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| DISTANCE REQUIRED FOR SAFE BRAKING |
| FORMULA: |
| DISTANCE = 0.019t^2 + 0.002t (ft) |
| WHERE: |
| t = time in seconds |
| FT = feet |

- **O** = DISTANCE REQUIRED FOR SAFE BRAKING
- **T** = TIME PER OPERATING BRAKE (1000)
- **H** = HORIZONTAL VELOCITY AT BEGINNING OF BRAKING
- **V** = AVERAGE GRADE IN PERCENT
- **S** = SPEED OR VELOCITY IN MILES PER HOUR (MPH)
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### FORMULA

- **DISTANCE BETWEEN SAFE BRAKES**
- **SPEED OF VEHICLE IN MILES PER HOUR (MPH)**
- **SPEED DEMAND IN PERCENT**
- **SPEED OF VEHICLE IN MILES PER HOUR (MPH)**

### PENINSULA CORRIDOR JOINT POWERS BOARD

### STANDARD DRAWINGS

- **SIGNAL AND COMMUNICATION SPEED CHARTS**
- **SIGNAL BRACING DISTANCE CHART**
- **ASCENDING - 100 TPD SHEET 1 OF 2**

### DETAILS

- **DISTANCE BETWEEN SAFE BRAKES**
- **SPEED OF VEHICLE IN MILES PER HOUR (MPH)**
- **SPEED DEMAND IN PERCENT**
- **SPEED OF VEHICLE IN MILES PER HOUR (MPH)**

### PENINSULA CORRIDOR JOINT POWERS BOARD

### STANDARD DRAWINGS

- **SIGNAL AND COMMUNICATION SPEED CHARTS**
- **SIGNAL BRACING DISTANCE CHART**
- **ASCENDING - 100 TPD SHEET 1 OF 2**
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### Notes
- **Designation:** This is the average grade of the average of the specified levels.
- **Recommended Speed:** For the specified speed, the design speed is 105 mph. The minimum horsepower required for the specified speed is calculated using the average grade of the average of the specified levels.
- **Speed Calculation:** The speed calculation is based on the average grade of the average of the specified levels.
- **Limitations:** The speed calculation is based on the average grade of the average of the specified levels.
### FREIGHT-TRAIN REDUCTION DISTANCES

#### VELOCITY AT ORIGIN (Vo)

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<tr>
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#### REDUCTION TO 40 M.P.H.

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#### DISTANCES

- **Distance Required for Safe Braking**
  - **Formulas**
    - Distance (in feet) = \( \frac{20}{20 - Vo} \) \( \frac{25}{25 - Vo} \) \( \frac{30}{30 - Vo} \) \( \frac{35}{35 - Vo} \) \( \frac{40}{40 - Vo} \) \( \frac{45}{45 - Vo} \) \( \frac{50}{50 - Vo} \) \( \frac{55}{55 - Vo} \) \( \frac{60}{60 - Vo} \)
  - **Distance Required for Safe Braking (in feet)**
  - **Distance Required for Safe Braking at 20 M.P.H.**
  - **Distance Required for Safe Braking at 25 M.P.H.**
  - **Distance Required for Safe Braking at 30 M.P.H.**
  - **Distance Required for Safe Braking at 35 M.P.H.**
  - **Distance Required for Safe Braking at 40 M.P.H.**

- **Time Required for Safe Braking**
  - **Formulas**
    - Time (in seconds) = \( \frac{1}{20 - Vo} \) \( \frac{1}{25 - Vo} \) \( \frac{1}{30 - Vo} \) \( \frac{1}{35 - Vo} \) \( \frac{1}{40 - Vo} \) \( \frac{1}{45 - Vo} \) \( \frac{1}{50 - Vo} \) \( \frac{1}{55 - Vo} \) \( \frac{1}{60 - Vo} \)
  - **Time Required for Safe Braking (in seconds)**
  - **Time Required for Safe Braking at 20 M.P.H.**
  - **Time Required for Safe Braking at 25 M.P.H.**
  - **Time Required for Safe Braking at 30 M.P.H.**
  - **Time Required for Safe Braking at 35 M.P.H.**
  - **Time Required for Safe Braking at 40 M.P.H.**

- **Final Velocity at End of Braking**
  - **Formulas**
    - Final Velocity (in m.p.h.) = \( \frac{20 - Vo}{20} \) \( \frac{25 - Vo}{25} \) \( \frac{30 - Vo}{30} \) \( \frac{35 - Vo}{35} \) \( \frac{40 - Vo}{40} \) \( \frac{45 - Vo}{45} \) \( \frac{50 - Vo}{50} \) \( \frac{55 - Vo}{55} \) \( \frac{60 - Vo}{60} \)
  - **Final Velocity at End of Braking (in m.p.h.)**
  - **Final Velocity at End of Braking at 20 M.P.H.**
  - **Final Velocity at End of Braking at 25 M.P.H.**
  - **Final Velocity at End of Braking at 30 M.P.H.**
  - **Final Velocity at End of Braking at 35 M.P.H.**
  - **Final Velocity at End of Braking at 40 M.P.H.**

- **Average Grade at Percent**
  - **Formulas**
    - Average Grade (in percent) = \( \frac{20 - Vo}{20} \) \( \frac{25 - Vo}{25} \) \( \frac{30 - Vo}{30} \) \( \frac{35 - Vo}{35} \) \( \frac{40 - Vo}{40} \) \( \frac{45 - Vo}{45} \) \( \frac{50 - Vo}{50} \) \( \frac{55 - Vo}{55} \) \( \frac{60 - Vo}{60} \)
  - **Average Grade at Percent**
  - **Average Grade at Percent at 20 M.P.H.**
  - **Average Grade at Percent at 25 M.P.H.**
  - **Average Grade at Percent at 30 M.P.H.**
  - **Average Grade at Percent at 35 M.P.H.**
  - **Average Grade at Percent at 40 M.P.H.**
## PASSENGER TRAIN DISTANCE IN FEET vs. SPEED IN M.P.H.

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<td>IRED</td>
<td>PRED</td>
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</table>

### FOR STOPPING DISTANCES:

A) SELECT MAXIMUM AUTHORIZED SPEED (OR INITIAL SPEED) IN MPH COLUMN.

B) READ DISTANCE TO STOP ON SAME LINE IN COLUMN 5.

### FOR REDUCING DISTANCES:

A) SELECT MAXIMUM AUTHORIZED SPEED (OR INITIAL SPEED) IN MPH COLUMN.

B) READ DISTANCE ON SAME LINE IN COLUMN 6 ± .5

C) SUBTRACT DISTANCE DERIVED FROM COLUMN 6: THIS IS THE REDUCING DISTANCE.

### NOTES:

1) * indicates that actual braking tests need not be performed on this data for information only.

2) EQUATIONS FOR CALCULATIONS:

- **Stopping Distance:**
  
  \[ D_{\text{stop}} = 0.00000005 \cdot v^4 + 0.00004 \cdot v^3 + 0.00062 \cdot v^2 + 0.00661 \cdot v + 0.1429 \]

- **Reducing Distance:**
  
  \[ D_{\text{reduce}} = D_{\text{stop}} - 0.00000005 \cdot v^4 + 0.00004 \cdot v^3 + 0.00062 \cdot v^2 + 0.00661 \cdot v + 0.1429 \]
### Acceptable Plug-In Relays for Use on Caltrain Projects

<table>
<thead>
<tr>
<th>Relay Description</th>
<th>Base Type</th>
<th>Date Code</th>
<th>Contact Configuration</th>
<th>AltNum</th>
<th>Old Site Tab</th>
<th>InfoSys</th>
<th>Old Site Tab</th>
</tr>
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<tbody>
<tr>
<td>Relay, 2 Ohm Baked Neutral Track</td>
<td>B1</td>
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<td>A622-120</td>
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**Vital Plug-In Relays**

- D.C. Based Neutral Relay
- D.C. Neutral Relay
- D.C. Based Neutral Relay - Code In Parallel

**Shelf Relay Symbols**

- D.C. Neutral Relay - Ordinary Release
- D.C. Neutral Relay - Slow Release
- D.C. Electro Neutral Relay - Arrow Indicates Direction of Current to Operate Relay
- D.C. Polarized Relay - Retain Neutrals
- D.C. Flasher Relay
- D.C. The Element Relay
- D.C. Polarized Relay

**Relay Contacts - Two Position Relays**

- Front Contact - Relay Normally Energized
- Front Contact - Relay Normally De-Energized
- Back Contact - Relay Normally Energized
- Back Contact - Relay Normally De-Energized
- Front and Back Contact - Relay Normally Energized
- Front and Back Contact - Relay Normally De-Energized

**Relay Contacts - Three Position Relays**

- D.C. Polar Relay Contact - Relay Normal
- D.C. Polar Relay Contact - Relay Reverse

**Typical Circuit**

```
  N  E  S  R  E
    |   |   |
    T   F   A
```

**Relay Contacts with Special Characteristics**

- Magnetic Slow-Out
- High Current (Heavy Duty) Front Contact
- High Current (Heavy Duty) Back Contact
- Close Before Open Contact
- Push Button - Push to Open
- Push Button - Push to Close
- Spring Return Push Button
- Switch Lock Contact - Closed
- Switch Lock Contact - Open
- Checking Contact of the Element Relay Used to Check the Relay Normal

**Switch Circuit Controller Wiring**

- Initial or Switch Circuit Controller (Terminal Board)
- Second Switch in Switch and Signal Combination or Crossed Switch (Terminal Board)

**Notes**

- AltNum, Formally ORS: Preferred Formally ORS
SEARCHLIGHT SIGNAL CONTACTS AND TERMINAL POST NUMBERING

TYPE M AND M2

WAYSIDE SIGNAL SYMBOLS

CONTROLLED SIGNAL

AUTOMATIC SIGNAL

GREEN YELLOW
RED
LUNAR

SIGNAL HOUSINGS

NOTE:
TYPES OF SIGNALS
CL = COLORLIGHT
SL = SEARCHLIGHT
CL = COLOR
LED = LIGHT EMITTING DIODE

CL AND SL DESIGNATIONS USED ONLY WHEN MORE THAN ONE TYPE OF SIGNAL IS SHOWN ON A DRAWING. OTHERWISE, ALL SIGNALS ARE COLORLIGHT.
INTERLOCKED SWITCHES AND DETAILS

