area outside of R/W	---
18" Compost Filter Sock	---

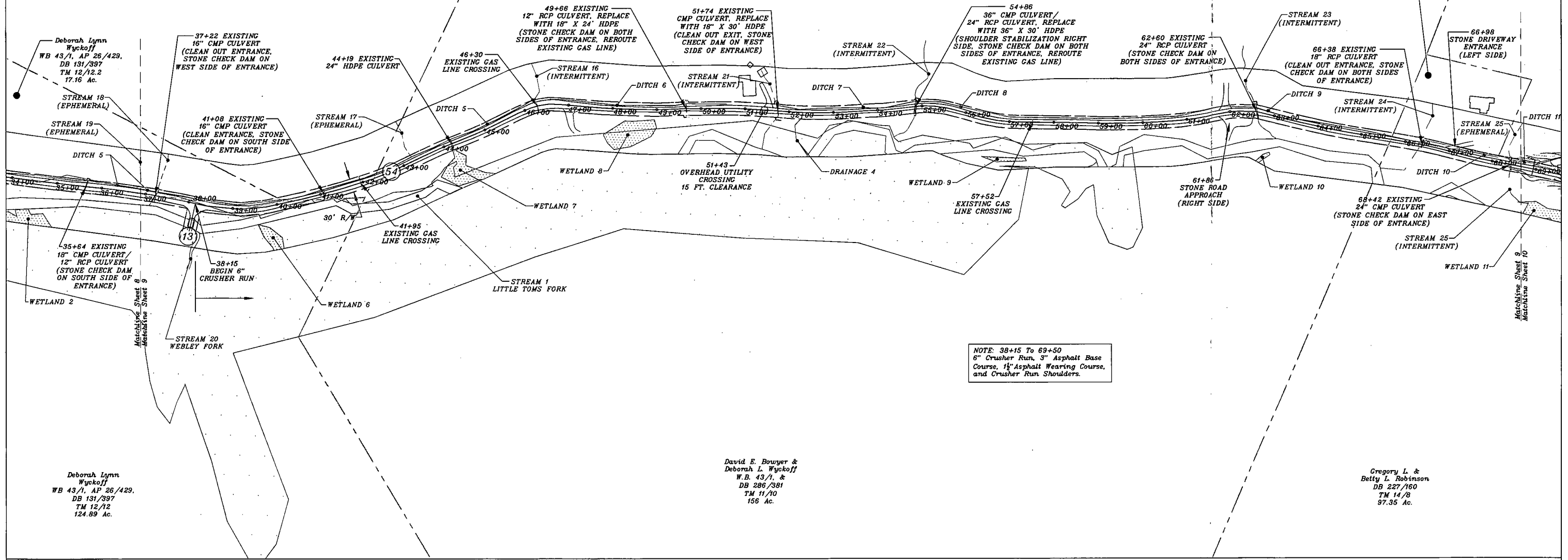


Deborah Lynn Wyckoff  
WB 43/1, AP 26/429,  
DB 131/397  
TM 12/12  
124.89 Ac.

David E. Bowyer &  
Deborah L. Wyckoff  
W.B. 43/1, &  
DB 286/381  
TM 11/10  
156 Ac.

James W. &  
Pauletta McKinney  
DB 302/543  
TM 14/9.1  
1 Ac.

Richard C.  
Robinson  
DB 251/148  
TM 14/9  
158.54 Ac.



NOTE: 38+15 To 69+50  
6" Crusher Run, 3" Asphalt Base  
Course, 1 1/2" Asphalt Wearing Course,  
and Crusher Run Shoulders.

David E. Bowyer &  
Deborah L. Wyckoff  
W.B. 43/1, &  
DB 286/381  
TM 11/10  
156 Ac.

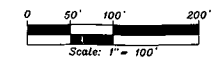
Gregory L. &  
Betty L. Robinson  
DB 227/160  
TM 14/8  
97.35 Ac.

**- GAI LEGEND -**

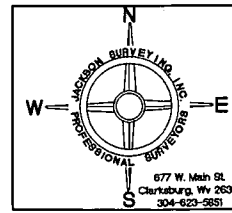
NRPW-EPHEMERAL	---
RPW-INTERMITTENT	---
RPW-PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PEM WETLAND	---
PUB HABITAT	---

NJD= NON-JURISDICTIONAL FEATURE  
JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION

Station	Project	Drainage Type	Impact To Jurisdictional Water (Pt.)	Disturbance (Sq. Ft.)
37+22	16" CMP	Stream 18 (Ephemeral)	8	24
41+08	16" CMP	Ditch (NJD)	0	24
49+66	18" HDPE	Ditch (NJD)	0	128
49+66	Gas Line	N/A	0	80
51+74	18" HDPE	Stream 21 (Intermittent)	46	152
54+86	36" CMP	Stream 22 (Intermittent)	38	152
54+86	Gas Line	N/A	0	80
61+86	Stone Approach	N/A	0	200
62+60	24" RCP	Ditch (NJD)	0	24
66+38	18" RCP	Stream 24 (Intermittent)	4	12
66+38	18" RCP	Ditch (NJD)	0	16
66+98	Stone Approach	N/A	0	200
68+42	24" CMP	Ditch (NJD)	0	12
			<b>Total Sheet 9 Disturbed Area:</b>	<b>1,104 Sq. Ft.</b>
				<b>0.03 Ac.</b>
Stream 18 Ephemeral (8 Ft.)				
Stream 21 Intermittent (46 Ft.)				
Stream 22 Intermittent (38 Ft.)				
Stream 24 Intermittent (4 Ft.)				



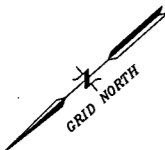
**DLF.**  
Dennis L. Fisher, RPE  
PO Box 281  
Phillippi, WV 26416  
Cell: 304-677-4129  
E-Mail: Fisher.Engineering@gmx.com



**Jackson Surveying Inc.**  
Plan  
Road Upgrade  
Sheet 9 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 57

**- LEGEND -**

Existing Grade	---
Proposed Grade	---
Fence	---*
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LDD	---
Overhead Utility	○---
Ditch	---
Area of Interest	○
Flood Plain Area	▨
Area outside of R/W	▨
18" Compust Filter Sock	---

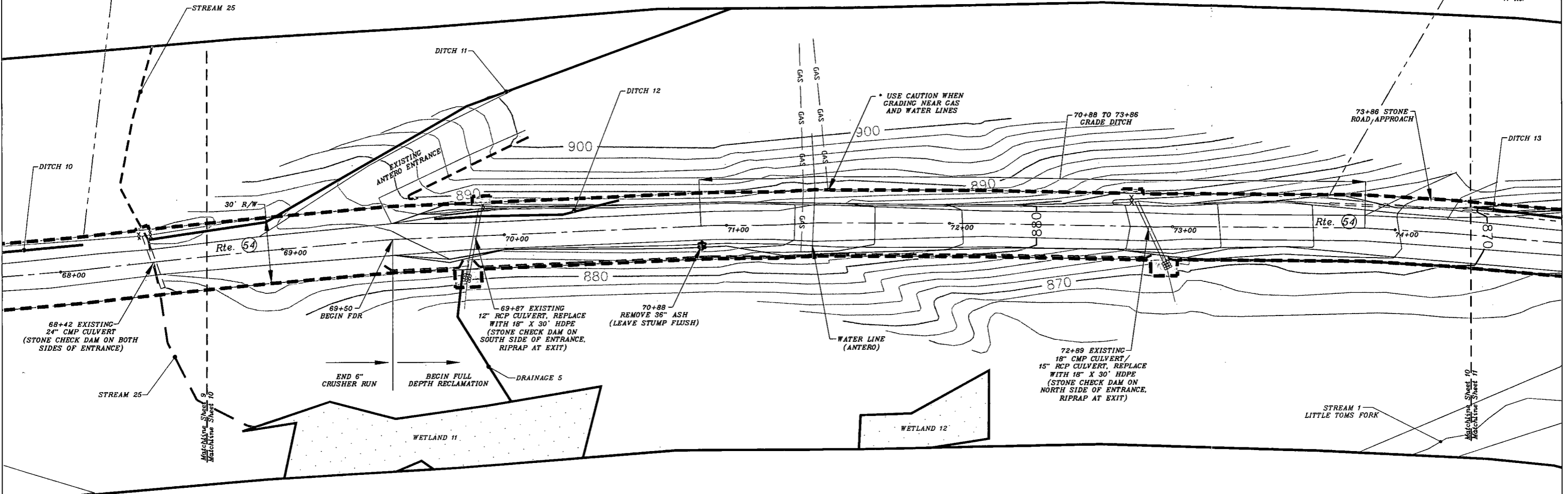


West Virginia State Plane North Zone NAD 83 RTK CPS

Richard C. Robinson  
DB 251/448  
TM 14/3  
158.54 Ac.

James W. & Pauletta McKinney  
DB 302/543  
TM 14/9.1  
1 Ac.

Mark J. & Mary Ann Daggett  
DB 263/644  
TM 14/9.3  
11 Ac.



Gregory L. & Betty L. Robinson  
DB 227/160  
TM 14/8  
97.35 Ac.

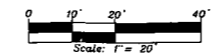
NOTE: 69+50 To 148+90 Full Depth Reclamation, 3" Asphalt Base Course, 1 1/2" Asphalt Wearing Course, and Crusher Run Shoulders.

Station	Project	Drainage Type	Impact To Jurisdictional Water (Ft.)	Disturbance (Sq. Ft.)
69+50	FDR	N/A	0	9,680
69+87	18" HDPE	Ditch (NID)	0	152
70+88	Grade Ditch	Ditch (NID)	0	894
72+89	18" HDPE	Ditch (NID)	0	152
73+86	Stone Approach	N/A	0	200
Total Sheet 10 Disturbed Area=				11,078 Sq. Ft.
				0.25 Ac.

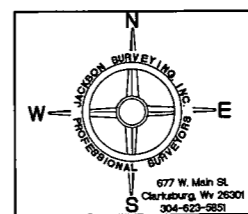
**- GAI LEGEND -**

NRPW - EPHEMERAL	---
RPW - INTERMITTENT	---
RPW - PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PEM WETLAND	▨
PUB HABITAT	▨

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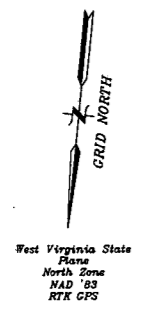
NID= NON-JURISDICTIONAL FEATURE  
JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION



Jackson Surveying Inc.  
Plan  
Road Upgrade  
Sheet 10 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 57

**LEGEND**

Existing Grade	---
Proposed Grade	---
Fence	---x---
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LOD	---
Overhead Utility	○---
Ditch	---
Area of Interest	---
Flood Plain Area	---
Area outside of R/W	---
18" Compact Filter Sock	---

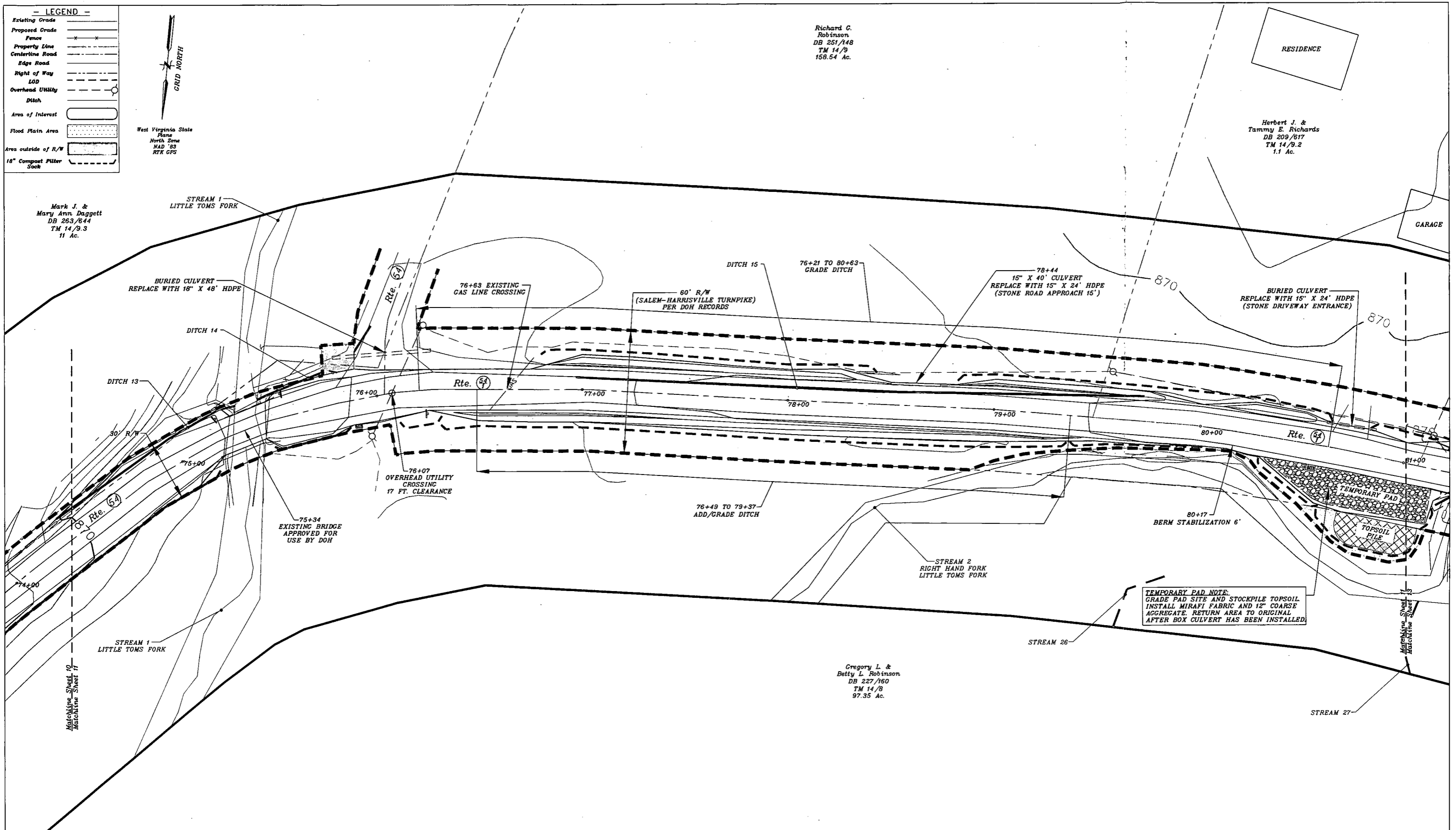


Richard C. Robinson  
DB 251/148  
TM 14/9  
158.54 Ac.

Herbert J. & Tammy E. Richards  
DB 209/617  
TM 14/9.2  
1.1 Ac.

Mark J. & Mary Ann Daggett  
DB 263/644  
TM 14/9.3  
11 Ac.

Gregory L. & Betty L. Robinson  
DB 227/160  
TM 14/8  
97.35 Ac.



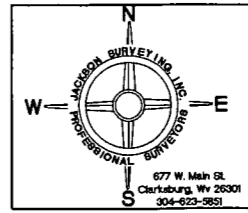
**TEMPORARY PAD NOTE:**  
GRADE PAD SITE AND STOCKPILE TOPSOIL. INSTALL MIRAFI FABRIC AND 12" COARSE AGGREGATE. RETURN AREA TO ORIGINAL AFTER BOX CULVERT HAS BEEN INSTALLED.

Station	Project	Drainage Type	Impact To Jurisdictional Wetter (PT)	Disturbance (Sq. Ft.)
74+34	FDR	N/A	0	13,320
74+34	Grade Ditch	Ditch (ND)	0	980
76+00	18" HDPE	Ditch (ND)	0	224
76+26	Grade Ditch	Ditch (ND)	0	2,652
76+49	Grade Ditch	N/A	0	2,016
80+80	15" HDPE	Ditch (ND)	0	128
81+00	Pad and Topsoil	N/A	0	1,810
Total Sheet 11 Disturbed Area:				21,130 Sq. Ft.
				0.49 Ac.

**GAI LEGEND**

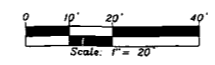
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RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PEM WETLAND	---
PUB HABITAT	---

**DLF.**  
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Philippi, WV 26416  
Cell: 304-677-4129  
E-Mail: Fisher.Engineering@gmz.com



Jackson Surveying Inc.  
Plan  
Road Upgrade  
Sheet 11 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 54

NJD= NON-JURISDICTIONAL FEATURE  
JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION

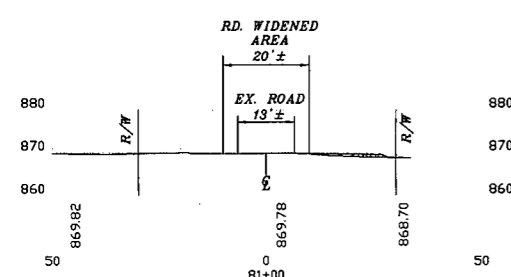
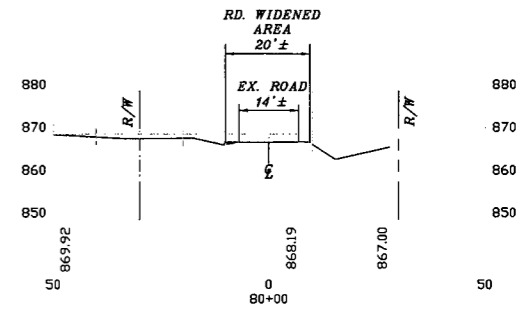
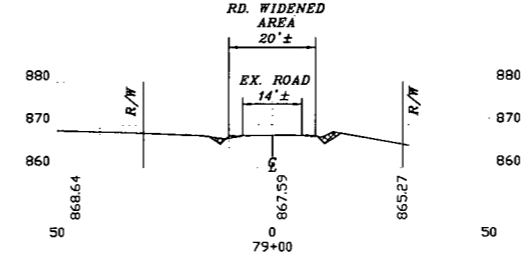
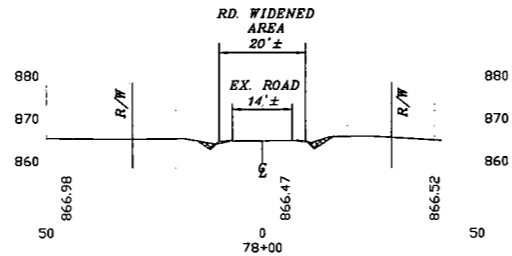
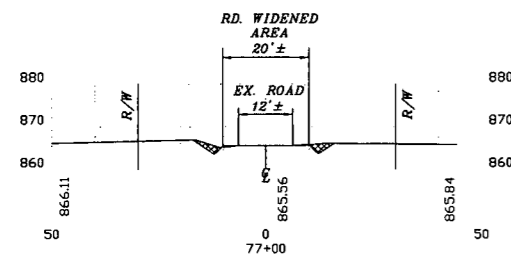
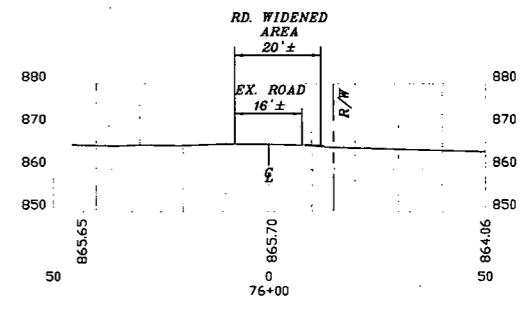
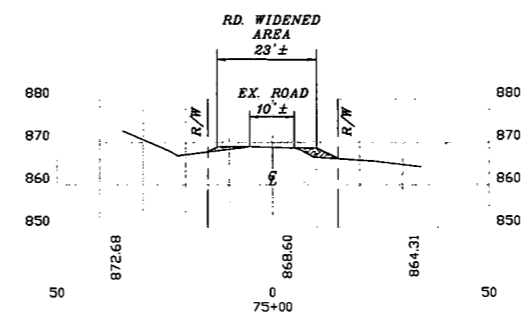
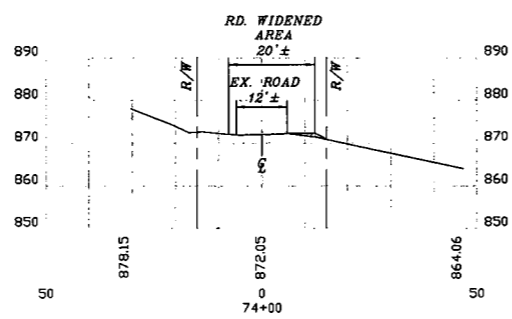
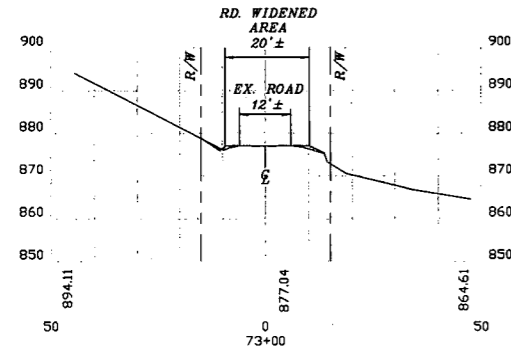
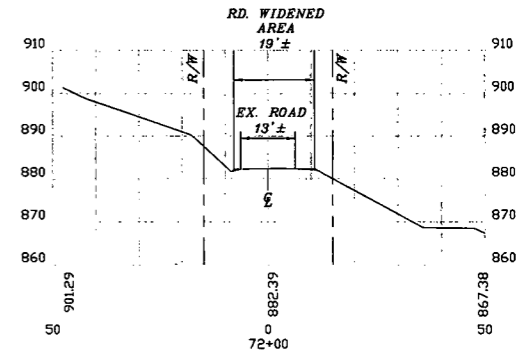
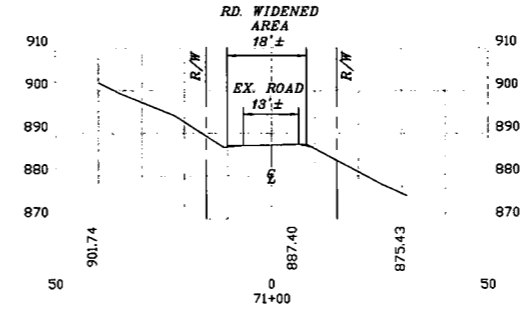
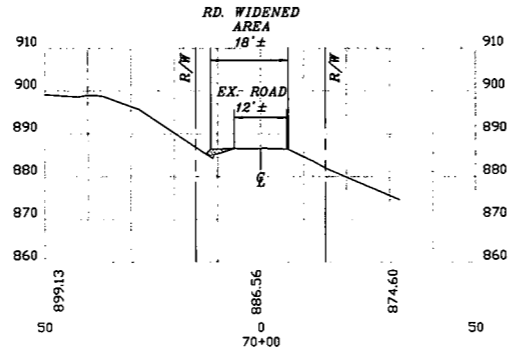
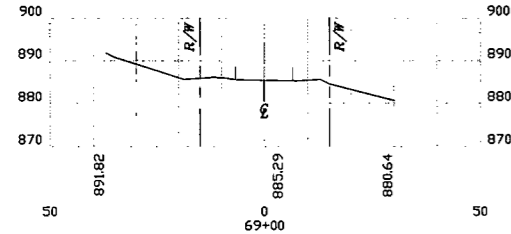




**— LEGEND —**

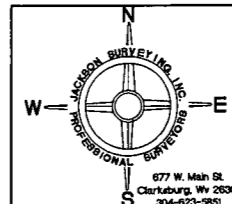
Existing Grade  
Proposed Grade  
Proposed Cut  
Proposed Fill

Vert. 1" = 20'  
Horiz. 1" = 20'  
(Typ.)



NOTE: Cut slopes are 1.5:1. Fill slopes are 2:1.  
If cut slope is in rock, refer to Detail Sheet 5.  
Protect all slopes with mulch or erosion fabric  
at the direction of the project engineer.

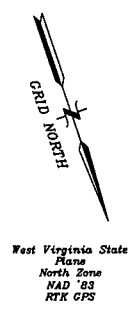
**DLF.**  
Dennis L. Fisher, RPE  
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Philippi, WV 26416  
Cell: 304-677-4129  
E-Mail: Fisher.Engineering@gmx.com



*Jackson Surveying Inc.*  
Cross Sections  
Road Upgrade  
Sheet 12 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 57

**- LEGEND -**

Existing Grade	---
Proposed Grade	---
Fence	---*
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LOD	---
Overhead Utility	---
Ditch	---
Area of Interest	---
Flood Plain Area	---
Area outside of R/W	---
18" Compust Filter Sock	---



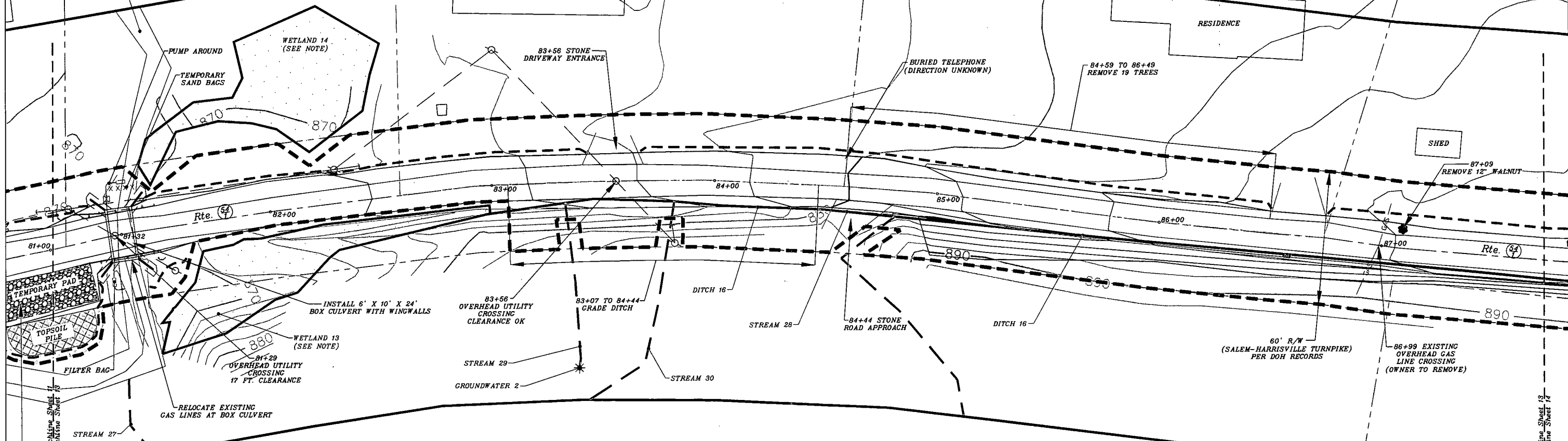
Gregory L. & Betty L. Robinson  
DB 227/160  
TM 14/8  
97.35 Ac.

**WETLAND NOTES:**  
PLACE SAFETY FENCE AROUND ALL WETLAND AREAS WITHIN THE ROAD RIGHT OF WAY.  
NO DISTURBANCE IS ALLOWED WITHIN A WETLAND AREA.

Katherine Dolsen  
DB 241/687  
TM 14/8.2  
.91 Ac.

Gregory & Betty L. Robinson  
DB 193/508  
TM 14/8.1  
1 Ac.

STREAM 2  
RIGHT HAND FORK  
LITTLE TOMS FORK



**TEMPORARY PAD NOTE:**  
GRADE PAD SITE AND STOCKPILE TOPSOIL  
INSTALL MIRAFI FABRIC AND 12" COARSE  
AGGREGATE. RETURN AREA TO ORIGINAL  
AFTER BOX CULVERT HAS BEEN INSTALLED.

Gregory L. & Betty L. Robinson  
DB 227/160  
TM 14/8  
97.35 Ac.

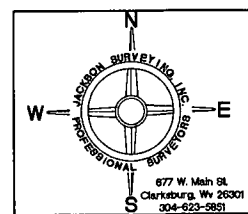
Robert V. Devericks  
DB 229/152  
TM 14/8.3  
1 Ac.

Station	Project	Drainage Type	Impact To Jurisdictional Water (Ft.)	Disturbance (Sq. Ft.)
81+00	FDR	N/A	0	13,440
81+32	Box Culvert	Stream 2 (Perennial)	50	900
83+07	Grade Ditch	Ditch 16 (JSWF)	137	548
83+56	Stone Approach	N/A	0	200
84+90	Grade Bank	Ditch (ND)	0	2,660
Total Sheet 13 Disturbed Area				17,748 Sq. Ft.
Stream 2 Perennial (50 Ft.)				0.41 Ac.
Ditch 16 (137 Ft.)				

