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1. PROJECT UNDERSTANDING

1.1 INTRODUCTION

Coyote Point is a regional recreation area operated by the San Mateo County Parks and Recreation Department (County). The Recreation Area is located south of San Francisco International Airport and its coastal section is a popular destination for swimmers, surfers, cyclists and walkers. The slightly concave north-facing coastal frontage is bounded by a rock headland to the east and Airport Boulevard promontory to the west. A 12-feet wide promenade runs along this frontage, which has been protected from coastal erosion by a variety of retaining structures since the 1990s. These structures have recently fallen into disrepair through storm-wave damage, causing parts of the promenade to collapse.

A site visit on August 22nd 2006 allowed a preliminary inspection of the coastal structures along a 1500 feet-long portion of the frontage. The eastern section, an area popular with swimmers, is protected by a low piece of concrete 'wall' placed against the seaward face of the soil beneath the promenade. This concrete now affords little protection because it has fallen away and eroded along its back side to expose the underlying soil to storm-wave attack. The removal of the soil has caused a small cliff over which the promenade is collapsing. The central portion of the shoreline is protected by rip-rap, installed in 1991, which is in disrepair for some of its length. The rip-rap is replaced by Armor Flex along the western section, which was installed in the 1990s to allow easier access to this part of the beach for surfers. The Armor Flex has been undermined by waves, which has caused slumping of the fabric.

The purpose of this proposed project is to provide cost-effective options for the repair, restoration and/or replacement of the existing retaining structures to protect the promenade from erosion in the future. Part of the enhancement is to facilitate good public access to the beach for a variety of users, particularly swimmers in the east and surfers in the west. The County is not adverse to repair of the promenade surface as part of this contract.

The beach fronting the structures at Coyote Point was nourished with sand from Monterey in the 1920s. Much of this sediment has been lost offshore, and the beach has historically eroded. Beach nourishment is not considered as part of this contract. However, future phases of the coastal enhancement may include this beach management technique as a component. Given this, the proposed project requires consideration of stable shoreline configurations, to result in a sustainable facility, and also be consistent with future implementation of nourishment schemes.

1.2 REVISED SCOPE

The original proposal was submitted to the County on September 11th, 2006. The scope of work provided below has been revised from the original scope after negotiations between PWA and the County at a meeting held October 4th, 2006 at the Counties offices in Redwood City. The negotiated revised scope is now divided into three phases, as follows

- Phase 1 – conceptual alternatives and selection of preferred alternative
- Phase 2 – preliminary design, permitting and final design
- Phase 3 – construction period

Phase 1 is anticipated to be contracted as described. Phase 2 is a preliminary scope which will be modified after the results of Phase 1 are published. Phase 2 is provided as an Appendix to Phase 1. Phase 3 is a later phase which is not scoped at this stage.

1.3 ROLES AND RESPONSIBILITIES

The consultant team will be led by PWA reporting directly to the County. The following is an outline of the roles and responsibilities of each team member:

Philip Williams & Associates, Ltd. (PWA)
- Project Management
- Project Engineer
- Civil and coastal engineering
- Coastal geomorphology

Treadwell & Rollo, Inc. (T&R)
- Geotechnical engineering and geology

H.T.Harvey (HTH)
- Biology
- Permitting

TRA Environmental Sciences (TRA)
- CEQA Initial Study

HJW Geospatial, Inc. (HJW)

- Surveying and Mapping

The Scopes of Work for each subconsultant are attached in the Appendix.

2. ASSESSMENT OF KEY ISSUES TO BE ADDRESSED IN PHASE 1

This section describes the key issues with respect to the design of coastal protection along the Coyote Point Recreation Area beachfront and proposes the methods we will adopt to reach a preferred conceptual design. The proposal is broken down into three main tasks. Task 1 describes the design criteria, which will be used to formulate design alternatives and a preferred conceptual design described in Task 2. Task 3 describes preliminary permitting requirements.

2.1 TASK 1: EXISTING CONDITIONS

Existing site conditions will be characterized based on existing and new data. Conceptual design criteria will be developed to aid in the formulation of alternatives. The criteria will be developed based on existing conditions, goal, objectives, opportunities, constraints and analysis.

2.1.1 Aerial Survey and Topography

San Mateo County Public Works recently retained HJW GeoSpatial to collect orthorectified aerial photographs of the whole of San Mateo County from which a digital elevation model (DEM) is being constructed. The DEM will be able to support 2 feet contours, and is presently in the quality control stage. Although these data will provide an overview, mapping may not be of sufficient resolution to be used for design in the proposed project.

