Anchorage for barrier Types 732 and 732A are similar to their respective details.

Details shown for barrier anchorage to Type 732A.

NOTE: Lifts are to be identified before barrier is placed.

1. Clearance to reinforcing steel in barrier to be 1", except as noted. Local initial reinforcement to stop at all expansion joints.

2. Dimensions may vary with roadway, cross slope and with certain thickness of surfacing. See Project Plans.

3. For typical metal railing connection details not shown. See Standard Plans A77U1 and A77U2.

4. Clearance to reinforcing steel in barrier to be 1", except as noted. Local initial reinforcement to stop at all expansion joints.

5. For electrical details, the maximum number of conduits in the barrier is limited to one conduit along with one 3" conduit. When a 3" conduit is used, it is restricted to the side of the barrier.

6. For electrical details, see Standard Plans ES-6A and ES-6B.

7. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.

8. Clearance to reinforcing steel in barrier to be 1", except as noted. Local initial reinforcement to stop at all expansion joints.

9. See Notes for electrical details. The maximum number of conduits in the barrier is limited to one conduit along with one 3" conduit. When a 3" conduit is used, it is restricted to the side of the barrier.

10. For electrical details, see Standard Plans ES-6A and ES-6B.

11. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.

12. Clearance to reinforcing steel in barrier to be 1", except as noted. Local initial reinforcement to stop at all expansion joints.

13. For typical metal railing connection details not shown. See Standard Plans A77U1 and A77U2.

14. For electrical details, the maximum number of conduits in the barrier is limited to one conduit along with one 3" conduit. When a 3" conduit is used, it is restricted to the side of the barrier.

15. For electrical details, see Standard Plans ES-6A and ES-6B.

16. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.

17. See Notes for electrical details. The maximum number of conduits in the barrier is limited to one conduit along with one 3" conduit. When a 3" conduit is used, it is restricted to the side of the barrier.

18. For electrical details, see Standard Plans ES-6A and ES-6B.

19. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.

20. See Notes for electrical details. The maximum number of conduits in the barrier is limited to one conduit along with one 3" conduit. When a 3" conduit is used, it is restricted to the side of the barrier.

21. For electrical details, see Standard Plans ES-6A and ES-6B.

22. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.

23. See Notes for electrical details. The maximum number of conduits in the barrier is limited to one conduit along with one 3" conduit. When a 3" conduit is used, it is restricted to the side of the barrier.

24. For electrical details, see Standard Plans ES-6A and ES-6B.

25. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.
Details shown for barrier anchorage to Type 742A. Anchorages for barrier Types 742 and 742A are similar to their respective details.
1. Walls are to be backfilled before the barrier is placed.
2. Longitudinal reinforcing steel to stop at all expansion joints.
3. The front face dimensions are to be constant above the finish surface.
4. Expansion joint to match deck joint.
5. No lap splicing allowed on the longitudinal rail reinforcing. Splicing shall be staggered.
6. For typical metal railing connection details not shown, see Standard Plans A77U1 and A77U2.
7. Chain link railing is not allowed on Type 80 Barriers.
8. Posts to be spaced equally, typically 6'-6" spacing. Post spacing may be reduced where location of hinges or expansion joints or the length of wingwalls will not accommodate the 6'-6" spacing. Maximum see-through availability is to be achieved for 6'-6" post spacing can not be achieved.
BARRIER MODIFICATION FOR ELECTROLIER

- Bend #5 and #8 Reinforcement in curb as required to clear pull box.
- Conduit is restricted to within the structure.
- Conduit for electroliers on the structure. Any transporting of larger conduit is restricted to within the structure.

ELECTROLIER NOTES:
1. See Project Plans for electrolier and pull box locations.
3. This barrier is designed to accommodate only two 1½" electrical conduit for electroliers on the structure. Any transporting of larger conduit is restricted to within the structure.
4. Only the additional reinforcing for the electrolier pedestal is shown. For other typical reinforcing for Type 80 barrier, see Standard Plan B11-60.

For other typical reinforcing for Type 80 Barrier, see Standard Plan B11-60.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER
TYPE 80
(SHEET 2 of 2)

NO SCALE

REVISED STANDARD PLAN RSP B11-61
Dist

POST MILES
TOTAL PROJECT

ROUTE

SHEET TOTAL
No. SHEETS

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REGISTERED CIVIL ENGINEER
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MAXIMUM WALL HEIGHTS

LEGEND:

COUNTY

BATTER
10" x 6" x 1'-0"

LC1

LC2

LC1

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LC2

PLANS APPROVAL DATE

LC2

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11'-0"

24'-0"

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10" x 6" STRETCHERS

27'-0"

20'-0"

27'-0"

31'-0"

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COPIES OF THIS PLAN SHEET.

LC1 = LOADING CASE I

1:6

31'-0"

13'-0"

36'-0"

23'-0"

36'-0"

33'-0"

1:4

33'-0"

15'-0"

36'-0"

25'-0"

36'-0"

36'-0"

C55599

Exp. 12-31-18

FILLER BLOCK ALIGNED AGAINST HEADER.
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Kathryn Griswell

IN E E R

May 31, 2018

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TYPE C

TYPE B

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TYPE A

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LC2 = LOADING CASE II
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EMBANKMENT SLOPE

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2'-0"

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2'-0"

EMBANKMENT SLOPE

LOADING CASE I & II

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3'-0"

6'-2"

13'-2"

4'-0"

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7'-0"

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6'-2"

Min

19'-4"

Min

TYPE A

TYPE B

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6'-2"

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5'-0"

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7'-0"

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6'-2"

6'-2"

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6'-2"

Min

25'-6"

TYPE C

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE CRIB WALL
TYPES A, B AND C
NO SCALE

C7A
1-29-18


REINFORCED CONCRETE CRIB WALL
TYPES A, B, AND C
HEADER AND STRETCHER DETAILS

NOTES:


2. Reinforced Concrete:
   - Concrete: 60 ksi
   - Reinforcement: 25.5 ksi
   - Steel: 60 ksi

3. Soil Parameters:
   - Coefficient of lateral earth pressure determined by Coulomb's theory.

   - Horizontal earth pressure on interior face:
     - Coefficient of lateral earth pressure determined by Coulomb's theory.

   - Vertical earth pressure on interior face:
     - Coefficient of lateral earth pressure determined by Coulomb's theory.

4. Concrete to concrete bearing surfaces shall be finished to a smooth plane. The gap between bearing surfaces shall not exceed 1/2 inch, where a gap of 1/2 inch to 3/4 inch exists, 3/8 inch pad of asphalt felt or sheet neoprene shall be placed between the bearing surfaces. For non-tangent wall alignment, special length stretchers may be required.

5. All members may be manufactured to dimensions 1/8 inch greater in thickness and stretchers 1/8 inch less in length.

6. Where an opening is specified in the face of a wall, special length stretchers and additional headers may be required.

7. For non-tangent wall alignment, special length stretchers may be required.

8. For non-tangent wall alignment and locations where filler blocks are required, special length front face closure members may be required.

9. The thickness of the lowest step for each wall type shall not be less than the dimension shown on these plans.

10. Use "Front Face Closure Member" only when specified on project plans or in the Special Provisions.

11. All stretchers are 12'-0" except as noted.

12. Place 2 filler blocks midspan between stretchers in the bottom 2 levels of walls 8 high and higher.

13. Concrete to concrete bearing surfaces shall be finished to a smooth plane. The gap between bearing surfaces shall not exceed 1/2 inch, where a gap of 1/2 inch to 3/4 inch exists, 3/8 inch pad of asphalt felt or sheet neoprene shall be placed between the bearing surfaces.
### Vertical Wall Height

<table>
<thead>
<tr>
<th>Type</th>
<th>Case</th>
<th>Bearing Stress (kPa)</th>
<th>Effective Footing Width (ft)</th>
<th>Nominal Soil Bearing Resistance (kPa)</th>
<th>Design Lateral Loads (kPa)</th>
<th>Vertical Wall Height (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1.5, 1.3, 1.2, 1.1, 1.0, 0.9</td>
<td>2.5, 2.4, 2.3, 2.2, 2.1, 2.0</td>
<td>4.5, 4.4, 4.3, 4.2, 4.1, 4.0</td>
<td>6.5, 6.6, 6.7, 6.8, 6.9, 7.0</td>
<td>8.5, 8.6, 8.7, 8.8, 8.9, 9.0</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>1.8, 1.7, 1.6, 1.5, 1.4, 1.3</td>
<td>2.8, 2.7, 2.6, 2.5, 2.4, 2.3</td>
<td>5.8, 5.9, 6.0, 6.1, 6.2, 6.3</td>
<td>8.8, 8.9, 9.0, 9.1, 9.2, 9.3</td>
<td>10.5, 10.6, 10.7, 10.8, 10.9, 11.0</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>2.0, 1.9, 1.8, 1.7, 1.6, 1.5</td>
<td>3.0, 2.9, 2.8, 2.7, 2.6, 2.5</td>
<td>7.0, 7.1, 7.2, 7.3, 7.4, 7.5</td>
<td>10.4, 10.5, 10.6, 10.7, 10.8, 10.9</td>
<td>13.0, 13.1, 13.2, 13.3, 13.4, 13.5</td>
</tr>
</tbody>
</table>

### 1:6 Battered Wall Height

<table>
<thead>
<tr>
<th>Type</th>
<th>Case</th>
<th>Bearing Stress (kPa)</th>
<th>Effective Footing Width (ft)</th>
<th>Nominal Soil Bearing Resistance (kPa)</th>
<th>Design Lateral Loads (kPa)</th>
<th>Vertical Wall Height (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1.3, 1.2, 1.1, 1.0, 0.9, 0.8</td>
<td>2.3, 2.2, 2.1, 2.0, 1.9, 1.8</td>
<td>5.0, 5.1, 5.2, 5.3, 5.4, 5.5</td>
<td>7.0, 7.1, 7.2, 7.3, 7.4, 7.5</td>
<td>9.5, 9.6, 9.7, 9.8, 9.9, 10.0</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>1.5, 1.4, 1.3, 1.2, 1.1, 1.0</td>
<td>2.5, 2.4, 2.3, 2.2, 2.1, 2.0</td>
<td>6.0, 6.1, 6.2, 6.3, 6.4, 6.5</td>
<td>8.0, 8.1, 8.2, 8.3, 8.4, 8.5</td>
<td>10.5, 10.6, 10.7, 10.8, 10.9, 11.0</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>1.7, 1.6, 1.5, 1.4, 1.3, 1.2</td>
<td>2.7, 2.6, 2.5, 2.4, 2.3, 2.2</td>
<td>7.0, 7.1, 7.2, 7.3, 7.4, 7.5</td>
<td>9.0, 9.1, 9.2, 9.3, 9.4, 9.5</td>
<td>11.5, 11.6, 11.7, 11.8, 11.9, 12.0</td>
</tr>
</tbody>
</table>

### 1:4 Battered Wall Height

<table>
<thead>
<tr>
<th>Type</th>
<th>Case</th>
<th>Bearing Stress (kPa)</th>
<th>Effective Footing Width (ft)</th>
<th>Nominal Soil Bearing Resistance (kPa)</th>
<th>Design Lateral Loads (kPa)</th>
<th>Vertical Wall Height (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1.2, 1.1, 1.0, 0.9, 0.8, 0.7</td>
<td>2.2, 2.1, 2.0, 1.9, 1.8, 1.7</td>
<td>4.5, 4.4, 4.3, 4.2, 4.1, 4.0</td>
<td>6.5, 6.6, 6.7, 6.8, 6.9, 7.0</td>
<td>8.5, 8.6, 8.7, 8.8, 8.9, 9.0</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>1.4, 1.3, 1.2, 1.1, 1.0, 0.9</td>
<td>2.4, 2.3, 2.2, 2.1, 2.0, 1.9</td>
<td>5.5, 5.6, 5.7, 5.8, 5.9, 6.0</td>
<td>7.5, 7.6, 7.7, 7.8, 7.9, 8.0</td>
<td>9.5, 9.6, 9.7, 9.8, 9.9, 10.0</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>1.6, 1.5, 1.4, 1.3, 1.2, 1.1</td>
<td>2.6, 2.5, 2.4, 2.3, 2.2, 2.1</td>
<td>6.5, 6.6, 6.7, 6.8, 6.9, 7.0</td>
<td>8.5, 8.6, 8.7, 8.8, 8.9, 9.0</td>
<td>10.5, 10.6, 10.7, 10.8, 10.9, 11.0</td>
</tr>
</tbody>
</table>
The plan shows the approximate location of devices within the service equipment enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.

1. In unpaved areas, a raised Portland cement concrete pad 2'-0" x 4' x width of foundation shall be constructed in front of the service equipment enclosure. The pad shall be set to elevation of foundation.

2. Plug-in circuit breakers may be mounted in the vertical or horizontal position. Cable-in/cable-out circuit breakers shall be mounted in the vertical position.

3. Types MF and Type BF service equipment enclosures shall have the meter viewing windows located on the front side of the service equipment enclosure.

4. Types M-AF and Type M-BF service equipment enclosures shall be similarly constructed to Types MF and Type BF respectively, except the meter viewing windows shall be located on the rear side of the service equipment enclosure.
Notes:
1. All panel dimensions are nominal.
2. Cabinet fan may be installed at an alternate location near the top of the cabinet when approved by the Engineer.
For layout, tolerances, and other details not shown see Std Plan P10.

For additional details on reinforcement member quantities of the wide flange beam terminal and Pavement Expansion Joint Type WF, see Standard Plan P32B.

For Pavement Terminal Joint Type, see Project Plans.

For the Pavement Terminal Joint Details, see Standard Plan P31A.

See Standard Plan B6-21 for "a".

See Standard Plan B4 for "x".

See Standard Plan B6-21 for "b".

See Standard Plan B6-21 for "c".

See Standard Plan B6-21 for "d".

See Standard Plan B6-21 for "e".

See Standard Plan B6-21 for "f".

See Standard Plan B6-21 for "g".

See Standard Plan B6-21 for "h".

See Standard Plan B6-21 for "i".

See Standard Plan B6-21 for "j".

See Standard Plan B6-21 for "k".

See Standard Plan B6-21 for "l".

See Standard Plan B6-21 for "m".

See Standard Plan B6-21 for "n".

See Standard Plan B6-21 for "o".

See Standard Plan B6-21 for "p".

See Standard Plan B6-21 for "q".

See Standard Plan B6-21 for "r".

See Standard Plan B6-21 for "s".

See Standard Plan B6-21 for "t".

See Standard Plan B6-21 for "u".

See Standard Plan B6-21 for "v".

See Standard Plan B6-21 for "w".

See Standard Plan B6-21 for "x".

See Standard Plan B6-21 for "y".

See Standard Plan B6-21 for "z".

See Standard Plan B6-21 for "aa".

See Standard Plan B6-21 for "ab".

See Standard Plan B6-21 for "ac".

See Standard Plan B6-21 for "ad".

See Standard Plan B6-21 for "ae".

See Standard Plan B6-21 for "af".

See Standard Plan B6-21 for "ag".

See Standard Plan B6-21 for "ah".

See Standard Plan B6-21 for "ai".

See Standard Plan B6-21 for "aj".

See Standard Plan B6-21 for "ak".

See Standard Plan B6-21 for "al".

See Standard Plan B6-21 for "am".

See Standard Plan B6-21 for "an".

See Standard Plan B6-21 for "ao".

See Standard Plan B6-21 for "ap".

See Standard Plan B6-21 for "aq".

See Standard Plan B6-21 for "ar".

See Standard Plan B6-21 for "as".

See Standard Plan B6-21 for "at".

See Standard Plan B6-21 for "au".

See Standard Plan B6-21 for "av".

See Standard Plan B6-21 for "aw".

See Standard Plan B6-21 for "ax".

See Standard Plan B6-21 for "ay".

See Standard Plan B6-21 for "az".

See Standard Plan B6-21 for "ba".

See Standard Plan B6-21 for "bb".

See Standard Plan B6-21 for "bc".

See Standard Plan B6-21 for "bd".

See Standard Plan B6-21 for "be".

See Standard Plan B6-21 for "bf".

See Standard Plan B6-21 for "bg".

See Standard Plan B6-21 for "bh".

See Standard Plan B6-21 for "bi".

See Standard Plan B6-21 for "bj".

See Standard Plan B6-21 for "bk".

See Standard Plan B6-21 for "bl".

See Standard Plan B6-21 for "bm".

See Standard Plan B6-21 for "bn".

See Standard Plan B6-21 for "bo".

See Standard Plan B6-21 for "bp".

See Standard Plan B6-21 for "bq".

See Standard Plan B6-21 for "br".

See Standard Plan B6-21 for "bs".

See Standard Plan B6-21 for "bt".

See Standard Plan B6-21 for "bu".

See Standard Plan B6-21 for "bv".

See Standard Plan B6-21 for "bw".

See Standard Plan B6-21 for "bx".

See Standard Plan B6-21 for "by".

See Standard Plan B6-21 for "bz".
SAFETY RAILING ELEVATION

NOTE:
Chain assembly behind
(see detail this page)

NOTE:
See Standard Plan
S101 and S109 for details.

SECTION D-D
TYPICAL BOLTED (ALTERNATIVE)
HINGED CONNECTION

SECTION C-C
ELEVATION VIEW

OVERHEAD SIGN-TRUSS
SINGLE POST TYPE
WALKWAY SAFETY
RAILING DETAILS
CHANGEABLE MESSAGE SIGNS
MODEL 500 AND 510
NO SCALE

NOTICE:
Alternative venting methods may be
used if approved by the Engineer.

NOTE:
1 ¾"

NOTE:
See Standard Plan
S101 and S109 for details.

SAFETY RAILING ELEVATION

NOTE:
Chain assembly behind
(see detail this page)

NOTE:
See Standard Plan
S101 and S109 for details.
1. Place an equal amount of washers on each side to align cable with end lug without restricting shackle bolt rotation or contacting cable.

2. For walkway grating details, see Standard Plan S114.

Backside weld lug shall be installed only for projects requiring backside walkways.

NOTES:
1. Use cable thimble at both ends.
2. "WELD LUG" ? THICK R = 1/2"
3. "WELD LUG" ? THICK AND HOLE
4. "THICK STIFFENER PLATE" LOOK OR THIMBLE AS POSSIBLE
5. "STAINLESS STEEL FORGED ANCHOR SHACKLE" COPED CORNER TO FIT
6. "GALVANIZED ALLOY STEEL FORGED ANCHOR SHACKLE" INSTALL THIS CLIP AS CLOSE TO LOOP OR THIMBLE AS POSSIBLE
7. "STAINLESS STEEL CABLE CLIPS" INSTALL AND TORQUE TO MANUFACTURER'S GUIDELINES.
8. "STAINLESS WIRE ROPE STEEL CLIPS" SPACE INTERIOR CLIPS EQUALLY.
9. "INTERIOR WALKWAY BRACKET" STIFFENER PLATE 1/4" THICK 1" Ø HOLE END SAFETY LUG BOTH ENDS STEEL CABLE 1/8" STAINLESS WIRE ROPE STEEL CLIPS INSTALL AND TORQUE TO MANUFACTURER'S GUIDELINES. SPACE INTERIOR CLIPS EQUALLY. TOTAL 2 CLIPS PER END

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
MODEL 500 AND 510
CHANGEABLE MESSAGE SIGNS
OVERHEAD SIGN-TRUSS SINGLE POST TYPE SAFETY CABLE ANCHORAGE DETAILS
NO SCALE
S141
1. All gussets to be same height.
2. Provide a smooth transition from gusset plate to tube.

NOTES:

LEGEND
NEW
REMOVAL

LIMITS OF CJP WELD

PIPE WALL
GUSSET PLATE
BASE PLATE
REMOVE EXCESS MATERIAL
GRIND SMOOTH TO 150 MICROINCHES

BASE PLATE PIPE WALL GUSSET PLATE

OVERHEAD SIGN-TRUSS
SINGLE POST TYPE
CHANGEABLE MESSAGE SIGNS
MODEL 500 AND 510
NO SCALE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
THE STATE OF CALIFORNIA OR ITS OFFICERS
OR AGENTS SHALL NOT BE RESPONSIBLE FOR
COPIES OF THIS PLAN SHEET.
**EXIT RAMP NEUTRAL AREA (GORE) TREATMENT**

**LAKE DROP AT EXIT RAMPS**

- The solid channelizing line shown may be omitted on short auxiliary lanes where weaving length is critical.

**LANE DROP AT INTERSECTIONS**

**CHEVRON PAVEMENT MARKINGS AT EXIT RAMP GORE AREA**

**CHEVRON PAVEMENT MARKINGS AT ENTRANCE RAMP GORE AREA**

**MARKER DETAILS**

- TYPE C RED-CLEAR RETROREFLECTIVE
- TYPE G ONE-WAY CLEAR RETROREFLECTIVE
- TYPE RY RED-YELLOW RETROREFLECTIVE

**LEGEND:**

- RETROREFLECTIVE FACE

---

**NOTES:**

- Install a minimum of 1 chevron in the gore area. If at least 1 chevron will not fit into the gore area, do not install chevrons. Terminate chevron markings at physical gore.
- Gore area chevron pavement markings shown. For Exit and Entrance Ramp channelizing lines details, see Details 36, 36A, and 36B.
NOTE:


TYPICAL LANE LINE OR RIGHT EDGE LINE CONTRAST DETAIL
**LEGEND**

- **MARKERS**
  - Type C Red-Clear Retroreflective

- **LINES**
  - 6" White Line

**MARKER DETAILS**

- Type C

- Retroreflective Face

**DETAILS**

**DETAIL 42**

**DETAIL 43**

**DETAIL 43A**

**DETAIL 44A**

**DETAIL 44B**

**DETAIL 45**

*If buffer space is wider than 4 feet use chevron markings.*
**NOTES:**

1. May be a limit line or crosswalk.
3. Place Type R one-way red retroreflective markers on outermost limit line or crosswalk line with red facing the intersection.
4. The distances and marker spacings may be adjusted based on site-specific conditions or exit ramp geometry.
5. The layout shown is a typical detail of an exit ramp, see Figure 3B-24 of the CA MUTCD for exit ramp configuration and arrow placement and spacing.
6. See Revised Standard Plan RSP A24G for Type V arrow detail with Type R one-way red retroreflective markers.

---

**LEGEND:**

- **MARKERS**
  - TYPE C TWO-WAY RED-CLEAR RETROREFLECTIVE
  - TYPE BY TWO-WAY RED-YELLOW RETROREFLECTIVE
  - TYPE R ONE-WAY RED RETROREFLECTIVE

- **LINES**
  - 6" WHITE
  - 6" YELLOW

**MARKER DETAILS**

- RETROREFLECTIVE FACE

---

**EXIT RAMP WITH ENHANCED PAVEMENT MARKERS FOR WRONG WAY DETAILS**

NO SCALE

REVISED STANDARD PLAN RSP A20G
NOTES:

1. If a message consists of more than one word, it must read upward. The first word must be nearest the driver.

2. The space between words must be at least four times the height of the characters for low-speed roads, but not more than ten times the height of the characters, the space may be reduced appropriately where there is limited space because of local conditions.

3. Minor variations in dimensions may be accepted by the Engineer.

4. Portions of a letter, number or symbol may be separated by connecting segments not to exceed 2" in width.

5. The words "NO PARKING" pavement marking is to be used for parking facilities. For typical locations of markings, see Standard Plans A90A and A90B.

6. The words "NO PARKING", shall be painted in white letters no less than 1-1/2" high on a contrasting background and located so that it is visible to traffic enforcement officials.

Word Markings

<table>
<thead>
<tr>
<th>Item</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANE</td>
<td>24</td>
<td>NO</td>
</tr>
<tr>
<td>POOL</td>
<td>23</td>
<td>BIKE</td>
</tr>
<tr>
<td>CITY</td>
<td>17</td>
<td>BUS</td>
</tr>
<tr>
<td>SCHOOL</td>
<td>27</td>
<td>ONLY</td>
</tr>
<tr>
<td>OTHER</td>
<td>24</td>
<td>PED</td>
</tr>
<tr>
<td>NO</td>
<td>18</td>
<td>EXPRS</td>
</tr>
<tr>
<td>PLAN</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

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YIELD LINE AT EXIT RAMP

LIMIT LINE (STOP LINE) AT EXIT RAMP

NOTE:
1. If there is crosswalk at the end of the exit ramp, place Type R markers in front of the first line for wrong way vehicle that travels up the ramp with the red reflective side facing the intersection.
NOTES:
1. For shoulder, edge line, and center line rumble strip details, see Standard Plans A20B, A20C, and A20D.
2. See Project Plans and Standard Plan A20A and Revised Standard Plan RSP A20B for pavement markers and traffic lines typical details.

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>DEPTH</th>
<th>INCHES</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>3</td>
<td></td>
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ELEVATIONS
SECTION A-A

PLACEMENT IN PASSING ZONE - ONE DIRECTION

PLACEMENT IN PASSING ZONE

PLACEMENT IN NO PASSING ZONE

TYPICAL CENTERLINE PLACEMENT

TYPICAL SHOULDER PLACEMENT

TYPICAL EDGE LINE PLACEMENT

LEFT OF DIRECTION OF TRAVEL

PLACEMENT IN PASSING ZONE - WITH RETROREFLECTIVE MARKERS

RIGHT OF DIRECTION OF TRAVEL

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SINUOSIDAL RUMBLE STRIP DETAILS
GROUND-IN INDENTATIONS

REVISED STANDARD PLAN RSP A40G

2018 REVISED STANDARD PLAN RSP A40G

2018 REVISED STANDARD PLAN RSP A40G

REVISED STANDARD PLAN RSP A40G

NO SCALE


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CIVIL DISTRICT COUNTY ROUTE POST MILES TOTAL PROJECT SHEET NO. TOTAL SHEETS

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October 16, 2020

Registered Civil Engineer

Atifa Ferouz
NOTE:
For shoulder, edge line and center line rumble strip details, see Standard Plans A40B, A40C and A40D.

LEGEND:

| | | | RUMBLE STRIPS (GROUND-IN) |

SHOULDER RUMBLE STRIPS WITH GAPS FOR BICYCLE
WHERE BICYCLES ARE PERMITTED AND CLEAR
SHOULDER WIDTH IS 5 FEET OR GREATER

EDGE LINE RUMBLE STRIPS WITH GAPS FOR BICYCLE
WHERE BICYCLES ARE PERMITTED AND CLEAR
SHOULDER WIDTH IS LESS THAN 5 FEET

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
RUMBLE STRIP PLACEMENT
WITH GAPS FOR BICYCLES
NO SCALE
RSP A40H DATED APRIL 16, 2021 DATES RSP A40H DATED OCTOBER 16, 2020
REVISED STANDARD PLAN RSP A40H
**REINFORCED CONCRETE BOX CULVERT EXCAVATION AND BACKFILL PRECAST**

**NOTES:**

1. Slope or shore excavation slopes as necessary.
2. Dimensions shown are minimum.
3. Method 2 and 3 for single or multiple boxes requires an approved external sealing band. See Revised Standard Plan RSP 093A.
4. Construction of roadway pavement structure in Method 2 or Method 3 shall not disurb the external sealing band installation.

