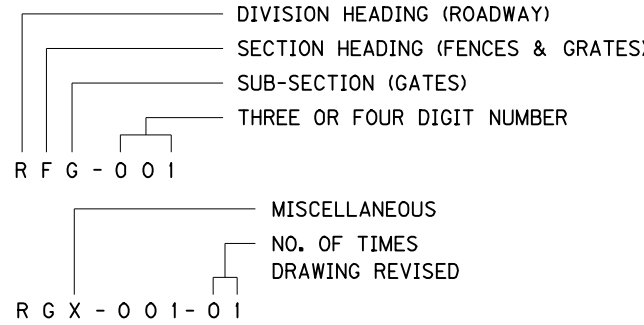
# KENTUCKY STANDARD DRAWINGS

- ROADWAY
  - BARRIERS
    - GUARDRAIL AND BRIDGE END DRAINAGE RBB-SERIES
    - GUARDRAIL CONNECTORS TO BRIDGE ENDS RBC-SERIES
    - ENERGY ABSORPTION DEVICES RBE-SERIES
    - TYPICAL BARRIER INSTALLATIONS RBI-SERIES
    - CONCRETE MEDIAN BARRIERS RBM-SERIES
    - GUARDRAIL HARDWARE RBR-SERIES
  - DRAINAGE
    - BOX INLETS AND OUTLETS RDB-SERIES
    - PAVED DITCHES, FLUME INLETS & CHANNEL LINNING RDD-SERIES
    - HEADWALLS RDH-SERIES
    - TYPICAL DRAINAGE INSTALLATIONS RDI-SERIES
    - MANHOLES RDM-SERIES
    - PERFORATED PIPE RDP-SERIES
    - MISCELLANEOUS DRAINAGE RDX-SERIES
  - FENCES AND GRATES
    - CHAIN LINK FENCE RFC-SERIES
    - GATES RFG-SERIES
    - WOVEN WIRE FENCE RFW-SERIES
  - GENERAL
    - SUPERELEVATION AND CURVE WIDENING RGS-SERIES
    - MISCELLANEOUS STANDARDS RGX-SERIES
  - PAVEMENT
    - MEDIANS, CURBS, APPROACHES, ETC. RPM-SERIES
    - NON-REINFORCED CONC. PAVEMENT RPN-SERIES
    - STANDARD REINF. CONC. PAVEMENT RPS-SERIES
    - MISCELLANEOUS PAVING RPX-SERIES
  - ROADSIDE DEVELOPMENT
    - EROSION CONTROL RRE-SERIES
    - PLANTS RRP-SERIES
- TRAFFIC
  - PERMANENT
    - MARKERS TPM-SERIES
  - TEMPORARY
    - TRAFFIC CONTROL TTC-SERIES
    - DEVICES TTD-SERIES
    - STRIPING OPERATIONS TTS-SERIES
- BRIDGES
  - SEE OVERLEAF

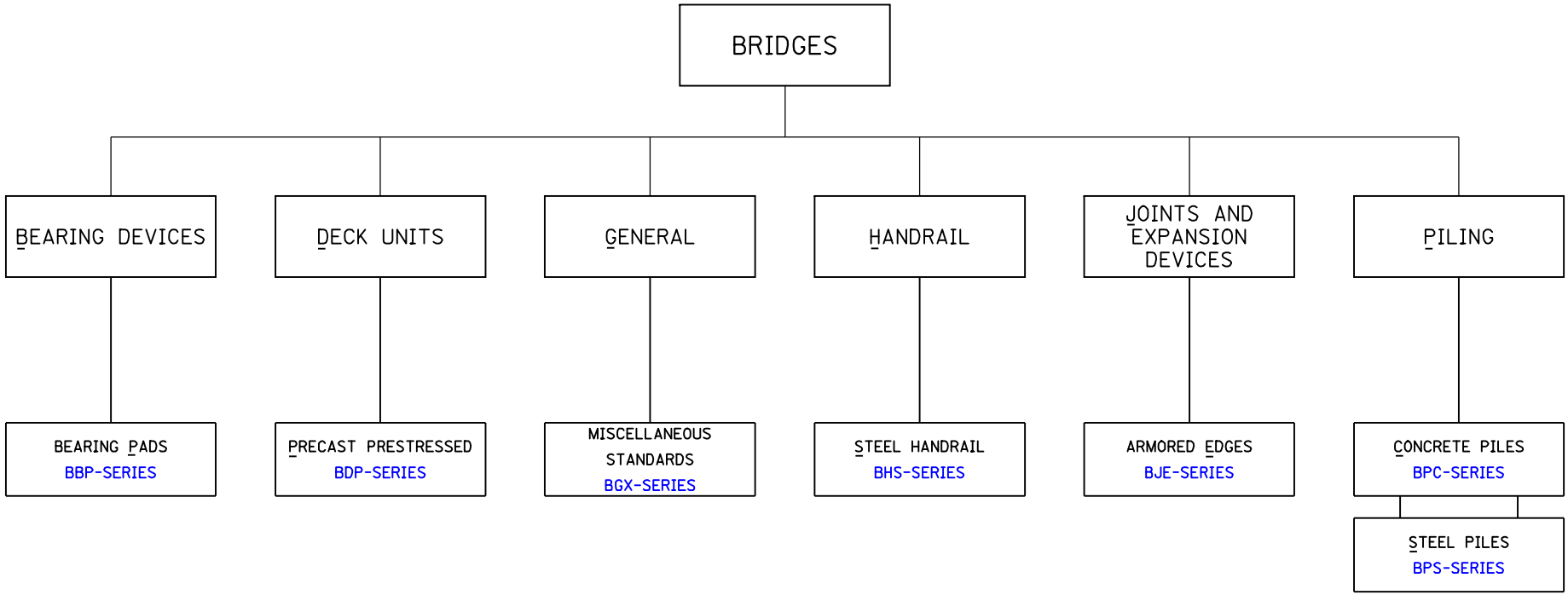
## ~ DRAWING NUMBER EXPLANATION ~




KENTUCKY DEPARTMENT OF HIGHWAYS

LAYOUT CHART FOR KENTUCKY STANDARD DRAWINGS

2003

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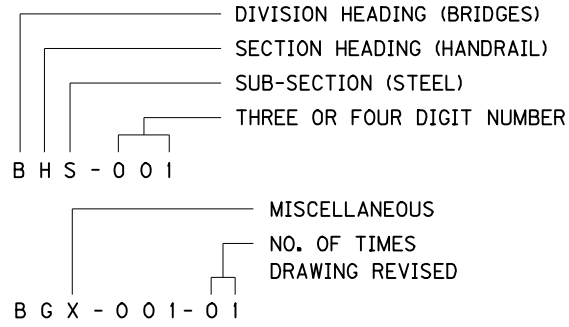
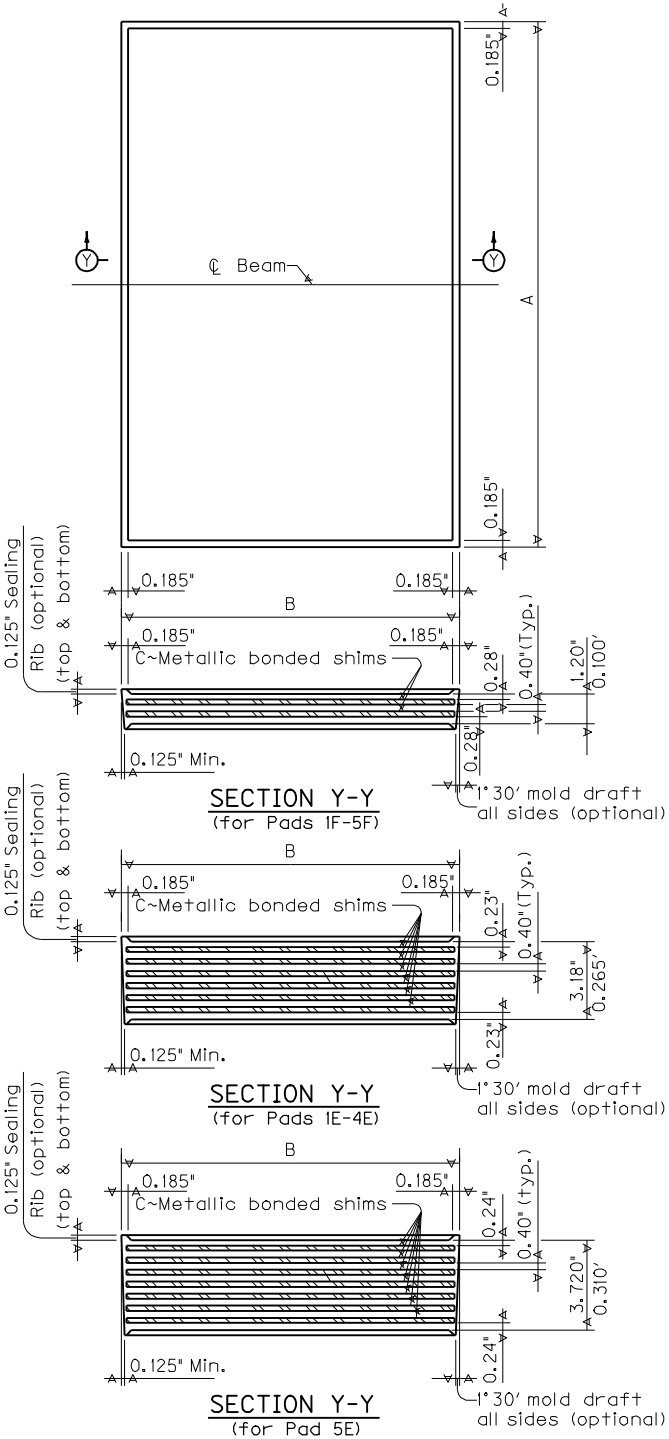



KENTUCKY DEPARTMENT OF HIGHWAYS

LAYOUT CHART FOR KENTUCKY STANDARD DRAWINGS

2003




## DIMENSIONS FOR I-BEAM PADS

| PAD | A | B | C | *MAXIMUM REACTION | MAXIMUM MOVEMENT (One Direction) |
|---|---|---|---|---|---|
| 1F | 14" | 10" | 2~0.12" x 13.630" x 9.630" | 88k | 0.5" |
| 2F | 16" | 10" | 2~0.12" x 15.630" x 9.630" | 107k | 0.5" |
| 3F | 20" | 10" | 2~0.12" x 19.630" x 9.630" | 145k | 0.5" |
| 4F | 24" | 10" | 2~0.12" x 23.630" x 9.630" | 185k | 0.5" |
| 5F | 24" | 11" | 2~0.12" x 23.630" x 10.630" | 219k | 0.5" |

* Use actual reactions to determine anchorage requirements for pads.

## DIMENSIONS FOR I-BEAM PADS

| PAD | A | B | C | *MAXIMUM REACTION | MAXIMUM MOVEMENT (One Direction) |
|---|---|---|---|---|---|
| 1E | 14" | 10" | 6~0.12" x 13.630" x 9.630" | 88k | 1.22" |
| 2E | 16" | 10" | 6~0.12" x 15.630" x 9.630" | 107k | 1.22" |
| 3E | 20" | 10" | 6~0.12" x 19.630" x 9.630" | 145k | 1.22" |
| 4E | 24" | 10" | 6~0.12" x 23.630" x 9.630" | 185k | 1.22" |
| 5E | 24" | 11" | 7~0.12" x 23.630" x 10.630" | 219k | 1.44" |

* Use actual reactions to determine anchorage requirements for pads.

## GENERAL NOTES

SPECIFICATIONS: Fabricate the Elastomeric Bearing Pads to the design and dimensions as shown on these drawings and to AASHTO Standard Specifications for Highway Bridges, Division II, Section 18.

Ensure bearings are low temperature Grade 3 with durometer hardness of 50 and subjected to the load testing requirements corresponding to Design Method A.

Include the price of bearing pads in the bid for the beams.

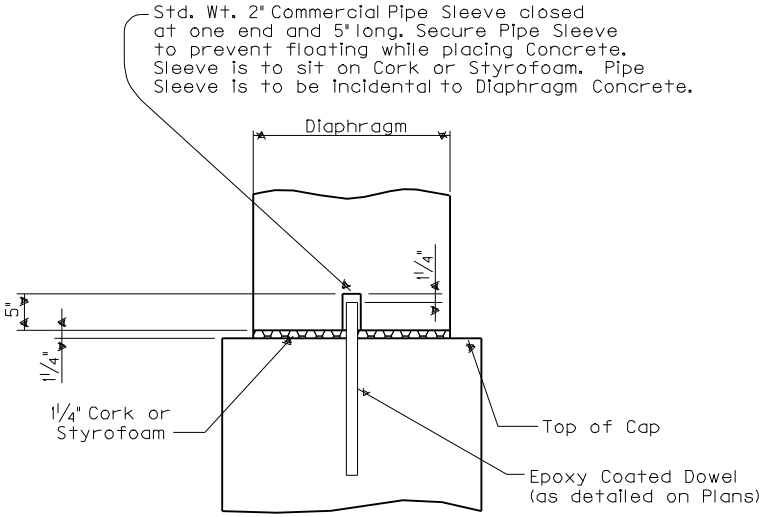
KENTUCKY
DEPARTMENT OF HIGHWAYS

**ELASTOMERIC BEARING PADS FOR PRESTRESSED BEAMS**

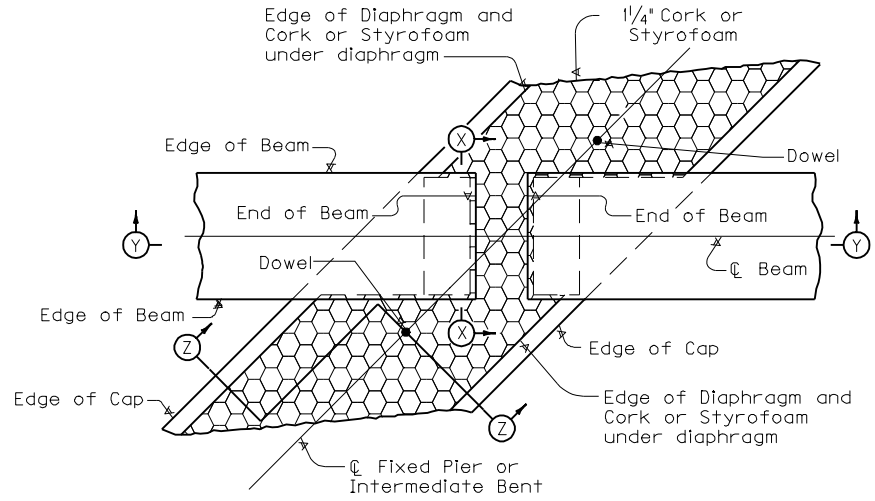
STANDARD DRAWING NO. BBP-001-11

SUBMITTED S E Goodrich DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

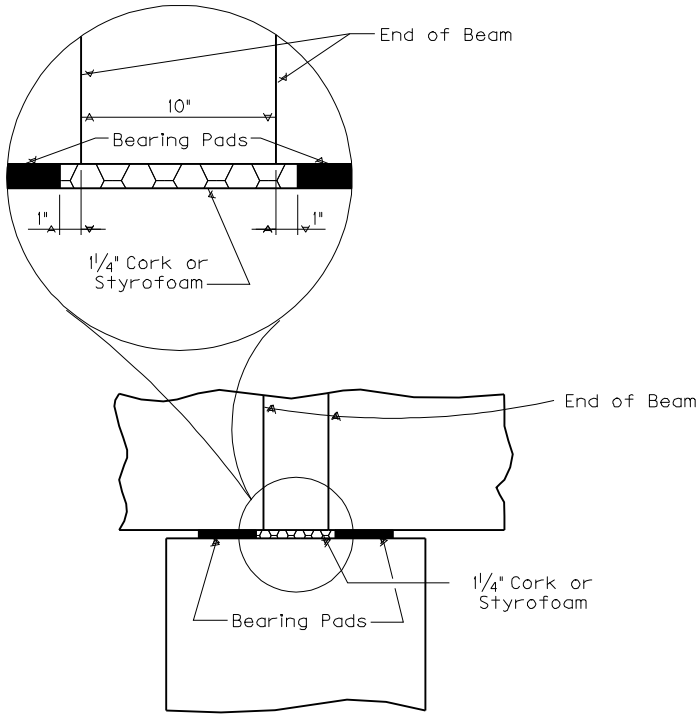
APPROVED J M Yancey STATE HIGHWAY ENGINEER 12-2-02 DATE



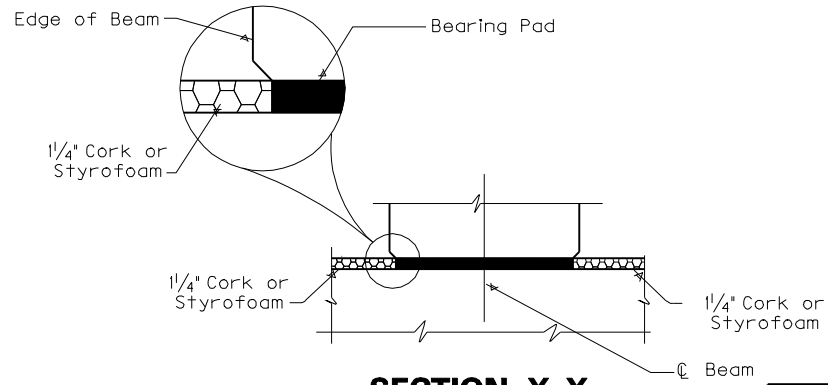

## SECTION Z–Z




## PLAN




## SECTION Y–Y




## SECTION X–X

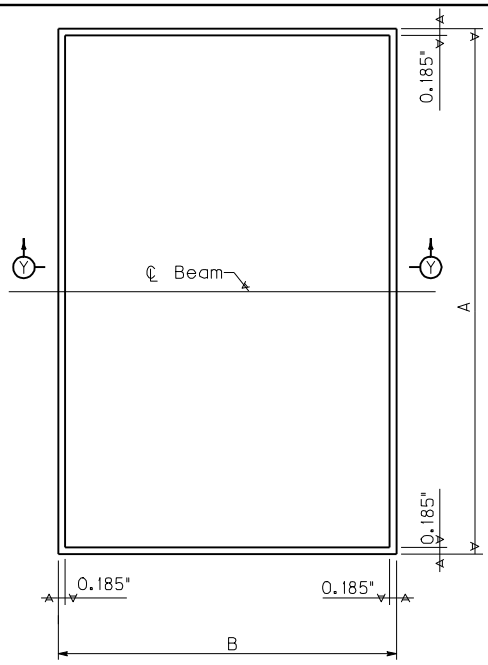
KENTUCKY
DEPARTMENT OF HIGHWAYS

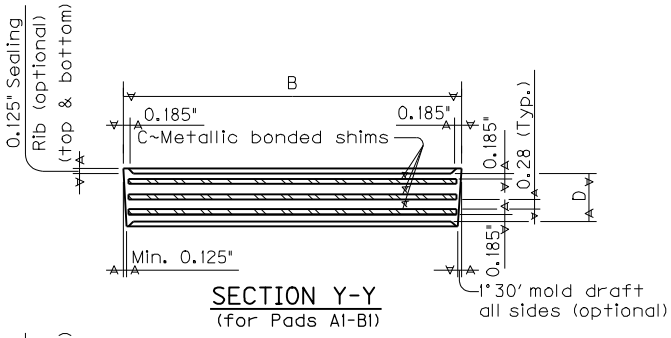
**BEARING DETAILS**

STANDARD DRAWING NO. BBP-002-04

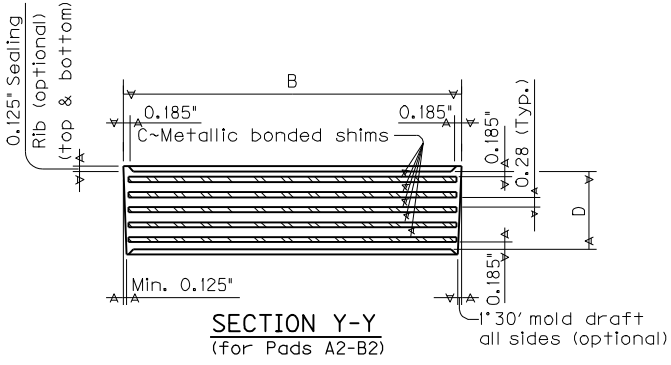
SUBMITTED S.E. Goodpaster DIRECTOR DIVISION OF BRIDGE DESIGN 12-1-99 DATE

APPROVED C.W. Graves STATE HIGHWAY ENGINEER 12-1-99 DATE




SECTION Y-Y
(for Pads A1-B1)




SECTION Y-Y
(for Pads A2-B2)

## DIMENSIONS FOR BOX-BEAM PADS

| PAD | A | B | C | D | *MAXIMUM REACTION | MAXIMUM MOVEMENT (One Direction) |
|---|---|---|---|---|---|---|
| A1 | 1'-10" | 7" | 3~0.12" x 21.630" x 6.630" | 1.290" | 123k | 0.500" |
| A2 | 1'-10" | 7" | 5~0.12" x 21.630" x 6.630" | 2.090" | 123k | 0.750" |
| B1 | 11" | 7" | 3~0.12" x 10.630" x 6.630" | 1.290" | 50k | 0.500" |
| B2 | 11" | 7" | 5~0.12" x 10.630" x 6.630" | 2.090" | 50k | 0.750" |
| | | | | | | |

* Use actual reactions to determine anchorage requirements for pads.

## GENERAL NOTES

SPECIFICATIONS: Fabricate the Elastomeric Bearing Pads to the design and dimensions as shown on these drawings and to AASHTO Standard Specifications for Highway Bridges, Division II, Section 18.

Ensure bearings are low temperature Grade 3 with durometer hardness of 50 and subjected to the load testing requirements corresponding to Design Method A.

Include the price of bearing pads in the bid for the beams.

KENTUCKY
DEPARTMENT OF HIGHWAYS

**ELASTOMERIC BEARING PADS FOR BOX BEAMS**

STANDARD DRAWING NO. BBP-003-01

SUBMITTED S.E. Goodrich — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

APPROVED J.M. Yancey — STATE HIGHWAY ENGINEER — 12-1-99 DATE

# PRECAST PRESTRESSED BOX BEAMS

## General Notes

SPECIFICATIONS: All references to the standard Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, with current supplemental specifications. All references to the AASHTO Specifications are to the current edition of the AASHTO Standard Specifications for Highway Bridges, with interims.

DESIGN LOADS: Beam sections are designed for HS25 live load or alternate loading of two 24-kip axles spaced at 4 ft. apart, whichever produces the greater stress. The HS25 live load is arrived by increasing the standard HS20-44 truck and lane loads as specified in the AASHTO Specifications by 25 percent.

MATERIAL DESIGN SPECIFICATIONS:

| | | |
|---|---|---|
| for Steel Reinforcement | FY | = 60000 PSI |
| for Prestressed Girder Concrete | F'C | = 5800 PSI |
| | F'Ci | = 4500 PSI |
| for Prestressing Steel | F'S | = 270000 PSI |

DESIGN LENGTH: Beam lengths shown in the Standards represent total beam length. Beams are designed for spans from centerline of bearing to centerline of bearing. Use the next greater designed section for non-Standard lengths.

CONSTRUCTION METHOD: Transferring bond stress to the concrete will not be allowed, nor releasing of end anchors until the concrete has attained a minimum compressive strength of 4500 PSI as shown by standard cylinders made and cured identically with the girders; attain 5800 PSI at or prior to 28 days. Apply an initial prestress force of 28000 lbs. per low relaxation strand. Beams with honeycomb of such extent as to affect the strength of resistance to deterioration will not be accepted. The allowance of .0005L (length) is made for shortening of beams due to shrinkage and elastic change. Furnish shop plans showing a detensioning plan by numbering, in sequence, the strand pattern.

PRESTRESSING STRANDS: Ensure prestressing strands to be ½", Grade 270 low-relaxation strands conforming to AASHTO M 203. If an alternate strand arrangement or strand type is preferred by the Contractor, the designer that developed the original plans will provide the design and also revise the original plans to reflect the changes. These design and plan modifications will be done at the Contractor's expense.

CORROSION INHIBITOR: Provide a corrosion inhibitor for B-type (non-composite) beams in accordance with the current Special Note for Corrosion Inhibitors.

BEVELED EDGES: Bevel all exposed edges ⅞".

REINFORCEMENT: Dimensions shown from the face of concrete to reinforcement are clear distances. Spacing of reinforcement is from center to center of reinforcement. All steel reinforcement is to be epoxy coated in accordance with Section 811.10 of the Specifications. Consider bars marked "C" to be a stirrup for purposes of bend diameters. Non-epoxy reinforcement may be used for fabrication purposes, only, provided that the steel is not used in the top 5½" of the beam and the location of the steel is indicated on the shop drawings.

CURBS: Pour curbs on B-type beams in the plant. Concrete must have the same mix design as the beam section, except that the cylinder strength need not exceed that for Class "AA" Concrete. Include the cost of the curbs in the price of beam.

GROUT: Provide non-shrink grout for anchor dowels, shear keys, and tensioning rod block-outs conforming with Section 601.03.03 of the Specifications. When side by side superstructure is utilized, grouting will be completed after lateral tension rods have been fully tightened and before leveling devices have been removed. Include the cost of furnishing and placing grout in the price of beam.

