ELEVATION

LONGITUDINAL SECTION

PLAN

DECK OR WINGWALL REINFORCING NOT SHOWN

3'-2"

9"

9"

6"

2'-0"

7½"

7½"

(Deck or wingwall reinforcing not shown)

LONGITUDINAL SECTION

POST

CURB

DECK

REINFORCING

ADDITIONAL WALL REINFORCING

EXPANSION JOINT DETAIL

NOTES:

1. Walls are to be backfilled before the barrier is placed.
2. Longitudinal reinforcing steel to stop at all expansion joints.
3. The front face dimensions are to be constant above the finish surface.
4. Expansion joint to match deck joint.
5. No lap splicing allowed on the longitudinal rail reinforcing. Splicing shall be staggered.
6. For typical metal railing connection details not shown, see Standard Plans A77U1 and A77U2.
7. Chain link railing is not allowed on Type 80 Barriers.
8. 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.

DEPARTMENT OF TRANSPORTATION

STATE OF CALIFORNIA

CONCRETE BARRIER

TYPE 80

(SHEET 1 OF 2)

NO SCALE
ELECTROLIER NOTES:
1. See Project Plans for electrolier and pull box locations.
3. This barrier is designed to accommodate only two 1½" electrical conductors. 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.
EXPANSION JOINT DETAIL

LONGITUDINAL SECTION

NOTES:
1. Expansion joint to match deck joint.
3. Post to be spaced equally, typically 6'-8" spacing. Post spacing may be reduced where location of hinges or expansion joints or the length of wingwalls will not accommodate the 6'-8" spacing. Maximum see-through availability is to be strived for, where 6'-8" post spacing cannot be achieved.

DECK REINFORCING NOT SHOWN

STANDARD PLAN B11-64
TUBULAR RAILS, SEE

OPENING IN BARRIER, Typ

END SHEET

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER
TYPE 80SW
(SHEET 2 OF 3)

NO SCALE

B11-63
G TUBE - WELDED SPLICE

60° or wall joints. Increase joint width in tubes to match expansion joint width and increase sleeve length accordingly. except a short length is permitted near deck or wall joints, electrical, or other rail discontinuities.

A A

2 x 2 x ? RAIL TUBE

TS 3 x 2 x ?

ELEVATION

LOWER RAIL DETAIL

C C

D D

STEEL BLOCK SLEEVE 5'-4" Typ ½" GAP ¾" RESIN CAPSULE 1½" x 1½" x 2¾"

ELEVATION

SLEEVE

EDGE OF SLOTTED HOLE ROADWAY FACE

6" 8" ¾" OR ½" BOLT ?" NUT INSIDE OF SLEEVE FOR ?" Hex BOLT WITH LOCK WASHER, ½" Ø HOLES NEAR AND FAR SIDE

2" 4" 8"

RAIL TUBE SLIDING FIT INSIDE OF BENT THUS, FOR SLEEVE FORMED OF ½" SLEEVE TUBE SPLICE DETAIL

G G

TUBULAR LOWER RAIL

VIEW G-G

VIEW H-H

6" 8" ¾" or WALL JOINT

SLEEVE FORMED OF ½" RAIL TUBE POST

ELEVATION

EXPANSION JOINT

E

E

TOP OF CONCRETE

MORTAR PAD

ESD MORTAR CHISEL

1½" x 1½" x 2¾" STEEL BLOCK SLEEVE 1½" x 1½" x 2¾" RESIN CAPSULE 1½" x 1½" x 2¾"

TUBULAR LOWER RAIL

VIEW H-H

SLEEVE FORMED OF ½" SLEEVE

SLEEVE TUBE SPLICE DETAIL

G G

RAIL CAP 1½" Â

SEE NOTE 4

G G

SEE NOTE 4

1. Posts shall be normal to railing.
2. Tube splices shall be located in the tubes spanning deck or wall joints, increase joint length in tubes to match expansion joint width and increase sleeve length accordingly.
3. Top rail tube shall be continuous over not less than two posts except a short length is permitted near deck or wall joints, electrical, or other rail discontinuities.
4. ½" nut tack welded to sleeve may be replaced by drilled and tapped hole in sleeve.

NOTES:

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER
TYPE 80SW
(SHEET 3 OF 3)

NO SCALE

B11-64
2. Rail posts shall be set normal to grade.
3. All exposed cuts or sheared edges shall be rounded and free of burrs.
4. Rail post anchoring nuts shall be tightened to a snug fit and given additional ½ turn.
5. Holes in posts for rail bar attachment may be field drilled. Holes shall be coated with an approved zinc-rich paint prior to erection.
6. This barrier is to be used only for speeds of 45 mph or less. For speeds greater than 45 mph, pedestrians should be protected by a separation traffic barrier.
7. A maximum of six - 4" round openings for future utilities. Openings are to be centered at a minimum of 1'-6" from face of sidewalk curbs and a minimum of 6" from face of rail. See Standard Plan BS-6 for minimum spacing between conduits.
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 1. Post spacing and/or end block length to be adjusted to fit bridge length or wingwall length.

OPENINGS ARE TO BE SEALd AT ENDS AND EXTENDED 8" minimum past end of sidewalk. If not used, duct forms are to be tied down.

RAIL BARS TS 4 x 4 x ?

For metal railing, connection details not shown. See standard plans.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
CALIFORNIA ST-40
BRIDGE RAIL
(SHEET 2 OF 2)
NO SCALE

EXPANSION JOINT

END OF RAILING ELEVATION

SECTION A-A
For details not shown, see typical section

SECTION B-B
For details not shown, see typical section

COUNTY
DIST.

POST MILES

TOTAL PROJECT

SHEET

TOTAL SHEETS

PLANS

APPROVAL

NUMBER

DATE

REGISTERED CIVIL ENGINEER
Tillat Satter
C42892

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REVISED STANDARD PLAN RSP B11-67


STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
CALIFORNIA ST-40
BRIDGE RAIL
(SHEET 2 OF 2)
NO SCALE

REVISED STANDARD PLAN RSP B11-67

REvised STANDARD PLAN RSP B11-67
Typical Rail Section

- Stud Bolt Details:
  - #5 Stud Bolt with Nuts, Washers, and Thread Locking System
  - 7/8" x 1-4/8" MS bolts with 6/4" threads, 2 nuts, 2 washers, and thread locking system

- Shims Not Shown Typ
- TS 9 x 4 x 9/16
- TS 9 x 4 x 9/16

- Level:
  - 1" Chawfer

- Stud Bolt Details:
  - 7/8" x 2-3/4" STUD BOLT
  - 7/8" x 2-3/4" STUD BOLT
  - 1/8" Hole Typ

- Section B-B:
  - Top anchorage
  - Lower anchorage

- Shims Required for Top and Bottom Rail

- Section at Post

- Stud Bolt Detail

- State of California
  - Department of Transportation

- California ST-10
  - Bridge Rail
  - (Sheet 1 of 3)

- No Scale
EXPANSION SLEEVE DETAIL

SECTION SLEEVE

STANDARD SLEEVE DETAIL

ALTERNATE TUBE WELDED SPlice

GENERAL NOTES:

1. Anchor bolts may be tack welded (shop or field) to anchorage.
2. All rough edges on posts and rails shall be ground smooth.
3. The alternative welded splice may be used in lieu of the standard splice.
4. Each rail length shall be continuous over a minimum of two posts.
5. The contractor shall check that the tubular sleeves splices conform to the dimensions indicated to ensure proper clearance.
6. Except for expansion splices, not more than one splice shall be permitted per same side of post.
7. See project plans for approach guard railing details.
Dist

POST MILES
TOTAL PROJECT

ROUTE

SHEET TOTAL
No. SHEETS

FESSIO
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REGISTERED CIVIL ENGINEER
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MAXIMUM WALL HEIGHTS

LEGEND:

COUNTY

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

LC1

LC2

LC1

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

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OR AGENTS SHALL NOT BE RESPONSIBLE FOR
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No.

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A
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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.
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Kathryn Griswell

IN E E R

May 31, 2018

G

TYPE C

TYPE B

R E G IS T

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TYPE A

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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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LOADING CASE I & II

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EMBANKMENT SLOPE

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EMBANKMENT SLOPE

LOADING CASE I & II

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3'-0"

6'-2"

13'-2"

4'-0"

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6'-2"

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TYPE A

TYPE B

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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


Notes:
1. Design:


   b. Reinforced Concrete: n = 8f' = 3.6 ksi f = 60 ksi

2. Soil Parameters: 60pcf, 34\(^{\circ}\) c y = 0.2g

   a. Lateral earth pressure determined by Coulomb's theory.

3. Concrete: 25.5\(^{\circ}\)

   a. Place 2 filler blocks midspan between stretchers in the bottom 2 levels of headers.

4. Maximum unsupported height at end of wall is 2'-0".

   a. Dimensions of walls 9' high and higher.

5. All members may be manufactured to dimensions ½ inch greater in thickness and stretchers ½ inch less in length.

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

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

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.
1. The plan shows the approximate location of devices within the enclosures. Components may be rearranged, however, the "working" clearances within the service equipment enclosure shall be maintained.

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

3. 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.

4. Type A and Type B service equipment enclosures shall have the meter viewing windows located on the front side of the service equipment enclosure.

5. Type A and Type B service equipment enclosure shall be similarly constructed to Type A and Type B respectively, except the meter viewing windows shall be located on the rear side of the service equipment enclosure.
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.
NOTE:
Curves represent the minimum maintained illuminance (FC).

ELECTRICAL SYSTEMS
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ROADWAY 1
34' Mounting Height
165 W (Max)

ROADWAY 2
40' Mounting Height
235 W (Max)

ROADWAY 3
40' Mounting Height
235 W (Max)

ROADWAY 4
40' Mounting Height
300 W (Max)

NOTE:
Maintained illuminance (FC).
Curves represent the minimum maintained illuminance (FC).
EXPANSION JOINT AND ANCHOR DETAILS

PAVEMENT ANCHOR DETAIL

1. For the locations of the terminal joints, expansion joints and pavement anchors, see project plans.
2. The CRCP shall continue across the pavement anchor and expansion joints as shown.
3. Details of reinforcement, tie bars, and longitudinal joints (and if necessary, transverse construction joints) are shown on Standard Plan B6-21 and P16.
4. Transverse construction joints are not allowed within 20'-0" of the pavement anchor.
5. When placing pipe through concrete barrier, use 4" slotted plastic pipe wrapped completely with 1/8" polystyrene.
7. See Standard Plan P4 for "A".
8. Place the 4" Slotted Plastic Pipe on the high side of the longitudinal grade.

ABBREVIATION:
D = Thickness of CRCP

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
CONTINUOUSLY REINFORCED
CONCRETE PAVEMENT-
EXPANSION JOINT AND ANCHOR DETAILS
NO SCALE
P31B
PLAN A ROADWAY

WIDE FLANGE BEAM

OMIT TIE BARS IN Pvm
OMIT TIE BARS IN Pvm
SHOULDER

A SHOULDER

SHOULDER

25'-0"

LIMIT OF CRCP

20'-0" 35'-0"

SEE NOTE 3

TERMINAL Jt, TYPE WF
Exp Jt
Pvmt
INFORMATION, SEE PROJECT PLANS
OR STUCTURE APPROACH SLAB
FOR THE ADJACENT PAVEMENT

For Pavement Terminal Joint Type, see Project Plans.

D = Thickness of CRCP

#4 @ 12" C-C

1'-0" 3" 3"

2" 2" 12 "

3'-9"

4"

A 6"

SEE DETAIL A
SEE DETAIL B
B C

7 " 11"

11"11"

EXP Jt
WITHIN PLASTIC CAP
1 "$ MOVEMENT

DETAIL B
DOWEL BAR
COATED WITH BOND BREAKER
2" Typ
12 "

SEE NOTE 2

SEE NOTE 2

SEE NOTE 2

TERMINAL JOINT
35'-0"

TYPE WF Pvmt Exp Jt

12 "LCB

SEE NOTE 3

LCB

SEE NOTE 3

1 "$ MOVEMENT

DETAIL A
DOWEL BAR
BOND BREAKER
2" Typ
12 "

SEE NOTE 2

SEE NOTE 2

SEE NOTE 2

1 "$ MOVEMENT

SEE Std PLAN B6-21

JOINT SEAL TYPE A,

SEE NOTE 2

JOINT SEAL TYPE B

(SEE NOTE 4)

SEE Std PLAN B6-21 (MR = 2"),

JOINT SEAL TYPE B

(SEE NOTE 4)

See Standard Plan B6-21 for "a".

SEE NOTE 6

"a"

NO SCALE

Continuously Reinforced Concrete Pavement -

Continuous Reinforcement -

Wide Flange Beam Terminals

For reinforcement A, B, and C Details, see Standard Plan P32B.

For layout, tolerances, and other details not shown see Std Plan P10.

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

2018 STANDARD PLAN P32A
SAFETY RAILING ELEVATION

NOTE:
Chain assembly behind
(see detail this page)

SAFETY CHAIN

NOTE:
See Standard Plans
S101 and S105 for walkway bracket spacing.

NOTE:
See Standard Plans
S101 and S105 for walkway bracket spacing.

SECTION D-D

END POST HINGE

CENTER POST HINGE

TWO POST HINGE

SAFETY CHAIN

SECTION C-C

DETAIL "A"

DETAIL "B"

DETAIL "A"

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

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

SECTION C-C

ELEVATION VIEW

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REGISTERED CIVIL ENGINEER
C57793
MAY 31, 2018

THE ACCURACY OR COMPLETENESS OF SCANNED
COPIES OF THIS PLAN SHEET.

STATE OF CALIFORNIA OR ITS OFFICERS
OR AGENTS SHALL NOT BE RESPONSIBLE FOR
END SAFETY LUG DETAIL

INTERIOR SAFETY LUG DETAIL

END SAFETY LUG DETAIL

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

3. Stainless steel clips shall be installed as close to loop or thimble as possible.

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

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

6. Install the weld lug with a cotter pin.

NOTES:

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

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

S141
GRINDING OPERATION OF GUSSET PLATE BEFORE INITIAL PROFILE AT TOP CJP

END OF PLATE CONTINUES AROUND REINFORCING FILLET

LIMITS OF CJP WELD

GRIND SMOOTH TO 150 MICROINCHES

WELD DETAILS

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

LEGEND

NEW

REMOVAL

INITIAL PROFILE FILLET WELD AT END OF PLATE

REMOVING EXCESS MATERIAL

GRIND SMOOTH TO 150 MICROINCHES

OVERHEAD SIGN-TRUSS
SINGLE POST TYPE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

NO SCALE

REGISTERED CIVIL ENGINEER
C57793

CANCELED BY APRIL 16, 2021
ON APRIL 16, 2021

S142
EXIT RAMP NEUTRAL AREA (GORE) TREATMENT

DETAIL 36

TRAFFIC LINES TYPICAL DETAILS

ENTRANCE RAMP NEUTRAL AREA (MERGE) TREATMENT

DETAIL 36A

ENTRANCE RAMP NEUTRAL AREA (ACCELERATION LANE) TREATMENT

DETAIL 36B

MARKER DETAILS

LEGEND:

- Type G Red-Clear Retroreflective
- Type G One-Way Clear Retroreflective
- Type RY Red-Yellow Retroreflective
- Type C and C and Type G
- Type RY
- Retroreflective Face

NOTES:

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

LANE DROP AT EXIT RAMPS

DETAIL 37

CHEVRON PAVEMENT MARKINGS AT EXIT RAMP GORE AREA

DETAIL 37A DETAIL 37A DELETED

DETAIL 37B DETAIL 37B DELETED

CHEVRON PAVEMENT MARKINGS AT ENTRANCE RAMP GORE AREA

DETAIL 37C DETAIL 37C DELETED

LANE DROP AT INTERSECTIONS

DETAIL 37D DETAIL 37D DELETED

CHEVRON PAVEMENT MARKINGS AT ENTRANCE RAMP GORE AREA

NOTE:

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

- Ramp channelizing lines details, see Details 36, 36A, and 36B.

- Gore area chevron pavement markings shown. For Exit and Entrance ramps, see Details 36, 36A, and 36B.

- 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 ramps, see Details 36, 36A, and 36B.

- Ramp channelizing lines details, see Details 36, 36A, and 36B.
**CHANNELIZING LINE**

**DETAIL 38**
- 6" WHITE LINE
- 24'-0" 24'-0"

**DETAIL 38A**
- 6" WHITE LINE

**DETAIL 38B**
- 6" WHITE LINE
- 24'-0" 24'-0"

**DETAIL 38C**
- 6" WHITE LINE

**DETAIL 38D**
- 6" WHITE LINE
- 24'-0" 24'-0"

**BIKE LANE LINE**

**DETAIL 39**
- 6" WHITE LINE

**INTERSECTION LINE**

**DETAIL 39A**
- 6" WHITE LINE
- 200'-0" INTERSECTION
- 6" WHITE LINE

**LANE LINE EXTENSIONS THROUGH INTERSECTIONS**

**DETAIL 40**
- 6" WHITE LINE
- 6" WHITE LINE
- 6" WHITE LINE

**DETAIL 40A**
- 6" WHITE LINE

**DETAIL 41**
- 6" WHITE LINE
- 6" WHITE LINE

**CENTER LINE EXTENSIONS THROUGH INTERSECTIONS**

**DETAIL 41A**
- 6" WHITE LINE
- 6" WHITE LINE

**RECESSED NOTES:**
A. See typical traffic line details for pavement markings.
B. See standard specifications for recess depth and recess striping material thickness.

**RETROREFLECTIVE PAVEMENT MARKER**

**DETAIL FOR RECESSED TRAFFIC STRIPE**

See Notes A and B.

**RECESSED MARKER NOTES:**
1. See typical traffic line details for pavement patterns to be used with recessed pavement markers.
2. The retroreflective pavement markers shown are not to be used for non-recessed installations.
3. The retroreflective pavement markers shown in recesses shall be 0 to ‰" below the pavement surface.
4. Use Type 1 recess for pavement markers with one-way retroreflective face, and Type 2 recess for pavement markers with two-way retroreflective face.

**P AVEMENT Markers and Traffic Lines**

**Typical Lines**

**REVISED STANDARD PLAN RSP A20D**

NOTE:

TYPICAL LANE LINE OR RIGHT EDGE LINE CONTRAST DETAIL

BLACK
WHITE
BLACK

2"
6" TO 8"
2"
**PREFERENTIAL LANE LINES**

- **DETAIL 42**
- **DETAIL 43**
- **DETAIL 43A**
- **DETAIL 44A**
- **DETAIL 44B**
- **DETAIL 45**

**MARKER DETAILS**

- **TYPE C**

**LEGEND**

- **MARKERS**
  - TYPE C RED-CLEAR RETROREFLECTIVE

- **LINES**
  - 8" WHITE LINE

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

**LEGEND:**
- **MARKERS**
  - Type C two-way red-clear retroreflective
  - Type RY two-way red-yellow retroreflective
  - Type R one-way red retroreflective

- **LINES**
  - 6" white
  - 6" yellow

**MARKER DETAILS**
- Retroreflective face

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

No scale

NOTES:

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

2. The space between words must be at least 0.5 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. The space width cannot be less than the height of the characters. The space may be reduced appropriately where there is limited space because of local conditions.

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

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

5. The words "NO PARKING" pavement marking is to be used for parking facilities. For typical exceptions of markings, see Standard Plans A60A and A60B.

6. The words "NO PARKING", shall be painted in white letters not less than 1" 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

NOTE:
1. If there is a 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.

LEGEND:

MARKERS
- Type R One-Way Red Reflective

MARKER DETAILS

Type R
- Reflective Face on Backside

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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TO ACCOMPANY PLANS DATED
11-24-20

REVISED STANDARD PLAN RSP A24H

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING ARROWS
NO SCALE


REVISED STANDARD PLAN RSP A24H
SINUSOIDAL RUMBLE STRIP DETAILS
GROUND-IN INDENTATIONS

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.
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
EXCAVATION
BACKFILL

RETAINING WALL IN FILL

RETAINING WALL IN FILL AND CUT

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.

NOTES:

1. Roadway embankment is not delineated on excavation drawings for clarity.
2. Retaining, if any, must be in place before structure excavation is made.
3. If no roadway or other excavation or embankment is involved in the wall, structure excavation will be measured from the original ground.
4. When an embankment settlement period is required, the upper limits of structure excavation are raised to conform to the elevation of the embankment after the settlement period or, when an embankment surcharge is used, to the finished surface and grading plane elevations.
5. Embankment slopes to be as steep as material permits. Slope assumed to be 1:1 for purposes of quantity calculations.
IN TRENCH

NON-REINFORCED CONCRETE PIPE

MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 1

<table>
<thead>
<tr>
<th>COVER</th>
<th>MINIMUM CLASS AND D-LOAD</th>
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<tbody>
<tr>
<td>0.0'</td>
<td>CLASS D 10000</td>
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<tr>
<td>0.1'</td>
<td>CLASS D 15000</td>
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<tr>
<td>0.2'</td>
<td>CLASS III SPECIAL 17000</td>
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<tr>
<td>0.3'</td>
<td>CLASS IV SPECIAL 20000</td>
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<tr>
<td>0.4'</td>
<td>CLASS IV SPECIAL 25000</td>
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<tr>
<td>0.5'</td>
<td>CLASS IV SPECIAL 30000</td>
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<tr>
<td>0.6'</td>
<td>CLASS IV SPECIAL 36000</td>
</tr>
</tbody>
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See Notes 6 and 9

MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 2

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See Notes 6 and 9

MINIMUM ALLOWABLE CLASSES OF RCP FOR METHOD 3

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<td>0.6'</td>
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</tbody>
</table>

See Notes 6 and 9

METHOD 1

METHOD 2

REINFORCED CONCRETE PIPE

See Notes 1, 2, 7 and 10

METHOD 3

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. Methods 2 and 3A shall be as follows:
   a) Pipe sizes 4'-0" to 5'-0", ID = 1'-0".
   b) Pipe sizes larger than 5'-0", ID = 2'-0".
   c) Pipe sizes 1'-0" to 3'-0", ID = 2'-0".

3. The "length of any culvert" is defined as the culvert between:
   a) Successive drainage structures (inlets, 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. Slope or shore excavation sides as necessary.

5. Embankment height prior to excavation for installation of all classes of RCP placed under Methods 2 and 3 shall be as follows:
   a) Pipe sizes 4'-0" to 5'-0", ID = 1'-0".
   b) Pipe sizes larger than 5'-0", ID = 2'-0".

6. The maximum size for all classes of RCP placed under Method 1 is 6'-0", ID = 5'-0".

7. Non-reinforced precast pipe sizes 1'-0" or smaller may also be placed under Methods 1, 2 or 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'-0" 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. If the precast non-reinforced concrete pipe is used as a substitute for the cast-in-place pipe, both the wall thickness and the concrete strength shall be at least as great as that specified for the cast-in-place pipe. The fill height allowed shall not exceed that shown for the cast-in-place pipe.
**INSTALLATION TYPE 1:**

The inner 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 inner 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 inner 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 1

**MINIMUM CLASS AND D-LOAD**

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### INSTALLATION TYPE 2

**MINIMUM CLASS AND D-LOAD**

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### INSTALLATION TYPE 3

**MINIMUM CLASS AND D-LOAD**

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EXCAVATION AND BACKFILL PRECAST REINFORCED CONCRETE BOX CULVERT

NOTES:
1. Slope or shore excavation slopes as necessary.
2. Dimensions shown are minimum.
3. Method 2 and 3 for single or multiple boxes requires an approved external sealing band.
   See Revised Standard Plan RSP D83A.
4. Construction of roadway pavement structure in Method 2 or Method 3 shall not disturb
   the external sealing band installation.

*1'-0" Min for Method 1 or 2 Backfill is used.
2'-0" Min for Method 3 Backfill is used,

 Legend:
- STRUCTURE EXCAVATION (CULVERT)
- STRUCTURE BACKFILL (CULVERT)
- 95% RELATIVE COMPACTION
- ROADWAY EMBANKMENT
- SLURRY CEMENT BACKFILL
- SAND BEDDING (CULVERT)
- ROADWAY PAVEMENT STRUCTURE

FILL HEIGHT GREATER THAN 2'-0"

FILL HEIGHT 2'-0" OR LESS

DEPARTMENT OF TRANSPORTATION

2018 REVISED STANDARD PLAN RSP A62G

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RSP A62G DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A62G

NO SCALE
METAL POST DETAIL

* 8'-0" for Type P object marker

Metal post to be as shown except that minor variations in design and dimensions in accordance with manufacturer's standards.

SECTION A-A

POST SECTION

1/2" x 3/16" BOLT

1 3/8" x 3/16" SLOT

3/8" x 3/16" SLOT

SNOW POLE BRACKET

Bracket to be 1/2" x 3/16" mild steel galvanized after fabrication.

TOP VIEW

SIDE VIEW

SNOW POLE BRACKET

SIDE VIEW

SNOW POLE BRACKET

1/4" # Holes

SEE DETAIL A

1/4" # Holes

SEE DETAIL A

TWO PLATE POST MOUNT

TARGET PLATE

BLIND ALUMINUM SCREWS

TARGET PLATE

YELLOW STRIPES RETROREFLECTIVE

BLACK STRIPES

SIDE VIEW

TOP VIEW

TYPE P (CA)

TYPE R (CA)

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

TYPE N-1 (CA), Yellow retroreflective,

N-2(CA), Orange retroreflective,

N-3(CA), Green retroreflective,

MBR MARKER

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.

OBJECT MARKERS

MARKERS

NO SCALE

REVISED STANDARD PLAN RSP A73B

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

REVISED STANDARD PLAN RSP A73B

Date: October 18, 2019
CONCRETE BARRIER TYPE 60M DELINEATION

See Note 5

CONCRETE BARRIER TYPE 60MA

Details similar to Type 60M except as noted.

CONCRETE BARRIER TYPE 60MC

Details similar to Type 60M except as noted.

CONCRETE BARRIER TYPE 60MD

See Note 8

NOTES:

1. See Standard Plan A76A for details of Concrete Barrier Type 60M and transitions to structures and transitions to Concrete Barrier Type 50M and Concrete Barrier Type 60MC.
2. See Standard Plan A75C for Concrete Barrier Type 60M transitions to bridge column and sign pedestals.
3. Reinforcing bars required on Concrete Barrier Type 60M, use Concrete Barrier Type 60MM.
4. Where roadbed offset is greater than 1½", see Concrete Barrier Type 60MC.
5. See Project Plans for barrier delineation locations.
6. Reinforcing bars not required for roadbed offsets less than 1½".
7. For roadbed surfaces offset greater than 8" and less than or equal to 12", use two #4 Rein at 3" above the lower roadbed surface.
8. For weep hole alignment and drainage details not shown, see Standard Plans 80-3 and 83-5.

REVIEWED

April 16, 2021

2018 REVISED STANDARD PLAN RSP A76A

No Scale

CONCRETE BARRIER TYPE 60M

NO SCALE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER TYPE 60M


REVISED STANDARD PLAN RSP A76A

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Concrete Barrier Type 60MF,

42 "

10 "

6¾"

3"

VO ID

4 "

VO ID

12 "

4 "

21¾"

2 "

S E E  N O T E  6
L E N G T H  F O R  P A Y M E N T

1"

TOP OF PEDESTAL

CONCRETE BARRIER BETWEEN PEDESTAL AND 1" EXPANDED POLYSTYRENE

FG

#4 @ 12, Typ

12 "

12 "

12"

20:1 Min TRANSITION

20:1 Min TRANSITION

CONCRETE BARRIER BETWEEN PEDESTAL AND 1" EXPANDED POLYSTYRENE

LIMITS OF PAYMENT FOR CONCRETE BARRIER TYPE 60MF

20:1 Min TRANSITION

12 "

12 "

12"

Typ

ROUND COLUMN

RECTANGULAR COLUMN

CONCRETE BARRIER

TRANSITION AT BRIDGE COLUMNS

Concrete Barrier Type 60MF,

see Note 1.

