




# Bridge Design Details 3.1 August 2022

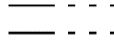
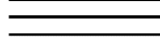

## General Plan

The GENERAL PLAN sheet provides an overall description of the scope of work for a given structure. This sheet is subject to review and approval by others, so it is important to keep it neat and clear. It should be thoroughly checked prior to the Type Selection meeting and again before GENERAL PLAN distribution.

## Plan

1. The PLAN view is placed on the lower-left side of the sheet.
2. The preferred scale is 1" = 20' (or 1" = 30' in some cases); avoid smaller scales as they result in a crowded sheet. For small structures it is acceptable to use 1" = 10'. For large structures, viaducts, or interchanges, use a GENERAL PLAN sheet with STRUCTURE PLAN sheet(s); for more information regarding Structure Plans refer to *Bridge Design Details: 3.4 Structure Plans*.
3. There should be a layout or reference line for each structure. The line should preferably be one of the following:
  - a) District alignment line
  - b) Inside or outside edge of traveled way line
  - c) Centerline of roadway, bridge, or construction layout line
4. The bridge should be drawn such that stationing runs left to right. Structures in a group, such as interchanges and retaining walls, should all be oriented in the same direction for uniformity. Consider District or other existing structures when orienting new alignments and structures.
5. Show the traveled way, shoulders, and median widths of the approach roadways.
6. Show the top and toe of approach fill or cuts; designate both lines with (  ) line pattern.
7. Show perpendicular horizontal distances under the structure from the toe of slopes to all roadways and railroad alignments, including future alignments. Include distances to columns and abutments when adjacent to roadways or railroads.



8. Show the name and direction of creek, stream, or river flows. Designate Ordinary High-Water Mark (OHWM) or typical water edges with (— - - —) line pattern. Large rivers and oceans may be designated with a double line pattern (  ) or graduated line weight pattern (  ).
9. Show North arrow.
10. Show all alignment data including bearings, radii, and curve data. Verify the alignment geometry shown matches the district ROADWAY PLANS and FOUNDATION PLAN provided by the Structure Design Preliminary Investigations Branch (PI).
11. Show the names and directions to nearest towns or cities. Towns or city names should match what is shown on the District Title Plan sheet and Bridge Site Submittal.
12. Show the centerline of all piers or bents. Designate with Line Code 7 (-----).
13. Show the skew angle at the center line of all supports.
14. Show all locations of Minimum Vertical Clearance within the traveled way using (  ) symbol.
15. Identify the type and locations of deck drains, manholes, deck drainage, or future access to utilities from the deck.
16. Show the locations where painting of structure name, bridge number, year constructed, and support numbering as required; see *Bridge Design Details: 3.30 Structure Identification*.
17. Show Beginning of Bridge (BB) and End of Bridge (EB) stations and elevations.
18. Show guard railing at ends of bridge (typically MGS on new structures), temporary railings, approach curbs, and sidewalks.
19. Show bank protection and slope paving.
20. Show structure mounted signs.
21. Show approach slabs.
22. Show a structure surveying Benchmark (if no FOUNDATION PLAN or LOG OF TEST BORING sheet is provided).



## Elevation

1. The ELEVATION view is a vertical projection from the lower side of the PLAN view.
2. Use the same scale as the PLAN view.
3. For widening projects between two structures, identify the location of the ELEVATION using letters on the PLAN view. When the opposite ELEVATION of a structure is materially different, both can be drawn on the GENERAL PLAN or on a STRUCTURE PLAN sheet(s). In these cases, identify both ELEVATIONS by different letters.
4. Use a DEVELOPED ELEVATION for curved structures. LONGITUDINAL SECTIONS may be used for culvert type structures. A MIRRORED ELEVATION shall be used for work to be done on the upper side of the PLAN view, such as retaining walls, widenings, or barrier rail replacements.
5. Show all supports. Use dashed Line Code 2 (-----) for portion of structure below grade. Label names and numbers (abutments, bents, and piers).
6. Show the Datum line with elevation and stations.
7. Show the original ground line at the bridge centerline, along the LONGITUDINAL SECTION, or as noted. The standard Line Code for showing the original ground line is Line Code 2 (-----); when two original ground lines are shown use Line Code 3 (-----) for the second line.
8. Show the total length of bridge (BB to EB). For structures and retaining walls on horizontal curves or that have multiple layout lines shown, identify length as:  
**Example: 100'-6" MEASURED ALONG "A" LINE**
9. Show all span lengths (BB or EB to centerline of piers or bents and between centerline of piers or bents).
10. For retaining walls, label the beginning, end, and top of wall, as well as the original and finished grade at the face of wall or layout line.
11. Show the dimension(s) of all Minimum Vertical Clearance locations, rounded down to nearest 1-inch.
12. Show all the locations where the painting of structure name, bridge number, year constructed, and support numbering are required; see *Bridge Design Details*: 3.30 Structure Identification.



13. Show the controlling High-Water Elevation using (  $\nabla$  ) symbol. Provide a reference note to the location of the “HYDROLOGIC SUMMARY TABLE” and reference the sheet in which it resides.
14. Show the bank protection or slope paving.
15. Show a portion of the retaining wall concrete surface texture and include a description in the notes.
16. Show all nearby structures and obstructions by referencing the structure name and bridge number of the adjoining structure.

## Profile Grade

1. Place the PROFILE GRADE above the ELEVATION view.
2. Show the PROFILE GRADE with no scale; scale should be exaggerated both horizontally and vertically.
3. Do not show a PROFILE GRADE for widenings. Grades will conform to the existing structure.
4. Show slopes with direction arrow, elevations, stations, length of vertical curve, and rate of change (% / station) along the PROFILE GRADE.
5. Do not show the SUPERELEVATION DIAGRAM on the GENERAL PLAN sheet. If required, it is preferable to show this diagram on the DECK CONTOUR or INDEX TO PLANS sheet instead.

## Typical Section


1. Place the TYPICAL SECTION in the upper right-hand portion of the sheet.
2. The preferred scale is from  $\frac{1}{4}'' = 1'-0''$  to  $1'' = 10'$ . Try not to exceed  $2\frac{1}{2}$  times the PLAN scale.
3. Take the section looking ahead on stationing. Identify with section letters and stationing limits if the section varies or the stationed layout lines are not continuous across the structure.
4. Show the section at a typical bent or pier for multi-span bridges. Do not show abutments. Use solid lines for portions of structures below grade.



5. Dimension the overall structure width, roadbed width, traveled way, shoulders, median, barriers, and sidewalks.
6. For retaining walls, show the original grade, finished grade, top of wall, and concrete texture.
7. Show the barrier, fence, and cable railing types.
8. Show the location of the PROFILE GRADE and layout line.
9. Show the superstructure depth from the top of the deck to the bottom of the girder or soffit. For precast or steel girders, show the typical structure depth at the centerline of bearing at the support.
10. Indicate the type of structure (e.g., Composite Welded Steel Girder, Concrete Slab, PC/PS Concrete Girder (Wide Flange), CIP/PS Concrete Box Girder, Concrete Girder (T-Beam), Retaining Wall (Type 1), etc.).
11. Show the overlay thickness or deck seal. Add a note stating that the structure depth shown does not include the overlay thickness.
12. Show crown or maximum cross slope as well as the cross-slope direction relative to the location of the PROFILE GRADE for a new structure. Show percent slope in fractions (e.g., 1½ %, not 1.50%). For varying cross slopes, show the slope as "MAX SLOPE AND VARIES".
13. For widenings, show cross slope with "± " and add note: "MATCH EXISTING GRADE AND CROSS SLOPE." Identify the location and limits of closure pour(s).
14. Show and label all existing, proposed, and future utility openings; see *Memo to Designers: 18-2 Utilities and Openings for Future Utilities in Bridge*.
15. Show the construction stages and identify the widths of stage construction and traffic during construction. For clarity, staging information can be placed on STAGE CONSTRUCTION sheet, leaving the TYPICAL SECTION on the GENERAL PLAN easier to read.
16. Show Temporary Railing (Type K) and offset from the layout line; see *Memo to Designers: 9-3 Widening Existing Bridges, 14-19 Temporary Railing, and 21-19 Guidelines for Clearance to Construction Operations*. Temporary Railings details and cost are normally covered by the District; therefore, add a reference to the ROADWAY PLANS.



## Miscellaneous

1. Never use more than one GENERAL PLAN for a project with a single structure; instead, use STRUCTURE PLAN or STAGE CONSTRUCTION sheet(s) to show additional information at a larger scale. Maintenance or other projects with more than one structure, such as a large corridor retrofit projects, approach slab replacements, joint seal rehabs, or deck overlay work may combine structure details into one plan set. A summary GENERAL PLAN may be created that shows the location of each structure and general work to be done followed by BRIDGE DETAILS and MISCELLANEOUS DETAIL sheets.
2. Show all dimensions in feet and inches. Do not use decimals of a foot or inch.
3. Run spell check and ensure only proper abbreviations are used.
4. Do not use Standard Plan "bubbles" (  ) on the GENERAL PLAN sheet.
5. Show important notations such as line types, symbols indicating electroliers, deck drains, or points of minimum vertical clearance in a LEGEND.
6. Give the location of the GENERAL NOTES, INDEX TO PLANS, STANDARD PLAN list and PILE DATA TABLE, if not shown on the GENERAL PLAN. For the GENERAL NOTES format and content, use standard detailing cell.
7. Leave a clear 6" x 6" space to list the QUANTITIES submitted by Structure Office Engineer Estimating Branch. If the QUANTITIES are not shown on the GENERAL PLAN sheet, note their location in plan set.
8. Avoid detailed descriptions of all the details shown on the GENERAL PLAN sheet. For retrofits, girder strengthening, joint seal replacement, approach slab, or other projects only reference the location of the work to be done. Place specific details on other sheets.
9. Place the completed "Falsework Requirements and Traffic Decal" on the GENERAL PLAN, which identifies all the traffic handling and falsework opening requirements for the structure. This decal is added prior to the Type Selection and General Plan Distribution milestones, however, should be removed before the P&Q milestone; see *Bridge Design Details* 3.5: Falsework Requirements.



10. Show existing bridges and other structures on the GENERAL PLAN; designate existing structures with Line Code 6 (— · · — · · —) line style in the LEGEND. For existing bridges or structures to be replaced on the same alignment, only show the existing structure in PLAN VIEW; do not show in ELEVATION or TYPICAL SECTION.
11. When removing an entire structure, do not hatch existing bridge removal limits on the GENERAL PLAN sheet. Large areas of cross hatching make details difficult to read. Hatching is acceptable when portions of a structure are being removed, or removal is done in stages; in this case identify limits and area(s) to be removed within LEGEND as "Bridge Removal (Portion)". A separate GENERAL PLAN (removal) is only required when existing bridge removal details cannot be determined from other plan sheets.
12. For widening or retrofit projects, show the dependent dimensions and standard verification note to Contractor; see *Bridge Design Details: 1.1.13 General Detailing*.