**- GAI LEGEND -**

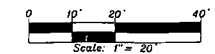
NRPW - EPHERERAL	---
RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PEM WETLAND	---
PUB HABITAT	---

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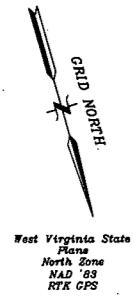
Jackson Surveying Inc.  
Plan  
Road Upgrade  
Sheet 13 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 64

NJD - NON-JURISDICTIONAL FEATURE  
JSWF - JURISDICTIONAL STORM WATER FEATURE  
FDR - FULL DEPTH RECLAMATION



**LEGEND**

Existing Grade	---
Proposed Grade	---
Fence	---x---
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LOD	---
Overhead Utility	○---
Ditch	---
Area of Interest	---
Flood Plain Area	---
Area outside of R/W	---
18" Compust Filter Stone	---

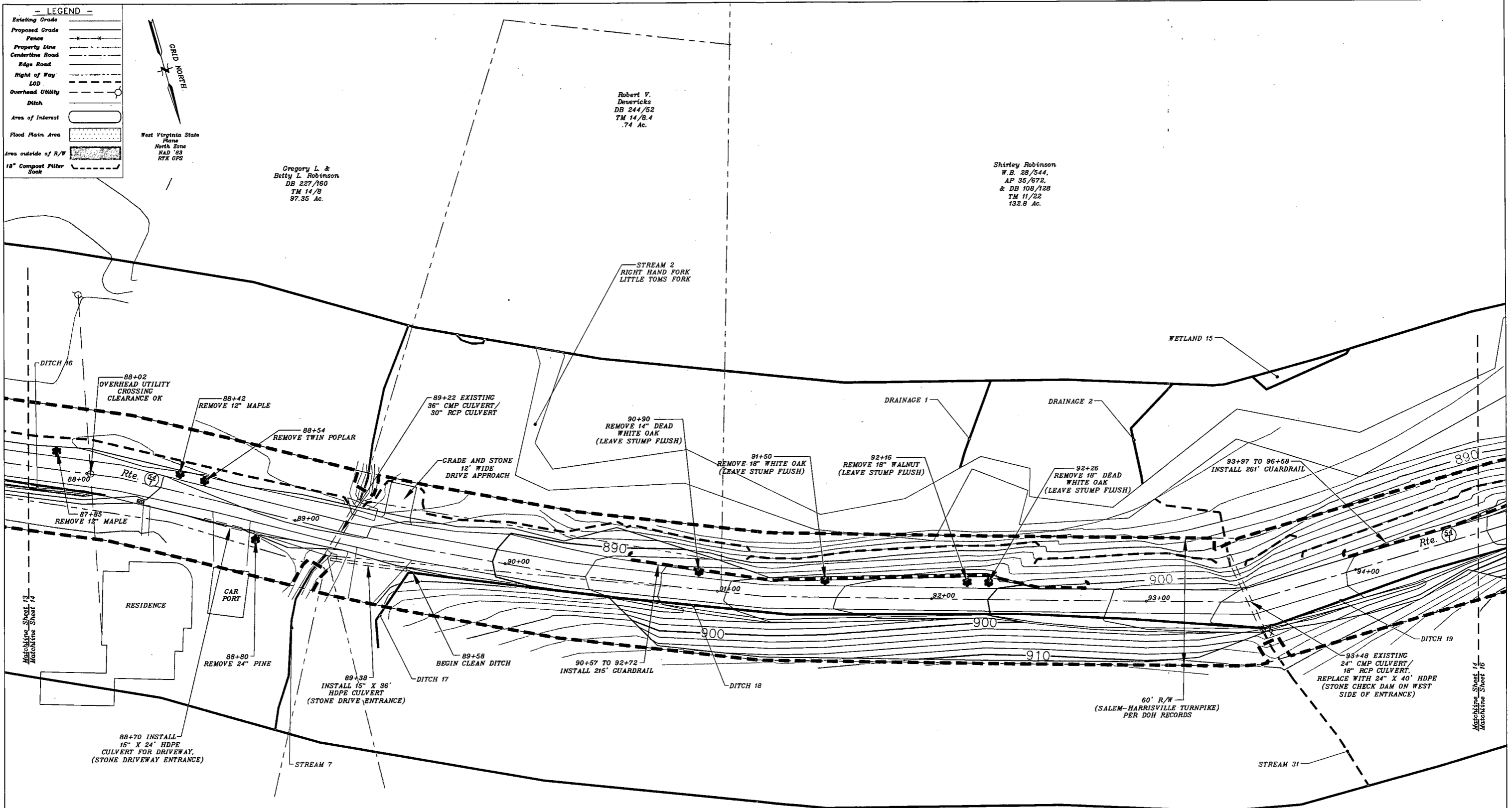


West Virginia State Plane  
North Zone  
NAD '83  
RTK GPS

Gregory L. &  
Betty L. Robinson  
DB 227/180  
TM 14/8  
97.95 Ac.

Robert V.  
Devericks  
DB 244/62  
TM 14/8.4  
.74 Ac.

Shirley Robinson  
W.B. 28/544,  
AP 35/672,  
& DB 108/128  
TM 11/22  
132.8 Ac.



Robert V.  
Devericks  
DB 229/152  
TM 14/8.3  
1 Ac.

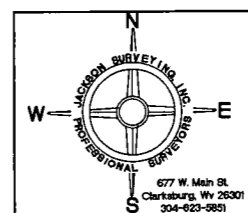
Shirley Robinson  
W.B. 28/544,  
AP 35/672,  
& DB 108/128  
TM 11/22  
132.8 Ac.

Station	Project	Drainage Type	Impact To Jurisdictional Water (Ft.)	Disturbance (Sq. Ft.)
87+72	FDR	N/A	0	13,750
87+72	Grade Ditch	Ditch (NJD)	0	150
88+70	15" HDPE	Ditch (NJD)	0	128
88+70	Stone Approach	N/A	0	200
89+38	15" HDPE	Ditch (NJD)	0	176
89+50	Stone Approach	N/A	0	200
89+60	Fill Slope	N/A	0	800
90+50	Cut Slope	Ditch (NJD)	0	6,600
93+48	24" HDPE	Stream 31 (Intermittent)	52	208
93+48	Cut Slope	Ditch (NJD)	0	950
Stream 31 Intermittent (52 Ft.)				
Total Sheet 14 Disturbed Area=				23,172 Sq. Ft. 0.53 Ac.

**GAI LEGEND**

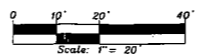
NRPW - SPERMERAL	---
RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PEM WETLAND	---
PUB HABITAT	---

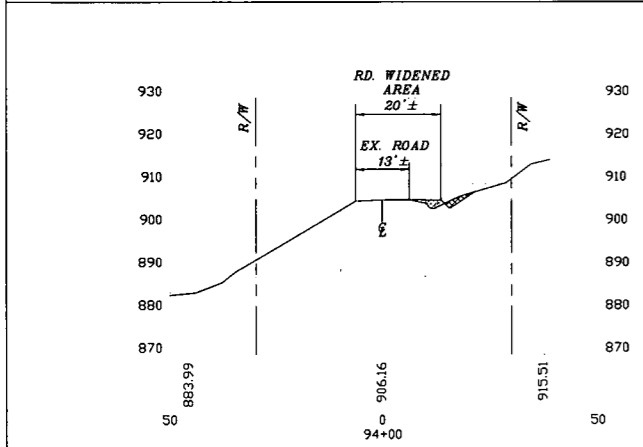
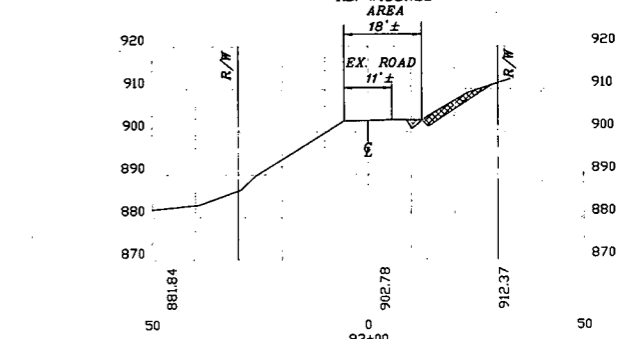
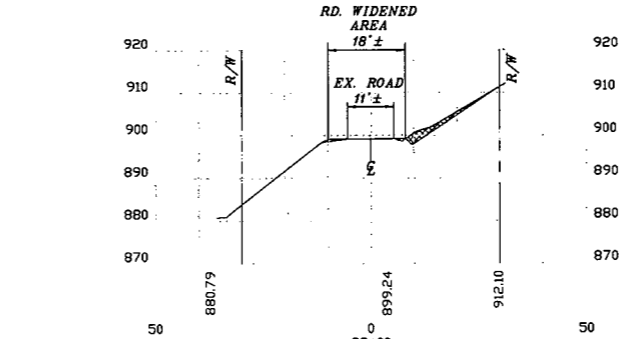
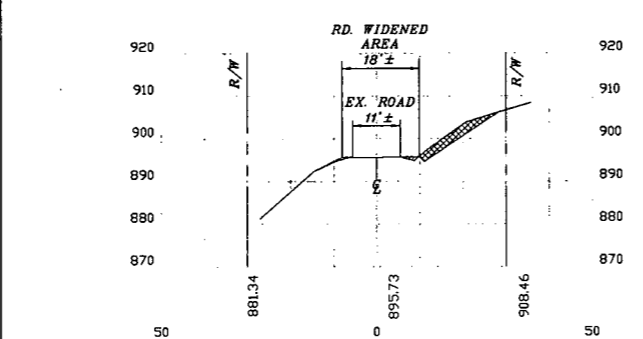
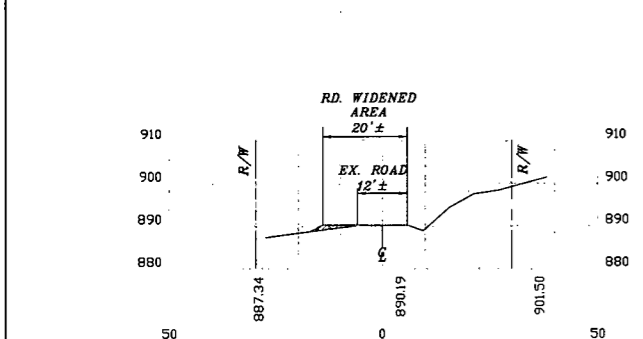
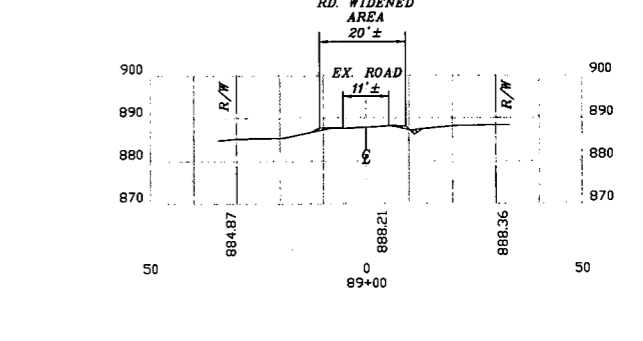
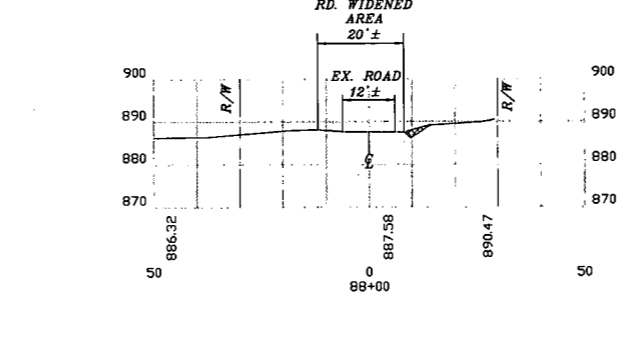
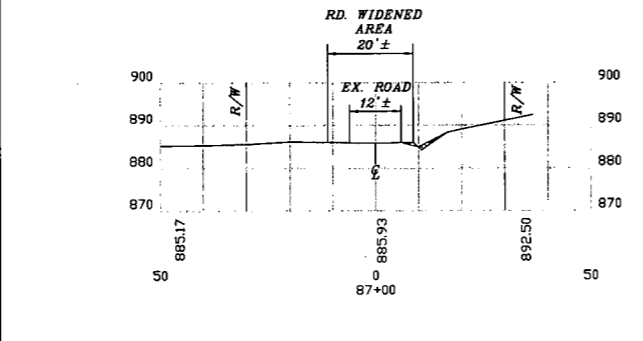
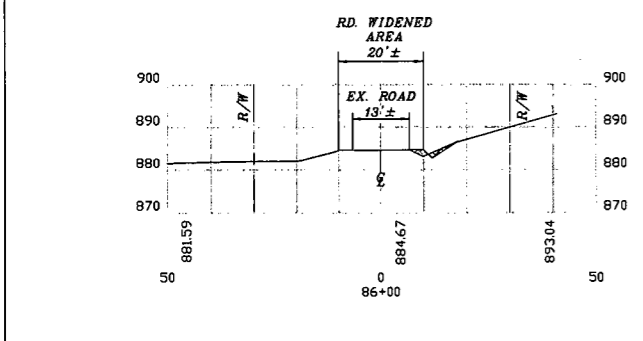
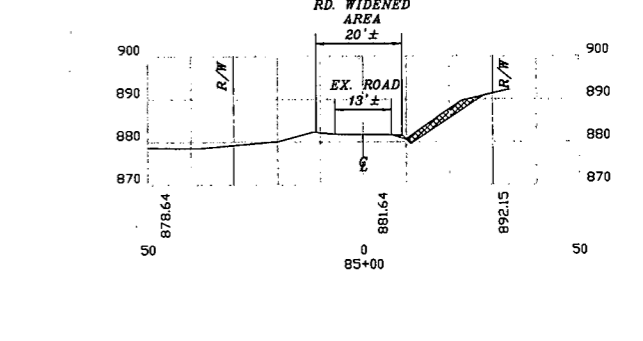
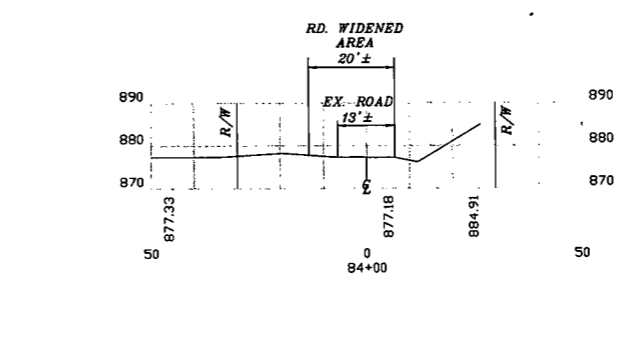
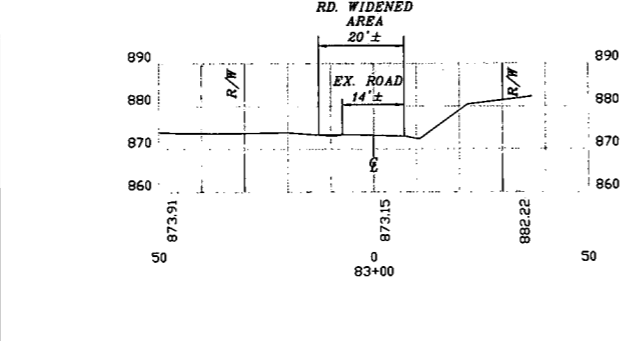
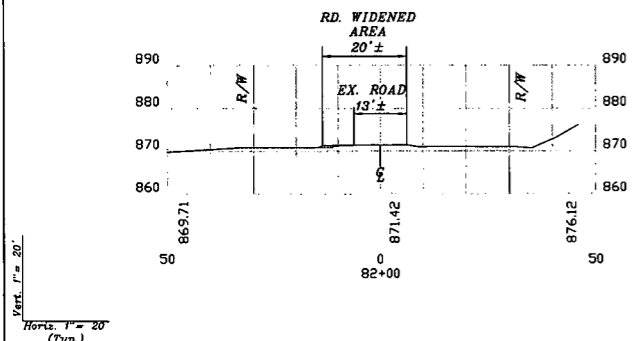
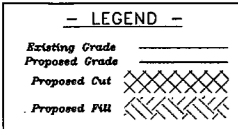
**DLF.**  
Dennis L. Fisher, RPE  
PO Box 281  
Philippi, WV 26416  
Cell: 304-677-4129  
E-Mail: Fisher.Engineering@gmail.com



Jackson Surveying Inc.  
Plan  
Road Upgrade  
Sheet 14 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 57

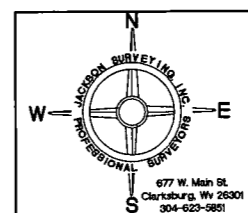
NJD - NON-JURISDICTIONAL FEATURE  
JSWF - JURISDICTIONAL STORM WATER FEATURE  
FDR - FULL DEPTH RECLAMATION





NOTE: Cut slopes are 1.5:1. Fill slopes are 2:1.  
 If cut slope is in rock, refer to Detail Sheet 5.  
 Protect all slopes with mulch or erosion fabric  
 at the direction of the project engineer.

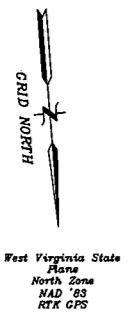
**DLF.**  
 Dennis L. Fisher, RPE  
 PO Box 281  
 Philippi, WV 26416  
 Cell: 304-677-4129  
 E-Mail: Fisher.Engineering@gmx.com



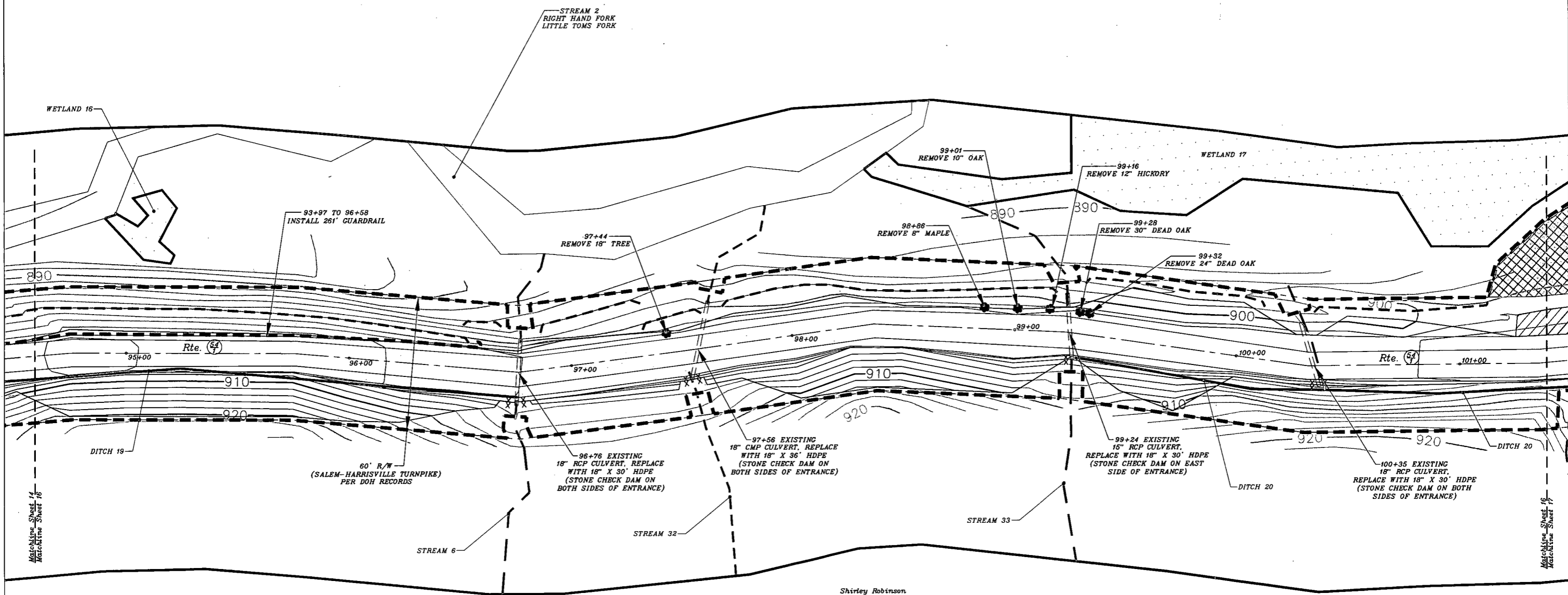
*Jackson Surveying Inc.*  
 Cross Sections  
 Road Upgrade  
 Sheet 15 of 27  
 Doddridge Co., WV Sec. Routes 13, 54, & 54

**- LEGEND -**

Existing Grade	—
Proposed Grade	—
Fence	— X —
Property Line	—
Centerline Road	—
Edge Road	—
Right of Way	—
LOD	—
Overhead Utility	—
Ditch	—
Area of Interest	—
Flood Plain Area	—
Area outside of R/W	—
18" Compust Filter Sock	—



Shirley Robinson  
 W.B. 28/544,  
 AP 35/672,  
 & DB 108/128  
 TM 11/22  
 132.8 Ac.



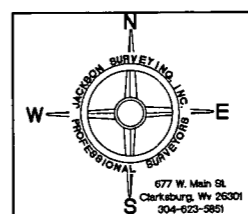
Shirley Robinson  
 W.B. 28/544,  
 AP 35/672,  
 & DB 108/128  
 TM 11/22  
 132.8 Ac.

Station	Project	Drainage Type	Impact To Jurisdictional Water (Ft.)	Disturbance (Sq. Ft.)
94+60	FDR	N/A	0	13,600
94+60	Cut Slope	Ditch (NID)	0	4,320
96+76	18" RCP	Ditch (NID)	0	152
96+76	Cut Slope	N/A	0	400
96+76	Fill Slope	N/A	0	240
97+56	18" HDPE	Stream 32 (Ephemeral)	44	176
97+56	Cut Slope	Ditch (NID)	0	3,024
97+56	Fill Slope	N/A	0	672
99+24	18" HDPE	Stream 33 (intermittent)	38	152
99+24	Cut Slope	Ditch (NID)	0	1,110
99+24	Fill Slope	N/A	0	1,332
100+35	18" HDPE	ISWF	38	152
100+35	Cut Slope	ISWF	105	525
100+35	Fill Slope	N/A	0	755
101+12	Brush Area	N/A	0	2,081
101+25	Road Widening	N/A	0	790
Total Sheet 16 Disturbed Area=				29,461 Sq. Ft.
Stream 32 Ephemeral (44 Ft.)				0.68 Ac.
Stream 33 Intermittent (38 Ft.)				
ISWF (143 Ft.)				

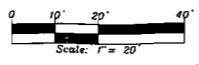
**- GAI LEGEND -**

NRPW-EPHEMERAL	---
RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PEM WETLAND	---
PUB HABITAT	---

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**Jackson Surveying Inc.**  
 Plan  
 Road Upgrade  
 Sheet 16 of 27  
 Doddridge Co., WV Sec. Routes 13, 54, & 54



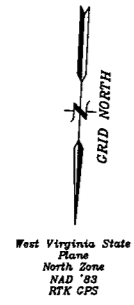
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 ISWF= JURISDICTIONAL STORM WATER FEATURE  
 FDR= FULL DEPTH RECLAMATION

Matchline Sheet 14  
 Matchline Sheet 16

Matchline Sheet 16  
 Matchline Sheet 17

**LEGEND**

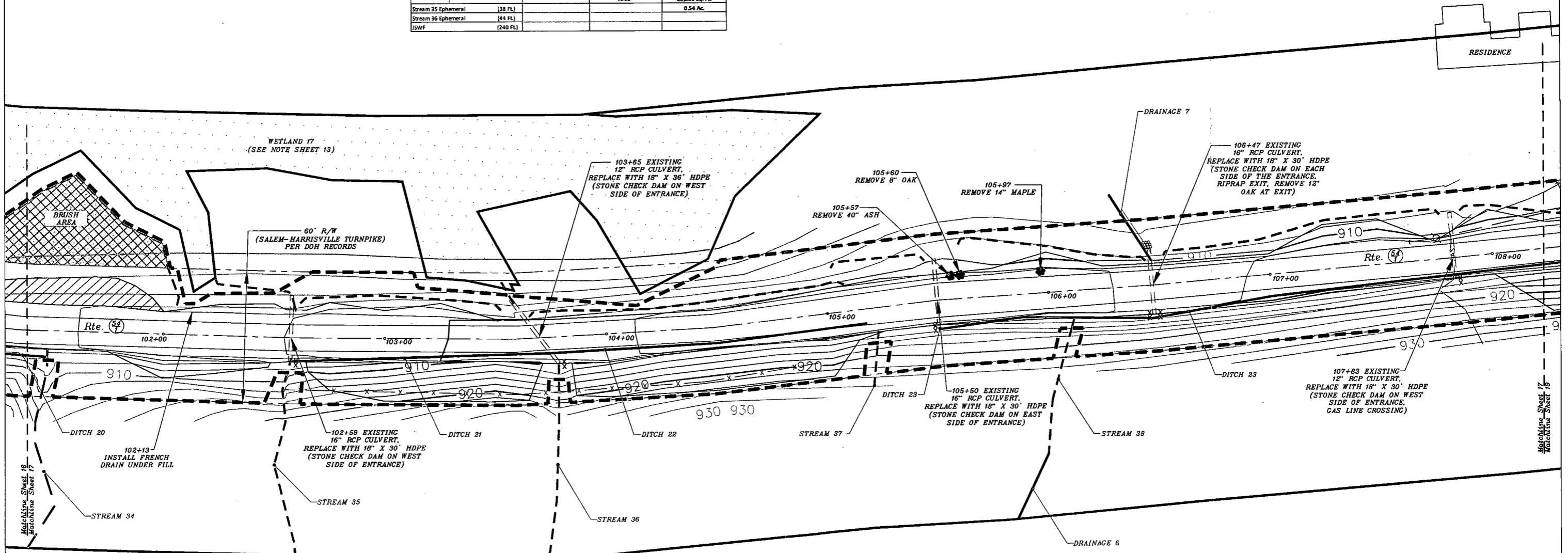
Existing Grade	---
Proposed Grade	---
Fence	---
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LOD	---
Overhead Utility	---
Ditch	---
Area of Interest	---
Flood Plain Area	---
Area outside of R/W	---
18" Compact Filter Sock	---



NJD = NON-JURISDICTIONAL FEATURE  
 JSWF = JURISDICTIONAL STORM WATER FEATURE  
 FDR = FULL DEPTH RECLAMATION

Station	Project	Drainage Type	Impact To Jurisdictional Water (Fl.)	Disturbance (Sq. Ft.)
101+40	FDR	N/A	0	13,660
101+75	Cut Slope	Ditch (NJD)	0	560
101+75	Fill Slope	N/A	0	320
102+59	18" HDPE	Stream 35 (Ephemeral)	38	152
102+59	Cut Slope	Ditch (NJD)	0	1,746
102+59	Fill Slope	N/A	0	485
103+65	18" HDPE	Stream 36 (Ephemeral)	44	176
103+65	Cut Slope	JSWF	142	2,840
103+65	Fill Slope	N/A	0	340
105+50	18" HDPE	JSWF	38	152
105+50	Grade Ditch	JSWF	60	180
105+50	Fill Slope	N/A	0	582
106+20	Grade Ditch	Ditch (NJD)	0	105
106+47	18" HDPE	Ditch (NJD)	0	152
106+47	Grade Ditch	Ditch (NJD)	0	408
106+47	Fill Slope	N/A	0	1,088
107+83	18" HDPE	Ditch (NJD)	0	152
107+83	Gas Line	N/A	0	88
107+83	Grade Ditch	Ditch (NJD)	0	114
107+83	Fill Slope	N/A	0	380
Total Sheet 17 Disturbed Area:				23,680 Sq. Ft.
Stream 35 Ephemeral (38 Fl.)				0.54 Ac.
Stream 36 Ephemeral (44 Fl.)				
JSWF (240 Fl.)				

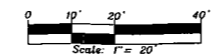
Shirley Robinson  
 W.B. 28/544,  
 AP 35/672,  
 & DB 108/128  
 TM 11/22  
 132.8 Ac.



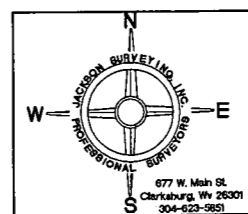
Shirley Robinson  
 W.B. 28/544,  
 AP 35/672,  
 & DB 108/128  
 TM 11/22  
 132.8 Ac.

