### INDEX FOR J44-06 STANDARDS:

- ABUTMENT BACKFILL DETAILS - 15°, 30°, & 45° SKEWS
- WING ARMORING & MACADAM STONE DETAILS
- BARRIER RAIL DETAILS
- ABUTMENT DETAILS - STEEL PILING
- ABUTMENT DETAILS 45° SKEW - STEEL PILING
- ABUTMENT DETAILS 15° SKEW - STEEL PILING
- ABUTMENT DETAILS 45° SKEW - TIMBER PILING
- ABUTMENT DETAILS 30° SKEW - TIMBER PILING
- ABUTMENT DETAILS 15° SKEW - TIMBER PILING
- ABUTMENT DETAILS 0° SKEW - TIMBER PILING
- NON-MONOLITHIC PIER CAP DETAILS ALL BRIDGES
- MONOLITHIC PIER CAP DETAILS ALL BRIDGES
- SUPERSTRUCTURE DETAILS ALL BRIDGES 45° SKEW
- SUPERSTRUCTURE DETAILS ALL BRIDGES 30° SKEW
- SUPERSTRUCTURE DETAILS ALL BRIDGES 15° SKEW
- SUPERSTRUCTURE DETAILS 150'-0 BRIDGE
- SUPERSTRUCTURE DETAILS 140'-0 BRIDGE
- SUPERSTRUCTURE DETAILS 110'-0 BRIDGE
- SUPERSTRUCTURE DETAILS 100'-0 BRIDGE
- SUPERSTRUCTURE DETAILS 100'-0 BRIDGE

### GENERAL NOTES:

The J44-06 bridge standards, if properly used, provide the structural plans necessary to construct three span 44' roadway continuous concrete slab bridges with lengths of 10'-0", 100'-0", 150'-0", 200'-0", 250'-0", 300'-0", and 350'-0".

These bridges may be built on a 0°, 15°, 30°, or 45° skew. These plans show the bridges skewed in one direction; all dimensions and details would be the same for the opposite skew.

These standards give most of the information necessary to build these bridges. However, the following additional information is required for use on any future routes. For segments that are not covered by the standards, the engineer may not require all sheets to be provided.

1. Title sheet with engineering design information.
2. Tide elevation cut-off.
3. Detailed to include class 20 excavation for bridge.
4. Elevation plan layout of bridge.
5. Bottom of abutment footing elevations.
7. Filling design information.
8. Slope protection layout if needed.
10. Lighting layout if needed.

For clarity, most sections shown on the following sheets are drawn with barrier rail only. These sections will be identical for open rail design with any modifications shown on sheet 9-06-A and 9-06-B.

These bridges are designed for load carrying plus 20 lbs. per sq. ft. for future nearside bearing surface, control of cracking by distribution of reinforcement for slab design based on pre-love 2012-13.

Note that when approach pavement is to be placed, the temporary paving blocks shall be removed and a proper joint for expansion shall be provided between the bridge and the approach pavement.

The floor slab as shown includes a 3-in. internal bearing surface.

The abutments for these bridges are built integral with the superstructure. Therefore, it is important that a proper joint for expansion be provided between the bridge and the approach pavement, when approach paving is needed.

The abutment design utilized on these bridges restricts their use in the following manner:

1. These bridges are not to be used when point bearing for the abutment steel piles could be obtained or in situations in which a distance less than 15 feet from the bottom of footing.
2. For the 100 and 150 foot long bridges the abutment piles are to be driven through oversized holes prebored to a minimum of 10 feet below the sides of the bottom of footing. The prebored holes shall be in accordance with section 2501.03, Q of the standard specifications.
3. If the bottom of the prebored hole shall be shown on the plans.
4. The elevation of the bottom of the prebored hole shall be shown on the plans.
5. It is necessary that the title and length for both the abutment and pier piles be designated on the front sheet of the plans.
6. The integral abutment and pile design for these J44 standards have been designated for use in both friction and point bearing piles. It is necessary that the title and length for both the abutment and pier piles be designated on the front sheet of the plans.
7. The integral abutment and pile design for these J44 standards have been designated for use in both friction and point bearing piles.
8. In the integral abutment and pile design for these J44 standards have been designated for use in both friction and point bearing piles.
9. The integral abutment and pile design for these J44 standards have been designated for use in both friction and point bearing piles.

### SPECIFICATIONS:

**Design: Iowa DOT, Series 2006 with internal 2005.**

**Construction:** Iowa Department of Transportation standards specifications for highway and bridge construction series 2005 plus applicable general supplemental specifications, developmental specifications and special provisions shall apply to construction work on this project.

**Design Stresses:**

- Design stresses for the following materials are in accordance with the Iowa DOT Design Specifications, Series 9.5.6, 10.0, 15.0, 25.0, 30.0, 35.0, and 40.0 psi. Structural steel in accordance with AASHTO Section 6.0. AASHTO Grade 60 or 50 psi. Class 30, Class 30 or Class 50.

**Light Load:**

- 150 light load plus 20 lbs. per sq. ft. for future nearside bearing surface. 1,100 lbs. is used to calculate equivalent for live load distribution.

- Six foot of approach slab slab and live load included in approach load, control of cracking by distribution of reinforcement for slab design based on pre-love 2012-13.
CONCRETE SEALER LIMITS FOR OPEN RAILS

Concrete sealer shall be applied to both sides of open rail slabs on the top, face of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face, side of slab, and on all sides of the open rail posts. See Article 2403.03 of the Standard Specifications. The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with the Iowa DOT requirements for barrier rail and open rail.

CONCRETE SEALER LIMITS

The concrete sealer limits for open rails shall be applied to both sides of open rail slabs on the top, face of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face, side of slab, and on all sides of the open rail posts. The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with Article 2403 of the Standard Specifications.

SLAB CROSS-SECTIONAL AREA

For barrier rail = 44'-0 ROADWAY
For open rail = 44'-6 ROADWAY

CONCRETE SEALER LIMITS

The concrete sealer limits for open rails shall be applied to both sides of open rail slabs on the top, face of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face, side of slab, and on all sides of the open rail posts. The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with Article 2403 of the Standard Specifications.

HALF SECTION NEAR ABUTMENT

HALF SECTION NEAR PIER

SLAB CROSS-SECTIONAL AREA

For barrier rail = 22'-3
For open rail = 22'-0

CONCRETE SEALER LIMITS

The concrete sealer limits for open rails shall be applied to both sides of open rail slabs on the top, face of slab, and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face, side of slab, and on all sides of the open rail posts. The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with Article 2403 of the Standard Specifications.

FORM CAMBER DIAGRAM

This diagram shows the form camber required to compensate for the anticipated ultimate dead load deflection. The above dimensions do not include any allowance for form deflection or falsework settlement.

PLACEMENT FOR LONGITUDINAL REINFORCEMENT

The placement for longitudinal reinforcement is shown in the diagram. The reinforcement is placed parallel to and 1" above the bottom of slab. Before concrete is poured, the reinforcement is to be securely wired in place and adequately supported on bar chairs. The reinforcement requirements shall apply for any cantilevered sections.

NOTE: DOUBLE DRIP GROOVES FOR OPEN RAIL OPTION ONLY.

*NOTE: DOUBLE DRIP GROOVES FOR OPEN RAIL OPTION ONLY.

IOWA DOT
Highway Division

STANDARD DESIGN - 44' ROADWAY, 3 SPAN BRIDGES
CONTINUOUS CONCRETE SLAB BRIDGES
NOVEMBER, 2006

SUPERSTRUCTURE DETAILS
TO'-O BRIDGE
### Bill of Reinforcing Steel for Superstructure - To Bridge

<table>
<thead>
<tr>
<th>Item Description</th>
<th>LBS.</th>
<th>C.Y.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slab, Diagonals, at Abutment</td>
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<td></td>
</tr>
<tr>
<td>Slab, Hairpins, at Abutment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slab Transverse Ends, Top</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slab Transverse Ends, Top</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slab Transverse Top</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slab Longitudinal Top</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIER CAP, TOP Longitudinal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIER CAP, Bottom Longitudinal</td>
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<td>PIER CAP, Bottom Longitudinal</td>
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</tr>
<tr>
<td>OPEN RAIL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL - LBS.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUB TOTAL - LBS.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- All reinforcing steel shall be cut to exact length.
- The reinforcing steel quantities are rounded to whole bars and are not exact lengths.
**SLAB BRIDGES**

**CONTINUOUS CONCRETE SLAB BRIDGES**

**NOVEMBER, 2006**

**SUPERSTRUCTURE DETAILS**

80'-0 BRIDGE

**THIS DIAGRAM SHOWS THE FORM CAMBER REQUIRED TO COMPENSATE FOR THE ANTICIPATED ULTIMATE DEAD LOAD DEFLECTION. THE ABOVE DIMENSIONS DO NOT INCLUDE ANY ALLOWANCE FOR FORM DEFLECTION OR FALSEWORK SETTLEMENT.**

**FORM CAMBER DIAGRAM**

**BARRIER RAIL SYNTHETIC**

**NOTE:** DOUBLE DRIP GROOVES FOR OPEN RAIL OPTION ONLY.

**BARRIER RAIL SPECIAL REQUIREMENTS**

**DOUBLE DRIP GROOVE**

**DOUBLE DRIP GROOVE**

**LIMITS FOR OPEN RAILS CONCRETE SEALER**

**LIMITS FOR OPEN RAILS CONCRETE SEALER**

**NOTE:** DOUBLE DRIP GROOVES FOR OPEN RAIL OPTION ONLY.

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**NOTE:** DOUBLE DRIP GROOVES FOR OPEN RAIL OPTION ONLY.
CONCRETE SEALER LIMITS FOR OPEN RAILS

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face of section of rail, and on all sides of the open rail posts.