Figure 3A.A.2 General Plan Detailing Example 2

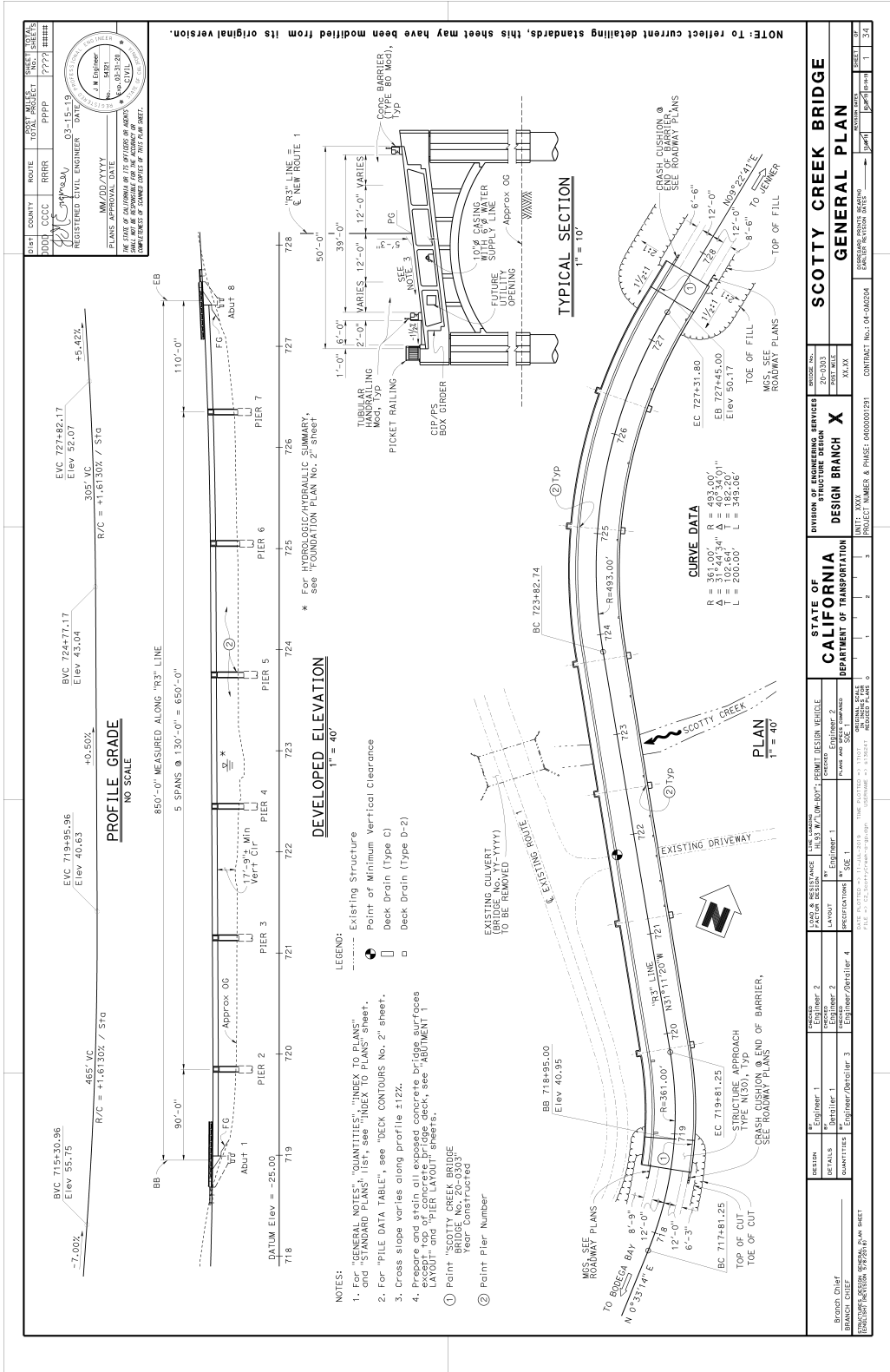




Figure 3A.A.3 General Plan Detailing Example 3

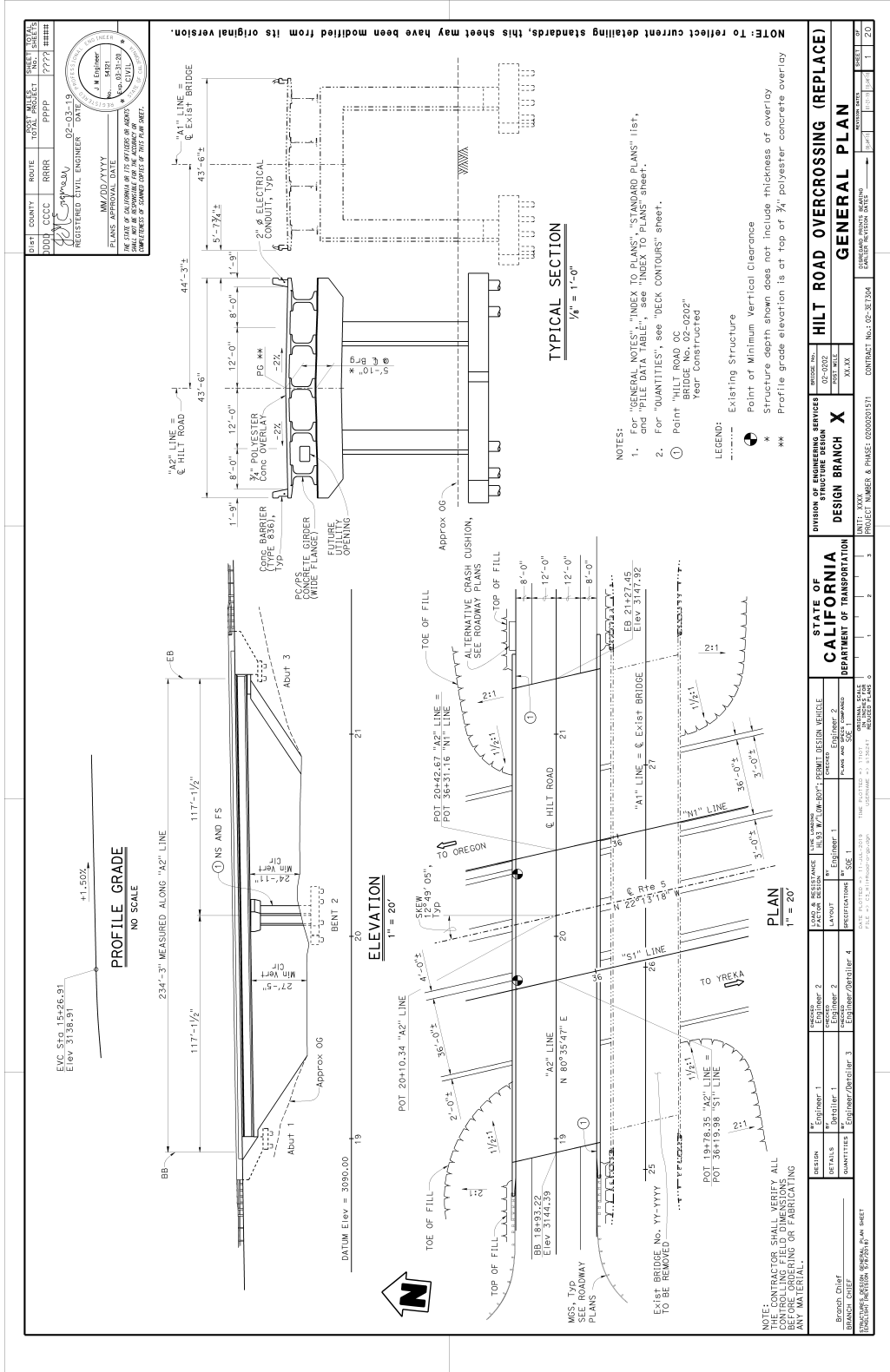




Figure 3A.A.4 General Plan Detailing Example 4

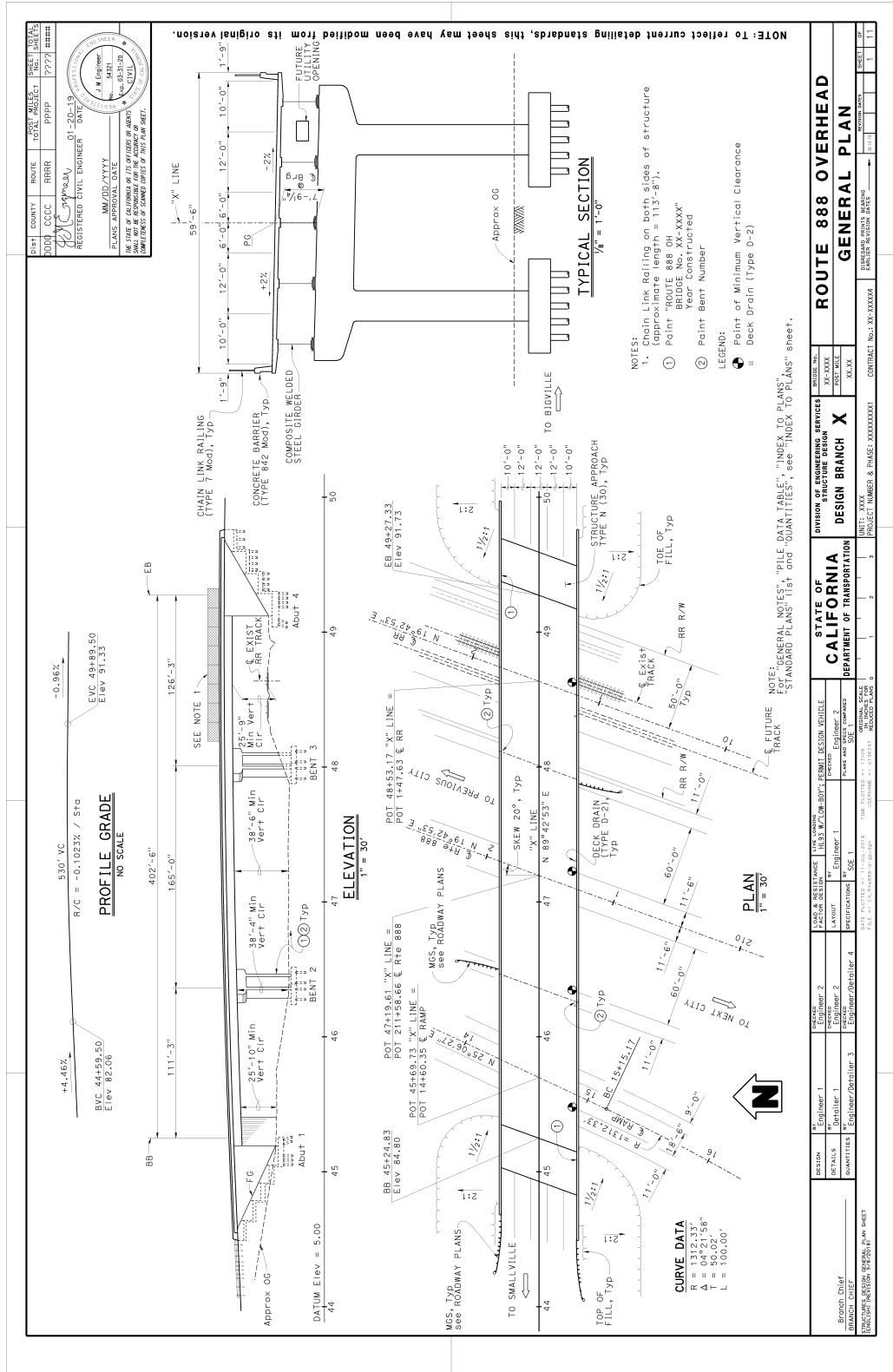






Figure 3A.A.6 General Plan Detailing Example 6

