Abutment Sheet Check List

A. Plan

1. Place at top, left side of sheet, oriented the same as the General Plan. May be placed horizontal with face down for very long abutments.
2. Show North arrow.
3. Scale 1/4" = 1'-0" usual minimum. Use 1/8" = 1'-0" on large structures, but show less detail.
4. Abutment sheet may be omitted on simple diaphragm type abutments. Layout and Sections should be shown with the girder layout.
5. Check List:
   • Do not repeat stations or bearings shown on Foundation Plan.
   • Dimension along same layout line as is stationed on Foundation Plan.
   • Do not dimension piles from edges of footings.
   • Show only layout dimensions and pile spacing, others should be shown on larger details.
   • Avoid showing any reinforcement.

B. Abutment Elevation

1. Place in front of Plan if “PLAN” is oriented the same as a General Plan, “ELEVATION” may be placed horizontal or looking normal to face of abutment.
2. May be omitted on simple diaphragm type abutments.
3. Rear elevations should be avoided.
4. Same scale as Plan.
5. Check List:
   • Show location of weep holes. See Standard Plan B0-3, Bridge Detail 3-1. As an alternative, weep holes and geocomposite drain may be used. See Bridge Design Details manual page 6-22.
   • Show elevations on slope paving; exception, a constant dimension below soffit.
   • Do not attempt to show entire skewed wingwalls.
   • Do not show all piles. Note “All piles not shown.”
   • It is not necessary to show railing.
   • Avoid detail dimensions.

C. Wingwall Elevation

1. Projection of Abutment Plan if possible. Locate by section symbols if not a projection, or simply call out as WINGWALL ELEVATION.
2. Always show looking normal to wall.
3. Same scale as Plan, unless reinforcement is to be shown. A few bars may be shown at 1/4" = 1'-0", but usually reinforcement should not be shown at less than 3/8" = 1'-0".
4. Check List:
   • Call out standard plans and wall length.
   • Show finished earth or slope paving lines.
   • Wingwall layout dimensions to be shown in Plan view.
   • Show all piles.
   • Railing need not be shown.

D. Sections and Details

1. Sections and details showing reinforcement should not be less than $\frac{3}{8}'' = 1'-0''$ scale; preferred scale is $\frac{1}{2}'' = 1'-0''$ minimum.
2. Plan of footing corners should be the same orientation as Plan view.
3. Sections should be oriented the same way as the view they are taken from.
4. Sections and details are to be taken from Plan, Elevation, or secondary views rather than from other sections.
5. Similar sections need not have all details repeated.
6. Do not shade or show aggregate in sections.
7. Abutment section call out joint seal and movement rating.

E. Retaining Walls

1. Show all layout information along one layout line (usually the face of wall).
2. Do not show dimensions given on standard sheets.
3. Show top of wall details for railings, sidewalks, overhangs, etc.
End Diaphragm Abutment

Notes:
1. Reinforce the abutment as shown on pages 1-2, 1-3, and 1-4 of the Bridge Design Aids.
2. The clearance between the top of slope and the soffit of the bridge should be about three feet, but may be as little as two feet or as much as four feet, depending upon individual circumstances. This dimension should be shown on the plans.
3. The bottom portion of an end diaphragm abutment on piles should be embedded a minimum of 3½ feet at the intersection of the slope and face of abutment.
4. For end diaphragm abutments on spread footings, the horizontal clearance from the top of footing to the face of slope should be five feet minimum.
5. Continuous pervious backfill material and drains or perforated pipe with permeable material shall be placed in accordance with the instructions in Memo to Designers 5-2. Note that permeable material is only specified when known water bearing material is present behind the abutment.
6. Weep Hole and Geocomposite Drains, Bridge Design Details 6-22, which is an alternative to Bridge Detail B0-3/3-1, should be added to the plans for abutments without structure approaches.
7. End slopes at abutments shall be 1½ to 1 or flatter except under very unusual circumstances.
Weep Hole and Geocomposite Drain

Alternative to Bridge Detail BO-3 3-1

Wall Section

Section A-A

Detail "A"

Detail "B"

Notes:

A. 4" drains at intermediate sag points and at 25' max. center to center (9' c-c for Type 3 and 9'-3" c-c for Type 4 retaining walls). For walls adjacent to sidewalks or curbs, provide 4" plastic pipe under sidewalk to discharge through curb face. Exposed wall drains shall be located 3"± above finished grade.