HJW GeoSpatial will perform a site-specific aerial survey at low tide to develop a topographic map of the beachfront and the backing land. The topographic map will show significant planimetric features (coastal structures, promenade and buildings) and 1-foot contours. The proposed mapping limits, from the west end of the Armor Flex to the Coyote Point headland, will be covered by a single stereo-model using 1:3000-scale aerial photography. However, the final limits would be confirmed with the County prior to accomplishing the work. Deliverables would be the mapping in AutoCAD dwg format, a color orthophotograph, and a set of contact prints.

The topographic data will be supported by ground surveys by PWA (section 2.1.2), and various records held by County Public Works including historic maps, aerial photographs, landscape drawings, water line as-builts, and site assessment information. The City of Burlingame also holds historic aerial photographs of the area, which, if made available, can be compared to the new data.

2.1.2 Beach Transects

PWA will collect a series of cross-shore beach profiles (transects) using a Total Station to map beach morphology and generalize wave runup conditions. Transects will be taken from below mean low water (wading depth at low tide) to the promenade surface across the coastal defense structures. The number of transects will be selected to represent reaches of shoreline having similar slope, substrate and orientation

to incoming waves. The transect locations will also consider the types of defense structures and backshore conditions (topography), affecting wave runup and overtopping. PWA assumes that benchmarks exist within the site vicinity to provide adequate control and which are defined relative to the County's DEM. PWA surveys will tie-in to the control used by HJW for mapping as well as nearby benchmark(s) used by the County in order to allow facilitate comparison and linkage with existing and future County surveys.

Surveying Practice

PWA performs land surveys and collects hydrographic data to augment traditional surveying services for the purposes of geomorphic interpretation, monitoring of project performance, and other specific uses consistent with Geologic and Landscape Surveys as defined in the Professional Land Surveyors' Act (California Business and Professionals Code). PWA does not provide traditional land survey services such as property boundaries and maps for general use by others. PWA recommends that these traditional surveying services be accomplished by a licensed, professional land surveyor either under direct contract with the client or as a subconsultant to PWA.

2.1.3 Physical Processes

PWA propose to analyze wind-generated waves that approach the frontage using the methods outlined in the Coastal Engineering Manual (2003) published by the U.S. Army Corps of Engineers and spot checked using more detailed numerical models such as SWAN or STWAVE. These methods allow calculation of wave heights and peak periods expected at the defense structures depending on the available winds, fetch and water depth. Estimates will be made for wind conditions with a range of return periods from which the design condition will be quantified. The extreme wave height and period analysis will be supported by other physical process data available from the San Francisco Airport study.

Wave runup and overtopping will be calculated for the beach and structures to investigate inundation and damage potential to the promenade. Wave runup is the potential elevation which is reached by the up-rush of the wave breaking on the shore. If extensive flooding of the shore and continuous overtopping of the retaining structures occurs due to wave runup, the promenade could be damaged. Wave runup calculations will be conducted according to the Coastal Flood Hazard Analysis and Mapping Guidelines for the Pacific coast of the United States (FEMA, 2005).

Stillwater level conditions at the beach front will be calculated using the closest NOAA tide gauge, located on San Mateo Bridge. Estimates of historic and future relative sea-level rise will then be incorporated for both existing conditions as well as future water conditions. Standard methods consistent with guidelines published by the U.S. Army Corps of Engineers and Federal Emergency Management Agency will be followed.

The design condition will be selected after discussions with the County at the first interim meeting.

2.1.4 Subsurface Conditions

Treadwell & Rollo (T&R) will assess the geotechnical conditions at the site using interpretation of previously published regional data and geotechnical information on the soils at, or adjacent to the Coyote Point Recreation Area site. We assume that the County will provide readily available subsurface data. Treadwell & Rollo will review their prior work for the Coyote Point Marina Breakwater. The main purposes of the analyses will be to define the soil profile along the promenade and beneath the beach, and provide data on slope stability and settlement. T&R will provide a preliminary letter report and recommend any appropriate adjustments to their Phase 2 subsurface exploration and analysis.

2.2 TASK 2: CONCEPTUAL DESIGN

PWA and the consultant team will develop a preliminary conceptual design of the shore renovation and document the design and supporting analyses in a Conceptual Design Report (CDR).

2.2.1 Design Alternatives

PWA will develop conceptual descriptions of design alternatives, and for each, highlight their opportunities and constraints. Descriptions will not be detailed, but will consist of text and a few sketches to facilitate comparison of alternatives and identification of key design issues, such as the type of beach access points and their number. PWA will consult with the County prior to selection of the preferred alternative for conceptual design. PWA anticipates up to five alternatives.

