



The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at *wvOASIS.gov*. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at *WVPurchasing.gov* with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

Header 1

List View

General Information | Contact | Default Values | Discount | Document Information

Procurement Folder: 605791

SO Doc Code: CRFQ

Procurement Type: Central Purchase Order

SO Dept: 0803

Vendor ID: 00000201886

SO Doc ID: DOT200000016

Legal Name: EASTERN VAULT COMPANY INC

Published Date: 8/5/19

Alias/DBA:

Close Date: 8/21/19

Total Bid: \$106,318.50

Close Time: 13:30

Response Date: 08/20/2019

Status: Closed

Response Time: 17:39

Solicitation Description: CONCRETE BOX BEAMS
(03200029)

Total of Header Attachments: 1

Total of All Attachments: 1



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

**State of West Virginia
 Solicitation Response**

Proc Folder : 605791
Solicitation Description : CONCRETE BOX BEAMS (03200029)
Proc Type : Central Purchase Order

Date issued	Solicitation Closes	Solicitation Response	Version
	2019-08-21 13:30:00	SR 0803 ESR08201900000001081	1

VENDOR
000000201886 EASTERN VAULT COMPANY INC

Solicitation Number: CRFQ 0803 DOT2000000016

Total Bid : \$106,318.50 **Response Date:** 2019-08-20 **Response Time:** 17:39:08

Comments:

FOR INFORMATION CONTACT THE BUYER
 Crystal G Hustead
 (304) 558-2402
 crystal.g.hustead@wv.gov

Signature on File	FEIN #	DATE
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All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Exterior Beam Section 17" Prestressed Concrete Box Beam	249.00000	SF	\$89.000000	\$22,161.00

Comm Code	Manufacturer	Specification	Model #
30101717			

Extended Description : Exterior Beam Section: 17" Prestressed Concrete Box Beams (3" wide) 2 Beams at 41'6" overall length skew= 15 deg right forward

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
2	Interior Beam Section 17" Prestressed Concrete Box Beam	622.50000	SF	\$89.000000	\$55,402.50

Comm Code	Manufacturer	Specification	Model #
30101717			

Extended Description : Interior Beam Section: 17" prestressed concrete box beams (3" wide) 5 beams at 41'6" overall length skew 15 deg right forward

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
3	1-13/16" Elastomeric Laminated Bearing Pads	12.00000	EA	\$190.000000	\$2,280.00

Comm Code	Manufacturer	Specification	Model #
31171526			

Extended Description : 1-13/16" Elastomeric Bearing Pad (60 Duro Hardness) B1 pads (4-3/4" x 15-1/2")

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
4	1-13/16" Elastomeric Laminated Bearing Pads	4.00000	EA	\$190.000000	\$760.00

Comm Code	Manufacturer	Specification	Model #
31171526			

Extended Description : 1-13/16" elastomeric bearing pads (60 Duro Hardness) B2 Pads (4-3/4" x 15-1/2")

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
5	1" Diameter x 2'-0" Swedged Anchor Bolt	14.00000	EA	\$10.000000	\$140.00

Comm Code	Manufacturer	Specification	Model #
31161601			

Extended Description : 1" diameter x 2'0" swedged anchor bolt or No. 8 Deformed Reinforcing Bar (grade 60) galvanized

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
6	2-1/8" Thick Sponge rubber Preformed Joint Filler	29.00000	SF	\$10.000000	\$290.00

Comm Code	Manufacturer	Specification	Model #
27112230			

Extended Description : 2-1/8" thick sponge rubber preformed joint filler at bearings 22.2 LF @ 6-3/8"wide=11.8 sf/end, 24 sf total, 5.4lf@4-3/4"wide=2.2sf/end 5 sf total

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
7	1" Thick Sponge Rubber Preformed Joint Filler at Beam Ends	63.00000	SF	\$10.000000	\$630.00

Comm Code	Manufacturer	Specification	Model #
27112230			

Extended Description : 1" thick sponge rubber preformed joint filler at beam ends 22.2lf @17" wide-31.5 sf/end, 63 sf total

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
8	Guardrail Attachment Assembly for Box Beams with Studs	16.00000	EA	\$333.000000	\$5,328.00

Comm Code	Manufacturer	Specification	Model #
30121717			

Extended Description : Guardrail attachment assembly for box beams with studs, nuts, and washers

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
9	1" Diameter Post Tensioning Thread Bar	97.50000	LF	\$15.000000	\$1,462.50

Comm Code	Manufacturer	Specification	Model #
31161618			

Extended Description : 1" diameter Post-tensioning thread bar w/10 hardened nuts 4 bars @ 24' 4-1/2"

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
10	Bearing Plate 9" x 9" x 1"	8.00000	EA	\$50.000000	\$400.00

Comm Code	Manufacturer	Specification	Model #
31171526			

Extended Description : Bearing plate 9" x 9" x 1"

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
11	Type TL-2 Bridge Guardrail Post	16.00000	EA	\$500.000000	\$8,000.00

Comm Code	Manufacturer	Specification	Model #
30121717			

Extended Description : type tl-2 bridge guardrail post

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
12	Type TL-2 Bridge Guardrail	91.00000	LF	\$100.000000	\$9,100.00

Comm Code	Manufacturer	Specification	Model #
30121717			

Extended Description : Type TL-2 Bridge Guardrail

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
13	1" Grout Stop	249.00000	LF	\$0.500000	\$124.50

Comm Code	Manufacturer	Specification	Model #
30111506			

Extended Description : 1" Grout Stop

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
14	1" x 8" x 8" Washer	24.00000	EA	\$10.000000	\$240.00

Comm Code	Manufacturer	Specification	Model #
31161800			

Extended Description : 1" x 8" x 8" washer, with a 3-1/2" diameter hole in center



Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

State of West Virginia
 Request for Quotation
 19 - Highways

Proc Folder: 605791

Doc Description: CONCRETE BOX BEAMS (03200029)

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2019-08-05	2019-08-21 13:30:00	CRFQ 0803 DOT2000000016	1

BID RECEIVING LOCATION

BID CLERK
 DEPARTMENT OF ADMINISTRATION
 PURCHASING DIVISION
 2019 WASHINGTON ST E
 CHARLESTON WV 25305
 US

VENDOR

Vendor Name, Address and Telephone Number:

FOR INFORMATION CONTACT THE BUYER

Crystal G Husted
 (304) 558-2402
 crystal.g.husted@wv.gov

Signature X

FEIN #

55-0520255

DATE

8-16-19

All offers subject to all terms and conditions contained in this solicitation

ADDITIONAL INFORMATION:

THE STATE OF WEST VIRGINIA PURCHASING DIVISION FOR THE AGENCY, WEST VIRGINIA DIVISION OF HIGHWAYS, IS SOLICITING BIDS TO ESTABLISH A CONTRACT FOR THE ONE-TIME PURCHASE OF CONCRETE BOX BEAMS FOR THE BRUSHY FORK BRIDGE PROJECT NO. S353-3-5.68 PER THE ATTACHED DOCUMENTS.

QUESTIONS REGARDING THE SOLICITATION MUST BE SUBMITTED IN WRITING TO CRYSTAL.G.HUSTEAD@WV.GOV PRIOR TO THE QUESTION PERIOD DEADLINE CONTAINED IN THE INSTRUCTIONS TO VENDORS SUBMITTING BIDS.

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	Exterior Beam Section 17" Prestressed Concrete Box Beam	249.00000	SF		

Comm Code	Manufacturer	Specification	Model #
30101717			

Extended Description :

Exterior Beam Section: 17" Prestressed Concrete Box Beams (3" wide) 2 Beams at 41'6" overall length skew= 15 deg right forward

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
2	Interior Beam Section 17" Prestressed Concrete Box Beam	622.50000	SF		

Comm Code	Manufacturer	Specification	Model #
30101717			

Extended Description :

Interior Beam Section: 17" prestressed concrete box beams (3" wide) 5 beams at 41'6" overall length skew 15 deg right forward

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
3	1-13/16" Elastomeric Laminated Bearing Pads	12.00000	EA		

Comm Code	Manufacturer	Specification	Model #
31171526			

Extended Description :

1-13/16" Elastomeric Bearing Pad (60 Duro Hardness) B1 pads (4-3/4" x 15-1/2")

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
4	1-13/16" Elastomeric Laminated Bearing Pads	4.00000	EA		

Comm Code	Manufacturer	Specification	Model #
31171526			

Extended Description :

1-13/16" elastomeric bearing pads (60 Duro Hardness) B2 Pads (4-3/4" x 15-1/2")

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
5	1" Diameter x 2'-0" Swedged Anchor Bolt	14.00000	EA		

Comm Code	Manufacturer	Specification	Model #
31161601			

Extended Description :

1" diameter x 2'0" swaged anchor bolt or No. 8 Deformed Reinforcing Bar (grade 60) galvanized

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG US	WV26101	STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City US	WV 99999

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
6	2-1/8" Thick Sponge rubber Preformed Joint Filler	29.00000	SF		

Comm Code	Manufacturer	Specification	Model #
27112230			

Extended Description :

2-1/8" thick sponge rubber preformed joint filler at bearings 22.2 LF@ 6-3/8"wide=11.8 sf/end, 24 sf total, 5.4lf@4-3/4"wide=2.2sf/end 5 sf total

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG US	WV26101	STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City US	WV 99999

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
7	1" Thick Sponge Rubber Preformed Joint Filler at Beam Ends	63.00000	SF		

Comm Code	Manufacturer	Specification	Model #
27112230			

Extended Description :

1" thick sponge rubber preformed joint filler at beam ends 22.2lf @17" wide=31.5 sf/end, 63 sf total

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
8	Guardrail Attachment Assembly for Box Beams with Studs	16.00000	EA		

Comm Code	Manufacturer	Specification	Model #
30121717			

Extended Description :
 Guardrail attachment assembly for box beams with studs, nuts, and washers

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
9	1" Diameter Post Tensioning Thread Bar	97.50000	LF		

Comm Code	Manufacturer	Specification	Model #
31161618			

Extended Description :
 1" diameter Post-tensioning thread bar w/10 hardened nuts 4 bars @ 24' 4-1/2"

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
10	Bearing Plate 9" x 9" x 1"	8.00000	EA		

Comm Code	Manufacturer	Specification	Model #
31171526			

Extended Description :
Bearing plate 9" x 9" x 1"

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
11	Type TL-2 Bridge Guardrail Post	16.00000	EA		

Comm Code	Manufacturer	Specification	Model #
30121717			

Extended Description :
type tl-2 bridge guardrail post

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
12	Type TL-2 Bridge Guardrail	91.00000	LF		

Comm Code	Manufacturer	Specification	Model #
30121717			

Extended Description :
Type TL-2 Bridge Guardrail

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
13	1" Grout Stop	249.00000	LF		

Comm Code	Manufacturer	Specification	Model #
30111506			

Extended Description :
1" Grout Stop

INVOICE TO		SHIP TO	
DIVISION OF HIGHWAYS DISTRICT THREE 624 DEPOT ST PARKERSBURG WV26101 US		STATE OF WEST VIRGINIA JOBSITE - SEE SPECIFICATIONS No City WV 99999 US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
14	1" x 8" x 8" Washer	24.00000	EA		

Comm Code	Manufacturer	Specification	Model #
31161800			

Extended Description :
1" x 8"x 8" washer, with a 3-1/2" diameter hole in center

SCHEDULE OF EVENTS

Line	Event	Event Date
1	VENDOR QUESTION DEADLINE	2019-08-09

INSTRUCTIONS TO VENDORS SUBMITTING BIDS

1. REVIEW DOCUMENTS THOROUGHLY: The attached documents contain a solicitation for bids. Please read these instructions and all documents attached in their entirety. These instructions provide critical information about requirements that if overlooked could lead to disqualification of a Vendor's bid. All bids must be submitted in accordance with the provisions contained in these instructions and the Solicitation. Failure to do so may result in disqualification of Vendor's bid.

2. MANDATORY TERMS: The Solicitation may contain mandatory provisions identified by the use of the words "must," "will," and "shall." Failure to comply with a mandatory term in the Solicitation will result in bid disqualification.

3. PREBID MEETING: The item identified below shall apply to this Solicitation.

A pre-bid meeting will not be held prior to bid opening

A **MANDATORY PRE-BID** meeting will be held at the following place and time:

All Vendors submitting a bid must attend the mandatory pre-bid meeting. Failure to attend the mandatory pre-bid meeting shall result in disqualification of the Vendor's bid. No one person attending the pre-bid meeting may represent more than one Vendor.

An attendance sheet provided at the pre-bid meeting shall serve as the official document verifying attendance. The State will not accept any other form of proof or documentation to verify attendance. Any person attending the pre-bid meeting on behalf of a Vendor must list on the attendance sheet his or her name and the name of the Vendor he or she is representing.

Additionally, the person attending the pre-bid meeting should include the Vendor's E-Mail address, phone number, and Fax number on the attendance sheet. It is the Vendor's responsibility to locate the attendance sheet and provide the required information. Failure to complete the attendance sheet as required may result in disqualification of Vendor's bid.

All Vendors should arrive prior to the starting time for the pre-bid. Vendors who arrive after the starting time but prior to the end of the pre-bid will be permitted to sign in, but are charged with knowing all matters discussed at the pre-bid.

Questions submitted at least five business days prior to a scheduled pre-bid will be discussed at the pre-bid meeting if possible. Any discussions or answers to questions at the pre-bid meeting are preliminary in nature and are non-binding. Official and binding answers to questions will be published in a written addendum to the Solicitation prior to bid opening.

4. VENDOR QUESTION DEADLINE: Vendors may submit questions relating to this Solicitation to the Purchasing Division. Questions must be submitted in writing. All questions must be submitted on or before the date listed below and to the address listed below in order to be considered. A written response will be published in a Solicitation addendum if a response is possible and appropriate. Non-written discussions, conversations, or questions and answers regarding this Solicitation are preliminary in nature and are nonbinding.

Submitted e-mails should have solicitation number in the subject line.

Question Submission Deadline: August 9, 2019 at 10:00 AM EST

Submit Questions to: Crystal Husted
2019 Washington Street, East
Charleston, WV 25305
Fax: (304) 558-4115 (Vendors should not use this fax number for bid submission)
Email: Crystal.G.Husted@wv.gov

5. VERBAL COMMUNICATION: Any verbal communication between the Vendor and any State personnel is not binding, including verbal communication at the mandatory pre-bid conference. Only information issued in writing and added to the Solicitation by an official written addendum by the Purchasing Division is binding.

6. BID SUBMISSION: All bids must be submitted electronically through wvOASIS or signed and delivered by the Vendor to the Purchasing Division at the address listed below on or before the date and time of the bid opening. Any bid received by the Purchasing Division staff is considered to be in the possession of the Purchasing Division and will not be returned for any reason. The Purchasing Division will not accept bids, modification of bids, or addendum acknowledgment forms via e-mail. Acceptable delivery methods include electronic submission via wvOASIS, hand delivery, delivery by courier, or facsimile.

The bid delivery address is:
Department of Administration, Purchasing Division
2019 Washington Street East
Charleston, WV 25305-0130

A bid that is not submitted electronically through wvOASIS should contain the information listed below on the face of the envelope or the bid may be rejected by the Purchasing Division.:

SEALED BID:
BUYER: Crystal Husted
SOLICITATION NO.: CRFQ DOT2000000016
BID OPENING DATE: August 21, 2019
BID OPENING TIME: 1:30 PM EST
FAX NUMBER: 304-558-3970

The Purchasing Division may prohibit the submission of bids electronically through wvOASIS at its sole discretion. Such a prohibition will be contained and communicated in the wvOASIS system resulting in the Vendor's inability to submit bids through wvOASIS. Submission of a response to an Expression or Interest or Request for Proposal is not permitted in wvOASIS.

For Request For Proposal ("RFP") Responses Only: In the event that Vendor is responding to a request for proposal, the Vendor shall submit one original technical and one original cost proposal plus n/a convenience copies of each to the Purchasing Division at the address shown above. Additionally, the Vendor should identify the bid type as either a technical or cost proposal on the face of each bid envelope submitted in response to a request for proposal as follows:

BID TYPE: (This only applies to CRFP)

Technical

Cost

7. BID OPENING: Bids submitted in response to this Solicitation will be opened at the location identified below on the date and time listed below. Delivery of a bid after the bid opening date and time will result in bid disqualification. For purposes of this Solicitation, a bid is considered delivered when confirmation of delivery is provided by wvOASIS (in the case of electronic submission) or when the bid is time stamped by the official Purchasing Division time clock (in the case of hand delivery).

Bid Opening Date and Time: August 21, 2019 at 1:30 PM EST

Bid Opening Location: Department of Administration, Purchasing Division
2019 Washington Street East
Charleston, WV 25305-0130

8. ADDENDUM ACKNOWLEDGEMENT: Changes or revisions to this Solicitation will be made by an official written addendum issued by the Purchasing Division. Vendor should acknowledge receipt of all addenda issued with this Solicitation by completing an Addendum Acknowledgment Form, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

9. BID FORMATTING: Vendor should type or electronically enter the information onto its bid to prevent errors in the evaluation. Failure to type or electronically enter the information may result in bid disqualification.

10. ALTERNATE MODEL OR BRAND: Unless the box below is checked, any model, brand, or specification listed in this Solicitation establishes the acceptable level of quality only and is not intended to reflect a preference for, or in any way favor, a particular brand or vendor. Vendors may bid alternates to a listed model or brand provided that the alternate is at least equal to the model or brand and complies with the required specifications. The equality of any alternate being bid shall be determined by the State at its sole discretion. Any Vendor bidding an alternate model or brand should clearly identify the alternate items in its bid and should include manufacturer's specifications, industry literature, and/or any other relevant documentation demonstrating the

equality of the alternate items. Failure to provide information for alternate items may be grounds for rejection of a Vendor's bid.

This Solicitation is based upon a standardized commodity established under W. Va. Code § 5A-3-61. Vendors are expected to bid the standardized commodity identified. Failure to bid the standardized commodity will result in your firm's bid being rejected.

11. EXCEPTIONS AND CLARIFICATIONS: The Solicitation contains the specifications that shall form the basis of a contractual agreement. Vendor shall clearly mark any exceptions, clarifications, or other proposed modifications in its bid. Exceptions to, clarifications of, or modifications of a requirement or term and condition of the Solicitation may result in bid disqualification.

12. COMMUNICATION LIMITATIONS: In accordance with West Virginia Code of State Rules §148-1-6.6, communication with the State of West Virginia or any of its employees regarding this Solicitation during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited without prior Purchasing Division approval. Purchasing Division approval for such communication is implied for all agency delegated and exempt purchases.

13. REGISTRATION: Prior to Contract award, the apparent successful Vendor must be properly registered with the West Virginia Purchasing Division and must have paid the \$125 fee, if applicable.

14. UNIT PRICE: Unit prices shall prevail in cases of a discrepancy in the Vendor's bid.

15. PREFERENCE: Vendor Preference may be requested in purchases of motor vehicles or construction and maintenance equipment and machinery used in highway and other infrastructure projects. Any request for preference must be submitted in writing with the bid, must specifically identify the preference requested with reference to the applicable subsection of West Virginia Code § 5A-3-37, and should include with the bid any information necessary to evaluate and confirm the applicability of the requested preference. A request form to help facilitate the request can be found at:

<http://www.state.wv.us/admin/purchase/vrc/Venpref.pdf>.

15A. RECIPROCAL PREFERENCE: The State of West Virginia applies a reciprocal preference to all solicitations for commodities and printing in accordance with W. Va. Code § 5A-3-37(b). In effect, non-resident vendors receiving a preference in their home states, will see that same preference granted to West Virginia resident vendors bidding against them in West Virginia. A request form to help facilitate the request can be found at:

<http://www.state.wv.us/admin/purchase/vrc/Venpref.pdf>.

16. SMALL, WOMEN-OWNED, OR MINORITY-OWNED BUSINESSES: For any solicitations publicly advertised for bid, in accordance with West Virginia Code §5A-3-37(a)(7) and W. Va. CSR § 148-22-9, any non-resident vendor certified as a small, women-owned, or minority-owned business under W. Va. CSR § 148-22-9 shall be provided the same preference made available to any resident vendor. Any non-resident small, women-owned, or minority-owned business must identify itself as such in writing, must submit that writing to the

Purchasing Division with its bid, and must be properly certified under W. Va. CSR § 148-22-9 prior to contract award to receive the preferences made available to resident vendors. Preference for a non-resident small, women-owned, or minority owned business shall be applied in accordance with W. Va. CSR § 148-22-9.

17. WAIVER OF MINOR IRREGULARITIES: The Director reserves the right to waive minor irregularities in bids or specifications in accordance with West Virginia Code of State Rules § 148-1-4.6.

18. ELECTRONIC FILE ACCESS RESTRICTIONS: Vendor must ensure that its submission in wvOASIS can be accessed and viewed by the Purchasing Division staff immediately upon bid opening. The Purchasing Division will consider any file that cannot be immediately accessed and viewed at the time of the bid opening (such as, encrypted files, password protected files, or incompatible files) to be blank or incomplete as context requires, and are therefore unacceptable. A vendor will not be permitted to unencrypt files, remove password protections, or resubmit documents after bid opening to make a file viewable if those documents are required with the bid. A Vendor may be required to provide document passwords or remove access restrictions to allow the Purchasing Division to print or electronically save documents provided that those documents are viewable by the Purchasing Division prior to obtaining the password or removing the access restriction.

19. NON-RESPONSIBLE: The Purchasing Division Director reserves the right to reject the bid of any vendor as Non-Responsible in accordance with W. Va. Code of State Rules § 148-1-5.3, when the Director determines that the vendor submitting the bid does not have the capability to fully perform, or lacks the integrity and reliability to assure good-faith performance.”

20. ACCEPTANCE/REJECTION: The State may accept or reject any bid in whole, or in part in accordance with W. Va. Code of State Rules § 148-1-4.5. and § 148-1-6.4.b.”

21. YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor’s entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of West Virginia Code §§ 5A-3-1 et seq., 5-22-1 et seq., and 5G-1-1 et seq. and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Purchasing Division constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Purchasing Division will disclose any document labeled “confidential,” “proprietary,” “trade secret,” “private,” or labeled with any other claim against public disclosure of the documents, to include any “trade secrets” as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

22. INTERESTED PARTY DISCLOSURE: West Virginia Code § 6D-1-2 requires that the vendor submit to the Purchasing Division a disclosure of interested parties to the contract for all contracts with an actual or estimated value of at least \$1 Million. That disclosure must occur on the form prescribed and approved by the WV Ethics Commission prior to contract award. A copy of that form is included with this solicitation or can be obtained from the WV Ethics Commission. This requirement does not apply to publicly traded companies listed on a national or international stock exchange. A more detailed definition of interested parties can be obtained from the form referenced above.

23. WITH THE BID REQUIREMENTS: In instances where these specifications require documentation or other information with the bid, and a vendor fails to provide it with the bid, the Director of the Purchasing Division reserves the right to request those items after bid opening and prior to contract award pursuant to the authority to waive minor irregularities in bids or specifications under W. Va. CSR § 148-1-4.6. This authority does not apply to instances where state law mandates receipt with the bid.

GENERAL TERMS AND CONDITIONS:

1. CONTRACTUAL AGREEMENT: Issuance of a Award Document signed by the Purchasing Division Director, or his designee, and approved as to form by the Attorney General's office constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.

2. DEFINITIONS: As used in this Solicitation/Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation/Contract.

2.1. "Agency" or "Agencies" means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.

2.2. "Bid" or "Proposal" means the vendors submitted response to this solicitation.

2.3. "Contract" means the binding agreement that is entered into between the State and the Vendor to provide the goods or services requested in the Solicitation.

2.4. "Director" means the Director of the West Virginia Department of Administration, Purchasing Division.

2.5. "Purchasing Division" means the West Virginia Department of Administration, Purchasing Division.

2.6. "Award Document" means the document signed by the Agency and the Purchasing Division, and approved as to form by the Attorney General, that identifies the Vendor as the contract holder.

2.7. "Solicitation" means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.

2.8. "State" means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.

2.9. "Vendor" or "Vendors" means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

3. CONTRACT TERM; RENEWAL; EXTENSION: The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

Term Contract

Initial Contract Term: This Contract becomes effective on _____ and extends for a period of _____ year(s).

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any request for renewal should be delivered to the Agency and then submitted to the Purchasing Division thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Unless otherwise specified below, renewal of this Contract is limited to _____ successive one (1) year periods or multiple renewal periods of less than one year, provided that the multiple renewal periods do not exceed the total number of months available in all renewal years combined. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General's office (Attorney General approval is as to form only)

Alternate Renewal Term – This contract may be renewed for _____ successive _____ year periods or shorter periods provided that they do not exceed the total number of months contained in all available renewals. Automatic renewal of this Contract is prohibited. Renewals must be approved by the Vendor, Agency, Purchasing Division and Attorney General's office (Attorney General approval is as to form only)

Delivery Order Limitations: In the event that this contract permits delivery orders, a delivery order may only be issued during the time this Contract is in effect. Any delivery order issued within one year of the expiration of this Contract shall be effective for one year from the date the delivery order is issued. No delivery order may be extended beyond one year after this Contract has expired.

Fixed Period Contract: This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within _____ days.

Fixed Period Contract with Renewals: This Contract becomes effective upon Vendor's receipt of the notice to proceed and part of the Contract more fully described in the attached specifications must be completed within _____ days. Upon completion of the work covered by the preceding sentence, the vendor agrees that maintenance, monitoring, or warranty services will be provided for _____ year(s) thereafter.