B. Geocomposite drain, cement treated permeable base, and 3" φ slotted plastic pipe continuous behind retaining wall or abutment. Cap ends of pipe. Provide "Tee" connection at each 4" φ drain.

C. Connect the low end of plastic pipe to the main outlet pipe as applicable.
STIRRUP REINFORCEMENT AT ABUTMENTS
(Sloping Exterior Girder)

Notes:
1. Additional stirrups or equivalent reinforcing may be required for sloping abutment face.
2. Consideration should be given to potential conflicts when accommodating prestressing flares and assemblies.
3. These details should be shown in addition to requirements on Standard Plans B6-1 and B7-1.
BOX GIRDER DIAPHRAGM – SLAB REINFORCEMENT
For Skews Greater Than 20°

At the junction of the bottom slab and end diaphragm of seat-type abutments, for skews greater than 20°, rebar clearance problems may be encountered. The slab thickness may not be adequate to accommodate the "stacking" of longitudinal and transverse slab bars, diaphragm stirrups, and diaphragm bottom bars.

Possible solutions are shown below.

---

**DROP-DIAPHRAGM ALTERNATIVE**

**FLARED SLAB ALTERNATIVE**

Note: Use in conjunction with page 8-32, Bridge Design Details.
### CANTILEVER ABUTMENT - SPREAD FOOTING

#### APPLIED SUPERSTRUCTURE LOAD IN KIPS PER FT.

<table>
<thead>
<tr>
<th>I</th>
<th>5</th>
<th>7.5</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1.5</td>
<td>9.4</td>
<td>112.0</td>
</tr>
<tr>
<td>12</td>
<td>1.5</td>
<td>13.7</td>
<td>13.5</td>
</tr>
<tr>
<td>14</td>
<td>1.5</td>
<td>19.0</td>
<td>23.30</td>
</tr>
<tr>
<td>16</td>
<td>1.5</td>
<td>25.4</td>
<td>33.40</td>
</tr>
<tr>
<td>18</td>
<td>1.5</td>
<td>+32.9</td>
<td>16.08</td>
</tr>
<tr>
<td>20</td>
<td>1.5</td>
<td>46.7</td>
<td>34.9</td>
</tr>
<tr>
<td>22</td>
<td>1.5</td>
<td>58.8</td>
<td>33.3</td>
</tr>
<tr>
<td>24</td>
<td>1.5</td>
<td>71.5</td>
<td>32.7</td>
</tr>
<tr>
<td>26</td>
<td>1.5</td>
<td>86.2</td>
<td>31.77</td>
</tr>
<tr>
<td>28</td>
<td>1.5</td>
<td>102.0</td>
<td>36.74</td>
</tr>
<tr>
<td>30</td>
<td>1.5</td>
<td>118.2</td>
<td>41.48</td>
</tr>
<tr>
<td>32</td>
<td>1.5</td>
<td>135.2</td>
<td>47.21</td>
</tr>
<tr>
<td>34</td>
<td>1.5</td>
<td>153.0</td>
<td>52.58</td>
</tr>
<tr>
<td>36</td>
<td>1.5</td>
<td>171.5</td>
<td>58.02</td>
</tr>
<tr>
<td>38</td>
<td>1.5</td>
<td>191.0</td>
<td>63.49</td>
</tr>
<tr>
<td>40</td>
<td>1.5</td>
<td>211.5</td>
<td>69.04</td>
</tr>
</tbody>
</table>

