OFFICE OF STRUCTURAL ENGINEERING

STANDARD BRIDGE DRAWINGS
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GENERAL NOTES

GENERAL: These drawings provide information for the designer and are not intended for use as construction drawings. The project plans for each structure will show span lengths, roadway width, skew, curve and super-elevation (if any), elevations, slab reinforcement details in plan and cross sections, estimated quantities, concrete sealing limits, seismic pedestal details, reinforcing steel list and other necessary details and special notes.

For deep girder bridges or suspended span bridges, the backwalls, windwalls and windwall footings may have to be more widely placed or additional reinforcing windwall footings may require additional row of piles.

DESIGN DATA:
CONCRETE - compressive strength 4000 psi (substructure)
REINFORCING STEEL - CWS-70.0 grade 60, winnow field strength 60 ksi.

SEISMIC PEDESTALS:

The designer shall determine if the standard end crossframes will clear the pedestals. If not, the crossframes layout shall be modified to clear the pedestals by plan details.
<no natural text content>
SECTION 0-0

SECTION G-G

SECTION F-F

SECTION H-H

SEE SHEET 7-3 FOR DRAINAGE PIPE OUTFIT DETAILS.
PELF - PREFORMED EXPANSION JOINT FILLER.

SECTION J-J

THE LOCATION OF THE MAIN REINFORCEMENT IN THE BEAM SEAT MAY BE ADJUSTED HORIZONTALLY ±1" TO ACCOMMODATE THE AB02 BARS.

* THE SURFACE OF THE BEAM SEAT IN THIS AREA SHALL BE FINISHED WITH A SEGMENTED TRENCH. THE SEGMENTS SHALL BE 1" DEEP MINIMUM.

BENDING DIAGRAMS

4° SKEN ANGLE

TABLE A
DETAIL A

DETAIL B

DETAIL C

DETAIL D

DETAIL E

DETAIL F

NOTE 1: PERFORMED ELASTOMERIC COMPRESSION JOINT SEAL, 100L-II-180 WITH A 1/2" HIGH GROOVE PLACED IN 1 1/2" x 2 1/4" GROOVE.

NOTE 2: 1" DEEP X 1" WIDE NOT APPLIED JOINT SEALER, 705.04.

NOTE 3: 1" DEEP X 1" WIDE NOT APPLIED JOINT SEALER, 705.04.

NOTE 4: TYPE "A" or "E" WATERPROOFING.

NOTE 5: SEASONAL CRACKS - CRACKING AND SEALING ASPHALT CONCRETE PAVEMENT JOINTS.

NOTE 6: SEE SUPPLEMENTAL SPECIFICATION "POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM".

TYPE "A" or "E" WATERPROOFING SHALL NOT EXTEND ABOVE THE BOTTOM OF THE GROOVE INTO WHICH THE PERFORMED ELASTOMERIC COMPRESSION JOINT SEAL IS TO BE PLACED. IT SHALL BE APPLIED TO THE ENTIRE AREA OF THE ABUTMENT OR SUPPLY STRUCTURE WHICH COMES INTO CONTACT WITH THE APPROACH SLAB.


FOR STRUCTURES WITHOUT STOP SEAL, COMPRESSION SEAL OR POLYMER MODIFIED ASPHALT EXPANSION JOINTS, THAT HAVE AN ASPHALT CONCRETE WEARING SURFACE ON BOTH THE BRIDGE DECK AND APPROACH SLAB, EXTEND THE DECK WATERPROOFING 2'-6" BEYOND THE BRIDGE LIMITS. FOR STRUCTURES WITH STOP SEAL AND COMPRESSION SEAL EXPANSION JOINTS, AND THE DECK WATERPROOFING AT THE PRESTRESSED BOX BEAM NOTCH. FOR STRUCTURES WITH POLYMER MODIFIED ASPHALT EXPANSION JOINTS, EXTEND THE DECK WATERPROOFING TO THE CENTERLINE OF THE JOINT.

APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

ON PRESTRESSED CONCRETE BOX BEAM BRIDGES

APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

ON SLAB BRIDGES

CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB

ON PREFERRED CONCRETE BOX BEAM BRIDGES

APPROACH SLAB SUPPORTED ON ABUTMENT BACKWALL

ASPHALT CONCRETE WEARING SURFACE ON BRIDGE DECK AND APPROACH SLAB

BRIDGE LIMIT

BRIDGE LIMIT

BRIDGE LIMIT

BRIDGE LIMIT

BRIDGE LIMIT

BRIDGE LIMIT

ON BRIDGES WITH INTEGRAL CONSTRUCTION

ON BRIDGES WITH INTEGRAL CONSTRUCTION

ON BRIDGES WITH INTEGRAL CONSTRUCTION

ON BRIDGES WITH INTEGRAL CONSTRUCTION

ON BRIDGES WITH INTEGRAL CONSTRUCTION

ON BRIDGES WITH INTEGRAL CONSTRUCTION

CONCRETE WEARING SURFACE ON BRIDGE DECK

CONCRETE WEARING SURFACE ON BRIDGE DECK

CONCRETE WEARING SURFACE ON BRIDGE DECK
AGGREGATE DRAIN, CMS 605.07, 2'-0" WIDE x 1'-0" DEEP, SECTION B-B, AND ADDITIONAL NOTES.

ASPHALT CONCRETE WEARING COURSES, DETAIL A, LIMITS OF AGGREGATE DRAIN, SEE SHEET 214 FOR REINFORCED CONCRETE APPROACH SLAB WITH OPTIONAL FOR APPROACH SLAB REINFORCING STEEL AND ADDITIONAL DETAILS, SEE STD. TO THAT OF THE REINFORCED CONCRETE APPROACH SLAB.

NOTE ON SHEET 14.

THICKNESS OF THE PROPOSED 25-FOOT FLEXIBLE (ASPHALT) PAVEMENT (T2) SHALL DWG. DM-1.1. FOR PIPE INSTALLATIONS SEE STD. CONSTR. DWG. DM-1.2.

SHALL BE SLOPED THE SAME AS THE PAVEMENT CROSS SLOPE.

AGGREGATE BASE IS TOWARDS THE APPROACH SLAB AND SLEEPER SLAB.

GRANULAR MATERIAL IS ONLY REQUIRED IF THE LONGITUDINAL SLOPE OF THE 6" DIA. PERFORATED PIPE (CMS 707.31) UNDERDRAIN (CMS 605.03) INCLUDING CENTERED ON THE CENTERLINE OF SLEEPER SLAB.

SEE DETAIL AA ON SHEET 214.

CAST-IN-PLACE CONCRETE TURNBACK WINGWALLS AND 6" DIA. PERFORATED PIPE UNDERDRAIN NOT SHOWN.

PROPOSED/EXISTING FLEXIBLE (ASPHALT) PAVEMENT THICKNESS TAPERS FROM T2 TO T3.

NOTE ON SHEET 214.

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
STANDARD BRIDGE DRAWING
3-2-15

SECTION A-A

INDEX OF DRAWINGS

SHEET NO. DESCRIPTION
1 OF 14 TYPE A INSTALLATION
2 OF 14 TYPE A INSTALLATION ADDITIONAL DETAILS, NOTES, AND SECTIONS
3 OF 14 TYPE B INSTALLATION WITH PROPOSED FLEXIBLE (ASPHALT) PAVEMENT
4 OF 14 TYPE B INSTALLATION WITH PROPOSED RIGID (CONCRETE) PAVEMENT
5 OF 14 TYPE B INSTALLATION ADDITIONAL DETAILS, NOTES, AND SECTIONS
6 OF 14
7 OF 14 TYPE C INSTALLATION WITH CAST-IN-PLACE CONCRETE TURNBACK WINGWALLS AND PROPOSED FLEXIBLE (ASPHALT) PAVEMENT
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9 OF 14 TYPE C INSTALLATION WITH CAST-IN-PLACE CONCRETE TURNBACK WINGWALLS AND PROPOSED RIGID (CONCRETE) PAVEMENT
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12 OF 14 TYPE C INSTALLATION WITH CAST-IN-PLACE CONCRETE TURNBACK WINGWALLS AND PROPOSED RIGID (CONCRETE) PAVEMENT
13 OF 14
14 OF 14 GENERAL NOTES

REINFORCING STEEL FOR SLEEPER SLAB

MARK LENGTH TYPE BENDING DIAGRAMS
S5501 A STR
S5502 B STR S5501
A = cos 0.5°
B = cos 0.5° 8
A = 7.5°
B = 7.5°

SEE DETAIL A FOR CONCRETE APPROACH SLAB WITH OPTIONAL ASPHALT CONCRETE MEANING COURSES, DETAIL A, LIMITS OF AGGREGATE DRAIN, SECTION B-B, AND ADDITIONAL NOTES.

F L E X I B L E  ( A S P H A L T )  P A V E M E N T  
P R O P O S E D  R I G I D  ( C O N C R E T E )  P A V E M E N T

B R I D G E  L I M I T  
B U R I E D  A P P R O A C H  S L A B

S E C T I O N  A - A
R E N D E R I N G  S T E E L  N O T  S H O W N

N O T E S:
1. 1" PREFORMED EXPANSION JOINT FILLER SHALL EXTEND UP BETWEEN CAST-ON-PLACE CONCRETE TURNBACK WINGWALLS AND THE SIDE FACES OF APPROACH SLAB AND PROPOSED FLEXIBLE ASPHALT PAVEMENT TO THE ELEVATION OF 1" BELOW THE FINAL SURFACE ELEVATION OF THE FLEXIBLE ASPHALT PAVEMENT. THEN, APPLY 1" DEEP x 1" WIDE HOT APPLIED JOINT SEALER AS PER CMS 705.04.
2. SEE STD. CONSTR. DWG. DM-4.1.
3. FOR DETAIL A AND ADDITIONAL NOTES, SEE SHEET 514.

L E G E N D:
P.E.J.F. = PREFORMED EXPANSION JOINT FILLER
1" P.E.J.F. (TYP.)
1" DEEP x 1" WIDE HOT APPLIED JOINT SEALER AS PER CMS 705.04.
5'-0" REINFORCED JOINT MESH, CENTERED ON JOINT, WITH TACK SEALER, CMS 705.04.
5'-0" REINFORCED JOINT MESH, CENTERED ON JOINT, WITH TACK SEALER, CMS 705.04.
FLEXIBLE ASPHALT PAVEMENT
PROPOSED RIGID (CONCRETE) PAVEMENT
PREFORMED EXPANSION JOINT FILLER
PRECAST CONCRETE TURNBACK WINGWALL
CAST-ON-PLACE CONCRETE TURNBACK WINGWALL (TYP.)
25'-0" FLEXIBLE (ASPHALT) PAVEMENT
25'-0" PROPOSED RIGID (CONCRETE) PAVEMENT
2'-0" REINFORCED CONCRETE APPROACH SLAB
1'-0" PEA F (TYP.)
R E N D E R I N G  S T E E L  N O T  S H O W N

S E C T I O N  A - A
R E N D E R I N G  S T E E L  N O T  S H O W N
DETAILED DIAGRAM:

OUTSIDE EDGE OF APPROACH SLAB AT THE END OF CONCRETE BRIDGE RAILING (TYPE 4-B CONCRETE CURB ON APPROACH SLAB AND THREE-BEAM RAIL NOT SHOWN)

REINFORCED JOINT MESH:
This item shall be used to reinforce the transverse joints. Place reinforcing mesh on proposed surface as shown in Section 4-A, Sheets 314 and 414. 1'-0" wide, along the length shown (measured along the skew), and centered on the joint. Apply a tack coat to maximize the bond between the two adjoining surfaces. After placement of the reinforced joint mesh, place the asphalt concrete as shown on the roadway plans. The reinforced joint mesh material shall be classified refin or macon as 25T. The reinforced joint mesh and a tack coat shall be placed in accordance with the manufacturer’s specifications.

LEMED:
P.E.J.F. = PREFORMED EXPANSION JOINT FILLER

NOTES:
1. "PREFORMED EXPANSION JOINT FILLER SHALL EXTEND UP BETWEEN CAST-IN-PLACE CONCRETE TURNBACK WINGWALLS AND THE SIDE FACES OF APPROACH SLAB AND PROPOSED FLEXIBLE ASPHALT PAVEMENT TO THE ELEVATION OF 1" BELOW THE FINAL SURFACE ELEVATION OF THE FLEXIBLE ASPHALT PAVEMENT. THEN, APPLY 1" DEEP X 1" WIDE HOT APPLIED JOINT SEALER AS PER CMS 705.04."
2. FOR MIDWEST GUARDRAIL SYSTEM, BRIDGE TERMINAL ASSEMBLY, TYPE 1, SEE STD. CONST. DWG. MGS-3.1. FOR MGS BRIDGE TERMINAL ASSEMBLY, TYPE 2, SEE STD. CONST. DWG. MGS-3.2.
3. FOR TYPE 4-B CONCRETE CURB, SEE STD. CONST. DWG. BP-5.1.
5. PROVIDE "PREFORMED EXPANSION JOINT FILLER AT THE INTERFACE BETWEEN END OF CONCRETE BRIDGE RAILING AND TYPE 4-B CONCRETE CURB."
6. FOR GENERAL NOTES, SEE SHEET 1414.
STATE OF OHIO DEPARTMENT OF TRANSPORTATION

DATE
ADMINISTRATOR
DESIGN AGENCY

REVISIONS
OFFICE OF STRUCTURAL ENGINEERING

STANDARD BRIDGE DRAWING

SECTION A-A
REINFORCING STEEL FOR SLEEPER SLAB

NOTES:

1. FOR DETAIL A, DETAIL B, AND ADDITIONAL NOTES, SEE SHEET 14 14.
2. FOR ARMORELESS PREFORMED Joints Seal OPENING TABLE SEE SHEET 14 14 FORM JOINT OPENING USING REMOVABLE FORM.
4. IF THE SKEW ANGLE IS 0°, INCREASE THE LENGTH OF SS501 REBARS SO THAT THE TOTAL LENGTH OF SS501 REBARS SHALL BE THE APPROACH SLAB WIDTH OUT-TO-OUT MINUS 6" AND OMIT SS504 SPlice REBARS. SEE DETAIL A ON SHEET 14 14.
5. APPLY BOND BREAKER TO THE ENTIRE TOP SURFACE OF THE CONCRETE SLEEPER SLAB. SEE "REINFORCED CONCRETE SLEEPER SLAB SURFACE FINISH AND BOND BREAKER" NOTE ON SHEET 14 14.
6. FOR GENERAL NOTES, SEE SHEET 14 14.

FOR APPROACH SLAB REINFORCING STEEL AND ADDITIONAL DETAILS, SEE STD. BRIDGE DWG. AS-1-15.

LEGEND
P.E.J.F. = PREFORMED EXPANSION JOINT FILLER

PLAN
JOINTLESS SUPERSTRUCTURE WITH MSE WALLS AND PROPOSED FLEXIBLE (ASPHALT) PAVEMENT JOINED SUPERSTRUCTURE SIMILAR

ELEVATION
TAKEN PERPENDICULAR TO E ROADWAY, LOOKING UP-STATION

REINFORCED CONCRETE APPROACH SLAB

PROPOSED FLEXIBLE (ASPHALT) PAVEMENT

APPROACH SLAB WIDTH (TOE-TO-TOE)

APPROACH SLAB WIDTH (OUT-TO-OUT)

LEGEND:
P.E.J.F. = PREFORMED EXPANSION JOINT FILLER

THICKNESS OF PROPOSED REINFORCED CONCRETE APPROACH SLAB

THICKNESS OF PROPOSED ASPHALT PAVEMENT

THICKNESS OF PROPOSED AGGREGATE BASE.

CONCRETE APPROACH SLAB.

THICKNESS OF PROPOSED FLEXIBLE (ASPHALT) PAVEMENT.

REINFORCING STEEL NOT SHOWN

SEE DETAIL A

SEE DETAIL B

SEE NOTE 2

SEE NOTE 3

SEE NOTE 4

SEE NOTE 5

SEE DETAIL A

FOR DETAIL A, DETAIL B, AND ADDITIONAL NOTES, SEE SHEET 14 14.

FOR ARMORELESS PREFORMED Joints Seal OPENING TABLE SEE SHEET 14 14 FORM JOINT OPENING USING REMOVABLE FORM.

FOR APPROACH SLAB REINFORCING STEEL AND ADDITIONAL DETAILS, SEE STD. BRIDGE DWG. AS-1-15.

IF THE SKEW ANGLE IS 0°, INCREASE THE LENGTH OF SS501 REBARS SO THAT THE TOTAL LENGTH OF SS501 REBARS SHALL BE THE APPROACH SLAB WIDTH OUT-TO-OUT MINUS 6" AND OMIT SS504 SPlice REBARS. SEE DETAIL A ON SHEET 14 14.

APPLY BOND BREAKER TO THE ENTIRE TOP SURFACE OF THE CONCRETE SLEEPER SLAB. SEE "REINFORCED CONCRETE SLEEPER SLAB SURFACE FINISH AND BOND BREAKER" NOTE ON SHEET 14 14.

GENERAL NOTES, SEE SHEET 14 14.

FOR APPROACH SLAB REINFORCING STEEL AND ADDITIONAL DETAILS, SEE STD. BRIDGE DWG. AS-1-15.
NOTES:

1. FOR LOCATION OF DETAIL A, DETAIL B, AND REINFORCING STEEL LIST, SEE SHEET 814.

2. FOR SECTIONS B-B, C-C, D-D, AND ADDITIONAL NOTES, SEE SHEET 814.

3. IF THE SKEW ANGLE IS 0°, 
   EQUAL TO ZERO.

4. IF THE SKEW ANGLE IS GREATER THAN 0°, 
   ADDITIONAL LENGTH DUE TO GEOMETRY 
   (SEE NOTE 3 ON SHEET 814).

5. FOR SECTIONS B-B, C-C, D-D, AND ADDITIONAL NOTES, SEE SHEET 814.


7. IF THE SKEW ANGLE IS 0°, 
   AND 
   EQUAL TO ZERO.

8. FOR SECTIONS B-B, C-C, D-D, AND ADDITIONAL NOTES, SEE SHEET 814.

9. IF THE SKEW ANGLE IS GREATER THAN 0°, 
   ADDITIONAL LENGTH DUE TO GEOMETRY 
   (SEE NOTE 3 ON SHEET 814).

10. FOR SECTIONS B-B, C-C, D-D, AND ADDITIONAL NOTES, SEE SHEET 814.

11. FOR LOCATION OF DETAIL A, DETAIL B, AND REINFORCING STEEL LIST, SEE SHEET 814.

LEGEND:

P.E.J.F. = PREFORMED EXPANSION JOINT FILLER

A: Additional length due to skew angle greater than 0°.

a: See Note 3 on this sheet.

b: See Note 4 on sheet 814.

c: See Note 5 on sheet 814.

d: See Note 6 on sheet 814.

e: See Note 7 on sheet 814.

D: Depth of joint slab.

F: Reinforcing steel.

M: Reinforcing steel.

T: Thickness of material.

W: Width of material.
**NOTES:**

2. FOR ARMORLESS PREFORMED JOINT SEAL OPENING TABLE, SEE SHEET 14.
3. APPLY BOND BREAKER TO THE ENTIRE TOP SURFACE OF THE CONCRETE SLEEPER SLAB. SEE REINFORCED CONCRETE SLEEPER SLAB SURFACE FINISH AND BOND BREAKER NOTE ON SHEET 14.
4. IF THE SKEW ANGLE IS 0°, \( \alpha_1 = \alpha_2 \) AND \( \alpha_1 = \alpha_2 = 0 \).

**SECTION B-B:**

- REINFORCING STEEL AND MSE WALL NOT SHOWN

**SECTION C-C:**

- REINFORCING STEEL AND MSE WALL NOT SHOWN

**SECTION D-D:**

- REINFORCING STEEL AND MSE WALL NOT SHOWN

---

**LEGEND:**

- P.E.J.F. = PREFORMED EXPANSION JOINT FILLER
- T1 = THICKNESS OF PROPOSED REINFORCED CONCRETE APPROACH SLAB, SEE BRIDGE PLAN

**ITEM 516 - ARMORLESS PREFORMED JOINT SEAL:**

- INSTALL THE ARMORLESS PREFORMED JOINT SEAL IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND UNDER THE SUPERVISION OF THE MANUFACTURER'S DESIGNATED REPRESENTATIVE.

- SELECT THE ARMORLESS PREFORMED JOINT SEAL FROM ONE OF THE MANUFACTURERS LISTED BELOW:
  - WATSON, INC.
  - P.O. BOX 795
  - VELTON, OH 43564
  - PHONE: (419) 257-8000
  - FAX: (419) 257-2200
  - SILICOFLEX S2-400 MAX. MOVEMENT RATING 4"

- WATSON BROWN ACME CORP.
- 95 PINEVIEW DRIVE
- AMHERST, OH 44001-1101
- PHONE: (716) 691-8800
- FAX: (716) 691-9239
- WABO SPS-400 MAX. MOVEMENT RATING 4"

- WATSON BROWN ACME CORP.
- 95 PINEVIEW DRIVE
- AMHERST, OH 44001-1101
- PHONE: (716) 691-8800
- FAX: (716) 691-9239
- WABO SPS-400 MAX. MOVEMENT RATING 4"

- ARMORLESS PREFORMED JOINT SEAL

- ITEM 516 - ARMORLESS PREFORMED JOINT SEAL (CONT.):
  - IF THE SKEW ANGLE IS 0°, \( \alpha_1 = \alpha_2 \) AND \( \alpha_1 = \alpha_2 = 0 \).

- ITEM 516 - ARMORLESS PREFORMED JOINT SEAL INSTALLATION:

- THE SEAL AND ADHESIVE ARE AN INTEGRAL JOINT SYSTEM THAT SHALL BE DESIGNED AND SUPPLIED BY THE SAME MANUFACTURER.

- SELECT THE ARMORLESS PREFORMED JOINT SEAL FROM ONE OF THE MANUFACTURERS LISTED BELOW:

  **SUPERVISING OFFICE**

  **MANUFACTURERS LISTED BELOW:**

  - WATSON, INC.
  - P.O. BOX 795
  - VELTON, OH 43564
  - PHONE: (419) 257-8000
  - FAX: (419) 257-2200
  - SILICOFLEX S2-400 MAX. MOVEMENT RATING 4"

  - WATSON BROWN ACME CORP.
  - 95 PINEVIEW DRIVE
  - AMHERST, OH 44001-1101
  - PHONE: (716) 691-8800
  - FAX: (716) 691-9239
  - WABO SPS-400 MAX. MOVEMENT RATING 4"

  - WATSON BROWN ACME CORP.
  - 95 PINEVIEW DRIVE
  - AMHERST, OH 44001-1101
  - PHONE: (716) 691-8800
  - FAX: (716) 691-9239
  - WABO SPS-400 MAX. MOVEMENT RATING 4"

- ITEM 516 - ARMORLESS PREFORMED JOINT SEAL INSTALLATION:

- THE SEAL AND ADHESIVE ARE AN INTEGRAL JOINT SYSTEM THAT SHALL BE DESIGNED AND SUPPLIED BY THE SAME MANUFACTURER.

