NOTES

PROVIDE A SUITABLE LIFTING DEVICES FOR THE PRECAST CAP AND COLUMN UNITS.

CAST-IN-PLACE ALTERNATIVE IS NOT ALLOWED.

STIRRUPS AT THE GROUTED COUPLER ARE SIZED BASED ON A 3" OUTER DIAMETER STEEL SLEEVE, ALONG WITH STIRRUP DIMENSIONS AS REQUIRED IF THE ACTUAL COUPLER SLEEVE DIAMETER DIFFERS.

MANUFACTURER TO DETERMINE THE PRECAST PIER COLUMN LENGTHS ASSUMING 5" STEEL SLEEVES ON THE TOP AND BOTTOM OF THE COLUMN.

THE NEW PRECAST PIER COLUMN/PAD PER PLAN VALUE AS BOTTOM OF PIER CAP ELEVATION MINUS TOP OF FOOTING ELEVATION.

DESIGNER NOTES

PIERS SHALL BE SUPPORTED BY A MINIMUM OF 2 COLUMNS WHEN MULTIPLE PIER CAPS ARE USED, EACH ELEMENT SHALL BE SUPPORTED BY A MINIMUM OF 2 COLUMNS.

THE FOLLOWING SPECIAL PROVISIONS SHALL BE USED:
- PRECAST PIER CAPS (SPV.0090.XXX)
- PRECAST PIER COLUMNS (505.1000.S)

THE MAXIMUM WEIGHT OF EACH PRECAST ELEMENT SHALL BE 90 KIP.

GROUTED COUPLER SLEEVES MAY BE OVERSIZED TO ALLOW FOR ACCUMULATED TOLERANCE IN THE FIELD. STANDARD PRACTICE IS TO OVERSIZE COUPLER SLEEVES TO AVOID WASTING STEEL OR CONCRETE AS NEEDED TO ACCOUNT FOR LARGER DIAMETER COUPLER SLEEVES.

VERIFY SEVERAL MANUFACTURER'S COUPLER SLEEVE DIMENSIONS PRIOR TO DESIGN. ASSUME THE MAXIMUM DIAMETER OF COUPLER SLEEVE FOR COLUMN DESIGN TOLERANCE.

SEE STANDARDS 13.01 AND 13.07 FOR ADDITIONAL PIER NOTES AND DETAILS.

INCLUDED AS SHOWN ON THIS STANDARD ARE INSTRUCTED FOR REQUIRED PRECAST PIER DESIGN TO MEET PROJECT SPECIFIC REQUIREMENTS. SEE 7.1.4.1.2 IN THE BRIDGE MANUAL AND STANDARDS 7.2.4 AND 7.6 FOR ADDITIONAL GUIDANCE.
**NOTES (BOX CULVERTS)**

The upper limits of excavation for structures, culverts, etc., shall be the existing groundline.

The backfill quantities are based on the pay limits shown on the plans and may not reflect actual placed quantities. The designer, in consultation with the geotechnical engineer or when constructed on fills, shall be incidental to excavation for structures. Limits of mechanically stabilized earth (MSE) backfill beyond pay limits or exceeding plan quantities shall be incidental to excavation for structures.

**NOTES (REMOVING WALLS)**

The upper limits of excavation for structures, retaining walls, etc., shall be the existing groundline.

The backfill quantities are based on the pay limits shown on the plans and may not reflect actual placed quantities. The designer, in consultation with the geotechnical engineer or when constructed on fills, shall be incidental to excavation for structures.

**DESIGNER NOTES**

The design engineer shall provide all necessary backfill pay limits and note the pay limits shown on the plans and may not reflect actual placed quantities. The contractor shall be incidental to excavation for structures.

**LEGEND**

- Backfill pay limits for backfill beyond pay limits shall be incidental to excavation for structures.
- **Note applicable when precast note is shown on the plans**

All precast box sections shall be placed on a bedding of mechanically stabilized earth (MSE) of 6" minimum depth. The upper limits of excavation for structures shall be incidental to excavation for structures.

- Note applicable when precast note is shown on the plans

**LIMITS AND NOTES 2**

- **Note applicable when precast note is shown on the plans**

The backfill quantities are based on the pay limits shown on the plans and may not reflect actual placed quantities. The designer, in consultation with the geotechnical engineer or when constructed on fills, shall be incidental to excavation for structures.

The contractor is responsible for base stability with any other granular material as approved by the geotechnical engineer.

Concrete coarse aggregate, select crushed material or Type A backfill structure type A required for the entire wall length. The contractor shall be incidental to excavation for structures.

The contractor may elect to substitute #1 or #2 in lieu of using breaker run for the box construction. The design engineer shall provide all necessary backfill pay limits and note the pay limits shown on the plans and may not reflect actual placed quantities.

Maximum structure type B required for all precast box sections shall be placed on a bedding of mechanically stabilized earth (MSE) of 6" minimum depth. The design engineer shall provide all necessary backfill pay limits and note the pay limits shown on the plans and may not reflect actual placed quantities.

The backfill quantities are based on the pay limits shown on the plans and may not reflect actual placed quantities. The design engineer shall provide all necessary backfill pay limits and note the pay limits shown on the plans and may not reflect actual placed quantities.

The contractor shall be incidental to excavation for structures.
**DESIGNER NOTES**

Structural approach slabs shall be used on all approaches and valleys.

