H44-14 THREE SPAN PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE STANDARDS
GENERAL NOTES:

THE H44-14 BRIDGE STANDARDS, IF PROPERLY USED, PROVIDE THE STRUCTURAL PLANS NECESSARY TO CONSTRUCT THESE SPAN AND ROUTE PRESTRESSED CONCRETE BEAM BRIDGES WITH LENGTHS OF 130'-10, 143'-8, 157'-4, 170'-4, AND 183'-10.

THESE BRIDGES MAY BE BUILT ON A 0°, 15° OR 30° SKEW. THESE PLANS SHOW THE BRIDGES SHOWN IN THIS DIRECTION BUT ALL DIMENSIONS AND DETAILS WERE THE SAME FOR THE OTHER DIRECTIONS.

FOR CLEARITY, MOST SECTIONS SHOWN ON THE FOLLOWING SHEETS ARE DRAWN WITH BARRIER ONLY. THESE SECTIONS WILL BE ILLUSTRATED FOR DESIGN ONLY WITH ANY MODIFICATIONS SHOWN ON SHEET H44-01A-14 AND H44-01B-14.

THESE BRIDGES ARE DESIGNED FOR 60,000 LB DLOADING, PER 500-5,073, ROADWAY FOR FUTURE HEARING U-SHAPE CONTROLLED TRAFFIC DISTRIBUTION FOR REINFORCING STEEL DESIGN BASED ON THE LDO 2005 INTERIM.

THE SHEET IS NOT A DEPARTMENT DESIGN SHEET. IT INDICATES AN INTEGRAL DESIGN USING STANDARD GUIDELINES.

INTEGRAL ABUTMENTS: TIMBER PILES (LIMITED BY BRIDGE LENGTH) OR HP10x57 PILES AT BRIDGE DESIGN MANUAL (BDM) ARTICLE 6.2.6.1 STRUCTURAL RESISTANCE LEVEL-1 (SRL-1) REPLACES THE 75 TON STEEL PILE DESIGNATION.

INTEGRAL ABUTMENTS, PILE BENTS, AND TEE PIERS FOR THESE H44 STANDARDS HAVE BEEN DESIGNED IN ACCORDANCE WITH ARTICLE 2501.03, Q, OF THE STANDARD SPECIFICATIONS. THE ELEVATION OF THE BOTTOM OF FOOTING SHALL BE LIMITED TO A MAXIMUM OF 10 FEET BELOW THE BOTTOM OF FOOTING.

PELICAN PILING WOULD BE OBTAINED ON ROCK AT A DISTANCE LESS THAN 15 FEET FROM THE ABUTMENTS.

THE INTEGRAL ABUTMENT DESIGN UTILIZED ON THESE BRIDGES RESTRICTS THEIR USE IN THE FOLLOWING MANNER:

- THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE ABUTMENTS.
- THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE PIER.
- THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE PIER.

THE ABUTMENTS FOR THESE BRIDGES ARE BUILT INTEGRAL WITH THE SUPERSTRUCTURE. THEREFORE, IT IS IMPORTANT TO HAVE A PROPER JOINT FOR EXPANSION BE PROVIDED BETWEEN THE BRIDGE AND APPROACH PAVING. WHEN APPROACH PAVING IS NEEDED.

THE INTERNAL DESIGN OF THESE BRIDGE BRIDGES RESTRICTS THEIR USE IN THE FOLLOWING MANNER:

- THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE PIER.
- THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE PIER.
- THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE PIER.

THESE STANDARDS ARE THE MOST OF THE INFORMATION NECESSARY TO BUILD THESE BRIDGES ON THE FOLLOWING SHEETS ARE BUILT FOR THE INTEGRAL DESIGN ON THE STANDARD SHEETS (EXCEPTION: STRUCTURAL CONCRETE). IT IS IMPORTANT TO HAVE A PROPER JOINT FOR EXPANSION BETWEEN THE BRIDGE AND APPROACH PAVING. WHEN APPROACH PAVING IS NEEDED.

THE INTERNAL DESIGN OF THESE BRIDGE BRIDGES RESTRICTS THEIR USE IN THE FOLLOWING MANNER:

- THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE PIER.
- THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE PIER.
- THE 201'-4, 213'-10, 226'-4 AND 243'-0 BRIDGES SHALL USE STEEL PILES AT THE PIER.

THE DESIGNER SHOULD NOTE WHERE THESE DIFFERENT TYPES OF BARS ARE USED FOR THE ABUTMENT AND PIER PILES SHOWN ON THE PLANS THE ABUTMENT AND PIER CAP DESIGNED TO BE REINFORCED IN ACCORDANCE WITH ARTICLE 2501.03, Q, OF THE STANDARD SPECIFICATIONS. THE ELEVATION OF THE BOTTOM OF THE PREBORED HOLE SHALL BE SHOWN ON THE LAYOUT.

THESE STANDARDS ARE THE MOST OF THE INFORMATION NECESSARY TO BUILD THESE BRIDGES ON THE FOLLOWING SHEETS ARE BUILT FOR THE INTEGRAL DESIGN ON THE STANDARD SHEETS (EXCEPTION: STRUCTURAL CONCRETE). IT IS IMPORTANT TO HAVE A PROPER JOINT FOR EXPANSION BETWEEN THE BRIDGE AND APPROACH PAVING. WHEN APPROACH PAVING IS NEEDED.

THE ABUTMENT PILING ARE TO BE DRIVEN THROUGH OVERSIZED HOLES PREBORED TO A MINIMUM OF 15 DEGREES BELOW THE BOTTOM OF FOOTING. THE PREBORED HOLES WOULD BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

THESE BRIDGE STANDARDS PROVIDE THE STRUCTURAL PLANS NECESSARY TO BUILD THESE BRIDGES. FOR MORE INFORMATION ON SRL-1 AND SRL-2, SEE THE BRIDGE DESIGN MANUAL, LOCATED ON THE IOWA STATE UNIVERSITY BRIDGE DESIGN EXAMPLES, ARE AVAILABLE ON THE OFFICE OF BRIDGES AND STRUCTURES IN WEB SITE: HTTP://WWW.IOWADOT.GOV/BRIDGE/INDEX.HTM.
EXAMPLES OF BRIDGE SEAT AND STEP CALCULATIONS:

The designer shall show on the plans the 7 elevations and the 6 step dimensions required for each of the pier top and abutment bridge ends. The boxes in details in the following examples show how the information should be indicated on the plans.

**Example No. 1**

- A straight grade of +0.13 with the P.I. elevation of 634.00 and elevation of 632.80. The bridge length is 230' to 0' of abutment bearings with 30' slab right heads.

**Elevations along Profile Grade Line** (P.I. Elev.)

- Bridge Sta. = 654.67
- P.I. Sta. = 252+10.00
- Bridge Elevation = 634.00
- P.I. Elevation = 316.09
- P.I. Station = 253+10.00
- Elevation of Vertical Curve = (2000)(0.0358) = 716 Feet
- M.O. = (0.0358)(716)(2) = 3.204 Feet

**Elevation top of slab facing along the stationing**

- Bearing Elevation = 632.80
- Top Slab Elevation = 632.80
- Slab Crown = 632.80
- P.G.L. Elevation = 632.80

**Example No. 2**

- Bridge Sta. = 254+00.00
- P.I. Sta. = 253+66.08
- Bridge Elevation = 313.56
- P.I. Elevation = 313.56
- P.I. Station = 253+10.00
- Elevation of Vertical Curve = (2000)(0.0358) = 716 Feet

**Pier No. 1**

- Elevation of Profile Grade Line = 634.00
- P.I. Sta. = 252+10.00
- Bridge Elevation = 645.72
- P.I. Elevation = 645.72
- P.I. Station = 252+10.00
- Elevation of Vertical Curve = (2000)(0.0358) = 716 Feet

**Abutment No. 1 Step Diagram**

**Pier No. 1 Step Diagram**

**Tee Pier Notes:**

The tee piers shown in these plans are designed for use with the H44-14 pretensioned prestressed concrete beam bridge standards. The piers may be used for either grade separation or stream crossing structures. The piers were designed for the following stream force and ice loading conditions, and should not be used where these loading conditions are exceeded.

**Ice Forces:**

Ice forces were applied at a height of +0.13 above the bottom of the tee piers. The over-all height of pier, the effective ice thickness, and the density of ice are assumed to be 0.9. The ice force was calculated according to the load specifications and was applied to the pier as follows:

- Case 1: 50% of F applied parallel to the piers long axis and the opposite end of F applied perpendicular to the pier's long axis.

**Stream forces:**

The stream velocity used was 5', and the ice coefficient was 1.4. The resulting stream force was assumed to act parallel to the pier's long axis. It was assumed that the second forces would be negligible. The stream force and ice force were calculated according to the load specifications and were applied to the pier as follows:

- Case 1: 50% of F applied parallel to the pier's long axis and the opposite end of F applied perpendicular to the pier's long axis.

**Footing Geometry:**

It was assumed that the footing would be set approximately 2.1. All piers with tee piers detailed in these standards are intended to have the same footing as the expansion piers. The pier layout and reinforcement shown are the same for either design. The bridge between fixed pier and expansion pier lies in the region of footing and footing slab. The keyway in the top of the cap should be eliminated from the expansion pier.

**Reinforcement:**

The tee piers shown in these plans are designed for use with the H44-14 tee pier notes as follows:

- Each bridge shall have one fixed pier and one expansion pier. The only distinction between fixed pier and expansion pier lies in the region of footing and footing slab. The keyway in the top of the cap shall be eliminated from the expansion pier.

**Pier Footing:**

When piers used in grade separation structures, epoxy coated reinforcement may be required for the columns. Consult current policy for guidance on the use of epoxy coated reinforcement in such cases, adjust the 0.1 column bar projection into the cap and large cap distance accordingly.
GENERAL NOTES:

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BARS SHALL BE 2½ UNLESS OTHERWISE NOTED OR SHOWN.

ALL REINFORCING BARS ARE TO BE SECURELY WIRED IN PLACE AND ARE TO BE PROVIDED ON ALL SLAB AREAS.

ALL PRESTRESSED CONCRETE BEAMS ARE TO BE SET VERTICAL.