RAILING SYSTEM TYPE II: Furnish this material per these specifications.

| ITEM | DESCRIPTION | MATERIAL SPECIFICATION | COATING SPECIFICATION |
|---|---|---|---|
| Post | W6x25 | ASTM A36 | A123 |
| Channel | C7x9.8 | ASTM A36 | A123 |
| Plate | ½"x 7" | ASTM A36 | A123 |
| Tubing | 8x4x0.1875 | ASTM A500 or A501 | A123 |
| Bolts | ⅝" | ASTM A307 | A153 |
| Nuts | for ⅝" | ASTM A563, Grade A or better | A153 |
| Washers | for ⅝" | ASTM A563, Grade A or better | A153 |
| Stud | 1¼" | ASTM A108 (1045 C.D. Bar) | B633, Type II, Class 25 |
| Ferrule | 2½"x 5" | ASTM A108 (11L17 Steel) | B633, Type II, Class 25 |
| Wire | ⅜" | ASTM A510 (1018 Steel) | B633, Type II, Class 25 |
| Nut | for 1¼" Bolt | ASTM A108 (12L14 Steel) | B633, Type II, Class 25 |
| Nut | for 1¼" Stud | ASTM A325M | B633, Type II, Class 25 |
| Washers | for 1¼" Stud | ASTM A325M | B633, Type II, Class 25 |

*Use the current edition of the references listed below with these standards.*

### STANDARD DRAWINGS

| | |
|---|---|
| BBP-003 | Elastomeric Bearing Pads |
| BHS-007 | Railing System Type II |
| BJE-001 | Armored Edge & Neoprene Joints |
| RBR-001 | Steel Beam Guardrail |
| RBR-005 | Guardrail Components |

### SPECIAL NOTES

for Corrosion Inhibitors

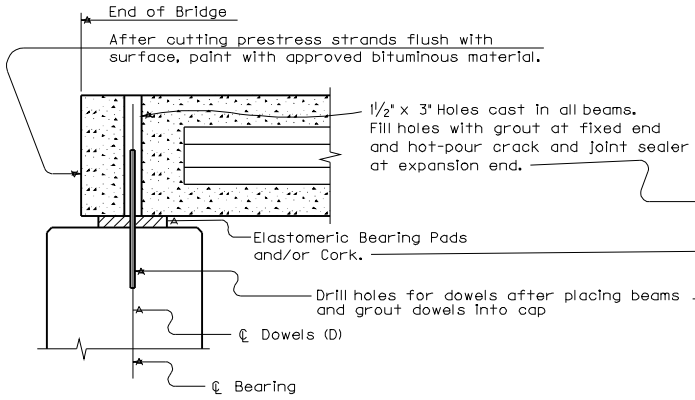
KENTUCKY
DEPARTMENT OF HIGHWAYS

**BOX BEAM**
**GENERAL NOTES**
**& REFERENCES**

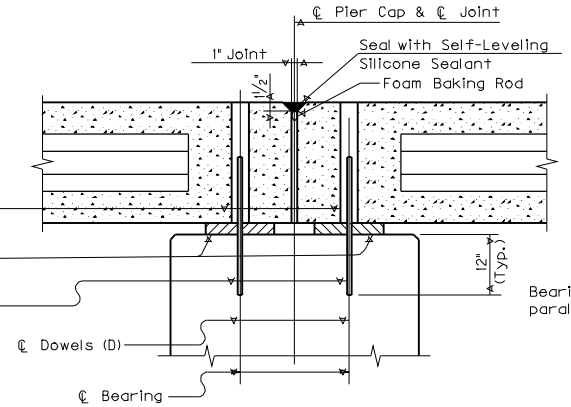
STANDARD DRAWING NO. BDP-001-03

SUBMITTED _____ DIRECTOR DIVISION OF BRIDGE DESIGN _____ DATE

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE

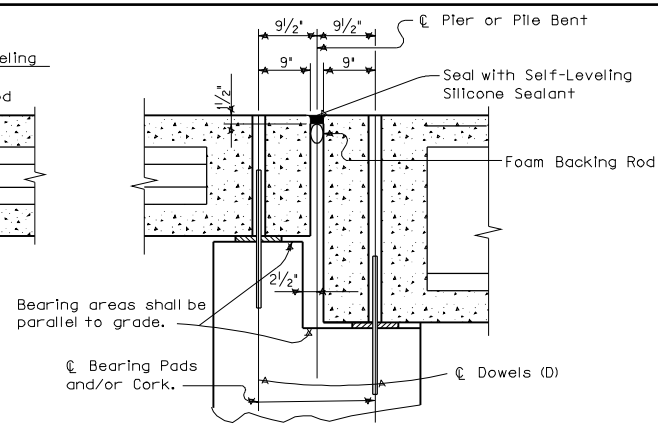



## ABUTMENT OR END BENT



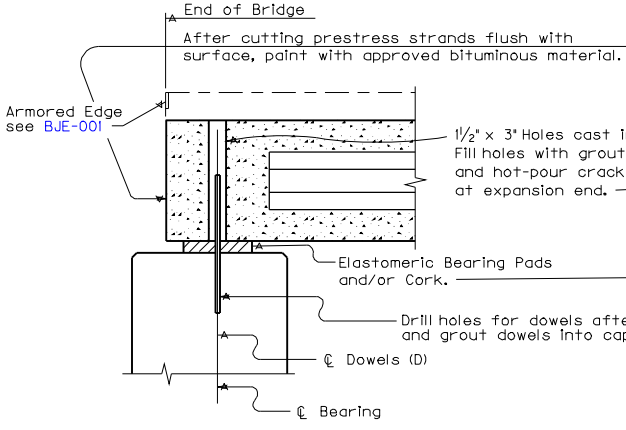

## PIER OR PILE BENT

# TYPICAL BEARING DETAILS (NON-COMPOSITE)




## STEPPED PIER OR PILE BENT

(Showing Location & Placement of Box Beams)

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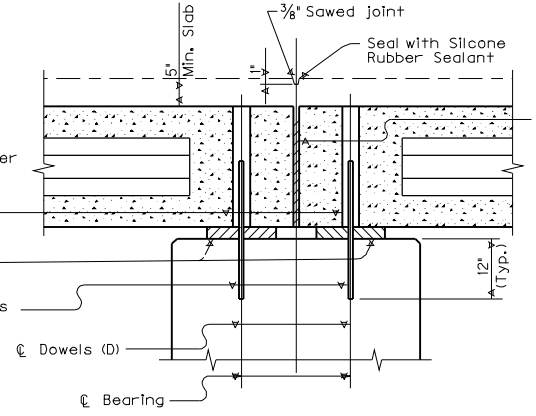
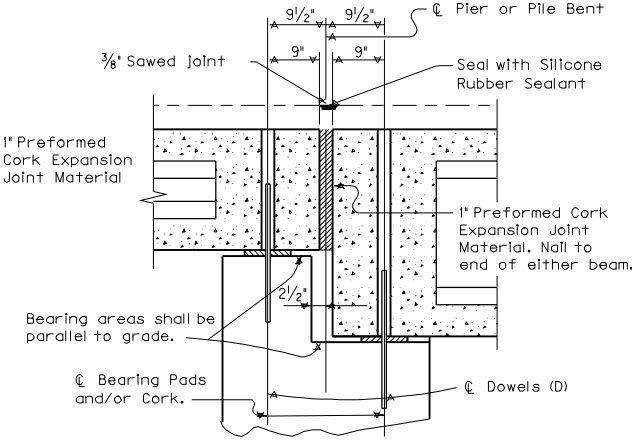


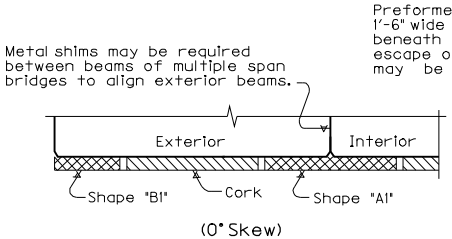

## PIER OR PILE BENT

# TYPICAL BEARING DETAILS (COMPOSITE)



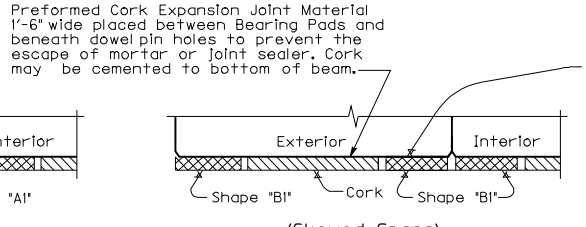

## STEPPED PIER OR PILE BENT

(Showing Location & Placement of Box Beams)




(0° Skew)

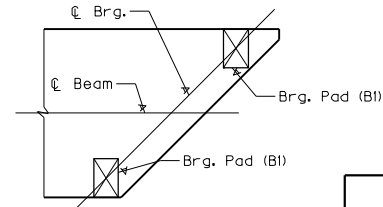
For Elastomeric Bearing Pad Details of Shapes A1 & B1, see Std. Dwg. BBP-003.




(Skewed Spans)

## SHOWING PADS FOR BEAM TYPES B27-B42 & CB27-CB42

Use ½" x 1'-6" preformed cork for beam types B12-B21 & CB12-CB21 for bearing.




## PAD PLACEMENT FOR SKEWS

Pads "B1" are to always be placed perpendicular to ℄ beam with center of pad over ℄ bearing.

## GENERAL NOTES

Provide metal shims conforming to ASTM A36 and galvanize in accordance with ASTM A123. As alternates, cork, polymer, or elastomer shims may be used. Include the cost of furnishing and placing these shims in the price per beam.

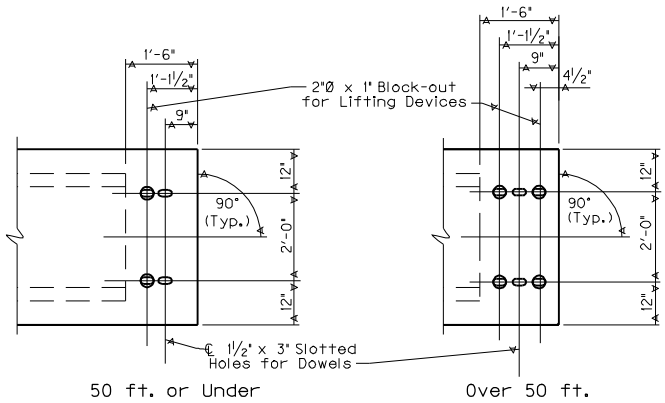
KENTUCKY DEPARTMENT OF HIGHWAYS

**BOX BEAM BEARING DETAILS**

STANDARD DRAWING NO. BDP-002-03

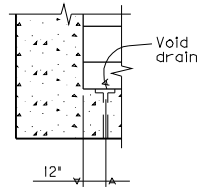
SUBMITTED S E Goodpaster DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

APPROVED J M Yanuzzelli STATE HIGHWAY ENGINEER 12-2-02 DATE



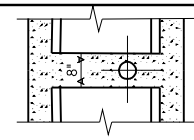

NOTE: Void omitted on 12" beams.

## TYPICAL STRAIGHT END



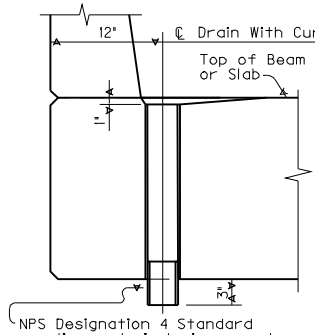

## VOID DRAIN DETAIL

Locate two drains at each end of each void. Provide 1"Ø drains of a type approved by the Division of Materials.



Diaphragms may be omitted if void is cut to allow drain to be encased with a minimum 2" of concrete.

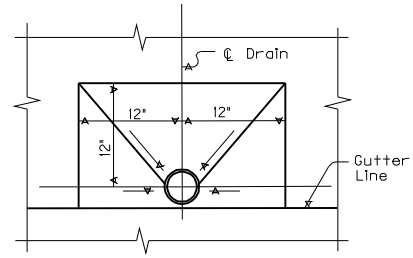
## SECTION THRU BEAM




## SECTION THRU DRAIN EXTERIOR BOX BEAM

(Showing coupling in barrier)

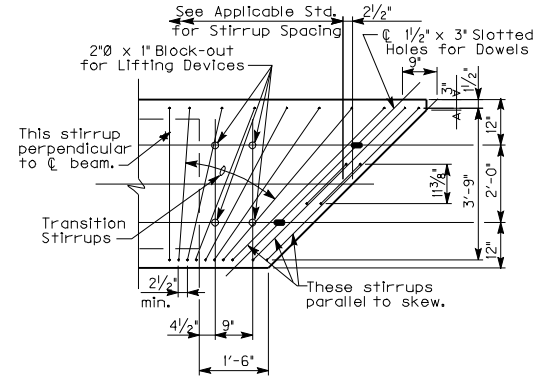
Provide drains on both sides of bridge with normal crown and on low side only for superelevated bridges. Space drains at maximum 12'-6" on centers with a minimun of one placed each gutter line per span. Omit drains when span crosses over a highway or railroad. Include the cost of pipe and fittings in the price of beam.




TOP VIEW OF DRAIN

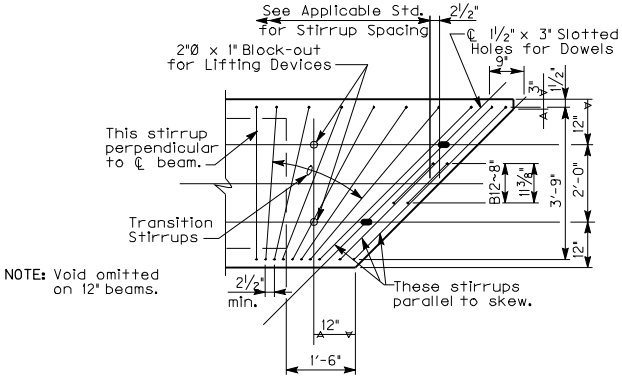
## DRAIN DETAILS

(For Spans With Curbs)




## TYPICAL SKEWED END FOR BEAMS OVER 50 FEET

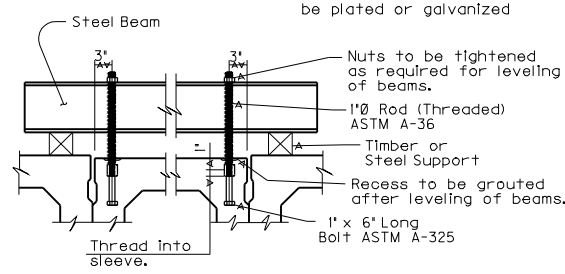
(Right Skew Shown, Left Opposite Hand)

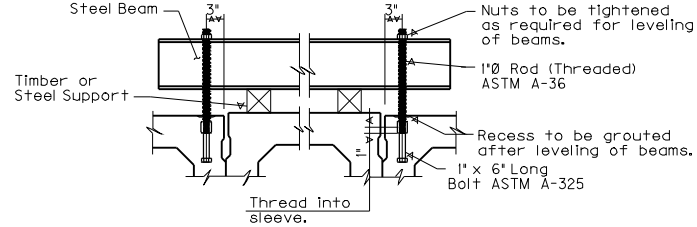



## TYPICAL SKEWED END FOR BEAMS 50 FEET OR LESS

(Right Skew Shown, Left Opposite Hand)

Note: Inserts are to be plated or galvanized

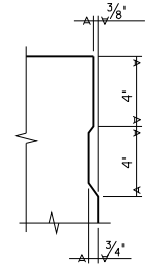



## LEVELING DEVICE DETAILS

Locate inserts at the center of beams up to 50 ft. and at diaphragm locations of beams over 50 ft. Include the cost of materials and labor involved in leveling beams in the price for beams. Submit alternate leveling devices to the Division of Bridge Design for approval.

NOTE: Omit shear key on exterior face of exterior beam.




## SHEAR KEY DETAIL

KENTUCKY
DEPARTMENT OF HIGHWAYS

# BOX BEAM MISCELLANEOUS DETAILS

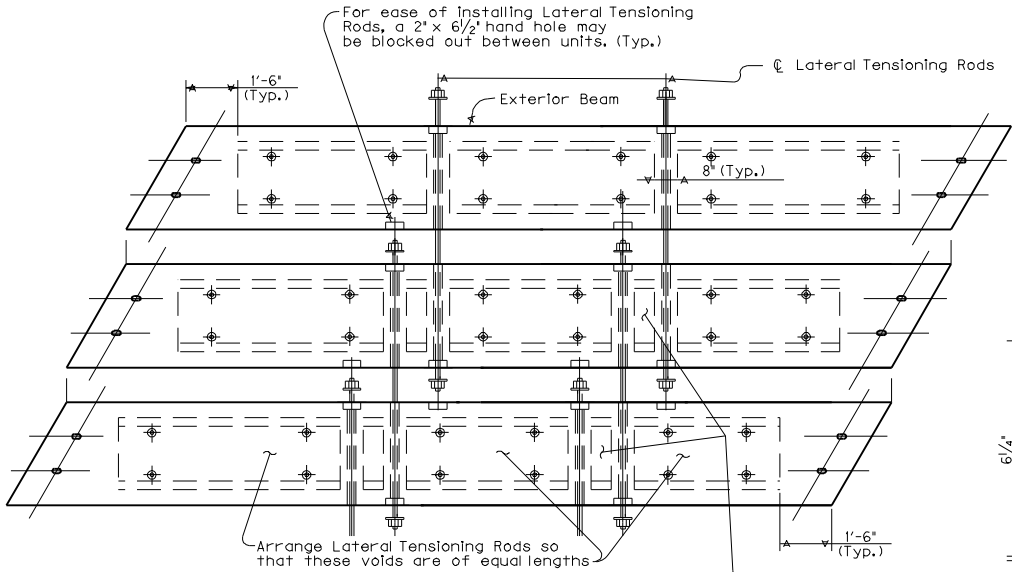
STANDARD DRAWING NO. BDP-003-03

SUBMITTED _____ DIRECTOR DIVISION OF BRIDGE DESIGN _____ DATE

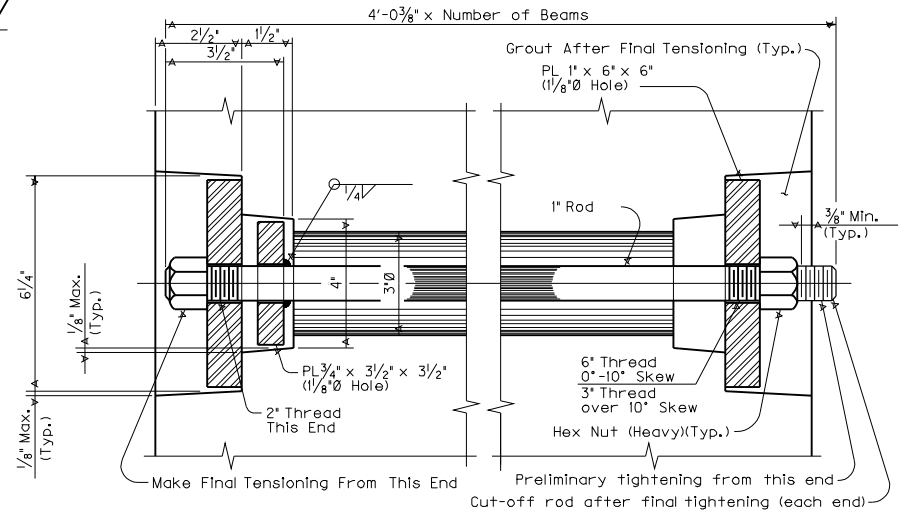
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE

## GENERAL NOTES

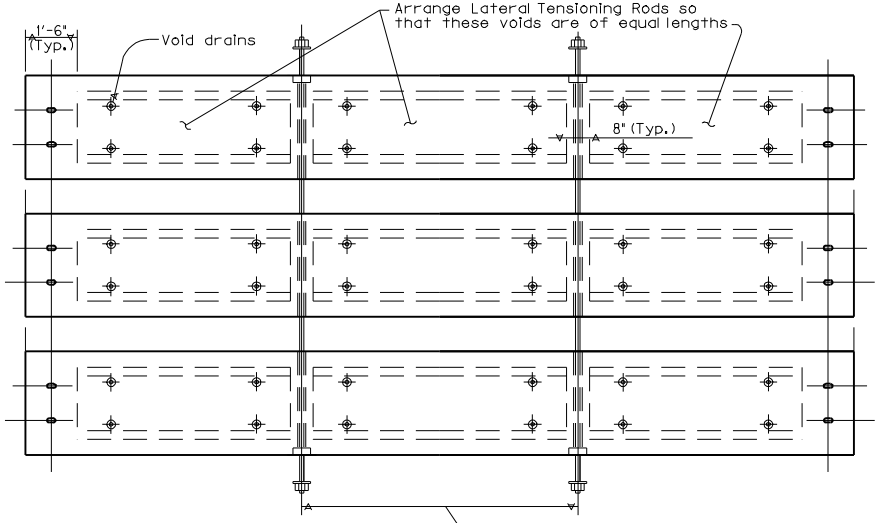
LATERAL TENSIONING RODS: After the deck units are in place, apply a preliminary tension to the lateral tensioning rods. Perform final tensioning that yields 20,000 psi as developed by a torque of 200 ft./lbs. Provide lateral tensioning rods and plates conforming to ASTM A36 with heavy hex nuts conforming to ASTM A307.




**SECTIONAL PLAN SHOWING LATERAL TENSIONING METHOD FOR SKEWED SPANS**

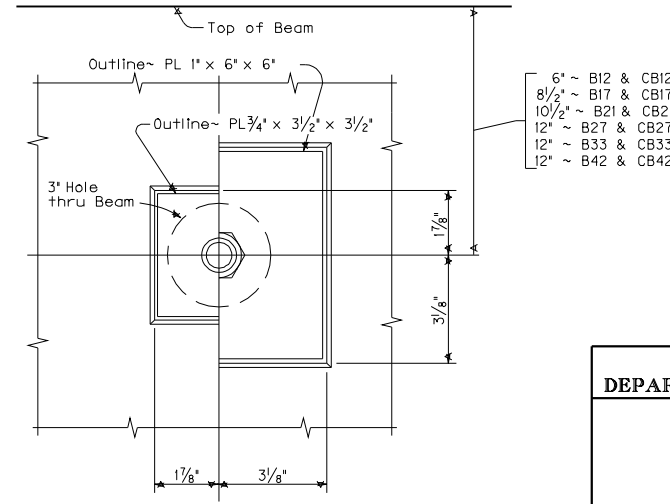



**SECTION THRU LATERAL TENSIONING ROD**




**SECTIONAL PLAN SHOWING LATERAL TENSIONING METHOD FOR STRAIGHT SPANS**

(The above arrangement is applicable from 0° skews to and including 10° skews)




**SECTIONAL END PLAN**

(Lateral Tension Rod Details)

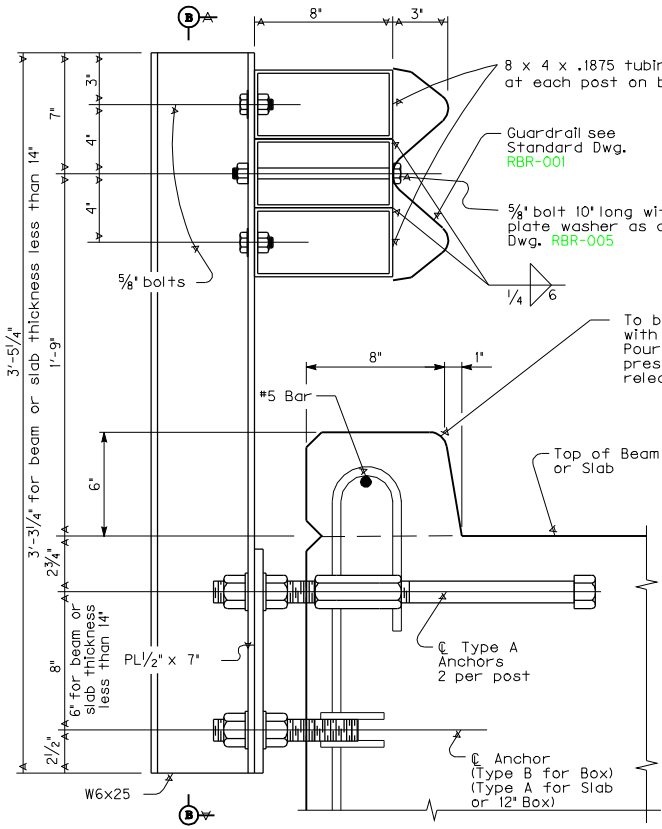
KENTUCKY
DEPARTMENT OF HIGHWAYS

**BOX BEAM TENSION ROD DETAILS**

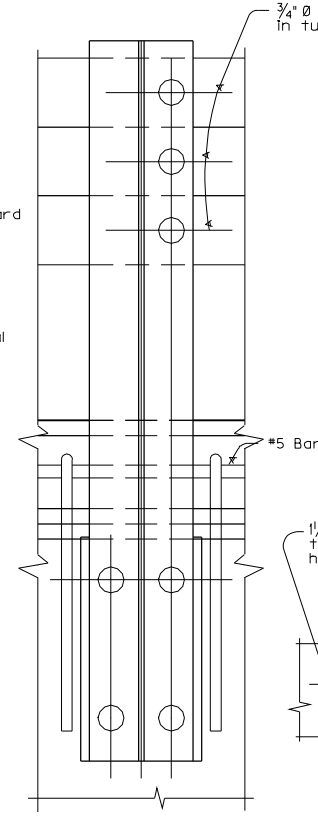
STANDARD DRAWING NO. BDP-004-03

SUBMITTED S E Goodpaster DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

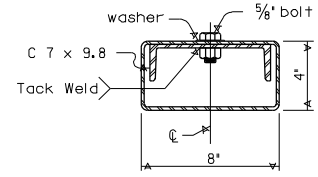
APPROVED C M Newell STATE HIGHWAY ENGINEER 12-2-02 DATE



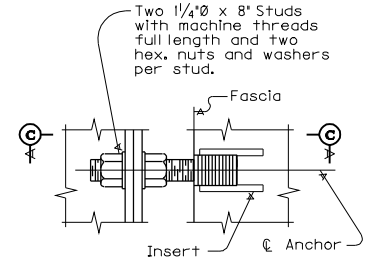

**TYPICAL SECTION**

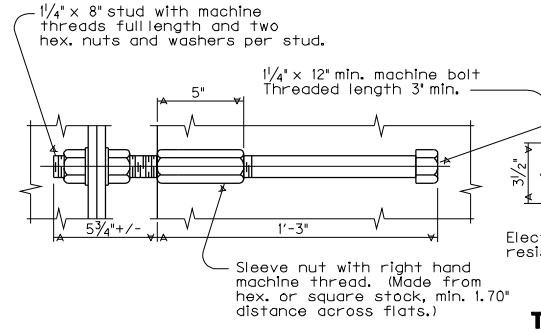



**SECTION B–B**

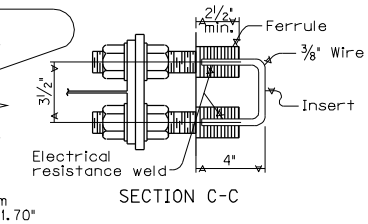



**SECTION A–A**



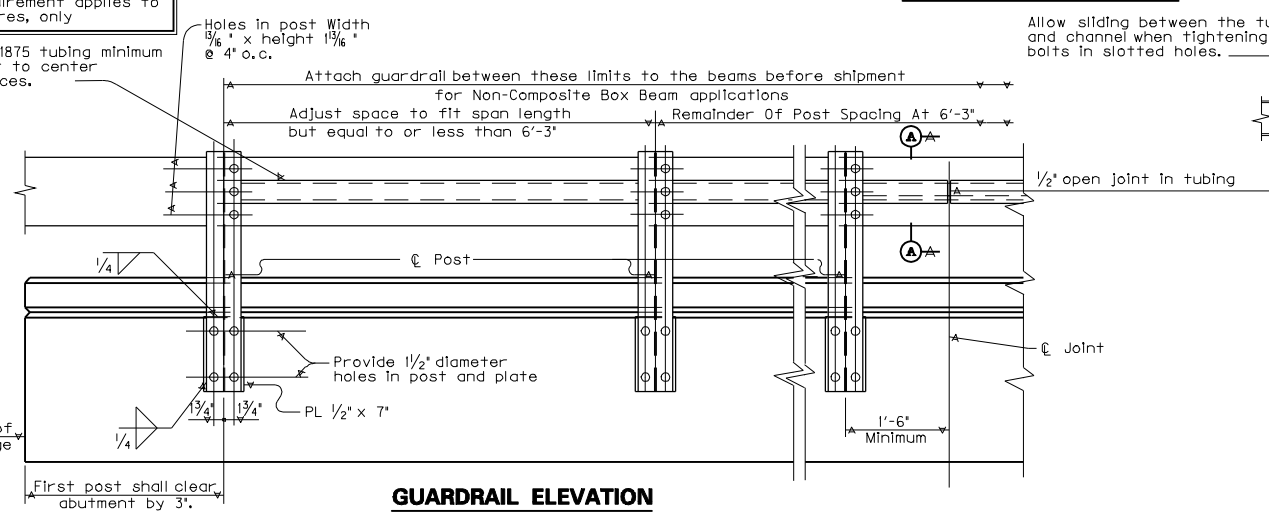

**TYPE A ANCHOR DETAIL**




SECTION C-C

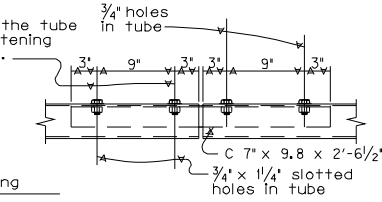
**TYPE B ANCHOR DETAIL**

NOTE: Include reinforcement shown on this sheet in the cost of the beam. This requirement applies to side-by-side box beam superstructures, only

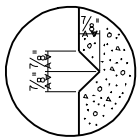



**GUARDRAIL ELEVATION**

Post Spacing




**OPEN JOINT**




**RUSTICATION GROOVE**

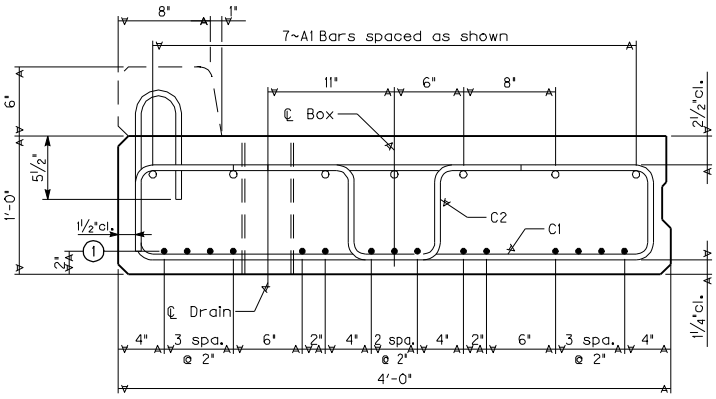
KENTUCKY DEPARTMENT OF HIGHWAYS

# RAILING SYSTEM TYPE II

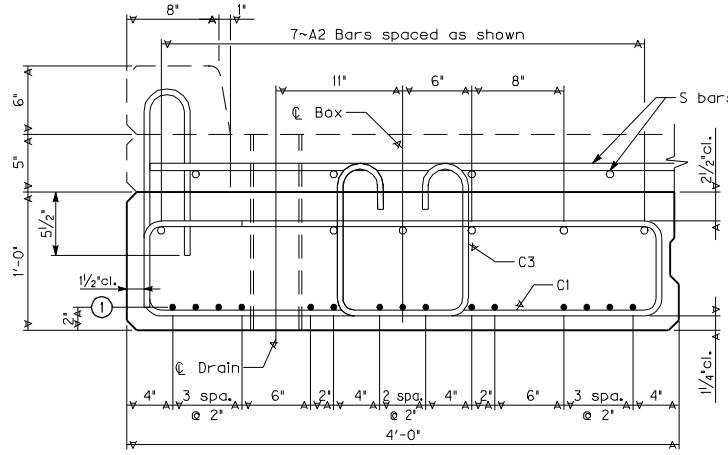
STANDARD DRAWING NO. BDP-005-03

SUBMITTED S E Goodrich DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

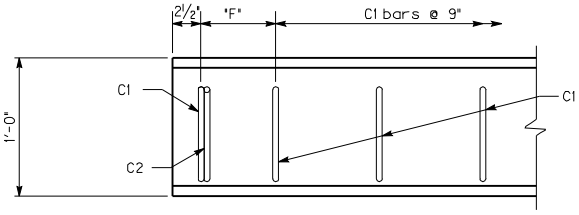
APPROVED C M Wyrosdick STATE HIGHWAY ENGINEER 12-2-02 DATE




