Typical Section Thru Abutment
(A1 abutment with structural Approach)

- MSE backfill
- Retained backfill
- Backwall reinforcement
- Limits of structural overlays
- Limits of mechanically stabilized earth wall

Typical Section Thru Abutment (A3 abutment with abutment anchorage)

- MSE wall
- Approach slab
- Pavement
- Pavement slabs

Abutment Backfill Diagram
For Wings Parallel to Roadway

- Body length
- Wing length
- Wing height
- Limits of base
- Geotextile Type DF schedule A

Underdrain
(SHOW DETAIL ON PLANS)

Suitable drainage. Attach rodent shield at ends of pipe.

Pipe underdrain is required for the attachment of the shield to the upstream end to prevent clogging.

Geotextile shall extend the entire length of the abutment body.

Underdrain shall extend to the entire length of the abutment body.

FOR MORE INFORMATION

See Standard 9.02 for retaining wall and box culvert details.


Designer Notes

- The design engineer should provide all necessary backfill pay limits and notes in order to determine quantities.

Note: See bridge manual sections 6.4.2 and 9.10 for additional information.

Legend

- Backfill pay limits
- Incidental to excavation for structures
- Limits of excavation
- Not required behind abutments
- Drainage details
- Subsurface drainage
- Drainage around the abutment rather than below the abutment.
DESIGNER NOTES

POLE DESIGN LOADINGS CAN BE USED IF PREBORED HOLE IS LARGE ENOUGH TO AVOID 
FREE MARGINS AND ALLOW FILLING WITH SAND.

SEE BRIDGE MANUAL SECTION 11.3.1 FOR PILE RESISTANCE VALUES.

IF LESS THAN THE MAXIMUM AXIAL RESISTANCE IS REQUIRED BY DESIGN,
STATE ONLY THE REQUIRED CORRESPONDING DRIVING RESISTANCE ON THE PLANS.
CONSULT WITH THE GEOTECHNICAL ENGINEER REGARDING POSSIBLE ESTIMATED 
PILE LENGTH ADJUSTMENTS.

NOTE:
CAST-IN-PLACE PILE SHELL MATERIAL SHALL BE IN ACCORDANCE WITH THE 
STANDARD SPECIFICATION.

IF APPlicable, PL ace THE FOLLOWING NOTE ON THE PLANS:
FREE PLACES IF PREBORED HOLE CORED INTO ROCK DO NOT REQUIRE DRIVING.

PILE DETAILS

Bill Oliva

STANDARD 11.01

SECTION THRU CONCRETE

CAST-IN-PLACE PILING 
USED WHEN PILES ARE EXPOSED 
OPEN PILE HOLE OR UNDER SUNK ABUTMENTS

<table>
<thead>
<tr>
<th>PILE DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-U4a-GF</td>
</tr>
<tr>
<td>B-U4a</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>LESS</td>
</tr>
<tr>
<td>FOR FPW</td>
</tr>
<tr>
<td>PLACE IN ARTESIAN CONDITIONS</td>
</tr>
<tr>
<td>FOR TIMBER BACKED ABUTMENTS, CUT OFF</td>
</tr>
</tbody>
</table>
**Designer Notes**

The type of wing should be used when possible in pairs of wings parallel to the roadway. Do not use for the strong side of abutment, and water elevation is above the top of wing. Use Wood's design of the unstable clays which are sometimes encountered in northwest Wis., Superior area.

- When timber railing is used as per standard 30.24, the wing is not used in construction joint shall be used. The top concrete shall be used in place. The top concrete shall be used in place.

- All wing bars shall be epoxy coated.