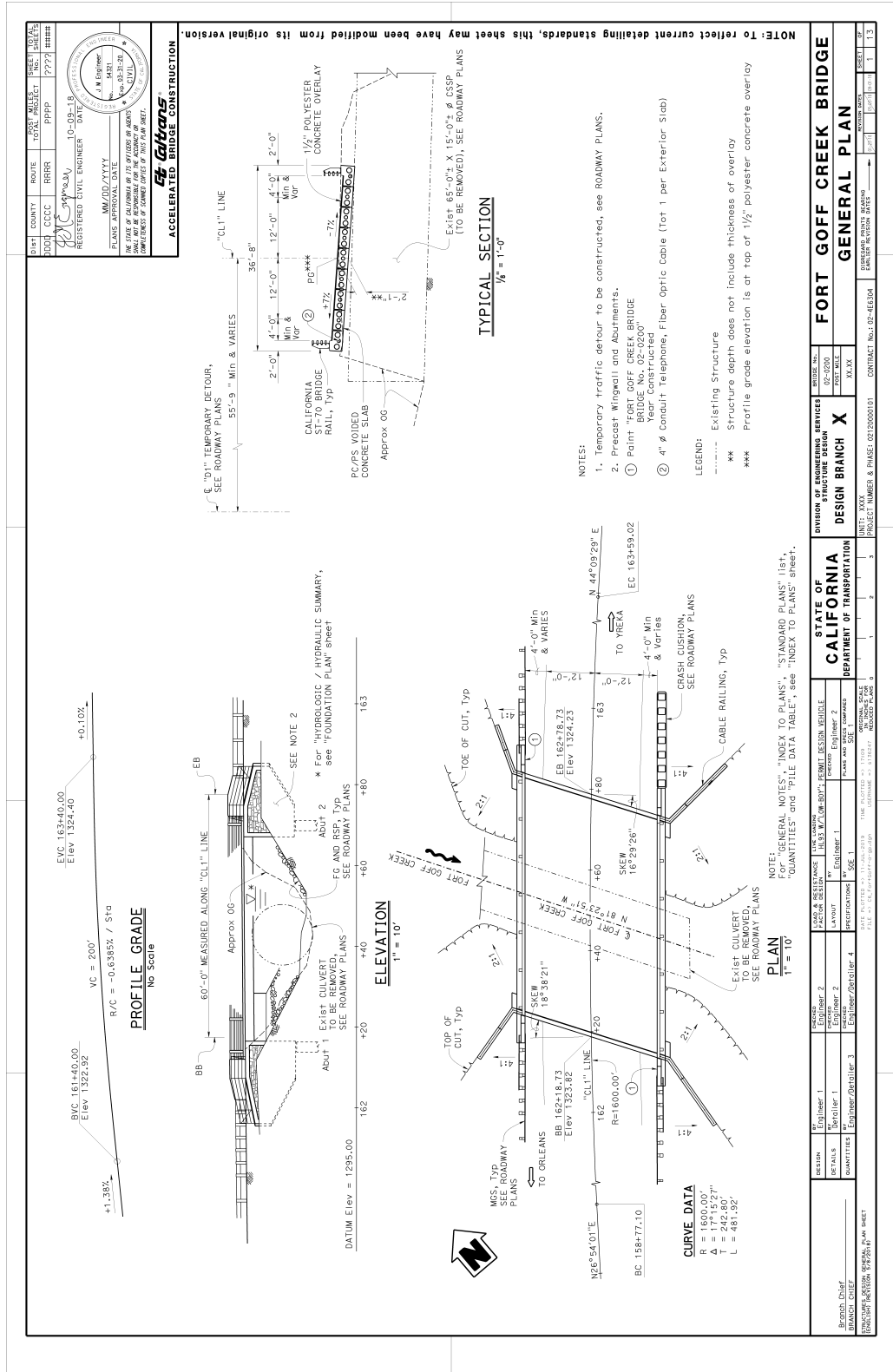




Figure 3A.A.7 General Plan Detailing Example 7

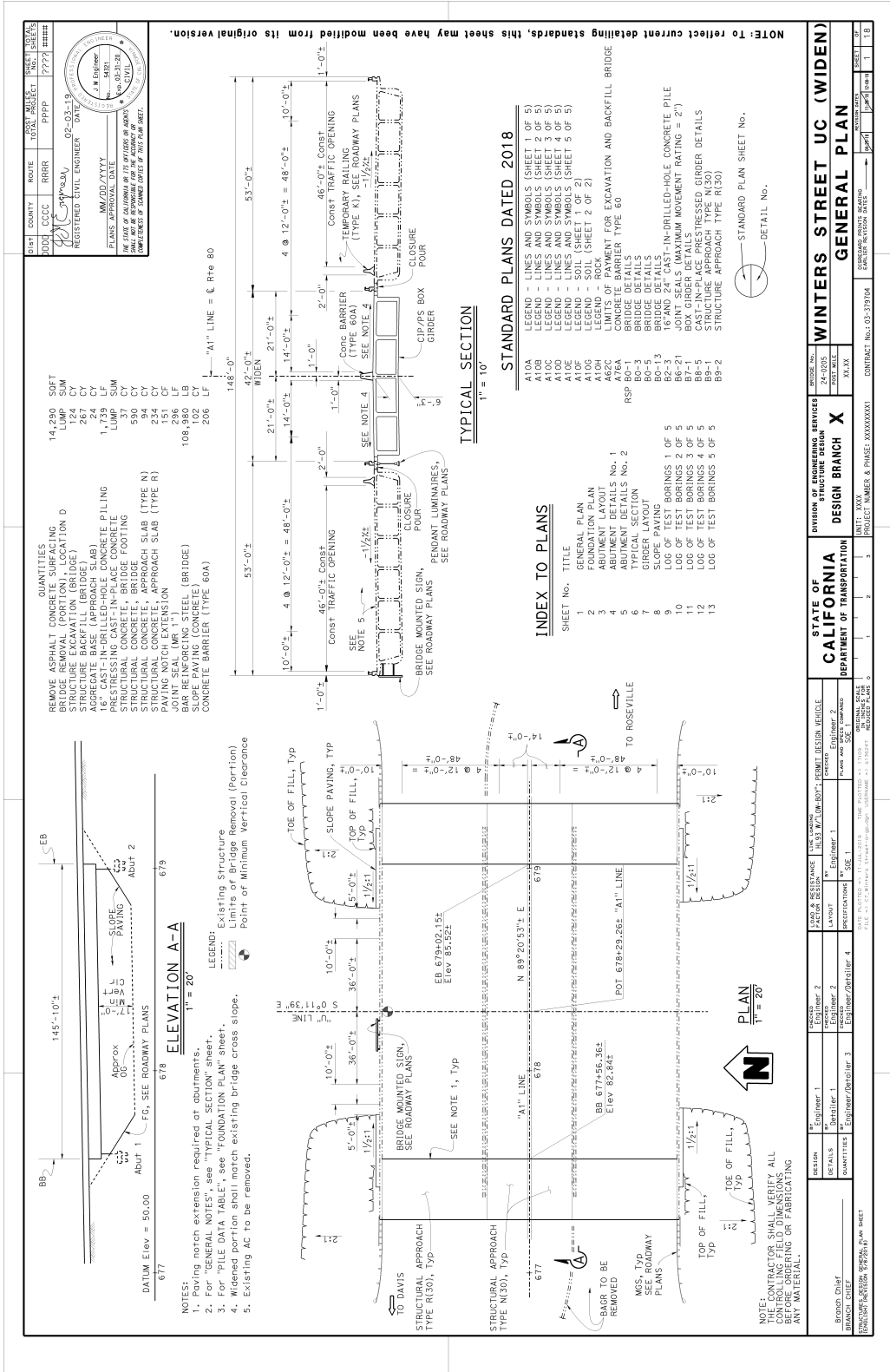




Figure 3A.A.8 General Plan Detailing Example 8

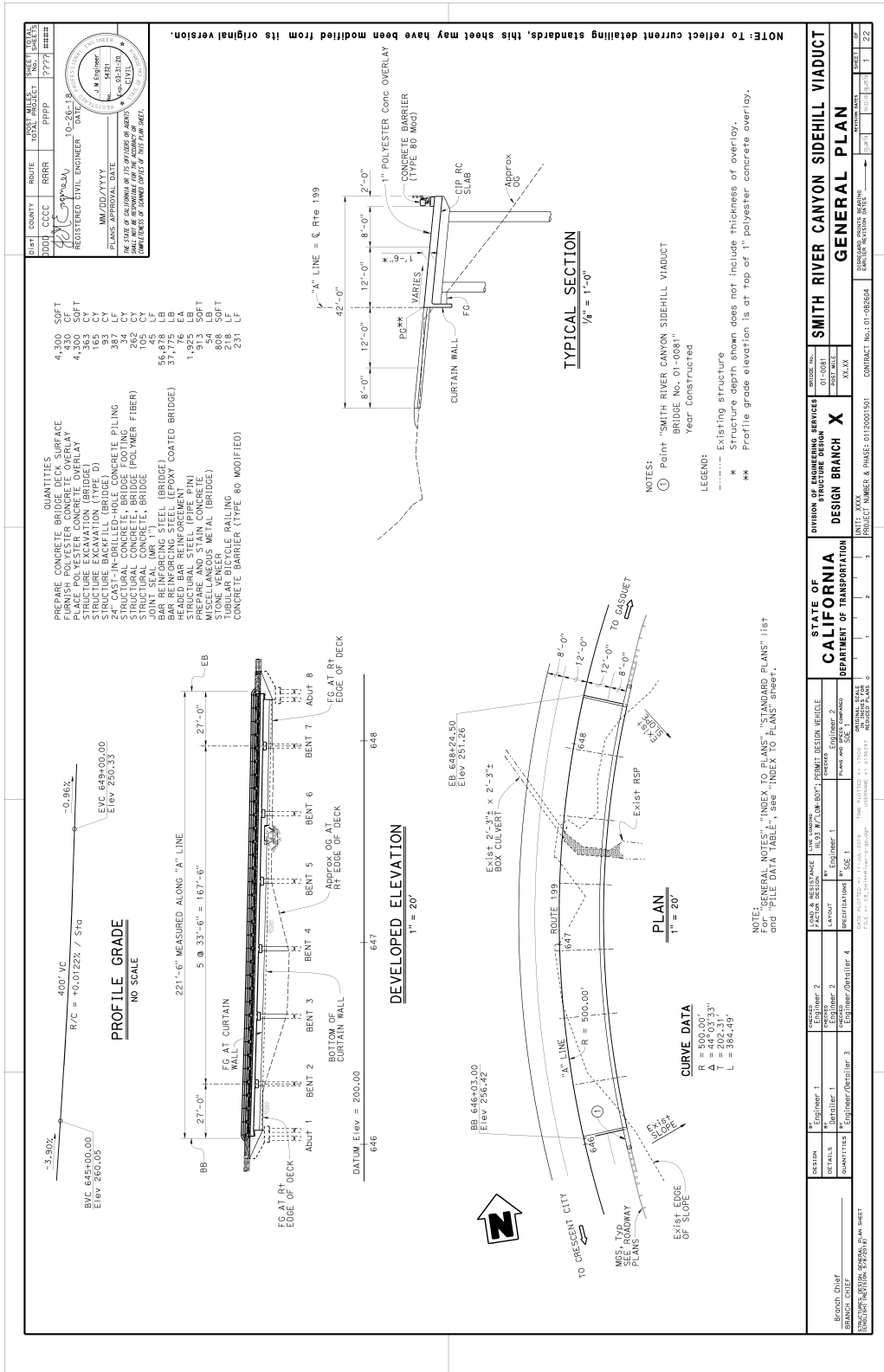




Figure 3A.A.9 General Plan Detailing Example 9

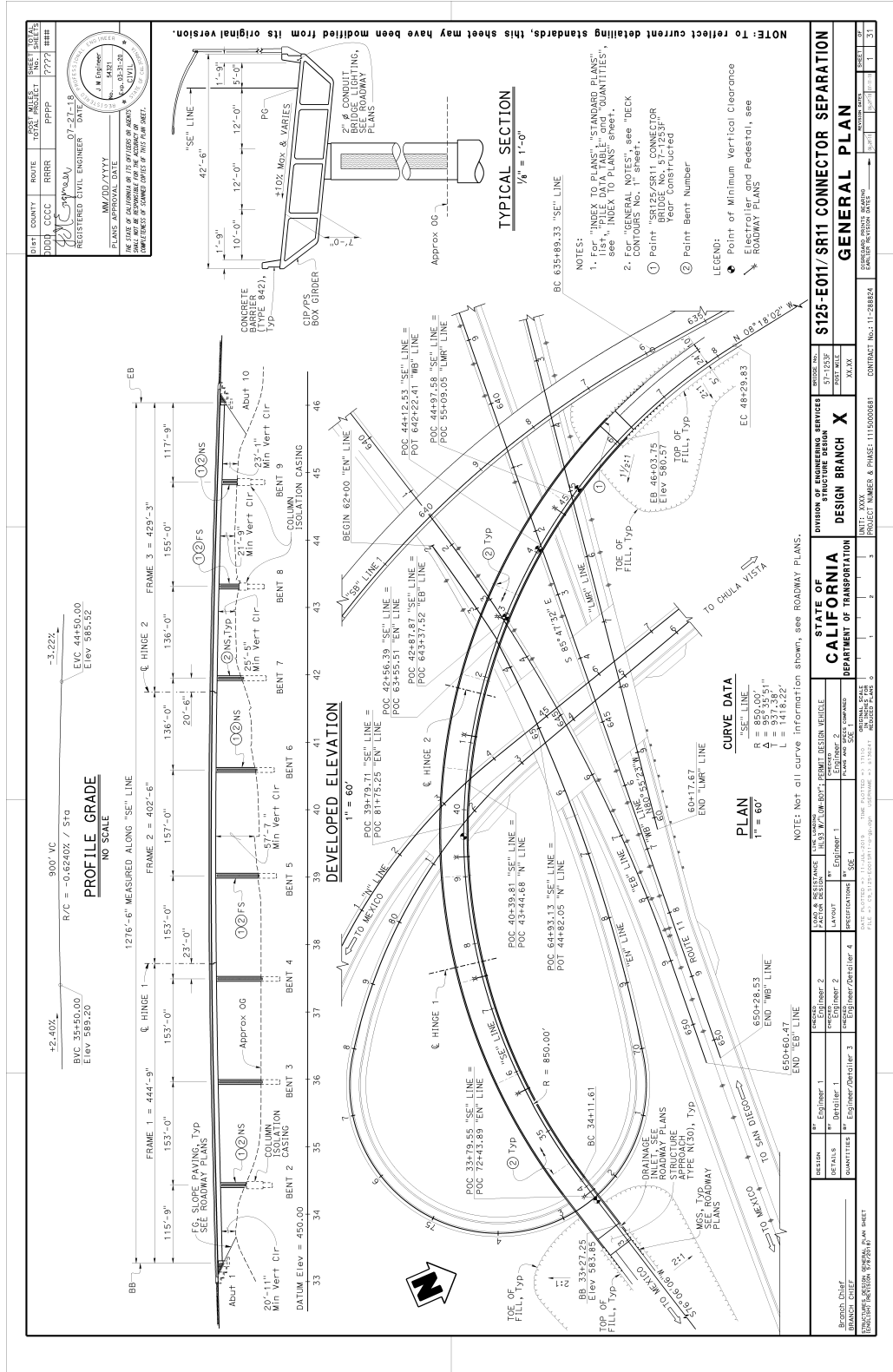
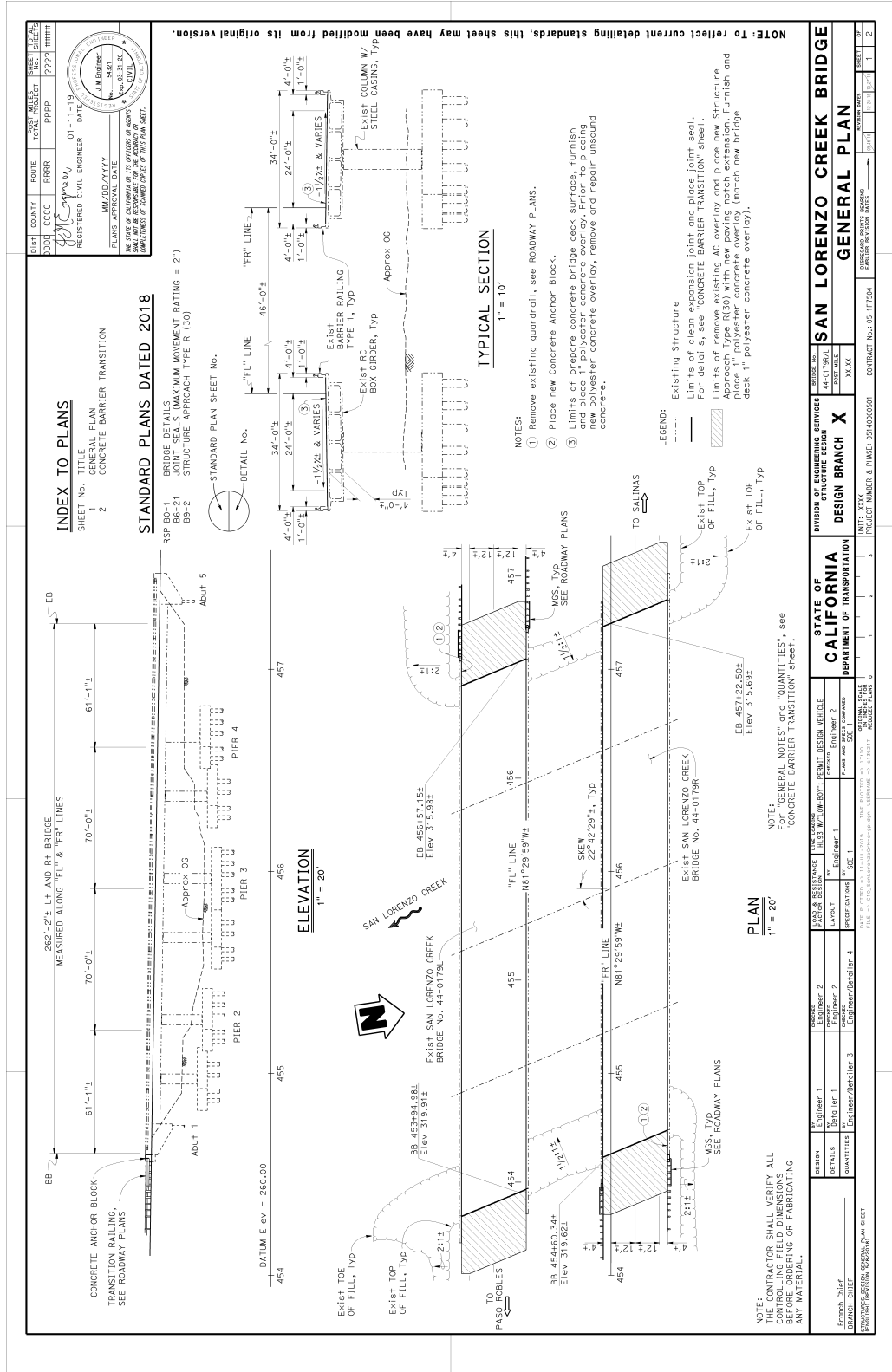






