Meeting of the Central Valley Flood Protection Board
June 26, 2015

Staff Report

California State University, Chico Bridge (Physical Sciences) Replacement, Butte County

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1.0 – ITEM

Consider Central Valley Flood Protection Board (Board) approval to replace a pedestrian bridge with a new vehicular bridge for emergency vehicle access across Big Chico Creek on the California State University, Chico campus in Chico (Attachment A) by draft Permit No. 19011 (Attachment B).

2.0 – APPLICANT

California State University, Chico (CSUC)

3.0 – PROJECT LOCATION

The project is located across Big Chico Creek, south of Arcadian Avenue, on the CSUC campus in the City of Chico (approximate population 86,200 per the 2010 Census) in Butte County (Attachment A). The bridge is located approximately four miles downstream of the Big Chico Creek Gates diversion structure, which was constructed in the 1940's and adopted as part of the State Plan of Flood Control (SPFC) in 1965. Big Chico Creek is a federal channel with a design capacity of 1,500 cubic feet per second (cfs) through the reach flowing through the CSUC campus

4.0 – PROJECT DESCRIPTION

CSUC is proposing to replace the existing Physical Science Bridge with a 22-foot wide single-span bridge that will allow access for emergency response vehicles as well as pedestrian use. The existing bridge is a narrow pedestrian bridge that inadequately serves the east side of campus for emergency vehicle access.

The new bridge will also preserve existing utility crossings by mounting conduits to the side of the bridge. A six (6)-inch domestic water line will also be rerouted within the south channel bank due to the new pier placement.

The proposed bridge design includes removal of the existing pier within the Big Chico Creek channel, which will eliminate the existing flow obstruction. Any disturbed rock slope protection (RSP) along the bank will be replaced in-kind. Other disturbed areas will be re-vegetated with grasses and other appropriate low flow vegetation to prevent erosion.

5.0 – AUTHORITY OF THE BOARD

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

Title 23:

- § 6 – Need for a Permit
- § 108 – Existing Encroachments
- § 112 – Streams Regulated and Nonpermissible Work Periods
- § 116 – Borrow and Excavation Activities
- § 121 – Erosion Control
- § 128 – Bridges
- § 128 – Vegetation

6.0 – AGENCY COMMENTS AND ENDORSEMENTS

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

- The U.S. Army Corps of Engineers (USACE) decision letter has not been received for this application. Staff anticipates receipt of a letter indicating that the USACE District Engineer has no objection to the project, subject to conditions. Upon receipt of the letter, staff will review to ensure conformity with the permit language and incorporate it into the permit as Exhibit A..

- Department of Water Resources Sutter Maintenance Yard (DWR) conditionally endorsed this project on December 9, 2014 (Attachment C). Board staff has incorporated the intent of DWR's conditions into the draft permit.

7.0 – PROJECT ANALYSIS

7.1 – Project Construction Details

The proposed bridge will be constructed along the same horizontal alignment as the existing bridge. Supporting bridge abutments will be placed outside the existing bridge abutments and near the top of the existing channel. The abutment foundation will include a concrete abutment cap atop five- 30-inch cast-in-drilled-hole (CIDH) concrete piles at a depth of approximately 35 feet below the existing grade.

Existing campus utilities including steam, gas, electrical and data services will continue to cross the bridge by conduit attached to the upstream side of the bridge, per Title 23 standards. A six (6)-inch domestic water line will also be rerouted within the south channel bank due to the new pier placement.

Approximately nine (9) trees will be removed for construction activities and will be replaced at the top of the channel bank and above the design water surface elevation (WSE). Disturbed areas will be re-vegetated with grasses and other appropriate low flow vegetation to prevent erosion.

Temporary scaffolding will be placed within the ordinary high water mark as well as the adjacent bank areas under the bridge. All scaffolding will be removed at the completion of the project and bank areas will be restored to pre-construction conditions prior to the flood season.

The existing RSP on the channel left bank will remain, and those areas disturbed will be replaced in-kind at a 2H:1V (horizontal to vertical) slope.

7.2 – Hydraulic Summary

Hydraulic characteristics of the proposed Physical Sciences Bridge and the nearby Gus Manolis Bridge (Application No. 19010) are both described in the hydraulic summary (Attachment E). The two bridges are approximately 300 feet apart with no structures in between, and were analyzed by North Star Engineering using the HEC-RAS version 4.1.0 hydraulic model.

Discharge within Big Chico Creek is controlled by the Big Chico Creek Gates diversion structure approximately four miles upstream of the project site. The Big Chico Creek Gates limit the amount of discharge down Big Chico Creek (to the project site) as headwaters rise at the face of the gates and excess discharge spills north into Sycamore Channel. This results in a relatively consistent water surface elevation at the face of the gate, with only minor increases in peak discharge at flood flows.

The 200-year flood discharge, derived from the recent hydraulic analysis by Central Valley Hydrology Study and the Central Valley Flood Evaluation and Delineation analysis, was estimated to be 1,640 cfs. The hydraulic model analyzed both the 200-year flow of 1,640 cfs and the project design flow of 1,500 cfs. The proposed soffit elevation is 197.90 feet. The resulting freeboard is 3.32 feet and 3.58 feet at the 200-year and project design flows, respectively. This is consistent and compliant with Title 23 standards and the adopted 2012 Central Valley Flood Protection Plan.

The contraction scour for this project is less than a foot and there is no abutment scour due to the fact that the bridge is a free-spanning structure with no piers in the waterway.

7.3 – Geotechnical Summary

Board staff has reviewed the geotechnical design information and has determined that the proposed project is expected to result in no adverse geotechnical impacts to the Big Chico Creek floodway. All fill, excavation, and temporary structures will be completed in compliance with Draft Permit No. 19011 and Title 23 standards.

8.0 – CEQA ANALYSIS

Board staff has prepared the following California Environmental Quality Act (CEQA) determination:

The Board, as a responsible agency under CEQA, has reviewed the Initial Study and Mitigated Negative Declaration (IS/MND) (SCH No.2014032059, June 2014), Addendum to the Adopted IS/MND (December 2014), and Mitigation Monitoring and Reporting Plan for the Bridge Replacement/Restoration Project, prepared by lead agency California State University, Chico. These documents, including project design, may be viewed or downloaded from the Central Valley Flood Protection Board website at http://www.cvfpb.ca.gov/meetings/2015/06-26-2015.cfm under a link for this agenda item. These documents are available for review in hard copy at the Board and CSU Chico offices.

CSU Chico determined that the project would have no significant effect on the environment on June 8, 2014 and a Notice of Determination was filed on June 11, 2014 with the State Clearinghouse.

Board staff finds that although the proposed project could have a potentially significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. The project proponent has incorporated mandatory mitigation measures into the project

plans to avoid identified impacts or to mitigate such impacts to a point where no significant impacts will occur. These mitigation measures are included in the project proponent's IS/MND and address impacts to aesthetics, air quality, biological resources, cultural resources, geology and soils, hydrology and water quality, noise, transportation and traffic. The description of the mitigation measures are further described in the adopted IS/MND.

9.0 – CALIFORNIA WATER CODE SECTION 8610.5 CONSIDERATIONS

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

  The Board will make its decision based on the evidence in the permit application and attachments, this staff report, and any other evidence presented by any individual or group.

- The best available science related 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 for the work proposed under this permit as regulated by Title 23 have been applied to the review of this permit.

- Effects of the decision on the facilities of the State Plan of Flood Control (SPFC), and consistency of the proposed project with the Central Valley Flood Protection Plan (CVFPP) as adopted by Board Resolution 2012-25 on June 29, 2012:

  This project has no adverse effect on facilities of the State Plan of Flood Control and is consistent with the Central Valley Flood Protection Plan and current Title 23 standards because the proposed project is expected to cause no increase in WSE, no substantial increase in channel velocities, and no adverse geotechnical impacts to the Big Chico Creek floodway or any SPFC facilities.

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

  There are no foreseeable projected future events that would impact this project.

10.0 – STAFF RECOMMENDATION

Staff recommends that the Board:

Adopt:

- the CEQA findings;

Approve:

- draft Encroachment Permit No. 19011 in substantially the form provided, and on condition of receipt of a favorable USACE 408 decision letter; and

Direct:

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

11.0 – LIST OF ATTACHMENTS

A – Project Maps and Photos

B – Draft Permit No. 19011

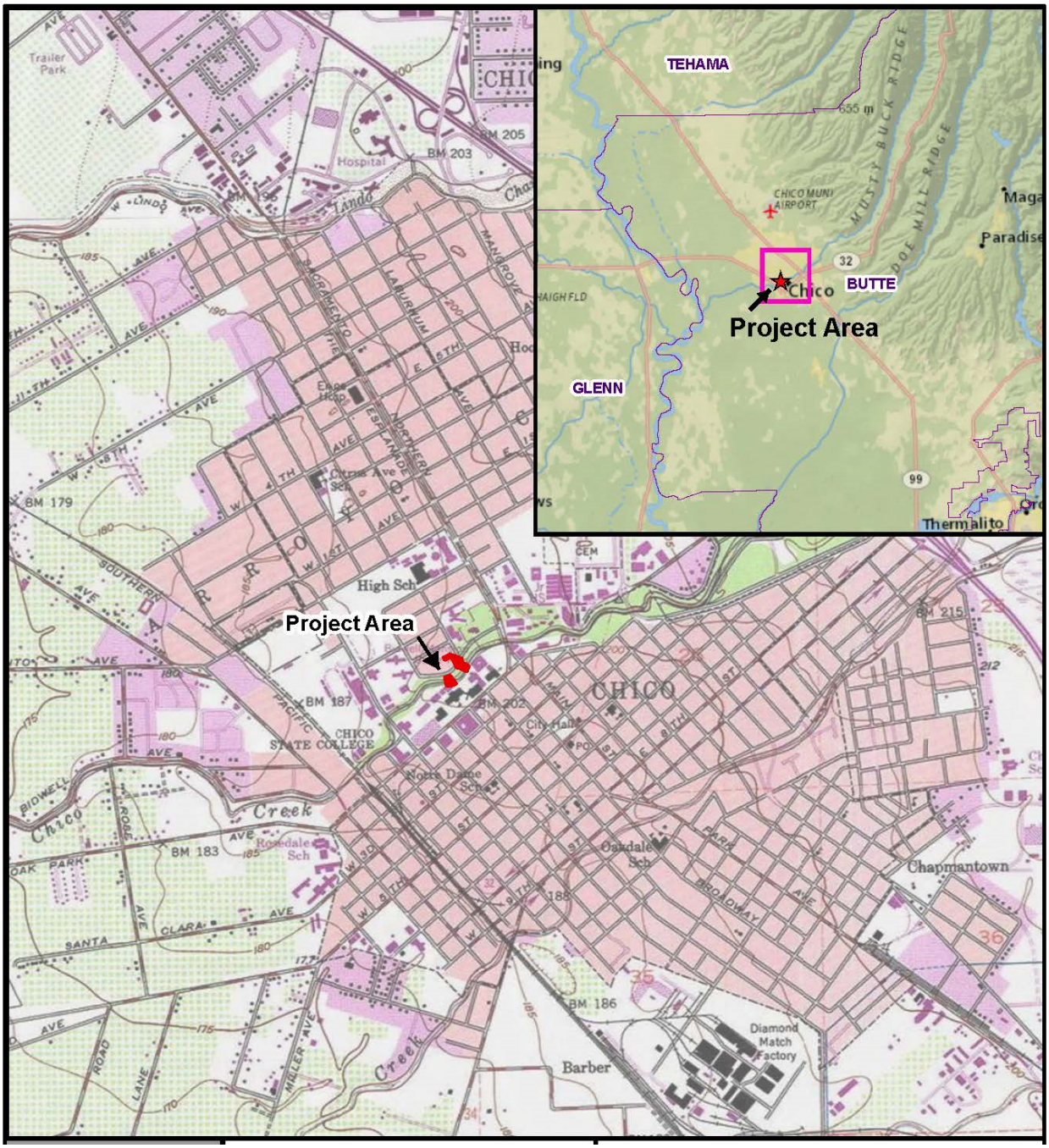
Exhibit A: USACE 408 Decision Letter

C – Sutter Maintenance Yard Endorsement

D – Project Drawings

E – Hydraulic Summary Information

Prepared By:	Ilene Wellman-Barbree, PE, Senior Engineer, Projects and Environmental Branch
Environmental Review:	Andrea Buckley, Senior Environmental Scientist (Specialist)
Staff Report Review:	Nancy Moricz, PE, Senior Engineer, Projects and Environmental Branch
	Eric Butler, PE, Supervising Engineer, Projects and Environmental Branch Chief
	Len Marino, PE, Chief Engineer
	Nicole Rinke, Deputy Attorney General
	Leslie Gallagher, Acting Executive Officer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CHICO STATE COLLEGE
Chapmantown
Barber
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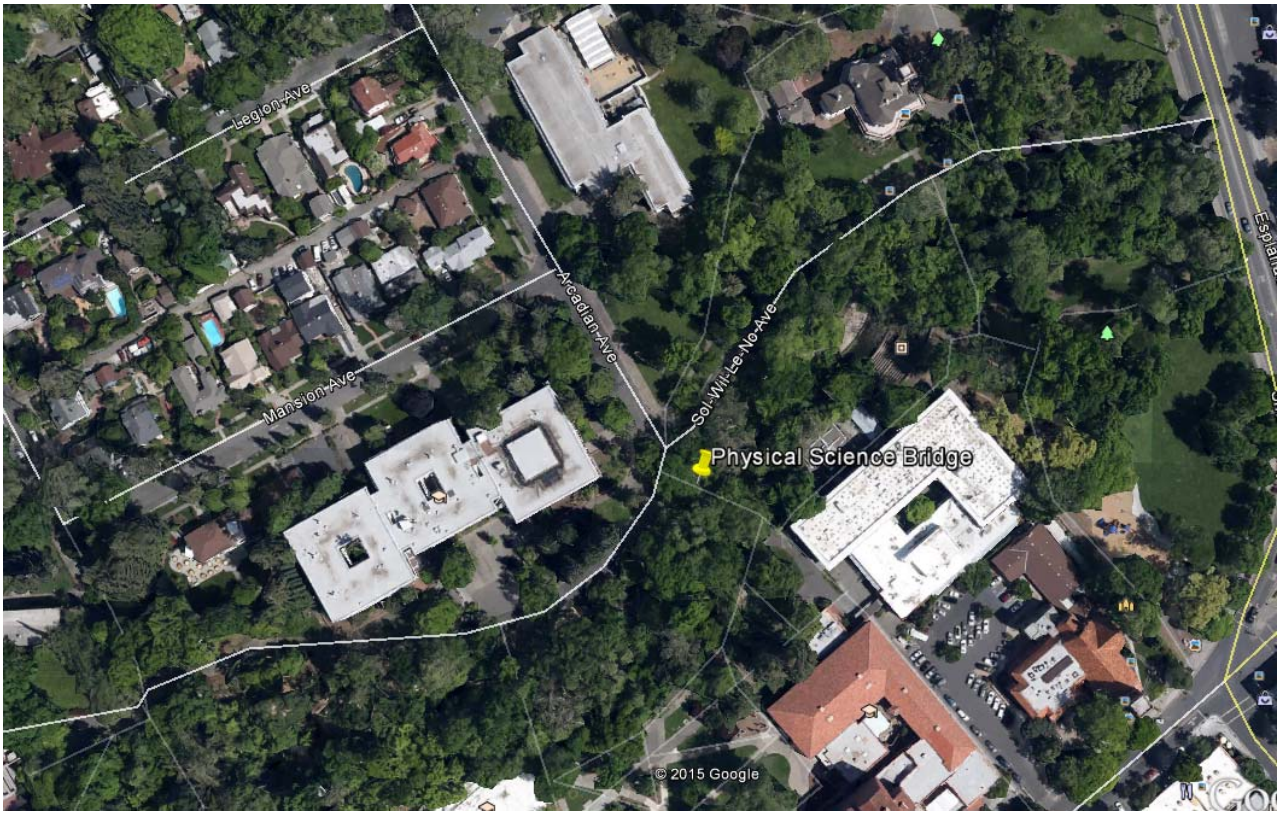


PHOTO 5 -

CSU Chico: Physical Science Vehicle Bridge crossing Big Chico Creek, standing north looking south.