LINE PLAN

NOTES:
1. SINGLE TurnOUT
2. SINGLE CROSSOVER
3. DECK POINT TYPE (S/D)
4. DECK LIFT TYPE
5. SINGLE LIFT SWICH
6. DOUBLE LIFT SWITCH WITH ROD PINS
7. INVERTIBLE POINT CROSSING PINS (W/P)
8. SINGLE LIFT SWITCH WITH W/P
9. DOUBLE LIFT SWITCH WITH W/P
10. SPRING SWITCH
NOTES:
1. POLARITY JOINTS SHALL HAVE A MAXIMUM SPACING OF 4'-0"
2. DISTANCE MEASURED BETWEEN END POSTS OF INSULATED JOINTS, EXCEPT POLARITY JOINTS SHALL BE 4'-0" MIN AND 10' MAX
3. DISTANCE FROM POINT OF SWITCH TO FIRST INSULATED JOINT SHALL BE APPROXIMATELY 50'. IN NO CASE SHALL THE DISTANCE BE LESS THAN 20'. INSTALLED LESS THAN 20' MUST BE APPROVED BY CALTRAIN DEPUTY DIRECTOR OF ENGINEERING.
4. SIGNAL SHALL BE CENTERED BETWEEN INSULATED JOINTS.
5. INSULATED JOINT SHALL BE PlACED APPROXIMATELY 50' BEYOND CLEARANCE POINT (C.P.'S) CENTERS. EXCEPT WHERE THE CLEAR POINT IS OH TARGET TRACK PARALLEL TO THE MAIN TRACK, IN WHICH CASE INSULATED JOINTS MAY BE PLACED AT CLEARANCE POINT PLUS 10'
6. SIGNALS ON CANTILEVERS AND BRIDGES SHALL BE LOCATED DIRECTLY ABOVE CENTERS OF TRACK CANTILEVERS AND BRIDGE MOUNTED SIGNALS SHALL BE CENTERED BETWEEN INSULATING JOINTS.
7. TE PLATES UNDER POLARITY JOINTS SHALL HAVE A MINIMUM 1" CLEARANCE FROM THE PLATE OF OPPOSITE POLARITY.
NOTES:
1. PREFERRED DISTANCE FOR MASONRY SIGNAL HOUSE IS 25' FROM C/L OF TRACK OR AS DIRECTED BY THE ENGINEER.
2. PREFERRED DISTANCE FOR CROSSING SIGNAL HOUSES IS 25' FROM C/L OF TRACK AND 30' FROM FACE OF CURB OR AS DIRECTED BY THE ENGINEER.
3. PREFERRED DISTANCE IS 90' SIGNALS SHALL NOT BE PLACED LESS THAN 12' WITHOUT THE APPROVAL OF THE ENGINEER.
4. ENSURE EQUIPMENT IS PLACED WITHIN PROPERTY BOUNDARY AND SIGNAL IS EASILY VIEWED FROM A PREFERRED DISTANCE OF 200'.
5. TOP OF SIGNAL FOUNDATION SHALL NOT BE HIGHER THAN TOP OF RAIL OR LOWER THAN BASE OF RAIL.
6. MATERIALS AND METHODS OF MAINTENANCE ARE TO BE AS DIRECTED BY ENGINEER.
7. MAINTENANCE OF SIGNAGE AND ENSURING SIGNS ARE VISIBLE IS THE RESPONSIBILITY OF THE OWNER OF PROPERTY.
NOTE:
When smaller sized solid conductors are required, flat nut and standard nuts will exchange position.

AAR TERMINAL WITH 1 5/8" STUDS

TURN THE DIRECTION TO TURNED NUT
PLACE SOLID WIRES EXCEPT OVER TERMINAL POST AS SHOWN

SHOWN LESS BUT A MINIMUM OF 32 TERMINALS SHALL BE PROVIDED FOR A CROSSING SIGNAL JUNCTION BOX

UNDERGROUND CABLE TO SHIELDER
SEAL CABLE ENTRANCE

NOTES:
1. All cables shall be insulated. Metal sheathing shall be attached to standing bolt in signal house.
2. Insulation on solid conductors shall be removed and the exposed wire thoroughly cleaned to provide new conductor. Take care not to nick or damage the wire. No insulated wire shall be affected.
3. The bare wire shall be formed to produce an explet which shall be placed over the tapping post. The explet shall be used to provide a turn fitting loop around the post but close enough to easily slide on and off.
4. A flat washer shall be placed on the tapping post. The explet shall then be placed on the post followed by another flat washer. A nut shall be applied and securely tightened with a terminal wrench.
5. Insulation on flex conductors shall be removed using a spring-loaded stripping tool recommended by the manufacturer of the wire and the exposed cable wire thoroughly cleaned to provide new conductivity.
6. Explet shall be attached to flex conductors. Only caltrain approved explet shall be used. A compression tool recommended by the manufacturer of the explet shall be used to attach the explet.
7. A flat washer shall be placed on the tapping post. The explet shall then be placed on the post followed by another flat washer or if applicable the second explet shall be placed on the post followed by a flat washer. A nut shall be applied and securely tightened with a terminal wrench.
8. An insulated test link shall be installed once the signal conductors and explet are attached. The test link shall be secured using one flat and one brass nut and the circuit closed by applying the brass nut.
9. Flex conductors shall be tagged using pacific approved tags.
10. Where possible, spare solid cable conductors shall be attached to spare tapping pool. No more than one insulated conductor shall be secured to a post.
11. Switches permits terminations of cable conductors and equipment within, this method shall be used in junction boxes, cabs, etc. Insulated test terminals shall be installed on each end of any cable terminated so that cable conductors may be isolated without removing conductor from terminal.
NOTES:

1. At signal houses, four ground rods shall be driven into the ground, one near each corner of the structure. At signal cases, two ground rods shall be driven into the ground at opposite corners of the structure. The ground rods shall be a minimum of 6' apart and shall be driven below the ground level. A trench, minimum 12" deep, shall be dug between the ground rods. Each of the ground rods shall be electrically connected to the others using a #8 and bare stranded copper cable held using a thermal sleeve and coated with epoxy resin. The ground wires shall be placed in the bottom of the trench. The trench shall be backfilled, maintaining the soil removed during construction of the trench.

2. Do not connect commercial "AC" power groundwire and signal ground to the same ground grid.

3. Ground wires shall have minimum 6DDG radius. No sharp bends permitted.

4. Ground rod shall be installed between mast and ladder at signal assemblies.
NOTES:
1. BONDS BETWEEN RAILS AT A, B, C AND D SHALL BE APPLIED TO RAIL HERR.
2. TURNOUTS SHALL BE DOUBLE BONDED USING ONE HERR TYPE BOND AND ONE RAILHEAD BOND, WITH EXCEPT TO JOINTS MARKED WITH AN "X". THOSE JOINTS ONLY REQUIRE RAILHEAD BOND WHEN TURNOUT TERMINATES IN A TRACK RELAY.
3. ALL HERR BONDS SHALL BE 3/16" IN DIAMETER, 12" LONG WITH STEEL TERMINALS HELD TO THE HERR OF THE HELD TYPE.
4. ALL RAILHEAD BONDS SHALL BE 3/16" IN DIAMETER WITH STEEL TERMINALS HELD TO CONDUCTORS OF THE HELD TYPE.
5. LOCATION OF THE INSULATED JOINTS MAY BE MODIFIED ONLY WITH THE ENGINEER'S APPROVAL.
6. PLACEMENT OF BOND WIRES SHALL BE VISIBLE BY BURIAL BAND DETECTION.
7. WIRES TO FOLLOW CURVATURE OF RAIL AND TIE WITH NO EXCESS SLACK.
8. ALL BONDS AND TRACK CONNECTIONS UTILIZING 3/16" BOND STRANDS ARE HELD TO THE RAIL HEADS WITH STEEL TERMINALS HELD TO THE RAIL.
9. WHERE THE 2 RAIL RAILS ARE HELD AS ONE PIECE BONDS ARE NOT REQUIRED.
10. ON RAIL FROG, BONDS SHALL BE INSTALLED ON THE SIDE OF THE FROG ON WHICH THE HEADS OF BOLTS ARE LOCATED. ON SPRING RAIL, FROG BONDS ARE NOT REQUIRED ON NOISELESS SIDE.
11. DISTANCE BETWEEN TERMINALS IS SHOWN AS "X". THIS DIMENSION MAY DECREASE, WHEN NECESSARY, DUE TO LIMIT DISTANCE FROM BOLT TO END OF RAIL.
12. WHEN A PLATE CLIP (ON SPRING RAIL, FROG) IS REQUIRED WITH APPLICATION OF BONDS AS SHOWN HEREIN, THE PLATE CLIP SHALL BE ARRANGED TO PERMIT PROPER INSTALLATION OF THE BONDS.
1. FOUNDATIONS SHALL BE HOT-DIPPED GALVANIZED
2. FORGED STEEL 5/8" DIA X 8" BOLTS WITH HEX HEADS, 12 NUTS AND 16 FLAT WASHERS
3. BOLTS SHALL BE THREADS TO ALLOW FOR LEVELING
4. BOLTS, WASHERS AND NUTS SHALL BE GALVANIZED STEEL AND SHALL BE PACKAGED SEPARATELY IN A WATER TIGHT CONTAINER SECURELY ATTACHED TO THE FOUNDATION.
NOTES:

1. INSTALL ON TOP OF HMAQ IN SCHEDULE 80 PVC CONDUIT OR GR3 CONDUIT.

2. WHERE HMAQ UNDERLAY IS INSTALLED, ALL SIGNAL CABLES AND TRACK WIRES SHALL BE INSTALLED IN 4" SCHEDULE 80 PVC Pipe BETWEEN TRACK CENTERS ABOVE HMAQ. PAD, SIGNAL AND TRACK CONSTRUCTION SHOULDN'T COORDINATE INSTALLATION OF CONDUIT UNDER TRACKS PRIOR TO INSTALLATION OF HMAQ. FINAL GRADE SHALL BE APPROVED INCLUDING ANY DRAINAGE SYSTEM. WHEN SIGNAL CABLES TRANSVERSE SIGNAL CABLES SHALL BE SET BELOW BOTTOM OF THE DRAINAGE SYSTEM UNTIL SYSTEM IS LINED, OR VARIANCE APPROVED BY THE ENGINEER.