- SELECT THE ARMORLESS PREFORMED JOINT SEAL FROM ONE OF THE MANUFACTURERS LISTED BELOW:

- ITEM 516 - ARMORLESS PREFORMED JOINT SEAL INSTALLATION:

- THE SEAL AND ADHESIVE ARE AN INTEGRAL JOINT SYSTEM THAT SHALL BE DESIGNED AND SUPPLIED BY THE SAME MANUFACTURER.
DETAIL A

JOINTLESS SUPERSTRUCTURE WITH CAST-IN-PLACE CONCRETE TURNBACK WINGWALLS AND PROPOSED FLEXIBLE (ASPHALT) PAVEMENT

NOTES:
1. FOR LOCATION OF DETAIL A AND REINFORCING STEEL LIST, SEE SHEET 14.
2. FOR SECTIONS C-C, D-D, E-E, AND ADDITIONAL NOTES, SEE SHEET 11.
3. IF THE SKEW ANGLE IS 0°, A AND B EQUAL TO ZERO.
4. REBARS SS502 AND SS503 SHALL BE PLACED PARALLEL TO CENTERLINE OF ROADWAY.
5. FOR ARMORLESS PREFORMED JOINT SEAL OPENING TABLE, SEE SHEET 14.
6. FOR ARMORLESS PREFORMED JOINT SEAL NOTE, SEE SHEET 14.
7. APPLY BOND BREAKER TO THE ENTIRE TOP SURFACE OF THE CONCRETE SLEEPER SLAB. SEE "REINFORCED CONCRETE SLEEPER SLAB SURFACE FINISH AND BOND BREAKER" NOTE ON SHEET 14.
8. FOR TYPE 4-A CONCRETE CURB AND TYPE 4-C CONCRETE CURB, SEE STD. CONST. CMS (P=0).
NOTES:
1. FOR LOCATION OF SECTIONS C-C, D-D, AND E-E, SEE SHEET 14-14.
2. FOR MIDWEST GUARDRAIL, SYSTEM BRIDGE TERMINAL ASSEMBLY, TYPE 1, SEE STD. CONST. DWG. MGS-3.1. MGS BRIDGE TERMINAL ASSEMBLY, TYPE 2 (STD. CONST. DWG. MGS-3.2) SIMILAR.
3. FOR TYPE 4-A CONCRETE CURB AND TYPE 4-C CONCRETE CURB, SEE STD. CONST. DWG. MGS-3.1.
4. FOR APPROACH SLAB REINFORCING STEEL AND ADDITIONAL DETAILS, SEE STD. BRIDGE DWG. BP-5.1.
5. FOR ARMORLESS PREFORMED JOINT SEAL OPENING TABLE, SEE SHEET 14-14.
6. FOR ARMORLESS PREFORMED JOINT SEAL NOTE, SEE SHEET 14-14.
7. FOR GENERAL NOTES, SEE SHEET 14-14.
8. PLACE DRAINS AND OUTLETS ON THE LOW SIDE OF SUPERELEVATED APPROACH SLABS AND BOTH SIDES IF THE APPROACH SLABS IS CROWNED.
9. PLACE DRAINS AND OUTLETS ON THE LOW SIDE OF SUPERELEVATED APPROACH SLABS FOR GENERAL NOTES, SEE SHEET 14-14.
10. FOR ARMORLESS PREFORMED JOINT SEAL OPENING TABLE, SEE SHEET 14-14.
11. FOR MIDWEST GUARDRAIL SYSTEM BRIDGE TERMINAL ASSEMBLY, TYPE 1, SEE STD. CONST. DWG. MGS-3.1.
12. FOR MIDWEST GUARDRAIL SYSTEM NOT SHOWN.
NOTE:
1. For additional details, notes, reinforcing steel list, armorless preformed joint seal opening table, see sheets 1414 through 1414.
2. For Type B pressure relief joint, see Std. Construct. DWG. BP-2.4.
3. For Approach Slab reinforcing steel and additional details, see Std. Bridge DWG. AS-13-15.
4. For general notes, see Sheet 1414.
GENERAL NOTES

GENERAL:
This standard drawing provides design and general construction details. The project plans shall show skew angles, special notes and details where necessary, and a pay item for type A, type B, or type C installation in the estimated quantities table. For conditions other than those indicated herein, the approach slab installation shall be adapted to fit the ends of the reinforced concrete approach slab.

For bridges and approach slabs with sidewalks, the details will be similar to the details shown here. The width of the approach slab shall be the full width of the bridge and the sidewalk will be on top of the approach slab.

DESCRIPTION:
Perform work in accordance with CMS 526 except as noted herein.

DESIGN CRITERIA:

DESIGN DATA:

DESIGN LOADS:
F.W.S. = 0.080 KSF

DESIGN STRESSES:
CONCRETE - COMPRESSIVE STRENGTH = 4.5 KSI
REINFORCING STEEL - MIN. YIELD STRENGTH = 60 KSI

REINFORCED CONCRETE SLEEPER SLAB LENGTH:
For type A installation and type C installation, the length of sleeper slab shall be for the entire width of the approach slab as shown on sheets 1141 through 1214 and sheets 1314 through 1414, respectively. For a skewed structure, the sleeper slab shall be placed parallel to the skew at the end of approach slab.

LONATIONAL CONSTRUCTION JOINTS:
For stage construction, longitudinal joint shall be in accordance with CMS 511.4. After water curing has been completed, membrane cure the sleeper slab. Apply a second coat of the membrane cure to the sleeper slab prior to approach slab concrete pour at the same dosage rate specified in CMS 511.4.6 to the surfaces labeled "Bond Breaker" on sheets 1114 and 1214 for type A installation and sheets 1314 through 1414 for type C installation.

REPAIRED CONCRETE SLEEPER SLAB SURFACE FINISH AND BOND BREAKER:

REINFORCED CONCRETE SLEEPER SLAB SURFACE FINISH AND BOND BREAKER:
For type A installation and type C installation, the top surface of reinforced concrete sleeper slab shall be steel troweled for a smooth finish.

WATER CURE THE SLEEPER SLAB AS PER CMS 511.4.6. After water curing has been completed, membrane cure the sleeper slab as per CMS 511.4.6. Apply a second coat of the membrane cure to the sleeper slab prior to approach slab concrete pour at the same dosage rate specified in CMS 511.4.6 to the surfaces labeled "Bond Breaker" on sheets 1114 and 1214 for type A installation and sheets 1314 through 1414 for type C installation.

REPAIRING COATING DAMAGE IDENTIFIED BY THE ENGINEER.

METHOD OF MEASUREMENT:
For type A installation and type C installation, the length of the completed in place and measured along the skew at the end of the approach slab. For type B installation sheets 1114 through 1214, the department will measure reinforced concrete sleeper slab by the number of linear feet complete in place and measured along the skew at the end of the approach slab.

BASIS OF PAYMENT:
The department will pay for accepted quantities at the contract price for item 526 - type * installation (* : designer should fill in the appropriate type A, type B, or type C which includes:
- 6" SBA. PERFORATED PIPE CMS 707.30 UNDERDRAIN (TYPE A INSTALLATION)
- GRANULAR MATERIAL FOR THE UNDERDRAIN (TYPE A INSTALLATION)
- PIPE COUPLINGS TYPE A INSTALLATION
- PIPE OUTLETS AS PER STD. CONSTR. DWG. DM-1.1 AND PIPE INSTALLATIONS AS PER STD. CONSTR. DWG. DM-1.2, IF REQUIRED (TYPE A INSTALLATION)
- AGGREGATE DRAINS (TYPE A INSTALLATION AND TYPE C INSTALLATION)
- REINFORCED JOINT MESH (TYPE B INSTALLATION)
- EXCAVATION FOR REINFORCED CONCRETE SLEEPER SLAB (TYPE A INSTALLATION AND TYPE C INSTALLATION)
- REINFORCED CONCRETE SLEEPER SLAB (TYPE A INSTALLATION AND TYPE C INSTALLATION)
- REINFORCED STEEL INCLUDING SUPPORTS, TIE WIRES, AND IF REQUIRED, MECHANICAL CONNECTORS (TYPE A INSTALLATION AND TYPE C INSTALLATION)
- BOND BREAKER (TYPE A INSTALLATION AND TYPE C INSTALLATION)
- LONGITUDINAL CONSTRUCTION JOINT FOR STAGE CONSTRUCTION, IF REQUIRED FOR TYPE A INSTALLATION AND TYPE C INSTALLATION

EXCAVATION FOR REINFORCED CONCRETE SLEEPER SLAB (TYPE A INSTALLATION)
POLYMER MODIFIED ASPHALT JOINT SYSTEMS (TYPE A INSTALLATION)
OPTICAL ASPHALT CONCRETE WEARING COURSES
GRANULAR MATERIAL FOR THE UNDERDRAIN
6" DIA. PERFORATED PIPE (CMS 707.31) UNDERDRAIN
REINFORCED JOINT MESH (TYPE B INSTALLATION)
OPTIONAL ASPHALT CONCRETE WEARING COURSES
TAR COAT
POLYMER MODIFIED ASPHALT JOINT SYSTEMS (TYPE A INSTALLATION)
ARMORED PREFORMED JOINT SEAL (TYPE C INSTALLATION)
PREFORMED EXPANSION JOINT FILLER

PREFORMED EXPANSION JOINT FILLER
ARMORLESS PREFORMED JOINT SEAL (TYPE C INSTALLATION)
POLYMER MODIFIED ASPHALT JOINT SYSTEMS (TYPE A INSTALLATION)
OPTIONAL ASPHALT CONCRETE WEARING COURSES
GRANULAR MATERIAL FOR THE UNDERDRAIN
6" DIA. PERFORATED PIPE (CMS 707.31) UNDERDRAIN
REINFORCED JOINT MESH (TYPE B INSTALLATION)
OPTIONAL ASPHALT CONCRETE WEARING COURSES
GRANULAR MATERIAL FOR THE UNDERDRAIN
6" DIA. PERFORATED PIPE (CMS 707.31) UNDERDRAIN
REINFORCED JOINT MESH (TYPE B INSTALLATION)
OPTIONAL ASPHALT CONCRETE WEARING COURSES
GRANULAR MATERIAL FOR THE UNDERDRAIN
6" DIA. PERFORATED PIPE (CMS 707.31) UNDERDRAIN
REINFORCED JOINT MESH (TYPE B INSTALLATION)
OPTIONAL ASPHALT CONCRETE WEARING COURSES
GRANULAR MATERIAL FOR THE UNDERDRAIN
6" DIA. PERFORATED PIPE (CMS 707.31) UNDERDRAIN
REINFORCED JOINT MESH (TYPE B INSTALLATION)
OPTIONAL ASPHALT CONCRETE WEARING COURSES
GRANULAR MATERIAL FOR THE UNDERDRAIN
6" DIA. PERFORATED PIPE (CMS 707.31) UNDERDRAIN
REINFORCED JOINT MESH (TYPE B INSTALLATION)
OPTIONAL ASPHALT CONCRETE WEARING COURSES
GRANULAR MATERIAL FOR THE UNDERDRAIN
6" DIA. PERFORATED PIPE (CMS 707.31) UNDERDRAIN
REINFORCED JOINT MESH (TYPE B INSTALLATION)
OPTIONAL ASPHALT CONCRETE WEARING COURSES
GRANULAR MATERIAL FOR THE UNDERDRAIN
6" DIA. PERFORATED PIPE (CMS 707.31) UNDERDRAIN
REINFORCED JOINT MESH (TYPE B INSTAL
**SECTION A-A**

**PLAN VIEW**
36° BR-1 PARAPET TRANSITION MOUNTED ON TURNBACK WINGWALL
WITH TYPICAL ABUTMENT SHOWN

**SECTION B-B**
(DRAWING SHOWN)
C-C

**SECTION D-D**

**SECTION E-E**

**REINFORCING STEEL FOR 36° BR-1 TRANSITION MOUNTED ON WINGWALL**

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<td>X503</td>
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**LEGEND**

- **N.S.** = Near Side
- **F.S.** = Far Side
- **E.S.** = Each Side
- **P.E.JF.** = Prefabricated Expansion Joint Filler

**NOTES**

1. FOR ALL NEW JERSEY SHAPE CONCRETE BRIDGE RAILINGS INCLUDING THE 36° TRANSITIONS, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MASTERS, REINFORCING BENDING DIAGRAMS, AND REINFORCING WEIGHTS.
2. SEE APPROPRIATE STANDARD BRIDGE DRAWING FOR ABUTMENT DETAILS.
3. FOR BRIDGE TERMINAL ASSEMBLY, SEE STD. CONSTR.oms. M05-1 AND M05-2.
4. FOR DEFLECTION JOINT DETAILS AND ADDITIONAL NOTES, SEE SHEET M00.
REINFORCING STEEL FOR 42° BR-1 TRANSITION MOUNTED ON BRIDGE OR APPROACH SLAB

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PLAN VIEW
42º BR-1 PARAPET TRANSITION MOUNTED ON TURNBACK WINGWALL
WITH TYPICAL ABUTMENT SHOWN

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

REINFORCING STEEL FOR 42º BR-1 TRANSITION MOUNTED ON WINGWALL

LEGEND
N.S. = NEAR SIDE
F.S. = FAR SIDE
E.S. = EACH SIDE
P.E.J.F. = PREFORMED EXPANSION JOINT FILLER

DETAIL B
SECTION THROUGH SAMCUT SAMCUT PERIMETER = 3'-6"
PLAN - MODIFIED BP-1 OR BP-3

STEEL TUBE RAILING NOT SHOWN

ELEVATION - MODIFIED BP-1 OR BP-3

SEE NOTE 1
REINFORCING STEEL NOT SHOWN

LEGEND:

DIA. = DIAMETER

HSS = HOLLOW STRUCTURAL SECTION

R = RADIUS

NOTES:

1. FOR BRIDGE SIDEWALK RAILING WITH VANDAL PROTECTION FENCE AS SHOWN IN STD. BRIDGE DWG. VFP-1/60. MODIFIED BP-1 OR BP-3 SHALL BE UTILIZED INSTEAD OF BP-4 OR BP-3 IN ORDER TO ACCOMODATE PLACEMENT OF VANDAL PROTECTION FENCE POSTS AND POST SLEEVES. FOR ADDITIONAL DETAILS AND NOTES ON VANDAL PROTECTION FENCE, SEE STD. BRIDGE DWG. VFP-1/60.

2. FOR DEFLECTION JOINT DETAILS AND GENERAL NOTES, SEE SHEET 313.

3. FABRICATE POST SLEEVE AND ATTACH TO BASE PLATE AS SHOWN ON STD. BRIDGE DWG. VFP-1/60, SHEET 313.
GENERAL NOTES

THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAMPLING. HOWEVER, THE SAMPLING SHALL NOT BE LESS THAN 1" DOWNTOWARD THE TOP OF THE CONCRETE DECK SLAB.

USE AN ELEVATION, FENCE, OR OTHER MEANS TO ENSURE THAT THE CUT JOINT IS STRAIGHT, TRUE, AND ALIGNED ON ALL PIECES OF THE PARAPET. THE关节 POINT SHALL BE THE END OF THE NEW COVER, A NOMINAL WIDTH OF 36" INCH.

SEAL THE PERIMETER OF THE DEFLATION JOINTS TO A MINIMUM DEPTH OF ONE INCH WITH A POLYURETHANE OR POLYUREA MATERIAL CONFORMING TO ASTM C930, TYPE S, LEAVE THE BOTTOM 36" INCH OF THE COVER INLET OR OUTLET A促进了 UNSHAPE ROOMS TO ALLOW FOR ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.

MINIMUM EMBEDMENT OF VERTICAL REINFORCING BARS: THE MINIMUM EMBEDMENT FOR THE VERTICAL REINFORCING BARS INTO THE BRIDGE DECK, APPROACH SLAB, DECK, OR SIDEWALK IS NOT MET, THEN THE DESIGNER SHALL CALCULATE THE HAZARDOUS FREQUENCY OF THE PARAPET. IT IS THE JOB OF THE DESIGNER TO ENSURE THAT THE "ASHTON GIBBS PARAPET DESIGN SPECIFICATIONS" ARE MET TO COMPLY WITH THE ASHIBONL GIBBS PARAPET DESIGN SPECIFICATIONS AS DATED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.


FOR BRIDGE SIDEWALK RAILING WITH VANDAL PROTECTION FENCES, THE DEPARTMENT WILL PAY FOR ACCEPTABLE QUANTITIES AT THE CONTRACT PRICE FOR ITEM SI.7, FENCE, RADIUS frame CONCRETE PARAPET WITH 3/4" STEEL TUBE RATING AND VANDAL PROTECTION. FENCES which includes Fabrication of steel plates with post sleeves and hexagonal socket set screws.

THE DEPARTMENT WILL PAY FOR ALL REMAINING VANDAL PROTECTION FENCE COMPONENTS SEPARATELY.


PART PLAN AT ABUTMENT
SQUARE STRUCTURE WITH TWIN STEEL TUBE BRIDGE RAILING
BRIDGE TERMINAL ASSEMBLY AND BRIDGE RAILING NOT SHOWN

ELEVATION
FOR SECTION F-F SEE SHEET 4 OF 4
(BRIDGE TERMINAL ASSEMBLY NOT SHOWN)
**GENERAL NOTES**

**DESIGN SPECIFICATIONS**
This standard drawing conforms to the "Marsh Lane Bridge Design Specifications" adopted by the American Association of State Highway and Transportation Officials, 2001, including the 2006 interim revisions, and the 2007 Good Bridge Design Manual.

**DESIGN DATA**
- **LOAD AND RESISTANCE FACTOR DESIGN**
- **Live Load** = M-93
- **Future Moving Surface** = 0.06 ksf
- **Design Stresses:**
  - Substructure Concrete - Compressive Strength = 4,000 psi
  - Reinforcing Steel - Minimum Yield Strength = 60,000 psi

**DESIGN INSTRUCTIONS**
- This drawing provides general design and construction details. The project plans for each structure shall show stations, span lengths, roadway width, skew, curve and superelevation data of any, elevations, superstructure details, estimated quantities, reinforcing steel list, areas of sealing, type of sealant and other necessary details and special notes.

**PILES**
The designer shall furnish the pile type, size, spacing and ultimate bearing value on the project plans. The maximum pile spacing is 8'-0".

**REINFORCING STEEL**
The minimum lap lengths for the reinforcing steel are 1'-10" for #4 bars and 3'-0" for #5 bars, unless noted otherwise. The lap lengths assume epoxy coated reinforcing steel. If the longitudinal bars are spliced, place lap splices in a staggered arrangement.

---

**REINFORCING STEEL**

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* Dimensions may vary with each individual structure.*

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**SECTION F-F**

* Minimum length for sections C-C and D-D, see Sheet 2 of 4.*

---

**Bending Diagrams**

- Type 1
- Type 2
- Type 3
- Type 4
- Type 5
- Type 6
DESIGN INSTRUCTIONS (CONTINUED)

GENERAL NOTES

The Department will measure pile encasement by the number of feet. The Department will determine the sum as the length measured along the axis of each pile from the bottom of the encasement to the bottom of the pier cap. The Department will pay for accepted quantities at the contract price for item - special, pile encasement.

FALSEWORK SUPPORT: The Department will allow permanent attachment of the falsework only if the attachment is made to the portion of the pile encased in the pier cap. The Department will not allow other methods of permanent attachment to the pier including methods that require permanent falsework support encased in the bridge slab. The falsework support shall not provide eccentric loads in the piles.

REINFORCING STEEL: The minimum lap lengths are 2'-7" for No. 5 bars and 4'-4" for No. 6 lap lengths. Alternate epoxy coated steel No. 6 bars shall be spliced by the use of mechanical connectors. The mechanical connector system used shall be able to develop 90 percent of the full yield strength of the reinforcing steel. If the longitudinal bars are spliced, place lap splices in a standard arrangement.

SLAB REINFORCING: See the continuous concrete slab standard drawing for details. Some pile caps are shown in elevations, but others are shown in plan or section views. All piles shall be encased in the bridge slab.

ITEM SPECIAL - PILE ENCASMENT: Encase all pile with I.P. reinforced concrete piles unless the bridge is shown to have 50' or 100' piles. Provide a concrete slump between 6 to 8 inches with a slump tester.

GENERAL NOTES (CONTINUED)

The Department will allow permanent attachment of the falsework only if the attachment is made to the portion of the pile encased in the pier cap. The Department will not allow other methods of permanent attachment to the pier including methods that require permanent falsework support encased in the bridge slab. The falsework support shall not provide eccentric loads in the piles.

REINFORCING STEEL: The minimum lap lengths are 2'-7" for No. 5 bars and 4'-4" for No. 6 lap lengths. Alternate epoxy coated steel No. 6 bars shall be spliced by the use of mechanical connectors. The mechanical connector system used shall be able to develop 90 percent of the full yield strength of the reinforcing steel. If the longitudinal bars are spliced, place lap splices in a standard arrangement.

SLAB REINFORCING: See the continuous concrete slab standard drawing for details. Some pile caps are shown in elevations, but others are shown in plan or section views. All piles shall be encased in the bridge slab.

ITEM SPECIAL - PILE ENCASMENT: Encase all pile with I.P. reinforced concrete piles unless the bridge is shown to have 50' or 100' piles. Provide a concrete slump between 6 to 8 inches with a slump tester.
**TOP LAYER OF STEEL**
(TRANSVERSE AND EDGE BEAM STEEL NOT SHOWN)

**BOTTOM LAYER OF STEEL**
(TRANSVERSE AND EDGE BEAM STEEL NOT SHOWN)

**SLAB ELEVATION**

Y (INCHES) = \( \frac{1}{2} \) [BRIDGE LIMITS (FEET) - ((NO. M BARS - 1) * M BAR SPACING (FEET)) * 12]

**NOTE:**
- E-BARS ARE NOT ALWAYS REQUIRED; SEE SLAB DATA TABLE ON SHEET 24.
- SEE PIER DETAILS FOR DIMENSIONS

**LEGEND:**
- E-BARS
- L-BARS
- T-BARS
- N-BARS
- V-BARS
- M-BARS
- A-BARS
- B-BARS
- C-BARS
- D-BARS

**DIMENSIONS:**
- V-BARS: VARIES (15" MAX.)
- M-BARS: #10 = 2'-5" , #9 = 1'-11" , #8 = 1'-6"
- MAX. 7" LAP W/ 3'-6"
GENERAL: This drawing provides design and general construction details for three span slab bridges. The project plans for each structure will show span lengths, roadway widths, skew, curve, and superelevation of any elevations, slab reinforcement details in plan and transverse sections, substructure details, estimated quantities, reinforcing steel list and other necessary details and special notes.

Additional, interior spans, the same length as the middle span, may be incorporated into the structure without change in slab thickness or area of reinforcing steel.

When shown, the project plans will show the revised details.

ROADWAY WIDTH: The slab design is applicable for the following roadway widths, measured out to out of bridge deck width ≥ 38 ft.


DESIGN DATA:

DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN (LRFD)

DESIGN LOADS: NO. 5 LEWIS

FUTURE WEARING SURFACE: 60 LB/FT²

WEARING SURFACE: ONE INCH MONOLITHIC CONCRETE - COMPREHENSIVE STRENGTH > 4500 PSI

REINFORCING STEEL: FURNISH THE REINFORCING STEEL LENGTHS AS INDICATED IN THE TABLE OR STANDARD DRAWINGS. IF THE CONTRACTOR ELECTS TO UTILIZE SHORTER BAR LENGTHS, PROVIDE THE MINIMUM LAP LENGTHS SHOWN BELOW AT NO ADDITIONAL COST TO THE STATE.

THE LOCATIONS OF THE SPACES SHALL BE APPROVED BY THE ENGINEER.

REINFORCING STEEL:

- U BARS SHALL NOT BE LAPPED WITH THE ADDITIONAL BARS PROVIDED AT THE ABUTMENTS AND:"
### Edge Beam Slab Data - Parapet

<table>
<thead>
<tr>
<th>Condition</th>
<th>Slab Depth</th>
<th>Width</th>
<th>Location</th>
<th>Center-to-Center</th>
<th>Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom Bars</td>
<td>30&quot; x 30&quot;</td>
<td>27&quot;</td>
<td>1'-10&quot;</td>
<td>21&quot;</td>
<td>1'-8&quot;</td>
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<tr>
<td>1'-3&quot;</td>
<td>30&quot;</td>
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<td>26&quot;</td>
<td>1'-8&quot;</td>
<td>21&quot;</td>
<td>1'-8&quot;</td>
</tr>
</tbody>
</table>

### Edge Beam Detail

**For Slabs with T < 18"**

- **No.**
  - Varies
- **Length**
  - Varies

**For Slabs with T ≥ 18"**

- **No.**
  - Varies
- **Length**
  - Varies

### Edge Beam Elevation - Parapet

- **F-1**
  - 1/2 x Bridge limits
- **F-2**
  - ADDITIONAL N-BARS
- **F-3**
  - N-BARS
- **F-4**
  - K-BARS

**Legend**
- K-BARS are not always required; see slab data table on this sheet.
- LENGTH * U3 [BRIDGE LIMITS (FEET) * E.6]
DESCRIPTION: This standard drawing provides an upgrade retrofit to the existing bridge railing system. It has been accepted by FDOT to order retrofit for TSS-425, RCI-2, and RCI-4 on November 1, 2016.

