Meeting of the Central Valley Flood Protection Board
August 30, 2019

Permit Staff Report

Madera County Public Works Department
Fresno River Seepage/Stability Berms, Madera County

1.0 – ITEM

Consider approval of Permit No. 19230. (Attachment A)

2.0 - APPLICANT

Madera County Public Works Department (County)

3.0 – PROJECT LOCATION

The proposed project sites are located between approximate Levee Mile (LM) 0.68 and 5.80 along the Fresno River in Madera County with the following approximate Latitude and Longitude (Lat-Long) coordinates:

- Site 1: Lat-Long (36.9734145°N, 120.3583291°W);
- Site 2: Lat-Long (36.9673500°N, 120.3523277°W);
- Site 3: Lat-Long (36.9671420°N, 120.3510084°W);
- Site 4: Lat-Long (36.9671422°N, 120.3500617°W);
- Site 5: Lat-Long (36.9671445°N, 120.3492796°W);
- Site 6: Lat-Long (36.9679819°N, 120.3501298°W);
- Site 7: Lat-Long (36.9682837°N, 120.2985369°W);
- Site 8: Lat-Long (36.9683058°N, 120.2874751°W); and
- Site 9: Lat-Long (36.9683184°N, 120.2705072°W).

(Fresno River, Madera County, Attachment B)

4.0 – PROJECT DESCRIPTION

The County proposes to construct the following seepage/stability berms at nine (9) critical levee repair sites along the Fresno River.

- Site 1: 522-foot long combined seepage and stability berm located at approximate LM 0.68 (left levee);
- Site 2: 100-foot long combined seepage and stability berm located at approximate LM 1.17 (left levee);
- Site 3: 100-foot long combined seepage and stability berm located at approximate LM 1.24 (left levee);
- Site 4: 130-foot long combined seepage and stability berm located at approximate LM 1.30 (left levee);
- Site 5: 120-foot long combined seepage and stability berm located at approximate LM 1.34 (left levee);
- Site 6: 100-foot long seepage berm located at approximate LM 1.35 (right levee);
- Site 7: 130-foot long seepage berm located at approximate LM 4.22 (right levee);
- Site 8: 130-foot long seepage berm located at approximate LM 4.85 (right levee); and
- Site 9: 140-foot long seepage berm located at approximate LM 5.80 (right levee).

5.0 – AUTHORITY OF THE BOARD

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

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

- § 6, Need for a Permit
- § 13.3, Consent Calendar
- § 112, Streams Regulated and Nonpermissible Work Periods
- § 120, Levees

6.0 - PROJECT ANALYSIS

The County proposes to construct seepage/stability berms at nine (9) sites along the landside of the left (south) and right (north) bank levees of the Fresno River. The seepage/stability berms consist of filter, drainage, and berm material layers. The design followed the Rural Levee Repair Guidelines (RLRG) for seepage/stability berms that were developed through a multi-agency collaboration the included representatives from the U.S. Army Corps of Engineers (USACE), the Board, the Department of Water Resources (DWR), local maintaining agencies, subject matter experts, and interested parties. RLRG was developed in response to the needs identified in the 2012 Central Valley Flood Protection Plan to develop a common, consistent set of rural levee repair guidelines to help local maintaining agencies plan, design, and construct levee repairs efficiently and effectively.

The construction activities include the removal of native vegetation to a depth of six (6) inches, followed by the construction of the seepage/stability berms. The proposed project will also include a paved 12-foot wide access road at the toe of the berms. The seepage/stability berms will be hydro-seeded at the completion of the project to protect them from erosion. Additional Sacramento-San Joaquin Drainage District easements will be obtained that extend the existing easement limit to 15 feet beyond the proposed berm toe.

6.1 – Hydraulic Analysis

The landside seepage/stability berms are designed in accordance with RLRG using the levee crown water surface elevations (WSEs) between 155.7 feet and 178.5 feet (NAVD88) that are equal to the levee crown. This provides the maximum seepage pressure for this levee system. The seepage/stability berms are designed to withstand this maximum seepage pressure to prevent levee through and underseepage. In addition, the seepage/stability berms will be constructed on the land side of the levee resulting in no effect to the WSE of Fresno River. Therefore, a hydraulic analysis was not required.

6.2 – Geotechnical Analysis

These repairs mitigate the known levee through and underseepage that are considered the cause of sand boils and piping that have been observed in the past. In accordance with RLRG, the minimum width of the seepage berm will be four times the levee height.

Because the RLRG guidelines require the final design to provide a mitigation for maximum seepage pressure, no geotechnical analysis was required.

7.0 – AGENCY COMMENTS AND ENDORSEMENTS

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

- Madera County is the applicant and local maintaining agency for the Fresno River.

- USACE 33 U.S.C. 408 permission letter has been received for this application. The USACE Sacramento District Engineer approves the request to alter the Federal flood risk reduction project, subject to conditions. The letter is incorporated into the permit as Exhibit A.

8.0 – CEQA ANALYSIS

Board staff has determined the project is exempt from CEQA under the Class 1, Existing Facilities categorical exemption (CEQA Guidelines § 15301) because the proposed activities consist of minor alterations to an existing levee system to prevent flooding. Further, none of the exceptions to the exemption in CEQA Guidelines § 15300.2 apply.

9.0 – CA WATER CODE SECTION 8610.5 AND OTHER CONSIDERATIONS

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

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

   Staff requests that the Board consider this staff report and its attachments or references and any evidence submitted to it prior to or during the hearing.

2. The best available science that relates 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 proposed project has been designed using the criteria given in RLRG. RLRG establishes the basis for certain rural levee repairs to mitigate known hazards and improve flood protection in an affected region. RLRG guidelines adhere to current industry standards and methods and are the most updated guidelines in relation to rural levee repair.

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

   The proposed project mitigates known through and underseepage at these specific sites resulting in more resilient flood control facilities for this part of the SPFC.

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

   The landside seepage/stability berms are expected to withstand the changes in hydrology, climate, and development within the watershed. Therefore, it is not anticipated there will be any effects to the proposed project from reasonably projected future events.

10.0 – STAFF RECOMMENDATION

Staff recommends that the Board:

Adopt:

- The CEQA finding that the permit is categorically exempt from CEQA under the Class 1 Categorical Exemption (CEQA Guidelines §15301) covering minor alterations to existing facilities.

Approve:

- Encroachment Permit No. 19230 in substantially the form provided in Attachment A; and

Direct:

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

11.0 – LIST OF ATTACHMENTS

A. Draft Permit No. 19230
B. Location Maps and Photos
C. Project Drawings

Reviewers:

Design Review:	Deb Biswas, Engineer, Permitting Section
Environmental Review:	Itzia Rivera, Senior Environmental Scientist
Document Review:	Gary W. Lemon, P.E., Permitting Section Chief
	Michael C. Wright, P.E., Chief Engineer
Legal Review:	Sarah Backus, Staff Counsel

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY

THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 19230 BD

This Permit is issued to:

Madera County Public Works Department
200 West 4th Street
Madera, California 93637

To construct the following seepage and stability berms at nine critical levee repair sites along Fresno River. These critical repairs are in general accordance with the California Department of Water Resources Rural Levee Repair Guidelines.

- Site 1: 522-foot long combined seepage and stability berm located at approximately Levee Mile (LM) 0.68 (left levee);
- Site 2: 100-foot long combined seepage and stability berm located at approximately LM 1.17 (left levee);
- Site 3: 100-foot long combined seepage and stability berm located at approximately LM 1.24 (left levee);
- Site 4: 130-foot long combined seepage and stability berm located at approximately LM 1.30 (left levee);
- Site 5: 120-foot long combined seepage and stability berm located at approximately LM 1.34 (left levee);
- Site 6: 100-foot long seepage berm located at approximately LM 1.35 (right levee);
- Site 7: 130-foot long seepage berm located at approximately LM 4.22 (right levee);
- Site 8: 130-foot long seepage berm located at approximately LM 4.85 (right levee); and
- Site 9: 140-foot long seepage berm located at approximately LM 5.80 (right levee).

The repair sites are located between approximately LM 0.68 and 5.80 along with the following beginning approximate Lat-Long.

- Site 1: Lat-Long (36.9734145°N, 120.3583291°W);
- Site 2: Lat-Long (36.9673500°N, 120.3523277°W);
- Site 3: Lat-Long (36.9671420°N, 120.3510084°W);
- Site 4: Lat-Long (36.9671422°N, 120.3500617°W);
- Site 5: Lat-Long (36.9671445°N, 120.3492796°W);
- Site 6: Lat-Long (36.9679819°N, 120.3501298°W);

- Site 7: Lat-Long (36.9682837°N, 120.2985369°W);
- Site 8: Lat-Long (36.9683058°N, 120.2874751°W); and
- Site 9: Lat-Long (36.9683184°N, 120.2705072°W,

Fresno River, Madera 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. 19230 BD

LIABILITY AND INDEMNIFICATION

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

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

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

AGENCY CONDITIONS

SIXTEEN: All work approved by this permit shall be in accordance with the submitted drawings and specifications dated September 27, 2017, except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Board.

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

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

NINETEEN: The permittee shall be responsible for the repair of any damages to the project levee, or

other flood control facilities due to construction, operation, or maintenance of the proposed project.

TWENTY: The permittee shall comply with all conditions set forth in the letter from the Department of the Army (U.S. Army Corps of Engineers, Sacramento District) dated August 21, 2019, which is attached to this permit as Exhibit A and is incorporated by reference.

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

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

PRE-CONSTRUCTION

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

CONSTRUCTION

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

TWENTY-FIVE: Prior to placement of fill against the levee slope and within 10 feet of the levee toe, all surface vegetation shall be removed to a depth of 6 inches. Organic soil and roots larger than 1-1/2 inches in diameter shall be removed to a depth of 3 feet.

TWENTY-SIX: Any excavations made in the levee section or within 10 feet of the levee toes shall be backfilled in 4- to 6-inch layers with impervious material with 20 percent or more passing the No. 200 sieve, a plasticity index of 8 or more, and a liquid limit of less than 50 and free of lumps or stones exceeding 3 inches in greatest dimension, vegetative matter, or other unsatisfactory material. Backfill material shall be compacted in 4- to 6-inch layers to a minimum of 90 percent relative compaction as measured by the current ASTM D1557 standard.

TWENTY-SEVEN: Compaction tests by a certified soils laboratory will be required to verify compaction of backfill within the levee section or within 10 feet of the levee toe.

POST-CONSTRUCTION

TWENTY-EIGHT: All debris generated by this project shall be properly disposed of outside the Project Works.

TWENTY-NINE: The project levee shall be restored to at least the condition that existed prior to commencement of work.

THIRTY: Upon completion of the project, the permittee shall submit as-constructed drawings to the Board.

OPERATIONS AND MAINTENANCE

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

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

PROJECT ABANDONMENT / CHANGE IN PLAN OF FLOOD CONTROL

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

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

END OF CONDITIONS

Exhibit A

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO, CA 95814-2922

408 Permission Section (19230)

AUG 2 1 2019

Ms. Leslie M. Gallagher
Executive Officer
Central Valley Flood Protection Board
3310 El Camino Avenue, Room 170
Sacramento, CA 95821

Dear Ms. Gallagher:

We have reviewed permit application number 19230 submitted by the Madera County Public Works Department to alter the Hidden Dam, Hensley Lake Project (of which improvement of the downstream channels is a part) authorized by the Flood Control Act of 1962, Public Law 87-874. These plans include the construction of seepage and stability berms at nine critical levee repair sites along the Fresno River within Madera County, CA. Construction would require the stripping of existing vegetation and soil to a depth of 6 inches and following construction, the berms would be hydro seeded. Construction would also include relocation of the 12 foot wide maintenance roads. All proposed work would take place on the landside of the levees. The proposed alterations include:

- Site 1: 522-foot long combined seepage and stability berm located at approximately Levee Mile (LM) 0.68 (left levee) between 36.9734145°N, 120.3583291°W and 36.9724047°N, 120.3570608°W NAD83;
- Site 2: 100-foot long combined seepage and stability berm located at approximately LM 1.17 (left levee) between 36.9673500°N,120.3523277°W and 36.9672583°N, 120.3520083°W NAD83;
- Site 3: 100-foot long combined seepage and stability berm located at approximately LM 1.24 (left levee) between 36.9671420°N, 120.3510084°W and 36.9671416°N, 120.3506662°W NAD83;
- Site 4: 130-foot long combined seepage and stability berm located at approximately LM 1.30 (left levee) between 36.9671422°N, 120.3500617°W and 36.9671435°N, 120.3496167°W NAD83;
- Site 5: 120-foot long combined seepage and stability berm located at approximately LM 1.34 (left levee) between 36.9671445°N, 120.3492796°W and 36.9671453°N, 120.3488689°W NAD83;
- Site 6: 100-foot long seepage berm located at approximately LM 1.35 (right levee) between 36.9679819°N, 120.3501298°W and 36.9679842°N, 120.3497876°W NAD83;

- Site 7: 130-foot long seepage berm located at approximately LM 4.22 (right levee) between 36.9682837°N, 120.2985369°W and 36.9682843°N, 120.2980919°W NAD83;
- Site 8: 130-foot long seepage berm located at approximately LM 4.85 (right levee) between 36.9683058°N, 120.2874751°W and 36.9683078°N, 120.2870301°W NAD83; and
- Site 9: 140-foot long seepage berm located at approximately LM 5.80 (right levee) between 36.9683184°N, 120.2705072°W and 36.9683178°N, 120.2700280°W NAD83.

The Sacramento District (Corps) has reviewed this application and determined that the alteration will not be injurious to the public interest and will not impair the usefulness of the project works. Pursuant to Section 14 of the Rivers and Harbors Act of 1899, 33 USC § 408 (Section 408), the District Engineering Division Chief approves the request to alter the Federal flood risk reduction project subject to the following conditions:

Engineering Conditions:

a. That the alteration must not interfere with the integrity of the flood risk management project; easement access; or maintenance, inspection, and flood fighting procedures.

b. That no temporary staging, stockpiles of materials, temporary buildings, or equipment can remain on the levee or in the floodway during flood season unless approved in writing by the non-federal project sponsor.

c. That the berms shall be designed and constructed in accordance with Department of Army, Engineering Manual 1110-2-1913.

d. That excavations must meet federal, state, and local criteria, Corps standards, and Office of Safety and Occupational Health standards.

e. That the requester is responsible for removal and disposal of trees or brush cleared during construction. The removal and disposal must be to areas outside the limits of the federal project easement.

f. That the requester is responsible for protecting the levee from being damaged by construction vehicles, equipment, construction activities, and storage of materials.

g. That appropriate property rights must be acquired as needed for construction, operation, and maintenance of the alteration as well as operation and maintenance of the levee and channel.

h. That areas disturbed during construction or other work associated with an alteration must be restored to pre-construction conditions once the work is complete.

i. That cut slopes into the levee embankment must be no steeper than 2 (horizontal): 1 (vertical).

j. That in areas of levee degrade, fill material must be placed in a maximum loose lift thickness of six-inches and compacted to not less than 95% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D698 (USACE Sacramento District preferred method), or alternately 90% of the maximum density at moistures between -2 and +3 percent of optimum moisture content obtained from ASTM D1557.

k. That fill materials placed within 4-feet of any structure must be compacted using appropriate hand operated compaction equipment and placed in 4-inch loose lifts.

l. That only suitable levee material shall be used as fill material. Fill must be free from: roots and other organic matter; contamination from hazardous, toxic or radiological substances; and trash and debris. Fill soil must have a plasticity index between 8 and 25, must have a liquid limit less than 50, a minimum fines content of 20%, and shall have 100% passing the 3-inch sieve.

m. That the berm shall be constructed with a 2% minimum slope to drain surface water away from the berm and the levee

n. This permission only authorizes you, the requester, to undertake the activity described herein under the authority provided in Section 14 of the Rivers and Harbors Act of 1899, as amended (33 USC § 408). This permission does not obviate the need to obtain other federal, state, or local authorizations required by law. This permission does not grant any property rights or exclusive privileges, and you must have appropriate real estate instruments in place prior to construction and/or installation.

Environmental Conditions:

o. That access to the proposed alteration site must occur in previously disturbed areas, such as existing roads, access ramps, driveways, or the levee crown.

p. That excess material from construction must be removed from the floodway and disposed in an area outside the federal project easement.

q. That proposed alterations must be designed to minimize the introduction of exotic species (both plant and animal) and any seed mixes used in site restoration must consist only of native species.

r. That proposed alterations must incorporate Best Management Practices (BMPs) to control storm water runoff, erosion, and contaminant spills (e.g., diesel fuel spills).

s. That in the event of an environmental spill, the requester must notify the Corps, the non-federal sponsor and the appropriate state agency immediately. Cleanup and repair is the requester's responsibility.

t. That if you discover any previously unknown historic properties (36 CFR § 800.13) while accomplishing the activity authorized by this Section 408 permission, you shall immediately notify the Corps of what you have found. The Corps will initiate any necessary Federal and State coordination to ensure continued compliance with the National Historic Preservation Act.

u. That landowner permission and any other applicable federal, state, or local permits must be secured before work can begin.

v. To ensure your project complies with the Federal Endangered Species Act, you shall implement all of the conservation measures identified in the enclosed U.S. Fish and Wildlife Service letter of concurrence (08ESMFF00-2019-I-1516, dated April 5, 2019; Enclosure 1). If you are unable to implement any of the proposed measures, you must immediately notify the Corps, prior to initiating the work, so the Corps may reinitiate consultation as appropriate, in accordance with the Federal Endangered Species Act.