The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with Article 2403.03, P, 3 of the Standard Specifications.
### Bill of Reinforcing Steel for Superstructure - 90° Bridge

**Location**
- **Slab Transverse Top**
- **Slab Transverse Bottom**
- **Slab Longitudinal Top**
- **Slab Longitudinal Bottom**
- **Slab Longitudinal at Rail**
- **Slab Transverse at Abutment**
- **Slab Transverse at Rail**

**Location**
- **Slab Transverse Ends, Top**
- **Slab Transverse Ends, Bottom**
- **Slab Longitudinal Ends, Top**
- **Slab Longitudinal Ends, Bottom**
- **Slab Longitudinal Top**
- **Slab Longitudinal Bottom**
- **Slab Longitudinal at Rail**
- **Slab Longitudinal at Rail**
- **Slab Longitudinal at Rail**
- **Slab Longitudinal at Rail**
- **Slab Longitudinal at Rail**
- **Slab Longitudinal at Rail**

**Dimensions**
- **Length**
- **Skew**
- **Angle**

**Weight**
- **Total Weight**
- **Lbs.**

**Revised 08-2020: Updated Bridge Engineering Signature.**

*Same as above except all "h" bars deleted.*

---

**Bill of Reinforcing Steel for Superstructure - Bridge with Open Rail**

**Superstructure Details**

**IowaDOT Highway Division**

**Standard Design - 4 of 8 Span Bridges**

**Continuous Concrete Slab Bridges**

**November, 2006**

**Superstructure 90°-0 Bridge**

**J44-07-06**

---

**Estimated Quantities for Superstructure - 90° Bridge**

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<thead>
<tr>
<th>Item</th>
<th>With Monolithic Open Cap</th>
<th>With Monolithic Solid Cap</th>
<th>With Nonmonolithic Open Cap</th>
<th>With Nonmonolithic Solid Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slab</td>
<td>64,136</td>
<td>64,136</td>
<td>64,136</td>
<td>64,136</td>
</tr>
</tbody>
</table>

*Includes 4 rings @ 6" Cyl, Excludes Rail Concrete.*
CONCRETE SEALER LIMITS FOR OPEN RAILS

CONCRETE SEALER SHALL BE APPLIED TO BOTH SIDES OF BRIDGE SLAB ON THE TOP, EDGE OF SLAB AND UNDER THE SLAB. THE CONCRETE SEALER SHALL ALSO BE APPLIED TO THE OPEN RAIL ON THE TOP, TRAFFIC FACE SIDE, BOTTOM OF RAIL, AND ON ALL SIDES OF THE OPEN RAIL POSTS.

THE CONCRETE SEALER LIMITS ARE SHOWN IN THE DETAIL; AND SHALL APPLY TO THE FULL LENGTH OF BRIDGE. CONCRETE SEALER SHALL BE APPLIED IN ACCORDANCE WITH ARTICLE 2403.03, PARA. 3 OF THE STANDARD SPECIFICATIONS.

SLAB CROSS-SECTIONAL AREA FOR OPEN RAIL = SQ. FT.

SLAB CROSS-SECTIONAL AREA FOR BARRIER RAIL = SQ. FT.

PLACEMENT FOR LONGITUDINAL REINFORCEMENT

NOTE: DOUBLE DRIP

RAIL OPTION ONLY.

GROOVES FOR OPEN RAIL =

SLAB CROSS-SECTIONAL AREA

5B4

8B1

10B3

10B12

22B0

32B0

10B1

22B0

30B9

24B9

5B0

7B4

86 SPACES @ 0'-6 = 43'-0

8B2

10B2

9B9

6B8

10'-0

3'-0

17'-9

3'-9

SYMMETRICAL

6'-3

30'-9

10'-0

39'-0

9'-0

27'-9

| ABUT. BRG.

12'-6

12'-6

11'-0

10b3

22'-6

32'-0

10b12

22'-0

30'-9

24'-9

5'-0

7b4

ƒ" DOUBLE DRIP

REVISED 07-16: DATE ON SHEET CHANGED TO CORRECT CLERICAL ERROR.

REVISED 08-2020: UPDATED BRIDGE ENGINEER SIGNATURE. ADDED 3 ...

(TYP.) & ...

TO LONGITUDINAL REINFORCEMENT LINE D & E IN "HALF SECTION NEAR PIER".

8/1/2020  11:56:46 AM
HALF SECTION NEAR ABUTMENT

SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL & 7'2" TOP SHAFT.

NOTE: FOR LONGITUDINAL REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR BELOW TOP OF SLAB. BOTTOM LONGITUDINAL REINFORCING STEEL IS TO BE PARALLEL TO AND 2" CLEAR BELOW TOP OF SLAB. TOP LONGITUDINAL REINFORCING STEEL IS TO BE SECURED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.

CONCRETE SEALER LIMITS FOR OPEN RAILS

CONCRETE SEALER SHALL BE APPLIED TO BOTH SIDES OF SLAB UNDER THE SLAB OR FALSEWORK SETTLEMENT. THE CONCRETE SEALER SHALL ALSO BE APPLIED TO THE OPEN RAIL ON THE TOP, TRAFFIC FACE, SIDE, EACH END, TOP, TRAFFIC FACE, CANOPY, AND ON ALL SIDES OF THE OPEN RAIL POSTS.

HALF SECTION NEAR PIER

SLAB CROSS-SECTIONAL AREA
FOR BARRIER RAIL & 7'2" TOP SHAFT.

FORM CAMBER DIAGRAM

THIS DIAGRAM SHOWS THE FORM CAMBER REQUIRED TO COMPENSATE FOR THE ANTICIPATED ULTIMATE DEAD LOAD DEFORMATION. THE ABOVE DIMENSIONS DO NOT INCLUDE ANY ALLOWANCE FOR FORM DEFLECTION OR FALSEWORK SETTLEMENT.

NOTE: TOP LONGITUDINAL REINFORCING STEEL IS TO BE SECURED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.

CONCRETE SEALER LIMITS FOR OPEN RAILS

CONCRETE SEALER SHALL BE APPLIED TO BOTH SIDES OF SLAB UNDER THE SLAB OR FALSEWORK SETTLEMENT. THE CONCRETE SEALER SHALL ALSO BE APPLIED TO THE OPEN RAIL ON THE TOP, TRAFFIC FACE, SIDE, EACH END, TOP, TRAFFIC FACE, CANOPY, AND ON ALL SIDES OF THE OPEN RAIL POSTS.

NOTE: TOP LONGITUDINAL REINFORCING STEEL IS TO BE SECURED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.
HALF SECTION NEAR ABUTMENT
SLAB CROSS-SECTIONAL AREA
FOR OPEN RAIL: 5'10" THICK SLAB

HALF SECTION NEAR PIER
SLAB CROSS-SECTIONAL AREA
FOR BARRIER RAIL: 2'2" THICK SLAB

CONCRETE SEALER LIMITS FOR OPEN RAILS
Concrete sealer shall be applied to both sides of barrier rail on the top, edge of slab and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face, sides, bottom of slab, and on all sides of the open rail posts.

The concrete sealer limits are shown in the detail and apply to the full length of bridge. Concrete sealer shall be applied in accordance with Article 2403.03, P, 3 of the Standard Specifications.

NOTES:
- Double drip grooves for open rail option only.
- Spec. 2403.03, P, 3 of the standard specifications.
- Concrete sealer limits are shown in the detail and apply to the full length of bridge. Concrete sealer shall be applied in accordance with Article 2403.03, P, 3 of the standard specifications.

PLACEMENT FOR LONGITUDINAL REINFORCEMENT

FORM CAMBER DIAGRAM
This diagram shows the form camber required to compensate for the anticipated ultimate dead load deflection. The above dimensions do not include any allowance for form deflection or falsework settlement.