MATERIALS:
- Steel tubing shall be ASTM A500, Grade B in accordance with FDOT.
- Steel angles and braced members shall be ASTM A572 Grade 50 in accordance with FDOT.
- BOLTS AND HARDWARE SHALL BE GALVANIZED ASTMT 479 IN ACCORDANCE WITH FDOT.
- ALL WORK OF A SURFACE EXPOSED TO THE ELEMENTS SHALL BE FINISHED IN ACCORDANCE WITH FDOT.
- APPROACH RAILING: Refer to standard construction drawing OR-3, Bridge Terminal Assembly, Type B.

METHOD OF EXECUTION: The Department will provide the steel beam bridge retrofit railing to the contractor for fabrication and installation. Bases the scope of work and pay for the work included under the contract.

ITEM NO. 1 DESCRIPTION
5’ FOOT DEEP BEAM BRIDGE RETROFIT RAILING

HSS SPlice DETAIL

SECTION E-E

SECTION A-A

SECTION D-D

DETAIL B

VIEW C-C

NOTE: This drawing is not to scale.
GENERAL NOTES:

COMPRESS SEAL: Furnish material conforming to T.O. 11. The seal configuration should be similar to the details shown herein. Accepted manufacturers are: DREMEL, MODEL C-1005, WATSON-BOWMAR-ACME (MODEL W-4040) OR AN Approved Equivalent. Install the seal according to the manufacturer's specifications and under the supervision of the manufacturer's designated representative.

JOINTS IN COMPRESSION SEALS: Furnish seals in one continuous piece unless otherwise approved by the engineer.

ARMOR STEEL: All channel shapes, angle shapes and all cross frame connection gusset plates, shall be ASTM (A) 572, Grade 50 or 60. All other steel parts (including retainers), shall be ASTM (A) 91, Grade A, 50 or 60.

JOINTS IN ARMOR STEEL: Shop or field joints in the armor shall be complete penetration welds ground flush with the joint and the retainer.

ARMOR COATING: Coat all steel parts of the joint assembly according to S-45.

D0c - T c = T c cos b

DO NOT FIELD PAINT METALIZED SURFACES EXCEPT AS NOTED. CLEAN AND PAINT THE AREAS ON THE GUSSET PLATES DAMAGED DURING ASSEMBLY. INSTALLATION IN CONFORMITY WITH THE STRUCTURE'S PAINT SYSTEM. PROTECT THE METALIZED COATING WHERE BLASTING OR COATING ADJACENT STEEL MEMBERS. OVERSPLAY NEED NOT BE REMOVED.

TEMPORARY SUPPORTS: The fabricator shall design and install temporary supports to resist shifting, erection and construction forces without damage to the steel armor or coating. These supports shall be adjustable in the field to account for vertical, horizontal and temperature setting. Install the supports after the fabrication and coating is complete.

CONSTRUCTION PROCEDURE:

1. Place superstructure concrete in the span adjacent to the abutment prior to placing abutment backwall concrete.

2. Not more than 4 hours prior to the day's peak ambient temperature, set abutment expansion joint width to dimension "A" which shall be determined as follows:

   A = \( \frac{1}{2} (D_{as} + D_{at}) \)

   \( A = \) Joint width (inches) measured normal to joint.

   \( D_{as} = \) Adjustment (inches) for a peak ambient temperature other than 60°F (See chart).

3. Place backwall concrete during stable or rising ambient temperatures and conclude placement at or (immediately) before the day's peak ambient temperature.

4. Loosen any temporary end and saw bolts after initial set of concrete. Complete tightening not later than two hours after conclusion of concrete placement.

DIMENSION "A" ADJUSTMENT D_{as}

COMPRESSION SEALS AT FIXTURE READINGS SHALL BE AS SHOWN WHERE DIMENSION "A" = 3" AT ANY AMBIENT TEMPERATURE.

LOCATION OF SEAL RETAINER BAR

See the manufacturer's catalogue for seal design and accessories chosen for use.
PART PLAN AT ABUTMENT

FOR BRIDGES WITH SIDEWALK PARAPET MALLING

SEE SHEET F/F FOR SECTION C-C.

SECTION C-C

NOTE: FOR DIMENSION AND ADDITIONAL NOTES AND DETAILS, SEE SHEET F/F.

SECTION E-E

SEE SECTION E-E FOR OTHER DETAILS NOT SHOWN.

LEGEND:

R = Radius

SEE SHEET F/F FOR NOTES AND PLATES A & B.

SEE SHEET F/F FOR ADDITIONAL DETAILS.

SECTION F-F

SEE SECTION F-F FOR OTHER DETAILS NOT SHOWN.
GENERAL NOTES:

COMPRESSION SEAL: Furnish material conforming to TFG.11. The seal configuration shall be similar to the details shown herein. Accepted manufacturers are: D.S. Show (model CV4000), Watson-Dunam-Ace (model 5000) or an approved equivalent. Install the seal according to the manufacturer's specifications and under the supervision of the manufacturer's designated representative.

JOINTS IN COMPRESSION SEALS: Furnish seals in one continuous piece unless otherwise approved by the Engineer.

ARMOR STEEL: All angle shapes shall be ASTM A590, grade 50 or 60. All other steel parts including fastenings shall be ASTM A441, grade 36, 50 or 60.

JOINTS IN ARMOR STEEL: Snap or field joints in the armor shall be made complete penetrating bracing permanent flow lines in contact with the seal and the repairer.

ARMOR COATING: Coat all steel parts of the joint assembly according to TFG.

TEMPORARY SUPPORTS: The fabricator shall design and install temporary supports to resist shearing, erection and construction loads due to damage to the steel armor (A). These supports shall be installed in the field to account for variable temperature settings. Install the supports after the fabrication and coating is complete.

STEEL DEFLECTORS: Furnish 22 gauge stainless steel conforming to ASTM A240, type 304 or equivalent, with a No. 1 finish.

NON-SHRINKING GROUT: Furnish material conforming to TFG.12. Mix the batch size such that placement can be completed within 30 minutes. Do not add water to increase fluidity which may be decreased by delayed use of water. Include with superstructure concrete for payment.

THREADED MODES: Furnish 5/8" diameter threaded rods and nuts conforming to ASTM A490, grade 36 or 43, galvanized according to TFG. Include with box beams for payment.

BASEMENT: The Department will pay for concrete placed in the box beam width separately under TFG.51.

CONSTRUCTION PROCEDURE:

1. Place joint assembly so the two (2) 114x4x5/8" angles remain parallel to each other and perpendicular to the roadway gradient.
2. For structures with a composite concrete wearing surface, place the superstructure concrete in the span adjacent to the adjustment prior to the placement of armor bottom concrete.
3. Not more than four hours prior to the day's peak ambient temperature, set initial expansion joint width to dimension "A" which shall be determined as follows:

   \[
   A = \frac{1}{2} \times D_b \times \frac{D_w}{2} 
   \]

   \[
   D_w = D_b \times \text{length} 
   \]

4. Place the backwall concrete during the early stages of joint assembly temperatures. Complete placement at or immediately before the day's peak ambient temperature.
5. Place and vibration concrete under joint armor to achieve complete consolidation of the concrete.
6. Allow any temporary joint armor supports after initial setting of the concrete. Preferably not later than two hours after completion of the concrete placement.
7. For structures with a noncomposite asphalt wearing surface, place the concrete in the box beam with concrete according to step 3 after the backwall concrete has been placed. Texture the surface parallel to the joint. Concrete minimum compressive strength 4.5 ksf.

NOTES TO DESIGNER:

DESIGN LIMITS: This design is intended for structures with span angles not greater than 6°. roadway grades of 2% or less, and dr/see chart on this sheet not larger than 150 ft.

The designer shall supply details for structures with roadway grades greater than 2%.

ANCHOR BAR HOLES: In adjustment slabs shall be 2" 9 unless otherwise shown on project plans.

COMPRESSION SEALS AT FIXED HEADINGS SHALL BE DETERMINED BASED ON DIMENSION "A", "B" AT ANY AMBIENT TEMPERATURES.

PRESTRESSED CONCRETE BOX BEAMS SHALL BE MODIFIED AS FOLLOWS FOR COMPRESSION SEAL INSTALLATION:

1. Stirrup reinforcing steel at notched areas at piers on composite beams shall not project above the top of concrete.
2. Ends of precast beams shall be notched full width on beams.
3. i.e. inch deep beams require a special design.
4. Hoels for anchor bars shall be 2 1/4" diameter.
5. Beam ends for structures on grades over 2% shall be made vertical.

LOCATION OF SEAL RETAINER BARS

DIMENSION "A" ADJUSTMENT DA

COMPRESSI0N SEAL DETAIL

\[ D_W = D_B \times \text{length} \]

G - ANGLE OF EXPANSION JOINT.

LOCATION OF SEAL RETAINER BARS

STEELربطcf:

22 gauge stainless steel conforming to ASTM A240, type 304 or equivalent with a No. 1 finish.

DESIGN LIMITS: This design is intended for structures with span angles not greater than 6°. Roadway grades of 2% or less and打入见chart on this sheet not larger than 150 ft.

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LOCATION OF SEAL RETAINER BARS

DIMENSION "A" ADJUSTMENT DA

COMPRESSI0N SEAL DETAIL

\[ D_W = D_B \times \text{length} \]

G - ANGLE OF EXPANSION JOINT.

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LOCATION OF SEAL RETAINER BARS

DIMENSION "A" ADJUSTMENT DA

COMPRESSI0N SEAL DETAIL

\[ D_W = D_B \times \text{length} \]

G - ANGLE OF EXPANSION JOINT.

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5. Beam ends for structures on grades over 2% shall be made vertical.

LOCATION OF SEAL RETAINER BARS

DIMENSION "A" ADJUSTMENT DA

COMPRESSI0N SEAL DETAIL

\[ D_W = D_B \times \text{length} \]

G - ANGLE OF EXPANSION JOINT.

LOCATION OF SEAL RETAINER BARS

STEELربطcf:

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1. Stirrup reinforcing steel at notched areas at piers on composite beams shall not project above the top of concrete.
2. Ends of precast beams shall be notched full width on beams.
3. i.e. inch deep beams require a special design.
4. Hoels for anchor bars shall be 2 1/4" diameter.
5. Beam ends for structures on grades over 2% shall be made vertical.
PART PLAN AT ABUTMENT
FOR SQUARE OR LOW SKEWED 15° OR LESS BRIDGES WITH DEFLECTOR PARAPET RAILING
(2BR railing is shown, SBM-A3 shall be similar)

PART TRANSVERSE SECTION
SEE STD. BRIDGE DWG. CSD-W-08 FOR DETAILS OF END CROSSFRAMES AND GUSSET PLATES.
* - INCLUDED WITH EXPANSION JOINT FOR COATING & PAYMENT.

SECTION A-A

SECTION B-B

SECTION C-C

DETAIL A

SEE SHEET 5/5 FOR SECTION X-X INCLUDING PLATE "A" DETAILS
SEE SHEET 7/5 FOR SECTION Y-Y INCLUDING PLATE "B" DETAILS

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
STANDARD REVIEWS DESIGNED DRAWN CHECKED REVIEWED DATE DESIGN AGENCY
E O F F I C E O F E N G I N E E R O F B R I D G E S

STEEL STRINGER STRUCTURES
IN SECTION B-B.
CHANNEL MAY BE TRIMMED TO THE END AS SHOWN
MAY BE OMITTED AND THE BOTTOM LEG OF THE CHANNEL MAY BE TRIMMED TO THE END AS SHOWN IN SECTION 6-6.

STEEL RETAINER MC 12X45 SUPPORT ANGLE 6X4X3" (TYP.)
PLATE 4" # 45° MAX. BETWEEN PLATES "A" (TYP.)
3" MIN. (TYP.)

PLATE "A" WITH ANCHOR BAR # 7'-0" MAX.
3" MIN. (TYP.)
STEEL RETAINER MC 12X45

PLATE "B" WITH ANCHOR BAR # 7'-0" MAX.
3" MIN. (TYP.)

STEEL RETAINER MC 12X45

3" # 45° WELDED SHEAR STUDS

30° (TYP.)

EDGE OF 3/8" PLATE

3/8" # 4" WELDED SHEAR STUDS

CURB LINE

ANCHOR PLATE

CURB LINE

END L-7X4X3/8" STEEL RETAINER MC 12X45

ANCHOR PLATE

CURB LINE

CURB LINE

CURB LINE

ANCHOR BAR

2" X 2" SLOTTED HOLES IN ANGLE

1/2" X 2" SLOTTED HOLES IN CHANNEL

E 3\(\frac{1}{2}\)% SLOTTED Holes IN ANGLE

PLATE "A" (TYP.) 6X4X3" (TYP.)

PLATE "B" (TYP.) 6X4X3" (TYP.)

E 3\(\frac{1}{2}\)% SLOTTED Holes IN CHANNEL

3" MIN. (TYP.)

3/8" # 4" WELDED SHEAR STUDS

STEEL RETAINER MC 12X45

1'-6" MIN. (TYP.)

3/8" X 4" WELDED SHEAR STUDS

1'-3" MIN.

1'-3" MIN.

1'-3" MIN.

1'-3" MIN.

1'-3" MIN.

1'-3" MIN.

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1'-3" MIN.

1'-3" MIN.

1'-3" MIN.

1'-3" MIN.

1'-3" MIN.
PLAN AT ABUTMENT

FOR SKewed BRIDGES OVER 15°

(with DEFLECTOR PARAPET RAILING)

(SBR-1 RAILING IS SHOWN, SBR-1-13 SHALL BE SIMILAR)

FINISH CONCRETE SURFACE EITHER FLUSH WITH OR A MAX.
OF $\frac{1}{4}"$ ABOVE JOINT ARMOR.

2" # HOLES, $\frac{1}{2}"$ PITCH

LOCATE ANCHORS IMMEDIATELY BELOW
THE UPPER DECK SLAB REINFORCING STEEL.

ANCHOR PLATE 5\"X5\"X5\"-6"
SEND AS NECESSARY AT THE DECK
ENDS TO ACCOMMODATE SKEW
PLATE. 9" SHALL BE INSTALLED
PERPENDICULAR TO THE MC
12X45 CHANNEL.

END CROSSFRAME DLIBER PLATE

SECTION X-X

$\frac{1}{4}"$ PLATE

$\frac{1}{4}"$ MAX. TO $\frac{1}{2}"$ MAX.
VENT HOLE 9" C/C

$\frac{1}{4}"$ MIN. TO $\frac{1}{2}"$ MAX.

$\frac{1}{8}"$ PLATE

3" (TYP.)

END CROSSFRAME SEE STD. BRIDGE
ENG. DSN-98 FOR DETAILS

$\frac{1}{4}"$ ANCHOR PLATES

$\frac{1}{4}"$ PLATE WITHIN $\frac{1}{2}"$ OF EACH
END OF ANGLE.

$\frac{1}{4}"$ ANCHOR PLATE

3" (TYP.)

3" 60° F. GL(PC FLANGES
ON SKEWED STRUCTURES)

$\frac{1}{4}"$ MIN. TO $\frac{1}{2}"$ MAX.

DIMENSION $\frac{1}{4}"$ SHALL BE DETERMINED
FROM TABLE "A", TABLE "B" OR TABLE
"C" ON SHEET 4 5.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

STANDARD DESIGN

DEVELOPMENT

STRUCTURAL ENGINEERING

DESIGN AGENT

DGM / APM

CHECKED

REVISED

DRAWN

ENGINEER OF BRIDGES

OFFICE OF STRUCTURAL ENGINEERING

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

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STATE OF OHIO DEPARTMENT OF TRANSPORTATION

STANDARD DESIGN DEVELOPMENT

STRUCTURAL ENGINEERING DESIGN AGENT

DGM / APM CHECKED REVISED DRAWN ENGINEER OF BRIDGES

OFFICE OF STRUCTURAL ENGINEERING
PART PLAN AT ABUTMENT
For bridges with sidewalk
Parapet railing

SECTION F-F

FOR BRIDGES WITH SIDEWALK
PARAPET RAILING

DETAIL C

DETAIL D

SECTION G-G

PART PLAN AT ABUTMENT
For bridges with sidewalk
Parapet railing

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

DESIGNED DRAWN CHECKED

DESIGN AGENCY

STRUCTURAL ENGINEERING OFFICE OF
ENGINEER OF BRIDGES

STRIP SEAL EXPANSION JOINTS
STEEL STRINGER STRUCTURES

FOR ADDITIONAL DETAILS, SEE DETAIL A ON SHEET 1/5.
FOR SECTION X-X SEE SHEET 17/3.
FOR SECTION Y-Y SEE SHEET 17/3.
LEGEND

1. THIS IS THE ACTUAL DISTANCE FROM THE CENTERLINE OF JOINT TO THE THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE MEASURED ALONG THE CENTERLINE OF ROADWAY. THIS DIMENSION IS THE SUM OF STEEL RETAINER WIDTHS AND STUDS. (TYP.)

2. THIS DISTANCE FOR EXPANSION JOINTS HAVING SKEW ANGLES OF 90° OR LESS IS THE ACTUAL DISTANCE TO THE THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE ALONG THE CENTERLINE OF ROADWAY. THIS DISTANCE FOR EXPANSION JOINTS HAVING SKEW ANGLES OVER 90° BUT NOT GREATER THAN 60° IS ARRIVED AT BY MULTIPLYING THE ABOVE DEFINED DISTANCE ALONG THE CENTERLINE OF ROADWAY BY THE COSINE OF THE EXPANSION JOINT SKEW ANGLE.

3. THIS IS THE JOINT OPENING DIMENSION REQUIRED AT THE TIME OF ABUTMENT BACKWALL CONCRETE PLACEMENT, BASED ON THE DAY'S ANTICIPATED PEAK AMBIENT TEMPERATURE.

4. MINIMUM JOINT OPENING DIMENSION "A" AT TIME OF SEAL GLAND INSTALLATION SHALL NOT BE LESS THAN 1/". IF THE JOINT OPENING IS LESS, INSTALLATION SHALL BE POSTPONED UNTIL THE INSTALLATION SHALL NOT BE LESS THAN 1/". IF THE JOINT INSTALLATION IS 65° F.

EXAMPLE


FIND - REQUIRED STRIP SEAL GLAND SIZE AND THE JOINT OPENING DIMENSION "A" AT THE TIME OF JOINT ARMOR INSTALLATION.

SOLUTION:

(A) ENTER TABLE A AT 287.5' WITH 90°F AND FIND THAT THE REQUIRED STRIP SEAL GLAND SIZE IS 4 INCHES.

(B) ENTER TABLE "C" AT 30° WITH 287.5' X COSINE OF 30° = 248.98' AND FIND REQUIRED JOINT OPENING AT 65°F IS 1.86".

NOTE: STEP (B) REQUIRED ONLY AT TIME OF CONSTRUCTION.
ARMOR STEEL: All channel shapes, angle shapes and all cross frame connections gusset plates, shall be ASTM A709, grade 50 or 50W. All other steel parts including retaining, shall be ASTM A572, grade 50 or 50W.

JOINTS IN ARMOR STEEL: Shop or field joints in the armor shall be complete penetration welds with full flash where in contact with the retractor.

ARMOR COATING: Coat all steel parts of the joint assembly according to use.

DO NOT FIELD PAINT METALIZED SURFACES EXCEPT AS NOTED. KEEP AND PAINT THE AREAS ON THE "GUSSET PLATES DAMAGED DURING Crossframe INSTALLATION IN CONFORMANCE WITH THE STRUCTURE'S PAINT SYSTEM. PROTECT THE METALIZED COATING WHEN BLASTING OR COATING ADJACENT STEEL MEMBERS. OVERSPRAY NEED NOT BE REMOVED.

TEMPORARY SUPPORTS: The fabricator shall design and install temporary supports to resist shipping, erection and construction forces without damage to the steel armor or coating. These supports shall be adjustable in the field to account for variable temperature sections, install the supports after the fabrication and coating is complete.

TABLE E (PHYSICAL PROPERTIES OF SEAL ELEMENT)

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>REQUIREMENT</th>
<th>ASTM METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TENSIILE STRENGTH, MIN. PSI</td>
<td>2000</td>
<td>D412</td>
</tr>
<tr>
<td>ELONGATION @ BREAK, MIN. PERCENT</td>
<td>250</td>
<td>D573</td>
</tr>
<tr>
<td>MODIFIED D2240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GIVEN AGING, TO HR @ 250°F</td>
<td>60 ± 5</td>
<td></td>
</tr>
<tr>
<td>TENSILE STRENGTH, LOSS, MAX.</td>
<td>20 PERCENT</td>
<td>D573</td>
</tr>
<tr>
<td>ELONGATION, LOSS, MAX.</td>
<td>20 PERCENT</td>
<td></td>
</tr>
<tr>
<td>HARDNESS, TYPE A DUROMETER, POINTS</td>
<td>0 TO +15</td>
<td>D471</td>
</tr>
<tr>
<td>MODIFIED D2240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLAY, ASTM CO, 3 TO HR @ 250°F WET</td>
<td>20 PERCENT</td>
<td></td>
</tr>
<tr>
<td>CHANGE MAX</td>
<td>45 PERCENT</td>
<td></td>
</tr>
<tr>
<td>STONE RESISTANCE, NO CRACKS</td>
<td>NO CRACKS</td>
<td></td>
</tr>
<tr>
<td>100 PERCENT STRAIN, 3000 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UV EXPOSURE, NO CRACKS</td>
<td>NO CRACKS</td>
<td></td>
</tr>
<tr>
<td>WITH 'IN VACUO TO REMOVE SURFACE CONTAMINATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MODIFIED D2240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOW TEMPERATURE STABILITY 7 DAYS @ -4°F HARDNESS, TYPE A DUROMETER, POINTS COMPRESSION SET, TO HR @ 220°F MAX.</td>
<td>60 ± 5</td>
<td>D395 METHOD B</td>
</tr>
<tr>
<td>0 TO +15</td>
<td>MODIFIED D2240</td>
<td></td>
</tr>
<tr>
<td>40 PERCENT</td>
<td>G395 METHOD B</td>
<td></td>
</tr>
</tbody>
</table>

LUBRICANT-ADHESIVE: Furnish a one part moisture curing polyurethane compound meeting the requirements of ASTM D4070 and as specified by the seal manufacturer. SEE "CONSTRUCTION PROCEDURE" FOR APPLICATION.

JOINTS IN STIP SEALS: Furnish seals in one continuous piece unless otherwise approved by the engineer.

SEAL RETAINERS: Furnish solid shape steel retainers, as shown on sheet 2 of 5 "REINFORCEMENT" that are extruded, not welded or machine. Retainers manufactured from welds plates or rolls of sheets are not acceptable. Furnish seal retainers that are complete and uniform in design and size with the retractor to achieve a positive seal and anchorage.

SEAL INSTALLATION: Before the seal is installed, correct any defects in the retractor, such as corrosion. The seal manufacturer shall obtain the engineer's approval for the design.

CONSTRUCTION PROCEDURE:
1. PLACE JUXTAPOSITIONal joint so that the channel and angle remain parallel to each other and perpendicular to the roadway.
2. PLACE ADJACENT BACKWALL CONCRETE AFTER THE SUPER-STRUCTURE CONCRETE IS PLACED IN THE SPAN ADJACENT TO THE ABUTMENT.
3. SET ABUTMENT EXPANSION JUXTAPOSITION TO DIMENSION "A" NO MORE THAN 12 HOURS PRIOR TO THE DAY'S PEAK AMBIENT TEMPERATURE. SEE PROJECT PLANS FOR DIMENSION "A".
4. PLACE THE BACKWALL CONCRETE DURING STABLE OR RISING AMBIENT TEMPERATURE. CONSIDER PLACEMENT AT OR IMMEDIATELY BEFORE THE DAY'S PEAK AMBIENT TEMPERATURE.
5. HAND PLACE AND VIBRATE CONCRETE UNDER JOINT ARMOR TO ACHIEVE COMPLETE CONSOLIDATION.
6. LOOSEN ANY TEMPORARY JOINT ARMOR SUPPORTS AFTER INSTALLATION, PREVIOUSLY NO LATER THAN TWO HOURS AFTER COMPLETION OF THE CONCRETE PLACEMENT.

