



Vendor Name	Vendor No.	Date	Check Number	Check Total
DODDRIDGE COUNTY COMMISSION	43312	Dec-23-2013	45191	\$3,614.00

VOUCHER	VENDOR INV #	INV DATE	TOTAL AMOUNT	PRIOR PMTS & DISCOUNTS	NET AMOUNT
12-AP-11130	BEECHLICKRUN	12/23/13	3,614.00	0.00	3,614.00
Beech Lick Run Road Bridge Flood Plain Permit					
TOTAL INVOICES PAID					3,614.00

*Permit # 13-112  
 Beech Lick Run Rd  
 Bridge.*

DETACH AND RETAIN FOR TAX PURPOSES

## Doddridge County, West Virginia

RECEIPT NO: 1453

DATE: 2014/02/11

FROM: ANTERO

AMOUNT: \$ 3,614.00

THREE THOUSAND SIX HUNDRED FOURTEEN DOLLARS AND 00 CENTS

FOR: PERMIT #13-112  
 BEECH LICK RUN ROAD BRIDGE

00000045191 FP-BUILDING PERMITS

020-318

TOTAL: \$3,614.00

MICHAEL HEADLEY  
 SHERIFF & TREASURER

MEC  
 CLERK

Legal Advertisement:  
Doddridge County  
Floodplain Permit Application

Please take notice that on the 6<sup>th</sup> day of January, 2014

**ANTERO RESOURCES CORPORATION – BEECH LICK RUN RD BRIDGE**

**Permit #13-112**

filed an

application for a Floodplain Permit to develop land located at or  
about: **SURFACE OWNERS: VICTOR R & WANDA F. COX**

**NEW MILTON DISTRICT, D/B: 207/541, T/M: 13/8.1**

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 **JANUARY 26<sup>TH</sup> 2014.**

Delivered to the:

Clerk of the County Court

118 E. Court Street, West Union, WV 26456.

Beth A Rogers, Doddridge County Clerk

Dan Wellings, Doddridge County Flood Plain Manager





13-112

January 2, 2014

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

Antero Resources  
1625 17th Street  
Denver, Colorado 80202  
Office 303.357.7310  
Fax 303.357.7315

Mr. Wellings:

Antero Resources Corporation (Antero) would like to submit a Doddridge County Floodplain permit application for the Beech Lick Run Road Bridge project. Our project is located in New Milton District and will consist of removal of an existing bridge railing and bridge superstructure. Per the enclosed description (Exhibit A), the replacement of the bridge results in no change to the base flood elevation.

Please Note: The permit fee enclosed has been doubled due to work done without a permit.

Attached you will find the following:

- Doddridge County Floodplain Permit Application and Required Permit Fee
- Description of Project-Exhibit A
- WV Flood Tool Map
- Beech Lick Run Road Bridge Plans for Construction

If you have any questions please feel free to contact me at (303) 357-6412.

Thank you in advance.

Sincerely,

Shaye Marshall  
Permit Representative  
Antero Resources Corporation

Enclosures

**FILED**  
2014 JAN -3 PM 1:04  
BETH A. ROGERS  
COUNTY CLERK  
DODDRIDGE COUNTY, WV

PERMIT NO. 13-112

**DODDRIDGE COUNTY**  
**FLOODPLAIN DEVELOPMENT**  
**PERMIT**

PURPOSE FOR PERMIT: BRIDGE REPLACEMENT

ISSUED TO ANTERO

1625 17TH STREET

ADDRESS: Denver Co. 80202

PROJECT ADDRESS: BEECH LICK + MEATHOUSE FORK

ISSUED BY: Dan Melting

DATE: 01/29/2014

CONSTRUCTION MUST START WITHIN 180 DAYS FROM ISSUED DATE. PERMIT EXPIRES IN 12 MONTHS FROM ISSUED DATE. IF EXTENSION IS NEEDED A REQUEST MUST BE MADE IN WRITING STATING A REASON FOR THE EXTENSION.

THIS PERMIT MUST BE POSTED ON THE PREMISES IN A CONSPICUOUS PLACE SO AS TO BE CLEARLY VISIBLE FROM THE STREET.

Doddridge County Flood Plain Application Fee Calculator (if in Flood Plain)	
Beech Lick Run Road Bridge	
Estimated Construction Costs	\$261,400.00
Amount over \$100,000	\$161,400.00
Drilling Oil and Gas Well Fee	\$1,000.00
\$5 per \$1,000 over \$100,000	\$807.00
Double Fee Per Stop Work Order	\$1,807.00 X
Amount Due with application	\$3,614.00

Correct

DJW

2 Because project was started without a flood plain permit.

#13-112

2157  
FEB 10 = 2009

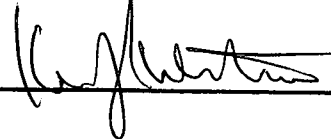
# DODDRIDGE COUNTY FLOODPLAIN DEVELOPMENT PERMIT APPLICATION

## 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 Completion 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.**

2014 JAN -3 PM 1:04  
BETH A ROGERS  
COUNTY CLERK  
DODDRIDGE COUNTY, WV

FILED

APPLICANT'S SIGNATURE 

DATE 1/2/14

## 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:** Antero Resources Corporation - Kevin Kilstrom

**ADDRESS:** 1625 17th Street, Denver, CO 80202

**TELEPHONE NUMBER:** Contact Shauna DeMattee 303-357-6820

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

**ADDRESS:** 1625 17th Street, Denver, CO 80202

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

**ENGINEER'S NAME:** Stantec- PE Stephen G. Johnson

**ADDRESS:** 111 Elkins St, Fairmont WV, 26554

**TELEPHONE NUMBER:** 304-367-9401

**PROJECT LOCATION:**

**NAME OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT)** Victor R. and Wanda F. Cox

**ADDRESS OF SURFACE OWNER/OWNERS (IF NOT THE APPLICANT)**

Rt. 3 Box 46, Salem WV 26426

**DISTRICT:** New Milton District

**DATE/FROM WHOM PROPERTY**

**PURCHASED:**

**LAND BOOK DESCRIPTION:**

**DEED BOOK REFERENCE:** DB 207/PG 541

**TAX MAP REFERENCE:** Tax Map 13/ Parcel 8.1

**EXISTING BUILDINGS/USES OF PROPERTY:** N/A

**NAME OF AT LEAST ONE ADULT RESIDING IN EACH RESIDENCE LOCATED UPON THE SUBJECT PROPERTY**

**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           | <i>Bridge</i> | <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 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 \$ 261,400.00**

**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:** Victor R. and Wanda F. Cox  
**ADDRESS:** Rt. 3 Box 46, Salem WV 26426

\* Victor R. and Wanda F. Cox own adjacent parcels 8.1, 8 and 11.

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

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

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

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

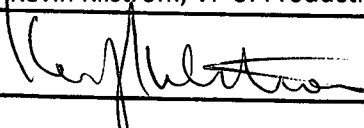
**E. CONFIRMATION FORM**

**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.

- (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): Kevin Kilstrom, VP of Production

SIGNATURE:  DATE: 1/2/14

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: 235  
 Dated: 10/09/2011

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 A  
 100-Year flood elevation is: N/A NGVD (~~MSE~~)

Unavailable

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

See section 4 for additional instructions.

SIGNED *Dan Wellings*

DATE 01/29/2014

**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:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**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** \_\_\_\_\_

# WV Flood Map

Beech Lick Run Road Bridge

Center of Project: 39.189287, -80.629871



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

Map Created on 1/2/2014



Location of the mouse click



**Flood Hazard Zone**  
(1% annual chance floodplain)

## User Notes:

## 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 is supported by FEMA, WV NFIP Office, and WV GIS Technical Center  
(<http://www.MapWV.gov/flood>)

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

**Elevation:** About 873 feet:

**Location (long, lat):** 80.629871 W, 39.189287 N

**Location (UTM 17N):** (531965, 4337848)

**FEMA Issued Flood Map:** 54017C0235C

**Contacts:** Doddridge County

**CRS Information:** No CRS information available

**Parcel Number:**





**Stantec Consulting Services Inc.**  
111 Elkins Street  
Fairmont WV 26554-4021  
Tel: (304) 367-9401  
Fax: (304) 367-9403

January 2, 2014  
File: 2027051343.T6

**Attention: Dan Wellings**  
Antero  
535 White Oaks Boulevard  
Bridgeport WV  
26330  
United States of America

Dear Dan Wellings,

**Reference: Beech Lick Road Bridge**

As designed the replacement of The Beech Lick Road Bridge consists of removal of an existing bridge railing and bridge superstructure. The existing bridge superstructure is comprised of (6) 36" wide x 27" deep x 59'-6" long precast concrete box beams. The removal of the beams per Note 3 on Sheet 5 of 14 which states: "Methods of removal shall include provisions to ensure that no debris of any kind shall fall into the stream flow. Any material dropped into the water shall be promptly and completely removed to the satisfaction of the engineer." The abutments will then be cleaned and prepared for new superstructure. The new superstructure is comprised of (6) 36" wide x 27" deep x 59'-6" long precast concrete box beams, which will be post tensioned. The new box beams are identical to the old box beams in terms of exterior size. They differ only in interior reinforcing and post tensioning. New railing will be placed on the structure which is also identical to the old railing in terms of size and configuration.

The replacement of the bridge results in no change to the bridge profile or hydraulic opening. No debris shall be allowed in the stream. There is no change in the abutment location or elevations. As such, there is no change in the base flood elevation as a result of Beech Lick Road Bridge Replacement

Regards,

**STANTEC CONSULTING SERVICES INC.**

A handwritten signature in black ink, appearing to read "R. L. Gaines", written over a circular stamp.

Richard Gaines, P.E.  
Senior Associate  
Phone: (304) 816-5190  
Fax: (304) 367-9403  
richard.gaines@stantec.com

Attachment: Beech Lick Road Bridge Plans





865 Clinic Drive  
Ivydale, WV 25113

**\*Certified DBE Company\***

Phone (304) 286-4524  
Fax (304) 286-2506

October 2, 2013

**CERTIFIED DBE QUOTE**

To: Antero Resources  
Attn: Shawn Flanigan

Re: Beech Lick Run Bridge  
Doddridge County

Item/Description	Qty/Unit	Unit Bid	Amount
Mobilization	1/LS	10,000.00	\$10,000.00
Dismantling - Superstructure	1/LS	50,000.00	\$50,000.00
Traffic Control at Bridge Site Only	1/LS	3,000.00	\$3,000.00
Class B Concrete - ~ 30/CY	1/LS	36,000.00	\$36,000.00
27x36 Pre-Stressed Beams - 360 LF	1/LS	150,000.00	\$150,000.00
Guardrail Tie Ins At Ends of Bridge - Used Guardrail	1/LS	2,400.00	\$2,400.00
Approach Paving - Maximum 10' on each end	1/LS	10,000.00	\$10,000.00
Total			<b>\$261,400.00</b>

**General Notes:** Price for Dismantling is for removing superstructure only.  
 Price for Traffic Control does not include Detour signs/temporary bridges as shown/expressed in plans  
 Price for Class B Concrete is cleaning existing abutments and constructing new, reinforced backwalls  
 Price for Prestressed Box Beams includes purchasing and installing beams  
 Price is based on using 3000 P.S.I. Concrete.  
 Price **DOES NOT** include any permits  
 Price does not include any utility relocation if required.  
 Prices do not include Bond or B & O Taxes. Please add 1.5% to each item for a P&P Bond.  
 Price does not include construction of roadway leading to or away from the bridge.

Carrie L. Haynes  
President



Equal Opportunity Employer

# DODDRIDGE COUNTY FLOODPLAIN

## STOP WORK ORDER NOTICE

TO: ANTERO RESOURCES  
DENVER, CO.  
\_\_\_\_\_

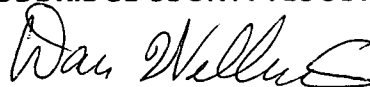
PURSUANT TO THE DODDRIDGE COUNTY FLOODPLAIN ORDINANCE ENACTED MAY 07, 2013, SECTION 7.7 (A) (1), YOU ARE **ORDERED** TO STOP ALL WORK, DEVELOPMENT AND CONSTRUCTION AT:

LOCATION: BRIDGE REPLACEMENT AT MEATHOUSE FORK  
NEAR MOUTH OF BEECH LICK  
INTERSECTION OF CO. RT. 25 & 25/10  
\_\_\_\_\_  
\_\_\_\_\_

FOR NON-COMPLIANCE WITH THE DODDRIDGE COUNTY FLOODPLAIN ORDINANCE, AND/OR CONDITIONS OF PERMIT, AND/OR DIRECTIVES OF THE FLOODPLAIN MANAGER.

DATE: 12/06/2013

DODDRIDGE COUNTY FLOODPLAIN MANAGER



DAN WELLINGS, PS

SERVICE ACCEPTED BY HAND DELIVERY THIS 6 DAY OF December  
20 13 BY Don Wellings.  
(DODDRIDGE COUNTY REPRESENTATIVE)

Ann M  
SIGNATURE (PERSON RECEIVING NOTICE)

Anthony Smith Design & Survey Manager  
(PRINT TITLE PERSON RECEIVING NOTICE)

Antero Resources  
(PRINT COMPANY NAME OF PERSON RECEIVING NOTICE)

---

Anthony Smith  
304-673-6196

Beech Lick Bridge  
Stop Work Order

File - ↑

Antero - Beech Lick bridge over Meathouse Fork

12/05/2013

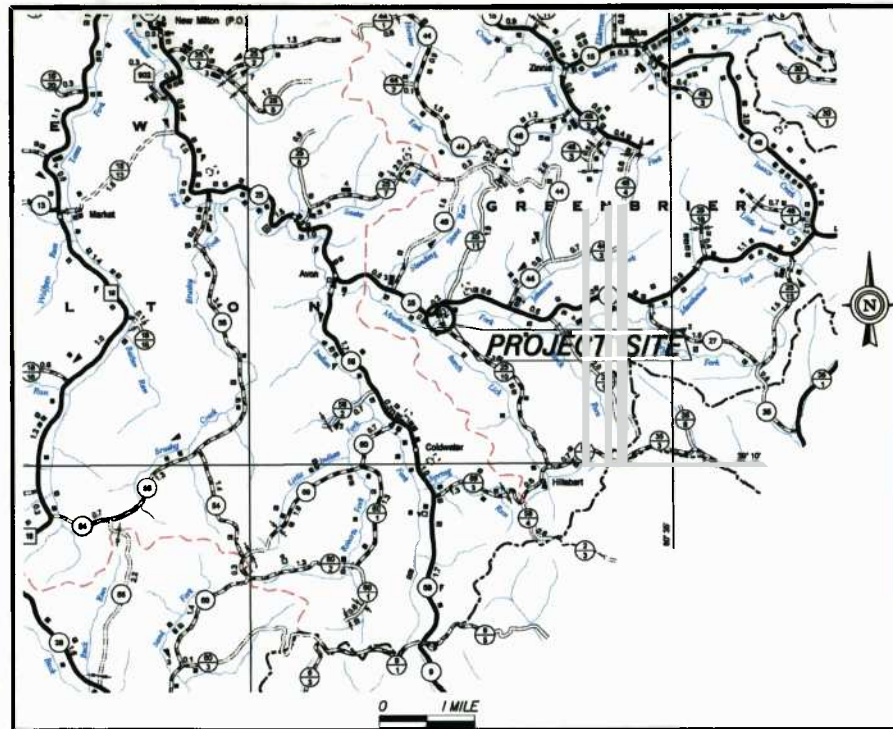




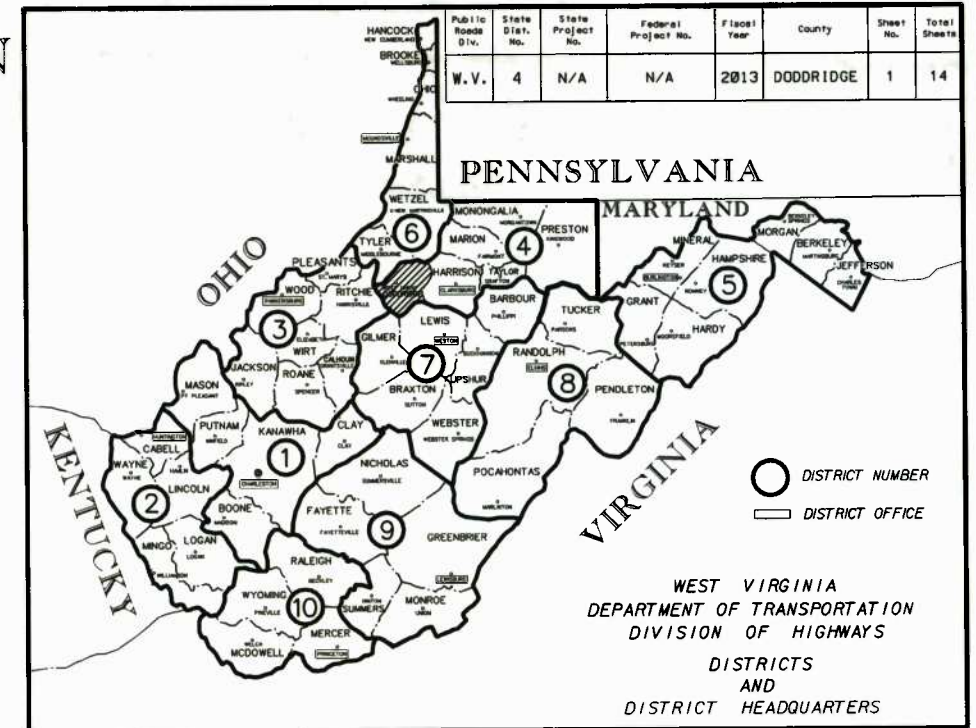
**WEST VIRGINIA  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PLANS FOR CONSTRUCTION  
OF  
BEECH LICK ROAD BRIDGE**

STATE PROJECT NO.  
ROUTE NO. DODDRIDGE CO. RT. 25 /10  
DODDRIDGE COUNTY  
NEW MILTON DISTRICT

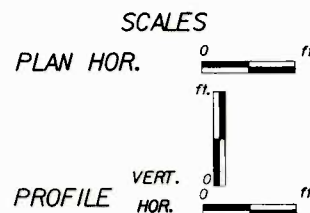
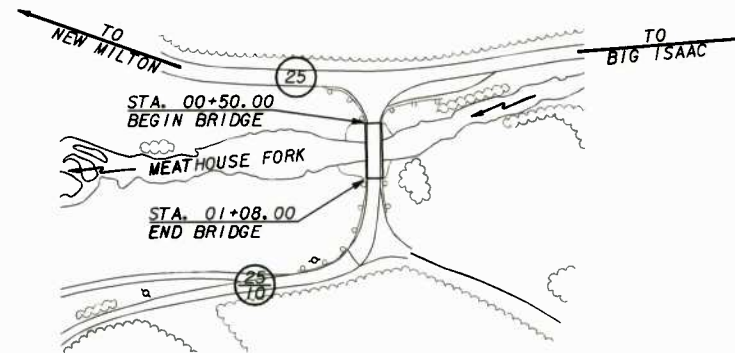
Station	Station	ft.	mile(s)
Roadway	to	=	=
Bridge	00+50.00 to 01+08.00	= 58.00	= 0.011
Roadway	to	=	=
Total Project Length =		58.00	0.011



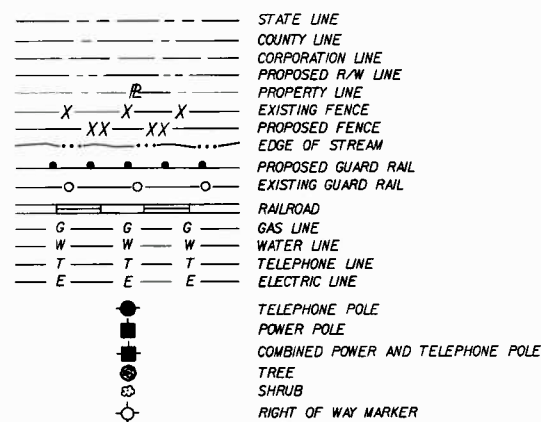
UTILITIES  
FRONTIER



**TYPE OF CONSTRUCTION  
BRIDGE REPLACEMENT #6541.1**



**CONVENTIONAL SIGNS**



**INDEX TO SHEETS**

NO.	DESCRIPTION
1	TITLE SHEET
2	TRAFFIC DETOUR PLAN
3	TRAFFIC CONTROL PLAN
4	PRESTRESSED CONCRETE BEAM DESIGN NOTES S8BR-8190
5	DEMOLITION PLAN AND NOTES
6	BEAM LAYOUT PLAN, ELEVATION AND SECTION
7	PRESTRESSED CONCRETE BEAM / ABUTMENT DETAILS
8	27" BOX BEAM DETAILS S8BR-827A
9	27" BOX BEAM DESIGN TABLE S8BR-827B
10	PRESTRESSED CONCRETE BEAM NOTES S8BR-8101
11	PRESTRESSED CONCRETE BEAM DETAILS S8BR-8102A
12	PRESTRESSED CONCRETE BEAM DETAILS S8BR-8102B
13	PRESTRESSED CONCRETE BEAM POST-TENSIONING DETAILS S8BR-8103
14	PRESTRESSED CONCRETE BEAM GUARDRAIL DETAILS S8BR-8104

**LAYOUT SCALE**



PLANS PREPARED BY

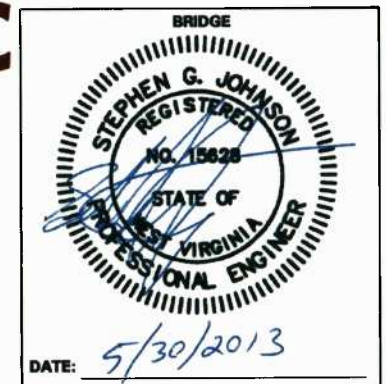
**Stantec**

111 ELKINS STREET  
FAIRMONT, WV 26554

PLANS PREPARED FOR



ANTERO RESOURCES  
175-D ELK CREEK ROAD  
MT. CLARE, WV 26408



NOTES: STANDARD DETAIL BOOK VOL. I DATED JANUARY 1, 2000 & VOLUME II DATED JAN. 1, 1994, SHALL APPLY TO THIS PROJECT.

