Bridge Design Details 4.1 October 2019

Deck Contours

A DECK CONTOURS sheet shall be included in the contract plans for all new structures. As a rule, deck contours should not be included for bridge decks that are to match an existing structure profile or cross-slope, such as a widening or deck replacement.

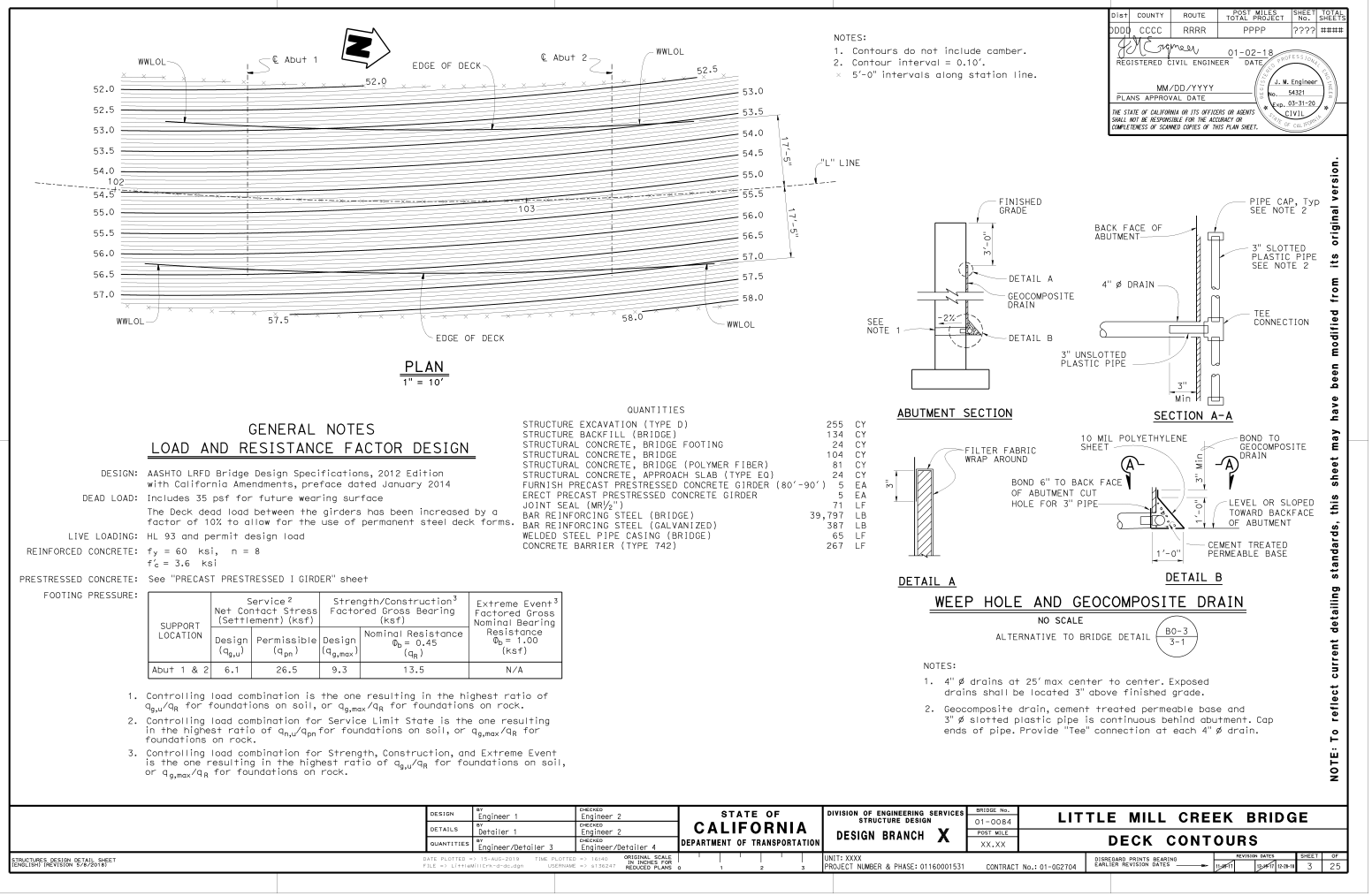
Plan

1. Place the deck contours at the top of the sheet and orient it in the same direction as the PLAN view shown on the GENERAL PLAN sheet.
2. Show North arrow.
3. The preferred scale is 1'' = 20'. Small structures may be shown at maximum 1'' = 10'. Do not fill up the sheet with smaller scales.
4. If the bridge is long, and continuation is needed, identify with match line(s). Match lines are often used on a single sheet for longer bridges. Using match lines does not necessarily mean there will be additional sheets.
5. Extend contours 10 feet beyond the edge of deck and 10 feet beyond the Beginning/End of Bridge (BB/EB), end of wingwall, or approach slab, whichever is farthest.
6. Dimension distances from alignment to both edges of deck.
7. Verify that the deck contours are drawn correctly. Spot check them in several places along the alignment, including at BB/EB, the end of approach slabs, drain inlets, the low point/high point of the structure, and a few other random locations.
8. For structures that are to receive a deck overlay such as HMA or Polyester Concrete Overlay, the contours shall be drawn at the top of the concrete deck. A note shall be included to indicate the location of the contours.

   Example: **Contours are shown at top of concrete deck. Grades have been lowered 1" below the Profile Grade for polyester concrete overlay.**
9. Note contour interval and that camber is not included.
10. Label alignment, stations, edges of deck, and centerlines of abutments and bents. Do not include curve or other alignment data.
11. Show wingwall and retaining wall layout lines.

12. If the super elevation changes within the bridge, approach slab, or retaining wall limits, a SUPERELEVATION DIAGRAM shall be included.
