WING & PARAPET AESTHETIC DETAILS

WING OPTIONS

- W3: STANDARD
  - Use 1'-0" when used with chain link fencing
  - Area = 3.29 sf, Weight = 493 lb/ft.
- W2: RUSTICATION
  - Rustication to extend 1'-0" min. below ground
  - Rustication to extend 1'-0" min. below ground
- W1: STANDARD
  - Use 1'-3" top dimension when used with modified 'vertical face parapet a''
  - Area = 3.27 sf, Weight = 474 lb/ft.

PARAPET OPTIONS

- P1: STANDARD
  - See STD. 30.07 'vertical face parapet a''
  - For details
- P2: DOUBLE RUSTICATION LINES
  - Modified 'single slope parapet 32ss'
  - Area = 4.01 sf, Weight = 602 lb/ft.
- P3: SINGLE RUSTICATION LINES
  - Modified 'single slope parapet 32ss'
  - Area = 3.25 sf, Weight = 488 lb/ft.

DESIGNER NOTES

- Wings parallel to centerline of abutment
- Elephant entrance to be plain type E

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

STANDARD 4.04
NOTES
- FRONT FACE OF 'ALIGNMENT KEYBLOCK' LOCATION TO BE HELD REGARDLESS OF ACTUAL MODULAR BLOCK SIZE OR GRS ABUTMENT BATTER.
  - 4"-0" WRAP (Typ.)
  - INDICATES GEOFABRIC REINFORCEMENT LAYER NUMBER, FOR LENGTHS, SEE PREVIOUS INFORMATION TABLE.
  - LENGTH OF GEOSYNTHETIC REINFORCEMENT LAYERS TO BE DESIGNED.
- FULL HEIGHT BLOCK IS TYPICAL IN FRONT OF BEARING SEAT BUT A HALF HEIGHT BLOCK AND A SPECIFIED EXPANDED POLYSTYRENE THICKNESS MAY BE DESIGNED IN SOME APPLICATIONS.
- LIMITS OF GRS BACKFILL TO BE PAID FOR UNDER THE NO NEW GEOSYNTHETIC REINFORCED SOIL ABUTMENT

DESIGNER NOTES
- THE TOP OF THE CONTRAST-COLORED BLOCKS SHALL BE 2'-0" BLOCK COURSES BELOW THE TOP OF RIPRAP ELEVATION.
- DIMENSIONS TO BE DESIGNED.
- THE MINIMUM REQUIRED UNLAMINATED STRENGTH OF THE GEOSYNTHETIC REINFORCEMENT SHALL BE DETERMINED FOR THE SPECIAL PROVISION. GEOSYNTHETIC REINFORCED SOIL ABUTMENT.
- MINIMUM CLEAR SPACE SHALL BE 3" OR 2% OF GRS ABUTMENT HEIGHT, WHICHEVER IS GREATER. MINIMUM CLEAR SPACE SHALL BE SHOWN ON THE PLANS.
- ** CONCRETE SPREAD FOOTING TO BE DETERMINED PER DESIGN.
- APPROACH GEOFABRIC REINFORCEMENT TO BE PAIRED UNDER THE NO NEW REINFORCEMENT GRS ABUTMENT.
- APPROACH GEOFABRIC REINFORCEMENT TO BE PAIRED UNDER THE NO NEW REINFORCEMENT GRS ABUTMENT.
- APPROACH GEOFABRIC REINFORCEMENT TO BE PAIRED UNDER THE NO NEW REINFORCEMENT GRS ABUTMENT.
- APPROACH GEOFABRIC REINFORCEMENT TO BE PAIRED UNDER THE NO NEW REINFORCEMENT GRS ABUTMENT.

GRS ABUTMENT DETAILS

<table>
<thead>
<tr>
<th>Layer Number</th>
<th>Minimum Length* [ft.]</th>
<th>EL.*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*LENGTH MEASURED FROM FRONT FACE OR MODULAR BLOCK TO END OF GEOFABRIC FABRIC.

DOES NOT INCLUDE WRAPPED GEOFABRIC FABRIC WHERE APPLICABLE.
NOTES

PRECAST CAP LENGTH: MAXIMUM LENGTH OF EACH CAP SEGMENT IS BASED ON WEIGHT.

LIMIT OF PRECAST PRECAST CAP TO BE PAID FOR UNDER THE BID ITEM 'PRECAST PIER CAPS'

SEE STANDARDS 7.05 AND 7.06 FOR ADDITIONAL GUIDANCE.

DESIGNER NOTES

PIERS SHALL BE SUPPORTED BY A MINIMUM OF 2 COLUMNS, WHEN MULTIPLE PIER CAPS ARE USED, EACH COLUMN SHALL BE SUPPORTED BY 4 MINIMUM.

THE FOLLOWING SPECIAL PROVISIONS SHALL BE USED:

- PRECAST PIER CAPS (SPV.0080.XXX)
- PRECAST PIER CAPS (SPV.0090.XXX)
- GROUTED BAR COUPLERS

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

GROUTED COUPLER SLEEVES MAY BE OVERSIZED TO ALLOW FOR ACCURATE LATERAL TOLERANCE IN THE FIELD. SIMULTANEOUS MAGNETIC PRINTS IS TO OVERSIZE COUPLER SLEEVES 1 BAR SIZE AS NEEDED TO ACCOUNT FOR LARGER DIAMETER COUPLER SLEEVES.