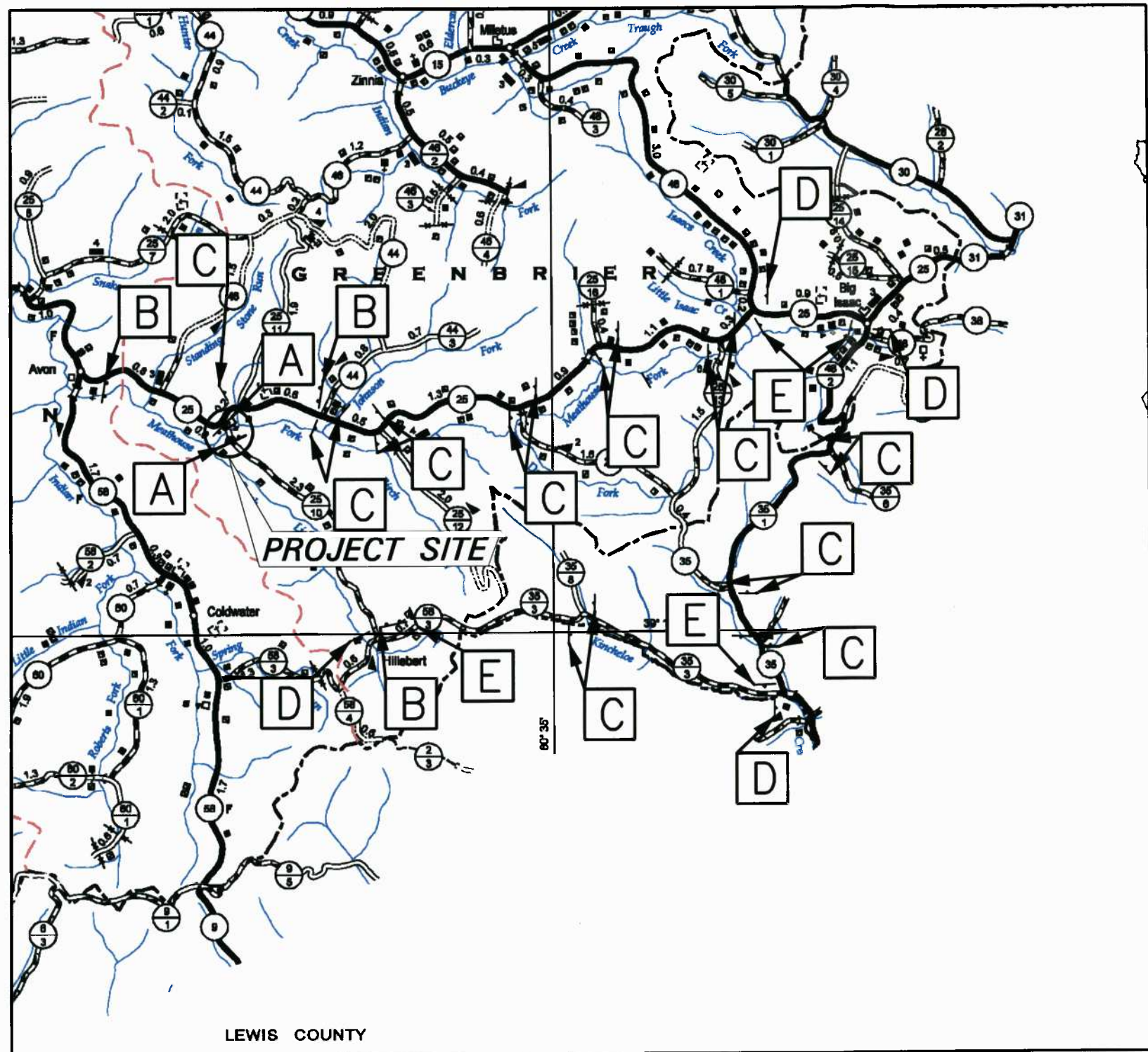
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT.

EXECUTIVE SECRETARY



Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W.V.	4		N/A	2013	DODDRIDGE	2	14



**BRIDGE CLOSED** R11-2  
48"X30"

**A** TYPE III BARRICADE  
48"X60" MIN.

**BRIDGE CLOSED  
XX MILES AHEAD  
LOCAL TRAFFIC ONLY** R11-3B  
60"X30"

**B**

**DETOUR**  
↑  
M4-9S  
30"X24"

**C**

**DETOUR**  
↙  
W1-1L  
30"X30"  
M4-8  
24"X12"

**D**

**DETOUR**  
↘  
W1-1R  
30"X30"  
M4-8  
24"X12"

**E**

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

**TRAFFIC DETOUR PLAN**



111 ELKINS STREET  
FAIRMONT, WV 26554

DESIGNED BY: **JDV**  
DRAWN BY: **JDV**  
CHECKED BY: **SGJ**

SCALE: 0 1 MILE

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

DATE PLOTTED: 02/04/13 11:11 AM



Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4		N/A	2013	ODDRIDGE	3	14

### SEQUENCE OF CONSTRUCTION

1. INSTALL TRAFFIC DETOUR SIGNAGE AND CLOSE BRIDGE.
2. DEMOLISH EXISTING BRIDGE SUPERSTRUCTURE.
3. ERECT NEW BRIDGE SUPERSTRUCTURE.
4. REMOVE TRAFFIC DETOUR SIGNAGE AND OPEN BRIDGE.

### MAINTENANCE OF TRAFFIC NOTES

1. MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH SECTION 636 OF WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, STANDARD SPECIFICATIONS, ROADS AND BRIDGES, ADOPTED 2010, AS AMENDED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS, SUPPLEMENTAL SPECIFICATIONS, ISSUED JANUARY 1, 2013. THE CONTRACT DOCUMENTS AND THE CONTRACT PLANS ARE THE GOVERNING PROVISIONS APPLICABLE TO THIS PROJECT, AND THE MANUAL ON TEMPORARY TRAFFIC CONTROL FOR STREETS AND HIGHWAYS - 2006 EDITION, WHICH IS MADE A PART OF THIS CONTRACT AND THE TRAFFIC DETOUR PLAN FOR INDIVIDUAL SEGMENTS AS DESCRIBED ON SHEET 2.
2. REFLECTIVE SHEETING ON TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE OF NEW CONDITION AT THE BEGINNING OF THE PROJECT LIFE. NIGHT VISIBILITY AND LEGIBILITY SHALL BE MAINTAINED.
3. ACCESS TO ALL HOUSES AND BUSINESSES SHALL BE MAINTAINED AT ALL TIMES.
4. LOCATION OF ALL TRAFFIC CONTROL DEVICES SHOWN ON THE TRAFFIC DETOUR PLAN ARE APPROXIMATE FINAL LOCATION OF THE TRAFFIC CONTROL DEVICES ARE TO BE ESTABLISHED BY THE ENGINEER IN THE FIELD.
5. IT SHALL BE THE CONTRATOR'S RESPONSIBILITY TO COORDINATE TRAFFIC CONTROL WITH ANY ADJACENT CONSTRUCTION PROJECT. THIS COORDINATION SHALL BE DONE SO THAT ANY CLOSURE SHALL NOT CONFLICT WITH ANY OTHER CLOSURE AND ALSO TO ENSURE THAT THE CONTRACTORS ARE AGREED IN REFERENCE TO WORKING PLANS AND STORAGE AREAS. THE PLAN OF COORDINATION SHALL BE PRESENTED TO THE ENGINEER IN WRITING FOR APPROVAL.

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

## TRAFFIC CONTROL PLAN

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY



111 ELKINS STREET  
FAIRMONT, WV 26554

DESIGNED BY: JDV  
DRAWN BY: JDV  
CHECKED BY: SGJ

RESERVED FOR THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
		4	DODDRIDGE	4	14

**GOVERNING SPECIFICATIONS**

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, ADOPTED 2010 AS AMENDED BY THE CURRENT SUPPLEMENTAL SPECIFICATIONS. THE CONTRACT PLANS AND CONTRACT SPECIAL PROVISIONS ARE THE GOVERNING PROVISIONS APPLICABLE TO THIS PROJECT.

ALL BEAMS ARE DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, DATED 1998 AS AMENDED BY THE 2003 INTERIM SPECIFICATIONS.

**DESIGN NOTES**

ALL STANDARD ADJACENT PRESTRESSED CONCRETE BRIDGE BEAMS ARE DESIGNED TO MEET THE FOLLOWING CRITERIA:

- DESIGN LOADS:
  - HL-93 LIVE LOAD IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
  - FUTURE WEARING SURFACE OF 50 PSF OF ROADWAY.
  - TYPE F PARAPET WEIGHING 321 PLF.
  - DIAPHRAGM DEAD LOAD, NUMBER REQUIRED BASED ON 15'-0" MAX. SPACING.
- TWO LANE BRIDGE WITH AN OVERALL WIDTH OF 24'-5" (INCL. 3/4" GAP BETWEEN ADJ. BEAMS), A CURB-TO-CURB WIDTH OF 22'-1", TRANSVERSE POST-TENSIONING, AND ZERO SKEW.
- DESIGN STRENGTH AND UNIT STRESSES:
 

MINIMUM CONCRETE STRENGTH @ STRAND RELEASE	5500 PSI
MINIMUM CONCRETE STRENGTH @ 28 DAYS	8000 PSI
TEMPORARY STRESS LIMITS IN CONCRETE BEFORE LOSSES:	
COMPRESSION STRESS LIMIT @ STRAND RELEASE	3300 PSI
TENSION STRESS LIMIT @ STRAND RELEASE	-200 PSI
COMPRESSIVE STRESS LIMITS IN CONCRETE @ SERVICE I AFTER LOSSES:	
@ FINAL I (PS+DL+LL)	4800 PSI
@ FINAL 2 (PS+DL)	3600 PSI
@ FINAL 3 (50%(PS+DL)+LL)	3200 PSI
TENSILE STRESS LIMIT IN CONCRETE @ SERVICE II AFTER LOSSES:	
@ FINAL I (PS+DL+LL)	-270 PSI
TENDON STRESS LIMIT PRIOR TO TRANSFER:	202.5 KSI
TENDON STRESS LIMIT AFTER ALL LOSSES:	194.4 KSI
- DEBONDING OR SHIELDING OF STRANDS TO REDUCE TEMPORARY TENSILE STRESSES IS PERMITTED, HOWEVER DEBONDING IS LIMITED TO 40% PER ROW AND 25% TOTAL. IN NO INSTANCES SHALL OUTER STRANDS BE DEBONDED. DEBONDED STRANDS SHALL BE SEPARATED BY AT LEAST ONE FULLY BONDED STRAND AND SHALL BE SYMMETRICAL ABOUT THE C OF THE BEAM. SHIELDING OF STRANDS SHALL BE ACCOMPLISHED BY TAPING OR TIGHT FITTING PLASTIC TUBES TAPED AT EACH END.
- THE ELASTOMERIC BEARING PADS PROVIDED IN THE STANDARD DESIGNS ARE BASED ON ZERO GRADE AND ARE LIMITED TO A MAXIMUM OF 5% GRADE. IN INSTANCES OF GRADES EXCEEDING THIS LIMIT, PADS SHALL BE SPECIFICALLY DESIGNED. INDIVIDUAL PAD DESIGNS SHALL BE IN ACCORDANCE WITH SECTION 14, AASHTO LRFD. BEVELED SOLE PLATES ARE PERMITTED.
- MAXIMUM BEAM SKEW SHALL BE 30 DEGREES.
- WHEN ALTERNATE DESIGNS OR SITE SPECIFIC DESIGNS ARE PROVIDED, CRITERIA SET FORTH IN THESE STANDARDS SHALL APPLY.
- NEGATIVE DESIGN CAMBER AFTER ALL LOSSES IS NOT PERMITTED.
- EACH BEAM PROVIDED IN THESE STANDARD DESIGNS HAS BEEN LOAD RATED IN ACCORDANCE WITH SECTION 3.15 OF THE WEST VIRGINIA DIVISION OF HIGHWAYS BRIDGE DESIGN MANUAL, 2004. ADDITIONALLY, LOAD RATING PROCEDURES ARE IN ACCORDANCE WITH THE AASHTO MANUAL FOR CONDITION EVALUATION AND LOAD AND RESISTANCE FACTOR RATING OF HIGHWAY BRIDGES, 2003.

**MATERIALS & FABRICATION NOTES**

THE PRESTRESSED CONCRETE BEAMS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF SECTION 603 OF THE STANDARD SPECIFICATIONS.

**MILD REINFORCEMENT:**

- ALL MILD REINFORCING STEEL SHALL BE GRADE 60, DEFORMED BILLET STEEL AND SHALL BE EPOXY COATED EXCEPT WHERE NOTED. ALL UNCOATED REINFORCING SHALL MEET THE REQUIREMENTS OF AASHTO M31. ALL EPOXY COATED REINFORCING SHALL MEET THE REQUIREMENTS OF AASHTO M284, EXCEPT WHERE AMENDED BY SECTION 709.1 OF THE STANDARD SPECIFICATIONS.
- ALL TENSION LAP SPLICES SHALL BE A CLASS B, CONTACT TYPE. MINIMUM LAP SPLICE LENGTHS SHALL BE AS GIVEN IN THE "LAP SPLICE TABLE", THIS SHEET. ADDITIONALLY, IF LAP SPlicing OF ET, LR, AND BT BARS IS USED, TERMINATION OF THE SPLICE SHALL BE NO CLOSER TO THE END OF THE BEAM THAN 1/10 OF THE SPAN LENGTH.
- MINIMUM BAR BENDING DIAMETER SHALL BE 6 BAR DIAMETERS, EXCEPT THAT NO. 4 AB BARS MAY HAVE A MINIMUM BEND DIAMETER OF 4 BAR DIAMETERS.
- MINIMUM CONCRETE COVER SHALL BE AS SPECIFIED IN SECTION 603.5 OF THE STANDARD SPECIFICATIONS, EXCEPT WHERE NOTED ON THE PLANS.

**PRESTRESSING STRAND:**

- ALL PRESTRESSING STEEL SHALL BE 1/2" Ø, GRADE 270, 7 WIRE UNCOATED, LOW-RELAXATION STRAND MEETING THE REQUIREMENTS OF AASHTO M203, SUPPLEMENT S1.
- ALL BEAMS DESIGNED IN THESE STANDARDS UTILIZE STRANDS WITH A NOMINAL AREA OF 0.167 SQ. IN. STRANDS WITH A NOMINAL AREA OF 0.153 SQ. IN. IS PERMITTED FOR INDIVIDUAL OR ALTERNATE DESIGNS, HOWEVER THE DESIGNER IS ENCOURAGED TO USE THE LARGER STRAND FOR UNIFORMITY REASONS. IN NO CASES WILL STRESS-RELIEVED STRAND BE PERMITTED.
- ALL STRANDS SHALL BE ENCLOSED INSIDE THE STIRRUP CAGE FOR THE FULL LENGTH OF THE BEAM.
- ALL EXPOSED PRESTRESSING STRAND AT EACH BEAM END SHALL BE SHOP COATED WITH A LIQUID COLD-APPLIED BITUMINOUS ELASTOMERIC WATERPROOFING MEMBRANE. MATERIAL SHALL MEET ASTM C836-84.

**CONCRETE:**

- ALL CONCRETE USED IN MANUFACTURING PRESTRESSED CONCRETE BEAMS SHALL MEET THE REQUIREMENTS OF SECTION 603.6 OF THE STANDARD SPECIFICATIONS. DESIGN STRENGTHS SHALL MEET OR EXCEED THE MINIMUM VALUES SET FORTH IN THESE PLANS.
- ALL CONCRETE USED IN PARAPETS AND CURBS SHALL BE CLASS K CONCRETE.

**ELASTOMERIC BEARING PADS:**

- ALL BEARING PADS SHALL MEET THE APPLICABLE REQUIREMENTS AS SET FORTH IN SECTION 18.2 OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, 1998 EDITION WITH CURRENT INTERIMS. ALL BEARINGS SHALL BE STEEL REINFORCED LAMINATED BEARINGS.
- THE ELASTOMER MATERIAL SHALL BE 60 DUROMETERS WITH A MINIMUM LOW TEMPERATURE GRADE OF 3 (ZONE C).
- ALL STEEL REINFORCING SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 36.

**GUARDRAIL, GUARDRAIL POSTS, TUBING & INSERTS:**

ALL W-BEAM GUARDRAIL AND ATTACHMENT HARDWARE SHALL BE IN ACCORDANCE WITH SECTION 712.4 OF THE STANDARD SPECIFICATIONS. GUARDRAIL POSTS, STRUCTURAL TUBING, POST ATTACHMENT INSERTS, AND HARDWARE SHALL MEET THE LISTED MATERIAL AND COATING SPECIFICATIONS:

ITEM	DESCRIPTION	MATERIAL SPEC.	COATING SPEC.
POST	W6 x 8.5 OR 9.0	AASHTO M270, GR 36	AASHTO M180
PLATE	1/2" x 6"	AASHTO M270, GR 36	AASHTO M180
STEEL PIPE	1 1/4" Ø x 3"	AASHTO M270, GR 36	AASHTO M232
NUTS	3/4" Ø	AASHTO M291, CLASS C	AASHTO M232
NUTS	3/8" Ø	AASHTO M291, CLASS C	AASHTO M232
BOLTS	3/8" Ø x ALL LEN.	AASHTO M164 (TYPE 1, HH)	AASHTO M232
BOLTS	3/4" Ø x ALL LEN.	AASHTO M164 (TYPE 1, HH)	AASHTO M232
WASHERS	ALL	AASHTO M293	AASHTO M232
THREADED INSERT	3/4" Ø	AASHTO M232	AASHTO M232

**WELDING:**

- TACK WELDING OF REINFORCEMENT IS NOT PERMITTED. REINFORCING CAGES AND LONGITUDINAL STEEL SHALL BE ADEQUATELY TIED WITH APPROVED MEANS TO PREVENT RACKING AND MISALIGNMENT.
- ALL WELDING OF FABRICATED ITEMS, AS SHOWN IN THESE PLANS SHALL BE IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS OF AASHTO/AWS D1.5, 2002.

**POST-TENSIONING BARS:**

- POST - TENSIONING THREAD BARS SHALL BE ONE INCH DIAMETER, 150 KSI STEEL, AND SHALL CONFORM TO AASHTO M275, TYPE II. STEEL THREAD BARS SHALL BE DESIGNED TO ALLOW THE USE OF HEAVY HEX NUTS AND COUPLERS THAT THREAD ONTO THE END OF THE DEFORMATIONS. HEAVY HEX NUTS AND COUPLERS SHALL BE OF A DESIGN AND MATERIAL RECOMMENDED BY THE BAR MANUFACTURER TO DEVELOP THE FULL TENSILE STRENGTH OF THE BAR. PROPERLY DOCUMENTED CERTIFIED MILL TEST REPORTS SHALL BE PROVIDED FOR EACH HEAT OF STEEL THREAD BARS.
- ALL POST-TENSIONING THREAD BARS, NUTS, BEARING PLATES, COUPLERS, AND ANCILLARY HARDWARE SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH AASHTO M111. THE GALVANIZING PLANT SHALL ADMINISTER ADEQUATE QUALITY CONTROL MEASURES TO SAFEGUARD AGAINST HYDROGEN EMBRITTELEMENT. QUALITY CONTROL MEASURES SHALL COMPLY WITH ASTM A-143. CERTIFICATION FOR HOT-DIP GALVANIZING SHALL BE PROVIDED BY THE GALVANIZING PLANT.
- ALL POST-TENSIONING BEARING PLATES SHALL CONFORM TO AASHTO M270, GRADE 36.