13. The GENERAL NOTES and QUANTITIES may be placed on this sheet when space is not available on the GENERAL PLAN sheet.

Figure 4A.A.1 Deck Contours Detailing Example 1



GENERAL NOTES
LOAD AND RESISTANCE FACTOR DESIGN

DESIGN: AASHTO LRFD Bridge Design Specifications, 2012 Edition with California Amendments, preface dated January 2014

DEAD LOAD: Includes 35 psf for future wearing surface

The Deck dead load between the girders has been increased by a factor of 10% to allow for the use of permanent steel deck forms.

LIVE LOADING: HL 93 and permit design load

REINFORCED CONCRETE: f_y = 60 ksi, n = 8
f'_c = 3.6 ksi

PRESTRESSED CONCRETE: See "PRECAST PRESTRESSED I GIRDER" sheet

FOOTING PRESSURE:

SUPPORT LOCATION	Service[2] Net Contact Stress (Settlement) (ksf)		Strength/Construction[3] Factored Gross Bearing (ksf)		Extreme Event[3] Factored Gross Nominal Bearing Resistance Φ_b = 1.00 (ksf)
	Design ($q_{g,u}$)	Permissible (q_{pn})	Design ($q_{g,max}$)	Nominal Resistance Φ_b = 0.45 (q_R)	
Abut 1 & 2	6.1	26.5	9.3	13.5	N/A

1. Controlling load combination is the one resulting in the highest ratio of $q_{g,u}/q_R$ for foundations on soil, or $q_{g,max}/q_R$ for foundations on rock.
2. Controlling load combination for Service Limit State is the one resulting in the highest ratio of $q_{n,u}/q_{pn}$ for foundations on soil, or $q_{g,max}/q_R$ for foundations on rock.
3. Controlling load combination for Strength, Construction, and Extreme Event is the one resulting in the highest ratio of $q_{g,u}/q_R$ for foundations on soil, or $q_{g,max}/q_R$ for foundations on rock.

QUANTITIES

STRUCTURE EXCAVATION (TYPE D)	255	CY
STRUCTURE BACKFILL (BRIDGE)	134	CY
STRUCTURAL CONCRETE, BRIDGE FOOTING	24	CY
STRUCTURAL CONCRETE, BRIDGE	104	CY
STRUCTURAL CONCRETE, BRIDGE (POLYMER FIBER)	81	CY
STRUCTURAL CONCRETE, APPROACH SLAB (TYPE EQ)	24	CY
FURNISH PRECAST PRESTRESSED CONCRETE GIRDER (80'-90')	5	EA
ERECT PRECAST PRESTRESSED CONCRETE GIRDER	5	EA
JOINT SEAL (MR1/2")	71	LF
BAR REINFORCING STEEL (BRIDGE)	39,797	LB
BAR REINFORCING STEEL (GALVANIZED)	387	LB
WELDED STEEL PIPE CASING (BRIDGE)	65	LF
CONCRETE BARRIER (TYPE 742)	267	LF

