SWING GATE DETAILS

NOTES:
1. A duplex system (paint or powder coat over galvanizing) shall be used for the swing gate assembly and hand railing after fabrication and surface preparation. The swing gate assembly and hand railing shall be hot-dip galvanized in accordance with ASTM A538 (products) and ASTM A325 (hardware) coating which has been shop or field galvanized by welding or damaged shall be repaired or recoated in accordance with ASTM A123.

2. After cleaning and prepping galvanized surface in accordance with ASTM A123, the swing gate assembly and hand railing shall be painted or powdercoated with a two-component primer coat. High performance epoxy paint and acrylic top coat. The paint color shall be Federal Color No. FS4092 unless noted otherwise.

3. Steel plates @ 4" O.C.

4. Steel pipe support 2" dia. x 40 STD.

5. Steel pipe frame 3" dia. x 40 STD.

6. Steel pickets 1" dia. x 40 STD.

7. Steel plate 3/16" steel plate welded on top of gate post.

8. Steel plate 4"x3"x2" steel plate welded on top of gate post.

9. Steel plate 12" dia. x 2'-6" deep concrete footing match existing grade and finished surface.

10. Match existing grade and finished surface.

11. Existing grade and finished surface.

12. Pull gate to open.

13. Exit only.


15. Push gate to open.

16. Track side emergency exit gate.

17. Look.

18. Notes:
- May be mounted on separate post.
- 1. Use exterior grade vinyl die cut sheeting, color silver.
- 2. Use 3M exterior grade reflective white sheeting.
- 3. For additional sign details see ES3318 and ES3319.


20. Copy color: black.


22. Panel 3/16" thick painted aluminum.

23. Symbol color: red.


25. Background color: reflective white.


27. Match existing grade and finished surface.

28. Pull gate to open.

29. Exit only.

30. Approach side emergency exit gate.

31. Push gate to open.

32. Track side emergency exit gate.

33. Look.

34. Symbols:
- Exit only.
- Approaching.
- Push gate to open.
- Track side emergency exit gate.

35. Description:
- 2" dia. x 40 STD steel pipe gate frame.
- 3/16" steel plate welded on top of gate post.
- Steel plates @ 4" O.C.
- Steel pipe support 2" dia. x 40 STD.
- Steel pipe frame 3" dia. x 40 STD.
- Steel pickets 1" dia. x 40 STD.
- Steel plate 3/16" steel plate welded on top of gate post.
- Steel plate 4"x3"x2" steel plate welded on top of gate post.
- Steel plate 12" dia. x 2'-6" deep concrete footing match existing grade and finished surface.
- Match existing grade and finished surface.
- Existing grade and finished surface.
- Pull gate to open.
- Exit only.
- Approach side emergency exit gate.
- Push gate to open.
- Track side emergency exit gate.
- Look.

36. Notes:
- May be mounted on separate post.
- 1. Use exterior grade vinyl die cut sheeting, color silver.
- 2. Use 3M exterior grade reflective white sheeting.
- 3. For additional sign details see ES3318 and ES3319.

37. Date:
- 12/12/09

38. Approved by:
- Director of Engineering and Construction

39. CADD file:
- ENG.
- DES.

40. Description:
- 2" dia. x 40 STD steel pipe gate frame.
- 3/16" steel plate welded on top of gate post.
- Steel plates @ 4" O.C.
- Steel pipe support 2" dia. x 40 STD.
- Steel pipe frame 3" dia. x 40 STD.
- Steel pickets 1" dia. x 40 STD.
- Steel plate 3/16" steel plate welded on top of gate post.
- Steel plate 4"x3"x2" steel plate welded on top of gate post.
- Steel plate 12" dia. x 2'-6" deep concrete footing match existing grade and finished surface.
- Match existing grade and finished surface.
- Existing grade and finished surface.
- Pull gate to open.
- Exit only.
- Approach side emergency exit gate.
- Push gate to open.
- Track side emergency exit gate.
- Look.

41. Notes:
- May be mounted on separate post.
- 1. Use exterior grade vinyl die cut sheeting, color silver.
- 2. Use 3M exterior grade reflective white sheeting.
- 3. For additional sign details see ES3318 and ES3319.

42. Scale:
- 1/8" = 1'-0"
NOTES:

1. HINGE SLEEVE CURVE OF STEEL TO BE ASTM A441 HARDENED STEEL.
2. ALL OTHER SLEEVE DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
3. HINGE SLEEVE MACHINING SHALL BE PRECISION TO THE NEAREST THOUSANDTH OF AN INCH.
4. CURVE SLEEVE CURVE SURFACES 'A' AND 'B' TO BE POLISHED.
5. CARTESIAN AND ASSEMBLY ONE GATE FOR TESTING, SUBMIT TO ISGOPPE, GATE TESTING, AND APPROVED GATE TESTING AND TESTING SPECIFICATIONS BEFORE ANY WORK DONE AT ANY STATION PEDESTRIAN CROSSING. GATE OPERATION IS NOT APPROVED BY SCROLL HOME GATE AND GATE FORCE REQUIRED TO OPERATE SHALL BE 22N (5 LBS) MAX.
6. FILTER REQUIRED TO OPERATE SHALL BE 22N (5 LBS) MAX.

OUTER SURFACE OF UPPER SLEEVE HINGE SHAPE OF STEEL TO BE ASTM A441 HARDENED STEEL.

HINGE SLEEVE MACHINING SHALL BE PRECISION TO THE NEAREST THOUSANDTH OF AN INCH (0.001).

ROTATING CURVED CONTACT SURFACES OF HINGE SLEEVE CURVE SURFACES 'A' AND 'B' TO BE POLISHED.

CONSTRUCT AND ASSEMBLE ONE GATE FOR TESTING, SUBMIT TO ISGOPPE, GATE TESTING, AND APPROVED GATE TESTING AND TESTING SPECIFICATIONS BEFORE ANY WORK DONE AT ANY STATION PEDESTRIAN CROSSING. GATE OPERATION IS NOT APPROVED BY SCROLL HOME GATE AND GATE FORCE REQUIRED TO OPERATE SHALL BE 22N (5 LBS) MAX.

HINGE SLEEVE CURVE DETAIL

HINGE SLEEVE DETAIL

HINGE SLEEVE CURVE DETAIL

DETAIL V1 & V2

PRE-FINAL SUBMITTAL
NOTES:


IN THE DISCUSSION OF THE DESIGN CONSIDERATIONS, THE TERM "FULL PEDESTRIAN TREATMENTS" SHALL INCLUDE SIGNAGE, MARKINGS, CHANNELIZATION, ACTIVE WARNING DEVICES WITH GATES AND SWING GATES. SCRRA POLICY AND PRACTICE IS TO APPLY FULL PEDESTRIAN TREATMENTS TO MOST RAIL CROSSINGS. IN THE ATTACHED FIGURE GRAPHICALLY SHOWS THE DECISION STEPS THAT SHALL BE FOLLOWED DURING THE DESIGN OF THE PEDESTRIAN CROSSING AT CROSSINGS. THIS PROCESS SHALL BE SIMILAR FOR ANY TYPE OF PEDESTRIAN CROSSING AND DEFINES THE SCRRA RECOMMENDED APPROACH TO THE APPLICATION OF PEDESTRIAN CROSSINGS.

