GENERAL NOTES:
Design Loading:
- Grid Deck (18") Concrete Filled - K500-44
Design Unit Stress:
- Class B1 Concrete (Substructure repair) fcu = 4600 psi
- Class B1 Concrete (Grid Deck) fcu = 5000 psi
- Reinforcing Steel (Grade 60) fy = 60,000 psi
- Structural Steel (Grade 50) fx = 50,000 psi

Structural Steel:
Structural Steel shall be ASTM A500 except as noted.
Reinforcing Steel:
Minimum elongation to reinforcing steel shall be 1% unless otherwise shown.

Concrete Bonding Compound:
An approved epoxy bonding agent is required between old and new concrete for substructure repair. See Standard Specifications.

Painting:
Shop Hand; Field, System B Aluminum, See Special Provisions.

Traffic Maintenance:
One lane traffic is to be maintained during construction. See Special Provisions.

Dimensions:
Counter shall verify all dimensions in the field before pouring new steel.

Drainage System Removal:
Drainage system of Abutment No. 1 & 2 is to be removed. New concrete of abutments caused by drainage system removal and to be filled by surface dressing. Drainage system appurtenances riveted directly to plate girders, that do not interfere with the installation of the grid work, are to remain in place, see Special Provisions.

Relocation of Existing Pile:
Relocate existing Pile to tops of remaining existing pile points as shown. It support 'Pile provides a permanent rigid connection of cond. It is to be subcontracted by the contractor and approved by the Engineer before relocation of conduit is begun.

Note: Special Work (Bridges) includes 5.0 cubic yards of Class B1 Concrete and 175 lbs. of Grade 60 Reinforcing Steel.

**ESTIMATED QUANTITIES**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>WEIGHT</th>
<th>SUPERIAL</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of Existing Bridge Deck</td>
<td>55 CY</td>
<td>55,450</td>
<td>55,450</td>
</tr>
<tr>
<td>Reinforcement (Concrete)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Class B1)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Plastic Concrete</td>
<td>2085 lb</td>
<td></td>
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<tr>
<td>Reinforcement (Steel)</td>
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</tr>
<tr>
<td>Field, System B Aluminum, See Special Provisions</td>
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<td></td>
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<tr>
<td>Traffic Maintenance</td>
<td></td>
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<tr>
<td>One lane traffic is to be maintained during construction. See Special Provisions</td>
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<tr>
<td>Dimensions</td>
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<tr>
<td>Counter shall verify all dimensions in the field before pouring new</td>
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<td></td>
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<tr>
<td>steel.</td>
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<tr>
<td>Drainage System Removal</td>
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<tr>
<td>Drainage system of Abutment No. 1 &amp; 2 is to be removed. New concrete of</td>
<td></td>
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<tr>
<td>abutments caused by drainage system removal and to be filled by surface dressing.</td>
<td></td>
<td></td>
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<tr>
<td>Drainage system appurtenances riveted</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>directly to plate girders, that do not interfere with the installation of the grid work, are to remain in place, see Special Provisions</td>
<td></td>
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<tr>
<td>Relocation of Existing Pile</td>
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</tr>
<tr>
<td>Relocate existing Pile to tops of</td>
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<tr>
<td>remaining existing Pile points as shown.</td>
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<tr>
<td>It support 'Pile provides a permanent rigid connection of cond. It is</td>
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<tr>
<td>to be subcontracted by the contractor and approved by the Engineer before relocation of conduit is begun.</td>
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</table>

**BRIDGE OVER MISSOURI RIVER**

**STATE ROAD FROM I-35 TO RTE. 24**

**AT LIBERTY BEND**

**PROJECT NO.: BR-11251**

**STA. 177 + 466**

**JOB NO.: 4-U623-564**

**RTE. 24**

**JACKSON**

**COUNTY**

**DATE:** November 6, 1984

**STD.:** L-5588
Details of Reinforcing Steel

Details of Abutment No. 9

Note: This drawing is not to scale. Follow dimensions.
ELEVATIONS AT TOP OF ASPHALT CONCRETE WEARING SURFACE

Note: Stations and Elevations are located at cross beams.
TABLE OF SHIM HEIGHT DIMENSIONS

<table>
<thead>
<tr>
<th>PLATE GIRDER SPAN (0-2)</th>
<th>PLATE GIRDER SPAN (0-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CROSS BEAM STATION</strong></td>
<td><strong>A</strong></td>
</tr>
<tr>
<td>177.4-43.90</td>
<td>4.0</td>
</tr>
<tr>
<td>224.59</td>
<td>4.0</td>
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<tr>
<td>271.95</td>
<td>4.0</td>
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<tr>
<td>322.85</td>
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<tr>
<td>373.70</td>
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<td>424.56</td>
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<tr>
<td>475.38</td>
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<tr>
<td>526.20</td>
<td>4.0</td>
</tr>
<tr>
<td>577.00</td>
<td>4.0</td>
</tr>
</tbody>
</table>

*Indicates proposed crossbeam.

Note: Carefully review the detailed drawings and plans for the project. The dimensions provided are based on the original design drawings and should be checked against the field survey data to ensure accuracy.
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

GENERAL NOTES:
- Design loading: Grid Deck (Non-Congcrete Filled). H-80
- Design Unit Stress: Class B1 Concrete (Substructure repair) Fc = 1,600 psi
- Reinforcing Steel: Grade 60 Fy = 60,000 psi

- Structural Steel: AS8 except as noted.

- Reinforcing Steel: Minimum clearance to reinforcing steel ¼" unless otherwise shown.

- Navigation and Clearance Lights: All navigation and clearance lighting kept in operation during all construction.

- Old and New Work:
- Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.
- Bents bonded in old concrete removed cleanly stripped and embedded into new concrete where possible. Length is available, old bents will extend into new concrete of listed 20 diameters for smooth bars and 32 diameters for deformed bars.

- Profile Grade: Thru Truss-Up, "Profile Grade Elevations" are given. A smooth, traffic surface is to be obtained. Top of expansion devices are to conform to crown and slopes of roadway surface.

- Design drawing is not to scale. Follow dimensions.

Concrete Bonding Compound:
An approved epoxy bonding agent is required between old and new concrete. For substructure repair, see Standard Specifications.

- Painting:

- Traffic Maintained:
- One lane traffic is maintained during construction. See Special Provisions.

- Dimensions:
- Contractor verify all dimensions in the field before ordering new steel.

- Drainage System Removal:
- Drainage system of Abutments No. 18 removed. Holes in concrete of abutments caused by drainage system removed are filled by surfacing grout. Drainage system appurtenances partially listed in concrete, that do not interfere with the installation of the grid deck, remain in place. See Special Provisions.

