



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division Of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0440 • 304/558-3505

Joe Manchin III
Governor

January 16, 2007

MEMORANDUM

TO: ALL HOLDERS OF STANDARD DETAILS BOOK, VOLUME 3

FROM: GREGORY L. BAILEY, DIRECTOR *Gregory Bailey*
ENGINEERING DIVISION

SUBJECT: ADDENDUM 1 TO THE 1999 STANDARD DETAILS BOOK, VOLUME 3

Attached for your use is Addendum 1 to the 1999 Standard Details Book, Volume 3. This addendum is necessary to revise the West Virginia Department of Transportation, Division of Highways, Standard Details Volume 3 dated August 1, 1999.

Also included in this package are the updated index and copies of the Standard Details that are affected. The revisions are as follows:

- Remove and destroy the existing index and replace it with the attached revised index. Revisions to the index are shown in ***bold/italic*** print.
- Add the attached Standard Details, dated December 2006.

Please note that this addendum adds all Standard Detail pages with prefix BRD-* which consist of AASHTO Type II, III, IV, IV Modified, IV-J, and 17" thru 42" P.C. spread box beams.

Any questions concerning this addendum should be directed to Mr. Lovell Facemire at (304) 558-9752.

GLB:Ts

Attachments

PROJECT NUMBERS		DISTRICT	COUNTY	SHEET NO.	TOTAL
STATE	FEDERAL				

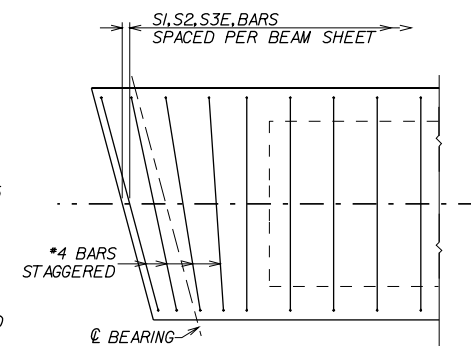
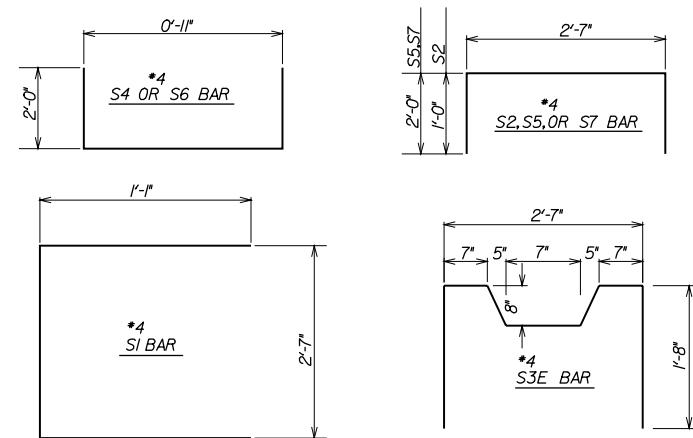
BR-1
BR-1
BR-1
BR-1A
BR-1A
BR-1A
BR-2A
BR-2B
BR-7S
BR-7S
BR-10
BR-10A
BR-11
BR-11M
BR-12
BR-12L
BR-13
BR-P13
BR-P14
BR-P15
BR-P16
BR-P17
BR-P17
BR-14
BR-14S
BR-14S
BR-15
BR-16
BR-17
BR-17
BR-17A
BR-S12A
BR-S12B
BR-B17A
BR-B17B
BR-B21A
BR-B21B
BR-B27A
BR-B27B
BR-B33A
BR-B33B
BR-B42A
BR-B42B
BR-B100
BR-B101
BR-B102
BR-B103
BR-B104
BR-T1
BR-T1
BR-T1
BR-T2
BR-T3
BR-T4
BR-T5
BR-T6