Figure 3A.A.10 General Plan Detailing Example 10



COUNTY ROUTE 0000 CCCC RRRR PPPP PROJECT NO. 01-11-19 SHEET NO. 7777 TOTAL SHEETS 7777		REGISTERED CIVIL ENGINEER DATE: 01-11-19 PROJECT NO. 01-11-19 SHEET NO. 7777 TOTAL SHEETS 7777	
STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION CONTRACT NO. 05-1F544 PROJECT NUMBER & PHASE: 05-1F544			
DIVISION OF HIGHWAY SERVICES PROJECT NO. 05-1F544 SHEET NO. 7777 TOTAL SHEETS 7777		SAN LORENZO CREEK BRIDGE GENERAL PLAN	
DESIGN BRANCH X DATE: 01-11-19 DRAWN BY: JKL CHECKED BY: MNO		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION CONTRACT NO. 05-1F544 PROJECT NUMBER & PHASE: 05-1F544	





Figure 3A.A.12 General Plan Detailing Example 12

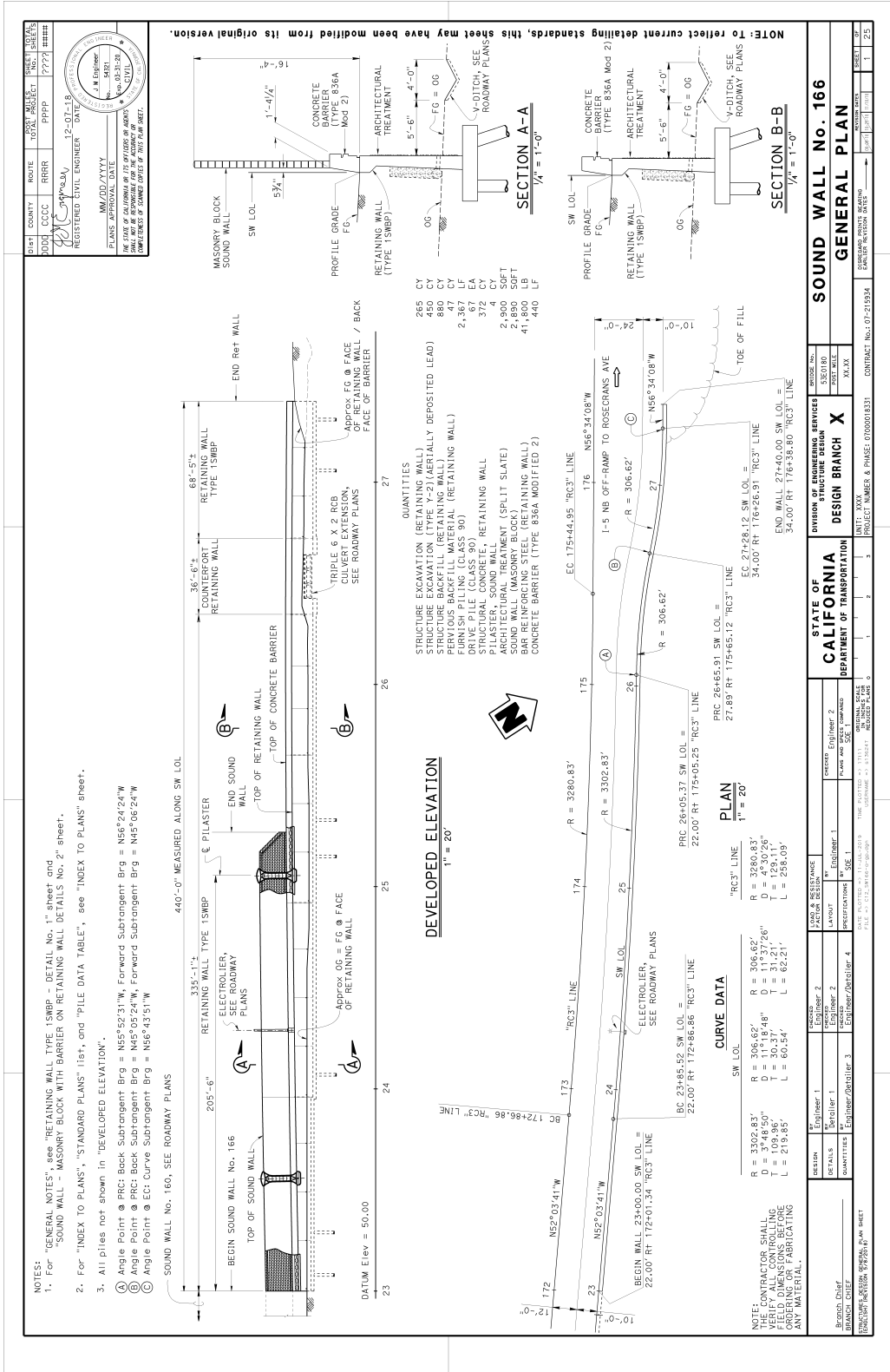




Figure 3A.A.13 General Plan Detailing Example 13

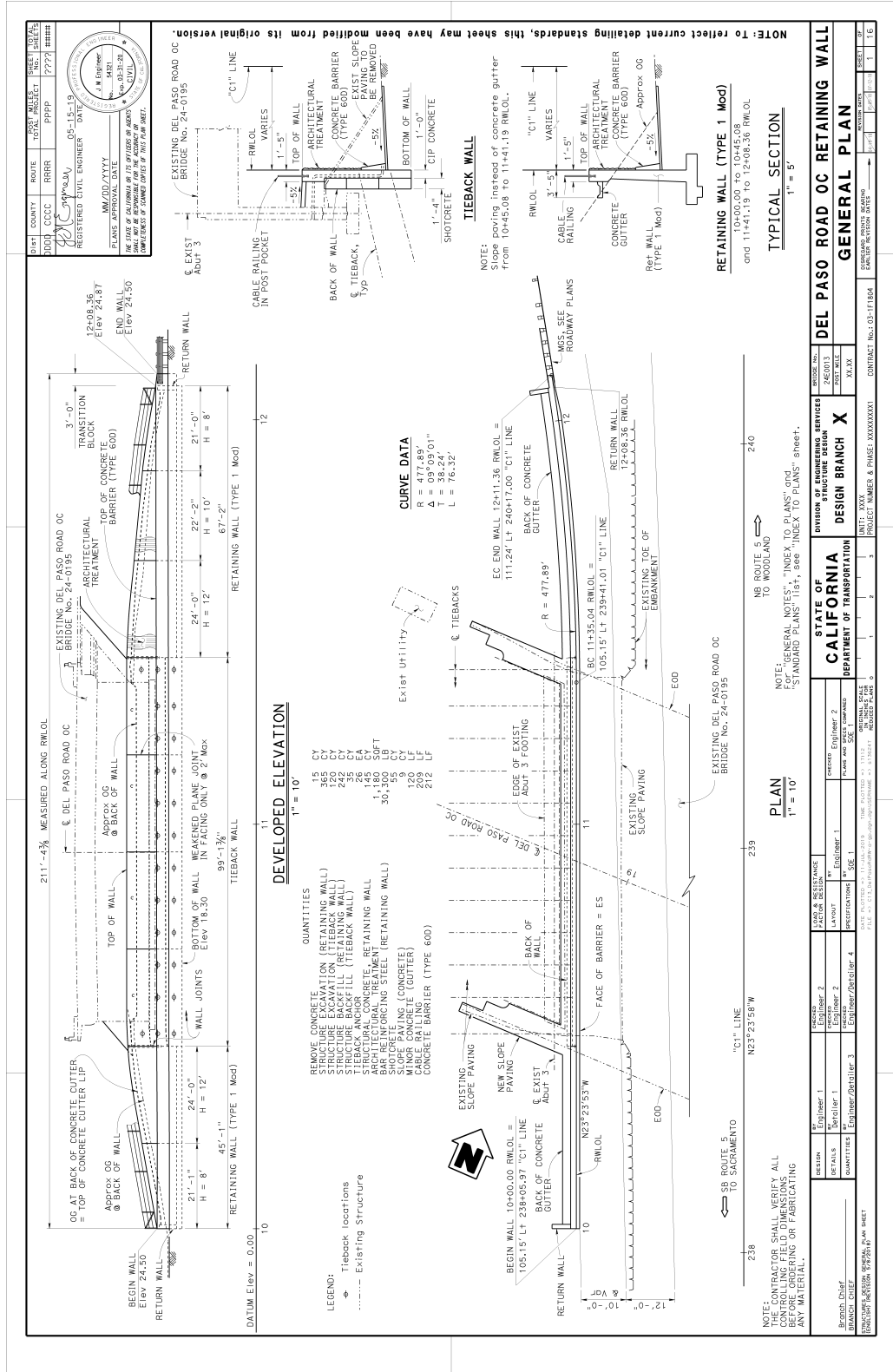






Figure 3A.A.15 General Plan Detailing Example 15

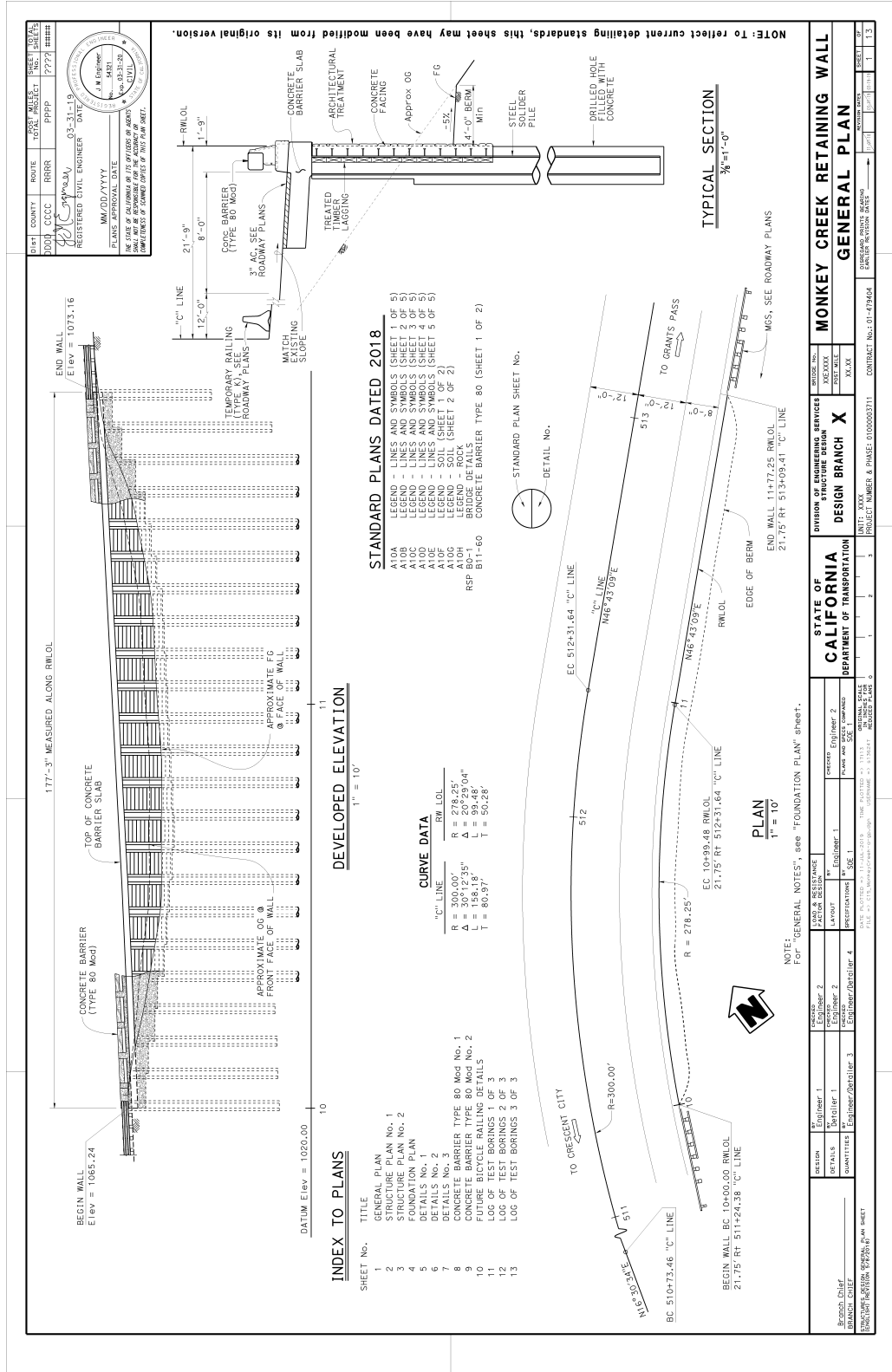
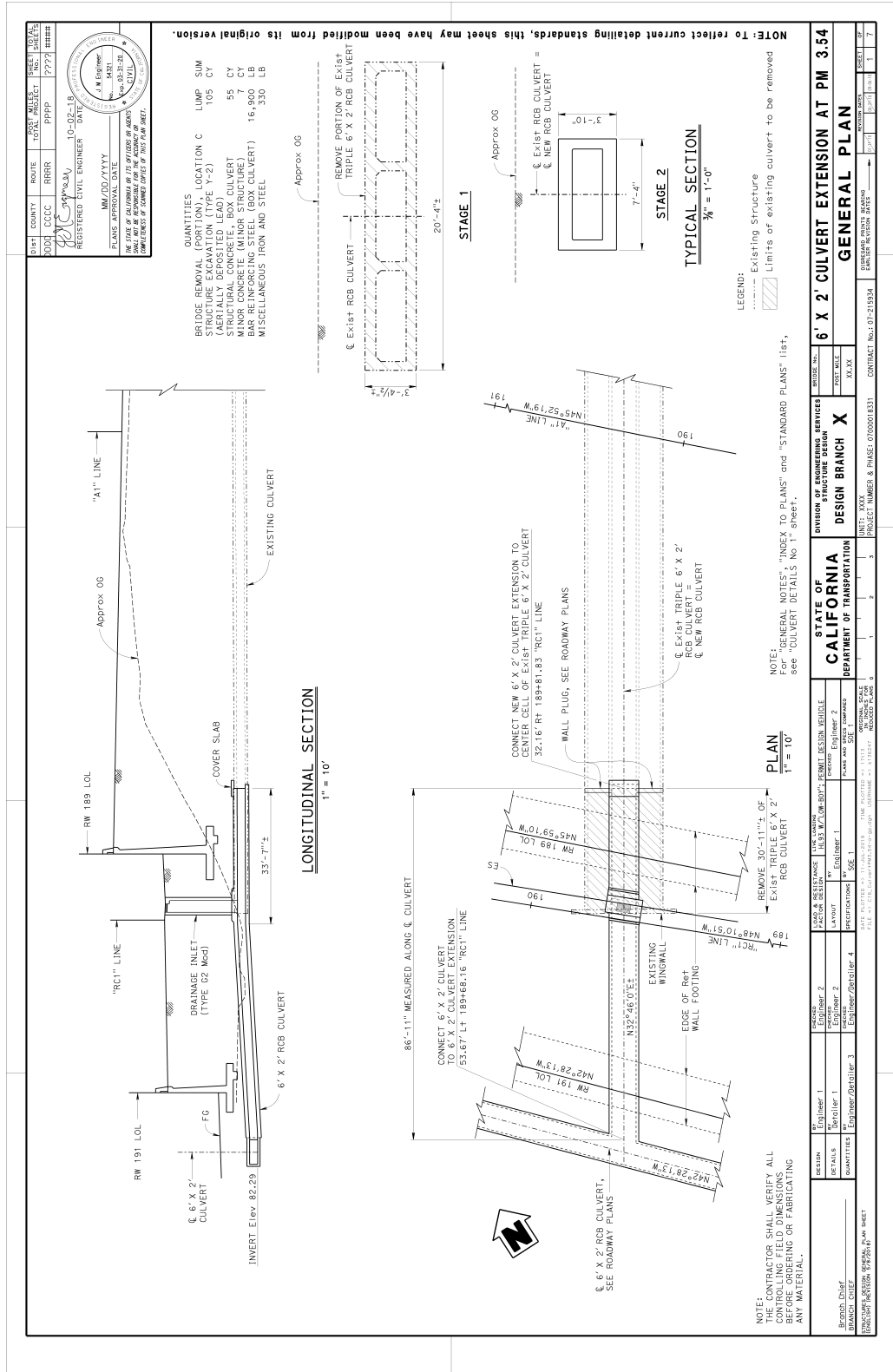




Figure 3A.A.16 General Plan Detailing Example 16





# Bridge Design Details 3.2 August 2019

## Milestone Notations & Borders

As a project progresses, complete plan sets are distributed for review. Before distribution, milestone notation stamps are added to the GENERAL PLAN to indicate the stage of the project as it goes through the course of its design.

Milestone notations stamps are included on the following distributions:

- GENERAL PLAN
- UNCHECKED DETAILS
- CHECKED DETAILS
- DRAFT STRUCTURE PLANS, SPECIFICATIONS & QUANTITIES (dSPS&E)
- EXPEDITE

A milestone notation stamp is not placed on the plans at the FINAL STRUCTURE PLANS, SPECIFICATIONS & QUANTITIES (SPS&E) milestone.

## Border Information

Include "BRIDGE", "UNDERPASS", "OVERCROSSING", etc. in the structure title. Do not use abbreviations in sheet titles unless absolutely necessary. If abbreviations are used, only use standard abbreviations.

When a separate Structure Plan set is prepared for two or more bridges having the same bridge number, the name for each should be stated. The bridge number identification provided by Structure Maintenance & Investigations (SM&I) will also indicate the location of each bridge.

### Example:

**BROADWAY UNDERCROSSING – LEFT BRIDGE (BRIDGE No. XX-XXXXL)**

**BROADWAY UNDERCROSSING – RIGHT BRIDGE (BRIDGE No. XX-XXXXR)**

For further border information and guidance, see *Bridge Design Details*: 1.3 Sheet Titles and Borders.





# Bridge Design Details 3.3 August 2019

## Index to Plans & Standard Plan List

The INDEX TO PLANS is followed by a list of applicable STANDARD PLANS used for the structure, see *Bridge Design Details: 1.1.12 General Detailing*, for typical order of sheets, and *Bridge Design Details: 1.5 Use of Standard Plans*, for a list of common STANDARD PLANS.

If the INDEX TO PLANS and STANDARD PLAN list are not located on the GENERAL PLAN, add a note on the GENERAL PLAN indicating their location. The INDEX TO PLANS may be placed on one of the following sheets:

- GENERAL PLAN: The preferred location for INDEX TO PLANS and STANDARD PLAN list is the lower right corner of the GENERAL PLAN sheet, otherwise, create an INDEX TO PLAN sheet.
- INDEX TO PLANS: If there is not adequate space on the GENERAL PLAN sheet, a sheet called INDEX TO PLANS may be inserted. If the INDEX TO PLANS sheet is used, this sheet is to immediately follow the GENERAL PLAN sheet.
- DECK CONTOURS: If there is not adequate space on the GENERAL PLAN sheet and an INDEX TO PLANS sheet is not used, then the INDEX TO PLANS and STANDARD PLAN list may be placed on the DECK CONTOURS sheet.

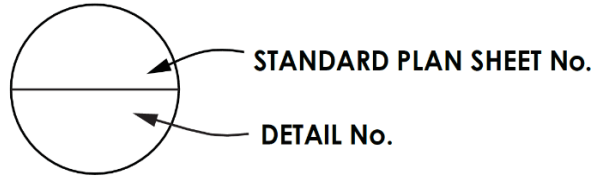
In some circumstances, other functional units may require sheets to be placed within a set of Structure Plans (e.g., Electrical Plans, Mechanical Plans, etc.). These details include hardware and other details that are attached to a structure. In most cases, these types of plans are designed and detailed by another unit and stamped by a separate licensed Engineer. Such plans should be listed after the Structure Plans, see *Bridge Design Details: 3.3 Index to Plans Detailing Example, Attachment 3A.B.1*.

## Standard Plans List

STANDARD PLANS are pre-engineered, commonly used, details that are used in conjunction with the Standard Specifications and Project Plans. STANDARD PLANS are not inserted or duplicated in the project plans, instead they are listed and called out where details are to be used. When detail modifications are required to a referenced STANDARD PLAN, only the modified details should be shown in the Structure Plans. A reference to the STANDARD PLAN used should be included for additional details not shown.

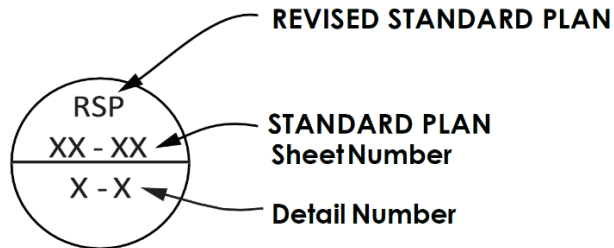


Under the STANDARD PLAN list, always show the STANDARD PLANS call-out legend:



**Figure 3.3.1 Standard Plans List Call-out Legend**

If an individual STANDARD PLAN is new or has been revised since originally released, the STANDARD PLAN will be inserted into the contract plans by District Office Engineer (DOE) and will be denoted as a REVISED STANDARD PLAN (RSP):



**Figure 3.3.2 Standard Plan Call-out Detail**

All current and revised Caltrans STANDARD PLANS are available on the Caltrans DES-OE Internet website in several electronic formats. Care should be taken to ensure that all REVISED STANDARD PLANS associated with a project are included in a set of plans. This includes those listed in the notes of any referenced STANDARD PLAN.



