Details shown are comparable to Type 736A. Anchors for barrier Types 736 and 736B 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.

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. Post 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, where 6'-6" post spacing cannot be achieved.
**ELEVATION PLAN**

Section D-D

**BARRIER MODIFICATION FOR ELECTROLIER**

- See Note 4

**ELECTROLIER NOTES:**

1. See Project Plans for electrolier and pull box locations.
3. This barrier is designed to accommodate only two 1½" electrical conduct 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.

**CONCRETE BARRIER TYPE 80**

(SHEET 2 of 2)

NO SCALE
Dist

POST MILES
TOTAL PROJECT

ROUTE

SHEET TOTAL
No. SHEETS

FESSIO
RO
N
P
A

REGISTERED CIVIL ENGINEER
D

L
E

R

E

MAXIMUM WALL HEIGHTS

LEGEND:

COUNTY

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

LC1

LC2

LC1

LC1

LC2

PLANS APPROVAL DATE

LC2

THE STATE OF CALIFORNIA OR ITS OFFICERS

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VERTICAL

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11'-0"

24'-0"

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10" x 6" STRETCHERS

27'-0"

20'-0"

27'-0"

31'-0"

THE ACCURACY OR COMPLETENESS OF SCANNED

S

OR AGENTS SHALL NOT BE RESPONSIBLE FOR
.

No.

T
A
T
E

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.
.

Kathryn Griswell

IN E E R

May 31, 2018

G

TYPE C

TYPE B

R E G IS T

E

N

TYPE A

CIVIL
IA
N
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OR
F
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LC2 = LOADING CASE II
y = 4 AND 6 FOR BATTERED

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LOADING CASE I & II

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9'-0"

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30'-0"

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10'-0" Max

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6'-0" Max

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Max

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6'-0"

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EMBANKMENT SLOPE

2018

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Max

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2'-0"

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Max

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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7'-0"

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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


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 6" inch, where a gap of 6" inch to 12" inch exists, a 1/4" inch pad of asphalt felt or sheet neoprene shall be placed between the bearing surfaces. For wall Types B and C, a 1/4" inch asphalt felt pad or sheet neoprene shall be placed between all concrete bearing surfaces below the 29'-10" level.

5. All members may be manufactured to dimensions 1/4" inch greater in thickness and stretchers 1/4" 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 9' high and higher.
### Vertical Wall Height

<table>
<thead>
<tr>
<th>Type</th>
<th>Case</th>
<th>Bearing and $q_u$ (ksf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0</td>
</tr>
</tbody>
</table>

### 1:6 Battered Wall Height

<table>
<thead>
<tr>
<th>Type</th>
<th>Case</th>
<th>Bearing and $q_u$ (ksf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0</td>
</tr>
</tbody>
</table>

### 1:4 Battered Wall Height

<table>
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<th>Case</th>
<th>Bearing and $q_u$ (ksf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6 3.8 4.0 4.2 4.4 4.6 4.8 5.0 5.2 5.4 5.6 5.8 6.0 6.2 6.4 6.6 6.8 7.0 7.2 7.4 7.6 7.8 8.0</td>
</tr>
</tbody>
</table>

### Design Footnote:
- Nominal soil bearing resistance design loads, settlement, and anchorage loads should be determined by methods based on a site specific investigation. The minimum load shall be designed in accordance with soil bearing resistance less than 3 ksf.
- Indicates maximum allowable wall height for particular wall type and particular loading case.
- Indicates maximum allowable wall height for particular wall type and particular loading case.
The plan shows the approximate location of devices within the clearances within the service equipment enclosure shall be maintained. In unpaved areas a raised portland cement concrete pad 2'-0" x 4" x width of foundation shall be constructed in front of new service equipment enclosure installation. Pad shall be set to elevation of foundation. 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. Type A-F and Type B-F service equipment enclosures shall have the meter viewing windows located on the front side of the service equipment enclosure. Similarly constructed as Type A-F and Type B-F respectively, except the meter viewing windows shall be located on the back side of the service equipment enclosure. The service equipment enclosure associated with working components may be rearranged, however, the "working" area must be maintained. Components may be rearranged, however, the "working" area (SERVICE EQUIPMENT ENCLOSURE NOTES TYPE EN SERIES)
NOTES:
1. Cabinet dimensions are nominal.
2. Cabinet fan may be installed at an alternate location near the top of the cabinet when approved by the Engineer.
NO SCALE

ELECTRICAL SYSTEMS

BBS CABINET

NC NO NC NO MBPS UPS

BP UPS AC+ IN

AC OUTPUT

AC INPUT

NC

NO

N

N

NC

N

N

UPSC

AC+ OUT

LOW Batt

RELAY A

RELAY B

RELAY C

TIMER

TE S T P O I N T S

IN P U T

NG

AC+

AC+

AC+

AC+

INVERTER/CHARGER UNIT

On Batt

Temp PROBE

Batt

Batt VO LT AG E

+ -

Temp PROBE

AC + LINE

CONTROLLER CABINET

TO CONTROLLER CABINET

PER BATTERY

20 HOUR RATE

AT AMPERE-HOURS 75 TO 80

PER BATTERY 20 HOUR RATE AT AMPERE-HOURS 75 TO 80

(4 TO 8 BATTERIES)

BATTERY SET HARNESS

BATT VOLTA GE

TEMP SENSOR

MANUFACTURER PREWIRED FROM ENCLOSURE SERVICE EQUIPMENT 2-WIRE Ckt FROM SINGLE-PHASE, 120 V

FILTER

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIAGRAM, WITHOUT BYPASS CONTROL LINE

1-30-18

ES-3L

2018 STANDARD PLAN ES-3L

No. Exp. Reg.

P R O F E S S I O N A L

E L E C T R I C A L

E N G I N E E R

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Zolfaghari Hamid

E15636 12-31-19

ELECTRICAL

May 31, 2018

STAT

O F C A L I F O R N I A

E R A L I C A L

R E G I S T E R E D

E N G I N E E R

O N I A
SAFETY RAILING ELEVATION

SECTION D-D

END POST HINGE - PLAN

CENTER POST HINGE - PLAN

TYPICAL BOLTED (ALTERNATIVE)

HINGED CONNECTION

NOTE:
alternative venting methods may be used if approved by the Engineer.

NOTE:
See Standard Plans 5101 and 5105 of drawings for walkway bracket spacing.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGN-TRUSS
SINGLE POST TYPE
WALKWAY SAFETY RAILING DETAILS
CHANGEABLE MESSAGE SIGNS
MODEL 500 AND 510

NO SCALE
END SAFETY LUG DETAIL

INTERIOR SAFETY LUG DETAIL

END SAFETY CABLE DETAIL

BACKSIDE WELD LUG DETAIL

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

1. Adjust 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.
NOTES:
1. All gussets to be same height.
2. Provide a smooth transition from gusset plate to tube.

LEGEND
NEW
REMOVAL

BASE PLATE
PIPE WALL
GUSSET PLATE

GRIND SMOOTH TO
BB
A
A

INITIAL PROFILE AT TOP
OF GUSSET PLATE BEFORE
GRINDING OPERATION

REPLACE EXCESS MATERIAL
GRIND SMOOTH TO
150 MICROINCHES

LIMITS OF CJP WELD

INITIAL PROFILE FILLET
WELD AT END OF PLATE

ENING FILLET CONTINUES AROUND
END OF PLATE

REINFORCING FILLET CONTINUES AROUND
END OF PLATE

LIM TS OF CJP WELD

SECTION A-A
SECTION B-B

WASHINGTON, D.C. DEPARTMENT OF TRANSPORTATION

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

REGISTERED CIVIL ENGINEER
C57793

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COVID-19 JANUARY 2021

LEFT EDGE LINES

DETAIL 24
(DIVIDED HIGHWAYS)
See Note

DETAIL 25

DETAIL 25A

DETAIL 25B

DETAIL 26

DETAIL 26A

DETAIL 26B

DETAIL 27

RIGHT EDGE LINES

DETAIL 27A
DETAIL 27A DELETED

DETAIL 27B

RIGHT EDGE LINE EXTENSION THROUGH INTERSECTIONS

DETAIL 27C

DETAIL 30
DETAIL 30 DELETED

MEDIAN ISLANDS

DETAIL 28

DETAIL 29

DETAIL 31

TWO-WAY LEFT TURN LANES

DETAIL 32

INTERSECTION TREATMENTS

DETAIL 33
DETAIL 33 DELETED

LEGEND

MARKERS

TYPE D TWO-WAY RETROREFLECTIVE

TYPE H ONE-WAY RETROREFLECTIVE

TYPE RY RED-YELLOW RETROREFLECTIVE

LINES

6" WHITE

6" YELLOW

MARKER DETAILS

Type RY Type H

AND TYPE RY

TYPE RY

RETROREFLECTIVE FACE

Pavement Markers and Traffic Lines Typical Details

No Scale

State of California

Department of Transportation

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**MARKERS**

- **DETAIL 36**
  - Theoretical Gore
  - EDGE OF TRAVELED WAY (MAINLINE)
  - EDGE OF TRAVELED WAY (RAMP)
  - SEE DETAIL 27B
  - SEE DETAIL 25A
  - EDGE OF TRAVELED WAY (RAMP)
  - 6" WHITE LINE
  - 6" YELLOW LINE

**ENTRANCE RAMP NEUTRAL AREA (MERGE) TREATMENT**

- **DETAIL 36A**
  - 6" WHITE LINE
  - 12" WHITE LINE
  - EDGE OF TRAVELED WAY (MAINLINE)
  - SEE DETAIL 27B
  - SEE DETAIL 25A
  - EDGE OF TRAVELED WAY (RAMP)
  - 6" WHITE LINE
  - 6" YELLOW LINE

**ENTRANCE RAMP NEUTRAL AREA (ACCELERATION LANE) TREATMENT**

- **DETAIL 36B**
  - 6" WHITE LINE
  - 12" WHITE LINE
  - EDGE OF TRAVELED WAY (MAINLINE)
  - EDGE OF TRAVELED WAY (RAMP)
  - SEE DETAIL 27B
  - SEE DETAIL 25A
  - EDGE OF TRAVELED WAY (RAMP)
  - 6" YELLOW LINE

**CHEVRON PAVEMENT MARKINGS**

- **DETAIL 37**
  - LANE DROP AT EXIT RAMPS
  - SEE DETAIL 36

- **DETAIL 37A**
  - DETAIL 37A DELETED

- **DETAIL 37B**
  - LANE DROP AT INTERSECTIONS
  - SEE DETAIL 36

- **DETAIL 37C**
  - DETAIL 37C DELETED

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

- SEE DETAILS 36A OR 36B
  - 50'

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

- SEE DETAILS 36A OR 36B
  - 50'

**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.

**LEGEND:**

- **MARKERS**
  - TYPE C RED-CLEAR RETROREFLECTIVE
  - TYPE G ONE-WAY CLEAR RETROREFLECTIVE
  - TYPE RY RED-YELLOW RETROREFLECTIVE
  - RETROREFLECTIVE FACE
NOTE:


TYPICAL LANE LINE OR RIGHT EDGE LINE CONTRAST DETAIL
PREFERENTIAL LANE LINES

DETAIL 42

DETAIL 43

DETAIL 43A

DETAIL 44A

DETAIL 44B

DETAIL 45

LEGEND

MARKERS

TYPE C RED-CLEAR RETROREFLECTIVE

LINES

8" WHITE LINE

MARKER DETAILS

TYPE C

RETROREFLECTIVE FACE

* 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 deal 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:
- Type C: Two-Way Red-Clear Retroreflective
- Type RY: Two-Way Red-Yellow Retroreflective
- Type R: One-Way Red Retroreflective

Lines:
- 6" White
- 6" Yellow

Type C and Type RY

Type R

See Notes 1, 2, and 3

Type R one-way red retroreflective markers.
NOTES:

1. If a message consists of more than one word, it must read as a word, the first word must be nearest the gride.

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 to two times the height in 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.

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.
YIELD LINE AT EXIT RAMP

LIMIT LINE (STOP LINE) AT EXIT RAMP

LIMIT LINE (STOP LINE)

YIELD LINE

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 vehicles that travel up the ramp with the red reflective side facing the intersection.

MARKER DETAILS

LEGEND:
- Type R one-way red retroreflective

MARKERS

TYPE R

LIMIT LINE (STOP LINE)

YIELD LINE

TYPE R ARROW AT EXIT RAMP

NOTE:
- White series of isosceles triangles
- White line
- Red reflective blank

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKINGS
YIELD LINES, LIMIT LINES,
AND WRONG WAY DETAILS

NO SCALE

RSP A24G DATED APRIL 16, 2021 SUPERSEDES RSP A24G

REVISED STANDARD PLAN RSP A24G

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April 16, 2021

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKINGS
YIELD LINES, LIMIT LINES,
AND WRONG WAY DETAILS

NO SCALE

RSP A24G DATED APRIL 16, 2021 SUPERSEDES RSP A24G

REVISED STANDARD PLAN RSP A24G

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April 16, 2021
NOTES:
1. For shoulder, edge line, and center line rumble strip details, see Standard Plans A40B, A40C, and A40D.
2. See Project Plans and Standard Plan A20A and Revised Standard Plan RSP A20B for pavement markers and traffic lines typical details.

SINUSOIDAL RUMBLE STRIP DETAILS
GROUND-IN INDENTATIONS

---

**Elevations Section A-A**

**Location**

<table>
<thead>
<tr>
<th>Location</th>
<th>Shoulder Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>b</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>c</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>d</td>
<td>5/8&quot;</td>
</tr>
<tr>
<td>e</td>
<td>1/2&quot;</td>
</tr>
</tbody>
</table>

**Placement in Passing Zone - One Direction**

**Placement in No Passing Zone Plan**

**Typical Shoulder Placement**

**Typical Centerline Placement**

**Typical Edge Line Placement**

**Right of Direction of Travel**

**Left of Direction of Travel**

---

*State of California Department of Transportation*

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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
SURCHARGE NOTES:

A. Bridge embankment surcharges to be placed at locations and to the heights listed in the special provisions.

B. Surcharge slopes to be as steep as stability of material permits.
IN TRENCH

MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 1

<table>
<thead>
<tr>
<th>COVER</th>
<th>MINIMUM CLASS AND D-LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0' - 7.9'</td>
<td>CLASS D 10000</td>
</tr>
<tr>
<td>8.0' - 9.9'</td>
<td>CLASS D SPECIAL 10000</td>
</tr>
<tr>
<td>10.0' - 11.9'</td>
<td>CLASS X 20000</td>
</tr>
<tr>
<td>12.0' - 13.9'</td>
<td>CLASS X SPECIAL 20000</td>
</tr>
<tr>
<td>14.0' - 16.9'</td>
<td>CLASS X 30000</td>
</tr>
<tr>
<td>16.0' - 18.9'</td>
<td>CLASS X SPECIAL 30000</td>
</tr>
<tr>
<td>20.0' - 24.0'</td>
<td>CLASS X 50000</td>
</tr>
<tr>
<td>25.0' - 29.0'</td>
<td>CLASS X SPECIAL 50000</td>
</tr>
<tr>
<td>30.0' - 34.9'</td>
<td>CLASS X 100000</td>
</tr>
<tr>
<td>35.0' - 41.9'</td>
<td>CLASS X SPECIAL 100000</td>
</tr>
<tr>
<td>42.0' - 50.0'</td>
<td>CLASS X 300000</td>
</tr>
</tbody>
</table>

See Notes 6 and 9

METHOD 1

IN EMBANKMENT

MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 2

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<thead>
<tr>
<th>COVER</th>
<th>MINIMUM CLASS AND D-LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0' - 2.9'</td>
<td>CLASS D 10000</td>
</tr>
<tr>
<td>3.0' - 3.9'</td>
<td>CLASS D SPECIAL 10000</td>
</tr>
<tr>
<td>4.0' - 4.9'</td>
<td>CLASS D SPECIAL 20000</td>
</tr>
<tr>
<td>5.0' - 5.9'</td>
<td>CLASS D SPECIAL 30000</td>
</tr>
<tr>
<td>6.0' - 6.9'</td>
<td>CLASS D SPECIAL 50000</td>
</tr>
<tr>
<td>7.0' - 7.9'</td>
<td>CLASS D SPECIAL 100000</td>
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<tr>
<td>8.0' - 8.9'</td>
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<tr>
<td>9.0' - 9.9'</td>
<td>CLASS D SPECIAL 300000</td>
</tr>
<tr>
<td>10.0' - 10.9'</td>
<td>CLASS D SPECIAL 500000</td>
</tr>
</tbody>
</table>

See Notes 8 and 9

METHOD 2

IN EMBANKMENT

MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 3

<table>
<thead>
<tr>
<th>COVER</th>
<th>MINIMUM CLASS AND D-LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5' - 2.0'</td>
<td>CLASS D 10000</td>
</tr>
<tr>
<td>2.0' - 2.5'</td>
<td>CLASS D SPECIAL 10000</td>
</tr>
<tr>
<td>2.5' - 3.0'</td>
<td>CLASS D SPECIAL 20000</td>
</tr>
<tr>
<td>3.0' - 3.5'</td>
<td>CLASS D SPECIAL 30000</td>
</tr>
<tr>
<td>3.5' - 4.0'</td>
<td>CLASS D SPECIAL 50000</td>
</tr>
<tr>
<td>4.0' - 4.5'</td>
<td>CLASS D SPECIAL 100000</td>
</tr>
<tr>
<td>4.5' - 5.0'</td>
<td>CLASS D SPECIAL 200000</td>
</tr>
<tr>
<td>5.0' - 5.5'</td>
<td>CLASS D SPECIAL 300000</td>
</tr>
<tr>
<td>5.5' - 6.0'</td>
<td>CLASS D SPECIAL 500000</td>
</tr>
</tbody>
</table>

See Notes 7 and 10

METHOD 3

IN EMBANKMENT

NOTES:

1. Unless otherwise shown on the plans or specified in the special provisions, the Contractor shall have the option of selecting the class of RCP and the method of backfill to be used, provided the height of cover does not exceed the value shown for the RCP selected.

2. Backfill shall be placed full width of excavation except where dimensions are shown.

3. Backfill shall be constructed prior to excavation.

4. Slope or shore excavation sides as necessary.

5. Embankment height prior to excavation for installation of all classes of RCP under Methods 2 and 3 shall be as follows:
   - Pipe sizes 2'-0" to 5'-0", ID = 3'-0"
   - Pipe sizes larger than 5'-0", ID = 5'-0"

6. The maximum size for all classes of RCP placed under Method 1 is 6'-0" ID.

7. Non-reinforced precast pipe sizes 1'-0" or smaller may also be placed under Methods 2 and 3.

8. Oval or arch shaped RCP shall be placed under Method 2 only.

9. Embankment compaction requirements govern over the 90% relative compaction requirement within 2'-6" of finished grade.

10. Backfill shall be placed full width of excavation except where dimensions are shown for backfill width or thickness. Dimensions shown are minimums.

11. The fill height allowed shall not exceed that shown for the cast-in-place pipe.
INSTALLATION TYPE 1:
The backfill and outer bedding shall be compacted to a
minimum 90 percent relative compaction. In addition, the
minimum sand equivalent in these areas shall be 30 and
the maximum percentage passing the No. 200 sieve size shall be 12.

INSTALLATION TYPE 2:
The backfill and outer bedding shall be compacted to a
minimum 90 percent relative compaction. In addition, the
minimum sand equivalent in these areas shall be 25.

INSTALLATION TYPE 3:
The backfill and outer bedding shall be compacted to a
minimum 85 percent relative compaction. The height of cover does not exceed the value shown for the
RCP selected.

1. Unless otherwise shown on the plans or specified in the special
   provisions, the Contractor shall have the option of selecting the
class of RCP and the type of installation to be used, provided
the height of cover does not exceed the value shown for the
RCP selected.
   a) Class I Special or stronger with Installation Type 1.
   b) Class II or stronger with Installation Type 2.
   c) Class III Special or stronger with Installation Type 3.

2. The class of RCP and Installation Type selected shall be the same
throughout the length of any given culvert.

3. The "length of any culvert" is defined as the culvert between:
   a) Successive drainage structures (intlet, junction boxes,
headwalls, etc.).
   b) A drainage structure and the inlet or outlet end of
the culvert.
   c) The inlet and outlet end of the culvert when there are no
   intervening drainage structures.

4. Oval and arch shaped RCP shall not be used.

5. Beading depth (lb/ft), not less than 3" for soil foundation
   and not less than 6" for rock foundation.

6. Shallow cement backfill may be substituted for backfill in the
   outer bedding and haunch areas. If slurry is used, the outer
   and middle beddings shall be omitted. Prior to installation, the soil
   under the middle OD of the outside diameter of the pipe shall be
   hardened by consolidating or otherwise to a minimum depth of
   12". Where slurry cannot be used, clear distance to trench wall may be reduced as set forth in the
   Standard Specifications.

7. Backfill shall be placed full width of excavation except where
   dimensions are shown for backfill width or thickness. Dimensions
   shown are minimum.

8. Lower side shall meet the requirement of AASHTO-CA BDS for Standard
   Specifications. Otherwise it shall be considered unsuitable as set
   forth in the Standard Specifications. See Note 1.

9. Where the pipe is placed in a trench, if the trench walls are sloped
   at 5 vertical to 1 horizontal or steeper for at least 90 percent of
   the trench height or up to not less than 13" from the grading
   plane, the firmness of the soil in the lower side need not be
   considered.

LEGEND:

- ROADWAY EMBANKMENT
- EMBANKMENT TRENCH
- STRUCTURE BACKFILL (CULVERT) FOR LOOSE BACKFILL
- STRUCTURE BACKFILL (CULVERT) FOR OUTER BEDDING
- STRUCTURE EXCAVATION (CULVERT)
- OUTER BEDDING
- LOOSE BACKFILL
- WILTE BEDDING
- 1/2 OD
- 1/4 OD
- 1 1/2 OD
- 3 1/2 OD
- 5 1/2 OD
- 7 1/2 OD
- SLOPE OR SURFACE AS NECESSARY
- 2' MIN SEE NOTE 6
- LENSIVE SIDE SEE NOTES 8 AND 9
- EXCAVATION
- 2' MIN SEE NOTE 6

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

EXCAVATION AND BACKFILL CONCRETE PIPE CULVERTS
INDIRECT DESIGN METHOD

NO SCALE
RSP A62DA DATED OCTOBER 15, 2021 SUPERSEDES STANDARD PLAN A62DA

REVISED STANDARD PLAN RSP A62DA
EXCAVATION AND BACKFILL PRECAST REINFORCED CONCRETE BOX CULVERT

NOTES:
1. Slope or shore excavation slopes as necessary.
2. Dimensions shown are minimum.
4. Construction of roadway pavement structure in Method 2 or Method 3 shall not disturb the external sealing bond installation.
All information shall be in U.S. Customary units (miles).