3. WHEN FIELD CONDITIONS PERMIT, POLARITY TRACK WIRES MAY BE INSTALLED AS SHOWN INSTEAD OF ON TOP OF

4. REFER TO SD-5115 FOR CONDUIT ENTRANCE-EXIT REQUIREMENTS FOR FULL-BORES

5. ALSTOM (FORMERLY GR3)

ANSALDO (FORMERLY US30)

CABLE TROUGH (SEE SD-5123)

TYPICAL CROSS SECTION

TOP OF CONDUIT TO BE 4" ABOVE TOP OF HMAQ.
HIGHWAY GRADE CROSSING SIGNAL HOUSE

STENCIL LETTERING ON BOTH SIDES OF HOUSING
TO BE VISIBLE FROM ROADWAY AND TRACK.

REPORT
EMERGENCY
1-877-723-7255
CROSSING 12554-4398
MAIN STREET

CONTROL POINT SIGNAL HOUSE

STENCIL LETTERING TO BE VISIBLE
TO TRAFFIC TRAVELING IN EITHER DIRECTION.

CP BRISBANE
EMP 6.90

Caltrain

HIGHWAY GRADE CROSSING CASE

STENCIL LETTERING TO BE VISIBLE
FROM ROADWAY AND TRACK.

REPORT
EMERGENCY
1-877-723-7255
CROSSING 12554-4398
MAIN STREET

NOTES:
1. EACH HIGHWAY GRADE CROSSING SHALL CONFORM WITH STANDARDS AND BE
   EQUIPPED WITH A SIGN IDENTIFYING THE CROSSING BY NAME AND HISTORICALLY
   KNOWN TO THE NEAREST TOWN OF A MILL AND A SHIP. ANY ADDITIONAL
   NAME THAT WILL CONNECT TO THE NEAREST AUTHORITY TO
   STOP UNCOVERED TRAFFIC IN CASE OF AN EMERGENCY AT THE CROSSING

2. FOR HIGHWAY GRADE CROSSING HOUSE / CASE SEE SD-5117 FOR
   EMERGENCY NOTIFICATION SCALES

3. FOR CONTROL POINT SIGNAL HOUSE / CASE, LEGEND SHALL BE BLACK
   LETTERS OF HIGH FROM CHINESE POINT 9020, CENTERED ON SIDE OF
   SIGNAL HOUSE, AND AT THE FRONT OF CASE.

PENINSULA CORRIDOR JOINT POWERS BOARD
STANDARD DRAWINGS
SIGNAL AND COMMUNICATION
GENERAL SIGNAL
TYPICAL MARKING LEGEND
HOUSE AND CASE

REPORT
EMERGENCY
1-877-723-7255
CROSSING 12554-4398
MAIN STREET

CONTROL POINT SIGNAL HOUSE
STENCIL LETTERING TO BE VISIBLE
TO TRAFFIC TRAVELING IN EITHER DIRECTION.

CP BRISBANE
EMP 6.90

Caltrain

HIGHWAY GRADE CROSSING CASE
STENCIL LETTERING TO BE VISIBLE
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PENINSULA CORRIDOR JOINT POWERS BOARD
STANDARD DRAWINGS
SIGNAL AND COMMUNICATION
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TYPICAL MARKING LEGEND
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EMERGENCY
1-877-723-7255
CROSSING 12554-4398
MAIN STREET

CONTROL POINT SIGNAL HOUSE
STENCIL LETTERING TO BE VISIBLE
TO TRAFFIC TRAVELING IN EITHER DIRECTION.

CP BRISBANE
EMP 6.90

Caltrain

HIGHWAY GRADE CROSSING CASE
STENCIL LETTERING TO BE VISIBLE
FROM ROADWAY AND TRACK.

REPORT
EMERGENCY
1-877-723-7255
CROSSING 12554-4398
MAIN STREET

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   EMERGENCY NOTIFICATION SCALES

3. FOR CONTROL POINT SIGNAL HOUSE / CASE, LEGEND SHALL BE BLACK
   LETTERS OF HIGH FROM CHINESE POINT 9020, CENTERED ON SIDE OF
   SIGNAL HOUSE, AND AT THE FRONT OF CASE.
REPORT EMERGENCY 1.877.723.7245 CROSSING 125F-6.39 MAIN STREET

REPORT EMERGENCY 1.877.723.7245 CROSSING 001E-1.19 7TH STREET

REPORT EMERGENCY 1.877.723.7245 CROSSING 001F-1.38 TOWNSEND ST

REPORT EMERGENCY 1.877.723.7245 CROSSING 125F-6.39 MAIN STREET

SIGNAGE PANEL

TYPE 1
Scale: Not to Scale

<table>
<thead>
<tr>
<th>TYPE</th>
<th>LOCATION ON SIGNAL HOUSE/CASE</th>
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<tbody>
<tr>
<td>1A</td>
<td>DOOR (1 1/2 WIDE)</td>
</tr>
<tr>
<td>1B</td>
<td>DOOR (2 1/2 AND WIDER)</td>
</tr>
<tr>
<td>2A</td>
<td>7TH STREET SIDE (SP)</td>
</tr>
<tr>
<td>2B</td>
<td>TOWNSEND STREET SIDE (SP)</td>
</tr>
<tr>
<td>2C</td>
<td>LONG SIDE</td>
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</tbody>
</table>

STENCIL MARKING

TYPE 2
Scale: Not to Scale

NOTES:
1. EMERGENCY NOTIFICATION SIGN (SEEN IN ILLUSTRATION) SHALL COMPLY WITH THE REQUIREMENTS OF CALIFORNIA STATE DEPARTMENT OF SAFETY AND WARRIORS.
2. SIGN PANEL SHALL BE 1/8" THICK ALUMINUM.
3. BACKGROUND: BLUE, FEDERAL STANDARD P510B.
4. LETTERS AND NUMBERS: WHITE, 1.75" HIGH ARIAL FOR TYPES 1A & 2A, 2.5" HIGH ARIAL FOR OTHERS, REMOVABLE.
5. CALTRANS WILL PROVIDE CIRCLE CROSSING NUMBER. FOR THE STREET NAME USE THAT OF THE STREET CROSSING THE TRACKS.
6. BORDERS: WHITE, 1" FOR TYPE 2A, 1/2" FOR OTHERS.
7. MOUNTING HARDWARE (TYPE 1): TAPPER PROOF STAINLESS STEEL SS316.
8. TYPE, PLACEMENT, AND LOCATION OF SIGN SHALL BE DETERMINED BY CALTRANS.
NOTE:
TUNED JOINT COUPLER (TJC) SHALL BE INSTALLED 3'-6" FROM POINT WHERE. TOP OF BOX SHALL BE VERTICAL FROM TRACK AND SHALL BE LEVEL WITH TOP OF THE ADDITIONAL BALLAST AND GRADE AS NEEDED TO EXTEND TRACK SHOULDER 3'-6" BEYOND BOX.

STANDARD TYPE PEDESTAL

FOR REFERENCE ONLY
### Excavation Size Chart

<table>
<thead>
<tr>
<th>Model</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>6x8</td>
<td>36&quot;</td>
<td>16&quot;</td>
</tr>
<tr>
<td>12x8</td>
<td>40&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>12x16</td>
<td>40&quot;</td>
<td>22&quot;</td>
</tr>
<tr>
<td>20x12</td>
<td>50&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>20x16</td>
<td>50&quot;</td>
<td>27&quot;</td>
</tr>
<tr>
<td>30x12</td>
<td>60&quot;</td>
<td>24&quot;</td>
</tr>
</tbody>
</table>

### Notes:
1. Prepare a line grade to set the leveling blocks using a transfer on cord line with line level.
2. Install and compact a layer of small aggregate rock, minimum 8" deep.
3. Locate leveling blocks to allow for even distribution of load with block spacing not to exceed 48". Blocks required whenever joints are full and compact the top of leveling blocks with stone. Granular stone backfill against the sides of the channels in 2' compacted lifts to within 2" of finished grade.
4. Channel top set at 2" below finished grade level. Consider joints to each other on the leveling blocks. Each channel should be supported for 1' on the leveling blocks at joints.
5. The details of cable trough intersection are for illustration only. Actual intersections may be different than shown.
NOTE 1

NOTE 2

NOTE 3

NOTE 4

NOTE 5

CABLE TO SIGNALS, LUMINARIES, BRACKETS, ETC.