**LRFD Design Loads (Wings)**

- **Use Load + 1/2' Surface Water Load**

**TABLE A**

<table>
<thead>
<tr>
<th>Wing Length</th>
<th>#4 Bars</th>
<th>#5 Bars</th>
<th>#6 Bars</th>
<th>#7 Bars</th>
<th>#8 Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>12'-0&quot;</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>16'-0&quot;</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

**Notes**

- Weight of Soil
- Horizontal Earth Load Based on: 35 P.c.f. EQUIV. FLUID UNIT
- Exposure Class 2, = 0.75
- = 1.75
- = 1.50
- = 1.25
- Load Factors:
  - Live Load = 1'-0" Surcharge
  - Dead Load = 1'-0" Surcharge
  - Wheel Load = 1'-0" Surcharge

**Wing Elevation**

- Wing Elevation: 10'-0" Minimum
- Wing Traveling Up Station
- Locate Name Plate on First Right Edge of Diaphragm
- Additional Details (See Std. 9.01 for Abutment Body Details)
- Wrapped (6-Inch) Pipe Underdrain
- Abutment Centerline
- Wing Length: 12'-0" Minimum

**Section A-A**

- See Std. 12.01 for Notes & Details

**Section B-B**

- See Std. 12.02 for Notes & Details

**Details for Wings Parallel to A1 Abutment Centerline**

- Approved: Bill Oliva
- Date: 7-21

**Standard 12.07**
**DESIGNER NOTES**

- **CONCRETE SLAB STRUCTURES**
  - All slab spaces to be based on "CLASS C" tension lap splice unless otherwise shown.
  - **Optional keyed construction joints in spans if provided shall be placed approximately 1/2 above normal water elevation.**
  - Optional keyed construction joints in spans should be provided so that the maximum height of any seam is not greater than the maximum height of any reinforced bar projection. No seam should be closer than 1/2 the effective projection length of any reinforcement shown. Plan notes may be omitted at the option of the designer.
  - **Keyed construction joints shall be formed by beveled keyed at depth of 1/3 thickness of shaft's 4" or less than length of shaft.**
  - A standard shaft taper of 45° may be used at the option of the designer, unless otherwise shown.
  - Shafts may be tapered in one or two directions when required for structural reasons.
  - A non-standard shaft taper is shown on shafts where not required for structural reasons. The taper may be either of the design or as shown.

- **ELEVATION**
  - **Level top of shaft in most cases.**
  - Level for girders parallel to grade. See standard 19.33, 19.34, 19.35.**

- **PLAN**
  - **Beam seats may be varied to match skew at the designer's discretion.**
  - **See standard 13.01 for additional reinforcing steel in bearing area for beam seats of non-sloped caps that are 4 inches or more above the lowest beam seat.**
  - Shaft may be tapered in one or two directions when required for structural reasons.
  - A non-standard shaft taper is shown on shafts where not required for structural reasons. The taper may be either of the design or as shown.

- **END VIEW**
  - **Level top of shaft in most cases.**
  - Level for girders parallel to grade. See standard 19.33, 19.34, 19.35.**

**PIER**

- **Optional keyed construction joints in spans if provided shall be placed approximately 1/2 above normal water elevation.**
- **Optional keyed construction joints in spans should be provided so that the maximum height of any seam is not greater than the maximum height of any reinforced bar projection. No seam should be closer than 1/2 the effective projection length of any reinforcement shown. Plan notes may be omitted at the option of the designer.**
- **Keyed construction joints shall be formed by beveled keyed at depth of 1/3 thickness of shaft's 4" or less than length of shaft.**
- A standard shaft taper of 45° may be used at the option of the designer, unless otherwise shown.
- Shafts may be tapered in one or two directions when required for structural reasons.
- A non-standard shaft taper is shown on shafts where not required for structural reasons. The taper may be either of the design or as shown.