1 DEC 2014

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY

THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 19011 BD

This Permit is issued to:

California State University, Chico
400 West First Street
Chico, California 95929

The California State University, Chico (CSU Chico) proposes to replace the existing pedestrian Physical Science Bridge with a vehicular bridge that will facilitate emergency vehicle and pedestrian access between the CSU Chico campus and Arcadian Avenue. The project also includes maintaining the existing CSU utilities attached to the bridge and rerouting a six (6) inch domestic water line located within the channel bank. Rock slope protection and vegetation will be replaced in-kind for any disturbed areas, and up to nine (9) trees will be replaced away from the bridge and above the design water surface elevation.

The project is located at Big Chico Creek south of Arcadian Avenue on the California State University, Chico campus. (Section 27, T22N, R1E, MDB&M, Sutter Maintenance Yard, Big Chico Creek, Butte 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. 19011 BD

LIABILITY AND IMDEMNIFICATION

THIRTEEN: The permittee shall defend, indemnify, and hold the Central Valley Flood Protection Board (Board) and the State of California, including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State") safe and harmless, of and from all claims and damages related to the Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

FOURTEEN: The permittee is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend, indemnify, and hold the Board and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State") safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

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

AGENCY CONDITIONS

SIXTEEN: The permittee shall comply with all conditions set forth in the letter from the U.S. Army Corps of Engineers District Engineer dated June XX, 2015, which is attached to this permit as Exhibit A and is incorporated by reference.

SEVENTEEN: The permittee agrees to incur all costs for compliance with local, State, and Federal permitting. If any conditions issued by other agencies conflict with any of the conditions of this permit, then the permittee shall resolve conflicts between any of the terms and conditions that agencies might impose under the laws and regulations it administers and enforces.

EIGHTEEN: If the permittee does not comply with the conditions of the permit and enforcement by the Board is required, the permittee shall be responsible for bearing all costs associated with the enforcement action, including reasonable attorney's fees. Permittee acknowledges that State law allows the imposition of fines in enforcement matters.

REAL ESTATE

NINETEEN: If the construction project extends onto land owned in fee and/or easement by the Sacramento and San Joaquin Drainage District acting by and through the Board, the permittee should secure an easement, license, or temporary entry permit from the Board prior to commencement of work. Contact Tom O'Neil at (916) 653-7654.

PRE-CONSTRUCTION

TWENTY: The permittee shall contact the Board by telephone at (916) 574-0609, and submit the enclosed postcard to schedule a preconstruction conference. Failure to do so at least 20 working days prior to start of work may result in delay of the project.

TWENTY-ONE: Thirty (30) calendar days prior to start of any demolition and/or construction activities within the floodway, the permittee shall submit to the Chief Engineer two sets of plans, specifications and supporting geotechnical and/ or hydraulic impact analyses, for any and all temporary, in channel cofferdam(s), gravel work pad(s), work trestle(s), scaffolding, piles, and/or other appurtenances that are to remain in the floodway during the flood season from November 1 through April 15. The Board shall acknowledge receipt of this submittal in writing within ten (10) working days of receipt, and shall work with the permittee to review and respond to the request as quickly as possible. Time is of the essence. The Board may request additional information as needed and will seek comment from the U.S. Army Corps of Engineers and / or local maintaining agency when necessary. The Board will provide written notification to the permittee if the review period is likely to exceed thirty (30) calendar days.

TWENTY-TWO: Prior to commencement of work, the permittee shall create a photo record, including associated descriptions, of the existing bridge site conditions. The photo record shall be certified

(signed and stamped) by a licensed land surveyor or licensed civil engineer registered in the State of California and submitted to the Board within thirty (30) calendar days of beginning the project.

TWENTY-THREE: The permittee shall provide construction supervision and inspection services acceptable to the Board.

CONSTRUCTION

TWENTY-FOUR: All work approved by this permit shall be in accordance with the submitted drawings and specifications 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.

TWENTY-FIVE: All addenda or other changes made to the submitted documents by the permittee after issuance of this permit shall be submitted to the Chief Engineer for review and approval prior to incorporation into the permitted project. The submittal shall include supplemental plans, specifications, and supporting geotechnical, hydrology and hydraulics, or other technical analyses. The Board shall acknowledge receipt of the addendum or change submittal in writing within ten (10) working days of receipt, and shall work with the permittee to review and respond to the request as quickly as possible. Time is of the essence. The Board may request additional information as needed and will seek comment from the U.S. Army Corps of Engineers and / or the local maintaining agency when necessary. The Board will provide written notification to the permittee if the review period is likely to exceed thirty (30) calendar days. Upon approval of the submitted documents the permit shall be revised, if needed, prior to construction related to the proposed changes.

TWENTY-SIX: 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, and shall be removed after completion of the project.

TWENTY-SEVEN: No material stockpiles, temporary buildings, or equipment shall remain in the floodway during the flood season from November 1 to April 15.

TWENTY-EIGHT: Cleared trees and brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1 to April 15.

TWENTY-NINE: The method and schedule of removing the bridge shall be submitted to and approved by the Board's Chief Engineer prior to the start of work.

THIRTY: Piers, bents, and abutments being dismantled shall be removed to at least one (1) foot below the natural ground.

THIRTY-ONE: The abandoned or dismantled bridge shall be completely removed and disposed of outside the limits of the levee section and floodway.

THIRTY-TWO: Backfill material for excavations shall be placed in four (4) to six (6) inch layers and compacted to at least the density of the adjacent, firm, undisturbed material.

THIRTY-THREE: All fill materials shall be placed in four (4) to six (6) inch layers and compacted to a relative compaction of not less than 90 percent per ASTM D 1557-91 or 97 percent per ASTM D 698-91 above optimum moisture content. Fill material within two feet of the bridge shall be compacted by appropriate hand operated compaction equipment. Field density tests shall be taken by a certified soils laboratory to verify compaction of the fill placed.

THIRTY-FOUR: Revetment shall be uniformly placed and properly transitioned into the bank, levee slope, or adjacent revetment and in a manner which avoids segregation.

THIRTY-FIVE: The revetment shall not contain any reinforcing steel, floatable, or objectionable material. Asphalt or other petroleum-based products may not be used as fill or erosion protection on the levee section or within the floodway.

THIRTY-SIX: Temporary access ramps shall be removed from the floodway during flood season from November 1 through April 15, and after completion of the project.

THIRTY-SEVEN: All debris generated by this project shall be disposed of outside the floodway.

POST-CONSTRUCTION

THIRTY-EIGHT: Except with respect to the activities expressly allowed under this permit, the work area shall be restored to the condition that existed prior to start of work.

THIRTY-NINE: Within 120 days of completion of the project, the permittee shall submit to the Board and DWR a mylar copy of as-built drawings, stamped and signed by a licensed civil engineer registered in the State of California, certifying the work was performed and inspected in accordance with the Board permit conditions and submitted drawings and specifications.

OPERATIONS AND MAINTENANCE

FORTY: The permittee shall be responsible for repair of any damages to the channel, banks, and floodway due to construction, operation, or maintenance of the proposed project.

FORTY-ONE: The permittee shall maintain the permitted encroachment(s) within the utilized area in the manner required and as requested by the authorized representative of the Board, Department of Water Resources, or any other agency responsible for maintenance.

FORTY-TWO: All debris that may accumulate around the bridge supports and abutments within the floodway shall be completely removed from the floodway following each flood season.

FORTY-THREE: If the bridge is damaged to the extent that it may impair the project design channel capacity, it shall be repaired or removed prior to the next flood season.

FORTY-FOUR: If the permitted encroachment(s) result in any adverse hydraulic impact or scouring the permittee shall provide appropriate mitigation acceptable to the Board.

FORTY-FIVE: If erosion occurs adjacent to the permitted encroachment(s), the permittee shall repair the eroded areas and place adequate mitigation on the affected areas to prevent further erosion.

FORTY-SIX: The permitted encroachment(s) shall not interfere with the flood conveyance capacity of Big Chico Creek. 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) under direction of the Board. If the permittee does not comply, the Board may modify or remove the encroachment(s) at the permittee's expense.

FORTY-SEVEN: At the request of either the permittee or the Board, the permittee and the Board shall conduct joint inspections of the project site to assess the integrity and operation of the project, and to assess and respond to any adverse impacts on the floodway or adjacent properties.

PROJECT ABANDONMENT, CHANGE IN PLAN OF FLOOD CONTROL

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

FORTY-NINE: 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 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 damaged by any cause. If the permittee does not comply, the Board may perform this work at the permittee's expense.

END OF CONDITIONS

State of California | DEPARTMENT OF WATER RESOURCES
CENTRAL VALLEY FLOOD PROTECTION BOARD | California Natural Resources Agency

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD
ENCROACHMENT PERMIT

Application No. _____
(For Office Use Only)

1. Description of proposed work being specific to include all items that will be covered under the issued permit.

The California State University, Chico (CSU Chico) proposes to replace the existing pedestrian Physical Science Bridge (proposed project) that spans Big Chico Creek with a vehicular bridge that will facilitate emergency vehicle and pedestrian access between the CSU Chico campus and Arcadian Avenue. See attached Project Description.

2. Project Location: Butte County, in Section Rancho Farwell Land Grant of 1844
Township: _____ (N) (S), Range: _____ (E) (W), M. D. B. & M.
Latitude: 39 43'51.86" N Longitude: 121 50'39.29"W
Stream : Big Chico Creek , Levee : _____ Designated Floodway: _____
APN: _____

3. Lynda Miracle, California State University, Chico (Name of Applicant / Land *Owner*) of 400 West First Street (Address)

Chico (City) | CA (State) | 95929 (Zip Code) | 530-898-6235 (Telephone Number)
lmiracle@csuchico.edu (E-mail)

4. Kamie Loeser, Senior Environmental Planner (Name of Applicant's Representative) of NorthStar Engineering (Company)

Chico (City) | CA (State) | 95926 (Zip Code) | 530-893-1600 x 213 (Telephone Number)
kloeser@northstareng.com (E-mail)

5. Endorsement of the proposed project from the Local Maintaining Agency (LMA):

We, the Trustees of DWR Sutter Maintenance Yard (Name of LMA) approve this plan, subject to the following conditions:

☐ Conditions listed on back of this form ☑ Conditions Attached ☐ No Conditions

Trustee _____ Date 12-9-14
Trustee _____ Date
Trustee _____ Date
Trustee _____ Date
Trustee _____ Date

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD
ENCROACHMENT PERMIT

6. Names and addresses of adjacent property owners sharing a common boundary with the land upon which the contents of this application apply. If additional space is required, list names and addresses on back of the application form or an attached sheet.

Name	Address	Zip Code
City of Chico	411 Main Street, Chico, CA	95928

7. Has an environmental determination been made of the proposed work under the California Environmental Quality Act of 1970? ☑ Yes ☐ No ☐ Pending

If yes or pending, give the name and address of the lead agency and State Clearinghouse Number:
California State University, Chico - Planning, Design & Construction
400 West First Street
Chico, CA 95929-0018
SCH No. #2014032059

8. When is the project scheduled for construction? Summer 2015

9. Please check exhibits accompanying this application.

A. ☑ Regional and vicinity maps showing the location of the proposed work.

B. ☑ Drawings showing plan view(s) of the proposed work to include map scale.

C. ☑ Drawings showing the cross section dimensions and elevations (vertical datum?) of levees, berms, stream banks, flood plain,

D. ☑ Drawings showing the profile elevations (vertical datum?) of levees, berms, flood plain, low flow, etc.

E. ☑ A minimum of four photographs depicting the project site.

Signature of Applicant 12/4/14 Date

Include any additional information:

CONDITIONS

Department of Water Resources
Sutter Maintenance Yard

Encroachments within the Floodway

1. Permittee must maintain encroachment/s in good operating condition in perpetuity.

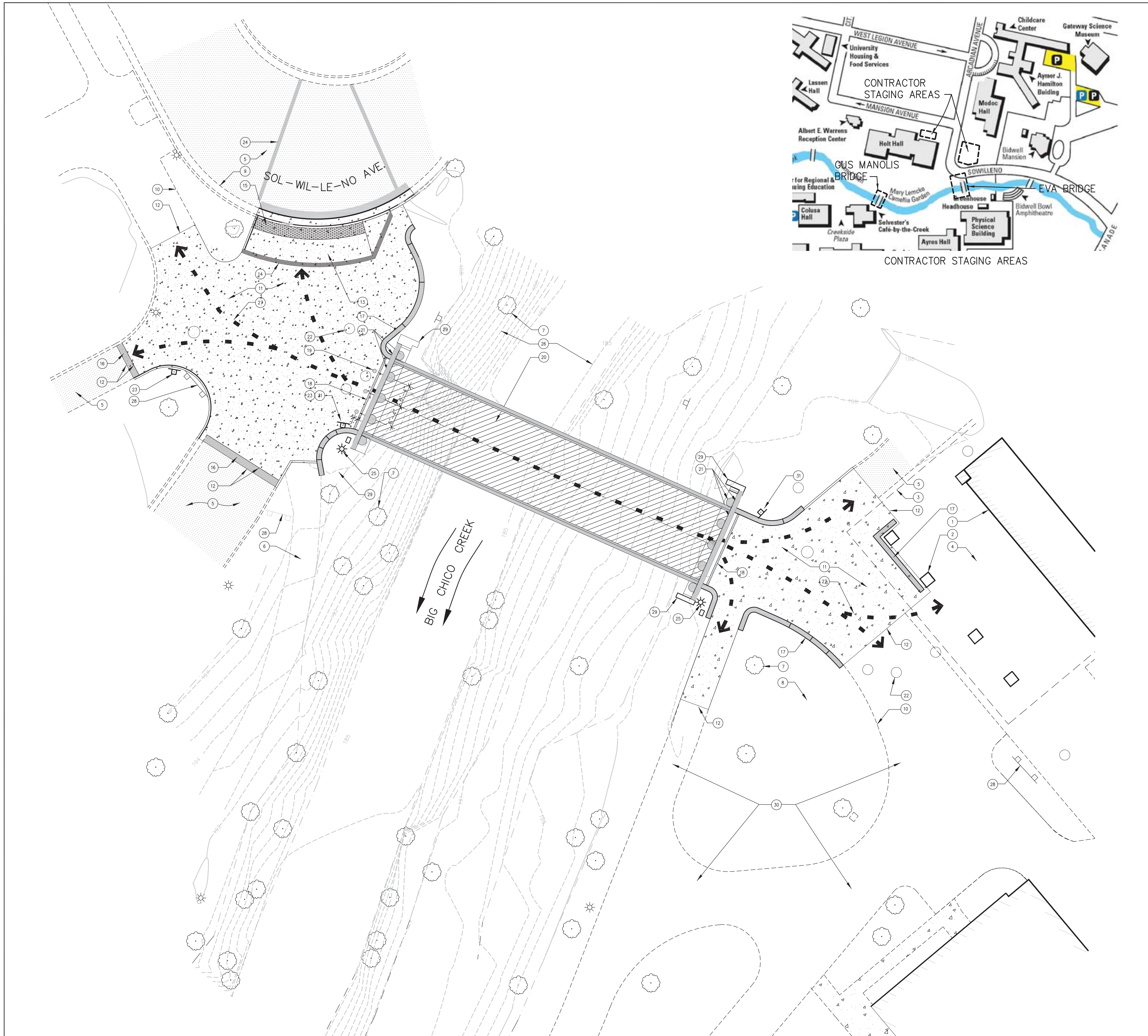
2. Repair and maintenance of the encroachment/s is the responsibility of the Permittee in perpetuity.