**B12 BEAM**

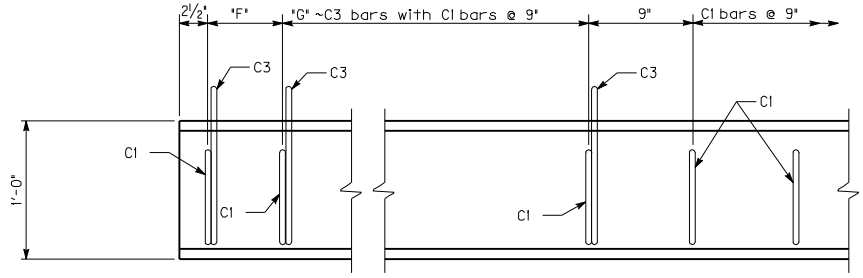



**CB12 BEAM**



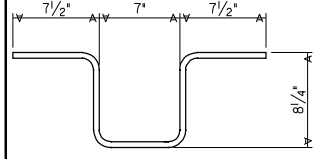

**B12 ELEVATION OF 0° SKEW**

*(Refer to BDP-003, for skewed details)*



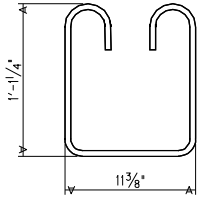

**CB12 ELEVATION OF 0° SKEW**

*(Refer to BDP-003, for skewed details)*



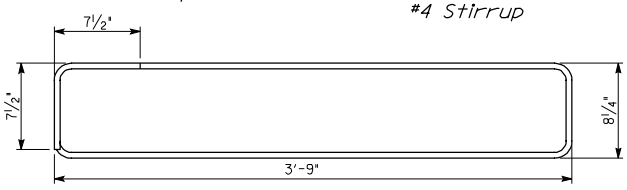

**C2(e) Bar**

*#4 Stirrup*



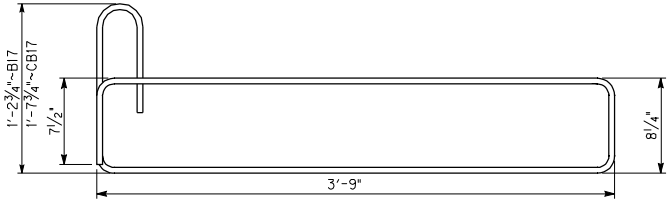

**C3(e) Bar**

*#4 Stirrup*




**C1(e) Bar**

*#4 Stirrup*




**C1(e) Bar – #4 Stirrup**

*for Exterior Beam, Only*

## TABLE OF DESIGN DATA

| Beam Type | Beam Length (feet) | Number of Strands Required | |
|---|---|---|---|
| | | Row ① | |
| B12 | 12 | 9 | |
| | 14 | 9 | |
| | 16 | 10 | |
| | 18 | 11 | |
| | 20 | 12 | |
| | 22 | 13 | |
| | 24 | 13 | |
| | 26 | 14 | |
| CB12 | 12 | 6 | |
| | 14 | 7 | |
| | 16 | 7 | |
| | 18 | 8 | |
| | 20 | 8 | |
| | 22 | 9 | |
| | 24 | 10 | |
| | 26 | 12 | |
| | 28 | 13 | |
| | 30 | 12 | |
| | 32 | 13 | |
| | 34 | 15 | |

## TABLE OF DIMENSION DATA

| Beam Type | Beam Length (feet) | "F" | "G" | | | | |
|---|---|---|---|---|---|---|---|
| B12 | 12 | 6½" | | | | | |
| | 14 | 5" | | | | | |
| | 16 | 8" | | | | | |
| | 18 | 6½" | | | | | |
| | 20 | 5" | | | | | |
| | 22 | 8" | | | | | |
| | 24 | 6½" | | | | | |
| | 26 | 5" | | | | | |
| CB12 | 12 | 6½" | 3 | | | | |
| | 14 | 5" | 3 | | | | |
| | 16 | 8" | 4 | | | | |
| | 18 | 6½" | 4 | | | | |
| | 20 | 5" | 5 | | | | |
| | 22 | 8" | 6 | | | | |
| | 24 | 6½" | 6 | | | | |
| | 26 | 5" | 8 | | | | |
| | 28 | 8" | 9 | | | | |
| | 30 | 6½" | 10 | | | | |
| | 32 | 5" | 12 | | | | |
| | 34 | 8" | 13 | | | | |

## Straight Reinforcement

| MARK | SIZE | LENGTH |
|---|---|---|
| A1(E) | #5 | Beam Length Minus 3" |
| A2(E) | #4 | Beam Length Minus 3" |
| D(E) | #8 | 2'-0" |

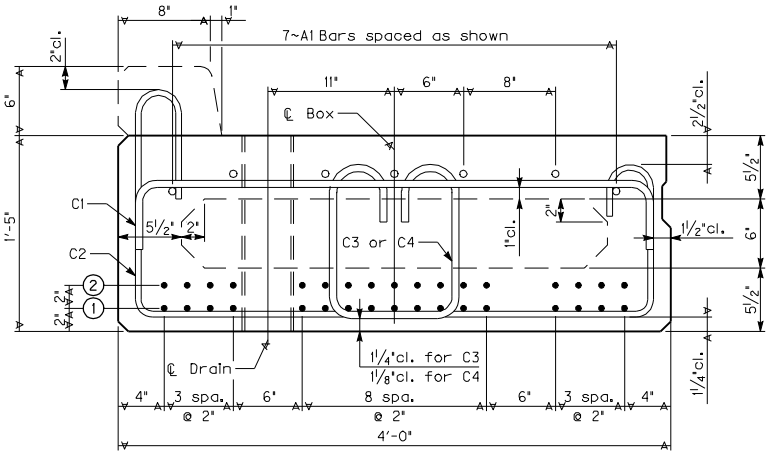
KENTUCKY
DEPARTMENT OF HIGHWAYS

# BOX BEAM
# B12 & CB12
# DETAILS

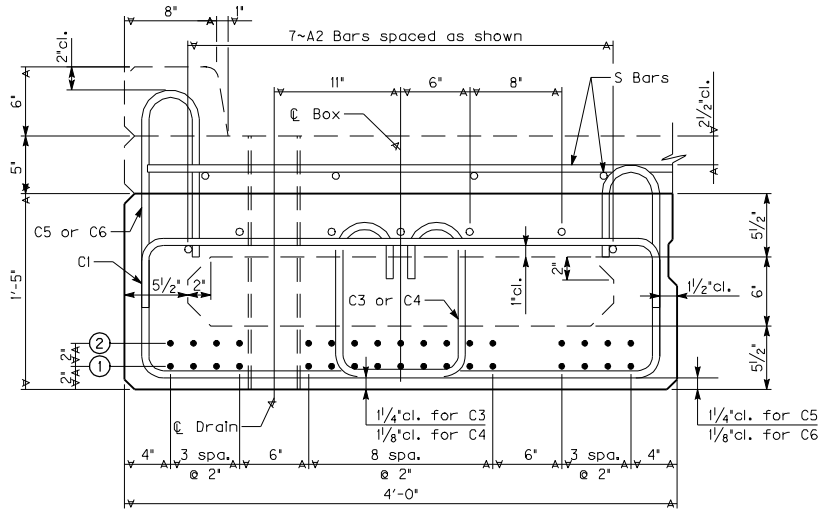
STANDARD DRAWING NO. BDP-006-03

SUBMITTED _____ DIRECTOR DIVISION OF BRIDGE DESIGN _____ DATE

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE




**B17 BEAM**



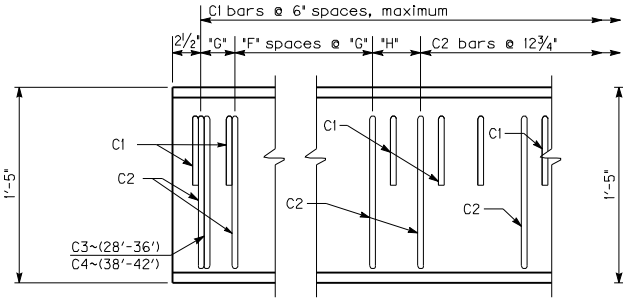

**CB17 BEAM**

## TABLE OF DESIGN DATA

| Beam Type | Beam Length (feet) | Number of Strands Required Row ① | Row ② |
|---|---|---|---|
| B17 | 28 | 12 | |
| | 30 | 13 | |
| | 32 | 12 | |
| | 34 | 12 | |
| | 36 | 14 | |
| | 38 | 15 | |
| | 40 | 17 | |
| | 42 | 17 | 3 |
| CB17 | 36 | 11 | |
| | 38 | 12 | |
| | 40 | 13 | |
| | 42 | 15 | |
| | 44 | 17 | |
| | 46 | 17 | 2 |
| | 48 | 17 | 4 |

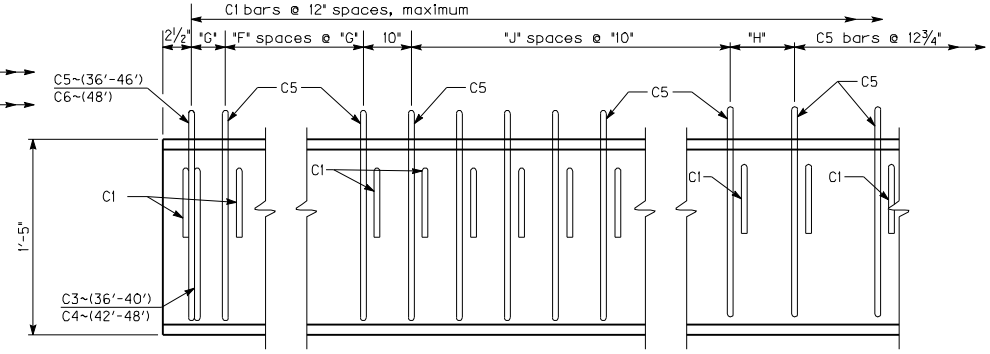
## TABLE OF DIMENSION DATA

| Beam Type | Beam Length (feet) | "F" | "G" | "H" | "J" | | |
|---|---|---|---|---|---|---|---|
| B17 | 28 | 6 | 5½" | 10½" | | | |
| | 30 | 7 | 5¼" | 12⅜" | | | |
| | 32 | 7 | 4¾" | 6½" | | | |
| | 34 | 9 | 4½" | 9⅞" | | | |
| | 36 | 10 | 4½" | 11" | | | |
| | 38 | 11 | 4¼" | 8¾" | | | |
| | 40 | 12 | 4¼" | 10⅛" | | | |
| | 42 | 13 | 4" | 8⅝" | | | |
| CB17 | 36 | 6 | 6¼" | 11⅜" | 4 | | |
| | 38 | 8 | 5½" | 11¼" | 4 | | |
| | 40 | 8 | 5½" | 10½" | 4 | | |
| | 42 | 9 | 5½" | 10⅝" | 4 | | |
| | 44 | 9 | 5½" | 11¾" | 7 | | |
| | 46 | 10 | 5½" | 11⅞" | 7 | | |
| | 48 | 11 | 5¼" | 11⅜" | 9 | | |




**B17 ELEVATION OF 0° SKEW**

*(Refer to BDP-003, for skewed details)*

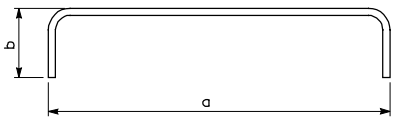



**CB17 ELEVATION OF 0° SKEW**

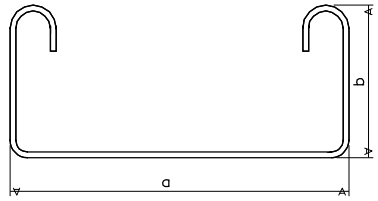
*(Refer to BDP-003, for skewed details)*

## Straight Reinforcement

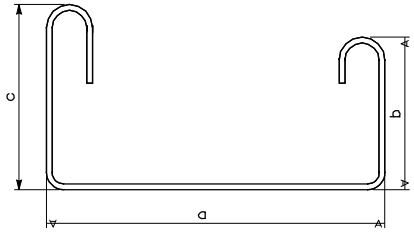
| Mark | Size | Length |
|---|---|---|
| A1(E) | #5 | Beam Length Minus 3" |
| A2(E) | #4 | Beam Length Minus 3" |
| D(E) | #8 | 2'-0" |




**C1(e) Bar**




**C2(e)–C6(e) Bars**




**C2(e), C5(e) & C6(e) Bars**

*for Exterior Beams, Only*

## Bent Reinforcement

| Mark | Size | a | b | c |
|---|---|---|---|---|
| C1(e) | #5 | 3'-9" | 6" | |
| C2(e) | #4 | 3'-9" | 1'-1¼" | 1'-7¾" |
| C3(e) | #4 | 11⅜" | 1'-1¼" | |
| C4(e) | #5 | 11⅜" | 1'-1⅜" | |
| C5(e) | #4 | 3'-9" | 1'-6¼" | 2'-0¾" |
| C6(e) | #5 | 3'-9" | 1'-6⅜" | 2'-0⅞" |
| | | | | |
| | | | | |
| | | | | |

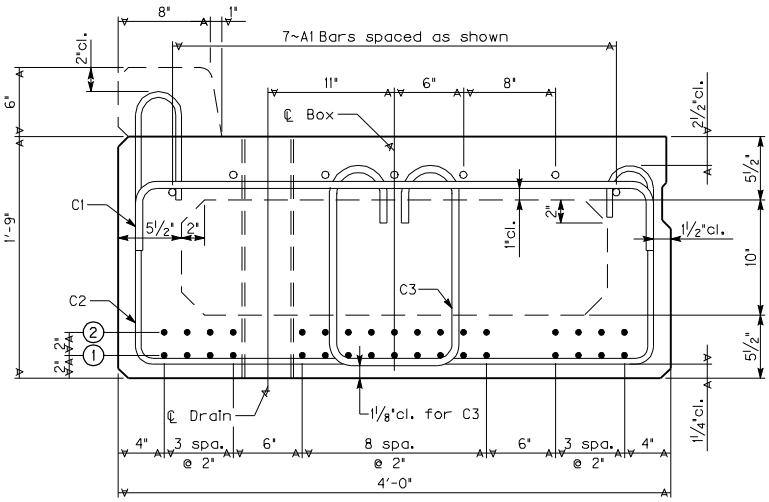
KENTUCKY
DEPARTMENT OF HIGHWAYS

# BOX BEAM
# B17 & CB17
# DETAILS

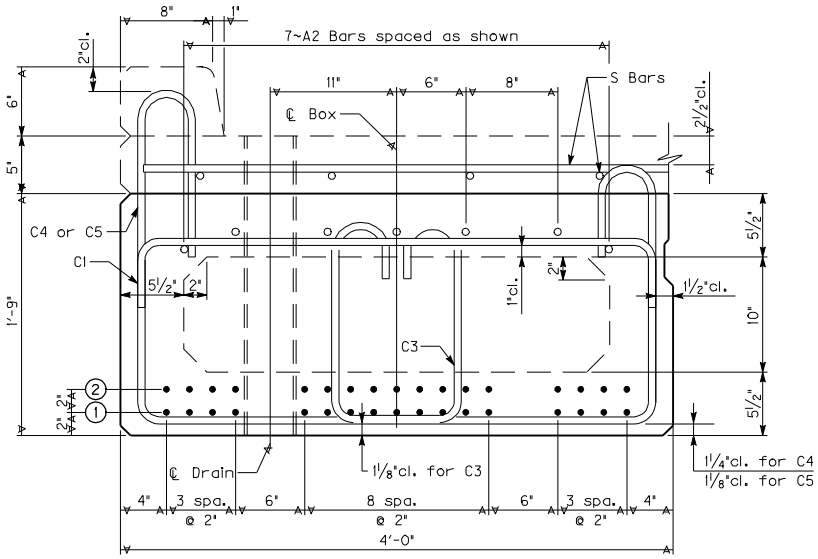
STANDARD DRAWING NO. BDP-007-03

SUBMITTED S E Goodrich DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

APPROVED C M Yowell STATE HIGHWAY ENGINEER 12-2-02 DATE




**B21 BEAM**



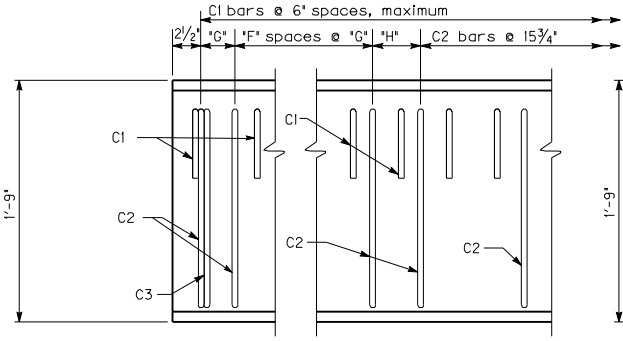

**CB21 BEAM**

**TABLE OF DESIGN DATA**

| Beam Type | Beam Length (feet) | Number of Strands Required Row ① | Row ② |
|---|---|---|---|
| B21 | 44 | 15 | |
| | 46 | 17 | |
| | 48 | 17 | 1 |
| | 50 | 17 | 4 |
| CB21 | 50 | 17 | |
| | 52 | 17 | 1 |
| | 54 | 17 | 3 |
| | 56 | 17 | 6 |

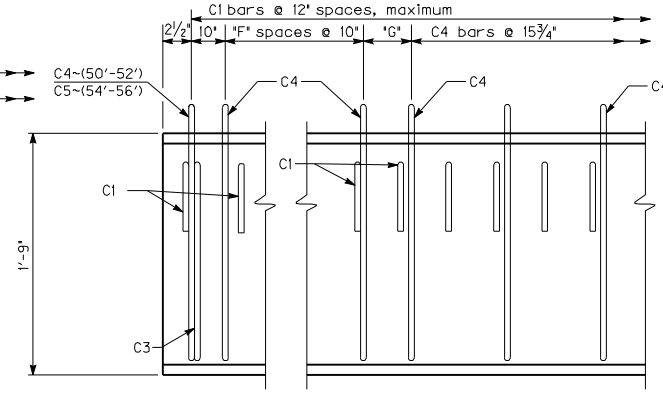
**TABLE OF DIMENSION DATA**

| Beam Type | Beam Length (feet) | "F" | "G" | "H" | | | |
|---|---|---|---|---|---|---|---|
| B21 | 44 | 6 | 12¾" | 14¾" | | | |
| | 46 | 3 | 13¼" | 15¾" | | | |
| | 48 | 6 | 12¾" | 15⅛" | | | |
| | 50 | 5 | 13" | 14¾" | | | |
| CB21 | 50 | 10 | 14¼" | | | | |
| | 52 | 12 | 14⅛" | | | | |
| | 54 | 14 | 14" | | | | |
| | 56 | 14 | 10¼" | | | | |




**B21 ELEVATION OF 0° SKEW**

*(Refer to BDP-003, for skewed details)*

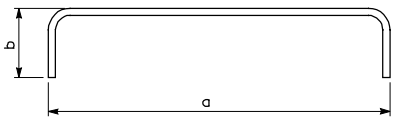



**CB21 ELEVATION OF 0° SKEW**

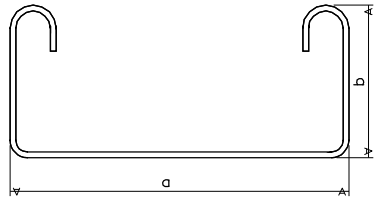
*(Refer to BDP-003, for skewed details)*

**Straight Reinforcement**

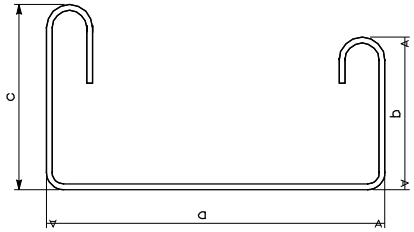
| Mark | Size | Length |
|---|---|---|
| A1(E) | #5 | Beam Length Minus 3" |
| A2(E) | #4 | Beam Length Minus 3" |
| D(E) | #8 | 2'-0" |




**C1(e) Bar**




**C2(e)–C5(e) Bars**




**C2(e), C4(e) & C5(e) Bars**

*for Exterior Beams, Only*

**Bent Reinforcement**

| Mark | Size | a | b | c |
|---|---|---|---|---|
| C1(e) | #5 | 3'-9" | 6" | |
| C2(e) | #4 | 3'-9" | 1'-5¼" | 1'-11¾" |
| C3(e) | #5 | 11⅜" | 1'-5⅜" | |
| C4(e) | #4 | 3'-9" | 1'-10¼" | 2'-4¾" |
| C5(e) | #5 | 3'-9" | 1'-10⅜" | 2'-4⅞" |

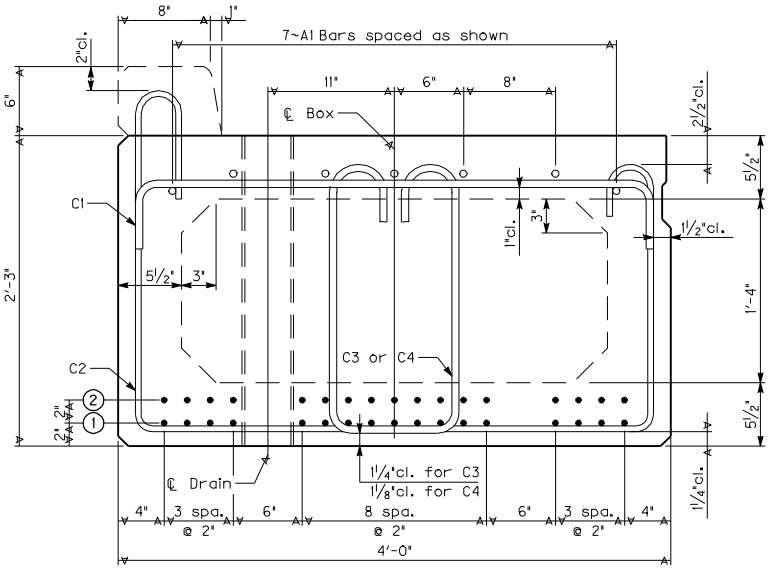
KENTUCKY DEPARTMENT OF HIGHWAYS

# BOX BEAM B21 & CB21 DETAILS

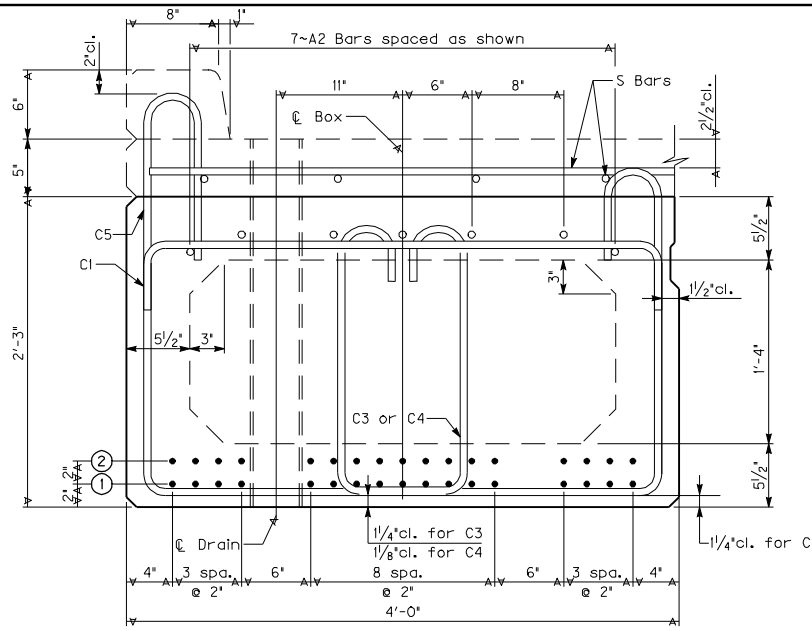
STANDARD DRAWING NO. BDP-008-03

SUBMITTED S E Goodrich DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

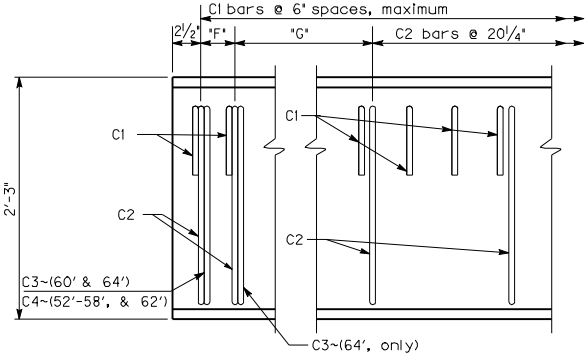
APPROVED J M Yowell STATE HIGHWAY ENGINEER 12-2-02 DATE




**B27 BEAM**

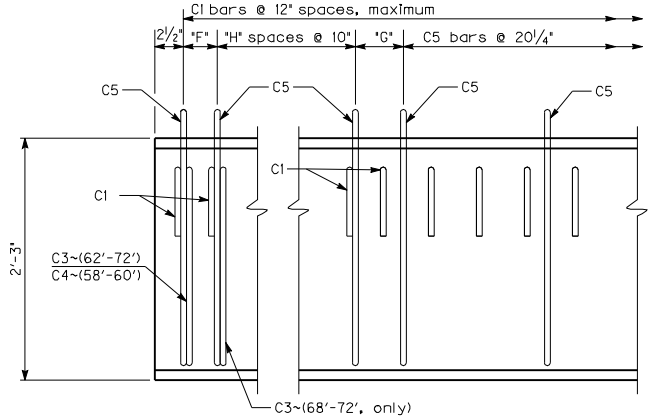



**CB27 BEAM**



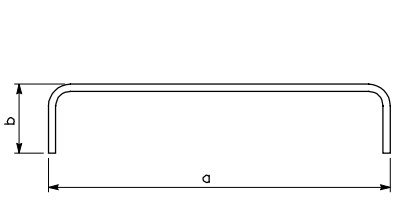

**B27 ELEVATION OF O° SKEW**

*(Refer to BDP-003, for skewed details)*

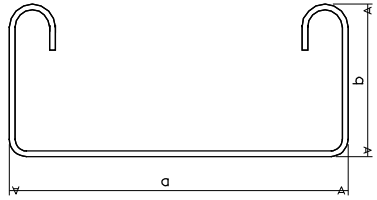



**CB27 ELEVATION OF O° SKEW**

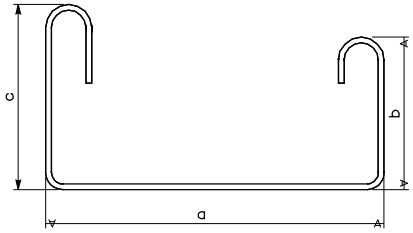
*(Refer to BDP-003, for skewed details)*




**C1(e) Bar**




**C2(e)–C5(e) Bars**




**C2(e) & C5(e) Bars**

*for Exterior Beams, Only*

## TABLE OF DESIGN DATA

| Beam Type | Beam Length (feet) | Number of Strands Required Row ① | Row ② |
|---|---|---|---|
| B27 | 52 | 15 | |
| | 54 | 17 | |
| | 56 | 17 | 1 |
| | 58 | 17 | 2 |
| | 60 | 17 | 4 |
| | 62 | 17 | 6 |
| | 64 | 17 | 7 |
| CB27 | 58 | 17 | |
| | 60 | 17 | 1 |
| | 62 | 17 | 3 |
| | 64 | 17 | 4 |
| | 66 | 17 | 6 |
| | 68 | 17 | 8 |
| | 70 | 17 | 10 |
| | 72 | 17 | 12 |

## TABLE OF DIMENSION DATA

| Beam Type | Beam Length (feet) | "F" | "G" | "H" |
|---|---|---|---|---|
| B27 | 52 | 15⅞" | 20¼" | |
| | 54 | 17¾" | 20¼" | |
| | 56 | 9½" | 20¼" | |
| | 58 | 12½" | 20¼" | |
| | 60 | 3½" | 9¾" | |
| | 62 | 3½" | 11⅝" | |
| | 64 | 3½" | 13½" | |
| CB27 | 58 | 10" | 12⅜" | 7 |
| | 60 | 10" | 14⅜" | 8 |
| | 62 | 3½" | 12⅞" | 10 |
| | 64 | 3½" | 14⅞" | 11 |
| | 66 | 3½" | 16⅞" | 12 |
| | 68 | 3½" | 18⅞" | 13 |
| | 70 | 3½" | 10¾" | 14 |
| | 72 | 3½" | 12¾" | 15 |

## Straight Reinforcement

| Mark | Size | Length |
|---|---|---|
| A1(E) | #5 | Beam Length Minus 3" |
| A2(E) | #4 | Beam Length Minus 3" |
| D(E) | #8 | 2'-0" |

NOTE: A1 and A2 bars are to be lapped 2'-2" when necessary.