**CONCRETE SLAB STRUCTURES**

- **All slab spaces to be based on "CLASS C" tension lap splice unless otherwise shown.**
- Optional keyed construction joints in spans if provided shall be placed approximately 1/2 above normal water elevation. Optional keyed construction joints in spans should be provided so that the maximum height of any seam is not greater than the maximum height of any reinforced bar projection. No seam should be closer than 1/2 the effective projection length of any reinforcement shown. Plan notes may be omitted at the option of the designer.
- Keyed construction joints shall be formed by beveled keyed at depth of 1/3 thickness of shaft's 4" or less than length of shaft. A standard shaft taper of 45° may be used at the option of the designer, unless otherwise shown.
- Shafts may be tapered in one or two directions when required for structural reasons. A non-standard shaft taper is shown on shafts where not required for structural reasons. The taper may be either of the design or as shown.

**PLAN NOTES**

- The bar spaces at the optional keyed construction joints may be eliminated whether or not the joint is utilized. Payment will be for the actual bars installed.

**ELEVATION**

- **Level top of shaft in most cases.**
- Level for girders parallel to grade. See standard 19.33, 19.34, 19.35.

**HAMMERHEAD PIER**

- **Optional keyed construction joints in spans if provided shall be placed approximately 1/2 above normal water elevation.**
- Optional keyed construction joints in spans should be provided so that the maximum height of any seam is not greater than the maximum height of any reinforced bar projection. No seam should be closer than 1/2 the effective projection length of any reinforcement shown. Plan notes may be omitted at the option of the designer.
- Keyed construction joints shall be formed by beveled keyed at depth of 1/3 thickness of shaft's 4" or less than length of shaft. A standard shaft taper of 45° may be used at the option of the designer, unless otherwise shown.
- Shafts may be tapered in one or two directions when required for structural reasons. A non-standard shaft taper is shown on shafts where not required for structural reasons. The taper may be either of the design or as shown.

**ENGINEER'S DISCRETION.**

- Beam seats may be varied to match skew at the designer's discretion.
- See standard 13.01 for additional reinforcing steel in bearing area for beam seats of non-sloped caps that are 4 inches or more above the lowest beam seat.
- Shaft may be tapered in one or two directions when required for structural reasons.
- A non-standard shaft taper is shown on shafts where not required for structural reasons. The taper may be either of the design or as shown.

**LATERAL TIES AT 1'-0" SPA.**

- See standard 13.01 for additional reinforcing steel in bearing area for beam seats of non-sloped caps that are 4 inches or more above the lowest beam seat.
- Shaft may be tapered in one or two directions when required for structural reasons.
- A non-standard shaft taper is shown on shafts where not required for structural reasons. The taper may be either of the design or as shown.

**LEVEL TOP OF SHAFT**

- See standard 13.01 for additional reinforcing steel in bearing area for beam seats of non-sloped caps that are 4 inches or more above the lowest beam seat.
- Shaft may be tapered in one or two directions when required for structural reasons.
- A non-standard shaft taper is shown on shafts where not required for structural reasons. The taper may be either of the design or as shown.

**CONSTRUCTION JOINTS DETAIL**

- See standard 13.01 for additional reinforcing steel in bearing area for beam seats of non-sloped caps that are 4 inches or more above the lowest beam seat.
- Shaft may be tapered in one or two directions when required for structural reasons.
- A non-standard shaft taper is shown on shafts where not required for structural reasons. The taper may be either of the design or as shown.
**FLASHING DETAIL FOR NEW BRIDGES WITH OPEN RAILING**

**DETAILED NOT TO BE USED IF CLEARANCE IS AN ISSUE OR IF DEBRIS IS A CONCERN**

**NOTE**

The bid item "Flashing stainless steel" shall include providing and installing the stainless steel flashing, concrete surface repair, and cleaning the edge of the deck prior to attachment of the flashing.

**REHABILITATION FLASHING DETAIL 1**

**NOTE**

The bid item "Flashing stainless steel" shall include providing and installing the stainless steel flashing, concrete surface repair, and cleaning the edge of the deck prior to attachment of the flashing.

**REHABILITATION FLASHING DETAIL 2**

**DESIGNER NOTES**

Edge of deck flashing is for open rail bridges and may be used for rehabilitation of new construction. Contact the Regional 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.