Based on the information provided, no Section 10 or Section 404 permit is needed. This Section 408 letter of permission does not serve as authorization for any work that affects navigable capacity of waters of the United States or that involves the discharge of dredge or fill material into waters of the United States.

A Copy of this letter is being furnished to Mr. Don Rasmussen, Chief, Flood Project Integrity and Inspection Branch, 3310 El Camino Avenue, Suite 200, Sacramento, CA 95821. For any questions regarding this permission, please contact Kimberlee Leonard at (916) 557-7183.

Sincerely,

Rick L. Poeppelman

Rick L. Poeppelman, P.E.
Chief, Engineering Division
Levee Safety Officer

Enclosure

Exhibit A

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
08ESMFF00-
2019-I-1516

APR 0 5 2019

Ryan T. Larson
Chief, Flood Protection and Navigation Section
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Subject: Informal Consultation on the Proposed Madera County Levee Repair Project, Madera County, California

Dear Mr. Larson:

This letter is in response to the U.S. Army Corps of Engineers' (Corps) March 8, 2019, request for initiation of informal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Madera County Levee Repair Project (proposed project) in Madera County, California. The Service received your request on March 19, 2019. At issue are the proposed project's effects on the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*). This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. §1531 *et seq.*) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

The federal action on which we are consulting is the issuance of Corps permissions under section 408 of the Clean Water Act to the Central Valley Flood Protection Board for the project proposed by Madera County Flood Control and Water Conservation Agency (applicant).

Pursuant to 50 CFR 402.12(j), you submitted a biological assessment for our review and requested concurrence with the findings presented therein. These findings conclude that the proposed project may affect, but is not likely to adversely affect the kit fox. The proposed project is not within designated or proposed critical habitat for any federally-listed species.

In considering your request, we based our evaluation on the following: (1) the March 8, 2019, letter initiating informal consultation; (2) the February 2019 biological assessment prepared by Tetra Tech; (3) a site visit, telephone and email correspondence between the Service, the applicant, and the consultant; and (4) additional information available to the Service.

Description of the Action

The proposed project includes the repair of 10 critical erosion sites from funding under the California Department of Water Resources (DWR) Flood System Repair Project. The levees are bordered on at least one side by actively farmed silage fields and orchards. Per the grant agreement, typical repair solutions were selected for each of the critical levee repair sites based on DWR's Rural Levee Repair Guidelines design templates.

Enclosure 1

Five of the 10 critical sites (Sites 1-5) will be repaired using design solutions for combined seepage-stability berms. Site 1 will not require relocating the levee toe road. The remaining five critical levee repair sites (Sites 6-10) will be repaired using design solutions for seepage berms. Typical cross-sections of these repair templates can be found in the Corps' initiation package. Per project specifications, the geotextile fabric used as a separation barrier between the drain layer (aggregate) and the overlying berm material (dirt) will be a nonwoven filter fabric or an approved equivalent. The proposed critical levee repair site characteristics are summarized in Table 1.

Table 1. Summary of proposed critical levee repair site characteristics.

Site No.	Waterway	Site ID	Bank Side	Length of Berm (feet)	Disturbed Area (acre)	Volume of Excavated Material (cy)	Volume of Fill Material (cy)	Area to be Hydroseeded (acre)
1	Fresno River	LM 00.68	Left	522	0.73	373	2,684	0.50
2	Fresno River	LM 01.17	Left	100	0.24	194	735	0.16
3	Fresno River	LM 01.24	Left	100	0.25	201	837	0.17
4	Fresno River	LM 01.30	Left	130	0.31	250	1,052	0.22
5	Fresno River	LM 01.34	Left	120	0.29	233	862	0.20
6	Fresno River	LM 01.35	Right	100	0.18	149	611	0.12
7	Fresno River	LM 04.22	Right	130	0.27	218	676	0.17
8	Fresno River	LM 04.85	Right	130	0.23	184	591	0.14
9	Fresno River	LM 05.80	Right	120	0.31	246	1,003	0.20
10	Berenda Sl.	LM 01.14	Left	140	0.28	224	531	0.16

All construction activities will be limited to the landside levee slope, the crown of the levee, and the access road at the toe of the levee. Encroachment into the riverside of the levee is prohibited. Additional easements will be obtained which will extend from the existing easement limit to 15 feet beyond the toe of the levee at all repair sites.

Construction equipment will include up to six dump trucks, two backhoes, two large excavators and various smaller pieces of equipment such as Bobcats, pickup trucks, and skip loaders. The staging area will include a construction management trailer and will be surrounded by construction and silt fencing and may contain a secured portable restroom, storage of small amounts of fuel and solvents, and storage of equipment. Storage areas will be secured to deter theft and entrance by animals. The staging area will be located in a 5.5 acre undeveloped, empty dirt lot just west of Site 2 on the landside of the levee within a Madera County right-of-way.

The first phase of construction at all of the critical levee repair sites will be the removal of vegetation and soil to a depth of 6 inches. In many areas, the original as-built levee toe on the landside of the levee has been buried under sediment deposition or regrading by farmers. Any fill or sediment above the original levee toe elevation will be removed prior to performing the 6-inch stripping of the existing ground. During the stripping process if loose or unstable soil is encountered, it will be removed and backfilled with competent material before placing repair berm material. Vegetation stripping will be followed by construction of the seepage or seepage-stability berm. All borrow material will be obtained from a permitted commercial site.

At Sites 3 and 5 sand bag rings were found during field investigations and remnants of sand bags were found at Site 9 embedded in the side slope of the levee. These sand bags will be removed and the levee embankment will be reconstructed to the original levee geometry prior to installing the seepage repair solution.

At all critical levee repair sites, except Site 1, the existing roadways at the landside levee toe will need to be relocated further away from the levee to accommodate the repair berms. All relocated roadways will be constructed with aggregate base material, except for Site 10 (Berenda Slough), where the relocated roadway will be paved with asphaltic concrete to match the existing roadway (Avenue 17). The seepage/seepage-stability berms will be hydroseeded for erosion control following completion of the repairs.

Construction is expected to be phased with work occurring at no more than two sites at once and each set of site taking about 1 month to complete. Construction hours will be between 7:00 am and 6:00 pm. There will be no work at night.

A consultant conducted general biological surveys on May 2, 2017, and November 27, 2018, in the vicinity of each site. Service biologists participated in the latter survey. During this time, surveyors were looking for burrows, scat, or tracks of kit fox. A single burrow that was large enough to allow kit fox entry was located about 150 feet away from Site 1. Suitable habitat for other listed species was not observed.

Conservation Measures

The following general conservation measures will be implemented as part of the proposed project design and construction standards:

1. All employees working on the site will be required to learn how to identify and avoid kit fox. Staff will be required to attend a contractor education and environmental training session at the beginning of the construction period. This training will include specific biological information regarding kit fox as well as protocols for minimizing impacts to kit fox if they are identified in the work area.
2. Construction activities will be restricted to daylight hours in areas with sensitive areas, including any areas that may be used by listed wildlife species for foraging or breeding.
3. Construction equipment will be washed before entering the work area. Mud and plant materials will be removed from construction equipment outside the work area prior to construction.
4. All staged material will be covered when not in use.
5. No trash will be left on the site at the end of the work day.
6. No firearms will be allowed on site.
7. No pets will be allowed on site.
8. Vehicle speed will be limited to 10 miles per hour or less in the Action Area.
9. Vehicles will be restricted to designated traffic areas.
10. Temporarily disturbed areas will be restored after project completion (including recontouring and revegetation with native species, as needed).
11. A stormwater pollution prevention plan (SWPPP) will be prepared and implemented by the construction contractor to ensure that polluted water is confined to the construction areas or the staging area. The SWPPP will include a Spill Response Plan with instructions and procedures for reporting spills, the use and location of spill contaminant equipment, and the use and location of spill collection materials.

The following kit fox specific conservation measures will also be implemented:

12. A qualified, Service-approved biologist will conduct pre-construction surveys no less than 14 days or no more than 30 days before the start of ground disturbing activities.
13. The biologist will survey the action area for any occupied, unoccupied, or potential kit fox dens.

14. The biologist will deploy motion-activated cameras where evidence of kit fox use has been identified.

If kit fox are found to be present near where activities will occur:

15. A qualified biologist will establish avoidance areas.
16. All pits and trenches more than 2 feet deep will be covered with plywood at the end of each working day. If the pit or trench cannot be covered, at least one wooden or earthen-fill escape ramp will be installed in the pit/trench. All pits and trenches will be inspected before they are filled. If any trapped animal is discovered, the Service and California Department of Fish and Wildlife (CDFW) will immediately be contacted.
17. All staged materials will be covered to prevent use of the materials as shelter.
18. Any pipes, culverts, or similar construction materials with a diameter of 4 or more inches that are stored overnight at the project site will be inspected for kit fox before the pipe is used or moved in any way. If the inspection reveals that a kit fox is inside the pipe, the pipe will not be moved until the Service has been contacted.
19. Construction in the vicinity of any occupied dens will not begin sooner than 30 minutes before sunrise, when feasible, and will cease 30 minutes before sunset.

If kit fox individuals, burrows, or diagnostic signs are detected within the area of direct effect, the following steps will be taken:

20. Disturbance to known kit fox dens will be avoided to the maximum extent possible.
21. During the December 1-July 31 breeding season, all construction activities will be prohibited within the following areas. For a known, non-natal/pupping den, the exclusion zone will have a minimum radius of 100 feet. The exclusion zone will be fenced with brightly-colored fencing that does not prevent access to the den by kit foxes. For a known, occupied or unoccupied natal/pupping den, the exclusion zone will be determined in consultation with the Service. The exclusion zone will be fenced with brightly-colored fencing that does not prevent access to the den by kit foxes. For potential or atypical dens, the exclusion zone will have a minimum radius of 50 feet. Fencing is not required for these exclusion zones. Instead, flags will be placed 50 feet from the den entrance(s).

If kit fox are observed at a den during the breeding season and construction cannot be avoided within the designated non-disturbance exclusion zones, the Corps will reinitiate consultation with the Service.

If any kit fox is inadvertently trapped, injured, or killed, the Service and CDFW will be notified immediately. If a kit fox is killed or injured an additional written notification will be sent within 3 working days of the incident.

The area surrounding the proposed construction sites is almost completely developed for agriculture with the exception of the area between the levees. Outside the levees, lands are intensively farmed for crops such as pistachio nuts, almonds, fruit, silage and other agricultural products. Remnant annual grassland, riparian forest and seasonal wetland communities persist within the levees along the watercourses. Kit fox may occur in suitable habitat in the action area although there are no known populations in or near the action area. There have been recorded occurrences of kit fox within 5 km (3.1 miles) of the action area (Tetra Tech 2019). The proposed project avoids kit fox core recovery areas identified in the Recovery Plan for Upland Species of the San Joaquin Valley (Service 1998), but is within satellite area 4 (Western Madera County), which means the area has

been identified as an area in the recovery plan that may periodically harbor kit foxes originating from a core area. Populations in satellite area 4 are presumed extirpated, but may be recolonized by immigrants if conditions improve and numbers in the core area increase (Service 2010). Given the species' dispersal habits, it may use the floodplains along the Fresno River, Chowchilla Bypass, and Brenda Slough as dispersal corridors, and suitable habitat was identified at each of the proposed critical levee repair sites (Tetra Tech 2019). Therefore, it is assumed kit foxes are likely to occur in the action area.

After review of the information provided, the Service concurs with your determination that the project may affect, but is not likely to adversely affect the kit fox. The project reached the 'may affect' level because there is habitat in the project area and it could also be used as a dispersal corridor. However; because the project has a small area of temporary impacts (10 sites totaling 3.09 acres) on suitable habitat compared to the entire range of the species, the impaired quality of habitat within the action area, the 2017 and 2018 general survey results, and the proposed conservation measures to avoid effects to the species, the Service believes any potential adverse effects to the kit fox from construction of the proposed project are discountable for the purposes of this consultation.

This concludes the Service's review of the proposed project. Note that take of listed species is not exempted from the prohibitions described under section 9 of the Act. If conditions change so that the project may adversely affect listed species, initiation of formal consultation, as provided in 50 CFR § 402.14, is required.

If you have questions regarding this letter, please contact me (douglas_weinrich@fws.gov), at the letterhead address, or at (916) 414-6563.

Sincerely,

Doug Weinrich

Doug Weinrich
Assistant Field Supervisor

ec:
Brian Luke, Sacramento Corps of Engineers, Sacramento, California

Literature Cited

Service (U.S. Fish and Wildlife Service). 1998. Recovery Plan for Upland Species of the San Joaquin Valley, California. Available at http://ecos.fws.gov/docs/recovery_plan/980930a.pdf

_____. 2010. San Joaquin kit fox 5-year review: Summary and Evaluation. Sacramento Fish and Wildlife Office, Sacramento, CA. 121 pp.

Tetra Tech. 2019. Biological Assessment Madera County Levee Repair Project. Tetra Tech, Portland, OR.


Merced
59
99
Le Grand
North Fork
El Nido
Chowchilla
152
Auberr
19229 - Berenda Slough
Dos Palos
Madera
Bonadelle Ranchos-Madera Ranchos
41
Firebaugh
168
Clovis
Approximate
Mendota
33
Fresno
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Sanger
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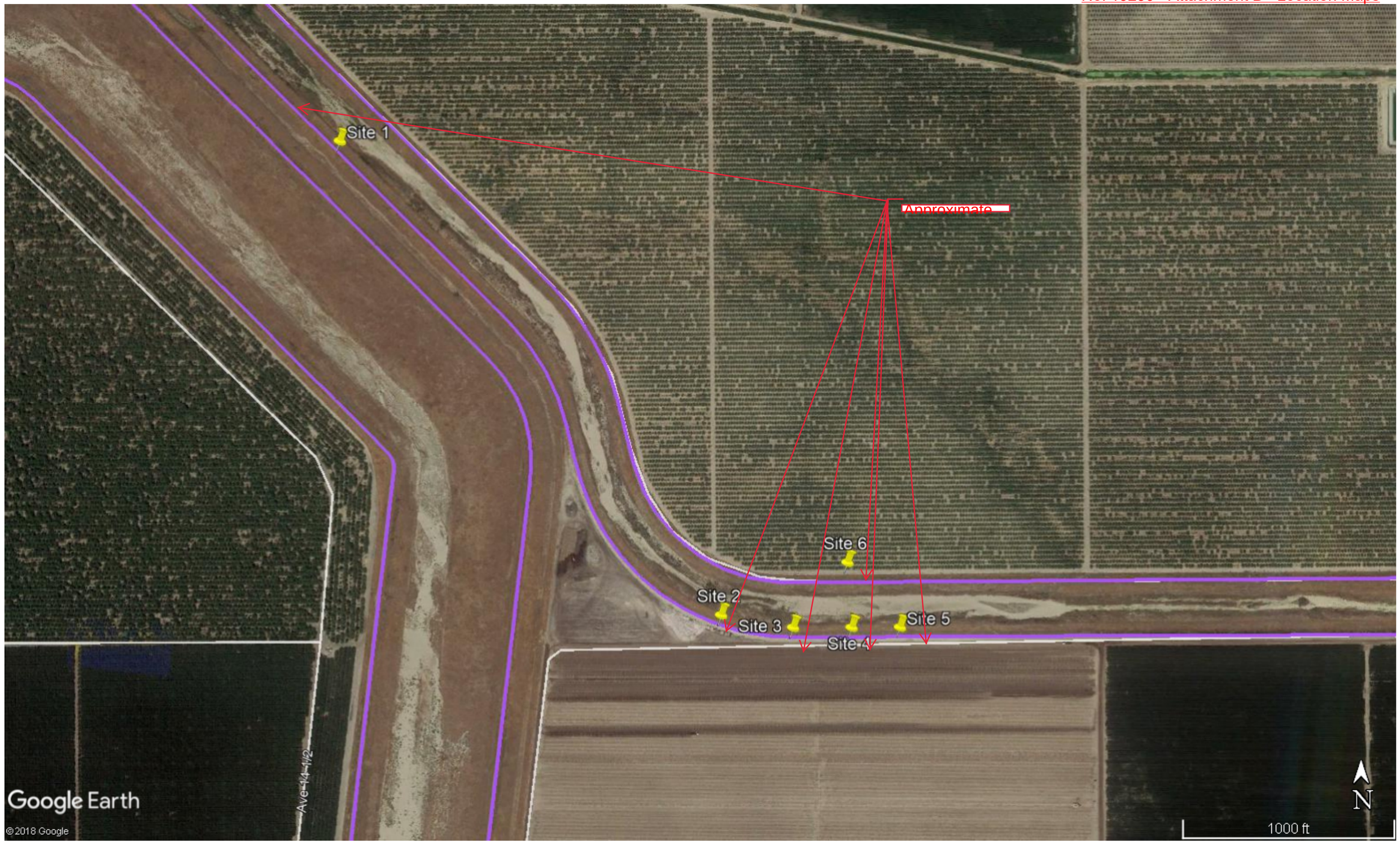
Site 1
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Site 7
Site 8
Site 9
Rd 14
Rd 15
Google Earth
© 2018 Google
2000 ft
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INDEX OF SHEETS