WEEP HOLE AND GEOCOMPOSITE DRAIN

NO SCALE

ALTERNATIVE TO BRIDGE DETAIL BO-3 / 3-1

NOTES:
1. 4" ø drains at 25' max center to center. Exposed drains shall be located 3" above finished grade.
2. Geocomposite drain, cement treated permeable base and 3" ø slotted plastic pipe is continuous behind abutment. Cap ends of pipe. Provide "Tee" connection at each 4" ø drain.

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

DESIGN	BY Engineer 1	CHECKED Engineer 2	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH X	BRIDGE No. 01-0084	LITTLE MILL CREEK BRIDGE	
DETAILS	BY Detailer 1	CHECKED Engineer 2			POST MILE XX.XX	DECK CONTOURS	
QUANTITIES	BY Engineer/Detailer 3	CHECKED Engineer/Detailer 4					

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REVISED 5/8/2018)
DATE PLOTTED => 15-AUG-2019 TIME PLOTTED => 16:40
FILE => L:\Htl\MillCrk-d-sc.dgn USERNAME => s136247
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3
UNIT: XXXX
PROJECT NUMBER & PHASE: 01160001531
CONTRACT No.: 01-0G2704
DISREGARD PRINTS BEARING EARLIER REVISION DATES
REVISION DATES: 11-04-17 | 05-04-18 | 12-28-18
SHEET 3 OF 25

