**PARAPET REPAIR DETAIL**

- Concrete surface repair
- Curb repair

**CURB REPAIR DETAIL**

- Concrete surface repair
- Curb repair

**DESIGNER NOTES**

Details may be shown on plans if necessary for clarity.

Include applicable concrete masonry bid item to fill repairs.

---

**ANCHOR DETAIL (EXAMPLE)**

- Adhesive anchors
- Bar steel reinforcement

**DESIGNER NOTES**

The design engineer shall provide anchor details as necessary. Plans shall include anchor notes when anchor anchors are used.

Anchor detail example applicable for adhesive anchors located in uncracked concrete.

Include anchor notes when adhesive anchors are used.

Use in cracked concrete.

---

**DECK REPAIR DETAIL - PLAN**

- Saw cut
- Insound concrete limits

**DECK REPAIR DETAIL - SECTION**

- Existing deck
- Saw cut
- Preparation decks type 1
- Preparation decks type 2
- Full-depth deck

**FULL-DEPTH DECK REPAIR DETAIL**

- Sawing pavement deck preparation areas
- Preparation decks type 1
- Preparation decks type 2
- Full-depth deck repair

**DESIGNER NOTES**

Details applicable to all overlay methods and deck repairs without overlays.

- Sawing pavement deck preparation areas not required for concrete overlays.
- Use concrete masonry deck repair detail for deck repairs under floating or floating w/insound overlays.
- Use concrete masonry deck repair detail for deck repairs without overlays.

Restrictions on removal items shall be placed on the plans to prevent damage to reinforcing steel.

---

**CONCRETE REPAIR DETAILS**

**BUREAU OF STRUCTURES**

Approved: Bill Oliva

Date: 1-18

STANDARD 4G01
GALVANIC ANODE

EXISTING REINFORCING WIRE, TYP.

ANODE TIE

TYPICAL INSTALLATION AT BAR STEEL INTERSECTION

TYPICAL INSTALLATION FOR BAR STEEL

EXISTING DECK

REPAIR AREA

PLACE GALVANIC ANODES AT INTERIOR OF REPAIR AREA AND CONTACT WITH THE EXISTING CONCRETE AT THE BOTTOM OF THE REPAIR.

PART, PLAN TYPICAL REPAIR DETAIL

SAWNOUT

GALVANIC ANODE - ATTACH PER TYPICAL DETAILS.

EXISTING REINFORCING STEEL, TYP.

NOTES

EXISTING REINFORCING STEEL TO BE COMPLETELY CLEANED OF CORRODED MATERIAL PRIOR TO INSTALLATION OF GALVANIC ANODES.

GALVANIC ANODE - ATTACH SAWNOUT.

REPAIR AREA - EDGE OF DECK

DESIGNER NOTES

CATHODIC PROTECTION SHALL BE USED ONLY AT THE REQUEST OF THE REGIONAL BRIDGE MAINTENANCE ENGINEER.

EXISTING REINFORCING STEEL TO BE COMPLETELY CLEANED OF CORRODED MATERIAL PRIOR TO INSTALLATION OF GALVANIC ANODES.

CONCRETE SURFACE REPAIR OF EXISTING GALVANIC ANODES EACH.

APPROVED: Bill Oliva

DATE: 1-15

CATHERIC PROTECTION

BUREAU OF STRUCTURES

STANDARD 46.02
**RUPTURED VOID REPAIR**

**SECTION THRU PARAPET ON WING**

- **CROSS SECTION**
  - Appropriately install drainage pipe per site-specific instructions.
  - Securely install pipe to prevent movement.
  - Corrugated Pipe Drainage pipe is not permitted to be placed near the edge of the site.

**SECTION THRU RAILING**

- **TOP OF OVERLAY**
  - Use Corrugated Polyethylene Drainage pipe for drainage.
  - Securely install pipe to prevent movement.

**SECTION AT END OF SLAB**

- **TOP OF OVERLAY**
  - Position splice with new No. 5 bar before pouring overlay.
  - Deflected to place pipe. If cut, restore to original position & splice with new No. 5 bar before pouring overlay.

**DESIGNER NOTES**

- **SAWCUT**
  - For deck repairs without overlays.
  - Use "Concrete Masonry Deck Repair" for deck repairs under polymer.
  - Sawing pavement deck preparation areas not required for concrete overlays.
  - Use "Concrete Masonry Deck Repair" for deck repairs without overlays.

- **ATTACHING PARAPETS OR RAILINGS TO EXISTING DECK |
  IN TWISTED BARS OR KNOTTED MASONRY OR ANCHORS IS NOT ALLOWED.**

**OVERLAY DETAILS**
**STANDARD 40.04**

**BILL OLIVA**

**END OF GIRDER**

**DESIGN OPENING**

+ + (IF REQUIRED)

**PAVING NOTCH**

4" *

**DECK STEEL**

**NEW TRANSVERSE**

1'-0"}

**CONCRETE OVERLAY limits**

6 " M IN .

**SECTION THRU PROPOSED JOINT**

STEEL GIRDER WITH END DIAPHRAGM

CONCRETE OVERLAY

**LONGIT. STEEL SALVAGE EXIST.**

2'-6" 1"

**EXIST. VERT. SALVAGE**

**BARS**

**EXIST. VERT.**

LEGEND

EXISTING JOINTS ARE LIKELY TO BE CORRODED AND/OR DAMAGED DURING CONCRETE LIFTING, EXISTING CONCRETE JOINTS ARE TO BE REMOVED AS PRATICAL, SUPPLEMENTED WITH THE BARS INDICATED BY .