APPLICABLE STANDARD PLANS

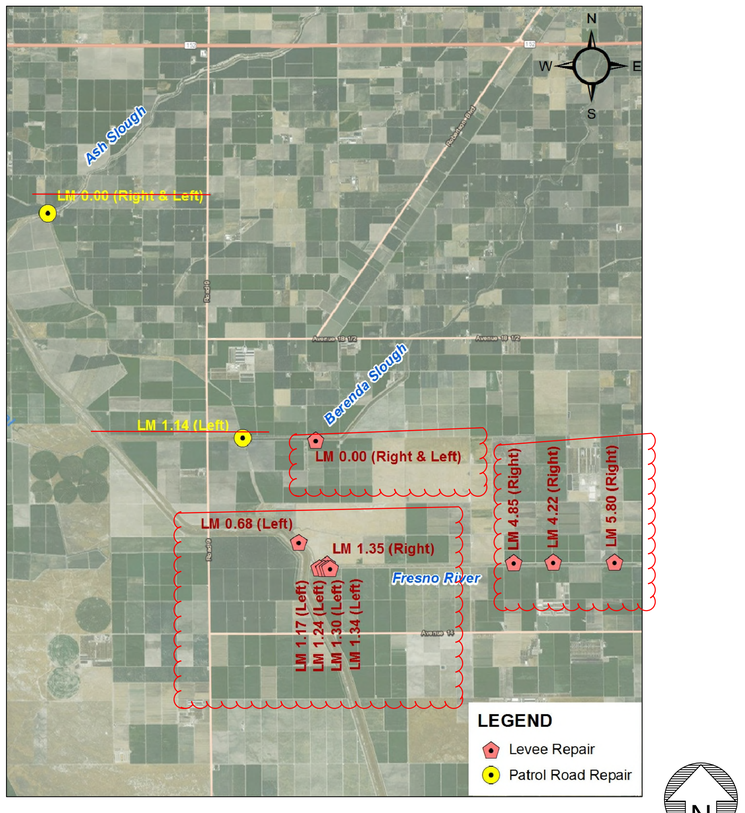
AS APPLICABLE

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

FRESNO RIVER

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	1	16

LOCATION MAP



VICINITY MAP
NOT TO SCALE

PRELIMINARY DRAFT

MADERA COUNTY

PUBLIC WORKS DIRECTOR

PLANS APPROVAL DATE

REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA

		SHEET
PROJECT NO.		1
		OF
CONTRACT NO.		16

CALL BEFORE YOU DIG
U S A
800-642-2444

UNDERGROUND FACILITIES SHOWN WERE LOCATED BASED ON INFORMATION PROVIDED BY UTILITY COMPANIES AND BY MEASURING SURFACE FEATURES. NO ATTEMPT WAS MADE TO LOCATE OTHER UNDERGROUND FACILITIES THAT WERE NOT READILY APPARENT FROM A VISUAL INSPECTION OF SURFACE FEATURES.

CONTRACTOR SHALL VERIFY ACTUAL DEPTH AND LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. CALL "UNDERGROUND SERVICE ALERT" (U.S.A.), (TOLL FREE 800–642–2444) AT LEAST 48 HOURS PRIOR TO TRENCHING, GRADING, EXCAVATION, DRILLING, PIPE PUSHING, PLANTING TREES, DIGGING POST HOLES FOR FENCES, ETC., (U.S.A.) WILL SUPPLY INFORMATION OR LOCATE AND MARK ANY UNDERGROUND FACILITIES.

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO CONTRACTORS" CONTAINED IN THE SPECIAL PROVISIONS

PROJECT PLANS FOR THE CONSTRUCTION OF
CRITICAL LEVEE REPAIRS & LEVEE PATROL ROAD REPAIRS (SJ05 & SJ11)
IN MADERA COUNTY

TO BE SUPPLEMENTED BY STANDARD PLANS AND STANDARD SPECIFICATIONS OF
LIST AS APPLICABLE

MADERA COUNTY PUBLIC WORKS DEPT. CONTRACT NO. 197-2015-0201

FUNDED UNDER THE FLOOD SYSTEM REPAIR PROJECT OF
THE CALIFORNIA DISASTER PREPAREDNESS AND FLOOD PREVENTION BOND ACT OF 2006

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3 4

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	2	16

PRELIMINARY DRAFT

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA

GENERAL NOTES

1. THE PURPOSE OF THIS REPAIR DESIGN IS TO REDUCE THE CURRENT FLOOD RISK, PROVIDE THE PRESCRIPTIVE REPAIR SOLUTION TO THE PREVIOUSLY DAMAGED AND IDENTIFIED LOCATIONS ONLY, AND IS NOT INTENDED TO IMPROVE THE LEVEE STRUCTURE TO MEET THE CURRENT USACE LEVEE DESIGN STANDARDS.

2. THE PROJECT DESIGN SHOWN ON THESE CONTRACT DRAWINGS IS BASED ON THE REPAIR SITE LOCATIONS AND PREFERRED REPAIR SOLUTIONS PREVIOUSLY IDENTIFIED IN THE 2013 PRE-FEASIBILITY REPORTS BY KLEINFELDER.

3. DETAILS ON THE CONTRACT DRAWINGS ARE INTENDED TO SHOW THE FINAL RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB SITE DIMENSIONS OR CONDITIONS, AND SUCH ADJUSTMENTS SHALL BE INCLUDED AS PART OF THE WORK. NO CHANGES TO THE CONTRACT DRAWINGS ARE ALLOWED WITHOUT WRITTEN APPROVAL OF THE COUNTY.

4. ALL REVISIONS TO THESE CONTRACT DRAWINGS SHALL BE APPROVED BY THE COUNTY PRIOR TO CONSTRUCTION, AND ANY CHANGES SHALL BE CLEARLY MARKED ON THE AS-BUILT DRAWING AND SUBMITTED TO THE COUNTY.

5. CONTRACTOR SHALL PROTECT ALL EXISTING LEVEE FACILITIES AND ACCESS ROADS, NOT DESIGNATED FOR MODIFICATION OR REMOVAL ON THE PLANS, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY THE CONTRACTOR'S CONSTRUCTION ACTIVITIES TO LEVEE FACILITIES AT NO ADDITIONAL COST TO THE COUNTY.

6. THESE CONTRACT DRAWINGS HAVE BEEN PREPARED BASED ON AN ABOVE-GROUND SURVEY. THE EXISTING UNDERGROUND UTILITIES SHOWN ARE BASED ON AS-BUILT INFORMATION PROVIDED BY THE OWNER IF ANY. THE BEST EFFORT HAS BEEN MADE TO DEPICT THESE UTILITIES, BUT THESE LOCATIONS SHALL BE CONSIDERED APPROXIMATE. THERE MAY BE ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN ON THIS PLAN SET. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT IN PLACE AND VERIFY THE EXISTENCE AND LOCATION OF ALL UTILITIES INCLUDING USE OF UTILITY LOCATING SERVICE AND POTHOLING AS NECESSARY TO CONFIRM ALL UTILITIES PRIOR TO CONSTRUCTION.

8. THE GEOTECHNICAL ENGINEERING REPORT, LEVEE AND LEVEE PATROL ROAD REPAIRS, FRESNO RIVER, BERENDA SLOUGH, AND ASH SLOUGH, MADERA COUNTY, CALIFORNIA, DATED DECEMBER 14, 2016, PREPARED BY TETRA TECH, INC. IS AVAILABLE FOR INFORMATIONAL PURPOSES. THE REPORT SHALL BE REFERRED TO FOR ANY GEOTECH-RELATED INFORMATION INCLUDING, BUT NOT LIMITED TO, BERM MATERIAL GRADATION, PLACEMENT, ETC.

9. NEITHER THE COUNTY NOR THE ENGINEER WARRANTS NOR GUARANTEES THE RESULTS OF ANY GEOTECHNICAL OR SUBSURFACE INVESTIGATIONS AS BEING REPRESENTATIVE OF THE SITE, BEYOND THE ACTUAL LOCATION OF THE TEST SPECIMEN(S) AND ASSUMES NO RESPONSIBILITY FOR THE MANNER IN WHICH THIS INFORMATION MAY BE USED OR THE CONCLUSIONS REACHED IN UTILIZING THE INFORMATION CONTAINED IN THE CONTRACT DOCUMENTS. FURTHER, NEITHER THE COUNTY NOR THE ENGINEER WARRANTS OR GUARANTEES THE CONCLUSIONS REACHED, RECOMMENDATIONS MADE OR TEST RESULTS PRESENTED AS PART OF THE GEOTECHNICAL OR SUBSURFACE INVESTIGATION AS BEING REPRESENTATIVE OF THE ENTIRE SITE. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO SUPPLEMENT ANY INFORMATION PROVIDED WITH ADDITIONAL SUBSURFACE INVESTIGATIONS AND TESTING, AT THEIR SOLE EXPENSE, IN ORDER TO ASSURE THE INFORMATION PROVIDED IN THE CONSTRUCTION DOCUMENTS IS REPRESENTATIVE OF THE CONDITIONS TO BE ENCOUNTERED WITHIN THE LIMITS OF THE PROJECT AT THE TIME OF CONSTRUCTION.

ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
C.L.	CONTROL LINE
CONC	CONCRETE
DIA	DIAMETER
DWR	DEPARTMENT OF WATER RESOURCES
EMB	EMBANKMENT
EL / ELEV.	ELEVATION
EG	EXISTING GRADE
EOP	EDGE OF PAVEMENT
EX	EXISTING
FS	FINISH SURFACE
FT	FOOT/FEET
GB	GRADE BREAK
IN	INCH
INV	INVERT
LM	LEVEE MILE
N.T.C	NOT TO SCALE
OC	ON CENTER
OE	OVERHEAD ELECTRICAL
OT	OVERHEAD TELEPHONE
PIP	PROTECT IN PLACE
P/L	PROPERTY LINE
PROP	PROPOSED
RC/ R/C	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
R/W	RIGHT-OF-WAY
SD	STORM DRAIN
SHT	SHEET
STR	STRUCTURAL
TBM	TEMPORARY BENCH MARK
TCE	TEMPORARY CONSTRUCTION EASEMENT
TEMP	TEMPORARY
TYP	TYPICAL
W	WATER
WSE	WATER SURFACE ELEVATION

DESIGN:	J. SUH
CHECKED:	Y. CHEN
DRAWN:	K. JAFARI
APPROVED:	XXXX

DATE	FUNDING SOURCE	PROJECT NO.
10/XX/17		
SCALE	BRIDGE NO.	CONTRACT NO.
AS SHOWN		

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

GENERAL NOTES AND ABBREVIATION

SHEET 2 OF 16

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

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DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	3	16

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA

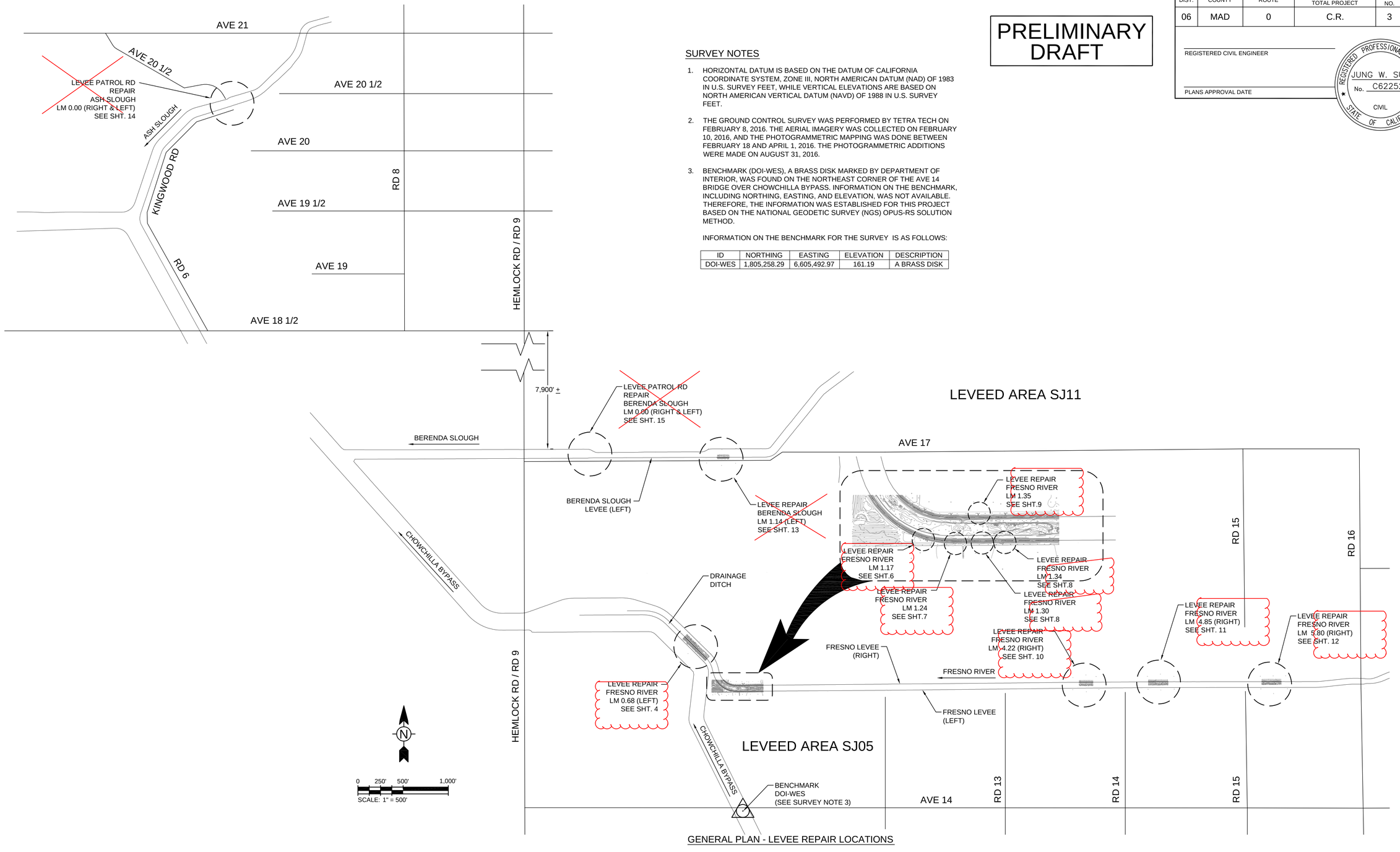
PRELIMINARY DRAFT

SURVEY NOTES

1. HORIZONTAL DATUM IS BASED ON THE DATUM OF CALIFORNIA COORDINATE SYSTEM, ZONE III, NORTH AMERICAN DATUM (NAD) OF 1983 IN U.S. SURVEY FEET, WHILE VERTICAL ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IN U.S. SURVEY FEET.
2. THE GROUND CONTROL SURVEY WAS PERFORMED BY TETRA TECH ON FEBRUARY 8, 2016. THE AERIAL IMAGERY WAS COLLECTED ON FEBRUARY 10, 2016, AND THE PHOTOGRAMMETRIC MAPPING WAS DONE BETWEEN FEBRUARY 18 AND APRIL 1, 2016. THE PHOTOGRAMMETRIC ADDITIONS WERE MADE ON AUGUST 31, 2016.
3. BENCHMARK (DOI-WES), A BRASS DISK MARKED BY DEPARTMENT OF INTERIOR, WAS FOUND ON THE NORTHEAST CORNER OF THE AVE 14 BRIDGE OVER CHOWCHILLA BYPASS. INFORMATION ON THE BENCHMARK, INCLUDING NORTHING, EASTING, AND ELEVATION, WAS NOT AVAILABLE. THEREFORE, THE INFORMATION WAS ESTABLISHED FOR THIS PROJECT BASED ON THE NATIONAL GEODETIC SURVEY (NGS) OPUS-RS SOLUTION METHOD.