Figure 4A.A.2 Deck Contours Detailing Example 2

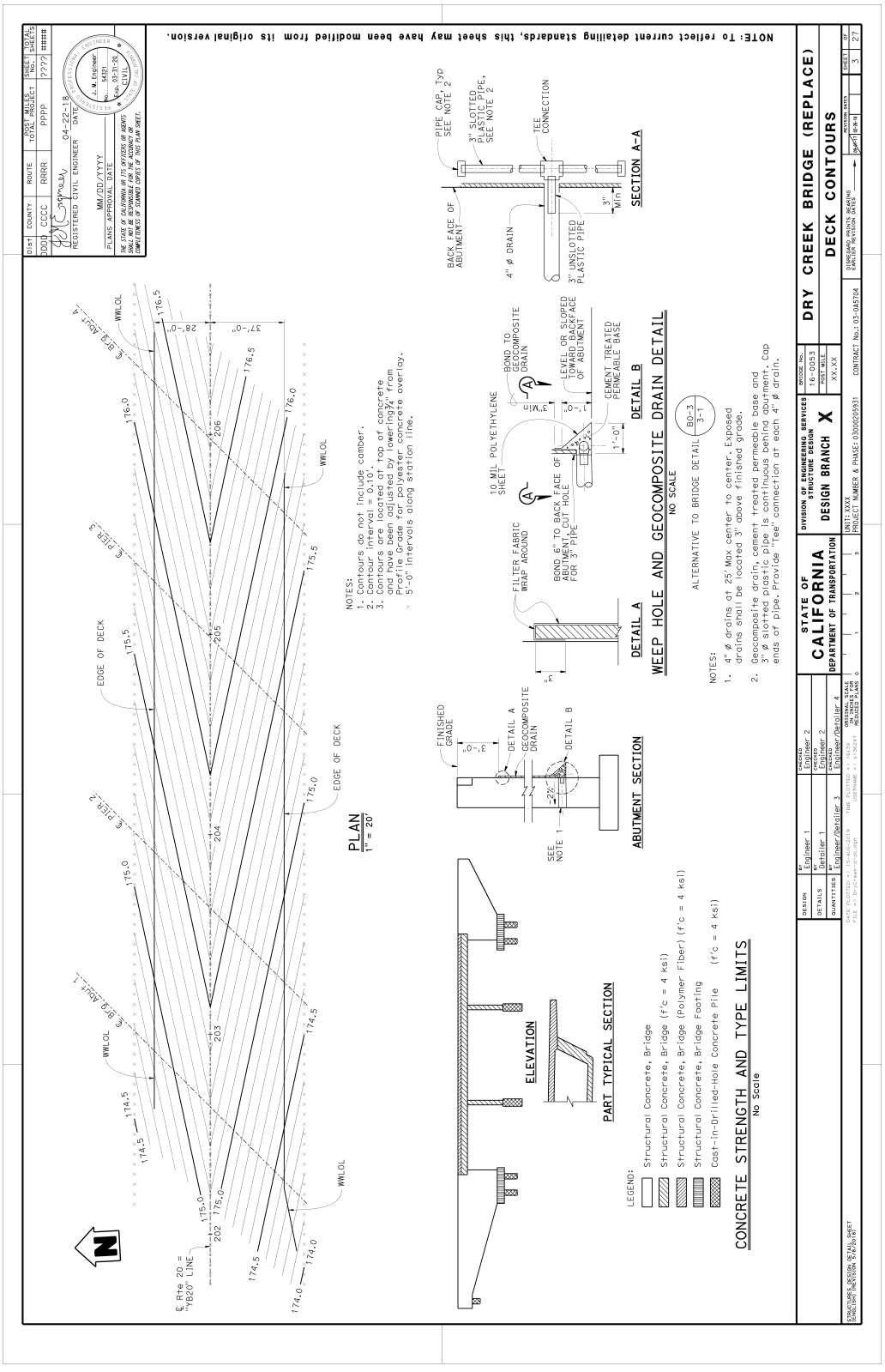