## Bent Reinforcement

| Mark | Size | a | b | c |
|---|---|---|---|---|
| C1(e) | #5 | 3'-9" | 6" | |
| C2(e) | #4 | 3'-9" | 1'-11¼" | 2'-5¾" |
| C3(e) | #4 | 11⅜" | 1'-11¼" | |
| C4(e) | #5 | 11⅜" | 1'-11⅜" | |
| C5(e) | #4 | 3'-9" | 2'-4¼" | 2'-10¾" |

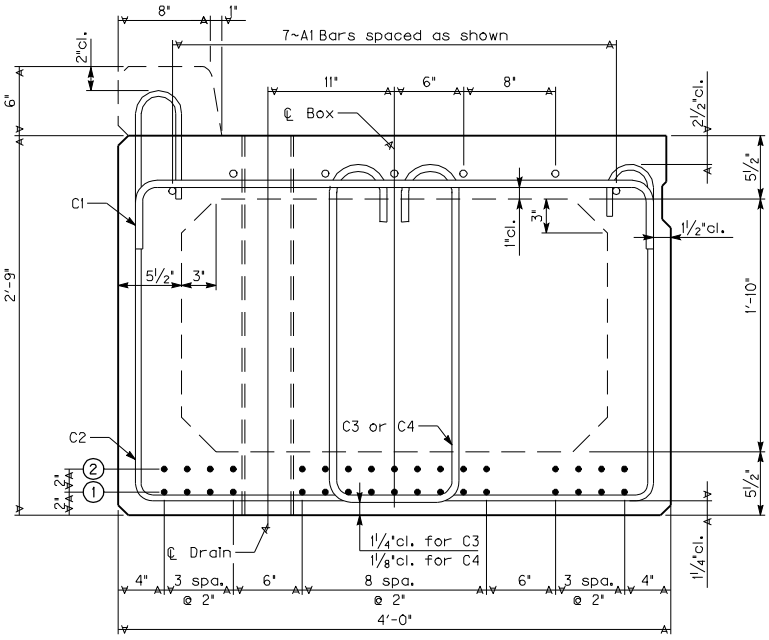
KENTUCKY DEPARTMENT OF HIGHWAYS

# BOX BEAM B27 & CB27 DETAILS

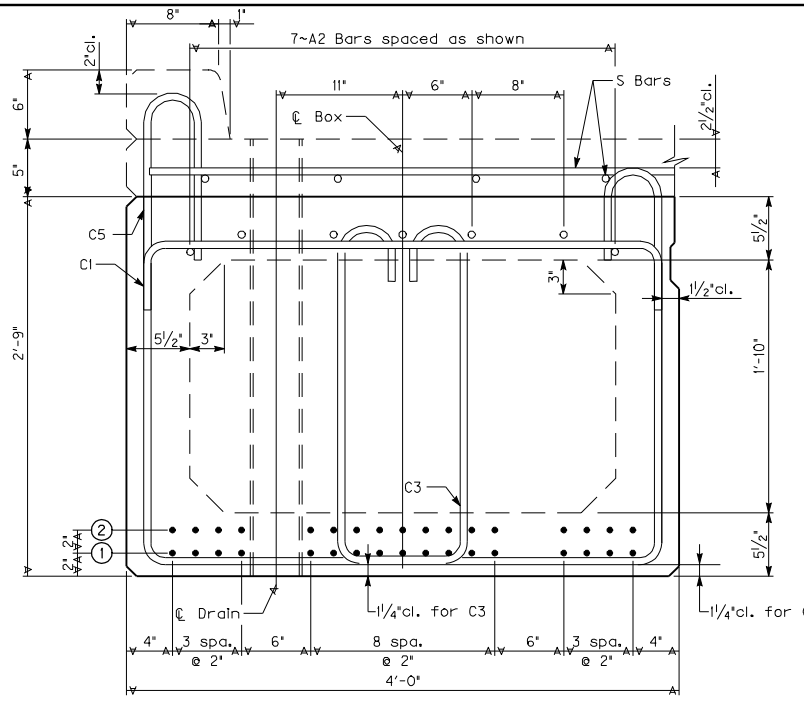
STANDARD DRAWING NO. BDP-009-03

SUBMITTED S E Goodrich DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

APPROVED C M Yowell STATE HIGHWAY ENGINEER 12-2-02 DATE




**B33 BEAM**



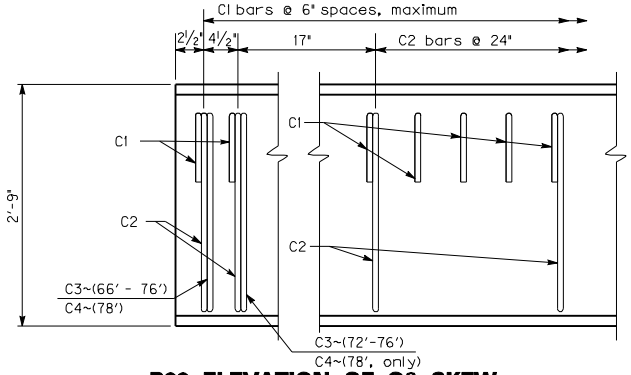

**CB33 BEAM**

## TABLE OF DESIGN DATA

| Beam Type | Beam Length (feet) | Number of Strands Required | |
|---|---|---|---|
| | | Row ① | Row ② |
| B33 | 66 | 17 | 2 |
| | 68 | 17 | 3 |
| | 70 | 17 | 5 |
| | 72 | 17 | 6 |
| | 74 | 17 | 8 |
| | 76 | 17 | 10 |
| | 78 | 17 | 16 |
| CB33 | 74 | 17 | 6 |
| | 76 | 17 | 7 |
| | 78 | 17 | 9 |
| | 80 | 17 | 11 |
| | 82 | 17 | 12 |
| | 84 | 17 | 14 |

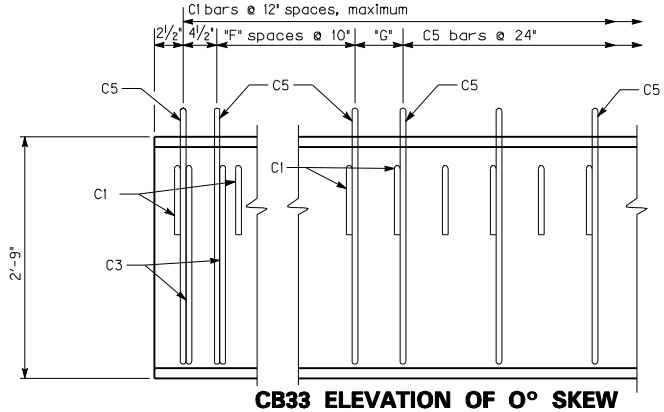
## TABLE OF DIMENSION DATA

| Beam Type | Beam Length (feet) | "F" | "G" | | | | |
|---|---|---|---|---|---|---|---|
| B33 | 66 | | | | | | |
| | 68 | | | | | | |
| | 70 | | | | | | |
| | 72 | | | | | | |
| | 74 | | | | | | |
| | 76 | | | | | | |
| | 78 | | | | | | |
| CB33 | 74 | 8 | 21' | | | | |
| | 76 | 9 | 23' | | | | |
| | 78 | 10 | 13' | | | | |
| | 80 | 11 | 15' | | | | |
| | 82 | 12 | 17' | | | | |
| | 84 | 13 | 19' | | | | |




**B33 ELEVATION OF 0° SKEW**

*(Refer to BDP-003, for skewed details)*



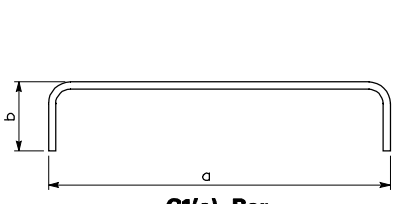

**CB33 ELEVATION OF 0° SKEW**

*(Refer to BDP-003, for skewed details)*

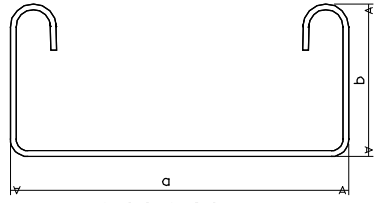
## Straight Reinforcement

| Mark | Size | Length |
|---|---|---|
| A1(E) | #5 | Beam Length Minus 3" |
| A2(E) | #4 | Beam Length Minus 3" |
| D(E) | #8 | 2'-0" |

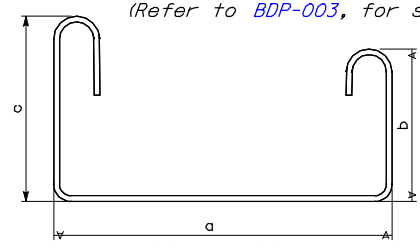
NOTE: A1 and A2 bars are to be lapped 2'-2" when necessary.




**C1(e) Bar**




**C2(e)–C5(e) Bars**




**C2(e) & C5(e) Bars**

*for Exterior Beams, Only*

## Bent Reinforcement

| Mark | Size | a | b | c |
|---|---|---|---|---|
| C1(e) | #5 | 3'-9" | 6" | |
| C2(e) | #4 | 3'-9" | 2'-5¼" | 2'-11¾" |
| C3(e) | #4 | 11⅜" | 2'-5¼" | |
| C4(e) | #5 | 11⅜" | 2'-5⅜" | |
| C5(e) | #4 | 3'-9" | 2'-10¼" | 3'-4¾" |
| | | | | |
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KENTUCKY DEPARTMENT OF HIGHWAYS

# BOX BEAM B33 & CB33 DETAILS

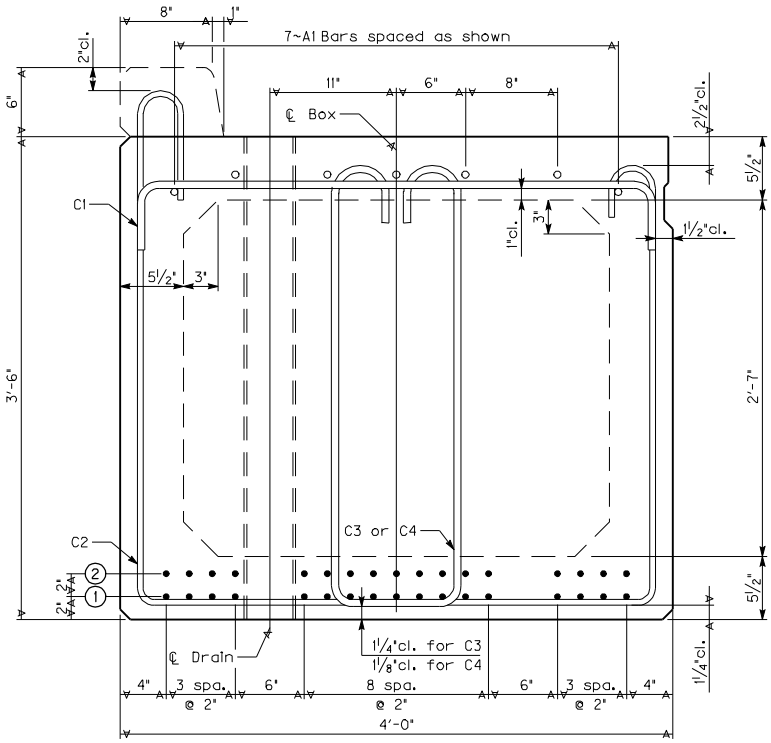
STANDARD DRAWING NO. BDP-010-03

SUBMITTED S E Goodpaster DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

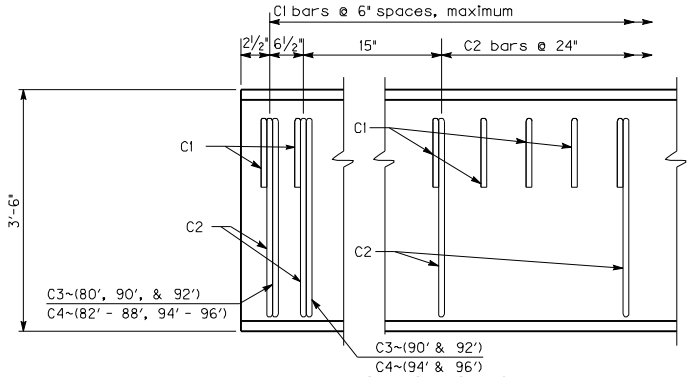
APPROVED J M Yowell STATE HIGHWAY ENGINEER 12-2-02 DATE

## TABLE OF DESIGN DATA

| Beam Type | Beam Length (feet) | Number of Strands Required | |
|---|---|---|---|
| | | Row ① | Row ② |
| B42 | 80 | 17 | 4 |
| | 82 | 17 | 5 |
| | 84 | 17 | 6 |
| | 86 | 17 | 8 |
| | 88 | 17 | 9 |
| | 90 | 17 | 10 |
| | 92 | 17 | 12 |
| | 94 | 17 | 14 |
| | 96 | 17 | 17 |




**B42 BEAM**



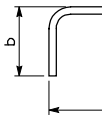

**B42 ELEVATION OF 0° SKEW**

*(Refer to BDP-003, for skewed details)*

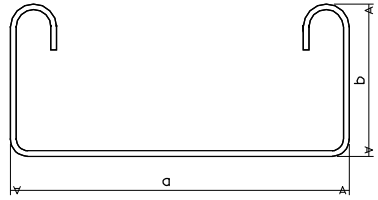
## Straight Reinforcement

| Mark | Size | Length |
|---|---|---|
| A1(E) | #5 | Beam Length Minus 3" |
| D(E) | #8 | 2'-0" |

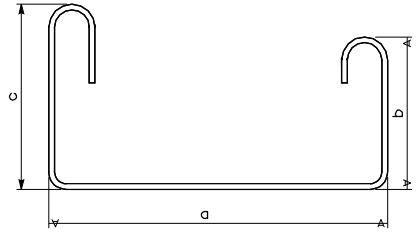
NOTE: A1 bars are to be lapped 2'-2" when necessary.




**C1(e) Bar**




**C2(e)–C4(e) Bars**




**C2(e) Bar**

*for Exterior Beams, Only*

## Bent Reinforcement

| Mark | Size | a | b | c |
|---|---|---|---|---|
| C1(e) | #5 | 3'-9" | 6" | |
| C2(e) | #4 | 3'-9" | 3'-2¼" | 3'-8¾" |
| C3(e) | #4 | 11⅜" | 3'-2¼" | |
| C4(e) | #5 | 11⅜" | 3'-2⅜" | |
| | | | | |
| | | | | |
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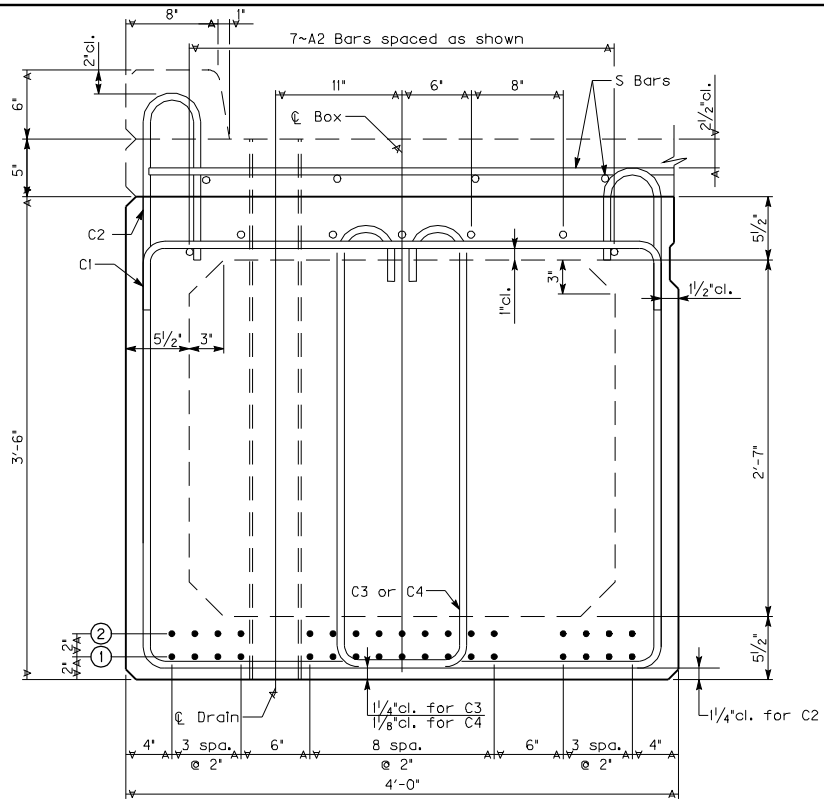
KENTUCKY DEPARTMENT OF HIGHWAYS

# BOX BEAM
# B42
# DETAILS

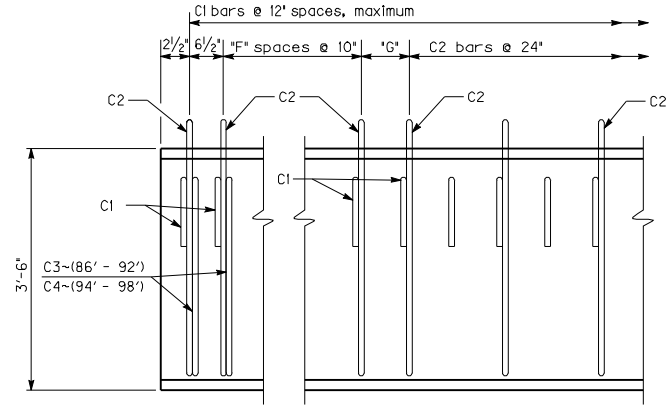
STANDARD DRAWING NO. BDP-011-03

SUBMITTED S E Goodpaster DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

APPROVED J M Yowell STATE HIGHWAY ENGINEER 12-2-02 DATE




**CB42 BEAM**




**CB42 ELEVATION OF 0° SKEW**

*(Refer to BDP-003, for skewed details)*

## TABLE OF DESIGN DATA

| Beam Type | Beam Length (feet) | Number of Strands Required | |
|---|---|---|---|
| | | Row ① | Row ② |
| CB42 | 86 | 17 | 7 |
| | 88 | 17 | 8 |
| | 90 | 17 | 10 |
| | 92 | 17 | 11 |
| | 94 | 17 | 13 |
| | 96 | 17 | 14 |
| | 98 | 17 | 16 |

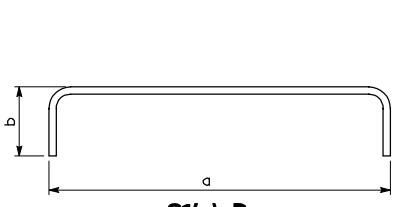
## TABLE OF DIMENSION DATA

| Beam Type | Beam Length (feet) | "F" | "G" | | | | |
|---|---|---|---|---|---|---|---|
| CB42 | 86 | 4 | 11" | | | | |
| | 88 | 4 | 11" | | | | |
| | 90 | 5 | 13" | | | | |
| | 92 | 6 | 15" | | | | |
| | 94 | 7 | 17" | | | | |
| | 96 | 8 | 19" | | | | |
| | 98 | 9 | 21" | | | | |

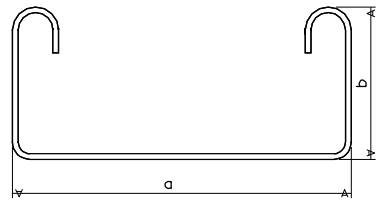
## Straight Reinforcement

| Mark | Size | Length |
|---|---|---|
| A2(E) | #4 | Beam Length Minus 3" |
| D(E) | #8 | 2'-0" |

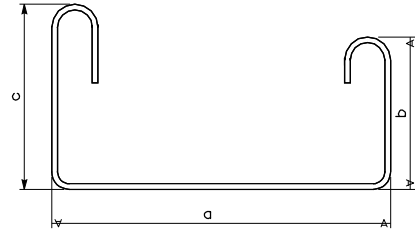
NOTE: A2 bars are to be lapped 2'-2" when necessary.




**C1(e) Bar**




**C2(e)–C4(e) Bars**




**C2(e) Bar**

*for Exterior Beams, Only*

## Bent Reinforcement

| Mark | Size | a | b | c |
|---|---|---|---|---|
| C1(e) | #5 | 3'-9" | 6" | |
| C2(e) | #4 | 3'-9" | 3'-7¼" | 4'-1¾" |
| C3(e) | #4 | 11⅜" | 3'-2¼" | |
| C4(e) | #5 | 11⅜" | 3'-2⅜" | |
| | | | | |
| | | | | |
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KENTUCKY
DEPARTMENT OF HIGHWAYS

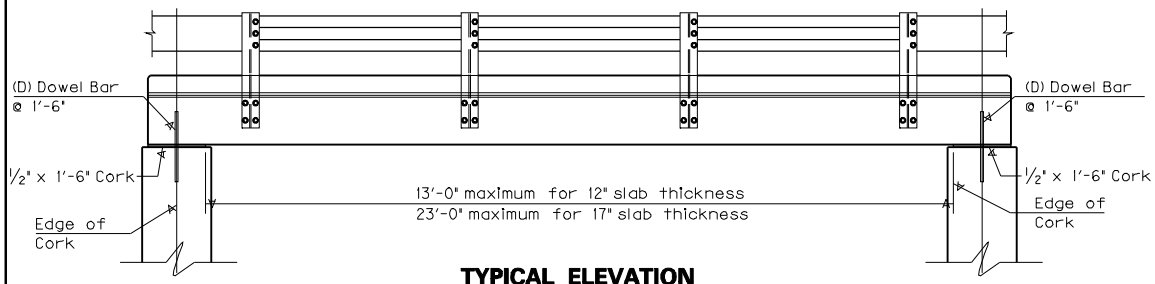
# BOX BEAM
# CB42
# DETAILS

STANDARD DRAWING NO. BDP-012-03

SUBMITTED S E Goodpaster DIRECTOR DIVISION OF BRIDGE DESIGN 12-2-02 DATE

APPROVED J M Yowell STATE HIGHWAY ENGINEER 12-2-02 DATE

# General Notes




**TYPICAL ELEVATION**

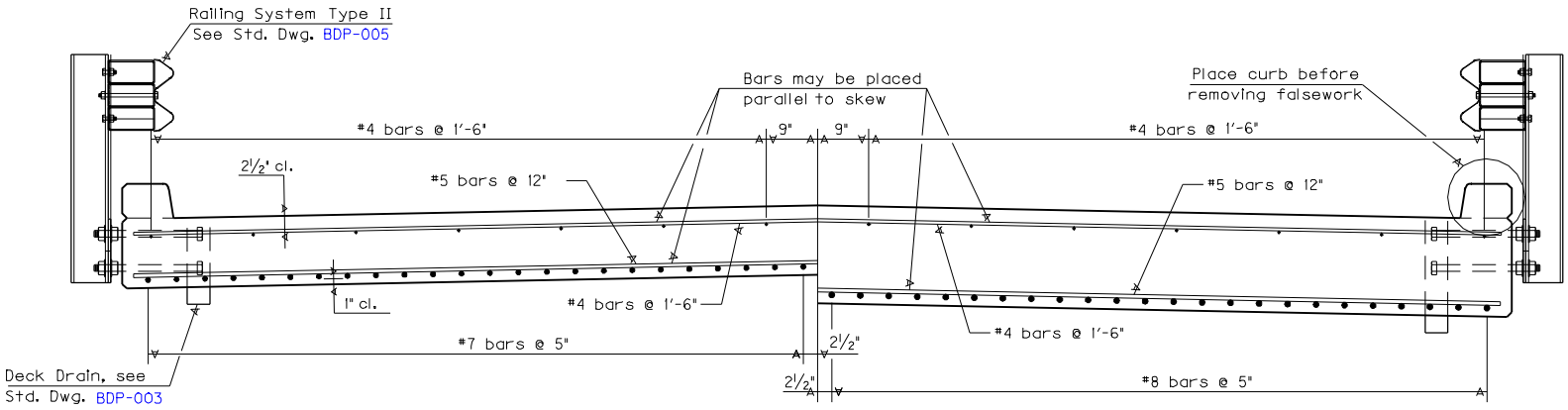
SLAB OPTION: The superstructure option shown on this Standard Drawing may be used in lieu of composite or non-composite adjacent box beams. Notify the Director of the Division of Bridge Design when this option is used.

CLASS "AA" REINFORCED CONCRETE: All falsework is to remain in place until the Class "AA" Concrete compressive strength is 4000 PSI. Class "AA" Concrete is to be used throughout the superstructure.

ELEVATIONS: Determine final elevations using the elevations, slopes, and grades shown on the detailed plans.

STEEL REINFORCEMENT: Ensure steel reinforcement is ASTM A 615 Grade 60 and epoxy coated.

SURFACE FINISH: The top of the slab surface may be finished with a floated surface finish in accordance with Section 601.03.18 and textured in accordance with Section 609.03.11.




***Half-Section showing 12" Slab*** ***Half-Section showing 17" Slab***

**TYPICAL SECTION OF CAST-IN-PLACE SLAB**

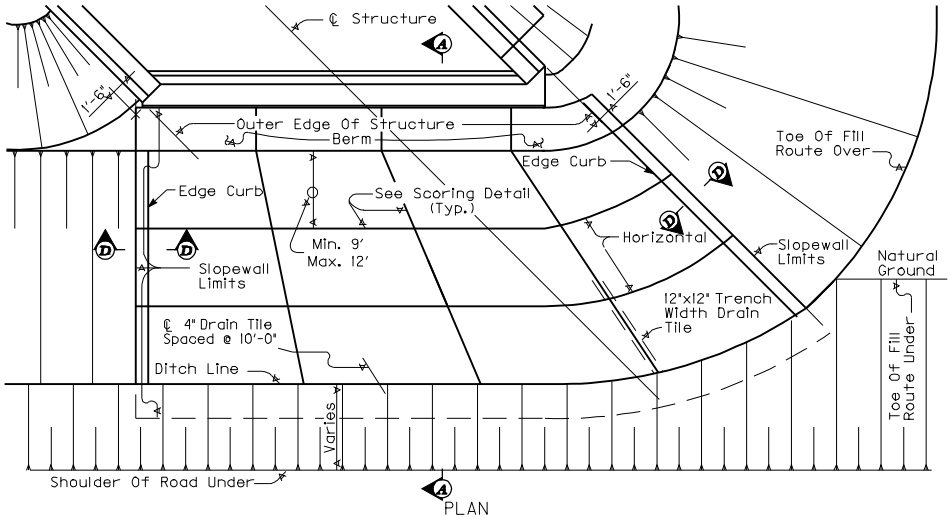
KENTUCKY
DEPARTMENT OF HIGHWAYS

**SLAB BRIDGE**
**FOR**
**12" & 17" BEAMS**

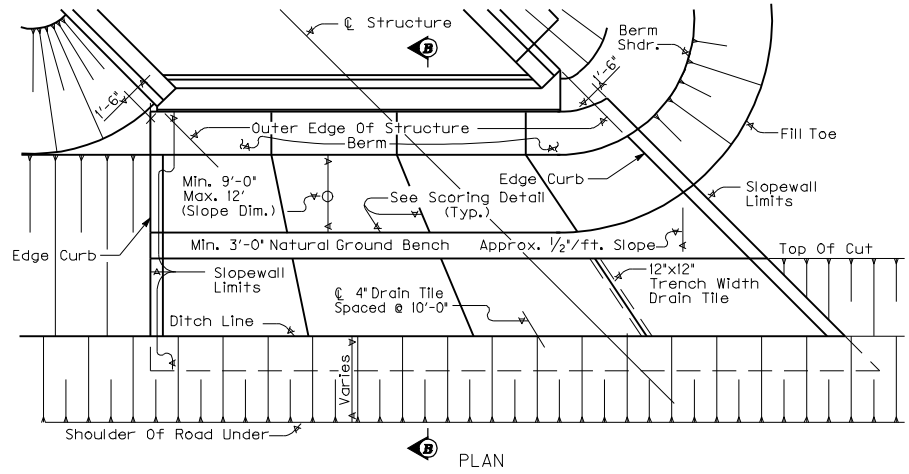
STANDARD DRAWING NO. BDP-013-01

SUBMITTED _____ DIRECTOR DIVISION OF BRIDGE DESIGN _____ DATE

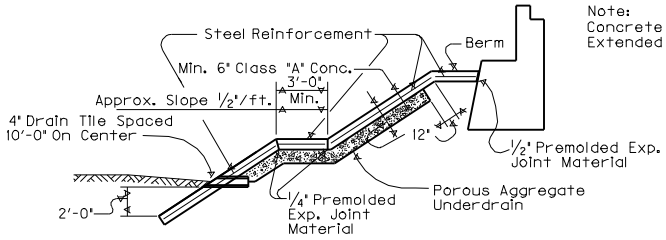
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE




ROUTE UNDER ON FILL WITH ROUTE OVER ON FILL
ROUTE UNDER AT GRADE WITH ROUTE OVER ON FILL

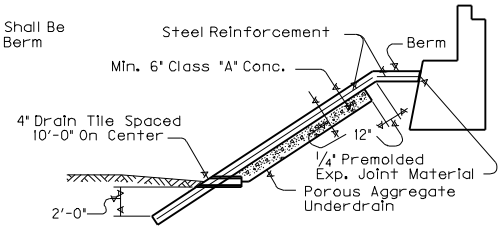



ROUTE UNDER IN EARTH CUT
ROUTE OVER ON FILL

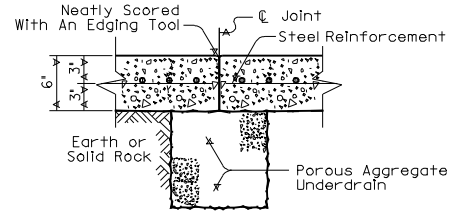



Note:
Concrete Slopewall Shall Be
Extended Through Berm

SECTION B-B

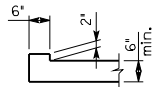



SECTION A-A




CONSTRUCTION JOINT DETAIL

CONSTRUCTION JOINTS REQUIRED AT 21'-0" CENTERS ALONG SLOPEWALL
CONSTRUCTION JOINTS PERMISSIVE AT SCORING DETAILS




SECTION D-D
*Edge Curb*

# GENERAL NOTES

SPECIFICATIONS: Slopewall is to be constructed according to details shown and to Section 703 of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

INCIDENTALS: Include the cost of steel reinforcement, drain tile, preformed expansion joint material, aggregate, excavation, and all labor and materials required to complete the work in accordance with the plans and Specifications in the price for 6" Concrete Slopewall.

ROCK EXCAVATION: Excavate the rock to plan depth and slope as near as possible to reduce the quantity of Concrete, Class "A" required to maintain a minimum slopewall thickness. Include the cost of additional concrete required to fill voids in the rock and maintain the slopewall thickness in the bid for 6" Concrete Slopewall.

SLOPEWALL REINFORCEMENT: Use No. 4 bars at 18" centers in each direction or an equivalent area of welded deformed steel fabric to reinforce the slopewall.

SKEW: A 45° Skew is detailed on this sheet. Details for other skews are similar.