SUPERSTRUCTURE PLAN-NORMAL CROSSING
SUPERSTRUCTURE PLAN-LEFT FORWAD SKEW
SUPERSTRUCTURE PLAN-RIGHT FORWARD SKEW
SUPERSTRUCTURE PLAN ON PILING NORMAL CROSSING
SUPERSTRUCTURE PLAN ON LEFT FORWARD SKEW
SUPERSTRUCTURE PLAN ON PILING RIGHT FORWARD SKEW
GENERAL NOTES
GENERAL NOTES
CONCRETE ABUTMENT BRIDGE SEAT DETAILS-LT. FORWARD SKEW
CONCRETE ABUTMENT BRIDGE SEAT DETAILS-RT. FORWARD SKEW
STEEL BEAM STRINGERS AND TIMBER DECK
DOWEL LAMINATED TIMBER DECK
STEEL BEAM STRINGERS AND STEEL GRID DECK
MODIFIED STEEL GRID DETAILS-OPEN TYPE
SHOE ASSEMBLY DETAILS-SPAN 60'-0" OR LESS
SHOE ASSEMBLY DETAILS
CONCRETE ABUTMENT LAYOUT
CONCRETE ABUTMENT ON PILING
CONCRETE ABUTMENT ON PILING-REINFORCING STEEL DETAILS
CONCRETE ABUTMENT ON PILING-LEFT WINGWALL DETAILS
CONCRETE ABUTMENT ON PILING-RIGHT WINGWALL DETAILS
CONCRETE ABUTMENT ON PILING-RANGE 1, 2, & 3
CONCRETE ABUTMENT ON PILING-RANGE 4 & 5
REINFORCED CONCRETE ABUTMENT-REINFORCING STEEL DETAILS
BRIDGE SEAT DETAILS-LEFT FORWARD SKEW
BRIDGE SEAT DETAILS-RIGHT FORWARD SKEW
LEFT WINGWALL DETAILS
RIGHT WINGWALL DETAILS
ABUTMENT FOOTING-RANGE 1, 2, & 3
ABUTMENT FOOTING-RANGE 4 & 5
ABUTMENT FOOTING
12" PRESTRESSED PLANK BEAM DESIGN AND ASSEMBLY DETAILS
DESIGN TABLE FOR 12" PRESTRESSED PLANK BEAM
17" PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS
DESIGN TABLE FOR 17" PRESTRESSED BOX BEAM
21" PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS
DESIGN TABLE FOR 21" PRESTRESSED BOX BEAM
27" PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS
DESIGN TABLE FOR 27" PRESTRESSED BOX BEAM
33" PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS
DESIGN TABLE FOR 33" PRESTRESSED BOX BEAM
42" PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS
DESIGN TABLE FOR 42" PRESTRESSED BOX BEAM
PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS
PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS
PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS
PRESTRESSED BOX BEAM TRANSVERSE POST-TENSIONING DESIGN AND ASSEMBLY DETAILS
PRESTRESSED BOX BEAM DESIGN AND ASSEMBLY DETAILS
GLULAM TIMBER SUPERSTRUCTURE PLAN-NORMAL CROSSING
GLULAM TIMBER SUPERSTRUCTURE PLAN-RIGHT FORWARD SKEW
GLULAM TIMBER SUPERSTRUCTURE PLAN-LEFT FORWARD SKEW
GLULAM TIMBER SUPERSTRUCTURE PLAN-GENERAL NOTES
GLULAM TIMBER SUPERSTRUCTURE DECK FASTENING DETAILS
GLULAM TIMBER SUPERSTRUCTURE DIAPHRAGM DETAILS
GLULAM TIMBER SUPERSTRUCTURE-GUARDRAIL POST DETAILS
GLULAM TIMBER SUPERSTRUCTURE-GIRDER ANCHORAGE DETAILS

BR-PP2
BR-PP3
BR-PS1
BR-PS2
BR-PS3
BRD-B 17X36
BRD-B 21X36
BRD-B 27X36
BRD-B 33X36
BRD-B 39X36
BRD-B 42X36
BRD-II 36X12
BRD-III 45X16
BRD-IV 54X20
BRD-IVJ 60X37
BRD-IVJ 60X43
BRD-IVJ 60X49
BRD-IVJ 60X61
BRD-IVJ 66X37
BRD-IVJ 66X43
BRD-IVJ 66X49
BRD-IVJ 66X61
BRD-IVJ 72X37
BRD-IVJ 72X43
BRD-IVJ 72X49
BRD-IVJ 72X61
BRD-IVJ 78X37
BRD-IVJ 78X43
BRD-IVJ 78X49
BRD-IVJ 78X61
BRD-IVJ 84X37
BRD-IVJ 84X43
BRD-IVJ 84X49
BRD-IVJ 84X61
BRD-IVM 60X36
BRD-IVM 66X36
BRD-IVM 72X36
BRD-IVM 78X36
BRD-IVM 84X36