1" EXPANDED POLYSTYRENE BETWEEN COLUMN AND CONCRETE BARRIER

CONCRETE BARRIER

TRANSITION AT SIGN PEDESTAL

Concrete Barrier Type 60MF,

see Note 7.

6¾"

3"

21¾"
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 CONNECTION TO STRUCTURE

CONCRETE BARRIER TYPE 60MS END ANCHORAGE
NOTES:
1. See Standard Plan A76F for Concrete Barrier Type 60MS.
2. Contractor options for fill between concrete barrier walls:
   A. Place 4" PCC at base between concrete barrier walls.
   B. Place 1"-0" of granular material at base between walls.
   C. Place granular material from base to bottom of 4" cap.
   D. Monolithic concrete with foam blockouts is not permitted.
3. Reinforcing steel shall extend continuous through construction joints.
4. See Overhead Sign plans for sign pedestal elevations on new construction.
5. Adjust height of concrete barrier wall on low side of offset or superelevated roadways to provide level grade across top of concrete barrier cap.
7. All locations with limited shoulder width available for barrier, see Standard Plan A76F for use of Concrete Barrier Type 60MS.

TRANSITION AT BRIDGE COLUMNS
Concrete Barrier Type 60MSF, see Note 7.

TRANSITION AT SIGN PEDESTAL
Concrete Barrier Type 60MSF, see Note 7.

SECTION A-A
SECTION B-B
SECTION C-C
NOTES:

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

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

State of California
Department of Transportation

Concrete Barrier
Wildlife Passageway (Type MM)

No Scale

RSP A76K DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN A76K

Revised Standard Plan RSP A76K
MIDWEST GUARDRAIL SYSTEM WITH WOOD POST AND BLOCKS

RAIL ELEMENT SPLICE DETAIL

a) Connect the overlapped end of the rail elements with a 3/8" x 1/4" button head oval shoulder splice bolt inserted into the 3/4" x 1/4" slots and bolted together with a 1/4" recessed hex nut. Three of the hex nut points toward the rail end. The total of 8 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) An end cap is to be attached to the end of each rail element. A total of 4 of the above described splice bolts and nuts are to be used.

ELEVATION

RAIL ELEMENT SPLICE DETAIL

a) Connect the overlapped end of the rail elements with 3/8" x 1/4" button head oval shoulder splice bolts inserted into the 3/4" x 1/4" slots and bolted together with a 1/4" recessed hex nut. Three of the hex nut points toward the rail end. The total of 8 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) An end cap is to be attached to the end of each rail element. A total of 4 of the above described splice bolts and nuts are to be used.

ELEVATION

MIDWEST GUARDRAIL SYSTEM WITH WOOD POST AND BLOCKS

NOTES:

1. For details of steel post installations, see Revised Standard Plan RSP A77L2.

2. For details of standard hardware used to construct MGS, see Revised Standard Plan RSP A77M1.

3. For details of wood posts and wood blocks used to construct MGS, see Standard Plans A77U1, A77U2 and A77V1.

4. For additional installation details, see Revised Standard Plan RSP A77N1.

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

6. For MGS typical layouts, see the A77P, A77Q and A77R series of Standard Plans.

7. If railing is connected to terminal system end treatment, use 3" height terminal system and treatment.

8. For MGS end anchor details, see Revised Standard Plans RSP A77T1 and RSP A77T2.

9. For details of MGS transition to bridge railing, see Revised Standard Plan RSP A77V1.

10. For additional details of MGS connection to bridge railing, see Standard Plans A77T1, A77T2 and A77V1.

11. For MGS connection details to document and walls, see Revised Standard Plan RSP A77V1.

12. For typical MGS delineation and dike positioning details, see Revised Standard Plan RSP A77U4.

13. Slotted holes for bolted connection of rail element to block and post.

14. Slotted holes for splice bolts to overlap ends of rail element.

15. Additional hole in uppermost portion of line post is for potential future adjustments of railing height. See Revised Standard Plan RSP A77V1.

16. 6" x 12" x 1'-2" block must be used with 6" Type A dike. If railing is connected to terminal system end treatment, use 31" height terminal system and treatment.

17. Install posts in soil.
NOTES:
1. For details of wood post installations, see Revised Standard Plan RSP A77L1.
2. For details of standard hardware used to construct MGS, see Revised Standard Plan RSP A77M1.
3. For details of steel posts and notched wood blocks used to construct MGS, see Revised Standard Plan RSP A77N2.
4. For additional installation details, see Revised Standard Plan RSP A77N3.
5. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
6. For MGS typical layouts, see the ATTP, AT70 and ATTR series of Standard Plans.
7. If railing is connected to terminal system end treatment, use 31" height terminal system end treatment.
8. For MGS end anchor details, see Revised Standard Plans RSP A77T1 and RSP A77T2.
9. For details of SCS transition to bridge railing, see Revised Standard Plan RSP A77U1.
10. For additional details of MGS connection to bridge railings, see Standard Plans A77U2 and AT77V1.
11. For details of MGS transition to bridge railing, see Revised Standard Plan RSP A77U4.
13. For details of wood posts and notched wood blocks used to construct MGS, see Revised Standard Plans RSP A77M1.
14. For details of wood post installations, see Revised Standard Plan RSP A77L1.
15. For details of standard hardware used to construct MGS, see Revised Standard Plan RSP A77M1.
16. Slotted holes for splice bolts to overlap ends of rail element.
17. Slotted holes for splice bolts to overlap ends of rail element.
18. Slotted holes for splice bolts to overlap ends of rail element.
19. Slotted holes for splice bolts to overlap ends of rail element.
20. Slotted holes for splice bolts to overlap ends of rail element.
21. Slotted holes for splice bolts to overlap ends of rail element.
TYPICAL RAIL ELEMENT

**NOTE:**
1. Slotted holes for splice bolts to overlap ends of rail element.
**NOTES:**

1. All holes in wood posts and blocks shall be ½" Dia ± ⅛".
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 8" x 8" x 6'-0" wood post if installed with 6" height dike.
NOTES:
1. All holes in steel post shall be 3/8" max.
2. Dimensions shown for wood block are nominal.
3. Notched face of block faces steel post.
4. 6'-0" length posts to be used for typical roadway installation. See Revised Standard Plan RSP A77N2.
5. The standard block on W6 x 6.5 or W6 x 9 post separates the metal beam guardrail element 8" from the post.
6. This post and 8" x 12" block combination to be used for line post sections of MGS on narrow roadways and where strengthened line post sections of MGS are warranted to shield fixed objects. Post longer than 6' must be labeled with 2" letters using black acrylic paint.
7. 6" x 12" notched wood block and 6" x 12" notched wood block must be used with 6" Type A alive.
DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA
TYPICAL LINE POST EMBEDMENT AND HINGE POINT OFFSET DETAILS
MIDWEST GUARDRAIL SYSTEM

NOTES:

1. These installation details also applicable to steel line post installations. For Details A, 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'-0" notched wood block 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 6" x 8" x 1'-0" steel post, 8'-0" in length, with 8" x 8" x 1'-0" notched wood block 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 WGS installations, see Standard Plan A77N4.

INSTALLATION AT EARTH RETAINING WALLS
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 1/4" - 20 self-tapping screws in 0.22" diameter holes or 3/8" bolts in 3/8" diameter holes.
7. 6" block can be used with 4" or lower dike, or no dike.
8. 8" block can be used with 4" or lower dike, or no dike.

DIKE POSITIONING

MGS DELINEATION

See Note 3

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP AT761, Standard Plans AT762 and AT761.

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. M6 x 8.5 or W6 x 8 wood 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 AT76 series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.

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

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

7. Where placement of dike is required with MGS installations, see Standard Plan AT761 for dikes positioning details.

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

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 posts, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77L3, 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 or 6'-0" steel posts, 6"-0" in length, with 6" x 8" x 1'-2" nuts. Wood blocks or 6'-0" steel posts 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 A77 Series of Standard Plans, are typically used where MGS is recommended to shield embankment slopes and a crashworthy 31" end treatment is required for both directions of traffic.
5. 31" in-line terminal system end treatments are used where site conditions will not accommodate a 31" flared end treatment.
6. The type of 31" terminal system end treatment to be used will be shown on the Project Plans.
7. Dependent on site conditions (embankment height and side slope), construction of additional MGS (length equal to multiples of 12'-0" with 6'-3" post spacing) may be advisable.
8. Where placement of dikes is required with MGS Installations, see Standard Plan A77M1 for dike positioning details.
9. The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of edge of traveled way. The length of MGS within the 15:1 or flatter flare is based on site conditions and should be 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 A77T2.
11. For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77P5.
12. Use this offset for 6-inch block, for 12-inch block, use 4'-0" Min offset.
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. Bury end of post. Line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-0" tapered wood blocks or plastic blocks (Embankment MGS installation with a buried end anchor treatment and a 31" flared end treatment at the ends of railing) may be advisable.

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

5. 31" in-line terminal system 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 post and MGS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.

8. Where placement of slope is required with MGS installations, see Standard Plan A77T1 for slope positioning details.

9. The 15:1 or flatter flare used with buried end anchors is based on the edge of the paved shoulder or offset line of the traveled way. The length of 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 11K and 11L Layouts, see Standard Plan A77T1.

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

12. Use this offset for 3'-0" block. For 12" block, use 4'-0" Min offset.
7. Dependent on site conditions (embankment height, side slopes, or other fixed objects), it may be advisable to construct additional guard railing (a length equal to multiples of 12'-6" with 6'-3" post spacing) between the transition railing and end treatment.

8. Where placement of dike is required with guard railing installations, see Standard Plan A77U4 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 right 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. See Standard Plan A77V2 for typical connection to walls or abutments, see Standard Plan A77U2 and Connection Detail FF on Standard Plans.

11. For additional details of typical connections to bridge rail, see Connection Detail AA on Standard Plans A77U1 and A77V1 and A77V2.

12. For 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.
TYPE 12AA LAYOUT
(MGS installation at structure departure with 31" in-line end treatment at trailing end of railing)

1. Line post blocks and hardware to be used are shown on Revised Standard Plans RSP A77U4, RSP A77L2, RSP A77N4, Revised Plans A77L1 and A77M1.

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

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

4. For Transition Railing (Type WB-31) details for Types 12AA and 12BB Layouts, see Revised Standard Plan RSP A77U4.

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

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

7. Where placement of wood is required with MGS installations, see Revised Standard Plan RSP A77U4 for wood positioning details.

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

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

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

NOTES:

1. Line post blocks and hardware to be used are shown on Revised Standard Plans RSP A77U4, RSP A77L2, RSP A77N4, Revised Plans A77L1 and A77M1.

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

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

4. For Transition Railing (Type WB-31) details for Types 12AA and 12BB Layouts, see Revised Standard Plan RSP A77U4.

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

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

7. Where placement of wood is required with MGS installations, see Revised Standard Plan RSP A77U4 for wood positioning details.
**TYPE 12CC LAYOUT**

(MGS installation at structure departure with MGS installation at structure departure with an end anchor attached at trailing end of railing), see Notes 9 and 10.

- For details of the buried end anchor treatment at trailing end of railing, see Revised Standard Plans RSP A77Q5.

**TYPE 12DD LAYOUT**

(MGS installation at structure departure with an end anchor attached at trailing end of railing), see Notes 9 and 10.

- For details of the buried end anchor treatment at trailing end of railing, see Revised Standard Plans RSP A77Q5.

**NOTES:**

1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, RSP A77N2 and RSP A77Q5.

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 12" x 1'-2" wood blocks. 6" x 8" x 6'-0" steel posts, 6'-0" in length, with 6" x 12" 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 12" x 1'-2" wood blocks where applicable and when specified.

4. For Transition Railing (Type Wb-31), see Revised Standard Plan RSP A77Q5.

5. For details of End Anchor Assembly (Type Sft-M) used with Type 12DD Layout, see Revised Standard Plan RSP A77Q5.

6. Type 12DD layout is typically used to the right of traffic departing a structure on two-way conventional highways where the traveled width across the structure is less than 40 feet and MGS is recommended (embankment height, side slopes or other fixed objects). Length of railing to be equal to multiples of 12'-6".

7. For additional details of a typical connection to bridge rail for Layout Type 12DD, see Connection Detail BB on Standard Plan A77U1 and A77V1.

8. For details of the buried post end anchor used with Type 12CC Layout, see Revised Standard Plans RSP A77Q5.

9. Where placement of dike is required with MGS installations, see Revised Standard Plan RSP A77Q5 for dike positioning details.

10. Type 12CC Layout is typically used to the right of traffic departing a structure on two-way conventional highways where the traveled width across the structure is less than 40 feet.

11. For additional details of a typical connection to bridge rail for Layout Type 12CC, see Connection Details CC on Standard Plan A77U2 and A77V2.

12. For additional details of a typical connection to bridge rail for Layout Type 12DD, see Connection Detail DD on Standard Plan A77U1 and A77V1.

13. For typical flare offsets for 25'-0" length parabola with maximum offset of 1'-0", see Revised Standard Plan RSP A77Q5.
**MEDIAN**

**EGI**

3'-1½" **(TYPE SFT-M), SEE NOTE 5**

**3'-1½"**

**3'-1½"**

**S**

**D**

**R**

### TYPICAL PARABOLIC LAYOUT

**PARABOLIC FLARE OFFSETS**

**TYPICAL PARABOLIC LAYOUT**

**DETAIL A**

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**NOTES:**

1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77R2.

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. 

4. For typical flare offsets for 25'-0" length parabola (10:1 or flatter flare), SEE NOTE 9.

5. See Revised Standard Plans RSP A77S1 for clearance information behind the rail within 50' of end anchor assembly. (Type SFT-M).

6. The median terminal or crash cushion to be used will be shown on the Project Plans.

7. Type 15A layout is typically used on multilane freeways or expressways to shield fixed objects or 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 Revised Standard Plan RSP A77S1.

9. The 15:1 or flatter flare is measured off of the face of a fixed object is less than 3'-0", but not less than 1'-0".

10. No 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".

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

---

**MIDWEST GUARDRAIL SYSTEM**

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

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**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**MIDWEST GUARDRAIL SYSTEM**

**TOTAL PROJECT SHEETS**

**TOTAL POST MILES**

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**REVISED STANDARD PLAN RSP A77R2**

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

Where placement of dike is required with MGS, see Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, RSP A77N2 and RSP A77M1.

The 15:1 or flatter flare used with Type 16C Layout is based on site conditions and should be a length equal to multiples of 12'-6". A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections and should be a length equal to multiples of 12'-6".

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". A 4'-0" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections and should be a length equal to multiples of 12'-6".

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

Notes:
1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77R3.
2. MGS post spacing to be 6'-3" center to center, except as otherwise noted.
3. Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 1'-2" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
4. A 3'-8" minimum clearance is required between the face of the railing and the face of a fixed object located directly behind MGS sections with post spacing of 6'-3". Contractor will be shown in the detail "Strengthened Midwest Guardrail System Sections for Fixed Object" or this plan, where the clearance between the face of the railing 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", concrete wall or barrier shall be constructed to shield the fixed object(s).
5. For end anchor assembly, see Revised Standard Plan RSP A77T1.
6. 31" in-line terminal system and treatments are used where site conditions will not accommodate a 31" flared end treatment.
7. The type of 31" terminal system to be used will be shown on the Project Plans.
8. The 31" in-line terminal system used with Type 16C Layout is based on the edge of paved shoulder or offset line of edge of traveled way. The length of MGS within the 31" in-line system is based on site conditions and should be a length equal to multiples of 12'-6".

For fixed object

Strengthened Midwest Guardrail System Sections

Use strengthened MGS sections with Types 16A, 16B or 16C layouts where minimum clearance between the back of post and the fixed object(s) is less than 3'-0", see Note 4.

State of California

Midwest Guardrail System

Typical Layouts for Roadside Fixed Objects

No Scale

STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS FOR FIXED OBJECT

Use strengthened MGS sections with layout Types 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.

1. Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77L1, RSP A77L2, RSP A77N1, RSP A77N2 and RSP 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 8'-0" wood post with 6" x 8" x 1'-2" wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 8'-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 railing and the face of a fixed object located directly behind MGS sections with post spacing of 6'-3". Construct MGS as shown in the detail "Strengthed Midwest Guardrail System Sections for Fixed Object" on this plan, where the clearance between the back of post and the fixed object(s) 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. The type of 31" terminal system to be used will be shown on the Project Plans.

6. As site conditions dictate, construct additional MGS to shield fixed object(s). Additional MGS length equal to multiples of 12'-0". Post spacing of 6'-3", except as specified in Note 4.

7. Layout Types 16D through 16M, shown on the Revised Standard Plans RSP A77 Series, 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. Where placement of dike is required with MGS, see Revised Standard Plan RSP A77N4 for dike positioning details.

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

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

10. 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 layout Type 16H 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.

1. The type of 31" terminal system to be used will be shown on the Project Plans.
2. As site conditions dictate, construct additional MGS to shield fixed object(s). Additional MGS length equal to multiples of 12'-0". Post spacing at 6'-3", except as specified in Note 4.
3. Layout Types 16D through 16L, shown in the A77R Series of Standard Plans, typically used where MGS is recommended to shield roadside fixed object(s) and a crashworthy 31" end treatment is required for both directions of traffic.
4. Where placement of dike is required with MGS, see Standard Plan A77N4 for dike positioning details.
5. Use 31" in-line terminal system and treatments are used where the fixed object(s) will not accommodate a 31" flared end treatment.
6. The offset for 6'-6" block use minimum 4'-0" offset.
STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS

FOR FIXED OBJECT

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

LESS THAN 3'-0", BUT NOT LESS THAN 1'-0"
6" x 8" x 6'-0" WOOD POST WITH
8" x 8" x 1'-2" WOOD BLOCK BEHIND
10" x 10" x 6'-0" WOOD POST WITH
8" x 8" x 1'-2" WOOD BLOCK

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

NOTE 13:
For details of Buried Post End Anchor, see Standard Plan A77T2.

PARABOLIC FLARE OFFSETS

LENGTH OF FLARE = MAXIMUM OFFSET
Y = OFFSET FROM BASE LINE
X = DISTANCE ALONG BASE LINE

NOTE 12:
For typical flare offsets for 25'-0" length parabola with 6:1 taper to 3'-0" from ES.

TERMINAL SYSTEM END TREATMENT

CALTRANS APPROVED 31" IN-LINE ETW

CALTRANS APPROVED 31" IN-LINE ETW

HINGE POINT

FRONT FACE OF END POST

CALTRANS APPROVED 31" IN-LINE ETW

FRONT FACE OF END POST

CALTRANS APPROVED 31" IN-LINE ETW

HINGE POINT

3'-8" Min, SEE NOTE 14

OFFSET LINE OF TRAVELED WAY

EDGE OF RAIL

NOTE 13:
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. 6" x 8.5 or 6" x 9 steel posts, 8'-0" in length, with 8" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used in place of the 10" x 10" x 6'-0" wood post with 8" x 8" x 1'-2" wood block shown in the detail Strengthened Midwest Guardrail System Sections for Fixed Object.
14. Use this offset for 6" block. For 12" block use minimum 4'-0" offset.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

MIDWEST GUARDRAIL SYSTEM

TYPICAL LAYOUTS FOR ROADSIDE FIXED OBJECTS


REVISED STANDARD PLAN RSP A77R7
STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS

FOR FIXED OBJECT

Use strengthened MGS sections with layout 16K or 16L layouts when 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.

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. Plan layout at roadside fixed object (bridge columns, overhead sign supports, etc.) shown on Revised Standard Plans RSP A77P1. Additional MGS length equal to multiples of 12'-6". Post spacing at 6'-3", except as specified in Note 4.

4. Line post, blocks and hardware to be used are shown on Revised Standard Plans A77L1 and A77L2. W6 x 8.5 or W6 x 9 steel post, 8'-0" in length, with 8" x 8" x 1'-2" wood blocks. W6 x 8.8 or W6 x 9 steel post, 6'-0" in length, with 6" x 8" x 1'-2" wood blocks. W6 x 8.8 or W6 x 9 steel post with 8" x 8" x 1'-2" wood blocks, see Note 12.

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

6. As site conditions dictate, construct additional MGS to shield fixed object(s). Additional MGS length equal to multiples of 12'-6". Post spacing at 6'-3", except as otherwise noted.

7. Chapter 14: Project Plans and Note 4. Additional MGS length equal to multiples of 12'-6". Post spacing at 6'-3", except as otherwise noted.

8. Placement of dike is required with MGS, see Revised Standard Plan RSP A77M1 for site position details.

9. The 15:1 or flatter flare for the buried post anchor 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 6'-3" longer to allow for 12"-2" wood block shown in the detail. Strengthened Midwest Guardrail System Sections for Fixed Object.

10. Use this offset for "6" block. For "12" block use minimum 4'-0" offset.

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

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MIDWEST GUARDRAIL SYSTEM
TYPICAL LAYOUTS FOR ROADSIDE FIXED OBJECTS

NO SCALE

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

CABLE CONNECTION END PLATE, SEE DETAIL "A" 

RAIL ELEMENT

TOP OF POST AND BLOCKS 
TOP OF RAIL 

RAIL TENSIONING ASSEMBLY PAY LIMIT

DOUBLE MGS PAY LIMIT

WOOD POST, SEE NOTE 3

LINE POST

3” Ø ANCHOR CABLE, SEE NOTE 2

GROUND LINE

SEE DETAIL "A"

END PLATE

MIDWEST GUARDRAIL SYSTEM 
RAIL TENSIONING ASSEMBLY

NOTES:


2. For details of the anchor plate and 3/4” 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 and plate must not be encased in HMA, concrete, or any other material that could restrict the plate from releasing.

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MIDWEST GUARDRAIL SYSTEM 
RAIL TENSIONING ASSEMBLY

NO SCALE

REVISED STANDARD PLAN RSP A77S2 

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ANCHOR PLATE DETAILS

SECTION A-A
(Alternative Type 1)

SECTION A-A
(Alternative Type 2)

ANCHOR PLATE DETAILS

ELEVATION
END ANCHOR ASSEMBLY (TYPE CA)

(Wood deck, MGS shown, details similar for Thrie Beam Barrier.)

NOTE:

ELEVATION
RETURN CAP (TYPE A)

NOTE:

OPTIONAL ENDS ON SINGLE ANCHOR ROD
(Not to be used for double anchors)

NOTE:

DOUBLE ANCHOR SINGE ANCHOR

ANCHOR RODS

METAL RAILING END
ANCHOR ASSEMBLY (TYPE CA)

STATE OF CALIFORNIA
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2018 REVISED STANDARD PLAN RSP A77T1
NO SCALE

REVISED STANDARD PLAN RSP A77T1
DISTRIBUTION SHEETS
PLANS
TOTAL PROJECT DISTANCE COUNT
COUNTY ROUTE POST MILES C 2018 California Department of Transportation

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Randell D. Hiatt
REGISTERED CIVIL ENGINEER

RSP A77T1 DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN A77T1

NOTES:

1. For typical use of this type of end anchor, see Standard Plan A77T1.

2. Anchor cable to be parallel to railing for straight runs of rail. Anchor cable may not have single cable or anchor plate if railing is curved.

3. Anchor rod hooks to be in contact with anchor reinforcement when concrete is placed. Wire ties may be used to position anchor rod.

4. Single sided railing installations require type A end anchor. Single sided railing installations require either CJP weld or drop-forged 1" Ø machine bolts in 1" Ø holes.

[Diagram of anchor plate details with dimensions and notes]
NOTES:
1. The buried end anchor assembly for flat slopes (Type B-F) should be installed on slopes between 1:1 and 2:1. Where slopes are steeper than 2:1, use Revised Standard Plan RSP A77T3 buried end anchor for steep slopes (Type B-S).
2. Maximum flare rate of guardrail should be 15:1 based on the edge of paved shoulder or offset line of the ETW. The flare rate can be increased up to 10:1 once the toe of cut slope behind the guardrail intersects the back of the guardrail post.
3. Do not place blocks on posts where blocks are in contact with soil.
4. For dike details, see Revised Standard Plan RSP A77T4.
5. Elevation of the guardrail should follow the grade of the shoulder within 1'-0" from face of the rail, see Section B-B. Slope for elevation will be determined by the Engineer.
6. W6 x 9 x 8' anchor post with hardware may be shifted up to 3'-1½" from end if authorized.
7. Details not shown for dike and slope treatment.
8. Lengths shown of Buried End Anchor Shallow Slope are based on a slope of 3:1 and may need to be adjusted to match slope in place.
9. Typical guardrail shown with steel post. Wood post may be used when specified or allowed by the Engineer.
MIDWEST GUARDRAIL SYSTEM CONNECTION TO ABUTMENT OR WALL

CONNECTION DETAIL EE

See Note 5

ELEVATION

MIDWEST GUARDRAIL SYSTEM CONNECTION TO ABUTMENT OR WALL

CONNECTION DETAIL DD

See Note 4

NOTES:

1. These connection details apply to abutments and walls.

2. Additional details of posts, blocks and hardware are shown on Revised Standard Plans RSP A77Q5 and Standard Plan A77Q2. For typical use of Connection Detail DD, see Layout Types 12A and 12B on Standard Plan A77Q2 and Layout Types 12C and 12D on Standard Plan A77Q1.

3. For additional details of Transition Railing (Type WB-31), see Revised Standard Plan RSP A77U4. Transition Railing (Type WB-31) transitions the 12 gauge MGS railing section to a heavier gauge nested thrie beam railing section which is connected to the concrete anchor block.

4. For typical use of Connection Details DD, see Layout Types 12A and 12B on Revised Standard Plan RSP A77U3 and Layout Types 12C and 12D on Revised Standard Plan RSP A77U4. Transition Railing (Type WB-31) transitions the 12 gauge MGS railing section to a heavier gauge nested thrie beam railing section which is connected to the concrete anchor block.

5. For typical use of Conversion Details DD, see Layout Type 120 on Revised Standard Plan RSP A77U3 and Layout Type 1200 on Revised Standard Plan RSP A77U4.