SEAL MATERIAL:
1. EXAMINE THE REPAIRS FOR DAMAGE OR DEFECTS THAT CAN OCCUR TO SEAL PRIOR TO SEAL INSTALLATION. REPAIR.
2. NOT MORE THAN 24 HOURS PRIOR TO SEAL INSTALLATION, BLAST THE RETAINER INTERIOR AND EXTERIOR SURFACES OF THE REPAIRS. BLASTING WITHOUT DAMAGING ADJACENT COATINGS. REMOVE ALL BLASTING MEDIA FROM THE RETAINER.
3. CLEAN ALL SURFACES OF THE SEAL WITH METHYL ETHYL KE-TONE (MEK) OR OTHER MANUFACTURER SPECIFIED SOLVENT USING CLEAN DISPOSABLE CLOTHS. MAINTAIN THE SURFACE CLEAN AND DRY UNTIL INSTALLED.
4. IMMEDIATELY BEFORE APPLYING THE LUBRICANT-ADHESIVE, BONDING SURFACES MUST BE DRY AND WARMER THAN 40°F. BONDING SURFACES MUST BE MAINTAINED IN THIS CONDITION UNTIL THE SEAL IS INSTALLED. LIBERALLY APPLY THE LUBRICANT-ADHESIVE TO BOTH THE RETAINER AND THE SEAL INTERFACE USING THE MANUFACTURER SPECIFIED METHODS FOR COMPLETE AND UNIFORM COVERAGE.
5. INSTALL THE SEAL WITH EQUIPMENT AND PROCEDURE SPECIFIED BY THE MANUFACTURER. ELASTOMERIC SEAL DAMAGES TO THE SEAL CAUSED BY INSTALLATION METHODS WILL BE REJECTIONS.
6. REMOVE EXCESS LUBRICANT-ADHESIVE AFTER INSTALLATION.

DESIGNER NOTES:
PROJECT PLANS SHALL LIST DIMENSION "A" FOR TEMPERATURE BETWEEN 50°F AND 90°F IN 10° INCREMENTS.
JOINT SEAL GLANDS AT FIXED BEARINGS SHALL BE THE SAME SIZE AT THE EXPANSION BEARINGS WITH A DIMENSION "A" OF 2" AT ANY AMBIENT TEMPERATURE.
LIMITATION: SEAL ANGLES SHALL NOT BE GREATER THAN 60°. THE DESIGNER SHALL SUPPLY DETAILS FOR STRUCTURES WITH ROADWAY GRADIENTS GREATER THAN 2°.
PART PLAN AT ABUTMENT
FOR SQUARE OR LOW SKEWED (15° OR LESS)
BRIDGES WITH DEFLECTOR PARAPET RAILING
(RW-1 RAILING IS SHOWN, SBR-1-13 SHALL BE SIMILAR)
FOR SECTION X-X SEE SHEET 2-5.

END OF SUPERSTRUCTURE
WITHOUT CURBS OR PARAPETS
- STEEL DROP STRIP, SEE STANDARD BRIDGE DRAWING.
NOT INCLUDED IN EXPANSION JOINT FOR PAYMENT.

NOTE: WHERE THE TOTAL WIDTH OUT TO OUT OF
BOX BEAMS IS EQUAL TO THE BRIDGE ROADWAY
WIDTH, JOINT ARMOR SHALL BE OF SUFFICIENT LENGTH TO ALLOW FOR FIT-UP
OF BEAMS. SEE FORMULA FOR LENGTH L.*

END ABUTMENT AND SUPERSTRUCTURE
JOINT ARMOR AT BOX BEAMS ON CURVES
(SEE FORMULA FOR LENGTH L).

STAINLESS STEEL DEFLECTOR, REFER TO
STANDARD BRIDGE DRAWING EXJ-3-82 FOR
ALL PERTINENT INFORMATION.

SUFFICIENT LENGTH TO ALLOW FOR FIT-UP
OF BOX BEAMS IS EQUAL TO THE BRIDGE ROADWAY WIDTH.
NOTE: WHERE THE TOTAL WIDTH OUT TO OUT OF
BOX BEAMS IS EQUAL TO THE BRIDGE ROADWAY WIDTH, JOINT ARMOR SHALL BE OF
SUFFICIENT LENGTH TO ALLOW FOR FIT-UP OF BEAMS. SEE FORMULA FOR LENGTH L.*

L = LENGTH OF JOINT, EDGE TO EDGE OF DECK (FEET)
N = NUMBER OF BEAMS
W = NOMINAL WIDTH OF BEAMS (INCHES)
O = SKEW ANGLE OF JOINT

" £ THREADED RODS WITH TWO HEX NUTS SET IN PRESTRESSED BOX BEAMS
DURING CASTING OPERATIONS.

PRESTRESSED BOX BEAMS
WITH TWO HEX NUTS SET IN
" £ THREADED RODS

PLAN OF PLATE "B"

"DIA. HOLES

SIDE
SIDE
SIDE
SIDE
PLAN AT ABUTMENT

FOR SKewed BRIDGES OVER 15°
WITH DEFLECTOR PARAPET RAILING

(1) SEE DETAIL B FOR SECTION A-A AND SECTION B-B. DETAILS A-A AND B-B ARE SIMILAR FOR SQUARE AND SKEWED BRIDGES (EXCEPT FOR PARAPET AT THE EDGE OF SLAB). EXCEPT FOR SKEWED BRIDGES (OVER 15°) WITH DEFLECTOR PARAPET RAILING (BR-1 RAILING IS SHOWN, SBR-1-13 SHALL BE SIMILAR).

FINISH CONCRETE SURFACE EITHER FLUSH WITH OR A MAX. OF 1" ABOVE JOINT ARMOR.

PLATES "A" AND "B" SHALL BE INSTALLED PARALLEL TO THE BOX BEAMS.

SECTION A-A AND SECTION B-B ARE SIMILAR FOR SQUARE AND SKEWED BRIDGES (EXCEPT FOR PARAPET AT THE EDGE OF SLAB). EXCEPT FOR SKEWED BRIDGES (OVER 15°) WITH DEFLECTOR PARAPET RAILING (BR-1 RAILING IS SHOWN, SBR-1-13 SHALL BE SIMILAR).

FINISH CONCRETE SURFACE EITHER FLUSH WITH OR A MAX. OF 1" ABOVE JOINT ARMOR.

PLATES "A" AND "B" SHALL BE INSTALLED PARALLEL TO THE BOX BEAMS.

THICKNESS OF ASPHALT CONCRETE WEARING SURFACE OR COMPOSITE SLAB DEPTH.

SECTION X-X

DIMENSION "X" SHALL BE DETERMINED FROM TABLE "E", TABLE "G" OR TABLE "H" ON SHEET 4/7.

ASPHALT CONCRETE WEARING SURFACE. THE CONCRETE MINIMUM COMPORESSIVE STRENGTH - 4.5 KSI.

RETAINER DETAIL

DETAIL B

SEE DETAIL B FOR DEFINITION OF "A", "B", "C" AND "D".

SECTION X-X

Эл - DIMENSION "X" SHALL BE DETERMINED FROM TABLE "E", TABLE "G" OR TABLE "H" ON SHEET 4/7.

ASPHALT CONCRETE WEARING SURFACE. THE CONCRETE MINIMUM COMPORESSIVE STRENGTH - 4.5 KSI.
PART PLAN AT ABUTMENT
FOR BRIDGES WITH SIDEWALK
PARAPET RAILING

SECTION F-F

SECTION G-G

\[ * \text{ Min. to } \frac{1}{2} \text{ in. at breakpoint in retainer for square bridges, on skew bridges two dimensions will only apply to the side of joint assembly which is nearest to the curb line (see detail "D") above.} \]
**LEGEND**

1. THIS IS THE ACTUAL DISTANCE FROM THE CENTERLINE OF JOINT TO THE THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE ALONG THE CENTERLINE OF ROADWAY. THIS DISTANCE SHALL BE A MAXIMUM OF 200' FOR 60° SKEWS, 300' FOR 45° SKEWS, 350' FOR 30° SKEWS AND 400' FOR 20° SKEWS. THE THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE IS THAT POINT WHICH HAS ZERO HORIZONTAL MOVEMENT DURING TEMPERATURE CHANGES.

2. THIS DISTANCE FOR EXPANSION JOINTS HAVING SKEW ANGLES OF 85° OR LESS IS THE ACTUAL DISTANCE TO THE THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE ALONG THE CENTERLINE OF ROADWAY. THIS DISTANCE FOR EXPANSION JOINTS HAVING SKEW ANGLES OVER 85° BUT NOT GREATER THAN 90° IS ARRIVED AT BY MULTIPLYING THE ABOVE DEFINED DISTANCE FOR EXPANSION JOINTS HAVING SKEW ANGLES OF 15° OR LESS BY THE COSINE OF THE EXPANSION JOINT SKEW ANGLE.

3. THIS IS THE JOINT OPENING DIMENSION "A" REQUIRED AT THE TIME OF JOINT ARMOR INSTALLATION.

4. MINIMUM JOINT OPENING DIMENSION "A" AT TIME OF SEAL GLAND INSTALLATION SHALL NOT BE LESS THAN 1/". IF THE JOINT OPENING IS LESS, INSTALLATION SHALL BE POSTPONED UNTIL THE TEMPERATURE DROPS A SUFFICIENT AMOUNT TO ALLOW THE MINIMUM JOINT OPENING (DIM. "A") AT TIME OF JOINT INSTALLATION.

**EXAMPLE**

**given** - the distance from the centerline of the joint to the thermal neutral point of the superstructure along the centerline of roadway. this distance is 287.5'.

**find** - required strip seal gland size and the joint opening dimension "a" at the time of joint installation.

**solution**

1. enter table "a" at 287.5' and find that the required strip seal gland size is 4 inches.
2. enter table "b" at 287.5' x cosine of 30° = 248.98' and find required joint opening at 65° f is 1.86".

*note* step (b) required only at time of construction.

**section y-y**

- this dimension is the sum of 2 x steel retainer width + dim. "a".

- provide a 1/" horizontal + 1/" vertical bevel at the exposed edge of the 3" cover plate and 1/" x 4" bar.
**GENERAL NOTES:**

*STRIP SEALS* FURNISH EXTRUDED POLYURETHANE MATERIAL ONLY. CONFORM TO THE REQUIREMENTS OF THE STANDARD. THE RECIPIENT SHALL CONFORM TO TABLE 2.

The manufacturer or an accredited laboratory shall test each lot as specified and submit two copies of certification of material, engineering, and installation. The seal and retainer are an integral system designed and supplied by the same manufacturer. See construction procedure for installation.

| TABLE 2 (PHYSICAL PROPERTIES OF SEAL ELEMENT) |
|-----------------------------|-----------------------------|
| PROPERTY                     | REQUIREMENT                 |
| TENSGE T STRENGTH, MIN. PSI  | 2500                        |
| ELONGATION # BREAK, MIN. PERCENT | 250                        |
| HARDNESS, TYPE A SORNER MOUNTED SOLUTION | MODIFIED 0240 |
| EVEN AGING, TO HP # 220°F | 0 TO +15                    |
| TENSILE STRENGTH, MIN. PSI  | 20 PERCENT                  |
| MODIFIED 0240               |                            |
| OIL SWELL, ASTM O.3 % TO HP # 220°F | 45 PERCENT                |
| CHANGE MAX                   |                            |
| OZONE RESISTANCE             | NO CRACKS                   |
| UN CHANGED PERCENT STRAIN, 300 PPM IN AIR TO HP # 104°F | 0149                       |
| NEEDED WITH TOLUENE TO MOVE SURFACE CONTAMINATION |                            |
| LOW TEMPERATURE STIFFENING | NO CRACKS                   |
| 90°F MAX. # HP 220°F           | 0240                       |
| HARDNESS, TYPE A SORNER MOUNTED SOLUTION | MODIFIED 0240 |
| COMPRESSION SET, TO HP # 220°F MAX. | 40 PERCENT                |
|                         | G395 METHOD R            |

**LUBRICANT-ADHESIVE:** Furnish a ONE PART MOISTU R CURING POLYURETHANE COMPOUNDETING THE REQUIREMENTS OF ASTM D1202, AND AS SPECIFIED BY THE MANUFACTURER. SEE CONSTRUCTION PROCEDURE FOR APPLICATION.

**JOINTS IN STRIP SEALS:** Furnish seals in one continuous piece unless otherwise approved by the engineer.

**SEAL RETAINERS:** Furnish Solid Steel Steel Retainers, as specified by the manufacturer and consistent with the requirements of ASTM A709, Grade 50 or 50W. All other steel parts, including retainers, shall be ASTM A572, Grade 50, or 50W.

**JOINTS IN ARMOR STEEL:** Shop or field joints in the armor shall be complete penetration welded ground flush where in contact with the retainer.

**ARMOR STEEL:** All angles shapes shall be ASTM A572, Grade 50 or 50W. All other steel parts, including retainers, shall be ASTM A572, Grade 50, or 50W.

**ARMOR COATING:** Coat all steel parts of the joint assembly according to ASTM.

**TEMPORARY SUPPORTS:** The fabri cator shall design and install temporary supports to resist shipping, erection and construction forces with out damage to the steel, armor or coating. These supports shall be adjustable in the field to ensure that the temporary supports after the fabrication and coating is complete.

**NOW-SHINING GROUND:** Furnish material conforming to F084. Limit the batch size such that placement can be completed within 30 minutes. Do not use mortar older than 30 minutes. Do not add water to increase fluidity which may have been degraded by delayed use of mortar. Include in joint areas for proper footing.

**THREADS RETAINED:** Furnish .5" DIAMETER THREADED SUCCRETE BOLTS, GRADE 50, GRADED ACCORDING TO S86. INCLUDE WITH SUPERSTRUCTURE CONCRETE FOR PAYMENT.

**BASE OF PAYMENT:** The department will pay for concrete, placed in the box beam structure separately from US.

**CONSTRUCTION PROCEDURE:**

1. **ARMOR INSTALLATION:** Place Armor and X over the two 0.144" + 0.144" ANGLES REMAIN PARALLEL TO EACH OTHER AND PERPENDICULAR TO THE ROADWAY GRADIENT.

2. **FOR STRUCTURES WITH A COMPOSITE CONCRETE WEARING SURFACE, PLACE THE SUPERSTRUCTURE SEAL IN THE SPAN ADJACENT TO THE ABUTMENT PRIOR TO THE PLACEMENT OF ABUTMENT BLACKTOP CONCRETE.

3. **SET ABUTMENT EXPANSION JOINT WIDTH TO DIMENSION 4" WILL BE AT LEAST FOUR INCHES PRIOR TO THE DAY'S PEAK AMBIENT TEMPERATURE.  SEE PROJECT PLANS FOR DIMENSION 4.**

4. **PLACE THE BLACKTOP CONCRETE DURING STABLE OR RISING AMBIENT TEMPERATURES.  CONCLUDE PLACEMENT AT OR IMMEDIATELY BEFORE THE DAY'S PEAK AMBIENT TEMPERATURE.

5. **HAND PLACE AND VIBRATE CONCRETE UNDER JOINT ARMOR TO ACHIEVE COMPLETE CONSOLIDATION.

6. **PREPARE ANY TEMPORARY JOINT ARMOR SUPPORTS AFTER INITIAL SET OF THE CONCRETE, PREVIOUSLY NOT LATER THAN TWO HOURS AFTER CONCLUSION OF THE CONCRETE PLACEMENT.**

7. **FOR STRUCTURES WITH A NON-COMPOSITE ASPHALT WEARING SURFACE, PLACE THE BOX BEAM STRUCTURE TO ACHIEVE 2" STEPS AFTER THE NON-COMPOSITE ASPHALT IS PLACED. TIGHTEN THE SURFACE PARALLEL TO THE JOINT, CONCRETE MIN. COMPRESSIVE STRENGTH - 4.5 KSI.

**SEAL INSTALLATION:**

1. **EXAMINE THE RETAINER FOR SIZES OR DEFECTS THAT CAN DAMAGE THE SEAL PRIOR TO SEAL INSTALLATION.  REPAIR DEFECTS.**

2. **NOT MORE THAN 24 HOURS PRIOR TO SEAL INSTALLATION, BLAST THE RETAINER INTERIOR FOR SBF "COMMERCIAL BLAST CLEANING", WITHOUT DAMAGING ADJACENT COATINGS. REMOVE ALL BLASTING MEDIA FROM THE RETAINER.

3. **CLEAN ALL SURFACES OF THE SEAL WITH MTHY FUM ETHER KETONE MEX, TOLUENE 1731 OR OTHER MANUFACTURERS SPECIFIED SOLVENT USING CLEAN DISPOSABLE CLOTHS.  MAINTAIN THE SURFACE CLEANLINESS UNTIL INSTALLATION.

4. **PREPARE THE BEAMS FOR INSTALLATION.**

**PRESTRESSED CONCRETE BOX BEAMS:** MAY BE MODIFIED AS FOLLOWS FOR STRIP SEAL INSTALLATION:

1. **STIRRUP REINFORCING STEEL IN NOTCHED AREAS AT ENDS OF COMPOSITE BEAMS SHALL NOT PROJECT MORE THAN SEVERAL TIMES.**

2. **ENDS OF FASCIA BEAMS SHALL BE NOTCHED FULL WIDTH OF BEAMS.**

3. **I 2 INCH DEEP BEAMS REQUIRE A SPECIAL DESIGN.**

4. **HOLES FOR ANCHOR BARS SHALL BE 25" DIAMETER.**

**CONSOLIDATION OF CONCRETE OVER 2% SHALL BE MADE VERTICAL.**

**SEAL MATERIALS:**

- **AMOR STEEL:** ALL ANGLE SHAPES SHALL BE ASTM A572, GRADE 50 OR 50W. ALL OTHER STEEL PARTS, INCLUDING RETAINERS, SHALL BE ASTM A572, GRADE 50, OR 50W.

- **JOINTS IN ARMOR STEEL:** SHOP OR FIELD JOINTS IN THE ARMOR SHALL BE COMPLETE PENETRATION WELDED GROUND FLUSH WHERE IN CONTACT WITH THE RETAINER.

- **ARMOR COATING:** COAT ALL STEEL PARTS OF THE JOINT ASSEMBLY ACCORDING TO ASTM.
### Table A

<table>
<thead>
<tr>
<th>Distance for Determining Seal Gland Size</th>
<th>Table A</th>
</tr>
</thead>
</table>

### Table B

<table>
<thead>
<tr>
<th>Distance for Determining Joint Opening</th>
<th>Table B</th>
</tr>
</thead>
</table>

### Table C

<table>
<thead>
<tr>
<th>Distance for Determining Joint Opening</th>
<th>Table C</th>
</tr>
</thead>
</table>

### Table D

<table>
<thead>
<tr>
<th>Distance for Determining Joint Opening</th>
<th>Table D</th>
</tr>
</thead>
</table>

### Legend

1. This is the actual distance from the centerline of joint to the thermal neutral point of the superstructure measured along the centerline or roadway. This distance shall be a minimum of 29" for 60° skew, 34½ for 45° skew, 38½ for 30° skew, and 42½ for 0° skew. The thermal neutral point or the superstructure is that point which has zero horizontal movement when temperature changes.

2. This distance for expansion joints having skew angles of 15° or less is the actual distance to the thermal neutral point of the superstructure along the centerline or roadway. This distance for expansion joints having skew angles over 15° but not greater than 60° is arrived at by multiplying the above given distance along the centerline of roadway by the cosine of the expansion joint skew angle.

3. This is the joint opening (dimension "A") required at the time of joint opening (installation) shall not be less than 1½". If the joint is less, installation shall be postponed until the temperature drops a sufficient amount to allow the minimum 1½" opening.

4. Minimum joint opening (dimension "A") at time of seal gland installation shall not be less than 1½". If the joint opening is less, installation shall be postponed until the temperature drops a sufficient amount to allow the minimum 1½" opening.

### Example

Given:
The distance from the centerline of the joint to the thermal neutral point of the superstructure along the centerline of the roadway is 300 ft. The skew angle of the expansion joint is 30° and the anticipated ambient temperature at time of joint installation is 65° F.

Find:
- Required strip seal gland size and the joint opening (dimension "A") at time of joint opening.

Solution:
1A. Refer to Table "A" at 1A with 297.5° and find that the required strip seal gland size is 8 inches.
1B. Refer to Table "C" at 1B with 205°. A cosine of 30° = 0.8660 and find required joint opening at 65°F is 1.65".

Note: Step 1B required only at time of construction.
NOTES:

1. PROVIDE 1'-0" CLOSURE POUR, MEASURED FROM THE EDGE OF THE ELASTOMERIC CONCRETE HEADER TO THE SMK AS SHOWN IN THE PARTIAL PLAN VIEW AT ABUTMENT, TO ACCOMMODATE THE INSTALLATION OF STRIP SEAL EXPANSION JOINT AT THE SIDEWALK. (SEE GENERAL NOTES)

2. FOR REINFORCED CONCRETE APPROACH SLAB, SEE STD. BRIDGE DWG. A5-19-56 AND STD. BRIDGE DWG. A5-20-56.

3. FOR TYPICAL ABUTMENT DETAILS, SEE STD. BRIDGE DWG. A5-19-56.

4. SEE DETAIL C ON SHEET 55 FOR ELASTOMERIC CONCRETE HEADER AND JOINT SEAL STEEL RETAINER DIMENSIONS.

5. FOR STOP SEAL EXPANSION JOINT NOTE AND SECTION D-D, SEE SHEET 55.

6. SEE PROJECT PLANS FOR DIMENSIONS OF W, H, AND H.

7. FOR EXAMPLE ON HOW TO DETERMINE STRIP SEAL GLAND OPENING DIMENSION, SEE SHEET 55.

8. FOR BRIDGE SIDEWALK RAILING WITH CONCRETE BARRIER, SEE STD. BRIDGE DWG. A5-20-15.

9. SIDEWALK COVER PLATES SHALL BE CLIPPED 1" x 1" AT ACUTE ANGLE CORNERS ONLY. FOR 90° SKewed BRIDGES, ALL FOUR (4) CORNERS OF SIDEWALK COVER PLATES SHALL BE CLIPPED 1" x 1"

10. FOR EPOXY COATED REINFORCING STEEL LIST, SEE SHEET 55.

11. PAYMENT FOR EPOXY COATED REINFORCING STEEL SHALL BE INCLUDED WITH ITEM 509

12. FOR GENERAL NOTES, SEE SHEET 55.
include the text from the image here.
**EXAMPLE**

- **Given**
  - The distance from the centerline of the joint to the thermal neutral point of the superstructure along the centerline of the roadway is 287.5 feet.
  - The skew angle of the expansion joint is 30° and the anticipated ambient temperature at the time of joint installation is 65°F.

- **Find**
  - The required strip seal gland size and the joint opening (dimension "A") at the time of joint installation.

**Solution**

1. Enter Table "A" at 1 with 287.5 feet and find that the required strip seal gland size is 4 inches.
2. Enter Table "D" at 4 with (287.5 feet) x (cosine of 30°) = 248.98 feet and find the required joint opening at 65°F is 1.86 inches.

**Note**

Step (b) is only required at time of construction.

---

**LEGEND**

1. This is the actual distance from the centerline of joint to the thermal neutral point of the superstructure measured along the centerline of roadway. This dimension shall be a maximum of 298 feet for 60° skews, 342 feet for 45° skews, 385 feet for 30° skews, and 427 feet for 0° through 15° skews. The thermal neutral point of the superstructure is that point which has zero horizontal movement during temperature changes.

2. This distance for expansion joints having skew angles of 0° or less is the actual distance to the thermal neutral point of the superstructure along the centerline of roadway. This distance for expansion joints having skew angles over 15°, but not greater than 60° is arrived at by multiplying the above defined distance along the centerline of roadway by the cosine of the expansion joint skew angle.

3. This is the joint opening dimension "A" required at the time of abutment backwall concrete placement, based on the day's anticipated peak ambient temperature.

4. Minimum joint opening dimension "A" at the time of seal gland installation shall not be less than the dimension shown on sheet 45. If the joint opening is less, installation shall be postponed until the temperature drops a sufficient amount to allow the minimum joint installation width dimension "A".