#### QUANTITIES

<table>
<thead>
<tr>
<th>Bar Reinforcing Steel (lbs./ft.)</th>
<th>Convl.</th>
<th>Applied Superstructure Load</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>5.05</td>
<td>75.5</td>
</tr>
<tr>
<td></td>
<td>29.1</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>38.9</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>43.7</td>
<td>172</td>
</tr>
<tr>
<td></td>
<td>53.7</td>
<td>211</td>
</tr>
<tr>
<td></td>
<td>57.4</td>
<td>307</td>
</tr>
<tr>
<td></td>
<td>6.02</td>
<td>65.6</td>
</tr>
<tr>
<td></td>
<td>6.21</td>
<td>180.3</td>
</tr>
<tr>
<td></td>
<td>6.55</td>
<td>217.6</td>
</tr>
<tr>
<td></td>
<td>6.82</td>
<td>254.9</td>
</tr>
<tr>
<td></td>
<td>7.03</td>
<td>292.2</td>
</tr>
<tr>
<td></td>
<td>7.48</td>
<td>329.5</td>
</tr>
</tbody>
</table>

#### NOTE TO DESIGNERS:

The footing 'F' dimension should be checked for compliance with current Bridge Design Specifications. The dimension and concrete quantity should be adjusted accordingly. A future revision will correct the non-complying portions of this table.

---

**NOTE:** For walls with seats less than 7'-0", the concrete quantity shall be increased by 2% per foot of variation.
CANTILEVER ABUTMENT — PILE FOOTING

TYPE I
H10 thru H14

NOTE:
Reinforcement detailed is in addition to that detailed for spread footing.

LEGEND

A = Allowable pile loading.
For 45 ton piles: \( L = 85.5 \) kips battered toe pile
900 kips plumb heel pile.

All values on this sheet are based on 45 ton piles.

Lateral resistance of each vertical pile in bending is limited to 15% of the axial load. Balance of lateral forces taken by the battered piles.

In cases of special foundation situations, values should be subject to review.

\[ \begin{align*}
N & = \text{number of piles per line} \\
S & = \text{pile spacing in feet between lines} \\
B & = \text{distance from \( \varepsilon \) bearing to center of gravity of pile pattern} \\
e & = \text{eccentricity from center gravity of pile pattern} \\
I & = \text{moment of inertia of one line of piles} \\
A & = \frac{1}{2} (b \cdot d) \text{ toe pile, 36 lbs ft pressure} \\
B & = \left( \frac{1}{2} - \frac{e}{d} \right) \text{ heel pile, 27 lbs ft pressure} \\
T & = \text{horizontal thrust in kips per line of piles} \\
V_{C_G} & = \text{section modulus one pile line, toe pile} \\
V_{C_H} & = \text{section modulus one pile line, heel pile} \\
\end{align*} \]
# CANTILEVER ABUTMENT - PILE FOOTING

## PILE LOADINGS FOR ABUTMENT PILE FOOTINGS

| H | N | 1/N | A | B | S | T | 1/C1 | 1/C4 | d | Bare Bar | 2 Bar | 3 Bar | 4 Bar | 5 Bar | 6 Bar | 7 Bar | 8 Bar | 9 Bar | 10 Bar | 11 Bar | 12 Bar | 13 Bar | 14 Bar | 15 Bar | 16 Bar | 17 Bar | 18 Bar | 19 Bar | 20 Bar |
| 10 | 5.6 | 1.08 | 3.87 | 0.35 | 0.29 | 0.24 | 0.19 | 0.14 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 12 | 7.9 | 1.19 | 4.43 | 0.38 | 0.33 | 0.28 | 0.23 | 0.18 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 14 | 10.3 | 1.34 | 5.09 | 0.41 | 0.36 | 0.31 | 0.26 | 0.21 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | 13.9 | 1.52 | 5.85 | 0.44 | 0.39 | 0.34 | 0.29 | 0.24 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 18 | 16.5 | 1.73 | 6.60 | 0.48 | 0.43 | 0.38 | 0.33 | 0.28 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 20 | 20.1 | 1.95 | 7.36 | 0.53 | 0.48 | 0.43 | 0.38 | 0.33 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 22 | 23.7 | 2.19 | 8.12 | 0.57 | 0.52 | 0.47 | 0.42 | 0.37 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 24 | 27.4 | 2.46 | 8.87 | 0.62 | 0.57 | 0.52 | 0.47 | 0.42 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 26 | 31.1 | 2.75 | 9.62 | 0.66 | 0.62 | 0.57 | 0.52 | 0.47 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 28 | 34.8 | 3.06 | 10.37 | 0.71 | 0.67 | 0.62 | 0.57 | 0.52 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 30 | 38.5 | 3.39 | 11.12 | 0.76 | 0.72 | 0.67 | 0.62 | 0.57 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 32 | 42.2 | 3.74 | 11.87 | 0.81 | 0.77 | 0.73 | 0.68 | 0.64 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 34 | 45.9 | 4.10 | 12.62 | 0.86 | 0.83 | 0.78 | 0.74 | 0.69 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 36 | 49.6 | 4.47 | 13.37 | 0.92 | 0.88 | 0.84 | 0.79 | 0.75 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

