

**Meeting of the Central Valley Flood Protection Board
September 27, 2019**

Permit Staff Report

**California Department of Transportation
Cosumnes River Bridge Replacements, Sacramento County**

1.0 – ITEM

Consider approval of Permit No. 19431. (Attachment A)

2.0 - APPLICANT

California Department of Transportation. (Caltrans)

3.0 – PROJECT LOCATION

The project is located where State Route (SR) 99 crosses the Cosumnes River Designated Floodway (DF), approximately 1.6 miles south of the Grant Line Road Overcrossing, about 2.5 miles south of the City of Elk Grove.
(Cosumnes River, Sacramento County, Attachment B)

4.0 – PROJECT DESCRIPTION

Caltrans proposes to:

1. Remove four (4) existing bridge structures within the Cosumnes River DF: two (2) bridges span the main channel at Post Mile (PM) 8.4 (Bridge Nos. 24-0020R and 24-0020L) and two (2) bridges span the overflow channel at PM 7.9. (Bridge Nos. 24-0021R and 24-0021L); and
2. Construct two new bridge structures (Cosumnes River Bridge Nos. 24-0391 and 24-0390).

5.0 – AUTHORITY OF THE BOARD

California Water Code § 8534, 8590 – 8610.5, and 8700 – 8710

California Code of Regulations, Title 23, Division 1 (Title 23):

- § 6, Need for a Permit
- § 13.3, Consent Calendar
- § 107, Permitted Uses in Designated Floodways
- § 112, Streams Regulated and Nonpermissible Work Periods
- § 121, Erosion Control
- § 128, Bridges

6.0 - PROJECT ANALYSIS

The Cosumnes River is listed as a regulated stream in Title 23, Section 112, Table 8.1. There are no levees along the Cosumnes River in the project area. The Cosumnes River DF was adopted by the Board on March 22, 1974.

The existing four (4) bridge structures to be replaced were originally constructed in 1958 (Permit No. 2404) and then widened in 1993 (Permit No. 15887).

- Bridge No. 24-0020R crosses the main channel and is 660.8 feet long, 42 feet wide, 22-span bridge with pier walls on reinforced concrete (RC) pile cap on timber piles.
- Bridge 24-0020L also crosses the main channel and is 658.2 feet long, 38 feet wide, 22-span bridge with pier walls on reinforced concrete (RC) pile cap on timber piles.
- Bridge No. 24-0021R crosses the Cosumnes River overflow channel and is a 639.8 feet long, 42-foot wide, 25-span bridge that is constructed with continuous reinforced concrete slab on RC piles/bents.
- Bridge No. 24-0021L also crosses the river's overflow channel and is a 639.8 feet long, 32.2 feet wide, 25-span bridge with continuous RC slab on RC pile/bents.

The existing four bridges are thought to be seismically and structurally deficient for rehabilitation. In addition, the two south-bound Cosumnes River bridges (Br No. 24-0020L and 24-0021L) have sub-standard freeway/expressway bridge shoulder widths. The new bridges will meet current Caltrans Bridge Design Standards and all applicable Title 23 Standards.

The proposed work consists of:

1. Constructing two new bridge structures:

- Bridge No. 24-0391 will cross the main channel and will be a 697 feet long, 117.5 feet wide, 5-span precast, pre-stressed wide flange girder bridge on seated abutments on piles; and
 - Bridge No. 24-0390 will cross the overflow channel and will be a 665 feet long, 117.5 feet wide, 6-span precast, pre-stressed wide flange girder bridge on seated abutments on piles.
 - Both new bridges will have piers that will consist of five—5-foot diameter concrete columns on 7-foot diameter case-in-drilled-hole (CIDH) piles.
2. Removing the existing four bridge structures;
 3. Constructing two temporary bridges adjacent to the existing Bridges (Nos. 24-0020R and 24-0021R) to accommodate traffic during construction of the new bridges, which is expected to last approximately four (4) years; and
 4. Placing rock slope protection at all four abutments for scour protection.

6.1 – Hydraulic Analysis

A hydraulic analysis was performed to assess the potential hydraulic impacts due to the proposed bridges. The one-dimensional U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center-River Analysis System (HEC-RAS) program was used to assess the impacts. All elevations reflect the North American Vertical Datum 1988 (NAVD 88). The analysis was done using the Board adopted design flow of 81,000 cubic feet-per-second (cfs) for the Cosumnes River DF. The DF design water surface elevation (DWSE) at the existing bridges was computed to be 44.58 feet and the proposed soffit elevations in the main and overflow channels for the new bridges will be 50.2 feet and 50.1 feet, respectively. This provides 5.62 feet of flowage clearance in the main channel and 5.52 feet of clearance in the overflow channel. The hydraulic analysis indicates there will be a slight rise in water surface elevation upstream of the bridges (0.01 feet) and a slight decrease in stream velocity (0.01 feet-per-second (fps)) due to the reduction of the number of bridge spans and piers within the channels. The impact is considered an insignificant impact to the existing hydraulics of the Cosumnes River DF.

The analysis also considered the hydraulic impacts from the two temporary bridges that will be installed within the floodway adjacent to the existing bridges for approximately four (4) years. The analysis (see attachment D) determined that the temporary bridges would increase the water surface elevation upstream of the bridges a maximum of 0.03 feet, which is also considered to be insignificant. The temporary bridges will be completely removed from the floodway following the completion of the project.

Caltrans also evaluated a peak flow of 93,000 cfs that was recorded during the 1997

flood that inundated parts of SR-99 in the Cosumnes River floodplain. The peak water surface elevation for that event was determined to be 44.92 feet. Even with this higher flow the bottom members of the proposed bridges will be 5.28 feet and 5.18 feet above the water surface elevation in the main channel and the overflow channels, respectively. The proposed project is not expected to result in any adverse hydraulic impacts to the Cosumnes River DF.

6.2 – Geotechnical Analysis

There are no levees associated with this project; therefore, a geotechnical analysis was not required for this review.

7.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with this project, from all pertinent agencies, are shown below:

- There are no Local Maintaining Agencies in the project area.
- The USACE Sacramento District Engineer has no comments or recommendations regarding flood control because the proposed work does not affect a federally constructed project.

8.0 – CEQA ANALYSIS

The Board, as a responsible agency under CEQA, has reviewed the Initial Study/Negative Declaration (IS/ND) (SCH No. 2019039070, May 2019), and proposed avoidance and minimization measures for the Cosumnes River Bridge Replacement Project, prepared by the lead agency, Caltrans. These documents, including project design, may be viewed or downloaded from the Central Valley Flood Protection Board website at <http://cvfpb.ca.gov/event/september-2019-regular-business-meeting/> under a link for this agenda item. The documents are also available for review in hard copy at the Board and Caltrans' offices.

Caltrans determined that the Cosumnes River Bridge Replacement Project would not have a significant effect on the environment and filed a Notice of Determination with the State Clearinghouse on May 22, 2019. Caltrans incorporated avoidance and minimization measures into the project plans to avoid significant adverse impacts. These avoidance and minimization measures are included in Caltrans' adopted IS/ND,

and address impacts to wetlands/waters and biological resources (migratory birds, bats, Swainson's Hawks, Giant Garter Snake, Vernal Pool Fairy Shrimp, Valley Elderberry Longhorn Beetle, and Central Valley Steelhead). The avoidance and minimization measures are further described in Caltrans' adopted IS/ND.

The Board, as a responsible agency, is responsible for mitigating and avoiding only the direct and indirect environmental effects of those parts of the project which it decides to carry out, finance, or approve (CEQA Guidelines § 15096(g); Public Resources Code § 21002.1(d)). The Board's responsibility under CEQA is limited to imposing conditions or mitigation related to effects on the State Plan of Flood Control.

In accordance with CEQA Guidelines § 15096, Board staff independently reviewed Caltrans' IS/ND, and finds the environmental documents prepared by the lead agency adequately address hydrology impacts, including potential flood risk, for the Board's approval of Permit No. 19431 to authorize work to replace four bridge structures, which is within the Board's responsibility as it relates to effects on the State's flood control system.

In accordance with CEQA Guidelines § 15096(f) and (g), staff recommends that the Board make responsible agency findings that approval of Permit No. 19431 will not result in any significant adverse impacts related to flood risk. The project will not adversely impact the State Plan of Flood Control; therefore, no additional mitigation measures within the Board's jurisdiction are required.

The documents and other materials which constitute the record of the Board's proceedings in this matter are in the custody of the Executive Officer, Central Valley Flood Protection Board, 3310 El Camino Ave., Suite 170, Sacramento, California 95821.

9.0 – CA WATER CODE SECTION 8610.5 AND OTHER CONSIDERATIONS

California Water Code Section 8610.5 (c) provides that the Board shall consider all the following matters, if applicable:

1. Evidence that the Board admits into its record from any party, state or local public agency, or nongovernmental organization with expertise in flood or flood plain management:

Staff requests that the Board consider this staff report, any attachments and materials to which the report refers, and any evidence submitted to it prior to or at the hearing.

2. The best available science that relate to the scientific issues presented by the executive officer, legal counsel, the Department of Water Resources or other parties that raise credible scientific issues.

The accepted industry standards of hydrology and hydraulics for the work proposed under this permit as regulated by Title 23 have been applied to the review of this permit. The one-dimensional HEC-RAS program was used to assess the hydraulic impacts and the analysis was done using the Board adopted design flow and the recorded 1997 peak flow discharge for the Cosumnes River DF. The analysis indicated a slight rise in water surface elevation of 0.01 feet upstream of the bridges and a slight decrease of 0.01 fps in stream velocity, which is considered an insignificant impact. With the incorporation of avoidance and minimization measures into project design, no significant environmental effects were identified.

3. Effects of the decision on facilities of the State Plan of Flood Control (SPFC).

The proposed bridge will have no adverse effects on facilities of the SPFC as the project is located where there are no SPFC facilities. The closest SPFC facilities are the levees of the Sacramento River, which are approximately 10 miles west and downstream of the proposed project.

4. Effects of reasonably projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:

The proposed bridges have a similar configuration as the existing bridges and do not significantly change the current hydraulic conditions. Replacing the existing bridges with new structures will improve the hydraulic conditions of the Cosumnes River DF by increasing the flow area under the bridges. The 1997 peak flows, which are higher than the DF flows, were also considered and there is still adequate clearance between the bottom members of the bridges and the DWSE. The new bridges will meet current Caltrans Bridge Design Standards along with improving traffic safety and will remedy the structural and seismic deficiencies of the existing bridges. Therefore, there are no expected adverse effects to the proposed project from reasonably projected future events.

10.0 – STAFF RECOMMENDATION

Adopt:

- CEQA finding: The Board, acting as a responsible agency under CEQA, has independently reviewed and considered the environmental documents prepared for the project. Approving Permit 19431 will not result in any significant adverse impacts related to flood risk and no additional mitigation measures within the Board's jurisdiction are required;

Approve:

- Encroachment Permit No. 19431 in substantially the form provided in Attachment A; and,

Direct:

- The Executive Officer to take the necessary actions to execute the permit and file a CEQA Notice of Determination with the State Clearinghouse.

11.0 – LIST OF ATTACHMENTS

- A. Draft Permit No. 19431
- B. Location Maps and Photos
- C. Project Drawings
- D. Hydraulic Profile Information

Reviewers:

Design Review:	Mauricio Meza, Permitting Section Staff
Environmental Review:	Jennifer Stewart, Senior Environmental Scientist
Document Review:	Gary W. Lemon, P.E., Permitting Section Chief
	Michael C. Wright, P.E., Chief Engineer
Legal Review:	Sarah Backus, Staff Counsel

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY
THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 19431 BD

This Permit is issued to:

California Department of Transportation
703 B Street
Marysville, California 95901

To remove four (4) bridge structures on State Route 99 over the Cosumnes River Designated Floodway, Cosumnes River Bridges (Br Nos. 24-0020R/L) and Cosumnes River Overflow Bridges (Br Nos. 24-0021R/L); and construct two (2) new bridge structures (Cosumnes River Bridge Nos. 24-0391 and 24-0390).

The project is located where State Route (SR) 99 crosses the Cosumnes River Designated Floodway (DF), approximately 1.6 miles south of the Grant Line Road Overcrossing, about 2.5 miles south of the City of Elk Grove, at 38.35216°N -121.34028°W, Cosumnes River, Sacramento County.

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: _____

Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 19431 BD

LIABILITY AND INDEMNIFICATION

THIRTEEN: The permittee shall defend, indemnify, and hold harmless the Central Valley Flood Protection Board (Board) and the State of California, including its agencies or departments thereof, including but not limited to, any and all boards, commissions, officers, agents, employees, and representatives (Indemnities), against any and all claims, liabilities, charges, losses, expenses, and costs including the State's attorneys' fees (Liabilities), that may arise from, or by reason of: (1) any action or inaction by the Indemnities in connection with the issuance or denial of any permit, lease, or other entitlement; (2) as a result of approvals or authorizations given by the Board to the permittee pursuant to, or as a result of, permittee's permit application; (3) provisions of the issued permit or lease, provisions of CEQA, an environmental document certified or adopted by the Board related to the permit application, or any other regulations, requirements, or programs by the State, except for any such Liabilities caused solely by the gross negligence or intentional acts or the State or its officers, agents, and employees.

FOURTEEN: Permittee shall reimburse the Board in full for all reasonable costs and attorneys' fees, including, but not limited to, those charged to it by the California Office of Attorney General, that the Board incurs in connection with the defense of any action brought against the Board challenging this permit or any other matter related to this permit or the work performed by the State in its issuance of this permit. In addition, the permittee shall reimburse the Board for any court costs and reasonable attorneys' fees that the Board/Indemnities may be required by a court to pay as a result of such action. The permittee may participate in the defense of the action, but its participation shall not relieve it of its obligations under the conditions of this permit.

FIFTEEN: The Board and Department of Water Resources shall not be held liable for any damages to the permitted encroachment(s) resulting from releases of water from reservoirs, flood fight, operation, maintenance, inspection, or emergency repair.

AGENCY CONDITIONS

SIXTEEN: All work approved by this permit shall be in accordance with the submitted drawings and specifications dated July 1, 2019 except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Board.

SEVENTEEN: Permittee shall pay to the Board, an inspection fee(s) to cover inspection cost(s), including staff and/or consultant time and expenses, for any inspections before, during, post-construction, and regularly thereafter as deemed necessary by the Board.

EIGHTEEN: In the event that bank erosion injurious to the adopted plan of flood control occurs at or adjacent to the permitted encroachment(s), the permittee shall repair the eroded area and propose measures, to be approved by the Board, to prevent further erosion.

NINETEEN: The permittee shall be responsible for the repair of any damages to the channel, banks, floodway, or other flood control facilities due to construction, operation, or maintenance of the proposed project.

TWENTY: Correspondence was received from the Department of the Army (U.S. Army Corps of Engineers, Sacramento District) dated July 24, 2019, signifying that the District Engineer has no comments or recommendations regarding flood control because the proposed project does not affect a federally constructed project.

TWENTY-ONE: The permittee agrees to notify any new property/encroachment owner(s) that they are required to submit a permit Name Change request form to the Board upon completion of the sale. The new owner(s) will be required to comply with all permit conditions. Name Change forms are available at <http://cvfpb.ca.gov/>

TWENTY-TWO: The Board reserves the right to add additional, or modify existing, conditions when there is a change in ownership and/or maintenance responsibility of the work authorized under this permit.

PRE-CONSTRUCTION

TWENTY-THREE: Upon receipt of a signed copy of the issued permit the permittee shall contact the Board by telephone at (916) 574-0609 to schedule a preconstruction conference with the inspector that is assigned to your project. Failure to do so at least 10 working days prior to start of work may result in a delay of the project.

CONSTRUCTION

TWENTY-FOUR: No construction work of any kind shall be done during the flood season from November 1 to April 15 without prior approval of the Board. Failure to submit a Time Variance Request to the Board at least 10 working days prior to November 1 may result in a delay of the project.

TWENTY-FIVE: No material stockpiles, temporary buildings (except the temporary bridges to accommodate traffic during construction), or equipment shall remain in the floodway during the flood season from November 1 to April 15.

TWENTY-SIX: The existing bridges shall be completely removed and disposed of outside the limits of the Cosumnes River Designated Floodway.