**OBJECT MARKERS**


as directed by the Engineer.

**METAL POST DETAIL**

DATED OCTOBER 19, 2018 AND STANDARD PLAN A73B

"BK" (Back), "AH" (Ahead), or a blank space shall apply when directed by the Engineer.

Orange retroreflective.

Red retroreflective.

Yellow retroreflective.

N-3(CA).

"BEGIN" or "END" shall apply as directed by the Engineer.

8'-0" for Type P object marker

A post mile prefix, such as "R", shall apply only with black Series D numerals and letters.

2. 1.

The marker body shall be white (non-reflective) background with white (non-reflective) Series C letters.

The marker shall be white (non-reflective) target plate with black Series C numbers and letters.

The marker header shall be green (non-reflective) background with white (non-reflective) Series C letters.

The marker shall be white (non-reflective) target plate with black Series D numerals and letters.

TYPE N-1 (CA), N-2 (CA), N-3 (CA)

N-1(CA), yellow retroreflective, N-2(CA) red retroreflective, N-3(CA), orange retroreflective.

**MILEPOST MARKER NOTES:**

1. The marker header shall be green (non-reflective).

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.

**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.
4. Where roadbed offset is greater than 1½", see Concrete Barrier Type 60MC.
5. See Project Plans for barrier delineation locations.
6. Reinforcing stirrup not required for roadbed offsets less than 1½".
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. For roadbed surfaces offset greater than 12" and less than or equal to 36", use two #4 Reinf at 3" above the lower roadbed surface and two #4 Reinf at every 8" increment vertical spacing above the first two #4 Reinf. 
8. For weep hole alignment and drainage details not shown, see Standard Plans B0-3 and B3-5.
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

SECTION A-A

CONCRETE BARRIER TYPE 60MS

SECTION B-B

CONCRETE BARRIER TYPE 60MS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER TYPE 60MS

NO SCALE

REvised STANDARD PLAN RSP A76H

2018 REVISED STANDARD PLAN RSP A76H
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 A76 series of the Standard Plans. For details of concrete barrier Type 60, see the A78 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 A76A.
5. Taper the top of the end of the concrete barrier od 4:1 to match the top elevation of the thrie beam rail element.
6. For details not shown, see Standard Plan A76A.

For details not shown, see Standard Plan A76A.

For details of the thrie beam element and hardware, see the A76 series of the Standard Plans. For details of concrete barrier Type 60, see the A78 series of the Standard Plans.

Concrete barrier Type 60, see the A76 series of the Standard Plans. For details of concrete barrier Type 60, see the A78 series of the Standard Plans.

Concrete barrier Type 60, see the A76 series of the Standard Plans. For details of concrete barrier Type 60, see the A78 series of the Standard Plans.
RAIL ELEMENT

SECTION THRU

1. 10" x 2 1/2" bolts and nut 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. Connect the overlapped end of the rail elements with 3 1/4" x 1 1/2" button head oval shoulder splice bolts inserted into the 1/2" x 1 1/2" slots and bolted together with 3 1/4" recessed hex nuts. Heads of hex nut points toward rail element. A total of 8 bolts and nuts with 1/2" Ø button head spliced into the 3/8" x 2 1/2" slots for bolted connection to line post. See Note 16.
5. For details of MGS connection to abutments and walls, see Standard Plan A77U1, A77U2 and A77V1.
6. For details of MGS transition to bridge railing, see Revised Standard Plan RSP A77U4.
7. If railing is connected to terminal system end treatment, use 31" height terminal system and treatment.
8. For details of steel post installations, see Revised Standard Plan RSP A77L2.
9. For details of steel post installations, see Revised Standard Plan RSP A77L2.
10. For additional installation details, see Standard Plan A77N3.
11. For MGS connection details to abutments and walls, see Standard Plan A77U1.
12. For typical MGS delineation and dike positioning details, see Standard Plan A77U3.
13. For MGS connection details to abutments and walls, see Standard Plan A77U2.
14. For MGS connection details to abutments and walls, see Standard Plan A77V1.
15. For additional installation details, see Standard Plan A77N3.
16. For MGS connection details to abutments and walls, see Standard Plan A77U4.
17. See Note 3.
18. See Note 4.
See Note 4

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 A77N2.
3. For details of steel posts and notched wood blocks used to construct MGS, see Standard Plan A77S1.
4. For additional installation details, see Standard Plan A77T2.
5. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
6. For MGS typical layouts, see the ATTF, ATTD and ATTF Series of Standard Plans.
7. If railing is connected to terminal system end treatment, use 31" height terminal system and treatment.
8. For MGS and anchor details, see Standard Plans A77S1 and A77T2.
9. For details of MGS transition to bridge railing, see Revised Standard Plan RSP A77L2.
10. For additional details of MGS connection to bridge railings, see Standard Plans A77U1, A77U2 and A77V1.
11. For details of MGS transition to bridge railing, see Revised Standard Plan RSP A77U4.
12. For details of wood post installations, see Revised Standard Plan RSP A77M1.
13. For details of wood post installations, see Revised Standard Plan RSP A77N1.
14. For details of wood post installations, see Revised Standard Plan RSP A77R4.
15. For details of wood post installations, see Revised Standard Plan RSP A77U4.
16. For dike positioning and MGS delineation details, see Revised Standard Plan RSP A77N4.

MIDWEST GUARDRAIL SYSTEM
STANDARD RAILING SECTION
(STEEL POST WITH NOTCHED WOOD OR NOTCHED RECYCLED PLASTIC BLOCK)

NOTES:

1. Where and gap 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.
2. The ends of the rail elements are to be overlapped in the direction of traffic (see details).
3. Connect the overlapped end of the rail elements with 3/8" x 1 1/2" button head hex shoulder splice bolts inserted into the 3/8" x 1 1/2" slots and bolted together with 3/8" recessed hex nuts. Recess of hex nut points toward road elements. A total of 4 bolts and nuts are to be used for each rail element connection.
4. The rail elements are to be spliced at 12'-6" intervals and 6'-3" nominal.
5. See Note 14.
6" x 8" WOOD POST
See Note 3

8" x 8" WOOD POST
See Note 4

10" x 10" WOOD POST
See Note 5

6" x 8" WOOD BLOCK
See Note 6 and Note 3

8" x 8" WOOD BLOCK
See Note 6 and Note 4

6" x 12" WOOD BLOCK
See Note 8

8" x 12" WOOD BLOCK
See Note 7

NOTES:

1. All holes in wood posts and blocks shall be 3/8" Dia ± 1/16".
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 8" x 8" 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 8" x 7'-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.

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MIDWEST GUARDRAIL SYSTEM
WOOD POST AND
WOOD BLOCK DETAILS

NO SCALE

RSP A77N1 DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A77N1
DATED MAY 31, 2018 – PAGE 61 OF THE STANDARD PLANS BOOK DATED 2018

REVISED STANDARD PLAN RSP A77N1
**Typical Line Post Embodement and Hinge Point Offset Details**

**Midwest Guardrail System**

**Detail A**
- **Typical Roadway Installation**
  - See Note 1
  - **Post Embedment**
    - 6" x 8" x 1'-2"
    - Wood Block
    - Top of Rail
    - Edge of Paved Shoulder or Offset Line of Edge of Traveled Way

**Detail B**
- **Narrow Roadway Installation**
  - See Note 1
  - **Post Embedment**
    - 6" x 8" x 6'-0"
    - Wood Block
    - Top of Rail
    - Edge of Paved Shoulder or Offset Line of Edge of Traveled Way

**Detail C**
- **Installation at Earth Retaining Walls**
  - **Post Embedment**
    - 6" x 8" x 6'-0"
    - Wood Block
    - Top of Rail
    - Edge of Paved Shoulder or Offset Line of Edge of Traveled Way

**Detail D**
- **Hinge Point Offset Details**
  - **Post Embedment**
    - 6" x 8" x 6'-0"
    - Wood Block
    - Top of Rail
    - Edge of Paved Shoulder or Offset Line of Edge of Traveled Way

**Notes:**
1. These installation details also applicable to steel line post installations. For Details A, B, C, and D, where steel line post installations are constructed, W6 x 8.5 or W6 x 9 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 Detail B, where steel line post installations are constructed, as a 1/4 or W6 x 3 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 Plans A77L1 and A77L2.
2. Where the distance between the back of the post and the hinge point is less than 7', see the Project Plans for special details.
3. For dike positioning with MGS installations, see Standard Plan A77N4.
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 A87A.
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 Plans 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 1/2 - 20 self-tapping screws in 0.22" diameter holes or 3/8" bolts in 5/8" diameter holes.
7. 6" 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.

MGS DELINEATION
See Note 5

DIKE POSITIONING
See Note 7

MIDWEST GUARDRAIL SYSTEM
TYPICAL RAILING DELINEATION
AND DIKE POSITIONING DETAILS
NO SCALE

REVISED STANDARD PLAN RSP A77N4
RSP A77N4 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN A77N4
Use this offset for 8-inch block. For 12-inch block, use 4'-0" Min offset.

Where placement of dike is required with MGS installations, see Standard Plan A77T2.

For details of the buried post end anchor used with Type 11C Layout, see Project Plans.

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 1st or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".

For details of the buried post and end anchor used with Type 11C Layout, see Standard Plan A77T2.

Where placement of dike is required with MGS installations, see Standard Plan A77T2 for dike positioning details.

Use this offset for 8-inch block. For 12-inch block, use 4'-0" Min offset.
1. Line post, blocks and hardware to be used are shown on Revised Standard Plan RSP A77L1, RSP A77L2, RSP A77N1, Standard Plans A77N2 and A77M1.

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

3. Except as noted, line posts are 6" x 6" x 6'-0" wood posts, 6" x 8" or 6" x 9" steel posts, 6'-0" in length, with 6" x 6" x 1'-2"-length 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 11F through 11L shown on the A77P Series of Standard Plans, are typically used where MOS is recommended to avoid embankment slope and/or cornering traffic and treatment is required for both directions of traffic.

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 MOS (length equal to multiples of 12'-6" 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 base line (edge of paved shoulder or offset line of edge of the traveled way) is determined on site conditions and should be a length equal to multiples of 12'-6".

8. For details of the buried post end anchor used with Type 11F and 11G Layouts, see Standard Plan A77T2.

9. Where placement of dike is required with MOS installations, see Standard Plan A77N2 for dike positioning details.

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

11. Use this offset for 8-inch block, for 12-inch block, use 4'-0" Min offset.
MIDWEST GUARDRAIL SYSTEM

TYPE 11H LAYOUT
(Embankment 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 A77M1, 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" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
4. Layout Types 11 through 11L, shown on the ATPS 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. 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.
7. Where placement of dike is required with MGS installations, see Standard Plan A77M1 for dike positioning details.
8. Use this offset for 8-inch block. For 12-inch block, use 4'-0" Min offset.

ADDITIONAL HMA DIKE, TYPE C

SEE NOTES 5 AND 6

CALTRANS APPROVED 31" FLARED TERMINAL SYSTEM END TREATMENT

SEE NOTE 6

CALTRANS APPROVED 31" IN-LINE TERMINAL SYSTEM END TREATMENT

SEE NOTE 5

ADDITIONAL HMA DIKE, TYPE C

SEE NOTE 7
1. Line post, blocks and hardware to be used are shown on Revised Standard Plan RSP A77P1.
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. Steel posts, 6'-0" in length, with 6" x 8" x 1'-2" matched wood blocks or 8" x 8" x 1'-2" wood 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 recommended to shield embankment slopes and a crashworthy 31" end treatment is required for dike positioning details.

NOTE 5:
5. 31" in-line terminal system end treatments are used where 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.
6. 10'-0" Min, SEE NOTE 8

NOTE 6:
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. Where placement of dike is required with MGS installations, see Standard Plan A77P5 for dike positioning details.

NOTE 7:
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 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 end anchor used with Type 11I Layout, see Standard Plan A77P1.
11. For typical flare offsets for 25'-0" length parabolic 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.

31" in-line terminal system end treatments are used where site conditions

will not accommodate a 31" flared end treatment.
1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77P1, A77T1 and A77T2, Standard Plans A77N1 and A77M1.

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

3. Wood posts are 4" x 6" x 6'-0" wood with 6'-0" x 1'-2" x 6" notched 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 ATP Series of Standard Plans, are typically used where MGS is required to shield embankment slopes and a crashworthy 31" 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 and treatment to be used will be shown on the Project Plans.

7. Dependent on site conditions (embankment height and side slope), construction of a 31" In-line MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.

8. Where placement of MGS is required with MGS installations, see Revised Standard Plan RSP A77L1 for MGS post positioning details.

9. The 15:1 or flatter flare used with buried end anchors is based on the edge 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 11K and 11L Layouts, see Standard Plan A77T2.

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

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

MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR EMBANKMENTS

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6. Where placement of dike is required with guard railing installations, see Standard Plan A77V4 for dike positioning details.
7. Type 12A or Type 12B Layouts are typically used:
   a. To the right of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
   b. To the left of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
   c. To the left of approaching traffic at the end of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.
   d. To the right of approaching traffic at the end of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.

8. See Note 9 for additional details of typical connections to bridge rail.
9. See Connection Detail A on Standard Plans A77U1 and Connection Detail B on Standard Plans A77V1 and A77V2.
10. For additional details of a typical connection to walls or abutments, see Standard Plan A77U3.
11. Use this offset for 8" block. For 12" block, use 4'-0" Min offset.
12. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
13. For Transition Railing (Type WB-31) details for Types 12A and 12B Layouts, see Note 4.
14. 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.

NOTES:
1. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
2. 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.
3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks or notched wood blocks may be used for 6" x 8" x 6'-0" 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 12A and 12B Layouts, see Standard Plan A77V4.
5. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
6. The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
7. Depending on site conditions (embankment height, side slopes, or other fixed objects), it may be advisable to construct additional guard railing in length equal to multiples of 12'-6" with 6'-3" post spacing between the transition railing and end treatment. A 120 degree angle of departure can be drawn on the Project Plans to the end point of the fixed object to determine the additional length of railing needed.
8. Where placement of dike is required with guard railing installations, see Standard Plan A77V4 for dike positioning details.
9. Type 12A or Type 12B Layouts are typically used:
   a. To the right of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
   b. To the left of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
   c. To the left of approaching traffic at the end of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.
   d. To the right of approaching traffic at the end of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.

10. For Transition Railing (Type WB-31) details for Types 12A and 12B Layouts, see Note 4.
11. For additional details of typical connections to bridge rail, see Connection Detail A on Standard Plans A77U1 and Connection Detail B on Standard Plans A77V1 and A77V2.
12. For additional details of a typical connection to walls or abutments, see Standard Plan A77U3.
13. Use this offset for 8" block. For 12" block, use 4'-0" Min offset.

SEE NOTES 11 AND 12
SEE NOTES 13 AND 14
SEE NOTES 5 AND 6
SEE NOTES 7
**Type 12E Layout**

See Note 9

**Notes:**
1. Line post, blocks and hardware to be used are shown on Standard Plans A77L1, A77L2, A77N1, A77N2, and A77M
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 w/en 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 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 W6-31) 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 A77U2.
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.

**State of California**

**Department of Transportation**

**Midwest Guardrail System**

**Typical Layouts for Structure Approach**

*No Scale*


**Revised Standard Plan RSP A77Q3**
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 one-way roadbeds.

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

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

10. W6 x 8.5 or W6 x 9 steel post, 6'-0" in length, with 8" x 8" x 1'-2" notched wood block 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.

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**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 6" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. 3'-0" or 6'-0" 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. A 4'-0" minimum clearance is required between the face of the rail and the face of a fixed object located directly behind MGS section 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'-0", but not less than 1'-0". Where the clearance is less than 1'-0", a concrete wall or partition should be constructed to shield the fixed object.

5. See Note 4.

6. Minimum 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 between the back of post and the face of a fixed object is less than 3'-0", but not less than 1'-0", a concrete wall or partition should be constructed to shield the fixed object.

7. See Note 7.

8. See Note 8.

9. See Note 9.

10. See Note 10.

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**REVISIONS:**

- **04/19/2019:** Updated design for new one-way traffic configuration
- **10/18/2019:** Updated design for new one-way traffic configuration

**ACKNOWLEDGMENTS:**

- **CALTRANS APPROVED:**
- **REGISTERED ENGINEER:** Randell D. Hiatt
- **C50200:**
- **EXPIRY:** 06/30/21
- **PROJECT NO.:**
- **DIST. COUNT. ROUTE POST MILE:**
- **TOTAL PROJECT SHEETS:**
- **TOTAL COUNT. PROJECT SHEETS:**
- **STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION:**
- **NO SCALE:**

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**MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR FIXED OBJECTS BETWEEN SEPARATE ROADBEDS (ONE-WAY TRAFFIC)**

**PREVIOUSLY REVISED STANDARD PLAN RSP A77Z2 DATED OCTOBER 10, 2019 SUPERSEDES RSP A77Z2 DATED APRIL 19, 2019 AND STANDARD PLAN A77Z2 DATED MAY 31, 2018.**

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STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS
FOR FIXED OBJECT

MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR ROADSIDE FIXED OBJECTS

NO SCALE

RSP A77R3 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R3 DATED APRIL 19, 2019 AND

REVISED STANDARD PLAN RSP A77R3
STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS

FOR FIXED OBJECT

Use strengthened MGS sections with typical Type 16D or 16E, 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.

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

5. 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.

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

8. Where placement of 31" is required with MGS, see Revised Standard Plan RSP A77R4 for site positioning details.

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

11. Do not bolt rail to block. Only bolt block to post.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR ROADSIDE FIXED OBJECTS

NO SCALE

RSP A77R4 DATED OCTOBER 18, 2019 SUPERSEDES RSP A77R4 DATED APRIL 19, 2019 AND STANDARD PLANS A77M1, A77N1, A77N2, A77L1, A77L2.

REVISED STANDARD PLAN RSP A77R4

2018 REVISED STANDARD PLAN RSP A77R4

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STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS

FOR FIXED OBJECT

Use strengthened MGS sections with layout Type 16M 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.

NOTES:

1. Use 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 notched recycled plastic blocks may be used for 3'-0", 6'-0" and when specified.

4. A 4'-0" minimum clearance is required between the face of the rolling and the back 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 Objects on this plan, where the clearance between the face of post and the 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. 31" in-line terminal system treatments are used where site conditions will not accommodate a 31" flared end treatment.

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 object(s). Additional MGS length equal to multiples of 12'-6". Post spacing of 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. Placement of dike is required with MGS, see Standard Plan A77N4 for dike positioning details.

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

11. Use this offset for 8' block, For 12' block use minimum 4'-0' offset.
STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS FOR FIXED OBJECT

Use strengthened MGS sections with layouts Type 16I or 16J layouts where minimum clearance between back of post and the fixed objects is less than 3'-0", but not less than 1'-0". See Note 4.

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 post with 6" x 8" x 1'-2" wood blocks. 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks where applicable and when specified.

4. A 4'-0" minimum clearance is required between the faces of the rolling and the rail of a fixed object located directly behind MGS sections with post spacing of 6'-3". Construct MGS as shown in the details "Strengthened Midwest Guardrail System Sections for Fixed Object(s)", in which the clearance between the back of post and the 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(s).

5. 3'-1" in-line system and treatments are used where site conditions will not accommodate a 3'-0" flared treatment.

6. For typical flare offsets for 25'-0" length parabola with 31" in-line end treatment and a buried end anchor treatment at the end of rolling, see Note 8.

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

8. 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks. 6" x 8" x 6'-0" wood post with 6" x 8" x 1'-2" wood blocks at the overlap strengthened Midwest guardrail system sections for fixed object(s).

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

10. As site conditions dictate, construct additional MGS to shield fixed object(s). Additional MGS length equal to multiples of 12'-6".

11. For details of Buried Post End Anchor, see Standard Plan A77T2.

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

13. See Note 8.
STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS

FOR FIXED OBJECT

Use strengthened MGS sections with layout 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.

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

6. As site conditions dictate, construct additional MGS to shield fixed object(s) and a crashworthy 31" end treatment is required for 6" x 8" x 8'-0" wood posts with 6" x 8" x 1'-2" wood blocks.

7. Begin 15:1 or flatter flare. Where placement of dike is required with MGS, see Revised Standard Plan RSP A77TP for dike positioning details.

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

9. Buried post end anchor, see Note 10.

10. No SCALE

NOTE A: For a series of fixed objects (bridge columns, overhead sign supports, etc.) attached to 10'-0" 10" x 8" x 1'-2" wood posts with 8" x 8" x 1'-2" wood blocks, see Note 12.

5. For details of Buried Post End Anchor, see Standard Plan A77RP.

11. For typical flare offsets for 25'-0" length parapets with maximum offset of 1'-0", see Revised Standard Plan RSP A77TP.

2. For details of the anchor plate and ¾" cable, see Standard Plan A77S4.

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 end plate must not be encased in HMA, concrete, or any other material that could restrict the plate from releasing.

DO NOT BOLT RAIL ELEMENT TO POST AND BLOCK AT RAIL ELEMENT SPlice

CABLE CONNECTION END PLATE, SEE DETAIL "A"

LINE POST

6" x 6" x 6'-0" WOOD POST, SEE NOTE 3

¾" Ø ANCHOR CABLE

RAIL ELEMENT

LINE POST (WOOD POST SHOWN)

3 ½" Ø HOLE IN WOOD POST, SEE NOTE 3

SEE DETAIL "A"

END PLATE

CABLE, SEE NOTE 2

GROUND LINE

TOP OF POST AND BLOCKS

TOP OF RAIL

6'-3"

1'-4"

5'-1½"

3'-1½"

SEE NOTE 4

2" Ø S&D STEEL PIPE IN 3½" Ø HOLE IN WOOD POST

ELEVATION

RAIL TENSIONING ASSEMBLY

SEE NOTE 1
PLATE `A' CONNECTION

1. Use 5/8" 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 wood post to thrie beam element may be increased to 1" 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 on railing.

3. Exterior splice bolt holes for rail element splices at Post No. T5 and the connection to the concrete barrier on railing shall be the standard 7/8" Ø. Interior splice bolt holes at these locations may be increased up to 1" 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 on railing.

4. The 0.100" thick wood post and concrete barrier or railing.

5. The nested rail elements, end cap, and wood post to thrie beam element may be increased 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 on railing.

