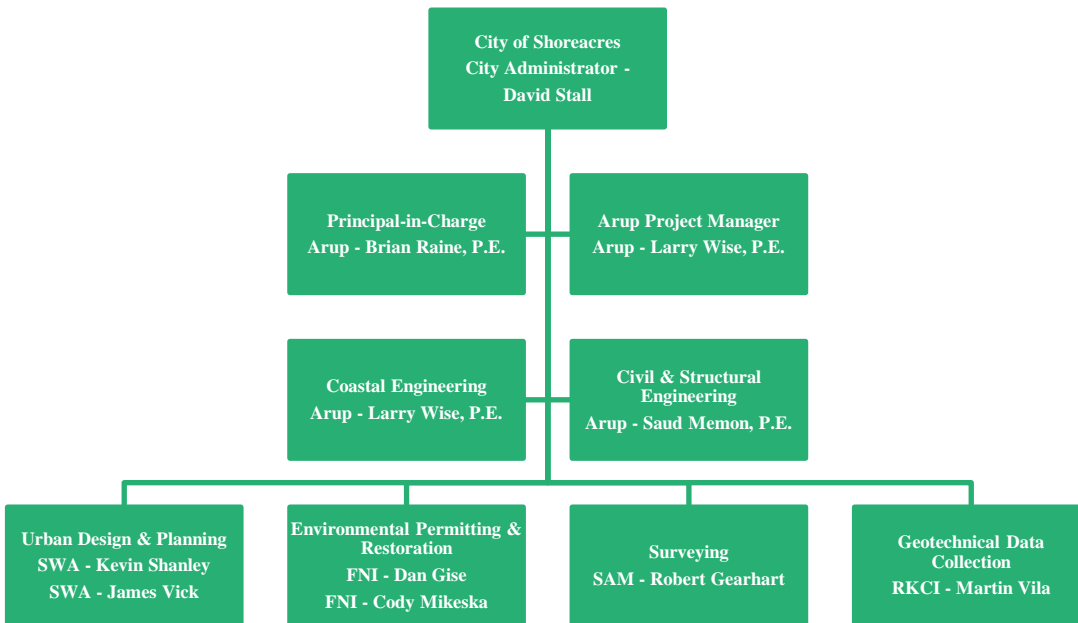


1 Introduction

The City of Shoreacres has received a Coastal Impact Assistance Program (CIAP) grant to develop a shoreline protection plan for Miramar Park including permitting and final design documents. This proposal, prepared by Arup Texas, Inc. (Arup), addresses the City’s project and provides an outline of the resources, scope of work, schedule, and budget proposed to accomplish the work. The development of a successful plan is dependent upon community input and consensus building which Arup and partners will undertake in cooperation with the City.

2 Project Team

Arup has assembled a team specifically to address the Shoreacres Miramar Park shoreline restoration project. This team includes members from Arup who will lead the project and focus on the engineering design of the project as well as key subconsultants chosen for their specific expertise.



3 Scope of Work

3.1 Project Kick-off

The Arup team will start the project by meeting with the City to better understand the current state of Miramar Park, the key issues as perceived by the City, and the history of the project. This meeting would be conducted at Shoreacres City Hall

and will include all the key team members. The project schedule and approach will be confirmed with the City at the kick-off meeting.

3.2 Community Input and Plan Development

Arup will work closely with the City Administrator, the citizens' advisory council (to be established by City), the public at large, and our subconsultants SWA Group and Freese & Nichols, Inc. (FNI) to develop a plan which incorporates and addresses to the extent possible all of the concerns raised by various stakeholders. The goal of the effort will be to develop a consensus based plan for Miramar Park which will address the shoreline protection as well as other potential uses and future projects in a holistic manner.

A series of workshops is anticipated for development of the consensus plan. Three workshops along with a final summary meeting are planned with the citizens' advisory council. Two open public forums and a presentation to City Council are planned. It is assumed that the City will arrange, coordinate, and provide suitable meeting space for all workshops as well as provide public notices as may be required. Only limited distribution of printed materials is planned; however, electronic documents will be provided to the City for distribution via the City's website or printing and physical distribution by the City as desired. In order to limit the travel time for consultants, it is recommended and assumed that advisory council and public workshop meetings be conducted on the same day if possible. SWA Group would attend all community input meetings described below; FNI would attend one advisory council meeting and one general public input meeting.