**GAI LEGEND**

NRPW-EPHEMERAL	---
RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURES	---
NON-JURISDICTIONAL	---
PEM WETLAND	---
PUB HABITAT	---



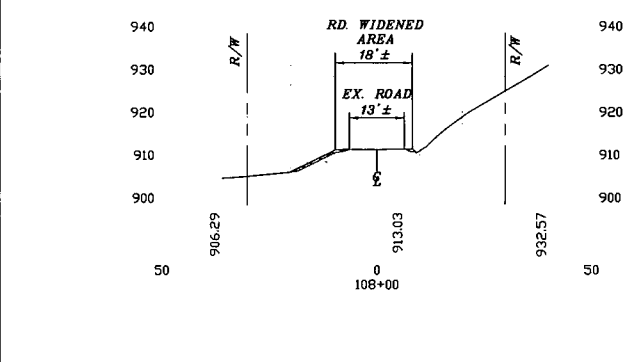
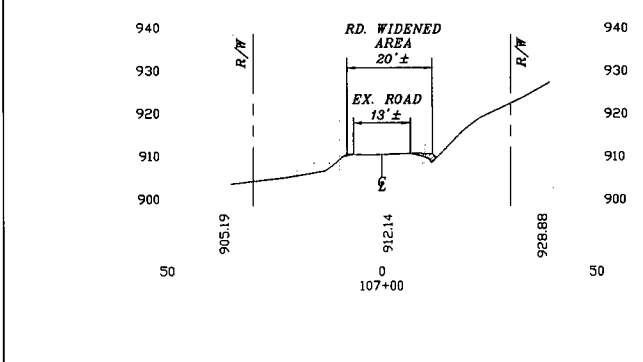
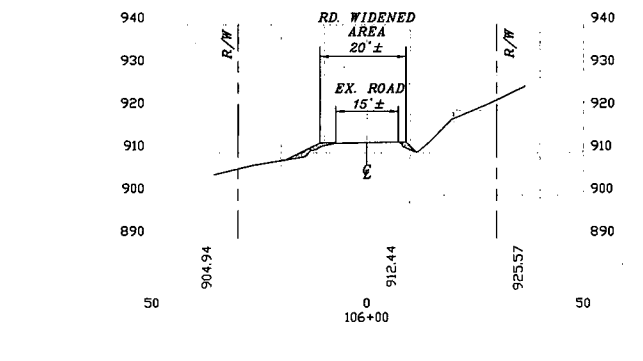
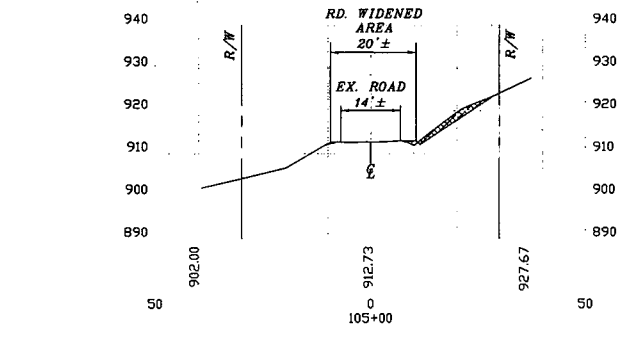
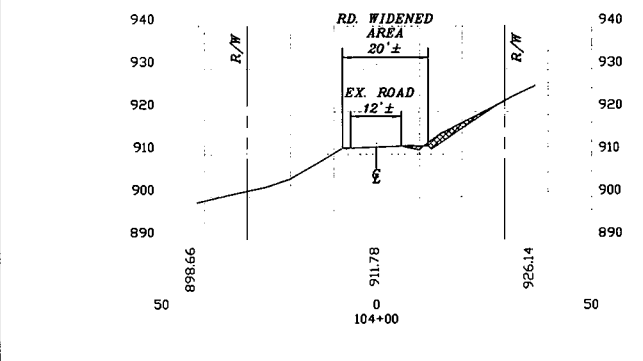
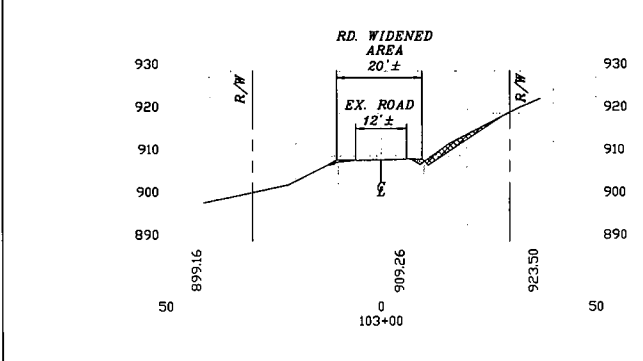
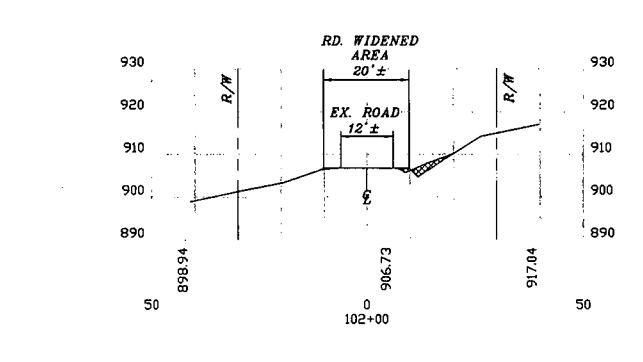
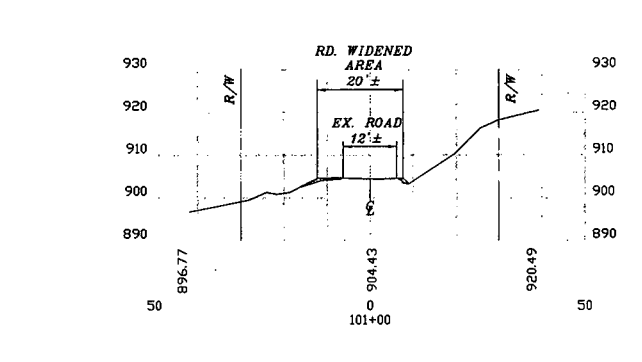
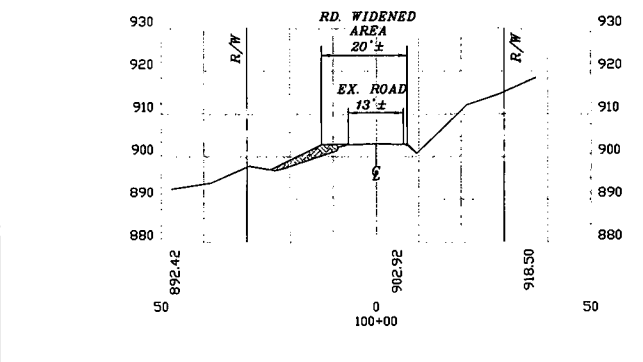
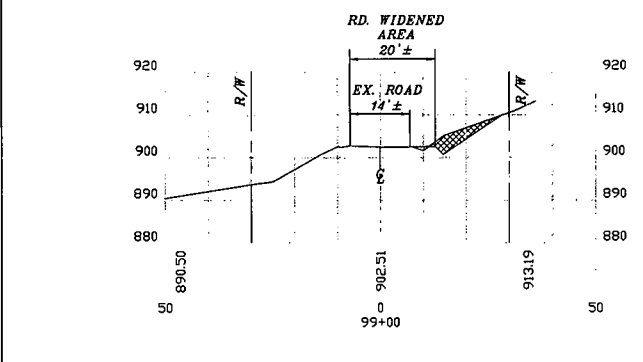
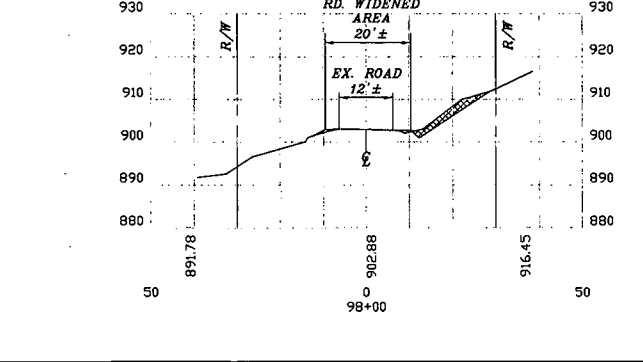
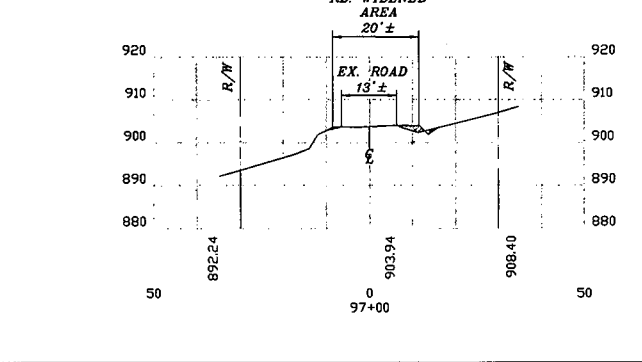
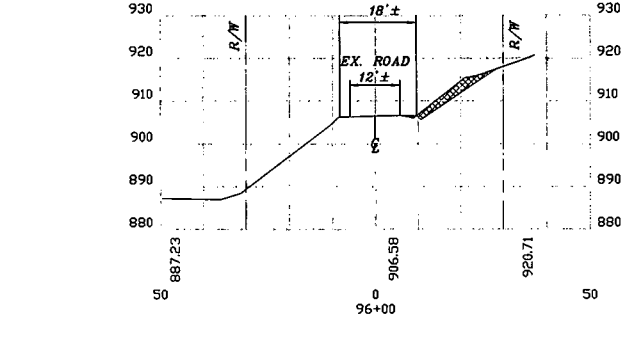
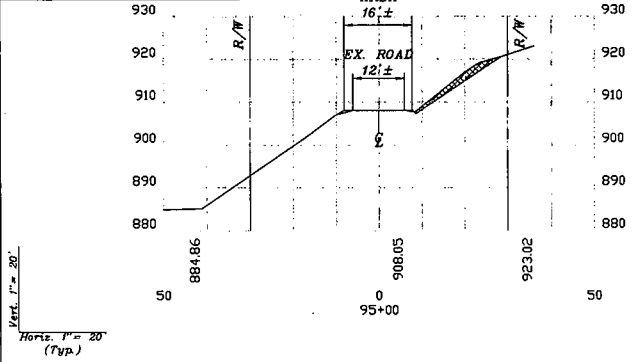
**DLF.**  
 Dennis L. Fisher, RPE  
 PO Box 281  
 Philippi, WV 26416  
 Cell: 304-677-4129  
 E-Mail: Fisher.Engineering@gmx.com



Jackson Surveying Inc.  
 Plan  
 Road Upgrade  
 Sheet 17 of 27  
 Doddridge Co., WV Sec. Routes 13, 54, & 57

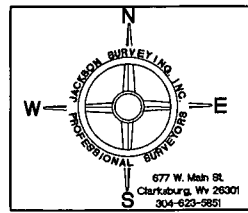
**- LEGEND -**

Existing Grade  
Proposed Grade  
Proposed Cut  
Proposed Fill



NOTE: Cut slopes are 1.5:1. Fill slopes are 2:1.  
If cut slope is in rock, refer to Detail Sheet 5.  
Protect all slopes with mulch or erosion fabric  
at the direction of the project engineer.

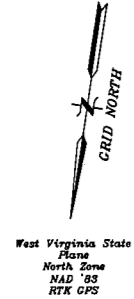
**DLF.**  
Dennis L. Fisher, RPE  
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**Jackson Surveying Inc.**  
Cross Sections  
Road Upgrade  
Sheet 18 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 57

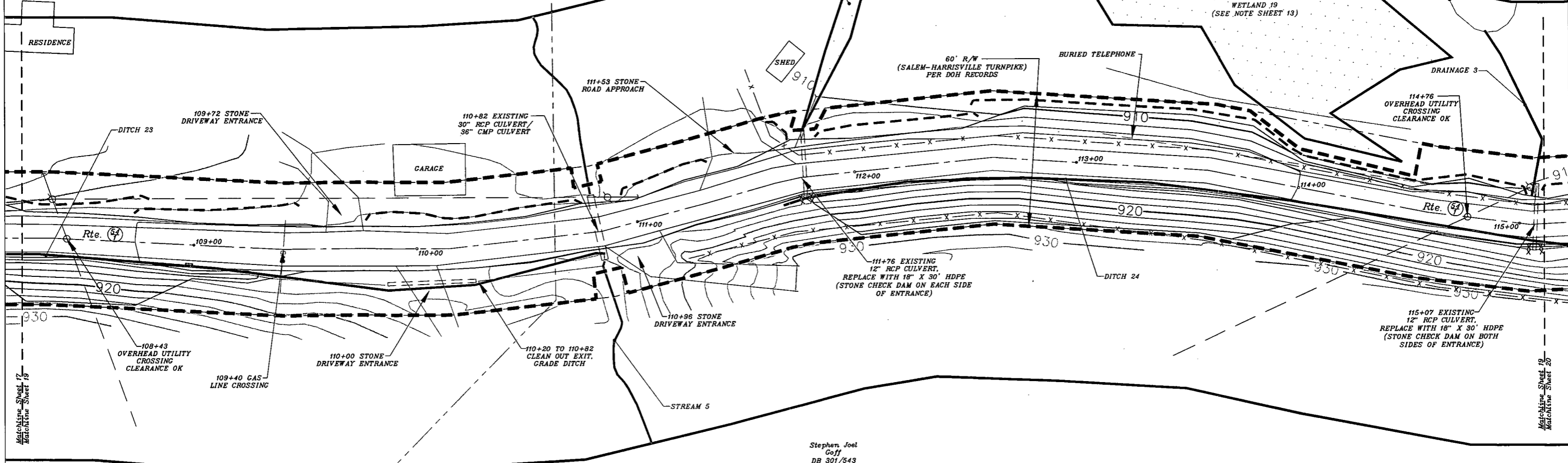
**- LEGEND -**

Existing Grade	—
Proposed Grade	—
Fence	—
Property Line	—
Centerline Road	—
Edge Road	—
Right of Way	—
LOD	—
Overhead Utility	—
Ditch	—
Area of Interest	—
Flood Plain Area	—
Area outside of R/W	—
18" Compust Filter Sock	—



Stephen Joel  
Coff  
DB 301/543  
TM 11/21  
120.04 Ac.

Shirley Robinson  
W.B. 28/544,  
AP 35/872,  
& DB 108/128  
TM 11/22  
132.8 Ac.



Stephen Joel  
Coff  
DB 301/543  
TM 11/21  
120.04 Ac.

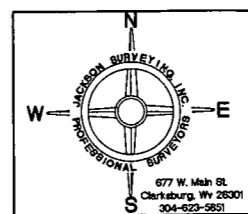
Shirley Robinson  
W.B. 28/544,  
AP 35/872,  
& DB 108/128  
TM 11/22  
132.8 Ac.

Station	Project	Drainage Type	Impact To Jurisdictional Water (Fl.)	Disturbance (Sq. Ft.)
108+23	FDR	N/A	0	13,740
108+23	Fill Slope	Ditch (NID)	0	1,440
109+72	Stone Approach	N/A	0	200
109+72	Grade Ditch	Ditch (NID)	0	120
110+00	Stone Approach	N/A	0	200
110+20	Grade Ditch	Ditch (NID)	0	165
110+96	Stone Approach	N/A	0	200
111+53	Stone Approach	N/A	0	200
111+76	18" HDPE	Ditch (NID)	0	152
111+76	Cut Slope	Ditch (NID)	0	4,320
111+76	Fill Slope	N/A	0	2,317
115+07	18" HDPE	Ditch (NID)	0	152
Total Sheet 19 Disturbed Area:				23,206 Sq. Ft. 0.53 Ac.

**- GAI LEGEND -**

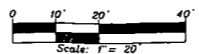
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RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURES	---
NON-JURISDICTIONAL	---
PEM WETLAND	---
PUB HABITAT	---

**DLF.**  
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**Jackson Surveying Inc.**  
Plan  
Road Upgrade  
Sheet 19 of 27  
Doddridge Co., WV Sec. Routes 13, 64, & 67

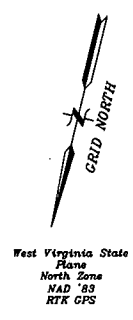
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JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION





**- LEGEND -**

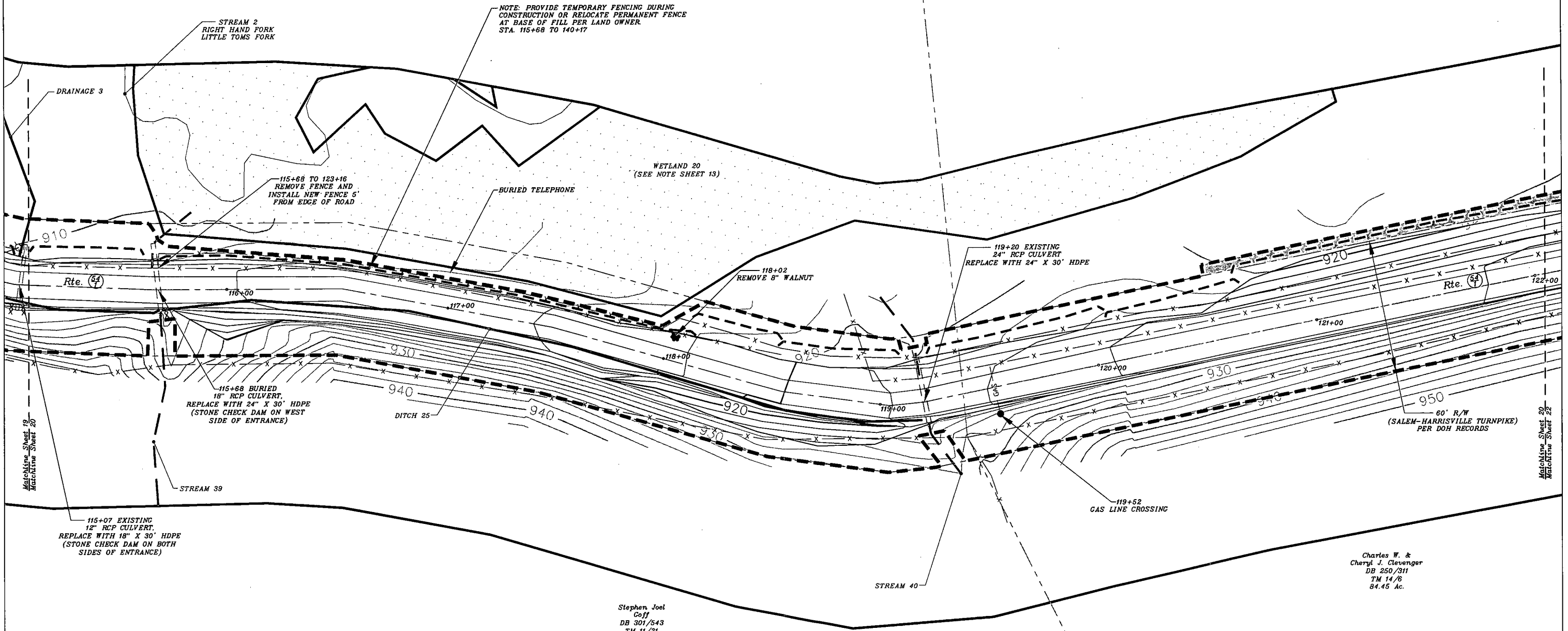
Existing Grade	—
Proposed Grade	—
Fence	— x —
Property Line	—
Centerline Road	—
Edge Road	—
Right of Way	—
LOD	—
Overhead Utility	—
Ditch	—
Area of Interest	—
Flood Plain Area	—
Area outside of R/W	—
18" Compact Filter Sock	—



Stephen Joel Coff  
DB 301/543  
TM 11/21  
120.04 Ac.

Charles Clevenger  
DB 140/171  
TM 14/7  
58.2 Ac.

NOTE: PROVIDE TEMPORARY FENCING DURING CONSTRUCTION OR RELOCATE PERMANENT FENCE AT BASE OF FILL PER LAND OWNER. STA. 115+68 TO 140+17



Matchline Sheet 19  
Matchline Sheet 20

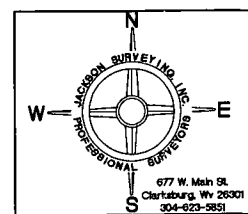
Matchline Sheet 20  
Matchline Sheet 22

Station	Project	Drainage Type	Impact To Jurisdictional Water (Ft.)	Disturbance (Sq. Ft.)
115+10	FDR	N/A	0	13,900
115+10	Grade Ditch	Ditch (NID)	0	180
115+10	Fill Slope	N/A	0	175
115+68	24" HDPE	Stream 39 (Intermittent)	38	152
115+68	Cut Slope	Ditch (NID)	0	375
115+68	Fill Slope	N/A	0	720
116+00	Cut Slope	Ditch (NID)	0	2,660
119+20	24" HDPE	Stream 40 (Intermittent)	38	152
119+20	Grade Ditch	Ditch (NID)	0	825
119+20	Fill Slope	N/A	0	2,520
Total Sheet 20 Disturbed Area:				21,659 Sq. Ft.
				0.50 Ac.
Stream 39 Intermittent (38 Ft.)				
Stream 40 Intermittent (38 Ft.)				

**- GAI LEGEND -**

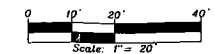
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RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PBM WETLAND	---
PUB HABITAT	---

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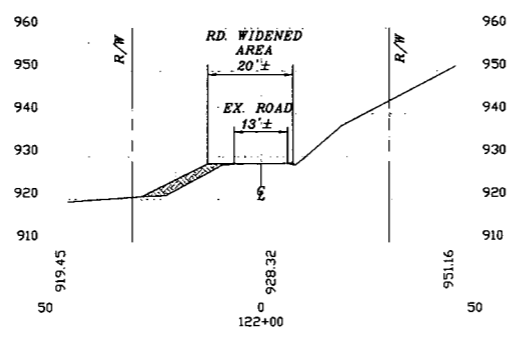
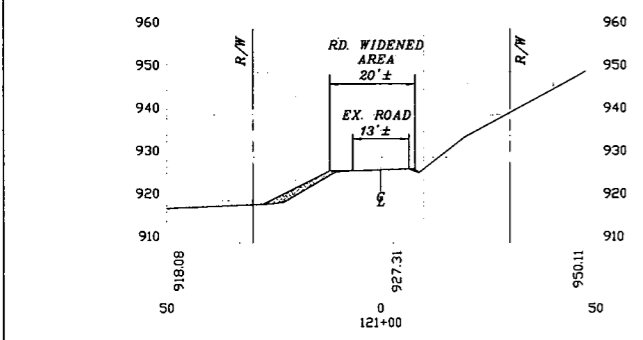
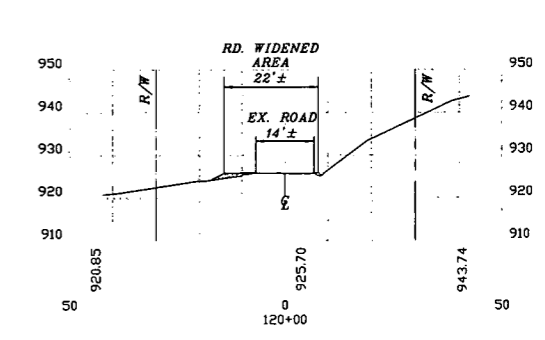
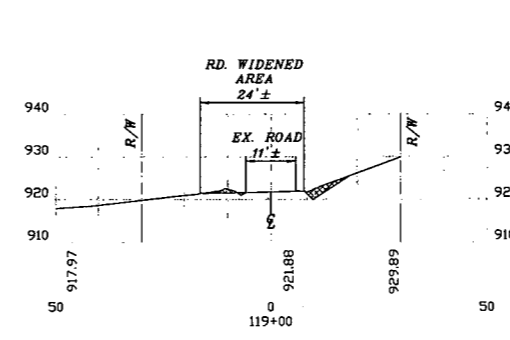
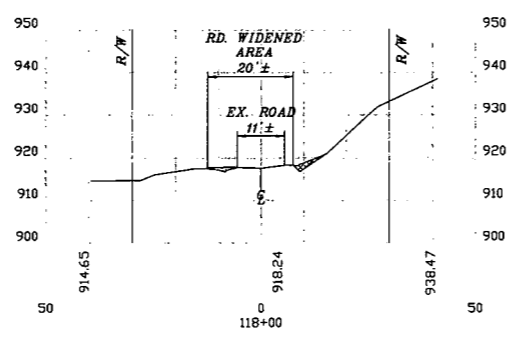
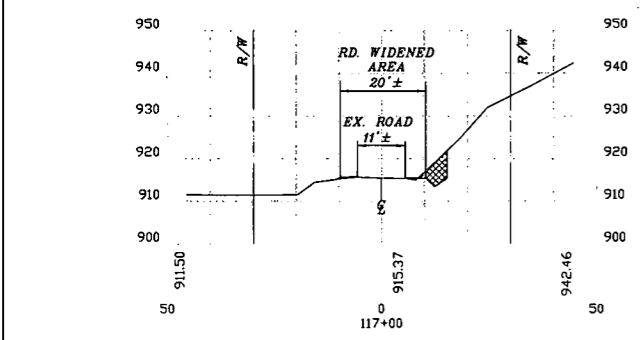
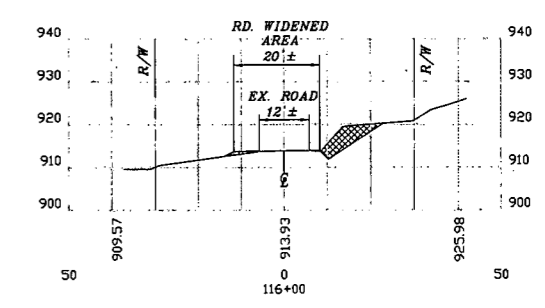
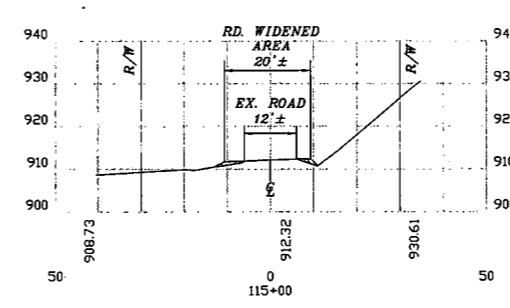
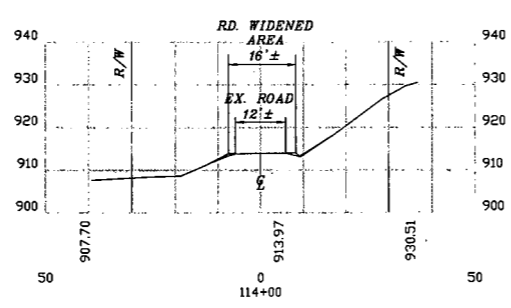
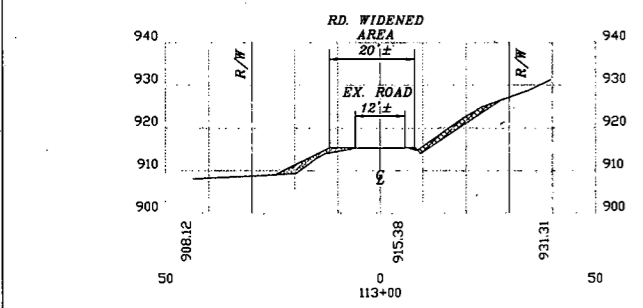
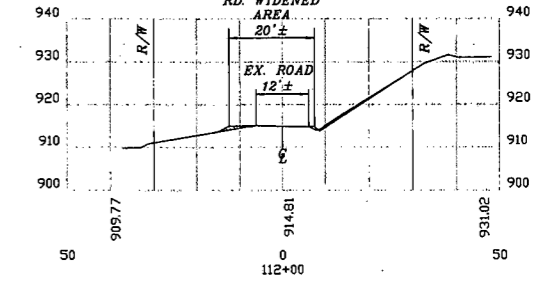
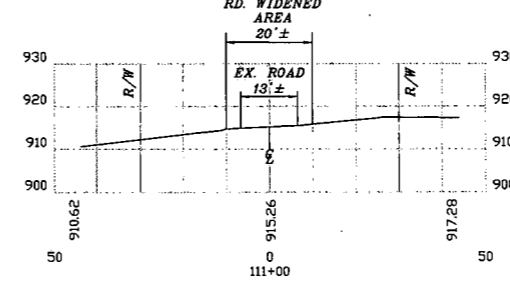
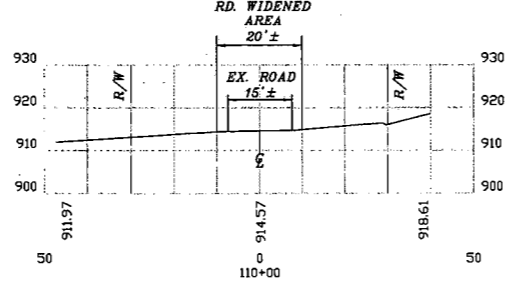
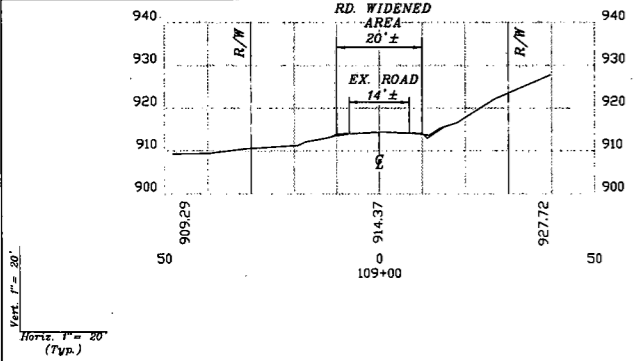
**Jackson Surveying Inc.**  
Plan  
Road Upgrade  
Sheet 20 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 57

NID= NON-JURISDICTIONAL FEATURE  
JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION



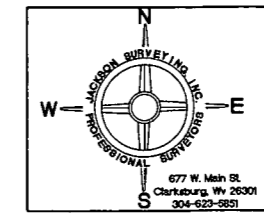
— LEGEND —

Existing Grade  
Proposed Grade  
Proposed Cut  
Proposed Fill



NOTE: Cut slopes are 1.5:1. Fill slopes are 2:1.  
If cut slope is in rock, refer to Detail Sheet 5.  
Protect all slopes with mulch or erosion fabric  
at the direction of the project engineer.