6. The depth of the metal box spacer varies from the 7/8" to 1" and is dependent on the width of the concrete or wall, with the nominal dimension for the depth of the metal box spacer plus the width of the frame or wall is typically 1.5". The combined depth of the metal box spacer and the width of the thrie beam element is less than 1/2" metal plate.

7. The depth of the metal box spacer varies from the 7/8" to 1" and is dependent on the width of the concrete or wall, with the nominal dimension for the depth of the metal box spacer plus the width of the frame or wall is typically 1.5". The combined depth of the metal box spacer and the width of the thrie beam element is less than 1/2" metal plate.

8. Minimum 0.100" thick wood post and concrete barrier or railing.

9. Use 5/8" button head bolts and two nuts for connections to posts. No washer on rail face for bolted connections to post.
Connect the overlapped ends of the thrie beam rail elements with 
3⁄4" x 1 1⁄2" button head bolts and shoulder bolts inserted into the 
3⁄4" x 1 1⁄2" slots and bolted together with 5⁄16" recessed hex nuts. 
Recess of hex nut points toward rail element. A total of 12 bolts 
and nuts are to be used at each rail splice connection.

WHERE BOLTS ARE USED, INSTALL SO THAT THE 
THREADED END OF THE BOLTS AND NUTS ARE 
PLACED AWAY FROM TRAFFIC SIDE OF RAIL.

SECTION THRU 
RAIL ELEMENT

RAIL ELEMENT SPLICE DETAIL

a) Connect the overlapped ends of the thrie beam rail elements with 
3⁄4" x 1 1⁄2" button head bolt and shoulder bolts inserted into the 
3⁄4" x 1 1⁄2" slots and bolted together with 5⁄16" recessed hex nuts. 
Recess of hex nut points toward rail element. A total of 12 bolts 
and nuts are to be used at each rail splice connection.

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

c) 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, where 
a return cap is to be attached to the ends of roll elements, a total 
of 8 of the above described splice bolts and nuts are to be used.

THRIE BEAM BARRIER

ELEVATION

SINGLE THRIE BEAM BARRIER
(Wood post and blocks)
See Note 1

ELEVATION

DOUBLE THRIE BEAM BARRIER
(Wood post and blocks)
See Note 1

RAIL SPICE

RAIL ELEMENT LENGTH = 13'-6 1⁄2"
END ANCHOR FOR TRAFFIC DEPARTURE END OF SINGLE THRIE BEAM BARRIER
(For one-way roadways)

**NOTES:**

1. For additional details of End Anchor Assembly (Type SFT), see Standard Plan A755.
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 ‰, 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 type shall be 5'-9". A †" Ø hex head bolt and nut shall be installed in the hole in the tube.

For additional details of End Anchor Assembly (Type SFT), see Standard Plan A755.

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.

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

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.

A 6'-0" length steel foundation tube, TS 8 x 6 x ‰, 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 type shall be 5'-9". A †" Ø hex head bolt and nut shall be installed in the hole in the tube.
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 A78C1.
1. 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.
2. For additional Thrie beam barrier details, see Standard Plans A76A, A78A, A78B, and A78C.
3. Where beveled metal box spacer is installed, place 1” Ø x 3” and 1” Ø x 2” pipe spacers on 1” HS bolts passing through interior of box.
NOTE:
1. Exact locations for desert tortoise fence are shown on the plans.

LEGEND
- Desert Tortoise Habitat

1" x 2" VERTICAL CLEAR MESH GALVANIZED STEEL HARDWARE CLOTH
3. 6" square aluminum or galvanized steel wire ¼" mesh hardware cloth, plastic pipe continuous behind retaining wall or abutment. Cap ends pipe under the sidewalk to discharge thru curb face. Exposed wall drains to center. For walls adjacent to sidewalks or curbs, provide 4" plastic.

4. Pervious backfill material continuous behind retaining wall or abutment. State of California Notes:

1. 4" Ø drains at intermediate eg points and 25'-5" maximum center to center, for walls adjacent to sidewalks or curbs, provide 4" plastic pipe under the sidewalk to discharge thru curb face. Exposed wall drains shall be located 3½” above finished grade.
2. 6" square aluminum or galvanized steel wire ½" mesh hardware cloth, minimum wire diameter 0.025", Anchor firmly to backface.
3. One cubic foot pervious backfill material in a nonwoven filter fabric, securely tied.

4. Pervious backfill material continuous behind retaining wall or abutment.
5. Geocomposite drain, treated permeable base and 3" square plastic pipe continuous behind retaining wall or abutment, cap ends of pipe, provide "tie" connection at each 4" Ø drain.
6. Connect the low end of plastic pipe to the main outlet pipe as applicable.
Resistance (Tension) Requirements

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

1'-8" 2'-8"

#6 #8 and load test piles, see "Load Test Pile Details (2)", Standard Plan B2-5.

ALTERNATIVE "W" *** W11.0 at 2" may be substituted instead of "A" BARS x 22'-0".

Concrete Strength:
- f'c = 4,000 psi
- fuc = 6,000 psi

Concrete Piles:
- #6 TOTAL 6
- 5 " CLR HOLE
- 2" Ø HOLES

Steel Pipe Pile Filled With Concrete:
- 5" FOR 2'-0"
- 6 @ 1 "

Steel Pipe Pile: 4 STRANDS, Min f = 60,000 psi

Concrete Strength:
- f'c @ 28 days = 6,000 psi (Alternative "W")
- f'c @ 28 days = 5,000 psi (Alternative "X")
- f'c @ 28 days = 4,000 psi (Alternative "Y")

Steel Pipe Pile:
- PP = Steel pipe pile
- PP14 = 10'-0" TOTAL 4
- PP14 x 0.438

Class 90 = PP14 x 0.375

Class 140 = PP14 x 0.438

PILE EMBEDMENT

Required Nominal Resistance (Tension) *

<table>
<thead>
<tr>
<th>&quot;A&quot; Bars</th>
<th>60 kips or Less</th>
<th>Greater than 60 kips</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;A&quot; Dimension</td>
<td>#6</td>
<td>#8</td>
</tr>
<tr>
<td>#6</td>
<td>1'-8&quot;</td>
<td>2'-8&quot;</td>
</tr>
</tbody>
</table>

* See Pile Data Table on the Project Plans for Nominal Resistance (Tension) Requirements
### Pile Details

**Class 200**

**ND Scale**

**Pile Details**

**Class 200**

**ND Scale**

**RSP B2-8**

1. Pile 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.

2. Maximum cutoff length at the top of the Alternative "X" and Alternative "Y" piles is 10'-6".

3. Clearance to spiral reinforcement shall be maintained if section used is larger than the minimum section shown.

### Design Notes:

#### Pile Embedment

**Design Capacity**

- Compression: 200 kip (Service state)
- Tension: 80 kip (Service state)

**Reinforced Concrete**

- $f_c' = 4,000$ psi
- $f_y = 60,000$ psi

**Precast Prestressed Piles**

- $P_p = 60,000$ psi
- Concrete Strength $f_c' = 28$ days = 7,000 psi

**Steel Pipe Pile**

- $f_y$ (minimum yield strength) = 45,000 psi
- $f_u$ (minimum tensile strength) = 66,000 psi

#### Design Notes:

- **W11.0 @ 1'-6"** may be substituted
- **W11.0 @ 1'-6"** may be substituted

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2018 Revised Standard Plan RSP B2-8

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**Pile Details**

**Class 200**

**ND Scale**

RSP B2-8 DATED: OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN B2-8

SKEW TO 20°

PLATE-DECK DRAIN ASSEMBLY

FACE OF BARRIER

SLOPE TOWARD DECK

TOP OF DECK

SLOPE DECK TOWARD DRAIN

FACE OF BARRIER

SLOPE TOWARD DECK

TOP OF DECK

SLOPE DECK TOWARD DRAIN

TOP OF DECK

DECK DRAIN ASSEMBLY DETAIL

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

NOTE:

For drain slope alignment, sleeve connection, drain outlet details and notes, see Standard Plan B7-7.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REVIEWED STANDARD PLAN RSP B7-7

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 embankment.

3. Except for "a" dimension and pipe diameter, see Project Plans.

Expansion coupling with 4 bolts shown. Coupling with a greater number of bolts allowed.

Adjust dimension to suit coupler end ring bolt circle.

NOTE:
Adjust spacing of main column reinforcement to clear drain outlet.

COLUMN REINFORCEMENT AT DRAIN OUTLET
For future utility opening dimensions not shown on Project Plans use:

- if \(d < 1\) foot, use 1'-6" minimum, whichever is greater.
- if \(d = 1\) foot, use 1'-0" minimum, whichever is greater.

Seal utilities at abutments with concrete or mortar, after tightly wrapping utility with 2 layers of 15 LBS building paper. If structure is prestressed, seal to be placed after stressing is completed.

For future utility opening dimensions, see Project Plans and Detail U-4.

When there is insufficient space to place reinforcement as shown, hook reinforcement into exterior girder.

Unless otherwise shown on Project Plans, casing shall extend to the State right-of-way limit.

When "Y" is less than 8", extend top of opening to bottom of bearing seat elevation.

Seal utilities at abutments with concrete or mortar, after tightly wrapping utility with 2 layers of 15 LBS building paper. If structure is prestressed, seal to be placed after stressing is completed.

For future utility opening dimensions, see Project Plans and Detail U-4.

When there is insufficient space to place reinforcement as shown, hook reinforcement into exterior girder.

Unless otherwise shown on Project Plans, casing shall extend to the State right-of-way limit.
NOTE #4
Type E-1 Approach Slab shown, see Table 4-3 for Type E-2 details.

SECTION A-A

NOTE: Seat type abutment shown, diaphragm type abutment similar.

LEGEND:
* - All approach slab reinforcement shall be epoxy coated and minimum top mat cover 2½" in Freeze-Thaw Area.

NOTES:
1. For MR ≤ 2", adjust reinforcement to clear sawcut for seated Joint. For MR ≥ 2", reinforcement must be normal to BB or EB and spaced to allow joint seal assembly anchorage.
2. Transverse Joint must be a minimum of 5'-0" from an existing or constructed weakened plane joint in approach PCC roadway pavement.
3. Place covers into the adjacent PCC pavement along the Transverse Joint. Refer to Standard Plan P102 and P30.
4. At Contractor's option, approach slab transverse reinforcement may be placed parallel to BB or EB. Spacing of transverse reinforcement is measured along PP roadway.
5. For details not shown, refer to Revised Standard Plan RSP B9-5.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
STRUCTURE APPROACH
TYPE N (30)

REVISED STANDARD PLAN RSP B9-1
NO SCALE
RSP B9-1 DATED OCTOBER 15, 2021 SUPERSEDES STANDARD PLAN B9-1
For additional details not shown, see "EXISTING SEAT ABUTMENT" or "EXISTING DIAPHRAGM ABUTMENT TIE DETAIL" on the standard plans book dated 2018.

**DIAPHRAGM ABUTMENT TIE DETAIL**

**SECTION A-A**

**NOTES:**

1. For all 2" joints, adjust reinforcement to clear amount for sealant. Steel for all 2" joints, reinforcement must be normal to BB or EB and spaced to avoid joint seal assembly anchorage.

2. Space reinforcement and abutment ties to avoid existing prestressing anchorages and other reinforcement in abutment, as needed.

3. Transverse joint must be a minimum of 5'-0" from an existing or constructed weakened plane joint in approach PCC roadway pavement. Transverse joint, refer to Standard Plans RSP B9-5.

4. Place dowels into the adjacent PCC pavement along the transverse joint, refer to Standard Plans RSP B9-5.

5. At the contractor’s option, approach slab transverse reinforcement may be added parallel to 0" or 1" space along roadway.

6. Paving notch extension is required if existing diafragm pavement notch is 0".

7. For details not shown, refer to Revised Standard Plan RSP B9-5.

**LEGEND:**

- Indicates Existing Structure

- All approach slab reinforcement shall be epoxy coated and top not cover 1/4" clear in Freeze-Thaw Area.

**STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
STRUCTURE APPROACH TYPE R (30)
NO SCALE**


REVISED STANDARD PLAN RSP B9-2
Paving notch extension is required if existing diaphragm paving notch is < 6".

For MR > 2", reinforcement must be normal to BB or EB and spaced parallel.

For MR < 2", adjust reinforcement to clear sawcut for sealed joint.

Place dowels into the adjacent PCC pavement along the Transverse Joint, refer to Standard Plans P10 and P30.

At the Contractor's option, approach slab transverse reinforcement may refer to Standard Plans P10 and P30.

For MR > 2", reinforcement must be normal to BB or EB and spaced parallel.

For MR < 2", adjust reinforcement to clear sawcut for sealed joint.

For MR > 2", reinforcement must be normal to BB or EB and spaced parallel.
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 extending 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 8" from face of rail.
3. A77V1 AND A77V2. STANDARD PLANS NOT SHOWN, SEE CONNECTION DETAILS FOR METAL RAILING.
DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA

PLANS
APPROVAL
DATE

No. 1-22-19

NO SCALE

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

CONCRETE BARRIER TYPE 836
DETAILS No. 1

NOTE:
Reinforcing for wall joint shown

ELEVATION
(SEE NOTE 5 ON DETAILS No. 2)

PLAN

2018 REVISED STANDARD PLAN RSP B11-79

REvised STANDARD PLAN RSP B11-79

DATED OCTOBER 18, 2019 THAT SUPERSEDES RSP B11-79
CONCRETE BARRIER TYPE 836
DETAILS No. 2

1. Walls are to be backfilled before barrier is placed.
2. Clearance to vehicular path in barrier to be 2", except as noted. Longitudinal reinforcement to stop at all expansion joints.
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.
5. See Standard Plans ES-9A, ES-9B, ES-9C, ES-9D, and ES-9E for electrical details. The maximum number of conduits in the barrier is limited to two 3" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.
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. Taper the top of the end of the bridge railing at 45° to match the top elevation of the thrie beam rail element.
9. For electroliner mounting details, see Standard Plans ES-6A and ES-6B.
**Concrete Barrier Type 85 Details No. 2**

**Plan at Top Beam**
- Dimensions: 3'-0" Min
- Orientation: Direction of Traffic
- Note: Tubular bicycle railing not shown for clarity.
- No. 5 Bars Transverse Bundled
- Limit of Top Mat of Deck
- No. 5 Bars

**Plan at Lower Beam (Curb)**
- Dimensions: 2'-0"
- Orientation: Direction of Traffic
- Note: Tubular bicycle railing not shown for clarity.
- No. 5 Bars Transverse Bundled
- Limit of Top Mat of Deck
- No. 5 Bars

**Elevation**
- Lower Beam (Curb)
- Deck Overhang
- Elevation
- Notes:
  1. Tubular bicycle railing optional for Type 85B.
  2. Minimum length of Type 85B is 40'-0".

**Typical Section**
- Type 85B
- Dimensions: 8'-6" Max
- Note: Upper tubular bicycle railing not shown for clarity.
- No. 5 Bars Transverse Bundled
- Limit of Top Mat of Deck
- No. 5 Bars

**Notes:**
- Upper tubular bicycle railing not shown for clarity.
- Dimension determined by bridge deck or FG.
- Dimension determined by bridge cross-slope and whether or not there is an overlay.

**Revision Information:**
- Dated April 16, 2021
DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED APRIL 16, 2021 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.
RSP B11-85 DATED OCTOBER 15, 2021 SUPERSEDES RSP B11-85 2018 REVISED STANDARD PLAN RSP B11-85

DETAILS No. 3
CONCRETE BARRIER TYPE 85

Notes:
1. Tubular bicycle railing 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. Upper tubular bicycle railing shall be continuous over not less than two posts.

LOWER TUBULAR BICYCLE RAILING DETAIL

SLEEVE TUBE SPlice AT EXPANSION JOINT DETAIL

STANDARD SLEEVE DETAIL

ALTERNATIVE TUBE WELDED STANDARD SPlice

NOTE FOR SPLICES NOT AT EXPANSION JOINTS

LOWER TUBULAR BICYCLE RAILING ELEVATION

RAIL CAP DETAIL

SECTION H-H

ELEVATION

PLAN

TUBULAR BICYCLE RAILING DETAILS

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

ELEVATION

VIEW G-G

VIEW F-F

SLEEVE FORMED OF ⅜" COVERS FACE "C", FOR SLIDING EYEBOLTS INSIDE OF RAIL TUBE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REVISED STANDARD PLAN RSP B11-85

CJP

2018 REVISED STANDARD PLAN RSP B11-85

J. Kaderabek
Gregory C40814
3-31-23
October 15, 2021

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6' 6"
8' 6"

1/4" Ø VENT

½" Ø VENT

3⅛" x 4½" x 8"
HSS2x2x¾ POST

1⅛" x 1½" x 2⅝"
STEEL BLOCK SLEEVE

3⅛" x 4½" x 8"
HSS3x2x¾ POST

½" Ø Holes, Typ

⅝" x ½" Holes, Typ

⅝" x ⅜" SLOTTED HOLE, Typ
**DESIGN NOTES**

**REINFORCED CONCRETE AND CONCRETE MASONRY**

- $f_{c', m} = 60 \text{ psi}$
- $f_y = 5.6 \text{ ksi}$
- $f_s = 2000 \text{ psi}$
- Provide materials to achieve the net compressive strength of concrete masonry of 4 ksi or greater than the specified $f_{c', m}$.

**CONCRETE MASONRY:**
- **Reinforced Concrete and Concrete Masonry**

**EXPANSION JOINTS**

- Cells with vertical expansion joint to be filled with grout.
- See note 3 on revised standard plan RSP B15-1.

**ELEVATION**

- Top of footing elevation shown.
- Expansion joints at 48'-0".
- Spread footing shown.

**SECTION A-A**

- $6"$ mix bond beam and reinf extension at step.
- Refer to revised standard plan RSP B15-2 for step sizes.

**FOOTING STEP DETAILS**

- **SPREAD FOOTING**
  - $#4$ @ 12 Max Horizontally
  - $#4$ @ 12 Max Vertically at each face

- **TRENCH FOOTING**

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**SOUND WALL**

**MASONRY BLOCK ON FOOTING DETAILS (2)**

**NO SCALE**

LEVEL ground (±10%) on both sides of the sound wall.

For details not shown, see Case 2.

For details not shown, see Case 1.

Full mortar bed at bottom of wall.

TYPICAL SECTION

For details not shown, see Case 2.

For details not shown, see Case 1.

LEVEL ground (±10%) on one side of the sound wall and sloping ground on the opposite side.

EXPANSION JOINTS AT 48'-0" MAX CENTERS, SEE OTHER SHEETS FOR LOCATION.

"L" PAYMENT LENGTH OF "L" PAYMENT POINT CONTROL SLOPE MIN 6'-0"

MAXIMUM #4 TOTAL 9 8'-0" #4 TOTAL 9 10'-0" #4 TOTAL 9 12'-0" #4 TOTAL 9 14'-0" #4 TOTAL 9 16'-0" #4 TOTAL 9 18'-0" #4 TOTAL 9

"H" LIMITED TO "SECTION A-A"

"H" LIMITED TO "SECTION B-B"

GROUND LINE TO BE AT THE SAME ELEVATION ON BOTH SIDES OF THE WALL. WALL SHALL NOT BE USED TO RETAIN EARTH. Typ CIDH PILE

FULL MORTAR BED AT BOTTOM OF WALL.

MORTAR CAP BOND BEAM AT TOP AND AT 4'-0" MAXIMUM CENTERS BELOW.

MASONRY BLOCK ON PILE CAP DETAILS (1)

PILE CAP SECTION

CASE 1

For details not shown, see Case 2.

Level ground (±10%) on both sides of the sound wall.

CASE 2

For details not shown, see Case 1.

Level ground (±10%) on one side of the sound wall and sloping ground on the opposite side.
GENERAL NOTES:

1. For type of block and joint finish, see other sheets.
2. When blocks are laid in stacked bond, header types, galvanized joint reinforcement shall be provided. A minimum of 2-6 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 weathered, vertical joints shall be tooled concave or 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 shall exceed 4'-0". Wall is not designed for impact loading.

DESIGN NOTES

WALL IS NOT DESIGNED FOR IMPACT LOADING.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
SOUND WALL
MASONRY BLOCK ON PILE CAP
DETAILS (2)
NO SCALE

SOUND WALL
MASONRY BLOCK ON PILE CAP
DETAILS (2)
NO SCALE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
SOUND WALL
MASONRY BLOCK ON PILE CAP
DETAILS (2)
NO SCALE

DESIGN:

- 1. For type of block and joint finish, see other sheets.
- 2. When blocks are laid in stacked bond, header types, galvanized joint reinforcement shall be provided. A minimum of 2-6 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 weathered, vertical joints shall be tooled concave or 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 shall exceed 4'-0". Wall is not designed for impact loading.
Case 1 - Level ground (±10%) on both sides of the sound wall.

Case 2 - Level ground (±10%) on traffic side of the sound wall.

Max H: 6'-0" 9'-0" 12'-0" 15'-0" 18'-0"

Pile Cap Step Detail

Note:
1. For details not shown, see Revised Standard Plans RSP B15-3 and RSP B15-4.
For details not shown, see Case 2.
Level ground ±10% on both sides of barrier.

Level ground ±10% at the traffic side of barrier and sloping ground on the opposite side.

### BARRIER SECTIONS

**EXPANSION JOINTS**
- At 96'-0" Max & 24'-0" Min
- Centers in Concrete Barrier
- Expansion Joints
  - At 96'-0" Max & 24'-0" Min
  - Centers in Masonry Block Wall
- See other sheets for locations

**PILE REINF.**
- #5 @ 8 Total 3
- #5 @ 8 Min. @ 16" Max.
- #5 @ 8 Min. @ 24" Max.
- #5 @ 8 Min. @ 30" Max.
- #5 @ 8 Min. @ 36" Max.
- #5 @ 8 Min. @ 48" Max.
- #5 @ 8 Min. @ 72" Max.
- #5 @ 8 Min. @ 96" Max.

