



DEPARTMENT OF PUBLIC WORKS

COUNTY OF HUMBOLDT

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May 3, 2010

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**REQUEST FOR PROPOSAL:  
Redwood Creek Levee Geotechnical Evaluation Project**

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LAND USE 445-7205

May 3, 2010

## REQUEST FOR PROPOSAL

### Consulting Assistance for Redwood Creek Levee Geotechnical Evaluation Project

#### Introduction

The Humboldt County Department of Public Works is seeking an experienced and qualified consulting firm or team of firms (consultant) to assist with a geotechnical evaluation project for the Redwood Creek levee system (project). Public Works has funds for the project through the California Department of Water Resources (DWR) Local Levee Assistance Program and the Community Development Block Grant Program. The project includes: (1) background review and site inspection; (2) field investigation and sampling; (3) laboratory analysis; (4) evaluation and reporting; and (5) repair and remedial alternatives evaluation. The total available funds for the project are \$345,000.

#### Scope of Work

Consultant candidates shall develop a proposal for a scope of work that conforms to the attached Work Plan, which was the basis for the DWR grant funding. Proposals are expected to closely follow the field investigation and sampling methodology described in the Work Plan. With proper justification, proposals may include modifications to the activities discussed in the Work Plan to the extent that the modifications expand the quantity and/or enhance the quality of the information obtained.

Geotechnical evaluations shall be based on applicable engineering standards including the following:

- Design and Construction of Levees. Engineering Manual EM 111-2-1913. U.S. Army Corps of Engineers (April 30, 2000).
- Design Guidance for Levee Underseepage. Engineering Technical Letter ETL 1110-2-569. U.S. Army Corps of Engineers (May 1, 2005).
- Geotechnical Levee Practice. REFP10L0. U.S. Army Corps of Engineers, Sacramento District (April 11, 2008).

### Work Performed by Others

1. Relevant and readily available existing information regarding levee design and surface and subsurface conditions will be available on the Public Works web site (<http://co.humboldt.ca.us/pubworks>) by May 10, 2010.
2. Public Works will obtain right of entry permission for activities performed outside Humboldt County's right-of-way.
3. Public Works will provide levee crest elevation data (surveyed in October 2008).

### Consultant Selection Process and Contract Schedule

The following schedule indicates the anticipated dates for steps in the consultant selection process. Public Works reserves the right to modify this schedule as circumstances may require.

1. Consultant candidates may participate in a pre-proposal conference to ask questions regarding this Request for Proposal. The conference is tentatively scheduled for May 14, 2010, at 1 p.m. at the Public Works office. Consultant candidates may e-mail the contact listed below to confirm the date, time, and venue.
2. Consultant candidates may submit questions via e-mail to the contact listed below until 5 p.m. on May 21, 2010. A summary of all questions and answers and new or updated information related to this Request for Proposal will be distributed via e-mail on or around May 25, 2010, to candidates who have requested this information.
3. Consultant candidates shall submit written proposals no later than noon on June 1, 2010, in accordance with the requirements set forth in this Request for Proposal.
4. Consultant candidates shall provide two hardcopies of the proposals and an electronic copy (either on CD or via e-mail to the contact listed below).
5. The Public Works Director will designate a review committee to evaluate and rank the submitted written proposals based on demonstrated competence and professional qualifications for performance of the services required. The committee may elect to interview the two or three firms that in the opinion of the committee appear to be most capable to meet the conditions of the project. Based on the committee's ranking, the Director or designee will enter directly into contract negotiations with the highest-ranked firm. The selected consultant must be prepared to comply with the contract requirements listed below. If Public Works is unable to successfully negotiate a satisfactory agreement with the highest-rank firm, Public Works may commence negotiations with the remaining firms in order of their ranking.
6. It is expected that the selected consultant will be given notice to proceed on or around July 5, 2010. The consultant should be prepared to begin work on the project immediately thereafter.

### Elements of Proposal

Each proposal should include the following elements:

1. **Scope of Work.** Description of a work program outlining the tasks needed to accomplish the project objectives. The work program should demonstrate how the consultant plans to delivery high-quality, cost-effective services. A general time line should be provided.
2. **Qualifications.** Identification of all members of the consultant's professional team (including sub-contractors) proposed to perform work elements for the project, and the estimated number of hours each participant will devote to the project. Description of the consultant's experience completing similar projects, with references.