**shear KEY GROUT:**

- SHEAR KEY GROUT SHALL BE A GROUT THAT IS RECOMMENDED BY THE MANUFACTURER FOR A POURABLE GROUT APPLICATION AND THAT BASED ON THE MANUFACTURER'S TEST DATA WILL ATTAIN A MINIMUM OF 4500 PSI COMPRESSIVE STRENGTH IN 3 DAYS UNDER CONDITIONS REPRESENTATIVE OF THE CONDITIONS TO BE EXPERIENCED AT THE SITE. THE GROUT MUST BE LISTED ON THE APPROVED LIST OF GROUTS PUBLISHED BY THE WEST VIRGINIA DIVISION OF HIGHWAYS, MATERIALS CONTROL, SOIL AND TESTING DIVISION. THE CONTRACTOR SHALL PRE-TEST THE PROPOSED GROUT FOR COMPRESSIVE STRENGTH AT 3 AND 7 DAYS AND SUBMIT THE RESULTS TO THE BRIDGE PROJECT MANAGER FOR APPROVAL PRIOR TO INSTALLATION OF THE GROUT IN THE STRUCTURE. THE TESTS WILL BE BASED ON A POURABLE CONSISTENCY WITH THE SAME WATER/GROUT MIXTURE RATIO TO BE USED IN THE STRUCTURE.
- THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT FOR EACH PROJECT, THE GROUT PRE-TEST RESULTS OBTAINED IN THE NOTE ABOVE. THE CONTRACTOR SHALL BE REQUIRED TO PERFORM A NEW PRE-TEST AND SUBMISSION FOR APPROVAL UNDER ANY OF THE FOLLOWING CONDITIONS:
  - A PERIOD OF 18 MONTHS HAS ELAPSED SINCE LAST PRE-APPROVAL TESTING.
  - GROUT MANUFACTURER HAS REVISED OR CHANGED THE GROUT SPECIFICATIONS.
  - THE CONTRACTOR ALTERS THE WATER/GROUT MIXTURE RATIO.
  - THE CONTRACTOR CHANGES GROUT MANUFACTURER.
  - THE CONTRACTOR IS REQUIRED TO COMPLETE THE GROUT STRENGTH TABLE ON BR-B103.
- TEST PROCEDURE FOR DETERMINING THE COMPRESSIVE STRENGTH OF GROUT SHALL USE CUBE SPECIMENS IN ACCORDANCE WITH ASTM C109, AS MODIFIED BY ASTM C107. GROUT TESTING IN ACCORDANCE WITH AASHTO T23 (STANDARD CYLINDER TEST) IS NOT ACCEPTABLE.

**PROTECTIVE SURFACE TREATMENT:**

- EACH PRESTRESSED CONCRETE BEAM SHALL BE TREATED BY THE MANUFACTURER AT THE FABRICATION PLANT WITH AN APPROVED CONCRETE SEALER (SILANE). AN APPROVED LIST OF CONCRETE SEALERS ARE ON FILE AT THE WEST VIRGINIA DIVISION OF HIGHWAYS, MATERIALS CONTROL, SOIL AND TESTING DIVISION. COVERAGE SHALL INCLUDE TOP AND BOTTOM OF INTERIOR BEAMS, AND TOP, BOTTOM AND EXTERIOR SIDE OF EXTERIOR BEAM. APPLICATION RATE SHALL BE PER TREATMENT MANUFACTURER'S RECOMMENDATION.
- AFTER COMPLETION OF THE SILANE TREATMENT BY FABRICATOR AND A MAXIMUM OF FIVE WORKING DAYS PRIOR TO SHIPMENT OF THE BEAMS, THE FABRICATOR SHALL BE RESPONSIBLE FOR ABRASIVE BLAST CLEANING TO CLEAN WHITE CONCRETE THE INTERIOR SIDES OF BEAMS FOR THE FULL LENGTH. CLEAN WHITE CONCRETE SHALL MEAN REMOVAL OF ALL DIRT, GREASE, OIL, AND LOOSE CONCRETE LAITANCE AND PROVIDE A ROUGHENED CONCRETE SURFACE. BLASTING MEDIUM SHALL BE APPROVED BY THE DIVISION OF HIGHWAYS.

**SHOP DRAWINGS:**

THE FABRICATOR SHALL BE RESPONSIBLE FOR THE PREPARATION OF SHOP DRAWINGS IN ACCORDANCE WITH THE WEST VIRGINIA DIVISION OF HIGHWAYS DOCUMENTS, DD-102 AND THE STANDARD SPECIFICATIONS. ADDITIONAL INFORMATION IS PROVIDED IN SECTION 7 OF THE BRIDGE DESIGN MANUAL. SHOP DRAWINGS SHALL INCLUDE THE FABRICATOR'S DETENSIONING PLAN.

BAR SIZE	NO. 3	NO. 4	NO. 5	NO. 6
SPLICE LEN.	21"	28"	34"	41"

THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD & REVISED SHEETS BR-B17A & B THRU BR-B42A & B, BR-B101, BR-B102A & B, BR-B103, BR-B104, BR-B105A & B AND BR-B106 AS APPLICABLE.

PRESTRESSED CONCRETE BEAM  
DESIGN & ASSEMBLY NOTES  
REVISED SHEET BR-B100

PREPARED:	
REVISION:	
10/12	SGJ

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION

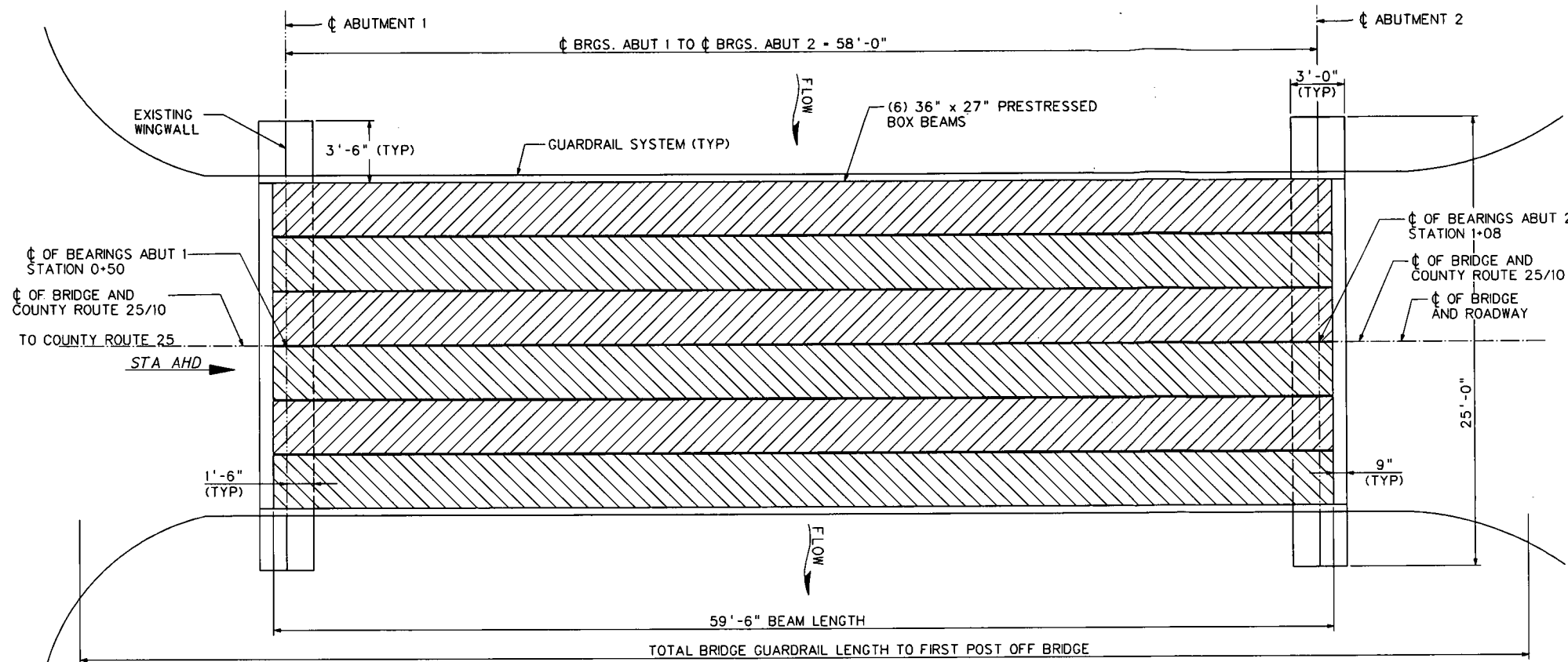
BEECH LICK RUN BRIDGE

DESIGNED BY: THB/SGJ  
DRAWN BY: THB/ATS  
CHECKED BY: MSS  
REVIEWED BY: MS  
DATE: 5/30/13  
SCALE: NTS  
SHEET NO. 4 OF 14  
BRIDGE NUMBER: 6541.1

ANTERO RESOURCES  
Stantec

PRESTRESSED CONCRETE BEAM  
DESIGN & ASSEMBLY NOTES

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
		4	DODDRIDGE	5	14



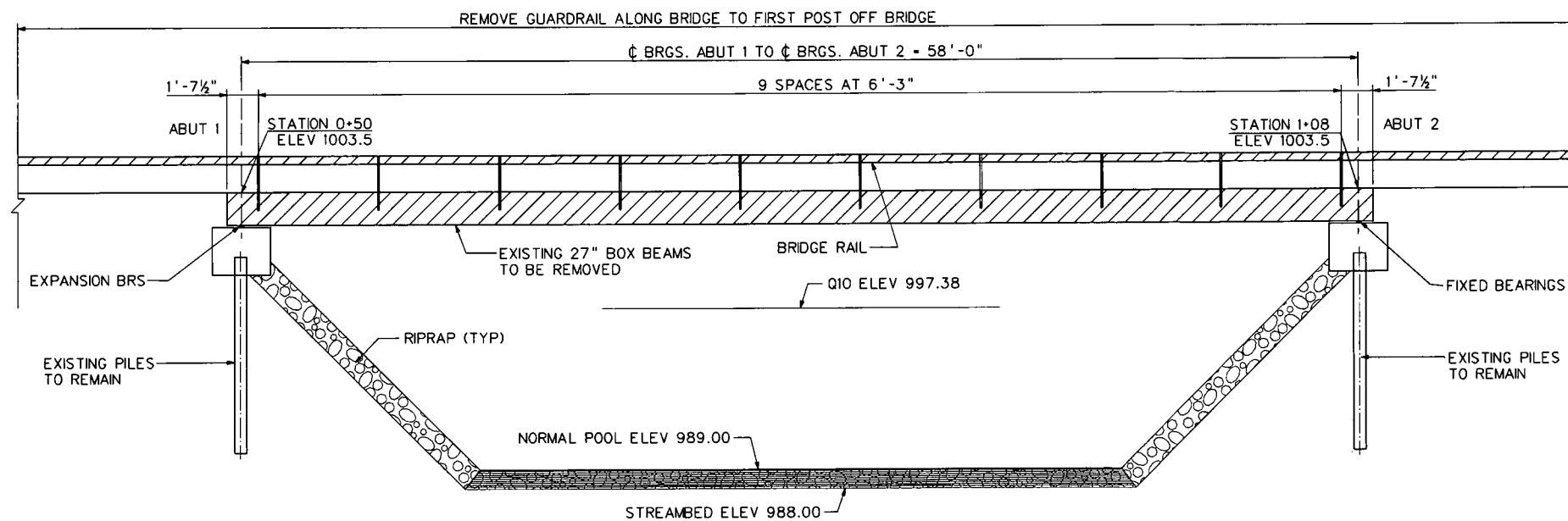
**PLAN VIEW**  
NOT-TO-SCALE

**SEQUENCE OF CONSTRUCTION**

1. INSTALL TEMPORARY DETOUR SIGNS AND BARRIERS.
2. SHIFT TRAFFIC TO DETOUR ROUTE.
3. REMOVE EXISTING BRIDGE RAILING AND SUPERSTRUCTURE.
4. CLEAN, REPAIR AND PREPARE EXISTING ABUTMENTS.
5. INSERT NEW BACKWALL DOWEL BARS INTO EXISTING ABUTMENT.
6. FORM AND POUR NEW BACKWALL.
7. SET NEW BOX BEAMS WITH BRIDGE RAILING, INSTALL POST TENSIONING THREAD BARS, AND GROUT SHEAR KEYS.
8. POST TENSION THE THREAD BARS IN ACCORDANCE WITH SHEET BR-B103.
9. INSTALL ANCHOR DOWELS IN ACCORDANCE WITH SHEET BR-B102A.
10. PROVIDE GUARDRAIL / TIE IN.
11. PROVIDE PAVEMENT TIE IN AS REQUIRED.
12. SHIFT TRAFFIC FROM TEMPORARY DETOUR TO PERMANENT ALIGNMENT.

**NOTES:**

1. REMOVAL OF EXISTING SUPERSTRUCTURE SHALL BE DONE IN A WORKMANLIKE MANNER SO AS NOT TO ENDANGER ADJACENT PROPERTY.
2. METHODS OF REMOVAL SHALL INCLUDE PROVISIONS TO PROTECT THE EXISTING ABUTMENTS AND BACKWALLS WHICH ARE TO REMAIN IN PLACE.
3. METHODS OF REMOVAL SHALL INCLUDE PROVISIONS TO ENSURE THAT NO DEBRIS OF ANY KIND SHALL FALL INTO THE STREAM FLOW. ANY MATERIAL DROPPED INTO THE WATER SHALL BE PROMPTLY AND COMPLETELY REMOVED TO THE SATISFACTION OF THE ENGINEER.
4. ANCHOR DOWELS SHALL BE REMOVED FROM THE ABUTMENT BY CORING OR SIMILAR PROCEDURE. THE AREA SHALL BE CLEANED AND GROUTED WITH HIGH STRENGTH NON SHRINK GROUT AND FINISHED SMOOTH.



**ELEVATION VIEW**  
NOT-TO-SCALE

NO.	REVISION	DATE:	BY:

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION

BEECH LICK RUN BRIDGE

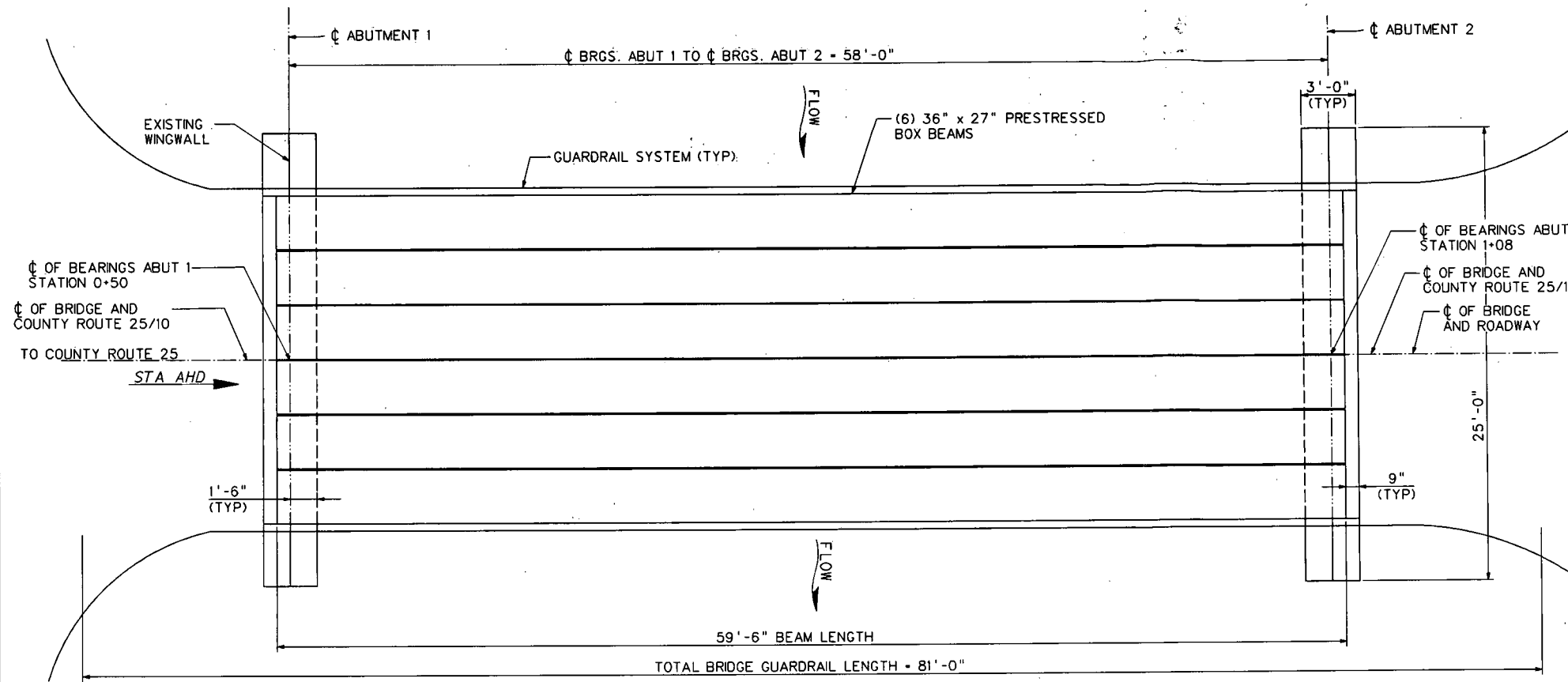
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DRAWN BY: ATS  
CHECKED BY: MSS  
REVIEWED BY: MS  
DATE: 5/30/13  
SCALE: NTS  
SHEET NO 5 OF 14  
BRIDGE NUMBER  
6541.1

ANTERO RESOURCES

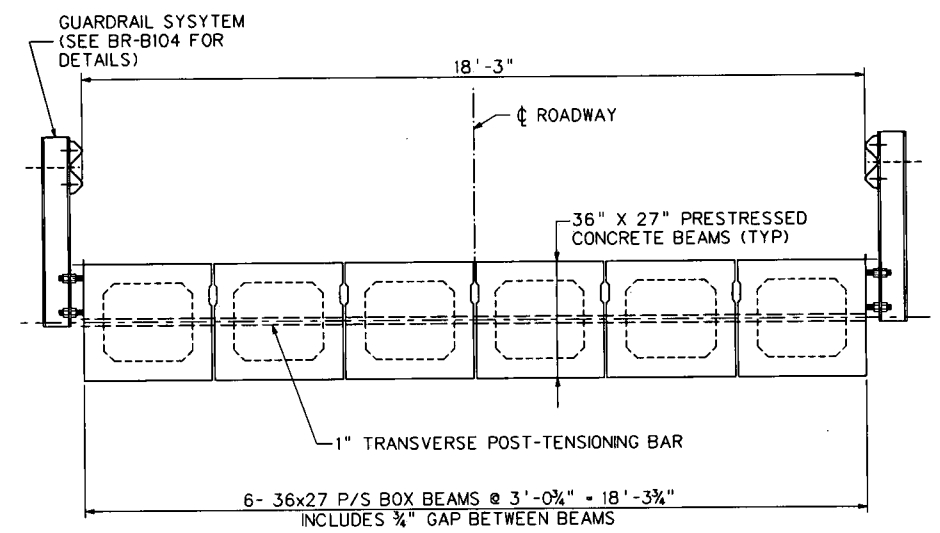
Stantec

CONSTRUCTION SEQUENCE  
DEMOLITION PLAN

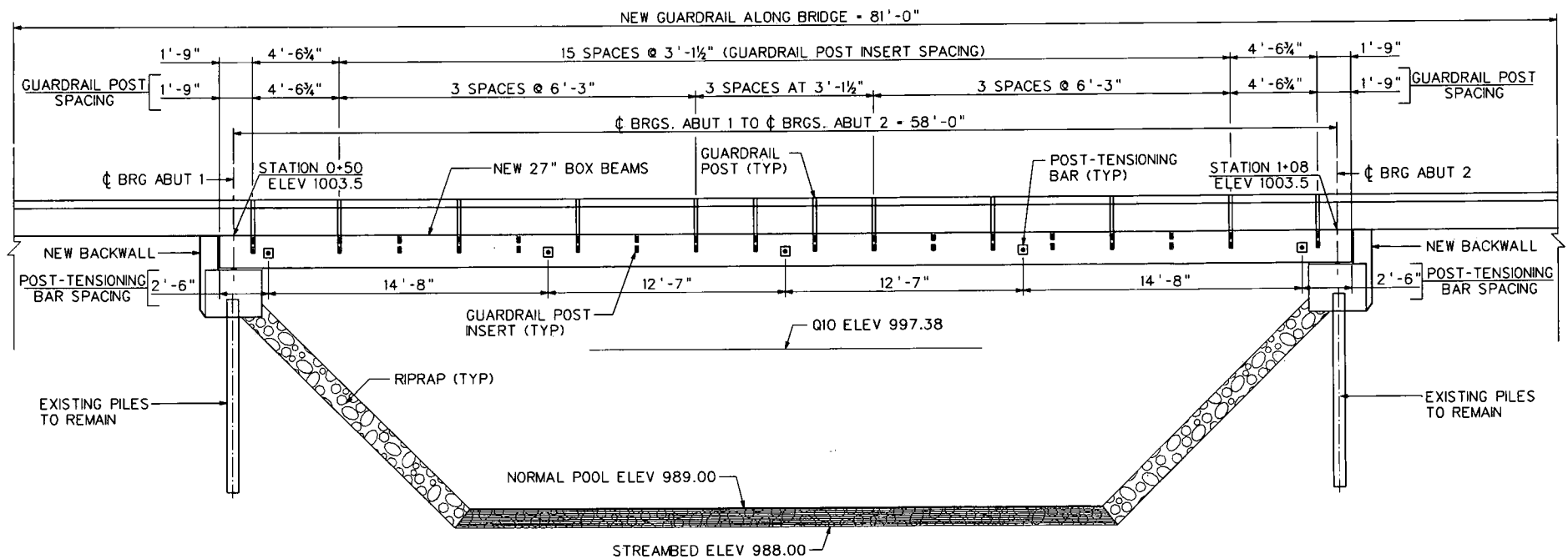
STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
		4	DODDRIDGE	6	14