- Relocation of Existing 3" conduit: Relocation of existing 3" conduit to area of remaining existing rail piers as shown. A support that provides a permanent rigid connection of conduit to piers, submitted by the contractor and approved by the Engineer, before relocation of conduit.

bridge over Missouri river
state road from 1-35 to rte. 24
at liberty biv
project no. (069-26)-81
job no. 41-25-37
jackson county

date: November 5, 1964

<table>
<thead>
<tr>
<th>ESTIMATED QUANTITIES</th>
<th>SUBTOTAL</th>
<th>SUPPLEMENT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of Existing Bridge Deck</td>
<td>32 ft</td>
<td>12 ft</td>
<td>44 ft</td>
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<tr>
<td>Haphalts (Asphaltic Concrete)</td>
<td>70 gal</td>
<td>50 gal</td>
<td>120 gal</td>
</tr>
<tr>
<td>(Mineral Aggregates, Architec)</td>
<td>70 gal</td>
<td>50 gal</td>
<td>120 gal</td>
</tr>
<tr>
<td>(Chute &quot;P&quot; Mix)</td>
<td>70 gal</td>
<td>50 gal</td>
<td>120 gal</td>
</tr>
<tr>
<td>Concrete Bonding Compound</td>
<td>3 gal</td>
<td>3 gal</td>
<td>6 gal</td>
</tr>
<tr>
<td>Shop Horses Field, System &amp; Aluminum, See Special Provisions</td>
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</tr>
<tr>
<td>Traffic Maintained</td>
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<tr>
<td>Dimensions</td>
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<tr>
<td>Drainage System Removal</td>
<td></td>
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<tr>
<td>Relocation of Existing 3&quot; Conduit</td>
<td></td>
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<tr>
<td>Installed Special Work (Bridges) includes 50 cubic yards of Class 2 Concrete and 170 Lbs. of Grade 60 Reinforcing Steel</td>
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</tbody>
</table>
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

Section 310 roadway

Note: Diagrams show grid layout of proposed grid deck. For project specifications, see Special Provisions

**SECTION THREE ROADWAY**

**THRU TRUSS SPANS (4-3 & 4-3)**

**SECTION THREE ROADWAY**

**THRU TRUSS SPANS (4-3 & 4-3)**

**PART SECTION B-B**

**AT INTERIOR FLOORBEAMS**

Note: Details shown in Part section B-B (at interior floorbeams) are for new propsed grid deck. For existing grid are similar.

**PART SECTION B-B**

**AT INTERIOR FLOORBEAMS**

Note: Details shown in Part section B-B (at interior floorbeams) are for new propsed grid deck. For existing grid are similar.

Note: See Special Provisions for the requirements of compression joint seal.

Concrete structures shall meet A.S.T.M. D3540-83

Concrete joint seal shall extend to 15' of outside edge of grid deck.

**DETAIL 8A**

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**DET
PART PLAN OF GRID DECK-THRU TRUSS SPANS (4-5) & (5-6) (SHOWING GRID DECK REMOVAL AND REPLACEMENT)

**Remove existing grid deck from 14' Filled Joint to this line and replace with new 8' deep concrete filled grid deck.**

Note: All connections for support beams (W8x21, W8x31) are to be made with 7/8" high strength bolts, complete with nut and washer.

Field drilling may be required for accurate placement of W8x31 with existing stringer angle. Support beams shall be in place in each of the areas shown before any removal of existing grid iron that area.

Shop drawings will not be required for support beams.

Turn of bolt method of tensioning high strength bolts will be permitted.

Note: This drawing is not to scale. Follow dimensions.

Note: Details for Grid Deck (Concrete Filled) not shown shall be in accordance with the grid deck manufacturer’s specifications. See Special Provisions.
Note: Corrugations for sway bracing replacement members shall be full high strength bolts, with + holes. Holes may be field drilled. Dimensions shown may be adjusted for proper field fit. Turn of nut method of tensioning high strength bolts will be permitted.

Shop drawings will not be required for sway bracing replacement members.

DETAILS OF 6" TRIM PLATES AT END DIAPHRAGM SIDE OF COMPRESSION JOINT SEALS AND BETWEEN GRID DECK UNITS

DETAILS OF 5" TRIM PLATE AT FLOORBEAM SIDE OF COMPRESSION JOINT SEALS

DETAILS OF SWAY BRACING REPAIR
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County

DECK REPLACEMENT
BRIDGE DECK FLOOR SYSTEM REHABILITATION, SUBSTRUCTURE REPAIRS AND FIELD APPLIED PROTECTIVE COATING

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1. TITLE AND INDEX OF SHEETS
2. GENERAL PLAN AND ELEVATION
3. GENERAL NOTES AND QUANTITIES
4. REMOVAL DETAILS
5. REMOVAL DETAILS - THRU TRUSS END FLOORBEAMS
6. REMOVAL DETAILS - THRU TRUSS INTERMEDIATE FLOORBEAMS
7. REMOVAL DETAILS - DECK TRUSS STRINGERS
8. REMOVAL DETAILS - POWER LINE SUPPORTS
9. ABUTMENT MODIFICATIONS
10. ABUTMENT MODIFICATIONS
11. SUBSTRUCTURE REPAIR DETAILS
12. FLOORBEAMS - THRU TRUSS
13. FLOORBEAM STRENGTHENING DETAILS
14. STRINGERS - THRU TRUSS
15. STRINGERS - DECK TRUSS
16. MISCELLANEOUS STEEL REPAIRS
17. BEARING MODIFICATIONS - THRU TRUSS
18. SLAB DETAILS - PLATE GIRDERS SPANS
19. SLAB DETAILS - DECK TRUSS SPANS
20. SLAB DETAILS - THRU TRUSS SPANS

INDEX OF SHEETS
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22. SLAB POURING SEQUENCE
23. BRIDGE APPROACH SLAB
24. DEFLECTION & CAMBER DIAGRAMS
25. DEFLECTION & CAMBER DIAGRAMS
26. SAFETY BARRIER CURB AT ABUTMENTS
27. SAFETY BARRIER CURB LAYOUT
28. TYPICAL SAFETY BARRIER CURB DETAILS
29. OPTIONAL S-LIP-FORM SAFETY BARRIER CURB
30. STRIP SEAL EXPANSION JOINT - ABUTMENTS AND PIERS 2 & 9
31. FINGER PLATE EXPANSION JOINT - PIERS 4 & 6
32. CONTRACTION JOINT - THRU TRUSS
33. CONTRACTION JOINT - DECK TRUSS
34. SLAB DRAIN
35. SLAB DRAIN DETAILS
36. EARTHQUAKE RESTRAINTERS - ABUTMENTS 1 & 9
37. EARTHQUAKE RESTRAINTERS - PIERS 4 & 6
38. PROFILE GRADE ELEVATIONS
39. STAGE HYDROGRAPH
40. BILL OF REINFORCING

REPAIRS TO: BRIDGE OVER MISSOURI RIVER
STATE ROAD FROM I-35 TO RTE 24 AT LIBERTY BEND
PROJECT NO. 400091416
JOB NO. MP1416
RTE. 291 NBL
JACKSON COUNTY

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
DATE 11/30/01
SHEET 1 OF 40
GENERAL NOTES:

The existing bridge deck consists of the removal of existing bridge deck and protective covering. Existing deck consists of concrete slabs. Existing barrier pain shall be removed, and the deck shall be made ready for new construction. See Special Provisions.

Concrete barrier pain shall be removed and the deck shall be made ready for new construction. See Special Provisions. Existing barrier pain shall be removed, and the deck shall be made ready for new construction. See Special Provisions.

PROTECTIVE COATING

Existing surface shall be cleaned and any loose material removed. Any loose material shall be removed. See Special Provisions. Existing surface shall be cleaned and any loose material removed. Any loose material shall be removed. See Special Provisions.