### Criteria for Consultant Selection

Proposals should contain information sufficient to permit Public Works to evaluate properly the competence and qualifications of the consultant for achieving the project objectives.

Competence for the project will be judged based on the merits of the approach for implementing the Work Plan. The proposals will be evaluated based on the following criteria:

- Understanding of the project objectives.
- Ability to provide high-quality, cost-effective consultation services.
- Expertise in the applicable technical fields.
- Experience or knowledge of previous levee studies or projects.
- Experience conducting projects of similar nature and scale.

### Contact Information

The contact for questions or additional information regarding this Request for Proposal is Hank Seemann, Environmental Services Manager. He may be reached at (707) 445-7741 or via electronic mail at [hseemann@co.humboldt.ca.us](mailto:hseemann@co.humboldt.ca.us).

### Deadline for Submittal and Delivery of Proposals

The deadline for submission of proposals is June 1, 2010, at noon. Any proposals arriving after the deadline will not be considered. Proposals must be delivered before this deadline to:

Humboldt County Public Works Department  
c/o Hank Seemann, Environmental Services Manager  
1106 Second Street  
Eureka, CA 95501

### Requests for Supplemental Information

Public Works reserves the right to require the submittal of additional information that supplements or explains proposal materials.

### Rejection of Proposals

Public Works reserves the unqualified right to reject any or all proposals.

### Reimbursement of Costs

No reimbursement whatsoever will be made by Public Works of any costs incurred by consultant candidates related to the preparation or presentation of proposals.

### Contract Requirements

The proposed Professional Services Agreement between the County of Humboldt and the selected consultant will be based on the County's contractual requirements. Provisions to be incorporated into the Professional Services Agreement include but are not limited to the following:

- **Conflict of Interest.** CONSULTANT warrants and covenants that no official or employee of County of Humboldt, nor any business entity in which an official of County of Humboldt has an interest, has been employed or retained to solicit or assist in the procuring of the resulting contract, nor that any such person will be employed in the performance of such contract without immediate divulgence of such fact to County of Humboldt.
- **Indemnification.** To the fullest extent permitted by law, and in accordance with Civil Code §2782.8, CONSULTANT shall indemnify, defend and hold harmless COUNTY, its officers, agents and employees, from any claim, liability, loss, injury or damage (collectively, "Litigation") that arises out of, pertains to, relates to, or is connected with, performance of this Agreement due to the negligence, recklessness, or willful misconduct of CONSULTANT and/or its agents, employees or subconsultants. CONSULTANT shall reimburse COUNTY for all costs, attorneys' fees, expenses and liabilities incurred with respect to any Litigation in which CONSULTANT is obligated to indemnify, defend and hold harmless COUNTY under this Agreement.
- **Equal Opportunity.** The County of Humboldt promotes fair housing and makes all programs available to low- and moderate-income families and individuals, regardless of race, religion, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, political affiliation, sex, age, sexual orientation or other arbitrary factor. This policy does not require the employment of unqualified persons.
- **Assignment.** This Agreement and any amendments or supplements thereto shall not be assignable by the CONSULTANT either voluntarily or by operation of law, without the written approval of the County, and shall not become an asset in any bankruptcy, receivership or guardianship proceedings.
- **Nuclear Free Humboldt County Ordinance Compliance.** CONSULTANT certifies by its signature below that CONSULTANT is not a Nuclear Weapons contractor, in that CONSULTANT is not knowingly or intentionally engaged in the research, development, production, or testing of nuclear warheads, nuclear weapons systems, or nuclear weapons components as defined by the Nuclear Free Humboldt County Ordinance. CONSULTANT agrees to notify COUNTY immediately if it becomes a nuclear weapons contractor, as defined above. COUNTY may

immediately terminate the Agreement if it determines that the foregoing certification is false or if CONSULTANT becomes a nuclear weapons contractor.

- **Insurance**

Workers' Compensation and Employer Liability Insurance: The consultant shall have in effect Workers Compensation Insurance compensation coverage as required by California Law and Employer Liability Insurance providing full statutory coverage.

