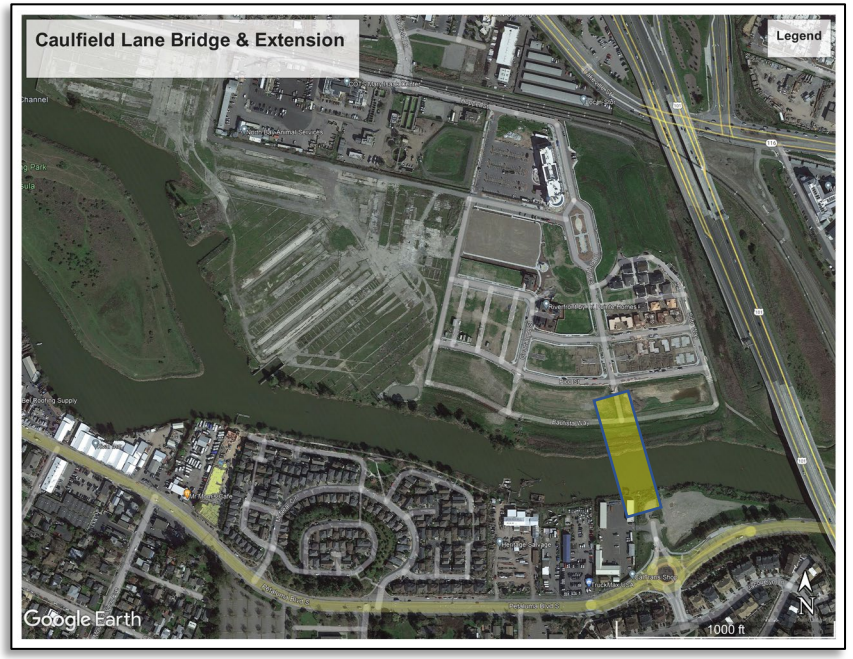
Caulfield Bridge & Extension Project

- Original Scope
  - Contract executed July 2, 2018
  - Preliminary Bridge Conceptual Engineering Report
    - Traffic Analysis- review existing data
    - Environmental Considerations
    - Prelim Bridge Alignment
    - US Coast Guard
    - Hydraulic Analysis
    - Structure Type Feasibility – APS GP&E
    - Structure Foundation Report
    - Preliminary Cost Estimate
    - Prelim Evaluation of Long-Term Operations & Maintenance
    - Project Stakeholders List



- Prelim Environmental Screening
- Risk Management Plan
- Utility Evaluation
- Construction Methodology
- Preliminary Aesthetic Details
- Project Schedule

Environmental Clearance Strategy

- **Documentation**
  - Assumed the City of Petaluma will be the Lead Agency with respect to the CEQA process and that the USCG will be the Lead Agency for NEPA
  - Based on available information, it is anticipated that an Initial Study (IS) is appropriate under CEQA. [IS-MND]
  - The appropriate level of NEPA documentation would be an Environmental Assessment. [EA-FONSI]
  - Both these assumptions will require that potential impacts would be avoided or mitigated to less than significant levels.
  - *If the City feels that there may be significant opposition to the project an EIR may be the best choice.*
- **Permit Acquisition** - The following permits or public agency approvals are anticipated to be required for the project:
  - USCG Bridge Permit
  - USACE CWA Section 404
    - A preliminary wetland delineation has been performed.
  - SFBRWQCB CWA Section 401
  - USFWS – ESA Section 7 Consultation; Biological Assessment [BA] with respect to fisheries issues
  - CDFW – Section 1602
  - CA State Lands Commission – Submerged Lands Lease
  - Tribal Consultation – under AB 52 and NHPA Section 106
- **Pre-application meetings with permitting agencies** are recommended as early in the process as feasible
  - to review project design features, and
  - discuss best management practices to minimize or avoid impacts, and
  - To identify typical mitigation measures.
- **References**

AECOM, 2020a. Draft Jurisdictional Delineation for the Caulfield Bridge and Extension Project, City of Petaluma, Sonoma County. June 2020.
AECOM, 2020b. Preliminary Biological Resources Memorandum for the Caulfield Bridge and Extension Project, City of Petaluma, Sonoma County. June 2020
AECOM, 2020c. Preliminary Cultural Resources Assessment, Proposed Caulfield Bridge, Petaluma, Sonoma County, CA. June 2020.
United States Coast Guard (USCG), 2019. Preliminary Clearance Determination, July 15.

Traffic Impact Study

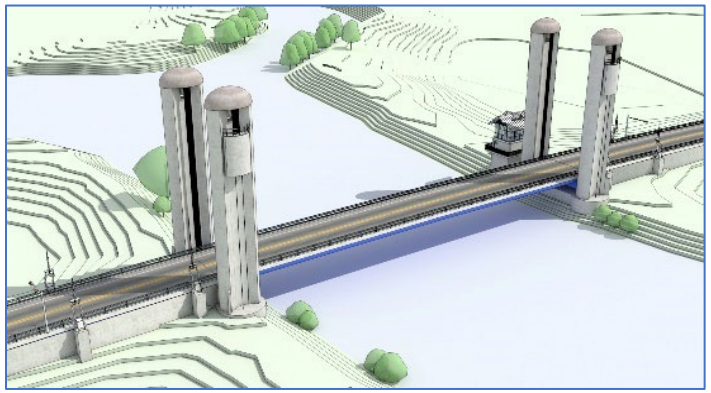
- Summary
  - An operational analysis was performed
  - Study area included 9 intersections
  - VMT was assessed for the Caulfield Bridge and Rainier Avenue extension to Petaluma Boulevard North [w/wo US 101 ramps]
    - VMT is slightly reduced for both the 2040 with Caulfield Bridge and the Rainier Extension without US 101 ramps
  - The intersection at Caulfield Lane/Lakeville Street will degrade to LOS F under Future with Bridge conditions.
    - To improve to LOS D or better would require widening, which would be in conflict with Petaluma's General Plan multi-modal objectives
  - Alternative Modes
    - The bridge will provide a critical link for ped/bike across the Petaluma River
    - Pedestrian markings of SMART at-grade crossing at Hooper recommended

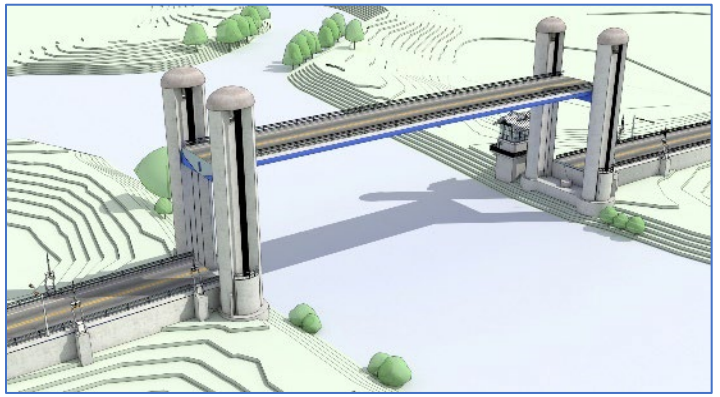
Structure Type Considerations

Movable Span Type	Bobtail Swing	Vertical Lift	Double Leaf Bascule	Single Leaf Bascule (Overhead Counterweight)	Single Leaf Bascule (Underdeck Counterweight)
Vertical Clearance	Unlimited	80 – 85 feet	Unlimited	Unlimited	Unlimited
Channel Width	115 feet	Unrestricted	115 feet	115 feet	115 feet
Alignment	Offset	Existing	Offset	Offset	Offset
Flow Obstruction Width	30 feet	None	40 feet	6.5 feet	6.5 feet
Operating Time	75 – 90 seconds	90 – 120 seconds	60 – 75 seconds	75 – 90 seconds	75 – 90 seconds
Equipment Maintenance	Moderate	Moderate	Moderate	Low	Low
Equipment Location	Below deck	Below deck and tower	Below deck	Above and Below deck	Below deck
Redundant Operation	No	No	Yes	No	No
Overhead Structure	No	Yes	No	Yes	No
Deck Surface	Concrete	Epoxy Wearing Surface	Concrete	Concrete	Concrete
Bridge Closure Required	Limited	Extended	None	None	None
River Closure Required	Limited	Limited	Limited	Limited	Limited
Levee Pier Excavation	Limited	Limited	Limited	Limited	Extensive
Navigational Hazard	Moderate	None	Low	Low	Low

Structure Type Considerations

- Lift spans were quickly eliminated from consideration
- Would require clear span of the channel
- Would need to match vertical clear of 70 feet above MHW at US 101





4 FREEBOARD CRITERIA

Because Petaluma River is a navigable waterway, freeboard criteria from the USCG was used to evaluate the freeboard of the proposed Petaluma River bridge. See Table 3 for the USCG freeboard criteria stated in the Completion Report dated June 9, 1981.

Table 3. USCG Freeboard Criteria for Petaluma River Bridge

Type of Clearance	Clearance Distance
Horizontal	100 ft (between) - 135 ft (actual)
Vertical	76 ft above Mean Lower-Low Water (MLLW)
	70 ft above Mean High Water (MHW)

Source: Communication Record, see Appendix D

The Mean Lower-Low Water (MLLW) and Mean High Water (MHW) elevations of Petaluma River at the proposed Petaluma River bridge were based on the water elevations recorded in NOAA's tidal bench mark No. 94155584, located approximately 300 ft downstream from the Petaluma River bridge (see Figure 7). Specifications of the bench mark are available in Table 4 and Appendix E.

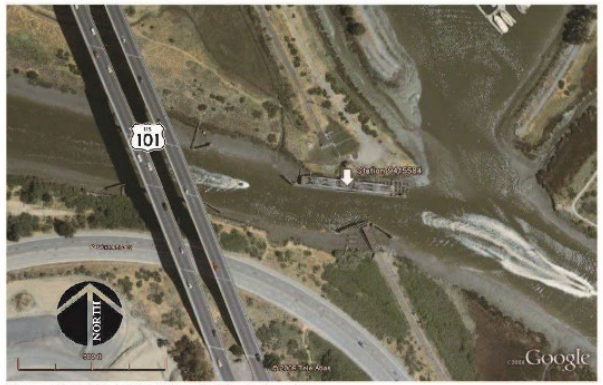
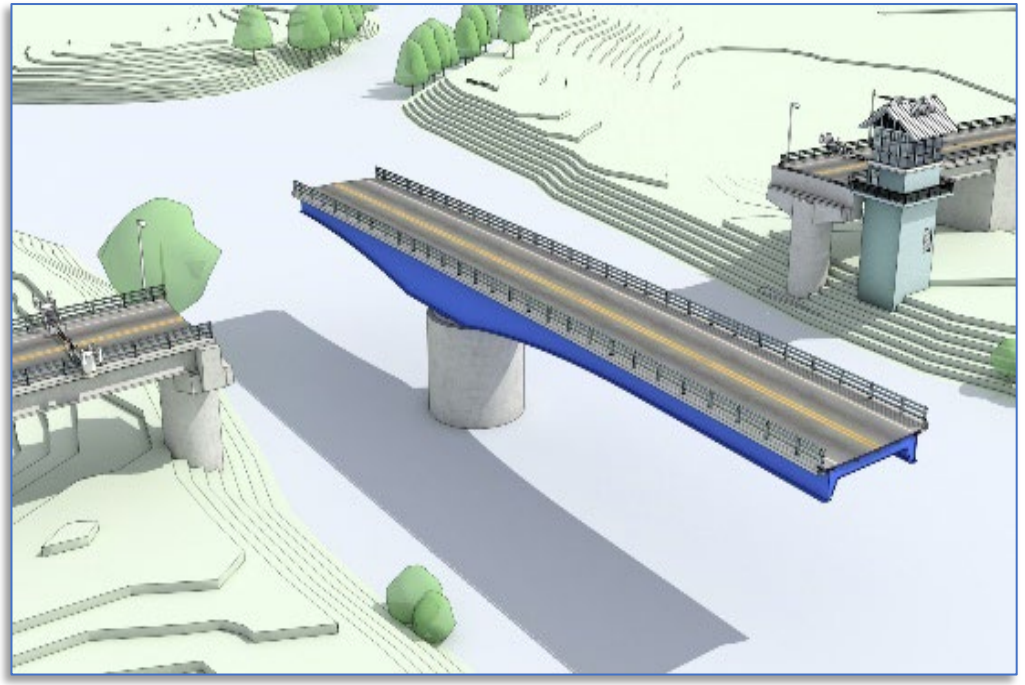


Figure 7. NOAA Tidal Bench Mark Location

Source: Google

Structure Type Considerations

- Obstruction to flow and superstructure depth quickly eliminated both balanced and “bobtail” swing type spans from consideration