Figure 4A.A.3 Deck Contours Detailing Example 3

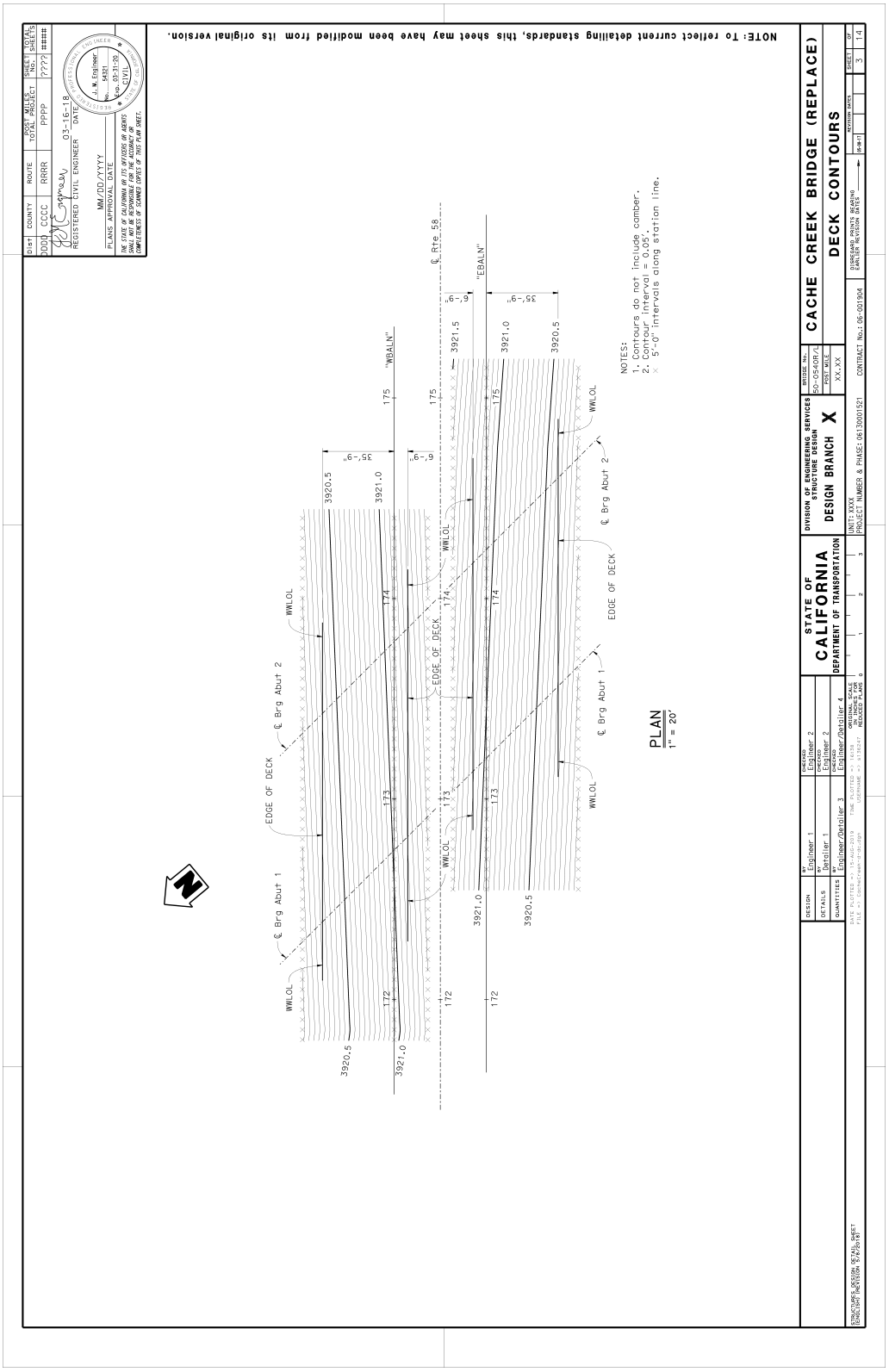


Figure 4A.A.4 Deck Contours