   INFORMATION ON THE BENCHMARK FOR THE SURVEY IS AS FOLLOWS:

ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
DOI-WES	1,805,258.29	6,605,492.97	161.19	A BRASS DISK



GENERAL PLAN - LEVEE REPAIR LOCATIONS

DESIGN:	J. SUH	DATE	FUNDING SOURCE	PROJECT NO.	
CHECKED:	Y. CHEN	10/XX/17			
DRAWN:	K. JAFARI	SCALE	BRIDGE NO.	CONTRACT NO.	
APPROVED:	XXXX	AS SHOWN			

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

SURVEY NOTES AND SHEET LAYOUT

SHEET 3 OF 16

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

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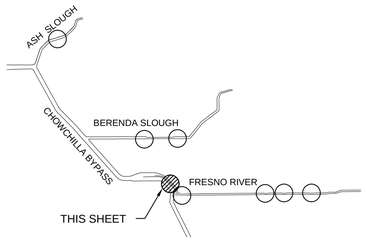
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	4	16

PRELIMINARY DRAFT

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA



KEY MAP
N.T.S

LEGEND

- BORING LOCATION
- CPT LOCATION
- CONTROL LINE FOR LEVEE MILE
- COUNTY R/W LIMIT
- EX. EASEMENT LIMIT
- PROJECT EASEMENT LIMIT

BORING/CTP LOCATIONS

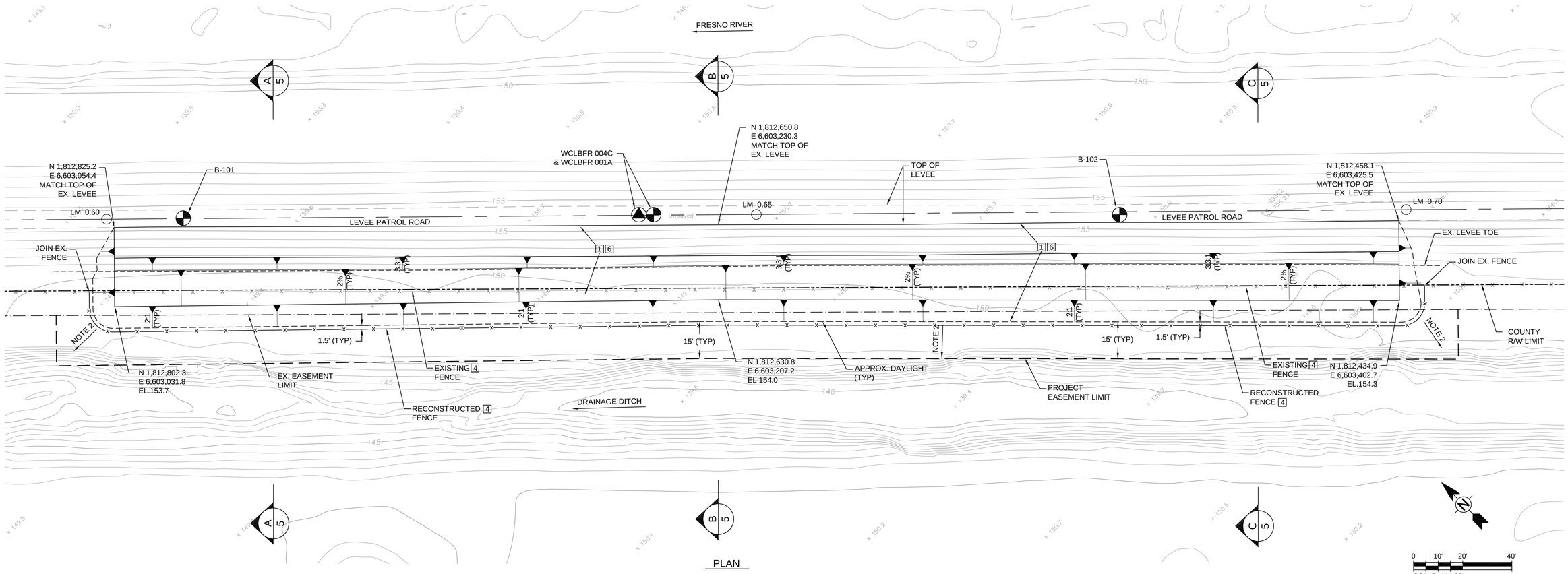
ID	NORTHING	EASTING
B-101	1,812,808	6,603,077
B-102	1,812,540	6,603,347
WCLBFR 001A	1,812,676	6,603,211
WCLBFR 004C	1,812,676	6,603,211

NOTES

1. CONTROL LINE FOR LEVEE MILES WAS ESTABLISHED BASED ON THE GIS INFORMATION PROVIDED BY CALIFORNIA DWR.
2. CONTRACTOR SHALL GRADE AND PROVIDE POSITIVE DRAINAGE AWAY FROM REPAIR BERM AND EXISTING LEVEE IN ADJACENT AREAS OF THE PROJECT.
3. INTERFERING PORTIONS OF EXISTING FENCE SHALL BE REMOVED AND REPLACED WITH IN-KIND MATERIAL AFTER SEEPAGE BERM CONSTRUCTION.

CONSTRUCTION NOTES

1. CONSTRUCT A COMBINED SEEPAGE-STABILITY BERM PER PLAN HEREON, TYPICAL SECTIONS ON SHEET 5, AND DETAILS ON SHEET 16.
4. EXISTING FENCE WITHIN PROJECT FOOTPRINTS SHALL BE REMOVED AND DISPOSED OF, AND RECONSTRUCTED WITH IN-KIND MATERIAL AFTER BERM CONSTRUCTION PER PLAN HEREON.
5. PRIOR TO CONSTRUCTION OF BERM, ALL EXISTING BURROWS WITHIN LANDSIDE SLOPE AND CREST OF LEVEE, AND FOOTPRINT OF THE BERM SHALL BE FILLED WITH A CEMENT-BENTONITE GROUT. THE LIMITS OF GROUTING OF BURROWS SHALL EXTEND AT LEAST 20 FEET UPSTREAM AND 10 FEET DOWNSTREAM OF THE FOOTPRINTS OF THE BERM ALONG THE LEVEE.
6. HYDROSEED BERM FINISH SURFACE PER PLAN HEREON.



PLAN

DESIGN:	J. SUH	DATE	FUNDING SOURCE	PROJECT NO.
CHECKED:	Y. CHEN	10/XX/17		
DRAWN:	K. JAFARI	SCALE	BRIDGE NO.	CONTRACT NO.
APPROVED:	XXXX	AS SHOWN		

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

CRITICAL LEVEE REPAIR - FRESNO RIVER (LM 0.68) (1 OF 2)

SHEET 4 OF 16

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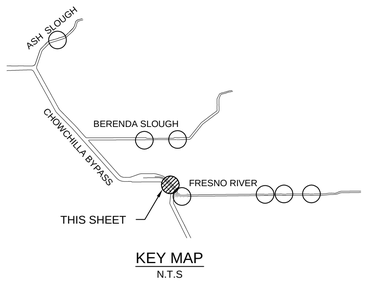
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	5	16

PRELIMINARY DRAFT

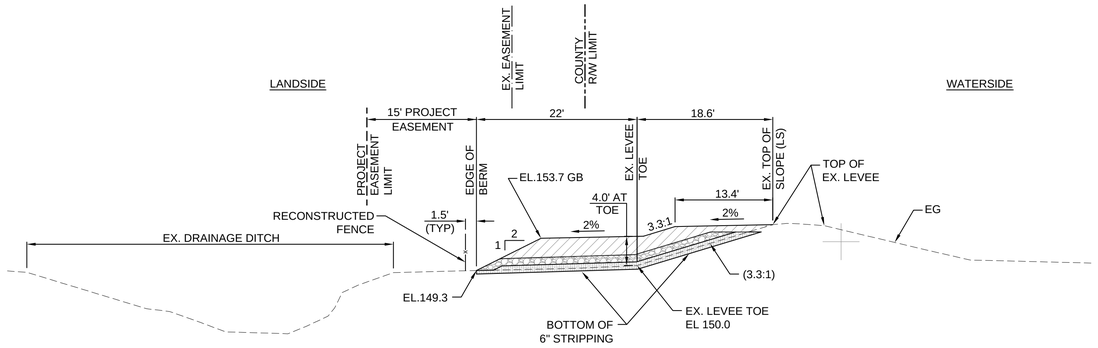
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

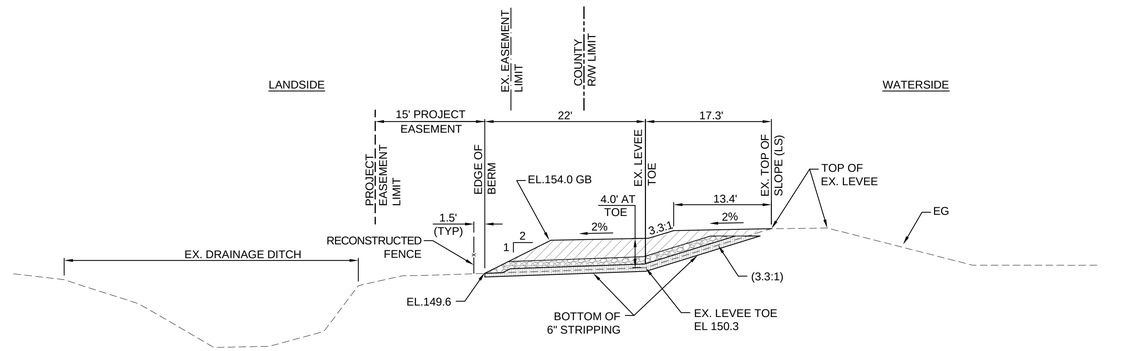
REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA



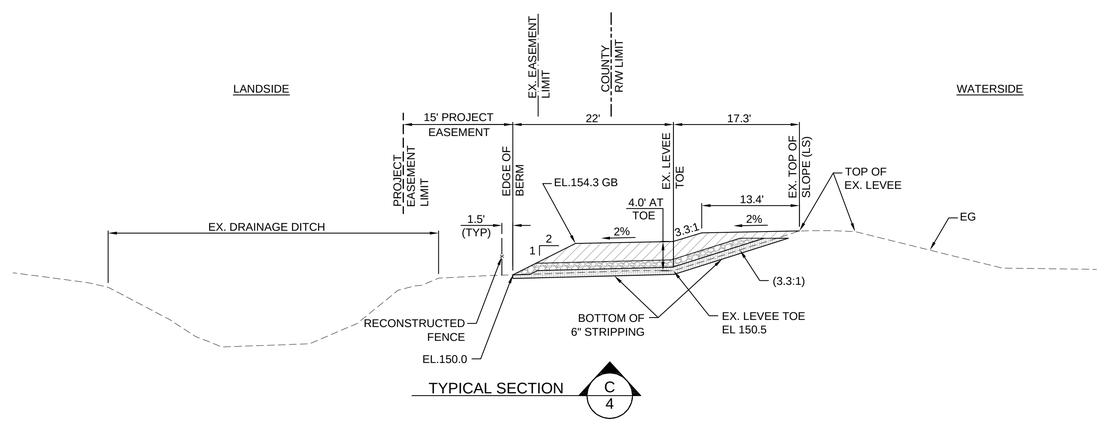
KEY MAP
N.T.S



TYPICAL SECTION A 4



TYPICAL SECTION B 4



TYPICAL SECTION C 4

0 5' 10' 20'
SCALE: 1" = 10'

DESIGN: J. SUH	DATE	FUNDING SOURCE	PROJECT NO.	MADERA COUNTY PUBLIC WORKS DEPARTMENT
CHECKED: Y. CHEN	10/XX/17			
DRAWN: K. JAFARI	SCALE	BRIDGE NO.	CONTRACT NO.	
APPROVED: XXXX	AS SHOWN			

CRITICAL LEVEES REPAIRS AND LEVEE PATROL ROAD REPAIRS — SHEET 5

CRITICAL LEVEE REPAIR - FRESNO RIVER (LM 0.68) (2 OF 2) — OF 16

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

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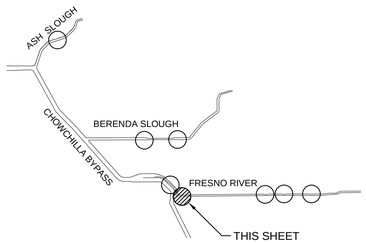
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	6	16

PRELIMINARY DRAFT

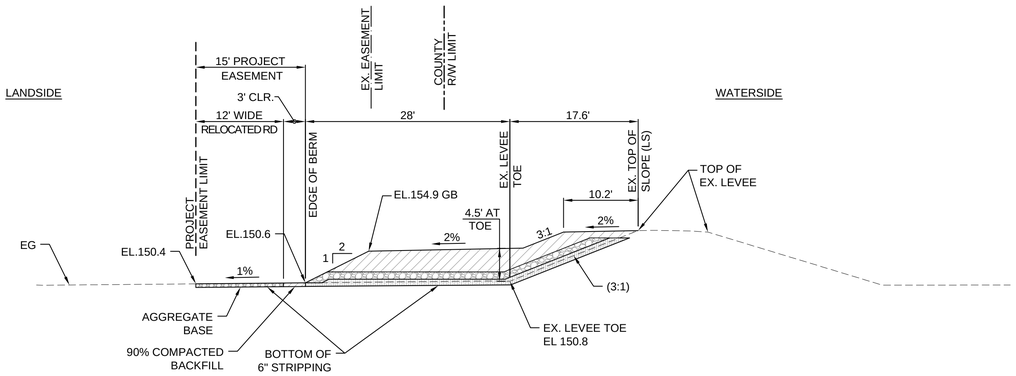
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA



KEY MAP
N.T.S



TYPICAL SECTION A

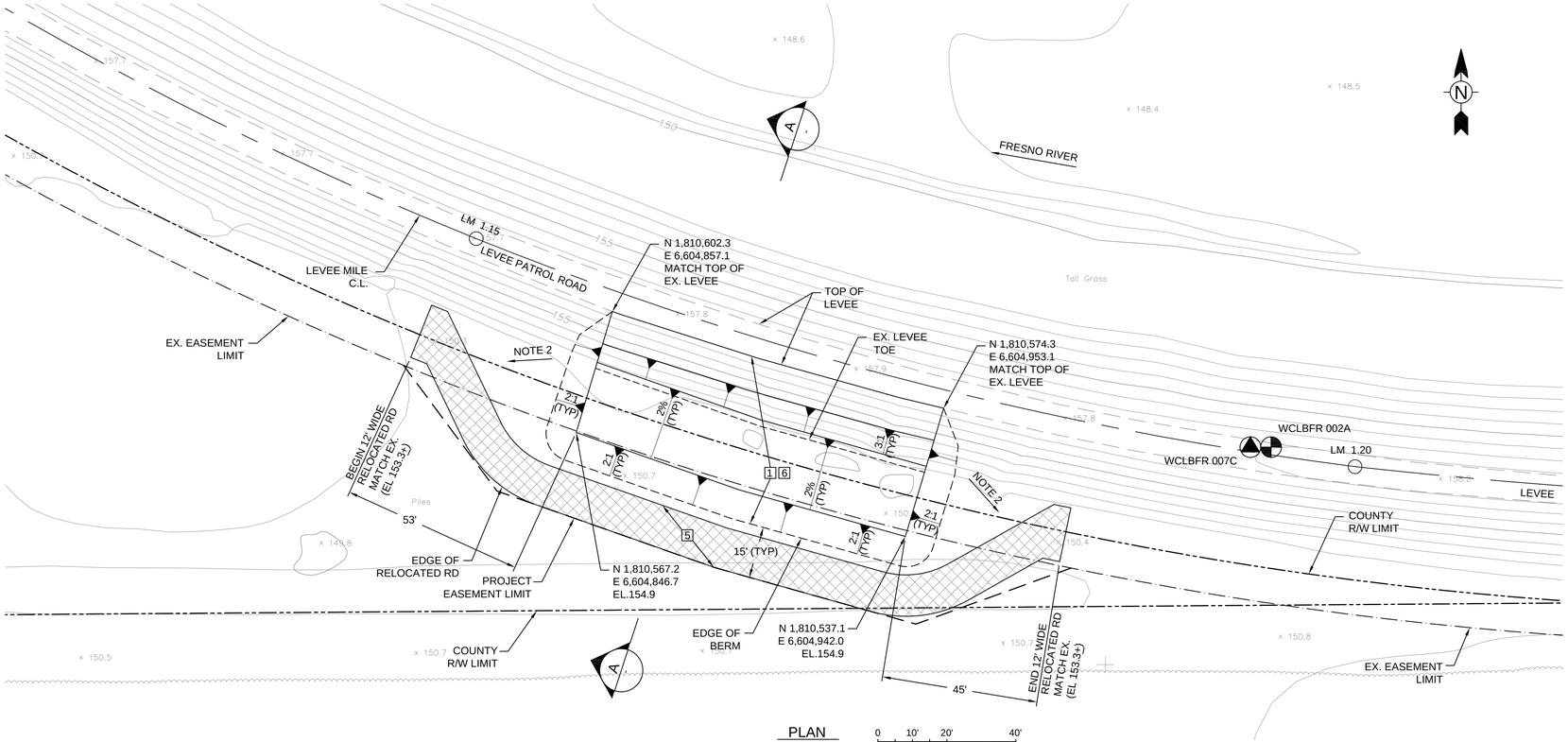
SCALE: 1" = 10'

CONSTRUCTION NOTES

1. CONSTRUCT A COMBINED SEEPAGE-STABILITY BERM PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.
5. CONSTRUCT 12' WIDE RELOCATED ROAD PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.
6. HYDROSEED BERM FINISH SURFACE PER PLAN HEREON.