SURE MANUFACTURERS COUPLER SLEEVE CONFIGURATIONS DIFFER TO DESIGN, ASSUME THE MAXIMUM DIAMETER OF COUPLER SLEEVES FOR COLUMN REINFORCEMENT DESIGN.

SEE STANDARDS 7.03 AND 7.04 FOR ADDITIONAL DESIGNER NOTES AND DETAILS.

DETAILED AS SHOWN ON THIS STANDARD ARE INTENDED FOR REQUIRED PRECAST PIER CAPS DESIGNED TO MEET PROJECT SPECIFIC REQUIREMENTS. SEE 7.1.4.1.1.2 IN THE BRIDGE MANUAL AND STANDARDS 7.03 AND 7.04 FOR ADDITIONAL GUIDANCE.

Material Properties:

- fy = 60,000 P.S.I. N°2 BAR REINFORCEMENT, GRADE 60
- f’c = 3,500 P.S.I. CONCRETE MASONRY

PRECAST PIER CAP AND COLUMNS

BUREAU OF STRUCTURES

Bill Oliva

STANDARD 7.03
CONTRACTOR NOTES

The contractor shall follow the standard when precast piers are used in lieu of the cast-in-place piers. The precast pier manufacturer shall provide a suitable lifting device for the precast cap, column, and bearing block unit. The contractor shall follow this standard when precast piers are used in lieu of the cast-in-place piers.

Designer notes

Provide cast-in-place details only. Precast pier references are for designer informational purposes only and shall not be placed on the plans. Precast details shall only be used when plans indicate allowance or with approval by the Bureau of Structures.

Special provisions shall be used:

- Cast-in-place details shall not be modified. All noted dimensions shall be followed.
- Only the pier cap length and column lengths shall be modified. All noted dimensions shall be followed.

The contractor may use precast segments at their discretion (e.g. precast cap only) with approval by the Bureau of Structures.

Additional information:

- The contractor may furnish a precast concrete pier to replace the cast-in-place pier. The precast pier shall be furnished to conform to the dimensions and details in the plan drawings. The precast pier shall be furnished by the precast manufacturer and shall be fabricated in accordance with the following standards.
- The precast pier shall be furnished with the following details:
  - Precast cap and column details
  - Precast bearing blocks details
- The contractor may use precast elements at their discretion. Only the pier cap and column shall be interchangeable between cast-in-place and precast options.

Allowable precast elements include columns, caps, and bearing blocks that have been approved by the Bureau of Structures. Precast pier columns shall be supported by a minimum of 3 columns. Precast pier columns shall be supported by a minimum of 3 columns. Precast pier columns shall be supported by a minimum of 3 columns.

The contractor shall follow this standard when precast piers are used in lieu of the cast-in-place piers.

Material properties:

- Concrete masonry
- Bar reinforcement, Grade 60
- Steel reinforcement, Grade 60

The following special provisions shall be used:

- Cast-in-place details shall not be modified. All noted dimensions shall be followed.
- Only the pier cap length and column lengths shall be modified. All noted dimensions shall be followed.

The contractor may use precast segments at their discretion (e.g. precast cap only) with approval by the Bureau of Structures.
Precast Bearing Block Details

**PARTIAL TRANSVERSE SECTION AT DIAPHRAGM PIER**

---

**PLAN**

- Pier Cap
- Bearing Block
- Bearing Pad
- Strengthening Plane

---

**ELEVATION**

- Pier Cap
- Bearing Block
- Bearing Pad

---

**PRECAST BEARING BLOCK DETAILS**

- Standard 7.06
- Approved: Bill Oliva
- Date: 1-18

---

**BILL OF BARS**

<table>
<thead>
<tr>
<th>Bar Mark</th>
<th>No.</th>
<th>Length</th>
<th>Dia.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>P552</td>
<td>3'-0&quot;</td>
<td>X</td>
<td>1&quot;</td>
<td>TOP &amp; BOTT. BAY</td>
</tr>
<tr>
<td>P553</td>
<td>3'-0&quot;</td>
<td>1&quot;</td>
<td>TOP &amp; BOTT. LONG</td>
<td></td>
</tr>
<tr>
<td>P552</td>
<td>3'-3&quot;</td>
<td>X</td>
<td>1&quot;</td>
<td>PIER DIAPHRAGM BETWEEN GIRDERS</td>
</tr>
<tr>
<td>P553</td>
<td>3'-3&quot;</td>
<td>1&quot;</td>
<td>TOP &amp; BOTT. LONG</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL COATED: XX LBS**

**NOTE:** THE BILL OF BARS IS SHOWN FOR INFORMATION ONLY. PRECAST PIER SHOP CHANGES MAY REQUIRE THE BARS FOR DIAPHRAGM REINFORCEMENT. PAYMENT FOR ALL ITEMS ASSOCIATED FROM THE OPTIONAL PRECAST PIER SHALL BE INCLUDED IN THE CAST-IN-PLACE CONCRETE BID ITEMS.

---

**PRECAST CONCRETE DETAIL NOTES**

- Precast Bearing Block Details shall only be used when plans indicate allowance for Precast Pier.
- A Precast pier shall be used only if it is determined by the contractor and manufacturer to be the most economical and practical solution for the project.

---

**DESIGNER NOTE**

SEE TABLE A FOR ADDITIONAL PRECAST PIER GUIDANCE.