The citizens' advisory council first workshop will be an initial discussion to align expectations and begin to understand community desires. In preparation for this workshop the Arup team will develop background information including maps of historic conditions, prior planning reports, and general engineering information. Basic outlines of project goals, potential alternatives, and criteria for evaluation of the alternatives will be developed to help foster discussions.

Following the first advisory council meeting, the Arup team will develop the required inputs for the plan development. These include surveys, environmental, and geotechnical information, as well as basic engineering information on the project site such as storm surge, wind waves, and ship generated waves. The alternatives which are in-line with outcomes of the first advisory council meeting will be developed to a conceptual level with relative, order-of-magnitude estimates of costs.

The second advisory council meeting will be held to present information and alternatives developed since the first meeting. The criteria for evaluation of criteria will be refined and the alternative discussed in greater detail. From this discussion the top three alternatives will be recognized to be emphasized for

public meeting. The goals for the project will also be formalized for presentation at the public meeting.

Following the second advisory council meeting, an open public workshop and meeting will be conducted. The purpose of the meeting will be to review the project history, present the basic information gathered regarding the project site, present the goals and evaluation criteria developed with the advisory council, and present conceptual level alternatives. Comments from the public will be taken regarding all of the above in order to synthesize issues and concerns as well as make refinement which will aid in consensus development.

The Arup team will meet again with the advisory council following the first public workshop. This meeting will review the information and comments received from the public workshop and use this information to refine goals, criteria, and/or alternatives as required. The Arup team will work with the council to refine the final selected alternative for the shoreline restoration. Based on the outcomes of this meeting the Arup team will prepare a draft conceptual design report documenting the project parameters, design, estimated cost, schedule, and potential funding sources.

A second, open public meeting will be held following completion of the draft conceptual design report. At this meeting the Arup team will present the preferred alternative and take public input on the proposed solution.

The final advisory council meeting will be held to ensure that all public concerns and issues have been adequately addressed to be considered as a community consensus. Any issues which remain which have a consensus has not been reached will be documented. Following the final advisory council meeting the conceptual design report will be finalized and submitted to the City.

Finally, the Arup project team will present the final selected alternative to City Council. At this time City Council will have the final word on the selected alternative before formal permitting and preliminary level design are begun. The City Council approval is a decision point prior to progressing design and permitting. If City Council approval is not received after the extensive community coordination outlined above, there is not an available contingency budget to restart the conceptual design and public coordination process and complete all other work within the total budget provided in this proposal.

3.3 Field Data Acquisition and Analysis

During the process of developing a consensus plan for the shoreline restoration, the team will also begin the data acquisition necessary to identify the design parameters and constraints.

3.3.1 Geotechnical Field Investigation

The field data acquisition includes conducting the geotechnical field investigation and laboratory testing. A series of eight, 30 feet deep shore based borings will be conducted along the length of the shoreline to identify the soil types and strengths for the project area. Laboratory testing will be conducted on sample taken using appropriate methods for basic soil classification and material properties. At present, no offshore sampling is planned. All of the geotechnical data collection and analysis will be conducted by Raba-Kistner, Inc. in accordance with the following:

- The proposed shoreline protection system is anticipated to consist of some type of gravity structure, either rip-rap revetment or concrete seawall, supported on shallow foundations. Height of the wall/revetment system is estimated to probably be less than 8 feet and the proposed width to be about 16 to 24 feet. In addition, there will be some adjacent low structures (gabion breakwaters for marsh restoration, oyster reef, etc.) in the shallow water area adjacent to the existing rip-rap section.
- Borings will be located in the field utilizing tape and right angle measurements from existing benchmarks or using recreational grade GPS. The boring locations will be staked and surveyed by SAM.
- Samples will be taken using conventional split-spoon and/or Shelby tube sampling techniques in general accordance with applicable American Society for Testing and Materials (ASTM) standards. Representative portions of the samples will be sealed, identified, packaged, and transported to our laboratory for subsequent testing and classification.
- Immediately following completion of drilling activities, water level readings, if applicable, will be recorded for the open boreholes and the boreholes will be backfilled using the auger cuttings generated during the drilling operations.
- Upon completion of the subsurface exploration, a testing program will be designed to define the strength and classification characteristics of the foundation soils. The laboratory testing program is anticipated to include moisture content tests, Atterberg Limits (plasticity) tests, unconfined compressive strengths, dry unit weight determinations, and grain size analyses, including hydrometer testing. However, the actual type and number of laboratory tests will be based on the subsurface conditions encountered in the borings. The laboratory testing will be performed in general accordance with applicable ASTM standards.
- The field and laboratory phases of the study will be reviewed by RKCI staff of engineers and geologists. The results of our review, together with the supporting field and laboratory data, will be presented in a written engineering report. Included therein will be recommendations concerning the design and construction of the shallow foundation systems for the

proposed shoreline protection system structures. The Geotechnical Engineering Report may include the following information and recommendations, if applicable:

- a summary of the field and laboratory sampling and testing program; Boring logs and laboratory testing results;
- a review of the general site conditions including a description of the site, the subsurface stratigraphy, groundwater conditions, and the presence and condition of fill materials, if encountered;
- allowable bearing capacities for shallow footings;
- settlement estimations, where applicable;
- groundwater considerations; and,
- foundation construction considerations, including: site preparation; shallow foundation excavations; potential reuse of on-site materials; excavation considerations; and fill placement and compaction.

A fault survey is not included in the geotechnical scope of work. Nor does it include conducting test pits at the site.

3.3.2 Surveying

The project surveying will be conducted by Surveying and Mapping, Inc. (SAM). These surveys will include both onshore topographic and boundary surveys as well as a subsurface utilities survey. (Note that an offshore hydrographic survey has not been recommended as part of the base scope of work. It is assumed that the City's prior hydrographic survey from 2004 will be made available and is bathymetry relatively unchanged for purposes of the proposed designs. This will be augmented near the shoreline by the wading depth surveys as described below. However, a cost for the hydrographic survey has been provided by SAM should one be required, but is not included in the budget for this project.) The surveys will be tied in to existing benchmarks and, if necessary, temporary construction benchmarks will be established near the park. The surveying data required to file a State of Texas submerged lands boundary survey (by a License State Lands Surveyor on the SAM team) will also be obtained on the assumption that such a survey will be required to be submitted by the Texas General Land Office. The detailed scope of work for SAM is outlined below.

- Topographic Survey
 - Cross-sections will be taken across the existing revetment at 100-ft centers from top of revetment to toe (maybe in 2 to 3ft of water).

- Every other transect (200-ft centers) will extend to the existing road and as far out as wading depth.
- Subsurface Utility Engineering (Utility Mapping)
 - Quality Level B (QL-B) Designating Service (Horizontal Location of Utilities) – Designating is to indicate, by marking with paint, the presence and approximate horizontal location of subsurface utilities using geophysical prospecting techniques including, without limitations, electromagnetic, sonic and acoustical techniques. SAM, Inc. will provide the following designating services to aid in the design of site, ROW, construction plans or project development plans, or for other purposes as agreed to by the parties. SAM, Inc. will:
 - Provide QL-B for known utilities located within the proposed project area
 - Provide all equipment, personnel and supplies required for performing toning services. SAM, Inc. shall determine which equipment, personnel and supplies are required to perform these toning services.
 - Designate the existing underground utilities within the project area previously described.
 - Conduct appropriate investigation of site conditions.
 - Mark the utilities on the ground, with paint and flags, within the project limits to be surveyed.
 - Analyze and correlate all of the field-collected information with the collected record information for ensuring continuity of the information collected. Resolve conflicts with Level D records information when necessary.
 - Any utility that is found in the field, by use of designating geophysical equipment and is not evident on any collected record information, will be shown in the QL-B utility file as an “unknown” utility as required by ASCE CI 38-02.
 - SAM, Inc. will provide normal traffic control for QL-B services. This includes standard placement of traffic cones, freestanding warning signage and vehicle-mounted traffic directional sign. Traffic control requiring lane closures, traffic detouring, flag persons, police, etc., is considered special traffic control measures. If special traffic control is to be provided by SAM, Inc. this service will be

subcontracted to an approved subcontractor and billed at cost.

