Bridge Design Details 1.1 June 2025

General Detailing

Structure Plans shall be detailed and arranged in such a manner that a contractor can quickly understand the scope of the work to be done, calculate quantities to estimate construction costs, and construct the project. Keep in mind that once a contract is awarded, the plans become an enforceable part of a contract from which a structure is built. Contractors and subcontractors have a very short timeline to prepare bids. A clear set of plans increases the probability of competitive and reasonable bids from contractors.

When detailing or reviewing plans:

- Whole words are preferred over abbreviations. If abbreviations are used, make sure they are defined in the *Standard Plans* (A3A, A3B, A3C, and B0-1), a collegiate dictionary, or are more familiar than the non-abbreviated version (e.g., PVC pipe).
- Dimensioning and detail call-outs should generally not appear in more than one place within a set of structure plans. Dimension duplication may create a problem if a dimension is changed on one detail and not on the other.
- Exact and proper names of all bid items shall be used throughout the plans. Refer to the current Bid Item Codes or *Estimating Quantities* guide on the Structure Office Engineer website for further guidance.
- When starting a new DGN file and details, the best practice is to choose the proper coordinate zone for the file settings. Detailing should be done in MASTER model space at 1:1 and then referenced into the border sheets. This will allow all CADD files to communicate with one another and be detailed with the correct coordinates.

Text Style and Size

Structure Plans shall use uppercase text for call-outs, dimensioning, and labeling. The use of uppercase text makes it easier to distinguish characters within the plans. For NOTES, a combination of upper and lowercase text shall be used since this is much easier to read than all uppercase text in sentence or paragraph form.

Sheet titles in the Title Blocks and Detail Titles shall be all uppercase text, except when using abbreviations in the cases that space is limited (e.g., St, Blvd, No., etc.).

For seldom used hand-drafted sheets, vertical single stroke Gothic or Reinhardt style text shall be used. Normal lettering height shall be $^{5}/_{32}$ inches minimum; text used for Title Block and Detail Titles shall be ¼ inch height.

For more commonly used CADD drafted sheets, use 0.14 inches for normal lettering height, 0.175 inches for Detail Subtitles, and 0.24 inches for Title Blocks and Detail Titles. Sheet Titles shall be 0.24 inches lettering height, font style BOLD43, and Weight 0. Refer to Figure 1.1.1 and the *CADD User's Manual*: 2.6 Text for more information regarding text size, fonts, and weights. All call-outs and notes on a sheet shall be left justified.

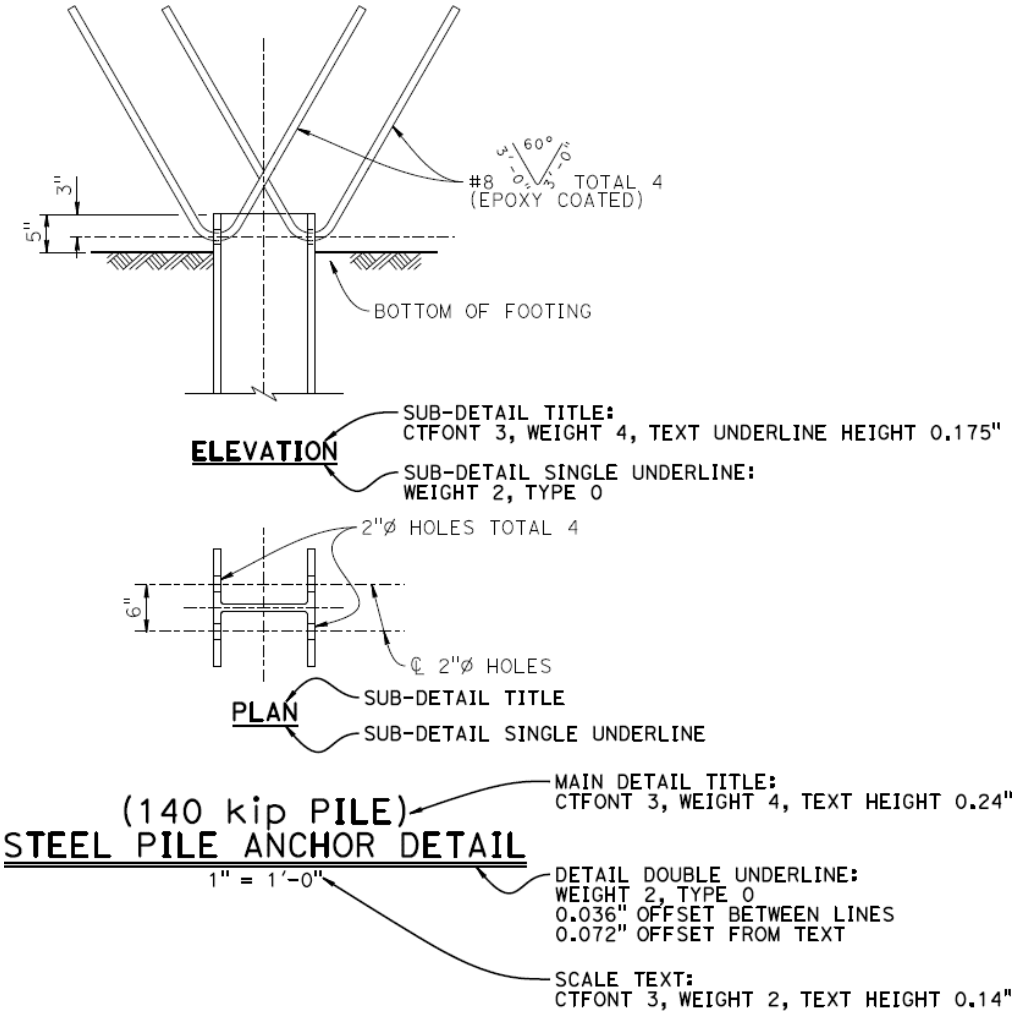


Figure 1.1.1 Text Style, Size, and Detail Titles

Detail Titles and Sheet Call-outs

If DETAILS or SECTIONS are not shown on the sheet to which they pertain, a cross reference shall be noted on the plans. This note shall be placed on the appropriate sheet referring to the sheet where the SECTION is cut, or the DETAIL is located. SECTIONS and DETAILS shall always be referenced in both directions.

Notes and Titles referring to specific Detail(s) shall show the exact Detail Title in all uppercase text with quotation marks:

Examples: **"**SECTION C-C**"**
"TYPICAL SECTION**"**

Notes calling out details or notes found on a different sheet shall show the exact Detail and Sheet Names in all uppercase text with quotation marks:

Examples: "DETAIL A", SEE NOTE 1
1. For location of "SECTION A-A", "SECTION B-B" and "DETAIL A", see "BENT LAYOUT" sheet.

Notes calling out details found on multiple sheets shall show all the exact Sheet Names in all uppercase text with quotation marks:

Examples: For locations of "SECTION C-C," see "ABUTMENT 1 LAYOUT" and "ABUTMENT 2 LAYOUT" sheets.

Detail Layout, Sections, and Views

The following rules provide guidance on the proper layout of details within a set of plans. They are meant to establish a standard to be used for all details to allow easy reading of the plans.

- Stationing for a PLAN view is normally left to right.
- TYPICAL SECTION and other SECTION views show further details for a typical bridge component at a given location. TYPICAL SECTIONS are used to depict standard elements for the abutments, bents, retaining walls, etc. On sheets other than the GENERAL PLAN, it is preferred to show lettered sections which show the location and orientation of the SECTION.
- Do not associate SECTIONS to the component(s) they are detailing (e.g., ABUTMENT SECTION A-A); instead, use lettered sections (e.g., SECTION A-A) for all components. SECTION letters may restart between components (e.g. abutments, bent, etc.) or continue from A to Z through the entire plan set.
- As additional SECTIONS are needed, define them with a lettered SECTION (e.g., SECTION A-A, SECTION B-B, etc.). Letters used for SECTIONS may repeat for each different bridge element within a set of plans. Avoid the use of double lettered SECTIONS (e.g., SECTION AA-AA). The same applies for DETAILS (e.g., DETAIL A, DETAIL B, etc.) and VIEWS (e.g., VIEW A-A, VIEW B-B, etc.).

- All SECTION views shall be taken from a PLAN, ELEVATION, DETAIL, or other VIEW. Do not take a SECTION from another SECTION.
- A SECTION view shall show all intersecting lines that intersect the SECTION cut plane, whereas a VIEW is a projection. Unlike a VIEW, do not show hidden lines, reinforcement, or other items beyond the cut plane in a SECTION. For an example of a SECTION view, see Figure 1.1.2.

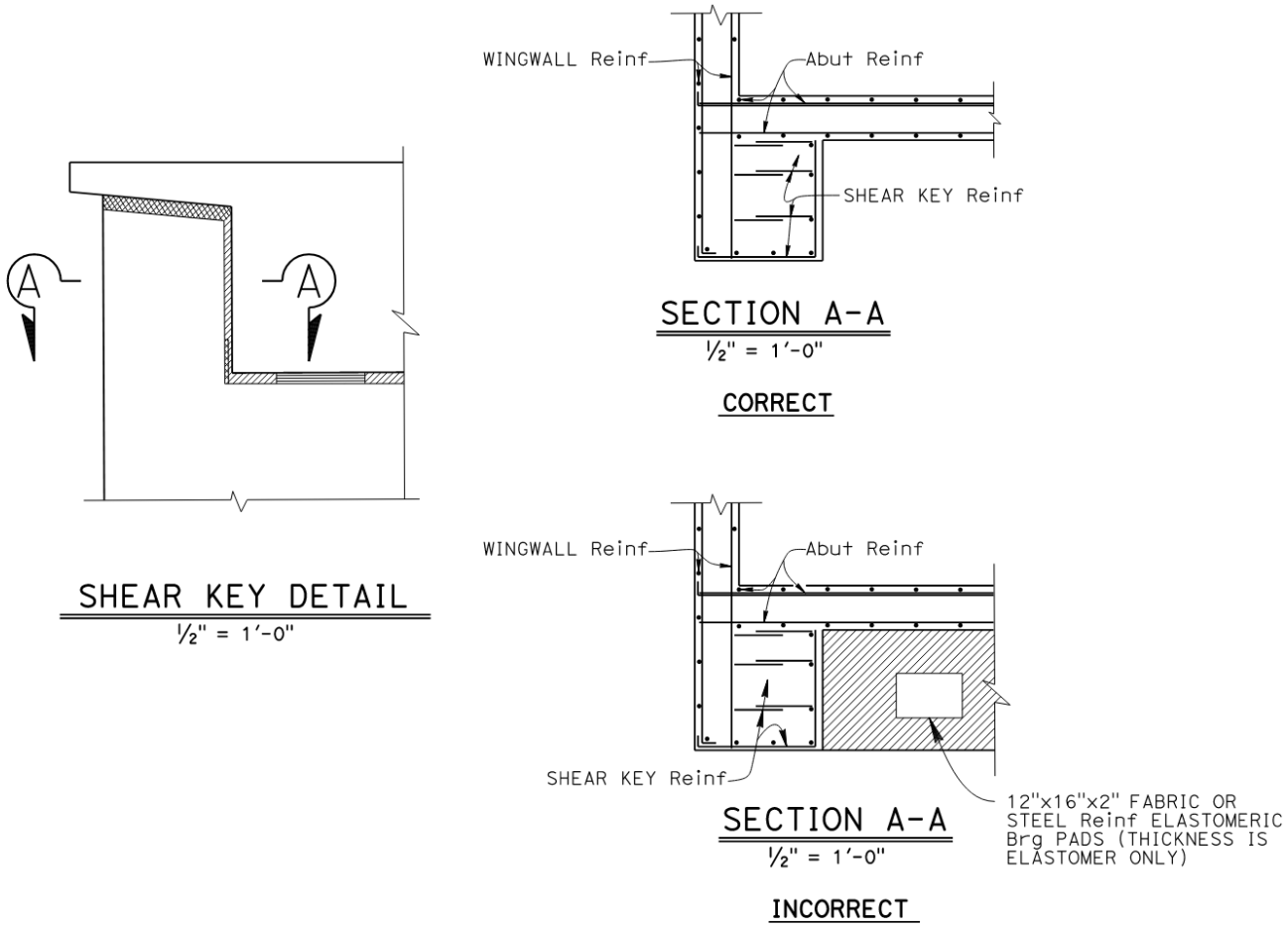


Figure 1.1.2 Section View

Elevation Views

ELEVATION views are usually projected from the right edge of the deck, face of the wall shown, or lower side of the structure shown in the PLAN view. The ELEVATION view may be mirrored, developed, or taken at a specific location as a VIEW.

When the work being done is only on the upper side of the PLAN view for a project, such as a widening, barrier rail replacement, or retaining wall in roadway fills, a MIRRORED ELEVATION shall be used. In addition, MIRRORED ELEVATION should be used for retaining walls, which are placed in roadway cuts along the bottom of the PLAN view. The MIRRORED ELEVATION is the view as if reflected in a mirror, with the stationing shown from left to right.

A DEVELOPED ELEVATION is used when the radius or bend of a structure is such that a projected elevation would not show an accurate view of the structure. The DEVELOPED ELEVATION shows the true length of the structure as though it were on a straight line. Use a DEVELOPED ELEVATION view for Pedestrian Overcrossing (POC) structures, bridges, and retaining walls that are not straight.

For curved structures in which work is done on the upper side of the PLAN view, this elevation view shall be titled "DEVELOPED MIRRORED ELEVATION." This may also be used for retaining walls which are placed in roadway cuts along the bottom of the PLAN view.

Scale Format

There are two types of scales used on Structure Plans, Architect and Engineer. These scales shall be expressed in the following formats:

- Architect scales are commonly used for DETAILS, SECTIONS, and VIEWS.

  Example: ¾" = 1'-0"

- Engineer scales are commonly used for PLAN and ELEVATION views.

  Example: 1" = 10'

To provide consistency, the term NO SCALE shall be added to those details that have varying height or length. All details shall still be drawn in MODEL space 1:1, and only referenced into the border at a varying scale and then called NO SCALE.

If ALL of the details on a sheet are to be NO SCALE, then the term “NO SCALE” shall be added to the bottom right of the sheet just above the sheet title. This will take the place of adding NO SCALE to every detail which is not preferred.

Dimensioning and Notations

- Lengths and distances are given in feet, inches, and fractions of an inch:

  Example: 279'-3½" MEASURED ALONG RWLOL

- Where a dimension is one foot or greater, place a hyphen between the foot and inch values:

  Examples: 1'-0", 2'-3", or 1’- 0½"

- Where a dimension is less than one foot, do not use the foot designation or hyphen in advance of the inch value:

  Example: 6" not 0'-6"

- Where a dimension is less than one inch, do not add zero in advance of the fraction:

  Example: ½" not 0'-½"

- Spacing between girders or pile spacing is given in feet and inches:

  Example: 4 SPACES @ 6'-0" = 24'-0"

- Elevations for DATUM and structure benchmarks are given in decimal feet, without the foot symbol, rounded to the hundredths of a foot:

  Examples: BB Elev = 330.00 or DATUM Elev = 200.00

- Elevations given for piles, footings, and other foundation work are shown to a tenth of a foot; this includes the bottom of footing elevations shown on FOUNDATION PLANS:

  Example: 330.1

- Spacing of reinforcement is given in inches, without the inches symbol, and is always assumed in inches unless otherwise shown:

  Example: #5 @ 18 (#5 bars spaced at 18 inches apart)

- Length of reinforcement is given and separated by lower-case “x” when applicable:

  Examples: #5 x 6’-0” @ 12 (6’-0” long #5 bars spaced 12 inches apart)

  #5 x 5’-0”, Tot 4 (total of four 5’-0” long #5 bars)

- Dimension call-outs shall NOT be "ASSOCIATED" with any details within a CADD file used to detail a set of structure plans; instead, dimensions should be "DROPPED" or edited using the text edit tools to "LOCK IN" the values. This prevents dimensions from changing if scales are changed.

- Angles for bearings are given in degrees, minutes, and seconds; bearings are rounded to the nearest second. Minutes and seconds are given in two-digit values.

  Examples: 9°05’09”

  30°15’38”

It is preferred that all text be read horizontally from the bottom of the sheet and in the same direction; vertical text should be read from the right side of the sheet. Mixing the orientation of dimensions and text on a given sheet and using circular dimensional text (shown below) should be avoided.

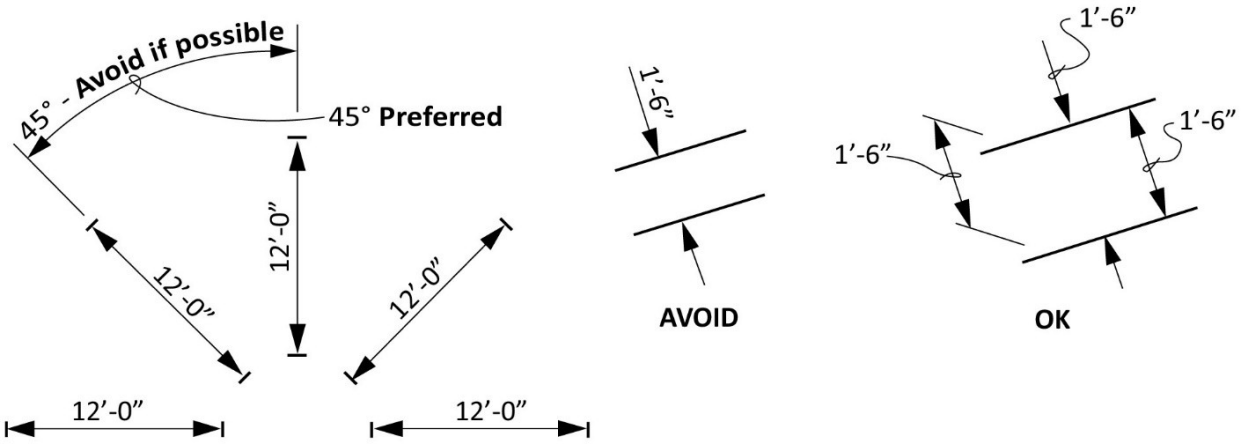


Figure 1.1.3 Orientation of Dimensions

Radius call-outs shall point to the inside of the curve. Text may be placed off the curve on small radii, but the leader arrow shall always point to the inside of the curve.

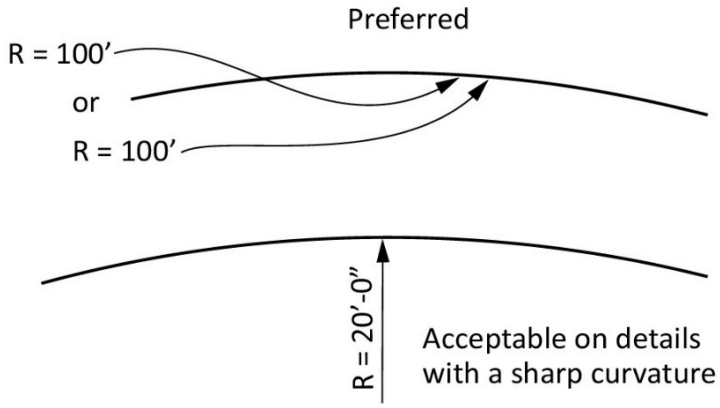


Figure 1.1.4 Radii Designation

The default clearance specified in the *Standard Specifications* is 2 inches; therefore, all 2-inch clearance locations shall not be shown on plans.

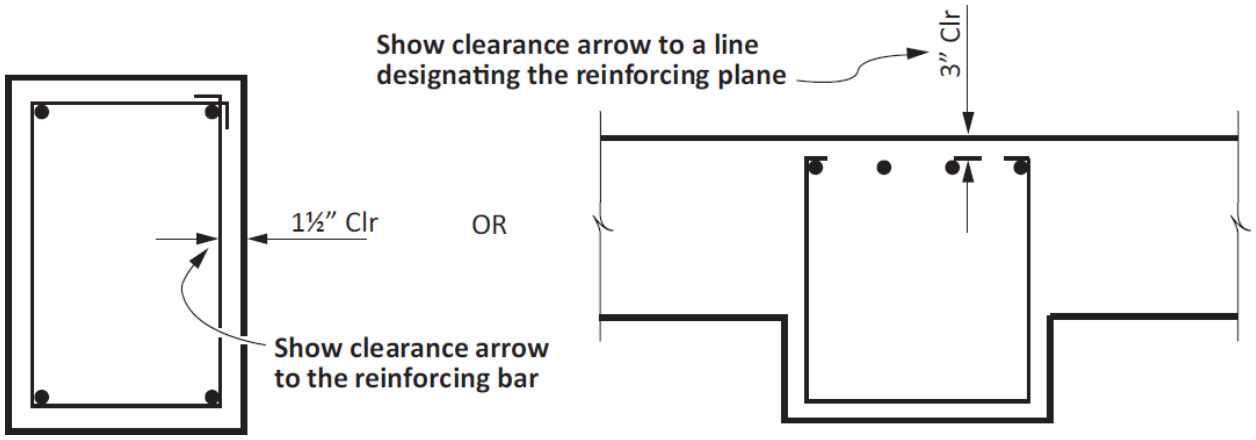


Figure 1.1.5 Reinforcing Clearance Dimension

It is generally clearer to show reinforcing in a SECTION view rather than in an ELEVATION view. The total number of bars (e.g., #11 Tot 14) shall only be called out if you can count every bar in the SECTION.

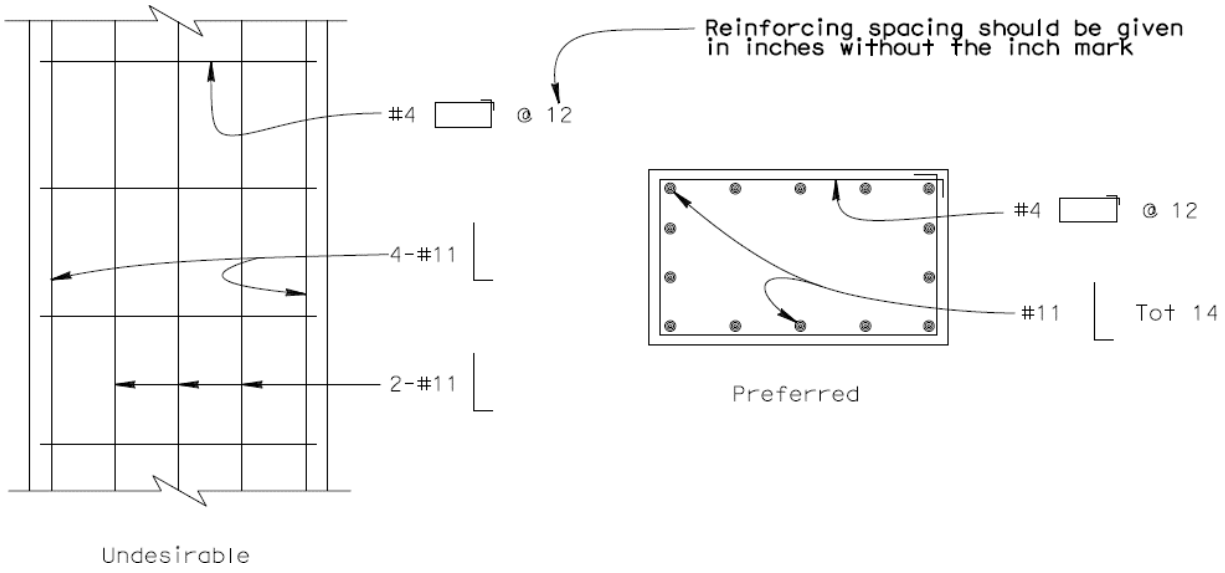


Figure 1.1.6 Reinforcement in Vertical and Horizontal Planes

There are several ways to show multiple layers of reinforcement, including staggered and alternating layers.

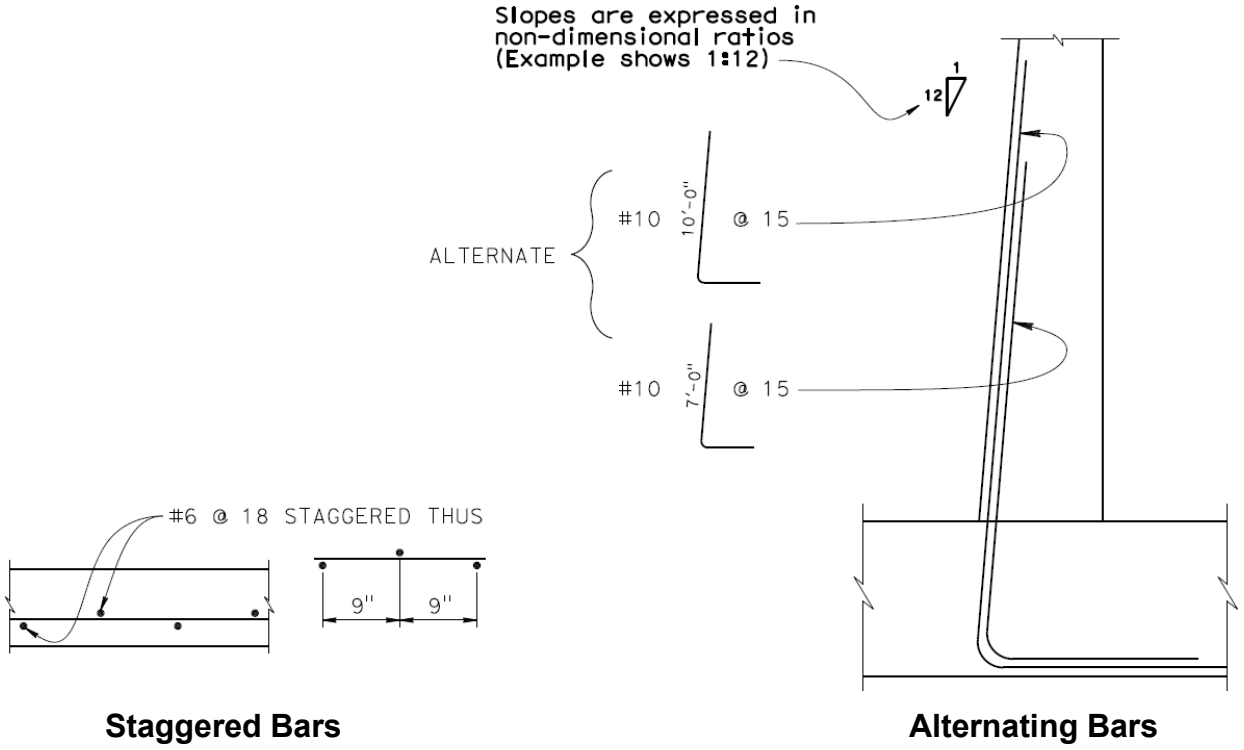


Figure 1.1.7 Staggered and Alternate Bars

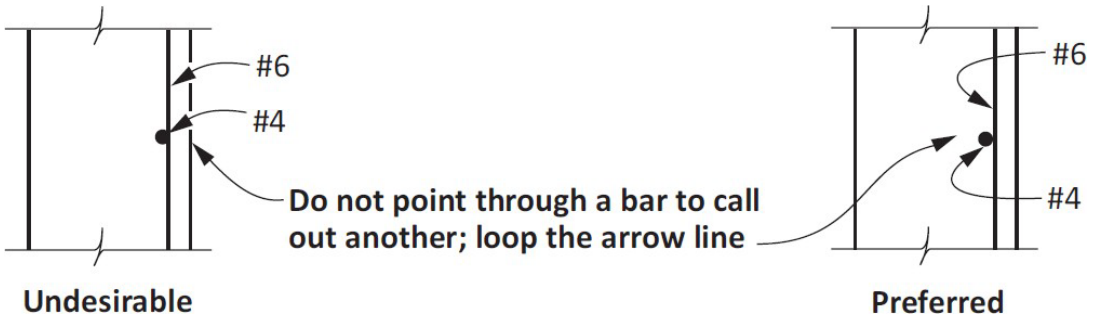


Figure 1.1.8 Multiple Layers of Reinforcement

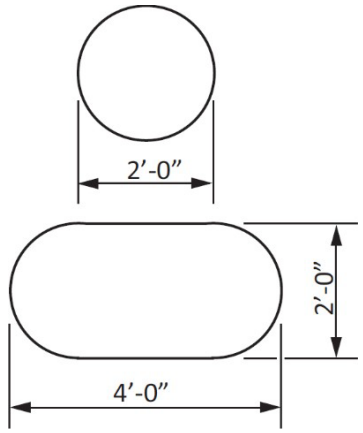


Figure 1.1.9 Circular Sections

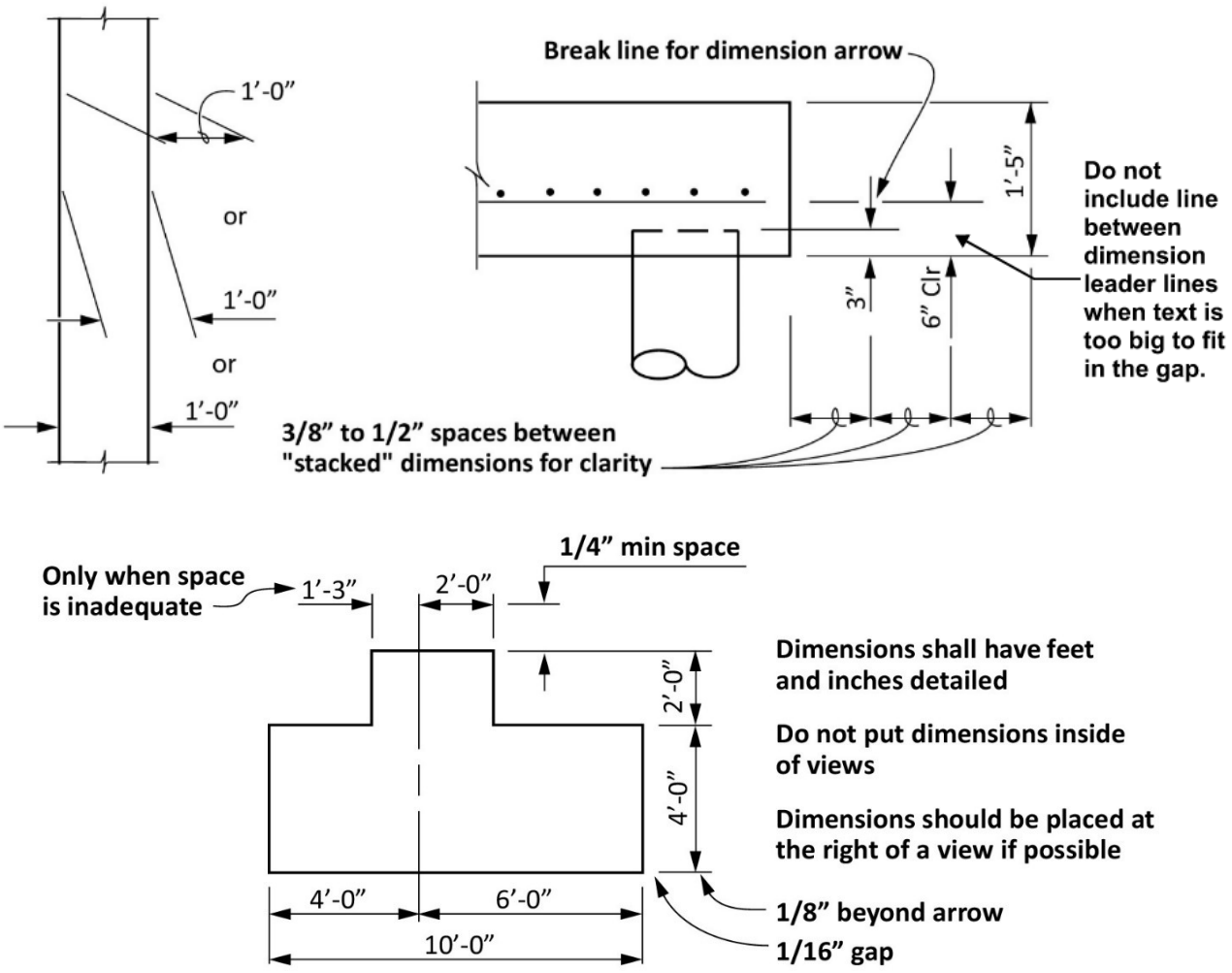
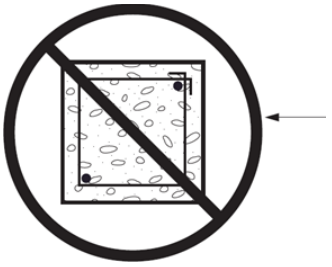
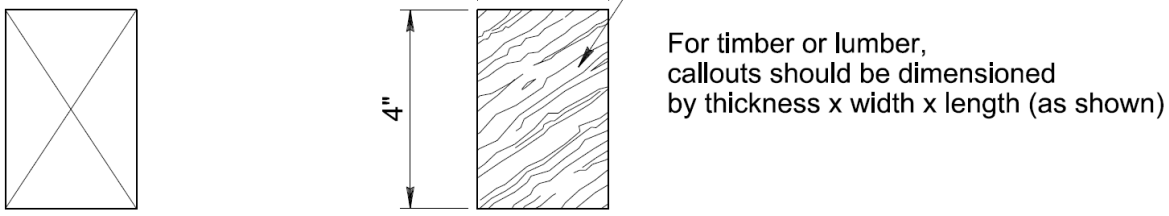