*1'-0" where Method 1 or 2 backfill is used, 2'-0" where Method 3 backfill is used.*

**STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION REVISED STANDARD PLAN RSP A62G**

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MARKERS

MILEPOST MARKER NOTES:
1. The marker shall be white (non-reflective) target plate with black Series C numerals and letters.
2. A post mile prefix, such as "R", shall apply only when directed by the Engineer.
3. "BEGIN" or "END" shall apply as directed by the Engineer.
4. TBMP abbreviations shall be Series D letters up to a maximum of 2" tall, to fit within the available maximum space of 14.5".
5. See Project Plans for TBMP abbreviations.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TREATMENT BEST MANAGEMENT PRACTICE (TBMP) MARKER

NOTES:
1. The marker header shall be green (non-reflective) background with white (non-reflective) Series C letters.
2. The marker body shall be white (non-reflective) target plate with black Series C numbers and letters.
3. "BEGIN" or "END" shall apply as directed by the Engineer.
4. TBMP abbreviations shall be Series D letters up to a maximum of 2" tall, to fit within the available maximum space of 14.5".
5. See Project Plans for TBMP abbreviations.
CONCRETE BARRIER TYPE 60M DELINEATION
See Note 5

CONCRETE BARRIER TYPE 60MA
Details similar to Type 60M except as noted.

CONCRETE BARRIER TYPE 60M
NOTES:
1. See Standard Plan A76A for details of Concrete Barrier Type 60M and transitions, connection to structures and transitions to Concrete Barrier Type 50 and Concrete Barrier Type 60MC.
2. See Standard Plan A76C for Concrete Barrier Type 60M transitions at bridge column and sign pedestals.
3. Where slope screen is required on Concrete Barrier Type 60M, use Concrete Barrier Type 60MC.
4. Where roadbed offset is greater than 1½", use Concrete Barrier Type 60MC.
5. See Project Plans for barrier delineation locations.
6. Reinforcing stirrup not required for roadbed offsets less than 1'-0".
7. For roadbed surfaces offset greater than 1½" and less than or equal to 3", no reinforcement required. For roadbed surfaces offset greater than 3" and less than or equal to 8", use two #4 Reinf at 3" above the lower roadbed surface. For roadbed surfaces offset greater than 8" and less than or equal to 12", use two #4 Reinf at 3" above the lower roadbed surface and two #4 Reinf at 3" above the lower roadbed surface. For roadbed surfaces offset greater than 12" and less than or equal to 18", use two #4 Reinf at 3" above the lower roadbed surface and two #4 Reinf at 3" above the lower roadbed surface.
8. For weep hole alignment and drainage details not shown, see Standard Plans B0-3 and B3-5.

Details similar to Type 60M except as noted. Use concrete barrier end anchor when necessary. 36" roadded surfaces offset shown.
NOTES:
1. See Standard Plan A76G for Concrete Barrier Type 60MS and Type 60MSA.
2. Footing monolithic or doweled with 2-#8 x 8" @ 2'-0", the footing is required at concrete barrier ends and at interruptions in concrete barrier.
3. 10" concrete barrier footing extends 10' back from structure.

CONCRETE BARRIER TYPE 60MS

1. See Standard Plan A76G for Concrete Barrier Type 60MS and Type 60MSA.
2. Footing monolithic or doweled with 2-#8 x 8" @ 2'-0", the footing is required at concrete barrier ends and at interruptions in concrete barrier.
3. 10" concrete barrier footing extends 10' back from structure.
CONCRETE BARRIER (TYPE 60)

1" Dia. HS bolts with plate washer and nuts, total 4

PLAN

ELEVATION

SECTION A-A

See Notes 4 and 5

NOTES:
1. Type MM Passageway typically used for crossing of medium size animals.
2. For details of the thrie beam element and hardware, see the A78 series of the Standard Plans. For details of concrete barrier Type 60, see the A76 series of the Standard Plans.
3. The end cap and the thrie beam element may be spliced together prior to bolting the elements to the concrete barrier. All 8 splice bolts, to connect the end cap to the rail element are not required. The 2 top and the 2 bottom splice bolts with washers and nuts shall be used.
4. Barrier end anchorage shall be constructed as shown in Section A-A of this plan or as shown on Standard Plan A76K.
5. Taper the top of the end of the concrete barrier 4:1 to match the top elevation of the thrie beam rail element.
6. For details not shown, see Standard Plan A76A.
RAIL ELEMENT SECTION THRU A-A

TYPICAL WOOD LINE POST INSTALLATION

RAIL ELEMENT SPLICE DETAIL

1. Connect the overlapped end of the rail elements with 
   3" x 1/2" button head oval shoulder splice bolts. 
   Inserted into the 3/4" x 1/2" slots and bolted together 
   with 3/4" recessed hex nuts. Recess of hex nut points 
   toward rail element. A total of 8 bolts and nuts 
   are to be used at each rail splice connection.

2. The ends of the rail elements are to be overlapped in the 
   direction of traffic (see details).

3. Where end cap is to be attached to the end of a rail element, 
   a total of 4 of the above described splice bolts and nuts are 
   to be used.

4. Inserted into the 3/4" x 1/2" slots and bolted together.

NOMINAL 0.108" TOLERANCE 
SYMMETRICAL ABOUT C

SECTION A-A

TYPICAL WOOD LINE 
POST INSTALLATION

See Note 4

STATE OF CALIFORNIA 
DEPARTMENT OF TRANSPORTATION 

MIDWEST GUARDRAIL SYSTEM 
STANDARD RAILING SECTION 
(WOOD POST WITH WOOD BLOCK)

2018 REVISED STANDARD PLAN RSP A77L1

NO SCALE

RSP A77L1 DATED OCTOBER 16, 2020 SUPERSEDES RSP A77L1 DATED APRIL 19, 2019 AND 

REVISI D STANDARD PLAN RSP A77L1
**NOTES:**

1. For details of wood post installations, see Revised Standard Plan RSP A77L1.
2. For details of standard hardware used to construct MGS, see Revised Standard Plan RSP A77L4.
3. For details of steel posts and notched wood blocks used to construct MGS, see Standard Plan RSP A77L1.
4. For additional installation details, see Standard Plan RSP A77M3.
5. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
6. For MGS typical layouts, see the A77P, A77Q and A77R Series of Standard Plans.
7. If railing is connected to terminal system and treatment, use 31" height terminal system and treatment.
8. For MGS and anchor details, see Standard Plans A77S1 and A77M1.
9. For details of MGS transition to bridge railing, see Revised Standard Plan RSP A77M4.
10. For additional details of MGS connection to bridge railings, see Standard Plans A77U1, A77T2 and A77M1.
11. For drive positioning and MGS delineation details, see Revised Standard Plan RSP A77U1.
13. Slotted hole for bolted connection of rail element to block and post.
14. Slotted holes for splice bolts to overlap ends of rail element.
15. 6" x 12" x 1'-2" block must be used with 6" cleat.
16. Install posts in soil.

---

**ELEVATION**

**RAIL ELEMENT SPLICE DETAIL**

- Connect the overlapped ends of the rail elements with 3/8" x 1-1/2" button head oval shoulder splice bolts inserted into the 3/8" x 1-1/2" slots and bolted together with 3/8" recessed hex nuts. Hex nuts point toward rail element. A total of 8 bolts and nuts are to be used at each rail splice connection.
- The ends of the rail elements are to be overlapped in the direction of traffic (see details).
- Where end cap is to be attached to the end of a rail element, a total of 4 of the above described splice bolts and nuts are to be used.

---

**SECTION THRU RAIL ELEMENT**

- 6" x 8.5 or 6" x 9 STEEL POST, 6'-0" LENGTH

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**MIDWEST GUARDRAIL SYSTEM**

**STANDARD RAILING SECTION**

(STEEL POST WITH NOTCHED WOOD OR NOTCHED RECYCLED PLASTIC BLOCK)

**NO SCALE**

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**REVISED STANDARD PLAN RSP A77L2**

---
6" x 8" WOOD POST

8" x 8" WOOD POST

10" x 10" WOOD POST

6" x 8" WOOD BLOCK

8" x 8" WOOD BLOCK

6" x 12" WOOD BLOCK

8" x 12" WOOD BLOCK

NOTES:

1. All holes in wood posts and blocks shall be 1/8" Dia ± 1/4".

2. Dimensions shown for wood post are nominal.

3. This post and block combination used for standard line post sections of MGS.

4. This post and 6" x 6" block combination used for line post sections of MGS on narrow roadways.

5. This post and 8" x 8" block combination is typically used where strengthened line post sections of MGS are warranted to shield fixed objects.

6. See Standard Plan A77L3 for use of 6" x 8" and 8" x 8" wood blocks.

7. To be used with 6" x 6" x 1'-0" wood post if installed with 6" height dike.

8. To be used with 6" x 8" x 6'-0" wood post if installed with 6" height dike.
DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA
TYPICAL LINE POST
EMBEDMENT AND
HINGE POINT OFFSET DETAILS
MIDWEST GUARDRAIL SYSTEM

POST EMBEDMENT

DETAIL A
TYPICAL ROADWAY INSTALLATION
See Note 1

LESS THAN 4'-0"

DETAIL B
NARROW ROADWAY INSTALLATION
See Note 1

POST EMBEDMENT

DETAIL C
INSTALLATION AT EARTH RETAINING WALLS

DETAIL D

NOTES:
1. These installation details also applicable to steel line post installations. For Details A, B, and C, where steel line post installations are constructed, W6 x 6.5 or W6 x 8 steel post, 5'-0" in length, with 8" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks are to be used in place of the size of wood post and wood block shown. For Detail D where steel line post installations are constructed, W6 x 6.5 or 8 steel post, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks are to be used in place of the size of wood post and wood block shown. For additional installation details, see Standard Plan A77L1 and A77L2.
2. Where the distance between the back of the post and the hinge point is less than 71, see the Project Plans for special details.
3. For dike positioning with MGS installations, see Standard Plan AT44.

October 19, 2018

Randell D. Hall
Registered Civil Engineer

2018 REVISED STANDARD PLAN RSP A77N3

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
MIDWEST GUARDRAIL SYSTEM
TYPICAL LINE POST EMBEDMENT AND HINGE POINT OFFSET DETAILS
REVISED STANDARD PLAN RSP A77N3

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NOTES:
1. When necessary to place dike more than 7" in front of face of MGS, only Type C dike may be used. For dike details, see Standard Plan A77N4.
2. For standard railing post embedment, see Standard Plan A77N3.
3. MGS delineation to be used where shown on the Project Plans.
4. When dike or curb is placed under MGS, the maximum height of the dike or curb shall be 6". Mountable dike should not be used. For dike and curb details, see Standard Plane A87A and A87B.
5. For details of typical distance between the face of rail and hinge point, see Standard Plan A77N3.
6. For steel line posts, use 1/4" - 20 self-tapping screws in 0.22" diameter holes or 1/4" bolts in 3/16" diameter holes.
7. 8" block can be used with 4" or lower dike, or no dike.
12" block can be used with 6" or lower dike, or no dike.

When necessary to place dike more than 7" in front of face of MGS, only Type C dike may be used. For dike details, see Standard Plan A77N4.

For standard railing post embedment, see Standard Plan A77N3.

MGS delineation to be used where shown on the Project Plans.

When dike or curb is placed under MGS, the maximum height of the dike or curb shall be 6". Mountable dike should not be used. For dike and curb details, see Standard Plane A87A and A87B.

For details of typical distance between the face of rail and hinge point, see Standard Plan A77N3.

For steel line posts, use 1/4" - 20 self-tapping screws in 0.22" diameter holes or 1/4" bolts in 3/16" diameter holes.

8" block can be used with 4" or lower dike, or no dike.
12" block can be used with 6" or lower dike, or no dike.
**NOTES:**

1. Line post blocks and hardware to be used are shown on Revised Standard Plans RSP A77T1, RSP A77T2, RSP A77N1, Standard Plans ATN2 and ATTM1.

2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.

3. Except as noted, line posts are 6" x 8" x 6'-0" wood blocks, 6" x 8" x 1'-2" wood blocks, 6" x 8" x 9" steel blocks, 6'-3" in length, with 6" x 8" x 1'-2" notched wood blocks or recycled plastic blocks may be used for 6" x 8" x 2'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.

4. For End Anchor Assembly (Type SFT) details, see Standard Plan ATNS1.

5. Layout Types 11A, 11B or 11C are typically used where MGS is recommended for end Treatments. The alignment treatment is required for only one direction of traffic.

6. 31" in-line terminal system and treatments are used where site conditions will not accommodate a flared end treatment.

7. The type of 31" terminal system and treatment to be used will be shown on the Project Plans.

8. Depending on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.

9. The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of the traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".

10. For details of the buried post and anchor used with Type 11C Layout, see Standard Plan ATTM1.


12. Use this offset for 8-inch block. For 12-inch block, use 4'-0" Win offset.
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
TYPICAL LAYOUTS FOR EMBANKMENTS

NOTES:

1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77M, Standard Plans A77N1 and A77N2.

2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.

3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, 6" x 8" or 6" x 9" steel posts, 6"-2" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.

4. Layout Types 11D through 11L shown on the A77 Series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.

5. 31" in-line terminal system end treatments are used where site conditions will not accommodate a flared end treatment.

6. Type of 31" terminal system end treatment to be used will be shown on the Project Plans.

7. Depending on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.

8. Where placement of dike is required with MGS installations, see Standard Plan A77/N4 for dike positioning details.

9. Use this offset for 8-inch block. For 12-inch block, use 4'-0" Min offset.

TYPE 11D LAYOUT
(Embankment MGS installation with 31" in-line end treatment at each end of rolling)

TYPE 11E LAYOUT
(Embankment MGS installation with 31" flared end treatment at each end of rolling)
1. Line post, blocks and hardware to be used are shown on Revised Standard Plans, RSP A77P3. (See Notes 4 and 9.)

2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.

3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or shaped blocks made to be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.

4. Layout Types 11F through 11L shown on the A77P Series of Standard Plans, are typically used where MGS is recommended to shield embankment or offset line of edge of traveled way. The length of parabola (for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P3).

5. The type of 31" terminal system and treatment to be used will be shown on the Project Plans.

6. Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-0" with 6'-3" post spacing) may be advisable.

7. The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of edge of the traveled way. The length of the parabola (for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P3).

8. For details of the buried post and anchor used with Type 11F and 11G Layouts, see Revised Standard Plan RSP A77P3.

9. Placement of dike is required with MGS installations, see Standard Plan A77T2.

10. For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P3.

11. Use this offset for 6-inch block, for 12-inch block, use 4'-0" Min offset.
NOTES:

1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.

2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.

3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.

4. Layout Types 11H through 11L, shown on the ATPP series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.

5. The type of 31" terminal system end treatment to be used will be shown on the Project Plans.

6. Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.

7. Line placement of dike is required with MGS installations, see Standard Plan A77N1 for dike positioning details.

8. Use this offset for 8-inch block. For 12-inch block, use 4'-0" min offset.

**TYPE 11H LAYOUT**

(Embarkment MGS installation with 31" flared end treatment and 31" in-line end treatment at the ends of railing)

See Notes 4 and 7
NOTES:
1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77P5, Standard Plans A77Q2 and A77M1.
2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
4. Layout Types 11D through 11L shown on the A77P Series of Standard Plans, are typically used where MGS is required to shield embankment slopes and a parabola 31'-0" in length, with 6" x 8" x 1'-2" notch wood blocks of parabolic length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
5. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77P5, Standard Plans A77Q2 and A77M1.
6. The type of 31'-0" terminal system and treatment to be used will be shown on the Project Plans.
7. Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
8. If placement of dike is required with MGS installations, see Standard Plan A77P5 for dike positioning details.
9. The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of edge of traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be equal to multiples of 12'-0".
10. For details of the buried post end anchor used with Type 11J Layout, see Standard Plan A77P5.
11. For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P5.
12. Use this offset for 6-inch block. For 12-inch block, use 4'-0" Min offset.

MIDWEST GUARDRAIL SYSTEM
Typical Layouts for Embankments

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

COPIES OF THIS PLAN SHEET.
THE ACCURACY OR COMPLETENESS OF SCANNED
OR AGENTS SHALL NOT BE RESPONSIBLE FOR
THE 15:1 OR FLATTER FLARE
BEGIN 15:1 OR FLATTER FLARE
6'-3" POST SPACING
EDGE OF PAVED SHOULDER OR
OFFSET LINE OF TRAVELED WAY)

ES
HMA DIKE, TYPE C
3'-0" Min
HINGE POINT
FRONT FACE OF END POST
CENTER OF END POST
BEGIN 15:1 OR FLATTER FLARE
6'-3" POST SPACING
OFFSET FOR
15:1 FLARE
1'-0" Max
OFFSET LINE OF TRAVELED WAY
NOTES:

1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77P5, Standard Plans A77Q2 and A77M1.
2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
4. Layout Types 11D through 11L shown on the A77P Series of Standard Plans, are typically used where MGS is required to shield embankment slopes and a parabola 31'-0" in length, with 6" x 8" x 1'-2" notch wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
5. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77P5, Standard Plans A77Q2 and A77M1.
6. The type of 31'-0" terminal system and treatment to be used will be shown on the Project Plans.
7. Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
8. If placement of dike is required with MGS installations, see Standard Plan A77P5 for dike positioning details.
9. The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of edge of traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be equal to multiples of 12'-0".
10. For details of the buried post end anchor used with Type 11J Layout, see Standard Plan A77P5.
11. For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P5.
12. Use this offset for 6-inch block. For 12-inch block, use 4'-0" Min offset.
The type of 31" terminal system end treatment to be used will be shown on the Project Plans. The type of 31" terminal system end treatment to be used will be shown on the Project Plans. Where placement of dike is required with MGS installations, see Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.

1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77P1, RSP A77P2, RSP A77P6, Standard Plans A77N2 and A77L1.

2. Total Project Plans emphasis is to achieve embankment height and side slope, construction of post-flared MSG (length equal to multiples of 12'-0" with 6'-3" post spacing) may be advisable.

3. Tablet or flatter slope when in-applicable and when specified.

4. Layout Types 11K through 11L shown on the A77P Series of Standard Plans, are typically used where MGS is recommended to achieve embankment height and side slope. Construction of 31" terminal system end treatment is required for both directions of traffic. Construction of 31" flared end treatment is required for both directions of traffic.

5. 31" In-Line terminal system and treatments are used where site conditions will not accommodate a 31" flared end treatment.

6. The type of 31" terminal system end treatment to be used will be shown on the Project Plans.

7. Dependent on site conditions (embankment height and side slope), construction of post-flared MSG (length equal to multiples of 12'-0" with 6'-3" post spacing) may be advisable.

8. Where placement of dike is required with MGS installations, see Standard Plan A77P4 for dike positioning details.

9. The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of the traveled way. The length of MSG within the 11K or flatter flare is based on site conditions and should be a length equal to multiples of 12'-0".

10. For details of the buried post end anchor used with Type 11K and 11L Layouts, see Standard Plan A77L6.

11. For normal flare offsets for 25'-0" length panels with maximum offset of 1'-0" see Revised Standard Plan RSP A77P6.

12. Use this offset for 8" block, for 12" block, use 4'-0" Min offset.
**TYPE 12E LAYOUT**

See Note 9

**NOTES:**
1. Line post, blocks and hardware to be used are shown on Standard Plans A77U1, A77U2, A77N1, A77N2, and A77M1.
2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" notched wood blocks, W6 x 8.5 or W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood line posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
4. For Transition Railing (Type WB-31) details, see Standard Plan A77U1.
5. For additional details of a typical connection to bridge rail, see Connection Detail AA on Standard Plan A77U1.
6. For Rail Tensioning Assembly details, see Standard Plan A77S2.
7. The type of Crash Cushion to be used will be shown on the Project Plans.
8. Type 12E Layout is typically used left of approaching traffic at the end of each structure on multilane freeways or expressways where a median type barrier is not constructed between separated roadways.
9. The 15:1 or flatter flare is measured off of the edge of traveled way.
10. Use this offset for 8" block. For 12" block, use 4'-0" Min offset.
MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR STRUCTURE DEPARTURE

NOTES:

1. Line post, blocks and hardware to be used are shown on Revised Standard
   Plans RSP A77U1, RSP A77U2, RSP A77N1, Standard Plans A77U2 and A77W1.

2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.

3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" notched
   wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-3" wood
   posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.

4. For Transition Railing (Type WB-31) details for Types 12AA and 12BB Layouts, see
   Revised Standard Plan RSP A77U1.

5. The type of 31" terminal system to be used will be shown on the Project Plans.

6. Depending on site conditions (embankment height, side slopes, other fixed objects),
   it may be advisable to construct additional MGS (a length equal to multiples of
   12'-0" with 6'-3" post spacing) between the transition railing and 31" end treatments.

7. Where placement of dike is required with MGS installations, see Revised Standard
   Plan RSP A77N4 for dike positioning details.

8. Type 12AA or Type 12BB Layouts are typically used to the right of traffic departing
   a structure on two-way conventional highways where the roadway width across the
   structure is less than 40 feet.

9. For additional details of typical connections to bridge rail, see Connection Detail CC
   on Standard Plan A77U2 and Connection Detail HH on Standard Plan A77V2.

10. Use this offset for 8" block, for 12" block, use 4'-0" win offset.
NOTES:
1. Line posts, blocks and hardware to be used are shown on Revised Standard Plans RSP A77R1, RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.
2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 6'-0" x 1'6" wood blocks. For fixed objects, 6" x 8" x 6'-0" wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'6" wood blocks where applicable and as specified.
4. A 4'-0" minimum clearance is required between the face of the rolling and the face of a fixed object located directly behind MGS sections with post spacing of 6'-3". Construct MGS as shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object" on this plan where the clearance between the back of post and the face of a fixed object is less than 3'-3", but not less than 1'-0". A concrete wall or barrier should be constructed to shield the fixed objects.
5. For End Anchor Assembly (Type SFT) details, see Standard Plan A77S2.
6. For details of Rail Tensioning Assembly, see Standard Plan A77S2.
7. The type of crash cushion to be used will be shown on the Project Plans.
8. Type 14A layout is typically used on multilane freeways or expressways to shield fixed objects where a median type barrier is not constructed between the separated roadways.
9. For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Note 4.
10. The 10'-0" or flatter flare is measured off of the edge of traveled way.
11. All steel or 6" x 8" x 8" x 6'-0" wood block or notched recycled plastic block may be used in place of the 10" x 10" x 8'-0" WOOD POST WITH 8" x 8" x 1'-2" WOOD BLOCK, SEE NOTE 11
12. Use this offset for 8" block. For 10" block use minimum 4'-0" offset.
13. Do not use block to block. Only bolt block to post.
14. GUARDRAIL SYSTEM SECTIONS FOR FIXED OBJECT

STRENGTHENED MIDWEST GUARDRAIL SYSTEM

SECTION A-A

TYPICAL DOUBLE MIDWEST GUARDRAIL SYSTEM

Use strengthened MGS sections with Type 14A layout where minimum clearance between the back of post and the fixed object(s) is less than 3'-3", but not less than 1'-0". See Note 4.

NOTE A:
For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10'-0" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks of 3'-1" center to center spacing are to be used between fixed objects.

SECTION A-A

TYPICAL DOUBLE MIDWEST GUARDRAIL SYSTEM

Use strengthened MGS sections with Type 14A layout where minimum clearance between the back of post and the fixed object(s) is less than 3'-3", but not less than 1'-0", See Note 4.

NOTE A:
For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10'-0" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks of 3'-1" center to center spacing are to be used between fixed objects.

STRENGTHENED MIDWEST GUARDRAIL SYSTEM

SECTIONS FOR FIXED OBJECT

Use strengthened MGS sections with Type 14A layout where minimum clearance between the back of post and the fixed object(s) is less than 3'-3", but not less than 1'-0", See Note 4.

NOTE A:
For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10'-0" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks of 3'-1" center to center spacing are to be used between fixed objects.

STRENGTHENED MIDWEST GUARDRAIL SYSTEM

SECTIONS FOR FIXED OBJECT

Use strengthened MGS sections with Type 14A layout where minimum clearance between the back of post and the fixed object(s) is less than 3'-3", but not less than 1'-0", See Note 4.

NOTE A:
For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10'-0" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks of 3'-1" center to center spacing are to be used between fixed objects.

STRENGTHENED MIDWEST GUARDRAIL SYSTEM

SECTIONS FOR FIXED OBJECT

Use strengthened MGS sections with Type 14A layout where minimum clearance between the back of post and the fixed object(s) is less than 3'-3", but not less than 1'-0", See Note 4.

NOTE A:
For a series of fixed objects (bridge columns, overhead sign supports, etc.) additional 10'-0" x 8'-0" wood post with 8" x 8" x 1'-2" wood blocks of 3'-1" center to center spacing are to be used between fixed objects.
5. For End Anchor Assembly (Type SFT) details, see Standard Plan A77S1.

6. Type of crash cushion to be used will be shown on the Project Plans.

7. Type 15A layout is typically used on multi-lane freeways or expressways to shield fixed objects in the area between separated lane roadways.

8. For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Standard Plan A77P1.

9. The 15:1 or flatter flare is measured off of the edge of the traveled way.

10. W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic block may be used in place of the 10" x 10" x 8'-0" wood post with 6" x 8" x 1'-2" wood block shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object".

11. Do not bolt rail to block, only bolt block to post.
The type of 31" terminal system to be used will be shown on the Project Plans.

10. No scale clearance is less than 1'-0", a concrete wall or barrier should be constructed of a fixed object is less than 3'-0", but not less than 1'-0". Where the
required for both directions of traffic.

8. As site conditions dictate, construct additional MGS to shield fixed objects. Additional MGS length equal to multiples of 12'-6". Post spacing to be 6'-3" center to center, except as otherwise noted.

7. For details of the Buried Post End Anchor, see Standard Plan A77T2. For site conditions dictate, construct additional MGS to shield fixed objects. Additional MGS length equal to multiples of 12'-6". Post spacing to be 6'-3" center to center, except as otherwise noted.

6. The 1511 or flatter flare for the buried post anchor is based on the edge of the paved shoulder or offset line of the traveled way. The length of MGS within the 1511 or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".

5. The type of 31" terminal system to be used will be shown on the Project Plans.

4. A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections for Fixed Object. See Notes 9 and 10.

3. Use this offset for 8" block. For 12" block use minimum 4'-0" offset.
ROADSIDE FIXED OBJECTS

TYPICAL LAYOUTS FOR FIXED OBJECT

6. The type of 31" terminal system to be used will be shown on the Project Plans.

7. As site conditions dictate, construct additional MGS to shield fixed objects. Additional MGS length equal to multiples of 12'-6" post spacing at 6'-3" except as specified in Note 4.

