

Addendum Number 2

Date: September 9, 2016

Project: Yurok Tribe Klamath Tank

Owner: Yurok Tribe Planning and Community Development

This addendum provides changes and/or clarifications, to the Contract Documents. These modifications pertain to the sections referenced below and to all other referenced or applicable sections in the Contract Documents.

Please sign the addendum receipt acknowledgment form and return to the Owner with your cost proposal and other required forms and documents.

Changes and/or clarifications to the bidding and contracting documents are as follows:

Bid opening will be held Wednesday, September 14th 2016 @ 2:00 pm at the Yurok Tribe, 190 Klamath Blvd., Klamath, CA 95548

Clarification: See attached Questions and Answers

Clarification: Revised Section 002100 Instruction to Bidders attached (Bid Date Correction)

Clarification: Revised Section 004100 Bid Schedule attached (Alternate Added)

Clarification: Section 004505 statement of
Qualifications Alaska native or Indian Owned Enterprises

Clarification: Revised Section 011000 SUMMARY OF WORK (F. Site Grading Revised)

Clarification: SHN June 9, 2016 Geotechnical Recommendations, Attached

Addendum Receipt Acknowledgement Form

Receipt of Acknowledgement:

My firm received Addendum No. 1, consisting of **29** pages, for the Yurok Tribe Klamath Water Tank on September 14, 2016.

Name of Firm _____

Name (Print) _____

Name (Signature) _____

Date: _____

Questions / **Answers**
Yurok Tribe / Klamath Tank

Q) What is the color of fencing? Are slants required? What height is fence?

A) Color to be selected by owner during submittal process, Slants not required, Height 6" mesh with 3 strand barb wire above.

Refer to plan sheets C03, C07.2 and SECTION 323100 *CHAIN-LINK FENCES AND GATES PART 1, GENERAL, 1.1 SUMMARY, A. Poly Vinyl Chloride (PVC) coated chain link fabric with PVC color coated galvanized steel framework and accessories for commercial or industrial applications.*

Q) Is a current plan holders list available?

A) No

Q) Is the sign-in sheet from the pre-bid meeting available.

A) Yes, See Attached

**SECTION 002100
INSTRUCTION TO BIDDERS**

BID SUBMITTALS AND CONDITIONS

BIDS will be received by the Yurok Tribe Planning Department (herein called the "OWNER"), Located at 190 Klamath Blvd., Klamath, CA 95548 until 2:00 p.m. on **September (14) 2, 2016.**

The following documents constitute a complete bid and are required to be submitted to form a responsive bid:

- i. Form of Bid (004000, & 004100)
- ii. Bid Bond (004300)
- iii. Subcontractor Schedule (004336)
- iv. Bidder Qualification (004500, & 004505)
- v. Non-Collusive Affidavit (004519)
- vi. Yurok Tribe TERO Form (forms)

Each BID must be submitted in a sealed envelope, addressed to Yurok Tribe Planning Department, 190 Klamath Blvd., Klamath, CA 95548. The sealed envelope containing the BID must be plainly marked on the outside as BID for the Klamath Water Tank Project, and the envelope should also bear on the outside the name of the BIDDER, his address and his license number.

If forwarded by mail, the bid must be received by the date and time of opening. Any bids received after the time and date of opening resulting from untimely delay due to the mail system or other methods of conveyance will not be considered. Faxed or emailed bids will not be accepted.

Bids received prior to the time of opening will be securely kept, unopened. The official who is to open the bids will decide when the specified time has arrived, and no bid received thereafter will be considered. No responsibility will attach to office personnel for the premature opening of a bid not properly addressed and identified. Telegraphic bids or modifications will not be considered.

Any BIDS may be withdrawn prior to the above scheduled time for the opening of BIDS or authorized postponement thereof.

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. A conditional or qualified BID will not be accepted. If there is an alternate in the bid schedule, fill it out completely and submit with bid. The alternate for additional work will be awarded upon approval of the owner. BIDDERS may copy the required pages from the Project Manual, and prepare their bid on those copies, in lieu of submitting the

entire Project Manual. Each signature page must bear an original signature, whether within or separate from the project Manual.

BIDDERS shall have a current California Contractors License appropriate for the nature of work to be performed. Bonafide BIDDERS (Licensed and Bonded in accordance with current California State Contractor's Law) shall have a License Class A.

After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done. No BIDDER may withdraw a BID within 10 (Ten) days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period; the time may be extended by mutual agreement between the OWNER and the BIDDER.

Prevailing Wage Rates shall apply.

Current Prevailing Wage Rates can be obtained from the CA Department of Industrial Relations (<http://www.dir.ca.gov/dirdatabases.html>)

Buy American

This project will follow "Buy American" requirements as outlined by the Consolidated Appropriations Act, Division G, Title IV, 2014 as it relates to the use of American iron and steel.