BORING/CTP LOCATIONS

ID	NORTHING	EASTING
WCLBFR 002A	1,810,563	6,605,045
WCLBFR 007C	1,810,563	6,605,045



PLAN

SCALE: 1" = 20'

NOTES

1. CONTROL LINE FOR LEVEE MILES WAS ESTABLISHED BASED ON THE GIS INFORMATION PROVIDED BY CALIFORNIA DWR.
2. CONTRACTOR SHALL GRADE AND PROVIDE POSITIVE DRAINAGE AWAY FROM REPAIR BERM AND EXISTING LEVEE IN ADJACENT AREAS OF THE PROJECT.
3. CONTRACTOR SHALL PROVIDE SMOOTH TRANSITION BETWEEN EXISTING AND NEW ROADWAYS.

LEGEND

- BORING LOCATION
- CPT LOCATION
- CONTROL LINE FOR LEVEE MILE
- COUNTY R/W LIMIT
- EX. EASEMENT LIMIT
- PROJECT EASEMENT LIMIT

		DATE	FUNDING SOURCE	PROJECT NO.
DESIGN:	J. SUH	10/XX/17		
CHECKED:	Y. CHEN	SCALE	BRIDGE NO.	CONTRACT NO.
DRAWN:	K. JAFARI	AS SHOWN		
APPROVED:	XXXX			

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

CRITICAL LEVEE REPAIR - FRESNO RIVER (LM 1.17)

SHEET 6 OF 16

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

P:\Vault\T35280 Madera County\03 Design\T35280CP100_004+ltr015.dwg 27 Sep 2017 8:50:40pm Jungs.suh

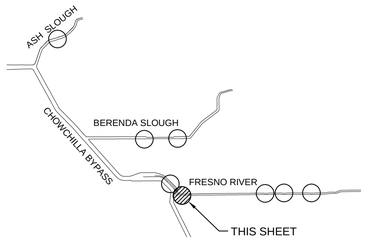
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	7	16

PRELIMINARY DRAFT

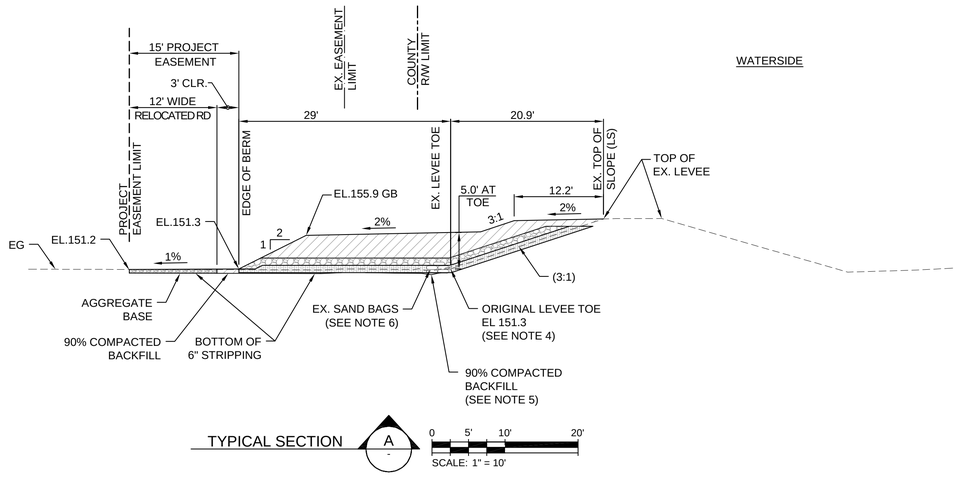
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA



KEY MAP
N.T.S



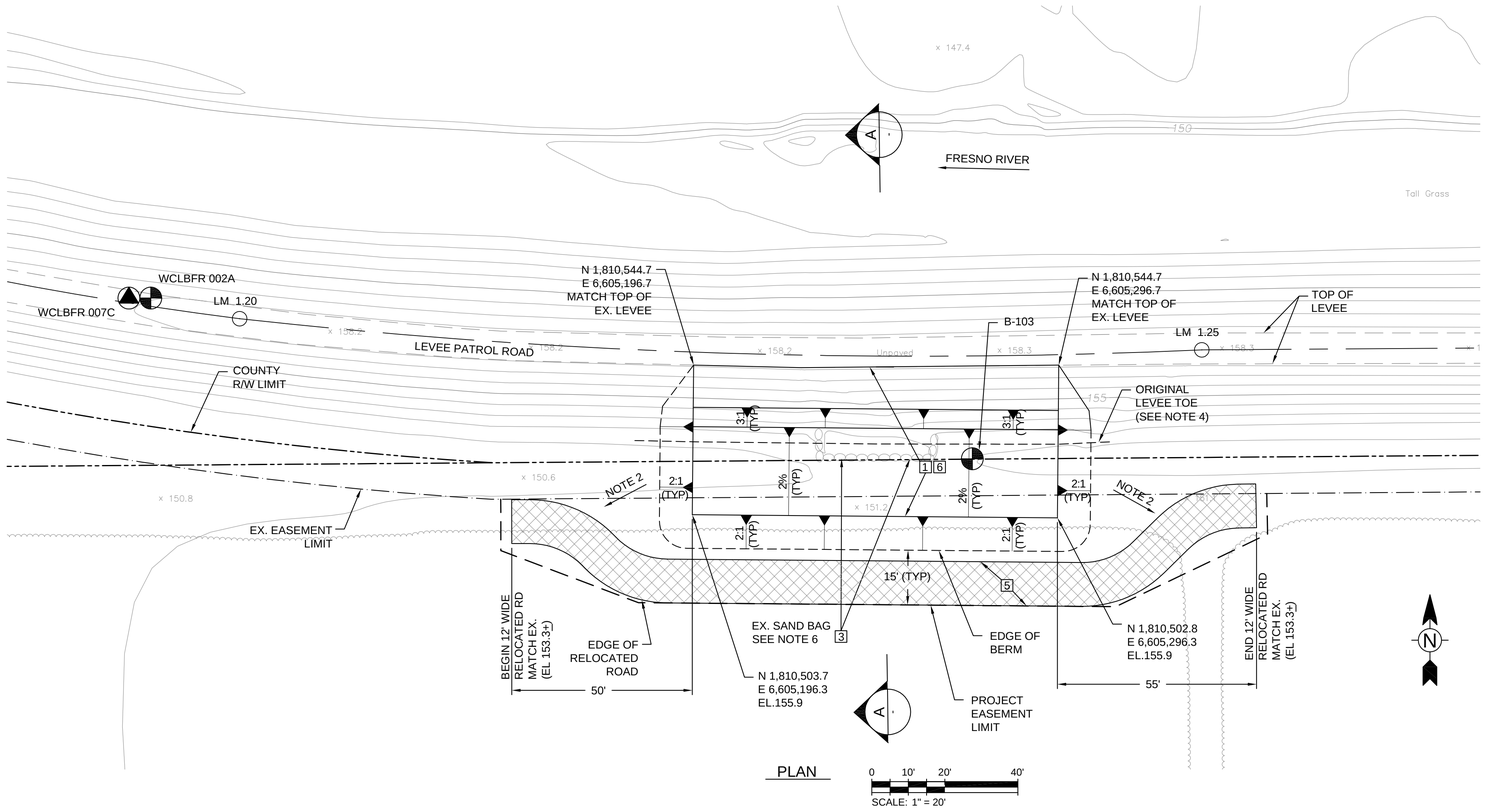
TYPICAL SECTION A - A'
SCALE: 1" = 10'

CONSTRUCTION NOTES

1. CONSTRUCT A COMBINED SEEPAGE-STABILITY BERM PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.
3. REMOVE AND DISPOSE OF EXISTING FEATURE PER PLAN HEREON.
5. CONSTRUCT 12' WIDE RELOCATED ROAD PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.
6. HYDROSEED BERM FINISH SURFACE PER PLAN HEREON.

BORING/CTP LOCATIONS

ID	NORTHING	EASTING
B-103	1,810,519	6,605,273
WCLBFR 002A	1,810,563	6,605,045
WCLBFR 007C	1,810,563	6,605,045



PLAN
SCALE: 1" = 20'

NOTES

1. CONTROL LINE FOR LEVEE MILES WAS ESTABLISHED BASED ON THE GIS INFORMATION PROVIDED BY CALIFORNIA DWR.
2. CONTRACTOR SHALL GRADE AND PROVIDE POSITIVE DRAINAGE AWAY FROM REPAIR BERM AND EXISTING LEVEE IN ADJACENT AREAS OF THE PROJECT.
3. CONTRACTOR SHALL REMOVE SEDIMENT DEPOSITION ALONG THE LEVEE SIDE SLOPE AND TOE TO THE ORIGINAL LEVEE GRADE PRIOR TO PERFORMING 6" STRIPPING.
4. THE ORIGINAL LEVEE TOE ELEVATION WAS DETERMINED BY PROJECTING ADJACENT GROUND ELEVATION AND SIDE SLOPE DUE TO SEDIMENT DEPOSITION ALONG THE LEVEE TOE.
5. IF LIMIT FOR 6" STRIPPING IS 6" OR MORE BELOW THE ORIGINAL LEVEE TOE ELEVATION, THE STRIPPED AREA SHALL BE BACKFILLED WITH 95% COMPACTED BACKFILL TO THE ELEVATION THAT IS 6" BELOW THE ORIGINAL LEVEE TOE ELEVATION PRIOR TO PLACING FILTER MATERIAL.
6. ALL SAND BAGS BURIED IN THE LEVEE SIDE SLOPE ADJACENT TO THE REPAIR SITE SHALL BE REMOVED AND BACKFILLED TO 6" OFFSET FROM THE ORIGINAL LEVEE GRADE WITH 90% COMPACTED FILL PRIOR TO CONSTRUCTION OF SEEPAGE REPAIR.
7. CONTRACTOR SHALL PROVIDE SMOOTH TRANSITION BETWEEN EXISTING AND NEW ROADWAYS.

LEGEND

- BORING LOCATION
- CPT LOCATION
- CONTROL LINE FOR LEVEE MILE
- COUNTY R/W LIMIT
- EX. EASEMENT LIMIT
- PROJECT EASEMENT LIMIT

DESIGN:	J. SUH
CHECKED:	Y. CHEN
DRAWN:	K. JAFARI
APPROVED:	XXXX

DATE	FUNDING SOURCE	PROJECT NO.
10/XX/17		
SCALE	BRIDGE NO.	CONTRACT NO.
AS SHOWN		

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

CRITICAL LEVEE REPAIR - FRESNO RIVER (LM 1.24)

SHEET 7 OF 16

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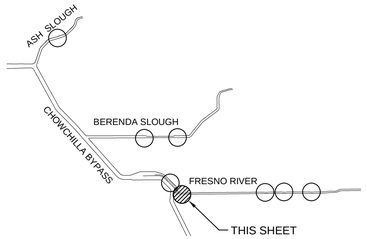
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	8	16

REGISTERED CIVIL ENGINEER

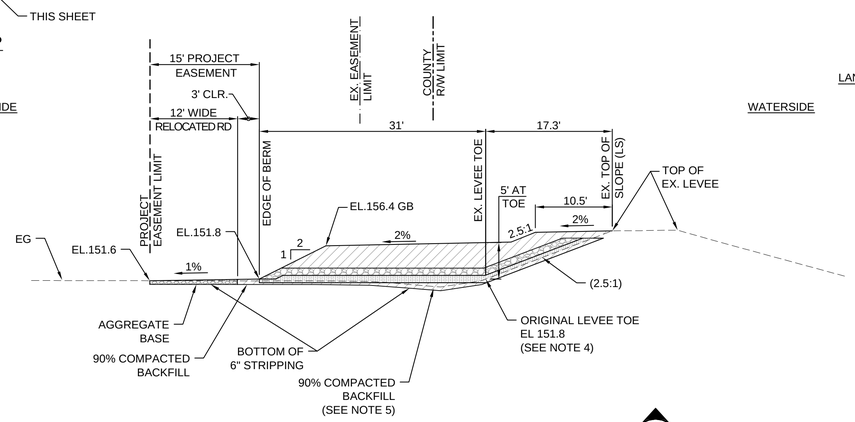
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA

PRELIMINARY DRAFT

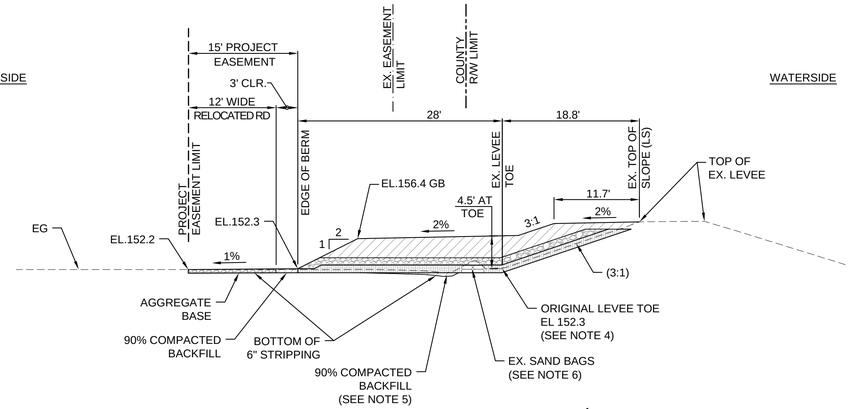


KEY MAP
N.T.S



TYPICAL SECTION - LM 01.30 SITE — A

SCALE: 1" = 10'



TYPICAL SECTION - LM 01.34 SITE — B

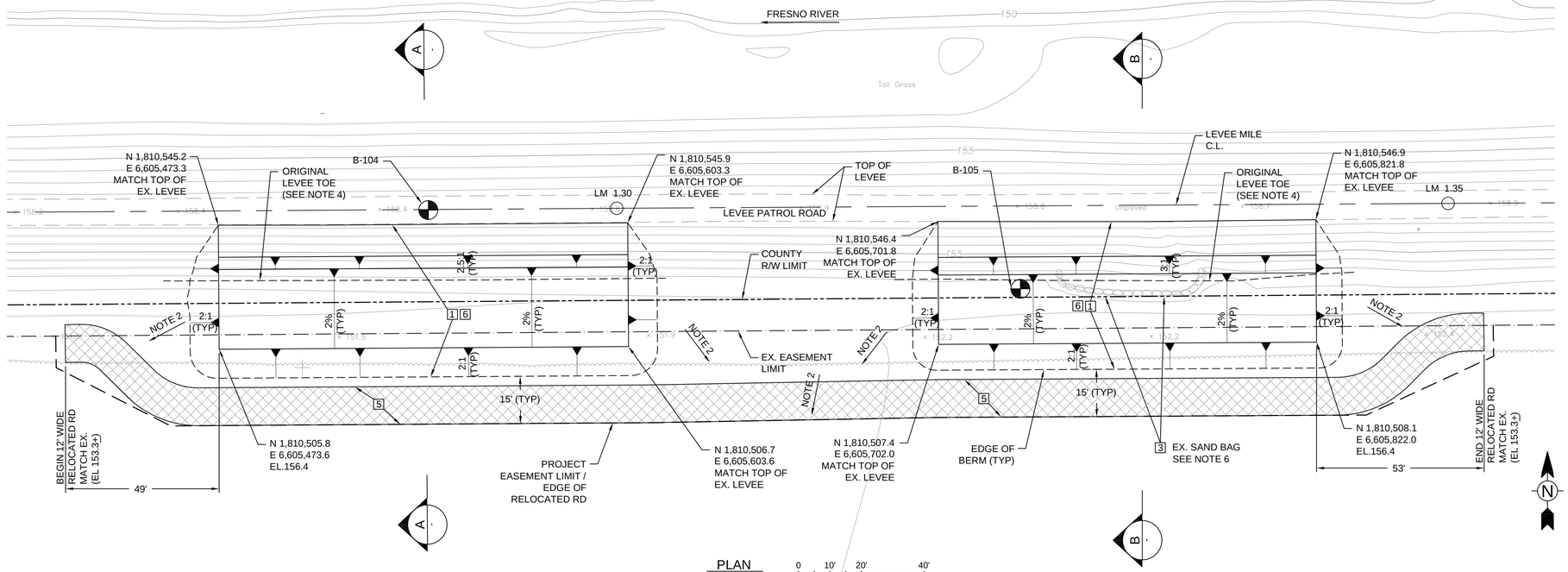
SCALE: 1" = 10'

CONSTRUCTION NOTES

1. CONSTRUCT A COMBINED SEEPAGE-STABILITY BERM PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.
2. CONSTRUCT A SEEPAGE BERM PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.
3. REMOVE AND DISPOSE OF EXISTING FEATURE PER PLAN HEREON.
5. CONSTRUCT 12' WIDE RELOCATED ROAD PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.
6. HYDROSEED BERM FINISH SURFACE PER PLAN HEREON.