8. Layout Types 16A through 16L shown on the A77R Series of Standard Plans, typically used where MGS is recommended to shield roadside fixed objects, and a crashworthy 31" end treatment is required for both directions of traffic.

9. Where placement of dike is required with MGS, see Standard Plan A77N4 for dike positioning details.

10. MGS installation at roadside fixed object or objects with 31" flared end treatment and 31" in-line end treatment at the ends of railing, See Note 8.

11. Use this offset for 8" block. For 10" block use minimum 4'-0" offset.
The type of 31" terminal system to be used will be shown on the Project Plans.

STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS

FOR FIXED OBJECT

Use strengthened MGS sections with layouts Types 16K or 16L layouts where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", but not less than 1'-0". See Note 4.

TYPICAL LAYOUTS FOR ROADSIDE FIXED OBJECTS

1. Line post blocks and hardware to be used are shown on Revised Standard Plan RSP A77R8 for MGS installation at roadside fixed object or objects with a buried end anchor treatment and a 31" terminal system end treatment at the ends of railing. See Note 7.

2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.

3. Except as noted, line post blocks are 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where adaptable and when specified.

4. A 3'-8" minimum clearance is required between the faces of the railing and the face of a fixed object located directly behind MGS sections with post spacing of 6'-3". A 3'-0" minimum clearance is required for the typical strengthened Midwest Guardrail System sections for fixed objects on this plan, where the clearance between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or barrier should be constructed to shield the fixed object.

5. The type of 31" terminal system to be used will be shown on the Project Plans.
NOTES:
2. For details of the anchor plate and ¾" cable, see Standard Plan A77S3.
3. A steel foundation tube with a wood post as shown on A77S1 may be used in place of the 8" x 6" x 6' wood post shown.
4. Cable connection and plate must not be encased in HMA, concrete, or any other material that could restrict the plate from releasing.
ANCHOR PLATE DETAILS

**SECTION A-A** (Alternative Type 1)

**SECTION A-A** (Alternative Type 2)

**REVIEW CAP (TYPE A)**

**ELEVATION**

**END ANCHOR ASSEMBLY** (TYPE CA)

**DETAIL A**

CABLE CLIP CONNECTION

**DETAIL B**

ANCHOR CABLE WITH SWAGED FITTING AND STUD

**DETAIL C**

ANCHOR RODS

**DETAIL D**

REINFORCING STEEL
MIDWEST GUARDRAIL SYSTEM CONNECTION TO ABUTMENT OR WALL

CONNECTION DETAIL EE
See Note 5

ELEVATION

CONNECTION DETAIL DD
See Note 4

MIDWEST GUARDRAIL SYSTEM CONNECTION TO ABUTMENT OR WALL

CONCRETE ABUTMENT OR WALL

9'-4" 9'

1 ¼" HOLE PLACEMENT FRONT AND BACK PANEL

DETAIL A

STRAIGHT METAL BOX SPACER

1 ¼" HOLE PLACEMENT CORNER LONG EACH WELD 1"

DETAIL B

anchor block for transition railing connection

DETAIL C

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

MIDWEST GUARDRAIL SYSTEM
CONNECTIONS TO ABUTMENTS AND WALLS

NO SCALE

REVISED STANDARD PLAN RSP A77U3

Mark Ballentine
REGISTERED CIVIL ENGINEER

APRIL 16, 2021

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REGISTERED PUBLIC WORKS ENGINEER

April 16, 2021

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THE ACCURACY OR COMPLETENESS OF SCANNED

TYPICAL USE OF CONNECTION DETAIL EE, SEE LAYOUT TYPE 12A ON STANDARD PLAN A77Q1, LAYOUT TYPE 12B ON STANDARD PLAN A77Q2 AND LAYOUT TYPE 12C ON STANDARD PLAN A77Q3.

FOR ADDITIONAL DETAILS OF TRANSITION RAILING (TYPE WB-31), SEE REVISED STANDARD PLAN RSP A77U4.

TRANSITION RAILING TYPE WB-31 TRANSITIONS THE 12 GAUGE MGS RAILING SECTION TO A HEAVIER GAUGE NESTED THRIE BEAM RAILING SECTION WHICH IS CONNECTED TO THE CONCRETE ANCHOR BLOCK.

1. These connection details apply to abutments and walls.
2. Additional details of posts, blocks and hardware are shown on revised standard plans RSP A77Q1 and RSP A77Q2.
3. For additional details of transition railing (type WB-31), see revised standard plan RSP A77U4. Transition railing (type WB-31) transitions the 12 gauge MGS railing section to a heavier gauge nested thrie beam railing section which is connected to the concrete anchor block.
4. For typical use of connection details DD, see layout types 12A and 12B on revised standard plan RSP A77Q1 and layout types 12C and 12D on standard plan A77Q1.
5. For typical use of connection detail EE, see layout type 12D on standard plan A77Q1 and layout types 12E on standard plan A77Q2.

TYPES OF CONNECTIONS TO ABUTMENTS AND WALLS

- TYPE A
- TYPE TC
- TYPE WB
1. Use 3/8" button head bolts and two nuts for connections to posts. No washer on rail face for bolted connections to post.

2. The nested rail elements, end cap, and middle thrie beam element may be spliced together prior to bolting the elements to the wood post and concrete barrier or railing.

3. Exterior splice bolt holes for rail element splices at Post No. T5 and the connection to the concrete barrier or railing shall be the standard 5/16" x 1" slot plus 1/2" washer, unless a splice bolt hole at the connection to the concrete barrier or railing shall be the standard 5/16" x 1" slot plus 1/2" washer. Interior splice bolt holes at these locations may be increased up to 1/2" Ø. Only the top 4 and the bottom 4 splice bolts with washers and nuts are required for rail splices at Post No. T5 and the connection to the concrete barrier or railing.

4. The top elevation of Posts No. T2 through No. T7 shall not project more than 1" above the top elevation of the rail element.

5. Typically, the railing connected to Transition Railing (Type WB-31) will be either standard rolling section of WG5 with height transition ratio of 150:1 or a Caltrans-approved 31" end plate element.

6. The depth of the metal box spacer varies from the 9/16" to 3/4" and is dependent on the width of the concrete railing or wall, the combined dimensions for the depth of the metal box spacer plus the width of rolling or wall is typically 1.2", where the depth of the metal box spacer is the distance between the backside of Posts No. T5 through No. T8 and the connection to the concrete barrier or railing.

7. Where the width of the concrete railing or wall is greater than 1.2", it is to be used to fill the space created between the backside of Posts No. T5 through No. T8 and the connection to the concrete barrier or railing. Wood blocks shall be 8" in width and 1'-2" in length. The combined dimension between the front thrie beam element and the rear thrie beam element is to match the width of the concrete railing or wall.

8. End cap may be installed over 12 gauge and 10 gauge thrie beam elements where transition rolling is installed on the departure end of bridge railing.

9. Conform standard rolling section height to 31" of Post No. T1 using height transition ratio of 150:1. WG5 tolerance of post No. T1 is ±1".
**THREE BEAM BARRIER STANDARD BARRIER RAILING SECTION (STEEL POST WITH NOTCHED WOOD BLOCK OR NOTCHED RECYCLED PLASTIC BLOCK)**

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

RSP A78B DATED APRIL 19, 2019  SUPERSEDES STANDARD PLAN A78B

**NOTES:**
1. For details of the cross section of the three beam frangible elements, see Standard Plan A78A.
2. For details of standard hardware, pads and blocks used to construct three beam barrier, see Standard Plan A78D1.
3. Three beam barrier post spacing to be 6'-0" center to center, except as otherwise noted.
4. Top of barrier roll to be 2'-0" above ground line or shoulder surfacing under the rail element.
5. For barrier and approaches, and barrier connections, see Standard Plan A78E1, A78E2, A78E3, A78F1, A78F2, A78G, A78H, A78I.
6. For connection to Concrete Barrier, see Standard Plan A78I.
7. Attach rail element to block and steel post with 2 bolts or rods on approaching traffic side of block and post. No washer on rail face for rod or bolted connections to line post.
8. For details of three beam barrier on bridges, see Standard Plan A78B. For details of three beam barrier on freeways, see Standard Plan A78A.
10. Install posts in soil.

**RAIL SPICE INSTALLATION**

1. For details of the cross section of the three beam frangible elements, see Standard Plan A78A.
2. For details of standard hardware, pads and blocks used to construct three beam barrier, see Standard Plan A78D1.
3. Three beam barrier post spacing to be 6'-0" center to center, except as otherwise noted.
4. Top of barrier roll to be 2'-0" above ground line or shoulder surfacing under the rail element.
5. For barrier and approaches, and barrier connections, see Standard Plan A78E1, A78E2, A78E3, A78F1, A78F2, A78G, A78H, A78I.
6. For connection to Concrete Barrier, see Standard Plan A78I.
7. Attach rail element to block and steel post with 2 bolts or rods on approaching traffic side of block and post. No washer on rail face for rod or bolted connections to line post.
8. For details of three beam barrier on bridges, see Standard Plan A78B. For details of three beam barrier on freeways, see Standard Plan A78A.
10. Install posts in soil.

**RAIL ELEMENT SPICE DETAIL**

a) Connect the overlapped ends of the three beam rail elements with 3/8" x 1-1/4" button head bolts or 10-12" rod, threaded both ends with hex nuts. See Notes 2 and 3.

b) Recess of hex nut points toward rail element. A total of 12 bolts and nuts are to be used at each rail splice connection.

1. Connect the overlapped ends of the three beam rail elements with 3/8" x 1-1/4" button head bolts or 10-12" rod, threaded both ends with hex nuts. See Notes 2 and 3.
2. Recess of hex nut points toward rail element. A total of 12 bolts and nuts are to be used at each rail splice connection.

**RAIL ELEMENT LENGTH = 13'-0"/6'-8"**

**ELEVATION**

**DOUBLE THREE BEAM BARRIER**

(Steel post with notched wood or notched plastic blocks) See Note 1.

**SINGLE THREE BEAM BARRIER**

(Steel post with notched wood or notched plastic blocks) See Note 1.

**PLAN**

1. Install posts in soil.
2. Notched face of block faces steel post.
3. For details of standard hardware, pads and blocks used to construct three beam barrier, see Standard Plan A78D1.
4. Three beam barrier post spacing to be 6'-0" center to center, except as otherwise noted.
5. Top of barrier roll to be 2'-0" above ground line or shoulder surfacing under the rail element.
6. For barrier and approaches, and barrier connections, see Standard Plan A78E1, A78E2, A78E3, A78F1, A78F2, A78G, A78H, A78I.
7. Attach rail element to block and steel post with 2 bolts or rods on approaching traffic side of block and post. No washer on rail face for rod or bolted connections to line post.
8. For details of three beam barrier on bridges, see Standard Plan A78B. For details of three beam barrier on freeways, see Standard Plan A78A.
10. Install posts in soil.
For one-way roadways

END ANCHOR FOR TRAFFIC DEPARTURE END
OF SINGLE THRIE BEAM BARRIER

1. For additional details of End Anchor Assembly (Type SFT), see Standard Plan A77S1.
2. The "W" beam to thrie beam section is only required where the terminal system connection to the thrie beam barrier is a "W" beam rail.
3. The type of terminal system to be used will be shown on the Project Plans.
4. A Caltrans approved crash cushion should be used in place of a terminal system end treatment where the backside of the railing would be exposed to traffic.
5. A 6'-0" length steel foundation tube, TS 8 x 6 x 3/4, without a soil plate, may be furnished and installed in place of the 4'-6" length steel foundation tube and soil plate shown. Minimum embedment of the 6'-0" length tube shall be 5'-9". A 1/2" hex head bolt and nut shall be installed in the hole in the tube.

POSTS NOT TO BE INSTALLED IN SURFACING

NOTES:

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
SINGLE THRIE BEAM BARRIER END ANCHOR ASSEMBLY AND TERMINAL SYSTEM END TREATMENT

NO SCALE

RSP A78E1 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A78E1
CONNECTION DETAIL 3A  

CONNECTION DETAIL 4A  

SINGLE THRIE BEAM BARRIER CONNECTION TO ABUTMENT OR WALL

NOTES:

1. These connection details apply to concrete abutments and walls. For additional connection details, see Project Plans.

2. For additional details of Transition Railing (Type STB), see Standard Plan A78J.

3. For details of End Cap (Type TC), see Standard Plan A78C.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

REVISED STANDARD PLAN RSP A78G  

RSP A78G DATED APRIL 16, 2021 SUPERSEDES STANDARD PLAN A78G.
For details of Concrete Barrier Type 60M, see Standard Plan A76A. Thrie beam barrier connections to Concrete Barrier Type 60MS and Type 60MG are similar to details shown on this plan. For details of Concrete Barrier Type 60M, see Standard Plan A76A. Thrie beam barrier connections to Concrete Barrier Type 60MS and Type 60MG are similar to details shown on this plan.

3. Where beveled metal box spacer is installed, place 1/2" x 3/4" and 1/2" x 2" pipe spacers on 1" HS bolts passing through interior of box.
1. Exact locations for desert tortoise fence are shown on the plans.

NOTE:

1. LEGEND:
   - Desert Tortoise Habitat

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1&quot; x 2&quot; Vertical Clear Mesh</td>
<td>Hardware Cloth Galvanized Steel</td>
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<tr>
<td>Fence</td>
<td></td>
</tr>
<tr>
<td>U-shaped Hold Down Pins</td>
<td>6&quot; long [24&quot; max spacing]</td>
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<tr>
<td>HOG RING TIES</td>
<td>@ 2' spacing Typ</td>
</tr>
<tr>
<td>BARBLESS WIRE</td>
<td></td>
</tr>
<tr>
<td>STEEL POST</td>
<td></td>
</tr>
<tr>
<td>10' Typ</td>
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</tbody>
</table>

2. REDIRECTIONAL CONFIGURATION PLAN VIEW

   - Fence Transition for Bedrock or Caliche Substrate

3. FRONT VIEW

   - DESERT TORTOISE FENCE

   - NO SCALE

4. DETAIL A

   - 1" x 2" Vertical Clear Mesh Hardware Cloth

5. DETAIL B

   - Details of fence transition for bedrock or caliche substrate

6. SECTION A-A

   - SEE DETAIL B

7. REVISED STANDARD PLAN RSP A84B

### Resistance (Tension) Requirements

* See Pile Data Table on the Project Plans for Nominal PILE DETAILS.

#### Alternative "X" Piles

- Minimum cutoff length at the top of the Alternative "X" and "Y" piles is 10'-0".
- "E"BAR S x 22'-0" Min
- Total 4 **
- FP = Prestressing force
- If section used is larger than the minimum section shown, then FP shall provide 700 psi minimum concrete strength.
- Concrete Strengths:
  - FC @ 28 days = 6,000 psi (Alternative "X")
  - 5,000 psi (Alternative "Y")
- Rd = Transfer = 4,000 psi

#### Reinforced Concrete

- FC = 4,000 psi
- FY = 60,000 psi

### Pile Embedment

<table>
<thead>
<tr>
<th>Required Nominal Resistance (Tension) *</th>
<th>60 kips or less</th>
<th>Greater than 60 kips</th>
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<tbody>
<tr>
<td>&quot;E&quot;BAR S XE</td>
<td>6E</td>
<td>6E</td>
</tr>
<tr>
<td>&quot;E&quot; Dimension</td>
<td>1'-8&quot;</td>
<td>2'-0&quot;</td>
</tr>
</tbody>
</table>

* See Pile Data Table on the Project Plans for Nominal Resistance (Tension) Requirements.
NOTES:
1. Pile reinforcement extending into footing shall be hooked 1'-8" to provide clearance to top of footing. Piles shall be extended only with details shown on the Project Plans.
2. If section used is larger than the minimum section shown, minimum cutoff length at the top of the Alternative "X" and Alternative "Y" piles is 1'-6".
3. 1'-10" minimum cutoff length at the top of the Alternative "Y" pile is 10'-0".
4. 2" clearance to spiral reinforcement shall be maintained if section used is larger than the minimum section shown.
5. * See Pile Data Table on the Project Plans for Nominal Resistance (Tension) Requirements

** Design Notes: **

** Pile Embedment **

** Design Capacity **

- Compression = 200 kip (Service state)
- = 400 kip (Nominal axial structural resistance)
- = 200 kip (Nominal axial structural resistance)

** Reinforced Concrete **

- \( f' = 4,000 \) psi
- \( f = 60,000 \) psi

** Prestressed Piles **

- \( P_e = 136,000 \) lbs
- \( P_p = 136,000 \) lbs
- \( f' = 4,000 \) psi
- \( f = 60,000 \) psi

** Steel Pipe Pile **

- \( P_e = 4,000 \) psi
- \( P_p = 4,000 \) psi

** Notes: **

- If section used is larger than the minimum section shown, minimum cutoff length at the top of the Alternative "X" and Alternative "Y" piles is 10'-0".
- All reinforcement extending into footing shall be hooked as required to provide clearance to top of footing. Piles shall be extended only with details shown on the Project Plans.
- The Contractor's option is to use steel pipe piles with 2" diameter or larger with steel tensioned in the footing. Piles may be extended as required to provide clearance to top of footing.
For drain pipe alignment, sleeve connection, drain outlet details and notes, see Standard Plan B7-6.

NOTE:
For drain pipe alignment, sleeve connection, drain outlet details and notes, see Standard Plan B7-6.
**DECK DRAIN PIPE DETAIL**

**NOTES:**
1. Pipe casing OD = drain pipe dia + 4" (1/4" Min wall thickness)
2. Unless otherwise shown on Project Plans, casing shall extend to the greater of 5'-0" beyond the end of approach slab or 20'-0" beyond the back of column.

**EXPANSION COUPLING**

1. For "a" dimension and pipe diameter, see Project Plans.
2. Expansion coupling with 4 bolts shown. Coupling with a greater number of bolts allowed.
3. Adjust dimensions to suit coupling end ring bolt circle.

**COLUMN REINFORCEMENT AT DRAIN OUTLET**

**ELEVATION A-A**

**SCUPPER DETAIL**

*At exterior face of barrier*

**STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**

REVISIONS AND NOTIFICATIONS

**NO SCALE**

**REVISED STANDARD PLAN RSP B7-8**


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For future utility opening dimensions not shown on Project Plans use:
- $\Theta = \frac{\sqrt{2}}{4}$ or 1'-6" minimum, whichever is greater.
- $\Theta = \frac{3}{5}$ or 2'-0" minimum, whichever is greater.
**EXISTING WALL (WITHOUT GUTTER)**

- Existing
- 1/4" # Eye Bolts in 1/2" # Drilled Holes, Peen Ends of Bolts
- 1/2" # Roly-Poly End & Jam End
- 1/2" # Turnbuckles with 1/2" Adjustment

**RETAILING WALL (WITH GUTTER)**

- Existing
- 2-1/2" # Cable Clamps Per End
- Intermediate Turnbuckles
- Pipe 1-1/2" OD
- Post Cap to be a Driven Fit

**NEW CONSTRUCTION**

- 1000' Max
- Post Cap to be a Driven Fit
- Pipe 2" OD
- Pipe 2" OD

**SECTION A-A**

- Existing
- 3'-8" Typ End Span
- 2'-0" Typ Intermediate Span

**SECTION B-B**

- Existing
- 4'-0" Typ End Span
- 6'-6" Typ Intermediate Span

**SECTION C-C**

- New construction
- 4'-0" Typ Intermediate Span
- 4'-0" Typ End Span

**ELEVATION**

- Eye Bolt or Eye End of Turnbuckle
- Crimped Sleeve Clamp
- Crimped Stop Sleeve Clamp
- Post Pocket

**ALT E R N AT I V E C A B L E C O N N E C T I O N**

- Mortar
- 4" x 5" x 9" OR 5" x 9" Post Pocket

**ALT E R N AT I V E D E A D E N D A N C H O R A G E**

- ALTERNATIVE CABLE CONNECTION

**NOTES:**

1. Maximum distance between turnbuckles shall be 200'-0".
2. Intermediate turnbuckles to be placed in adjacent spans.
3. Cable shall not be spliced between intermediate turnbuckles and end posts.
4. Posts to be vertical.
5. Alignment of holes in posts may vary to conform to slope of top of retaining wall.
6. The Contractor shall verify all dependent dimensions in the field before ordering or fabricating any material.
7. Line posts shall be spaced horizontally and trussed diagonally in both directions at intervals not to exceed 1000'.
8. Post pockets to be centered in top of wall.
9. Typical end spans, braced in both directions, shall be constructed off changes in line where the angle of deflection is 15° or more.
10. Shall not be used for pedestrian walkways.

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**CABLE RAILING**

**NO SCALE**

**RSP B11-47 DATED OCTOBER 16, 2020 SUPERSEDES STANDARD PLAN B11-47**

**DATE**

**APPROVAL**

**DISTRICT**

**COUNTY**

**ROUTE**

**POST MILES**

**TOTAL PROJECT SHEETS**

**TOTAL PROJECT**
NOTES:

1. Post spacing and/or end block length to be adjusted to fit bridge length or wingwall length.

2. A maximum of six - 4" and a minimum of two - 4" round openings for future utilities. Openings are to be spaced at ends and extended 8" minimum past end of sidewalk. If not used, duct forms are to be tied down. Round openings are to be a minimum of 1'-6" from face of sidewalk curb and a minimum of 6" from face of rail.

3. Post spacing 8'-0" max.

4. Level 1" CHAMFER

5. For metal railing, connection details not shown, see standard plans.

6. See Typical Section for details not shown.

Concrete Barrier Type 842 Details No. 2

NOTE:
1. Walls are to be backfilled before barrier is placed.
2. Clearance to reinforcing steel in barrier to be 2", except as noted. Longitudinal reinforcement to stop
3. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS."
4. For typical metal railing connection details not shown, see Standard Plans A77U1 and A77U2.
6. Minimum concrete edge distance, to the reinforcing steel in barrier to be 2", except as noted. Longitudinal reinforcement to stop
7. Taper the top of the end of the bridge railing at 4:1 to match the top elevation of the string beam rail element.
8. In front and back of pull box (SECTION C-C) the #8 x 3'-2" bar must be centered so that they extend minimum 8" beyond ends of pull box. As an alternative, may substitute 4 x 4 - W12 x 12 web steel fabricated extending minimum 8" beyond ends of pull box.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER TYPE 842
DETAILS No. 2

RSP B11-82 DATED OCTOBER 19, 2018
SUPPLEMENTS RSP B11-82

REVISED STANDARD PLAN RSP B11-82
CONCRETE BARRIER TYPE 85
DETAILS No. 2
NO SCALE

REVISED STANDARD PLAN RSP B11-84

DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA
TO ACCOMPANY PLANS DATED APRIL 16, 2021
SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.
NOTES:
1. Posts shall be normal to railing.
2. Tube splices shall be located in the tubes spanning deck or wall joints, increase joint width in tubes to match expansion joint width and increase sleeve length accordingly.
3. Top rail tube shall be continuous over not less than two posts.
4. ¾" nut rack welded to sleeve may be replaced by drilled and tapped hole in sleeve.
**TYPICAL SECTION**

- For details not shown, see Case 2.
- Level ground (±10%) on both sides of the sound wall.

**CASE 1**

- For details not shown, see Case 2.
- Level ground (±10%) on both sides of the sound wall, and sloping ground on the opposite side.

**CASE 2**

- For details not shown, see Case 1.
- Level ground (±10%) on both sides of the sound wall, and sloping ground on the opposite side.

---

**SPREAD FOOTING SECTION**

- Full mortar bed at bottom of wall
- Slope shall not be steeper than 1:0:8

**TRENCH FOOTING**

- Ground line to be at the same elevation on both sides of the sound wall and shall not be used to retain earth, typ.
- Slope shall not be steeper than 1:0:4

**SOUND WALL REINFORCEMENT TABLE**

<table>
<thead>
<tr>
<th>H</th>
<th>CASE 1</th>
<th>CASE 2</th>
<th>Total 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>6'-0&quot;</td>
<td>#4 @ 18 M</td>
<td>#4 @ 18 M</td>
<td>#4 Total 2</td>
</tr>
<tr>
<td>8'-0&quot;</td>
<td>#4 @ 16 M</td>
<td>#4 @ 16 M</td>
<td>#4 Total 4</td>
</tr>
<tr>
<td>10'-0&quot;</td>
<td>#4 @ 16 M</td>
<td>#4 @ 16 M</td>
<td>#4 Total 4</td>
</tr>
</tbody>
</table>

**NOTES:**
1. For type of block and joint finish, see other sheets.
2. When blocks are laid in stacked bond, spandrel-type, galvanized joint reinforcement shall be provided. A minimum of 2/4 gauge wire continuous at 4'-0" maximum to be used. Locate reinforcement in joints that are at the approximate midpoint between bond beams.
3. Horizontal joints shall be backfilled concrete or may be weathered. Vertical joints shall be backfilled concrete or may be raked.
4. For minimum wall heights that are between the "H's" given, use the tabular information for the next higher "H".
5. Bundle additional # bars with typical # bars.
6. If wall is placed behind traffic barriers, clear distance from face of barrier to face of wall must exceed 4'-0". Wall is not designed for impact loading.

---

**MASONRY BLOCK ON FOOTING DETAILS (1)**

- No scale

---

**REVISED STANDARD PLAN RSP B15-1**

DESIGN NOTES

DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA
SOUND WALL
MASONRY BLOCK ON FOOTING
DETAILS (2)

NOTE:
1. For details not shown, see "SOUND WALL MASONRY BLOCK ON FOOTING-DETAILS No. 1" SHEET.

CONCRETE MASONRY:
REINFORCED CONCRETE &
CONCRETE MASONRY
fy = 60 ksi
f'c = 3.6 ksi
fy = 2000 psi

* Provide materials to achieve the net compressive strength of concrete masonry unit equal or greater than the specified f'm.

DESIGN:
AMERICAN LRFD Bridge Design Specifications,
8th Edition, AASHTO LRFD Bridge Design Specifications,
2016 California Building Code

DESIGN WIND LOAD:
36.5 psf

DESIGN SEISMIC LOAD:
5.07 Dead Load

TRENCH FOOTING
FOOTING STEP DETAILS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
SOUND WALL
MASONRY BLOCK ON FOOTING
DETAILS (2)

NO SCALE

AASHTO LRFD DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN RSP B15-2

REVISED STANDARD PLAN RSP B15-2

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ELEVATION C-C

Note: For "DETAIL 0", see "SOUND WALL MASONRY BLOCK ON PILE CAP - DETAILS No. 3" sheet.