---

**CONTRACTOR NOTES**

- The Contractor shall follow the standard when Precast Piers are used in lieu of the Cast-In-Place Pier.
- The Contractor may use Cast-In-Place Bearing Blocks in lieu of Precast Bearing Block Details. The Contractor is responsible for the additional weight which may cause Pier Cap segments to be in excess of 90 kips.

---

**TABLE A**

<table>
<thead>
<tr>
<th>Tie Angle</th>
<th>Pier Block Length</th>
<th>Long Bar Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>0° TO 15°</td>
<td>2&quot; - 3&quot;</td>
<td>2&quot; - 3&quot;</td>
</tr>
<tr>
<td>15° TO 20°</td>
<td>2&quot; - 3&quot;</td>
<td>2&quot; - 3&quot;</td>
</tr>
<tr>
<td>&gt; 20°</td>
<td>2&quot; - 3&quot;</td>
<td>2&quot; - 3&quot;</td>
</tr>
</tbody>
</table>

Design: Benno Pepic
Date: 1-18
PARTIAL TRANSVERSE SECTION
AT DIAPHRAGM PIER
SEE TABLE "A"

EXTERIOR GIRDER
INTERIOR GIRDER

TOP OF DECK
3" MIN.

TOP OF CAP
CONTRACT PLANS
PRECAST OPTION

EXTERIOR GIRDER
INTERIOR GIRDER

3" PIER CAP
BEARING PAD
P553

BAR SHOWN IN CONTRACT PLANS.

DESIGNER NOTE
SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.

CONTRACTOR NOTES
THE CONTRACTOR SHALL FOLLOW THE STANDARD WHEN PRECAST PIER DETAILS ARE USED.
AND WHEN CAST-IN-PLACE BEARING BLOCKS ARE USED IN LIEU OF PRECAST BEARING BLOCKS.
SEE STANDARD 7.07 FOR ADDITIONAL NOTES AND DETAILS.

CAST-IN-PLACE CONCRETE DETAIL NOTES
CAST-IN-PLACE BEARING BLOCK DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE
FOR PRECAST PIER.

A CAST-IN-PLACE HEIGHT IS MEASURED TO 2'-0" MAX. CONTRACTOR TO DETERMINE THE
CAST-IN-PLACE BEARING BLOCK HEIGHT.

CAST-IN-PLACE BEARING BLOCK DETAILS

BUREAU OF STRUCTURES
APPROVED: Bill Oliva
DATE: 1-18

STANDARD 7.07
**NOTES**

The upper limits of excavation shall be the existing groundline.

Backfill quantities are based on the pay limits shown on the plans. Note that the limits of excavation shall also be the limits of placement. The pay limits are intended to cover the entire excavation area, and backfill beyond the pay limits is not required. The limits of placement shall be incidental to excavation for structures.

The backfill quantities are based on the pay limits shown on the plans. Note that the limits of excavation shall also be the limits of placement. The pay limits are intended to cover the entire excavation area, and backfill beyond the pay limits is not required. The limits of placement shall be incidental to excavation for structures.

**DESIGNER NOTES**

The design engineer should provide all necessary backfill pay limits and notes in order to determine quantities. For abutments, the design engineer should provide all necessary backfill pay limits and notes in order to determine quantities. For abutments, the design engineer should provide all necessary backfill pay limits and notes in order to determine quantities. For abutments, the design engineer should provide all necessary backfill pay limits and notes in order to determine quantities. For abutments, the design engineer should provide all necessary backfill pay limits and notes in order to determine quantities.

**LEGEND**

- RODENT SHIELD DETAIL
  - Dimensions are approximate. The grate is sized to fit into a pipe coupling, oriented as shown in the detail. The grate is commercially available as a floor strainer. A PVC grate similar to this detail is commercially available as a floor strainer. A PVC grate similar to this detail is commercially available as a floor strainer.
  - The rodent shield shall be a PVC grate similar to this detail. The rodent shield shall be a PVC grate similar to this detail. The rodent shield shall be a PVC grate similar to this detail.
  - The grate is sized to fit into a pipe coupling, oriented as shown in the detail. The grate is commercially available as a floor strainer. A PVC grate similar to this detail is commercially available as a floor strainer. A PVC grate similar to this detail is commercially available as a floor strainer.
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<table>
<thead>
<tr>
<th>Wings Parallel to Roadway</th>
<th>Wings Parallel to Abutment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard Wing</strong></td>
<td><strong>Standard Wing</strong></td>
</tr>
<tr>
<td><strong>With Structural Approach Slab</strong></td>
<td><strong>With Railing or Fence Only</strong></td>
</tr>
<tr>
<td><strong>Standard Fill</strong></td>
<td><strong>Standard Fill</strong></td>
</tr>
<tr>
<td><strong>With Sidewalk</strong></td>
<td><strong>With Sidewalk</strong></td>
</tr>
</tbody>
</table>

### Typical Fill Section at Wing Tips

- **Standard Fill**
  - Place fill even with top of wing, 2 feet from wing tip.
  - Place heavy riprap even with top of wing, 2 feet from wing tip.

- **Rip Rap**
  - Place heavy riprap even with top of wing, 2 feet from wing tip.

- **Standard Fill with Sidewalk**
  - Place fill even with top of wing, 2 feet from wing tip.