One Time Purchase: The term of this Contract shall run from the issuance of the Award Document until all of the goods contracted for have been delivered, but in no event will this Contract extend for more than one fiscal year.

Other: See attached.

4. NOTICE TO PROCEED: Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Award Document will be considered notice to proceed.

5. QUANTITIES: The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

Open End Contract: Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

Service: The scope of the service to be provided will be more clearly defined in the specifications included herewith.

Combined Service and Goods: The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

One Time Purchase: This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, Purchasing Division, and Attorney General's office.

6. EMERGENCY PURCHASES: The Purchasing Division Director may authorize the Agency to purchase goods or services in the open market that Vendor would otherwise provide under this Contract if those goods or services are for immediate or expedited delivery in an emergency. Emergencies shall include, but are not limited to, delays in transportation or an unanticipated increase in the volume of work. An emergency purchase in the open market, approved by the Purchasing Division Director, shall not constitute a breach of this Contract and shall not entitle the Vendor to any form of compensation or damages. This provision does not excuse the State from fulfilling its obligations under a One Time Purchase contract.

7. REQUIRED DOCUMENTS: All of the items checked below must be provided to the Purchasing Division by the Vendor as specified below.

BID BOND (Construction Only): Pursuant to the requirements contained in W. Va. Code § 5-22-1(c), All Vendors submitting a bid on a construction project shall furnish a valid bid bond in the amount of five percent (5%) of the total amount of the bid protecting the State of West Virginia. The bid bond must be submitted with the bid.

PERFORMANCE BOND: The apparent successful Vendor shall provide a performance bond in the amount of 100% of the contract. The performance bond must be received by the Purchasing Division prior to Contract award.

LABOR/MATERIAL PAYMENT BOND: The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be delivered to the Purchasing Division prior to Contract award.

In lieu of the Bid Bond, Performance Bond, and Labor/Material Payment Bond, the Vendor may provide certified checks, cashier's checks, or irrevocable letters of credit. Any certified check, cashier's check, or irrevocable letter of credit provided in lieu of a bond must be of the same amount and delivered on the same schedule as the bond it replaces. A letter of credit submitted in lieu of a performance and labor/material payment bond will only be allowed for projects under \$100,000. Personal or business checks are not acceptable. Notwithstanding the foregoing, West Virginia Code § 5-22-1 (d) mandates that a vendor provide a performance and labor/material payment bond for construction projects. Accordingly, substitutions for the performance and labor/material payment bonds for construction projects is not permitted.

MAINTENANCE BOND: The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Purchasing Division prior to Contract award.

LICENSE(S) / CERTIFICATIONS / PERMITS: In addition to anything required under the Section of the General Terms and Conditions entitled Licensing, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits prior to Contract award, in a form acceptable to the Purchasing Division.

The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications prior to Contract award regardless of whether or not that requirement is listed above.

8. INSURANCE: The apparent successful Vendor shall furnish proof of the insurance identified by a checkmark below and must include the State as an additional insured on each policy prior to Contract award. The insurance coverages identified below must be maintained throughout the life of this contract. Thirty (30) days prior to the expiration of the insurance policies, Vendor shall provide the Agency with proof that the insurance mandated herein has been continued. Vendor must also provide Agency with immediate notice of any changes in its insurance policies, including but not limited to, policy cancelation, policy reduction, or change in insurers. The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed in this section.

Vendor must maintain:

- Commercial General Liability Insurance** in at least an amount of: \$100,000-See Below per occurrence.
- Automobile Liability Insurance** in at least an amount of: _____ per occurrence.
- Professional/Malpractice/Errors and Omission Insurance** in at least an amount of: _____ per occurrence.
- Commercial Crime and Third Party Fidelity Insurance** in an amount of: _____ per occurrence.
- Cyber Liability Insurance** in an amount of: _____ per occurrence.
- Builders Risk Insurance** in an amount equal to 100% of the amount of the Contract.
- Pollution Insurance** in an amount of: _____ per occurrence.
- Aircraft Liability** in an amount of: _____ per occurrence.
- ***STATE OF WV MUST BE LISTED AS ADDITIONAL INSURED ON INSURANCE CERTIFICATE**
- ***CERTIFICATE HOLDER SHOULD READ AS FOLLOWS:**
STATE OF WV
1900 KANAWHA BLVD E, BLDG 5, CHARLESTON, WV 25305
-
-

Notwithstanding anything contained in this section to the contrary, the Director of the Purchasing Division reserves the right to waive the requirement that the State be named as an additional insured on one or more of the Vendor's insurance policies if the Director finds that doing so is in the State's best interest.

9. WORKERS' COMPENSATION INSURANCE: The apparent successful Vendor shall comply with laws relating to workers compensation, shall maintain workers' compensation insurance when required, and shall furnish proof of workers' compensation insurance upon request.

10. [Reserved]

11. LIQUIDATED DAMAGES: This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy. Vendor shall pay liquidated damages in the amount specified below or as described in the specifications:

_____ for _____

Liquidated Damages Contained in the Specifications

12. ACCEPTANCE: Vendor's signature on its bid, or on the certification and signature page, constitutes an offer to the State that cannot be unilaterally withdrawn, signifies that the product or service proposed by vendor meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise indicated, and signifies acceptance of the terms and conditions contained in the Solicitation unless otherwise indicated.

13. PRICING: The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification. Notwithstanding the foregoing, Vendor must extend any publicly advertised sale price to the State and invoice at the lower of the contract price or the publicly advertised sale price.

14. PAYMENT IN ARREARS: Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears.

15. PAYMENT METHODS: Vendor must accept payment by electronic funds transfer and P-Card. (The State of West Virginia's Purchasing Card program, administered under contract by a banking institution, processes payment for goods and services through state designated credit cards.)

16. TAXES: The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

17. ADDITIONAL FEES: Vendor is not permitted to charge additional fees or assess additional charges that were not either expressly provided for in the solicitation published by the State of West Virginia or included in the unit price or lump sum bid amount that Vendor is required by the solicitation to provide. Including such fees or charges as notes to the solicitation may result in rejection of vendor's bid. Requesting such fees or charges be paid after the contract has been awarded may result in cancellation of the contract.

18. FUNDING: This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.

19. CANCELLATION: The Purchasing Division Director reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Purchasing Division Director may also cancel any purchase or Contract upon 30 days written notice to the Vendor in accordance with West Virginia Code of State Rules § 148-1-5.2.b.

20. TIME: Time is of the essence with regard to all matters of time and performance in this Contract.

21. APPLICABLE LAW: This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.

22. COMPLIANCE WITH LAWS: Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendor acknowledges that it has reviewed, understands, and will comply with all applicable laws, regulations, and ordinances.

SUBCONTRACTOR COMPLIANCE: Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to comply with all applicable laws, regulations, and ordinances. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

23. ARBITRATION: Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

24. MODIFICATIONS: This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any change to existing contracts that adds work or changes contract cost, and were not included in the original contract, must be approved by the Purchasing Division and the Attorney General's Office (as to form) prior to the implementation of the change or commencement of work affected by the change.

25. WAIVER: The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.

26. SUBSEQUENT FORMS: The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency or Purchasing Division such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.

27. ASSIGNMENT: Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency, the Purchasing Division, the Attorney General's office (as to form only), and any other government agency or office that may be required to approve such assignments.

28. WARRANTY: The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.

29. STATE EMPLOYEES: State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.

30. PRIVACY, SECURITY, AND CONFIDENTIALITY: The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/default.html>.

31. YOUR SUBMISSION IS A PUBLIC DOCUMENT: Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of West Virginia Code §§ 5A-3-1 et seq., 5-22-1 et seq., and 5G-1-1 et seq. and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Purchasing Division constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Purchasing Division will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

32. LICENSING: In accordance with West Virginia Code of State Rules § 148-1-6.1.e, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Purchasing Division Director or the Agency to verify that the Vendor is licensed and in good standing with the above entities.

SUBCONTRACTOR COMPLIANCE: Vendor shall notify all subcontractors providing commodities or services related to this Contract that as subcontractors, they too are required to be licensed, in good standing, and up-to-date on all state and local obligations as described in this section. Obligations related to political subdivisions may include, but are not limited to, business licensing, business and occupation taxes, inspection compliance, permitting, etc. Notification under this provision must occur prior to the performance of any work under the contract by the subcontractor.

33. ANTITRUST: In submitting a bid to, signing a contract with, or accepting a Award Document from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to Vendor.

34. VENDOR CERTIFICATIONS: By signing its bid or entering into this Contract, Vendor certifies (1) that its bid or offer was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid or offer for the same material, supplies, equipment or services; (2) that its bid or offer is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this Solicitation in its entirety; understands the requirements, terms and conditions, and other information contained herein.

Vendor's signature on its bid or offer also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency. The individual signing this bid or offer on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or offer or any documents related thereto on Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

35. VENDOR RELATIONSHIP: The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, etc. and the filing of all necessary documents, forms, and returns pertinent to all of the foregoing.

Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

36. INDEMNIFICATION: The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

37. PURCHASING AFFIDAVIT: In accordance with West Virginia Code §§ 5A-3-10a and 5-22-1(i), the State is prohibited from awarding a contract to any bidder that owes a debt to the State or a political subdivision of the State, Vendors are required to sign, notarize, and submit the Purchasing Affidavit to the Purchasing Division affirming under oath that it is not in default on any monetary obligation owed to the state or a political subdivision of the state.

38. ADDITIONAL AGENCY AND LOCAL GOVERNMENT USE: This Contract may be utilized by other agencies, spending units, and political subdivisions of the State of West Virginia; county, municipal, and other local government bodies; and school districts ("Other Government Entities"), provided that both the Other Government Entity and the Vendor agree. Any extension of this Contract to the aforementioned Other Government Entities must be on the same prices, terms, and conditions as those offered and agreed to in this Contract, provided that such extension is in compliance with the applicable laws, rules, and ordinances of the Other Government Entity. A refusal to extend this Contract to the Other Government Entities shall not impact or influence the award of this Contract in any manner.

39. CONFLICT OF INTEREST: Vendor, its officers or members or employees, shall not presently have or acquire an interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

40. REPORTS: Vendor shall provide the Agency and/or the Purchasing Division with the following reports identified by a checked box below:

Such reports as the Agency and/or the Purchasing Division may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Purchasing Division via email at purchasing.requisitions@wv.gov.

41. BACKGROUND CHECK: In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry.

After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision. The State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

Revised 06/05/2019

Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

42. PREFERENCE FOR USE OF DOMESTIC STEEL PRODUCTS: Except when authorized by the Director of the Purchasing Division pursuant to W. Va. Code § 5A-3-56, no contractor may use or supply steel products for a State Contract Project other than those steel products made in the United States. A contractor who uses steel products in violation of this section may be subject to civil penalties pursuant to W. Va. Code § 5A-3-56. As used in this section:

- a. "State Contract Project" means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of and materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited on or after June 6, 2001.
- b. "Steel Products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more or such operations, from steel made by the open heath, basic oxygen, electric furnace, Bessemer or other steel making process. The Purchasing Division Director may, in writing, authorize the use of foreign steel products if:
- c. The cost for each contract item used does not exceed one tenth of one percent (.1%) of the total contract cost or two thousand five hundred dollars (\$2,500.00), whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project; or
- d. The Director of the Purchasing Division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

43. PREFERENCE FOR USE OF DOMESTIC ALUMINUM, GLASS, AND STEEL: In Accordance with W. Va. Code § 5-19-1 et seq., and W. Va. CSR § 148-10-1 et seq., for every contract or subcontract, subject to the limitations contained herein, for the construction, reconstruction, alteration, repair, improvement or maintenance of public works or for the purchase of any item of machinery or equipment to be used at sites of public works, only domestic aluminum, glass or steel products shall be supplied unless the spending officer determines, in writing, after the receipt of offers or bids, (1) that the cost of domestic aluminum, glass or steel products is unreasonable or inconsistent with the public interest of the State of West Virginia, (2) that domestic aluminum, glass or steel products are not produced in sufficient quantities to meet the contract requirements, or (3) the available domestic aluminum, glass, or steel do not meet the contract specifications. This provision only applies to public works contracts awarded in an amount more than fifty thousand dollars (\$50,000) or public works contracts that require more than ten thousand pounds of steel products.

The cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than twenty percent (20%) of the bid or offered price for foreign made aluminum, glass, or steel products. If the domestic aluminum, glass or steel products to be supplied or produced in a

“substantial labor surplus area”, as defined by the United States Department of Labor, the cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than thirty percent (30%) of the bid or offered price for foreign made aluminum, glass, or steel products. This preference shall be applied to an item of machinery or equipment, as indicated above, when the item is a single unit of equipment or machinery manufactured primarily of aluminum, glass or steel, is part of a public works contract and has the sole purpose or of being a permanent part of a single public works project. This provision does not apply to equipment or machinery purchased by a spending unit for use by that spending unit and not as part of a single public works project.

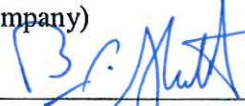
All bids and offers including domestic aluminum, glass or steel products that exceed bid or offer prices including foreign aluminum, glass or steel products after application of the preferences provided in this provision may be reduced to a price equal to or lower than the lowest bid or offer price for foreign aluminum, glass or steel products plus the applicable preference. If the reduced bid or offer prices are made in writing and supersede the prior bid or offer prices, all bids or offers, including the reduced bid or offer prices, will be reevaluated in accordance with this rule.

44. INTERESTED PARTY SUPPLEMENTAL DISCLOSURE: W. Va. Code § 6D-1-2 requires that for contracts with an actual or estimated value of at least \$1 million, the vendor must submit to the Agency a supplemental disclosure of interested parties reflecting any new or differing interested parties to the contract, which were not included in the original pre-award interested party disclosure, within 30 days following the completion or termination of the contract. A copy of that form is included with this solicitation or can be obtained from the WV Ethics Commission. This requirement does not apply to publicly traded companies listed on a national or international stock exchange. A more detailed definition of interested parties can be obtained from the form referenced above.

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

BRIAN P. STRUBLE VP : GM
(Name, Title)
BRIAN P. STRUBLE
(Printed Name and Title)
PO Box 1134 Princeton WV 24740
(Address)
P. 304-425-8955 / 304-425-1171
(Phone Number) / (Fax Number)
BSTRUBLE@EASTERNVAULT.NET
(email address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

EASTERN VAULT CO. INC.
(Company)
 BRIAN P. STRUBLE VP : GM
(Authorized Signature) (Representative Name, Title)
BRIAN P. STRUBLE VP : GM
(Printed Name and Title of Authorized Representative)
8-16-19
(Date)
304-425-8955 / 304-425-1171
(Phone Number) (Fax Number)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: CRFQ DOT200000016

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

- | | |
|---|--|
| <input type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

EASTERN VAULT Co., INC.
Company
BRIAN P. STRUBE
Authorized Signature
8-16-19
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

**REQUEST FOR QUOTATION
CRFQ DOT2000000016
Prestressed Concrete Box Beams Brushy Fork Bridge S353-3-5.68 (03200029)**

SPECIFICATIONS

- 1. PURPOSE AND SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of West Virginia Division of Highways District 3 Bridge Department to establish a contract for the one-time purchase of Pre-stressed Concrete Box Beams and accessories for Brushy Fork Bridge Project No. S353-3-5.68.

- 2. DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions.
 - 2.1 “Contract Item”** means Pre-stressed Concrete Box Beams and accessories as more fully described by these specifications.

 - 2.2 “Pricing Page”** means the pages, contained in wvOASIS or attached as Exhibit A, upon which Vendor should list its proposed price for the Contract Items.

 - 2.3 “Solicitation”** means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.

- 3. GENERAL REQUIREMENTS:**
 - 3.1 Mandatory Contract Item Requirements:** Contract Item must meet or exceed the mandatory requirements listed below.
 - 3.1.1 Contract Item #1 – Exterior Beams**
 - 3.1.1.1** Exterior Beams must be 17” deep by 36” wide by 41’-6” overall length. (40’-0” c-c bearing anchor bolt holes). The beams shall be skewed 15° right forward.

 - 3.1.2 Contract Item #2 – Interior Beams**
 - 3.1.2.1** Interior Beams must be 17” deep by 36” wide by 41’-6” overall length. (40’-0” c-c bearing anchor bolt holes). The beams shall be skewed 15° right forward.

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3.1.3 Contract Item #3 – Type B1 Elastomeric Bearing Pads

3.1.3.1 Type B1 Elastomeric Laminated Bearing Pads must be 1-13/16” thick by 4-3/4” wide by 28” length.

3.1.3.2 Must be 60 Duro Hardness.

3.1.4 Contract Item #4 – Type B2 Elastomeric Bearing Pads

3.1.4.1 Type B2 Elastomeric Laminated Bearing Pads must be 1-13/16” thick by 4-3/4” wide by 15-1/2” length.

3.1.4.2 Must be 60 Duro Hardness.

3.1.5 Contract Item #5 – Swedged Anchor Bolts

3.1.5.1 Swedged Anchor Bolt or No. 8 Deformed Reinforcing Bar (Grade 60) galvanized.

3.1.5.2 Must be 1” diameter by 2’-0” length.

3.1.6 Contract Item #6 – Preformed Joint Filler for Bearings

3.1.6.1 Preformed Joint Filler for use around the bearing pads must be 2-1/8” thick.

3.1.6.2 The dimensions of Joint Filler to be placed behind the bearing pads shall be 22.2’ long by 6-3/8” wide at each abutment yielding 11.8 sf/abutment for a total of 24 sf of Joint Filler.

3.1.6.3 The dimensions of Joint Filler to be placed between the bearing pads shall be 5.4’ long by 4-3/4” wide at each abutment yielding 2.2 sf/abutment for a total of 5 sf of Joint Filler.

3.1.7 Contract Item #7 – Preformed Joint Filler for Beam Ends

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3.1.7.1 Preformed Joint Filler for use at the beam ends must be 1" thick.

3.1.7.2 The dimensions of Joint Filler for beam ends shall be 22.2' long by 17" wide at each abutment yielding 31.5 sf/abutment for a total of 63 sf of Joint Filler.

3.1.8 Contract Item #8 – Guardrail Assembly

3.1.8.1 Guardrail Assembly must be provided as shown in the plans (Attachment 1) and must include all necessary studs, nuts and washers.

3.1.9 Contract Item #9 – Post Tensioning Bars

3.1.9.1 Post Tensioning Bars must be 1" diameter. 4 Bars @ 24'-4½" are required for a total length of 97.5'.

3.1.9.2 Post Tensioning Bars must be threaded and supplied with 10 hex nuts and other hardware as required in the plans.

3.1.10 Contract Item #10 – 1" Bearing Plates

3.1.10.1 Bearing Plates for exterior beams must be 9"x 9" x 1" thick.

3.1.11 Contract Item #11 – Bridge Guardrail Posts

3.1.11.1 Bridge Guardrail Posts must be designed for a minimum TL-2 crash testing criteria.

3.1.12 Contract Item #12 – Bridge Guardrail

3.1.12.1 Bridge Guardrail must be designed for a minimum TL-2 crash testing criteria.

3.1.13 Contract Item #13 – Grout Stop

3.1.13.1 Grout Stop must be 1" thick sponge rubber or 1" backer rod.

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3.1.14 Contract Item #14 – Washers

3.1.14.1 Washers must be 8"x8" squares of 1" thick sponge rubber with a 3-1/2" diameter hole in the center.

3.2 Mandatory Requirements: Vendor must meet or exceed the mandatory requirements as shown below:

3.2.1 All Pre-stressed Concrete Box Shaped Beams shall be manufactured in accordance with the attached plans (Attachment #1) for State Project No. S353-3-5.68.

3.2.2 Prior to delivery, all Beams, Accessories and Optional Items shall be inspected for acceptance in accordance with Section 603 of the Division of Highways Standard Specifications Roads and Bridges adopted 2017 and as modified by any Supplemental Specification and attached hereto as Exhibit B.

3.2.3 Cracks developing in a beam may be cause for rejection of the beam. Cracks that are not detrimental to the structural integrity of the beam, as determined by Division of Highways, may be accepted under the following conditions:

3.2.3.1 Cracks of 0.004 inch or less shall be treated with a coat of a Division of Highways approved sealer.

3.2.3.2 Cracks of more than 0.004 inch shall be treated with a second coat of a Division of Highways approved sealer or epoxy injected.

3.2.3.3 A list of West Virginia Division of Highways approved concrete sealers may be found at:

www.transportation.wv.gov/highways/mcst/Pages/707.12concseal.aspx.

All concrete sealer and epoxy injection required for acceptance shall be performed at no additional cost to the Division of Highways.

4. CONTRACT AWARD:

**REQUEST FOR QUOTATION
CRFQ DOT200000016**

Prestressed Concrete Box Beams Brushy Fork Bridge S353-3-5.68 (03200029)

4.1 Contract Award: The Contract is intended to provide Agencies with a purchase price for the Contract Items. The Contract shall be awarded to the Vendor that provides the Contract Items meeting the required specifications for the lowest overall total cost as shown on the Pricing Pages.

4.2 Pricing Page: Vendor should complete the Pricing Page in full as failure to complete the Pricing Page in its entirety may result in Vendor's bid being disqualified.

Vendor should type or electronically enter the information into the Pricing Page to prevent errors in the evaluation.

5. PAYMENT:

5.1 Payment: Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia.

6. DELIVERY AND RETURN:

6.1 Shipment and Delivery: Vendor shall deliver the Contract Items in accordance with the following procedure after receiving a purchase order or notice to proceed. Contract Items must be delivered to Agency at the project site.

Upon receipt of a State Purchase Order the Vendor shall submit shop drawings to the District Three Bridge Engineer within twenty (20) calendar days. Shop drawings must be approved by the Division of Highways prior to the manufacture of any beam sections.

All beam sections and accessories shall be available for delivery to the specified delivery site within sixty (60) calendar days after the Vendor's receipt of approved shop drawings. Should the vendor fail to have the beams available within the 60 day requirement, the vendor may be subject to a penalty of \$100.00 per day (Saturdays and Sundays excluded). However, this penalty may be waived by the Engineer subject to written approval of Vendor's request.

The Division of Highways requires that all of the beam sections and accessories be delivered on the same date. Should the Vendor fail to meet the same day delivery requirement, the vendor shall be assessed a penalty of \$2,000.00 per day (Saturdays and Sundays excluded) up to a maximum of \$10,000.

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Prior to delivery, all Beams, Accessories and Optional Items shall be inspected for acceptance in accordance with Section 603 of the Division of Highways Standard Specifications Roads and Bridges adopted 2017 and as modified by any Supplemental Specification.

- 6.2 Late Delivery:** The Agency placing the order under this Contract must be notified in writing if the shipment of the Contract Items will be delayed for any reason. Any delay in delivery that could cause harm to an Agency will be grounds for cancellation of the Contract, and/or obtaining the Contract Items from a third party.

Any Agency seeking to obtain the Contract Items from a third party under this provision must first obtain approval of the Purchasing Division.

- 6.3 Delivery Payment/Risk of Loss:** Vendor shall deliver the Contract Items F.O.B. destination to the Agency's location.
- 6.4 Return of Unacceptable Items:** If the Agency deems the Contract Items to be unacceptable, the Contract Items shall be returned to Vendor at Vendor's expense and with no restocking charge. Vendor shall either make arrangements for the return within five (5) days of being notified that items are unacceptable, or permit the Agency to arrange for the return and reimburse Agency for delivery expenses. If the original packaging cannot be utilized for the return, Vendor will supply the Agency with appropriate return packaging upon request. All returns of unacceptable items shall be F.O.B. the Agency's location. The returned product shall either be replaced, or the Agency shall receive a full credit or refund for the purchase price, at the Agency's discretion.
- 6.5 Return Due to Agency Error:** Items ordered in error by the Agency will be returned for credit within 30 days of receipt, F.O.B. Vendor's location. Vendor shall not charge a restocking fee if returned products are in a resalable condition. Items shall be deemed to be in a resalable condition if they are unused and in the original packaging. Any restocking fee for items not in a resalable condition shall be the lower of the Vendor's customary restocking fee or 5% of the total invoiced value of the returned items.

7 VENDOR DEFAULT:

- 7.1** The following shall be considered a vendor default under this Contract.

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- 7.1.1 Failure to provide Contract Items in accordance with the requirements contained herein.
 - 7.1.2 Failure to comply with other specifications and requirements contained herein.
 - 7.1.3 Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.
 - 7.1.4 Failure to remedy deficient performance upon request.
- 7.2 The following remedies shall be available to Agency upon default.
- 7.2.1 Immediate cancellation of the Contract.
 - 7.2.2 Immediate cancellation of one or more release orders issued under this Contract.
 - 7.2.3 Any other remedies available in law or equity.

EXHIBIT B
SECTION 603
PRESTRESSED CONCRETE MEMBERS

603.1-DESCRIPTION:

This work consists of the construction of precast/prestressed concrete members, pretensioned in accordance with these specifications and in conformity with the plan details and notes. This work shall include manufacturing, inspection, handling, storing, transporting and erecting of structural members of precast/prestressed concrete, and, when specified, shall also include precast concrete members which do not contain pretensioning steel components.

Concrete floors, curbs, parapets, curtain walls, and diaphragms shall be cast in place on the project unless otherwise provided for on the plans. When the above elements are specified as precast members, they shall be manufactured in accordance with this specification.