**PLAN VIEW**  
NOT-TO-SCALE



**DECK CROSS SECTION**  
NOT-TO-SCALE



**ELEVATION VIEW**  
NOT-TO-SCALE

NO.	REVISION	DATE	BY

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION

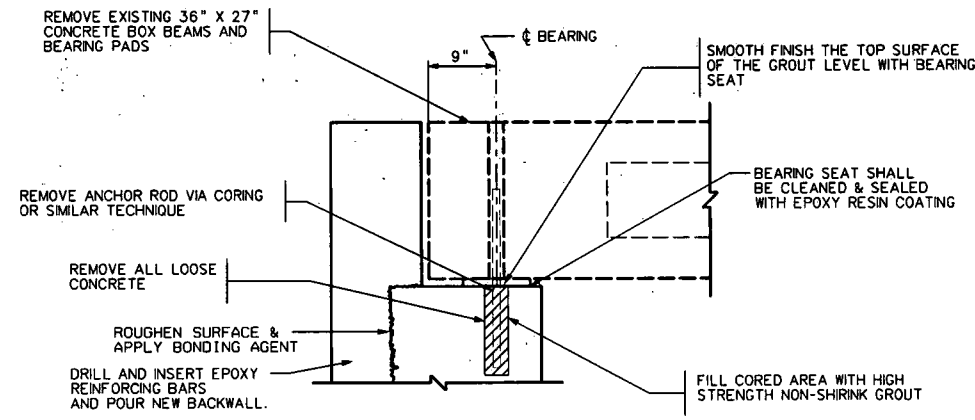
**BEECH LICK RUN BRIDGE**

DESIGNED BY: SGJ  
DRAWN BY: ATS  
CHECKED BY: MSS  
REVIEWED BY: MS  
DATE: 5/30/13  
SCALE: NTS  
SHEET NO 6 OF 14  
BRIDGE NUMBER  
**6541.1**

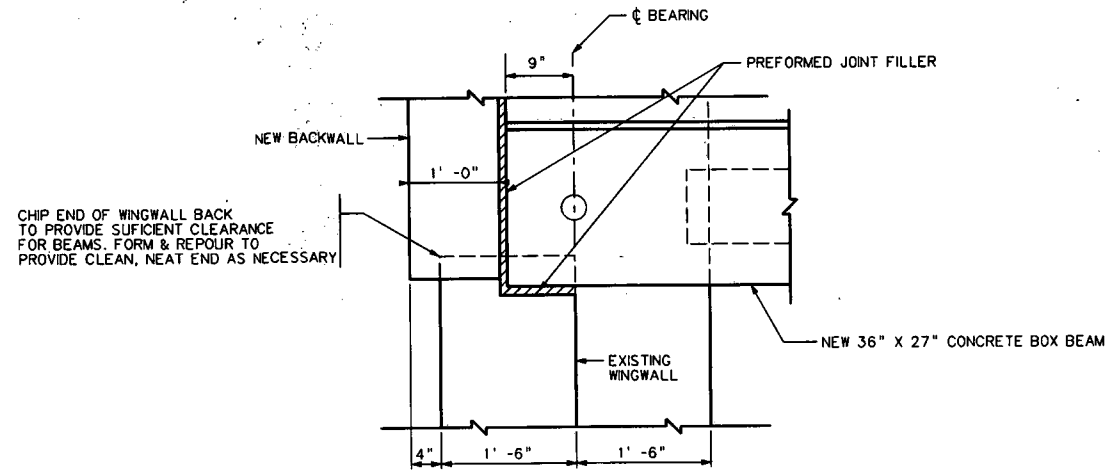
ANTERO RESOURCES      Stantec

BEAM LAYOUT, ELEVATION  
AND SECTION

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
		4	DODDRIDGE	7	14



ABUTMENT REPAIR DETAIL



A-A' ABUTMENT END JOINT FILLER DETAIL

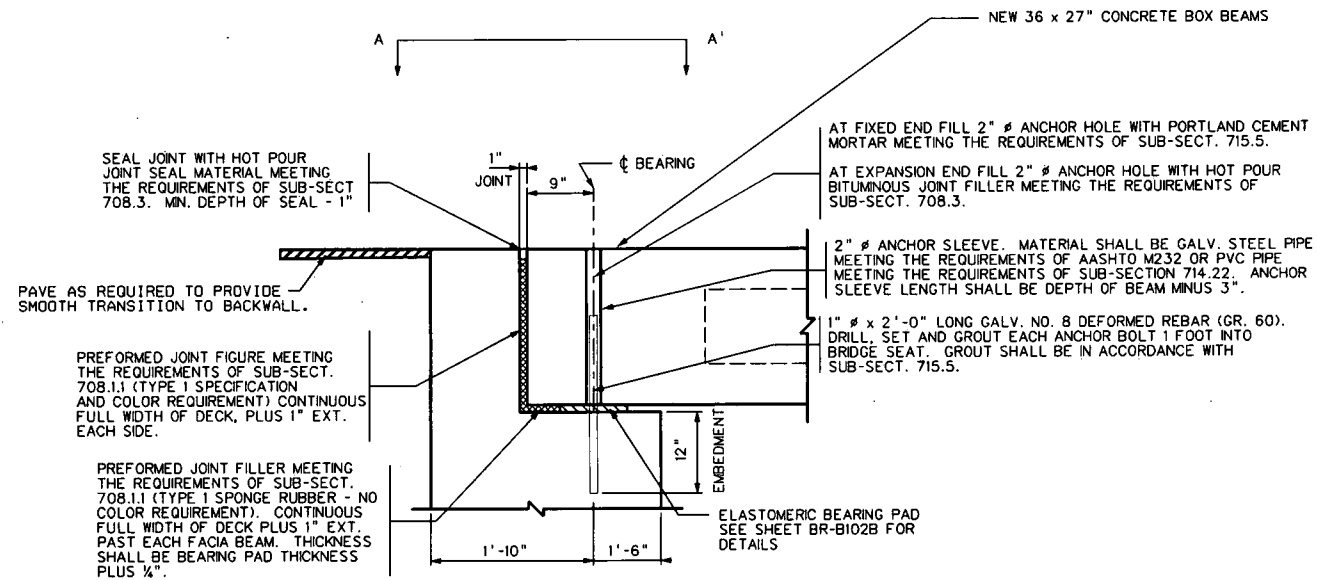
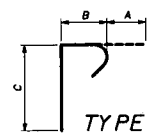
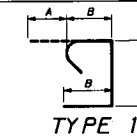
REINFORCEMENT NOTES:

1. ALL REINFORCEMENT BARS TO BE EPOXY COATED.
2. REINFORCEMENT BAR SCHEDULE IS FOR INFORMATION ONLY. VERIFY IT PRIOR TO FABRICATION.

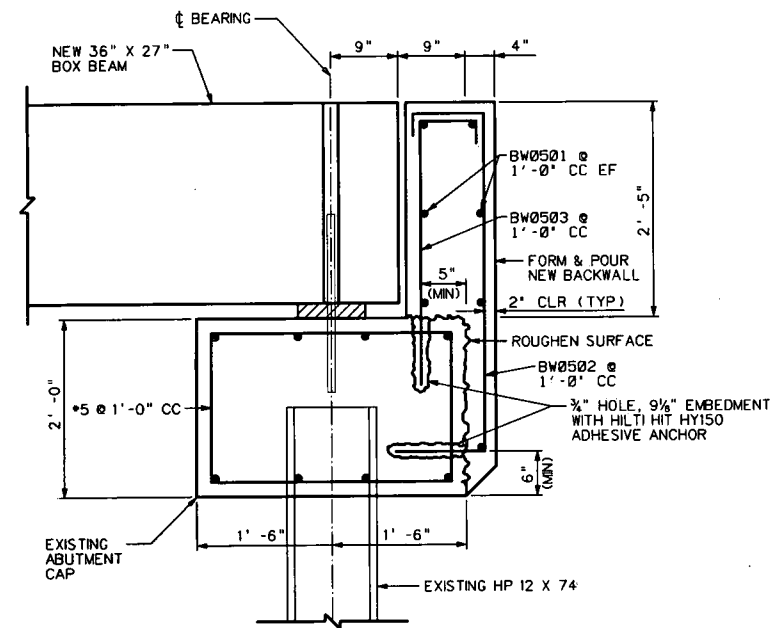
SCHEDULE OF REINFORCEMENT

MARK	SIZE	NO.	LENGTH	TYPE	A	B	C	D	REMARKS
COMBINED ABC FOUNDATION									
BW0501	.5	14	17'-10"	STR.					
BW0502	5	38	5'-11 1/2"	1	6"	9"	3'-9"	11 1/2"	
BW0503	5	38	4'-3 1/2"	2	6"	9"	3'-0 1/4"	D	

BAR TYPES



END BEARING DETAIL NEW BEAM AND NEW ANCHOR



NEW BACKWALL DETAIL

NO.	REVISION	DATE:	BY:

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION

BEECH LICK RUN BRIDGE

DESIGNED BY: SGJ  
DRAWN BY: ATS  
CHECKED BY: MSS  
REVIEWED BY: MS  
DATE: 5/20/13  
SCALE: NTS  
SHEET NO 7 OF 14

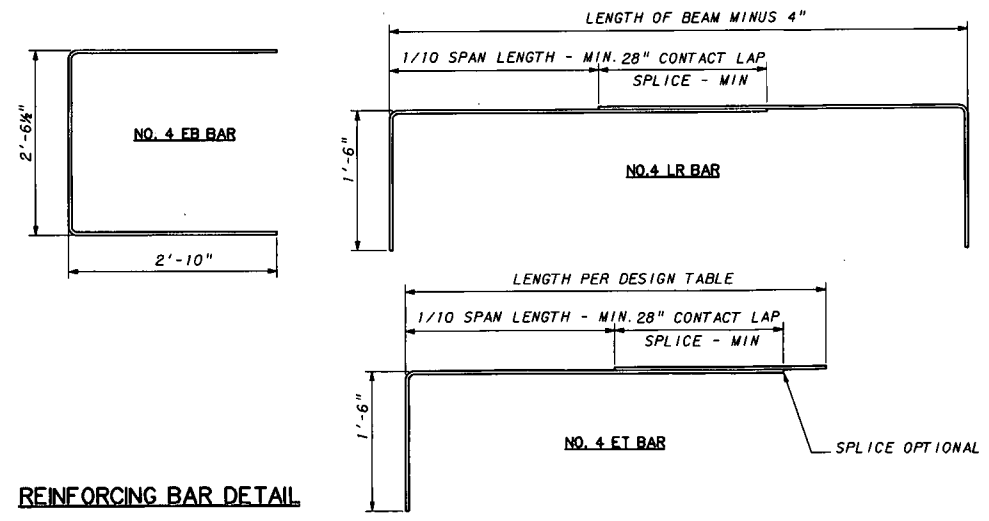
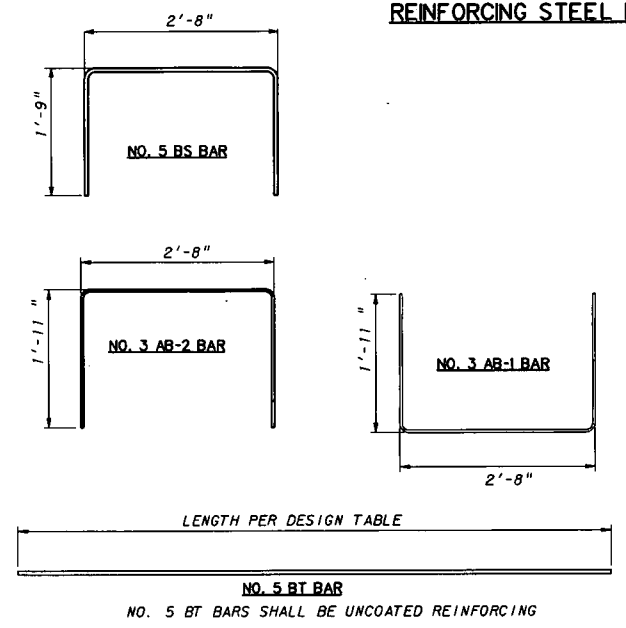
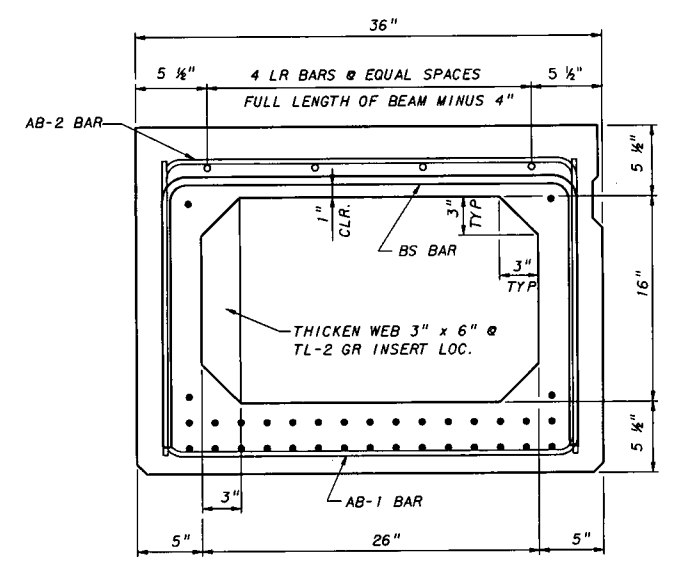
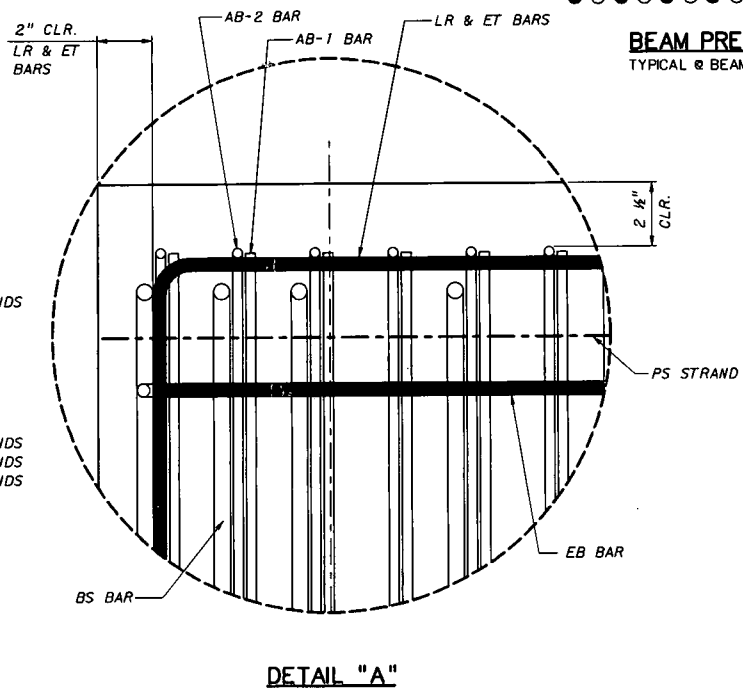
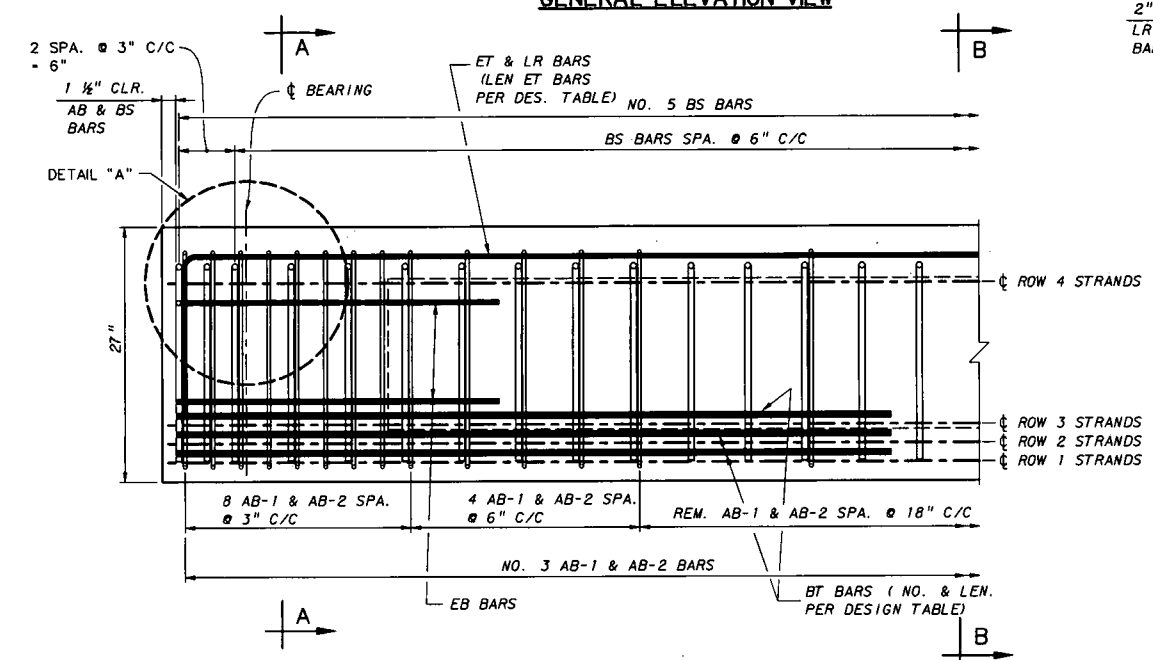
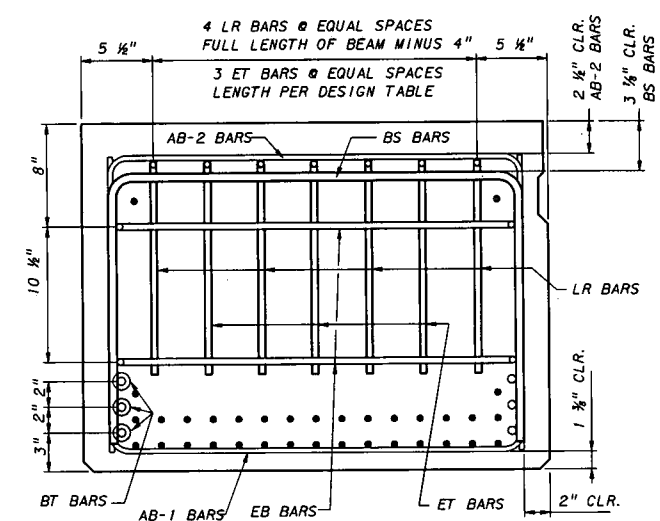
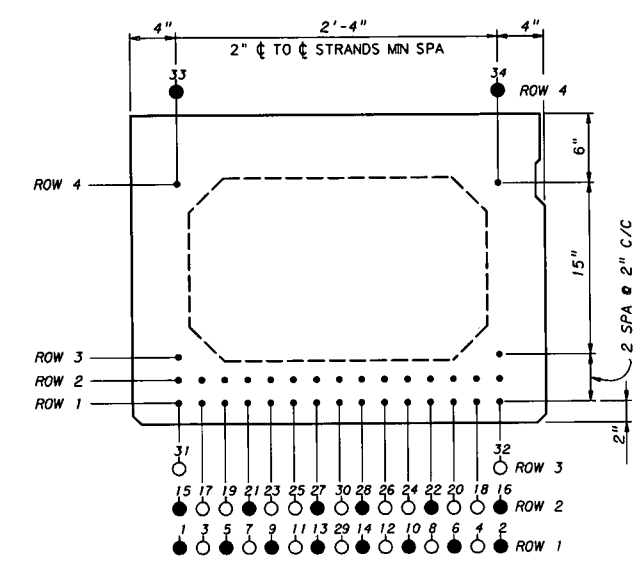
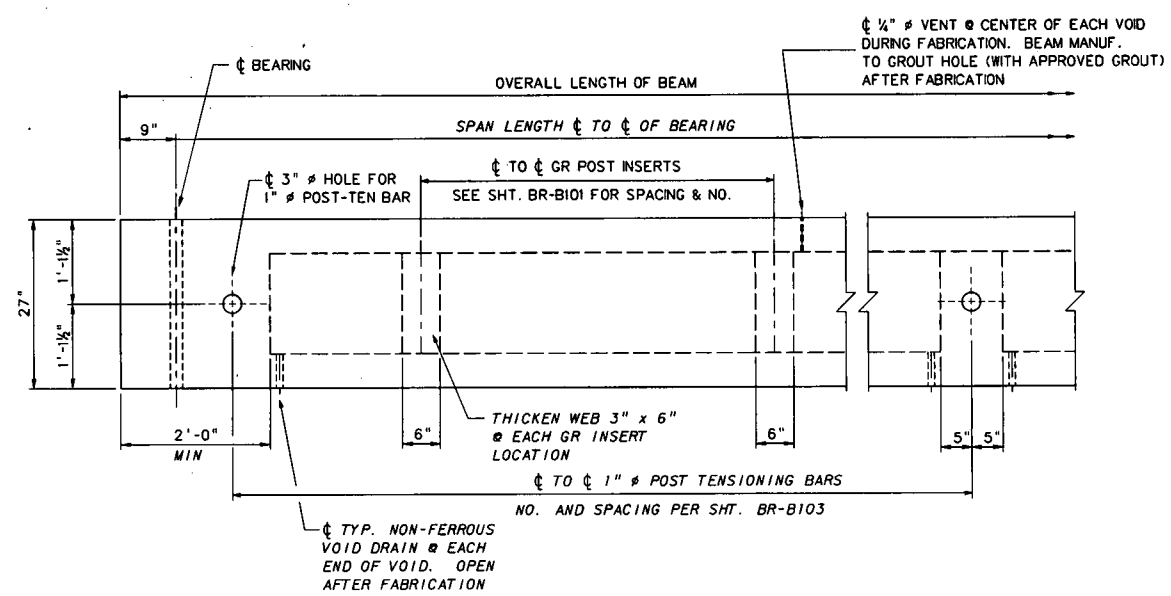
ANTERO RESOURCES