REINFORCED CONCRETE PIER ON PILES LAYOUT
REINFORCED CONCRETE PIER STEM DETAILS (SQUARE NOSE)
REINFORCED CONCRETE PIER STEM DETAILS (ROUND NOSE)
REINFORCED CONCRETE PIER FOOTING ON PILING
REINFORCED CONCRETE PIER LAYOUT
17" P.C. SPREAD BOX BEAM
21" P.C. SPREAD BOX BEAM
27" P.C. SPREAD BOX BEAM
33" P.C. SPREAD BOX BEAM
39" P.C. SPREAD BOX BEAM
42" P.C. SPREAD BOX BEAM
AASHTO TYPE II 36" PRECAST CONCRETE BEAM
AASHTO TYPE III 45" PRECAST CONCRETE BEAM
AASHTO TYPE IV 54" PRECAST CONCRETE BEAM
AASHTO TYPE IV-J PC BEAM 60" DEEP, 37" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 60" DEEP, 43" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 60" DEEP, 49" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 60" DEEP, 61" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 66" DEEP, 37" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 66" DEEP, 49" TOP FLANGE
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AASHTO TYPE IV-J PC BEAM 66" DEEP, 61" TOP FLANGE
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AASHTO TYPE IV-J PC BEAM 72" DEEP, 43" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 72" DEEP, 49" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 72" DEEP, 61" TOP FLANGE
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AASHTO TYPE IV-J PC BEAM 78" DEEP, 43" TOP FLANGE
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AASHTO TYPE IV-J PC BEAM 78" DEEP, 61" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 84" DEEP, 37" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 84" DEEP, 43" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 84" DEEP, 49" TOP FLANGE
AASHTO TYPE IV-J PC BEAM 84" DEEP, 61" TOP FLANGE
AASHTO TYPE IV MODIFIED 60" PRECAST CONCRETE BEAM
AASHTO TYPE IV MODIFIED 66" PRECAST CONCRETE BEAM
AASHTO TYPE IV MODIFIED 72" PRECAST CONCRETE BEAM
AASHTO TYPE IV MODIFIED 78" PRECAST CONCRETE BEAM
AASHTO TYPE IV MODIFIED 84" PRECAST CONCRETE BEAM

NO.	REVISION	DATE:	BY:
WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS ENGINEERING DIVISION			
DESIGNED	DATE		
	12/5/06		
DRAWN			
CHECKED			
REVIEWED			
APPROVED		SHEET OF	
DIRECTOR ENGINEERING DIVISION		BRIDGE NO.	

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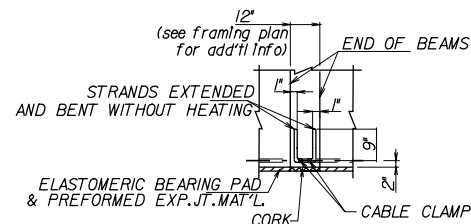
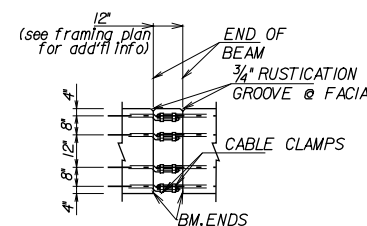
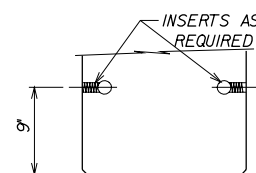
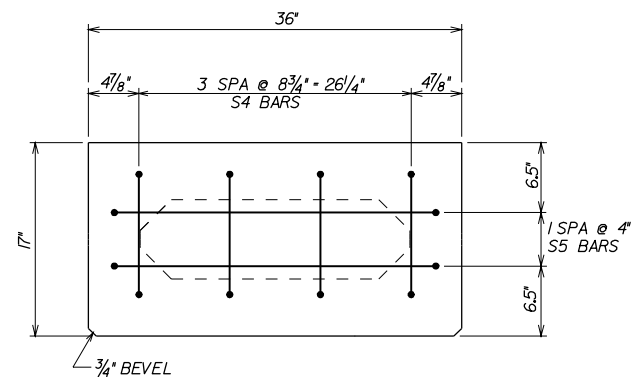
DEBONDING OF STRANDS			
GROUP	NUMBER OF STRANDS EA. GROUP	HEIGHT OF STRAND (IN)	SHIELDING LENGTH FROM EA. BM. END (IN)