5. This is the actual distance from the centerline of joint to the thermal neutral point of the superstructure along the centerline of the roadway. This dimension shall be a maximum of 298 feet for 60° skews, 342 feet for 45° skews, 385 feet for 30° skews, and 427 feet for 0° through 15° skews. The thermal neutral point of the superstructure is that point which has zero horizontal movement during temperature changes.

6. This distance for expansion joints having skew angles of 0° or less is the actual distance to the thermal neutral point of the superstructure along the centerline of roadway. This distance for expansion joints having skew angles over 15°, but not greater than 60° is arrived at by multiplying the above defined distance along the centerline of roadway by the cosine of the expansion joint skew angle.

7. This is the joint opening dimension "A" required at the time of abutment backwall concrete placement, based on the day's anticipated peak ambient temperature.

8. Minimum joint opening dimension "A" at the time of seal gland installation shall not be less than the dimension shown on sheet 45. If the joint opening is less, installation shall be postponed until the temperature drops a sufficient amount to allow the minimum joint installation width dimension "A".
GENERAL NOTES

GENERAL:
This standard drawing provides design and general construction details. The project plans shall list dimension "A" for temperatures between 30°F and 90°F, other pertinent details, and special notes that are specific to the structure.

DESCRIPTION:
Perform work in accordance with CMS 516 except as noted herein.

DESIGN DATA (STIP SEAL SYSTEM)
DESIGN LOADING: HL-93
DESIGN STRESSES (TABLEWITH):
EPOXY COATED REINFORCING STEEL = MIN. YIELD STRENGTH = 60 KSI

NEOPRENE STRIP SEAL GLAND:
Furnish strip seal gland meeting the requirements of ASTM D9593. Provide to the engineer seven (7) days before starting work, certified test data conforming to CMS 101.03. Acceptance is not required.

LUBRICANT-ADHESIVE: Use a lubricant-adhesive to install the gland, provided by the manufacturer of the neoprene strip seal gland.

INSTALLATION:
Install strip seal expansion joint system after all corrective deck work has been completed, including grinding.

JOINTS IN NEOPRENE STRIP SEAL GLAND:
Furnish neoprene strip seal gland in one continuous piece unless otherwise approved by the engineer.

STEEL RETAINERS:
Furnish solid shape steel retainers, as shown in detail, sheet A, that are extruded, not rolled or machined. Retainers manufactured from bent plate or built-up pieces are not acceptable. The manufacturer shall specify the internal dimensions of the steel retainer to achieve a positive seal and anchorage.

At joint upturns, especially on skewed bridge decks, the use of split retainers may be necessary to ensure proper neoprene strip seal gland installation. Where the split retainers are required, the manufacturer shall obtain the engineer's acceptance for the design.

Before neoprene strip seal gland is installed, correct any defect in the steel retainer or the actual strip seal expansion joint that could cause damage to the neoprene strip seal gland.

STRUCTURAL STEEL MATERIAL FOR STEEL RETAINERS SHALL BE ASTM A572, GRADE 36, 50, OR 50W.

CLOSURE POURS:
The closure pours allow for installation of the expansion joint system after the concrete railings and sidewalk are installed.

For projects with inertial profiling surface smoothness requirements, the expansion joint system shall be installed after all surface smoothness correction work has been performed.

For projects without inertial profiling surface smoothness requirements, the concrete railings and sidewalk may be completed without closure pours.

JOINTS IN STEEL RETAINERS:
Welds shall be water tight, partial penetration welds around the outer periphery of the abutting surfaces. Grind flush all welds in contact with the neoprene strip seal gland. Do not use short pieces of steel retainers less than 6'-0" long, unless required at curbs or sidewalks. Do not provide additional splices in retainers at the curb or sidewalk sections other than those detailed in the standard bridge drawings.

STRIP SEAL EXPANSION JOINT COATING:
Coat steel parts of the strip seal expansion joint assembly according to CMS 516.

STEEL RETAINER TEMPORARY SUPPORTS:
The fabricator shall design, provide, and install temporary supports to resist shipping, erection, and construction forces without damage to the steel retainers or coating. These supports shall be adjustable in the field to account for variable temperature settings and weight adjustments. Install the temporary supports after the fabrication and strip seal expansion joint coating is complete.

NOTES TO DESIGNER:
Project plans shall list dimension "A" as shown in section A-A, sheets B and C for temperatures between 30°F and 90°F in 10°F increments.

Neoprene strip seal gland at fixed bearings shall be the same size as at the expansion bearings with a dimension "A" of 2 inches at any ambient temperature.

LIMITATION: Skew angles shall not be greater than 60°.
END CROSSFRAME NOTES:

MATERIAL: All end crossframe material shall be A572 Grade 50, except when the superstructure main steel is A572 Grade 36, then the end crossframe material shall also be A572 Grade 36.

BEAM/GIRDERS: Ends for structures on grade, the beam/girder ends shall be fabricated to be vertical after erection, a three (3) inch minimum clearance at 90° from the beam/girder and the vertical face of the backwall unless the contract criteria/plans show otherwise.

WORK POINTS: Work points shall be coordinated between expansion joint and structural steel suppliers to assure fit up at all design locations.

STIFFENER NOTES:

INSTALL STIFFENERS ACCORDING TO S12. UNLESS THE CONTRACT DOCUMENTS REQUIRE LAPPED WELDS, PROVIDE A 3/8 WELD WHEN THE THICKER PLATE IS 1/2 IN OR LESS AND A 5/8 WELD WHEN THE THICKER PLATE IS GREATER THAN 3/4 IN.
SECTION D-D

- Structural tubing shall be plumb when erected.

SECTION E-E

- See fastener note 1.

- See fastener note 2.

SCUPPER NOTES:

GENERAL: The designer shall show the location of the scuppers in a plan view of the bridge deck on the contract documents.

SUPPLEMENTAL REINFORCEMENT: Reinforce the concrete deck at the two scupper locations opposite the curb line with one 3/8" bar, 2'-0" long oriented at 45° to the long axis of the scupper and located just below the transverse bars (in the top way of steel). The designer shall provide a plan view of the bridge deck on the contract documents.

MATERIAL: Furnish structural steel tubing according to TPO-10. Tension testing in accordance with ASTM A242 is not required. All other material shall be ASTM A36, 50 or 55, Galvanize support angles, links, bolts, nuts and washers in accordance with TII-12.

DECK CROWN/SCREED ELAVATION: Cut the top of the steel tubing square for cross slopes 2½" per foot and less, cut the top of the tubing parallel to the deck surface for cross slopes greater than 2½" per foot.

FASTENER NOTES:

1. The size of the slotted holes shall be 3/16" x 1/2".

2. The bolts shall be 1½" diameter for the main deck, bolts shall be 3/4" diameter for the auxiliary deck, bolts shall be ½" diameter for the weathering steel structures, each assembly shall include a bolt, nut and two washers, tighten according to T22.

3. For weathering steel structures, provide 3/8" x 1½" preformed reaming holes, with a ½" diameter hole, between the beam web and the angle, after the beam concrete has been poured, field drill the ½" diameter hole in the web.

BASIS OF PAYMENT: The department will pay for the supplemental reinforcement described above separately under item 505.
**Application:** Provide Full Height Headwalls for skewed and non-skewed culverts having a diameter of rise of 42" to 84" inclusive. Use Type "A" if the skew angle is over 10 degrees or less and Type "B" if the skew angle is over 10 degrees.

**Design Data:** The following design data is assumed:
- Internal Angle of Friction of Backfill Soil, $\phi = 30^\circ$
- Total Unit Weight of Backfill Soil = 100 psf
- Internal Angle of Friction (drained) of Foundation Soil, $\phi_d = 28^\circ$
- Undrained Shear Strength (circular) of Foundation Soil, $c_u = 500$ psf
- Unit Weight of Concrete = 150pcf
- Slope of Backfill = 2:1
- Concrete Class C10 - Compressive Strength = 4000 psi
- Reinforcing Steel - Grade 60 Minimum Yield Strength = 60,000 psi (All Reinforcing Shall be Epoxy Coated)

Based on the assumed design data, the headwalls for the standard design achieve factored bearing resistances that are greater than their respective factored bearing pressures. If a backfill material with a higher internal angle of friction is used, or when the skew angle (\(\theta\)) is ten degrees or less and Type "B" is used, a higher drained internal angle of friction is used if a backfill material with a higher drained internal angle of friction is encountered. The stability of the wall is satisfactory.

**Notes:**
- Chamfer all exposed corners 3/16".
- Provide Full Height Headwalls for skewed and non-skewed culverts having a diameter of rise of 42" to 84" inclusive. Use Type "A" if the skew angle is over 10 degrees or less and Type "B" if the skew angle is over 10 degrees.

**Details and Quantities:** Are shown for circular sections only. When used with reinforced elliptical concrete pipe or corrugated steel pipe culverts, adjust dimensions and quantities to conform to those listed for the nearest size circular pipe. Apply the dimensions established by vertical diameter to span, round all calculated dimensions established by horizontal diameter to the nearest in. Chamfer all exposed corners 3/16".

**Headwall Location:** Determine by intersection of the embankment slope of the back of the headwall at point "K." Provide 2:1 slopes adjacent to the headwall.

**Payment:** Item 602 Concrete Masonry includes reinforcing.

**Design Data:**
- Reinforcing Steel - Grade 60 Minimum Yield Strength = 60,000 psi (All Reinforcing Shall be Epoxy Coated)
- Concrete Class C10 - Compressive Strength = 4000 psi
- Slope of Backfill = 2:1
- Unit Weight of Concrete = 150pcf
- Internal Angle of Friction (drained) of Foundation Soil, $\phi_d = 28^\circ$
- Undrained Shear Strength (circular) of Foundation Soil, $c_u = 500$ psf
- Total Unit Weight of Backfill Soil = 100 psf
- Internal Angle of Friction of Backfill Soil, $\phi = 30^\circ$

**Headwall Location:** Determine by intersection of the embankment slope of the back of the headwall at point "K." Provide 2:1 slopes adjacent to the headwall.

**Payment:** Item 602 Concrete Masonry includes reinforcing.

**Design Data:**
- Reinforcing Steel - Grade 60 Minimum Yield Strength = 60,000 psi (All Reinforcing Shall be Epoxy Coated)
- Concrete Class C10 - Compressive Strength = 4000 psi
- Slope of Backfill = 2:1
- Unit Weight of Concrete = 150pcf
- Internal Angle of Friction (drained) of Foundation Soil, $\phi_d = 28^\circ$
- Undrained Shear Strength (circular) of Foundation Soil, $c_u = 500$ psf
- Total Unit Weight of Backfill Soil = 100 psf
- Internal Angle of Friction of Backfill Soil, $\phi = 30^\circ$

**Headwall Location:** Determine by intersection of the embankment slope of the back of the headwall at point "K." Provide 2:1 slopes adjacent to the headwall.

**Payment:** Item 602 Concrete Masonry includes reinforcing.

**Notes:**
- Chamfer all exposed corners 3/16".
**CIRCULAR**

**METAL PIPE PROFILE**

W/ ANCHOR BOLT OPTION

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**CAST-IN-PLACE HW FOR CORRUGATED METAL PIPE & PLASTIC PIPE (English)**

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**PIECE-ARCH**

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**METAL PIPE END TREATMENT "A" W/ ANCHOR BOLT OPTION**

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**PIECE-ARCH**

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**METAL PIPE END TREATMENT "B" W/ ANCHOR BOLT OPTION**

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*Note: Extensive chart drawing for pipe sizes between 8" and 16" are included in this document.*

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**Anchor Bolts at approximately 1'-6" centers, provide at least two bolts for all conduit sizes.**
secure cables such that they are taut after the grout or concrete has cured.

1. Fill any openings made for anchor cables with grout after the cables are placed to a taut fit.
2. Form or drill 1" diameter openings for anchor cable at locations shown.
3. Cut galvanized anchor cable to length required. Tightly wrap galvanized anchor cable one time completely around the circumference of the conduit. Furnish hook at least 4" long at the ends of the anchor cable.
4. Provide improved inlet at headwall extension.

NOTES

ANCHOR CABLE DETAIL

CIRCULAR METAL PIPE-ARCH

ANCHOR CABLE PROFILE

METAL PIPE END TREATMENT "A"

PLASTIC & METAL PIPE END TREATMENT "B"

PLASTIC & METAL PIPE-ARCH

PLASTIC & METAL PIPE PROFILE

HALF-HEIGHT HEADWALLS FOR CORRUGATED METAL PIPE AND PLASTIC PIPE
PLASTIC & METAL PIPE PROFILE
W/ ANCHOR CABLE EYE BOLT OPTION

ANCHOR CABLE DETAIL FOR EYEBOLT OPTION

NOTES

Drill openings a min. of 3" deep for eyebolts at the locations shown. Insert entire length of bolt shank into opening. Fill openings with grout and allow to harden before securing anchor cable. Alternatively, place eyebolts in wet concrete at the locations shown above. Tightly wrap galvanized anchor cable one time completely around the circumference of the conduit. Cut galvanized anchor cable to length required. Place cable through eyebolt and form a loop as shown in the above detail. Ensure the cable is pulled to a tight fit and secured with a galvanized wire rope clip.
HDPE IMPROVED INLET - TYPE A CONSISTS

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<th>C</th>
<th>D</th>
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<tr>
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NOTES

GENERAL: Provide a riprap reinforced concrete slab according to SCD DM-1.1. If the pipe is depressed as it is specified in the plan, the punch party is mixed per square yard of Item 601 Riprap using 6" Reinforced Concrete Slab and included in the cost of the riprap wall.

This drawing is for cast-in-place half-height headwalls. Precast half-height headwalls are only allowed for round conduits with a maximum conduit diameter of 12". When precast headwalls are furnished, provide openings for the anchor cable as shown and fill with grout after placement of the anchor cable. If anchor bolts are to be used with a precast headwall, fill the anchor cable openings with grout.

CONCRETE: Use 4000 psi compressive strength concrete for headwall. Concrete quantities are based on headwalls without the 6" extension under the channel protection.

ANCHOR BOLT: Furnish bolts (see detail sheet 2/3) that meet ASTM A 307 for anchoring both ends of metal pipe. The 6" min. of the bolt must be galvanized according to ASTM A 153. Cost of anchors is included in the price bid per foot of Item 611.

Headwall dimensions are based on end treatment "A" for pipe sizes up to and including 120", 13'-3"x9'-4", and 7'-3"x5'-3".

Plastic pipe may not be available in all the sizes specified on this drawing.

ANCHOR CABLE: Furnish galvanized anchor cable (see detail sheet 2/4) that meets ASTM A 307 for anchoring both ends of metal pipe. The top 6" min. of the anchor cable must be galvanized according to ASTM A 153. Cost of anchor cable and wire rope clip is included in the unit price bid per foot of Item 611.

End wall dimensions are based on end treatment "A" for pipe sizes up to and including 120", 13'-3"x9'-4", and 7'-3"x5'-3".

STANDARD BRIDGE DRAWING

DESIGN AGENCY

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

DATE

ADMINISTRATOR

OFFICE OF STRUCTURAL ENGINEERING

REVISIONS
**INLET CHANNEL PROTECTION DETAIL**

- Item 601 Riprap using 6" reinforced concrete, see SCD DM-1.1
- 6" extension required when riprap is specified

**OUTLET CHANNEL PROTECTION DETAIL**

- Item 601 Rock Channel Protection (with filter)
- 6" Extension
- Riprap width equal to headwall width unless otherwise shown on plan
- Thickness shown on plan and used for computing quantity of Item 601 R.C.P. (with filter)
- No. 3 or No. 4 granular bed, 6" thick or geotextile fabric as per CMS 601.09

**CONCRETE PIPE**

- See Sheet 2 of 2 for Pipe Tables and NOTES.
C.I.P. HEADWALL FOR CONCRETE PIPE (ENGLISH)

Riprap and rock channel protection width

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Rise

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Notes:
- Use 4000 psi compressive strength concrete for headwalls.
- The height headwalls are only approved for round conduits with a maximum conduit size of 36".
- The cost of the cutoff wall includes the slab and the channel protection.
- The table above includes the dimensions for headwalls with a square yard of concrete.
- The information in the table is based on standards without the channel protection.
"M" = Windwall Length

6" Non-Perforated Corrugated Plastic Pipe (FG033 Type S)

Pile Spacing

Maximum Spacing of AS01, AS02, and AS03 Bars = 1'-6" C/C

Reinforcing Steel


B-Length and Incremental Sizes May Vary With Each Individual Structure.

1. 1/2 (Length of AB01) + 1/2 Bar Lap.
2. Length is dependent upon dimension "M" (Length of Windwall).
NOTE: FOR BEARING DESIGN DETAILS, CONNECTIONS AND NOTES, SEE STRUCTURE PLANS TO BE SUPPLIED BY DESIGNER.

SECTION M-M
(SUPPORT BOLTS NOT SHOWN)

SECTION THRU ABUTMENT

SECTION THRU PIER

SECTION L-L

RECOMMENDED PIER BEARING

GENERAL NOTES

LIMITATIONS: THIS DESIGN IS INTENDED FOR SITES WHERE THERE ARE NO CONCERNS ABOUT SETTLEMENT OR DIFFERENTIAL SETTLEMENT, SKews NOT GREATER THAN 30°, FOR UNBROKEN STRUCTURES. A BRIDGE EXPANSION LENGTH OF 25' TO 250'-0" AND FOR A TOTAL LENGTH OF 400'-0", THE ABUTMENT TYPE MUST BE FLEXIBLE (CAPED PILE OR SINGLE ROW OF PILES, REGARDLESS OF PILE TYPE).

BRIDGE SEAT CONSTRUCTION JOINT shall BE STRAIGHT BETWEEN ENDs OF BACKWALL.

HOLE LOCATIONS IN THE STRUCTURAL STEEL ARE TO BE DETAILLED IN THE PROJECT PLANS. PLANE CUTTING OF HOLEs IS NOT PERMITTED.
1. DESIGN SPECIFICATIONS:
   - GEOTEXTILE WRAP: Elkonok 502 with 4 oz. weight, coated with a 0.4 mil EVA film.
   - CONCRETE: Precautionary cast-in-place concrete with a minimum water-cement ratio of 0.45. The concrete mix design for posts shall contain a concrete mixture with a minimum NRC (noise reduction coefficient) of 0.70.
   - STEEL REINFORCEMENT: The noise barrier panels shall be cast with an ashlar stone pattern from a supplier certified by the ODOT Office of Environment Services. For approved equal consideration, provide certified laboratory test data documenting the acoustical, freeze-thaw, and load-bearing requirements. The noise barrier panels shall also be cast with an ashpore stone pattern from a supplier certified by the ODOT Office of Environment Services.

2. MATERIAL SPECIFICATIONS:
   - CONCRETE MIXTURE: Precautionary cast-in-place concrete with a minimum water-cement ratio of 0.45. The concrete mix design for posts shall contain a concrete mixture with a minimum NRC (noise reduction coefficient) of 0.70.
   - STEEL REINFORCEMENT: The noise barrier panels shall be cast with an ashlar stone pattern from a supplier certified by the ODOT Office of Environment Services. For approved equal consideration, provide certified laboratory test data documenting the acoustical, freeze-thaw, and load-bearing requirements. The noise barrier panels shall also be cast with an ashpore stone pattern from a supplier certified by the ODOT Office of Environment Services.

3. DESIGN LOADS:
   - WIND LOAD: The wind load is based on an 80 mph base wind velocity. The applied wind load on posts is 25 PSF (14' < BH < 25').
   - SERVICE I LOAD CASE: FURNACE SLAG (GGBF).
   - STRENGTH III LOAD CASE: ADMIXTURE AND 15% BY WEIGHT FLY ASH OR 15-30% GROUND GRANULATED BLAST FURNACE SLAG (GGBF).

4. DESIGN STANDARDS:
   - PCI DESIGN HANDBOOK, FIFTH EDITION.
   - AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION, 2007.

5. SHOP DRAWINGS:
   - DRAWING: SHEET 1/13 FOR PANELS AND SHEET 2/13 FOR POSTS.
   - CONCRETE NOISE BARRIER PANELS SHALL BE CAST WITH AN ASHLAR STONE PATTERN FROM A SUPPLIER CERTIFIED BY THE ODOT OFFICE OF ENVIRONMENT SERVICES.
   - FOR AESTHETIC PURPOSES, HORIZONTAL JOINT LINES BETWEEN PANELS SHALL MATCH ACROSS ADJACENT BARS WITH THE SAME TOP OF WALL, ELEVATION, EXCEPT AT ANGLES GREATER THAN 30°.

6. MANUFACTURING, TESTING, TRANSPORTING, STORING, AND INSTALLING:
   - CHECKER: DATED BY AN OHIO REGISTERED ENGINEER. DEPARTMENT ACCEPTANCE IS NOT REQUIRED.
   - DRAWING: SHEET 1/13 FOR PANELS AND SHEET 2/13 FOR POSTS.
   - ALL BOTTOM NOISE BARRIER PANELS REQUIRE A NEOPRENE PREFORMED BEARING PAD BETWEEN THE BOTTOM OF THE NOISE PANEL AND THE BEARING SURFACE.
   - THE NOISE BARRIER PANELS SHALL BE CAST WITH AN ASHLAR STONE PATTERN FROM A SUPPLIER CERTIFIED BY THE ODOT OFFICE OF ENVIRONMENT SERVICES.

7. INSTALLATION:
   - INSTALLATION: DETAILED IN SHEET 3/13 FOR PANELS AND SHEET 4/13 FOR POSTS.
   - THE CONTRACTOR SHALL PROVIDE AN ELECTRONIC COPY OF A WRITTEN ACCEPTANCE LETTER THAT DOCUMENTS ACCEPTANCE OF THE SHOP DRAWINGS INCLUDING CONFIRMATION OF THE CONTRACTOR'S RESPONSIBILITY. THE PREPARER(S) AND CHECKER(S) SHALL NOT BE INDIVIDUALS IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
GENERAL

1. AVOIDANCE OF UNEXPECTED OBSTRUCTIONS: If the avoidance of unexpected obstructions or other obstructions requires the use of temporary fencing, the contractor shall furnish and install additional foundations, wall, and panel systems as directed by the engineer. The contractor shall conform to these standards of workmanship and operation. The top and bottom elevations of all temporary fences, and panel systems shall conform to the original details shown in the project plans. The contractor shall not accept field cuttings or post panels to match the new post locations.

CONSTRUCTION METHODS

1. LAUNCH AND SKEW EACH NOISE BARRIER IN THE FIELD AND VERIFY THE PROPER DIMENSIONS OF THE POSTS AND PANELS PRIOR TO INSTALLATION. CONSTRUCT ALL MEMBERS TO CONFORM TO THE FOLLOWING TOLERANCES.

METHOD OF MEASUREMENT

1. POST DIMENSIONAL TOLERANCES:
   a. POST LENGTH AND HEIGHT = +/- 0" 
   b. PANEL LENGTH AND HEIGHT = +/- 0" 
   c. PANEL ARCHITECTURAL/ABSORPTIVE MATERIAL THICKNESS = +/- 0" 
   d. PANEL STRUCTURAL THICKNESS = +/- 0" 
   e. PANEL LENGTH AND HEIGHT = +/- 0" 
   f. PANEL BEARING PLATE ANCHOR BOLT HOLES = +/- 0" 
   g. POST VERTICAL SWEEP: 
      A. POST HEIGHT = +/- 0" 
      B. POST VERTICAL SWEEP = +/- 0" 
   h. PANEL ARCHITECTURAL/ABSORPTIVE MATERIAL THICKNESS = +/- 0" 
   i. PANEL STRUCTURAL THICKNESS = +/- 0" 
   j. PANEL LENGTH AND HEIGHT = +/- 0" 
   k. PANEL BEARING PLATE ANCHOR BOLT HOLES = +/- 0" 

2. BASE PLATE DIMENSIONAL TOLERANCES:
   a. FURNISH STEEL BASE PLATES ACCORDING TO CMS 635.

3. NOISE BARRIER CONSTRUCTION TOLERANCES:
   a. POSITION INDIVIDUAL DRILLED SHAFT WITHIN +/- 1/16" OF THE PLAN LOCATION IN THE HORIZONTAL PLANE.
   b. POSITION POSITIVELY DRILLED SHAVES WITHIN +/- 1/16" OF THE CENTER-TO-CENTER SPACING SHOWN IN THE PLANS, MEASURED IN THE HORIZONTAL PLANE AT THE TOP ELEVATION OF THE SHAFT
   c. POSITION AN INDIVIDUAL DRILLED SHAFT WITHIN +/- 1/16" OF THE PLAN ELEVATION LIMITS
   d. POSITION OF THE CENTER OF THE DRILLED SHAFT, POSITION BASE PLATE ANCHOR BOLTS = +/- 0" IN THE CORRECTION PARALLEL TO THE SHORT SLOT ELEVATION
   e. PANELS SHALL BE PLANE.
   f. INSTALL NOISE BARRIERS SO THAT THE FINAL TOP OF ELEVATION BARRIER IS WITHIN +/- 1/4" OF HEIGHT FROM THE PLAN ELEVATION.