Tribe TERO Ordinance

This project will follow the Yurok Tribe TERO requirements.

BID REVIEW AND AWARD

The OWNER may waive any informalities or minor defects or reject any and all BIDS.

Award will be made to the lowest responsive, responsible BIDDER.

BIDDING INFORMATION

The OWNER shall provide to BIDDERS prior to BIDDING:

- i. A package containing the BID and CONTRACT DOCUMENTS necessary to construct the project.
- ii. All information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.
- iii. A pre-bid conference to be held at the Yurok Tribe Planning Department. All bidders are strongly advised to attend although attendance is not mandatory. Bidders who do not attend the pre-bid conference may make no claim of misunderstanding. Pre-bid conference minutes and notes will be delivered to all bidders who make a written request.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve him from fulfilling of any of the conditions of the contract.

BIDDERS must satisfy themselves as to the accuracy of the estimated quantities in the BID Schedule by examining the site and reviewing the drawings and specifications including ADDENDA. The failure or omission to do this shall in no way relieve any BIDDER from any obligation in respect to his BID.

Requests for clarification must be in writing, addressed to the Owner, and received at least five working days prior to the bid opening date. Owner provided clarifications and supplemental instructions will be issued as addenda to the specifications and mailed via general mail to all Plan Holders (at respective addresses furnished for such purpose) no later than three working days prior to the BID opening date.

CONTRACTOR'S QUESTIONNAIRE

BIDDERS must fill out, sign and submit this form as part of the proposal. BIDDERS must also, if required, present additional satisfactory evidence that they are fully prepared with the necessary experience, capital, machinery and materials to furnish the articles called for and to conduct the work as required by the drawings and specifications.

NON-COLLUSIVE AFFIDAVIT

Each person submitting a bid for any portion of the work contemplated by the bidding documents shall execute an affidavit, in the form provided by the Owner, to the effect that he has not colluded with any other person, firm or corporation in regard to any bid submitted. Such affidavit shall be attached to the bid.

BONDING REQUIREMENTS

BID, PERFORMANCE, and PAYMENT BONDS will be required for this project.

BID BONDS totaling 10% of the total bid and payable to the OWNER shall accompany any BID. A certified check may be used in lieu of a BID BOND. As soon as the BID prices have been compared, the OWNER will return the bonds of all except the three lowest responsible BIDDERS. When the AGREEMENT is executed, the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the PAYMENT and PERFORMANCE BONDS have been executed and approved, after which it will be returned.

PERFORMANCE and PAYMENT BONDS, each totaling 100% of the CONTRACT PRICE, with a corporate surety approved by the OWNER, shall be provided to the OWNER when the AGREEMENT is executed.

Attorneys-in-fact who sign BID, PAYMENT and PERFORMANCE BONDS must file with each bond a certified and effective dated copy of their power of attorney.

NOTICE OF AWARD

The OWNER may make such investigations, as he deems necessary to determine the ability of the BIDDER to perform the WORK. BIDDERS shall be prepared to furnish such information and data for this purpose at the OWNER's request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the AGREEMENT and to complete the WORK contemplated therein.

The successful BIDDER will be required to execute an AGREEMENT and obtain the PERFORMANCE and PAYMENT BOND, if required, within ten calendar days from the date when NOTICE OF AWARD is delivered to the BIDDER. In case of failure of the BIDDER to execute the AGREEMENT, the OWNER may at his option consider the BIDDER in default, in which case any BID BOND accompanying the proposal shall become the property of the OWNER.

The OWNER, within ten days of receipt of the AGREEMENT and any required PERFORMANCE and PAYMENT BONDS signed by the party to whom the AGREEMENT was awarded, shall sign the AGREEMENT and return to such party an executed duplicate of the AGREEMENT. Should the OWNER not execute the AGREEMENT within such period, the BIDDER may by WRITTEN NOTICE withdraw his signed AGREEMENT. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

NOTICE TO PROCEED

The OWNER will issue the NOTICE TO PROCEED within ten days after the AGREEMENT is fully executed. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period; the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten-day period or within the period mutually agreed upon, the CONTRACTOR may terminate the AGREEMENT without further liability on the part of either party.

OTHER REQUIREMENTS

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the PROJECT shall apply to the contract throughout.

The successful BIDDER shall abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the equal opportunity clause set forth in the GENERAL CONDITIONS.

The successful BIDDER shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS to the OWNER within ten days of receipt of the NOTICE TO PROCEED.

The successful BIDDER shall supply submittals information in accordance with the submittals section of the contract documents.