**EXPANSION JOINT REINFORCEMENT AT STEP**
- #14 Dowel @ 4'-0" Total 4
- #9 - 3'-10"
- #8 - 3'-0"
- #5 Cont AT EACH
- #8 - 5'-4"
- Upper Wall Reinf.
- All Cells Grouped for
- Lower 4 Courses
- Lower 5'-4"
- Lower Wall Reinf.
- 2'-8" Diag. x ½" Long
- 1'-0" for Case 2
- 6" for Case 1 and 1'-0" for Case 2
- Joints centered over piles.
- #5 @ 8 Total 3
- 2'-6"
- 1'-6" for Case 1
- 6" for Case 1 and 1'-0" for Case 2
- #5 Cont
- #14 Stainless Steel
- Enclose portion of #14 bar and wrap around #14 bar with 2 layers of building paper
- 2'-0"

### TYPICAL SECTION


**NOTES A THROUGH D**

A. For type of block, type of block bond, and joint finish, see other sheets.

B. When blocks are laid in stacked bond, header type, galvanized joint reinforcement shall be provided. A minimum of 2-5 gauge wires continuous at 4'-0" maximum to be used. Locate reinforcement in joints that are at the approximate midpoint between bond beams.

C. Horizontal joints shall be tooled concave or raked. Vertical joints shall be tooled concave or weathered. Vertical joints shall be tooled concave or weathered. Vertical joints shall be tooled concave or weathered. Vertical joints shall be tooled concave or weathered. Vertical joints shall be tooled concave or weathered. Vertical joints shall be tooled concave or weathered.

D. Reinforcement shall be hooked on the opposite side.

### STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

SOUND WALL

MASONRY BLOCK ON

TYPE 836S/836SV BARRIER

DETAILS (1)

NO SCALE

RSP B15-6 DATED OCTOBER 15, 2021
SUPPLEMENT RSP B15-6 DATED APRIL 17, 2020 AND
### CASE 1: PILE DATA TABLE

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**NOTES:**

1. * For details not shown, see Revised Standard Plans RSP B15-6 and RSP B15-7.

**SOUND WALL MASONRY BLOCK ON TYPE 836/SV BARRIER DETAILS (3)**

**NO SCALE**

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 II 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.

TYPE I
Shape batter shall not be flatter than 1:1.

PROFILE GRADE CONCRETE BARRIER

MORTAR CAP

TOP OF FOOTING OR FILE CAP

INTERMEDIATE BOND BEAMS WITH #5

CUT BLOCKS AS REQUIRED

H=10'-0"

SINGLE STEP

H=10'-8" TO H=14'-0"

2 STEPS

H=14'-8" TO H=16'-0"

3 STEPS

END OF WALL DETAILS

MORTAR CAP

TOP OF FOOTING OR FILE CAP

MORTAR CAP

INTERMEDIATE BOND BEAMS WITH #5

BOND BEAM AT TOP AND AT 4'-0" BELOW - TYPICAL

MORTAR CAP

TOP OF FOOTING OR FILE CAP

MORTAR CAP

INTERMEDIATE BOND BEAMS WITH #5

MORTAR CAP

8" x 8" x 16" BLOCK

CONCRETE BARRIER

PROFILE GRADE

BOND BEAM AT TOP AND AT MORTAR CAP

MORTAR CAP

TOP OF FOOTING OR PILE CAP

MORTAR CAP

TOP OF FOOTING OR PILE CAP

MISCELLANEOUS DETAILS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REVISIONS STANDARD PLAN RSP B15-9

NO SCALE

REVISED STANDARD PLAN RSP B15-9

NOTES:
1. Gate mounted on sloping grade shall be oriented to be in a closed position when at lower grade point.
2. Two concrete cells adjacent to each side of gate to be reinforced and grouted.
3. Those blocks upon which the supporting steel channels are mounted shall be smooth faced on the mounting side.
4. When sound wall as measured from the bottom of the gate opening exceeds 6'-8", see Revised Standard Plan RSP B15-11.

FOR LOCATION OF NYLON FINISHING WASHERS, SEE REVISED STANDARD PLAN RSP B15-11.
SOUND WALL MASONRY BLOCK
ON FOOTING OR PILE CAP
5'-0" ACCESS GATE
DETAILS (2)

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Sound Wall Masonry Block
On Footing or Pile Cap
5'-0" Access Gate
Details (2)

Provide snug but not binding fit

Partial Elevation (Back)
For details not shown, see above.
DETAIL A

WALL OPENING

DETAIL B

WALL OPENING

PLAN
LOCK ON
GATE SIDE OF WALL

PLAN
LOCK ON
INSIDE OF WALL OPENING

SECTION J-J

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.

MASONRY ON FOOTING

MASONRY ON BARRIER

MASONRY ON FOOTING

OR PILE CAP

GATE LOCKING ASSEMBLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SOUND WALL MASONRY BLOCK
ACCESS GATE LOCKING DETAILS

NO SCALE

RSP B15-14 DATED APRIL 17, 2020 SUPERSEDES STANDARD PLAN B15-14

REVISED STANDARD PLAN RSP B15-14

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CASE 1
For details not shown, see Case 2.

CASE 2
For details not shown, see Case 1.

PART ELEVATIONS

CASE 1 : PILE DATA TABLE

CASE 2 : PILE DATA TABLE

NOTE:
1. For wall reinforcement details, see Revised Standard Plan RSP B15-6.
**GRATE FRAME FOR TYPE GDO INLET**

* Holes Required Only with Trash Rack

### TOTAL HOLES @ 2" C-C

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<thead>
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<th>Location</th>
<th>Dimension</th>
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<tr>
<td>L3 1/2 x 3 x 1/4</td>
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<tr>
<td>L4 x 3 x 1/4</td>
<td>3'-4 1/2&quot;</td>
</tr>
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</table>

### TRASH RACK

For use with pump installation

**NOTES:**


2. Where shown on the project plans, place a 5/8" 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 SUPERSEDES STANDARD PLAN D73E

### Design Notes:
- **Design:** AASHTO LRFD Bridge Design Specifications, 6th edition with California Amendments, Direct Design Method
- **Earth Loading:** Weger Soil Pressure Distribution
- **Unit Stress:** (f_y) = 65 ksi
- **Modification Factor:** E = 0.86
- **Sheets Used in Design Tables:** 42
- **RCP as Shown on this Sheet is Not Intended to be Used in a Corrosive Environment. A Special Design May be Required.

### Walls B, C, X

**Table of Dimensions:**

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### Wall B

- **Notes:**
  - Pipe barrel wall thickness, inches
  - Inner cage reinforcement, square inches/LF
  - Outer cage reinforcement, square inches/LF
  - C = Design clearance, inches (see Note 5)

### Wall C

- **Notes:**
  - Pipe barrel wall thickness, inches
  - Inner cage reinforcement, square inches/LF
  - Outer cage reinforcement, square inches/LF
  - C = Design clearance, inches (see Note 5)

### Wall X

- **Notes:**
  - Pipe barrel wall thickness, inches
  - Inner cage reinforcement, square inches/LF
  - Outer cage reinforcement, square inches/LF
  - C = Design clearance, inches (see Note 5)
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<td>6&quot;</td>
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<td>6&quot;</td>
</tr>
</tbody>
</table>

**Notes:**
1. For spans with span or height less than those shown in table, use next smaller size box concrete dimensions and reinforcement unless the table includes special design.
2. Quantities are approximate and for design purposes only.
3. When using spans or heights greater than those shown in tables, a special design is required.
4. No hooks are required on every other bar.
5. For design and details not shown, see Revised Standard Plan RSP D82.
6. For design and details not shown, see Revised Standard Plan RSP D82.

**Typical Section SPANS 4' THRU 8'**

**Typical Section SPANS 10' THRU 14'**

**Flat Invert**

**V Invert**

**Trapezoidal Invert**

**Reinforced Concrete Single Box Culvert**

**State of California Department of Transportation**

**Cast-In-Place**

**No Scale**

**Revised Standard Plan RSP D80**

**Date:**

- October 15, 2021
**TYPICAL SECTION - SPANS 4'-0" THRU 12'-0"**

**EXTERNAL SEALING BAND SCHEMATIC**

**TABLE**

<table>
<thead>
<tr>
<th>SPAN, S</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM EARTH COVER</td>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
<td>Q</td>
<td>R</td>
</tr>
<tr>
<td>CONCRETE</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td>AA</td>
<td>AB</td>
<td>AC</td>
</tr>
</tbody>
</table>

**NOTES:**

1. The inside and outside surfaces of the RCB roof shall be marked "TOP".
2. H1 minimum shall equal the wall thickness. H1 maximum shall be 8" for spans through 8' and 14" for spans over 8'.
3. Quantities are approximate and for design purposes only.
4. For design and details not shown see Revised Standard Plan RSP D83A.
5. For external sealing band applications see Revised Standard Plan RSP D83A.
6. Soil pressures shown are factored per design live load where applicable.
7. If earth cover is less than 3", the concrete cover for the reinforcement at the toe of the top slab shall be 2", and all other concrete cover shall be revised accordingly in this code.

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**PRECAST REINFORCED CONCRETE BOX CulVERT**

**NO SCALE**

RSP D83A DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN D83A
LONGITUDINAL JOINT "RCB" INTERMEDIATE BOX CROSS HIES PRECAST RCB TERMINOLOGY PRECAST RCB TERMINOLOGY NOTES: Inner and outer reinforcement to be exposed as required to tie to cast-in-place construction. A minimum of two cross wires shall be exposed on all sides.

PARTIAL PLAN INTERIOR WALL MULTICELL CULVERT PARTIAL PLAN VIEW For illustrative purposes only, for correct skew direction see plans.

SECTION C-C * Reinforcing required for barrier parapet application only.

CAST-IN-PLACE END ELEVATION

PRECAST REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS

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**NOTES:**

1. Preserve existing rebar during removal of side wall to tie 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.

2. Drill rebar ends 3' into existing concrete, overlap and connect with double barrel mechanical coupler.
TO ACCOMPANY PLANS DATED 12-29-20.


LADDER DETAILS

1. Rungs must be skid resistant.
2. Use wall mounted handrails for vault depths between 4'-0" and 6'-6". For deeper vaults, use extendable handrail details. Vault depth is distance between top of wall and either top of floor slab or top of filter media material (use whichever 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 (THIS SHEET ONLY):

1. Ladder must be skid resistant.
2. Use wall mounted handrails for vault depths between 4'-0" and 6'-6". Vault depth is distance between top of wall and either top of floor slab or top of filter media material (use whichever 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.

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April 16, 2021

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2018 REVISED STANDARD PLAN RSP D118

ELEVATION WALL MOUNTED HANDRAIL

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

LADDER DETAILS
NO SCALE

REVISED STANDARD PLAN RSP D118

5. Trench filler material and surface gravel layer and along the sides of the infiltration trench.

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

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

2. Place concrete curb at the locations shown on the plans. See Standard Plan A87A for details not shown.

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

NOTES:

FILTER FABRIC

CURB OPENING DETAIL

See Note 2
**GENERAL NOTES**

**Designations**

Types of Gross Solids Removal Devices (GSRDs) are

Linear Radial (LR) and Inclined Screen. The Linear Radial has either a stepwise or high velocity configuration noted as Linear Radial (LR) or Linear Radial (HV). All GSRD BMP Detail Drawings are applicable for velocities up to 20 fps.

**Special Reinforcement Coverage**

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 Designs**

Required for ground water conditions above bottom or GSRD, surcharge loads exceeding HS20 truck load, design bearing pressures or sizes greater than those on the plan.

**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.

---

### DESIGN NOTES

#### Specification Design

The Design Specification April 2000 (LEO) (1996 AASHTO) with interims and revisions by Caltrans

**Case I**

- Level + 2'-0" surcharge, GSRD empty
- Design bearing pressures or sizes greater than those on the plan

**Case II**

- 2:1 Unlimited slope, GSRD empty
- Earth pressure for 2:1 unlimited slope determined from Rankine's formula with Ø = 33°42' (Case II).

**Case III**

- Surcharge, GSRD full of water, no soil pressure
- Earth pressure for 2:1 unlimited slope determined from Rankine's formula with Ø = 33°42' (Case III).

---

### INCLINED SCREEN DESIGN FLOW CHART

<table>
<thead>
<tr>
<th>GSRD TYPE</th>
<th>TOTAL SCREEN LENGTH</th>
<th>FLOW RATE (cfs)</th>
<th>DEBRIS AREA (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3'-0&quot;</td>
<td>5.83</td>
<td>2.21</td>
</tr>
<tr>
<td>B</td>
<td>5'-0&quot;</td>
<td>8.79</td>
<td>3.31</td>
</tr>
<tr>
<td>C</td>
<td>7'-0&quot;</td>
<td>11.35</td>
<td>4.41</td>
</tr>
<tr>
<td>D</td>
<td>9'-0&quot;</td>
<td>14.57</td>
<td>5.52</td>
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<tr>
<td>E</td>
<td>10'-0&quot;</td>
<td>17.48</td>
<td>6.63</td>
</tr>
<tr>
<td>F</td>
<td>11'-0&quot;</td>
<td>20.39</td>
<td>7.74</td>
</tr>
</tbody>
</table>

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

---

### INCLINED SCREEN LEGEND

- **GSRD WALL**
- **GSRD BOTTOM**
- **LEVEL + 2'5" SURCHARGE**
- **CASE I**
- **CASE II**
- **CASE III**

### INCLINED SCREEN NOTES

1. Slope or shore excavation sides as necessary.
2. Dimensions shown are minimum.

---

**ABBREVIATIONS**

<table>
<thead>
<tr>
<th>CFT</th>
<th>CUBIC FEET PER SECOND</th>
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<tbody>
<tr>
<td>EWT&amp;B</td>
<td>EACH WAY TOP AND BOTTOM</td>
</tr>
<tr>
<td>FPS</td>
<td>FEET PER SECOND</td>
</tr>
<tr>
<td>FIBERGLASS REINFORCED PLASTIC</td>
<td>FRP</td>
</tr>
<tr>
<td>LL</td>
<td>LIVE LOAD</td>
</tr>
<tr>
<td>A</td>
<td>ABRUPT CURVE</td>
</tr>
<tr>
<td>B</td>
<td>EMBANKMENT</td>
</tr>
<tr>
<td>C</td>
<td>EXPANSION JOINTS</td>
</tr>
<tr>
<td>D</td>
<td>GSRD WALL</td>
</tr>
<tr>
<td>E</td>
<td>GSRD BOTTOM</td>
</tr>
<tr>
<td>F</td>
<td>GSRD BOTTOM</td>
</tr>
<tr>
<td>G</td>
<td>GSRD BOTTOM</td>
</tr>
</tbody>
</table>

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**GROSS SOLIDS REMOVAL DEVICE**

**INCLINED SCREEN LEGEND**

**NOTES**

- Expansion joints
- Construction joints

---

**180 DEGREES CURVE**

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---

**INCLINED SCREEN**

**GROSS SOLIDS REMOVAL DEVICE**

**INCLINED SCREEN LEGEND**

**NOTES**

1. Slope or shore excavation sides as necessary.
2. Dimensions shown are minimum.

---

**REVISED STANDARD PLAN RSP D139A**
**GROSS SOLIDS REMOVAL DEVICE**

**INCLINED SCREEN DETAILS No. 1**

**OUTLET DETAIL**

**PIPE EXIT AT WALL - INCLINED SCREEN**

**INLET DETAIL**

**PIPE ENTRANCE AT WALL**

**CABLE RAILING**

**POST ANCHORAGE**

---

**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. Length must be approximately 12 links per foot. Length must be minimum which allows lock-up of safety railing.

---

**VIEW E-E**

**NOTE:**
Jet plate and flow deflectors not shown for clarity.
GROSS SOLIDS REMOVAL DEVICE
INCLINED SCREEN DETAILS No. 2

SECTION A-A - REINFORCEMENT

SECTION B-B - REINFORCEMENT

SECTION C-C - REINFORCEMENT

SECTION F-F

INLET PIPE

OVERFLOW PIPE

OUTLET PIPE

NOTE:
Flow deflectors and jet plate not shown for clarity.

JET PLATE DETAIL

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2018 REVISED STANDARD PLAN RSP D139D

NOTES:
1. For additional reinforcing at openings, see Revised Standard Plan RSP D139E.
2. For section locations, see Revised Standard Plan RSP D139B.
3. 3/8" jet plate with 2" x 2" x 1/4" braced supports around perimeter for screen lengths up to 6'-6". For longer screen lengths, use 2" x 2" x 1/4" braced supports around jet plate @ 1'-6" O.C. Use additional interior supports @ 2'-6" Max. O.C. equally spaced. Fillet weld brace supports to plate @ 1'-6" O.C. Fasten jet plate assembly to jet end supports with five 3/8" machine bolts @ 2'-6" Max. equally spaced. Start bolt pattern @ 2'-6" Max. from edge.
ENERGY DISSIPATION SLAB

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

WALL OPENING

To be used at inlet and outlet pipe locations.

CONCRETE SIDE WALL

NOTE:
In all opening locations, horizontal reinforcement to be standard except as shown. All reinforcement to clear opening by 2" minimum.

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GROSS SOLIDS REMOVAL DEVICE
INCLINED SCREEN DETAILS No. 3
WALL OPENING DETAILS

REVIEWED STANDARD PLAN RSP D139E
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. The overflow and outlet piping shall be connected via standard elbows and tees.
3. Inlet and outlet piping opening sizes are shown on the "Drainage Plans." See "Drainage Plans" for inlet and outlet pipe details not shown.
4. For inlet and outlet pipe details not shown, see Revised Standard Plan RSP D139F1.

FLOW DEFLECTORS NOT SHOWN FOR CLARITY

OUTLET PIPE SLOPE TO DAYLIGHT (B E Y O N D)

LEVEL STRIP, 4'-1¾" WIDE

LEVEL SLAB DISSIPATION ENERGY

WEDGE-WIRE SCREEN
INCLINED SCREEN DETAILS No. 4

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

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

NO SCALE


2018 REVISED STANDARD PLAN RSP D139F1

REVISED STANDARD PLAN RSP D139F1

REGISTERED CIVIL ENGINEER

ENGINEER OF RECORD

APPROVAL DATE

R E G I S T E R E D

STAT E O F C A L I F Ö R N I A
D E P A R T M E N T O F T R A N S P O R T A T I O N

April 16, 2021

6-30-21

C61257

Swanger

Bruce D.
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."

FLOW DEFLECTORS NOT SHOWN FOR CLARITY

NOTCHED DETAIL

SECTION B-B
FLOW DEFLECTORS NOT SHOWN FOR CLARITY

SECTION C-C
FLOW DEFLECTORS NOT SHOWN FOR CLARITY

GROSS SOLIDS REMOVAL DEVICE INCLINED SCREEN DETAILS No. 6 PULTRUDED FRP SCREEN

NO SCALE

REVISED STANDARD PLAN RSP D139G2

DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA

GROSS SOLIDS REMOVAL DEVICE
INCLINED SCREEN DETAILS No. 7
PULTRUDED FRP SCREEN

NOTES:
2. The dimension shown is the distance between top of plate and bottom of screen.
3. Mount screen to metal frame using stainless steel taper proof fasteners assembly.
4. Mount screen to metal frame using stainless steel taper proof fasteners assembly.
5. Pultruded FRP screen length is: 3'-6" Width FRP screen. Use 6 clip assemblies for FRP screens that are less than 3'.
6. Use all components of screen and concrete where gap is > 0.02".
GENERAL NOTES

Designation:
Types of Gross Solids Removal Devices (GSRDs) are:
Linear Radial (LR) and Intermediate Screener. 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 Designs
Required for ground water conditions above bottom
of GSRD, surcharge loads exceeding MSI truck load,
and 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 MBGR shall be provided
between GSRDs and traffic lanes.

LINEAR RADIAL DESIGN CHART

<table>
<thead>
<tr>
<th>GSRD TYPE</th>
<th>TOTAL SCREENED PIPE LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;L&quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;S&quot;</td>
</tr>
</tbody>
</table>

NOTES:
1. The total screened pipe length "L" is the sum of
   the end screened and intermediate screened pipes.
   For dimension "L", see plan view. Likwise, the total screened pipe and
   intermediate screened pipes, see Revised Standard Plan RSP 0140G.

2. Example of Linear Radial nomenclature is LR-1 (6'-0"
   for high velocity type LR(HV)-1 (3'-0"
   between GSRDs and traffic lanes.

3. The inside length "L" is shown on Revised Standard Plan RSP 0140G.
   See plan view.

4. The length "L" shown on Revised Standard Plan RSP 0140G.
   See plan view.

5. The number represented in the parentheses.

6. The number represented in the parentheses.

DETAILED DESIGN CHART

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>E = Earth Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASE I</td>
<td>135 lb/ft² vertical</td>
</tr>
</tbody>
</table>

NOTES:
1. Slope or shore excavation sides
   are necessary. Exposed condition is a high velocity type LR(HV). All GSRD BMP
   Detail Drawings are applicable for velocities up to 20 fps.

2. Dimensions shown are minimum.

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GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL LEGEND

NOTES:
1. Slope or shore excavation sides
   are necessary. Exposed condition is a high velocity type LR(HV). All GSRD BMP
   Detail Drawings are applicable for velocities up to 20 fps.

2. Dimensions shown are minimum.

REVISED STANDARD PLAN RSP D140G

April 16, 2021

LONGITUDINAL SECTION - MAXIMUM SCREENED PIPE HEIGHT

LONGITUDINAL SECTION - MINIMUM SCREENED PIPE HEIGHT

TYPICAL SECTION

GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL LAYOUT

NOTES (THIS SHEET ONLY):
1. For Sections A-A, B-B, C-C and D-D, see Revised Standard Plan RSP D140C.
2. For ladder details, see Revised Standard Plan RSP D140E.
3. For end and intermediate screened pipe details, see Revised Standard Plan RSP D140F.
4. For grate details, see Revised Standard Plan RSP D140G.
5. For layout of inlet and outlet pipes, see "Drainage Plans".
6. For FL elevation of inlet and outlet pipes, see "Drainage Profiles".
7. For dimension "L", "T" and other design data, see Revised Standard Plan RSP D140A.
8. For dimension "H", see Revised Standard Plan RSP D140C.