BRIDGE DECK:

The existing bridge deck consists of an 8" slab in lieu of truss spans and a 4" slab on the girders. Coating system shall be in accordance with the Special Provisions. The existing bridge deck consists of an 8" slab in lieu of truss spans and a 4" slab on the girders. Coating system shall be in accordance with the Special Provisions. The existing bridge deck consists of an 8" slab in lieu of truss spans and a 4" slab on the girders. Coating system shall be in accordance with the Special Provisions. The existing bridge deck consists of an 8" slab in lieu of truss spans and a 4" slab on the girders. Coating system shall be in accordance with the Special Provisions.

NAVIGATION LIGHTS:

All navigation and clearance lighting shall be kept in operation during all construction.

CONSTRUCTION:

The entire existing deck shall be removed and a new structural unit shall be constructed in accordance with the Special Provisions. The existing deck shall be removed and a new structural unit shall be constructed in accordance with the Special Provisions. The existing deck shall be removed and a new structural unit shall be constructed in accordance with the Special Provisions. The existing deck shall be removed and a new structural unit shall be constructed in accordance with the Special Provisions. The existing deck shall be removed and a new structural unit shall be constructed in accordance with the Special Provisions.

REINFORCING STEEL:

Reinforcement shall be deformed billet type bars conforming to AISI ASTMB-370, Grade 60. All dimensions to reinforcing steel shall be checked prior to placement, and the reinforcing steel shall be placed where specified. See Special Provisions. Reinforcement shall be deformed billet type bars conforming to AISI ASTMB-370, Grade 60. All dimensions to reinforcing steel shall be checked prior to placement, and the reinforcing steel shall be placed where specified. See Special Provisions. Reinforcement shall be deformed billet type bars conforming to AISI ASTMB-370, Grade 60. All dimensions to reinforcing steel shall be checked prior to placement, and the reinforcing steel shall be placed where specified. See Special Provisions. Reinforcement shall be deformed billet type bars conforming to AISI ASTMB-370, Grade 60. All dimensions to reinforcing steel shall be checked prior to placement, and the reinforcing steel shall be placed where specified. See Special Provisions. Reinforcement shall be deformed billet type bars conforming to AISI ASTMB-370, Grade 60. All dimensions to reinforcing steel shall be checked prior to placement, and the reinforcing steel shall be placed where specified. See Special Provisions.

NOTE:

The scope of the Protective Coating System is limited to the removal of existing bridge deck and the deck shall be made ready for new construction. See Special Provisions. The scope of the Protective Coating System is limited to the removal of existing bridge deck and the deck shall be made ready for new construction. See Special Provisions. The scope of the Protective Coating System is limited to the removal of existing bridge deck and the deck shall be made ready for new construction. See Special Provisions. The scope of the Protective Coating System is limited to the removal of existing bridge deck and the deck shall be made ready for new construction. See Special Provisions. The scope of the Protective Coating System is limited to the removal of existing bridge deck and the deck shall be made ready for new construction. See Special Provisions.
GENERAL NOTES:
The scope of work generally consists of the removal of existing Bridge Deck, Barriers and Safety Railings before the construction of new Bridge Deck and Safety Railings. The removal of existing Bridge Deck materials will include the following: removal of the existing Bridge Deck materials, including concrete, asphalt, and any other materials. The installation of the new Bridge Deck, Barriers, and Safety Railings will be performed by the contractor. The new materials for the new Bridge Deck, Barriers, and Safety Railings will be specified in the contract documents.

Two-way traffic will be provided on the existing southbound Missouri Route 291 Bridge, while single lane open to traffic during construction.

Utility companies whose facilities are shown on the plans or are otherwise notified in writing prior to construction shall be notified by the contractor of the construction activities.

All dimensions are given in feet unless otherwise noted. Drawings shall not be scaled.

Conductor shall verify all dimensions and required locations in the field before starting any concrete and structural steel work.

PREVENTIVE COATING:

- Existing Bridge Deck, existing pavements, and other materials shall be removed before new materials are installed. See Special Provisions.
- Existing Bridge Deck System 0 shall be installed in accordance with the Special Provisions.
- Bridge Deck shall be coated with the manufacturer's recommended anti-corrosion coating, as specified in the Special Provisions.

NAVIGATION LIGHTS:

- All navigation and control lighting shall be installed, maintained, and operated in accordance with the Special Provisions.

TABLE OF ESTIMATED QUANTITIES - BRIDGE DECK, AND COATING

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Total</th>
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<tbody>
<tr>
<td>Bridge Deck</td>
<td>Sq.Ft.</td>
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<tr>
<td>Bridge Deck Coating</td>
<td>Sq.Ft.</td>
<td>39,400</td>
</tr>
<tr>
<td>Bridge Deck Rehabilitation</td>
<td>Sq.Ft.</td>
<td>40,400</td>
</tr>
<tr>
<td>Bridge Deck Coating Rehabilitation</td>
<td>Sq.Ft.</td>
<td>39,400</td>
</tr>
</tbody>
</table>

CONSTRUCTION:

- All concrete above the construction joint at the approaches shall be included in the quantities for "Concrete on Steel".
- Concrete above the construction joint at the approaches shall be included in the quantities for "Concrete on Steel".
- See Special Provisions for Alternate Methods of Construction.
DECK TRUSS SPANS

Notes:
1. All intermediate cantilever brackets, tie bolts, anchor plates, etc., supporting roll posts on the west side shall be removed.
2. Lateral connection plate B5s (LT & LT1) to be removed.
3. Existing flange bolts at LD, LD1, LD2, LD3, LD4 plus 2 locations to be determined by Engineer after deck is removed.

PLATE GIRDER SPANS

Notes:
1. All exterior stringers plus interior or locations to be determined after deck is removed.
2. L (rivets, bolts or wire) to be removed.
3. T(gas line one side only)
4. R (west side only)

THRU TRUSS SPANS BETWEEN VERTICALS

Notes:
1. Salvage, see Special Provisions.

MODIFICATION OF EXISTING NAVIGATION LIGHT PLATFORMS

HARRINGTON & CORTEYIOUI, INC.
Consulting Engineers
DRAFTED: 04/01
CHECKED: 05/01
NOTES: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

ROUTE 291 MISSOURI RIVER BRIDGE
Joardan County
SHEET 4 OF 40
Note:
- Support stringers with blocking on pier prior to removing end floorbeam.
- Bearing not shown for clarity.
- A single element to be removed.
- For replacement details, see "Floorbeams - Thru Truss" sheet.
  - Remove connector, replace with H.S. Bolt.

REM OVAL DETAILS - THRU TRUSS
END FLOORBEAMS
ROUTE 291 MISSOURI RIVER BRIDGE
JOHNSON COUNTY

NOTE: DO NOT SCALE THIS DRAWING. FOLLOm DIMENSIONS.
HALF SECTION OF EXISTING FLOORBEAM @ L6/L6' TO BE REMOVED

Remove the Floorbeams at L12 & L12' which is posterior

Notes:
1. All stringer to floorbeam clip angles in thru truss spans shall be removed and replaced with new angles. Steel plates shall be removed, reamed and reused for use on future repairs.
2. Clean testing of floorbeams, joints, if used and. Remove the stringer to a 304 Structure by a professional engineer before applying new stringer connection angles.
3. Two additional intermediate stringer and eight lateral connection plates will be removed or locations to be determined by the engineer after the deck is removed.
4. Saddle joints occur at L6, L6', L12 and L12' in the thru truss beam. Removal of additional stringers are shown in the sheet next to saddle joints.
5. Contractor shall remove and reinstall, or temporarily support stringers adjacent to floorbeams which are to be repaired.