Work This Drawing With Drawing No. BGX-005

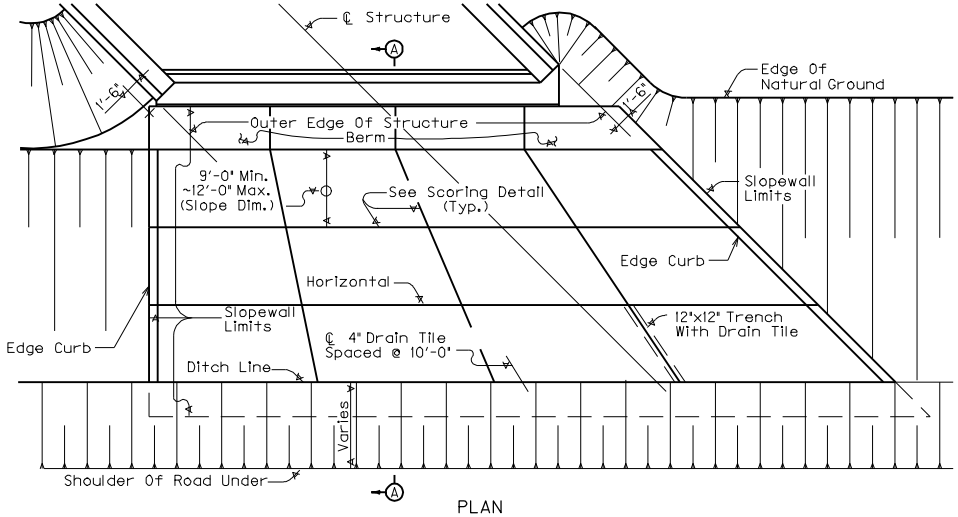
KENTUCKY
DEPARTMENT OF HIGHWAYS

**CONCRETE SLOPEWALLS FOR GRADE SEPARATION BRIDGES**

STANDARD DRAWING NO. BGX-004-09

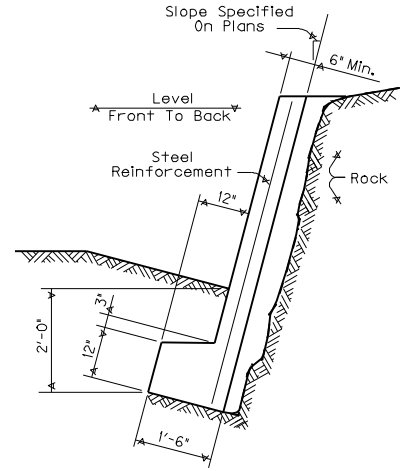
SUBMITTED S E Goodrich DIRECTOR DIVISION OF BRIDGE DESIGN 12-1-99 DATE

APPROVED C M Newcomb STATE HIGHWAY ENGINEER 12-1-99 DATE

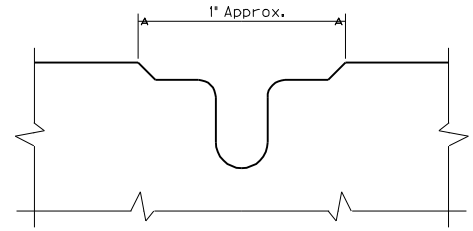



PLAN

## ROUTE UNDER IN FULL EARTH CUT

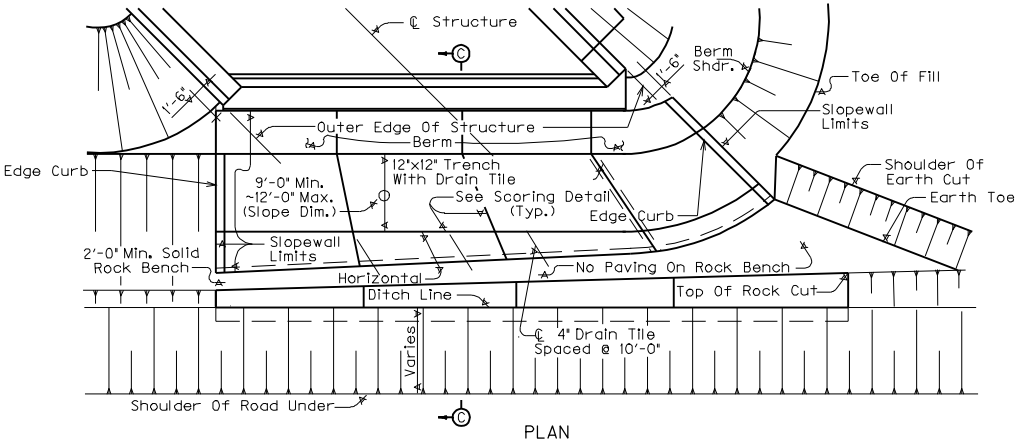



## STEEP SLOPE SECTION
## 6" CONCRETE SLOPEWALL



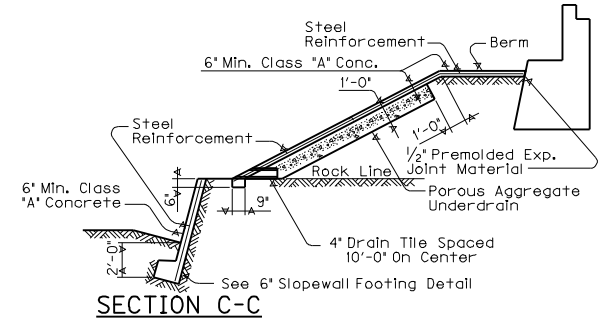

## SCORING DETAIL

(Score With Approved Grooving Tool)




PLAN

## ROUTE UNDER IN ROCK CUT AND EARTH CUT
## ROUTE OVER ON FILL




## SECTION C-C

Work This Drawing With Drawing No. BGX-004

KENTUCKY
DEPARTMENT OF HIGHWAYS

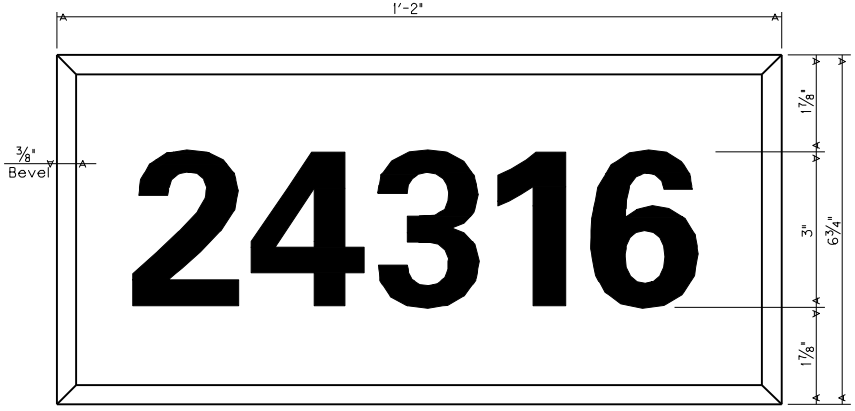
# CONCRETE SLOPEWALLS FOR GRADE SEPARATION BRIDGES

STANDARD DRAWING NO. BGX-005-09

SUBMITTED S.E. Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

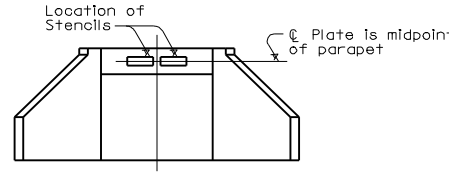
APPROVED C.M. Newell — STATE HIGHWAY ENGINEER — 12-1-99 DATE


STENCIL FOR YEAR AND DESIGN LOADING
When year only is used place year in center of plate

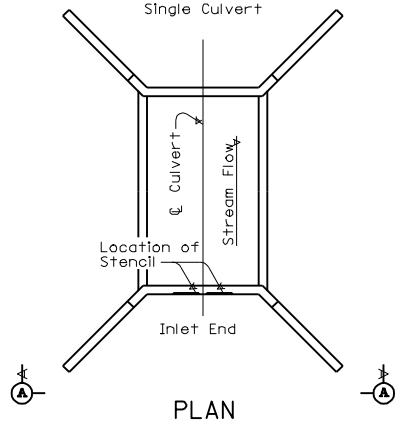



STENCIL FOR DRAWING NUMBER

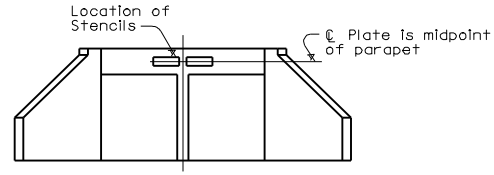

CONTRACTOR STENCIL



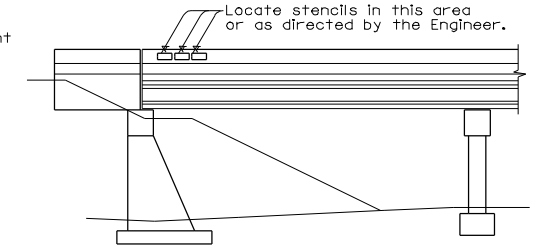

ELEVATION A-A
Single Culvert



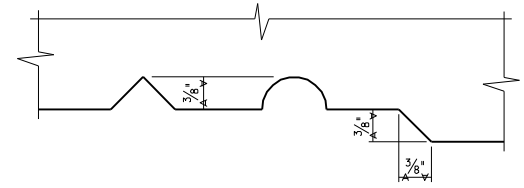

PLAN
Location of Stencils on all Culverts (Single or Multiple) and Arches




ELEVATION A-A
Multiple span Culvert




LOCATION OF STENCILS ON BRIDGES




TYPE OF LETTERS

## GENERAL NOTES

STENCILS: Fabricate all stencils from recessed panels with beveled edges with raised letters and figures in accordance with Subsection 601.03.19 of the Specifications.

YEAR AND DESIGN LOADING STENCIL: Show the year that the contract is executed and the design load as shown on the contract plans. The design load is required on all structures classified as bridges by Subsection 101.03 of the Specifications and on other structures as referenced on plans.

DRAWING NUMBER STENCIL: Use this stencil on all structures. The number to be placed on the stencil shall be taken from the contract plans.

CONTRACTOR STENCIL: Place on all bridges, the name of the prime contractor and subcontractor(s), when applicable, in proximity to other stencils required.

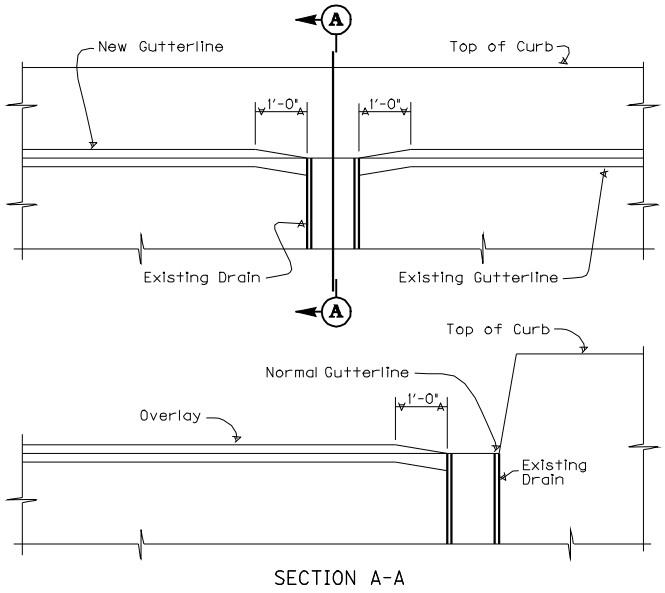
KENTUCKY
DEPARTMENT OF HIGHWAYS

**STENCILS FOR STRUCTURES**

STANDARD DRAWING NO. BGX-006-08

SUBMITTED S E Goodrich — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

APPROVED J M Yowell — STATE HIGHWAY ENGINEER — 12-1-99 DATE




SECTION A-A

FIGURE NO. 1

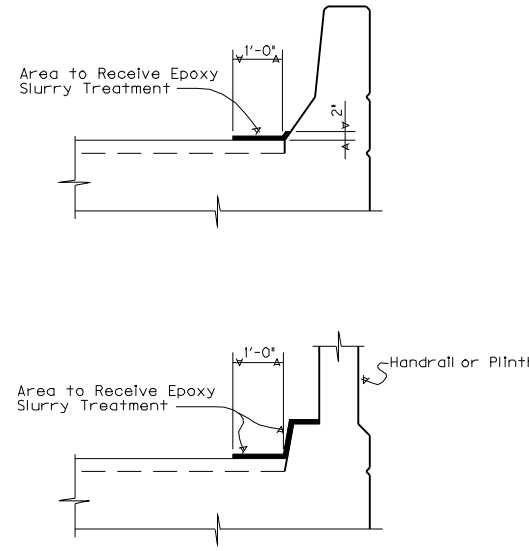



FIGURE NO. 2

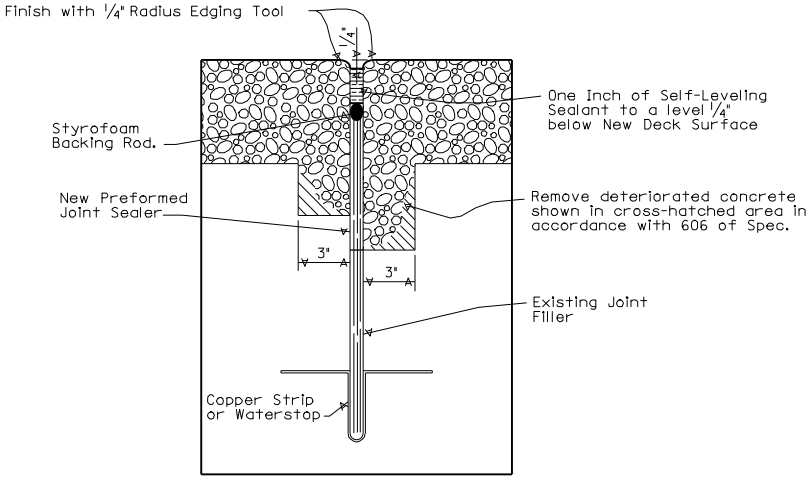
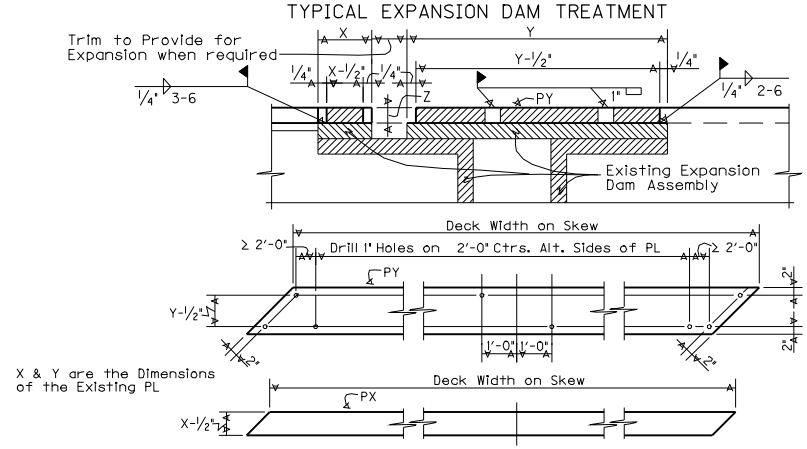



FIGURE NO. 3




Structural Steel weights given are approximate and the Contractor is responsible for all measurements.

Determine dimension Z for thickness of the built-up plates as the minimum specified thickness of overlay minus 1/4".

Steel is to be furnished in 3-foot minumum lengths welded together as directed by the Engineer.

FIGURE NO. 4

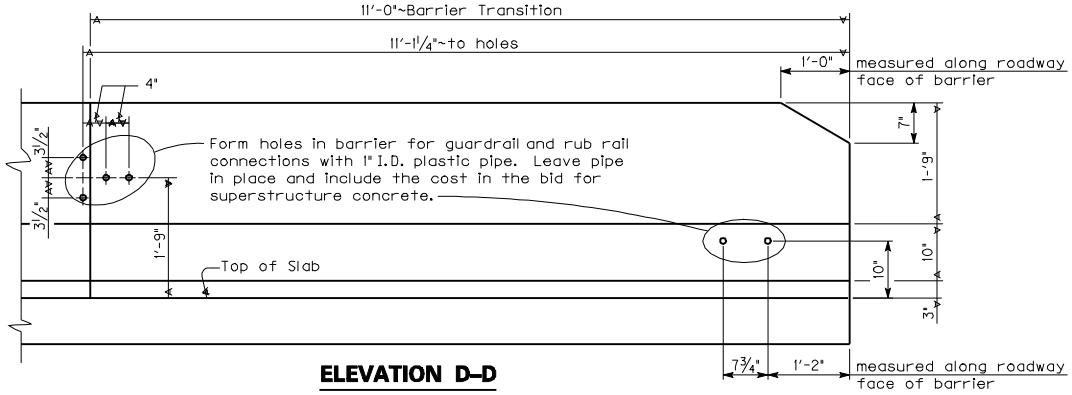
KENTUCKY
DEPARTMENT OF HIGHWAYS

**BRIDGE RESTORATION AND WATERPROOFING WITH CONCRETE OVERLAYS**

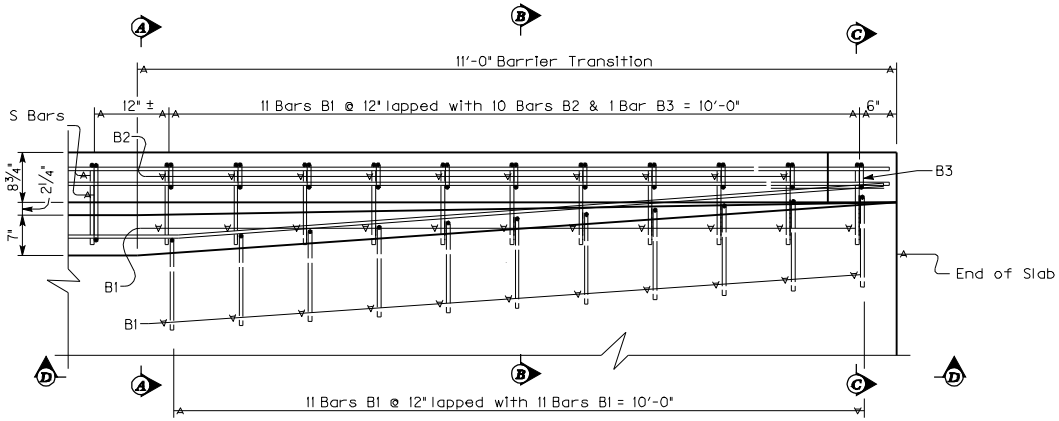
STANDARD DRAWING NO. BGX-009-04

SUBMITTED S E Goodpaster DIRECTOR DIVISION OF BRIDGE DESIGN 12-1-99 DATE

APPROVED J M Prewell STATE HIGHWAY ENGINEER 12-1-99 DATE



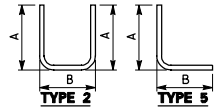

## ELEVATION D–D

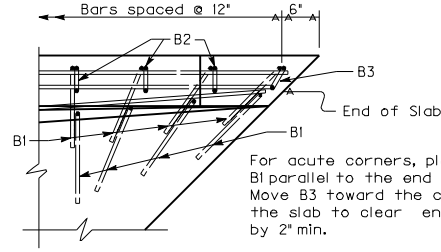



## PLAN OF BARRIER TRANSITION

## BILL OF REINFORCEMENT

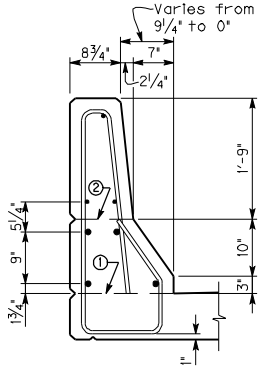
| MARK | TYPE | NO. | SIZE | LENGTH FT. | LENGTH IN. | LOCATION | A FT. | A IN. | B FT. | B IN. |
|---|---|---|---|---|---|---|---|---|---|---|
| B1e | 5s | 22 | 5 | 2 | 11 | Slab Into Barrier | 1 | 8 | 1 | 4 |
| B2e | 2s | 10 | 5 | 5 | 7 | Barrier | 2 | 8 | 0 | 5 |
| B3e | 2s | 1 | 5 | 4 | 5 | Barrier | 2 | 1 | 0 | 5 |




For acute corners, place bars B1 parallel to the end of slab. Move B3 toward the center of the slab to clear end of slab by 2" min.

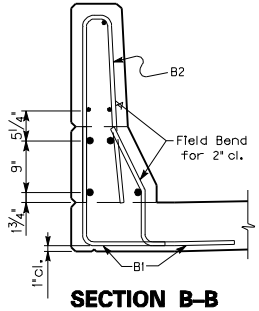
## PLAN OF SKEWED END



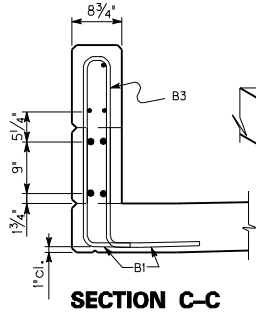

## SECTION A–A

① Mandatory roughened construction joint. Concrete above this joint is to be placed after slab has been properly cured.

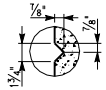
② Permissible construction joint and bottom of ¼" open joint in top of barrier. "V-Groove" rustication joint is required if construction joint is used.



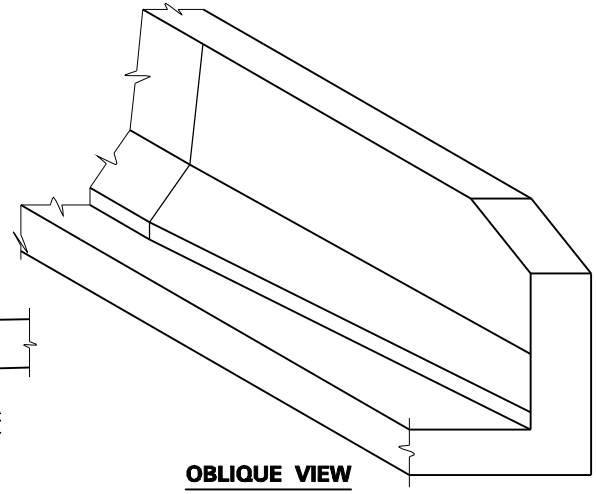

## SECTION B–B




## SECTION C–C




## "V-Groove" Rustication



## OBLIQUE VIEW

## ESTIMATE OF QUANTITIES

| | |
|---|---|
| Steel Reinforcement, Epoxy Coated | 140 LBS. |
| Concrete, Class "AA" | 1.0 C.Y. |

NOTE: The concrete quantity is the concrete above the gutter line and 11'-0" from the end of the slab. This estimate of quantities is for one barrier transition and for information only. Barrier transition quantities are included in the estimate of quantities for the superstructure.

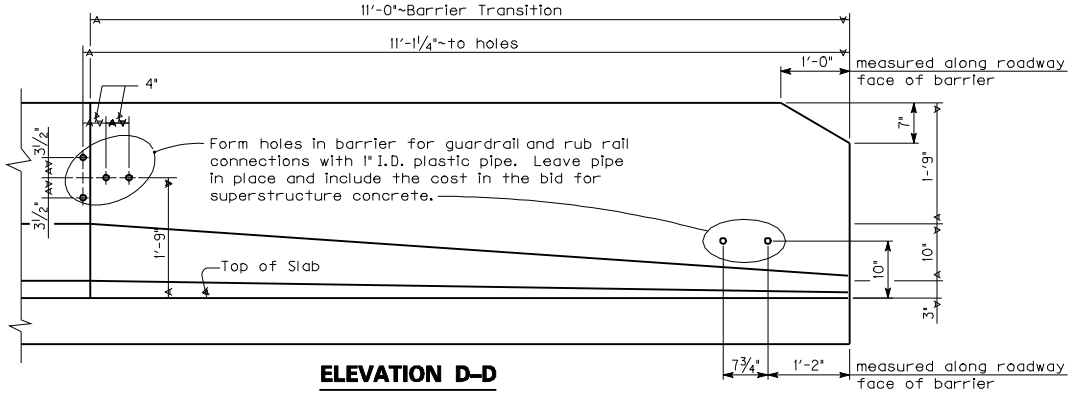
KENTUCKY
DEPARTMENT OF HIGHWAYS

# BARRIER TRANSITION

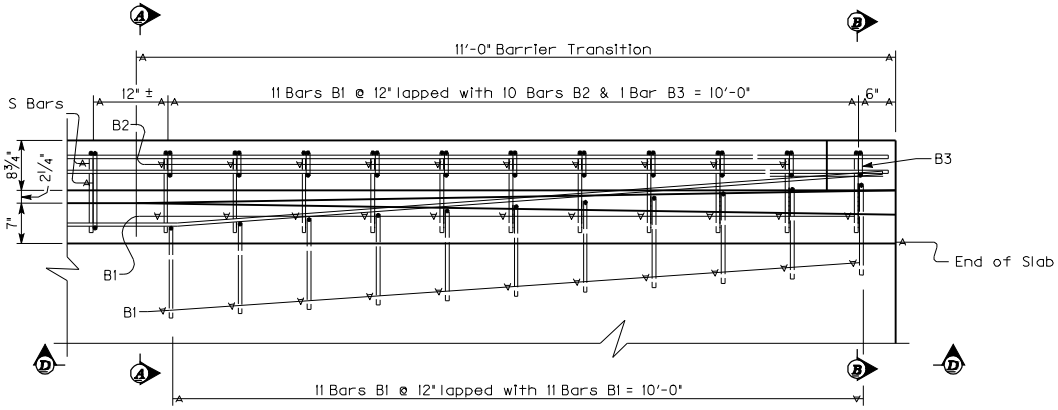
STANDARD DRAWING NO. BGX-010-04

SUBMITTED S E Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

APPROVED J M Prewitt — STATE HIGHWAY ENGINEER — 12-1-99 DATE



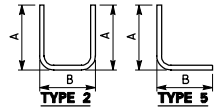

**ELEVATION D–D**

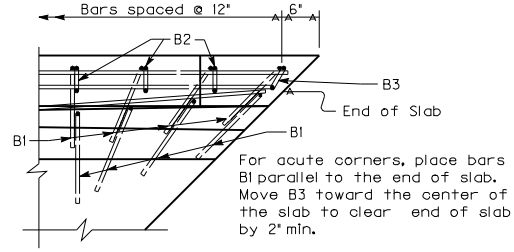



**PLAN OF BARRIER TRANSITION**

## BILL OF REINFORCEMENT

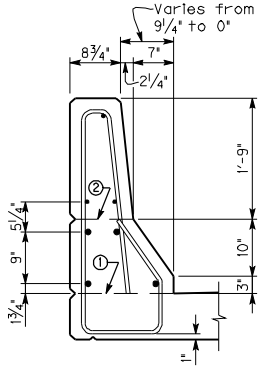
| MARK | TYPE | NO. | SIZE | LENGTH FT. | LENGTH IN. | LOCATION | A FT. | A IN. | B FT. | B IN. |
|---|---|---|---|---|---|---|---|---|---|---|
| B1e | 5s | 22 | 5 | 2 | 11 | Slab Into Barrier | 1 | 8 | 1 | 4 |
| B2e | 2s | 10 | 5 | 5 | 7 | Barrier | 2 | 8 | 0 | 5 |
| B3e | 2s | 1 | 5 | 4 | 5 | Barrier | 2 | 1 | 0 | 5 |



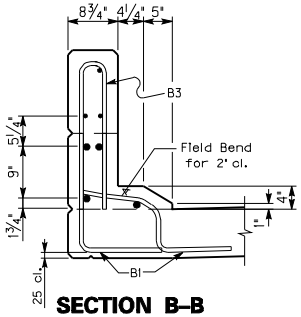




For acute corners, place bars B1 parallel to the end of slab. Move B3 toward the center of the slab to clear end of slab by 2" min.

**PLAN OF SKEWED END**



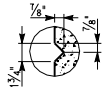

**SECTION A–A**



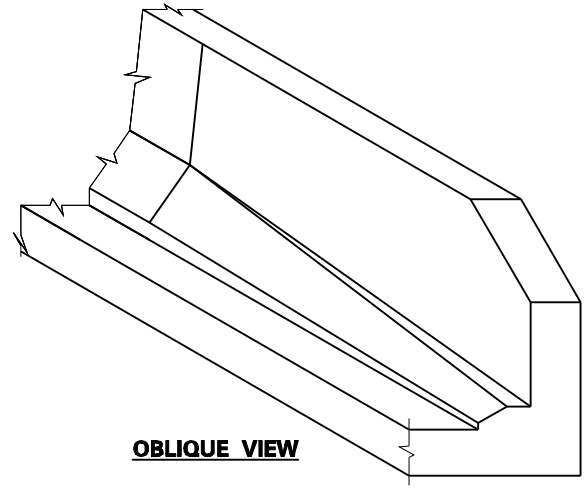

**SECTION B–B**

① Mandatory roughened construction joint. Concrete above this joint is to be placed after slab has been properly cured.

② Permissible construction joint and bottom of ¼" open joint in top of barrier. "V-Groove" rustication joint is required if construction joint is used.




**"V-Groove" Rustication**



**OBLIQUE VIEW**

## ESTIMATE OF QUANTITIES

| | |
|---|---|
| Steel Reinforcement, Epoxy Coated | 140 LBS. |
| Concrete, Class "AA" | 1.0 C.Y. |

NOTE: The concrete quantity is the concrete above the gutter line and 11'-0" from the end of the slab. This estimate of quantities is for one barrier transition and for information only. Barrier transition quantities are included in the estimate of quantities for the superstructure.