2.2.2 Preferred Conceptual Design and Report

PWA will develop a preferred conceptual design in sufficient detail to identify approximate construction costs and potential environmental constraints and effects in general terms. A Conceptual Design Report (CDR) will be submitted to the County to document the design alternatives, selected alternative, and possible options for use in communication with funding entities and other interested parties. PWA anticipates that the City of San Mateo may choose to participate in the selection of the preferred alternative. PWA will provide three bound hard copies of the CDR, and one unbound reproducible hard copy. Digital copies in MS Word and AutoCAD 2006 (or if requested an earlier version allowed by AutoCAD 2006) will be provided to the County.

2.3 TASK 3: PROVISIONAL PERMITTING REQUIREMENTS

2.3.1 Background Review and Site Visit

H.T. Harvey & Associates will gather available information on biotic resources that occur in the vicinity of the study area. The information will be reviewed in order to help focus field surveys on the

determination of sensitive habitats on site. This task will include a site visit and a review of PWA's work within the context of potential permitting requirements as part of Phase 2.

2.4 TASK 4: MEETINGS

We anticipate five meetings between PWA and the County:

- Start-up
- First, second and third interim's
- Wrap-up- Phase 1 and preparation for Phase 2

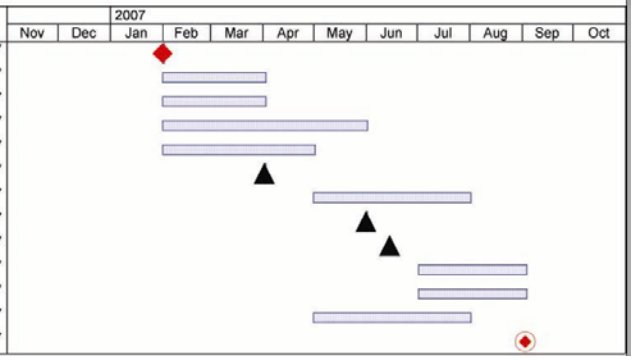
The first interim meeting will be timed to coincide with completion of Task 1 – existing conditions – in order to consult with the County and City of San Mateo about alternatives, and include discussion of flood management objectives. The second interim meeting will take place before the preferred conceptual design stage, in order to allow consultation with the County on this aspect. H.T. Harvey & Associates will attend the second interim meeting. Their attendance at this meeting is an important opportunity to develop a permitting strategy and to create avoidance and minimization measures related to potential impacts to sensitive habitats. The third interim meeting will be a public meeting. The timing of this meeting is flexible. The meeting will be organized and facilitated by the County. PWA will present the alternatives and supporting analysis and answer questions from the public. The County will synthesize the public input in order to provide direction to PWA and the consultant team.

3. PROPOSED TIMELINE FOR PHASE 1

The overall timeframe to conduct and complete the scope of services for Phase 1 is 7 months from an assumed start date of February 1, 2007. The schedule will be updated based on the actual start data. PWA anticipates a simple shifting of the entire schedule based on the start date change unless otherwise requested by the County. The attached chart provides a schedule that identifies important milestones and specifies completion dates for each task and a final project completion date. PWA will work with the County to manage the schedule and adjust as appropriate to facilitate a successful project completion.

Coyote Point Recreation Area Engineering Study
Proposed Project Schedule

ID	Task Name	Start	Finish
1	Kick-off Meeting	Thu 2/1/07	Thu 2/1/07
2	Aerial Survey and Topography	Thu 2/1/07	Mon 4/2/07
3	Beach Transects	Thu 2/1/07	Mon 4/2/07
4	Physical Processes	Thu 2/1/07	Fri 6/1/07
5	Subsurface Conditions	Thu 2/1/07	Tue 5/1/07
6	Interim Meeting 1: City of San Mateo	Mon 4/2/07	Mon 4/2/07
7	Design Alternatives	Tue 5/1/07	Wed 8/1/07
8	Interim Meeting 2: Alternative Selection	Fri 6/1/07	Fri 6/1/07
9	Interim Meeting 3: Public	Fri 6/15/07	Fri 6/15/07
10	Preferred Conceptual Design	Mon 7/2/07	Mon 9/3/07
11	Conceptual Design Report	Mon 7/2/07	Mon 9/3/07
12	Provisional Permitting Requirements	Tue 5/1/07	Wed 8/1/07
13	Project Wrap-up Meeting	Mon 9/3/07	Mon 9/3/07



5. ASSESSMENT OF KEY ISSUES TO BE ADDRESSED IN PHASE 2

This section describes the key issues with respect to the design of coastal protection along the Coyote Point Recreation Area beachfront and proposes the methods we will adopt to reach a preferred design after completion of the Phase 1 – Conceptual Design. The scope of work for Phase 2 is broken down into a number of tasks. Task 1 describes more site-specific subsurface investigations required for design. Task 2 formulates the preferred detailed design based on the conceptual design from Phase 1. Task 3 provides design plans and specifications and Task 4 discusses our approach to securing permits.