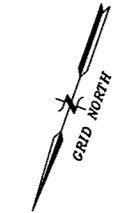
DLF.  
Dennis L. Fisher, RPE  
PO Box 281  
Philippi, WV 26416  
Cell: 304-677-4129  
E-Mail: Fisher.Engineering@gmx.com



Jackson Surveying Inc.  
Cross Sections  
Road Upgrade  
Sheet 21 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 57

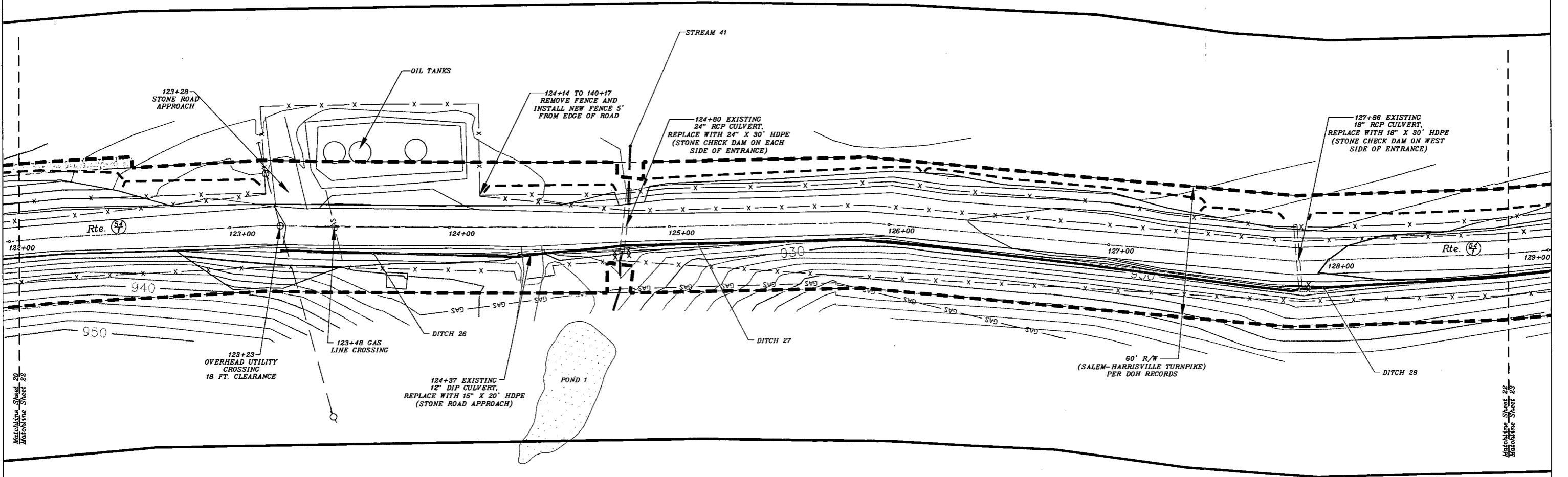
**- LEGEND -**

Existing Grade	---
Proposed Grade	---
Fence	-x-x-
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LOD	---
Overhead Utility	○
Ditch	---
Area of Interest	○
Flood Plain Area	▨
Area outside of R/W	▨
18" Compact Filter Sock	---



West Virginia State Plane  
North Zone  
NAD '83  
RTK GPS

Charles Clevenger  
DB 140/171  
TM 14/7  
58.2 Ac.



Charles W. & Cheryl J. Clevenger  
DB 250/311  
TM 14/6  
84.45 Ac.

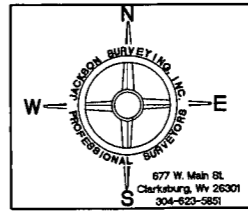
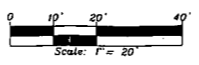
Station	Project	Drainage Type	Impacted to Jurisdictional Water (Ft.)	Disturbance (Sq. Ft.)
122+05	FDR	N/A	0	13,540
122+05	Grade Ditch	Ditch (NJD)	0	210
122+05	Fill Slope	N/A	0	690
122+80	Cut Slope	Ditch (NJD)	0	1,080
123+28	Stone Approach	N/A	0	200
123+28	Grade Ditch	Ditch (NJD)	0	456
124+37	15" HDPE	Ditch (NJD)	0	84
124+37	Stone Approach	N/A	0	200
124+80	24" HDPE	Stream 41 (Intermittent)	38	152
124+80	Grade Ditch	Ditch (NJD)	0	918
124+80	Fill Slope	N/A	0	2,448
127+86	18" HDPE	Ditch (NJD)	0	152
127+86	Grade Ditch	Ditch (NJD)	0	279
127+86	Fill Slope	N/A	0	372
Total Sheet 22 Disturbed Area=				20,781 Sq. Ft.
Stream 41 Intermittent (38 Ft.)				0.48 Ac.

**- GAI LEGEND -**

NRPW-EPHEMERAL	---
RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PBM WETLAND	▨
PUB HABITAT	▨

NJD= NON-JURISDICTIONAL FEATURE  
JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION

**DLF.**  
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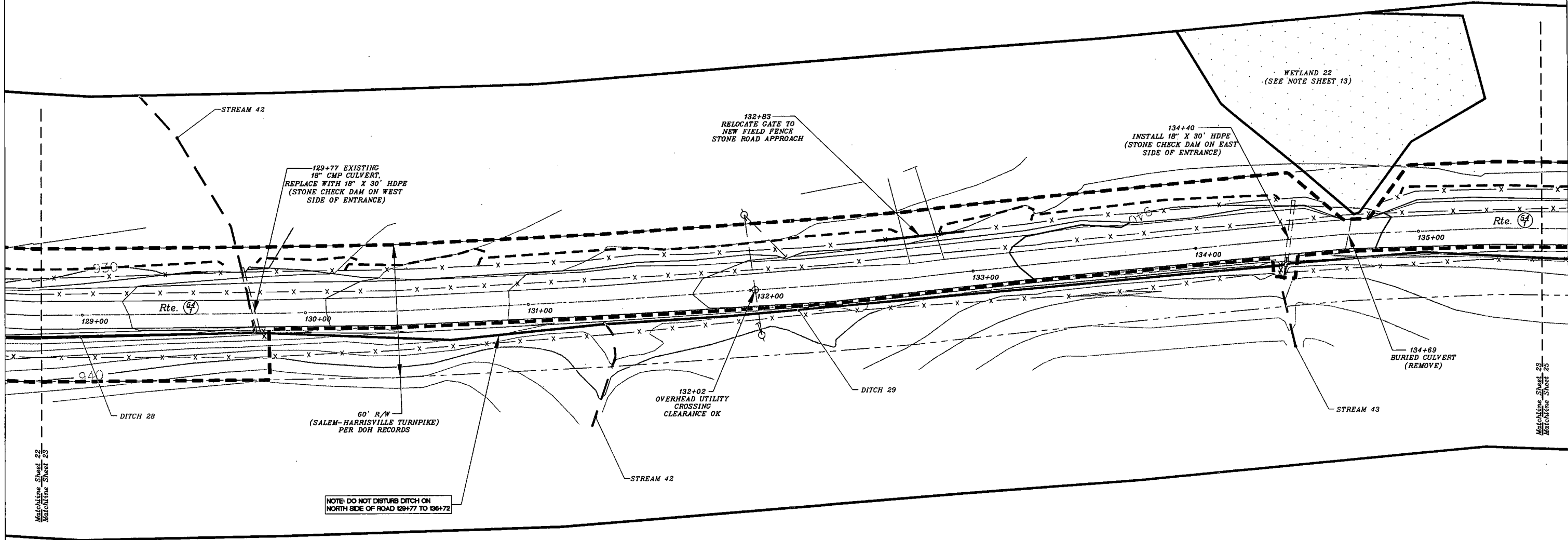
**Jackson Surveying Inc.**  
Plan  
Road Upgrade  
Sheet 22 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 54

**- LEGEND -**

Existing Grade	---
Proposed Grade	---
Fence	-x-x-
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LOD	---
Overhead Utility	○---
Ditch	---
Area of Interest	○
Flood Plain Area	▨
Area outside of R/W	▨
18" Compust Filter Stone	▨



Charles Clevenger  
DB 140/171  
TM 14/7  
58.2 Ac.



NOTE: DO NOT DISTURB DITCH ON NORTH SIDE OF ROAD 129+77 TO 130+72

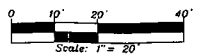
Charles W. & Cheryl J. Clevenger  
DB 250/311  
TM 14/6  
84.45 Ac.

Station	Project	Drainage Type	Impact To Jurisdictional Water (Ft.)	Disturbance (Sq. Ft.)
128+82	FDR	N/A	0	13,460
128+82	Grade Ditch	Ditch (N/D)	0	285
129+77	18" HDPE	Stream 42 (Intermittent)	38	152
129+77	Stone Check	JSWF	4	12
129+77	Fill Slope	N/A	0	1,120
132+83	Stone Approach	N/A	0	200
132+90	Fill Slope	N/A	0	620
134+40	18" HDPE	Stream 43 (Intermittent)	38	152
134+40	Stone Check	JSWF	4	12
134+80	Fill Slope	N/A	0	260
Total Sheet 23 Disturbed Area:				16,273 Sq. Ft.
				0.37 Ac.
Stream 42 Intermittent (38 Ft.)				
Stream 43 Intermittent (38 Ft.)				
JSWF (8 Ft.)				

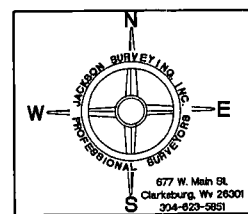
N/D= NON-JURISDICTIONAL FEATURE  
JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION

**- GAI LEGEND -**

NRPW-EPHEMERAL	---
RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PEM WETLAND	▨
PUB HABITAT	▨



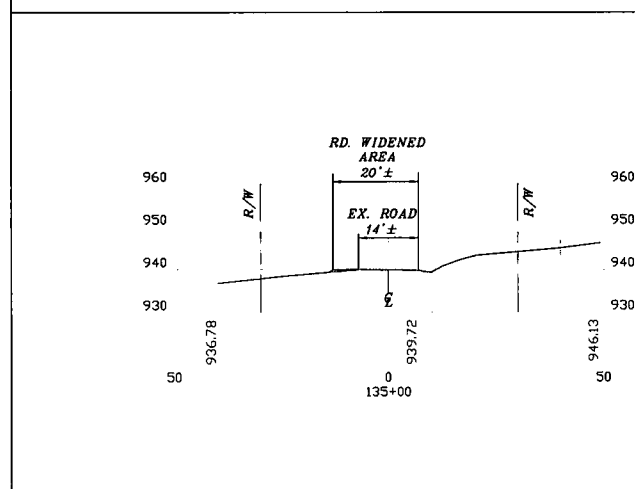
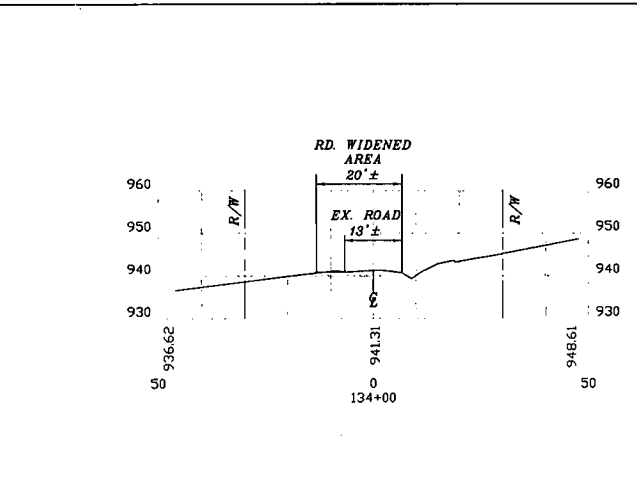
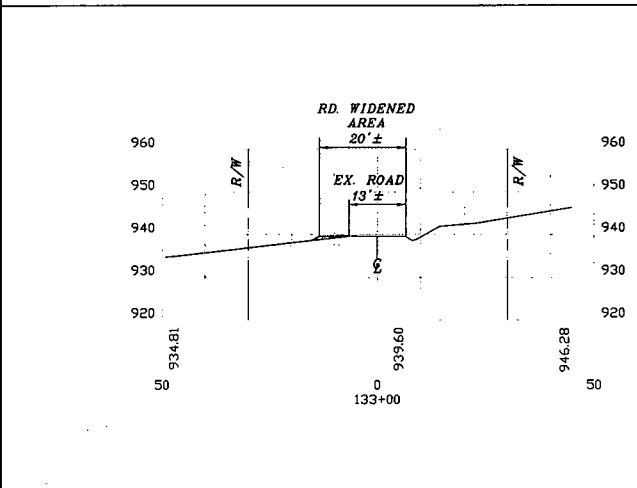
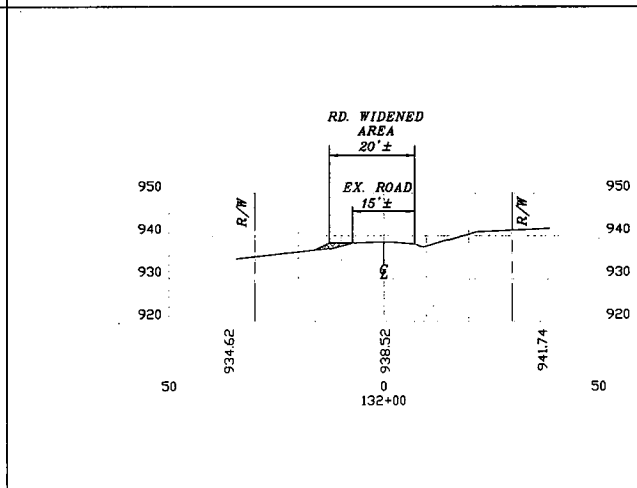
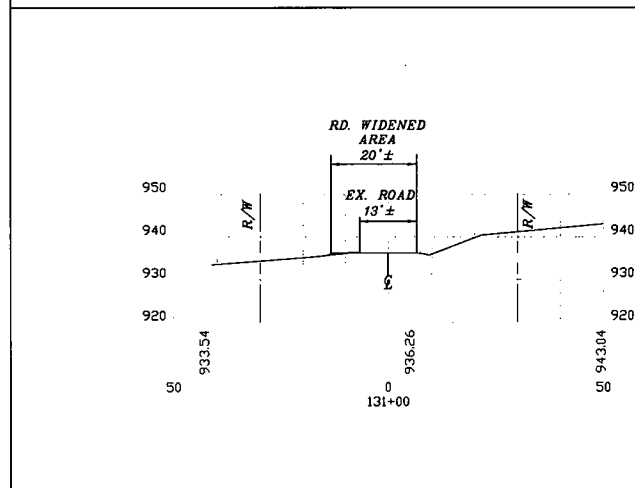
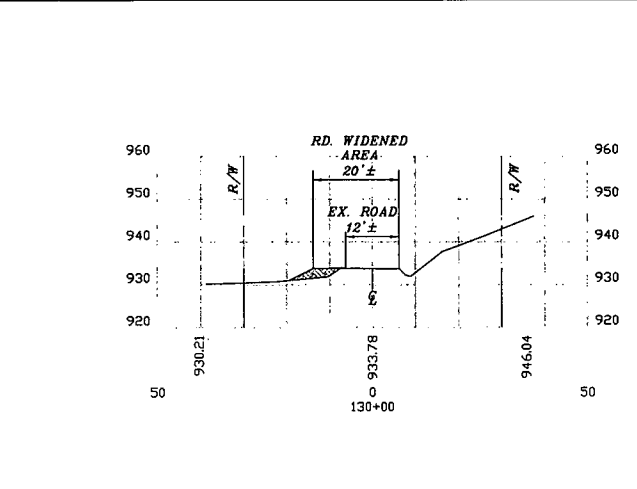
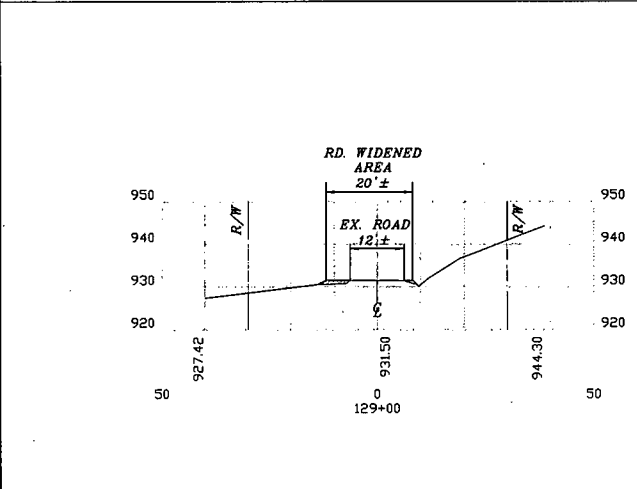
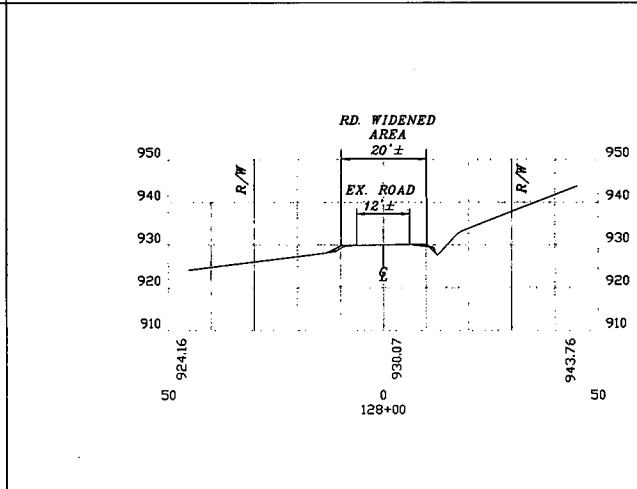
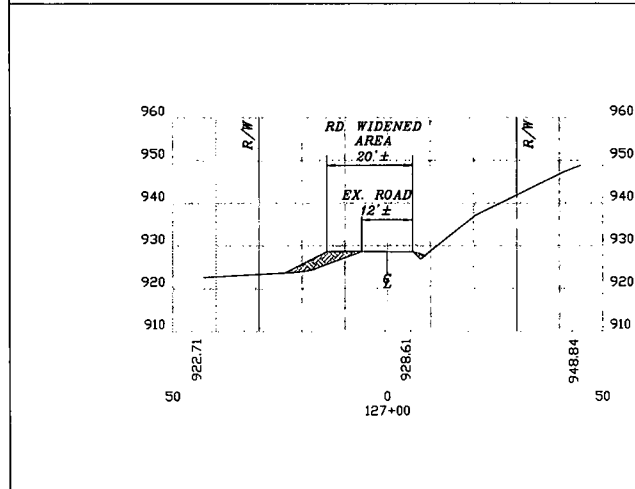
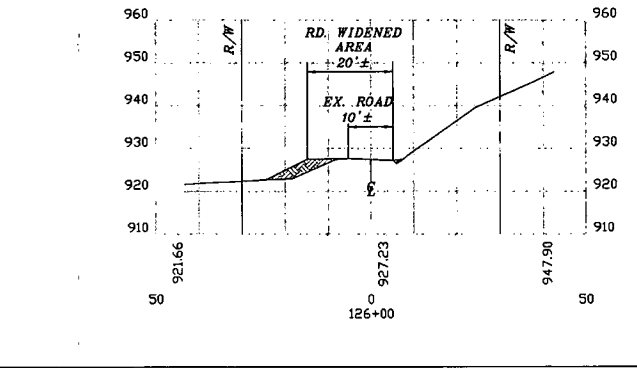
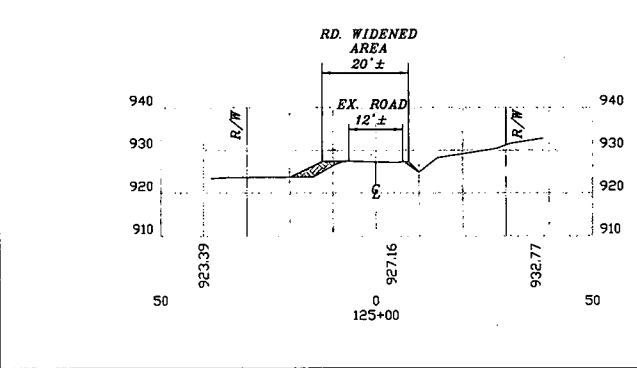
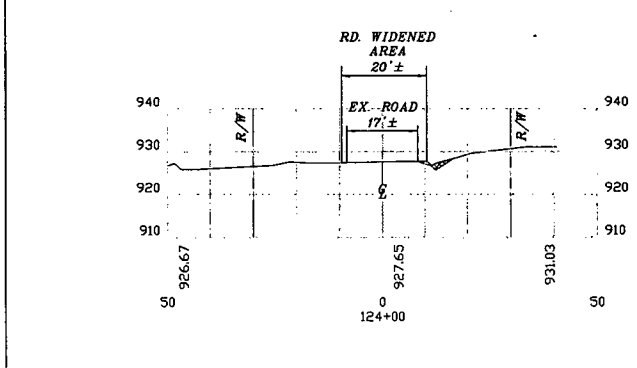
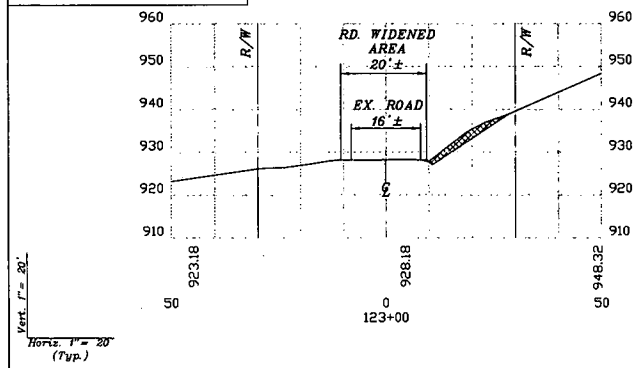
**DLF.**  
Dennis L. Fisher, RPE  
PO Box 281  
Philippi, WV 26416  
Cell: 304-677-4129  
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Jackson Surveying Inc.  
Plan  
Road Upgrade  
Sheet 23 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 64

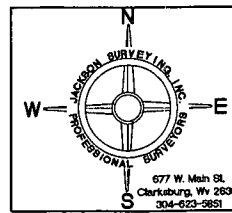
**— LEGEND —**

Existing Grade  
Proposed Grade  
Proposed Cut  
Proposed Fill



NOTE: Cut slopes are 1.5:1. Fill slopes are 2:1.  
If cut slope is in rock, refer to Detail Sheet 5.  
Protect all slopes with mulch or erosion fabric  
at the direction of the project engineer.

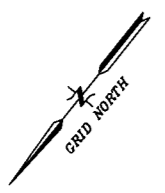
**DLF.**  
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Cell: 304-677-4129  
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**Jackson Surveying Inc.**  
Cross Sections  
Road Upgrade  
Sheet 24 of 27  
Doddrige Co., WV Sec. Routes 13, 54, & 57

**- LEGEND -**

Existing Grade	---
Proposed Grade	---
Fence	---
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LOD	---
Overhead Utility	---
Ditch	---
Area of Interest	---
Flood Plain Area	---
Area outside of R/W	---
18" Compast Filter Spack	---

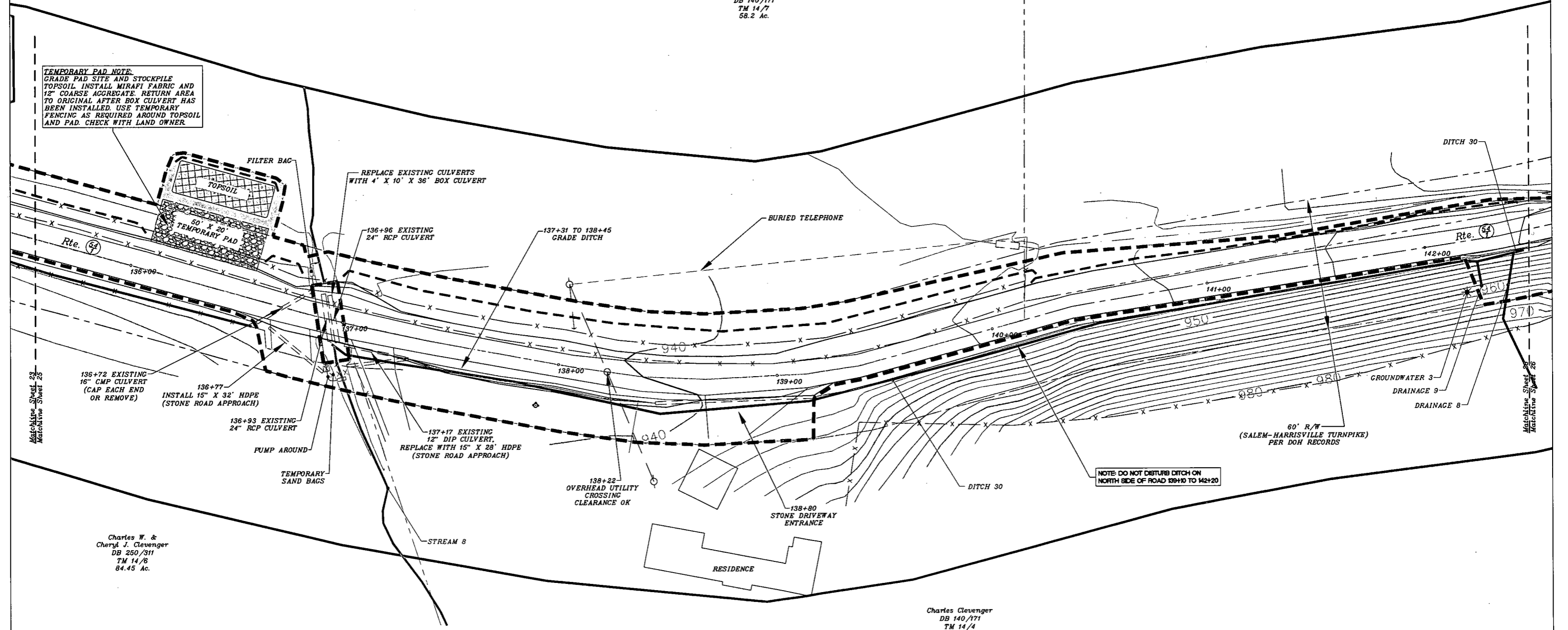


West Virginia State  
Plane  
North Zone  
NAD '83  
RTK CFS

Kermit C. Jr. &  
Helen Hines  
DB 166/765  
TM 14/11  
59.1 Ac.

Charles Clevenger  
DB 140/171  
TM 14/7  
58.2 Ac.

**TEMPORARY PAD NOTE:**  
GRADE PAD SITE AND STOCKPILE  
TOPSOIL. INSTALL MIRAFI FABRIC AND  
12" COARSE AGGREGATE. RETURN AREA  
TO ORIGINAL AFTER BOX CULVERT HAS  
BEEN INSTALLED. USE TEMPORARY  
FENCING AS REQUIRED AROUND TOPSOIL  
AND PAD. CHECK WITH LAND OWNER.



Matchline Sheet 25  
Matchline Sheet 26

Matchline Sheet 25  
Matchline Sheet 26

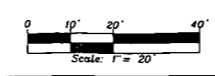
Charles W. &  
Cheryl J. Clevenger  
DB 250/311  
TM 14/6  
84.45 Ac.

Charles Clevenger  
DB 140/171  
TM 14/4  
94.56 Ac.

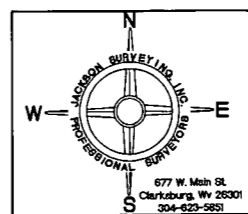
Station	Project	Drainage Type	Impact To Jurisdictional Water (Ft.)	Disturbance (Sq. Ft.)
135+65	FDR	N/A	0	13,860
136+10	Pad and Topsoil	N/A	0	2,050
136+77	15" HDPE	JSWF	40	160
136+93	Box Culvert	Stream 8 (Perennial)	60	1,080
137+00	Grade Ditch	JSWF	115	345
137+00	15" HDPE	JSWF	36	144
138+50	Stone Approach	N/A	0	200
142+16	Grade Ditch	Ditch (ND)	0	90
Total Sheet 25 Disturbed Area:				17,929 Sq. Ft.
				0.41 Ac.
Stream 8 Perennial (60 Ft.)				
JSWF (191 Ft.)				