SPACIAL REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.
Before concrete is poured, place and adequately supported on bar chairs. Reinforcing steel is to be securely wired in parallel to and 1" clear above bottom of slab. Bottom longitudinal reinforcing steel is to be parallel to and 2" clear below top of slab.}

TOP LONGITUDINAL REINFORCING STEEL IS TO BE
PARALLEL TO AND 2" CLEAR BELOW TOP OF SLAB.
NOTE: TOP LONGITUDINAL REINFORCING STEEL IS TO BE
PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF SLAB.
### Half Section Near Abutment

**Slab Cross-Sectional Area for Open Rail**

- 3 SPA. @ 8'-6
- 4'-9 MIN. LAP

**Slab Cross-Sectional Area for Barrier Rail**

- 4 SPA. @ 8'-6 = 39'-6

**Crown Ordinates**

- 2.0% SLOPE

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### Half Section Near Pier

**Slab Cross-Sectional Area for Open Rail**

- 3 SPA. @ 8'-6
- 4'-9 MIN. LAP

**Slab Cross-Sectional Area for Barrier Rail**

- 4 SPA. @ 8'-6 = 39'-6

---

**Concrete Sealer Limits for Open Rails**

Concrete sealer shall be applied to both sides of barrier rail on the top, edge of slab and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face side and bottom of slab, and on all sides of the open rail posts.

The concrete sealer limits are shown in the detail and shall apply to the full length of bridge. Concrete sealer shall be applied in accordance with Article 2403.03 P, 3 of the Standard Specifications.

---

**Form Camber Diagram**

This diagram shows the form camber required to compensate for the anticipated ultimate dead load deflection. The above dimensions do not include any allowance for form deflection or falsework settlement.

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**Placement for Longitudinal Reinforcement**

- 4'-9 MIN. LAP
- 3 SPA. @ 8'-6

---

**Superstructure Details**

**130'-0 Bridge**

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**Iowa DOT**

Highway Division

**Standard Design - 44'-0 Roadway, 3 Span Bridges**

**Continuous Concrete Slab Bridges**

**November, 2006**
CONCRETE SEALER LIMITS FOR OPEN RAILS

Concrete sealer shall be applied to both sides of bridge slab on the top, edge of slab and under the slab. The concrete sealer shall also be applied to the open rail on the top, traffic face, side of slab, and on all sides of the open rail post.

The concrete sealer limits are shown in the detail and apply to the full length of bridge. Concrete sealer shall be applied in accordance with Article 2403.03, P.3 of the standard specifications.

FORM CAMBER DIAGRAM

This diagram shows the form camber required to compensate for the anticipated ultimate dead load deflection. The above dimensions do not include any allowance for form deflection or falsework settlement.
15° Skew Reinforcing Steel Layout

Floor drain details

Floor drain location

NOTE: 4" x 8" outside dimension rolled tube with .41 wall thickness may be substituted for the welded drain shown.

Limits of concrete sealer applied to bottom of slab.

Limits of concrete sealer applied to bottom of slab.

15° Transv. Rein. Dimension Table

<table>
<thead>
<tr>
<th>Bridge</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>70' Bridge</td>
<td>66</td>
<td>66-0</td>
<td>67</td>
<td>28-0</td>
<td>17-0</td>
<td>28-0</td>
</tr>
<tr>
<td>60' Bridge</td>
<td>76</td>
<td>16-0</td>
<td>77</td>
<td>32-0</td>
<td>18-0</td>
<td>32-0</td>
</tr>
<tr>
<td>90' Bridge</td>
<td>86</td>
<td>66-0</td>
<td>87</td>
<td>36-0</td>
<td>21-0</td>
<td>36-0</td>
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<tr>
<td>100' Bridge</td>
<td>96</td>
<td>96-0</td>
<td>97</td>
<td>40-0</td>
<td>23-0</td>
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<tr>
<td>110' Bridge</td>
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<td>107</td>
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<tr>
<td>120' Bridge</td>
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<tr>
<td>130' Bridge</td>
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<td>147</td>
<td>60-0</td>
<td>33-0</td>
<td>60-0</td>
</tr>
</tbody>
</table>

NOTE: 4" x 8" outside dimension rolled tube with .41 wall thickness may be substituted for the welded drain shown.

Concrete sealer limits

Header drilled for reinforcing bars

NOMINAL BEVELED 2x6 KEYWAY

Header drilled for reinforcing bars

NOMINAL BEVELED 2x6 KEYWAY

NOTICE: DRAINS ARE TO BE GALVANIZED. INCLUDE COST OF DRAINS WITH "WELDED DRILL" MAY BE SUBSTITUTED FOR THE WELDED DRAIN SHOWN.

NOTE: 4" x 8" outside dimension rolled tube with .41 wall thickness may be substituted for the welded drain shown.

Concrete sealer limits

Limits of concrete sealer applied to bottom of slab.

Limits of concrete sealer applied to bottom of slab.

15° Skew Reinforcing Steel Layout
### TYPICAL NUMBERS OF PILES AND SPACINGS AND FACTORED PIER LOADS

<table>
<thead>
<tr>
<th>Length</th>
<th>Pile &amp; Pile Cap Spacing</th>
<th>Pile &amp; Pile Cap Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>23'-7</td>
<td>9 SPA. @ ABOUT 4'-9</td>
<td>9 SPA. @ ABOUT 4'-9</td>
</tr>
<tr>
<td>848 KIPS</td>
<td>9 SPA. @ ABOUT 4'-9</td>
<td>9 SPA. @ ABOUT 4'-9</td>
</tr>
<tr>
<td>10 SPA. @ ABOUT 4'-9</td>
<td>9 SPA. @ ABOUT 4'-9</td>
<td>9 SPA. @ ABOUT 4'-9</td>
</tr>
<tr>
<td>11 SPA. @ ABOUT 4'-9</td>
<td>9 SPA. @ ABOUT 4'-9</td>
<td>9 SPA. @ ABOUT 4'-9</td>
</tr>
<tr>
<td>12 SPA. @ ABOUT 4'-9</td>
<td>9 SPA. @ ABOUT 4'-9</td>
<td>9 SPA. @ ABOUT 4'-9</td>
</tr>
</tbody>
</table>

### PIER NOTES:

All monolithic pier cap reinforcing and concrete is included in superstructure estimate of quantities. The minimum clear distance from the face of the concrete to reinforcing bar is to be 2 unless otherwise noted or shown.

- **Cap Steel** as detailed on P10L Standard Pile Drawing is required for monolithic pier caps.
- **Concrete Quantities** are based on the use of Type 3 Piling. If Type 1 or Type 2 is used, the concrete quantities may be adjusted to account for the concrete displaced by the Piers.
- **All reinforcing steel** is to be Grade 60.
- **Pier Piling** was designed for HL-93 Loading with an allowance for 20 psf future wearing surface.

**PIECE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES**
NOTE: BOTTOM OF CAP ELEVATIONS WILL BE REQUIRED AT THE TYP. HOOP SPACING.

- **70'-0 & 80'-0 Bridges**
  - 9 equal pile spaces
  - Cap steel: 2'-2, 1', 0
  - Typical hoop spacing: 1', 0

- **90'-0 Bridge**
  - 11 equal pile spaces
  - Cap steel: 2'-2, 1', 0
  - Typical hoop spacing: 1', 0

- **100'-0 Bridge**
  - 12 equal pile spaces
  - Cap steel: 2'-2, 1', 0
  - Typical hoop spacing: 1', 0

- **110'-0 Bridge**
  - 16 equal pile spaces
  - Cap steel: 2'-2, 1', 0
  - Typical hoop spacing: 1', 0

- **120'-0 Bridge**
  - 15 equal pile spaces
  - Cap steel: 2'-2, 1', 0
  - Typical hoop spacing: 1', 0

- **130'-0 Bridge**
  - 17 equal pile spaces
  - Cap steel: 2'-2, 1', 0
  - Typical hoop spacing: 1', 0

- **140'-0 Bridge**
  - 14 equal pile spaces
  - Cap steel: 2'-2, 1', 0
  - Typical hoop spacing: 1', 0

- **150'-0 Bridge**
  - 16 equal pile spaces
  - Cap steel: 2'-2, 1', 0
  - Typical hoop spacing: 1', 0

**Note:**
- The bottom of the cap elevations will be required at the typical hoop spacing.
- Each exterior pile is to be embedded 1'-0 into pier cap.
NON-MONOLITHIC PIER CAP DETAILS

PART PLAN

- Pier Cap
- Edge of slab
- Tar paper full width and length of cap

PART SECT A-A

- TYP. SECTION
  - Joint material
  - Fillet

- Joint material is to go all the way around pier cap for square and skewed bridges.

PART SECT B-B

- 4 x 1 strip of preformed joint material at ends of pier cap. Note that joint material is to go all the way around pier cap for square and skewed bridges.