FEDERAL REQUIREMENTS

1. Compliance with Executive Order 11246 of September 24, 1965 entitled "Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967 and as supplemented in Department of Labor regulations (41 CFR Chapter 60) (All construction contracts awarded in excess of \$10,000).
2. Compliance with the Copeland "Anti-Kickback" Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR part 3) (All contracts and sub grants for construction or repair).
3. Compliance with the Davis-Bacon Act (40 U.S.C. 276a to a-7) as supplemented by Department of Labor regulations (29 CFR part 5) (Construction contracts in excess of \$2,000 when required by Federal grant program legislation).
4. Compliance with Sections 103 and 107 of the contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by Department of Labor regulations (29 CFR part 5) (Construction contracts in excess of \$2,000, and in excess of \$2,500 for other contracts which involve the employment of mechanics or laborers).
5. Access to and retention of records for a period of three (3) years relating to this Project as required by 24 CFR 85.36(j) (10) and (11). Cooperation and provision of all necessary information and documentation as may be required for reporting relating to this project.
6. Affirmative steps to assure that minority firms, women's business enterprises, and labor surplus area firms are used when possible (24 CFR 85.36(e); E.O. 11625).
7. No award or subcontract at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs under Executive Order 12549, "Debarment and Suspension".
8. Compliance with the provisions of the Hatch Act (5 U.S.C. 1501-1508) and the Intergovernmental Personnel Act of 1970 as amended by Title VI of Civil Service Reform Act (Pub. L. 95-454 Section 4728) prohibiting use of federally appropriated funds for influencing or attempting to influence the award of any federal monies and to make such reports and disclosures as are required there under. The signing of the contract in which this Attachment is referenced is a certification of agreed compliance.
9. Prohibition against personal or financial interest in or benefit from this contract obtained by certain affiliates, associates, board members or employees of Owner or its grantees, either from themselves or their families or business associates, during their tenure or for one year thereafter.

10. Compliance with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821, et seq.) and implementing regulations at 24 CFR 570.608, as well as compliance with the requirements regarding asbestos of 40 CFR Part 61 and 40 CFR Part 763, as well as 29 CFR 1910.1001 and 1926.58.

END SECTION 002100

**004100
 BID SCHEDULE**

KLAMATH TANK PROJECT

BASE BID

Item #	Description	Unit	# of Units	Unit Price	Total
015000-01	Temporary Facilities	Lump Sum	1		
017100-01	Mobilization / Demobilization	Lump Sum	1		
033000-01	Concrete – Tank Foundation	Lump Sum	1		
221200-01	125,000 Gal bolted Steel Tank	Lump Sum	1		
312200-01	Site Grading Tank	Lump Sum	1		
312500-01	Erosion Control	Lump Sum	1		
313700-01	Rock Slope Protection	Ton	10		
321123-01	Aggregate Base	Ton	60		
323100-01	Security Fencing	Linear Foot	210		
331100-01	Miscellaneous Piping	Lump Sum	1		

SUBTOTAL = _____

ALTERNATE #A – RETAINING WALL

Item #	Description	Unit	# of Units	Unit Price	Total
033713-01	Shotcrete	Square Ft	2,600		
312200-01	Site Grading Retaining Wall	Lump Sum	1		
313236-01	Soil Nailing	Linear Foot	1,465		

SUBTOTAL= _____

ALTERNATE #B – ACCESS ROAD IMPROVEMENTS

Item #	Description	Unit	# of Units	Unit Price	Total
313700-01	Rock Slope Protection	Ton	20		
312200-01	Site Grading – Roadway	Lump Sum	1		
321123-01	Aggregate Base	Ton	360		
321300-01	Asphalt Paving	Ton	210		
334200-01	Drainage Facilities	Linear Foot	40		

SUBTOTAL= _____

TOTAL AMOUNT= _____

Respectfully Submitted:

Signature

Address

Title

Date

License No.

Expiration Date

SEAL – (if BID is by a corporation)

End of Section 004100

**SECTION 004505
STATEMENT OF QUALIFICATIONS
ALASKA NATIVE OR INDIAN OWNED ENTERPRISES**

The undersigned certifies under oath the truth and correctness of all answers to questions made hereinafter:

- Applicant wishes to qualify as an "Economic Enterprise" as defined in Section 3(e) of the Indian Financing Act of 1974 (P.L. 93-262); that is: "an Indian-Owned... commercial, industrial or business activity established or organized for the purpose of profit: Provided, that such Indian ownership shall constitute not less than fifty-one percent (51%) of the enterprise",

or

- A "Tribal Organization" as defined in Section 4(c) of the Indian Self-Determination and Education Assistance Act (P.L. 93-638); that is: "the recognized governing body of any Indian Tribe; any legally established organization of Indians which is controlled, sanctioned or chartered by such governing body or which is democratically elected by the adult members of the Indian community to be served by such organization and which includes the maximum participation of Indians in all phases of its activities: Provided, that in any case where a contract is let or grant made to an organization to perform services benefiting more than one Indian Tribe, the approval of each such Indian Tribe shall be a prerequisite to the letting or making of such contract or grant..."