1. For Sections A-A, B-B, C-C and D-D, see Revised Standard Plan RSP D140D.
2. For ladder details, see Revised Standard Plan RSP D118.
3. For end and intermediate screened pipe details, see Revised Standard Plan RSP D140F.
4. For grate details, see Revised Standard Plan RSP D140G.
5. For layout of inlet and outlet pipes, see "Drainage Plans".
6. For FL elevation of inlet and outlet pipes, see "Drainage Profiles".
7. For dimension "L", "T" and other design data, see Revised Standard Plan RSP D140A.
8. For dimension "H", see Revised Standard Plan RSP D140C.
WALL OPENING DETAILS
To be used at Linear Radial inlet and outlet pipe locations

SECTION A-A
REINFORCING STEEL AND DATA FOR WALLS

<table>
<thead>
<tr>
<th>Design &quot;H&quot;</th>
<th>4'-0&quot;</th>
<th>6'-0&quot;</th>
<th>8'-0&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bars</td>
<td>#6 @ 8&quot;</td>
<td>#6 @ 8&quot;</td>
<td>#6 @ 8&quot;</td>
</tr>
<tr>
<td>#4 Bars</td>
<td>M5 @ 12&quot;</td>
<td>M5 @ 12&quot;</td>
<td>M5 @ 12&quot;</td>
</tr>
<tr>
<td>#5 Bars</td>
<td>M5 @ 14&quot;</td>
<td>M5 @ 14&quot;</td>
<td>M5 @ 14&quot;</td>
</tr>
<tr>
<td>#6 @ 18&quot;</td>
<td>M5 @ 12&quot;</td>
<td>M5 @ 12&quot;</td>
<td>M5 @ 12&quot;</td>
</tr>
</tbody>
</table>

NOTE: For maximum inlet pipe opening, see wall opening details.

SECTION B-B
END OUTLET PIPE INTO GROODED HEAD WALL, 3'-0" MINIMUM ABOVE FLOOR LEVEL. SEE NOTE 2

SECTION C-C
END INLET PIPE INTO GROODED HEAD WALL, MINIMUM 3'-0" ABOVE FLOOR LEVEL. SEE NOTE 2

SECTION D-D
NOTE: Outlet wall shown, inlet wall similar.

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GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL DETAILS
NO SCALE

REVISED STANDARD PLAN RSP D140C
NOTE (THIS SHEET ONLY):
1. All metal components of screen pipe including connections to concrete must be stainless steel.
BEARING BARS

CROSS BARS 1/4" ROUND OR RECTANGULAR OR HEXAGONAL BAR OF EQUIVALENT AREA

BAR OF EQUIVALENT AREA
RECTANGULAR OR HEXAGONAL CROSS BARS 1/4" ROUND

BEARING BARS

1 1/2" x 1/4"
3"

SPACING
16 SPACES @ 4" = 5'-4" 8'-10 3/4"

Typ

Fillet Welded

RESISTANCE WELDED OR ELECTROFORGED CROSS BARS MAY BE FILLET WELDED, NOTE:
BAR OF EQUIVALENT AREA
OR RECTANGULAR OR HEXAGONAL CROSS BARS 1/4" ROUND

BEARING BARS

1 1/2" x 1/4"
3"

SPACE
22 SPACES @ 1 1/8" FOR L = 2'-2 1/8"

Typ

Min

L 2 1/4" x 2 1/4" x 1/4"
3"

GRATE PANEL

GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL GRATE PANEL DETAILS
NO SCALE

REVISED STANDARD PLAN RSP D140F

GROSS SOLIDS REMOVAL DEVICE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SCREENED PIPES
No. OF INTERMEDIATE PIPES
0
1
2
3
4
5

No. OF GRATES
No. OF GRATES LR(HV)
5
7
9
11
13
15

1/16" GAP, SEE NOTE 1

L 2 1/2" x 2 1/2" x 1/4"

GRATE SUPPORT

SECTION J-J

SECTION K-K

1/16" GAP

8"" 12" 12"

TOP OUTSIDE EDGE OF OUTLET WALL

TOP OUTSIDE EDGE OF SIDE WALL

GRATE LAYOUT

TO ACCOMPANY PLANS DATED 2018

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.

No. OF GRATES LR
0
1
2
3
4
5
10 12
14
16

No. OF INTERMEDIATE SCREENED PIPES
0
1
2
3
4
5
6

8"" 12" 12"

TOP OUTSIDE EDGE OF INLET WALL

TOP OUTSIDE EDGE OF INLET WALL

1/16" GAP

8" 12" 12"

1/16" GAP

8" 12" 12"

TOP OUTSIDE EDGE OF INLET WALL

TOP OUTSIDE EDGE OF INLET WALL

8" 12" 12"

8" 12" 12"

8" 12" 12"

REVISED STANDARD PLAN RSP D140F

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GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL GRATE PANEL DETAILS
NO SCALE


REVISED STANDARD PLAN RSP D140F

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL GRATE PANEL DETAILS
NO SCALE

**Annotation Symbol Description**

- **ABANDON, IF APPLIED TO CONDUIT, REMOVE CONDUCTORS**
- **INSTALL FULL BOX IN EXISTING CONDUIT RUN**
- **PEDESTRIAN BARRIAGE, 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 TAPES**
- **DETECTOR HANDRAIL**
- **FOUNDATION TO BE ABANDONED**
- **INSTALL SIGN ON SIGNAL MAST ARM**
- **NO SLIP BASE ON STANDARD**
- **PHOTOELECTRIC 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**

**Standard**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>New</th>
<th>Existing</th>
<th>Type</th>
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<td>PHOTOELECTRIC UNIT</td>
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<td>CONNECT NEW AND EXISTING CONDUIT, REMOVE EXISTING CONDUCTORS AND INSTALL CONDUCTORS AS INDICATED</td>
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<td>ABANDON. IF APPLIED TO CONDUIT, REMOVE CONDUCTORS</td>
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**Soffit and Wall-Mounted Luminaires**

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<th>Symbol</th>
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<tbody>
<tr>
<td>← 0</td>
<td>PENDANT SOFFIT LUMINAIRE</td>
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<tr>
<td>← 2</td>
<td>FLUSH-MOUNTED SOFFIT LUMINAIRE</td>
</tr>
<tr>
<td>← 3</td>
<td>WALL-MOUNTED LUMINAIRE</td>
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**Miscellaneous Electrolizers**

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<th>Symbol</th>
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<tbody>
<tr>
<td>o</td>
<td>LUMINAIRE ON WOOD POLE</td>
</tr>
<tr>
<td>← o</td>
<td>NON-STANDARD ELECTROLIER (SEE PROJECT LEGEND)</td>
</tr>
<tr>
<td>→ o</td>
<td>CITY ELECTROLIER</td>
</tr>
<tr>
<td>← 0</td>
<td>ELECTROLIER FOUNDATION (FUTURE INSTALLATION)</td>
</tr>
</tbody>
</table>

**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.

**Electrical Systems (Legend)**

- **No Scale**

**All Rights Reserved 2021 California Department of Transportation**
POLE MOUNTED SERVICE INSTALLATIONS

LEGEND:

1. METER SOCKET.
2. SERVICE ENCLOSURE MUST BE ACCESSIBLE, UNLESS OTHERWISE SHOWN.
3.-service utility will furnish and install required service riser and equipment.
4. STATE OWNED POLE, THE CONTRACTOR SHALL FURNISH AND INSTALL REQUIRED SERVICE RISER AND EQUIPMENT.
5. SERVICE UTILITY SHALL DETERMINE THE EXACT LOCATION.

NOTES:

1. Ground clamp and required fittings must be accessible, conduct must extend to protect grounding electrode conductor from mechanical damage.
2. Use where service utility requires 18" clearance between grounding electrode and the pole or service equipment enclosure. Installation shown is for sidewalk 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.

SERVICE GROUNDING

SERVICE UTILITY SHALL FURNISH AND INSTALL REQUIRED SERVICE RISER, PEU WITH CONDUCTORS AND SERVICE EQUIPMENT ENCLOSURE WITH A MINIMUM 60 A RATED MAIN CIRCUIT BREAKER, UNLESS OTHERWISE SHOWN.

SERVICE UTILITY WILL FURNISH AND INSTALL REQUIRED SERVICE RISER AND EQUIPMENT.
**DETAIL A**

**TYPE III-A SERVICE EQUIPMENT ENCLOSURE (TYPICAL)**

**DETAIL A**

- **NAMEPLATE**

**DETAIL B**

**BASE FOR TYPE III-A SERVICE EQUIPMENT ENCLOSURE**

**DETAIL C**

**120/240 V SERVICE WIRING DIAGRAM (TYPICAL)**

**DETAIL D**

**NOTES:**

1. Unless otherwise indicated on the plans, service equipment items shall be provided for each service equipment enclosure as shown.

2. Connect to remote test switch mounted on lighting standards, high posts, or structure when required.

3. Items (a) and (b) shall be isolated from the service equipment enclosure.

4. Type 3 photoelectric control shall be used unless otherwise indicated on the plans.

5. Items (c) and (d) shall be gorged operated CB.

6. The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the working electronics within the service equipment enclosure shall be maintained.

---

**REVISED STANDARD PLAN RSP ES-2D**

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**ELECTRICAL SYSTEMS**

(SERVICE EQUIPMENT ENCLOSURE AND TYPICAL WIRING DIAGRAM, TYPE III-A SERIES)

NO SCALE
The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.

1. Unless otherwise indicated on the plans, service equipment items shall be provided for each service equipment enclosure as shown.
2. Connect to remote test switch mounted on lighting standards, sign posts, or structure when required.
3. Items 7 and 8 shall be isolated from the service equipment enclosure.
4. Type III photoelectric control shall be used unless otherwise indicated on the plans.
5. Item 12 and 20 shall be ganged operated CB.
6. The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.

DETAIL C

120/240 V SERVICE WIRING DIAGRAM (TYPICAL)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COMPONENT</th>
<th>NAMEPLATE DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NEUTRAL LUG</td>
<td>15 A, 120 V, 1P, CB</td>
</tr>
<tr>
<td>2</td>
<td>LANDING LUG</td>
<td>30 A, 240 V, 2P, CB</td>
</tr>
<tr>
<td>3</td>
<td>TEST BYPASS FACILITY</td>
<td>100 A, 240 V, 2P, CB</td>
</tr>
<tr>
<td>4</td>
<td>METER SOCKET AND SUPPORT</td>
<td>30 A, 240 V, 2P, CB</td>
</tr>
<tr>
<td>5</td>
<td>TERMINAL BLOCKS</td>
<td>50 A, 120 V, 1P, CB</td>
</tr>
<tr>
<td>6</td>
<td>NEUTRAL BUS</td>
<td>50 A, 120 V, 1P, CB</td>
</tr>
<tr>
<td>7</td>
<td>GROUND BUS</td>
<td>20 A, 120 V, 1P, CB</td>
</tr>
<tr>
<td>8</td>
<td>GROUNDING ELECTRODE</td>
<td>15 A, 120 V, 1P, CB</td>
</tr>
<tr>
<td>9</td>
<td>30 A, 2P, NO CONTACTOR</td>
<td>SIGN ILLUMINATION</td>
</tr>
<tr>
<td>10</td>
<td>METER SOCKET</td>
<td>20 A, 120 V, 1P, CB</td>
</tr>
<tr>
<td>11</td>
<td>PEU WINDOWS</td>
<td>15 A, 120 V, 1P, CB</td>
</tr>
<tr>
<td>12</td>
<td>LIGHTING CONTROL</td>
<td>30 ILLUMINATION TEST SWITCH</td>
</tr>
<tr>
<td>13</td>
<td>15 A, 1P, TEST SWITCH</td>
<td>SIGN ILLUMINATION TEST SWITCH</td>
</tr>
<tr>
<td>14</td>
<td>60 A, 2P, NO CONTACTOR</td>
<td>LIGHTING CONTROL</td>
</tr>
</tbody>
</table>

NOTES:

1) The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.
2) Connect to remote test switch mounted on lighting standards, sign post, or structure when required.
3) The plan shows the approximate location of devices within the enclosure. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.
4) Type III photoelectric control shall be used unless otherwise indicated on the plans.
5) Item 12 and 20 shall be ganged operated CB.

BASE FOR TYPE III-B SERVICE EQUIPMENT ENCLOSURE

DETAIL A

SIDE VIEW

FRONT VIEW

TYPE III-B SERVICE EQUIPMENT ENCLOSURE (TYPICAL)

DETAIL A

DETAIL B

SERVICE EQUIPMENT ENCLOSURE

DETAIL B

SERVICE CONDUIT

LOAD CONDUIT

GROUNDING ELECTRODE LOCATION

NAMEPLATE

CONCRETE PAD

GROUND CLAMP

GROUNDING BUS

LOAD SIDE AREA

UTILITY AREA

LOAD AREA

REMOVABLE FRONT PANEL

FOOTING CONDUIT

NEUTRAL LUG

Piano hinge

HINGE

LANDING LUGS

Neutral bus

GROUND BUS

BONDING JUMPER

GROUND BUS

NEUTRAL BUS

CONDUIT

GROUNDING ELECTRODE

ANCHOR BOLTS, 3/8 IN. X 20 IN.

SIDE VIEW

FRONT VIEW

SIDE VIEW

FRONT VIEW

BASE FOR TYPE III-B SERVICE EQUIPMENT ENCLOSURE

DETAIL A

DETAIL B

SERVICE EQUIPMENT ENCLOSURE
The plan shows the approximate location of devices otherwise indicated on the plans. Components may be rearranged, however, the "working" electronics within the service equipment enclosure shall be maintained.
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 controller cabinet. The pad shall be 3'-0" x 4" thick x 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 5" clear vertical space shall be provided inside the cabinet for the equipment.
7. Telephone interconnect conductors shall be enclosed in a 3/4" 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 3/4" x 1'-6" with a 2" - 90° bend.

TOP OF PEDESTAL SHALL BE LEVEL ADJUSTED TO PROVIDE CLEARANCE AROUND CABINET BASE.
CHAMFER EDGE 3/8" x 3/4"

FINISHED GRADE

PEDESTAL FOUNDATION
FOR MODEL 336LS CABINET
DETAIL A
NOTES:
1. Where telephone interconnect is required, a minimum of 5" 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.

ELECTRICAL SYSTEMS
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
NO SCALE

COUNTY ROUTE
POST MILES
TOTAL PROJECT
SHEET
TOTAL SHEETS
PLANS
APPROVAL
DATE
No.
Exp.
ELECTRICAL ENGINEER
DISTRICT ENGINEER
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR COPIES OF THIS PLAN SHEET.

THE ACCURACY OR COMPLETENESS OF SCANNED CONDUIT AREA

DOOR
FRONT
GROUND CLAMP
ELECTRODE AND 10' GROUNDING

MIN
MIN

FOUNDATION AND PAD DETAIL
MODEL 332LS, 334LS, and 334LC

MODEL 332LS CABINET
MOUNTED TO THE MODEL 332LS CABINET

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))

BOLT MOUNTING LOCATION (4 Typ)

ANCHOR BOLTS (2 Min)
¾" Ø x 1'-3" WITH A 2"-90^ BEND (4 Min)

ANCHOR BOLTS (2 Min)
¾" x 1'-3" WITH A 2"-90^ BEND (4 Min)

LX-BSS CABINET DOOR

2" CHASE NIPPLE

2" CHASE NIPPLE

2" CHASE NIPPLE

10' GROUNDING ELECTRODE AND GROUND CLAMP

CONCRETE PAD

CONCRETE PAD

MODEL 332LS, 334LS CB TAIN

MODEL 332LS, 334LS, AND 334LC C ABINET

MODEL 332LS CABINET
MOUNTED TO THE MODEL 332LS CABINET

LEFT SIDE INSTALLATION DETAIL A

RIGHT SIDE INSTALLATION DETAIL B

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

( CONTROLLER CABINET FOUNDATION AND PAD DETAILS)

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS

NO SCALE


April 16, 2021

REVISED STANDARD PLAN RSP ES-3C

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.

CONDUIT AREA (9" x 12")

FOUNDATION AND PAD DETAIL

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

CONDUIT AREA (9" x 12")

MODEL 342LX, 344LX, AND 346LX CABS, 2" - 90° REO (3/4")

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

FOUNDATION FOR THE MODEL

SIDE VIEW

FRONT VIEW

FOUNDATION FOR TYPE LX CABINET

DETAIL A

DETAIL B
**NOTES:**

1. Where telephone interconnect is required, a minimum of 2" clear vertical space shall be provided inside the cabinet for the equipment.

2. Telephone interconnect conductors shall be enclosed in a 3¼" 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, 1½"-16 x 1" bolts; two washers per bolt, designed for 1½"-16 bolts and are 18-8 stainless steel, 1" outside diameter, round, and flat; and one A-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.
**NOTES:**

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 Type 1-C Standard. The steel pedestal shall be 2'-6" x 2'-6" in length. Anchor bolts shall be ¾" x 3'-6" with a 2" - 90° bend. Four bolts required per cabinet.

3. Telephone interconnect conductors shall be enclosed in a ¾" 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 G cabinet pedestal and foundation (see Revised Standard Plan RSP ES-3B).

**FASTENER SCHEDULE**

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<tr>
<th>Description</th>
<th>Fasteners</th>
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<tbody>
<tr>
<td>BACKBOARD</td>
<td>4 - 5/8&quot; (LENGTH) WOOD SCREWS</td>
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<tr>
<td>2 SHELF SUPPORTS</td>
<td>4 - 5/8&quot; (LENGTH) WOOD SCREWS</td>
</tr>
<tr>
<td>JUNCTION BOX MOUNTED TO BACKBOARD</td>
<td>4 - 5/8&quot; (LENGTH) WOOD SCREWS</td>
</tr>
<tr>
<td>TERMINAL BLOCK, 12 POSITIONS</td>
<td>4 - 5/8&quot; (LENGTH) WOOD SCREWS</td>
</tr>
</tbody>
</table>

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**STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**

**ELECTRICAL SYSTEMS (TELEPHONE DEMARCATION CABINET, TYPE A)**

**NO SCALE**


**REVISED STANDARD PLAN RSP ES-3D**
BREAKER CIRCUIT 10" 11"
LOUVERS FILTERED VENTILATION CONTROLLER CABINET
2" TO CONTROL THERMOSTAT 3"

SECTION A-A
FRONT VIEW INTERIOR DETAIL A

SECTION B-B
FRONT VIEW SIDE VIEW

DETAIL A
FRONT VIEW
INTERIOR DETAIL A

DETAIL B
FRONT VIEW SIDE VIEW

BASE PLAN DETAIL C

WIRING DIAGRAM DETAIL D

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (TELEPHONE DEMARCATION CABINET, TYPE B)

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

DETAIL E

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
ELECTRICAL SYSTEMS
(TELEPHONE DEMARCATION CABINET, TYPE C)
NO SCALE
NOTE:
1. Base mounting frame shall be constructed with 0.134" galvanized steel.
CONDUIT FROM ELECTRIC SERVICE JOINT

IRRIGATION CONTROLLER ENCLOSURE CABINET
NOT PART OF ELECTRICAL WORK

ELEVATION DETAIL A

NOT PART OF ELECTRICAL WORK CONCRETE FOUNDATION,
GROUNDING ELECTRODE

SECTION A-A

IRRIGATION CONTROLLER ENCLOSURE CABINET WIRING DIAGRAM (Typ)

IRRIGATION CONTROLLER ENCLOSURE CABINET
NOT PART OF ELECTRICAL WORK CONCRETE FOUNDATION, GROUNDING ELECTRODE

GROUND CLAMP, TYPE 1 OR 4

GFCI DUPLEX RECEPTACLE
15 A, CB

GROUNDING LUG

ON/OFF SWITCH

15 A

GANG JUNCTION BOX

ON/OFF SWITCH

REAR-MOUNTED 0" x 0" x 3/8" JUNCTION BOX

1/2", TYPE 1 OR 4

ELECTRICAL JUNCTION BOX LAYOUT

DEFECT C

GFCI

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
IRRIGATION CONTROLLER ENCLOSURE CABINET

NO SCALE

NOTES:
1. Install connections when BBS is equipped with this option.
2. Install and connect harness for BBS or GT-BBS.

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

TO CONTROLLER CABINET

Circuitry

CLEAN
IN
AC+
IN
AC-
OUT
AC+
OUT
AC-
G

TO BATTERY SET

AC+ Line to UPS

BATTERY BACKUP SYSTEM

ELECTRONICS ASSEMBLY CONNECTION DIAGRAM

BATTERY BACKUP SYSTEM

ELECTRICAL SYSTEMS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REVISED STANDARD PLAN RSP ES-3K

RSP ES-3K DATED APRIL 16, 2021 SUPERSEDES RSP ES-3K DATED OCTOBER 16, 2020 AND
ABBREVIATIONS:

SV  SITE MOUNTED SIGNAL HEADS
T  TERMINAL COMPARTMENT
TV  TOP MOUNTED SIGNAL HEADS
1, 2, 3, 4  NUMBER OF SIGNAL FACES
A, B, C, D  CONFIGURATION OF SIGNALS

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

ABBREVIATIONS:
- SP: SIDE MOUNTED PEDESTRIAN SIGNAL
- TP: TOP MOUNTED PEDESTRIAN SIGNAL
- T: TERMINAL COMPARTMENT

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

DETAIL A

- PEDESTRIAN SIGNAL HEAD MOUNTINGS

- TOP MOUNTINGS
- SIDE MOUNTINGS

DETAIL B

- PERSON WALKING INTERVAL
- FLASHING UPRaised HAND INTERVAL
- STEADY UPRaised HAND INTERVAL
- LED COUNTDOWN PEDESTRIAN SIGNAL FACE MODULE
**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.

**NOTES:**
- Typical signal pole placement unless dimensioned on plans.
- For A and B dimensions, see Pole Schedule.

**SIGNAL FACES**
- State of California Department of Transportation
- Electrical Systems

**TYPICAL SIGNAL HEAD INSTALLATIONS**

- Type 1-A, 1-B, 1-C and 1-D standard as indicated on plans

- Normally used on standards with luminaire or signal mast arm

- Type 1-A, 1-B, 1-C and 1-D standard as indicated on plans

- Use plans for type of signal mounting

- see plans for type of signal mounting

- Pedestrian signal head

- Special 90° elbow

- Top mounted terminal compartment

- Side mounted terminal compartment

- Type LT-2-T signal mounting

- Top mounted pedestrian signal head

- Side mounted pedestrian signal head

- APS when required, typ

- U-turn

- U-turn

- U-turn

- Top mounted signals (TV)

- Side mounted signals (SV and SP)

- Left turn lane signal

- Six 10-24 or 10-32 stainless steel machine screws and flat washers

- Drill signal face and attach backplate with six 10-24 or 10-32 self-tapping and locking machine screw and nut.

- Signal face and backplate retroreflective strip when required

- Backplate

- 8" and 12" sections

- 8" diameter front view

- 12" diameter front view

- ISOMETRIC VIEW

- SECTION A-A

- SECTION B-B

- VISORS

- ISOMETRIC VIEW

- DIRECTIONAL LOUVER

- Directional louvers shall be oriented and secured in place with one plated brass machine screw and nut.
**TOP MOUNTINGS**

**SIGNAL SLIP FITTERS**

3 CADMIUM PLATED STEEL SET SCREWS

1 TO 4 OPENINGS AS REQUIRED

**MISCELLANEOUS MOUNTING HARDWARE**

COVER

CABLE GUIDE

**TOP VIEW**

SECTION A-A

POLE PLATE FOR SIDE MOUNTED SIGNAL HEAD

WITHOUT TERMINAL COMPARTMENT

**SECTION B-B**

TERMINAL COMPARTMENT

SIGNAL STANDARD

FLAT WASHER

1 1/2" NIPPLE

STOP

BRONZE WASHER CURVED TO FIT STANDARD

DETAIL C

**TYPE MAT**

MAST ARM MOUNTING

For 2 NPS pipe, see Note 1.