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MIDWEST GUARDRAIL SYSTEM
CONNECTIONS TO ABUTMENTS AND WALLS

NO SCALE

REVISED STANDARD PLAN RSP A77U3


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**DETAIL A**

Straight Metal Box Spacer

- 6" x 6\(\frac{1}{2}\) x 4" E
- See Detail B
- Detail B
- Plate 'A'

**DETAIL C**

Plate 'A'

- 6\(\frac{1}{2}\) x 6\(\frac{1}{2}\) x 4" E
- Plate 'A'
- Meld 1/" Long Each Corner
- 1/"-2" x 1/" Holes

**DETAIL D**

Concrete Barrier or Railing

- END CAP (Type TC)
- 10 GAUGE THRIE BEAM ELEMENT
- 1/" Ø Button Head Splice Bolt With Washer and Nut on Threaded End, See Note 3
- Hex Nuts
- Plate 'A'

**SECTION A-A**

Transition Railing (Type WB-31)

- No Blockout Attachment
- Vertical Face
- Vertical Face
- End Cap (Type TC)
- See Note 3
- Sandwiched Between 12 GAUGE AND ONE THRIE BEAM ELEMENT. See Note 4
- 3'-1" CHAMFER

**SECTION B-B**

Transition Railing (Type WB-31)

- (Blockout Attachment)
- Vertical Face
- Vertical Face
- End Cap (Type TC)
- See Note 3
- Sandwiched Between 12 GAUGE AND ONE THRIE BEAM ELEMENT. See Note 4
- 3'-1" CHAMFER

**NOTES:**

1. Use 5/" Ø 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 transition thrie beam element may be made from the same material. The transition thrie beam element may either be of the same material as the front thrie beam element or an alternate material as the front thrie beam element.
3. Exterior splice bolt holes for rail element splices at Post No. T5 and the connection to the concrete barrier or railing shall be in the standard 5/" Ø x 1/" wide, hex head bolt holes. Interior splice bolt holes at these locations may be increased up to 1/" Ø. Only the top 4 and the bottom 4 splice bolt holes with washers and nuts are required for rail splices at Post No. T5 and the connection to the concrete barrier or railing.
4. The top elevation of Posts No. T7 through No. T9 shall not project more than 1/" above the top elevation of the rail element.
5. Typically, the railing connected to Transition Railing (Type WB-31) will be either standard railing section of MSG with height transition rails of STB or a Caltrans approved 31" and treatment attached to Post No. T1.
6. The depth of the metal box spacer varies from the 9/" to 1/" and is dependent on the width of the concrete railing or wall, the caltrans dimensions for the depth of the nested flange beam plus, the width of railing or wall is typically 9/". Where the width of the combined rail element is greater than 9/", metal plates shall be used to allow the width of the concrete railing or wall.
7. Where the width of the concrete railing or wall is greater than 9/", metal plates are to be used to fill the space created between the backside of Posts No. T5 through No. T8 and the thrie beam elements. These wood blocks shall be 9/" in width and 1/" in length. The distance between the front thrie beam element and the rear thrie beam element is to match the width of the concrete railing or wall.
8. End cap may be installed over 12 gauge and 10 gauge thrie beam elements where transition railing is installed on the departure end of bridge railing.
9. Conform standard railing section height to 31" on Post No. T1 using height transition ratio of 150:1. MSG tolerance of post No. T1 is ± 1/".

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**MIDWEST GUARDRAIL SYSTEM TRANSITION RAILING (TYPE WB-31)**

**NO SCALE**

The plan details the arrangement and installation of a thrie beam barrier, with specific guidelines for the use of bolts and nuts. Here are the key points:

1. For details of steel post thrie beam barrier, see Standard Plan A78B.
2. For details of standard hardware, posts and blocks used to construct thrie beam barriers, see Standard Plan A78C1 and A78C2.
3. Thrie beam barrier post spacing to be 6'-3" center to center, except as otherwise noted.
4. Top of barrier rail to be 2'-8" above ground line or shoulder surfacing under the rail element.
5. For barrier end treatments and barrier connections, see Standard Plans A78E3 and A78G, for connection to Concrete Barrier (Type 60M), see Standard Plan A78E1 and A78L, and Standard Plan A78E2.
6. For connection to Concrete Barrier (Type 60M), see Standard Plans A78E1 and A78L.
7. For details of thrie beam barrier on bridge see Standard Plan A78D1.
8. For details of thrie beam barrier on bridge see Standard Plan A78D2.
9. Install posts in soil.
10. 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.
1. For details of the cross section of the thrie beam rail element and details for wood post with wood block installations, see Standard Plan A78A.

2. For details of the standard hardware, posts and blocks used to construct thrie beam barrier, see Standard Plan A78E1 and A78E2, A78E3, A78F1, A78F2, A78G and A78H.

3. For details of standard hardware, posts and blocks used to construct thrie beam barrier, see Standard Plans A78C1 and A78C2.

4. For details of the cross section of the thrie beam rail element and details for wood blocks, see Standard Plan A78D1.

5. For connection to Concrete Barrier, see Standard Plan A78I.

6. For details of thrie beam barrier on bridges, see Standard Plan A78D2. For barrier end treatments and barrier connections, see Standard Plans A78E1, A78E2, A78E3, A78F1, A78F2, A78G and A78H.

7. Attach rail element to block and steel post with 2 bolts or rods on approaching traffic side of block and post web. No washer on rail face for rod or bolted connection to line post.

8. A78E1, A78E2, A78E3, A78F1, A78F2, A78G and A78H.

9. Details of the cross section of the thrie beam rail element and details for wood blocks, see Standard Plan A78D1.


NOTES:

1. For details of the cross section of the thrie beam rail element and details for wood post with wood block installations, see Standard Plan A78A.

2. For details of the standard hardware, posts and blocks used to construct thrie beam barrier, see Standard Plan A78E1 and A78E2.

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

4. Top of barrier roll to be 2'-8" above ground line or shoulder surfacing under the rail element.

5. For barrier end treatments and barrier connections, see Standard Plans A78E1, A78E2, A78E3, A78F1, A78F2, A78G and A78H.

6. For connection to Concrete Barrier, see Standard Plan A78I.

7. Attach rail element to block and steel post with 2 bolts or rods on approaching traffic side of block and post web. No washer on rail face for rod or bolted connection to line post.

8. For details of thrie beam barrier on bridges, see Standard Plan A78D2. For barrier end treatments and barrier connections, see Standard Plans A78E1, A78E2, A78E3, A78F1, A78F2, A78G and A78H.


10. Install parts in well.

SECTION A-A

Typical Steel Line Post Installation

- Rail Splice and SLOTS for 6" Ø Button Head Bolts to connect roll to post and block

SECTION B-B

Typical Steel Line Post Installation

- Rail Splice and SLOTS for 6" Ø Button Head Bolts with Hex Nuts, See Notes 2 and 9

RAIL ELEMENT SPLICE DETAIL

c) Connect the overlapped ends of the thrie beam rail elements with 1 1/2" x 1 1/2" button head oval shoulder bolt inserted into the 1 1/2" x 1 1/2" holes and bolted together with 1 1/2" recessed hex nuts. Recess of hex nut points toward roll element. A total of 12 bolts and nuts are to be used at each rail splice connection.

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

e) 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 rail elements, a total of 8 of the above described splice bolts and nuts are to be used.
END ANCHOR ASSEMBLY (TYPE SFT-M) FOR TRAFFIC DEPARTURE END OF SINGLE THRIE BEAM BARRIER
(For one-way roadways)

NOTES:
1. For additional details of End Anchor Assembly (Type SFT-M), see Revised Standard Plan RSP A751.
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 crush cushion should be used in place of a terminal system and treatment where the backsides of the rails would be exposed to traffic.
5. A 6'-0" length steel foundation tube, T5 8 x 6 x ¾", without a soil plate, may be furnished and installed in place of the 4'-6" length steel foundation tube and soil plate shown. Minimum embedment of the 6'-0" length tube shall be 5'-9". A ¾" x ⅝" high-shear bolt and nut shall be installed in the hole in the 6'-0" length tube to keep the wood post from dropping into the tube.

END TREATMENT FOR TRAFFIC APPROACH END OF SINGLE THRIE BEAM BARRIER
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. Transition Railing (Type STB) transitions the standard 12 gauge single thrie beam barrier to a heavier gauge single thrie beam railing section then to a heavier gauge nested double thrie beam barrier section which then is connected to the concrete anchor block.

3. For details of End Cap (Type TC), see Standard Plan A78C1.

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. Transition Railing (Type STB) transitions the standard 12 gauge single thrie beam barrier to a heavier gauge single thrie beam railing section then to a heavier gauge nested double thrie beam barrier section which then is connected to the concrete anchor block.

3. For details of End Cap (Type TC), see Standard Plan A78C1.

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SINGLE THRIE BEAM BARRIER CONNECTIONS TO
ABUTMENTS AND WALLS

NO SCALE

PLATE 'A'

SINGLE THRIE BEAM BARRIER

ANCHOR BLOCK FOR TRANSITION
RAILING CONNECTION

DETAIL "C"

REVISED STANDARD PLAN RSP A78G

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Mark Ballentine
APRIL 16, 2021

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THE ACCURACY OR COMPLETENESS OF SCANNED
PLAN SHEETS IS NOT GUARANTEED AND IS
TO ACCOMPANY PLANS DATED April 16, 2021
SUPERSSEDES STANDARD PLAN A78G
1. For details of Concrete Barrier Type 60M, see Standard Plan A78A. 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 A78A, A78B, A78C1, and A78C2.

3. Where beveled metal box spacer is installed, place 1 1/4" Ø x 3" and 1 1/4" 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

**LEGEND**
- Desert Tortoise Habitat

REDIRECTIONAL CONFIGURATION PLAN VIEW

DETAIL A
- 1" x 2" VERTICAL CLEAR MESH GALVANIZED STEEL HARDWARE CLOTH
- STEEL POST

DETAIL B
- 6" to 8" AT POST
- HOG RING TIES @ 2" SPACING
- BARB WIRE

FRONT VIEW
- HOG RING TIES @ 2" SPACING
- WIRE TIE
- BARB WIRE
- STEEL POST

SECTION A-A
- TRENCH
- BACKFILL
- STEEL POST

FENCE TRANSITION FOR
BEDROCK OR CALICHE SUBSTRATE

DESER T TORTOISE FENCE
**DIMENSIONS TABLE**

<table>
<thead>
<tr>
<th>GROUP 1A</th>
<th>GROUP 1B</th>
<th>GROUP 1C</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROUND PIPE</td>
<td>ROUND PIPE</td>
<td>ROUND PIPE</td>
</tr>
<tr>
<td>B (in)</td>
<td>D (ft)</td>
<td>WEIGHT (lb/ft)</td>
</tr>
<tr>
<td>5'-0&quot;</td>
<td>0</td>
<td>1.35</td>
</tr>
<tr>
<td>6'-0&quot;</td>
<td>0</td>
<td>1.875</td>
</tr>
<tr>
<td>10'-0&quot; Max</td>
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<td>2.38</td>
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</table>

**NOTES:**
1. The table to the right shows minimum sized posts and braces complying with the specifications. Larger or heavier post and brace sizes may be used upon approval.
2. Sections shown in the tables must also comply with the strength requirements and other provisions of the specifications.
3. Other sections which comply with the strength requirements and other provisions of the specifications may be used upon approval.
4. Options exercised shall be uniform on any project.
5. Offset to be 2'-0" at monument locations, measured at right angles to R/W lines, taper to remove offset to be at least 20'-0" long.
4. Pervious backfill material continuous behind retaining wall or abutment.
5. Geocomposite drain, treated permeable base and 3" Ø slotted plastic pipe continuous behind retaining wall or abutment. Cap ends of pipe, provide "TEE" 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. E" DIMENSION

2. At the Contractor's option, alternative steel piles with at least the diameter and wall thickness shown on these plans may be used. The diameter shall not exceed 1.5".

3. Pile reinforcement and steel pile anchor bars extending into a footing shall be hooked as required to provide clearance 4-6" of footing. Piles shall be extended only with details shown on the Project Plans.

4. 2" clearance to spiral reinforcement shall be maintained if section used is larger than the minimum section shown.

5. Maximum cutoff length at the top of the Alternative "X" and Alternative "Y" pile is 10'-0".

6. For longitudinal reinforcement and prestressing for anchor piles and load test piles, see "Load Test Pile Details (2)" Standard Plan 92-10.

NOTES:

1. Details are the same for both Class 90 and Class 140 piles unless noted otherwise.

2. Place radially # equal spacing around pile.

3. To be in place when pile is cast.

4. Minimum tensile strength = 66,000 psi

5. Minimum yield strength = 45,000 psi

6. For longitudinal reinforcement and prestressing for anchor piles and load test piles, see "Load Test Pile Details (2)" Standard Plan 92-10.

ALTERNATIVE PILE ANCHOR FOR PRESTRESSED PILES

Pile Embedment

REQUIRED NOMINAL RESISTANCE (TENSION) *

60 kips or less 
Greater than 60 kips

"E" DIMENSION

1" or 2"

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

Alternative "W"
1. Pile reinforcement extending into footing shall be hooked as required to provide clearance to top of footing. Slabs shall be extended only with details shown on the Project Plans.

2. At the Contractor's option, alternative steel piles with alternate reinforcing shown on these plans may be used. The Contractor shall not exceed 1'-6".

3. Maximum cutoff length at the top of the Alternative "X" and Alternative "Y" piles is 10'-0".

4. Clearance to spiral reinforcement shall be maintained.

5. Minimum section used larger than the minimum section shown.
**DESIGN CONDITIONS:**

Design H may be expanded by 6" before going to the next size. Special footing design is required where foundation material is incapable of supporting bearing stress listed in the table.

---

**DESIGN NOTES:**

TO ACCOMPANY PLANS DATED

Design ASHTA LRFD Bridge Design Specifications, 8th Ed., with California Amendments

Preface dated April 2019

LS1: Variable live load surcharge on level ground surface

DC1: Stem architectural treatment of thickness up to 2" of concrete (25 psi) considered

CTAx: 54 ksi transverse force applied at 30° above FS distributed over 10 feet of the top of wall and 1.5" distribution span and outward. Distribution below footing taken no less than 40 feet.

MAXIMUM:

- H = 30', fy = 0.0
- H = 30'
- Soil for = 30'

**REINFORCED CONCRETE:**

- fy = 6,000 psi
- Concrete: cy = 60,000 psi

**LOAD COMBINATIONS AND LIMIT STATES**

Service 1: 0 = 1.00E+0.00E+1.00E+1.00E

Strength 1: 0 = 1.00E+1.00E+1.00E+1.00E

**EXHIBITS**

- Design
- Construction
- Seismic
- Live Load Surcharge
- Load Effects
- Design
- Earth Pressure
- SRPT

**NOTES:**

1. For details not shown and drainage notes, see page 53.

2. For wall joint details, see page 56.

3. H = 6', no notice are allowed within 1'-6" above the top of footing.

4. Bundle bars from H = 23" to 36".

5. Provide No. 10@12" bars over a distance of 5'-0" measured from top expansion joints, begin wall and end wall locations. For H = 16', 12@12" bars at top and reduce bar length as needed to maintain min. Gir cover.

6. For no stem haunch alternative, where H ≤ 18', increase stem thickness, "T", to constant 1'-4" with no batter.

7. For no stem haunch alternative, where H > 18', adjust stem batter to maintain original stem thickness at top of footing according to data defined in table.

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**REVIEWED STANDARD PLAN RSP B3-1A**

RSP B3-1A DATED APRIL 15, 2022, SUPERSEDES STANDARD PLAN B3-1A

**DESIGN CONDITIONS:**

Design H may be exceeded by 6" before going to the next size. Special footing design is required when foundation material is incapable of supporting bearing stress listed in the table.

**DESIGN NOTES:**

- Design based on LRFD Bridge Design Specifications, 8th edition with California Amendments. 
- Footing details dated April 2019.
- Variable live load surcharge on ground level surface.
- See architectural treatment of thickness up to area of concrete (125 psf) considered.

**SEISMIC:**

- $K_h = 0.2$
- $K_v = 0.0$

**SOIL BACKFILL:**

- $y = 120$ psf
- Basis $\phi = 33\degree$

**REINFORCED:**

- $f'_c = 3,600$ psi
- Concrete $f_y = 60,000$ psi

**LOAD COMBINATIONS AND LIMIT STATES:**

- Service I $Q = f'_c + 1.5 f_y + 1.2 Q_{LS}$
- Extreme I $Q = f'_c + 1.5 f_y + 1.2 Q_{LS} + 1.0 Q_{EV} + 1.0 Q_{EH} + 1.0 Q_{EQD} + 1.0 Q_{EQE}$

**NOTES:**

- LF = Force Effects
- SF = Live Load Surcharge
- NE = Net Bearing Stress
- SD = Soil Driveway Load
- SR = Service Limit State I
- Ext I = Extreme Event Limit State I
- LS = Live Load Surcharge
- EV = Earthquake
- SHE = Seismic Horizontal Earth Pressure
- LS = Level Ground Surcharge
- NE = Net Earth Pressure
- SF = Service Limit State II
- Ext II = Extreme Event Limit State II
- LS = Level Ground Surcharge
- EV = Earthquake
- SHE = Seismic Horizontal Earth Pressure
- LS = Level Ground Surcharge
- EV = Earthquake

**REINFORCING STEEL, DIMENSIONS AND DATA:**

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<tr>
<th>N</th>
<th>G</th>
<th>B</th>
<th>H</th>
<th>T</th>
<th>C</th>
<th>M</th>
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<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
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**SYMBOLS:**

- Sr = Service Limit State I
- Ext I = Extreme Event Limit State I
- SF = Service Limit State II
- Ext II = Extreme Event Limit State II

**TABLE OF REINFORCING STEEL, DIMENSIONS AND DATA:**

- N: Number of bars
- G: Grade of steel
- B: Bar size
- H: Height
- T: Thickness
- C: Concrete size
- M: Moment of inertia
- I: Shear moment

**TYPICAL SECTION:**

- Note: For details not shown and drainage notes, see D.
- For wall stem joint details, see E.
- For bunching of bars, see F.
- Use transverse stirrups for H = 4".
- Build up bars for H > 26".

**ELEVATION:**

- Note: For wall stem joint details, see D.
- For bunching of bars, see E.
- Use transverse stirrups for H = 4".
- Build up bars for H > 26".
DESIGN CONDITIONS:
Design A may be executed by 6" before going to the next step. Special footing design is required where foundation settlement is impossible of supporting bearing stress listed in the tables.

DESIGN NOTES:
1. CL0: Stem Architectural Treatment of thickness up to 3'-0" (concrete B25) considered.
2. ZONE 1: Top of footing to top of short @ bar.
3. ZONE 2: Bottom half of stem height.
4. BARS: Bundle of two bars.
5. FOOTING: Const Joint.
6. K = 0.2
7. VS = 0
8. FC = 10000 psi
9. fy = 60,000 psi
10. VIN = 1.2: 12
11. SEQ:

TABLE OF REINFORCING STEEL, DIMENSIONS AND DATA

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<td>16</td>
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<td>M</td>
<td>17</td>
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NOTES:
1. For details not shown and drainage notes, see sheet 2018.
2. For wall stem Joint details, see sheet 6.
3. At joints, no splices are allowed within 1'-0" above the top of footing.
4. Bundle bars for H = 36".
5. Wall strut around the area with alternating transverse reinforcement at 2'-6" for designing load or 1'-0" for designing load or.
REINFORCING STEEL, DIMENSIONS AND DATA

<table>
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<th>DESIGN #</th>
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</tr>
</tbody>
</table>

SYMBOLS:
- Ser - service limit state
- Str - strength limit state
- Ext 1 - extreme event limit state
- Ext 2 - extreme event limit state

- W - width of wall (ft)
- H - height of wall (ft)
- B - footing width (ft)
- E - effective width (ft)
- Q - force effects
- LS - live surcharge load
- EV - vertical earth pressure
- EH - horizontal earth pressure
- DC - dead load of structure components
- EQD - equivalent dead load
- EQE - equivalent live surcharge load
- LS - live surcharge load
- EV - vertical earth pressure
- EH - horizontal earth pressure

DESIGN CONDITIONS:
- Design H may be exceeded by 6" before going to the next size. Special footing design is required if the foundation material is incapable of supporting bearing stress listed in the table.

DESIGN NOTES:
- Design H may be exceeded by 6" before going to the next size. Special footing design is required if the foundation material is incapable of supporting bearing stress listed in the table.

NOTES:
- For details not shown and drainage notes, see.
- For wall stem joint details, see.
- For additional reinforcement, see.
- For expansion joints, begin with wall and end wall location.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REVISION PLANS
RSP B3-3A
DATED APRIL 15, 2022
SUPERSEDES STANDARD PLAN B3-3A
DATED MAY 31, 2018

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**SPREAD FOOTING SECTION**

Place concrete in the against undisturbed material, except as permitted by the Engineer.

**SYMBOLS:**
- Ext I - extreme event limit state I
- Str - strength limit state I
- Ser - service limit state I

**TABLE OF REINFORCING STEEL, DIMENSIONS AND DATA**

<table>
<thead>
<tr>
<th>Design</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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<td>#5 @ 12</td>
<td>#5 @ 12</td>
<td>#5 @ 12</td>
<td>#5 @ 12</td>
<td>#5 @ 18</td>
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<tr>
<td>Str</td>
<td>#5 @ 12</td>
<td>#5 @ 12</td>
<td>#5 @ 12</td>
<td>#5 @ 12</td>
<td>#5 @ 18</td>
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<tr>
<td>Ser</td>
<td>#5 @ 12</td>
<td>#5 @ 12</td>
<td>#5 @ 12</td>
<td>#5 @ 12</td>
<td>#5 @ 18</td>
</tr>
</tbody>
</table>

**NOTES:**
1. Use service limit state I
2. Design is incapable of supporting bearing stress listed in the table.

**DESIGN CONDITIONS:**
- Design I may be expanded by 6" before going to the next size.

**DESIGN NOTES:**
- Special footing design is required where foundation material is incapable of supporting bearing stress listed in the table.

**LOAD COMBINATIONS AND LIMIT STATES:**
- Design I: FOR H = 12', V = 0.2
- Service I: FOR H = 12', V = 0.0

**SOIL BACKFILL:**
- q' = 120 psf
- Soil for 34°, E = 120 psf

**SEISMIC:**
- k = 0.6
- Seismic Earth Pressure

**REINFORCED CONCRETE:**
- fy = 60,000 psi
- f'c = 3,600 psi

---

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

**RETAINING WALL TYPE 1A (CASE 2)**

**NO SCALE**

**REVISED STANDARD PLAN RSP B3-3B**

---

**DESIGNER:** Gary Wang
**REGISTERED CIVIL ENGINEER**

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SKEW TO 20°

PLAN-DECK DRAIN ASSEMBLY

NO SKEW

1'-0" 1'-0"

PIPE 6 x 2'-0"

SKEW OVER 20°

TOP OF DECK

FACE OF BARRIER

SLOPE DECK TOWARD DRAIN

TOP OF DECK

SLOPE DECK TOWARD DRAIN

SEAL

BENT SKEW 2" Min

DETAIL A, Typ

MATCH SLOPE OF SOFFIT

ELEVATION-DECK DRAIN LOCATIONS

SECTION C-C

SECTION A-A

SECTION B-B

DECK DRAIN ASSEMBLY DETAIL

BAR 2½ x ½ x 1'-4½"

BAR 2½ x ½ x 1'-4½"

1" OD SPRING 0.204" # M WASHER

STAINLESS STEEL 2" PIECE LENGTH

SPRING CONSTANT OF 24 LBS/INCH

SPRING TO MAKE FLAT GROUND ENDS

DUSKING 9¼ OD

5/8" ID x 1¼"

BAR 1½ x ½ x 1½"

WTH 5/8" # HOLE

SEE LOCK BAR DETAIL

LOCK BAR

BAR 1½ x ½ x 1'-3¼"

BAR 1½ x ½ x 1'-3¼"

BAR 1½ x ½ x 1'-3¼"

BAR 2¼ x ½ x 1'-4½"

ANCHOR STUD

TOTAL 6, Typ

ELEVATION-DECK DRAIN LOCATIONS

SECTION E-E

FRAME

VIEW D-D

REVIEWED STANDARD PLAN RSP B7-7

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

DECK DRAIN TYPE D-3

NOTE:

For drain pipe alignment, sleeve connection, drain outlet details and notes, see Standard Plan B7-7.
**NOTES:**

1. Pipe casing OD = drain pipe Dia + 4" (1/4" min. wall thickness)

2. Unless otherwise shown on Project Plans, couplers shall extend to the greater of 5'-0" beyond the end of approach abutment or 20'-0" beyond the back of abutment.

3. Use coupling from Table 11.3, Column Reinforcement and Length 3'-0" x 1'-4".

---

**NOTES:**

1. For "a" dimension and pipe diameter, see Project Plans.

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

3. Adjust dimension to suit coupler end ring bolt circle.
ABUTMENT DIAPHRAGMS

INTERMEDIATE DIAPHRAGMS AND HINGES

NOTE 4
NOTE 5
NOTE 6
NOTE 8
NOTE 9
NOTE 10
NOTE 11
NOTE 6
NOTE 7
NOTE 8
NOTE 6

DETAIL U-1
DETAIL U-2
DETAIL U-3
DETAIL U-4
DETAIL U-5
DETAIL U-6
DETAIL U-7
DETAIL U-8

FOR FUTURE UTILITY OPENING DIMENSIONS
NOT SHOWN ON PROJECT PLANS USE:

NOTES:
1. The exact location, elevation, size, and direction of openings shall be
   in accordance with the Project Plans and as directed by the Engineer.
2. Openings not shown. See Project Plans.
3. All reinforcement detailed to be placed in addition to reinforcement
   shown on Project Plans.
4. Seal utilities 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.
5. Reinforcement to clear opening.
6. Missing reinforcement to be same bar size and $\bar{D}$ the spacing of adjacent
   reinforcement shown on Project Plans.
7. Replace each set of 2-#9 bars cut off by opening. Place $\bar{D}$ on each
   side of opening.
8. When Y is less than 8', extend top of opening to bottom of bearing
   seat elevation.
9. For future utility opening dimensions, see Project Plans and Detail U-4.
10. Unless otherwise shown on Project Plans, casing shall extend to the
    state right-of-way limit.

UTILITY OPENING
BOX GIRDER

NOTES (FOR PIPE DIAMETER NOT SHOWN ON PROJECT PLANS,
THROUGH 2'-8'' DIAMETER OPENING)

NOTE 6
NOTE 7
NOTE 8
NOTE 9
NOTE 10
NOTE 11
NOTE 12
NOTE 13
NOTE A
Type E-1 Approach Slab shown, see Table for Type E-2 details.

SECTION A-A

LEGEND:
- * = All approach slab reinforcement shall be epoxy coated and minimum two not cover 2½" in Freeze-Thaw Area.

NOTES:
1. For MR ≤ 2", adjust reinforcement to clear aspect for seated Joint. For MR > 2", reinforcement must be normal to BB or EB and spaced to match 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 P10 and P30.
4. At the Contractor's option, approach slab Transverse reinforcement may be placed parallel to BB or EB and spaced to avoid joint seal assembly anchorage.
5. For details not shown, refer to Revised Standard Plan RSP B9-5.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REVIEWED STANDARD PLAN RSP B9-1

NO SCALE
RSP B9-1 DATED OCTOBER 15, 2021 SUPERSEDES STANDARD PLAN B9-1
**LEGEND**

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

**NOTES:**

1. For MR < ½", adjust reinforcement to clear sawcut for sealed joint. For MR ≥ ½", reinforcement must be normal to BB or EB and spaced to avoid joint seal assembly anchorage.

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

3. At the Contractor's option, approach slab transverse reinforcement may be placed parallel to BB or EB. Spacing of transverse reinforcement is measured along roadway.

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

**JOINT TIE DETAILS**

**SECTION A-A**

- **ABUTMENT TIE DETAILS**
- **DEAPHRAGM TYPE ABUTMENT**

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

**STRUCTURE APPROACH**
**TYPE EQ (10)**

**REVISED STANDARD PLAN RSP B9-4**

**2018 REVISED STANDARD PLAN RSP B9-4**

**NO SCALE**

**RSP B9-4 DATED OCTOBER 15, 2021 SUPERSEDES STANDARD PLAN B9-4**

**DATED MAY 31, 2018 – PAGE 355 OF THE STANDARD PLANS BOOK DATED 2018.**

**REVISED STANDARD PLAN RSP B9-4**

**10'-0"**

**SEAT TYPE ABUTMENT**

**ABUTMENT TIE DETAILS**

- **SEE “ABUTMENT TIE DETAILS”**
  - **#5 @ 12, 1'-3"**
  - **#6 @ 6, PARALLEL TO LANE LINES, **
  - **NORMAL TO LANE LINES**

- **#6 @ 12, PARALLEL TO LANE LINES, **
  - **NORMAL TO LANE LINES**

- **NOTE:** Seat type abutment shown, diaphragm type abutment similar.
NOT ALL BARRIER PAINT SHOWN.