3. Encroachment/s must not interfere with Sutter Maintenance Yard's access to the levee, ability to perform levee maintenance, or conduct any emergency response operations.

4. Any changes made to the project as described in this encroachment application will be subject to review by the endorser, Sutter Maintenance Yard.

5. All conditions of CVFPB will be met by Permittee.

ATTACHMENT D- Project Drawings



SITE PLAN (PHYSICAL SCIENCE)

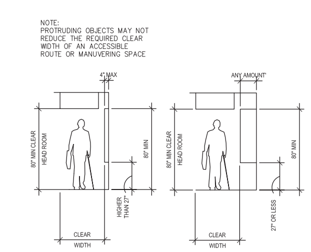
NORTH SCALE: 1" = 10'-0"

LEGEND NOTES

1. EXISTING BUILDING FOOTPRINT (TYP.).
2. EXISTING BUILDING COLUMN (TYP.).
3. EXISTING BUILDING OVERHANG (TYP.).
4. EXISTING CONCRETE (TYP.).
5. EXISTING ASPHALT PAVING (TYP.).
6. EXISTING NON-ADA PATH
7. EXISTING TREE (TYP.).
8. EXISTING PLANTER (TYP.). NOTE: RETURN ALL AREAS DISTURBED DURING CONSTRUCTION TO ORIGINAL CONDITION. RE-ROUTE IRRIGATION LINES AND RELOCATE IRRIGATION HEADS AND ACCESSORIES IN CONFLICT WITH NEW CONSTRUCTION.
9. EXISTING CURB AND GUTTER (TYP.).
10. OUTLINE OF EXISTING HARDSCAPE (TYP.)
11. CONCRETE WALK/APPROACH. SEE CIVIL DRAWINGS.
12. PROVIDE FLUSH TRANSITION TO EXISTING SURFACE (TYP.).
13. CONCRETE CURB RAMP. SEE CIVIL AND DETAIL 16/AS1.2 (SIM.).
14. 12" WIDE GROOVED BORDER. SEE DETAIL 16/AS1.2 (SIM.).
15. DETECTABLE WARNING (TRUNCATED DOMES) AT CURB RAMP. SEE DETAILS 15/AS1.2 AND 16/AS1.2.
16. ASPHALT PAVING. SEE CIVIL DRAWINGS.
17. CONCRETE SEAT WALL (TYP.). SEE DETAILS 35/AS1.2 AND 45/AS1.2. SEE CIVIL DRAWINGS FOR TOP OF WALL DATUM ELEVATIONS/GRADING.
18. TRENCH DRAIN. SEE CIVIL DRAWINGS AND DETAIL 36/AS1.2.
19. REMOVABLE BOLLARD (TYP.). SEE DETAIL 46/AS1.2.
20. BRIDGE. SEE BRIDGE DRAWINGS.
21. CONCRETE FOOTING AND APRON. SEE STRUCTURAL DRAWINGS.
22. ADJUST LID FOR EXISTING UTILITY VAULT. SEE CIVIL DRAWINGS.
23. ACCESSIBLE DIRECTIONAL SIGNAGE. SEE DEAIL 56/AS1.2. REFER TO SPECIFICATION SECTION 101413 FOR MOUNTING POST REQUIREMENTS.
24. CROSSWALK STRIPING. SEE CIVIL DRAWINGS.
25. POLE-MOUNTED LIGHT FIXTURE. SEE SHEET AS1.3.
26. GRADING CONTOURS (TYP.). SEE CIVIL DRAWINGS AND EXISTING TOPOGRAPHIC PLAN.
27. ACCESSIBLE PATH OF TRAVEL (TYP.). SEE ACCESSIBILITY NOTES ON THIS SHEET.
28. EXISTING SIGN.
29. RETAINING WALLS. SEE CIVIL DRAWINGS.
30. EXISTING DSA-APPROVED CONCRETE WALK PER PHASE 1 PROJECT - SOUTHSIDE IMPROVEMENTS (SEE DSA APPLICATION NUMBER 02-113528).
31. SIGN MOUNTED TO POST. SIGN TO READ "BRIDGE WEIGHT LIMIT: 72,000 lbs.".

ACCESSIBILITY NOTES

1. ALL FLATWORK SHALL BE CONSTRUCTED TO COMPLY WITH CURRENT ADA ACCESSIBILITY GUIDELINES AND TITLE 24 CALIFORNIA BUILDING CODE REQUIREMENTS. THIS REQUIRES "EXTRA EFFORT" IN ACHIEVING THE ACCURACY OF THE GRADES AND SLOPES REQUIRED (FINISHED GRADES OF CONCRETE IN TITLE 24 AREAS SHALL BE WITHIN A TOLERANCE OF ±1/8" OF PROPOSED GRADES). PRIOR TO POURING CONCRETE ON ANY TITLE 24 ACCESSIBLE PATH OF TRAVEL, THE GRADE DIFFERENTIAL OR SLOPES ARE TO BE VERIFIED BY THE CONTRACTOR AS BEING IN COMPLIANCE WITH TITLE 24 REQUIREMENTS. IF ANY DIFFERENCES ARE FOUND NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY PRIOR TO PROCEEDING. ANY CONCRETE ITEMS NOT MEETING THE TOLERANCE FOR ACCESSIBILITY WILL BE REJECTED. ALL COSTS FOR REMOVAL AND RECONSTRUCTION OF SUCH ITEMS SHALL BE BORNE SOLELY BY THE CONTRACTOR.
2. WALKS AND SIDEWALKS:
   A. WALKS AND SIDEWALKS SHALL HAVE A CONTINUOUS COMMON SURFACE NOT INTERRUPTED BY STEPS OR BY ABRUPT CHANGES IN LEVEL EXCEEDING 1/2 INCH PER BELOW AND SHALL BE A MINIMUM OF 4 FEET IN WIDTH.
   B. ABRUPT CHANGES IN LEVEL ALONG ANY ACCESSIBLE ROUTE SHALL NOT EXCEED ½ INCH. WHEN CHANGES IN LEVEL DO OCCUR, THEY SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 1V:2H EXCEPT THAT LEVEL CHANGES NOT EXCEEDING 1/4 INCHES MAY BE VERTICAL. WHEN CHANGES IN LEVEL GREATER THAN 1/2 INCH ARE NECESSARY, COMPLY WITH THE REQUIREMENTS FOR CURB RAMPS.
   C. WALKS, SIDEWALKS AND PEDESTRIAN WAYS SHALL BE FREE OF GRATING WHENEVER POSSIBLE. FOR GRATINGS LOCATED IN THE SURFACE OF ANY OF THESE AREAS, GRID OPENINGS IN GRATINGS SHALL BE LIMITED TO 1/2 INCH IN THE DIRECTION OF TRAFFIC FLOW. THE LONG DIMENSION OF GRATING OPENINGS SHALL BE PERPENDICULAR TO THE PEDESTRIAN ROUTE.
   D. ALL WALKS SHALL HAVE LESS THAN 2% CROSS SLOPE AND LESS THAN 5% RUNNING SLOPE WHEN PART OF AN ACCESSIBLE ROUTE. WHEN THE SLOPE IN THE DIRECTION OF TRAVEL OF ANY WALK EXCEEDS 1 VERTICAL TO 20 HORIZONTAL IT SHALL COMPLY WITH THE CBC PROVISIONS FOR RAMPS.
3. ALL WALKS TO BE FREE OF OVERHEAD OBSTRUCTIONS WITHIN 80" ABOVE THE WALKING SURFACE
4. ALL WALKS TO BE FREE OF OBJECTS WHICH PROTRUDE MORE THAN 4" BETWEEN THE HEIGHTS OF 27" AND 80" ABOVE THE WALKING SURFACE.
5. ACCESSIBLE PATH OF TRAVEL (POT) IS INDICATED BY:



ACCESSIBLE ROUTE CLEARANCE

ARCHITECTURAL SITE PLAN (PHYSICAL SCIENCE)
PHYSICAL SCIENCE BRIDGE, PHASE II
CALIFORNIA STATE UNIVERSITY, CHICO CALIFORNIA

AS1.1
75-14135-00
2014-11-07

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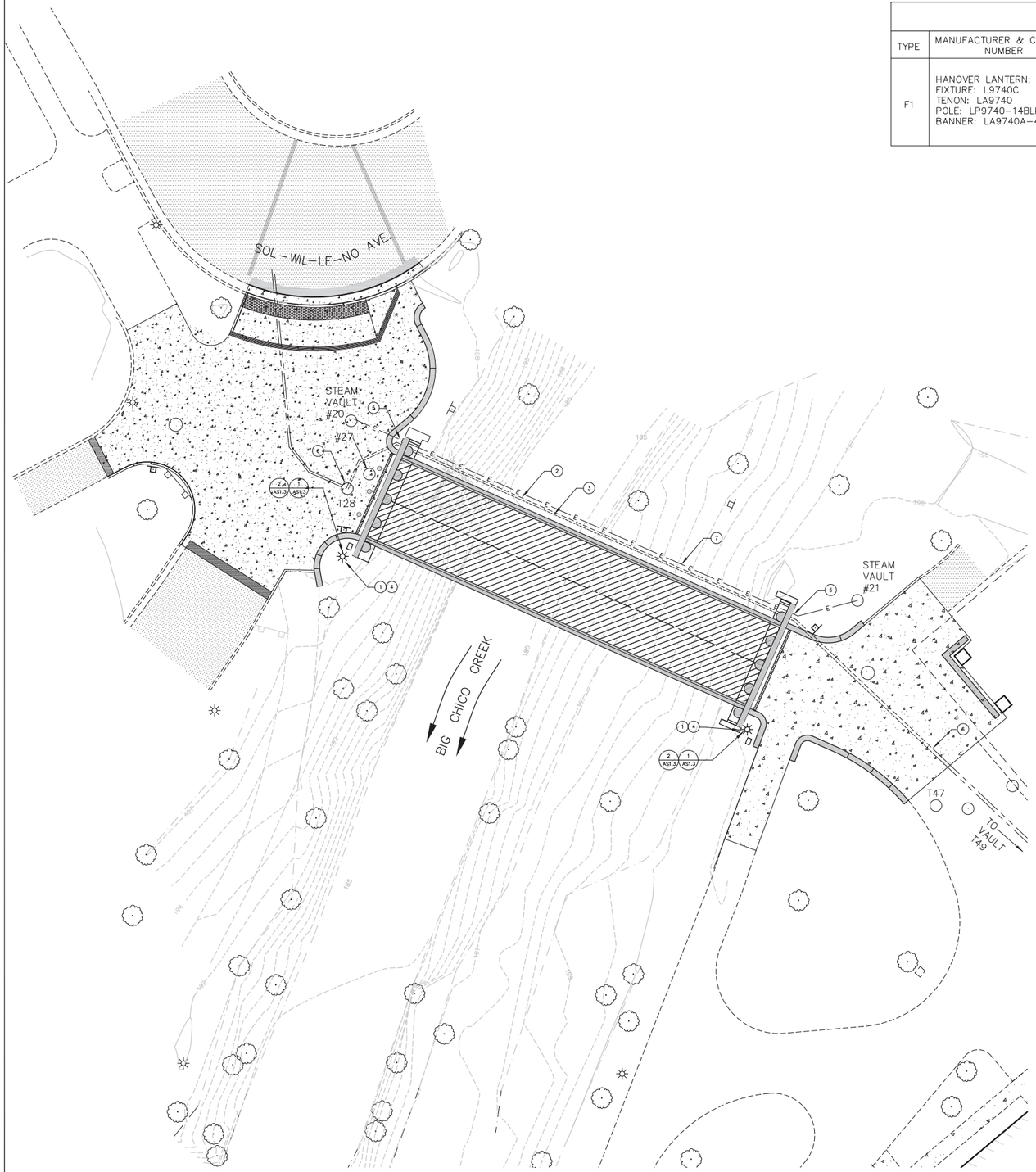
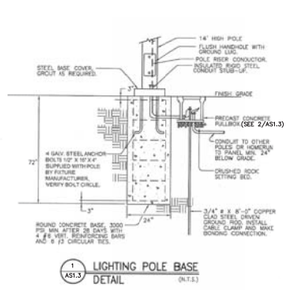
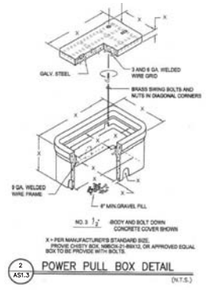


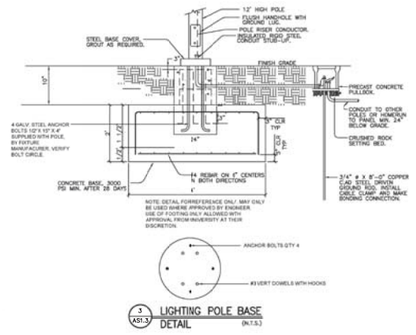
FIXTURE SCHEDULE						
TYPE	MANUFACTURER & CATALOG NUMBER	LAMP QUANTITY–LAMP	VOLTAGE/VA	DETAIL	DESCRIPTION	SYMBOL
F1	HANOVER LANTERN: FIXTURE: L9740C TENON: LA9740 POLE: LP9740–14BLK BANNER: LA9740A–4BLK24	80W LED 4500 LUMINS	120/277	1/AS1.3	ACORN LED FIXTURE TO MATCH EXISTING FIXTURES. NO SUBSTITUTIONS WILL BE ACCEPTED. 4" X14' ROUND POLE TO MATCH EXISTING. PROVIDE FIXTURE WITH FOUR BLACK BANNER ARMS MOUNTED 24" APART CONSTRUCTED OF HEAVY WALL PIPE. HOLDER ARM LENGTH (EACH) TO BE 24". UL LISTED.	☼



1 AS1.3 LIGHTING POLE BASE DETAIL (N.T.S.)



2 AS1.3 POWER PULL BOX DETAIL (N.T.S.)



3 AS1.3 LIGHTING POLE BASE DETAIL (N.T.S.)

ELECTRICAL LEGEND NOTES:

1. REFER TO FIXTURE SCHEDULE AND DETAILS ON THIS SHEET FOR FIXTURE TYPE TO REPLACE EXISTING. NO SUBSTITUTIONS OF FIXTURES SHALL BE ALLOWED. FIXTURES SHALL MATCH EXISTING FROM RECENTLY COMPLETED PHASE 1 WORK.
2. TEMPORARILY RELOCATE FROM EXISTING BRIDGE AND PROTECT (5) EXISTING 3" TELECOM CONDUITS (WITH FIBER) DURING DEMOLITION AND NEW CONSTRUCTION ACTIVITIES. COORDINATE AND INSTALL SLEEVES THROUGH NEW CONCRETE ABUTMENTS. AFTER NEW BRIDGE ERECTION, INSTALL (5) NEW 3" TELECOM CONDUITS OVER BRIDGE AND UNDER APPROACHES, AND TERMINATE AT EACH END WHERE INDICATED FOR OWNER TIE–IN (OWNER TO MAKE FINAL CONDUIT CONNECTION AND PULL / TERMINATE / TEST WIRING).
3. TEMPORARILY RELOCATE FROM EXISTING BRIDGE AND PROTECT (1) EXISTING 3" TELECOM CONDUIT (WITH 300 PAIR COPPER) DURING DEMOLITION AND NEW CONSTRUCTION ACTIVITIES. COORDINATE AND INSTALL SLEEVES THROUGH NEW CONCRETE ABUTMENTS. AFTER NEW BRIDGE ERECTION, INSTALL (1) NEW 3" TELECOM CONDUIT OVER BRIDGE AND UNDER APPROACHES, AND TERMINATE AT EACH END WHERE INDICATED FOR OWNER TIE–IN (OWNER TO MAKE FINAL CONDUIT CONNECTION AND PULL / TERMINATE / TEST WIRING).
4. INTERCEPT EXISTING FEED TO EXISTING LIGHT FIXTURE AND EXTEND TO NEW PULL BOX.
5. RUN NEW CONDUIT AND SLEEVES THROUGH TOP OF CONCRETE ABUTMENT.
6. POINT OF CONNECTION FOR NEW TO EXISTING TELECOM CONDUITS (MAKE FINAL CONNECTION AFTER BRIDGE STRUCTURE ERECTION).
7. INTERCEPT EXISTING WIRING (POWER) AND CONDUIT TO EXISTING STEAM VAULT #21 FOR SUMP PUMP. RUN NEW CONDUIT AND WIRING (MATCH IN–KIND) THROUGH CONCRETE ABUTMENTS (WITH SLEEVE) AND OVER BRIDGE TO NEW STEAM VAULTS #20 AND #21.

