

MARKET SURVEY FOR A TRAINING COURSE ON INSPECTION OF CONSTRUCTION OF EARTH AND ROCKFILL DAMS

The Panama Canal Authority (ACP) seeks the services of a specialized consulting/training contractor experienced in all procedures, inspection techniques and phases related to the construction of earth and rockfill dams. The contractor shall prepare and provide a training course targeted for ACP technical personnel illustrating attendees not only the basic construction methods but the different field complications that can occur during the construction process and explore alternate solutions for them.

1. BACKGROUND INFORMATION: The ACP has been committed to undergo a Canal Expansion Program consisting in the construction of two new sets of locks - one on the Pacific and one on the Atlantic side of the Canal. In order to open a new 6.1 km-long access channel to connect the Pacific locks and the Culebra Cut, four dry excavation projects will be executed. The last of the excavation projects named CAP4 entails the construction of a 3.5 kilometers long impervious clay core-rock fill dam (approximately 180 meters wide base by 30 meters high, with a 30 meters wide top crest), which comprises approximately 5 million cubic meters of fill.

2. COURSE OBJECTIVES:

2.1 This course shall be structured to improve the attendees' ability and knowledge in all procedures, inspection techniques and phases related to the construction of earth and rockfill dams.

2.2 The course shall illustrate the attendees of the different field complications that could occur during the construction process of earth and rockfill dams and explore alternate solutions for these.

2.3 The course should be designed for inspectors, designers, engineers, contract specialists and Project management personnel.

3. SCOPE AND TOPICS TO BE INCLUDED IN THE TRAINING COURSE:

3.1 Different types of Dams (Earth, Rockfill Dams)

3.2 Zone designation for dam construction (Core Zone, Shell Zones and Riprap, Filter and Drain Zones). ¿How are the zones constructed?

3.3 Specifications for different type of materials.

3.4 Excavation and preparation of earth and rockfill dams foundations. Foundation requirements and control of seepage and piping in foundations. Infiltrations, water pressure, settlements, deformations, injections, slurry wall, jet grout, etc.

3.5 Backfill specifications and how to keep record of them. Backfill settlements.

3.6 Quality Control. Materials quality and lab tests.

3.7 Internal erosion (Control of seepage and piping in embankments).

3.8 Construction Methods (Dewatering).

3.9 Handling of materials used to build the embankment zones.

3.10 Handling of materials used to build the core zone (earthfill) and the shell zone and riprap (rockfill).

3.11 Handling of materials used to build the filter and drain zones.

3.12 Past experiences in real life cases related to problems encountered during earth and rockfill dam constructions. Corrective measures for the problems encountered.

3.13 Flaws occurred during and after the construction of earth and rockfill dams, why they occurred and how to prevent them.

3.14 Instrumentation needed for earth dams. Why should we measure? Different types of instrumentation.

3.15 Active faults crossing earth and rock dams. How is the dam dimensioned? Foundation mapping.

4. PERIOD OF PERFORMANCE: The course should be completed before June 30, 2010. The contractor has to design the course in such a way to cover all topics in 4 or 5 days. Course breaks include 1 hour break for lunch daily and other coffee breaks as needed during the morning and afternoon sessions. Course should be programmed to begin at 7:30 a.m. and finish at 4:30 p.m., completing an 8-hour daily training.

5. COURSE MATERIAL AND ATTENDEES:

5.1 Every attendee should be given a Training Course Manual in English language for the construction of Earth and Rockfill Dams, which will serve as a guide during the course and for future reference.

5.2 Number of attendees varies from 30 to 35 persons. All attendees have a technical background in civil engineering, architecture, geotechnical engineering, project management, or similar.

5.3. The course shall be provided in the English language.

6. **FACILITIES:** The ACP will provide training facilities with air conditioning, audio-visual controls and support (including screen projector), coffee break servings, restroom facilities, etc.

7. **COURSE LOCATION:** The course will be provided at the ACP Training Facility located in Building 702 or 704, Balboa, Pacific area, Panama City, Republic of Panama.

8. **QUESTIONS TO BE RESPONDED:**

- 1. Does your company have the necessary experience and expertise to provide these services? Provide project details in which experience and expertise was obtained, including date of execution.
- 2. Is your company a firm dedicated to provide consulting engineering services? Does the deadline imposed to have the training course in place too restrictive? What impact would the time for performance have in the cost of the course?
- 3. What other conditions would affect your decision to participate in bidding on a tender for such engineering services?
- 4. Does your company have any training course that meets our requirements? If available, please include the outline of the course in your response.

Point of contact for this inquiry is: Mr. Irving Herrera. Telephone: (507) 276-3401; Facsimile: (507) 276-2121; or Email: iherrera@pancanal.com. Please indicate your interest in participating by responding to this message by either e-mail or facsimile by no later than **January 29, 2010**.

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