## APPLIED SUPERSTRUCTURE LOAD (K.F.T.)

<table>
<thead>
<tr>
<th>10 Bar</th>
<th>12 Bar</th>
<th>14 Bar</th>
<th>16 Bar</th>
<th>18 Bar</th>
<th>20 Bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5</td>
<td>15.2</td>
<td>12.9</td>
<td>10.6</td>
<td>8.4</td>
<td>6.1</td>
</tr>
<tr>
<td>20</td>
<td>17.6</td>
<td>15.3</td>
<td>13.0</td>
<td>10.7</td>
<td>8.5</td>
</tr>
<tr>
<td>12</td>
<td>16.0</td>
<td>13.7</td>
<td>11.4</td>
<td>9.2</td>
<td>7.0</td>
</tr>
<tr>
<td>10</td>
<td>14.4</td>
<td>12.1</td>
<td>9.9</td>
<td>7.7</td>
<td>5.5</td>
</tr>
</tbody>
</table>

## NOTES:
- The values of "S" given are maximum allowable. Where only values of "A" are listed, the toe pile governs. When "B" values only are listed, the heel pile governs.
- For other pile loadings obtain the required spacing by proportion, for example: allowable pile loading 60 tons, multiply values of "S" in the table by 60/45.
**FOOTING PILE PATTERN LAYOUT**

<table>
<thead>
<tr>
<th>FOOTING</th>
<th>PILE PATTERN LAYOUT</th>
<th>CONCRETE PILES</th>
<th>STEEL PILES</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATA</td>
<td>P = x 6.0</td>
<td>Values of x, 21, and x' are thus/ft</td>
<td>Values of x, 21, and x' are thus/ft</td>
</tr>
<tr>
<td>W</td>
<td>C</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>6</td>
<td>4.8</td>
<td>4.8</td>
<td>4.8</td>
</tr>
<tr>
<td>6</td>
<td>4.8</td>
<td>4.8</td>
<td>4.8</td>
</tr>
<tr>
<td>6</td>
<td>4.8</td>
<td>4.8</td>
<td>4.8</td>
</tr>
<tr>
<td>6</td>
<td>4.8</td>
<td>4.8</td>
<td>4.8</td>
</tr>
</tbody>
</table>

**DESIGN DATA**

- Weight of earth = 120 lbs per cu ft. Equivalent fluid pressure, with
  - 2 1/2 Level Surcharge = 27 to 35 lbs per sq ft per ft of height
  - Horizontal and Vertical Earth Pressures for 2 1/2 unlimited and 1/4 unlimited are from A.E.A graph. Appendix C 8-5-18, Soil Type 1.

- Lateral resistance N, is limited to 135° each pile plus value of component of battered piles of 1/3.

- Pile spacing P and C is max. Reduce to suit length of footing.

- Min distance between any two piles is 3' 0".

- Distance between center line of piles and edge of footing 1' 6" min., except 1' 6" min. for H 4' to 8'.

- For details, dimensions, and reinforcement see Type I Container Retaining Wall.

- The design assumes a lateral resistance of 135° per pile, if the allowable resistance is less, the pile spacing or batter must be adjusted to provide the proper lateral resistance.

- Note 2 1/2 surcharge are unlimited. Subscript 90 indicates 45 ton piles. Subscript 64 indicates 32 ton piles.

---

**PLAN TYPE VI**

---

**PLAN TYPE VII**

---

**FOR OFFICE USE ONLY**

---

**PILE LAYOUT**

---

**TYPE I RETAINING WALL (H4-36)**
**TABLE OF PILE SPACING**

<table>
<thead>
<tr>
<th>PILE</th>
<th>LOAD</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
<th>26</th>
<th>28</th>
<th>30</th>
<th>32</th>
<th>34</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Measured on outside side of layout line from that shown in typical section.
TYPICAL SECTION

Wall layout line

TYPICAL SECTION

Alternate piles are vertical in this row except as noted.