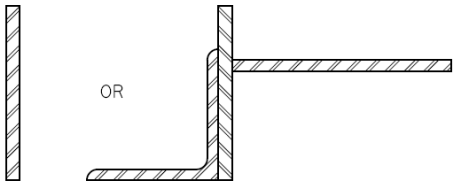
Figure 1.1.10 Rectangular Views

Section Hatching

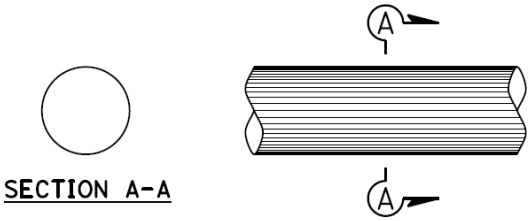


Do not show the sand and aggregate in any concrete section.

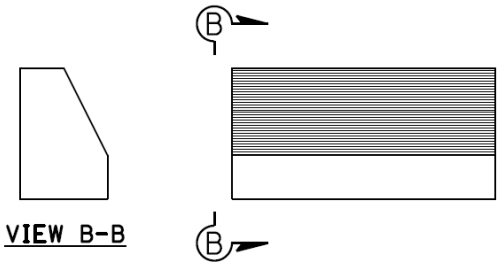




Cross hatch steel in large scale (½" = 1'-0" or greater) when two or more pieces are shown. Hatch alternate direction on pieces to clearly define limits.



Avoid shading lines on rounded or sloping surfaces. When needed to clarify detail, space the shading lines a minimum of 0.0625 inches apart.



A SECTION or VIEW defines the shape more clearly than shading.

Figure 1.1.11 Section Hatching

Notes and Legend

- NOTES and LEGEND titles shall be capitalized.
- Use a colon and DO NOT underline NOTES and LEGEND titles.
- Use upper and lowercase text for NOTES and LEGEND. Capitalize the first word in a NOTE, as well as other pronouns or bid items.
- DO NOT identify NEW CONSTRUCTION in LEGEND or elsewhere in plans.
- Use the same standard line type for existing structures above and below grade.
- The LEGEND shall provide symbols used to describe the items on a sheet. DO NOT include symbols that are in the Standard Plans (A10A through A10E) in LEGEND.

Example:

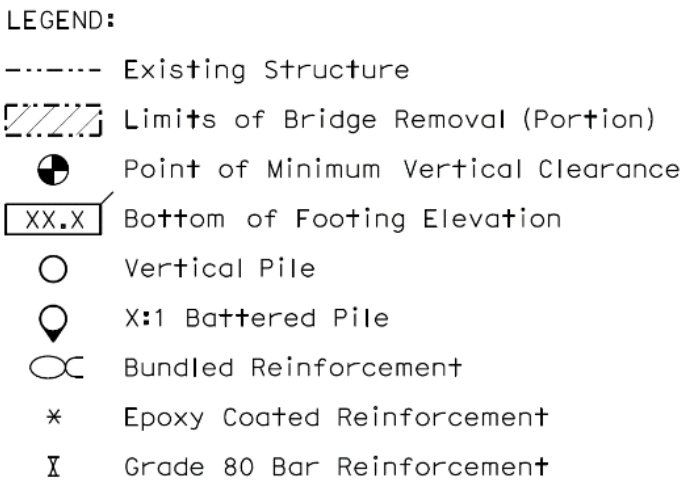


Figure 1.1.12 Example of Legend

- When additional reinforcement is shown in TYPICAL SECTION, hollow circles are used and labeled in the LEGEND. P/S strands are not typically shown.
- One exception to this is on the PC Girder XS Sheets…avoid using different symbols like “x” or “+” to show P/S strands. If a debonding pattern is shown, like below, the location of the LEGEND should be clear. It can be next to the detail unless it applies to the entire sheet. Care should be taken so that symbols or hatching are not repeated (i.e., showing hollow circles for debonded P/S and additional reinforcement on the same sheet).

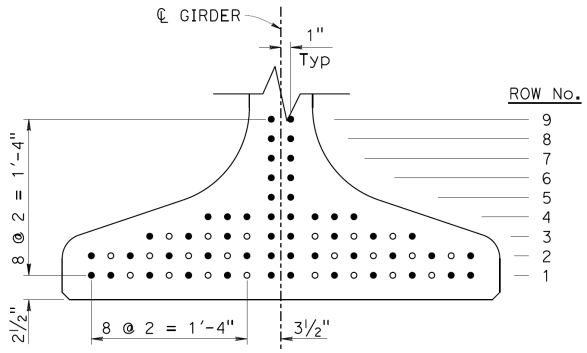


Figure 1.1.13 Example Debonded Strands on XS Sheet

- As a rule, placing a NOTE on a sheet can provide information relative to an entire sheet, or it can reference a location that provides more information for a specific detail elsewhere in the plans.
- NOTES that are given in complete sentences or statements shall end with a period.
- The use of extensive call-outs should be avoided. Examples of when call-outs are needed include existing bridge strengthening or retrofit projects, where locations of work should be clearly identified. Statements for locations of work do not always require punctuation.
- All NOTES or call-outs shall be denoted with 1, 2, 3… do not continue numbering across multiple sheets. Sequence should restart each sheet.
- Bubble call-outs should only be used where space does not permit full text and shall be denoted with ①, ②, ③… when necessary. Do not use lettered call-outs to avoid conflicts with other Standard Plan Notations.
- NOTES shall be placed above call-outs when listed together.

Example:

NOTES:

Notes

1. For "PILE DATA TABLE", see "INDEX TO PLANS" sheet.
2. For details not shown, see "BENT DETAILS No. 1" sheet.
3. For MGS, see ROADWAY PLANS.

Call-outs

① Paint "XYZ AVENUE OC
BRIDGE No. XX-XXXX"
Year Constructed

② Paint Bent Number

③ Retrofit hinge with pipe seat extenders and cable restrainers

Figure 1.1.14 Example Notes and Call-outs

Structures North Arrow

A Structures North Arrow shall be placed on all PLAN views within a set of Structure Plans to identify the orientation of the PLAN view. The bottom of the arrow width shall be ⅜" wide and height 9/16" tall on reduced plans. On full size plans, these dimensions shall be ¾" x 1⅛" respectively.

Example:

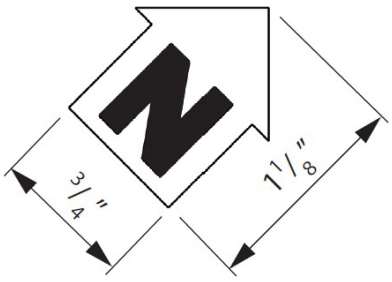


Figure 1.1.15 Standard Structure Detailing Cell (North Arrow)

Existing Structures

The standard structure detailing cell shown below shall be placed in the lower left-hand corner of the GENERAL PLAN sheet and in the same location on any other sheet when new work is dependent on existing dimensions:

NOTE:
THE CONTRACTOR SHALL VERIFY ALL
CONTROLLING FIELD DIMENSIONS
BEFORE ORDERING OR FABRICATING
ANY MATERIAL.

Figure 1.1.16 Standard Structure Detailing Cell (Existing Dimensions)

For example, when dimensioning a TYPICAL SECTION for a widening project, the overall roadway width is set by the Roadway Designer, while the existing roadway or structure dimensions are shown with a "±" and taken from AS-BUILT plans. Since the widening width is based on the actual dimension of the existing structure, it also warrants a "±"; however, the final dimension does not require a "±" because the overall widened width of the bridge is shown by dimensioning the new edge of deck from a new station line.

Dimensions, including existing radii, bearing, or elevations on an existing structure, shall always include a "±" to indicate that they are approximate. The dependent dimensions shown on the plans must be accurate enough to enable quantity calculations. The dimensions shown shall reflect the accuracy to which the dimensions of the existing structure are known, and contractors should not be required to field verify dimensions to prepare their bids.

Advanced Planning Study

At the request of the District, an Advance Planning Study (APS) is prepared by Structure Design. An APS shall be delivered on an 11 x 17 sheet with true scale shown. The scales and details shown on the APS shall assume to be full size on 11 x 17 sheet. *See Memo to Designers:* 1-8 Planning Studies and Attachments 1A.B.1 through 1A.B.6 for more information and examples.

As a project goes through the APS (K or 0) phase, it is given a “Project EA” (e.g. 0A020). The phase associated with an APS will be either “K” or “0”. When the project goes to the design phase (1), the “Project EA” changes to the “Contract Number” (e.g. 01-0A0204).

Structure Plan Sheet Order

Except for the GENERAL PLAN, FOUNDATION PLAN(s), BRIDGE STANDARD DETAIL SHEETS (XS SHEETS), and LOG OF TEST BORING(s), all Structure Plans shall use a structure detail border. Do not use periods or parentheses after sheet numbers in the INDEX TO PLANS.

Structure Plan sheets shall be placed in the following order:

SHEET No.	TITLE
1	GENERAL PLAN*
2	INDEX TO PLANS**
3	STAGE CONSTRUCTION***
4	STRUCTURE PLAN No. 1, 2, 3…****
5	DECK CONTOURS
6	FOUNDATION PLAN
7	ABUTMENT LAYOUTS
8	ABUTMENT DETAILS
9	BENT LAYOUT
10	BENT DETAILS
11	TYPICAL SECTION
12	GIRDER LAYOUT*****
13	GIRDER REINFORCEMENT
14	ARCHITECTURAL DETAILS No. 1, 2, 3…******
15	BRIDGE STANDARD DETAIL SHEETS (XS SHEETS)
16	TEST BORING LAYOUT
17	LOG OF TEST BORING X OF X

* The GENERAL PLAN sheet typically shows a PLAN, ELEVATION, TYPICAL SECTION, and PROFILE GRADE for any given structure. No more than one GENERAL PLAN shall be used for a single structure. For long structures, it may be necessary to add STRUCTURE PLAN sheets that show PLAN and ELEVATION, using as many sheets as necessary with a minimum scale of 1" = 20'.

  A clear space shall be left on the GENERAL PLAN for the quantities decal that will be provided by the Structure Cost Estimates Branch. Quantity decals are typically 4" wide and 3" to 5" tall. Each quantity listed shall be given on one line. If the quantities decal cannot fit on the GENERAL PLAN sheet, it may be placed on another sheet near the front of the set of plans. If an INDEX TO PLANS sheet is used, this is the preferred alternate location. If the quantities decal is not on the GENERAL PLAN, place a note on the GENERAL PLAN referencing the location of the quantities decal.

** The INDEX TO PLANS sheet shall only be used if the INDEX TO PLANS will not fit on the GENERAL PLAN sheet. The INDEX TO PLANS shall show the exact name of each sheet in uppercase letters. The preferred location for the INDEX TO PLANS is on the GENERAL PLAN; otherwise, an INDEX TO PLANS sheet may include the INDEX TO PLANS, GENERAL NOTES, PILE DATA TABLE, CONCRETE STRENGTH AND TYPE LIMITS diagram, and other information, as required. In some cases, there is only one sheet in a set of plans; in that case, no INDEX TO PLANS is listed on the GENERAL PLAN.

*** STAGE CONSTRUCTION sheet shall be used when multiple stage construction details cannot fit on the GENERAL PLAN. Separating the staging details will allow for additional information to be shown and provide clarity. If a STAGE CONSTRUCTION sheet is used, information shall not be duplicated on TYPICAL SECTION shown on GENERAL PLAN.

**** STRUCTURE PLAN sheet(s) shall be used for large structures when the scale shown on the GENERAL PLAN sheet is too small to provide adequate details. When STRUCTURE PLAN sheets are used, the GENERAL PLAN sheet can be simplified with the PLAN, ELEVATION, and PROFILE GRADE shown at a scale that displays the entire structure.

  The preferred location for the TYPICAL SECTION is on the GENERAL PLAN sheet; however, the TYPICAL SECTION may be shown on STRUCTURE PLAN sheets when appropriate. An exception to this is when there are ramps, or the structure width varies substantially enough that they are better displayed on a separate sheet.

  In some cases, a STRUCTURE PLAN sheet for a retaining wall will not have a PLAN view; in this case, the ELEVATION view shall show all details, including the spacing of ground anchors and piles.

***** CAMBER diagram/notes and PRESTRESSING NOTES shall be placed on the GIRDER LAYOUT sheet. If the detail or notes cannot fit on the GIRDER LAYOUT sheet, they should be placed on the GIRDER REINFORCEMENT or GIRDER DETAILS sheets.

****** ARCHITECTURAL DETAILS (or AESTHETIC DETAILS) should be used when input from the Bridge Architecture & Aesthetics Branch is required. These sheets are either shared directly as insertable sheets from the Bridge Architecture & Aesthetics Branch or created by sharing details separately with the Bridge Design branches to detail themselves.

Since Bridge Design Project Engineers are not technically licensed architects, the title of these sheets should be carefully managed. If the sheets are shared by the Architecture & Aesthetics Branch as insertable sheets and are not modified, the sheet may be titled ARCHITECTURAL DETAILS. If the sheets are detailed, cleaned up and/or stamped by the Bridge Design Branch, the details should use a standard Bridge Design border and be titled AESTHETIC DETAILS.

Additional Structure Plan detail sheets and insertable *Bridge Standard Detail Sheets* (XS Sheets) are placed before the LOG OF TEST BORING sheet(s). See 1.6 Use of Bridge Standard Detail Sheets (XS Sheets) for more information.

Overcrowding plan sheets shall be avoided. If additional sheets are needed for bridge components, number them sequentially.

Examples: ABUTMENT DETAILS No. 1
ABUTMENT DETAILS No. 2…

Avoid using the phrases "To be approved by the Engineer" or "as directed by the Engineer". If you must use these or similar phrases, discuss it with the Structure Specifications Branch or your Branch Chief.

Use ROADWAY PLANS when referring to the District portion of Project Plans within a set of Structure Plans. Do not use quotation marks.

Examples: Approx FG, SEE ROADWAY PLANS

NOTE:
1. For proposed utility layout details, see ROADWAY PLANS.

Table 1A.A.1 Decimals of a Foot Equivalents

Decimal of an inch	Fraction of an Inch	0”	1”	2”	3”	4”	5”	6”	7”	8”	9”	10”	11”	Fraction of an Inch	Decimal of an Inch
0	0	0	0.0833	0.1667	0.2500	0.3333	0.4167	0.5000	0.5833	0.6667	0.7500	0.8333	0.9167	0	0
0.0625	1/16	0.0052	0.0885	0.1719	0.2552	0.3385	0.4219	0.5052	0.5885	0.6719	0.7552	0.8385	0.9219	1/16	0.0625
0.1250	1/8	0.0104	0.0938	0.1771	0.2604	0.3438	0.4271	0.5104	0.5938	0.6771	0.7604	0.8438	0.9271	1/8	0.1250
0.1875	3/16	0.0156	0.0990	0.1823	0.2656	0.3490	0.4323	0.5156	0.5990	0.6823	0.7656	0.8490	0.9323	3/16	0.1875
0.2500	1/4	0.0208	0.1042	0.1875	0.2708	0.3542	0.4375	0.5208	0.6042	0.6875	0.7708	0.8542	0.9375	1/4	0.2500
0.3125	5/16	0.0260	0.1094	0.1927	0.2760	0.3594	0.4427	0.5260	0.6094	0.6927	0.7760	0.8594	0.9427	5/16	0.3125
0.3750	3/8	0.0313	0.1146	0.1979	0.2813	0.3646	0.4479	0.5313	0.6146	0.6979	0.7813	0.8646	0.9479	3/8	0.3750
0.4375	7/16	0.0365	0.1198	0.2031	0.2865	0.3698	0.4531	0.5365	0.6198	0.7031	0.7865	0.8698	0.9531	7/16	0.4375
0.5000	1/2	0.0417	0.1250	0.2083	0.2917	0.3750	0.4583	0.5417	0.6250	0.7083	0.7917	0.8750	0.9583	1/2	0.5000
0.5625	9/16	0.0469	0.1302	0.2135	0.2969	0.3802	0.4635	0.5469	0.6302	0.7135	0.7969	0.8802	0.9635	9/16	0.5625
0.6250	5/8	0.0521	0.1354	0.2188	0.3021	0.3854	0.4688	0.5521	0.6354	0.7188	0.8021	0.8854	0.9688	5/8	0.6250
0.6875	11/16	0.0573	0.1406	0.2240	0.3073	0.3906	0.4740	0.5573	0.6406	0.7240	0.8073	0.8906	0.9740	11/16	0.6875
0.7500	3/4	0.0625	0.1458	0.2292	0.3125	0.3958	0.4792	0.5625	0.6458	0.7292	0.8125	0.8958	0.9792	3/4	0.7500
0.8125	13/16	0.0677	0.1510	0.2344	0.3177	0.4010	0.4844	0.5677	0.6458	0.7344	0.8177	0.9010	0.9844	13/16	0.8125
0.8750	7/8	0.0729	0.1563	0.2396	0.3229	0.4063	0.4896	0.5729	0.6563	0.7396	0.8229	0.9063	0.9896	7/8	0.8750
0.9375	15/16	0.0781	0.1615	0.2448	0.3281	0.4115	0.4948	0.5781	0.6615	0.7448	0.8281	0.9115	0.9948	15/16	0.9375
1.000	1	0.0833	0.1667	0.2500	0.3333	0.4167	0.5000	0.5833	0.6667	0.7500	0.8333	0.9167	1.0000	1	1.000

Table 1A.A.2 Useful Angles

Batter	Angles from Horizontal DºM'S"	Angles from Vertical Decimal
½ : 12	2° 23' 09.40"	2.3859
⅝ : 12	2° 58' 53.26"	2.9815
¾ : 12	3° 34' 34.80"	3.5763
⅞ : 12	4° 10' 13.57"	4.1704
1 : 12	4° 45' 49.11"	4.7636
1 : 6	9° 27' 44.36"	9.4623
1 : 4	14° 02' 10.48"	14.0362
1 : 3	18° 26' 05.82"	18.4349

Slope English	Angles from Horizontal DºM'S"	Angles from Horizontal Decimal
½ : 1	63° 26' 05.82"	63.4349
1 : 1	45° 00' 00.00"	45.0000
1½ : 1	33° 41' 24.24"	33.6901
2 : 1	26° 33' 54.18"	26.5651
3 : 1	18° 26' 05.82"	18.4349
4 : 1	14° 02' 10.48"	14.0362

Grade	Angles from Horizontal DºM'S"	Angles from Horizontal Decimal
1%	0° 34' 22.58"	0.5729
1½%	0° 51' 33.74"	0.8594
2%	1° 08' 44.75"	1.1458
2½%	1° 25' 55.55"	1.4321
3%	1° 43' 06.09"	1.7184
4%	2° 17' 26.20"	2.2906
5%	2° 51' 44.56"	2.8624
6%	3° 26' 00.11"	3.4336
7%	4° 00' 15.02"	4.0042
8%	4° 34' 26.12"	4.5739
9%	5° 08' 33.95"	5.1428
10%	5° 42' 38.14"	5.7106
11%	6° 16' 38.27"	6.2773
12%	6° 50' 33.98"	6.8428
12½%	7° 07' 30.06"	7.1250
15%	8° 31' 50.76"	8.5308

Figure 1A.A.3 CADD Short Cut Keys

32	33 !	34 "	35 #	36 $	37 %	38 &	39 '	40 (	41)	42 *	43 +	44 ,	45 -	46 .	47 /	48 0	49 1	50 2
51 3	52 4	53 5	54 6	55 7	56 8	57 9	58 :	59 ;	60 <	61 =	62 >	63 ?	64 @	65 A	66 B	67 C	68 D	69 E
70 F	71 G	72 H	73 I	74 J	75 K	76 L	77 M	78 N	79 O	80 P	81 Q	82 R	83 S	84 T	85 U	86 V	87 W	88 X
89 Y	90 Z	91 [	92 \	93]	94 °	95	96 `	97 a	98 b	99 c	100 d	101 e	102 f	103 g	104 h	105 i	106 j	107 k
108 l	109 m	110 n	111 o	112 p	113 q	114 r	115 s	116 t	117 u	118 v	119 w	120 x	121 y	122 z	123 {	124 ¦	125 }	126 ~
127 ℄	128 ₸	129 1/2	130 1/4	131 3/4	132 1/8	133 3/8	134 5/8	135 7/8	136 1/16	137 3/16	138 5/16	139 7/16	140 9/16	141 11/16	142 13/16	143 15/16	144 1/32	145 3/32
146 5/32	147 7/32	148 9/32	149 11/32	150 13/32	151 15/32	152 17/32	153 19/32	154 21/32	155 23/32	156 25/32	157 27/32	158 29/32	159 31/32	160 1/64	161 3/64	162 5/64	163 7/64	164 9/64
165 11/64	166 13/64	167 15/64	168 17/64	169 19/64	170 21/64	171 23/64	172 25/64	173 27/64	174 29/64	175 31/64	176 °	177 35/64	178 37/64	179 39/64	180 41/64	181 43/64	182 45/64	183 47/64
184 49/64	185 51/64	186 53/64	187 55/64	188 57/64	189 59/64	190 61/64	191 63/64	192 Δ	193 ø	194 ₽	195 μ	196 ²	197 ³	198 ⍙	199	200 ±	201	202
203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221
222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259

To get the special character represented in the box you must type a back slash then the number above the character in the Microstation Text Editor window. Example\38 will show the & sign.