Figure 3A.B.1 Index to Plans Detailing Example

<p style="text-align: center;"><b>STANDARD PLANS DATED 2018</b></p> <p>LEGEND LINES AND SYMBOLS (SHEET 1 OF 5)          LEGEND LINES AND SYMBOLS (SHEET 2 OF 5)          LEGEND LINES AND SYMBOLS (SHEET 3 OF 5)          LEGEND LINES AND SYMBOLS (SHEET 4 OF 5)          LEGEND LINES AND SYMBOLS (SHEET 5 OF 5)          LEGEND - SOIL (SHEET 1 OF 2)          LEGEND - SOIL (SHEET 2 OF 2)          LEGEND OF ROCK          LEGEND OF SURFACE          BRIDGE SURCHARGE AND WALL          LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL BRIDGE          RAILINGS WITHOUT SIDEWALKS DETAILS No. 2          BRIDGE DETAILS          BRIDGE DETAILS          BRIDGE DETAILS          UTILITY OPENINGS T-BEAM          CABLE RAILING 70 BRIDGE RAIL (SHEET 1 OF 4)          CALIFORNIA 51-70 BRIDGE RAIL (SHEET 2 OF 4)          CALIFORNIA 51-70 BRIDGE RAIL (SHEET 3 OF 4)          CALIFORNIA 51-70 BRIDGE RAIL (SHEET 4 OF 4)</p>	<p style="text-align: center;"><b>INDEX TO PLANS</b></p> <p><b>STRUCTURAL PLANS</b></p> <p>TITLE SHEET No.</p> <p>1 GENERAL PLAN 31</p> <p>2 INDEX TO PLANS 32</p> <p>3 LIMITS OF EXCAVATION AND BACKFILL 33</p> <p>4 FOUNDATION PLAN 34</p> <p>5 FOUNDATION PLAN 35</p> <p>6 ABUTMENT 1 LAYOUT 36</p> <p>7 ABUTMENT 2 LAYOUT 37</p> <p>8 ABUTMENT DETAILS No. 1 38</p> <p>9 ABUTMENT DETAILS No. 2 39</p> <p>10 ABUTMENT DETAILS No. 3</p> <p>11 ABUTMENT DETAILS No. 4</p> <p>12 SOLDIER PILE WALL DETAILS No. 1</p> <p>13 SOLDIER PILE WALL DETAILS No. 2</p> <p>14 GIRDER SECTION</p> <p>15 GIRDER LAYOUT</p> <p>16 GIRDER DETAILS No. 1</p> <p>17 GIRDER DETAILS No. 2</p> <p>18 SPLICE PLATE DETAILS No. 1</p> <p>19 SPLICE PLATE DETAILS No. 2</p> <p>20 CATWALK DETAILS No. 1</p> <p>21 CATWALK DETAILS No. 2</p> <p>22 CALIFORNIA 51-70 Mod DETAILS</p> <p>23 STEEL GIRDER SHOP SPLICE &amp; STUD CONNECTOR DETAILS</p> <p>24 STEEL GIRDER CONNECTION STIFFENER DETAILS</p> <p>25 STEEL GIRDER CONNECTION STIFFENER DETAILS</p> <p>26 STRIP JOINT SEAL ASSEMBLY (MFE=4")</p> <p>27 LOG OF TEST BORINGS 1 OF 3</p> <p>28 LOG OF TEST BORINGS 2 OF 3</p> <p>29 LOG OF TEST BORINGS 3 OF 3</p> <p>30</p>	<p style="text-align: center;"><b>ELECTRICAL PLANS</b></p> <p>TITLE SHEET No.</p> <p>EE-1 LEGEND 31</p> <p>EE-2 SEISMIC MONITORING LAYOUT 32</p> <p>EE-3 SEISMIC MONITORING SENSOR ENCLOSURE TABLE 33</p> <p>EE-4 SEISMIC MONITORING SENSOR ENCLOSURE TABLE 34</p> <p>EE-5 SEISMIC MONITORING ENCLOSURE MOUNTING DETAILS 35</p> <p>EE-6 SEISMIC MONITORING FREEFIELD DETAILS 36</p> <p>EE-7 SEISMIC MONITORING RECORDER DETAILS 37</p> <p>EE-8 SEISMIC MONITORING SENSOR ENCLOSURE DETAILS 38</p> <p>EE-9 SEISMIC MONITORING UTILITY SERVICE DETAILS 39</p>	<p style="text-align: center;"><b>GENERAL NOTES</b></p> <p style="text-align: center;"><b>LOAD AND RESISTANCE FACTOR DESIGN</b></p> <p>DESIGN TO LEFD Bridge Design Specifications, 2012 edition with California Amendments, preface dated Jan 2014.</p> <p>DEAD LOAD: 35 psf for future wearing surface. The deck load between the girders has been increased by a factor of 10% to allow for the use of steel deck forms.</p> <p>LIVE LOAD: HS-20 and permit design load HL-93 and 300 lb concentrated load Catwalk: 40 psf uniform load, 300 lb concentrated load</p> <p>SEISMIC LOADING: Seismic Mass = 1650 k/Sec          Main Frame Group Mass = 1.4          Peak Ground Acceleration 0.29g</p> <p>5% damping</p> <p>REINFORCED CONCRETE:          f<sub>y</sub> = 60 ksi          f<sub>c</sub> = 3.6 ksi          n = 8</p> <p>STRUCTURAL STEEL: Girder web, flanges, stiffener plates, connection plates and gusset plates, Cross frames, catwalk and miscellaneous details f<sub>y</sub> = 36 ksi (unless otherwise noted)</p> <p>HIGH-STRENGTH BOLTS: High-strength bolts with threads included from the shop plate (unless otherwise noted).</p> <p>STEEL SOLDIER PILE:          F<sub>y</sub> = 50 ksi</p> <p>STRUCTURAL TIMBER:          Treated Douglas Fir No. 2 or better          Timber 100 be Tull sawn.</p>	<p style="text-align: center;"><b>INDEX TO PLANS</b></p> <p><b>PFEIFFER CANYON BRIDGE</b></p> <p><b>INDEX TO PLANS</b></p>
<p>NOTE: To reflect current detailing standards, this sheet may have been modified from its original version.</p>				



# Bridge Design Details 3.4 August 2019

## Structure Plans

Do NOT use more than one GENERAL PLAN.

Large structures, viaducts, retaining walls, and interchanges too long to fit on a single GENERAL PLAN, shall be drawn using STRUCTURE PLAN sheet(s). In this case, the entire structure, bridge, or retaining wall should be shown on one GENERAL PLAN using a small scale (e.g., 1" = 200'). The alignment and other details that are typically shown on the GENERAL PLAN will instead be provided on STRUCTURE PLAN sheet(s) using a 1" = 20' scale. Use as many STRUCTURE PLAN sheet(s) as necessary at this scale.

STRUCTURE PLAN sheet(s) should use a structure detailing border and immediately follow the GENERAL PLAN or INDEX TO PLANS sheet. Refer to *Bridge Design Details*: 3.4 Structure Plan Detailing Examples, Attachment 3A.C.1 and Attachment 3A.C.2.

## Retaining Walls

STRUCTURE PLAN sheet(s) are typically included in retaining wall plans to show additional information, such as footing layouts, design heights, and other details not shown on the GENERAL PLAN. PLAN views for Soldier Pile Walls and standard retaining walls on spread footings are not required. On STRUCTURE PLAN sheet(s), both the ELEVATION and PLAN views should be included at equal scales; the preferred scale for both is 1" = 10'.

Refer to *Bridge Design Details*: 3.4 Structure Plan Detailing Examples, Attachments 3A.C.3 through Attachment 3A.C.7 for examples of typical retaining wall STRUCTURE PLAN sheet(s):

- Attachment 3A.C.3 - Modified Standard Retaining Walls (Types 1, 5, 6 or 7)
- Attachment 3A.C.4 - Modified Standard Retaining Walls (Types 1SW, 5SW or 7SW)
- Attachment 3A.C.5 - Soldier Pile, Tangent or Secant Pile Walls
- Attachment 3A.C.6 - Soil Nail Walls
- Attachment 3A.C.7 - Ground Anchor Walls