TRANSVERSE SLAB REINFORCING MAY BE SPACED WITH ONE LAP LOCATED AS FOLLOWS:

TOP EDGE OF SLAB REINFORCING (BUCKET - MIN. LAP = 1'-10"

BOTTOM EDGE OF SLAB REINFORCING (BUCKET - MIN. LAP = 1'-10"

AND NO ALLOWANCE SHALL BE MADE FOR THE ADDITIONAL LENGTH OF REINFORCING BARS PROVIDED FOR THE USE OF SPLICES.

PAYMENT FOR REINFORCING BARS SHALL BE BASED ON NO SPLICES, BOTTOM BARS - LAP OVER BEAMS (MIN. LAP = 1'-10"

TOP BARS - LAP MIDWAY BETWEEN BEAMS (MIN. LAP = 1'-10"

FOR DETAILS OF RAIL AND RAIL REINFORCING SEE SHEET H44-31-14

FOR DETAILS OF TRANSVERSE SLAB REINFORCING See sheet H44-33-14

LENGTH OF S3 x 7.5 (ARCHMENT BEAM SECTIONS)

BEAM BOTTOM FLANGE WIDTH

LENGTH OF S

P=5

P=35

P=8

P=65

SUPERSTRUCTURE DETAILS H44-03-14

H44-14-14
SLAB AND HAUNCH THICKNESS AT BEAMS FOR VERTICAL CURVE

Length of vertical curve required = \((20,000 \times (G_1 - G_2))\) ft.

LOD-02 is the clearance difference of the approach grades expressed in decimal form and need not have the same value as \(G_1\) and \(G_2\). The final value of \(G_1 - G_2\) is sl. length of curve and \(G_1\) and \(G_2\) are in feet.

SLAB AND HAUNCH THICKNESS AT BEAMS FOR STRAIGHT GRADE

SLAB THICKNESS DETAILS

Note: The slab thickness at the beam of slab plus haunch is based on the anticipated beam camber (see note 7).

STRAIGHT LINE BETWEEN HAUNCHES

STRAIGHT LINE BETWEEN HAUNCHES

NOTE:

1. Drains are to be galvanized after fabrication. See "Situation Sketch" for location of drain.
2. Weight shown is based on rolled tube.
3. For nail holes, o.d. x 8 outside dimension rolled tube with 1" wall thickness.
4. Use for barrier rail only. Not required for open rail.
5. Use for barrier rail only. Not required for open rail.

DATA FOR ONE DRAIN

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<thead>
<tr>
<th>BEAM SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<td>4</td>
<td>4</td>
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<tr>
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<td>4</td>
<td>4</td>
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<tr>
<td>WT. (LB)</td>
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SLAB AND HAUNCH THICKNESS AT BEAMS FOR VERTICAL CURVE

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 2403.06 of the Standard Specifications.

Typical Slab and Haunch Detail

Exterior Beams on Open Rail

Interior Beams

Exterior Beams on Barrier Rail

TYPICAL SLAB AND HAUNCH DETAIL

NOTE:

1. Elevation in the slab is to be revised.
2. Drains shall serve as anchor.
3. Concrete slab shall be applied in accordance with Article 2403.03, P, 4, of the Standard Specifications.

NOTE:

- Drains are to be galvanized after fabrication.
- See "Situation Sketch" for location of drain.
- Weight shown is based on rolled tube.
Note: Bridge is symmetrical about E.

- **EXPANSION PIER**: PRESTRESSED PIPE WITH EXPANDING FOAM PRIOR PLUG 3"½ PVC PIPE.
  - Note: Use 3"½ PVC with expanding foam prior to backfilling backing arrangements.
  - Also note: Fixed pier details are included in the bridge plan sheets.

- **ABUTMENT BEARING TO BEAM BEARINGS**: MIDWAY BETWEEN BEAM BEARINGS.
  - Note: See beam coil ties details in these plans for details of intermediate diaphragm see sheet H44-31-14.

- **BEARING DETAILS**: SEE SHEET H44-37-14
  - Note: Beams are located at 1'-0, 2'-0, and 1'-6.

- **PART PLAN**: BEAMS.
  - Note: Beams are located at 1'-0, 2'-0, and 1'-6.

- **SECTION A-A**: LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES
  - Note: Locations for fixed pier details in these plans for details of barrier rail end sections.

- **SECRETARY BEARING TO PIER**: MIDWAY BETWEEN BEARINGS.
  - Note: See section details in these plans for details of intermediate diaphragm see sheet H44-31-14.

- **ELEVATION A**: PROVIDE ELEVATIONS A, B, AND C IN THE BRIDGE PLAN SHEETS.

- **PART END VIEW AT ABUTMENT**: PROVIDE ELEVATIONS A, B, AND C IN THE BRIDGE PLAN SHEETS.
  - Note: Field bend 5h4 bar as necessary to avoid fire in abutment wing.

- **PART SECTION AT PIER**: MIDWAY BETWEEN BEARING ARRANGEMENTS.
  - Note: Joint filler around bearings, face of steps, face of end of beams.

- **PART SECTIONS C-C**: MIDWAY BETWEEN SHEET COIL TIES.
  - Note: Locations for fixed pier details in these plans for details of intermediate diaphragm see sheet H44-31-14.

- **PART END VIEW AT PIER**: PROVIDE ELEVATIONS A, B, AND C IN THE BRIDGE PLAN SHEETS.
  - Note: Field bend 5h4 bar as necessary to avoid fire in abutment wing.

- **PART LONGITUDINAL SECTION NEAR GUTTER**: (FOR DETAILED INTERMEDIATE DIAPHRAGM SEE SHEET H44-31-14)
  - Note: Prestressed steel strands beam prestressing.

- **CONCRETE BEAM BRIDGES**: STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE
  - Note: Use 3"½ PVC with expanding foam prior to backfilling backing arrangements.

- **EXPANSION PIER**: PRESTRESSED PIPE WITH EXPANDING FOAM PRIOR PLUG 3"½ PVC PIPE.
  - Note: Use 3"½ PVC with expanding foam prior to backfilling backing arrangements.

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**PRETENDED PRESTRESSED CONCRETE BEAM, END SPAN**

**PRETENDED PRESTRESSED CONCRETE BEAM, CENTER SPAN**

**ABUT. WINGS**

**PIER DIAPHRAGM, SECTIONS 4 & 5**

**HAUNCH, SECTION 2**

**& WINGWALLS**, SECTIONS 1 & 3

**SLAB INCLUDING HAUNCH, ABUT. DIAPHRAGM, ABUT. BRG.**

**NOTE:**

- CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

- NOTE:

  (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)

**ESTIMATED QUANTITIES**

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<td>201'-4</td>
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<td>5.7</td>
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<td>243'-0</td>
<td>3.5</td>
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<tr>
<td>163'-10</td>
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**PREBORED HOLES (W/STEEL H-PILES)**

**PREBORED HOLES (W/WOOD PILES)**

**NO. OF STEEL H-PILES FOR TWO ABUTMENTS (HP 10 x 57)**

**NO. OF WOOD PILES, TREATED FOR TWO ABUTMENTS**

**CONCRETE RAIL (BARRIER OR OPEN)**

**PRETENSIONED PRESTRESSED CONCRETE BEAM, END SPAN**

**PRETENSIONED PRESTRESSED CONCRETE BEAM, CENTER SPAN**

**WING ARMORING**

**ABUTMENT WINGS**

**PIER DIAPHRAGM, SECTIONS 4 & 5**

**HAUNCH, SECTION 2**

**& WINGWALLS**, SECTIONS 1 & 3

**SLAB INCLUDING HAUNCH, ABUT. DIAPHRAGM, ABUT. BRG.**

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**PRETENSIONED PRESTRESSED CONCRETE BEAM, CENTER SPAN**

**WING ARMORING**

**ABUTMENT WINGS**

**PIER DIAPHRAGM, SECTIONS 4 & 5**

**HAUNCH, SECTION 2**

**& WINGWALLS**, SECTIONS 1 & 3

**SLAB INCLUDING HAUNCH, ABUT. DIAPHRAGM, ABUT. BRG.**

**NOTE:**

- CONCRETE QUANTITIES SHALL BE LISTED ON THE SUMMARY QUANTITIES SHEET.

- NOTE:

  (SUPERSTRUCTURE PLUS INTEGRAL ABUTMENTS)
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<td>5p3</td>
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**BEAM BRG.**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUT. BRG.**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUT. DIAPH.**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUT. WING EXT.**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**PIER DIAPH. TIES**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUT. TO WING ANCHOR**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUT. WING HORIZ. B.F.**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUT. WING HORIZ. TRAFFIC FACE**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUTMENT HOOPS**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**PAVING NOTCH**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**UNDER BEAMS AT ABUTMENTS**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUT. DIAPH. WING EXT.**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUT. DIAPH. TIES**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**ABUT. DIAPH. WING EXT.**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**PILLARS**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**PILLARS, AT FIELD**

- 1'-0 2'-0
- 1'-0 2'-0
- 1'-0 2'-0

**NOTE:**

- All dimensions are cut to cut, 3'-0" diameter.
- Deck & Abutment Reinforcement is not included.

**DECK & ABUTMENT REINF.**

- H44-10-14

---

**REINFORCING BARS LIST**

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**STANDARD DESIGN * 4 RAMP ROADWAY THREE SPAN BRIDGE PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES**

- Highway Division
- September, 2004
- H44-10-14
### ESTIMATED QUANTITIES

<table>
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<tr>
<th>Concrete Beam Section</th>
<th>PIER - ABUT. BRG.</th>
<th>138'-10</th>
<th>135.0</th>
<th>138'-10</th>
<th>143.8</th>
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<tbody>
<tr>
<td>Top of Beam to Pier at C.L. Pier</td>
<td>L.F.</td>
<td>300</td>
<td>7.2</td>
<td>160</td>
<td>320</td>
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<tr>
<td>Top of Beam to Pier at C.L. Pier</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>L.F.</strong></td>
<td>320</td>
<td>7.2</td>
<td>320</td>
<td>7.2</td>
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<tr>
<td><strong>TOTAL</strong></td>
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### GENERAL DATA

<table>
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<tr>
<th>Concrete Beam Section</th>
<th>PIER - ABUT. BRG.</th>
<th>138'-10</th>
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<td>16</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>L.F.</strong></td>
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<td>7.2</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>NO.</strong></td>
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**NOTE:**
- Concrete quantities shall be listed on the summary quantities sheet.
- Concrete beam sections shall be placed in sections and designated in feet. Estimated procedures for placing concrete beam sections are subject to approval. The contractor must submit a modified method and evidence that the contractor has prepared the necessary equipment and facilities to accomplish the required results. Estimated procedures for placing concrete beam sections shall be reviewed by the Iowa Department of Transportation, Division of Construction.