**- GAI LEGEND -**

NRPW-EPHEMERAL	---
RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURE	---
NON-JURISDICTIONAL	---
PBM WETLAND	---
PUB HABITAT	---



**DLF.**  
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Jackson Surveying Inc.  
Plan  
Road Upgrade  
Sheet 25 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 64

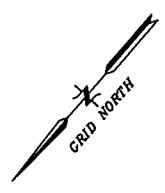
NJD= NON-JURISDICTIONAL FEATURE  
JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION

NOTE: DO NOT DISTURB DITCH ON  
NORTH SIDE OF ROAD 139+00 TO 142+20

60' R/W  
(SALEM-HARRISVILLE TURNPIKE)  
PER DOH RECORDS

**- LEGEND -**

Existing Grade	---
Proposed Grade	---
Fence	-x-x-
Property Line	---
Centerline Road	---
Edge Road	---
Right of Way	---
LOD	---
Overhead Utility	○
Ditch	---
Area of Interest	---
Flood Plain Area	---
Area outside of R/W	---
18" Compact Filter Sock	---

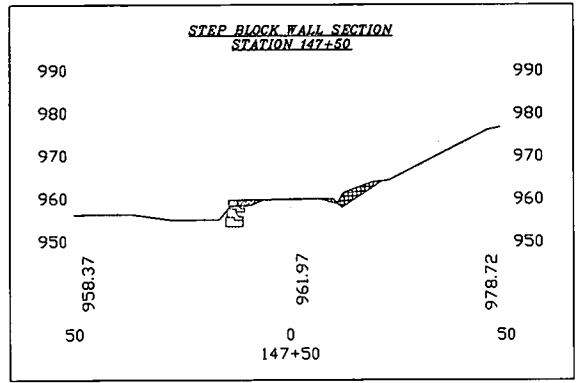
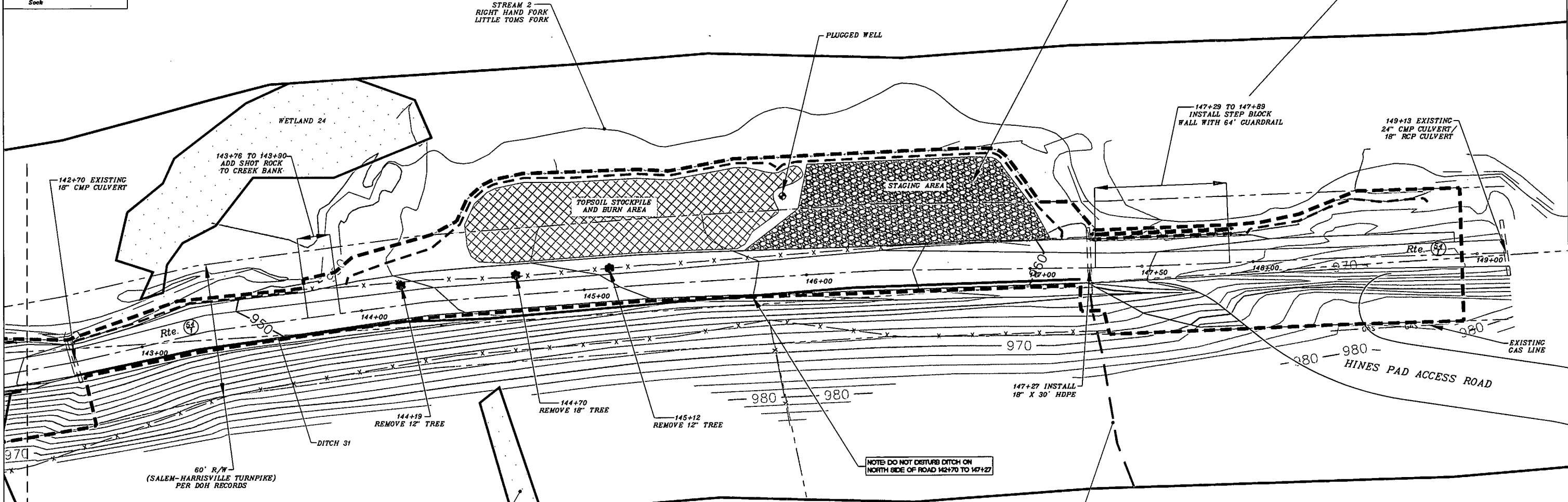


West Virginia State  
Plane  
North Zone  
NAD '83  
RTK GPS

Kernit C. Jr. &  
Helen Hines  
DB 166/765  
TM 14/11  
59.1 Ac.

**STAGING AREA NOTE:**  
REMOVE TOPSOIL AND  
PLACE FILL TO GRADE.  
ADD FABRIC AND STONE.

**NOTE:**  
CONTRACTOR MAY SUBSTITUTE AN  
ALTERNATIVE TO STEP BLOCKS SHOWN  
(SEE DETAILS ON SHEET 5). CONTRACTOR  
SHALL OBTAIN APPROVAL FROM DOH FOR  
GUARDRAIL PLACEMENT ON THE  
ALTERNATIVE WALL.



Kernit C. Jr. &  
Helen Hines  
DB 157/220  
TM 14/5  
19.5 Ac.

Charles Clevenger  
DB 140/171  
TM 14/4  
94.56 Ac.

Station	Project	Drainage Type	Impact To Jurisdictional Water (Ft.)	Disturbance (Sq. Ft.)
142+48	FDR	N/A	0	12,840
142+48	Grade Ditch	Ditch (NJD)	0	60
143+76	Creek Bank	Stream 2 (Perennial)	14	84
144+50	Topsoil	N/A	0	4,615
145+90	Staging	N/A	0	4,069
147+27	18" HDPE	Stream 44 (Intermittent)	38	152
147+27	Cut Slope	Ditch (NJD)	0	400
147+27	Wall	Stream 2 (Perennial)	68	272

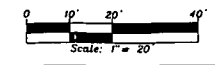
Total Sheet 26 Disturbed  
Area = 22,492 Sq. Ft.  
0.52 Ac.

Stream 2 Perennial	(82 Ft.)
Stream 44 Intermittent	(38 Ft.)

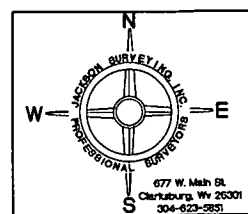
NJD= NON-JURISDICTIONAL FEATURE  
JSWF= JURISDICTIONAL STORM WATER FEATURE  
FDR= FULL DEPTH RECLAMATION

**- GAI LEGEND -**

ERP-EPHEMERAL	---
RPW INTERMITTENT	---
RPW PERENNIAL	---
JURISDICTIONAL STORMWATER FEATURES	---
NON-JURISDICTIONAL	---
PEM WETLAND	---
PUB HABITAT	---

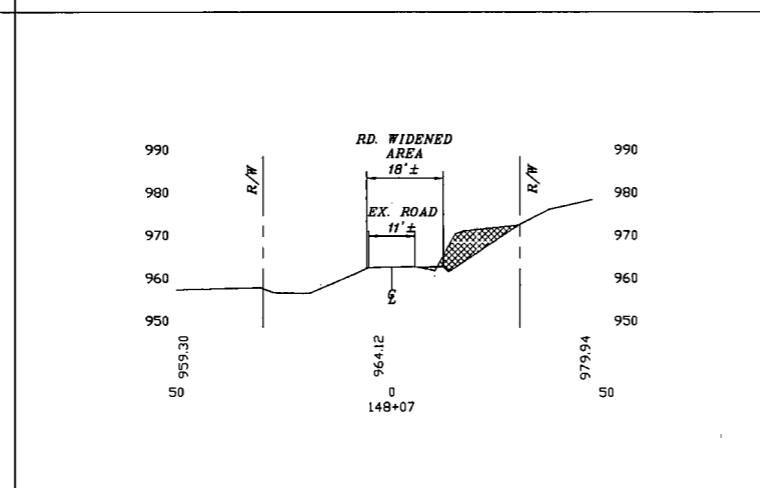
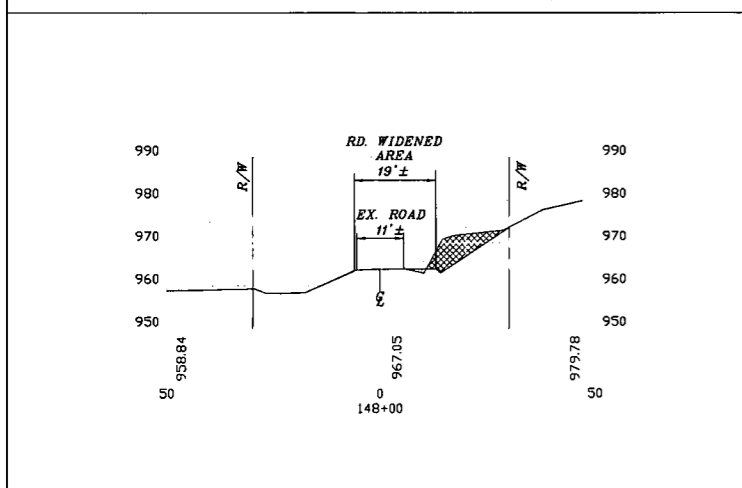
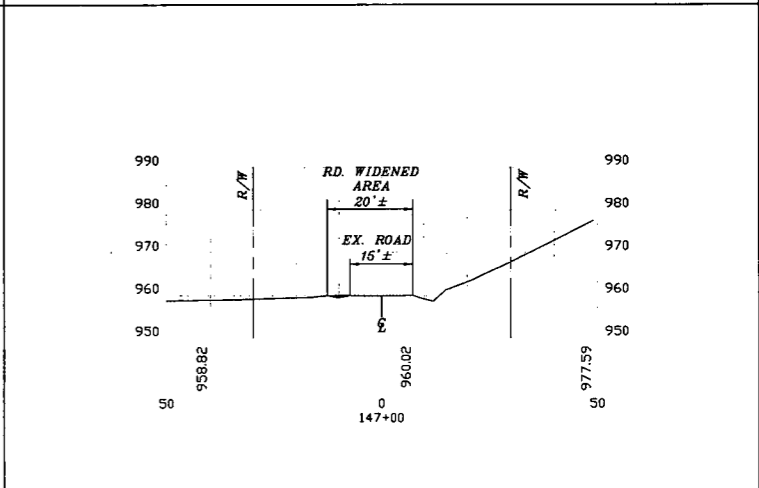
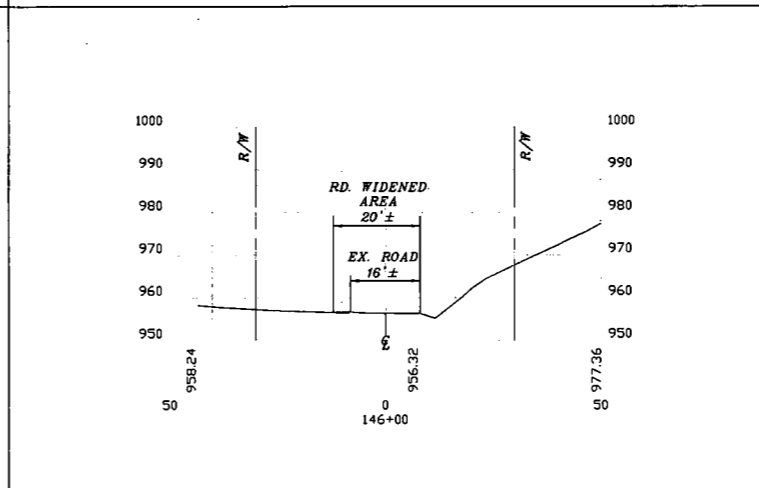
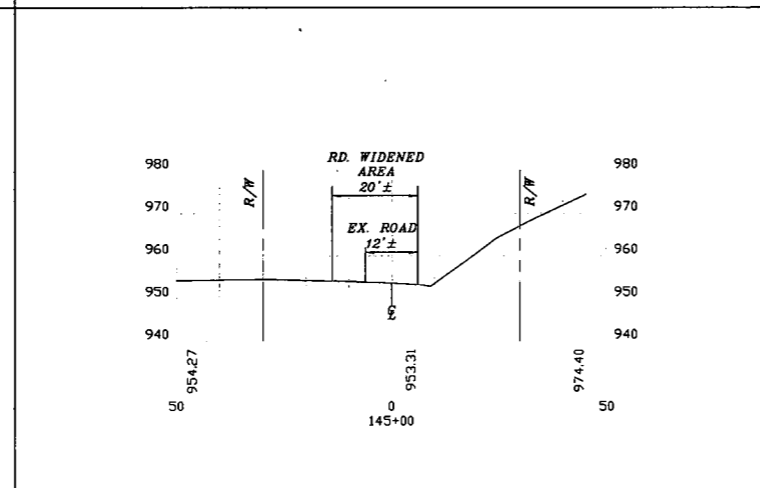
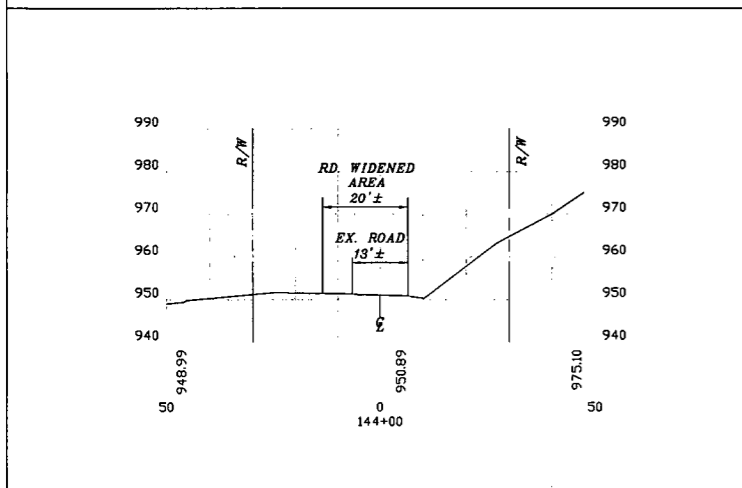
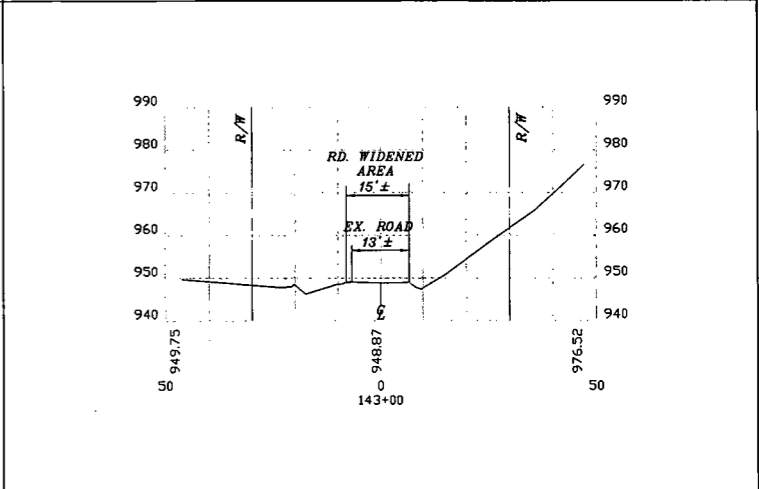
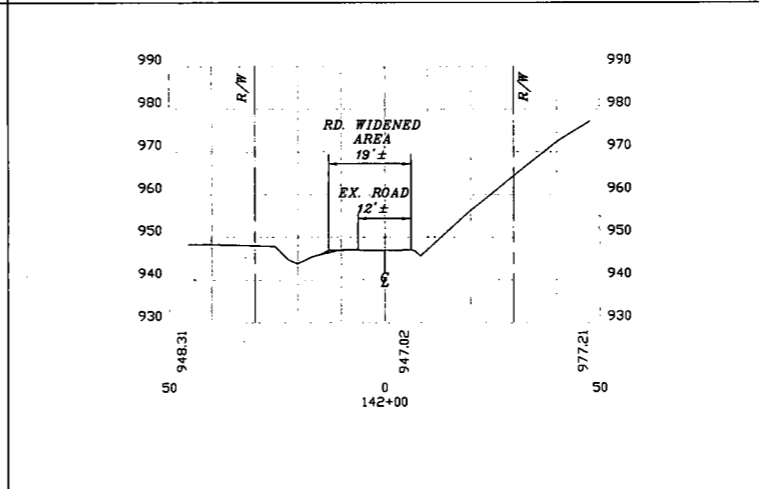
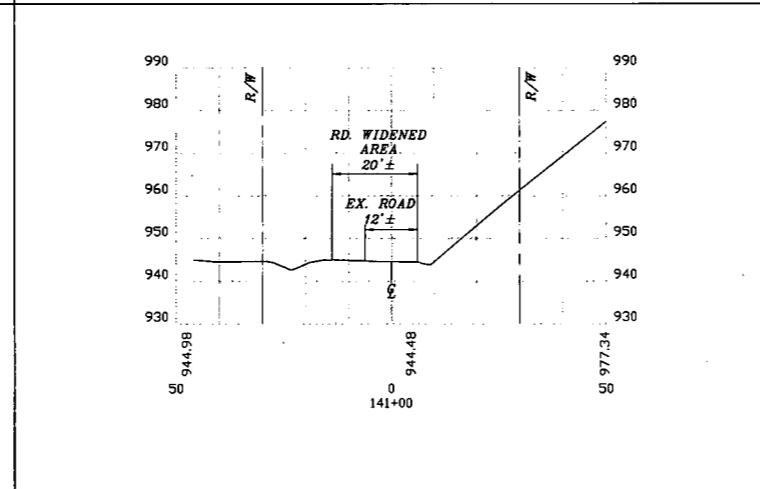
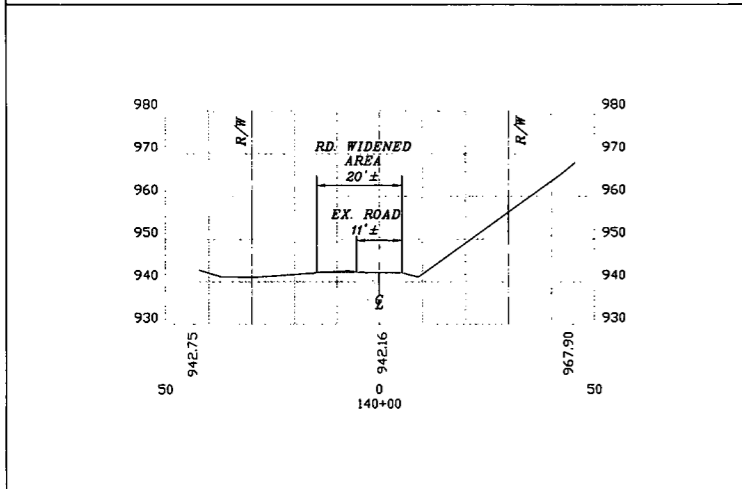
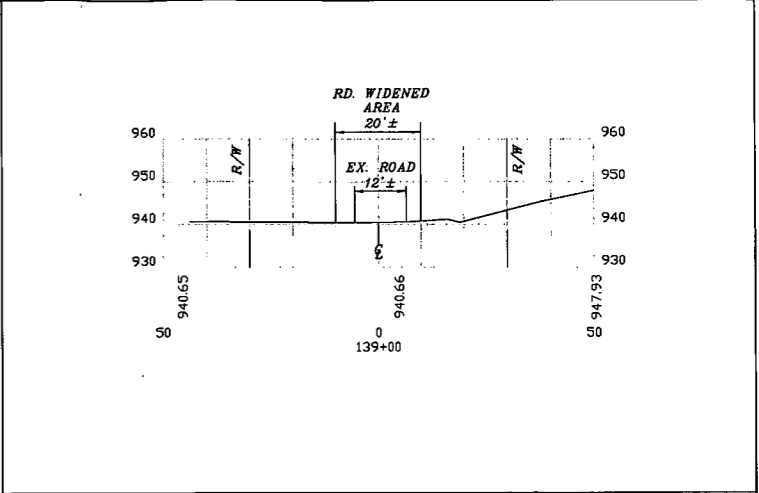
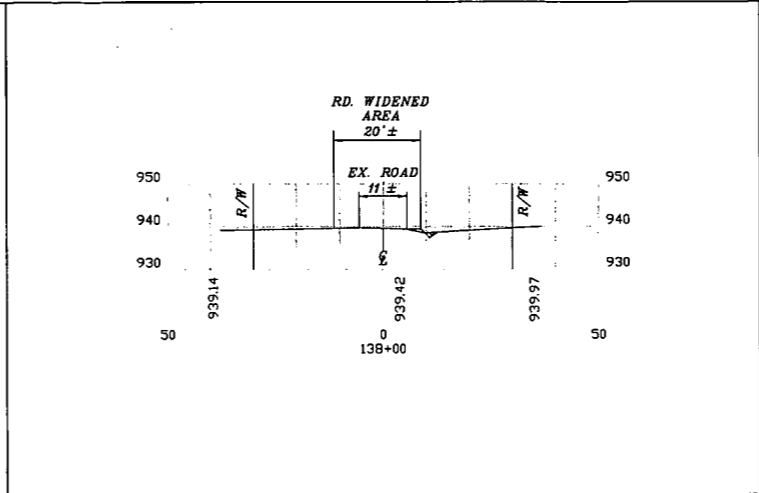
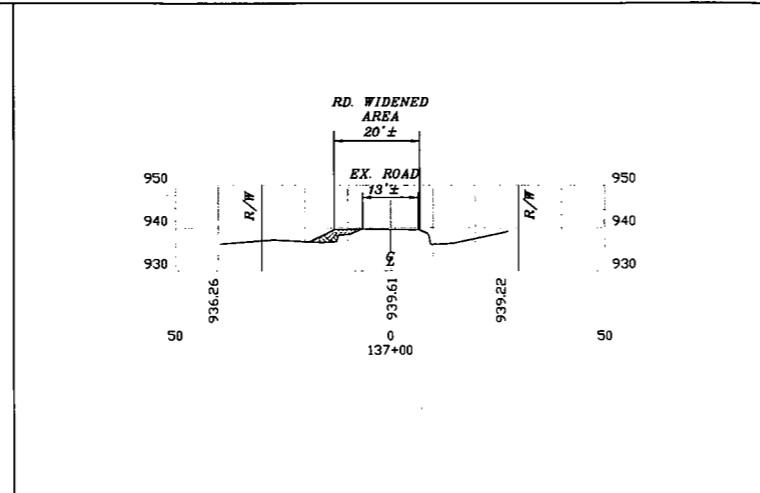
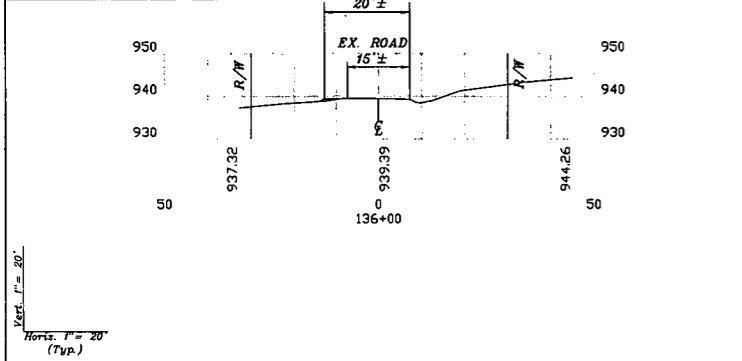


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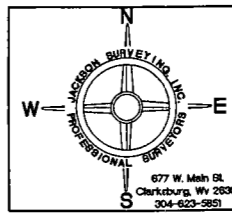
**Jackson Surveying Inc.**  
Plan  
Road Upgrade  
Sheet 26 of 27  
Doddridge Co., WV Sec. Routes 13, 54, & 57

**— LEGEND —**  
 Existing Grade  
 Proposed Grade  
 Proposed Out  
 Proposed Fill



NOTE: Cut slopes are 1.5:1. Fill slopes are 2:1.  
 If cut slope is in rock, refer to Detail Sheet 5.  
 Protect all slopes with mulch or erosion fabric  
 at the direction of the project engineer.

**DLF.**  
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 E-Mail: Fisher.Engineering@gmx.com



*Jackson Surveying Inc.*  
 Cross Sections  
 Road Upgrade  
 Sheet 27 of 27  
 Doddridge Co., WV Sec. Routes 13, 54, & 54




**HYDRAULIC INVESTIGATION  
for Proposed Improvement of Route 54-1  
at Right Hand Fork  
Vicinity of Market  
Doddridge County, West Virginia**

*Prepared for:*

Mr. David Jackson PS  
Jackson Surveying, Inc.  
Clarksburg, WV  
davidjackson@frontier.com

*Prepared by:*

 **ENGINEERING PERFECTION, PLLC**  
339 Sixth Avenue  
South Charleston, WV 25303  
jerry@engineeringperfection.net

March 17, 2015

**HYDRAULIC INVESTIGATION**  
**for Proposed Improvement of Route 54-1**  
**at Right Hand Fork**  
**Vicinity of Market**  
**Doddridge County, West Virginia**

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- Appendix C: HEC-RAS Analysis

# **HYDRAULIC INVESTIGATION**

## **for Proposed Improvement of Route 54-1 at Right Hand Fork, Vicinity of Market Doddridge County, West Virginia**

### **1 PURPOSE**

Engineering Perfection was requested by Jackson Surveying, Inc. to determine the base flood elevation for Right Hand Fork in the vicinity of a proposed highway improvement project. The proposed project is in support of natural gas development. The project location is at the crossing of Route 54-1 over Right Hand Fork, a tributary to Toms Fork, in the vicinity of Market, Doddridge County, West Virginia. The project scope includes the upgrade of public Route 54-1 such that use of the highway by heavier and larger vehicles would be permissible. A determination of the impact of the Base Flood event by replacement of an existing highway bridge crossing Right Hand Fork with a proposed culvert was also requested.

The term Base Flood is the predicted flood event with a one percent probability of being equaled or exceeded in any given year and is used extensively in the Federal Emergency Management Agency program for flood insurance. The Base Flood event term has also been incorporated in local ordinances, including the floodplain ordinance for Doddridge County.

This investigation was conducted using HEC-RAS to determine the flood stages of Right Hand Fork under various conditions, including the Base Flood event. The HEC-RAS model was compiled using survey data provided by Jackson Surveying Inc.

### **2 SITE DATA**

The site is located in Doddridge County, WV along Right Hand Fork at longitude 80.721 degrees W and latitude 39.195 degrees N. The FEMA Community Number is 540095 with the site shown on panel 0230C, revised May 3, 2010. On the Flood Insurance Rate Map the site is shown to be an X Zone; no FEMA flood study has been conducted in this reach of Right Hand Fork.

Site data used in this project included the following:

1. Topographic cross sections, elevations, and photographs provided by Jackson Surveying. The data forms included textfile, CAD and portable document format files. A detailed list of the data provided is listed in Appendix A.

2. The Base Flood flow rates for Right Hand Fork were calculated using a method developed by the US Geological Survey.
3. Aerial photography and topographic map data obtained from the West Virginia Geographic Information System Technical Center, at West Virginia University in Morgantown.
4. High resolution National Hydrography Dataset files obtained from the US Geological Survey.

### 3 HYDRAULIC ANALYSIS

The hydraulic analysis was comprised of five elements. They were:

- ⊗ determination of drainage area,
- ⊗ determination of flows needed for replacement culvert design,
- ⊗ preparation of cross section data for the HEC-RAS model,
- ⊗ execution of the Existing Condition models, and
- ⊗ summary of the design process and results.

#### *Determination of Drainage Area*

The area draining to Right Hand Fork at the site was determined by first selecting the subwatershed boundary in the National Hydrography Dataset encompassing this location. The drainage area of Right Hand Fork at the project site was determined to be approximately 1.31 square miles.

#### *Determination of Flows Needed for Replacement Culvert Design*

The discharges were computed using the regional regression equation developed by the US Geological Survey. Doddridge County is located in the Western Plateaus Region of West Virginia according to the USGS report. The desired discharges used for this investigation were the 10% and 1% probability return storm event. The equations for estimating flood-frequency discharge for the desired probability storm events are:

$$PK_{10}(10\%AOP) = 292 * DRNAREA ^ 0.699$$

$$PK_{100}(1\%AOP) = 557 * DRNAREA ^ 0.674$$

where DRNAREA is the drainage area in square miles and the term starting with PK represents the peak discharge for that particular return storm event for the point of interest. Table 1 lists the discharge used for this study. Additional information is provided in Appendix B.

**Table 1 Regional Discharge Values**

<b>Frequency</b>	<b>Equation Constant</b>	<b>Drainage Area (sq. mi.)</b>	<b>Equation Exponent</b>	<b>Peak Flow (cfs)</b>
<b>10%</b>	292	1.31	0.699	<b>353</b>
<b>1%</b>	557	1.31	0.674	<b>668</b>

*Preparation of Cross Sections for HEC-RAS Model*

Seven cross sections and the road centerline were surveyed for use in the HEC-RAS model for Right Hand Fork. Their locations are shown in Figure 1 below. The cross sections were prepared using the field data provided by Jackson Surveying. Several cross sections were interpolated or copied from the field data, a usual practice in HEC-RAS modeling.

The elevation data for the cross sections were obtained by field surveying collected by Jackson Surveying in February and March 2015. Jackson Surveying used real time kinetic surveying methods to establish site control. The datum used in the Jackson Surveying data was in NAVD 88 and all elevations presented in this report are referenced to this datum.

The cross section information includes estimates of the Manning's stream roughness coefficient. Site inspection as well as location photographs were used to confirm these values and to determine placement of these values along the modeled cross section geometry. For Right Hand Fork the stream channel roughness in the model was 0.04 and for the overbank areas 0.06 was used.

Figure 1 Location of Surveyed Cross Sections



### *Execution of the Existing Condition Models*

The U.S. Army Corps of Engineers Hydrologic Engineering Center developed the River Analysis System, or HEC-RAS computer program. Version 4.1.0, issued January 2010, was used to compute stream profiles in this study. The study employed the steady state model analysis.