TYPICAL SECTION

Alternate piles are vertical in this row except as noted.

TYPICAL SECTION

These piles to be added for H = 28 only.

TYPICAL SECTION

These piles to be added for H = 28 only.

**TABLE OF PILE SPACING**

<table>
<thead>
<tr>
<th>H (ft)</th>
<th>20'</th>
<th>22'</th>
<th>24'</th>
<th>26'</th>
<th>28'</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>4'-0&quot;</td>
<td>4'-11&quot;</td>
<td>5'-3&quot;</td>
</tr>
<tr>
<td>B</td>
<td>2'-9&quot;</td>
<td>2'-9&quot;</td>
<td>3'-3&quot;</td>
<td>3'-7&quot;</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>M</td>
<td>1'-0&quot;</td>
<td>1'-0&quot;</td>
<td>1'-4&quot;</td>
<td>1'-8&quot;</td>
<td>2'-2&quot;</td>
</tr>
<tr>
<td>N</td>
<td>0'-0&quot;</td>
<td>0'-0&quot;</td>
<td>0'-4&quot;</td>
<td>0'-8&quot;</td>
<td>1'-2&quot;</td>
</tr>
<tr>
<td>U</td>
<td>0'-6&quot;</td>
<td>0'-6&quot;</td>
<td>1'-0&quot;</td>
<td>1'-4&quot;</td>
<td>2'-2&quot;</td>
</tr>
<tr>
<td>R1</td>
<td>3'-6&quot;</td>
<td>3'-6&quot;</td>
<td>4'-0&quot;</td>
<td>4'-4&quot;</td>
<td>5'-3&quot;</td>
</tr>
<tr>
<td>R2</td>
<td>3'-9&quot;</td>
<td>3'-9&quot;</td>
<td>4'-3&quot;</td>
<td>4'-7&quot;</td>
<td>5'-6&quot;</td>
</tr>
<tr>
<td>P1</td>
<td>4'-3&quot;</td>
<td>4'-3&quot;</td>
<td>4'-7&quot;</td>
<td>5'-1&quot;</td>
<td>6'-3&quot;</td>
</tr>
<tr>
<td>P2</td>
<td>4'-6&quot;</td>
<td>4'-6&quot;</td>
<td>5'-0&quot;</td>
<td>5'-4&quot;</td>
<td>6'-2&quot;</td>
</tr>
<tr>
<td>P3</td>
<td>4'-9&quot;</td>
<td>4'-9&quot;</td>
<td>5'-3&quot;</td>
<td>5'-7&quot;</td>
<td>6'-5&quot;</td>
</tr>
<tr>
<td>PLAN</td>
<td>6'</td>
<td>6'</td>
<td>6'</td>
<td>6'</td>
<td>6'</td>
</tr>
</tbody>
</table>

**DESIGN DATA**

- Weight of earth = 120 lbs per cu ft and equivalent fluid pressure of 27 to 36 lbs per sq ft per ft of height.
- Passive pressure at earth on outer face of wall is considered in this design.
- Lateral resistance of each pile in bending is limited to 15% of dead pile load for 64 kip piles and 10% for 90 kip piles. Balance of lateral forces taken by battered piles.
- Pile spacing P1, P2, and P3 is maximum. Reduce to suit length of footing.
- Min. distance between any two piles = 3'-0".
- Distance between center of pile and edge of footing = 1'-6" min.

For details, dimensions, and reinforcement see Wingwalls - Pile Footing.

**Notes:**
- If 32 ton piles are used, revise C and W dimensions on Standard Plan.
Pile Footings

Concrete Piles

Steel Piles

Timber Piles
Piles at Abutment Corners

Note "A"  Battered pile at this location is unnecessary. Pile should be vertical.

Note "B"  Use vertical rather than battered piles at sharp acute corners where it may be difficult to drive battered piles.
Bearing Pad Location at Anchorage Blockout

Avoid blackouts where pad does not have good bearing.