- The accuracy of subsurface data can be influenced by factors beyond our control such as conductivity of materials and their surroundings, soil moisture content, proximity of other underground utilities or structures, depth of utility, etc. Therefore, only the accuracy of data obtained by actual physical verification (through vacuum excavation or otherwise) can be guaranteed to applicable engineering and/or surveying standards.
 - Paint markings placed on the ground by SAM, Inc. are to be used for design purposes only and not for construction purposes. The use of QL-B information provided does not relieve any contractor or the City from the duty to comply with applicable utility damage prevention laws and regulations, including, but not limited to, giving notification to utility owners or One-Call centers before excavation. SAM, Inc. will not be responsible for any omission of utility information that is not obtainable via electromagnetic or sonic designating services.
 - Non-metallic piping, inactive electric and/or communication lines may or may not be found by electromagnetic or sonic designating practices. SAM, Inc. does not warrant and/or guarantee that all existing utilities will be found.
- Project Control:
 - SAM, Inc. will establish horizontal and vertical control prior to field data collection activities.
 - SAM, Inc. will utilize Real-Time Kinematic (RTK) GPS for all surveys.
 - All geographic coordinates will be referenced to the North American Datum of NAD 1983 (2011) Texas Coordinate System, South Central Zone.
 - Final elevations will be referenced to the North American Vertical Datum of 1988 (NAVD88) Geoid12A with ties to mean higher high water (MHHW) datum.
 - Survey Deliverables:

- A survey plat (24x36-inch sheets) showing topographic contours, planimetric features, and utilities with locations of cross-sections overlaid.
 - Digital CAD files of the above with a Digital Terrain Model in MicroStation v8i or AutoCAD Civil 3D.
 - If required, a survey plat of an approximate 4-acre parkland tract, in accordance with a Texas Society of Professional Land Surveyors, Category 1B, Condition II, Boundary Survey.
 - If required, a survey plat, depicting the shoreline boundary in accordance with Section 33.136 of the Natural Resources Code, for submittal to the Texas General Land Office.
- Assumptions:
 - The extent of the project shoreline is approximately 3100 ft.
 - All the topographic surveying work will be prepared to allow for future use as a coastal state lands boundary survey (LSLS), in accordance with Section 33.136, Natural Resources Code, if required.
 - Right-of-entry, if needed, will be obtained by the CLIENT.
 - Surveying services outside of the scope of work described will be considered additional services.
 - Hydrographic survey (if needed) will be scheduled during a period forecast as having calm seas and fair winds; however, the survey will not be delayed on condition that safety and data quality are not compromised.

3.3.3 Wetlands Delineation

FNI scientists will document the limits of waters of the U. S. to determine the impacts of the project on these areas for permitting purposes, including mitigation. This information will be used to develop the Wetlands/Waters of the U.S. delineation report which in turn will be appended to the Preliminary Jurisdictional Determination Report. It is likely all impacted waters would be jurisdictional waters and would require authorization from the USACE prior to any activities that would result in the placement of dredged or fill material into these waters. The project team environmental scientists would review the project with the City and the design team to determine potential engineering options for the site as well as the proposed end result of the project.

3.4 Preliminary Design

With a conceptual design chosen by the community and the basic physical environment for the project defined by the field data, Arup will develop the preliminary design of the project. This will include basic design (to approximately 30% design level), permitting assessment, and development of a more accurate cost estimate. The design of the project will inherently have a heavy coastal engineering emphasis; however, other key disciplines will also be involved in the design process, depending on design chosen, including FNI addressing wetland and habitat and Arup's civil engineer addressing utilities and site grading. The design will address the basic dimensions, quantities, and materials in sufficient detail to begin the USACE permitting process.

While the exact design analyses to be conducted cannot be determined until the conceptual design is chosen, in general the Arup team will focus on using available data to the maximum extent possible. It is anticipated that there is sufficient data available from efforts by the USACE and the Federal Emergency Management Agency (FEMA) to provide most needed coastal engineering design parameters. The amount of numerical modeling required for this project is expected to be relatively minimal and project budget developed accordingly.

Design standards will be based on USACE Engineering Manuals, including the Coastal Engineering Manual. The team's knowledge of local contractors, materials, and equipment will be used to help ensure that the design is economically constructible. Depending on the design requirements, local contractors may be surveyed to help develop the constructability analysis and costing for the project.

3.5 Permitting

Permitting for the project will be led by FNI. Once the preliminary design is sufficiently advanced and the environmental team is familiar with the project, a Pre-Application Meeting with the U. S. Army Corps of Engineers (USACE) will be requested. At this meeting the project team would review the project concept, discuss project design, and assess environmental issues potentially associated with the project. This meeting would be arranged upon approval of the client and would include project team's environmental team, the project engineer and, if desired, the City's representative along with the USACE assigned project manager. Secondly, depending on the degree of impacts, a Joint Evaluation Meeting (JEM) may be held. The JEM brings all the regulatory agencies that may have regulatory oversight of the project together to discuss environmental issues and conflicts that may impinge on the project. A key discussion may be the presence of threatened and endangered species in the project area and agency concerns regarding the impact of the project on these species. The objective of these meetings will be to facilitate permitting by identifying issues early in project

development and make design changes or modifications where feasible to reduce project impacts and the mitigation required.