DECISION POINT 1

IS THE EXISTANCE OF PEDESTRIAN ACTIVITY BEING DETERMINED. THIS INCLUDES SIDEWALKS LEADING UP TO THE RIGHT-OF-WAY, OR EVIDENCE OF PEDESTRIANS CROSSING AT THE LOCATION. SCRRA STANDARDS CALL FOR THE APPLICATION OF PEDESTRIAN CROSSING TREATMENTS IF PEDESTRIANS USE THE AREA FOR CROSSING. THE DESIGN ENGINEER SHALL TAKE THE FOLLOWING ACTIONS WHEN EVIDENCE OF ACTIVITY EXISTS WITHOUT PEDESTRIAN FACILITIES:
- DETERMINE IF THE PEDESTRIAN ACTIVITY IS LEGAL
- WORK WITH THE LOCAL MUNICIPALITY TO DEVELOP THE SIDEWALKS
- IF LEGAL, THE DESIGN SHALL PROVIDE SIDEWALKS OVER THE RIGHT-OF-WAY
- IF WANTED, THE DESIGNER CAN ADD PASSIVE WARNING DEVICES TO THE CROSSING.

DECISION POINT 2

IF THE CROSSING IS TO BE INCLUDED IN A QUIET ZONE, THE CROSSING SHALL RECEIVE FULL TREATMENT FOR SAFETY ENHANCEMENTS AND QUIET ZONE SIGNAGE SHALL BE INSTALLED.

DECISION POINT 3

THE TYPE OF PEDESTRIAN CROSSING IS ANALYZED AT THIS STEP. A PEDESTRIAN CROSSING WITHIN A STATION OR A PEDESTRIAN CROSSING ASSOCIATED WITH A VEHICLE CROSSING ADJACENT TO THE STATION - REQUIRES FULL PEDESTRIAN TREATMENT.

DECISION POINT 4

THE CROSSING LOCATED WITHIN A 10 MINUTE WALKING DISTANCE OF A SCHOOL, HOSPITAL OR OTHER FACILITY THAT CAN BE EXPECTED TO SUPPORT DISABLED PEOPLE IF THE ANSWER IS "YES" TO ANY OF THE ABOVE, THEN THE CROSSING REQUIRES FULL PEDESTRIAN TREATMENTS. IF THE ANSWER IS "NO", THEN I THERE IS SIGNIFICANT PEDESTRIAN ACTIVITY AT THE CROSSING IN ORDER TO ANSWER "YES" TO WHETHER THERE IS SIGNIFICANT PEDESTRIAN ACTIVITY, THE DESIGN ENGINEER SHALL CONDUCT A STUDY OF THE CROSSING IN ORDER TO DETERMINE THE VOLUME OF PEDESTRIANS USING THE CROSSING BOTH ON-Peak AND OFF-Peak HOURS. THE TYPES OF PEDESTRIANS (i.e., SCHOOL CHILDREN, ELDERLY, DISABLED, BIKE RIDERS, ETC.) AND THE BEHAVIOR PATTERN OF THE PEDESTRIANS (ARE THE PEDESTRIANS BEHAVING IN A SAFE MANNER IN USING THE CROSSING, CONSIDERATING POTENTIAL TRAIN ACTIVITY). AND THEN DISCUSS THE RESULTS OF THIS STUDY WITH SCRRA AND CPUC FOR CLEAR CONSENSUS WITH THE SAFETY REVIEW TEAM AS TO THE PRESENCE OR ABSENCE OF SIGNIFICANT PEDESTRIAN ACTIVITY. FULL TREATMENTS ARE REQUIRED IN THE EVENT OF A "YES" ANSWER TO ANY OF THESE QUESTIONS.

DECISION POINT 5

DOES THE CROSSING HAVE THREE OR MORE MAIN OR CONTROLLED SIDING TRACKS? IF THE ANSWER IS "YES", THE PEDESTRIAN CROSSING SHALL BE GRADE SEPARATED. THE GRADE SEPARATION CAN BE AN OVERHEAD OR UNDERPASSED.

DECISION POINT 6

DOES THE CROSSING HAVE TWO MAIN RAILROAD TRACKS? THIS DECISION POINT IS ARRANGED SO THAT A "YES" ANSWER TO THIS QUESTION ACCOUNTS FOR TWO TRACKS IN RURAL AREAS THAT SEE FEW PEDESTRIANS. IN THIS CASE, IT MAY NOT BE APPROPRIATE TO INSTALL FULL PEDESTRIAN TREATMENTS. BUT STILL NEED APPROVAL FROM SCRRA. IF PEDESTRIAN ACTIVITY IS IN AN URBAN ENVIRONMENT, HOWEVER, FULL TREATMENTS ARE REQUIRED WHEN MULTIPLE TRACKS ARE IN A LOCATION WITH LIMITED VISIBILITY.

DECISION POINT 7

THE CROSSING LOCATION HAVE RESTRICTED VISIBILITY. FULL TREATMENTS ARE REQUIRED WHEN THERE IS LIMITED VISIBILITY AT CROSSINGS.

DECISION POINT 8

IS THE RIGHT-OF-WAY NEEDED TO COMPLY WITH THE MANUAL UNDESIRED IF NOT, THEN FULL PEDESTRIAN TREATMENTS ARE REQUIRED. SCRRA STANDARDS DRAWINGS INCLUDE VARIATIONS TO THE STANDARD CONFIGURATION DEPICTED ON THE AVAILABLE RIGHT-OF-WAY. IN CASES WHERE THE RIGHT-OF-WAY REQUIRED FOR THE USE OF ONE OF THESE STANDARDS APPLICATIONS CANNOT BE AQUIRED DUE TO EXISTING PROPERTY USES, OR BECAUSE OF OTHER CONDITIONS, THE DESIGN ENGINEER SHALL REQUEST A MODIFICATION FROM SCRRA AND DESIGN A NON-STDANDARD APPLICATION.

DECISION POINT 9

IS THE CROSSING CONSIDERED FOR QUIET ZONE. IF THE ANSWER IS "YES", THE PEDESTRIAN CROSSING SHALL BE GRADE SEPARATED. THE GRADE SEPARATION CAN BE AN OVERHEAD OR UNDERPASSED.

DECISION POINT 10

IS THE CROSSING CONSIDERED FOR QUIET ZONE. IF THE ANSWER IS "YES", THE PEDESTRIAN CROSSING SHALL BE GRADE SEPARATED. THE GRADE SEPARATION CAN BE AN OVERHEAD OR UNDERPASSED.

DECISION POINT 11

IS THE CROSSING CONSIDERED FOR QUIET ZONE. IF THE ANSWER IS "YES", THE PEDESTRIAN CROSSING SHALL BE GRADE SEPARATED. THE GRADE SEPARATION CAN BE AN OVERHEAD OR UNDERPASSED.