**REINFORCING BARS**

- **Top Slab:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)
- **Bottom Slab:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)
- **WINGWALLS:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)
- **BARRIER WALLS:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)
- **H-PILES:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)

**REINFORCING BARS**

- **Top Slab:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)
- **Bottom Slab:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)
- **WINGWALLS:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)
- **BARRIER WALLS:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)
- **H-PILES:**
  - Bottom Slab: 6a1 Bars (Top)
  - Top Slab: 6a1 Bars (Bottom)
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<tr>
<th>BENT</th>
<th>BAR DETAILS</th>
<th>EPOXY COATED REINFORCING</th>
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</thead>
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</tbody>
</table>

**Highway Division**

**PRETENSIONED PRESTRESSED**

**CONCRETE BEAM BRIDGES**

**DECK & ABUTMENT REINF.**

**Revised: 23-14**
A Beam Details

NOTE: Bars 3d are to be placed in pairs.

- Epoxy coated bars
- Dimensions at end of beam
- Keep deflected strands

Beam A42

Beam A46

Beam A50

Beam A55

NOTE: Dimensions for the location of the deflected strands are at 1' beam and end of beam.
TYPICAL AT Both beam ends.

SECTION A-A SHOWING PLACEMENT OF STIRRUPS NEAR END OF BEAM

**Notes:**
- These beams are designed for dead live loads as indicated in above table with an allowance of 0.04 in. square foot of roadway for debris. EXPANSION JOINTS INCUSSED AT PIPE PADS ON BEARINGS.
- Holes must be cast in the web to accommodate the steel diagonals. PRECAST DIAPHRAGMS SHALL BE AS DETAILLED ON OTHER DESIGN SHEETS. NO. 12 DIAMETER STEEL IS TO BE USED IN BRIDGES MADE CONTINUOUS BY ACTIONS OF THE PRESTRESS BEAMS THAT ARE TO BE PRETENSIONED PRESTRESSED STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
- CONCRETE IN ACCORDANCE WITH A.A.S.H.T.O. LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007:
- CONCRETE IN ACCORDANCE WITH SECTION 5, GRADE 270.
- STEEL IN ACCORDANCE WITH A.A.S.H.T.O. LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007:
- REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
- CONCRETE IN ACCORDANCE WITH SECTION 5, GRADE 270.
- STEEL IN ACCORDANCE WITH A.A.S.H.T.O. LRFD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007:
- REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
C Beam Details

**Rev. 11-09 - The Specification References Were Changed. The Beam Details Were Updated to the Current Details.**

6/26/2015  2:52:05 PM

THE APPROVAL OF THE ENGINEER. LIFTING LOOPS ALTERNATE TYPES MAY BE SUBSTITUTED WITH COIL TIE DETAIL

**Typical at Both Beam Ends**

**Section A-A Showing Placement of Stirrups Near End of Beam**

**Reinforcing Bar List**

**Notes:**

These beams are designed for normal live loads as indicated in the Table with an allowance of 20 in. square root of roadway for future loading. Initial design for the beam is placed after a shorter curing time is approved by the bridge engineer. The portions of the prestressed tendons that are to be emplaced are marked with a fresh or fiber strands will be placed for a distance of approximately 6 ft from the beam and by sandblasting or other approved methods to provide suitable bond between the beam and the sheathing in accordance with Article 2403.03, I, of the Standard Specifications.

**Design Stresses:**

Design stresses for the following materials are to be used for elastic shortening, creep and shrinkage.

For Highway Bridges, Series of 2007

Pretensioning steel in accordance with Section 5, Grade 60.

Concrete in accordance with Section 5, FC = 5000 psi.

**Notes:**

If the Steel Diaphragm Option is allowed and used, new bars are necessary. All locations in the Table where the Steel Diaphragm Option is allowed and used, the Steel Diaphragm Attachments are detailed on the steel diaphragm detail sheets. If the bridge is designed for this option, the Full Length of the Beam in the Top Flange.

**Specifications:**

Constructing Standard Specifications of the Iowa Department of Transportation, current series, with current applicable special provisions and supplementary material.

**Design Details:**

Lifted Series of 2007, with minor modifications.

**Notes:**

The approval of the engineer. Lifting loops alternate types may be substituted with coil tie detail.

**Lifting Loop Detail**

Alternate types may be substituted with the exception of the center loop detail. Lifting loops are to be structural grade.

**Coil Tie Detail**

Number and exact location of coil ties to be as detailed on specific bridge design.

**Sections at Both beam ends**

**Lifting Loop Detail**

Alternate types may be substituted with the exception of the center loop detail. Lifting loops are to be structural grade.

**Coil Tie Detail**

Number and exact location of coil ties to be as detailed on specific bridge design.

**Graph:**

- **Figure 1:** Typical at Both Beam Ends
- **Figure 2:** Section A-A Showing Placement of Stirrups Near End of Beam
- **Figure 3:** Reinforcing Bar List

**Table:**

- **Table 1:** Beam Details
- **Table 2:** Concrete Beam Bridges

**Notes:**

These beams are designed for normal live loads as indicated in the Table with an allowance of 20 in. square root of roadway for future loading. Initial design for the beam is placed after a shorter curing time is approved by the bridge engineer. The portions of the prestressed tendons that are to be emplaced are marked with a fresh or fiber strands will be placed for a distance of approximately 6 ft from the beam and by sandblasting or other approved methods to provide suitable bond between the beam and the sheathing in accordance with Article 2403.03, I, of the Standard Specifications.

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**Specifications:**

Constructing Standard Specifications of the Iowa Department of Transportation, current series, with current applicable special provisions and supplementary material.

**Design Details:**

Lifted Series of 2007, with minor modifications.

**Notes:**

The approval of the engineer. Lifting loops alternate types may be substituted with coil tie detail.

**Lifting Loop Detail**

Alternate types may be substituted with the exception of the center loop detail. Lifting loops are to be structural grade.

**Coil Tie Detail**

Number and exact location of coil ties to be as detailed on specific bridge design.

**Graph:**

- **Figure 1:** Typical at Both Beam Ends
- **Figure 2:** Section A-A Showing Placement of Stirrups Near End of Beam
- **Figure 3:** Reinforcing Bar List

**Table:**

- **Table 1:** Beam Details
- **Table 2:** Concrete Beam Bridges

**Notes:**

These beams are designed for normal live loads as indicated in the Table with an allowance of 20 in. square root of roadway for future loading. Initial design for the beam is placed after a shorter curing time is approved by the bridge engineer. The portions of the prestressed tendons that are to be emplaced are marked with a fresh or fiber strands will be placed for a distance of approximately 6 ft from the beam and by sandblasting or other approved methods to provide suitable bond between the beam and the sheathing in accordance with Article 2403.03, I, of the Standard Specifications.

**Design Stresses:**

Design stresses for the following materials are to be used for elastic shortening, creep and shrinkage.

For Highway Bridges, Series of 2007

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If the Steel Diaphragm Option is allowed and used, new bars are necessary. All locations in the Table where the Steel Diaphragm Option is allowed and used, the Steel Diaphragm Attachments are detailed on the steel diaphragm detail sheets. If the bridge is designed for this option, the Full Length of the Beam in the Top Flange.

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Constructing Standard Specifications of the Iowa Department of Transportation, current series, with current applicable special provisions and supplementary material.

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Number and exact location of coil ties to be as detailed on specific bridge design.

**Graph:**

- **Figure 1:** Typical at Both Beam Ends
- **Figure 2:** Section A-A Showing Placement of Stirrups Near End of Beam
- **Figure 3:** Reinforcing Bar List

**Table:**

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**Notes:**

These beams are designed for normal live loads as indicated in the Table with an allowance of 20 in. square root of roadway for future loading. Initial design for the beam is placed after a shorter curing time is approved by the bridge engineer. The portions of the prestressed tendons that are to be emplaced are marked with a fresh or fiber strands will be placed for a distance of approximately 6 ft from the beam and by sandblasting or other approved methods to provide suitable bond between the beam and the sheathing in accordance with Article 2403.03, I, of the Standard Specifications.

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**Notes:**

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BARRIER RAIL NOTES:

- Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.
- The permissible construction joints are to be placed between the vertical bars at a minimum spacing of 20 feet, construction joint contact surfaces are to be coated with an approved bond breaker.
- Cost of the joint sealer and bond breaker shall be considered incidental to the other construction.

The concrete barrier rail is to be run on a linear foot basis. The number of linear feet of barrier rail installed will be paid for by the contract price per linear foot based on plan quantities. The price paid for concrete barrier rails will be full compensation for all materials, including reinforcing steel, and all of the equipment and labor required to erect the rail in accordance with these plans and current specifications.

Concrete is required in this plan for the steel, concrete, junction boxes, and fittings including labor and any additional work to do. The installation is considered incidental to the cost of the paving.

ELEVATION OF BARRIER RAIL LAYOUT

All barrier rail reinforcing steel is to be included in the summary quantities sheet in the plan.

CONSTRUCTION JOINT

All barrier rail reinforcing steel is to be either epoxy coated or stainless steel as shown on the bar. The stainless steel reinforcing steel shall be designed and sized in accordance with the requirements of materials applied.

The joint seal shall be a light gray nonpigmented jointing sealant which meets the criteria for corrosion joints or testing or certification is required. Top of the barrier rail is to be parallel to the theoretical edge. Cross-sectional view of the standard section of the barrier rail is 4" squared feet.

Concrete barrier rails placed using the suction method will require the use of a Class C or concrete in accordance with Article 2202A.2 of the standard specifications. East-West Barrier Rails shall use Class C or Class D concrete. This method is not permitted for concrete barrier rails east or west of the

PREFORMED METHOD

Concrete barrier rails placed using the suction method will require the use of a Class C or concrete in accordance with Article 2202A.2 of the standard specifications. East-West Barrier Rails shall use Class C or Class D concrete. This method is not permitted for concrete barrier rails east or west of the
**Stanford Steel Reinforcement Steel—Two Barrier Rails**

(Notes: These reinforcing bars are to be used on all skew.)