For replacement details, see "Floorbeam - Thru Truss" and "Intermediate Steel Repair" sheets:
- Remove connector, replace w/ M.S. Bolt.

REMOVAL DETAILS - THRU TRUSS INTERMEDIATE FLOORBEAMS
ROUTE 291 MISSOURI RIVER BRIDGE
JACKSON COUNTY

HARRINGTON & CORTELL, INC. 
CONSULTING ENGINEERS

DRAFTED: 08/01
CHECKED: 09/01
NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

L05644 SHEET 4 OF 40
PLAN OF EXTERIOR STRINGER
STRINGER TO FLOORBEAM CONNECTION
DETAILS AT UB AND UB'

TYPICAL STRINGER TO FLOORBEAM CONNECTION DETAILS

REMIVAL DETAILS - DECK TRUSS STRINGERS
ROUTE 291 MISSOURI RIVER BRIDGE
JACKSON COUNTY

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
Transmission Line Tower Removal @ U1 and U1'

SECTION A-A

SECTION B-B

SECTION C-C

Notes:
- A designates items to be removed (shown at selected locations for clarity only).
- Entire transmission line tower support elements including guide, brace, crossarm, hanger, attachment, and guy wire connections shall be removed.
- Complete removal of all structural steel and connections for both chords and crossarm members.
- Steel sections, guy wires and rigging sizes shown are based on original plan details. Variations of additional elements encountered during removal and disposal will be considered incidental and not grounds for add.
- All components associated with furnishing and installing new H.S. bolts in open rivet holes at tower and crossarm connections to truss will be considered incidental. The time and effort involved will be considered incidental to the scope of work.

Removal Details
Power Line Supports
Route 291 Missouri River Bridge
Jackson County

Harrington & Cortelyou, Inc.
Consulting Engineers
DETAILED: 09/01
FINISHED: 09/01
NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

L05684
ELEVATION OF DRAIN AT ABUTMENT

(Facing pocketstone at Abutment 1, Abutment 9 opposite hand.)

- Cap with Geotextile Fabric, see Special Provisions.
- Cap
- Perforated Drain Pipe
- Coupler
- Unperforated Drain Pipe
- 5° Elbow
- Limits of granular backfill
- Pipe to drain
- Soil to backfill

SECTION A-A

- Cap
- Perforated Drain Pipe
- Coupler
- 5° Elbow
- Unperforated Drain Pipe
- Wire mesh
- Daylight side
- Cut Coupler flush with ground line
- Cut Cap/Elbow to slope of ground line

DETAIL B

- Fill adjacent with controlled low strength material (flowable fill), see Special Provisions (approx. 2 cu. yds.)
- Apron
- Drainage System, geotextile fabric around perforated pipe, filling cavities with controlled low strength material, all incidental shall be included under the contract unit prices per lump sum for "Abutment Modifications".

PLAN

(1 Abutment 5 shown, Abutment 1 similar except apron and flowable fill)

NOTE: DO NOT SCALE THIS DRAWING, FOLLOW DIMENSIONS.
Drilled areas on piles, clean and seal, typ.

PLAN

Limits of Protective Coating (Deteriorous Agents), see Special Provisions.

ELEVATION

Spalled area ( VARIES of each pier)

Pier Cap

Tie Beam

Spalled area (VARIES of each pier)

SECTION

Notes:
- Spalled areas shall be chipped and cleaned by sandblasting or other approved method. Areas cleaned shall be patched and sealed in accordance with the Special Provisions.
- Pier caps and columns shall be cleaned and sealed after repair and/or replacement of structural steel elements and adjustment to bearings.
- Total grade of repair shall be determined by the Engineer in the field at the time of construction.
- Piers 4 & 5 shown. Repairs on all other piers and documents below areas of new concrete are similar.

SUBSTRUCTURE REPAIR DETAILS
ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County

HARRINGTON & CORELLO, INC.
Consulting Engineers

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

DETAILED: 06/01
CHECKED: 06/01

SHEET 11 OF 40

LD5684
Note: Hole locations shown based on shop drawing dimensions. Holes shall be drilled to match existing connection holes in trusses.

For additional details of holes in top flange of floorbeams, see "Miscellaneous Steel Repairs" Sheet. All fasteners on this sheet shall be 3/8"-16 x A325.

HARRINGTON & CORTELYOU, INC.
Consulting Engineers

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
Note: All hole spacings shown based on shop drawing dimensions. Holes shall be drilled to match existing connection holes in trusses.

**FLOORBEAM AT 6', 12', 16' & 12'**

To match existing connection holes in trusses.

---

**SECTION A-A**

**SECTION B-B**

**SECTION C-C**

**SECTION D-D**

**FLOORBEAMS - THRU TRUSS**

**ROUTE 291 MISSOURI RIVER BRIDGE**

**JACKSON COUNTY**

**SHEET 12 OF 40**

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**HARRINGTON & CORTELYOU, INC.**

Consulting Engineers

**DILLED: 09/01**

**CHECKED: 09/01**

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**NOTE:** DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
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Notes:
The dimension from the S of each hole to the L of the existing bracket connection is 14'-10" at the LA end and 14'-11" at the L end of the lower lateral bracing, between L8 & L9 (LD similar). For all other rows, the dimension from the S of each hole to the L of the existing bracket connection will be as shown on sheet 12A or opposite hand depending on the orientation of the lower lateral bracing. See "Lower Lateral Bracing Details" sheet 12A for drawing and other notes.

LOCATION DIAGRAM

LOWER LATERAL BRACING DATA
LO TO LA & LO TO L8

Per Fabricator's Request 8/13/02
New Sheet 7/26/02
Jackson County

HARRINGTON & CORTELYOU, INC.
Consulting Engineers
DETAILED: 07/02
CHECKED: 07/02
NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

LO5684
**BEARING STIFFENER ANGLE REPLACEMENT LOCATIONS**

(North Deck Truss)

East Truss: U1', South side, exterior
U3', South side, interior
U5, South side, exterior
U7, South side, exterior
U9, South side, exterior
U11, South side, exterior
U13, South side, exterior
U15, South side, exterior
U17, South side, exterior
U19, South side, exterior
U21, South side, exterior

West Truss: U2, North side, exterior
U4, North side, interior
U6, North side, exterior
U8, North side, exterior
U10, North side, exterior
U12, North side, exterior
U14, North side, exterior
U16, North side, exterior
U18, North side, exterior
U20, North side, exterior
U22, North side, exterior

For Bearing Stiffener Angle Replacement Details, see detail & on "Floorbeam Strengthening Details" sheet.

**WELDED COVER PLATE LOCATIONS**

(North Deck Truss only)

Top Flange Cover: U1', East exterior stringer
U5, East exterior stringer
Batt. Flange Cover: U1, East exterior stringer
U5, East exterior stringer
U9, East exterior stringer
U13, East exterior stringer
U17, East exterior stringer
U21, East exterior stringer

**DECK TRUSS FLOORBEAM DETAILS**

**FLOORBEAM UB' - SOUTH DECK TRUSS**

East Exterior Floorbeam Location

Notes:
- Remove 6" wide by 3" tall area of web as shown.
- Provide 1/2 radii at ends of drilled holes. Grind out edges.
- Apply new plate (dotted lines) as shown in detail. Provide backing plate in grid between saddle and web of floorbeam.
- Clean, prime and coat required area in accordance with Special Provisions.
- Drill a 7/8" hole in floorbeam at each saddle bearing location, where major plate in web will be replaced.
- Remove interior stringers on saddle side of floorbeam UB' & UB'. Thoroughly clean flanges and weld all exterior and interior saddle bearings.
- Including edge between saddle and floorbeam web. Apply 5 component Calcium Sulfonate to all affected areas to the Special Provisions to area of floorbeam web behind saddle bearing location. Apply 5 component Calcium Sulfonate when applying all 5 component Calcium Sulfonate. Apply 5 component Calcium Sulfonate to all areas where System C coating will be applied. If any area of the Calcium Sulfonate is applied, the Calcium Sulfonate shall be removed prior to application of System C coating.
- Grind gap between saddle and floorbeam web with compressible joint material. Allow 1/4 for a moist type season curing at top of joint material.