THRU HOLE M5 X 1/4 X 1/2 DEEP

1/2 FLAT WASHERS (6 PLACES)

SRR RESISTANT SURFACE

1/2 UNC X 4 1/2

SEE DETAIL 1

SEE DETAIL 2

DETAIL 2 FOR 6" X 6" SIGNAL HOUSE

DETAIL 1 FOR 8" X 14" SIGNAL HOUSE

SLACK LOOP REQUIREMENTS:
3 TO 5 SLACK LOOP RECOMMEND AT MOSS FILL BOX AND AT LEAST FILL BOX BEFORE EXITING FOR FIELD EQUIPMENT SLACK LOOP NOT REQUIRED FOR THROUGH CABLES

NOTE:
1. PLACE A LAYER OF CRUSHING ROCKS AT A MINIMUM OF 6" BELOW AND EXTENDING 12" FROM EACH SIDE OF THE PULL BOX. ROCKS SHALL BE COMPAETED PRIOR TO PLACEMENT OF PULL BOX

2. NATIVE MATERIAL SHALL BE USED FOR BACKFILLING CONDUIT ROCK AND DEBITS LARGER THAN 3 INCHES IN DIAMETER SHALL BE REMOVED. BACKFILL CONTRACTION SHALL BE Grades INC IN 8" LISTS

3. PULL BOX SHALL BE DESIGNED FOR 40-60± BRIDGE LOADS AND EQUIPPED WITH COVER DESIGNED FOR VEHICULAR TRAFFIC. MINIMUM NOMINAL SIZE OF PULL BOX SHALL BE 2" X 2" LARGE PULL BOXES SHALL BE PROUER FOR MINIMUM DIA RADIUS OF CABLE AS A FACTOR. TOP OF PULL BOX SHALL BE LEVEL WITH FINISH GRADE

4. FOR CONTROL POINTS, OR CROSSING SIGNAL HOUSE THE COVER ASSEMBLY SHALL BE USED WITH A 4" X 4" PULL BOX WITH NOTE 3 DEIGN SIZES. COVER IS DESIGNED TO BE OPENED FOR THE SIGNAL HOUSE Cable Chute. THE SIDE OF THE COVER WITH THE CABLE CHUTE OPENING IS RATED FOR PEDESTRIAN TRAFFIC ONLY

5. ALL PULL BOXES SHALL BE PROTECTED FROM DAMAGE UNTIL PLACEMENT IN SERVICE

6. SEAL CONDUIT / CABLE WELLS WITH PLASTER OF PARIS OR OTHER SUITABLE MATERIAL
NOTES:
1. WHERE CLEARANCES ARE NOT A FACTOR, SIGNALS SHALL BE SET 12 MIN. TO 15 MAX. FROM CENTER LINE OF TRACKS.
2. FOR SIGNAL UNIT REFERENCE SEE SD-0200. NUMBER PLATE TO BE CARRIED ON CONTROLLED SIGNALS.
3. FOR FOUNDATION SEE SD-0214.
4. ALL IN-LINE SIGNAL LIGHT UNITS SHALL BE LIT, INCANDESCENT LIGHT IS NOT ACCEPTABLE.
5. "P" PLATE Omitted unless called for on circuit plans.
6. SIGNALS SHALL BE EQUIPPED WITH LADDER GUARD AND LOCKING MECHANICAL LADDER AND PLATFORM SHALL MEET CURRENT CODE REQUIREMENTS AND SHALL BE MOUNTED ON FIELD SIDE OF MAST.
7. PROVIDE A MIN. DISTANCE OF 4' FOR WALKWAY AROUND SIGNAL & LADDER.
8. ADJUST SIGNAL LENS NUTS IN TO MANUFACTURER'S SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER.
NOTES:

1. MINIMUM CLEARANCES ARE NOT A FACTORY SPECIFICATION. CLEARANCES SHOWN SHOULD BE APPROVED BY FIELD ENGINEER.

2. FOR SIGNAL UNIT REFERENCE, SEE SE-5201. NUMBER PLATE TO BE MOUNTED ON CONTROLLED SIGNALS.

3. FOR FOUNDATION SEE SE-5114.

4. ALL RH-SIDE SIGNAL UNIT LUMINARIES SHALL BE LED. INCANDESCENT LIGHT IS NOT ACCEPTABLE.

5. 3" PLATE UNLESS CALLED FOR ON CIRCUIT SHEETS

6. SIGNAL UNIT SHALL BE EQUipped WITH LACER GUARD AND LOCKING BRACKET. LOCKS AND PLATFORM SHALL MEET METAL PARTS AND SHALL BE MOUNTED ON FIELD ACCESS OF MAST.

7. PROVIDE A MINIMUM DISTANCE OF 4" FOR WALKWAY AROUND SIGNAL & TOWER.

8. ADJUST SIGNAL UNIT HEIGHT TO MANUFACTURER'S SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER.

9. A LAYER OF CRUSHED ROCKS, 3/4" X 1" SHALL BE PLACED AROUND STRUCTURE A MINIMUM DISTANCE OF 4".
NOTES:

1. Where clearances are not a factor, signals shall be set 1200 mm. to 1500 mm. from center line of tracks.

2. For signal unit reference see SD-5205. Number plate to be stamped on controller signals.

3. For foundation see SD-5119.

4. All 6-line signal light units shall be LED. Incandescent light is not acceptable.

5. 12" plate omitted unless called for on circuit plans.

6. Signal shall be equipped with ladder guard and locking bracket. Ladder and platform shall meet current signal requirements and shall be mounted on field side of race.

7. Provide a min. distance of 4' for walkway around signal & ladder.

8. Select signal lens interior to manufacturer's specifications or as directed by the Engineer.

9. A layer of glassed bonds, 3/4" x 1/4" shall be placed around structure a minimum distance of 4'.
NOTES:

1. WHERE CLEARANCES ARE NOT A FACTOR, SIGNALS SHALL BE SET 12 MIN. TO 15 MAX. FROM CENTER LINE OF TRACKS.

2. FOR SIGNAL UNIT REFERENCE SEE SD-5205, NUMBER PLATE TO BE OBLiterated ON CONTROLLED SIGNALS.

3. FOR FOUNDATION SEE SD-5114.

4. ALL PH-3A SIGNAL LIGHT UNITS SHALL BE RED. INCANDESCENT LIGHT IS NOT ACCEPTABLE.

5. 30" PLATE OBLiterated UNLESS CALLED FOR ON CIRCUIT PLAN.

6. SIGNALS SHALL BE EQUIPPED WITH LACER GUARD AND LACER BRACKET MOUNTED ALONG LATERAL WALLS WITH SUPPORT MEETS CURRENT CIRCA REQUIREMENTS AND SHALL BE MOUNTED ON FIELD SIDE OF WALL.

7. PROVIDE A MINIMUM DISTANCE OF 4" FOR WALKWAY AROUND SIGNAL & LACER.

8. ADJUST SIGNAL LENS MOUNTING TO MANUFACTURER'S SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER.

9. A LAYER OF CRUSHED ROCKS, ¾" X 1¼" SHALL BE PLACED AROUND STRUCTURE & A MINIMUM DISTANCE OF 4
NOTES:
1. ALL LAMP UNITS SHALL BE EQUIPPED WITH ADJUSTABLE REFLECTORS.
2. ALL IN-LINE SIGNAL UNIT LAMPS SHALL BE LED.
3. INCANDESCENT UNIT IS NOT ACCEPTABLE.
4. ADJUST SIGNAL LENS MOTORS TO MANUFACTURER’S SPECIFICATIONS OR AS DIRECTED BY FIVE.
NOTES:

1. TERMINAL BOX SHALL BE ALUMINUM MEASURING 17" W X 28" H X 9 1/2" D.
2. INSTALLED TEST TERMINALS AS SHOWN IN SO-SIZE SHALL BE INSTALLED GUTTER FLUX CONDUCTOR AND CABLE CONDUCTOR.
3. ALL CONDUCTORS SHALL BE IDENTIFIED WITH SLEET TYPE TAGS. TAGS SHALL DISPLAY NOMENCLATURE AS SHOWN ON CIRCUIT DRAWING.
4. EACH SPARE CABLE CONDUCTOR SHALL BE TERMINATED ON AN APPROVED TRAY, TERMINAL ON EACH CORNER OF THE TERMINAL BOX.
5. TERMINALS NOT USED SHALL BE EQUIPPED WITH TWO WASHERS AND TWO CROWN NUTS.
6. CABLE ENTRANCE SHALL BE SEALED TO PREVENT ACCESS BY ROODIES AND OTHER PEOPLE.
7. PROTECT CABLE FROM SHARP EDGES WITH RUBBER COUNTRY-WATERS.
8. AN ADDITIONAL JUNCTION BOX MAY BE REQUIRED IF AMOUNT OF CONDUCTORS EXCEEDS THE AMOUNT OF TERMINALS.

PENINSULA CORRIDOR JOINT POWERS BOARD

STANDARD DRAWINGS

CALTRAIN

TYPICAL SIGNAL TERMINAL BOX

DRAWING NO. 1-05-528S

DATE: 08/29/32

SIGNATURES:


developer

reviewer

APPROVED:

signed

signed
NOTES:
1. NUMBER PLATES SHALL BE MADE OF ALUMINUM OR STEEL AND COMPLETE WITH ALL HARDWARE REQUIRED FOR MOUNTING TO ALMOST ANY SIZE MAST.
2. ALL NUMBER AND LETTER PLATES SHALL BE WHITE PAINT ON BLACK BACKGROUND.
3. MOUNTING BRACKETS SHALL BE FOR 5' PIPE MAST MOUNTING UNLESS OTHERWISE SPECIFIED.

4444

5 1/2 (TOP)
1/4
WHEN INSTALLING ON SIGNAL, APPLY PLASTIC TAPE TO ALUMINUM SURFACES IN CONTACT WITH STEEL SURFACES.

3/8" X 1 1/2" X 1 1/2" ALUMINUM ANGLE FOR BRACKET

9/16" HOLE FOR 1/2" BOLT

1/4" SLotted ROUND HEAD ALUMINUM MACHINE SCREWS 5/8" LONG WITH NYLON KNOT AND SNAP-PROOF WASHER.