TWENTY-SEVEN: Piers, bents, and abutments being dismantled shall be removed to at least 1 foot below the natural ground line and at least 3 feet below the bottom of the low-water channel.

TWENTY-EIGHT: Excavations in the riverbanks, to facilitate removal of the existing bridges shall be backfilled in layers and compacted to a density equal to that of the adjacent undisturbed material.

TWENTY-NINE: The soffit of the bridge shall be a minimum of 3 feet above the flood plane elevation of 44.58 feet, NAVD88 Datum.

POST-CONSTRUCTION

THIRTY: All debris generated by this project shall be properly disposed of outside the Cosumnes River Designated Floodway and off all Project Works.

THIRTY-ONE: The Cosumnes River Designated Floodway shall be restored to at least the condition that existed prior to commencement of work.

THIRTY-TWO: Upon completion of the project, the permittee shall submit as-constructed drawings to the Board to: Central Valley Flood Protection Board, Inspection Section, 3310 El Camino Avenue, Suite 170, Sacramento, California 95821.

OPERATIONS AND MAINTENANCE

THIRTY-THREE: After each period of high water, debris that accumulates at the site shall be completely removed from the Cosumnes River Designated Floodway.

THIRTY-FOUR: The permittee shall maintain the permitted encroachment(s) and the Project Works within the utilized area in the manner required and as requested by the authorized representative of the Board, the Department of Water Resources, or any other agency responsible for maintenance and shall, at all times, allow officials from these agencies to access any adjacent areas as necessary for flood control.

THIRTY-FIVE: The permitted encroachment(s) shall not interfere with the operation and maintenance of the flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) within 30-days of being notified in writing by the Board. In the event of an emergency a shorter timeframe may be required. If the permittee does not comply, the Board, or a designated agency or company authorized by the Board, may modify or remove the encroachment(s) at the permittee's expense.

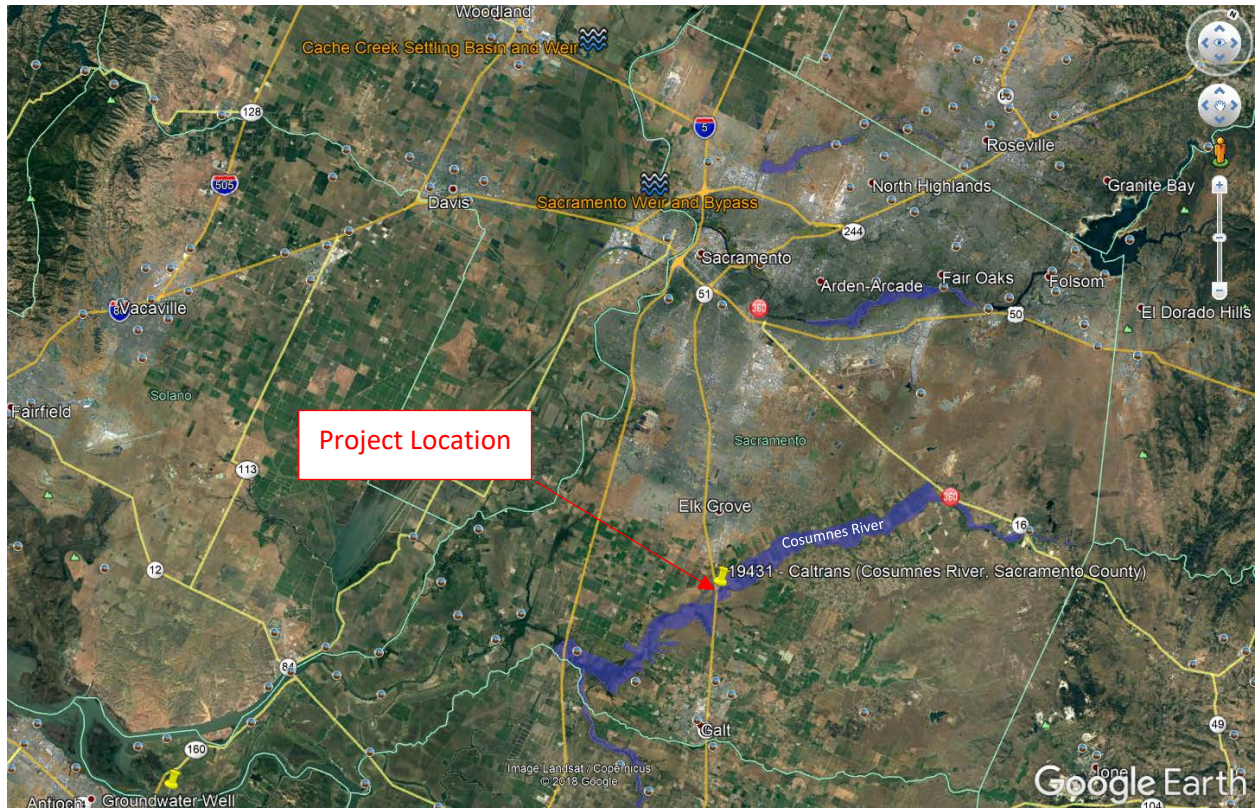
PROJECT ABANDONMENT / CHANGE IN PLAN OF FLOOD CONTROL

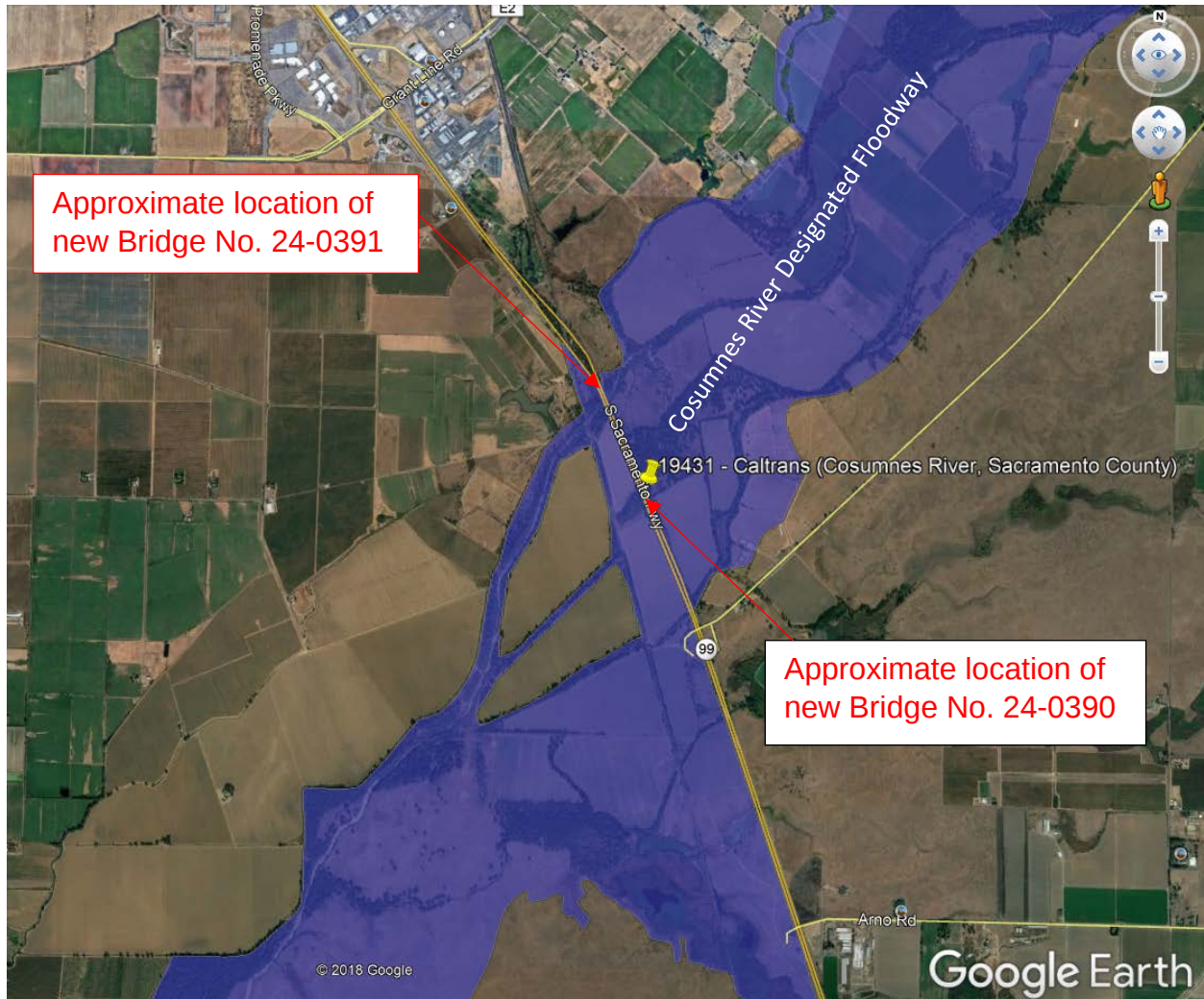
THIRTY-SIX: If the project, or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project under direction of the Board at the permittee's or successor's cost and expense.

THIRTY-SEVEN: The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if in the discretion of the Board the removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if the project is not maintained or is damaged by any cause. The permittee shall remove the encroachment(s) within 30-days of being notified in writing by the Board. In the event of an emergency a shorter timeframe may be required. If the permittee does not comply the Board will remove the encroachment(s) at the permittee's expense.

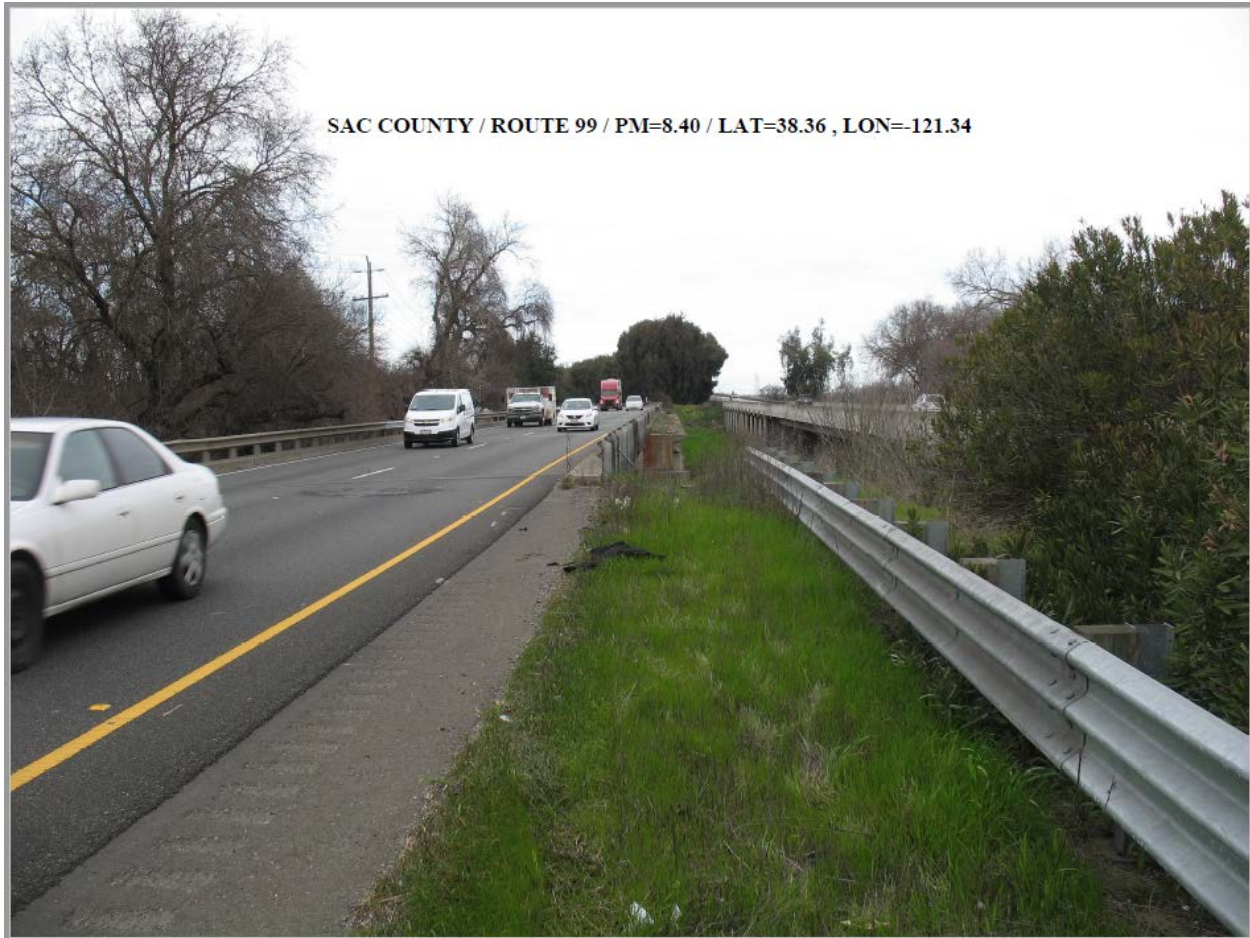
END OF CONDITIONS

No. 19431 – Attachment B – Location Maps and Photos









Cosumnes River Bridges spanning the main channel at Post Mile (PM) 8.4 (Bridge Nos. 24-0020R and 24-0020L)



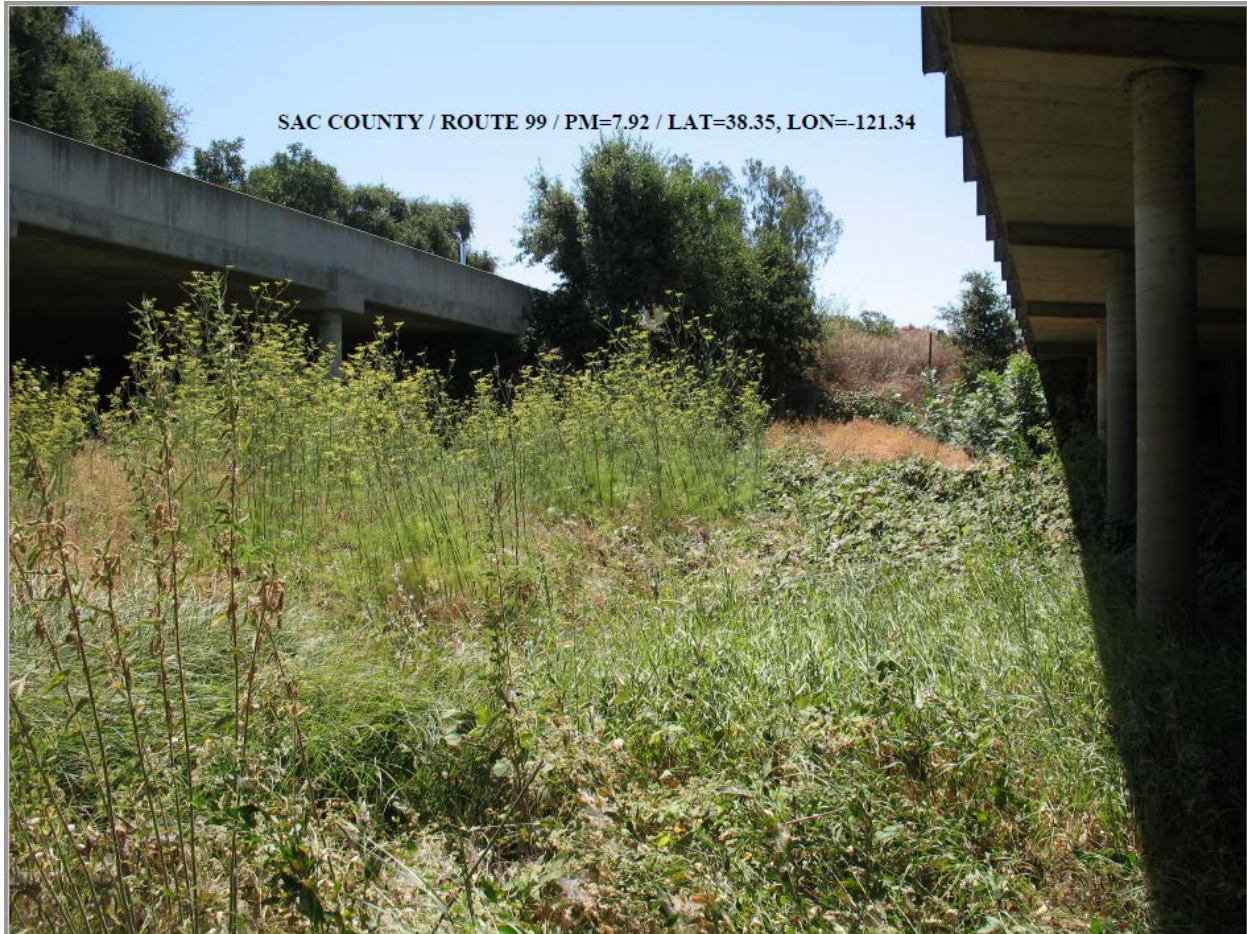
Cosumnes River Bridges spanning the main channel at Post Mile (PM) 8.4 (Bridge Nos. 24-0020R and 24-0020L)