EXISTING BARS ARE CORRODED AND/OR DAMAGED DURING CONCRETE PLACEMENT, ONLY TO BE REPLACED AS NEEDED.

**SPC.** consult the designer to confirm.

4" possible additional odd legs may need to be added.

**DESIGNER NOTES**

See standard 24.12 for supports used for strip seal steel extrusions.

For design 20°, where original transverse deck reinforcement was placed normal to the girder, save and incorporate all bars. New transverse bars are placed parallel to the girder.

**DATA IN JOINT REPAIR, SMALL MATCH EXISTING REINFORCEMENT TYPE CASTED OR UNSPLICED.**

**ALL REPLACEMENT PAVING BLOCK EMPLOYS SMALL MATCH EXISTING PAVING BLOCK IN COLOR AND TEXTURE.**

**FOR SUPPORTS USED FOR STRIP SEAL STEEL EXTRUSIONS.**

**TOTAL ESTIMATED QUANTITIES**

<table>
<thead>
<tr>
<th>BID ITEM</th>
<th>UNIT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>502.2901</td>
<td>LF</td>
<td></td>
</tr>
<tr>
<td>502.2905</td>
<td>EACH</td>
<td></td>
</tr>
<tr>
<td>502.3101</td>
<td>LF</td>
<td></td>
</tr>
<tr>
<td>502.3200</td>
<td>LF</td>
<td></td>
</tr>
<tr>
<td>502.3205</td>
<td>CY</td>
<td></td>
</tr>
<tr>
<td>502.3300</td>
<td>LF</td>
<td></td>
</tr>
<tr>
<td>502.3400</td>
<td>LF</td>
<td></td>
</tr>
<tr>
<td>502.3500</td>
<td>CY</td>
<td></td>
</tr>
</tbody>
</table>

**Bureau of Structures**

**Bill Oliva**

**DATE:**

**STANDARD 40.04**

**POSSIBLE ADDITIONAL BID ITEMS**

- Expansion device
- Emblem cleaning
- Adhesive anchors
- Bar steel
- Concrete masonry deck repair
- Joint repair
- Concrete masonry deck repair

**NOTE:**

- In a future lift of possible odd legs, additional bars may need to be added.
- For supports used for strip seal steel extrusions.

**POSSIBLE ADDITIONAL BID ITEMS**

- Bar steel reinforcement of structures
- Bar steel reinforcement of concrete structures
- Concrete masonry deck repair
CROSS SECTION THRU ROADWAY LOOKING EAST

HALF PLAN SHOWING TOP BAR STEEL REINF.

TOTAL ESTIMATED QUANTITIES

LONGIT. CONST.
JOINT REPAIRS

BUREAU OF STRUCTURES
APPROVED
Bill Oliva
DATE: 7-16

STANDARD 4605
NOTES

1. CONSTRUCTION LIMITS, FOUR CONCRETE ABOVE THE GIRDERS AFTER SUPERSTRUCTURE CONCRETE IS IN PLACE. STRIKE OFF AND LEAVE ROUGH.

2. DRIP PLUMB-LINE TO INTERNAL WATERPROOFING SEAL ALL HORIZONTAL JOINTS AT INTERFACE.

3. SALVAGE EXIST. BARS, EXTEND FULL LENGTH Into NEW WORK.

4. HORIZONTAL SURFACE OF CONCRETE 1/2" DEEP MINIMUM AT ALL AREAS WHERE NEW CONCRETE CONTACTS EXISTING CONCRETE.

5. EXISTING WINGS: REMOVE A MIN. OF 2'-0" BELOW GRADE.

6. ELEV. 6" IF ABRUT, BACK WALL AND OUTLINE.

7. REMOVE CONC. IN THE AREA DOWN TO ELEV. SPECIAL SEAT INTEGRATES EXIST. BARS STAY INTO NEW WORK.

DESIGNER NOTES

SEE CHAPTER 12 FOR NEW BAR STEEL PLACEMENT, DETAILS, DIMENSIONS, & NOTES.

ABUTMENT WIDENING

STANDARD 40.06

APPROVED
Bill Oliva
1-18
EXPANSION BEARING REPLACEMENT - STEEL GIRDERS

STEEL BEARINGS

EXPANSION BEARING REPLACEMENT - PRESTRESSED GIRDERS

ELASTOMERIC BEARINGS

NOTES

- All materials used for bearings shall be paid at the unit price bid for bearing pads elastomeric laminates.
- Steel plates that are welded to existing flanges shall be grinded smooth.
- Design notes shall be approved by the engineer.
- Welding procedures shall be established by the contractor to restrict the maximum temperature reached by surfaces in contact with elastomer to 200°F (93°C). Temperatures shall be controlled by temperature indicating wax pencils or other suitable means approved by the engineer.
- Top steel plate may not be omitted.
- Top steel plate may not be omitted.
- The steel top plate thickness may be reduced, if necessary, to match the overall existing height. When the thickness is reduced, the following note shall be added to the specifications: The steel plate shall be characterized by the contractor to control the maximum temperature reached by surfaces in contact with concrete bearing surface, and shall be reduced (fs" min.) to match the overall existing height.
- Steel plates may not be omitted.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
- Steel plates shall be grinded smooth.
NOTES

HINGE HOLES OF HANGER PLATES SHALL BE COATED WITH LEAD FREE MELT WELDING RODS AS RECOMMENDED BY THE MANUFACTURER. THE HANGER PLATES SHALL BE MOUNTED IN THE HINGE THROUGH A CLEARANCE OF 0.005 INCH AND DETAIL AS REQUIRED. DETAILS SHOWN IN THE DRAWING CANNOT BE USED FOR UNTREATED STEEL.