Grind top or bottom of floorbeam flanges, if required, at cover plate locations.

**DECK TRUSS FLOORBEAM REPAIRS**

ROUTE 291 MISSOURI RIVER BRIDGE

Jackson County

Revised 4/09/04
New Sheet 3/02/04
Sheet 134 of 40

HARRINGTON & CORTLEDYNE, INC.
Consulting Engineers

DETAILED: 03/04
CHECKED: 03/04

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

LO5684
New Connection and Fill Plates at L6, L12, L18 and L24. Use existing plates for templates.

**PLAN**

**STRINGER TO EXPANSION FLOORBEAM CONNECTION DETAILS**

1. **STAY PLATES AT TOP OF BOTTOM CHORD - THRU TRUSS**
   - All stay plates shall be 10 3/8" x 1 1/2" x 1/4". Use plate being replaced by template. Replace removed plates with 10 3/8" x 1 1/2" x 1/4".

2. **NEW CONNECTION ANGLES**
   - All new angles shall be 30 1/2" x 30 1/2" x 1/4".

3. **PLATE FOR TOP FLANGE**
   - All new plates shall be 10 3/8" x 1 1/2" x 1/4".

4. **PLATE FOR BOTTOM FLANGE**
   - All new plates shall be 10 3/8" x 1 1/2" x 1/4".

5. **STRAP PLATE AT UB & UB' - DECK TRUSS**
   - Use old lateral connection plates or new plate 30 1/2" x 30 1/2" x 1/4".

6. **FILL PLATE AT INTERIOR STRINGERS AT UB & UB' - DECK TRUSS**
   - Use old lateral connection plates or new plate 30 1/2" x 30 1/2" x 1/4".

7. **FILL PLATE AT EXTERIOR STRINGERS AT UB & UB' - DECK TRUSS**
   - Use old lateral connection plates or new plate 30 1/2" x 30 1/2" x 1/4".

**ELEVATION**

**NEW STRINGER AND FILL PLATES AT LO AND LO'**

- Use existing plates for templates. All fasteners shall be 7/16" x 1 1/2" x 100 bolts installed in 100 holes.
DETAIL OF EXISTING EXPANSION SHOE

Notes:
The rockers in the expansion bearings at Pier 4 and Pier 6 are tilted upward or away from Pier 5. Modifications to masonry plates are provided to shift the position of these rockers and masonry plates so that the rockers set approximately vertical at 60°F under full dead load. This shall be accomplished by removing the masonry plates and shims, plugging the existing anchor bolt holes and drilling new 1 1/2" holes. The new masonry bolts are to be installed to the new masonry plates to contain the new rocker bolt holes. Each masonry plate shall be shimmed with shims which may have to be replaced after rehabilitation. The masonry plates shall be re-installed using new nuts and washers. The existing anchor bolts on the longitudinal shall be cut off flush with the new masonry plates and seat welded to the masonry plates.

PLUGGING DETAIL

SEAL WELD DETAIL

NEW SHEET 4

MODIFICATIONS TO MASONRY PLATE

Cut anchor bolts flush w/ top of masonry plate (5" projection of Pier 4, 1" projection at Pier 6).

END VIEW

DETAIL OF PINTLE

NEW SHEET 3

DETAIL OF EXPANSION SHOE

Bearing Modifications - thru truss

Route 291 Missouri River Bridge
Joaquin County

NOTE: DO NOT SCALE THIS DRAWING, FOLLOW DIMENSIONS.
SLAB PLAN - L12' TO L12'

(For spacing of reinforcing see Section Thru roadway)

STAY-IN-PLACE FORM OPTION DETAILS

SECTION D-D THRU ROADWAY

SLAB DETAILS - THRU TRUSS SPANS

ROUTE 291 MISSOURI RIVER BRIDGE

Jasper County
### THRU TRUSS

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**Note:** Does not include correction factor for floorbeam members.

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**Note:** Does not include correction factor for floorbeam members.

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For notes, see "Deflection & Camber Diagrams" sheet.

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
### DECK TRUSS - N. END

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**Note:** DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
DETAILS OF PLASTIC WATERSTOP

Notes:
- Plastic waterstop shall be placed in all safety barrier curb filled joints.
- Cost of plastic waterstop complete in place shall be included in the contract unit price for Safety Barrier Curb.

PART ELEVATION

- Top of safety barrier curb
- Install with downward pressure against surface
- Face of safety barrier curb

PART PLAN

- 1 1/4" Resin anchor system 6" long with 2 nuts and lock washers each
- 1 1/4" Oval head above bolt with 2 nuts and lock washers
- Outside face of barrier curb

SAFE BARRIER CURB MOVEMENT GAUGE DETAIL

Notes:
- A movement gauge shall be provided at all safety barrier curb expansion joints.
- All steel for movement gauges shall be galvanized.
- Cost of movement gauge complete in place shall be included in the contract unit price bid for Safety Barrier Curb.

LOCATION OF MOVEMENT GAUGES

LOCATION OF MOVEMENT GAUGES

SAFETY BARRIER CURB NOTES:

- Top of safety barrier curb shall be built parallel to grade with safety barrier curb joints tongue at end and barrel nails to grade.
- All expanded edges of safety barrier curb shall have either a 3" radius or a 6" bevel unless otherwise noted.
- When the safety barrier curb is bid by the lineal foot measured horizontally from one end to end of curb on the center line.
- Concrete in the safety barrier curb shall be Class B1.
- Measurement of safety barrier curb is to the nearest linear foot measured horizontally from one end to end of curb on the center line.
- Cost of furnishing and installing platform anchors is required and shall be included in contract unit price bid for "Safety Barrier Curb". Double nuts shall be provided at each anchor.

TYPICAL SAFETY BARRIER CURB DETAILS

ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
PLATE GIRDER SPANS

DECK TRUSS SPANS

TYPICAL SECTION NEAR LEFT SAFETY BARRIER CURB AT SUPPORT LOCATIONS

(OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB)

Note: Slip-form option is allowed in plate girder and deck truss spans.

Contractor shall provide detailed construction drawings to slip forming for approval by the Engineer. Slip forming is to be used in the thru truss spans. See Special Provisions.

Top of safety barrier curb shall be built parallel to grade with safety barrier curb joints (except at end bents) normal to grade. If slip forming is used, the joint line for safety barrier curb is to be at the linear foot measured horizontally from end to end of barrier curb. Joints shall be made at the grade line.

Joint detail and slip form options shall be used in all slip-form bridge safety barrier curbs. Instead of joint filling material, C bars (slip-form option only) shall be used in addition to conventional concrete. For slip forming, C bars shall be located on the approach slab side of joint and between all joints in the deck truss spans. C20 bars shall be located at the ends of the slip form spans. C20 bars shall be located in the approach slab side of joint and between all joints in the deck truss spans.