KENTUCKY
DEPARTMENT OF HIGHWAYS

# BARRIER TRANSITION END DRAINAGE

STANDARD DRAWING NO. BGX-011-04

SUBMITTED S.E. Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

APPROVED J.M. Prewitt — STATE HIGHWAY ENGINEER — 12-1-99 DATE

## Description of Soil Compactness or Consistency

| SOIL TYPE | COMPACTNESS OR CONSISTENCY | RANGE OF PENETRATION RESISTANCE | RANGE OF UNCONFINED COMPRESSIVE STRENGTH |
|---|---|---|---|
| Coarse grained soils (More than half of material is larger than No. 200 sieve size.) | Very loose<br>Loose<br>Medium compact<br>Compact<br>Very compact | Less than 4 blows per ft.<br>4 to 10<br>10 to 30<br>30 to 50<br>Greater than 50 | Not applicable |
| Fine grained soils (More than half of material is smaller than No. 200 sieve size.) | Very soft<br>Soft<br>Medium stiff<br>Stiff<br>Very stiff<br>Hard | Not applicable | Less than 0.25 tsf<br>0.25 to 0.50<br>0.50 to 1.0<br>1.0 to 2.0<br>2.0 to 4.0<br>Greater than 4.0 |

## Unified Soil Classifications

| MAJOR DIVISION | | SYMBOL | | NAME |
|---|---|---|---|---|
| COARSE GRAINED SOILS | GRAVEL AND GRAVELLY SOILS | GW | | Well-graded gravels or gravel-sand mixtures, little or no fines. |
| | | GP | | Poorly graded gravels or gravel-sand mixtures, little or no fines. |
| | | GM | | Silty gravels, gravel-sand-silt mixtures. |
| | | GC | | Clayey gravels, gravel-sand-clay mixtures. |
| | SAND AND SANDY SOILS | SW | | Well graded sands or gravelly sands, little or no fines. |
| | | SP | | Poorly graded sands or gravelly sands, little or no fines. |
| | | SM | | Silty sands, sand-silt mixtures. |
| | | SC | | Clayey sands, sand-clay mixtures. |
| FINE GRAINED SOILS | SILTS AND CLAYS LL IS LESS THAN 50 | ML | | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity. |
| | | CL | | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays silty clays, lean clays. |
| | SILTS AND CLAYS LL IS GREATER THAN 50 | MH | | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. |
| | | CH | | Inorganic clays of high plasticity, fat clays. |
| UNCLASSIFIED MATERIAL | | NONE | | Non-classified material (i.e. overburden, pavement, slag, etc.) include visual description. |

| | |
|---|---|
| AI | Activity Index |
| LI | Liquidity Index |
| N | Penetration Resistance |
| S+C(%) | Material finer than No. 200 sieve |
| ○ | Rockline Soundings |
| ⊕ | Disturbed Sample Boring |
| ◎ | Undisturbed Sample Boring |
| ◎ | Undisturbed Sample Boring & Rock Core |
| ○ | Rock Core |
| ☼ | Slope Inclinometer Installation |
| | typical applications: ☼ ⊕ ◎ ◎ ☼ |
| ▱→ | Approximate Footing Elevation |
| OW | |
| ⊻ | 7-Day (or greater) Water Table & Date |
| □ | Thin-walled Tube Sample |
| < | Standard Penetration Test Sample |
| UU (psi) | Unconsolidated, Undrained Triaxial Test |
| Qu (psi) | Unconfined Compressive Strength |
| w (%) | Moisture Content |
| RQD (%) | Rock Quality Designation |
| SDI (JS) | Slake Durability Index (Jar Slake Test) |
| Rec. (%) | Core Recovery |
| Ø | Angle of Internal Friction |
| Ø̄ | Effective Angle of Internal Friction |
| c (psi) | Cohesion |
| c̄ (psi) | Effective Cohesion |
| γ | Total Unit Weight |
| RDZ | Rock Disintegration Zone |
| OB | Overburden Bench |
| IB | Intermediate Bench |
| R | Refusal |
| NR | Refusal Not Encountered |
| VS (psi) | Field Vane Shear Strength |

LIMESTONE

SANDSTONE

COAL

NONDURABLE SHALE (SDI < 90)

DURABLE SHALE (SDI ≥ 90)

TALUS OR MINE WASTE OR FILL MATERIAL

ROADWAY FILL-GRANULAR EMBANKMENT

STRUCTURE GRANULAR BACKFILL

SLOPE PROTECTION

## Relation of RQD and in situ Rock Quality

| RDQ (%) | Rock Quality |
|---|---|
| 90 - 100 | Excellent |
| 75 - 90 | Good |
| 50 - 75 | Fair |
| 25 - 50 | Poor |
| 0 - 25 | Very Poor |

KENTUCKY DEPARTMENT OF HIGHWAYS

**GEOTECHNICAL LEGEND**

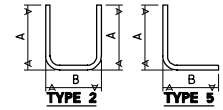
STANDARD DRAWING NO. BGX-012-02

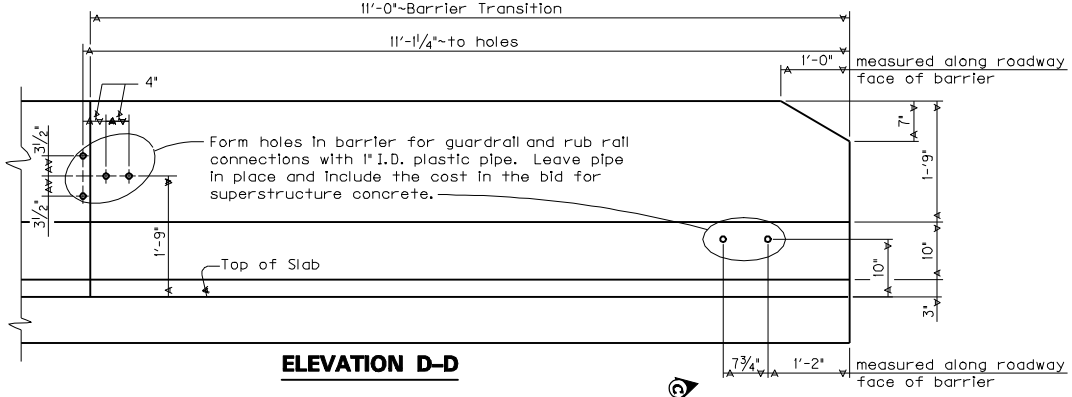
SUBMITTED S.E. Goodpaster DIRECTOR DIVISION OF BRIDGE DESIGN 12-1-99 DATE

APPROVED J.M. Yewell STATE HIGHWAY ENGINEER 12-1-99 DATE

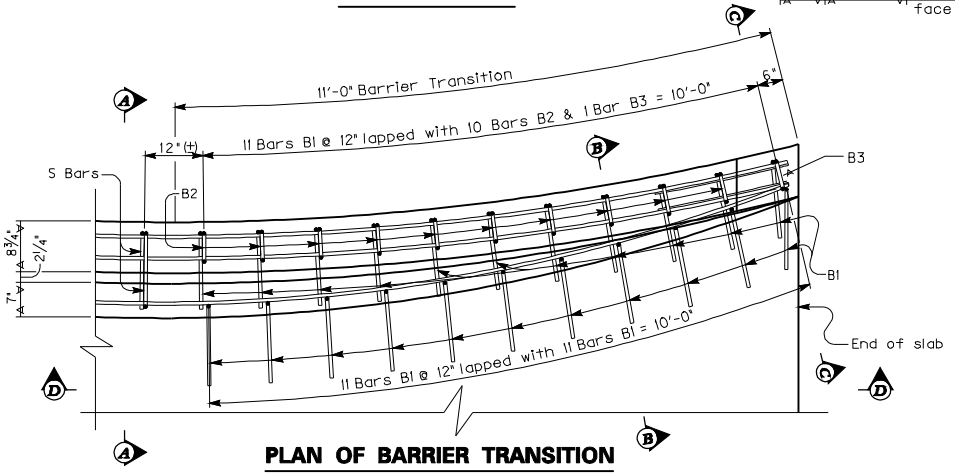
## BILL OF REINFORCEMENT

| MARK | TYPE | NO. | SIZE | LENGTH FT. | LENGTH IN. | LOCATION | A FT. | A IN. | B FT. | B IN. |
|---|---|---|---|---|---|---|---|---|---|---|
| B1e | 5s | 22 | 5 | 2 | 11 | Slab into Barrier | 1 | 8 | 1 | 4 |
| B2e | 2s | 10 | 5 | 5 | 7 | Barrier | 2 | 8 | 0 | 5 |
| B3e | 2s | 1 | 5 | 4 | 5 | Barrier | 2 | 1 | 0 | 5 |

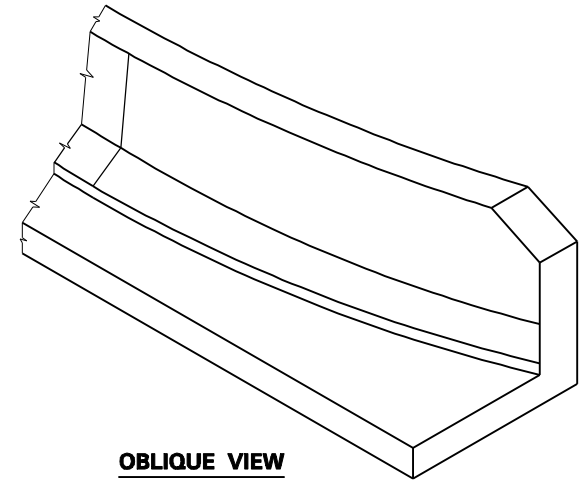


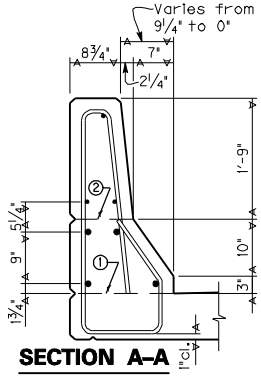

**ELEVATION D–D**



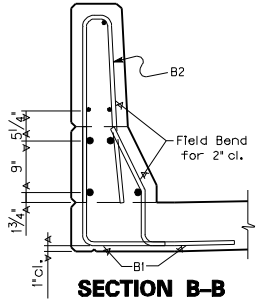

**PLAN OF BARRIER TRANSITION**



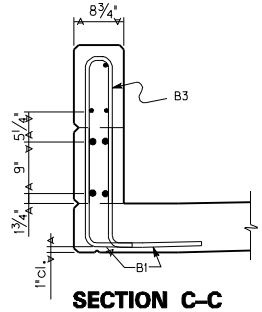
**OBLIQUE VIEW**



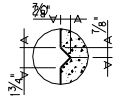

**SECTION A–A**




**SECTION B–B**




**SECTION C–C**

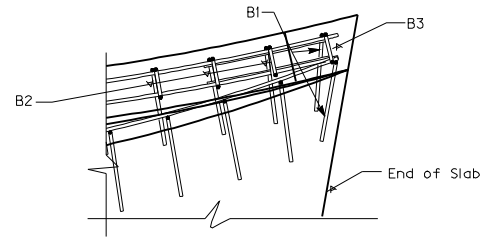



**"V–Groove" Rustication**

① Mandatory roughened construction joint. Concrete above this joint is to be placed after slab has been properly cured.

② Permissible construction joint and bottom of ¼" open joint in top of barrier. "V-Groove" rustication joint is required if construction joint is used.

For acute corners, place bars B1 parallel to the end of slab. Move B3 toward the center of the slab to clear end of slab by 2" min.




**PLAN OF SKEWED END**

## ESTIMATE OF QUANTITIES

| | |
|---|---|
| Steel Reinforcement, Epoxy Coated | 140 LBS. |
| Concrete, Class "AA" | 1.0 C.Y. |

NOTE: The concrete quantity is the concrete above the gutter line and 11'-0" from the end of the slab. This estimate of quantities is for one barrier transition and for information only. Barrier transition quantities are included in the estimate of quantities for the superstructure.

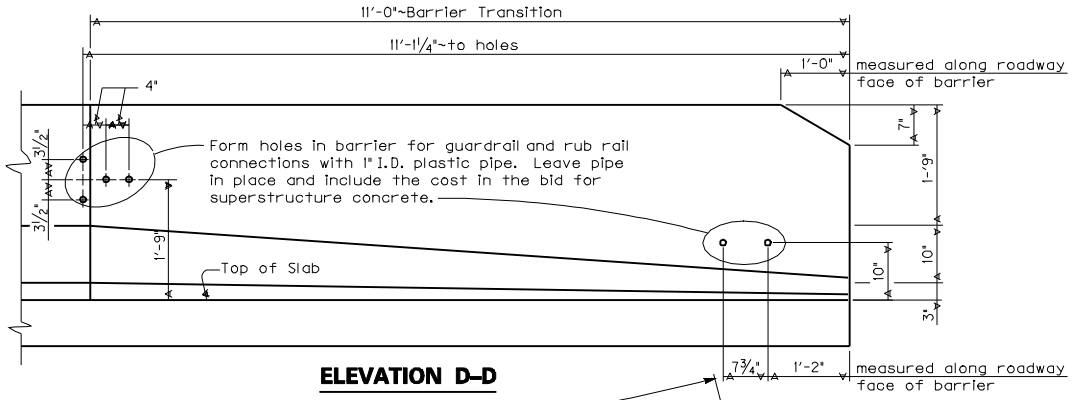
KENTUCKY
DEPARTMENT OF HIGHWAYS

# CURVED BARRIER TRANSITION

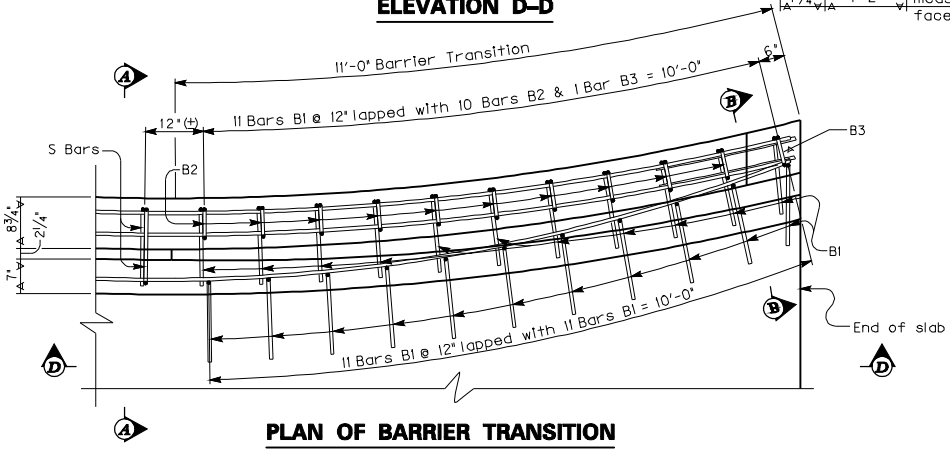
STANDARD DRAWING NO. BGX-013-02

SUBMITTED S E Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

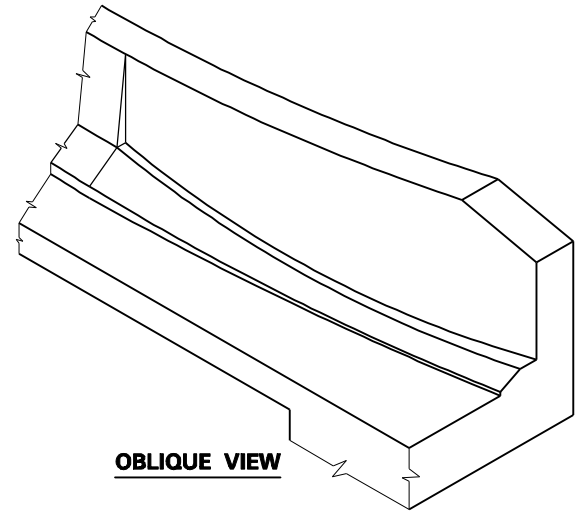
APPROVED J M Yowell — STATE HIGHWAY ENGINEER — 12-1-99 DATE




## ELEVATION D–D



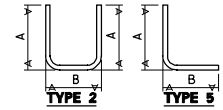

## PLAN OF BARRIER TRANSITION

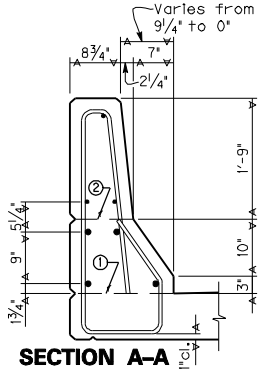


## OBLIQUE VIEW

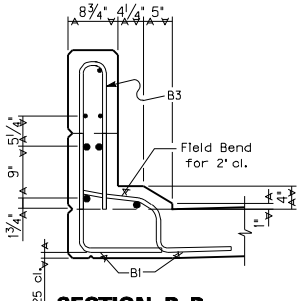
## BILL OF REINFORCEMENT

| MARK | TYPE | NO. | SIZE | LENGTH FT. | LENGTH IN. | LOCATION | A FT. | A IN. | B FT. | B IN. |
|---|---|---|---|---|---|---|---|---|---|---|
| B1e | 5s | 22 | 5 | 2 | 11 | Slab into Barrier | 1 | 8 | 1 | 4 |
| B2e | 2s | 10 | 5 | 5 | 7 | Barrier | 2 | 8 | 0 | 5 |
| B3e | 2s | 1 | 5 | 4 | 5 | Barrier | 2 | 1 | 0 | 5 |

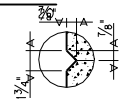



## SECTION A–A




## SECTION B–B

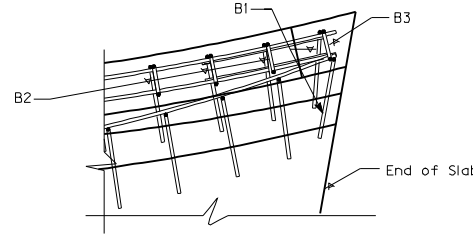



## "V-Groove" Rustication

① Mandatory roughened construction joint. Concrete above this joint is to be placed after slab has been properly cured.

② Permissible construction joint and bottom of 1/4" open joint in top of barrier. "V-Groove" rusticaction joint is required if construction joint is used.

For acute corners, place bars B1 parallel to the end of slab. Move B3 toward the center of the slab to clear end of slab by 2" min.




## PLAN OF SKEWED END

## ESTIMATE OF QUANTITIES

| | |
|---|---|
| Steel Reinforcement, Epoxy Coated | 140 LBS. |
| Concrete, Class "AA" | 1.0 C.Y. |

NOTE: The concrete quantity is the concrete above the gutter line and 11'-0" from the end of the slab. This estimate of quantities is for one barrier transition and for information only. Barrier transition quantities are included in the estimate of quantities for the superstructure.

KENTUCKY
DEPARTMENT OF HIGHWAYS

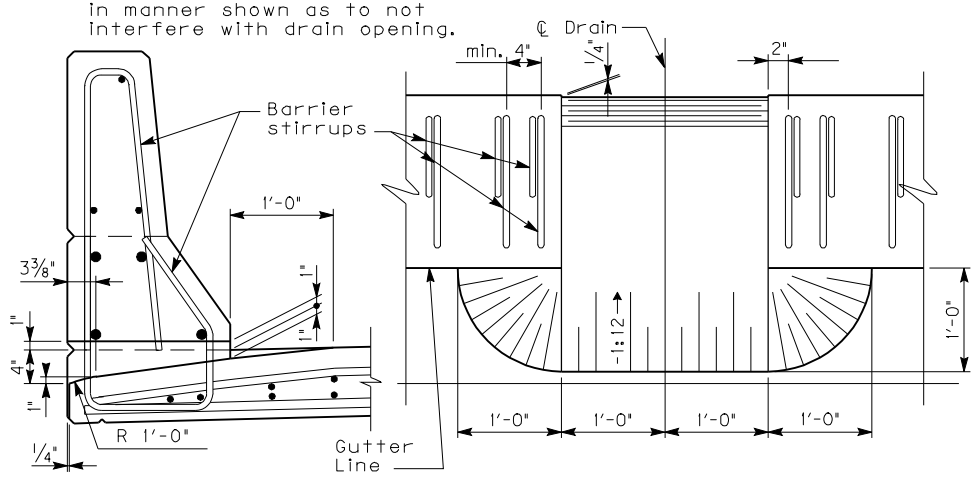
# CURVED BARRIER TRANSITION END DRAINAGE

STANDARD DRAWING NO. BGX-014-02

SUBMITTED S.E. Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

APPROVED J.M. Yowell — STATE HIGHWAY ENGINEER — 12-1-99 DATE

NOTE: Reposition barrier stirrups in manner shown as to not interfere with drain opening.

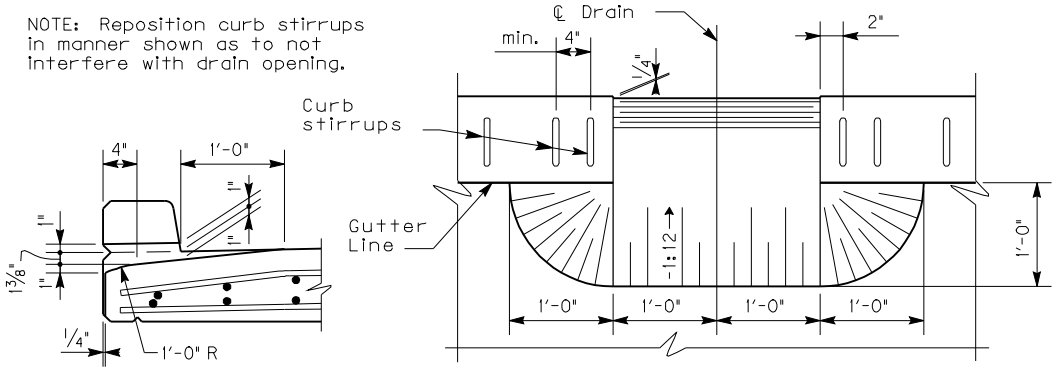



**SECTION THROUGH DRAIN** **PLAN OF DRAIN (Barrier not in place)**

NOTE: Field bend top transverse slab reinforcement in the area of the drain to maintain 2½" of concrete cover through the drain. Bend reinforcement approximately 1'-0" from the gutter line. Transverse slab reinforcement adjacent to the opening is not to be bent. Longitudinal reinforcement is not to be tied to the transverse reinforcement adjacent to the drain for a distance sufficient to allow the reinforcement to sag under the bent reinforcement in the drain area.

## THROUGH BARRIER DRAIN DETAILS

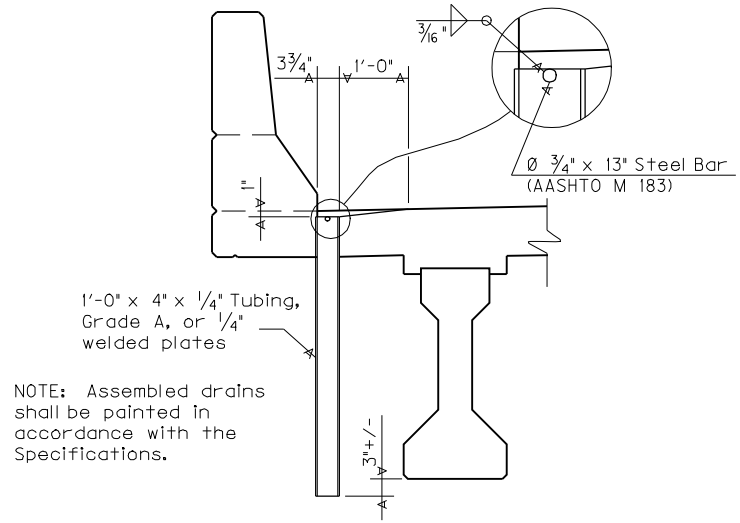
NOTE: Reposition curb stirrups in manner shown as to not interfere with drain opening.




**SECTION THROUGH DRAIN** **PLAN OF DRAIN (Curb not in place)**

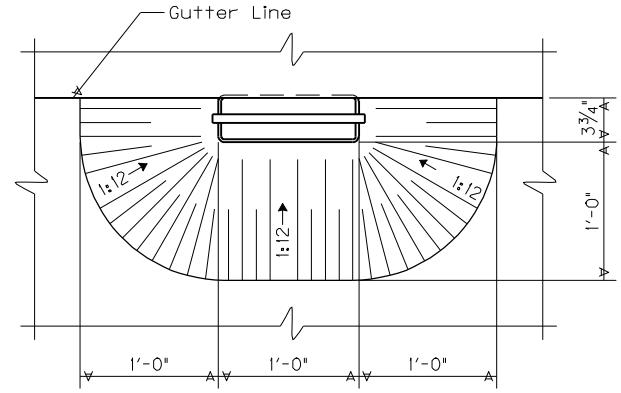
NOTE: Field bend top transverse slab reinforcement in the area of the drain to maintain 2½" of concrete cover through the drain. Bend reinforcement approximately 1'-0" from the gutter line. Transverse slab reinforcement adjacent to the opening is not to be bent. Longitudinal reinforcement is not to be tied to the transverse reinforcement adjacent to the drain for a distance sufficient to allow the reinforcement to sag under the bent reinforcement in the drain area.

## THROUGH CURB DRAIN DETAILS




NOTE: Assembled drains shall be painted in accordance with the Specifications.

**SECTION THROUGH DRAIN**




**PLAN OF DRAIN**

## THROUGH DECK DRAIN DETAILS

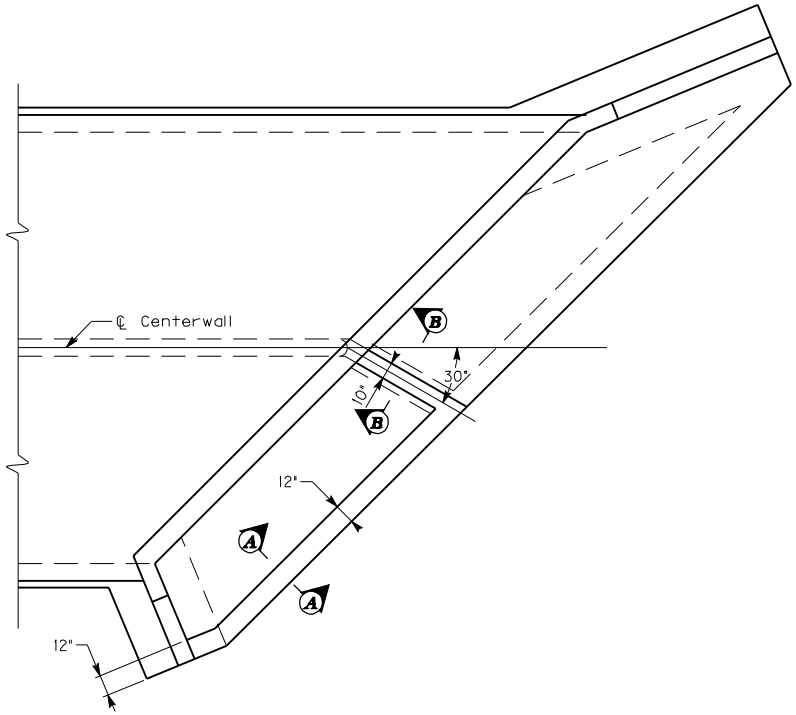
KENTUCKY
DEPARTMENT OF HIGHWAYS

**BRIDGE DRAINS**

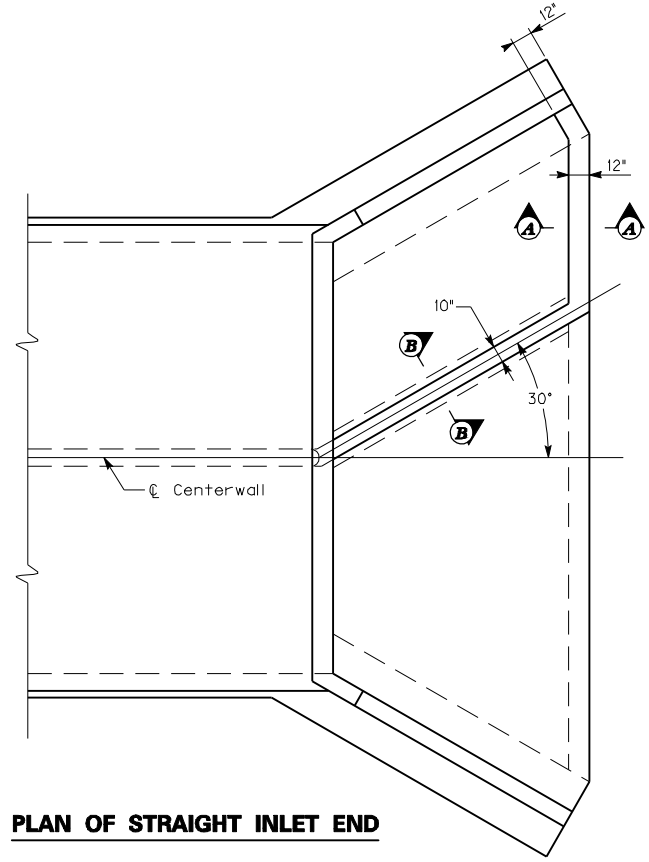
STANDARD DRAWING NO. BGX-015-02

SUBMITTED S E Goodrich — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

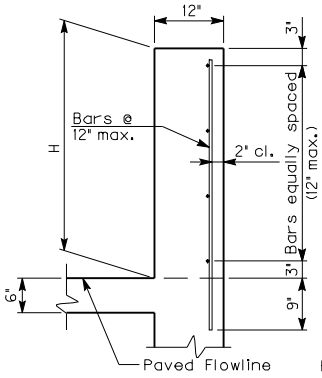
APPROVED C M Yowell — STATE HIGHWAY ENGINEER — 12-1-99 DATE



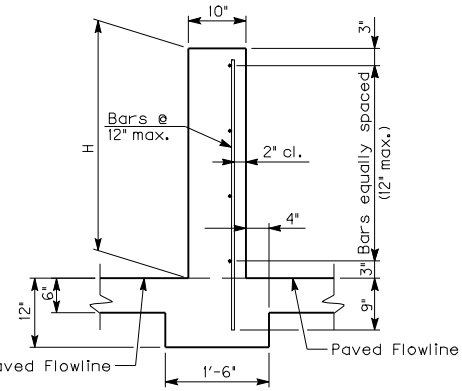

**PLAN OF SKEWED INLET END**




**PLAN OF STRAIGHT INLET END**




**SECTION A–A**




**SECTION B–B**

# *General Notes*

LOW FLOW DIVERSION CURB: Include all materials and labor required to construct the Low Flow Diversion Curb in the bid for Low Flow Diversion Curb.