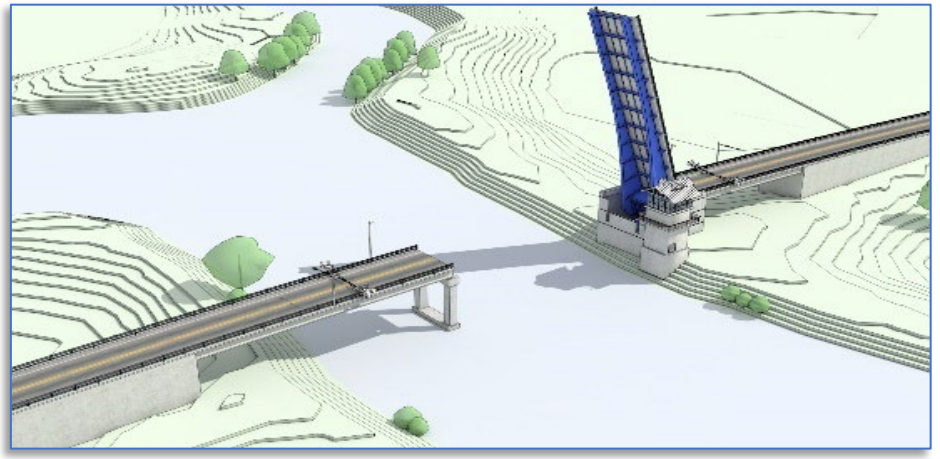


Structure Type Considerations

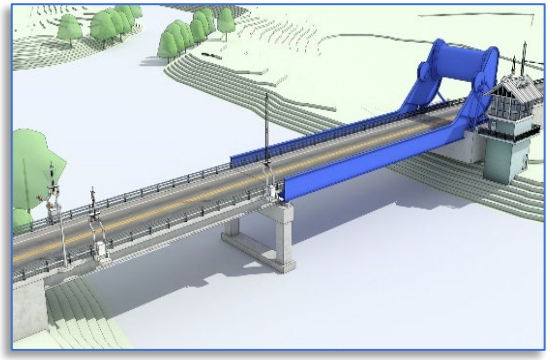
- Dual Leaf bascule with below deck counterweight
- Less visual impact
- With a back span, the bascule pier presents significant obstruction to flow

Structure Type Considerations

- Single leaf bascule spans reduced obstruction to flow by minimizing the substructure elements within the waterway

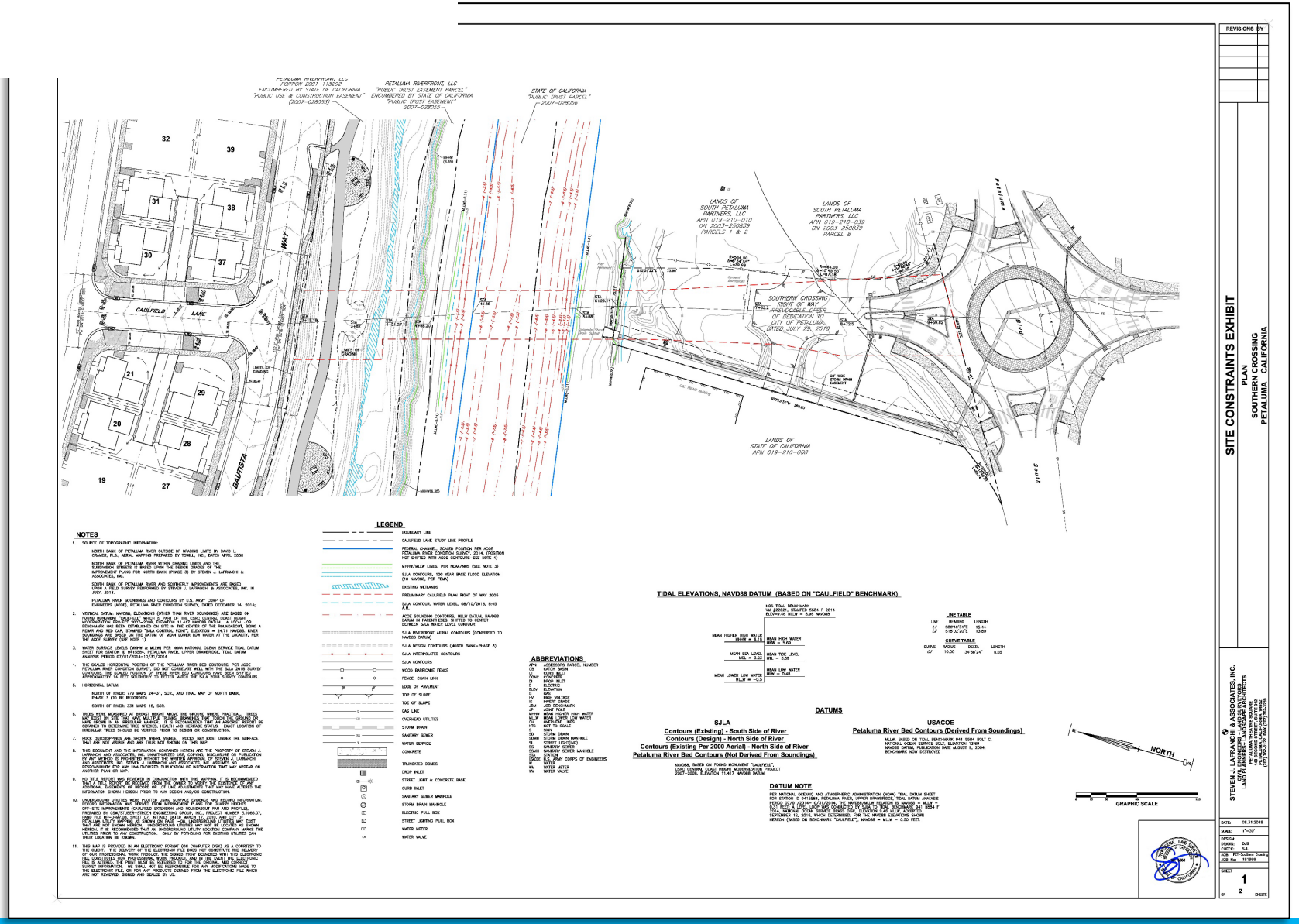


- Rolling leaf bascule with below deck configuration requires increase of roadway profile to accommodate structure depth
- Overhead counterweight, reduced structure depth
- Fender system not shown



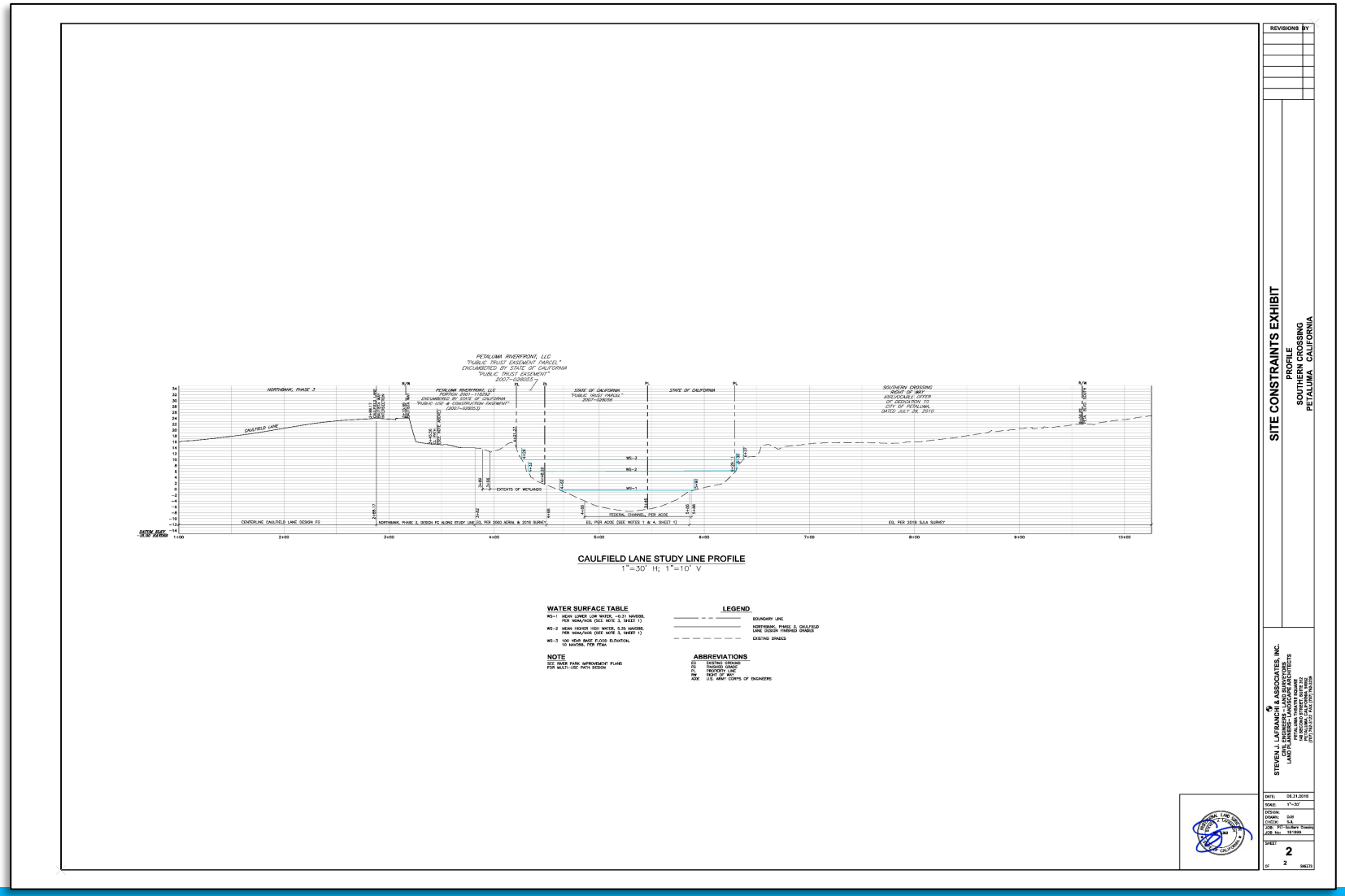
Structure Type Considerations
USCG Coordination

- Compiled available topo and bathymetry data and generated preliminary alignments: horizontal & vertical



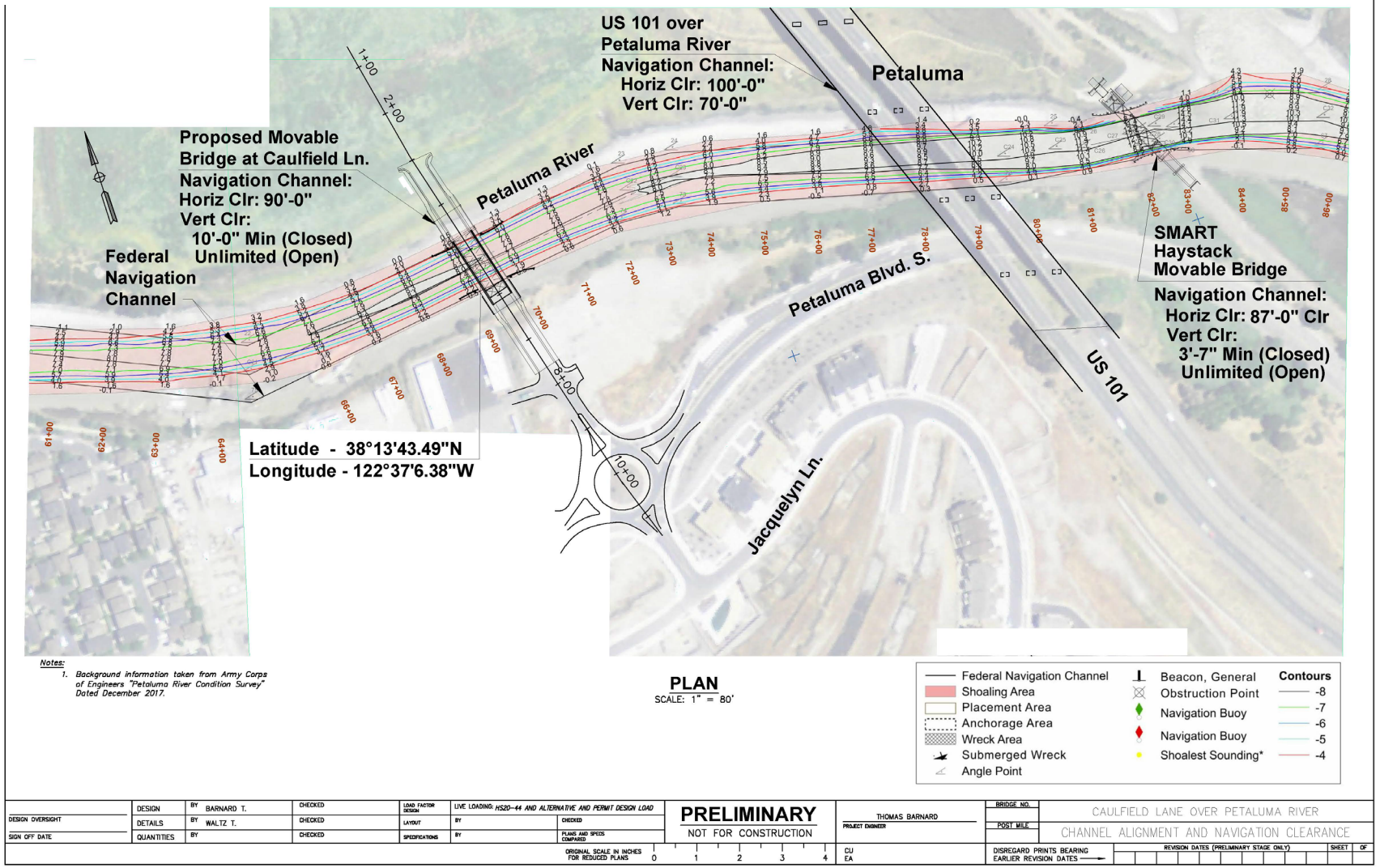
Structure Type Considerations
USCG Coordination