Sound Wall Reinforcement Table

<table>
<thead>
<tr>
<th>Maximum Height (H)</th>
<th>2 Bars @ 6'-0&quot;</th>
<th>2 Bars @ 8'-0&quot;</th>
<th>1'-4&quot; Max Bar Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>6'-0&quot;</td>
<td>#4</td>
<td>#4</td>
<td>1'-6&quot; Min</td>
</tr>
<tr>
<td>8'-0&quot;</td>
<td>#6</td>
<td>#6</td>
<td>2'-4&quot; Min</td>
</tr>
<tr>
<td>10'-0&quot;</td>
<td>#8</td>
<td>#8</td>
<td>3'-6&quot; Min</td>
</tr>
<tr>
<td>12'-0&quot;</td>
<td>#8</td>
<td>#8</td>
<td>5'-0&quot; Min</td>
</tr>
<tr>
<td>14'-0&quot;</td>
<td>#8</td>
<td>#8</td>
<td>6'-0&quot; Min</td>
</tr>
<tr>
<td>16'-0&quot;</td>
<td>#8</td>
<td>#8</td>
<td>8'-0&quot; Min</td>
</tr>
</tbody>
</table>

Typical Section

- Full mortar bed at bottom of wall.

State of California
Department of Transportation

Sound Wall
Masonry Block on Pile Cap
Details (1)

No Scale

RSP B15-3 Dated April 17, 2020
Supercedes Standard Plan B15-3
GENERAL NOTES:
1. For type of block and joint finish, see other sheets.
2. When blocks are laid in stacked bond, header type, galvanized joint reinforcement shall be provided. A minimum of 2-8 gauge wires continuous at 4'-0" maximum to be used. Locate reinforcement in joints that are at the approximate midpoint between bond beams.
3. Horizontal joints shall be tooled concave or may be weathered, vertical joints shall be tooled concave or may be raked.
4. For intermediate wall heights that are between the "H's" given, use the tabular information for the next higher "H".
5. If wall is placed behind traffic barriers, clear distance from face of barrier to face of wall must exceed 4'-0". Wall is not designed for impact loading.

DESIGN NOTES

For details not shown, see other sections:

SECTION A-A
H=6'-0" THRU H=10'-0"

SECTION A-B
H=12'-0" THRU H=16'-0"

SECTION B-B

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
SOUND WALL  
MASONRY BLOCK ON PILE CAP DETAILS (2)  

NO SCALE  

RSP B15-4 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-4  

REVISED STANDARD PLAN RSP B15-4
SOUND WALL
MASONRY BLOCK
MISCELLANEOUS DETAILS

NOTES:
1. 1'-0" wide block not allowed within 6'-0" of profile grade.
2. For structural details, see other sheets.
3. Type III not permitted for sound walls with "H" less than 10'-0".
4. The end of the wall details may be used with any of the standard supporting foundations for masonry block. The foundations shown for the different types are for the purpose of illustration only.

1'-0" WIDE PROJECTING BLOCK

A - Cell width to match 8" block.

ARCHITECTURAL ALTERNATIVES

CONCRETE BARRIER
PROFILE GRADE
MORTAR CAP
TOP OF FOOTING OR PILE CAP
BOND BEAM
CAP
MORTAR
WITH #5
8" x 8" x 16" BLOCK

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SOUND WALL
MASONRY BLOCK
MISCELLANEOUS DETAILS

NO SCALE

RSP B15-9 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-9
PARTIAL ELEVATION (BACK)

For details not shown, see above.
NOTES:
1. Masonry anchors to be installed after the grout in the block cells has attained specified strength.
2. The Contractor may submit alternative gate locking assemblies for approval by the Engineer.
3. See other sheets for gate details.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
SOUND WALL MASONRY BLOCK
ACCESS GATE LOCKING DETAILS
NO SCALE

REVISED STANDARD PLAN RSP B15-14

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For details not shown, see Case 2.
See Note 1
Grate Frame for Type GDO Inlet

* Holes required only with trash rack

Total 16 \( \phi \) holes @ 2" C-C

L4 x 3 x \( \frac{1}{4} \)

L3\( \frac{1}{4} \) x 3 x \( \frac{1}{4} \) x 3\( \frac{1}{2} \)" long

L3\( \frac{1}{4} \) x 3 x \( \frac{1}{4} \) x 3\( \frac{1}{2} \)" as required

Type B Dike

- Variable gutter flowline depression, cut-in in smaller locations
- Simple joint, typ
- See general note 15

Table A

<table>
<thead>
<tr>
<th>Type</th>
<th>Normal Curb</th>
<th>Curb Batter</th>
<th>&quot;H&quot; Dimension</th>
<th>&quot;W&quot; Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1-6</td>
<td>6&quot;</td>
<td>1( \frac{1}{2} )&quot;</td>
<td>4( \frac{3}{4} )&quot;</td>
<td>4( \frac{1}{4} )&quot;</td>
</tr>
<tr>
<td>A1-8</td>
<td>8&quot;</td>
<td>2&quot;</td>
<td>4( \frac{1}{2} )&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>A1-6</td>
<td>8&quot;</td>
<td>2&quot;</td>
<td>4( \frac{1}{2} )&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>A1-6</td>
<td>6&quot;</td>
<td>1( \frac{1}{2} )&quot;</td>
<td>4( \frac{3}{4} )&quot;</td>
<td>4( \frac{1}{4} )&quot;</td>
</tr>
</tbody>
</table>

Notes:
2. Where shown on the project plans, place a 6\( \frac{1}{8} \)" plain round protection bar horizontally across the length of the opening and bend back 4" into the inlet wall on each side.
3. Complete joint penetration butt welds may be substituted for the fillet welds on all anchors.
4. Standard square, hexagon, round or equivalent headed anchors may be substituted for the right angle hooks on the anchors shown on this plan.

State of California
Department of Transportation

Precast Drainage Inlets
Types GO and GDO

No scale

RSP D73E dated April 19, 2019 supercedes standard plan D73E
TYPICAL SECTION - SPANS 4'-0" THRU 12'-0"

EXTERNAL SEALING BAND SCHEMATIC

SPAN 5

HEIGHT, H

MAXIMUM EARTH COVER

CONCRETE (INCH)

SIDE WALL

INVERT

MINIMUM WELDED WIRE FABRIC (INCH)

MINIMUM EARTH COVER

WELDED WIRE COVER

CONCRETE (INCH)

SIDE WALL

INVERT

MINIMUM WELDED WIRE FABRIC (INCH)

WELDED WIRE COVER

TABLE

QUANTITY

REINFORCING WIRE

REINFORCEMENT

MINIMUM EARTH COVER

SPANS 4'-0"

SPANS 5'-0"

SPANS 6'-0"

SPANS 7'-0"

SPANS 8'-0"

SPANS 9'-0"

SPANS 10'-0"

SPANS 11'-0"

SPANS 12'-0"

NOTES:

1. The inside and outside surfaces of the RCB roof shall be marked "TOP".
2. Minimum shall equal the wall thickness.
3. Quantities are approximate and for design purposes.
4. Rebar quantities are for use in shear calculations.
5. For external sealing band applications see Revised Standard Plan RSP D83A.
6. Soil pressures shown are factored per M.A. 1982, California Department of Transportation.
7. For external sealing band applications see Revised Standard Plan RSP A62G.
8. RCB roof shall be marked "TOP".

PRECAST REINFORCED CONCRETE BOX CULVERT

NO SCALE

REVISED STANDARD PLAN RSP D83A

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

REGISTRATION NO.

**REVISED STANDARD PLAN RSP D83B**

**DATED MAY 31, 2018 - PAGE 225 OF THE STANDARD PLANS BOOK DATED 2018.**

**RSP D83B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN D83B**

**MISCELLANEOUS DETAILS**

For correct skew direction see plans.

For illustrative purposes only.

**CONCRETE BOX CULVERT**

**SECTION C-C**

**PRECAST REINFORCED 1'-4" BARRIER PARAPET**

**WINGWALL**

**DEPARTMENT OF TRANSPORTATION**

**4'-0" Min with/BARRIER PARAPET**

**CAST-I**

**12" Min**

**4'-0" Min**

**For wall and invert reinforcement not shown, See “End Elevation” detail.**

**TYPICAL CULVERT END DETAILS**

#5 Tot 7

PRECAST

#6   @ 12 VERTICALLY

*(Barrier Parapet) (Standard Height Parapet)*

#4   @ 12 VERTICALLY

**SKEW ANGLE**

**10"**

**h = Height, 1'-0" Min**

**a = 12 cosine skew angle**

**s = Clear span (ft)**

**NOTE:**

Skewed Precast End Box

Extends Precast RCB Reinforcement

**1'-0" Min with/BARRIER PARAPET**

1'-9" Box End Joint

1'-3" Min

**END BOX**

**PARTIAL PLAN VIEW**

For illustrative purposes only.

For correct skew direction see plans.

**SECTION C-C**

* Reinforcing required for barrier parapet application only.

**CONSTRUCTION NOTES:**

**Cutoff walls:**

4'-0" Cutoff walls are to be provided at inlet and oulet only unless channel is lined and unless otherwise shown. These walls are to be extended if scour conditions warrant. See Standard Plans D84, D85 and D86A.

**Wingwalls:**

Wingwalls shall be cast-in-place and shall conform to standard plan details for box culvert wingwalls. See Standard Plans D84, D85 and D86A.

**Earthworks:**

See Revised Standard Plan RSP A620.

**Construction Loads:**

Strengthening may be required near temporary ends, for construction loads on culverts, See Standard Plan D88.

**Earthwork:**

**Wingwalls:**

Strengthening may be required near temporary ends, for construction loads on culverts, See Standard Plan D88.

**Earthwork:**

**Axial loading on the members has not been considered.**

**GENERAL NOTES:**

**Designations:**

Standard single or multiple precast box culvert are shown on the plans as single cells. Maximum cover over roof must be 10' x 5' RCB with 10'-0" or double 10' x 5' RCB with 20'-0", followed by alternatives.

**Altrnatives:**

Single cells

Standard dimensions of AASHTO Material Specification 'M259' or 'M273'.

Multiple cells

Constructed by piping single cells adjacent to each other. Inlet and outlet ends of culvert will be rounded unless square are designated. Parapets will be shown unless designated in plans. Such designation may be different for inlet and outlet ends.

**Limitations:**

Where the overfill is less than 12", Precast RCB culverts are not to be used. Precast RCB culverts are not to be used in aliphine or pressurized installations unless appropriate "watertight" jointing is provided.

**Special reinforcement coverages:**

Precast RCB culvert standard plans are not to be used if there is a severe corrosive flow condition or freeze-thaw locations.

**Special design:**

Required for culvert with different conditions, loads or design bearing pressures greater than those given on these plans. Required for culverts where end details need higher shear angles, higher parapets or barrier sections.

**Cast-in-Place End Elevation**

**Barrier Parapet Reinforcement**

**Cast-in-Place End Elevation**

**Precast Reinforced Concrete Box Culvert**

**Miscellaneous Details**

**RSP D83B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN D83B**

EXISTING INLET 6" Min

INLET TOP OF DRAINAGE ~ ISLAND OR DIKE CURB, BARRIER, CONCRETE BACKFILL ISLAND OR DIKE CURB, BARRIER, SURFACE PAVEMENT MANHOLE OR DRAINAGE INLET (CONCRETE DRAINAGE INLET SHOWN)

6" TO 9" Var BACKFILL 6" Min CONCRETE

VARIABLE LENGTH ALTERNATIVE

SECTION A-A OR CURB TOP OF DIKE SEE DETAIL "A"

1. NOTES:
   SEE NOTE 1 (Typ)
   6" Min
   3" Max

   2. SEE NOTE 2
   #4 TOT 4 EQUALLY SPACED
   (GRATE WIDTH + 4") x 39" x ¼"
   STEEL PLATE
   WITH FULL PENETRATION BUTT WELDS
   ½" Dia x 6" SHEAR STUDS @ 6" OC
   17 " Min
   4½"

   #4 TOT 3 EQUALLY SPACED
   (GRATE WIDTH + 4") x 39" x ¼"
   STEEL PLATE
   GRATED LINE DRAIN SECTIONS
   GRATED LINE DRAIN PLAN

   PRESERVE EXISTING REBAR DURING REMOVAL OF SIDE WALL TO FILL TO TRENCH DRAIN REINFORCEMENT. INSTALL ADDITIONAL REBAR TO FACILITATE CONNECTION TO DROP INLET AND REPLACE DAMAGED EXISTING REBAR. DOWELING PERPENDICULAR TO SIDE WALL IN LIEU OF CONNECTING TO EXISTING REBAR IS NOT PERMITTED.

   1. Drill rebar ends 3" into existing concrete, overlap and connect with double barrel mechanical coupler.

   2. 

   PARTIAL REMOVAL OF EXISTING DROP INLET

   SEE DETAIL "B"

   TRENCH WALL

   #4 TOT 3 EQUALLY SPACED
   STEEL PLATE
   (GRATE WIDTH + 4") x 39" x ¼"
   6" Min
   CONCRETE BACKFILL

   3½" x 3½" x ?" ANGLE
   (LENGTH = GRATE WIDTH + 4")
   3½" x 3½" x ¼"
   STEEL PLATE

   SECTION B-B

   SEE NOTE 1

   6" Min (Typ)
   3" Min (Typ)
NOTES (THIS SHEET ONLY):

1. Rungs must be skid resistant. TO ACCOMPANY PLANS DATED ____________.

2. Use wall mounted handrails for vault depths between 4'-0" and 6'-6". For deeper vaults use extendable handrails. Vault depth is distance between top of wall and either top of floor slab or top of filter media material (use which ever distance is less). Ladders must not extend into filter media material.

3. No handrail required for Linear Radial GSRD 4'-0" depth, due to grate conflict.

4. At ladder locations provide a ladder on the outside of the wall if landing area finished grade elevation is 24" or greater from the top of wall elevation, use Standard Plan D75C.

5. Bolted ladder, see Standard Plan D75C is optional.
NOTES:

1. Filter fabric shall be placed between trench filler material and surface gravel layer and along the sides of the infiltration trench.

2. Concrete curb to be placed along perimeter of trench, see Standard Plan A87A for details not shown.

3. Centerline of observation well to be placed a minimum of 1'-6" from edge of trench.

4. The exact location of curb openings shall be determined by the Engineer in the field.

5. The plastic protection well cover shall be flush with top of the surface gravel layer.

MODIFIED TYPE A1-6 CURB
**GENERAL NOTES**

**Designations**
Types of Gross Solids Removal Devices (GSRDs) are:
- Linear Radial (LR) and Inclined Screen. The Linear Radial has given a steep or high velocity configuration noted as Linear Radial or Linear Radial (LR).
- All GSRD assemblies are included in the GSRD BMP Detail Drawings.

Special Reinforcement coverage:
GSRD BMP Detail Drawings are not to be used in a corrosive environment or in freeze-thaw locations.

**Special Design**
Required for ground water conditions above bottom of GSRD, surcharge loads exceeding GSRD truck load, design bearing pressures or sizes greater than those on the GSRD Design Specifications.

**Traffic Loading**
No traffic load is allowed over GSRDs, as determined by the Engineer, barriers or MBGR shall be provided between GSRDs and traffic lanes.

**DETAIL OF DESIGN LOADING CASES**

**CASE I**
- Level + 2'-0" surcharge, GSRD empty
- Level + 2'-0" surcharge, GSRD full of water, no soil pressure

**CASE II**
- Level + 2'-0" surcharge, GSRD empty

**CASE III**
- Level + 2'-0" surcharge, GSRD empty
- Linear Radial or Linear Radial (LR), GSRD full of water, no soil pressure

**GSRD WALL**
- GSRD empty or full of water

**GSRD BOTTOM**
- GSRD empty or full of water

**NOTES**
1. The total screen length "C" is shown on Revised Standard Plans RSP D139B, RSP D139F1, and RSP D139G1.

**ABBREVIATIONS**
- cfs: Cubic Feet per Second
- EWT&B: Each Way Top and Bottom
- E: Earth Load
- GSRD: Gross Solids Removal Device
- LL: Live Load
- FRP: Fiberglass Reinforced Plastic

**LANDSCAPE LEGEND**
- **GSRD WALL**
- **GSRD BOTTOM**
- **PROGRAM AND NOTES**
  - 1. Slope or shore excavation sides as necessary.
  - 2. Dimensions shown are minimum.

**STATE OF CALIFORNIA**
**DEPARTMENT OF TRANSPORTATION**

**GROSS SOLIDS REMOVAL DEVICE**
**INCLINED SCREEN LEGEND**

INCLINED SCREEN DETAILS No. 1

GROSS SOLIDS REMOVAL DEVICE
INCLINED SCREEN DETAILS No. 1

CABLE RAILING

POST ANCHORAGE

OUTLET DETAIL

PIPE EXIT AT WALL - INCLINED SCREEN

NOTE:
1. Safety chain must be 1/4" galvanized steel coil chain, approximately 12 links per foot. Length must be minimum which allows lock-up of safety railing. Minimum of two safety chains per safety railing. Material must be grade 43 high test chain ASTM A413.

NOTE:
JET PLATE AND FLOW DEFLECTORS NOT SHOWN FOR CLARITY.

Pipes NPS 2 Std (Centered)

INLET WALL

10'-0" Max Typ
6'-0" Max Typ

INTERMEDIATE SPAN

END SPAN

NOTE:
Refer to Revised Standard Plan RSP D139C for additional information.

REVISED STANDARD PLAN RSP D139C

NO SCALE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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INLET WALL

45° TAPER

SLAB (BEYOND)

OVERFLOW PIPE OPENING 15" Dia

30" Max Pipe Opening (Beyond)

30" Max Outlet Pipe Opening

Construct 120, Typ

VIEW E-E

NOTE:
JET PLATE AND FLOW DEFLECTORS NOT SHOWN FOR CLARITY.
INCLINED SCREEN DETAILS No. 2

GROSS SOLIDS REMOVAL DEVICE

INCLINED SCREEN DETAILS No. 2

SECTION A-A - REINFORCEMENT

SECTION B-B - REINFORCEMENT

SECTION C-C - REINFORCEMENT

SECTION D-D - REINFORCEMENT

SECTION E-E

SECTION F-F

SECTION G-G

NOTES:

1. For additional reinforcing at openings, see Revised Standard Plan RSP D139E.

2. For section locations, see Revised Standard Plan RSP D139B.

3. 3/4" jet plate with 12" x 2" x 1/4" braced supports around perimeter for screen lengths up to 6'-0". For longer screen lengths use 12" x 2" x 1/4" use additional interior supports at 2'-6" O.C. equally spaced. Fillet web brace supports to plate at 1'-6" O.C.. Fasten jet plate assembly to jet end supports with five 3/4" machine bolts A307 equally spaced. Start bolt pattern at 2'-6" max from edge.

Support, SEE NOTE 3

SUPPORT, SEE NOTE 3

JET PLATE PERIMETER SUPPORT

SAME SIZE SUPPORT AS JET END SUPPORT, USE 3/4" x 3/4" x 1/4" IN BOTH DIRECTIONS

FLOW DEFLECTORS AND JET PLATE NOT SHOWN FOR CLARITY

FOR CLARITY JET PLATE NOT SHOWN

Jet Plate Detail

Inclined Screen

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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Please refer to the standard plans book dated 2018.
TO ACCOMPANY PLANS DATED 12-29-20.


NOTE:
(Only specified horizontal bars are shown)

CONCRETE SIDE WALL

1'-3" #6 BARS

A+10" Typ

#6 Tot 2

A A

0.5 x A + 3'-3"

1'-3" (OMIT FOR "A" LESS THAN 12"

TO BE USED AT INLET AND OUTLET PIPE LOCATIONS

REINFORCEMENT, USE STRAIGHT BARS)

WHEN CONFLICT WITH FOOTING REINFORCEMENT

STANDARD VERTICAL REINFORCEMENT

ABOVE AND BELOW OPENING

STANDARD VERTICAL REINFORCEMENT

MAX 2'-6"

MAX 2'-0"

A

A

SECTION L-L

ENERGY DISSIPATION SLAB

To be used at cleanout

(Place 8 - #5 as shown top and bottom. Extend bars 1'-3" past the opening or use 6" hooks if development length is not available.)

SECTION M-M

(Only specified horizontal bars are shown)

NOTE:

In all opening locations, horizontal reinforcement to be standard except as shown. All reinforcement to clear opening by 2" minimum.
TO ACCOMPANY PLANS DATED 12-29-20.

NOTES:
1. See "Drainage Plans" for additional details.
2. For Section B-B and C-C locations, see Revised Standard Plan RSP D139F1 dated April 16, 2021.
3. Inlet and outlet piping opening sizes are shown on the "Drainage Plans." The overflow and outlet piping shall be connected via standard elbows and tees.
4. For inlet and outlet pipe details not shown, see Revised Standard Plan RSP D139F1.

SECTION B-B
FLOW DEFLECTORS NOT SHOWN FOR CLARITY

SECTION C-C
FLOW DEFLECTORS NOT SHOWN FOR CLARITY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

GROSS SOLIDS REMOVAL DEVICE
INCLINED SCREEN DETAILS No. 4
WEDGE-WIRE SCREEN

REVISED STANDARD PLAN RSP D139F1

April 16, 2021
NOTES:
1. See "Drainage Plans" for additional details.
2. For Section B-B and Section C-C locations, see Revised Standard Plan RSP D139B.
3. Inlet and outlet piping opening sizes are shown on the "Drainage Plans." The overflow and outlet piping shall be connected via standard elbows and tees.
4. For inlet and outlet pipe details not shown, see "Drainage Plans."
Where:
12-29-20
REVISED STANDARD PLAN RSP D140A
NO SCALE
LINEAR RADIAL LEGEND
DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA
90% RELATIVE COMPACTION
STRUCTURE BACKFILL
as necessary.1. Slope or shore excavation sides
STRUCTURE EXCAVATION

Design Soil Bearing Pressure (Service Load) = 20 psi
y=60 ksi (bar reinforcing)
f
\[ f = \] 
Revised Standard Plan RSP D140G, see plan view.
HV
Unit Stresses:
Grating (LL) Load :
1'-0"1'-0"1'-0"1'-0"
Earth Load:
125 lb/ft² vertical,
Water Load: 0.24 lb/ft² horizontal,
Equivalent Fluid Pressure =
100 lb/ft² horizontal (Case I).
Earth pressure for 2:1 unlimited slope determined
from Rankine's formula with \( \phi = 33^42' \) (Case II).
Earth pressure for 2:1 unlimited slope determined
from Rankine's formula with \( \phi = 33^42' \) (Case II).
H

DETAIL OF DESIGN LOADING CASES

CASE I
Level + 2'-0" surcharge, GSRD empty
CASE II 2:1 unlimited slope, GSRD empty
CASE III GSRD full of water, no soil pressure
Groping (LL) Load = 0.2 psi
Unit Stresses:
7.5 x 7.5 in (
bar reinforcing) Design Soft Bearing Pressure (Service Load) = 20 psi

NOTES:
1. The total screened pipe length "T" is the sum of
the end screened and Intermediate screened pipes.
For dimension "T" location of end screened pipe and
Intermediate screened pipes, see Revised Standard Plan RSP D140G.
2. Example of Linear Radial nomenclature is LR-1 (6'-0"
for high velocity type LR(H)-3 (3'-0"
Intermediate screened pipes, see Revised Standard Plan RSP D140B.
3. For dimension "T" and location of end screened pipe and
Intermediate pipes, see Revised Standard Plan RSP D140B.

GSRD BMP Detail Drawings are applicable for velocities up to 20 fps.
GSRD BMP Detail Drawings are not to be used in a
Corrosive environment or where there is a severe
abrasive flow condition or in freeze-thaw locations.

Linear Radial (LR) and Inclined Screen. The Linear Radial
Types of Gross Solids Removal Devices (GSRDs) are
noted as Linear Radial or Linear Radial (HV). All GSRD BMP
Detail Drawings are applicable for velocities up to 20 fps.

NOTES:
1. Slope or shore excavation sides above bottom
of GSRD, surcharge loads exceeding MU30 truck load,
design bearing pressures or sizes greater than those
on this plan.

Traffic Loadings
No traffic load is allowed over GSRDs. As determined
by the Engineer, barriers or MSE shall be provided
between GSRDs and traffic lanes.

LINEAR RADIAL DESIGN CHART

<table>
<thead>
<tr>
<th>GSRD TYPE</th>
<th>TOTAL SCREENED PIPE LENGTH &quot;T&quot;</th>
<th>FLOW RATE (cfs)</th>
<th>DEBRIS AREA (acres)</th>
<th>INSIDE LENGTH &quot;L&quot;</th>
<th>HIGH VELOCITY &quot;H&quot;</th>
<th>NO. OF INTERMEDIATE SCREENED PIPES</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR-1</td>
<td>3'-6&quot;</td>
<td>3.04</td>
<td>0.19</td>
<td>11'-11&quot;</td>
<td>14'-3&quot;</td>
<td>0</td>
</tr>
<tr>
<td>LR-2</td>
<td>15'-6&quot;</td>
<td>7.07</td>
<td>0.48</td>
<td>16'-11&quot;</td>
<td>15'-3&quot;</td>
<td>1</td>
</tr>
<tr>
<td>LR-3</td>
<td>15'-6&quot;</td>
<td>10.96</td>
<td>0.74</td>
<td>21'-11&quot;</td>
<td>24'-3&quot;</td>
<td>2</td>
</tr>
<tr>
<td>LR-4</td>
<td>20'-6&quot;</td>
<td>14.99</td>
<td>3.16</td>
<td>26'-11&quot;</td>
<td>29'-3&quot;</td>
<td>3</td>
</tr>
<tr>
<td>LR-5</td>
<td>25'-6&quot;</td>
<td>18.92</td>
<td>3.95</td>
<td>31'-11&quot;</td>
<td>34'-3&quot;</td>
<td>4</td>
</tr>
<tr>
<td>LR-6</td>
<td>30'-6&quot;</td>
<td>21.91</td>
<td>4.74</td>
<td>36'-11&quot;</td>
<td>39'-3&quot;</td>
<td>5</td>
</tr>
</tbody>
</table>

* High velocity is achieved when inlet Velocity exceeds 8.2 fps.

NOTES:
1. The total screened pipe length "T" is the sum of
the end screened and Intermediate screened pipes.
For dimension "T" location of end screened pipe and
Intermediate screened pipes, see Revised Standard Plan RSP D140G.
2. Example of Linear Radial nomenclature is LR-1 (6'-0"
for high velocity type LR(H)-3 (3'-0"
Intermediate screened pipes, see Revised Standard Plan RSP D140G.
3. For dimension "T" and location of end screened pipe and
Intermediate pipes, see Revised Standard Plan RSP D140B.

GENERAL NOTES
Designation:
Types of Gross Solids Removal Devices (GSRDs) are
Linear Radial (LR) and Inclined Screen. The Linear Radial
has either a standard or high velocity configuration
noted as Linear Radial or Linear Radial (HV). All GSRD BMP
Detail Drawings are applicable for velocities up to 20 fps.
Special Reinforcement Coverages
GSRD BMP Detail Drawings are not to be used in a
corrosive environment or where there is a severe
abrasive flow condition or in freeze-thaw locations.

Special Reinforcement
Required for ground water conditions above bottom
of GSRD, surcharge loads exceeding MU30 truck load,
design bearing pressures or sizes greater than those
on this plan.

Traffic Loadings
No traffic load is allowed over GSRDs. As determined
by the Engineer, barriers or MSE shall be provided
between GSRDs and traffic lanes.