HIGHWAY DIVISION

STANDARD DESIGN - 44' ROADWAY, 3 SPAN BRIDGES

CONTINUOUS CONCRETE SLAB BRIDGES

NOVEMBER, 2006

NON-MONOLITHIC PIER CAP DETAILS

ALL BRIDGES

J44-27-06
NON-MONOLITHIC PIER CAP DETAILS

TYPE 3 TRESTLE BENT PILES

TYP. HALF PLAN VIEW

NOTE: NUMBER OF PILES AND STIRRUPS SHOWN ARE FOR A 90'-0 BRIDGE. CAP DIMENSIONS ARE TYPICAL FOR ALL BRIDGES.
BILL OF EPOXY REINFORCING STEEL - ONE PIER

### Bridge Length

<table>
<thead>
<tr>
<th>Bridge Length</th>
<th>TOL.</th>
<th>70'-0</th>
<th>80'-0</th>
<th>90'-0</th>
<th>100'-0</th>
<th>110'-0</th>
<th>120'-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>60'-0</td>
<td>10</td>
<td>25'-3</td>
<td>25'-3</td>
<td>25'-3</td>
<td>25'-3</td>
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<td>28'-4</td>
<td>28'-4</td>
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<td>28'-4</td>
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<tr>
<td>80'-0</td>
<td>10</td>
<td>31'-1</td>
<td>31'-1</td>
<td>31'-1</td>
<td>31'-1</td>
<td>31'-1</td>
<td>31'-1</td>
</tr>
<tr>
<td>90'-0</td>
<td>10</td>
<td>34'-2</td>
<td>34'-2</td>
<td>34'-2</td>
<td>34'-2</td>
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</table>

### Typical Numbers of Piles and spacings and Factored Pier Loads

<table>
<thead>
<tr>
<th>Typical # of Piles</th>
<th>ID</th>
<th>ID</th>
<th>ID</th>
<th>ID</th>
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<tbody>
<tr>
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<td>TOL.</td>
<td>TOL.</td>
<td>TOL.</td>
<td>TOL.</td>
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<tr>
<td>5 964</td>
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<td>8 964</td>
<td>8 964</td>
<td>8 964</td>
<td>8 964</td>
</tr>
</tbody>
</table>

### PIER NOTES:

- Pier piles should be driven to full embedment, if practical, but in no case to a driving value less than the pile bearing required for each bridge length as shown on this page.

- The concrete quantities are based on the use of Type 3 piles. If Type 1 or Type 2 piles are used, the concrete quantities may be adjusted to account for the concrete displaced by the piles.

- All reinforcing steel is to be Grade 60.

- Pier piles were designed for 60 1/2 ksi loading with an allowance for 20 ksi, per future wearing surface.
ABUTMENT NOTES:
The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet are to be used only when abutments are placed on timber piles.

The minimum clear distance from the face of the concrete to near reinforcing bar is to be 2 inches unless otherwise noted or shown. Timber piles shall be driven to full penetration if practicable but in no case to a bearing value less than shown in design plans. Timber piles shall not be driven to more than 160 tons. All reinforcing steel is to be grade 60.

Abutment pile was designed for 20 lbs. per sq. ft. future wearing surface.

NOTE:  WING REINFORCING AND RAIL NOT SHOWN.
WITH SUPERSTRUCTURE QUANTITIES.

FOR 20 LBS. PER SQ. FT. FUTURE WEARING SURFACE.
ABUTMENT PILING WAS DESIGNED FOR HL-93 LOADING WITH AN ALLOWANCE IN ALL REINFORCING STEEL IS TO BE GRADE 60.
TIMBER PILES SHALL NOT BE DRIVEN TO MORE THAN 160 TONS.
IN SLAB
TIMBER PILES SHALL BE DRIVEN TO FULL PENETRATION IF PRACTICABLE.
REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.
The minimum clear distance from the face of the concrete to near reinforcing bar is to be 2 inches unless otherwise noted or shown. Timber piles shall be driven to full penetration if practicable but in no case to a bearing value less than shown in design plans. Timber piles shall not be driven to more than 160 tons. All reinforcing steel is to be grade 60.

ABUTMENT AT GUTTERLINE:

SECTION NORMAL TO ABUTMENT AT C

SECTION NORMAL TO ABUTMENT AT GUTTERLINE

PLATE VIEW
NOTE: WING REINFORCING AND RAIL NOT SHOWN.
6t2, 6e3, 6e4, AND 8e ARE INCLUDED & PILES
ABUT. BRG.
44-6t1 F.F. & 44-6t2 B.F. DOWELS
43 SPA. @ 1'-0 = 43'-0 & 44-6e4 DIAGONALS IN SLAB & 44-6e3 HAIRPINS IN SLAB & 6e4 DIAGONALS & 6e3 HAIRPINS
6t1 DOWELS, 6t2
6e3
6t2
6e4
2'-0 @ ABOUT 4'-0 CTRS.
6t2
6e3
6t2
6e4
6t1
6e3
6e4
44'-0 ROADWAY
BOTTOM OF SLAB
22'-0
| ROADWAY
1'-1
ABUT. BRG.
6'-1 @ |
| ROADWAY
1'-7
1'-7
3'-0
JOINT
CONSTRUCTION
PUNCHED TO HOLD SPIRAL.
3" PITCH WITH 3-‡x‡x" SPACERS
7 TURNS OF #2 BAR 21" DIAMETER,
SPIRAL AT TOP OF EACH PILE.
1'-3
3'-0
4'-9
BAR
b SLAB
SEE DETAIL A
FOR CLARITY.
NOT SHOWN
6e4 & 6t1
8r1 OR 8r2
6t2
8e1
8e2
8r
6c
5d
1  " C L.
11ˆ B A R R I E R R A I L
10  O P E N R A I L
44-6t1 F.F. & 44-6t2 B.F. DOWELS
43 SPA. @ 1'-0 = 43'-0 & 44-6e4 DIAGONALS IN SLAB & 44-6e3 HAIRPINS IN SLAB & 6e4 DIAGONALS & 6e3 HAIRPINS
6t1 DOWELS, 6t2
6e3
6t2
6e4
2'-0 @ ABOUT 4'-0 CTRS.
6t2
6e3
6t2
6e4
6t1
6e3
6e4
44'-0 ROADWAY
BOTTOM OF SLAB
22'-0
| ROADWAY
1'-1
ABUT. BRG.
6'-1 @ |
| ROADWAY
1'-7
1'-7
3'-0
JOINT
CONSTRUCTION
PUNCHED TO HOLD SPIRAL.
3" PITCH WITH 3-‡x‡x" SPACERS
7 TURNS OF #2 BAR 21" DIAMETER,
SPIRAL AT TOP OF EACH PILE.
1'-3
3'-0
4'-9
BAR
b SLAB
SEE DETAIL A
FOR CLARITY.
NOT SHOWN
6e4 & 6t1
8r1 OR 8r2
6t2
8e1
8e2
8r
6c
5d
1  " C L.
11ˆ B A R R I E R R A I L
10  O P E N R A I L

NUMBER OF PILES AND ABUTMENT DESIGN LOADS

<table>
<thead>
<tr>
<th>BRIDGE LENGTH</th>
<th>70'-0</th>
<th>80'-0</th>
<th>90'-0</th>
<th>100'-0</th>
<th>110'-0</th>
<th>120'-0</th>
<th>130'-0</th>
<th>140'-0</th>
<th>150'-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>75'-0</td>
<td>539</td>
<td>571</td>
<td>613</td>
<td>653</td>
<td>699</td>
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<td>906</td>
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<tr>
<td>80'-0</td>
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<td>571</td>
<td>613</td>
<td>653</td>
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<tr>
<td>95'-0</td>
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<td>571</td>
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<td>699</td>
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<td>100'-0</td>
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<td>105'-0</td>
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<td>110'-0</td>
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<td>130'-0</td>
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<td>571</td>
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<td>744</td>
<td>792</td>
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<td>135'-0</td>
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<td>571</td>
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<td>699</td>
<td>744</td>
<td>792</td>
<td>849</td>
<td>906</td>
</tr>
</tbody>
</table>

A INCLUDES DYNAMIC LOAD ALLOWANCE.
NOTE: STRENGTH 1 DESIGN LOAD IMPIES THE VALUE USED IN THE FIELD FOR DRIVING PILES.
ABUTMENT NOTES:
The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet are to be used only when abutments are placed on timber piles.

The minimum clear distance from the face of the concrete to near reinforcing bars is to be 2 inches unless otherwise noted or shown.

Timber piles shall be driven to full penetration if practicable, but in no case to a bearing value less than shown in design plans. Timber piles shall not be driven to more than 160 tons. All reinforcing steel is to be Grade 60.

Abutment piles are designed for HL-93 loading with an allowance for 20 lbs./sq. ft. future wearing surface.