- Channel cross-section along the alignment of the proposed road showing the limits of the “Federal Channel per USACOE
- Water surface elevations for MLLW, MHW and 100 year - Base Flood



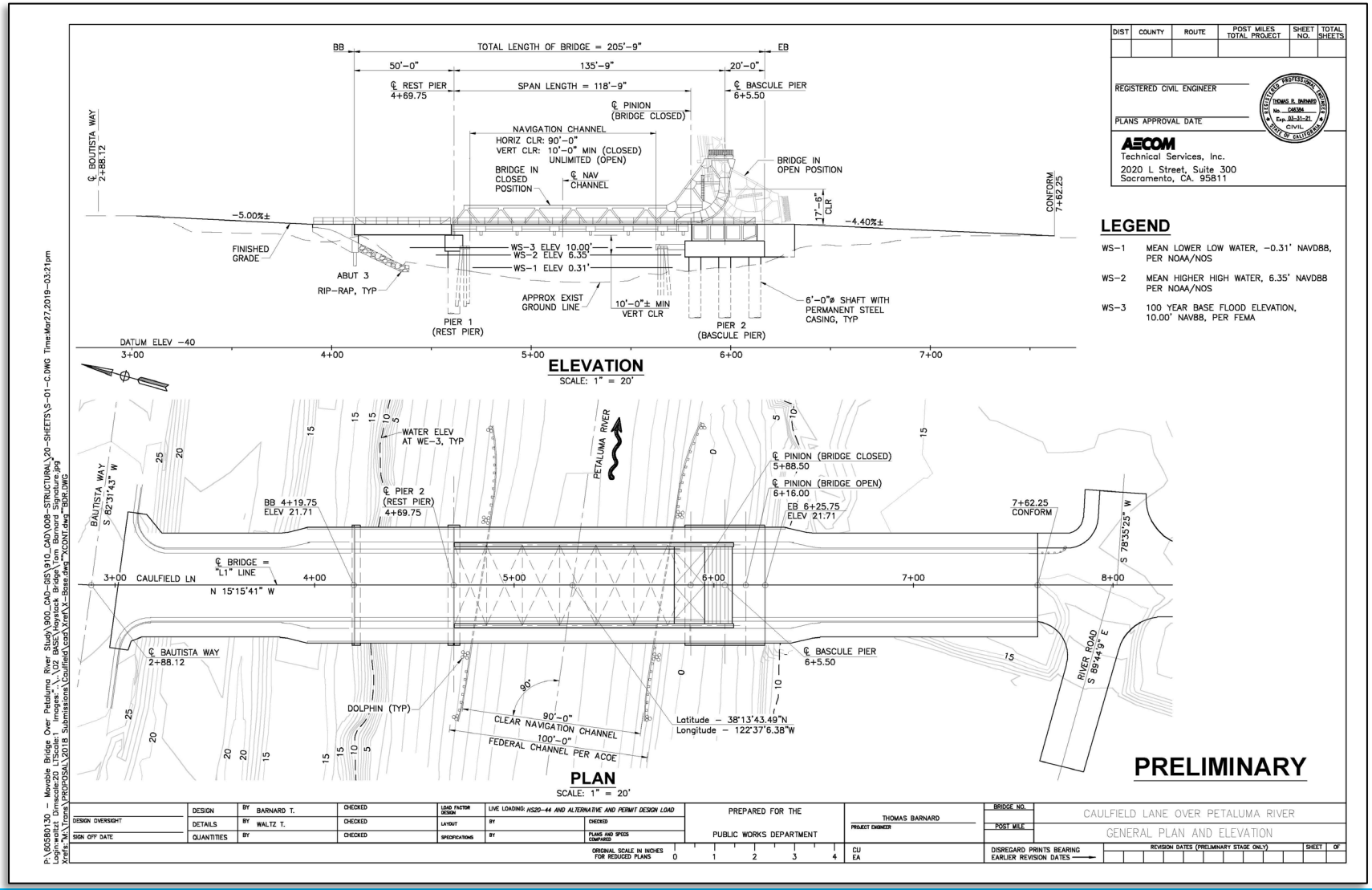
Structure Type Considerations
USCG Coordination

- Draft layout went to Carl Hausner at USCG early December 2018.



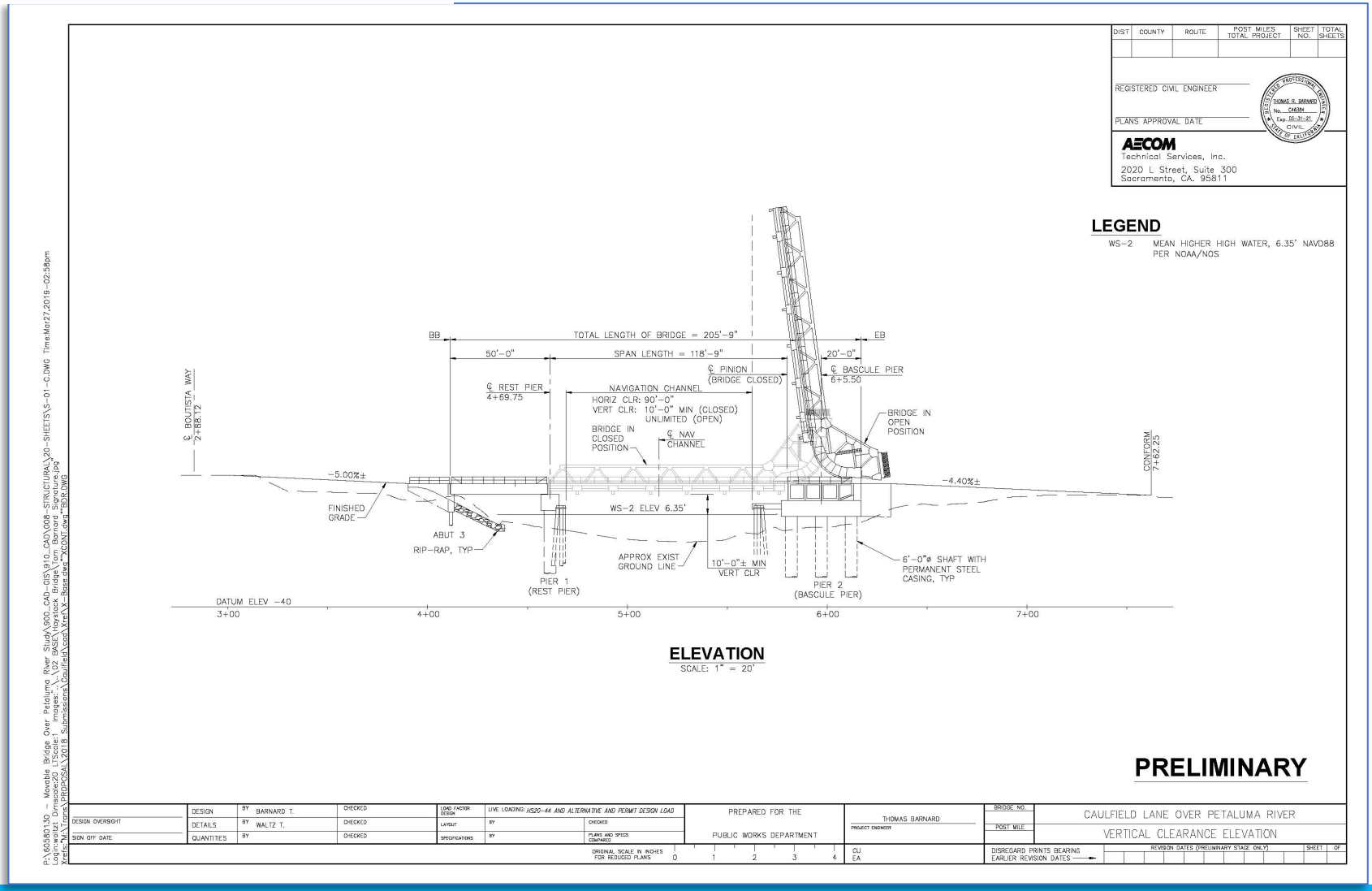
Structure Type Considerations
USCG Coordination

- The rolling leaf bascule with overhead counterweight allowed the roadway profile to conform within the limited space, while still providing the minimum vertical navigation clear in the closed position.
- Profile adjustment may be required during final design to meet ADA



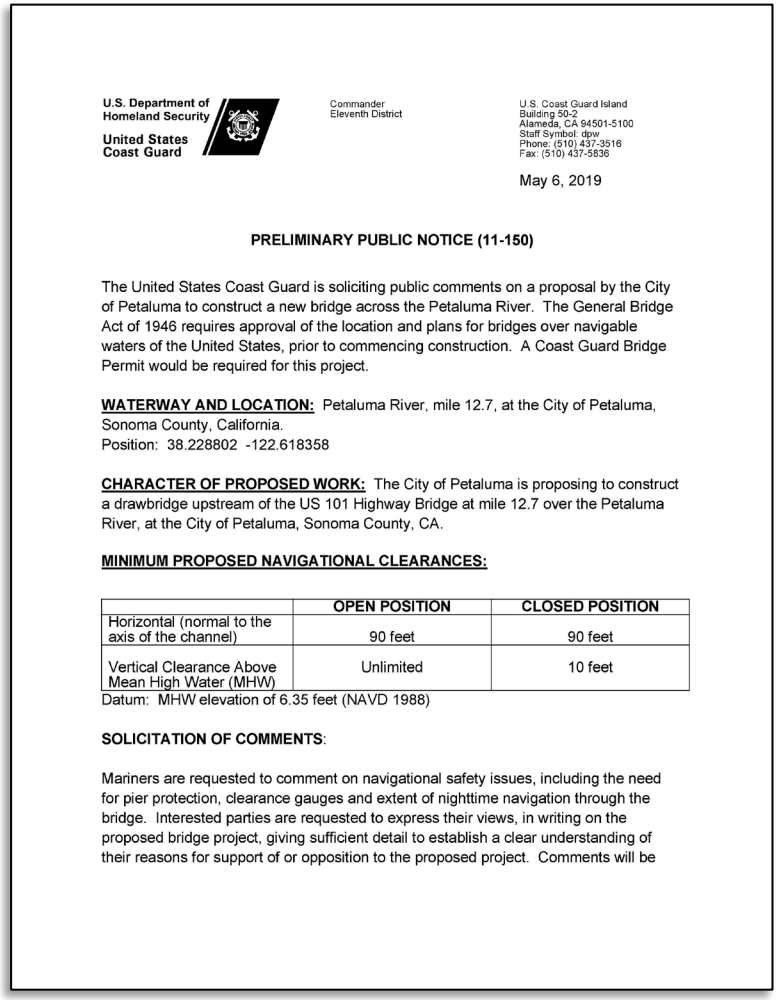
Structure Type Considerations
USCG Coordination

- Configuration shown used for the USCG circulation for comments/ letter to mariners.
- Proposed span shown in open position.
- Required fender system shown defines limits of navigation channel



Structure Type Considerations
USCG Coordination

- "Preliminary Public Notice (11-150)", circulated May 6, 2019.
- Comments were due June 5, 2019



U.S. Department of Homeland Security
United States Coast Guard

Commander
Eleventh District

U.S. Coast Guard Island
Building 50-2
Alameda, CA 94501-5100
Staff Symbol: dpw
Phone: (510) 437-3516
Fax: (510) 437-5836

May 6, 2019

PRELIMINARY PUBLIC NOTICE (11-150)

The United States Coast Guard is soliciting public comments on a proposal by the City of Petaluma to construct a new bridge across the Petaluma River. The General Bridge Act of 1946 requires approval of the location and plans for bridges over navigable waters of the United States, prior to commencing construction. A Coast Guard Bridge Permit would be required for this project.