Cosumnes River Bridges spanning the main channel at Post Mile (PM) 8.4 (Bridge Nos. 24-0020R and 24-0020L)



Cosumnes River Overflow Bridges spanning the overflow channel at PM 7.9. (Bridge Nos. 24-0021R and 24-0021L);



Cosumnes River Overflow Bridges spanning the overflow channel at PM 7.9. (Bridge Nos. 24-0021R and 24-0021L);



Cosumnes River Overflow Bridges spanning the overflow channel at PM 7.9. (Bridge Nos. 24-0021R and 24-0021L);

65% UNCHECKED DETAILS

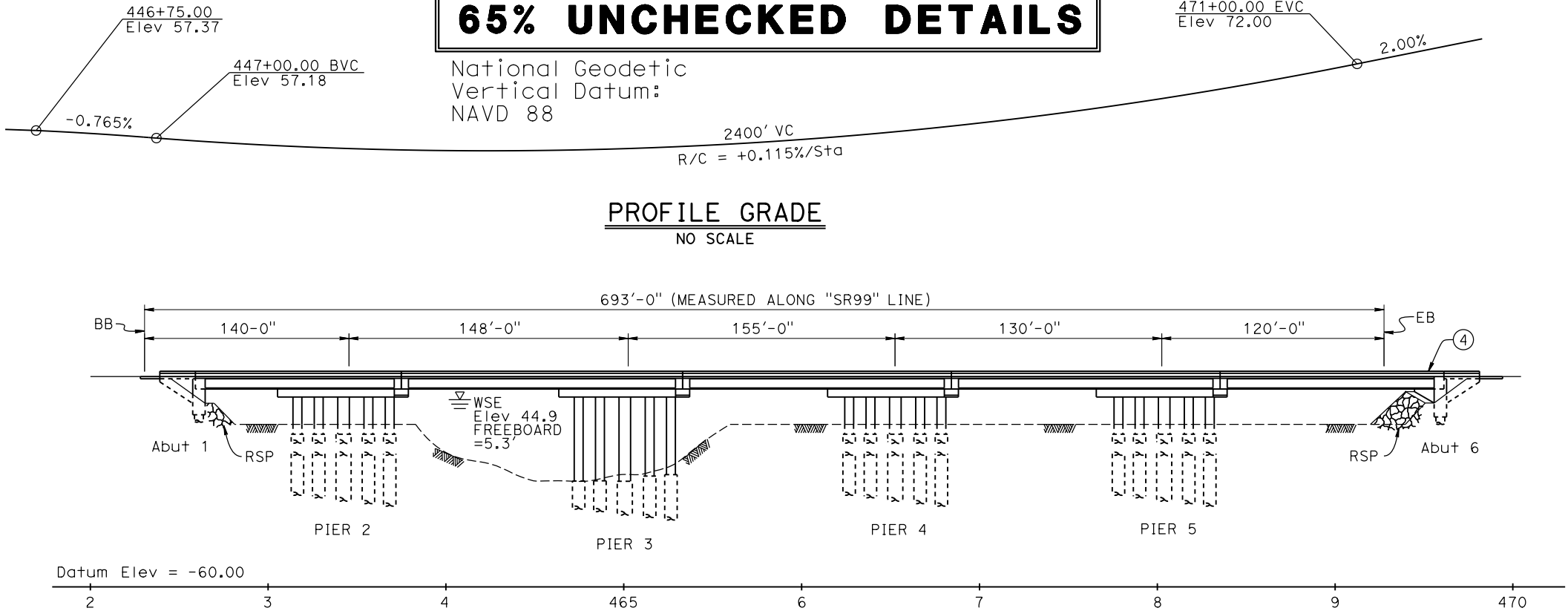
National Geodetic
Vertical Datum:
NAVD 88

PROGRESS PRINT

PRINTED
DATE: 17-JUL-2019
Office of
Structure Design
STATE OF CALIFORNIA

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	Sac	99	PPPP	????	####
REGISTERED CIVIL ENGINEER			DATE		
MM/DD/YYYY			No.		
PLANS APPROVAL DATE			Exp.		
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.			CIVIL STATE OF CALIFORNIA		

PROFILE GRADE
NO SCALE



ELEVATION
1" = 40'

TRAFFIC NOTES

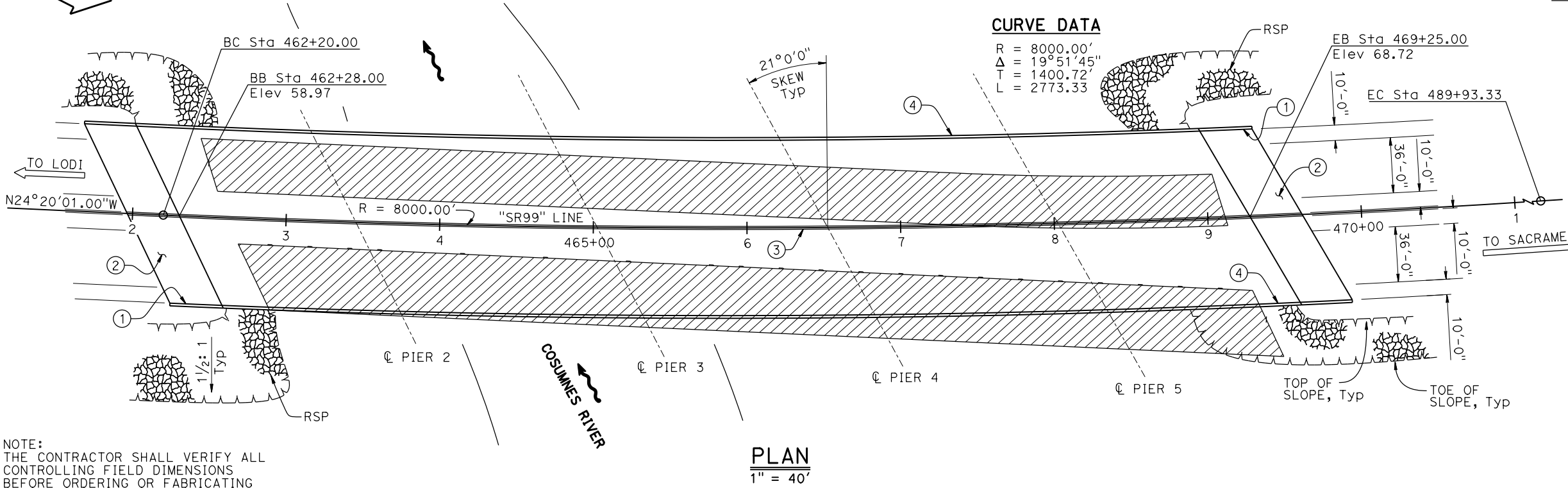
- VEHICULAR TRAFFIC:
1. New alignment. No traffic at the site.
 2. Traffic will be detoured away from the site.
 3. Traffic will be carried on the structure. Stage construction will be required.
 4. Traffic will pass under the structure on (Name of St or Hwy)
- A. No falsework allowed over traffic.
B. Falsework opening(s) required:
- | | Temp Vertical Clearance | Width of Traffic Opening |
|-----------|-------------------------|--------------------------|
| - Bound | - | - |
| - Bound | - | - |
| - Two-Way | - | - |
- C. Temporary traffic lane reduction needed for footing excavation.

- PEDESTRIAN TRAFFIC:
Falsework opening required on:
- | Location | Height | (Name of St) | Width |
|----------|--------|--------------|-------|
| - | - | - | - |

- RAILROAD TRAFFIC:
Falsework opening required over:
- | Vertical Clearance | Horiz Clear Width | (Name of RR) |
|--------------------|-------------------|--------------|
| - | - | - |

CURVE DATA

R = 8000.00'
Δ = 19°51'45"
T = 1400.72'
L = 2773.33'



- LEGEND:
- New structure
 - - - Existing structure
 - ▨ Limits of Bridge removal
 - Point of minimum vertical clearance

- NOTES:
1. PAINT "CONSUMNES RIVER BRIDGE" "BRIDGE No. 24-0391" YEAR COMPLETED
 2. APPROACH SLAB TYPE N(30)
 3. CONCRETE BARRIER TYPE 60MA
 4. CONCRETE BARRIER TYPE 842

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

PLAN
1" = 40'

GARY BLAKESLEY BRANCH CHIEF	DESIGN	BY ALI YOUSIF	CHECKED X	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 6	BRIDGE No. 24-0391	COSUMNES RIVER BRIDGE (REPLACE) GENERAL PLAN No. 1	
	DETAILS	BY X	CHECKED X	LAYOUT	BY ALI YOUSIF			CHECKED X		POST MILE 8.40
	QUANTITIES	BY X	CHECKED X	SPECIFICATIONS	BY X			PLANS AND SPECS COMPARED X		
	DATE PLOTTED => 17-JUL-2019 TIME PLOTTED => 16:22 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS							UNIT: 3591 PROJECT NUMBER & PHASE: 03 1200 0069 1 CONTRACT No.: 03-0F2804		DISREGARD PRINTS BEARING EARLIER REVISION DATES

National Geodetic
Vertical Datum:
NAVD 88

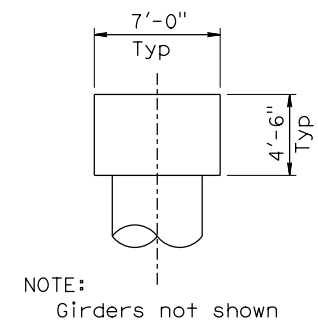
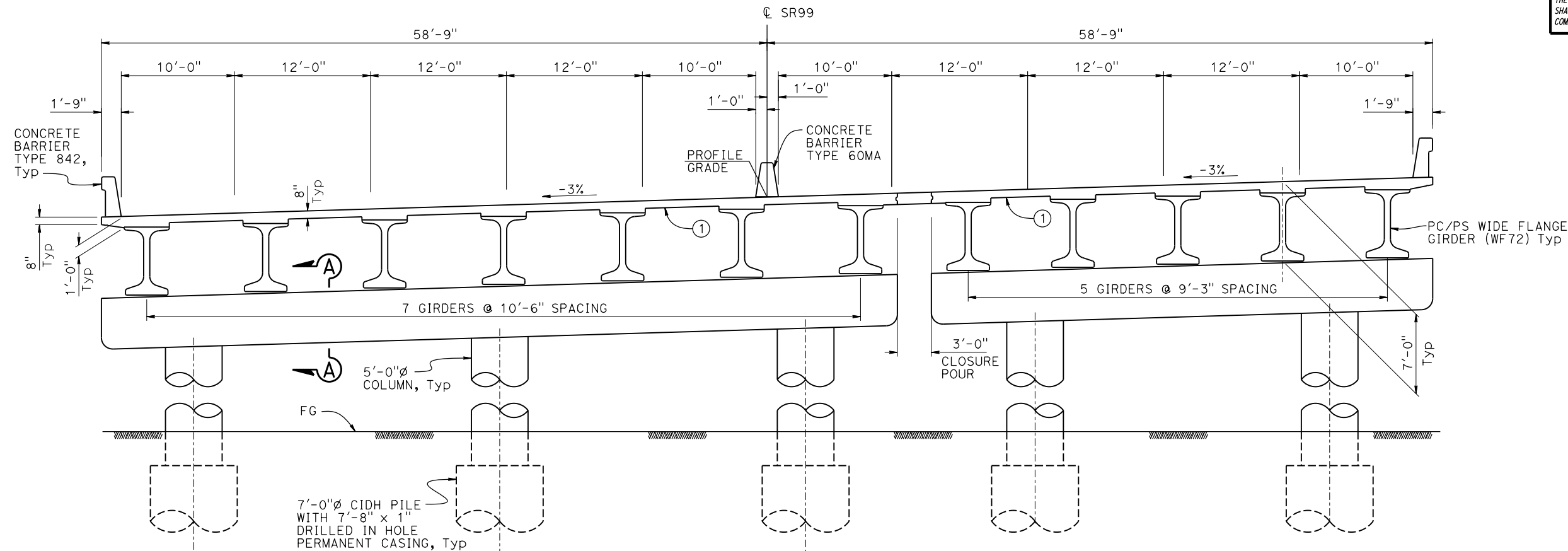
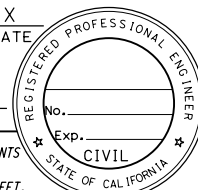
65% UNCHECKED DETAILS

PROGRESS PRINT

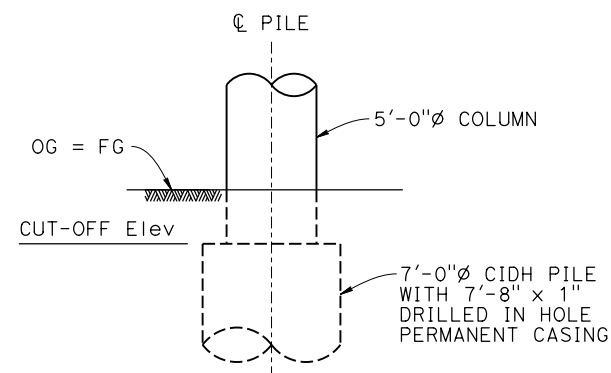
PRINTED
DATE: 17-JUL-2019

Office of
Structure Design
STATE OF CALIFORNIA

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	Sac	99	PPPP	????	####
REGISTERED CIVIL ENGINEER			X	DATE	
MM/DD/YYYY			PLANS APPROVAL DATE		
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.					



SECTION A-A
 $\frac{3}{16}'' = 1'-0''$



PIER PILE DETAIL
 $\frac{3}{16}'' = 1'-0''$

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

TYPICAL SECTION

$\frac{3}{16}'' = 1'-0''$

NOTES:

- ① STAY IN PLACE METAL FORM (SIPMF), Typ

NOTES:

1. LENGTH OF Col Avg = 35'-0"
2. LENGTH OF PERMANENT CASING = 50'-0"
3. LENGTH OF PILE SHAFT = 125'-0"

HYDROLOGIC SUMMARY

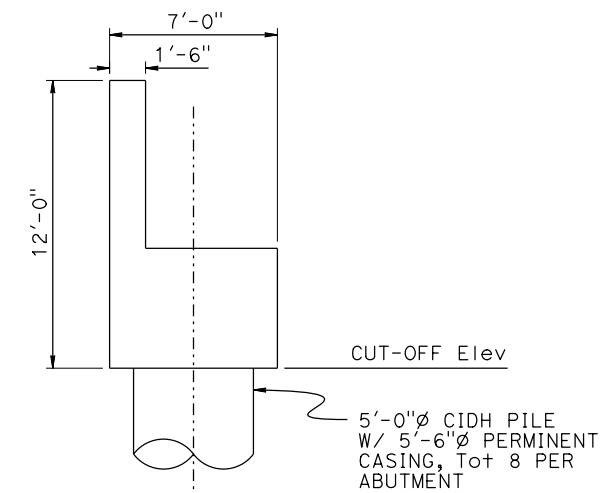
Drainage Area: 725.8 mi²

Frequency	100-Year (Caltrans)	Overtopping Flood/ Flood of Record
Discharge, cfs	91,300	117,000
Channel	Main	n/a
Condition	Existing (Br#24-20L/R)	Proposed (Br#24-0391)
WSE at Bridge, ft (NAVD 88)	44.9	44.9
		n/a

Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.