Figure 3A.C.1 Structure Plan Detailing Example 1

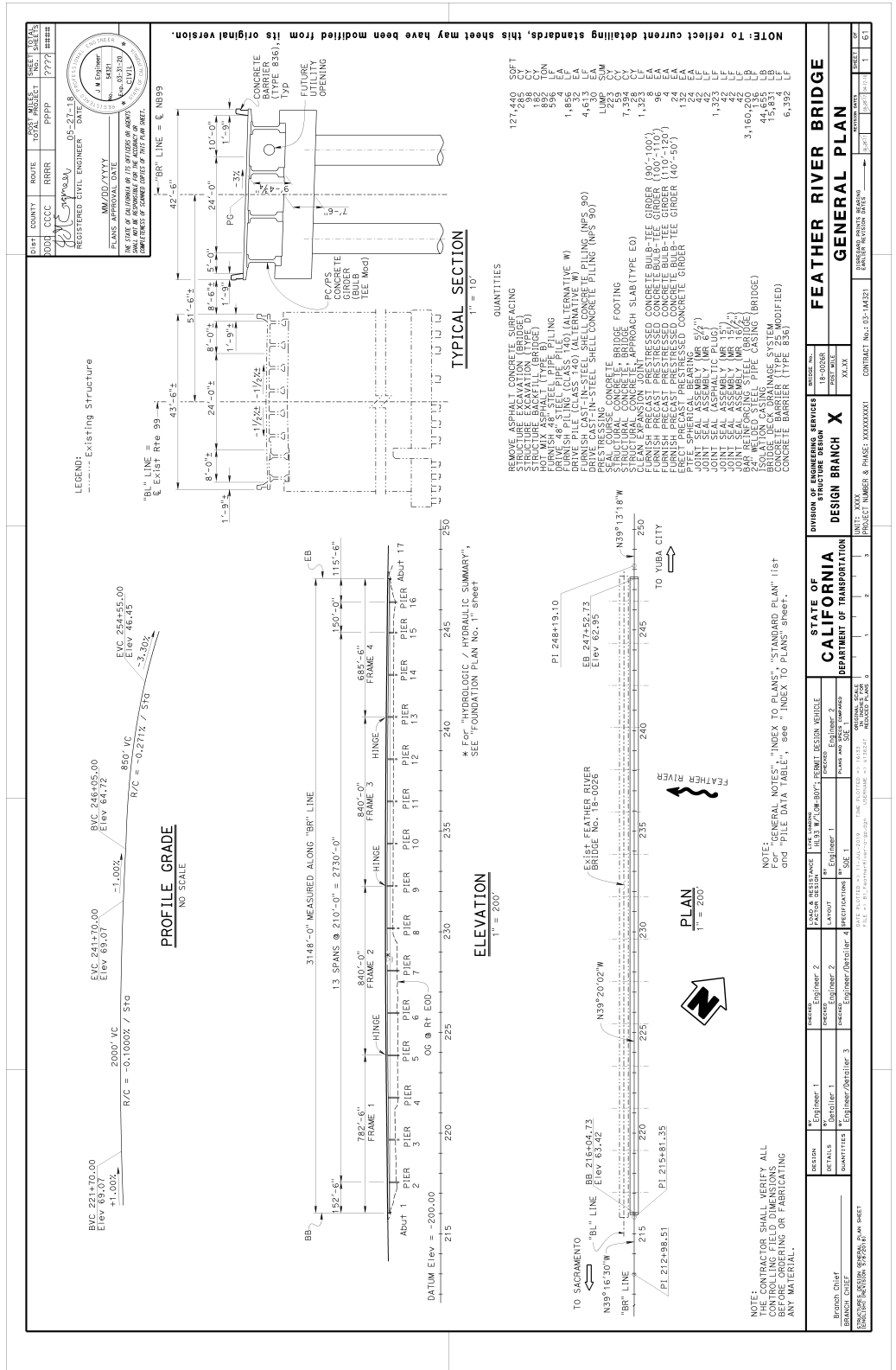




Figure 3A.C.2 Structure Plan Detailing Example 2

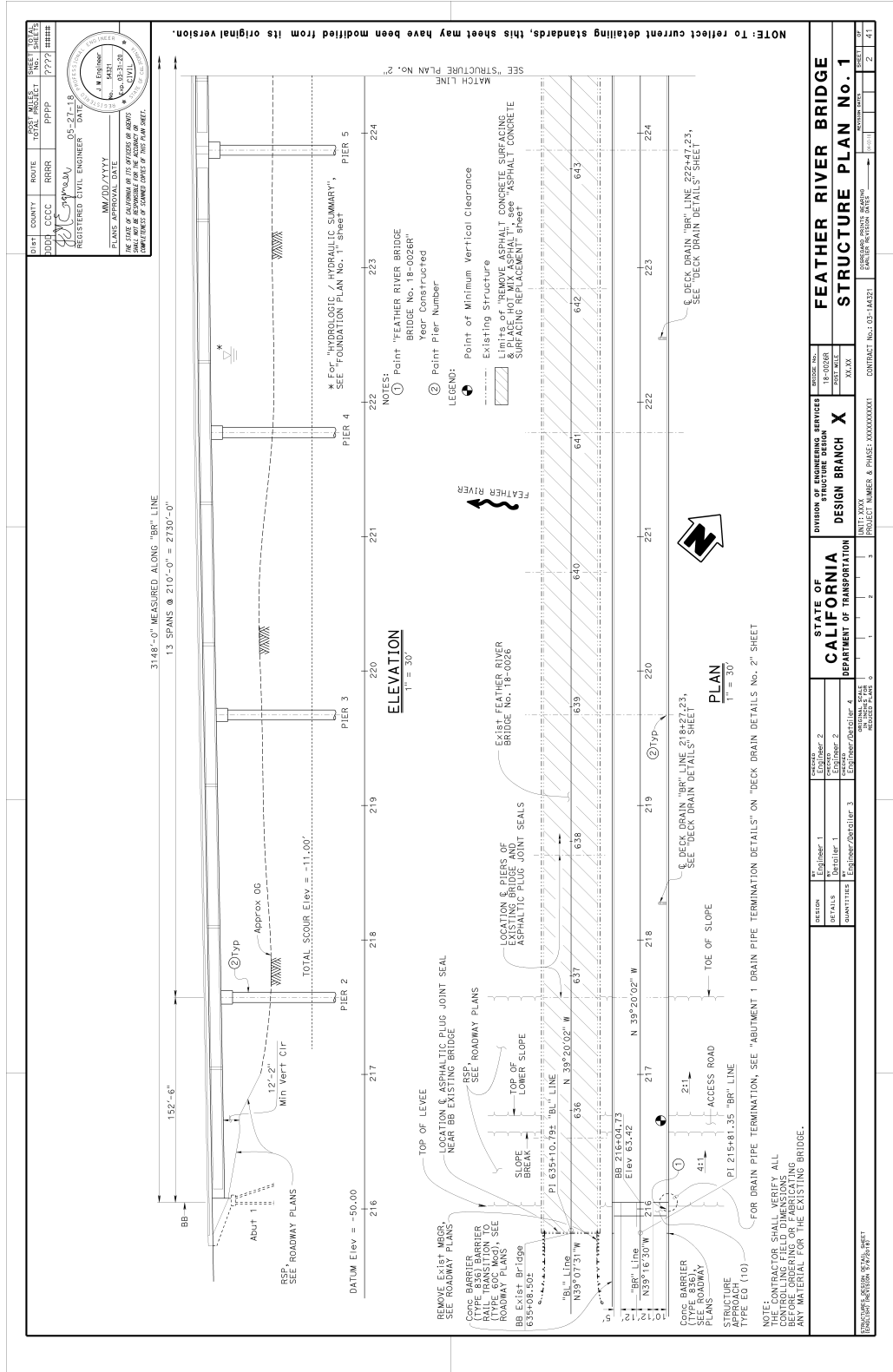






Figure 3A.C.4 Modified Standard Retaining Walls (Types 1SW, 5SW or 7SW) Detailing Example