**TYPE MAS**

MAST ARM MOUNTING

For 4 NPS pipe, see Note 2.

**LOCK RING**

Use where locking ring is not integral with signal housing or fitting.

**SIGNAL SLIP FITTERS**

1 1/2" NPS PIPE THREAD

SPECIAL 90° ELBOW

One for each signal head, except those with special slip fitter mounting

NOTES:

1. After mast arm signal has been plumbed and secured, drill 3/8" hole through mast arm tenon in line with slip fitter hole. Place a cadmium plated 3/8" x 1 1/2" galvanized bolt with washer under ring, passing through signal heads or fittings, and tenon, securing with cadmium plated locking ring. Top opening shall be offset when backplate is used.

2. Threaded top mounted slip fitter openings shall be 1 1/2" NPS. Serrations in fittings shall match those on bottom of signal heads or in lock ring. 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 1/2".
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 lane detection and bicycle lanes.

DIAGRAMS:
- **Type A Loop Detector Configuration**
- **Type B Loop Detector Configuration**
- **Type C Loop Detector Configuration**
- **Type D Loop Detector Configuration**
- **Type E Loop Detector Configuration**
- **Type F Loop Detector Configuration**

DIMENSIONS:
- **6'-0"**
- **1'-0"**
- **2'-6"**
- **2'-3"**
- **3'-0"**
- **5'-8"**
- **6'-0"**
- **7'-0"**
- **8"**
- **8'-0"**

**Notes to Plans**:
- **STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**
- **ELECTRICAL SYSTEMS (DETECTORS)**
- **No Scale**
- **REVISED STANDARD PLAN RSP ES-5B**
- **DATED MAY 31, 2018 - PAGE 505 OF THE STANDARD PLANS BOOK DATED 2018.**
NOTES:
1. Bushing shall be used at end of conduit.
2. Tape detector conductors 3" each side of bushings.
3. Install duct seal compound to each end of termination conduit before installing sections.
4. Round all sharp edges where detector conductors have to pass.
5. End of conduit shall be 3/4" below roadway surface.
6. Conduit size
   - Loop conductors
     - 1/2" minimum: 1 to 2 pairs
     - 3/4" minimum: 5 to 4 pairs
     - 1" minimum: 5 or more pairs
7. Splice detector conductors to detector lead-in-cable.
8. Location of detector handhole when shown on plans.
9. When the shoulder and traveled way are paved with the same material and there is no joint between them, the conduit shall extend only 2'-0" into the shoulder pavement.
10. 3/4": 3 conduit 6" long minimum, plug both ends with duct compound to keep out sealant.
11. 1/2" minimum between top of conduit and pavement surface.
12. Sawcut shall not exceed 1" in width and 3/4" longer than conduit to be installed.
13. Conductors with 1/2" minimum slack inside conduit.
TYPE 15 AND TYPE 21

ELEVATION A

TYPE 15 AND TYPE 21 BARRIER RAIL MOUNTED

ELEVATION B

POLE DATA

| POLE TYPE | 4" | BASE THICKNESS | TOP THICKNESS | BOLT CIRCLE THICKNESS | ANCHOR BOLT SIZE
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>3'-6&quot;</td>
<td>1&quot;/8&quot;</td>
<td>3&quot;/8&quot;</td>
<td>1&quot;/8&quot;</td>
<td>1&quot; x 36&quot; x 2&quot;/8&quot;</td>
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<tr>
<td>21</td>
<td>3'-0&quot;</td>
<td>9/6&quot;</td>
<td>3&quot;/8&quot;</td>
<td>1&quot;/8&quot;</td>
<td>1&quot; x 36&quot; x 2&quot;/8&quot;</td>
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</table>

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

BASE PLATE DATA

<table>
<thead>
<tr>
<th>CIDH PILE FOUNDATION</th>
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<tbody>
<tr>
<td>Depth</td>
</tr>
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<td>2'-0&quot;</td>
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LUMINAIRE MAST ARM DATA

<table>
<thead>
<tr>
<th>LUMINAIRE MAST ARM DATA</th>
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<tbody>
<tr>
<td>MAST ARM PLATE</td>
</tr>
<tr>
<td>AXIS OF POLE</td>
</tr>
</tbody>
</table>

BASE PLATE

DETAIL A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(LIGHTING STANDARD,
TYPES 15 AND 21)

NO SCALE

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

**NOTES:**

1. Furnish shims 0.012" thick and 0.036" thick. Shims shall be fabricated brass shim stock or galvanized steel.
2. Drill and tap thru chord plate for 1" Ø HS cap screws, total 4 holes equally spaced.
3. Drill and tap thru chord plate for 1" Ø HS cap screws, total 4 holes equally spaced.
4. 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.

**ELEVATION A**

**DETAIL A**

**SECTION K-K**

**LUMINARIE MAST ARM DATA**

<table>
<thead>
<tr>
<th>Length</th>
<th>Rise</th>
<th>Min Clr Typ</th>
<th>Nominal Thickness</th>
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<tr>
<td>15'-0&quot;</td>
<td>6½&quot;</td>
<td>4'-9&quot;</td>
<td>0.1196&quot;</td>
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<tr>
<td>20'-0&quot;</td>
<td>7¼&quot;</td>
<td>5'-0&quot;</td>
<td>0.1793&quot;</td>
</tr>
<tr>
<td>25'-0&quot;</td>
<td>5&quot;</td>
<td>10'-0&quot;</td>
<td>0.1793&quot;</td>
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**POLE DATA**

<table>
<thead>
<tr>
<th>Pole Extension Type</th>
<th>Height &quot;H&quot;</th>
<th>Min OD Base</th>
<th>Min OD Top</th>
<th>Thickness</th>
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<td>Tapered Steel Pole</td>
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<tr>
<td></td>
<td>10'-0&quot;</td>
<td>5½&quot;</td>
<td>5½&quot;</td>
<td>0.1793&quot;</td>
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</tbody>
</table>

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**2018 REVISED STANDARD PLAN RSP ES-6C**

**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.
TYPE 1 SIGNAL STANDARDS

DETAIL A

SEE DETAIL J

0.1186" WALL THICKNESS
THREADED STEEL POST
6'-0" at Base.
Nom. TAP 3/8-16" PER FOOT

0.1186" WALL THICKNESS
THREADED STEEL POST
4" x 1/8" Class 250
galv. cast iron pipe
flange

BASE PLATE
DETAIL A-2

BASE PLATE
DETAIL A-4

BASE PLATE
DETAIL A-6

TOTAL NUMBER OF BOLT HOLES MAY VARY.

NOTE:
For Details not shown see Type 1-A Standard

Self Adhesive 3/8" LETTERS

IDENTIFICATION CHARACTER DETAIL
DETAIL B-1

DETAIL B-2

ELEVATION

LOCATION OF EQUIPMENT IDENTIFICATION CHARACTERS
ON STANDARDS AND POSTS

DETAIL B

DETAIL A-5

DETAIL A-7

DETAIL J

1" x 10" Class 250
galv. cast iron pipe
flange

TOTAL PROJECT SHEETS
8

TOTAL POST MILES
20

TOTAL NUMBER OF COPIES
25

TOTAL PROJECT
20-000

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(SIGNAL AND LIGHTING STANDARD, TYPE 1 AND EQUIPMENT IDENTIFICATION CHARACTERS)

NO SCALE

See Detail J

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REVISED STANDARD PLAN RSP ES-7E

ELECTRICAL SYSTEMS
(SIGNAL AND LIGHTING STANDARD, CASE 3 SIGNAL MAST ARM LOADING, WIND VELOCITY=100 MPH AND SIGNAL MAST ARM LENGTHS 15' TO 45')

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA


INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.
DETAIL C1

Continuous External Collar

BASE PLATE

COLLAR

EXTERNAL

CONTINUOUS

DETAIL C2

Countersink

BASE PLATE

CJP

BACKGOUGE

DETAIL C3

Base Plate or Mast Arm Plate

DIAMETER = POLE INSIDE DIAMETER - 2"

CENTRAL HOLE IN BASE PLATE OR MAST ARM PLATE

DETAIL C4

For alternative base, see Detail C4

ELEVATION B

ELEVATION C

For alternative base, see Detail C4

ELEVATION B

ELEVATION C

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(SIGNAL AND LIGHTING STANDARD,
DETAIL NO. 3)

NO SCALE
RSP ES-70 DATED OCTOBER 19, 2018 SUPERcedes STANDARD PLAN ES-70

REvised STANDARD PLAN RSP ES-70

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SECTION A-A

No. 3½(T), No. 5(T), AND No. 6(T)

TRAFFIC PULL BOX

NOMINAL DIMENSIONS TABLE

<table>
<thead>
<tr>
<th>PULL BOX TYPE</th>
<th>MINIMUM THICKNESS</th>
<th>MINIMUM DEPTH</th>
<th>L0</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>W0</th>
<th>W1</th>
<th>LOAD RATING</th>
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<tr>
<td>No. 3½(T)</td>
<td>1½&quot;</td>
<td>1&quot;-0&quot;</td>
<td>1'-5½ - 1'-6½</td>
<td>1'-0 - 1'-0½</td>
<td>1'-0 - 1'-0½</td>
<td>1'-0 - 1'-0½</td>
<td>1'-0 - 1'-0½</td>
<td>1'-0 - 1'-0½</td>
<td>1'-0 - 1'-0½</td>
<td></td>
</tr>
<tr>
<td>No. 5(T)</td>
<td>1½&quot;</td>
<td>1&quot;-0&quot;</td>
<td>2'-4½ - 2'-5½</td>
<td>2'-0 - 2'-1½</td>
<td>2'-0 - 2'-1½</td>
<td>2'-0 - 2'-1½</td>
<td>2'-0 - 2'-1½</td>
<td>2'-0 - 2'-1½</td>
<td>2'-0 - 2'-1½</td>
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</tr>
<tr>
<td>No. 6(T)</td>
<td>2&quot;</td>
<td>1&quot;-0&quot;</td>
<td>2'-11½ - 2'-11½</td>
<td>2'-6 - 2'-7½</td>
<td>2'-6 - 2'-7½</td>
<td>2'-6 - 2'-7½</td>
<td>2'-6 - 2'-7½</td>
<td>2'-6 - 2'-7½</td>
<td>2'-6 - 2'-7½</td>
<td></td>
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</table>
FLUSH-MOUNTED SOFFIT LUMINAIRE INSTALLATION
DETAIL F

PENDANT SOFFIT LUMINAIRE INSTALLATION
DETAIL P

WALL-MOUNTED LUMINAIRE INSTALLATION
DETAIL W

REINFORCING STEEL
(SEE STANDARD PLAN 13-71)

CENTER BETWEEN GIRDERS
DECK SLAB

METAL BALL TYPE
FLEXIBLE FIXTURE HANGER
WITH FLANGE AND INSULATED BUSHING.

SPOT WELD TO PULL BOX
WITH FLANGE AND INSULATED BUSHING.

6" x 6" x 6"
NEMA TYPE 4 (10 Ga.)
METAL JUNCTION BOX

TOP VIEW

SIDE VIEW

TERMINAL BLOCK
MOUNTING BRACKET
DETAIL T

LOCKNUT
FACE OF CONCRETE WHERE STRUCTURE IS NOT HORIZONTAL

PLUG UNUSED HUBS
REINFORCING STEEL
(SEE STANDARD PLAN 13-71)

BRIDGE SOFFIT
REFRACTOR AND FRAME ASSEMBLY

1:1 SLOPE
(EVEN WITH BOTTOM GIRDER)

CONDUIT HUB, INSTALL PLUG OR REDUCER AND CONDUIT, AS REQUIRED

ANCHOR RING
PLUG UNUSED HUBS
REFRACTOR AND FRAME ASSEMBLY

1:1 SLOPE
(EVEN WITH BOTTOM GIRDER)

FLUSH-MOUNTED SOFFIT LUMINAIRE INSTALLATION
DETAIL F

PENDANT SOFFIT LUMINAIRE INSTALLATION
DETAIL P

WALL-MOUNTED LUMINAIRE INSTALLATION
DETAIL W

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(FLUSH-MOUNTED SOFFIT,
PENDANT SOFFIT
AND WALL-MOUNTED LUMINAIRE
STRUCTURE INSTALLATIONS)

NO SCALE

REVISED STANDARD PLAN RSP ES-9E

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2018 REVISED STANDARD PLAN RSP ES-9E
Flux-Mounted Soffit Luminaire Assembly

Section A-A

- Starting aid with #16 AWG Type SFF-2 wiring and #10 stainless steel strap with worm gear drive.
- Existing flush-mounted soffit luminaire housing.
- Existing reflector lens.
- Existing refractor lens.
- 2½" height mogul screw base porcelain socket.
- 8 x 6 metal encapsulated capacitor with grounding resistor and wiring.
- Lamp starting aid with 90° elbow ballast with quick disconnect male blade tabs.
- Five section twin screw terminal block with quick disconnect male blade tabs.
- Mounting bracket, see detail on this sheet.
- ½" hole with rubber grommet for interconnecting wires.
- ½" slot and ½" # holes on top plate for mounting.
- 1½" # holes on bottom of plate.
- ½" # lamp socket mounting holes.
- ½" # terminal block mounting holes.
- ½" thick insulation.
- 2½" spot weld mounting holes.
- 3½" thick porcelain block.
- ½" # terminal block with quick disconnect.
- ½" terminal block (Typ).
- Capacitor.
- MPS lamp.
- Permanent marker for voltage rating.
- Interconnecting wiring with rubber grommet and slot.
- Holes on top plate for strap for mounting.
- Mounting bracket details.
- Wiring diagram.

Note:
1. Use #8 or #10 machine screws, lockwashers, and nuts for mounting ballast and terminal strips.

Electrical Systems (Flux-Mounted Soffit Luminaire Details)
WALL-MOUNTED
15' Mounting Height
ANSI Designation S62
Lamp operated at 5,800 lm
70 W (Max)

WALL-MOUNTED
15' Mounting Height
ANSI Designation S54
Lamp operated at 9,500 lm
100 W (Max)

FLUSH-MOUNTED SOFFIT
17' Mounting Height
ANSI Designation S62
Lamp operated at 5,800 lm
70 W (Max)

PENDANT SOFFIT
TYPE III SHORT
17' Mounting Height
ANSI Designation S62
Lamp operated at 5,800 lm
70 W (Max)

PENDANT SOFFIT
17' Mounting Height
ANSI Designation S62
Lamp operated at 5,800 lm
70 W (Max)

OVERHEAD SIGN LUMINAIRE
80' (Max)

NOTE:
Curves represent the minimum maintained illuminance (FC).
KINKING DETAIL FOR SLIP BASE STANDARDS
DETAIL A

- Make tight kink in each conductor at or somewhere below shear plane.
- Slack in conductors removed.
- Bonding bushing required.
- Bonding strap.
- Wrapped and secured conductors 4 times around projecting end of conduit; then continue to fused splice connector.

STEP 1
STEP 2

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

TYPICAL BANDING DETAILS
DETAIL B

- End of detector head-in cable.
- End of pedestrian signal conductor.
- End of sign lighting conductor.

PHASE
CIRCUIT
PHASE
PEDESTRIAN PUSH BUTTON CIRCUIT
BAND

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

No Scale

REVISED STANDARD PLAN RSP ES-13B

October 19, 2018

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REVISED STANDARD PLAN RSP ES-13B
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.

10" LETTERS

CROSS-SECTION OF SIGN

ISOMETRIC VIEW

TYPICAL FRONT VIEW OF SIGN UNIT

PREPARE TO STOP
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 120 V unswitched circuit.

Type LC3 Control
For 240 V unswitched circuits.

Type LC4 Control
For 480 V unswitched circuits.

Contactor
30 A, 2P
For 120 V unswitched circuit

Transformer
500 VA
For 120 V unswitched circuit

Type LC1 Control
For 120 V switched circuit, see Note 1 for Type SC1A

Type LC2 Control
For 240 V switched circuit, see Note 1 for Type SC2A

Type LC3 Control
For 480 V switched circuit, see Note 1 for Type SC3A

Type LC4 Control
For 480 V switched sign circuit, see Note 1 for Type SC4A

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.
**POLE DATA**

<table>
<thead>
<tr>
<th>POLE EXTENSION TYPE</th>
<th>WEIGHT /&quot;</th>
<th>WIN CD</th>
<th>THICKNESS</th>
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<tbody>
<tr>
<td>CAMERA POLE 5</td>
<td>5&quot;</td>
<td>4½&quot;</td>
<td>0.1793&quot;</td>
</tr>
<tr>
<td>CAMERA POLE 10</td>
<td>10&quot;</td>
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<td>3½&quot;</td>
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<tr>
<td>CAMERA POLE 15</td>
<td>15&quot;</td>
<td>6½&quot;</td>
<td>1½&quot;</td>
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</tbody>
</table>

**POLE DATA**

- **CAMERA MOUNTING ADAPTER DETAIL**
  - SHIM AS REQUIRED TO PLUMB POLE. CAST AROUND BASE PLATE AFTER ERECTION FOR RAIN TIGHT JOINT.
  - EXIST UPPER CHORD PLATE.
  - SHIM TO THE SAFETY CHAIN BRACKET.

**DETAIL A**

- **ELEVATION A**
  - POLE - J HOOK
  - TOP PLATE
  - SAFETY CHAIN BRACKET
  - SAFETY CHAIN BRACKET

**SECTION A-A**

- **SECTION K-K**
  - ½ PLATE
  - TRUSS AXIS
  - ¾" OLD HOLE FOR ¾" HS CAP SCREWS

**CAMERA MOUNTING ADAPTER DETAIL D**

- J HOOK FOR CABLE SUPPORT
- EXIST UPPER CHORD PLATE
- EXIST UPPER COLLAR
- 4½" & 2½", TAPERED STEEL POLE SECTION 4 = 0.1793".
- SEE DETAIL E

**EASTERN LIMITED DESIGNER**

**REVISION HISTORY**

- NEW: 2018 REVISED STANDARD PLAN RSP ES-16A
- DATE: MAY 31, 2018

**NOTES:**

1. Verify controlling field dimensions before ordering or fabricating any materials.
2. Bolt hole locations may vary at the discretion of the Engineer.
3. See Std Plan 513.
4. For wind loading see Revised Standard Plan RSP ES-7M.
5. Materials (Structural Steel):
   - A = 65,000 psi (A36)
   - B = 55,000 psi (Grade A1041)
   - C = 50,000 psi (unless otherwise noted)

**REVISED STANDARD PLAN RSP ES-16A**
**BASE PLATE DATA**

<table>
<thead>
<tr>
<th>POLE TYPE</th>
<th>HEIGHT &quot;h&quot;</th>
<th>MPD O.D.</th>
<th>THICKNESS &quot;t&quot;</th>
<th>THICKNESS ANCHOR BOLT SIZE</th>
<th>BC = BOLT CIRCLE</th>
<th>D.I.G.&quot;h&quot;</th>
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</thead>
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<td>CAMERA POLE 25</td>
<td>25'</td>
<td>7 3/4&quot;</td>
<td>3 3/8&quot;</td>
<td>1 1/16&quot;</td>
<td>1 1/16&quot;</td>
<td>2 1/16&quot;</td>
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<td>CAMERA POLE 30</td>
<td>30'</td>
<td>8&quot;</td>
<td>1 1/16&quot;</td>
<td>1 1/2&quot;</td>
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<td>2 - 6&quot;</td>
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<tr>
<td>CAMERA POLE 35</td>
<td>35'</td>
<td>8 3/8&quot;</td>
<td>1 - 2&quot;</td>
<td>1 1/2&quot;</td>
<td>1 - 2&quot;</td>
<td>2 - 6&quot;</td>
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<td>CAMERA POLE 40</td>
<td>40'</td>
<td>9 3/8&quot;</td>
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<td>1 1/2&quot;</td>
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<tr>
<td>CAMERA POLE 45</td>
<td>45'</td>
<td>10&quot;</td>
<td>1 - 3&quot;</td>
<td>1 1/2&quot;</td>
<td>1 - 2&quot;</td>
<td>8 - 8&quot;</td>
</tr>
</tbody>
</table>

**NOTES:**

1. Verify controlling field dimensions before ordering or fabricating any material.
2. During pole installation, the pole 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. fy = 55,000 psi (tapered steel tube and anchor bolts)
   - b. fy = 50,000 psi (unless otherwise noted)
5. Materials (Reinforced Concrete):
   - a. fc' = 3,625 psi
   - b. fy = 60,000 psi

**ELEVATION A**

- **SECTION A-A**
  - BASE PLATE
  - J HOOK
  - SAFETY CHAIN BRACKET
  - TOP PLATE
  - BOX ENCLOSURE
  - ANCHOR BOLT

- **DETAIL A**
  - BASE PLATE
  - J HOOK FOR CABLE SUPPORT
  - SQUARE

- **DETAIL B**
  - TOP PLATE

- **DETAIL C**
  - CAMERA MOUNTING ADAPTER
  - DETAIL

- **DETAIL D**
  - BOX ENCLOSURE
  - J HOOK

- **DETAIL E**
  - J HOOK
  - SQUARE

- **DETAIL F**
  - SAFETY CHAIN BRACKET
  - TACK WELD

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

**ELECTRICAL SYSTEMS**
(CAMERA POLE 25' TO 45')

**NO SCALE**

RSP ES-16B DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-16B

**REVIEWED STANDARD PLAN RSP ES-16B**

__Countrywide Standard Plan, State of California__

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Pole details shall suit the lowering device and this foundation plan. Pole details shall be submitted to the Engineer for approval.

1. Pole details shall suit the lowering device and this foundation plan. Pole details shall be submitted to the Engineer for approval.

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 = 50,000 psi (unreinforced steel tube)
- fy = 50,000 psi (unless otherwise noted)
FIBER OPTIC MARKER
FOR VAULTS AND PULL BOXES

FIBER OPTIC MARKER
FOR PAVED AREAS

FIBER OPTIC MARKER
FOR UNPAVED AREAS

NOTES:
1. "PB" for Pull Box or "VT" for Vault,
2. Telephone number as specified,
3. 1" black text,
4. 3/8" black text.