Liability Insurance: Comprehensive or Commercial General Liability Insurance at least as broad as Insurance Services Office Commercial General Liability coverage (occurrence form CG 0001), in an amount of \$2,000,000 per occurrence for any one incident, including, personal injury, death and property damage. If a general aggregate limit is used, either the general aggregate limit shall apply separately to this project or the general aggregate shall be twice the required occurrence limit.

Required insurance shall include:

Employer Liability Insurance	\$1,000,000 per accident for bodily injury and disease.
Comprehensive General Liability	\$2,000,000 minimum per occurrence.
Auto Liability Insurance	\$1,000,000 combined single limit coverage (CSL).
Professional Liability	\$2,000,000 combined single limit (CSL).

The County and its officers, agents, employees and servants shall be endorsed as additional insured on any such policies of insurance, except professional liability, which shall also contain a provision that the insurance afforded thereby to the County, its offices, agents, employees and servants shall be primary insurance to the full limits of liability of the policy, and that if the County, or its officers and employees have other insurance against a lot covered by such policy, such other insurance shall be excess insurance only.

List of Attachments

1. Work Plan (May 3, 2010)

# **WORK PLAN**

## **Redwood Creek Levee Geotechnical Evaluation Project Humboldt County, California**

**Prepared by:  
Humboldt County  
Public Works Department  
c/o Hank Seemann  
1106 Second Street  
Eureka, CA 95501**

**Reference: 251052**

**Revised May 3, 2010**

**Prepared for:  
California Department of Water Resources  
Division of Flood Management  
Local Levee Assistance Program  
Local Levee Evaluation (LOLE)**

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# 1 Project Description

The Redwood Creek Flood Control Project is located in the unincorporated community of Orick, situated on the northern California coast in the northern portion of Humboldt County (Figure 1a). The flood control project consists of a system of two earthen embankment levees with associated infrastructure, for a length of approximately 3.4 miles.

Humboldt County proposes a geotechnical evaluation project for the Redwood Creek Flood Control Project with funding from the Local Levee Evaluation (LOLE) segment of the Department of Water Resources' Local levee Assistance Program. The purpose of the project is to collect and analyze geotechnical information in order to assess the stability of the levee foundation and embankment and to determine the potential for settlement, seepage, underseepage, or erosion to cause instability under base flood (1%-annual-chance flow) conditions. Existing information is not sufficient to assess these risks for the Redwood Creek Flood Control Project. The results of the project will assist Humboldt County in assessing the public safety risks associated with the levee, and in determining whether the levee meets the embankment and foundation stability requirements of FEMA's National Flood Insurance Program standards at 44 CFR 65.10. Documentation of sufficient stability is necessary in order for the levee to be certified on FEMA's Flood Insurance Rate Map for the area, which is scheduled for revision in 2010.

Phase One of the project (Tasks 1 through 4) includes the geotechnical data collection and analysis. Phase Two of the project (Task 5) provides for the identification of feasible repair or remedial alternatives, but will only be performed if Phase One identifies that corrective action is warranted.

## 2 Phase One

### 2.1 Task 1 – Background Review and Site Inspection

A qualified geotechnical engineer will review readily available existing information regarding surface and subsurface conditions associated with the levee system. This information will include:

- Exploratory boring logs and as-built information from levee construction.
- LIDAR data for the Orick valley from 2002 (County of Humboldt) and 2007 (National Park Service).
- Results from recent geotechnical exploration associated with other projects.
- Cross-sectional surface elevation data for the levee and river channel.
- Modeled water surface elevations for the base flood.
- Monitoring data from the relief well system.
- Vertical and oblique aerial photographs of the levee.

A qualified geotechnical engineer will conduct a thorough inspection of the levee system for visible evidence of erosion or instability, and will assess the role of vegetation (beneficial and

deleterious) for bank protection and stability. Relief wells and outlet pipes will be inspected, and wells will be sounded. Also during the field inspection, personnel will check for appropriate access and overhead clearance for operation of drill rig equipment, and will coordinate access approval with landowners.