### Approach Slab Plan

- **Location:**
  - Approach slab Tab 18.2

- **Reinforcement:**
  - Stainless steel (as abut. - girder span)
  - Stainless steel (as abut. - slab span)
  - Stainless steel (as abut. - abut.)

- **Bar Steel Reinforcement:**
  - Grade 60, fy:

- **Bill of Bars**

### Construction Joint

1. Construction joint recommended when width of superstructure exceeds 100 ft. Run requirement between the joints.
2. Structural approach slab reinforcement shall be placed parallel to the approach slab, not normal to the superstructure.

### Design Data

- Concrete strength: Structural approach slab and footing, PC: 6200 P.S.I.
- Steel reinforcement,ibs: 40,000 P.S.I.
- Allowable soil bearing pressures: 2,000 P.S.F.

### Legend

- Steel all exposed horizontal and vertical surfaces of cast-in-place and non-monolithic surfaces.

### Bill of Bars

- Notes: The first two rows of the bar marks signify the bar size.
- See standard details for location of name plate and bench mark.

---

**DESIGNER:**

Bill Oliva

**DATE:**

1-19

**BUREAU OF STRUCTURES**

**STANDARD 12.10**

---

**SECTIONS A-A THRU G-G ARE SHOWN ON STANDARD 12.11 & 12.12**

**APPROACH SLAB PLAN**

(As shown, drawn as as abut., tab 18.2)

---

**APPROACH SLAB PARALLEL TO BRIDGE**

---

**CONSTRUCTION JOINT**

- Required when the width of the superstructure exceeds 100 ft.
- Run requirement between the joints.

---

**AT M.S. WINGWALLS**

---

**AT WINGWALLS PARALLEL TO BRIDGE**

---

**BILL OF BARS**

<table>
<thead>
<tr>
<th>Bar No.</th>
<th>Length</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>T501</td>
<td>5</td>
<td>APPROACH SLAB - TRANS.</td>
</tr>
<tr>
<td>T502</td>
<td>5</td>
<td>APPROACH SLAB - TOP.</td>
</tr>
<tr>
<td>T503</td>
<td>5</td>
<td>APPROACH SLAB - WALL</td>
</tr>
<tr>
<td>T504</td>
<td>5</td>
<td>APPROACH SLAB - TRANS.</td>
</tr>
<tr>
<td>T505</td>
<td>5</td>
<td>APPROACH SLAB - TRANS.</td>
</tr>
<tr>
<td>T506</td>
<td>5</td>
<td>APPROACH SLAB - TRANS.</td>
</tr>
<tr>
<td>T507</td>
<td>5</td>
<td>APPROACH SLAB - TRANS.</td>
</tr>
<tr>
<td>T508</td>
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<td>5</td>
<td>APPROACH SLAB - TRANS.</td>
</tr>
</tbody>
</table>

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**STANDARD 12.10**

---

**APPROVED:**

Bill Oliva
**SECTION THRU APPROACH SLAB**

**SECTION E-E**

**SECTION F-F**

**SECTION G-G**

**SECTION G-G**

**LEGEND**

- **Steel**: Use the surface treatment for roadway and place multiple layers (0.03" min. total) of polyethylene sheets over the entire top of subgrade.
- **Concrete Abutment**: Follow the requirements for roadway approach pavement.
- **Steel reinforcement**: Use stainless steel reinforcement as indicated.
- **R-501, R-502**: These bars are standard special provision for stainless structures.

**DESIGNER NOTES**

- See Chapter 30 for parapets on structural approach slab details.
- Sections A-A thru G-G are from standard 12.10.

**OUTSIDE ELEVATION**

(Parapet on structural approach slab at A3 abut.)

End of girder (wing not shown for clarity)

---

**STANDARD 12.12**

Bill Oliva
PILE ENCASED PIER

ELEVATION

PLAN

SECTION A

STANDARD 13.03

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-19

DESIGNER NOTES

- Steel piles shown cast in place
- Concrete slab superstructure parallel to grade
- Top of pier to be level
- Minimum spa. 3'-0" max.
- Maximum spa. 8'-0"
- #4 bars @ 1'-0" each face
- #5 bars & ed. spaces
- #5 bars @ 1'-0" max., on large skews use when economical for girders
- 2" X 6" beveled keyway
- Optional concrete joints
- See standards 13.03, 19.33 and 19.34
- For prestressed girders, standard 19.34

SUPERSTRUCTURE FOLLOW

FOR CONCRETE SLAB SUPERSTRUCTURE, TYP. 2" X 6" BEVELED KEYWAY.

For prestressed girders, use additional designer notes.

SEE BRIDGE MANUAL SECTION 13.11.5 FOR GUIDANCE ON COFFERDAMS.
PILING 2" PER FT.

BATTER EXTERIOR ELEVATION 
LOOKING UP STATION

PILE SPA. (MEASURED AT BOTTOM OF CAP)

PIER SET HAS TAKEN PLACE.
IS POURED BUT BEFORE INITIAL MAY BE PLACED AFTER CONC. #5 BARS @ 1'-0" (2'-0" LONG)
PLACE AS SHOWN

DESIGNER notes
SECTION A-A

ENGINEER'S DISCRETION.
BEAM SEATS MAY BE ANGLED TO MATCH SKEW AT THE DESIGN ENGINEER'S DISCRETION.