DETAIL A

DISK MARKER ETCHING

DETAIL B

SEE NOTE 1

SEE NOTE 2

SEE NOTE 3

SEE NOTE 4

FOR VAULTS AND PULL BOXES
FOR PAVED AREAS
FOR UNPAVED AREAS

DISK MARKER ETCHING

FIBER OPTIC MARKER

FIBER OPTIC MARKER

FIBER OPTIC MARKER

FIBER OPTIC MARKER

SEE NOTE 2

SEE NOTE 2

SEE NOTE 2

SEE NOTE 2

SEE NOTE 1

SEE NOTE 1

SEE NOTE 1

SEE NOTE 1

SEE NOTE 2

SEE NOTE 2

SEE NOTE 2

SEE NOTE 2

SEE NOTE 3

SEE NOTE 3

SEE NOTE 3

SEE NOTE 3

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

SEE NOTE 4

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

NO SCALE

REVISED STANDARD PLAN RSP ES-17A

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No scale

REVISED STANDARD PLAN RSP ES-17A

CASE 1N
POLE AT DEAD END
WITH ATTACHMENTS

CASE 2N
POLE AT TANGENT
WITH ATTACHMENTS

CASE 3N
POLE AT TANGENT OR CORNER
WITH ATTACHMENTS

CASE 4N
POLE AT JUNCTION
WITH ATTACHMENTS

CASE 5N
POLE WITHOUT OVERHEAD BUNDLE
WITH ATTACHMENTS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

Guy wire in line with opposing span ± 5°.

1. Camera or vehicle detection system
2. Overhead bundle consisting of a 1/2" # messenger wire, overhead conductors, and flushing wire
3. Lumincline with taped guy
4. Pedestrian push button or accessible push button
5. Signal face with 3 indications or single sheet sign panel (10 SQFT Max)
6. Riser with weather hood as required
7. Pull box as required
8. Grounding as required
9. Single flashing beacon or single sheet sign panel (4 SQFT Max)
10. Single sheet sign panel (4' x 4' Max) or signal face with 3 indications
11. Flashing beacon control assembly
12. 3/8" guy wire with white guy marker and strain insulator (for anchorage)

See "TEMPORARY WOOD POLES-DETAILS No. 2" sheet.

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°.
### Pole Selection Table

<table>
<thead>
<tr>
<th>Maximum H</th>
<th>MINIMUM POLE CLASS</th>
<th>POLE ENHANCEMENT (E)</th>
<th>POLE ENHANCEMENT (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>H-2</td>
<td>H-2</td>
<td>H-2</td>
</tr>
<tr>
<td>1.5&quot;</td>
<td>H-3</td>
<td>H-3</td>
<td>H-3</td>
</tr>
<tr>
<td>2&quot;</td>
<td>H-2</td>
<td>H-3</td>
<td>H-3</td>
</tr>
<tr>
<td>2.5&quot;</td>
<td>H-2</td>
<td>H-3</td>
<td>H-3</td>
</tr>
<tr>
<td>3&quot;</td>
<td>H-2</td>
<td>H-3</td>
<td>H-3</td>
</tr>
</tbody>
</table>

### Notes:

1. Minimum horizontal span must not exceed 100'.
2. Maximum of 3 SIGNAL FACES per span within the hatched regions indicated by "LOCATION OF SIGNAL FACES".
3. Guy wire in line with opposing span ± 5'.

### Legend

- **A**: Wood Pole with attachments
- **TS**: Overhead Bundle
- **SE**: With Signal Faces

### Horizontal Span

- **32'-0" Max**
- **7'-0" Typ**
- **11'-0" Max**
- **15'-0" Max**
- **30'-0" Max**
- **34'-0" or 40'-0" Max**
- **25'-0" Min (Typ)**
- **17'-0" Min (Typ)**
- **90° Max**
- **75° Min**

### Location of Signal Faces

1. Cameras or vehicle detection system
2. Overhead bundle consisting of 3/8" messenger wire and overhead conductors and lashing wire
3. Luminaire with mast arm
4. Push button, push button or accessible push button
5. Signal face with 3 indications or single sheet sign panel (10 SQFT Max)
6. Riser with weather head as required
7. Pedestrian signal head
8. Luminaire with mast arm

### Temporary Wood Poles

- Guyed with Signal Faces on Spans
- No Scale

---

**Temporary Wood Poles**

**Guyed - With Signal Faces on Spans**

**State of California**

**Department of Transportation**

**Case 1GT**

- Pole at Dead End
- With Attachments

**Case 2GT**

- Pole at Corner
- With Attachments

**Case 3GT**

- Pole at Junction
- With Attachments

---

*October 19, 2018*

**LEGEND**

- Wood Pole with Attachments
- TS

**Table: POLE SELECTION**

<table>
<thead>
<tr>
<th>MAXIMUM DU</th>
<th>1&quot;</th>
<th>1.5&quot;</th>
<th>2.0&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINIMUM POLE CLASS</td>
<td>H-3</td>
<td>H-6</td>
<td>H-9</td>
</tr>
<tr>
<td>POLE EMBEDMENT (E)</td>
<td>13'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

1. Maximum of 2 SIGNAL FACES per span within the hatched regions indicated by LOCATION OF SIGNAL FACES.

**Temporary Wood Poles**

**Non-Guyed With Signal Faces On Span**

NO SCALE


STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REVISED STANDARD PLAN RSP ES-18E

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1. Luminaire mast arms must be in compliance with Standard Plan ES-6D with noted modifications.
2. Verify pole dimensions at tie-rod attachment height. Fabricate 9" flat bar with "L" dimension to maintain an open gap between flanges in finished installation.
3. Not all screw heads and bolt heads are shown for clarity.
4. Mast arm not shown for clarity.

**Notes:**

**Section A-A**

**Detail A**

**Tie-Rod at Luminaire Arm**

**Section E-E**

**Detail B**

**Arm Connection Details**

**Detail C**

**Tie-Rod at Pole**

**State of California**

**Department of Transportation**

**Temporary Wood Poles Details No. 3**

**No Scale**

NOTES:

1. Verify pole dimensions at terminal compartment entry locations with raintight cap.
2. Backing plate to be galvanized after fabrication.
3. ⅜" x 0.044" minimum, rounded edge stainless steel straps, double wrapped with 2" long bend under stainless steel strap buckle.
4. For miscellaneous details for signal mounting not shown see Revised Standard Plan RSP ES-4D.
5. If the terminal compartment has a cable entry guide on the rear face, remove the cable entry guide to a level that will not interfere with electrical components. Close any unused cable entry locations with raintight caps.

Stainless Steel Strap, (SEE NOTE 3)

Wood Pole

BACKING PLATE DETAIL

CURVED WASHER DETAIL

SECTION A-A

SIDE MOUNTING TERMINAL COMPARTMENT
PERSPECTIVE

VINE STAKING

FACE OF WALL OR FENCE

TIE VINES TO STAKE WITH PLANT TIE MATERIAL

2 - STAKES

FOLIAGE PROTECTOR

SECTION

ROOT PROTECTOR

TOP OF CYLINDER

WIRE MESH CYLINDER

WIRE MESH COVER

JUTE MESH COVER

SECTION

CORE HOLE (VINE)

CONCRETE MASONRY BLOCK TYPE

FOREST HOLE COVER

NOTES:

1. FOR WOOD SUPPORT STAKES:
   FASSEND WOOD SCREWS 2" FROM TOP OF STAKE AND 1" ABOVE FG.
   SECURE WIRE MESH TO STAKE WITH SCREWS AND TIE WIRE.

2. FOR REBAR SUPPORT STAKES:
   SECURE WIRE MESH TO STAKE WITH WIRE.
Backflow Preventer Assembly

In One Piece Enclosure

Elevation

Lifting Handle Each Side

BPE

Tee W/Threaded Plug

LW

2" Win, Typ

UNION, Typ

3" Loose Key Carry

Backflow Preventer

W/Slimmer

Lock-Guard

Clasp or Latch For Padlock

PCC Pad

Tape, Typ (See Note 4)

2'0" Min

SEE NOTE 5

FLOW

Supply Line (Main)

FROM WM

Compacted or Undisturbed Soil, Typ

SELECTION

FLOW SENSOR

COIL 3'-0" OF WIRE IN BOX

Valve Box

EXTEND VALVE BOX TO MATCH DEPTH OF PIPE
CONNECT TO IRRIGATION CONTROLLER

REDUCING BRUSHING

SLIP COUPLING

FLOW

FLOW

NO SCALE

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

LANDSCAPE DETAILS

NOTES:

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

2. 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.

3. The connector must be located 6 to 9 inches away from the edge of PCC pad.

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.

5. The connector must be located 6 to 9 inches away from the edge of PCC pad.

REVISED STANDARD PLAN RSP H7

October 15, 2021

2018 REVISED STANDARD PLAN RSP H7

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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
LANDSCAPE DETAILS
NO SCALE

GSP
2 " M in
4 " M a x
DUST CAP
COUPLER
GSP NIPPLE
GSP NIPPLE
CHECK VALVE
SUPPLY LINE
ADAPTER (S x T)
Galv STEEL ELL (T x T)
WOVEN WIRE CLOTH
6"
FG
PVC PIPE CONDUIT (SLEEVE)
IRRIGATION SUPPLY LINE
SURFACING

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
NOTES:
1. 12" upstream of RCV
2. Width sufficient to allow spacing 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

IRRIGATION SUPPLY LINE, ELECTRICAL CONDUIT OR CNC BUNDLE

SECTION
POINTS OF MEASUREMENT
NOTE:
1. Stake notch detail shown in perspectives are for slope inclination of 10:1 (Horizontal:Vertical) and steeper.

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EROSION CONTROL DETAILS
FIBER ROLL AND COMPOST SOCK

NOTE:
1. May install stake adjacent to bottom edge of compost sock.
TABLE No. 1  LONGITUDINAL BAR REINFORCEMENT

<table>
<thead>
<tr>
<th>D</th>
<th>BAR SIZE</th>
<th>SPACING AT EDGE OR JOINT</th>
<th>REGULAR BARS</th>
<th>ADDITIONAL BARS AT TRANSVERSE CONSTRUCTION JOINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>24&quot;</td>
<td>#6</td>
<td>3&quot; to 4&quot;</td>
<td>12&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>36&quot;</td>
<td>#6</td>
<td>3&quot; to 4&quot;</td>
<td>12&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>36&quot;</td>
<td>#6</td>
<td>3&quot; to 4&quot;</td>
<td>12&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>48&quot;</td>
<td>#6</td>
<td>3&quot; to 4&quot;</td>
<td>12&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>48&quot;</td>
<td>#6</td>
<td>3&quot; to 4&quot;</td>
<td>12&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>60&quot;</td>
<td>#6</td>
<td>3&quot; to 4&quot;</td>
<td>12&quot;</td>
<td>6&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 contraction and construction joint details, see Standard Plan P4.
3. For curved lane layout see Standard Plan P16.

ABBREVIATION:
- D - Thickness of CRCP
- #6 - Bar size

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

REVIEWED STANDARD PLAN RSP P4
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. For additional longitudinal bars detail, see Revised Standard Plan RSP P4.
5. For longitudinal construction joint details, see Standard Plan P16.
6. For tie bar details at longitudinal construction joint, see Standard Plan P16.
7. For longitudinal construction joint plan layout not shown, see Revised Standard Plan RSP P4.
8. For limits of rumble strips, see Project Plans.

ABBREVIATION:
- D = Thickness of CRCP
- 3 = Thickness of CRCP
- B = Thickness of CRCP
- ETW = EDGE OF TRAVELED WAY
- ES = EDGE OF SHOULDER
- HMA OR Conc = CONCRETE PAVEMENT
- CRC P = CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
- CLR = CLEARANCE
- JPCP = JUNCTURE POLITIC
- TRAVEL WAY = TRAVELED WAY

For longitudinal bar size, spacing and clearances, see Revised Standard Plan RSP P4.
For tie bar and intermediate transverse bar details, see Standard Plan P16.
Place Intermediate Transverse bars parallel to and in the same plane as Transverse bars.

NOTE 1: For longitudinal contraction joint details, see Standard Plan P16.
NOTE 2: For additional longitudinal bars detail, see Revised Standard Plan RSP P4.
NOTE 3: For longitudinal construction joint plan layout not shown, see Revised Standard Plan RSP P4.
NOTE 4: For tie bar details at longitudinal construction joint, see Standard Plan P16.
NOTE 5: For limits of rumble strips, see Project Plans.
NOTE 6: For longitudinal construction joint details, see Standard Plan P16.
NOTE 7: For longitudinal construction joint plan layout not shown, see Revised Standard Plan RSP P4.
NOTE 8: For tie bar details at longitudinal construction joint, see Standard Plan P16.
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 16' intervals. Watch 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 Note 1 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
7. The bottom of the saw cut must be at least 0.5" clear of any dowel bar, tie bar and bar reinforcement.

5. Use either drill and bond or splice couplers.

4. For dowel bar sizes, see Standard Plan P10.

3. Tie bar details apply to inside widenings.

2. Where new pavement is placed against existing concrete pavement, rounding the corner is not required.

1. See Standard Plan P1 for typical dowel bar and tie bar placement and locations.
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

TERMINAL JOINT DETAILS

NOTES:
1. See Standard Plan B6-21 for "A".
2. For layout, tolerances, and other details not shown, see Standard Plan P10.

ABBREVIATIONS:
D = Thickness of CRCP
A = Depth of HMA as shown on Project Plans
U = Thickness of Base

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Notes:
1. D = Thickness of CRCP (See Project Plans).
2. See Standard Plan BE-21 for "U".
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.
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 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 3/8" drive rivets.
5. For details not shown, see Standard Plans RS1 and RS2.

**Balance Single Post Installation**

**Back Brace Detail**

**Back Brace Mounting Detail**

**Back Brace Mounting Detail**
**WALKWAY GRATING DETAILS**

- **Interior Safety Lug Detail**
  - At every walkway bracket between exterior walkway brackets.

- **End Safety Lug Detail**
  - At every walkway bracket.

**OVERHEAD SIGN LUMINAIRE MOUNTING CHANNEL DETAILS**

- **Typical Connection**
- **Connection at Splice**

**NOTES:**

1. Walkway grating shall be welded type or mechanical lock grating with 1" x 1/2" bearing bars at 1/2" centers with 1/2" diameter (or equal cross bars of 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" x 1/2" x 0.1084" cont-slot steel channel with pre-punched slots not larger than 3/8" x 3/8". Slots shall be at bottom of channel and shall be parallel to channel. Slots shall be spaced not closer than 3/4" 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.
INSTRUCTIONS TO FABRICATOR

PROJECT PLAN SHEETS

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

REVIEW TO THE FOLLOWING REVISED STANDARD PLANS FOR

NOTES:

1. Signs are shown and dimensioned looking in the direction of traffic. Double faced signs are shown and dimensioned looking ahead along skewing.
2. For Two Post Type, maximum cantilever length is 50' (50' trim length).
3. For cantilever lengths ≤ 40°, sign panels and walkways may be placed on both sides of truss. For cantilever lengths ≥ 40° and ≤ 50°, 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. For the 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 (one post signs, 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.

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OVERHEAD SIGNS-VERSATILE TRUSS
ONE AND TWO POST TYPE

80'-0" Wax

80'-0" Wax

WALKWAY, SEE NOTE 3

SIGN PANEL, SEE NOTE 3

WALKWAY, SEE NOTE 3

PLAN

WALKWAY

SAFETY RAILING

UNBALANCED ONE POST TYPE MAXIMUM COVERAGE

WALKWAY

SAFETY RAILING

CANTILEVER ONE POST TYPE MAXIMUM COVERAGE

WALKWAY

SAFETY RAILING

TWO POST TYPE WITH CANTILEVER MAXIMUM COVERAGE

WALKWAY

SAFETY RAILING

PLAN

WALKWAY

SAFETY RAILING

STANDARD PLAN SHEET NO.

DETAIL NO.

NOTE:

1. Plans are shown and dimensioned looking in the direction of traffic. Double faced signs are shown and dimensioned looking ahead along skewing.
2. For Two Post Type, maximum cantilever length is 50' (50' trim length).
3. For cantilever lengths ≤ 40°, sign panels and walkways may be placed on both sides of truss. For cantilever lengths ≥ 40° and ≤ 50°, 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. For the 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 (one post signs, 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 POST TYPE
TRUSS LAYOUT
NO SCALE

REVISED STANDARD PLAN RSP S101

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

NOTE:
1. For connection of frame to post, see Revised Standard Plan RSP S113.
2. For walkway details, see Revised Standard Plans RSP S115, RSP S116, and RSP S117.
3. For walkway length, see Revised Standard Plan RSP S100.
4. Minimum length of frame varies by frame depth, see Revised Standard Plan RSP S102.
5. For interior members, refer to "Typical Section B-B" on Revised Standard Plan RSP S111.
6. A single exit plaque may be placed above the sign, at any location on the truss. Maximum exit plaque length = 16'-0". Maximum exit plaque depth = 5'-0".
7. See Revised Standard Plan RSP S122 for Exit Plaque Mounting Details.

LEGEND:
- SIGN PANEL
- EXIT PLAQUE

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>MAXIMUM FRAME DEPTH</th>
<th>MAXIMUM VERTICAL L SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>80&quot;</td>
<td>60&quot;</td>
<td>45°</td>
</tr>
<tr>
<td>180&quot;</td>
<td>72&quot;</td>
<td>54°</td>
</tr>
<tr>
<td>240&quot;</td>
<td>120&quot;</td>
<td>90°</td>
</tr>
</tbody>
</table>

80" | 60" | 45° |
180" | 72" | 54° |
240" | 120" | 90° |
### TRUSS MEMBER TABLE

<table>
<thead>
<tr>
<th>LONGER ARM LENGTH</th>
<th>FRAME WIDTH</th>
<th>ANGLE MEMBER SIZE AND MINIMUM OVERLAP LENGTH TO GUSSET PLATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10'-0&quot; &lt; L &lt; 20'-0&quot;</td>
<td>30'-0&quot; &lt; D &lt; 40'-0&quot;</td>
<td>L4 x 3 x ½ L5 x 3 x ½ 3 L5 x 2 x ½ 4 L6 x 2 x ½ 5 L7 x 2 x ½ 3</td>
</tr>
<tr>
<td>20'-0&quot; &lt; L &lt; 30'-0&quot;</td>
<td>30'-0&quot; &lt; D &lt; 40'-0&quot;</td>
<td>L4 x 3 x ½ L5 x 3 x ½ 3 L5 x 2 x ½ 4 L6 x 2 x ½ 5 L7 x 2 x ½ 3</td>
</tr>
<tr>
<td>30'-0&quot; &lt; L &lt; 40'-0&quot;</td>
<td>30'-0&quot; &lt; D &lt; 40'-0&quot;</td>
<td>L4 x 3 x ½ L5 x 3 x ½ 3 L5 x 2 x ½ 4 L6 x 2 x ½ 5 L7 x 2 x ½ 3</td>
</tr>
<tr>
<td>40'-0&quot; &lt; L &lt; 50'-0&quot;</td>
<td>30'-0&quot; &lt; D &lt; 40'-0&quot;</td>
<td>L4 x 3 x ½ L5 x 3 x ½ 3 L5 x 2 x ½ 4 L6 x 2 x ½ 5 L7 x 2 x ½ 3</td>
</tr>
</tbody>
</table>

### POST SELECTION TABLE

<table>
<thead>
<tr>
<th>SIGN PANEL DEPTH</th>
<th>LONGER ARM LENGTH</th>
<th>POST TYPE BY POST CLEAR HEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0° &lt; D ≤ 80°</td>
<td>20'-0&quot;</td>
<td>L1 16&quot; 1.218&quot;</td>
</tr>
<tr>
<td></td>
<td>30'-0&quot;</td>
<td>L1 16&quot; 1.218&quot;</td>
</tr>
<tr>
<td></td>
<td>40'-0&quot;</td>
<td>L1 16&quot; 1.218&quot;</td>
</tr>
<tr>
<td></td>
<td>50'-0&quot;</td>
<td>L1 16&quot; 1.218&quot;</td>
</tr>
</tbody>
</table>

### POST TYPE TABLE

<table>
<thead>
<tr>
<th>POST TYPE</th>
<th>CHARACTER</th>
<th>MIN. NORMAL Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>16&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td>L2</td>
<td>16&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td>L3</td>
<td>16&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td>L4</td>
<td>16&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td>L5</td>
<td>16&quot;</td>
<td>1.218&quot;</td>
</tr>
</tbody>
</table>

### OVERHEAD SIGNS-VERSATILE TRUSS

**ONE POST TYPE**

**STEEL POST TYPE AND TRUSS MEMBER TABLE**

**NO SCALE**

REvised STANDARD PLAN RSP S102

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS-VERSATILE TRUSS

ONE POST TYPE

STEEL POST TYPE AND TRUSS MEMBER TABLE

NO SCALE

CIDH PILE FOUNDATION DETAILS

OVERHEAD SIGNS-VERSATILE TRUSS
ONE POST TYPE
CIDH PILE FOUNDATION DETAILS
NO SCALE

CIDH IN CUT-SLOPE

NOTES:
1. For "ANCHORAGE DETAILS", see Revised Standard Plan RSP S103.
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. Slope stabilization required when indicated on the Project Plans.
5. For drain holes and central void in mortar, see Standard Plan ES-15C Detail N.
6. Refer to Revised Standard Plan RSP S102 for "Post Type Table".
7. Use pedestal with CIDH pile foundation when shown on the Project Plans, see Revised Standard Plan RSP S114.
8. On single post sign structures, the post shall be raked out of plumb, with the use of the leveling nuts to make the bottom of the sign frame level.
9. At final position of post all top and bottom nuts shall be tightened against base plate.
10. For CIDH pile foundation with inspection pipes, see Revised Standard Plan RSP S101.
11. Maximum electrical conduit diameter is 3".