### Details

- **Transition fill to top of curb, wing, 2 feet from wing tip.**
- **Place fill as shown in wing elevation detail.**
- **Note: Place heavy riprap as shown in wing elevation detail.**
- **Note: Place fill as shown.**
ABUTMENT TYPE A3

SECTION W1
WING WITHOUT PILE

SECTION W2
WING WITH PILE

SECTION W3
WING WITH PILE (FRONT FACE)

SECTION W3
WING WITHOUT PILE (FRONT FACE)

SECTION W3
WING WITHOUT PILE (BACK FACE)

SECTION W3
WING WITH PILE (BACK FACE)

DATE: 1-18

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

STANDARD: 12.04
NO FILLER, NO GAP

SECTION G-G
1'-0" 4"
T508 @ 1'-0"
(STAINLESS STEEL)

T501 @ 1'-0"

APPROACH SLAB

T03

(1'-6" WIDE x FTG. LENGTH)

STANDARD SPEC. 502.2.7
FILLER ACCORDING TO
PREFORMED JOINT

FILLER ACCORDING TO
PREFORMED JOINT

OUTSIDE ELEVATION
PARAPET ON STRUCTURAL APPROACH SLAB AT A3 ABUT

LEGEND
100 STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYERS OVER THE ENTIRE TOP OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF FOOTING.

PLACE MULTIPLE LAYERS OVER THE ENTIRE TOP OF SUBGRADE BENEATH SLAB.

MEASURED NORMAL TO ABUTMENT.

FOLLOW FOR HORIZONTAL REQUIREMENTS FOR ROADWAY APPROACH PAVEMENT.

SECTION REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.

THE BID ITEM FOR SS901 AND SS601 BARS SHALL BE STANDARD SPECIAL PROVISION "BAR STEEL REINFORCEMENT HS STAINLESS STRUCTURES".

ROAD BARRIERS TO BE USED TO STRUCTURAL APPROACH SLAB STEEL AND AdH STEEL BEFORE STRUCTURAL APPROACH SLAB IS POURED.

DESIGNER NOTES

SEEN CHARTER 10 FOR PARAPETS ON STRUCTURAL APPROACH SLAB DETAILS.

SECTIONS A-A THRU G-G ARE FROM STANDARD 12.10

BILL OLIVA

APPROVED DATE:

STANDARD 12.12
LEGEND

- Deal all exposed horizontal and vertical surfaces of 1/2" filler with nonstaining, nonrenewable joint sealer.
- Fill and level joint surfaces with concrete.

* Partial plans represent a similar location as shown on standard 12.10 for different applications.

PARTIAL PLANS shown here are from standard 12.10.

SUPERSTRUCTURE

PARTIAL PLANS SHOWN HERE ARE FROM STANDARD 12.10.
BEARING ELASTOMERIC PLATE OR LAMINATED STEEL MASONRY FULLY DEVELOPED.

DOWELS TO BE PLACED.

FOOTING OF FOOTING MAT DOWELS ON TOP PLACE FOOTING TYP. FOR PILE AND SPREAD FOOTINGS)
IN BOTH DIRECTIONS,
(MIN. MAT STEEL=#6 AT 1'-0"
BAR LAPS TO BE DESIGNED
# 4  HOOP BARS AT 1'-0" CTRS.

3 '-0"
2'-0"

#5 U-BARS
MIN.
MIN.
MAX.
MAX.
1'-0"
MAX. 2'-0"

footing width
MIN.
MAX.
1
4

ROADWAY REF. LINE
` brg

BEAM SEATS.
GIVE ELEVATION OF
COLUMN HEIGHTS

ENGINEER'S DISCRETION.

BAR STEEL REQUIRED FOR BENDING IN PIER CAP SHALL BE DETAIL D IN LENGTHS AS REQUIRED FOR CONSTRUCTIBILITY.

PIERS UNDER EXPANSION JOINTS AND ON ALL PIERS AT GRADE EPOXY COAT BAR STEEL DOWN TO TOP OF FOOTINGS IN ALL AREAS 4" OR MORE ABOVE LOWEST BEAM SEAT.

STIRRUP SPA.

STEPS TO CLEAR VERTICAL COLUMN REINFORCEMENT.

MIN. CL.
6 "
9"

LEVEL UNLESS DIM."A" IS 9" GREATER THAN MIN. DEPTH.
LEVEL UNLESS DIM."A" IS 9" GREATER THAN MIN. DEPTH.

BEARINGS BOLTS FOR STEEL TO CLEAR ANCHOR DIMENSIONS.

ANCHOR BOLTS IN FIELD TO MISS SPACE STIRRUPS ` OF ANCHOR BOLT CLEARANCE TO ANCHOR

STEPS TO CLEAR VERTICAL COLUMN REINFORCEMENT.

MIN. ANCHOR BOLTS

TOP OF CAP REINF.

PLAN VIEW SHOWING END OF CAP REINF.

MULTI-COLUMNED PIER

SECTION P1

SECTION P2

STANDARD 13,01

Bill Oliva

APPROVED:

DATE:

1-18
STANDARD CROSS SECTION THRU SELECT CRUSHED MATERIAL
Asphalt material shall not be applied to the surface of select crushed material.

STANDARD CROSS SECTION THRU CRUSHED AGGREGATE
Round stone will not be accepted.

NOTES
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THE DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS.
WOOD FORMS MAY BE LEFT IN PLACE IF OF A QUALITY ACCEPTABLE TO THE ENGINEER.
PREVIOUS SECTION SHOWN FOR ALTERNATE SECTION SEE FIG 11-35-1.