Figure 1A.B.1 Advance Planning Study Detailing Example 1

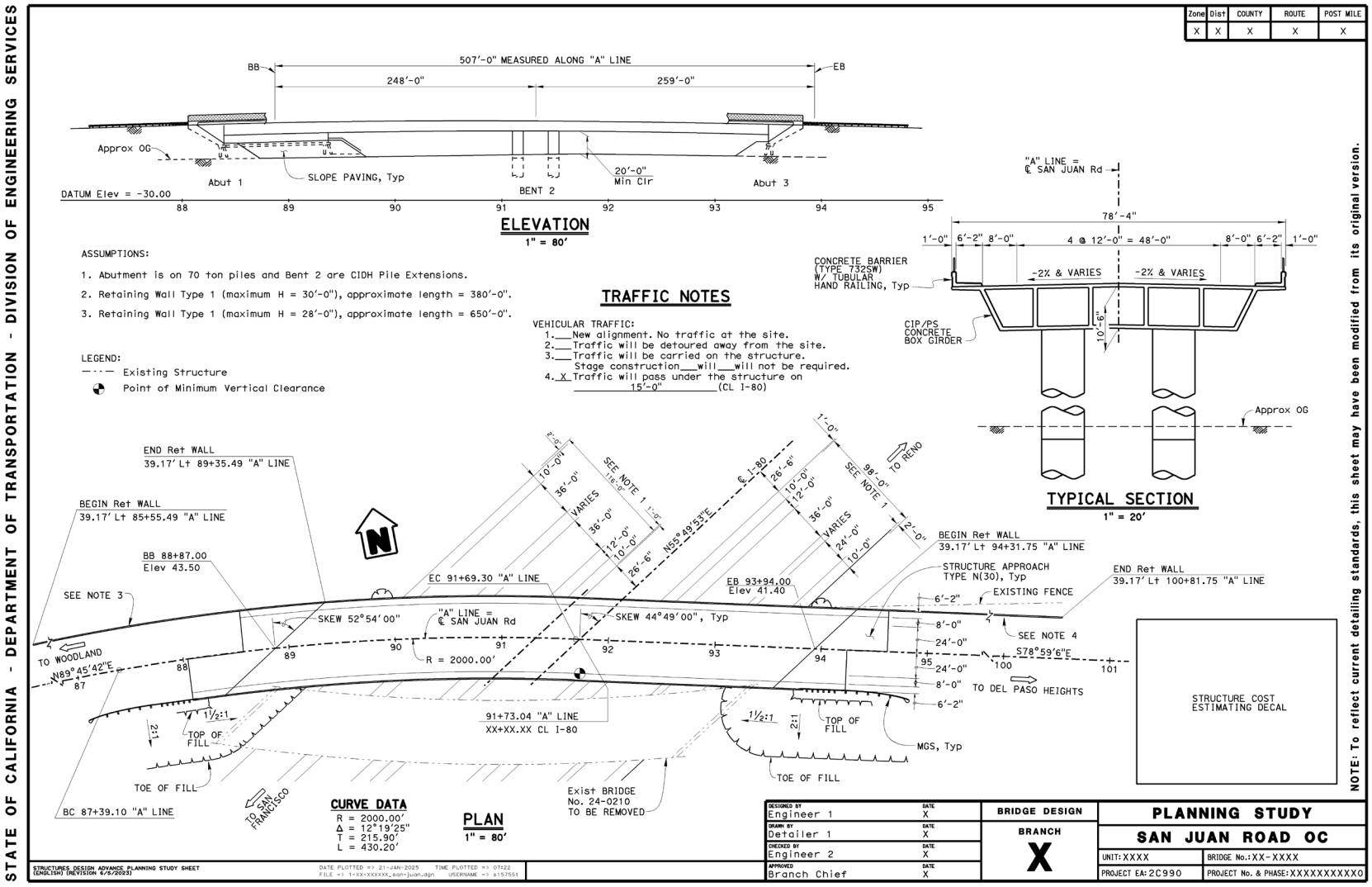


Figure 1A.B.2 Advance Planning Study Detailing Example 2

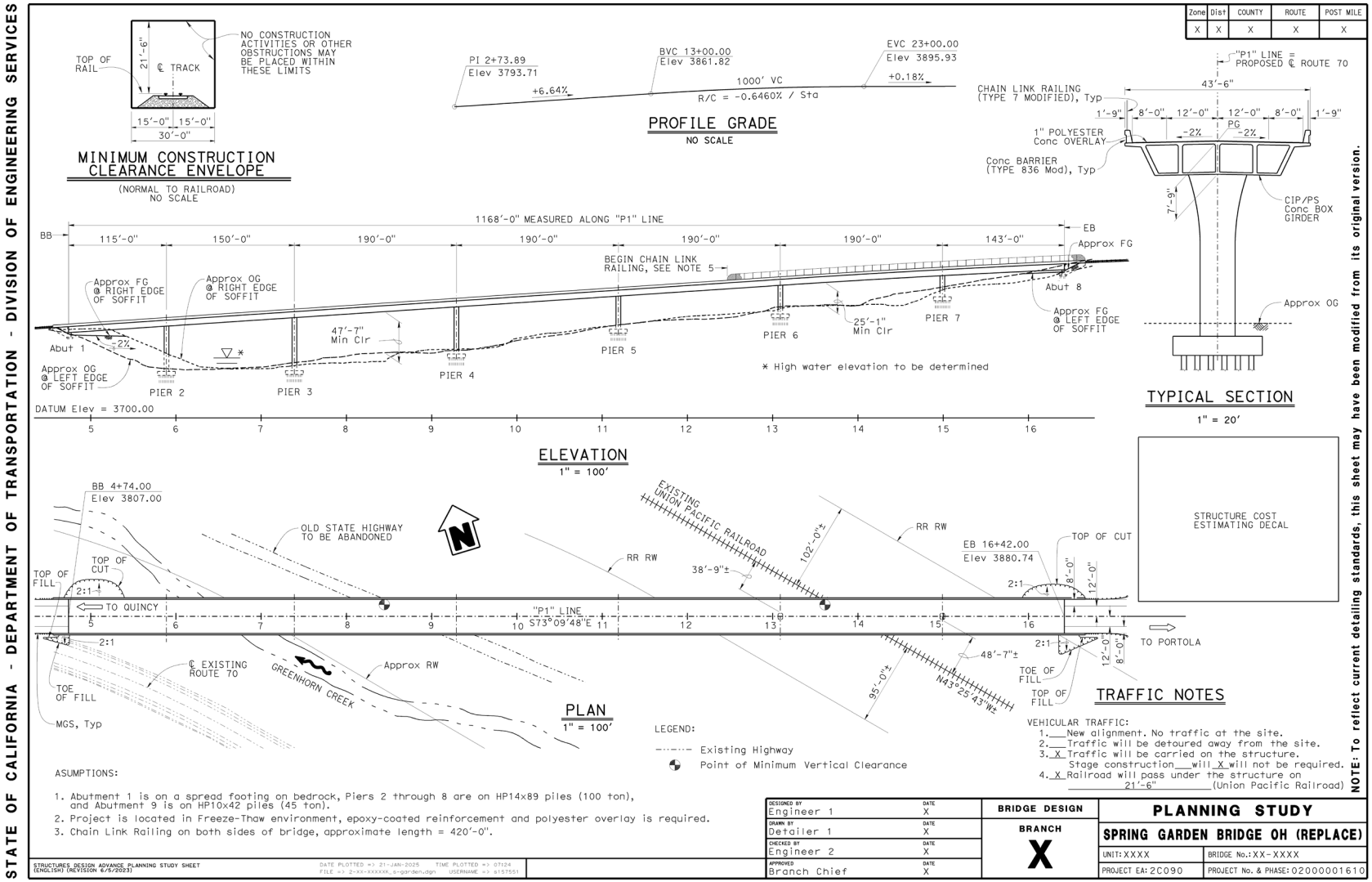


Figure 1A.B.3 Advance Planning Study Detailing Example 3

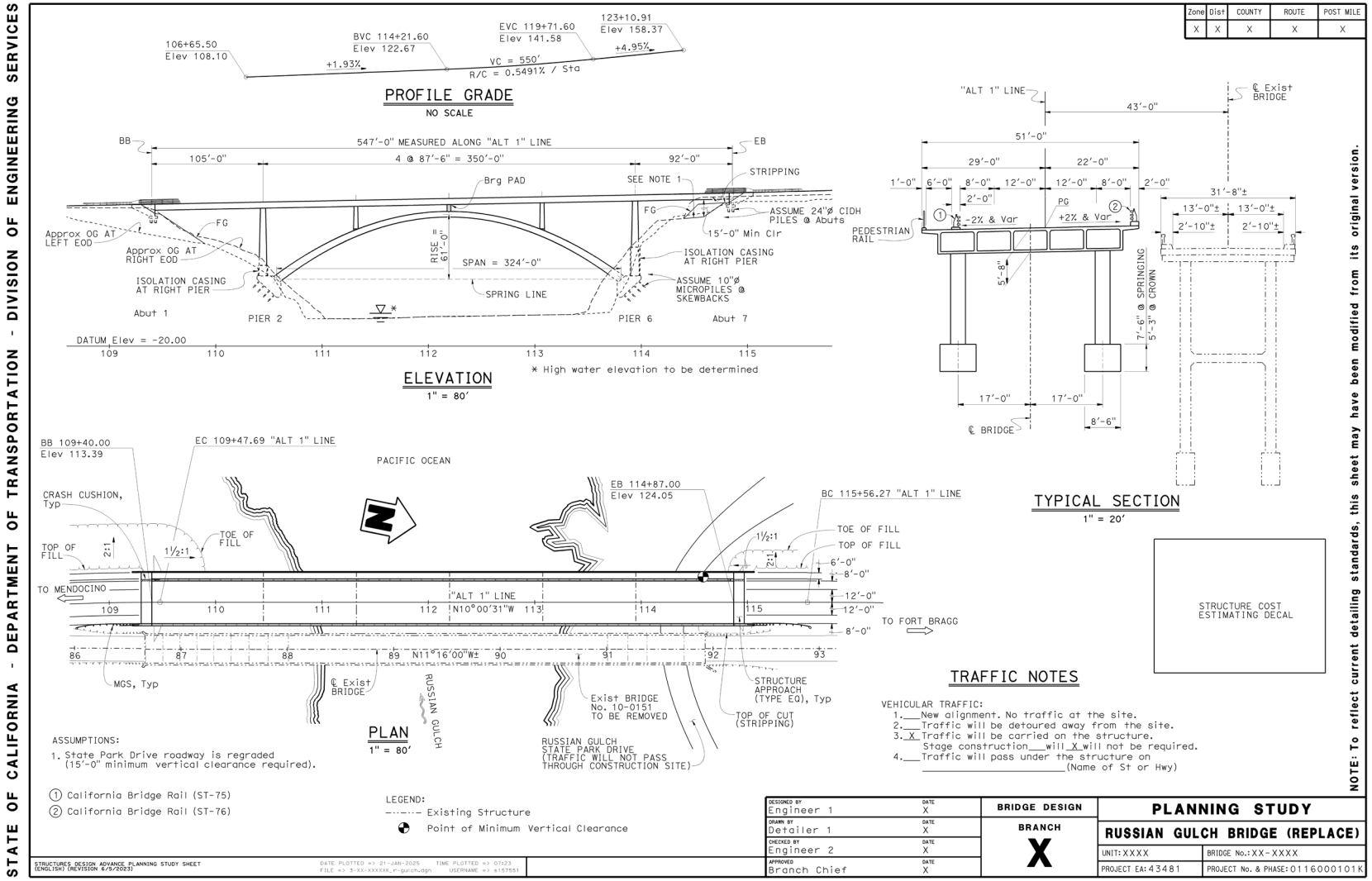


Figure 1A.B.4 Advance Planning Study Detailing Example 4

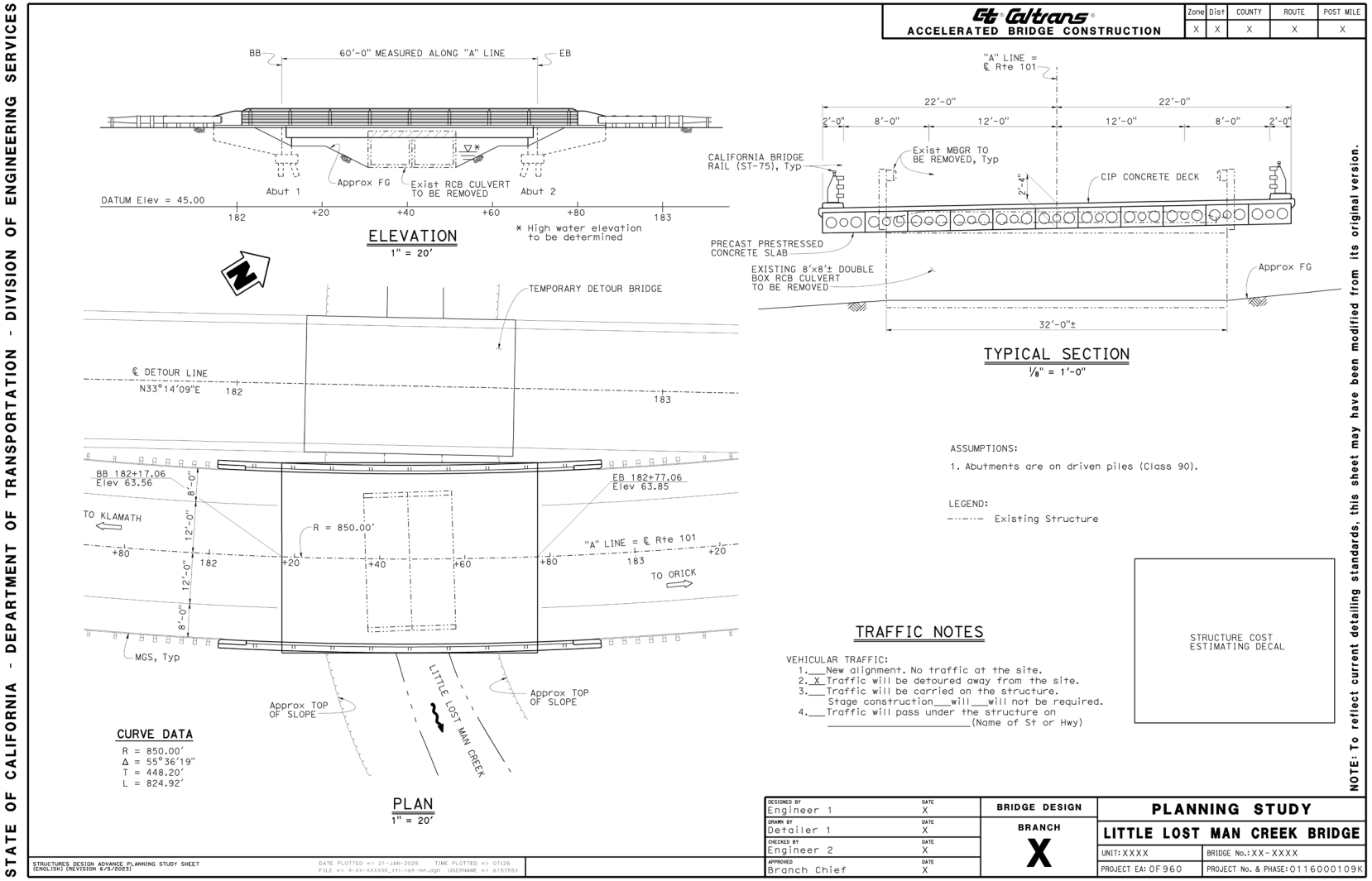


Figure 1A.B.5 Advance Planning Study Detailing Example 5

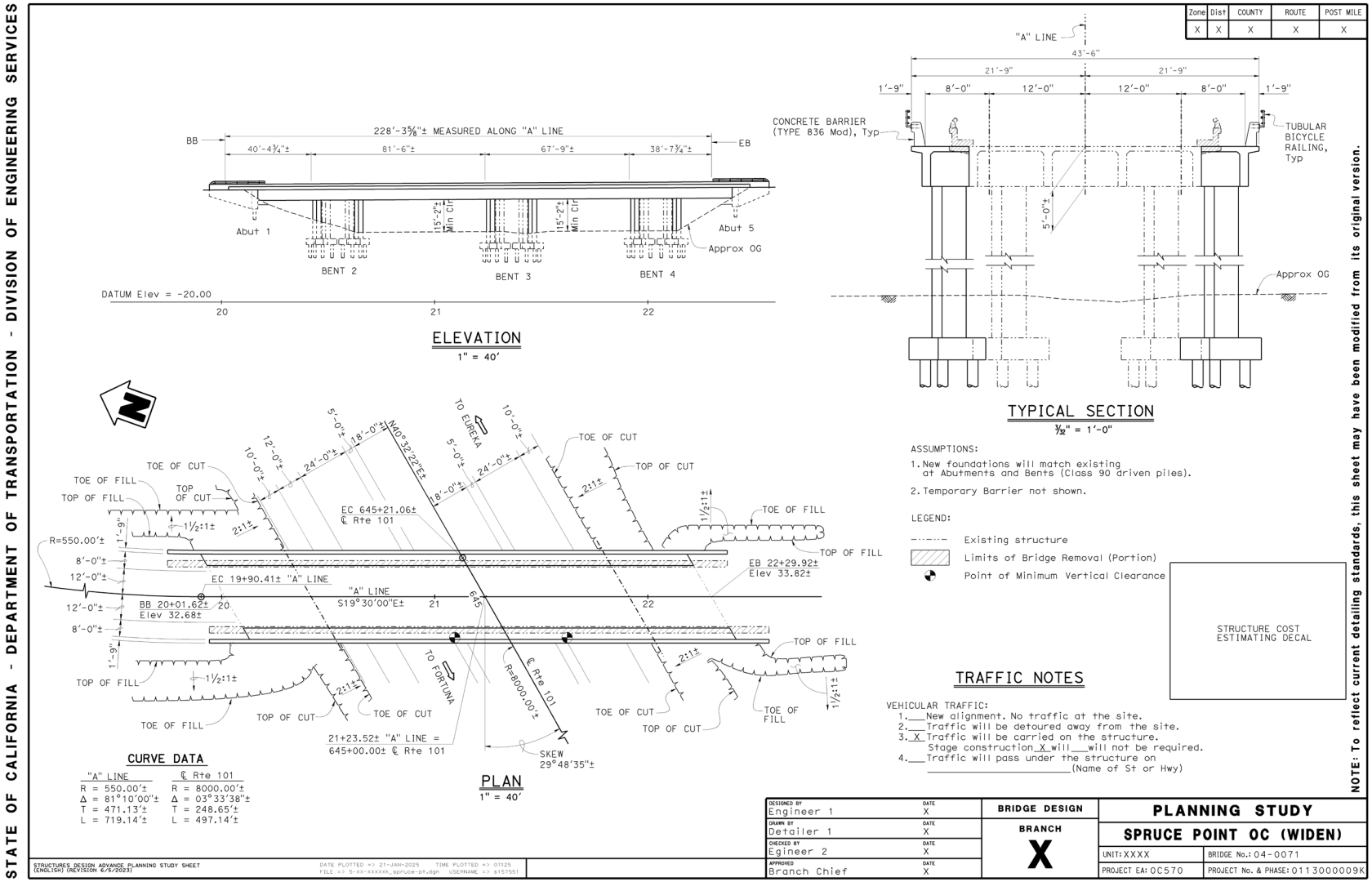
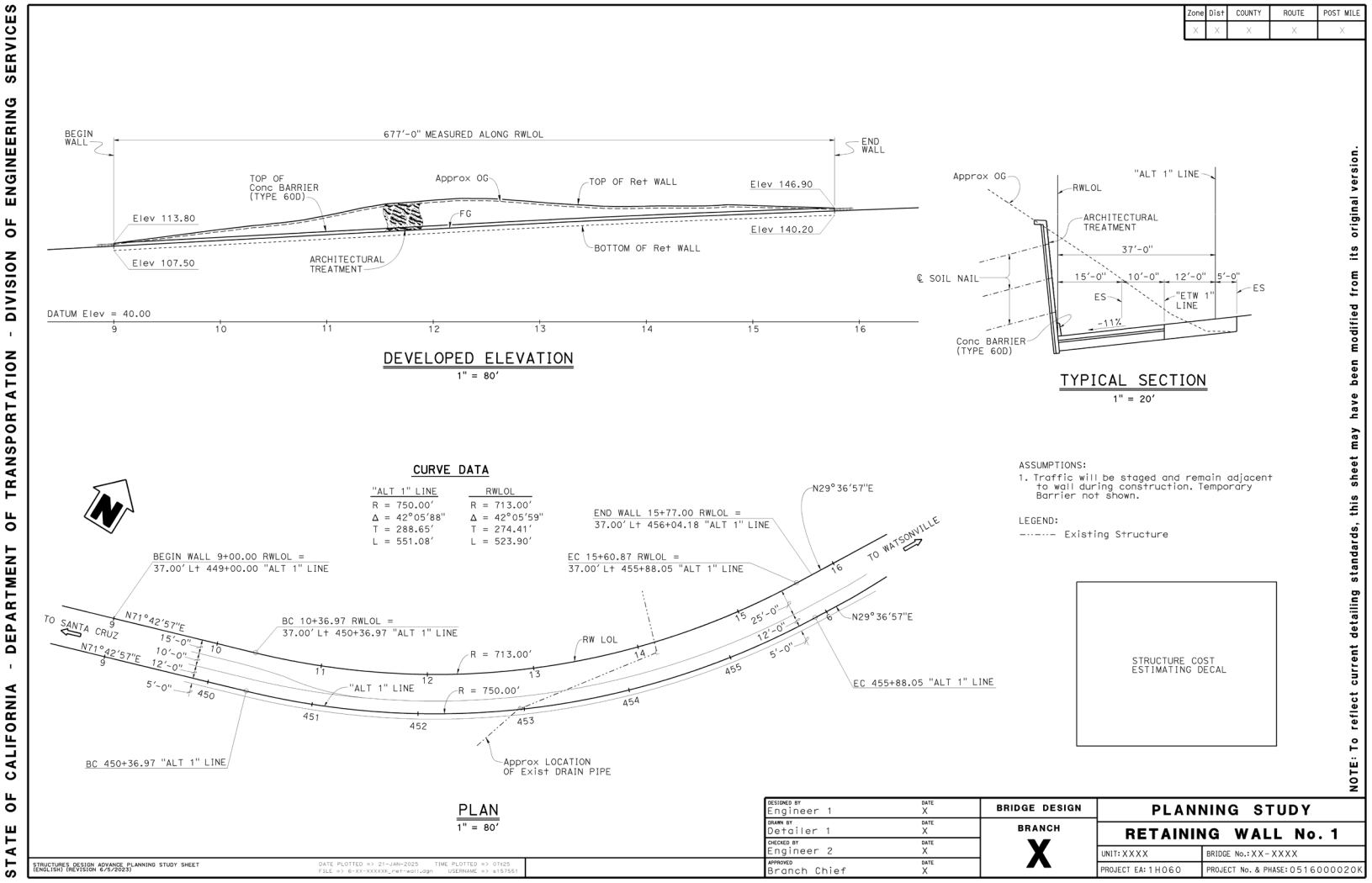


Figure 1A.B.6 Advance Planning Study Detailing Example 6



Bridge Design Details 1.2 June 2025

Abbreviations

Abbreviations should not be used where the meaning may be in doubt. In case of doubt, it is best to spell out the word. In general, it is considered best not to use conventional signs (#, /, >, etc.) in the text of NOTES.

Example: use “6 LB”, rather than “6#”

Modified standard bridge items shall be noted as such. These modified items may include barriers, girder types, or any other non-standard item.

Examples: CHAIN LINK RAILING (TYPE 7 Mod)
PC/PS CONCRETE GIRDER (BULB TEE Mod)
CALIFORNIA BRIDGE RAIL (ST-75 Mod)

Multiple modifications to a similar item shall be numbered sequentially.

Examples: CONCRETE BARRIER (TYPE 842 Mod 1)
CONCRETE BARRIER (TYPE 842 Mod 2)

Modified Bridge Standard Detail Sheets (XS Sheets) may use the abbreviation “Mod” within the Sheet Title. For an example, see Attachment 1A.E.1.

Omission of Periods

The omission of periods after abbreviations is recommended by the International Committee on Weights and Measures for English Units and is advocated by the *American Standards Association Sectional Committee* on scientific symbols and abbreviations. *The American Society of Civil Engineers* (ASCE) also follows this practice, while many other publications do not.

Example: use “5 oz” rather than “5 oz.”

Only abbreviations that are also considered complete English words should have periods.

Examples: in. (inch)

Fig. (figure) No. (number)

Some complete English words that are provided as abbreviations in the *Standard Plans* (A3A, A3B, A3C and B0-1), do not include periods.

Examples: Tot (total)

Hex (hexagonal)

Phrases Describing Work or Materials

When abbreviating a phrase describing work or material, the noun following the abbreviated words should be spelled out in full. Exceptions are very common names, such as PCC, for Portland Cement Concrete.

Examples: CIDH CONCRETE PILES
CIP/PS CONCRETE BOX GIRDER
CL RAILING (TYPE 6)
AC DIKE

Do not end a sentence with an abbreviation; in this case, spell out the word. Avoid using abbreviations in NOTES by default.

Bridge Design Details 1.3 June 2025

Titles and Borders

All words in Sheet Titles (e.g., GENERAL PLAN, TYPICAL SECTION, etc.) shall be spelled out completely.

Figure 1.3.1 Sheet Titles

Abbreviations for Structure Names are acceptable when space is limited (e.g., OC, St, Ave, No., etc). The Structure Name should fit in one box and be the same on every sheet. The main characteristic of a project shall be identified in the Structure Name (e.g., REPLACE, RETROFIT, WIDEN, BARRIER REPLACEMENT, etc.); if more than one characteristic fits, use "MODIFY." Other characteristics such as "JOINT SEAL REPLACEMENT" and "APPROACH SLAB REPLACEMENT" are normally tied together, and the term "MODIFY" should be used in those cases.

Figure 1.3.2 Structure Names

For adjacent structures shown on the same set of plans, such as bridge widenings, joint seal and approach slab replacements, or other similar work, Bridge Numbers shall be given as "XX-XXXXL/R". Refer to 3.1 General Plan Detailing Examples, Attachment 3A.A.1 through 3A.A.18.

The County and Route placeholders “XXX/XXX” shall be filled out as appropriate. If the County abbreviation is only two characters (e.g., DN, SF), the extra “X” shall not be used. If the route is single or double digit (e.g., 5, 80), the extra “Xs” shall not be used, and no extra zeros shall be added in front of the route number. Some county abbreviations and routes are three characters.

Names on Structure Plan Sheets

Names shown on Structure Plan sheets should be placed as each component of the work is completed. The check of both the design and details is performed by the Engineer assigned to be the “Checker”. The Engineer who initiates the engineering design is the “Designer” and is never listed as the “Checker”. The “Designer” and “Checker” are both responsible for a complete review of all the details and ensure they meet the intent of the design. Names should be printed using upper and lowercase text.

Please note that on the GENERAL PLAN sheet, additional names are placed in the border. In the lower left corner, the Design Branch Chief’s name at the time the work was completed is given (see Figure 1.3.5), the Engineers responsible for “Layout” are recorded, and the name of the Specifications Engineer is listed for both of the “Specifications” and “Plans and Specs Compared” cells. If the specifications are prepared by a non-registered Engineer, the name of non-registered Specification Engineer is listed in the "Specifications" cell, and the name of registered Specifications Reviewer is listed in the "Plans and Specs Compared" cell. In some cases, the names for the seismic analysis will be the same as the designer and checker, while in other cases, they may be from another Branch. If seismic analysis is not done on the structure, “N/A” shall be placed in the name boxes.

The Design Branch number is also provided on all Structure Plan sheets.

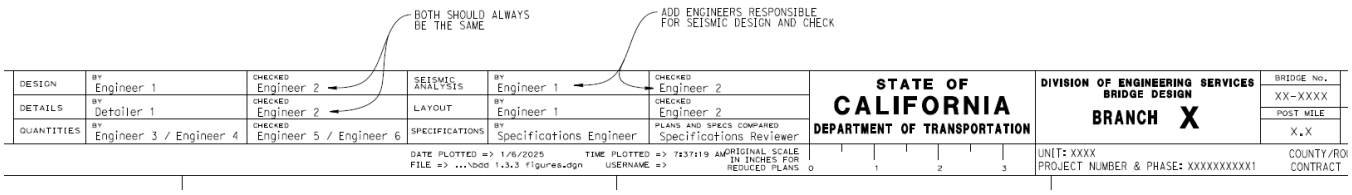


Figure 1.3.3 Names on General Plan Sheet

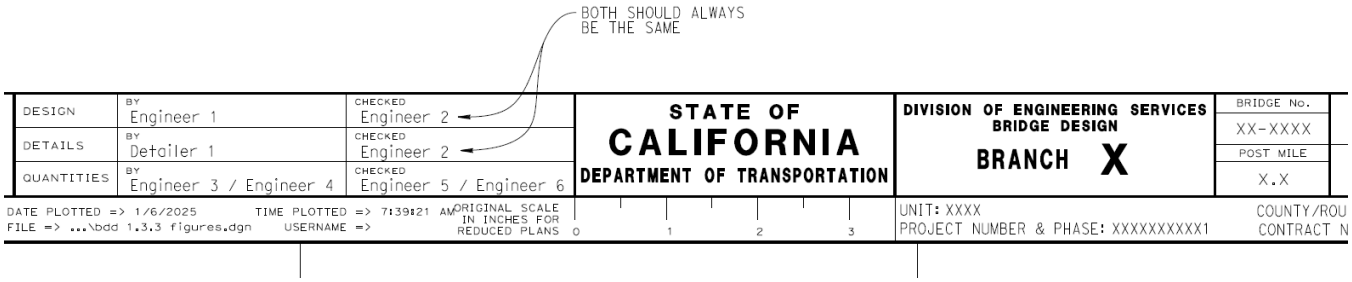
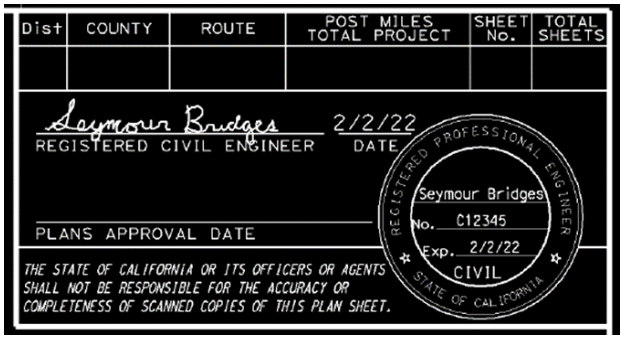


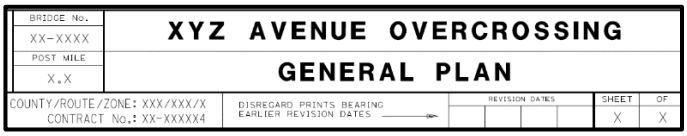
Figure 1.3.4 Names on Structure Plan Sheets

Sheet Title and Signature Block

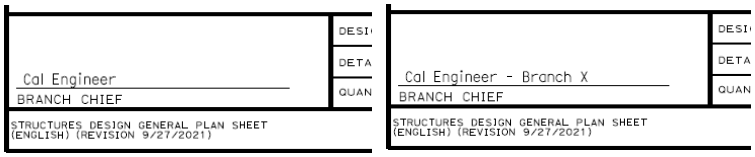


Typical Index Block includes the signature and seal of the registered Project Engineer with name, license number, and expiration date. Index Blocks are used on GENERAL PLAN (GP), Detail Sheet(s), and Bridge Standard Detail Sheets (XS Sheets).

NOTE: Do not change contents of the District placeholder cells (District, County, Route, Post Miles Total Project, Sheet No. or Total Sheets). These placeholders are placed by District electronically with Plans Approval Date during the FPS&E phase of a project.

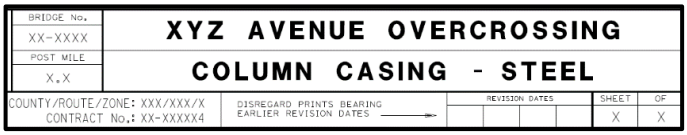


Typical Sheet Title Block for Structure Plan Sheets.

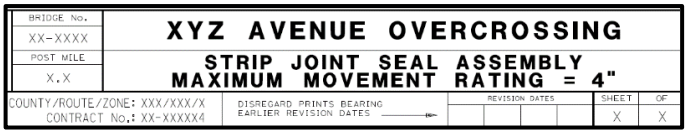


Branch Chief Block on GP sheet.

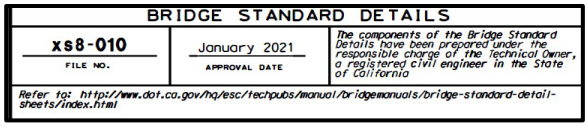
NOTE: Branch Chief's name should be printed using upper and lowercase text. Plans created by Consultant for Division of Engineering Services should include the Branch Chief's name and Branch number.



Typical Sheet Title Block for Bridge Standard Detail Sheets (XS Sheets).



Typical Sheet Title Block for Bridge Standard Detail Sheets (XS Sheets) with long name.