CIDH CONCRETE PILE TABLE

<table>
<thead>
<tr>
<th>POST TYPE</th>
<th>DIAMETER</th>
<th>VERTICAL BAR SIZE</th>
<th>TOTAL NUMBER OF VERTICAL BARS</th>
<th>SPIRAL BAR SIZE</th>
<th>SPIRAL PITCH</th>
<th>MINIMUM CIDH PILE LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>5&quot;-0&quot;</td>
<td>1/8</td>
<td>50</td>
<td>5/16</td>
<td>3&quot;</td>
<td>22'-0&quot;</td>
</tr>
<tr>
<td>1B</td>
<td>5&quot;-0&quot;</td>
<td>1/8</td>
<td>50</td>
<td>5/16</td>
<td>3&quot;</td>
<td>22'-0&quot;</td>
</tr>
<tr>
<td>1C</td>
<td>5&quot;-0&quot;</td>
<td>1/8</td>
<td>50</td>
<td>5/16</td>
<td>3&quot;</td>
<td>22'-0&quot;</td>
</tr>
<tr>
<td>1D</td>
<td>5&quot;-0&quot;</td>
<td>1/8</td>
<td>50</td>
<td>5/16</td>
<td>3&quot;</td>
<td>22'-0&quot;</td>
</tr>
<tr>
<td>1E</td>
<td>5&quot;-0&quot;</td>
<td>1/8</td>
<td>50</td>
<td>5/16</td>
<td>3&quot;</td>
<td>22'-0&quot;</td>
</tr>
<tr>
<td>1F</td>
<td>5&quot;-0&quot;</td>
<td>1/8</td>
<td>50</td>
<td>5/16</td>
<td>3&quot;</td>
<td>22'-0&quot;</td>
</tr>
<tr>
<td>1G</td>
<td>5&quot;-0&quot;</td>
<td>1/8</td>
<td>50</td>
<td>5/16</td>
<td>3&quot;</td>
<td>22'-0&quot;</td>
</tr>
<tr>
<td>1H</td>
<td>5&quot;-0&quot;</td>
<td>1/8</td>
<td>50</td>
<td>5/16</td>
<td>3&quot;</td>
<td>22'-0&quot;</td>
</tr>
</tbody>
</table>

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

400 BATTERY STREET
SAN FRANCISCO, CA 94111

April 16, 2021

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REVIEWED STANDARD PLAN RSP S104

OVERHEAD SIGNS-VERSATILE TRUSS
ONE POST TYPE
CIDH PILE FOUNDATION DETAILS
NO SCALE

RSP S104 DATED APRIL 16, 2021 SUPERSEDES STANDARD PLAN S104

REVISED STANDARD PLAN RSP S104

2018 REVISED STANDARD PLAN RSP S104

2018 REVISED STANDARD PLAN RSP S104

2018 REVISED STANDARD PLAN RSP S104
### CIDH PILE FOUNDATION DETAILS

**ELEVATION**

**CONCRETE PEDESTAL WITH ONE POST TYPE, SEE REVISED STANDARD PLAN RSP S113**

**PEDESTAL DIAMETER**

- Ø Bar Reinf: 3" CLR

**Section D-D**

#### ROUND PEDESTAL

- PEDESTAL VERT: Ø Bar Reinf
- PEDESTAL REINF: SPIRAL

**SECTION D-D**

#### SQUARE PEDESTAL

- PEDESTAL VERT: Ø Bar Reinf
- PEDESTAL SPIRAL: REINF

**Notes:**

1. For "ANCHORAGE DETAILS", see Revised Standard Plan RSP S103.
2. For "Base Elevation", see Project Plans.
3. Prior to erection of the post, backfill weld 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 S104 for additional details and notes not shown on this sheet.
6. Refer to Revised Standard Plan RSP S102 for "Post Type Table".
7. For drain holes and central void in mortar, see Standard Plan ES-56 detail 1A.
8. Refer to Revised Standard Plan RSP S102 for "Post Type Table".

### CONCRETE PEDESTAL AND CIDH CONCRETE PILE TABLE

<table>
<thead>
<tr>
<th>POST TYPE</th>
<th>PEDESTAL DIAMETER</th>
<th>PEDESTAL SPIRAL LENGTH</th>
<th>VERTICAL &quot;a&quot; BAR SIZE</th>
<th>NUMBER OF VERTICAL &quot;a&quot; BARS</th>
<th>SPIRAL BAR SIZE</th>
<th>MIN &quot;a&quot; BAR DEVIATION</th>
<th>DIAMETER</th>
<th>VERTICAL BAR SIZE</th>
<th>SPIRAL BAR SIZE</th>
<th>MINIMUM CIDH FILE LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>3'-0&quot;</td>
<td>3'-0&quot;</td>
<td>3&quot;</td>
<td>18</td>
<td>3/4&quot;</td>
<td>5/8&quot;</td>
<td>#10</td>
<td>30</td>
<td>3/4&quot;</td>
<td>20'-0&quot;</td>
</tr>
<tr>
<td>1B</td>
<td>5'-0&quot;</td>
<td>5'-0&quot;</td>
<td>3&quot;</td>
<td>20</td>
<td>3/4&quot;</td>
<td>5/8&quot;</td>
<td>#10</td>
<td>30</td>
<td>3/4&quot;</td>
<td>20'-0&quot;</td>
</tr>
<tr>
<td>1C</td>
<td>3'-10&quot;</td>
<td>3'-0&quot;</td>
<td>3&quot;</td>
<td>18</td>
<td>3/4&quot;</td>
<td>5/8&quot;</td>
<td>#10</td>
<td>30</td>
<td>3/4&quot;</td>
<td>20'-0&quot;</td>
</tr>
<tr>
<td>1D</td>
<td>4'-0&quot;</td>
<td>4'-0&quot;</td>
<td>3&quot;</td>
<td>22</td>
<td>3/4&quot;</td>
<td>5/8&quot;</td>
<td>#10</td>
<td>30</td>
<td>3/4&quot;</td>
<td>20'-0&quot;</td>
</tr>
<tr>
<td>1E</td>
<td>4'-0&quot;</td>
<td>4'-0&quot;</td>
<td>3&quot;</td>
<td>24</td>
<td>3/4&quot;</td>
<td>5/8&quot;</td>
<td>#10</td>
<td>30</td>
<td>3/4&quot;</td>
<td>20'-0&quot;</td>
</tr>
</tbody>
</table>

**State of California Department of Transportation**

OVERHEAD SIGNS - VERSATILE TRUSS

ONE POST TYPE

CONCRETE PEDESTAL WITH CIDH PILE FOUNDATION DETAILS

NO SCALE

RSP S105 DATED APRIL 16, 2021 SUPERSEDES STANDARD PLAN S105
SEE REVISED STANDARD PLAN RSP S107 FOR "FRAME WIDTH SCHEMATIC."

BOTTOM PLAN
Vertical, diagonal and interior L members not shown, walkway 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 elongated.

LEGEND:
SIGN
EXIT PLAQUE

CAMBER FOR FABRICATION AT MAIN SPAN CENTERLINE

SECTION A-A
Walkway and wind bracing not shown.

RIGHT CANTILEVER SHOWN: CANTILEVER MAY BE LEFT OR RIGHT.

OVERHEAD SIGNS - VERSATILE TRUSS
TWO POST TYPE
TRUSS LAYOUT

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 S105
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. Slope stabilization required when indicated on the Project Plans.
5. For drain holes and central void in mortar, see Standard Plan ES-6B detail N.
6. Refer to Revised Standard Plan RSP S107 for "Post Type Table".
7. Use Pedestal with CIDH pile foundation when shown on the Project Plans.
8. On single post sign structures, the post shall be raked out of plumb, with the use of the leveling nuts to make the post vertical to the sign frame level.
9. At final position of post, all top and bottom nuts shall be tightened against base plate.
10. For CIDH pile foundation with inspection pipes, see Revised Standard Plan RSP S114.
11. Maximum electrical conduit diameter is 3".

CIDH CONCRETE PILE TABLE

<table>
<thead>
<tr>
<th>POST TYPE</th>
<th>DIAMETER</th>
<th>VERTICAL BAR SIZE</th>
<th>TOTAL NUMBER OF VERTICAL BARS</th>
<th>SPIRAL BAR SIZE</th>
<th>SPIRAL PITCH</th>
<th>MINIMUM CIDH PILE LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A</td>
<td>5&quot;-0&quot;</td>
<td>0</td>
<td>30</td>
<td>0.8</td>
<td>5&quot;</td>
<td>22&quot;-0&quot;</td>
</tr>
<tr>
<td>2B</td>
<td>5&quot;-0&quot;</td>
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<td>30</td>
<td>0.8</td>
<td>5&quot;</td>
<td>22&quot;-0&quot;</td>
</tr>
<tr>
<td>2C</td>
<td>5&quot;-0&quot;</td>
<td>0</td>
<td>30</td>
<td>0.8</td>
<td>5&quot;</td>
<td>22&quot;-0&quot;</td>
</tr>
<tr>
<td>2D</td>
<td>5&quot;-0&quot;</td>
<td>0</td>
<td>30</td>
<td>0.8</td>
<td>5&quot;</td>
<td>22&quot;-0&quot;</td>
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<tr>
<td>2E</td>
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<td>0.8</td>
<td>5&quot;</td>
<td>22&quot;-0&quot;</td>
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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS-VERSATILE TRUSS
TWO POST TYPE
CIDH PILE FOUNDATION DETAILS

NO SCALE

RSP S109 DATED APRIL 16, 2021 SUPERSEDES STANDARD PLAN S109
DATED MARCH 1, 2018 - PAGE 44 OF STANDARD PLANS BOOK DATED 2018.
TABLE 1
BOLTED CHORD SPLICE

<table>
<thead>
<tr>
<th>CHORD THICKNESS</th>
<th>NORMAL BOLT DIAMETER</th>
<th>Min</th>
<th>Max</th>
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</thead>
<tbody>
<tr>
<td>3/8&quot;</td>
<td>&quot;</td>
<td>3/4&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
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<td>1/2&quot;</td>
<td>3/4&quot;</td>
<td>1/2&quot;</td>
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<td>1/2&quot;</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1</td>
<td>1/2&quot;</td>
</tr>
</tbody>
</table>

TABLE 2
BOLTED WIND BRACE AT CHORD SPLICE

<table>
<thead>
<tr>
<th>CHORD THICKNESS</th>
<th>MIN WIDTH</th>
<th>MIN THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>1&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>1&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1-1/2&quot;</td>
<td>1-1/2&quot;</td>
</tr>
</tbody>
</table>

TABLE 3
BOLTED MEMBER TO GUSSET PLATE

<table>
<thead>
<tr>
<th>WEAR RESISTANCE</th>
<th>NORMAL BOLT DIAMETER</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot;</td>
<td>1/4&quot;</td>
<td>3/8&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>1&quot;</td>
<td>3/4&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1-1/2&quot;</td>
<td>1-1/2</td>
<td>1/2&quot;</td>
</tr>
</tbody>
</table>

NOTES:
1. All bolted connections for the chord splice and gusset plate connections are fully tensioned.
2. See "Truss Member Table" on Revised Standard Plans RSP S102 and S107 for the size of bolted wind brace angle. The bolted wind brace leg width and thickness shall be increased if necessary to meet the minimum dimensions on "Table 2".
3. See "Table 4" for nominal bolt diameter and spacing for bolted members to gusset plate.
4. The bolt spacing for the bolted chord splice may be increased up to 1" in order to accommodate the bolted wind brace. The unbolted leg of the wind brace may be trimmed in order to avoid conflicts with the chord splice plate bolts, see "Wind Bracing Coping Detail" on Revised Standard Plan RSP S111.
5. See Revised Standard Plan RSP S111 for details not shown.

SECTION G-G
BOLTED WIND BRACE AT CHORD SPLICE

SECTION H-H
BOLTED WIND BRACE AT GUSSET PLATE

BOLTED WIND BRACE AT BOLTED CHORD SPLICE

WELDED CHORD SPLICE

OVERHEAD SIGNS-VERSATILE TRUSS CHORD SPLICE DETAILS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

RSP S112 DATED APRIL 16, 2021 SUPERSEDES STANDARD PLAN S112
POST TYPES 1A, 1B, 1C, 1D, 2A, 2B, 2C AND 2D

POST TYPES 1E AND 2E

POST TYPES 1F AND 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.

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

REvised Standard Plan RSP S114
**NOTES:**

1. Aluminum bar grating with bearing bars of 1/2" spacing shall be used, with loose bars at Max 6" spacing. Max unsupported span shall be 5'-6". Bearing bar width shall be 1/2". Max height shall be 2 1/4", and bearing bar thickness shall be 1/16". 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 1/300. 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). At non-splice locations, saddle anchors may 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 1/4" x 0.1084" cont-slot steel channel with pre-punched slots not larger than 1/8" x 1/2". Slots shall be at pattern of channel and shall be parallel to channel. Slots shall be spaced not closer than 1/2" center to center.

---

**WALKWAY DETAILS No.2**

**OVERHEAD SIGNS-VERSATILE TRUSS**

**WALKWAY DETAILS No.2**

**ALUMINIUM WALKWAY GRATING DETAILS**

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**OVERHEAD SIGNS-VERSATILE TRUSS**

**WALKWAY DETAILS No.2**

**ALUMINIUM WALKWAY GRATING DETAILS**

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**OVERHEAD SIGNS-VERSATILE TRUSS**

**WALKWAY DETAILS No.2**

**ALUMINIUM WALKWAY GRATING DETAILS**

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**OVERHEAD SIGNS-VERSATILE TRUSS**

**WALKWAY DETAILS No.2**

**ALUMINIUM WALKWAY GRATING DETAILS**

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**OVERHEAD SIGNS-VERSATILE TRUSS**

**WALKWAY DETAILS No.2**

**ALUMINIUM WALKWAY GRATING DETAILS**

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**OVERHEAD SIGNS-VERSATILE TRUSS**

**WALKWAY DETAILS No.2**

**ALUMINIUM WALKWAY GRATING DETAILS**

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**OVERHEAD SIGNS-VERSATILE TRUSS**

**WALKWAY DETAILS No.2**

**ALUMINIUM WALKWAY GRATING DETAILS**

---

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**OVERHEAD SIGNS-VERSATILE TRUSS**

**WALKWAY DETAILS No.2**

**ALUMINIUM WALKWAY GRATING DETAILS**
NOTES:

1. Cover plates placed on the walkway grating side of toe plate.
2. Cover plate is 1/4" thick aluminum sheet 5052-H32.
SAFETY RAILING ELEVATION

NOTE: Thread cable through ø 3/8" hole in diagonal members, diagonal members not shown.

TYPICAL BOLTED (ALTERNATIVE) HINGED CONNECTION

NOTE:
- Alternative venting methods may be used if approved by the Engineer.
- Diagonal members not shown.
- Hinge proved that is not in line with the cable.

OVERHEAD SIGNS-VERSATILE TRUSS WALKWAY SAFETY RAILING DETAILS
ELEVATION
SIGN

OVERHEAD SIGNS-VERSATILE TRUSS
SIGN MOUNTING DETAILS
LAMINATE PANEL - TYPE A

<table>
<thead>
<tr>
<th>PANEL DEPTH</th>
<th>MOUNTING BEAMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>9'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>8'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>7'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>6'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>5'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>4'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>3'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>2'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>1'-0&quot;</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
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 at 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 embed 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. For sign panel depths of 70" or less the top of the beam to truss connection details.
9. The Contractor must verify all dependent dimensions in the field before ordering or fabricating any material.

SECTION A-A
SECTION B-B
SECTION C-C

MOUNTING BEAM SPACING TABLE

<table>
<thead>
<tr>
<th>PANEL DEPTH</th>
<th>NUMBER MOUNTING BEAMS</th>
<th>OVERHANG</th>
<th>MOUNTING BEAM SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>9'-0&quot;</td>
<td>2</td>
<td>8&quot;</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>8'-0&quot;</td>
<td>2</td>
<td>8&quot;</td>
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* 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.
TABLE 1

<table>
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<tr>
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<th>A</th>
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NOTE:
Sign panel mounting holes ¼" # maximum for ⅜" # bolts.

TABLE 2

<table>
<thead>
<tr>
<th>PANEL DEPTH</th>
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</tbody>
</table>

NOTE:
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.

NOTE:
The Contractor shall verify all dependent dimensions in the field before ordering or fabricating any material.
OVERHEAD SIGNS - VERSATILE TRUSS
EXIT PLAQUE MOUNTING DETAILS

NO SCALE


STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REVISED STANDARD PLAN RSP S122
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)
OVERHEAD SIGNS-VERSATILE TRUSS EMS AND FLASHING BEACON DETAILS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

2018 REVISED STANDARD PLAN RSP S124

1. Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for lane closures only.
2. Each advance warning sign shall be equipped with at least two flags for daytime closures. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacon shall be placed at the locations indicated for lane closure during hours of darkness.
3. A sign "END ROAD WORK" 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.
4. A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.
5. Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work area.
7. Sign installations and cones are not required when a median barrier is in place.
NOTES:

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

2. 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.

3. A W20-4 "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.

4. An optional C45(CA) sign may be placed below the W20-4 sign.

5. Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work areas. They are optional if the work area is visible from the flagger station.

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

7. Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type I, II, or III.

8. If C45(CA) is not used, measure distance C from W20-4.
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. Portable flashing beacons are shown for closures during hours of darkness.

2. See Standard Plan T9, Table 3 for advanced warning sign spacing.

NOTES:
1. Place C36(CA) sign when pilot car is used.
2. Place C36(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:
- STOP
- REVERSE TRAFFIC CONTROL WITH ADDITIONAL FLAGGERS
  FOR SIDE ROADS AND BUSINESS DRIVEWAYS
- REVERSE TRAFFIC CONTROL WITH SIGNS
  FOR RESIDENTIAL DRIVEWAYS AND LOW VOLUME SIDE ROADS
- WORK AREA

SIGN PANEL SIZE (Min):
- 48" x 48"
- 36" x 42"
moving lane closure on median lane or outside lane of multilane highways

notes:

1. either a changeable message sign or a sc10(ca) sign panel and a type i flashing arrow sign shall be mounted on the rear of sign vehicle v1. the changeable message sign shall be sequenced to show the "road work ahead" message first, followed by the "right lane closed" message. for median lane closure, 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 queues. 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 painting, 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 ii flashing arrow sign shall be mounted on the rear of shadow vehicle v2. for median lane closure the flashing arrow sign symbol 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 defer 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.

legend:

v1 sign vehicle
v2 shadow vehicle
v3 work/application vehicle
fas flashing arrow sign
fpm changeable message sign
tma truck-mounted attenuator

traffic control system for moving lane closure on multilane highways

state of california department of transportation

2018 revised standard plan rsp t15

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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' and the outside 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, 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:

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.

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 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.

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM
CONSTRUCTION WORK ZONE
SPEED LIMIT REDUCTION ON FREEWAYS AND EXPRESSWAYS

NO SCALE


REVISED STANDARD PLAN RSP T18
### LEGEND:
- **TRAFFIC CONE**
- **TRAFFIC CONE (OPTIONAL TAPER)**
- **TEMPORARY TRAFFIC CONTROL SIGN**
- **FLASHING ARROW SIGN (FAS)**
- **PORTABLE FLASHING BEACON**
- **PORTABLE CHANGABLE MESSAGE SIGN (PCMS)**
- **FEEDBACK SIGN SYSTEM**

### SIGN PANEL SIZE (Min)
- 48" x 48" (A)
- 36" x 36" (B)
- 24" x 30" (C)
- 24" x 18" (D)
- 24" x 36" (E)
- 24" x 24" (F)
- 24" x 18" (G)

### NOTES:
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.
   - Where speed limit reduction zones are longer than 3 miles, place intermediate signs at approximately 3-mile spacing throughout the speed limit reduction zone.
   - Approximately 500 feet downstream from major intersections within the speed limit reduction zone.

### Diagram:
- **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.**

---

**Lane Closure**

**XX ZONE AHEAD WILL BE ENFORCED**

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**TRAFFIC CONTROL SYSTEM CONSTRUCTION WORK ZONE SPEED LIMIT REDUCTION ON CONVENTIONAL HIGHWAYS**

**NO SCALE**

**RSP T19 DATED APRIL 17, 2020 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.**

**REVISED STANDARD PLAN RSP T19**
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 outside the MOO-1 construction area sign, place a MOO-1 sign in advance of the PCMS.
4. Place the R3CAL 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.

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.

Multiple speed reduction steps within Traffic Control System

Multiple work areas within Traffic Control System
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
      to be closed.
3. Place additional R2-1 sign and G20-5aP plaques:
   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.

See Standard Plan T9 for Table 3 showing advanced warning sign spacing.

No Scale
RSP T21 DATED OCTOBER 16, 2020 SUPERSEDES RSP T21 DATED APRIL 17, 2020
THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.
TYPICAL SPEED LIMIT REDUCTION WITH REVERSIBLE TRAFFIC CONTROL WITH ADVANCE FLAGGER

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

TYPICAL SPEED LIMIT REDUCTION WITH REVERSIBLE TRAFFIC CONTROL

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

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

W20-1
12-22-20

W3-5
SPEED LIMIT
WORK ZONE
ROAD AHEAD

E20-5aP

SPEED LIMIT
WORK ZONE
ROAD AHEAD

R2-1

SPEED LIMIT
WORK ZONE
ROAD AHEAD

PRSFSS
PORTABLE RADAR SPEED
FEEDBACK SIGN SYSTEM (PRSFSS)

PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

R2-12
END WORK ZONE SPEED LIMIT

TOTAL PROJECT SHEET
NO SCALE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM
FOR CONSTRUCTION WORK ZONE
SPEED LIMIT REDUCTION ON
TWO LANE CONVENTIONAL HIGHWAYS

NO SCALE

NOTES:

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.


3. One impact attenuator vehicle per closed internal lane adjacent to the mobile barrier.
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
- Temporary traffic control sign
- Type II flashing arrow sign
- Fas support on trailer
- Portable changeable message sign
- Repositioning mobile barrier

MOBILE BARRIER WITHIN REVERSIBLE TRAFFIC CONTROL SYSTEM

MOBILE BARRIER WITHIN SHOULDER TRAFFIC CONTROL SYSTEM

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 DECK
- SIGN
- SUPPORT OR TRAILER
- LOCATION
- FLASHING ARROW SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

OPERATIONAL GUIDELINE FOR PCMS MESSAGES
FOR POSTED SPEED LIMIT 55 MPH

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<tr>
<td>STOPPED TRAFFIC AHEAD</td>
<td>&gt; 25</td>
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</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.
OPERATIONAL GUIDELINE FOR PCMS MESSAGES FOR POSTED SPEED LIMIT 55 MPH

<table>
<thead>
<tr>
<th>MESSAGE AT</th>
<th>LAST 5 MIN SPEED AVERAGES, MPH</th>
<th>MESSAGE AT</th>
<th>LAST 5 MIN SPEED AVERAGES, MPH</th>
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<td>&gt; 25</td>
<td>&lt; 25</td>
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</table>

Speed Adjustment = X posted speed limit - 55 mph

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

Add speed adjustments to speed averages.