PILE CUT-OFF ELEVATION

SUPPORT	CUT-OFF Elev
Abut 1	40.0
Pier 2	36.0
Pier 3	36.0
Pier 4	36.0
Pier 5	36.0
Abut 6	40.0



NOTES:

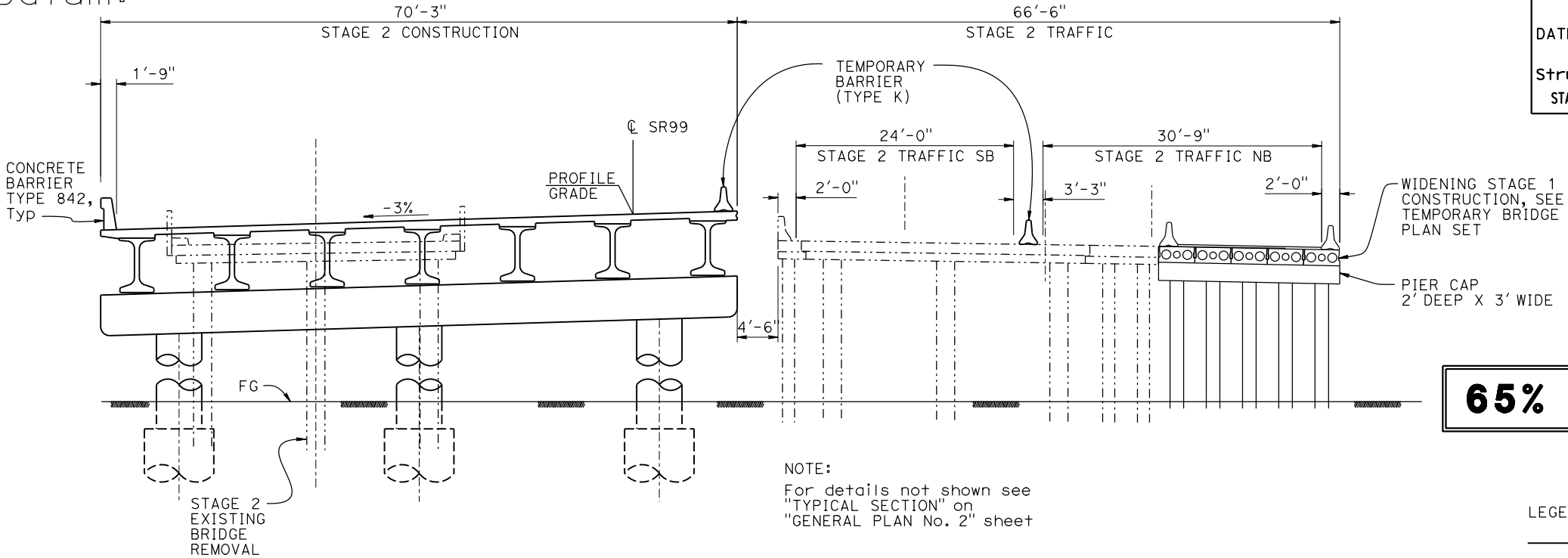
1. LENGTH OF PILE = 100'-0"
2. LENGTH OF PERMANENT CASING = 50'-0"

ABUTMENT SECTION

$\frac{1}{4}'' = 1'-0''$

GARY BLAKESLEY BRANCH CHIEF	DESIGN	BY ALI YOUSIF	CHECKED X	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 6	BRIDGE No. 24-0391	COSUMNES RIVER BRIDGE (REPLACE) GENERAL PLAN No. 2																																																		
	DETAILS	BY X	CHECKED X	LAYOUT	BY ALI YOUSIF			CHECKED X		POST MILE 8.40																																																	
	QUANTITIES	BY X	CHECKED X	SPECIFICATIONS	BY X			PLANS AND SPECS COMPARED X																																																			
STRUCTURES DESIGN GENERAL PLAN SHEET (ENGLISH) (REVISION 3/17/2017)										DATE PLOTTED => 17-JUL-2019 TIME PLOTTED => 16:23 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS										UNIT: 3591 PROJECT NUMBER & PHASE: 03 1200 0069 1 CONTRACT No.: 03-OF2804										DISREGARD PRINTS BEARING EARLIER REVISION DATES										REVISION DATES										SHEET 2 OF X									

National Geodetic
Vertical Datum:
NAVD 88



PROGRESS PRINT

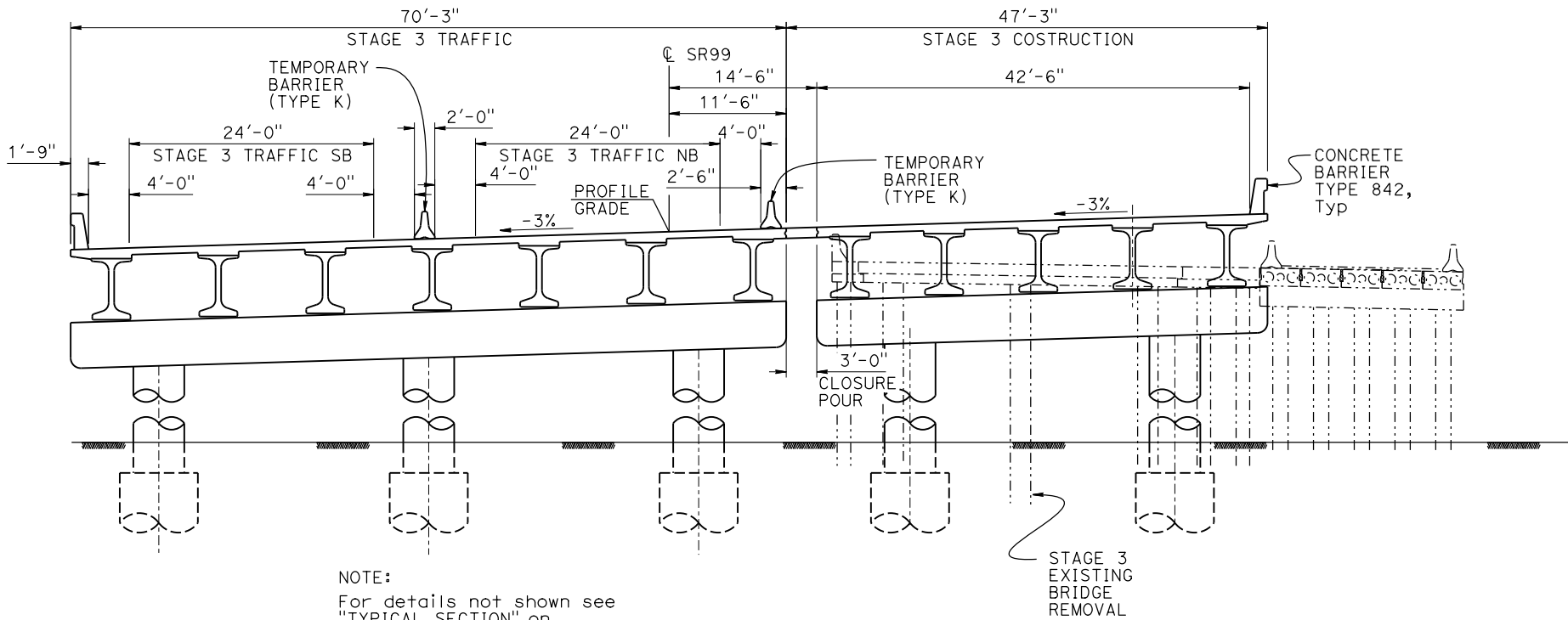
PRINTED
DATE: 17-JUL-2019

Office of
Structure Design
STATE OF CALIFORNIA

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	Sac	99	PPPP	????	####
REGISTERED CIVIL ENGINEER			X	DATE	
MM/DD/YYYY			PLANS APPROVAL DATE		
No.			Exp.		
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.					

65% UNCHECKED DETAILS

STAGE 2
1/8" = 1'-0"



STAGE 3
1/8" = 1'-0"

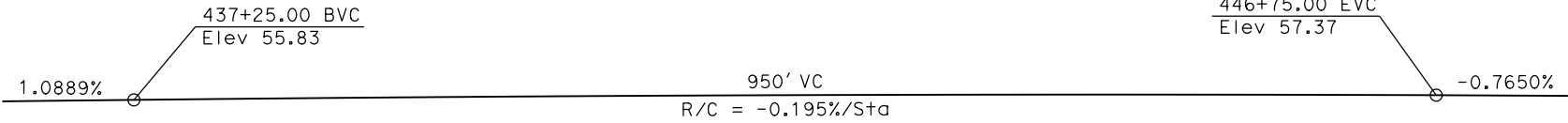
NOTE:
THE CONTRACTOR SHALL VERIFY ALL
CONTROLLING FIELD DIMENSIONS
BEFORE ORDERING OR FABRICATING
ANY MATERIAL.

GARY BLAKESLEY BRANCH CHIEF	DESIGN	BY ALI YOUSIF	CHECKED X	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 6	BRIDGE No. 24-0391	COSUMNES RIVER BRIDGE (REPLACE) GENERAL PLAN No. 3			
	DETAILS	BY X	CHECKED X	LAYOUT	BY ALI YOUSIF			CHECKED X		POST MILE 8.40		
	QUANTITIES	BY X	CHECKED X	SPECIFICATIONS	BY X			PLANS AND SPECS COMPARED X				
DATE PLOTTED => 17-JUL-2019 TIME PLOTTED => 16:24 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS						UNIT: 3591 PROJECT NUMBER & PHASE: 03 1200 0069 1 CONTRACT No.: 03-OF2804		DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES 3-19 6-4-19	SHEET 3	OF X

National Geodetic Vertical Datum:
NAVD 88

INCOMPLETE PLAN
FOR DESIGN STUDY
PRINTED
DATE: 17-JUL-2019
Office of
Structure Design
STATE OF CALIFORNIA

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	Sac	99	PPPP	????	####
REGISTERED CIVIL ENGINEER			DATE		
MM/DD/YYYY			PLANS APPROVAL DATE		
No.			Exp.		
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.					

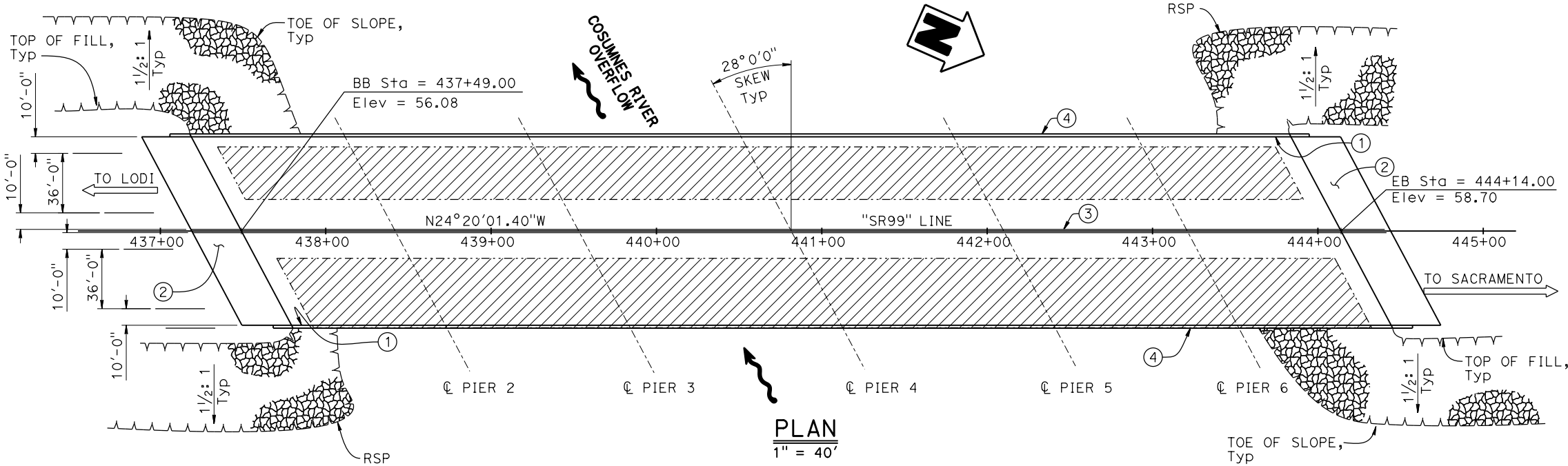
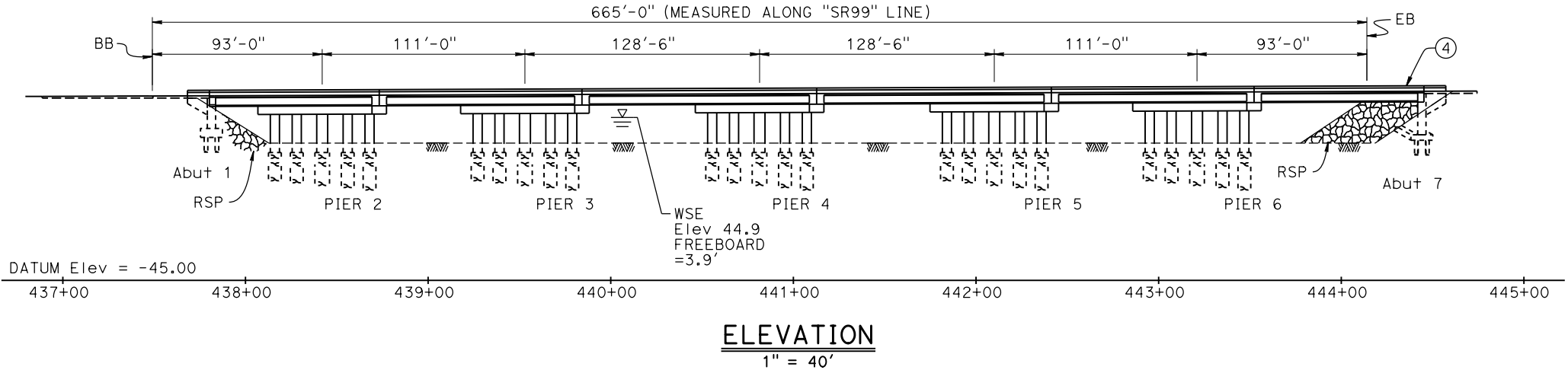


PROFILE GRADE
NO SCALE

65% UNCHECKED DETAILS

- LEGEND:
- Indicates new structure
 - - - - Indicates existing structure
 - /// Indicates Limits of Bridge removal

- NOTES:
- ① PAINT "COSUMNES RIVER OVERFLOW BRIDGE"
"BRIDGE No. 24-0390"
YEAR COMPLETED
 - ② APPROACH SLAB TYPE N(30)
 - ③ CONCRETE BARRIER TYPE 60MA
 - ④ CONCRETE BARRIER TYPE 842



NOTE:
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BEFORE ORDERING OR FABRICATING
ANY MATERIAL.

TRAFFIC NOTES

- VEHICULAR TRAFFIC:
- 1. — New alignment. No traffic at the site.
 - 2. — Traffic will be detoured away from the site.
 - 3. X Traffic will be carried on the structure.
Stage construction X will be required.
 - 4. — Traffic will pass under the structure on
— (Name of St or Hwy)
 - A. — No falsework allowed over traffic.
 - B. — Falsework opening(s) required:
Temp Vertical Clearance Width of
— Bound — Traffic Opening
— Bound —
— Two-Way —
 - C. — Temporary traffic lane reduction needed
for footing excavation.

- PEDESTRIAN TRAFFIC:
Falsework opening required on:
— (Name of St)
Location Height Width
— — —

- RAILROAD TRAFFIC:
Falsework opening required over:
— (Name of RR)
Vertical Clearance Horiz Clear Width
— —

X BRANCH CHIEF	DESIGN	BY Mufeed Khalaf	CHECKED X	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 6	BRIDGE No. 24-0390	COSUMNES RIVER OVERFLOW BRIDGE (REPLACE) GENERAL PLAN No. 1	
	DETAILS	BY J. Reid / S. Shamra	CHECKED X	LAYOUT	BY Mufeed Khalaf			CHECKED X		POST MILE 7.92
	QUANTITIES	BY X	CHECKED X	SPECIFICATIONS	BY X			PLANS AND SPECS COMPARED X		
	DATE PLOTTED => 17-JUL-2019 TIME PLOTTED => 16:14 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3							UNIT: 3591 PROJECT NUMBER & PHASE: 03 1200 0069 1 CONTRACT No.: 03-0F2804		DISREGARD PRINTS BEARING EARLIER REVISION DATES

National Geodetic Vertical Datum:
NAVD 88

65% UNCHECKED DETAILS

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PRINTED
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STATE OF CALIFORNIA

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03	Sac	99	PPPP	????	####
REGISTERED CIVIL ENGINEER			X DATE		
MM/DD/YYYY					
PLANS APPROVAL DATE					
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.					