REINFORCING BAR LIST				
MARK	TYPE	COUNT/BEAM		LENGTH
		A ₁ , B ₁ , C ₁	A ₂ , B ₂ , C ₂	
S1	BENT			
S2	BENT			
S3E	BENT			
S4	BENT			
S5	BENT			
S6	BENT			
S7	BENT			

NO.	REVISION	DATE:	BY:

DESIGNED	DATE 12/5/06
DRAWN	
CHECKED	
REVIEWED	

SHEET	OF
BRIDGE NO.	

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PROJECT NUMBERS		DISTRICT	COUNTY	SHEET NO.	TOTAL
STATE	FEDERAL				

NOTES:

THE CONCRETE SHALL ATTAIN A COMPRESSIVE STRENGTH OF AT LEAST XXX psi,AS SHOWN BY STANDARD CYLINDERS CURED IDENTICALLY WITH THE BEAMS,BEFORE TRANSFERRING BOND STRESS TO THE CONCRETE;OR BEFORE RELEASING THE END ANCHORS.CYLINDER STRENGTH SHALL BE XXX psi WITHIN 28 DAYS.

PRETENSIONED XXXX P.C.BOX BEAMS SHALL BE USED.APPLY AN INITIAL FORCE OF XXXX lbs TO EACH LOW-RELAXATION STRAND.THE DEPARTMENT WILL REJECT THE BEAMS IF THE FINISHED UNITS CONTAINED HONEYCOMBED CONCRETE TO THE EXTENT THAT THE ENGINEER DETERMINES THE STRENGTH OR DETERIORATION RESISTANCE IS REDUCED.BEAM SHORTENING DUE TO SHRINKING AND ELASTIC CHANGES IS LIMITED TO 0.0005L.

PRESTRESSING STRANDS SHALL BE 1/2" NOMINAL DIA.GRADE 270, UNCOATED SEVEN WIRE LOW-RELAXATION STRAND IN ACCORDANCE WITH AASHTO M203.THE STRANDS SHALL BE PLACED SYMMETRICALLY IN EACH LAYER.SHOP DRAWINGS SHALL SHOW THE STRAND LOCATIONS AND THE DETENSIONING PLAN BY NUMBERING THE SEQUENCE OF THE STRAND PATTERN.THE SHOP DRAWINGS SHALL ALSO SHOW THE STRAND PATTERN FOR DEBONDED STRANDS.

ROUGHEN THE TOP SURFACE OF EACH BEAM TO AN AMPLITUDE OF APPROXIMATELY 1/4" AND MAINTAIN CLEAN AND FREE OF LAITANCE.

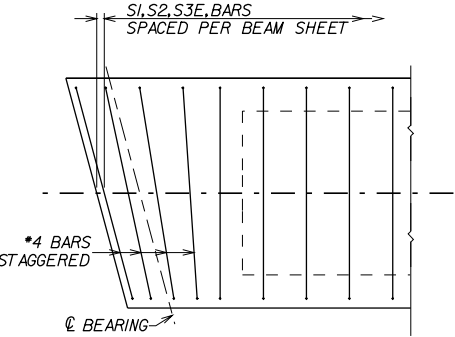
DEFORMED WIRE FABRIC IS PERMITTED INSTEAD OF REINFORCING STEEL BARS PROVIDED AN EQUAL STEEL AREA IS ATTAINED.WIRE FABRIC MUST CONFORM TO THE REQUIREMENTS OF AASHTO SECTION M225.

ALL NON-PRESTRESSING REINFORCING BARS SHALL BE GRADE 60.