WATERWAY AND LOCATION: Petaluma River, mile 12.7, at the City of Petaluma, Sonoma County, California.
Position: 38.228802 -122.618358

CHARACTER OF PROPOSED WORK: The City of Petaluma is proposing to construct a drawbridge upstream of the US 101 Highway Bridge at mile 12.7 over the Petaluma River, at the City of Petaluma, Sonoma County, CA.

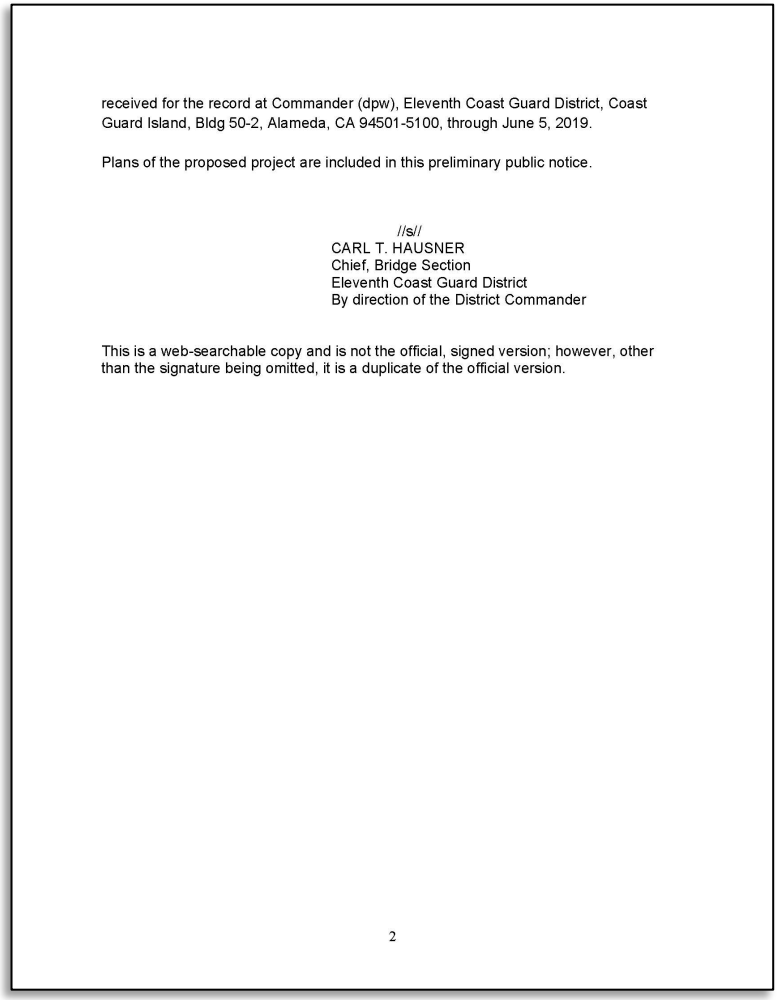
MINIMUM PROPOSED NAVIGATIONAL CLEARANCES:

	OPEN POSITION	CLOSED POSITION
Horizontal (normal to the axis of the channel)	90 feet	90 feet
Vertical Clearance Above Mean High Water (MHW)	Unlimited	10 feet

Datum: MHW elevation of 6.35 feet (NAVD 1988)

SOLICITATION OF COMMENTS:

Mariners are requested to comment on navigational safety issues, including the need for pier protection, clearance gauges and extent of nighttime navigation through the bridge. Interested parties are requested to express their views, in writing on the proposed bridge project, giving sufficient detail to establish a clear understanding of their reasons for support of or opposition to the proposed project. Comments will be



received for the record at Commander (dpw), Eleventh Coast Guard District, Coast Guard Island, Bldg 50-2, Alameda, CA 94501-5100, through June 5, 2019.

Plans of the proposed project are included in this preliminary public notice.

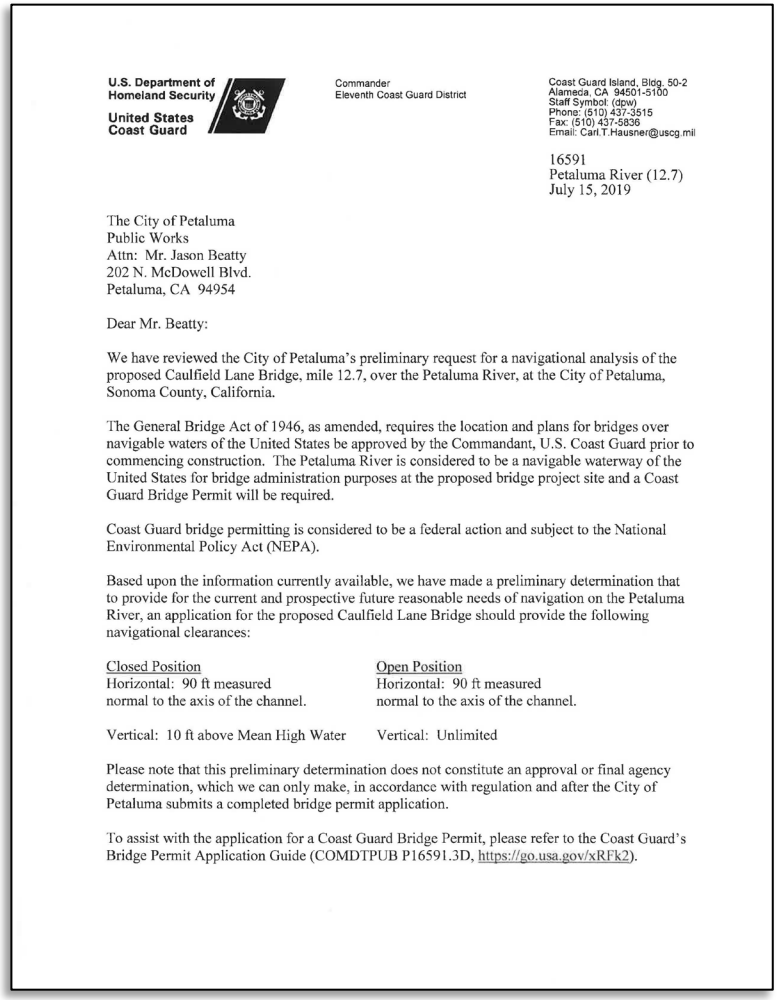
//s//
CARL T. HAUSNER
Chief, Bridge Section
Eleventh Coast Guard District
By direction of the District Commander

This is a web-searchable copy and is not the official, signed version; however, other than the signature being omitted, it is a duplicate of the official version.

2

Structure Type Considerations
USCG Coordination

- A preliminary determination was made that affirmed the proposed horizontal and vertical clears on July 15, 2019
- Contingent upon successful processing of a complete bridge permit application



U.S. Department of Homeland Security
United States Coast Guard

Commander
Eleventh Coast Guard District

Coast Guard Island, Bldg. 50-2
Alameda, CA 94501-5100
Staff Symbol: (dpw)
Phone: (510) 437-3515
Fax: (510) 437-5836
Email: Carl.T.Hausner@uscg.mil

16591
Petaluma River (12.7)
July 15, 2019

The City of Petaluma
Public Works
Attn: Mr. Jason Beatty
202 N. McDowell Blvd.
Petaluma, CA 94954

Dear Mr. Beatty:

We have reviewed the City of Petaluma's preliminary request for a navigational analysis of the proposed Caulfield Lane Bridge, mile 12.7, over the Petaluma River, at the City of Petaluma, Sonoma County, California.

The General Bridge Act of 1946, as amended, requires the location and plans for bridges over navigable waters of the United States be approved by the Commandant, U.S. Coast Guard prior to commencing construction. The Petaluma River is considered to be a navigable waterway of the United States for bridge administration purposes at the proposed bridge project site and a Coast Guard Bridge Permit will be required.

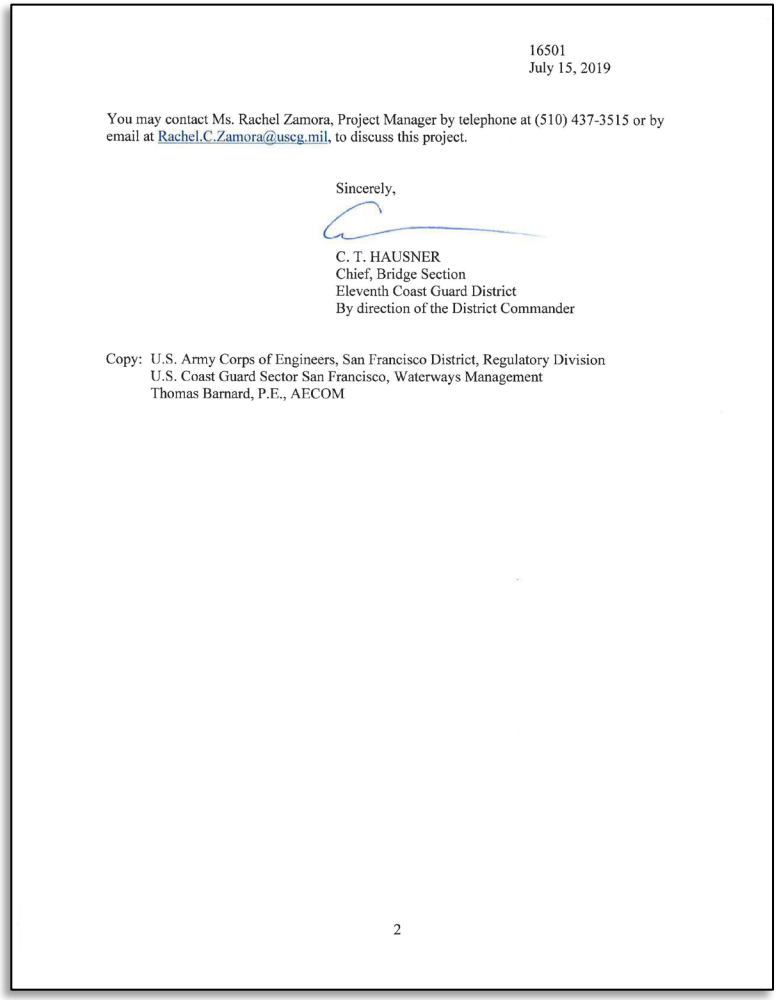
Coast Guard bridge permitting is considered to be a federal action and subject to the National Environmental Policy Act (NEPA).

Based upon the information currently available, we have made a preliminary determination that to provide for the current and prospective future reasonable needs of navigation on the Petaluma River, an application for the proposed Caulfield Lane Bridge should provide the following navigational clearances:

Closed Position	Open Position
Horizontal: 90 ft measured normal to the axis of the channel.	Horizontal: 90 ft measured normal to the axis of the channel.
Vertical: 10 ft above Mean High Water	Vertical: Unlimited

Please note that this preliminary determination does not constitute an approval or final agency determination, which we can only make, in accordance with regulation and after the City of Petaluma submits a completed bridge permit application.

To assist with the application for a Coast Guard Bridge Permit, please refer to the Coast Guard's Bridge Permit Application Guide (COMDTPUB P16591.3D, https://go.usa.gov/xRFk2).



16501
July 15, 2019

You may contact Ms. Rachel Zamora, Project Manager by telephone at (510) 437-3515 or by email at Rachel.C.Zamora@uscg.mil, to discuss this project.