Note: Do not scale this drawing. Follow dimensions.

(Continued on Sheet 29 of 40)
1 1/2" Threaded Rod, 2 1/2" Holes in web of end floorbeams
& Retrainer assemblies

ELEVATION

(8 Retrainer Assemblies total on each. 1 ea. side of each stringer)
(Detail at Pier 6 shown, detail opp. face of Pier 4)

SECTION A-A

SECTION B-B

SECTION C-C

Notes:
- Structural steel for plates shall be ASTM A36. Grade B.
- Threaded rods shall be A307 and all bolts shall be ASTM A325.
- Type I, 5/8" in 8" holes unless otherwise noted. High strength bolts, nuts and washers will be supplied for quality assurance as specified in Standard Specification 106 and Field Section 715-104 from Materials Manual.
- All steel used in earthquake restrainer assemblies shall be guaranteed in accordance with ASTM A325 and Section 112 of the Missouri Standard Specifications for Highway Construction.

The cost of furnishing and installing the restrainer assemblies including washers, nuts, steel anchor assemblies, drilling holes thru existing steel, and other incidental items shall be completely covered in the unit bid price for "Earthquake Retrainer Assemblies" per each.

Total weight of 16 restrainer assemblies is 6,240 lbs.
NOTES

Stage Hydrograph was plotted from readings of the Misouri River near the Missouri Bridge located at River Mile 392.7 in Kansas City, Missouri. Gage zero is 115.8 ft. M.S.L. (mean sea level) for plots prior to October 1999 and 106.4 for plots after October 1999.

Seasonal variations in the water elevations of the Missouri Bridge can be estimated by adding the stage readings to Elevation 115.8 or 106.4, as applicable.

The Route 291 Bridge is located at river mile 392.7. An estimate for seasonal variations in water surface elevations on this reach of the River can be made by adding 11.4 to 14.6 feet from those at the Missouri Bridge.

Stage Hydrograph is based on information provided by the U.S. Army Corps of Engineers. Accuracy of details or dimensions is not guaranteed.

HARRINGTON & CORTELYOU, INC.
Consulting Engineers

NOTE: DO NOT SCALE FROM DRAWING. FOLLOW DIMENSIONS.

JAMES D. MILLER
Chief Engineer

HARRINGTON & CORTELYOU, INC.
Consulting Engineers

ETAIL: 09/01
DATE: 09/01

SHEET 39 OF 40

L05584
ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County
DECK REPLACEMENT
BRIDGE DECK FLOOR SYSTEM REHABILITATION, SUBSTRUCTURE REPAIRS AND FIELD APPLIED PROTECTIVE COATING

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2. GENERAL PLAN AND ELEVATION
3. GENERAL NOTES AND QUANTITIES
4. REMOVAL DETAILS
5. REMOVAL DETAILS - THRU TRUSS END FLOORBEAMS
6. REMOVAL DETAILS - THRU TRUSS INTERMEDIATE FLOORBEAMS
7. REMOVAL DETAILS - DECK TRUSS STRINGERS
8. REMOVAL DETAILS - POWER LINE SUPPORTS
9. ABUTMENT MODIFICATIONS
10. ABUTMENT MODIFICATIONS
11. SUBSTRUCTURE REPAIR DETAILS
12. FLOORBEAMS - THRU TRUSS
12A. LATERAL BRACING DETAILS
12B. LATERAL BRACING DATA 10 TO 18 & 18" TO 18" 13. FLOORBEAM STRENGTHENING DETAILS
13A. DECK TRUSS FLOORBEAM REPAIRS
14. STRINGERS - THRU TRUSS
15. STRINGERS - DECK TRUSS
16. MISCELLANEOUS STEEL REPAIRS
16A. MISCELLANEOUS STEEL REPLACEMENTS
17. BEARING MODIFICATIONS - THRU TRUSS
18. SLAB DETAILS - PLATE GIRDER SPANS
19. SLAB DETAILS - DECK TRUSS SPANS
20. SLAB DETAILS - THRU TRUSS SPANS

LOCATION SKETCH

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22. SLAB POURING SEQUENCE
23. BRIDGE APPROACH SLAB
24. DEFLECTION & CAMBER DIAGRAMS
25. DEFLECTION & CAMBER DIAGRAMS
26. SAFETY BARRIER CURB AT ABUTMENTS
27. SAFETY BARRIER CURB LAYOUT
28. TYPICAL SAFETY BARRIER CURB DETAILS
28A. NAVIGATION LIGHT CONDUIT AT PIERS 6
29. OPTIONAL SLIP-FORM SAFETY BARRIER CURB
30. STRIP SEAL EXPANSION JOINT - ABUTMENTS AND PIERS 2 & 6
31. FINGER PLATE EXPANSION JOINT - PIERS 4 & 6
31A. EXPANSION JOINT MODIFICATIONS AT PIERS 4 & 6
32. CONTRACTION JOINT - THRU TRUSS
33. CONTRACTION JOINT - DECK TRUSS
34. SLAB DRAINS
35. SLAB DRAIN DETAILS
36. EARTHQUAKE RESTRAINTS - ABUTMENTS 1 & 9
37. EARTHQUAKE RESTRAINTS - PIERS 4 & 6
38. PROFILE GRADE ELEVATIONS
39. STAGE HYDROGRAPH
40. BILL OF REINFORCING

REPAIRS TO: BRIDGE OVER MISSOURI RIVER
STATE ROAD FROM I-35 TO RTE 24 AT LIBERTY BEND
PROJECT NO. FAF-291-1161  STA. 99+32.10 (MATCH EXISTING)
JOB NO. J4P1416  RTE. 291 NBL
JACKSON  COUNTY
DATE  

SEAT 1 OF 40

HARRINGTON & CORTELYOU, INC.
Consulting Engineers

ST. 504.00  ST. 405.10  ST. 409.00  ST. 706.35

LS5684

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

△ added sheet numbers 09-22-04
GENERAL NOTES:
The scope of work generally consists of the removal of existing bridge deck and coating, construction of new bridge deck and coating, and associated work such as including construction of structural steel and storage of existing bridge deck and coating. The coating of new and existing structural steel is also part of the work of this contract.

Two-way traffic will be handled on the existing southbound Missouri Route 291 Bridge, which shall remain open to traffic during construction.

Utility companies whose facilities are shown on the plans or are known to be within the construction limits shall be notified by the contractor of the construction start date.

All dimensions shown unless otherwise noted. Drawings shall not be altered.

The SPECIAL PROVISIONS shall be considered bid items.

SPECIFICATIONS:

CONSTRUCTION MATERIALS:
1. Reinforcing Steel:
   - ASTM A615 Gr. 40 or Grade 60 high yielding strength.

2. Concrete:
   - Minimum 2,500 psi at 28 days
   - Minimum 1.35 f' x w (compressive strength factor)

3. Structural Steel:
   - ASTM A992

NAVIGATION LIGHTS:
All navigation and clearance lighting shall be kept in operation during all construction.

CONSTRUCTION:
The entire existing deck shall be removed within each structural unit through truck-mounted hydro-abrasion units, prior to placement of new concrete and structural steel. The contractor shall submit for approval construction drawings showing proposed concrete structural steel connections and placement sequence of the new bridge deck.