REPLACE EXISTING HANGER PLATES, PINS, AND WIND TRANSFER PLATES AND REPLACE WITH NEW MATERIALS.

THE NEW SHALL BE SELECTED FOR THE SAME MATERIAL AND WORK INSTRUCTIONS SHALL BE USED FOR "HINGE REPLACEMENT".

NEW HANGER PLATES SHALL BE SELECTED FOR THE SAME MATERIAL AND WORK INSTRUCTIONS SHALL BE USED FOR "HINGE REPLACEMENT".

NEW-PIN-BORE AND PIN PLATES WITHIN 0.06" OF PIN IN ACCORDANCE WITH THE STEEL SPECIFICATIONS STANDARDS SPECIFICATION N100-94 PINS. HANGER PLATES CLEAVED WITH ORGANIC TIMES USED.

WIND TRANSFER PLATES AND HANGER PLATES SHALL BE EQUIVALENT.

BUSHINGS SHALL BE THE SAME LENGTH AS THE HANGER PLATE MATERIAL.

NON-METALLIC WASHERS SHALL HAVE AN INSIDE DIAMETER OF BETWEEN 0.005" AND 0.010" LARGER THAN THE PIN DIAMETER.

STEEL FOR PINS TO CONFORM TO THE REQUIREMENTS OF ASTM A193 B7 DATED OCTOBER 2009.

BOLTS AND PIN PLATES TO BE PAINTED ANSI 125.

STRENGTH BOLTS TO BE DESIGNED BY THE CONTRACTOR.

HOLES FOR HIGH TENSILE STRENGTH BOLTS. HOLES IN BARS FOR 3/8" COTTER PIN.

COTTER PIN (PRESSED STEEL) WITH STANDARD HEX NUT WITH MISSION RICH PAINT.

HOLES IN FLANGE AND 3/8" DIAMETER STRENGTH BOLTS.

NOTES:

NOTE THAT THE HOLE DIAMETER SHALL BE ONE SIZE SMALLER THAN THE PIN DIAMETER.

STEEL FOR PINS TO CONFORM TO THE REQUIREMENTS OF ASTM A193 B7 DATED OCTOBER 2009.

BOLTS AND BUSHINGS TO BE PAINTED ANSI 125.

STRENGTH BOLTS TO BE DESIGNED BY THE CONTRACTOR.

HOLES FOR HIGH TENSILE STRENGTH BOLTS. HOLES IN BARS FOR 3/8" COTTER PIN.

COTTER PIN (PRESSED STEEL) WITH STANDARD HEX NUT WITH MISSION RICH PAINT.

HOLES IN FLANGE AND 3/8" DIAMETER STRENGTH BOLTS.

NOTES:

NOTE THAT THE HOLE DIAMETER SHALL BE ONE SIZE SMALLER THAN THE PIN DIAMETER.

STEEL FOR PINS TO CONFORM TO THE REQUIREMENTS OF ASTM A193 B7 DATED OCTOBER 2009.

BOLTS AND BUSHINGS TO BE PAINTED ANSI 125.

STRENGTH BOLTS TO BE DESIGNED BY THE CONTRACTOR.

HOLES FOR HIGH TENSILE STRENGTH BOLTS. HOLES IN BARS FOR 3/8" COTTER PIN.

COTTER PIN (PRESSED STEEL) WITH STANDARD HEX NUT WITH MISSION RICH PAINT.

HOLES IN FLANGE AND 3/8" DIAMETER STRENGTH BOLTS.

NOTES:

NOTE THAT THE HOLE DIAMETER SHALL BE ONE SIZE SMALLER THAN THE PIN DIAMETER.

STEEL FOR PINS TO CONFORM TO THE REQUIREMENTS OF ASTM A193 B7 DATED OCTOBER 2009.

BOLTS AND BUSHINGS TO BE PAINTED ANSI 125.

STRENGTH BOLTS TO BE DESIGNED BY THE CONTRACTOR.

HOLES FOR HIGH TENSILE STRENGTH BOLTS. HOLES IN BARS FOR 3/8" COTTER PIN.

COTTER PIN (PRESSED STEEL) WITH STANDARD HEX NUT WITH MISSION RICH PAINT.

HOLES IN FLANGE AND 3/8" DIAMETER STRENGTH BOLTS.

NOTES:

NOTE THAT THE HOLE DIAMETER SHALL BE ONE SIZE SMALLER THAN THE PIN DIAMETER.

STEEL FOR PINS TO CONFORM TO THE REQUIREMENTS OF ASTM A193 B7 DATED OCTOBER 2009.

BOLTS AND BUSHINGS TO BE PAINTED ANSI 125.

STRENGTH BOLTS TO BE DESIGNED BY THE CONTRACTOR.

HOLES FOR HIGH TENSILE STRENGTH BOLTS. HOLES IN BARS FOR 3/8" COTTER PIN.

COTTER PIN (PRESSED STEEL) WITH STANDARD HEX NUT WITH MISSION RICH PAINT.

HOLES IN FLANGE AND 3/8" DIAMETER STRENGTH BOLTS.
**PRECAST CONCRETE BLOCK DETAIL**

Depth = Height, Max. 1'-0".

Anchor in U-shaped anchors include adhesive anchors.  
Anchor bolts in conjunction.

Cement 1'-6" embed 1'-0" in concrete.

**CONCRETE BEARING BLOCK DETAILS**

MAY BE USED IN LIEU OF PLATE AS SHOWN ON UNIX 40.08

Burn existing anchor bolts off flush with beam seat.
NOTES

For dowel bar couplers, all dowel bars shall be lapped and tied to the reinforcement bars.