WINGWALL OR RETAINING WALL

MATCH DECK PROTECTION IN FREEZE-THAW AREA.

Polyester concrete shall be placed across approach slab to match bridge deck protection in Freeze-Thaw Area.

DETAIL X-1

TYPE E-1

DETAIL X-2

TYPE E-2

DETAIL X-3

LONGITUDINAL CONSTRUCTION
JOIN ALTERNATIVES

LEGEND

* Min lap splice for bottom Rein in Freeze-Thaw area shall be 3'-6".

** Threaded Rods and Dowels in Freeze-Thaw area shall be stainless steel or epoxy-coated prefabricated 9" Drill and bond dowels into a 9" deep hole.

NOTES:

1. Paint edge angle at beginning of barrier transition, end of wingwall or end of structure approach as applicable.

2. Solid concrete barrier shown, details similar for all concrete and standard post-beam barriers.

3. Joint protection details shown for MR < 2". Details similar when joint seal assembly is required.

4. Polyester concrete shall be placed across approach slab to match bridge deck protection in Freeze-Thaw Area.
PIPE HANDRAILING REQUIRED ONLY WHERE SLOPE IS 6% OR GREATER, OR AS INDICATED ELSEWHERE IN THE PLANS.

**Design Notes:**

- Loadings:
  - f' = 3.6 ksi
  - HSS: f = 50 ksi
  - Concrete: f = 60 ksi

- Section:
  - C = 0.148" Ø steel wire ties
  - @ 1'-0" TO ALL PIPES

**TYPICAL CONNECTION DETAILS**

1. Peen all bolt threads.
2. Railing shall conform to horizontal and vertical alignment.
3. When railing is on slope, 6'-0" chain link fabric shall be placed parallel to slope.
4. Additional HSS 1.9 x 0.188 required when radius is less than 150'-0".

**ANCHORAGE DETAIL**

**ALTERNATIVE ANCHORAGE DETAIL**

May be used when thickness of concrete is 1'-0" or more.

**NOTES:**

- See Note 4
- Notes:
  - California Amendments April 2019
  - AASHTO LRFD Bridge Design Specifications 8th Edition 2017
  - with California Amendments April 2019

- Materials:
  - Concrete:
    - f = 60 ksi
  - Steel:
    - HSS: f = 50 ksi

- Dimensions:
  - 6'-0" POST POCKET
  - 1" Ø HOLE
  - 3" x 6" x 6" OR 5" x 16" W/FLAT WASHER
  - HEX NUT AND 2" VENT BOLT END
  - 1/2" x 8" x 8" WITH 1/2" Ø U BOLT W/HEX NUT

- Anchorage:
  - Drive all bolts through or provide anchorage detail as required.
  - Provide spacing in mesh as required.
  - Fabric continuous at Electrolier but may be cut and spliced.

- Elevation:
  - Pipe Handrail at end of deck.

- Plan:
  - Pipe Handrail at end of deck.

- Side View:
  - Pipe Handrail bracket.

- Elevation:
  - Pipe Handrail at end of deck.

**Notes:**

- Peen bolt threads.
- Railing shall conform to horizontal and vertical alignment.
- When railing is on slope, 6'-0" chain link fabric shall be placed parallel to slope.
- Additional HSS 1.9 x 0.188 required when radius is less than 150'-0".

**Typical Connection Details**

- 1/2" Ø hole
- 3/4" Ø bolt 3" thread
- 1/2" x 8" x 8" WITH 1/2" Ø U BOLT W/HEX NUT
- 3" x 6" x 6" OR 5" x 16" W/FLAT WASHER
- HEX NUT AND 2" VENT BOLT END
- 1/2" x 8" x 8" WITH 1/2" Ø U BOLT W/HEX NUT
- 3" x 6" x 6" OR 5" x 16" W/FLAT WASHER
- HEX NUT AND 2" VENT BOLT END

**Design Notes:**

- California Amendments April 2019
- AASHTO LRFD Bridge Design Specifications 8th Edition 2017
- with California Amendments April 2019

- Materials:
  - Concrete:
    - f = 60 ksi
  - Steel:
    - HSS: f = 50 ksi

- Dimensions:
  - 6'-0" POST POCKET
  - 1" Ø HOLE
  - 3" x 6" x 6" OR 5" x 16" W/FLAT WASHER
  - HEX NUT AND 2" VENT BOLT END

- Anchorage:
  - Drive all bolts through or provide anchorage detail as required.
  - Provide spacing in mesh as required.
  - Fabric continuous at Electrolier but may be cut and spliced.

- Elevation:
  - Pipe Handrail at end of deck.

- Plan:
  - Pipe Handrail at end of deck.

- Side View:
  - Pipe Handrail bracket.

- Elevation:
  - Pipe Handrail at end of deck.

**Notes:**

- Peen bolt threads.
- Railing shall conform to horizontal and vertical alignment.
- When railing is on slope, 6'-0" chain link fabric shall be placed parallel to slope.
- Additional HSS 1.9 x 0.188 required when radius is less than 150'-0".
CONCRETE BARRIER TYPE 836
DETAILS No. 1

NOTE:
Reinforcing for wall joint shown

ELECTROLIER
(SEE NOTE 5 ON DETAILS No. 2)

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER TYPE 836
DETAILS No. 1
NO SCALE

RSP B11-79 DATED OCTOBER 18, 2019 SUPERSEDES RSP B11-79

REVISED STANDARD PLAN RSP B11-79
CONCRETE BARRIER TYPE 836
DETAILS No. 2

NOTE:
Types 836A and 836B are similar to Type 836 except as noted.

1. Holes are to be backfilled before barrier is placed.

2. Clearance to reinforcing steel in barrier to be 2", except as noted. Lateral 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 standard metal railing connection details not shown, see Standard Plans A77U1 and A77U2.

5. Various used. 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 2" conduits along with one 3" conduit. When a 3" conduit is used, see Standard Plans A77U1 and A77U2.

6. For typical metal railing connection details not shown, see Standard Plans ES-9A, ES-9B, ES-9C, ES-9D, and ES-9E. The maximum number of conduits in the barrier is limited to two 2" 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 4:1 to match the top elevation of the thrie beam rail element.

9. In front and back of pull box (SECTION C-C) the #4 x 3"-2" bars must be centered so that they extend minimum 8" beyond ends of pull box. As an alternative, may substitute #4 x 4"-2" welded fabric extending minimum 8" beyond ends of pull box.

NOTE: 3

Rev. 10/18/2019

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

2018 REVISED STANDARD PLAN RSP B11-80

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October 18, 2019

TO ACCOMPANY PLANS DATED

REVISED STANDARD PLAN RSP B11-80
DATED OCTOBER 18, 2019 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

COUNTY: TIMES, COUNTY: NAPA
DISTRIBUTION CODE: NAPA

REVISED STANDARD PLAN RSP B11-80

NO SCALE

NOTE:
Types 836A and 836B are similar to Type 836 except as noted.

1. Holes are to be backfilled before barrier is placed.

2. Clearance to reinforcing steel in barrier to be 2", except as noted. Lateral 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 standard metal railing connection details not shown, see Standard Plans A77U1 and A77U2.

5. Various used. 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 2" conduits along with one 3" conduit. When a 3" conduit is used, see Standard Plans A77U1 and A77U2.

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9. In front and back of pull box (SECTION C-C) the #4 x 3"-2" bars must be centered so that they extend minimum 8" beyond ends of pull box. As an alternative, may substitute #4 x 4"-2" welded fabric extending minimum 8" beyond ends of pull box.

NOTE: 3
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 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.

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

7. Minimum concrete edge distance to the reinforcing shown shall be increased. Edge distance may be increased to accommodate increase in concrete cover for architectural reinforcement.

8. Taper the top of the end of the bridge railing at 41° to match the top elevation of the tfrf beam rail element.

9. In front and back of pull box (SECTION C-C) the #4 x 3'-0" bars must be centered so that they extend minimum 9" beyond ends of pull box. As an alternative, may substitute 4 x 4 - W12 x 12 welded fabric extending minimum 9" beyond ends of pull box.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
CONCRETE BARRIER TYPE 842
DETAILS No. 2


11. #5 12 @ 12, #4 16 @ 6, #5 16 @ 8, #5 16 @ 12, and #6 6 @ 6 for electrical details. The minimum size 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.

12. Minimum concrete edge distance to the reinforcing shown shall be increased. Edge distance may be increased to accommodate increase in concrete cover for architectural reinforcement.

13. Taper the top of the end of the bridge railing at 41° to match the top elevation of the tfrf beam rail element.

14. In front and back of pull box (SECTION C-C) the #4 x 3'-0" bars must be centered so that they extend minimum 9" beyond ends of pull box. As an alternative, may substitute 4 x 4 - W12 x 12 welded fabric extending minimum 9" beyond ends of pull box.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE BARRIER TYPE 842
DETAILS No. 2

NOTE: Types 842A & 842B are similar to Type 842 except as noted.

NOTE: #5 are to be backfilled before barrier is placed.

1. Clearance to reinforcing steel in barrier to be 2", except as noted. Longitudinal reinforcement to stop

2. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS.”

3. For electrolier mounting details, see Standard Plans ES-6A and ES-6B.

4. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS.”

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 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.

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

7. Minimum concrete edge distance to the reinforcing shown shall be increased. Edge distance may be increased to accommodate increase in concrete cover for architectural reinforcement.

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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
CONCRETE BARRIER TYPE 842
DETAILS No. 2

NOTE: Types 842A & 842B are similar to Type 842 except as noted.

NOTE: #5 are to be backfilled before barrier is placed.

1. Clearance to reinforcing steel in barrier to be 2", except as noted. Longitudinal reinforcement to stop

2. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS.”

3. For electrolier mounting details, see Standard Plans ES-6A and ES-6B.

4. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS.”

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 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.

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

7. Minimum concrete edge distance to the reinforcing shown shall be increased. Edge distance may be increased to accommodate increase in concrete cover for architectural reinforcement.

8. Taper the top of the end of the bridge railing at 41° to match the top elevation of the tfrf beam rail element.

9. In front and back of pull box (SECTION C-C) the #4 x 3'-0" bars must be centered so that they extend minimum 9" beyond ends of pull box. As an alternative, may substitute 4 x 4 - W12 x 12 welded fabric extending minimum 9" beyond ends of pull box.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE BARRIER TYPE 842
DETAILS No. 2

NOTE: Types 842A & 842B are similar to Type 842 except as noted.

NOTE: #5 are to be backfilled before barrier is placed.

1. Clearance to reinforcing steel in barrier to be 2", except as noted. Longitudinal reinforcement to stop

2. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS.”

3. For electrolier mounting details, see Standard Plans ES-6A and ES-6B.

4. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS.”

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 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.

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

7. Minimum concrete edge distance to the reinforcing shown shall be increased. Edge distance may be increased to accommodate increase in concrete cover for architectural reinforcement.

8. Taper the top of the end of the bridge railing at 41° to match the top elevation of the tfrf beam rail element.

9. In front and back of pull box (SECTION C-C) the #4 x 3'-0" bars must be centered so that they extend minimum 9" beyond ends of pull box. As an alternative, may substitute 4 x 4 - W12 x 12 welded fabric extending minimum 9" beyond ends of pull box.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE BARRIER TYPE 842
DETAILS No. 2

NOTE: Types 842A & 842B are similar to Type 842 except as noted.

NOTE: #5 are to be backfilled before barrier is placed.

1. Clearance to reinforcing steel in barrier to be 2", except as noted. Longitudinal reinforcement to stop

2. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS.”

3. For electrolier mounting details, see Standard Plans ES-6A and ES-6B.

4. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See "ROADWAY PLANS.”

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 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.

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

7. Minimum concrete edge distance to the reinforcing shown shall be increased. Edge distance may be increased to accommodate increase in concrete cover for architectural reinforcement.

8. Taper the top of the end of the bridge railing at 41° to match the top elevation of the tfrf beam rail element.

9. In front and back of pull box (SECTION C-C) the #4 x 3'-0" bars must be centered so that they extend minimum 9" beyond ends of pull box. As an alternative, may substitute 4 x 4 - W12 x 12 welded fabric extending minimum 9" beyond ends of pull box.
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2018 REVISED STANDARD PLAN RSP B11-84

DETAILS No. 2

CONCRETE BARRIER TYPE 85

**ELEVATION**

NOTES:

1. Tubular bicycle railing optional for Type 85B.
2. Minimum length of Type 85B is 40'-0".

**PLAN AT LOWER BEAM (CURB)**

**PLAN AT TOP BEAM**

**TYPICAL SECTION**

NOTE: Tubular bicycle railing not shown for clarity.

*Dimension determined by bridge cross-slope and whether or not there is an overlay.*

2. Minimum length of Type 85B is 40'-0".

SEE NOTE 1

---

**REGISTERED CIVIL ENGINEER**

Gregory C40814

3-31-23

TO ACCOMPANY PLANS DATED APRIL 15, 2022 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2018.

REVISED STANDARD PLAN RSP B11-84

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**STATE OF CALIFORNIA**

DEPARTMENT OF TRANSPORTATION

CONCRETE BARRIER TYPE 85

DETAILS No. 2

NO SCALE


REVISED STANDARD PLAN RSP B11-84

---

**TYPICAL SECTION**

CONCRETE BARRIER TYPE 85

DETAILS No. 2

NO SCALE

**DESIGN NOTES**

**DEPARTMENT OF TRANSPORTATION**

**STATE OF CALIFORNIA**

**SOUND WALL**

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

**NO SCALE**


**REVIEWED STANDARD PLAN RSP B15-2**

**SECTION A-A**

**ELEVATION**

**FOOTING STEP DETAILS**

**FROM REVISION STANDARD PLAN RSP B15-1**

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**SOUND WALL**

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

**NO SCALE**


**REVIEWED STANDARD PLAN RSP B15-2**

**SECTION A-A**

**ELEVATION**

**FOOTING STEP DETAILS**

**FROM REVISION STANDARD PLAN RSP B15-1**

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**SOUND WALL**

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

**NO SCALE**


**REVIEWED STANDARD PLAN RSP B15-2**

**SECTION A-A**

**ELEVATION**

**FOOTING STEP DETAILS**

**FROM REVISION STANDARD PLAN RSP B15-1**

**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.

Sound Wall Reinforcement Table

<table>
<thead>
<tr>
<th>MAXIMUM H</th>
<th>1'-4&quot; W</th>
<th>1'-4&quot; W</th>
<th>9&quot;</th>
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</tr>
<tr>
<td>16'-0&quot;</td>
<td>#4</td>
<td>#4</td>
<td>#4</td>
</tr>
</tbody>
</table>

Elevation

Case 1
For details not shown, see Case 2.
Level ground (±10%) on both sides of the sound wall and sloping ground on the opposite side.

Case 2
For details not shown, see Case 1.
Level ground (±10%) on one side of the sound wall and sloping ground on the opposite side.

Pile Cap Section

Masonry Block on Pile Cap Details (1)

No Scale

Sound Wall

State of California Department of Transportation

Revised Standard Plan RSP B15-3

2018 Revised Standard Plan RSP B15-3
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 2-8 gauge wires continuous or 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

DESIGN:
ASHRAE LEED Bridge Design Specifications, 8th Edition 2017 with California Amendment, Effective Date April 2019
TMS 402-16
2019 California Building Code

DESIGN WIND LOADS
50%permit

DESIGN SEISMIC LOAD
0.57 Dead Load
REINFORCED CONCRETE & CONCRETE MASONRY
fy = 60 ksi
fc = 5.4 ksf
f'c = 2000 psi

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

NOTE 3
SIZE AS REQUIRED FOR SNUG FIT.
JOINT FILLER PLACED IN SASH BLOCK RECESSES.
AT EXPANSION JOINTS: CONTINUOUS EXPANSION
CELLS WITH VERTICAL REIN AND BOND SEEMS TO BE FILLED WITH GROUT
BEAMS TO BE FILLED WITH GROUT.
CELLS WITH GROUT

SECTION A-A
For details not shown, see other sections.
H=6'-0" THRU H=10'-0"

SECTION B-B
For details not shown, see other sections.
H=12'-0" THRU H=16'-0"

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


REVISED STANDARD PLAN RSP B15-4
**Case 1** - Level ground (±10%) on both sides of the sound wall.

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

**Details**
- **Section E-E**
- **Pile Cap Step Detail**
- **Case 1** and **Case 2** Pile Data Tables

**NOTE:**
1. For details not shown, see Revised Standard Plans RSP B15-3 and RSP B15-4.
For details not shown, see Revised Standard Plans RSP B11-79 and RSP B11-80.

For details not shown, see other details.

For Concrete Anchor Block and connection details, see Connection Detail DD on Revised Standard Plan RSP B15-6.

For details not shown, see BARRIER SECTIONS. For Reinforcement not shown in BARRIER SECTIONS, Consult RSP A77U3.

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

Provide materials to achieve the net compressive strength of high-strength blocks only.

Provide materials to achieve the net compressive strength of concrete masonry unit equal to or greater than the specified f'.
### SOUND WALL MASONRY BLOCK
ON TYPE 836S/SV BARRIER
DETAILS (3)

#### CASE 1: PILE DATA TABLE

<table>
<thead>
<tr>
<th>H (ft)</th>
<th>MAXIMUM Ø (in)</th>
<th>ø = 25 Min</th>
<th>ø = 30 Min</th>
<th>ø = 35 Min</th>
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</thead>
<tbody>
<tr>
<td>6'-0&quot;</td>
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<td>16'-0&quot;</td>
<td>8' 7&quot;</td>
<td>10'-0&quot;</td>
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<tr>
<td>10'-4&quot;</td>
<td>10'-0&quot;</td>
<td>16'-0&quot;</td>
<td>8' 7&quot;</td>
<td>10'-0&quot;</td>
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<tr>
<td>12'-4&quot;</td>
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<td>8' 7&quot;</td>
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<td>16'-0&quot;</td>
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**NOTES:**
1. For details not shown, see Revised Standard Plans RSP B15-6 and RSP B15-7.

#### CASE 2: PILE DATA TABLE

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<th>H (ft)</th>
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**NOTES:**
1. For details not shown, see Revised Standard Plans RSP B15-6 and RSP B15-7.

---

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

**REVISIONS:**
- **RSP B15-8 DATED OCTOBER 15, 2021**
- **SUPERSEDES RSP B15-8 DATED APRIL 17, 2020**
- **AND STANDARD PLAN B15-8 DATED MAY 31, 2018**

**REVISED STANDARD PLAN RSP B15-8**

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ELEVATION - METAL FRAME

PARTIAL ELEVATION (BACK)

For details not shown, see above.
**SECTION A-A**

**CHANNEL MOUNTING HOLE**

- 12 Ga STEEL CHANNEL
- 1 ½" Ga CHANNEL MOUNTING HOLE
- 4-⅛ x 1/2" Wood Screws
- 3/8" Studs with Expansion Anchors
- Lock Washers and Hex Nuts

**NOTE:**

- Those blocks upon which the supporting steel channels are mounted shall be smooth faced on the mounted side.
- When sound wall is measured from the bottom of the gate opening exceeds 6'-8", see Revised Standard Plan RSP B15-13.

**SECTION C-C**

**NOTES:**

- The masonry cells adjacent to each side of the gate to be reinforced and grouted.

**SECTION E-E**

**DISTANCE:**

- 12 Ga STEEL CHANNEL
- 1½" x 1 ½" x 3 ¾" Concrete
- 12 Ga STEEL CHANNEL

**SECTION O-D**

**STOP DETAIL**

- 12 Ga STEEL CHANNEL
- Tapered End, bend and weld vertical flange as shown
- Cut channel to form tapered end, bend and weld vertical flange as shown

**SECTION B-B**

**SECTION D-D**

**SECTION B-B**

**CHANNEL MOUNTING HOLE**

- 12 Ga METAL FRAME
- 12 Ga STEEL CHANNEL
- 1 ½" Ga CHANNEL MOUNTING HOLE
- 4-⅛ x 1/2" Wood Screws
- 3/8" Studs with Expansion Anchors
- Lock Washers and Hex Nuts

**NOTE:**

- When sound wall as measured from the bottom of the gate opening exceeds 6'-8", see Revised Standard Plan RSP B15-13.

**SECTION B-B**

**SECTION B-B**

**CHANNEL MOUNTING HOLE**

- 12 Ga METAL FRAME
- 12 Ga STEEL CHANNEL
- 1 ½" Ga CHANNEL MOUNTING HOLE
- 4-⅛ x 1/2" Wood Screws
- 3/8" Studs with Expansion Anchors
- Lock Washers and Hex Nuts

**NOTE:**

- Those blocks upon which the supporting steel channels are mounted shall be smooth faced on the mounted side.
- When sound wall is measured from the bottom of the gate opening exceeds 6'-8", see Revised Standard Plan RSP B15-13.

**SECTION C-C**

**NOTES:**

- For location of nylon finishing washers, see Revised Standard Plan RSP B15-13.

**SECTION B-B**

**SECTION B-B**

**CHANNEL MOUNTING HOLE**

- 12 Ga METAL FRAME
- 12 Ga STEEL CHANNEL
- 1 ½" Ga CHANNEL MOUNTING HOLE
- 4-⅛ x 1/2" Wood Screws
- 3/8" Studs with Expansion Anchors
- Lock Washers and Hex Nuts

**NOTE:**

- Those blocks upon which the supporting steel channels are mounted shall be smooth faced on the mounted side.
- When sound wall is measured from the bottom of the gate opening exceeds 6'-8", see Revised Standard Plan RSP B15-13.

**SECTION C-C**

**NOTES:**

- For location of nylon finishing washers, see Revised Standard Plan RSP B15-13.
REVISED STANDARD PLAN RSP B15-13

PART ELEVATION (BACK)
For details not shown, see above.

**NOTES:**
- CSP landing required when slope of ground behind barrier is steeper than 8:1.
- See additional detail sheets for location where required.
- CSP interior to ground is backfilled.
- Lower CSP as required to provide minimum clearance.
- Match top of concrete barrier elevation.

**ELEVATION (BACK)**

- 2 nylon finishing washers 3/8" Dia. w/ mounted 3/8" Studs w/ lock washers and expansion anchors in 4" deep drilled holes.
- Finished grade.
- For ground elev., see additional detail sheets.

**SECTION F-F**

- 6 equal spaces
- CSP landing required when slope of ground behind barrier is steeper than 8:1.
- See additional detail sheets for location where required.
- CSP interior to ground is backfilled.
- Lower CSP as required to provide minimum clearance.
- Match top of concrete barrier elevation.

**SECTION G-G**

- *Elevation of centerline of top rung to match top of concrete barrier elevation*
- *Top of barrier*
- *Bottom of gate opening*

**SECTION H-H**

- E ¼" x 2½"
- Ground line
- Detail "A"

**ELEVATION - METAL FRAME**

- 6 equal spaces
- CSP landing required when slope of ground behind barrier is steeper than 8:1.
- See additional detail sheets for location where required.
- CSP interior to ground is backfilled.
- Lower CSP as required to provide minimum clearance.
- Match top of concrete barrier elevation.

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**SECTION G-G**

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- *Top of barrier*
- *Bottom of gate opening*

**SECTION H-H**

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- Detail "A"

**ELEVATION - METAL FRAME**

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- See additional detail sheets for location where required.
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- Match top of concrete barrier elevation.

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- Detail "A"

**ELEVATION - METAL FRAME**

- 6 equal spaces
- CSP landing required when slope of ground behind barrier is steeper than 8:1.
- See additional detail sheets for location where required.
- CSP interior to ground is backfilled.
- Lower CSP as required to provide minimum clearance.
- Match top of concrete barrier elevation.
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.

SOUND WALL MASONRY BLOCK
ACCESS GATE LOCKING DETAILS
NO SCALE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

RSP B15-14 DATED APRIL 17, 2020 SUPersedes STANDARD PLAN B15-14
CASE 1
For details not shown, see Case 2. See Note 1.

CASE 2
For details not shown, see Case 1. See Note 1.

CASE 1: PILE DATA TABLE

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CASE 2: PILE DATA TABLE

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</table>

NOTE:
1. For wall reinforcement details, see Revised Standard Plan RSP B15-6.

DESIGN NOTES:
- **DESIGN**
  - AASHTO LRFD Bridge Design Specifications, 8th Edition 2017 with California Amendment, Preface date April 2019
  - Example Building Code
  - DESIGN MINIMUM LOAD
  - DESIGN SPECIFIED LOAD
  - DESIGN IMPACT LOAD
  - 36.5 psf
  - 0.57 Dead load
  - TL-3
  - DESIGN LIVE LOAD SURCHARGE
  - 240 psf surcharge on level ground surface
  - REINFORCED CONCRETE & CONCRETE MASONRY
  - $c = 3.6$ ksi
  - $f_t = 60$ psi
  - $f_s = 2000$ psi

- **STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**
- **2018 REVISED STANDARD PLAN RSP B15-15**
- **SOUND WALL MASONRY BLOCK ON TYPE 836/SV BARRIER ON PILE FOOTING FOR SPANNING UTILITIES**
- **No Scale**

**CASE 1**
Level ground ±10% on both sides of barrier.
For details not shown, see Case 2.

**CASE 2**
Level ground ±10% at the traffic side of barrier and sloping ground on the opposite side.
For details not shown, see Case 1.

**SECTION K-K**
For spanning utilities.

**WIRE**
- #8 @ 2" at option of Contractor.

**PROFILE GRADE**
- #5 TOTAL 14
- #6 TOTAL 10 IN TYP BARRIER

**SOUND WALL**
- #5 TOTAL 10 AS INDICATED
- #6 TOTAL 18

**SLOPE**
- SLOPE SHALL NOT BE STEEPER THAN 2:1
- THAN 2:1

**PAYMENT**
- K
- K
- L

**LENGTH FOR**
- LOWER WALL
- UPPER WALL

**BARRIER SECTIONS**
- 2'-0" ON TYPE 836/SV BARRIER ON PILE FOOTING FOR SPANNING UTILITIES
GRATE FRAME FOR TYPE GDO INLET

* HOLES REQUIRED ONLY WITH TRASH RACK

TABLE A

<table>
<thead>
<tr>
<th>CURB TYPE</th>
<th>Normal Curb Height</th>
<th>Curb Batter</th>
<th>&quot;%&quot; Dimension</th>
<th>&quot;%&quot; Dimension</th>
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<td>T4 1/2&quot;</td>
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</tbody>
</table>

NOTES:
2. Where shown on the project plans, place a 3/8" 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

REVISED STANDARD PLAN RSP D73E


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**WALL A**

<table>
<thead>
<tr>
<th>Method</th>
<th>MINIMUM COVER TO</th>
<th>10'-0&quot; MAX COVER</th>
<th>20'-0&quot; Max COVER</th>
<th>30'-0&quot; Max COVER</th>
<th>40'-0&quot; Max COVER</th>
<th>50'-0&quot; Max COVER</th>
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**WALL AA**

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**WALL BB**

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<td>0.60</td>
<td>0.58</td>
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<td>0.54</td>
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</tbody>
</table>

**DESIGN NOTES:**

- **Earth Loadings:** Per Uniform Soil Pressure Distribution, except for any potential soil pressure effects, see design lateral pressure chart (Circular Pipe only).
- **Unit Stresses:** Design in Design Tables
- **f'c** = 55 ksi
- **f'c** = See Tables

The RCP as shown on this sheet is not intended to be used in a corrosive environment. A special design may be required.