All work shall be performed in accordance with the Plans and Specifications.

JOINER:
All joint filler shall meet the requirements of standard specification 230.6.4. except as noted.

REINFORCING STEEL:
Reinforcing steel shall be deformed billet steel bars conforming to ASTM A615. All dimensions shown to reinforcing steel on detail drawings are to be checked on bar as clear distances in the plans of construction.

Minimum clearance to reinforcing steel shall be 3" unless otherwise shown.

All reinforcing steel shall be lap-joined in accordance with AASHTO B32 unless otherwise shown or noted.

All reinforcing in the new bridge deck, barrier curbs and abutment baffle walls shall be epoxy-coated, except as noted.

The epoxy-coated reinforcing bars shall be coated in accordance with Section 111 of the AASHTO, for highway construction.

PROTECTIVE COATING:
Protective Coatings System 6 by the contractor in accordance with the requirements of the Special Provisions.

Prime Coats: The coat of the prime coat shall be an undercoat type of the prime coat specified in the Special Provisions.

Field Coats: The coat of the intermediate and finish coats shall be in accordance with the requirements of the Special Provisions.

Brush Applied Stone: The coat of the intermediate and finish coats shall be in accordance with the requirements of the Special Provisions.

Interior Coats: The coat of the intermediate and finish coats shall be in accordance with the requirements of the Special Provisions.

Bridge Deck:
- Bridge deck consists consists of an 8" slab in truss spans and an 8" slab in the girder spans.
- Connections with connections for expansion joints shall be used for side construction in the girder and deck truss spans.
- Alternating step-in-place steel deck forms will be allowed in the through truss spans only.
- Full depth Shear connectors shall be applied to structural steel stringers at a 6" on center.

QUANTITIES FOR SLAB ON STEEL:

<p>| TABLE OF FINAL QUANTITIES - BRIDGE DECK, AND COATING |</p>
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NOTES:
- This quantity is for a single item. Additional items used as specified shall be charged to the contract.
- Concrete shall be made in accordance with AASHTO specifications.

GENERAL NOTES AND QUANTITIES:
ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County

HARRINGTON & CORTELYOU, INC.
Consulting Engineers
Drafted: 08/01
Checked: 09/01

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

REVISED 2-8-02 SHEET 3 OF 40

LO6684
FINAL PLANS

I CERTIFY THAT THIS PLAN SHEET ACCURATELY DEPICTS THE
CONFIGURATION AND LOCATION OF THE ROADWAY AND ALL
ITS APPURTENANT FEATURES. TO THE BEST OF MY KNOWLEDGE,
AS I AND MY STAFF HAVE OBSERVED THE CONTRACTOR'S
CONSTRUCTION OF THIS PROJECT, I SPECIFICALLY DISCLAIM
ANY RESPONSIBILITY FOR THE DESIGN OF THIS PROJECT,
EXCEPT AS I AND MY STAFF MAY HAVE MODIFIED OR
AUTHORIZED THE MODIFICATION OF THE PROJECT DESIGN
DURING ITS CONSTRUCTION AND I DISCLAIM RESPONSIBILITY
FOR THE CONTRACTOR'S ACTUAL CONSTRUCTION OF THE PROJECT,
EXCEPT AS I AND MY STAFF MAY HAVE DIRECTED OR ORDERED
THAT THE PROJECT BE CONSTRUCTED.

SIGNATURE

DATE

Notes:
Support stringers with blocking on pler prior to removing end floorbeam.
Bearing not shown for clarity.
R denotes element to be removed.
For replacement details, see "Floorbeams - Thru Truss" sheet.
- Remove connector, replace w/ H.S. Bolt.
NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

SECTION B-B

VIEW C-C

FINAL PLANS

I CERTIFY THAT THIS PLAN SHEET ACCURATELY DEFINES THE CONSTRUCTION AND LOCATIONS OF THE PROJECT AS AND WHERE SHOWN THEREON. I HEREBY DISCLAIM ANY AND ALL RESPONSIBILITY FOR THE DESIGN OF THIS PROJECT EXCEPT AS SET FORTH IN THIS SHEET AND SPECIFIED IN CONTRACT DOCUMENTS. THIS SHEET FORMS PART OF THE CONTRACT FOR THE CONSTRUCTION OF THE PROJECT EXCEPT AS NOTED ON THE SHEET. I HEREBY DISCLAIM ANY AND ALL RESPONSIBILITY FOR THE CONTRACTOR'S INTERPRETATION OF THIS DRAWING.

REMOVAL DETAILS - THRU TRUSS

INTERMEDIATE FLOORBEAMS

HARRINGTON & CORTELYOU, INC.
Consulting Engineers

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

ROUTE 291 MISSOURI RIVER BRIDGE
Jenks County

SHEET 6 OF 40

LO5684
PLAN OF EXTERIOR STRINGER

STRINGER TO FLOORBEAM CONNECTION
DETAILS AT UB AND UB'

TYPICAL STRINGER TO FLOORBEAM CONNECTION DETAILS

REMOVAL DETAILS - DECK TRUSS STRINGERS
ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
**ELEVATION OF DRAIN AT ABUTMENT**
(Planning basketation of Abutment 1, Abutment 3 opposite hand.)


**SECTION A-A**
- Cut coupler flush with ground line.

**DETAIL B**
- Unperforated drain pipe
- Wire mesh

**FINAL PLANS**
- I certify that this plan sheet adequately reflects the conformance and location of the project and all its important features, to the best of my knowledge.
- As I and my staff have observed the contractor's construction of this project, I specifically disclaim any responsibility for the design of this project.
- The project will be constructed as per the plans and specifications provided. I authorize the modification of the project design during its construction, and I assign responsibility for the contractor's action to the contractor. Except as I, and my staff may have directed otherwise, I authorize the project to be constructed.

**APRON**
- Fill cavities with controlled low strength material (flowable fill).
- See Special Provisions (Approx. 2 cu. yds.)

**PLAN**
- Abutment 3 shown. Abutment 1 similar except apron and flowable fill.

**NOTE:** Do not scale this drawing. Follow dimensions.

**ABUTMENT MODIFICATIONS**
ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County
CRAckEED AREAS ON PILERS CLEENE AND SEAL. SEE SPECIAL PROVISIONS.

LIMITS OF PROTECTIVE COATING (DELETERIOUS AGENTS), SEE SPECIAL PROVISIONS.

PIER CAP

TIE BEAM

SPALTED AREA (VARIES AT EACH PIER)

SPALTED AREA (VARIES AT EACH PIER)

ESPLASHER A BLASTING, USING A

PIER

FINAL PLANS

I CERTIFY THAT THE PLAN SHEET ACCURATELY BOUNDS THE CONSTRUCTION AND LOCATES THE WORKMAN AND ALL ITS APPROPRIATE FEATURES. THE WORKMAN AND SELL. SIGNS AND SEALS HAVE CONTROLLED THE CONTRACTOR'S CONSTRUCTION OF THIS PROJECT. I SPECIFICALLY ENSURE THAT THE CONTRACTOR KNOWS THAT THE CONTRACTOR IS RESPONSIBLE FOR THE CONSTRUCTION OF THE PROJECT, THAT THE CONTRACTOR'S RESERVOIR IS LOCATED IN A SAFE AREA, AND THAT IT IS PROTECTED FROM OR PART OF THE PROJECT ITSELF.