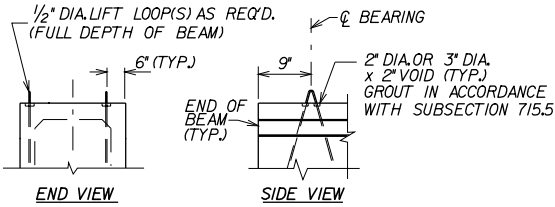
ALL REINFORCING STEEL BARS DESIGNATED "E" SHALL BE EPOXY COATED.

ALL STRANDS SHALL BE ENCLOSED INSIDE STIRRUP CAGE FOR THE ENTIRE LENGTH OF BEAM.

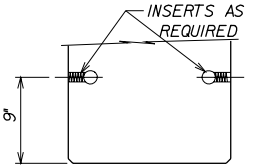
LIFTING DEVICES SHALL BE SHOWN ON SHOP DRAWINGS FOR APPROVAL.LIFTING SHALL BE BY EQUAL LOADS TO EACH DEVICE. INCLUDE PAYMENT IN ITEM 603-01,PRESTRESSED CONCRETE BEAMS,PER FOOT.



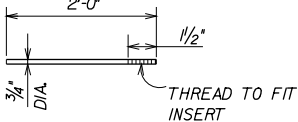
REINFORCING BAR DETAIL



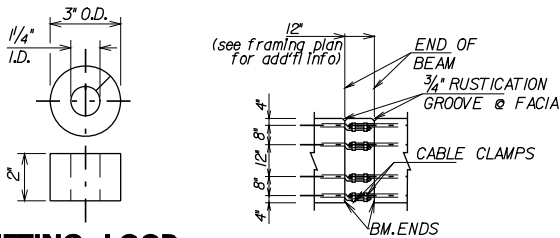
LIFT DETAILS



INSERT DETAIL



THREADED BAR DETAIL



LIFTING LOOP BLOCKOUT DETAILS

STRAND SPLICING DETAILS

NUMBER OF 1/2" DIA.-7 WIRE STRANDS IN INDICATED ROW						
MARK	BOTTOM TOP					INITIAL PRESTRESS FORCE/STRAND (lbs)
	①	②	③	④	⑤	

DESIGNED	DATE 12/5/06
DRAWN	
CHECKED	
REVIEWED	

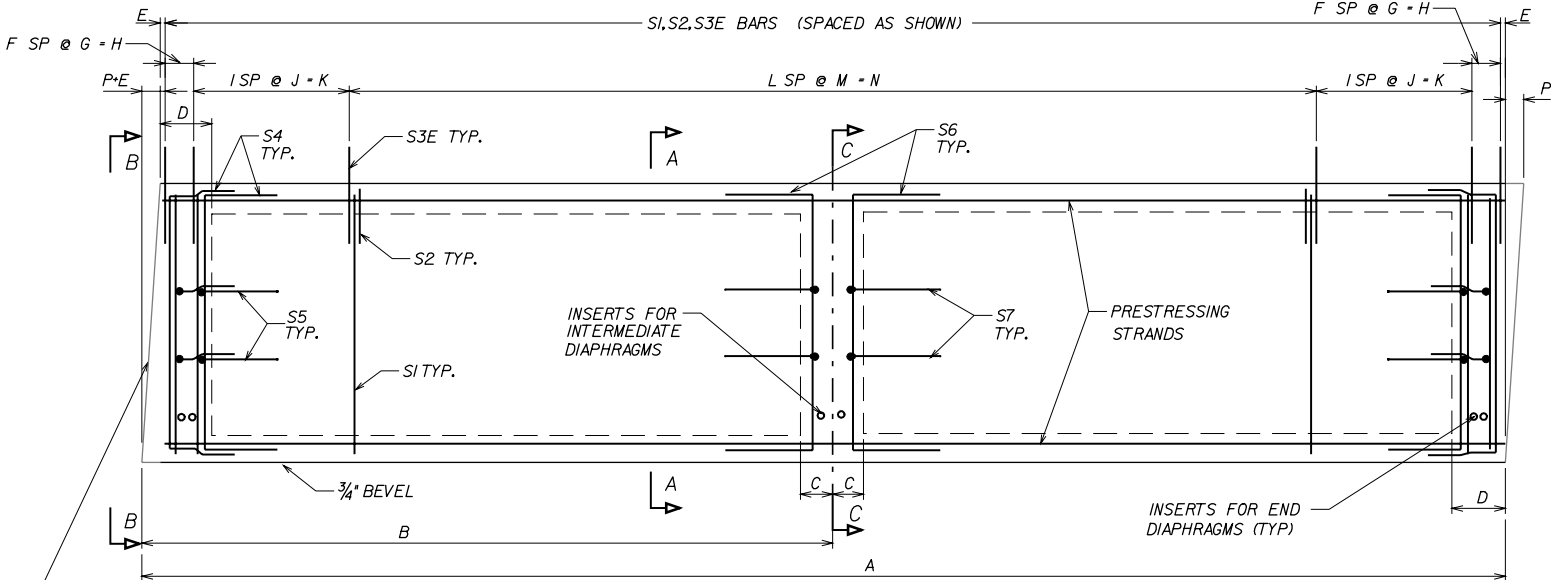
NO.	REVISION	DATE:	BY:

W. VA. DEPARTMENT OF HIGHWAYS
ENGINEERING DIVISION

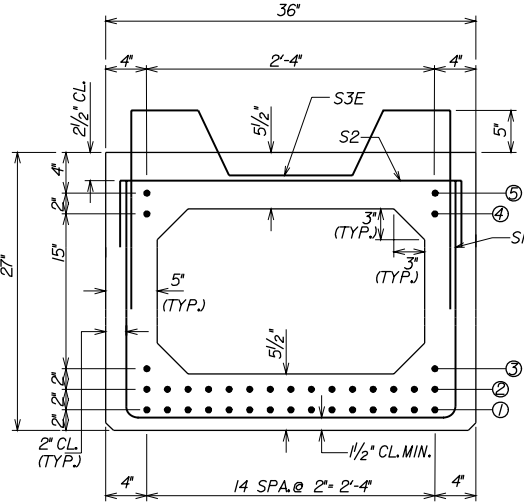
27" P.C. SPREAD BOX BEAM DETAILS

BRD-B 27X36

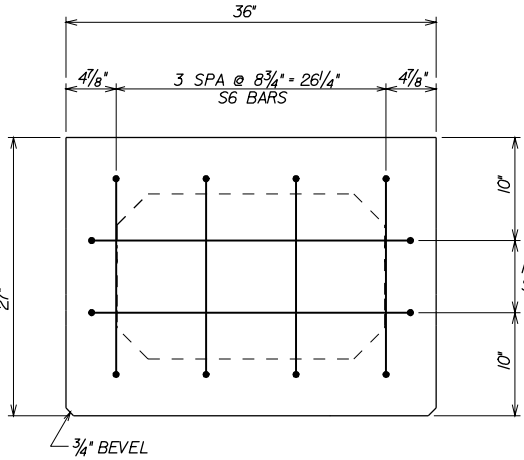
SHEET OF
BRIDGE NO.