**CAGE REINFORCEMENT**

- **t** = Pipe barrel wall thickness, inches
- **A** = Inner cage reinforcement, or single circular cage reinforcement, square inches
- **A** = Outer cage reinforcement, square inches
- **A** = Elliptical single cage reinforcement, square inches
- **C** = Cage design clearance, inches (see Note 6)

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**PRECAST REINFORCED CONCRETE PIPE**

**DIRECT DESIGN METHOD**

**NO SCALE**

**RSP D79 DATED OCTOBER 15, 2021 SUPERSEDES STANDARD PLAN D79**

**DATED MAY 11, 2018 - PAGE 219 OF THE STANDARD PLANS BOOK DATED 2016.**
DIRECT DESIGN METHOD

MINIMUM COVER MEASURED AT THE EDGE OF TRAVELED WAY (ETW) SHALL BE 2'-0" TO 6¼"

- Pipe barrel wall thickness, inches
   - Outer cage reinforcement, square inches/lf
   - Inner cage reinforcement, square inches/lf

- Single circular cage reinforcement, square inches/lf
- Elliptical single cage reinforcement, square inches/lf

- Design clearance, inches (see Note 5)

**NOTES:**

1. For details of the method of excavation, backfill and bedding:
   - See Revised Standard Plan RSP A62DA, Installation Type 1, Installation Type 2, etc., see Revised Standard Plan RSP A62DA, Installation Type 1, Installation Type 2, etc., see Revised Standard Plan RSP A62DA.

2. The tables for minimum allowable classes and D-values of RCP on Revised Standard Plan RSP A62DA shall not apply to direct design RCP.

3. Notes 3 and 4 on Revised Standard Plan RSP A62DA shall apply to direct design RCP.

4. Throughout the length of any given culvert, the direct design selected by the Contractor shall be the same, including the method of excavation, backfill and bedding.

5. For single circular cage reinforcement, minimum clearance shall be 403" of the wall thickness (t), for elliptical and double circular cage reinforcement, the minimum clearance (Clr) for reinforcement shall be 35", and where the wall thickness (t) is 2½" or more, the minimum clearance (Clr) for reinforcement shall be 1½".

6. Minimum cover measured at the Edge of Traveled Way (ETW) shall be 2'-0" to 6½" of existing AC pavement and 1½" to 6½" of existing AC pavement.

7. Cover greater than the table maximum requires a special design.

**DESIGN NOTES:**

- Design: AASHTO LRFD Bridge Design Specifications, 6th edition with California Amendments, DIRECT DESIGN METRO
- Earth Loading: Hager Soil Pressure Distribution Y = 140 psf
- Unit Stresses Used in Design Tables:
  - Y = 65 ksf
  - f' = See Tables

The RCP as shown on this sheet is not intended to be used in a corrosive environment. A special design may be required.

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**PRECAST REINFORCED CONCRETE PIPE**

**DIRECT DESIGN METHOD**

**NO SCALE**

RSP D79A DATED OCTOBER 15, 2021 SUPERSEDES STANDARD PLAN D79A
Soil pressures shown are factored per AASHTO LRFD and include soil weight. It is permissible to eliminate the 180° hooks on every other bar.

For boxes with span or height less than those shown in tables, a special design is required. Quantities are approximate and for design purposes only. The state of California or its officers shall not be responsible for revisions standard plan RSP D80 dated May 31, 2018 - Page 221 of the standard plans book dated 2018.

### Soil Pressure (ksf), Str

<table>
<thead>
<tr>
<th>Span</th>
<th>1'</th>
<th>2'</th>
<th>3'</th>
<th>4'</th>
<th>5'</th>
<th>6'</th>
<th>7'</th>
<th>8'</th>
<th>9'</th>
<th>10'</th>
<th>11'</th>
<th>12'</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-3'</td>
<td>2.3</td>
<td>2.6</td>
<td>2.9</td>
<td>3.2</td>
<td>3.5</td>
<td>3.8</td>
<td>4.1</td>
<td>4.4</td>
<td>4.7</td>
<td>5.0</td>
<td>5.3</td>
<td>5.6</td>
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<tr>
<td>4-4'</td>
<td>4.7</td>
<td>5.0</td>
<td>5.3</td>
<td>5.6</td>
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<td>9.4</td>
<td>9.7</td>
<td>10.0</td>
</tr>
</tbody>
</table>

### Reinforcement

**See Note 7**

**See Note 4**

**See Note 4**

**See Note 4**

**See Note 4**

### Typical Section

**SPANS 4' THRU 8'**

**SPANS 10' THRU 14'**

**Notes:**

1. For boxes with span or height less than those shown in tables, use next greater size box reinforcement. Make necessary changes in bar lengths and quantities.

2. Quantities are approximate and for design purposes only.

3. For boxes with span or height or cover greater than those shown in tables, a special design is required.

4. It is permissible to eliminate the 180° hooks on every other bar. 

5. Provide splicing options when tops are exposed and when pavement is concrete, and adjust quantities.

6. For design and details not shown, see Revised Standard Plan RSP D82.

**Soil pressures shown are factored per ASHRAE LIVG and include self-weight of fill over box, self-weight of box and live load where applicable.**

**Stagger rebars for wall thicknesses less than 8".**

**Check plans dated May 31, 2018 - Page 221 of the standard plans book dated 2018.**

**State of California**

**Department of Transportation**

**Cast-In-Place**

**Reinforced Concrete**

**Single Box Culvert**

**No Scale**

**GENERAL NOTES**

Designations

Standard single or multiple box culverts are shown on plans as shown.

Definitions:
- Standard single or multiple box culverts are shown on plans as shown.
- EXPANSION JOINTS: Unless otherwise shown, all expansion joints shall be placed as shown.

**CONSTRUCTION NOTES:**

- Designation:
  - Standard single or multiple box culverts are shown on plans as shown.
  - EXPANSION JOINTS: Unless otherwise shown, all expansion joints shall be placed as shown.

- Standards:
  - AASHTO LRFD Bridge Design Specifications, 8th Edition and CA Amendments.
  - California Department of Transportation Standard Specifications.

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- Standards:
  - AASHTO LRFD Bridge Design Specifications, 8th Edition and CA Amendments.
  - California Department of Transportation Standard Specifications.
TYPICAL SECTION - SPANS 4'-0" THRU 12'-0"

PRECAST REINFORCED CONCRETE BOX CULVERT

END JOINT DETAIL

ALTERNATIVE DETAILING OPTION

EXTERIOR SEALING BAND SCHEMATIC

NOTES:
1. The inside and outside surfaces of the RCB roof shall not be less than 6" on all sides.
2. H1 minimum shall equal the wall thickness.
3. 
4. For design and details not shown see Revised Standard Plan RSP A62G.
5. For external sealing band applications see Revised Standard Plan RSP A62G.
6. Soil pressures shown are governed per ASCE 40-10 and include soil weight-of-fill over box, self weight of box and live load where applicable.
7. If earth cover is less than 3", the concrete cover for the reinforcement of the top of the top slab shall be 2". If in the table shall note an additional "T" and quantities shall be revised accordingly in this code.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

REvised STANDARD PLAN RSP D83A
Eliminate cutoff wall if adjacent channel is paved and skew is 20° maximum.

**Soil bearing pressure shown in the table is the equivalent uniform pressure per AASHTO LRFD 11.6.3.2**

- Quantities include 1'-0" extension above the design "H" limit.

**CASE I**
- qu (ksf), B' (ft)
  - 2.28, 7.55
  - 2.77, 8.14
  - 2.50, 7.84
  - 2.29, 7.60
  - 1.69, 6.86
  - 1.51, 6.55
  - 1.33, 6.13

- B ‐ B - (2) eccentricity, B' is the effective footing width.

**CASE II**
- qu (ksf), B' (ft)
  - 2.81, 8.59
  - 2.77, 8.14
  - 2.50, 7.86
  - 2.29, 7.60
  - 1.69, 6.86
  - 1.51, 6.55
  - 1.33, 6.13

**CASE III**
- qu (ksf), B' (ft)
  - 2.81, 8.59
  - 2.77, 8.14
  - 2.50, 7.86
  - 2.29, 7.60
  - 1.69, 6.86
  - 1.51, 6.55
  - 1.33, 6.13

- B = B - (2) eccentricity, B' is the effective footing width.

**TYPICAL SECTION**
- H = 4' THRU 12'
- H = 13' THRU 16'
- FOOTING STEP DIMENSIONS

**STRAIGHT WINGWALLS**
- TYPES A, B AND C

- Short "c" bars
- Long "c" bars

**REINFORCED CONCRETE WINGWALLS**
- **CASE I**
  - #4, @ 12"
  - #5, @ 12"

- **CASE II**
  - #4, @ 12"
  - #5, @ 10"

- **CASE III**
  - #6, @ 11"
  - #6, @ 9"

- **SOIL BEARING PRESSURE**
  - Equivalent fluid pressure: 36 pcf
  - Earth density: 120 pcf

- Unit Stresses: f'c = 3,600 psi, fy = 60,000 psi

- Footing to upper end of footing to adjacent grade.

- Elevations, length and angle of flare of wings may be varied by the Engineer to suit conditions encountered in the field.

- Wall height may be varied by B' before going to next greater "H".

- **CONSTRUCTION JOINTS**
  - 1'0" @ W/3 vert
  - 3" Clr for footing step dimensions and reinforcement, see

- **USING THE PLAN**

- **ENGINEER**
  - To accompany plans dated 26/10/18, copies of this plan sheet.

- **REGISTERED CIVIL ENGINEER**
  - October 19, 2018

- **AASHTO LRFD**
  - 11.6.3.2

- **REINFORCEMENT CONC WITH ATTACHED WALLS**
  - Rust if "angle of flare" is less than 30°.

- **DEVELOPMENT OF WALL**
  - Extends all longitudinal bars in box walls 2'-0" into wings, except where expansion joint occurs.

- **CONSTRUCTION JOINTS**
SEE DETAIL "A"

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.

PARTIAL REMOVAL OF EXISTING DROP INLET

6" Min. concrete backfill

EXISTING INLET

6" Min.
NOTES (THIS SHEET ONLY):

1. Rungs must be skid resistant. To accompany plans dated 12-29-20.

2. Use wall mounted handrails for vault depths between 4'-0" and 6'-6" for deeper vaults use extendable handrails due to grate conflict.

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 and extendable handrail detail.

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

<table>
<thead>
<tr>
<th>NOTE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rungs must be skid resistant.</td>
</tr>
<tr>
<td>2</td>
<td>Use wall mounted handrails for vault depths between 4'-0&quot; and 6'-6&quot; for deeper vaults use extendable handrails due to grate conflict.</td>
</tr>
<tr>
<td>3</td>
<td>No handrail required for Linear Radial GSRD 4'-0&quot; depth, due to grate conflict.</td>
</tr>
<tr>
<td>4</td>
<td>At ladder locations provide a ladder on the outside of the wall and extendable handrail detail.</td>
</tr>
<tr>
<td>5</td>
<td>Bolted ladder, see Standard Plan D75C is optional.</td>
</tr>
</tbody>
</table>
NOTES:
1. Filter fabric shall be placed between trench filler material and surface gravel layer and along the sides of the infiltration trench.
2. Place concrete curb at the locations shown on the plans. See Standard Plan A87A for details not shown.
3. Centerline of observation well to be placed a minimum of 1'-6" from edge of trench.
4. Exact location of curb openings shall be determined by the Engineer in the field.
5. The plastic protection well cover shall be flush with top of the surface gravel layer.

See Note 2

See Note 3

GENERAL NOTES

Designations

Types of Gross Solids Removal Devices (GSRDs) are

Linear Radial (LR) and Inclined Screen. The Linear

Radial has a radially high velocity configuration

notated as Linear Radial or Linear Radial (LR). All GSRD

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 Design

Required for ground water conditions above bottom
or GSRD, surcharge loads exceeding 150 kips/m, or GSRD
large bearing pressures or sides greater than those
on the GSRD.

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.

**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>
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<tr>
<td>B</td>
<td>5'-0&quot;</td>
<td>8.74</td>
<td>3.31</td>
</tr>
<tr>
<td>C</td>
<td>6'-0&quot;</td>
<td>11.65</td>
<td>6.41</td>
</tr>
<tr>
<td>D</td>
<td>8'-0&quot;</td>
<td>14.57</td>
<td>5.52</td>
</tr>
<tr>
<td>E</td>
<td>10'-0&quot;</td>
<td>17.48</td>
<td>8.63</td>
</tr>
<tr>
<td>F</td>
<td>11'-0&quot;</td>
<td>20.39</td>
<td>1.74</td>
</tr>
</tbody>
</table>

**Notes**

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

**Design Notes**

Specifications:

- Inclined Screen Design Specification April 2000 (LFD)
- 1996 AASHTO with interims and revisions by Caltrans
- Footing (LFD): 1.5D + 1.5E
- Capacity reduction factor included

Earth Load:

- 125 lb/ft vertical, 62.4 lb/ft horizontal
- Equivalent Fluid Pressure = 100 lb/ft horizontal (Case I)
- Earth pressure for 2:1 unlimited slope determined from Rankine's formula with Ø = 33°42' (Case III).

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.

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<td>E</td>
<td>10'-0&quot;</td>
<td>17.48</td>
<td>8.63</td>
</tr>
<tr>
<td>F</td>
<td>11'-0&quot;</td>
<td>20.39</td>
<td>1.74</td>
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</table>

**Inclined Screen Design Flow Chart**

<table>
<thead>
<tr>
<th>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>8.74</td>
<td>3.31</td>
</tr>
<tr>
<td>C</td>
<td>6'-0&quot;</td>
<td>11.65</td>
<td>6.41</td>
</tr>
<tr>
<td>D</td>
<td>8'-0&quot;</td>
<td>14.57</td>
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<tr>
<td>E</td>
<td>10'-0&quot;</td>
<td>17.48</td>
<td>8.63</td>
</tr>
<tr>
<td>F</td>
<td>11'-0&quot;</td>
<td>20.39</td>
<td>1.74</td>
</tr>
</tbody>
</table>

**Notes**

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

**Inclined Screen Design Flow Chart**

<table>
<thead>
<tr>
<th>Type</th>
<th>Total Screen Length</th>
<th>Flow Rate (cfs)</th>
<th>Debris Area (acres)</th>
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<td>A</td>
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<td>F</td>
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INCLINED SCREEN DETAILS No. 2

GROSS SOLIDS REMOVAL DEVICE

SECTION A-A - REINFORCEMENT

SECTION B-B - REINFORCEMENT

SECTION C-C - REINFORCEMENT

SECTION D-D

SECTION E-E

SECTION F-F

SECTION G-G

JET PLATE DETAIL

NOTES:

1. Start bolt pattern @ 2¼" Max from edge.
2. Supports with five ¼" machine bolts A307 equally spaced.
3. For section locations, see Revised Standard Plan RSP D139B.
4. ½" jet plate with L3" x 2" x ¼" braced supports around perimeter for screen lengths up to 6'-0". For longer screen lengths use L3" x 2" x ¼" use additional interior supports at 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 ½" machine bolts A307 equally spaced. Start bolt pattern @ 2¼" Max from edge.
ENERGY DISSIPATION SLAB
To be used at cleanout.
(Place 8 = 65 as shown top and bottom. Extend bars 1' - 3" past the opening or use 6" max. if development length is not available.)

SECTION L-L

WALL OPENING
To be used at inlet and outlet pipe locations

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

SECTION M-M
(Only specified horizontal bars are shown)

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

REVISED 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.
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."
WEDGE-WIRE SCREEN
INCLINED SCREEN DETAILS No. 5
GROSS SOLIDS REMOVAL DEVICE

NOTES:
2. The dimension shown is the distance between top of plate and bottom of wire.
3. Support rod diameter equals 3/8". Align rods to match vertical angle supports. Screen manufacturer will weld support rods to wedge wire.
4. Weld support rods to metal frame (all around).

SECTION H-H
- TOP OF FOOTING
- L1½" x 1½" x 3/8"
- VARIOUS
- CONCRETE INSERTS
- 4" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION J-J
- L1½" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION I-I
- L1½" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION H-H
- TOP OF FOOTING
- L1½" x 1½" x 3/8"
- VARIOUS
- CONCRETE INSERTS
- 4" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION J-J
- L1½" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION I-I
- L1½" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION H-H
- TOP OF FOOTING
- L1½" x 1½" x 3/8"
- VARIOUS
- CONCRETE INSERTS
- 4" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION J-J
- L1½" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION I-I
- L1½" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION H-H
- TOP OF FOOTING
- L1½" x 1½" x 3/8"
- VARIOUS
- CONCRETE INSERTS
- 4" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION J-J
- L1½" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
- SECTION I-I
- L1½" x 1½" x 3/8" NOTCHED TO FIT L 1½" x 1½" x 3/8"
NOTCHES:
1. For inlet and outlet pipe details not shown, see "Drainage Plans.
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."
PULTRUDED FRP SCREEN

INCLINED SCREEN DETAILS No. 7

BASE PLATE

SECTION I-I

GROSS SOLIDS REMOVAL DEVICE

SEE ELEVATION

DEPARTMENT OF TRANSPORTATION
STATE OF CALIFORNIA

SCREEN MOUNTING BRACKET
FRAME MOUNTING PLATE

2 " 2 "
L1½" x 1½" x ?"
TO FIT BAR 1½" x ?"

1 ? " Ø HOLE
FIT L1½" x 1½" x ?"

2 ¾ " 2½" PLATE
1 ? " 1½" x ?" VERTICAL BAR OR
2 ½ "

1½" x ?" BAR 3" x ?" SLOTTED
TO FIT BAR 1½" x ?" WELD ALL AROUND.

PLATE 2½" x 4½" x ?" WELD ALL AROUND, Typ

TOP OF SUPPORT FRAME

TOP OF FOOTING

EXPANSION ANCHOR
SEE BASE PLATE DETAIL

2½" FOR 3'-4" SCREEN

2½" FOR 5'-0" SCREEN, Typ

SEE FRAME MOUNTING PLATE DETAIL AND NOTES 3 AND 4

SEE ELEVATION

SEE ELEVATION

3½" BASE PLATE WITH SLOTTED HOLE FOR CONCRETE ANCHORS, SEE BASE PLATE DETAIL

3½" MECHANICAL EXPANSION ANCHOR

SCREEN MOUNTING BRACKET

FRAME MOUNTING PLATE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NOTE 5:

The dimension shown is the distance between top of plate and bottom of screen.

3. Weld L1½" x 1½" x ?" to metal frame.

4. Mount screen to metal frame using stainless steel temper proof fastenal assembly.

6. Use all holes on all edges of screen and concrete where gap is > 0.2".

NOTES:


2. The dimension shown is the distance between top of plate and bottom of screen.

3. Weld L1½" x 1½" x ?" to metal frame.

4. Mount screen to metal frame using stainless steel temper proof fastenal assembly.

Field locate and drill ½" Ø hole in the support beam and screen mounting bracket to install the hold down clip assembly. Use a minimum of 3 clip assemblies for top 3' width FRP screen, use 6 clip assemblies for FRP screens that are less than 3'. Adjust screen mounting bracket locations as needed. Place bracket in between tie rods.

5. Pultruded FRP screen length is:

3. 0'

6. 20'

6. 30'

6. 40'

6. 50'

6. 60'

6. 70'

6. 80'

6. 90'

6. 100'
GENERAL NOTES

Designation:
Types of Gross Solids Removal Devices (GSRDs) are linear radial (LR) and interifice screens. The linear radial (LR) has either a standard or high velocity configuration noted as Linear Radial or Linear Radial (HV). All GSRD amp. Detail Drawings are applicable for velocities up to 20 fps.

Special Reinforcement Coverage:
GSRD amp. 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 MWO truck load, design bearing pressures or sizes greater than those on this plan.

Traffic Loadings:
No traffic load is allowed over GSRDs, as determined by the Engineer, barriers or 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 (ft)</th>
<th>FLOW RATE (cfs)</th>
<th>GERRIS AREA (acres)</th>
<th>INSIDE LENGTH</th>
<th>HIGH VELOCITY INSIDE LENGTH</th>
<th>NO. OF INTERMEDIATE GERRIS PIPES</th>
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</thead>
<tbody>
<tr>
<td>LR-1</td>
<td>5'-0&quot;</td>
<td>3.54</td>
<td>0.79</td>
<td>11'-11&quot;</td>
<td>16'-8'</td>
<td>0</td>
</tr>
<tr>
<td>LR-2</td>
<td>10'-0&quot;</td>
<td>7.02</td>
<td>1.56</td>
<td>16'-11&quot;</td>
<td>19'-6'</td>
<td>1</td>
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<tr>
<td>LR-3</td>
<td>15'-0&quot;</td>
<td>10.56</td>
<td>2.25</td>
<td>21'-11&quot;</td>
<td>24'-3'</td>
<td>2</td>
</tr>
<tr>
<td>LR-4</td>
<td>20'-0&quot;</td>
<td>14.09</td>
<td>3.16</td>
<td>26'-11&quot;</td>
<td>29'-3'</td>
<td>3</td>
</tr>
<tr>
<td>LR-5</td>
<td>25'-0&quot;</td>
<td>18.63</td>
<td>3.95</td>
<td>31'-11&quot;</td>
<td>34'-3'</td>
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<td>LR-6</td>
<td>30'-0&quot;</td>
<td>21.91</td>
<td>4.74</td>
<td>36'-11&quot;</td>
<td>39'-3'</td>
<td>5</td>
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</table>

* High velocity is achieved when inlet velocity exceeds 22 fps.

NOTES:
1. The total screened pipe length ("L") is the sum of the end screened and intermediate screened pipes. For dimension "L" and location of one screened pipe and intermediate screened pipes, see Revised Standard Plan RSP D1400, see plan view. Likewise, the length of the number represented is the parentheses.
2. The inside length ("L") is shown on Revised Standard Plan RSP D1400, see plan view. Likewise, the inside length ("L") is shown on Revised Standard Plan RSP D1400, see plan view.
3. The inside length ("L") is shown on Revised Standard Plan RSP D1400, see plan view. Likewise, the inside length ("L") is shown on Revised Standard Plan RSP D1400, see plan view.

DETAILED DESIGN LOADING CASES

CASE I: Level + 2'-0" surcharge, GSRD empty
CASE II: 2'1' unlimited slope, GSRD empty
CASE III: GSRD full of water, no soil pressure

Grossing (LL) Load = 0.5 psi
Unit Stress: γ = 60 ksf (bar reinforcing)
Design Soil Bearing Pressure (Service Load) = 20 psi

LINEAR RADIAL

NOTES:
1. Slope or shore excavation sides as necessary.
2. Slope or shore excavation sides as necessary.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL LEGEND
NO SCALE


REvised STANDARD PLAN RSP D140A
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 D118.
3. For end and intermediate screened pipe details, see Revised Standard Plan RSP D140E.
4. For grate details, see Revised Standard Plan RSP D140F.
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 "H", "L", "T" and other design data, see Revised Standard Plan RSP D140C.
8. For dimension "W", see Revised Standard Plan RSP D140G.
NOTE (THIS SHEET ONLY):

1. All metal components of screen pipe including connections to concrete must be stainless steel.

2' ID OPENING ANCHOR PLATE WITH 36" x 32" x ½"

2'-10" ANCHOR PLATE 36" x 32" x ½"

3 " 4" 8 " 8 " 4 "

¼"

NON-LOUVERED PIPE WITH 12" X 18" OVERFLOW OPENING 2' ID X ¼"

ANCHORS WITH DOUBLE NUT, Typ ½" MECHANICAL EXPANSION

90.57° OPENING COLLAR

½" OVERFLOW COLLAR

½" MECHANICAL EXPANSION ANCHORS, Typ

INLET PIPE

GROSS SOLIDS REMOVAL DEVICE

LINEAR RADIAL OVERFLOW PIPE DETAILS

OVERFLOW PIPE AND ANCHOR PLATE DETAILS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL OVERFLOW PIPE DETAILS
NO SCALE


REVISED STANDARD PLAN RSP D140D
REVISED STANDARD PLAN RSP D140E
SIDE VIEW

SECTION I-I

NO SCALE

LINEAR RADIAL SCREENED PIPE DETAILS

GROSS SOLIDS REMOVAL DEVICE

SECTION G-G

SECTION H-H

DETAIL A

DETAIL B

END SCREENED PIPE

INTERMEDIATE SCREENED PIPE

NOTES (THIS SHEET ONLY):
1. Provide 1" x 3/4" stainless steel bar at all cut edges to provide a seal and support for all doors when closed.
2. Provide stainless steel 1/4" thick heavy duty hinges 4" x 4" stock with 3/8" pin, use fillet weld at cover and frame. Total 2 each door, evenly spaced.
3. Attach 2 - 1" x 1" x 3" stainless steel bars (or fabricator equivalent design) to support doors when in an open position. Mechanical stops can be welded on hinges.
4. Provide latch. Latch must have threaded bolt for adjustment. Latch to have 1/2" lateral adjustability and 112.5° drawing movement and be rated at 360 lb.
5. Provide stainless steel handles at locations indicated.
6. End doors to be secured 4x and screen with 3/4" Dia x 10" continuous bolt with lock nut through flat bars.
7. The aperture size of each louver slot must be 3/8" wide x 25" long. Louver slot apertures must meet the following requirements:
   - Length: % of Total
     - 0.169" - 0.200" - 100
     - 0.225" - 0.250" - 90
     - 0.300" - 0.325" - 80
   - Width: % of Total
     - 0.169" - 0.200" - 100
     - 0.225" - 0.250" - 90
     - 0.300" - 0.325" - 80
8. If inlet invert height above floor is at the minimum 3 inch height, use anchor bolts to mount the pipe support base plate to the floor. Otherwise, construct concrete support.

DEPARTMENT OF TRANSPORTATION

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL SCREENED PIPE DETAILS
NO SCALE

TO ACCOMPANY PLANS DATED 2018

REVISED STANDARD PLAN RSP D140F

BEARING BARS
CROSS BARS
SPACING
Typ 1 1/2"
@ 1 1/2"

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

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 1/2"
3 1/2"
16 SPACES @ 1 1/2" FOR L = 5'-4"
1 1/2"

GRATE PANEL

CONCRETE WALL

1/4" CAP

MIN, Typ

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

TACK HELD 1 1/2" OF 1/4" HEAT-TREATED CHAIN
(ASTM A413 GRADE 70) TO FRAME AND GRATE,
SEE NOTE 3

1/2" # THREADED ANCHOR RODS,
A307 @ 3" C-C

GRATE SUPPORT

BEARING BARS
CROSS BARS
SPACING
Typ 1 1/2"
@ 1 1/2"

SECTION J-J

SECTION K-K

A307 @ 3' C-C

GROSS SOLIDS REMOVAL DEVICE
LINEAR RADIAL GRATE PANEL DETAILS

GRATE LAYOUT

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

NOTES (THIS SHEET ONLY):
1. Gap between grate panels is 1 1/2".
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 INTERMEDIATE SCREENED PIPES
No. OF GRATES
No. OF LR(HV)

0
1
2
3
4
5

5
6
7
8
9
10
11
12
13
14
15
16

Note: Cross bars may be fillet welded or resistance welded or electroformed to bearing bars.
**SOFFIT AND WALL-MOUNTED LUMINAIRES**

**MISCELLANEOUS ELECTROLIERS**

**ANNOTATION**

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<tr>
<td>🔴</td>
<td>ABANDON, IF APPLIED TO CONDUIT, REMOVE CONDUCTORS</td>
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<tr>
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<td>INSTALL PULL BOX IN EXISTING CONDUIT RUN</td>
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<td>PEDESTRIAN HARNESSE, TYPE AS INDICATED ON PLAN</td>
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<td>INSTALL CONDUIT INTO EXISTING PULL BOX</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>CONDUIT TO REMAIN FOR FUTURE USE, REMOVE CONDUCTORS. INSTALL FULL TAPE</td>
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<td>DETECTOR MANHOLE</td>
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<td>INSTALL SIGN ON SIGNAL MAST ARM</td>
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<td>EQUIPMENT OR MATERIAL TO BE REMOVED AND BECOME THE PROPERTY OF THE CONTRACTOR</td>
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<td>RELOCATE EQUIPMENT</td>
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<td>SERVICE DISCONNECT</td>
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**STANDARD**

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**NOTE:** Arrow indicates "street side" of luminaire.
### MISCELLANEOUS EQUIPMENT

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<tr>
<td>CMS</td>
<td>CMS</td>
<td>HIGHWAY ADVISORY RADIO POLE AND ANTENNA</td>
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<tr>
<td>CMS</td>
<td>CMS</td>
<td>EXTINGUISHER MESSAGE SIGN</td>
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<td>DETECTION DEVICE</td>
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### WIRING COMPONENTS

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<td>TIE POINT</td>
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<tr>
<td>—</td>
<td>CONTACTOR COIL</td>
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<tr>
<td>—</td>
<td>ENCLOSED BOND</td>
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<tr>
<td>—</td>
<td>GROUNDING ELECTRODE</td>
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<tr>
<td>—</td>
<td>CIRCUIT BREAKER</td>
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### HANDHOLES, PULL BOXES, AND VAULTS

<table>
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<tr>
<th>NEW</th>
<th>EXISTING</th>
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<tr>
<td>DETECTOR MANHOLE</td>
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<td>PULL BOX, No. 5 UNLESS OTHERWISE INDICATED</td>
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<td>VAULT</td>
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### DETECTORS

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<td>TYPE B LOOP DETECTOR, OUTLINE OF SAW CUT SHOWN</td>
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<tr>
<td>TYPE Q LOOP DETECTOR, OUTLINE OF SAW CUT SHOWN</td>
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### LIGHTING STANDARD, SIGNAL AND LIGHTING STANDARD

- M - MICROWAVE SENSOR
- V - VIDEO IMAGE SENSOR

### DETECTORS AND PHASE DIAGRAMS

- PHASE 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
- SNF, JG
- E17490

### STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS

LEGEND

NO SCALE

REVISED STANDARD PLAN RSP ES-1C

POLE MOUNTED SERVICE INSTALLATIONS

LEGEND:
- Meter socket.
- Service enclosure with a minimum 60 A rated main circuit breaker, unless otherwise shown.
- A. Utility owned pole, the service utility will furnish and install required service riser and equipment as needed.
- B. State owned pole, the contractor shall furnish and install required service riser and equipment.