Do not use flashing if freeboard is less than 3" for a slab bridge.

**NOTES**

The bid item "Flashing stainless steel" shall include providing and installing the stainless steel flashing, cleaning caulk and " concrete screws, and providing and installing the stainless steel flashing, concrete surface repair, and cleaning the edge of the deck prior to attachment of the flashing.

Concrete screws shall be 410 stainless steel. Caulk shall be non-staining, gray non-bituminous joint sealer.

Caulk shall be non-staining, gray non-bituminous joint sealer.

For rehabilitation flashing detail 1 or detail 2, or a combination of the two, may be used for rehabilitation or new construction. Consult the Regional 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.

Do not use flashing if freeboard is less than 3" for a slab bridge.
PLAN OF PIER

PIER CAP OR WALL TYPE PIER

OPTIONAL LONGITUDINAL CONSTRUCTION JOINT

TOP TRANSVERSE REIN FOR PIER COLUMN DETAILS

Pier Cap or Wall Type Pier

See Standard 18.01 for Column and Cap Pier Detail.

Notes:

1. General:
   - Slab thickness shall be determined based on column requirements, bridge geometry, and construction practices.
   - Bar sizes shall be selected based on concrete strength and slab thickness.
   - Bar placement shall be consistent with construction joints.

2. Construction Joints:
   - Optional longitudinal joints may be used when overall slab width exceeds 60 ft.
   - Use optional longitudinal joints when over 52 ft.
   - Use pier dowels as shown.
   - Min. of #10 bars at 1'-0" centers.
   - Min. of #12 bars at 2'-0" centers.

3. Other Details:
   - Min. clear spacing of #5 bars at 1'-0" min. req'd.
   - Max. spacing 1'-0" ctrs.
   - Column spacing or 8'-0" max.
   - Min. of #10 bars at 2'-0" centers.
   - Min. of #12 bars at 4'-0" centers.

4. Reinforcement:
   - Transverse in top of slab - 4 bars max. and not bars spaced.
   - Top transverse bars shall be supported by individual bar chairs at approximately 4'-0" centers each way.
   - Bottom longitudinal bars shall be supported by continuous bar chairs at approximately 7'-6" ctrs.

5. Joint Details:
   - Standard 18.02 is used.
   - Paver joints are to be omitted on slab structures where possible.
   - Paver joints are to be used at the 2/10 and 8/10 points.
   - Paver joints are to be omitted from slab structures where possible.

6. Settlement:
   - Future creep and settlement include the allowance for form construction.
   - The maximum allowable skew angle of structure shall be 30°.

7. Approval:
   - Information required before releasing slab falsework.
   - Top of slab elevations taken at the reference line on the plans.
   - Provide camber values at the 10th points of all spans.
   - Provide top of slab elevations at the reference line on the plans.
   - Provide top of slab elevations at the reference line on the plans.
   - Provide top of slab elevations at the reference line on the plans.

8. Reinforcement:
   - Reinforcement in slab must meet temperature and shrinkage requirements.

Standard 18.02

Bill Oliva

Date: 7-21
STANDARD 18.03

CONCRETE SLAB DETAILS

BILL OLIVA

STAGED CONSTRUCTION.

SHALL BE POURED AFTER FALSEWORK HAS BEEN RELEASED, EXCEPT FOR PARAPETS, SIDEWALKS AND MEDIANS PLACED ON TOP OF THE SLAB FORM SETTLEMENT.

AND FUTURE CREEP. CAMBER DOES NOT INCLUDE ALLOWANCE FOR CAMBER SPANS AS SHOWN TO PROVIDE FOR DEAD LOAD DEFLECTION. CAMBER SHOWN IS BASED ON 3 TIMES DEAD LOAD DEFLECTION.

CAMBER AND SLAB THICKNESS DIAGRAM

CAMBER SHOWN IS BASED ON 3 TIMES DEAD LOAD DEFLECTION.