Detailing Example 4

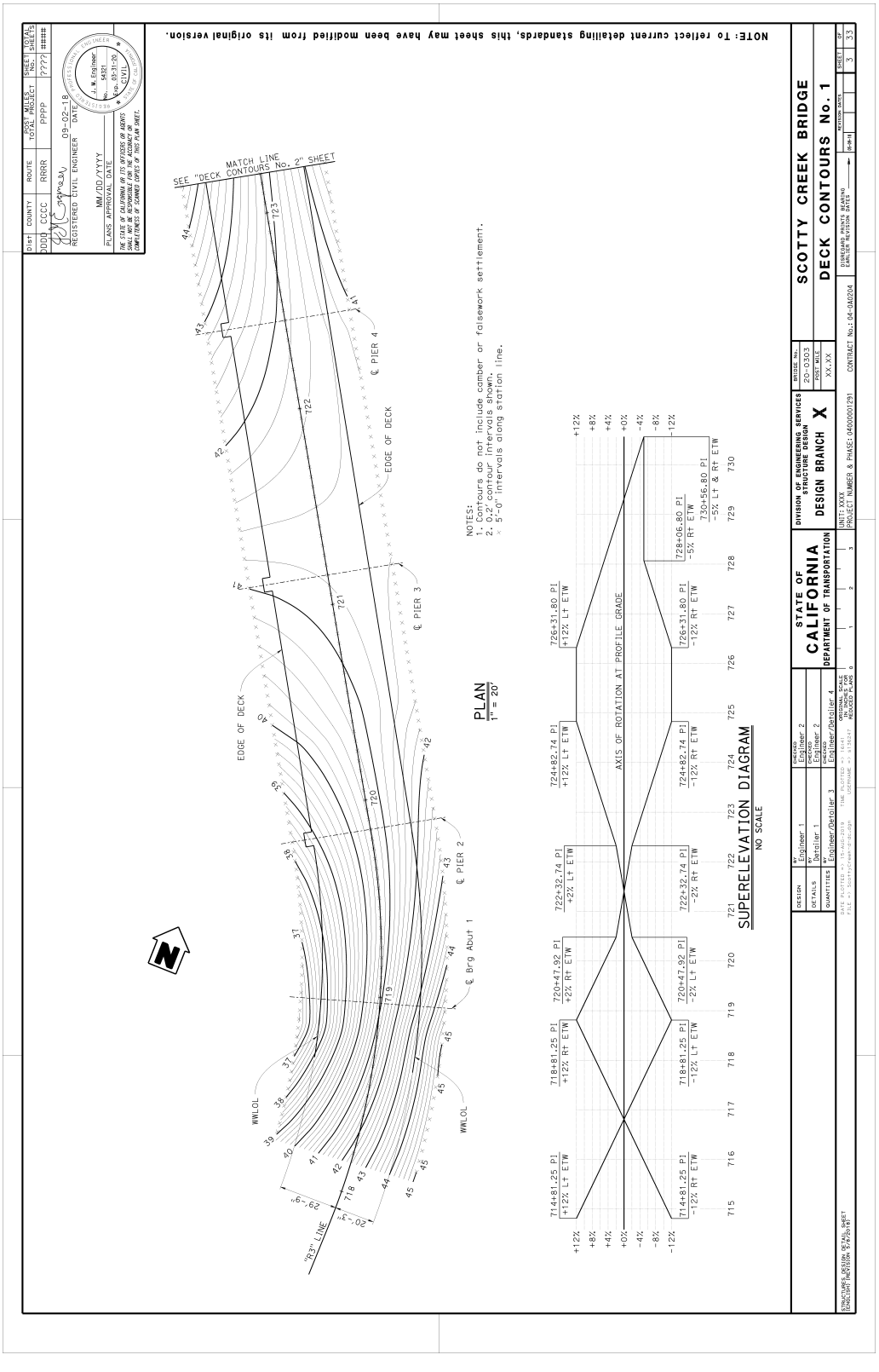
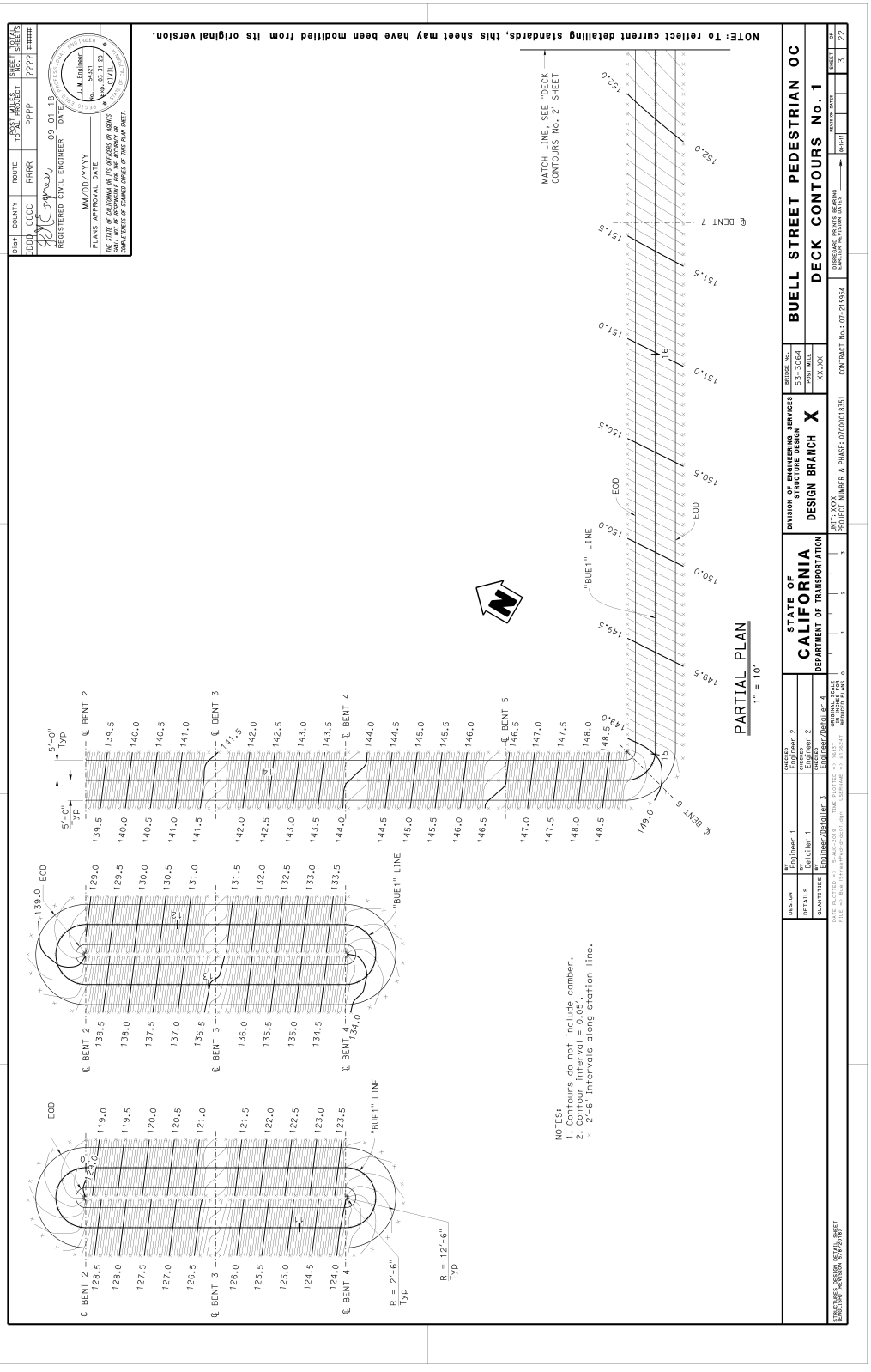