DESIGNER NOTES

On the plans provide location, spacing, size and quantities, do not give specific information regarding the coupler as this is covered by the bar coupler option.

On the plans show details similar to "SECTION THRU DECK" and "BAR COUPLER ALTERNATIVES".

At the plans showarker, indicate when bars require bar couplers by use of a symbol, use the same symbol and a note stating that a bar coupler is required. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations.

The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the bar coupler manufacturer's recommendations. The location and length of the bars shall be indicated by the barcoupl
SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

SIDE VIEW OF GIRDER

LOCATION OF DRAPED STRANDS

SECTION THRU GIRDER

DESIGNER NOTES

BE VIEW SHALL BE "PRESTRESSED GIRDER TYPE II" "EN-MIN"

SPACING CONCRETE STRENGTHS AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MINIMUM REINFORCEMENT 6% OF FLOOD PLAN SECTION FOR ALL SPANS AS REQUIRED. THE MIN. NUMBERS OF SHAPED C/O, STIRRUPS & ELASTOMERIC BRGS. ARE 6 AND THE MAX. NUMBERS FOR C/O, ELASTOMERIC BRGS. IS 5.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED OF THE STANDARD STRAND PATTERNS LISTED ON STANDARD PAGES AND THE SPANNING SHOWN IN TABLE 27.05. USING DIFFERENT REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD END SECTION DESIGN OF THE GIRDER, WHICH MUST BE APPROVED BY THE BUREAU OF STRUCTURES.

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 2" OF GIRDER, WHICH SHALL BE SMOOTHED USING A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDER. STRANDS SHALL BE FLUSH WITH END OF GIRDER FOR GRADE 60 REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A1064 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

PRESTRESSING STRANDS SHALL BE 1" IN DIA. FOR GRADE 60 OR 16 BAR DIA. FOR GRADE 70, WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

54" PRESTRESSED GIRDER DETAILS

BUREAU OF STRUCTURES

54" PRESTRESSED GIRDER DETAILS

APPROVED: Bill Oliva

DATE: 7-17

STANDARD 46.13
BEAMS, NESTED 12 GAUGE THRIE TWO, 12'-6" LONG BEAM GUARD ANCHOR ASSEMBLY FOR ABUTMENT WING END OF DECK OR THRIE BEAM TERMINAL END SYM. ABOUT ` NAME PLATE "CHAMFER, TYP. 2'-0" 9 " 1'-8" 8" 2" 3 Ž " 3 Ž " 3  " ELEVATION OF PARAPET PART PLAN ON PARAPET (WHEN TRANSITION ENDS ON ABUT. WING) EXPANSION JOINT OPENING A A B B C C D D 11" 7 " 2'-6" 9'-0" 4'-0" 6'-6" 9 " ABUT. BACKWALL FRONT FACE OF CONSTRUCTION JOINT AT DEFLECTION AND AT WING END TRANSITION Notes

- CONSTRUCTION joint - Strike off as shown & finish with a wooden trowel.
- Minimum joint spacing of 80'-0". Define construction joint with a 1" 'V' groove.
- Reinforcement thru the joint. Lap longitudinal bars a minimum of 2'-11".
- Optional construction joints in the parapets may be used. Run bar deflection joints are required on slab span structures only.
- Joints in parapets are used, plate separators shall be omitted. Plate required when deflection joints are required. If construction otherwise shown.

- ALL SLOPED FACE PARAPET 'B' REINFORCEMENT ARE NO. 4 BARS UNLESS SHOWN OR NOTED.
- PLACE REQUIRED WHEN DEFLECTION JOINTS ARE REQUIRED. CONSTRUCTION JOINTS IN PARAPETS ARE REQUIRED ONLY WHEN CONSTRUCTION JOINTS ARE REQUIRED ON SLAB SPAN STRUCTURES ONLY.
- Optional construction joints in parapets may be used. Run bar deflection joints are required on slab span structures only.
- Joints in parapets are used, plate separators shall be omitted. Plate required when deflection joints are required. If construction otherwise shown.

- NOTES
- Construction joints are to be closed.
- Joint closure is required for 5'-0" O.C. use 5" long screws. Use screws to be countersunk & fill with non-staining gray zinc plate or plastic or 'V' groove. Joint closing or 5'-0" O.C. screws to be countersunk & filled with a 1" "V" groove.
- ALL SLOPED FACE PARAPET 'B' REINFORCEMENT ARE NO. 4 BARS UNLESS SHOWN OR NOTED.
- PLACE REQUIRED WHEN DEFLECTION JOINTS ARE REQUIRED. CONSTRUCTION JOINTS IN PARAPETS ARE REQUIRED ONLY WHEN CONSTRUCTION JOINTS ARE REQUIRED ON SLAB SPAN STRUCTURES ONLY.
- Optional construction joints in parapets may be used. Run bar deflection joints are required on slab span structures only.
- Joints in parapets are used, plate separators shall be omitted. Plate required when deflection joints are required. If construction otherwise shown.

- PART PLAN ON PARAPET

- ELEVATION OF PARAPET

- SECTION A

- SECTION B

- SECTION C

- SECTION D

- SLOPED FACE PARAPET 'B'
**Design Notes**

The details shall be prepared for **Prestressed Girder Type I 45-INCH**.

**SUPPORT WITH STEEL OR ELASTOMERIC BRS.**

- Elastomeric bearing pad of plate anchor in pairs.
- #6 stirrups at top of girder.
- 2 holes drilled, each end - see detail A.