ACCUMPTMENT REQUIREMENTS

1. IN ADDITION TO COMPLIANCE WITH THE STRUCTURAL REQUIREMENTS AS SHOWN IN THE BASE PLANS, THE BARRIERS SHALL ALSO COMPLY WITH THE FOLLOWING AESTHETIC REQUIREMENTS:
   a. THE CONTRACTOR SHALL DELIVER TO THE JOB SITE AND ERECT ONE FULL BAY PER FOOT OF THE CONSTRUCTION COST, THE CONTRACTOR SHALL FURNISH AND INSTALL ADDITIONAL FOUNDATIONS, POSTS, AND PANELS AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL NOT SUBSTITUTE ANY MATERIALS OR COMPONENTS DUE TO IMPROPER HANDLING, TRANSPORTING, STORAGE, OR ERECTING.
NOISE BARRIER SEALER

DESCRIPTION

APPLICATION TO ALL CONCRETE SURFACE AREAS OF NOISE BARRIER PANELS, INCLUDING CONCRETE TO CONCRETE CONTACT SURFACES. DO NOT SEAL POSTS.

APPLY THE COLOR DEFINED BY THE FEDERAL COLOR STANDARD IDENTIFICATION NUMBER AS NO. 507, OR THE ENGINEER WILL SPECIFY THE COLOR.

MATERIALS

SELECT AND USE PRODUCTS ONLY FROM THE OFFICE OF MATERIALS MANAGEMENT'S APPROVED LIST.

MANAGEMENT'S APPROVED LIST.

MATERIALS: SELECT AND USE PRODUCTS ONLY FROM THE OFFICE OF MATERIALS MANAGEMENT. THE NOISE WALL PLANS. IF THERE IS NO NUMBER, THE ENGINEER WILL SPECIFY THE COLOR.

APPLICATION

APPLY THE SEALER TO ACCELERATED CURED PRECAST AFTER THE CONCRETE HAS REACHED ITS DESIGNED 28 DAY DESIGN STRENGTH OF 1500 PSI, OR 48 HOURS FOR COMPLETION OF CURING.

CONTACTOR EQUIPMENT

PROVIDE, IN GOOD WORKING ORDER, THE FOLLOWING TESTING EQUIPMENT:

1. ANILINE PSYCHROMETER INCLUDING PSYCHOMETRIC TABLES USED TO RELATIVE HUMIDITY AND DEW POINT TEMPERATURE.
2. TWO STEEL SURFACE THERMOMETERS ACCURATE WITHIN 2 DEGREES F OR ONE PORTABLE INFRARED THERMOMETER AVAILABLE FROM MODEL PARTNER ST SERIES -19 DEGREES C TO 100 DEGREES C MANUFACTURER: RUTTER INC.
3. SPECIES VISUAL STANDARD FOR ABRASIVE BLAST CLEANED STEEL SSPC-VIS 1-89
4. ONE RECORDER THERMOMETER CAPABLE OF RECORDING THE DATE, TIME AND TEMPERATURE OVER A PERIOD OF AT LEAST 30 HOURS.

SURFACE PREPARATION

FOR BOTH ABSORPTIVE AND NON-ABSORPTIVE SURFACES, AFTER COMPLETION OF CURING, REMOVE THE CONCRETE SURFACES. REMOVE DIRT, DUST, OIL, WAX, CURING COMPOUNDS, HYDROGEN SULFIDE, LAITANCIES, OILS, RESIDUES, AND OTHER FOREIGN MATERIALS. CURE THE CONCRETE CORRECTLY AND APPLY THE CLEANING MATERIALS WITH DEVICES TO PREVENT OIL OR OTHER FOREIGN MATERIAL BEING DEPOSITED ON THE COATING. USE CLEANING EQUIPMENT FITTED WITH SUITABLE TRAPS, FILTERS, DRIP PANS AND OTHER RECOMMENDED CLEANING MATERIALS TO HELP REMOVE FOREIGN MATERIALS.

TEST APPLICATION:

MIX SEALER ACCORDING TO THE MANUFACTURER'S RECOMMENDED WRITTEN INSTRUCTIONS OR WRITTEN INSTRUCTIONS AS SPECIFIED ABOVE.

APPEARANCE

FOLLOW THE MANUFACTURER'S RECOMMENDED APPLICATION PROCEDURE. APPLY THE SEALER TO A MEASURED TEST COVERAGE AREA OF DIFFERENT NOISE WALL COMPONENTS TO DEMONSTRATE THE DESIGNED PHYSICAL AND VISUAL EFFECT OF THE COATING AT THE END OF THE CURING PERIOD.

APPLICATION TEMPERATURES

MINIMUM AMBIENT TEMPERATURE: 40 DEGREES F MAXIMUM AMBIENT TEMPERATURE: 70 DEGREES F

TEST APPLICATION:

APPLY THE SEALER TO A MEASURED TEST COVERAGE AREA OF DIFFERENT NOISE WALL COMPONENTS TO DEMONSTRATE THE DESIGNED PHYSICAL AND VISUAL EFFECT OF THE COATING AT THE END OF THE CURING PERIOD.

ENVIROMENTAL REQUIREMENTS:

PROTECT PLANTS AND VEGETATION FROM OVERSPRAY BY COVERING WITH DROP CLOTHS, CLOTHES, ETC., IN THE AREA BEFORE APPLYING THE SEALER. APPLY THE SEALER TO A MEASURED TEST COVERAGE AREA OF DIFFERENT NOISE WALL COMPONENTS TO DEMONSTRATE THE DESIGNED PHYSICAL AND VISUAL EFFECT OF THE COATING AT THE END OF THE CURING PERIOD.

PRECAUTIONS:

FOLLOW THE MANUFACTURER'S RECOMMENDED APPLICATION PROCEDURE. APPLY THE SEALER TO A MEASURED TEST COVERAGE AREA OF DIFFERENT NOISE WALL COMPONENTS TO DEMONSTRATE THE DESIGNED PHYSICAL AND VISUAL EFFECT OF THE COATING AT THE END OF THE CURING PERIOD.

ENVIRONMENTAL RESTRICTIONS:

PROTECT PLANTS AND VEGETATION FROM OVERSPRAY BY COVERING WITH DROP CLOTHS, CLOTHES, ETC., IN THE AREA BEFORE APPLYING THE SEALER. APPLY THE SEALER TO A MEASURED TEST COVERAGE AREA OF DIFFERENT NOISE WALL COMPONENTS TO DEMONSTRATE THE DESIGNED PHYSICAL AND VISUAL EFFECT OF THE COATING AT THE END OF THE CURING PERIOD.

APPLICATION

APPLY THE SEALER TO A MEASURED TEST COVERAGE AREA OF DIFFERENT NOISE WALL COMPONENTS TO DEMONSTRATE THE DESIGNED PHYSICAL AND VISUAL EFFECT OF THE COATING AT THE END OF THE CURING PERIOD.

ENVIRONMENTAL REQUIREMENTS:

PROTECT PLANTS AND VEGETATION FROM OVERSPRAY BY COVERING WITH DROP CLOTHS, CLOTHES, ETC., IN THE AREA BEFORE APPLYING THE SEALER. APPLY THE SEALER TO A MEASURED TEST COVERAGE AREA OF DIFFERENT NOISE WALL COMPONENTS TO DEMONSTRATE THE DESIGNED PHYSICAL AND VISUAL EFFECT OF THE COATING AT THE END OF THE CURING PERIOD.

PRECAUTIONS:

FOLLOW THE MANUFACTURER'S RECOMMENDED APPLICATION PROCEDURE. APPLY THE SEALER TO A MEASURED TEST COVERAGE AREA OF DIFFERENT NOISE WALL COMPONENTS TO DEMONSTRATE THE DESIGNED PHYSICAL AND VISUAL EFFECT OF THE COATING AT THE END OF THE CURING PERIOD.
**Precast Concrete Panel Design Table**

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<tr>
<th>Post Reference Line</th>
<th>Panel and Noise Barrier Alignment</th>
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</thead>
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<tr>
<td>B</td>
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<tr>
<td>C</td>
<td>Panel and Noise Barrier Alignment</td>
</tr>
<tr>
<td>D</td>
<td>Panel and Noise Barrier Alignment</td>
</tr>
</tbody>
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**Notes:**

1. For general notes refer to sheets 1-3/13.
2. If stacked panels are required refer to details on sheet 6/13.
3. Adjust panel length to accommodate post details at each end as shown in section B-B and PLD table.
4. Provide supplemental reinforcing, and the minimum number of lifting inserts required for all panels.
5. Thickness of reinforcing material varies according to the material properties used by the manufacturer.
6. The project plans will provide the welded wire fabric requirements including the area of steel, the required supplemental reinforcing, and the minimum number of lifting inserts required for all panels.

**Post Details:**

<table>
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<tr>
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**PLD Table:**

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<td>D</td>
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**Notes:**

1. For general notes refer to sheets 1-3/13.
2. If stacked panels are required refer to details on sheet 6/13.
3. Adjust panel length to accommodate post details at each end as shown in section B-B and PLD table.
4. Provide supplemental reinforcing, and the minimum number of lifting inserts required for all panels.
5. Thickness of reinforcing material varies according to the material properties used by the manufacturer.
6. The project plans will provide the welded wire fabric requirements including the area of steel, the required supplemental reinforcing, and the minimum number of lifting inserts required for all panels.

**Notes:**

1. For general notes refer to sheets 1-3/13.
2. If stacked panels are required refer to details on sheet 6/13.
3. Adjust panel length to accommodate post details at each end as shown in section B-B and PLD table.
4. Provide supplemental reinforcing, and the minimum number of lifting inserts required for all panels.
5. Thickness of reinforcing material varies according to the material properties used by the manufacturer.
6. The project plans will provide the welded wire fabric requirements including the area of steel, the required supplemental reinforcing, and the minimum number of lifting inserts required for all panels.
ELEVATION, REINFORCING, AND STORAGE PLAN

TYPICAL POST DETAIL C - INTEGRAL POST CAP DETAIL

DETAIL D - NON-INTEGRAL POST CAP DETAIL

NOTES:
1. FOR GENERAL NOTES REFER TO SHEETS 1-3/13.
2. FASTEN THE NON-INTEGRAL CAP ATOP THE POST BY THREADING A ¾" Ø ANCHOR BOLT INTO THE FERRULE LOOP INSERT.
3. FASTEN THE INTEGRAL CAP ATOP THE POST BY THREADING A 1½" Ø ANCHOR BOLT INTO THE POST CAP. (SEE NOTE 4)

LEGEND:
# Ø ANCHOR BOLT INTO THE FERRULE LOOP INSERT
A ¾" Ø ANCHOR BOLT INTO THE POST CAP (TYP)
A ½" Ø ANCHOR BOLT INTO THE NON-INTEGRAL POST CAP (TYP)
THE TOP OF BARRIER ELEVATION
A CENTER OF DRILLED SHAFT
TBE = TOP OF BARRIER ELEVATION
BH = BARRIER HEIGHT
FPH = FINISHED POST HEIGHT
NIC = NON-INTEGRAL CAP ADDITION
FERRULE LOOP INSERT
STANDARD CIRCULAR WASHER
SWIFT LIFT ANCHOR; 2-TON CAPACITY
TOP OF INTEGRAL POST CAP (TYP) (SEE NOTE 4)
TOP OF INTEGRAL PANEL CAP (TYP)
TOP OF INTEGRAL PANEL CAP (TYP) (STEPED PANEL)
FOOTING CLEARANCE
FOOTING CLEARANCE (TYP)
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**NOTES:**

1. For general notes refer to sheets 1-3/13.
2. For section 1-6, see sheet 1/13.
3. Install all threaded connections according to the anchor bolt nut requirements of CMS 630.06. In lieu of providing separate threaded rods, the "A" rebar must be threaded and extended to connect the base plate to the bottom of the post. Extension "A" rebar shall be galvanized full length. Fabricator to detail hole locations and sizes on shop drawings.

4. Provide headed anchor bolts with standard circular washers; hooked ends are not allowed.

5. Provide bolts with standard circular washers; hooked ends are not allowed.

6. In lieu of providing separate threaded rods, the "A" rebar must be threaded and extended to connect the base plate to the bottom of the post. Extension "A" rebar shall be threaded into the baseplate (tip = 3") and tack welded in place. The assembly shall be cast into the post.

7. Fabricator to detail anchor bolt projection on shop drawings. When installed, the end of the bolt shall project at least two thread lengths outside the face of the nut.

---

**BASE PLATE DATA FOR 16" PRECAST CONCRETE POSTS**

<table>
<thead>
<tr>
<th>Barrier Height (ft)</th>
<th>Max Post Spacing (in)</th>
<th>Type A Post</th>
<th>Type B Post</th>
<th>Type C Post</th>
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</thead>
<tbody>
<tr>
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<td>Plate Thickness (in)</td>
<td>Anchor Bolt Hole (in)</td>
<td>Plate Thickness (in)</td>
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<tr>
<td></td>
<td></td>
<td>L x W (in)</td>
<td>Ø (in)</td>
<td>Ø (in)</td>
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<tr>
<td>8'-0&quot;</td>
<td>24'-0&quot;</td>
<td>3&quot; x 5&quot;</td>
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<td>0.6&quot;</td>
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<td>24'-0&quot;</td>
<td>3&quot; x 5&quot;</td>
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**BASE PLATE DATA FOR 20" PRECAST CONCRETE POSTS**

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<tr>
<th>Barrier Height (ft)</th>
<th>Max Post Spacing (in)</th>
<th>Type A Post</th>
<th>Type B Post</th>
<th>Type C Post</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Plate Thickness (in)</td>
<td>Anchor Bolt Hole (in)</td>
<td>Plate Thickness (in)</td>
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<td>L x W (in)</td>
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<td>Ø (in)</td>
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<tr>
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<td>3&quot; x 5&quot;</td>
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<tr>
<td>8'-0&quot;</td>
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<td>3&quot; x 5&quot;</td>
<td>0.6&quot;</td>
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---

**LEGEND:**

- ANSI = American National Standard
- HDG = Hot Dipped Galvanized
- HDG @ = HDG Bolt EMBEDMENT LENGTH
- PT = STEEL BASE PLATE THICKNESS
- * = CENTER OF DRILLED SHAFT
**Panel Seat Elevation**

(Threads rods not shown for clarity)

**Legend:**
- + Center of Drilled Shaft

**Notes:**
1. For general notes refer to sheets 1-3/13.
2. Non-integral precast concrete step blocks shall be used from a minimum height of 3' to a maximum height of 4'. Integral precast concrete step blocks shall be used for heights over 4'.
3. Ensure that step block anchor locations do not interfere with precast concrete post shear reinforcing. Refer to "Detail F" on this sheet for anchor location requirements.

---

**Panel Seat Plan with Integral Step Block**

(H6, type E post shown; other posts similar)

**Detail F - Step Block Anchor Layout**

Notes:
1. For general notes refer to sheets 1-3/13.
2. Non-integral precast concrete step blocks shall be used from a minimum height of 3' to a maximum height of 4'.
3. Ensure that the Step Block is fully seated on the Steel Base Plate.

---

**Panel Seat Plan with Non-Integral Step Block**

(H6, type A post shown; other posts similar)
1. FOR GENERAL NOTES REFER TO SHEETS 1-3/13.

2. REFER TO THE REINFORCING STEEL LIST IN THE PROJECT PLANS FOR THE REINFORCING STEEL DETAILS FOR EACH DRILLED SHAFT DESIGN.

LEGEND:

NOTES:

1. FOR GENERAL NOTES REFER TO SHEETS 1-3/13.

2. REFER TO THE REINFORCING STEEL LIST IN THE PROJECT PLANS FOR THE REINFORCING STEEL DETAILS FOR EACH DRILLED SHAFT DESIGN.
1. Construct a trench with a minimum longitudinal slope of 1.0% under the noise barrier panels as shown in the typical elevation.

2. Provide underdrain slope of 1% minimum or as specified in project plans. Install in accordance with item 605.

3. Outlet conduit to be spaced at 500' max.; install in accordance with item 605.

4. At sag points, specify raised panel section.

SLOPED SECTION DRAINAGE NOTES:
GENERAL
NOTE

The beam ends shall be designed to resist the loads from the structure and the reinforcement shall not be applied to structures with high values of 60 or less. The minimum concrete cover for the reinforcement shall be 1" or more. The reinforcement shall be placed not later than the hardening of the concrete and shall be uniformly distributed throughout the beam cross-section. The reinforcement shall be placed in accordance with the project specifications.

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3. THE MINIMUM TOP LONGITUDINAL REINFORCING STEEL SHALL BE 6" BARS.

NOTES:
- ALL DESIGN PLANS FOR 100% PRESTRESSED CONCRETE SYSTEMS SHALL BE DRAWN TO SCALE AND SHOWN ON ACCEPTABLE DRAWING MATERIAL.
- ALL DETAILING SHALL BE DONE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- ALL DETAILING SHALL BE SIGNATURED AND DATED.
- ALL DETAILING SHALL BE REVIEWED BY THE PROJECT ENGINEER.

NOTES (CONTINUED):
- ALL SHEET 3" TYP.
- ALL SHEET 3" TYP.
- ALL SHEET 3" TYP.
- ALL SHEET 3" TYP.
- ALL SHEET 3" TYP.
- ALL SHEET 3" TYP.
NOTE: THE PRESTRESSING STRANDS WHICH ARE BENT UP SHALL BE STAGGERED IN ABUTTING OF THE TOTAL NUMBER OF STRANDS BENT UP APPROXIMATELY ONE HALF OF THE TOTAL NUMBER OF STRANDS BENT UP.

36" WIDE BEAMS OF 6 STRANDS BENT UP. 48" WIDE BEAMS WITH LESS THAN 12 STRANDS TOTAL SHALL HAVE THE VERTICAL POSITION TO PROVIDE THE REQUIRED CLEARANCE.

*LAP BARS SAME SIZE AND NUMBER AS BEAM BARS. HOOKS MAY BE ROTATED FROM BEARING|

SECTION A-A

**PARTIAL PLAN OF BEAM CONNECTION OVER PIER**

E PIER

- CAST-IN-PLACE CONCRETE
- BEAM BARS, INCLUDING FULL LENGTH AND PARTIAL LENGTH FUNCTIONAL BARS,
- NO. 4 OR NO. 2 BARS LOADED BEAM BARS
- NO. 6 BARS
- PRESTRESSING STRANDS

- At the intersection section, strands may be extended and bent up as shown.
- Strands total shall be bent up by a 1/2 of the total number of strands bent up. 36" wide beam is shown 12 strands total. 48" wide beam is shown 24 strands total. In both cases, the number of strands bent up shall be staggered in abutment beam ends to avoid interferences.

SECTION PROPERTIES FOR COMPOSITE SECTIONS ARE COMPARED WITH A CLEAR BOTTOM FIBER. THE THICKNESS OF SLAB IS 6" WHICH INCLUDES A MONOLITHIC WEARING SURFACE.

- All dimensions are in inches.
- All angles are in degrees.
- Modulus of elasticity of steel is 29000000 psi.
- Modulus of elasticity of concrete is 4500 psi.

**SECTION PROPERTIES**

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**BEAM TABLE**

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<td>12</td>
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<tr>
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</table>

**NOTES**

- Type 1
- Type 2

**CONCRETE TABLE**

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</tr>
</tbody>
</table>

**REMARKS**

- All dimensions are in inches.
- All angles are in degrees.
- Modulus of elasticity of steel is 29000000 psi.
- Modulus of elasticity of concrete is 4500 psi.

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- All angles are in degrees.
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<tr>
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<td>12</td>
<td>24</td>
</tr>
</tbody>
</table>
Sheet 2 Notes and Legend:

1. One longitudinal bar from the bottom may of guy reinforcing shall be placed under each 401 bar. This bar is included in payment for the guy reinforcing steel and shall be rusted coated.

2. The member shall be provided as shown. Additional reinforcing bars may be added in plans if required by analysis. Additional bars shall be placed symmetrically about E and meet all related requirements.

3. See sheet 4 of 10 for WWR details.

4. All reinforcing steel may be replaced with equivalent WWR. If steel WWR, these strand locations must be shaped.

WF48-49

(82 permissible bottom flange strand locations)

WF54-49

(82 permissible bottom flange strand locations)

WF60-49

(82 permissible bottom flange strand locations)

WF54-49

(82 permissible bottom flange strand locations)
ANCHORAGE ZONE REINFORCING STEEL

strands not shown for clarity

Sheet 4 Notes and Legend

(a) - 401 bar shall be epoxy coated. 401 bar spacing shall be determined by analysis to achieve composite design.

(b) - Anchor zone reinforcement shall be shown in structure plans and shall be designed to meet AASHTO 5.10.10.

(c) - Discontinue 305 bars at a distance of 1.5 times the depth of the beam beyond the termination of strand debonding.

(d) - Trowel exterior 9" of top flange smooth. Apply two coats of C&M 705.07, type 1 or 2 membrane curing compound with a roller to act as a bond breaker. Refer to "Bond Breaker for Top Flange" note on Sheet 10 of 10.

(e) - Size of WWR shall be given in plans as a required area and maximum spacing. The maximum difference in cross-sectional area of intersecting wires shall be 40%.

(f) - Shipping holes are not allowed in beams 54" deep or less.

(g) - If shipping holes are utilized, two #3 bars shall be added on each face of the web. The #3 bars shall be tied to the outside face of the WWR and extend for a minimum of 1'-0" beyond the shipping holes. E.F. - each face.

SECTION A-A

- If utilized in WF girders, these strands shall be draped. 401 bars not shown for clarity.

SECTION B-B

- If utilized in WF girders, these strands shall be draped. 401 bars not shown for clarity.

SECTION C-C

- If utilized in WF girders, these strands shall be draped. 401 bars not shown for clarity.

401 Bar Spacing shall be determined by analysis.

THEMAX. DIFFERENCE IN CROSS-SECTIONAL AREA OF INTERSECTING WIRES SHALL BE 40%.
DIAPHRAGMS BEAM BEARINGS
SKEW ANGLE £
DIAPHRAGM PIER
ABUT. BEARINGS
BEAM BEARINGS & DIAPHRAGM INTERMEDIATE S
SOLE PLATE EMBEDDED STEEL ƒ" THICK
END WELDED STUD †" DIA. x 5"
SEE DETAIL B Š"
(ALL BEARING TYPES)
TYPICAL LOCATION OF CHAMFER.
STEEL LOAD PLATES: ALL LAMINATED, ELASTOMERIC BEARINGS SHALL INCLUDE A SOLE PLATE IN THE LOAD PLATE. A LOAD PLATE TO ALLOW FOR FIT-UP, THE PLATE WIDTH MAY BE DECREASED BY … " DIMENSION "A" SHALL BE CORRECTED ACCORDINGLY. PRESTRESSING STRANDS. THE DESIGNER SHALL SHOW EXACT LOCATION OF THE STUDS ON THE PLANS.

DIAPHRAGMS FASCIA BEAM
INTERIOR BEAM
PLAN FOR SKEW ANGLES ≤ 10°

DIAPHRAGMS FASCIA BEAM
INTERIOR BEAM
PLAN FOR SKEW ANGLES > 10°

TYPICAL FRAMING PLAN

SOLE PLATE DIMENSIONS

SHEET 5 NOTES AND LEGEND

10 - IN ORDER TO ALLOW FOR FIT-UP, THE PLATE WIDTH MAY BE DECREASED BY … " DIMENSION "A" SHALL BE CORRECTED ACCORDINGLY.