603.2-MATERIALS:

Materials shall meet the requirements specified in the following Sections/Subsections:

Precast/Prestressed Concrete Materials	Sections/Subsections
+Admixtures:	
Air Entraining Admixtures	707.1
Retarding Admixtures	707.2
Water Reducing Admixtures	707.3
**Pozzolonic Additives	707.4
Specific Performance Admixtures	707.17
Cement	ASTM C150, 701.3
Coarse Aggregates*	703.1, 703.2, & 703.3
Concrete Sealant	707.12
Elastomeric Bearing Pads	715.14
Fine Aggregates #	702.1
Hot-Poured Elastic Type Concrete Joint Sealer	708.3
Mixing Water	715.7
Preformed Expansion Joint Filler	708.1
Prestressing Steel	709.2
Reinforcing Steel	709.1
Shear-Key Grout	715.5
Steel Bolts and Nuts	709.23
Welded Wire Fabric	709.4

- # When the top surface of a prestressed member is designed as the bridge wearing surface
- * The maximum size of coarse aggregate shall not exceed the minimum horizontal or vertical clear spacing between pretensioned or reinforcing steel elements divided by 1.33. Lightweight aggregates shall not be used unless their use is permitted by the Engineer in writing.
For Class S-P concrete, a blend of two AASHTO gradations of coarse aggregates can be used. The maximum aggregate size permitted is ¾ inches (19 mm). A coarse aggregate gradation using a #67 aggregate is allowed only if 100% of the material passes the ¾ inch (19 mm) sieve
- ** The use of a pozzolanic additive is not permitted when a blended hydraulic cement is used. For Class S-P concrete, a combination of up to two pozzolanic additives is permitted, as shown in Table 603.6.3.1. The maximum percent of total cementitious materials permitted in Class S-P concrete mix designs is shown in Table 603.6.3.1.
- + Calcium chloride or any admixture containing chloride ion in excess of 0.1 percent by weight shall not be used in prestressed concrete members.

603.2.1-Inspection and Testing: A representative of the Engineer shall have free entry at all times, while the work on the Contract is being performed, to all parts of the manufacturer's works which concern the manufacture of the materials ordered. The manufacturer shall afford the representative of the Engineer, without charge, all reasonable facilities to satisfy themselves that the material is being furnished in accordance with these specifications.

603.3-PLANT REQUIREMENTS AND APPROVAL:

603.3.1-Plant Approval: All fabricators of prestressed concrete members shall be certified in the appropriate Group and Category in accordance with the Precast/Prestressed Concrete Institute (PCI) Plant Certification Program. Fabricators shall be certified in Group B3 or B4 for manufacture of prestressed straight strand bridge members. For prestressed draped strand bridge members, the fabricator shall be certified in Group B4. The Engineer or his authorized representative shall approve all plants manufacturing prestressed and precast reinforced concrete bridge members before manufacture of the members may be started. Requests for such approvals shall be submitted to the Engineer at least three weeks prior to the date of manufacture of the members. Requests shall include details of the plant facilities, materials, and the production methods the manufacturer intends to use.

The manufacturer shall have an established quality control program in effective operation at the plant. This program shall be submitted to the Engineer for approval at least 30 days prior to the start of the production.

If a contractor/fabricator is found to consistently deviate from PCI guidelines, the contractor/fabricator will be required to use independent laboratory quality control testing and inspection until it can be shown that conformity with PCI guidelines has been reestablished. The laboratory used is subject to the approval by the Engineer. The cost of the independent laboratory is to be borne by the contractor/fabricator.

603.3.2-Supervision: The contractor/fabricator shall provide a PCI Level II certified technician, skilled in the use of the system of prestressing to be used, who shall supervise the work and give the Engineer or his representative such assistance as may be considered necessary.

603.3.3-Equipment and Tools:

603.3.3.1-General: All equipment, tools and machinery used in the work shall be adequate for the purpose for which it is to be used and shall be maintained in a satisfactory working condition. The use of portable pretensioning beds for the manufacture of prestressed concrete members is not acceptable.

The contractor/fabricator shall provide all other equipment and tools necessary for the construction and the prestressing.

603.3.3.2-Equipment: The jacks shall be equipped with instruments for monitoring the hydraulic pressure. Electronic pressure transducers with digital indicators may be used. All pressure gauges or electronic pressure indicators shall indicate the load directly to one (1) percent of the maximum gauge or sensor/indicator capacity or (2) two percent of the maximum load applied, whichever is smaller.

Each jack and its gauge shall be calibrated as a unit with the cylinder extension in the approximate position that it will be at final jacking force. The calibration of the jack and

gauge shall be done while the jack is in the identical configuration as will be used on the site, e.g., same length hydraulic lines. An independent laboratory shall furnish certified calibration charts with each jack and gauge used in the work. Certified calibration of each ram shall be made prior to the start of stressing operations and every six (6) months thereafter, or as requested by the Engineer. Any repair of the rams, such as replacing seals, changing length of hydraulic lines, changing type of pump or using gauges which have not been calibrated with the ram, shall be cause for recalibration of the jack and gauge with a load cell. No extra compensation will be allowed for the initial or subsequent ram calibrations.

603.3.3.3-Forms and Casting Beds: Forms and casting beds shall be subject to the approval of the Engineer. Unless otherwise approved, only metal forms on concrete founded casting beds shall be used. The forms and casting beds shall be well constructed, carefully aligned, substantial and firm, securely braced and fastened together, sufficiently tight to prevent leakage of mortar and strong enough to withstand the action of mechanical vibrators. The forms shall be constructed to permit movement of the members without damage during release of the prestressing force or movement caused by thermal expansion during curing. The casting beds and all form work will be approved before any concrete is placed, but such approval shall not relieve the contractor/fabricator of responsibility for the results obtained.

603.4-WORKING DRAWINGS:

603.4.1-General: The contractor/fabricator shall expressly understand that the Engineer's approval of the working drawings submitted by the contractor/fabricator covers the requirements for "strength and detail," and that the Engineer assumes no responsibility for errors in dimensions.

Working drawings must be approved prior to performance of the work involved and such approval shall not relieve the contractor/fabricator of any responsibility under the contract for the successful completion of the work.

All working drawings shall be in English units. Use of dual (metric and English) units is not allowed.

603.4.2-Shop Drawings: The contractor/fabricator shall submit copies of the detailed shop drawings to the Engineer for approval. Shop drawings shall be submitted sufficiently in advance of the start of the work to allow time for review by the Engineer and corrections by the contractor/fabricator without delaying the work. The size of the original drawings shall be 22 inches x 34 inches (559 mm x 864 mm) including margins, unless otherwise permitted. The shop drawings submitted for approval may be reduced.

Shop drawings for concrete structures shall give full detailed dimensions and sizes of component parts of the structure and details of all miscellaneous parts. Design camber for all members shall be shown on the shop drawings.

603.4.3-Erection Drawings: The contractor shall submit drawings illustrating fully their proposed method of erection. The drawings shall show details of all falsework bents, bracing, guys, dead-men, lifting devices, and attachments to the bridge members: sequence of erection, location of cranes and barges, crane capacities, location of lifting points on the bridge

members, and weights of the members. The plan and drawings shall be complete in detail for all anticipated phases and conditions during erection. Design calculations, sealed by a Registered Professional Engineer, shall be submitted by the contractor/fabricator to the Engineer for approval which will demonstrate that allowable stresses for falsework and concrete members being erected are not exceeded and that member capacities and final geometry shall be correct.

When the designated concrete deck overhang exceeds 30 inches (760 mm) , the erection drawings submitted by the contractor/fabricator shall include complete details of the forming and bracing for the overhang and shall transmit the concrete deck dead load to an area of the beam or stringer which will prevent distortion. All forming and bracing procedures are subject to approval of the Engineer.

603.5-REINFORCEMENT:

All reinforcing bars and welded wire fabric shall meet all requirements of Section 602 and shall be free of frost, loose rust, grease, dirt, oil, paint, mill scale, corrosion or other deleterious substances. Any steel which cannot be satisfactorily cleaned shall not be used.

When splicing is required, all reinforcing bars shall be lapped for a length of at least 30 bar diameters.

Reinforcing bars, welded wire fabric and other embedded fixtures shall be accurately placed as indicated on the Plans and shall be maintained in their correct position during the manufacture of the unit. Reinforcement shall not be held in position by tack welding.

The minimum concrete cover for reinforcing steel shall be as follows, unless otherwise shown on the Plans:

Main Reinforcement	1½ inches (40 mm)
Slab Reinforcement, top of slab	1½ inches (40 mm)
Slab Reinforcement, bottom of slab	1 inch (25 mm)
Stirrups and Ties.....	1 inch (25 mm)

The longitudinal or main wires of welded wire fabric shall be placed transverse to the longitudinal axis of the unit. Laps of welded wire fabric shall be a minimum of 6 inches (150 mm) unless otherwise approved by the Engineer.

603.6-CONCRETE:

603.6.1-General: The composition, proportioning, and mixing of concrete shall be such so as to produce a homogeneous concrete mixture of a quality that will conform to the test and design requirements specified and as noted on the Plans. Concrete for all prestressed members shall have a minimum compressive strength as may be specified on the plans or in the special provisions. Materials used to form voids in the members shall be fabricated from form material acceptable to the Engineer or from cardboard, which has been treated with a waterproofing agent. Any void made from more than one piece of material shall be glued and banded to prevent separation during concreting operations. Any evidence of separation will be cause for rejection. All concrete materials including admixtures shall meet requirements specified in subsection 603.2 and/or as indicated in the plans.

603.6.1.1-Class S-P Concrete: Class S-P concrete shall be self-consolidating concrete for precast/prestressed applications and may be used for the fabrication of prestressed

concrete box beams. If Class S-P concrete is to be used in the fabrication of prestressed concrete I-Beams or Bulb Tee Beams, additional testing, as outlined in Section 603.6.1.1.1, shall be required. Class S-P concrete shall meet the requirements of this Section.

Class S-P concrete shall consist of a homogeneous, flowable mixture of cement, fine aggregate, coarse aggregate, chemical admixtures and water. Class S-P concrete may also contain fly ash, ground granulated blast furnace slag, and silica fume. The mixture proportions shall be such that the Class S-P concrete will resist segregation, bleeding, and the generation of foam during placement, and will need no external compaction or vibration, unless the mix is qualified as outlined in Section 603.6.1.1.1. While the properties of fresh SCC differ significantly from that of conventional fresh concrete, the quality in terms of strength, durability, and performance of the hardened SCC shall be equal to or better than that of a similar specified conventional concrete mix. Establishment of the mixture proportions shall be coordinated with the manufacturer of the admixtures which will be used in the Class S-P concrete.

SCC exhibits self-leveling capabilities. Creating a successful SCC mix requires combining ingredients to achieve a highly-flowable product that also has the capability to resist dynamic segregation and foaming during placement while resisting static segregation and bleeding once in place. SCC mix designs are often achieved using high-range water reducing (HRWR) admixtures, and by carefully selecting a proper aggregate gradation, incorporating high volumes of powder in the mix, through the use of viscosity-modifying admixtures (VMAs), or a combination of the previously mentioned.

For Class S-P concrete, a combination of admixtures which may be used includes water-reducing admixtures, air-entraining agents, water-reducing and retarding admixtures, VMAs, shrinkage-reducing admixtures (SRAs), and other specific performance admixtures, provided they are on the WVDOH approved list of admixtures. These admixtures used shall all come from the same manufacturer, and measures should be taken to ensure that no adverse reactions occur. Also, for Class S-P concrete, it is permitted to use a combination of up to two AASHTO gradations of coarse aggregate to obtain an optimal combination of strength, self-consolidating ability, and passing ability. Likewise, a combination of up to two pozzolanic additives may be used in combination with Portland cement for Class S-P concrete in order to achieve ideal characteristics for the mix.

603.6.1.1.1-Pre-Qualification of Class S-P Concrete Construction Methods: If Class S-P is to be used in the fabrication of prestressed concrete I-Beams or Bulb Tee Beams, or if vibration is to be used during fabrication, the Class S-P concrete mix and proposed method of construction must be pre-qualified prior to fabrication.

A full-size test member, at least 10 feet (3 m) in length shall be constructed with the Class S-P concrete mix which will be used during fabrication. The full-size test member shall represent the "worst-case" member which the Fabricator shall be allowed to fabricate, using Class S-P concrete. This "worst-case" member shall consist of the tallest I-beam or Bulb Tee shape and shall contain the maximum amount of prestressing strand and reinforcing steel which would be encountered in such a member. The type and maximum duration of vibration, which will be used during fabrication, shall also be used during construction of this test member. All other aspects of construction of this test member, including the free fall height of concrete above the beam, shall be identical to those which will be used during fabrication of members during production.

After the completion of curing of this test member, three 4-inch (100 mm) diameter cores shall be taken from the member at mid-length. One core shall be taken from the top flange of the member, one core shall be taken from the web of the member at mid-height, and one core shall be taken from the bottom flange or bulb of the member. A point count, in accordance with MP 700.03.50 or other equivalent test method approved by the Engineer, shall be performed on each of these cores in order to determine if segregation is occurring due to the vibration.

If the results of the point counts show that the percentages of coarse aggregate, fine aggregate, air content, and paste vary by more than 15% between any of these three cores, that type of member shall not be permitted to be constructed with Class S-P concrete.

If, at some time after the above mentioned "worst-case" test member is fabricated and tested, the Fabricator needs to fabricate a member larger than this "worst-case" member (which would now be a new "worst-case" member), the Engineer shall determine, based on the test results from the previous "worst-case" member, whether or not the testing required in this section will again be required for this new "worst-case" member. If the test results from the previous "worst-case" member are within an acceptable margin below the allowable test criteria, and if the new "worst-case" member is not significantly larger than the previous "worst-case" member, then the Engineer may allow this new "worst-case" member to be constructed with Class S-P concrete without additional pre-qualification testing required in this section.

603.6.2-Mix Design: Concrete mixtures must be established initially by methods in accordance with ACI 318, Chapter 5. Class S-P concrete mixtures shall be developed in accordance with MP 711.03.23 and the requirements of this Section, not the ACI methods. Mixes may be designed either by a commercial laboratory or by PCI certified concrete plant personnel. Prior to adoption of a mix design as a plant standard, it shall be field tested by use of the production plant batching and mixing equipment, construction methods, and curing to be used in production of the members. The use of a previous mix design can be approved for a project if sufficient test data (30 or more tests) are available from the past year for evaluation (ACI 301, Chapter 3, method).

All design mixes shall be developed using the type of cement, the type and gradation of aggregates, and admixtures proposed for use in plant mixes. The mix design shall also include either compressive strength tests or a penetration resistance test (in accordance with ASTM C 403) that verify the amount of time it takes to achieve a compressive strength of 500 psi (3.5 Mpa). The Engineer shall approve the mix design. When any of these variables are changed, or after a three-year time period, the mix shall be re-evaluated and submitted to the Engineer for approval.

603.6.2.1-Class S-P Concrete Mix Design Testing: To ensure repeatability of production, two batches of concrete with the same mix proportions shall be created for mix qualification testing. The results of this testing shall be submitted to the Division for approval at least 45 days prior to the use of the mix in construction.

The two trial batches at the target cement factor plus one bag (see Section 3.3 of MP 711.03.23), are not required for Class S-P concrete mixes.

Batching equipment and curing procedures for test specimens fabricated from these test batches should be as close as possible to the techniques that will be used by the Fabricator

during production. The minimum batch size for these trial batches shall be 2.0 yd³ (1.53 m³), or the largest possible batch when using the mixer that will be used for production, if approved by the Division.

The fresh properties measured at the proposed time of casting for each trial batch shall include air content, consistency, Visual Stability Index (VSI), T₅₀, J-Ring Value, Unit Weight, Yield, Rapid Assessment of Static Segregation Resistance, and Segregation Resistance. Target values and their tolerances for the fresh properties of the trial batches shall conform to the requirements in the following table:

TABLE 603.6.2.1A

Fresh Property	Mix Design Batch Acceptance Criteria
Air Content	***Target minus 0.5% ≤ Air Content ≤ ***Target plus 1.5%
Slump Flow (ASTM C1611)	Target ≤ Spread ≤ Target plus 1.5 inches (38 mm) 2 seconds ≤ T ₅₀ ≤ 7 seconds Visual Stability Index ≤ 1.0
Passing Ability (ASTM C1621)	J-Ring Value ≤ 1 inch (25 mm)
Rapid Assessment of Static Segregation Resistance (ASTM C1712)	Penetration Depth (PD) ≤ 0.5 inch (13 mm)
Segregations Resistance (ASTM C1610)	Segregation ≤ 12%
Unit Weight and Yield	± 2% of Theoretical

*** The target air content of Class S-P concrete shall be determined in accordance with Table 603.6.2.1B

TABLE 603.6.2.1B

Nominal Maximum Aggregate Size in the Class S-P Mix	Target Air Content of Class S-P Concrete
3/8 inch (9.5 mm)	7.5%
1/2 inch (12.5 mm)	7.0%
3/4 inch (19 mm)	6.0%

After the properties of the trial batches of fresh concrete have been established to be within the specification limits in Table 603.6.2.1A, specimens will be cast for compressive strength, modulus of elasticity, creep, length change (total shrinkage), rapid chloride permeability and freeze-thaw testing. Casting of all Class S-P specimens to be used for hardened property testing shall be done in one lift without rodding. Compressive strength testing shall be conducted on both trial batches, but modulus of elasticity, creep, length change (total shrinkage), rapid chloride permeability and freeze-thaw testing is only required on one of the trial batches.

If steam curing is to be used during the production, the same curing procedure (time, temperature, etc.) shall be used on all of the above test specimens except for the shrinkage specimens. After discontinuation of steam curing, all specimens shall be cured as noted in the footnotes in the table below.

Target values and their tolerances for the hardened properties of the trial batches shall conform to the requirements in Table 603.6.2.1C:

TABLE 603.6.2.1C

Hardened Property Test	Total # Specimens	Specimen Size	Age at Testing	Magnitude of Loading	Approval Condition
Compressive Strength (AASHTO T22)	7	4"x8" (100x200 mm) or 6"x12" (150 x 300 mm) cylinders	1 @ 24 ± 2 hrs. 1 @ 3days ± 2 hrs. 1 @ 7days ± 2 hrs. 1 @ 14days ± 2 hrs. 3 @ 28days ± 4 hrs.	Load Until Failure	per Design
Modulus of Elasticity ^b (ASTM C469)	7	6"x12" (150 x 300 mm) cylinders	1 @ 3days ± 2 hrs. 1 @ 7days ± 2 hrs. 1 @ 14days ± 2 hrs. 3 @ 28days ± 4 hrs.	40% of compressive strength (obtained above)	$\geq 57,000\sqrt{f'_c}$ ^a
Creep ^b (ASTM C512)	8 total (3 loaded, 3 remain unloaded, 2 tested for compressive strength)	6"x12" (150 x 300 mm) cylinders	72 ± 2 hours at age of initial loading	40% of compressive strength at time of loading	Creep Coefficient ^c ≤ 1.19 at 90 days ^a
Length Change (ASTM C157)	3	3"x3"x11" (75 x 75 x 275 mm) prisms	56 days	28-day cure per ASTM C157 then Air Storage for 28-days	≤ 0.0002 at 28 days of Air Storage ^a
Rapid Chloride ^b Permeability (AASHTO T277)	3	4"x2" (100 x 50 mm) disc specimen	56 days or 28 days	60.0 ± 0.1 V	≤ 1500 coulombs (56 days) or ≤ 2000 coulombs (28 days)
Freeze-Thaw Resistance (ASTM C666-Procedure A) ^b	3	3"x4"x16" (75 x 100 x 400 mm) prisms	28 day cure prior to testing	300 cycles (0°F to 40°F)	Durability Factor ≥ 80

- a. If the values obtained from testing the Class S-P mix do not meet the specified values in Table 603.6.2.1C, then the Fabricator's Engineer may submit calculations for prestress losses, camber, and long term deflections to the Division for review in accordance with Section 105.2.1.1, the Division Approval Method for shop drawings. If the Fabricator's calculations show that the values exceeding the specified values in Table 603.6.2.1C will not adversely affect the prestress losses, camber, and long term deflections, and the Division approves these calculations, then the Class S-P mix in question may be used to fabricate prestressed bridge members.
- b. After the discontinuation of steam curing, test specimens shall be removed from the molds within 23.5 ± 0.5 hours and moist cured in the laboratory at a temperature between 73.5 ± 3.5 °F (23.0 ± 2.0 °C) until the time of test. Freeze-Thaw Resistance testing shall begin when the specimens are at an age of 28 days.
- c. The Creep Coefficient shall be defined as the Creep Strain at 90 days divided by the Initial Elastic Strain at the Time of Initial Loading. The Initial Elastic Strain shall be determined within 2 minutes after the application of the initial load.

In addition to the hardened property tests above, at least one trial batch shall be subjected to the prestressing strand bond strength testing as outlined in MP 603.06.20. The Class S-P mix in question must pass this test.

Although a concrete mix may meet the necessary strength requirements and exhibit acceptable fresh properties at the time of initial testing, the Engineer can require a re-design of the mix based on other criteria, such as insufficient retention of the slump flow for the mix, excessive foam buildup, etc. The slump flow of the mix must be retained, within the limits specified in Table 603.6.4.1, throughout the duration of the concrete placement. The submittal for a proposed mix design shall include completed copies of Attachments 1S-P, 2S-P and 3S-P of MP 711.03.23. All pertinent information supporting these attachments and pertaining to the information in them should also be submitted.

603.6.3-Propportioning of Normal (Non-SCC) Concrete: Materials shall be proportioned by weight, unless otherwise authorized by the Engineer. The concrete shall contain the minimum water-to-cementitious materials (w/c) ratio required to obtain satisfactory workability and the specified minimum strength, but in no case shall this (w/c) ratio exceed 0.44, including the free water in the aggregate and/or admixtures. The minimum cement factor shall be 658 lbs. per cubic yard (390 kg per cubic meter). Concrete for all members shall be air-entrained with a target air content of seven percent. A working tolerance of plus or minus two percentage points will be allowed. When the ambient temperature is 90 °F (32°C) or higher, a mix using a retarding admixture shall be used. Slump shall not exceed 8 inches (200 mm) with the use of high range water reducers.

603.6.3.1-Propportioning of Class S-P Concrete: The water-to-cementitious materials (w/c) ratio for Class S-P concrete shall fall within a range of 0.32 to 0.40. A water-to-cementitious materials (w/c) ratio less than 0.32 may be used if approved by the Engineer. The minimum cementitious material factor for Class S-P concrete shall be 658 lbs. per cubic yard (390 kg per cubic meter). Unless otherwise approved by the Engineer, the maximum cementitious material factor for Class S-P concrete shall be 799 lbs. per cubic yard (474 kg per cubic meter).

Concrete for members cast with Class S-P concrete shall be air-entrained with a target air content as shown in Table 603.6.2.1B. A working tolerance of plus or minus 1.5 percentage points will be allowed during fabrication. Material proportions should be selected to ensure an optimal combination of fresh and hardened properties.

A standard Class S-P concrete shall be designed to have a slump flow of 25 ± 2 inches (635 \pm 50 mm) in diameter. This 25 inch (635 mm) slump flow diameter will be referred to as the target value for mix qualification and site approval. The contractor may request that the Engineer approve a different target slump, which must be less than 25 inches (635 mm). If approved, this requested value will be used as the target value for mix qualification and the approval of batches during production.

TABLE 603.6.3.1

Cementitious Materials	Maximum Percent of Total Cementitious Materials in Class S-P Concrete by Mass
Class F Fly Ash	25
Ground Granulated Blast Furnace Slag	50
Microsilica	10
Total of Class F Fly Ash and Silica Fume	35
Total of Ground Granulated Blast Furnace Slag and Silica Fume	50

NOTE:

Class F Fly Ash shall constitute no more than 25 percent of the total weight of cementitious materials. Microsilica shall constitute no more than 10 percent of the total weight of cementitious materials.

603.6.4-Sampling and Test Methods:

Sampling Freshly Mixed Concrete	AASHTO T 141
Slump of Hydraulic-Cement Concrete	AASHTO T 119
Unit Weight and Yield of Concrete	AASHTO T 121
Air Content of Freshly Mixed Concrete	AASHTO T 152 or AASHTO T 196
Making and Curing Concrete Test Specimens in the Field	AASHTO T 23
Compressive Strength of Cylindrical Concrete Specimens	AASHTO T 22
Temperature of Concrete	ASTM C 1064
Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression	ASTM C469
Fabricating Test Specimens with Self-Consolidating Concrete	ASTM C 1758
Slump-Flow of Self-Consolidating Concrete	ASTM C 1611
Passing Ability of Self-Consolidating Concrete using J-Ring	ASTM C 1621
Rapid Assessment of Static Segregation Resistance of Self-Consolidating Concrete Using Penetration Test	ASTM C 1712
Static Segregation of Self-Consolidating Concrete using Column Technique	ASTM C 1610
Standard Method of Test for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration	AASHTO T 277
Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing	ASTM C 666
Standard Test Method for Creep of Concrete in Compression	ASTM C 512
Length Change (Drying Shrinkage) of Hardened Concrete	ASTM C 157
Standard Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete	ASTM C457
Standard Method of Microscopical Determination of Air-Void Content	MP 700.03,50

Cylinders shall be manipulated and cured by methods identical to those used in curing the concrete members.