8" BLACK LETTERS SCREENED ON WHITE NON-REFLECTIVE PLASTIC REAR BACKGROUND

FOR REFERENCE ONLY
NOTES:
1. BASE OF BRIDGE MAST SHALL BE LEVEL WITH TOP OF HIGHEST RAIL
2. 4" x 7/8" x 1/4" x 1/4" pre-stressedordinary
    cold-formed steel, anchor plate required
    inside the mast. This anchor plate does not have
    sufficient capacity
3. Bridge ladder and steps shall meet all
    code requirements.
4. Spacing of bridge mounted signals varies per
    location and will be determined during design

FOOTING REQUIREMENTS:
1. A layer of crushed rocks, 3/4" x 1/4" small
   pebbles around structure a minimum
   distance of 4 ft. Provide retaining wall if
   required.
NOTES:
1. BASE OF BRIDGE MAST SHALL BE LEVEL WITH TOP OF HIGHEST RAIL
2. 48" X 72 3/4" X 24" FREE STANDING POWDER COATED STEEL JUNCTION CASE REQUIRED WHERE MAST MOUNTED JUNCTION CASE DOES NOT HAVE SUFFICIENT CAPACITY
3. BRIDGE LADDERS AND CASES SHALL MEET ALL OBSA REQUIREMENTS
4. SPACING OF BRIDGE MOUNTED SIGNALS VARIES PER LOCATION AND WILL BE DETERMINED DURING DESIGN

FOOTING REQUIREMENTS:
1. A LAYER OF CRUSHED ROCKS 3/4" X 1 1/4" SHALL BE PLACED AROUND STRUCTURE A MINIMUM DISTANCE OF 4'. PROVIDE RETAINING WALL IF REQUIRED

4" FLEX CONDUCTORS MAY BE RUN OUTSIDE OF FOUNDATION TO ENTER BOTTOM OF JUNCTION BOX. REFER TO SD-2206
NOTES:

1. CONCRETE SHALL BE IN ACCORDANCE WITH AGGRAVATION SPECIFICATIONS FOR CONCRETE STRUCTURES AND FOUNDATIONS.

2. TOP AND BOTTOM SURFACES OF ALL PARTS SHALL BE FLAT AND PARALLEL.

3. STEEL PLATE AND NUT ASSEMBLIES SHALL BE PLACED ON MAST WHEN ASSEMBLED. THE PLATE SHALL BE PERPENDICULAR TO THE BASE PLATE UPPER SURFACE WITHIN ONE DEGREE OF PERPENDICULARITY.

4. NUT ASSEMBLY SHALL BE ARRANGED SUCH THAT ONE NUT AND FLAT WASHER WILL BE USED TO SECURE ANCHOR BOLTS TO FOUNDATION. ANOTHER NUT AND FLAT WASHER SHALL BE USED TO LEVEL THE BRIDGE AND OR CANTILEVER MAST AND A THIRD NUT/WASHER COMBINATION TO SECURE MAST IN PLACE.

5. TARP EXCAVATION WILL PROVIDE CRUSHED ROCK PRIOR TO SETTING FOUNDATION.
NOTES:

1. Foundation Shall be hot-dipped galvanized and in accordance with ASTM SPEC A53.

2. All angle iron shall be ASTM 1000 structural steel. 2-1/2" x 2-1/2" x 1/4" thick, and all plate steel to be ASTM 1000 and at least 1/4" thick.

3. Each assembly shall consist of 4 (four) fasteners: 5/8" x 10" x 1-1/2" long hex head bolts, 4 hex nuts and 8 flat washers for attaching pier to struts and cage.

4. Tap foundation hole and provide crushed rock prior to setting foundation.

INSTALLATION SET-UP

<table>
<thead>
<tr>
<th>BOLT CENTERS</th>
<th>WTE WITH CASE</th>
</tr>
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<tbody>
<tr>
<td>18 1/2&quot; x 34&quot;</td>
<td>2&quot; x 7&quot;</td>
</tr>
<tr>
<td>18 1/2&quot; x 41 3/4&quot;</td>
<td>3&quot; x 7&quot;</td>
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<tr>
<td>18 1/2&quot; x 71 1/4&quot;</td>
<td>8&quot; x 7&quot;</td>
</tr>
</tbody>
</table>
NOTES:
1. STANDARD JUNCTION BOX SHALL CONTAIN A MINIMUM OF 30 AAT TERMINALS
2. ALTERNATE JUNCTION BOX SHALL CONTAIN A MINIMUM OF 12 AAT AND MANUAL JUMPERS TERMINAL - TO BE USED ON NEW INSTALLATIONS ONLY WITH APPROVAL OF THE ENGINEER
3. ONLY ONE SOLID WIRE PER TERMINAL FOR CORD PROTECTION
4. IMAC INSTALLATION - PEDESTAL MODIFICATION: TOP OF IMAC LEVELED WITH TOP OF TFE
5. CALIFORNIA WIRE (COP) MAY BE USED IN LUGS OF PEDESTAL AS PART OF A CONDUIT AND PULL BOX INSTALLATION
NOTES:
1. TOP OF JUNCTION BOX AND SHALL BE LEVEL WITH TOP OF RAIL
2. SWITCH CIRCUIT CONTROLLER SHALL BE EQUIDISTANT BETWEEN INTERNAL OR EXTERNAL SPRING
3. JUNCTION BOX SHALL BE MOUNTED ON A 1 1/2" TIE IN TO OPEN AWAY FROM TRACK
4. THE CENTER LINE OF THE CRANK SHAFT SHALL BE AT A MAXIMUM 2" FROM THE FACE OF THE RAIL
5. FLEX CONDUIT BETWEEN JUNCTION BOX AND SWITCH CIRCUIT CONTROLLER SHALL BE 3'/8" TO 2'4" AND CONTAIN A STEEL CONE
6. FLEX CONDUIT SHALL BE ROUTED SO IT DOES NOT INTERFERE WITH ROOD MOVEMENT
7. SEE TRACK STANDARDS FOR PROPER TIE LENGTH & SPACING
8. LAYOUT BASED ON USE OF HIGH SWITCH CRANK MAINTAIN ADJUSTMENTS BASED ON SWITCH STAND USED
9. WITH THE OPERATING CRANK POINTING VERTICALLY DOWNWARD AND THE SWITCH POINTS IN MID-POSITION, MARK THE LOCATION OF THE CONTROL BOX MOUNTING HOLES AND DRILL
10. PLACE 3/4" DIA. BOLTS THROUGH THE HOLES OF BOLT SHALL BE REEDED WITH AROUND WASHER AT BOTTOM OF THE
11. INSTALL OPERATING ROOD ON POINT KNOB AND OPERATING CRANK WITH THE SWITCH POINTS IN MID-POSITION
12. CENTER SCREW JAON ON THREADED PORTION OF POINT DETECTOR ROD
13. ALLOW ENOUGH CLEARANCE BETWEEN THE SIDE OF THE HEAD BLOCK TIE AND THE 3/4" OR 1 1/4" BALL STUD TO INSURE FREE MOVEMENT
14. ANSALDO STR FORMERLY USES

NEAR POINT NORMALLY CLOSED (PREFERRED)

FAR POINT NORMALLY CLOSED
NOTES:
1. THROW RODS CUT OFF TO 14' LENGTH REMOVE ALUMINUM FITTINGS FROM TURNOUT BOLT TO CLEAR COVER ON SWITCH MACHINE
2. SWITCH ADJUSTER VERTICAL
3. LOCK ROD CONNECTION
4. POINT DETECTOR ROD
5. SQUARE JAW
6. SCREW JAW
7. ADJUSTABLE LINK
8. PIPE GUIDE
9. SWITCH POINT ROLLER, CM-4 (TWO PER SET, 3 SETS PER SWITCH)
10. 2" X 1/2" STEEL STRAPS
11. "T" CRANK STAND ASSEMBLY (SHORT)
12. "T" CRANK STAND ASSEMBLY (LONG)
13. SCREW, 1/4" X 4" LACES
14. CRANK STAND BASE
15. FOR THE LENGTH AND THE SPACING REFER TO 50-200 SERIES DRAWINGS

FOR REFERENCE ONLY

PENINSULA CORRIDOR JOINT POWERS BOARD
STANDARD DRAWINGS
SIGNAL AND COMMUNICATION SWITCH APPARATUS
M-23A SWITCH MACHINE LAYOUT
NO. 20 TURNOUT, RIGHT MOUNTED

Caltrain
Approved by
Bernard Brownlee, Stephen C. Signer

Drawn
June 14, 2011

Sheet No. 50-5006
Scale 1:1
NOTES:
1. "5'-8" CUT OUTF" OFF "4'-10" LENGTH REMOVE ALLURE FITTING TURNED BOLT TO CLEAR COVER ON SWITCH MACHINE
2. SWITCH ADJUSTABLE VERTICAL
3. LOCK ROD CONNECTION
4. POINT DETECTOR ROD
5. 1/2" x 3" STAINLESS STEEL STRAP CUT TO REQUIRED LENGTH AND DRILLED FOR 5/8" LAG SCREW
6. 1'-8" MAX. ELEVATION SHALL BE LEVEL BETWEEN SWITCH MACHINE AND JUNCTION BOX TOP OF JUNCTION BOX SHALL NOT BE HIGHER THAN TOP OF SWITCH MACHINE
7. FLEX CONDUIT TO BE STEEL CORE
8. SET MACHINE SO THAT CONNECTING RODS ARE PERPENDICULAR TO TRACK
9. REFER TO SD-230 SERIES DRAWINGS FOR TIE SPACING AND LENGTH

LEFT HAND MOUNTED
NOT TO CONCRETE
TIES SPACING

SWITCH POINT SHALL BE LAG
AT CASE PLATE ON T

RIGHT HAND MOUNTED
NOT TO CONCRETE
TIES SPACING

67" C/C JUNCTION BOX TO
EDGE OF AT CASE PLATE
NOTES:
1. THROW ROD CUT OFF TO 74" LENGTH, REMOVE ALUMINUM FITTING TURNED BOLT TO CLEAR COVER ON SWITCH MACHINE
2. SWITCH ADJUSTMENT, VERTICAL
3. LOCK ROD CONNECTION
4. POINT DETECTOR ROD
5. 1/2" x 8" STEEL LAG BOLT TO REQUIRED LENGTH AND DRILLED FOR 3/4" LAG SCREW
6. 18"x24" MAX. LAG BOLT SHALL BE LEVEL BETWEEN SWITCH MACHINE AND LOCATION BOX, TOP OF LOCATION BOX SHALL BE HIGHER THAN TOP OF SWITCH MACHINE
7. FLEX CONDUIT TO BE STEEL CONDUIT
8. SET MACHINE SO THAT CONNECTING RODS ARE HORIZONTAL TO TRACK
9. REFER TO 320-3500 SERIES DRAWINGS FOR THE SPACING AND LENGTH

LEFT HAND MOUNTED
NO. 10 WOOD TIES SPACING

RIGHT HAND MOUNTED
NO. 14 WOOD TIES SPACING

SWITCH POLY SHELL LAG AT GAGE PLATE TO 84" SPACING
END OF POINT NEEDS TO HANG OVER THE FRONT EDGE OF THE #1 CAGE PLATE BY 9/32".