Stantec

PRESTRESSED CONCRETE BEAM  
ABUTMENT MODIFICATIONS  
MISC. DESIGN AND ASSEMBLY DETAILS

BRIDGE NUMBER  
6541.1

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
		4	DODDRIDGE	8	14



NOTES:

- REFER TO SHEET BR-B102A FOR SHEAR KEY DETAILS.
- DESIGNER SHALL USE THE FOLLOWING KEY TO INDICATE STRAND AND DEBONDING PATTERN ON "BEAM PRESTRESSING VIEW". THIS SHEET.
  - ACTIVE STRAND
  - ▽ DEBOND STRAND: LENGTH FROM END OF BEAM
  - △ DEBOND STRAND: LENGTH FROM END OF BEAM
  - DEBOND STRAND: LENGTH FROM END OF BEAM
- THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD SHEETS BR-B27B, BR-B100, BR-B101, BR-B102A & B, BR-B103, BR-B104, BR-B105A & B AND BR-B106 AS APPLICABLE.

APPROVED: *Dwight Bails* DATE: 10-25-07  
DIRECTOR, ENGINEERING DIVISION

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS ENGINEERING DIVISION

27" PRESTRESSED CONCRETE BOX BEAMS DESIGN AND ASSEMBLY DETAILS

STANDARD SHEET BR-B27A

PREPARED: 07-02-07

REVISED:

WHEN A POST-TEN ACCESS POCKET IS USED AS DETAILED ON SHEET BR-103 STRANDS IN ROWS 3 AND 4 SHALL BE ELIMINATED. THE BEAM SHALL BE REDESIGNED AS NECESSARY.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION

BEECH LICK RUN BRIDGE

DESIGNED BY: TW/SGJ  
DRAWN BY: BH/ATS  
CHECKED BY: MSS  
REVIEWED BY: MS  
DATE: 5/30/13  
SCALE: NTS  
SHEET 8 OF 14  
BRIDGE NO. 6541.1

ANTERO RESOURCES

Stantec

27" PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
		4	DODDRIDGE	9	14

**DESIGN DATA FOR 27" DEPTH ADJACENT BOX BEAM**

SPAN LENGTH @ TO @ BEARING		40'-0"	42'-0"	44'-0"	46'-0"	48'-0"	50'-0"	52'-0"	54'-0"	56'-0"	58'-0"	60'-0"						
OVERALL LENGTH OF BEAM		41'-6"	43'-6"	45'-6"	47'-6"	49'-6"	51'-6"	53'-6"	55'-6"	57'-6"	59'-6"	61'-6"						
NO. OF 270 KSI, 1/2" # LOW-RELAXATION STRANDS, AREA/STRAND = 0.167 SQ. IN.		10	10	12	12	12	12	14	14	16	16	18						
STRAND POSITION NUMBER	ROW 1	1,2,11,12	1,2,11,12	1,2,7,8,13,14	1,2,7,8,13,14	1,2,7,8,13,14	1,2,7,8,13,14	1,2,7,8,13,14	1,2,7,8,13,14	1,2,5,6,9,10,13,14	1,2,5,6,9,10,13,14	1,2,5,6,9,10,13,14						
	ROW 2	15,16,25,26	15,16,25,26	15,16,27,28	15,16,27,28	15,16,27,28	15,16,27,28	15,16,21,22,27,28	15,16,21,22,27,28	15,16,21,22,27,28	15,16,21,22,27,28	15,16,19,20,23,24,27,28						
	ROW 3	---	---	---	---	---	---	---	---	---	---	---						
	ROW 4	33,34	33,34	33,34	33,34	33,34	33,34	33,34	33,34	33,34	33,34	33,34	33,34					
PRESTRESSING FORCE IMMEDIATELY AFTER STRAND RELEASE, Ppt, (KIPS/BEAM)		329	329	392	393	393	393	456	457	519	519	581						
EFFECTIVE PRESTRESSING FORCE AFTER ALL LOSSES, Ppe, (KIPS/BEAM)		301	302	355	356	357	358	411	413	463	465	514						
REQUIRED FACTORED MOMENT @ STRENGTH I, Mu (FT-KIPS/BEAM)		563	608	660	717	772	829	887	946	1007	1069	1132						
FACTORED FLEXURAL RESISTANCE, Mr (FT-KIPS/BEAM)		706	706	868	868	868	868	1011	1011	1164	1164	1299						
TOTAL NO. DEBONDED STRANDS		---	---	---	---	---	---	---	---	---	---	---						
DEBONDED STRAND POSITION NUMBER & SHIELDING LENGTH FROM EACH END	ROW 1	---	---	---	---	---	---	---	---	---	---	---						
	ROW 2	---	---	---	---	---	---	---	---	---	---	---						
NUMBER & LENGTH #4 ET TOP TENSION BARS @ EACH END		3 - #4 x 5'-6"	3 - #4 x 5'-6"	3 - #4 x 6'-0"	3 - #4 x 6'-0"	3 - #4 x 6'-0"	3 - #4 x 6'-6"	3 - #4 x 6'-6"	3 - #4 x 7'-0"	3 - #4 x 7'-0"	3 - #4 x 7'-0"	3 - #4 x 7'-6"						
NUMBER & LENGTH #5 BT BOTTOM TENSION BARS @ EACH END		6 - #5 x 7'-0"	6 - #5 x 7'-0"	6 - #5 x 7'-0"	6 - #5 x 7'-0"	6 - #5 x 7'-0"	6 - #5 x 7'-0"	6 - #5 x 7'-6"	6 - #5 x 7'-6"	4 - #5 x 7'-6"	4 - #5 x 7'-6"	4 - #5 x 8'-0"						
DESIGN CAMBER + = POSITIVE (UP) (INCHES)	@ RELEASE	0.13	0.13	0.23	0.23	0.22	0.21	0.33	0.32	0.48	0.47	0.62						
	@ ERECTION	0.18	0.15	0.34	0.31	0.28	0.24	0.42	0.37	0.64	0.58	0.82						
	@ FINAL	0.13	0.07	0.14	0.22	0.14	0.04	0.25	0.13	0.44	0.30	0.55						
NUMBER & SPACING OF GUARDRAIL INSERTS SEE NOTE 6	NO OF INSERTS REQD.											36 ( 18- EACH SIDE )						
	END OF BEAM TO @ OF FIRST INSERT EA. END											1'-9"						
	@ OF 1st INSERT TO @ 2nd INSERT EA. END											4'-6 3/4"						
WEIGHT OF TYPICAL BEAM INCLUDING DIAPHRAGM (TONS)		13.8	14.4	15.0	15.7	16.3	16.9	17.5	18.1	18.7	19.3	19.9						

MIN. CONCRETE STRENGTH @ RELEASE = 5500 PSI  
 MIN. CONCRETE STRENGTH @ 28 DAYS = 8000 PSI  
 INITIAL PULL/STRAND = 33,820 LBS  
 CROSS-SECTION AREA/STRAND = 0.167 SQ. IN.

REVISED 10/12  
 \* FABRICATOR TO PROVIDE DEBONDING SCHEME TO BE APPROVED BY THE ENGINEER PRIOR TO CASTING.

**NOTES**

1. BEAM WEIGHTS LISTED IN THE DESIGN TABLE ARE BASED ON ZERO SKEW, 2 FT. LONG ENDBLOCK AND DIAPHRAGMS SPACED @ 15 FT C/C. WEIGHTS FOR SKEWED BEAMS, LONGER ENDBLOCKS AND ADDITIONAL DIAPHRAGMS SHOULD BE ADJUSTED ACCORDINGLY.  
 FOR ADDITIONAL DIAPHRAGMS, ADD 361 LBS/DIAPHRAGM.  
 FOR SKEW ADD 27 LBS/DEGREE OF SKEW/END.  
 FOR LONGER ENDBLOCK, ADD 433 LBS/LF/END.

2. DESIGNERS SHOULD NOTE THAT DATA IN STANDARD TABLE IS BASED ON EVEN SPAN LENGTHS, A TWO LANE STRUCTURE 8 BEAMS WIDE AND ZERO SKEW. SUPERIMPOSED DEAD LOADS INCLUDE TYPE F PARAPET (321 PLF) AND A FWS OF 50 PSF. FOR NON-STANDARD BRIDGES DATA SHOULD BE VERIFIED AND IF REQUIRED NEW DESIGN DATA ENTERED INTO BLANK COLUMNS. IN NO CASE SHALL THE STANDARD DESIGN TABLE BE ALTERED.

3. PREDICTED DESIGN CAMBER VALUES LISTED IN THE TABLE ARE BASED ON EMPIRICAL FORMULAS AND AS SUCH ARE APPROXIMATE. FOR MEMBERS WITH SPAN-TO-DEPTH RATIOS AT OR EXCEEDING 25, THE TOLERANCE VALUES LISTED IN APPENDIX B OF PCI MANUAL FOR QUALITY CONTROL, MNL-116, MAY NOT APPLY.  
 MEASUREMENT OF CAMBER FOR COMPARISON TO PREDICTED DESIGN VALUES SHOULD BE COMPLETED WITHIN 72 HOURS OF RELEASE. ADDITIONALLY, CAMBER SHOULD BE EVALUATED UNDER CONDITIONS THAT MINIMIZE THE EFFECT OF TEMPERATURE VARIATION.

4. DESIGNER, FABRICATOR, AND ERECTOR SHALL BE AWARE THAT SKEWED END BEAMS MAY TWIST OR WARP, CAUSING UNEVEN BEAM SEATING AT THE BEARINGS. THE CONTRACTOR IS REQUIRED TO CORRECT AT THE TIME OF ERECTION, BEFORE THE BEAMS ARE SECURED IN PLACE. METHOD OF CORRECTION SHALL PROVIDE AN EVEN, TOTAL BEARING AND A LEVEL TOP BEAM SURFACE. TOLERANCE, AFTER CORRECTION, SHALL BE (+/-) 1/8 INCH. THE FABRICATOR SHALL NOTIFY THE CONTRACTOR AND DESIGNER IF CORRECTIONS ARE REQUIRED PRIOR TO SHIPMENT.

5. MAXIMUM BEAM SKEW SHALL BE 30 DEGREES.

6. DESIGNER INPUT VALUES OF NUMBER OF INSERTS, DISTANCE FROM END OF BEAM TO @ FIRST INSERT, AND @ FIRST INSERT TO @ SECOND INSERT. REMAINING INSERTS SPACED @ 3'-1 1/2"

7. THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD SHEETS BR-B33A, BR-B100, BR-B101, BR-B102A & B, BR-B103, BR-B104, BR-B105A & B AND BR-B106 AS APPLICABLE.

DESIGN TABLE FOR 27"  
 PRESTRESSED BOX BEAM  
 REVISED STANDARD SHEET BR-B27B

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 ENGINEERING DIVISION

BEECH LICK RUN BRIDGE

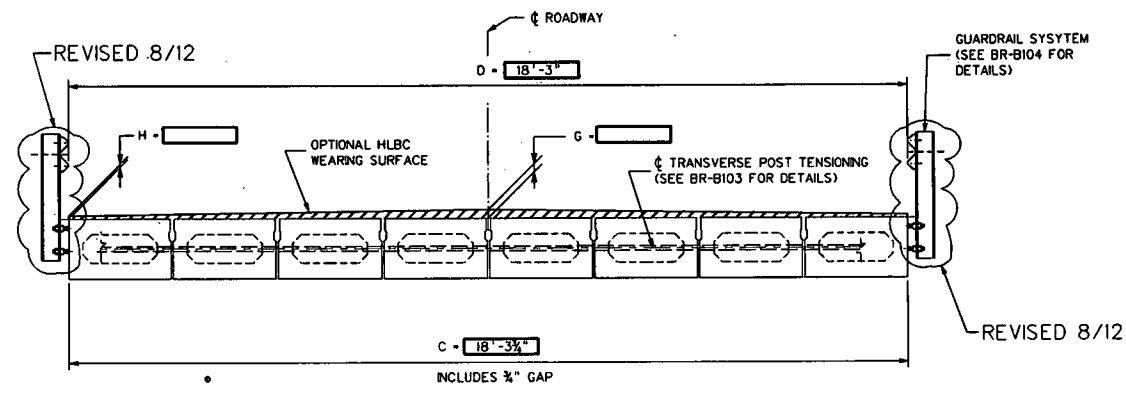
**ANTERO RESOURCES**

**Stantec**

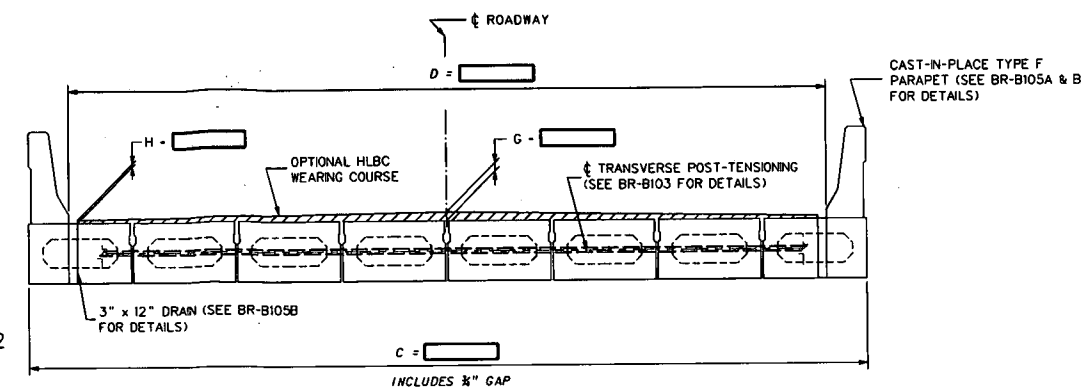
DESIGN TABLE FOR 27"  
 PRESTRESSED BOX BEAM

DESIGNED BY: TW/SGJ
DRAWN BY: THB/ATS
CHECKED BY: MSS
REVIEWED BY: MS
DATE: 5/30/13
SCALE: NTS
SHEET NO 9 OF 14
BRIDGE NUMBER 6541.1

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
		4	DODDRIDGE	10	14

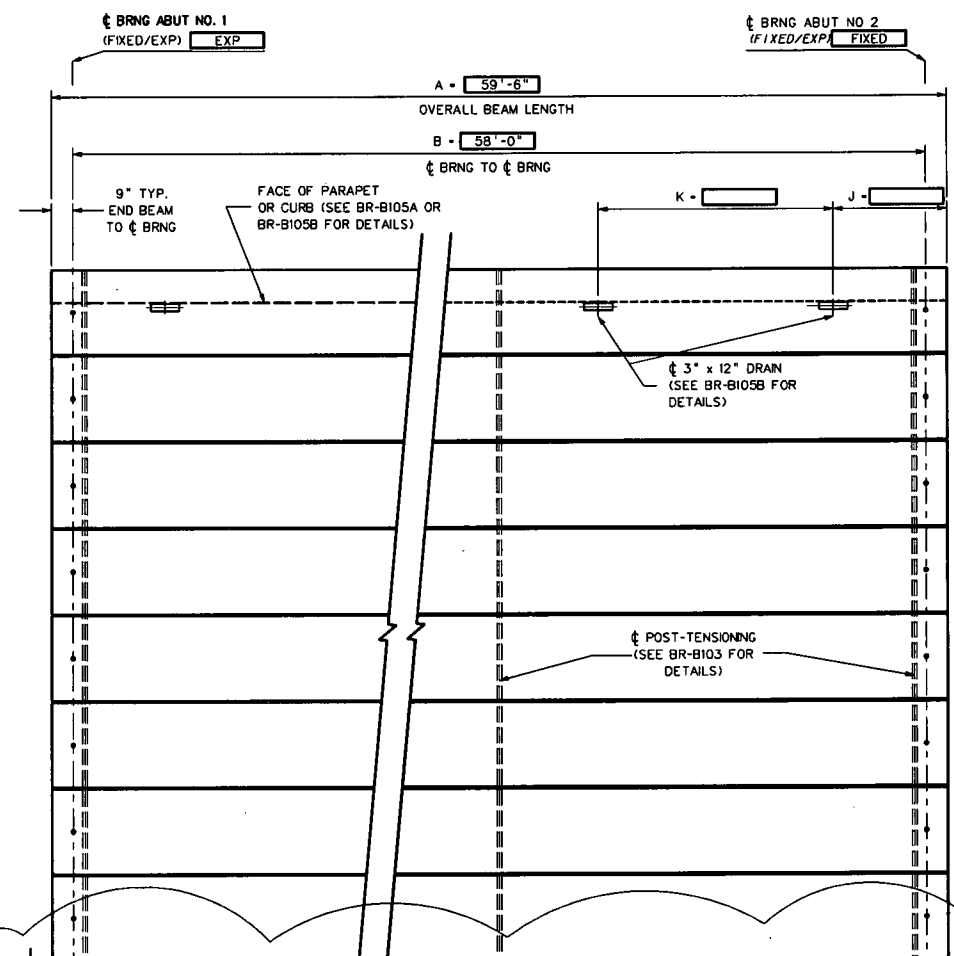


TYPICAL CROSS-SECTION WITH GUARDRAIL

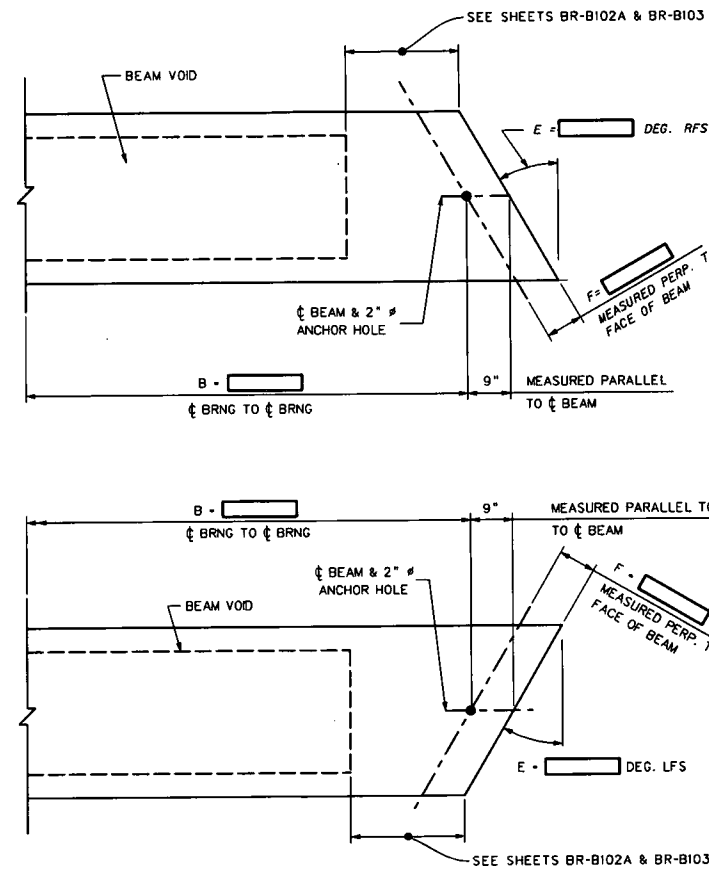


TYPICAL CROSS-SECTION WITH PARAPET OR CURB

CONTROL DIMENSIONS		
DESCRIPTION	CODE	VALUE
OVERALL BEAM LENGTH	A	59'-6"
SPAN LENGTH, $\phi$ BEARING TO $\phi$ BEARING	B	58'-0"
SUPERSTRUCTURE WIDTH - OUT TO OUT	C	18'-3 1/4"
ROADWAY WIDTH - FACE GR/PARAPET TO FACE GR/PARAPET	D	18'-3"
NUMBER OF BEAMS REQUIRED	—	6
BEAM SIZE (WIDTH x DEPTH)	—	36 x 27
SKEW ANGLE (NORMAL, DEG. RFS OR DEG. LFS)	E	0
PERPENDICULAR DISTANCE FROM FACE OF BEAM TO $\phi$ BEARING	F	-
HLBC WEARING COURSE REQUIRED (YES/NO)	—	NO
THICKNESS OF WEARING COURSE @ $\phi$ OF DECK OR ROADWAY	G	-
THICKNESS OF WEARING COURSE @ EDGE OF DECK OR PARAPET	H	-
TL-2 BRIDGE GUARDRAIL SYSTEM REQUIRED (YES/NO)	—	NO
FABRICATOR TO SUPPLY TL-2 BRIDGE GUARDRAIL (YES/NO)	—	NO
FABRICATOR TO INSTALL BRIDGE GUARDRAIL PRIOR TO SHIPMENT (YES/NO) (IF NO, FABRICATOR TO SHIP LOOSE)	—	YES
NUMBER OF GUARDRAIL POST INSERTS REQUIRED PER SIDE	—	18
TYPE F PARAPET REQUIRED (YES/NO)	—	NO
DRAINS REQUIRED (YES/NO)	—	NO
NUMBER OF DRAINS REQUIRED PER SIDE	—	N/A
10" CURB REQUIRED (YES/NO)	—	NO
FABRICATOR TO SUPPLY GUARDRAIL SYSTEM PER REVISED BR- B101, SHEET 14	—	YES
NUMBER OF GUARDRAIL POST REQUIRED PER SIDE	—	12