SLOPE PAVING - STRUCTURES (CRUSHED AGGREGATE & SELECT CRUSHED MATERIAL)
EDGE OF DECK FLASHING

Railing not shown for clarity.

FLASHER DETAIL FOR NEW BRIDGES WITH OPEN RAILING

The 3D item "16 gauge stainless steel flashings" shall include providing and installing the stainless steel flashings. Silicone caulking, concrete screws, and cleaning the edge of the deck prior to attachment of the flashing.

REHABILITATION FLASHING DETAIL 1

Detail A is not to be used if clearance is an issue or debris is a concern.

The 3D item "16 gauge stainless steel flashings" shall include providing and installing the stainless steel flashings. Silicone caulking, concrete screws, and cleaning the edge of the deck prior to attachment of the flashing.

REHABILITATION FLASHING DETAIL 2

Detail A is not to be used if clearance is an issue or debris is a concern.

The 3D item "16 gauge stainless steel flashings" shall include providing and installing the stainless steel flashings. Silicone caulking, concrete screws, and cleaning the edge of the deck prior to attachment of the flashing.

NOTE

Concrete screws shall be 4" stainless steel.
1. **REBAR DIMENSION**
   - **SECTION 1**
     - 7'-0" TYP.
     - 6'-0" TYP.
     - 5'-0" TYP.
     - 4'-0" TYP.
   - **SECTION 2**
     - 6'-0" TYP.
     - 5'-0" TYP.
     - 4'-0" TYP.
     - 3'-0" TYP.
   - **SECTION 3**
     - 5'-0" TYP.
     - 4'-0" TYP.
     - 3'-0" TYP.
     - 2'-0" TYP.
   - **SECTION 4**
     - 4'-0" TYP.
     - 3'-0" TYP.
     - 2'-0" TYP.
     - 1'-0" TYP.
   - **SECTION 5**
     - 3'-0" TYP.
     - 2'-0" TYP.
     - 1'-0" TYP.
     - 0'-0" TYP.

2. **RECESS DETAIL**
   - **SECTION 1**
     - End block bottom stirrup #4 and #5 bars, see elevation for spacing.
     - Duct stirrup #4 at 5" max., 10 #4 bars (#4 bars max. over each order duct).
     - Longitudinal bar 16 #4 bars max., 12 #4 bars max. for sections 1-3.
     - Shear connector tie one leg of bar to 3" dia. vent, 9#4 at 2'-0" max. for sections 2-6.
     - Shear connector tie one leg of bar to 3" dia. vent, 9#4 at 2'-0" max. for section 3.
   - **SECTION 2**
     - End block bottom stirrup #4 and #5 bars, see elevation for spacing.
     - Duct stirrup #4 at 5" max., 10 #4 bars (#4 bars max. over each order duct).
     - Longitudinal bar 16 #4 bars max., 12 #4 bars max. for sections 1-3.
     - Shear connector tie one leg of bar to 3" dia. vent, 9#4 at 2'-0" max. for sections 2-6.
     - Shear connector tie one leg of bar to 3" dia. vent, 9#4 at 2'-0" max. for section 3.

3. **LEGEND**
   - Dimensions given for post-tensioning duct end from end of prestressed box girder.
   - Dimensions given for stirrups perpendicular to the prestressed box girder length. Adjust the dimension for stirrups at skewed prestressed box girder ends.
   - Show spacing for these strands only if required by design.
   - Substitute one bar on exterior edge of exterior girders, see standard 16.06.

4. **DESIGNER NOTE**
   - See standard 16.06 for notes, designer notes, material properties.
   - Approved: Bill Oliva
   - Date: 1-18

5. **STANDARD 19.51**
BEFORE POST-TENSIONING. JOINTS TO BE GROUTED FOR APPROVAL. DESIGN SECTION TO THE STRUCTURES TO BE SUBMITTED ANCHOR DETAILS

SEAL WASHER 9"

STRESS POCKET DETAIL 8"

POST-TENSIONING DETAILS - ONE DUCT PER DIAPHRAGM

POST-TENSIONING DETAILS - TWO DUCTS PER DIAPHRAGM

SEAL WASHER (SEE DETAIL)

STRAIN CHAMFERED POCKET CAN BE NON-SHRINK GROUT 1" MIN. 2" MAX.

MOISTURE) TO DRAIN SEALER (CUT LATER COMPRESSIBLE SELF-ADHESIVE

PRESTRESSED BOX GIRDER DETAILS 3

SECTIONS 1 THROUGH 4)

SECTIONS 5 AND 6)

STANDARD 19.54

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 0-0-0
TABLE "D"

<table>
<thead>
<tr>
<th>MEMBER &quot;C&quot;</th>
<th>MEMBER &quot;D&quot;</th>
<th>WEB DEPTHS</th>
<th>NO. OF BOLTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM</td>
<td>MINIMUM</td>
<td>LENGTH</td>
<td>&quot;C&quot; SIZE</td>
</tr>
<tr>
<td>15°</td>
<td>6</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>15°</td>
<td>6</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>15°</td>
<td>6</td>
<td>0</td>
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<tr>
<td>15°</td>
<td>6</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>15°</td>
<td>6</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

END DIAPHRAGM CONNECTIONS - WEB DEPTHS > 60°

MEMBER "D" END CONNECTIONS

-Level (see notes)
-All end connecting plates shall be friction type using 3/8" dia. high strength structural bolts with double washers.
-All welded connections shall be friction type using 3/8" dia. high strength structural bolts with double washers.
-Lower cross frame members are sloped when difference in adjacent bottom flange elevations exceeds 4", hold up from top of adjacent flange to bottom of connections on lower cross frame when these members are sloped.