Slump, Temperature, and Air Content tests shall be conducted on the first batch of concrete each day and every time that cylinders are fabricated. Slump, Temperature, and

Air Content tests shall also be conducted whenever Quality Control Personnel or the Inspector see a variation in the mix.

Unit Weight and Yield tests shall be conducted on the first batch of concrete each day and thereafter, as deemed necessary by Quality Control or Quality Assurance Personnel.

The Fabricator's Quality Control Personnel shall maintain records of the beam number(s) into which each batch of concrete is placed.

603.6.4.1-Acceptance Testing of Class S-P Concrete: During production, each batch of Class S-P concrete shall be tested to determine the air content, slump-flow, passing ability using the J-Ring, rapid segregation resistance, and temperature. Unit Weight and Yield tests shall be conducted on the first batch of concrete each day and thereafter, as deemed necessary by the Quality Control or Quality Assurance Personnel. The fresh concrete properties shall meet performance criteria as shown in Table 603.6.4.1.

TABLE 603.6.4.1

Fresh Property	Production Acceptance Criteria
Air Content (ASTM C173)	Target $\pm 1.5\%$
Consistency (ASTM C1611)	Target Spread ± 2.0 inches (50 mm) 2 seconds \leq Measured $T_{50} \leq 7$ seconds Visual Stability Index ≤ 1.0
Passing Ability (ASTM C1621)	J-Ring Value ≤ 1.5 inch (38 mm)
Rapid Segregation Resistance (ASTM C1712)	Penetration Depth (PD) ≤ 0.5 inch (13 mm)
Temperature	$< 90^{\circ}\text{F}$ (32°C)
Unit Weight and Yield	$\pm 2.0\%$ of Theoretical

603.6.5-Strength of Concrete: Each strength test (i.e. strand release and 28-day) shall consist of the average strength of a minimum of two compressive strength test cylinders fabricated from a single randomly selected batch of concrete, as it is being placed in the forms.

A minimum of one set of cylinders shall be fabricated (at random) for each member cast in a form, with a maximum of one set of cylinders per batch of concrete. These cylinders, molded during fabrication, shall be the same size specimens as were used in the approved mix design.

Any member, for which the average concrete compressive strength at 28-days is less than the 28-day design compressive strength value, may be rejected at the option of the Contractor. If the Contractor elects to use such a member, it will be evaluated as to its adequacy for the use intended. Any member evaluated as unsatisfactory will be rejected by the Division, and the Contractor shall fabricate another member to replace the one which was evaluated as unsatisfactory. When the evaluation indicates that the member will be satisfactory for its intended use, the Engineer will provide for an appropriate price adjustment under the provisions of 603.14.2.1.

Whenever the compressive strength of a member at 28-days is less than the 28-day design compressive strength value, the subject member may still be accepted without a price adjustment if the compressive strength at any time prior to shipment (up to a maximum of 56-days from the date of fabrication) exceeds the 28-day design compressive strength value. The Division shall not be responsible for any project delays incurred due to the delayed strength

attainment, and time extensions under Section 108 of the Specifications are not applicable to this scenario.

603.6.6-Batching and Mixing: Concrete batching plants and their operation shall be in conformance with ASTM C 94, "Specifications for Ready-Mix Concrete". Concrete batch plants shall be capable of producing concrete of the quality required and they shall be adequately equipped and properly operated. Concrete supplied to the plant by an outside batch plant shall meet the same requirements of batch plant facilities. Evidence of conformance will be certification of the outside plant by the National Ready-Mix Concrete Association (NRMCA).

Fine and coarse aggregates and cement shall be measured by weight. Water and liquid admixture may be measured by either weight or volume. Measurement of the various components of concrete, and measuring equipment shall be in accordance with ASTM C 94.

Concrete shall be mixed by one of the following methods:

1. Central mixed concrete-concrete mixed in a central stationary mixer and delivered to the casting area by appropriate methods.
2. Shrink mixed concrete-concrete that is partially mixed in a stationery mixer, then mixed completely and delivered to the casting site in a truck mixer.
3. Truck mixed concrete-concrete that is completely mixed in a truck mixer as it is delivered to the casting site.

Mixing times shall be established by uniformity tests in accordance with procedures in ASTM C 94.

Class S-P concrete shall be batched at the site of fabrication of the prestressed members. For Class S-P concrete, all wash water must be completely discharged from the mixing drum prior to addition of any materials for the subsequent batch. When using Class S-P concrete, under no circumstances shall water be used to adjust the consistency of the mix. If it is necessary to adjust the Class S-P concrete's consistency, this shall be done through the addition of chemical admixtures only, and adequate mixing after the adjustment, must occur before any Class S-P concrete is discharged into the formwork. Two compressive strength specimens, from this adjusted batch, shall be fabricated and tested. Also, the concrete tests required in Table 603.6.4.1, with the exception of the unit weight and yield tests, shall be performed on this adjusted batch. These results must meet the requirements shown in Table 603.6.4.1.

603.6.7-Placing Concrete: Suitable means shall be used for placing concrete without segregation. The concrete mixture shall not be dropped from a distance of more than 4 feet (1.2 meters), relative to the top of the form or the reinforcement. Special care shall be taken to deposit the concrete in its final position in each part of the form. Working of flowing concrete along the forms from the point of deposit will not be permitted. Care must be taken to work the concrete under and around the prestressing strands and reinforcement. The plastic concrete shall be consolidated in place by either external or internal vibration, or both when necessary. The vibrators shall be of a type and design approved by the Engineer, and the size of the vibrating head will be governed by the spacing of the prestressing cables and reinforcement. Vibrators may be used only to consolidate the concrete after it has been properly placed.

Internal vibrators shall be operated vertically and shall be slowly pushed into and pulled out of the concrete and shall not be held in one spot long enough to cause segregation. Concrete segregated by the vibrator shall be removed and discarded. Partially hardened layers of concrete shall not be penetrated or disturbed by the vibrator. Transmission of vibration into prestressing cable or reinforcement embedded in partially hardened concrete by the vibrating equipment will not be permitted.

The plans for delivery and placement of Class S-P concrete to the casting beds should ensure that construction of the entire member is completed during the workable period of the concrete established in MP 711.03.23, such that no vibration of the concrete is necessary at any point during construction. If vibration is to be used at any time during fabrication, the Class S-P concrete mix and the method of construction must be pre-qualified as outlined in Section 603.6.1.1.1. Batching, transportation and delivery of the Class S-P shall be planned by the manufacturer such that there is a reasonably continuous feed into the formwork and, therefore, at no time shall there be a large pause or delay in the casting process which causes the fresh concrete properties to exceed the limits set forth in Table 603.6.4.1.

603.6.8-Cold Weather Production: In addition to the requirements of Subsection 601.9.1, the following requirements shall apply to outdoor casting operations. When ambient temperatures below 40° F (4°C) are anticipated, the following shall be used as necessary to keep the temperature of concrete within the prescribed limits:

1. Minimum concrete temperature shall be 50° F (10°C) after placement.
2. Concrete shall not be placed on cold forms, steel, or appurtenances. When the temperature of these facilities are below 40° F (4°C), steam heat or other means shall be provided to maintain the temperature to at least 50° F (10°C) unless concrete is delivered above 60° F (15°C) and no frost, snow or ice is present in the form.
3. Placing concrete under covers or in suitable enclosures.
4. Use of heated mixing water.
5. Avoidance of the use of frozen aggregate or aggregate containing frost, snow or ice.
6. Use of insulated forms.

603.6.9-Hot Weather Production: In addition to the requirements of Subsection 601.9.2, the following requirements shall apply to outdoor casting operations:

When the ambient temperature is above 100° F (38°C), or other adverse weather conditions are present, it is recognized that plastic shrinkage of concrete, or loss of strength below specification requirements, or both may occur. If such conditions do occur, the following procedures or combination of procedures shall be used as necessary to correct these deficiencies:

1. Water fog spraying of forms, prior to placement of concrete. Forms exposed to direct sunlight can be misted for cooling prior to placement of concrete.
2. Shaded storage for aggregates.
3. Burying, insulating or shading water supply facilities.
4. Sprinkling or fog spraying of aggregates.
5. Use of shaved or crushed ice for a portion of the mixing water. Only so much ice shall be used as will be entirely melted at the completion of the mixing period.

6. Use of cold water in batching. Water can be chilled and stored in an insulated tank or pulled from a source if temperatures are low enough to aid mix temperature reduction.
7. Application of wet burlap or mats or fog spraying as soon as the water sheen disappears from the concrete. This is especially important for hot, windy, exposed locations.
8. Use of white pigmented curing compound for its heat-reflective properties except on composite surfaces.
9. Use of self-retarding admixtures.
10. Avoidance of the use of cement with temperatures over 170° F (77°C).
11. Shading of product surface during and after casting to avoid heat buildup in direct sunlight.

Concreting operations shall be discontinued when concrete temperatures exceed 100° F (38°C) at the time of placing.

603.7-PRESTRESSING:

603.7.1-Protection of Prestressing Steel: All prestressing steel shall be protected against physical damage and rust at all times during storage and manufacturing. Prestressing steel shall also be free of deleterious material such as grease, oil, wax, or paint, except where called for on the plans. Prestressing steel that has sustained physical damage at any time shall be rejected. The use of prestressing reinforcement having kinks, bends, nicks, or other defects will not be permitted. The development of pitting, other than slight rusting shall be cause for rejection.

Prestressing steel shall be packaged in containers or shipping forms for the protection of the strand against physical damage and corrosion during shipping and storage. A corrosion inhibitor which prevents rust or other results of corrosion shall be incorporated in a corrosion inhibitor carrier type packaging material, or when permitted by the Engineer, may be applied directly to the steel. The corrosion inhibitor shall have no deleterious effect on the steel or concrete or bond strength of steel to concrete.

The shipping package or form shall be clearly marked with a statement that the package contains high strength prestressing steel, and the type of corrosion inhibitor used, including the date packaged.

All anchorages, end fittings, couplers, and exposed strands, which will not be encased in concrete or grout in the completed work, shall be permanently protected against corrosion.

If an anti-bonding agent is used on the forms to facilitate member removal, every precaution shall be taken to protect the prestressing strands against any ° of coating by the anti-bonding agent.

603.7.2-Storing of Prestressing Steel: Prestressing steel shall be stored in a protected area which includes a roof (and sides if necessary) to keep moisture off the strand. In addition the cover must have a floor or at least the strand must be placed on supports to keep it out of mud and water until it is to be used. It shall not be removed from its protective packaging until immediately prior to installation in the forms and placement of concrete. Openings in the packaging shall be resealed as necessary to protect the unused steel. While exposed, the steel shall be protected to prevent corrosion.

603.7.3-Placement of Prestressing Steel: Prestressing shall be accurately installed in the forms and held in place by the stressing jack or temporary anchors and, when tendons are to be draped, by hold-down devices. The hold down devices used at all points of change in slope of tendon trajectory shall be of a low-friction type.

603.7.4-Safety Measures: Effective safety measures shall be taken to prevent injuries to personnel due to the breakage of strands or failure of anchorage devices during the tensioning operations. The protection provided shall be adequate and shall permit the inspector to perform his normal duties. When the safety precautions, in the opinion of the Engineer, are inadequate the contractor will revise the procedures or equipment to the satisfaction of the Engineer. The inspector will abide by the safety rules established by the producer.

603.7.5-Stressing Requirements:

603.7.5.1-General: The provisions set forth in this section refer to the application and measurement of stresses to prestressed concrete members manufactured by the process of pretensioning. Prestressing forces shall not be transferred to any member nor shall end anchors be released before the concrete has attained a minimum compressive strength as specified on the plans or in the special provisions as determined by tests of standard cylinders cured identically as the member.

An initial force shall be applied to each strand such as to develop a load of approximately 10% of the final prestressing load as shown on the plans. A record shall be maintained of the jacking force and elongations thereby. Several prestressed members may be cast in one continuous line and stressed at one time.

Forms shall be removed and members detensioned immediately after steam curing or heat curing is discontinued while the concrete is still warm and moist. The elements shall be cut or released in an order such that lateral eccentricity of prestress forces will be a minimum.

603.7.5.2-Tensioning of Strands: In all methods of tensioning, stress induced in the strands shall be determined by monitoring applied force and independently by measurement of elongation. Applied force may be monitored by direct measurement using a pressure gauge piped into the hydraulic pump and jack system. The elongation measurements shall agree with their computed theoretical values within a tolerance of $\pm 5\%$. If discrepancies are in excess of 5% between the calculated forces, determined by elongation measurement and gauge reading, the tensioning operation shall be suspended and the source of error determined, evaluated, and corrected by qualified personnel before proceeding.

Calculations for elongation and gauge readings must include appropriate allowances for friction in the jacking system, strand seating, movement of bulkheads, bed shortening if under load, thermal corrections, and any other compensation for the setup.

603.7.5.3-Methods of Stress Measurement: Methods of measurement of the stressing force consist of pressure gauges to measure force from the pressure applied to hydraulic jacks or any other method approved by the Engineer.

603.7.5.4-Gauging Systems: Hydraulic gauges shall conform to the provisions set forth in Section 603.3.3. All gauges measuring the stressing load shall be graduated so they can be read within a tolerance of $\pm 2\%$.

Tensioning methods employing hydraulic gauges shall have appropriate bypass valve snubbers and fittings so that the gauge pointer will not fluctuate but will remain steady until the jacking load is released.

603.7.5.5-Control of Jacking Force: Pressure bypass valves may be used for stopping the jack at the required load or for manually stopping the load with the valve. The accuracy of setting of automatic cutoff valves shall be verified by running to the desired cutoff load whenever there is reason to suspect improper results, and at a minimum, at the beginning of the operation each day.

603.7.5.6-Wire Failure in Strands: Failure of wires in a pretensioning strand is acceptable provided the total area of wire failure is not more than 2% of the total area of strands in a member, and providing the breakage is not symptomatic of a more extensive distress condition. Failure of any individual wire prior to placing concrete will require replacement of the strand.

603.7.5.7-Calibration Records for Jacking Equipment: All jacking and load measuring equipment shall be calibrated as specified in Section 603.3.3. Calibration records should show the following data.

1. Date of calibration.
2. Agency, laboratory or registered Professional Engineer (PE) supervising the calibration.
3. Method of calibration; i.e. proving ring, load cell, testing machine, etc., and its calibration reference.
4. The full range of calibration with gauge readings indicated against actual load.

Calibration records for all tensioning systems being used shall be available for preparing theoretical tensioning values. Personnel involved in preparing tensioning calculations shall have a copy of these records for reference.

603.7.6-Pretensioning and Strand Debonding: Pretensioning shall conform to the provisions set forth in Article 2.2, "Pretensioning" of the latest edition of the PCI Quality Control Manual MNL-116.

Plastic sheathing shall be used for strand debonding and shall be approved by the Engineer prior to use. Items such as animal fat, reactive greases, or PVC pipes shall not be used. Any other material shall be approved by the Engineer prior to use.

603.7.7-Detensioning: Detensioning shall conform to the provisions set forth in Article 2.3, "Detensioning" of the latest edition of the PCI Quality Control Manual MNL-116.

603.7.8-Concrete Cover: Minimum concrete cover for prestressing steel shall be 1 ½ inches (40 mm) unless otherwise shown on the plans.

603.8-CURING:

603.8.1 General: Careful attention shall be given to the proper curing of concrete. Prior to placing of concrete, the contractor shall submit the proposed curing methods and procedures to the Engineer for approval. Elevated temperature curing facilities shall be tested prior to approval. Approved equipment and materials for curing shall be available for use prior to casting.

Inadequate curing facilities or lack of attention to the proper curing of concrete shall be sufficient cause for the Engineer to stop all concrete placement until approved curing is provided. Inadequate curing may be cause for rejection of the member. All test cylinders shall be cured in the same environment as the precast/prestressed concrete members.

Curing shall be commenced prior to the formation of surface shrinkage cracks. The curing mats, sheets, or blankets shall be carefully placed in contact with the concrete member to avoid damage to the freshly finished concrete.

The following curing requirements shall apply for precast/prestressed members. Any other special method of curing shall meet with the approval of the Engineer. Concrete shall not be exposed to temperatures below freezing until the specified minimum strength as shown in plan notes has been attained.

All concrete shall be cured by water curing, accelerated temperature curing, or any other method approved by the Engineer.

603.8.2-Water Curing: All exposed surfaces of the concrete shall be kept wet continuously for the required curing time. The water used for curing shall meet the requirements of 603.2. Water curing shall be permitted as follows:

603.8.2.1-Wet Mat Method: For water curing by the mat method, cotton mats, polyethylene sheeting, or polyethylene burlap blankets may be used. The mats, sheets or blankets shall be adequately anchored and weighted to provide continuous contact with all concrete surfaces. Any concrete surfaces which cannot be cured by contact shall be enclosed by mats, adequately anchored, so that outside air cannot enter the enclosure. Sufficient moisture shall be provided inside the enclosure to keep all of the surfaces of the concrete wet for the required curing time, but in no case less than 36 hours.

603.8.2.2-Saturated Cover Curing: The member, covered as specified for the initial phase of curing, shall be maintained on the casting bed in an approved enclosure designed and equipped to insure complete saturation of the covering. The temperature within the enclosure and that of the covering material shall be maintained to provide a uniform curing temperature at the surface of the member, within the limits of 80 °F to 130 °F (27°C) to (54°C), until the specified strength is attained, but in no case less than 36 hours. The covering shall be kept thoroughly saturated throughout the entire curing period and the temperature of the water used shall be controlled uniformly to maintain the selected curing temperature of the surface of the member.

603.8.2.3-Water Spray Curing: The member, covered as specified for the initial phase of curing, shall be maintained in the casting bed in an approved enclosure. When the concrete is sufficiently hardened to resist damage, the covering shall be removed and the exposed surfaces of the unit shall be subjected to a continuous fine spray of water. The

temperature within the enclosure and that of the water used shall be controlled to provide a uniform curing temperature at the surface of the member, within the limits of 80°F and 130°F (27°C) to (54°C) until the specified member strength is attained, but in no case less than 36 hours.

603.8.3-Accelerated Curing: Accelerated curing of the concrete shall be done by low pressure steam curing, or radiant heat curing. Transfer of stress shall be accomplished immediately after the heat curing has been discontinued. Accelerated curing shall be applied at a controlled rate following initial set of the concrete as per ASTM C403. Accelerated curing shall be done under suitable enclosures which minimize all heat losses and maintain uniform cure conditions within the enclosed area. Members must be maintained wet during accelerated curing time.

If accelerated curing is used, the contractor/fabricator shall furnish recording thermometers showing the time-temperature relationship of the concrete throughout the entire curing period. Recording thermometers shall be kept in proper calibration and recalibrated at least annually.

603.8.3.1-Low-Pressure Steam Curing: Low-pressure steam curing shall be done under a suitable enclosure to contain the live steam and minimize moisture and heat losses. The concrete shall be allowed to attain its initial set before application of the live steam.

Application of live steam shall not be directed on the concrete or forms such as to cause localized high temperatures. During the initial application of live steam, the concrete temperature shall be raised at an average rate not exceeding 80°F (27°C)/per hour, until the curing temperature is reached. The maximum sustained concrete temperature during the curing cycle shall not exceed 160°F (70°C). The maximum temperature shall be held until the concrete has reached the required release strength. The maximum peak concrete temperature during the curing cycle shall be 190°F (88°C). The concrete temperature shall be maintained uniformly throughout the extremities of the prestressed member. At the end of curing, the concrete temperature shall be reduced at an average rate not exceeding 50°F (10°C)/per hour.

603.8.3.2-Radiant Heat Curing: Radiant heat may be applied by means of pipes circulating steam, hot oil or hot water, or by electric heating elements. Radiant heat curing shall be done under a suitable enclosure to contain the heat, and moisture loss shall be minimized by covering all exposed concrete surfaces with a plastic sheeting or by applying an approved liquid membrane curing compound to all exposed concrete surfaces. The heat application shall be maintained to create a uniform concrete temperature throughout the extremities of the member.

After the waiting period prior to application of the heat, the concrete temperature shall increase at an average rate not exceeding 80°F (27°C)/per hour until the curing temperature is reached. The maximum sustained concrete temperature within the curing cycle shall not exceed 160°F (70°C). The maximum temperature shall be held until the concrete has reached the required release strength as shown in plan notes. The maximum peak concrete temperature during the curing cycle shall be 190°F (88°C). The maximum cooling rate from sustained concrete curing temperature shall be 50°F (10°C)/per hour.

603.9-FINISHING:

To assure the production of well-formed matching members, all surfaces of the concrete shall be finished, shall be true and even, and shall be free from rough, open, or honeycombed areas, depressions or projections. The edges shall be finished or chamfered, or both. Care shall be exercised in removing forms to avoid spalling or otherwise damaging the concrete.

Top surfaces of prestressed members shall be screeded or rough floated to bring mortar to the surface and cover all aggregate. The top surface of members that will receive cast-in-place concrete on the project site shall be finished as noted on the project plans, or if no finish is noted, they shall have either a raked or stiff broom finish. Aggregate shall not be loosened when roughening the surface. The fascia surfaces of bridge members shall be finished with a PCI Grade A Formed Finish. All other members shall be finished with a PCI Standard Grade Formed Finish. Concrete on exposed reinforcing steel and loose laitance on concrete surfaces to be in contact with cast-in-place concrete shall be removed from all members.

Fabrication holes, except box beam vent holes, in the bottom of all beams, shall be filled with nonshrink mortar and made flush with the surrounding surface. No patching is required for small holes and irregularities on the sides of adjacent box beams that are to be sandblasted prior to shipment. Care shall be taken in final cutting the ends of strands to avoid damaging the concrete surface.

603.10-WORKMANSHIP:

603.10.1-General: Holes and voids in the surface of concrete resulting from bolts, ties, or large air pockets shall be wetted and filled with mortar having the same proportion of fine aggregate and cement as in the concrete, after which exposed mortar surfaces shall be finished smooth and even with a wood float.

Surfaces to be repaired and finished shall be kept wet for at least one hour before hydraulic cement mortar is applied. Immediately following patching work, repaired areas shall be wet cured for at least 48 hours. The wet cure may be accomplished by the use of steam, wet burlap or continuous spray wetting. A liquid membrane-curing compound may be used on non-composite surfaces.

Beams or girders having honeycomb of such extent to affect their strength or resistance to deterioration will not be accepted.

603.10.2-Defects and Breakage: Defective or damaged members which cannot be satisfactorily repaired, or which are not acceptable to the Engineer will not be incorporated into the work. All other members that sustain damage during fabrication, handling, storage or transportation shall be evaluated in accordance with Chapter three of PCI Journal Vol. 30, # 3 entitled "Fabrication and Shipment Cracks in Precast or Prestressed Beams and Columns", hereinafter referred to as "specification". This specification is to be used to determine the severity of cracks. All cracks with a width of 4 mils (0.1 mm) or less may be repaired by silane treatment if the repair section of the specification allows repairs. All cracks over 4 mils (0.1 mm) to and including 16 mils (0.4 mm) shall be repaired by epoxy injection if allowed by the specification. Members with cracks over 16 mils (0.4 mm) shall not be incorporated into the work unless approved by the Engineer.

603.10.2.1-Epoxy Injection of Cracks: The work shall consist of repairing cracks with a width greater than 4 mils and up to and including 16 mils on prestressed concrete bridge beams.

603.10.2.1.1-Materials: The epoxy material used for epoxy injection crack repair shall meet the requirements specified for epoxy resin adhesives in ASTM C 881, Type IV, Grade 1, and Classes B or C. For the epoxy paste or material used to bond and cover the injection ports to the substrate, use the epoxy resin manufacturer's recommendation.

603.10.2.1.2-Equipment: The equipment to be used to inject the epoxy shall meet the recommendations of the epoxy injection material manufacturer and/or the following requirements:

1. Use equipment that has the ability to automatically proportion the material components within the mix ratio tolerances set by the epoxy materials manufacturer.
2. Use equipment that has the ability to automatically mix the epoxy component materials within the pump and injection apparatus.

603.10.2.1.3-Crack Surface Preparation and Cleaning Requirements: After the concrete beam has achieved 28 day shipping strength, clean the concrete surface along the crack of all deteriorated concrete, efflorescence and other contaminants which would be detrimental to the adhesion of the surface sealing epoxy compound. The substrate must be sound, dry on the surface, and free from oil and grease. Blow out the crack with oil free and dry compressed air.

603.10.2.1.4-Epoxy Injection: Place the base of the injection ports directly over the crack and bond to the substrate with an epoxy paste or the recommended product by the epoxy resin manufacturer. The injection ports should be spaced over the length of the crack at a spacing that will allow the epoxy resin to seal the entire crack traveling from one port to another. The ports spacing is dependent upon the viscosity of the resin.

Use an epoxy adhesive to seal over the surface ports and exposed cracks. The entire exposed crack is to be covered with the epoxy adhesive leaving only the port holes uncovered. The cure time for the epoxy will be based upon concrete temperature.

The temperature requirements of the concrete for the injected resin must be satisfied before the process can begin. Begin injecting at the lowest port on the beam and continue until the epoxy resin begins to "ooze" out of the port above it. The "ooze" out of the port above it is a sign that the crack has been filled to that level. Plug the first port with a cap and move up to the next port, repeating this procedure until the entire crack has been filled with epoxy. Use slow, constant pressure to inject the epoxy into the crack which will reduce the possibility of leaks or blow-outs and allow time for the repair material to fully penetrate the crack.