Sincerely,

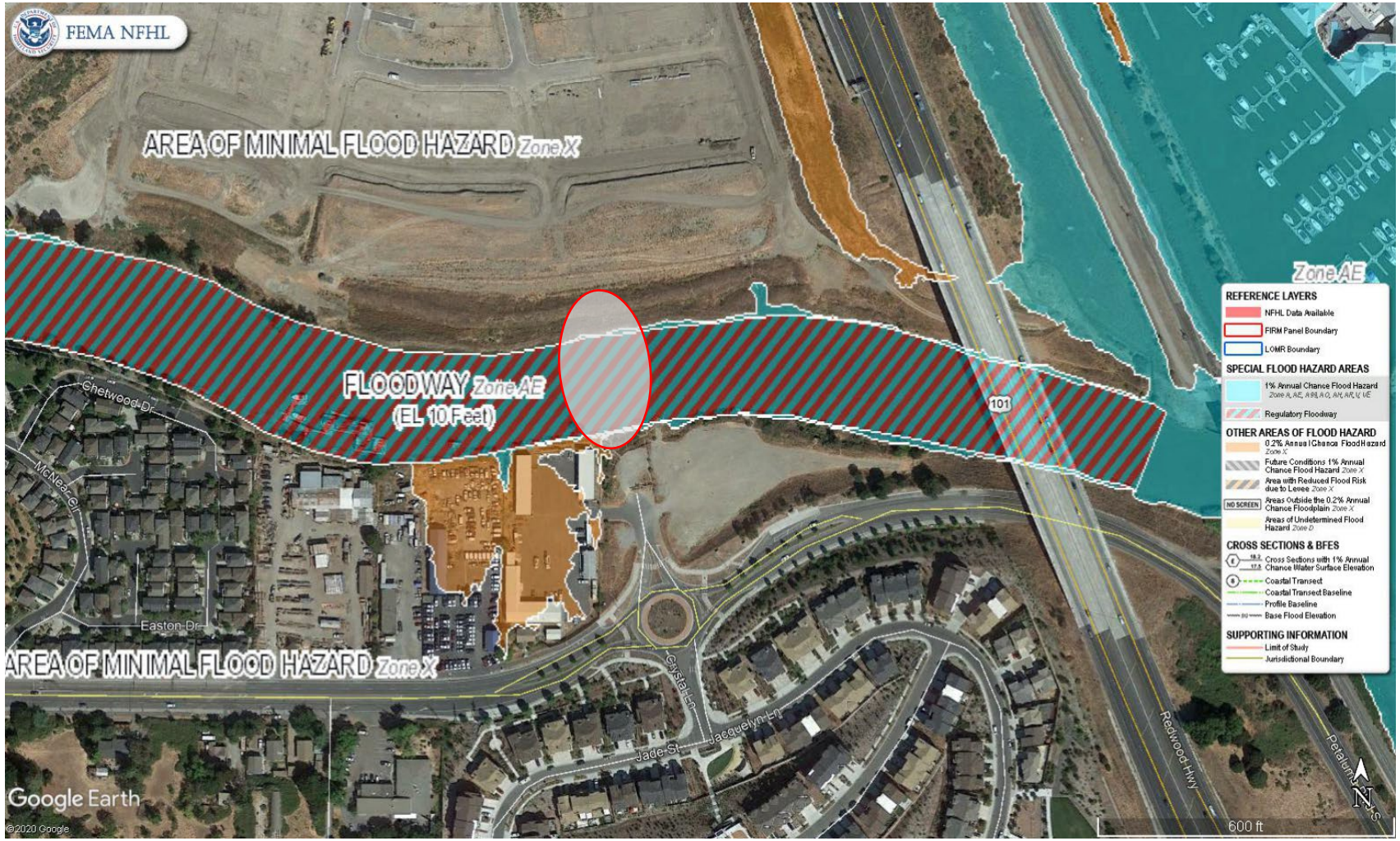
C. T. HAUSNER
Chief, Bridge Section
Eleventh Coast Guard District
By direction of the District Commander

Copy: U.S. Army Corps of Engineers, San Francisco District, Regulatory Division
U.S. Coast Guard Sector San Francisco, Waterways Management
Thomas Barnard, P.E., AECOM

2

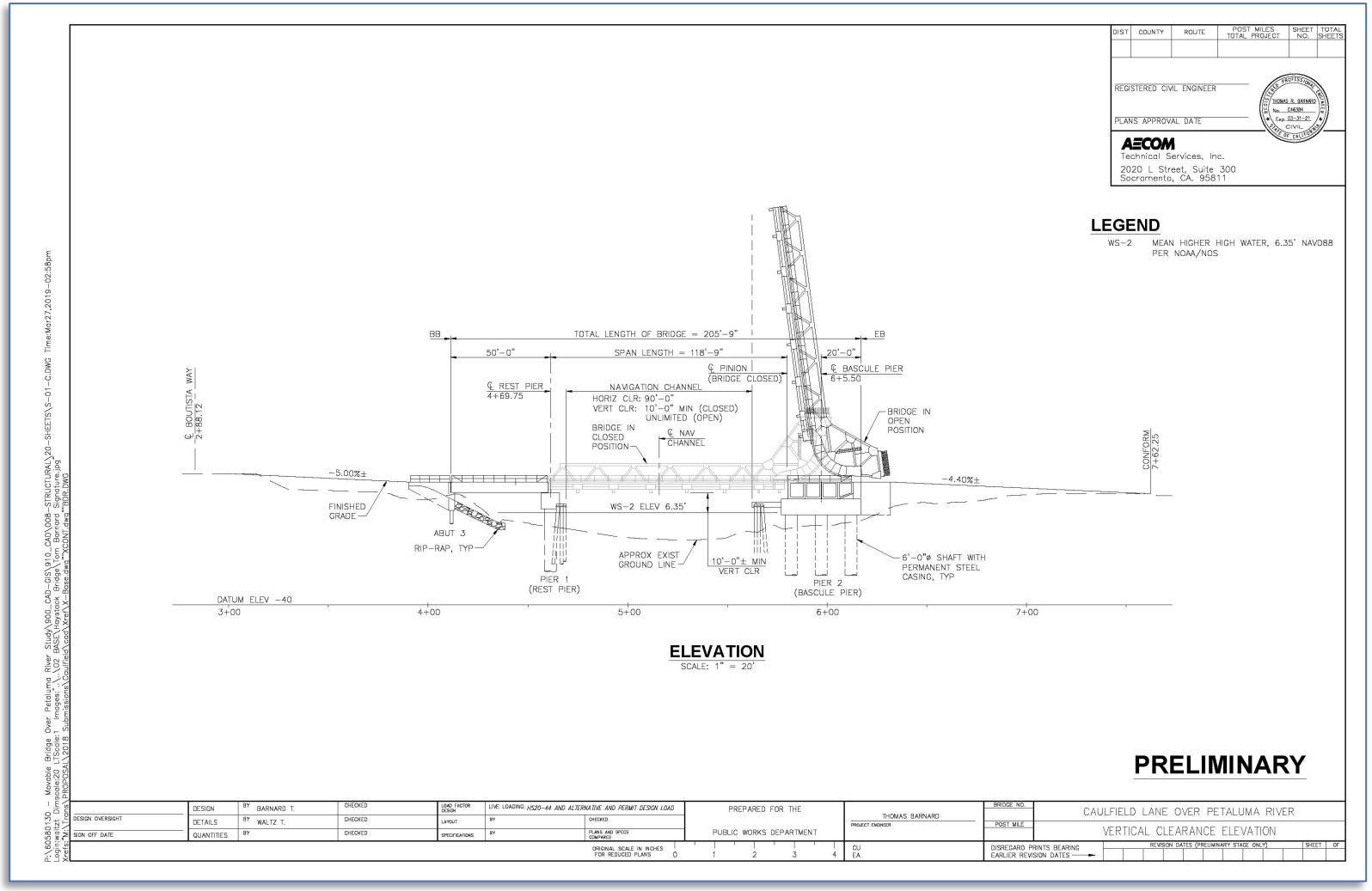
Structure Type Considerations
Bridge Hydrology/Hydraulics

- Preliminary structure configuration was based on the assumption that the governing water surface elevation at the project site was similar to that at the Haystack Bridge downstream.
- W_{surf_elev} = 100 year flood event + King Tide
- The project site is within the FEMA Floodway Zone AE
- Requires a “Flood Neutral” response to placement of structure within the flow
- Non-compliance requires CLOMR or LOMR to be filed



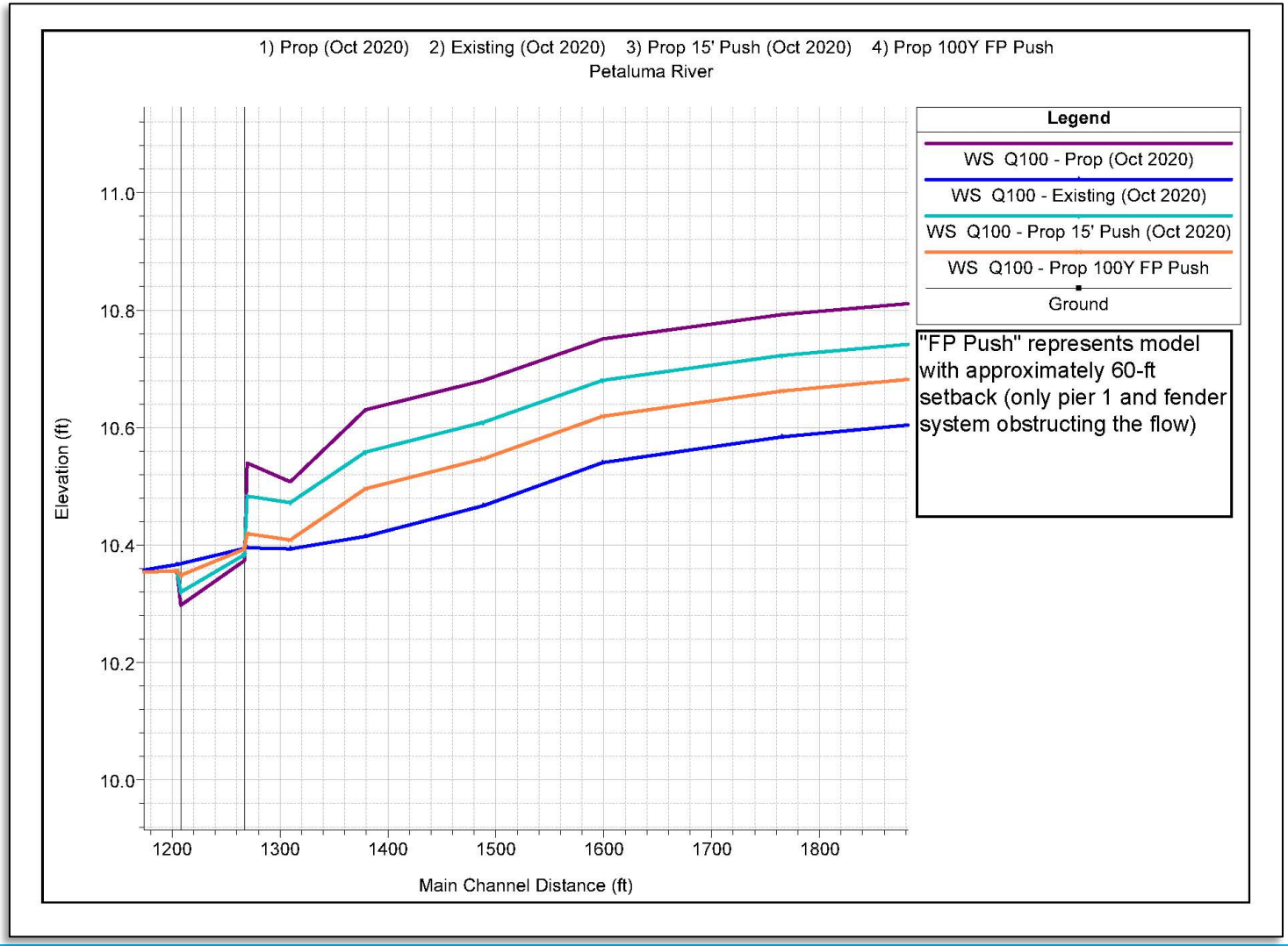
Structure Type Considerations
Bridge Hydrology/Hydraulics

- Introduction of the rest pier and fenders alone we enough to raise the water surface above an acceptable threshold.
- Per the request from the City our H&H subconsultant sent their HEC-RAS model to WEST Engineering for a peer review.
- WEST affirmed that the modeling was reasonable and slightly conservative.