SERVICE GROUNDING

NOTES:
1. Ground clamp and required fittings must be accessible, conduit must extend to protect grounding electrode from mechanical damage.
2. Use where service utility requires 18" clearance between grounding electrode and pole or service equipment enclosure. Installation shown is for sidewalk or paved areas. In unpaved areas, omit special service equipment enclosure. Installation shown is for sidewalk between grounding electrode and pole or service equipment enclosure.

SERVICE CONDUIT - CONDUIT TO PHOTOVOLTAIC UNIT - TYPE 3 CONDUIT WITH A GROUNDED TYPE BUSHING INSTALLED IN THE SERVICE UTILITY

SERVICE CONDUIT WITH A GROUNDED TYPE BUSHING INSTALLED IN THE SERVICE UTILITY

GROUNDING CONDUCTOR MUST BE ATTACHED TO THE BUSHING, CARRIED THROUGH THE CONDUIT RUN AND ATTACHED TO THE SERVICE EQUIPMENT ENCLOSURE'S GROUNDING ELECTRODE.

SERVICE UTILITY SHALL DETERMINE THE EXACT LOCATION.

SERVICE UTILITY SHALL DETERMINE THE EXACT LOCATION.
1. **Side View**
   - Min 18" Gasket, Typ
   - Minimum 1/4" nipple
   - Minimum 1/4", Rain Tight Conduit hub
   - Max Hex Head Wood Screw with Washer, Typ
   - 1/2", Grounding Electrode conductor
   - Conduct must extend up to grounding electrode to protect grounding electrode from mechanical damage.
   - Swivel Type Ground Clamp for threaded rigid conduit

2. **Top View**
   - 12 GAUGE SHEET METAL STRAP BOLTED TO POLE AND SERVICE FRAME (Cadmium-Plated Nuts and Washers)
   - Existing Service Utility Wood Pole
   - Exterior Plywood (Painted) or 8 GAUGE SHEET METAL (Galv) Service Frame
   - Grounding Bushing
   - Permanent Label Equipment, Voltage and Function in Enclosure

3. **Front View**
   - Load Conduit
   - Existing Service Utility Wood Pole
   - Exterior Plywood (Painted) or 8 GAUGE SHEET METAL (Galv) Service Frame

4. **Type SCE-1**
   - Detail A
   - Type SCE-2
   - Detail B

5. **Notes**
The plan shows the approximate location of devices within the service equipment enclosure. Components may be rearranged; however, the "working" components within the service equipment enclosure shall be maintained.
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.

Item 12 and 20 shall be ganged operated CB.

Connect to remote test switch mounted on lighting padlock latch.

Component may be rearranged, otherwise indicated on the plans.

NEUTRAL LUG

GROUNDING ELECTRODE

GROUND BUS

LOAD BUS

TERMINAL BLOCKS

GROUND BUS

LOAD CONDUIT

BASE FOR TYPE III-B

SERVICE EQUIPMENT ENCLOSURE

DETAIL B

SIDE VIEW

FRONT VIEW

TYPE III-B SERVICE EQUIPMENT ENCLOSURE (TYPICAL)

DETAIL A

BASE FOR TYPE III-B

SERVICE EQUIPMENT ENCLOSURE

DETAIL B

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 padlock latch.
3. Items 1 and 6 shall be isolated from the service equipment enclosure.
4. Type III photoelectric control shall be used unless otherwise indicated on the plans.
5. Items 5 and 6 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.
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'-0" plus a width of foundation.
3. A 1" drain shall be provided through the foundation of a cabinet. Drain pipe shall be screened.
4. Cabinet shelves shall be adjustable for vertical spacing and shall be removable.
5. Controller units, plug-mounted equipment, shelf-mounted equipment and wall-mounted equipment shall be located to permit safe and easy removal or replacement without removing any other piece of equipment.
6. Where telephone interconnect is required, a minimum of 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.

Drain pipe shall be screened.

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

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

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.

Where telephone interconnect is required, a minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.

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.

Anchor bolts for cabinet shall be 3/4" x 1'-6" with a 2" - 90° bend.
NOTES:

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

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

---

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

*FOR DIMENSIONS AND DETAILS NOT SHOWN, SEE CABINET HOUSING DETAILS OF THE TRANSPORTATION ELECTRICAL EQUIPMENT SPECIFICATION (TEES)*

---

**FOUNDATION AND PAD DETAIL**

**MODEL 332LS, 334LS, AND 334LC**

**RIGHT SIDE INSTALLATION DETAIL B**

**LEFT SIDE INSTALLATION DETAIL A**

---

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

**STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION ELECTRICAL SYSTEMS (CONTROLLER CABINET FOUNDATION AND PAD DETAILS)**

**REVISED STANDARD PLAN RSP ES-3C DATED APRIL 16, 2021 SUPERSEDES RSP ES-3C DATED OCTOBER 16, 2020 AND NO SCALE**

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**NOTES:**

1. Where telephone interconnect is required, a minimum of 3" clear vertical space shall be provided inside the cabinet for the equipment.
2. Telephone interconnect conduit shall be enclosed in a Type 2 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, for 120 V Service.
7. Conduit area for the controller side of cabinet.

---

**CONDUIT AREA (9" x 12")**

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

**FOUNDATION AND PAD DETAIL**

**DETAIL A**

**DETAIL B**

**SIDE VIEW**

**FRONT VIEW**

**FOUNDATION FOR TYPE LX CABINET**

**ELECTRICAL SYSTEMS**

(CONTROLLER CABINET FOUNDATION AND PAD DETAILS)

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

REVISED STANDARD PLAN RSP ES-3C1
The LX BBS cabinet shall be mounted to the Model 342LX or 344LX cabinet foundation.

Where telephone interconnect is required, a minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.

A minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.

Conduit area for the controller side of cabinet.

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

Conduit area, to 120 V Service.

Conduit area for the controller side of cabinet.

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

Grounding electrode shall be placed 3 inches in front of the service conduit area.

All dimensions are nominal.

The controller cabinet shall be mounted to the Model 342LX or 344LX cabinet foundation with four #18-8 stainless steel hex head, fully-threaded, ½" Ø x 1½" bolts; two washers per bolt, designed for ½" bolts and are #18-8 stainless steel, 1" outside diameter, round, and flat; and one ¼-20 UNF Lock nut per bolt that is #18-8 stainless steel and a hex-nut.

Grounding electrode shall be placed 3 inches in front of the service conduit area.

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

All dimensions are nominal.

The controller cabinet shall be mounted to the Model 342LX or 344LX cabinet foundation with four #18-8 stainless steel hex head, fully-threaded, ½" Ø x 1½" bolts; two washers per bolt, designed for ½" bolts and are #18-8 stainless steel, 1" outside diameter, round, and flat; and one ¼-20 UNF Lock nut per bolt that is #18-8 stainless steel and a hex-nut.

Grounding electrode shall be placed 3 inches in front of the service conduit area.

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

All dimensions are nominal.

The controller cabinet shall be mounted to the Model 342LX or 344LX cabinet foundation with four #18-8 stainless steel hex head, fully-threaded, ½" Ø x 1½" bolts; two washers per bolt, designed for ½" bolts and are #18-8 stainless steel, 1" outside diameter, round, and flat; and one ¼-20 UNF Lock nut per bolt that is #18-8 stainless steel and a hex-nut.

Grounding electrode shall be placed 3 inches in front of the service conduit area.

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

All dimensions are nominal.

The controller cabinet shall be mounted to the Model 342LX or 344LX cabinet foundation with four #18-8 stainless steel hex head, fully-threaded, ½" Ø x 1½" bolts; two washers per bolt, designed for ½" bolts and are #18-8 stainless steel, 1" outside diameter, round, and flat; and one ¼-20 UNF Lock nut per bolt that is #18-8 stainless steel and a hex-nut.

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 A. Type 1-C Standard. The steel pedestal shall be 2'-1" to 2'-6" in length. Anchor bolts shall be 3/8" x 1'-6" with a 2'-9" bend. Four bolts required per cabinet.

3. Telephone interconnect conductors shall be enclosed in a 1/2" 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**

<table>
<thead>
<tr>
<th>Item</th>
<th>Fastener</th>
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<tbody>
<tr>
<td>BACKBOARD</td>
<td>4 - 5/8&quot; (LENGTH) WOOD SCREWS</td>
</tr>
<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</td>
<td>4 - 5/8&quot; (LENGTH) WOOD SCREWS</td>
</tr>
</tbody>
</table>

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**ELECTRICAL SYSTEMS**

(Telephone Demarcation Cabinet, Type A)

No Scale

WIRING DIAGRAM

DETAIL E

1. Dimension are nominal.

2. Hardware for fastening of mounting boards:
   a. Four backboard A and backboard B to telephone demarcation cabinet with 3/4" x 3/4" stainless steel carriage bolts (8 required).
   b. Fasten backboard A and backboard B to backboard C with 2" x 2" wood screws (9 required).

DETAIL F

1'-6" METAL BOX

DETAIL C

TOP VIEW
1'-6" THERMOSTAT CONTROL

DETAIL A

FRONT VIEW
1'-0" OUTER DOOR REMOVED FOR CLARITY

SIDE VIEW
1'-0" 1'-4" 1'-8" 1'-12"

NOTE:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

CABINET BASE (SEE REVISED STANDARD PLAN RSP ES-3G)

BACKBOARD A (SEE REVISED STANDARD PLAN RSP ES-3G)

BACKBOARD B (SEE REVISED STANDARD PLAN RSP ES-3G)

BACKBOARD C (SEE REVISED STANDARD PLAN RSP ES-3G)

CONCRETE PAD

FOUNDATION

HOUSING WITH ELECTRIC FAN
SCREENED VENTILATOR
RAIN TIGHT

FILTERED VENTILATION LOUVERS

PLANK HINGED DOOR
DRAW LATCH, LOCKABLE WITH PADLOCK

1'-0" WIN TO 120 V SERVICE
1'-0" WIN TO TELEPHONE SERVICE
1'-0" WIN TO CONTROLLER CABINET

TYPICAL SEE PLANS

NOTES:

b. Fasten hinged metal bracket to backboard B and backboard C to hinged metal bracket with 
   (10 x 3/4" wood screws (9 required).

DETAIL B

SIDE VIEW

DETAIL D

1'-0" 1'-6" 1'-12"

NOTE:
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS

(TELEPHONE DEMARCATION CABINET, TYPE C)

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(5-9-18)

October 19, 2018

HAF

850 H Street

Department of Transportation

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RSP ES-3F DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-3F
NOTE:
1. Base mounting frame shall be constructed with 0.134" galvanized steel.
NOTES:
1. See Standard Plan H10 for other details.
2. Underground electrical work done prior to foundation installation.
**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.

**Details:**

- **Person Walking Interval**
- **Flashing Upraised Hand Interval**
- **Steady Upraised Hand Interval**
- **LED Countdown Pedestrian Signal Face Module**
TUNNEL  FULL CIRCLE  CAP OR CUT AWAY  LEFT ANGLE (Right angle is reversed of figure)

VISORS

8" AND 12" SECTIONS
BACKPLATE

DIRECTIONAL LOUVER
Directional louvers shall be oriented and secured in place with one plated brass machine screw and nut.

ISOMETRIC VIEW
SECTION A-A

ISOMETRIC VIEW
SECTION B-B

8" DIAMETER
FRONT VIEW

12" DIAMETER
FRONT VIEW

NOTE:
1. Typical signal pole placement unless dimensioned on plans.
2. For A and B dimensions, see Pole Schedule.

TYPICAL SIGNAL HEAD INSTALLATIONS

TOP MOUNTED SIGNALS (TT)
Type 1-A, 1-B, 1-C and 1-D standard as indicated on plans

SIGNALS (SV AND SP)
Normally used on standards with luminaire or signal mast arm

SIDE MOUNTED

TYPES 1-2-T SIGNAL MOUNTING

LEFT TURN LANE SIGNAL
Type 1-A, 1-B, 1-C and 1-D standard as indicated on plans

TYPICAL SIGNAL FACE INSTALLATIONS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(SIGNAL HEADS AND MOUNTINGS)

NO SCALE

REVISED STANDARD PLAN RSP ES-4C
**TOP MOUNTINGS**

**SIGNAL SLIP FITTERS**

- 3 CADMIUM PLATED STEEL SET SCREWS
- 1 TO 4 OPENINGS AS REQUIRED

**MISCELLANEOUS MOUNTING HARDWARE**

- COVER
- CABLE GUIDE
- FLAT WASHER
- LOCK RING

**TERMINAL COMPARTMENT**

**SIDE MOUNTING**

- TWO ROWS OF STANDARD PIPE THREAD
- FOR BOLTS, SEE DETAIL C
- CURVED WASHER
- ON UPPER PLATE

**POLE PLATE FOR SIDE MOUNTED SIGNAL HEAD**

**Pole Plate Detail**

For bolts, see pole plate detail.

**TYPE MAT**

MAST ARM MOUNTING

For 2 NPS pipe, see Note 1.

**SIGNAL SLIP FITTERS**

- 1½ NPS PIPE THREAD
- 1½ NIPPLE
- ½" ø LOCK WASHER
- ½" ø NUT
- FLAT WASHER
- 1½ NPS PIPE THREAD

**MISSING MOUNTING HARDWARE**

- COVER
- CABLE GUIDE
- FLAT WASHER
- LOCK RING

**TERMINAL COMPARTMENT**

**SIDE MOUNTING**

- TWO ROWS OF STANDARD PIPE THREAD
- FOR BOLTS, SEE DETAIL C
- CURVED WASHER
- ON UPPER PLATE

**POLE PLATE FOR SIDE MOUNTED SIGNAL HEAD**

**Pole Plate Detail**

For bolts, see pole plate detail.

**TYPE MAS**

MAST ARM MOUNTING

For 4 NPS pipe, see Note 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 line detection and bicycle lanes.

<table>
<thead>
<tr>
<th>Type A Loop Detector Configuration</th>
<th>Type B Loop Detector Configuration</th>
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<tr>
<td>WINDING DETAIL</td>
<td>SAW CUT DETAIL</td>
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<tr>
<td>5 TURNS</td>
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<tr>
<td>1'-0&quot;</td>
<td>2'-6&quot;</td>
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<tr>
<td>1'-0&quot;</td>
<td>2'-3&quot;</td>
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<td>3'-0&quot;</td>
<td>3'-0&quot;</td>
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<td>6'-0&quot;</td>
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**TYPE 15 AND TYPE 21 BARRIER RAIL MOUNTED**

**ELEVATION A**

<table>
<thead>
<tr>
<th>POLE TYPE</th>
<th>POLE DATA</th>
<th>BASE PLATE DATA</th>
<th>CIDH PILE FOUNDATION</th>
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<tbody>
<tr>
<td>15</td>
<td>35'-0&quot; x 8&quot;</td>
<td>0.1793&quot;</td>
<td>0.1196&quot;</td>
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<td>21</td>
<td>35'-0&quot; x 8&quot;</td>
<td>0.1196&quot;</td>
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</table>

* For BARRIER RAIL BOLTS, see STANDARD PLAN ES-6B.

**NOTES:**
1. Indicates mast arm length to be used unless otherwise noted on the plans.
2. For Type 15-50, use Type 15 standard with Type 30 slip base plate details, see Standard Plan ES-6F.
3. Handhole shall be located on the downstream side of traffic.
4. For additional notes and details, see Standard Plans ES-1N and ES-1N.

**ELEVATION B**

**LUMINAIRE MAST ARM CONNECTION**

**DETAIL A**

**BASE PLATE DATA**

**STATE OF CALIFORNIA**

**DEPARTMENT OF TRANSPORTATION**

**ELECTRICAL SYSTEMS**

(LIGHTING STANDARD, TYPES 15 AND 21)

NO SCALE

RSP ES-6A DATED OCTOBER 18, 2019 SUPERcedes STANDARD PLAN ES-6A
NOTES:
1. The Contractor shall verify all controlling field dimensions before ordering or fabricating any materials.
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

ELEVATION A

DETAIL A

SECTION K-K

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

RSP ES-6C DATED APRIL 16, 2021 SUPERSEDES RSP ES-6C DATED OCTOBER 19, 2018 AND

REVISED STANDARD PLAN RSP ES-6C
RISE BASE LENGTH

Indicates mast arm length to be used unless otherwise noted on plans.

Mast arm lengths 25' to 45'.

WIND VELOCITY = 100 MPH AND SIGNAL

NOTE: To accompany plans dated

Handhole shall be located on the downstream side of traffic.

Indicates mast arm length to be used unless otherwise noted on plans.
**IDENTIFICATION NUMBER**

1. Attach a stamped metal tag with pole’s identification number above the handhole. "1/8" high, minimum. 
2. Attach a stamped metal tag with mast arm’s identification number to the bottom of the signal mast arm near the pole plate. "1/8" high, minimum.

**NOTES:**
1. Provide a Hex nut, leveling nut and 2 washers for each bolt.
2. Luminaires mast arms shall be round, tapered steel tubes, taper of 0.1315" to 0.1380" per foot with a minimum of 29.00 for mounting hardware. Extensions of 2 NPS standard pipe and 1/2" long may be used at the option of the manufacturer, when low pressure sodium luminaires are required, the extension shall be 1" - 3".
3. Signal mast arms shall be round, tapered steel tubes, maximum taper 0.1470" per foot.
4. Handhole reinforcement ring shall be 1/2" x 2" for 0.1196" to 0.2039" thick plate, 3/8" x 2" for 0.2039" to 0.3757" thick plate.
5. Handholes shall be located on the downstream side of traffic.
6. Detail E, fatigue resistant welds, is required at socket welded signal mast arm plate and pole base plate.
7. Cap screws shall be tightened by the turn-snap method 1/2 turn from a snug tight condition. No washer will be required.
8. Outside diameter, wall thickness, and corresponding section properties of poles and mast arms as shown in the Standard Plans are minimum. Unless otherwise specified, alternative sections shall require approval by the Engineer.
10. Materials (Structural steel) 
   - fy = 55,000 psi (tapered steel tube and anchor bolts) 
   - fy = 60,000 psi (unless otherwise noted)
11. Materials (Reinforced concrete) 
   - f_c = 3,685 psi 
   - fy = 6,000 psi

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

**ELECTRICAL SYSTEMS**
(SIGNAL AND LIGHTING STANDARD, DETAIL No. 1)

**NO SCALE**

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>LO</th>
<th>LJ</th>
<th>WO</th>
<th>Wf</th>
<th>L</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 3½(T)</td>
<td>1½&quot;</td>
<td>1&quot;-0&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1&quot;-0&quot;</td>
<td>1'-10&quot; - 1'-11&quot;</td>
<td>1'-21&quot; - 1'-22&quot;</td>
<td>1'-31&quot; - 1'-32&quot;</td>
<td>1'-41&quot; - 1'-42&quot;</td>
<td>1'-51&quot; - 1'-52&quot;</td>
<td>1'-61&quot; - 1'-62&quot;</td>
<td></td>
</tr>
<tr>
<td>No. 5(T)</td>
<td>1½&quot;</td>
<td>1&quot;-0&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1&quot;-0&quot;</td>
<td>2'-0&quot; - 2'-0½&quot;</td>
<td>2'-10&quot; - 2'-11&quot;</td>
<td>2'-20&quot; - 2'-21&quot;</td>
<td>2'-30&quot; - 2'-31&quot;</td>
<td>2'-40&quot; - 2'-41&quot;</td>
<td>2'-50&quot; - 2'-51&quot;</td>
<td></td>
</tr>
<tr>
<td>No. 6(T)</td>
<td>2&quot;</td>
<td>1&quot;-0&quot;</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>1&quot;-0&quot;</td>
<td>2'-11&quot; - 2'-12&quot;</td>
<td>2'-21&quot; - 2'-22&quot;</td>
<td>2'-31&quot; - 2'-32&quot;</td>
<td>2'-41&quot; - 2'-42&quot;</td>
<td>2'-51&quot; - 2'-52&quot;</td>
<td>2'-61&quot; - 2'-62&quot;</td>
<td></td>
</tr>
</tbody>
</table>
"CALTRANS FIBER OPTICS" MUST BE MADE ON THE COVER IN 3-INCH TALL LETTERS.

VAULT-ISOMETRIC VIEW

SECTION A-A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (VAULTS)

NO SCALE

FLUSH-MOUNTED SOFFIT LUMINAIRE INSTALLATION

SECTION A-A

PENDANT SOFFIT LUMINAIRE INSTALLATION

WALL-MOUNTED LUMINAIRE INSTALLATION

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE
1. Use No. 8 Ø machine screws, lockwashers and nuts for mounting ballast and terminal strips.

NOTE:

OF LAMP TERMINAL BLOCK WITH QUICK DISCONNECT STARTING AID

OF LAMP TERMINAL BLOCK WITH QUICK DISCONNECT STARTING AID

EXISTING REFRACTOR LENS

EXISTING REFLECTOR BASE PORCELAIN SOCKET 2†" HEIGHT MOGUL SCREW BUSHING MOUNTING BRACKET, SEE DETAIL ON THIS SHEET

5" WIDE x 10" LONG x 1/2" THICK
STAINLESS STEEL STRAP RESISTOR AND WIRING CAPACITOR WITH GROUNDING STAINLESS STEEL STRAP RESISTOR AND WIRING CAPACITOR


REVIEWED STANDARD PLAN RSP ES-9F

FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY

SECTION A-A

FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY

FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY

FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY

FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY

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FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY

FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY

FLUSH-MOUNTED SOFFIT LUMINAIRE ASSEMBLY
ENGLISH SYSTEMS

ISOFOOTCANDLE CURVES

NOTE:
Curves represent the minimum maintained illuminance (FC).

WALL-MOUNTED
15' Mounting Height
ANSI Designation 562
Lamp operated at 5,800 lm
70 W (Max)

1.0 FC
0.5 FC
0.2 FC
0.1 FC

PENDANT SOFFIT
TYPE III SHORT
17' Mounting Height
ANSI Designation 562
Lamp operated at 5,800 lm
70 W (Max)

OVERHEAD SIGN LUMINAIRE
60' (Max)

40' 

20' 

10' 

20' 

40' 

60' 

10' 

20' 

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60' 

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20' 

40' 

60'
KINKING DETAIL FOR SLIP BASE STANDARDS

DETAIL A

STEP 1

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

SIDE VIEW

FRONT VIEW

90°

STEP 2

MAKE TIGHT KINKS IN EACH CONDUCTOR AT OR SOMEWHERE BELOW SHEAR PLANE

SLACK IN CONDUCTORS REMOVED

BONDING STRAP

WRAPPED AND SECURED CONDUCTORS 4 TIMES AROUND PROJECTING END OF CONDUCTOR THEN CONTINUE TO FIXED SPLICE CONNECTOR

END OF BONDING STRAP

BONDING BUSHING REQUIRED

TYPICAL BANDING DETAILS

DETAIL B

END OF DETECTOR LEAD-IN CABLE

PHASE

(1 TO 6)

INPUT FILE

(1 TO J)

SLOT NUMBER IN INPUT FILE

(1 TO 9)

LOCATION IN SLOT

(U = UPPER, L = LOWER)

END OF PEDESTRIAN SIGNAL CONDUCTOR

CIRCUIT

PHASE

END OF PEDESTRIAN PUSH BUTTON CIRCUIT

BAND

END OF SIGN LIGHTING CONDUCTOR

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(KINKING AND BANDING DETAIL)
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.

5. See Wiring Notes and Symbols on Revised Standard Plan RSP ES-14B, Detail A.

ELECTRICAL SYSTEMS
(EXTINGUISHABLE MESSAGE SIGN 10" LETTERS)

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PREPARE
TO STOP

TYPICAL FRONT VIEW OF SIGN UNIT

INTAKE VENTS

CROSS-SECTION OF SIGN

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(EXTINGUISHABLE MESSAGE SIGN 10" LETTERS)

NO SCALE

REVISED STANDARD PLAN RSP ES-14A


REVISED STANDARD PLAN RSP ES-14A

DATED OCTOBER 19, 2018 - SUPERSEDES STANDARD PLAN ES-14A

2018 REVISED STANDARD PLAN RSP ES-14A

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THE ACCURACY OR COMPLETENESS OF SCANNED

Zolfaghari
Hamid
E15636
12-31-19

ELECTRICAL
REGISTERED ELECTRICAL ENGINEER

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TO ACCOMPANY PLANS DATED

October 19, 2018
THE FLASHER SHALL MATE WITH A CINCH-JONES SOCKET S-406-SB OR EQUAL AND CONNECTED AS FOLLOWS:

- **Pin 1**: Circuit 10, Normal
- **Pin 8**: Circuit 10, Load
- **Pin 9**: Circuit 10, Line
- **Pin 10**: Circuit 10, Line Ground

WIRING DIAGRAM

**DETAIL A**

**CONNECTOR SOCKET**

**SOLID STATE FLASHER UNIT**

WIRING DIAGRAM

**FLASHER UNIT**

**SOLID STATE**

**SIGN ON DIM**

**CONTROL TEST**

**SIGN UNIT**

**120 V**

**BEACON 1**

**BEACON 2**

WIRING DIAGRAM

**EXTINGUISHABLE MESSAGE SIGN**

**DETAIL A**

WIRING DIAGRAM

**FLASHING BEACON CONTROL ASSEMBLY**

**DETAIL B**

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS
(EMS AND FBCA WIRING DIAGRAMS)

NO SCALE


REVISED STANDARD PLAN RSP ES-14B

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OVERHEAD SIGN LUMINAIRE MOUNTING DETAIL (TYPICAL)

TO LUMINAIRE SEE CONDUIT ENTRANCE DETAIL

TYPE 1, ¾" MIN

¾" TYPE "T" CONDUIT FITTING WITH GASKETED COVER PLATE
(¾" x ¾" x ¾"

CONDUIT CLAMPED TO SIGN STRUCTURE "I" BOLTS WITH ¼" x 3/8" BOLTS

TOP VIEW

CAP THE CONDUIT AT THE FIRST AND LAST SIGN SUPPORTING ARM

SIGN STRUCTURE SIGN SUPPORTING ARM

SIDE VIEW

OVERHEAD SIGN LUMINAIRE MOUNTING DETAIL (TYPICAL)

SECURE CONDUIT TO WALKWAY GRATING WITH CONDUIT CLAMPS

CONDUIT FITTING TO WALKWAY GRATING

WALKWAY GRATING

WALKWAY GRATING CONDUIT FITTING

CONDUIT ENTRANCE DETAIL

¾" TYPE 4 CONDUIT

¾" LOCK WASHER (TOTAL 4)

¾" WASHER (TOTAL 4)

MOUNTING PLATE

MOUNTING (CHANNEL) SHALL EXTEND 1" BEYOND THE FIRST SUPPORT PAST THE LAST LUMINAIRE

SEE CONDUIT TO LUMINAIRE, SEE CONDUIT ENTRANCE DETAIL

CONDUIT CONNECTOR

LOCKNUT

CONDUIT CONNECTOR

SIDE VIEW

S115

S16

SEE NOTES

NOTES:

1. The first number listed is the dimension from the edge of the sign luminaire to the panel centerline of the end-most sign luminaire. The second number listed is the dimension between centers of successive sign luminaires.