11 - END WELDED STUDS MAY BE RELOCATED IN ORDER TO AVOID INTERFERING WITH REINFORCING STEEL AND PRESTRESSING STRANDS. THE DESIGNER SHALL SHOW EXACT LOCATION OF THE STUDS ON THE PLANS.
**S401 & S402 BARS MAY BE MOVED TO ACCOMMODATE 3 S401 & S402 BARS FOR 60", 66", & 72" DEEP BEAMS.**

(b) - 2 S401 & S402 BARS FOR GIRDERS 54" OR LESS.

S402 BARS (b)
1. **Flange (Typ.)**: The larger flange is placed parallel to the beams.

2. **Flange Edge**: The edge of the larger flange is specified.

3. **Thickness of Web (T)**: The thickness of the web is defined.

4. **Width (W)**: The larger of the top or bottom flange is specified.

5. **Vertical Bars**: All vertical bars are placed at a maximum of 1'-0" C/C.

6. **Dowel Bars**: Nonshrink, non-metallic grout is recommended for dowel holes.

7. **Steel Load Plate**: The steel load plate shall not be clipped.

8. **Grade Differences**: The thickness to account for grade differences is specified.

9. **Elastomeric Bearing**: Fixed pier only.

10. **Elastic Anchor Rod**: The elastic anchor rod is specified.

11. **Beam Not Shown**: The beam is not shown in the diagram.

12. **Beam Spacings**: Additional bars are required for beam spacings exceeding 9'-0".

13. **Diaphragm Face**: The face of the diaphragm is shown.

14. **Concrete**: Pre-stressed concrete I-beam bridge details are included.

15. **Reinforcing Steel**: The superstructure reinforcing steel is specified.

16. **N = 1'-6" cos £ + W sin £**: The formula for calculating the distance is given.

17. **Sheet 8 Notes and Legend**: Additional notes and legend are provided for clarity.
The designer shall include a deck pour sequence in the design specifications.

Dead load - 60 lb/ft (future wearing surface)

It is not intended that details shown on this standard label "for information only".

Complete the plans.

Placement sequence.

The beams. The cost of fabrication, erection and construction of bearings and fixed dowel requirements. Positions, centerline of beam bearings, orientation of lines of bearings.

Laminated elastomeric bearing details, including dimensions, dowelometer and load plate.

Details of end and pier diaphragms, including dimensions, rebar layouts and size and spacing.

Expansion joint details.

Details of abutments and piers, including dowel rod positions, centerline of beam bearings, orientation of bearings and fixed dowel requirements.

All plan quantities item required to properly cover the cost of fabrication, erection and construction of the beams.

Plan notes, including but not limited to, concrete placement sequence.

All other details and information necessary to complete the plans.

Provide bar marks, bending diagrams, etc. for the cast in place intermediate diaphragm reinforcement in the contract drawings. Reinforcing steel schedule and label. *For information only.*

It is not intended that details shown on this standard drawing shall be fabricated on the project plans except as may be required for clarity.

Design specifications

Design specifications. This structure conforms to the "PBD bridge design specifications" adopted by the American Association of State Highway and Transportation Officials, 2002 and the Ohio bridge design manual, 2007.

Design loading

Dead load = 80 lb/ft (future wearing surface)

Live load = M-E-53 loading

Design stresses

Pre-stressed concrete, F'c = 30-40 KSI

Release:

Abutment, intermediate, and pier diaphragm concrete, F'c = 4000 PSI

Reinforcing steel - Min. yield strength = 60 KSI

Welded wire reinforcement - Min. yield strength = 70 KSI

Pre-stressing strand - Furnish material conforming to T37 ASTM (uncast, uncoated), seven wires strand. Strands shall be 0.8 inches in diameter with a total cross-sectional area of 0.217 in².

Structural steel - ASTM A709, Grade 36 or 50

- The designer shall specify a 28-day compressive strength in the range of 5500 PSI minimum to 7000 PSI maximum and list the value in the structures general notes.

- The designer shall specify a release strength in the range of 4000 PSI minimum to 5000 PSI maximum and list the value in the structure’s general notes.

- The designer shall specify the strand area in the structure’s general notes.

- The designer shall not specify more than one release strength and one 28-day strength in a single structure.

Deck reinforcing: The designer shall design the deck reinforcing over the piers to resist the negative moments induced by any superposed dead loads and live loads, assuming the superposed load is fully continuous.

Lap splices for reinforcing steel in I-beams and diaphragms shall be:

- 1'-0" in length for #8 bars

- 2'-0" in length for #3 bars

- 3'-0" in length for #4 bars

- 4'-0" in length for #6 bars

Fabrication and construction requirements:

Erection procedure the contractor shall submit plans for erection and handling procedures according to solid.

Erection and lifting devices: The designer fabricator is responsible for the design of the lifting system for handling I-beams. As a minimum, the fabricator shall use two lift points, one within 5 feet of each end, the fabricator shall consider the system on the shop drawings and use a factor of safety of four in the design. Refer to the PCI handbook.

Temporary stability for deck placement: The erection procedure shall include any additional temporary diaphragms or supports needed to assure the I-beams will remain stable before, during and upon completion of the placement of the concrete deck.

The placement of deck concrete shall not proceed until all intermediate diaphragms have been properly installed. The space between the I-beams and the diaphragms shall be completed at least 48 hours before deck placement begins.

Cast-in-place deck concrete: Thoroughly clean the top surface of the deck prior to the pour of the deck concrete. Seal any other foreign materials with water, air under pressure or any other methods that produces satisfactory result. Thoroughly clean the top surface with clean water. Before placing the concrete, allow the surface to dry to a damp condition.

The designer shall include a deck pour sequence in the plans for multi-span, continuous bridges. Two construction joints spaced at 6'-0", parallel, and centered about the piers are required. Do not place concrete before these construction joints prior to the placement of concrete in each adjacent span. Open crack fillers of the deck in the adjacent spans, place the diaphragm and deck concrete between the joints with high molecular weight urethane resin according to S5.22.

Continuous deck pour procedures, which proceed from end to end of the bridge and the pier diaphragm concrete construction. One concrete, may be approved by the engineer if the placement submittal can assure that the deck concrete on the adjacent spans will be placed before the pier diaphragm concrete has reached its initial set.

Except for the exterior 9" on modified asphalt and HF systems, the fabricator shall intentionally roughen the surfaces of the I-beam flanges to be incorporated into the deck concrete. Before the concrete has reached its internal set.

Galvanizing: Galvanize all structural steel, dowel bars, pipe sleeves, bolts, studs, inserts, threaded rods, nuts and washers, embedded steel plates and bearing load plates according to CMS 1.01.

Sealing of fascia beam: Seal the fascia I-beam with an epoxy-silane sealer as shown on sheet 4 of 10. The department will pay for accepted quantities separately under sealing of concrete surfaces.

Sealing of beam ends: Seal all straights at beam ends with Type 1 or 1D to the portions of the top surface of the beam outside of the fascia beam. The fascia beam surface shall be clean of loose shavings and dry for a minimum of 2 hours prior to application of the curbing compound. The temperature of the concrete and the air shall be 40° or higher at the time of application. The second coat may immediately follow application of the first coat. Do not expose coating to precipitation or foot traffic for a minimum period of 4 hours after application.

Repair Coating damage identified by the engineer.

The department will consider costs associated with application of the bond to be incidental to the deck concrete.

Basis of payment: In addition to the items listed in S5.22. The department will consider all costs associated with items being considered to the cost of the I-beam threaded rods, bearingsole plates; temporary bracing and fixed anchor dowels.

The department will pay for pier and abutment diaphragms separately under item S6.2. Concircon is for structures.
**Structural Steel Bolster**

See Table below for additional dimensions.

<table>
<thead>
<tr>
<th>Bolster No.</th>
<th>Rocker No.</th>
<th>Dimensions (inches)</th>
<th>Weight Each (lbs.)</th>
<th>Maximum Load (lbs.)</th>
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</tr>
</tbody>
</table>

Weights given are for one rocker or bolster complete including sheet lead, anchor bolts, and washers.

**Top Bearing Detail**

Top cover 2 3/4 x 1/4
12 top pins 3/4 x 3/32

**Dowel Detail**

5/8" x 1/2 dowels, press fit


Limitation: This rocker and bolster design shall not be used where the anticipated movement is in excess of 5 inches.
NOTES:
1. FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE BRIDGE RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATIONS OF DEFLECTION JOINTS.
2. DEFLECTION JOINT SPACING SHALL NOT EXCEED 1'-1" ON CENTERS. FOR CONTINUOUS STRUCTURES, THE DEFLECTION JOINTS WITHIN THE DEAD LOAD CONTRAFLUXURE NEGATIVE MOMENT REGIONS OVER PIECE LOCATIONS SHALL BE SPACED NOT LESS THAN 0'-6" NOR MORE THAN 1'-6" ON CENTERS.
3. PAYMENT FOR 3'-0" GLASS FIBER REINFORCED POLYMER (GFRP) STIFFENING REINFORCEMENT SHALL BE INCLUDED WITH CONTRACT PRICE FOR ITEM 509 - EPOXY COATED REINFORCING STEEL.
4. LIMITS OF SAWCUT IS SHOWN IN DETAIL A, SHEET 5, THE 4" SAWCUT DEPTH SHOWN IN DETAIL A IS THE MINIMUM REQUIRED. HOWEVER, THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUT.

DESIGN CRITERIA:

DESIGN DATA:
CONCRETE - COMPRESSIVE STRENGTH ≥ 5.5 KSI
REINFORCING STEEL - MINIMUM YIELD STRENGTH = 60 KSI

AREA OF STANDARD 42" SBR-1 CROSS SECTION = 588.0 SQ. IN.

REINFORCEMENT ACCORDING TO SECTION 13 OF THE "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR STANDARD 42" SBR-1 CONCRETE PARAPETS:
THE MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR THE STANDARD 42" SBR-1 CONCRETE PARAPET SHALL BE 1'-0", UNLESS NOTED OTHERWISE.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR 42" SBR-1 TRANSITIONS:

MINIMUM EMBEDMENT OF VERTICAL REINFORCING BARS:
IF THE MINIMUM EMBEDMENT SHOWN FOR THE VERTICAL REINFORCING BARS INTO THE BRIDGE DECK, APPROACH SLAB, OR WINGWALL IS NOT MET, THEN THE DESIGNER SHALL CALCULATE THE REQUIRED REINFORCEMENT ACCORDING TO SECTION 13 OF THE "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.

THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUT. HOWEVER, THE SAWCUT SHALL NOT BE LESS THAN 1'-0" FROM THE TOP OF THE CONCRETE DECK SLAB.

USE AN EDGE GUIDE, FENCE, OR JIG TO ENSURE THAT THE CUT JOINT IS STRAIGHT, TRUE, AND ALIGNED ON ALL FACES OF THE PARAPET. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF 1//INCH.

SEAL THE PARAMETERS OF THE DEFLECTION JOINTS TO A MINIMUM DEPTH OF ONE INCH WITH A POLYURETHANE OR POLYMERIC MATERIAL CONFORMING TO ASTM C920, TYPE S. LEAVE THE BOTTOM 1/INCH OF BOTH THE INSIDE AND OUTSIDE FACES OF THE PARAPET UNSEALLED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.

AT EACH DEFLECTION JOINT LOCATION, USE GLASS FIBER REINFORCED POLYMER (GFRP) REINFORCEMENT TO MAINTAIN THE RIGIDITY OF THE CAGE ACROSS THE PROPOSED JOINTS AT THOSE CONSTRUCTION LOADS ON THE DECK (EXCLUDING PERSONNEL; HAND OPERATED EQUIPMENT AND MANUALLY POWERED VEHICLES); AND OTHER NON-FERROUS REINFORCEMENT MAY BE PROPOSED FOR USE, SUBJECT TO APPROVAL BY THE ENGINEER.

FOR TRANSITION SECTION, PLACE A DEFLECTION JOINT AT THE BEGINNING OF THE M'-4" TRANSITION. DEFLECTION JOINTS ARE NOT REQUIRED WITHIN THE M'-0" TRANSITION SECTION.


PRESTRESSED CONCRETE I-BEAMS/PRECASTED CONCRETE I-BEAMS/GIRDERS SHOWN.
NOTES:
1. FOR 57° SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCING WEIGHTS.
2. FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATION OF CONTRACTION JOINTS, SPACED AT 20'-0" MAX.
3. CONTRACTION JOINT IS NOT REQUIRED WITHIN THE APPROACH SLAB MEDIAN BARRIER SECTIONS.
4. PLACE 6'-Y402 @ 6" = 2'-6" EPOXY COATED DOWEL BARS, 4'-0" LONG, SPACED AT 45" ± 3" MAXIMUM, AT STAGGERED LOCATIONS WITHIN THE APPROACH SLAB MEDIAN BARRIER. PLACE #8 EPOXY COATED DOWEL BARS (Y801 BARS), 12" LONG, SPACED AT 45° ± 3" MAXIMUM, AT STAGGERED LOCATIONS WITHIN THE UNREINFORCED MEDIAN BARRIER.
5. STAKE OUT MEDIAN BARRIER AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
6. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
7. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
8. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
9. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
10. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
11. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
12. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
13. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
14. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
15. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
16. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
17. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
18. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
19. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
20. PROVIDE 3'-OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
PLAN VIEW

57" SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING, TYPE B1, WITH TYPICAL ABUTMENT SHOWN.
DOWARD ABUTMENT SHOWN, REAR ABUTMENT SIMILAR, BUT OPPOSITE HAND.

SECTION A-A

REINFORCING STEEL LIST

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<th>BENDING DIAGRAMS</th>
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<td>1A, 2A</td>
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</tr>
<tr>
<td>Y801</td>
<td>5'</td>
<td>STR</td>
<td>SEE PROJECT PLANS.</td>
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NOTES:
1. FOR 57' SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCING WEIGHTS.
2. FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATION OF CONTRACTION JOINTS, SPACED AT 20'-0" MAX.
3. CONTRACTION JOINT IS NOT REQUIRED WITHIN THE APPROACH SLAB MEDIAN BARRIER SECTIONS.
4. PLACE #8 EPOXY COATED DOWEL BARS (Y801 BARS), 12" LONG, SPACED AT 45" MAXIMUM, AT STAGGERED LOCATIONS WITHIN THE UNREINFORCED MEDIAN BARRIER. PLACE #8 EPOXY COATED DOWEL BARS (Y801 BARS), 12" LONG, SPACED AT 45" MAXIMUM, AT STAGGERED LOCATIONS WITHIN THE UNREINFORCED MEDIAN BARRIER.

SECTION B-B

SECTION C-C

SECTION D-D
PLAN VIEW

5° SINGLE SLOPE BACK-TO-BACK CONCRETE MEDIAN RAILINGS WITH SEMI-INTEGRAL ABUTMENT SHOWN (INTEGRAL ABUTMENT AND CAPPED PILE ABUTMENT SIMILAR) (FORWARD ABUTMENT SHOWN. REAR ABUTMENT SIMILAR, BUT OPPOSITE HAND)

DEFLECTION JOINT (SEE NOTE 3)

SECTION A-A

REINFORCING STEEL LIST

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NOTES:
1. FOR 5° SINGLE SLOPE CONCRETE MEDIAN RAILING, PROJECT PLANS SHALL INCLUDE PLAN VIEW, ELEVATION VIEW, SECTIONS, REINFORCING MARKS, REINFORCING BENDING DIAGRAMS, AND REINFORCING WEIGHTS.
2. FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE MEDIAN RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATIONS OF DEFLECTION JOINTS.
3. DEFLECTION JOINT IS NOT REQUIRED WITHIN THE APPROACH SLAB MEDIAN BARRIER SECTIONS.
4. SEE APPROPRIATE STANDARD BRIDGE DRAWING FOR ABUTMENT DETAILS.
5. FOR SINGLE SLOPE BARRIER BEYOND THE STRUCTURE ROADWAY BARRIERS, SEE STD. ROADWAY CONSTR. DWG. RM-4.3 THROUGH RM-4.5.
6. PROVIDE 3° OPEN GAP JOINT AT THE END OF APPROACH SLAB TO ACCOMMODATE THE LONGITUDINAL MOVEMENT FROM SUPERSTRUCTURE WITH SEMI-INTEGRAL OR INTEGRAL ABUTMENTS.
7. FOR DEFLECTION JOINT DETAILS AND ADDITIONAL NOTES, SEE SHEET .

SECTION A-A

REINFORCING MEDIAN BARRIER

SECTION B-B

REINFORCED CONCRETE DECK ON STEEL OR PRESTRESSED CONCRETE I-BEAMS/GIRDERS (BEAMS/GIRDERS NOT SHOWN)

SECTION C-C

REINFORCED CONCRETE DECK ON STEEL OR PRESTRESSED CONCRETE I-BEAMS/GIRDERS (BEAMS/GIRDERS NOT SHOWN)

SECTION D-D

AREA 12.32 SQ. FT. + AREA OF MEDIAN GAP
NOTES:
1. FOR THE ENTIRE LENGTH OF SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILINGS, PROJECT PLANS SHALL SHOW THE LOCATIONS OF DEFLECTION JOINTS. THE MAXIMUM SPACING OF VERTICAL REINFORCING BARS FOR THE 57" SINGLE SLOPE BACK-TO-BACK CONCRETE MEDIAN BRIDGE RAILING IS SHOWN ON SHEETS 1 5 THROUGH 4 5.

2. DEFLECTION JOINT SPACING SHALL NOT EXCEED 5'-6" ON CENTERS. FOR CONTINUOUS STRUCTURES, THE DEFLECTION JOINTS WITHIN THE DEAD LOAD CONTRAFALEXURE NEGATIVE MOMENT REGIONS OVER PIER LOCATIONS SHALL BE SPACED NOT LESS THAN 5'-0" NOR MORE THAN 7'-6" ON CENTERS.

3. FOR NOTES. SEE NOTES 1 & 2 AND DETAIL A. THE 4" SAWCUT DEPTH SHOWN IN DETAIL A IS THE MINIMUM REQUIRED. HOWEVER, THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUT.

4. LIMITS OF SAWCUT IS SHOWN IN DETAIL A. THE 4" SAWCUT DEPTH SHOWN IN DETAIL A IS THE MINIMUM REQUIRED. HOWEVER, THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUT.

DESIGN CRITERIA:

DESIGN DATA:
CONCRETE - COMPRESSIVE STRENGTH ≥ 4,000 PSI.
REINFORCING STEEL - MINIMUM YIELD STRENGTH = 60 KSI.
AREA OF 57" SINGLE SLOPE CONCRETE MEDIAN BRIDGE RAILING IS SHOWN ON SHEETS 1 5 THROUGH 4 5.

MAXIMUM SPACING OF VERTICAL REINFORCING BARS:
The maximum spacing of vertical reinforcing bars for the 57" single slope concrete median bridge railing type B1 shall be 2'-0".
The maximum spacing of vertical reinforcing bars for the 57" single slope back-to-back concrete median bridge railing shall be 1'-0".

CONTRACTION JOINTS FOR 57" SINGLE SLOPE UNREINFORCED CONCRETE MEDIAN BRIDGE RAILINGS TYPE B1 (Sheets 1 5 and 2 5) SEE NOTES.
CONTRACTION JOINTS FOR 57" SINGLE SLOPE BACK-TO-BACK REINFORCED CONCRETE MEDIAN BRIDGE RAILINGS (Sheets 1 5 and 2 5) SEE NOTES.
CONTRACTION JOINTS FOR 57" SINGLE SLOPE BACK-TO-BACK REINFORCED CONCRETE MEDIAN BRIDGE RAILINGS (Sheets 1 5 and 2 5)

MINIMUM EMBEDMENT OF VERTICAL REINFORCING BARS:
B. IF THE MINIMUM EMBEDMENT SHOWN FOR THE VERTICAL REINFORCING BARS INTO THE BRIDGE DECK IS NOT MET, THEN THE DESIGNER SHALL CALCULATE THE REQUIRED EMBEDMENT ACCORDING TO SECTION 13 OF THE "NASHTO LIND BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.

OPTIONAL REINFORCING STEEL:
IN LIEU OF THE SINGLE VERTICAL BAR, THE CONTRACTOR MAY PROVIDE VERTICAL REINFORCEMENT IN THE FORM OF LAYED BARS AT THE VERTICAL BAR SPACING AND EMBEDMENT SHOWN AS FOLLOWS:

THE DEPARTMENT WILL NOT ADJUST THE TOTAL QUANTITY OF REINFORCING STEEL TO ACCOMMODATE THIS OPTIONAL REINFORCEMENT. THE DEPARTMENT WILL CONSIDER DELAYS RESULTING FROM THIS OPTIONAL REINFORCEMENT AS NON-EXCUSABLE DELAYS.

DEFLECTION JOINT FOR 57" SINGLE SLOPE BACK-TO-BACK REINFORCED CONCRETE MEDIAN BRIDGE RAILINGS (Sheets 1 5 and 2 5)

CONSTRUCTION JOINTS FOR 57" SINGLE SLOPE UNREINFORCED CONCRETE MEDIAN BRIDGE RAILINGS TYPE B1 (Sheets 1 5 and 2 5): USE AN EDGE GUIDE, FENCE, OR JOG TO ENSURE THAT THE CUT JOINT IS STRAIGHT, TRUE, AND ALIGNED ON ALL FACES OF THE MEDIAN BRIDGE RAILING. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAM BLADE, A NOMINAL WIDTH OF 1'-0".

SEAL THE PERIMETER OF THE DEFLECTION JOINTS TO A DEPTH OF ONE INCH WITH A POLYURETHANE OR REFRACTIVE MATERIAL. CONSISTING OF ASTM C95, TYPE 5. LEAVE THE BOTTOM 1'-0" INCH OF BOTH FRONT FACES OF THE MEDIAN BRIDGE RAILINGS UNSEALED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.

AT EACH DEFLECTION JOINT LOCATION, USE GLASS FIBER REINFORCED POLYMER GRP REINFORCEMENT TO MAINTAIN THE RIGIDITY OF THE CAGE ACROSS THE PROPOSED JOINTS. AS SOON AS CUTTING OPERATIONS CAN BEGIN WITHOUT DAMAGING THE CONCRETE, SAWCUT 1'-0" DEEP DEFLECTION CONTROL JOINTS ALONG THE PERIMETER OF THE MEDIAN BRIDGE RAILING.

AFTER THE CURING PERIOD AND BEFORE APPLYING LOAD TO THE MEDIAN BRIDGE RAILING, PERFORM 4" INCH SAWCUT AS SHOWN IN DETAIL A. APPLIED BRIDGE RAILING LOAD INCLUDES CONSTRUCTION LOADS ON THE DECK EXCLUDING PERSONNEL, HAND OPERATED EQUIPMENT AND MANUALLY POWERED VEHICLES AND VEHICLE TRAFFIC IN THE LANE IMMEDIATELY ADJACENT TO MEDIAN BRIDGE RAILING AFTER REMOVAL OF TRAFFIC CONTROL DEVICES.

CONTRIBUTION OF FORMED CONSTRUCTION:
REMOVING THE FORMS BEFORE APPLYING LOAD TO THE MEDIAN BRIDGE RAILING, AS SOON AS THE FORMS ARE REMOVED, PERFORM 4" INCH SAWCUT AS SHOWN IN DETAIL A. THE 1'-0" SPACE OF THE FORMS ARE NOT REQUIRED.

THE CONTRACTOR HAS AN OPTION TO PERFORM FULL DEPTH SAWCUTS. HOWEVER, THE SAWCUT MUST NOT BE LESS THAN 1'-0" FROM THE TOP OF THE CONCRETE DECK SLAB.
PART ELEVATION

NOTE:
In ULTIMATE STEEL SHOWN IS MINIMUM. DESIGNER SHALL PROVIDE THE REINFORCEMENT REQUIRED FOR THE INDIVIDUAL STRUCTURE.
SEISMIC PERIODICAL IS NOT SHOWN FOR CLARITY. SEE SHEET A-2 FOR MORE INFORMATION.