BORING/CTP LOCATIONS

ID	NORTHING	EASTING
B-104	1,810,550	6,605,540
B-105	1,810,525	6,605,728



PLAN

0 10' 20' 40'

SCALE: 1" = 20'

NOTES

1. CONTROL LINE FOR LEVEE MILES WAS ESTABLISHED BASED ON THE GIS INFORMATION PROVIDED BY CALIFORNIA DWR.
2. CONTRACTOR SHALL GRADE AND PROVIDE POSITIVE DRAINAGE AWAY FROM REPAIR BERM AND EXISTING LEVEE IN ADJACENT AREAS OF THE PROJECT.
3. CONTRACTOR SHALL REMOVE SEDIMENT DEPOSITION ALONG THE LEVEE SIDE SLOPE AND TOE TO THE ORIGINAL LEVEE GRADE PRIOR TO PERFORMING 6" STRIPPING.
4. THE ORIGINAL LEVEE TOE ELEVATION WAS DETERMINED BY PROJECTING ADJACENT GROUND ELEVATION AND SIDE SLOPE DUE TO SEDIMENT DEPOSITION ALONG THE LEVEE TOE.
5. IF LIMIT FOR 6" STRIPPING IS 6" OR MORE BELOW THE ORIGINAL LEVEE TOE ELEVATION, THE STRIPPED AREA SHALL BE BACKFILLED WITH 95% COMPACTED BACKFILL TO THE ELEVATION THAT IS 6" BELOW THE ORIGINAL LEVEE TOE ELEVATION PRIOR TO PLACING FILTER MATERIAL.
6. ALL SAND BAGS BURIED IN THE LEVEE SIDE SLOPE ADJACENT TO THE REPAIR SITE SHALL BE REMOVED AND BACKFILLED TO 6" OFFSET FROM THE ORIGINAL LEVEE GRADE WITH 90% COMPACTED FILL PRIOR TO CONSTRUCTION OF SEEPAGE REPAIR.
7. CONTRACTOR SHALL PROVIDE SMOOTH TRANSITION BETWEEN EXISTING AND NEW ROADWAYS.

LEGEND

- BORING LOCATION
- CPT LOCATION
- CONTROL LINE FOR LEVEE MILE
- COUNTY R/W LIMIT
- EX. EASEMENT LIMIT
- PROJECT EASEMENT LIMIT

		DATE	FUNDING SOURCE	PROJECT NO.
DESIGN:	J. SUH	10/XX/17		
CHECKED:	Y. CHEN	SCALE	BRIDGE NO.	CONTRACT NO.
DRAWN:	K. JAFARI	AS SHOWN		
APPROVED:	XXXX			

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

CRITICAL LEVEE REPAIR - FRESNO RIVER (LM 1.30 & LM 1.34)

SHEET 8 OF 16

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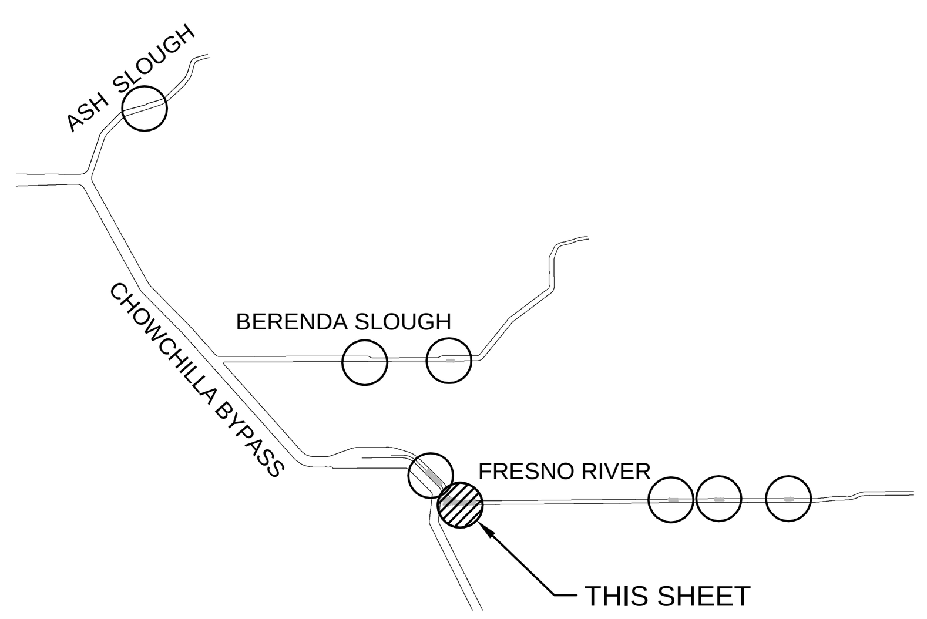
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	9	16

REGISTERED CIVIL ENGINEER

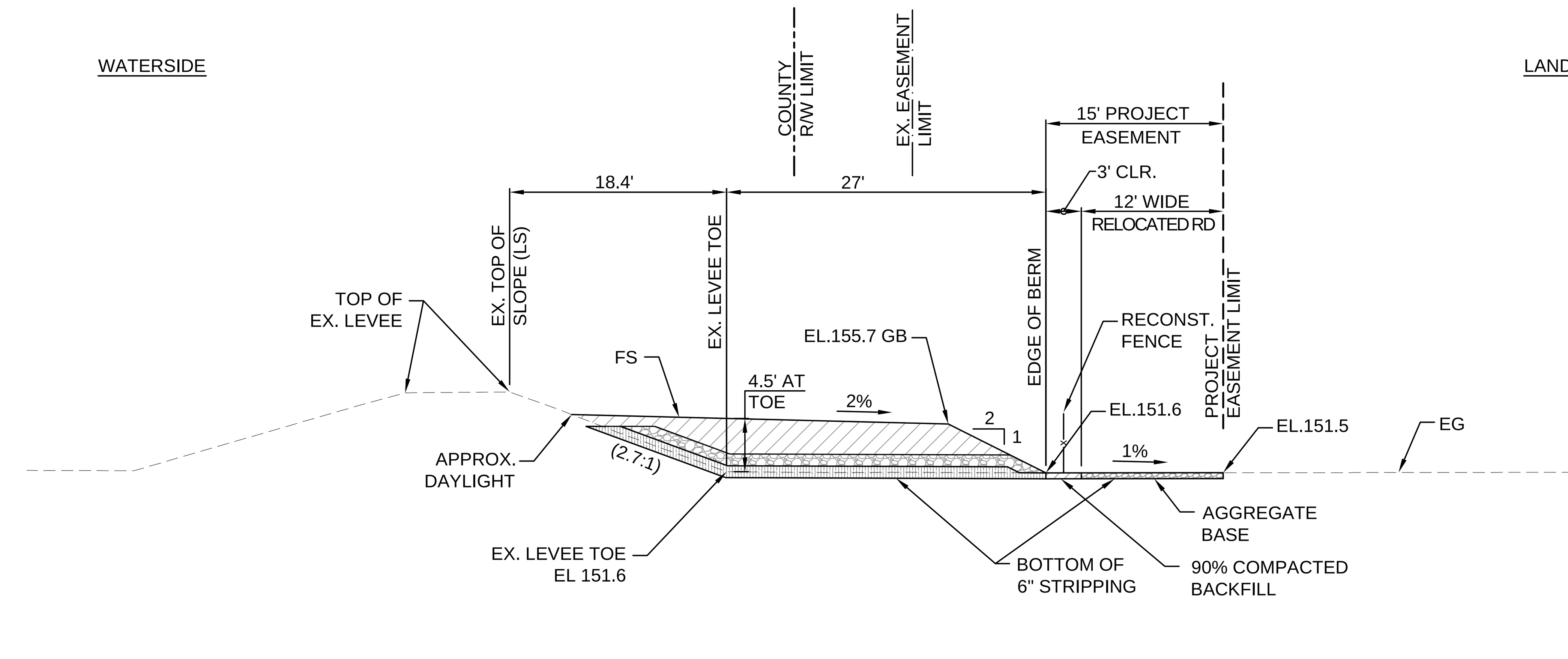
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA

PRELIMINARY DRAFT

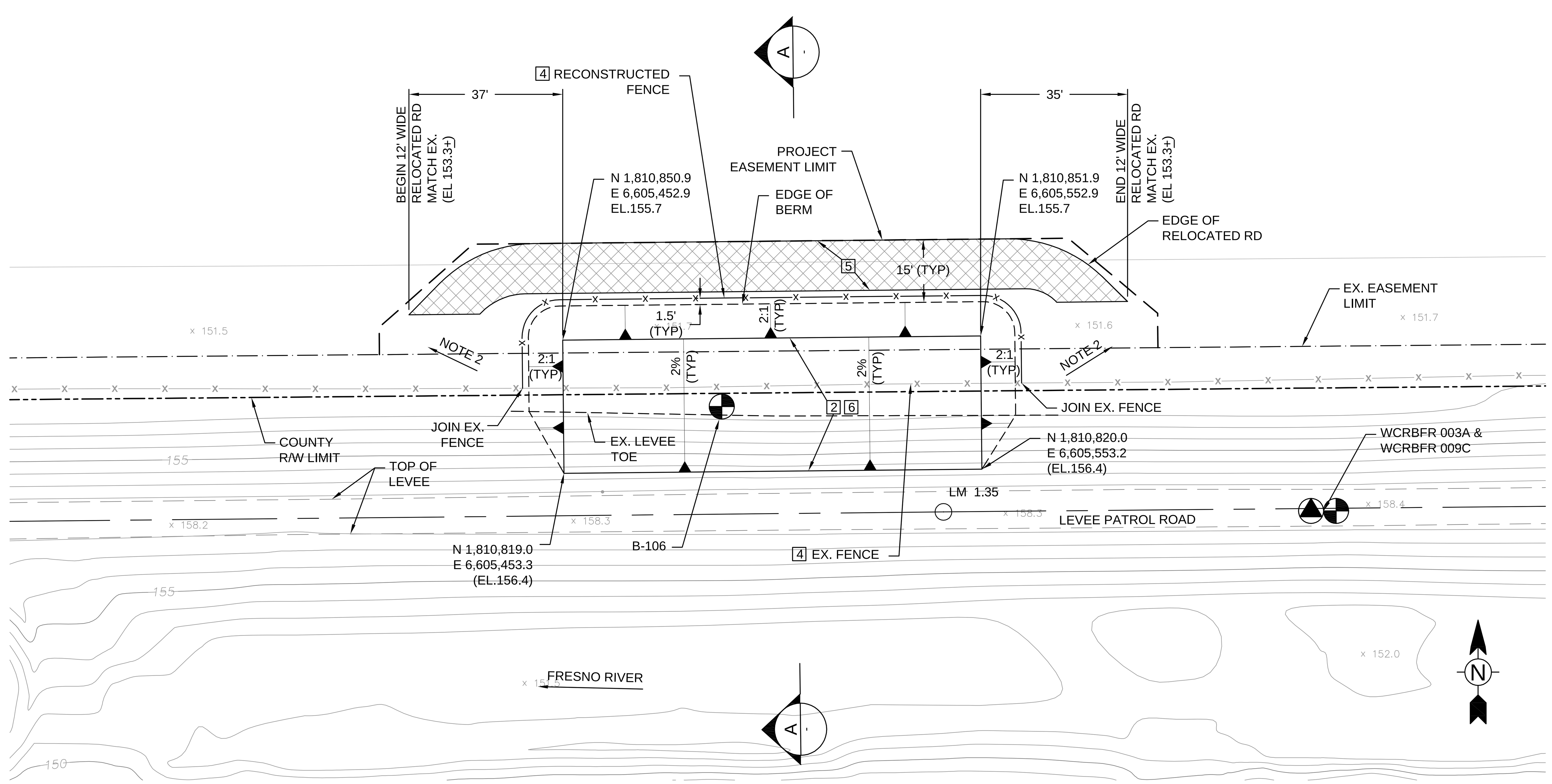


KEY MAP
N.T.S



TYPICAL SECTION A

SCALE: 1" = 10'



PLAN

SCALE: 1" = 20'

CONSTRUCTION NOTES

2 CONSTRUCT A SEEPAGE BERM PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.

4 EXISTING FENCE WITHIN PROJECT FOOTPRINTS SHALL BE REMOVED AND DISPOSED OF, AND RECONSTRUCTED WITH IN-KIND MATERIAL AFTER BERM CONSTRUCTION PER PLAN HEREON.

5 CONSTRUCT 12' WIDE RELOCATED ROAD PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.

6 HYDROSEED BERM FINISH SURFACE PER PLAN HEREON.

BORING/CTP LOCATIONS

ID	NORTHING	EASTING
B-106	1,810,835	6,605,491
WCRBFR 003A	1,810,810	6,605,635
WCRBFR 009C	1,810,810	6,605,635

NOTES

1. CONTROL LINE FOR LEVEE MILES WAS ESTABLISHED BASED ON THE GIS INFORMATION PROVIDED BY CALIFORNIA DWR.
2. CONTRACTOR SHALL GRADE AND PROVIDE POSITIVE DRAINAGE AWAY FROM REPAIR BERM AND EXISTING LEVEE IN ADJACENT AREAS OF THE PROJECT.
3. CONTRACTOR SHALL PROVIDE SMOOTH TRANSITION BETWEEN EXISTING AND NEW ROADWAYS.

LEGEND

- BORING LOCATION
- CPT LOCATION
- CONTROL LINE FOR LEVEE MILE
- COUNTY R/W LIMIT
- EX. EASEMENT LIMIT
- PROJECT EASEMENT LIMIT

		DATE	FUNDING SOURCE	PROJECT NO.
DESIGN:	J. SUH	10/XX/17		
CHECKED:	Y. CHEN			
DRAWN:	K. JAFARI	SCALE	BRIDGE NO.	CONTRACT NO.
APPROVED:	XXXX	AS SHOWN		

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

CRITICAL LEVEE REPAIR - FRESNO RIVER (LM 1.35)

SHEET 9 OF 16

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

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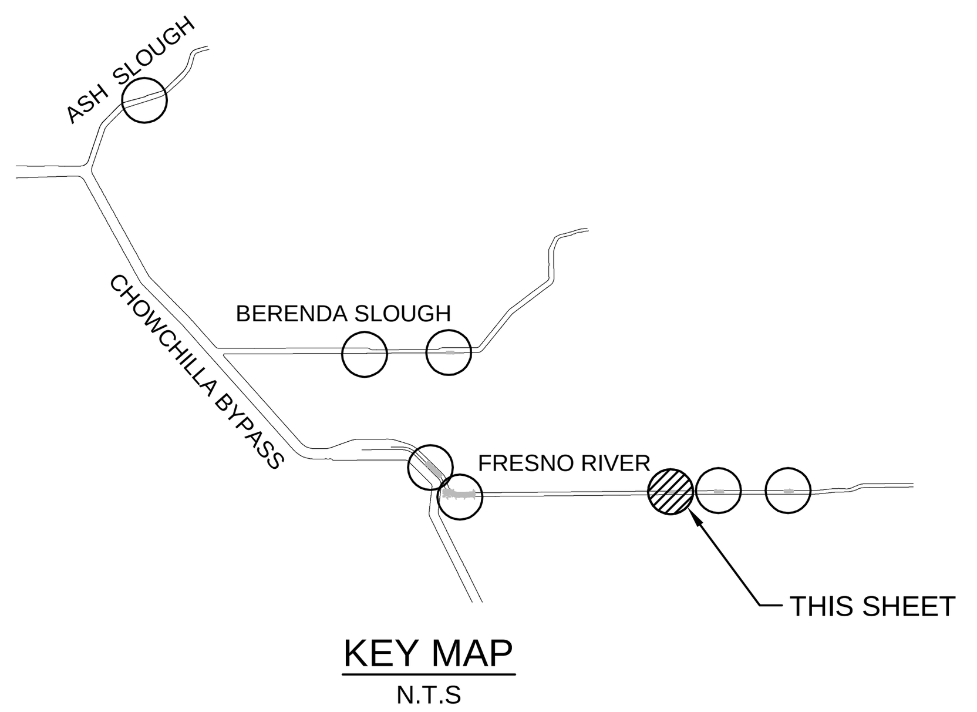
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	10	16