ELECTRICAL GENERAL NOTES:

1. REMOVE AND SALVAGE EXISTING LIGHT FIXTURE AND POLE BASE AND RETURN TO OWNER AS DIRECTED BY OWNER'S REPRESENTATIVE. IF OWNER DOES NOT WANT ITEMS, CONTRACTOR SHALL LEGALLY DISPOSE OF OFF–SITE.
2. THE CONTRACTOR SHALL VISIT THE JOBSITE AND VERIFY ALL EXISTING CONDITIONS PRIOR TO BIDDING AND SHALL INCLUDE IN THE BID THE NECESSARY COSTS TO CONSTRUCT THIS PROJECT IN ACCORDANCE WITH THESE DRAWINGS, SPECIFICATIONS, AND APPLICABLE CODES.
3. ALL ELECTRICAL MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS LABORATORIES AND BEAR THEIR LABEL.
4. CONTRACTOR SHALL REMOVE ALL LEFT OVER CONDUIT, WIRE, SCRAPS, ETC. AND LEAVE PREMISES CLEAN AND FREE OF TRASH AND DEBRIS RESULTING FROM HIS WORK.
5. CONTRACTOR SHALL REPORT TO THE OWNER'S REPRESENTATIVE ANY OBSERVATIONS OF CONDITIONS WHICH ARE DISCOVERED ON–SITE WHICH WOULD PREVENT THE CORRECT INSTALLATION OF THE ELECTRICAL SYSTEM.
6. CONDUIT ROUTING (WHERE SHOWN) IS ESSENTIALLY DIAGRAMMATIC. CONTRACTOR SHALL LAYOUT RUNS TO SUIT FIELD CONDITIONS AND THE COORDINATION REQUIREMENTS OF OTHER TRADES.
7. COORDINATE LOCATIONS OF ALL SITE PULL BOXES AND TRENCHING WITH ARCHITECT PRIOR TO INSTALLATION. UTILITY LINES SHALL BE MINIMUM OF 10'–0" AWAY FROM TREE LOCATIONS.
8. SIZE PULL BOXES TO MINIMUM CODE REQUIREMENTS. OBTAIN ARCHITECT'S APPROVAL OF ANY PULLBOX(ES) NOT INDICATED, BUT ADDED TO FACILITATE THE INSTALLATION OF CONDUITS SHOWN ON THE PLANS.

NORTH

ELECTRICAL SITE PLAN (PHYSICAL SCIENCE)

SCALE: 1" = 10'–0"

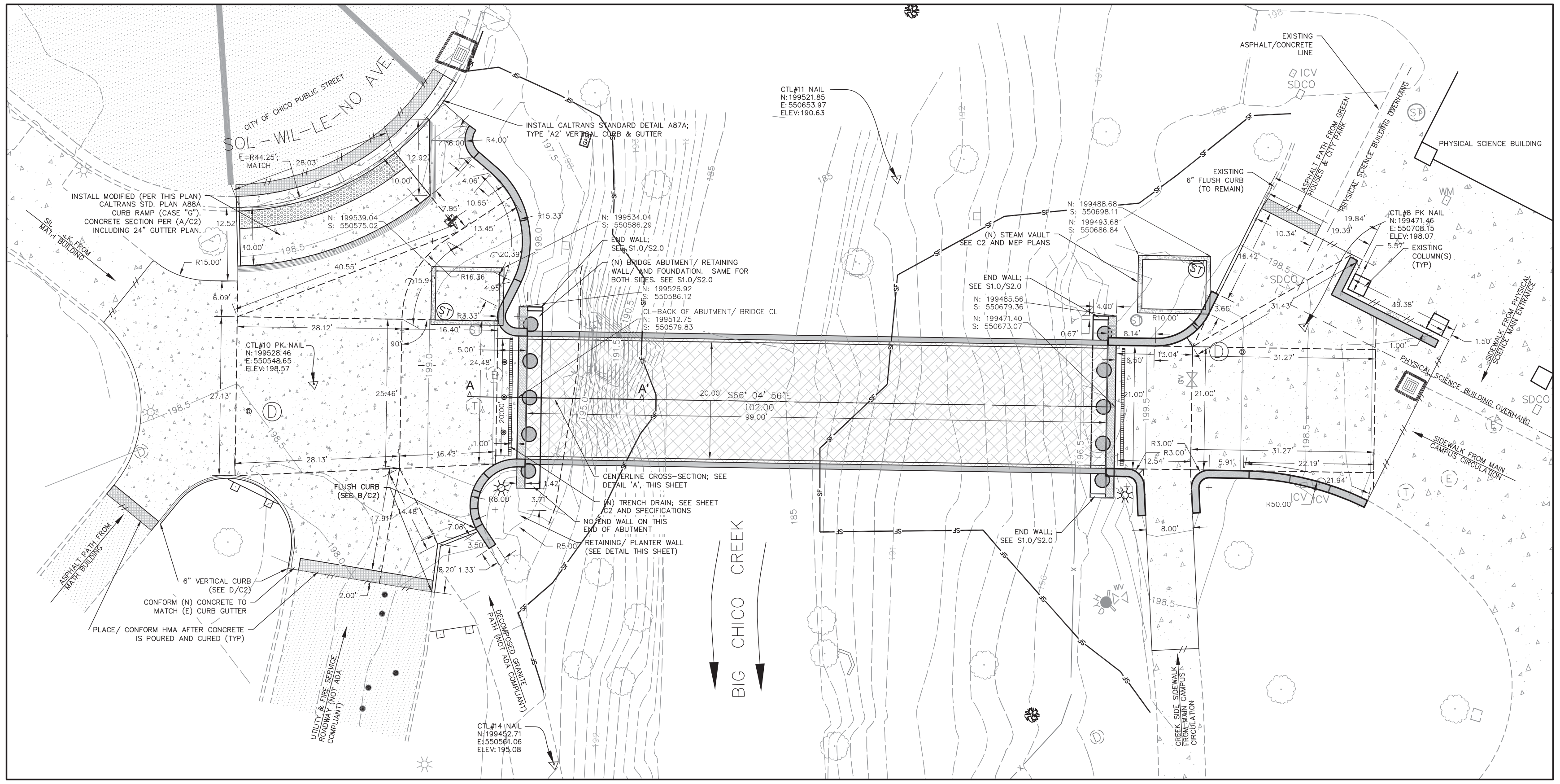
DLR Group
Architecture Engineering Planning Interiors

FILE # CSRC
ALL PLOTTED SHEETS SHALL BE SIGNED BY THE ARCHITECT OF RECORD
APPL. # ———
AC ——— RS ——— SS ———
DATE ———

AS1.3
75-14135-00
2014-1-07

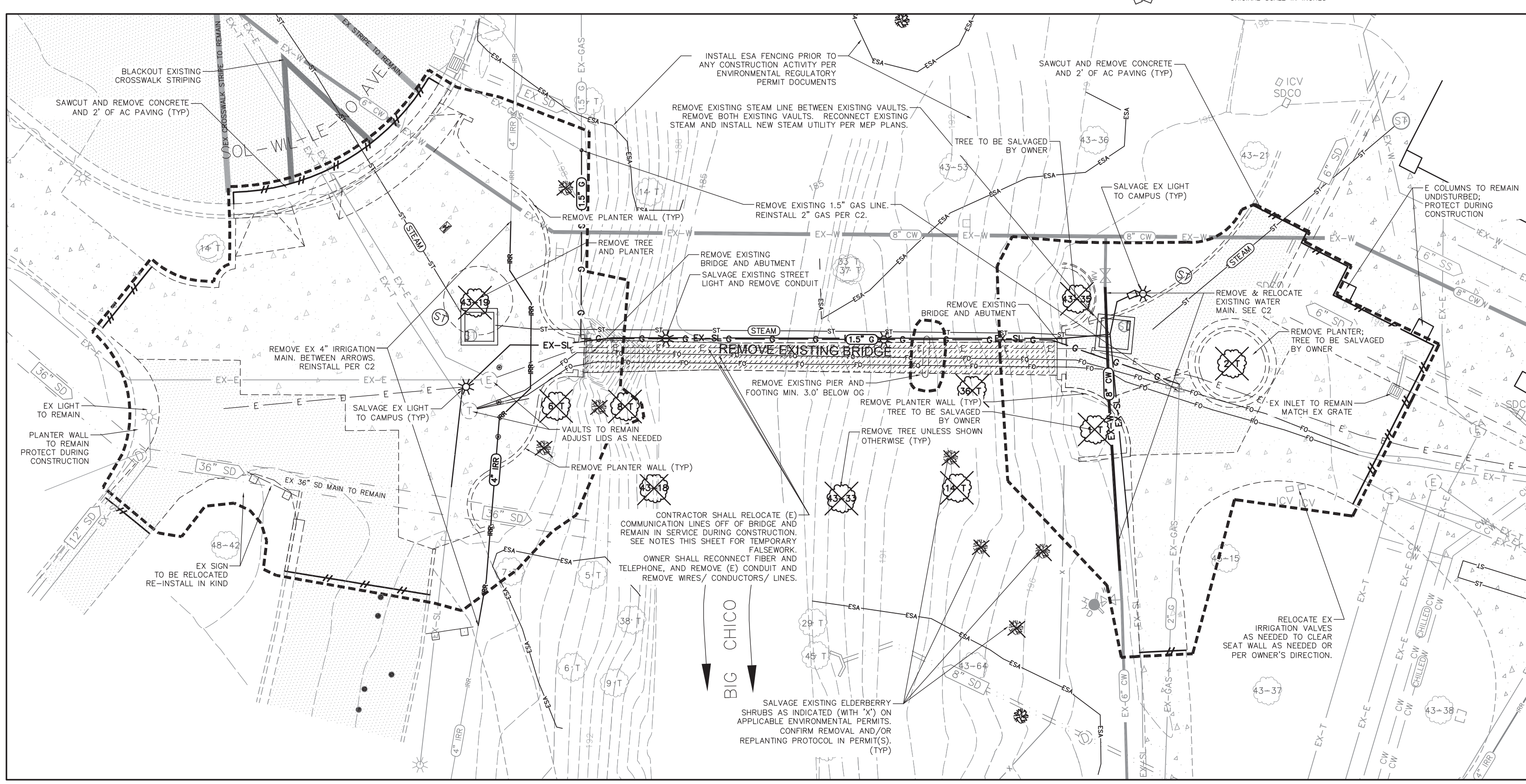
ELECTRICAL SITE PLAN (PHYSICAL SCIENCE)
PHYSICAL SCIENCE BRIDGE, PHASE II
CALIFORNIA STATE UNIVERSITY, CHICO CALIFORNIA

ATTACHMENT D- Project Drawings



LAYOUT PLAN

ORIGINAL SCALE IN INCHES



DEMOLITION PLAN

ORIGINAL SCALE IN INCHES

LEGEND

EXISTING STORM DRAIN LINE & SIZE	EXISTING STREET LIGHT
EXISTING SEWER LINE & SIZE	EXISTING STORM DRAIN INLET
EXISTING CAL WATER MAIN	EXISTING STORM DRAIN MANHOLE
EXISTING IRRIGATION MAIN	EXISTING WATER VALVE
EXISTING GAS MAIN	EXISTING WATER METER
EXISTING TELE-COM LINE	EXISTING FIRE HYDRANT
EXISTING ELECTRIC LINE	EXISTING ELDERBERRY SHRUB (TO BE PRESERVED)
EXISTING STREET LIGHT LINE	EXISTING TREE (TO BE PRESERVED)
EXISTING CHILLED WATER LINE	EXISTING SIGN
EXISTING STEAM LINE	EXISTING SURVEY CONTROL POINT
EXISTING FENCE	EXISTING STEAM VAULT
EXISTING 5' MAJOR CONTOUR	EXISTING ELECTRIC MANHOLE
EXISTING 0.5' MINOR CONTOUR	EXISTING TELECOM MANHOLE
EXISTING HARDSCAPE IMPROVEMENTS	PROPOSED REMOVABLE BOLLARD (46/AS1.2)
EXISTING CONCRETE CURB	PROPOSED/RELOCATED SIGN
LIMITS OF GENERAL DEMOLITION WORK	PROPOSED IRRIGATION VALVE/ UTILITY BOX
EXISTING CONCRETE SURFACE	
EXISTING ASPHALT SURFACE	
EXISTING BUILDING	
PROPOSED SAWCUT LINE	
PROPOSED CONCRETE SCORE / JOINT LINE	
PROPOSED GRADE BREAK	
PROPOSED SD PIPE	
PROPOSED WATER MAIN & SIZE (C/C2)	
PROPOSED IRRIGATION MAIN & SIZE (C/C2)	
PROPOSED GAS LINE & SIZE	
PROPOSED STEAM CONDUIT (ALONG BRIDGE)	
PROPOSED STREET LIGHT CONDUIT	
PROPOSED GRADE BREAK	
PROPOSED ESA/VEGETATION FENCE	
PROPOSED GRADE CATCH	
PROPOSED EROSION CONTROL SILT FENCE	
PROPOSED EROSION CONTROL WATTLE	
PROPOSED SEAT WALL (35&45/AS1.2)	
PROPOSED ASPHALT CONCRETE PAVING 3" AC ON 9" AB ON 12" COMPACTED SUBGRADE (95%RD)	
PROPOSED CONCRETE SIDEWALKS (A/C2)	

CONSTRUCTION LAYOUT NOTE:
CONSTRUCTION STAKING FOR NEW CONSTRUCTION TO BE PERFORMED BY A LICENSED CIVIL ENGINEER OR LICENSED LAND SURVEYOR. THE ELECTRONIC AUTO CAD FILE SHOWING LAYOUT & GRADES WILL BE MADE AVAILABLE TO THE WINNING BIDDER TO AID IN THE SETUP OF CONSTRUCTION STAKING.