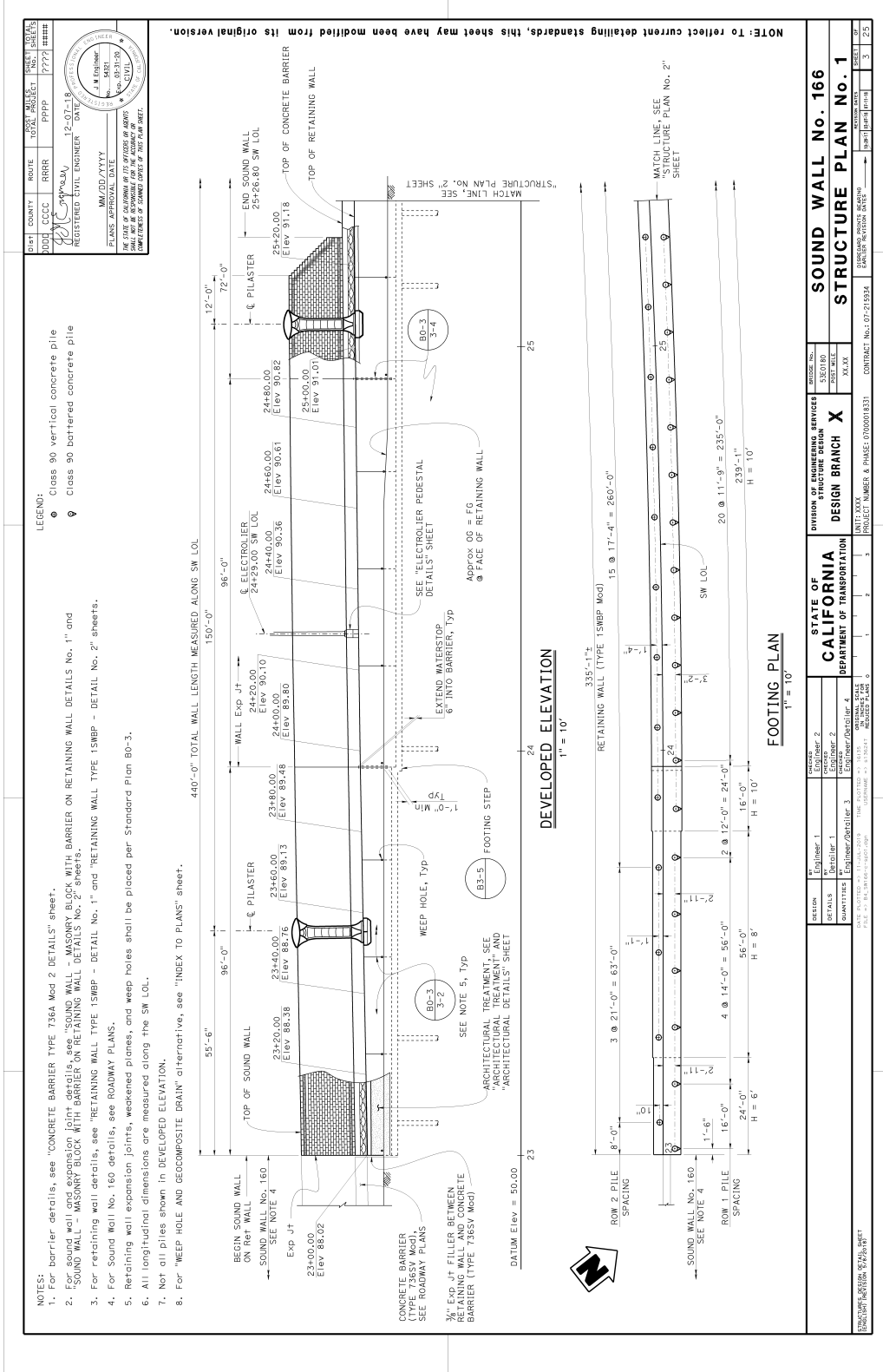






Figure 3A.C.5 Soldier Pile, Tangent or Secant Walls Detailing Example

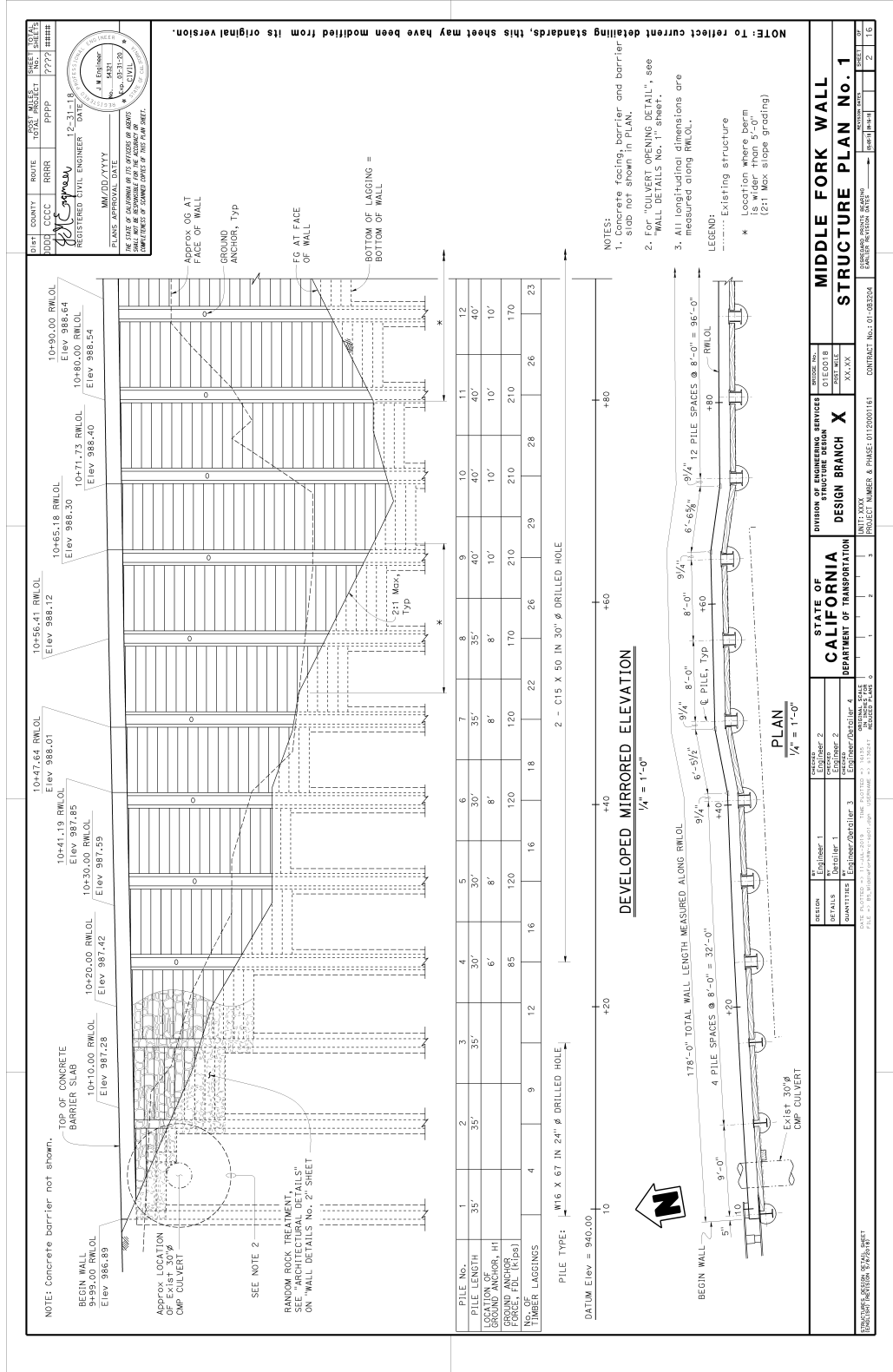




Figure 3A.C.6 Soil Nail Wall Detailing Example

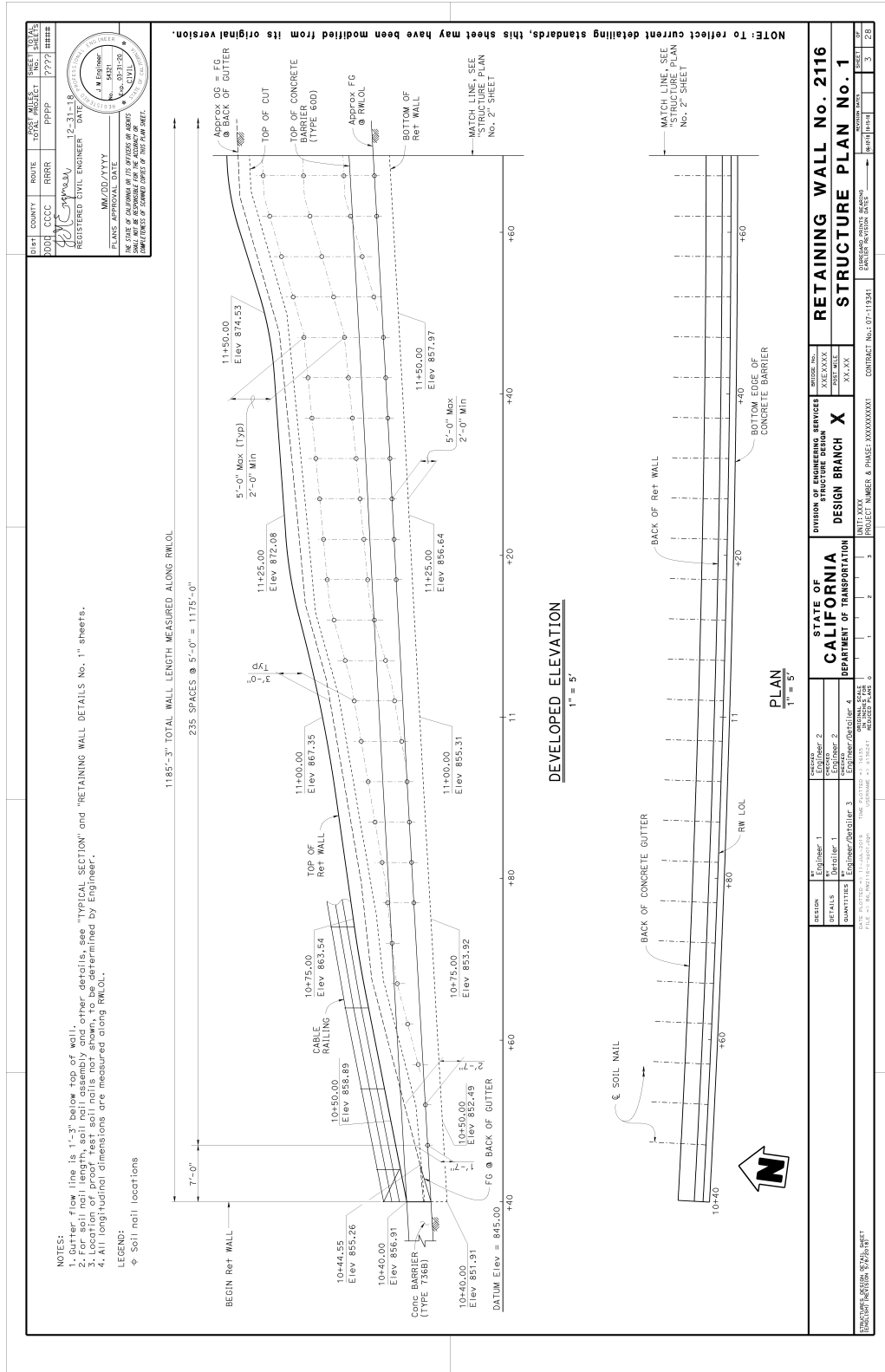
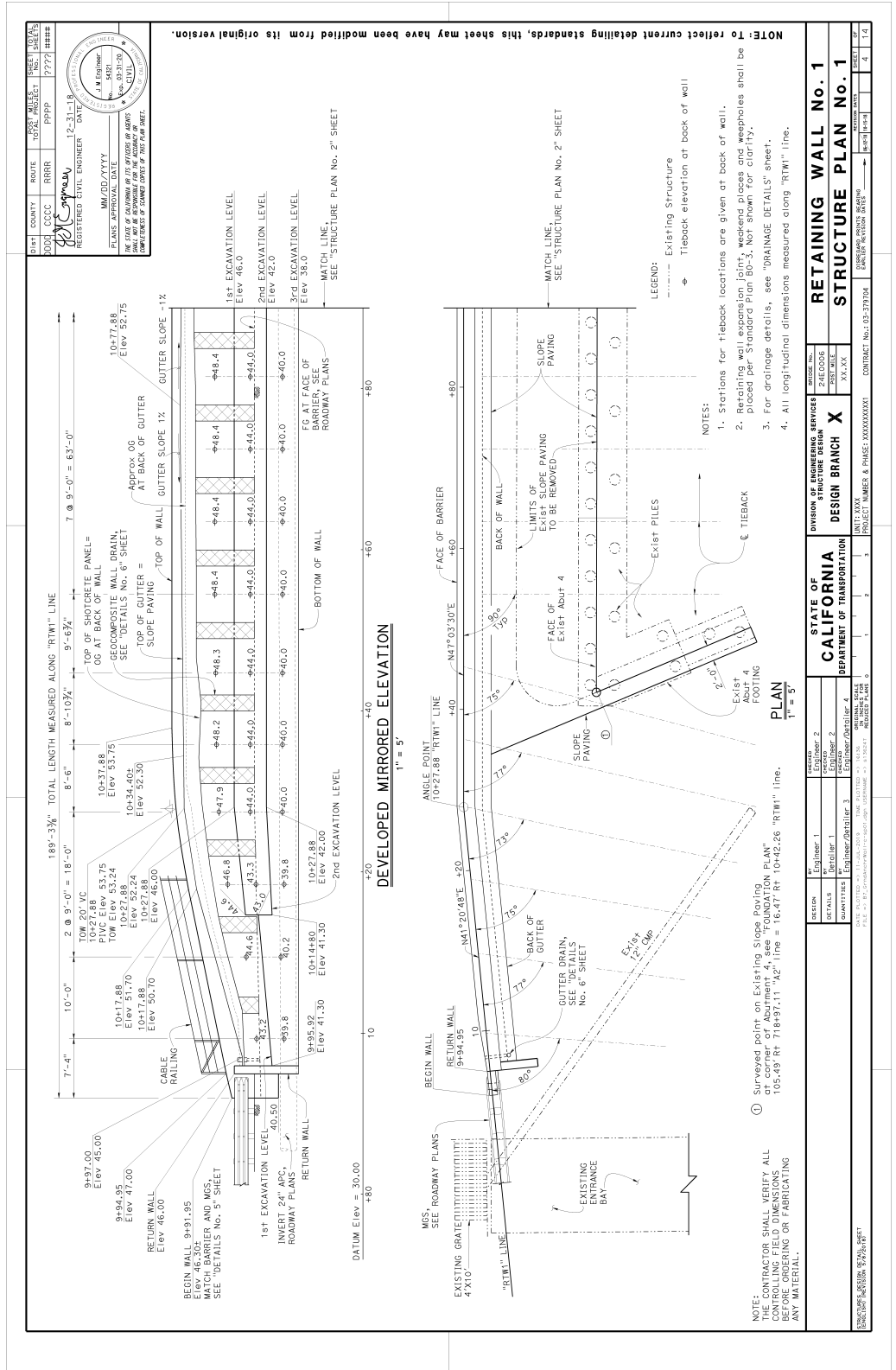




Figure 3A.C.7 Ground Anchor Wall Detailing Example





# Bridge Design Details 3.5 August 2019

## Falsework Requirements

To ensure that traffic handling is given proper consideration in the early design and planning stages, it is necessary to identify traffic handling and falsework assumptions as early as possible.

This information is described by placing the falsework requirements and traffic notes decal (shown below) on the GENERAL PLAN sheet before Type Selection and GENERAL PLAN Distribution milestone. Remove the decal before the UNCHECKED DETAILS milestone.

Vehicular Traffic

1.  New alignment. No traffic at the site.
2.  Traffic will be detoured away from the site.
3.  Traffic will be carried on the structure.  
Stage construction will/will not be required.
4.  Traffic will pass under the structure on \_\_\_\_\_ (Name of St. or Hwy.)
  - A.  No falsework allowed over traffic.
  - B.  Falsework opening(s) required:
 

Temporary Vertical Clearance	Width of Traffic Opening
_____ Bnd _____	_____
_____ Bnd _____	_____
_____ Two-way _____	_____
  - C.  Temporary traffic lane reduction needed for footing excavation.

Pedestrian Traffic

Falsework opening required on \_\_\_\_\_ (Name of St.)

Location	Height	Width
_____	_____	_____

Railroad Traffic

Falsework opening required over \_\_\_\_\_ (Name of RR)

Vertical Clearance	Horizontal Clear Width
_____	_____

**Figure 3.5.1 Falsework Requirements and Traffic Notes Decal**

For more information regarding falsework openings; see *Highway Design Manual* and *Bridge Design Aids: 10-6 Clearance at Structures*.

If traffic requirements are not clearly indicated in the Bridge Site Submittal, the Structure Project Engineer should contact the District Project Engineer to obtain clarification on assumptions before Type Selection.



# Bridge Design Details 3.30 August 2019

## Structure Identification

Prior to Type Selection, the Structure Design Branch requests a bridge identification number from the Structures Maintenance and Investigations (SM&I) unit. This number will be used on all Structure Plans, reports, and other identifying information.