CAMBER SPANS AS SHOWN TO PROVIDE FOR DEAD LOAD DEFLECTION AND FUTURE CREEP/CAMBRS DOES NOT INCLUDE ALLOWANCE FOR FORM SETTLEMENT.

PARAPETS, SIDEWALKS AND MEDIANS PLACED ON TOP OF THE SLAB SHALL BE POURED AFTER FALSEWORK HAS BEEN RELEASED, EXCEPT FOR STAGED CONSTRUCTION.

TO DETERMINE FALSEWORK ELEVATION AT EDGE OF SLAB, CROWN OR REFERENCE LINE FOLLOW THE PROCEDURE:

STEP 1: CAMBER

STEP 2: SLAB THICKNESS

STEP 3: FALSEWORK SETTLEMENT/DEFLECTION DUE TO PLACEMENT OF SLAB CONCRETE (TO BE COMPUTED BY THE CONTRACTOR)

EQUALS = TOP OF SLAB FALSEWORK ELEVATION

SURVEY TOP OF SLAB ELEVATIONS

SHOW FOR EACH SPAN

% INCH

5/10

% INCH

5/10

SUPPORT NAME

SUPPORT NAME

FILL IN

EDGE OF SLAB

FILL IN

GUTTER

THE ABOVE TABLE FOR THE "AS BUILT" PLANS.


NOTES

FILL IN THE TABLE OF "SURVEY TOP OF SLAB ELEVATIONS" FOR EACH SPAN ON CONTRACT PLANS.

INCLUDE THE "SURVEY TOP OF SLAB ELEVATIONS" TABLE ON THE CONTRACT PLANS TO SHOW IT MAY BE FILLED IN DURING CONSTRUCTION. FOR BRIDGES WITH ~ LINE NOT ON THE CROWN, PROVIDE ELEVATIONS AT BOTH LOCATIONS.

TOP OF SLAB ELEVATIONS

SHOW FOR EACH SPAN

% INCH

5/10

% INCH

5/10

SUPPORT NAME

SUPPORT NAME

FILL IN

EDGE OF SLAB

FILL IN

CROWN AND/OR ~
TABLE "D"

<table>
<thead>
<tr>
<th>MEMBER &quot;C&quot; MAXIMUM LENGTH</th>
<th>MEMBER &quot;D&quot; SIZE</th>
<th>NO. OF 3/8&quot; DIA. BOLTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5' - 6'</td>
<td>6 x 6 x 6&quot;</td>
<td>6</td>
</tr>
<tr>
<td>7' - 8'</td>
<td>6 x 6 x 6&quot;</td>
<td>7</td>
</tr>
<tr>
<td>9' - 10'</td>
<td>6 x 6 x 6&quot;</td>
<td>8</td>
</tr>
<tr>
<td>11' - 12'</td>
<td>6 x 6 x 6&quot;</td>
<td>10</td>
</tr>
<tr>
<td>13' - 14'</td>
<td>6 x 6 x 6&quot;</td>
<td>12</td>
</tr>
<tr>
<td>15' - 16'</td>
<td>6 x 6 x 6&quot;</td>
<td>15</td>
</tr>
<tr>
<td>17' - 18'</td>
<td>6 x 6 x 6&quot;</td>
<td>18</td>
</tr>
<tr>
<td>19' - 20'</td>
<td>6 x 6 x 6&quot;</td>
<td>21</td>
</tr>
</tbody>
</table>

MEMBER "D" END CONNECTIONS

END DIAPHRAGMS
See Bridge Manual 30.3 (10) for additional guidance. See STD. 30.07 sidewalks or sidewalks separated from traffic by a barrier. Protective screening may be bent or straight for raised on single slope parapet.

8 ft. high fence = 21 lb/ft
6 ft. high fence = 18 lb/ft

Weight of chain link fence:

SEE STD. 17.02 FOR ADDED LOADS ON FIXED JOINTS MAINTAIN TYP. VERT. POST SPACE. EXPANSION JOINT OPENING < 2" OF MOVEMENT.