**SIDE VIEW OF GIRDERS**

- Elastomeric bearing pad of plate anchor in pairs.
- #6 stirrups at top of girder.
- 2 holes drilled, each end - see detail A.

**PLAN VIEW**

- Location of draped strands 7/8".
- #4 bar at top of girder.
- 2 holes drilled, each end - see detail A.

**SECTION THRU GIRDER**

- Elastomeric bearing pad of plate anchor in pairs.
- #6 stirrups at top of girder.
- 2 holes drilled, each end - see detail A.

**NOTES**

- The girder shall be designed based on the standard strand patterns shown in Table 40.7-1. Using different strand reinforcement in standard end section of the girder is based on the standard strand patterns shown in Table 40.7-1.

**SECTION THRU GIRDER**

- Elastomeric bearing pad of plate anchor in pairs.
- #6 stirrups at top of girder.
- 2 holes drilled, each end - see detail A.

**DESIGNER NOTES**

- The girder shall be designed based on the standard strand patterns shown in Table 40.7-1. Using different strand reinforcement in standard end section of the girder is based on the standard strand patterns shown in Table 40.7-1.

**ELASTOMERIC BEARING` OF PLATE ANCHOR IN PAIRS**

- #6 stirrups at top of girder.
- 2 holes drilled, each end - see detail A.

**Support with 1/2" Elastomeric Brg. Pad.**

- #6 stirrups at top of girder.
- 2 holes drilled, each end - see detail A.

**Section thru Girder**

- Elastomeric bearing pad of plate anchor in pairs.
- #6 stirrups at top of girder.
- 2 holes drilled, each end - see detail A.

**45" Prestressed Girder Details**

- The girder shall be designed based on the standard strand patterns shown in Table 40.7-1. Using different strand reinforcement in standard end section of the girder is based on the standard strand patterns shown in Table 40.7-1.
### 70" Ø 0.5" DIA. DRAPED STRANDS

#### Standard Patterns

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>( n_s )</th>
<th>( A_s )</th>
<th>( f_s )</th>
<th>( P_{Init} )</th>
<th>( E_{Res} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>-1.62</td>
<td>2.656</td>
<td>309.290</td>
<td>910</td>
<td>2.750</td>
</tr>
<tr>
<td>22</td>
<td>-1.65</td>
<td>2.665</td>
<td>309.460</td>
<td>682</td>
<td>2.739</td>
</tr>
<tr>
<td>24</td>
<td>-1.69</td>
<td>2.674</td>
<td>309.630</td>
<td>444</td>
<td>2.727</td>
</tr>
<tr>
<td>26</td>
<td>-1.73</td>
<td>2.683</td>
<td>309.800</td>
<td>806</td>
<td>2.716</td>
</tr>
<tr>
<td>28</td>
<td>-1.77</td>
<td>2.692</td>
<td>309.970</td>
<td>248</td>
<td>2.705</td>
</tr>
</tbody>
</table>

#### Calculation of \( y \) and \( S \)

\[
y = \frac{35.38 \text{ in.}}{659.70 \text{ in.}} = 0.05248 \text{ in./in.}
\]

\[S = -14,750 \text{ in.} \]

#### Pre-Tension

\[
\sigma_t = 270,000 \text{ ksi}
\]

\[
E_{Res} = 0.75 \times 270,000 = 202,500 \text{ ksi}
\]

#### Weight

\[
W.T. = 0.806 \text{ kips/ft.} + 0.05248 \text{ kips/linear ft.}
\]

### 70" Ø 0.6" DIA. DRAPED STRANDS

#### Standard Patterns

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>( n_s )</th>
<th>( A_s )</th>
<th>( f_s )</th>
<th>( P_{Init} )</th>
<th>( E_{Res} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>-1.62</td>
<td>2.646</td>
<td>309.090</td>
<td>910</td>
<td>2.750</td>
</tr>
<tr>
<td>22</td>
<td>-1.65</td>
<td>2.655</td>
<td>309.260</td>
<td>682</td>
<td>2.739</td>
</tr>
<tr>
<td>24</td>
<td>-1.69</td>
<td>2.664</td>
<td>309.430</td>
<td>444</td>
<td>2.727</td>
</tr>
<tr>
<td>26</td>
<td>-1.73</td>
<td>2.673</td>
<td>309.600</td>
<td>806</td>
<td>2.716</td>
</tr>
<tr>
<td>28</td>
<td>-1.77</td>
<td>2.682</td>
<td>309.770</td>
<td>248</td>
<td>2.705</td>
</tr>
</tbody>
</table>

#### Calculation of \( y \) and \( S \)

\[
y = \frac{2.614 \text{ in.}}{659.70 \text{ in.}} = 0.05248 \text{ in./in.}
\]

\[S = -14,750 \text{ in.} \]

#### Pre-Tension

\[
\sigma_t = 270,000 \text{ ksi}
\]

\[
E_{Res} = 0.75 \times 270,000 = 202,500 \text{ ksi}
\]

#### Weight

\[
W.T. = 0.806 \text{ kips/ft.} + 0.05248 \text{ kips/linear ft.}
\]
NOTES

The fabricator may increase base plate thickness as an alternate to shims.

All structural steel bearing plates shall be flat rolled, steel plates, all surfaces smooth and free from warp and all edges straight, parallel and vertical.

All plate cuts shall be machined or machine plane cuts. On bearing selection, final machining can be performed before welding is completed.

All materials for bearings including shims but excluding anchor bolts, nuts, and washers shall conform to ASTM specification type A709 Grade 50W steel.