Typical Signature Block for Bridge Standard Detail Sheets (XS Sheets).

Figure 1.3.5 Sheet Titles and Signature Blocks

Level for Engineer's Signatures

When creating new design sheets, Engineers' signatures and their corresponding expiration dates shall be placed on Level *str_Border_PSE_Signature-A*. This level is dedicated solely to these signatures in order to facilitate easy removal.

Note that this level shall also be utilized for the Project Engineer's signature and date, that is recorded in a Change Order (CO) decal.

PE Registration Date

Once a Structure Project Engineer has signed the form for use of electronic signatures and the Structure Design Technician has placed the digitized signature on the sheet, his/her seal information and expiration date remain valid in perpetuity as long as the information on the sheet is unmodified. Any changes made to the sheet will require a new seal and date or a supplemental seal typically furnished for change orders. This policy applies to all contract plan sheets.

Unit, Phase, and Contract Number

The Unit Number on Contract Plan sheet(s) is the four digit cost center number of the Design Branch assigned to do the work. The Project Number is the District assigned Enterprise Financial Infrastructure System (EFIS) number ending with a 1, which identifies Phase 1 design stage of the Plans, Specifications, and Estimate (PS&E). The Contract Number is the six digit District Project Expenditure Authorization (EA) number ending with a 4. During the planning phase of projects, the Project EA number is listed as the five digit number preceding the number 4; the Project EA only becomes a contract when plans are delivered to construction.

The Project Number & Phase and Contract Number on all Structure Plan sheets must match the number on Roadway Plans and Special Provisions.

Figure 1.3.6 Unit, Phase, and Contract Number

Revision Date Blocks

A. The date in the first box is the date that the CADD file was created (e.g., 09-02-18). This date does not change throughout the life of the sheet

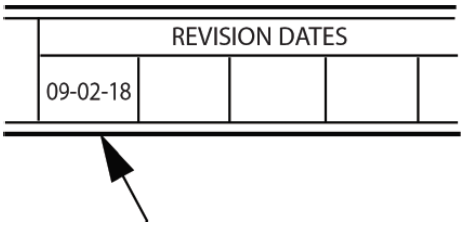


Figure 1.3.7 First Date Block

B. The next three revision dates follow in the next three boxes (e.g.,10-04-18, 10-06-18, 10-09-18), with the previous revision dates crossed out.

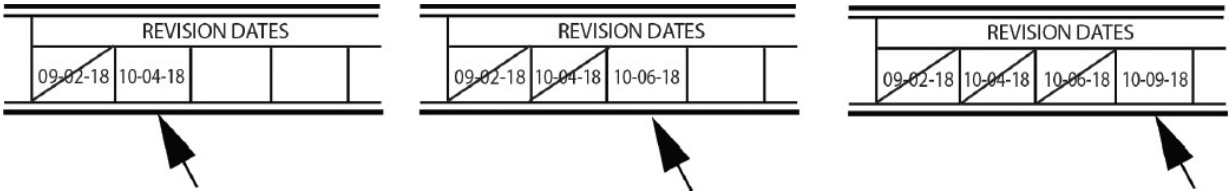


Figure 1.3.8 Revision Date Blocks

C. If there are more revisions, delete (blank out) the date in the second box. The next revision date (e.g., 10-11-18) will go in the third box. From this point on, alternate dates between the third and fourth boxes only, leaving the creation date in the first box crossed out and the second box empty.

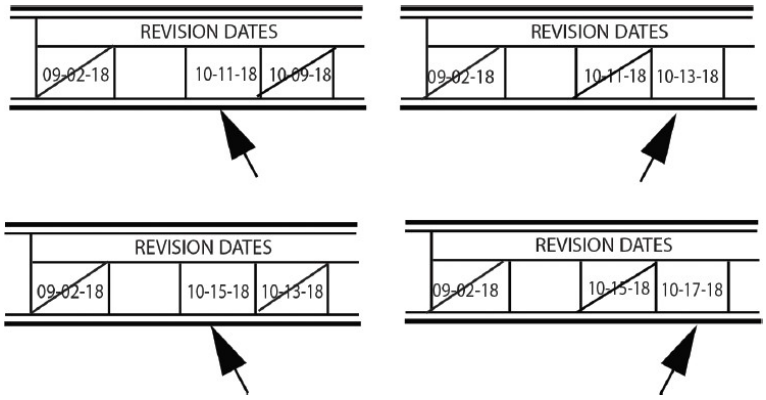


Figure 1.3.9 Additional Revision Date Blocks

Bridge Design Details 1.4 June 2025

Test Boring Layout

Geotechnical Services (GS) will draft a Test Boring Layout (TBL) sheet. GS will include the North Arrow, geolocated test boring locations (test boring name identifications and symbols identifying the type of drilling/test methods), the scale (e.g., 1" = 40'), and the names of the appropriate GS personnel in the border.

After GS completes the Log of Test Borings (LOTB) and TBL Quality Control processes, GS will deliver the corresponding, finalized (i.e., signed and stamped) LOTBs and unsigned TBL to Bridge Design. The finalized LOTBs and unsigned TBL should be delivered prior to Type Selection.

Bridge Design will draft/superimpose the alignment(s), support centerlines, and/or other project features, and include the names of the appropriate Bridge Design personnel and any other appropriate information in the border. Bridge Design will NOT draft the Borehole Location Table or determine and provide Stations/Offsets. Bridge Design will finalize (i.e., sign and stamp) the TBL during the Final Structure Plans, Specifications & Estimates process.

For an example of a TEST BORING LAYOUT sheet, see Attachment 1A.C.1.

Log of Test Boring Modifications

Typically, once the LOTB sheets have been signed by the Professional Geologist, no modifications shall be made to the plan sheet, except for sheet numbering.

Other modifications to the LOTB sheet(s) may be necessary including adding final alignments after early drilling has been done and final support locations to help with the identification of the location of LOTBs.

If significant changes are required, the following procedure shall be implemented:

- The Project Engineer will send a request for changes to the Professional Geologist whose stamp is on the sheet.
- The Professional Geologist will concur with the proposed changes, and the Geotechnical Services staff will make the revisions.
- The revised LOTB sheet(s) CADD file(s) will then be placed into a directory, and an email will be sent to the requesting engineer notifying him/her of the completed LOTB and its location. A new signature authorization form shall be provided with the revised LOTB sheet(s).

For an example of a LOG OF TEST BORING sheet, see Attachment 1A.C.2.

Log of Test Boring from Image of As-Built Plans

If AS-BUILT LOTB sheet(s) from an existing structure or previously created LOTBs from an archived project are referenced or used during the foundation investigations, the Professional Geologist may elect to include them in the new contract plans. If included, the Professional Geologist will send a TIFF image copy of the As-Built LOTB sheet(s) to be used to the Project Engineer.

When As-Built(s) are used for new contract plans such as LOTB(s), the following procedures shall be followed:

- As-Built LOTB sheet(s) used for information only shall have a statement to that effect. This NOTE should be added using the standard decal.

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

Here is another example:

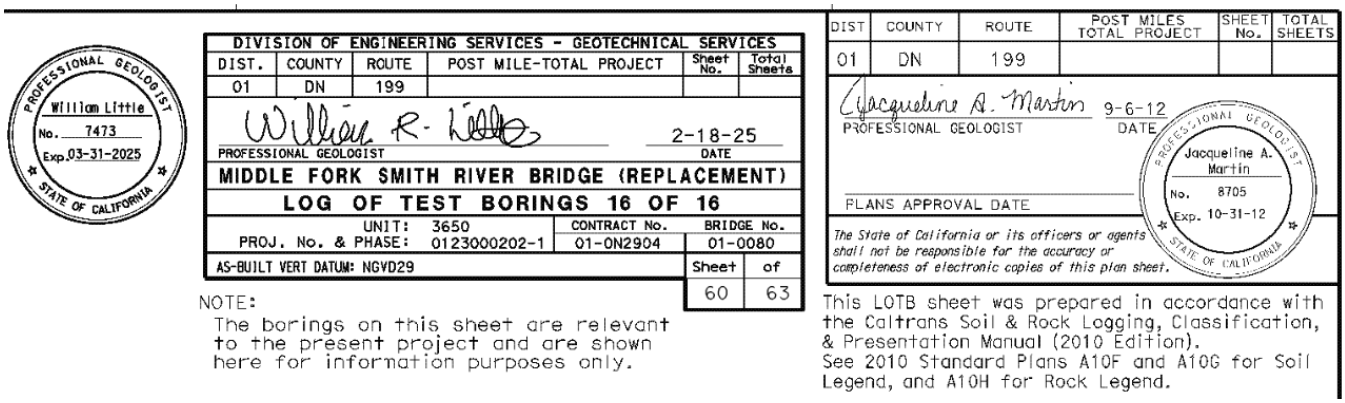


Figure 1.4.1 Example of LOTB "Information Only" Note

For a full example of an As-Built LOTB sheet, see Attachment 1A.C.3.

Figure 1A.C.1 Test Boring Layout Detailing Example

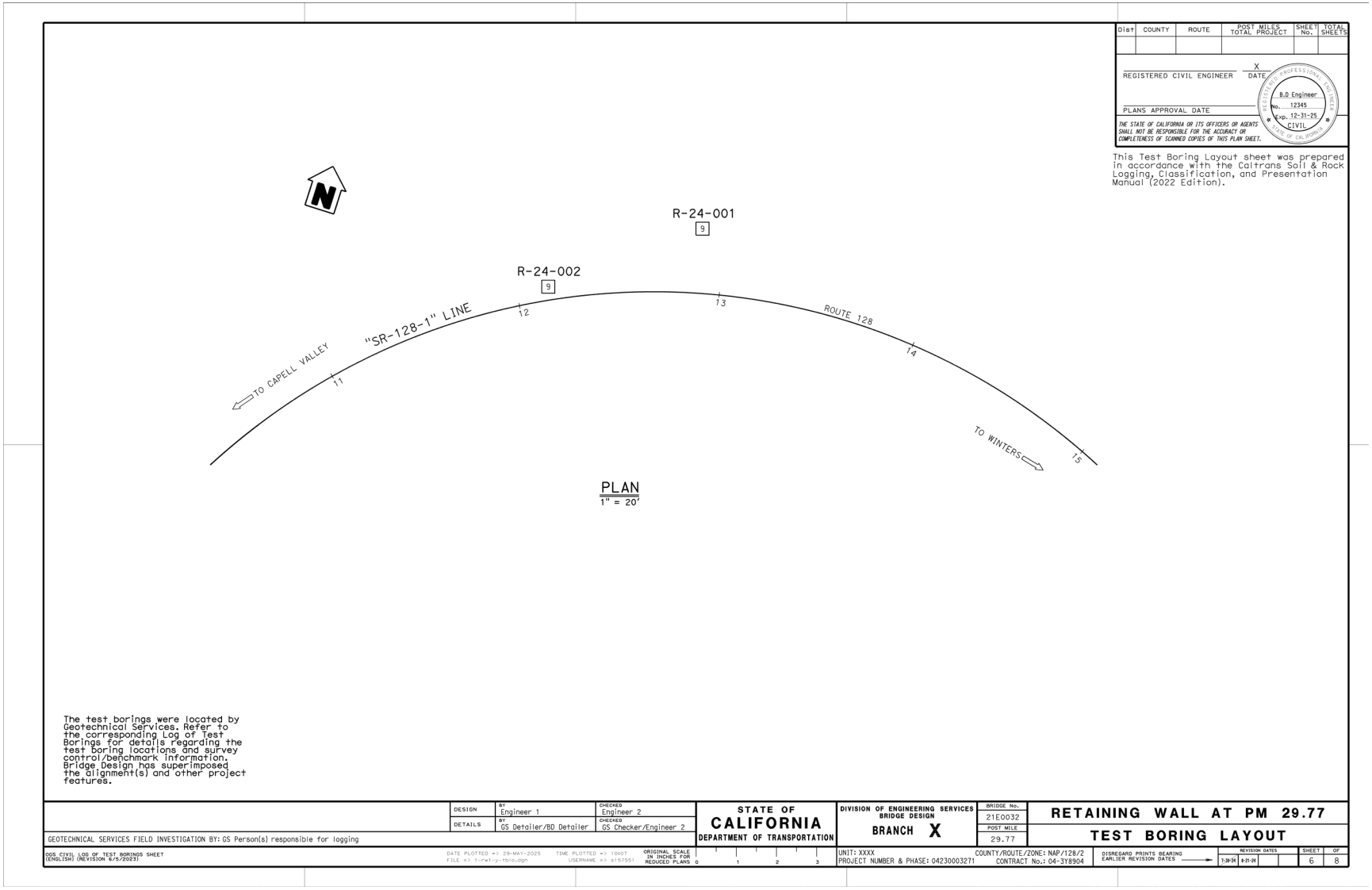


Figure 1A.C.2 Log of Test Borings Detailing Example 1

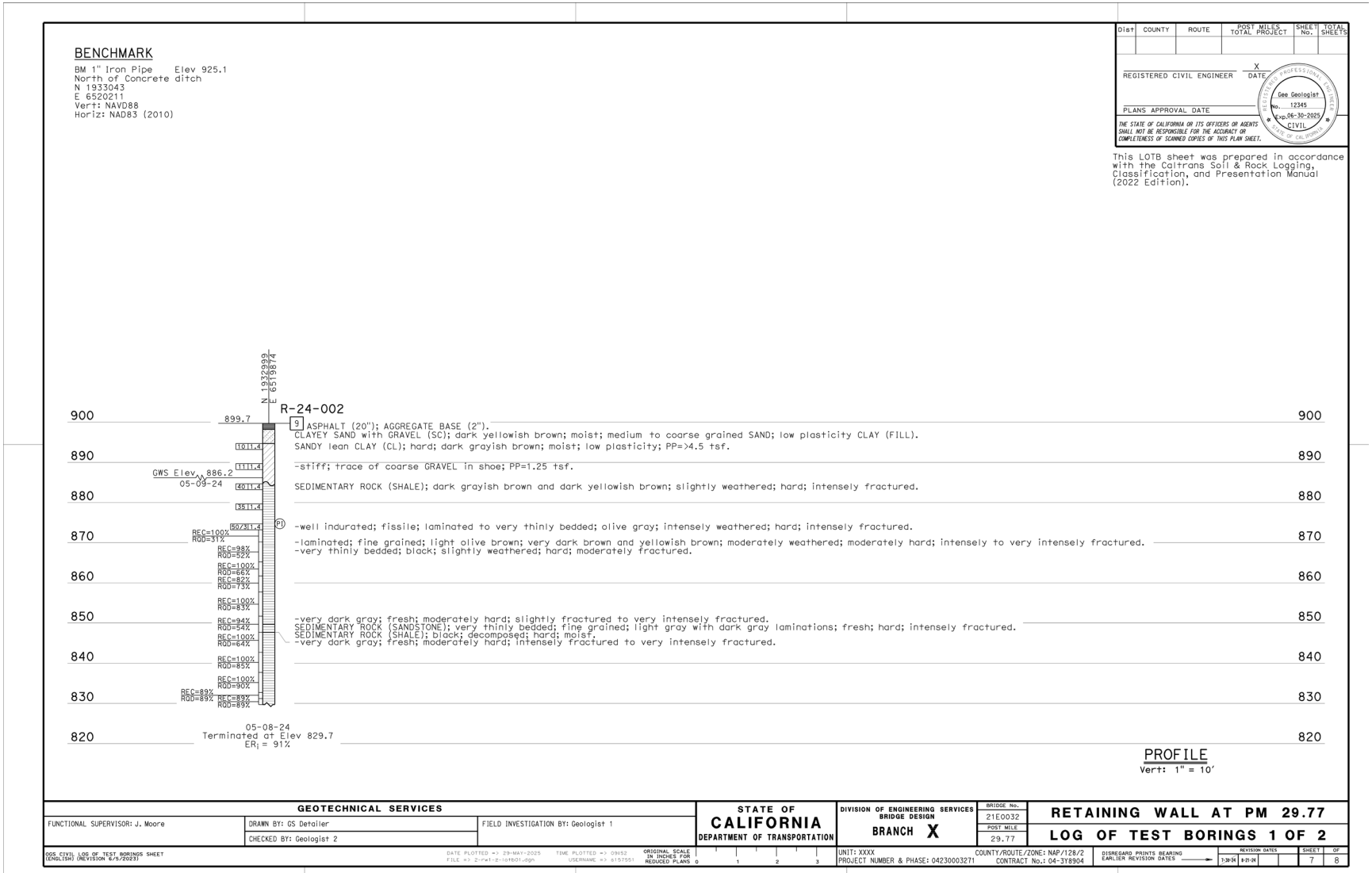
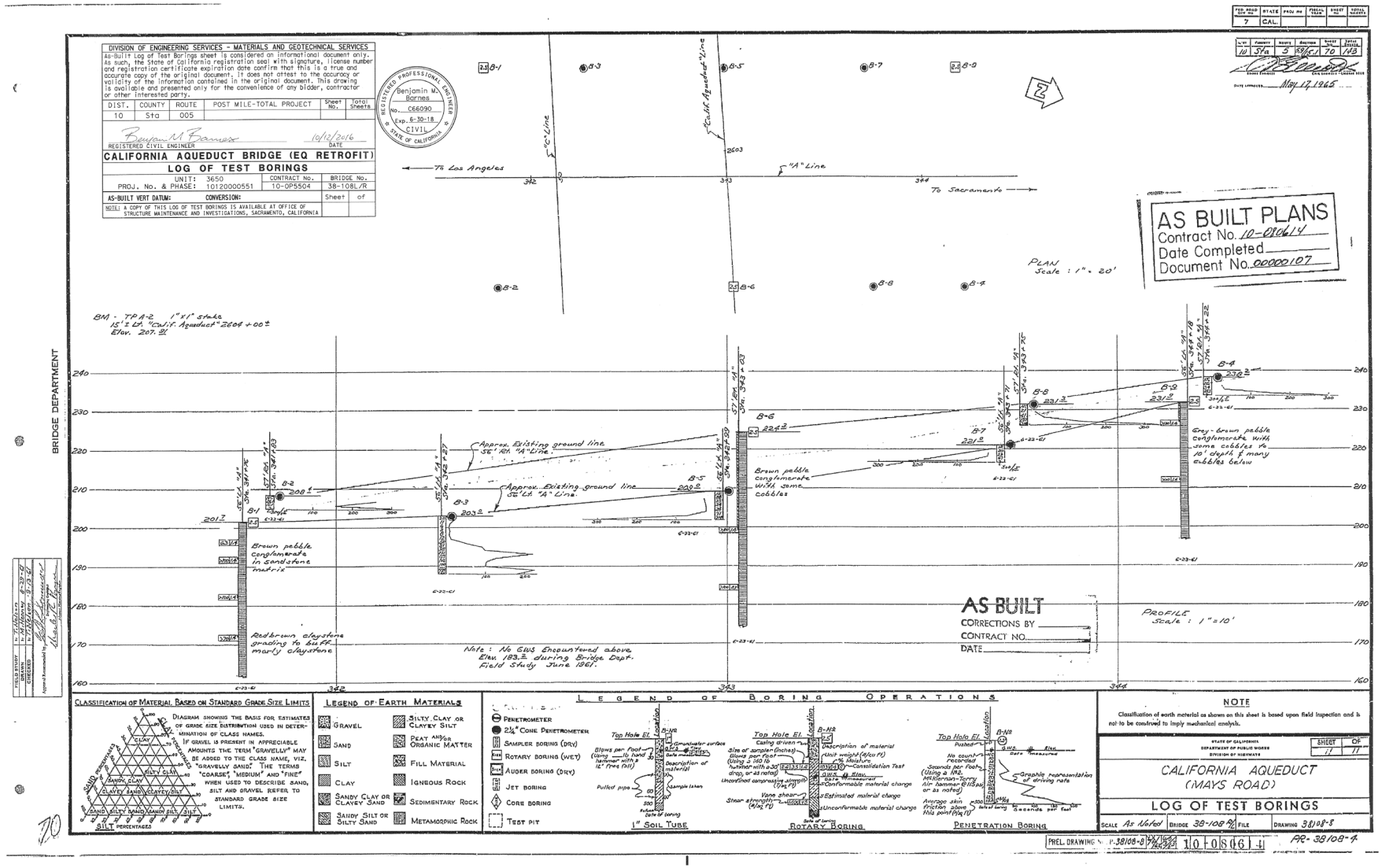


Figure 1A.C.3 Log of Test Borings Detailing Example 2



Bridge Design Details 1.5 June 2025

Use of Standard Plans

The California Department of Transportation issues a book of Standard Plans, which includes Roadway and Bridge Standard Plans. This book is an official part of the contract for all projects, and the edition should be noted in GENERAL NOTES for all projects (including maintenance type projects with multiple structures). The GENERAL NOTES may be abbreviated, but at the very least the GENERAL NOTES will allow a singular place for the Standard Plan edition to be shown rather than adding RSPs throughout the plans.

Typical Standard Plans

Structure Plans shall include a standard plan bubble that refers to the standard detail used for a given design. Structure Project Engineers will provide Standard Plans List Transmittal form to Structure Office Engineer (SOE) at P&Q and Expedite Step 1, see Attachment 1A.D.1 and 1A.D.2

If a Standard Plan sheet has been revised since its original release date, Revised Standard Plans (RSPs) will be provided in the Special Provisions and noted in the GENERAL NOTES, as shown in Figure 1.5.1. Do not show RSP in the bubbles on the plans.

Standard Plans that are referenced within the notes or elsewhere on a Standard Plan do not need to be included in the list to SOE. However, if these nested Standard Plans or others used for the design or detailing are revised, the RSP should be provided in the District Roadway Plans placed before the Structure Plans. It is the Project Engineer's and Specification Engineer's responsibility to make sure all the RSPs are included in the structure specifications, which will list the RSPs to be included in the final advertised plan set.

District and SOE may request that the structure package and standard edition be updated all the way up to the time a project is advertised. As soon as the preview site is posted, Project Engineers should start this transition.

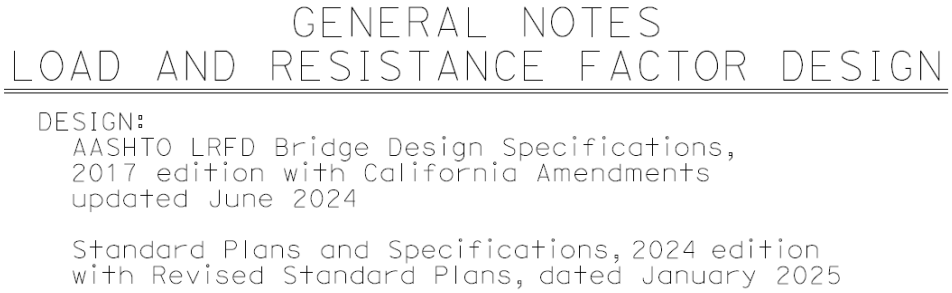


Figure 1.5.1 General Notes

Modifying Standard Plan Details

If a detail shown on a Standard Plan sheet is to be modified or replaced for a specific project, a new detail shall be drawn on a structure plan sheet with the modifications required. Once modified, a reference should be made to the associated Standard Plan details used so additional details may be found, if necessary.

Only modifications to Standard Plans need to be shown. Per Standard Specifications (5-1.02), if a discrepancy exists, the project plans govern over Standard Plans.

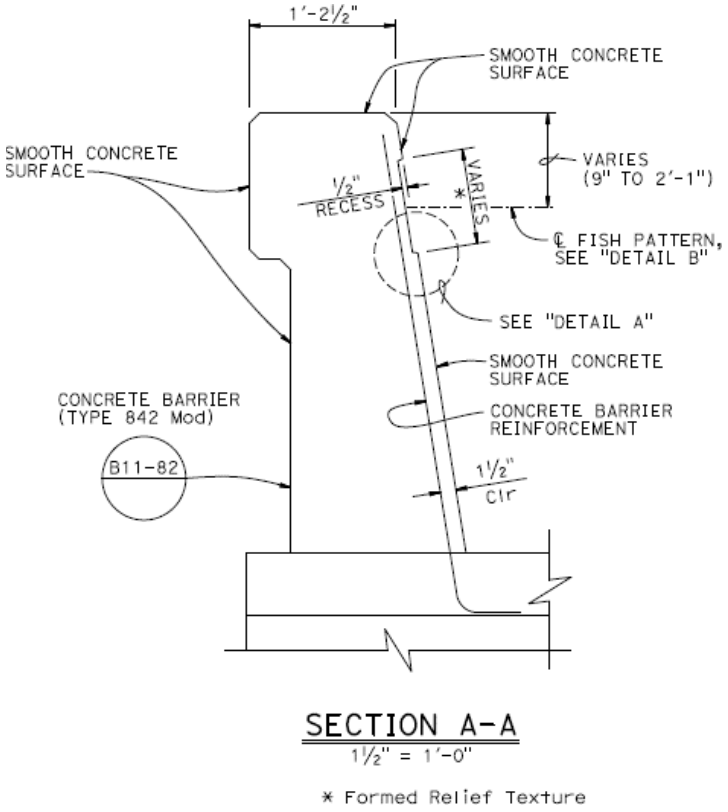


Figure 1.5.2 Example of Modified Barrier

If a standard plan "bubble" is shown on a detail sheet, and no specific detail is referenced in the bottom half of the circle, the bottom of the circle should be blank. If a specific detail callout is warranted on a standard plan, the bottom of the circle should show the name of the detail.

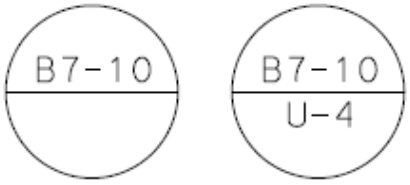
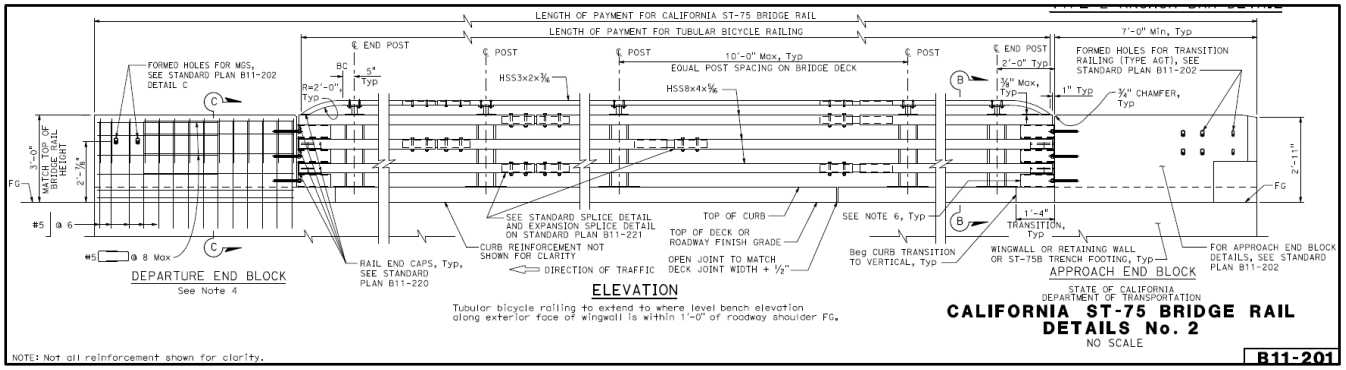


Figure 1.5.4 Example of Standard Plan Bubble

When a Standard Plan or RSP shows “Min” length, which is tied to length of payment for other items, the actual length should be shown clearly on the plans.