DESIGNER NOTES

See standard for bearing stretcher cope & weld details.

FOR WEB DEPTHS GREATER THAN 60", THE NUMBER OF BOLTS REQUIRED BETWEEN BEARING STIFFENERS AND LOWER CONNECTING PLATES EQUALS THE NUMBER OF BOLTS REQUIRED IN MEMBER "C" OF THE MEMBER REQUIRED IN THE LOWER HORIZONTAL MEMBER, MEMBER "D" OR CLEATED.

N 3/8" DIAM. USE 4"-UNLESS INCREASED TO ACCOMODATE LARGE EXPANSION DEVICES.

W24 X 55 TYPICAL CONN.
WELD TO MEMBER "C" SIZE web depth > 60" SHOWN.

SECTION A-A

END DIAPHRAGM CONNECTIONS - WEB DEPTHS < 48°

-W24 X 55 TYPICAL CONN.
-WELD TO MEMBER "C" SIZE web depth > 60" SHOWN.

SECTION B-B

END DIAPHRAGM CONNECTIONS - WEB DEPTHS > 48" < 60°

MEMBER "D" END CONNECTIONS

-Level (see notes)
-All end connecting plates shall be friction type using 3/8" dia. high strength structural bolts with double washers.
-All welded connections shall be friction type using 3/8" dia. high strength structural bolts with double washers.
-Lower cross frame members are sloped when difference in adjacent bottom flange elevations exceeds 4", hold up from top of adjacent flange to bottom of connections on lower cross frame when these members are sloped.

DESIGNER NOTES

See standard for bearing stretcher cope & weld details.

FOR WEB DEPTHS GREATER THAN 60", THE NUMBER OF BOLTS REQUIRED BETWEEN BEARING STIFFENERS AND LOWER CONNECTING PLATES EQUALS THE NUMBER OF BOLTS REQUIRED IN MEMBER "C" OF THE MEMBER REQUIRED IN THE LOWER HORIZONTAL MEMBER, MEMBER "D" OR CLEATED.

N 3/8" DIAM. USE 4"-UNLESS INCREASED TO ACCOMODATE LARGE EXPANSION DEVICES.
NOTES

- For rehabilitation projects:
  - Use part transverse section at expansion end for typical extents.
  - See bridge manual 17.5.3.2 for guidance on required longitudinal reinforcing over piers.
  - See part transverse section at diaphragm to extend to girder web.
  - See STD. 40.04 for additional details.

- Designers note:
  - #4 bars at 9" CTRS. between F.F. ABUT. BACKWALL.
  - #4 bars at 9" CTRS. between JT. OPENING.

DESIGNER NOTE

- 3" MINIMUM STAINLESS STEEL BOLTS ARE NEEDED TO ACCOMMODATE LARGE EXPANSION DEVICES.

LEGEND

- Bars placed parallel to girder.
- Bars spaced perpendicular to girder.
- Dimension is taken normal to E. alignment.

STEEL GIRDER SLAB & SUPERSTRUCTURE DETAILS

BILL OLIVA
**Notes**

BEPINGS SHALL NOT BE PLACED AT A TEMPERATURE GREATER THAN 200°F. ALL MATERIAL USED FOR BEARINGS SHALL BE HERMETICALLY LAMINATED ELASTOMERIC BEARING.

For all new bridges, the steel top plate shall have a minimum thickness of 1\(\frac{1}{2}\)".

For bearings in bearing replacement projects, the steel top plate thickness may be reduced to a minimum of 1\(\frac{1}{2}\)" to match the overall existing bearing height. However, the following note shall be located on the plans:

*"Welding procedures shall be established by the contractor to ensure the maximum temperature reached by surfaces in contact with elastomer to not exceed 200°F (93°C). Temperature shall be controlled to prevent overheating due to friction, and to ensure that temperatures do not exceed 200°F (93°C)."

**Designer Notes**

See Chapter 43 Standards for Use of Elastomeric Bearings on Reinforced and Precast Structural Steel Girders, for all new bridges, the steel top plate shall have a minimum thickness of 1\(\frac{1}{2}\)".

For bearings used in bearing replacement projects, the steel top plate thickness may be reduced to a minimum of 1\(\frac{1}{2}\)" to match the overall existing bearing height. However, the following note shall be located on the plans:

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For bearings used in bearing replacement projects, the steel top plate thickness may be reduced to a minimum of 1\(\frac{1}{2}\)" to match the overall existing bearing height. However, the following note shall be located on the plans:

*"Welding procedures shall be established by the contractor to ensure the maximum temperature reached by surfaces in contact with elastomer to not exceed 200°F (93°C). Temperature shall be controlled to prevent overheating due to friction, and to ensure that temperatures do not exceed 200°F (93°C)."
VERTICAL FACE PARAPET 'A'

1. Girder structures and slab structures with a sidewalk should have a deflection joint approx. every 4'-0" each side of pier, with none directly over the pier. If there is a light standard at the pier, place a deflection joint approx. every 2'-8".