**Concrete Placement Summary—C.Y.**

<table>
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<th>Bridge Length</th>
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**Concrete Barrier Rail Quantities—L.F.**

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</table>

**Concrete Barrier Rail Quantities—L.F.**

- **Pretensioned Prestressed Concrete Beam Bridges**
- **September, 2004**

**Bent Bar Details**

- **Concrete Placement Summary—C.Y.**
- **Concrete Barrier Rail Quantities—L.F.**
- **Concerto Barrier Rail Quantities—L.F.**

---

**NOTE:** Rebar quantities are to be included on the summary quantities sheet in the plan.
**TABLE OF OPEN RAIL DIMENSIONS AND NUMBERS**

<table>
<thead>
<tr>
<th>DIMENSION OR NUMBER</th>
<th>DIMENSION OR NUMBER</th>
<th>DIMENSION OR NUMBER</th>
<th>DIMENSION OR NUMBER</th>
<th>DIMENSION OR NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>L (FT.-IN.)</td>
<td>C (FT.-IN.)</td>
<td>F (FT.-IN.)</td>
<td>L (FT.-IN.)</td>
<td>C (FT.-IN.)</td>
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<td>1'-0</td>
</tr>
</tbody>
</table>

**PART ELEVATION VIEW**

**ELEVATION OF OPEN RAIL LAYOUT**

**OPEN RAIL NOTES:**

1. Open rail notes shall be rendered on provided drawing sheet with the following details:
   - Minimum concrete cover distance from face of concrete to nearest reinforcing bar shall be 2" unless otherwise noted or shown.
   - Cost of the joint sealer and bond breaker shall be considered incidental to other construction.
   - The concrete open rail shall be set on a located post base finished from end to end of rail. The number of linear feet of open rail installed shall be paid for at the contract price for linear post, price end for concrete open rail, and all other materials and labor required to construct the rail in accordance with these plans and specification.
   - All open rail reinforcing steel shall be placed on the summary quantity sheet in the plan.

2. Open rail, with a minimum concrete cover distance from face of concrete to nearest reinforcing bar, shall be rendered on provided drawing sheet with the following details:
   - Minimum concrete cover distance from face of concrete to nearest reinforcing bar shall be 2" unless otherwise noted or shown.
   - Cost of the joint sealer and bond breaker shall be considered incidental to other construction.

3. Open rail, with a minimum concrete cover distance from face of concrete to nearest reinforcing bar, shall be rendered on provided drawing sheet with the following details:
   - Minimum concrete cover distance from face of concrete to nearest reinforcing bar shall be 2" unless otherwise noted or shown.
   - Cost of the joint sealer and bond breaker shall be considered incidental to other construction.

4. Open rail, with a minimum concrete cover distance from face of concrete to nearest reinforcing bar, shall be rendered on provided drawing sheet with the following details:
   - Minimum concrete cover distance from face of concrete to nearest reinforcing bar shall be 2" unless otherwise noted or shown.
   - Cost of the joint sealer and bond breaker shall be considered incidental to other construction.

**IOWA DOT Highway Division**

**PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES**

**O-OPEN RAIL, TL-4 DETAILS**

**SHEET 1 OF 2**

**H44-35-14**

**6/26/2015 5:02:35 PM**
INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

OF BEAMS FORMED OUT AS SHOWN TO EXCLUDE CONCRETE.

WITH THE LAMINATED NEOPRENE PADS SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING.

COMPLETED PRIOR TO GALVANIZING. THE SURFACE OF THE PINTLE PLATE IN CONTACT

EXPANSION PIER BEARING NOTES:

SURFACES MARKED "F" SHALL BE FINISHED AND PAINTED.

PINTLE PLATES ARE A PART OF THE SUPERSTRUCTURE STRUCTURAL STEEL QUANTITY.

COSTS OF ANCHORED CURVED SOLE PLATES AND NEOPRENE PADS ARE TO BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

THE SOLE PLATES AND PINTLE PLATES SHALL BE GALVANIZED. ALL ANCHORING RODS SHALL BE

CONNECTED PRIOR TO GALVANIZING. THE SURFACE OF THE PINTLE PLATE IN CONTACT

WITH THE LAMINATED NEOPRENE PADS SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING.

SOLE PLATES ARE TO BE SET IN FORMS AND BEAMS ARE CAST AND THE BOTTOM

OF BEAMS FORCED OUT AS SHOWN TO EXCLUDE CONCRETE.

SOLE PLATES SHALL COMPLY WITH ONE OF THE FOLLOWING:

ASTM A 709 GRADE HPS 70W

ASTM A 514 GRADE B

EXPANSION PIER LAMINATED NEOPRENE PAD / CURVED SOLE E ASSEMBLY

STRUCTURAL STEEL

DATA FOR ONE BEARING

BEAM SIZE BEAM Weight (lbs.)

30 440

55 1090

DOES NOT INCLUDE CURVED SOLE E

INTERSTUCTURAL STEEL WEIGHT IS INCLUDED ON THE SUMMARY QUANTITIES SHEET.
PIER PILES SHALL BE DRIVEN TO VALUES SHOWN IN DESIGN PLANS.

THESE PIER BENTS ARE DESIGNED FOR USE IN LOCATIONS WHERE ICE AND TYPE 3 TRESTLE BENT PILES

CONCRETE (CY)

BAR

5m1

5n1

5c1

b1

a1

44'-8

44'-8

11'-8

8'-1

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

| NO. | PILE TYPE | NOTE: THE NUMBER OF PILES AND THE PILE TYPE ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>1, 2</td>
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</table>

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

CONCRETE QUANTITIES SHOWN HAVE HAD THE VOLUME OF EMBEDDED PILES DEDUCTED FOR TYPES 1 AND 2 BASED ON 0.8 FT³

<table>
<thead>
<tr>
<th>ABUTMENT</th>
<th>163'-10</th>
<th>138'-10</th>
<th>201'-4</th>
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<th>HP12x53</th>
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<td>477</td>
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<tr>
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<td>129</td>
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</table>

5m1

5n1

5c1

b1

a1

44'-8

44'-8

8'-1

8'-1

477

414

71

33

71

33
PILE BENT NOTES:

These pile bends are designed for use in locations where ice and drift conditions are not severe. For details of thistle piles, see standard pile.

Minimum clear distance from face of concrete to near reinforcing bar shall be 2 inches unless otherwise noted on drawing.

Pile bent shall be driven to values shown in design plans.

Pier piles shall be driven to values shown in design plans.

Reinforcing steel shall be 2 inches unless otherwise noted. Minimum clear distance from face of concrete to near ice and drift conditions are not severe.

These pier bends are designed for use in locations where ice and drift conditions are not severe. These pile bends are designed for use in locations where ice and drift conditions are not severe.

NOTE: The concrete quantity is to be included on the Summary Quantities Sheet in the Plan.

NOTES:

1. The reinforcing steel quantity is to be included on the Summary Quantities Sheet in the Plan.

2. The concrete quantity is to be included on the Summary Quantities Sheet in the Plan.

3. The number of piles and the pile type are to be included on the Summary Quantities Sheet in the Plan.

4. Trestle piles are included on the Summary Quantities Sheet in the Plan.

5. Point bearing includes side friction and point bearing in rock.

6. Friction bearing includes side friction and end bearing in soil.

7. Point bearing includes side friction and point bearing in rock.

8. Side friction includes side friction and end bearing in soil.

9. Point bearing includes side friction and point bearing in rock.

10. Trestle piles are included on the Summary Quantities Sheet in the Plan.

11. Point bearing includes side friction and point bearing in rock.

12. Trestle piles are included on the Summary Quantities Sheet in the Plan.

13. Point bearing includes side friction and point bearing in rock.

14. Trestle piles are included on the Summary Quantities Sheet in the Plan.

15. Point bearing includes side friction and point bearing in rock.

16. Trestle piles are included on the Summary Quantities Sheet in the Plan.

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112. Trestle piles are included on the Summary Quantities Sheet in the Plan.

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117. Point bearing includes side friction and point bearing in rock.

118. Trestle piles are included on the Summary Quantities Sheet in the Plan.

119. Point bearing includes side friction and point bearing in rock.

120. Trestle piles are included on the Summary Quantities Sheet in the Plan.

121. Point bearing includes side friction and point bearing in rock.

122. Trestle piles are included on the Summary Quantities Sheet in the Plan.

123. Point bearing includes side friction and point bearing in rock.
TYPICAL PLAN

SYMMETRICAL ABOUT THIS POINT THROUGH HOT ROTAION EXCEPT STEP ELEVATIONS

KEYED NOTCH DETAIL

NOTED:

1" PREFORMED EXPANSION JOINT MATERIAL (TYP.)

SEE SHEET H44-15-14 FOR "U" DIMENSION.

ADJACENT BEAMS ALONG | PIER.

ELEVATIONS OF THE TOP OF SLAB AT SEAT IS EQUAL TO THE DIFFERENCE IN THE HEIGHT OF THE STEPS ON THE BRIDGE.

NOTE:

VIEW A-A

KEYED NOTCH DETAIL

FOR 10 PILE BENT

FOR 11, 12, 13, 14, 15 & 16 PILE BENTS

FOR 17 PILE BENT

SYMMETRICAL ABOUT | PIER EXCEPT STEPS

GRADE ELEV. @ | PIER

10 PILE BENT

11 PILE BENT

12 PILE BENT

13 PILE BENT

14 PILE BENT

15 PILE BENT

16 PILE BENT

17 PILE BENT

H44-42-14

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

15° SKEW

PILE BENT PIERS
## PILE BENT NOTES:

1. **Reinforcing Steel (LB.)**
   - Concrete (CY)
   - Structural

2. **Reinforcing Bar List and Estimated Quantities - Per Pile Bent**

3. **Reinforcing Steel Quantity is to be included**

4. **Note: The number of piles and the pile type are to be**

5. **Note: The Reinforcing Steel Quantity is to be included**

### Rebar List and Estimated Quantities - Per Pile Bent

<table>
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<tr>
<th>No.</th>
<th>Bar Type</th>
<th>Size</th>
<th>Dia.</th>
<th>Length</th>
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</table>

**Note:** All dimensions are

### Pile Bent Details

#### Pile Bent Piers
- **Pretensioned Prestressed Concrete Beam Bridges**

#### Pile Type
- **3 Trestle Bent Piles**
TYPICAL PLAN

SYMMETRICAL ABOUT E PIER EXCEPT STEPS

NOTE:
THE HEIGHT OF THE STEPS ON THE BRIDGE
BEAM IS EQUAL TO THE DIFFERENCE IN
ELEVATIONS OF THE TOP OF SLAB AT
ADJACENT BEAMS ALONG E PIER.
SEE SHEET H44-44-14 FOR 1" DIMENSION.