LAYOUT OF BRIDGE FOUNDATION SHALL BE COMPLETED USING ACTUAL BRIDGE PLANS FROM MANUFACTURER AND FIELD RE-CHECKED FOR ACCURACY PRIOR TO PLACING ANY CONCRETE. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE CONSTRUCTED FITTINGS WILL MATCH DELIVERED BRIDGE.

EROSION CONTROL NOTES:
1. EROSION CONTROL BMPS ARE PROVIDED ON THIS PLAN AS A REFERENCE FOR THE CONTRACTOR. THE SIZE, TYPE, PLACEMENT LOCATION AND TIMING OF INSTALLATION OF SEDIMENT AND EROSION CONTROL BMPS SHALL BE DEVELOPED BY THE CONTRACTOR AS APPROPRIATE.
2. THIS SITE IS UNDER 1 ACRE IN SIZE AND IS NOT SUBJECT TO THE STATE CONSTRUCTION GENERAL PERMIT, THUS A SWPPP HAS NOT BEEN DEVELOPED AS PART OF THIS PLAN.

DEMOLITION NOTES:
1. CALL USA PRIOR TO THE START OF ANY CONSTRUCTION OR DEMOLITION. COORDINATE MARKING OF CAMPUS OWNED UTILITIES WITH UNIVERSITY STAFF.
2. REMOVED ASPHALT AND AGGREGATE BASE MAY BE REUSED FOR SITE FILL UNDER PROPOSED HARDSCAPE IMPROVEMENTS ONLY, ASPHALT SHALL BE GROUND TO MEET THE MINIMUM SIZE REQUIREMENTS.
3. EXISTING BRIDGE FOOTINGS & ABUTMENTS SHALL BE REMOVED TO A DEPTH OF AT LEAST 3' BELOW FINISHED GRADE AND FURTHER AS NEEDED TO AVOID CONFLICTS WITH PROPOSED SITE OR UTILITY FEATURES.
4. SITE SURVEY AND COMPILATION OF EXISTING AS-BUILTS IS NOT SUFFICIENT TO LOCATE EXISTING UNDERGROUND UTILITY LINES WITH ANY CONFIDENCE. CONTRACTOR TO BE AWARE THAT UNDERGROUND LINES MAY EXIST ANYWHERE ON THE SITE AND SHALL USE EXTREME CAUTION DURING ALL EXCAVATION AND EARTHWORK.
5. CONTRACTOR TO REVIEW CONSTRUCTION DRAWINGS AND SAVE ANY FACILITIES SHOWN AS REMAINING. COORDINATE THE EXACT LIMITS OF REMOVAL WITH CONSTRUCTION CONTRACTOR TO ENSURE GOOD CONTINUATION OF FACILITIES TO BE MATCHED.
6. UNDERGROUND DEMOLITION IS SHOWN IN GENERALLY ONLY, ACTUAL WORK PER EACH DISCIPLES INDIVIDUAL PLANS. WORK MAY EXTEND OUTSIDE OF DEMOLITION LIMITS SHOWN. CONTRACTOR TO REPAIR ALL DAMAGED SURFACES IN KIND.
7. ALL CONCRETE, STEEL, DELETERIOUS MATERIAL, ASPHALT, PLANTER WALLS, AND OTHER HARDSCAPE IMPROVEMENTS WITHIN DEMOLITION LIMITS SHALL BE COMPLETELY REMOVED UNLESS NOTED TO REMAIN.
8. TREES REMOVED WITHIN THE CREEK CHANNEL SHALL CONSIST OF REMOVING THE ABOVE GROUND PORTION ONLY. NO EXCAVATION OF ROOTS OR STUMP GRINDING TO BE ALLOWED. TREES OUTSIDE OF CHANNEL SHALL BE COMPLETELY REMOVED INCLUDING STUMPS & ROOTS.
9. TEMPORARY FALSEWORK BEAM SYSTEM SHALL BE PROVIDED BY GENERAL CONTRACTOR TO LOWER AND SUPPORT EXISTING UTILITIES DURING CONSTRUCTION.
10. UTILITIES OTHER THAN STEAM SHALL REMAIN IN OPERATION DURING CONSTRUCTION. SHORT DURATION SERVICE OUTAGE IS ALLOWED DURING SPLICING/RECONNECTION OF NEW UTILITIES.

CIVIL PLAN ABBREVIATIONS

AGGREGATE BASE ROCK	AB
ASPHALT CONCRETE	AC
AMERICAN DISABILITIES ACT	ADA
ATT TELEPHONE LINE	ATT
BUILDING	BLDG
BACK OF WALL	BOW
CENTER LINE	CL
CONCRETE	CONC
CONTROL	CTL
CAL WATER	CW
DRAIN INLET	DI
ELECTRIC	E
ELEVATION	ELEV
ENVIRONMENTALLY SENSITIVE AREA	ESA
EXISTING	EX
FLOW LINE	FL
GRADE BREAK	GB
GAS	G
STEAM	HW
IRRIGATION CONTROL VALVE	IVC
INVERT	INV
IRRIGATION	IRR
ON CENTER	O.C.
POINT OF CONNECTION	POC
RADIUS	R
STORM DRAIN	SD
STORM DRAIN CLEAN OUT	SDCO
STANDARD	STD
SEWER	S
SIDEWALK	SW
TOP OF WALL	TOW
TOP BACK OF CURB	TBC
WATER	W

SOILS REPORT

CONSTRUCTION SHALL CONFORM TO THE SOILS REPORT PREPARED BY MATRISCOPE ENGINEERING LABORATORIES, INC DATED SEPTEMBER 5, 2014. THE CONTRACTOR IS TO NOTIFY THE ENGINEER IMMEDIATELY IF SOILS DIFFERING IN CHARACTER OR STRUCTURE FROM THE REPORT ARE FOUND TO BE PRESENT ON THE SITE.

SURVEY NOTES

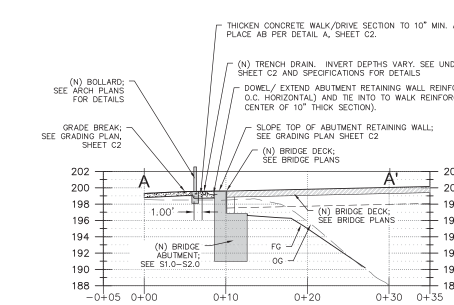
ALL SURVEYING FOR THIS PROJECT WAS PROVIDED BY CSUC AND COMPLETED BY ROBERTSON ERICKSON CIVIL ENGINEERS & SURVEYORS. THE REPORTED BASIS OF BEARINGS FOR THIS PROJECT IS BETWEEN FOUND MONUMNETS ON SHEET 2 OF 39-MAPS-52-55. THE BEARING OF SAID LINE BEING N61°55'35"E.

VERTICAL AND HORIZONTAL CONTROL IS BASED ON A MAP FOR CSUC BY RINGEL AND ASSOCIATES, DATED MARCH 22, 1988.

ELEVATIONS ARE BASED ON CSUC VERTICAL CONTROL POINT #V9A(H-9), A BRASS DISK AT THE INTERSECTION OF LEGION& CITRUS STREETS. ELEVATION = 192.27' USC & GS DATUM. TO CONVERT TO CITY OF CHICO DATUM SUBTRACT 0.53'. TO CONVERT TO NAVD88 ADD 2.33'.

COORDINATES ARE BASED ON CSUC HORIZONTAL CONTROL POINT H-9, A BRASS DISK AT THE SW CORNER OF LEGION & CITRUS STREETS.
CALIFORNIA ZONE 2 NAD 83
N- 2,392,553.912
E- 6,604,564.782

A WALKWAY/ TRENCHDRAIN/ ABUTMENT CROSS SECTION A-A'



NOTES:
1. THIS PROFILE IS PROVIDED TO ILLUSTRATE WALKWAY THICKNESS AT ABUTMENT WALL(S) AND CONNECTION TO ABUTMENT. REFER TO APPROPRIATE PLAN SHEETS AND SPECIFICATIONS FOR DETAILS.
2. CONCRETE WALK THICKNESS AND CONNECTION TO ABUTMENT RETAINING WALL SHALL BE THE SAME FOR BOTH SIDES OF THE BRIDGE.

CIVIL LAYOUT & DEMOLITION PLAN
PHYSICAL SCIENCE BRIDGE, PHASE II
CALIFORNIA STATE UNIVERSITY, CHICO CALIFORNIA

C1
75-14135-00
2014-12-08

NorthStar
Civil Engineers..Surveyors
Chico, California
111 Mission Ranch BLVD, STE 100 Chico, California 95926
Phone: (530) 893-1600 Fax: (530) 893-2113 Web: www.northstareng.com

REGISTERED PROFESSIONAL ENGINEER ROSS MORGAN SIMMONS No. 68511 CIVIL STATE OF CALIFORNIA

FILE 4-CSUC
IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
OFFICE OF REGULATION SERVICES
APPL. #: 02-
AC FLS SS
DATE

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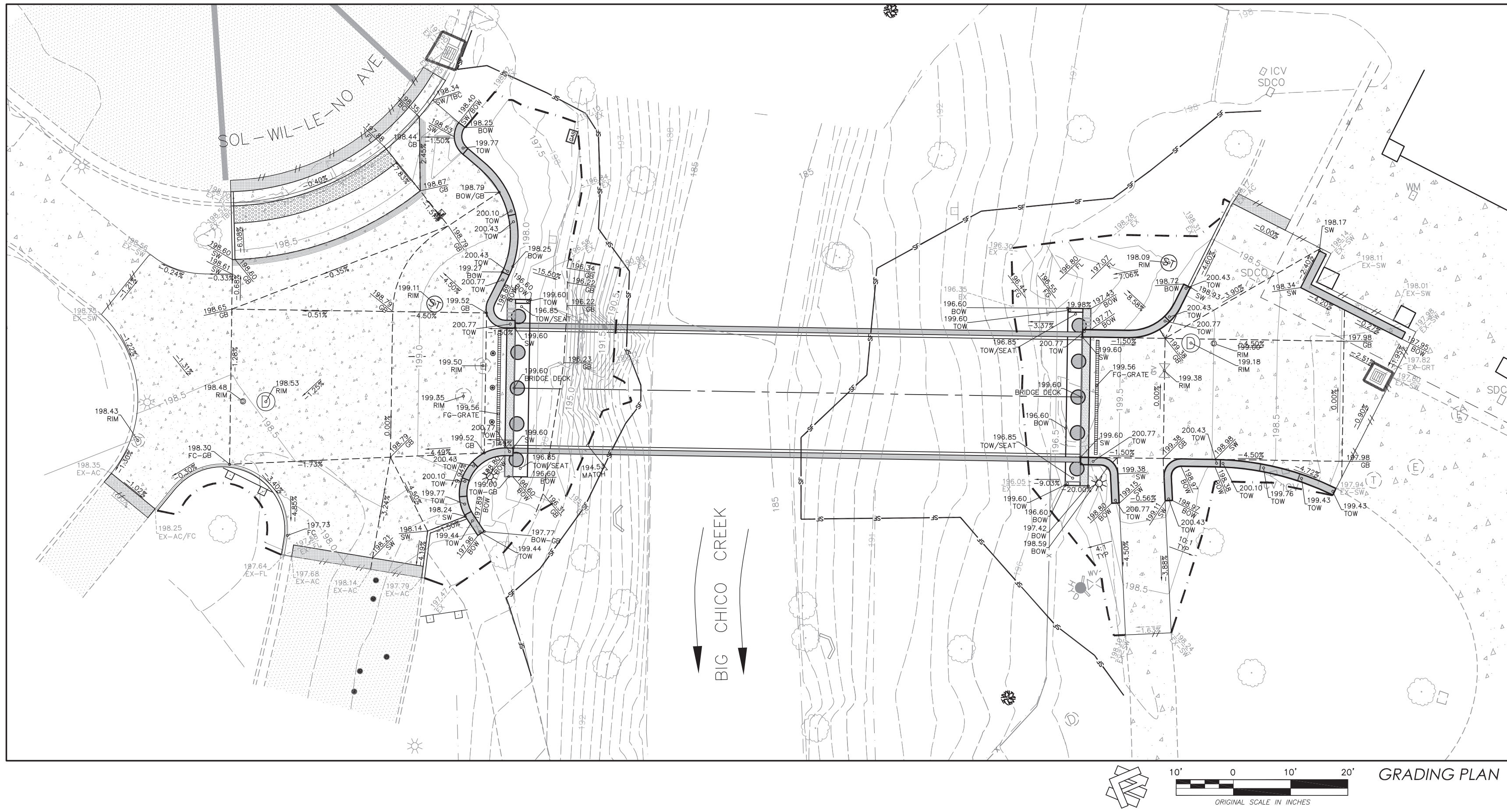
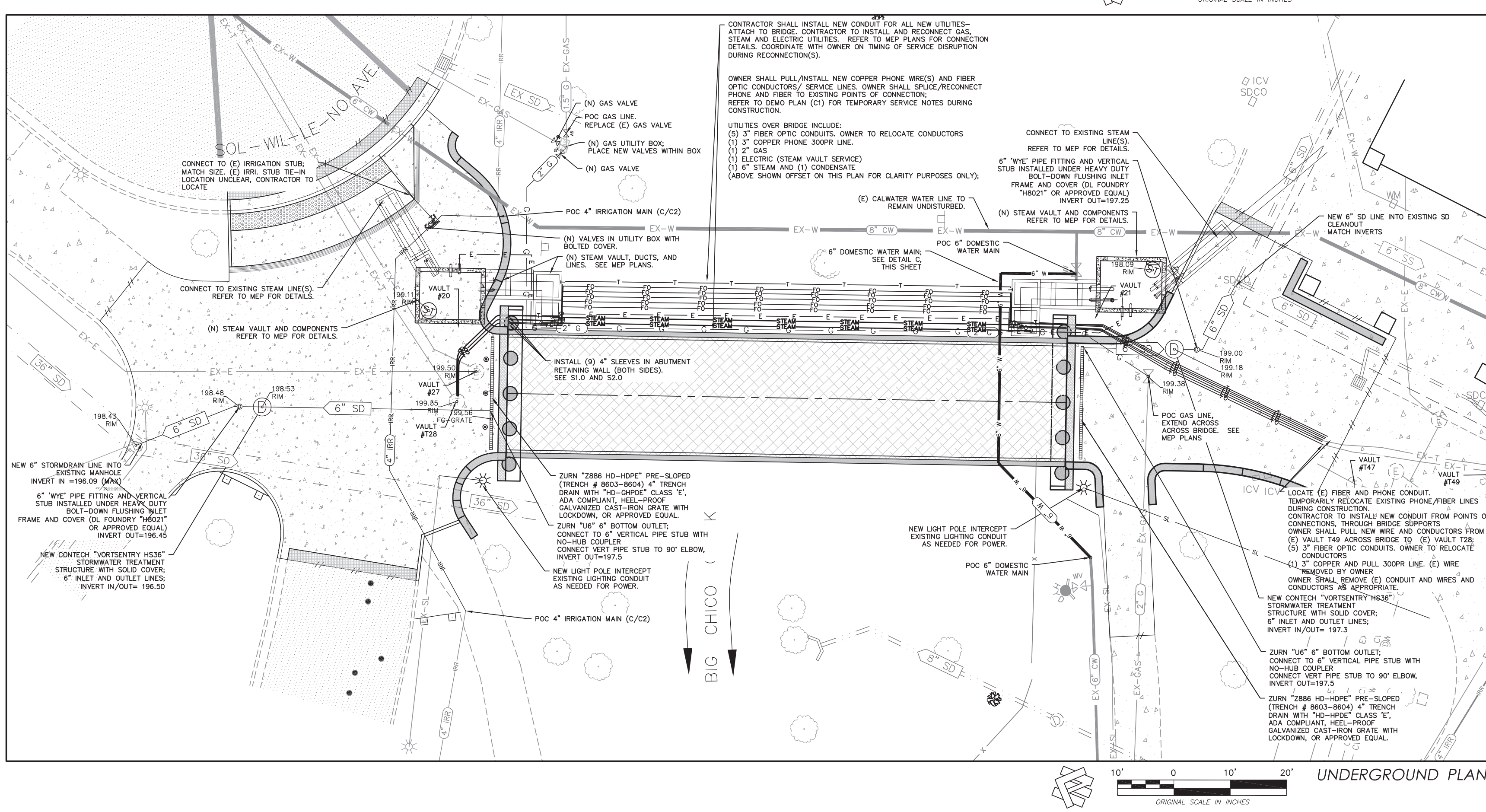