A typical Existing Condition profile includes the stream at the point of interest and sufficient distances up- and downstream to quantify the hydraulic effects. For this project, the modeled stream reach included about 550 feet downstream to about 1000 feet upstream of the existing bridge.

### *Summary of the Design Process and Results*

The basic objective is to provide heavy vehicle access to a natural gas development site. The proposed structural design (by others) includes replacing a small bridge (stream opening 6.5 feet wide and about 4 feet high) with a box culvert (stream opening 10 feet wide and 5 feet high). The design elevation for the proposed culvert is one half foot below the existing stream bed. This is intended to allow the natural accumulation of stream sediments and lessen potential environmental impact. Additional design details of the proposed culvert are listed in Table 2.

The hydraulic analysis of the existing and proposed structures was performed by Engineering Perfection. Entrance and exit velocities for the proposed culvert are 3.2 and 7.0 feet per second, respectively. The entrance and exit velocities are 2.9 and 7.0 feet per second, respectively for the existing bridge. Depending on soil conditions, erosion protection in the vicinity of the proposed culvert may be required. Table 3 provides the elevation of the water surface for the Base Flood event for the existing bridge (identified as the "Refined Existing Condition") and proposed design. Also shown in this table is the difference in water surface between the existing bridge and replacement culvert.

**Table 2 Proposed Culvert Design Criteria**

Item	Proposed Design
Centerline stream station (feet)	564
Top deck elevation, not level (feet)	870.78
Low chord elevation (feet)	869.78
Culvert invert elevation (feet)	864.78
Culvert length (feet)	24
Culvert width (feet)	10
Culvert height (feet)	5
Entrance velocity (feet/second)	3.2
Exit velocity (feet/second)	7.0
Guardrail elevation, not level (feet)	873.24

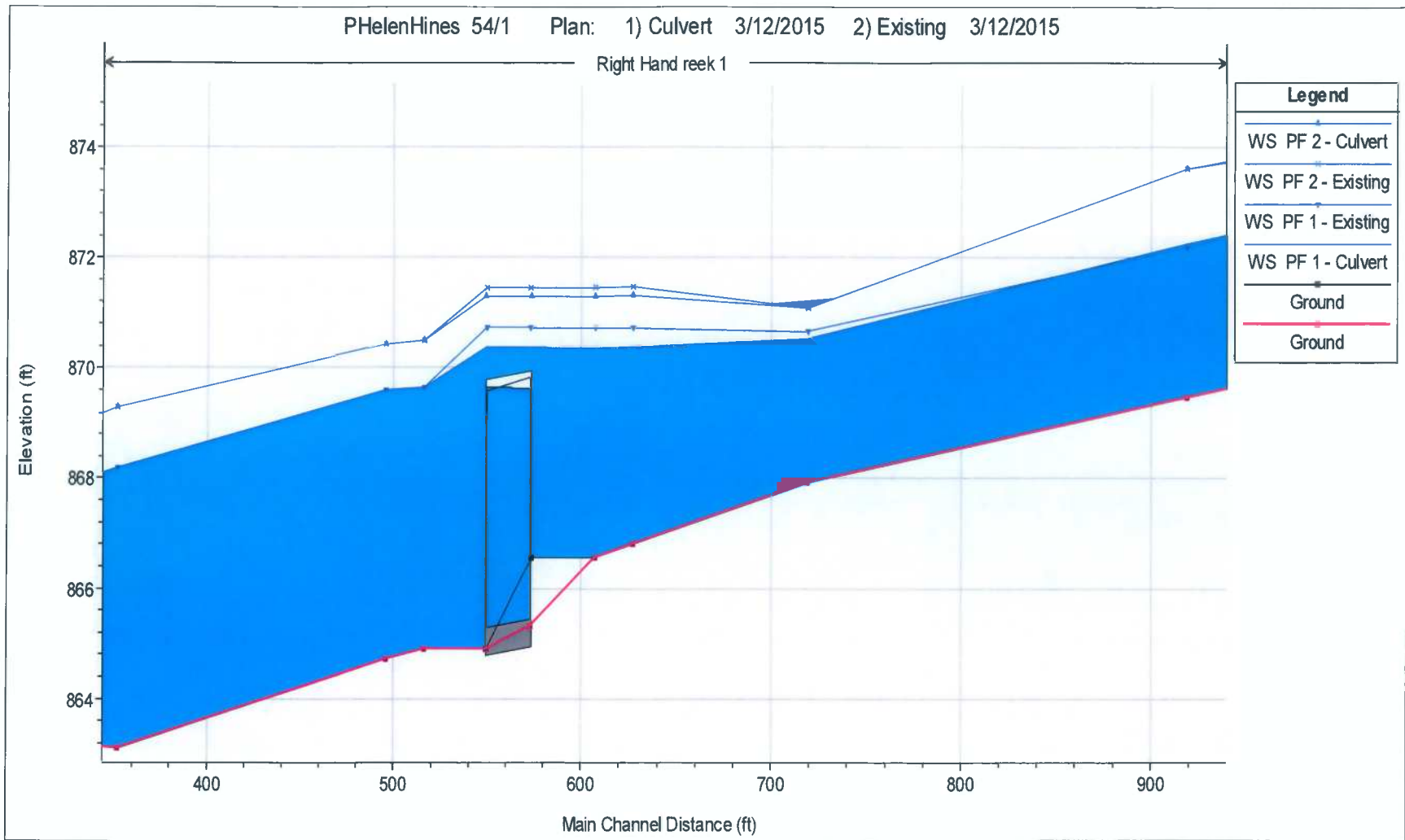
**Table 3 Base Flood Event Water Surface Elevations and Differences**

River Station (feet)	Plan	Water Surface Elevation (feet)	Difference (feet)
1119	Existing	874.85	
1119	Culvert	874.86	0.01
919	Existing	873.61	
919	Culvert	873.61	0.00
719	Existing	871.10	
719	Culvert	871.09	(0.01)
627	Existing	871.48	
627	Culvert	871.31	(0.17)
607	Existing	871.47	
607	Culvert	871.30	(0.17)
564		<b>Bridge/Culvert</b>	
516	Existing	870.51	
516	Culvert	870.51	0.00
496	Existing	870.43	
496	Culvert	870.43	0.00

Figure 2 shows the stream profiles for Existing Bridge and Proposed Culvert Conditions for Right Hand Fork for the 10-year and Base Flood events.



**Figure 2 Ten-year and Base Flood Profiles of Existing Bridge and Proposed Culvert**



The hydraulic modeling demonstrates that immediately upstream of Route 54-1, the proposed culvert will slightly lower the water stage for the 10% and Base Flood events, compared to the existing condition. Downstream of Route 54-1, the proposed improvements have no effect on Right Hand Fork stream stages.

The locations of private structures in close vicinity to the proposed project are shown in Figure 1. All of the shown structures are upstream of Highway 54-1. The hydraulic modeling demonstrates virtually no change in the flood stages for these structures as a result of the proposed project.

#### **4 CONCLUSIONS**

The proposed design includes replacing an existing bridge with a 5 by 10 foot box culvert with an invert elevation of 864.78. The design will pass the 10% return frequency flood and Base Flood (1% return frequency flood) events at slightly lower stages than the existing bridge. Nearby structures will remain reasonably unaffected from flooding by this proposed highway improvement.

#### **5 LIMITATIONS**

The design proposed in this report considers only floodplain effects. Consideration of other elements, such as structural and transportation design, have not been performed by Engineering Perfection, PLLC. The conclusions submitted in this report apply to the proposed project only. They are not applicable to on-site subsequent construction, or adjacent or nearby projects. In the event that conclusions or recommendations based on this report and relating to any other projects are made by other, such conclusions and recommendations are not the responsibility of Engineering Perfection, PLLC. In performing our professional services, we used that degree of care and skill ordinarily exercised under similar circumstances by members of the engineering profession. No other warranty, expressed or implied is made.

## Appendix A Data Provided by Jackson Surveying

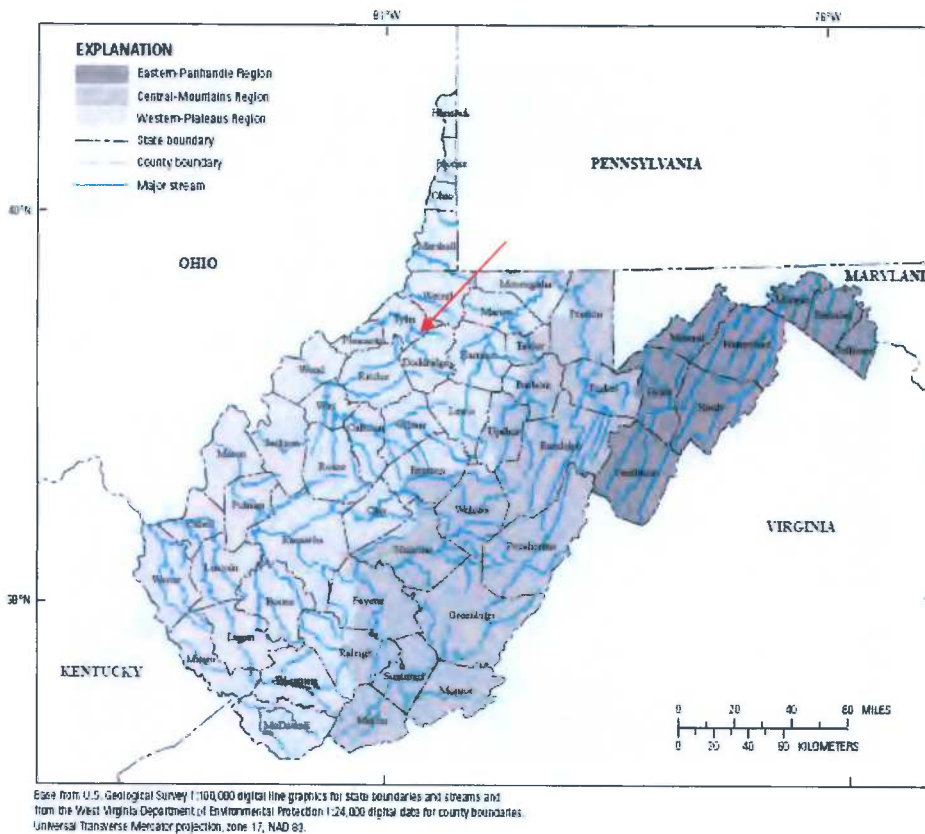
Maps in PDF provided on February 11, 2015

Maps in PDF, site photos, AutoCAD files, and survey data provided on March 6, 2015

# Appendix B: Regional Regression Analysis

## Regression Equation Regions

### 12 Estimation of Flood-Frequency Discharges for Rural, Unregulated Streams in West Virginia



**Figure 4.** The Eastern Panhandle, Central Mountains, and Western Plateaus Regions of West Virginia for which equations for estimation of flood frequency discharges were developed in this study.

# Regression Equation

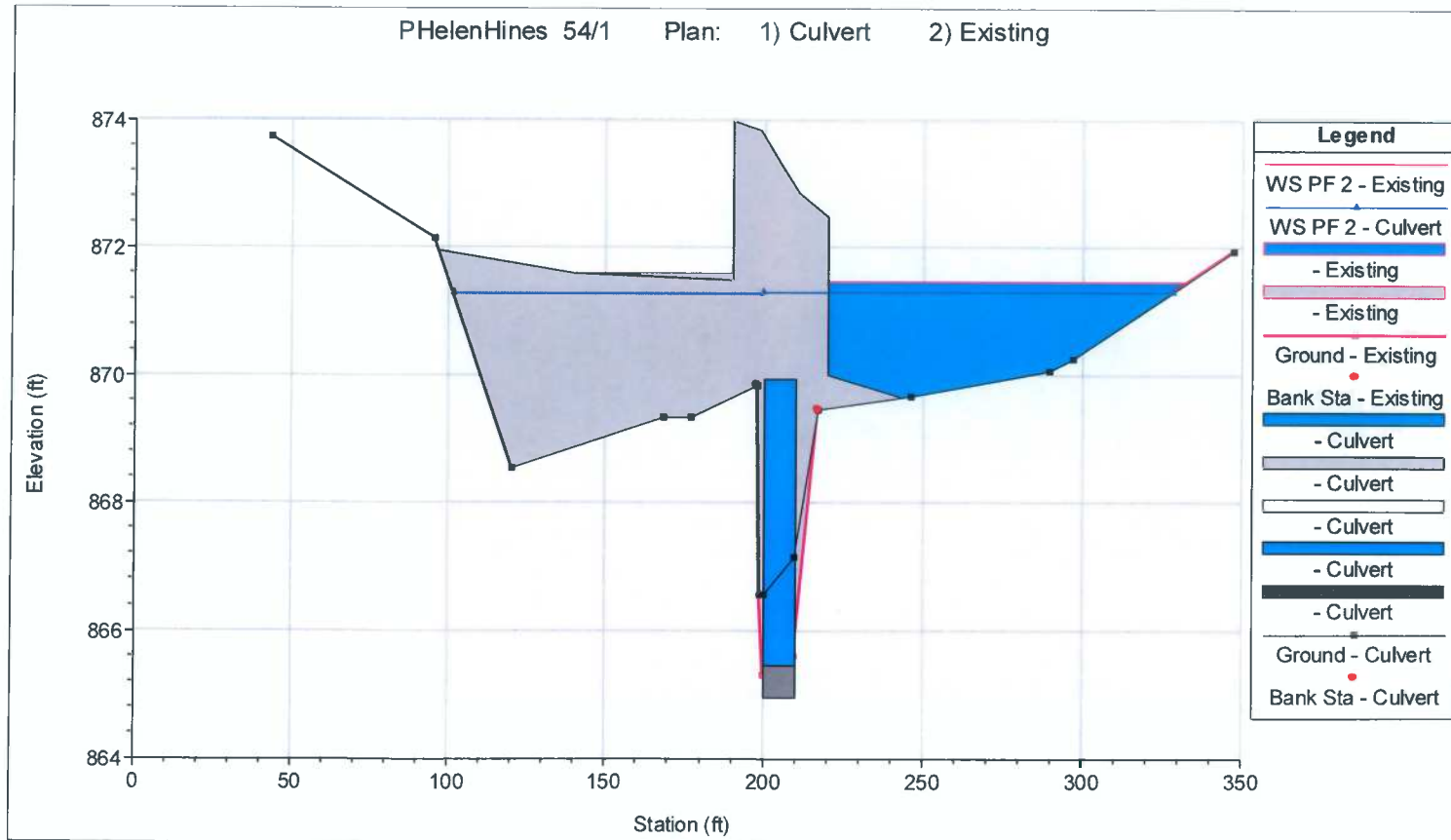
**Table 4.** Equations used to estimate selected flood-frequency discharges for streams in the Eastern Panhandle, Central Mountains, and Western Plateaus Regions of West Virginia.

[PK(n,n), peak discharge in cubic feet per second for the (n,n)-year recurrence interval; PK(n), peak discharge in cubic feet per second for the (n)-year recurrence interval; %, percent; AOP, annual-occurrence probability; DRNAREA, drainage area in square miles]

Equation	Standard error of the model, in percent	Average standard error of sampling, in percent	Average prediction error, in percent	Equivalent years of record, unitless
Eastern Panhandle Region (Range in DRNAREA from 0.21 to 1,461 for 57 streamgage stations)				
PK1_1(90%AOP) = 29.6 DRNAREA <sup>0.835</sup>	43.4	10.3	44.8	3.4
PK1_5(67%AOP) = 46.4 DRNAREA <sup>0.824</sup>	35.7	8.9	36.9	3.3
PK2(50%AOP) = 59.8 DRNAREA <sup>0.832</sup>	32.1	8.6	33.4	4.1
PK5(20%AOP) = 105 DRNAREA <sup>0.813</sup>	25.6	8.9	27.2	10.6
PK10(10%AOP) = 145 DRNAREA <sup>0.840</sup>	22.5	9.5	24.5	19.1
PK25(4%AOP) = 204 DRNAREA <sup>0.861</sup>	19.7	10.3	22.4	34.1
PK50(2%AOP) = 254 DRNAREA <sup>0.845</sup>	18.6	11.1	21.7	46.1
PK100(1%AOP) = 307 DRNAREA <sup>0.820</sup>	18.3	11.6	21.7	56.7
PK200(0.5%AOP) = 365 DRNAREA <sup>0.850</sup>	18.4	12.4	22.4	64.7
PK500(0.2%AOP) = 447 DRNAREA <sup>0.884</sup>	19.4	13.5	23.8	70.9
Central Mountains Region (Range in DRNAREA from 0.10 to 1,619 for 83 streamgage stations)				
PK1_1(90%AOP) = 33.4 DRNAREA <sup>0.814</sup>	40.0	8.3	41.0	2.4
PK1_5(67%AOP) = 53.8 DRNAREA <sup>0.827</sup>	34.6	7.3	35.4	2.0
PK2(50%AOP) = 69.4 DRNAREA <sup>0.872</sup>	33.4	7.3	34.2	2.1
PK5(20%AOP) = 116 DRNAREA <sup>0.845</sup>	34.1	8.0	35.1	3.2
PK10(10%AOP) = 153 DRNAREA <sup>0.821</sup>	36.3	8.6	37.4	4.0
PK25(4%AOP) = 206 DRNAREA <sup>0.816</sup>	39.9	9.8	41.2	4.8
PK50(2%AOP) = 250 DRNAREA <sup>0.827</sup>	42.9	10.6	44.4	5.3
PK100(1%AOP) = 297 DRNAREA <sup>0.810</sup>	46.2	11.3	47.9	5.6
PK200(0.5%AOP) = 347 DRNAREA <sup>0.879</sup>	49.7	12.0	51.5	5.9
PK500(0.2%AOP) = 420 DRNAREA <sup>0.780</sup>	54.3	13.1	56.3	6.1
Western Plateaus Region (Range in DRNAREA from 0.13 to 1,516 for 106 streamgage stations)				
PK1_1(90%AOP) = 56.9 DRNAREA <sup>0.763</sup>	38.2	7.6	39.1	3.8
PK1_5(67%AOP) = 97.8 DRNAREA <sup>0.741</sup>	33.4	6.5	34.1	2.8
PK2(50%AOP) = 129 DRNAREA <sup>0.753</sup>	31.6	6.1	32.2	2.8
PK5(20%AOP) = 221 DRNAREA <sup>0.730</sup>	29.3	6.5	30.0	4.4
PK10(10%AOP) = 292 DRNAREA <sup>0.759</sup>	28.9	6.5	29.7	5.9
PK25(4%AOP) = 391 DRNAREA <sup>0.685</sup>	29.4	7.3	30.3	7.9
PK50(2%AOP) = 472 DRNAREA <sup>0.643</sup>	30.2	7.6	31.3	9.1
PK100(1%AOP) = 557 DRNAREA <sup>0.679</sup>	31.4	8.0	32.5	10.1
PK200(0.5%AOP) = 647 DRNAREA <sup>0.598</sup>	32.7	8.3	33.9	10.8
PK500(0.2%AOP) = 775 DRNAREA <sup>0.641</sup>	34.8	8.9	36.1	11.4

## Appendix C HEC RAS Model Outputs

### Cross Section at Upstream End of Culvert for Base Flood (100-Year) Event



# Cross Section at Upstream End of Culvert for 10-Year Event

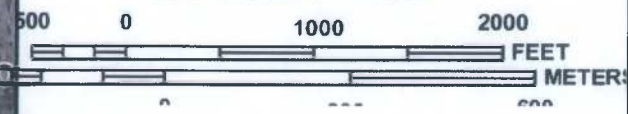


**Porto Rico Road Upgrade (CR 54/1)**

Begin Road Upgrade at:  
80.703037 W  
39.205934 N



MAP SCALE 1" = 1000'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0230C

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

PANEL 230 OF 325  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0230	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**  
54017C0230C  
**MAP REVISED**  
OCTOBER 4, 2011

Federal Emergency Management Agency

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)



Porto Rico Road Upgrade (CR 54/1)

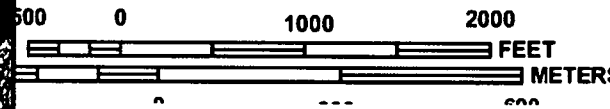


End Road Upgrade at:  
80.742314 W  
39.191090 N

1620000 FT



MAP SCALE 1" = 1000'



PANEL 0230C

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

PANEL 230 OF 325  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0230	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.

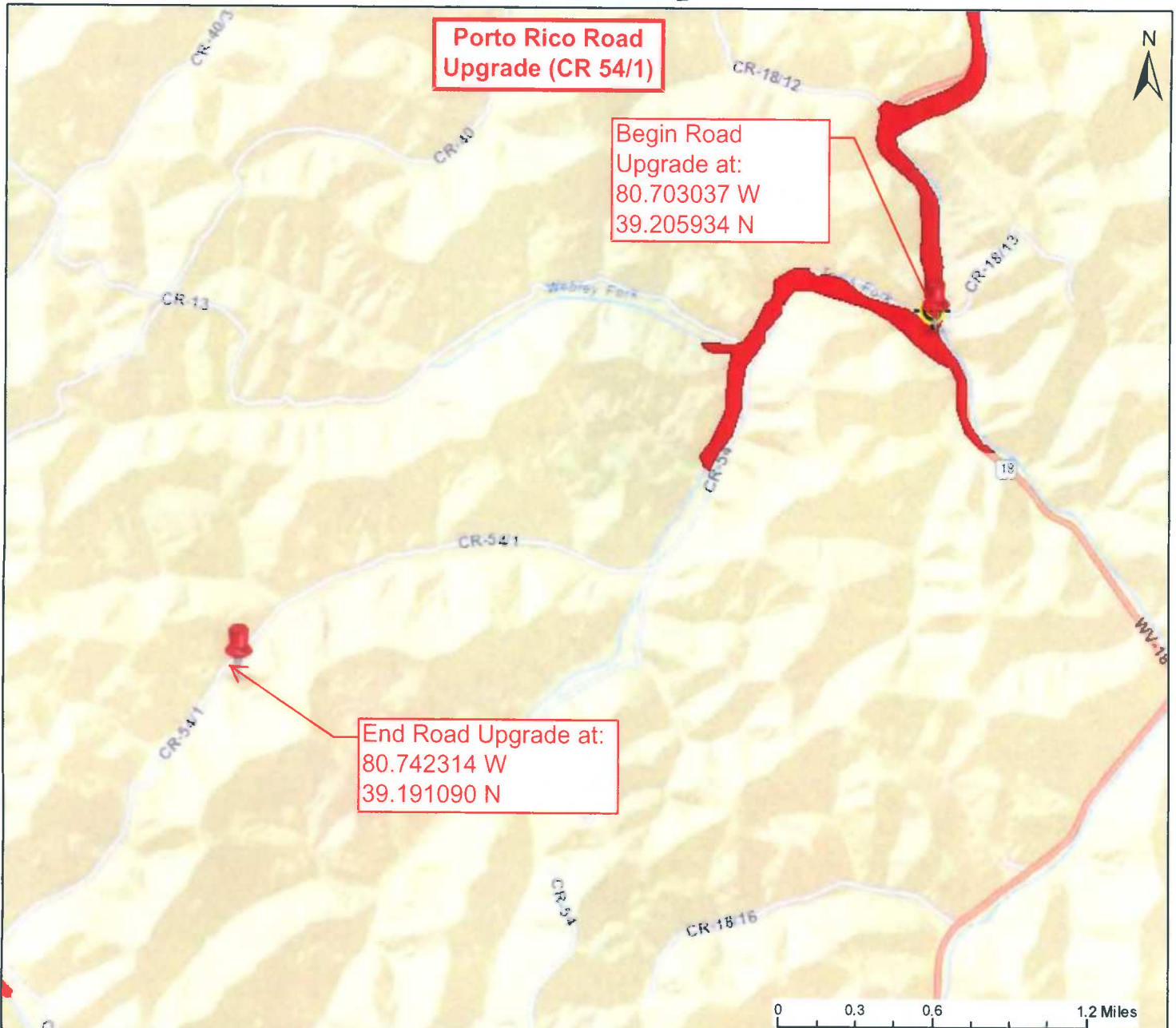


MAP NUMBER  
54017C0230C  
MAP REVISED  
OCTOBER 4, 2011

Federal Emergency Management Agency

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# WV Flood Map



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:

Map created on April 22, 2015

### Flood Hazard Area:

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

FEMA Issued Flood Map: 54017C0230C

Watershed (HUC8): Little Musringum-Middle Island (5

Elevation: About 849 ft

Location (long, lat): (80.703248 W, 39.205795 N)

Location (UTM 17N): (525622, 4339655)

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.



**Antero Resources**  
535 White Oaks Blvd.  
Bridgeport, WV 26330  
Office 304.842.4100  
Fax 304.842.4102

April 22, 2015

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

Mr. Wriston:

Antero Resources Corporation (Antero) would like to submit a Doddridge County Floodplain permit application for our Porto Rico Road Upgrade (CR 54/1). Our project is located in Doddridge County, New Milton District where the road upgrade will be begin at coordinates 39.205934 N, 80.703037 W and will continue to the Helen Hines Pad at coordinates 39.191090 N, 80.742314 W. Per the FIRM Map #54017C0230C, this location is in the floodplain.

Attached you will find the following:

- Doddridge County Floodplain Permit Application
- Surface Owner Information
- Design Plans
- HEC-RAS study
- FIRM Map
- WV Flood Tool Map

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

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in cursive script, appearing to read "Rachel Grzybek".

Rachel Grzybek  
Floodplain Engineer  
Antero Resources Corporation

Enclosures

# DODDRIDGE COUNTY FLOODPLAIN DEVELOPMENT PERMIT APPLICATION

## 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 \_\_\_\_\_

DATE 4/22/15

## SECTION 2: PROPOSE DEVELOPMENT (TO BE COMPLETED BY APPLICANT).

**IF THE APPLICANT IS NOT A NATURAL PERSON, THE NAME, ADDRESS, AND TELEPHONE NUMBER OF A NATURAL PERSON WHO SHALL BE APPOINTED BY THE APPLICANT TO RECEIVE NOTICE PURSUANT TO ANY PROVISION OF THE CURRENT DODDRIDGE COUNTY FLOODPLAIN ORDINANCE.**

APPLICANT'S NAME: \_\_\_\_\_

ADDRESS: 1615 Wynkoop Street, Denver, CO 80202

TELEPHONE NUMBER: (303) 357-7310

**BUILDER'S NAME:** Antero Resources Corporation

**ADDRESS:** 1615 Wynkoop Strett, Denver, CO 80202

**TELEPHONE NUMBER:** (303)-357-7310

**ENGINEER'S NAME:** Jackson Surveying Inc.

**ADDRESS:** 677 W. Main St, Clarksburg, WV 26301

**TELEPHONE NUMBER:** (304) 623-5851

**PROJECT LOCATION:**

**NAME OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT)** Please see Surface Owner Table

**ADDRESS OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT)** Please see Surface Owner Table

**DISTRICT:** \_\_\_\_\_

**DATE/FROM WHOM PROPERTY**

**PURCHASED:** \_\_\_\_\_

**LAND BOOK DESCRIPTION:** Please see Surface Owner Table

**DEED BOOK REFERENCE:** Please see Surface Owner Table

**TAX MAP REFERENCE:** Please see Surface Owner Table

**EXISTING BUILDINGS/USES OF PROPERTY:** None

**NAME OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY** Please see Surface Owner Table

**ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY** \_\_\_\_\_

To avoid delay in processing the application, please provide enough information to easily identify the project location.

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

**A. STRUCTURAL DEVELOPMENT**

**ACTIVITY**

**STRUCTURAL TYPE**

- |                                     |                         |                          |                                  |
|-------------------------------------|-------------------------|--------------------------|----------------------------------|
| <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)
- 

**C. STANDARD SITE PLAN OR SKETCH**

1. SUBMIT ALL STANDARD SITE PLANS, IF ANY HAVE BEEN PREPARED.
2. IF STANDARD SITE PLANS HAVE NOT BEEN PREPARED:  
SKETCH ON A SEPARATE 8 ½ X 11 INCH SHEET OF PAPER THE SHAPE AND LOCATION OF THE LOT. SHOW THE LOCATION OF THE INTENDED CONSTRUCTION OR LAND USE INDICATING BUILDING SETBACKS, SIZE & HEIGHT. IDENTIFY EXISTING BUILDINGS, STRUCTURES OR LAND USES ON THE PROPERTY.
3. SIGN AND DATE THE SKETCH.