The side walk cross slope shall not exceed 2% without prior approval from the engineer. The sidewalk cross slope shall be calculated and the engineer shall be consulted.

NOTES

- Posts are to be set vertical.

- Chain link fence system is galvanized steel except the fence panel may be aluminum-coated steel or stainless steel.

- Posts shall be cast iron or ASTM A491, Class 2, Steel posts, posts and post sleeves shall conform to ASTM A491.

- Standard weight pipe (Schedule 40), fittings shall conform to ASTM A491.

- The color of the chain link coating on this structure shall be gray, non-bituminous joint sealer.

- Chain link fence does not continue beyond bridge.

- Pedestrian railing may be used on wingwall parapets if required.

- Vulnerable areas, or as stated in FDM Procedure 11-35-1.

- ALL FENCE COMPONENTS SHALL BE GALVANIZED STEEL. EXCEPT STAINLESS STEEL OR ASTM 307. IF 307 IS USED, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE EITHER STAINLESS STEEL OR ASTM 307. WASHERS SHALL BE GALVANIZED.

- ALTERNATE METHOD TO WELD RAIL DIRECTLY TO END POST.

- Chain link fence shall be continuous over the C/L of the post.

- ALL BOLT HEADS ARE TO BE SET AWAY FROM THE SIDEWALK ON TOP OF END POSTS AND OVERHANG POSTS WITH BOTH THE TOP AND BOTTOM WIRE IN 2" DIAMOND PATTERN MESH.

- Flame cut. All plate cuts shall be machine or machine cut and free from warp and all edges straight and vertical.

- Steel rails shall be free from spalls and grinded to the top of handrail.

- Post shall be set vertical and to posts without tension bands, with the rails welded around spaced post.

- Bolt tip shall be to end and to secure overhang section. Alternate is to hold rail end to secure overhang section.

- Bottom of handrail shall be to slope gROUT or slotted to secure overhang section.

- Width of handrail shall be 2" of posts spaced.

- Designer notes:

- The chain link fence system selected for the structure is a "Metal-Coated" chain link fence system.

- The chain link fence does not continue beyond bridge.

- Chain link fence shall be used along bridge deck edge. The slope of the parapet is greater than 5%. Top of parapet shall be made with a minimum of 1/2" slope. Side sidewalk, top of parapet is made, finished, and free from spalls and grinded to the top of handrail.

- Chain link fence shall be provided for either side of the bridge.

- For more details see the standard.

- Standard pipe (Schedule 40). Fittings shall conform to ASTM F1083, fabric shall conform to ASTM F668, Class 2B. Steel rails, coated polymer-coating on the outside.

- Steel rails shall be free from spalls and grinded to the top of handrail.

- Post shall be set vertical and to posts without tension bands, with the rails welded around spaced post.

- Bolt tip shall be to end and to secure overhang section. Alternate is to hold rail end to secure overhang section.

- Width of handrail shall be 2" of posts spaced.

- Designer notes:

- The chain link fence system selected for the structure is a "Metal-Coated" chain link fence system.

- The chain link fence does not continue beyond bridge.

- Chain link fence shall be used along bridge deck edge. The slope of the parapet is greater than 5%. Top of parapet shall be made with a minimum of 1/2" slope. Side sidewalk, top of parapet is made, finished, and free from spalls and grinded to the top of handrail.

- Chain link fence shall be provided for either side of the bridge.

- For more details see the standard.

- Standard pipe (Schedule 40). Fittings shall conform to ASTM F1083, fabric shall conform to ASTM F668, Class 2B. Steel rails, colored polymer-coating on the outside.

- Steel rails shall be free from spalls and grinded to the top of handrail.

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- The chain link fence does not continue beyond bridge.

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- Chain link fence shall be provided for either side of the bridge.