5 1/4" MAX & 4 3/4" MIN. THROW

NOTE 2

END OF POINT NEEDS TO HANG OVER THE FRONT EDGE OF THE #1 CAGE PLATE BY 9/32".

5 1/4" MAX & 4 3/4" MIN. THROW

NOTE 2

LEFT HAND MOUNTED
NO. 10 CONCRETE TIES SPACING

RIGHT HAND MOUNTED
NO. 14 CONCRETE TIES SPACING

NOTES:
1. SET MACHINE SO THAT CONNECTING RODS ARE PERPENDICULAR TO TRACK
2. 18° - 26° MAX. ELEVATION SHALL BE LEVEL BETWEEN SWITCH MACHINE AND JUNCTION BOX. TOP OF JUNCTION BOX SHALL NOT BE HIGHER THAN TOP OF SWITCH MACHINE.
3. REFER TO 50-2000 SERIES DRAWINGS FOR TIE SPACING AND LENGTH
LEFT HAND MOUNTED

NO. 10 WOOD TIES
SPACING

RIGHT HAND MOUNTED

NO. 10 WOOD TIES
SPACING

NOTES:

1. SET MACHINE SO THAT CONNECTING RODS ARE PERPENDICULAR TO TRACK

2. 1½"-2¼" MAX. EXCURSION SHALL BE LEVEL BETWEEN SWITCH MACHINE AND JUNCTION BOX. TOP OF JUNCTION BOX SHALL NOT BE HIGHER THAN TOP OF SWITCH MACHINE

3. REFER TO 50-2000 SERIES DRAWINGS FOR THE SPACING AND LENGTH
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### ITEM # | DESCRIPTION / MATERIAL / APPROX. SIZE
--- | ---
1 | SWIVEL ROD 7/8" DIA.
2 | ADJUSTABLE SWIVEL FRONT END
3 | ADJUSTABLE HORIZONTAL
4 | FRONT END
5 | LATCH BAR
6 | INSULATION PLATE
7 | INSULATION PLATE
8 | INSULATION PLATE, 7" X 20" X .005 X 1 3/32" 5G
9 | SIDE 1/2" X 1/2" X 3/32" DRILLED
10 | SIDE 3/4" X 3/4" LONG TO HD OR FOR 3/8" SOCKET X 3 7/8"
11 | SIDE 1/8" THICK HD
12 | LOCK WASHER 3/8" X 3/32"
13 | SPACER 3/4" X 1/32" LONG
14 | SPACER PLATE
15 | 1/8" BOLT - FRONT END SWIVEL SIDE
16 | OS 1/2" X 3/8" HEAVY HD NO.
17 | LOCK WASHER 1/8" X 3/32"
18 | SPACER 1/4" X 1/2" X 3/32"
19 | COTTER PIN 1/4" X 3/32"

**NOTE:**
THROW RODS SHALL BE MADE FROM 1 1/8" ROUND BAR STOCK.
POSITIONED WITH SIDE 7/8" THREADED BOLT 2 MECHANICAL NUTS
AND LOCK WASHERS, AS SHOWN. NO MELTING OF ROD IS
PERMITTED.
PROCEDURE
1. CENTER SCREW JAWS ON THREADED PORTION OF POINT DETECTOR ROD
2. POSITION SINE ON HEA DBLOCK TIE INSURING AMPLE CLEARANCE FOR OPERATING ROD ON THE POINT LUG AND OPERATING CRANK POINTS, HORIZONTALLY AND/OR VERTICALLY CONVERGENT.
3. WITH THE SWITCH POINT IN MID-POSITION INSTALL THE OPERATING ROD ON THE POINT LUG AND OPERATING CRANK.
4. WITH CRANK VERTICALLY CONVERGENT AND SWITCH POINTS CENTERED, MARK HOLES AND DRILL.

NOTES
1. TOP OF JUNCTION BOX LID LEVELS WITH TOP OF TIE
2. FOR TIE LENGTH AND SPACING REFER TO TRACK STANDARDS
3. CIRCUIT CONTROLLER SHALL BE POSITIONED SO THAT LID OPENS AWAY FROM THE TRACK

JUNCTION BOX DETAIL
FOR ASSEMBLED JUNCTION BOX DETAIL (SEE 50-6320), LOCATE JUNCTION BOX OUTSIDE BALLAST EDGE AND EMBRACE CONDUITS TO PREVENT WIRING REINSURANCE TOP OF JUNCTION BOX LEVEL WITH TOP OF TIE.
NOTES FOR 50/51 SWITCH STAND:
1. BOLT CLAMP 2 TO SWITCH LEVER, FIGURES 1 AND D
2. USING A 3/8" DRILL, DRILL THROUGH CLAMP AND LEVER AND INSTALL RIVET 4, FIGURE D
3. NO TE CAPPING, FIGURE B
4. INSTALL CABLE EXTENSION ADAPTERS AND DEVIATORS BEFORE BENDING LOCK IN PLACE, SECURE LOCK ON TE WITH NUTS, GAP WASHER, NUTS, AND LOCK WASHERS
5. TO ASSEMBLE LATCHING ROD FIGURE C-1, PLACE SWITCH LEVER IN LOCKED UP POSITION, FIGURE A, PRESS PEDAL DOWN AND INSERT LATCH ROD THROUGH HORIZONTAL HOLE IN LOCK STAND, INSERT STUD 4 FIGURE D. THROUGH FRONT HOLE IN LATCH ROD AND TEMPORARILY SECURE IT TO CLAMP AS DEEP AS IT WILL GO AND WIDEN IT IN POSITION. SCREW ACROSS FACE OF LATCH ROD NEXT TO PEDAL CASTING FIGURE D. REMOVE STUD AND LATCH ROD. CLOTH LATCH ROD 1/32" SHORT OF SCREW MARK
6. FOR ADJUSTABLE LATCH ROD FOLLOW PREVIOUS PROCEDURE, EXCEPT INSERT LATCH ROD IN 1/8" STUDS INSTEAD OF STUDS
7. IN FINAL ASSEMBLY, MOUNT STUDS FIGURE D, WITH A WRENCH TO SECURE LATCH ROD TO CLAMP, DRILL THROUGH CLAMP AND STUD WITH A 1/8 DRILL RIVET PIN D, FIGURE D

NOTES FOR MERIDIAN (RACOR) SWITCH STAND:
1. BOLT CLAMP 2 TO SWITCH LEVER, FIGURE C
2. USING A 3/8" DRILL, DRILL THROUGH CLAMP AND LEVER AND INSTALL RIVET 4, FIGURE C
3. INSTALL CABLE EXTENSION ADAPTERS AND DEVIATORS BEFORE BENDING LOCK IN PLACE, SECURE LOCK ON TE WITH NUTS, GAP WASHERS, NUTS, AND LOCK WASHERS, FIGURE A
4. TO ASSEMBLE LATCH ROD FIGURE B-2, PLACE SWICH LEVER IN LOCKED UP POSITION, FIGURE B, PRESS PEDAL DOWN AND INSERT LATCH ROD THROUGH HORIZONTAL HOLE IN LOCK STAND, INSERT STUD 4 FIGURE B. THROUGH FRONT HOLE IN LATCH ROD AND TEMPORARILY SECURE IT TO CLAMP AS DEEP AS IT WILL GO AND WIDEN IT IN POSITION. SCREW ACROSS FACE OF LATCH ROD NEXT TO PEDAL CASTING, REMOVE STUD AND LATCH ROD. CUT OFF LATCH ROD 1/32" SHORT OF SCREW MARK
5. IN FINAL ASSEMBLY, MOUNT STUD FIGURE B-14 WITH A WRENCH TO SECURE LATCH ROD TO CLAMP, DRILL THROUGH CLAMP AND STUD WITH A 1/8 DRILL RIVET PIN D, FIGURE C
CONSTRUCTION NOTES:

NOTE 1:
When dismantling or making adjustments, air shall be shut off at the gauge valve located at one end of the top switch valve.

NOTE 2: SLIDE BAR
The slide bar stroke (1/2") may be adjusted by means of an adjusting nut on the end of the pivot rod. To obtain equal travel of the slide bar roller on either side of the equipment, that is, the center portion is obtained, the adjusting nut is tightened up with the center of one of the gauge gun holes in the top rail when the bar is at its respective extreme position.

NOTE 3: SCREW CRANK
The maximum operating rod thrust for a switch model is obtained when the operating arm is adjusted to the shortest possible length to give the necessary switch stroke (1/2") lost motion in the switch. Excess is generally considered inefficient.

NOTE 4: FRICTION LOCK
Adjustment of the friction lock spring is obtained when the split ends of the adjusting screw threads flush with the body of the friction lock arm when it is threaded.

NOTE 5: ADJUSTMENT
Loosen the clamping or locking bolt. Adjust the position of nuts on the arm and turn the locking device on the slide bar into the respective notches in the lock rod without any interference. Then, adjust the slide bar horizontally and vertically with the connecting rod. The clearance on each side of the locking rod when the clamp bolt and lock nut is in correct position. Move the remaining points coincide with the outer edges of the locking notches.

NOTE 6: POINT DETECTOR BAR ADJUSTMENT
Turn the bar by means of the thumbscrew in or out on the inclined portion of the connecting rod. Until the beveled portion against the spring point clears the point detector roller by 1/8". This condition shall be checked by using a 1/8" dial gauge to ensure a snug fit. Lock the adjustment with the lock nut in the connecting rod. Operate the machine to the other extreme position and maintain the same relationship between the beveled portion of the adjustable guide on the detector bar and the point detector roller by turning the beveled nut on the bar until necessary. Lock the adjustment with the lock nut in the connecting rod. Adjustments 1/4" movement from point detector bar shall throw the reed switch and 1/16" movement should latch the controller.