2. Girder structures and slab structures without sidewalks should have no deflection joints in the parapets.

NOTE: threaded inserts for 1/4" dia. 2" long galvanized hex head cap screws. Cap screws to be inserted 1/2" of 1/4" and shall be inserted to thread a minimum of 3/8".

NOTE: when parapets are poured continuously from end to end, there shall be a deflection joint at the deflection joint in a piece of 1/2" dia. plastic, plate cut as shown. When parapets are poured separately, deflection joints in parapets are used at the deflection joints. One piece of 1/2" plate shall be coated with an approved liquid bond breaker and plate separators may be omitted.

LEGEND
- Hex. head cap screws & washers to be galvanized.
- "V" groove details seen in this area - similar to that shown in the steel.
- Non-straining gray non-bituminous joint sealer.
- Steel plate beam guard each.
- Steel plate on end plate, provide recessed miter for threading.
- JOINT SEALER: gray non-bituminous fill with non-staining gray non-bituminous joint sealer.

NOTE: when parapets are poured continuously from end to end, there shall be a deflection joint at the deflection joint in a piece of 1/2" dia. plastic, plate cut as shown. When parapets are poured separately, deflection joints in parapets are used at the deflection joints. One piece of 1/2" plate shall be coated with an approved liquid bond breaker and plate separators may be omitted.

DESIGNER NOTE
- A red box may be used in lieu of a system of brackets to the facing system on type A railings.

APPROVED
Bill Oliva
DATE: 1-18

STANDARD 30.07
For Wing Locations.

"General Plan" Sht.

For Three Beam. See.

1'-8"
2'-6"
2'-0"
9"
1'-9"

Bar Mark
C
O
A
B
E
N
T
abut.

Length Location
Bill of Bars
r501
r502
r503
r504
r505
r506
r507
r508
s501
s503
s504

5-10
5-0
3-0
5-7
4-9
4-10
4-5
2-9
4-4

x
x
x
x
x
x
x
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x
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x
x
x
x
x
x
x
x
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abut.
parapet-vert.
parapet-vert.
parapet-vert.
parapet-vert.
parapet-vert.
parapet-vert.
parapet-horiz.
parapet-vert.
parapet-vert.

assembly
of anchor
as roadway
parapet same
not covered by
finish surface

FUNCTION CONST. JOINT WITH A 1/16" - MIN. JOINT SPACING OF 80'-0". LAP LONGIT. BARS A MIN. OF 1'-9". RUN BAR REINF. THRU THE JOINT.

IN THE PARAPETS MAY BE USED. OPTIONAL CONSTRUCTION JOINTS 5"
FUNCTION V-GROOVE.
DEFINE CONST. JOINT WITH A 1/16" - MIN. JOINT SPACING OF 80'-0". LAP LONGIT. BARS A MIN. OF 1'-9". RUN BAR REINF. THRU THE JOINT.

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FUNCTION V-GROOVE.
DEFINE CONST. JOINT WITH A 1/16" - MIN. JOINT SPACING OF 80'-0". LAP LONGIT. BARS A MIN. OF 1'-9". RUN BAR REINF. THRU THE JOINT.
"GENERAL PLAN" SHT.

FOR THREE BEAM. SEE NAME PLATE. FOR LOCATION SEE "GENERAL PLAN" SHT.

BILL OF BARS FOR ABUTMENT PARAPETS

<table>
<thead>
<tr>
<th>BAR</th>
<th>AMOUNT</th>
<th>LENGTH</th>
<th>LOCATION</th>
</tr>
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<tbody>
<tr>
<td>R501</td>
<td>x</td>
<td>5-30</td>
<td>PARAPET-VET</td>
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<tr>
<td>R502</td>
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<td>x</td>
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<tr>
<td>S503</td>
<td>x</td>
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SINGLE SLOPE PARAPET 36SS
For wing locations.

"General Plan" SHT.

For three beams. See assembly of anchor assembly.

Bar marking.

Bill of bars.

<table>
<thead>
<tr>
<th>Bar Mark</th>
<th>Description</th>
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<tbody>
<tr>
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<tr>
<td>R508</td>
<td></td>
</tr>
<tr>
<td>R509</td>
<td></td>
</tr>
</tbody>
</table>

Length location.

Outside elevation.

Plan.

Inside elevation.

Section A.

Section B.

Section C.

Designer notes.

See structural approach slab standards 12.10 and 12.16 for approach slab information.

As used, see standard 12.2 for A3 abut. details.

See standard 30.31 for details of 36SS parapet on bridge.
**NUMBER OF ANCHORS PER WALL**

**APPROXIMATE/GUIDELINE**

<table>
<thead>
<tr>
<th>NO. ANCHORS</th>
<th>APPROXIMATE LENGTH OF WALL</th>
<th>MAX. BACKFILL REQUIREMENTS</th>
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<tr>
<td>2</td>
<td>24'-0&quot; &lt; L</td>
<td>MIN. 4'-0&quot;</td>
</tr>
<tr>
<td>3</td>
<td>20'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>16'-0&quot;</td>
<td></td>
</tr>
</tbody>
</table>

*NOTE: Adjacent segments shall be attached to each other to keep their faces in alignment. Then, place a filler at these joints with a membrane along the joint at the back face.*
**DESIGNER NOTES**

Details may be shown on plans if necessary for clarity.

Include applicable concrete masonry bid item to fill repairs.