- For more details see the standard.
**NUMBER OF ANCHORS PER WALL**

APPROXIMATE/GUIDELINE

<table>
<thead>
<tr>
<th>NO. ANCHORS</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>24'-0&quot; &lt; L</td>
<td>1'-0&quot;</td>
<td>2'-0&quot;</td>
<td>3'-0&quot;</td>
</tr>
</tbody>
</table>

**WALL BACKFILL REQUIREMENTS**

**BACKFILL REQUIREMENTS**

**IN-SITU SOIL**

MIN. 4'-0"

**HEIGHT**

**FILL GRADE**

**BASE/ FINISH TO ROADWAY**

**L = 14'-0"**

**L = 20'-0"**

**L = 24'-0"**

**NOTE:** JOINTS WITH A MEMBRANE ALONG THE JOINT AT THE BACK FACE.

**VERTICAL EARTH PRESSURE:**  UNIT WEIGHT = 120 PCF

**HORIZONTAL EARTH PRESSURE:**  UNIT WEIGHT = 125 PCF

**LIVE LOAD:** HL-93

**SOIL IN-SITU EXCAVATION LIMITS OF FINISHED GRADE**

**COMPACTED MATERIAL**

**PRECAST WINGWALL**

**LIMITS OF BACKFILL STRUCTURE**

**C.I.P. FOOTINGS**

**APPRAVED:**

**Bill Oliva**

**DATE:** 7-21

**STANDARD 36.10**
CONCRETE BEARING BLOCK DETAILS

GIRDER REACTIONS AT BEARINGS (KIPS)

<table>
<thead>
<tr>
<th></th>
<th>E. GIR</th>
<th>W. GIR</th>
<th>C. GIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUPPORT NAME</td>
<td>SUPPORT NAME</td>
<td>SUPPORT NAME</td>
<td></td>
</tr>
<tr>
<td>Interior Girder</td>
<td>DL</td>
<td>LL</td>
<td>LL</td>
</tr>
<tr>
<td>Exterior Girder</td>
<td>DL</td>
<td>LL</td>
<td>LL</td>
</tr>
</tbody>
</table>

NOTES

THE THEORETICAL SERVICE LOADS SHOWN ON THIS SHEET INCLUDE THE EFFECT OF VARIOUS OPERATING LOADS SUCH AS WC-20, VEHICLES OF ACCIDENTAL OR ADJACENT STRUCTURAL PARTS, OR Effects OF ADJACENT SUBSTRUCTURE UNITS, IS NOT INCLUDED.

THE LL REACTIONS ARE BASED ON HS-20/ML-93 AND INCLUDE IMPACT.

EXTERIOR GIRDERS HAVE LOAD REACTIONS Which ACCOUNT FOR VARIABILITY IN COMPOSITE OR DISTRIBUTION METHODS.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACCURACY OF THE LOADS AT THE J ACKING LOCATION.

DESIGNER NOTES

ADD 10% TO THE EXTERIOR GIRDER LL REACTIONS TO ACCOUNT FOR VARIABILITY IN COMPOSITE OR DISTRIBUTION METHODS.