STANDARD 13.02 FOR DETAIL.
BEAM SEATS ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

STANDARD 13.01 FOR ADDITIONAL REINFORCING STEEL IN BEARING AREA FOR BEAM SEATS OF NON-SLOPED CAPS THAT ARE 0-6" MORE ABOVE LOWEST BEAM SEAT.

MAX. SPA. = 3'-0", MAX. SPA. = 8'-0" (MIN. OF 5 PILES)
3 Eq. SPA. ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

ENGINEER'S DISCRETION.
THE CAP PARALLEL TO GRADE. SEE STANDARD 18.01.

1. FOR GIRDERS WITH "ELASTOMERIC BEARING PADS" WITH MINIMUM WALL THICKNESS OF 3/4".
2. FOR CONCRETE SLAB SUPERSTRUCTURES MAKE THE TOP OF THE GAP PARALLEL TO GRADE. SEE STANDARD 30.01.

CONCRETE BENT SUPPORTS ARE TYPICAL TO MISS PILING #5 STIRRUPS @ 1'-0" 3 Eq. SPA.

MAX. SPA. = 3'-0" MIN. SPA. = 8'-0" (MIN. OF 5 PILES)
3 Eq. SPA. MEASURED AT BOTTOM OF CAPS

MAX. SPA. = 3'-0" MIN. SPA. = 8'-0" (MIN. OF 5 PILES)

MAX. SPA. = 3'-0" MIN. SPA. = 8'-0" (MIN. OF 5 PILES)

ENGINEER'S DISCRETION.
THE CAP PARALLEL TO GRADE. SEE STANDARD 18.01.

STANDARD 13.01 FOR ADDITIONAL REINFORCING STEEL IN BEARING AREA FOR BEAM SEATS OF NON-SLOPED CAPS THAT ARE 0-6" MORE ABOVE LOWEST BEAM SEAT.

ENGINEER'S DISCRETION.
THE CAP PARALLEL TO GRADE. SEE STANDARD 18.01.
CONCRETE WALL PANEL
PRECAST CONCRETE WALL PANELS SHALL BE STABILIZED EARTH (MSE) WALLS.

CONCRETE TRAFFIC BARRIER SIMILAR TO ONE PANEL CONNECTION PER PANEL.

STABILITY LIMITS OF MECHANICALLY STABILIZED EARTH (MSE) WALL.

ANCHOR DETAIL
SEE WALL PANEL DETAIL FOR ADDITIONAL INFORMATION.

CONSTRUCTION DETAILS
CONCRETE MASONRY RETAINING WALLS

MATERIAL PROPERTIES
CONCRETE MASONRY RETAINING WALLS
PRECAST CONCRETE WALL PANEL

BAR STEEL REINFORCEMENT

GRADE 60
fy = 60,000 PSI

STRUCTURAL CARBON STEEL
ASTM A36
fy = 36,000 PSI

DESIGNER NOTES

CONTRACTOR'S NOTES

CONTRACTOR TO DESIGN LENGTH TO PROVIDE REQUIRED HORIZONTAL CLEARANCE TO维生素 AMOUNT OF COMPLETED WALL PANELS.

CLEVIS AND CLEVIS PIN, COUPLER, MULTIDIRECTIONAL CONNECTOR, AND TURNBUCKLE TO BE CORROSION RESISTANT AND DEVELOP 125% OF ULTIMATE STRENGTH OF THE 1" DIAMETER ROOD.

FOR BAR STEEL HARDWARE AND DEADMANS WHICH INCLUDES ALL ASSOCIATED REINFORCEMENT ARE INCLUDED IN THE BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".

PANEL COMPONENTS TO BE STABILIZED EARTH MUST BE ACCOUNTED FOR IN THE DESIGN OF MSE REINFORCEMENT WHEN SATISFYING FORCE AND MOMENT EQUILIBRIUM.

PANEL TO ALLOW FOR SETTLEMENT OF THE WIRE FACED MSE WALL.

ANCHOR 설계 노트

CONTRACTOR TO DESIGN LENGTH TO PROVIDE REQUIRED HORIZONTAL CLEARANCE TO VOLUME AMOUNT OF COMPLETED WALL PANELS.

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PANEL COMPONENTS TO BE STABILIZED EARTH MUST BE ACCOUNTED FOR IN THE DESIGN OF MSE REINFORCEMENT WHEN SATISFYING FORCE AND MOMENT EQUILIBRIUM.

PANEL TO ALLOW FOR SETTLEMENT OF THE WIRE FACED MSE WALL.

ANCHOR 설정자
PLACEMENT OF HEAVY RIPRAP AT RIVER CROSSINGS

SECTION A-A

SECTION B-B

TOE DETAIL

NORMAL WATER ELEVATION 2'-0" ABOVE STREAM BED

TOE DETAIL

NORMAL WATER ELEVATION 2'-0" ABOVE STREAM BED

HEAVY RIPRAP

1:1 MAX. SLOPE

HEAVY RIPRAP

1:1 MAX. SLOPE

HEAVY RIPRAP

1:1 MAX. SLOPE

HEAVY RIPRAP

1:1 MAX. SLOPE

HEAVY RIPRAP OR OTHER SLOPE PROTECTION TYPE 'HR' BELOW IT.

IF HEAVY RIPRAP IS USED, PLACE GEOTEXTILE 'TYPE HR' BELOW IT.