<table>
<thead>
<tr>
<th>BRIDGE LENGTH</th>
<th>10'-0</th>
<th>20'-0</th>
<th>30'-0</th>
<th>40'-0</th>
<th>50'-0</th>
<th>60'-0</th>
<th>70'-0</th>
<th>80'-0</th>
<th>90'-0</th>
<th>100'-0</th>
<th>110'-0</th>
<th>120'-0</th>
<th>130'-0</th>
<th>140'-0</th>
<th>150'-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>THICKNESS DESIGN LOAD</td>
<td>1.5%</td>
<td>2.5%</td>
<td>3.5%</td>
<td>4.5%</td>
<td>5.5%</td>
<td>6.5%</td>
<td>7.5%</td>
<td>8.5%</td>
<td>9.5%</td>
<td>10.5%</td>
<td>11.5%</td>
<td>12.5%</td>
<td>13.5%</td>
<td>14.5%</td>
<td>15.5%</td>
</tr>
</tbody>
</table>

6 includes dynamic load allowance.

NOTES:

1. The bottom of footing is to be sloped to compensate for grade on this skewed abutment. Therefore, bottom of footing elevations will be required at each exterior pile.

2. Footing is to be 15° SKEW - TIMBER PILING.

3. Reinforcing bar is to be 2 inches unless otherwise noted or shown.

4. The minimum clear distance from the face of the concrete to near reinforcing bars is to be 2 inches unless otherwise noted or shown.

5. All reinforcing steel is to be Grade 60.

6. Abutment piles are designed for HL-93 loading with an allowance for 20 lbs./sq. ft. future wearing surface.

7. Includes dynamic load allowance.

8. Stress design load shall be the value used in the field for driving piles.
ABUTMENT NOTES:
The concrete and reinforcing steel for the wings is included with the superstructure.
Details on this sheet are to be used only when abutments are placed on timber piles.
The minimum clear distance from the face of the concrete to rail reinforcing bar is to be 6 inches unless otherwise noted or shown.
Timber piles shall be driven to full penetration if practicable but in no case to a bearing value less than shown in design plans.
Timber piles shall not be driven to more than 160 tons.
All reinforcing steel is to be Grade 60.
Abutment piling may be designed for HL-93 loading with an allowance for 20 lbs. per sq. ft. for future wearing surface.

NOTE: The bottom of footing is to be sloped to compensate for grade on this skewed abutment. Therefore, bottom of footing elevations will be required at each exterior pile.

The minimum clear distance from the face of the concrete to top of each pile is 21 inches. 7 turns of #2 bar, 21" diameter. 3" pitch with 3" x 3" spacers punched to hold spiral.

Note: Wing reinforcing and rail not shown. 6c, 6e4 and 6e are included with superstructure quantities.

PLAN VIEW

SECTION NORMAL TO ABUTMENT AT GUTTERLINE

SECTION NORMAL TO ABUTMENT AT Q

DETAIL A

ABUTMENT DETAILS
30° SK EW - TIMBER PILING

J44-34-06

NUMBER OF PILES AND ABUTMENT DESIGN LOADS

<table>
<thead>
<tr>
<th>NUMBER</th>
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<th>11</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
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<td>PILING - NUMBER</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>9</td>
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<td>PULL</td>
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<td>736</td>
<td>828</td>
<td>929</td>
<td>1031</td>
<td>1134</td>
</tr>
</tbody>
</table>

Includes dynamic load allowance of 120% of design load. 120% is not the value used in the field for driving piles.
PILE PLAN - 30° SKEW
WOOD PILING

70°-0 & 80°-0 BRIDGES

90°-0 & 100°-0 BRIDGES

110°-0 BRIDGE

120°-0 BRIDGE

130°-0 BRIDGE

140°-0 BRIDGE

150°-0 BRIDGE

160°-0 BRIDGE

170°-0 BRIDGE

180°-0 BRIDGE

ABUTMENT DETAILS
30° SKEW - TIMBER PILING

J44-35-06

IOWA DOT
Highway Division

STANDARD DESIGN - 44' ROADWAY, 3 SPAN BRIDGES
CONTINUOUS CONCRETE SLAB BRIDGES
NOVEMBER, 2006

REVISED 08-2020: UPDATED BRIDGE ENGINEER SIGNATURE.
REVISED 11-08: REVISED NUMBER OF PILES FOR 70'-0 BRIDGE.

LATEST REVISION DATE
APPROVED BY BRIDGE ENGINEER
**ABUTMENT NOTES:**

The concrete and reinforcing steel for the wings is included with the superstructure.

Details on this sheet are to be used only when abutments are placed on timber piles.

The minimum clear distance from the face of the concrete to near reinforcing bar is to be 2 inches, unless otherwise noted or shown.

Timber piles shall be driven to full penetration if practicable, but in no case to a bearing value less than shown in design plans.

All reinforcing steel is to be Grade 60.

Abutment piling was designed for H-93 loading with an allowance for 200 lbs. per sq. ft. future wearing surface.

**NOTE:** The bottom of footing is to be sloped to compensate for grade on this skewed abutment. Therefore, bottom of footing elevations will be required at each exterior pile.

**REAR ELEVATION**

- Spiral at top of each pile, 7 turns of #2 bar, 21" diameter, 3" pitch, with 3/4" x 1" spacers, punched to hold spiral.
- Note: The bottom of footing is to be sloped to compensate for grade on this skewed abutment, therefore, bottom of footing elevations will be required at each exterior pile.

**SECTION NORMAL TO ABUTMENT AT GUTTERLINE**

- Spiral at top of each pile, 7 turns of #2 bar, 21" diameter, 3" pitch, with 3/4" x 1" spacers, punched to hold spiral.

**DETAIL A**

- Spiral at top of each pile, 7 turns of #2 bar, 21" diameter, 3" pitch, with 3/4" x 1" spacers, punched to hold spiral.

**SECTION NORMAL TO ABUTMENT AT GUTTERLINE**

- Spiral at top of each pile, 7 turns of #2 bar, 21" diameter, 3" pitch, with 3/4" x 1" spacers, punched to hold spiral.
### BILL OF REINFORCING STEEL - ONE ABUTMENT - 0° SKEW

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUTMENT FOOTING INTRUSION</td>
<td>1'-6</td>
<td>135</td>
</tr>
<tr>
<td>ABUTMENT FOOTING HOOPS</td>
<td>2'</td>
<td>40</td>
</tr>
<tr>
<td>POLE SPIRALS</td>
<td>3'-5</td>
<td>50</td>
</tr>
<tr>
<td>SPIRAL SPACERS</td>
<td>0.20</td>
<td>F+D 39 55 42 35 42 36 36 90 50 50 45 54 68 62 61 63</td>
</tr>
</tbody>
</table>

**Reinforcing Steel Epoxy Coated - Total Lbs.**

- 2282
- 2737
- 2175
- 2005
- 2854
- 2584
- 3268
- 2186
- 2246

### ESTIMATED QUANTITIES - ONE ABUT., - 0° SKEW

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENT BAR DETAILS</td>
<td>D=2&quot;</td>
</tr>
<tr>
<td>ABUTMENT DETAILS</td>
<td>2'-6</td>
</tr>
<tr>
<td>POLE SPIRALS</td>
<td>3'-5</td>
</tr>
<tr>
<td>SPIRAL SPACERS</td>
<td>0.20</td>
</tr>
</tbody>
</table>

### BILL OF REINFORCING STEEL - ONE ABUTMENT - 15° SKEW

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUTMENT FOOTING INTRUSION</td>
<td>1'-6</td>
<td>135</td>
</tr>
<tr>
<td>ABUTMENT FOOTING HOOPS</td>
<td>2'</td>
<td>40</td>
</tr>
<tr>
<td>POLE SPIRALS</td>
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</tr>
<tr>
<td>SPIRAL SPACERS</td>
<td>0.20</td>
<td>F+D 39 55 42 35 42 36 36 90 50 50 45 54 68 62 61 63</td>
</tr>
</tbody>
</table>

**Reinforcing Steel Epoxy Coated - Total Lbs.**

- 2282
- 2737
- 2175
- 2005
- 2854
- 2584
- 3268
- 2186
- 2246

### ESTIMATED QUANTITIES - ONE ABUT., - 15° SKEW

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENT BAR DETAILS</td>
<td>D=6</td>
</tr>
<tr>
<td>ABUTMENT DETAILS</td>
<td>2'-6</td>
</tr>
<tr>
<td>POLE SPIRALS</td>
<td>3'-5</td>
</tr>
<tr>
<td>SPIRAL SPACERS</td>
<td>0.20</td>
</tr>
</tbody>
</table>