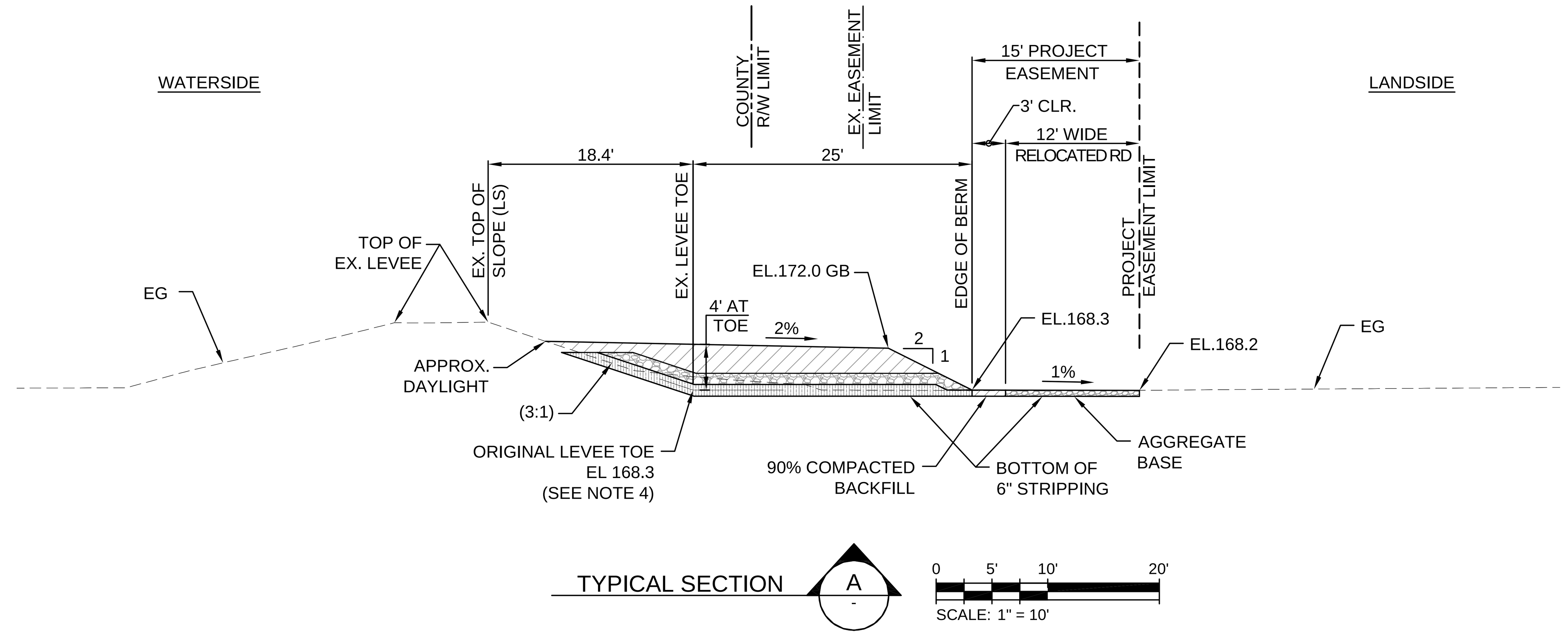
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER JUNG W. SUH No. C62252 CIVIL STATE OF CALIFORNIA

PRELIMINARY DRAFT





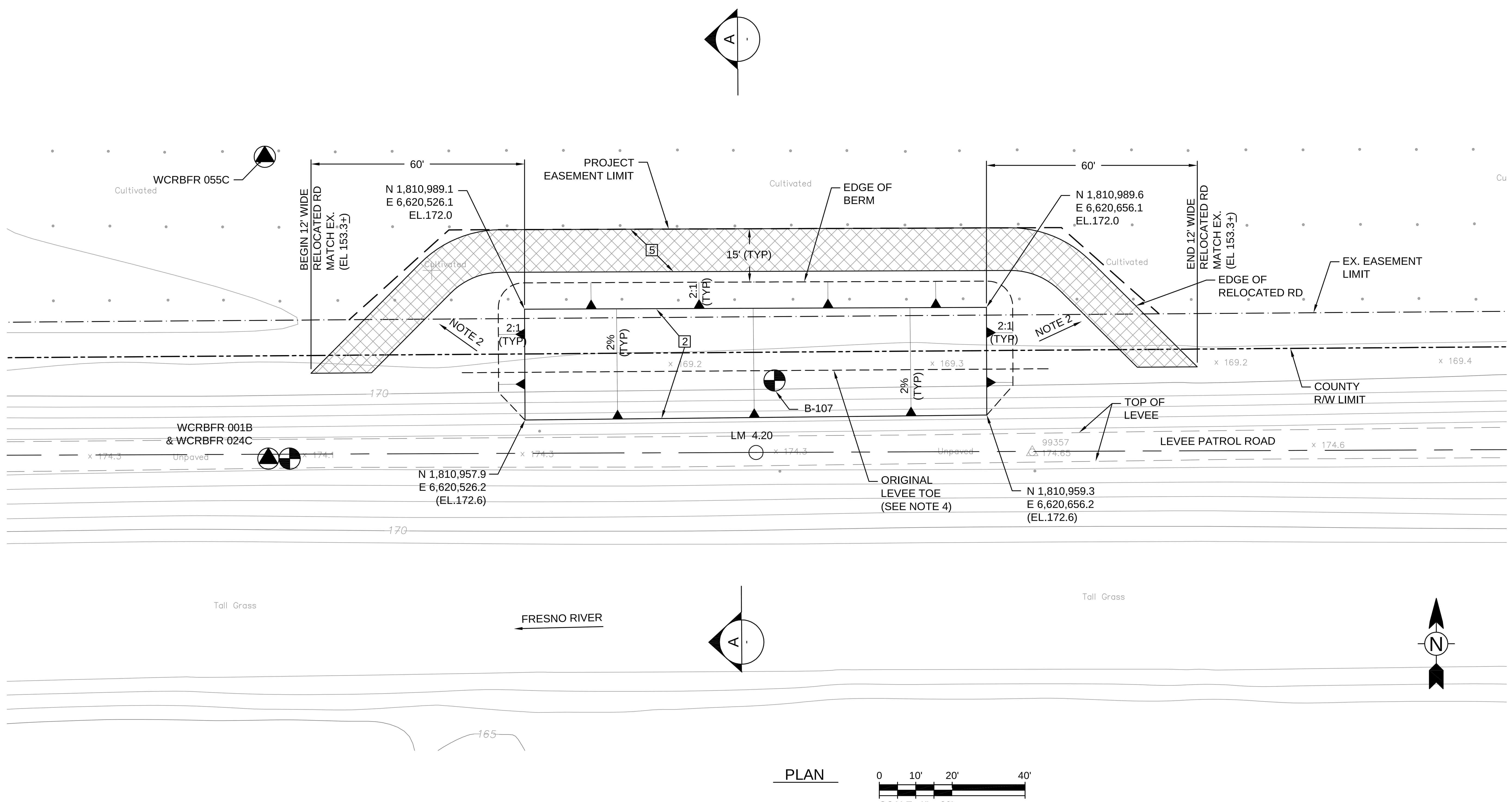
CONSTRUCTION NOTES

2 CONSTRUCT A SEEPAGE BERM PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.

5 CONSTRUCT 12' WIDE RELOCATED ROAD PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.

BORING/CTP LOCATIONS

ID	NORTHING	EASTING
B-107	1,810,969	6,620,596
WCRBFR 001B	1,810,947	6,620,457
WCRBFR 024C	1,810,947	6,620,457
WCRBFR 055C	1,811,032	6,620,453



NOTES

1. CONTROL LINE FOR LEVEE MILES WAS ESTABLISHED BASED ON THE GIS INFORMATION PROVIDED BY CALIFORNIA DWR.
2. CONTRACTOR SHALL GRADE AND PROVIDE POSITIVE DRAINAGE AWAY FROM REPAIR BERM AND EXISTING LEVEE IN ADJACENT AREAS OF THE PROJECT.
3. CONTRACTOR SHALL REMOVE SEDIMENT DEPOSITION ALONG THE LEVEE SIDE SLOPE AND TOE TO THE ORIGINAL LEVEE GRADE PRIOR TO PERFORMING 6" STRIPPING.
4. THE ORIGINAL LEVEE TOE ELEVATION WAS DETERMINED BY PROJECTING ADJACENT GROUND ELEVATION AND SIDE SLOPE DUE TO SEDIMENT DEPOSITION ALONG THE LEVEE TOE.
5. CONTRACTOR SHALL PROVIDE SMOOTH TRANSITION BETWEEN EXISTING AND NEW ROADWAYS.

LEGEND

- BORING LOCATION
- CPT LOCATION
- CONTROL LINE FOR LEVEE MILE
- COUNTY R/W LIMIT
- EX. EASEMENT LIMIT
- PROJECT EASEMENT LIMIT

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DESIGN:	J. SUH	DATE	FUNDING SOURCE	PROJECT NO.
CHECKED:	Y. CHEN	10/XX/17		
DRAWN:	K. JAFARI	SCALE	BRIDGE NO.	CONTRACT NO.
APPROVED:	XXXX	AS SHOWN		

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

CRITICAL LEVEE REPAIR - FRESNO RIVER (LM 4.22)

SHEET 10 OF 16

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

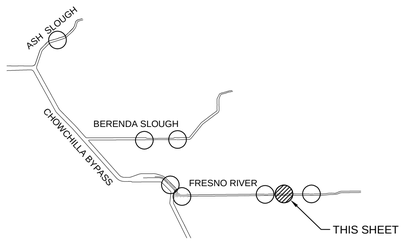
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	11	16

PRELIMINARY DRAFT

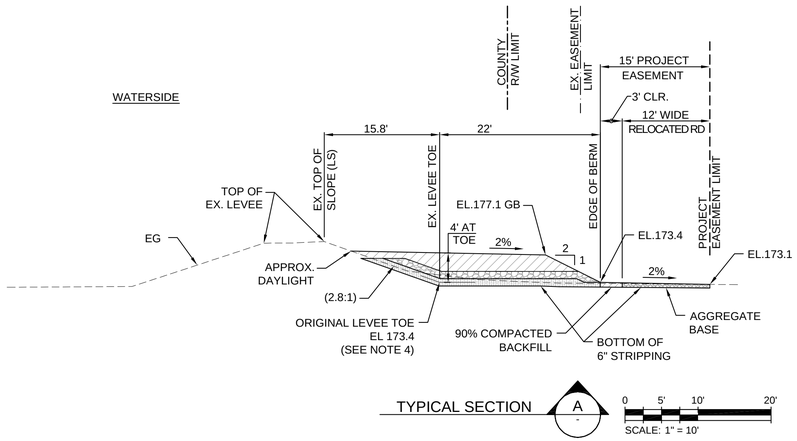
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA



KEY MAP
N.T.S



TYPICAL SECTION A-A'

0 5' 10' 20'
SCALE: 1" = 10'

CONSTRUCTION NOTES

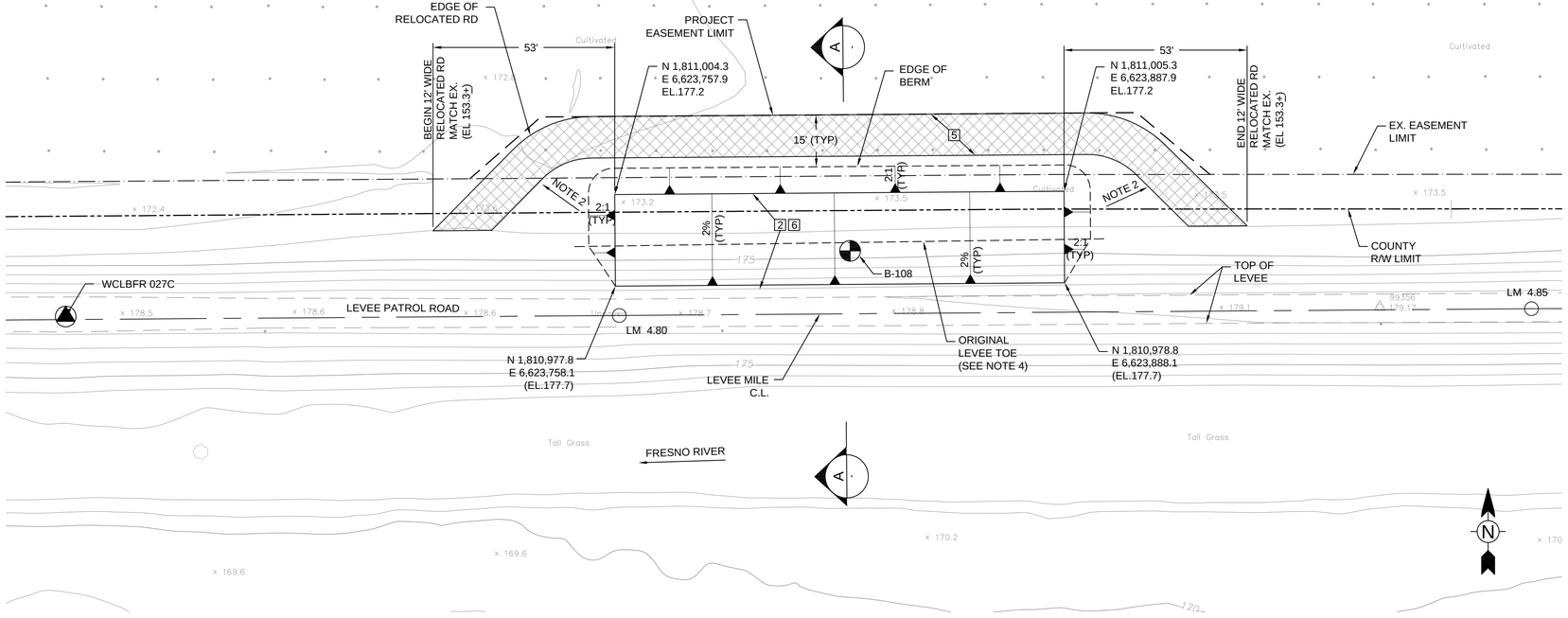
2 CONSTRUCT A SEEPAGE BERM PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.

5 CONSTRUCT 12' WIDE RELOCATED ROAD PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.

6 HYDROSEED BERM FINISH SURFACE PER PLAN HEREON.

BORING/CTP LOCATIONS

ID	NORTHING	EASTING
B-108	1,810,988	6,623,826
WCRBFR 027C	1,810,969	6,623,599



PLAN

0 10' 20' 40'
SCALE: 1" = 20'

NOTES

1. CONTROL LINE FOR LEVEE MILES WAS ESTABLISHED BASED ON THE GIS INFORMATION PROVIDED BY CALIFORNIA DWR.
2. CONTRACTOR SHALL GRADE AND PROVIDE POSITIVE DRAINAGE AWAY FROM REPAIR BERM AND EXISTING LEVEE IN ADJACENT AREAS OF THE PROJECT.
3. CONTRACTOR SHALL REMOVE SEDIMENT DEPOSITION ALONG THE LEVEE SIDE SLOPE AND TOE TO THE ORIGINAL LEVEE GRADE PRIOR TO PERFORMING 6" STRIPPING.
4. THE ORIGINAL LEVEE TOE ELEVATION WAS DETERMINED BY PROJECTING ADJACENT GROUND ELEVATION AND SIDE SLOPE DUE TO SEDIMENT DEPOSITION ALONG THE LEVEE TOE.
5. CONTRACTOR SHALL PROVIDE SMOOTH TRANSITION BETWEEN EXISTING AND NEW ROADWAYS.