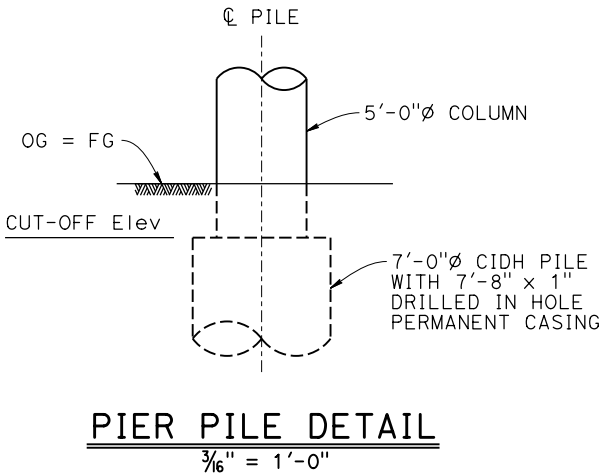
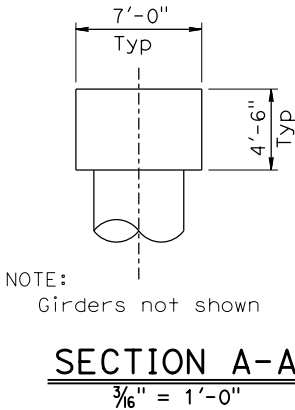
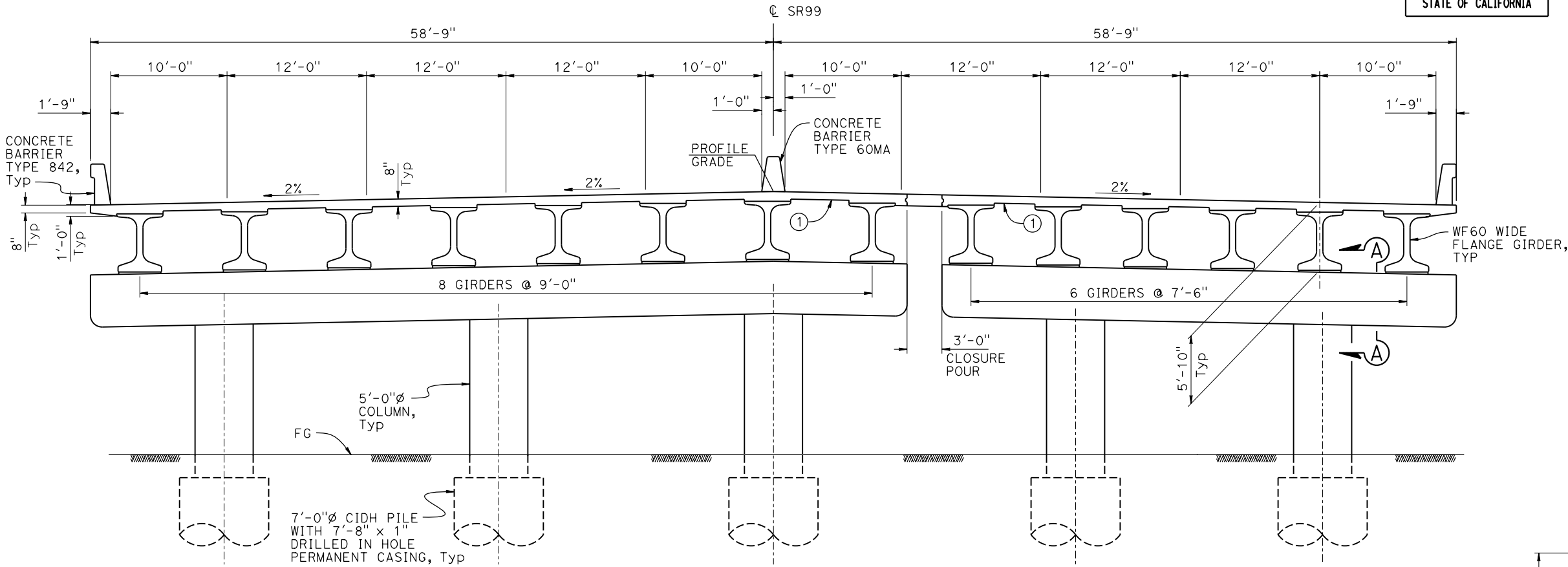
REGISTERED PROFESSIONAL ENGINEER

No.

Exp.

CIVIL

STATE OF CALIFORNIA

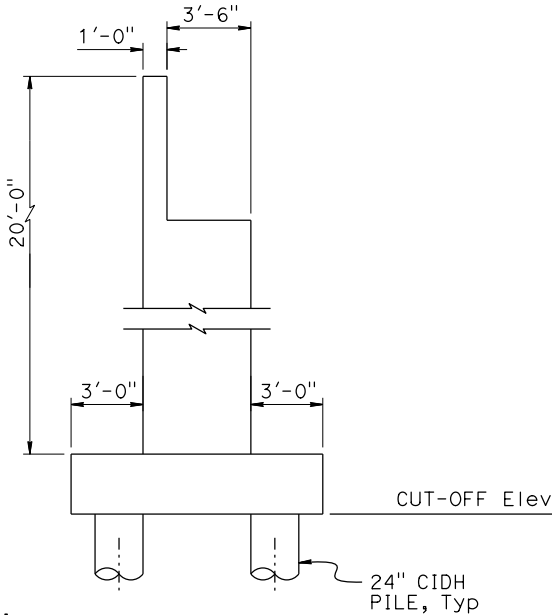


TYPICAL SECTION
3/16" = 1'-0"

- NOTE:
① STAY IN PLACE METAL FORM (SIPMF) BETWEEN GIRDERS, Typ
- NOTES:
1. LENGTH OF Col Avg = 25'-0"
2. LENGTH OF PERMANET CASING = 50'-0"
3. LENGTH OF PILE SHAFT = 100'-0"

HYDROLOGIC SUMMARY			
Drainage Area: 725.8 mi ²			
Frequency	100-Year (Caltrans)		Overtopping Flood/ Flood of Record
Discharge, cfs	91,300		117,000
Channel	Overflow-1		n/a
Condition	Existing (Br#24-21L/R)	Proposed (Br#24-0390)	n/a
WSE at Bridge, ft (NAVD 88)	44.9	44.9	n/a
Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.			

PILE CUT-OFF ELEVATION	
Support	Cut-off Elev
Abut 1	35.0
Pier 2	33.0
Pier 3	33.0
Pier 4	33.0
Pier 5	33.0
Pier 6	33.0
Abut 7	35.0



- NOTES:
1. LENGTH OF PILE = 45'-0"
2. LENGTH OF PERMANET CASING = 25'-0"

NOTE:
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CONTROLLING FIELD DIMENSIONS
BEFORE ORDERING OR FABRICATING
ANY MATERIAL.

National Geodetic
Vertical Datum:
NAVD 88

65% UNCHECKED DETAILS

INCOMPLETE PLAN
FOR DESIGN STUDY
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DATE: 17-JUL-2019
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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	Sac	99	PPPP	????	####
REGISTERED CIVIL ENGINEER			X DATE		
MM/DD/YYYY					
PLANS APPROVAL DATE					
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.					

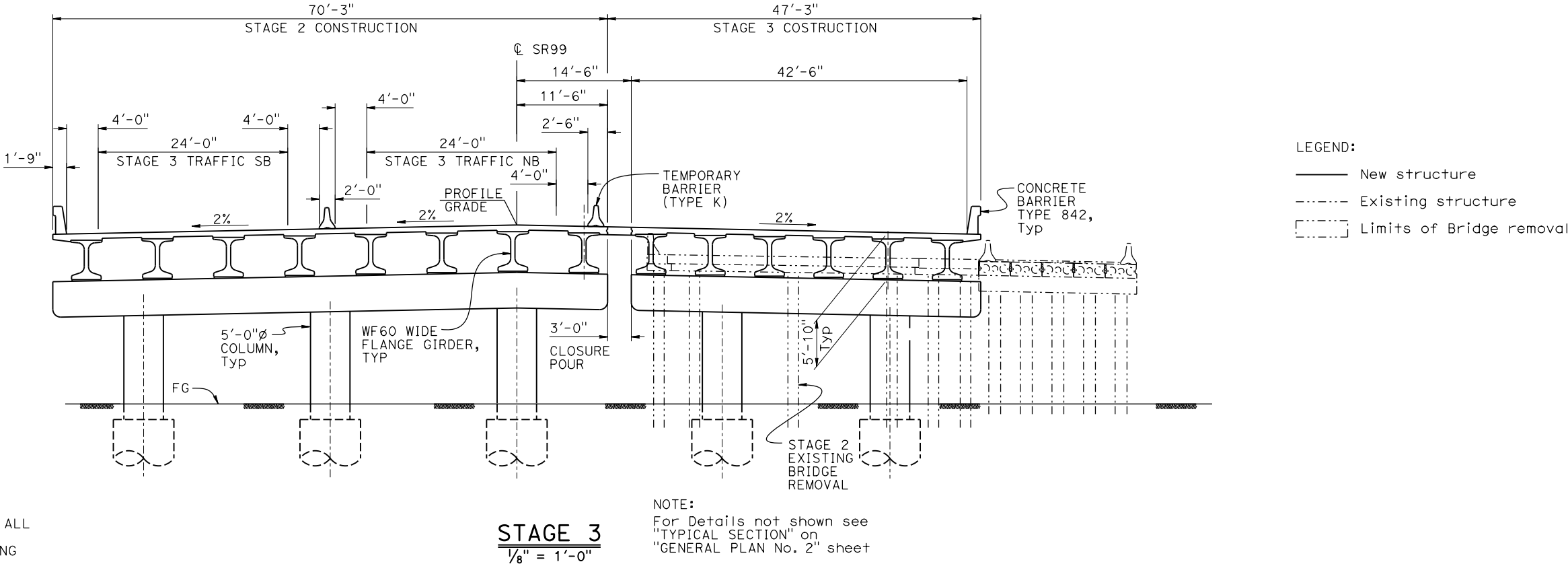
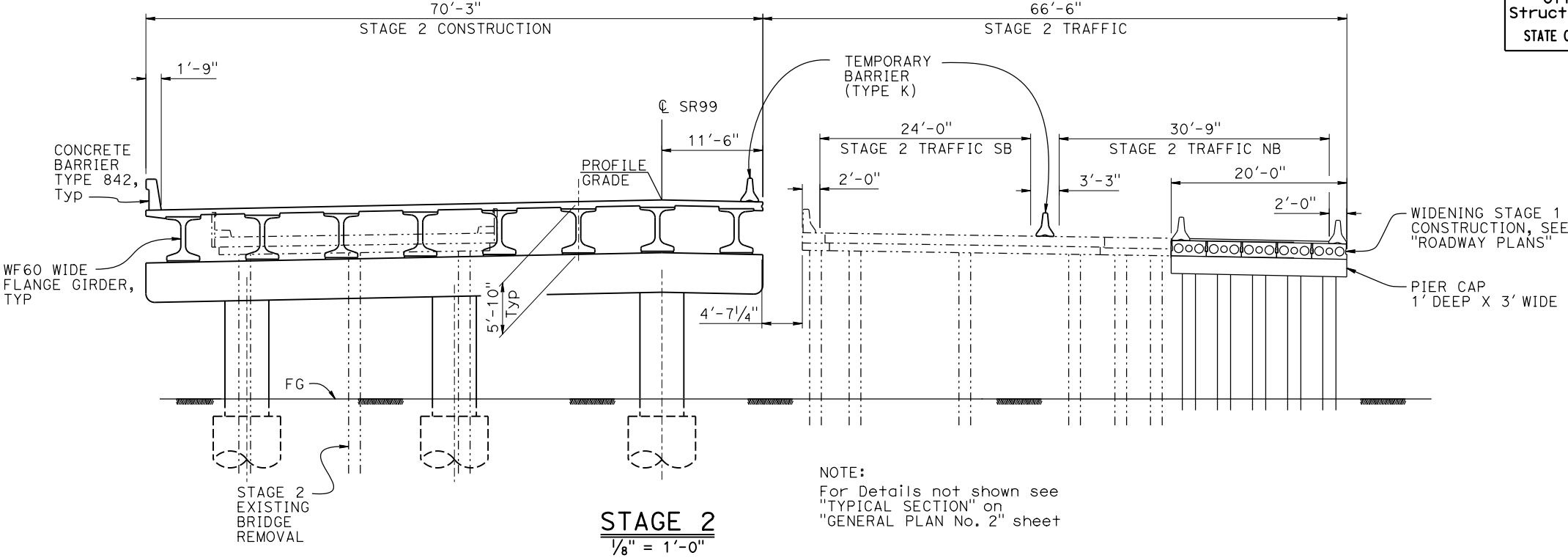
REGISTERED PROFESSIONAL ENGINEER

No.

Exp.

CIVIL

STATE OF CALIFORNIA



LEGEND:
—— New structure
----- Existing structure
[] Limits of Bridge removal

X BRANCH CHIEF	DESIGN	BY Mufeed Khalaf	CHECKED X	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 6	BRIDGE No. 24-0390	COSUMNES RIVER OVERFLOW BRIDGE (REPLACE) GENERAL PLAN No. 3																																																		
	DETAILS	BY J. Reid / S. Shamra	CHECKED X	LAYOUT	BY Mufeed Khalaf			CHECKED X		POST MILE 7.92																																																	
	QUANTITIES	BY X	CHECKED X	SPECIFICATIONS	BY X			PLANS AND SPECS COMPARED X																																																			
STRUCTURES DESIGN GENERAL PLAN SHEET (ENGLISH) (REVISION 3/17/2017)										DATE PLOTTED => 17-JUL-2019 TIME PLOTTED => 16:25 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3										UNIT: 3591 PROJECT NUMBER & PHASE: 03 1200 0069 1 CONTRACT No.: 03-OF2804										DISREGARD PRINTS BEARING EARLIER REVISION DATES										REVISION DATES										SHEET 3 OF X									

National Geodetic
Vertical Datum:
NAVD 88

90% PLANS

INDEX TO PLANS

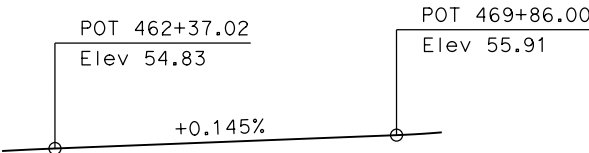
PROGRESS PRINT

PRINTED
DATE: 17-JUL-2019
Office of
Structure Design
STATE OF CALIFORNIA

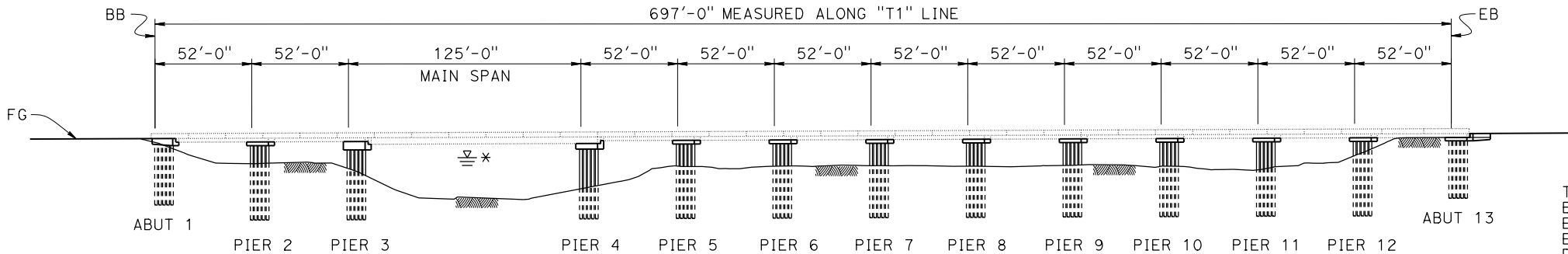
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	Sac	99	PPPP	????	####
REGISTERED CIVIL ENGINEER			X	DATE	
MM/DD/YYYY			No.	X	
PLANS APPROVAL DATE			Exp.	X	
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.			CIVIL	STATE OF CALIFORNIA	