EXAMPLES:



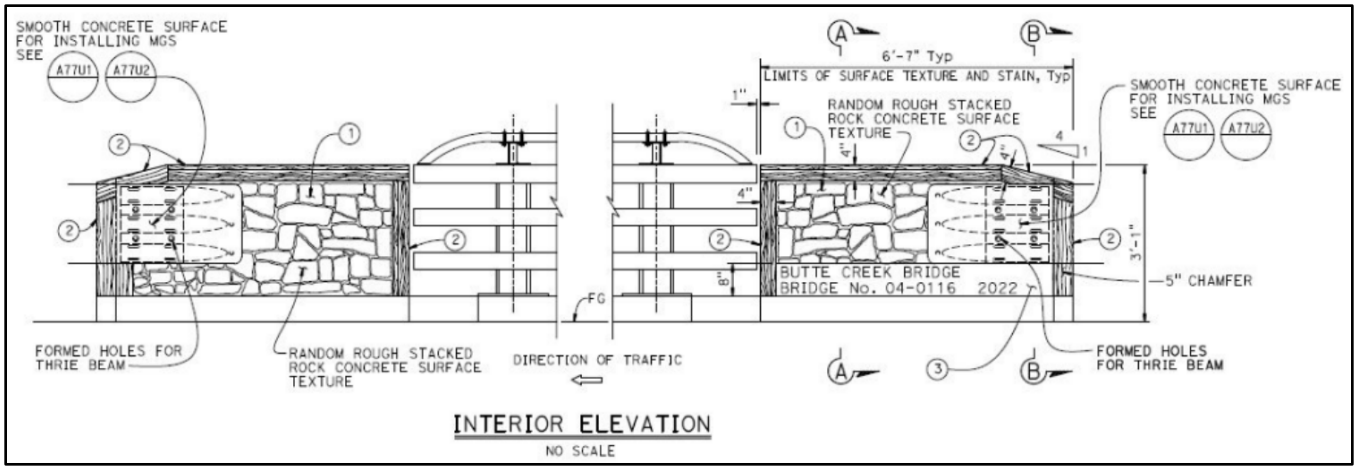


Figure 1.5.4 Example of Modified Barrier End Block

Structure Standard Plan Transmittal Form

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES

STRUCTURE STANDARD PLAN TRANSMITTAL

BD-0354 (REV 05/16/2025)

BRIDGE DESIGN

Project ID:	EA:	Project Name:	Date:

☐	A3A	Abbreviations (Sheet 1 of 3)*
☐	A3B	Abbreviations (Sheet 2 of 3)
☐	A3C	Abbreviations (Sheet 3 of 3)
☐	A10A	Legend - Lines & Symbols (Sheet 1 of 5)
☐	A10B	Legend - Lines & Symbols (Sheet 2 of 5)
☐	A10C	Legend - Lines & Symbols (Sheet 3 of 5)
☐	A10D	Legend - Lines & Symbols (Sheet 4 of 5)
☐	A10E	Legend - Lines & Symbols (Sheet 5 of 5)
☐	A10F	Legend - Soil (Sheet 1 of 2)
☐	A10G	Legend - Soil (Sheet 2 of 2)
☐	A10H	Legend - Rock
☐	A62A	Excavation & Backfill - Miscellaneous Details
☐	A62B	Limits of Payment for Excavation & Backfill - Bridge Surcharge and Wall
☐	A62C	Limits of Payment for Excavation & Backfill - Bridge
☐	A76A	Concrete Barrier Type 60M
☐	B0-1	Bridge Details
☐	B0-3	Bridge Details
☐	B0-5	Bridge Details
☐	B0-13	Bridge Details
☐	B2-3	16" and 24" Cast-in-Drilled-Hole Concrete Pile
☐	B2-5	Pile Details - Class 90 and Class 140
☐	B2-8	Pile Details - Class 200
☐	B2-9	Load Test Pile Details (1)
☐	B2-10	Load Test Pile Details (2)
☐	B2-11	Load Test Pile Details (3)
☐	B3-1A	Retaining Wall Type 1 (Case 1)
☐	B3-1B	Retaining Wall Type 1 (Case 2)
☐	B3-1C	Retaining Wall Type 1 (Case 3)
☐	B3-3A	Retaining Wall Type 1A (Case 1)
☐	B3-3B	Retaining Wall Type 1A (Case 2)
☐	B3-4A	Retaining Wall Type 5 (Case 1)
☐	B3-4B	Retaining Wall Type 5 (Case 2)
☐	B3-4C	Retaining Wall Type 5 (Case 3)
☐	B3-5	Retaining Wall Details No.1
☐	B3-6	Retaining Wall Details No.2
☐	B3-7A	Retaining Wall Type 6 (Case 1)
☐	B3-7B	Retaining Wall Type 6 (Case 2)
☐	B3-7C	Retaining Wall Type 6 Details
☐	B6-1	T-Beam Details
☐	B6-10	Utility Openings - T-Beam
☐	B6-21	Joint Seals (Maximum Movement Range = 2")
☐	B7-1	Box Girder Details
☐	B7-5	Deck Drains
☐	B7-6	Deck Drains (Type D-1) & (Type D-2)
☐	B7-7	Deck Drain (Type D-3)
☐	B7-8	Deck Drainage Details
☐	B7-10	Utility Opening - Box Girder
☐	B7-11	Utility Details
☐	B8-5	Cast-in-Place Post Tensioned Girder Details
☐	B9-1	Structure Approach (Type N)(30)
☐	B9-2	Structure Approach (Type R)(30)
☐	B9-3	Structure Approach (Type R)(10)
☐	B9-4	Structure Approach (Type EQ)(10)
☐	B9-5	Structure Approach - Slab Details
☐	B9-6	Structure Approach - Drainage Details
☐	B11-7	Chain Link Railing
☐	B11-47	Cable Railing
☐	B11-51	Tubular Hand Railing
☐	B11-52	Chain Link Railing Type 7
☐	B11-58	Concrete Barrier - Type 732SW Details No. 1
☐	B11-59	Concrete Barrier - Type 732SW Details No. 2
☐	B11-59A	Concrete Barrier - Type 732SW Details No. 3
☐	B11-79	Concrete Barrier Type 836 Details No. 1
☐	B11-80	Concrete Barrier Type 836 Details No. 2
☐	B11-80A	Concrete Barrier Type 836 Details No. 3
☐	B11-81	Concrete Barrier Type 842 Details No. 1
☐	B11-82	Concrete Barrier Type 842 Details No. 2
☐	B11-82A	Concrete Barrier Type 842 Details No. 3
☐	B11-83	Concrete Barrier Type 85 Details No. 1
☐	B11-83A	Concrete Barrier Type 85 Details No. 2
☐	B11-84	Concrete Barrier Type 85 Details No. 3
☐	B11-85	Concrete Barrier Type 85 Details No. 4
☐	B11-86	Concrete Barrier Type 85 Details No. 5
☐	B11-87	Concrete Barrier Type 85 Details No. 6
☐	B11-200	California ST-75 Bridge Rail Details No. 1
☐	B11-201	California ST-75 Bridge Rail Details No. 2
☐	B11-202	California ST-75 Bridge Rail Details No. 3
☐	B11-205	California ST-75SW Bridge Rail Details No. 1
☐	B11-206	California ST-75SW Bridge Rail Details No. 2
☐	B11-207	California ST-75SW Bridge Rail Details No. 3
☐	B11-210	California ST-76 Bridge Rail Details No. 1
☐	B11-211	California ST-76 Bridge Rail Details No. 2
☐	B11-212	California ST-76 Bridge Rail Details No. 3
☐	B11-215	California ST-76SW Bridge Rail Details No. 1
☐	B11-216	California ST-76SW Bridge Rail Details No. 2
☐	B11-217	California ST-76SW Bridge Rail Details No. 3
☐	B11-220	California Bridge Rail ST-75, ST-75SW, ST-76 & ST-76SW Post and Rail Details
☐	B11-221	California Bridge Rail ST-75, ST-75SW, ST-76 & ST-76SW Rail Splice Details
☐	B11-222	California Bridge Rail ST-75, ST-75SW, ST-76 & ST-76SW Parapet Shoe Details
☐	B14-1	Structural Steel Plate Vehicular Undercrossing
☐	B14-3	Communication and Sprinkler Control Conduits (Conduits < 4")
☐	B14-4	Water Supply Line (Bridge) (Pipe Sizes Less than 4")*
☐	B14-5	Water Supply Line (Details) (Pipes Size Less than 4")*

2024 Standard Plans Edition with Revised Standard Plans as of April 21, 2025.*

STATE OF CALIFORNIA · DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES

STRUCTURE STANDARD PLAN TRANSMITTAL

BD-0354 (REV 05/16/2025)

BRIDGE DESIGN

Project ID:	EA:	Project Name:	Date:

- ☐ B15-1 SW Masonry Block on Footing Details (1)
- ☐ B15-2 SW Masonry Block on Footing Details (2)
- ☐ B15-3 SW Masonry Block on Pile Cap Details (1)
- ☐ B15-4 SW Masonry Block on Pile Cap Details (2)
- ☐ B15-5 SW Masonry Block on Pile Cap Details (3)
- ☐ B15-6 SW Masonry Block on Type 836S/SV Barrier Details (1)
- ☐ B15-7 SW Masonry Block on Type 836S/SV Barrier Details (2)
- ☐ B15-8 SW Masonry Block on Type 836S/SV Barrier Details (3)
- ☐ B15-9 SW Masonry Block Miscellaneous Details
- ☐ B15-10 SW Masonry Block on Footing or Pile Cap 5'-0" Access Gate Details (1)
- ☐ B15-11 SW Masonry Block on Footing or Pile Cap 5'-0" Access Gate Details (2)
- ☐ B15-12 SW Masonry Block on Barrier - 5'-0" Access Gate Details (1)
- ☐ B15-13 SW Masonry Block on Barrier - 5'-0" Access Gate Details (2)
- ☐ B15-14 SW Masonry Block Access Gate Locking Details
- ☐ B15-15 SW Masonry Block on Type 836S/SV Barrier on Pile Footing for Spanning Utilities

Other(s):

- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐
- ☐

Bridge Design Details 1.6 June 2025

Use of Bridge Standard Detail Sheets (XS Sheets)

Bridge Standard Details (XS SHEETS) contain pre-engineered details for a variety of structural components, such as earth retaining systems, sound walls, joint seal assemblies, bridge railings, and underground structures. The use of XS SHEETS provides an efficient means of reducing engineering and detailing efforts for a specific project.

XS SHEETS may be incorporated into the project “as is” (unmodified) or with modifications. XS SHEETS inserted into the plans as detail sheets shall contain details and dimensions specific to a set of Structure Plans or District Roadway Plans. XS SHEETS are to be signed by the Project Engineer who is responsible for the selection and proper application of the component design and any modifications shown. Individual XS SHEET User Guides generated by Technical Owners are posted online with specific information for each XS SHEET.

Eventually, XS SHEETS posted online may become Standard Plans. By becoming Standard Plans, the number of Structure Plan sheets may be reduced in the future, and the details will be available for all contracts.

Modifying Bridge Standard Detail Sheets

Modifications to an XS SHEET shall be denoted as follows:

- Modifications shall be indicated by a pentagon shaped symbol (⬠) placed near the revised portion of the detail. A modification number shall be placed inside the pentagon (e.g., ⬠2). Consecutively numbered pentagons shall be used to indicate multiple changes.
- Corresponding symbols and brief explanations shall be placed in the border at bottom left-center.
- Details and notes that do not apply shall be crossed out. Any details or notes that are removed or replaced shall be indicated as a modification.
- The text “SPECIAL DETAILS” shall be added directly above the title block of the XS SHEET and “REVISED” shall be added before “BRIDGE STANDARD DETAILS” on the bottom left corner of the border. To provide a consistent standard for text size, standard Title Text attributes should be used, which are CTFont 3, weight 4 and text height 0.24”.
- If more than one modified XS SHEET is needed for a project or structure, the modification numbers (e.g., ⬠1 , ⬠2) shall start over with each modified XS SHEET.

- When directed by the Specifications Engineer, “(Mod)” shall be added after the XS SHEET title to indicate that the modifications in the XS SHEET impact the bid item of the structural component and the standard bid item designation no longer applies.
- Filling information into blank tables on XS Sheets should not be treated as a XS Sheet modification, example below:

JOINT INFORMATION			"a" DIMENSIONS		
LOCATION	MOVEMENT RANGE (MR)	SKEW	WINTER	SPRING & FALL	SUMMER

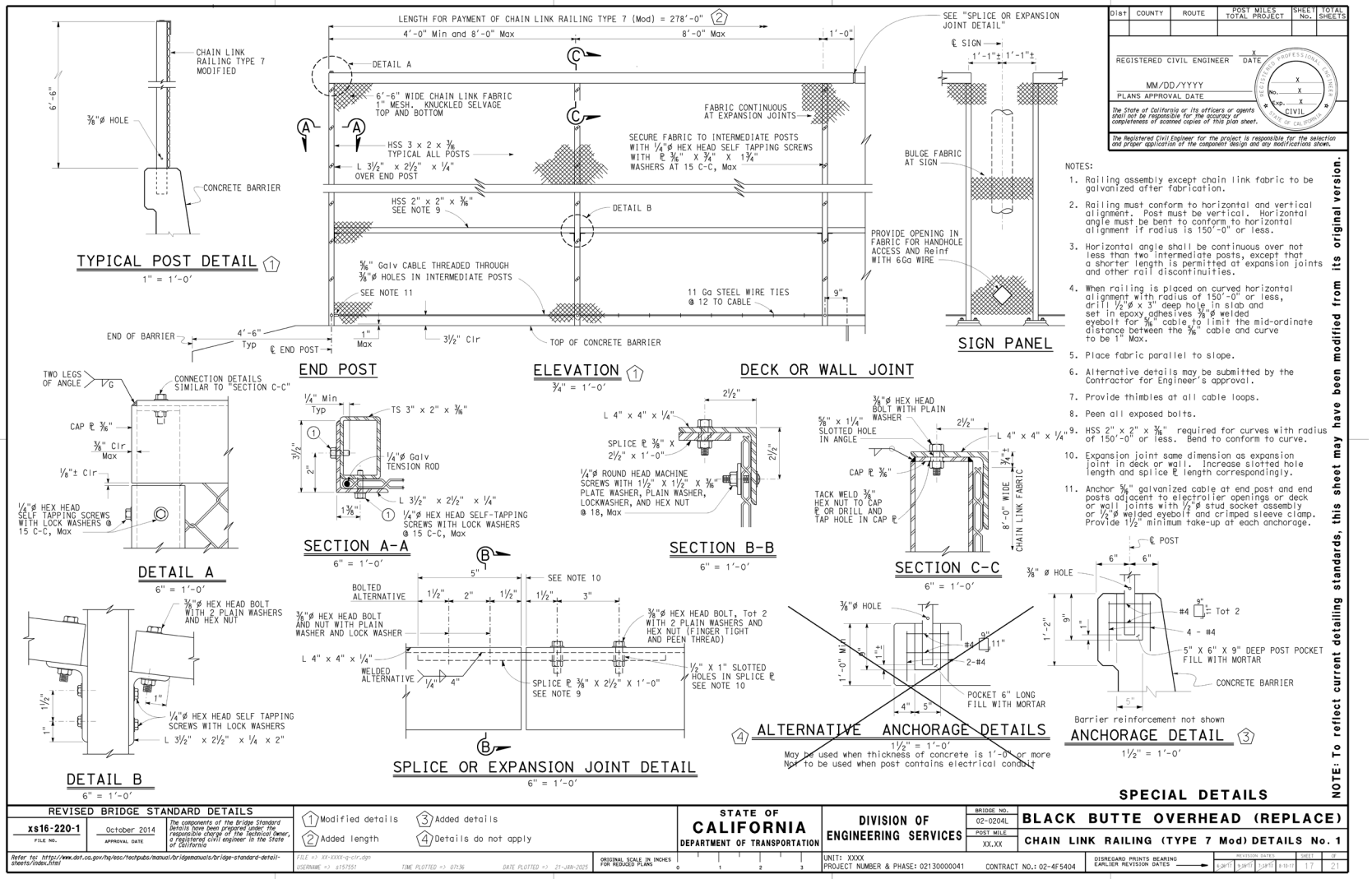
Figure 1.6.1 Example of Design Information on XS-Sheet

If significant modifications to the XS SHEETS are required, the Project Engineer may place the modified details and notes on a new Structure Design Detail sheet in a structure detail border. The Project Engineer shall consult with the Technical Owner of the XS SHEET to fully discuss the design methodology and the impacts of the changes. If a new sheet is used, the details shall be designed, detailed, and checked as a new structural component by the project design team. To avoid confusion, the new Sheet Title shall conform to the given set of plans and be different from the XS SHEETS from which the details are derived.

The latest XS SHEETS and associated Technical Owners can be found online.

See Attachment 1A.E.1 for an example of a modified XS SHEET.

Figure 1A.E.1 Modified Bridge Standard Detail Sheet Detailing



Bridge Design Details 1.7 February 2025

Use of CADD Cells or Components

Addition, modification or deletion of standard structural cells or components should be coordinated through the Bridge Design Detailing Technical Committee. Once approved, the changes are submitted to the Structures CADD Software Support Unit for implementation.

It is good practice to routinely update CADD structure cell libraries, as cells are constantly being improved. To update the CADD structure cell library, run the “BATCH FILE UPDATE” tool.

Bridge Design Details 1.19 June 2025

Transmitting Late Plan Changes (Prior to RTL)

It may be necessary to revise the structure plans after they have been sent to the District Office Engineer (DOE), but before they have been advertised. If this situation occurs, the Structure Office Engineer (SOE) and the DOE shall be alerted that new plan sheets are to be updated by the Design Branch. The Structure Design Branch then fills out the file request form, *REQUEST FOR ELECTRONIC CONTRACT DRAWINGS* illustrated in Figure 1.20.3: Request for Electronic Contract Drawings, as *revisions* and submits it to Structures CADD Software Support (SCSS). SCSS will contact DOE to retrieve the most up-to-date files and place them in a folder on the *S:\pickup* directory.

Addendum detail changes on the plans shall not be crossed out as the entire plan sheet is either REPLACED or ADDED, showing the modified details. For addendums that require quantity decal changes, the quantity shall be crossed out to match the SOE Bid Item List in the project specifications. Once the revised plan sheets are complete, they shall be reviewed by the SOE Cost Estimator again to determine if re-certification of the estimate is required. Only then may the Design Branch re-submit the files to SCSS using the form *AADD CADD SUBMITTAL*, “Revised” option shall be selected.

Refer to the *Procedures for Processing Electronic Structure Plans* manual for more information.

Revision: Changes After RTL and Before Advertising

No changes shall be made to project plan sheets after they have been forwarded to DOE as part of the PS&E package without the *approval* of the Project Engineer from the Design Branch involved. To ensure that no unauthorized changes are made, DOE personnel in charge of project plans will not allow anyone access to the project plans without this approval.

When changes are made to the project plans, notify SOE so the specifications engineer, and cost estimator can meet his/her responsibility by making the Special Provisions and Engineer’s Estimate consistent with the structure plans.

Addendum: Changes After Advertising and Before Bid Opening

To be sure that all bidders have the same contract plan sheets, no revisions shall be made on project plans between the time the prints are made for advertising and the bid opening, *except* when a formal addendum is issued. An addendum is coordinated with the DOE and SOE.

During this period, requests to obtain the original project plans shall include authorization from SOE. The structure plan files shall be retrieved from DOE using the *REQUEST FOR ELECTRONIC CONTRACT DRAWINGS* form.

DOE will handle placement of the Addendum Number and revision of the sheet numbers, if necessary, for all projects. Projects that have an addendum will be handled by the submitting Design Branch, as denoted below.

- If the addendum sheet is *replacing* a previously advertised sheet, the note will read:

  The replacement sheet number will be the same as the sheet being replaced (without an "R") so that the addendum is not confused with possible future change orders. If revisions are too numerous to show with triangles, the entire sheet can be replaced with one triangle added to the top right of the sheet near the Project Engineer seal. For examples of addendum sheet replacements, see Attachments 1A.F.1 through 1A.F.6.

- If a new sheet is being *inserted* as part of the addenda, then the note will read:

  The sheet number used for the new addendum sheet will be in accordance with the sequence of sheets to which it is being inserted (e.g., if sheet number 541 went out for advertisement and a new sheet is being inserted that belongs to that series of sheets, the addendum sheets need to be sequenced behind sheet number 541 following the logic of the job. The numbers will be 541A, 541B, 541C, etc.). The total number of sheets for a set of Roadway Plans in the top right corner of the sheet should not be changed (e.g., 541), but the INDEX TO PLANS for the specific structure(s) shall be modified with the number of additional sheets (e.g., one additional sheet "17 of 17" change to "18 of 18"). One triangle shall be added to the top right of the sheet near the Project Engineer seal. For an example of added addendum sheet, see Attachments 1A.F.6 through 1A.F.7.

- If a sheet is being *deleted* as part of the addenda, then the note will read:

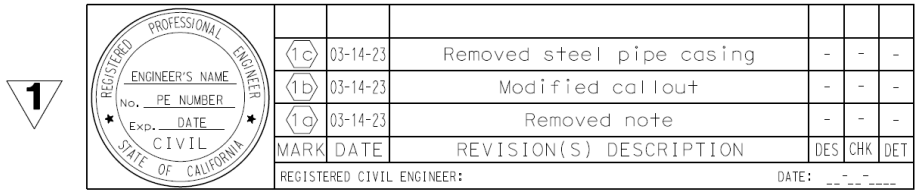
  One triangle shall be added to the top of the sheet near the Project Engineer seal. For an example of deleted addendum sheet, see Attachment 1A.F.8.

Addendum: Changes to Project Engineer Before Bid Opening

If the Project Engineer is no longer available to process the Addendum or with the state, the addendum sheet shall be prepared by a new licensed Engineer. The new Project Engineer will take responsibility for only the revisions associated with the addendum.

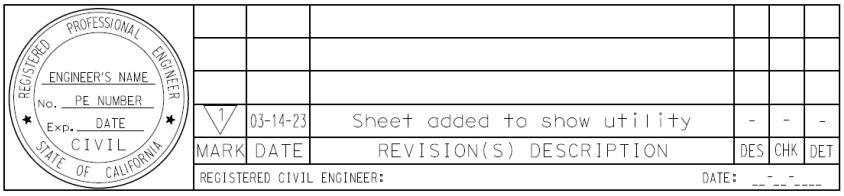
For an additional example of addendum sheet replacement, see Attachment 1A.F.9. Projects that have an addendum with new Engineer will be handled by the submitting Design Branch as denoted below.

- If the addendum sheet is replacing a previously advertised sheet, the Addendum revision block and note will be added. The Addendum number is placed within the triangle adjacent to the Addendum revision block and Addendum text block. If there are multiple changes related to the Addendum, the number of Addendum and sequential letters will be added within a hexagon inside the Addendum revision block, counting from 1 up from the bottom (delete unused hexagons from the standard cell or add additional lines above the Addendum revision block if necessary):



1 REPLACED PER ADDENDUM No. 1, DATED MONTH XX, 20XX

- If a new sheet is being inserted as part of the addenda, then the note will read:



ADDED PER ADDENDUM No. 1, DATED MONTH XX, 20XX

Figure 1A.F.1 Addendum Detailing Example 1

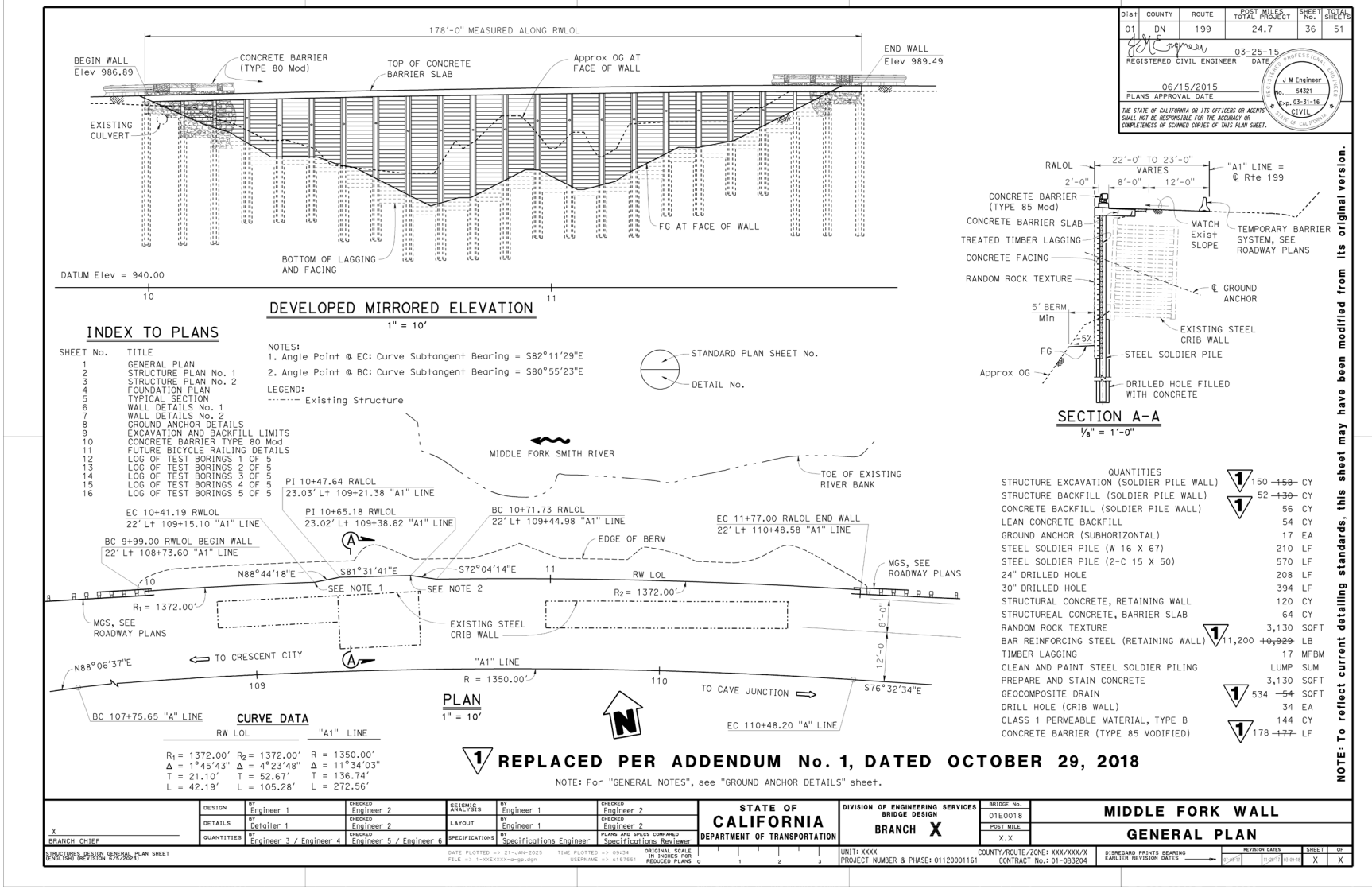


Figure 1A.F.2 Addendum Detailing Example 2

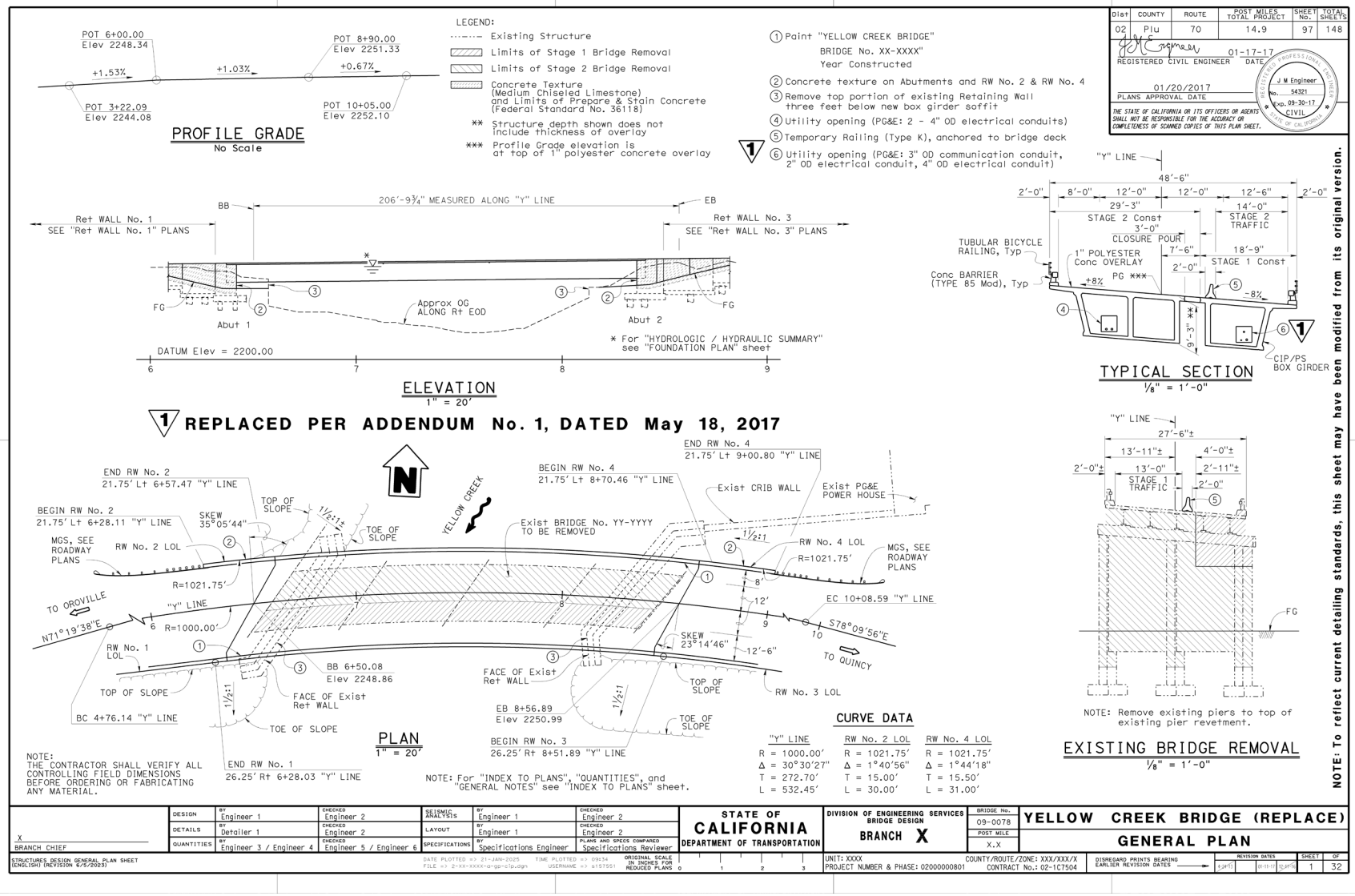


Figure 1A.F.3 Addendum Detailing Example 3

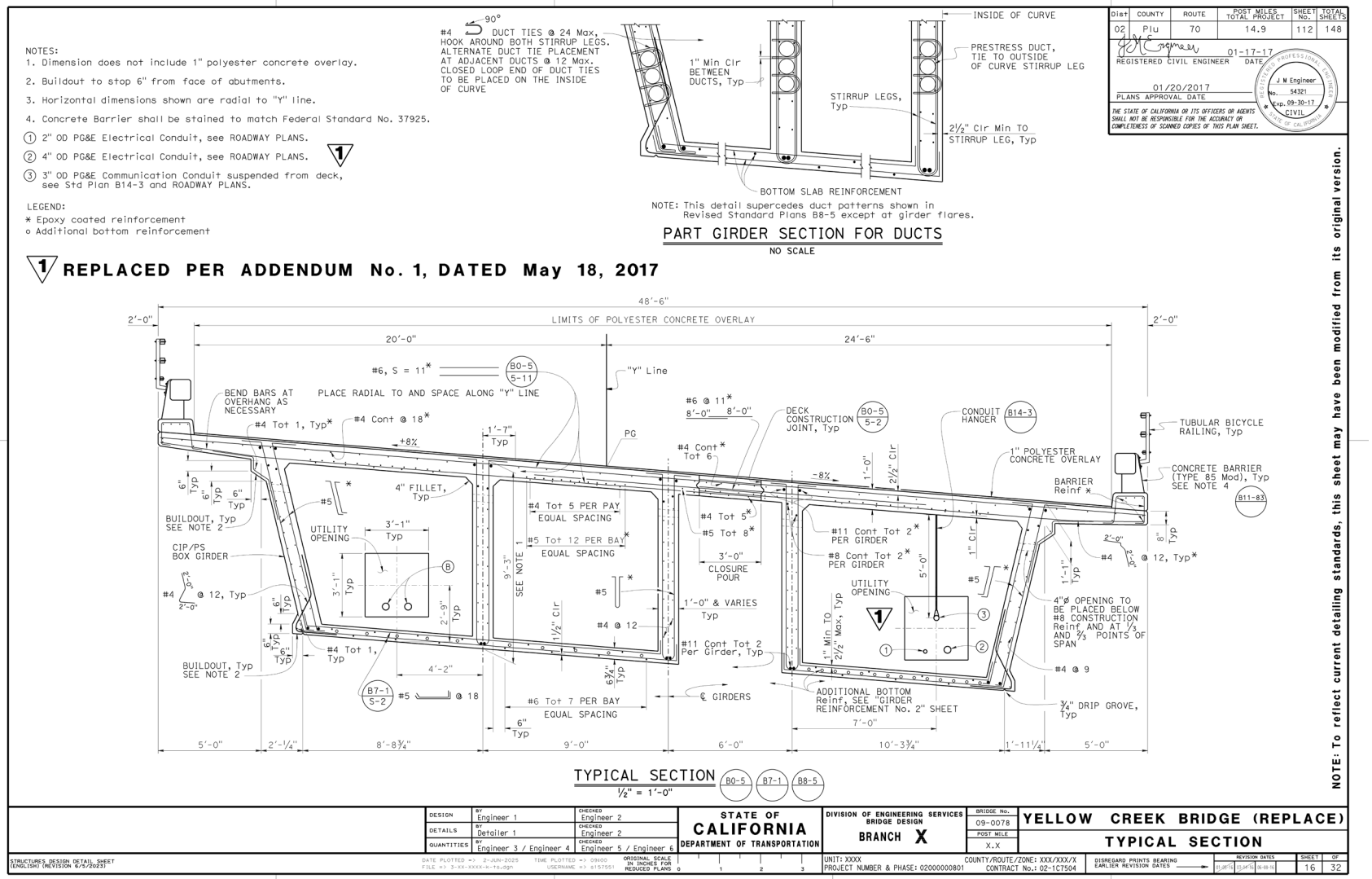


Figure 1A.F.4 Addendum Detailing Example 4

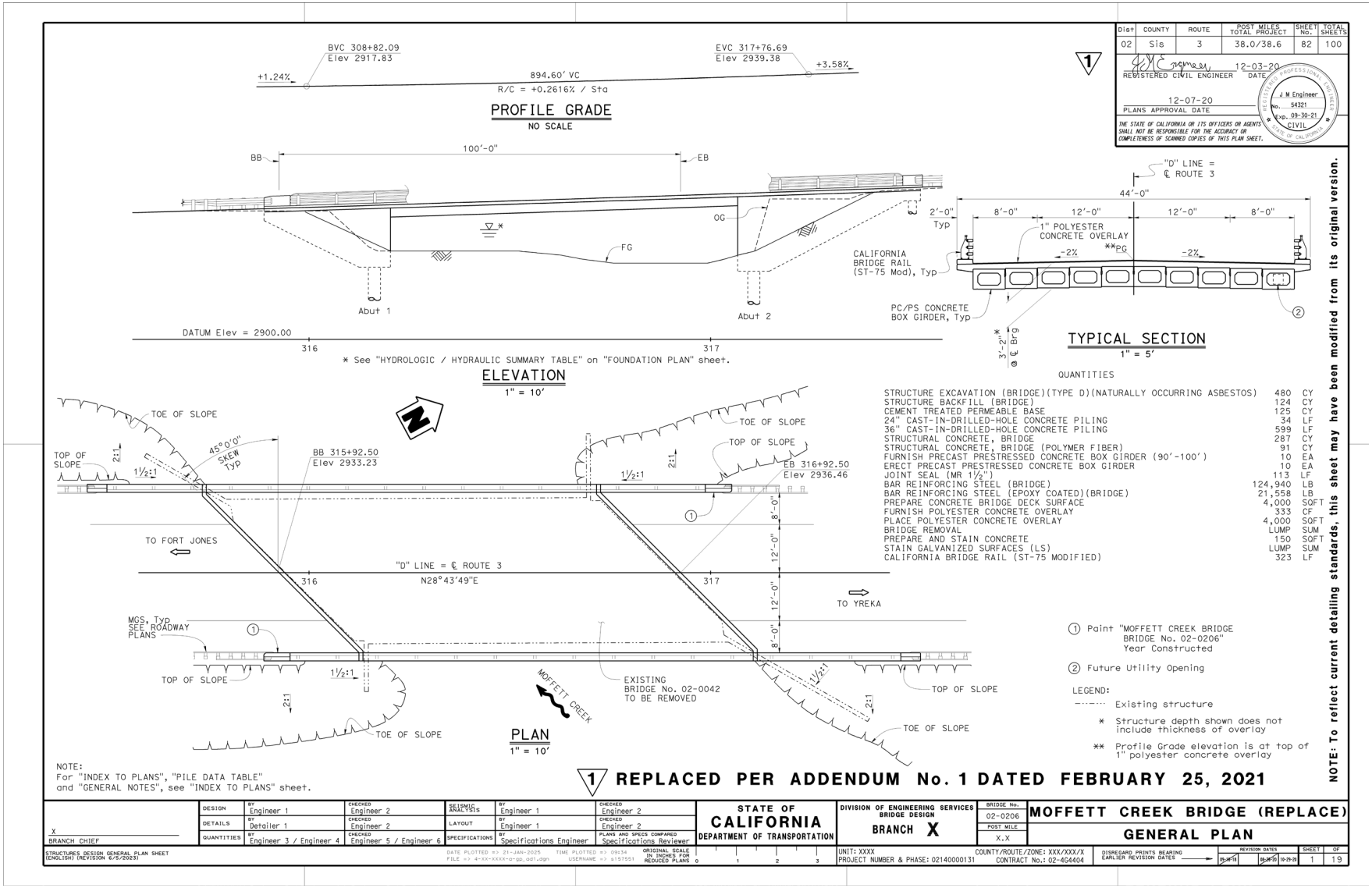


Figure 1A.F.5 Addendum Detailing Example 5

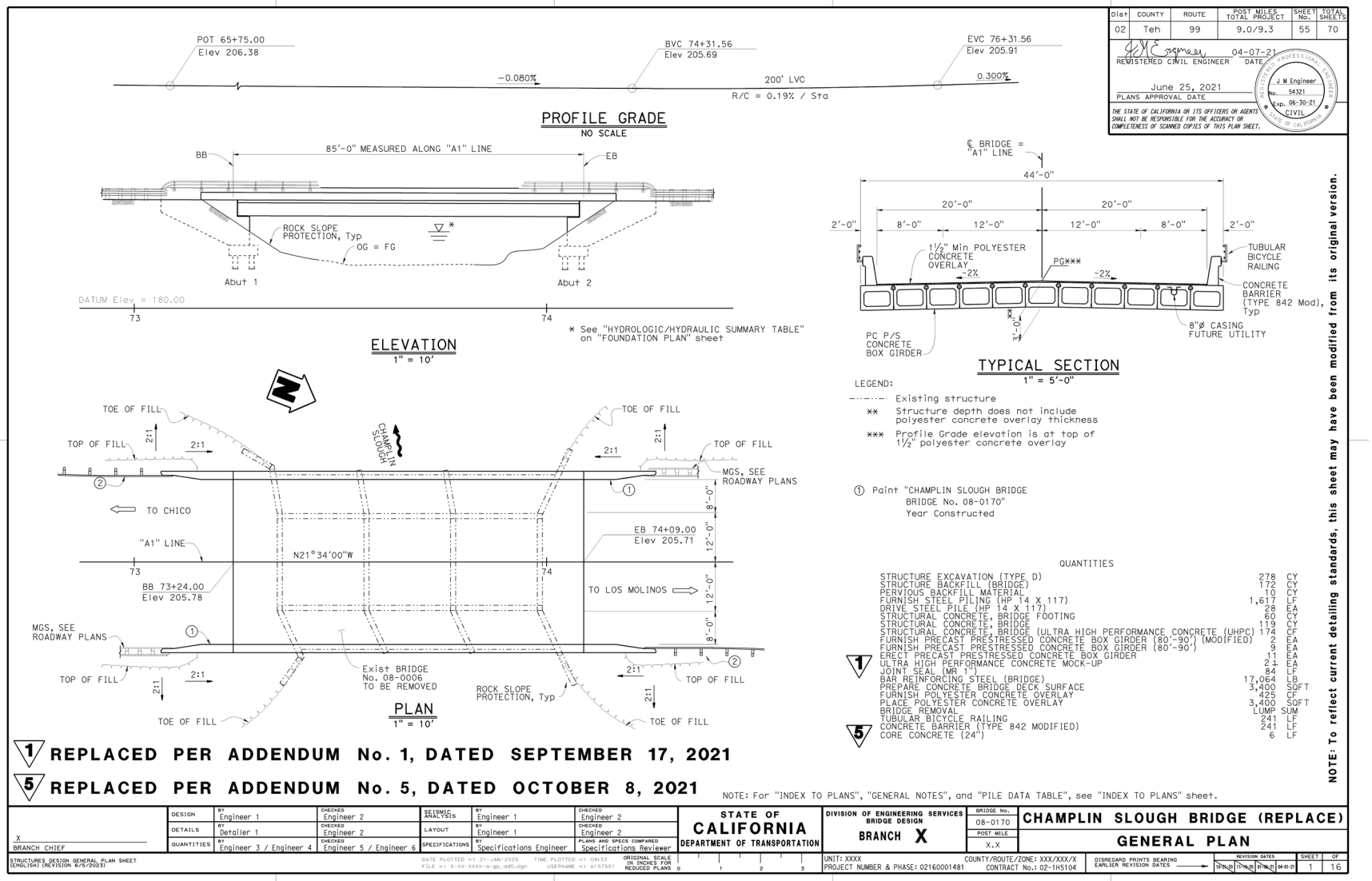


Figure 1A.F.6 Addendum Detailing Example 6

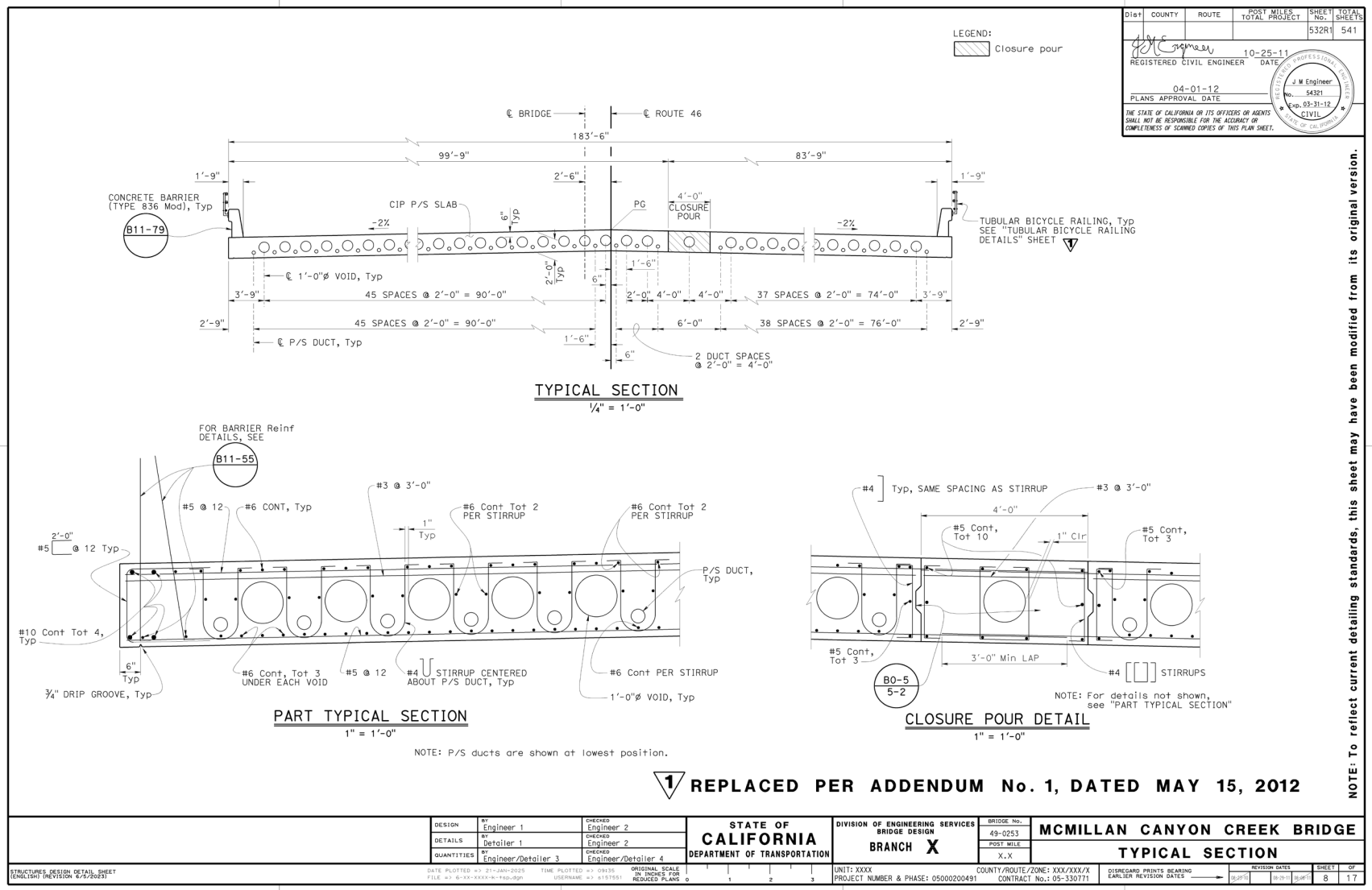


Figure 1A.F.7 Addendum Detailing Example 7

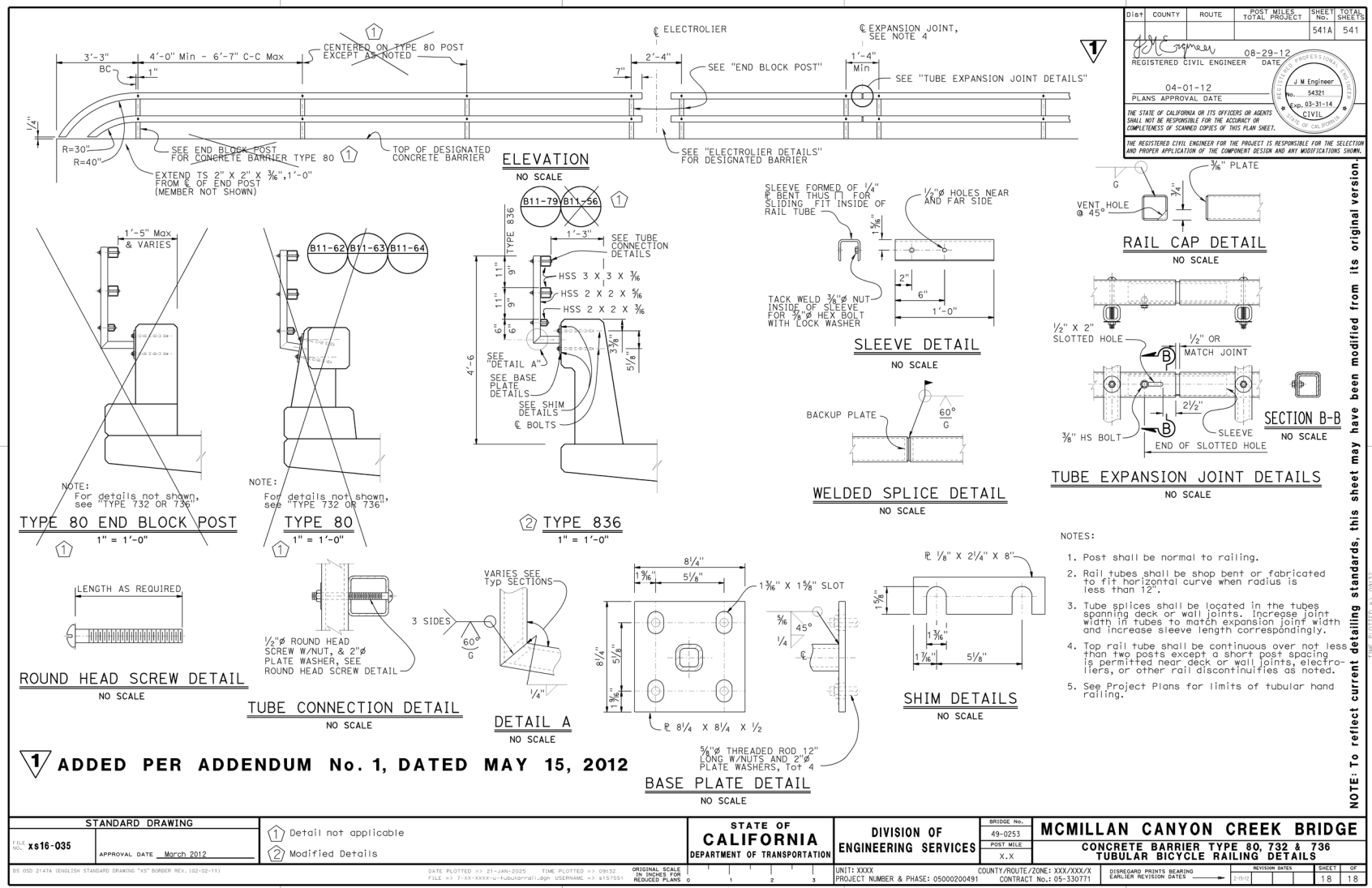


Figure 1A.F.8 Addendum Detailing Example 8

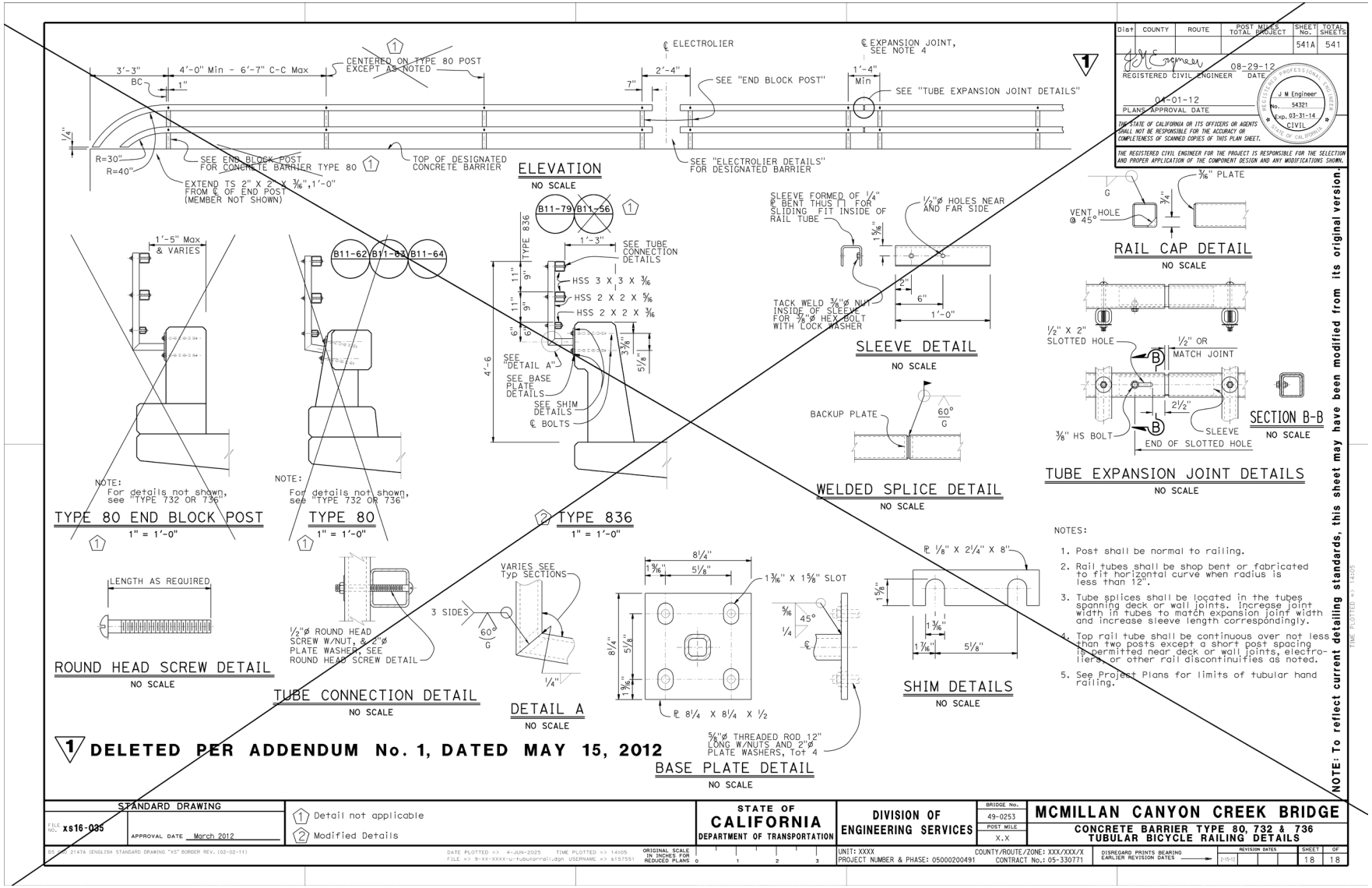
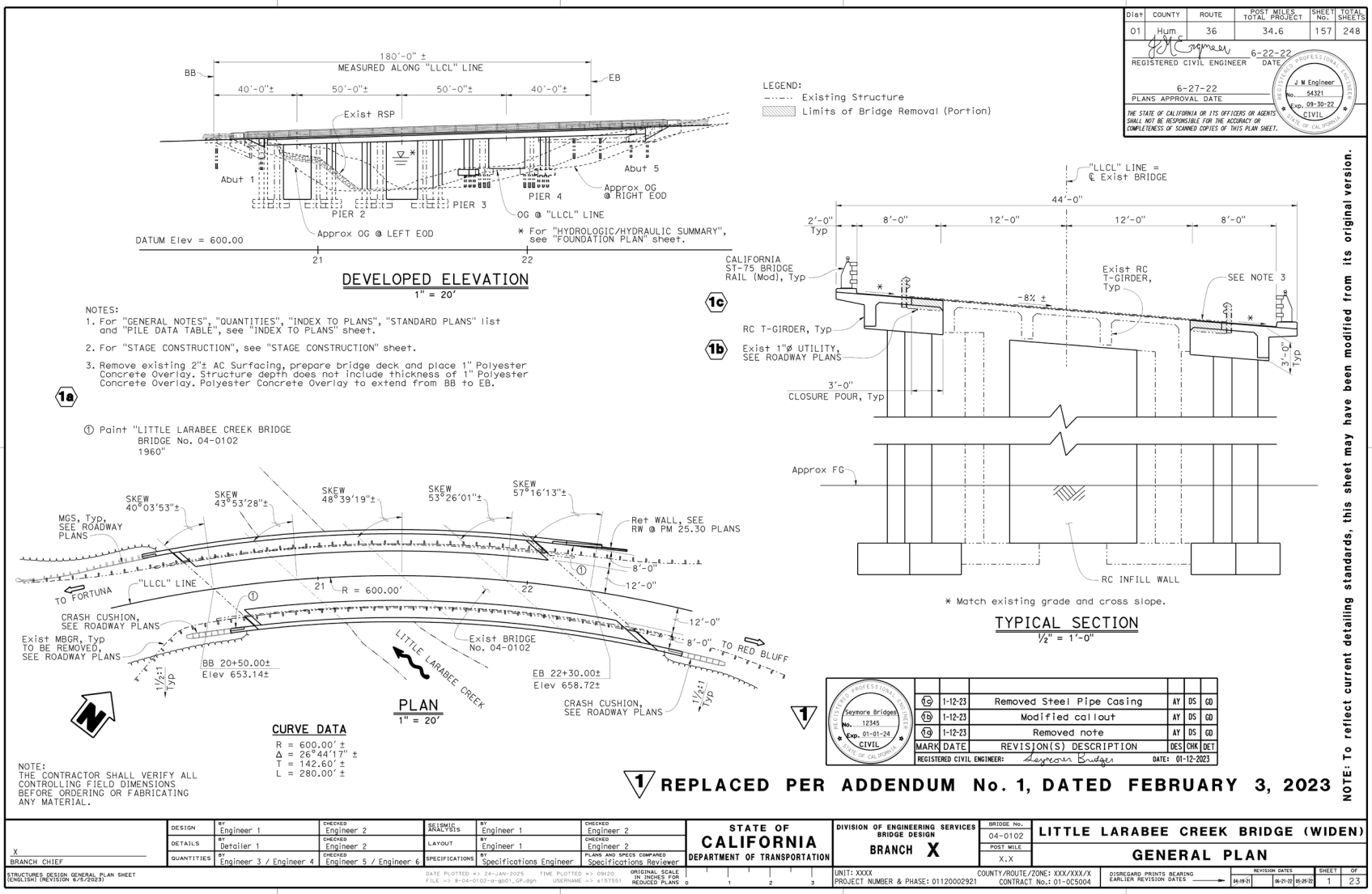


Figure 1A.F.9 Addendum Detailing Example 9



Bridge Design Details 1.20 June 2025

Revisions to Contract Plans by Change Order

The original contract plan files may NOT be retrieved after Bid Opening until the contract is *approved*.

After Contract Approval, all sheets needing revisions shall be retrieved by the Structures CADD Software Support (SCSS) Unit using the *REQUEST FOR ELECTRONIC CONTRACT DRAWINGS* and submitted back to SCSS, illustrated in Figure 1.20.4. Refer to the *Procedures for Processing Electronic Structure Plans* manual for more information.

After Award Revisions

Once a contract is *approved* or has reached "After Awarded" status, contract plan sheet(s) can be added, supplemented, revised or deleted through a Change Order (CO) as follows:

1. Revisions:
    a. Partial revisions (e.g., *adding*, *deleting*, or *revising* existing details, text, etc.) or,
    b. Total *replacement* of the original contract plan sheets.
2. Supplemental sheets (e.g., additional information to *supplement* existing plans).
3. Additional sheets (e.g., new project plan sheet covering *additional* information not in the scope of the original contract plans).
4. Deleted sheets (e.g., entire sheet from original contract plans is *deleted*).

When sheet revisions, supplemental, or additional sheets apply to more than one bridge, each bridge shall have its own CO sheet.

Partial Revisions

Partial revisions to the original contract plan sheets should be made as illustrated in Attachments 1A.G.1 through 1A.G.3. Do not cross out existing details that require revisions; instead redraw details that need to be revised. Each revision to the original plan sheet shall be clearly marked by an equilateral triangle placed near the revision (e.g., △1). A number is placed within the triangle that refers to the revision specified in the CO revision block.

Similar revisions in different places on the same sheet shall bear the same number; dissimilar revisions shall be numbered consecutively (e.g., △1 , △2 , etc.). The CO revision block cell is located in the CADD structures cell library. The revision numbers shall reset for each page, numbers should not continue or be tied to other sheets in the plan set.

The preferred placement of the CO revision block is in the lower right-hand corner of the plan sheet. The CO revision block shall include: an identifying number, short description of the revision, the initials of the person making, checking, and detailing the change, the date the CO is to be transmitted to Structure Construction, and the Project Engineer's signature/stamp. The

block may be manipulated if necessary to record subsequent revisions. Do not reduce the size of the Engineer's Seal.