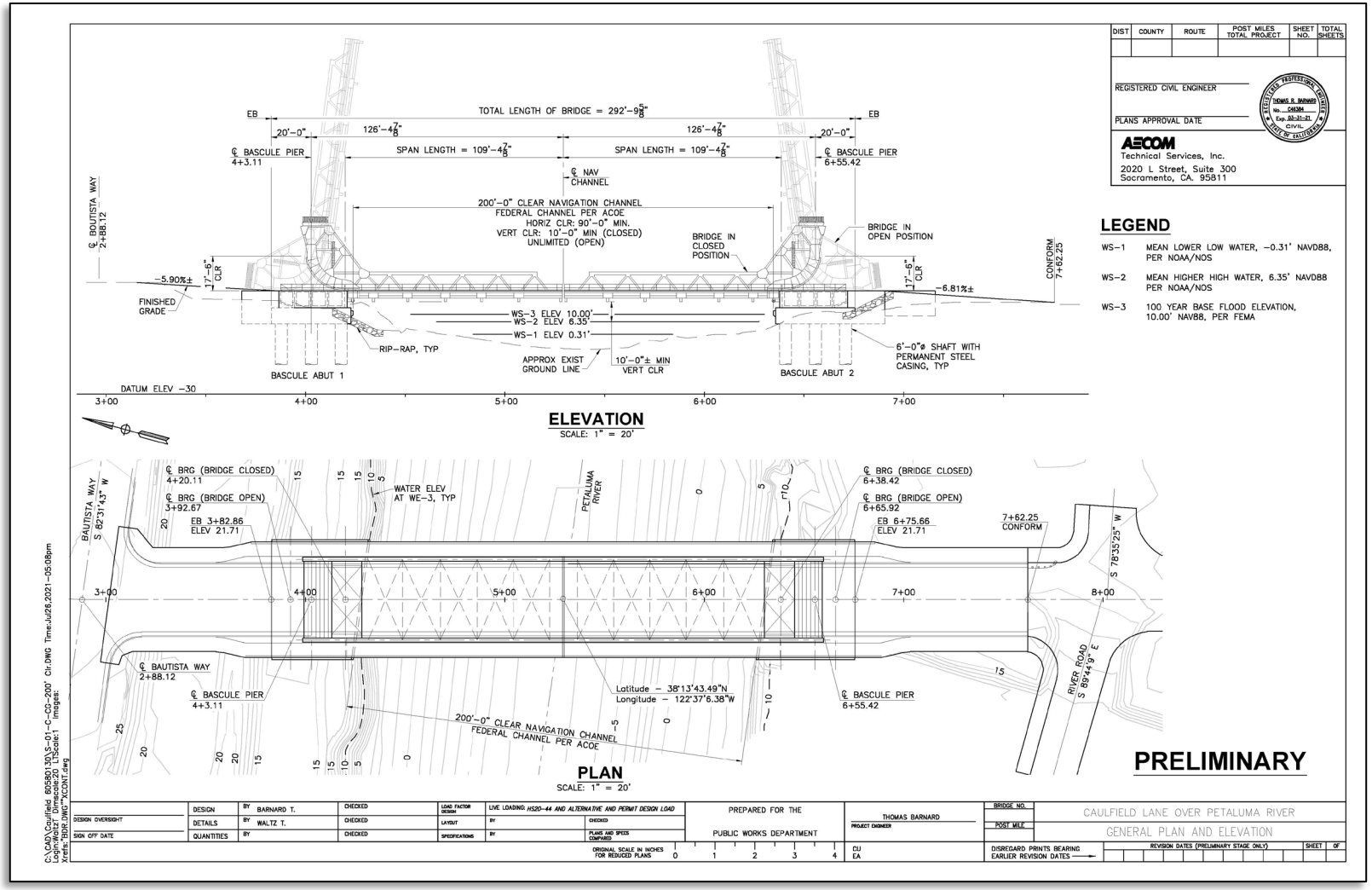
Structure Type Considerations
Bridge Hydrology/Hydraulics

- Various configurations were triedf the rest pier and fenders alone we enough to raise the water surface above an acceptable threshold.
- .



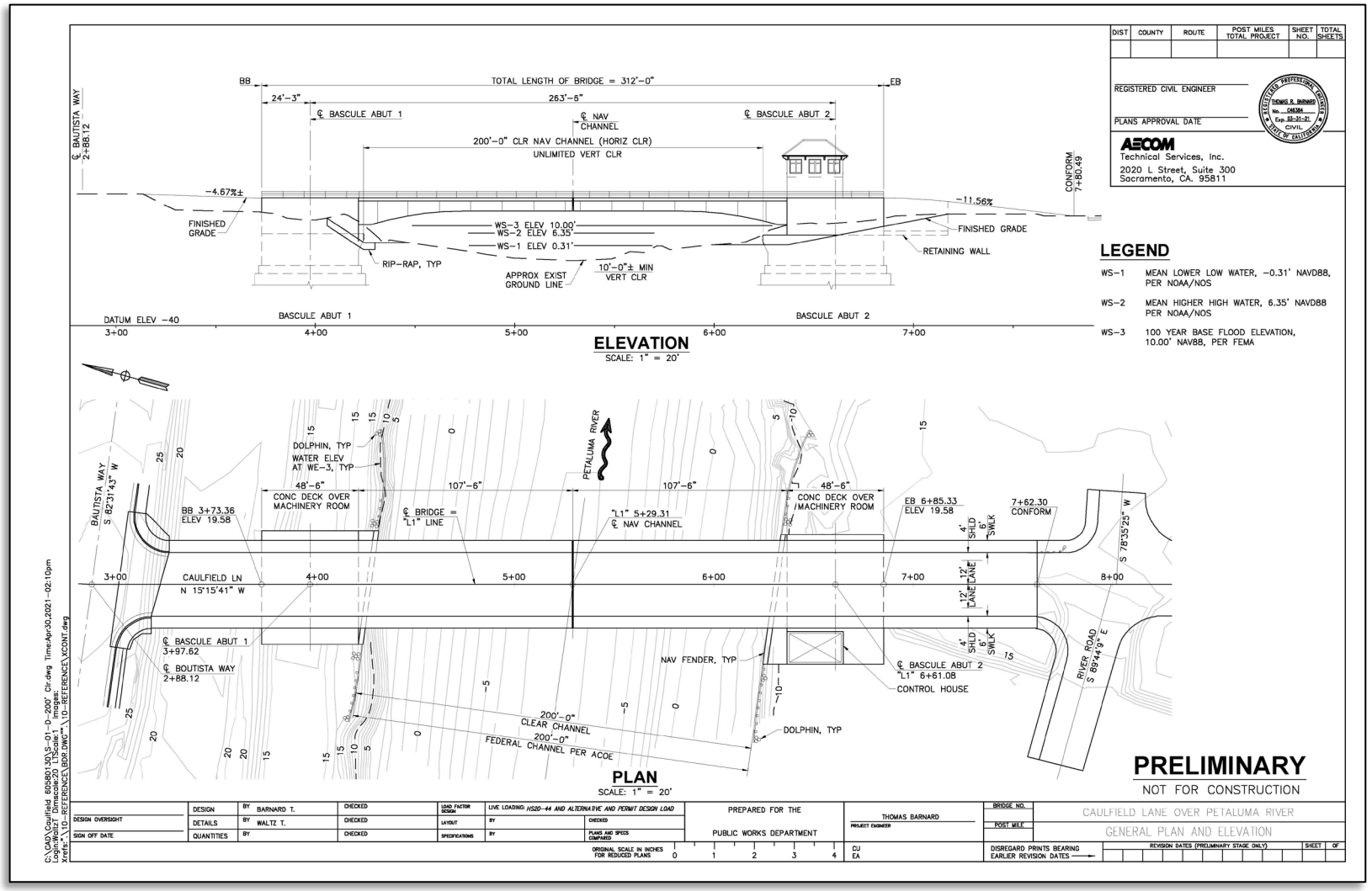
Structure Type Considerations
Bridge Hydrology/Hydraulics

- A dual, rolling leaf bascule with overhead counterweights is required
- Able to pass the design flows without affecting the water surface elevation.
- Reduces the impact to the roadway profile making ADA compliance more economical
- Additional survey data required for final design to manage conforms



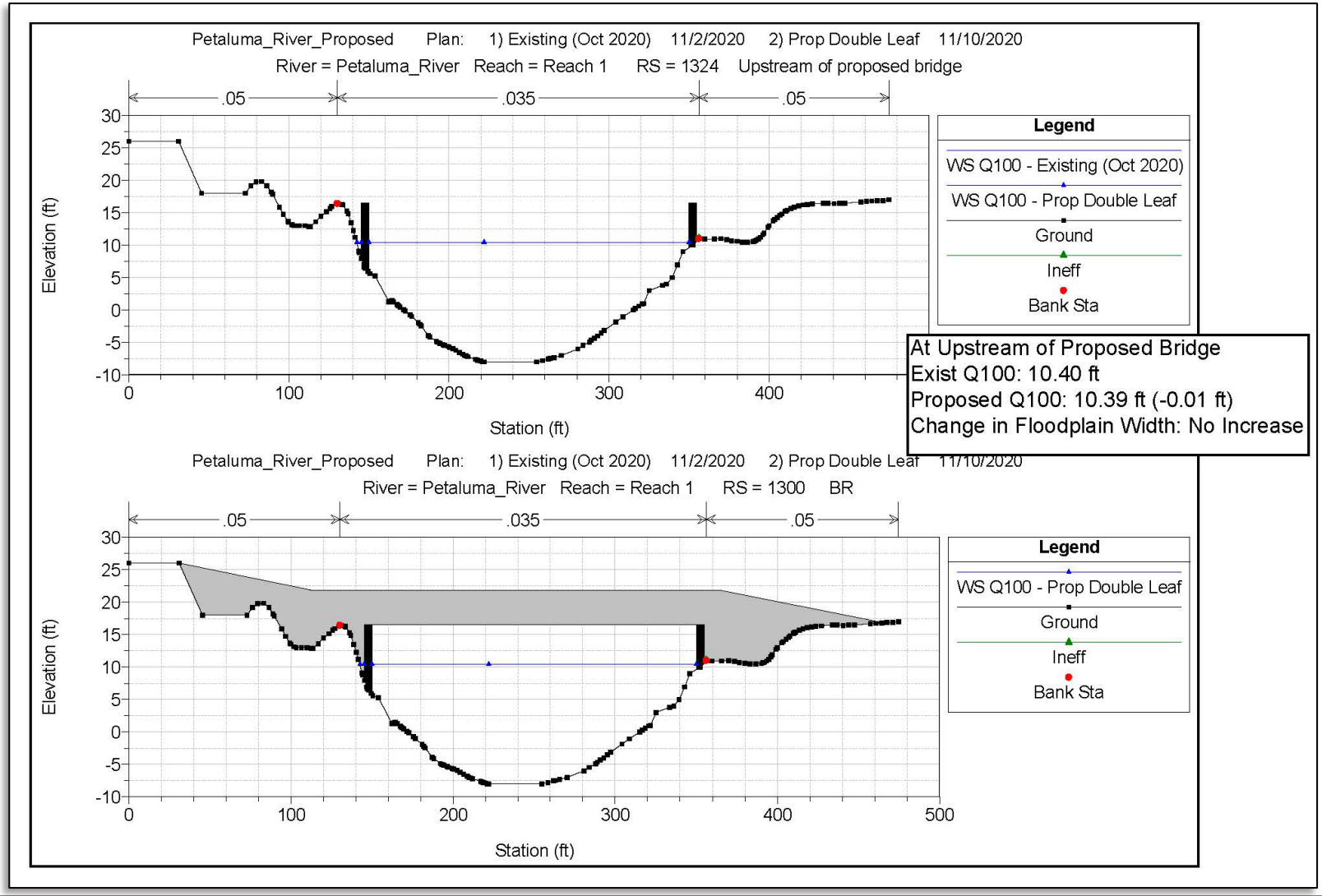
Structure Type Considerations
Bridge Hydrology/Hydraulics

- Example of a dual, rolling leaf bascule with below deck counterweights
- Superstructure depth causes significant rise in roadway profile.
- Large foundations for counterweights and mechanical equipment Susceptible to high water events in excess of design flows without affecting the water surface elevation.