1. Name of Enterprise or Organization: _____

Address: _____

Telephone No.: _____

Fax No.: _____

2. Check One:

_____ Corporation

_____ Joint Venture

_____ Partnership

_____ Sole Proprietorship

_____ Other (Specify) _____

5.1 Will any officer or partner listed in Section 4 be engaged in outside employment?

_____ Yes _____ No

If Yes, complete the following:

Name/Title	Hours Per Week Outside the Enterprise

6. Does this enterprise have any subsidiaries or affiliates or is it a subsidiary or affiliate of another concern?

_____ Yes _____ No

If yes, complete the following:

Name and Address of subsidiary, affiliate or other concerns	Description of Relationship

7. Does this enterprise or any person listed in Q4 above have or intend to enter into any type of agreement with any other concern or person which relates to or affects the on-going administration, management or operations of this enterprise? These include but are not limited to management, and joint venture agreements and any arrangement or contract involving the provision of such compensated services as administrative assistance, data processing, management consulting of all types, marketing, purchasing, production and other type of compensated assistance.

_____ Yes _____ No

If yes, attach a copy of any written agreement or an explanation of any oral or intended agreement.

8. Indicate the core crew employees in your work force, their job titles, and whether they are Indian or Non-Indian. Core crew is defined as an individual who is a current bona-fide individual who is regularly employed by the contractor in a supervisory or other key position when work is available.

Core Crew

Name	Title	I or NI

- b. Over the past three years, what has been the average number of employees?

9. Attach evidence showing membership in a tribe or other evidence of enrollment in a federally recognized tribe or qualification as a California Indian according to federal law.
10. Attach a certified copy of the charter, articles of incorporation, by-laws, partnership agreement, joint venture agreement and/or other pertinent organizational documentation.

NOTE:Omission of any information may be cause for this statement not receiving timely and complete consideration.

**SECTION 011000
SUMMARY OF WORK**

PART 1 GENERAL

1.1 Contractor Responsibility

- A. Contractor responsibility for each item of work for the project includes provision of all labor, equipment, materials, supervision, and all other pertinent items of interest to competently and satisfactorily complete each task.
- B. **Contractor to maintain water service to all residences during construction of new system.** Contractor to provide the Klamath Community Service District (KCSD) with five (5) days' notice prior to beginning construction.
- C. Contractor to coordinate and provide the KCSD with five (5) days' notice for the following:
 - Discuss construction activities
(Provide work schedule & planned procedures if necessary or required)
 - Schedule connection to the existing water system
 - Schedule closing/opening of water valves
 - Schedule inspections
 - Schedule Water disruptions
(Planned water service disruptions shall comply with CPUC)
- D. Contractor to provide submittal of planned construction activities. Submittal shall demonstrate how contractor proposes to maintain residential services during construction of new water system within the maximum allowable water service disruption time frame. Submittal shall show type and placement of all temporary water system components.
- E. This project shall follow "Buy American" requirements as outlined by the Consolidated Appropriations Act, Division G, Title IV, 2014 as it relates to the use of American iron and steel.

1.2 Item Pricing

- A. Contractor to include total cost for labor, equipment, materials, supervision, incidentals, general conditions, overhead, and profit in each item of the Bid Schedule as is applicable including permitting fees and contract security costs.
- B. Measurement and payment for all work shall be per the contract BID SCHEDULE section 004100

1.3 Work Items Brief Description

A. Temporary Facilities

- a. Refer to Section 015000 for details.
- b. Temporary facilities for the site include fencing, traffic control, restroom facilities, material and equipment storage, temporary power, security, utilities, and all other required temporary structures and services needed to complete the scope of work for the project safely and efficiently.

B. Mobilization/Demobilization

- a. Refer to Section 017100 for details.
- b. Mobilization/Demobilization to include all required equipment, trucking, personnel, and incidentals required to move tools, equipment, and laborers to and from each site. Billing and payment for mobilization/demobilization shall be seventy-thirty (70-30), seventy percent of the item shall be billed out under mobilization to the site(s), and thirty percent shall be billed out for demobilization from the site(s).

C. Concrete – Tank Foundation

- a. Refer to Section 033000 for details.
- b. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, tools, equipment, and performing all work required for construction of the water storage tank foundation as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.
- c. Contractor to provide submittal and receive approval prior to order or installation.

D. Shotcrete

- a. Refer to Section 033713 for details.
- b. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, reinforcing, drains, tools, equipment, and performing all work required for construction of the shotcrete retaining wall as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.
- c. Contractor to provide submittal and receive approval prior to order or installation.

E. 125,000 Gallon Bolted Steel Tank

- a. Refer to Section 221200 for details.
- b. The price paid for the completed item of work shall include full compensation for tank design, fabrication and construction, tank foundation, installation, shop drawings, and connections as shown in the project drawings. Includes furnishing all labor, materials, tools, equipment, and performing all work required for 125,000 gallon bolted steel tank with all required connections not covered by other items as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.
- c. Contractor to provide submittal and receive approval prior to order or installation.