DECK PLAN VIEW



BEAM PLAN VIEW - SKEWED ENDS

ESTIMATE OF QUANTITIES

ITEM NO.	DESCRIPTION	UNITS	QUANTITY
603016	PRESTRESSED CONCRETE BOX BEAM	LF	357

- NOTES:
- WHEN BRIDGE GUARDRAIL IS TO BE SUPPLIED BY THE BEAM FABRICATOR, COST OF ALL BRIDGE GUARDRAIL ITEMS TO INCLUDE POSTS, RAIL ELEMENTS, ATTACHMENT HARDWARE, AND MISCELLANEOUS ITEMS NEEDED TO COMPLETELY INSTALL BRIDGE GUARDRAIL SHALL BE INCLUDED IN ITEM 603016 \*PRESTRESSED CONCRETE BOX BEAM.\*
  - THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD & REVISED SHEETS BR-B17A & B THRU BR-B42A & B, BR-B100, BR-B102A & B, BR-B103, BR-B104, BR-B105A & B AND BR-B106.

PREPARED: 8/12 SGJ  
 DESIGN AND ASSEMBLY NOTES  
 REVISED SHEET BR-B101

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 ENGINEERING DIVISION

BEECH LICK RUN BRIDGE

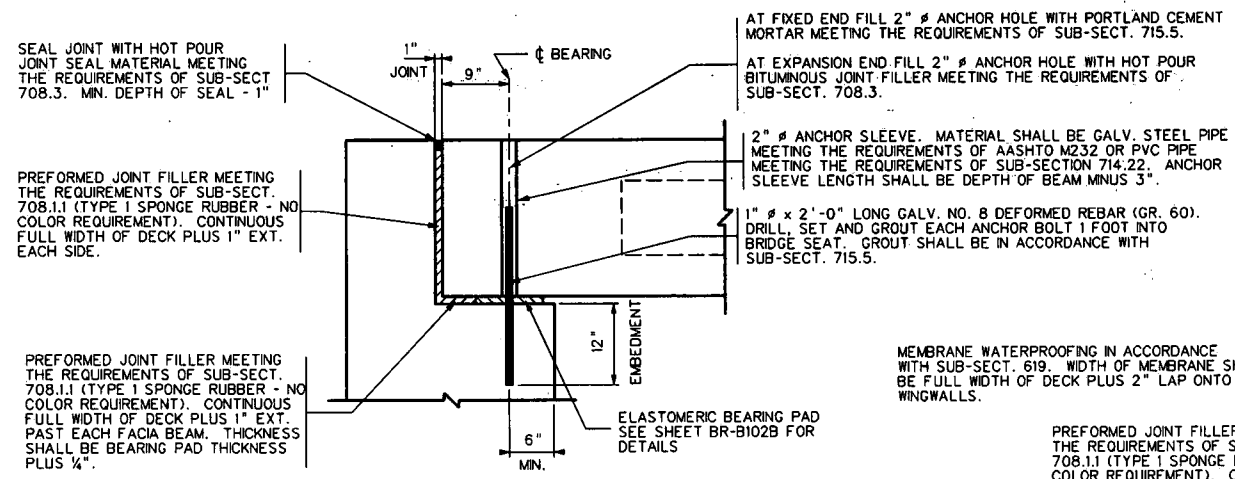
DESIGNED BY: THB/SGJ  
 DRAWN BY: THB/ATS  
 CHECKED BY: MSS  
 REVIEWED BY: MS  
 DATE: 5/30/13  
 SCALE: NTS  
 SHEET NO 10 OF 14  
 BRIDGE NUMBER 6541.1

ANTERO RESOURCES  
 Stantec

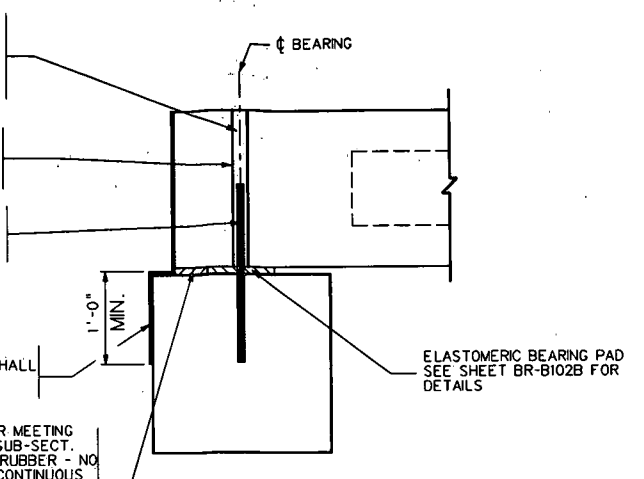
PRESTRESSED CONCRETE BEAM  
 DESIGN & ASSEMBLY NOTES



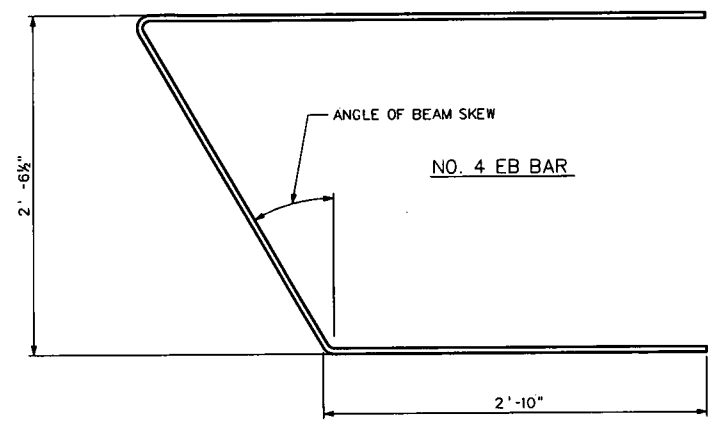
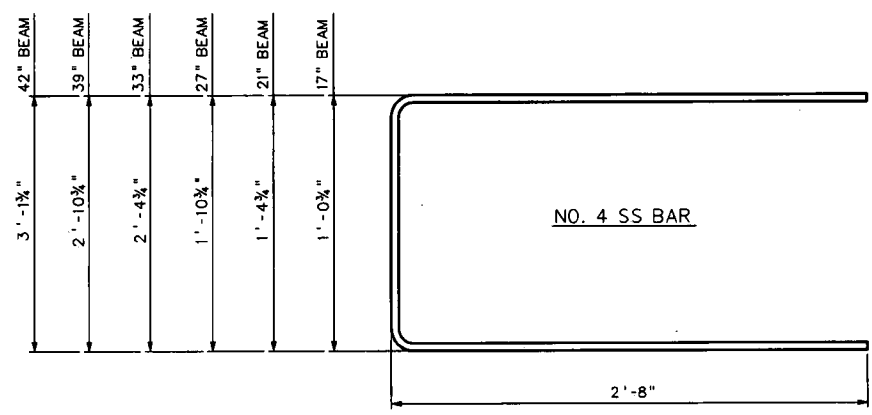
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		4	DODDRIDGE	11	14



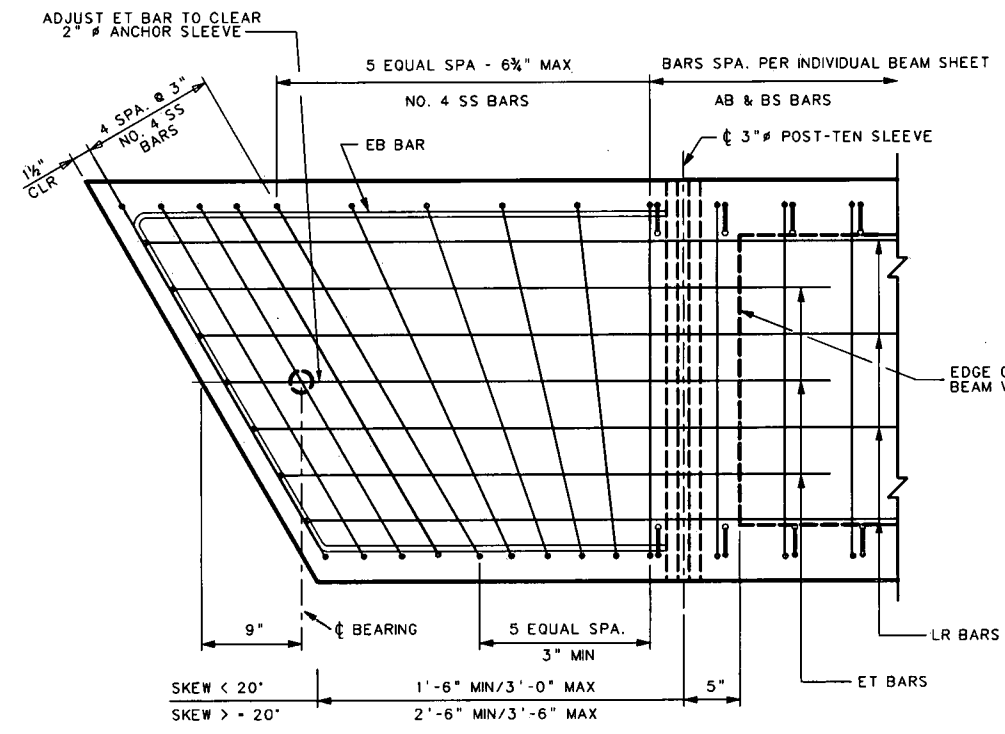
**END BEARING DETAIL WITH BACKWALL**



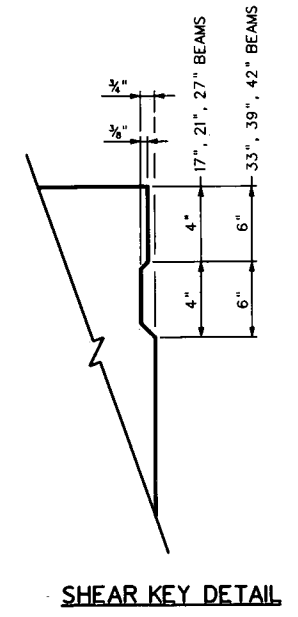
**END BEARING DETAIL WITHOUT BACKWALL**



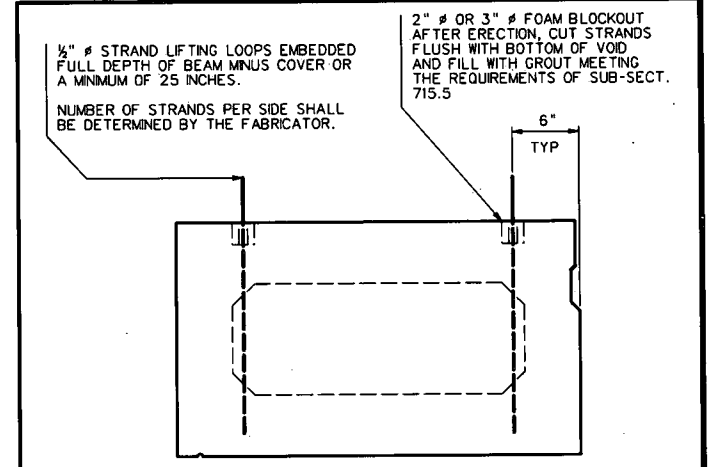
**REINFORCING BAR DETAIL SKEWED BEAMS**



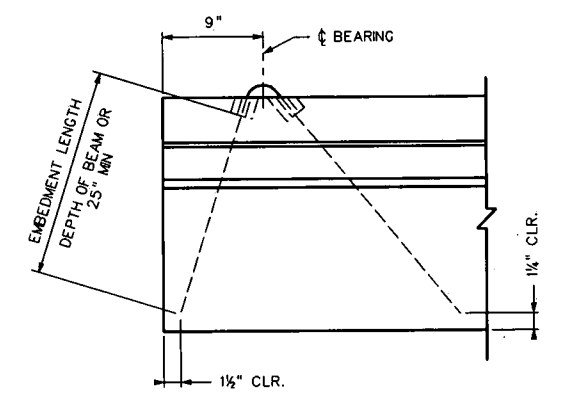
**END BLOCK DETAIL - SKEWED BEAMS  
WO/POST-TEN. ACCESS POCKET**



**SHEAR KEY DETAIL**

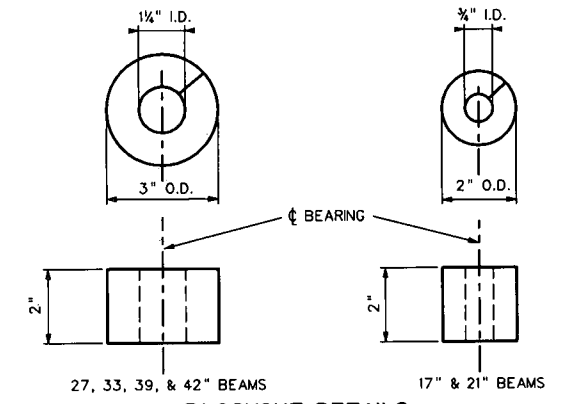


**END VIEW**



**SIDE VIEW**

**LIFTING DETAILS**



**BLOCKOUT DETAILS**

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION

**BEECH LICK RUN BRIDGE**

DESIGNED BY: THB/SG

DRAWN BY: THB/ATS

CHECKED BY: MSS

REVIEWED BY: MS

DATE: 5/30/13

SCALE: NTS

SHEET 11 OF 14

BRIDGE NO. 6541.1

PRESTRESSED CONCRETE BEAM  
SKEWED END REINFORCING  
MISC. DESIGN AND ASSEMBLY DETAILS

APPROVED: *Gregory Bailey* DATE: 10-25-07  
DIRECTOR, ENGINEERING DIVISION

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION

PREPARED: 07-02-07

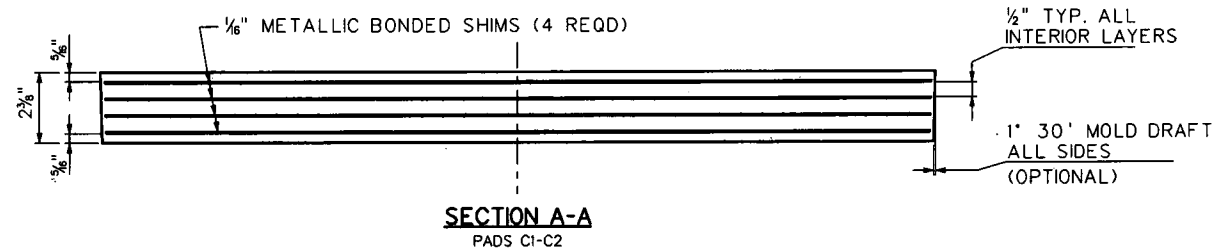
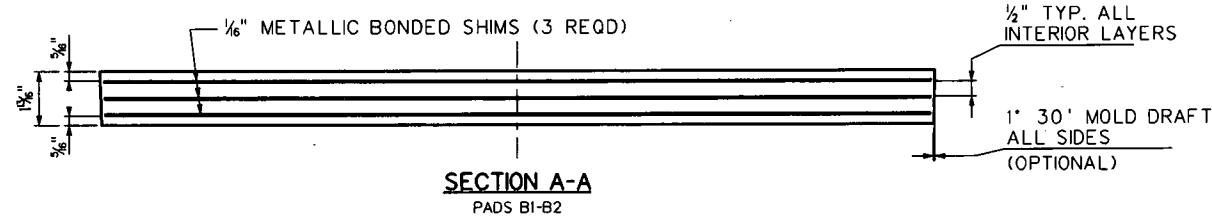
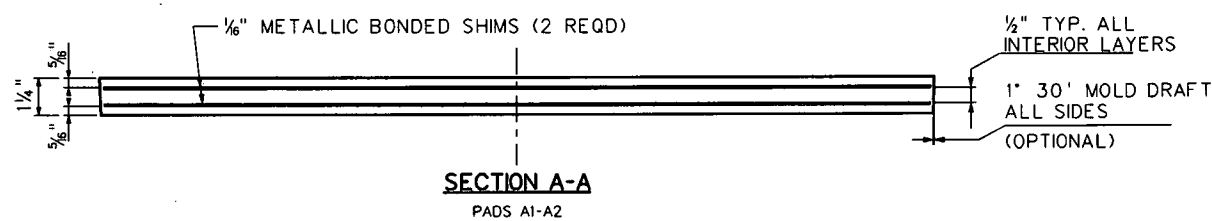
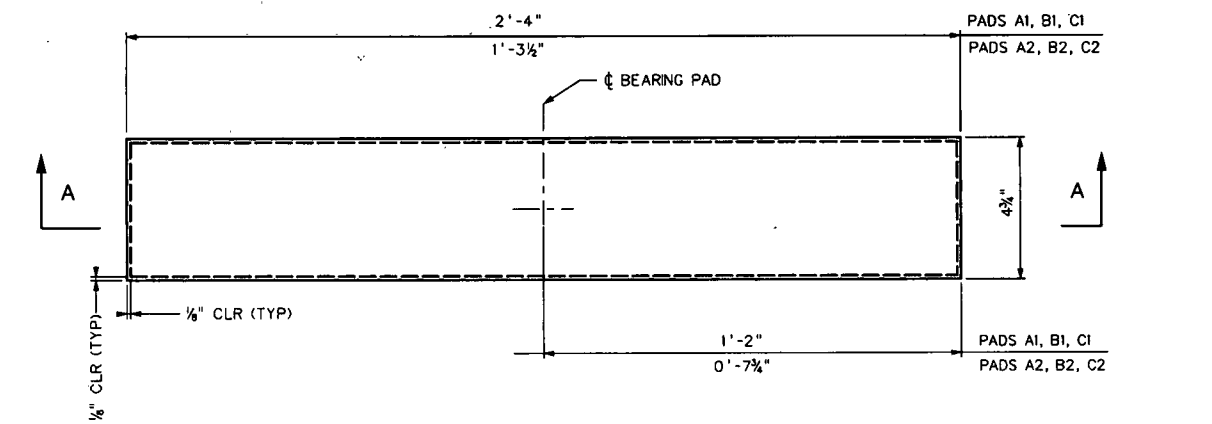
REVISED: T.W. 12/21/10

PRESTRESSED CONCRETE BEAM  
SKEWED END REINFORCING  
MISC. DESIGN AND ASSEMBLY DETAILS

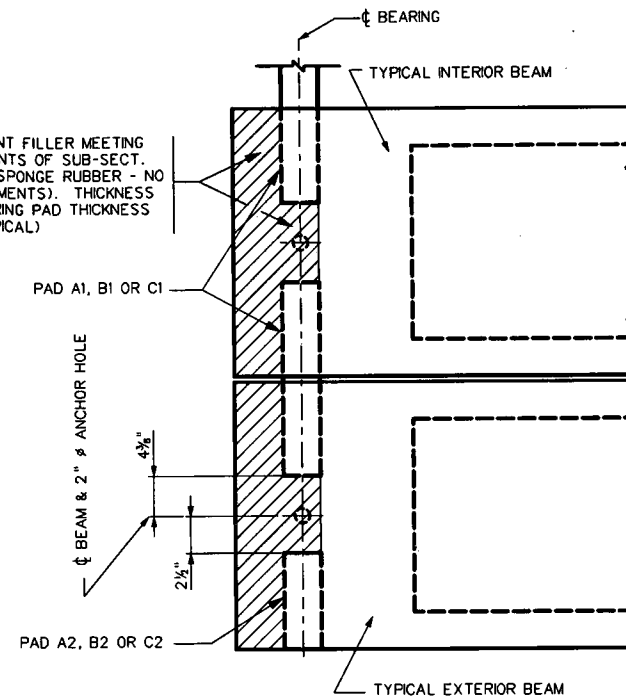
REVISED STANDARD SHEET BR-B102A

THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD SHEETS BR-B17A & B THRU BR-B42A & B, BR-B100, BR-B101, BR-B102B, BR-B103, BR-B104, BR-B105A & B AND BR-B106 AS APPROPRIATE.