DIMENSION "H": This dimension is the lesser of the wing tip elevation, one-half the barrel height opening, or as designated on the plans.

METHOD OF MEASUREMENT: The limits of the Low Flow Diversion Curb is the entire wall that is above the paved flowline, extending from the centerwall to the wing face as detailed on the Plan views, and the 6" x 1'-6" footing as shown in Section B-B.

STEEL REINFORCEMENT: All steel reinforcement is #4 bars in accordance with ASTM A 615, Grade 60.

CONCRETE: Class "A" Concrete is to be used.

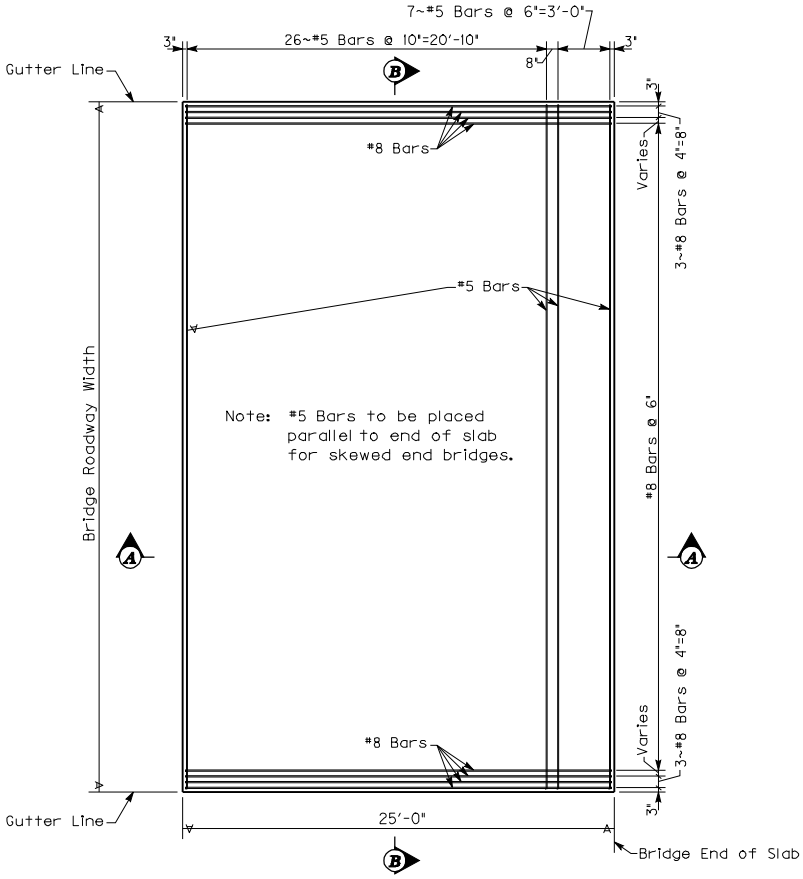
KENTUCKY
DEPARTMENT OF HIGHWAYS

**LOW FLOW DIVERSION CURB**

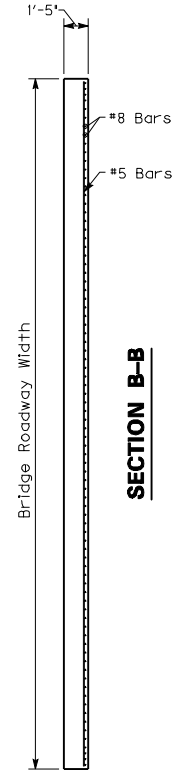
STANDARD DRAWING NO. BGX-016-01

SUBMITTED S.E. Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

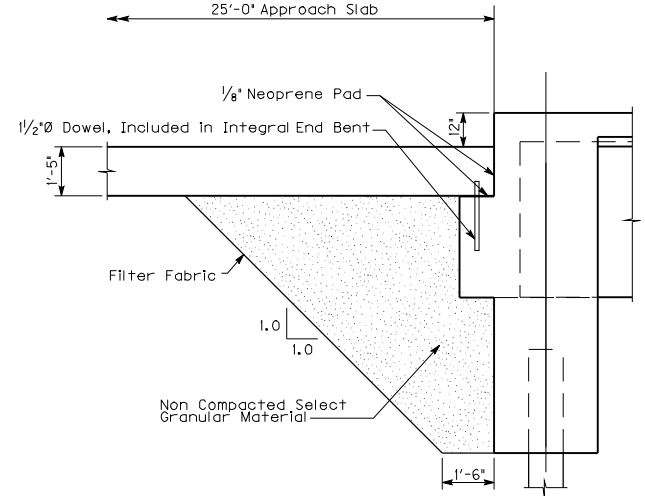
APPROVED J.M. Haywell — STATE HIGHWAY ENGINEER — 12-1-99 DATE



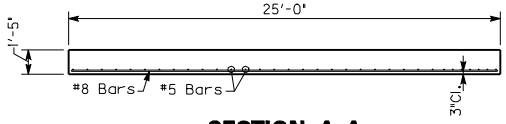

**PLAN**




**SECTION B-B**




**TYPICAL SECTION @ BRIDGE END**




**SECTION A-A**

## GENERAL NOTES

CROWN: Crown shall conform to the rate of crown at the approach pavement and bridge deck. If the rate of crown at the bridge deck differs from that of approach pavement, a smooth transition shall be provided within the limits of the approach slab.

CONCRETE: Concrete shall be Class "AA".

REINFORCEMENT: All steel reinforcement shall be Grade 60 and epoxy coated.

PAYMENT: Include the cost of Class "AA" Concrete, epoxy-coated steel reinforcement, and all labor and materials required to construct the approach slab in the bid item for Approach Slab.

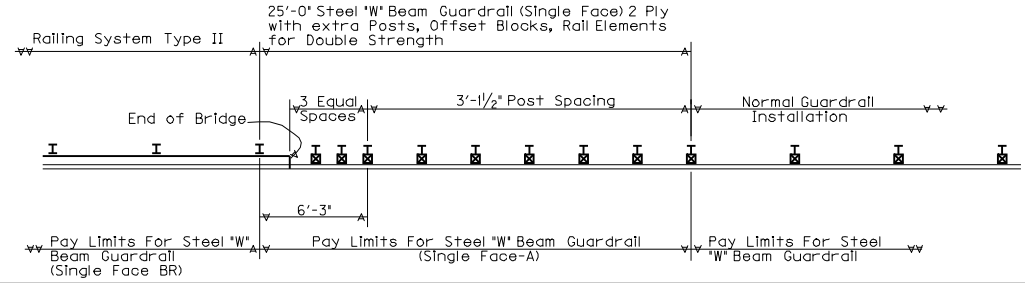
KENTUCKY
DEPARTMENT OF HIGHWAYS

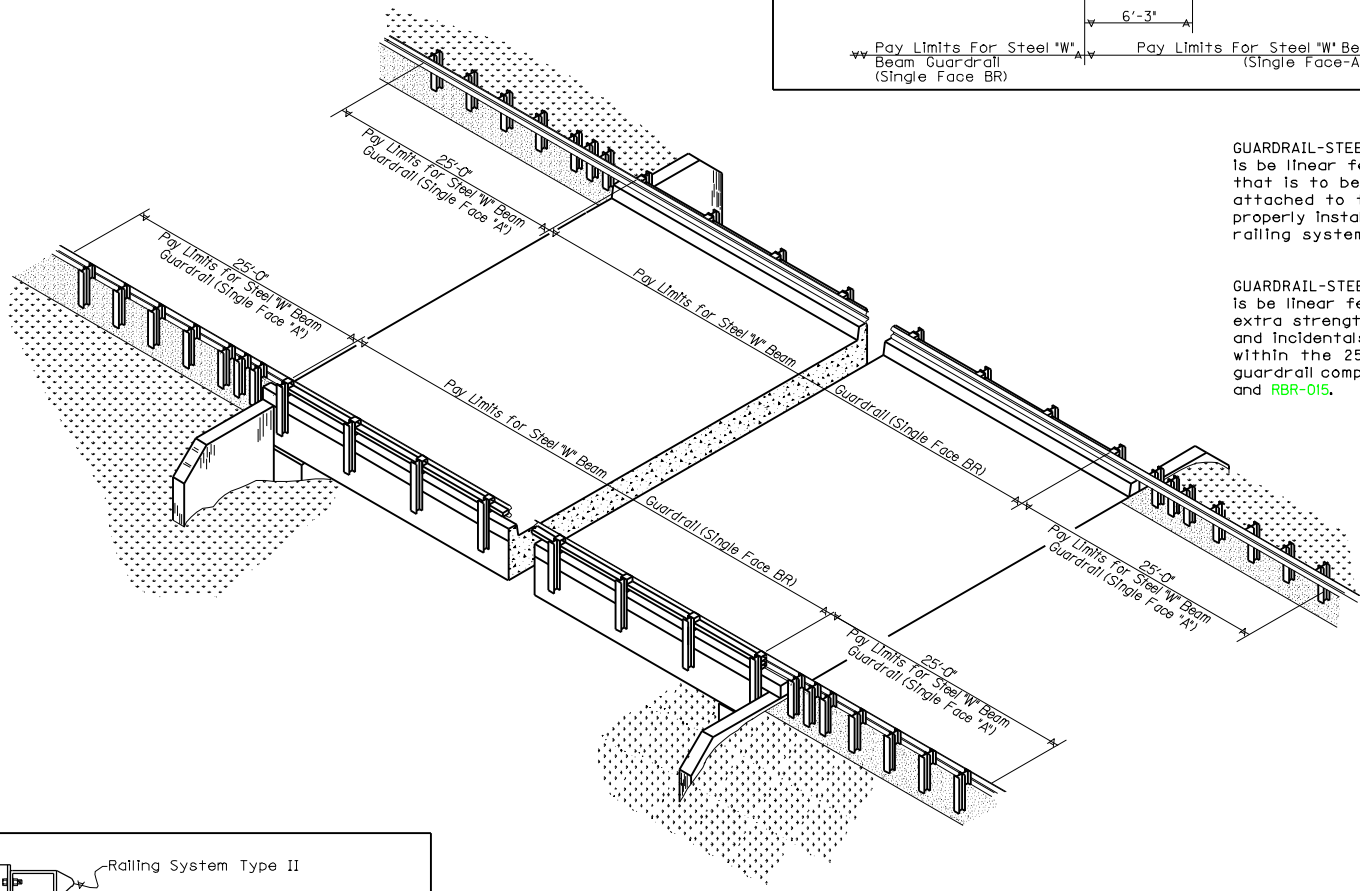
# APPROACH SLAB

STANDARD DRAWING NO. BGX-017

SUBMITTED _____ DIRECTOR DIVISION OF BRIDGE DESIGN — 11-21-07 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 11-21-07 DATE

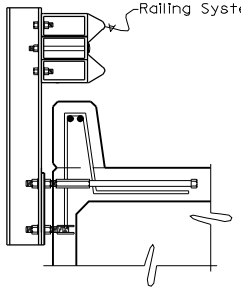


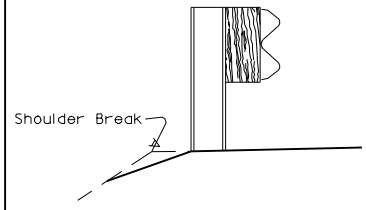

## BID ITEM NOTES

GUARDRAIL-STEEL W BEAM (SINGLE FACE BR): The bid unit for this item is be linear feet. This item shall include the Railing System Type II that is to be installed on the bridge between the endmost posts attached to the bridge and all labor and incidentals necessary to properly install the railing system. For non-composite box beams, the railing system is attached to the beam prior to shipment.

GUARDRAIL-STEEL W BEAM (SINGLE FACE A): The bid unit for this item is be linear feet. This item includes the W-Beam guardrail (2 ply for extra strength), guardrail posts, offset blocks, hardware, and labor and incidentals necessary to properly install the approach guardrail within the 25'-0" limits at each corner of the structure. For guardrail components, refer to Standard Drawings RBR-001, RBR-005 and RBR-015.




BRIDGE GUARDRAIL INSTALLATION




ROADWAY SHOULDER
G.R. INSTALLATION

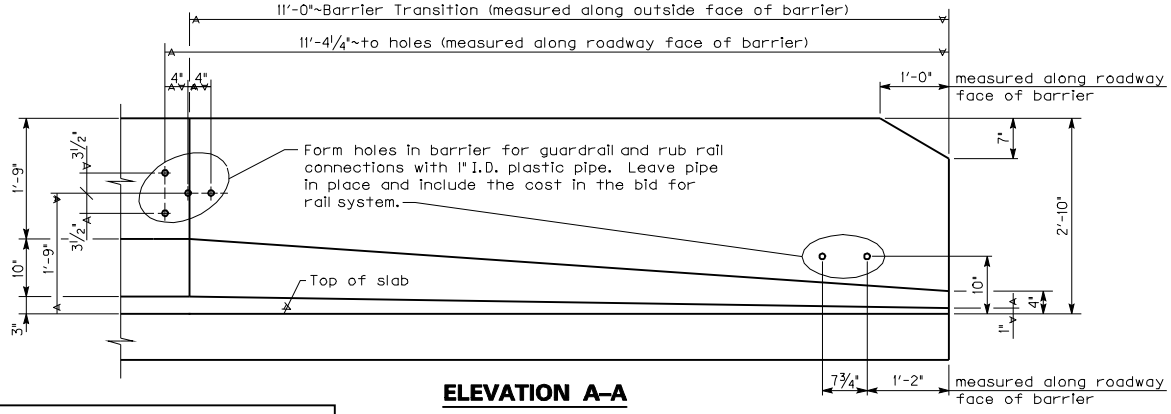
KENTUCKY
DEPARTMENT OF HIGHWAYS

**RAILING SYSTEM**
**TYPE II**
**GUARDRAIL TREATMENT**

STANDARD DRAWING NO. BHS-007-05

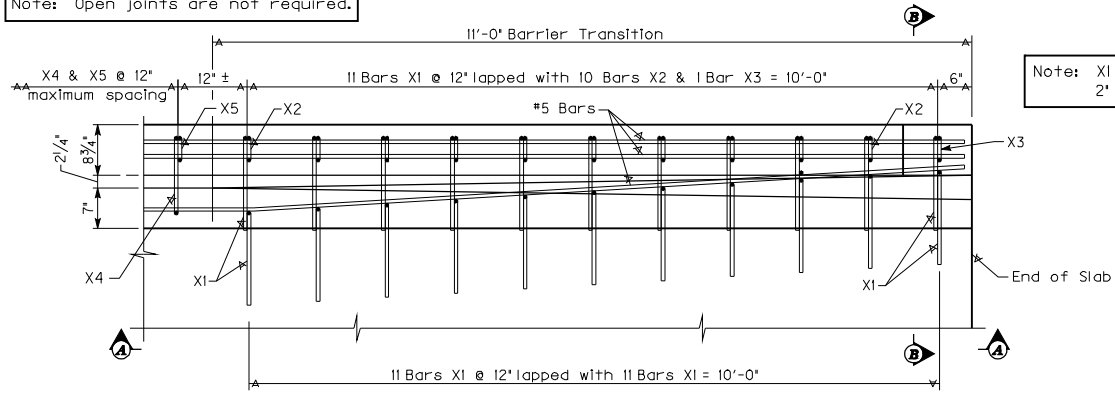
SUBMITTED S.E. Goodpaster DIRECTOR DIVISION OF BRIDGE DESIGN 12-1-99 DATE

APPROVED C.M. Howell STATE HIGHWAY ENGINEER 12-1-99 DATE



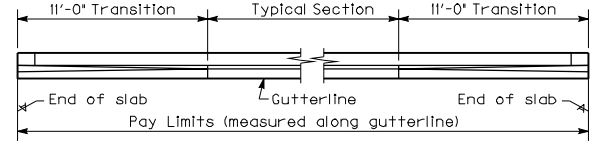

## ELEVATION A–A

Note: Open joints are not required.

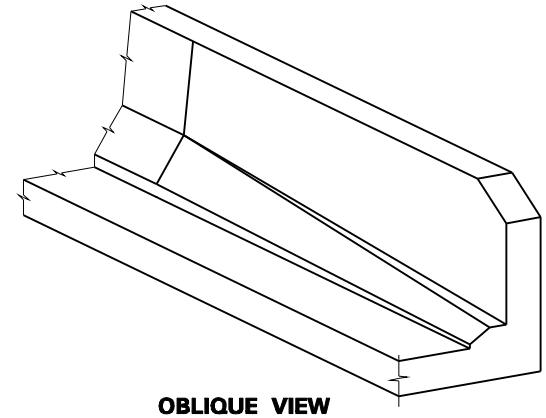



## PLAN OF BARRIER TRANSITION

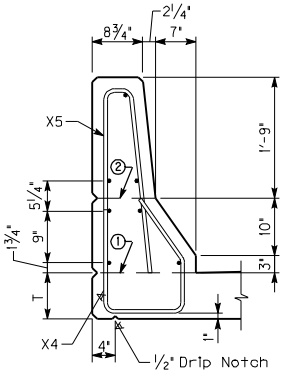
Note: X1 & X3 Bars at end of slab may be adjusted to maintain 2" minimum clearance on curved and skewed end bridges.




## PLAN OF BARRIER



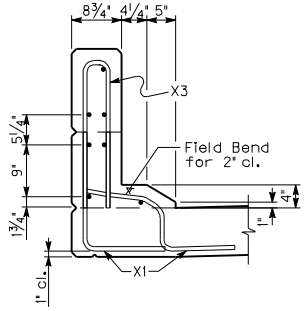
## OBLIQUE VIEW



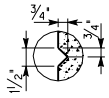

## TYPICAL BARRIER SECTION

① Mandatory roughened construction joint. Concrete above this joint is to be placed after slab has been properly cured and included in the bid for Rail System, Type 3.

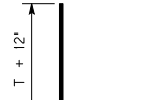
② Permissible construction joint. "V-Groove" rustication joint is required if construction joint is used. ¼" Open joints are not required.




## SECTION B–B

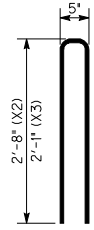



## "V-Groove" Rustication



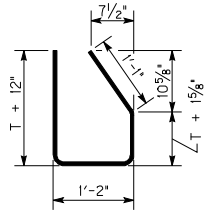

## X1(e) Bars

#5 Bar



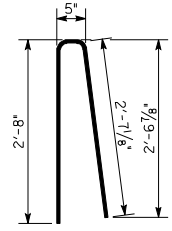

## X2(e) & X3(e) Bars

#5 Bar




## X4(e) Bars

#5 Bar




## X5(e) Bars

#5 Bar

## General Notes

MEASUREMENT: The linear foot bid for the barrier is measured along the roadway gutterline. Include all reinforcement shown and all concrete above the top of slab in the bid item for Rail Sytem Type 3.

REINFORCEMENT: All reinforcement shown on this sheet is to be epoxy coated. Use stirrup bend diameters for all bent bars. Straight reinforcement is to be Size #5 and lapped 2'-2" when necessary.

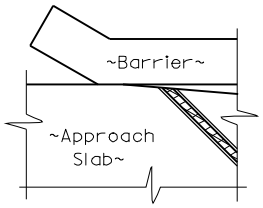
KENTUCKY DEPARTMENT OF HIGHWAYS

# RAIL SYSTEM TYPE 3

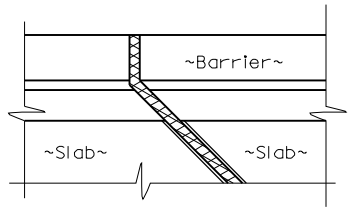
STANDARD DRAWING NO. BHS-008

SUBMITTED Mark W Frank DIRECTOR DIVISION OF BRIDGE DESIGN 11-21-07 DATE

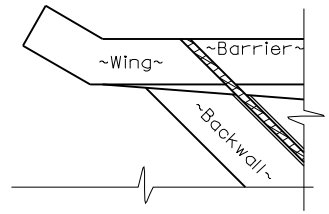
APPROVED Marvelyn Matthews STATE HIGHWAY ENGINEER 11-21-07 DATE




@ Integral End Bents



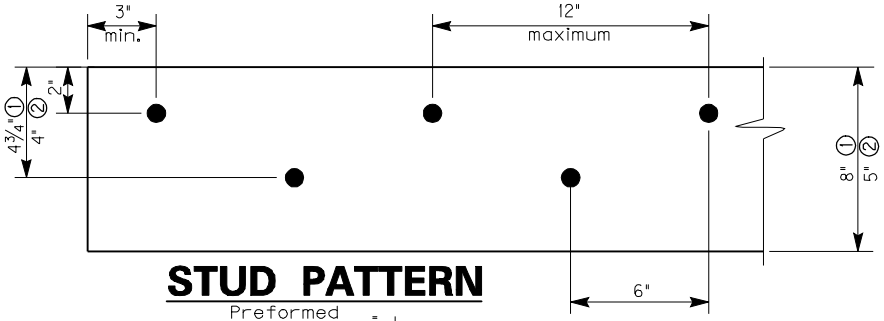

@ Piers or Bents



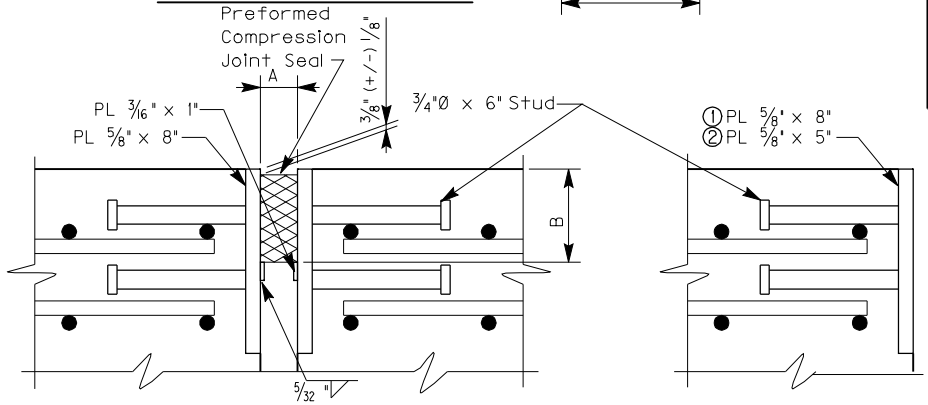

@ Backwall Substructures

# TYPICAL BARRIER-JOINT TREATMENTS

*Details are for skewed joints*




## STUD PATTERN



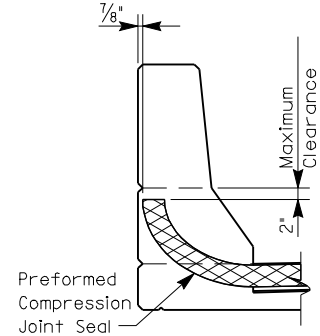

## SECTION THROUGH JOINT

"A" - Minimum Joint opening @ 60°F
"B" - Manufacturer's compressed seal height 1/4".

| Joint Data | | |
|---|---|---|
| Dim. A @ 15°C (in) | Movement (in) | The joint seal supplied must accommodate the required movement shown. Set Dimension A with temperature change increment and as required by the manufacturer to obtain the required movement. |
| 1 1/2 | 1 | |
| 2 | 1 1/2 | |
| 2 1/2 | 2 | |

## SECTION THROUGH ARMORED EDGE

① Assembly weight = 18.8 lbs./ft.
② Assembly weight = 12.4 lbs./ft.




## SECTION THROUGH BARRIER

# General Notes

SPECIFICATIONS: All references to the Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. All references to the AASHTO Specifications are to the current edition of the AASHTO Standard Specifications for Highway Bridges.

INSTALLATION PROCEDURE: Seal the ends of the joint seal to prevent the entrance of water and foreign material.

WELDING SPECIFICATIONS: Ensure techniques and welding procedure comply with current joint specification ANSI/AASHTO/AWS D1.5 Bridge Welding Code.

MATERIAL SPECIFICATIONS: Ensure steel material is new, commercial grade steel suitable for welding. Acceptance will be based on visual inspection by the Engineer. Joint sealing material, only, is in accordance with Section 807 of the Specifications. Ensure stud shear connectors conform to ASTM A108, Grade 1015.

LOCATION: Locate armored edges and/or expansion dams in accordance with detail plans.

PAINT: Clean and paint all structural steel in accordance with the Specifications, except that no field coating will be required.

SHOP DRAWINGS: Contrary to the Specifications, no shop plans are required.

BASIS OF PAYMENT: The accepted quantities of Neoprene Expansion Dam which includes the armored edges & preformed compression joint seal will be paid for at the contract unit price per linear foot for each size, measured along centerline of joint between the vertical faces of the barriers. When only an Armored Edge is required the cost of furnishing and placing the armored edge will be paid for at the contract unit price per linear foot, measured along the Armored Edge between the vertical faces of the barriers.

① Applies to 8" slab thickness ② Applies to 5" slab thickness

| Temperature Change Increment per 10°F | | | |
|---|---|---|---|
| Concrete | | Steel | |
| Span Length (ft) | Increment (in) | Span Length (ft) | Increment (in) |
| 0 - 80 | 1/32 | 0 - 60 | 1/32 |
| 81 - 140 | 1/16 | 61 - 100 | 1/16 |
| 141 - 200 | 3/32 | 101 - 140 | 3/32 |
| 201 - 260 | 1/8 | 141 - 180 | 1/8 |
| 261 - 320 | 5/32 | | |

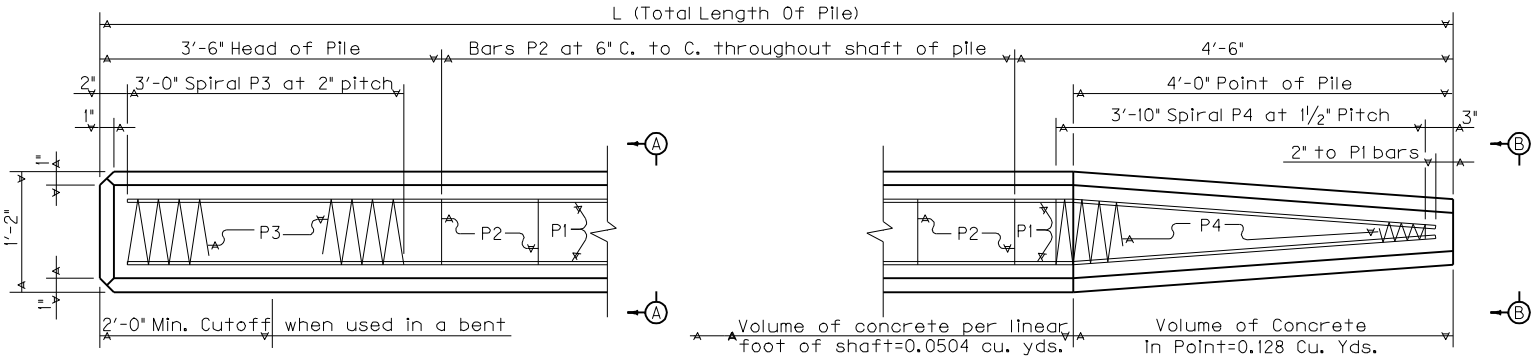
KENTUCKY DEPARTMENT OF HIGHWAYS

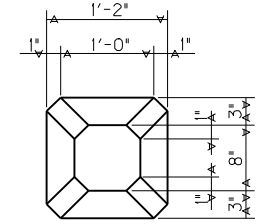
**NEOPRENE EXPANSION DAMS AND ARMORED EDGES**

STANDARD DRAWING NO. BJE-001-11

SUBMITTED _____ DIRECTOR DIVISION OF BRIDGE DESIGN _____ DATE

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE

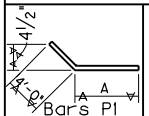


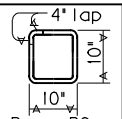



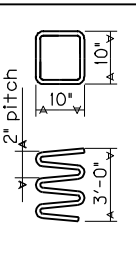

VIEW B-B

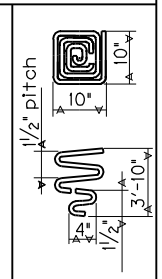
## TABLE OF DIMENSIONS AND QUANTITIES (FOR ONE PILE ONLY)

BILL AND TYPES OF REINFORCEMENT (FOR ONE PILE ONLY)



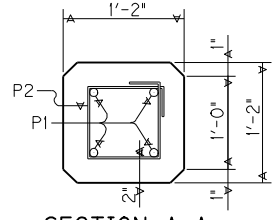

| L | ESTIMATED CONCRETE CLASS "D" | Length | | A | | Number |
|---|---|---|---|---|---|---|
| Ft. | Cu. Yd. | Ft. | In. | Ft. | In. | |
| 16 | 0.73 | 15 | 8 | 11 | 8 | 17 |
| 18 | 0.83 | 17 | 8 | 13 | 8 | 21 |
| 20 | 0.93 | 19 | 8 | 15 | 8 | 25 |
| 22 | 1.04 | 21 | 8 | 17 | 8 | 29 |
| 24 | 1.14 | 23 | 8 | 19 | 8 | 33 |
| 26 | 1.24 | 25 | 8 | 21 | 8 | 37 |
| 28 | 1.34 | 27 | 8 | 23 | 8 | 41 |
| 30 | 1.44 | 29 | 8 | 25 | 8 | 45 |
| 32 | 1.54 | 31 | 8 | 27 | 8 | 49 |
| 34 | 1.64 | 33 | 8 | 29 | 8 | 53 |
| 36 | 1.74 | 35 | 8 | 31 | 8 | 57 |
| 38 | 1.84 | 37 | 8 | 33 | 8 | 61 |
| 40 | 1.94 | 39 | 8 | 35 | 8 | 65 |
| 42 | 2.04 | 41 | 8 | 37 | 8 | 69 |
| 44 | 2.14 | 43 | 8 | 39 | 8 | 73 |
| 46 | 2.24 | 45 | 8 | 41 | 8 | 77 |
| 48 | 2.34 | 47 | 8 | 43 | 8 | 81 |
| 50 | 2.44 | 49 | 8 | 45 | 8 | 85 |
| 52 | 2.54 | 51 | 8 | 47 | 8 | 89 |
| 54 | 2.64 | 53 | 8 | 49 | 8 | 93 |
| 56 | 2.74 | 55 | 8 | 51 | 8 | 97 |
| 58 | 2.84 | 57 | 8 | 53 | 8 | 101 |
| 60 | 2.94 | 59 | 8 | 55 | 8 | 105 |

*¼" Plain Round Bars may be used in place of Deformed Bars

One in Head of Each Pile

One in Point of Each Pile

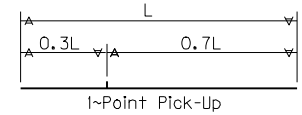
Pile lengths beyond those shown in table will have their concrete quantities adjusted to the length required.