- Linear Radial (LR)
- Inclined Screen

GSRD BMP Detail Drawings are not to be used in a
corrosive environment or where there is a severe
abrasive flow condition or in freeze-thaw locations.

Linear Radial (LR) and Inclined Screen. The Linear Radial
Types of Gross Solids Removal Devices (GSRDs) are
noted as Linear Radial or Linear Radial (HV). All GSRD BMP
Detail Drawings are applicable for velocities up to 20 fps.
NOTES (THIS SHEET ONLY):
1. For location of sections A-A, B-B, C-C and D-D, see Revised Standard Plan RSP D140C.
2. For invert elevation differential between inlet and outlet, see "Drainage Profiles" sheets.
3. For grate support details, see Revised Standard Plan RSP D140F.

TO ACCOMPANY PLANS DATED 2018 REVISION STANDARD PLAN RSP D140C

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

WALL OPENING DETAILS
To be used at Linear Radial inlet and outlet pipe locations

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

SECTION F-F

NOTE: In all opening locations, horizontal reinforcement to be standard except as shown. All reinforcement to clear opening by 2" minimum.
NOTE (THIS SHEET ONLY):
1. All metal components of screen pipe including connections to concrete must be stainless steel.
BEARING BARS
CROSS BARS
SPACING
Typ 1½"
@ 1½"
BAR OF EQUIVALENT AREA
RECTANGULAR OR HEXAGONAL
CROSS BARS ¼" ROUND OR
GRATE TO BEARING BARS.
RESISTANCE WELDED OR ELECTROFORGED
CROSS BARS MAY BE FILLET WELDED, NOTE:
BAR OF EQUIVALENT AREA
OR RECTANGULAR OR HEXAGONAL
BEARING BARS 1½" x ?" 3?" 16 SPACES @ 4" = 5'-4"
5'-10¾"
22 SPACES @ 1?" FOR L = 2'-2"
L 2½" x 2½" x ½"
CONCRETE WALL
¾" GAP
MIN. ?" L 2½" x 2½" x ?" 3"
MIN. INSIDE LENGTH = "L"
GRATE PANEL
SECTION J-J
SECTION K-K
A307 @ 3’ C-C
SHEET 1 OF 1
2018 REVISED STANDARD PLAN RSP D140F
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
NOTES (THIS SHEET ONLY):
1. Gap between grate panels is 1".
2. All metal components of grating including connections to wall must be galvanized.
3. Attach "heat-treated chain" per grate on wall opposite of service ladder, see "Grate Support Detail" this sheet.

GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL GRATE PANEL DETAILS
NO SCALE
REVISED STANDARD PLAN RSP D140F
2018 REVISED STANDARD PLAN RSP D140F
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL GRATE PANEL DETAILS
NO SCALE
NOTES (THIS SHEET ONLY):
1. For Section A-A, B-B, and D-D, see Revised Standard Plan RSP D140C.
2. For ladder details, see Revised Standard Plan RSP D118.
3. For end and intermediate screened pipe details, see Revised Standard Plan RSP D140A.
4. For grate details, see Revised Standard Plan RSP D140F.
5. For layout of inlet and outlet pipes, see "Drainage Plans".
6. For FL elevations of inlet and outlet pipes, see "Drainage Profiles".
7. For dimension "L", "T" and other design data, see Design Chart on Revised Standard Plan RSP D140A.
8. For dimension "H", see Revised Standard Plan RSP D140C.
9. For Sections N-N and P-P, see Revised Standard Plan RSP D140G.
ANDEONATION
SYMBOL DESCRIPTION
○ ABANDON, IF APPLIED TO CONDUIT, REMOVE CONDUCTORS
○ INSTALL FULL BOX IN EXISTING CONDUIT RUN
○ PEDESTRIAN BARRICADE, TYPE AS INDICATED ON PLAN
○ INSTALL CONDUIT INTO EXISTING FULL BOX
○ CONNECT NEW AND EXISTING CONDUIT, REMOVE EXISTING CONDUCTORS AND INSTALL CONDUCTORS AS INDICATED
○ CONDUIT TO REMAIN FOR FUTURE USE, REMOVE CONDUCTORS, INSTALL FULL TAPe
○ DETECTOR HANDHELD
○ FOUNDATION TO BE ABANDONED
○ INSTALL SIGN ON SIGNAL WAST ARM
○ NO SLIP BASE ON STANDARD
○ PHOTOCURRENT CONTROL
○ PHOTOELECTRIC UNIT
○ EQUIPMENT OR MATERIAL TO BE REMOVED AND BECOME THE PROPERTY OF THE CONTRACTOR
○ RELOCATE EQUIPMENT
○ REMOVE AND REUSE EQUIPMENT
○ REMOVE AND SALVAGE EQUIPMENT
○ SPLICE NEW TO EXISTING CONDUCTORS
○ SERVICE DISCONNECT
○ TELEPHONE SERVICE POINT
○ SPECIFIC PROJECT NOTES

SOFFIT AND WALL-MOUNTED LUMINAIRES

SYMBOL DESCRIPTION
□ PENDANT SOFFIT LUMINAIRE
□ FLUSH-MOUNTED SOFFIT LUMINAIRE
□ WALL-MOUNTED LUMINAIRE
□ EXISTING SOFFIT OR WALL-MOUNTED LUMINAIRE TO REMAIN UNMODIFIED
□ EXISTING SOFFIT OR WALL-MOUNTED LUMINAIRE TO BE MODIFIED AS SPECIFIED

NOTE: Arrow indicates "street side" of luminaire.

MISCELLANEOUS ELECTROLIERS

SYMBOL DESCRIPTION
□ LUMINAIRE ON WOOD POLE
□ NON-STANDARD ELECTROLIER (SEE PROJECT LEGEND)
□ CITY ELECTROLIER
□ ELECTROLIER FOUNDATION (FUTURE INSTALLATION)

NOTE:
1. Luminaires shall be Roadway 2 when installed on Type 21, 21D, 30, 31 and 32 Standards, unless otherwise specified.
2. Luminaires shall be Roadway 1 when installed on other type standards or poles, unless otherwise specified.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
ELECTRICAL SYSTEMS (LEGEND)
NO SCALE

RSP ES-1A DATES OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-1A

REVISED STANDARD PLAN RSP ES-1A
### Conduit

<table>
<thead>
<tr>
<th>New</th>
<th>Existing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lighting conduit, unless otherwise indicated or noted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication conduit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic signal conduit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fire alarm conduit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Telephone conduit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fiber optic conduit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conduit riser attached to the structure or service pole</td>
</tr>
</tbody>
</table>

### Conduit Termination

<table>
<thead>
<tr>
<th>New</th>
<th>Existing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Push button assembly post</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pedestrian barricade</td>
</tr>
</tbody>
</table>

### Signal Equipment

<table>
<thead>
<tr>
<th>New</th>
<th>Existing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pedestrian signal head</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Push button assembly post</td>
</tr>
</tbody>
</table>

### Service Equipment

<table>
<thead>
<tr>
<th>New</th>
<th>Existing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Overhead lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pole guy with anchor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Utility transformer - ground mounted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Service equipment enclosure type, door indicates front of enclosure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Telephone demarcation cabinet</td>
</tr>
</tbody>
</table>

### Pole-Mounted Service Designation

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type H Service, 28'-10&quot;</td>
<td>Type 1 standard with attached vehicle signal heads</td>
</tr>
</tbody>
</table>

### Flushing Beacon

<table>
<thead>
<tr>
<th>New</th>
<th>Existing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Standard with a signal, post, attached vehicle signal heads and street name sign</td>
</tr>
</tbody>
</table>

### Overhead Sign

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard with luminaire and signal mast arms and attached vehicle signal heads</td>
</tr>
</tbody>
</table>

### Notes

1. All signal sections shall be 12" unless shown otherwise.
2. Signal heads shall be provided with backplates unless shown otherwise.
POLE MOUNTED SERVICE INSTALLATIONS

LEGEND:

1. METER SOCKET.
2. SERVICE ENCLOSURE WITH A MINIMUM 60-A RATED MAIN CIRCUIT BREAKER, UNLESS OTHERWISE SHOWN.
   B. STATE OWNED POLE, THE CONTRACTOR SHALL FURNISH AND INSTALL REQUIRED SERVICE RISER AND EQUIPMENT.
4. 2" SERVICE CONDUIT MUST HAVE A GROUNDED TYPE BUSHING INSTALLED AT UPPER END OF THE METALLIC POLE RISER CONDUIT. A GROUNDED CONDUCTOR MUST BE ATTACHED TO THE BUSHING, CARRIED THROUGH THE CONDUIT RUN AND ATTACHED TO THE SERVICE EQUIPMENT ENCLOSURE'S GROUNDING ELECTRODE.
5. CONDUCTOR LENGTH AND SIZE AS REQUIRED.
6. 3/4" TAP, SEE SERVICE GROUNDING.
7. SERVICE PULL BOX, NO. 5 UNLESS OTHERWISE NOTED, FURNISHED AND INSTALLED BY THE CONTRACTOR.
8. SERVICE UTILITY SHALL DETERMINE THE EXACT LOCATION.

NOTES:

1. Ground clamp and required fittings must be accessible. Conduit must extend to protect grounding electrode conductor from mechanical damage.
2. Use service utility requires 18" clearance between grounding electrode and the pole or service equipment enclosure. Installation shown is for sidewalks or paved areas. In unpaved areas, omit special service pull box and locate ground clamp above ground or locate ground clamp in nearest pull box.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
ELECTRICAL SYSTEMS
(SERVICE EQUIPMENT)

NO SCALE
NOTES:

1. Cabinet shall be installed with the back toward the nearest lane of traffic.

2. In unpaved areas, a raised Portland cement concrete pad shall be constructed in front of each control cabinet. The pad shall be 3'-0" x 4" thick, a width of foundation.

3. A 1" drain shall be provided through the foundation of a cabinet. Drain pipe shall be screened.

4. Cabinet shelves shall be adjustable for vertical spacing and shall be removable.

5. Controller units, plug-mounted equipment, shelf-mounted equipment and wall-mounted equipment shall be located to permit safe and easy removal or replacement without removing any other piece of equipment.

6. Where telephone interconnect is required, a minimum of 3" clear vertical space shall be provided inside the cabinet for the equipment.

1. Telephone interconnect conductors shall be enclosed in a ¾" or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets or pedestals.

8. Anchor bolts for cabinet shall be ¾" Ø x 1'-6" with a 2" - 90° bend.

NOTE 3:

Anchor bolts for cabinet shall be ¾" Ø x 1'-6" with a 2" - 90° bend.
**NOTES:**

1. Where telephone interconnect is required, a minimum of 6" clear vertical space shall be provided inside the cabinet for the equipment.

2. Telephone interconnect conductors shall be enclosed in a ¾" or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets.

---

**BASE PLAN FOR LX-BBS CABINET MOUNTED TO THE MODEL 332LS CABINET**

(for dimensions and details not shown, see cabinet housing details of the transportation electrical equipment specification (tees))

**FOUNDATION AND PAD DETAIL**

Model 332LS, 334LS, and 334LC

**RIGHT SIDE INSTALLATION DETAIL B**

**MODEL 332LS CABINET FOUNDATION DETAIL WITH LX-BATTERY BACKUP SYSTEM**

( controller cabinet foundation and pad details)
NOTES:
1. Where telephone interconnect is required, a minimum of 6" clear vertical space shall be provided inside the cabinet for the equipment.
2. Telephone interconnect conductors shall be enclosed in a ¾" or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets.
3. Dimensions are nominal.
4. For Model 342LX, 344LX, and 346LX cabinets details, see "Transportation Electrical Equipment Specifications".
5. Grounding electrode shall be placed 3 inches in front of the service conduit area.
6. Conduit area, to 120 V Service.
7. Conduit area for the controller side of cabinet.

Where telephone interconnect is required, a minimum of 6" clear vertical space shall be provided inside the cabinet for the equipment. Telephone interconnect conductors shall be enclosed in a ¾" or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets. Dimensions are nominal. For Model 342LX, 344LX, and 346LX cabinets details, see "Transportation Electrical Equipment Specifications". Grounding electrode shall be placed 3 inches in front of the service conduit area. Conduit area, to 120 V Service. Conduit area for the controller side of cabinet.

CONDUIT AREA (9" x 12")

FOUNDATION FOR TYPE LX CABINET

DETAIL A

BASE PLAN FOR THE MODEL 342LX, 344LX, AND 346LX CABINET

FOUNDATION AND PAD DETAIL

MODEL 342LX, 344LX, AND 346LX CABINET ANCHOR BOLTS, 3/8" x 1 1/4" with a 2" - 90° BEND (4 WTH)

PCC PAD

CONCRETE PAD

1 1/4""
**Foundation Details**

1. Where telephone interconnect is required, a minimum of 3" clear vertical space shall be provided inside the cabinet for the equipment.

2. Telephone interconnect conductors shall be enclosed in a ¾"C or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets.

3. The LX BBS cabinet shall be mounted to the Model 342LX or 344LX cabinet with four 18-8 stainless steel hex head, fully-threaded, 3/4" x 1-½" bolts, designed for 3" bolts and are 18-8 stainless steel, 1" outside diameter, round, and flat on one 3/4" lock nut per bolt that is 18-8 stainless steel and a hex-nut.

4. All dimensions are nominal.

5. The dimensions of the BBS cabinet shall be verified prior to constructing the foundation of the Model 342LX or 344LX cabinet foundation.

6. Conduit area, to 120 V Service.

7. Conduit area for the controller side of cabinet.

8. For Type LX cabinets details, see "Transportation Electrical Equipment Specifications".

9. Grounding electrode shall be placed 3 inches in front of the service conduit area.
1. Dimensions are nominal.

2. The steel pedestal, base plate, and bolt circle for the telephone demarcation cabinet shall be the same as that shown for cabinet Type 1-C. The steel pedestal shall be 2'-1" to 2'-6" in length. Anchor bolts shall be 3/4" x 1'-6" with a 2" - 90° bend. Four bolts required per cabinet.

3. Telephone interconnect conductors shall be enclosed in a Type 4 conduit or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in the cabinet and pedestal.

4. Mount cabinet on Type 6 cabinet pedestal and foundation (see Revised Standard Plan RSP ES-3B).

5. Hinged cover with padlock hasp 0.080" (minimum thickness), 1'-8" x 1'-8" x 1'-0" (W x H x D), cabinet, 15 A, 1P, CB.

6. GFCI enclosure for CB.

7. Terminal block, 12 positions, Type 4 conductors.

8. Non-GFCI duplex receptacle.


10. Labelling "GFCI".


12. Backboard to backboard junction box mounted.


15. 15 A, 1P, CB.
1. Dimensions are nominal.
NOTES:

1. Dimensions are nominal.
2. Hardware for fastening of mounting boards:
   a. For each backboard A and backboard B to telephone demarcation cabinet with 3/8 x 3/4 stainless steel carriage bolts (8 required).
   b. For each hinged metal bracket to backboard B and backboard C to hinged metal bracket with no. 10 x 3/4 wood screws (9 required).

CONCRTE PAD FOUNDATION AND PAD DETAILS

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION ELECTRICAL SYSTEMS (TELEPHONE DEMARCATION CABINET, TYPE C) NO SCALE

NOTE:
1. Base mounting frame shall be constructed with 0.154" galvanized steel.
NOTES:
1. See Standard Plan H10 for other details.
2. Underground electrical work done prior to foundation installation.

IRRIGATION CONTROLLER ENCLOSURE CABINET

WIRING DIAGRAM (Typ)

DETAIL B

IRRIGATION CONTROLLER ENCLOSURE CABINET

ELEVATION

DETAIL C

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(IRRGATION CONTROLLER ENCLOSURE CABINET)

NO SCALE

REVISED STANDARD PLAN RSP ES-3H
NOTES:
1. Install connections when BBS is equipped with this option.
2. Install and connect harness for BBS on GT-BBS.

ABBREVIATIONS:
- TBS: Terminal Block Service
- UBS: Utility to BBS
- EQP: Equipment Circuit
- GT: Green Technology

TO CONTROLLER CABINET
CIRCUITRY

1. Install connections when BBS is equipped with this option.
2. Install and connect harness for BBS on GT-BBS.
ABBREVIATIONS:
SV: SIDE MOUNTED SIGNAL HEADS
T: TERMINAL COMPARTMENT
TV: TOP MOUNTED SIGNAL HEADS
1, 2, 3, 4: NUMBER OF Signal HEADS
A, B, C, D: CONFIGURATION OF SIGNALS

NOTES:
1. Mountings shall be oriented to provide maximum horizontal clearance to adjacent roadway.
Abbreviations:

- TP: Top mounted pedestrian signal
- SP: Side mounted pedestrian signal
- 1, 2: Number of signal faces
- T: Terminal compartment
- TP: Top mounted pedestrian signal

Notes:
1. Mounting shall be oriented to provide maximum horizontal clearance to adjacent roadway.

LED Countdown Pedestrian Signal Face Module

Person Walking Interval

Flashing Upraised Hand Interval

Steady Upraised Hand Interval
SIGNAL STANDARD PLACEMENT DIMENSIONS
AND EQUIPMENT LOCATIONS

1. Typical signal pole placement unless dimensioned on plans.

2. For A and B dimensions, see Pole Schedule.

SIGNAL FACES

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(SIGNAL HEADS
AND MOUNTINGS)

TYPICAL SIGNAL HEAD INSTALLATIONS

TUNNEL FULL CIRCLE CAP OR CUT AWAY LEFT ANGLE (Right angle is reversed of figure)
**TOP MOUNTINGS**

**SIGNAL SLIP FITTERS**

1. After mast arm signal has been plumbed and secured, drill 7⁄8" hole through mast arm tenon in line with slip fitter hole. Place a cadmium plated 5⁄8" bolt with washer under signal fitting and secure mast arm to post. Repeat for all signal heads to be mounted.

2. Threaded top mounted slip fitter openings shall be 1 1⁄4" NPS. Serrations in fittings shall match those on bottom of signal heads or in signal housing or fitting. Top opening shall be offset when backplate is used.

3. Wireway shall have a cross section area of 0.95 square inch minimum. Minimum width of 1".

**TERMINAL COMPARTMENT**

**SIGNAL HEAD MOUNTING**

**POLE PLATE FOR SIDE MOUNTED SIGNAL HEAD**

**MISCELLANEOUS MOUNTING HARDWARE**

- **Brass Ring to match Flange**
- **Openings**
- **Top Mountings**
- **Side Mounting**
- **Drill and Tap for 5⁄8" NPS Standard Pipe Thread**

**NOTE**

- **No Scale**
NOTES:
1. Round corners of acute angle saw cuts to prevent damage to conductors.
2. Typical distance separating loops from edge to edge is 10' for Type A, B, D, E, and F installation in single lane.
3. Use Type D and F loops for limit line detection and bicycle lanes.

1'-0" 3'-0"
5'-8"
6'-0"
8"
10"
6'-0"
1'-0" 1'-3"
2'-3"
2'-6"
3'-0"
6'-0"
6" Max

SEE NOTE 1

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
ELECTRICAL SYSTEMS
(DETECTORS)

NO SCALE

2018 REVISED STANDARD PLAN RSP ES-5B

DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA

(ADETECTORS)

ELECTRICAL SYSTEMS

TYPE A LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE B LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE C LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE D LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE E LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE F LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE G LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE H LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE I LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE J LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE K LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE L LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE M LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE N LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL

TYPE O LOOP DETECTOR CONFIGURATION

WINDING DETAIL

SAW CUT DETAIL
TYPICAL LOOP LEAD-IN DETAIL

1. Saw edge before trenching.
2. Trench shall be of minimum depth to accommodate conduit size.
3. Place conduit across joint.
4. Seal conduit ends with approved sealing compound.
5. End of conduit shall be 3/4" below joint surface.
6. Non-corroding material.
7. Cast iron frame and cover.
8. Non-asphalt material.
9. Clean, crushed rock sump.
10. Location of detector handhole when shown on plans.
11. Location of detector handhole when shown on plans.
12. Splice detector conductors to detector lead-in cable.
13. Conduit shall extend from joint to be extended beyond shoulder pavement.
15. Inductive loop detector saw slot.
16. Type A conduit 6" long minimum, plug both ends with duct compound to keep out sealant.
17. Minimum between top of conduit and pavement surface.
18. Duct shall not exceed 1/2" in width and 1/2" longer than conduit to be installed.
19. Conductors with 1/2" minimum slack inside conduit.
20. Minimum between top of conduit and pavement surface.
21. Conduit not shall exceed 1/2" in width and 1/2" longer than conduit to be installed.
22. Inductive loop detector saw slot.
23. Cast iron frame and cover.
24. Non-asphalt material.
25. Clean, crushed rock sump.
26. Location of detector handhole when shown on plans.
27. Splice detector conductors to detector lead-in cable.
28. Conduit shall extend from joint to be extended beyond shoulder pavement.
29. Inductive loop detector saw slot.
30. Type A conduit 6" long minimum, plug both ends with duct compound to keep out sealant.
31. Minimum between top of conduit and pavement surface.
32. Duct shall not exceed 1/2" in width and 1/2" longer than conduit to be installed.
33. Inductive loop detector saw slot.
34. Cast iron frame and cover.
35. Non-asphalt material.
36. Clean, crushed rock sump.
37. Location of detector handhole when shown on plans.
38. Splice detector conductors to detector lead-in cable.
39. Conduit shall extend from joint to be extended beyond shoulder pavement.
40. Inductive loop detector saw slot.
41. Type A conduit 6" long minimum, plug both ends with duct compound to keep out sealant.
42. Minimum between top of conduit and pavement surface.
43. Duct shall not exceed 1/2" in width and 1/2" longer than conduit to be installed.
44. Inductive loop detector saw slot.
45. Cast iron frame and cover.
46. Non-asphalt material.
47. Clean, crushed rock sump.
48. Location of detector handhole when shown on plans.
49. Splice detector conductors to detector lead-in cable.
50. Conduit shall extend from joint to be extended beyond shoulder pavement.
51. Inductive loop detector saw slot.
52. Type A conduit 6" long minimum, plug both ends with duct compound to keep out sealant.
53. Minimum between top of conduit and pavement surface.
54. Duct shall not exceed 1/2" in width and 1/2" longer than conduit to be installed.
55. Inductive loop detector saw slot.
TYPE 15 AND TYPE 21

ELEVATION A

BACK OF FIXTURE

W PROJECTED LENGTH

TYPE 15 AND TYPE 21 BARRIER RAIL MOUNTED

ELEVATION B

BASE PLATE DATA

POLE DATA

Pole Type

N Height

Min Dia

Wall Thickness

C

BC = Bolt Circle

Thickness

Anchor Bolt Side

CIDP Pile Foundation

15

35'-0"

8" 

3/8"

1/8''

1/8''

1/8''

1/8''

1/8''

1/8''

21

35'-0"

8"

3/8"

1/8''

1/8''

1/8''

1/8''

1/8''

1/8''

* For barrier rail bolts, see Standard Plan ES-6B.

1. Indicates most one length to be used unless otherwise noted on the plans.

2. For Type 15-SB, use Type 15 standard with Type 30 slip base plate details, see Standard Plan ES-6F.

3. Manhole shall be located on the downstream side of traffic.

4. For additional notes and details, see Standard Plans ES-7M and ES-7N.

NOTES:
ELEVATION A

SECTION K-K

NOTES:
1. The Contractor shall verify all controlling field dimensions before ordering or fabricating any material.
2. Bolt hole locations may vary at the discretion of the Engineer.
3. For Wind Loading see Revised Standard Plan RSP ES-7M.
5. Materials (Structural Steel):
   a. fy = 55,000 psi tapered steel tube (pole)
   b. fy = 50,000 psi unless otherwise noted

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(LIGHTING STANDARD, TYPES 5 AND 10,
OVERHEAD SIGN MOUNTED)

NO SCALE

NOTES:
1. For additional notes, details and data for Type 15TS and Type 21TS Standards, see Standard Plan ES-6A.
2. Handhole shall be located on the downstream side of traffic.