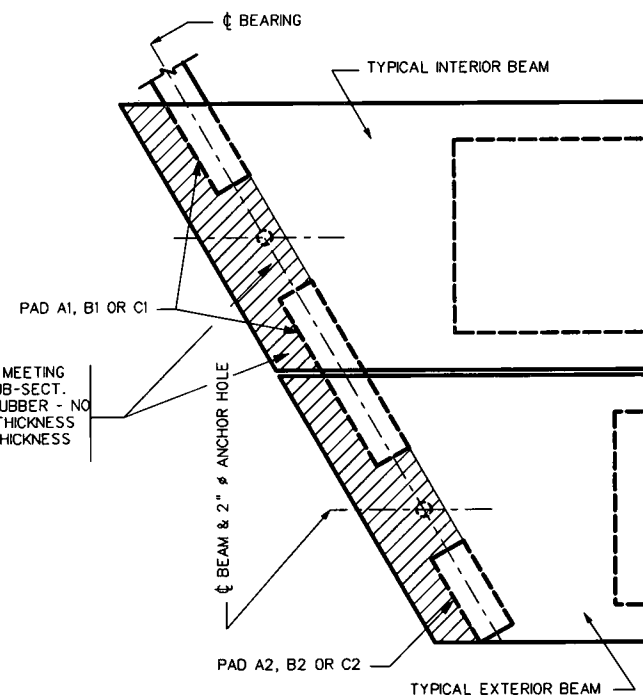
STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
		4	DODDRIDGE	12	14



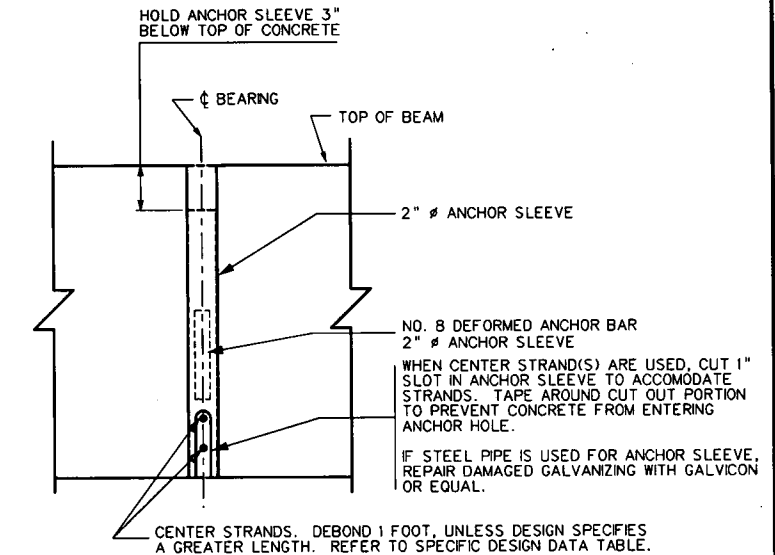
PREFORMED JOINT FILLER MEETING THE REQUIREMENTS OF SUB-SECT. 708.11 (TYPE 1 SPONGE RUBBER - NO COLOR REQUIREMENTS). THICKNESS SHALL BE BEARING PAD THICKNESS PLUS 1/4". (TYPICAL)



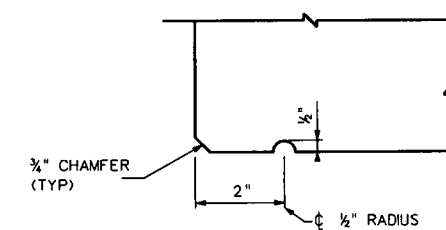
PLAN VIEW - BEARING PLACEMENT  
NORMAL BEAMS



PLAN VIEW - BEARING PLACEMENT

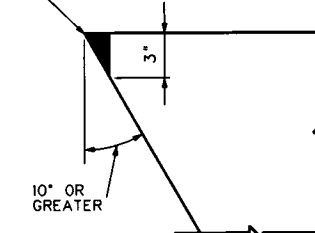


ANCHOR SLEEVE DETAIL



DRIP GROOVE DETAIL  
EXTERIOR BEAMS

FOAM BLOCKOUT REQD. AFTER ERECTION FILL VOID WITH GROUT MEETING THE REQUIREMENTS OF SUB-SECT. 715.5



SKEW BLOCKOUT DETAIL

NOTES:

- ELASTOMERIC BEARING PADS ARE DESIGNED IN ACCORDANCE WITH DESIGN METHOD B CONTAINED IN SECTION 14 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS. FABRICATION SHALL BE IN ACCORDANCE WITH SECTION 18 OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS.
- ALL BEARINGS ARE DESIGNED FOR A LOW TEMPERATURE ZONE C AND SHALL HAVE A DUROMETER HARDNESS OF 60. METALLIC REINFORCEMENT SHALL HAVE A MINIMUM YIELD STRENGTH OF 36 KSI.
- BEARING PADS ARE DESIGNED FOR ZERO BRIDGE GRADE. FOR BRIDGE GRADES GREATER THAN 5%, PADS SHALL BE SPECIFICALLY DESIGNED FOR THE GRADE. AS AN ALTERNATE, CAST-IN-PLACE BEVELED SOLE PLATES MAY BE USED.
- DESIGNER, FABRICATOR AND ERECTOR SHALL BE AWARE THAT SKEWED END BEAMS MAY TWIST OR WARP, CAUSING UNEVEN BEAM SEATING AT THE BEARINGS. THE CONTRACTOR IS REQUIRED TO CORRECT AT THE TIME OF ERECTION, BEFORE THE BEAMS ARE SECURED IN PLACE. METHOD OF CORRECTION SHALL PROVIDE AN EVEN, TOTAL BEARING AND A LEVEL TOP BEAM SURFACE. TOLERANCE AFTER CORRECTION SHALL BE ± 1/8 INCH. THE FABRICATOR SHALL NOTIFY THE CONTRACTOR AND DESIGNER IF CORRECTIONS ARE REQUIRED PRIOR TO SHIPMENT.
- FOR BEAMS WITH STEPPED ENDS USE PADS A2, B2, OR C2 ON BOTH SIDES OF EACH BEAM.
- ELASTOMERIC BEARING PADS SHALL BE INCLUDED IN THE PRICE OF THE BEAMS.
- THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD SHEETS BR-B17A & B THRU BR-B42A & B, BR-B100, BR-B101, BR-B102A, BR-B103, BR-B104, BR-B105A & B AND BR-106 AS APPROPRIATE.

BOX BEAM BEARING PAD CONTROL DIMENSIONS								
PAD	LENGTH	WIDTH	HEIGHT	NO. SHIMS	SHIM SIZE	SPAN RANGES	MAXIMUM REACTION	MAXIMUM MOVEMENT ONE DIRECTION
A1	4 3/4"	28"	1 1/4"	2	1/8" x 4 1/2" x 2'-3 3/4"	20' - 38'	55 KIPS	0.39"
B1	4 3/4"	28"	1 5/8"	3	1/8" x 4 1/2" x 2'-3 3/4"	40' - 78'	75 KIPS	0.80"
C1	4 3/4"	28"	2 3/8"	4	1/8" x 4 1/2" x 2'-3 3/4"	80' - 100'	89 KIPS	1.02"
A2	4 3/4"	15 1/2"	1 1/4"	2	1/8" x 4 1/2" x 1'-3 3/4"	20' - 38'	28 KIPS	0.39"
B2	4 3/4"	15 1/2"	1 5/8"	3	1/8" x 4 1/2" x 1'-3 3/4"	40' - 78'	38 KIPS	0.80"
C2	4 3/4"	15 1/2"	2 3/8"	4	1/8" x 4 1/2" x 1'-3 3/4"	80' - 100'	45 KIPS	1.02"

APPROVED: *Gregory Bailey* DATE: 10-25-07  
DIRECTOR, ENGINEERING DIVISION

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION

PREPARED: 07-02-07  
REVISED: 12/27/10

PRESTRESSED CONCRETE BEAM  
ELASTOMERIC BEARING PAD DETAILS  
MISC. DESIGN AND ASSEMBLY DETAILS

REVISED STANDARD SHEET BR-B102B

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION

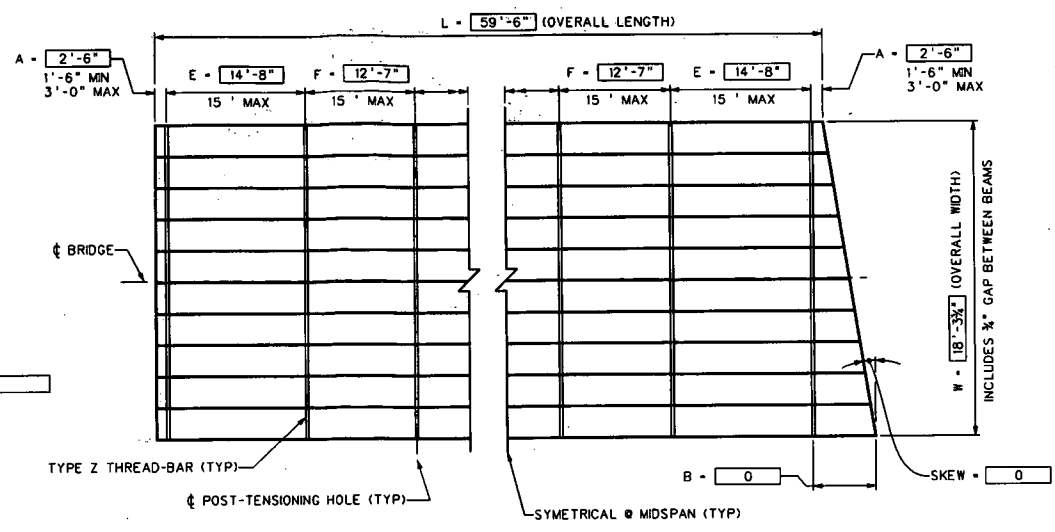
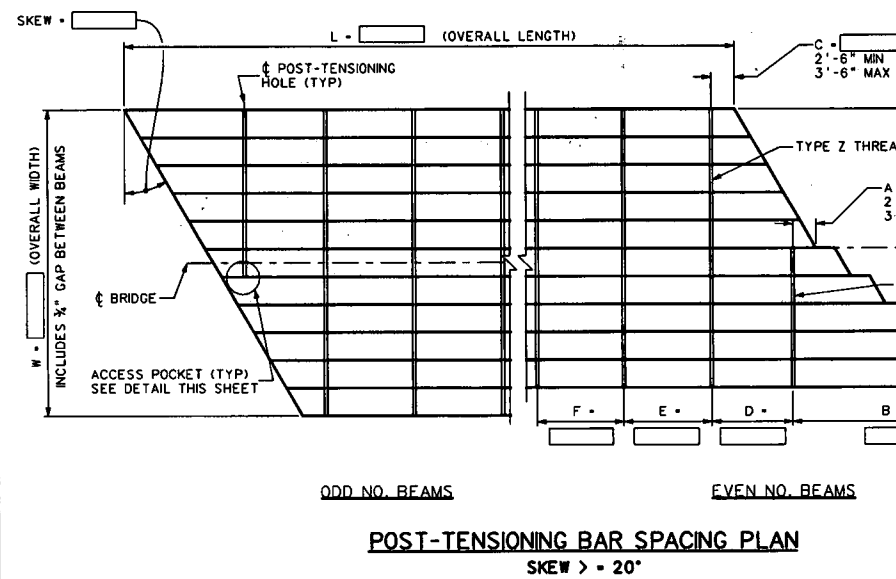
BEECH LICK RUN BRIDGE

DESIGNED BY: THB/SGA  
DRAWN BY: THB/ATS  
CHECKED BY: MSS  
REVIEWED BY: MS  
DATE: 5/30/13  
SCALE: NTS  
SHEET 12 OF 14  
BRIDGE NO. 6541.1

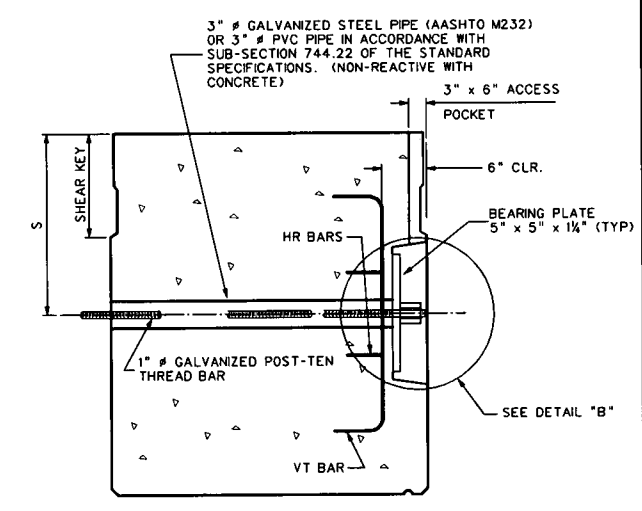
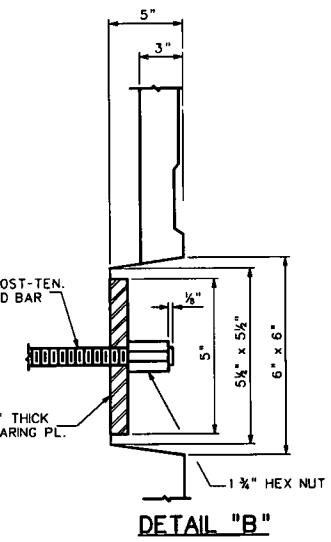
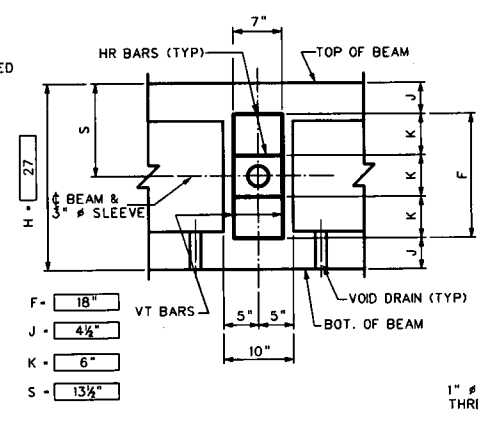
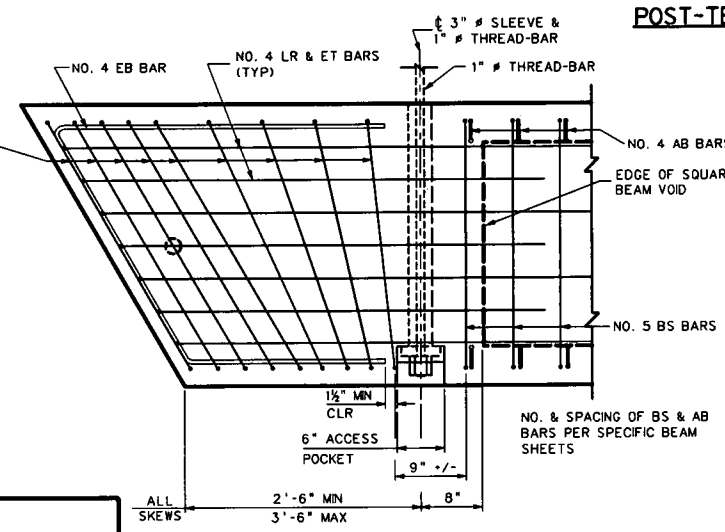
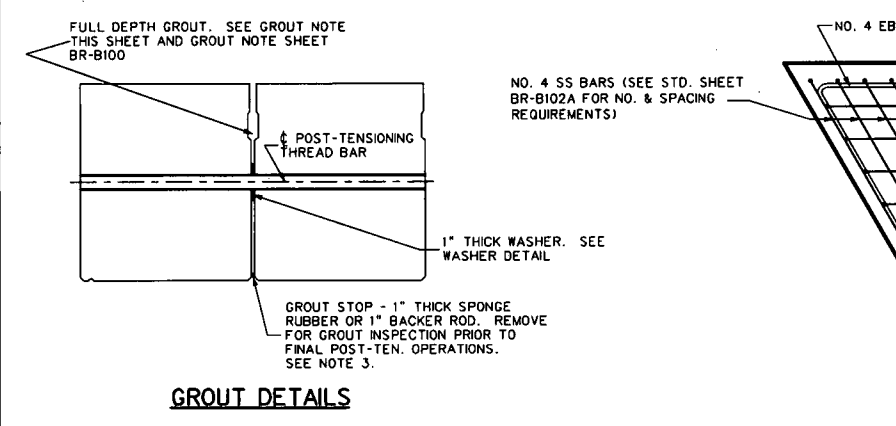
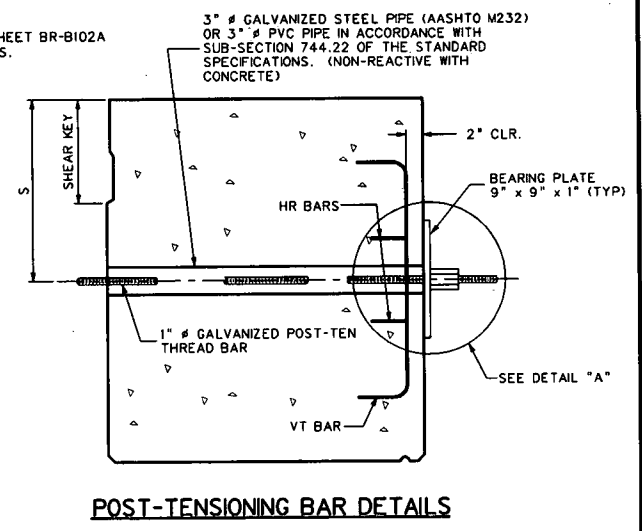
ANTERO RESOURCES  
Stantec

PRESTRESSED CONCRETE BEAM  
ELASTOMERIC BEARING PAD DETAILS  
MISC. DESIGN AND ASSEMBLY DETAILS

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
		4	DODDRIDGE	13	14



REFER TO STANDARD SHEET BR-B102A FOR SHEAR KEY DETAILS.