DO NOT INCLUDE LL REACTIONS FOR JACKING SITUATIONS THAT WILL NOT BE UNDER TRAFFIC.
ADJUSTING FLOOR DRAINS

NOTES

- Dimensions shall not be scaled.
- Dimensions shown are based on the original structure plans.
- Protective surface treatment shall be applied to the entire floor surface of the new concrete overlay.
- Sealant used for construction joints shall be compatible with the protective surface treatment and shall not interfere with the protective surface treatment.
- Removal of 1" of existing deck under the bid item "Cleaning decks" is carried for previously overlaid decks. Existing concrete cover (1" min.) shall be maintained and considered when determining concrete removals.
- Cost incidental to bid item "Concrete Masonry Overlay Decks" includes the cost of labor and materials required for the installation of the concrete overlay.
- The average overlay thickness is based on the minimum overlay thickness plus 1/8" to account for variation in the deck surface.
- Full-depth deck repair areas shall be filled with "Concrete Masonry Overlay Decks".
- Overlay limit should be offset from existing open steel railing for improved access for deck repairs.
- A minimum of 1" of concrete shall be removed from the existing deck for the bid item "Cleaning decks".
- Overlay limits for previously overlaid decks shall be based on the original structure plans.
- Provided an average overlay thickness on the plans. The average overlay thickness is the minimum overlay thickness plus 1/8" to account for variation in the deck surface.
- Obstructions on removal items shall be placed on the plans to prevent damage to previously overlaid areas.
- Overlay limits shall be offset from existing open steel railing for improved access for deck repairs.
- Overlay limit should be offset from existing open steel railing for improved access for deck repairs.
- Overlay limits for previously overlaid decks shall be based on the existing overlay limits.
- Even a partial list is required. The bid item may need to be added on a job-by-job basis.

TOTAL ESTIMATED QUANTITIES

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Description</th>
<th>Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>502,000</td>
<td>Protective surface treatment</td>
<td>CY</td>
<td></td>
</tr>
<tr>
<td>502,001</td>
<td>Protection deck type</td>
<td>CY</td>
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<tr>
<td>502,002</td>
<td>Protection deck type 2</td>
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<tr>
<td>502,003</td>
<td>Cleaning decks</td>
<td>CY</td>
<td></td>
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<tr>
<td>502,004</td>
<td>Full-depth deck repair</td>
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<td></td>
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<tr>
<td>502,005</td>
<td>Concrete Masonry Overlay decks</td>
<td>CY</td>
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</table>

CONCRETE OVERLAY

BUREAU OF STRUCTURES

STANDARD 40.31

Bill Oliva

DATE: 7-21
**36" GIRDERS**

- **A** = 369 SQ. IN.
- **r** = 18.05 IN.
- **y** = 20.27 IN.
- **S** = 2,022 IN.
- WT. = 384 #/FT.

### PRE-TENSION

\[
f' = 270,000 \text{ P.S.I}
\]

\[
f = 0.75 \times 270,000 = 202,500 \text{ P.S.I}
\]

\[
\frac{y}{r} = \frac{-15.83}{138.15} = -0.1146 \text{ in./in.}
\]

### DESIGNER NOTES

- Label the span it is used in.
- Applies to the designed structure and applies to the designed structure and label the span it is used in.

### STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS (0.6" DIA.)

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>D (Inches)</th>
<th>Finit. (Kips)</th>
<th>f (K/sq.in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>-12.03</td>
<td>393</td>
<td>3.85</td>
</tr>
<tr>
<td>10</td>
<td>-12.23</td>
<td>421</td>
<td>3.85</td>
</tr>
<tr>
<td>12</td>
<td>-12.59</td>
<td>507</td>
<td>3.85</td>
</tr>
<tr>
<td>14</td>
<td>-12.91</td>
<td>615</td>
<td>3.85</td>
</tr>
<tr>
<td>16</td>
<td>-13.26</td>
<td>783</td>
<td>3.85</td>
</tr>
</tbody>
</table>

### CONSTRUCTION CUBES

### STANDARD STRAND PATTERNS FOR DRAPED STRANDS (0.5" DIA.)

<table>
<thead>
<tr>
<th>NO. STRANDS</th>
<th>D (Inches)</th>
<th>Finit. (Kips)</th>
<th>f (K/sq.in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
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<tr>
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<td>-12.23</td>
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<td>12</td>
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<td>372</td>
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<tr>
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<tr>
<td>26</td>
<td>-14.77</td>
<td>806</td>
<td>4.63</td>
</tr>
</tbody>
</table>

### ARRANGEMENT AT 6' SPAN - FOR ORDERS WITH DRAPED 0.5" DIA. STRANDS