5.1 TASK 1: SUBSURFACE CONDITIONS

5.1.1 Geotechnical Investigation

Treadwell & Rollo will provide a detailed assessment of the subsurface conditions at the site using a geotechnical investigation. The investigation will consist of a series of cone penetration tests (CPTs) and borings along the promenade and if possible on the beach. The latter will depend on gaining access permission and the ability of equipment to operate on the weak soil of which the beach is comprised. We estimate that the borings and CPTs would extend to depths of approximately 20 feet. However, weak bay deposits are expected to directly underlie the armoring and promenade paving that currently exists on the site, and we would attempt to explore to at least the bottom of the weak soil layer. The program may be modified after a review of existing conditions. The field data collection and laboratory investigation is anticipated to include the following elements, although the actual effort may be adjusted based on Phase 1 and consultation with the County:

- recover soil samples for strength, compressibility and index testing (from borings)
- obtain *in situ* strength data (CPTs)
- establish the groundwater depth
- gauge the size voids under the Armor Flex articulated block mat (this action may not be needed depending on the selected alternative)
- recommendations on stable slopes for shore protection.

The project site is in a seismically active region. The probability of large magnitude earthquakes impacting on the frontage will be made using published information from the U.S. Geological Survey. Seismic analysis is not proposed at this time owing to our understanding of the project and engineering needs.

5.2 TASK 2: PRELIMINARY DETAILED DESIGN

PWA and the consultant team will develop a preliminary detailed design of the shore renovation and document the design and supporting analyses in a Preliminary Design Report (PDR). The PDR will focus on the shoreline stabilization and access protection. An initial analysis of the long-term sustainability of

the existing shore and promenade will be completed in order to assess the sustainability of the present access configuration. The assessment of sustainability will include a conceptual consideration of sand placement for beach nourishment, sea-level rise, natural shore planform and section, and risk of coastal flooding and erosion damages. If it appears that alternative approaches beyond traditional shore protection are potentially viable and advantageous, the County may wish to expand the preliminary design to consider a broader array of conceptual alternatives that address, for example, sand placement. The objective of these considerations is to make sure that the investment in armoring is appropriate, and to avoid a redesign and construction in the near term.

5.2.1 Preferred Detailed Design

PWA will expand on the Preferred Conceptual Design and Report as a product of Phase 1 to provide a preferred detailed design. The design will include a conceptual plan, typical sections, and engineers' estimates of approximate construction quantities and costs. Estimates of construction costs will be largely based on discussions with construction contractors active in the area.

5.2.2 Preliminary Design Report

A Preliminary Design Report will be submitted to the County to document the project description as a basis for environmental review, permitting and budgeting purposes, prior to design plans and specifications. PWA will provide three bound hard copies of the PDR, and one unbound reproducible hard copy. Digital copies in MS Word and AutoCAD 2006 (or if requested an earlier version allowed by AutoCAD 2006) will be provided to the County.

5.3 TASK 3: DESIGN PLANS AND SPECIFICATIONS

PWA will accomplish the detailed design of the selected shore armoring alternative, consistent with the PDR, and produce construction drawings, technical specifications and engineer's estimates of likely construction quantities and costs. We anticipate the following drawings:

1. Title (location and vicinity maps, index)
2. Grading Plan 1 (site preparation, earthwork, armoring, promenade)
3. Grading Plan 2 (" " ")
4. Typical Sections and Details

Technical specifications (sometimes referred to as Specific Requirements) will include construction materials, measurement and payment methods, and general requirements such as permitting limitations, construction access, etc. PWA will also provide the bid schedule for the County's use. We assume that the County will provide the general and special provisions, and incorporate the documents PWA provides into bidding and contract documents. PWA assumes that the County's standards will be used and other

standard technical specifications such as the California Department of Transportation. PWA anticipates the following technical specification sections:

- Mobilization
- Surveying and Staking
- Demolition
- Earthwork and Dredging
- Rock and Rockwork
- Filter Fabric
- Landscaping

Please note that the actual drawing list, and extent of other documents provided by PWA, and our corresponding level of design effort, may vary depending on the project description, as detailed in the PDR, and also as affected by the findings of technical analyses and permitting requirements. The proposed design does not include sand placement or mitigation measures that may or may not be required. Bid and construction period services will not be included, but should be defined during the design phase so that the construction documents are consistent with the County's approach. PWA typically provides engineering support during the bidding and construction phases, and can provide other services such as construction observation, if desired.