SHEET No.	TITLE
1	GENERAL PLAN
2	GENERAL NOTES
3	FOUNDATION PLAN No. 1
4	FOUNDATION PLAN No. 1
5	ABUTMENT 1 LAYOUT
6	ABUTMENT 13 LAYOUT
7	ABUTMENT DETAILS No. 1
8	ABUTMENT DETAILS No. 2
9	PIER LAYOUT (TYPICAL)
10	PIER DETAILS (TYPICAL)
11	PIER LAYOUT (PIER 3 AND 4)
12	PIER DETAILS (PIER 3 AND 4)

- LEGEND:
- Existing Structure
 - ~~~~~ Indicates direction of Flow
 - * 100 year Storm Elevation = 44.90'
 - Indicates future work



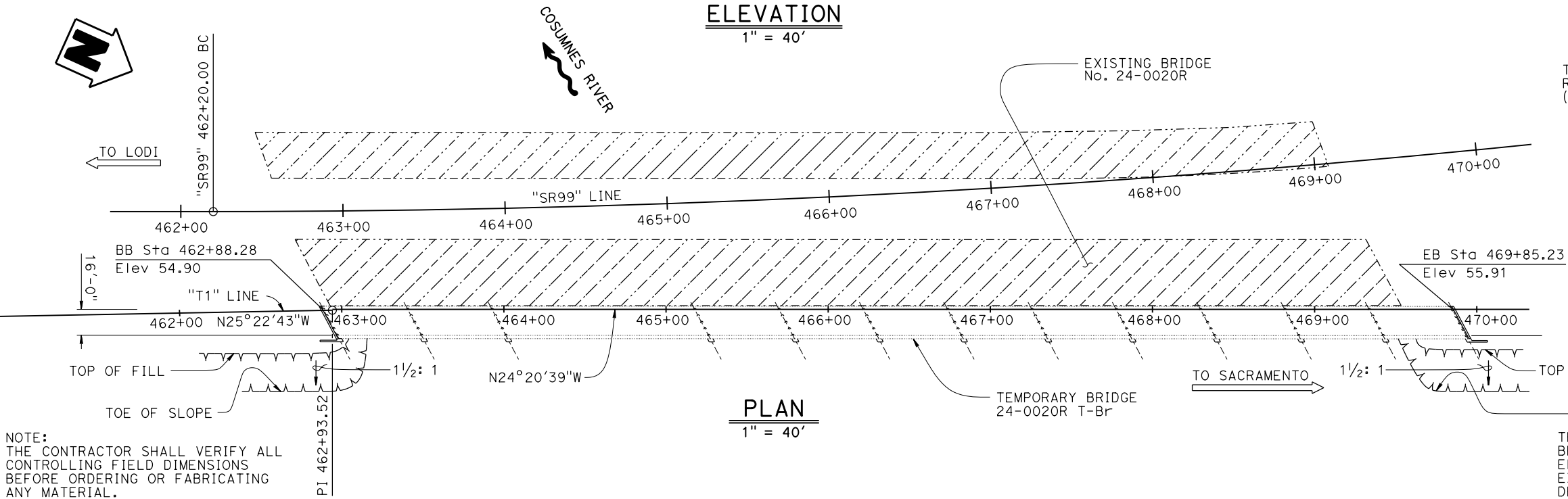
PROFILE GRADE
NO SCALE



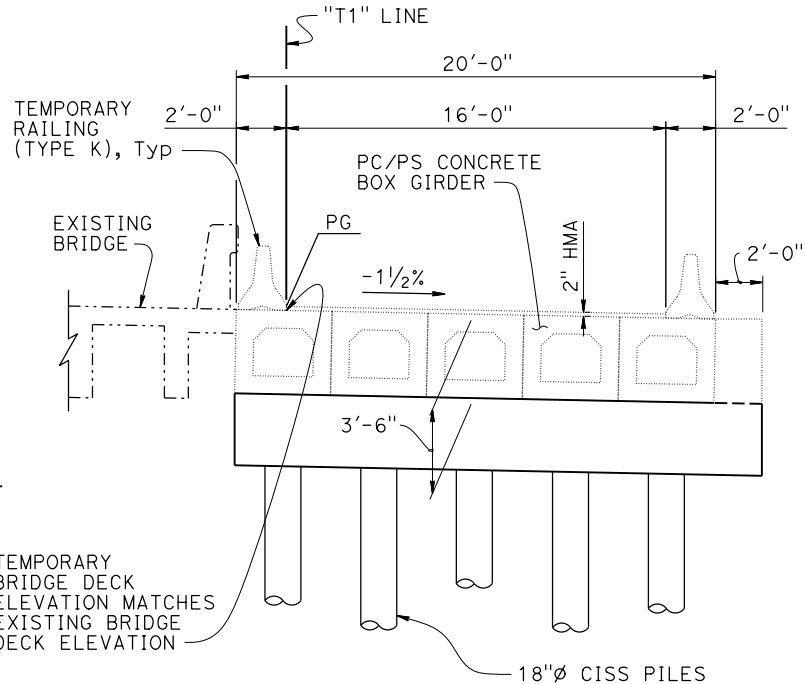
DATUM Elev = -40.00'

462+00 463+00 464+00 465+00 466+00 467+00 468+00 469+00 470+00

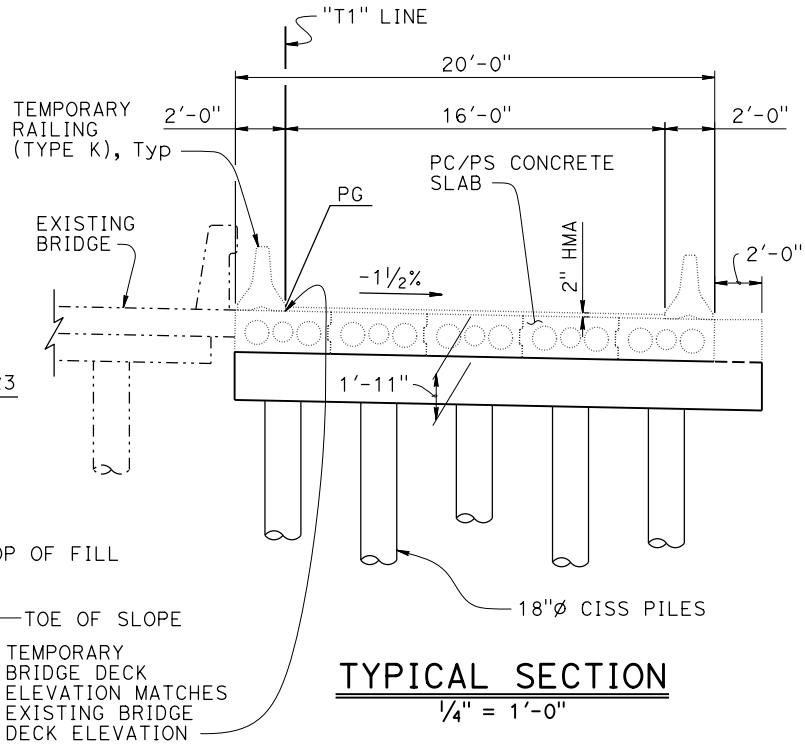
ELEVATION
1" = 40'



NOTE:
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ANY MATERIAL.



MAIN SPAN SECTION
1/4" = 1'-0"



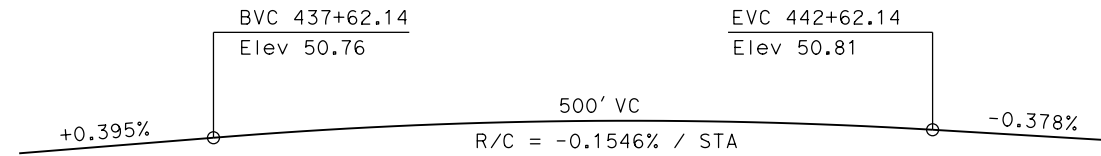
TYPICAL SECTION
1/4" = 1'-0"

GARY BLAKESLEY BRANCH CHIEF	DESIGN	BY YOLANDA PULIDO-VILLEGAS	CHECKED X	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING HL93 W/ "LOW-BOY"; PERMIT DESIGN VEHICLE	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 6	BRIDGE No. 24-20R T-Br	COSUMNES RIVER TEMPORARY BRIDGE GENERAL PLAN		
	DETAILS	BY R. ENRIQUEZ / S. SHAMBRA	CHECKED X	LAYOUT	BY J. CHOU			CHECKED X		POST MILE	
	QUANTITIES	BY X	CHECKED X	SPECIFICATIONS	BY X			PLANS AND SPECS COMPARED X		8.40	
	DATE PLOTTED => 17-JUL-2019 TIME PLOTTED => 16:29 ORIGINAL SCALE FILE => 24-20r-tbr-a-gp01.dgn USERNAME => s148295 IN INCHES FOR REDUCED PLANS							UNIT: 3591 PROJECT NUMBER & PHASE: 03 1200 0069 1 CONTRACT No.: 03-OF2804			
DISREGARD PRINTS BEARING EARLIER REVISION DATES									REVISION DATES	SHEET	OF
									05-05-19 05-06-19 6-26-19	1	X

National Geodetic
Vertical Datum:
NAVD 88

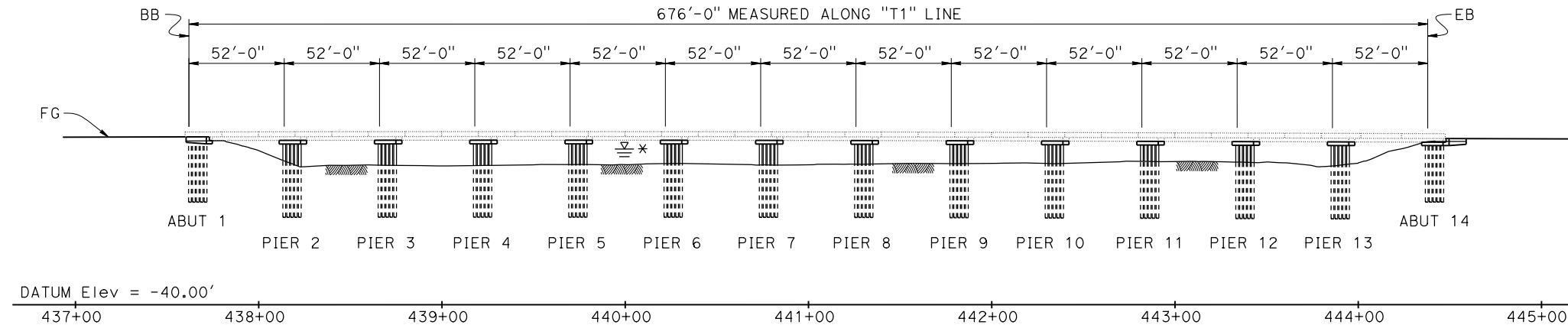
LEGEND:

- Existing Structure
- ~~~~~ Indicates direction of Flow
- * 100 year Storm Elevation = 44.90'
- Indicates direction of Flow



PROFILE GRADE
NO SCALE

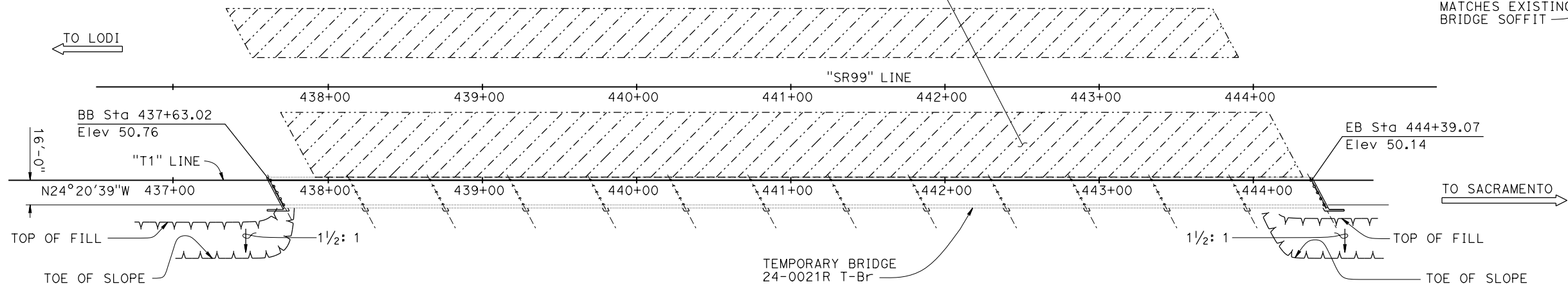
90% PLANS



ELEVATION
1" = 40'



COSUMNES RIVER
OVERFLOW



PLAN
1" = 40'

NOTE:
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PROGRESS PRINT

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DATE: 17-JUL-2019

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Structure Design

STATE OF CALIFORNIA

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
03	Sac	99	PPPP	????	####

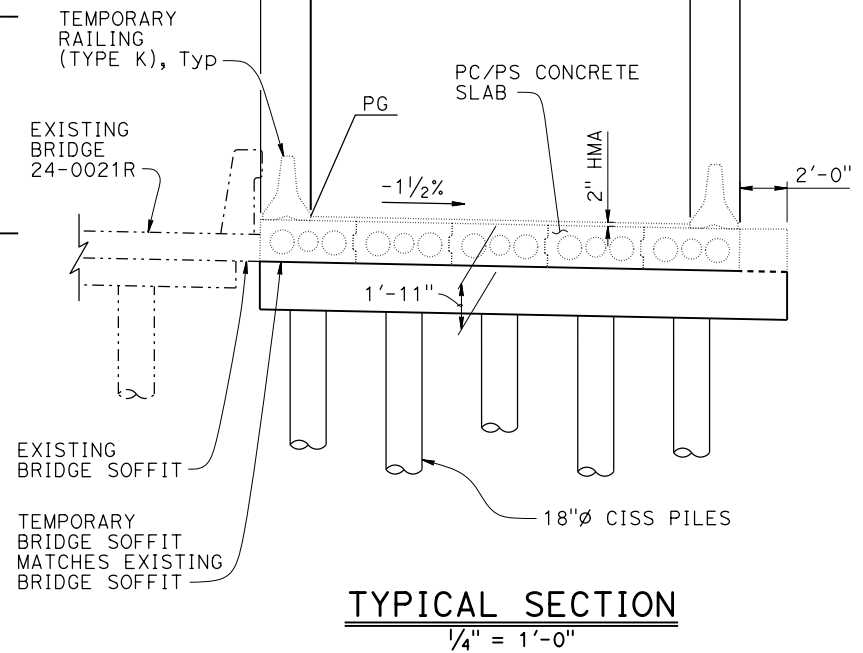
REGISTERED CIVIL ENGINEER X DATE

MM/DD/YYYY

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER
No. X
Exp. X
CIVIL
STATE OF CALIFORNIA



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3	FOUNDATION PLAN No. 1
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5	ABUTMENT 1 LAYOUT
6	ABUTMENT 14 LAYOUT
7	ABUTMENT DETAILS No. 1
8	ABUTMENT DETAILS No. 2
9	PIER LAYOUT
10	PIER DETAILS

GARY BLAKESLEY BRANCH CHIEF	DESIGN	BY A. YOUSIF Y. PULIDO-VILLEGAS	CHECKED X	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING HL93 W/ "LOW-BY"; PERMIT DESIGN VEHICLE	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 6	BRIDGE No. 24-21R T-Br	COSUMNES RIVER OVERFLOW TEMPORARY BRIDGE						
	DETAILS	BY R. ENRIQUEZ / S. SHAMBRA	CHECKED X	LAYOUT	BY J. CHOU			CHECKED X		POST MILE 7.92					
	QUANTITIES	BY Y. PULIDO-VILLEGAS	CHECKED A. YOUSIF	SPECIFICATIONS	BY M. QUEST	PLANS AND SPECS COMPARED X			GENERAL PLAN						
STRUCTURES DESIGN GENERAL PLAN SHEET (ENGLISH) (REVISION 1/11/2019)		DATE PLOTTED => 17-JUL-2019 FILE => 24-21r-t-br-a-gp01.dgn		TIME PLOTTED => 16:32 USERNAME => s148295		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		UNIT: 3591 PROJECT NUMBER & PHASE: 03 1200 0069 1 CONTRACT No.: 03-OF2804		DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES 05-05-19 05-06-19 06-26-19		SHEET 1	OF X