BILL OLIVA

APPROVED

DATE: 1-19

STANDARD 15.01
FLAShING DETAIL FOR NEW BRIDGES WITH OPEN RAILING

REHABILITATION FLASHING DETAIL 1

REHABILITATION FLASHING DETAIL 2

DESIGNER NOTES

NOTES

CONCRETE SCREWS MAY BE USED FOR REHABILITATION OR NEW CONSTRUCTION. CONTACT THE REGION BRIDGE MAINTENANCE ENGINEER FOR THE DECISION ON WHETHER OR NOT TO USE THE FLASHING ON NEW BRIDGES. DETAIL 1 OR DETAIL 2, OR A COMBINATION OF THE TWO, MAY BE USED FOR REHABILITATION.

THE DESIGN ENGINEER SHALL PROVIDE CONCRETE SURFACE REPAIR DETAILS AS NEEDED. CONCEPTUAL DETAILS ARE SHOWN ON THIS STANDARD.

PROVIDING AND INSTALLING THE STAINLESS STEEL FLASHING, SILICONE CAULK, AND CONCRETE SCREWS IS THE DESIGN ENGINEER'S RESPONSIBILITY. THE DESIGN ENGINEER SHALL PROVIDE DETAIL 1 OR DETAIL 2, OR A COMBINATION OF THE TWO, FOR THE REGION BRIDGE MAINTENANCE ENGINEER TO DETERMINE WHETHER OR NOT TO USE THE FLASHING ON NEW BRIDGES.

TOP OF FLASHING TO BE PLACED APPROXIMATELY 1 INCH BELOW TOP OF DECK/SLAB SURFACE.
1. Camber & Deflection Diagram

- "A" = Prestress Camber
- "B" = Dead Load Deflection
- "C" = Round off to Nearest ½"
- "T" = Residual Camber

2. Deck Haunch Detail

- (Skews < 10°)

3. Intermediate Concrete Diaphragm Details

- For Skews > 10°

4. Deck Steel

- #4 bars at 1'-0" CTRS.
- #6 bar thread one end 3" to weld to #4 tie bar.
- #4 tie bars fasten dowspout insert.
- ½" dia. ferrule loop insert.
- ½" filler at top of deck before deck is poured.
- Note on plan that diaphragm spacing is part of the bridge aesthetic package on 28", 36", 45", 54" and 72" wide girders.

5. Pilaster Detail at Piers

- #4 bars at 1'-0" CTRS.
- Concrete & Masonry Bridges.

6. Post-Tensioned Girders Details

- Prestressed girders.
- "A" = Prestress Camber
- "B" = Dead Load Deflection
- "C" = Round off to Nearest ½"
- "T" = Residual Camber

7. Bureau of Structures

- Approved:
- Bill Oliva
- Date: 1-19

- Standard 19.32
**Fixed Bearing Details**

**Type A - Steel Girders**

**Author:** Bill Oliva

**Date:** 1-19

---

**BEARING NOTES**

All bearings are symmetrical about O of girder and O of bearing.

1. Loads of long span girders, fabricated, may increase thickness of masonry plate D by the sum plate thickness.

2. All connections, steel bearing pad shall be made of rolled steel plates with all edges smooth, round and free from sharp and angular edges.

3. All plates shall be made of carbon or low-alloy steel, plate thickness - 12", to a 250 HBS minimum.

4. All plate caps shall be made of carbon or low-alloy steel, plate thickness - 12", to a 250 HBS minimum.

5. All plate caps shall be made of carbon or low-alloy steel, plate thickness - 12", to a 250 HBS minimum.

6. All plate caps shall be made of carbon or low-alloy steel, plate thickness - 12", to a 250 HBS minimum.

---

**Fixed Bearing Assembly**

- Use a Type I masonry plate for special assemblies.
- Use a Type II masonry plate for regular assemblies.
- Use a Type III masonry plate for heavy-duty assemblies.

---

**Anchor Bolt Notes**

- For anchor bolts in masonry plate D, use a Type IV masonry plate for special assemblies.
- Use a Type III masonry plate for regular assemblies.
- Use a Type II masonry plate for heavy-duty assemblies.

---

**Designer Notes**

- All existing beams shall be made of carbon or low-alloy steel, plate thickness - 12", to a 250 HBS minimum.
- All existing beams shall be made of carbon or low-alloy steel, plate thickness - 12", to a 250 HBS minimum.
- All existing beams shall be made of carbon or low-alloy steel, plate thickness - 12", to a 250 HBS minimum.

---

**Clearance Diagram**

- At Skewed Pier
- At Skewed Abutments
- At Expansion Brd.
- At Fixed Brd.

---

**Calculation**

- Calculate the reaction at the bearings due to total loads. Use the bearing loads derived from loads. Consider only dead load (0.4 kips per ft) and live load (0.1 kips per ft) to adjust loads. See standard plans for details.

---

**Bureau of Structures**

**Approved:**

**Date:** 1-19

**Standard 27.02**
STANDARD 27.07

ELASTOMERIC BEARINGS FOR PRESTRESSED CONCRETE GIRDER

DESIGNER NOTES

ALL MATERIAL USED FOR BEARINGS SHALL BE FLAT CUTS. ALL PLATE CUTS SHALL BE MACHINE OR FLAME CUTS. ALL PLATE CUTS SHALL BE FLAT FROM WARP AND ALL EDGES SMOOTH, STRAIGHT, ROLLED WITH ALL SURFACES SMOOTH AND FREE OF LAMEINATIONS.