LEGEND

- BORING LOCATION
- CPT LOCATION
- CONTROL LINE FOR LEVEE MILE
- COUNTY R/W LIMIT
- EX. EASEMENT LIMIT
- PROJECT EASEMENT LIMIT

DESIGN:	J. SUH
CHECKED:	Y. CHEN
DRAWN:	K. JAFARI
APPROVED:	XXXX

DATE	FUNDING SOURCE	PROJECT NO.
10/XX/17		
SCALE	BRIDGE NO.	CONTRACT NO.
AS SHOWN		

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

CRITICAL LEVEE REPAIR - FRESNO RIVER (LM 4.85)

SHEET 11 OF 16

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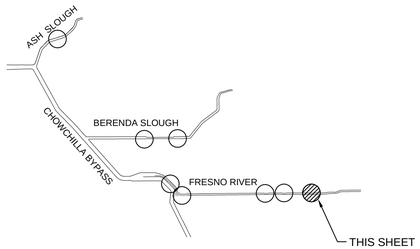
DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	12	16

PRELIMINARY DRAFT

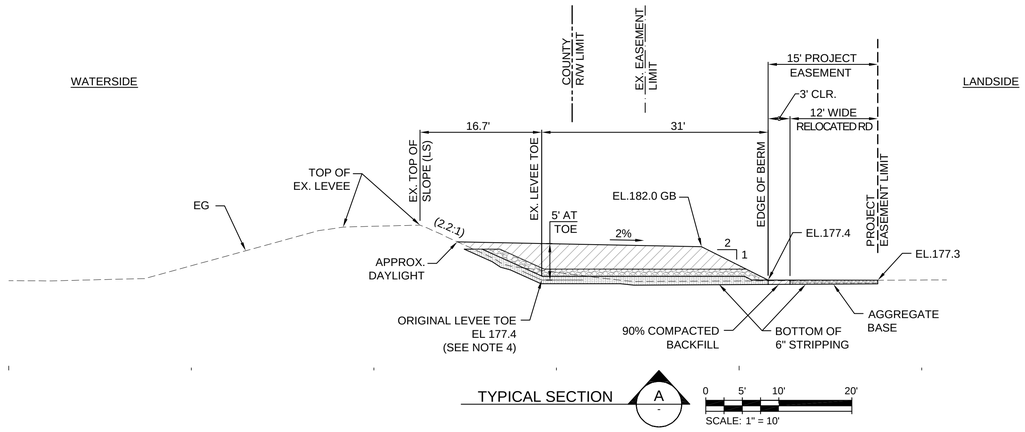
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA



KEY MAP
N.T.S



TYPICAL SECTION A-A'

SCALE: 1" = 10'

CONSTRUCTION NOTES

2 CONSTRUCT A SEEPAGE BERM PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.

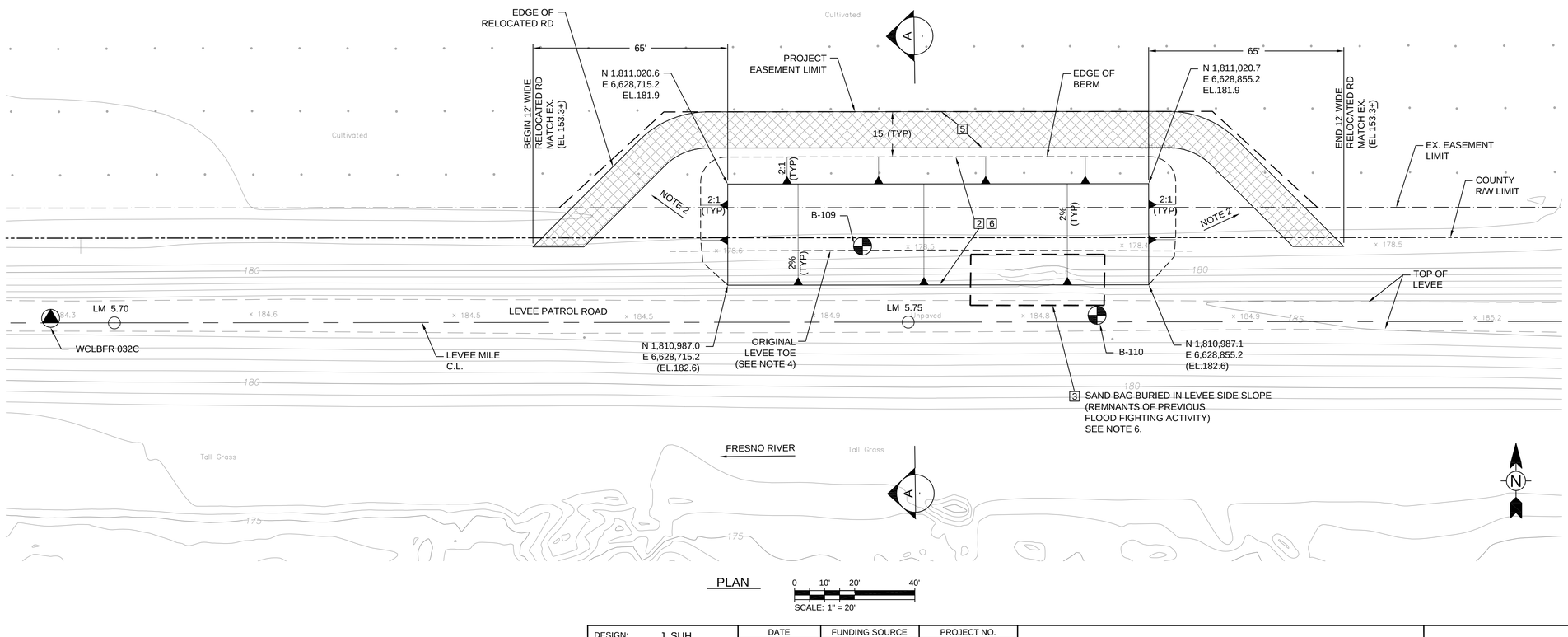
3 REMOVE AND DISPOSE OF EXISTING FEATURE PER PLAN HEREON.

5 CONSTRUCT 12' WIDE RELOCATED ROAD PER PLAN AND TYPICAL SECTION HEREON AND DETAILS ON SHEET 16.

6 HYDROSEED BERM FINISH SURFACE PER PLAN HEREON.

BORING/CTP LOCATIONS

ID	NORTHING	EASTING
B-109	1,811,000	6,628,760
B-110	1,810,977	6,628,838
WCRBFR 032C	1,810,976	6,628,490



PLAN

SCALE: 1" = 20'

NOTES

1. CONTROL LINE FOR LEVEE MILES WAS ESTABLISHED BASED ON THE GIS INFORMATION PROVIDED BY CALIFORNIA DWR.
2. CONTRACTOR SHALL GRADE AND PROVIDE POSITIVE DRAINAGE AWAY FROM REPAIR BERM AND EXISTING LEVEE IN ADJACENT AREAS OF THE PROJECT.
3. CONTRACTOR SHALL REMOVE SEDIMENT DEPOSITION ALONG THE LEVEE SIDE SLOPE AND TOE TO THE ORIGINAL LEVEE GRADE PRIOR TO PERFORMING 6" STRIPPING.
4. THE ORIGINAL LEVEE TOE ELEVATION WAS DETERMINED BY PROJECTING ADJACENT GROUND ELEVATION AND SIDE SLOPE DUE TO SEDIMENT DEPOSITION ALONG THE LEVEE TOE.
5. IF LIMIT FOR 6" STRIPPING IS 6" OR MORE BELOW THE ORIGINAL LEVEE TOE ELEVATION, THE STRIPPED AREA SHALL BE BACKFILLED WITH 95% COMPACTED BACKFILL TO THE ELEVATION THAT IS 6" BELOW THE ORIGINAL LEVEE TOE ELEVATION PRIOR TO PLACING FILTER MATERIAL.
6. ALL SAND BAGS BURIED IN THE LEVEE SIDESLOPE ADJACENT TO THE REPAIR SITE SHALL BE REMOVED AND BACKFILLED TO BOTTOM OF 6" STRIPPING LIMIT WITH 90% COMPACTED FILL PRIOR TO CONSTRUCTION OF SEEPAGE REPAIR.
7. CONTRACTOR SHALL PROVIDE SMOOTH TRANSITION BETWEEN EXISTING AND NEW ROADWAYS.

LEGEND

- BORING LOCATION
- CPT LOCATION
- CONTROL LINE FOR LEVEE MILE
- COUNTY R/W LIMIT
- EX. EASEMENT LIMIT
- PROJECT EASEMENT LIMIT
- TCE LIMIT

DESIGN:	J. SUH
CHECKED:	Y. CHEN
DRAWN:	K. JAFARI
APPROVED:	XXXX

DATE	FUNDING SOURCE	PROJECT NO.
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SCALE	BRIDGE NO.	CONTRACT NO.
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FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

CRITICAL LEVEE REPAIR - FRESNO RIVER (LM 5.80)

SHEET 12 OF 16

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DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
06	MAD	0	C.R.	16	16

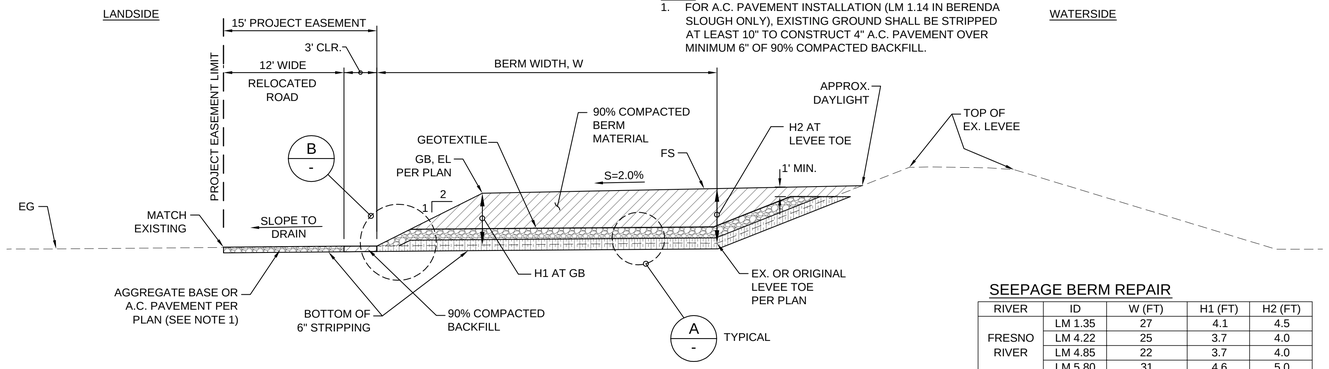
PRELIMINARY DRAFT

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JUNG W. SUH
No. C62252
CIVIL
STATE OF CALIFORNIA

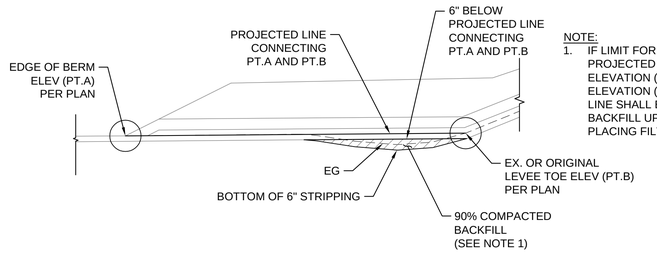
NOTE:
1. FOR A.C. PAVEMENT INSTALLATION (LM 1.14 IN BERENDA SLOUGH ONLY), EXISTING GROUND SHALL BE STRIPPED AT LEAST 10" TO CONSTRUCT 4" A.C. PAVEMENT OVER MINIMUM 6" OF 90% COMPACTED BACKFILL.



TYPICAL SECTION - SEEPAGE BERM REPAIR
N.T.S

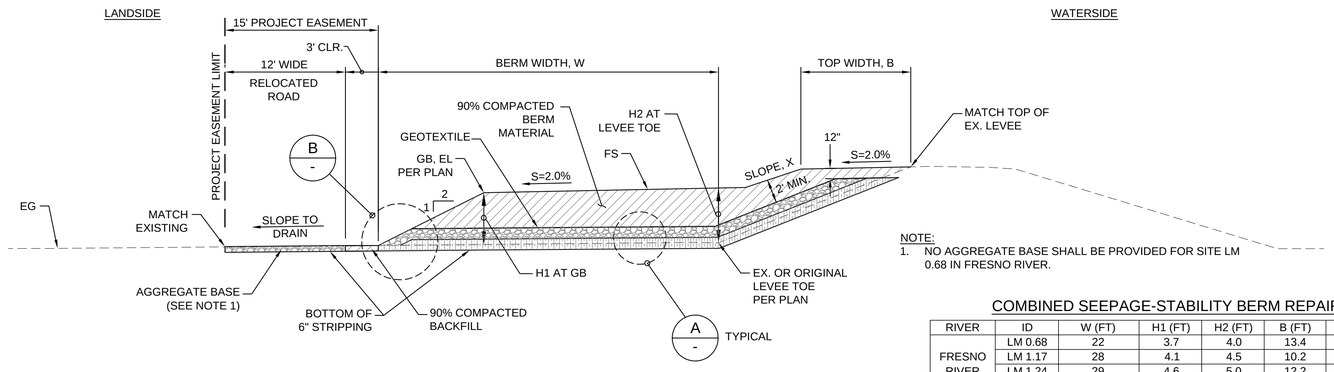
SEEPAGE BERM REPAIR

RIVER	ID	W (FT)	H1 (FT)	H2 (FT)
FRESNO RIVER	LM 1.35	27	4.1	4.5
	LM 4.22	25	3.7	4.0
	LM 4.85	22	3.7	4.0
	LM 5.80	31	4.6	5.0
BERENDA SLOUGH	LM 1.14	20	3.7	4.0



NOTE:
1. IF LIMIT FOR 6" STRIPPING IS 6" OR MORE BELOW THE PROJECTED LINE CONNECTING EDGE OF BERM ELEVATION (PT.A) AND EXISTING OR ORIGINAL LEVEE TOE ELEVATION (PT.B), THE AREA BELOW THE PROJECTED LINE SHALL BE BACKFILLED WITH 90% COMPACTED BACKFILL UP TO THE PROJECTED LINE PRIOR TO PLACING FILTER MATERIAL.

BACKFILL PRIOR TO PLACING FILTER MATERIAL DETAIL
N.T.S



NOTE:
1. NO AGGREGATE BASE SHALL BE PROVIDED FOR SITE LM 0.68 IN FRESNO RIVER.

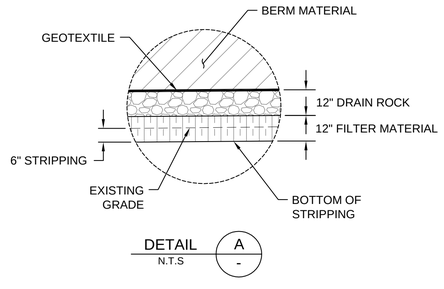
COMBINED SEEPAGE-STABILITY BERM REPAIR

RIVER	ID	W (FT)	H1 (FT)	H2 (FT)	B (FT)	X (H:V)
FRESNO RIVER	LM 0.68	22	3.7	4.0	13.4	3.3:1
	LM 1.17	28	4.1	4.5	10.2	3.0:1
	LM 1.24	29	4.6	5.0	12.2	3.0:1
	LM 1.30	31	4.6	5.0	10.5	2.5:1
	LM 1.34	28	4.1	4.5	11.7	3.0:1

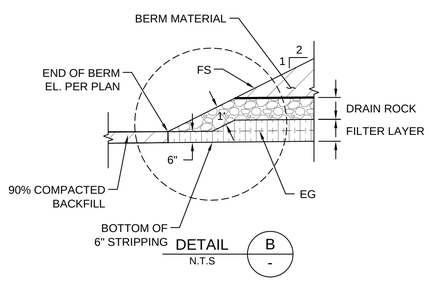
TYPICAL SECTION - COMBINED SEEPAGE-STABILITY BERM REPAIR
N.T.S

NOTE
1. AGGREGATE BASE NOT SHOWN FOR CLARITY.
2. LOCALIZED ZONES OF LOOSE AND/OR UNSTABLE SOILS ENCOUNTERED DURING GRADING OPERATION MUST BE OVEREXCAVATED AND RECOMPACTED.

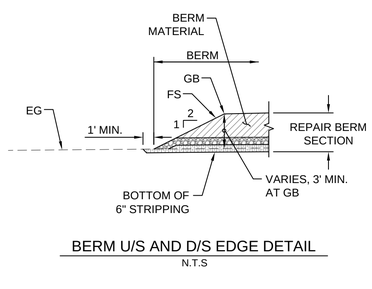
LEVEE PATROL ROAD REPAIR - TYP. FOUNDATION PREPARATION DETAIL
N.T.S
C 14 C 15



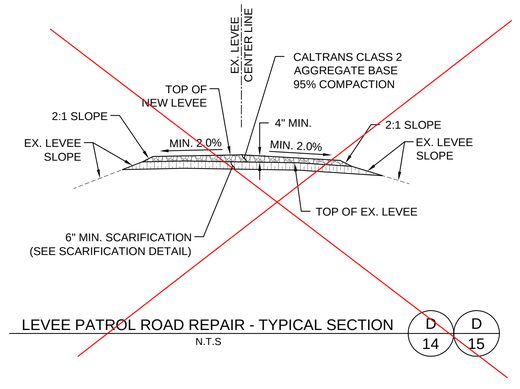
DETAIL A
N.T.S



DETAIL B
N.T.S



BERM U/S AND D/S EDGE DETAIL
N.T.S



LEVEE PATROL ROAD REPAIR - TYPICAL SECTION
N.T.S
D 14 D 15

		DATE	FUNDING SOURCE	PROJECT NO.
DESIGN:	J. SUH	10/XX/17		
CHECKED:	Y. CHEN	SCALE	BRIDGE NO.	CONTRACT NO.
DRAWN:	K. JAFARI	AS SHOWN		
APPROVED:	XXXX			

MADERA COUNTY
PUBLIC WORKS DEPARTMENT

CRITICAL LEVEE REPAIRS AND LEVEE PATROL ROAD REPAIRS

TYPICAL SECTIONS AND DETAILS

SHEET 16 OF 16

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3 4

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