GRADING PLAN



UNDERGROUND PLAN

LEGEND

- EXISTING STORM DRAIN LINE & SIZE
- EXISTING SEWER LINE & SIZE
- EXISTING CAL WATER MAIN
- EXISTING IRRIGATION MAIN
- EXISTING GAS MAIN
- EXISTING TELE-COM LINE
- EXISTING ELECTRIC LINE
- EXISTING STREET LIGHT LINE
- EXISTING CHILLED WATER LINE
- EXISTING STEAM LINE
- EXISTING FENCE
- EXISTING 5' MAJOR CONTOUR
- EXISTING 0.5' MINOR CONTOUR
- EXISTING HARDSCAPE IMPROVEMENTS
- EXISTING CONCRETE CURB
- LIMITS OF GENERAL DEMOLITION WORK
- EXISTING CONCRETE SURFACE
- EXISTING ASPHALT SURFACE
- EXISTING BUILDING
- PROPOSED SAWCUT LINE
- PROPOSED CONCRETE SCORE / JOINT LINE
- PROPOSED GRADE BREAK
- PROPOSED SD PIPE
- PROPOSED WATER MAIN & SIZE (C/C2)
- PROPOSED IRRIGATION MAIN & SIZE (C/C2)
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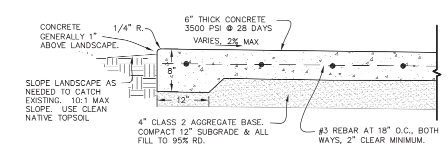
- PROPOSED ESA/VEGETATION FENCE
- PROPOSED GRADE CATCH
- PROPOSED EROSION CONTROL SILT FENCE
- PROPOSED EROSION CONTROL WATTLE
- PROPOSED SEAT WALL (35&45/AS1.2)
- PROPOSED ASPHALT CONCRETE PAVING 3" AC ON 9" AB ON 12" COMPACTED SUBGRADE (95%RD)
- PROPOSED CONCRETE SIDEWALKS (A/C2)
- EXISTING STREET LIGHT
- EXISTING STORM DRAIN INLET
- EXISTING STORM DRAIN MANHOLE
- EXISTING WATER VALVE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT
- EXISTING ELDERBERRY SHRUB (TO BE PRESERVED)
- EXISTING TREE (TO BE PRESERVED)
- EXISTING SIGN
- EXISTING SURVEY CONTROL POINT
- EXISTING STEAM VAULT
- EXISTING ELECTRIC MANHOLE
- EXISTING TELECOM MANHOLE
- PROPOSED REMOVABLE BOLLARD (46/AS1.2)
- PROPOSED/RELOCATED SIGN
- PROPOSED IRRIGATION VALVE/ UTILITY BOX

A TYPICAL TRAFFIC RATED CONCRETE

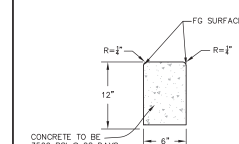
NOT TO SCALE



NOTES:
1. THICKEN EDGES OF CONCRETE SIDEWALKS AN EXTRA 2" FOR A MIN OF 12".
2. INSTALL SCORE AND EXPANSION JOINTS AS DETAILED BY ARCHITECTS PLANS. LOCATE JOINTS AS SHOWN ON LAYOUT PLANS TYPICALLY IN A SQUARE SCORE PATTERN FOR 10' SQUARES TYPICAL & 30' ON CENTER FOR EXPANSION JOINTS. ADDITIONALLY CONSTRUCT EXPANSION JOINTS ADJACENT TO ALL FIXED SITE FEATURES, INCLUDING SEAT WALLS, EXISTING CONCRETE WALKS, & DRAIN INLETS.
3. LONGITUDINAL SLOPE NOT TO EXCEED 5% (EXCEPT ON PED RAMPS), TRANSVERSE SLOPE NOT TO EXCEED 2%.
4. WHEN NEW CONCRETE IS CONSTRUCTED ADJACENT TO EXISTING CONCRETE DOWEL @ 36" O.C. WITH 12" #4 DOWELS, EQUAL EMBEDMENT, ONE SIDE TO BE SLIP ONE SIDE TO BE FIXED.

B FLUSH CURB DETAILS

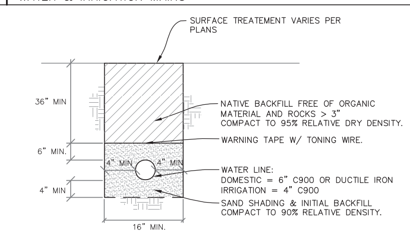
NOT TO SCALE



FLUSH CURB

NOTES:
1. PAVING ADJACENT TO CURBS SHALL BE FLUSH WITH THE TOP OF THE CURB.
2. INSTALL 1/4" WIDE EXPANSION JOINTS AT 50' MAX. INTERVALS AS WELL AS RETURNS AND 1/8" SCORED CONTROL JOINTS AT 10' MAX INTERVALS ON ALL CURBS.

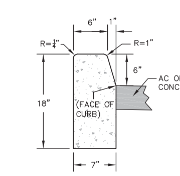
C WATER & IRRIGATION MAINS



NOTES:
1. FOR UTILITY TRENCH CROSSINGS SEPARATE LINES BY 12" MIN VERTICALLY.
2. ALL ANGLE POINTS IN LINES SHALL EITHER BE MECHANICALLY RESTRAINED OR HAVE CONCRETE THRUST BLOCKS CONSTRUCTED TO PREVENT SEPARATION.

D 6" VERTICAL CURB DETAILS

NOT TO SCALE



6" VERTICAL CURB

NOTES:
1. PAVING ADJACENT TO CURBS SHALL BE FLUSH WITH THE FACE OF THE CURB.
2. INSTALL 1/4" WIDE EXPANSION JOINTS AT 50' MAX. INTERVALS AS WELL AS RETURNS AND 1/8" SCORED CONTROL JOINTS AT 10' MAX INTERVALS ON ALL CURBS.

UTILITY NOTES:
1. SITE SURVEY AND COMPILATION OF EXISTING AS-BUILTS IS NOT SUFFICIENT TO LOCATE EXISTING UNDERGROUND UTILITY LINES WITH ANY CONFIDENCE. CONTRACTOR TO BE AWARE THAT UNDERGROUND LINES MAY EXIST ANYWHERE ON THE SITE AND SHALL USE EXTREME CAUTION DURING ALL EXCAVATION AND EARTHWORK.
2. UTILITY CONNECTION LOCATIONS SHOWN ON PLANS ARE APPROXIMATE. CONTRACTOR IS TO LOCATE AND CONNECT TO UTILITIES TO MEET THE PLANS OVERALL INTENT AND TO MAINTAIN SERVICE TO CAMPUS.
3. DO NOT USE VIBRATING SHEEPSFOOT ROLLER FOR COMPACTION ABOVE OR NEXT TO EXISTING UTILITY LINES. THIS APPLIES TO THE ENTIRE PROJECT AREA AS ACTUAL LOCATION OF BURIED UTILITIES IS UNKNOWN. ROLLER COMPACTION IS ACCEPTABLE. SEE SPECS FOR SPECIFIC TRENCH COMPACTION REQUIREMENTS.
4. UTILITIES AT BRIDGE CROSSING SHALL BE CONSTRUCTED TO ALLOW FOR BRIDGE FLEXURE, FOOTING AVOIDANCE, AND AT LOCATIONS ON BRIDGE ACCEPTABLE TO THE OWNER. UTILIZE ALL NEW MATERIALS TYPICAL FOR OUTDOOR INSTALLATION, COORDINATE MATERIALS AS NEEDED WITH BRIDGE MANUFACTURER TO ENSURE THEY ARE WITH IN EXPECTED LOADING AND WORK WITH BRIDGE MANUFACTURES STANDARD UTILITY HANGERS. CONTRACTOR IS RESPONSIBLE FOR SUPPLYING AND SECURING ALL UTILITY HANGERS AND COORDINATING WITH BRIDGE MANUFACTURE TO ENSURE SUITABILITY.

GRADING NOTES:
1. CONTRACTOR TO CONSTRUCT GRADING CONFORMS IN ADJACENT LANDSCAPE & DIRT AREAS TO ALL NEW SIDEWALKS AND ASPHALT SURFACES. SLOPE TO BE 5:1 MAXIMUM. IN AREAS OF CONFORM CONTRACTOR IS TO REPLACE EXISTING SURFACE, I.E. SOD IN AREAS OF LAWN, BARK MULCH IN PLANTING & NATIVE AREAS ALONG CREEK, DECOMPOSED GRANITE IN AREAS OF D.G. PATH CONFORM.
2. CONTRACTOR SHALL PROVIDE AND IMPLEMENT EROSION AND WATER POLLUTION CONTROL PLANS NEEDED TO ENSURE CONSTRUCTION CONFORMS TO ALL NATIONAL, STATE, AND LOCAL REQUIREMENTS.
3. REFER TO RE-VEGETATION PLAN FOR RE-VEGETATION OF DISTURBED AND FILLED AREAS.

CIVIL GRADING & UNDERGROUND PLAN
PHYSICAL SCIENCE BRIDGE, PHASE II
CALIFORNIA STATE UNIVERSITY, CHICO CALIFORNIA

C2
75-14135-00
2014-12-08

NorthStar
Civil Engineers..Surveyors
Chico, California
111 Mission Ranch BLVD, STE 100 Chico, California 95926
Phone: (530) 893-1600 Fax: (530) 893-2113 Web: www.northstareng.com

REGISTERED PROFESSIONAL ENGINEER ROSS MORGAN SIMMONS No. 68511 CIVIL STATE OF CALIFORNIA

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GENERAL CONDITIONS:

1-1 The Contractor shall verify all dimensions, details and job site conditions prior to commencing work and notify the Engineer of any discrepancies.
1-2 All construction and methods shall be in strict conformance with the applicable provisions of the latest edition of the AASHTO Bridge Design Specifications as well as all applicable municipal, State, and Federal regulations.
1-3 All work is subject to the approval of the building official's field inspector.
1-4 The Contractor shall provide all measures necessary to protect the structure, workmen, and all other persons during construction.
1-5 The Engineer is responsible for the structural items in these plans only. Should any changes be made from the design as specified in the calculations without approval from the Engineer (i.e. alterations to the structural system or addition of construction materials or loads), the Engineer will assume no responsibility for any element or system of the structure.
1-7 The Contractor or Owner shall secure all required approvals and permits from the appropriate agencies as required. If they elect not to obtain a permit, these plans shall be considered null and void.
1-8 In the event certain features of the construction are not fully shown on the plans or called for in the notes or specifications, their construction shall be of similar character to conditions shown on the plans and shall be reviewed by the Engineer and Owner prior to construction.
1-9 The drawings and specifications represent the finished structure, and, unless specifically noted otherwise do not show the method of construction. The Contractor is responsible for the method of construction, and shall provide all measures necessary to protect the public, construction workers, and the structure during construction. Such measures shall include forming, shoring, bracing, scaffolding, etc.
1-13 All contractors and / or subcontractors or installers shall be experienced in performing the work they are responsible to perform for the project. Under no circumstances shall inexperienced labor be utilized.

FOUNDATION:

2-1 The Contractor shall be responsible for the location of all underground facilities or other buried objects which may be encountered but which are not shown on these plans. Locations and depths of any existing utilities that may or may not be shown on these plans are approximate and may not be complete.
2-4 These calculations assume stable, undisturbed soils. Any unusual soil conditions such as organic soils or uncertified fills shall be brought to the attention of the Architect, Engineer, and Geotechnical Engineer prior to construction.
2-10 Foundations shall not be scaled from plan or detail drawings.
2-11 The Contractor shall be responsible for verifying the exact location and diameter of the anchor bolts with the bridge manufacturers plans prior to installation / concrete pour. Any discrepancies between the Consultants drawings for the abutment and the bridge design manufacturers drawings shall be brought to the attention of the Engineer prior to installation and / or concrete pour.

CONCRETE:

3-1 All foundation and slab on grade concrete shall have a mix design not less than f'c=4,000 psi after 28 days curing and shall require special inspection. Aggregate size shall be a maximum of 3/4". Maximum aggregate size should be reduced to 3/8" where wall thickness is less than 6" nominal or where reinforcing is sufficiently congested to prevent proper placement with a larger diameter aggregate.
3-2 Curing compound shall be sprayed on all exposed surfaces immediately after final troweling.
3-3 All cement used shall conform to ASTM C-150 and shall be Type II or Type III low alkali.
3-4 Aggregate shall conform to ASTM C-33 and shall not contain materials which are alkali reactive as determined by ASTM C-227, 289, and 295. If test data is unavailable in regards to alkali reactive materials, provide cement with a maximum alkali content less than 0.45% by weight.
3-5 Concrete exposed to freezing or thawing shall be protected in accordance to the latest edition of the ACI code and the applicable building code.
3-6 All concrete shall be properly consolidated.
3-7 Construction joints shall be clean and wet prior to placing concrete.
3-8 Concrete shall have a water-cement ratio of 0.52 lb./lb. or less. Addition of water at the job site is not permitted unless special inspection has been provided and test specimens are taken. If hot weather conditions are anticipated at the job site, concrete materials (aggregates, mixing water, and cement) shall be cooled prior to mixing, and retarders or plasticizers may be added to provide workable concrete. Forms, reinforcing steel and subgrade shall be fogged or sprinkled with cool water just before concrete is placed.
3-9 All projecting corners of slabs, beams, columns, walls, etc. shall be formed with a 3/4" chamfer, unless specifically noted otherwise.

REINFORCING STEEL:

5-1 Reinforcing steel shall conform to the provisions of ASTM A-615, Grade 60. All rebar is to be deformed. Welded wire fabric shall conform to the provisions of ASTM A 185.
5-2 All lap splices shall not be less than 62 bar diameters of the larger bar. Horizontal laps in adjacent bars shall be staggered 5' - 0" minimum.
5-3 Reinforcement cover shall be as follows:

Concrete cast against and permanently exposed to soil:		3" clear
Concrete with soil or weather exposure:	#5 bars and smaller:	1 1/2" clear
	#6 bars and larger:	2" clear
Concrete without soil or weather exposure:		3/4" clear

5-4 All rebar bends shall be made cold. #5 and larger rebar shall not be re-bent.
5-5 All reinforcing steel and anchor bolts shall be accurately secured in position before and during concrete placement.
5-6 All reinforcing steel shall be clean and free of deleterious materials at the time of concrete placement.
5-7 Each reinforcing bar shall be wired to a cross bar at a maximum spacing of 2'-0" o.c. each way for bars in top layers of reinforcing (or in areas where only one layer of reinforcing exists) and 3'-0" o.c. each way for bottom layers of reinforcing. All perimeter intersections of reinforcing bars and a minimum of 50% of interior intersections shall be tied, subject to the spacing requirements in the preceding sentence.
5-9 A "standard hook" is defined as either a 180° bend plus a 4 bar diameter extension, but not less than 2 1/2" at the free end of the bar or a 90° bend plus a 12 bar diameter extension at the free end of the bar. Hooks for stirrups and ties shall be as follows:
1. 90° bend plus 12 bar diameter extension at free end of bar
2. #8 bar and smaller, 135° bend plus 6 bar diameter extension at free end of bar.