NOTE:
Refer to SE-2000 series drawings for the spacing.
FIGURE 1
SINGLE LANE GROUND FLASHERS WITH BAKC LIGHTS

FIGURE 2
TWO LANE APPROACH GROUND FLASHERS WITH BACK LIGHTS

FIGURE 3
TWO LANE APPROACH GROUND FLASHERS ON R.M. SAIE AND ONE MEDIAN - NO BACK LIGHTS

NOTES:
1. THIS DRAWING SHALL BE USED ONLY AS A GUIDE. EACH CROSSING SHALL BE EVALUATED AND LED LAMPS ADJUSTED TO PROVIDE OPTIMUM COVERAGE.
2. DEFLECTION FOR BACK LIGHTS AND SIDE LIGHTS: 70'
3. DEFLECTION FOR LIGHTS FACING TRAFFIC: 20'/15'
4. DEFLECTION FOR LIGHTS OVER TRAFFIC: BOTH DIRECTIONS: 20'/15'
5. FIRST NUMBER IS HORIZONTAL DEFLECTION
6. SECOND NUMBER IS DOWNWARD DEFLECTION
7. ANGLES OF DEFLECTION DO NOT APPLY TO LED SIGNALS
8. FIXED LED LIGHTS TO FOCUS POINT ON DRAWING
9. MAINTAIN 30 INCH SEPARATION BETWEEN FLASHERS
FLAShING LIGHT SIGNALS WITH ENTRANCE AND EXIT GATES
SIGNAL CROSSING HOUSE PULL BOX AND CONDUIT CONFIGURATION

LEGEND
- 18" x 18" x 12" CONCRETE PULL BOX
- 24" x 18" x 12" Precast Pull Box
- 6" x 6" x 4" CONCRETE PULL BOX
- MULTIPLE CONDUITS (NUMBER OF CONDUITS)
- SINGLE CONDUIT
- WATER SERVICE
- 8x6 CROSSING HOUSE

NOTES:
1. CROSSING SIGNAL HOUSE LOCATION IS TYPICAL. MAY BE LOCATED IN ANY NEUTRAL QUADRANT.
2. ALL CONDUITS SHALL BE 4" SCHEDULE 80 PVC UNLESS OTHERWISE SPECIFIED.
3. A MINIMUM OF A CONDUIT SHALL BE MAINTAINED UNDERNEATH THE ROADWAY ON BOTH SIDES OF TRACKS AFTER INITIAL INSTALLATION.
4. SPARE CONDUITS SHALL BE INSTALLED COMPLETELY FROM ONE 6 x 6 x 4 PULL BOX TO THE OTHER 6 x 6 x 4 PULL BOX.
5. THE AMOUNT OF EXPRESS CONDUITS (AS SHOWN) SHALL BE DETERMINED BY CALTRAIN DURING DESIGN.
6. ALL CONDUITS SHALL BE SIZED A MINIMUM OF 36" BELOW TOP OF GROUND SPACE.
7. INSTALL CABLE AND TRACK WIRE AS SPECIFIED BY SIGNAL DESIGN DRAWINGS.
8. 24" x 18" x 12" PULL BOXES SHALL BE PLACED DIRECTLY OVER THE SIGNAL MAST AT A MINIMUM DISTANCE OF 3'-0".
9. Deviation from this standard shall be approved by CALTRAIN.
FLAShING LIGHT SIGNALS WITH ENTRANCE AND EXIT GATES
THE USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY CALTRAIN.

NOTES:
1. THE LOCATION PLAN MAY VARY AS FIELD CONDITIONS REQUIRE.
2. ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 32" MEASURED FROM THE CENTER OF AXLE TO THE TOP OF GATE ARM.
3. SEE STANDARD DRAWINGS SD-7000 SERIES FOR ADDITIONAL INFORMATION.
4. REFER TO AREA GAS MANUAL PART 3.95 FOR DIFFERENT CONFIGURATION.
**CANTILEVER FLASHERS WITH ENTRANCE AND EXIT GATES:**

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

*IN USE OF MINIMUM DIMENSIONS SHALL BE AUTHORIZED BY CALTRAIN.*

**NOTES:**

1. **TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.**
2. **ROADWAY GATE ARM LENGTH SHALL NOT EXCEED 25' MEASURED FROM THE CENTER OF GATE TO THE TOP OF GATE ARM.**
3. **SEE STANDARD DRAWINGS 50-7000 SERIES FOR ADDITIONAL INSTRUCTIONS.**
RIGHT ANGLE CROSSING

ACUTE ANGLE CROSSING

OBTUSE ANGLE CROSSING

FLASHING LIGHT SIGNALS WITH ENTRANCE AND EXIT GATES AND MEDIAN

ONE OR MORE TRACKS. TWO-WAY VEHICULAR TRAFFIC. TWO LANES EACH WAY WITH MEDIAN.

MINIMUM DIAMETER AND SPACING OF GATE ENTRANCES SHOULD BE ALTERNATED BY GATE.

NOTES:

1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE.
2. ADDITIONAL MEDIAN WIDTH MAY BE REQUIRED TO PROVIDE CLEARANCE FOR
   247 BACKGROUNDS, VIOLENTS, OR GATE COMPONENTS.
3. BACKLIGHTS MAY BE ADDED AS CONDITIONS REQUIRE.
4. ROADSIDE GATE ARM LENGTH SHALL NOT EXCEED 32' MEASURED FROM THE
   CENTER OF WINDING TO THE TOP OF GATE ARM.
5. WHERE BOTH ENTRANCE GATES AND EXIT GATES ARE ALIGNED ON A MEDIAN,
   FRONT LIGHTS SHALL BE INSTALLED ON THE ASSEMBLY CLOSEST TO TRAFFIC
   APPROACHING IN THE LEADING DIRECTION.
6. MAINTAIN 50' SEPARATION FOR FLASHERS.
7. SEE STANDARD DRAWINGS 50-7050 SERIES FOR ADDITIONAL INFORMATION.
8. REFERENCE ARENA CBS MANUAL PART 3.1.36 FOR DIFFERENT CONFIGURATIONS.
CANTILEVER FLASHERS WITH ENTRANCE AND EXIT GATES AND MEDIAN

1. TYPICAL LOCATION PLAN MAY VARY AS CONDITIONS REQUIRE
2. ADDITIONAL MEDIAN WIDTH MAY BE REQUIRED TO PROVIDE CLEARANCE FOR 24" BARRIERS, WOODFRAME, OR GATE COUNTERWEIGHTS
3. ROADWAY GATE WARD LENGTH SHALL NOT EXCEED 25' MEASURED FROM THE CENTER OF ANCHORAGE TO THE TOP OF GATE STALL
4. SEE STANDARD DRAWINGS SD-9000 SERIES FOR ADDITIONAL INFORMATION
5. WHERE BOTH ENTRANCE GATES AND EXIT GATES ARE ALIGNED ON A MEDIAN, FRONT LIGHTS SHALL BE INSTALLED ON THE ASSEMBLY CLOSEST TO TRAFFIC APPROACHING IN THE LEFTHAND DIRECTION
TYPICAL LOOP LAYOUT DIMENSIONS

1. LOOPS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS
2. "A" - TYPICALLY 15" MINIMUM DIMENSION, "14" AND "12" MAY BE REDUCED IF ENTRANCE GATES CANNOT BE LOCATED
3. "B" - TYPICALLY 15" MAY BE REDUCED IF EXIT GATES CANNOT BE LOCATED, SEE "C"
4. "C" - TYPICALLY 12", MAY VARY FROM 8" TO 12" DEPENDING ON PAVEMENT QUALITY
5. "D" - TYPICALLY 2' FROM EDGE OF TRAVELEDeway OR LANE LINE
6. "E" - 3'-3/4" REQUIRED TO AVOID LOOP ACTIVATION WHEN A VEHICLE DRIVES UNDER AN ENTRANCE GATE. DIMENSION MAY BE REDUCED IF GATES CANNOT BE LOCATED IN ORDER TO MAINTAIN THE 5' MINIMUM RECOMMENDED IN DIMENSION "G"
7. "F" - TYPICALLY 2' FROM LOOP TO EDGE OF TRAVELEDeway. SIMILAR TO DIMENSION "E" MAY BE INCREASED UP TO 3' IF IMPERVIOUS SURFACE OR OTHER EXISTS OR PROTRUDS AS DETERMINED BY ENGINEER
8. "G" - MAXIMUM LOOP WIDTH SHALL BE 8' MAXIMUM. LOOP WIDTH OF ENTRANCE AND EXIT LOOPS SHALL BE 5' MINIMUM. LOOPS BETWEEN TRACKS SHALL BE 3' WIDE MINIMUM
9. "H" - MAXIMUM LOOP LENGTH 28'-6"
10. "I" - MAXIMUM 1.5' BETWEEN LOOPS IN THE SAME LANE

NOTES:

1. TOTAL AREA OF LOOP SHALL BE 144 SQ FT MAXIMUM
   (EXAMPLE 1: 8' X 18' = 144 SQ FT)
   (EXAMPLE 2: 6' X 24' = 144 SQ FT)
2. WHILE LOOPS MAY COVER MULTIPLE Lanes, THEY SHALL NOT COVER PARTIAL LANES
3. PREFER VEHICLE DETECTION LOOPS, WELL WATER REPELLENT, WITH AN INTEGRAL CHECK LOOP SUCH AS THAT MANUFACTURED BY RENDA ARE
4. SHALL BE CONSTRUCTED TO ENSURE LOOP INSTALLATION SHALL BE AVOIDED

PENINSULA CORRIDOR JOINT POWERS BOARD

STANDARD DRAWINGS

SIGNAL AND COMMUNICATION HIGHWAY GRADE CROSSOVER APPARATUS PLACEMENT FOR INDUCTIVE LOOPS USED WITH EXIT GATES
NOTES FOR GATE ARM:

1. GATE ARM LENGTH IS MEASURED FROM GATE MECHANISM GATE SHAFT TO END OF GATE ARM.

2. END OF GATE ARM SHALL BE LOCATED WITHIN 24" OF THE CENTERLINE OF ROADWAY OR FACE OF MEDIAN CURB WHERE GATE IS TO BE LOCATED.