All anchor bolts, nuts, and washers shall conform to ASTM specification type A709 Grade 50W steel. Anchor bolts shall be threaded 2". Provide one standard bearing washer and one hex nut and bolt setup anchor bolts to plate thickness. All bearing plates for composite action (welded) anchor bolts only.

After welding, shoe assembly, finish bottom of base plate to a flat surface.

All surfaces marked "shall be machine finished by an automatic process. The contact area of bottom surface of the girder flange shall be machine finished.

Anchor bolt distances along "T" or "U" may be increased from normal when a common grid detail is desired for identical services.

For unpainted structures the upper 6" of the anchor bolts, nuts, and washers shall be galvanized as required by ASTM specification type A709 Grade 50W steel.

All anchor bolts, nuts, and washers shall conform to ASTM specification type A709 Grade 36 steel. Anchor bolts shall be threaded 3".

Provide one standard wrought washer and one type A709 Grade 36 steel. Anchor bolts shall be threaded 3".

All materials of equivalent yield strength and elongation.

Use the above load service loads for bearing selection. Consider the above loads and the bearing load when selecting type B bearing. Final bearing selection is the standard prescription.

TYPE 'B' - STEEL GIRDERS FIXED SHOE

BUREAU OF STRUCTURES

STANDARD 40.22

APPROVED: Bill Oliva

DATE: 1-18
WING STRAPPING

NOTES

WING STRAPPING DETAIL FOR THE PURPOSE OF WEIGHING AWARD
WING STRAPPING IS ALTERNATIVE TO THE PREFERRED METHOD
TO DETAIL "A" WHICH DEPENDS ON BRIDGE MAINTENANCE ENGINEER TO APPROVE USE
OF DETAIL PRIOR TO INSTALLATION.

ALL PRODUCED STEEL MATERIAL SHALL CONFORM TO ASTM A36.
ALL STRUCTURAL STEEL, CHANNELS SHALL BE GALVANIZED, THREADED RODS, WING WALLS AND MASONRY SHEAR
BE GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C.
ALL PROVIDER STEEL, MATERIAL SHALL CONFORM TO ASTM A36.
ALL PROVIDER STEEL, MATERIAL SHALL CONFORM TO ASTM A153 CLASS C.
ALL STRUCTURAL STEEL, CHANNELS SHALL BE GALVANIZED, THREADED RODS, MASONRY
ANCHORS, NUTS AND WASHERS SHALL BE GALVANIZED.

WING WALLS AND MASONRY SHEAR SHALL BE GALVANIZED TO THE DEPENDS ON BRIDGE MAINTENANCE ENGINEER TO APPROVE USE
OF DETAIL PRIOR TO INSTALLATION.

WING WALLS AND MASONRY SHEAR PLAN TO CONFORM TO THE STANDARD SPECIFICATIONS.
**Bill of Bars for Abutment Parapets**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R503</td>
<td>3&quot; x 5'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R504</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R505</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R506</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R507</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S503</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>

**Bar Series Table**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R507</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>

**Bench Mark Cap**

To the top of the parapet.

**PARAPET VERT.**

- R501 or S501, R502 or S502, R505

**PARAPET HORIZ.**

- R503 or S503, R504

**ROADWAY OPENING OR 2'-6" min. for expansion joint.**

**FLOOR OPENING ON 2'-6" for expansion joint.**

**INSIDE ELEVATION**

- Highway opening on 2'-6" for expansion joint.
- Use 12 opening with rebar for at abutments.

**SECTION A**

-pdf page 1

**SECTION B**

-pdf page 2

**SECTION C**

-pdf page 3

**OUTSIDE ELEVATION**

-pdf page 4

**SLOPED FACE PARAPET 'HF'**

-pdf page 5

**SLOPED FACE PARAPET 'HF'**

-pdf page 6

**SLOPED FACE PARAPET 'HF'**

-pdf page 7

**Bill of Bars for Abutment Parapets**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R503</td>
<td>3&quot; x 5'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R504</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R505</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R506</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R507</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S503</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>

**Bar Series Table**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R507</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>

**Bench Mark Cap**

To the top of the parapet.

**PARAPET VERT.**

- R501 or S501, R502 or S502, R505

**PARAPET HORIZ.**

- R503 or S503, R504

**ROADWAY OPENING OR 2'-6" min. for expansion joint.**

**FLOOR OPENING ON 2'-6" for expansion joint.**

**INSIDE ELEVATION**

- Highway opening on 2'-6" for expansion joint.
- Use 12 opening with rebar for at abutments.

**SECTION A**

-pdf page 1

**SECTION B**

-pdf page 2

**SECTION C**

-pdf page 3

**OUTSIDE ELEVATION**

-pdf page 4

**SLOPED FACE PARAPET 'HF'**

-pdf page 5

**SLOPED FACE PARAPET 'HF'**

-pdf page 6

**SLOPED FACE PARAPET 'HF'**

-pdf page 7

**Bill of Bars for Abutment Parapets**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R503</td>
<td>3&quot; x 5'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R504</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R505</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R506</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R507</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S503</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>

**Bar Series Table**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R507</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>

**Bench Mark Cap**

To the top of the parapet.

**PARAPET VERT.**

- R501 or S501, R502 or S502, R505

**PARAPET HORIZ.**

- R503 or S503, R504

**ROADWAY OPENING OR 2'-6" min. for expansion joint.**

**FLOOR OPENING ON 2'-6" for expansion joint.**

**INSIDE ELEVATION**

- Highway opening on 2'-6" for expansion joint.
- Use 12 opening with rebar for at abutments.