603.10.2.1.5-Post Epoxy Injection: After a minimum of 24 hours, the injection ports can be removed from the beam. Clean the concrete surface areas of excess epoxy injection work. Clean so as to not damage the concrete by scraping, light sand blasting, grinding, use of solvents, or any other appropriate method approved by the engineer. Clean the excess materials so that no epoxy material or injection ports extend beyond the plane surface of the concrete.

603.11-DIMENSIONAL TOLERANCES:

All tolerances shall be applied with respect to the theoretical positions and dimensions shown in the plans. The tolerances listed in this article represent the total allowable tolerance that will be accepted in the finished product.

The limits of tolerance do not necessarily represent fully acceptable construction; they are the limits at which construction becomes unacceptable. In general, workmanship shall be at a level of quality that will be well within the tolerance limits. Out of tolerance dimensions shall be handled in accordance with MP 603.10.40.

603.11.1-Prestressed Concrete I-Beams and Bulb Tee Beams:

<i>Characteristics</i>	<i>Value</i>
Depth (flanges)	±1/4 inch (± 6 mm)
Depth (Overall)	+1/2 inch, to -1/4 inch (+15 to -6 mm)
Width (flanges)	+3/8, to -1/4 inch (+10 to -6 mm)
Width (Web)	+3/8, to -1/4 inch (+10 to -6 mm)
Length of Beam	±1/8 inch per 10 feet, ±1 inch max. (± 1 mm/m, 25 mm max)
Sweep (variation from straight line parallel to centerline of member)	± 1/8 inch per 10 ft (± 1 mm/m)
Camber variation from design camber	± 1/8 inch per 10 feet ± 1/2 inch max up to 80 feet length ± 1 inch max. over 80 length (± 1 mm/m) (± 13 mm max. up to 24 m length) (± 25 mm max. over 24 m length)
Camber variation from design camber	±3/16 inch per 12 inches ± 1 inch (±15 mm/m, ± 5 mm max)
Position of plates	± 1 inch (± 25 mm)
Position of bearing plates	± 5/8 inch (± 16 mm)
Diaphragm Inserts (spacing between centers of inserts and from centers of inserts to the ends of the beams.)	± 1/2 in (± 15 mm)
Stirrup bars (Projection above top of beam)	± 3/4 inch (± 20 mm)
Stirrup bars (Longitudinal spacing)	± 2 inches (± 50 mm)
Concrete Cover	± 1/4 in (± 6 mm)
Position of inserts for structural connections	± 1/2 in (± 15 mm)
Position of hold-down points for draped strands	± 5 inches (± 125 mm)
Position of Inserts	± 1/2 inch (± 15 mm)
Position of handling devices: Parallel to length Transverse to length	± 6 inches (± 150 mm) ± 1 inch (± 25 mm)
Prestressing strand position (vertical or horizontal).	± 1/4 inch (± 6 mm)

603.11.2 Precast/Prestressed Concrete Box Beams and Plank Beams:

<i>Characteristics</i>	<i>Value</i>
Depth (Overall)	±1/4 inch (± 6 mm)
Depth (top flange)	+1/2 inch (+15 mm)
Depth (bottom flange)	+1/2 inch to -1/8 inch (+15 to 3 mm)
Width (Overall)	±1/4 inch (±6 mm)
Width (Web)	±3/8 inch (±6 mm)
Length	± 3/4 inch (± 20 mm)
Sweep (variation from straight line parallel to centerline of member) Up to 40 feet (12 m) length member	±1/4 inch (± 6 mm)
40 to 60 feet (12 to 18 m) length member	±3/8 inch (±10 mm)
Greater than 60 feet (18 m) length member	± 1/2 in (± 15 mm)
Camber variation from design camber	±1/8 inch per 10 feet, ±1/2 inch Max. (±1 mm/m, ±15 mm Max)
Variation from specified end Squareness of skew:	
Horizontal	± 5/8 inch (± 16 mm)
Vertical	±1/8 inch per 12 inches ± 1/2 inch Max. (±1 mm/100 mm, ±15 mm Max)
Position of tendons Individual	± 1/4 in (± 6 mm)
Position of Inserts for structural connections	± 1/2 in (± 15 mm)
Position of handling devices:	
Parallel to length	± 6 inches (± 150 mm)
Transverse to length	± 1 in (± 25 mm)
Position of stirrups:	
Longitudinal spacing	± 1 inch (± 25 mm)
Projection above top	+ 1/4 inch (± 6 mm), - 3/4 inch (- 20 mm)
Position of dowels tubes	± 5/8 inch (± 16 mm)
Position of hold-down points for draped strands	± 5 inch (± 125 mm)
Position of tie rods tubes:	
Parallel to length	± 1/2 inch (± 15 mm)
Vertical	±3/8 inch (±10 mm)
Position of slab void:	
End of void to center of tie hole	± 1/2 inch (± 15 mm)
Adjacent to end block	± 1 inch (± 25 mm)
Concrete Cover	± 1/4 inch (± 6 mm) per 10 feet long. Bars (6 mm per 3 m)

603.11.3-Prestressed Concrete Deck Panels:

<i>Characteristics</i>	<i>Value</i>
Length	± 1/2 in (± 15 mm)
Width	± 1/2 in (± 15 mm)
Nominal Depth	+ 1/4 inch - 1/8 in (+6 mm, -3 mm)
Horizontal Alignment – Deviation from straightness of matting edge of panels	1/8 in (3 mm)
Deviation of ends from plan dimension Horizontal Alignment	± 1/2 in (± 15 mm)
Position of strands :	
Vertical	±1/8 (±3 mm)
Horizontal	± 1/2 in (± 15 mm)
Concrete Cover	± 1/4 inch (± 6 mm) 1/4 inch per 10 feet long. Bars (6 mm per 3 m)

603.12-HANDLING, STORING, TRANSPORTING, AND ERECTION:

The Contractor shall be responsible for proper handling, lifting, storing, hauling, and erection of all members so that they are placed in the structure without damage.

Prestressed members shall be maintained in an upright position at all times and shall be handled and supported in a manner which prevents torsion. No member shall be moved from the casting yard until the member has been accepted.

Storing of members shall be done with adequate blocking so that warpage or cracking will not occur. Blocking will be such that at least 6 inches (150 mm) clearance is maintained above the surface on which the blocking is placed. Placement of the blocking from beam ends shall be at locations not greater than (3) percent of the beam length. Concrete box beams shall be supported by the solid end block area during handling, storage, hauling, and erection. Members which are improperly stored and which become cracked, warped, or otherwise damaged in storage will be subject to rejection.

Members when stacked, shall be separated by blocking capable of supporting the members. The blocking shall be arranged in vertical planes. Stacking of members shall be arranged such that lifting devices will be accessible and undamaged. Stacking shall not exceed two members high.

All concrete beams or girders when erected, shall be securely tied and/or braced unless otherwise shown on the plans. When railroad or roadway traffic must be maintained beneath girders or beams already placed, traffic shall be protected against falling objects during the erection of diaphragms and other structural members, during the placing of cast-in-place concrete, and during the erection and dismantling of forms. Protection shall consist of nets or flooring with openings not larger than 1 inch (25 mm).

When precast / prestressed concrete adjacent box beams are erected, the fit of mating surfaces will be such that excessive grout leakage will not occur. If such fit is not provided the joint shall be filled with grout or sealed with an acceptable caulking suitable to the Engineer.

603.13-CONSTRUCTION OF DECK:

The variation in heights between beams shall not be more than 1/2 in (13 mm) between adjacent box beams where there is no wearing surface. For adjacent box beam bridges with wearing surfaces, the differential shall not exceed 3/4 inches (19 mm).

Dowel bar and lifting bolt holes shall be filled with non-shrink grout. Adjacent box beam units shall be transverse post tensioned by the use of high strength threaded bars, or by other methods as shown on the Plans.

603.14-MEASUREMENT AND PAYMENT:

603.14.1-Method of Measurement: Precast/Prestressed concrete structural members will be measured along the member centerline in linear feet (meter). Deck panels shall be measured by area in square feet (meter) complete in place.

Precast reinforced concrete three-sided structures shall be measured along the centerline of the erected structure in linear feet (meter).

Precast reinforced concrete headwalls and wingwalls for use with precast reinforced concrete three-sided structures shall be measured in square feet (meter) as measured on the exterior face of the member.

603.14.2-Basis of Payment: Precast/Prestressed concrete beams, deck panels, precast reinforced concrete three-sided structures, and precast reinforced concrete headwalls and wingwalls will be paid for at the contract unit price bid for the items listed below, which price and payment shall be full compensation for furnishing all the materials and doing all the work prescribed in a workmanlike and acceptable manner including the cost of furnishing and manufacturing the concrete members; for labor, concrete, forms, conventional reinforcing steel, prestressing strands, inserts, anchorage devices, bearing pads, shims, grout, wingwalls and headwall connection hardware, joint sealing/waterproofing, and other devices, and for moving, transporting and erecting the finished product in accordance with the Plans and Specifications. For precast reinforced concrete three-sided structures where the headwall is cast integral with the end structure unit, the headwall will be paid for in square feet (meter) as if it were not integral cast. Cast-in-place concrete diaphragms, curb, parapet, railing, and reinforcing steel for cast-in-place concrete are not included in this item.

603.14.2.1-Price Adjustments: Members found not in compliance with the requirements of 603.6.5 for compressive strength, but for which the evaluation indicates may still be used, will be paid for at a reduced price in accordance with the following formulas, depending on who purchased the members:

FORMULA 1: Use the following price reduction formula when the members are used in a project constructed by a Contractor:

$$\text{Price Reduction} = \left(\frac{f'_c - \bar{X}}{0.5f'_c} \right) \times 40\% \text{ of the Contract Unit Bid Price}$$

FORMULA 2: Use the following price reduction formula when the beams are used in a project constructed by the Division:

$$\text{Price Reduction} = \left(\frac{f'_c - \bar{X}}{0.5 f'_c} \right) \times \text{IC}$$

Where:

f'_c = 28-Day Design Compressive Strength, psi (Mpa)

\bar{X} = Average 28-day Compressive Strength as determined in 603.6.5

IC_(Formula 2 only) = The invoiced cost of the member itself, as billed to the Division by the Fabricator. This cost shall not include other items associated with the member such as guardrail, bearing pads, etc.

603.15-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
603016-*	"size" Prestressed Concrete Box Beam	Linear Feet (Meter)
603017-*	"size" Prestressed Concrete Plank Beam	Linear Feet (Meter)
603018-*	"size" Prestressed Concrete I Beam	Linear Feet (Meter)
603019-*	"size" Prestressed Concrete Bulb T Beam	Linear Feet (Meter)
603020-*	"size" Prestressed Concrete Deck Panel	Linear Feet (Meter)
603021-*	"size" Precast Concrete Deck Panel	Linear Feet (Meter)

* Sequence number

707.8-WATERPROOF PAPER FOR CURING CONCRETE:

Waterproof paper shall consist of two sheets of kraft paper cemented together with bituminous material and reinforced with fiber. The top surface shall be white. Acceptance will be based on visual inspection.

707.9-LIQUID MEMBRANE-FORMING COMPOUNDS FOR CURING CONCRETE:

Curing compounds shall conform to the requirements of ASTM C309, Type 2, Class A.

707.10-WHITE POLYETHYLENE SHEETING (FILM) FOR CURING CONCRETE:

The sheeting shall be opaque white plastic film. The film shall be clean and free of imperfections. Acceptance will be based on visual inspection.

707.11-EPOXY RESIN PROTECTIVE COATING:

The material shall conform to the requirements of ASTM C881, Type III, Grades 1 or 2, Class B or C. Pigmentation shall be required in the system so the cured coating shall conform to Federal Color Standard 595, No. 16357.

707.12-CONCRETE SEALER:

707.12.1-General: The material shall be a one component, water repellent penetrating sealer, meeting the criteria listed in section 707.12.2. The material shall be capable of meeting the criteria with a single coat and shall not alter the color of the treated surfaces.

707.12.2-Acceptance: The Contractor shall furnish certified laboratory test data showing the material meets the following performance requirements:

1. Absorption-ASTM C642 (non-air entrained concrete). Concrete should be proportioned and mixed in accordance with ASTM C672. Sealed concrete, under total immersion, will not exceed 1.0% absorption after 48 hours or 2.0% absorption after 50 days.
2. Scaling Resistance-ASTM C672. A rating of "No Scaling" after 100 cycles on the sealed concrete (non-air entrained concrete) as compared to "Severe Scaling" on untreated concrete.
3. NCHRP 244, Series II-Cube Test
 - 3.1 Weight Gain-not to exceed 25% of untreated cube.
 - 3.2 Absorbed Chloride-not to exceed 25% of untreated cube.
4. NCHRP 244, Series IV-Southern Exposure
 - 4.1 Absorbed Chloride-not to exceed 10% of untreated concrete.

707.13-ACCELERATING ADMIXTURES FOR CONCRETE:

707.13.1-Acceptance Requirements for Approval of Accelerators: Accelerating admixtures for concrete shall be non-chloride and shall conform to the requirements of AASHTO M 194, Type C.

707.13.2-Performance Requirements for Concrete Accelerators:

707.13.2.1-The effects of using accelerating admixtures may vary widely with different types of cement, cement from different mills, aggregate proportions, aggregates from different sources and of different gradation, and changes in water-cement ratio. Therefore,



[MCST Main Page](#)

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[Quality Assurance System](#)

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[Upcoming Materials Contracts](#)

Transportation > Highways > Materials

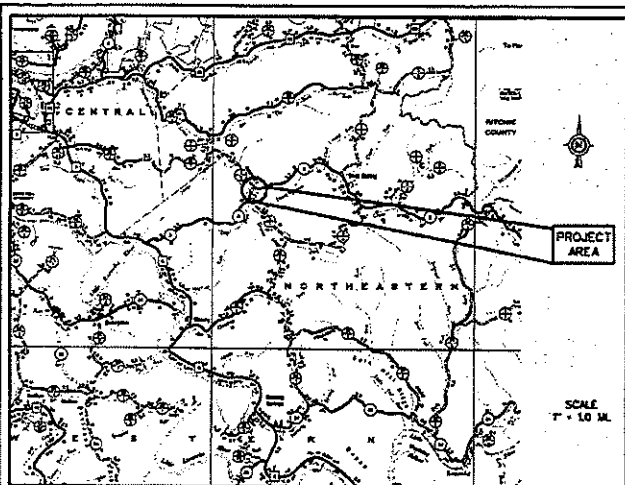
707.12 - Concrete Sealers

Effective Date: October 14, 2009

Contact: Adam Gillispie (304) 558-7447
Email: Adam.M.Gillispie@wv.gov

Material	Producer	Approved Lab Number
Enviroseal 40	BASF (B266A)	1395328
Hydrozo Silane 40 VOC Degussa	BASF	1395330
Aquanil Plus 40	ChemMasters (M044A)	1390179
Powerseal 40	Vexcon	1428582

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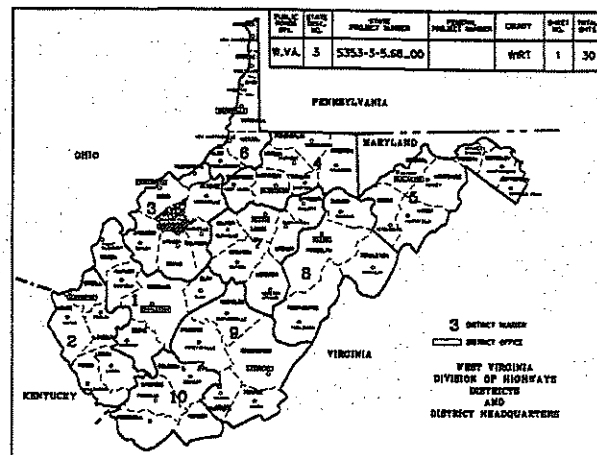


WEST VIRGINIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR CONSTRUCTION
OF
STATE HIGHWAY

FEDERAL PROJECT NO.
STATE PROJECT NO. S353-3-5.68_00
COUNTY ROUTE NO. 3 (SLS)
DISTRICT NO. THREE
WIRT COUNTY

BRUSHY FORK BRIDGE

ROADWAY 10+00.00 TO 12+72.45 - 272.45 FT. - 0.052 MI.
BRIDGE 12+72.45 TO 13+16.00 - 43.55 FT. - 0.008 MI.
ROADWAY 13+16.00 TO 15+25.00 - 209.00 FT. - 0.040 MI.
TOTAL PROJECT LENGTH - 525.00 FT. - 0.100 MI.



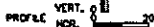
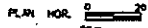
TYPE OF CONSTRUCTION
BRIDGE NO. 11508
BRIDGE REPLACEMENT
SUB & SUPER STRUCTURE REPLACEMENT
GRADING, PAVING, AND DRAINAGE

UTILITIES
FRONTIER COMMUNICATIONS - TELEPHONE
MONPOWER - ELECTRIC
ENERGY CORP OF AMERICA - GAS

SEEK TO SHEETS

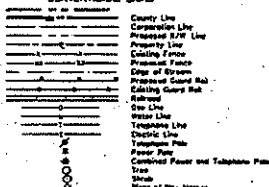
NO.	DATE	DESCRIPTION
1		TITLE SHEET
2		TYPICAL SECTIONS DETAIL
3		EXHIBIT OF EXISTING SCOPES OF WORK
4		CONCRETE MIXTURE
5		GRADING DATA AND SURVEY INSTRUMENTS
6		TRAFFIC CONTROL
7		PLANS
8		PROFILES
9		CONCRETE MIXTURE
10		CONCRETE MIXTURE
11		CONCRETE MIXTURE
12		CONCRETE MIXTURE
13		CONCRETE MIXTURE
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18		CONCRETE MIXTURE
19		CONCRETE MIXTURE
20		CONCRETE MIXTURE

SCALES



DESIGNATION	DEMONSTRATION
A.D.T. (2015) = 204	
A.D.T. () =	
D.H.V. = 30	
D. =	
T. =	
V. = 25 MPH	

CONVENTIONAL SIGNS



BEGN PROJECT
POB 10+00.00

BEGN PAVING
POB 11+25.00

BEGN DETOUR
POB 0+00.00

BEGN BRIDGE
12+72.45

END BRIDGE
13+16.00

END PAVING
14+50.00

END PROJECT
15+25.00

END DETOUR
11+25.00

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS
OF PROJECT S353-3-5.68_00

June 28, 19
Gene Hedges
EXECUTIVE SECRETARY

NO.	SHEET	REVISION	DATE	BY

SIGNED: *Brian J. Brown*
RESPONSIBLE CHARGE ENGINEER
DATE: 6/25/19

BRIAN J. BROWN
REGISTERED PROFESSIONAL ENGINEER
16193
STATE OF WEST VIRGINIA

RECOMMENDED: *Brian J. Brown*
PROJECT ENGINEER

RECOMMENDED FOR APPROVAL: *Gene Hedges*
STATE HIGHWAY ENGINEER

APPROVED: *James Weston, P.E.*
COMMISSIONER OF HIGHWAYS

PROJECT NO. S353-3-5.68_00

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
5353-3-5-68		5	WRT	12	30

DISMANTLING STRUCTURE

THE CONTRACTOR SHALL DISMANTLE AND REMOVE (TO A MINIMUM OF 24 INCHES BELOW FINISHED GROUND) THE EXISTING STRUCTURE IN ACCORDANCE WITH SECTION 203 OF THE STANDARD SPECIFICATIONS AND SPECIFIC PROVISIONS.

THE DEMOLITION/DISMANTLING PLANS SHALL BE PROVIDED TO THE DISTRICT BRIDGE ENGINEER AT LEAST SEVEN DAYS PRIOR TO BEGINNING ANY DEMOLITION/DISMANTLING WORK. RECEIPT OF THE DEMOLITION/DISMANTLING PLANS DOES NOT RELIEVE THE CONTRACTOR OF HIS/HER RESPONSIBILITY TO SATISFACTORILY DEMOLISH/DISMANTLE THE STRUCTURE SPECIFIED.

THE DEMOLISHED/DISMANTLED STRUCTURE SHALL BECOME THE PROPERTY OF THE CONTRACTOR EXCEPT AS NOTED IN THE PLANS. ANY EXISTING PIPES AND INLETS THAT ARE REMOVED DURING CONSTRUCTION SHALL ALSO BECOME THE PROPERTY OF THE CONTRACTOR.

THE BRIDGE PLATES SHALL BE REMOVED FROM THE PROJECT SITE IN AN APPROVED MANNER AND TURNED OVER TO THE ENGINEER.

THE COST SHALL BE INCLUDED IN ITEM 20300-000 DISMANTLING STRUCTURE.

LEAD PAINT

THE EXISTING BRIDGE CONTAINS LEAD-BASED PAINT AND CARE SHALL BE EXERCISED DURING REMOVAL. LEAD PAINT CONTAMINATED STEEL MUST BE PROPERLY DISPOSED OF ACCORDING TO EPA AND OTHER REGULATORY AGENCIES. ANY ADDITIONAL COST ASSOCIATED WITH THE PRESENCE OF THIS PAINT SHALL BE INCLUDED IN ITEM 20300-000 DISMANTLING STRUCTURE.

ASBESTOS

THE EXISTING STRUCTURE HAS BEEN INSPECTED AND IS NOT KNOWN TO CONTAIN ASBESTOS. THE CONTRACTOR SHOULD BE ALERT TO ANY UNDISCOVERED ASBESTOS. THE CONTRACTOR SHALL SUBMIT ANY NECESSARY ENVIRONMENTAL PAPERWORK TO THE APPROPRIATE AGENCIES TEN DAYS PRIOR TO DEMOLITION.

VERIFICATION OF DIMENSIONS

THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL PLAN AND ELEVATION DIMENSIONS PRIOR TO ORDERING MATERIAL FOR THE CONSTRUCTION OF VARIOUS BID ITEMS FOR THIS PROJECT.

PLANS FOR THE EXISTING STRUCTURE ARE AVAILABLE AT THE DISTRICT OFFICE. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THESE PLANS AS NECESSARY THROUGHOUT THE DURATION OF THE PROJECT.

DESIGN UNIT STRESSES

THIS BRIDGE IS DESIGNED FOR AN HL-93 LIVE LOAD CAPACITY, AS WELL AS FOR A 25 PSF WEARING SURFACE. DESIGN UNIT STRESSES:

STRUCTURAL STEEL (A36) Fy = 58,000 PSI STRUCTURAL STEEL (A572) Fy = 60,000 PSI
 CLASS B CONCRETE Fc = 3,000 PSI STRUCTURAL STEEL (A588) Fy = 50,000 PSI
 REINFORCING STEEL, AASHTO, M31 GRADE 60, Fy = 60,000 PSI

SHOP DRAWINGS

SHOP DRAWINGS (3 COPIES) AND ANY CONSTRUCTION HANDBOOKS NECESSARY FOR THIS PROJECT WILL BE DIRECTED TO MR. JAMES E. ROTEN, DISTRICT ENGINEER, ATTN: MR. KEELING FFE, WYDOK DISTRICT 3, 624 DEPOT STREET, PARKERSBURG, WV 26101.

CONCRETE (CAST-IN-PLACE)

CONCRETE SHALL BE CURED IN ACCORDANCE WITH SUBSECTION 601.12 OF THE STANDARD SPECIFICATIONS.

IF USED, POLYETHYLENE COATED BURLAP SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 707.9 OF THE STANDARD SPECIFICATIONS.

THE MINIMUM COVERING MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF ANY REINFORCING STEEL BAR, SHALL BE 3 INCHES IF THE CONCRETE IS IN CONTACT WITH THE GROUND SURFACE AND 2 INCHES OTHERWISE, EXCEPT AS SPECIFIED DIFFERENTLY ON THE PLANS.

SUBSTRUCTURE CONCRETE (CAST-IN-PLACE)

ALL CONCRETE IN THE SUBSTRUCTURE SHALL BE CLASS B, AIR ENTRAINED.

CHAMFER ALL EXPOSED EDGES OF THE SUBSTRUCTURE CONCRETE 1 INCH, EXCEPT FOR THE ABUTMENT CURBS, WHICH SHALL BE CHAMFERED 3/4 INCH.

THE EXPOSED SURFACE OF THE SUBSTRUCTURE SHALL BE CLASS 1, ORDINARY SURFACE FINISH, IN ACCORDANCE WITH SUBSECTION 601.11 OF THE STANDARD SPECIFICATIONS, EXCEPT FOR THE ABUTMENT CURBS AND WINGWALLS, WHICH SHALL BE CLASS 2, RUBBED FINISH, IN ACCORDANCE WITH SUBSECTION 601.12 OF THE STANDARD SPECIFICATIONS.

THE ABUTMENT CURTAIN WALL SHALL NOT BE POURED UNTIL AFTER THE SUBSTRUCTURE IS IN PLACE.

THE ABUTMENT BEARING SEAT, UPON WHICH THE SHOES OR OTHER BEARING DEVICES WILL BE SET, SHALL BE FINISHED TO TRUE ELEVATIONS AS SHOWN ON THE PLANS.

FILL ANCHOR BOLT HOLES WITH NON-SHRINK GROUT AFTER ANCHOR BOLTS ARE SET. THE NON-SHRINK GROUT SHALL CONSIST OF 1 PART REGULAR PORTLAND CEMENT, 1 PART SILICA SAND AND 1 PART NON-SHRINK ADMIXTURE OR THE GROUT SHALL BE AN APPROVED EQUAL.