### BILL OF REINFORCING STEEL - ONE ABUTMENT - 30° SKEW

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUTMENT FOOTING INTRUSION</td>
<td>1'-6</td>
<td>135</td>
</tr>
<tr>
<td>ABUTMENT FOOTING HOOPS</td>
<td>2'</td>
<td>40</td>
</tr>
<tr>
<td>POLE SPIRALS</td>
<td>3'-5</td>
<td>50</td>
</tr>
<tr>
<td>SPIRAL SPACERS</td>
<td>0.20</td>
<td>F+D 39 55 42 35 42 36 36 90 50 50 45 54 68 62 61 63</td>
</tr>
</tbody>
</table>

**Reinforcing Steel Epoxy Coated - Total Lbs.**

- 2282
- 2737
- 2175
- 2005
- 2854
- 2584
- 3268
- 2186
- 2246

### ESTIMATED QUANTITIES - ONE ABUT., - 30° SKEW

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENT BAR DETAILS</td>
<td>D=3</td>
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<tr>
<td>ABUTMENT DETAILS</td>
<td>2'-6</td>
</tr>
<tr>
<td>POLE SPIRALS</td>
<td>3'-5</td>
</tr>
<tr>
<td>SPIRAL SPACERS</td>
<td>0.20</td>
</tr>
</tbody>
</table>

### BILL OF REINFORCING STEEL - ONE ABUTMENT - 45° SKEW

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUTMENT FOOTING INTRUSION</td>
<td>1'-6</td>
<td>135</td>
</tr>
<tr>
<td>ABUTMENT FOOTING HOOPS</td>
<td>2'</td>
<td>40</td>
</tr>
<tr>
<td>POLE SPIRALS</td>
<td>3'-5</td>
<td>50</td>
</tr>
<tr>
<td>SPIRAL SPACERS</td>
<td>0.20</td>
<td>F+D 39 55 42 35 42 36 36 90 50 50 45 54 68 62 61 63</td>
</tr>
</tbody>
</table>

**Reinforcing Steel Epoxy Coated - Total Lbs.**

- 2282
- 2737
- 2175
- 2005
- 2854
- 2584
- 3268
- 2186
- 2246

### ESTIMATED QUANTITIES - ONE ABUT., - 45° SKEW

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENT BAR DETAILS</td>
<td>D=4</td>
</tr>
<tr>
<td>ABUTMENT DETAILS</td>
<td>2'-6</td>
</tr>
<tr>
<td>POLE SPIRALS</td>
<td>3'-5</td>
</tr>
<tr>
<td>SPIRAL SPACERS</td>
<td>0.20</td>
</tr>
</tbody>
</table>

### BENT BAR DETAILS

- 8r1
- 5s1 & 5s2
- 8r2

**NOTE:** The pile spirals and spiral spacers are to be non-coated reinforcing but may be epoxy coated at the contractor's option and expense.

---

**STANDARD DESIGN - 4 OF ROADSIDE 2 SPAN BRIDGES**

**CONTINUOUS CONCRETE SLAB BRIDGES**

**November, 2006**

**ABUTMENT DETAILS**

**TIMBER PILING**

**IOWA DOT**

Highway Division

J44-38-06
ABUTMENT NOTES:

ALL PILING WP 8R2.

THE CONCRETE AND REINFORCING STEEL FOR THE WINGS IS INCLUDED WITH THE SUPERSTRUCTURE.

DETAILS ON THIS SHEET ARE TO BE USED ONLY WHEN ABUTMENTS ARE PLACED ON STEEL PILES. IF ROCK IS ENCOUNTERED CLOSER THAN 12' BEHIND ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

ALLEN CLEARANCE DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR REINFORCEMENT BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED ON SHEET.

STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN. STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN. STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN. STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN. STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

ABUTMENT DETAILS

0° SKEW - STEEL PILING

NUMBER OF PILES AND ABUTMENT DESIGN LOADS

<table>
<thead>
<tr>
<th>PILING LENGTH</th>
<th>DESIGN LOAD</th>
<th>ABUTMENT LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>44'-0路ROADWAY</td>
<td>3 SPANS BRIDGE</td>
<td>44'-0路ROADWAY</td>
</tr>
<tr>
<td>TO ROADWAY</td>
<td>STANDARD DESIGN</td>
<td>44'-0路ROADWAY</td>
</tr>
<tr>
<td>22'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
<tr>
<td>70'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
<tr>
<td>80'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
<tr>
<td>90'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
<tr>
<td>100'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
<tr>
<td>110'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
<tr>
<td>120'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
<tr>
<td>130'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
<tr>
<td>140'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
<tr>
<td>150'-0</td>
<td>8R1</td>
<td>8R1</td>
</tr>
</tbody>
</table>

A INCLUDES DYNAMIC LOAD ALLOWANCE.
NOTE: ALL REINFORCING STEEL IS TO BE GRADE 60.

DETAIL A

NOTE:  STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

6P-0 ROADWAY

REAR ELEVATION

PLAN VIEW

REAR ELEVATION

PLAN VIEW

NOTE: WING REINFORCING AND BAR, NOT SHOWN, 8R1 AND 8R2 ARE INCLUDED WITH SUPERSTRUCTURE QUANTITIES.
NOTE: PU, STRENGTH 1 DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

~`INCLUDES DYNAMIC LOAD ALLOWANCE

PILE PLAN - 15° SKEW

NUMBER OF PILES AND ABUTMENT DESIGN LOADS

<table>
<thead>
<tr>
<th>PILE LENGTH</th>
<th>70'-0</th>
<th>80'-0</th>
<th>90'-0</th>
<th>100'-0</th>
<th>110'-0</th>
<th>120'-0</th>
<th>130'-0</th>
<th>140'-0</th>
<th>150'-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESIGN LOAD</td>
<td>544</td>
<td>658</td>
<td>705</td>
<td>749</td>
<td>749</td>
<td>794</td>
<td>818</td>
<td>875</td>
<td>927</td>
</tr>
</tbody>
</table>

STRENGTH 1 DESIGN LOAD (KIPS)

1'-7 3' @ ABUTMENT DETAILS

NOTE: THE BOTTOM OF FOOTING IS TO BE SLOPED TO COMPENSATE FOR GRADE ON THIS SKEWED ABUTMENT. THEREFORE BOTTOM OF FOOTING ELEVATIONS WILL BE REQUIRED AT EACH EXTERIOR PILE.

ABUTMENT NOTES:

ALL PILING AT ABUTMENTS.

THE CONCRETE AND REINFORCING STEEL FOR THE RINGS IS INCLUDED WITH THE SUPERSTRUCTURE.

DETAILS ON THIS SHEET ARE TO BE USED ONLY WHEN ABUTMENTS ARE PLACED ON STEEL PILES, IF ROCK IS ENCOUNTERED CLOSER THAN 15' FROM ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR BOTTOM OF FOOTING ELEVATIONS WILL BE REQUIRED AT EACH EXTERIOR PILE.

MADEN & MIHAL NOT SHOWN. 

NOTE: ALL REINFORCING STEEL IS TO BE GRADE 60.

ABUTMENT PILING WAS DESIGNED FOR HL-93 LOADING WITH AN ALLOWANCE FOR 20 LBS. PER SQ. FT. FUTURE WEARING SURFACE.

NOTE: HORIZONTAL REINFORCING WAS NOT SHOWN.

NOTE: SEE DETAIL A FOR CLARITY.
ABUTMENT NOTES:

**Piles:**
- All piles are HP 10x42.
- The concrete and reinforcing steel for the abutments is included with the superstructure.
- Details on this sheet are to be used only when abutments are included.
- Reinforcing bars are to be located at least 2 inches apart, unless otherwise noted or shown.
- Steel abutment piles shall be driven to full penetration.
- The minimum clear distance from the face of the abutment to the nearest pile is to be 2 inches unless otherwise noted or shown.
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**Piping:**
- All piles are HP 10x42.
- The concrete and reinforcing steel for the abutments is included with the superstructure.
- Details on this sheet are to be used only when abutments are included.
- Reinforcing bars are to be located at least 2 inches apart, unless otherwise noted or shown.
- Steel abutment piles shall be driven to full penetration.
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**Steel Piling:**
- The concrete and reinforcing steel for the abutments is included with the superstructure.
- Details on this sheet are to be used only when abutments are included.
- Reinforcing bars are to be located at least 2 inches apart, unless otherwise noted or shown.
- Steel abutment piles shall be driven to full penetration.
- The minimum clear distance from the face of the abutment to the nearest pile is to be 2 inches unless otherwise noted or shown.
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**Superstructural Quantities:**
- The concrete and reinforcing steel for the wings is included with the superstructure.
- Details on this sheet are to be used only when abutments are included.
- Reinforcing bars are to be located at least 2 inches apart, unless otherwise noted or shown.
- Steel abutment piles shall be driven to full penetration.
- The minimum clear distance from the face of the abutment to the nearest pile is to be 2 inches unless otherwise noted or shown.
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**Additional Notes:**
- The minimum clear distance from the face of the abutment to the nearest pile is to be 2 inches unless otherwise noted or shown.
- Steel abutment piles shall be driven to full penetration.
- The minimum clear distance from the face of the abutment to the nearest pile is to be 2 inches unless otherwise noted or shown.
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**Steel Piles:**
- The concrete and reinforcing steel for the abutments is included with the superstructure.
- Details on this sheet are to be used only when abutments are included.
- Reinforcing bars are to be located at least 2 inches apart, unless otherwise noted or shown.
- Steel abutment piles shall be driven to full penetration.
- The minimum clear distance from the face of the abutment to the nearest pile is to be 2 inches unless otherwise noted or shown.
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**Concrete and Rebar:**
- The concrete and reinforcing steel for the wings is included with the superstructure.
- Details on this sheet are to be used only when abutments are included.
- Reinforcing bars are to be located at least 2 inches apart, unless otherwise noted or shown.
- Steel abutment piles shall be driven to full penetration.
- The minimum clear distance from the face of the abutment to the nearest pile is to be 2 inches unless otherwise noted or shown.
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- The minimum clear distance from the face of the abutment to the nearest pile is to be 2 inches unless otherwise noted or shown.
ABUTMENT NOTES:

ALL PILING IS HP 10x42.

THE CONCRETE AND REINFORCING STEEL FOR THE WINGS IS INCLUDED WITH THE SUPERSTRUCTURE.

DETAILS ON THIS SHEET ARE TO BE USED ONLY WHEN ABUTMENTS ARE PLACED ON STEEL PILES. IF ROCK IS ENCOUNTERED DEEGER THAN 12' BELOW ABUTMENT FOOTING, SPECIAL ANALYSIS MAY BE REQUIRED.

THE MINIMUM CLEAR DISTANCE FROM THE FACE OF THE CONCRETE TO NEAR BOTTOM OF SLAB IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

STEEL ABUTMENT PILES SHALL BE DRIVEN TO FULL PENETRATION IF REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

ALL REINFORCING STEEL IS TO BE GRADE 60.

ABUTMENT PILING WAS DESIGNED FOR HL-93 LOADING WITH AN ALLOWANCE IN DESIGN PLANS.

REINFORCING BAR IS TO BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

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ABUTMENT PILING WAS DESIGNED FOR HL-93 LOADING WITH AN ALLOWANCE IN DESIGN PLANS.
### PILE PLAN - 45° SKEW STEEL PILING

NOTE: ALL PILES ARE TO BE ORIENTED WITH WEBS PERPENDICULAR TO THE L. OF THE ROADWAY AS SHOWN.

### NUMBER OF PILES AND ABUTMENT DESIGN LOADS

<table>
<thead>
<tr>
<th>BRIDGE LENGTH</th>
<th>FIL 3</th>
<th>FIL 4</th>
<th>FIL 5</th>
<th>FIL 6</th>
<th>FIL 7</th>
<th>FIL 8</th>
<th>FIL 9</th>
<th>FIL 10</th>
<th>FIL 11</th>
<th>FIL 12</th>
<th>FIL 13</th>
<th>FIL 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>70'-0, 80'-0, 90'-0, 100'-0, 110'-0, 120'-0, &amp; 130'-0 BRIDGES</td>
<td>565</td>
<td>590</td>
<td>632</td>
<td>674</td>
<td>716</td>
<td>762</td>
<td>807</td>
<td>852</td>
<td>897</td>
<td>942</td>
<td>986</td>
<td>1030</td>
</tr>
</tbody>
</table>

A *INCLUDES DYNAMIC LOAD ALLOWANCE*

NOTING, STRENGTH 1 DESIGN LOAD (KIPS) IS NOT THE VALUE USED IN THE FIELD FOR DRIVING PILES.

**NOTE:** 45° SKEW - STEEL PILING

**STANDARD DESIGN - 44' ROADWAY, 3 SPAN BRIDGES**

**CONTINUOUS CONCRETE SLAB BRIDGES**

**NOVEMBER, 2006**

- REvised 08-2020: Updated Bridge Engineer Signature.
- Revised 06-13: Revision for LRFD Pile Design.
- Latest Revision Date: November 2006
**Bill of Reinforcing Steel - One Abutment - 0° Skew**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6t1</td>
<td>2582</td>
<td>1</td>
<td>Footing To Slab Dowels</td>
</tr>
<tr>
<td>5s1 &amp; 5s2</td>
<td>2832</td>
<td>1</td>
<td>Abutment Footing Hoops</td>
</tr>
<tr>
<td>5t2</td>
<td>376</td>
<td>1</td>
<td>Abutment Footing Longitudinal</td>
</tr>
</tbody>
</table>

**Estimated Quantities - One Abut., 0° Skew**

<table>
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<tr>
<th>LOCATION</th>
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<tr>
<td>5s1 &amp; 5s2</td>
<td>2832</td>
<td>1</td>
<td>Abutment Footing Hoops</td>
</tr>
</tbody>
</table>

**Bill of Reinforcing Steel - One Abutment - 15° Skew**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6t2</td>
<td>2881</td>
<td>1</td>
<td>Footing To Slab Dowels</td>
</tr>
<tr>
<td>5t2</td>
<td>376</td>
<td>1</td>
<td>Abutment Footing Longitudinal</td>
</tr>
</tbody>
</table>

**Estimated Quantities - One Abut., 15° Skew**

<table>
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<td>6t2</td>
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<td>1</td>
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<tr>
<td>5t2</td>
<td>376</td>
<td>1</td>
<td>Abutment Footing Longitudinal</td>
</tr>
</tbody>
</table>

**Bill of Reinforcing Steel - One Abutment - 30° Skew**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6t3</td>
<td>2391</td>
<td>1</td>
<td>Footing To Slab Dowels</td>
</tr>
<tr>
<td>5t2</td>
<td>376</td>
<td>1</td>
<td>Abutment Footing Longitudinal</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
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<th>UNIT</th>
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<tbody>
<tr>
<td>6t3</td>
<td>2391</td>
<td>1</td>
<td>Footing To Slab Dowels</td>
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<td>5t2</td>
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<td>1</td>
<td>Abutment Footing Longitudinal</td>
</tr>
</tbody>
</table>

**Bill of Reinforcing Steel - One Abutment - 45° Skew**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6t4</td>
<td>2361</td>
<td>1</td>
<td>Footing To Slab Dowels</td>
</tr>
<tr>
<td>5t2</td>
<td>376</td>
<td>1</td>
<td>Abutment Footing Longitudinal</td>
</tr>
</tbody>
</table>

**Estimated Quantities - One Abut., 45° Skew**

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>6t4</td>
<td>2361</td>
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</tr>
</tbody>
</table>

**Bent Bar Details**

**Iowa DOT**

**Standard Design of Roadway, 2 Span Bridges**

**Continuous Concrete Slab Bridges**

**November, 2006**

**Abutment Details**

**Steel Piling**

**J44-44-06**
### Concrete Barrier Rail Quantities

<table>
<thead>
<tr>
<th>Bridge Length</th>
<th>Unit</th>
<th>LF 70'-0</th>
<th>LF 80'-0</th>
<th>LF 90'-0</th>
<th>LF 100'-0</th>
<th>LF 110'-0</th>
<th>LF 120'-0</th>
<th>LF 130'-0</th>
<th>LF 140'-0</th>
<th>LF 150'-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Barrier Rails</td>
<td>0°</td>
<td>LF</td>
<td>162.0</td>
<td>182.0</td>
<td>202.0</td>
<td>222.0</td>
<td>242.0</td>
<td>262.0</td>
<td>282.0</td>
<td>302.0</td>
</tr>
<tr>
<td>Concrete Barrier Rails</td>
<td>10°</td>
<td>LF</td>
<td>162.0</td>
<td>182.0</td>
<td>202.0</td>
<td>222.0</td>
<td>242.0</td>
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</tr>
<tr>
<td>Concrete Barrier Rails</td>
<td>20°</td>
<td>LF</td>
<td>162.0</td>
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<td>242.0</td>
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<td>302.0</td>
</tr>
</tbody>
</table>

### Concrete Placement Summary

<table>
<thead>
<tr>
<th>Bridge Length</th>
<th>LF 70'-0</th>
<th>LF 80'-0</th>
<th>LF 90'-0</th>
<th>LF 100'-0</th>
<th>LF 110'-0</th>
<th>LF 120'-0</th>
<th>LF 130'-0</th>
<th>LF 140'-0</th>
<th>LF 150'-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>170</td>
<td>160</td>
<td>150</td>
<td>140</td>
<td>130</td>
<td>120</td>
<td>110</td>
<td>100</td>
<td>90</td>
</tr>
<tr>
<td>Total</td>
<td>170</td>
<td>160</td>
<td>150</td>
<td>140</td>
<td>130</td>
<td>120</td>
<td>110</td>
<td>100</td>
<td>90</td>
</tr>
</tbody>
</table>

**Note:** All dimensions are out to out. Sections are based on 45° skew bid lengths.
OUTLET DETAILS

**MIN. DRILLED HOLES FOR ATTACHMENT PIN**

**TOP VIEW REMOVABLE RODENT GUARD DETAILS**

**TYPICAL SECTION OF SUBDRain OUTLET**

**SITUATION PLAN**

**PROTECTION LAYOUT 0° SKEW**

**PROTECTION LAYOUT SKEWED**

**SUBDRAIN DETAILS**

---

**SUBDRAIN OUTLET**

- 2. Insert 1'-0 of the 4½" subdrain into the 6½" metal outlet pipe. Then fully seal the entire opening with grout.