DECISION POINT 12

IS THE CROSSING CONSIDERED FOR QUIET ZONE. IF THE ANSWER IS "YES", THE PEDESTRIAN CROSSING SHALL BE GRADE SEPARATED. THE GRADE SEPARATION CAN BE AN OVERHEAD OR UNDERPASSED.

DECISION POINT 13

IS THE CROSSING CONSIDERED FOR QUIET ZONE. IF THE ANSWER IS "YES", THE PEDESTRIAN CROSSING SHALL BE GRADE SEPARATED. THE GRADE SEPARATION CAN BE AN OVERHEAD OR UNDERPASSED.

DECISION POINT 14

IS THE CROSSING CONSIDERED FOR QUIET ZONE. IF THE ANSWER IS "YES", THE PEDESTRIAN CROSSING SHALL BE GRADE SEPARATED. THE GRADE SEPARATION CAN BE AN OVERHEAD OR UNDERPASSED.

DECISION POINT 15

IS THE CROSSING CONSIDERED FOR QUIET ZONE. IF THE ANSWER IS "YES", THE PEDESTRIAN CROSSING SHALL BE GRADE SEPARATED. THE GRADE SEPARATION CAN BE AN OVERHEAD OR UNDERPASSED.
NOTES:

1. PEDESTRIAN BARRICADE SHALL BE AS PER CALTRANS PLAN ES-799 AND AS MODIFIED HERETHROUGH.
2. PIPE POSTS TO BE SET 1'-6" BACK FROM FACE OF CURB UNLESS OTHERWISE SPECIFIED.
3. STEEL SLEEVE TO BE CONSTRUCTED WITH A DIAMETER OF 1'-6" LARGER THAN POST. WALL THICKNESS OF SLEEVE TO BE SAME AS POST OR LARGER.
4. CONTRACTOR MAY SUBMIT ALTERNATIVE DETAILS FOR APPROVAL BY SCRRA.
5. PIPE MATERIALS TO BE CONFIRMED BY CONTRACTOR.
6. THE LOCATION OF BARRICADE SHALL BE COORDINATED WITH LOCAL AUTHORITY AND SCRRA.
7. THE "CROSS ONLY AT CROSSWALKS" (R9-2) AND "USE CROSSWALK" (R9-3b) SIGNS AS PER CA MUTCD SHALL BE INSTALLED AT APPROPRIATE LOCATIONS AS NEEDED.

PEDESTRIAN BARRICADE DETAILS

NOTES:

1. METAL HAND RAILING SHALL BE AS PER APWA STANDARD PLAN 600-2, "TYPE B" AND AS MODIFIED HERETHROUGH.
2. RAILS, POSTS AND PICKETS SHALL BE GALVANIZED STEEL PIPE.
3. MAXIMUM SPACING OF POSTS SHALL BE 8'-0" ON STRAIGHT ALIGNMENTS, AND 6'-0" ON CURVED ALIGNMENTS WITH LESS THAN 30' RADIUS. MAKE SPACING UNIFORM BETWEEN CHANGES IN ALIGNMENTS.
4. WELDS SHALL BE SLOT OR FILLET WELDS EQUAL TO THICKNESS OF PIPE.
5. INSTALL HIGH VISIBILITY YELLOW REFLECTIVE TAPE 3" x 3".
NOTES:
1. THESE STANDARDS ARE NOT INTENDED TO REPLACE EXISTING MUTCD STANDARDS, NOR TO BE A SUBSTITUTE FOR ENGINEERING KNOWLEDGE.
2. CALL SCRRA OR ITS OFFICERS OR AGENTS AT 700 SOUTH FLOWER STREET, 26TH FLOOR, LOS ANGELES, CALIFORNIA 90017.
3. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
   a. SCRRA ENGINEERING STANDARD ES4201 FOR CONCRETE PANELS AND PAVED END RAMP.
   b. SCRRA ENGINEERING STANDARD ES5101 FOR INTER-TRACK FENCE.
   c. SCRRA ENGINEERING STANDARD ES5107 FOR SECURITY ACCESS GATE, K-RAIL AND BOLLARDS.
   d. SCRRA ENGINEERING STANDARD ES4002 FOR SWING GATE DETAILS.
   e. SCRRA ENGINEERING STANDARD ES8302 FOR SWING ENTRANCE GATES ONLY.
   f. SCRRA ENGINEERING STANDARD ES8308 AND ES8309 FOR PEDESTRIAN WARNING DEVICES.
   g. CALTRANS STANDARD PLANS A20A FOR TRAFFIC LINES (STRIPE) AND A20C FOR DETECTABLE WARNING LINE (STRIPE).
   h. CALTRANS STANDARD PLANS A20A DETAIL 27B AND A20C DETAIL 27B FOR PEDESTRIAN WARNING DEVICES.
   i. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL. (ONE ADDITIONAL RAIL 4" FROM BOTTOM).
   j. SCRRA ENGINEERING STANDARD ES4001 FOR TRACK ACCESS GATE, K-RAIL AND BOLLARDS.
   k. SCRRA ENGINEERING STANDARD ES4002 FOR SWING GATE DETAILS.
   l. CALTRANS STANDARD PLANS A20A FOR TRAFFIC LINES (STRIPE) AND A20C FOR DETECTABLE WARNING SURFACE (STRIPE).
   m. CALTRANS STANDARD PLANS A20A DETAIL 27B AND A20C DETAIL 27B FOR PEDESTRIAN WARNING DEVICES.
   n. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL. (ONE ADDITIONAL RAIL 4" FROM BOTTOM).
4. FENCING AND STEEL TUBE RAIL LOCATIONS SHALL BE ADJUSTED AS NECESSARY TO PROVIDE SCRRA MAINTENANCE VEHICLES ACCESS TO RIGHT-OF-WAY AND SIGNAL & TRACK FACILITIES WITH SCRRA APPROVAL.
5. PRECISION AND TOTAL WARNING TIME SHALL TAKE INTO CONSIDERATION THE PEDESTRIAN WALKING DISTANCE AND CLEARANCE TIME AND SHALL MEET THE REGULATIONS AND REQUIREMENTS OF THE AMERICAN WITH DISABILITIES ACT (ADA) AND CALMUDD.
NOTES:
1. THESE STANDARDS ARE NOT INTENDED TO REPLACE EXISTING REGULATORY STANDARDS, NOR TO BE A SUBSTITUTE FOR ENGINEERING KNOWLEDGE, EXPERIENCE, AND JUDGMENT OF PROFESSIONALS. THEY ARE PROVISIONAL GUIDELINES WHICH ARE MOST IMPORTANT FOR SAFE CONSTRUCTION, MAINTENANCE, AND OPERATION OF PEDESTRIAN FACILITIES AT HIGHWAY-RAIL GRADE CROSSINGS. SINCE THE ACTUAL DESIGN WILL TYPICALLY BE SITE SPECIFIC, INFORMATION SHOWN ON THIS DRAWING WILL BE MODIFIED AS NEEDED IN CLOSE COLLABORATION WITH SCRRA.
2. FOLLOW CALIFORNIA MUTCD FOR STRIPING, SIGNING, AND OTHER TRAFFIC WARNING DEVICES.
3. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
   a. SCRRA ENGINEERING STANDARD ES4201 FOR CONCRETE PANELS AND PAVED END RAMP.
   b. SCRRA ENGINEERING STANDARD ES5101 FOR INTER-TRACK FENCE.
   c. SCRRA ENGINEERING STANDARD ES5107 FOR SECURITY ACCESS GATE X-RAIL AND BOLLARDS.
   d. SCRRA ENGINEERING STANDARD ES4001 FOR TRACK FENCE DETAILS.
   e. SCRRA ENGINEERING STANDARD ES4002 FOR SWING GATE DETAILS.
   f. SCRRA ENGINEERING STANDARD ES5308 AND ES5309 FOR PEDESTRIAN WARNING DEVICES.
   g. CALTRANS STANDARD PLANS A20A FOR TRAFFIC LINES (STRIPE) AND A20C TYPE "G" FOR PAVEMENT MARKERS.
   h. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).
   i. APWA STANDARD PLAN 608-2, TYPE "A" FOR PAVEMENT ENDS.
4. FENCING AND STEEL TUBE RAIL LOCATIONS SHALL BE ADJUSTED AS NECESSARY TO PROVIDE SCRRA MAINTENANCE VEHICLES ACCESS TO RIGHT-OF-WAY AND SIGNAL & TRACK FACILITIES WITH SCRRA APPROVAL.
5. PREEMPTION AND TOTAL WARNING TIME SHALL TAKE INTO CONSIDERATION THE PEDESTRIAN WALKING DISTANCE AND CLEARANCE TIME AND SHALL MEET THE REGULATIONS AND REQUIREMENTS OF THE AMERICAN WITH DISABILITIES ACT (ADA) AND CA MUTCD.