REQUIREMENTS FOR SPECIAL INSPECTION:

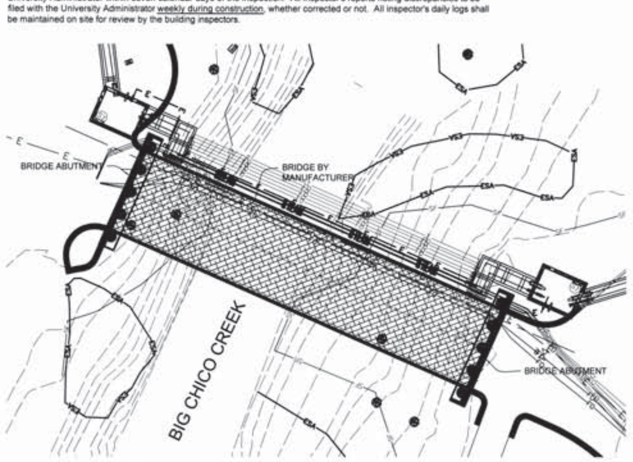
The owner shall be responsible for ensuring that the following special inspections are provided. Special inspectors shall be employed by the owner and not by the contractor or any other person responsible for the work. The special inspector must be acceptable to the project engineer and the local building official. All inspections shall be performed in accordance with the applicable buiding code. Inspectors shall be approved by the building department prior to the issuance of a building permit.

High Strength Concrete

The portions of work that require special inspection are the placing of concrete and reinforcement and taking of test specimens for the concrete of the bridge abutments, retaining walls, columns, and elevated slabs. The duties of the inspector shall be as noted below:

- All concrete mix designs shall be prepared by a recognized testing laboratory and copies shall be sent to the Engineer for review.
- Observe the concrete as it is being placed in the forms. Ensure that concrete is per section 3 of the general notes on sheet S-1.
- Ensure that reinforcing is in compliance with the plans.
- Test specimens shall be per the applicable building code. Each specimen shall contain at least four cylinders, including one for testing at seven days and two at 28 days. If the 28 day results are below the minimum specified 28 day strength, the extra cylinder shall be tested at 56 days. Compressive strength tests shall also include test results for slump and entrained air (if specified), and shall be sent to the Engineer for review.
- Provide report to the University Administrator as noted below.

Samples of inspection reports shall be provided by the special inspector (if required). Reports shall be submitted to the University Administrator within seven calendar days of the inspection. All inspector's reports noting discrepancies to be filed with the University Administrator weekly during construction, whether corrected or not. All inspector's daily logs shall be maintained on site for review by the building inspectors.



LOCATION PLAN
N.T.S.

GENERAL NOTES:

Any revisions, corrections or other notations placed on these drawings that are not computer-generated (i.e. pencil, ink, marker, etc.) are invalid, have not been approved by the Engineer and shall not be considered a legitimate revision or addendum to the drawing set. Should the Engineer desire to issue a revision or addendum to the drawing set, it will be performed utilizing one of the following methods:

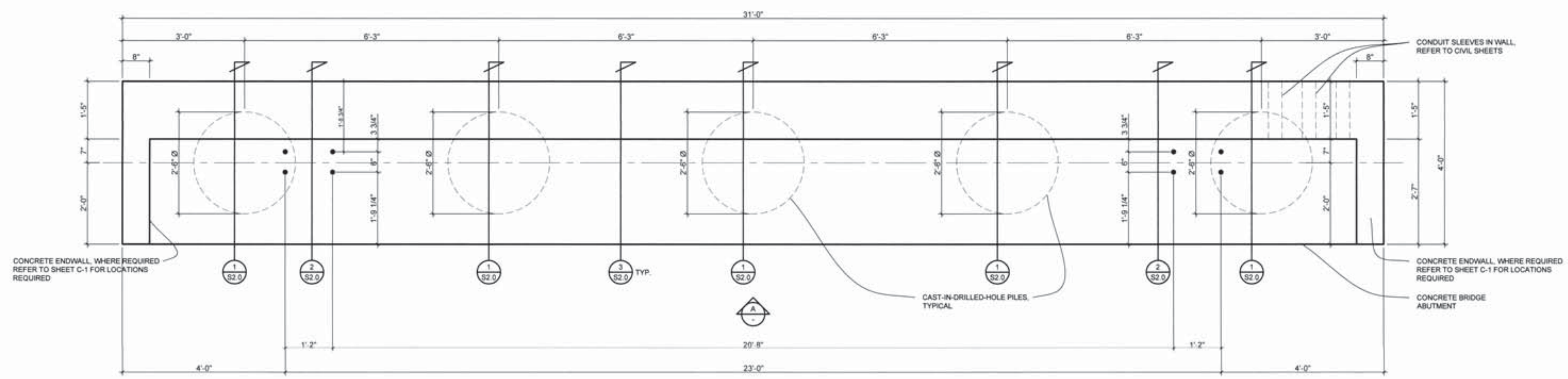
A. The affected portions of the set will be addressed by way of a letter and / or detail on an 8-1/2 x 11 (or 11 x 17) addendum sheet from the Engineer and will contain the Engineer's wet stamp and wet signature.
B. The affected sheet(s) will be re-issued in their entirety and will contain the Engineer's wet stamp and wet signature.
C. The drawing set will be re-issued in its entirety and will contain the Engineer's wet stamp and wet signature.

PRE-MANUFACTURED BRIDGE:

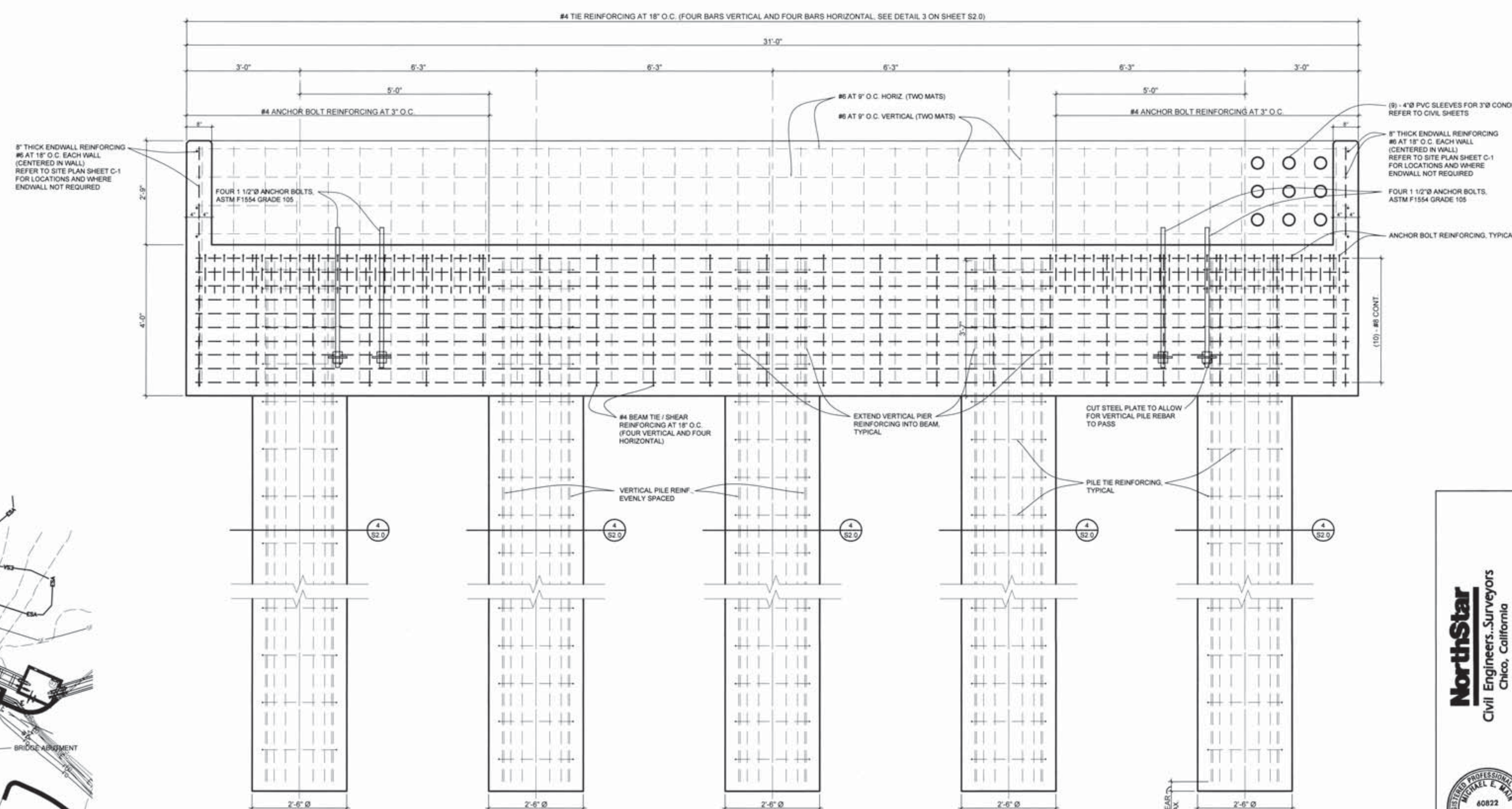
The pre-manufactured bridge calculation package dated 9-4-14 (Physical Science vehicular bridge) and 11-11-14 (Gus Manolis pedestrian bridge) by Big R Bridge Company is an integral part of this plan set. The use of any other bridge manufacturer or calculation package, including revised sets by the same manufacturer but dated later than noted above, may pose different spans, supports or loading conditions than those which the abutments have been designed for. Such discrepancies may compromise the structural integrity of the the foundation system. If any bridge package, other than that referenced above, is utilized for this project NorthStar Engineering is to be notified immediately.

SPECIAL NOTE:

The geotechnical report (MatriScope Engineering Laboratories Inc, September 5, 2014, Project No. 2419) is an integral part of this plan set and shall be on the job site at all times during foundation preparation and construction. The Contractor shall review the report prior to commencing construction and any discrepancies between the plans and the report shall be brought to the attention of NorthStar Engineering immediately. It is the sole responsibility of the Contractor to ensure that all construction is in compliance with the report.



PLAN VIEW OF VEHICULAR BRIDGE ABUTMENT
3/4" = 1'-0"



A ELEVATION OF VEHICULAR BRIDGE ABUTMENT
3/4" = 1'-0"

PHYSICAL SCIENCE PLANS - NOTES, FOUNDATION, AND ELEVATION
PHYSICAL SCIENCE BRIDGE, PHASE II
CALIFORNIA STATE UNIVERSITY, CHICO CALIFORNIA

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2014-12-08

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REGISTERED PROFESSIONAL ENGINEER
MICHAEL E. MAIN
60822
EXP 12-31-14
CIVIL
STATE OF CALIFORNIA

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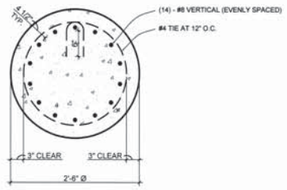
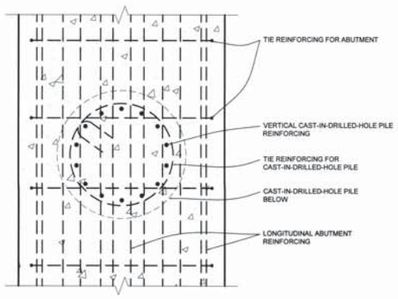
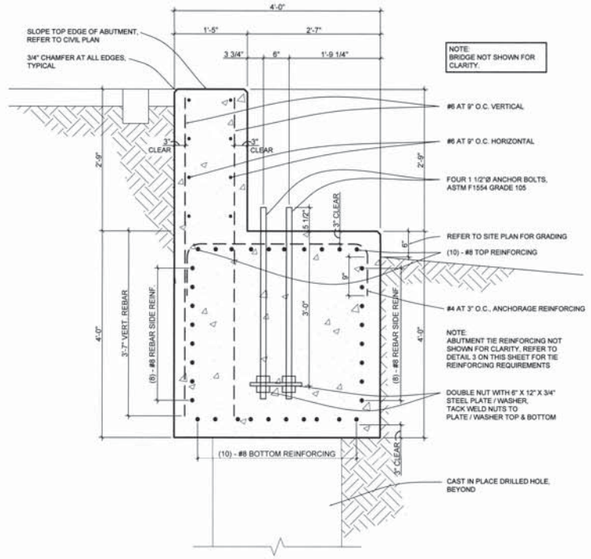


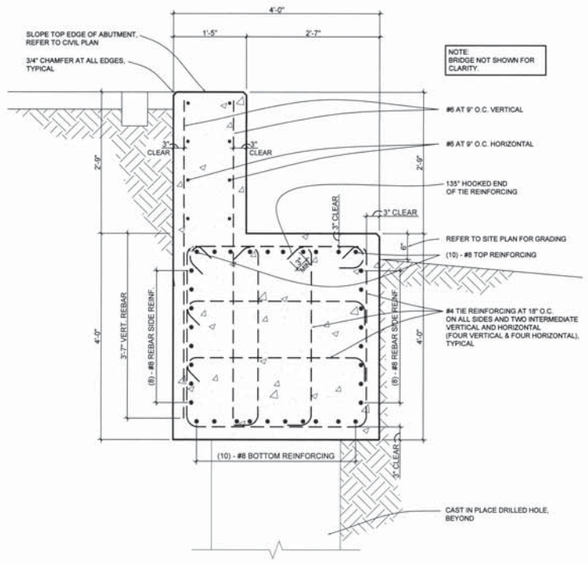
4 SECTION THRU CIDH PILE
1" = 1'-0"



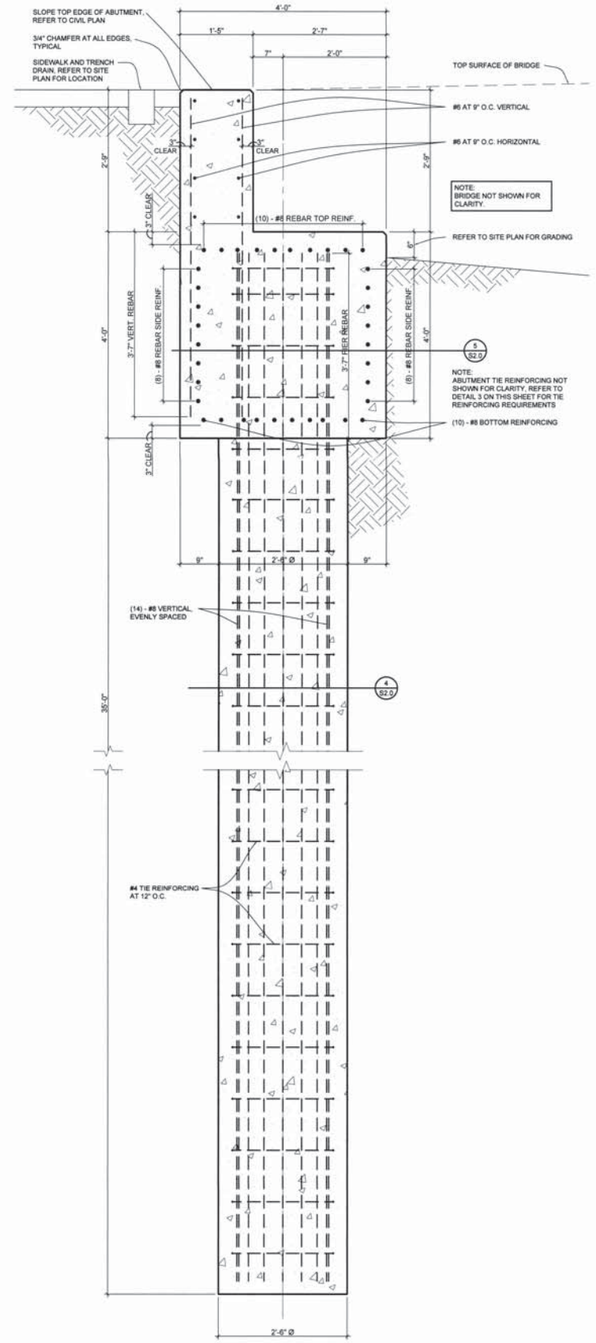
5 SECTION THRU ABUTMENT BEAM
1" = 1'-0"