F. *Site Grading TANK*

- a. Refer to Section 312200 for details.
- b. Grading for the project will include, but not be limited to perform grade contouring, ~~retaining wall excavation~~, and cut and fill to construct a building site for the water storage tank as shown on the construction plans. Excess fill material shall be disposed offsite and in accordance with applicable regulations.

ADDED Site Grading RETAINING WALL

- a. Refer to Section 312200 for details.
- b. Grading for the project will include, but not be limited to perform grade contouring, retaining wall excavation, and ~~cut and fill to construct a building site for the water storage tank~~ as shown on the construction plans. Excess fill material shall be disposed offsite and in accordance with applicable regulations.

G. Erosion Control

- a. Refer to Section 312500 for details.
- b. Erosion control measures for the site include perimeter barriers, stabilized construction entrance, stockpile management, equipment/vehicle maintenance controls, and vegetation/shrubbery protection. Erosion and sediment controls are to be in place prior to grading and soil impacts occurring. Erosion/sediment controls to be maintained throughout construction activities and are to be repaired or replaced as required to maintain protection.

H. Soil Nailing

- a. Refer to Section 313236 for details.
- b. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, tools, equipment, and performing all work required for construction of the soil nails as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.
- c. Contractor to provide submittal and receive approval prior to order or installation.

I. Rock Slope Protection

- a. Refer to Section 313700 for details.
- b. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, nonwoven fabric, excavation, tools, equipment, and performing all work required for construction of the rock slope protection as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.

J. Aggregate Base

- a. Refer to Section 321123 for details.
- b. Measurement and payment to be per field verified delivered and installed tonnage used for the site and access road portion of project.
- c. Aggregate base for road crossings and road repairs associated with trenching are considered incidental to the water line installation and other construction activities.

- d. Aggregate base for under foundations, sidewalks, concrete pads, and miscellaneous concrete are considered incidental to concrete work and other construction activities.
- e. Contractor to provide submittal for aggregate base to be used on site and receive approval prior to order or installation.
- f. All base is to be delivered, installed, spread, and compacted using typical equipment. Following initial installation of base and compaction testing/verification subsequent installation of additional base to correct construction activity impacts will not merit additional compensation or time. The Contractor is responsible for protecting base in place following installation and prior to contract completion.
- g. All quantities of materials delivered to the site will be contingent on Engineer verification for payments.

K. Asphalt Paving

- a. Refer to Section 321300 for Details.
- b. Measurement and payment to be per field verified delivered and installed tonnage. Contractor to provide submittal for asphalt and receive approval prior to order or installation.
- c. Additional asphalt required to repair damage caused by contractors equipment to existing roadways shall be repaired at contractors' expense with no additional cost to Owner.

L. Security Fencing

- a. Refer to Section 323100 for Details.
- b. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, tools, equipment, and performing all work required to install fencing as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.
- c. Contractor to provide submittal and receive approval prior to order or installation.

M. Miscellaneous Piping

- a. The price paid for the completed item of work shall include all piping and connections necessary for plant operation and system distribution that is not specifically paid for elsewhere, and full compensation for furnishing all labor, materials, tools, equipment, and performing all work required by the provisions of the contract to install miscellaneous piping as specified in the contract documents, and as directed by the Engineer.

N. Drainage Facilities

- a. Refer to Section 334200 for details.
- b. The price paid for the completed item of work shall include full compensation for furnishing all labor, materials, excavation, bedding material, nonwoven fabric, end sections, tools, equipment, and performing all work required for construction of the soil nails as required by the provisions of the contract as specified in the project plans, and as directed by the Engineer.

PART 2 MEASUREMENT & PAYMENT

Measurement and payment for all work shall be in accordance with the contract BID SCHEDULE, refer to Section 004100 and actual work as field measured and verified. No payments will be made for materials on hand. All payments to be made following field verification of work.

END OF SECTION 011000



Technical Memorandum

Reference: 016144
Date: June 9, 2016
To: Josh McKnight, PE
From: John H Dailey, PE, GE; Gary D Simpson, PG, CEG
Subject: Preliminary Geotechnical Recommendations, New Water Tank, Klamath, California

Introduction

This memorandum presents the results of SHN's preliminary geotechnical investigation for a proposed new water tank in Klamath, California. We understand that the Yurok Tribe is interested in construction of a new 125,000-gallon water tank adjacent to an existing tank on a cut pad above the north end of the Klamath townsite. The existing tank pad is a narrow bench occupied by a 125,000-gallon water tank; the existing tank is a relatively tall tank with a small footprint due to the limited pad area. For this investigation, we have assumed that construction of a new pad at the site would require expansion of the existing pad, and that this expansion would occur by cutting into the hillslope. We expect that this expansion may require construction of a substantial retaining wall to mitigate the steepness of the ascending slope above the pad. Site survey or conceptual plans for the proposed tank have not been prepared to date, therefore the details of the project are not yet known. For this reason, the results of this investigation should be viewed as preliminary until additional project planning has been completed; additional geotechnical recommendations may be appropriate as the project progresses.