STRUCTURAL STEEL

ALL STRUCTURAL STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A572 Fy = 60,000 PSI UNLESS OTHERWISE NOTED.

FOR SUBSTRUCTURES UTILIZING STEEL GIRD FLOORING, STRUCTURAL STEEL CONFORMING TO THE REQUIREMENTS OF ASTM A588 Fy = 50,000 PSI MAY BE SUBSTITUTED FOR ASTM A572 STEEL. NO PAINTING SHALL BE REQUIRED FOR ASTM A588 STEEL UNLESS SPECIFIED IN THE PLANS OR APPLICABLE STANDARD DETAILS.

REINFORCING STEEL BARS

ALL REINFORCING STEEL BARS SHALL BE INTERMEDIATE GRADE BULLET STEEL, GRADE 60 IN ACCORDANCE WITH SUBSECTION 709.1 OF THE STANDARD SPECIFICATIONS. THE REQUIREMENTS OF SECTION 602 OF THE STANDARD SPECIFICATIONS SHALL BE FOLLOWED.

THE MINIMUM SPLICE LENGTH OR DOWEL BAR EMBEDMENT SHALL BE 30 BAR DIAMETERS. REINFORCEMENT UNDER THE SHOES OR OTHER BEARING DEVICES SHALL BE SO PLACED SO AS TO AVOID INTERFERENCE WITH DRILLING OF ANCHOR BOLT HOLES.

ALL SUBSTRUCTURE REINFORCING STEEL BARS SHALL BE EPOXY COATED.

TEMPORARY FILL

IT IS ASSUMED THAT TEMPORARY FILL WILL BE NECESSARY TO SET THE BOX BEAMS. THE COST FOR CONSTRUCTION, INCLUDING MATERIALS, TEMPORARY PIPE, CRANE MATS, MAINTENANCE AND REMOVAL OF THE TEMPORARY FILL SHALL BE INCLUDED IN ITEM 603016-007.

CONCRETE SEALER

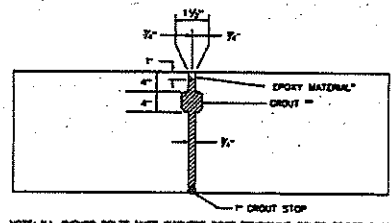
ALL CONCRETE SURFACES SHALL BE SEALED WITH A WYDOK-APPROVED CONCRETE SEALER IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. THE COST OF THE SEALER SHALL BE INCLUDED IN ITEM 601002-001.

FOUNDATION PROTECTION

- FOUNDATION PROTECTION MATERIAL FOR SCOUR PROTECTION SHALL BE UNIFORMLY GRADED AS FOLLOWS WITH A D50 SIZE OF 18":

STONE	% OF GRADATION SMALLER THAN
30"	100%
24"	85%
18"	50%
10"	15%
- THE STONE SHALL BE REASONABLY WELL GRADED THROUGHOUT THE SCOUR PROTECTION THICKNESS AS DETERMINED BY THE ENGINEER BY VISUAL INSPECTION.
- STONES SMALLER THAN THE SPECIFIED SIZE SHALL NOT BE PERMITTED IN ANY AMOUNT EXCEEDING 20% BY WEIGHT.
- MATERIAL SHALL CONSIST OF ROCK (MEDIUM HARD OR HARDER) OF A QUALITY SATISFACTORY TO THE ENGINEER AND SHALL BE PLACED PER SECTION 218 EXCEPT THAT NO TESTING SHALL BE REQUIRED.
- THE USE OF SHALE IS NOT PERMITTED.
- FOR ESTIMATION PURPOSES THE FOUNDATION PROTECTION WEIGHT SHALL BE ASSUMED AS 145 T/CY.
- ALL COST ASSOCIATED WITH PLACING THE FOUNDATION PROTECTION (INCLUDING EXCAVATION, EMBANKMENT AND CLEARING & GRUBBING NOT OTHERWISE INCLUDED IN THE ROADWAY CROSS-SECTIONS) SHALL BE INCLUDED IN ITEM 21806-000 FOUNDATION PROTECTION.

GROUTING DETAIL



NOTE: ALL ANCHOR BOLTS, NUTS, WASHERS, POST-TENSIONING BOLTS, BRIDGE QUADRANT ATTACHMENT HARDWARE, ELASTOMERIC BEARING PADS, EPOXY MATERIAL, SLAG TREATMENT, AND ALL OTHER BEAM HARDWARES SHALL BE INCLUDED IN THE UNIT BID FOR ITEM 603016-007.

* EPOXY MATERIAL TO BE "30A-OUR 42, GROUT PAK" AS MANUFACTURED BY THE SUELL CORPORATION, OR AN APPROVED EQUAL.

** GROUTING - IN ADDITION TO GROUTS MEETING SUBSECTION 781.5 OF THE STANDARD SPECIFICATIONS, AN EPOXY TYPE GROUT MAY BE USED WITH APPROVAL OF THE ENGINEER. "30A-OUR 42, GROUT-PAK" (SEE APPROVED EQUAL) MAY BE USED IN THE RECORD. AN ESTIMATED 75 - 50% BACE OF NON-SHRINK GROUT WILL BE REQUIRED FOR THIS PROJECT. (FOR INFORMATION ONLY.)

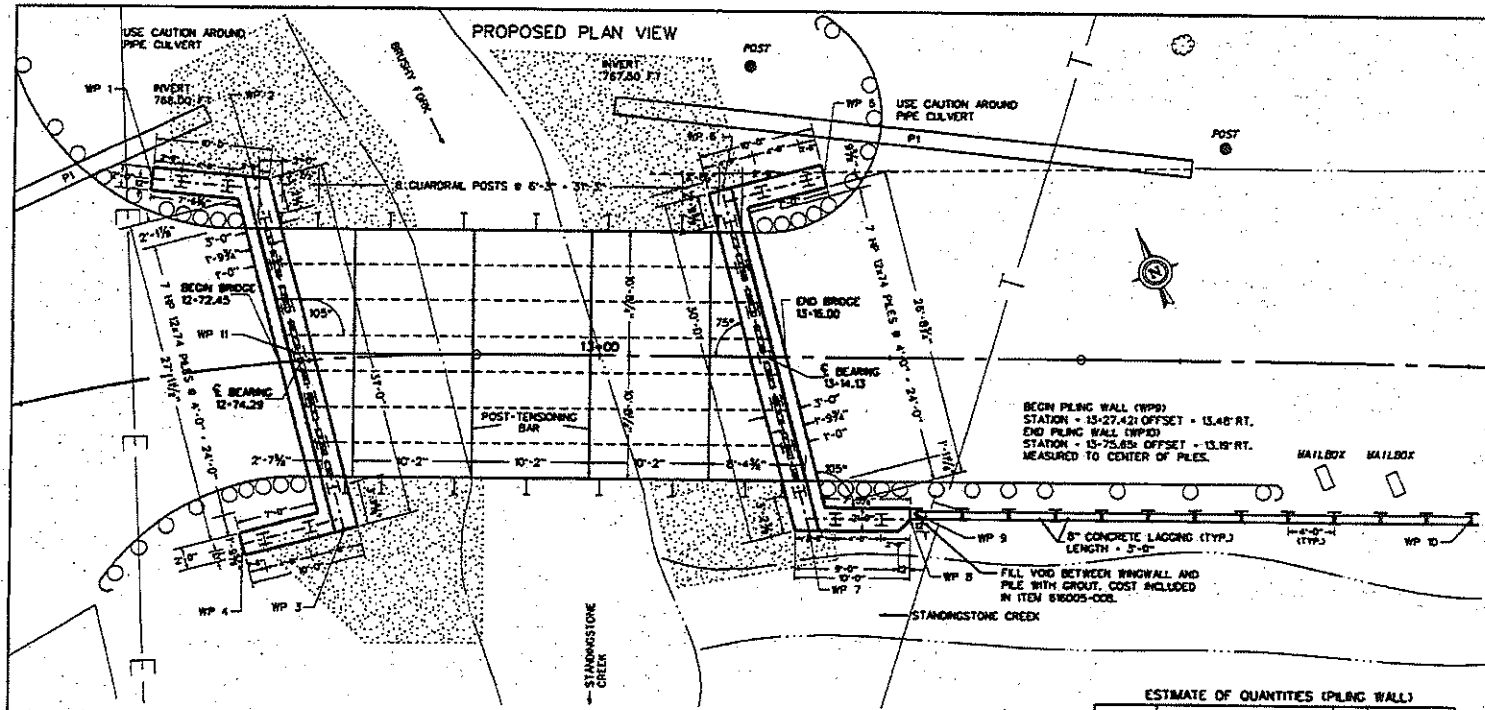
REVISED STANDARD DRAWINGS USED	
DRAWING	REVISION DATE

NO.	REVISION	DATE	BY
THE W.VA. DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS BRIDGE NO. 53-3-5-68 OVER BRUSHY FORK OF STANDING CREEK ON COUNTY ROUTE 3 (SLS) IN WRT COUNTY			
STRUCTURE NOTES & DETAILS			SHEET 12 OF 30 BRIDGE NUMBER 53-3-5-68 75605

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
5353-3-5-BB		3	WRT	13	30

PRE-DRILLING NOTES

- PILES SHALL BE PRE-DRILLED TO A DEPTH SUFFICIENT TO PROVIDE 3' OF PILE EMBEDMENT IN ROCK OR A MINIMUM PILE LENGTH OF 30' WHICHEVER IS GREATER.
- MINIMUM HOLE DIAMETER SHALL BE 20".
- THE DRILLED HOLE SHALL BE REASONABLY FREE OF FALL-IN SOIL OR OTHER DEBRIS IMMEDIATELY PRIOR TO GROUTING.
- THE HOLE SHALL BE PUMPED FREE OF WATER PRIOR TO PLACEMENT OF GROUT.
- PILE INSTALLATION AND GROUTING OF A HOLE IS TO BE COMPLETED ON THE SAME DAY AS THE DRILLING OF THE HOLE.
- THE REQUIRED 7-DAY COMPRESSIVE STRENGTH OF THE GROUT SHALL BE A MINIMUM OF 2000 PSI, TESTED PRIOR TO INSTALLATION.
- THE GROUT SHALL BE COMPOSED OF A MIXTURE OF 1 PART PORTLAND CEMENT AND 3 PARTS SAND MIXED WITH WATER TO PRODUCE A WORKABLE CONSISTENCY, THE AMOUNT SHALL BE DESIGNATED BY THE ENGINEER.
- THE PILE HOLES SHALL BE FILLED WITH GROUT TO AN ELEVATION THAT IS 1' BELOW THE BASE OF THE CONCRETE CAP. THE REMAINING 1' SHALL BE BACKFILLED WITH SAND.



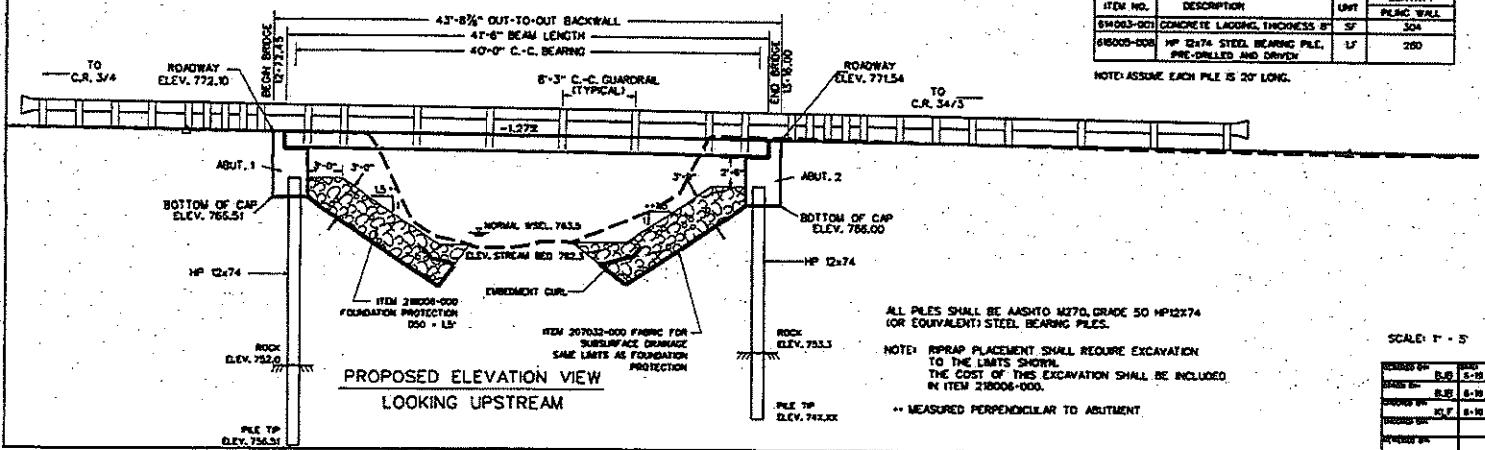
ESTIMATE OF QUANTITIES (PILING WALL)

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
61003-000	CONCRETE LAGGING THICKNESS 5"	SF	304
61005-000	HP 12x74 STEEL BEARING PILE, PRE-DRILLED AND DRIVEN	LF	200

NOTE: ASSUME EACH PILE IS 20' LONG.

WORKPOINT COORDINATES

WORKPOINT	NORTHING	EASTING
WP1	200,397.29	1,484,112.54
WP2	200,393.93	1,484,120.66
WP3	200,367.88	1,484,115.75
WP4	200,369.25	1,484,107.20
WP5	200,374.48	1,484,103.63
WP6	200,376.84	1,484,107.06
WP7	200,346.90	1,484,102.33
WP8	200,344.25	1,484,100.75
WP9	200,344.50	1,484,101.42
WP10	200,324.98	1,484,208.27
WP11	200,378.48	1,484,118.22



ALL PILES SHALL BE AASHTO M270, GRADE 50 HP12X74 (OR EQUIVALENT) STEEL BEARING PILES.

NOTE: RIPRAP PLACEMENT SHALL REQUIRE EXCAVATION TO THE LIMITS SHOWN. THE COST OF THIS EXCAVATION SHALL BE INCLUDED IN ITEM 218006-000.

** MEASURED PERPENDICULAR TO ABUTMENT.

NO.	REVISION	DATE	BY

THE W.VA. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRIDGE NO. 53-3-5-BB
OVER
BRUSHY FORK OF STANDINGSTONE CREEK
ON
COUNTY ROUTE 3 (SLS)
IN
WRT COUNTY

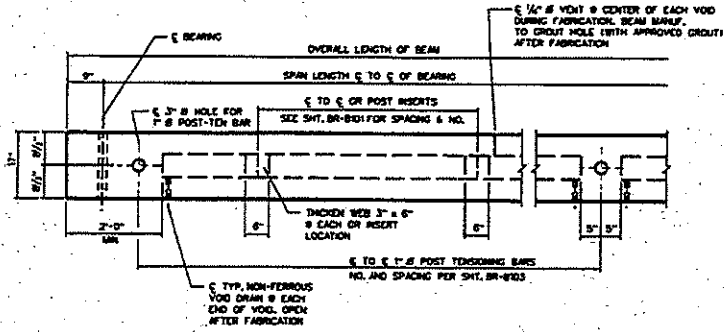
SCALE 1" = 5'

DESIGNED BY: [] DATE: 6-10
CHECKED BY: [] DATE: 6-10
DRAWN BY: [] DATE: 6-10
IN CHARGE BY: []

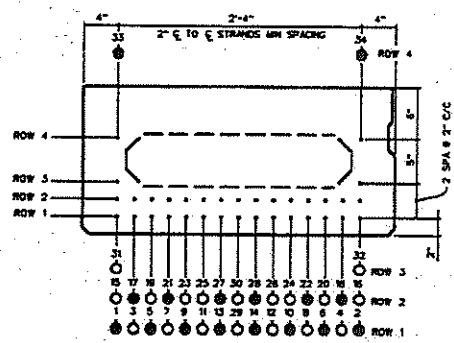
ABUTMENT LAYOUT

SHEET 13 OF 30
BRIDGE NUMBER 53-3-5-BB
11500

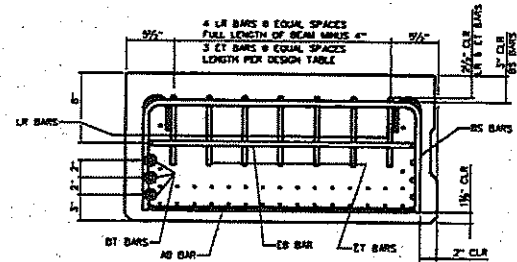
PROJECT NUMBER		DISTRICT	COUNTY	SHEET NO.	TOTAL
STATE	FEDERAL				
S353-5-5.68		3	WRT	17	30



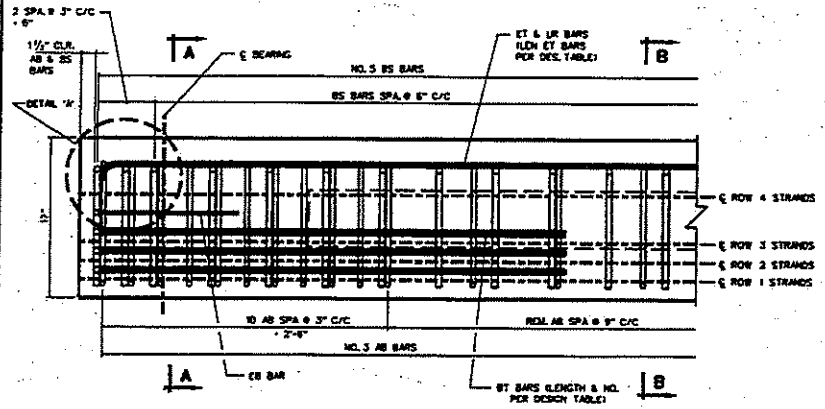
GENERAL ELEVATION VIEW



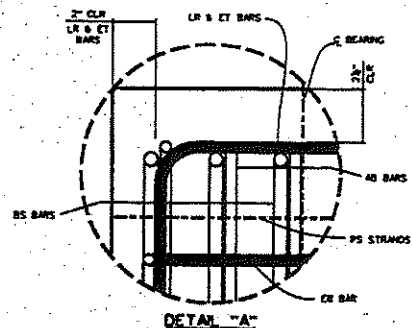
BEAM PRESTRESSING
TYPICAL @ BEAM END @ NORMAL



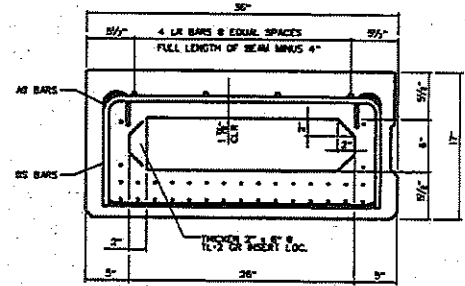
SECTION A-A



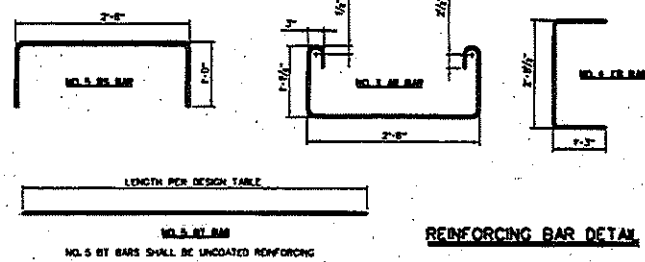
REINFORCING STEEL ELEVATION



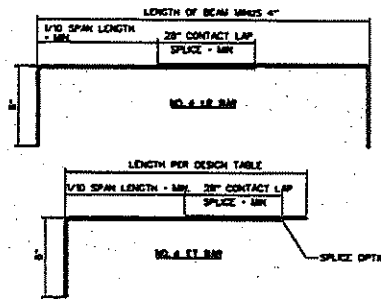
DETAIL 'A-A'



SECTION B-B



REINFORCING BAR DETAIL



- NOTES:**
- REFER TO SHEET BR-802A 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-801A, BR-802, BR-803, BR-804, BR-805A & B AND BR-806 AS APPLICABLE.

WHEN A POST-TENSION ACCESS POINT IS USED AS DETAILED ON SHEET BR-105 STRANDS IN ROWS 3 AND 4 SHALL BE CLIMBERED. THE BEAM SHALL BE REINFORCED AS NECESSARY.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

BRIDGE NO. 53-3-5.68
OVER
BRUSHY FORK
ON
COUNTY ROUTE 3 (SLS)
IN
WIRT COUNTY

17" PRESTRESSED CONCRETE
BOX BEAMS
DESIGN AND ASSEMBLY DETAILS

STANDARD SHEET BR-87A

DESIGNED BY/TW
CHECKED BY/TW
REVIEWED BY/TW
DATE: 6-19
SCALE:
SHEET 17 of 30
PROJECT NO. 53-3-5.68

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
5333-3-5.68		3	WRT	18	30

DESIGN DATA FOR 17" DEPTH ADJACENT BOX BEAM

SPAN LENGTH ϵ TO ϵ BEARING		20'-0"	22'-0"	24'-0"	26'-0"	28'-0"	30'-0"	32'-0"	34'-0"	36'-0"	38'-0"	40'-0"
OVERALL LENGTH OF BEAM		27'-6"	29'-6"	31'-6"	33'-6"	35'-6"	37'-6"	39'-6"	41'-6"	43'-6"	45'-6"	47'-6"
NO. OF 270 KSI, 1/2" ϕ LOW-RELAXATION STRANDS, AREA/STRAND = 0.167 SQ. IN.		10	10	10	10	12	12	14	14	16	16	16
STRAND POSITION NUMBER	ROW 1	12,11,12	12,11,12	12,11,12	12,11,12	12,7,8,13,14	12,7,8,13,14	12,7,8,13,14	12,5,8,9,10,13,14	12,5,8,9,10,13,14	12,5,8,9,10,13,14	12,5,8,9,10,13,14
	ROW 2	17,18,25,26	17,18,25,26	17,18,25,26	17,18,25,26	17,18,27,28	17,18,27,28	17,18,27,28	17,18,21,22,27,28	17,18,21,22,27,28	17,18,21,22,27,28	17,18,21,22,27,28
	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
PRESTRESSING FORCE IMMEDIATELY AFTER STRAND RELEASE, Ppl (KIPS/BEAM)		328	328	328	328	389	389	451	451	512	512	513
EFFECTIVE PRESTRESSING FORCE AFTER ALL LOSSES, P _{eff} (KIPS/BEAM)		293	293	294	294	345	346	396	397	443	445	447
REQUIRED FACTORED MOMENT @ STRENGTH L _u (FT-KIPS/BEAM)		264	231	260	269	319	349	382	415	453	491	531
FACTORED FLDURAL RESISTANCE, M _u (FT-KIPS/BEAM)		406	406	408	408	496	496	568	568	648	648	646
TOTAL NO. DEBONDED STRANDS		---	---	---	---	---	---	---	---	---	---	---
DEBONDED STRAND POSITION NUMBER & SHELDING LENGTH FROM EACH END	ROW 1	---	---	---	---	---	---	---	---	---	---	---
	ROW 2	---	---	---	---	---	---	---	---	---	---	---
NUMBER & LENGTH \pm 4 ET TOP TENSION BARS @ EACH END		3 - #4 x 3'-6"	3 - #4 x 3'-6"	3 - #4 x 4'-0"	3 - #4 x 4'-0"	3 - #4 x 4'-0"	3 - #4 x 4'-6"	3 - #4 x 4'-6"	3 - #4 x 5'-0"	3 - #4 x 5'-0"	3 - #4 x 5'-0"	3 - #4 x 5'-0"
NUMBER & LENGTH \pm 5 BT BOTTOM TENSION BARS @ EACH END		2 - #5 x 4'-0"	2 - #5 x 4'-0"	2 - #5 x 4'-6"	2 - #5 x 4'-6"	2 - #5 x 4'-6"	2 - #5 x 5'-0"	2 - #5 x 5'-0"	2 - #5 x 5'-0"	2 - #5 x 5'-0"	2 - #5 x 5'-0"	2 - #5 x 5'-0"
DESIGN CAMBER \pm POSITIVE (UP) INCHES	@ RELEASE	0.13	0.14	0.16	0.17	0.28	0.30	0.40	0.42	0.59	0.62	0.63
	@ ERECTION	0.21	0.24	0.26	0.27	0.45	0.47	0.64	0.65	0.95	0.95	0.95
	@ FINAL	0.27	0.28	0.30	0.30	0.53	0.53	0.71	0.69	1.03	0.98	0.82
NUMBER & SPACING OF TL-2 QUADRAL INSERTS	END OF BEAM TO ϵ OF FIRST INSERT E.A. END											2'-0"
	ϵ OF 1st INSERT TO ϵ OF 2nd INSERT E.A. END											3'-65"
WEIGHT OF TYPICAL BEAM INCLUDING DIAPHRAGM (TONS)		5.6	6.1	6.6	7.1	7.6	8.1	8.6	9.1	9.6	10.1	10.6

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.