7 PILE BENT
8 PILE BENT
9 PILE BENT
10 PILE BENT
11 PILE BENT
12 PILE BENT

VIEW A-A
FOR 7, 9, 10 PILE BENTS

VIEW A-A
FOR 8, 11, 12 PILE BENTS

KEYED NOTCH DETAIL

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
SEPTEMBER, 2014

HP14 PILES
PILE BENT PIERS
H44-44-14
PILE BENT NOTES:

These pier bends are designed for use in locations where ice and drift conditions are not severe.

For details of these pile types, see Standard P10L.

Minimum clear distance from face of concrete to near reinforcing bar shall be 2 inches unless otherwise noted on drawing.

Pier piles shall be driven to values shown in design plans.

BENT BAR DETAILS

---

PILE BENT PIERS

---

PER PILE BENT

---

REINFORCING BAR LIST AND ESTIMATED QUANTITIES PER PILE BENT

---

PILE BENT NOTES:

These pier bends are designed for use in locations where ice and drift conditions are not severe.

For details of these pile types, see Standard P10L.

Minimum clear distance from face of concrete to near reinforcing bar shall be 2 inches unless otherwise noted on drawing.

Pier piles shall be driven to values shown in design plans.

---

NOTES: The reinforcing steel quantity is to be included on the summary quantities sheet in the plan.

NOTES: The concrete quantity is to be included on the summary quantities sheet in the plan.

NOTES: The number of piles and the pile type are to be included on the summary quantities sheet in the plan.

---

PILE BENT PIER

---

NOTE: The reinforcing steel quantity is to be included on the summary quantities sheet in the plan.

NOTE: The concrete quantity is to be included on the summary quantities sheet in the plan.

NOTE: The number of piles and the pile type are to be included on the summary quantities sheet in the plan.

---

PILE BENT NOTES:

These pier bends are designed for use in locations where ice and drift conditions are not severe.

For details of these pile types, see Standard P10L.

Minimum clear distance from face of concrete to near reinforcing bar shall be 2 inches unless otherwise noted on drawing.

Pier piles shall be driven to values shown in design plans.

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H44-45-14

---

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014
PILE BENT NOTES:
These pile bents are designed for use in locations where ice and drift conditions are not severe.
For details of trestle piles, types 1, 2, and 3, see standard plan.
Minimum clear distance from face of concrete to near reinforcing bar shall be 2 inches unless otherwise noted on plans.
Pile heights shall be driven to values shown in design plans.

PILE ORIENTATION DETAIL FOR TYPE 3 TRESTLE BENT PILES

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

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<th>TAIL</th>
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PILE BENT DETAILS

FRICION BEARING PILING

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FRICION OR POINT BEARING PILING

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</table>

NOTE: The reinforcing steel quantity is to be included on the summary quantities sheet in the plan.
NOTE: The concrete quantity is to be included on the summary quantities sheet in the plan.
NOTE: The number of piles and the pile type are to be included on the summary quantities sheet in the plan.

NOTE: All dimensions are to outside diameters.

REINFORCING BAR LIST AND ESTIMATED QUANTITIES - PER PILE BENT

<table>
<thead>
<tr>
<th>SHEET</th>
<th>HEAD</th>
<th>TAIL</th>
<th>TOP</th>
<th>BOTTOM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTICE: Friction bearing includes side friction and end bearing in soil.
Point bearing includes side friction and point bearing in rock.
TYPICAL PLAN

NOTED

THE HEIGHT OF THE STEPS ON THE BRIDGE
MENT IS EQUAL TO THE DIFFERENCE IN
ELEVATIONS OF THE TOP OF SLAB AT
ADJACENT BEAMS LONG ALONG A PIER,
SEE SHEET H44-22-14 FOR DIMENSIONS.

KEYED NOTCH DETAIL

VIEW A-A
FOR 8, 9, 10 & 11 PILE BENTS

VIEW A-A
FOR 12 PILE BENT

KEYED NOTCH DETAIL

STANDARD DESIGN – 44' ROADWAY, THREE SPAN BRIDGE
PRETENSIONED Prestressed Concrete Beam Bridges
SEPTEMBER, 2014

Pile Bent Piers
HP14 Piles
H44-48-14
### Pile Bent Notes:

Pile bent notes are to be used in conjunction with the Pile Bent Details sections of the plans. The notes include:

1. **Pile Type**: Indicates the type of pile used. For example, HP14, HP14x89.
2. **Pile Size**: Specifies the size of the pile.
3. **Number of Piles**: Indicates the number of piles used per bent.
4. **Weight**: Provides the weight of the pile.
5. **Length**: Indicates the length of the pile.
6. **Diameter**: Provides the diameter of the pile.
7. **Note**: Includes any additional notes or specifications.

**Note:** All dimensions are shown in inches unless otherwise noted.

### Trestle Piles

- **Trestle Pile Type**: P10L
- **Number of Piles**: 3
- **Size**: HP14x89
- **Length**: 23.5 ft
- **Note**: Trestle piles are to be used in locations where ICE and DRIFT CONDITIONS ARE NOT SEVERE.

### Reinforcing Bar List and Estimated Quantities

- **Reinforcing Bar Details**
- **Reinforcing Steel (LB.)**
- **Concrete (CY)**
- **Structural No.**
- **Weight**
- **No.**
- **Weight**
- **No.**
- **Weight**
- **No.**
- **Weight**

### Example Table

<table>
<thead>
<tr>
<th>Pile Bent Notes</th>
<th>Pile Type</th>
<th>Pile Size</th>
<th>Number of Piles</th>
<th>Weight</th>
<th>Length</th>
<th>Diameter</th>
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</thead>
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<tr>
<td>HP14</td>
<td>HP14x89</td>
<td>23.5 ft</td>
<td>3</td>
<td>222</td>
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<td>HP14x73</td>
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<td>210</td>
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<td>HP14x89</td>
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<td>226</td>
<td>4</td>
<td>180</td>
<td>171</td>
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**Note:** All dimensions are shown in inches unless otherwise noted.
PIER NOTES:

See "TEE PIER NOTES" on H44-02-14 for notes regarding application of these pier standards.

Minimum clear distance from face of concrete to nearest reinforcing bar shall be 2 inches unless otherwise noted or shown.

Eliminate 2x8 beveled keyway on top of cap for expansion piers.

For size of bearing pads, see H44-37-14.

See sheet H44-09-14 for "U" dimension.

For size of bearing pads, see H44-37-14.
BENT BAR DETAILS

NOTE: ALL DIMENSIONS ARE OUT TO OUT.

D = PIN DIAMETER.

5c1, 5c2 & 5c3

5ml

2x7

5c4

5e1

NOTE: THE REINFORCING STEEL QUANTITIES FOR THE CAP AND
COLUMN ARE TO BE INCLUDED ON THE SUMMARY
QUANTITIES SHEET IN THE PLAN.

NOTE: THE CONCRETE QUANTITIES FOR THE CAP AND COLUMN
COLUMN ARE TO BE INCLUDED ON THE SUMMARY
QUANTITIES SHEET IN THE PLAN.

CAP

COLUMN

PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

Highway Division

PRESTRESS CONCRETE BEAM BRIDGES

STANDARD DESIGN - 40 ROADWAY, THREE SPAN BRIDGE

WASHINGTON DIVISION

56/5/15 - 2:53:01 PM - 1.5142 - bridge/MethodsSection/44-09 Concept Design/44-51-14 - H44-51-14 - 119972336
NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED IN THE CONSTRUCTION DRAWINGS.

FOOTING SIZE

- 4' x 10' x 26'
- 4' x 10' x 25'
- 4' x 11' x 26'
- 213'-10"
- 243'-0"
- 226'-4"
- 201'-4"

<table>
<thead>
<tr>
<th>FOOTING SIZE</th>
<th>WEIGHT (LB.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4' x 10' x 26'</td>
<td>1461</td>
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<tr>
<td>4' x 10' x 25'</td>
<td>1454</td>
</tr>
<tr>
<td>4' x 11' x 26'</td>
<td>1444</td>
</tr>
<tr>
<td>213'-10&quot;</td>
<td>920</td>
</tr>
<tr>
<td>243'-0&quot;</td>
<td>268</td>
</tr>
<tr>
<td>226'-4&quot;</td>
<td>289</td>
</tr>
<tr>
<td>201'-4&quot;</td>
<td>257</td>
</tr>
</tbody>
</table>

NOTE: WEIGHTS ARE OUT TO OUT.

TYPICAL SECTION

FOOTING NOTES:

- These footings are designed and detailed to be used with the cap and column details of the tee pier as shown on sheet H44-50-14.
- Batter piles in exterior rows are in the direction shown.
- Steel piles used as point bearing shall have a minimum distance of approximately 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piles shall not exceed 7'-6".
- Pier piles shall be driven to values shown in design plans.

STEEL PILE FOOTINGS

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

September, 2014

Highway Division

IOWA DOT
FOOTING NOTES:

These footings are designed and detailed to be used with the cap and column details of the tee piers as shown on sheet H44-50-14. Batter piles in exterior rows are in the direction shown. Steel piles used as point bearings shall have a minimum distance of approximately 2 feet from section of footing to top of bearing rock. The pile layouts are shown so that the distance center to center of adjacent piles shall not exceed 8 feet. Piers piles shall be driven to values shown in design plans.
FOOTING NOTES:

These spread footings are designed and detailed to be used with the cap and column details of the tee piers as shown on sheet H44-50-14. These spread footings shall extend at least 12 inches into suitable foundation rock and the last 12 inches of rock excavation shall be to these lines of masonry. The foundation rock shall have a minimum LRFD nominal bearing resistance of 30 kips per square foot allowable service live loading value of at least 10 kips per square foot.