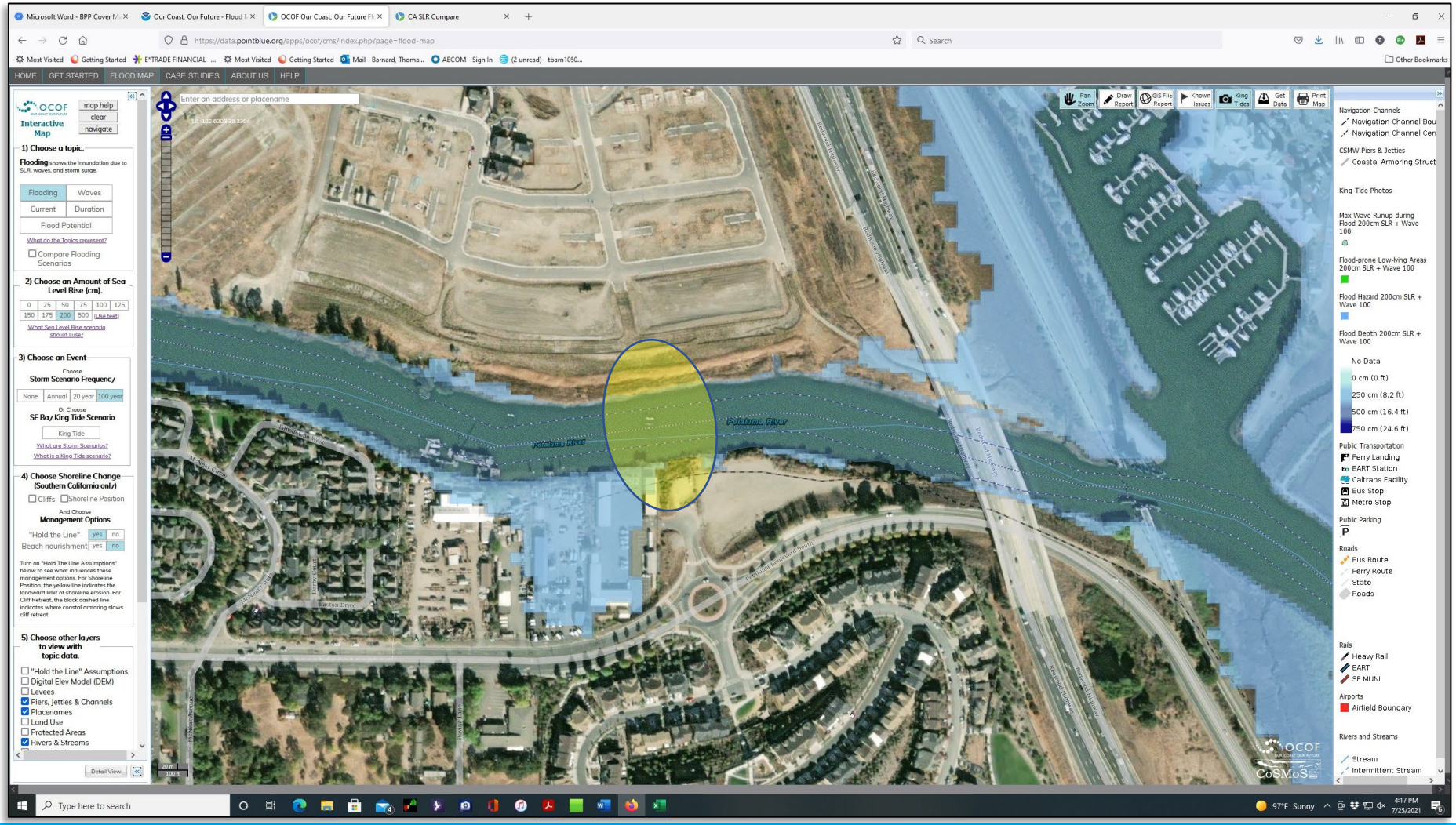
Structure Type Considerations
Bridge Hydrology/Hydraulics

- A dual, rolling leaf bascule with overhead counterweights is required to pass the design flows without affecting the water surface elevation.
- Change is less than 0.01 ft



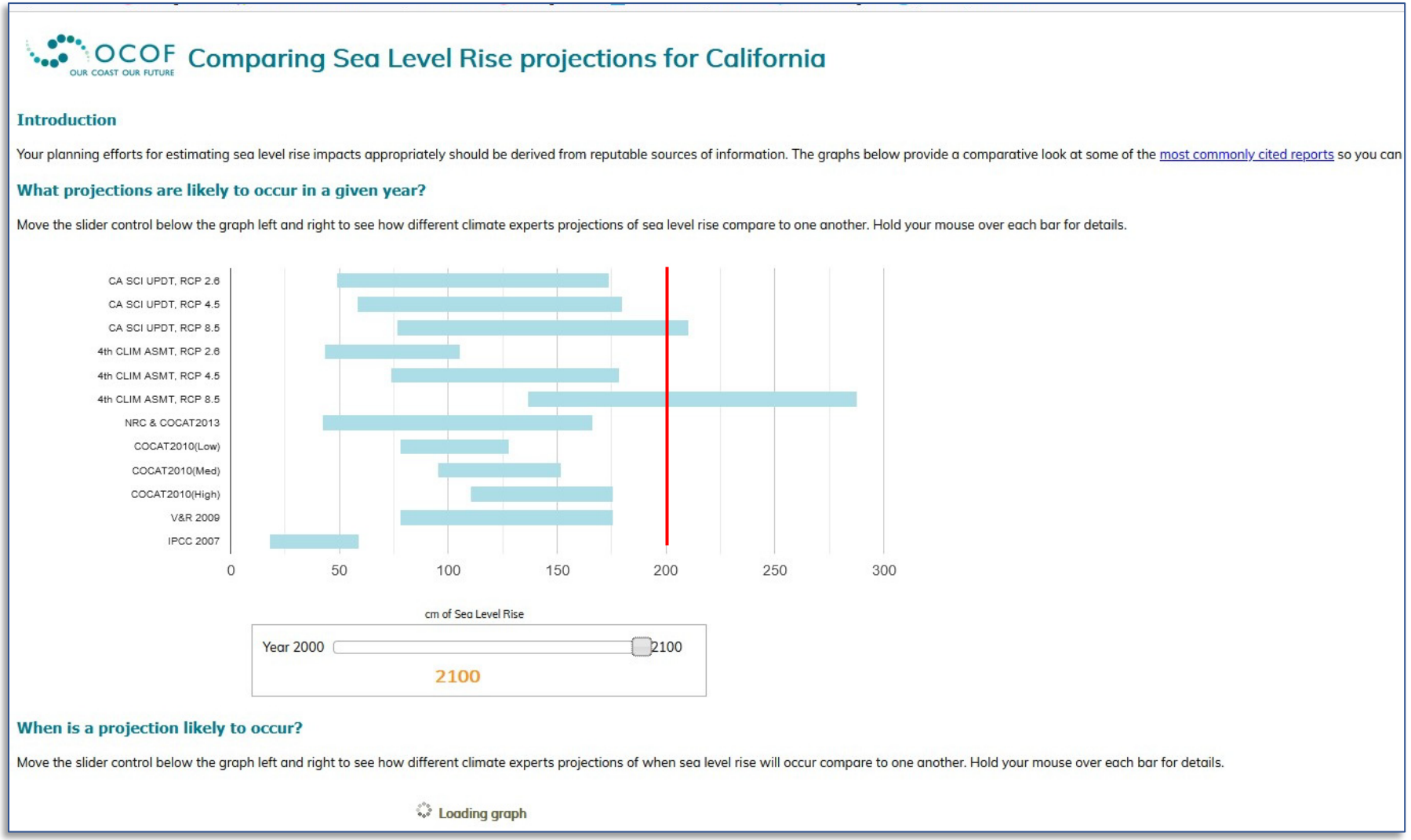
Structure Type Considerations
Sea Level Rise

- Proposed solution is not adversely affected by sea level rise of 200 cm or more.
- Decision on which model to use would be required during design.



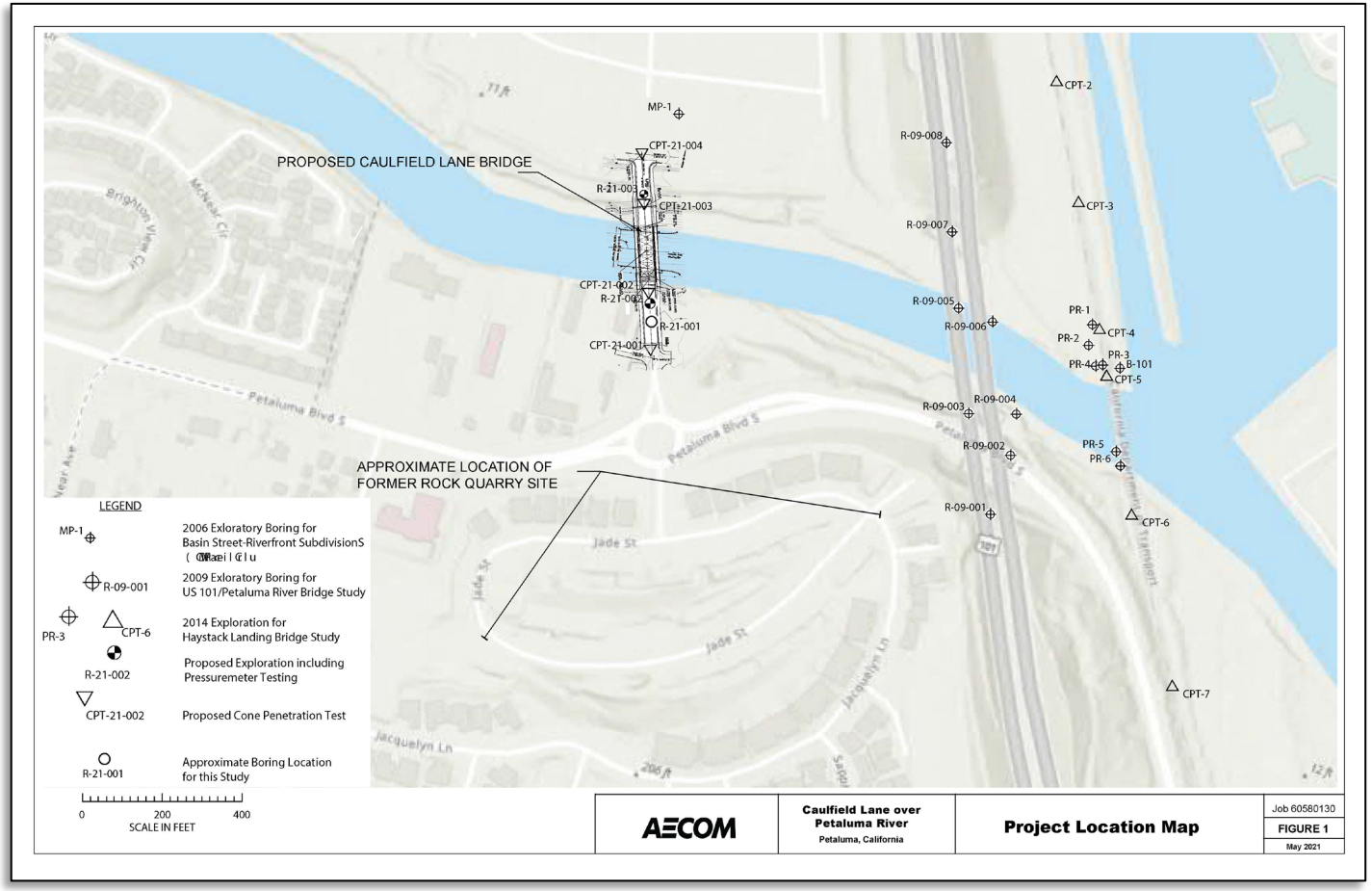
Structure Type Considerations
Sea Level Rise

- Only 2 of 11 models charted on NOAA OCOF webpage exceed 200 cm before 2100
- Proposed solution provides adequate protection against inundation.



Structure Type Considerations
Foundations

- Performed 1 boring on south side of channel to confirm assumptions regarding suitable foundation type and depths
- Large diameter cast-in-drilled-hole (CIDH) piling are appropriate.
- Similar to the foundations used at the SMART Haystack Landing Bridge
- Depth of bay mud on north side of channel will need to be verified during final design
- Pressure-meter testing of boring on North side of channel during final design will inform tip elevations for bascule pier/abutments.