This memorandum is focused on the geotechnical conditions at the existing water tank pad, but we note that considerable improvements to the access road will be necessary prior to construction. Recommendations relative to upgrades to the access road are beyond the scope of this investigation and are not included herein.

Geologic Conditions

Published geologic maps indicate that the site is underlain by bedrock of the "Broken Formation" subunit of the Cretaceous age Franciscan Complex. At the site, we observed blocky competent sandstone (greywacke) bedrock that is consistent with descriptions of typical Broken Formation lithologies. Our field investigation consisted of shallow excavations (with a "mini-excavator") on the existing pad surface and along the existing cut bank. We observed very strong, moderately weathered, strongly fractured sandstone bedrock. Fracture density varied across the exposures we observed, which affects the blockiness and competence of the overall rock mass. Where fracture density is higher, weaker rock seams exist; where fracture density is low, blocky, competent rock exists. The excavator was able to break small pieces of the bedrock (½-inch to 6-inch fragments), typically by working along existing fractures; larger blocks are present between these fractures. Excavation was difficult and it was not possible to achieve significant penetration with the small excavator. The field investigation essentially confirmed the presence of hard resistant bedrock at the site.

Discussion and Conclusions

Based on the results of our limited geotechnical investigation, we judge that the new water tank may be constructed as proposed, provided the geotechnical recommendations contained herein are incorporated into the project design. The most significant geotechnical issues for the project are the presence of moderately hard rock, differing foundation conditions across the tank footprint, and providing uniform bearing conditions beneath the tank. Excavation in the hard rock may be moderately difficult using conventional equipment; hydraulic hammers and/or blasting may be necessary. Cut slopes are likely to be irregular due to blocky rock conditions.

Consideration should be given to excavating the entire foundation areas to a minimum of 12 inches below "base of footing" depth, then backfilling with compacted imported Caltrans Class 2 aggregate base rock, or similar material, to finished subgrade level. This will provide uniform bearing conditions below the tank, and neat footing excavations.

Recommendations

Site Preparation

Site preparation includes removal of debris, organics, organic topsoil, loose soil and/or soft bedrock, and any other unsuitable material. Site preparation operations should extend at least 5 feet beyond the limits of improvements. We anticipate that stripping to a depth of about 2 to 4 inches will be required to remove the organics and topsoil. Deeper stripping may be required locally, to remove concentrations of vegetation, such as, brush and tree roots.

Any vegetation and organic topsoil with more than 2 percent organic material by dry weight should be removed. The Geotechnical Engineer of Record should observe and approve the prepared site prior to any excavation, subgrade preparation, and placement of fill or improvements.

All areas to receive engineered fill should be stripped of loose and/or soft surface soils and vegetation, and benched into firm soil/rock. If zones of weak or saturated soils are encountered during site preparation, they should be removed by further excavation to expose firm natural soil/rock, and replaced with engineered fill.

The Contractor shall be responsible for the stability of all temporary excavations and should comply with applicable Occupational Safety and Health Administration (OSHA) regulations (California Construction Safety Orders, Title 8). The Contractor should periodically monitor all open cuts for evidence of incipient stability failures.

Excavations

We anticipate varying support materials for the subgrade exposed beneath the footprint of the proposed new water tank based on subsurface conditions encountered in our exploratory excavations. To avoid supporting the new water tank on materials with variable support characteristics, we recommend that overexcavation be performed across the entire footprint of the

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new water tank that extends deep enough so that a minimum of 2 feet of new engineered fill is present beneath finish pad grade level. The soil/rock surface exposed by overexcavation should be checked by the Geotechnical Engineer of Record or qualified representative to determine the need for any additional overexcavation to remove loose, yielding, or unsuitable materials. The limits of overexcavation should extend at least 5 feet horizontally from the edges of planned footings and slabs. After approval by the Geotechnical Engineer of Record, the site may then be brought to finish grade by placement of engineered fill consisting of Class 2 aggregate base material, or equal.

Engineered Fill

After overexcavation operations has been completed in all areas to receive fill material, the exposed soil subgrade should be scarified to a depth of 8 inches; uniformly moisture conditioned to facilitate compaction, as necessary; and compacted to at least 90 percent compaction (ASTM-International [ASTM] Test Method D1557). Subgrades beneath vehicular pavement areas should be moisture conditioned and compacted to at least 95 percent compaction (ASTM Test Method D-1557).

Scarification is not required for subgrades consisting of hard rock or for the bottoms of underground utility trenches. Scarification, moisture conditioning, and recompaction of subgrades that become dry and/or disturbed should be performed. The Geotechnical Engineer of Record should approve all subgrades before they are covered by fill or improvements.