## **2.2 Task 2 – Field Investigation and Sampling**

Task 2 includes drilling, field characterization, and in situ permeability testing for a total of nine cross-sections along the levee system (average of one per 1,750 feet of levee length). Each section will have two sides (one on each embankment), and each side will have four drilling locations, for a total of 72 borings. Proposed section locations are shown in Figure 1b and 1c.

The proposed drilling locations include the waterside toe of the levee, the levee crown, the landside toe of the levee, and a location offset from the landside levee toe approximately 25 to 100 feet. All borings will extend below the impervious foundation (if present) to native material. A total depth of 50 feet below ground surface (BGS) for each levee crown boring is expected. A total depth of 25 feet BGS for each waterside toe, landside toe, and landside offset boring is expected.

Borings will be advanced with rotary sonic drilling, in conjunction with standard penetration testing (SPT) at five foot intervals. SPT will be performed in accordance with ASTM D1586, and will characterize the density of the subsurface deposits and fill material. A field geologist will log the borings in general accordance with the Unified Soil Classification System.

One undisturbed sample will be collected from each boring in a Shelby tube for laboratory testing of consolidation and Atterberg limits. Three disturbed samples will be collected from the three primary strata (pervious fill, impervious fill, and native materials) in each boring and tested in the laboratory for grain size. One borehole at each side will be completed with a monitoring well, for a total of 18 monitoring wells.

Following completion of the laboratory analysis (Task 3) and a preliminary evaluation of the results, the four sides with the highest susceptibility for underseepage will be identified. Field testing will be performed on the monitoring wells at these four sites to measure in situ permeability.

Levee crest elevation data was collected with real time kinetic (RTK) surveying in October 2008 by the Public Works Department based on the NAVD 88 vertical datum. This data will be analyzed as part of Task 4.

## **2.3 Task 3 – Laboratory Analysis**

This task provides for the laboratory analysis described in Task 2. Laboratory testing will be performed to characterize the strength and permeability properties of levee embankment, foundation, and native soils. A total of 18 Shelby tubes will be analyzed for consolidation (ASTM D-2435) and Atterberg limits (ASTM 4318). A total of 216 soil samples will be tested for grain size (ASTM D-422).

## **2.4 Task 4 – Evaluation and Reporting**

A geotechnical engineer (or qualified personnel working under his or her supervision) will prepare boring logs, cross-sections, and summary tables of the collected data. Based on the data and information acquired, the geotechnical engineer will assess the potential for settlement, liquefaction, internal and external erosion, seepage, and underseepage. Maps will be prepared for any erosion risk areas identified during the site inspection or the evaluation of LIDAR, survey data, and aerial photographs. Conceptual models will be developed for subsurface site conditions to analyze seepage and stability conditions. The geotechnical engineer will calculate exit gradients and compare the results to applicable underseepage exit gradient criteria in order to identify potential levee foundation/stability deficiencies. The geotechnical engineer will assess the condition, capacity, and function of the relief well system related to underseepage, and determine whether this system is sufficient based on current standards. The geotechnical engineer will render a professional opinion regarding the role of vegetation for bank protection and stability.

Evaluation for Task 4 will be conducted in accordance with the Corps of Engineers levee design manual (Corps of Engineers, 2000) and the Corps of Engineers Sacramento District Geotechnical Levee Practice (Corps of Engineers, 2008).

The geotechnical engineer will prepare a narrative report (signed and stamped) describing the work activities and presenting the results of the evaluation. The report will contain a full set of tables, figures, analysis results, and other supporting material as attachments.

## **3 Phase Two**

### **3.1 Task 5 – Repair and Remedial Alternatives Evaluation**

If corrective action is warranted based on the results of Phase One (Tasks 1 through 4) of the project, alternatives for repair and/or remediation will be identified and evaluated in accordance with the Corps of Engineers levee design manual (Corps of Engineers, 2000) and the Corps of Engineers Sacramento District Geotechnical Levee Practice (Corps of Engineers, 2008). The results of the repair and remedial alternatives evaluation will be included in the report for Task 4.

## **4 References**

U.S. Army Corps of Engineers, Design and Construction of Levees, EM 1110-2-1913, April 30, 2000.

U.S. Army Corps of Engineers (Sacramento District), Geotechnical Levee Practice, REFP10L0, April 11, 2008 (Rev 2).