1. THESE STANDARDS ARE NOT INTENDED TO REPLACE EXISTING REGULATORY STANDARDS, NOR TO BE A SUBSTITUTE FOR ENGINEERING KNOWLEDGE, EXPERIENCE, AND JUDGMENT OF PROFESSIONALS. THEY ARE PROVISIONAL GUIDELINES WHICH ARE MOST IMPORTANT FOR SAFE CONSTRUCTION, MAINTENANCE, AND OPERATION OF PEDESTRIAN FACILITIES AT HIGHWAY-RAIL GRADE CROSSINGS. SINCE THE ACTUAL DESIGN WILL TYPICALLY BE SITE SPECIFIC, INFORMATION SHOWN ON THIS DRAWING WILL BE MODIFIED AS NEEDED IN CLOSE COLLABORATION WITH SCRRA.
2. FOLLOW CALIFORNIA MUTCD FOR STRIPING, SIGNING, AND OTHER TRAFFIC WARNING DEVICES.
3. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
   a. SCRRA ENGINEERING STANDARD ES4201 FOR CONCRETE PANELS AND PAVED END RAMP.
   b. SCRRA ENGINEERING STANDARD ES5101 FOR INTER-TRACK FENCE.
   c. SCRRA ENGINEERING STANDARD ES5107 FOR SECURITY ACCESS GATE X-RAIL AND BOLLARDS.
   d. SCRRA ENGINEERING STANDARD ES4001 FOR TRACK FENCE DETAILS.
   e. SCRRA ENGINEERING STANDARD ES4002 FOR SWING GATE DETAILS.
   f. SCRRA ENGINEERING STANDARD ES5308 AND ES5309 FOR PEDESTRIAN WARNING DEVICES.
   g. CALTRANS STANDARD PLANS A20A FOR TRAFFIC LINES (STRIPE) AND A20C TYPE "G" FOR PAVEMENT MARKERS.
   h. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).
   i. APWA STANDARD PLAN 608-2, TYPE "A" FOR PAVEMENT ENDS.
4. FENCING AND STEEL TUBE RAIL LOCATIONS SHALL BE ADJUSTED AS NECESSARY TO PROVIDE SCRRA MAINTENANCE VEHICLES ACCESS TO RIGHT-OF-WAY AND SIGNAL & TRACK FACILITIES WITH SCRRA APPROVAL.
5. PREEMPTION AND TOTAL WARNING TIME SHALL TAKE INTO CONSIDERATION THE PEDESTRIAN WALKING DISTANCE AND CLEARANCE TIME AND SHALL MEET THE REGULATIONS AND REQUIREMENTS OF THE AMERICAN WITH DISABILITIES ACT (ADA) AND CA MUTCD.
NOTES:

1. THESE STANDARDS ARE NOT INTENDED TO REPLACE EXISTING REGULATORY STANDARDS, NOR TO BE A SUBSTITUTE FOR ENGINEERING KNOWLEDGE, EXPERIENCE AND JUDGMENT, BUT ARE REQUIREMENTS WHICH ARE OF MATERIAL IMPORTANCE TO SAFE CONSTRUCTION, MAINTENANCE, AND OPERATION OF EGRESS FACILITIES AT HIGHWAY-RAIL GRADE CROSSINGS. THESE STANDARDS ARE INTENDED TO PROVIDE A FRAMEWORK FOR THE DESIGN OF SUCH FACILITIES AND TO ASSIST IN THE PREPARATION OF PLANS AND SPECIFICATIONS.

2. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
   a. SCRRA ENGINEERING STANDARD ES0401 FOR CONCRETE PANELS AND PAVED END RAMPS.
   b. SCRRA ENGINEERING STANDARD ES0501 FOR INTERTRACK PANELS.
   c. SCRRA ENGINEERING STANDARD ES0601 FOR SECURITY ACCESS GATE K-RAIL AND BOLLARDS.
   d. SCRRA ENGINEERING STANDARD ES0150 FOR TRACK STANDARDS AND ASPHALT CONCRETE PAVEMENT DETAILS.
   e. SCRRA ENGINEERING STANDARD ES0022 FOR SWING GATE DETAILS.
   f. SCRRA ENGINEERING STANDARD ES0001 FOR CONCRETE CROSSING DETAILS.
   g. CALTRANS STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
   h. CALTRANS STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
   i. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).

3. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
   a. APWA STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
   b. CALTRANS STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
   c. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).

4. PEDESTRIAN AND STEEL TUBE RAIL LOCATION SHALL BE ADJUSTED AS NECESSARY TO PROVIDE SCRRA MAINTENANCE ACCESS TO RAILWAY-YARD AND SIGNAL & TRACK FACILITIES WITH SCRRA APPROVAL.

5. PEDESTRIAN AND VEHICLE ACCESS TO RIGHT-OF-WAY AND SIGNAL & TRACK FACILITIES WITH SCRRA APPROVAL.

6. DESIGN AND DEPTH OF CONCRETE CROSSING BEYOND CROSSING (TYP) SEE NOTE 4

7. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
   a. SCRRA ENGINEERING STANDARD ES0001 FOR CONCRETE CROSSING DETAILS.
   b. CALTRANS STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
   c. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).

8. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
   a. SCRRA ENGINEERING STANDARD ES0001 FOR CONCRETE CROSSING DETAILS.
   b. CALTRANS STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
   c. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).

9. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
   a. SCRRA ENGINEERING STANDARD ES0001 FOR CONCRETE CROSSING DETAILS.
   b. CALTRANS STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
   c. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).

10. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
    a. SCRRA ENGINEERING STANDARD ES0001 FOR CONCRETE CROSSING DETAILS.
    b. CALTRANS STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
    c. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).

11. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
    a. SCRRA ENGINEERING STANDARD ES0001 FOR CONCRETE CROSSING DETAILS.
    b. CALTRANS STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
    c. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).

12. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
    a. SCRRA ENGINEERING STANDARD ES0001 FOR CONCRETE CROSSING DETAILS.
    b. CALTRANS STANDARD PLAN A20B DETAIL 278 AND 277, TYPE "C" FOR PAVEMENT MARKERS.
    c. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).
NOTES:

1. THESE STANDARDS ARE NOT INTENDED TO REPLACE EXISTING REGULATORY STANDARDS, NOR TO BE A SUBSTITUTE FOR ENGINEERED EXPERIENCE AND JUDGMENT, BUT ARE REQUIREMENTS WHICH ARE MOST IMPORTANT FOR SAFE CONSTRUCTION, MAINTENANCE, AND OPERATION OF PEDESTRIAN FACILITIES AT HIGHWAY-RAIL GRADE CROSSINGS. SINCE THE ACTUAL DESIGN WILL TYPICALLY BE SITE SPECIFIC, INFORMATION SHOWN ON THIS DRAWING WILL BE MODIFIED AS NECESSARY IN CLOSE COLLABORATION WITH SCRRA.

2. FOLLOW CALIFORNIA MUTCD FOR STRIPING, SIGNING, AND OTHER TRAFFIC WARNING DEVICES.

3. REFER TO THE FOLLOWING FOR ADDITIONAL DESIGN INFORMATION:
   a. SCRRA ENGINEERING STANDARD ES4201 FOR CONCRETE PANELS AND PAVED END RAMP.
   b. SCRRA ENGINEERING STANDARD ES5001 FOR INTER-TRACK FENCE.
   c. SCRRA ENGINEERING STANDARD ES5017 FOR SECURITY ACCESS GATE, K-RAIL AND BOLLARDS.
   d. SCRRA ENGINEERING STANDARD ES4001 FOR TRACK SECTIONS AND ASPHALT CONCRETE PAVEMENT DETAILS.
   e. SCRRA ENGINEERING STANDARD ES4002 FOR SWING GATE DETAILS.
   f. SCRRA ENGINEERING STANDARD ES5008 AND ES6007 FOR PEDESTRIAN WARNING DEVICES.
   g. CALTRANS STANDARD PLANS A20A FOR TRAFFIC LINES (STRIPES) AND AREA FOR DETECTABLE WARNING SURFACE (STRIPES).
   h. CALTRANS STANDARD PLANS A20A DETAIL 278 AND A20A DETAIL 279 FOR PEDESTRIAN WARNING DEVICES.
   i. APWA STANDARD PLAN 606-2, TYPE "B" FOR STEEL TUBE RAIL (ONE ADDITIONAL RAIL 4" FROM BOTTOM).

4. FENCING AND STEEL TUBE RAIL LOCATIONS SHALL BE ADJUSTED AS NECESSARY TO PROVIDE SCRRA MAINTENANCE VEHICLES ACCESS TO RIGHT-OF-WAY AND SIGNAL & TRACK FACILITIES IN ACCORDANCE WITH SCRRA APPROVAL.

5. PREDETERMINED AND TOTAL WARNING TIME SHALL TAKE INTO ACCOUNT THE PEDESTRIAN WALKING DISTANCE AND CLEARANCE TIME AND SHALL MEET THE REGULATIONS AND REQUIREMENTS OF THE AMERICAN WITH DISABILITIES ACT (ADA) AND CA MUTCD.

LEGEND

- STRIPING
- DETECTABLE WARNING STRIP
- CONCRETE
- AC PAVEMENT (SHOWN FOR PEDESTRIAN FACILITY ONLY)
- DIRECTION OF TRAFFIC

CURB AND GUTTER

2'-0" WIDE STOP LINE
AT RIGHT ANGLE TO TRAVELED WAY
ON 8' CA MUTCD

STEEL TUBE RAIL (TYP) SEE NOTE 4

PEDESTRIAN WARNING DEVICE (TYP)

2'-0" WIDE DETECTABLE WARNING STRIP (TYP)

PCC SIDEWALK

10'-0" TIMBER GRADE CROSSING RISERS

6" YELLOW SAFETY WARNING STRIPES

KEEP LEFT SIGN

WARNING SIGNS

AC RAMP

INTER-TRACK FENCE

PEDESTRIAN / VEHICLE CROSSING
ADJACENT TO STATION

ENGINEERING STANDARDS

THE SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
700 SOUTH FLOWER STREET, 30TH FLOOR
LOS ANGELES, CALIFORNIA 90017

CONSTRUCTION

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

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TYPICAL DRAIN PIPE LAYOUT

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

REVISED DRAIN PIPE LAYOUTS

FIELD PANEL

TYPICAL BALLAST AND ASPHALT DETAIL

SINGLE TRACK

SCALE: 1" = 1'-0"

2'-6" MIN. tracker ballast all around

FILTERED DRAIN PIPE (BOTH SIDES), WRAP WITH 6" PERFORATED DRAIN PIPE

6" DIAMETER PERFORATED PIPE

(4) - 4" PVC SCHEDULE 80 SIGNAL CONDUITS (CAPPED)

TYPICAL BALLAST AND ASPHALT DETAIL

DOUBLE TRACK

SCALE: 1" = 1'-0"

WOOD TIE (TYP.) 7" x 9" x 10'-0"

LIMITS OF SIGNAL CONDUITS (CAPPED)

LORD ROAD

FIELD PANEL

NOTE:

COMPACTED HOT MIX ASPHALT CONCRETE (HMAC) SECTION, 6" MINIMUM COMPACTED TO 7" MINIMUM HOT MIX ASPHALT CONCRETE

COMPACTED SUBGRADE DRAWN AT CENTER OF TRACKS, 2% SLOPE AWAY FROM CENTERLINE, 95% COMPACTION TEST (ASTM D1557-21).

FIELD PANEL

2'-6" MIN.

TYPICAL BALLAST AND ASPHALT DETAIL

SINGLE TRACK

SCALE: 1" = 1'-0"

2'-6" MIN. tracker ballast all around

FILTERED DRAIN PIPE (BOTH SIDES), WRAP WITH 6" PERFORATED DRAIN PIPE

6" DIAMETER PERFORATED PIPE

(4) - 4" PVC SCHEDULE 80 SIGNAL CONDUITS (CAPPED)

TYPICAL BALLAST AND ASPHALT DETAIL

DOUBLE TRACK

SCALE: 1" = 1'-0"

WOOD TIE (TYP.) 7" x 9" x 10'-0"

LIMITS OF SIGNAL CONDUITS (CAPPED)

LORD ROAD

FIELD PANEL

NOTE:

COMPACTED HOT MIX ASPHALT CONCRETE (HMAC) SECTION, 6" MINIMUM COMPACTED TO 7" MINIMUM HOT MIX ASPHALT CONCRETE

COMPACTED SUBGRADE DRAWN AT CENTER OF TRACKS, 2% SLOPE AWAY FROM CENTERLINE, 95% COMPACTION TEST (ASTM D1557-21).