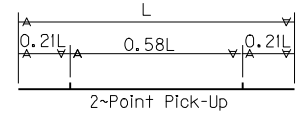

SECTION A-A

Table Showing Max. Length of Concrete Piles for Various Methods of Handing.

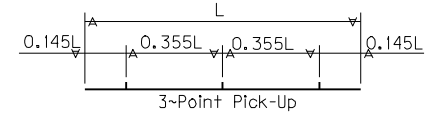
| Pick-up Method | Max. Length for 4~#8 | Max. Length for 4~#9 |
|---|---|---|
| 1~Point | 41 ft. | 43 ft. |
| 2~Point | 58 ft. | 61 ft. |
| 3~Point | 87 ft. | 92 ft. |




1~Point Pick-Up




2~Point Pick-Up




3~Point Pick-Up

All lifting to be at pick-up points. Clearly mark all pick-up points.

## GENERAL NOTES

SPECIFICATIONS: Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, current edition.

CONCRETE: Use class "D" concrete throughout the piles.

REINFORCEMENT: Include the cost of reinforcement in the price bid per linear foot of piles. Concrete piles must not be damaged below cut-off elevation. Concrete and spiral bars above cut-off elevation are to be removed. Bars P1 and P2 are to remain and project into structure above. Field bend these bars if necessary to maintain clearance shown on Bridge details.

PILING: Minimum penetration of all piles is 20 feet unless solid rock is encountered.

TEST PILES: Drive test piles where designated on Bridge Plans to determine the length required. Locate all test piles so they will act as a part of the piling system.

PILE CUT-OFF: No payment will be made for pile cut-off.

SPIRAL REINFORCEMENT: May be plain or deformed and have a minimum yield strength of 40,000 psi and a minimum tensile strength of 70,000 psi.

KENTUCKY
DEPARTMENT OF HIGHWAYS

**14" REINFORCED CONCRETE PILE**

STANDARD DRAWING NO. BPC-002-08

SUBMITTED S.E. Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — DATE 12-1-99

APPROVED J.M. Yewell — STATE HIGHWAY ENGINEER — DATE 12-1-99

# GENERAL NOTES

SPECIFICATIONS: All references to the Standard Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for road and bridge construction.

CONCRETE: Use class 'D' modified concrete in piles. Cylinder strength shall be 4000 psi at the time of release of the prestress strands and 5000 psi minimum at 28 days.

PRESTRESS STRANDS: Ensure prestressing reinforcement to be ½ inch nominal diameter uncoated seven-wire low lax strand conforming to the requirements of grade 270, AASHTO M203, current edition.

DESIGN STRESSES: Initial strand tension=30,982 pounds. f's=270,000 psi. (strands) f's=20,000 psi (mild reinforcement) f'c=5,000 psi. f'c at transfer=4000 psi. Spiral reinforcement wire W3.5 conforming to ASTM A82.

DRIVING PILES: Protect piles heads from direct hammer impact by using approved cushion blocks.

EDGES: Chamfer all edges one inch or rounded to approximately one inch radius.

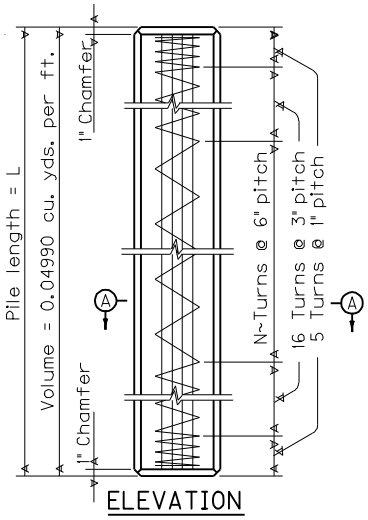
BUILD-UP AND SPLICES: Build-ups and splices may be used, as detailed, if authorized by the Engineer.

FORMS: For forming the exterior of piles, the use of steel forms on concrete casting beds is required unless otherwise approved by the Engineer. Ensure concrete finish conforms to Subsection 601.03.18, Part A of the Specifications.

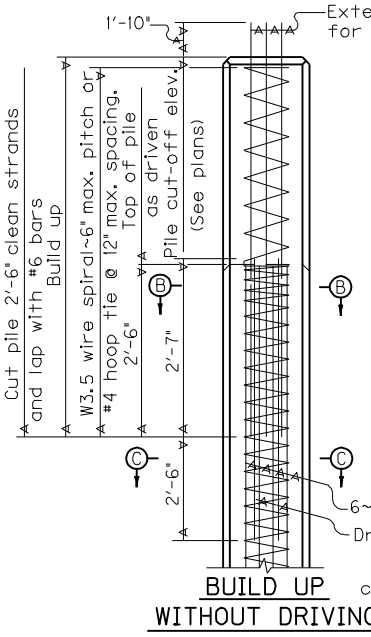
PAYMENT: Payment is to be made on the basis of the unit price bid per linear foot of piling. See Section 604.04 of the Specifications.

PILE TIP: Use pile tips when specified in the bridge plans and the pile is used as a point bearing pile. Include the cost of pile tip in the unit price bid per linear foot of piling.

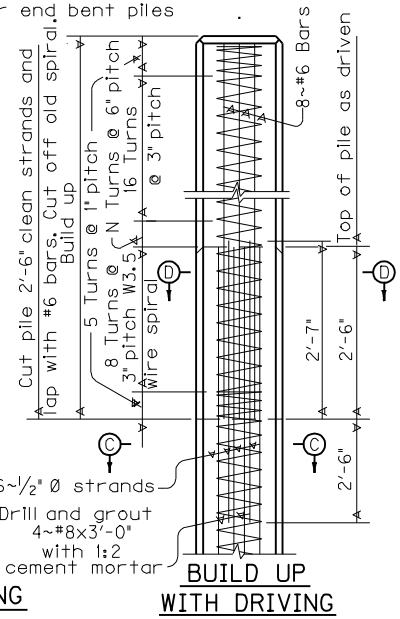
| Pick-up Method | Maximum Length |
|---|---|
| 1-Point | 54 ft. |
| 2-Point | 77 ft. |
| 3-Point | 111 ft. |
| 4-Point | 151 ft. |



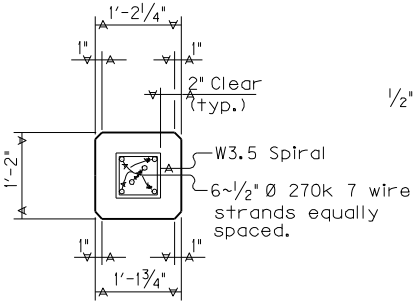

ELEVATION



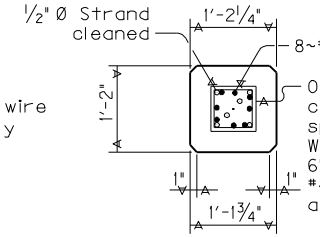

BUILD UP WITHOUT DRIVING



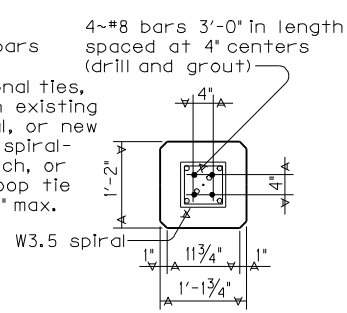

BUILD UP WITH DRIVING



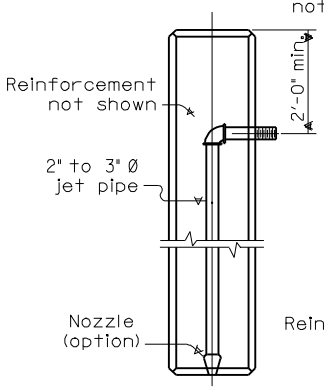

SECTION A-A



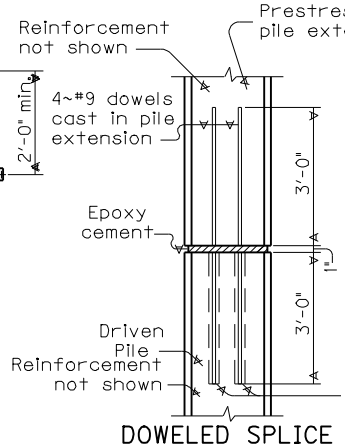

SECTION B-B



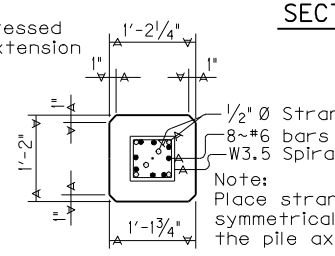

SECTION C-C



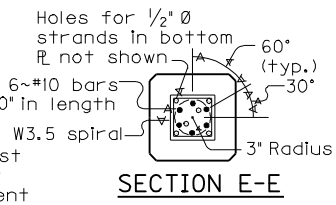

JET PIPE



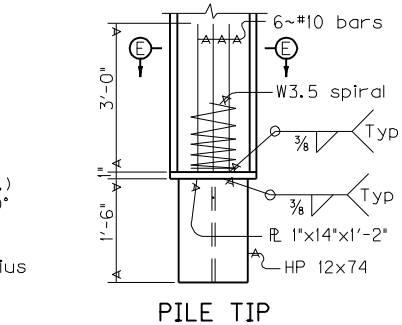

DOWELED SPLICE



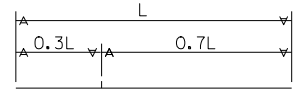

SECTION D-D



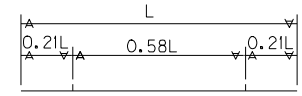

SECTION E-E



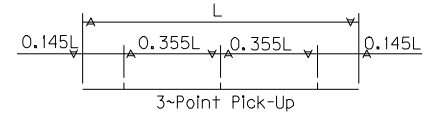

PILE TIP



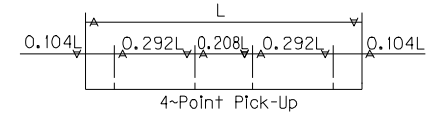

1-Point Pick-Up




2-Point Pick-Up




3-Point Pick-Up




4-Point Pick-Up

All lifting to be at pick-up points. Clearly mark all pick-up points.

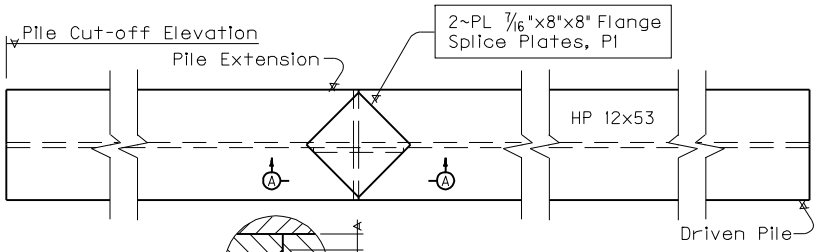
KENTUCKY DEPARTMENT OF HIGHWAYS

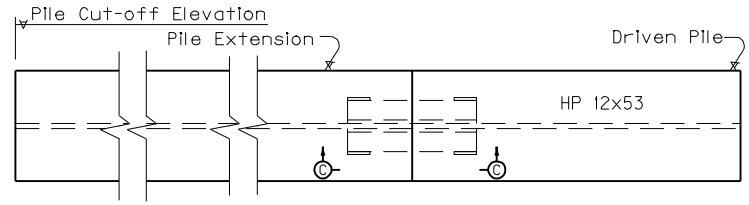
**14" PRECAST PRESTRESSED CONCRETE PILE**

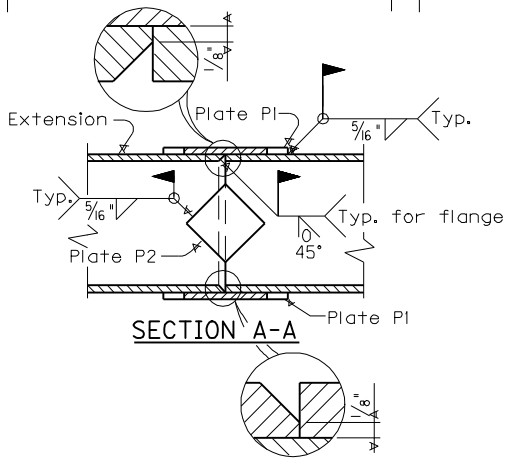
STANDARD DRAWING NO. BPC-011-07

SUBMITTED S.E. Goodrich DIRECTOR DIVISION OF BRIDGE DESIGN 12-1-99 DATE

APPROVED J.M. Yowell STATE HIGHWAY ENGINEER 12-1-99 DATE

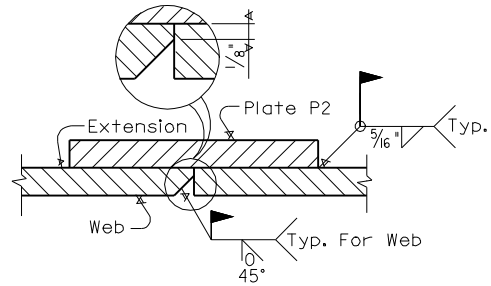


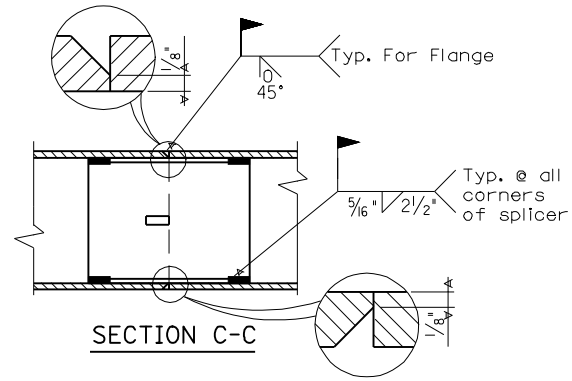




SECTION A-A

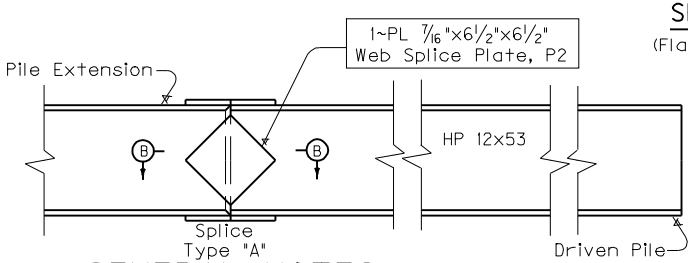
NOTE:
Bevel flanges and web of pile extension on 1:1 bevel as shown and employ conventional butt weld.

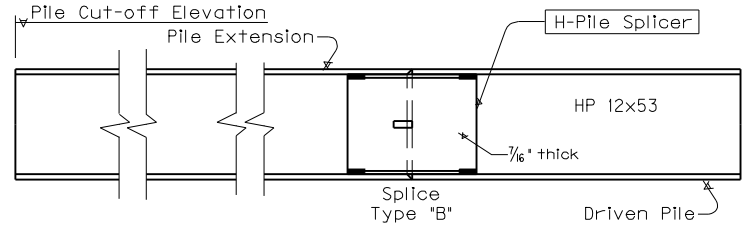



SECTION B-B
(Flange Not Shown)




SECTION C-C




## GENERAL NOTES

SPECIFICATIONS: Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, current edition.

MATERIALS: Ensure structural steel piles conforms to A.S.T.M. A36, current Specifications.

SPLICE PLATES: Ensure all pile splicing options conform to A.S.T.M. A36,current Specifications. In lieu of Splice Option "A" or Splice option "B", splice plates may be flame cut from HP12x53 sections. If flange sections are used, the portion cut at the web must be turned outside in order to obtain a tight fit. Grind the edges smooth prior to welding.

SPLICE OPTION "B": The pile splicer shown in the details for Splice Option "B" may be Champion H-Pile Splicer, Model HP 30000, or an approved equal. Ensure the splicer is in accordance to the manufacturer's recommendations and subject to the Engineer's approval.

FIELD WELDS: Ensure field welding material and workmanship for all piling conforms to the current Joint Specifications ANSI/AASHTO/AWS D1.5 Bridge Welding Code. Splice piles as indicated above only when driven below cut-off elevation.

PAYMENT: Payment for the piles in accordance with plans and specifications will be made at the contract price per linear foot.

PAINT: No painting is required on steel piles.

MILL TEST REPORTS: Furnish mill test reports in triplicate to the Department showing that all materials furnished conform to the Specifications.

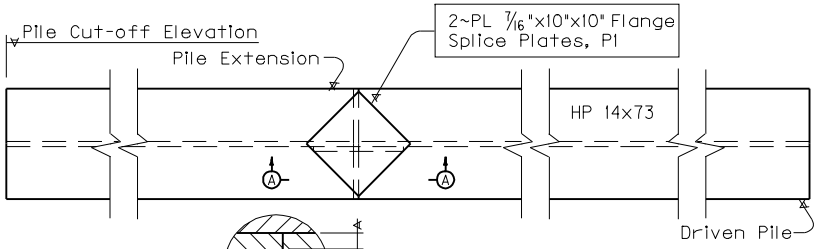
KENTUCKY
DEPARTMENT OF HIGHWAYS

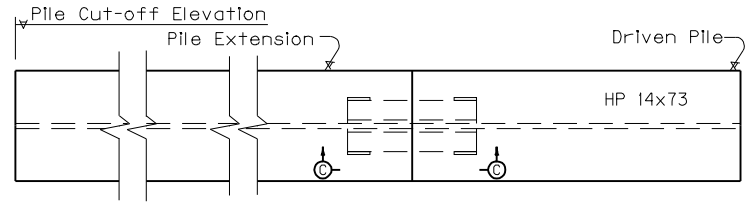
**HP12x53**
**STEEL PILE**

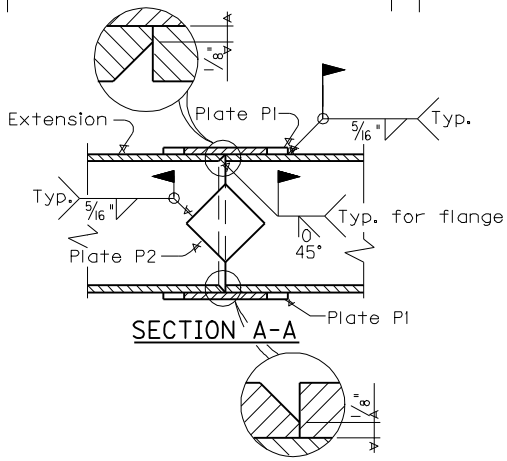
STANDARD DRAWING NO. BPS-003-08

SUBMITTED S.E. Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

APPROVED J.M. Yowell — STATE HIGHWAY ENGINEER — 12-1-99 DATE

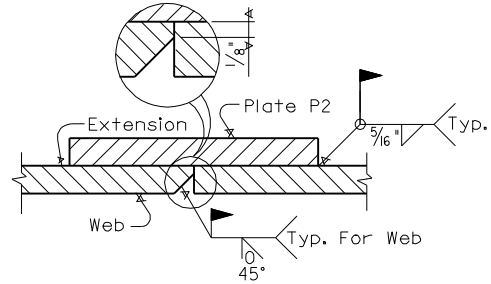


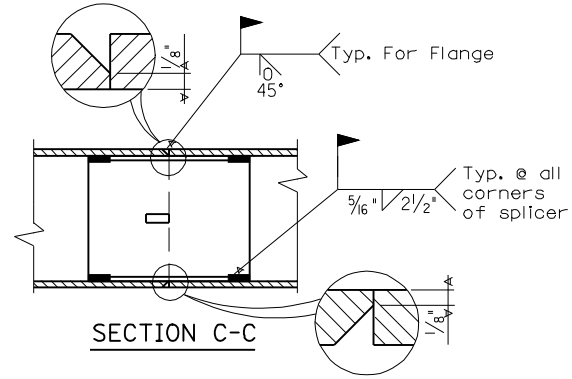




SECTION A-A

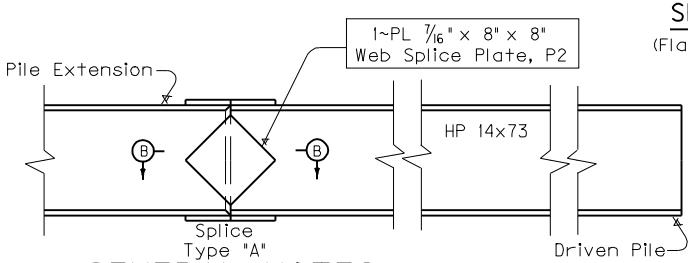
NOTE:
Bevel flanges and web of pile extension on 1:1 bevel as shown and employ conventional butt weld.

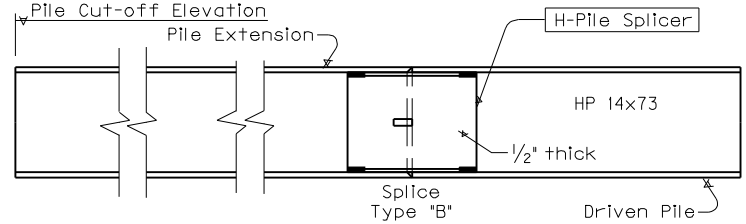



SECTION B-B
(Flange Not Shown)




SECTION C-C




## GENERAL NOTES

SPECIFICATIONS: Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, current edition.

MATERIALS: Ensure structural steel piles conforms to A.S.T.M. A36, current Specifications.

SPLICE PLATES: Ensure all pile splicing options conform to A.S.T.M. A36,current Specifications. In lieu of Splice Option "A" or Splice option "B", splice plates may be flame cut from HP14x73 sections. If flange sections are used, the portion cut at the web must be turned outside in order to obtain a tight fit. Grind the edges smooth prior to welding.

SPLICE OPTION "B": The pile splicer shown in the details for Splice Option "B" may be Champion H-Pile Splicer, Model HP 30000, or an approved equal. Ensure the splicer is in accordance to the manufacturer's recommendations and subject to the Engineer's approval.

FIELD WELDS: Ensure field welding material and workmanship for all piling conforms to the current Joint Specifications ANSI/AASHTO/AWS D1.5 Bridge Welding Code. Splice piles as indicated above only when driven below cut-off elevation.

PAYMENT: Payment for the piles in accordance with plans and specifications will be made at the contract price per linear foot.

PAINT: No painting is required on steel piles.

MILL TEST REPORTS: Furnish mill test reports in triplicate to the Department showing that all materials furnished conform to the Specifications.

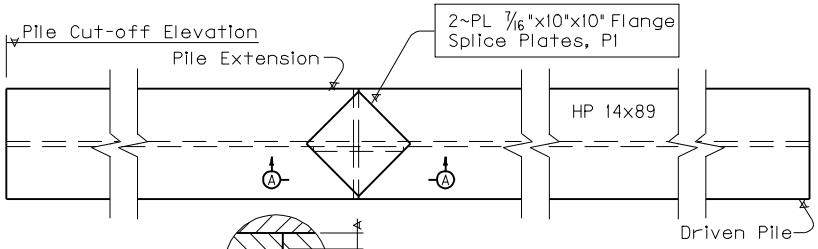
KENTUCKY
DEPARTMENT OF HIGHWAYS

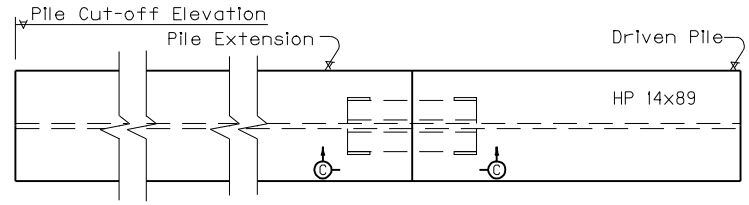
**HP14x73**
**STEEL PILE**

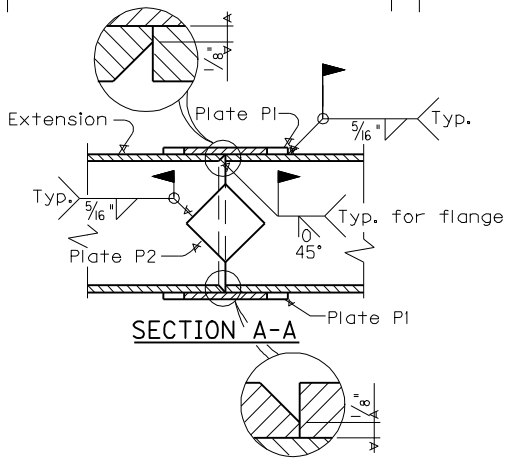
STANDARD DRAWING NO. BPS-009-07

SUBMITTED S.E. Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

APPROVED J.M. Haywell — STATE HIGHWAY ENGINEER — 12-1-99 DATE




SECTION A-A

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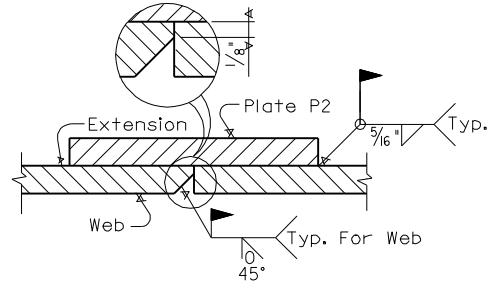
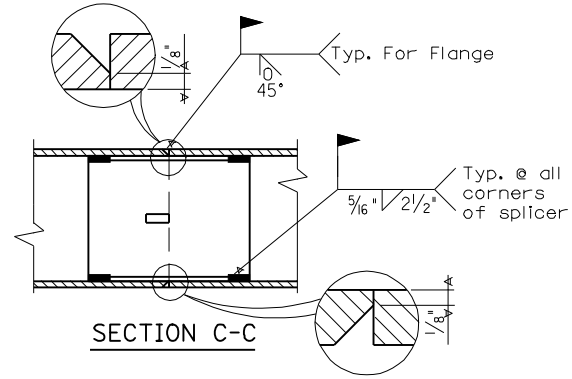
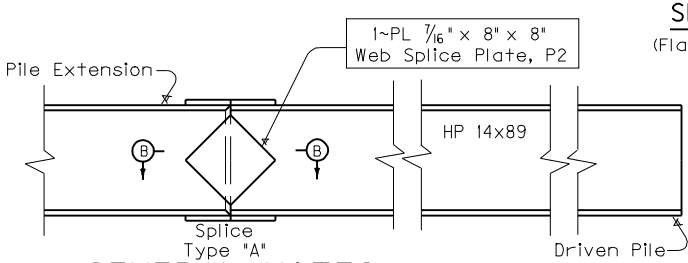
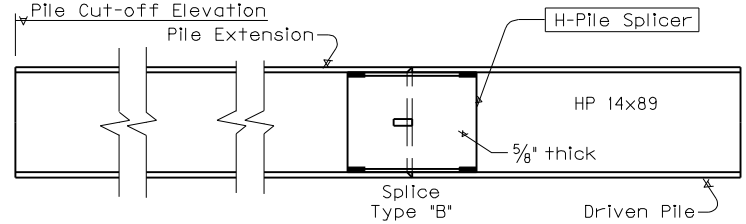



SECTION B-B
(Flange Not Shown)




SECTION C-C

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KENTUCKY
DEPARTMENT OF HIGHWAYS

**HP14x89**
**STEEL PILE**

STANDARD DRAWING NO. BPS-011-03

SUBMITTED S.E. Goodpaster — DIRECTOR DIVISION OF BRIDGE DESIGN — 12-1-99 DATE

APPROVED J.M. Haywood — STATE HIGHWAY ENGINEER — 12-1-99 DATE