**SECTION A**

-pdf page 1

**SECTION B**

-pdf page 2

**SECTION C**

-pdf page 3

**OUTSIDE ELEVATION**

-pdf page 4

**SLOPED FACE PARAPET 'HF'**

-pdf page 5

**SLOPED FACE PARAPET 'HF'**

-pdf page 6

**SLOPED FACE PARAPET 'HF'**

-pdf page 7

**Bill of Bars for Abutment Parapets**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R503</td>
<td>3&quot; x 5'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R504</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R505</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R506</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R507</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S503</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>

**Bar Series Table**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R507</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>

**Bench Mark Cap**

To the top of the parapet.

**PARAPET VERT.**

- R501 or S501, R502 or S502, R505

**PARAPET HORIZ.**

- R503 or S503, R504

**ROADWAY OPENING OR 2'-6" min. for expansion joint.**

**FLOOR OPENING ON 2'-6" for expansion joint.**

**INSIDE ELEVATION**

- Highway opening on 2'-6" for expansion joint.
- Use 12 opening with rebar for at abutments.

**SECTION A**

-pdf page 1

**SECTION B**

-pdf page 2

**SECTION C**

-pdf page 3

**OUTSIDE ELEVATION**

-pdf page 4

**SLOPED FACE PARAPET 'HF'**

-pdf page 5

**SLOPED FACE PARAPET 'HF'**

-pdf page 6

**SLOPED FACE PARAPET 'HF'**

-pdf page 7

**Bill of Bars for Abutment Parapets**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R503</td>
<td>3&quot; x 5'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R504</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R505</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R506</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>R507</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S502</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S503</td>
<td>2&quot; x 4'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>

**Bar Series Table**

<table>
<thead>
<tr>
<th>Mark</th>
<th>BC Code</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R507</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
<tr>
<td>S501</td>
<td>6&quot; x 9'</td>
<td>PARA_VERT.</td>
</tr>
</tbody>
</table>
**PREPARATION DECKS TYPE 1**

**PREPARATION DECKS TYPE 2**

**CLEANING DECKS**

**FULL-DEPTH DECK REPAIR**

**CONCRETE MASONRY OVERLAY DECKS**

**PLAN**

**TOTAL ESTIMATED QUANTITIES**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1002.2000</td>
<td>PROTECTIVE SURFACE TREATMENT</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>109.2000</td>
<td>PREPARATION DECKS TYPE 1</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>109.2020</td>
<td>PREPARATION DECKS TYPE 2</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>504.2000</td>
<td>CLEANING DECKS</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>509.2000</td>
<td>FULL-DEPTH DECK REPAIR</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>506.2500</td>
<td>CONCRETE MASONRY OVERLAY DECKS</td>
<td>CY</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES**

- Design data shall not be scaled.
- Dimensions shown are based on the original structure plans.
- Protective surface treatment shall be applied to the entire top surface of the new concrete overlay.
- Seal overlay construction joints according to Section 502.13.2 of the Standard Specifications. Cost incidental to be item "concrete masonry overlay decks".
- A minimum of 6 inches of concrete shall be removed from the existing bridge deck under the "cleaning decks".
- The average overlay thickness is based on the normal overlay thickness plus 1/2-inch to account for variations in the deck surface.
- Preparation decks to preparation decks type 1, and full-depth deck repair areas are based on the plans and as determined by the engineer. Preparation and full-depth deck repairs shall be filled with "concrete masonry overlay decks".
- Any excavation required to complete the overlay or joint repairs at the abutments shall be considered incidental to the bid item "concrete masonry overlay decks".

**DESIGNER NOTES**

- Plan view appearance to all overlay methods and deck repairs without overlays.
- For cross sections not in super-elevation transitions, the preferred minimum slope is 2%.
- Provide an average overlay thickness on the plans. The average overlay thickness is the sum of the normal overlay thickness plus 1/2-inch to account for variations in the deck surface. Changes in cross-slope increase the average overlay thickness. Quantities are based on the average overlay thickness.
- Do not provide a profile grade line on the plans. Do not include new draining superficial deck preparation areas for deck preparation.
- New drainage of 1" of existing deck under the new concrete overlay is not intended for previously overlaid decks. Existing concrete cover 1" or more shall be maintained and considered when determining concrete removals. Remove the top 1" of concrete overlay for repair in concrete overlay.
- Provide an average overlay thickness on the plans. The average overlay thickness is the sum of the normal overlay thickness plus 1/2-inch to account for variations in the deck surface. Changes in cross-slope increase the average overlay thickness. Quantities are based on the average overlay thickness.

**TOTAL ESTIMATED QUANTITIES**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1002.2000</td>
<td>PROTECTIVE SURFACE TREATMENT</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>109.2000</td>
<td>PREPARATION DECKS TYPE 1</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>109.2020</td>
<td>PREPARATION DECKS TYPE 2</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>504.2000</td>
<td>CLEANING DECKS</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>509.2000</td>
<td>FULL-DEPTH DECK REPAIR</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>506.2500</td>
<td>CONCRETE MASONRY OVERLAY DECKS</td>
<td>CY</td>
<td></td>
</tr>
<tr>
<td>506.2500</td>
<td>CONCRETE MASONRY OVERLAY DECKS</td>
<td>CY</td>
<td></td>
</tr>
</tbody>
</table>

**CONCRETE OVERLAY**

**BUREAU OF STRUCTURES**

**STANDARD 40.31**

**APPROVED: Bill Oliva**

**DATE:** 7-19
**NOTES**

- Preconstruction site visit shall be scheduled to identify and verify the location of all expansion and construction joints. Joints shall be defined by a saw cut. Joint location on plans shall correspond to the saw cut. Transitions areas are to be included in the bid item.