3. THE FOLLOWING GUIDELINES SHALL BE USED FOR GATE ARM AND LIGHT ASSEMBLY DESIGN:
   - LIGHTS SHALL BE PLACED FOR OPTIMUM VIEWING BY MOTORIST.
   - LIGHTS SHALL BE CENTERED BETWEEN LAMP A AND LAMP C.
   - LAMP A: 12" FROM END OF GATE ARM.
   - LAMP B: GATE ARM SHOULDN'T BE CENTERED BETWEEN LAMP A AND LAMP C.
   - LAMP C: GATE ARM SHOULD BE 25" FROM CENTER OF GATE.

4. FOR GATE ARM AND LIGHT ASSEMBLY DESIGN:
   - LIGHTS SHOULD BE PLACED FOR OPTIMUM VIEWING BY MOTORIST.
   - LIGHTS SHOULD BE CENTERED BETWEEN LAMP A AND LAMP C.
   - LAMP A: 12" FROM END OF GATE ARM.
   - LAMP B: GATE ARM SHOULDN'T BE CENTERED BETWEEN LAMP A AND LAMP C.
   - LAMP C: GATE ARM SHOULD BE 25" FROM CENTER OF GATE.

5. TOP OF FOUNDATION SHALL BE LEVEL WITH GROUND LEVEL.

6. WHEN USED, SIGNAGE ASSEMBLY SHALL BE PLACED SO AS NOT TO INTERFERE WITH GATE ARM OR REDUCE CLEARANCE.

7. TRAFFIC SIGN SHALL BE PLACED WHERE TWO OR MORE TRACKS CROSS STREET.

8. GATE LAMPS SHALL BE 14" IN DIAMETER.

9. FLASHING LIGHT Signals Light Backgrounds - 24" and Vents Shall Be Steel.

10. LENS HORIZONTAL DEFLECTION PER AREA/AREA.

11. WHEN AUXILIARY PEDISTRIAN GATE ARM IS USED, FLASHING LIGHT BRACKETS SHALL BE OFFSET.

12. GATE MECHANISM SHALL BE ADJUSTED TO ENSURE THAT WHEN GATE IS IN FULL HORIZONTAL POSITION, THE GATE ARM RESTS BETWEEN 5" TO 4" ABOVE CENTER OF MEDIAN.

13. PEDISTRIAN GATE ARM SHALL HAVE TOP LAMP UP TO 10" GATE ARMS LONGER THAN 10" TO HAVE THREE LIGHTS.

14. PEDISTRIAN GATE ARM SHALL NOT BLOCK ENTRANCE OR EXIT ACCESS.

15. BACKHAUL: GATE LOCATION ON CARRETERA GATE SHALL BE DETERMINED DURING DESIGN.

PENINSULA CORRIDOR JOINT POWERS BOARD
STANDARD DRAWINGS
HIGHWAY GRADE CROSSING APPARATUS
SIGNAL AND COMMUNICATION CROSSING WAVE WITH AND WITHOUT FLASHING LIGHT SIGNALS
DRAWN:
CALTRAIN
APPROVED:
 m/s 06-011
09-09-01
S-0409
S-0409
S-0409
NOTES:
1. PER CHDG GENERAL ORDER 750. SIGNAL AT ALL NEW LOCATIONS SHALL HAVE LED FLASHER ASSEMBLY
2. FLASHING LIGHT SIGNAL UNITS SHALL BE 12" LED TYPE DESIGNED TO OPERATE WITH A SOLID STATE CROSSING CONTROLLER AND SMALL CONFORM TO AEMRA CAB MANUAL REQUIREMENTS
3. 1-WAY OR 2-WAY LED FLASHER ASSEMBLIES SHALL INCLUDE JUNCTION BOX CROSS ARM ASSEMBLY AND LAMP MOUNTING BRACKETS PER AEMRA CAB MANUAL PART 3.2.2.1.12" LED LAMP UNITS, 24V STAINLESS, STEEL BACKGROUNDS, STEEL HOODS AND ALL ASSOCIATED HARDWARE
4. LIGHT ASSEMBLIES SHALL BE PLACED SO AS THEY DO NOT TO INTERFERENCE ARM GATE AND MOVEMENT
5. INSTALL FLASHERS PER SITE SPECIFIC SIGNAL DRAWINGS
6. WHEN COUNTERTOPS ARE ADDED ENFORCE THAT SMALL FLASHERS ARE USED TO AVOID EXCESSIVE OBSTRUCTIONS IN AREA THE PEDESTRIAN MAY OCCUPY
7. SEE 32-7020 SERIES FOR OTHER DETAILS OF CROSS DRAWINGS
8. SMOOTHED GATE TO BE BURIED AND SMOOTH EDGES
9. CABLE ENTRY SHALL BE PROTECTED FROM RODENTS AND VANDALISM
10. TOP OF FOUNDATION SHALL BE LEVELLED WITH SIDEWALK
11. FOR FLASHER HEIGHT SEE SD 5409 (CPC NO. 9)
12. ORIENTATION OF GATE ARM AND MECHANISM WILL vary depending ON SITE SPECIFIC REQUIREMENTS. ORIENTATION AS SHOWN FOR ILLUSTRATION PURPOSES ONLY
13. INSTALL BRACKETS EQUAL DISTANCE BETWEEN FLASHERS AND ELECTRONIC BELL
14. ON PEDESTRIAN GATES HALF ARM CAN BE USED ON OPPOSITE SIDE OF ARM WITH COUNTER WEIGHT
15. ON PEDESTRIAN GATES EXCESS BOLT THREAD SHALL BE REMOVED FROM SUPPORT BOLTS AFTER INSTALLATION OF COUNTER WEIGHTS
NOTE:
To minimize crossing distance, the pedestrian gate shall be parallel to tracks, align with every side of the vertical gate counter. Minimum time provided: 17" min and 15" max (track center to ped signal mast).
NOTES:
1. TOP OF FOUNDATION SHALL BE LEVEL WITH CHOWN OF ROAD, MAXIMUM 4" ABOVE TOP OF GROUND LEVEL
2. FOUNDATION BOLTS SHALL EXTEND A MINIMUM OF 8" ABOVE TOP OF CONCRETE FOUNDATION
3. LENS LIGHTS AND ADDITIONAL MAIN LIGHTS SHALL BE INSTALLED WHEN SHOWN ON LAYOUT DRAWING
4. FOUNDATION SHALL MEET OR EXCEED CANTILEVER MANUFACTURER'S RECOMMENDATIONS
5. CANTILEVER SHALL BE EQUIPPED WITH LADDER GUARD AND LOOKING BRACKET
6. LADDER, CAGE, AND PLATFORM SHALL BE CSA COMPLIANT
NOTES:
1. TOP OF FOUNDATION SHALL BE LEVEL WITH CROWN OF ROAD, MAXIMUM 4" ABOVE TOP OF GROUND LEVEL
2. FOUNDATION BOLTS SHALL EXTEND A MINIMUM OF 6" ABOVE TOP OF CONCRETE FOUNDATION
3. LANE LIGHTS AND ADDITIONAL D AA LIGHTS SHALL BE INSTALLED WHEN TYPED OR DETAILED ON DETAIL SHEET
4. FOUNDATION SOCKET OF MOUNT CANTILEVER MANUFACTURER'S RECOMMENDATIONS
5. CANTILEVER SHALL BE EQUIPPED WITH LADDER GUARD AND LOCKING BRACKET
6. LADDER, CAGE, AND PLATFORM SHALL BE OSHA COMPLIANT
NOTES:
1. ALL HARDWARE SHALL BE 1/2" X 1 1/2" EXCEPT AS NOTED.
2. SUPPORT SHALL BE CONSTRUCTED OF 1/4" X 2" FLAT BAR ALUMINUM EXCEPT OR EXCEPT OR MATERIAL OF EQUIVALENT TEMPERATURE STRENGTH AND CORROSION RESISTANCE.
3. MAINTAIN MINIMUM MINIMUM CLEARANCE.
LOCATION OF AUTOMATIC WARNING DEVICE
WHERE CANTILEVERS AND GATES ARE REQUIRED

LOCATION OF HOUSE FROM
STREET AND TRACK

MINIMUM CLEARANCE OF AUTOMATIC
WARNING DEVICES ANGLED CROSSINGS

NOTE:
Either cantilevers or gate may be utilized
for track at local conditions require and
if authorized by Caltrain.
NOTES:
1. Auxiliary Red Gate Arm Configuration is Not for New Construction
2. Maximum Vehicular Gate Length is 25' 11''

MORE THAN TWO LANES IN ONE DIRECTION USE CONTINUOUS
NOTES:
1. *Auxiliary Gate Arm Configuration is Not for New Construction*
2. If more than two lanes per direction, continental rail crossings with the set of planing centers per lane. Median is preferred. Maximum gate length is 30'
NOTES:
1. ALTERNATE PEDESTRIAN GATE ARM CONFIGURATION IS NOT FOR NEW CONSTRUCTION

2. IF MORE THAN TWO LANES PER DIRECTION, CANTILEVERS ARE REQUIRED WITH ONE SET OF FLASHING LIGHTS PER LANE. MEDIAN IS PREFERRED. MAXIMUM GATE LENGTH IS 30 FT.
NOTE:
1. AUXILIARY PED GATE ARM CONFIGURATION IS NOT FOR NEW CONSTRUCTION.
2. CENTER MEDIAN IS PREFERRED WHERE DISTANCE OF GATE TO MERRIMAC IS GREATER THAN 20 FT. A 5 FT MEDIAN WITH FLASHING GATE APPLIQUES AND GATE SHALL BE INSTALLED. IF OVER TWO LANE REDIRECTION, CANTILEVER AND GATES ARE REQUIRED. MAXIMUM GATE LENGTH 32 FT.

PENINSULA CORRIDOR JOINT POWERS BOARD

STANDARD DRAWINGS

SIGNAL AND COMMUNICATION
HIGHWAY GRADE CROSSING APPARATUS
HIGHWAY GRADE CROSSING NO MEDIAN
TYPICAL 3-LANE WITH AUXILIARY GATE ARM