FOR BEARINGS USED IN BEARING REPLACEMENT PROJECTS, THE STEEL TOP PLATE THICKNESS MAY BE REDUCED TO A MINIMUM OF 1" TO MATCH THE OVERALL EXISTING BEARING HEIGHT. WHEN THE THICKNESS IS REDUCED, THE FOLLOWING NOTE SHALL BE EXCELLED TO THE PLANS.

NOTE: STEEL TOP PLATE THICKNESS MAY BE REDUCED TO A MINIMUM OF 1" TO MATCH THE OVERALL EXISTING BEARING HEIGHT. ALL MATERIAL USED FOR BEARINGS SHALL BE FLAT CUTS. ALL PLATE CUTS SHALL BE MACHINE OR FLAME CUTS.

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NOTES

BEARINGS SHALL NOT BE PLACED AT A TEMPERATURE GREATER THAN 100°F. ALL PLATE CUTS SHALL BE MACHINE OR FLAME CUTS. ALL PLATE CUTS SHALL BE FLAT CUTS. ALL PLATE CUTS SHALL BE FLAT CUTS.

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### Expansion Bearing Assembly

#### Designer Notes
- The designer notes are included in the gearbox unit. For detailed information, refer to the gearbox unit's manual.
- Bolt details are listed in the gearbox unit's manual. For more information, contact the manufacturer.

#### Bearing Notes
- All bearings are subjected to 1/4" of order and 1/8" of shear.
- Anchor bolts, nuts, and washers shall be galvanized.
- M20 bolts are used for anchoring purposes.
- The bearing assembly is designed to accommodate 1/4" of order and 1/8" of shear.
- Anchor bolts, nuts, and washers shall be galvanized. For more information, contact the manufacturer.

#### Expansion Bearing Details

**Behavioral Notes:**
- The bearing assembly is designed to accommodate 1/4" of order and 1/8" of shear.
- Anchor bolts, nuts, and washers shall be galvanized. For more information, contact the manufacturer.

**Bolt Details:**
- Bolt details are listed in the gearbox unit's manual. For more information, contact the manufacturer.

**Stainless Steel - TFE Expansion Bearing**

**Standard 27.08**

---

**Table:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Plate</td>
<td>X</td>
</tr>
<tr>
<td>Steel Plate</td>
<td>Y</td>
</tr>
<tr>
<td>Masonry Plate</td>
<td>Z</td>
</tr>
</tbody>
</table>

---

**Diagram:**

- The diagram shows the expansion bearing assembly with top plate, steel plate, and masonry plate components.
- Anchor bolts, nuts, and washers are shown in the diagram. For more information, contact the manufacturer.

---

**Notes:**
- The notes are included in the gearbox unit's manual. For detailed information, refer to the gearbox unit's manual.
- Bolt details are listed in the gearbox unit's manual. For more information, contact the manufacturer.
**ELEVATION OF PARAPET**

Roadway opening to show for expansion joint. Use of opening with filler for abutments.

**AT ABUTMENTS**

Elevation of parapet showing outside face of parapet & reinf. Joint sealer. Gray non-bituminous fill with non-staining gray non-bituminous joint sealer.

**AT DEFLECTION JOINTS**

End of pier, lap long. Bars adjacent to the paving notch on type A A501 bar may be used in lieu of a S501 bar. Steel plate beam guard, each. Anchors for plate assemblies for steel plate beam guard.

**BILL OF BARS**

<table>
<thead>
<tr>
<th>Bar Mark</th>
<th>Phase</th>
<th>Length</th>
<th>Size</th>
<th>Series</th>
<th>Location</th>
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<tr>
<td>R501</td>
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<tr>
<td>S502</td>
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</tbody>
</table>

**NOTE**

When parapets are poured continuously from end to end, they shall be separated at the deflection joints by a piece of 2" horizontal plate, as shown. Deflection joints in parapets are used at the deflection joints. The ends of joints shall be coated with an approved liquid bond breaker and plate separators may be omitted.

**VERTICAL FACE PARAPET 'A'**

Parapet detail shown in this area. Steel plate beam guard, each. Anchors for plate assemblies for steel plate beam guard.

**DESIGNER NOTE**

A 2" light standard at the pier is recommended. This is for use with straight parapets. If a light standard at the pier is used, the deflection joints should be placed at the pier. Deflection joints should have no separation joints in the parapets.
**SECTION THRU PARAPET ON BRIDGE**

- Access locations of bars to allow placement of anchor assembly for railing and beam columns.

**END POST DETAIL**

- **E** Post:
  - 1'-1" Grove

**END VIEW**

- **Pier F.F. Abut. Bkwl. End of Wing**

**INSIDE ELEVATION**

- Optional construction joints in the parapets may be used. Run bars thru the joint. Lap longitudinal bars a min. of 1'-9".

- Min. joint spacing of road opening for strip seal. See standard 30.07 for joints and strip seal spacing.

**DESIGNER NOTES**

- Steel railing weight: 25 lb/ft
- See standard 30.07 for additional railing details
- Parapet maintenance and details

**STANDARD 30.08**

- Combination railing type '3T'
- Combinations of bars to allow placement of anchor assembly for railing and beam columns.

**STANDARD 30.09**

- For additional railing details, see standard 30.07.
- Parapet maintenance and details.