FIELD PANEL

2'-6" MIN.

TYPICAL BALLAST AND ASPHALT DETAIL

SINGLE TRACK

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2'-6" MIN. tracker ballast all around

FILTERED DRAIN PIPE (BOTH SIDES), WRAP WITH 6" PERFORATED DRAIN PIPE

6" DIAMETER PERFORATED PIPE

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SCALE: 1" = 1'-0"

WOOD TIE (TYP.) 7" x 9" x 10'-0"

LIMITS OF SIGNAL CONDUITS (CAPPED)

LORD ROAD

FIELD PANEL

NOTE:

COMPACTED HOT MIX ASPHALT CONCRETE (HMAC) SECTION, 6" MINIMUM COMPACTED TO 7" MINIMUM HOT MIX ASPHALT CONCRETE

COMPACTED SUBGRADE DRAWN AT CENTER OF TRACKS, 2% SLOPE AWAY FROM CENTERLINE, 95% COMPACTION TEST (ASTM D1557-21).

FIELD PANEL

2'-6" MIN.
1. Temporary Traffic Control Planning and Design shall be coordinated with the Southern California Regional Rail Authority (SCRRA) since Public Agencies and SCRRA are required to coordinate all installation, operation, maintenance, use, and protection of grade crossings, according to the California Public Utilities Commission. In order to assure the safe operation of grade crossings and to prevent unsafe and inefficient movements of trains, vehicles, bicyclists, and pedestrians, SCRRA must approve any and all temporary traffic control plans and devices.


3. SCRRA reserves the right to close the crossing to vehicle traffic, revoke or cancel the temporary right to entry agreement between the public agency or the contractor to cancel the temporary traffic control in the public agency or contractor, or both if the temporary traffic control activities do not meet MUTCD Section 6B.1 requirements. In the opinion of SCRRA, the temporary traffic control activities must be withdrawn or eliminated if railroad-grade crossings are not present at the permanent rail grade crossing or if the flagging, flagging, or the flagger procedures and flagger training does not meet the SCRRA minimums or MUTCD requirements. The traffic control will be designed instanter and work will be resumed at a later date after approval has been granted by SCRRA.

4. The location and duration of temporary traffic control, in both directions, of rail and highway traffic and flagging can affect the design and selection of temporary traffic control plan. These variable factors should be carefully studied prior to designing and implementing temporary traffic control zones. Refer to the accompanying flow chart that provides a quick reference to the relationship between railroad crossing conditions and traffic control requirements.

5. SCRRA Form No. 6 (Temporary Right of Entry Agreement) will be executed and submitted when the construction activity is located within the railroad right-of-way or its officers or agents. SCRRA Form No. 6 (Temporary Right of Entry Agreement) will be executed and submitted when the railroad crossing warning system in both directions, or the flagger qualifications, clothing, hand-signal devices, flagger procedures, and flagger training does not meet the SCRRA minimum or MUTCD requirements. The temporary traffic control will be designed instanter and work will be resumed at a later date after approval has been granted by SCRRA.

6. Work in the vicinity of railroad right-of-way shall not be responsible for the accuracy or completeness of this plan sheet.
REQUESTS FOR TEMPORARY CONSTRUCTION CROSSINGS WILL BE CONSIDERED BY SCRRA ONLY WHERE IT IS SHOWN THAT EXTREME HARDSHIP AND/OR UNUSUAL CONDITIONS JUSTIFY THE CROSSING.

2. GEOTEXTILE MUST BE PLACED OVER THE TE PLATES AND OTHER TRACK MATERIAL (OTM) TO DEEP ASPHALT AND BASE AWAY THE MINIMUM WEIGHT OF GEOTEXTILE SHALL BE 4.5 OZ. PER SQ. YARD AND THICKNESS SHALL BE 40 MILS.

3. THE CROSSING MUST NOT BE USED WITHOUT SCRRA AUTHORIZED PERSONNEL.

4. THE CHAINLINK FENCE SHALL MEET SCRRA ENGINEERING STANDARD ES5106.

5. CHAINLINK FENCE GATES WILL BE LOCKED WITH SCRRA LOCK ONLY. PROVIDE KEEPERS TO HOLD GATES OPEN.

6. COLD MIX ASPHALT IS NOT AN SCRRA APPROVED MATERIAL FOR THE PAVEMENT. HOT MIX ASPHALT MUST COMPLY WITH CALTRANS SPECIFICATIONS.


8. ENVIRONMENTAL RULES OF THE LOCAL AUTHORITY SHALL BE FOLLOWED WHEN DISPOSING OF THE ASPHALT MATERIALS.

NOTES:
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THE SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THIS PLAN SHEET.
**Example of Pedestrian Treatment at Grade Crossing with Entrance Gate Only**

1. **Exit Gate with Stub Mast**
   - Exit Decal: Engineering Grade Retroreflective Material, White with 3" 1/2 Black Arial Bold Letters and Arrow
   - Gate Arm Length
     - 6'-0" 1'-6" 3'-0" 1'-6"
     - 6'-6" 1'-7'/2" 3'-3" 1'-7'/2"
     - 7'-0" 1'-9" 3'-6" 1'-9"
   - Gate Arm Lamp Spacing and Placement
   - This typical assembly shall be used in quadrants that do not have roadway warning devices installed.

2. **Exit Gate with Entrance Gate**
   - Exit Decal: Placed on each pedestrian warning device centered on the gate arm with the arrow pointing in the direction of the designated exit path and one-way swing gate

3. **Pedestrian Gate Assembly for "Off-Quadrant" Applications**
   - Includes:
     - 16'-0" Mast With Junction Box
     - 8'-0" Fiber Glass Gate Arm *
     - Two L.E.D. Gate Arm Lamps *
     - Complete Gate Assy
     - Electronic Bell
     - Crossbuck
     - Hardware
   - * Ordered separately

**Notes:**
1. Refer to Engineering Standards ES2015 thru ES2022 for information regarding specific configurations of pedestrian treatments at vehicle crossings.
2. Orientation of gate arm and mechanism will vary depending on site specific requirements. Orientation as shown in this standard are for illustration purposes only.
3. Complete gate assemblies shall include gate mechanism, left and right support arms, type B conversion bracket, break-away gate arm adapter, 3 shear pins, king pin assembly, 8'-0" long liquid tight flex conduit and connectors, and all associated hardware.
4. Deviation from this standard shall be approved by manager, C&S Engineering or designate.

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**Example of Pedestrian Treatment at Grade Crossing with Entrance Gate Only**

**GATE AND LAMP SPACING**

**Exit Decal**

**GATE ARM LENGTH**

**GATE ARM LAMP SPACING**

**EXIT DECA**

**EXIT**

**GATE WITH ENTRANCE AND EXIT GATE**

---

**Southern California Regional Rail Authority**

**WITH ENTRANCE ONLY**

**WITH ENTRANCE GATE ONLY**
See Note 2

Install omnidirectional electronic bell in each quadrant with warning devices where required.