These spread footings shall be designed and detailed to be used with the cap and column details of the tee piers as shown on sheet H44-50-14.

For the Tee Pier - Spread Footings, the footing size is as follows:

- 3'-6 x 9'-0 x 25'-0
- 3'-6 x 9'-0 x 29'-0
- 3'-6 x 10'-0 x 29'-0

REINFORCING STEEL (ONE FOOTING)

| FOOTING SIZE | BAR NO., SIZE & SPACING | EFFECTIVE LENGTH | TOTAL WEIGHT | STRUCTURAL CONCRETE
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3'-6 x 9'-0 x 25'</td>
<td>24 - #9 @ 0'-8&quot;</td>
<td>3'-6 x 9'-0 x 25'</td>
<td>25'-0</td>
<td>1'-0</td>
</tr>
<tr>
<td>3'-6 x 9'-0 x 29'</td>
<td>28 - #7 @ 0'-11&quot;</td>
<td>3'-6 x 9'-0 x 29'</td>
<td>29'-0</td>
<td>1'-0</td>
</tr>
<tr>
<td>3'-6 x 10'-0 x 29'</td>
<td>46 - #9 AS SHOWN</td>
<td>3'-6 x 10'-0 x 29'</td>
<td>29'-0</td>
<td>1'-0</td>
</tr>
</tbody>
</table>

NOTE: D = PIN DIAMETER.
WEIGHT TOTAL

3531 (LB.)

Note: The reinforcing steel quantity is to be included on the summary quantities sheet in the plan.

Service Load Bearing Value of at least 10 kips per square foot.

NOMINAL BEARING RESISTANCE OF 30 KIPS PER SQUARE FOOT (ALLOWABLE LOAD-bearing VALUE OF 10 KIPS PER SQUARE FOOT).
**TYPICAL SECTION**

3'-6" x 9'-0" x 25'-0" FOR 22A, 24A & 25A

**FOOTING NOTES:**
- These footings are designed and detailed to be used with the cap and column details of the tee piers as shown on Sheet H44-58-14.
- Pile spacings in elevation rows 9d are the center line of piles.
- A minimum distance of 6 feet from bottom of footing to top of bearing rock is required. The pile layout allows a distance greater than 6 feet.
- Footing shall be driven to values shown in design plans.

**REINFORCING STEEL**

<table>
<thead>
<tr>
<th>FOOTING</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R6</th>
</tr>
</thead>
<tbody>
<tr>
<td>2'-10&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
</tr>
</tbody>
</table>

**REINFORCING STEEL 110 PERCENT DESIGN LOAD**

<table>
<thead>
<tr>
<th>FOOTING</th>
<th>REINFORCING STEEL 110 PERCENT DESIGN LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2'-10&quot;</td>
<td>2 1⁄4&quot; x 1 1⁄4&quot; (28) 2 1⁄4&quot; x 1 1⁄4&quot; (28)</td>
</tr>
</tbody>
</table>

**NOTE:** The reinforcing steel quantity is to be included on the summary quantities sheet in the plan.

**NOTE:** The concrete quantity is to be included on the summary quantities sheet in the plan.
FOOTING NOTES:

These footings are designed and detailed to be used with the cap and column details of the tee piers as shown on sheet H44-58-14.

Steel piles in exterior rows are in the direction shown.

Steel piles used as point bearing shall have a minimum distance of approximately 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piling shall not exceed 8 feet.

Pier piles shall be driven to values shown in design plans.
FOOTING SIZE

4' x 10' x 26' FOR 15D, 16D, 17C & 18D

FOOTING NOTES:

These footings are designed and detailed to be used with the cap and column details of the TEE PIER as shown on SHEET H44-58-14.

Batter piles in exterior rows are in the direction shown.

Steel piles used as point bearing shall have a minimum distance of approximately 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piles shall not exceed 8'-0.

PIER piles shall be driven to values shown in design plans.
FOOTING NOTES:

These spread footings are designed and detailed to be used with the cap and column details of the tee pier as shown on sheet H44-58-14.

These spread footings shall extend at least 12 inches into suitable foundation rock and the last 12 inches of rock excavation shall be to neat lines of masonry. The foundation rock shall have a minimum LRFD nominal bearing resistance of 30 kips per square foot allowable service live load bearing value of at least 10 kips per square foot.

Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

Pretensioned Prestressed Concrete Beam Bridges

September, 2004

Tee Pier - Spread Footings

H44-14
FOOTING SIZE

FOOTING NOTES:
- These spread footings are designed and detailed to be used with the cap and column details of the tee pier as shown on Sheet H44-58-14.
- These spread footings shall extend at least 18 inches into suitable foundation rock and the last 18 inches of rock excavation shall be to heavy loads of material, the foundation rock shall make a minimum load bearing resistance of 10 kips per square foot. The service load bearing value of at least 10 kips per square foot.
- Dimensions are out to out.

FOOTING SIZE

<table>
<thead>
<tr>
<th>FOOTING SIZE</th>
<th>BAR NO., SIZE &amp; SPACING</th>
<th>LENGTH</th>
<th>TOTAL CONCRETE (CU. FT)</th>
<th>STRUCTURAL CONCRETE (PC.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4' x 9' x 27'</td>
<td>10 - #5 @ 0'-8&quot;</td>
<td>27'</td>
<td>138'-10&quot;</td>
<td>1618</td>
</tr>
<tr>
<td>4' x 9' x 31'</td>
<td>10 - #5 @ 1'-0&quot;</td>
<td>31'</td>
<td>188'-10&quot;</td>
<td>226'-4&quot;</td>
</tr>
<tr>
<td>4' x 10' x 31'</td>
<td>11 - #8 @ 0'-10&quot;</td>
<td>31'</td>
<td>201'-4&quot;</td>
<td>151'-4&quot;</td>
</tr>
<tr>
<td>4' x 10' x 31'</td>
<td>48 - #9 AS SHOWN</td>
<td>31'</td>
<td>226'-4&quot;</td>
<td>288</td>
</tr>
<tr>
<td>4' x 9' x 29'</td>
<td>11 - #6 @ 0'-10&quot;</td>
<td>29'</td>
<td>201'-4&quot;</td>
<td>151'-4&quot;</td>
</tr>
<tr>
<td>4' x 9' x 27'</td>
<td>11 - #6 @ 0'-10&quot;</td>
<td>27'</td>
<td>188'-10&quot;</td>
<td>288</td>
</tr>
<tr>
<td>4' x 9' x 25'</td>
<td>48 - #9 AS SHOWN</td>
<td>25'</td>
<td>201'-4&quot;</td>
<td>151'-4&quot;</td>
</tr>
<tr>
<td>4' x 10' x 31'</td>
<td>11 - #6 @ 0'-10&quot;</td>
<td>31'</td>
<td>201'-4&quot;</td>
<td>151'-4&quot;</td>
</tr>
<tr>
<td>4' x 9' x 27'</td>
<td>11 - #6 @ 0'-10&quot;</td>
<td>27'</td>
<td>188'-10&quot;</td>
<td>288</td>
</tr>
<tr>
<td>4' x 9' x 31'</td>
<td>11 - #6 @ 0'-10&quot;</td>
<td>31'</td>
<td>201'-4&quot;</td>
<td>151'-4&quot;</td>
</tr>
<tr>
<td>4' x 10' x 31'</td>
<td>11 - #6 @ 0'-10&quot;</td>
<td>31'</td>
<td>201'-4&quot;</td>
<td>151'-4&quot;</td>
</tr>
</tbody>
</table>

TYPICAL SECTION

FOOTING SIZE

<table>
<thead>
<tr>
<th>FOOTING SIZE</th>
<th>BAR NO., SIZE &amp; SPACING</th>
<th>LENGTH</th>
<th>TOTAL CONCRETE (CU. FT)</th>
<th>STRUCTURAL CONCRETE (PC.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4' x 9' x 25'</td>
<td>10 - #5 @ 0'-8&quot;</td>
<td>25'</td>
<td>138'-10&quot;</td>
<td>1618</td>
</tr>
<tr>
<td>4' x 9' x 29'</td>
<td>10 - #5 @ 1'-0&quot;</td>
<td>29'</td>
<td>188'-10&quot;</td>
<td>226'-4&quot;</td>
</tr>
<tr>
<td>4' x 10' x 29'</td>
<td>30 SP. @ 1'-0&quot; = 29'-0&quot;</td>
<td>29'</td>
<td>201'-4&quot;</td>
<td>151'-4&quot;</td>
</tr>
<tr>
<td>4' x 9' x 27'</td>
<td>30 SP. @ 1'-0&quot; = 27'-0&quot;</td>
<td>27'</td>
<td>188'-10&quot;</td>
<td>226'-4&quot;</td>
</tr>
<tr>
<td>4' x 9' x 27'</td>
<td>30 SP. @ 1'-0&quot; = 27'-0&quot;</td>
<td>27'</td>
<td>188'-10&quot;</td>
<td>226'-4&quot;</td>
</tr>
<tr>
<td>4' x 9' x 31'</td>
<td>30 SP. @ 1'-0&quot; = 31'-0&quot;</td>
<td>31'</td>
<td>201'-4&quot;</td>
<td>151'-4&quot;</td>
</tr>
<tr>
<td>4' x 10' x 31'</td>
<td>30 SP. @ 1'-0&quot; = 31'-0&quot;</td>
<td>31'</td>
<td>201'-4&quot;</td>
<td>151'-4&quot;</td>
</tr>
</tbody>
</table>

NOTE: D = PIN DIAMETER.
PIER NOTES:

See "See Pier Notes" on H44-02-14 for notes regarding application of these Pier Standards.

Minimum clear distance from face of concrete to near reinforcing bar shall be 2 inches unless otherwise noted or shown.

Eliminate 2x8 Beveled Keyway on top of cap for expansion pier.

For size of bearing pads, see H44-37-14.

See sheet H44-22-14 for "U" dimension.

NOTE:

Shift 5c1 bars to clear of column bars all spans.