SIGNATURE DATE

Notes:
- Spalled areas shall be chipped and cleaned by blasting or an approved method. Areas cleaned shall be patched and sealed in accordance with the Special Provisions.
- Pier caps and columns shall be cleaned and sealed after repair and/or replacement of structural steel elements and adjustment to bringings.
- Total areas of repair shall be determined by the Engineer in the field at the time of construction.
- Piers 2A & 5 shown, repairs at all other piers and abutments below areas of new concrete are similar.

SUBSTRUCTURE REPAIR DETAILS
ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County
NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DIMENSION</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>L1-L2 &amp;</td>
<td>14'-0&quot;</td>
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<tr>
<td>L2-L3 &amp;</td>
<td>14'-0&quot;</td>
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<td>L7-L8 &amp;</td>
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<td>14'-0&quot;</td>
</tr>
<tr>
<td>L9-L10 &amp;</td>
<td>14'-0&quot;</td>
</tr>
</tbody>
</table>

**Notes:**

The dimension from the edge of the hole to the center of the nearest edge of the existing broach connection is 14'-0" (the L0 and L14). At the L1 and L14 locations, the lower lateral bracing will be shown on sheet 12A or an opposite hand, depending on the orientation of the lower lateral bracing.

See "Lower Lateral Bracing Details" sheet 12A for drawing and other notes.

**FINAL PLANS**

I certify that this plan sheet accurately depicts the configuration and location of the restraints and all other apparatus, features, to the best of my knowledge, as I and my staff have observed the contractor's construction of this project. I specifically disclaim any responsibility for the design of this project, except as I and my staff may have assumed or authorized the modification of the project design during its construction or any by others for the contractor's actual construction of the project. I certify as I and my staff may have directed or approved that the project be constructed.

**Signature**

**DATE**

**LOWER LATERAL BRACING DATA**

LO TO LB & L14 TO LB

ROUTE 291 MISSOURI RIVER BRIDGE

Jackson County

**Per Fabricator's Request 5/13/02**

**New Sheet 7/29/02**

**Sheet 12B of 40**
BEARING STIFFENER ANGLE
REPLACEMENT LOCATIONS

East Truss: U1, South side, exterior
U2, South side, exterior & interior
U3, South side, exterior
West Truss: U1', North side, exterior & interior
U2', South side, exterior
U3', South side, exterior
U3, South side, exterior

For Bearing Stiffener Angle Replacement Details, see section A on "Floorbeam Strengthening Details" sheet.

WELDED COVER PLATE LOCATIONS

Top Flange Cover (north deck truss only)
Bolt, Flange Cover (north deck truss only)

Strap Plate

SECTION C

DECK TRUSS FLOORBEAM DETAILS

FLOORBEAM UB - SOUTH DECK TRUSS

Notes:
- Provide 2'' radius at corners of flanges (drilled holes).
- Grind out edges.
- Slope in new plate level with edges as shown in detail. Provide backing plates in gap between old and new plate.
- Clean, prime and coat repaired area in accordance with Special Provisions.
- Drill 3/4'' hole in new plate where 2'' hole in old plate occurs. Plug weld and grind hole.
- Clean out interior stringers on side of floorbeam UB & UB'. Thoroughly clean before applying new plate.
- New plate welds to old plate shall be made in accordance with Special Provisions or Special Instructions.

For notes pertaining to Bearing Stiffener Angle Replacement and Welded Cover Plates, see "Floorbeam Strengthening Details" sheet.

DECK TRUSS FLOORBEAM REPAIRS

ROUTE 291 MISSOURI RIVER BRIDGE

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
SLAB PLAN
15'6" slab for span 8 shown. Span 1 opposite hand.

26'-4" Profile Grade
HANDLING
See Detail B

30'-6"

22'-8"

8'-4"

40'-4"

26'-4"

28'-4"

30'-0"

5'-4"

15'-4"

13'-4"

3'-6"

3'-6"

4'-0"

4'-0"

4'-0"

4'-0"

52 Spaces @ 5'-6" = 26'-6"

Parabolic Crown

Top Reinforcing

Bottom Reinforcing

E. Floorbeam

Section, Joint, typ.

E. Roadway & Profile Grade

Note:
The Contractor shall pour and satisfactorily finish the roadway side at a rate of not less than 25 cubic yards per hour.

F Series - 56 and 57 bars to match every other row of bars.

Expansion joint pour shall be placed in parallel and simultaneously at each expansion joint, and only after completion of the pour pour. The direction of pour shall be uphill.

FINAL PLAN

KEY TO EXTEND FULL WIDTH OF SLAB OVERHANGING

TYPICAL CONSTRUCTION JOINT

SECTION D-D THRU ROADWAY

SLAB DETAILS - PLATE GIRDER SPANS

HARRINGTON & CORTESY, INC.
Consulting Engineers
DRAFTED 08/01
CHECKED: 10/01

SLAB DETAILS - PLATE GIRDER SPANS
ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.
GENERAL NOTES:

1. All details of this drawing are based on and in accordance with the requirements of Section 19-63.3 of the Missouri Standard Specifications.

2. The reinforcing steel in the bridge approach slab and bridge approach guardrail shall be Grade 60 steel with Fy = 60,000 psi.

3. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

4. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

5. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

6. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

7. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

8. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

9. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

10. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

11. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

12. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

13. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

14. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

15. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

16. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

17. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

18. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

19. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

20. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

21. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

22. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

23. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

24. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

25. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

26. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

27. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

28. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

29. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

30. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

31. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

32. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

33. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

34. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

35. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

36. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

37. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

38. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.

39. All reinforcing steel shall be classified as Grade 60 steel with Fy = 60,000 psi.

40. The parapet wall in the bridge approach slab and guardrail shall be designed to resist wind pressures of 40 MPH with a 50-year return period.
### TRUSS

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<thead>
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<th>Joint</th>
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<th>Theoretical Bottom Sleeve (inches)</th>
<th>Theoretical Elevation (feet)</th>
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### Note: Does not include correction factor for floorbeam canters.
## Plate Girder Spans - N. End

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<th>Data</th>
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## Plate Girder Spans - S. End

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### Deck Truss - N. End

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<tbody>
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### Deck Truss - S. End

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</thead>
<tbody>
<tr>
<td>Column 1</td>
<td>Column 2</td>
<td>Column 3</td>
</tr>
</tbody>
</table>

Note: Additional columns and data may be present in the table and diagram.
DETAILS OF PLASTIC WATERSTOP

Notes:
1. Plastic waterstop shall be placed in all safety barrier curb filled joints.
2. Cost of plastic waterstop complete in place shall be included in the contract unit price for Safety Barrier Curb.

PART ELEVATION

Top of safety barrier curb

FACE OF SAFETY BARRIER CURB

HARRINGTON CORTELYOU, INC.
Consulting Engineers
DRAFTED: 06/01
CHECKED: 05/31

NOTE: DO NOT SCALE THIS DRAWING. FOLLOW DIMENSIONS.

TYPICAL SAFETY BARRIER CURB DETAILS

ROUTE 291 MISSOURI RIVER BRIDGE
Jackson County
SHEET 28 OF 40

LO5684
### Deck Drain Locations

<table>
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### Slab Drains

- **Route**: 293 Missouri River Bridge
- **County**: Jackson County
- **Owner**: Missouri Department of Transportation
- **Contractor**: Hargreaves & Coteleyou, Inc.

**Note:** Do not scale this drawing. Follow dimensions.