Engineered fill should be compacted to at least 95 percent compaction based on ASTM Test Method D1557. Fill and backfill more than 5 feet beyond the edges of structures, slabs-on-grade, or other improvements may be compacted to at least 90 percent compaction. Engineered fill should be placed in horizontal lifts that are less than 8 inches in uncompacted thickness, and each lift should be compacted prior to placing subsequent lifts.

Cut Slopes

Permanent cut slopes in the moderately to slightly weathered bedrock may be inclined as steep as 1H:1V (horizontal to vertical) unless adverse geologic conditions are encountered. The top of all permanent cut slopes should be flattened to an inclination of 2H:1V within the upper 5 feet below original grade or to the depth of severely weathered rock and soil, whichever is greater.

Interceptor drains should be provided along the tops of slopes where the tributary area flowing toward the slope has a drainage path greater than 40 feet, measured horizontally. The interceptor drains should be sloped to a suitable drainage device and disposed of offsite well below the toe of the slope. The permanent cut slopes should be inspected periodically for erosion; if detected, it should be repaired immediately. Interceptor drains should be cleaned before the start of each rainy season, and if necessary, after each rainstorm. To minimize erosion and gulying, all disturbed areas should be planted with erosion-resistant vegetation suited to the area. As an alternative, jute netting or geotextile erosion control mats can be installed in accordance with the manufacturer's recommendations, or the area(s) can be rock-lined using local materials.

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Surface Drainage

Surface drainage should be provided to prevent ponding and to drain surface water away from the proposed footings. Surface runoff should be directed toward suitable collection or discharge facilities. SHN recommends using a surface gradient of at least 2 percent within 10 feet of the footing.

Concentrated water should not be discharged onto bare ground or slopes, but should be carried in pipes or lined channels to suitable disposal locations. We recommend implementing approved temporary and permanent erosion control measures to reduce erosion and comply with applicable county requirements.

CBC Seismic Parameters

Based on the results of our field and laboratory testing, we classify the geologic subgrade at the project site as Site Class B (rock profile), in accordance with Table 20.3-1 in American Society of Civil Engineers ASCE 7-10 (ASCE, 2010). Based on the Site Class, Occupancy Category (I) and a latitude and longitude of 41.5357 and -124.0428, respectively, we obtained the "code based" design spectral response acceleration parameters using the United States Geological Survey "U.S. Seismic Design Maps tool," v. 3.1.0, updated July 11, 2013. Calculated values are presented in Table 1.

S_S	1.448
S_1	0.672
F_a	1.0
F_v	1.0
S_{MS}	1.448
S_{M1}	0.672
S_{DS}	0.965
S_{D1}	0.448
Seismic Design Category	D

Foundations

Based on our limited geotechnical investigation, we conclude that the proposed new water tank may be supported by a concrete ring-wall footing provided that the grading and earthwork recommendations are adhered to during the design and construction of earthwork and foundation improvements. We recommend that a representative of the Geotechnical Engineer of Record observe all foundation excavations prior to the placing of reinforcing steel. This inspection should be conducted to ensure that the bottoms and sides of all foundation excavations are level or suitably benched and are free of loose or soft soil, ponded water, and debris. Any loose pocket encountered in the bottom of the foundation excavations should be over-excavated, and the base of the excavation should be recompact or backfilled using lean concrete. It is important that foundation excavations be clean and free of loose or soft soils, water, or other debris at the time concrete is placed.

Footings should be embedded at least 12 inches below the lowest adjacent grade. SHN defines lowest adjacent grade as the tank bottom, or exterior soil subgrades, whichever results in a deeper footing. Footing thicknesses and widths should meet the minimum requirements in the 2013 California Building Code and American Water Works Association (AWWA) Standard D100-05.

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Footings bearing on compacted engineered fill should be designed using a maximum allowable bearing capacity of 3,000 pounds per square foot (psf) for dead plus normal duration live loads. This allowable bearing capacity may be increased by one-third for total load conditions, including wind and seismic.

Base friction resistance may be calculated using an ultimate friction coefficient of 0.4 for concrete on fill, assuming AB (aggregate base) is used as engineered fill beneath the new water tank. For a steel tank bottom on any soil, a friction coefficient of 0.25 should be used. Passive resistance may be calculated using an equivalent fluid unit weight of 350 pounds per cubic foot (pcf). The recommended passive resistance is reduced by a factor of about 1.5 from the ultimate value to reduce deflections to tolerable amounts. The recommended passive pressure and friction coefficients may be combined, without reduction, for calculating total lateral resistance. The passive resistance contributed by soils within 1 foot of the ground surface should be neglected unless these soils are protected and confined by a slab-on-grade or pavement. Gaps between the footing and adjacent ground should be completely backfilled using engineered fill, concrete, or lean cement slurry with a 28-day unconfined compressive strength of at least 100 pounds per square inch (psi).