**ELEVATION A**

**DETAIL A**

**BASE PLATE**

**PUSH BUTTON ASSEMBLY POST**

**DETAIL B**

---

**POLE DATA**

<table>
<thead>
<tr>
<th>POLE TYPE</th>
<th>HEIGHT</th>
<th>MIN OD</th>
<th>WALL THICKNESS</th>
<th>BASE CIRCLE</th>
<th>THICKNESS</th>
<th>ANCHOR BOLT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>15TS</td>
<td>30'-0&quot;</td>
<td>8&quot;</td>
<td>3&quot;</td>
<td>1'-6&quot; Ø</td>
<td>2&quot;</td>
<td>1 1/2&quot; x 42&quot;</td>
</tr>
<tr>
<td>21TS</td>
<td>35'-0&quot;</td>
<td>9 1/2&quot;</td>
<td>3&quot;</td>
<td>1'-6&quot; Ø</td>
<td>2&quot;</td>
<td>1 1/2&quot; x 42&quot;</td>
</tr>
</tbody>
</table>
Type 1 Signal Standards

Base Plate Details

Type 1-A Standard

Type 1-B Standard

Type 1-C Standard

Type 1-D Standard

Identification Character Details

Typical Identification Character Format

Location of Equipment Identification Characters on Standards and Posts

Anchor Bolts with Sleeve Nuts

Coupling Nut Table

Electrical Systems (Signal and Lighting Standard, Type 1 and Equipment Identification Characters)
FLASHING BEACON WITH SLIP BASE INSTALLATION

TYPE 15-FBS

VIEW A-A

FLASHING BEACON MAST ARM

DETAIL D

TYPE 1-A, 1-C, AND 1-D

FLASHING BEACON INSTALLATION

DETAIL E

ELEVATION A

TYPE 40-0-100

ELEVATION A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(FLASHING BEACON ON A TYPE 1, TYPE 15-FBS, AND TYPE 40 STANDARD)

NO SCALE

REVISED STANDARD PLAN RSP ES-7J

October 19, 2018

REVISED STANDARD PLAN RSP ES-7J

DID DATE OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-7J

2018 REVISED STANDARD PLAN RSP ES-7J

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FLASHING BEACON INSTALLATION

DETAIL C

BASE PLATE

DETAIL C

TYPE 1-A, 1-C, AND 1-D

FLASHING BEACON INSTALLATION

DETAIL E

ELEVATION A

TYPE 40-0-100

ELEVATION A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(FLASHING BEACON ON A TYPE 1, TYPE 15-FBS, AND TYPE 40 STANDARD)

NO SCALE

REVISED STANDARD PLAN RSP ES-7J

October 19, 2018

REVISED STANDARD PLAN RSP ES-7J

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2018 REVISED STANDARD PLAN RSP ES-7J

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BASE PLATE

COLLAR

DETAIL C1

DETAIL C2

DETAIL C3

DETAIL C4

ELEVATION B

ELEVATION C

For alternative base, see Detail C4

Central hole in base plate or mast arm plate diameter = pole inside diameter - 2"
FLAT WASHER
CLEAN CRUSHED ROCK SUMP
GROUT
DRAIN HOLE
GROUND CLAMP

SECTION A-A

INSTALLATION DETAILS
DETAIL A

RECESS IN COVER FOR MARKER (TOTAL 0.1"

SECTION A-A

SIDE VIEW

COVER TOP VIEW

COVER MARKING AREA

LOAD RATING

MANUFACTURER'S LOGO

NOMINAL DIMENSIONS TABLE

<table>
<thead>
<tr>
<th>FULL BOX TYPE</th>
<th>MINIMUM DEPTH BOX</th>
<th>MINIMUM DEPTH EXTENSION</th>
<th>MAXIMUM WEIGHT</th>
<th>LI MIN</th>
<th>WE MIN</th>
<th>TE</th>
<th>B</th>
<th>L</th>
<th>V</th>
<th>MAXIMUM WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 3½</td>
<td>12&quot;</td>
<td>N/A</td>
<td>40 lb</td>
<td>1&quot; - 1/8&quot;</td>
<td>9&quot;</td>
<td>1½&quot; - 1¾&quot;</td>
<td>1/4&quot;</td>
<td>1½&quot; - 1¾&quot;</td>
<td>10&quot; - 10½&quot;</td>
<td>30 lb</td>
</tr>
<tr>
<td>No. 6</td>
<td>12&quot;</td>
<td>10&quot;</td>
<td>65 lb</td>
<td>1&quot; - 3&quot;</td>
<td>11&quot;</td>
<td>2&quot;</td>
<td>1&quot;</td>
<td>1½&quot; - 1¾&quot;</td>
<td>1½&quot; - 1¾&quot;</td>
<td>60 lb</td>
</tr>
<tr>
<td>No. 8</td>
<td>12&quot;</td>
<td>10&quot;</td>
<td>70 lb</td>
<td>2&quot; - 1/2&quot;</td>
<td>1½&quot; - 3/4&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>2½&quot;- 4½&quot;</td>
<td>1½&quot; - 3/4&quot;</td>
<td>95 lb</td>
</tr>
</tbody>
</table>

TYPICAL COVER CAPTIVE BOLT OR SIMILAR

TYPICAL THREADED INSERT OR SIMILAR

REVISED STANDARD PLAN RSP ES-8A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(NON-TRAFFIC PULL BOX)

REVISED STANDARD PLAN RSP ES-8A

DETAILED SHEETS

NO SCALE

REVISED STANDARD PLAN RSP ES-8A


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No. 3½(T), No. 5(T), AND No. 6(T)
TRAFFIC PULL BOX

SECTION A-A

NOMINAL DIMENSIONS TABLE

<table>
<thead>
<tr>
<th>PULL BOX TYPE</th>
<th>MINIMUM THICKNESS</th>
<th>MINIMUM DEPTH</th>
<th>L0</th>
<th>L1</th>
<th>W0</th>
<th>W1</th>
<th>COVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 3½(T)</td>
<td>1½&quot;</td>
<td>1'-0&quot;</td>
<td>1'-3&quot;</td>
<td>1'-11&quot;</td>
<td>1'-5&quot;</td>
<td>1'-20&quot;</td>
<td>1'-5&quot;</td>
</tr>
<tr>
<td>No. 5(T)</td>
<td>1½&quot;</td>
<td>1'-0&quot;</td>
<td>1'-3&quot;</td>
<td>1'-11&quot;</td>
<td>1'-5&quot;</td>
<td>1'-20&quot;</td>
<td>1'-5&quot;</td>
</tr>
<tr>
<td>No. 6(T)</td>
<td>2&quot;</td>
<td>1'-0&quot;</td>
<td>1'-3&quot;</td>
<td>1'-11&quot;</td>
<td>1'-5&quot;</td>
<td>1'-20&quot;</td>
<td>1'-5&quot;</td>
</tr>
</tbody>
</table>
"CALTRANS FIBER OPTICS" MUST BE MARKED ON THE COVER IN 3-INCH FALL LETTERS.

VAULT-ISOMETRIC VIEW

"CALTRANS FIBER OPTICS" MUST BE MARKED ON THE COVER IN 3-INCH FALL LETTERS.

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VAULT-ISOMETRIC VIEW

"CALTRANS FIBER OPTICS" MUST BE MARKED ON THE COVER IN 3-INCH FALL LETTERS.

VAULT-ISOMETRIC VIEW
WELD TO BOTTOM AND SIDES OF BOX

SEE DETAIL J No. 8 PULL BOX

DRAIN HOLE

DETAIL J

SECTION A-A

PLAN

COVER DETAIL

SECTION B-B

PLAN

COVER DETAIL

WELD TO BOTTOM AND SIDES OF BOX

SEE DETAIL J No. 8 PULL BOX

DRAIN HOLE

DETAIL J

SECTION A-A

PLAN

COVER DETAIL

SECTION B-B

PLAN

COVER DETAIL

No. 7 PULL BOX

No. 8 PULL BOX

No. 9 PULL BOX

No. 9A PULL BOX
SECTION A-A

FLUSH-MOUNTED SOFFIT LUMINAIRE INSTALLATION

PENDANT SOFFIT LUMINAIRE INSTALLATION

WALL-MOUNTED LUMINAIRE INSTALLATION
FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY

SECTION A-A

FLUSH-MOUNTED SOFFIT LUMINAIRE DETAILS

NOTE:
1. Use No. 8 # machine screws, lockwashers and nuts for mounting ballast and terminal strips.

MOUNTING BRACKET DETAILS

TOP VIEW

WIRING DIAGRAM

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS

REVISED STANDARD PLAN RSP ES-9F

MOUNTING BRACKET DETAILS

SIDE VIEW

REVISED STANDARD PLAN RSP ES-9F

October 19, 2018


RSP ES-9F (DATED OCTOBER 19, 2018) SUPERSEDES STANDARD PLAN ES-9F
NOTE: Curves represent the minimum maintained illuminance (FC).

- **WALL-MOUNTED**
  - Type III Short
  - ANSI Designation: S62
  - 17' Mounting Height
  - Lamp operated at 5,800 lm
  - 70 W (Max)

- **FLUSH-MOUNTED SOFFIT**
  - 17' Mounting Height
  - ANSI Designation: S54
  - Lamp operated at 9,500 lm
  - 100 W (Max)

- **PENDANT SOFFIT**
  - Type III Short
  - ANSI Designation: S62
  - 17' Mounting Height
  - Lamp operated at 5,800 lm
  - 70 W (Max)

- **OVERHEAD SIGN LUMINAIRE**
  - 60 W (Max)
KINKING DETAIL FOR
SLIP BASE STANDARDS
DETAIL A

BONDING BRUSHING REQUIRED
BONDING STRAP
WRAPPED AND SECURED CONDUCTORS 4 TIMES AROUND PROJECTING END OF CONDUCTOR THEN CONTINUE TO FUSED SPLICE CONNECTOR

SIDE VIEW
FRONT VIEW
FRONT VIEW

MAKE TIGHT KINK IN EACH CONDUCTOR AT OR SOMEWHERE BELOW SHEAR PLANE
SLACK IN CONDUCTORS REMOVED

CONTINUE KINK TO AT LEAST 90° POSITION AS INDICATED IN STEP 2.

STEP 1
STEP 2

90°

TYPICAL BANDING DETAILS
DETAIL B

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
ELECTRICAL SYSTEMS
(KINKING AND BANDING DETAIL)

NO SCALE

REVISED STANDARD PLAN RSP ES-13B

October 19, 2018

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR COPIES OF THIS PLAN SHEET.
NOTES:
1. Sheet metal shall be 1/8".
2. Welds shall be continuous.
3. Powder coat all internal and external surfaces black.
4. The door frame shall utilize two gas spring lift arms and two latching devices to maintain an open position.
5. See Wiring Notes and Symbols on Revised Standard Plan RSP ES-14B, Detail A.

CROSS-SECTION OF SIGN

ISOMETRIC VIEW

TYPICAL FRONT VIEW OF SIGN UNIT

ELECTRICAL SYSTEMS
(EXTINGUISHABLE MESSAGE SIGN
10" LETTERS)
NOTES:
1. The first number listed is the dimension from the edge of the mounting channel of the first and last sign luminaire.
   The second number listed is the dimension between centers of successive sign luminaire.
2. Where adjacent sign panels are spaced 1'-0" or less, the combination of these panels shall be considered a single panel.
3. Physical configuration and mounting details may vary from what is shown.

CONDUIT ENTRANCE DETAIL

OVERHEAD SIGN LUMINAIRE MOUNTING DETAIL (TYPICAL)

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
ELECTRICAL SYSTEMS
(SIGN ILLUMINATION EQUIPMENT)

NOTES:

1. Type 4 conduit shall be secured to the nearest walkway using one-hole galvanized malleable iron or steel straps and brass machine screws tapped into the bracket.

2. See Overhead Signs Standard Plans for overhead signs and frame juncture details for photoelectric unit installation.

3. Enclosures and straps shall be secured by 3/4" maximum size screws.

4. The contactor and test switch enclosures shall be readily accessible from the sign walkway.

TYPICAL SIGN ILLUMINATION EQUIPMENT
INSTALLATION FOR OVERHEAD SIGNS TUBULAR
DETAIL A

TYPICAL SIGN ILLUMINATION EQUIPMENT
INSTALLATION FOR OVERHEAD SIGNS ROUND POST
DETAIL B

TYPICAL SIGN ILLUMINATION EQUIPMENT
INSTALLATION FOR OVERHEAD SIGNS BRIDGE MOUNTED
DETAIL C

See Note 4
NOTE:
1. Type SC1A, SC2A, SC3A controls are similar to Types SC1, SC2 and SC controls respectively except test switch and wiring are not required.

TYPE LC1 CONTROL
For 120 V unswitched circuit with no more than 1000 W load.

TYPE LC2 CONTROL
For 170 V unswitched circuit

TYPE LC3 CONTROL
For 240 V unswitched circuits

TYPE LC4 CONTROL
For 480 V unswitched circuits

TYPE SC1 CONTROL
For 120 V switched circuit, see note 1 for Type SC1A

TYPE SC2 CONTROL
For 240 V switched circuit, see note 1 for Type SC2A

TYPE SC3 CONTROL
For 480 V switched sign circuit, see note 1 for Type SC3A

ELECTRICAL SYSTEMS (LIGHTING AND SIGN ILLUMINATION CONTROL)
NO SCALE

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**POLE DATA**

<table>
<thead>
<tr>
<th>POLE EXTENSION TYPE</th>
<th>WEIGHT &quot;H&quot;</th>
<th>DN DD</th>
<th>TOP THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAMERA POLE 5</td>
<td>5</td>
<td>3/4&quot;</td>
<td>0.1793&quot;</td>
</tr>
<tr>
<td>CAMERA POLE 10</td>
<td>10</td>
<td>3/4&quot;</td>
<td>0.1793&quot;</td>
</tr>
<tr>
<td>CAMERA POLE 15</td>
<td>15</td>
<td>3/4&quot;</td>
<td>0.1793&quot;</td>
</tr>
</tbody>
</table>

**MIN OD**

- 3" x 5"
- 8" x 8" x 8"
- 2" Ø HOLE
- 7" BOLT CIRCLE
- TOTAL 4 SQUARE
- R = 1/2 Typ
- SLOTS 3/8" x 1 1/6"

**NOTES:**

1. Verify controlling field dimensions before ordering or fabricating any materials.
2. Bolt hole locations may vary at the discretion of the Engineer.
4. For wind loading see Revised Standard Plan RSP ES-7M.
5. Materials (Structural Steel)
   - f_y = 55,000 psi (A36 steel)
   - f_y = 50,000 psi (unless otherwise noted)
1. Verify controlling field dimensions before ordering or fabricating any material.

2. During pole installation, the post shall be raked as necessary with the use of leveling nuts to provide a plumb pole axis.

3. For wind loading see Revised Standard Plan RSP ES-7M.

4. Materials (Structural Steel):
   - a. $f_y = 55,000$ psi (tapered steel tube and anchor bolts)
   - b. $f_y = 60,000$ psi (unless otherwise noted)

5. Materials (Reinforced Concrete):
   - a. $f_c = 3,625$ psi
   - b. $f_y = 50,000$ psi (unless otherwise noted)

ELEVATION A

SECTION A-A

DETAIL A

BASE PLATE

DETAIL B

TOP PLATE

DETAIL C

CAMERA MOUNTING ADAPTER

DETAIL D

BOX ENCLOSURE

DETAIL E

J HOOK

DETAIL F

SAFETY CHAIN BRACKET

SECTION B-B

BASE PLATE TO MATCH CAMERA BASE

J HOOK FOR CABLE SUPPORT

VIEW B

VIEW A

VIEW C

VIEW D

VIEW E

VIEW F

VIEW G

VIEW H

VIEW I

VIEW J

VIEW K

VIEW L

VIEW M

VIEW N

VIEW O

VIEW P

VIEW Q

VIEW R

VIEW S

VIEW T

VIEW U

VIEW V

VIEW W

VIEW X

VIEW Y

VIEW Z

NOTES:
1. Verify controlling field dimensions before ordering or fabricating any material.
2. During pole installation, the post shall be raked as necessary with the use of leveling nuts to provide a plumb pole axis.
3. For wind loading see Revised Standard Plan RSP ES-7M.
4. Materials (Structural Steel):
   - a. $f_y = 55,000$ psi (tapered steel tube and anchor bolts)
   - b. $f_y = 60,000$ psi (unless otherwise noted)
5. Materials (Reinforced Concrete):
   - a. $f_c = 3,625$ psi
   - b. $f_y = 50,000$ psi (unless otherwise noted)
Foundation design is based on a 3-second wind gust of 100 mph.

Materials (Structural Steel):
- Lower End Thickness:
  - 3" ± 3/8" (Min)
  - 2'
  - 3'

Access opening shall be located on the downstream side of traffic unless otherwise determined by the Engineer.

For wind loading see Revised Standard Plan RSP ES-7M.

Materials (Structural Steel):
- fy = 55,000 psi (tapered steel tube)
- fy = 50,000 psi (unless otherwise noted)

NOTES:
1. Pole details shall suit the lowering device and this foundation plan. Pole details shall be submitted to the Engineer for approval.
2. Access opening shall be located on the downstream side of traffic unless otherwise determined by the Engineer.
3. Foundation design is based on a 3-second wind gust of 100 mph.
4. For central void and drain holes in mortar, see Standard Plan ES-6B detail N.
5. Soil classification and permeability information are provided in the soil survey, see Standard Plan ES-16C.
6. Materials (Structural Steel):
   - fy = 55,000 psi (tapered steel tube)
   - fy = 50,000 psi (unless otherwise noted)

Access opening shall be located on the downstream side of traffic unless otherwise determined by the Engineer.

Pole details shall suit the lowering device and this foundation plan. Pole details shall be submitted to the Engineer for approval.
NOTES:
1. "PB" for Pull Box or "VT" for Vault.
2. Telephone number as specified.
3. 1" black text.
4. 1/2" black text.

DETAIL A

FIBER OPTIC MARKER
FOR VAULTS AND PULL BOXES

FIBER OPTIC MARKER
FOR PAVED AREAS

FIBER OPTIC MARKER
FOR UNPAVED AREAS

DETAIL B

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
ELECTRICAL SYSTEMS
(FIBER OPTIC MARKER DETAILS)

REVISED STANDARD PLAN RSP ES-17A
### POLE SELECTION TABLE

<table>
<thead>
<tr>
<th>POLE SELECTION TYPES</th>
<th>POLE AT DEAD END</th>
<th>POLE AT TANGENT</th>
<th>POLE AT TANGENT OR CORNER</th>
<th>POLE AT JUNCTION</th>
<th>POLE WITHOUT OVERHEAD BUNDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Attachments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without Attachments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### LEGEND
- Wood Pole - No Attachments
- Wood Pole With Attachments
- Overhead Bundle

<table>
<thead>
<tr>
<th>POLE SELECTION TYPES</th>
<th>MAXIMUM Hp</th>
<th>MINIMUM POLE CLASS</th>
<th>POLE EMBEDMENT (E)</th>
<th>MINIMUM POLE CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Attachments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without Attachments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NOTES:
1. In addition to other restrictions on maximum horizontal span, this horizontal span must not exceed 100'.
2. Cases 1N, 3N and 4N may substitute the attachments shown in Case 5N if the photovoltaic panel is not included.
3. For Case 1N without an overhead bundle (item 3) use minimum pole class H-1 with E=11'.

---

**TEXT:**

1. Camera or vehicle detection system
2. Overhead bundle consisting of a 3/8" messenger wire, overhead conductors, and lashing wire
3. Luminaire with mast arm
4. Pedestrian push button or accessible push button
5. Signal face with 3 indications or single sheet sign panel (4 SQFT Max)
6. Riser with weather head as required
7. Pull box as required
8. Grounding as required
9. Single flashing beacon or single sheet sign panel (4 SQFT Max)
10. 2'-12" flashing beacons
11. 25' SQFT Max total photovoltaic panels mounted as shown as required
12. Single sheet sign panel (10 SQFT Max)
13. Signal face with 3 indications or single sheet sign panel (4 SQFT Max)
14. 2-12" flashing beacons
**POLE SELECTION TABLE**

<table>
<thead>
<tr>
<th>MAXIMUM Dp</th>
<th>POLE EMBEDMENT (E)</th>
<th>MINIMUM POLE CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1'</td>
<td>9'</td>
<td>H-1</td>
</tr>
<tr>
<td>1.5'</td>
<td>9'</td>
<td>H-2</td>
</tr>
<tr>
<td>2.0'</td>
<td>9'</td>
<td>H-3</td>
</tr>
<tr>
<td>2.5'</td>
<td>9'</td>
<td>H-4</td>
</tr>
<tr>
<td>3'</td>
<td>9'</td>
<td>H-5</td>
</tr>
<tr>
<td>3.5'</td>
<td>9'</td>
<td>H-6</td>
</tr>
</tbody>
</table>

**NOTES:**
1. In addition to other restrictions on maximum horizontal span, this horizontal span must not exceed 100'.
2. Guy wire in line with opposing span ± 5°.

---

**LEGEND**

- Wood pole with attachments
- Overhead Bundle
- Guy Anchor

---

**CASE 1G**

**POLE AT DEAD END WITH ATTACHMENTS**

- Camera or vehicle detection system
- Overhead bundle consisting of 3/8" messenger wire, overhead conductors, and lighting wire
- Lighting with edge arm
- Pedestrian push button or accessible push button
- Signal face with 3 indications or single sheet sign panel (10 SQFT Max)
- Riser with weather hood as required
- Pull box as required
- Grounding as required
- Single flashing beacon or single sheet sign panel (4 SQFT Max)
- Single sheet sign panel (4' x 4' Max) or signal face with 3 indications
- Flashing beacon control assembly
- 1/4" guy wire with white guy marker and strain insulator (for anchorage see "TEMPORARY WOOD POLES-DETAILS No. 2" sheet)

**CASE 2G**

**POLE AT DEAD END WITH ATTACHMENTS**

- Camera or vehicle detection system
- Overhead bundle consisting of 3/8" messenger wire, overhead conductors, and lighting wire
- Lighting with edge arm
- Pedestrian push button or accessible push button
- Signal face with 3 indications or single sheet sign panel (10 SQFT Max)
- Riser with weather hood as required
- Pull box as required
- Grounding as required
- Single flashing beacon or single sheet sign panel (4 SQFT Max)
- Single sheet sign panel (4' x 4' Max) or signal face with 3 indications
- Flashing beacon control assembly
- 1/4" guy wire with white guy marker and strain insulator (for anchorage see "TEMPORARY WOOD POLES-DETAILS No. 2" sheet)

**CASE 3G**

**POLE AT CORNER WITH ATTACHMENTS**

- Camera or vehicle detection system
- Overhead bundle consisting of 3/8" messenger wire, overhead conductors, and lighting wire
- Lighting with edge arm
- Pedestrian push button or accessible push button
- Signal face with 3 indications or single sheet sign panel (10 SQFT Max)
- Riser with weather hood as required
- Pull box as required
- Grounding as required
- Single flashing beacon or single sheet sign panel (4 SQFT Max)
- Single sheet sign panel (4' x 4' Max) or signal face with 3 indications
- Flashing beacon control assembly
- 1/4" guy wire with white guy marker and strain insulator (for anchorage see "TEMPORARY WOOD POLES-DETAILS No. 2" sheet)
**POLE SELECTION TABLE**

<table>
<thead>
<tr>
<th>POLE SELECTION TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM dp</td>
</tr>
<tr>
<td>MINIMUM POLE CLASS</td>
</tr>
<tr>
<td>MINIMUM POLE CLASS</td>
</tr>
<tr>
<td>POLE EMBEDMENT (E)</td>
</tr>
<tr>
<td>POLE EMBEDMENT (E)</td>
</tr>
</tbody>
</table>

**NOTES:**

1. In addition to other restrictions on maximum horizontal span, this horizontal span must not exceed 100'.
2. Maximum of 2 SIGNAL FACES per span within the hatched regions indicated by "LOCATION OF SIGNAL FACES".
3. Guy wire in line with opposing span ± 5°.

**LOCATION OF SIGNAL FACES**

**POLE AT CORNER WITH ATTACHMENTS**

**POLE AT JUNCTION WITH ATTACHMENTS**

**POLE SELECTION TABLE**

<table>
<thead>
<tr>
<th>CASE 10T</th>
<th>CASE 20T</th>
<th>CASE 30T</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM dp</td>
<td>1st</td>
<td>2nd</td>
</tr>
<tr>
<td>MINIMUM POLE CLASS</td>
<td>M-2</td>
<td>M-3</td>
</tr>
<tr>
<td>POLE EMBEDMENT (E)</td>
<td>10'</td>
<td>10'</td>
</tr>
</tbody>
</table>

**LOCATION OF SIGNAL FACES**

**POLE AT DEAD END WITH ATTACHMENTS**

**POLE AT JUNCTION WITH ATTACHMENTS**

**POLE SELECTION TABLE**

<table>
<thead>
<tr>
<th>CASE 10T</th>
<th>CASE 20T</th>
<th>CASE 30T</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM dp</td>
<td>1st</td>
<td>2nd</td>
</tr>
<tr>
<td>MINIMUM POLE CLASS</td>
<td>M-2</td>
<td>M-3</td>
</tr>
<tr>
<td>POLE EMBEDMENT (E)</td>
<td>10'</td>
<td>10'</td>
</tr>
</tbody>
</table>
LANDSCAPE DETAILS
(SPRINKLER ASSEMBLY)

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REVISED STANDARD PLAN RSP H4

RSP H4 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN H4
DATED MAY 31, 2018 - PAGE 269 OF THE STANDARD PLANS BOOK DATED 2018
1. Wye strainer and fittings must be the same size as the supply line (main) pipe to be installed from the water meter to the backflow preventer assembly.

2. Wye strainer must be located and fitted in accordance with local water ordinance.

3. Backflow preventer assembly manifold pipe must be the same pipe as the supply line (main) pipe to be detailed from the water meter to the backflow preventer assembly.

4. All metal in contact with soil and Portland Cement Concrete must be wrapped with 2" wide plastic backed adhesive polyethylene tape 20 mil thick with ½" overlap.

NOTES:

1. Wye strainer and fittings must be the same size as the backflow preventer shown on the plans.

2. Wye strainer must be located and fitted in accordance with local water ordinance.

3. Backflow preventer assembly manifold pipe must be the same pipe as the supply line (main) pipe to be detailed from the water meter to the backflow preventer assembly.

4. All metal in contact with soil and Portland Cement Concrete must be wrapped with 2" wide plastic backed adhesive polyethylene tape 20 mil thick with ½" overlap.
NOTES:
1. 40" - 50"
2. 12" downstream of RCV
   18" upstream of RCV

SECTION
IRRIGATION CONDUIT
UNDER TRAVELED WAY

SECTION
PVC PIPE CONDUIT (SLEEVE)
UNDER SIDEWALKS, DRIVEWAYS, PAVEMENT, SLOPE PAVING, PAVED DITCHES AND PATHS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

LANDSCAPE DETAILS
NO SCALE

REVISED STANDARD PLAN RSP H8

RSP H8 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN H8
DATED APRIL 19, 2019.
NOTES:
1. 12" downstream of RCV
2. Width sufficient to allow unrolling of pipe and CNC bundles without stacking.
3. 1 ft minimum to back of sidewalk.
4. 2" min or 3/8 of largest pipe in trench.

SECTION
IRRIGATION TRENCH DETAIL

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
LANDSCAPE DETAILS

REVISED STANDARD PLAN RSP H9
NOTE:
1. Installations shown in the perspectives are for slope inclination of 10:1 (Horiz:Vert) and steeper.
### Table No. 1  Longitudinal Bar Reinforcement

<table>
<thead>
<tr>
<th>D</th>
<th>Bar Size</th>
<th>Spacing A</th>
<th>Spacing B</th>
<th>Spacing 2 × B</th>
<th>C1</th>
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</thead>
<tbody>
<tr>
<td>8.25</td>
<td>6#</td>
<td>3&quot; to 4&quot;</td>
<td>6.25&quot;</td>
<td>18&quot; Z</td>
<td>4&quot;</td>
</tr>
<tr>
<td>8.75</td>
<td>6#</td>
<td>3&quot; to 4&quot;</td>
<td>6.25&quot;</td>
<td>18&quot; Z</td>
<td>4&quot;</td>
</tr>
<tr>
<td>9.25</td>
<td>6#</td>
<td>3&quot; to 4&quot;</td>
<td>6.25&quot;</td>
<td>18&quot; Z</td>
<td>4&quot;</td>
</tr>
<tr>
<td>9.75</td>
<td>6#</td>
<td>3&quot; to 4&quot;</td>
<td>6.25&quot;</td>
<td>18&quot; Z</td>
<td>4&quot;</td>
</tr>
<tr>
<td>10.25</td>
<td>6#</td>
<td>3&quot; to 4&quot;</td>
<td>6.25&quot;</td>
<td>18&quot; Z</td>
<td>4&quot;</td>
</tr>
<tr>
<td>10.75</td>
<td>6#</td>
<td>3&quot; to 4&quot;</td>
<td>6.25&quot;</td>
<td>18&quot; Z</td>
<td>4&quot;</td>
</tr>
</tbody>
</table>

**NOTES:**
1. Place tie bars and intermediate transverse bars parallel to and in the same plane as transverse bars.
2. For longitudinal construction and construction joint details, see Standard Plan P14.
3. For curved lane layout see Standard Plan P16.