2. Where adjacent sign panels are spaced 1'-0" or less, adjacent sign panels may be considered a single panel.

3. Physical configuration and mounting details may vary from what is shown.
TYPICAL SIGN ILLUMINATION EQUIPMENT
INSTALLATION FOR OVERHEAD SIGNS TUBULAR

DETAIL A

TYPICAL SIGN ILLUMINATION EQUIPMENT
INSTALLATION FOR OVERHEAD SIGNS ROUND POST

DETAIL B

TYPICAL SIGN ILLUMINATION EQUIPMENT
INSTALLATION FOR OVERHEAD SIGNS BRIDGE MOUNTED

DETAIL C

NOTES:
1. Type 4 conduit shall be secured to the nearest walkway
   using one-hole galvanized malleable iron or steel
   straps and brass machine screws tapped into the bracket.
2. See Overhead Signs Standard Plans for overhead signs and
   frame juncture details for photoelectric unit installation.
3. Enclosures and straps shall be secured by ¾" maximum
   size screws.
4. The contactor and test switch enclosures shall be readily
   accessible from the sign walkway.
NOTE:
1. Type SC1A, SC2A, SC3A controls are similar to Types SC1, SC2 and SC controls respectively except test switch and wiring are not required.

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

**TYPE LC2 CONTROL**
For 120 V unswitched circuit.

**TYPE LC3 CONTROL**
For 240 V unswitched circuits.

**TYPE LC4 CONTROL**
For 480 V unswitched circuits.

**ELECTRICAL SYSTEMS**
(LIGHTING AND SIGN ILLUMINATION CONTROL)

NO SCALE

RSP ES-15D DATED OCTOBER 19, 2018 SUPERSEDES STANDARD PLAN ES-15D

REVISED STANDARD PLAN RSP ES-15D
1. Verify controlling field dimensions before ordering or fabricating any material.

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

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

4. Materials (Structural Steel):
   - a. fy = 60,000 psi (tapered steel tube and anchor bolts)  
   - b. fy = 55,000 psi (tapered steel tube and anchor bolts)  
   - c. fy = 50,000 psi (unless otherwise noted)

5. Materials (Reinforced Concrete):
   - a. f'c = 3,625 psi
   - b. fy = 60,000 psi

6. NO SCALE

7. HDMI = X- X- X-

8. TOP PLATE

9. BOX ENCLOSURE

10. SAFETY CHAIN BRACKET

11. J HOOK FOR CABLE SUPPORT

12. 2" # NOM.

13. BASE PLATE TO MATCH

14. BASE PLATE

15. J HOOK

16. DETAIL E

17. DETAIL F

18. DETAIL C

19. DETAIL B

20. DETAIL A

21. BASE PLATE DATA

22. POLE DATA

23. POLE TYPE

24. HEIGHT (FT)

25. THICKNESS (IN)

26. BASE PLATE DATA

27. MIN OD (IN)

28. BASE PLATE (IN)

29. THICKNESS (IN)

30. ANCHOR BOLT SIZE

31. BC = BOLT CIRCLE

32. DEG ""

33. POLE TYPE

34. CAMERA POLE 25'

35. 25' 1/4''

36. 25' 1/4''

37. THICKNESS 0.1793""
Pole details shall suit the lowering device and this foundation plan. Pole details shall be submitted to the Engineer for approval.

**Pole Details:**

- **Pole Type:**
  - High Mast Camera Pole 50' to 90'

- **Base Plate Data:***
  - Type: Steel Tube
  - Diameter: 3" ± 3/16" x 5" x 5" (Min 25' Long)
  - Min. O.D.: 1'-0"
  - Max. O.D.: 1'-6"
  - Min. Thickness: 0.25" (Min. 12"
  - Max. Thickness: 0.375"
  - Min. Height: 2'-6"
  - Max. Height: 6'-0"
  - Min. Anchor Bolt Circle: 2"
  - Max. Anchor Bolt Circle: 3'-6"
  - Min. Anchor Bolt: 3/4"
  - Max. Anchor Bolt: 3/4"
  - Min. Height: 13'-0"
  - Max. Height: 15'-0"

- **Covered Head:**
  - For top view, see detail D.

- **Top of Pole:**
  - Pole segment splice, see detail A.

- **Median Location:**
  - Pole segment splice, see detail A.

- **Typical Location:**
  - Pole segment splice, see detail A.

- **Foundation Design:**
  - 3-second wind gust of 100 mph.

- **Materials (Structural Steel):**
  - (Min 25' Long)

- **Concrete Barrier:**
  - Pedestal, see detail B.

- **Access Opening:**
  - Reinforced, Max. 4'-6" x 5'" (Min. 2'-0"

- **Elevation A:**
  - Pole, median location, elevation A.

- **Elevation B:**
  - Pole, typical location, elevation B.

- **Elevation C:**
  - Pole, median location, elevation C.

**Notes:**

1. Pole details shall suit the lowering device and this foundation plan. Pole details shall be submitted to the Engineer for approval.
2. Access opening shall be located on the downstream side of traffic unless otherwise determined by the Engineer.
3. Foundation design is based on a 3-second wind gust of 100 mph.
4. For central void and drain holes in mortar, see Standard Plan ES-6B detail N.
5. For wind loading see Revised Standard Plan RSP ES-7M.
6. Materials (Structural Steel):
   - fy = 55,000 psi (tapered steel tube)
   - fy = 50,000 psi (unless otherwise noted)
1. Camera or vehicle detection system
2. Overhead bundle consisting of a 36" messenger wire, overhead conductors, and lashing wire
3. Luminaire with mast arm
4. Pedestrian push button or accessible push button
5. Signal face with 3 indications or single sheet sign panel (10 SQFT Max)
6. Riser with weather head as required
7. Pull box as required
8. Grounding as required
9. Single flashing beacon or single sheet sign panel (4 SQFT Max)
10. Flashing beacon control assembly
11. Enclosure, 26"(W) x 56"(H) x 12"(D) Max dimensions. Max weight including batteries, 450 lbs
12. 25 SQFT Max 404 photovoltaic panels mounted as shown as required
13. 2-12" flashing beacons

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

POLE SELECTION TABLE

<table>
<thead>
<tr>
<th>POLE CLASS</th>
<th>MAXIMUM Dp</th>
<th>MINIMUM POLE CLASS</th>
<th>POLE EMBEDMENT (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1N</td>
<td>1'</td>
<td>H-1</td>
<td>150' Min</td>
</tr>
<tr>
<td>Case 2N</td>
<td>1.5'</td>
<td>H-2</td>
<td>180' Max</td>
</tr>
<tr>
<td>Case 3N</td>
<td>2.0'</td>
<td>H-3</td>
<td>180' Max</td>
</tr>
<tr>
<td>Case 4N</td>
<td>2.5'</td>
<td>H-4</td>
<td>240' Max</td>
</tr>
<tr>
<td>Case 5N</td>
<td>3.0'</td>
<td>H-5</td>
<td>300' Max</td>
</tr>
</tbody>
</table>

POLE AT DEAD END

POLE AT TANGENT

POLE AT JUNCTION

REVISED STANDARD PLAN RSP ES-18B
POLE SELECTION TABLE

<table>
<thead>
<tr>
<th>POLE CLASS</th>
<th>MAXIMUM END (E)</th>
<th>MINIMUM POLE CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-1</td>
<td>150'</td>
<td>H-1</td>
</tr>
<tr>
<td>H-2</td>
<td>200'</td>
<td>H-2</td>
</tr>
<tr>
<td>H-3</td>
<td>250'</td>
<td>H-3</td>
</tr>
<tr>
<td>H-4</td>
<td>300'</td>
<td>H-4</td>
</tr>
</tbody>
</table>

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

CASE 1G
POLE AT DEAD END
WITH ATTACHMENTS

CASE 2G
POLE AT DEAD END
WITH ATTACHMENTS

CASE 3G
POLE AT CORNER
WITH ATTACHMENTS

CASE 4G
POLE AT JUNCTION
WITH ATTACHMENTS

TEMPORARY WOOD POLES
GUYED - NO SIGNALS ON SPANS
NO SCALE
POLE SELECTION TABLE

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

LOCATION OF SIGNAL FACES

LEGEND

POLE SELECTION TABLE

POLE AT JUNCTION WITH ATTACHMENTS

GUYED - WITH SIGNAL FACES ON SPANS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TEMPORARY WOOD POLES
WITH ATTACHMENTS

REvised STANDARD PLAN RSP ES-18D
**Typical Lashing Detail**

1. Use guy wires with 3 clamps.
2. Use ¾” Ø except ½” Ø at guyed wires.
3. Install additional angle thimble eyetlet or thimble with guy wire to pole with 2 guy wires.

**Notes:**

- **POLE AT DEAD END WITH GUY-WIRE CONNECTION**
  - Use if d is 1½” or less.
  - Temporary wood poles.

- **POLE AT TANGENT OR CORNER CONNECTION**
  - See note 2.

- **POLE AT JUNCTION CONNECTION**
  - See note 2.

- **POLE AT DEAD END CONNECTION**
  - See note 2.

**Termination of Wires Using Automatic Dead End**

- **Guy-Wire Tether, or Messenger Wire**
  - Use if required.

- **Angle Thimble Eye**
  - Thimble eye nut with jam nut, typ (see note 2).

- **Termination, typ**
  - See note 2.

- **Guy-Wire Tether, or Messenger Wire**
  - Use if required.

- **Angle Thimble Eye**
  - Thimble eye nut with jam nut, typ (see note 2).

- **Termination, typ**
  - See note 2.

- **Temporary Wood Poles Details No. 1**

- **No Scale**

- **Alternate Termination of Messenger Wires Using Guy Clamps**
  - See note 3.

- **Pole at Dead End Connection**
  - Use if d is 1½” or less.

- **Pole at Tangent or Corner Connection**
  - Use if d is 1½” or less.

- **Pole at Dead End with Guy-Wire Connection**
  - Use if d is 1½” or less.

- **Pole at Junction Connection**
  - Use if d is 1½” or less.
NOTES:
1. Verify pole dimensions at terminal compartment for fabrication of backing plate and curved washer.
2. Backing plate to be galvanized after fabrication.
3. \( \frac{3}{8}" \times 0.044" \) 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 the mounting, close any unused cable entry locations with raintight caps.
PERSPECTIVE
VINE STAKING

TREE STAKING

SECTION
ROOT PROTECTOR

NOTE:
1. FOR WOOD SUPPORT STAKES:
   FASTEN 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.
**RISER TYPE I**
- Supply Line
- Level Ground
- Tree
- Riser Type I

**RISER TYPE II**
- Supply Line
- Level Ground
- Tree
- Riser Type II

**RISER TYPE III**
- Supply Line
- Level Ground
- Tree
- Riser Type III

**RISER TYPE IV**
- Supply Line
- Level Ground
- Tree
- Riser Type IV

**RISER TYPE V**
- Supply Line
- Level Ground
- Tree
- Riser Type V

**TREE WELL ASSEMBLY AND RISER TYPE V DIAGRAM**
- Tree, shrub or vine (as shown on plans)
- 4" dia. perforated drain pipe, filled with gravel, holes facing root ball
- Removable drain grate
- Plant basin
- 4" min. clearance to 2" dia.

**LANDSCAPE DETAILS**
- (Sprinkler Assembly)
- No Scale
NOTES:
1. Wye strainer and fittings must be the same size as the backflow preventer shown on the plans.
2. Wye strainer must be located and fitted in accordance with local water ordinance.
3. Backflow preventer assembly manifold pipe must be the same pipe as the supply line (main) pipe to be installed from the water meter to the backflow preventer assembly.
4. All metal in contact with soil and Portland Cement Concrete must be wrapped with 2" wide plastic backed adhesive polyethylene tape 20 mil thick with ½" overlap.
5. The connector must be located 6 to 9 inches away from the edge of PCC pad.

LANDSCAPE DETAILS

ELEVATION
BACKFLOW PREVENTER ASSEMBLY
IN ONE PIECE ENCLOSURE

ELEVATION
BACKFLOW PREVENTER ASSEMBLY
IN TWO PIECE ENCLOSURE

COIL 3'-0" OF WIRE IN BOX

SECTION
FLOW SENSOR

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

2018 REVISED STANDARD PLAN RSP H7

TOTAL PROJECT
COUNTY
ROUTE
POST MILES

TOTAL SHEET
No.

NOTES:

1. Wye strainer and fittings must be the same size as the backflow preventer shown on the plans.
2. Wye strainer must be located and fitted in accordance with local water ordinance.
3. Backflow preventer assembly manifold pipe must be the same pipe as the supply line (main) pipe to be installed from the water meter to the backflow preventer assembly.
4. All metal in contact with soil and Portland Cement Concrete must be wrapped with 2" wide plastic backed adhesive polyethylene tape 20 mil thick with ½" overlap.
5. The connector must be located 6 to 9 inches away from the edge of PCC pad.

LANDSCAPE DETAILS

ELEVATION
BACKFLOW PREVENTER ASSEMBLY
IN ONE PIECE ENCLOSURE

ELEVATION
BACKFLOW PREVENTER ASSEMBLY
IN TWO PIECE ENCLOSURE

COIL 3'-0" OF WIRE IN BOX

SECTION
FLOW SENSOR

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

2018 REVISED STANDARD PLAN RSP H7

TOTAL PROJECT
COUNTY
ROUTE
POST MILES

TOTAL SHEET
No.

NOTES:

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LANDSCAPE DETAILS

ELEVATION
BACKFLOW PREVENTER ASSEMBLY
IN ONE PIECE ENCLOSURE

ELEVATION
BACKFLOW PREVENTER ASSEMBLY
IN TWO PIECE ENCLOSURE

COIL 3'-0" OF WIRE IN BOX

SECTION
FLOW SENSOR

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

2018 REVISED STANDARD PLAN RSP H7

TOTAL PROJECT
COUNTY
ROUTE
POST MILES

TOTAL SHEET
No.

NOTES:

1. Wye strainer and fittings must be the same size as the backflow preventer shown on the plans.
2. Wye strainer must be located and fitted in accordance with local water ordinance.
3. Backflow preventer assembly manifold pipe must be the same pipe as the supply line (main) pipe to be installed from the water meter to the backflow preventer assembly.
4. All metal in contact with soil and Portland Cement Concrete must be wrapped with 2" wide plastic backed adhesive polyethylene tape 20 mil thick with ½" overlap.
5. The connector must be located 6 to 9 inches away from the edge of PCC pad.

LANDSCAPE DETAILS

ELEVATION
BACKFLOW PREVENTER ASSEMBLY
IN ONE PIECE ENCLOSURE

ELEVATION
BACKFLOW PREVENTER ASSEMBLY
IN TWO PIECE ENCLOSURE

COIL 3'-0" OF WIRE IN BOX

SECTION
FLOW SENSOR

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

2018 REVISED STANDARD PLAN RSP H7
NOTES:
1. 40" - 50"
2. 12" downstream of RCV
3. 18" upstream of RCV

* NEW: USED WITH RECYCLED WATER
REPLACE GSP FITTINGS WITH PVC AND COUPLING.

SUPPLY LINE
PVC FEMALE ADAPTER (T x T)
GSP CLOSE NIPPLE

ELEVATION
QUICK COUPLING VALVE

GSP NIPPLE
GSP NIPPLE
GSP NIPPLE

CAM COUPLER ASSEMBLY

SUPPLY LINE
PVC FEMALE ADAPTER (T x T)
GSP CLOSE NIPPLE

ELEVATION
QUICK COUPLING VALVE

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RSP H8 DATED APRIL 19, 2019 SUPERSEDES STANDARD PLAN H8 DATED 2018.
NOTES:
1. 15" downstream of RCV
2. Width sufficient to allow spacing of pipe and CNC bundles without stacking.
3. 3 ft minimum to back of sidewalk.
4. 3' Min or 3/4 of largest pipe in trench.

SECTION
IRRIGATION TRENCH DETAIL

STATE OF CALIFORNIA
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LANDSCAPE DETAILS

REVISED STANDARD PLAN RSP H9

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**STAKE NOTCH DETAIL**

1. Installations shown in the perspective are for slope inclination of 10:1 (Horiz:Vert) and steeper.

**NOTE:**
- 1. May install stake adjacent to bottom edge of compost sock.

**SECTION**

- **FIBER ROLL (TYPE 1)**
- **FIBER ROLL (TYPE 2)**
- **COMPOST SOCK**

**PLAN**

- 1'-0" Min
- 1'-6" Min
- 2'-0" Min
- 6" Min

**ELEVATION**

- STAKE TYPE
- ROPE
- SLOPE
- NOTCH TYPE
- SLOPE

**PERSPECTIVE**

- **FIBER ROLL (TYPE 1)**
- **COMPOST SOCK**
- **FIBER ROLL (TYPE 2)**

**EROSION CONTROL DETAILS**

FIBER ROLL AND COMPOST SOCK

NO SCALE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION


REVISED STANDARD PLAN RSP H51
**TABLE No. 1  LONGITUDINAL BAR REINFORCEMENT**

<table>
<thead>
<tr>
<th>D</th>
<th>BAR SIZE</th>
<th>SPACING A</th>
<th>SPACING B</th>
<th>SPACING 2 x B</th>
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<tbody>
<tr>
<td>2.5'</td>
<td>#6</td>
<td>3&quot; 10' 4&quot;</td>
<td>3&quot; 10' 4&quot;</td>
<td>6&quot; 20' 8&quot;</td>
<td>2'</td>
</tr>
<tr>
<td>2.5'</td>
<td>#6</td>
<td>3&quot; 10' 4&quot;</td>
<td>3&quot; 10' 4&quot;</td>
<td>6&quot; 20' 8&quot;</td>
<td>2'</td>
</tr>
<tr>
<td>2.5'</td>
<td>#6</td>
<td>3&quot; 10' 4&quot;</td>
<td>3&quot; 10' 4&quot;</td>
<td>6&quot; 20' 8&quot;</td>
<td>2'</td>
</tr>
<tr>
<td>2.5'</td>
<td>#6</td>
<td>3&quot; 10' 4&quot;</td>
<td>3&quot; 10' 4&quot;</td>
<td>6&quot; 20' 8&quot;</td>
<td>2'</td>
</tr>
<tr>
<td>2.5'</td>
<td>#6</td>
<td>3&quot; 10' 4&quot;</td>
<td>3&quot; 10' 4&quot;</td>
<td>6&quot; 20' 8&quot;</td>
<td>2'</td>
</tr>
<tr>
<td>2.5'</td>
<td>#6</td>
<td>3&quot; 10' 4&quot;</td>
<td>3&quot; 10' 4&quot;</td>
<td>6&quot; 20' 8&quot;</td>
<td>2'</td>
</tr>
<tr>
<td>2.5'</td>
<td>#6</td>
<td>3&quot; 10' 4&quot;</td>
<td>3&quot; 10' 4&quot;</td>
<td>6&quot; 20' 8&quot;</td>
<td>2'</td>
</tr>
<tr>
<td>2.5'</td>
<td>#6</td>
<td>3&quot; 10' 4&quot;</td>
<td>3&quot; 10' 4&quot;</td>
<td>6&quot; 20' 8&quot;</td>
<td>2'</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 P14.
3. For curved lane layout see Standard Plan P16.
4. For tie bar and intermediate transverse bar details, see Standard Plan P16.

**ABBREVIATION**

D = Thickness of CRCP

**STATE OF CALIFORNIA**
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**CONTINUOUSLY REINFORCED**
**CONCRETE PAVEMENT**

**REVISED STANDARD PLAN RSP P4**

NOTES:
1. For longitudinal bar size, spacing and clearances, see Revised Standard Plan RSP P4.
2. For the bar and intermediate transverse bar details, see Standard Plan P16.
3. Place Intermediate transverse bars parallel to and in the same plane as transverse bars.
4. Construct transverse joints at right angle to the longitudinal joints. In adjacent CRCP, leave joints at no less than 10' intervals and no more than 14' intervals. Meter location of JPCP transverse joint with CRCP transverse construction joint or expansion joint. Omit dowel bars.
5. For longitudinal construction joint details, see Standard Plan P16.
6. For additional longitudinal bars details, see Detail A on Revised Standard Plan RSP P4.
7. For longitudinal construction joint plan layout not shown, see Revised Standard Plan RSP P4.
8. For ties of rumble strips, see Project Plans.

ABBREVIATION:
D = Thickness of CRCP

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2018 REVISED STANDARD PLAN RSP P5A
RSP P5A DATED OCTOBER 18, 2019 SUPERSEDES STANDARD PLAN P5A

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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
TIE BAR LAYOUT IN CURVED LANES

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

5. Use either drill and bond or splice couplers.

DETAILS

TIE BAR LAYOUT IN CURVED LANES

LONGITUDINAL CONTRACTION JOINT

LONGITUDINAL CONSTRUCTION JOINT

ALTERNATIVE SPlice COUPLER

CONTRACTION JOINT DETAIL

STATE OF CALIFORNIA
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CONCRETE PAVEMENT-TIE BAR
DETAILS

REvised STANDARD PLAN RSP P15

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NOTES:
1. D = Thickness of CRCP (See Project Plans).
2. See Standard Plan B6-21 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.

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REVISED STANDARD PLAN RSP P32

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT - EXPANSION TERMINAL JOINT SYSTEM
NO SCALE

SINGLE POST INSTALLATION

<table>
<thead>
<tr>
<th>POST SIZE</th>
<th>Max. Area (Square Feet) of Sign</th>
<th>SLEEVE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; x 2&quot; x 12 Ga</td>
<td></td>
<td>7/8&quot; x 7/8&quot;</td>
</tr>
<tr>
<td>2½&quot; x 2½&quot; x 10 Ga</td>
<td></td>
<td>1½&quot; x 1½&quot;</td>
</tr>
<tr>
<td>3&quot; x 3&quot; x 10 Ga</td>
<td></td>
<td>2½&quot; x 2½&quot;</td>
</tr>
</tbody>
</table>

Notes:
1. The sign post shall have 7/8" diameter perforations 1" on center on all four sides for the full length.
2. Use two drive rivets to fasten assembled sign and sign post into anchor sleeve. Install drive rivets or fastener alternative into the sides facing traffic.
3. All steel sign posts and anchor sleeves shall be galvanized.
4. All anchor sleeves shall be embedded in PCC.
5. Sign post height to center of sign:
   - 5'-0" for 2½" x 2½" x 10 Ga
   - 4'-0" for 2" x 2" x 10 Ga
   - 4'-6" for 2½" x 2½" x 10 Ga
6. Steel post: fy = 60 ksi

ANCHOR SLEEVE IN
PAVED SURFACE

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

SINGLE POST INSTALLATION

BACK BRACE DETAIL

BACK BRACE MOUNTING DETAIL

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ROADSIDE SIGN
PSST POST
TYPICAL INSTALLATION
DETAILS NO. 2

NO SCALE

REVISED STANDARD PLAN RSP RS6

April 16, 2021

2018 REVISED STANDARD PLAN RSP RS6

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Details No. 2
TYPICAL INSTALLATION

April 16, 2021

2018 REVISED STANDARD PLAN RSP RS6

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INSTRUCTIONS TO FABRICATOR

PROJECT PLANS SHOWN:
1. Sign structure location.
2. Length of structure frame.
3. Foundation elevation or location of pile foundation.
4. Walkway length for two post signs.
5. Foot type and height to bottom of frame.
7. Footing elevation or location of pile foundation.
8. Photocell unit location if required.

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

Sheet No. SHEET NAME
S1  Overhead Signs-Truss, Instructions and Examples
S2  Overhead Signs-Truss, Single Post Type, Post Types A to D
S3  Overhead Signs-Truss, Single Post Type, Post Types E to S
S4  Overhead Signs-Truss, Single Post Type, Structural Frame Members Details No. 1
S5  Overhead Signs-Truss, Single Post Type, Structural Frame Members Details No. 2
S6  Overhead Signs-Truss, Gusset Plate Details
S7  Overhead Signs-Truss, Single Post Type, Round Pedestal Pile Foundation
S8  Overhead Signs-Truss, Two Post Type, Round Pedestal Pile Foundation
S9  Overhead Signs-Truss, Two Post Type, Base Plate and Anchorage Details
S10 Overhead Signs-Truss, Two Post Type, Structural Frame Members
S11 Overhead Signs-Truss, Structural Frame Details
S12 Overhead Signs-Truss, Frame Juncture Details
S13 Overhead Signs-Truss, Frame Details
S14 Overhead Signs-Truss, Safety Railing Details
S15 Overhead Signs-Truss, Sign Mounting Details, Laminated Panel-Type A
S16 Overhead Signs, Walkway Details No. 1
S17 Overhead Signs, Walkway Details No. 2
S18 Overhead Signs, Walkway Details No. 3
S19 Overhead Signs, Walkway Details No. 4
S20 Overhead Signs, Structural Frame Members Details No. 1
S21 Overhead Signs, Structural Frame Members Details No. 2
S22 Overhead Signs-Truss, Removable Sign Panel Frames, 9'-2" and 10'-0" Sign Panels

WALKWAY BRACKETS:
Space all walkway brackets maintaining uniform spacing where possible. Maximum spacing shall not exceed 5'-6".

OVERHEAD SIGN LUMINAIRE MOUNTING CHANNELS:
Where distance from walkway bracket to end of a sign panel exceeds 1'-4", extend walkway sign luminaires mounting channels to next walkway bracket. See Example No. 2.

WALKWAY AND SAFETY RAILING:
Walkway to be continuous for entire length of frame for single post signs. For two post signs, walkway to be continuous for no more than 11'-0" in one unit.