**ACTUAL TOTAL CONSTRUCTION COSTS OF THE COMPLETE DEVELOPMENT IRRESPECTIVE OF WHETHER ALL OR ANY PART OF THE SUBJECT PROPOSED CONSTRUCTION PROJECT IS WITHIN THE FLOODPLAIN \$ 51,226**

**D. ADJACENT AND/OR AFFECTED LANDOWNERS:**

**1. NAME AND ADDRESS OF ALL OWNERS OF SURFACE TRACTS ADJACENT TO THE AREA OF THE SURFACE TRACT (UP & DOWN STREAM) UPON WHICH THE PROPOSED ACTIVITY WILL OCCUR AND ALL OTHER SURFACE OWNERS UP & DOWN STREAM) WHO OWN PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY (IF ONE HAS BEEN COMPLETED).**

NAME: Please see attached landowner  
 ADDRESS: information  
 \_\_\_\_\_  
 \_\_\_\_\_

NAME: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

NAME: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
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NAME: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**1. NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON ANY ADJACENT PROPERTY AT THE TIME THE FLOODPLAIN PERMIT APPLICATION IS FILED AND THE NAME AND ADDRESS OF AT LEAST ONE ADULT RESIDING IN ANY HOME ON ANY PROPERTY THAT MAY BE AFFECTED BY FLOODING AS IS DEMONSTRATED BY A FLOODPLAIN STUDY OR SURVEY.**

NAME: Please see attached landowner  
 ADDRESS: information  
 \_\_\_\_\_  
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NAME: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
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**E. CONFIRMATION FORM**

**THE APPLICANT ACKNOWLEDGES, AGREES, AND CONFIRMS THAT HE/IT WILL PAY WITHIN 30 DAYS OF RECEIPT OF INVOICE BY THE COUNTY FOR ALL EXPENSES RELATIVE TO THE PERMIT APPLICATION PROCESS GREATER THAN THE REQUIRED DEPOSIT FOR EXPENSES INCLUDING:**

- (A) PERSONAL SERVICE OF PROCESS BY THE DODDRIDGE COUNTY SHERIFF AT THE RATES PERMITTED BY LAW FOR SUCH SERVICE.
- (B) SERVICE BY CERTIFIED MAIL RETURN RECEIPT REQUESTED.
- (C) PUBLICATION.

- (D) COURT REPORTING SERVICES AT ANY HEARINGS REQUESTED BY THE APPLICANT.
- (E) CONSULTANTS AND/OR HEARING EXPERTS UTILIZED BY DODDRIDGE COUNTY FLOODPLAIN ADMINISTRATOR/MANAGER OR FLOODPLAIN APPEALS BOARD FOR REVIEW OF MATERIALS AND/OR TESTIMONY REGARDING THE EFFICACY OF GRANTING OR DENYING THE APPLICANT'S FLOODPLAIN PERMIT.

NAME (PRINT): \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE: 4/22/15

After completing SECTION 2, APPLICANT should submit form to Floodplain Administrator/Manager or his/her representative for review.

**SECTION 3: FLOODPLAIN DETERMINATION (to be completed by Floodplain Administrator/Manager or his/her representative)**

**THE PROPOSED DEVELOPMENT:**

THE PROPOSED DEVELOPMENT IS LOCATED ON:

FIRM Panel: \_\_\_\_\_

Dated: \_\_\_\_\_

Is **NOT** located in a Specific Flood Hazard Area (Notify applicant that the application review is complete and **NO FLOODPLAIN DEVELOPMENT PERMIT IS REQUIRED**).

Is located in Special Flood Hazard Area.  
 FIRM zone designation \_\_\_\_\_  
 100-Year flood elevation is: \_\_\_\_\_ NGVD (MSL)

Unavailable

The proposed development is located in a floodway.  
 FBFM Panel No. \_\_\_\_\_ Dated \_\_\_\_\_

See section 4 for additional instructions.



SIGNED \_\_\_\_\_

DATE \_\_\_\_\_

**SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by Floodplain Administrator/Manager or his/her representative)**

The applicant must submit the documents checked below before the application can be processed.

- A plan showing the location of all existing structures, water bodies, adjacent roads, lot dimensions and proposed development.
- Development plans, drawn to scale, and specifications, including where applicable: details for anchoring structures, storage tanks, proposed elevation of lowest floor, (including basement or crawl space), types of water resistant materials used below the first floor, details of flood proffing of utilities located below the first floor and details of enclosures below the first floor. Also \_\_\_\_\_  
\_\_\_\_\_
- Subdivision or other development plans (If the subdivision or development exceeds 50 lots or 5 acres, whichever is the lesser, the applicant must provide 100-year flood elevations if they are not otherwise available).
- Plans showing the extent of watercourse relocation and/or landform alterations.
- Top of new fill elevation \_\_\_\_\_ Ft. NGVD (MSL).  
For floodproofing structures applicant must attach certification from registered engineer or architect.
- Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood. A copy of all data and calculations supporting this finding must also be submitted.
- Manufactured homes located in a floodplain area must have a West Virginia Contractor's License and a Manufactured Home Installation License as required by the Federal Emergency Management Agency (FEMA).

Other:

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**SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Administrator/Manager or his/her representative)**

I have determined that the proposed activity (type is or is not) in conformance with provisions of the Floodplain Ordinance adopted by the County Commission of Doddridge County on May 21, 2013. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_

If the Floodplain Administrator/Manager found that the above was not in conformance with the provisions of the Doddridge County Floodplain Ordinance and/or denied that application, the applicant may complete an appealing process below.

APPEALS:   Appealed to the County Commission of Doddridge County?  Yes  No  
Hearing Date: \_\_\_\_\_  
County Commission Decision - Approved    Yes    No

CONDITIONS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION 6: AS-BUILT ELEVATIONS (To be submitted by APPLICANT before Certificate of Compliance is issued).**

The following information must be provided for project structures. This section must be completed by a registered professional engineer or a licensed land surveyor (or attach a certification to this application).

COMPLETE 1 OR 2 BELOW:

- 1 Actual (As-Built) Elevation of the top of the lowest floor (including basement or crawl space) is \_\_\_\_\_ FT. NGVD (MSL)
- 2 Actual (As Built) elevation of floodproofing is \_\_\_\_\_ FT. NGVD (MSL)

**Note:** Any work performed prior to submittal of the above information is at risk of the applicant.

**SECTION 7: COMPLIANCE ACTION (To be completed by the Floodplain Administrator/Manager or his/her representative).**

The Floodplain Administrator/Manager or his/her representative will complete this section as applicable based on inspection of the project to ensure compliance with the Doddridge County Floodplain Ordinance.

**INSPECTIONS:**

DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
DEFICIENCIES ? Y/N

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION 8: CERTIFICATE OF COMPLIANCE (To be completed by Floodplain Administrator/Manager or his/her representative).**

Certificate of Compliance issued: DATE: \_\_\_\_\_ BY: \_\_\_\_\_

**CERTIFICATE OF COMPLIANCE  
FOR DEVELOPMENT IN SPECIAL FLOOD HAZARD AREA  
(OWNER MUST RETAIN)**

**PERMIT NUMBER:** \_\_\_\_\_

**PERMIT DATE:** \_\_\_\_\_

**PURPOSE –**

**CONSTRUCTION LOCATION:** \_\_\_\_\_

**OWNER'S ADDRESS:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**THE FOLLOWING MUST BE COMPLETED BY THE FLOODPLAIN  
ADMINISTRATOR/MANAGER OR HIS/HER AGENT.**

**COMPLIANCE IS HEREBY CERTIFIED WITH THE REQUIREMENT OF THE  
FLOODPLAIN ORDINANCE ADOPTED BY THE COUNTY COMMISSION OF  
DODDRIDGE COUNTY ON MAY 21, 2013.**

**SIGNED** \_\_\_\_\_ **DATE** \_\_\_\_\_

**Property Owner Table-Doddridge County Floodplain Permit  
 Antero Resources Corporation-Porto Rico Road Upgrade**

Property Owner Name	Mailing Address	Parcel ID	Deed Book Reference
<b>Host Properties-Inside Floodplain</b>			
Fluharty Michael D, Richard P & Robert L	7715 Dam 4 Rd, Williamsport, MD 21795	6-11-8	Book 256, Page 678
Hurst Stokes A Et Al	Rt 1 Box 35, New Milton, WV 26411	6-11-10	Book SF9, Page 172
Hogue Sammy L & Shirley Jane	Star Route 83 Box 1, Ellenboro, WV 26346	6-12-9	Book 0186, Page 0546
Hurst Stokes Jr & Louise	502 West Main St, West Union, WV 26456	6-12-12	Book 0131, Page 0297
Hurst Stokes Jr	502 West Main St, West Union, WV 26456	6-12-12.2	Book AP26, Page 429
Nicholson Roy K & Creolam	Rt 1 Box 14, New Milton, WV 26411	6-12-13	Book 0187, Page 0572
<b>Properties Abutting Host Properties-Inside Floodplain</b>			
Dilger Arthur F & Claudiah	Rt 1 Box 67, New Milton, WV 26411	6-12-12.1	Book 232, Page 167
Nicholson Roy K & Creolam	Rt 1 Box 14, New Milton, WV 26411	6-12-14	Book 0187, Page 0572
Nicholson Donovan L & Pamela S	Rt 1 Box 43 C, New Milton, WV 26411	6-12-14.1	Book 224, Page 212
Nicholson Roy K	Rt 1 Box 14, New Milton, WV 26411	6-12-29	Book 229, Page 379
Nicholson Milton Dean	Rt 1 Box 68, New Milton, WV 26411	6-12-30	Book 229, Page 382
Hurst Stokes Jr	502 W Main St, West Union, WV 26456	6-12-41	Book AP26, Page 429

West Virginia  
 Department of Transportation  
 Division of Highways  
 Upgrade For WV. Sec. Rte. 13, 54 and 54  
 (New Milton District, Doddridge County)  
**ANTERO RESOURCES - HINES PAD**

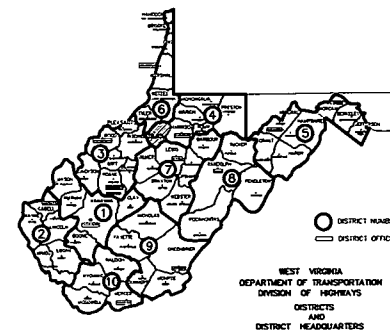
March 31, 2015

Project Length: STA. 0+00 to STA. 148+90 (2.82 Miles)

STA. 0+00 to 38+15 Subgrade Failure Repair, 1 1/2" Asphalt Wearing Course, Crusher Run Shoulders (As Needed)

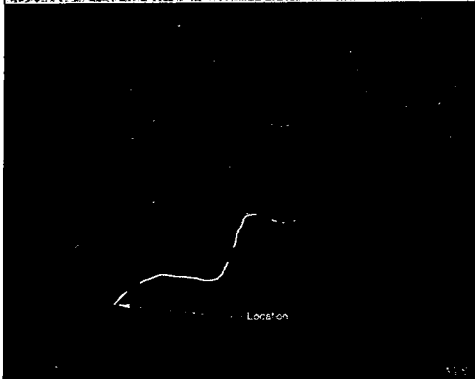
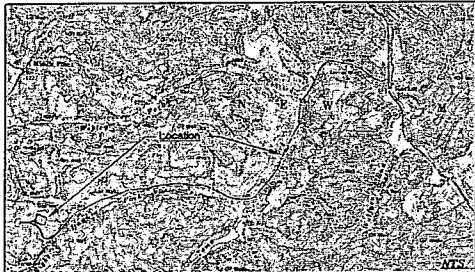
STA. 38+15 to 69+50 6" Crusher Run, 3" Asphalt Base Course, 1 1/2" Asphalt Wearing Course, Crusher Run Shoulders

STA. 69+50 to 148+90 Full Depth Reclamation, 3" Asphalt Base Course, 1 1/2" Asphalt Wearing Course, Crusher Run Shoulder



**ENGINEERING NOTES:**  
 It is the policy of WEST VIRGINIA DEPARTMENT OF TRANSPORTATION to upgrade the road to meet the latest construction and design requirements to meet the needs of the user and to provide a safe, reliable, and durable roadway. The design and construction of the roadway shall be in accordance with the latest standards and specifications of the American Road & Builders Builders' Council and the American Road & Builders Builders' Council. The design and construction of the roadway shall be in accordance with the latest standards and specifications of the American Road & Builders Builders' Council and the American Road & Builders Builders' Council. The design and construction of the roadway shall be in accordance with the latest standards and specifications of the American Road & Builders Builders' Council and the American Road & Builders Builders' Council.

**NOTE:** Upgrade will consist of culvert extension/replacement, new box culverts, bank excavation, road widening, shoulder stabilization and road surface improvement.



Revision:  
 Added Note for Step Block Wall 5-20-15  
 Added Asphalt Changed Box Culvert 5-29-15

Beginning WV. Sec. Rte. (13)  
 Geographic NAD 27  
 Lat.: 39.205847  
 Long.: 80.703213  
 UTM NAD 83 (Meters)  
 N: 4339662.0  
 E: 525624.6  
 (@ Sta. 0+00)

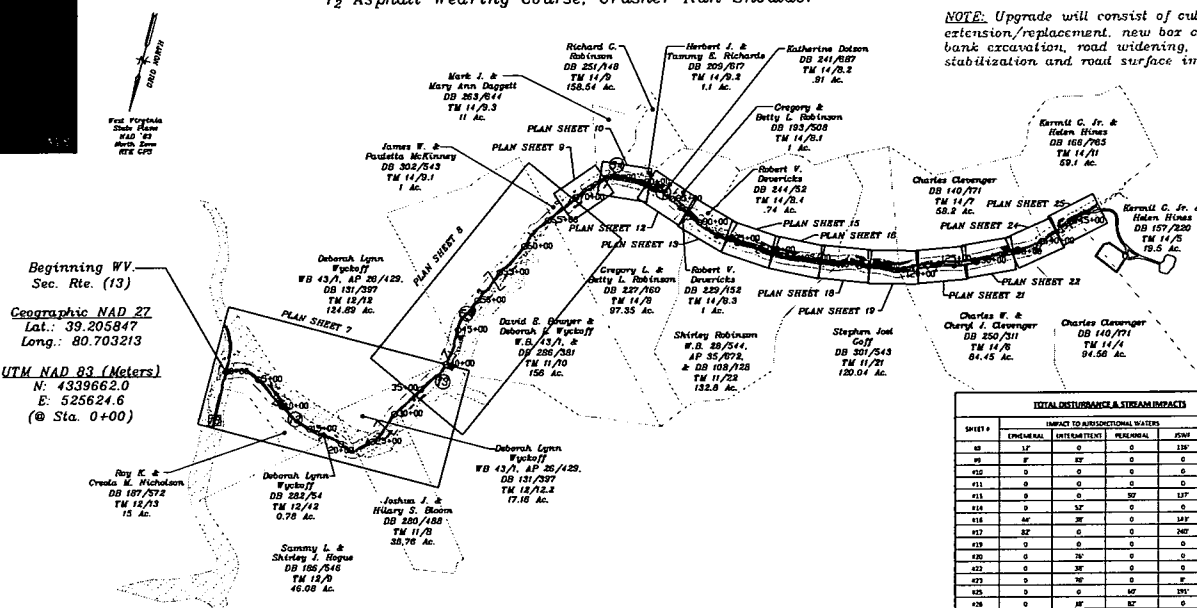
All Property Boundaries are based on current deeds and field evidence collected with a Sub-Meter GPS

NOTE: Stream & Wetland information from report prepared by CAI, dated 04-07-2015 except as noted and may not match field locations.

FLOOD PLAIN INFORMATION FROM FEMA MAP PANEL: 1510712520C, Dated 10-1-2011

FLOOD PLAIN AREA

AREA of INTEREST



Sheet	Description
1	Cover
2	Notes & Details
3	Details
4	Details
5	Details
6	Details
7	Details
8	Plan
9	Plan
10	Plan
11	Plan
12	Cross Sections
13	Details
14	Plan
15	Cross Sections
16	Plan
17	Plan
18	Cross Sections
19	Plan
20	Plan
21	Plan
22	Cross Sections
23	Plan
24	Cross Sections
25	Plan
26	Plan
27	Cross Sections

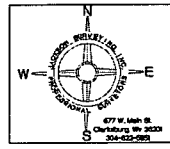
TOTAL DISTURBANCE & STREAM IMPACTS					
SHEET #	IMPACT TO JURISDICTIONAL WATERS				DISTURBANCE
	PERMANENT	NONPERMANENT	PERMANENT	NONPERMANENT	
10	17'	0	0	120'	0.15 AC.
16	0	0	0	0	0.00 AC.
110	0	0	0	0	0.00 AC.
111	0	0	0	0	0.00 AC.
113	0	0	0	120'	0.15 AC.
114	0	0	0	0	0.00 AC.
116	0	0	0	0	0.00 AC.
117	22'	0	0	240'	0.34 AC.
120	0	0	0	0	0.00 AC.
121	0	0	0	0	0.00 AC.
123	0	0	0	0	0.00 AC.
125	0	0	0	0	0.00 AC.
126	0	0	0	0	0.00 AC.
TOTALS	146'	00'	127'	857'	0.50 AC.
TOTAL TREE REMOVAL (INCLUDES NONPERMANENT)	0.71 AC.				



**WEST VIRGINIA 811**  
 CALL BEFORE Dial 811 or YOU DIG! 800.245.4848  
 www.WV811.com

Professional Engineer  
 DENNIS L. FISHER  
 No. 8081  
 State of West Virginia  
 05-28-2015  
 DENNIS L. FISHER RPE 8884

DLF.  
 Dennis L. Fisher, RPE  
 PO Box 281  
 Parkersburg, WV 26106  
 Cell: 304-677-4129  
 E-Mail: Fisher.Engineering@gmail.com



Jackson Surveying Inc.  
 Cover Road Upgrade  
 Sheet 1 of 27  
 Doddridge Co., WV Sec. Routes 13, 54, & 54

**HYDRAULIC INVESTIGATION**  
**for Proposed Improvement of Route 54-1**  
**at Right Hand Fork**  
**Vicinity of Market**  
**Doddridge County, West Virginia**

*Prepared for:*

Mr. David Jackson PS  
Jackson Surveying, Inc.  
Clarksburg, WV  
davidjackson@frontier.com

*Prepared by:*



**ENGINEERING PERFECTION, PLLC**

339 Sixth Avenue  
South Charleston, WV 25303  
jerry@engineeringperfection.net

March 17, 2015

**HYDRAULIC INVESTIGATION  
for Proposed Improvement of Route 54-1  
at Right Hand Fork  
Vicinity of Market  
Doddridge County, West Virginia**

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Appendix A: Data Provided by Jackson Surveying  
Appendix B: Regional Regression Analysis  
Appendix C: HEC-RAS Analysis



# **HYDRAULIC INVESTIGATION**

## **for Proposed Improvement of Route 54-1 at Right Hand Fork, Vicinity of Market Doddridge County, West Virginia**

### **1 PURPOSE**

Engineering Perfection was requested by Jackson Surveying, Inc. to determine the base flood elevation for Right Hand Fork in the vicinity of a proposed highway improvement project. The proposed project is in support of natural gas development. The project location is at the crossing of Route 54-1 over Right Hand Fork, a tributary to Toms Fork, in the vicinity of Market, Doddridge County, West Virginia. The project scope includes the upgrade of public Route 54-1 such that use of the highway by heavier and larger vehicles would be permissible. A determination of the impact of the Base Flood event by replacement of an existing highway bridge crossing Right Hand Fork with a proposed culvert was also requested.

The term Base Flood is the predicted flood event with a one percent probability of being equaled or exceeded in any given year and is used extensively in the Federal Emergency Management Agency program for flood insurance. The Base Flood event term has also been incorporated in local ordinances, including the floodplain ordinance for Doddridge County.

This investigation was conducted using HEC-RAS to determine the flood stages of Right Hand Fork under various conditions, including the Base Flood event. The HEC-RAS model was compiled using survey data provided by Jackson Surveying Inc.

### **2 SITE DATA**

The site is located in Doddridge County, WV along Right Hand Fork at longitude 80.721 degrees W and latitude 39.195 degrees N. The FEMA Community Number is 540095 with the site shown on panel 0230C, revised May 3, 2010. On the Flood Insurance Rate Map the site is shown to be an X Zone; no FEMA flood study has been conducted in this reach of Right Hand Fork.

Site data used in this project included the following:

1. Topographic cross sections, elevations, and photographs provided by Jackson Surveying. The data forms included textfile, CAD and portable document format files. A detailed list of the data provided is listed in Appendix A.

2. The Base Flood flow rates for Right Hand Fork were calculated using a method developed by the US Geological Survey.
3. Aerial photography and topographic map data obtained from the West Virginia Geographic Information System Technical Center, at West Virginia University in Morgantown.
4. High resolution National Hydrography Dataset files obtained from the US Geological Survey.

### 3 HYDRAULIC ANALYSIS

The hydraulic analysis was comprised of five elements. They were:

- ⊗ determination of drainage area,
- ⊗ determination of flows needed for replacement culvert design,
- ⊗ preparation of cross section data for the HEC-RAS model,
- ⊗ execution of the Existing Condition models, and
- ⊗ summary of the design process and results.

#### *Determination of Drainage Area*

The area draining to Right Hand Fork at the site was determined by first selecting the subwatershed boundary in the National Hydrography Dataset encompassing this location. The drainage area of Right Hand Fork at the project site was determined to be approximately 1.31 square miles.

#### *Determination of Flows Needed for Replacement Culvert Design*

The discharges were computed using the regional regression equation developed by the US Geological Survey. Doddridge County is located in the Western Plateaus Region of West Virginia according to the USGS report. The desired discharges used for this investigation were the 10% and 1% probability return storm event. The equations for estimating flood-frequency discharge for the desired probability storm events are:

$$PK10(10\%AOP) = 292 * DRNAREA ^ 0.699$$

$$PK100(1\%AOP) = 557 * DRNAREA ^ 0.674$$

where DRNAREA is the drainage area in square miles and the term starting with PK represents the peak discharge for that particular return storm event for the point of interest. Table 1 lists the discharge used for this study. Additional information is provided in Appendix B.

**Table 1 Regional Discharge Values**

<b>Frequency</b>	<b>Equation Constant</b>	<b>Drainage Area (sq. mi.)</b>	<b>Equation Exponent</b>	<b>Peak Flow (cfs)</b>
<b>10%</b>	292	1.31	0.699	<b>353</b>
<b>1%</b>	557	1.31	0.674	<b>668</b>

*Preparation of Cross Sections for HEC-RAS Model*

Seven cross sections and the road centerline were surveyed for use in the HEC-RAS model for Right Hand Fork. Their locations are shown in Figure 1 below. The cross sections were prepared using the field data provided by Jackson Surveying. Several cross sections were interpolated or copied from the field data, a usual practice in HEC-RAS modeling.

The elevation data for the cross sections were obtained by field surveying collected by Jackson Surveying in February and March 2015. Jackson Surveying used real time kinetic surveying methods to establish site control. The datum used in the Jackson Surveying data was in NAVD 88 and all elevations presented in this report are referenced to this datum.

The cross section information includes estimates of the Manning's stream roughness coefficient. Site inspection as well as location photographs were used to confirm these values and to determine placement of these values along the modeled cross section geometry. For Right Hand Fork the stream channel roughness in the model was 0.04 and for the overbank areas 0.06 was used.

Figure 1 Location of Surveyed Cross Sections



### *Execution of the Existing Condition Models*

The U.S. Army Corps of Engineers Hydrologic Engineering Center developed the River Analysis System, or HEC-RAS computer program. Version 4.1.0, issued January 2010, was used to compute stream profiles in this study. The study employed the steady state model analysis.

A typical Existing Condition profile includes the stream at the point of interest and sufficient distances up- and downstream to quantify the hydraulic effects. For this project, the modeled stream reach included about 550 feet downstream to about 1000 feet upstream of the existing bridge.

### *Summary of the Design Process and Results*

The basic objective is to provide heavy vehicle access to a natural gas development site. The proposed structural design (by others) includes replacing a small bridge (stream opening 6.5 feet wide and about 4 feet high) with a box culvert (stream opening 10 feet wide and 5 feet high). The design elevation for the proposed culvert is one half foot below the existing stream bed. This is intended to allow the natural accumulation of stream sediments and lessen potential environmental impact. Additional design details of the proposed culvert are listed in Table 2.

The hydraulic analysis of the existing and proposed structures was performed by Engineering Perfection. Entrance and exit velocities for the proposed culvert are 3.2 and 7.0 feet per second, respectively. The entrance and exit velocities are 2.9 and 7.0 feet per second, respectively for the existing bridge. Depending on soil conditions, erosion protection in the vicinity of the proposed culvert may be required. Table 3 provides the elevation of the water surface for the Base Flood event for the existing bridge (identified as the "Refined Existing Condition") and proposed design. Also shown in this table is the difference in water surface between the existing bridge and replacement culvert.

**Table 2 Proposed Culvert Design Criteria**

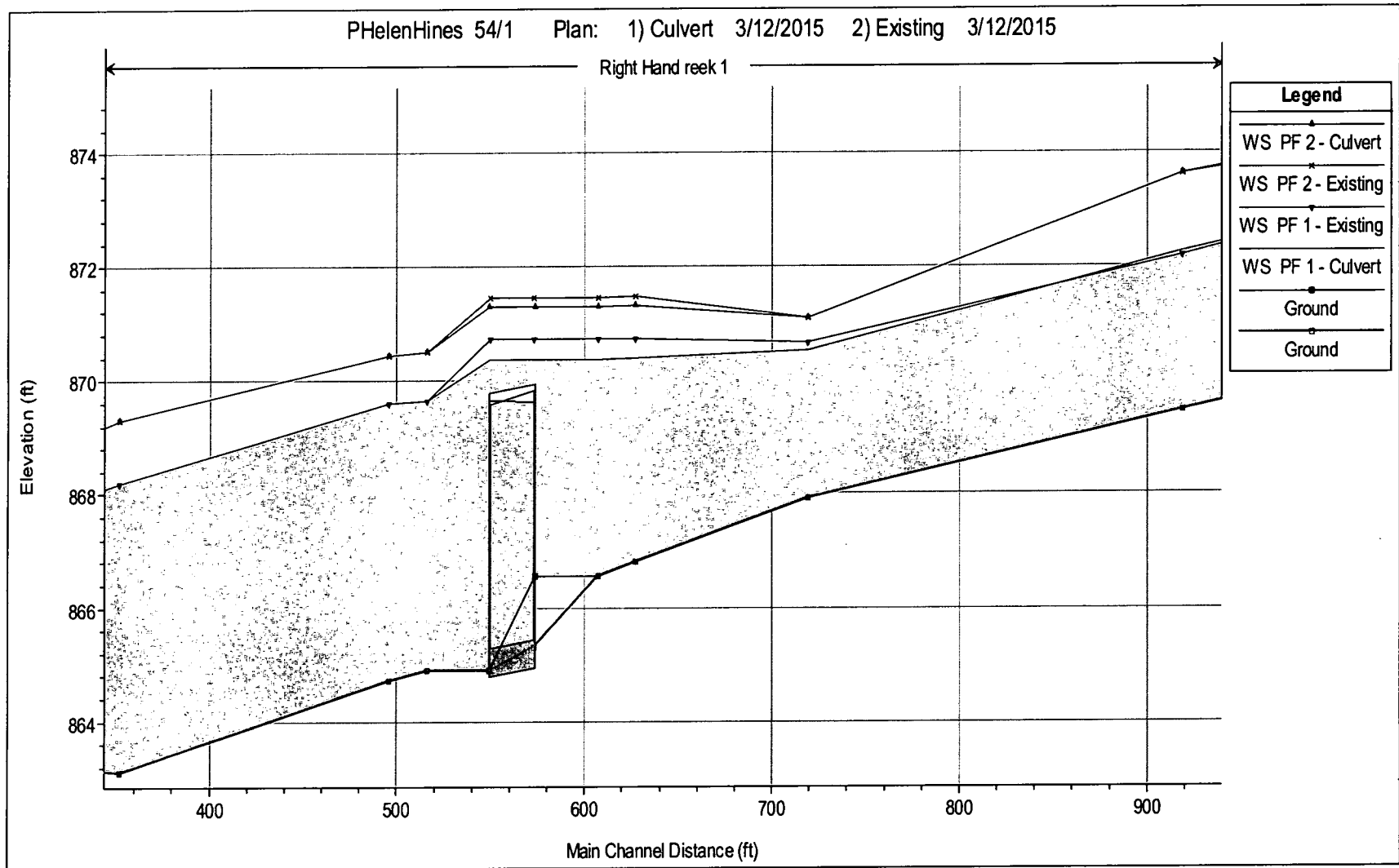
Item	Proposed Design
Centerline stream station (feet)	564
Top deck elevation, not level (feet)	870.78
Low chord elevation (feet)	869.78
Culvert invert elevation (feet)	864.78
Culvert length (feet)	24
Culvert width (feet)	10
Culvert height (feet)	5
Entrance velocity (feet/second)	3.2
Exit velocity (feet/second)	7.0
Guardrail elevation, not level (feet)	873.24

**Table 3 Base Flood Event Water Surface Elevations and Differences**

River Station (feet)	Plan	Water Surface Elevation (feet)	Difference (feet)
1119	Existing	874.85	
1119	Culvert	874.86	0.01
919	Existing	873.61	
919	Culvert	873.61	0.00
719	Existing	871.10	
719	Culvert	871.09	(0.01)
627	Existing	871.48	
627	Culvert	871.31	(0.17)
607	Existing	871.47	
607	Culvert	871.30	(0.17)
564		<b>Bridge/Culvert</b>	
516	Existing	870.51	
516	Culvert	870.51	0.00
496	Existing	870.43	
496	Culvert	870.43	0.00

Figure 2 shows the stream profiles for Existing Bridge and Proposed Culvert Conditions for Right Hand Fork for the 10-year and Base Flood events.