**ABBREVIATION:**
- D = Thickness of CRCP

---

**STATE OF CALIFORNIA**
**DEPARTMENT OF TRANSPORTATION**

**CONTINUOUSLY REINFORCED CONCRETE PAVEMENT**

**NO SCALE**

RSP P4 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN P4
NOTES:
1. For longitudinal bar size, spacing and clearances, see Revised Standard Plan RSP P4.
2. For the bar and intermediate transverse bar details, see Standard Plan P16.
3. Place Intermediate transverse bars parallel to and in the same plane as transverse bars.
4. Construct transverse joints at right angle to the longitudinal joints in adjacent CRCP, spaced 10'-0" on less than 10' intervals and no more than 14' intervals. Match location of JPCP transverse joint with CRCP transverse construction joint or expansion joint. Omit dowel bars.
5. For longitudinal construction joint details, see Standard Plan P16.
6. For additional longitudinal bars details, see Detail A on Revised Standard Plan RSP P4.
7. For longitudinal construction joint plan layout not shown, see Revised Standard Plan RSP P4.
8. For tie details at longitudinal construction joints, see Standard Plan P16.

ABBREVIATION:
D = Thickness of CRCP

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
CONTINUOUSLY REINFORCED
CONCRETE PAVEMENT
(WIDENED LANE)

NOTE 1
See Note 1

NOTE 2
See Note 2

NOTE 3
See Note 3

NOTE 4
See Note 4

NOTE 5
See Note 5

NOTE 6
See Note 6

NOTE 7
See Note 7

NOTE 8
See Note 8

REVISED STANDARD PLAN RSP P5A

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2018 REVISED STANDARD PLAN RSP P5A

JOINT, SEE REVISED TRANSVERSE CONSTRUCTION

RUMBLE STRIP, SEE NOTE 8

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
CONTINUOUSLY REINFORCED
CONCRETE PAVEMENT
(WIDENED LANE)

NO SCALE

RSP P5A DATED OCTOBER 18, 2019 SUPersedes STANDARD PLAN P5A

REVISED STANDARD PLAN RSP P5A
**NOTES:**

1. For longitudinal bar size, spacing and clearances, see Revised Standard Plan RSP P4.
2. For tie bar and intermediate transverse bar details, see Standard Plan P16.
3. Place intermediate transverse bars parallel to and in the same plane as transverse bars.
4. Construct transverse joints at right angle to the longitudinal joints in adjacent CRCP. Space joints at no less than 10' intervals and no more than 14' intervals. Match location of JPCP transverse construction joint with CRCP transverse construction joint or expansion joint. Omit dowel bars.
5. For longitudinal construction joint details, see Standard Plan P16.
6. Do not construct longitudinal construction joint when edge of new CRCP is less than 3'-3" from lane line.
7. For additional longitudinal bars detail, see Detail A on Revised Standard Plan RSP P14.
8. For longitudinal construction joint plan layout not shown, see Revised Standard Plan RSP P4.
9. For limits of rumble strips, see Project Plans.

**ABBREVIATION:**

D = Thickness of CRCP
NOTES:
1. For transverse and longitudinal bar sizes, spacing and clearances, see Table 1 on Revised Standard Plan RSP P14.
2. For tie bars in longitudinal construction joint, see Standard Plan P16.
3. Place additional longitudinal bars parallel to and in the same plane as the longitudinal bars.
4. Place additional longitudinal bars symmetrically about longitudinal construction joint.

ABBREVIATION
D = Thickness of CRCP

SECTION X-X
TRANSVERSE CONSTRUCTION JOINT

DETAIL A
Additional longitudinal bars at transverse construction joint

TRANVERSE CONSTRUCTION JOINT

LONGITUDINAL CONSTRUCTION JOINT

Additional longitudinal bars, see note 1

TRANSVERSE BARS, SEE NOTE 1

ADDITIONAL LONGITUDINAL BARS, SEE NOTES 3 AND 4

TIE BARS, SEE NOTE 2

LONGITUDINAL BARS, SEE NOTE 1

LONGITUDINAL BARS, SEE NOTE 1

LONGITUDINAL BARS, SEE STANDARD PLAN P16

LONGITUDINAL BARS, SEE NOTE 4 AND STANDARD PLAN P16

TRANSVERSE CONSTRUCTION JOINT

2'-1"

24" 24"

4'-2"

ADDITIONAL LONGITUDINAL BARS #8, SEE NOTES 3 AND 4

2'-1"

24" 24"
1. See Standard Plan P1 for typical dowel bar and tie bar placement and locations.
2. Where new pavement is placed against existing concrete pavement, rounding the corner is not required.
3. For dowel bar sizes, see Standard Plan P10.
4. Tie bar details apply to inside widenings.
5. Use either drill and bond or splice couplers.
6. Full depth drilled hole, fill hole with filler material.
7. The bottom of the saw cut must be at least 0.5" clear of any dowel bar, tie bar and bar reinforcement.
NOTE:

1. D - Thickness of CRCP (See Project Plans).
2. See Standard Plan B6-21 for "U", and "Type"
3. Extend support slab 2'-0" beyond the outside edges of CRCP.
4. For layout, tolerances, and other details not shown, see Standard Plan P10.
5. For the Pavement Terminal Joint Type F Detail, See Revised Standard Plan RSP P31A.
6. No bar splices allowed within 14'-0" of expansion joints.
7. No bar splices allowed in transition slabs.

REVISED STANDARD PLAN RSP P32

2018 REVISED STANDARD PLAN RSP P32

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT - EXPANSION TERMINAL JOINT SYSTEM

NOTE SCALE
RSP P32 DATED APRIL 17, 2020 SUPersedes RSP P32 DATED OCTOBER 18, 2019 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018

REVISED STANDARD PLAN RSP P32
**SINGLE POST INSTALLATION**

<table>
<thead>
<tr>
<th>POST SIZE</th>
<th>MAX AREA (SQUARE FEET) OF SIGN</th>
<th>SLEEVE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; x 2&quot; x 12 Ga</td>
<td>10,8</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>2&quot; x 2&quot; x 15 Ga</td>
<td>30,8</td>
<td>5/8&quot;</td>
</tr>
<tr>
<td>2&quot; x 2&quot; x 18 Ga</td>
<td>45,8</td>
<td>7/8&quot;</td>
</tr>
<tr>
<td>2&quot; x 2&quot; x 24 Ga</td>
<td>60,8</td>
<td>1&quot;</td>
</tr>
<tr>
<td>2&quot; x 2&quot; x 25 Ga</td>
<td>60,8</td>
<td>1 1/4&quot;</td>
</tr>
</tbody>
</table>

**NOTES:**

1. The sign post shall have 3/8" diameter perforations 1" on center on all four sides for the full length.
2. Use two drive rivets to fasten assembled sign and sign post into anchor sleeve. Install drive rivets or fastener alternative into the sides facing traffic.
3. All steel sign posts and anchor sleeves shall be galvanized.
4. All anchor sleeves shall be embedded in PCC.
5. For details not shown, see Standard Plans RS1 and RS2.
6. Steel posts: f_y = 60 ksi

**ANCHOR SLEEVE IN PAVED SURFACE**

**ANCHOR SLEEVE IN UNPAVED SURFACE**

---

**DETAILED DRAWING**

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**ROADSIDE SIGN PSST POST TYPICAL INSTALLATION DETAILS NO. 1**

**REVISIONS TO ACCOMPANY PLANS DATED 2018 REVISED STANDARD PLAN RSP RS5**

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**STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**

**NO SCALE**

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NOTES:
1. Balanced single post installations of single sheet aluminum panel signs require back braces when 2'-10" or more in length.
2. Wood block spacers are not required for signs mounted on metal posts.
3. Attach rectangular sign panel to sign post with bolts at the top and bottom. Center may be attached with either bolt or \( \frac{3}{8} \)" drive rivets.
4. Attach diamond sign panel to sign post with bolt at center. Top and bottom may be attached with either bolt or \( \frac{3}{8} \)" drive rivets.
5. For details not shown, see Standard Plans RS1 and RS2.

---

SINGLE POST INSTALLATION

**BACK BRACE DETAIL**

**ELEVATION**

**PLAN**

**BACK BRACE MOUNTING DETAIL**

**NOTES:**
- Balanced single post installations of single sheet aluminum panel signs require back braces when 2'-10" or more in length.
- Wood block spacers are not required for signs mounted on metal posts.
- Attach rectangular sign panel to sign post with bolts at the top and bottom. Center may be attached with either bolt or \( \frac{3}{8} \)" drive rivets.
- Attach diamond sign panel to sign post with bolt at center. Top and bottom may be attached with either bolt or \( \frac{3}{8} \)" drive rivets.
- For details not shown, see Standard Plans RS1 and RS2.
INSTRUCTIONS TO FABRICATOR

PROJECT PLANS SHOW

1. Sign structure location.
2. Length of structure frame.
3. Sign panel size and locations on structure.
4. Walkway length for single post signs.
5. Panel size and locations on structure.
6. Footing elevation or location of pile foundation.
7. Plans. Safety railing to protect entire walkway, but
   where distance from walkway bracket to end of
   walkway brackets, see Example No. 2.
8. Refer to the following standard plans for details not
   shown on project plans.

Sheet No. SHEET NAME
S1 Overhead Signs-Truss, Instructions and Examples
S2 Overhead Signs-Truss, Single Post Type, Post Types B to D
S3 Overhead Signs-Truss, Single Post Type, Post Types E through S
S4 Overhead Signs-Truss, Single Post Type, Structural Frame Members Details No. 1
S5 Overhead Signs-Truss, Single Post Type, Structural Frame Members Details No. 2
S6 Overhead Signs-Truss, Round Pedestal Pile Foundation
S7 Overhead Signs-Truss, Round Pedestal Pile Foundation
S8 Overhead Signs-Truss, Structural Frame Members Details No. 1
S9 Overhead Signs-Truss, Structural Frame Members Details No. 2
S10 Overhead Signs-Truss, Round Pedestal Pile Foundation
S11 Overhead Signs-Truss, Round Pedestal Pile Foundation
S12 Overhead Signs-Truss, Frame Juncture Details
S13 Overhead Signs-Truss, Frame Juncture Details
S14 Overhead Signs-Truss, Round Pedestal Pile Foundation
S15 Overhead Signs-Truss, Round Pedestal Pile Foundation
S16 Overhead Signs-Truss, Single Post Type, Round Pedestal Pile Foundation
S17 Overhead Signs-Truss, Single Post Type, Round Pedestal Pile Foundation
S18 Overhead Signs-Truss, Single Post Type, Round Pedestal Pile Foundation
S19 Overhead Signs-Truss, Single Post Type, Round Pedestal Pile Foundation
S20 Overhead Signs-Truss, Single Post Type, Round Pedestal Pile Foundation
S21 Overhead Signs-Truss, Single Post Type, Round Pedestal Pile Foundation
S22 Overhead Signs-Truss, Single Post Type, Round Pedestal Pile Foundation

OVERHEAD SIGN LUMINAIRE MOUNTING CHANNELS

Where distance from walkway bracket to end of
walkway brackets exceeds 1'-4", extend overhead sign luminaire
mounting channels to next walkway bracket, see Example No. 2.

WALKWAY BRACKETS:

Wall to be continuous for entire length of frame
for single post signs. For two post signs, see Project.

WALKWAY AND SAFETY RAILING:

Wall to be continuous for entire length of frame
for single post signs. For two post signs, see Project.

GENERAL NOTES:

LOADING:

Normal to face of sign 40.2 psi on 100% True surface area (i.e., 100% panel coverage).
Transverse to face of sign 20% of normal force.

WALKWAY LOADS:

Dead load +500 LB concentrated line load.

UNIT STRESSES:

STRUCTURAL STEEL: fy = 36,000 psi
REINFORCED CONCRETE: f'c = 3000 psi
FOOTING SOIL PRESSURE: 2.0 kPa (spread footing)

MINIMUM CLEARANCE:

Vertical roadway clearance 18'-0" (bottom of walkway system)
MELDING:

All welding continuous unless otherwise noted on the plans.
WALKWAY GRATING DETAILS
(After every walkway bracket between exterior walkway brackets)

END SAFETY LUG DETAIL

SECTION A-A
WALKWAY GRATING DETAILS
Shown at splice

OVERHEAD SIGN LUMINAIRE MOUNTING CHANNEL DETAILS 2

OVERHEAD SIGN LUMINAIRE MOUNTING CHANNEL DETAILS 1

OVERHEAD SIGN LUMINAIRE MOUNTING CHANNELS

WALKWAY DETAILS No. 2

INTERIOR SAFETY LUG DETAIL

(At every walkway bracket between exterior walkway brackets)

END SAFETY LUG DETAIL

NOTES:
1. Walkway grating shall have 1" x 1" bearing bars at 1" centers with 1/8" diameter (or equal cross bars at 4" centers). If mechanical lock grating is used, it shall be equal in strength to the welded type. Alternate hold-down clips may be submitted for approval.

2. Walkway grating and overhead sign luminaire mounting channels to be continuous (no splices) over as many walkway brackets as practical and consistent with fabrication, ease of handling and assembly.

3. Contractor may substitute 1/2" x 1/2" x .1084" cont-slot steel channel with pre-punched slots not larger than 1/4" x 3/8". Slots shall be at bottom of channel and shall be parallel to channel. Slots shall be spaced not closer than 1" center to center.

4. Place an equal amount of washers on each side to align cable with end lug without restricting shackle bolt rotation or contacting cable.

5. Place 1/8" cement-filled holes at 1" intervals in walkway brackets. Place 1/8" holes at the bottom of the channel at 1" intervals.
INSTRUCTIONS TO FABRICATOR

1. Sign structure location.
2. Length of structure frame.
3. Panel size and locations on structure.
4. Walkway length for two post signs.
5. Post type and height to bottom of frame.
7. Adjusted shape and form, if applicable.
8. Location of pile foundation.
9. Photovoltic unit location if required.

REFER TO THE FOLLOWING REVISED STANDARD PLANS FOR DETAILS NOT SHOWN ON PROJECT PLANS.

NOTE:
1. Signs are shown and dimensioned looking in the direction of travel. Double faced signs are shown and dimensioned looking ahead along stationing.
2. For Two Post Type, maximum cantilever length
3. For cantilever lengths > 40'-0", sign panels and walkways may be placed on both sides of truss. For cantilever lengths < 40'-0" and > 50'-0", sign panels and walkways may only be placed on one side of truss.
4. A single Changeable Message Sign (CMS) 500, 700, or 710 may be placed anywhere on the truss, CMS and static sign panels may be placed on the same truss.
5. Refer to Revised Standard Plan RSP S123 for CMS mounting details.
6. Place walkway and safety railing on truss only when called out on the project plans. When required, walkway to be continuous for entire length of frame (for one post signs). For two post signs, see Project Plans. Safety railing to run the entire length of walkway.
7. Threaded locking nuts or locking washers shall be used for all connections, unless noted otherwise.
8. All high strength (HS) bolts are to be snug tightened unless otherwise noted on the plans.
9. All welds are continuous unless otherwise noted on the plans.

OVERHEAD SIGNS-VERSATILE TRUSS

ONE AND TWO POST TYPE

PHOTO VOLTIC UNIT LOCATION IF REQUIRED.

BASE PLATE ELEVATION.

POST TYPE AND HEIGHT TO BOTTOM OF FRAME.

SAFETY RAILING.

SIGN PANEL, WALKWAY, SEE NOTE 3.

DEPARTMENT OF TRANSPORTATION

WIND LOADING:

Design wind speed (V) = 100 mph

Importance factor (UI) = 1.0

Velocity conversion factor (CV) = 1.0

Height and exposure factor (KE) = 1.18


Gust effect factor (G) = 1.14

WALKWAY LOADS:

Dead load plus 500 lb concentrated live load.

CMS LOADING:

CMS 500 maximum weight = 2400 lb

CMS 700 maximum weight = 2500 lb

CMS 1000 maximum weight = 2000 lb

MINIMUM CLEARANCES:

Vertical roadway clearance 18'-6" (bottom of frame/CMS/walkway)

COMMON ELEMENTS SHEETS:

RSP S111 Overhead Signs-Versatile Truss, Truss Connection Details

RSP S112 Overhead Signs-Versatile Truss, Chord Splice Details

RSP S113 Overhead Signs-Versatile Truss, Steel To Steel Connection Details

RSP S114 Overhead Signs-Versatile Truss, CIDH Pile Foundation with Inspection Pipes

RSP S115 Overhead Signs-Versatile Truss, Horizontal Details No. 1

RSP S116 Overhead Signs-Versatile Truss, Horizontal Details No. 2

RSP S117 Overhead Signs-Versatile Truss, Horizontal Safety Railing Details

RSP S118 Overhead Signs-Versatile Truss, Walkway Safety Railing Details

RSP S119 Overhead Signs-Versatile Truss, Sign Mounting Details Laminated Panel-Type A

RSP S120 Overhead Signs-Versatile Truss, Sign Mounting Details Laminated Panel-Type B

RSP S121 Overhead Signs-Versatile Truss, Removable Sign Panel Frames Details No. 1

RSP S122 Overhead Signs-Versatile Truss, Exit Plaque Mounting Details

RSP S123 Overhead Signs-Versatile Truss, CMS Mounting Details

RSP S124 Overhead Signs-Versatile Truss, EWS and Flashing Beacon Details

SOIL PARAMETERS FOR CIDH FOUNDATION:

Minimum Soil Shear Strength: 1.5 ksf (cohesive soils)

Minimum Soil Friction Angle: 30^ (non-cohesive soils)

Minimum Unit Weight of soils 120 psf (non-cohesive soils)

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS-VERSATILE TRUSS
ONE AND TWO POST TYPE

REVIEWED STANDARD PLAN SHEET NO.

RSP S100 DATED APRIL 16, 2021 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

NO SCALE
BOTTOM PLAN

Vertical, diagonal and interior L members not shown. Walkway not shown.

FRAME WIDTH, SEE REVISED STANDARD PLAN RSP S102

FRAME WIDTH SCHEMATIC

END TIE AT ENDS AND AT VERTICAL L's ADJACENT TO POST ONLY, TYPICAL TOP AND BOTTOM.

END TIE MEMBER SIZE = WIND BRACE MEMBER SIZE

DIAGONAL L's AND VERTICAL L SPACING

EQUAL SPACING BACK TO BACK ANGLES

FRAME WIDTH

LONGER ARM LENGTH

SEE TABLE ON REVISED STANDARD PLAN RSP S102

VERTICAL AND DIAGONAL L's

SEE LOWER JUNCTURE CONNECTION ON REVISED STANDARD PLAN RSP S113

SECTION A-A

Walkway and wind bracing not shown.

SIGN AND EXIT PLAQUE PLACEMENT

NOTE:
Equal sign panel overhangs apply to sign panels only.
The exit plaque is mounted above sign panels and the walkway is mounted below the sign panels, when used.

TRUSS FRAME DEPTH AND VERTICAL ANGLE SPACING TABLE

<table>
<thead>
<tr>
<th>MAXIMUM SIGN PANEL DEPTH</th>
<th>FRAME DEPTH</th>
<th>MAXIMUM VERTICAL L SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>80°</td>
<td>60°</td>
<td>45°</td>
</tr>
<tr>
<td>160°</td>
<td>72°</td>
<td>54°</td>
</tr>
<tr>
<td>240°</td>
<td>120°</td>
<td>90°</td>
</tr>
</tbody>
</table>

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS - VERSATILE TRUSS
ONE POST TYPE
TRUSS LAYOUT

NO SCALE

RSP S101 DATED April 16, 2021
SUPERSEDES STANDARD PLAN S101
### TRUSS MEMBER TABLE

<table>
<thead>
<tr>
<th>Long Arm Length</th>
<th>Frame Depth</th>
<th>Angle Member Size and Minimum Overlap Length to Gusset Plate</th>
<th>L</th>
<th>Diagonal</th>
<th>L</th>
<th>Interior</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>10'-0&quot; &lt; L &lt; 20'-0&quot;</td>
<td>60&quot;</td>
<td>L4 x 4 x ½</td>
<td>L5 x x ½</td>
<td>3</td>
<td>L5 x x ½</td>
<td>5</td>
<td>L5 x 25 x ¼</td>
</tr>
<tr>
<td>20'-0&quot; &lt; L &lt; 30'-0&quot;</td>
<td>60&quot;</td>
<td>L5 x 5 x ½</td>
<td>L5 x x ½</td>
<td>3</td>
<td>L4 x 4 x ½</td>
<td>6</td>
<td>L5 x 25 x ¼</td>
</tr>
<tr>
<td>30'-0&quot; &lt; L &lt; 40'-0&quot;</td>
<td>60&quot;</td>
<td>L5 x 5 x ½</td>
<td>L5 x x ½</td>
<td>3</td>
<td>L4 x 4 x ½</td>
<td>6</td>
<td>L5 x 25 x ¼</td>
</tr>
<tr>
<td>40'-0&quot; &lt; L &lt; 50'-0&quot;</td>
<td>60&quot;</td>
<td>L5 x 5 x ½</td>
<td>L5 x x ½</td>
<td>4</td>
<td>L5 x 5 x ½</td>
<td>4</td>
<td>L3 x 3 x ¾</td>
</tr>
</tbody>
</table>

### POST SELECTION TABLE

<table>
<thead>
<tr>
<th>Sign Panel Depth</th>
<th>Long Arm Length</th>
<th>Post Type by Post Clear Height</th>
<th>Post Type</th>
<th>Post Clear Height</th>
<th>Min Nominal Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>D ≤ 80&quot;</td>
<td>20'-0&quot;</td>
<td>L4 x 4 x ½</td>
<td>1A</td>
<td>18&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td></td>
<td>20'-0&quot;</td>
<td>L5 x 5 x ½</td>
<td>1B</td>
<td>18&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td></td>
<td>20'-0&quot;</td>
<td>L6 x 6 x 1</td>
<td>1C</td>
<td>18&quot;</td>
<td>1.218&quot;</td>
</tr>
</tbody>
</table>

### POST TYPE TABLE

<table>
<thead>
<tr>
<th>Post Type</th>
<th>Post Character</th>
<th>Min Nominal Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>18&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td>1B</td>
<td>18&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td>1C</td>
<td>18&quot;</td>
<td>1.218&quot;</td>
</tr>
</tbody>
</table>

Notes: All table dimensions are given in inches, unless otherwise noted.

### OVERHEAD SIGNS-VERSATILE TRUSS

#### ONE POST TYPE

#### STEEL POST TYPE AND TRUSS MEMBER TABLE

<table>
<thead>
<tr>
<th>Frame Width</th>
<th>Post Type</th>
<th>Character</th>
<th>Min Nominal Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHORTER CHORD LEG</td>
<td>POST</td>
<td>1A</td>
<td>18&quot;</td>
</tr>
<tr>
<td>SHORTER CHORD LEG</td>
<td>POST</td>
<td>1B</td>
<td>18&quot;</td>
</tr>
<tr>
<td>SHORTER CHORD LEG</td>
<td>POST</td>
<td>1C</td>
<td>18&quot;</td>
</tr>
</tbody>
</table>

### FRAME WIDTH SCHEMATIC

**NOTES:****

1. Shorter arm member sizes shall match the member sizes selected for the longer arm.
2. Post clear height is measured to underside of bottom truss chord.
4. Minimum overlap lengths to gusset plates 1½, 2½, and 3½ one in inches.
OVERHEAD SIGNS - VERSATILE TRUSS
ONE POST TYPE

STEEL POST BASE PLATE AND ANCHORAGE DETAILS

14 bolt template depicted. Others similar.

NOTE: Template to match base plate anchor bolt pattern.

Pipe sleeve diameter same as post type diameter

GALVANIZED

PLATE WASHER, 5" OD x 1" THICK

NOTE: Permanent plate thickness = ¾", Min.

BASE PLATE AND ANCHOR BOLT DIMENSIONS

<table>
<thead>
<tr>
<th>POST TYPE</th>
<th>PLATE THICKNESS</th>
<th>PLATE DIAMETER</th>
<th>OPENING DIAMETER</th>
<th>NUMBER OF BOLTS</th>
<th>BOLT DIAMETER</th>
<th>BOLT LENGTH</th>
<th>BOLT HOLE DIAMETER</th>
<th>BOLT CIRCLE DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>3½&quot;</td>
<td>3-1/8&quot;</td>
<td>8&quot;</td>
<td>14</td>
<td>3/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>3-1/8&quot;</td>
</tr>
<tr>
<td>1B</td>
<td>3½&quot;</td>
<td>3-1/8&quot;</td>
<td>8&quot;</td>
<td>14</td>
<td>3/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>3-1/8&quot;</td>
</tr>
<tr>
<td>1C</td>
<td>3½&quot;</td>
<td>3-1/8&quot;</td>
<td>8&quot;</td>
<td>14</td>
<td>3/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>3-1/8&quot;</td>
</tr>
<tr>
<td>1D</td>
<td>3½&quot;</td>
<td>3-1/8&quot;</td>
<td>8&quot;</td>
<td>14</td>
<td>3/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>3-1/8&quot;</td>
</tr>
<tr>
<td>1E</td>
<td>3½&quot;</td>
<td>3-1/8&quot;</td>
<td>8&quot;</td>
<td>14</td>
<td>3/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>3-1/8&quot;</td>
</tr>
<tr>
<td>1F</td>
<td>3½&quot;</td>
<td>3-1/8&quot;</td>
<td>8&quot;</td>
<td>14</td>
<td>3/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>3-1/8&quot;</td>
</tr>
<tr>
<td>1G</td>
<td>3½&quot;</td>
<td>3-1/8&quot;</td>
<td>8&quot;</td>
<td>14</td>
<td>3/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>3-1/8&quot;</td>
</tr>
</tbody>
</table>

ANCHOR BOLT TEMPLATE ASSEMBLY

NOTE: One bolt shown only. Other bolts same configuration around pipe sleeve.

ANCHOR BOLT TEMPLATE

14 bolt template depicted. Others similar.

NOTE: Template to match base plate anchor bolt pattern.

Pipe sleeve diameter same as post type diameter

ANCHOR BOLT TEMPLATE ASSEMBLY

NOTE: One bolt shown only. Other bolts same configuration around pipe sleeve.
BOTTOM PLAN
Vertical, diagonal and interior L members not shown. Walkway not shown.

SECTION A-A
Walkway and wind bracing not shown.

SIGN AND EXIT PLAQUE PLACEMENT
Note: Equal sign panel overhangs apply to sign panels only. The exit plaque is mounted above the sign panels and the walkway is mounted below the sign panels when used.

NOTES:
1. Frame widths shown are nominal. These widths may be varied by ¼" to standardize fabrication methods.
2. For Section B-B, see Revised Standard Plan RSP S111.
3. No crossties on diagonals.

LEGEND:
SIGN
EXIT PLAQUE

CAMBER FOR FABRICATION AT MAIN SPAN CENTERLINE

<table>
<thead>
<tr>
<th>SPAN</th>
<th>FRAME DEPTH</th>
<th>CAMBER</th>
<th>FRAME DEPTH</th>
<th>CAMBER</th>
<th>FRAME DEPTH</th>
<th>CAMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>30'-0&quot; TO 60'-0&quot;</td>
<td>60&quot;</td>
<td>1½&quot;</td>
<td>30&quot;</td>
<td>1½&quot;</td>
<td>1&quot;</td>
<td></td>
</tr>
<tr>
<td>61'-0&quot; TO 105'-0&quot;</td>
<td>60&quot;</td>
<td>3½&quot;</td>
<td>60&quot;</td>
<td>3½&quot;</td>
<td>3&quot;</td>
<td></td>
</tr>
<tr>
<td>106'-0&quot; TO 150'-0&quot;</td>
<td>60&quot;</td>
<td>6¼&quot;</td>
<td>60&quot;</td>
<td>6¼&quot;</td>
<td>3½&quot;</td>
<td></td>
</tr>
</tbody>
</table>

Camber to approximate parabola. Camber of cantilever arm = ½" for arms greater than 10'-0".