Add the letter "R" and a revision number after the sheet number in the upper right-hand title block (e.g., the first revision to sheet 68 is entitled 68R1). When a sheet (e.g., 68R1) is revised, it shall be treated in the same manner as the original sheet, revising the sheet number (e.g., 68R2). The numbers following "R" do not necessarily correspond with the numbers in the triangles because it is quite possible for two or more revisions to be made on any given CO. See examples illustrated in Figure 1.20.1.

Do not change the *Total Sheets* number at the top of the revised sheet; this is handled by District Office Engineer.

Insert the cell for the CO number as near as possible to the CO revision block. Do not fill in the blanks for the CO number or sheet numbers as they will be added by Structure Construction when the CO is prepared.

Do not revise the Plans Approval Date, Registered Civil Engineer Signature, or Plans Approval Date in the upper right-hand corner of the sheet.

The *AUTHORIZATION FOR ELECTRONIC SIGNATURE SHEET* form shall be filled out and kept in the Project Engineer's records.

Total Replacement of Contract Plan Sheets

Replacing plan sheets places an additional burden on the Contractor and Structure Representative to identify the changes; therefore, *total replacement* should be avoided unless the original plan sheet needs extensive revisions to warrant the replacement.

A sheet replacing a contract plan sheet shall be prepared in the same manner as described above. A note identifying the sheet it replaces should be placed as shown in Attachment 1A.G.4. Number the sheets to match the original sheet being replaced and add the Project Engineer's seal information in the same manner as for partial revisions (upper right-hand corner).

Add the District, County, Route, Post Miles, and sheet numbers in the Index Block at the top of the sheet. In the preparation of typical plans, this data is left partially incomplete to be filled in by Office Engineer; however, replacement sheets do not follow this same procedure. Failing to completely fill in this area may cause confusion and lost time during routine handling after the package leaves the Division of Engineering Services.

Place the cell for the CO number as closely as possible to the sheet title block. Do not fill in the blanks for the CO number or sheet numbers; they will be added by Structure Construction when the CO is prepared.

The identifying data from the original sheet shall be completely filled in on the replacement sheet. This will enable everyone concerned to readily identify the project to which the sheet belongs.

Supplemental Sheets

When CO(s) are needed for a specific sheet, but those changes do not fit on the sheet describing the Detail(s) to be revised, a *supplemental* sheet is required. Supplemental sheets shall be prepared in the same manner as previously described for partial revisions and shall follow the detail sheet in which the supplemental details are required.

The sheet number of the sheet being supplemented shall be placed in the Project Information block located in the upper right-hand corner. This number shall be suffixed with the letter “S,” (e.g., 68S). The Seal, Signature Block, and Title Block shall be prepared in the same manner as a typical contract plan sheet. Place “SUPPLEMENTAL SHEET” in the lower right-hand corner, immediately above the sheet title. Use CTFONT1, text height 0.02’ and line weight 4.

If the original plan set had 10 total sheets, and the Supplemental change order was for sheet 7, the supplemental structure plan sheet(s) shall be given a sequential number. For example, if two sheets are added, the first Supplemental Sheet will be numbered in the bottom right corner as 7S1 of 12 and the second sheet will be 7S2 of 12. See Attachments 1A.G.5.

Subsequent revisions to supplemental sheets shall be made in the same manner as partial revisions to original sheets. After making a revision to supplemental sheet (e.g., 68S1, the sheet number would then become 68S1R1). See examples illustrated in Figure 1.20.3.

All identifying sheet data, including the CO number cell and plan approval dates shall be handled in the same manner as a total replacement CO, except as noted above.

The INDEX TO PLANS list does not need to be modified when supplemental sheets are added to a set of plans, since this would cause all of the sheets that follow to be renumbered.

Additional Sheets

Additional sheets shall be handled in the same manner as supplemental sheets, except that they shall follow the last sheet of the applicable structure plans and carry the same sheet number as the sheet they follow with suffix of a letter for each structure. The difference between an Additional Sheet and a Supplemental Sheet is that an additional sheet covers details not tied to a specific bridge element or detail shown on the original plan set. Normally, the additional sheet will cover details added at the later stages of a project, such as barrier rail attachments or even additional LOG OF TEST BORING sheets.

The Structure Design Technician and the Project Engineer shall make sure all Structure Plan sheets, including additional sheets, are listed under the INDEX TO PLANS. Unlike Supplemental Sheet(s), Additional Sheet(s) are added to the INDEX TO PLANS list as a *Revised* sheet. Place “ADDITIONAL SHEET” in the lower right-hand corner on the *Additional* sheet, immediately above the sheet title. Use CTFONT1, text height 0.02' and line weight 4. See Attachment 1A.G.6.

The additional sheet(s) are added to the structure plan(s) set and numbered in the lower right corner of sheet to match the INDEX TO PLANS. None of the original sheet numbers will be changed when adding Additional Sheets. If the original plan set had 10 total sheets, the Additional Sheets will be given a sequential number. For example, if two sheets are added, the

first Additional Sheet will be numbered 11A of 12 and the second sheet will be 12A of 12. If additional change orders come in the future as additional sheets, the Additional Sheet(s) will be numbered 13A of 14 and 14A of 14 for example.

In the upper right corner of the sheet, the first additional sheet of the first structure in a project will be numbered “A1”; the second “A2,” etc. (e.g., 68A1, 68A2). The second structure’s first additional sheet will be “B1”; the second “B2,” etc. (e.g., 68B1, 68B2); and so on for additional structures. To avoid confusion with revision and supplemental sheets, do not use the letters “R” and “S”. Revisions to added sheets will be handled in a manner similar to supplemental sheets. See examples illustrated in Figure 1.20.3.

Deleted Sheets

Sheets shall be *deleted* from a contract plan set by crossing out entire sheet and adding “Entire sheet removed per Change Order No. __”, near the original signature block. Use CTFONT1, text height 0.02' and line weight 4. In most cases, deleted sheets are associated with *additional* or *supplemental* change order sheets. See Attachment 1A.G.7.

Revision Box/PE Stamp for Change Orders

1. For CO(s) requiring replacement sheets, supplemental sheets, or additional sheets; these sheets require the Project Engineer’s stamp. The upper right-hand corner seal and signature block shall be utilized for the Engineer’s seal and signature. The signature date shall correspond to the CO date.
2. For revisions to an existing sheet, the original signature block shall be maintained, regardless of whether the Engineer who signed these original plans is also preparing the CO. The date on the original signature block represents the signature date of the original sheet. Revisions to this sheet will be indicated in the CO revision block, and the revisions shall be sealed. The date of the signature for these revisions shall correlate with the date of the CO.

The diameter of the Engineer’s seal used in the CO revision block is 2” when printed on the full-size sheet (1” on a half-scale sheet). The size of the Engineer’s seal shall not be reduced as these sizes meet the Board of Registration’s design requirements.

The revisions shall be numbered sequentially from the bottom line of the CO revision block up. If there are more than four revisions, additional horizontal lines may be added to the standard cell. Extra triangles and placeholders should be removed.

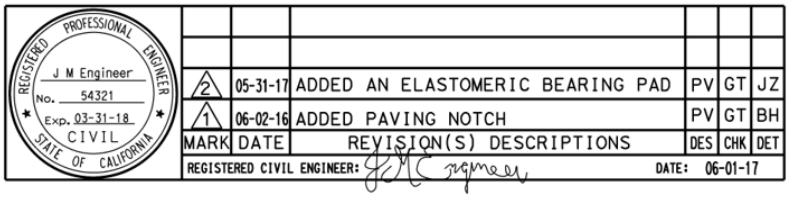


Figure 1.20.1 Change Order cell

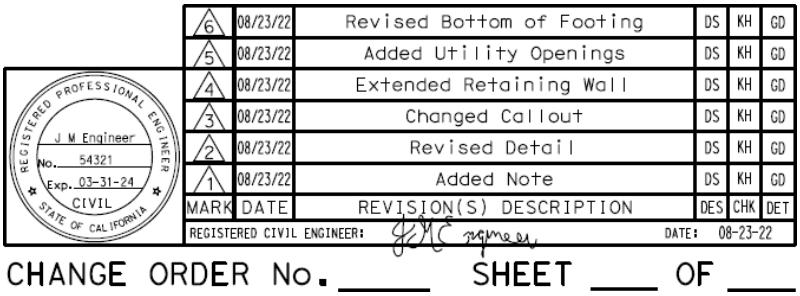
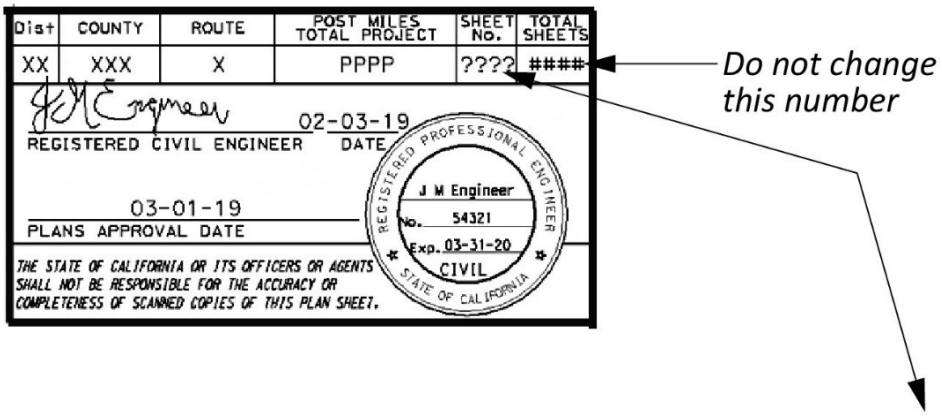


Figure 1.20.2 Change Order cell with numerous changes

If space is limited and multiple change orders are required to the same sheet the CO revision block maybe be combined, see Attachment 1A.G.2. Otherwise, when the responsible charge PE changes for the work or additional CO(s) are made to the same sheet, multiple CO revision blocks should be used, see Attachment 1A.G.3.



1. REVISIONS
   a) Revision to original contract plan sheet.....68R1
      Subsequent revisions to contract plan sheets.....68R2, etc.
   b) Total replacement of a contract plan sheet.....68R1

      - Add this note at top of sheets using CTFONT1, text height 0.015' and line weight 2:

      "THIS SHEET REPLACES SHEET No. XX of XX OF PLANS APPROVED XXXX XX, 20XX"

2. SUPPLEMENTAL SHEETS
   a) Addition of supplemental sheet.....68S1
   b) Subsequent Supplemental Sheets to contract plan sheets.....68S2, etc.
      Revision of a supplemental sheet.....68S1R1, etc.

      - Add "SUPPLEMENTAL SHEET" above the lower right-hand title block using CTFONT1, text height .02' and line weight 4.

3. ADDITIONAL SHEETS
   a) Additional sheet.....XX = # from last sheet XXA1
      Subsequent additional sheets to first structure in contract plans.....XXA2
      Subsequent additional sheets to different structures in contract plans.....XXB1
   b) Revisions to additional sheets.....XXA1R1

      - Add "ADDITIONAL SHEET" above the lower right-hand title block using CTFONT1, text height .02' and line weight 4.

Figure 1.20.3 Seal Signature and Block

STATE OF CALIFORNIA · DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES

REQUEST FOR ELECTRONIC CONTRACT DRAWINGS
IN-HOUSE
BD-0398 (REV 06/2024)

BRIDGE DESIGN

Project ID: | EA: | Project Name: | Date:

REQUESTOR INFORMATION

Requestor (Name) email
Unit or Address (Name) phone

NOTIFY

Bridge Design Branch Chief (Name) email
Structural Design Technician (Name) email
Structure Project Engineer (Name) email

REQUESTING: ☐ ALL SHEETS ☐ SPECIFIED SHEETS

REQUESTING FILES FOR: (Check One) CONTRACT NO.:

☐ REVISIONS :1st Notice Files
☐ ADDENDUM :2nd Notice Files
☐ OTHER
☐ CCO - VCEP :2nd Notice Files w/addendum
☐ AS-BUILTS :2nd Notice Files w/addendum & CCOs

REQUESTED FILES:

BRIDGE NO. (Ex: 59-2482rl)	FILE NAME (Ex: 59-2482rl-a-g-gp01.dgn)

BRIDGE NO. (Ex: 59-2482rl)	FILE NAME (Ex: 59-2482rl-a-g-gp01.dgn)

☐ **Additional Sheets Requested On Next Page**

COMMENTS:

Structure Representative (Name) email
Specification Engineer (Name) email

Signature

Bridge Design Branch Chief

Branch Chief signature only required for CADD files requested and sent to Structure Construction. The Structure Representative shall assume all responsibility and liability for any modifications to the contents of the transmitted files.