No. 19431 - Attachment D - Hydraulic Profile Information

HEC-RAS River: main Reach: reach_5 Profile: FEMA

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
reach_5	3377.951	FEMA	01	81000.00	22.64	36.60	33.33	36.66	0.000711	2.02	40475.57	10169.71	0.18
reach_5	3377.951	FEMA	02	81000.00	22.64	36.60	33.33	36.66	0.000711	2.02	40475.57	10169.71	0.18
reach_5	3377.951	FEMA	01+temp	81000.00	22.64	36.60	33.33	36.66	0.000711	2.02	40475.57	10169.71	0.18
reach_5	4028.674	FEMA	01	81000.00	22.85	37.02	33.54	37.08	0.000589	1.92	42799.11	10355.82	0.16
reach_5	4028.674	FEMA	02	81000.00	22.85	37.02	33.54	37.08	0.000589	1.92	42799.11	10355.82	0.16
reach_5	4028.674	FEMA	01+temp	81000.00	22.85	37.02	33.54	37.08	0.000589	1.92	42799.11	10355.82	0.16
reach_5	4549.764	FEMA	01	81000.00	22.52	37.29	33.12	37.34	0.000427	1.67	49289.51	11365.25	0.14
reach_5	4549.764	FEMA	02	81000.00	22.52	37.29	33.12	37.34	0.000427	1.67	49289.51	11365.25	0.14
reach_5	4549.764	FEMA	01+temp	81000.00	22.52	37.29	33.12	37.34	0.000427	1.67	49289.51	11365.25	0.14
reach_5	4955.474	FEMA	01	81000.00	24.38	37.47	33.18	37.52	0.000470	1.73	48232.21	11332.43	0.14
reach_5	4955.474	FEMA	02	81000.00	24.38	37.47	33.18	37.52	0.000470	1.73	48232.21	11332.43	0.14
reach_5	4955.474	FEMA	01+temp	81000.00	24.38	37.47	33.18	37.52	0.000470	1.73	48232.21	11332.43	0.14
reach_5	5383.082	FEMA	01	81000.00	24.37	37.69	33.50	37.74	0.000562	1.84	44716.45	11240.74	0.16
reach_5	5383.082	FEMA	02	81000.00	24.37	37.69	33.50	37.74	0.000562	1.84	44716.45	11240.74	0.16
reach_5	5383.082	FEMA	01+temp	81000.00	24.37	37.69	33.50	37.74	0.000562	1.84	44716.45	11240.74	0.16
reach_5	5903.590	FEMA	01	81000.00	24.39	37.95	33.19	38.00	0.000428	1.67	48380.09	10410.99	0.14
reach_5	5903.590	FEMA	02	81000.00	24.39	37.95	33.19	38.00	0.000428	1.67	48380.09	10410.99	0.14
reach_5	5903.590	FEMA	01+temp	81000.00	24.39	37.95	33.19	38.00	0.000428	1.67	48380.09	10410.99	0.14
reach_5	6452.022	FEMA	01	81000.00	24.24	38.18	33.04	38.21	0.000375	1.60	51143.69	10819.80	0.13
reach_5	6452.022	FEMA	02	81000.00	24.24	38.18	33.04	38.21	0.000375	1.60	51143.69	10819.80	0.13
reach_5	6452.022	FEMA	01+temp	81000.00	24.24	38.18	33.04	38.21	0.000375	1.60	51143.69	10819.80	0.13
reach_5	6987.560	FEMA	01	81000.00	25.80	38.37	32.82	38.41	0.000346	1.55	52825.13	11126.93	0.12
reach_5	6987.560	FEMA	02	81000.00	25.80	38.37	32.82	38.41	0.000346	1.55	52825.13	11126.93	0.12
reach_5	6987.560	FEMA	01+temp	81000.00	25.80	38.37	32.82	38.41	0.000346	1.55	52825.13	11126.93	0.12
reach_5	7493.587	FEMA	01	81000.00	22.47	38.53	32.40	38.57	0.000283	1.45	56083.18	11081.52	0.11
reach_5	7493.587	FEMA	02	81000.00	22.47	38.53	32.40	38.57	0.000283	1.45	56083.18	11081.52	0.11
reach_5	7493.587	FEMA	01+temp	81000.00	22.47	38.53	32.40	38.57	0.000283	1.45	56083.18	11081.52	0.11
reach_5	7989.603	FEMA	01	81000.00	25.50	38.67	32.45	38.70	0.000253	1.41	58307.05	11251.41	0.11
reach_5	7989.603	FEMA	02	81000.00	25.50	38.67	32.45	38.70	0.000253	1.41	58307.05	11251.41	0.11
reach_5	7989.603	FEMA	01+temp	81000.00	25.50	38.67	32.45	38.70	0.000253	1.41	58307.05	11251.41	0.11
reach_5	8425.031	FEMA	01	81000.00	24.85	38.79	33.21	38.82	0.000296	1.38	59354.11	12672.67	0.11
reach_5	8425.031	FEMA	02	81000.00	24.85	38.79	33.21	38.82	0.000296	1.38	59354.11	12672.67	0.11
reach_5	8425.031	FEMA	01+temp	81000.00	24.85	38.79	33.21	38.82	0.000296	1.38	59354.11	12672.67	0.11
reach_5	8946.558	FEMA	01	81000.00	21.13	38.93	32.42	38.96	0.000253	1.32	61782.37	11911.81	0.10
reach_5	8946.558	FEMA	02	81000.00	21.13	38.93	32.42	38.96	0.000253	1.32	61782.37	11911.81	0.10
reach_5	8946.558	FEMA	01+temp	81000.00	21.13	38.93	32.42	38.96	0.000253	1.32	61782.37	11911.81	0.10
reach_5	9352.672	FEMA	01	81000.00	28.05	39.06	34.49	39.10	0.000450	1.53	53114.64	12834.24	0.13
reach_5	9352.672	FEMA	02	81000.00	28.05	39.06	34.49	39.10	0.000450	1.53	53114.64	12834.24	0.13
reach_5	9352.672	FEMA	01+temp	81000.00	28.05	39.06	34.49	39.10	0.000450	1.53	53114.64	12834.24	0.13
reach_5	9647.686	FEMA	01	81000.00	27.61	39.21	34.84	39.25	0.000622	1.60	50481.56	14256.47	0.15
reach_5	9647.686	FEMA	02	81000.00	27.61	39.21	34.84	39.25	0.000622	1.60	50481.56	14256.47	0.15
reach_5	9647.686	FEMA	01+temp	81000.00	27.61	39.21	34.84	39.25	0.000622	1.60	50481.56	14256.47	0.15
reach_5	9922.801	FEMA	01	81000.00	28.83	39.39	35.51	39.44	0.000726	1.58	45787.42	13193.77	0.16
reach_5	9922.801	FEMA	02	81000.00	28.83	39.39	35.51	39.44	0.000726	1.58	45787.42	13193.77	0.16
reach_5	9922.801	FEMA	01+temp	81000.00	28.83	39.39	35.51	39.44	0.000726	1.58	45787.42	13193.77	0.16
reach_5	10090.27	FEMA	01	81000.00	28.07	39.50	38.38	39.79	0.006524	4.33	18743.10	9166.88	0.49
reach_5	10090.27	FEMA	02	81000.00	28.07	39.50	38.38	39.79	0.006524	4.33	18743.10	9166.88	0.49
reach_5	10090.27	FEMA	01+temp	81000.00	28.07	39.50	38.38	39.79	0.006524	4.33	18743.10	9166.88	0.49
reach_5	10159.54	FEMA	01	81000.00	28.30	39.76	39.76	41.00	0.025089	9.22	9063.08	4822.81	0.98
reach_5	10159.54	FEMA	02	81000.00	28.30	39.76	39.76	41.00	0.025089	9.22	9063.08	4822.81	0.98
reach_5	10159.54	FEMA	01+temp	81000.00	28.30	39.76	39.76	41.00	0.025089	9.22	9063.08	4822.81	0.98
reach_5	10279			Bridge									
reach_5	10399.81	FEMA	01	81000.00	29.81	44.58	38.47	44.61	0.000162	1.12	63459.78	13267.37	0.09
reach_5	10399.81	FEMA	02	81000.00	29.81	44.58	38.47	44.61	0.000161	1.12	63510.60	13268.13	0.09
reach_5	10399.81	FEMA	01+temp	81000.00	29.81	44.61	38.47	44.63	0.000160	1.12	63736.74	13271.48	0.09
reach_5	10484.85	FEMA	01	81000.00	29.28	44.60	38.18	44.62	0.000122	1.00	70699.51	13807.71	0.08
reach_5	10484.85	FEMA	02	81000.00	29.28	44.61	38.18	44.63	0.000122	1.00	70752.34	13808.12	0.08
reach_5	10484.85	FEMA	01+temp	81000.00	29.28	44.63	38.18	44.65	0.000121	1.00	70987.30	13809.97	0.08
reach_5	10582.74	FEMA	01	81000.00	28.03	44.62	37.18	44.64	0.000111	1.07	76715.01	14114.64	0.08
reach_5	10582.74	FEMA	02	81000.00	28.03	44.62	37.18	44.64	0.000111	1.07	76771.51	14114.68	0.07

No. 19431 - Attachment D - Hydraulic Profile Information

HEC-RAS River: main Reach: reach_5 Profile: FEMA (Continued)

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
reach_5	10582.74	FEMA	01+temp	81000.00	28.03	44.64	37.18	44.66	0.000110	1.07	77022.42	14114.83	0.07
reach_5	10697.89	FEMA	01	81000.00	28.75	44.63	36.52	44.65	0.000098	1.03	79978.63	14189.54	0.07
reach_5	10697.89	FEMA	02	81000.00	28.75	44.64	36.52	44.65	0.000098	1.02	80035.24	14190.00	0.07
reach_5	10697.89	FEMA	01+temp	81000.00	28.75	44.66	36.52	44.67	0.000097	1.02	80286.84	14192.07	0.07
reach_5	10819.66	FEMA	01	81000.00	27.90	44.65	35.87	44.66	0.000088	0.98	84607.98	14268.84	0.07
reach_5	10819.66	FEMA	02	81000.00	27.90	44.65	35.87	44.67	0.000088	0.97	84668.39	14268.92	0.07
reach_5	10819.66	FEMA	01+temp	81000.00	27.90	44.67	35.87	44.69	0.000087	0.97	84936.70	14269.26	0.07
reach_5	10976.11	FEMA	01	81000.00	28.06	44.66	35.05	44.67	0.000077	0.93	88347.02	14490.56	0.06
reach_5	10976.11	FEMA	02	81000.00	28.06	44.67	35.05	44.68	0.000077	0.93	88409.87	14490.61	0.06
reach_5	10976.11	FEMA	01+temp	81000.00	28.06	44.69	35.05	44.70	0.000076	0.93	88688.98	14490.81	0.06
reach_5	11241.99	FEMA	01	81000.00	28.27	44.68	36.09	44.69	0.000075	0.89	91031.95	14624.57	0.06
reach_5	11241.99	FEMA	02	81000.00	28.27	44.69	36.09	44.70	0.000075	0.89	91094.75	14624.61	0.06
reach_5	11241.99	FEMA	01+temp	81000.00	28.27	44.71	36.09	44.72	0.000074	0.89	91374.00	14624.75	0.06
reach_5	11624.10	FEMA	01	81000.00	23.59	44.71	34.98	44.72	0.000072	0.88	93115.94	14962.07	0.06
reach_5	11624.10	FEMA	02	81000.00	23.59	44.71	34.98	44.73	0.000072	0.88	93179.89	14962.11	0.06
reach_5	11624.10	FEMA	01+temp	81000.00	23.59	44.73	34.98	44.75	0.000071	0.88	93464.16	14962.30	0.06
reach_5	11958.70	FEMA	01	81000.00	28.91	44.74	35.90	44.75	0.000119	1.06	76548.16	13759.36	0.08
reach_5	11958.70	FEMA	02	81000.00	28.91	44.74	35.90	44.76	0.000119	1.06	76603.82	13760.85	0.08
reach_5	11958.70	FEMA	01+temp	81000.00	28.91	44.76	35.90	44.78	0.000118	1.05	76851.09	13767.38	0.08
reach_5	12317.60	FEMA	01	81000.00	28.52	44.79	38.25	44.83	0.000316	1.52	53349.71	13240.82	0.12
reach_5	12317.60	FEMA	02	81000.00	28.52	44.79	38.25	44.83	0.000316	1.52	53395.84	13243.33	0.12
reach_5	12317.60	FEMA	01+temp	81000.00	28.52	44.81	38.25	44.85	0.000312	1.51	53601.02	13254.50	0.12
reach_5	12674.99	FEMA	01	81000.00	31.28	44.91	38.71	44.96	0.000394	1.63	49665.54	12938.00	0.13
reach_5	12674.99	FEMA	02	81000.00	31.28	44.92	38.71	44.96	0.000393	1.63	49706.91	12939.88	0.13
reach_5	12674.99	FEMA	01+temp	81000.00	31.28	44.93	38.71	44.98	0.000388	1.62	49890.97	12948.25	0.13
reach_5	13129.82	FEMA	01	81000.00	22.88	45.05	35.56	45.08	0.000182	1.29	62826.98	13219.77	0.09
reach_5	13129.82	FEMA	02	81000.00	22.88	45.05	35.56	45.08	0.000181	1.29	62865.93	13220.84	0.09
reach_5	13129.82	FEMA	01+temp	81000.00	22.88	45.07	35.56	45.09	0.000180	1.29	63039.28	13225.61	0.09
reach_5	13502.94	FEMA	01	81000.00	24.94	45.16	38.60	45.20	0.000407	1.41	51839.90	12035.64	0.13
reach_5	13502.94	FEMA	02	81000.00	24.94	45.16	38.60	45.20	0.000406	1.41	51880.36	12041.05	0.13
reach_5	13502.94	FEMA	01+temp	81000.00	24.94	45.18	38.72	45.22	0.000403	1.41	52059.50	12058.82	0.13
reach_5	13887.86	FEMA	01	81000.00	31.36	45.51	41.01	45.58	0.001013	1.64	39034.15	11393.16	0.19
reach_5	13887.86	FEMA	02	81000.00	31.36	45.51	41.01	45.59	0.001011	1.64	39063.75	11395.62	0.19
reach_5	13887.86	FEMA	01+temp	81000.00	31.36	45.52	41.01	45.60	0.001002	1.64	39193.68	11409.78	0.18
reach_5	14326.09	FEMA	01	81000.00	35.65	46.57	45.35	46.94	0.009315	4.89	16580.69	5671.06	0.50
reach_5	14326.09	FEMA	02	81000.00	35.65	46.57	45.35	46.94	0.009312	4.88	16582.61	5671.27	0.50
reach_5	14326.09	FEMA	01+temp	81000.00	35.65	46.58	45.35	46.95	0.009296	4.88	16592.56	5672.35	0.50
reach_5	14758.10	FEMA	01	81000.00	30.22	48.24	45.61	48.40	0.001693	3.21	25209.25	6087.63	0.28
reach_5	14758.10	FEMA	02	81000.00	30.22	48.24	45.61	48.40	0.001693	3.21	25209.62	6087.64	0.28
reach_5	14758.10	FEMA	01+temp	81000.00	30.22	48.24	45.61	48.40	0.001693	3.21	25211.50	6087.74	0.28
reach_5	15199.55	FEMA	01	81000.00	30.33	48.91	45.93	49.01	0.001130	2.62	30948.49	7292.53	0.22
reach_5	15199.55	FEMA	02	81000.00	30.33	48.91	45.93	49.01	0.001130	2.62	30948.73	7292.54	0.22
reach_5	15199.55	FEMA	01+temp	81000.00	30.33	48.91	45.93	49.01	0.001130	2.62	30950.04	7292.58	0.22
reach_5	15689.11	FEMA	01	81000.00	29.31	49.45	46.28	49.55	0.001072	2.58	31403.09	7268.61	0.22
reach_5	15689.11	FEMA	02	81000.00	29.31	49.45	46.28	49.55	0.001072	2.58	31403.26	7268.62	0.22
reach_5	15689.11	FEMA	01+temp	81000.00	29.31	49.45	46.28	49.55	0.001072	2.58	31404.12	7268.67	0.22
reach_5	16161.12	FEMA	01	81000.00	30.13	49.93	46.54	50.02	0.000893	2.31	35005.00	8316.29	0.20
reach_5	16161.12	FEMA	02	81000.00	30.13	49.93	46.54	50.02	0.000893	2.31	35005.15	8316.30	0.20
reach_5	16161.12	FEMA	01+temp	81000.00	30.13	49.93	46.54	50.02	0.000893	2.31	35005.86	8316.38	0.20
reach_5	16691.64	FEMA	01	81000.00	31.95	50.39	46.36	50.46	0.000775	2.17	37384.26	8809.50	0.19
reach_5	16691.64	FEMA	02	81000.00	31.95	50.39	46.36	50.46	0.000775	2.17	37384.37	8809.51	0.19
reach_5	16691.64	FEMA	01+temp	81000.00	31.95	50.39	46.36	50.46	0.000775	2.17	37384.94	8809.54	0.19
reach_5	17107.32	FEMA	01	81000.00	30.50	50.68	46.29	50.75	0.000633	2.05	39436.23	8649.85	0.17
reach_5	17107.32	FEMA	02	81000.00	30.50	50.68	46.29	50.75	0.000633	2.05	39436.30	8649.86	0.17
reach_5	17107.32	FEMA	01+temp	81000.00	30.50	50.68	46.29	50.75	0.000633	2.05	39436.73	8649.87	0.17
reach_5	17499.39	FEMA	01	81000.00	30.28	51.00	47.25	51.13	0.001447	2.83	28618.09	7215.38	0.25
reach_5	17499.39	FEMA	02	81000.00	30.28	51.00	47.25	51.13	0.001447	2.83	28618.12	7215.38	0.25
reach_5	17499.39	FEMA	01+temp	81000.00	30.28	51.00	47.25	51.13	0.001447	2.83	28618.42	7215.39	0.25
reach_5	17958.32	FEMA	01	81000.00	30.90	51.63	47.72	51.74	0.001245	2.66	30467.34	7539.37	0.23
reach_5	17958.32	FEMA	02	81000.00	30.90	51.63	47.72	51.74	0.001245	2.66	30467.37	7539.37	0.23