## 5 Task Breakdown

Task	Activity	Cost
1 Background review and site inspection	Background review and site inspection	\$7,920
	<b>Task 1 Subtotal:</b>	<b>\$7,920</b>
	Requested Funds:	\$7,128
	Match Funds:	\$792
2 Field investigation and sampling	Oversight and field characterization by geologist	\$35,640
	Sonic drilling and standard penetration testing	\$178,200
	Drilling mobilization, per diem, supplies, etc.	\$16,500
	In situ permeability testing	\$2,970
	Levee crest RTK survey - preparation/post-processing*	\$2,376
	Levee crest RTK survey - field work*	\$3,080
	*Work performed Oct. 2008	<b>Task 2 Subtotal: \$238,766</b>
		Requested Funds: \$214,889
	Match Funds: \$23,877	
3 Laboratory analysis	Consolidation/Atterberg limits	\$30,096
	Disturbed sample preparation	\$8,316
	Particle size	\$17,820
	<b>Task 3 Subtotal:</b>	<b>\$56,232</b>
	Requested Funds: \$50,609	
	Match Funds: \$5,623	
4 Evaluation and reporting	Evaluation and reporting	\$35,640
	<b>Task 4 Subtotal:</b>	<b>\$35,640</b>
	Requested Funds:	\$32,076
	Match Funds:	\$3,564
5 Repair and Remedial alternatives evaluation	Repair and remedial alternatives evaluation	\$11,880
	<b>Task 5 Subtotal:</b>	<b>\$11,880</b>
	Requested Funds:	\$10,692
	Match Funds:	\$1,188
		<b>Total: \$350,438</b>
		Requested Funds: \$315,394
		Match Funds: \$35,044

### Assumptions

#### Drilling:

- 9 cross-sections, 2 sides (left and right) per section, 4 borings per side – total of 72 borings
- Two 10-hour days to perform one side – total of 36 days for drilling

#### In situ permeability testing:

- Two piezometers, two-person crew, four hours per test plus travel

#### Laboratory testing:

- One Shelby tube per hole for consolidation (ASTM D-2435) and Atterberg limits (ASTM 4318) - total of 72 samples
- Three samples per hole for grain size (ASTM D-422) - total of 216 samples

## EXHIBIT A-2

### OVERALL PROJECT BUDGET

<b>Task</b>	<b>Subtotal</b>	<b>Requested Funds</b>	<b>Match Funds</b>	<b>Completed Work</b>
1 Background review and site inspection	\$7,920	\$7,128	\$792	
2 Field investigation and sampling	\$238,766	\$214,889	\$23,877	\$5,456 <sup>(1)</sup>
3 Laboratory analysis	\$56,232	\$50,609	\$5,623	
4 Evaluation and reporting	\$35,640	\$32,076	\$3,564	
5 Repair and remedial alternatives evaluation	\$11,880	\$10,692	\$1,188	
Project Total:	\$350,438	\$315,394	\$35,044	
		Credit for completed work:	\$5,456	
		Match funds remaining:	\$29,588	

#### Notes

(1) Levee crest survey data was collected and processed in October 2008 with Humboldt County funds.

Project: Redwood Creek Levee Geotechnical Evaluation Project

Program: Department of Water Resources Local Levee Assistance Program

May 3, 2010

# EXHIBIT A-3

## OVERALL PROJECT SCHEDULE

Activity		Responsible Party	2010												
			Mar	Apr	May	June	July	Aug	Sept	Oct	Nov				
1	Develop and execute grant agreement	DWR/HCDPW	■	■											
2	Request for Proposal and contracting for consulting assistance	HCDPW		■	■										
3	Task 1: Background review and site inspection	Consultant			■	■									
4	Task 2: Field investigation and sampling	Consultant				■	■	■	■						
5	Task 3: Laboratory analysis	Consultant					■	■	■	■					
6	Task 4: Evaluation and reporting	Consultant						■	■	■	■	■	■	■	
7	Task 5: Repair and remedial alternatives evaluation (if needed)	Consultant									■	■	■	■	
8	Post-implementation Report	HCDPW												■	■

Project: Redwood Creek Levee Geotechnical Evaluation Project

Program: Department of Water Resources Local Levee Assistance Program