**PROCEDURE NOTES**

- INSTALL ONE INCH THICK WASHER AND GROUT STOP BY GLUING TO ONE SIDE, FOR THE ENTIRE LENGTH OF EACH BEAM PRIOR TO SETTING BEAMS. GLUE SHALL BE AN APPROVED CONSTRUCTION TYPE GLUE OR EPOXY ADHESIVE. GROUT STOP MAY BE INSTALLED AFTER BEAMS ARE SET.
- GLUE A 1/2" x 2" x 2" PIECE OF PRESSURE TREATED PLYWOOD AT EACH THREAD-BAR LOCATION TO INSURE THAT A 3/8" GAP IS OBTAINED. PLYWOOD SPACERS TO BE OFFSET APPROXIMATELY 2 FEET FROM THE THREAD-BAR HOLE AND CENTERED ON THE HOLE DEPTH. PLYWOOD SPACERS ARE REQUIRED ON ONLY ONE BEAM EDGE FACE OF ADJUTING BEAMS. AFTER THE BEAMS ARE SET AND THE THREAD-BARS INSTALLED, PULL THE ENTIRE SUPERSTRUCTURE TOGETHER BY APPLYING A POST-TENSIONING FORCE OF APPROXIMATELY 3000 POUNDS. AT THIS STAGE THE GAP BETWEEN BEAMS SHALL BE A UNIFORM 3/8" WITH ALL SWEEP REMOVED. RECORD THE ACTUAL FORCE APPLIED.
- FILL THE GAP BETWEEN BEAMS AND SHEAR KEY FULL DEPTH WITH THE PRE-APPROVED, PRE-TESTED GROUT MIXTURE. FROM EACH BATCH, PREPARE JOB CONTROL GROUT CUBES FOR THREE AND SEVEN DAY TESTS. THESE JOB CONTROL SAMPLES WILL BE USED TO DETERMINE WHEN THE GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI. A MINIMUM OF THREE SPECIMENS PER TEST SHALL BE OBTAINED, AND THE AVERAGE OF THE TEST RESULTS USED. ACCEPTANCE SAMPLING AND TESTING OF THE GROUT IS THE RESPONSIBILITY OF THE CONTRACTOR; HOWEVER, A REPRESENTATIVE OF THE WDDH SHALL WITNESS ALL OF THE ACCEPTANCE SAMPLING AND TESTING.  
  
TEST PROCEDURE SHALL BE ASTM C109 AS MODIFIED BY ASTM C1017. IN NO INSTANCE SHALL THE CONTRACTOR PROCEED WITH POST-TENSIONING OR OTHER BEAM ERECTION PROCEDURES UNTIL THE REQUIRED MINIMUM GROUT STRENGTH IS ATTAINED AND VERIFIED BY THE ENGINEER. IN THE EVENT THAT THE MINIMUM GROUT STRENGTH IS NOT ATTAINED, THE ENGINEER SHALL BE NOTIFIED AND CORRECTIVE ACTION TAKEN AT THE DIRECTION OF THE ENGINEER. SEE SHEAR KEY GROUT NOTE, SHEET BR-B100 FOR ADDITIONAL REQUIREMENTS.  
  
AFTER THE GROUT HAS REACHED AN INITIAL SET CONDITION AND PRIOR TO ANY FINAL POST-TENSIONING PROCEDURES, THE CONTRACTOR SHALL REMOVE THE GROUT STOP AND INSPECT THE GROUT FOR VOIDS OR OTHER IRREGULARITIES. ANY VOIDS DEEPER THAN 2" FROM THE BOTTOM SHALL BE REGROUTED IN A MANNER ACCEPTABLE TO THE ENGINEER.
- AFTER GROUT AS BEEN PLACED AND REACHED IT'S MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI AND HAS CURED A MINIMUM OF 3 DAYS, APPLY 50% OF THE FINAL POST-TENSIONING FORCE TO ALL THREAD-BARS, WORKING BEAM ENDS TO MIDSPAN. AFTER ALL THREAD-BARS HAVE BEEN TENSIONED TO 50%, APPLY THE REMAINING PERCENTAGE OF FINAL POST-TENSIONING FORCE, WORKING IN THE SAME SEQUENCE AS THE FIRST STAGE OF FINAL TENSIONING.
- MEASURE AND RECORD, IN THE ELONGATION TABLE, THIS SHEET, THE ACTUAL TOTAL ELONGATION OF EACH THREAD-BAR. COMPARE THE MEASURED ELONGATION TO THE CALCULATED ELONGATION. A SIGNIFICANT DIFFERENCE BETWEEN MEASURED AND CALCULATED ELONGATIONS COULD INDICATE IMPROPER JACKING TECHNIQUES, FAULTY MATERIALS, FAULTY JACKS, OR IMPROPERLY CALBRATED JACKS. IF THE DIFFERENCE IS GREATER THAN 15%, THEN THE JACK SHALL BE RE-CALBRATED AND THE JACKING TECHNIQUES EVALUATED. IF, AFTER THE ABOVE STEPS ARE TAKEN, THE PERCENTAGE DIFFERENCE IS GREATER THAN 10%, THEN THE ENGINEER SHALL BE NOTIFIED AND CORRECTIVE ACTION TAKEN AT THE DIRECTION OF THE ENGINEER. ALL COSTS INVOLVED IN CORRECTION SHALL BE AT THE CONTRACTORS EXPENSE.
- USING SAW, TRIM EXCESS THREAD-BAR LEAVING 4" TO 6" PAST THE NUT. DO NOT TRIM THREAD-BARS BY TORCH CUTTING. TOUCH-UP TRIMMED ENDS WITH GALVICON OR EQUAL.
- INSTALL ANCHOR DOWELS AS DETAILED ON STANDARD SHEETS BR-B101 AND BR-B102A.

**FINAL POST-TENSIONING FORCE**  
TYPE Z BARS - 80 KIPS  
TYPE V BARS - 40 KIPS

SPAN	1
SKEW	0
L	59'-6"
W	18'-3 3/4"
A	2'-6"
B	0
C	-
D	-
E	14'-8"
F	12'-7"
STEP	-

BEAM SIZE	REINFORCEMENT		BAR DIST
	DM	SPACING	
H	F	J	K
IN.	IN.	IN.	IN.
17	12	2 1/2	4
21	12	4 1/2	4
27	18	4 1/2	6
33	24	4 1/2	8
39	30	4 1/2	10
42	33	4 1/2	11

	3 DAY (PSI)	7 DAY (PSI)
PRE-TEST STRENGTH		
JOB CONTROL STRENGTH		
GROUT TYPE & MANUFACTURER		

BAR	FORMULA	LENGTH
V(EVEN)	1/2 * 3'	-
Z	W * 3'	21' - 3 3/4"
V(ODD)	1/2 * 4' - 6"	-

BAR	CODE	CALC.	MEASURED												
			NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6	NO. 7	NO. 8	NO.	NO.			
Z	⊗	0.7384													
V	⊙														

CALCULATED ⊗ - (W.F.T.) / 24.8  
CALCULATED ⊙ - (W.F.T.) / 99.2

ODD NO. BEAMS  
CALCULATED ⊙ - (W.F.T.) \* 3 / 99.2

**SPECIAL WARNING NOTES**

- DO NOT STAND IN LINE WITH THE POST-TENSIONING BAR DURING TENSIONING PROCEDURES.
- NUTS, COUPLERS AND EXTENSION RODS USED IN THE POST-TENSIONING WORK SHALL BE THE MATERIAL APPROVED BY THE MANUFACTURER OF THE HIGH STRENGTH POST-TENSIONING RODS. IN NO CASE SHALL THE CONTRACTOR USE NON-APPROVED MATERIAL OR MATERIAL FROM TWO DIFFERENT SOURCES.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION  
PRESTRESSED CONCRETE BEAM  
TRANSVERSE POST-TENSIONING DETAILS  
STANDARD SHEET BR-B103

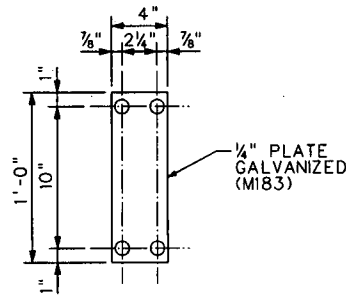
DESIGNED BY: THB/SGJ  
DRAWN BY: THB/ATS  
CHECKED BY: MSS  
REVIEWED BY: MS  
DATE: 5/30/13  
SCALE: NTS  
SHEET NO 13 OF 14  
BRIDGE NUMBER  
6541.1

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
ENGINEERING DIVISION  
BEECH LICK RUN BRIDGE

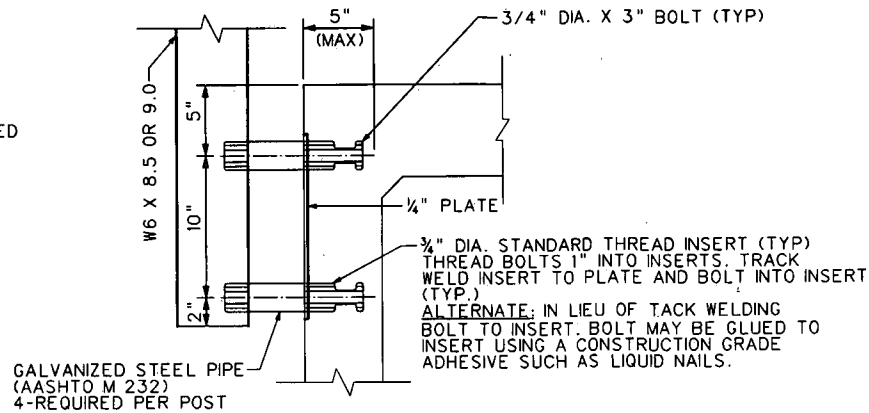
ANTERO RESOURCES  
Stantec

PRESTRESSED CONCRETE BEAM  
TRANSVERSE POST-TENSIONING DETAILS

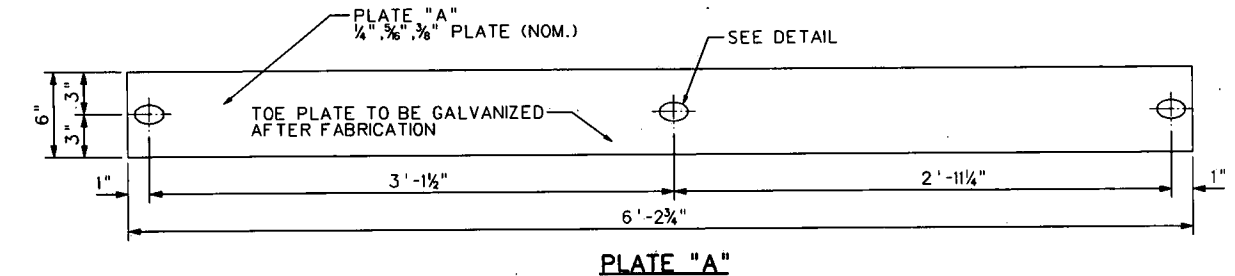
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		4	DODDRIDGE	14	14



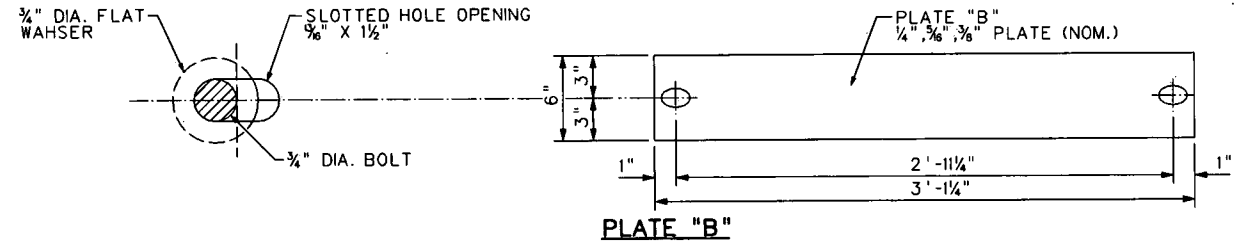
**GUARDRAIL INSERT  
DETAIL**



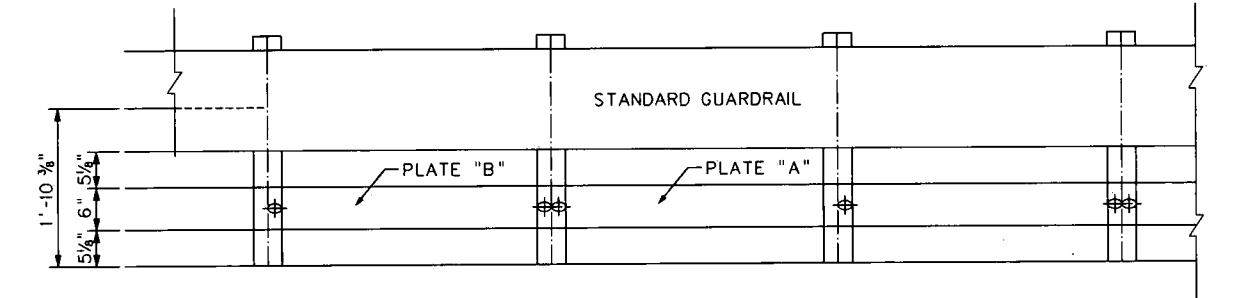
**GUARDRAIL SET-OUT  
DETAIL**



**PLATE "A"**



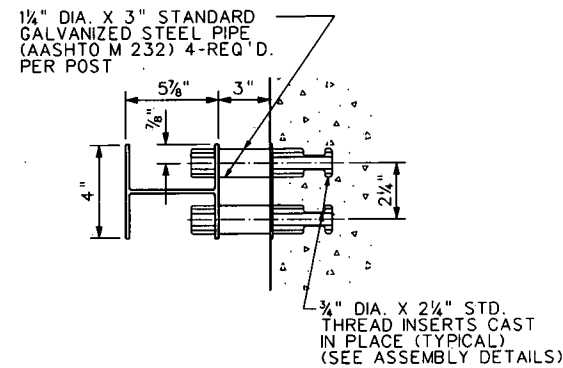
**PLATE "B"**



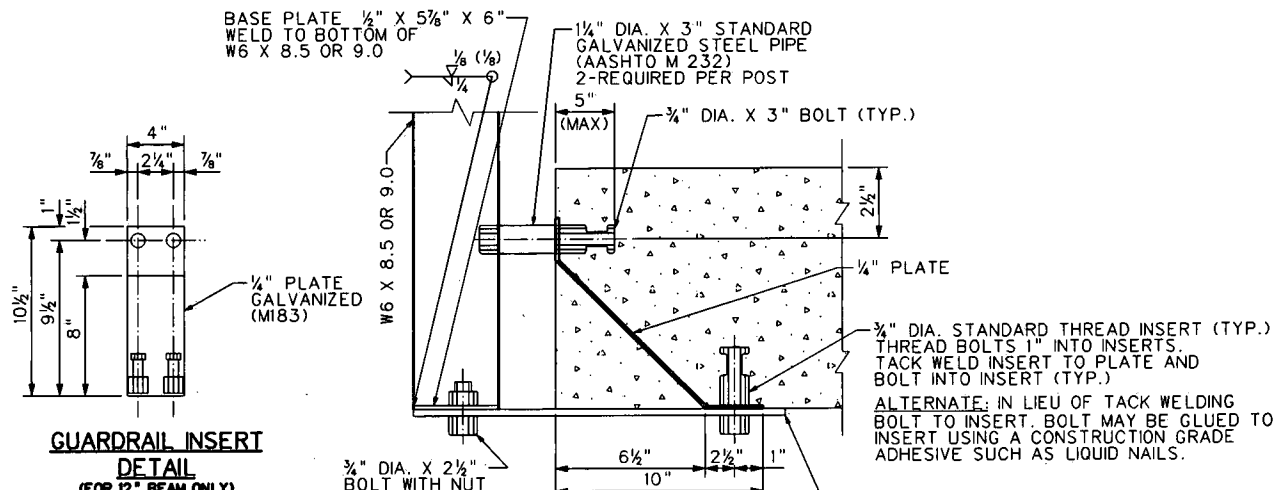
**TOE PLATE DETAILS  
FOR USE ON STRUCTURES WITH NO CURB**

**NOTES:**

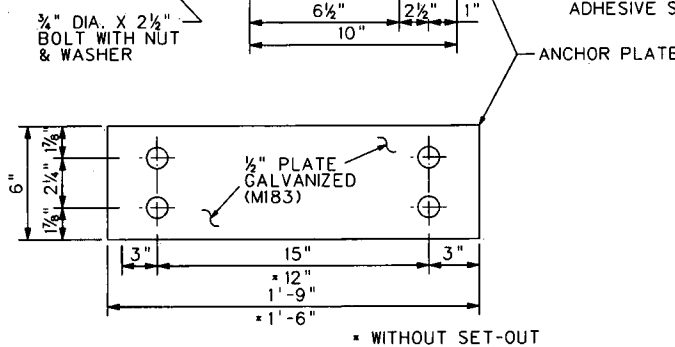
- ENTIRE ASSEMBLY IS TO BE HOT-DIPPED GALVANIZED AFTER FABRICATION. RETAP THREADS FOR PROPER FIT. ALTERNATE: IN LIEU OF HOT-DIP GALVANIZING, GUARDRAIL INSERT ASSEMBLY MAY BE ELECTRO-DEPOSITED ZINC COATED AFTER FABRICATION IN ACCORDANCE WITH ASTM B-633, TYPE 2, CLASSIFICATION NO. 25.
- ANY DAMAGE TO GALVANIZED AREAS SHALL BE TOUCHED WITH GALVICON, OR EQUAL.
- WHEN THE GUARDRAIL POST IS LOCATED OVER THE BRIDGE SEAT (ON 12" BEAMS ONLY) THE ANCHOR PLATE AND FOUR BOLTS SHALL BE OMITTED. INSTALL IN ACCORDANCE WITH THE "GUARDRAIL ANCHOR OVER BRIDGE SEAT" DETAIL THIS SHEET.



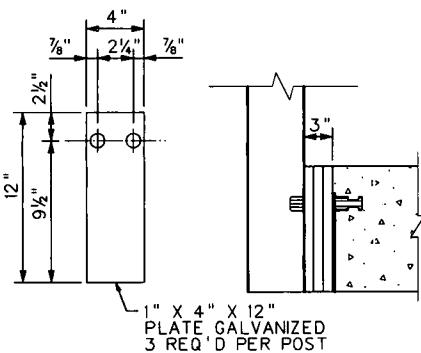
**ANCHOR DETAILS**



**GUARDRAIL INSERT  
DETAIL  
(FOR 12" BEAM ONLY)**



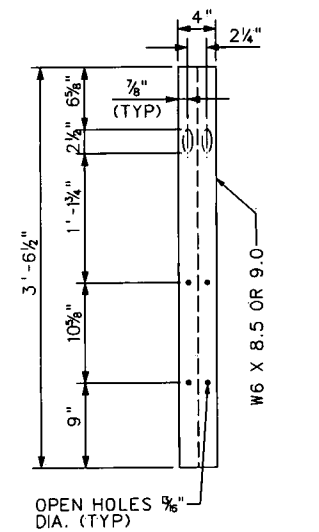
**GUARDRAIL SET-OUT  
DETAIL  
(FOR 12" BEAM ONLY)**



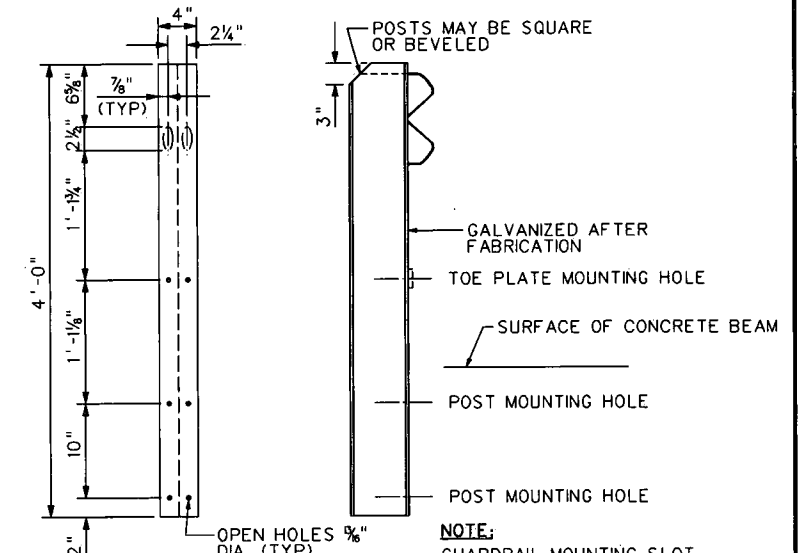
**GUARDRAIL ANCHOR  
OVER BRIDGE SEAT  
(FOR 12" BEAM ONLY)**

**NOTE:**

THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD AND REVISED SHEETS BR-17A & B THRU BR-B42A & B, BR101, BR-B102A & B, BR-B103, BR-B104, BR-B105A & B AND BR-B106 AS APPLICABLE.



**TYPICAL GUARDRAIL POST  
(FOR 12" BEAM ONLY)**



**TYPICAL GUARDRAIL POST**

**NOTE:**  
GUARDRAIL MOUNTING SLOT (RAISE GUARDRAIL UPON COMPLETION OF FUTURE WEARING SURFACE)

PRESTRESSED CONCRETE BEAM  
DESIGN AND ASSEMBLY NOTES  
REVISED BR-B101

REVISED	
08/12	SGJ



PRESTRESSED CONCRETE BEAM  
DESIGN & ASSEMBLY NOTES

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS ENGINEERING DIVISION	
BEECH LICK RUN BRIDGE	
DESIGNED BY: THB/SGJ	DRAWN BY: THB/ATS
CHECKED BY: MSS	REVIEWED BY: MS
DATE: 5/30/13	SCALE: NTS
SHEET NO 14 OF 14	BRIDGE NUMBER
	6541.1