1

Figure 1.20.4 Request for Electronic Contract Drawings

Figure 1A.G.1 Partial Revision Change Order Detailing Example 1

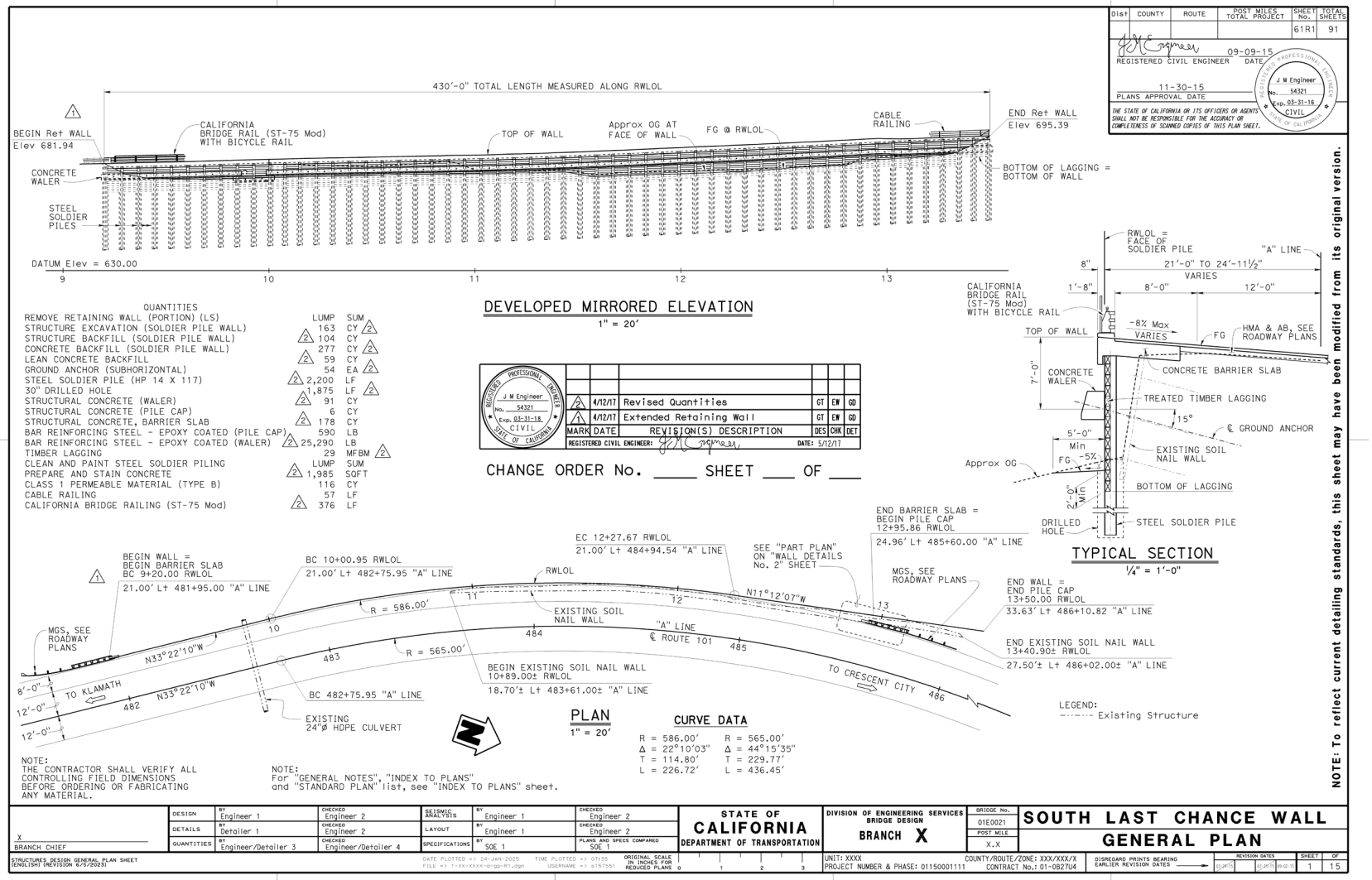


Figure 1A.G.2 Partial Revision Change Order Detailing Example 2

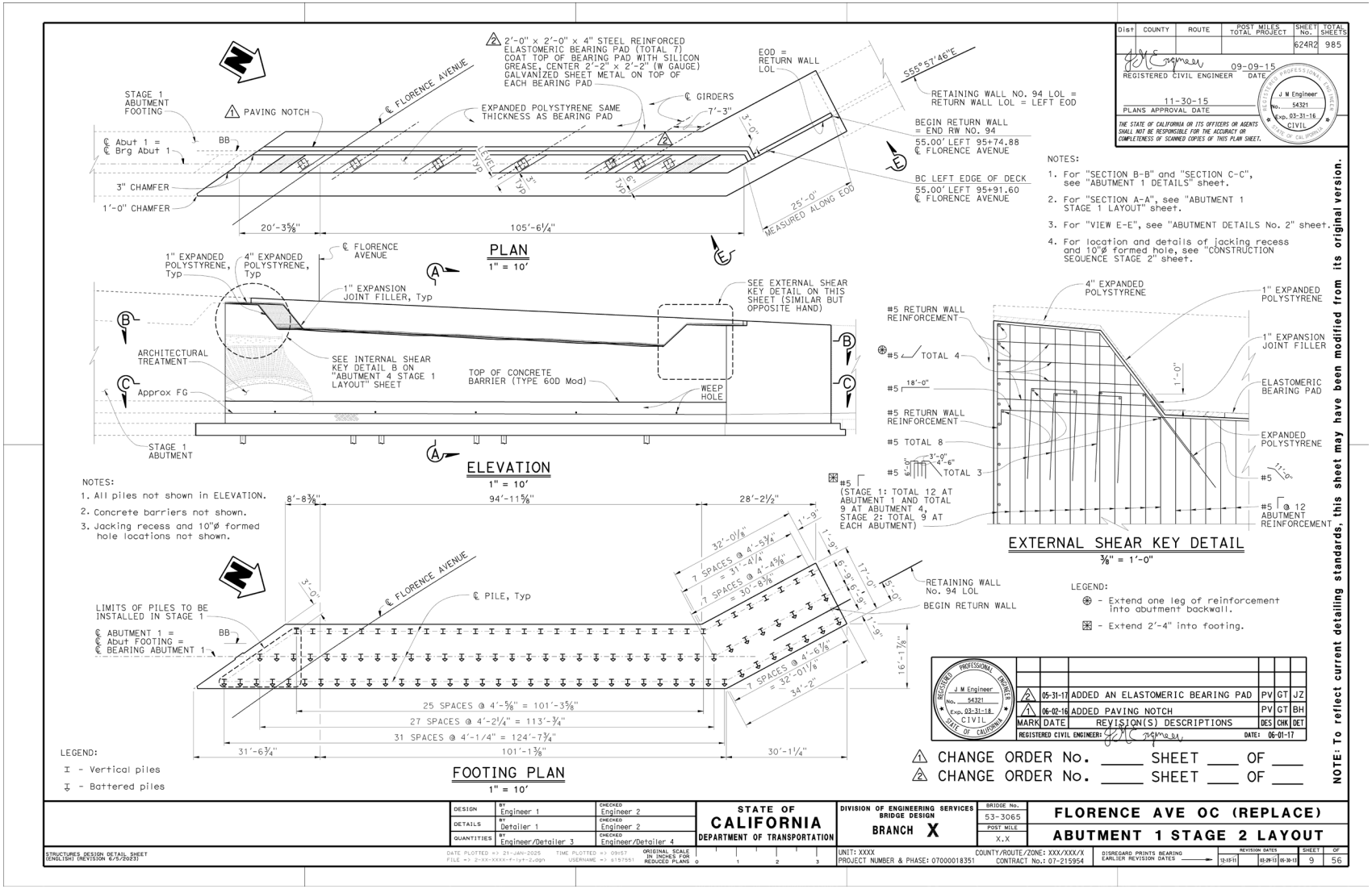


Figure 1A.G.3 Partial Revision Change Order Detailing Example 3

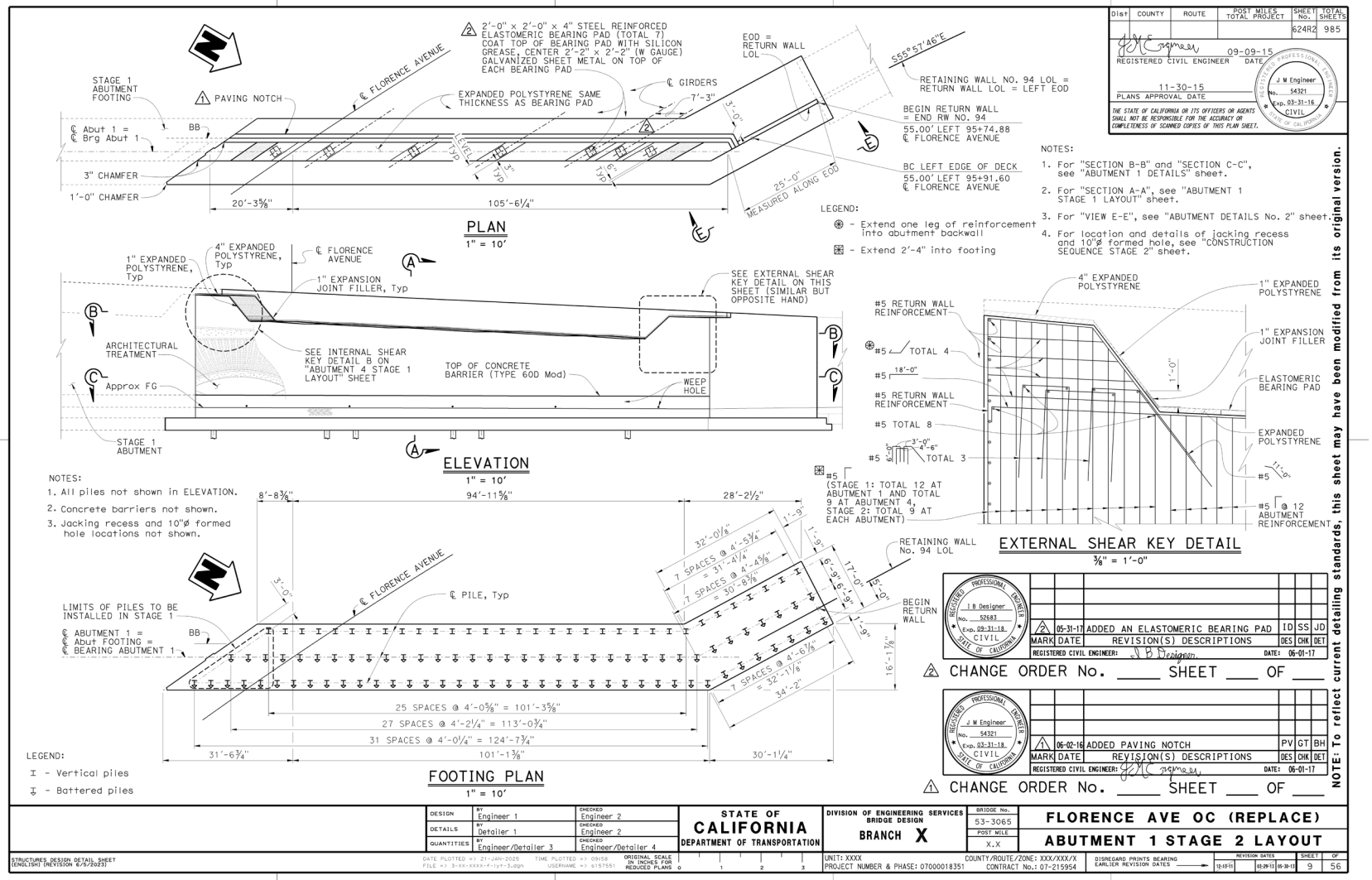


Figure 1A.G.4 Total Replacement Change Order Detailing Example 1

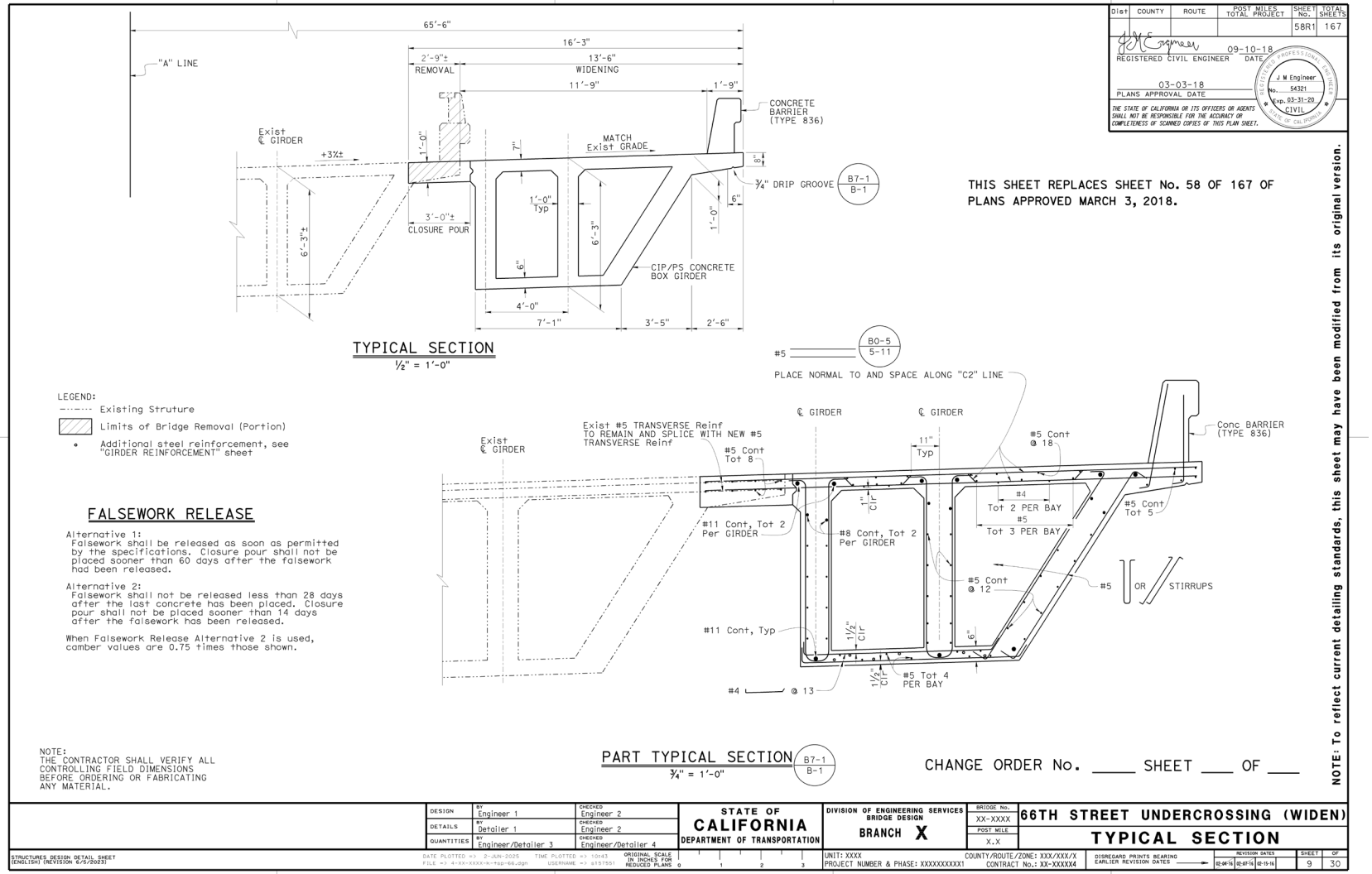


Figure 1A.G.5 Supplemental Change Order Detailing Example 1

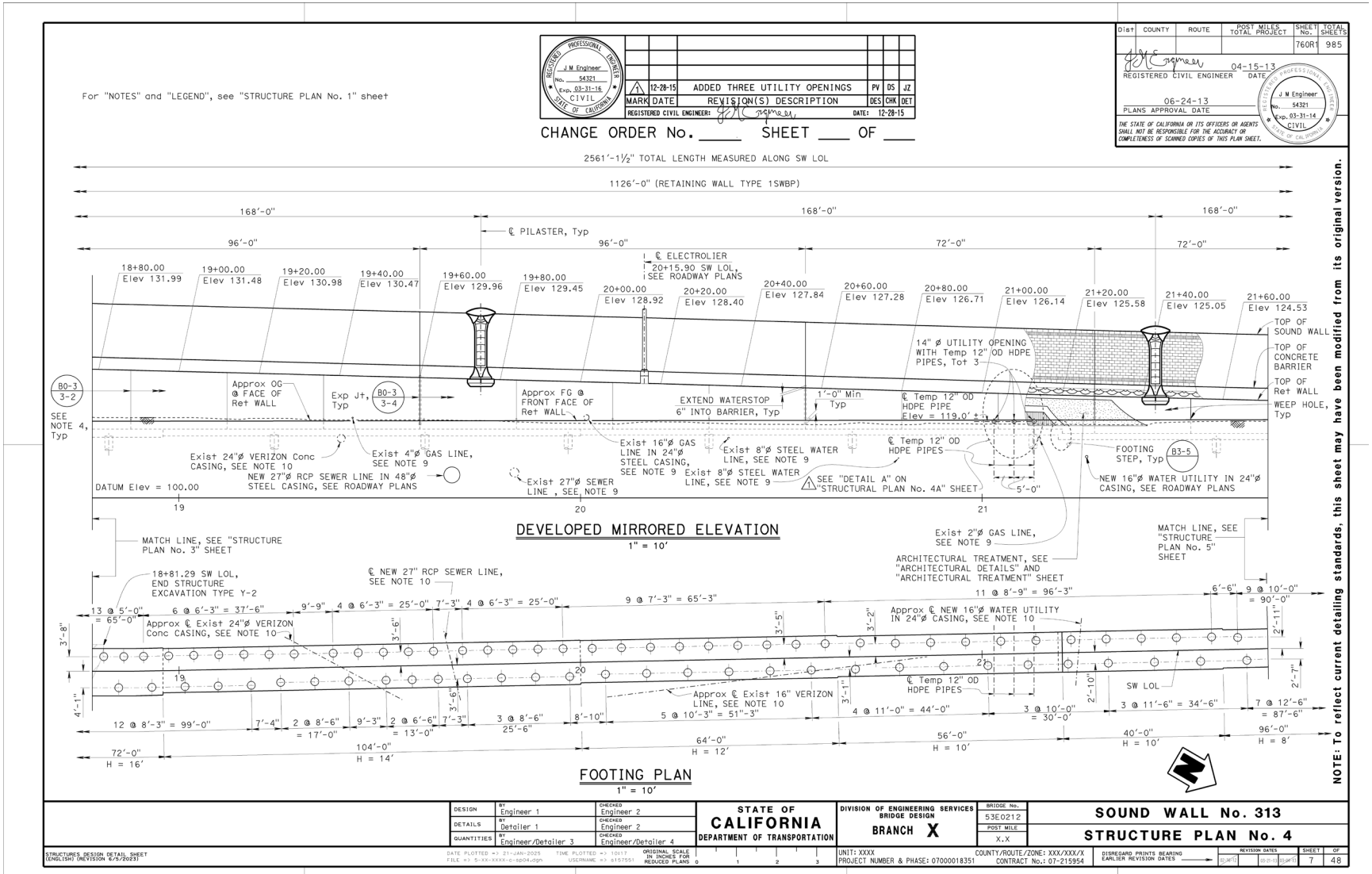
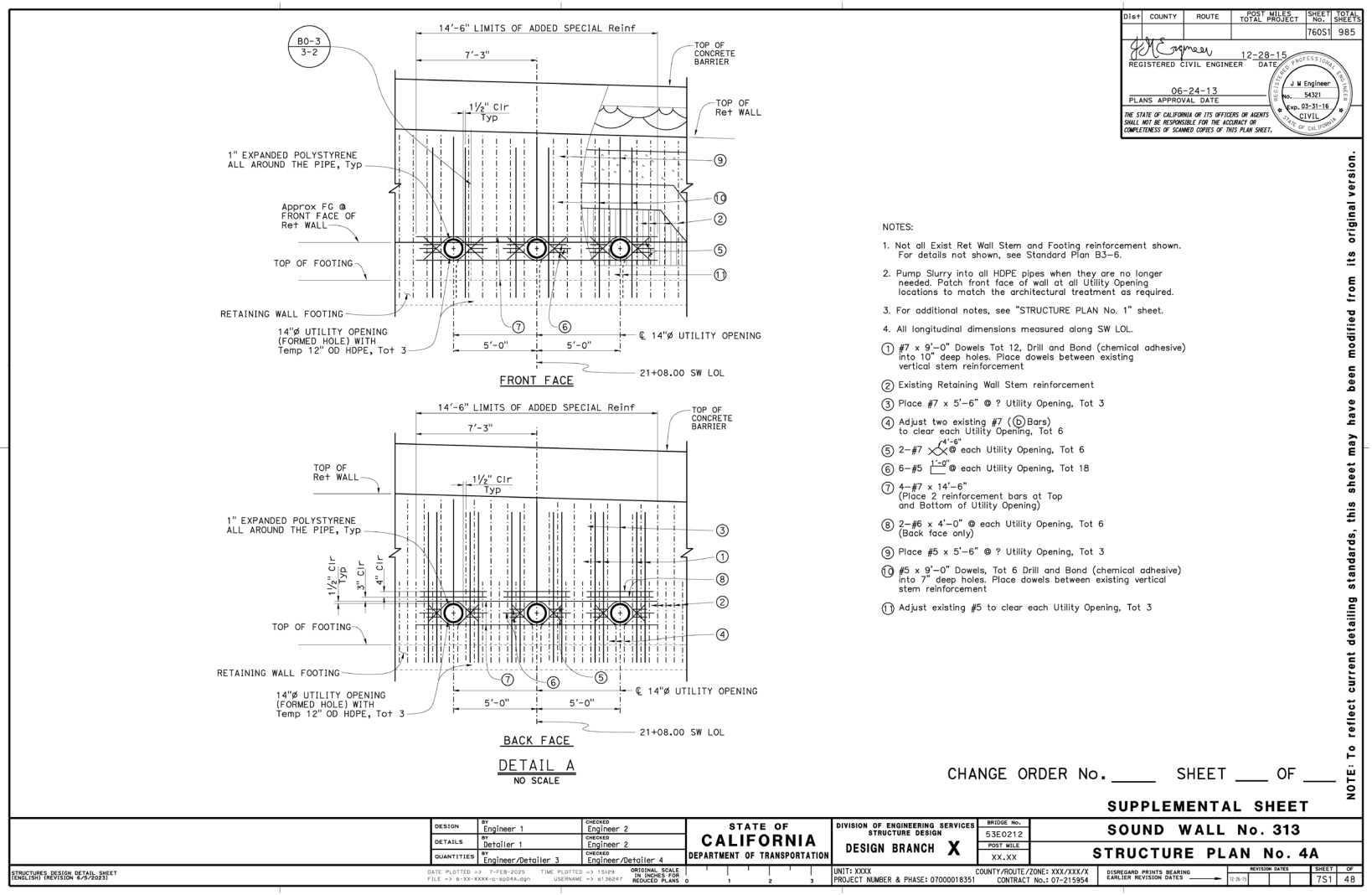


Figure 1A.G.5 Supplemental Change Order Detailing Example 1 (Continued)



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
				760S1	985

J M Engineer 12-28-15
REGISTERED CIVIL ENGINEER DATE

06-24-13
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — J M Engineer — No. 54321 — Exp. 03-31-16 — CIVIL — STATE OF CALIFORNIA

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

NOTES:

1. Not all Exist Ret Wall Stem and Footing reinforcement shown. For details not shown, see Standard Plan B3-6.
2. Pump Slurry into all HDPE pipes when they are no longer needed. Patch front face of wall at all Utility Opening locations to match the architectural treatment as required.
3. For additional notes, see "STRUCTURE PLAN No. 1" sheet.
4. All longitudinal dimensions measured along SW LOL.

(1) #7 x 9'-0" Dowels Tot 12, Drill and Bond (chemical adhesive) into 10" deep holes. Place dowels between existing vertical stem reinforcement

(2) Existing Retaining Wall Stem reinforcement

(3) Place #7 x 5'-6" @ ? Utility Opening, Tot 3

(4) Adjust two existing #7 ((b) Bars) to clear each Utility Opening, Tot 6

(5) 2-#7 (4'-6" @) each Utility Opening, Tot 6

(6) 6-#5 (1'-0" @) each Utility Opening, Tot 18

(7) 4-#7 x 14'-6" (Place 2 reinforcement bars at Top and Bottom of Utility Opening)

(8) 2-#6 x 4'-0" @ each Utility Opening, Tot 6 (Back face only)

(9) Place #5 x 5'-6" @ ? Utility Opening, Tot 3

(10) #5 x 9'-0" Dowels, Tot 6 Drill and Bond (chemical adhesive) into 7" deep holes. Place dowels between existing vertical stem reinforcement

(11) Adjust existing #5 to clear each Utility Opening, Tot 3

NOTE: To reflect current detailing standards, this sheet may have been modified from its original version.

CHANGE ORDER No. ____ SHEET ___ OF ___

SUPPLEMENTAL SHEET

	BY	CHECKED
DESIGN	Engineer 1	Engineer 2
DETAILS	Detailer 1	Engineer 2
QUANTITIES	Engineer/Detailer 3	Engineer/Detailer 4

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH X

BRIDGE No.	SOUND WALL No. 313
53E0212	
POST MILE	STRUCTURE PLAN No. 4A
XX.XX	

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REVISION 6/5/2023)

DATE PLOTTED => 7-FEB-2025 TIME PLOTTED => 15:29
FILE => 6-XX-XXXX-c-sp04A.dgn USERNAME => 813247
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: XXXX COUNTY/ROUTE/ZONE: XXX/XXX/X
PROJECT NUMBER & PHASE: 07000018351 CONTRACT No.: 07-215954

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES				SHEET	OF
11-IN-15				7S1	48

Figure 1A.G.6 Additional Change Order Detailing Example 1

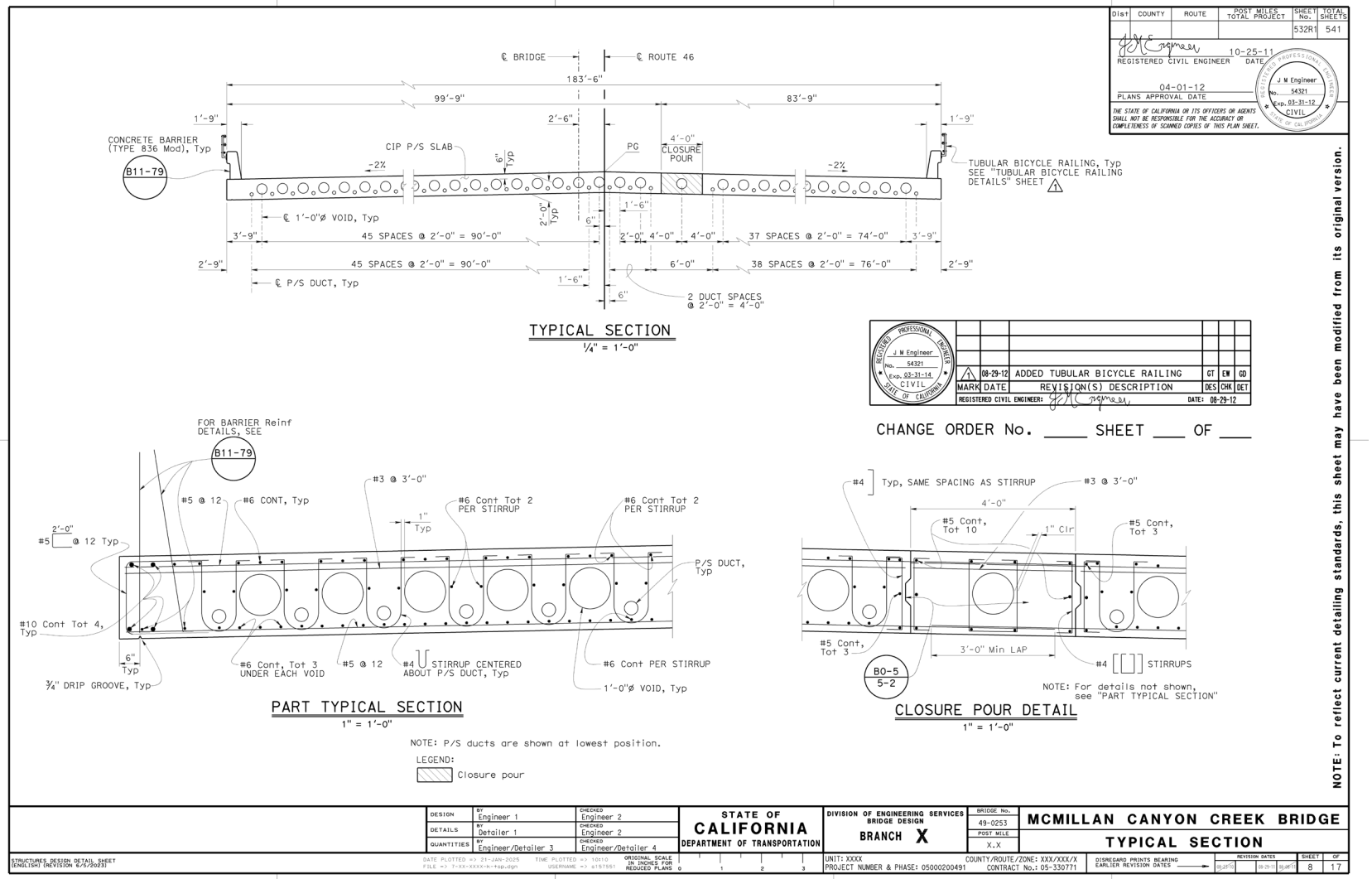


Figure 1A.G.6 Additional Change Order Detailing Example 1 (Continued)

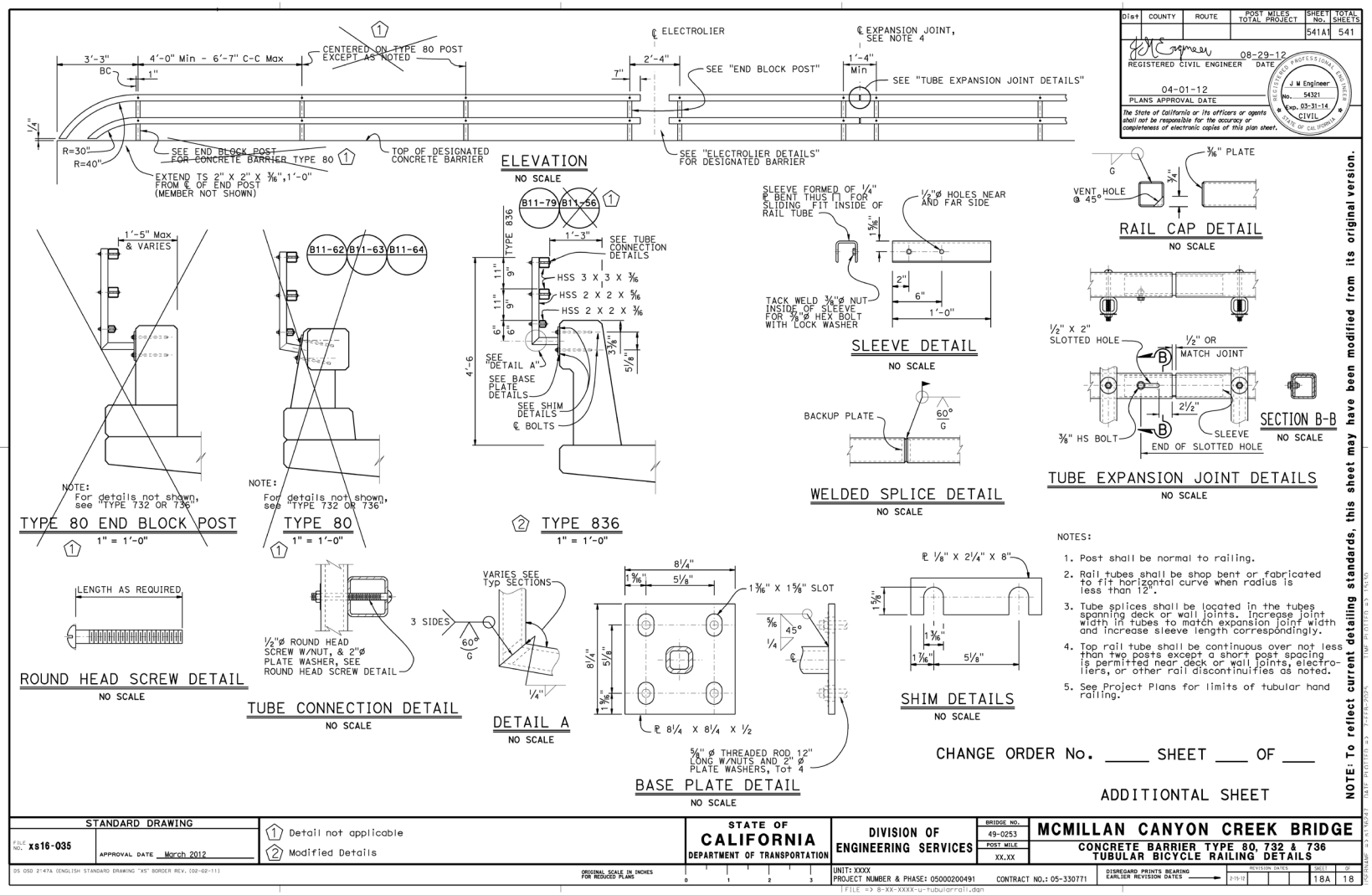
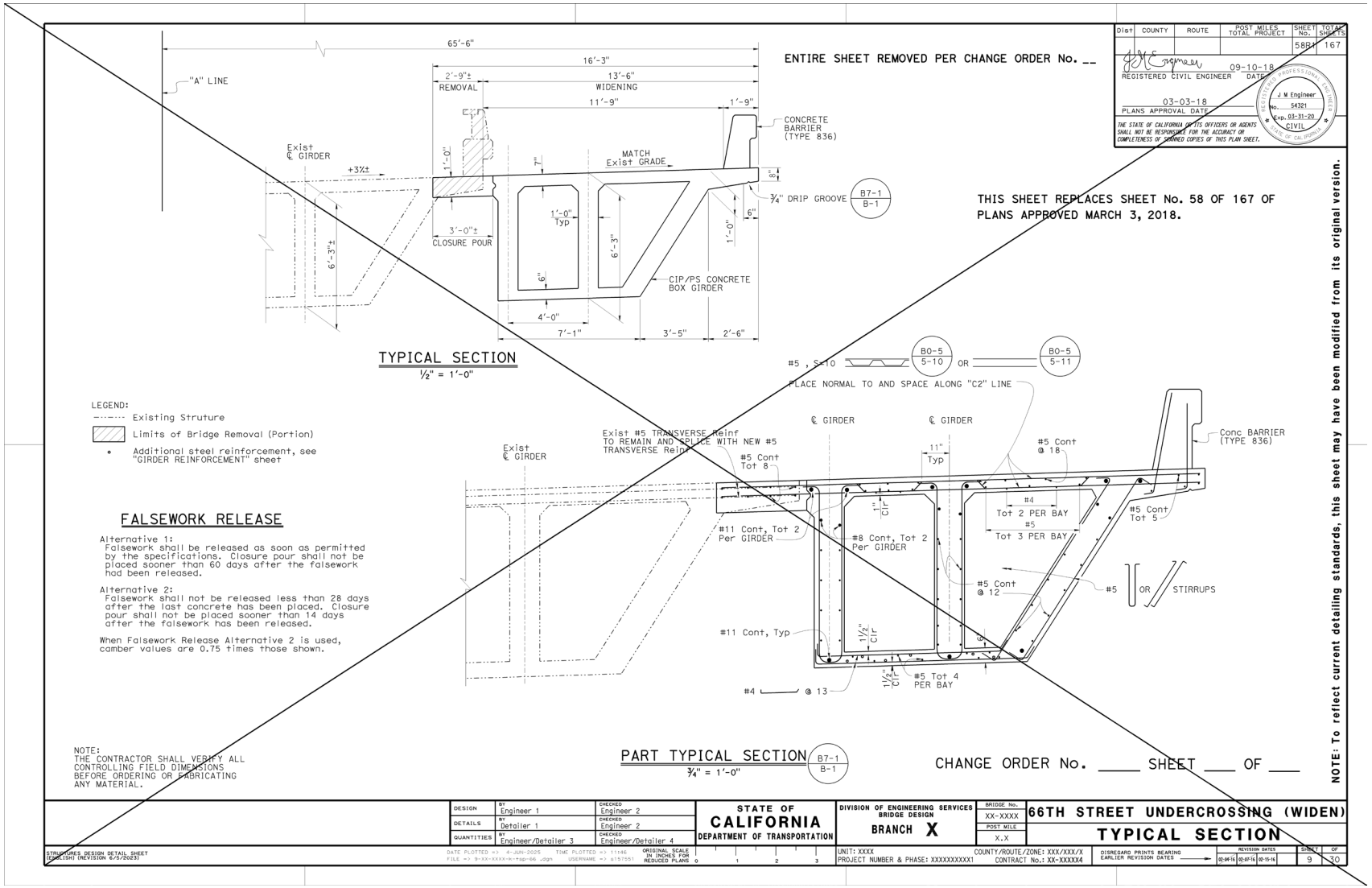


Figure 1A.G.7 Deleted Sheet Detailing Example



Bridge Design Details 1.21 June 2025

Preparation of As-Built Corrections by Structure Construction Representative

After a project has been completed in the field, the Structure Representative shall prepare and submit the “AS-BUILT” corrections of the structure plans to Structure Construction Office Associates. Structure Construction Associates shall forward the As-Builts to the Design Branch to process corrections.

The As-Built corrections of all on-the-job changes that were made during construction should be:

- Printed on reduced size (11” X 17”) plans. Full-size plans may be used if changes are extensive.
- Changes should be marked in red on each hardcopy structure plan sheet. New or revised details shall be legible with additional notes to clarify details if needed.
- Each structure plan shall be stamped with an As-Built stamp. Each sheet shall be stamped whether or not there are changes to the sheet. The stamps shall be similar to and contain the information shown in the As-Built stamp in Figure 1.21.1:

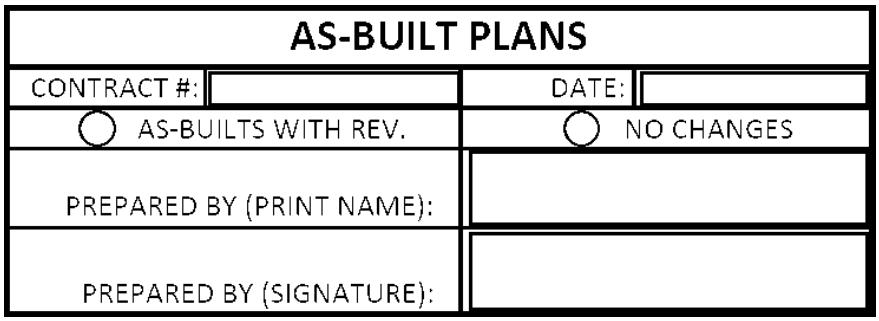


Figure 1.21.1 As-Built Stamp

- If no changes are made to the sheet, mark in red “NO AS-BUILT CHANGES” above the As-Built stamp shown in Figure 1.21.1.

Preparations of As-Built Corrections by Design Branch

The Design Branch shall make the As-Built changes to the official “AS-BUILT” Plans, which include “As-Awarded” plans, Addendums, and Change Orders.

Changes shall be made electronically on the “Archived Contract Plans” CADD files when they are available. If these CADD files are not available, changes shall be made by hand using an “F” or softer lead pencil on “Archived Contract Plans” hardcopy plans. Refer to *Procedures for Processing Electronic Structures Contract Plans Manual* for requirements to retrieve “Archived

Contract Plans," CADD files, and other procedures regarding As-Built plans. All sheets shall be retrieved by the Structures CADD Software Support (SCSS) Unit using the REQUEST FOR ELECTRONIC DRAWINGS form and submitted back to SCSS using the CCO/As-Built TRANSMITTAL form.

In making changes to the "Archived Contract Plans", the plan sheets, details, and notes shall not be deleted. Instead, draw a line through the item in such a manner that it will not be obliterated.

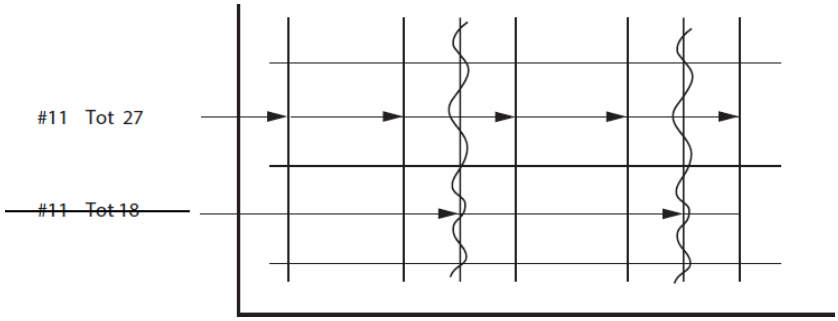


Figure 1.21.2 Example of As-Built Corrections

Additionally, an As-Built change description symbol ◇– shall be added adjacent to each change and summarized in the cell shown in Figure 1.21.3. The height of this cell will depend on the amount of field changes on the sheet. In order to keep the responsible charge intact, the As-Built change(s) and associated As-Built descriptive table will tie the changes made in the field to the name shown in the left border as "Field Corrections By"; this is normally the Structure Representative.

◇–	–
◇–	–
◇–	–
◇–	–
MARK	AS-BUILT CHANGE DESCRIPTION

Figure 1.21.3 Example of As-Built Change Description Cell

When the maximum, minimum, and average pile tip elevations appear on the LOG OF TEST BORINGS sheet(s), this information shall be transferred to the GENERAL PLAN sheet by the Design Branch. Another location in the AS-BUILT plans to show pile tip elevation changes is on the FOOTING LAYOUT detail.

Permanent reference elevation points are provided along new barriers. These elevations appear on the GENERAL PLAN sheet(s) for new bridges, widenings, and barrier replacements and should be included in AS-BUILT corrections. These reference elevation points should be indicated as "AS-BUILT CHANGES".

No As-Built changes shall ever be made by anyone other than the Professional Geologist on the LOG OF TEST BORINGS sheet(s). If "Red Line" changes are required on the LOG OF

TEST BORINGS sheet(s), the Structure Project Engineer should contact the Geotechnical Engineer who signed the LOG OF TEST BORINGS sheet(s). The latest version of the LOG OF TEST BORINGS sheet(s) is requested by the Design Branch. Then, a scanned color .pdf of the red line changes is sent to the Professional Geologist who makes the changes and places the As-Built Stamp cell on the LOG OF TEST BORINGS sheet(s) and fills out the appropriate fields. The .dgn is sent back to the Design Branch for completion of the process.

Stamping Final As-Built Plans Hardcopy

For changes made on hardcopy plans, a stamp or decal with the information shown in the above CADD cell shall be placed on each sheet. Make sure the information is legible.

Stamping Final As-Built Plans CADD Files

After changes are made to CADD files, one of the following As-Built CADD cells shall be placed on the left edge of the border of each sheet and filled out as follows:

A) If “AS-BUILT” corrections are not received:

AS DESIGNED

AS-BUILTS NOT RECOVERABLE

Contract No.: xx-yyyyyy Date: aa/bb/cccc

Structure Rep: Structure Rep Name

B) If the “AS-BUILT” corrections are received, including previously processed Addendum and Change Orders with no further corrections made in the field, and no corrections are needed:

NO AS-BUILT CORRECTIONS

Corrections Transferred by: Detailer Initials Transfer Date: aa/bb/cccc

Field Corrections by: Field Person Name Field Corrections Date: aa/bb/cccc

Contract No.: xx-yyyyyy

C) If “AS-BUILT” corrections are received, and corrections are needed:

AS-BUILT CORRECTIONS

Corrections Transferred by: Detailer Initials Transfer Date: aa/bb/cccc

Field Corrections by: Field Person Name Field Corrections Date: aa/bb/cccc

Contract No.: xx-yyyyyy

As-Built Stamp When As-Built Corrections are Lost

When processing drawings where the As-Built corrections have become lost, the structure and missing “AS-BUILT” Plans shall be jointly discussed with DES Structure Construction and the Project Engineer. In this case, the As-Built stamp shall indicate that the drawings to be archived are As-Designed. The contract number, the Structure Representative’s name, and the date of processing the As-Designed 2nd Notice plans are included in the contents of the stamp.

The following stamp designs shall be used:

Stamp for Hard Copy Drawings

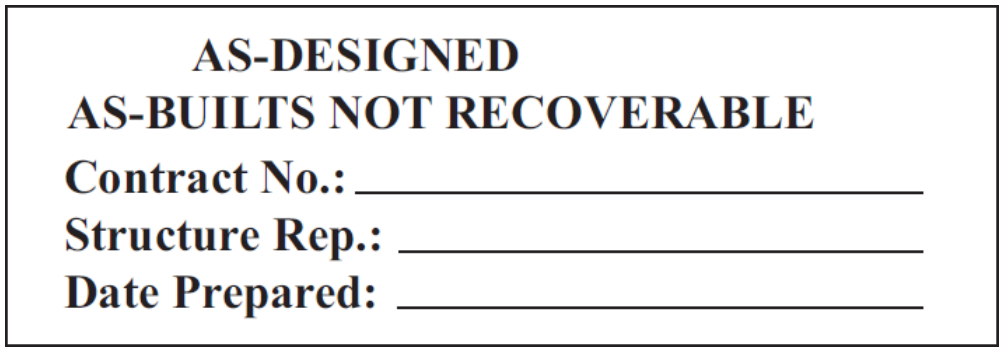


Figure 1.21.4 As-Built Stamp for Hard Copies

Stamp (cell) for Electronic Drawings

Figure 1.21.5 As-Built Stamp for Electronic Drawings