PWA anticipates coordination with the Federal Emergency Management Agency (FEMA) and County Department of Public Works (DPW) during the design phase. PWA anticipates one meeting with FEMA staff to identify any requirements associated with possible funding for hazard mitigation, etc. that may be incorporated into the project. PWA also anticipates two meetings with DPW: one to identify their requirements for formats, etc. and one to discuss DPW comments provided on PWA's submittals. PWA anticipates the scope described herein to be appropriate. If unanticipated requirements are identified that would affect the project cost, PWA will inform the County as soon as practicable in order to identify the desired appropriate actions. PWA will advise County staff of the meeting times, etc. so that they may participate.

For the 65% completion, 90% completion, and Final technical specification submittals, PWA will provide three bound hard copies, and one unbound reproducible hard copy. It is assumed that the County will review the plans and specifications at 65% and 90% completion to ensure they meet County standards. PWA understands that the County Department of Public Works will review one or more PWA submittals and provide comments for resolution by PWA.

5.4 TASK 4: CEQA AND PERMITTING

5.4.1 Permitting

H.T. Harvey & Associates will prepare and process the necessary permits from the regulatory agencies. The shoreline protection improvements will require approvals from three resource/regulatory agencies;

the U.S. Army Corps of Engineers (Corps), Regional Water Quality Control Board, and Bay Conservation and Development Commission (BCDC). Based on existing conditions within the promenade work area, a separate approval should not be needed from the California Department of Fish & Game, although some time has been included to cover preparation of permit materials should it become necessary. CEQA approval is an important requirement of the two state resource agencies from which permits are needed, as described in Section 5.4.2.

The project is a good candidate to be permitted *via* the Joint Aquatic Resources Permit Application (JARPA) process. The JARPA permit application is designed to replace individual applications for ten state, regional, and national agencies. Alternatively, the various agencies may request that separate permit application packages be prepared for the work. Thus, task assumes that either the JARPA process will be used for the project, or that the Corps will authorize the work under an existing Nationwide Permit (and thus not require an Individual Permit with associated 404(b) (1) Alternatives Analysis), and BCDC will approve the work as part of an Administrative Permit (and not require a Major Permit). We also assume that the work will not affect special-status species. Impacts to these species would complicate the permitting phase beyond the current scope as it would involve a separate permit action with the U.S. Fish & Wildlife Service through a Section 7 Consultation. All fees associated with the permit applications are to be paid by the County.

5.4.2 Development of CEQA Mitigation Measures

H.T. Harvey & Associates will also assist the CEQA process by providing the biologic input to TRA and the County. If mitigation measures are required, HTH will identify assist in the development of mitigation measures in support of a Negative Declaration (ND) or Mitigated ND. It is anticipated that little or no mitigation is required owing to the highly disturbed and developed condition of the site, and the consideration of shoreline set-back to minimize or reduce net Bay fill.

5.4.3 CEQA

TRA will take the lead role developing CEQA documentation for the project on behalf of and in close coordination with the County. Other team members will provide supporting technical information for use by TRA. It is anticipated that a ND or Mitigated ND will be appropriate, as described previously. If one or more issues arise that indicate a more detailed environmental review process, TRA will advise the team and the County as soon as practicable so that the desired appropriate actions can be identified and implemented.

5.5 TASK 5: MEETINGS

We anticipate four meetings with the County:

- Start-up
- First interim

- Second interim
- Wrap-up

The first interim meeting will take place at the preferred design stage, in order to allow consultation with the County on this aspect before proceeding to the PDR. The second interim meeting will take place after completion of the PDR to allow consultation on the design plans and specifications.

H.T. Harvey & Associates will attend the first interim meeting for the purpose of reviewing and commenting on the preferred design prior to compilation of resource agency permits and before the preparation of the detailed final design, and plans and specs. H.T. Harvey & Associates will clarify impacts and provide further guidance on avoidance and minimization measures related to potential impacts to sensitive habitats.

6. PROPOSED TIMELINE FOR PHASE 2

The overall timeframe to conduct and complete the scope of services for Phase 2 will be negotiated with the County upon completion of Phase 1, but is anticipated to take no longer than one (1) year. This assumes County review of deliverables within one (1) month of submittal of draft reports and the ability to schedule meetings on time.