INCORRECT

CORRECT

6-73
WITH STRUCTURE APPROACH

MR ≤ 2"

WITHOUT STRUCTURE APPROACH

MR ≥ 2 ½"

SEALED JOINTS
Joint Seal (MR = ____")

Alternative 1
Temporary Bumper with inserts

1/8" x 12" neoprene strip bonded 3" minimum width each side of joint. Place prior to backfilling the abutment backwall and installing the temporary bumper. (Fold neoprene into chamfer.)

Abutment backwall

JOINT PROTECTION DETAIL

NOTE:
1. Do not use waterstop with this detail.
2. Estimate 12" Neoprene Strip in linear feet.
WITH STRUCTURE APPROACH

WITHOUT STRUCTURE APPROACH

DIAPHRAGM ABUTMENT

WITH STRUCTURE APPROACH

WITHOUT STRUCTURE APPROACH

SEAT ABUTMENT

BB AND EB LOCATIONS

BB = Beginning of Bridge
EB = End of Bridge
**ABUTMENT STRUCTURE APPROACH DETAILS**

(FUTURE CONSTRUCTION)
CANTILEVERED WINGWALLS
Minimum Soil Cover

ELEVATION
RETAINING WALL WINGWALL

# $\frac{1}{2}$ tot. 2 (Same size as main retaining wall reinforcement)

Abutment layout line

Wingwall layout line

Face of wall or overhang

WALL OFFSET

8'-0" min.

Check district's typical section

* Preferred step dimensions. May vary to fit slope conditions or pile spacings.

WINGWALL ELEVATION

**Extend waterstop 6" into concrete barrier.
ABUTMENT WINGWALL CORNERS

Tension reinforcement *should not* be bent around a re-entrant corner. The small amount of concrete cover is not sufficient to keep the reinforcing from straightening.

Reinforcement in each face *should* be straight and extend the required development length after it crosses the bar from the other direction. Standard practice for detailing reinforcement in *all* re-entrant corners and angle changes in members is shown below.
SIDEWALK SUPPORT BRACKET

ELEVATION A-A

ELEVATION B-B

PLAN
Sidewalk not shown

<table>
<thead>
<tr>
<th>S</th>
<th>D Bars</th>
<th>E Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>12'</td>
<td>Bundle 4 #9</td>
<td>2 #4</td>
</tr>
<tr>
<td>14'</td>
<td>Bundle 4 #10</td>
<td>2 #4</td>
</tr>
<tr>
<td>16'</td>
<td>Bundle 2 #10, 2 #11</td>
<td>2 #8</td>
</tr>
<tr>
<td>18'</td>
<td>Bundle 4 #11</td>
<td>2 #11</td>
</tr>
</tbody>
</table>

Length of "D" bars = S + 6' or hook into abutment.

SECTION C-C

Types 26 & 29

Note: Reinforcement shown is in addition to standard reinforcement in curb and wingwall except as noted.
SIDEWALK ON WINGWALL

Support end of sidewalk on paving notch.

6' maximum
See BDD 6-84 when > 6'

4"

-2%

8" min.

6"

6" max

#5 x 5'-0" @ 18 maximum

Note: Reinforcement shown is in addition to standard reinforcement in curb and wingwall unless otherwise noted.

TYPES 26 & 29
CONCRETE BARRIER TYPE 25 ON WALLS

When Type 25 is to be placed on wingwalls or retaining walls, the wall must be detailed to alert the contractor of the additional work to be performed. Part of this information is on the Concrete Barrier Type 25 standard. Details below illustrate the minimum additional detail required.
DETAILS SHOWN ARE FOR EXAMPLE ONLY
NOT TO BE USED FOR DESIGN PURPOSES
DETAILING EXAMPLE

DETAILS SHOWN ARE FOR EXAMPLE ONLY
NOT TO BE USED FOR DESIGN PURPOSES
DETAILS SHOWN ARE FOR EXAMPLE ONLY
NOT TO BE USED FOR DESIGN PURPOSES
DETAILING EXAMPLE

DETAILS SHOWN ARE FOR EXAMPLE ONLY
NOT TO BE USED FOR DESIGN PURPOSES