**COMBINATION RAILING TYPE ‘3T’**

- Designer notes

**BUREAU OF STRUCTURES**

- Approved: Bill Oliva
- Date: 1-19
TYPICAL RAIL POST BASE PLATE

ANCHOR PLATE

BASE PLATE 30" x 4" x 3" x 1" x 1/4" STAINED STEEL (FRONT AND BACK) FOR BOLT NO. 12.

ANCHOR PLATE NOT REQUIRED IF ALL ANCHORS ARE PROVIDED.

NOTICE:
- ANCHOR PLATE NOT REQUIRED IF ALL ANCHORS ARE PROVIDED.

ANCHORAGE FOR RAIL POSTS
- NUT AND LOCK WASHER
- SLOTS PARALLEL TO LONG SIDE OF PLATE.
- BASE PLATE 3" X 6" X 10" WITH 1/4" X 1" SLOTTED HOLES FOR THR'ED RODS.
- BASE PLATE 3" X 6" X 10" WITH 1/4" X 1" SLOTTED HOLES FOR THR'ED RODS.

FIELD EJECTION JOINT DETAIL
- 1/4" STEEL BOLT TO NO. 4 AS SHOWN.
- 1/4" STEEL BOLT TO NO. 4 AS SHOWN.

LEGEND
- BASE PLATE 30" x 6" x 4" x 1" x 1/4" STAINED STEEL (FRONT AND BACK) FOR BOLT NO. 12.
- ANCHOR PLATE NOT REQUIRED IF ALL ANCHORS ARE PROVIDED.
- STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATE NO. 1, WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.
- STEEL ITEMS SHOWN.

NOTES
- ALL MATERIALS EXCEPT NO. 3 & 12 SHALL CONFORM TO SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS.
- ADHESIVE ANCHORS 1'-inch. embed 7" in concrete. ADHESIVE ANCHORS
- ALTERNATIVE ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE
- STEEL SHEAR WASHERS & GALV.
- PLASTIC WASHERS
- STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATE NO. 1, WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.
- STEEL ITEMS SHOWN.
ASSEMBLY OF ANCHOR for the beam.

**DESIGNER NOTES**

SECTION THRU PARAPET ON BRIDGE

INSIDE ELEVATION

PLAN

SECTION A

SECTION B

SECTION C

ADHESIVE ANCHOR CONNECTION

WITH CRASHWORTHY ADJACENT EXTERIOR PARAPET

NOTES:

o~ DRILLING OR BURNING THRU DECK REINFORCEMENT SHALL BE PROHIBITED

o~ PARAPET FOOTING BARS SHALL BE EPOXY COATED.

o~ ALL PARAPET FOOTING BARS SHALL BE EPOXY COATED.

o~ ADHESIVE ANCHORS MAY BE USED AS AN APPROVED ALTERNATIVE - SEE ADHESIVE ANCHOR CONNECTION DETAIL ON THE PLAN. THE CONTRACTOR MAY REQUEST THE DETAIL IF DESIRED.

o~ NOT SHOW THE ADHESIVE ANCHOR CONNECTION DETAIL ON THE PLAN. CONTRACTOR MAY REQUEST THE DETAIL IF DESIRED.

PARAPET FOOTING

STANDARD 30.10

Bill Oliva

DATE: 1-19

BUREAU OF STRUCTURES
SECTION THRU FENCE
ON SINGLE SLOPE PARAPET

POST SHIM DETAILS

ANCHOR PLATE

BASE PLATE

SECTION A-A

NOTE: PLACE ALL BOLT HEADS ON SIDE OF FENCE ADJACENT TO PEDESTRIANS.

NOTE: IN LIEU OF USING THE POST SLEEVE, THE FENCE POST MAY BE WELDED TO THE BASE PLATE.

NOTES

POSTS ARE TO BE SET VERTICAL.

CHAIN LINK FENCE DETAILS

The chain link fence system selected for the structure shall be either a "metallic-coated fence system" or a "polymer-Coated fence system." Chain link fence does not continue beyond bridge.

The designer shall select the superstructure to account for the maximum 2% gusset cross slope.

1. Place all bolt heads on side of fence adjacent to pedestrian.

2. In lieu of using the post sleeve, the fence post may be welded to the base plate.

3. Complete any required leveling of components before backfilling.

4. Post base plates shall be set with all surfaces smooth and free from sharp edges, corners, and verticals. All plate cuts shall be made on machine.

5. Base plates, anchor plates and ships shall be at least 30 ft. long from edge to edge.  

6. All post splices are measured horizontally at the top of the post.

7. Chain link fence system is selected for the structure shall be either a "metallic-coated fence system" or a "polymer-Coated fence system." Chain link fence does not continue beyond bridge.

8. The designer shall select the superstructure to account for the maximum 2% gusset cross slope.
Combination railings type C1-C6 may also be used as a traffic barrier in situations where a traffic barrier is required between the roadway and the sidewalk. For this traffic barrier, the minimum height of the railing shall be 3'-6" and the maximum height shall be 4'-6". When used on a bridge, the minimum post size of 3"x3"x6" shall be used. The clear space between the top two rails may be increased to a maximum of 6" except for "type C1" railing.

A minimum 12'-0" wing length is recommended to accommodate the rail end transition and provide a post spacing of 8'-0" on the wing that will maintain the rail aesthetics. See standard 30.17 for additional railing details.