SECTION D-D
(IN DRILLED SHAFT)

SECTION E-E
(IN DRILLED SHAFT)

SECTION F-F
(IN DRILLED SHAFT)
PART ELEVATION OF BEAM SEAT

NOTE:
HP STEEL SHAPE INCLUDES ELASTOMERIC BEARING FOR PAYMENT.
SEE NOTES ON SHEET [X] FOR ADDITIONAL REQUIREMENTS.

SECTION L-L
Ο ‐ CLIP ONLY THE TOP FLANGE TO MAINTAIN THE CLEARANCE

SECTION K-K
Ο ‐ DESIGNER SHALL PROVIDE THE MEASURED WELD SIZE IN THE PROJECT PLANS TOG-081-2.

BEARING DETAIL
SHAPES AND PLATES.


FASTENERS: FURNISH MATERIAL CONFORMING TO THE FOLLOWING:

END WELDED STUDS SHALL CONFORM TO ASTM A108.

THE TUBE RAIL TO POST CONNECTION RODS AND NUTS SHALL CONFORM TO 711.10 (ASTM A325). REFER TO STANDARD CONSTRUCTION DRAWING WSS-3.1 FOR THE BRIDGE TERMINAL ASSEMBLY CONNECTION HARDWARE.

THE HEX CAP SCREWS (BOLTS), HEX NUTS AND WASHERS SHALL CONFORM TO ASTM A 449.

BOX BEAM: THE DISTANCE FROM THE CENTERLINE OF A GUARDRAIL POST TO THE ABUTMENT END OF THE BEAM OR TO THE CENTERLINE OF A TIE ROD SHALT NOT BE LESS THAN 1'-8". THE DISTANCE FROM THE CENTERLINE OF A GUARDRAIL POST TO THE PIER END OF THE BEAM SHALL NOT BE LESS THAN 2'-10". THE LOCATION OF THE HORIZONTAL TIE RODS MAY NEED TO BE ADJUSTED IN ORDER TO ACCOMMODATE EACH POST ANCHOR DEVICE.


THE DEPARTMENT WILL PAY FOR BRIDGE TERMINAL ASSEMBLY HARDWARE SEPARATELY.
GENERAL NOTES

DESIGN

TRUSS RODS

H.S.

ADHESIVE CONNECTIVE BANDS

MALLEABLE OR CAST IRON FITTINGS

DETAILS REGARDING THE HIGH STRENGTH ANCHOR BOLTS FOR PORTABLE CONCRETE BARRIER

MECHANICAL CONNECTORS

TRANVERSE DECK REBAR THAT WILL BE OBSTRUCTED BY THE CONTRACTOR MAY USE A SUBSTITUTE MECHANICAL CONNECTOR THAT IS APPROVED BY THE ENGINEER FOR PLACEMENT IN THE PORTABLE CONCRETE BARRIER.

ADHESIVE CONNECTIVE BANDS (H.D. DECO)

THE CONTRACTOR OR THE DESIGNER SHALL DESIGN AND ENGINEER THE SUBSTITUTE MECHANICAL CONNECTOR ACCORDING TO ACI 318 CHAPTER 17, "ANCHORING SYSTEMS".

ADHESIVE CONNECTIVE BANDS (PORTABLE CONCRETE BARRIER)

THE EFFECTIVE ENTRAPMENT DEPTH FOR 5/8 INCH DIAMETER ANCHORS INSTALLED IN THE PORTABLE CONCRETE BARRIER SHALL BE 4-INCHES.

THE FACTORED LOADING ON EACH ANCHOR CONSISTS OF 2.0 KIPS OF TENSION AND 0.5 KIPS OF SHEAR.

WHEN NO LONGER NEEDED, REMOVE NON-ADHERENT ADHESIVES AS DIRECTED BY THE MANUFACTURER.

THE CONTRACTOR SHALL FURNISH, INSTALL AND COMPLETE THE DESIGNATED ITEMS OF SUPPLEMENTAL temporary fencing materials and systems. THE CONTRACTOR SHALL FURNISH ALL MATERIALS AND INSTALL ALL DEVICES AS REQUIRED UNDER THE CONTRACT DOCUMENTS.

ITEM DESCRIPTION

607 FOOT TEMPORARY VANDAL FENCE, TYPE A

607 FOOT TEMPORARY VANDAL FENCE, TYPE B

607 FOOT TEMPORARY VANDAL FENCE, TYPE C

DESIGNATION

MALLABLE OR CAST IRON FITTINGS

MALLEABLE OR CAST IRON FITTINGS SHALL BE USED FOR LINE RAIL ENDs. ALL FITTINGS SHALL BE GALVANIZED ACCORDING TO CMS 79.03.

FABRIC COIL SPRING WIRE CONFORMING TO AASHTO M181.

THE CONTRACTOR SHALL INSTALL FABRIC TIES AND HOG RINGS TO MAINTAIN AND SUBSEQUENTLY REMOVE TEMPORARY VANDAL FENCING TAUT AND WITHIN 1 INCH OF THE TENSION WIRE. THE CONTRACTOR SHALL COMPLETE AND INSTALL TEMPORARY FENCING AS SHOWN ON THE PLANS.

PER STANDARD DRAWING VPF-1-90. FABRICATE AND INSTALL EXISTING BARRIER POSTS.

30,000 PSI MINIMUM YIELD STRENGTH, 7.58 LB/FT,

SHALL BE 3.500 INCH OUTSIDE DIAMETER PIPE, ASTM A53, NUTS SHALL BE GALVANIZED ACCORDING TO C&MS 711.02.

THE TENSION WIRE SHALL BE ALUMINIZED 0.07 INCH DIAMETER STEEL COIL, SPECIFICALLY GATES 70 WT. MILD STEEL COIL SPRING WIRE CONFORMING TO AASHTO M181. PLACE TENSION WIRE AS CLOSE TO THE BOTTOM OF THE FENCE AS PRACTICAL BUT NOT MORE THAN 3 INCHES MAXIMUM. THE TENSION WIRE SHALL NOT SPAN MORE THAN 24'-6". THE MAXIMUM SAD IN THE WIRE SHALL BE 3/4 INCH AFTER TENSIONING.

ADJUSTABLE TENSILE RODS

INSTALL TRUSS RODS AS NECESSARY TO MEET THE REQUIREMENTS OF THIS DRAWING. ADJUSTABLE TENSILE RODS SHALL BE 5/8 INCH DIAMETER STEEL, GALVANIZED ACCORDING TO CMS 79.02.

MECHANICAL CONNECTORS

ALL MECHANICAL CONNECTORS SHALL CONFORM TO CMS 509.07. SUPPLY A MECHANICAL CONNECTOR FOR EACH TRANSVERSE DECK REINFORCING BAR THAT WILL BE OBSTRUCTED BY THE HIGH STRENGTH ANCHOR BOLTS FOR PORTABLE CONCRETE BARRIER.

MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER C&MS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

DAYTON SUPERIOR DDB COUPLER SYSTEM

MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER CMS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

D E S I G N  A G E N C Y

S T A T E  O F  O H IO  D E P A R T M E N T  O F  T R A N S P O R T A T IO N

O F F IC E  O F

A D M IN IS T R A T O R

TENSION WIRE

THE TENSION WIRE SHALL BE ALUMINIZED 0.07 INCH DIAMETER STEEL COIL, SPECIFICALLY GATES 70 WT. MILD STEEL COIL SPRING WIRE CONFORMING TO AASHTO M181. PLACE TENSION WIRE AS CLOSE TO THE BOTTOM OF THE FENCE AS PRACTICAL BUT NOT MORE THAN 3 INCHES MAXIMUM. THE TENSION WIRE SHALL NOT SPAN MORE THAN 24'-6". THE MAXIMUM SAD IN THE WIRE SHALL BE 3/4 INCH AFTER TENSIONING.

ADJUSTABLE TENSILE RODS

INSTALL TRUSS RODS AS NECESSARY TO MEET THE REQUIREMENTS OF THIS DRAWING. ADJUSTABLE TENSILE RODS SHALL BE 5/8 INCH DIAMETER STEEL, GALVANIZED ACCORDING TO CMS 79.02.

MECHANICAL CONNECTORS

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MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER C&MS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

DAYTON SUPERIOR DDB COUPLER SYSTEM

MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER CMS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

D E S I G N  A G E N C Y

S T A T E  O F  O H IO  D E P A R T M E N T  O F  T R A N S P O R T A T IO N

O F F IC E  O F

A D M IN IS T R A T O R

TENSION WIRE

THE TENSION WIRE SHALL BE ALUMINIZED 0.07 INCH DIAMETER STEEL COIL, SPECIFICALLY GATES 70 WT. MILD STEEL COIL SPRING WIRE CONFORMING TO AASHTO M181. PLACE TENSION WIRE AS CLOSE TO THE BOTTOM OF THE FENCE AS PRACTICAL BUT NOT MORE THAN 3 INCHES MAXIMUM. THE TENSION WIRE SHALL NOT SPAN MORE THAN 24'-6". THE MAXIMUM SAD IN THE WIRE SHALL BE 3/4 INCH AFTER TENSIONING.

ADJUSTABLE TENSILE RODS

INSTALL TRUSS RODS AS NECESSARY TO MEET THE REQUIREMENTS OF THIS DRAWING. ADJUSTABLE TENSILE RODS SHALL BE 5/8 INCH DIAMETER STEEL, GALVANIZED ACCORDING TO CMS 79.02.

MECHANICAL CONNECTORS

ALL MECHANICAL CONNECTORS SHALL CONFORM TO CMS 509.07. SUPPLY A MECHANICAL CONNECTOR FOR EACH TRANSVERSE DECK REINFORCING BAR THAT WILL BE OBSTRUCTED BY THE HIGH STRENGTH ANCHOR BOLTS FOR PORTABLE CONCRETE BARRIER.

MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER C&MS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

DAYTON SUPERIOR DDB COUPLER SYSTEM

MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER CMS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

D E S I G N  A G E N C Y

S T A T E  O F  O H IO  D E P A R T M E N D  O F  T R A N S P O R T A T IO N

O F F IC E  O F

A D M IN IS T R A T O R

TENSION WIRE

THE TENSION WIRE SHALL BE ALUMINIZED 0.07 INCH DIAMETER STEEL COIL, SPECIFICALLY GATES 70 WT. MILD STEEL COIL SPRING WIRE CONFORMING TO AASHTO M181. PLACE TENSION WIRE AS CLOSE TO THE BOTTOM OF THE FENCE AS PRACTICAL BUT NOT MORE THAN 3 INCHES MAXIMUM. THE TENSION WIRE SHALL NOT SPAN MORE THAN 24'-6". THE MAXIMUM SAD IN THE WIRE SHALL BE 3/4 INCH AFTER TENSIONING.

ADJUSTABLE TENSILE RODS

INSTALL TRUSS RODS AS NECESSARY TO MEET THE REQUIREMENTS OF THIS DRAWING. ADJUSTABLE TENSILE RODS SHALL BE 5/8 INCH DIAMETER STEEL, GALVANIZED ACCORDING TO CMS 79.02.

MECHANICAL CONNECTORS

ALL MECHANICAL CONNECTORS SHALL CONFORM TO CMS 509.07. SUPPLY A MECHANICAL CONNECTOR FOR EACH TRANSVERSE DECK REINFORCING BAR THAT WILL BE OBSTRUCTED BY THE HIGH STRENGTH ANCHOR BOLTS FOR PORTABLE CONCRETE BARRIER.

MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER C&MS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

DAYTON SUPERIOR DDB COUPLER SYSTEM

MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER CMS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

D E S I G N  A G E N C Y

S T A T E  O F  O H IO  D E P A R T M E N D  O F  T R A N S P O R T A T IO N

O F F IC E  O F

A D M IN IS T R A T O R

TENSION WIRE

THE TENSION WIRE SHALL BE ALUMINIZED 0.07 INCH DIAMETER STEEL COIL, SPECIFICALLY GATES 70 WT. MILD STEEL COIL SPRING WIRE CONFORMING TO AASHTO M181. PLACE TENSION WIRE AS CLOSE TO THE BOTTOM OF THE FENCE AS PRACTICAL BUT NOT MORE THAN 3 INCHES MAXIMUM. THE TENSION WIRE SHALL NOT SPAN MORE THAN 24'-6". THE MAXIMUM SAD IN THE WIRE SHALL BE 3/4 INCH AFTER TENSIONING.

ADJUSTABLE TENSILE RODS

INSTALL TRUSS RODS AS NECESSARY TO MEET THE REQUIREMENTS OF THIS DRAWING. ADJUSTABLE TENSILE RODS SHALL BE 5/8 INCH DIAMETER STEEL, GALVANIZED ACCORDING TO CMS 79.02.

MECHANICAL CONNECTORS

ALL MECHANICAL CONNECTORS SHALL CONFORM TO CMS 509.07. SUPPLY A MECHANICAL CONNECTOR FOR EACH TRANSVERSE DECK REINFORCING BAR THAT WILL BE OBSTRUCTED BY THE HIGH STRENGTH ANCHOR BOLTS FOR PORTABLE CONCRETE BARRIER.

MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER C&MS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

DAYTON SUPERIOR DDB COUPLER SYSTEM

MECHANICAL CONNECTORS SHALL BE EPOXY COATED PER CMS 509.09.

SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:
TEMPORARY FENCE ELEVATION

FENCE MOUNTED ON THE TOP OF DECK

- 2.875" O.D. POST
- 2.875" O.D. POST
- MESH FABRIC
- 2" DIAMOND MESH FABRIC

TEMPORARY FENCE ELEVATION

FENCE MOUNTED TO EXISTING

- 2.875" O.D. POST
- MESH FABRIC
- 2" DIAMOND MESH FABRIC

NOTES:
1. FABRICATE BASE PLATES AND POST SLEEVES AS SHOWN IN STD. DWG. VPF-1-90. FOR DECK AND CURB MOUNTED POSTS INSTALL THE ANCHORS PER THIS DRAWING. FOR POSTS MOUNTED ON EXISTING BARRIER INSTALL THE ANCHORS PER STD. DWG. VPF-1-90.
2. FOR ADDITIONAL PARAPET TYPES, SEE SHEET VPF-1-90.
ANCHOR REQUIREMENTS.
- SEE GENERAL NOTES FOR NON-TRAFFIC SIDE
- SEE GENERAL NOTES FOR TRAFFIC SIDE
TEMPORARY FENCE ELEVATION
FENCE MOUNTED ON THE DECK EDGE

TENSION WIRE WITH HOG RINGS
AT 12" C/C

FACTORIES TIES FOR POST
AT 12" C/C MAX.

THREADED ROD (B.S.)
H.S. THREADED
†" DIA. 6" LONG

DECK REBAR
TRANSVERSE
#5 TOP CONNECTORS
#5 MECH. CONNECTORS

HOLE (TYP.)
2" x 2" SLOTTED

1'-1" HOLE
(SEE DETAIL)

TRUSS ROD (TYP. AT
†" DIA. ADJUSTABLE
THREADED HOLES FOR
SIDE OF PIPE)

CUT SLOT IN BOTH
SIDES OF PIPE

SIDES OF PIPE

TRAFFIC TIES FOR POST
AT 12" C/C
WITH HOG RINGS
TENSION WIRE
IRON RAIL END FITTING
MALLEABLE IRON OR CAST
IRON RAIL (TYP.)
1.66" O.D. LINE
RAIL (TYP.)

2.875" O.D. POST
(10'-0" MAX. SPACING)

3.5" O.D. POST
SLEEVE
3.5" O.D. POST
SLEEVE

SIDE MOUNTED CONNECTION DETAIL
POST AND SET SCREWS NOT SHOWN

SIDE MOUNTED CONNECTION DETAIL
POST AND SET SCREWS NOT SHOWN
GENERAL NOTES

(0) TENSION BANDS AND BRACE BANDS SHALL BE 5/8 INCH X 1 INCH DIAMETER X 5'/2 INCH GALVANIZED WIRE. ONE TENSION BAND SHALL BE SUPPLIED FOR EACH 6 FT STRAIGHT, 1/2 INCH DIAMETER X 5'/2 INCH GALVANIZED BOLT.  THE TENSION BANDS SHALL BE GALVANIZED ACCORDING TO MIL-G-16146.

(1) EXPANSION SLEEVES: PROVIDE EXPANSION SLEEVES AT LEAST 2 INCHES LONG ON ALL BOLT PANELS SPANNING STRUCTURAL EXPANSION JOINTS. EXPANSION SLEEVES SHALL BE OUTSIDE TYPE WITH INTERNAL HEAVY SPRING AND GALVANIZED ACCORDING TO MIL-G-16146. THE EXPANSION SLEEVES SHOULD BE CAPABLE OF ACCOMODATING THE MAXIMUM EXPANSION AND CONTRACTION MOVEMENTS OF THE STRUCTURE.

(2) CONSTRUCTION PROCEDURE:

1. FIELD VERIFY THE PLAN LOCATIONS OF ALL BASE PLATES AND MARK PARAPETS ACCORDINGLY.


3. INSTALL POSTS AND BASE PLATES AND SHINE WHERE REQUIRED.

4. INSTALL FENCING FOR EACH CONSTRUCTION PHASE PRIOR TO OPENING THAT PHASE TO VEHICULAR AND/OR PEDESTRIAN TRAFFIC.

5. SPECIAL DESIGNS ARE REQUIRED FOR BUILDINGS WITH 28 DAY CONCRETE STRENGTH OF LESS THAN 4,000 PSI. ALSO, SPECIAL DESIGNS ARE REQUIRED WHERE THE MOUNT OF THE EXPRESSED FENCING HEIGHT IS GREATER THAN 50 FEET ABOVE THE NORMAL TERRAIN LEVEL.

6. PROJECT PLANS: THE DESIGNER SHALL SPECIFY THE TYPE OF POSTS TO BE USED AND PROVIDE A SCHEMATIC SITE PLAN SHOWING THE FENCE POST SPACING.

7. METHOD OF MEASUREMENT: THE DEPARTMENT WILL MEASURE THE LENGTH OF THE FENCE FROM CENTER TO CENTER OF END POSTS.

8. BASIS OF PAYMENT: THE DEPARTMENT WILL PAY FOR THE COMPLETE AND ACCEPTED QUANTITIES OF VANDAL PROTECTION FENCE AS FOLLOWS:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>601</td>
<td>6 FT</td>
<td>STRAIGHT, COATED FABRIC</td>
</tr>
<tr>
<td>602</td>
<td>8 FT</td>
<td>STRAIGHT, COATED FABRIC</td>
</tr>
<tr>
<td>603</td>
<td>10 FT</td>
<td>CURVED, COATED FABRIC</td>
</tr>
</tbody>
</table>

(3) BASE PLATES SHALL BE ASTM A 709 GRADE 36 OR 50 STEEL GALVANIZED ACCORDING TO MIL-G-16146.

CONCRETE PARAPETS WITH HORIZONTAL RAIL ELEMENTS AS SHOWN ON STANDARD BRIDGE DRAWING BR-2-67, BR-2-82, BR-2-98, BR-1-65 AND AR-1-57 TYPE C RAILING NOT SHOWN.

BP-1 SHALL BE USED WITH PS-3 OR PS-4 POST SECTIONS ON CONCRETE PARAPETS WITH HORIZONTAL RAIL ELEMENTS AS SHOWN ON STANDARD BRIDGE DRAWING BR-2-67, BR-2-82, BR-2-98, BR-1-65 AND AR-1-57 TYPE C RAILING NOT SHOWN. BP-1 AND BP-2 POST SECTIONS INSTALL FENCE BY REMOVING AND REINSTALLING THE HORIZONTAL RAIL ELEMENTS BP-1 REQUIRES A SLEEVE. SEE POST SLEEVE DETAILS ON THIS SHEET.

BP-2 SHALL BE USED WITH PS-3 OR PS-4 POST SECTIONS ON CONCRETE PARAPETS WITH HORIZONTAL RAIL ELEMENTS AS SHOWN ON STANDARD BRIDGE DRAWING BR-2-67, BR-2-82, BR-2-98, BR-1-65 AND AR-1-57 TYPE C RAILING NOT SHOWN. BP-1 AND BP-2 POST SECTIONS INSTALL FENCE BY REMOVING AND REINSTALLING THE HORIZONTAL RAIL ELEMENTS BP-1 REQUIRES A SLEEVE. SEE POST SLEEVE DETAILS ON THIS SHEET.

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**VANDAL PROTECTION FENCE**

- **DATE:** 09-26-90
- **SCD NUMBER:** 57
- **ADVISOR:** J CR
- **ENGINEERING:** ADMINISTRATOR
- **STRUCTURAL OFFICE OF RLD:**
- **REVIEWS:** WFT, JCR, GJ
- **DESIGNED:**
- **CHECKED:**
- **DRAWN:** STANDARD BRIDGE DRAWING

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**Technical Specifications:**

- **CURB/SIDEWALK > 3'-9"**
- **WIDTH > 2'-6"**
- **2'-1" R**
- **1" X 1" FABRIC**
- **1'-6"**
- **3'-3"**
- **2'-3‡"**
- **1'-6†"**
- **8'-9‡"**
- **3'-0"**
- **6'-0"**
- **8'-0"**
- **3'-0"**
- **4'-0"**
- **9'-11‡"**
- **1'-8"**
- **1'-8"**
- **1" X 1" FABRIC**
- **1.66" O.D. TOP RAIL**
- **1.66" O.D. LINE RAIL**
- **1.66" O.D. BOTTOM RAIL**
- **2.875" O.D. STRAIGHT POST**
- **2.875" O.D. CURVED POST**
- **2.875" O.D. STRAIGHT POST**
- **2.875" O.D. CURVED POST**
- **HALF BALL POST CAP**
- **LOOP CAP**
- **POST SECTION PS-1**
- **POST SECTION PS-2**
- **POST SECTION PS-3**
- **POST SECTION PS-4**

---

**Drawings and Details:**

- **Existing Aluminum Post**
- **Access Opening at Light Pole**
- **Cover Not Shown**
- **Knuckle Fabric**
- **Bolts with Washer and Hex Nut**
- **Tack Miels at Two Opposite Sides**
- **Reinforcement**
- **Bolts According to 711.02.**
- **Tack Welded Head on Outside Face.**
- **Loop Cap**
- **Access Cover**

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**Additional Notes:**

- Special fence design may be required.
- Pole base dimension exceeds 16" square, details and additional information.

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**Access Notes:**

- Access opening at light pole.
- Cover not shown.

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**General Notes:**

- See general notes for optional anchorages in new concrete.
- Light pole transformer base, refer to traffic standards construction drawings for pole base details. Structure lighting details and additional information. If pole base dimension exceeds 16" square, a special fence design may be required.

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**Construction Details:**

- Fabric details at typical light pole pilaster.
- Fabric placed on outside of post.
- Fabric details on sheet 11.

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**References:**

- See General Notes for Optional Anchorages in New Concrete.
HALF BALL POST CAP (TYP.)

WORK POINT LINE @ 12" C/C MAX. (TYP.) WITH …" x 1" BOLTS "" x 1" TENSION BAR

DOUBLE WRAP FABRIC TIES FOR RAILS SPACED AT 12" C/C MAX.

EXISTING RAILING POST (TYP.)

INSIDE ELEVATION OF CURVED VANDAL PROTECTION FENCE

Notes:
- The centerline of the nearest base plate anchor shall not be placed closer than 8" to a parapet deflection control joint nor shall base plates span across a parapet deflection control joint.
- Top rails shall be continuous over two or more line posts.
- Details for other railing types are similar.
TENSION WIRE SPAN (3 POST SPACING MAXIMUM)
HOG RINGS SPACED @ 12" C/C
TENSION BAND (TYP.)
HOG RING (TYP.)
FENCE FABRIC

RAILING PLAN

INSIDE RAILING ELEVATION

FENCE FABRIC
TRAFFIC RAIL
HOG RING

SECTION A-A

NOTES:
FOR TRAFFIC RAILINGS THAT WILL NOT PERMIT THE INSTALLATION
OF A BOTTOM LINE RAIL, INSTALL TENSION WIRE. CONNECT TENSION WIRE
TO FENCE FABRIC USING HOG RINGS AT 12" MAXIMUM SPACING. TENSION
WIRE SHALL SPAN A MAXIMUM OF THREE POST SPACINGS. THE MAXIMUM
SAG AT THE MIDDLE POINT OF THE WIRE SHALL BE 1/4" AFTER TENSIONING.