See footing details.
BENT BAR DETAILS

NOTE: ALL DIMENSIONS ARE SHOWN OOT TO OOT.
D = PIN DIAMETER.

CAP

NOTE: THE REINFORCING STEEL QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
NOTE: THE CONCRETE QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

COLUMN

NOTE: THE REINFORCING STEEL QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.
NOTE: THE CONCRETE QUANTITIES FOR THE CAP AND COLUMN ARE TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

SEE SHEET H44-24-14 FOR STEP REINFORCING STEEL QUANTITIES AND DETAILS.
TYPICAL SECTION

\[ d_2 \]

NOTES:

1. Pin diameter dimensions are cut to cut.

2. The reinforcing steel quantity is to be included on the summary quantities sheet in the plan.

3. The concrete quantity is to be included on the summary quantities sheet in the plan.

4. The pile type is to be included on the summary quantities sheet in the plan.

FOOTING NOTES:

These footings are designed and detailed to be used with the cap and column details of the tee piers as shown on sheet H44-66-14.

Battered piles in exterior rows @ in the direction shown.

Steel piles used as point bearing shall have a minimum distance of approximately 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piles shall not exceed 8'.

Pier piles shall be driven to values shown in design plans.

<table>
<thead>
<tr>
<th>FOOTING SIZE</th>
<th>STEEL PILING FOOTING SIZE</th>
<th>CONCRETE BEAM BRIDGES</th>
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</thead>
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<td>D10 x 57 SRL-1</td>
<td>TEE PIER-HPi10x57 SRL-1</td>
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<tr>
<th>FOOTING SIZE</th>
<th>PILE OTHER DETAILS</th>
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<tr>
<th>FOOTING SIZE</th>
<th>PILING NOTES</th>
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<th>CONCRETE QUANTITY SHEET</th>
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<th>PILING NOTES</th>
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<thead>
<tr>
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<table>
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<th>FOOTING SIZE</th>
<th>PILING NOTES</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
</tbody>
</table>
NOT THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

- These footings are designed and detailed to be used with the cap and column details of the TEE pier as shown on Sheet H44-66-14.
- Batter piles in exterior rows are in the direction shown.
- Steel pile footings used as point bearing shall have a minimum distance of 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piles shall not exceed 8 feet.
- TEE pier shall be driven to values shown in design plans.

REINFORCING STEEL (ONE FOOTING)

<table>
<thead>
<tr>
<th>Footing Size</th>
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<td>33 - #8 @ 0'-9&quot;</td>
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<tr>
<td>4' x 11' x 25'</td>
<td>50 - #10 AS SHOWN</td>
<td>14 - #10 BARS</td>
<td>10 - #10 BARS</td>
</tr>
</tbody>
</table>

FOOTING SIZE

4' x 11' x 27'

4' x 11' x 25'

FOOTING WEIGHT

Total 4602 (LB.)

WEIGHT 4'-0 x 11'-0 x 25'-0 FOR 24B, 25B, 26B & 27B

WEIGHT 4'-0 x 11'-0 x 27'-0 FOR 24C, 25C, 26C & 27C

WEIGHT 4'-0 x 11'-0 x 27'-0 FOR 28B & 29A

STEEL PILE FOOTINGS

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

Highway Division

IOWA DOT

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

TYPICAL SECTION

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

NOTE: THE PILE TYPE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

FOOTING NOTES:

- These footings are designed and detailed to be used with the cap and column details of the TEE pier as shown on Sheet H44-66-14.
- Batter piles in exterior rows are in the direction shown.
- Steel pile footings used as point bearing shall have a minimum distance of 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piles shall not exceed 8 feet.
- TEE pier shall be driven to values shown in design plans.
### TYPICAL SECTION

**Note:** Axle Load Dimensions Are Out to Out.

- **d2**: Pin Diameter.

### FOOTING NOTES:

- **Footing Details:**
  - These footings are designed and detailed to be used with the cap and column details of the TEE piers as shown on Sheet H44-66-14.
  - Batter piles in exterior rows 1:4 in the direction shown.
  - Steel piling used as point bearing shall have a minimum distance of approximately 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piling shall not exceed 8'-0.

- **Design Bridge (Kips):**
  - Standard Design - 44' Roadway, Three Span Bridge

### Footing Notes:

- Steel piling used as point bearing shall have a minimum distance of approximately 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piling shall not exceed 8'-0.

### Rebar Layout:

- d2 Bar Layout

### Table: Rebar Quantities

<table>
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<tr>
<th>Footing Size</th>
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<th>No. &amp; Size of Rebar</th>
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<tbody>
<tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**

- Rebar section and design loads are shown on Sheet H44-66-14.

---

**H44-70-14**

### Highway Division

**Standard Design - 44' Roadway, Three Span Bridge**

**Pretensioned Prestressed Concrete Beam Bridges**

**September, 2014**

**IOWA DOT**

**TEE PIER-HP10x57 SRL-2**

**Steel Pile Footings**

**H44-70-14**
4'-0 x 9'-0 x 26'-0 FOR 16B

FOOTING NOTES:
These footings are designed and detailed to be used with the cap and column details of the TEE Piers as shown on sheet H44-66-14.

Steel Piling used as point bearing shall have a minimum distance of approximately 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piling shall not exceed 8'-0.
Pier piles shall be driven to values shown in design plans.

IOWA DOT
Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
SEPTEMBER, 2014

TYPICAL SECTION

4'-0 x 9'-0 x 26'-0 FOR 17B, 18B & 19A

FOOTING NOTES:
These footings are designed and detailed to be used with the cap and column details of the TEE Piers as shown on sheet H44-66-14.

Battered piles in exterior rows 1:4 in the direction shown.

Steel Piling used as point bearing shall have a minimum distance of approximately 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piling shall not exceed 8'-0.
Pier piles shall be driven to values shown in design plans.

IOWA DOT
Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
SEPTEMBER, 2014

TYPICAL SECTION

4'-0 x 10'-0 x 26'-0 FOR 17C, 18C & 19B

FOOTING NOTES:
These footings are designed and detailed to be used with the cap and column details of the TEE Piers as shown on sheet H44-66-14.

Battered piles in exterior rows 1:4 in the direction shown.

Steel Piling used as point bearing shall have a minimum distance of approximately 10 feet from bottom of footing to top of bearing rock. The pile layouts are such that the distance center to center of adjacent piling shall not exceed 8'-0.
Pier piles shall be driven to values shown in design plans.

IOWA DOT
Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE
PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
SEPTEMBER, 2014

TYPICAL SECTION
FOOTING NOTES:

These spread footings are designed and detailed to be used with the cap and column details of the tee piers as shown on Sheet H44-66-14.

These spread footings shall extend at least 12 inches into suitable foundation rock and the last 12 inches of rock excavation shall be to bedrock. The foundation rock shall have a minimum of 30 Kips per square foot (allowable bearing resistance of 30 Kips per square foot). The foundation rock and the last 12 inches of rock excavation shall be to bedrock. The foundation rock shall have a minimum service load bearing value of at least 10 Kips per square foot.

BEARING REQUIREMENTS:

The foundation rock and the last 12 inches of rock excavation shall be to bedrock. The foundation rock shall have a minimum service load bearing value of at least 10 Kips per square foot.
FOOTINGS

FOOTING NOTES:

These spread footings are designed and detailed to be used with the cap and column details of the tee piers as shown on sheet H44-66-14.

These spread footings shall extend at least 12 inches into suitable foundation rock and the last 12 inches of rock excavation shall be to next level of weathering. The foundation rock shall have a minimum field normal bearing resistance of 30 kips per square foot. Allowable service load bearing value of at least 50 kips per square foot.

REINFORCING STEEL (ONE FOOTING) 

NOTE: THE REINFORCING STEEL QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

CONCRETE QUANTITIES

NOTE: THE CONCRETE QUANTITY IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

TYPICAL SECTION

4'-0 x 8'-0 x 30'-0

4'-0 x 9'-0 x 30'-0

4'-0 x 10'-0 x 34'-0

NOTE: THE FOOTING SIZE IS TO BE INCLUDED ON THE SUMMARY QUANTITIES SHEET IN THE PLAN.

<table>
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<tr>
<th>FOOTING SIZE</th>
<th>NO.</th>
<th>BAR NO.</th>
<th>SIZE &amp; SPACING</th>
<th>LENGTH</th>
<th>REINFORCING STEEL</th>
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<td>2800</td>
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COMMUNITY PROJECT DIVISION

Highway Division

STANDARD DESIGN - 44' ROADWAY, THREE SPAN BRIDGE

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

SEPTEMBER, 2014

THERMO-LECTORS

HIGHWAY & BRIDGE METHODS-SHEET H44-73-14

H44-73-14 - 23/6/2015

IOWA DOT

4'-0 x 9'-0 x 32'-0

4'-0 x 10'-0 x 34'-0

4'-0 x 10'-0 x 30'-0

4'-0 x 9'-0 x 30'-0

4'-0 x 8'-0 x 30'-0

4'-0 x 10'-0 x 30'-0

4'-0 x 8'-0 x 30'-0
SUBDRAIN DETAILS

OUTLET DETAILS

- 6"½ CORRUGATED METAL PIPE OUTLET, OR 4½" CORRUGATED DOUBLE-WALLED PE OR PVC PIPE OUTLET WITH AN APPROPRIATE COUPLER, IF METAL PIPE TO IDEAL, THE PIPES SHOULD BE COUPLED IN ONE OF THE TWO FOLLOWING WAYS:
- USE AN IN-OUT FIT REDUCER COUPLER TO ACCEPT THE LARGER 6"½ PIPE INSERTED A MINIMUM OF 1'-0 INTO CMP.
- INSERT 2'-0 OF THE 4½ SUBDRAIN INTO THE 6½ METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.

MATERIALS I.M. 443.01

GUARD DETAILS

REMOVABLE RODENT TUBING)

CORRUGATED (POLYETHYLENE)

SUBDRAIN 4½ PERFORATED

6' -0

SUBDRAIN OUTLET

TYPICAL SECTION

SLOPE PROTECTION (IF REQUIRED)

NOTE:

SEE ABUTMENT BACKFILL DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

SITUATION PLAN

REFER TO SITUATION PLAN FOR NORTH ARROW.
**EDGING DETAILS**

4" x 6" TREATED TIMBER EDGE DETAILS

**SUBDRAIN NOTES:**

See H44-74-14 and General Elevation Data Sheets for details of placing all subdrains and subdrain outlets required for this structure.