See standard 30.18 for straight member field splice details and notes. Example joint details and notes. Designer notes for TIE STUDS AND PARTITIONS. See standard 30.07 for: - Deflection joint details and notes. - Beams and guard anchor assembly details. - Field erection joint location. See "DETAIL B" for additional notes.

End of wing shall be "rail steel pedestrian type C(1-6) B____", the clear space between the top two rails may be increased to a maximum of 6" except for "type C1" railing. The clear space between the top two rails may be increased to maximum of 6" except for "type C1" railing.

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**LEVEL WORKING POINT**

**CORNER A**

**CORNER B**

**APRON DETAIL**

**ALTERNATE SECTION C6**

**SECTION C6**

**ALTERNATE CUTOFF WALL**

**SECTION THRU WINGWALLS**

**BOX CULVERT APRON DETAILS**
EXPANSION BEARING REPLACEMENT - STEEL GIRDERS

STEEL BEARINGS

SEE STANDARD 27.08 FOR BEARING DETAILS

PLATE 'E' DETAILS

SEE TABLE FOR CONCRETE BLOCK ALTERNATIVE

EXPANSION BEARING REPLACEMENT - STEEL GIRDERS

ELASTOMERIC BEARINGS

SEE STANDARD 27.07 FOR ADDITIONAL INFORMATION.

EXPANSION BEARING REPLACEMENT - PRESTRESSED GIRDERS

ELASTOMERIC BEARINGS

NOTES & DESIGNER NOTES

SEE EXPANSION BEARING REPLACEMENT - PRESTRESSED GIRDERS ON THIS STANDARD.

EXPANSION BEARING REPLACEMENT DETAILS

Table: ELASTOMERIC BEARINGS

Approved: Bill Oliva

Date: 1-19
NOTES

- PLATE REQUIRED WHEN DEFLECTION JOINTS ARE REQUIRED. 5-1/2" CONSTRUCTION JOINTS & PLATE FILL ARE REQUIRED ON ALL PLATE SECTIONS DEPICTED. DEFLECTION JOINTS REQUIRE NUMBERED ON 12 ml PLATE SECTIONS ONLY.
- CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR PLATE SEPARATORS SHALL BE SUPPLIED, INCLUDING WELD TO INSERTS. PLATE REQUIRED WHEN DEFLECTION JOINTS ARE REQUIRED. IF CONSTRUCTION JOINTS ARE REQUIRED OR NOTED.
- CONJ. JOINT - STRIKE OFF AS SHOWN & FINISH WITH A ROUNDED CORNER.

PART PLAN ON PARAPET

SECTION A:
- BAR A: @ 9" (5 bars)
- BAR B: @ 9" (5 bars)
- BAR C: @ 9" (5 bars)
- BAR D: @ 9" (5 bars)

SECTION B:
- BAR A: @ 9" (5 bars)
- BAR B: @ 9" (5 bars)
- BAR C: @ 9" (5 bars)

SECTION C:
- BAR A: @ 9" (5 bars)
- BAR B: @ 9" (5 bars)

SECTION D:
- BAR A: @ 9" (5 bars)
- BAR B: @ 9" (5 bars)

ELEVATION OF PARAPET

- PARAPET
  - AREA: 2.25 SF
  - WEIGHT: 338 LB/FT

OTHERWISE SHOWN OR NOTED

- SEE SECTION B FOR DETAILS UNLESS OTHERWISE SHOWN OR NOTED.

SLOPED FACE PARAPET 'B'

- NON-BITUMINOUS JOINT SEALER
- FILL WITH NON-STAINING GRAY ZINC PLATE
- "V" PLASTIC OR 'V' GROOVE DETAILS FOR 1/8" "V"-
- SEE STD. 17.02 FOR 1/8" "V"-GROOVE DETAILS.
- CONDUITS ONLY THIS SECTION WITH 3 1/2" DIA.
- CONDUIT
- JUNCTION BOX 6" X 8"
- KONECTORS 8" X 8"
- OTHERWISE SHOWN OR NOTED
- SEE SECTION B FOR DETAILS UNLESS OTHERWISE SHOWN OR NOTED.

SECTION B:
- BAR A: @ 9" (5 bars)
- BAR B: @ 9" (5 bars)
- BAR C: @ 9" (5 bars)
- BAR D: @ 9" (5 bars)

SECTION B1:
- BAR A: @ 9" (5 bars)
- BAR B: @ 9" (5 bars)

SLOPED FACE PARAPET 'B'

- NON-BITUMINOUS JOINT SEALER
- FILL WITH NON-STAINING GRAY ZINC PLATE
- "V" PLASTIC OR 'V' GROOVE DETAILS FOR 1/8" "V"
- SEE STD. 17.02 FOR 1/8" "V"-GROOVE DETAILS.
NOTES
1. POSTS SHALL BE "TUBULAR TYPICAL TYPE B", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN AND SHOWN.
2. POST BASE PLATES SHALL BE PLACED UNDER ALL SURFACE SHOWN AND SHOWN ALL POSTS SHALL BE COVERED UNDER NO. 1 WITH 1'-0" X 2'-9" X 8" CLEAR ANCHORAGE PLATE NO. 2 AND NO. 3 SHALL BE COVERED UNDER NO. 2.
3. ALL ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF POST TO FIELD POSTS.
4. POSTS SHALL BE PROVIDED WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.
5. ALL JOINTS IN CONCRETE PAVEMENT MUST BE VERTICAL.
6. ALL ITEMS SHOWN AND SHOWN ALL ITEMS SHOWN UNDER NO. 1 AND NO. 2, NO. 2, NO. 3, NO. 4 AND NO. 5 SHALL CONFORM TO ASTM A325, GRADE 8 (BOLTS) AND NO. 6 SHALL CONFORM TO ASTM A36 (STRUCTURAL STEEL). POST BASE PLATES SHALL BE PROVIDED UNDER BASE PLATE IN INCHES TO FIELD POST LOCATION.
7. TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING AND NO EXTRA COST.
8. THE FINISH COLOR SHALL BE AMS STD. COLOR NO. SUCH COLOR MAY BE USED AS AN ALTERNATE, BILL OF BARS:

<table>
<thead>
<tr>
<th>BAR NO.</th>
<th>DIA.</th>
<th>LENGTH</th>
<th>LOCATION</th>
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<tbody>
<tr>
<td>S401</td>
<td>1&quot;</td>
<td>3'-3&quot;</td>
<td>PARALLEL VER.</td>
</tr>
<tr>
<td>S402</td>
<td>1&quot;</td>
<td>4'-0&quot;</td>
<td>PARALLEL VER.</td>
</tr>
<tr>
<td>S403</td>
<td>1&quot;</td>
<td>2'-0&quot;</td>
<td>PARALLEL VER.</td>
</tr>
<tr>
<td>S404</td>
<td>1&quot;</td>
<td>5'-0&quot;</td>
<td>PARALLEL VER.</td>
</tr>
<tr>
<td>S405</td>
<td>1&quot;</td>
<td>6'-0&quot;</td>
<td>PARALLEL VER.</td>
</tr>
<tr>
<td>S406</td>
<td>1&quot;</td>
<td>7'-0&quot;</td>
<td>PARALLEL VER.</td>
</tr>
<tr>
<td>S407</td>
<td>1&quot;</td>
<td>8'-0&quot;</td>
<td>PARALLEL VER.</td>
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BAR SERIES TABLE

<table>
<thead>
<tr>
<th>BAR NO.</th>
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<td>8'-0&quot;</td>
</tr>
<tr>
<td>S408</td>
<td>9'-0&quot;</td>
</tr>
</tbody>
</table>

SHOWN ON SHOP DRAWINGS)

BILLY OLIVA

RAILINGS TUBULAR

TYPE 9F DETAILS

BILL OF BARS

NOTES
1. THE POSTS OF POST TWO SERIES OF THE RAILING SHALL BE SHOWN SEPARATELY.
2. THE POSTS OF POST TWO SERIES OF THE RAILING SHALL BE SHOWN SEPARATELY.
3. THE POSTS OF POST TWO SERIES OF THE RAILING SHALL BE SHOWN SEPARATELY.
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8. THE POSTS OF POST TWO SERIES OF THE RAILING SHALL BE SHOWN SEPARATELY.

BUREAU OF STRUCTURES

APPROVED

BILL OLIVA

STANDARD 40.25
**DESIGN DATA**

**LIVE LOAD**
- Structure is designed for a future wearing surface of 20 pounds per square foot.
- Structure is designed for a future wearing surface.

**REHABILITATION OVERLAY**

**MAXIMUM STANDARD PERMIT VEHICLE LOAD**
- 1,000 kips
- 5,200 kips
- 3,500 kips

**OPERATING RATING**
- 1.0 kip
- 1.0 kip
- 1.0 kip

**INVENTORY RATING**
- 1.0 kip
- 1.0 kip
- 1.0 kip

**TOTAL ESTIMATED QUANTITIES**

<table>
<thead>
<tr>
<th>BID ITEM</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>509.0301</td>
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<td>SY</td>
</tr>
<tr>
<td>509.0310</td>
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</tbody>
</table>

**PREVENTATIVE OVERLAY**

**MAXIMUM STANDARD PERMIT VEHICLE LOAD**
- 1,000 kips
- 5,200 kips
- 3,500 kips

**OPERATING RATING**
- 1.0 kip
- 1.0 kip
- 1.0 kip

**INVENTORY RATING**
- 1.0 kip
- 1.0 kip
- 1.0 kip

**TOTAL ESTIMATED QUANTITIES**

<table>
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<th>BID ITEM</th>
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<tbody>
<tr>
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**NOTES**

- Drawings shall not be scaled.
- Dimensions shown are based on the original structure plans.
- Deck surface preparation is included in the bid item "Polymer Overlay".
- Areas of rehabilitation decks type 1 shall be defined by a saw cut.
- Preparation decks type 1, preparation decks type 2, and full-depth deck repair areas are based on the plans.
- Deck repair is included in the bid item "Polymer Overlay".
- Full-depth deck repairs shall be made with "concrete masonry deck repair".

**POLYMER OVERLAY**

**MAXIMUM STANDARD PERMIT VEHICLE LOAD**
- 1,000 kips
- 5,200 kips
- 3,500 kips

**OPERATING RATING**
- 1.0 kip
- 1.0 kip
- 1.0 kip

**INVENTORY RATING**
- 1.0 kip
- 1.0 kip
- 1.0 kip

**TOTAL ESTIMATED QUANTITIES**

<table>
<thead>
<tr>
<th>BID ITEM</th>
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