Two-way (front and back lights) without counterweights.

I. 8'-1" or more

See ES8309 for details on gate lamp spacing.

42" top of final grade sidewalk/pathway.

Pedestrian flashing light signals with gate assembly.

"For gate arms up to 8'-0" long."

"For gate arms 8'-1" or longer."

04-3815010-0

Includes:

- 16' mast w/ jct. box
- 2-way LED flasher assy
- Complete gate assy
- 8’-0” fiberglass gate arm *
- Two L.E.D. gate arm lamps *
- Electronic bell
- Crossbucks
- Ped Xing sign
- Hardware

* ordered separately

5. Flashing light signal units shall be 12" L.E.D. type designed to operate with a solid state crossing controller and shall conform to AREMA C&S Manual recommendations.

6. 1-way or 2-way LED flasher assemblies shall include junction box cross arm assembly and lamp mounting brackets per AREMA C&S Manual Part 3.2.51, 12" L.E.D. lamp units, 24" steel backgrounds, steel hoods and all associated hardware.

7. Complete gate assemblies shall include gate mechanism, left and right support arms (with or without counterweight support depending on configuration), (4) 50lb and (2) 25lb counterweights and retainer brackets (if required), Type B conversion bracket, breakaway gate arm adapter, 3 shear pins, king pin assembly, 8’-0” long liquid tight flex conduit and connectors, and all associated hardware.

8. The dimensions shown are typical.
FLASHING LIGHT SIGNALS WITH ENTRANCE GATES:

ONE OR MORE TRACKS,
TWO-WAY VEHICULAR TRAFFIC,
ONE LANE EACH WAY.

RIGHT ANGLE CROSSING
ACUTE ANGLE CROSSING
OBTUSE ANGLE CROSSING

REFERENCE AREMA
C&S MANUAL PART 3.1.36A

6" MAX.

i -1'

15'

( )

C&S MANUAL PART 3.1.6B

USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY SCRRA MANAGER OF C&S ENGINEERING OR DESIGNATE.

NOTES:
1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.
2. ALL DIMENSIONS ARE SHOWN IN FEET AND INCHES.
3. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.
4. USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY SCRRA MANAGER OF C&S ENGINEERING OR DESIGNATE.
5. DEVIATION FROM THIS STANDARD SHALL BE APPROVED BY SCRRA MANAGER OF C&S ENGINEERING OR DESIGNATE.

REFERENCES:
1. ES8300 THROUGH ES8308
2. STANDARD DRAWINGS ES8350

THE SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
ENGINEERING STANDARDS
8350

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
ENGINEERING STANDARDS
8350

FOR THE ACCURACY OR COMPLETENESS OF THIS
SUBMITTED BY THE AUTHOR'S OFFICERS OR AGENTS

FOR THE ACCURACY OR COMPLETENESS OF THIS
NUMBER OF CONDUITS AS DESIGNATED IN THIS STANDARD IS INTENDED ONLY AS A GUIDE. INSTALL NUMBER OF CONDUITS AS REQUIRED.

1. INSTRUMENT ENCLOSURE LOCATION IS TYPICAL, MAY BE LOCATED IN ANY NEUTRAL QUADRANT.
2. ALL CONDUITS SHALL BE LOCATED IN ANY NEUTRAL QUADRANT.
3. INSTALLATION ENDS LOCATION IS TYPICAL, MAY BE LOCATED IN ANY NEUTRAL QUADRANT.
4. INSTALLATION ENDS LOCATION IS TYPICAL, MAY BE LOCATED IN ANY NEUTRAL QUADRANT.

NOTES:

8. 24" x 18" x 13" pull boxes should be placed directly beside the signal mast at a minimum distance of 3'-0".

9. Deviation from this standard shall be approved by SCRRA Manager of C&S Engineering or Designate.

LEGEND

- 8x6 CROSSING HOUSE
- METER SERVICE
- SINGLE CONDUIT
- MULTIPLE CONDUITS
- CONCRETE PULL BOX
- FIBERGLASS PULL BOX
- MULTIPLE CONDUITS

ENGINEERING STANDARDS
FLAShING LIGHT SIGNALS WITH ENTRANCE AND EXIT GATES:

ONE OR MORE TRACKS,
TWO-WAY VEHICULAR TRAFFIC,
ONE LANE EACH WAY.

6" MAX.
12" MAX.

RIGHT ANGLE CROSSING

GATES PARALLEL TO TRACK

GATES PERPENDICULAR TO ROADWAY

REFERENCES AREMA C&S MANUAL PART 3.1.6C

NOTES:
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NOTES:
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2. ALL DIMENSIONS ARE SHOWN IN FEET AND INCHES.
3. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.
4. SEE STANDARD DRAWINGS ES8300 THROUGH ES8308 FOR ADDITIONAL INFORMATION.
5. DEVIATION FROM THIS STANDARD SHALL BE APPROVED BY SCRRA MANAGER OF C&S ENGINEERING OR DESIGNATE.

* USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY SCRRA MANAGER OF C&S ENGINEERING OR DESIGNATE.

CENTRAL FLASHERS WITH ENTRANCE GATES:
TWO LANE TOTAL.
ONE OR MORE TRACKS.

CANTILEVER FLASHERS WITH ENTRANCE GATES:
ACUTE ANGLE CROSSING
RIGHT ANGLE CROSSING
OBLIQUE ANGLE CROSSING
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4. APPROXIMATE GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.
5. USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY SCRRA MANAGER OF C&S ENGINEERING OR DESIGNATE.
RIGHT ANGLE CROSSING

12" MAX. - 9'-0" MIN.

15' MAX.

12' MIN.

OBTUSE ANGLE CROSSING

4'-6" MIN.

FLASHTING LIGHT SIGNALS WITH GATES AND MEDIAN:
ONE OR MORE TRACKS,
TWO-WAY VEHICULAR TRAFFIC,
TWO LAKES EACH WAY WITH MEDIAN.

NOTES:
1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.
2. ALL DIMENSIONS ARE SHOWN IN FEET AND INCHES.
3. ADDITIONAL MEDIAN WIDTH MAY BE REQUIRED TO PROVIDE CLEARANCE FOR 24" BACKROUNDS, WINDGUARD OR GATE COUNTERWEIGHTS.
4. BACKLIGHTS MAY BE ADDED AS CONDITIONS REQUIRE.
5. GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.
6. SEE STANDARD DRAWINGS ES8300 TO ES8308 FOR ADDITIONAL INFORMATION.
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5. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.

NOTES:

1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.
2. ALL DIMENSIONS ARE SHOWN IN FEET AND INCHES.
3. ADDITIONAL MEDIAN WIDTH MAY BE REQUIRED TO PROVIDE CLEARANCE FOR 24" BACKROUNDS, WINDGUARD OR GATE COUNTERWEIGHTS.
4. BACKLIGHTS MAY BE ADDED AS CONDITIONS REQUIRE.
5. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.