Structure Type Considerations
Preliminary Estimate

PROJECT

PLANNING COST ESTIMATE

EA: DS-123456 PID: DS1234567

EA: DS-123456
PID: DS1234567

District-County-Route: 04-SON-NA
PM: NA

Type of Estimate : Planning Level
Program Code : NA
Project Limits : Caulfield Lane Extension & Bridge
Project Description: Southern Cross-town connector for the City of Petaluma across the Petaluma River at Caulfield Lane
Scope :
Alternative : Preferred - Rolling Double Rolling Leaf Bascule Bridge w/Overhead Counterweight; 200' Horiz Clear, 2-12' lanes w/ 2' shldr and 6' wide cantilevered walkways on each side

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	$ 2,573,840	$ 2,772,947
TOTAL STRUCTURES COST	$ 24,726,270	$ 26,639,041
SUBTOTAL CONSTRUCTION COST	$ 27,300,110	$ 29,411,988
TOTAL RIGHT OF WAY COST	$ -	$ -
TOTAL CAPITAL OUTLAY COSTS	$ 27,301,000	$ 29,412,000
PR/ED SUPPORT	$ 750,000	$ 750,000
PS&E SUPPORT	$ 3,925,000	$ 3,925,000
RIGHT OF WAY SUPPORT	$ 200,000	$ 200,000
CONSTRUCTION SUPPORT	$ 3,750,000	$ 3,750,000
TOTAL SUPPORT COST	$ 8,625,000	$ 8,625,000
TOTAL PROJECT COST	**$ 35,950,000**	**$ 38,050,000**

If Project has been programmed enter Programmed Amount

	Month	Year
Date of Estimate (Month/Year)	3	2021
Estimated Construction Start (Month/Year)	1	2024
Number of Working Days =	652.5	
Estimated Mid-Point of Construction (Month/Year)	3	2025
Estimated Construction End (Month/Year)	6	2026
Number of Plant Establishment Days	0	

Estimated Project Schedule

PID Approval	xx/xx/xxxx
PA/ED Approval	xx/xx/xxxx
PS&E	xx/xx/xxxx
RTL	xx/xx/xxxx
Begin Construction	xx/xx/xxxx

Reviewed by District O.E. or Cost Estimate Certifier

	xx/xx/xxxx	(xxx) xxx-xxxx
Office Engineer / Cost Estimate Certifier	Date	Phone

Approved by Project Manager

	xx/xx/xxxx	(xxx) xxx-xxxx
Project Manager	Date	Phone

PLEASE READ ALL THE SUGGESTIONS THAT ARE INCLUDED IN THE CELLS SHOWING RED TRIANGLE COMMENT MARKS.
Only use sheets 1 through 10 for attachment to approval documents, skip sheet 11 since Support Cost are include in separate attachment i.e. Programing Sheet.
Last updated: 11/16/2017

EA: DS-123456 PID: DS1234567

II. STRUCTURE ITEMS

	Bridge 1	Bridge 2	
DATE OF ESTIMATE	03/30/21	03/30/21	00/00/00
Bridge Name	Caulfield	Caulfield	xxxxxxxxxxxxxxxxx
Bridge Number	C20-XX1	C20-XX1	57-XXX
Structure Type	Rolling Dbl-Leaf Bascule	6'-0" Cantilever Walkway	xxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	30 LF	12 LF	0 LF
Total Bridge Length (Feet)	293 LF	293 LF	0 LF
Total Area (Square Feet)	8790 SQFT	3516 SQFT	0 SQFT
Structure Depth (Feet)	4 FT	2 FT	0 LF
Footing Type (pile or spread)	CIDH	Super-structure	xxxxxxxxxxxxxxxxx
Cost Per Square Foot	$1,850	$225	$0
COST OF EACH	**$16,261,500**	**$791,100**	**$0**

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Name	xxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxx
Bridge Number	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	0 LF	0 LF	0 LF
Total Length (Feet)	0 LF	0 LF	0 LF
Total Area (Square Feet)	0 SQFT	0 SQFT	0 SQFT
Structure Depth (Feet)	0 LF	0 LF	0 LF
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxx
Cost Per Square Foot	$100	$0	$0
COST OF EACH	**$0**	**$0**	**$0**

TOTAL COST OF BRIDGES		**$17,052,600**
TOTAL COST OF BUILDINGS		**$0**
Structures Mobilization Percentage	10%	$1,705,260

Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Structures Contingency Percentage	35%	$5,968,410
TOTAL COST OF STRUCTURES		**$24,726,270**

Estimate Prepared By: _____ _____
XXXXXXXXXXXXXXXX ------ Division of Structures — Date

Preliminary Estimate

	Wisconsin Street				Maple Oregon				17th Street				Racine Street			
Year Bid	2006				2007				2011				2020			
Span Type	Double leaf rolling lift				Double leaf rolling lift				Single leaf rolling lift				Double leaf rolling lift			
Span Length	144'-0"				308'-0"				115'-0"				171'-6"			
Width	74'-0"				50'-0"				54'-4"				48'-0"			
Location	Oshkosh, WI				Sturgeon Bay, WI				Two Rivers, WI				Menasha, WI			
Bid Item	Qty	Unit	Low Bid Unit Cost	Item Total	Qty	Unit	Low Bid Unit Cost	Item Total	Qty	Unit	Low Bid Unit Cost	Item Total	Qty	Unit	Low Bid Unit Cost	Item Total
Excavation Rock													300	CY	$50.00	$15,000.00
Concrete Masonry Bridges	4,488	CY	$350.00	$1,570,800.00	6,180	CY	$475.00	$2,935,500.00	1,600	CY	$480.00	$768,000.00	2,500	CY	$800.00	$2,000,000.00
Concrete Masonry Seal	3,674	CY	$125.00	$459,250.00	4,800	CY	$175.00	$840,000.00	1,000	CY	$180.00	$180,000.00				
Bar Steel Reinf.	413,889	LB	$0.95	$393,194.55	403,700	LB	$0.85	$343,145.00	210,000	LB	$1.20	$252,000.00	280,000	LB	$1.00	$280,000.00
Bar Steel Reinf. Coated	75,920	LB	$1.00	$75,920.00	340,000	LB	$0.95	$323,000.00	33,000	LB	$1.30	$42,900.00	356,000	LB	$1.05	$373,800.00
Welded Stud Shear Connectors	2,024	EA	$2.75	$5,566.00	8,280	EA	$2.75	$22,770.00	700	EA	$3.50	$2,450.00	1,760	EA	$6.00	$10,560.00
Piling HP14x73					4,300	LF	$48.00	$206,400.00	7,800	LF	$45.00	$351,000.00				
Pile Points					330	EA	$100.00	$33,000.00								
Railing Pipe	1	LS	$60,000.00	$60,000.00	1	LS	$105,000.00	$105,000.00								
Painting Epoxy System	1	LS	$350,000.00	$350,000.00	1	LS	$500,000.00	$500,000.00	1	LS	$425,000.00	$425,000.00	1	LS	$1,300,000.00	$1,300,000.00
Concrete Masonry Lightweight					229	CY	$675.00	$154,575.00					93	CY	$500.00	$46,500.00
Counterweight Concrete	341	CY	$475.00	$161,975.00	937	CY	$450.00	$421,650.00	216	CY	$825.00	$178,200.00	346	CY	$400.00	$138,400.00
Access Hatch		EA			4	EA	$2,900.00	$11,600.00								
Underwater Foundation Inspection	1	EA	$2,500.00	$2,500.00				$0.00								
Structural Steel Carbon Bascule Span	947,628	LB	$3.40	$3,221,935.20	146,800	LB	$3.10	$455,080.00	500,000	LB	$5.30	$2,650,000.00	901,000	LB	$7.00	$6,307,000.00
Structural Steel Bascule Span HS					1,033,000	LB	$3.10	$3,202,300.00								
Structural Steel Bascule Span HPS					562,000	LB	$3.10	$1,742,200.00								
Steel Castings	31,598	LB	$19.50	$616,161.00	98,140	LB	$13.75	$1,349,425.00	53,700	LB	$10.00	$537,000.00	42,574	LB	$8.65	$368,265.10
Cofferdams	1	LS	$350,000.00	$350,000.00	0.30	LS	$1,815,000.00	$544,500.00	1.00	LS	$725,000.00	$725,000.00	2	EA	$375,000.00	$750,000.00
Piling HP14x89					14,755	LF	$56.00	$826,280.00								
Waterproofing Bascule Pier									1	LS	$35,000.00	$35,000.00	1	LS	$75,000.00	$75,000.00
Closures and Seals	1	LS	$20,000.00	$20,000.00	1	LS	$60,000.00	$60,000.00	1	LS	$30,000.00	$30,000.00	1	LS	$72,600.00	$72,600.00
Rear, Long., and Front Break Joint Assemblies					1	LS	$145,000.00	$145,000.00								
Treated Timber and Lumber for Fenders and Walkways					1	LS	$115,000.00	$115,000.00								
Plumbing Work	1	LS	$30,000.00	$30,000.00	1	LS	$135,000.00	$135,000.00					1	LS	$24,000.00	$24,000.00
HVAC Work	1	LS	$15,000.00	$15,000.00	1	LS	$45,000.00	$45,000.00	1	LS	$30,000.00	$30,000.00	1	LS	$52,000.00	$52,000.00
Mechanical Work Bascule Span	1	LS	$1,950,000.00	$1,950,000.00					1	LS	$1,200,000.00	$1,200,000.00	1	LS	$3,075,000.00	$3,075,000.00
Operator House Misc.	1	LS	$350,000.00	$350,000.00	1	LS	$350,000.00	$350,000.00	1	LS	$300,000.00	$300,000.00	1	LS	$403,000.00	$403,000.00
Electrical Work	1	LS	$534,400.00	$534,400.00	1	LS	$1,356,000.00	$1,356,000.00	1	LS	$360,000.00	$360,000.00	1	LS	$496,000.00	$496,000.00
Submarine Cables	1	LS	$400,000.00	$400,000.00					1	LS	$165,000.00	$165,000.00	1	LS	$1,130,000.00	$1,130,000.00
Fender Rub Rails	1	LS	$35,000.00	$35,000.00					1	LS	$30,000.00	$30,000.00	1	LS	$75,000.00	$75,000.00
Railing Steel Special									1	LS						
Traffic Gate and Signal Assemblies	1	LS	$104,950.00	$104,950.00					1	LS	$87,000.00	$87,000.00	1	LS	$230,000.00	$230,000.00
Navigation Lights and Aids	1	LS	$35,750.00	$35,750.00												
Lighting Bascule Span	1	LS	$45,400.00	$45,400.00												
CCTV Camera	4	EA	$4,088.00	$16,352.00												
CCTV Monitor	4	EA	$1,595.00	$6,380.00												
CCTV Camera Mounting	4	EA	$902.00	$3,608.00												
CCTV System	1	LS	$23,400.00	$23,400.00												
Bridge Control System	1	LS	$263,300.00	$263,300.00												
Limit Switches and Transducers	1	LS	$15,200.00	$15,200.00					1	LS	$10,100.00	$10,100.00	1	LS	$7,400.00	$7,400.00
Lighting Protection and TVSS	1	LS	$146,530.00	$146,530.00					1	LS	$42,500.00	$42,500.00	1	LS	$31,000.00	$31,000.00
Span Drives and Motors	1	LS	$253,700.00	$253,700.00	1	LS	$2,250,000.00	$2,250,000.00	1	LS	$133,000.00	$133,000.00	1	LS	$144,000.00	$144,000.00
PLC Cabinet									1	LS	$52,600.00	$52,600.00	1	LS	$100,000.00	$100,000.00
Control Console									1	LS	$58,000.00	$58,000.00	1	LS	$100,000.00	$100,000.00
Motor Control Center									1	LS	$36,500.00	$36,500.00	1	LS	$76,400.00	$76,400.00
Programming									1	LS	$87,500.00	$87,500.00	1	LS	$52,000.00	$52,000.00
Center Lock Machinery					1	LS	$120,000.00	$120,000.00								
Tail Lock Machinery					1	LS	$275,000.00	$275,000.00								
Electrical Controls					1	LS	$364,000.00	$364,000.00								
Auxiliary Equipment	1	LS	$79,300.00	$79,300.00					1	LS	$124,000.00	$124,000.00	1	LS	$193,000.00	$193,000.00
Bridge Balance Monitoring System					1	LS	$53,000.00	$53,000.00								
Rear Locks Bascule Span	1	LS	$200,000.00	$200,000.00					1	LS	$170,000.00	$170,000.00	1	LS	$319,000.00	$319,000.00
Staining Concrete	11,480	SF	$0.90	$10,332.00												
Steel Grating Special					26,256	SF	$7.50	$196,920.00								
Steel Grid Floor Open 5-inch	4,212	SF	$75.00	$315,900.00					2,438	SF	$65.00	$158,470.00				
Training and Manuals	1	LS	$26,780.00	$26,780.00					1	LS	$61,000.00	$61,000.00	1	LS	$26,000.00	$26,000.00
Steel Stairs, Platforms and Railings									1	LS	$185,000.00	$185,000.00	1	LS	$325,000.00	$325,000.00
Railing Aluminum Special	0.15	LS	$250,000.00	$37,500.00									367	LF	$350.00	$128,450.00
Steel Grid Floor Concrete Filled													3,339	SF	$100.00	$333,900.00
Fiberglass sidewalk floor plates													1,346	SF	$85.00	$114,410.00
			Total=	$12,186,083.75			Total=	$19,481,345.00			Total=	$9,467,220.00			Total=	$19,157,685.10
			Area=	10656			Area=	15400			Area=	6248			Area=	8232
			Cost/SF=	$1,143.59			Cost/SF=	$1,265.02			Cost/SF=	$1,515.24			Cost/SF=	$2,327.22
				2006				2007				2011				2020