LOADING:

Table 1 for

MOUNTING CHANNELS

Plan 1 - UNBALANCED SINGLE POST TYPE

Example No. 1

6'-0" Min IF USED
5'-0" Max SEE NOTE 2
40'-0" Min TO 14'-0" Max

Example No. 2

CANTILEVER SINGLE POST TYPE

PART DOUBLE-FACED

Example No. 3

OVERHEAD SIGNS-TRUSS
INSTRUCTIONS AND EXAMPLES

NO SCALE

OVERHEAD SIGN LUMINAIRE MOUNTING CHANNELS

NOTE:
1. Signs are shown and dimensioned looking in the direction of traffic. Double faced signs are shown and dimensioned looking chord along street.
2. Mandatory dimension line.
OVERHEAD SIGN LUMINARIE MOUNTING CHANNEL DETAILS 1

OVERHEAD SIGN LUMINARIE MOUNTING CHANNEL DETAILS 2

OVERHEAD SIGN LUMINARIE MOUNTING CHANNEL DETAILS 3

END SAFETY CABLE DETAIL

SECTION A-A

WALKWAY GRATING DETAILS

INTERIOR SAFETY LUG DETAIL

WALKWAY GRATING DETAILS

OVERHEAD WALKWAY BRACKET"
### INSTRUCTIONS TO FABRICATOR

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

**NOTE:**
- All welds are continuous unless otherwise noted on the plans.
- Safety railing to run the entire length of walkway.
- Thread locking nuts or locking washers shall be used for all connections.
- All high strength (HS) bolts are to be snug tightened unless otherwise noted on the plans.
- All welds are continuous unless otherwise noted on the plans.

**COMMON ELEMENTS SHEETS:**
- **RSP S100** Overhead Signs-Versatile Truss, One and Two Post Type
- **RSP S101** Overhead Signs-Versatile Truss, One Post Type, Truss Layout
- **RSP S102** Overhead Signs-Versatile Truss, One Post Type, Steel Post Type and Truss Member Table
- **RSP S103** Overhead Signs-Versatile Truss, One Post Type, Steel Post Base Plate and Anchorage Details
- **RSP S104** Overhead Signs-Versatile Truss, One Post Type, CDM Pile Foundation Details
- **RSP S105** Overhead Signs-Versatile Truss, One Post Type, Concrete Pile Foundation with CDM Pile Foundation Details
- **RSP S106** Overhead Signs-Versatile Truss, Two Post Type, Truss Layout
- **RSP S107** Overhead Signs-Versatile Truss, Two Post Type, Steel Post Type and Truss Member Table
- **RSP S108** Overhead Signs-Versatile Truss, Two Post Type, Steel Post Base Plate and Anchorage Details
- **RSP S109** Overhead Signs-Versatile Truss, Two Post Type, CDM Pile Foundation Details
- **RSP S110** Overhead Signs-Versatile Truss, Two Post Type, Concrete Pile Foundation Details
- **RSP S111** Overhead Signs-Versatile Truss, Truss Connection Details
- **RSP S112** Overhead Signs-Versatile Truss, Chord Splice Details
- **RSP S113** Overhead Signs-Versatile Truss, Truss To Steel Post Connection Details
- **RSP S114** Overhead Signs-Versatile Truss, CDM Pile Foundation with Inspection Pipes
- **RSP S115** Overhead Signs-Versatile Truss, Walkway Details No. 1
- **RSP S116** Overhead Signs-Versatile Truss, Walkway Details No. 2
- **RSP S117** Overhead Signs-Versatile Truss, Walkway Safety Railing Details
- **RSP S118** Overhead Signs-Versatile Truss, Walkway Safety Railing Details
- **RSP S119** Overhead Signs-Versatile Truss, Sign Mounting Details Laminated Panel-Type A
- **RSP S120** Overhead Signs-Versatile Truss, Removable Sign Panel Frames Details No. 1
- **RSP S121** Overhead Signs-Versatile Truss, Removable Sign Panel Frames Details No. 2
- **RSP S122** Overhead Signs-Versatile Truss, Exit Plate Mounting Details
- **RSP S123** Overhead Signs-Versatile Truss, CMS Mounting Details
- **RSP S124** Overhead Signs-Versatile Truss, CMS and Flashing Beacon Details

**NOTE:**
- Signs are shown and dimensioned looking in the direction of traffic. Double faced signs are shown and dimensioned looking ahead along postings.
- For Two Post Type, maximum cantilever length is 50% of span length/3.
- For cantilever lengths > 40'-0" and < 50'-0", signs panels and walkways may only be placed on one side of Truss.
- 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.
- Refer to Revised Standard Plan RSP S123 for CMS mounting details.
- 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 truss. For one post signs, see Project Plans. Safety railing to run the entire length of walkway.
- Thread locking nuts or locking washers shall be used for all connections, unless noted otherwise.
- All high strength (HS) bolts are to be snug tightened unless otherwise noted on the plans.
- Panel size and locations on structure.

**DESIGN NOTES:**
- Design wind speed (V) = 100 mph
- Importance Factor (IP) = 1.0
- Velocity conversion factor (Cv) = 1.0
- gust effect factor (Gx) = 1.0

**SOIL PARAMETERS FOR CIDH FOUNDATION:**
- Minimum Soil Shear Strength: 1.5 ksf (cohesive soils)
- Minimum Soil Shear Strength: 1.5 ksf (non-cohesive soils)

**WIND LOADING:**
- CMS Loading:
  - CMS 500 maximum weight = 2000 lb
  - CMS 700 maximum weight = 2500 lb
  - CMS 710 maximum weight = 3000 lb

**WALKWAY LOADING:**
- CMS 710 maximum weight = 2000 lb

**CMS LOADING:**
- CMS Loading:
  - CMS 500 maximum weight = 2000 lb
  - CMS 700 maximum weight = 2500 lb
  - CMS 710 maximum weight = 3000 lb

**MATERIALS & UNIT STRESSES:**
- Structural Steel:
  - f'c = 4 ksi
  - fy = 55 ksi
  - fy = 60 ksi
  - f'y = 55 ksi
- Anchor Bolts:
  - Dia > 24" fy = 50 ksi
  - Dia > 24" fy = 55 ksi

**STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**

**OVERHEAD SIGNS-VERSATILE TRUSS ONE AND TWO POST TYPE**

**REVISED STANDARD PLAN SHEET No. RSP S100**

**RSP S100 DATED APRIL 16, 2021 SUPPLEMENTS THE STANDARDS PLANS BOOK DATED 2016**
TRUSS MEMBER TABLE

<table>
<thead>
<tr>
<th>Longer Arm Length</th>
<th>Frame Depth</th>
<th>Chord</th>
<th>Vertical</th>
<th>Diagonal</th>
<th>Wind Brace</th>
<th>Interior</th>
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<tbody>
<tr>
<td>20'-0&quot;</td>
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<td>L6 x 6 x 6</td>
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</table>

POST SELECTION TABLE

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<thead>
<tr>
<th>Sign Panel Depth</th>
<th>Longer Arm Length</th>
<th>Post Type by Post Clear Height</th>
<th>L</th>
<th>W</th>
<th>T</th>
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<td>L6 x 6 x 6</td>
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<tr>
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<td>L6 x 6 x 6</td>
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<tr>
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<td>L6 x 6 x 6</td>
<td>L6 x 6 x 6</td>
</tr>
</tbody>
</table>

POST TYPE TABLE

<table>
<thead>
<tr>
<th>Post Type</th>
<th>Character</th>
<th>Min. Normal Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>10&quot;</td>
<td>1.21B</td>
</tr>
<tr>
<td>1B</td>
<td>10&quot;</td>
<td>1.15B</td>
</tr>
<tr>
<td>1C</td>
<td>10&quot;</td>
<td>1.09B</td>
</tr>
<tr>
<td>1D</td>
<td>10&quot;</td>
<td>0.95B</td>
</tr>
<tr>
<td>1E</td>
<td>10&quot;</td>
<td>0.85B</td>
</tr>
<tr>
<td>1F</td>
<td>10&quot;</td>
<td>0.75B</td>
</tr>
<tr>
<td>1G</td>
<td>10&quot;</td>
<td>0.65B</td>
</tr>
<tr>
<td>1H</td>
<td>10&quot;</td>
<td>0.55B</td>
</tr>
</tbody>
</table>

NOTE:
1. Shorter arm member sizes shall match the member sizes selected for the longer arm.
2. Post clear height is measured to underside of bottom truss chord.
4. Minimum overlap lengths to gusset plates by, lb, le, and ll one in inches.
CIDH PILE FOUNDATION DETAILS

ELEVATION

CONCRETE PEDESTAL WITH ONE POST TYPE

OVERHEAD SIGNS - VERSATILE TRUSS

SECTION D-D

ROUND PEDESTAL

SECTION D-D

SQUARE PEDESTAL

CONCRETE PEDESTAL AND CIDH CONCRETE PILE TABLE

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 would be 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 "CIDH pile foundation details when a pedestal is not indicated in the Project Plans.
6. Refer to Revised Standard Plan RSP S104 for additional details and notes not shown on this sheet.
7. For drain holes and central void in mortar, see Standard Plan ES-6B detail.
8. Refer to Revised Standard Plan RSP S102 for "Post Type Table".
9. For CIDH pile foundation with inspection pipes, see Revised Standard Plan RSP S113.
10. Maximum electrical conduit diameter is 3".

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
### POST SELECTION TABLE

<table>
<thead>
<tr>
<th>Sign Panel Depth</th>
<th>Main Span Length</th>
<th>Post Type</th>
<th>Post ID</th>
<th>Clear Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>30'-0&quot; - 45'-0&quot;</td>
<td>2A</td>
<td>2B</td>
<td>2C</td>
<td>2D</td>
</tr>
<tr>
<td>45'-0&quot; - 60'-0&quot;</td>
<td>2E</td>
<td>2F</td>
<td>2G</td>
<td>2H</td>
</tr>
<tr>
<td>60'-0&quot; - 75'-0&quot;</td>
<td>2I</td>
<td>2J</td>
<td>2K</td>
<td>2L</td>
</tr>
<tr>
<td>75'-0&quot; - 90'-0&quot;</td>
<td>2M</td>
<td>2N</td>
<td>2O</td>
<td>2P</td>
</tr>
</tbody>
</table>

### TRUSS MEMBER TABLE

<table>
<thead>
<tr>
<th>Main Span Length</th>
<th>Frame Depth</th>
<th>Angle Member Size and Minimum Overlap Length to Gusset Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>30'-0&quot;</td>
<td>60&quot;</td>
<td>L5 x 3 x ½</td>
</tr>
<tr>
<td>45'-0&quot;</td>
<td>72&quot;</td>
<td>L8 x 3 x ½</td>
</tr>
<tr>
<td>60'-0&quot;</td>
<td>90&quot;</td>
<td>L8 x 3 x ½</td>
</tr>
<tr>
<td>75'-0&quot;</td>
<td>105&quot;</td>
<td>L8 x 3 x ½</td>
</tr>
<tr>
<td>90'-0&quot;</td>
<td>120&quot;</td>
<td>L8 x 3 x ½</td>
</tr>
</tbody>
</table>

### POST TYPE TABLE

<table>
<thead>
<tr>
<th>Post Type</th>
<th>Diameter</th>
<th>Min Nominal Split</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A</td>
<td>10&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td>2B</td>
<td>10&quot;</td>
<td>1.031&quot;</td>
</tr>
<tr>
<td>2C</td>
<td>10&quot;</td>
<td>1.218&quot;</td>
</tr>
<tr>
<td>2D</td>
<td>10&quot;</td>
<td>1.031&quot;</td>
</tr>
</tbody>
</table>

### OVERHEAD SIGNS - VERSATILE TRUSS

**TWO POST TYPE**

**STEEL POST TYPE**

**TRUSS MEMBER TABLE**

**NO SCALE**

RSP S107 DATED APR 16, 2016 SUPERSEDES STANDARD PLAN S107

**BASE PLATE AND ANCHOR BOLT DIMENSIONS**

<table>
<thead>
<tr>
<th>BASE PLATE AND ANCHOR BOLT DIMENSIONS</th>
<th>POST TYPE</th>
<th>PLATE THICKNESS</th>
<th>PLATE RADIUS</th>
<th>SPLIT</th>
<th>OPENING RADIUS</th>
<th>NUMBER OF BOLTS</th>
<th>MOUNTING</th>
<th>ANCHOR BOLT</th>
<th>ANCHOR BOLT LENGTH</th>
<th>BOLT HOLES</th>
<th>BOLT CIRCLE DIAMETER</th>
<th>RADIUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>POST TYPE:</td>
<td>2A</td>
<td>3/4&quot;</td>
<td>1'-3&quot;</td>
<td>N/A</td>
<td>2½&quot;</td>
<td>20</td>
<td>1'</td>
<td>6&quot;</td>
<td>1'-11&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
</tr>
<tr>
<td>POST TYPE:</td>
<td>2A</td>
<td>3/4&quot;</td>
<td>1'-3&quot;</td>
<td>N/A</td>
<td>2½&quot;</td>
<td>20</td>
<td>1'</td>
<td>6&quot;</td>
<td>1'-11&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
</tr>
<tr>
<td>POST TYPE:</td>
<td>2B</td>
<td>3/4&quot;</td>
<td>1'-0&quot;</td>
<td>N/A</td>
<td>2½&quot;</td>
<td>18</td>
<td>1'</td>
<td>6&quot;</td>
<td>1'-11&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
</tr>
<tr>
<td>POST TYPE:</td>
<td>2C</td>
<td>3/4&quot;</td>
<td>1'-0&quot;</td>
<td>N/A</td>
<td>2½&quot;</td>
<td>18</td>
<td>1'</td>
<td>6&quot;</td>
<td>1'-11&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
</tr>
<tr>
<td>POST TYPE:</td>
<td>2D</td>
<td>3/4&quot;</td>
<td>1'-0&quot;</td>
<td>N/A</td>
<td>2½&quot;</td>
<td>18</td>
<td>1'</td>
<td>6&quot;</td>
<td>1'-11&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
</tr>
<tr>
<td>POST TYPE:</td>
<td>2E</td>
<td>3/4&quot;</td>
<td>1'-0&quot;</td>
<td>N/A</td>
<td>2½&quot;</td>
<td>18</td>
<td>1'</td>
<td>6&quot;</td>
<td>1'-11&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
</tr>
<tr>
<td>POST TYPE:</td>
<td>2F</td>
<td>3/4&quot;</td>
<td>1'-0&quot;</td>
<td>N/A</td>
<td>2½&quot;</td>
<td>18</td>
<td>1'</td>
<td>6&quot;</td>
<td>1'-11&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
</tr>
</tbody>
</table>

**ANCHOR BOLT TEMPLATE ASSEMBLY**

**OVERHEAD SIGNS-VERSATILE TRUSS TWO POST TYPE STEEL POST BASE PLATE AND ANCHORAGE DETAILS**

**POST TO BASE PLATE CONNECTION DETAIL**
Notes:

1. For "ANCHORAGE DETAILS", see Revised Standard Plan RSP S108.
2. For "Base elevation", see Project Plans.
3. Prior to erection of the post, backfill which is equivalent to the surrounding material shall be in place.
4. For "PEDESTAL HEIGHT" and "PEDESTAL SHAPE", see Project Plans.
5. Refer to Revised Standard Plan RSP S109 for CIDH pile foundation details when a pedestal is not indicated in the Project Plans.
6. Refer to Revised Standard Plan RSP S109 for additional details and notes not shown on this sheet.
7. For drain holes and central void in mortar, see Standard Plan ES-6B Detail N.
8. Refer to Revised Standard Plan RSP S107 for "Post Type Table".
9. For CIDH pile foundation with Inspection Pipes, see Revised Standard Plan RSP S114.
10. Maximum electrical conduit diameter is 3".
TABLE 1
BOLTED CHORD SPlice

<table>
<thead>
<tr>
<th>CHORD THICKNESS</th>
<th>NORMAL BOLT DIAMETER</th>
<th>⅜&quot;</th>
<th>⅝&quot;</th>
<th>1⅛&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>½&quot;</td>
<td>⅜&quot;</td>
<td>⅜&quot;</td>
<td>⅝&quot;</td>
<td>1⅛&quot;</td>
</tr>
<tr>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
</tr>
<tr>
<td>1⅛&quot;</td>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
</tr>
</tbody>
</table>

TABLE 2
BOLTED WIND BRACE AT CHORD SPlice

<table>
<thead>
<tr>
<th>CHORD THICKNESS</th>
<th>BOLTED WIND BRACE</th>
<th>MIN WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>⅜&quot;</td>
<td>⅜&quot;</td>
<td>⅜&quot;</td>
</tr>
<tr>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
</tr>
<tr>
<td>1⅛&quot;</td>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
</tr>
</tbody>
</table>

TABLE 3
BOLTED MEMBER TO GusSET PLATE

<table>
<thead>
<tr>
<th>MEMBER THICKNESS</th>
<th>NORMAL BOLT DIAMETER</th>
<th>MIN WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>⅜&quot;</td>
<td>⅜&quot;</td>
<td>⅜&quot;</td>
</tr>
<tr>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
<td>⅝&quot;</td>
</tr>
<tr>
<td>1⅛&quot;</td>
<td>⅝&quot;</td>
<td>⅝&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 RSP S107 for the size of bolted wind brace angle. The bolted wind brace leg width and thickness shall be increased if necessary. In order to meet the minimum dimensions on "Table 2".
3. See "Table 3" 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 bolts, see "Wind Brace Coping Detail" on Revised Standard Plan RSP S111.
5. See Revised Standard Plan RSP S111 for details of plate connections are fully tensioned. The splice shall be located so as not to interfere with the gusset plate connections for the vertical and diagonal legs. For the post type, see also RSP S106.

FILTER E:
The filter plates welded to the angle legs on the splice shall be welded before drilling the bolt holes. The filter plates shall be the same length as the splice plates. The filter plates are not necessary on the single post. The filler plates are not necessary on the single post. The filler plates are not necessary on the single post.

SEE NOTE 1:
The splice shall be located so as not to interfere with the gusset plate connections for the vertical and diagonal legs. For the post type, see also RSP S106.

SEE NOTE 2:
The splice shall be located so as not to interfere with the gusset plate connections for the vertical and diagonal legs. For the post type, see also RSP S106.

SEE NOTE 3:
The splice shall be located so as not to interfere with the gusset plate connections for the vertical and diagonal legs. For the post type, see also RSP S106.

SEE NOTE 4:
The splice shall be located so as not to interfere with the gusset plate connections for the vertical and diagonal legs. For the post type, see also RSP S106.

SEE NOTE 5:
The splice shall be located so as not to interfere with the gusset plate connections for the vertical and diagonal legs. For the post type, see also RSP S106.
REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE

REVISED STANDARD PLAN RSP S113
LOWER JUNCTURE CONNECTION ONE POST TYPE

Section I-I

ELEVATION

NO SCALE
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.
TO ACCOMPANY PLANS DATED 10-14-2020.

REVISED STANDARD PLAN RSP S115

NOTE:
1. Mounting beam spacing to be determined by sign requirements. Refer to Revised Standard Plans RSP S119 to RSP S122 and RSP S124 for details.
2. For signs without walkways, mounting beam to be cut short at bottom. Refer to Revised Standard Plans RSP S119 to RSP S122 and RSP S124 for details.
3. Walkway brackets shall be bolted to mounting beams when walkways are provided. Maximum spacing = 5'-6".
4. For signs and CMS 710 that do not project below the truss, maintain 1" clearance between the mounting clip and walkway bracket gusset plate assembly.
5. For aluminum walkway grating details, see Revised Standard Plan RSP S116.
6. For sign luminaire mounting channel details, see Revised Standard Plan RSP S116.
7. For "Section B-B" and "Detail 3" see Revised Standard Plan RSP S116.
8. For "Detail 4" and "Detail 5" see Revised Standard Plan RSP S117.
9. For "Toe Plate Cut-Out Detail" and "Cover Plate Detail" see Revised Standard Plan RSP S117.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS-VERSATILE TRUSS
WALKWAY DETAILS No.1

REVISED STANDARD PLAN RSP S115

NOTE: ½" Ø Steel Ring not shown
**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 expansion reflective tape.
6. Refer to Revised Standard Plan RSP S115 for mounting beam to truss connection details.
7. For sign panel depths of 60" or less, or where a walkway is installed, the bottom of the mounting beam extends further than 1" from the bottom of the sign panel. Refer to Revised Standard Plan RSP S115.
8. Signs longer than 24"-0" are fabricated and mounted as adjoining single panels. The location of the vertical splice line will be determined by the Engineer.
9. The Contractor must verify all dependent dimensions in the field before ordering or fabricating any material.
OVERHEAD SIGNS - VERSATILE TRUSS

EXIT PLAQUE MOUNTING DETAILS

**EXIT PLAQUE MOUNTING BEAM TABLE**

<table>
<thead>
<tr>
<th>525% PANEL DEPTH, D</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>3'-0&quot; D ≤ 110&quot;</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>3'-6&quot; D ≤ 110&quot;</td>
<td>9'-0&quot;</td>
</tr>
<tr>
<td>10'-0&quot; D ≤ 110&quot;</td>
<td>10'-0&quot;</td>
</tr>
<tr>
<td>15'-0&quot; D ≤ 110&quot;</td>
<td>11'-0&quot;</td>
</tr>
<tr>
<td>18'-0&quot; D ≤ 110&quot;</td>
<td>12'-0&quot;</td>
</tr>
<tr>
<td>21'-0&quot; D ≤ 110&quot;</td>
<td>13'-0&quot;</td>
</tr>
</tbody>
</table>

**MOUNTING BEAM SPACING NOTES AND ABBREVIATIONS:**

A: Maximum mounting beam spacing for sign support = 8'-0".
B: Maximum mounting beam spacing for exit plaque support. A minimum of 2 mounting beams are required per exit plaque. Refer to "EXIT PLAQUE MOUNTING BEAM TABLE" for "B" values.
C: Maximum sign panel/exit plaque overhang length. Refer to Revised Standard Plans RSP S119 and RSP S120 for permissible overhang values.

Notes: Additional mounting beams will be required when walkways are installed. Maximum mounting beam spacing on walkways = 5'-6". Refer to Revised Standard Plan RSP S115 for walkway mounting beam details. When mounting beams are added for walkway or exit plaque support, they are not required to be attached to the sign panels.
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)
NOTES:
1. For mounting beam to truss chord connection details, see Revised Standard Plan RSP S115.
2. For horizontal and vertical position of exinguishable message, see Project Plans.
3. Beveled washers must be used at the channel member flanges.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS-VERSATILE TRUSS EMS AND FLASHING BEACON DETAILS


REVISED STANDARD PLAN RSP S124

Juan J. Jauregui
9-30-22
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. Each advance warning sign shall be equipped with at least two flags for daytime closure. 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 G20-2 "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 C29(CA) sign may be placed below the C9A(CA) sign.

5. Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals
   throughout extended work area. 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 C9A(CA) is not used, measure distance C from W20-4.
**LEGEND:**

- TRAFFIC CONE
- TEMPORARY TRAFFIC CONTROL SIGN
- PORTABLE FLASHING BEACON
- TRAILER
- FLÄGER
- PORTABLE CHANGEMBLE MESSAGE SIGN

**SIGN PANEL SIZE (Min):**

- 48" x 48"

---

**NOTES:**

1. Sign must be equipped with at least two flags for daytime closures. Flags must be orange in color and at least 16 inches by 16 inches in size. Place flashing beacons as shown for closures during hours of darkness.

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

REVERSIBLE TRAFFIC CONTROL WITH ADDITIONAL FLAGGERS
FOR SIDE ROADS AND BUSINESS DRIVEWAYS

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

NOTES:
1. Place C38(CA) sign when pilot car is used.
2. Place C39(CA) sign when pilot car is not used.
3. Sign must be equipped with at least two flags for daytime closures. Flags must be orange in color and at least 16 inches by 16 inches in size. Place flashing beacons as shown for closures during hours of darkness.
4. See Standard Plan T9, Table 3 for advance warning sign spacing.

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

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

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM
TWO LANE CONVENTIONAL HIGHWAYS
NO SCALE


REVISED STANDARD PLAN RSP T13B
NOTES:

1. Either a changeable message sign or a SC10(CA) sign panel and a Type Î Î Î 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 Î Î Î or above retroreflective sheeeting, 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 Î Î Î 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 vehicle(s) and the shadow vehicles, and between each shadow vehicle should be minimized to deter road users from driving in between.

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

MOVING LANE CLOSURE ON MEDIAN LANE OR OUTSIDE LANE OF MULTILANE HIGHWAYS
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 plaques:
   a. Where speed limit reduction zones are longer than 3 miles, place intermediate signs at approximately 3-mile spacing throughout the speed limit reduction zone.
   b. Approximately 500 feet downstream from major intersections within the speed limit reduction zone.

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

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION TRAFFIC CONTROL SYSTEM CONSTRUCTION WORK ZONE SPEED LIMIT REDUCTION ON CONVENTIONAL HIGHWAYS NO SCALE


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 R20-1 construction area sign, place a R20-1 sign in advance of the PCMS.
4. Place the RSCAL sign 400 feet downstream from the end of the last work area and place an optional vehicle speed feedback sign system 400 feet upstream from the beginning of each work area with a separation of more than 2 miles.
5. The distances shown for sign spacing are approximate, are intended as guidance purposes only, and should be applied with engineering judgement, the distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommended distances.

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

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

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
      are to be closed.
3. Place additional R2-1 signs and G20-5aP plagues:
   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
   work zone speed limit reduction.
5. Where speed limit reduction zones are longer than 3 miles, place additional appropriate advanced warning signs
   instead of approximately 3-mile spacing throughout the speed reduction zone.
TO ACCOMPANY PLANS DATED
B C D G20-5aP FEEDBACK SIGN VEHICLE SPEED R2-1

TYPICAL SPEED LIMIT REDUCTION WITH REVERSIBLE TRAFFIC CONTROL

Road Work Ahead
Speed Limit XX

W20-1
W3-5

NOTE:
1. See Standard Plan T9, Table 3 for advanced warning sign spacing.
2. The distance B to the PRSFS 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 PRSFS is measured from W20-2.

Legend:
- Traffic Cone
- Temporary Traffic Control Sign
- Portable Flashing Beacon
- Flagger
- Portable Radar Speed Feedback Sign System (PRSFS)
- PRSFS Support or Trailer
- Portable Changeable Message Sign (PCMS)

Lane closure traffic control devices shown for reference only.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SYSTEM FOR CONSTRUCTION WORK ZONE SPEED LIMIT REDUCTION ON TWO LANE CONVENTIONAL HIGHWAYS
NO SCALE


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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.

MOBILE BARRIER WITHIN TRAFFIC CONTROL SYSTEM
IN LANE ADJACENT TO WORK AREA

LEGAL:
- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL)
- TEMPORARY TRAFFIC CONTROL SIGN
- TYPE II FLASHING ARROW SIGN
- PORTABLE CHANGEABLE MESSAGE SIGN
- REPOSITIONING MOBILE BARRIER
- IMPACT ATTENUATOR
- TYPE II FLASHING ARROW SIGN
- FLASHING CAUTION MODE
- TYPE II FLASHING ARROW SIGN
- ALTERNATING DIAMONDS

MOBILE BARRIER WITHIN TRAFFIC CONTROL SYSTEM
IN LANE ADJACENT TO WORK AREA
NOTE:
1. Channelizing devices shown adjacent to the mobile barrier may be removed or not placed while the mobile barrier is stationary, but must be placed or replaced as the barrier moves within the work area.

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

MOBILE BARRIER WITHIN REVERSIBLE TRAFFIC CONTROL SYSTEM

MOBILE BARRIER WITHIN SHOULDER TRAFFIC CONTROL SYSTEM

NOTE:
See Table 2


Traffic control devices shown for reference only. See traffic control system standard plans for required traffic control devices and spacing.

The State of California or its Officers or Agents shall not be responsible for copies of this plan sheet.

Charles D. Suszko
C43029
April 16, 2021

2018 REVISED STANDARD PLAN RSP T25

REVISED STANDARD PLAN RSP T25

MOBILE BARRIER SYSTEM

NO SCALE