NOTES:

1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.
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5. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.
CANTILEVER FLASHERS WITH ENTRANCE GATES AND MEDIAN:
ONE OR MORE TRACKS, TWO-WAY VEHICULAR TRAFFIC, THREE OR MORE LANES EACH WAY WITH MEDIAN.

NOTES:
1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.
2. ALL DIMENSIONS ARE SHOWN IN FEET AND INCHES.
3. ADDITIONAL MEDIAN WIDTH MAY BE REQUIRED TO PROVIDE CLEARANCE FOR 24" BACKROUNDS, WINDGUARD OR GATE COUNTERWEIGHTS.
4. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF THE ARM.
5. SEE STANDARD DRAWINGS CS2000, CS2030 AND CS2040 FOR ADDITIONAL INFORMATION.
6. DEVIATION FROM THIS STANDARD SHALL BE APPROVED BY SCRRA MANAGER OF C&S ENGINEERING OR DESIGNATE.

11/21/08
THE SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
ENGINEERING STANDARDS
700 SOUTH FLOWER STREET
LOS ANGELES, CALIFORNIA 90017

5' 6'' MAX.
6' MIN.
12' MIN.*

4' MIN.*
14'-6'' MIN.
3'-0'' MAX.

19'-0'' MIN.
4'-6'' MIN.
15' MIN.*
CANTILEVER FLASHERS WITH ENTRANCE AND EXIT GATES AND MEDIAN:
ONE OR MORE TRACKS,
TWO-WAY VEHICULAR TRAFFIC,
THREE OR MORE LANES
EACH WAY WITH MEDIAN.

ACUTE ANGLE CROSSING

NOTE:
1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.
2. ALL DIMENSIONS ARE SHOWN IN FEET AND INCHES.
3. ADDITIONAL MEDIAN WIDTH MAY BE REQUIRED TO PROVIDE CLEARANCE FOR 24" BACKROUNDS, WINDGUARD OR GATE COUNTERWEIGHTS.
4. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM.
5. SEE STANDARD DRAWINGS ES8300 THROUGH ES8308, ES8320 & ES8325 FOR ADDITIONAL INFORMATION.
6. WHERE BOTH ENTRANCE GATES AND EXIT GATES ARE ALIGNED ON A MEDIAN, FRONT LIGHTS SHALL BE INSTALLED ON THE ASSEMBLY CLOSEST TO TRAFFIC APPROACHING THE MEDIAN.
7. DEVIATION FROM THIS STANDARD SHALL BE APPROVED BY SCRRA MANAGER OF C&S ENGINEERING OR DESIGNATE.

THE SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY
AND ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THIS PLAN SHEET.

NOTE: USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY SCRRA MANAGER OF C&S ENGINEERING OR DESIGNATE.
**NOTES:**

1. **PED PLATFORM**: Platform End Of.

2. **PED PLATFORM**: Platform Application.

3. **TRACK**: One or more tracks.

4. **TYPICAL LOCATION PLAN** may vary as conditions require.

5. USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY SCRRA MANAGER OF CS ENGINEERING OR DESIGNATE.

6. **THE SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY** OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THIS PLAN SHEET.

7. DISTANCE BETWEEN END OF PLATFORM AND GATES SHALL NOT BE LESS THAN 10 FEET.

8. PED PLATFORM ALTITUDE ABOVE GROUND LEVEL SHALL NOT BE LESS THAN 5 FEET.

9. PED PLATFORM LENGTH SHALL NOT BE LESS THAN 10 FEET.

10. PED PLATFORM WIDTH SHALL NOT BE LESS THAN 10 FEET.

11. **ENGINEERING STANDARDS**:

   - The minimum distance between the end of the platform and the gate shall be 10 feet.
   - The distance between the end of the platform and the gate shall not be less than 5 feet.
   - The distance between the edge of the platform and the gate shall not be less than 10 feet.
   - The width of the platform shall not be less than 10 feet.
   - The platform shall be at least 5 feet above ground level.

12. **TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.**

13. **ALL DIMENSIONS ARE SHOWN IN FEET AND INCHES.**

14. **GATE ARM LENGTH SHALL NOT EXCEED 8' MEASURED FROM THE CENTER OF KINGPIN TO THE TIP OF GATE ARM WITHOUT COUNTERWEIGHTS.**

15. **SEE STANDARD DRAWING ES8395 FOR ADDITIONAL INFORMATION.**

16. **DEVIATION FROM THIS STANDARD SHALL BE APPROVED BY SCRRA MANAGER OF CS ENGINEERING OR DESIGNATE.**

17. **PEDESTRIAN GATE CONFIGURATIONS MUST HAVE CHANNELIZATION AND EXIT SWING GATES.**

18. **DISTANCE BETWEEN TIP OF GATE ARM AND POST TO BE BETWEEN 4 1/2 IN. AND 5 IN. GATE TIP MUST BE FREE OF BURRS AND SHARP EDGES.**

19. **US REVISIONS OR REVIEWS.**

20. **FINAL REVIEW BY CS ENGINEERING OR DESIGNATE DATE 1/21/88.**

21. **APPROVED BY CS ENGINEERING DIRECTOR.**
Typical Loop Layout Dimensions

1. Loops to be installed per manufacturer's recommendations.
2. "A" - Typically 15' to maintain dimensions "G" and "E" may be reduced if entrance gates cannot be relocated.
3. "B" - Typically 15' may be reduced if exit gates cannot be relocated (see "E").
4. "C" - Typically 12", may vary from 6" to 12" depending on pavement quality.
5. "D" - Typically 2' from edge of traveled way or lane line.
6. "E" - 3'-3.5' recommended to avoid loop activation when a vehicle crowds under an entrance gate. Dimension may be reduced if gates cannot be relocated in order to maintain the 5' minimum referenced in dimension "G".
7. "F" - Typically 2' from loop to edge of traveled way, similar to dimension "D", may be increased up to 5' where improved shoulder or other exists or further as determined by diagnostic review.
8. "G" - Maximum loop width shall not exceed 8'. Minimum loop width of entrance and exit loops typically not to be less than 5'. Loops between tracks shall not be less than 3' wide.
9. "H" - Maximum loop length 28'-6".
10. "I" - Maximum 13' between loops in the same lane.

Notes:
1. TOTAL AREA OF LOOP SHALL NOT EXCEED 144 SQ. FT (EX. 8' MAX WIDTH X 18'. 144 SQ. FT.
2. WHILE Loops may cover multiple lanes, they shall not cover partial lanes.
3. Vehicle detection loops shall be pre-formed, vital water repellent, with an integral check loop such as that manufactured by Reno Air. 
4. Saw-cutting pavement for loop installation shall be avoided.

Revisions:
Final Review by C&SC Date: 11/21/06

SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY

ENGINEERING STANDARDS

8405 SH Press Street
Los Angeles, California 90017

FOR THE ACCURACY OR COMPLETENESS OF THIS PLANS SHEET, SOUTHERN CALIFORNIA REGIONAL RAIL AUTHORITY OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE AND IT'S ENGINEERS, CONSTRUCTION DIRECTORS, ENG. AN CONTRUCTION.