- Deck repairs shall be filled with "CONCRETE MASONRY DECK REPAIR".

- Deck repairs using a Portland cement based concrete requires a minimum cure time of 28 days prior overlay placement. When deemed absolutely necessary (by region and BOS design staff) "rapid set deck repair" may be used in lieu of "concrete masonry deck repair" to shorten time required for placing overlay.

- Do not provide a profile grade line on the plans.

- Provide overlay transitional area details and identify locations on the plans.

- Polymer overlays are not recommended on concrete approaches.

- Deck revenge area intended for use on decks with a minimum age of 2 years. An additional contract may be required for applying the preventative overlay intended for use on decks with a minimum age of 28 days and 2% of the structure's lifetime. Preventative overlays shall be defined by a saw cut or "overlay (polymer) limits" or "overlay (polymer) removal".

- Do not include a profile grade line on the plans.

- Polymer overlays and transitional areas are not recommended on concrete approaches.

- Do not provide a profile grade line on the plans.

- Provide overlay transitional area details and identify locations on the plans.

- The minimum thickness of polymer overlay is to be determined by the engineer based on the plans and deck area.

**DESIGN DATA**

- **LIVE LOAD**
  - WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = ___ KIPS
  - OPERATING RATING FACTOR: RF=___
  - INVENTORY RATING FACTOR: RF=___
  - DESIGN LOADING: HL-93

- **MATERIAL PROPERTIES**
  - CONCRETE MASONRY - DECK PATCHING f'c = 4,000 P.S.I.

- **CONSTRUCTION Joints**
  - Expansion and Construction joints are to be included in the bid item.

- **DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS. DRAWINGS SHALL NOT BE SCALED.**

- **TOTAL ESTIMATED QUANTITIES**

- **REHABILITATION OVERLAY**

- **PREVENTATIVE OVERLAY**

- **POLYMER OVERLAY**

- **BUREAU OF STRUCTURES**

- **STANDARD 40.32**

- **BILL OLIVA**

- **APPROVED**

- **DATE: 7-20**
DESIGNER NOTES

Concrete overlays are the current preferred method to overlay a bridge.

Restrictions on removal items shall be placed on the plans to prevent damage to reinforcing steel.

NOTE

Do not provide a profile grade line on the plans.

TOTAL ESTIMATED QUANTITIES

<table>
<thead>
<tr>
<th>BID ITEM</th>
<th>UNIT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>509.0300</td>
<td>SY</td>
<td>40.33</td>
</tr>
</tbody>
</table>

ASPHALTIC OVERLAY

NOTE

Areas of Preparation deck type 1 shall be removed by a saw cut.

Preparation deck type 1, preparation deck type 2, and full-depth deck repair areas are based on the plans and as determined by the engineer. Preparation and full-depth deck repairs shall be filled with concrete masonry deck repair.

Any excavation required to complete the overlay or joint repair at the abutments to be considered incidental to the bid item " Maintaining Existing Overlay Thickness".

The plan quantity for the bid item "Maintaining Existing Overlay Thickness" is based on the average overlay thickness.

Profile grade line shall be determined in the field based on a minimum overlay thickness of 2" placed above the deck surface. Expected average overlay thickness is 2½" or as given on the plans. Expected average overlay thickness is exceeded by more than 1/8", contact the structures design section.
CROSS SECTION THRU ROADWAY
LOOKING NORTH

SECTION THRU ABUTMENT
TRANSITIONAL AREA ON DECK
AT EXPANSION JOINT

NOTE: TRANSITIONAL AREA REQUIRED WHEN APPROACH PAVEMENT HAS BEEN PLACED PRIOR TO OVERLAY PLACEMENT.

NOTE: TRANSITIONAL AREA REQUIRED WHEN APPROACH PAVEMENT HAS BEEN PLACED PRIOR TO OVERLAY PLACEMENT.

SECTION THRU ABUTMENT
TRANSITIONAL AREA ON DECK
AT SEMI-EXPANSION OR FIXED JOINT

NOTE: TRANSITIONAL AREA REQUIRED WHEN APPROACH PAVEMENT HAS BEEN PLACED PRIOR TO OVERLAY PLACEMENT.

TOTAL ESTIMATED QUANTITIES

<table>
<thead>
<tr>
<th>BID ITEM</th>
<th>UNIT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>509.0300</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>509.0302</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>509.2000</td>
<td>CY</td>
<td></td>
</tr>
</tbody>
</table>

NOTES

- PREPARATION DECKS TYPE 1: Preparation decks are based on the original structure plans. All new polyester concrete shall be removed from the entire existing deck under the bid item "cleaning decks." Preparation decks type 1 are not recommended on concrete approaches. Plans shall specify the required removal depth. Poly-Crete overlays and transitional areas are not recommended on concrete approaches. Plans shall specify the required removal depth. Poly-Crete overlays are intended to be placed on decks with minimal surface distress where full-depth joint repairs or full-depth deck repairs are not expected to extend more than a 1/2" below grade. Use of Poly-Crete overlay is limited. See 40.5 in the Bridge Manual for additional guidance.

- TRANSITIONAL AREAS: Transitions between existing and overlay deck are to be performed at semi-expansion or fixed joints. Use of Poly-Crete overlay is limited. See 40.5 in the Bridge Manual for additional guidance.

- TOTAL QUANTITIES: Total quantities are provided in the table above.

- BID ITEMS: BID items include Poly-Crete overlays and Poly-Crete deck repairs.

- APPROVAL: The design is approved by Bill Oliva, Date: 7-20