The bridge contractor is to install subdrains behind the abutment. The subdrains shall be 4" in diameter and be in accordance with Article 4161, of the Standard Specifications. The subdrain outlet should consist of a 6'-0" length of pipe with a permeable test gravel.

The subdrains shown for the proposed subdrains are based on the proposed grading layout of bridge street. The subdrains 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 subdrain (including excavation) granular backfill, porous backfill, and subdrain outlet is to be included in the price bid for structural concrete bridges. No extra payment will be made.

**MACADAM STONE ARMORING NOTES:**

Macadam stone shall be placed along the face of the wing and abutment footing. This is typical at each corner of the bridge unless otherwise noted in the plans. Macadam stone at these locations shall be underlaid with engineering fabric and be in accordance with Article 4161, of the Standard Specifications.

The bridge parapet foreplank shall be compacted and shaped as shown on these plans. The construction plan and as directed by the engineer, the parapet foreplank shall be firm when the engineering fabric and macadam stone are placed.

The engineering fabric shall be in accordance with Article 4161, of the Standard Specifications. If the engineering fabric is lifted, the lift shall be a minimum of one foot in length, filled with 4% slope, and placed on top and placed for continuity.

The macadam stone shall be in accordance with Article 4196.01, 3, of the Standard Specifications. The macadam stone shall be deposited, spread, and shaped by mechanical or hand methods that will provide uniform depth and density and provide uniform surface quality.

The bridge parapet foreplank shall be bid as "Bridge Parapet Foreplank + Macadam Stone" in square yards and shall include costs of all materials and labor to construct the bridge parapet foreplank as shown on these plans.
MACADAM STONE WING ARMORING NOTES:
MACADAM STONE SHALL BE PLACED ALONG THE LINE OF THE WING AND ARMORING FOOTING. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLaid WITH ENGINEERING FABRIC AND BE IN ACCORDANCE WITH ARTICLE 4122.02 OF THE STANDARD SPECIFICATIONS. THE ENGINEERING FABRIC SHALL BE COMPLETELY EXposed AND SHOWN AS SHOWN ON THESE PLANS. THE SITUATION PLAN AS DIRECTED BY THE ENGINEER. THE ENGINEERING FABRIC SHALL BE PERMANENT IN THE ENGINEERING FABRIC AND MACADAM STONE ARE PLACED.

THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B OF THE STANDARD SPECIFICATIONS. THE SUBDRAIN OUTLET SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B OF THE STANDARD SPECIFICATIONS. THE SUBDRAIN OUTLET SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 OF THE STANDARD SPECIFICATIONS. THE SUBDRAIN OUTLET SHALL BE IN ACCORDANCE WITH ARTICLE 4161 OF THE STANDARD SPECIFICATIONS.

MACADAM STONE SHALL BE PLACED IN ACCORDANCE WITH SECTION 4161 OF THE STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE PLACED IN ACCORDANCE WITH THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, AND BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 OF THE STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE PLACED UNDERLAYED WITH ENGINEERING FABRIC AND BE IN ACCORDANCE WITH ARTICLE 4122.02 OF THE STANDARD SPECIFICATIONS.
ABUTMENT BACKFILL PROCESS:

The base of the excavation surface behind the abutment is to be graded with a 4% slope away from the abutment footing and a 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 subsurface has been shaped, 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 up the abutment backfill. The ends of the fabric placed shall overlap approximately 4 feet and be pinned in place. The fabric shall be attached to the abutment by using flat plates 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 toe of the abutment wing wall.

Periodic backfill is then placed and leveled. No compaction is required.

The backfilling work involves backfilling with floodable backfill, surface flooding, and vibratory compaction. The floodable backfill material shall be in accordance with the standard specifications. The floodable backfill shall be placed in individual lifts, surface flooded, and compacted with vibratory equipment in accordance with the requirements. The use of vibratory fill consolidation, limit the loose lifts to no more than 1 to 2 feet in thickness.

Start surface flooding for each floodable 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 flooding, water running full in a 2-inch diameter pipe should be sprayed in successive 0-foot to 4-foot increments for 5 minutes within each increment.

Floodable backfill lift placement, flooding, and compaction shall progress until the required full thickness of the abutment backfill has been completed.

Water, floodable, subdrain, and porous floodable backfill and geotextile fabric furnished at this abutment shall be included in the contract unit price for structural concrete.

The cost of water required for flooding, subdrains, porous floodable backfill, and geotextile fabric furnished at the bridge abutments shall be included in the contract unit price for structural concrete.

NOTE:
- Subdrain shall be placed in accordance with Article 4196.01, B, 6 of the standard specifications. If the engineering fabric is left, the tops shall be a minimum of one foot in length, single fabric, with a slope lap piece on top and stapled for continuity.

Highway Division
IOWA DOT

PRETENDED PRESTRESSED CONCRETE BEAM BRIDGES

ABUTMENT BACKFILL DETAILS
NOTE: See subdrain details sheet for details not shown on this sheet which are pertinent to this structure.
ABUTMENT BACKFILL PROCESS:

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

After the subdrain has been boxed, 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 of the abutment backfill. The fabric should extend above the face of the abutment a distance equal to at least two feet higher than the height of the porous subdrain outlet. The fabric placed shall overlap approximately 1 foot and shall be pinned in place. The fabric shall be attached to the abutment by using latex placed in the fabric and secured to the concrete wall 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 excavation slope. A lift 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 subdrain is then placed and leveled. No compaction is required.

The subdrain involves backfilling with porous subdrain. Sizing, and grading compaction. The porous subdrain material shall be in accordance with the standard specifications. The porous subdrain shall be placed in individual lifts. Sizing, and grading compaction. After full consolidation, limit the loose lifts to no more than 2 feet of thickness.

Start surface dressing for each porous subdrain lift at the high point of the subdrain and proceed to the low point where the subdrain exits the fabric. To ensure uniform surface dressing, water runoff fall in a 2-inch targeted note should be spaced in successive 6-foot to 8-foot increments for 5 minutes within each increment.

Flooding subdrain lift placement, flooding, and compaction shall progress until the required full thickness of the porous subdrain has been completed.

Water required for flooding subdrains, porous subdrain, and porous subdrain, geotextile fabric furnished at the bridge abutments shall not be measured separately for payment.

The cost of water required for flooding subdrains, porous subdrain, and porous subdrain, geotextile fabric furnished at the bridge abutments shall be included in the contract unit price for structural concrete.

NOTE:

Subdrain small slope downward 2% from approach roadway when outleeting both sides of the abutment.
Subdrain small slope downward 2% from high end when outleeting at one end of the abutment.

The geotextile fabric shall be in accordance with article 4196.01, B, 6 of the standard specifications. If the engineer otherwise calls for geotextile fabric is to be be used on one foot in length. Single fabric with a top of slope lap piece on top and stapled for continuity.

ABUTMENT BACKFILL DETAILS

NOTE: Geotextile fabric will be attached to face of abutment footing and wings.

A & B Beams - Skewed

PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES

Section A-A

NOTES:

See subdrain details sheet for details not shown on this sheet which are pertinent to this structure.

\[ \text{W} \] DIMENSION

<table>
<thead>
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<th>Dimension</th>
<th>Width</th>
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<tbody>
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<td>2'-0</td>
</tr>
<tr>
<td>15&quot;</td>
<td>3'-0</td>
</tr>
</tbody>
</table>
ABUTMENT BACKFILL PROCESS:

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

2. After the subgrade has been shaped, 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 of the abutment. The geotextile must be pinned against the excavation face at a height that will be approximately 4 to 6 feet higher than the height of the porous backfill placed as shown in the backfill details on this sheet. The strips of the fabric placed shall overlap approximately 1 foot and shall be pinned in place. The fabric will 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.

3. When the fabric is in place, the subgrade shall be installed directly on the fabric. At the toe of the rear excavation slope, a lift will need to be cut in the fabric at the point where the subgrade exits the fabric near the end of the abutment wing wall.

4. Periodic backfill is then placed and leveled; no compaction is required.

5. The remaining work involves backfilling with flexible backfill, surface flooding, and compaction. The flexible backfill material shall be in accordance with the standard specifications. The flexible backfill shall be placed in individual lifts, surface flooded, and compacted in accordance with the standard specifications. The flexible backfill shall be placed 2% subdrain slope to the high point. The flexible backfill along the abutment wing shall be compacted to a minimum of 90% of its standard proctor density. The flexible backfill shall be placed to a minimum of 90% of its standard proctor density.

6. Surface flooding for each flexible backfill lift at the high point of the subgrade is required. Water shall be applied uniformly along the subgrade surface. Water shall be applied at a rate of 1 inch per minute. Water shall be applied in increments of 6 inches to 8 inches. Water shall be applied to the subgrade surface for a minimum of 5 minutes within each increment.

7. Flexible backfill lift placement, flooding, and compaction shall progress until the required full thickness of the abutment backfill has been completed.

8. Water required for flooding subgrades, porous backfill, flexible backfill, and geotextile fabric placed at this abutment will not be reimbursed separately for payment.

9. The cost of water required for flooding subgrades, porous backfill, flexible backfill, and geotextile fabric placed at this abutment shall be included in the contract unit price for structural concrete.
ABUTMENT BACKFILL PROCESS:

THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE ABUTMENT IS TO BE GRACED WITH A 4% SLOPE AWAY FROM THE ABUTMENT FOOTING AND A 2% CROSS SLOPE IN THE DIRECTION OF THE APPROACH ROADWAY. THE SUBGRADE SUBDRAIN IS TO BE COMPLETED PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE AND BACKFILL MATERIAL.


THE REMAINING WORK INVOLVES BACKFILLING WITH FLEXIBLE BACKFILL MATERIAL. THE FLEXIBLE BACKFILL MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLEXIBLE BACKFILL SHALL BE PLACED IN SUCCESSIVE LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY COMPACTION. THE FABRIC PLACED LONG THE EXCAVATION SUBGRADE LIMIT OF THE FABRIC NEAR THE END OF THE ABUTMENT WALL WILL NOT BE INSTALLED.