---

**DECK REPAIR DETAIL - PLAN**

For designer information only

---

**DECK REPAIR DETAIL - SECTION**

For designer information only

---

**FULL-DEPTH DECK REPAIR DETAIL**

For designer information only

---

**DESIGNER NOTES**

Details applicable to all overlay methods and deck repairs without overlays.

- Using pavement deck preparation areas is not required for concrete overlays.
- Use concrete masonry deck repair methods for deck repairs under footings, sidewalk, or parapets with concrete overlays. Use concrete masonry deck repair for deck repairs without overlays.
- Restrictions on removal items shall be placed on the plans to prevent damage to reinforcing steel.
RUPTURED VOID REPAIR

SECTION THRU PARAPET ON WING

SECTION AT END OF SLAB

SECTION THRU RAILING

DESIGNER NOTES

OVERLAY DETAILS

ATTACHING PARAPETS OR RAILINGS TO EXISTING DECK WHERE EXISTING ANCHORS ARE NOT AVAILABLE IS NOT ALLOWED.

BILL OLIVA
STANDARD 46.03
**PREPARATION DECKS TYPE 1**

**PREPARATION DECKS TYPE 2**

**CLEANING DECKS**

**FULL-DEPTH DECK REPAIR**

**CONCRETE MASONRY OVERLAY DECKS**

---

**PLAN**

**TOP OF DECK SHOWN**

---

**DESIGNER NOTES**

Plan view applicable to all overlay methods and deck repairs without overlays.

---

**TOTAL ESTIMATED QUANTITIES**

---

**NOTES**

---

**CONCRETE OVERLAY**

---
**DESIGNER NOTES**

Polymer overlays shall not be placed on concrete approaches. When bid item "polymer Overlay" is used rating should include the 5 psf overlay. Polymer overlays shall not be placed on concrete approaches.

**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".

**TOTAL ESTIMATED QUANTITIES**

<table>
<thead>
<tr>
<th>BID ITEM</th>
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<tr>
<td>509.0301 Preparation Decks Type 1</td>
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</tr>
<tr>
<td>509.0302 Preparation Decks Type 2</td>
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</tr>
<tr>
<td>509.0303 Sawn Rehab Deck Preparation Areas</td>
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</tr>
<tr>
<td>509.0304 Full-Depth Deck Repair</td>
<td>SY</td>
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<td>509.0305 Polymer Overlay</td>
<td>SY</td>
<td></td>
</tr>
<tr>
<td>509.0306 Concrete Masonry Deck Repair</td>
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<td></td>
</tr>
<tr>
<td></td>
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</tr>
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*This is a partial list of possible bid items. Bid items may need to be added or removed to fit each individual case.*
**DESIGNER NOTES**

Concrete overlays are the current preferred method to overlay a bridge. Minimal areas require a minimum cure time of 7 days before placing overlay. In preparation to concrete deck patches may be used to shorten the required for placing overlay. Provide an average overlay thickness. The average overlay thickness value is based on the theoretical average overlay thickness plus 0.02 to account for variations in the deck surface. Quantities are based on the average overlay thickness. Do not provide a profile grade line on the plans. Overlays not requiring sheet membrane waterproofing are preferred. Designers to contact the original bridge maintenance engineer to determine if polymer modified asphaltic material is available. Restrictions on removal items shall be placed on the plans to prevent damage to reinforcing steel.

### TOTAL ESTIMATED QUANTITIES

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<tr>
<th>BID ITEM</th>
<th>UNIT</th>
<th>TOTAL</th>
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### DESIGN DATA

**LIVE LOAD**

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<th>MAXIMUM STANDARD DESIGN VEHICLE LOAD</th>
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<tbody>
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</tbody>
</table>

**MATERIAL PROPERTIES**

Concrete Masonry - Deck Patching Pn = a load.

**NOTES**

Drawings shall not be scaled.

Areas of preparation deck type 1 shall be defined by a saw cut. Preparation deck type 1, preparation deck type 2, and full-depth deck repair areas are based on the plans and as determined by the engineer. Preparation and full-depth deck repairs shall be filled with concrete masonry deck repairs. Any excavation required to complete the overlay or joint repair at the abutments to be considered incidental to the bid item "HMA OVERLAY Polymer-MODIFIED". The plan quantity for the bid item "HMA OVERLAY Polymer-MODIFIED" is based on the average overlay thickness. Profile grade line shall be determined in the field based on a minimum overlay thickness of 2" placed above the deck surface. Expected average overlay thickness is 2" or as shown on the plans. If expected average overlay thickness is exceeded by more than 2", contact the structures design section.

---

**POLYMER MODIFIED ASPHALTIC OVERLAY**

Material Properties:

Concrete Masonry - Deck Patching Pn = a load.

**NOTES**

Drawings shall not be scaled.

Areas shown are based on the original structure plans. Areas of preparation decks type 1 shall be defined by a saw cut. Preparation deck type 1, preparation deck type 2, and full-depth deck repair areas are based on the plans and as determined by the engineer. Preparation and full-depth deck repairs shall be filled with concrete masonry deck repairs. Any excavation required to complete the overlay or joint repair at the abutments to be considered incidental to the bid item "HMA OVERLAY Polymer-MODIFIED". The plan quantity for the bid item "HMA OVERLAY Polymer-MODIFIED" is based on the average overlay thickness. Profile grade line shall be determined in the field based on a minimum overlay thickness of 2" placed above the deck surface. Expected average overlay thickness is 2" or as shown on the plans. If expected average overlay thickness is exceeded by more than 2", contact the structures design section.