- Materials: I.M 443.01

- 3. Use an inside fit reducer coupler. Coupler must be inserted a minimum of 1'-0 into CMP.

- 4. Insert 1'-0 of the 4½" subdrain into the 6½" metal outlet pipe. Then fully seal the entire opening with grout.

---

**OUTLET DETAILS**

- A 4½" perforated subdrain to be sloped downward from the top of slope. Underneath the slope protection and outlet, a reinforcing grate of slope shall not be flatter than 2%.
SUBDRAIN NOTES:

SEE J44-50-06 AND SITUATION PLAN SHEETS FOR DETAILS OF PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.

THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS ALONG THE LENGTH OF THE BRIDGE. THE FILM LENGTHS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE Grading LAYOUT.

THE COST OF FURNISHING AND PLACING SUBDRAINS (INCLUDING EXCAVATION, GRAVEL BACKFILL, PORES BACKFILL, AND SUBDRAIN OUTLET) IS TO BE INCLUDED IN THE PRICE BID FOR STRUCTURAL CONCRETE (BRIDGE). NO EXTRA PAYMENT WILL BE MADE.

MACADAM STONE WING ARMORING NOTES:

MACADAM STONE SHALL BE PLACED ALONG THE EDGE OF THE WING AND ALONG THE SURFACE PROTECTION. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLAYERED WITH ENGINEERING FABRIC AND BE IN ACCORDANCE WITH ARTICLE 4122.02, OF THE STANDARD SPECIFICATIONS.

THE BRIDGE FOOTING IS TO BE UNDERLAYERED WITH ENGINEERING FABRIC AND BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STRAIGHT FOR CONTINUITY.

THE MACADAM STONE SHALL BE IN ACCORDANCE WITH ARTICLE 4122.02, OF THE STANDARD SPECIFICATIONS FOR COURSE MATERIAL (NO CHOKE STONE IS ALLOWED). WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWS FOR SIDES, AND BE IN ACCORDANCE WITH SECTION 4161, OF THE STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR THE BRIDGE WING ARMORING SHALL BE INCIDENTAL TO THE END ITEM STRUCTURAL CONCRETE ORDERED AND SHALL INCLUDE COSTS OF ALL MATERIAL AND LABOR TO CONSTRUCT THE WING ARMORING AS SHOWN ON THESE PLANS.
ABUTMENT BACKFILL PROCESS:

The base of the excavation subdrain behind the abutment is to be graded with a 4% slope away from the abutment footing. A 2% cross slope in the direction of the subdrain outlet. This excavation shaping is to be done prior to beginning installation of the geotextile and backfill material.

After the subdrain has been installed, the geotextile fabric shall be installed in accordance with the details shown. The fabric is intended to be installed in the base of the excavation and extended vertically. If the abutment backfill, abutment wing walls, and excavation face are a height that will be approximately 1 to 2 feet higher than the height of the porous backfill placement, as shown in the "geotextile fabric limits" on this sheet, the strips of the fabric placed shall overlap approximately 1 foot and shall be pinned in place. The fabric shall be attached to the abutment by using lath placed in the fabric and secured to the concrete with shallow concrete nails. The fabric placed against the excavation face shall be pinned.

When the fabric is in place, the subdrain shall be installed directly on the fabric at the toe of the rear excavation slope. A slot will need to be cut in the fabric at the point where the subdrain exits the fabric near the end of the abutment wing wall.

Porous backfill is then placed and leveled; no compaction is required.

The backfill work involves backfilling with porous backfill, surface slabs, and subdrain compaction. The porous backfill material shall be in accordance with the standard specifications. The porous backfill shall be placed in individual lifts, surface slabs, and compaction of subdrain to ensure full consolidation. Limit the loose lifts to no more than 2 feet of thickness.

Start surface slabs for each porous backfill lift at the high point of the subdrain and proceed to the low point where the subdrain exits the fabric. To ensure uniform surface slabs, water running full in a 2-inch diameter pipe shall be sprayed in successive 10-foot increments for five minutes within each increment.

Porous backfill lift placement, leveling, and compaction shall progress until the required full thickness of the abutments backfill has been completed.

Water required for leveling, subdrains, porous backfill, and geotextile will be removed at the abutment. The abutments will not be measured separately for payment.

The cost of water required for leveling, subdrains, porous backfill, and geotextile will be removed at the abutment. The abutments will not be included in the contract unit price bid for structural concrete.

NOTE:
- Subdrain shall slope downward 2% from Approach road when outlying both sides of the abutment.
- Subdrain shall slope downward 2% from high end when outlying at one end of the abutment.

The geotextile fabric shall be in accordance with Article 4.2.7.2 of the Standard Specifications. The geotextile and backfill material shall be provided at the bridge abutments. The fabric placed against the excavation face shall be pinned.

When the fabric is in place, the subdrain shall be installed directly on the fabric at the toe of the rear excavation slope. A slot will need to be cut in the fabric at the point where the subdrain exits the fabric near the end of the abutment wing wall.

Porous backfill is then placed and leveled; no compaction is required.

The backfill work involves backfilling with porous backfill, surface slabs, and subdrain compaction. The porous backfill material shall be in accordance with the standard specifications. The porous backfill shall be placed in individual lifts, surface slabs, and compaction of subdrain to ensure full consolidation. Limit the loose lifts to no more than 2 feet of thickness.

Start surface slabs for each porous backfill lift at the high point of the subdrain and proceed to the low point where the subdrain exits the fabric. To ensure uniform surface slabs, water running full in a 2-inch diameter pipe shall be sprayed in successive 10-foot increments for five minutes within each increment.

Porous backfill lift placement, leveling, and compaction shall progress until the required full thickness of the abutments backfill has been completed.

Water required for leveling, subdrains, porous backfill, and geotextile will be removed at the abutment. The abutments will not be measured separately for payment.

The cost of water required for leveling, subdrains, porous backfill, and geotextile will be removed at the abutment. The abutments will not be included in the contract unit price bid for structural concrete.

NOTE:
- See subdrain details sheet for details not shown on this sheet when attaching to this structure.
ABUTMENT BACKFILL PROCESS:
The base of the excavation subdrain behind the abutment is to be graded with a 4% slope away from the abutment footing and 2% cross slope in the direction of the subdrain outlet. This excavation grading is to be done prior to beginning installation of the geotextile and backfill material.

After the subdrain has been shaped, the geotextile fabric shall be installed in accordance with the details shown. The fabric is intended to be installed in the slope of the excavation and extended horizontally of the excavation backfill until the skirt of the abutment. The horizontal installation shall extend 3'-0" from the face of the abutment. The geotextile fabric shall be attached to the abutment by using hooks placed in the fabric to ensure full consolidation.

The subdrain shall be installed directly on the fabric at the toe of the rear excavation slope. The subdrain will be placed and compacted with vibratory compaction to ensure full consolidation. Limits of bottom trench along abutment shall be included in the contract unit price bid for structural concrete. Backfill, and geotextile fabric furnished at the bridge abutments shall be measured separately for payment.

NOTE: Subdrain shall slope downward 2% from each side of the abutment, and shall slope downward 2% from the ends of the abutment.

The geotextile fabric shall be in accordance with paragraph 4196.01, B, 6 of the standard specifications. If the engineering is lifted the lift shall be a minimum of one foot in length, single elevation method of subdrain outlet up to the top and should be intended to facilitate continuity.

NOTE: Subdrain shall slope downward 2% from each side of the abutment, and shall slope downward 2% from the ends of the abutment.

The geotextile fabric shall be in accordance with paragraph 4196.01, B, 6 of the standard specifications. If the engineering is lifted, the lift shall be a minimum of one foot in length, single elevation method of subdrain outlet up to the top and should be intended to facilitate continuity.

NOTE: Subdrain shall slope downward 2% from each side of the abutment, and shall slope downward 2% from the ends of the abutment.

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