The structure name, bridge number, and year constructed shall be painted on all new structures and widenings. This bridge identification information should be in a place visible to traffic from the roadway at both the upper and lower levels of traffic. At the upper level, it shall be painted on the bridge barrier near the paving notch to the right of approaching traffic on both ends of the structure. At the lower level, if required, it shall be painted on a column or wingwall to the right of approaching traffic.

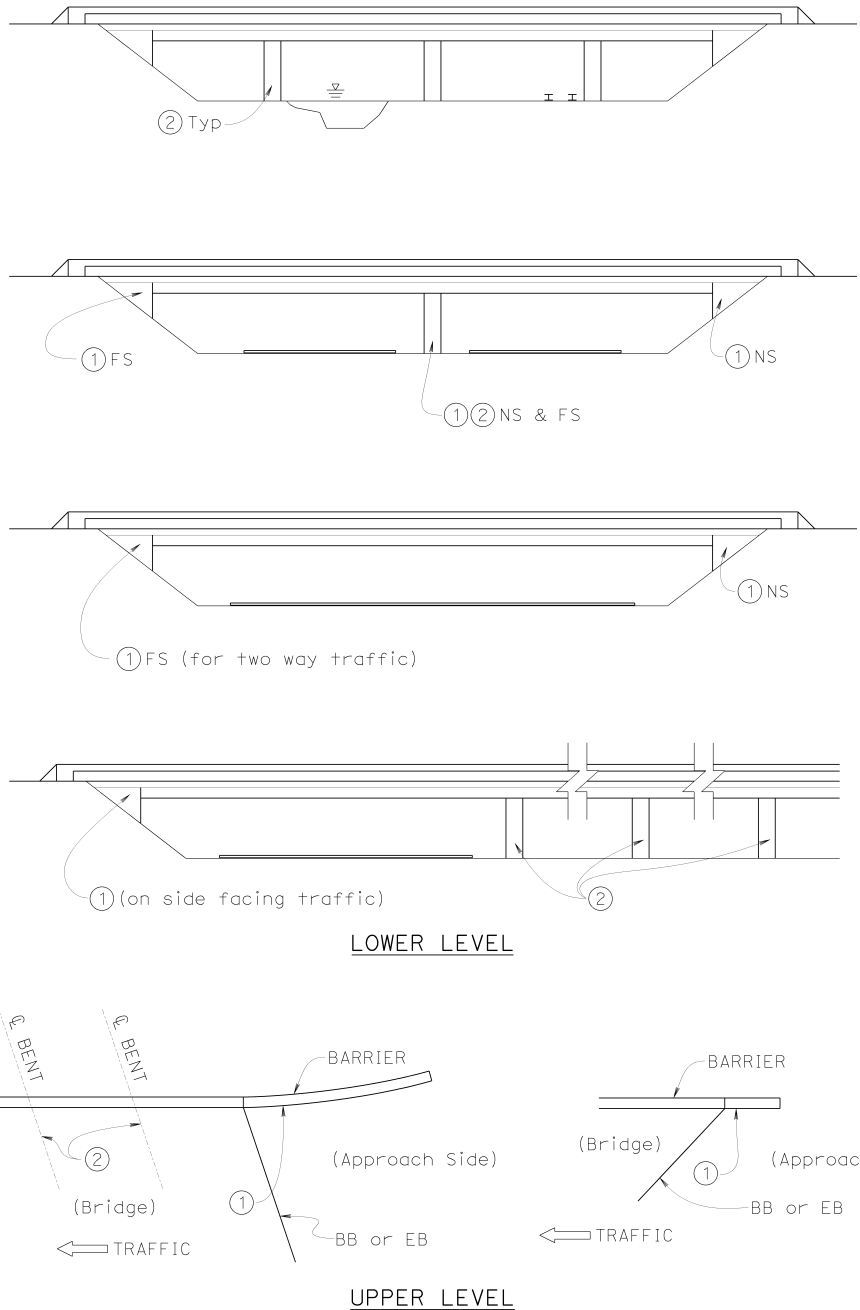
Bridge supports shall be numbered to follow the direction of increasing stations along a route; stationing direction and other information is typically provided by the District.

Exceptions:

- For structures with no columns adjacent to the roadway, the bridge name, number and year constructed shall be painted on the abutment wingwall or on a column in the center of the roadway to the left of traffic.
- On "long" structures over 300 feet long or consisting of five or more spans, each bent, or pier, shall be identified for maintenance personnel, both underneath and on the barrier along the bridge at each support. The support identification numbers should be the same as those used in the contract plans.

**Examples: BENT 2R, PIER 15L, etc.**

- It is very common for structures to have a roadway "Mile Post" sign located at the bridge, retaining wall or culvert. These details are typically shown in the Roadway Plans and may include the bridge name, number, and post mile.
- For structures with long adjacent retaining walls or approaches where metal beam bridge railings extend well beyond the structure, the structure identification shall be painted on the barrier's concrete end block. If the retaining wall is long enough, the Roadway Plans may also indicate a roadway "Mile Post" sign near the paving notch of the bridge or structure that also includes the structure identification information.



- ① Paint "NAME OF STRUCTURE, BRIDGE No. XX-XXXX", Year Constructed
- ② Paint Bent or Pier Number (on long structures only)

**Figure 3.30.1 Structure Identification**