**Figure 2 Ten-year and Base Flood Profiles of Existing Bridge and Proposed Culvert**



The hydraulic modeling demonstrates that immediately upstream of Route 54-1, the proposed culvert will slightly lower the water stage for the 10% and Base Flood events, compared to the existing condition. Downstream of Route 54-1, the proposed improvements have no effect on Right Hand Fork stream stages.

The locations of private structures in close vicinity to the proposed project are shown in Figure 1. All of the shown structures are upstream of Highway 54-1. The hydraulic modeling demonstrates virtually no change in the flood stages for these structures as a result of the proposed project.

#### **4 CONCLUSIONS**

The proposed design includes replacing an existing bridge with a 5 by 10 foot box culvert with an invert elevation of 864.78. The design will pass the 10% return frequency flood and Base Flood (1% return frequency flood) events at slightly lower stages than the existing bridge. Nearby structures will remain reasonably unaffected from flooding by this proposed highway improvement.

#### **5 LIMITATIONS**

The design proposed in this report considers only floodplain effects. Consideration of other elements, such as structural and transportation design, have not been performed by Engineering Perfection, PLLC. The conclusions submitted in this report apply to the proposed project only. They are not applicable to on-site subsequent construction, or adjacent or nearby projects. In the event that conclusions or recommendations based on this report and relating to any other projects are made by other, such conclusions and recommendations are not the responsibility of Engineering Perfection, PLLC. In performing our professional services, we used that degree of care and skill ordinarily exercised under similar circumstances by members of the engineering profession. No other warranty, expressed or implied is made.



## Appendix A Data Provided by Jackson Surveying

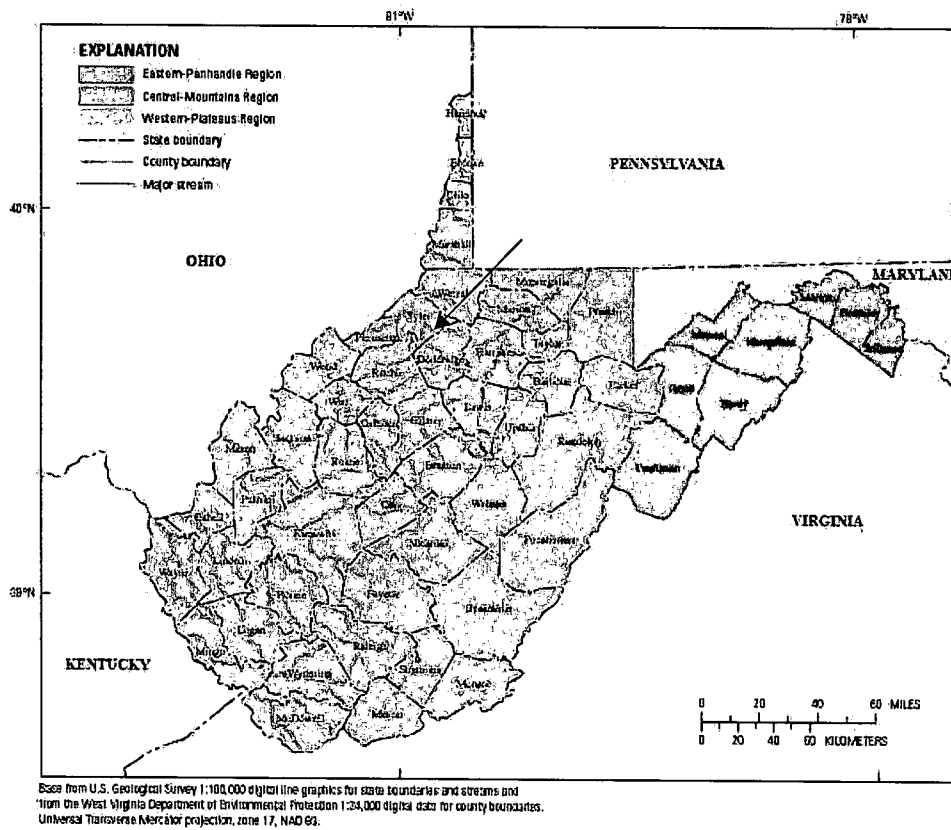
Maps in PDF provided on February 11, 2015

Maps in PDF, site photos, AutoCAD files, and survey data provided on March 6,  
2015

# Appendix B: Regional Regression Analysis

## Regression Equation Regions

12 Estimation of Flood-Frequency Discharges for Rural, Unregulated Streams in West Virginia



**Figure 4.** The Eastern Panhandle, Central Mountains, and Western Plateaus Regions of West Virginia for which equations for estimation of flood frequency discharges were developed in this study.

# Regression Equation

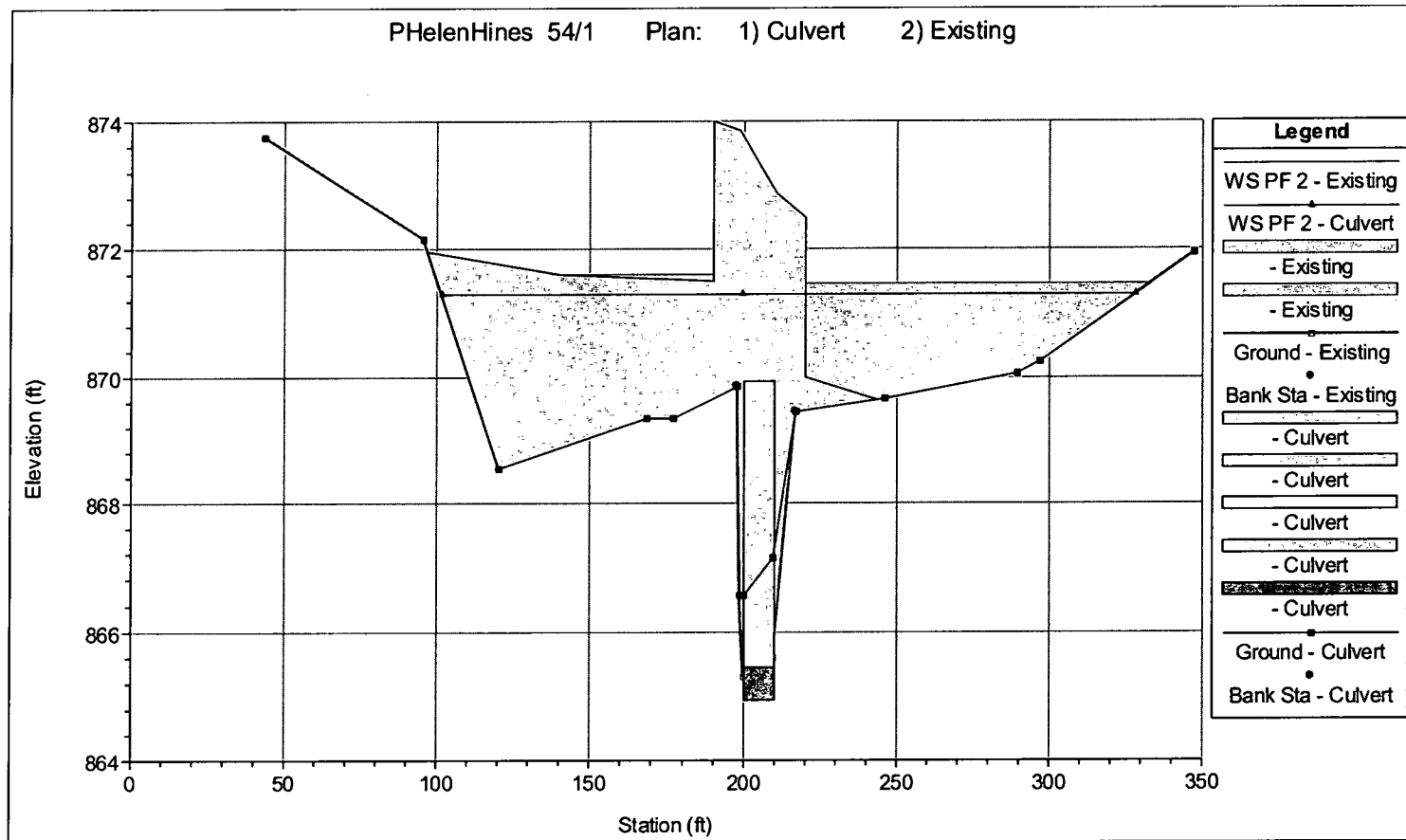
**Table 4.** Equations used to estimate selected flood-frequency discharges for streams in the Eastern Panhandle, Central Mountains, and Western Plateaus Regions of West Virginia.

[PK(n, n), peak discharge in cubic feet per second for the (n,n)-year recurrence interval; PK(n), peak discharge in cubic feet per second for the (n)-year recurrence interval; %, percent; AOP, annual-occurrence probability; DRNAREA, drainage area in square miles]

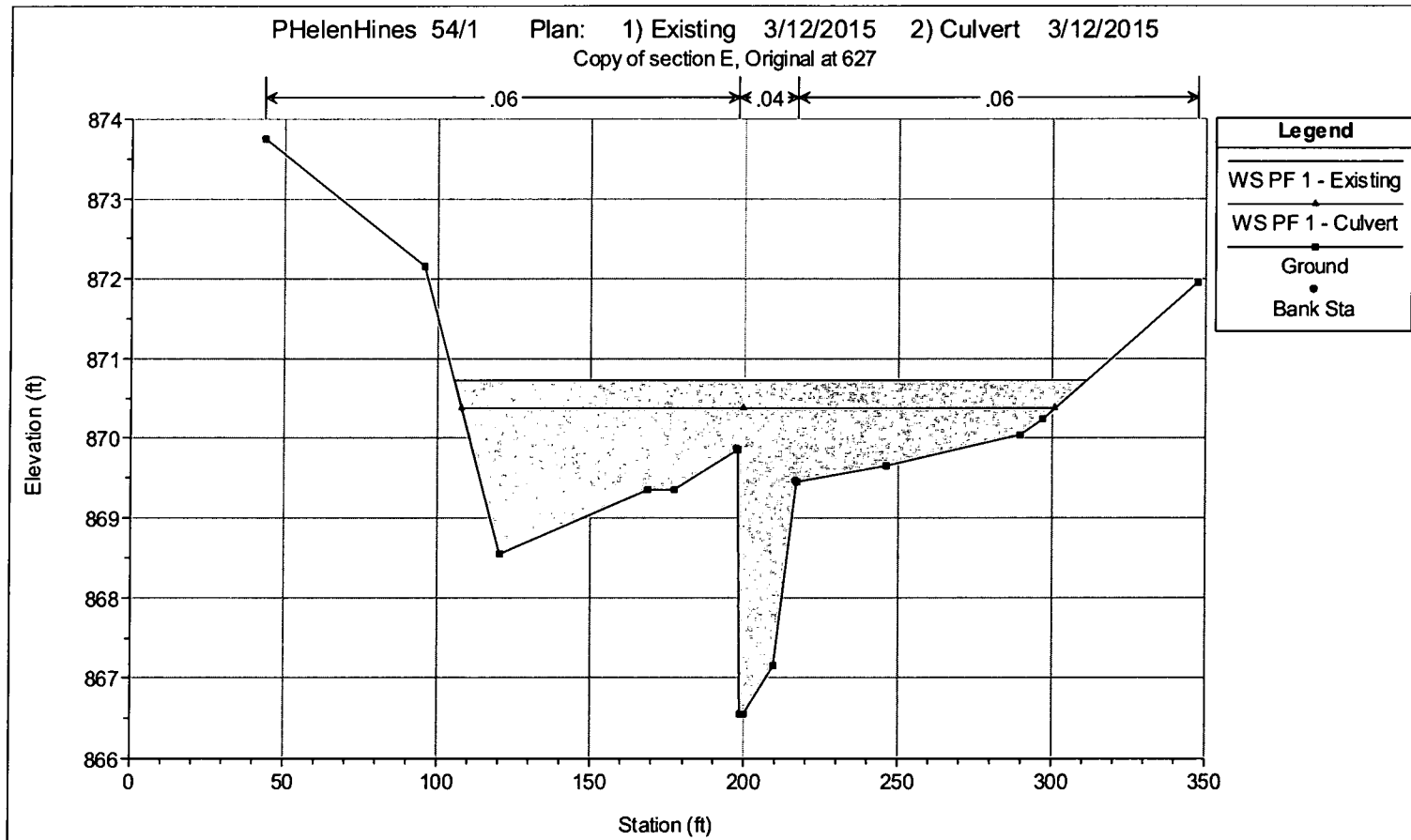
Equation	Standard error of the model, in percent	Average standard error of sampling, in percent	Average prediction error, in percent	Equivalent years of record, unitless
Eastern Panhandle Region (Range in DRNAREA from 0.21 to 1,461 for 57 streamgage stations)				
PK1_1(90%AOP) = 29.6 DRNAREA <sup>0.333</sup>	43.4	10.3	44.8	3.4
PK1_5(67%AOP) = 46.4 DRNAREA <sup>0.222</sup>	35.7	8.9	36.9	3.3
PK2(50%AOP) = 59.8 DRNAREA <sup>0.222</sup>	32.1	8.6	33.4	4.1
PK5(20%AOP) = 105 DRNAREA <sup>0.166</sup>	25.6	8.9	27.2	10.6
PK10(10%AOP) = 145 DRNAREA <sup>0.142</sup>	22.5	9.5	24.5	19.1
PK25(4%AOP) = 204 DRNAREA <sup>0.142</sup>	19.7	10.3	22.4	34.1
PK50(2%AOP) = 254 DRNAREA <sup>0.133</sup>	18.6	11.1	21.7	46.1
PK100(1%AOP) = 307 DRNAREA <sup>0.133</sup>	18.3	11.6	21.7	56.7
PK200(0.5%AOP) = 365 DRNAREA <sup>0.133</sup>	18.4	12.4	22.4	64.7
PK500(0.2%AOP) = 447 DRNAREA <sup>0.204</sup>	19.4	13.5	23.8	70.9
Central Mountains Region (Range in DRNAREA from 0.10 to 1,619 for 83 streamgage stations)				
PK1_1(90%AOP) = 33.4 DRNAREA <sup>0.271</sup>	40.0	8.3	41.0	2.4
PK1_5(67%AOP) = 53.8 DRNAREA <sup>0.227</sup>	34.6	7.3	35.4	2.0
PK2(50%AOP) = 69.4 DRNAREA <sup>0.222</sup>	33.4	7.3	34.2	2.1
PK5(20%AOP) = 116 DRNAREA <sup>0.202</sup>	34.1	8.0	35.1	3.2
PK10(10%AOP) = 153 DRNAREA <sup>0.142</sup>	36.3	8.6	37.4	4.0
PK25(4%AOP) = 206 DRNAREA <sup>0.216</sup>	39.9	9.8	41.2	4.8
PK50(2%AOP) = 250 DRNAREA <sup>0.207</sup>	42.9	10.6	44.4	5.3
PK100(1%AOP) = 297 DRNAREA <sup>0.132</sup>	46.2	11.3	47.9	5.6
PK200(0.5%AOP) = 347 DRNAREA <sup>0.222</sup>	49.7	12.0	51.5	5.9
PK500(0.2%AOP) = 420 DRNAREA <sup>0.222</sup>	54.3	13.1	56.3	6.1
Western Plateaus Region (Range in DRNAREA from 0.13 to 1,516 for 106 streamgage stations)				
PK1_1(90%AOP) = 56.9 DRNAREA <sup>0.256</sup>	38.2	7.6	39.1	3.8
PK1_5(67%AOP) = 97.8 DRNAREA <sup>0.241</sup>	33.4	6.5	34.1	2.8
PK2(50%AOP) = 129 DRNAREA <sup>0.222</sup>	31.6	6.1	32.2	2.8
PK5(20%AOP) = 221 DRNAREA <sup>0.199</sup>	29.3	6.5	30.0	4.4
PK10(10%AOP) = 292 DRNAREA <sup>0.216</sup>	28.9	6.5	29.7	5.9
PK25(4%AOP) = 391 DRNAREA <sup>0.216</sup>	29.4	7.3	30.3	7.9
PK50(2%AOP) = 472 DRNAREA <sup>0.202</sup>	30.2	7.6	31.3	9.1
PK100(1%AOP) = 557 DRNAREA <sup>0.174</sup>	31.4	8.0	32.5	10.1
PK200(0.5%AOP) = 647 DRNAREA <sup>0.202</sup>	32.7	8.3	33.9	10.8
PK500(0.2%AOP) = 775 DRNAREA <sup>0.202</sup>	34.8	8.9	36.1	11.4

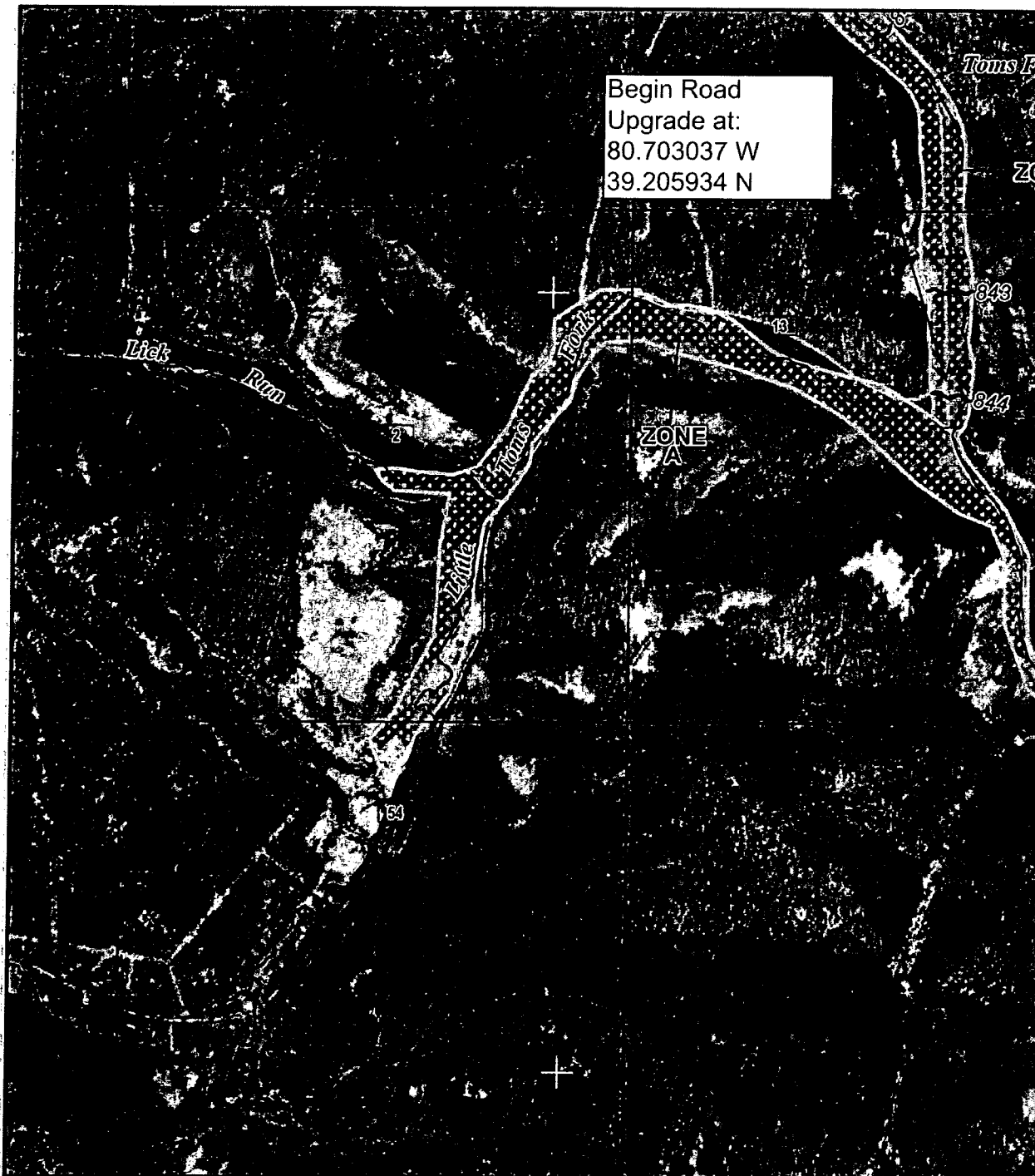
## Appendix C HEC RAS Model Outputs

### Cross Section at Upstream End of Culvert for Base Flood (100-Year) Event



# Cross Section at Upstream End of Culvert for 10-Year Event

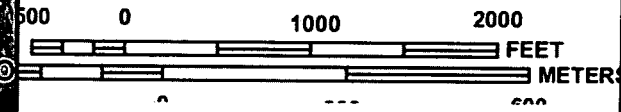




Begin Road Upgrade at:  
80.703037 W  
39.205934 N



MAP SCALE 1" = 1000'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0230C

## FIRM

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

PANEL 230 OF 325  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

COMMUNITY	NUMBER	PANEL	SUFFIX
DODDRIDGE COUNTY	540024	0230	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**  
54017C0230C  
**MAP REVISED**  
OCTOBER 4, 2011

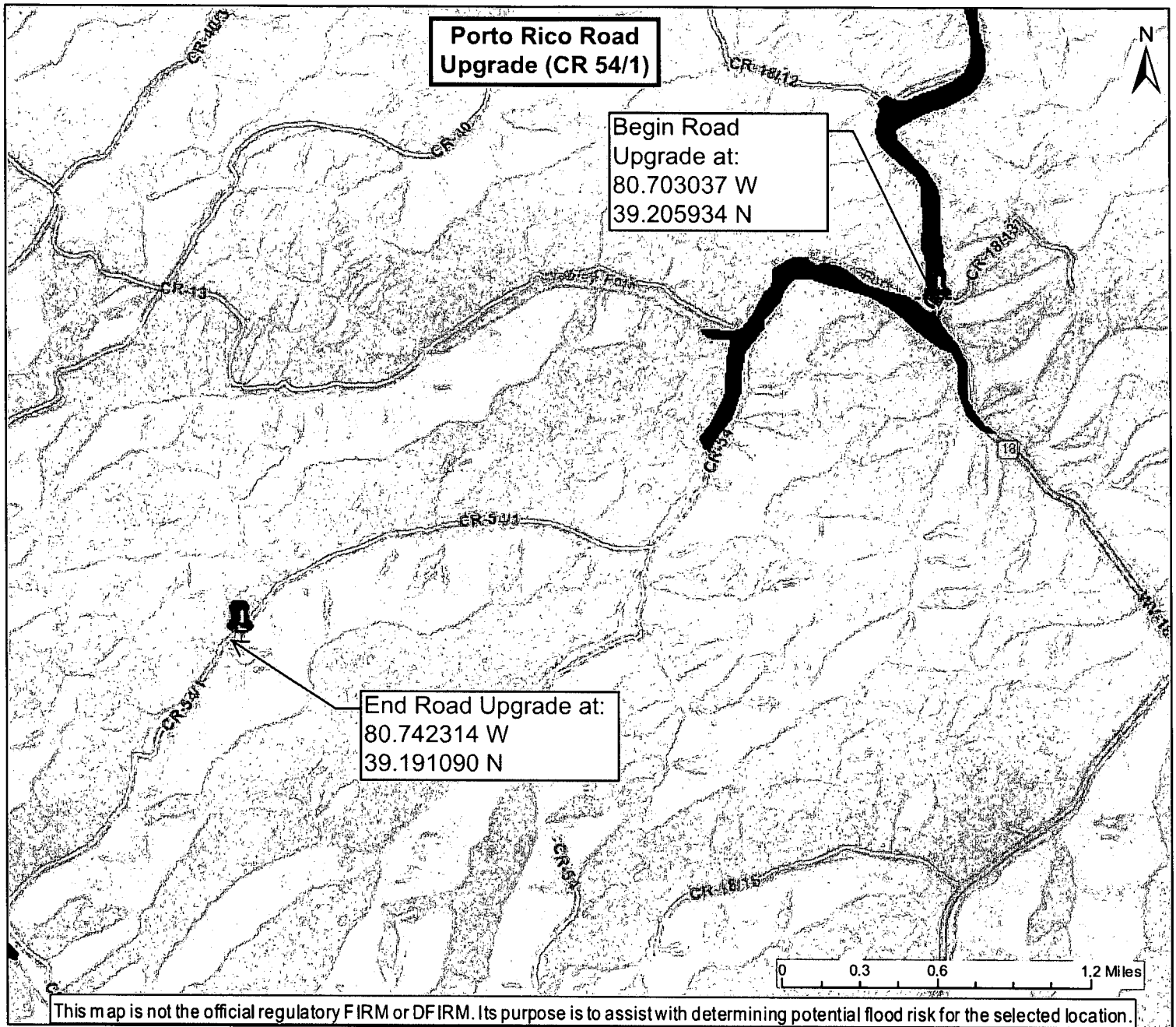
Federal Emergency Management Agency

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)

Porto Rico Road Upgrade (CR 54/1)

← End Road Upgrade at:  
80.742314 W  
39.191090 N

# WV Flood Map



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:

Map created on April 22, 2015

- 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.

### Flood Hazard Area:

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

**FEMA Issued Flood Map:** 54017C0230C

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

**Elevation:** About 849 ft

**Location (long, lat):** (80.703248 W, 39.205795 N)

**Location (UTM 17N):** (525622, 4339655)

**Contacts:** Doddridge

**CRS Information:** N/A

**Parcel Number:**





George Eidel &lt;doddridgecountyfpm@gmail.com&gt;

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**Porto Rico Rd Upgrade**

3 messages

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**George Eidel** <doddridgecountyfpm@gmail.com>  
To: Rachel Grzybek <rgrzybek@anteroresources.com>

Wed, Mar 15, 2017 at 4:08 PM

Rachel,

We are going through our records and found that Permit #15-354 Porto Rico Rd Upgrade was never done. Is this project still ongoing if so a new permit and fees will need to be done. Let me know.

--

George C. Eidel, CFM, OEM Director/Floodplain Manager  
Doddridge County Commission  
108 Court Street Suite 1  
West Union, WV 26456-2095  
Work Phone: 1-304-873-1343  
Mobile Phone: 1-304-281-7407  
Fax: 1-304-873-1840  
doddridgecountyfpm@gmail.com

--

CONFIDENTIALITY NOTE: This email message is for the sole use of the intended recipient(s) and may contain confidential, privileged, or sensitive information. Any unauthorized review, use, disclosure, or distribution is strictly prohibited and may be legally accountable.

---

**Rachel Grzybek** <rgrzybek@anteroresources.com>  
To: George Eidel <doddridgecountyfpm@gmail.com>

Wed, Mar 15, 2017 at 4:11 PM

This project was put on hold.

Thanks for checking,

***Rachel Grzybek***

Phone: (304) 842-4008

Cell: (304) 641-2396

Fax: (304) 842-4102

[rgrzybek@anteroresources.com](mailto:rgrzybek@anteroresources.com)**From:** George Eidel [mailto:doddridgecountyfpm@gmail.com]**Sent:** Wednesday, March 15, 2017 4:09 PM**To:** Rachel Grzybek**Subject:** Porto Rico Rd Upgrade

[Quoted text hidden]

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**George Eidel** <doddridgecountyfpm@gmail.com>  
To: Rachel Grzybek <rgrzybek@anteroresources.com>

Wed, Mar 15, 2017 at 4:16 PM

OK, we will close out this permit. If you all decide to go ahead with the project a new permit application will have to be completed

[Quoted text hidden]

STATE OF WEST VIRGINIA,  
COUNTY OF DODDRIDGE, TO WIT

I, Virginia Nicholson, Editor of THE  
HERALD RECORD, a weekly newspaper  
published regularly, in Doddridge County,  
West Virginia, Do Hereby Certify  
That the Accompanying Legal Notice  
Entitled:

*Floodplain Permit*

was published in said paper for *2*

successive weeks beginning with the issue  
of *May 5<sup>th</sup>* 2015 and  
ending with the issue of

*May 12<sup>th</sup>* 2015 and

that said notice contains *189*  
WORD SPACE at *.115* cents a word

amounts to the sum of \$ *21.675*

FOR FIRST PUBLICATION, SECOND  
PUBLICATION IS 75% OF THE FIRST  
PUBLICATION

\$ *16.31*  
and each publication thereafter  
\$ *38.05* TOTAL

EDITOR

*Virginia Nicholson*

SWORN TO AND SUBSCRIBED

BEFORE ME THIS THE *14<sup>th</sup>* DAY  
OF *May* 2015

NOTARY PUBLIC

*Robert E. Burnside*

LEGAL ADVERTISEMENT:  
Doddridge County  
Floodplain Permit Application  
Please take notice that on the 22nd day of April, 2015  
Antero Resources filed an application for a Floodplain  
Permit to develop land located at or about: New Milton  
District 39.205934N/80.703037W to  
39.191090N/80.742314W Permit#15-354 Porto Rico Road  
Upgrade (CR 54/1). 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 May 12, 2015.

Delivered to the:  
Clerk of the County Court  
118 E. Court Street, West Union, WV 26456  
Beth A. Rogers, Doddridge County Clerk  
Edwin L. "Bo" Wriston, Doddridge County Flood Plain  
Manager

5-5-2xb