Figure 4A.A.5 Deck Contours Detailing Example 5



Bridge Design Details 4.2 October 2019

“4-Scale” Contour Sheets

Two copies of the "4-Scale" Contour sheet(s) are provided to Structure Construction during EXPEDITE as a part of the Resident Engineer Pending File. “4-Scale” Contours sheet(s) are used by contractors during construction to determine the location of structure components (e.g., deck, soffit elevations, etc.). These sheets are critical in determining the layout and extent of falsework that is required for a structure. A copy of the "4-Scale" Contour sheet(s) is also used by the Structure Representative to verify that the structure is being built correctly and to the correct elevations.

The following guidelines should be observed, in addition to the items listed for the DECK CONTOUR plan sheet(s) in *Bridge Design Details*: 4-1 Deck Contours.

1. The “Deck Contours Label” cell shall be placed on each “4-Scale” sheet. If the plot is 6 feet or longer, the label shall be placed at each end of the sheet.
2. The “4-Scale” sheet(s) shall be plotted using (¼" = 1'-0").
3. If a structure is too wide to fit on a standard plot (22" wide), a match line should be utilized. Normally this match line is placed along an alignment or other controlling layout line.
4. Once the plots are made you MUST check the accuracy of the contours drawn and the scale of the plots in both the “X” and “Y” directions. Image scale adjustments may be required due to distortions by the printing process.

Deck Contours - Checklist

Structure:	Structure Number:
Contract Number:	Project Number & Phase:
Detailer:	Date:
Designer:	Date:
Checker:	Date

Plan

- ☐ 1. Place the deck contours at the top of the sheet and orient it in the same direction as the PLAN view shown on the GENERAL PLAN sheet.
- ☐ 2. Show North arrow.
- ☐ 3. The preferred scale is 1'' = 20'. Small structures may be shown at maximum 1''= 10'. Do not fill up the sheet with smaller scales.
- ☐ 4. If the bridge is long, and continuation is needed, identify with match line(s). Match lines are often used on a single sheet for longer bridges. Using match lines does not necessarily mean there will be additional sheets.
- ☐ 5. Extend contours 10 feet beyond the edge of deck and 10 feet beyond the Beginning/End of Bridge (BB/EB), end of wingwall, or approach slab, whichever is farthest.
- ☐ 6. Dimension distances from alignment to both edges of deck.
- ☐ 7. Verify that the deck contours are drawn correctly. Spot check them in several places along the alignment, including at BB/EB, the end of approach slabs, drain inlets, the low point/high point of the structure, and a few other random locations.
- ☐ 8. For structures that are to receive a deck overlay such as HMA or Polyester Concrete Overlay, the contours shall be drawn at the top of the concrete deck. A note shall be included to indicate the location of the contours.
- ☐ 9. Note contour interval and that camber is not included.
- ☐ 10. Label alignment, stations, edges of deck, and centerlines of abutments and bents. Do not include curve or other alignment data.
- ☐ 11. Show wingwall and retaining wall layout lines.
- ☐ 12. If the super elevation changes within the bridge, approach slab, or retaining wall limits, a SUPERELEVATION DIAGRAM shall be included.
- ☐ 13. The GENERAL NOTES and QUANTITIES may be placed on this sheet when space is not available on the GENERAL PLAN sheet.