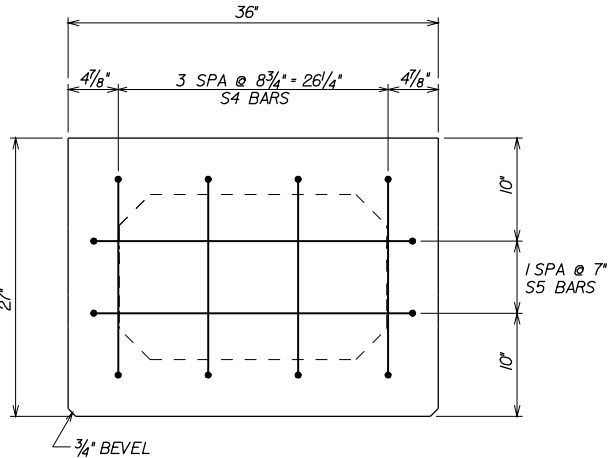
ELEVATION



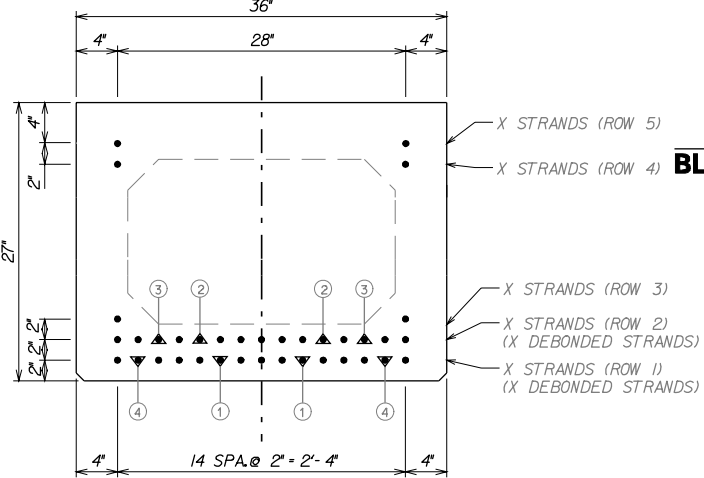
SECTION A-A
TYPICAL BEAM PRESTRESSING



SECTION C-C
TYPICAL BEAM REINFORCEMENT



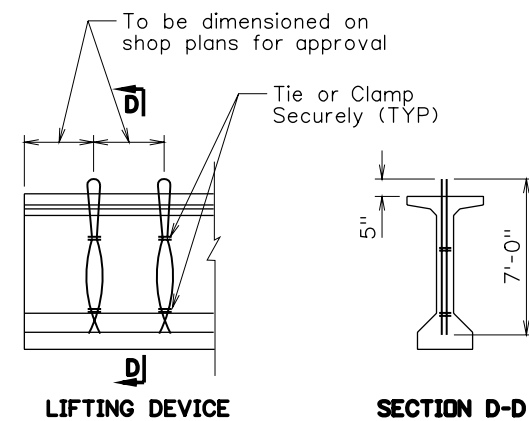
SECTION B-B
TYPICAL BEAM REINFORCEMENT



STRAND POSITIONS &
DEBONDED STRANDS
(ALL BEAMS)

APPROVED *Gregory Bailey* DATE 12/18/06
DIRECTOR ENGINEERING DIVISION

PROJECT NUMBERS		DISTRICT	COUNTY	SHEET NO.	TOTAL
STATE	FEDERAL				



NOTES:

1. The concrete shall attain a compressive strength of at least XXX psi, as shown by standard cylinders cured identically with the beams, before transferring bond stress to the concrete; or before releasing the end anchors. Cylinder strength shall be YYY psi within 28 days.
2. The Department will reject the beams if the finished units contained honeycombed concrete to the extent that the Engineer determines the strength or deterioration resistance is reduced. Beam shortening due to shrinking and elastic changes is limited to 0.0005L.
3. Roughen the top surface of each beam to an amplitude of approximately $\frac{1}{4}$ inch and maintain clean and free of laitance.
4. Shop drawings shall show the detensioning plan by numbering the sequence of the strand pattern.
5. Prestressing strands shall be stabilized strand (1/2 inch nominal diameter) low relaxation uncoated seven wire strand in accordance with AASHTO M 203 grade 270. An initial stress of 202.5 psi shall be applied to the strand.
6. Uncoated seven wire stress relieved strand may be substituted. However, if the Contractor chooses this alternate, he shall provide the design for the stress relieved strand and shall revise the original plans to reflect these changes. This design and plan modification shall be made at the Contractor's expense.
7. Deformed wire fabric is permitted instead of reinforcing steel bars provided an equal steel area is provided. Wire fabric must conform to the requirements of AASHTO Section M225.
8. The Elastomeric bearing pads under the prestressed beams shall conform to AASHTO Division 2, Section 18 Duro 60. Section 18.2.3.2 specifies laminate material to be:

9. Payment for Elastomeric bearing pads and any preformed joint material specified shall be included in Item 603-01. See pier & abutment sheets for details.
10. The threaded inserts shall have a minimum safe work load of 2500 lb in tension. All inserts shall be plugged to prevent concrete intrusion. Omit inserts on exterior face of exterior beams.
11. All threaded inserts and anchorage dowels are to be hot-dip galvanized after fabrication. Include the cost in Item 603-01.
12. S5 vertical reinforcing bars placed at the ends of the beam is designed for bursting resistance as per LRFD 5.10.10.1. Refer to S5 bar table.