2 SECTION THRU VEHICULAR BRIDGE ABUTMENT AT ANCHOR BOLTS
1" = 1'-0"



3 SECTION THRU VEHICULAR BRIDGE ABUTMENT TIE REINFORCING
1" = 1'-0"



1 SECTION THRU VEHICULAR BRIDGE ABUTMENT
1" = 1'-0"

PHYSICAL SCIENCE PLANS - SECTIONS AND DETAILS
PHYSICAL SCIENCE BRIDGE, PHASE II
CALIFORNIA STATE UNIVERSITY, CHICO CALIFORNIA

S2.0
73-14150-00
2014-12-08

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KEY FINDINGS

PHYSICAL SCIENCES BRIDGE

Proposed Bridge Description :	99 feet long, 22.75 feet wide, pre-manufactured Single Span, Steel Truss, with Cambered (arched) 9” thick concrete deck with 16” tall floor beams
Proposed Bottom Soffit Elevation =	200.70 (deck high-point of chamber); **197.90** (lowest bridge member)
Proposed Floodplain Water Surface Elev. =	194.70
Proposed WSE/Soffit Clearance =	**3.2 feet**
Existing Bottom Soffit Elevation =	197.3
Existing Floodplain Water Surface Elev. =	194.68
Existing WSE/Soffit Clearance =	2.62 feet

GUS MANOLIS BRIDGE

Proposed Bridge Description :	72 feet long, 6.5 feet wide, pre-manufactured Single Span Steel Truss, with Cambered (arched), 5” thick concrete deck with 5” floor beams
Proposed Bottom Soffit Elevation =	199.01 (center deck; high-point of chamber); **197.70** (lowest bridge member near)
Proposed Floodplain Water Surface Elev. =	194.38
Proposed WSE/Soffit Clearance =	**3.32 feet**
Existing Floodplain Water Surface Elev. =	194.39
Existing WSE/Soffit Clearance =	Unknown; existing bridge collapsed and removed in Fall, 2014.

parameters exist for both the existing and design conditions. These common input parameters of note are discussed further below in subsequent sections.

The close proximity of the two bridge replacements provided the opportunity to perform a single hydraulic model that includes both of the bridge crossings to better estimate the hydraulic conditions of each bridge crossing. Sufficient channel cross sections were surveyed and incorporated into the model to best estimate the hydraulic conditions downstream, between and upstream of the respective bridges.

4.1.2 Vertical Datum

Elevations referenced in this study are based on the Topography Survey provided by the Owner (CSU-Chico), and is understood to have a vertical datum of NVGD 29.

4.2 Cross-Sectional Geometric Data

Cross-sectional data was obtained from two field topographic survey data sets, both provided by CSUC; one in the summer of 2013 for the physical sciences bridge; and the second in September of 2014 for the Gus Manolis Bridge. A follow-up topographic survey to capture cross-section information upstream and downstream of the project bridges (outside of the previously surveyed area), and to capture bathymetric data were performed in October 2014. All cross-sectional information used in this model was developed from observations and physically surveyed data.

4.2.1 Bridge Orientation

4.2.1.1 Physical Sciences

The proposed Physical Sciences emergency vehicle access bridge follow a similar alignment as the existing footprint with the upstream edge of the deck being very close to the upstream edge of the existing structure. The proposed structure is significantly wider to accommodate emergency vehicles, and the additional footprint extends downstream of the existing structure. See Appendix A for more information. Since the proposed structure is much wider than existing, to appropriately model the existing condition, unique cross sections were developed for both the existing and proposed conditions with respect to the downstream and bridge cross sections and direct comparison under the proposed structure are not possible. Figure 5 illustrates the *approximate* relative difference between the spatially closest existing and proposed cross-sections; note the cross-sections are not sampling the exact same location. This figure was provided to illustrate the approximate differences between the pre vs post bridge condition. Please refer to Appendix A for a more detailed cross-section comparison for this crossing.

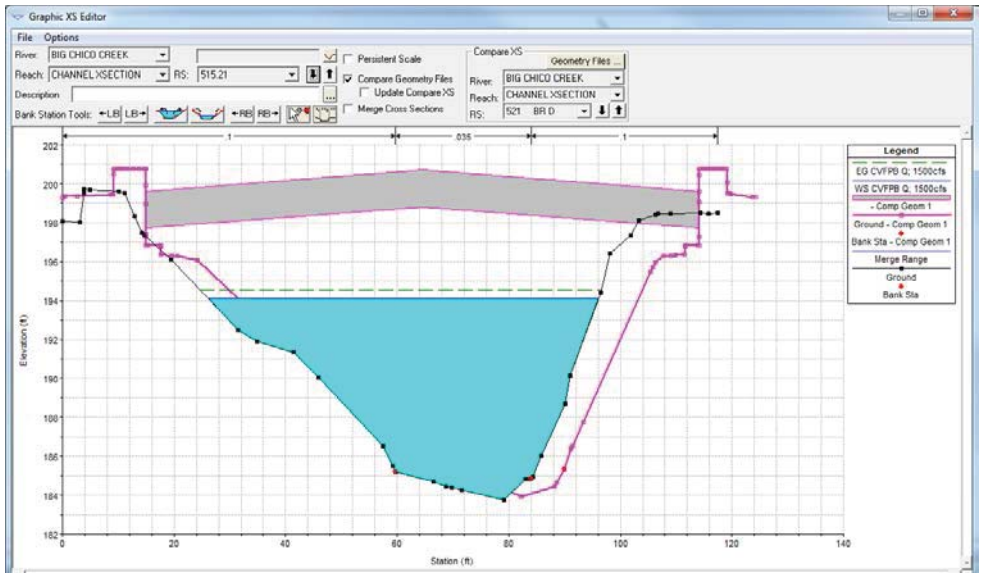

Figure 5: Comparison of Existing/Proposed condition cross section for Physical Sciences; taken from HEC-RAS geometry editor.

4.2.1.2 Gus Manolis Bridge

As mention elsewhere in this report, the Gus Manolis replacement structure will replace the previous structure with a similar pedestrian structure at the same alignment but with longer span with abutments proposed to be offset compared to the previous foundation. The alignment of the replacement structure (following the existing touchdown locations) is slightly skewed to normal direction of channel flow by approximately 7-8˚. Cross sections are oriented perpendicular to the flow direction and the skew of the structure was accounted for in bridge cross-section and to sections adjacent to the bridge. No skew was recorded in the model as this information is correctly represented in the geometry cross-sections. Figure 6 illustrate the direct geometric cross-sectional differences of the existing and proposed conditions. Note the lines with cyan color are the proposed features.

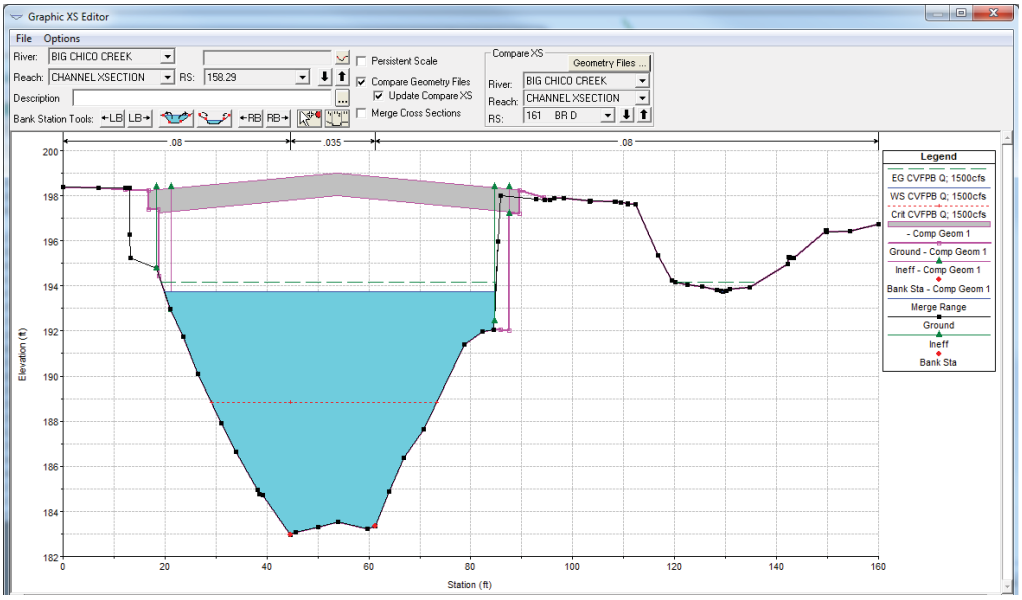

Figure 6: Comparison of Existing/Proposed condition downstream Gus Manolis Bridge cross-section; taken from HEC-RAS geometry editor

HEC-RAS Plan: Proposed River: BIG CHICO CREEK Reach: CHANNEL XSECTION

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Crit W.S.	Frctn Loss	C & E Loss	Top Width	Q Left	Q Channel	Q Right	Vel Chnl	Vel Total	Vel Left	Vel Right	Hydr Depth	Froude # Chl
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft/s)	(ft/s)	(ft/s)	(ft/s)	(ft)	
CHANNEL XSECTION	569.44	1500cfs; 100-yr	194.74	194.33		0.03	0.00	70.16	95.75	1314.37	89.88	5.50	3.65	1.00	1.18	5.86	0.31
CHANNEL XSECTION	569.44	1640cfs; 200-yr	195.16	194.71		0.03	0.00	72.53	113.31	1424.65	102.04	5.73	3.74	1.06	1.23	6.04	0.32
CHANNEL XSECTION	539.28	1500cfs; 100-yr	194.71	194.28	189.54	0.01	0.02	66.91	127.16	1292.72	80.12	5.66	3.69	1.15	1.20	6.07	0.32
CHANNEL XSECTION	539.28	1640cfs; 200-yr	195.13	194.66	189.82	0.01	0.02	68.92	147.37	1402.05	90.58	5.90	3.80	1.21	1.25	6.27	0.33
CHANNEL XSECTION	521 BR U	1500cfs; 100-yr	194.69	194.32	189.23	0.02	0.01	69.06	133.85	1308.37	57.79	5.21	3.49	1.08	1.05	6.23	0.29
CHANNEL XSECTION	521 BR U	1640cfs; 200-yr	195.10	194.70	189.51	0.02	0.01	71.13	154.49	1419.75	65.76	5.44	3.59	1.13	1.09	6.43	0.30
CHANNEL XSECTION	521 BR D	1500cfs; 100-yr	194.67	194.24	189.53	0.01	0.00	72.42	141.89	1270.96	87.15	5.65	3.56	1.13	1.23	5.81	0.32
CHANNEL XSECTION	521 BR D	1640cfs; 200-yr	195.08	194.62	189.83	0.01	0.00	74.44	165.87	1375.97	98.15	5.89	3.65	1.19	1.28	6.03	0.33
CHANNEL XSECTION	500.55	1500cfs; 100-yr	194.66	194.21		0.03	0.02	70.34	135.35	1301.15	63.51	5.76	3.79	1.20	1.11	5.63	0.32
CHANNEL XSECTION	500.55	1640cfs; 200-yr	195.07	194.59		0.03	0.02	72.62	159.07	1407.56	73.37	5.99	3.88	1.27	1.17	5.82	0.33
CHANNEL XSECTION	463.07	1500cfs; 100-yr	194.60	194.23		0.03	0.01	71.84	80.67	1353.73	65.59	5.16	3.53	0.89	0.91	5.92	0.29
CHANNEL XSECTION	463.07	1640cfs; 200-yr	195.01	194.61		0.03	0.01	74.25	96.52	1469.10	74.38	5.38	3.62	0.95	0.95	6.10	0.30
CHANNEL XSECTION	210.88	1500cfs; 100-yr	194.35	194.02		0.02	0.01	123.00	133.63	1121.21	245.16	5.30	3.04	1.54	1.25	4.51	0.29
CHANNEL XSECTION	210.88	1640cfs; 200-yr	194.76	194.42		0.02	0.01	129.84	146.45	1186.35	307.20	5.40	3.05	1.56	1.37	4.89	0.29
CHANNEL XSECTION	178.19	1500cfs; 100-yr	194.32	194.02	188.75	0.01	0.00	121.32	158.74	1097.14	244.12	5.10	3.09	1.52	1.48	5.75	0.28
CHANNEL XSECTION	178.19	1640cfs; 200-yr	194.73	194.41	189.04	0.01	0.00	122.43	179.19	1171.17	289.64	5.24	3.16	1.60	1.58	6.15	0.28
CHANNEL XSECTION	161 BR U	1500cfs; 100-yr	194.31	194.00	188.73	0.00	0.00	68.14	274.82	1016.61	208.57	5.33	3.23	1.86	1.67	6.89	0.29
CHANNEL XSECTION	161 BR U	1640cfs; 200-yr	194.72	194.38	189.05	0.00	0.00	68.14	306.43	1094.14	239.44	5.54	3.35	1.95	1.77	7.28	0.29
CHANNEL XSECTION	161 BR D	1500cfs; 100-yr	194.31	194.00	188.60	0.00	0.00	68.01	239.87	1056.21	203.93	5.16	3.28	1.88	1.64	7.30	0.28
CHANNEL XSECTION	161 BR D	1640cfs; 200-yr	194.71	194.38	188.88	0.00	0.00	68.59	266.45	1140.09	233.46	5.37	3.41	1.98	1.74	7.68	0.28
CHANNEL XSECTION	153.93	1500cfs; 100-yr	194.30	194.00		0.01	0.00	70.98	214.07	1093.96	191.97	5.06	3.31	1.79	1.63	7.23	0.27
CHANNEL XSECTION	153.93	1640cfs; 200-yr	194.71	194.38		0.01	0.00	71.89	238.12	1179.24	222.64	5.27	3.44	1.89	1.75	7.62	0.28
CHANNEL XSECTION	145.46	1500cfs; 100-yr	194.30	193.99		0.01	0.00	98.13	198.26	1070.12	231.62	5.16	3.28	1.78	1.67	6.90	0.28
CHANNEL XSECTION	145.46	1640cfs; 200-yr	194.70	194.38		0.01	0.00	104.53	220.80	1151.09	268.11	5.36	3.40	1.87	1.79	7.29	0.29

ATTACHMENT E - Hydraulic Summary Information