- 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 135 LBS/DIAPHRAGM. FOR SKEW, ADD 17 LBS/DEGREE OF SKEW/END. FOR LONGER ENDBLOCK, ADD 163 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 THE MANUAL FOR QUALITY CONTROL, MFL-176, 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 $\pm 1/16$ 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 ϵ FIRST INSERT, AND ϵ FIRST INSERT TO ϵ SECOND INSERT, ABOVE VALUES SHALL BE BASED ON THE REQUIRED 6"-3" QUADRAL POST SPACING ACROSS THE BRIDGE.
7. SPECIAL STRAND NOTE FOR 17" BOX SECTION ONLY: WHEN TL-2 QUADRAL INSERTS ARE REQUIRED THE BOTTOM INSERT (TYPE 2A ANCHOR) CONFLICTS WITH STRAND NO. 15. STRANDS 15 AND 16 HAVE BEEN MOVED TO POSITIONS 17 AND 18, FOR UNIFORMITY PURPOSES. ALL BEAMS OF THE SAME DESIGN SHALL USE SAME STRAND PATTERN.
8. THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD SHEETS BR-817A, BR-817B, BR-817C, BR-817D, BR-817E, BR-817F, BR-817G, BR-817H, BR-817I, BR-817J, BR-817K, BR-817L, BR-817M, BR-817N, BR-817O, BR-817P, BR-817Q, BR-817R, BR-817S, BR-817T, BR-817U, BR-817V, BR-817W, BR-817X, BR-817Y, BR-817Z AS APPLICABLE.

DESIGNER: *[Signature]* DATE: 07-02-07
 CHECKED: *[Signature]* DATE: 07-02-07
 STANDARD SHEET BR-817B

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

BRIDGE NO. 53-3-5.68
 OVER
 BRUSHY FORK
 ON
 COUNTY ROUTE 3 (SL5)
 IN
 WRT COUNTY

**DESIGN TABLE FOR 17"
 PRESTRESSED BOX BEAM**

18 of 30

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE DIST. NO.	COUNTY	SHEET NO.	TOTAL SHEETS
5335-3-5.68		3	WRT	19	30

GOVERNING SPECIFICATIONS

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, ADOPTED [2017] 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 ALIGNMENT PRESTRESSED CONCRETE BRIDGE BEAMS ARE DESIGNED TO MEET THE FOLLOWING CRITERIA:

1. 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 WIDENING 321 PLF.

DIAPHRAGM DEAD LOAD, NUMBER REQUIRED BASED ON 15'-0" MAX. SPACING.

2. TWO LANE BRIDGE WITH AN OVERALL WIDTH OF 24'-5" (INCL. 1/2" GAP BETWEEN ADJ. BEAMS), A CURB-TO-CURB WIDTH OF 22'-1", TRANSVERSE POST-TENSIONING, AND ZERO SKEW.

3. DESIGN STRENGTH AND LIMIT STRESSES:

MINIMUM CONCRETE STRENGTH @ STRAND RELEASE ----- 6000 PSI

MINIMUM CONCRETE STRENGTH @ 28 DAYS ----- 8000 PSI

TEMPORARY STRESS LIMITS IN CONCRETE BEFORE LOSSES: -----

COMPRESSION STRESS LIMIT @ STRAND RELEASE ----- 3800 PSI

TENSION STRESS LIMIT @ STRAND RELEASE ----- -200 PSI

COMPRESSIVE STRESS LIMITS IN CONCRETE @ SERVICE (AFTER LOSSES): -----

@ FINAL 1 (PS-DL-LL) ----- 4800 PSI

@ FINAL 2 (PS-LL) ----- 3600 PSI

@ FINAL 3 (50XPS-DL-LL) ----- 3200 PSI

TENSILE STRESS LIMIT IN CONCRETE @ SERVICE (AFTER LOSSES): -----

@ FINAL 1 (PS-DL-LL) ----- -270 PSI

TENSION STRESS LIMIT PRIOR TO TRANSFER ----- 202.6 KSI

TENSION STRESS LIMIT AFTER ALL LOSSES ----- 84.4 KSI

4. DEBONDING OR SHELDDING 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.

SHELDDING OF STRANDS SHALL BE ACCOMPLISHED BY TAPING OR TIGHT FITTING PLASTIC TUBES TAPED AT EACH END.

5. 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 803 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 708.1 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 1/3 OF THE SPAN LENGTH.

MINIMUM BAR BENDING DIAMETER SHALL BE 6 BAR DIAMETERS, EXCEPT THAT NO. 4 AND 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" DIA, GRADE 270, 7 WIRE UNCOATED, LOW-RELAXATION STRAND MEETING THE REQUIREMENTS OF AASHTO M203, SUPPLEMENT 51.

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 STRAPPING 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. MINIMUM SHALL MEET ASTM C836-04.

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 81.2 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 80 DUROMETERS WITH A MINIMUM LOW TEMPERATURE GRADE OF 3 (20C C).

ALL STEEL REINFORCING SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 36.

GUARDRAIL, GUARDRAIL POSTS, TUBING & HARDWARE:

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	W6x25	AASHTO M270, GR 36	AASHTO M111
PLATE	1/2" x 7"	AASHTO M270, GR 36	AASHTO M111
TUBING	TS 84x2 1/2	ASTM A500, GR B	AASHTO M111
CHANNEL	C7x9.8	AASHTO M270, GR 36	AASHTO M111
FERRULE	TYPE 2A 1/2" x 5" x 2 1/2" MIN LEN.	ASTM A307 (ML17 STEEL)	AASHTO M232
WIRE	ANCHOR 3/8" x 5'	ASTM A310 (3016 STEEL)	AASHTO M232
STUDS	1/4" x 5" x 8" LONG	ASTM A307 (1045 C.D. STEEL)	AASHTO M232
NUTS	1/4" x 5"	AASHTO M231, CLASS C	AASHTO M232
COUPLERS	TYPE 1A 1/4" x 5" x 5" LONG	ASTM A307 (12154 STEEL)	AASHTO M232
BOLTS	ANCHOR 1/4" x 5" x 12" LONG	AASHTO M364 (TYPE L 190)	AASHTO M232
BOLTS	1/4" x 5" = ALL LEN.	AASHTO M364 (TYPE L 190)	AASHTO M232
NUTS	3/8" x 5"	AASHTO M231, CLASS C	AASHTO M232
WASHERS	ALL	AASHTO M293	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 D15.2002.

POST-TENSIONING BARS:

POST-TENSIONING THREAD BARS SHALL BE ONE INCH DIAMETER, 150 KSI STEEL, AND SHALL CONFORM TO AASHTO M275, TYPE 1. 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-463, 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-8103.

TEST PROCEDURE FOR DETERMINING THE COMPRESSIVE STRENGTH OF GROUT SHALL USE CUBE SPECIMENS IN ACCORDANCE WITH ASTM C109, AS MODIFIED BY ASTM C1097. 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 (SLANE). 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 SLANE 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. LINTANCE 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, CO-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 SHEETS BR-817A & B THRU BR-842A & B, BR-8101, BR-8102A & B, BR-8103, BR-8104, BR-8105A & B AND BR-8106 AS APPLICABLE.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

BRIDGE NO. 53-3-5.68
OVER
BRUSHY FORK
ON
COUNTY ROUTE 3 (SLS)
IN
WRT COUNTY

PRESTRESSED CONCRETE BEAM
DESIGN & ASSEMBLY NOTES

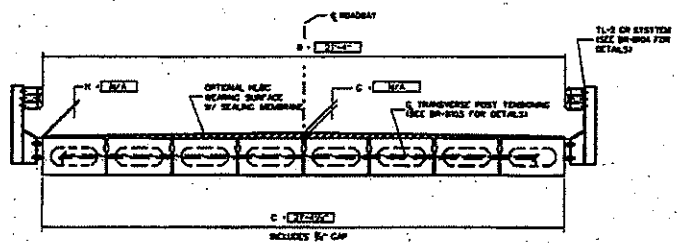
STANDARD SHEET BR-8100

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

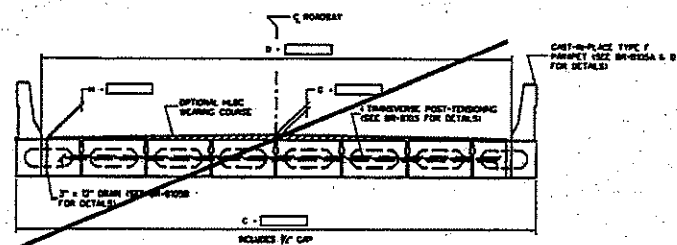
BRIDGE NO. 53-3-5.68
OVER
BRUSHY FORK
ON
COUNTY ROUTE 3 (SLS)
IN
WRT COUNTY

PRESTRESSED CONCRETE BEAM
DESIGN & ASSEMBLY NOTES

DESIGNED BY: []
CHECKED BY: []
REVISIONS: []
DATE: 07-02-07
SHEET NO. 19 OF 30
SERIES NUMBER 53-3-5.68
FLOOR



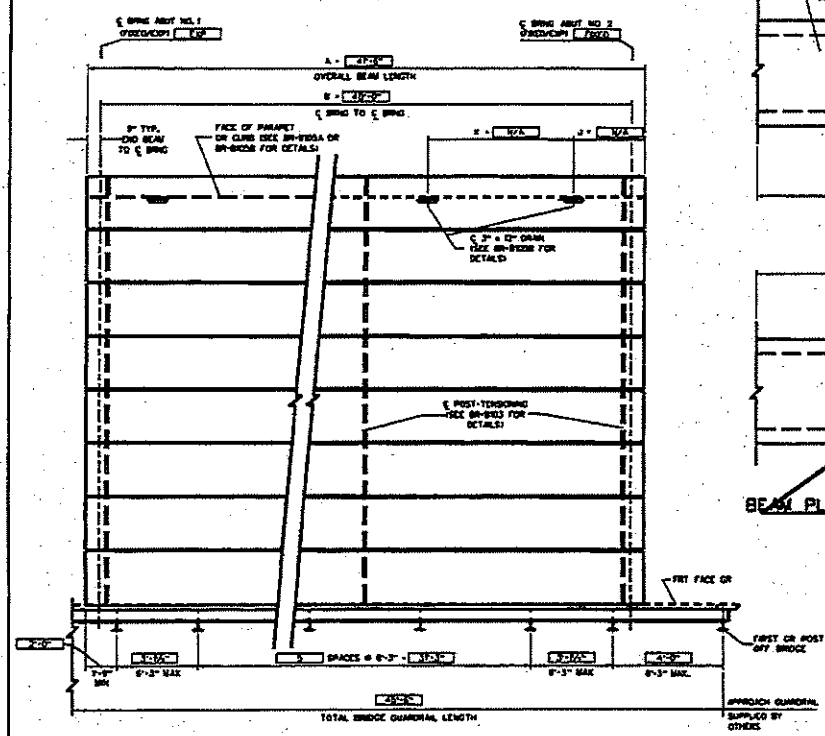
TYPICAL CROSS-SECTION WITH GUARDRAIL



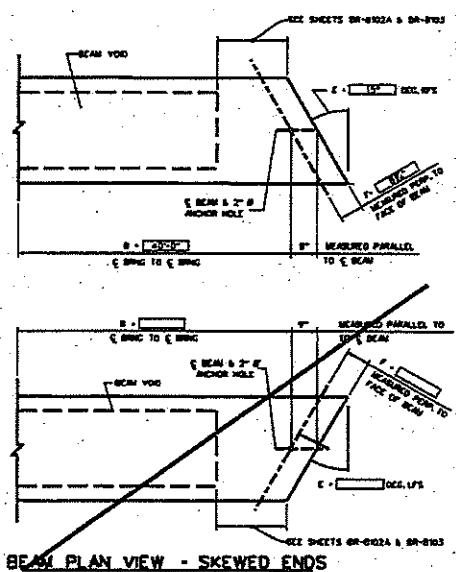
TYPICAL CROSS-SECTION WITH PARAPET OR CURB

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	SHEET NO.	DATE	SHEET NO.	TOTAL SHEETS
5353-3-5.68		3	WRT	20	30

CONTROL DIMENSIONS	
DESCRIPTION	CODE VALUE
OVERALL BEAM LENGTH	A 41'-6"
SPIN LENGTH & BEARING TO F BEARING	B 40'-0"
SUPERSTRUCTURE WIDTH - OUT TO OUT	C 21'-4 1/2"
ROADWAY WIDTH - FACE OF PARAPET TO FACE OF PARAPET	D 21'-4"
NUMBER OF BEAMS REQUIRED	7
BEAM SIZE (WIDTH x DEPTH)	36"x17"
BEAM ANGLE (NORMAL, DEG. NPS OR DEG. LPS)	E 15° RFS
PERPENDICULAR DISTANCE FROM FACE OF BEAM TO G BEARING	F 8 1/2"
H.L.C. WEARING COURSE REQUIRED (YES/NO)	NO
THICKNESS OF WEARING COURSE @ C OF DECK OR ROADWAY	G N/A
THICKNESS OF WEARING COURSE @ EDGE OF DECK OR PARAPET	H N/A
T.L.O. BROOK GUARDRAIL SYSTEM REQUIRED (YES/NO)	YES
FABRICATOR TO SUPPLY T.L.O. BRIDGE GUARDRAIL, ITEMS:	YES
FABRICATOR TO INSTALL BRIDGE GUARDRAIL, PRIOR TO SHIP LOADING (YES/NO) OF NO, FABRICATOR TO SHIP LOOSE:	NO
NUMBER OF GUARDRAIL POST SHEETS REQUIRED PER SIDE	0
TYPE F PARAPET REQUIRED (YES/NO)	NO
DILERS REQUIRED (YES/NO)	NO
NUMBER OF DRAINS REQUIRED PER SIDE	0
10" CURB REQUIRED (YES/NO)	NO



DECK PLAN VIEW



ESTIMATE OF QUANTITIES

ITEM NO.	DESCRIPTION	UNITS	QUANTITY
0000-001	PRESTRESSED CONCRETE BOX BEAM	Lf	290.5

- NOTES:
1. 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 0000-001 "PRESTRESSED CONCRETE BOX BEAM".
 2. THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD SHEETS BR-801A & B, BR-802A & B, BR-803, BR-804, BR-805A & B, AND BR-806.

DESIGNED BY	DATE
CHECKED BY	07-02-07
APPROVED BY	
STANDARD SHEET BR-801	

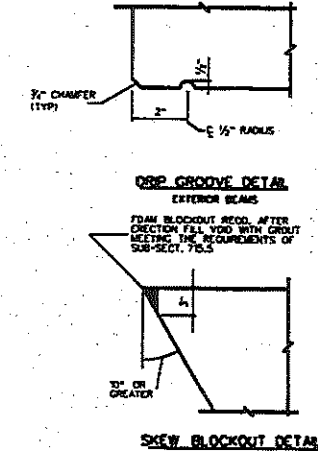
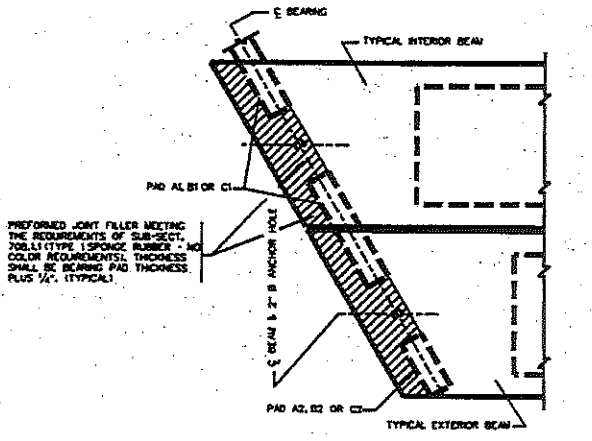
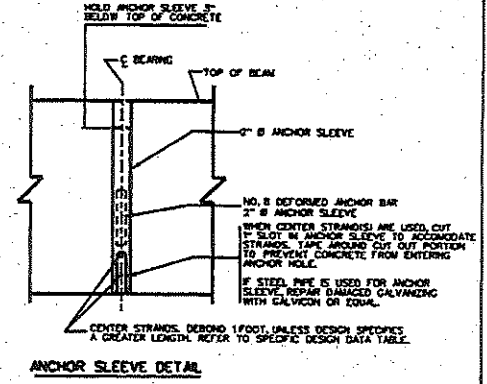
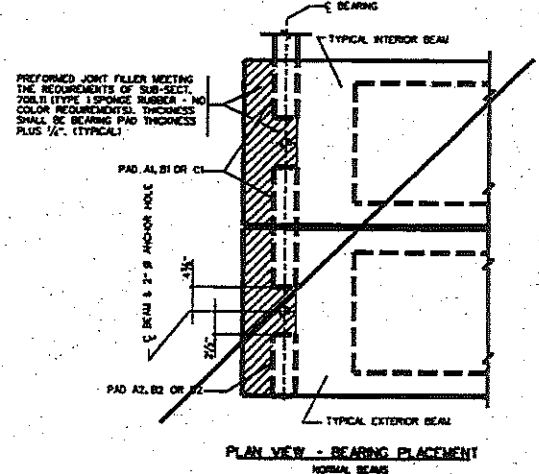
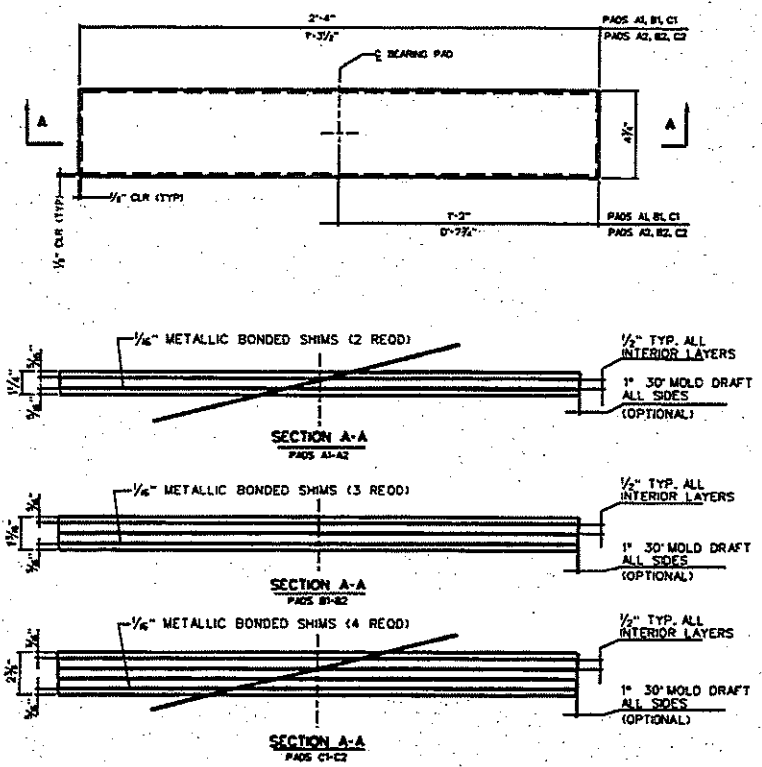
WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

BRIDGE NO. 53-3-5.68
OVER
BRUSHY FORK
ON
COUNTY ROUTE 3 (SLS)
IN
WRT COUNTY

PRESTRESSED CONCRETE BEAM
DESIGN & ASSEMBLY NOTES

20 of 30
DATE PLOTTED
05-25-08
TSCB

STATE	FEDERAL PROJECT NUMBER	STATE SHEET NO.	COUNTY	SHEET NO.	TOTAL SHEETS
VA	5353-3-5.6B	3	WRT	22	30



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 15 OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS.
- ALL BEARINGS ARE DESIGNED FOR A LOW TEMPERATURE ZONE C AND SHALL HAVE A DIAMETER HARDNESS OF 80. METALLIC REINFORCEMENT SHALL HAVE A MINIMUM YIELD STRENGTH OF 36 KSI. BEYONDED SOLE PLATES MAY BE USED.
- 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 BEYONDED SOLE PLATES MAY BE USED.
- DESIGNER, FABRICATOR AND ERECTOR SHALL BE AWARE THAT SKEWED END BEAMS MAY FIRST OR SECOND CAUSE UNIFORM BEAM SEASING 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 3/16 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 CONNECTION WITH STANDARD SHEETS BR-817A & B THRU BR-842A & B, BR-850L, BR-851, BR-852A, BR-853, BR-854, BR-855A & B AND BR-856 AS APPROPRIATE.

PAD	LENGTH	WIDTH	HEIGHT	NO. SHIMS	SHIM SIZE	SPAN RANGES	MAXIMUM REACTION	MAXIMUM MOVEMENT ONE DIRECTION
A1	47"	28"	1 1/4"	2	1/4" x 4 1/2" x 2'-3 1/2"	20' - 36'	55 KIPS	0.39"
B1	47"	28"	1 3/4"	3	1/4" x 4 1/2" x 2'-3 1/2"	40' - 78'	75 KIPS	0.80"
C1	47"	28"	2 3/4"	4	1/4" x 4 1/2" x 2'-3 1/2"	80' - 100'	88 KIPS	1.02"
A2	47"	15 1/2"	1 1/4"	2	1/4" x 4 1/2" x 2'-3 1/2"	20' - 36'	28 KIPS	0.39"
B2	47"	15 1/2"	1 3/4"	3	1/4" x 4 1/2" x 2'-3 1/2"	40' - 78'	38 KIPS	0.80"
C2	47"	15 1/2"	2 3/4"	4	1/4" x 4 1/2" x 2'-3 1/2"	80' - 100'	45 KIPS	1.02"

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

PREPARED BY: [Signature]
DATE: 07-02-07

STANDARD SHEET BR-8102B

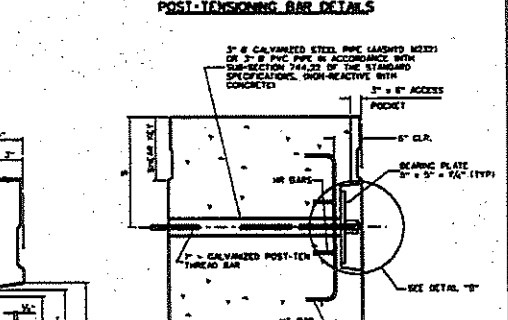
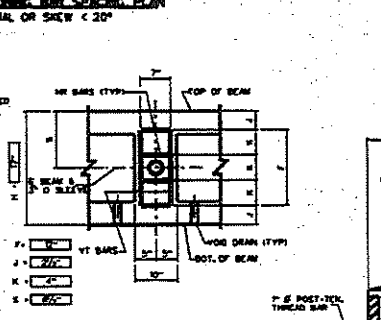
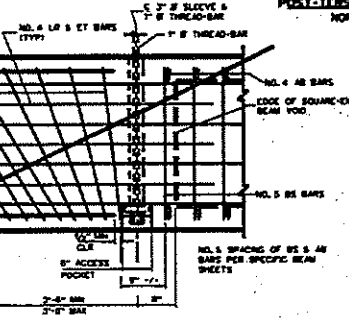
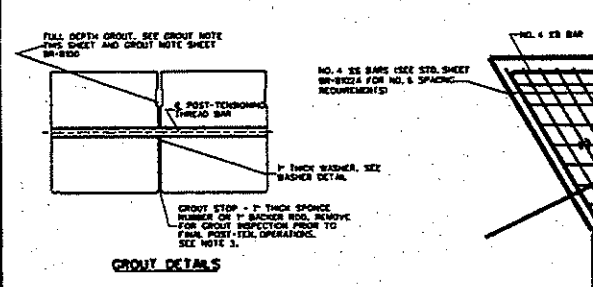
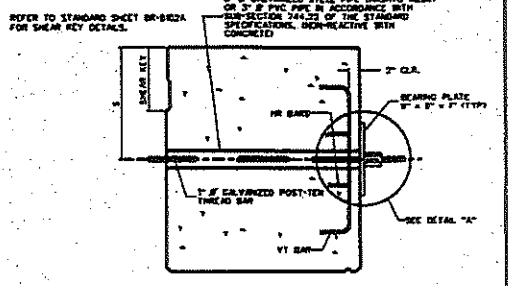
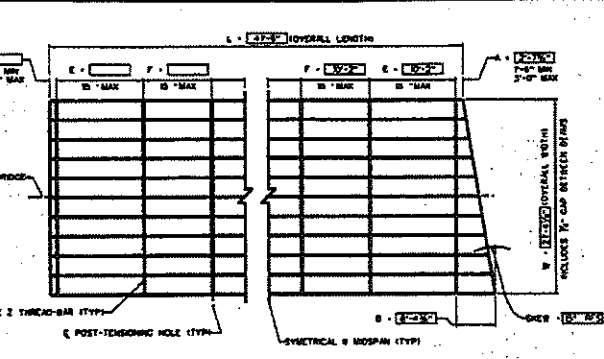
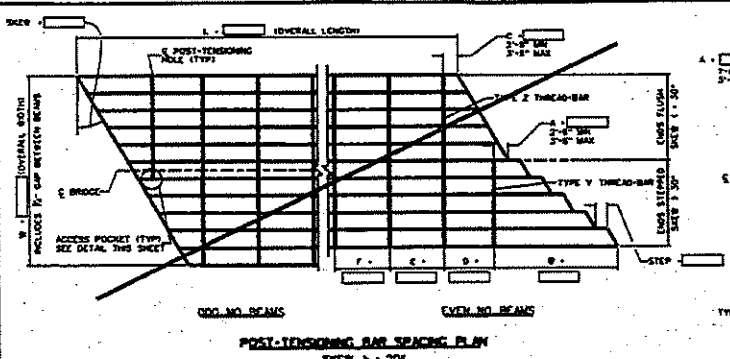
WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

BRIDGE NO. 53-3-5.6B
OVER
BRUSHY FORK
ON
COUNTY ROUTE 3 (SLS)
IN
WIRT COUNTY

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

DESIGNED BY: [Signature]
CHECKED BY: [Signature]
DATE: 6-19
SCALE:
SHEET: 22 of 30

SHEET	TYPICAL	DATE	COUNT	SHEET	TOTAL
PROJECT NUMBER	PROJECT NUMBER	REV.		NO.	SHEETS
5353-3-5.68		3	WRT	25	30



- PROCEDURE NOTES**
- INSTALL ONE EACH THIN WASHER AND CROUT 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. CROUT STOP MAY BE INSTALLED AFTER BEAMS ARE SET.
 - GLUE A 2" x 2" x 1/2" PIECE OF PRESSURE TREATED PLYWOOD AT EACH THREAD-BAR LOCATION TO INSURE THAT A 1/2" 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 ABUTTING 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 MINIMUM 1/2" WITH ALL SHEAR REMOVED. RECORD THE ACTUAL FORCE APPLIED.
 - FILL THE GAP BETWEEN BEAMS AND SHEAR KEY FULL DEPTH WITH THE PRE-APPROVED, PRE-TESTED CROUT MIXTURE, FROM EACH BEAM. PREPARE JOINT CONTROL CROUT CURBS FOR THREE AND SEVEN DAY TESTS. THESE JOINT CONTROL SAMPLES WILL BE USED TO DETERMINE WHEN THE CROUT 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 CROUT IS THE RESPONSIBILITY OF THE CONTRACTOR HOWEVER, A REPRESENTATIVE OF THE WYDOT SHALL WITNESS ALL OF THE ACCEPTANCE SAMPLING AND TESTING.
- TEST PROCEDURE SHALL BE ASTM C109 AS MODIFIED BY ASTM C1091, IN NO INSTANCE SHALL THE CONTRACTOR PROCEED WITH POST-TENSIONING OR OTHER BEAM ERECTION PROCEDURES UNTIL THE REQUIRED MINIMUM CROUT STRENGTH IS ATTAINED AND VERIFIED BY THE ENGINEER. IN THE EVENT THAT THE MINIMUM CROUT STRENGTH IS NOT ATTAINED, THE ENGINEER SHALL BE NOTIFIED AND CORRECTIVE ACTION TAKEN AT THE DIRECTION OF THE ENGINEER. SEE SHEAR KEY CROUT NOTE, SHEET BR-800 FOR ADDITIONAL REQUIREMENTS.
- AFTER THE CROUT HAS REACHED AN INITIAL SET CONDITION AND PRIOR TO ANY FINAL POST-TENSIONING PROCEDURES, THE CONTRACTOR SHALL REMOVE THE CROUT STOP AND INSPECT THE CROUT FOR HOLES OR OTHER DEFICIENCIES. ANY HOLES DEEPER THAN 1/2" FROM THE BOTTOM SHALL BE RECORDED IN A MANNER ACCEPTABLE TO THE ENGINEER.
- 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 CALCULATED JACKS. IF THE DIFFERENCE IS GREATER THAN 10%, THEN THE JACK SHALL BE RECALCULATED 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 CONNECTION SHALL BE AT THE CONTRACTOR'S EXPENSE.
 - USING SAW, TRIM EXCESS THREAD-BAR LEAVING 4" TO 6" PAST THE END. DO NOT TRIM THREAD-BARS BY TORCH CUTTING, TOUCH-UP TRIMMED ENDS WITH DIALYDOR OR EQUAL.
 - INSTALL ANCHOR BOWLS AS DETAILED ON STANDARD SHEETS BR-803 AND BR-802A.