The ring-wall footing should be reinforced to resist hoop stresses within the wall. Hoop stresses may be calculated by assuming outward lateral pressure acting on the foundation equal to 0.45 times the vertical pressure imposed on the subgrade within the ring-wall. Lateral soil pressures acting on buried vaults that may be constructed adjacent to the tank should likewise be calculated using a lateral soil pressure equal to 0.45 times the vertical pressure acting on the adjacent subgrade.

Retaining Walls

Retaining walls should be designed to resist static earth pressures, seismic earth pressures, and surcharge pressures. Retaining wall backfill should be placed and compacted according to the recommendations above in "Site Preparation," and drainage should be provided behind walls according to the recommendations that follow. Retaining wall foundations should be designed according to the recommendations above in "Foundations."

Active earth pressures may be used for design of unrestrained retaining walls where the top of the wall is free to translate or rotate. To develop active earth pressures, the walls should be capable of deflecting by at least $0.004H$ (where H is the height of the wall). At-rest earth pressures should be used for design of retaining walls where the wall top is restrained such that the deflections required to develop active soil pressures cannot occur or are undesirable. Cantilever walls retaining firm native soil or engineered fill may be designed for active or at-rest lateral earth pressures for various backfill slopes using the equivalent fluid unit weights presented in Table 2.

Backfill Slope	At-Rest Conditions	Active Conditions
Level	62	36
3H:1V ²	81	46
2H:1V	89	55

1. pcf: pounds per cubic foot
2. H:V: horizontal to vertical

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Lateral earth pressures for backfill slopes other than those given above can be estimated by interpolation. The lateral earth pressures should be applied to a plane extending vertically upward from the base of the heel of the retaining wall to the ground surface.

The lateral earth pressures given above apply where the wall backfill is fully drained, is not subject to traffic or other surcharge loads, and the backfill is not subject to heavy compaction equipment within a distance of one-third the height of the backfill. Lateral surcharge pressures are discussed later in this section.

If retaining wall backfill will be subject to passenger vehicle or light truck traffic loading within a distance of $H/2$ from the top of the wall (where H is the wall height), the wall should be designed to resist an additional uniform lateral pressure of 72 psf applied to the back of yielding walls (active conditions), or 124 psf applied to the back of non-yielding walls (at-rest conditions). Surcharge loads imposed by greater loads or unusual loads within a distance of H of the back of the wall should be considered on a case-by-case basis.

In addition to the active or at-rest lateral soil pressures, retaining walls should be designed to resist additional dynamic earth pressures during earthquake loading. The additional dynamic pressure increment may be calculated using an additional equivalent fluid pressure of 10 pcf for back slopes up to 3H:1V. The dynamic pressure increment should be applied to the wall as a triangular distribution so the resultant force acts at a distance of $0.33H$ above the base of the wall (where H is the height of the wall). Under the combined effects of static and dynamic loading, a safety factor of 1.1 against sliding or overturning is acceptable. The dynamic component of the lateral earth pressure was calculated using the Mononabe-Okabe equation and, therefore, assumes that sufficient deformation of the wall will occur during seismic loading to develop active soil conditions.

A drainage system should be constructed on the backside of all retaining walls. The drainage system for backfilled walls should consist of a 4-inch diameter perforated pipe surrounded by Class 2 Permeable Material complying with Section 68 of the Caltrans Standard Specifications, latest edition. Alternatively, the perforated pipe may be surrounded by clean coarse gravel or drain rock, provided the gravel or rock is completely separated from the surrounding soil by an engineering filter fabric, such as, Mirafi 140N or similar fabric. The section of permeable material should be at least 12 inches wide and should extend up the back of the wall to within about 18 inches of finished grade. The drainage material should be capped with compacted fine-grained soil, soil-cement, or other relatively impermeable material or barrier. The pipe should be (polyvinyl chloride) PVC Schedule 40 or acrylonitrile-butadiene-styrene (ABS) with a standard dimension ratio (SDR) of 35 or better. Perforations in the drainpipe should be $\frac{1}{4}$ inch in diameter. The perforated pipe should be placed holes-down near the bottom of the section of permeable material and should discharge by gravity to a suitable outlet. Accessible subdrain cleanouts should be provided and maintained on a regular basis.

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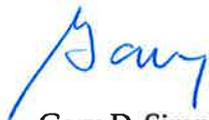
Closure

We hope that this memorandum provides the information that you need at this time. As indicated above, in the absence of conceptual plans, the results presented herein are preliminary. Additional geotechnical input may be appropriate once more complete development plans are available. SHN should be allowed to review preliminary design plans to ensure they conform to the recommendations outlined herein, and to determine if additional recommendations are appropriate.

We appreciate the opportunity to assist in this important project that will enhance the infrastructure for the Klamath community.

Respectfully,

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