REINFORCING BAR LIST				
MARK	SIZE	COUNT/BEAM	TOTAL	LENGTH
S1				
S2				
S3(E)				
S4				

REINFORCING BAR LIST			
MARK	SIZE	COUNT/BEAM	TOTAL
*S5			

BEARING PADS		
NO.	DESCRIPTION	LOCATION

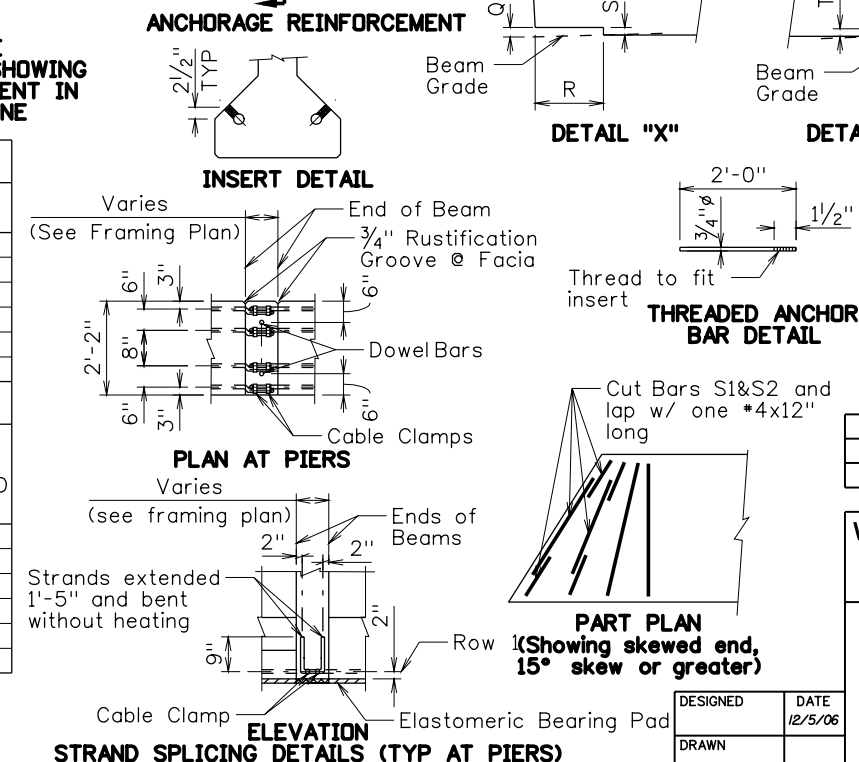
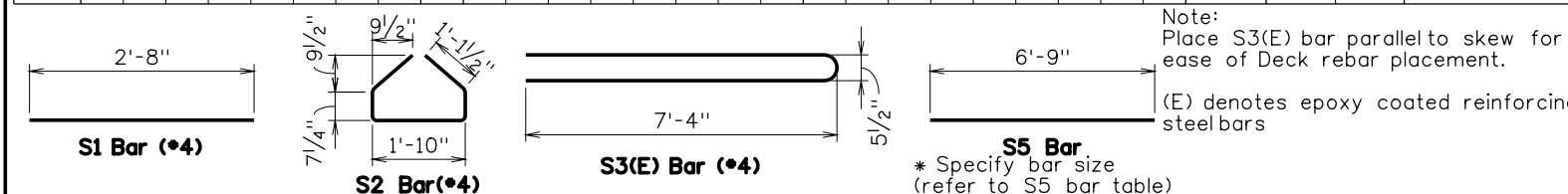
NO.	REVISION	DATE:	BY:

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

DESIGNED	DATE 12/5/06
DRAWN	
CHECKED	
REVIEWED	

**AASHTO TYPE IV MODIFIED
84" PRECAST CONC. BEAM
BRD-IVM 84X36**

SHEET _____ OF _____
BRIDGE NO. _____

[illegible]

APPROVED Gregory Bailey DATE 12/18/06
DIRECTOR ENGINEERING DIVISION