No. 19431 - Attachment D - Hydraulic Profile Information

HEC-RAS River: main Reach: reach_5 Profile: FEMA (Continued)

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
reach_5	17958.32	FEMA	01+temp	81000.00	30.90	51.63	47.72	51.74	0.001245	2.66	30467.57	7539.39	0.23
reach_5	18380.62	FEMA	01	81000.00	31.84	52.17	47.92	52.29	0.001326	2.81	28861.40	6900.97	0.24
reach_5	18380.62	FEMA	02	81000.00	31.84	52.17	47.92	52.29	0.001326	2.81	28861.40	6900.97	0.24
reach_5	18380.62	FEMA	01+temp	81000.00	31.84	52.17	47.92	52.29	0.001326	2.81	28861.54	6900.98	0.24
reach_5	18753.50	FEMA	01	81000.00	35.44	52.57	48.04	52.65	0.000724	2.31	35027.65	7114.47	0.18
reach_5	18753.50	FEMA	02	81000.00	35.44	52.57	48.04	52.65	0.000724	2.31	35027.65	7114.47	0.18
reach_5	18753.50	FEMA	01+temp	81000.00	35.44	52.57	48.04	52.65	0.000724	2.31	35027.77	7114.47	0.18
reach_5	19146.22	FEMA	01	81000.00	35.36	52.81	48.10	52.87	0.000422	1.90	42628.13	7841.23	0.14
reach_5	19146.22	FEMA	02	81000.00	35.36	52.81	48.10	52.87	0.000422	1.90	42628.13	7841.23	0.14
reach_5	19146.22	FEMA	01+temp	81000.00	35.36	52.81	48.10	52.87	0.000422	1.90	42628.21	7841.24	0.14
reach_5	19613.67	FEMA	01	81000.00	35.02	53.00	48.18	53.04	0.000316	1.66	48904.11	8852.12	0.12
reach_5	19613.67	FEMA	02	81000.00	35.02	53.00	48.18	53.04	0.000316	1.66	48904.11	8852.12	0.12
reach_5	19613.67	FEMA	01+temp	81000.00	35.02	53.00	48.18	53.04	0.000316	1.66	48904.22	8852.13	0.12
reach_5	20046.06	FEMA	01	81000.00	36.23	53.15	48.68	53.20	0.000419	1.82	44400.98	8548.50	0.14
reach_5	20046.06	FEMA	02	81000.00	36.23	53.15	48.68	53.20	0.000419	1.82	44400.98	8548.50	0.14
reach_5	20046.06	FEMA	01+temp	81000.00	36.23	53.15	48.68	53.20	0.000419	1.82	44401.07	8548.51	0.14
reach_5	20424.37	FEMA	01	81000.00	35.99	53.29	48.73	53.34	0.000312	1.65	49224.53	8857.89	0.12
reach_5	20424.37	FEMA	02	81000.00	35.99	53.29	48.73	53.34	0.000312	1.65	49224.53	8857.89	0.12
reach_5	20424.37	FEMA	01+temp	81000.00	35.99	53.29	48.62	53.34	0.000312	1.65	49224.62	8857.89	0.12
reach_5	20892.62	FEMA	01	81000.00	36.07	53.47	49.69	53.52	0.000499	1.90	42603.70	8788.97	0.15
reach_5	20892.62	FEMA	02	81000.00	36.07	53.47	49.69	53.52	0.000499	1.90	42603.70	8788.97	0.15
reach_5	20892.62	FEMA	01+temp	81000.00	36.07	53.47	49.68	53.52	0.000499	1.90	42603.80	8788.97	0.15
reach_5	21312.55	FEMA	01	81000.00	36.08	53.68	49.93	53.74	0.000521	1.95	41502.69	8492.57	0.16
reach_5	21312.55	FEMA	02	81000.00	36.08	53.68	49.93	53.74	0.000521	1.95	41502.69	8492.57	0.16
reach_5	21312.55	FEMA	01+temp	81000.00	36.08	53.68	49.94	53.74	0.000521	1.95	41502.80	8492.57	0.16
reach_5	21706.73	FEMA	01	81000.00	34.91	53.91	50.27	53.99	0.000765	2.18	37167.66	8601.73	0.18
reach_5	21706.73	FEMA	02	81000.00	34.91	53.91	50.27	53.99	0.000765	2.18	37167.66	8601.73	0.18
reach_5	21706.73	FEMA	01+temp	81000.00	34.91	53.91	50.26	53.99	0.000765	2.18	37167.70	8601.73	0.18
reach_5	22111.71	FEMA	01	81000.00	36.17	54.22	50.39	54.29	0.000749	2.22	36448.28	8225.82	0.19
reach_5	22111.71	FEMA	02	81000.00	36.17	54.22	50.39	54.29	0.000749	2.22	36448.28	8225.82	0.19
reach_5	22111.71	FEMA	01+temp	81000.00	36.17	54.22	50.39	54.29	0.000749	2.22	36448.31	8225.82	0.19
reach_5	22470.67	FEMA	01	81000.00	35.14	54.50	50.55	54.59	0.000870	2.29	35380.90	8344.19	0.20
reach_5	22470.67	FEMA	02	81000.00	35.14	54.50	50.55	54.59	0.000870	2.29	35380.90	8344.19	0.20
reach_5	22470.67	FEMA	01+temp	81000.00	35.14	54.50	50.55	54.59	0.000870	2.29	35380.93	8344.19	0.20
reach_5	22908.19	FEMA	01	81000.00	35.62	54.87	51.18	54.95	0.000787	2.24	36238.10	8484.53	0.19
reach_5	22908.19	FEMA	02	81000.00	35.62	54.87	51.18	54.95	0.000787	2.24	36238.10	8484.53	0.19
reach_5	22908.19	FEMA	01+temp	81000.00	35.62	54.87	51.18	54.95	0.000787	2.24	36238.14	8484.53	0.19
reach_5	23315.78	FEMA	01	81000.00	36.02	55.29	52.71	55.42	0.001753	2.91	27842.64	7754.60	0.27
reach_5	23315.78	FEMA	02	81000.00	36.02	55.29	52.71	55.42	0.001753	2.91	27842.64	7754.60	0.27
reach_5	23315.78	FEMA	01+temp	81000.00	36.02	55.29	52.71	55.42	0.001753	2.91	27842.64	7754.60	0.27
reach_5	23787.47	FEMA	01	81000.00	36.50	55.94	51.91	56.03	0.000977	2.44	33262.88	8054.98	0.21
reach_5	23787.47	FEMA	02	81000.00	36.50	55.94	51.91	56.03	0.000977	2.44	33262.88	8054.98	0.21
reach_5	23787.47	FEMA	01+temp	81000.00	36.50	55.94	51.91	56.03	0.000977	2.44	33262.88	8054.98	0.21
reach_5	24475.34	FEMA	01	81000.00	37.99	56.56	52.41	56.65	0.000823	2.36	34346.89	7619.93	0.19
reach_5	24475.34	FEMA	02	81000.00	37.99	56.56	52.41	56.65	0.000823	2.36	34346.89	7619.93	0.19
reach_5	24475.34	FEMA	01+temp	81000.00	37.99	56.56	52.41	56.65	0.000823	2.36	34346.89	7619.93	0.19
reach_5	24908.97	FEMA	01	81000.00	36.73	56.97	53.16	57.08	0.001153	2.66	30569.27	7594.69	0.23
reach_5	24908.97	FEMA	02	81000.00	36.73	56.97	53.16	57.08	0.001153	2.66	30569.27	7594.69	0.23
reach_5	24908.97	FEMA	01+temp	81000.00	36.73	56.97	53.16	57.08	0.001153	2.66	30569.27	7594.69	0.23
reach_5	25305.01	FEMA	01	81000.00	37.69	57.39	53.35	57.49	0.000948	2.51	32361.39	7660.37	0.21
reach_5	25305.01	FEMA	02	81000.00	37.69	57.39	53.35	57.49	0.000948	2.51	32361.39	7660.37	0.21
reach_5	25305.01	FEMA	01+temp	81000.00	37.69	57.39	53.35	57.49	0.000948	2.51	32361.39	7660.37	0.21
reach_5	25756.87	FEMA	01	81000.00	37.88	57.78	53.54	57.88	0.000781	2.49	32589.81	6546.43	0.19
reach_5	25756.87	FEMA	02	81000.00	37.88	57.78	53.54	57.88	0.000781	2.49	32589.81	6546.43	0.19
reach_5	25756.87	FEMA	01+temp	81000.00	37.88	57.78	53.54	57.88	0.000781	2.49	32589.81	6546.43	0.19
reach_5	26165.59	FEMA	01	81000.00	37.98	58.08	53.78	58.17	0.000632	2.32	35094.11	7095.18	0.17
reach_5	26165.59	FEMA	02	81000.00	37.98	58.08	53.78	58.17	0.000632	2.32	35094.11	7095.18	0.17
reach_5	26165.59	FEMA	01+temp	81000.00	37.98	58.08	53.78	58.17	0.000632	2.32	35094.11	7095.18	0.17
reach_5	26513.18	FEMA	01	81000.00	38.20	58.32	54.46	58.39	0.000675	2.21	36594.25	7616.65	0.18
reach_5	26513.18	FEMA	02	81000.00	38.20	58.32	54.46	58.39	0.000675	2.21	36594.25	7616.65	0.18

HEC-RAS River: main Reach: reach_5 Profile: FEMA (Continued) **No. 19431 - Attachment D - Hydraulic Profile Information**

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
reach_5	26513.18	FEMA	01+temp	81000.00	38.20	58.32	54.46	58.39	0.000675	2.21	36594.25	7616.65	0.18
reach_5	26843.62	FEMA	01	81000.00	38.63	58.56	54.92	58.65	0.000893	2.39	33821.42	7791.23	0.20
reach_5	26843.62	FEMA	02	81000.00	38.63	58.56	54.92	58.65	0.000893	2.39	33821.42	7791.23	0.20
reach_5	26843.62	FEMA	01+temp	81000.00	38.63	58.56	54.92	58.65	0.000893	2.39	33821.42	7791.23	0.20
reach_5	27176.35	FEMA	01	81000.00	38.94	58.83	54.84	58.91	0.000688	2.24	36148.32	7545.69	0.18
reach_5	27176.35	FEMA	02	81000.00	38.94	58.83	54.84	58.91	0.000688	2.24	36148.32	7545.69	0.18
reach_5	27176.35	FEMA	01+temp	81000.00	38.94	58.83	54.84	58.91	0.000688	2.24	36148.32	7545.69	0.18
reach_5	27631.01	FEMA	01	81000.00	39.24	59.12	54.44	59.19	0.000526	2.02	40100.00	7723.15	0.16
reach_5	27631.01	FEMA	02	81000.00	39.24	59.12	54.44	59.19	0.000526	2.02	40100.00	7723.15	0.16
reach_5	27631.01	FEMA	01+temp	81000.00	39.24	59.12	54.44	59.19	0.000526	2.02	40100.00	7723.15	0.16
reach_5	27969.09	FEMA	01	81000.00	39.33	59.30	54.89	59.36	0.000491	2.01	40380.77	7745.30	0.15
reach_5	27969.09	FEMA	02	81000.00	39.33	59.30	54.89	59.36	0.000491	2.01	40380.77	7745.30	0.15
reach_5	27969.09	FEMA	01+temp	81000.00	39.33	59.30	54.89	59.36	0.000491	2.01	40380.77	7745.30	0.15
reach_5	28358.25	FEMA	01	81000.00	40.05	59.49	54.98	59.54	0.000434	1.84	44024.39	8450.44	0.14
reach_5	28358.25	FEMA	02	81000.00	40.05	59.49	54.98	59.54	0.000434	1.84	44024.39	8450.44	0.14
reach_5	28358.25	FEMA	01+temp	81000.00	40.05	59.49	54.98	59.54	0.000434	1.84	44024.39	8450.44	0.14
reach_5	28706.94	FEMA	01	81000.00	40.06	59.66	55.55	59.73	0.000688	2.18	37136.57	7948.42	0.18
reach_5	28706.94	FEMA	02	81000.00	40.06	59.66	55.55	59.73	0.000688	2.18	37136.57	7948.42	0.18
reach_5	28706.94	FEMA	01+temp	81000.00	40.06	59.66	55.55	59.73	0.000688	2.18	37136.57	7948.42	0.18
reach_5	29072.78	FEMA	01	81000.00	40.19	59.93	55.80	60.03	0.000897	2.55	31808.32	6574.93	0.20
reach_5	29072.78	FEMA	02	81000.00	40.19	59.93	55.80	60.03	0.000897	2.55	31808.32	6574.93	0.20
reach_5	29072.78	FEMA	01+temp	81000.00	40.19	59.93	55.80	60.03	0.000897	2.55	31808.32	6574.93	0.20
reach_5	29473.90	FEMA	01	81000.00	40.70	60.28	56.04	60.39	0.000916	2.70	30046.90	5959.57	0.21
reach_5	29473.90	FEMA	02	81000.00	40.70	60.28	56.04	60.39	0.000916	2.70	30046.90	5959.57	0.21
reach_5	29473.90	FEMA	01+temp	81000.00	40.70	60.28	56.04	60.39	0.000916	2.70	30046.90	5959.57	0.21
reach_5	29894.96	FEMA	01	81000.00	41.00	60.67	56.62	60.79	0.000963	2.83	28628.11	5504.29	0.21
reach_5	29894.96	FEMA	02	81000.00	41.00	60.67	56.62	60.79	0.000963	2.83	28628.11	5504.29	0.21
reach_5	29894.96	FEMA	01+temp	81000.00	41.00	60.67	56.62	60.79	0.000963	2.83	28628.11	5504.29	0.21
reach_5	30303.90	FEMA	01	81000.00	41.81	61.08	57.13	61.21	0.001075	2.97	27308.31	5153.59	0.23
reach_5	30303.90	FEMA	02	81000.00	41.81	61.08	57.13	61.21	0.001075	2.97	27308.31	5153.59	0.23
reach_5	30303.90	FEMA	01+temp	81000.00	41.81	61.08	57.13	61.21	0.001075	2.97	27308.31	5153.59	0.23

Existing Bridge = Short ID 01

Proposed Bridge = Short ID 02

Temporary Bridge = Short ID 01+temp

No. 19431 - Attachment D - Hydraulic Profile Information