SHEAR REINFORCEMENT DETAIL
BEAMS WITH ACCESS POCKETS

FINAL POST-TENSIONING FORCE

TYPE 2 BARS = 80 KIPS
TYPE V BARS = 40 KIPS

POST-TENSIONING BAR LAYOUT SCHEDULE

SPAN	40'-0"
SKEW	15° R/S
L	47'-6"
W	27'-0 1/2"
B	2'-7 1/2"
C	N/A
D	N/A
E	62'-0"
F	52'-0"
STEP	N/A

CROUT STRENGTH TABLE

PRE-TEST STRENGTH	3 DAY (PSI)	7 DAY (PSI)
JOB CONTROL STRENGTH		
CROUT TYPE & MANUFACTURE		

ELONGATION (INCHES)

BAR	DIA.	CALC.	MEASURED										
			NO. 1	NO. 2	NO. 3	NO. 4	NO. 5	NO. 6	NO. 7	NO. 8			
2	1/2												
3	3/4												

CALCULATED $\sigma = \frac{P}{A} \times \frac{L}{E}$
 CALCULATED $\epsilon = \frac{P}{A} \times \frac{L}{E} \times 1000$

DIMENSIONS

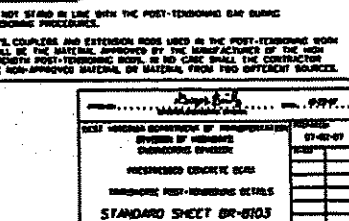
BEAM SIZE	REINFORCEMENT BAR SPACING (IN)
12	7 1/2
16	9 1/2
20	11 1/2
24	13 1/2
28	15 1/2
32	17 1/2
36	19 1/2
40	21 1/2
44	23 1/2
48	25 1/2

POST-TENSIONING BAR LENGTH

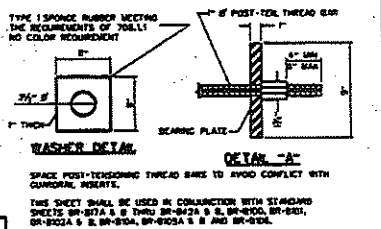
BAR	FORMULA	LENGTH
VIEWS	2-2	
Z	W-2	24'-0 1/2"
VIEWS	2-2-4	

- WASHER, BUSHING, NUT**
- DO NOT STAIN IN LINE WITH THE POST-TENSIONING BAR BURING TENSIONING PROCEDURES.
 - WASHER, BUSHING AND EXTENSION ROSE USED IN THE POST-TENSIONING WORK SHALL BE THE MATERIAL APPROVED BY THE MANUFACTURER OF THE HIGH STRENGTH POST-TENSIONING BODY. IN NO CASE SHALL THE CONTRACTOR USE NON-APPROVED MATERIAL, OR MATERIAL FROM TWO DIFFERENT SOURCES.

REINFORCING BAR DETAIL
ALL BARS ON 50' LAPARY COATED



ACCESS POCKET END POST-TENSIONING BAR



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

BRIDGE NO. 53-3-5.68
OVER
BRUSHY FORK
ON
COUNTY ROUTE 3 (SLS)
IN
WYRT COUNTY

DESIGNED BY THIS DIVISION
DRAWN BY: [Name]
CHECKED BY: [Name]
DATE: 6-15
SCALE: [Scale]

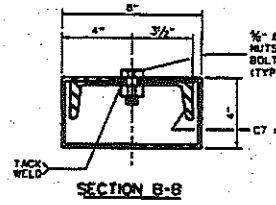
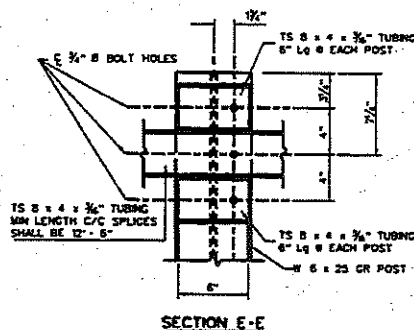
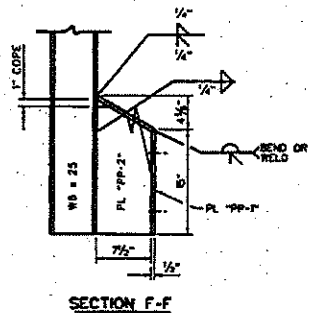
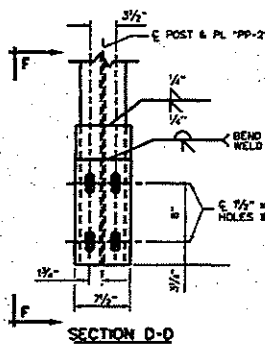
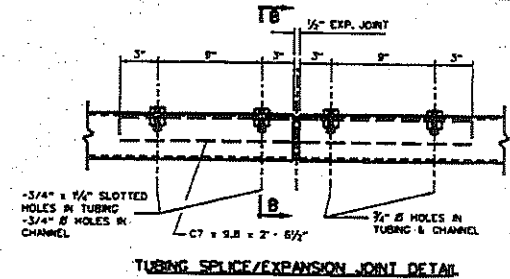
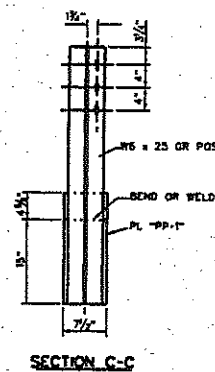
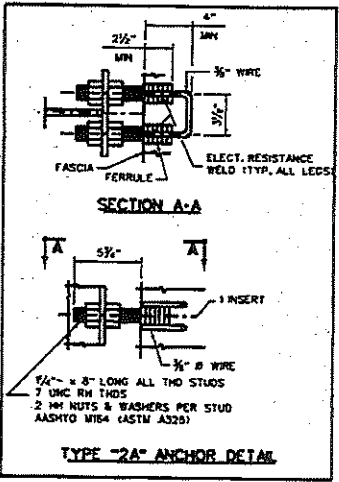
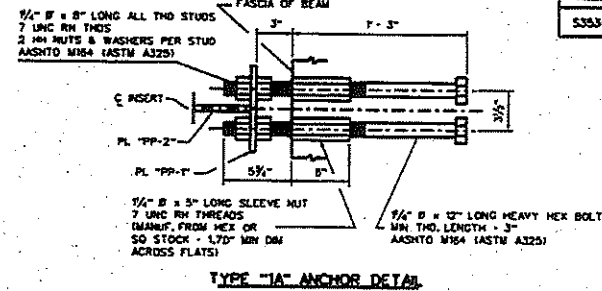
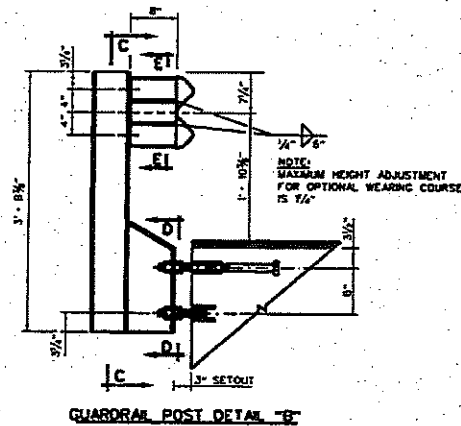
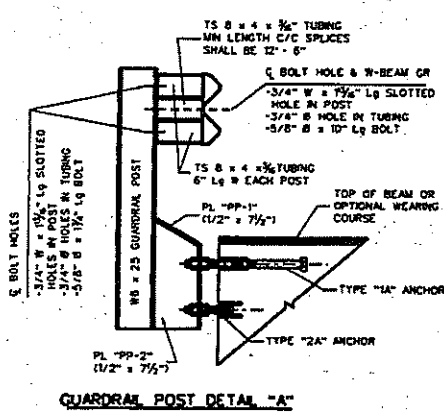
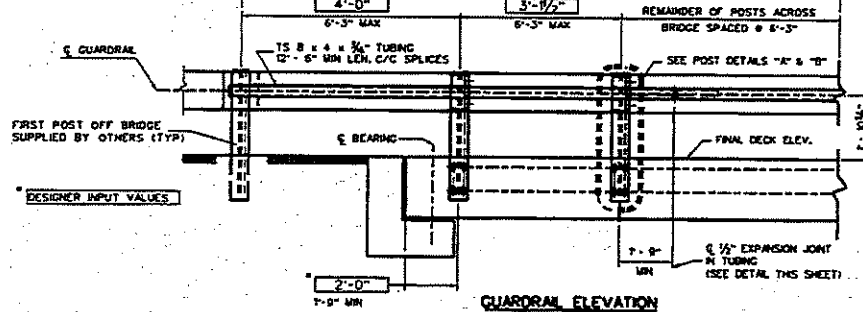
SHEET NO. 25 OF 30
STANDARD SHEET BR-803

STATE PROJECT NUMBER	FEDERAL PROJECT NUMBER	STATE SHEET NO.	COUNTY	SHEET NO.	TOTAL SHEETS
5353-3-5.68		3	WRT	24	30

BRIDGE APPROACH GUARDRAIL
SEE SHEETS CR-THRU GR-11,
STANDARD DETAILS BOOK
(SUPPLIED BY OTHERS).

NOTE TO BEAM FABRICATOR REFER TO BR-8101
FOR SUPPLY AND INSTALLATION REQUIREMENTS

45'-6" TOTAL BRIDGE GUARDRAIL LENGTH



DESIGNED BY	DATE
DRAWN BY	SCALE
CHECKED BY	
REVIEWED BY	
DATE	
SHEET NO.	24 OF 30
PROJECT NO.	53-3-5.68
TITLE	BRUSHY FORK ON COUNTY ROUTE 3 (SLS) IN WRT COUNTY PRESTRESSED CONCRETE BEAM TYPE TL-2 GUARDRAIL SYSTEM DESIGN & ASSEMBLY DETAILS

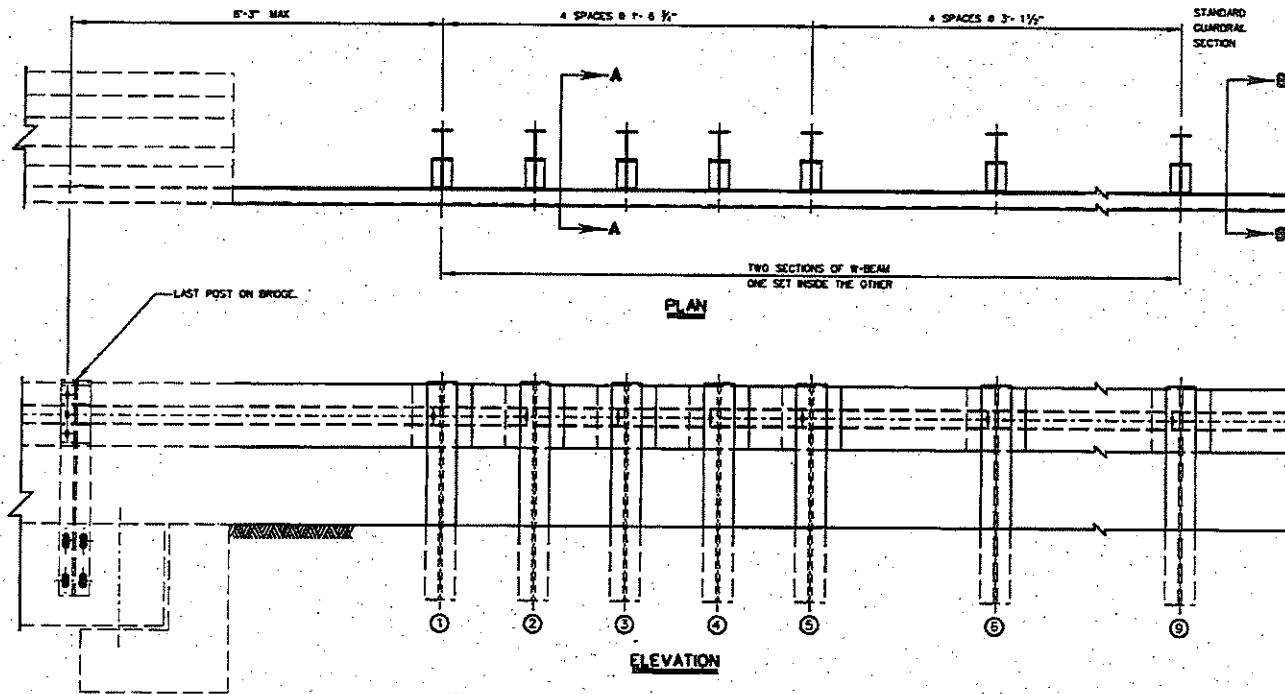
WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

BRIDGE NO. 53-3-5.68
OVER
BRUSHY FORK
ON
COUNTY ROUTE 3 (SLS)
IN
WRT COUNTY

PRESTRESSED CONCRETE BEAM
TYPE TL-2 GUARDRAIL SYSTEM
DESIGN & ASSEMBLY DETAILS

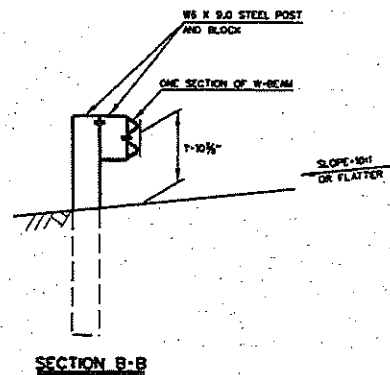
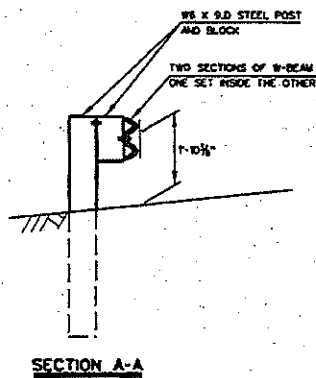
DESIGNED BY
DRAWN BY
CHECKED BY
REVIEWED BY
DATE
SCALE
SHEET NO. 24 of 30
PROJECT NO. 53-3-5.68
TITLE

PROJECT NUMBER		DISTRICT	COUNTY	SHEET NO.	TOTAL
STATE	FEDERAL				
5353-3-5.68		5	WVRT	25	30



NOTES

1. THIS GUARDRAIL TRANSITION IS APPROPRIATE FOR CONNECTION TO GUARDRAIL ON BRIDGE.
2. W-BEAM IS NOT BOLTED TO POSTS AT POSTS 2 THROUGH 4 AND POST 6.
3. SEE STANDARD SHEET BR-8104 FOR ANCHOR DETAILS.
4. THERE IS NO SEPARATE PAY ITEM FOR THIS CONNECTION AND ALL COMPONENTS AS DETAILED HEREIN SHALL BE INCLUDED IN THE CONTRACT PRICE FOR GUARDRAIL.



THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD SHEETS BR-817A & B THRU BR-842A & B, BR-8100, BR-8101, BR-8102A & B, BR-8103 AND BR-8104 AS APPLICABLE.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

BRIDGE NO. 53-3-5.68
OVER
BRUSHY FORK
ON
COUNTY ROUTE 3 (SLS)
IN
WIRT COUNTY


TYPE 1L-2 GUARDRAIL TRANSITION

DESIGNED BY/REV	
CHECKED BY/REV	
REVIEWED BY/REV	
DATE	6-12
SCALE	
SHEET	25 OF 30
DATE	5-25-06
SCALE	1/8\"/>

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS ENGINEERING DIVISION	DATE: 07-02-07
PREFABRICATED CONCRETE BEAM TYPE 1L-2 GUARDRAIL SYSTEM DESIGN & ASSEMBLY DETAILS	
STANDARD SHEET BR-8105	

Exhibit A Pricing Page

CRFQ DOT2000000016

Item Number	Quantity	Unit of Measure	Description	Unit Price	Total Cost
1	249	Square Feet	Exterior Beam Section: 17" Prestressed Concrete Box Beams (3' Wide). 2 Beams at 41'-6" Overall Length. Skew = 15° Right Forward	89.00	22161.00
2	622.5	Square Feet	Interior Beam Section: 17" Prestressed Concrete Box Beams (3' Wide). 5 Beams at 41'-6" Overall Length. Skew = 15° Right Forward	89.00	55402.50
3	12	Each	1-13/16" Elastomeric Laminated Bearing Pads (60 Duro Hardness) B1 pads (4-3/4" x 28")	190.00	2280.00
4	4	Each	1-13/16" Elastomeric Laminated Bearing Pads (60 Duro Hardness) B2 Pads (4-3/4" x 15-1/2")	190.00	760.00
5	14	Each	1" Diameter x 2'-0" Swedged Anchor Bolt or No. 8 Deformed Reinforcing Bar (Grade 60) Galvanized	10.00	140.00
6	29	Square Feet	2-1/8" Thick Sponge Rubber Preformed Joint Filler at Bearings 22.2 LF @ 6-3/8" Wide = 11.8 SF/End, 24 SF Total 5.4 LF @ 4-3/4" Wide = 2.2 SF/End, 5 SF Total	10.00	290.00
7	63	Square Feet	1" Thick Sponge Rubber Preformed Joint Filler at Beam Ends 22.2 LF @ 17" Wide = 31.5 SF/End, 63 SF Total	10.00	630.00
8	16	Each	Guardrail Attachment Assembly for Box Beams with Studs, Nuts, and Washers	333.00	5328.00
9	97.5	Linear Feet	1" Diameter Post-Tensioning Thread Bar w/10 Hardened Nuts 4 Bars @ 24'-4 1/2"	15.00	1462.50
10	8	Each	Bearing Plate 9"x9"x1"	50.00	400.00
11	16	Each	Type TL-2 Bridge Guardrail Posts	500.00	8,000.00
12	91	Linear Feet	Type TL-2 Bridge Guardrail	100.00	9,100.00
13	249	Linear Feet	1" Grout Stop	.50	124.50
14	24	Each	1"x 8"x 8" Washer, with a 3-1/2" diameter hole in the center.	10.00	240.00
Total Bid Amount 					106,318.50

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: EASTERN Vault Co., Inc.

Authorized Signature: [Signature] Date: 8-16-19

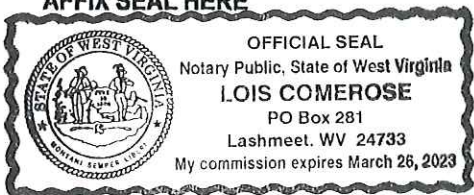
State of West Virginia

County of Merces, to-wit:

Taken, subscribed, and sworn to before me this 16th day of August, 2019

My Commission expires March 26, 2023

AFFIX SEAL HERE



NOTARY PUBLIC [Signature]

West Virginia Ethics Commission



Disclosure of Interested Parties to Contracts

Pursuant to *W. Va. Code* § 6D-1-2, a state agency may not enter into a contract, or a series of related contracts, that has/have an actual or estimated value of \$1 million or more until the business entity submits to the contracting state agency a Disclosure of Interested Parties to the applicable contract. In addition, the business entity awarded a contract is obligated to submit a supplemental Disclosure of Interested Parties reflecting any new or differing interested parties to the contract within 30 days following the completion or termination of the applicable contract.

For purposes of complying with these requirements, the following definitions apply:

"Business entity" means any entity recognized by law through which business is conducted, including a sole proprietorship, partnership or corporation, but does not include publicly traded companies listed on a national or international stock exchange.

"Interested party" or *"Interested parties"* means:

- (1) A business entity performing work or service pursuant to, or in furtherance of, the applicable contract, including specifically sub-contractors;
- (2) the person(s) who have an ownership interest equal to or greater than 25% in the business entity performing work or service pursuant to, or in furtherance of, the applicable contract. (This subdivision does not apply to a publicly traded company); and
- (3) the person or business entity, if any, that served as a compensated broker or intermediary to actively facilitate the applicable contract or negotiated the terms of the applicable contract with the state agency. (This subdivision does not apply to persons or business entities performing legal services related to the negotiation or drafting of the applicable contract.)

"State agency" means a board, commission, office, department or other agency in the executive, judicial or legislative branch of state government, including publicly funded institutions of higher education: Provided, that for purposes of *W. Va. Code* § 6D-1-2, the West Virginia Investment Management Board shall not be deemed a state agency nor subject to the requirements of that provision.

The contracting business entity must complete this form and submit it to the contracting state agency prior to contract award and to complete another form within 30 days of contract completion or termination.

This form was created by the State of West Virginia Ethics Commission, 210 Brooks Street, Suite 300, Charleston, WV 25301-1804. Telephone: (304)558-0664; fax: (304)558-2169; e-mail: ethics@wv.gov; website: www.ethics.wv.gov.

West Virginia Ethics Commission
Disclosure of Interested Parties to Contracts

(Required by W. Va. Code § 6D-1-2)

Name of Contracting Business Entity: EASTERN VAULT CO. INC. Address: PO BOX 1134
PRINCETON WV 24740

Name of Authorized Agent: BRIAN P. STRUBLE Address: SAME -

Contract Number: DOT 2000000016 Contract Description: PRESTRESSED BEAM

Governmental agency awarding contract: WV DOH

Check here if this is a Supplemental Disclosure

List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below (attach additional pages if necessary):

1. Subcontractors or other entities performing work or service under the Contract

Check here if none, otherwise list entity/individual names below.

2. Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)

Check here if none, otherwise list entity/individual names below.

3. Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)

Check here if none, otherwise list entity/individual names below.

Signature: [Signature] BRIAN P. STRUBLE Date Signed: 8-16-19

Notary Verification

State of West Virginia, County of Mercer:

I, BRIAN P. STRUBLE, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this 16th day of August, 2019.

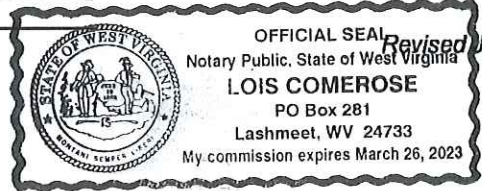
[Signature]
Notary Public's Signature

To be completed by State Agency:

Date Received by State Agency: _____

Date submitted to Ethics Commission: _____

Governmental agency submitting Disclosure: _____



Revised June 8, 2018