VERTICAL ANGLE SPACING TABLE

<table>
<thead>
<tr>
<th>MAXIMUM</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
<th>MINIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>45°</td>
<td>45°</td>
<td>90°</td>
<td>90°</td>
</tr>
<tr>
<td>54°</td>
<td>54°</td>
<td>54°</td>
<td>54°</td>
</tr>
</tbody>
</table>

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
OVERHEAD SIGNS-VERSATILE TRUSS
TWO POST TYPE
TRUSS LAYOUT
NO SCALE

RSP S106 DATED APRIL 16, 2021, SUPERSEDES STANDARD PLAN S106
NOTES:
1. For "ANCHORAGE DETAILS", see Revised Standard Plan RSP S108.
2. For "Base elevation", see Project Plans.
3. Prior to erection of the post, backfill which is equivalent to the surrounding material shall be in place.
4. For "PEDESTAL HEIGHT" and "PEDESTAL SHAPE", see Project Plans.
5. Refer to Revised Standard Plan RSP S109 for CIDH pile foundation details when a pedestal is not indicated in the Project Plans.
6. Refer to Revised Standard Plan RSP S109 for "Post Type Table".
7. For drain holes and central void in mortar, see Standard Plan ES-6B Detail K.
10. Maximum electrical conduit diameter is 3".
POST TYPES 1A, 1B, 1C, 1D, 2A, 2B, 2C AND 2D

POST TYPES 1E AND 1F

POST TYPES 1G

POST TYPE 1H

POST TYPES 2F AND 2G

POST TYPE 2H

NOTE:
1. For details not shown, see Revised Standard Plans RSP S104, RSP S105, RSP S109 and RSP S110.

OVERHEAD SIGNS—VERSATILE TRUSS CIDH PILE FOUNDATION WITH INSPECTION PIPES

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS—VERSATILE TRUSS CIDH PILE FOUNDATION WITH INSPECTION PIPES

NO SCALE

RSP S114 DATED APRIL 16, 2021 SUPERSEDES STANDARD PLAN S114
**NOTES:**

1. Aluminum bar grating with bearing bars at 1/2" spacing shall be used, with grate bars at 1/2" spacing. Max unsupported span shall be 5'-6". Bearing bar min. height shall be 1/2". Max height shall be 2", and bearing bar thickness shall be 3/8". Grating shall be capable of carrying a 500 lb. concentrated load and a 40 psf uniform load, applied non-concurrently. Max allowable deflection under 40 psf uniform loading shall be 1.75". The max allowable grating self-weight shall be 9.0 psf.

2. Aluminum walkway grating and light fixture mounting channels to be continuous (no splices) over as many walkway brackets as practical and consistent with fabrication, ease of handling, and assembly.

3. Hold down saddle anchors shall be installed at every walkway bracket (not just splice locations). Hold-down saddle anchors shall be installed on one side of girder web only. All hold-down hardware shall be galvanized. The hold-down saddle anchor shall be aluminum, and a nylon washer shall be installed on the underside of the nut.

4. Contractor may substitute 1/2" x 1/8" x 0.060" cold-rolled steel channel with pre-punched slots not larger than 1/2" x 3/8". Slots shall be at pattern of channel and shall be parallel to channel. Slots shall be spaced not closer than 4" center to center.

**ALUMINIUM WALKWAY GRATING DETAILS**

**STATE OF CALIFORNIA**
**DEPARTMENT OF TRANSPORTATION**

**OVERHEAD SIGNS-VERSATILE TRUSS WALKWAY DETAILS No.2**

**REVISED STANDARD PLAN RSP S116**
OVERHEAD SIGNS - VERSATILE TRUSS
WALKWAY DETAILS No.3

COVER PLATE DETAIL
(SEE NOTES 1 AND 2)

TOE PLATE CUT-OUT DETAIL

AT SAFETY RAILING HINGE

AT RING EXTENSION UNDER CMS

NOTES:
1. Cover plates placed on the walkway grating side of toe plate.
2. Cover plate is ¼" thick aluminum sheet 5052-H-32.
OVERHEAD SIGNS - VERSATILE TRUSS
SIGN MOUNTING DETAILS
LAMINATE PANEL - TYPE A

1. The location of the horizontal splice line is dependent on the Contractor for signs greater than 60" in depth.
2. Mounting bolts and clamps are required on each side of the horizontal splice lines of each support beam.
3. Dimension varies from panel to panel, average value approximate 1".
4. Torque stainless steel sign panel mounting bolts to 100 inch-pounds.
5. Drill through panel at integral track, install Type A-2 mounting hardware and attach reflective tape.
6. Refer to Revised Standard Plan RSP S115 for mounting beam to truss connection details.
7. For sign panel depths of 60" or less, or where a walkway is installed, the bottom of the mounting beam extends further than 1" from the bottom of the sign panel. Refer to Revised Standard Plan RSP S115.
8. Signs longer than 24'-0" are fabricated and mounted as adjoining single panels. The location of the vertical splice line will be determined by the Engineer.
9. Refer to Revised Standard Plan RSP S115 for mounting hardware and attach reflective tape.
10. Drill through panel at integral track, install Type A-2 mounting hardware and attach reflective tape.
11. The Contractor must verify all dependent dimensions in the field before ordering or fabricating any material.

**Notes:**
- The location of the horizontal splice line is dependent on the Contractor for signs greater than 60" in depth.
- Mounting bolts and clamps are required on each side of the horizontal splice lines of each support beam.
- Dimension varies from panel to panel, average value approximate 1".
- Torque stainless steel sign panel mounting bolts to 100 inch-pounds.
- Drill through panel at integral track, install Type A-2 mounting hardware and attach reflective tape.
- Refer to Revised Standard Plan RSP S115 for mounting beam to truss connection details.
- For sign panel depths of 60" or less, or where a walkway is installed, the bottom of the mounting beam extends further than 1" from the bottom of the sign panel. Refer to Revised Standard Plan RSP S115.
- Signs longer than 24'-0" are fabricated and mounted as adjoining single panels. The location of the vertical splice line will be determined by the Engineer.

**Mounting Beam Spacing Table**

<table>
<thead>
<tr>
<th>Panel Depth</th>
<th>Number of Mounting Beams</th>
<th>Panel Overhang</th>
<th>Mounting Beam Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1'-0&quot;</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5'-0&quot;</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>6'-0&quot;</td>
<td>2</td>
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<td>4</td>
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<tr>
<td>7'-0&quot;</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
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<td>6</td>
<td>6</td>
</tr>
<tr>
<td>9'-0&quot;</td>
<td>2</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
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</tr>
<tr>
<td>11'-0&quot;</td>
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</tr>
<tr>
<td>12'-0&quot;</td>
<td>2</td>
<td>10</td>
<td>10</td>
</tr>
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<td>13'-0&quot;</td>
<td>2</td>
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<td>14'-0&quot;</td>
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<tr>
<td>24'-0&quot;</td>
<td>2</td>
<td>22</td>
<td>22</td>
</tr>
</tbody>
</table>

* Signs longer than 24'-0" are fabricated and mounted as adjoining single panels. The location of the vertical splice line will be determined by the Engineer.
REVISED STANDARD PLAN RSP S120

OVERHEAD SIGNS-VERSATILE TRUSS REMOVABLE SIGN PANEL FRAMES
DETAILS No.1

NOTE 1:
1. Frames shall be all-welded construction.
2. Panel mounting holes shall be drilled by template. Sign panel may be considered as a template.
3. Drilled and tapped holes ¼" may be used where interference due to welds or structural members is encountered.
4. WT3 x 6 shall be flush with faces of frame angles.
5. Mounting clip angles shall be located such as to allow the top and bottom frame angles of the removable sign panel to lie on a straight horizontal line.
6. Notes for mounting removable sign panel frame may be sketched 1" maximum parallel to the axis of the sign.
7. WT3 x 6 may be crimped at ends to join frame angles. Fill weld all around.
8. For TABLE 2 see Revised Standard Plan RSP S121.
9. For sign panel depth of 10" or less the top of the mounting beam extends beyond the limits of the sign panel. Refer to Section T-T for connection details.
10. For sign panel depth of 60" or less, or where a walkway is installed, the bottom of the mounting beam extends further than 1" below the clip L.

REMOVABLE FRAME
GREATER THAN 20'-0'

PLAN FRAME LENGTH

TYPICAL REMOVABLE FRAME
(4'-0" thru 20'-0")
NOTE:
Sign panel mounting holes ½" Ø maximum for ¾" Ø bolts.

When constructing a new frame:
1. Refer to Revised Standard Plan RSP S120 for structural details.
2. Sign panels shall be considered as a template for drilling holes for mounting bolts.

The Contractor shall verify all dependent dimensions in the field before ordering or fabricating any material.

### Table 1

<table>
<thead>
<tr>
<th>Panel Depth</th>
<th>MOUNTING BOLT SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 SPICE</td>
</tr>
<tr>
<td>50&quot;</td>
<td>1¾&quot;</td>
</tr>
<tr>
<td>60&quot;</td>
<td>1¾&quot;</td>
</tr>
<tr>
<td>70&quot;</td>
<td>1¾&quot;</td>
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<tr>
<td>80&quot;</td>
<td>1¾&quot;</td>
</tr>
<tr>
<td>90&quot;</td>
<td>1¾&quot;</td>
</tr>
<tr>
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<td>1¾&quot;</td>
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<tr>
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<td>1¾&quot;</td>
</tr>
<tr>
<td>120&quot;</td>
<td>1¾&quot;</td>
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</table>

### Table 2

<table>
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<th>Panel Depth</th>
<th>PANEL DEPTH GREATER THAN 120&quot;</th>
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<tbody>
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<td></td>
<td>TOP PANEL</td>
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<td>70&quot;</td>
</tr>
<tr>
<td>140&quot;</td>
<td>70&quot;</td>
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<tr>
<td>150&quot;</td>
<td>80&quot;</td>
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<td>230&quot;</td>
<td>120&quot;</td>
</tr>
<tr>
<td>240&quot;</td>
<td>120&quot;</td>
</tr>
</tbody>
</table>
OVERHEAD SIGNS - VERSATILE TRUSS
EXIT PLAQUE MOUNTING DETAILS

MOUNTING BEAM SPACING NOTES AND ABBREVIATIONS:
A: Maximum mounting beam spacing for sign support = 8'-0".
B: Maximum mounting beam spacing for exit plaque support.
C: Minimum of 2 mounting beams are required per exit plaque.

REVISIONS TO THE STANDARD PLANS BOOK DATED 2018.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REGISTERED CIVIL ENGINEER

APPROVAL
DATE
No.
Exp.

DISTRICT
COUNTY
ROUTE
POST MILES

THE STATE OF CALIFORNIA OR ITS OFFICERS
OR AGENTS SHALL NOT BE RESPONSIBLE FOR
COPIES OF THIS PLAN SHEET.

April 16, 2021


MOUNTING BEAM SPACING NOTES AND ABBREVIATIONS:
A: Maximum mounting beam spacing for sign support = 8'-0".
B: Maximum mounting beam spacing for exit plaque support.
C: Minimum of 2 mounting beams are required per exit plaque.

REVISIONS TO THE STANDARD PLANS BOOK DATED 2018.

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NOTES:
1. For mounting beam to truss chord connection details, see Revised Standard Plan RSP S115.
2. For horizontal and vertical position of CMS 500, 700 or 710 see Project Plans.
3. Contractor shall verify Z bar spacing prior to drilling holes in mounting channels.
4. If walkway is required per Project Plans, refer to Revised Standard Plan RSP S115 for details. Minimum vertical clearance shall be measured to underside of walkway.

ALUMINUM Z BAR SPACING MODEL 500

ALUMINUM Z BAR SPACING MODEL 700

ALUMINUM Z BAR SPACING MODEL 710

ELEVATION

(DIAGONAL AND WIND SPACE MEMBERS NOT SHOWN)
**ELEVATION A**

Vertical and Diagonal Truss Members Not Shown

**SECTION A-A**

Top Truss Chord not shown

**SECTION B-B**

**SECTION E-E**

Refer to Standard Plan ES-14C for additional details

**NOTES:**

1. For mounting beam to truss chord connection details, see Revised Standard Plan RSP S115.
2. For horizontal and vertical position of Extinguishable message, see Project Plans.
3. Beveled washers must be used at the channel member flanges.

**DETAIL C**

Top Truss Chord not shown

**DETAIL D**

Top of Sign

**DETAIL H**

SIGN MOUNTING

**STATE OF CALIFORNIA**

DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS-VERSATILE TRUSS EMS AND FLASHING BEACON DETAILS

REvised STANDARD PLAN RSP S124

NOTES:
Use cone spacing X for taper segments, Y for tangent segments or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.
Provide at least one person to continuously maintain traffic control devices for lane closures.

Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.

Sign must be equipped with at least two flags for daytime closures. Flags must be orange in color and at least 16 inches by 16 inches in size. Place flags where they can be seen by oncoming traffic.

A D20-4 "END ROAD WORK" sign shall be placed at the end of the lane closure, unless the end of work area is obvious or ends within the larger project’s limits.

An optional C29(CA) sign may be placed below the C9A(CA) sign.

Length may be reduced by the Engineer to address site conditions.

Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type 1, 2, or 3.

If C45(CA) is not used, measure distance C from W20-4.

Distance X, Y, or Z cone spacing is shown on this sheet.

Flags must be orange in color and at least 16 inches by 16 inches in size. Place flags where they can be seen by oncoming traffic.

Provide at least one person to continuously maintain traffic control devices for lane closures.

Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.

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Length may be reduced by the Engineer to address site conditions.

Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type 1, 2, or 3.

If C45(CA) is not used, measure distance C from W20-4.
LEGEND:
- TRAFFIC CONE
- TEMPORARY TRAFFIC CONTROL SIGN
- PORTABLE FLASHING BEACON
- TRAILER
- FLAGGER
- PORTABLE CHANGEABLE MESSAGE SIGN

SIGN PANEL SIZE (Min):
- 48" x 48"

NOTES:
1. Sign must be equipped with at least two flags for daytime closures.
   Flags must be orange in color and at least 16 inches by 16 inches in size.
   Place flashing beacons as shown for closures during hours of darkness.
2. See Standard Plan T9, Table 3 for advanced warning sign spacing.
REVERSIBLE TRAFFIC CONTROL WITH ADDITIONAL FLAGGERS
FOR SIDE ROADS AND BUSINESS DRIVEWAYS

REVERSIBLE TRAFFIC CONTROL WITH SIGNS
FOR RESIDENTIAL DRIVEWAYS AND LOW VOLUME SIDE ROADS

NOTES:
1. Place W3-4(CA) sign when pilot car is used.
2. Place C80(CA) sign when pilot car is not used.
3. Sign must be equipped with at least two flags for daytime closures.
   Flags must be orange in color and at least 16 inches by 16 inches in size.
   Place flashing beacons as shown for closures during hours of darkness.
4. See Standard Plan T9, Table 3 for advance warning sign spacing.

LEGEND:
- TRAFFIC CONE
- TEMPORARY TRAFFIC CONTROL SIGN
- PORTABLE FLASHING BEACON
- FLAGGER

SIGN PANEL SIZE (MIN):
- 48" x 48"
- 36" x 42"
NOTES:

1. Either a changeable message sign or a SC10(CA) sign panel and a Type III flashing arrow sign shall be mounted on the rear of sign vehicle V1. The changeable message sign shall be positioned to show the "ROAD WORK AHEAD" message first, followed by the "RIGHT LANE CLOSED" message. For median lane closures, the flashing arrow symbol shall be reversed with the arrowhead on the right and the changeable message sign shall show "LEFT LANE CLOSED".

2. If traffic queues develop, sign vehicle V1 should be positioned upstream from the end of curve. Sign vehicle V1 shall be positioned where highly visible when shoulders are not available.

3. A minimum sight distance of 1500' should be provided in advance of sign vehicle V1.

4. Sign vehicle V1 should remain at the beginning of horizontal or vertical curves until the other vehicles (V2 and V3) are far enough beyond the curve to resume the minimum sight distance of 1500'.

5. Vehicle-mounted sign panels shall have Type II or above retroreflective sheathing, black or white, or black on fluorescent orange, with 6" minimum series D letters per Caltrans sign specifications.

6. Shadow vehicle V2 shall be equipped with a truck-mounted attenuator. The sign panel shown, and a Type III flashing arrow sign shall be mounted on the rear of shadow vehicle V2. For median lane closure, the flashing arrow sign shall be displayed with the arrowhead on the right.

7. All vehicles used for lane closures shall be equipped with two-way radios, and the vehicle operators shall maintain communication during the work or application operation.

8. All vehicles shall be equipped with flashing or rotating amber lights.

9. If sign vehicle V1 encroaches into the traffic lane due to insufficient shoulder width, sign vehicle V1 shall be equipped with a truck-mounted attenuator. Sign vehicle V1 shall stay as close to the edge of shoulder as practicable.

10. Where workers would be on foot in the work area, a stationary type lane closure (Standard Plan T10, T11, etc., as applicable) shall be used instead of this plan.

11. For moving lane closure on interior lane of multilane highways, use Standard Plan T16.

12. The spacing between work vehicles and the shadow vehicles, and between each shadow vehicle should be minimized to deter road users from driving in between.

13. When the work/application vehicle V3 occupies the median lane, sign vehicle V1 should drive in the median shoulder and indicate left lane closed ahead.

MOVING LANE CLOSURE ON MEDIAN LANE OR OUTSIDE LANE OF MULTILANE HIGHWAYS

LEGEND

V1 SIGN VEHICLE
V2 SHADOW VEHICLE
V3 WORK/APPLICATION VEHICLE
CAMS FLASHING ARROW SIGN (FAS)
CMS CHANGEABLE MESSAGE SIGN
TMA TRUCK-MOUNTED ATTENUATOR

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM
FOR MOVING LANE CLOSURE
ON MULTILANE HIGHWAYS

REVISED STANDARD PLAN RSP T15
DATED APRIL 19, 2019
SUPERSEDES STANDARD PLAN T15
DATED MAY 31, 2018

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NOTES:
1. Duplicate sign installations are not required:
   a) On opposite shoulder if at least one-half of the available lanes remain open to traffic.
   b) In the median if the width of the median shoulder is less than 8 ft and the outer lanes
      are to be closed.
2. Where speed limit reduction zones are longer than 3 miles, place intermediate R2-1 sign and G20-5aP
   plaque at approximate 3-mile spacing throughout the speed limit reduction zone.
3. Place an R2-1 sign and G20-5aP plaque at each entrance ramp within the speed limit reduction zone.
4. The distances shown for sign spacing are approximate, are intended as guidance only, and should be applied with engineering judgement. The distances should be adjusted by the Engineer
   for field conditions, if necessary, by increasing or decreasing the recommended distances.

Place an R2-1 sign and G20-5aP plaque at each entrance ramp within the speed limit reduction zone.

The distances shown for sign spacing are approximate, are intended as guidance only, and should be applied with engineering judgement. The distances should be adjusted by the Engineer
for field conditions, if necessary, by increasing or decreasing the recommended distances.

Atifa Ferouz  C80402  3-31-21
1. See Standard Plan T9 for Table 3 showing advanced warning sign spacing.
2. If the PCMS is outside the W20-1 construction area sign, place a W20-1 sign in advance of the PCMS.
3. Place additional R2-1 sign and G20-5aP plaque:
   a. Where speed limit reduction zones are longer than 3 miles, place intermediate signs at approximately 3-mile spacing throughout the speed limit reduction zone.
   b. Approximately 500 feet downstream from major intersections within the speed limit reduction zone.

Lane closure traffic control devices shown for reference only. See Standard Plans for Traffic Control System for required lane closure traffic control devices and spacing.
**NOTES:**

1. See Standard Plan T9 for Table 3 showing advanced warning sign spacing.
2. Duplicate sign installations are not required.
   a) On opposite shoulder if at least one-half of the available lanes remain open to traffic.
   b) In the median if the width of the median shoulder is less than 8' and the outside lanes are to be closed.
3. If the PCMS is inside the R20-1 construction zone sign, place a R20-1 sign in advance of the PCMS.
4. Place the R3(CA) sign 400 feet downstream from the end of the last work area and place an additional vehicle speed feedback sign system 400 feet upstream from the beginning of each work area with a separation of more than 2 miles.
5. The distances shown for sign spacing are approximate, are intended as guidance purposes only, and should be applied with engineering judgement. The distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommended distances.

Duplicate sign installations are not required. See Standard Plan T9 for Table 3 showing advanced warning sign spacing.

### Multiple Speed Reduction Steps Within Traffic Control System

- **XX Zone Ahead** will be enforced.

### State of California
**Department of Transportation**

**Traffic Control System Construction Work Zone Speed Limit Reduction Details**

No Scale


**Rev. 3-2018 (RSP T20)**

**2018 Revised Standard Plan RSP T20**

**2018 REVISED STANDARD PLAN RSP T20**

**2018 REVISED STANDARD PLAN RSP T20**
NOTES:
1. See Standard Plan T9 for Table 3 showing advanced warning sign spacing.
2. Duplicate sign installations are not required:
   a. On opposite shoulder if at least one-half of the available lanes remain open to traffic.
   b. In the median if the width of the median shoulder is less than 8' and the outside lanes are to be closed.
3. Place additional R2-1 sign and G20-5aP plaque:
   a. Where speed limit reduction zones are longer than 3 miles, place intermediate sign at approximately 3-mile spacing throughout the speed limit reduction zone.
   b. At each entrance ramp within the speed limit reduction zone.
   c. Approximately 500 feet downstream from major intersections within the speed limit reduction zone.
4. Place appropriate advanced warning sign for the roadway condition that requires the construction zone speed limit reduction.
5. Where speed limit reduction zones are longer than 3 miles, place additional appropriate advanced warning signs intermediate at approximately 3-mile spacing throughout the speed reduction zone.
TYPICAL SPEED LIMIT REDUCTION WITH REVERSIBLE TRAFFIC CONTROL SYSTEM
FOR CONSTRUCTION WORK ZONE
SPEED LIMIT REDUCTION ON
TWO LANE CONVENTIONAL HIGHWAYS

NOTES:
1. See Standard Plan T9, Table 3 for advanced warning sign spacing.
2. The distance B to the PCS is measured from the C29 (CA) sign or the PCMS at the Advance Flagger Station.
3. If rumble strips are not used, the distance D to the PCS is measured from the W20-4.

Lane closure traffic control devices shown for reference only, see Revised Standard Plans RSP T13 and RSP T13A for Traffic Control System for required lane closure traffic control devices and spacing.

TYPICAL SPEED LIMIT REDUCTION WITH REVERSIBLE TRAFFIC CONTROL
**NOTE:**
1. Channelizing devices shown adjacent to the mobile barrier may be removed or not placed while the mobile barrier is stationary, but must be placed or replaced as the barrier moves within the work area.


---

**LEGEND:**
- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL)
- TEMPORARY TRAFFIC CONTROL SIGN
- TYPE II FLASHING ARROW SIGN
- FAS SUPPORT OR TRAILER
- PORTABLE CHANGEABLE MESSAGE SIGN
- REPOSITIONING MOBILE BARRIER

---

**MOBILE BARRIER SYSTEM**

MOBILE BARRIER WITHIN TRAFFIC CONTROL SYSTEM

IN LANE ADJACENT TO WORK AREA

---

**MOBILE BARRIER WITHIN TRAFFIC CONTROL SYSTEM**

IN LANE ADJACENT TO WORK AREA

---

**STATE OF CALIFORNIA**

DEPARTMENT OF TRANSPORTATION

REVISED STANDARD PLAN RSP T24

---

**MOBILE BARRIER SYSTEM**

NO SCALE


---

**REisOpenable STANDARD PLAN RSP T24**

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12-22-20

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1. Channelizing devices shown adjacent to the mobile barrier may be removed or not placed while the mobile barrier is stationary, but must be placed or replaced as the barrier moves within the work area.

NOTE:
1. Channelizing devices shown adjacent to the mobile barrier may be removed or not placed while the mobile barrier is stationary, but must be placed or replaced as the barrier moves within the work area.
2. See Standard Plan No. 96 for details.

LEGEND:
- Traffic Cone
- Traffic Cone (Optional)
- Temporary Traffic Control Sign
- Type II Flashing Arrow Sign
- Gas Support or Trailer
- Portable Changeable Message Sign
- Repositioning Mobile Barrier

MOBILE BARRIER WITHIN REVERSIBLE TRAFFIC CONTROL SYSTEM

MOBILE BARRIER WITHIN SHOULDER TRAFFIC CONTROL SYSTEM


See Table 2

See Note 1

See Note 2

Traffic control devices shown for reference only. See Traffic Control System Standard Plans for required traffic control devices and spacing.

State of California
Department of Transportation

MOBILE BARRIER SYSTEM

NO SCALE


REVISED STANDARD PLAN RSP T25
**LEGEND:**
- Portable Vehicle Speed Sensor
- Traffic Cone
- Traffic Cone (Optional Taper)
- Portable Flashing Beacon
- Sign
- Support or Trailer
- Location
- Flashing Arrow Sign
- Portable Changeable Message Sign (PCMS)

**OPERATIONAL GUIDELINE FOR PCMS MESSAGES**

**FOR POSTED SPEED LIMIT 55 MPH**

<table>
<thead>
<tr>
<th>MESSAGE AT</th>
<th>SENSOR AT</th>
<th>SENSOR AT</th>
<th>SENSOR AT</th>
<th>SENSOR AT</th>
</tr>
</thead>
<tbody>
<tr>
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<td>&gt; 45</td>
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<td>&gt; 45</td>
<td>&gt; 45</td>
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<td>SLOW TRAFFIC 2 MILES</td>
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<td>&gt; 45</td>
<td>&gt; 45</td>
<td>25 &lt; V &lt; 45</td>
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<tr>
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<td>&gt; 45</td>
<td>25 &lt; V &lt; 45</td>
<td>25 &lt; V &lt; 45</td>
<td>---</td>
</tr>
<tr>
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<td>25</td>
<td>25</td>
<td>325</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

For other posted speed limits adjust speeds shown on the table by adding or subtracting the calculated speed adjustment using the following formula:

Speed Adjustment = X posted speed limit - 55 mph

Add speed adjustments to speed averages.

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**TEMPORARY AUTOMATED END OF QUEUE WARNING SYSTEM**

**TYPE 1**

*(QUEUE <= 3.5 MILES)*

**NO SCALE**