The steps to prepare a permit application and acquire authorization for the project are discussed below.

3.5.1 Permit Application

Once the project design is sufficiently complete to the point where it is not likely to change (normally, at the 30 to 60% design stage), the permit application will be completed for submittal to the USACE. The permit application will be completed and submitted to the USACE for processing and authorization. The permit application will be submitted in standard USACE format (ENG Form 4345) with all appropriate maps, photo graphs, design drawings and supplemental information sheets. The project team would attend any site visits or meetings with the USACE during the permit authorization process. Project team environmental scientists have reviewed the project and believe that the most likely vehicle for this project is an individual permit (IP) or a Letter of Permission (LOP) 1. LOP 1 can be used to permit projects conducted, sponsored, or funded, in whole or in part, by the USACE, U. S. Fish and Wildlife Service (USFWS), U. S. Environmental Protection Agency (EPA), Natural Resources Conservation Service (NRCS), Texas Parks and Wildlife Department (TPWD), Texas Natural Resources Conservation Commission (TNRCC), or the Texas Water Development Board. This project is funded at least in part by the USFWS, so it may be eligible for this permit. In addition, the project team would explore the use of various Nationwide Permits to determine the suitability of these permits for authorization of the project since the time and effort to authorize the project by NWP is considerably less than via an IP or LOP 1. At this time the project team does not believe an NWP could be used for this project but the various options would be reviewed with the USACE. In addition, design changes could be considered that might make the project feasible for authorization under an NWP. FNI assumes that project mitigation would be through the purchase of credits through an approved mitigation bank and that a detailed mitigation plan would not be required.

FNI will submit the draft permit application to the City for review and comment. FNI will finalize the permit application based on the City's comments and then submit it to the USACE.

3.5.2 Environmental Assessment

It is assumed that the project will fall under the CIAP environmental assessment and that only minimal additional coordination with the CIAP environmental team will be required to ensure compliance with the CIAP environmental assessment.

3.5.3 Resource Agency Coordination

The initial task in the preparation of the permit application would be to request a Pre-Application Meeting with the U. S. Army Corps of Engineers (USACE). At this meeting the project team would review the project concept, discuss project design, and assess environmental issues potentially associated with the project. This meeting would be arranged upon approval of the client and would include PROJECT TEAM's environmental team, the project engineer and, if desired, the client's representative along with the USACE assigned project manager. Secondly, depending on the degree of impacts, a Joint Evaluation Meeting (JEM) may be held. The JEM brings all the regulatory agencies that may have regulatory oversight of the project together to discuss environmental issues and conflicts that may impinge on the project. A key discussion may be the presence of threatened and endangered species in the project area and agency concerns regarding the impact of the project on these species. The objective of these meetings will be to facilitate permitting by identifying issues early in project development and make design changes or modifications where feasible to reduce project impacts and the mitigation required.

3.5.4 Public Coordination

FNI will attend one meeting with the Advisory Council and one open house in support of the project Team. A Public Hearing may be required prior to the issuance of the permit to inform the public of the project, obtain public input and comments and make any necessary changes to the project based upon public input. FNI would support the client at the Public Hearing and address comments received during the Public Hearing or during the public comment period.

3.5.5 Excluded Permitting Services

The above scope of work is based on our understanding of the project site, likely design solutions, and typical resource agency requirements; however, during the permitting process additional services may be required by resource agencies. The following permitting and environmental coordination services are not believed to be required and are excluded from the permitting scope of work, but may be provided at additional fee if required by resource agencies:

- Conducting an underwater oyster or other species survey or presence/absence survey.
- Preparation of Environmental Information Document, Environmental Assessment, or an Environmental Impact Statement.
- Meetings or consultation with the USACE or other resource agencies, except as specifically noted in the scope of services.
- Public Hearings beyond those described above as may potentially be required by USACE, including preparing public notices, submitting

notices to local newspaper(s); providing verbatim transcript services, attending the public hearing; and incorporating the hearing record into the EA.

- Presence/absence surveys for federally listed threatened/endangered species.
- Preparation of a mitigation plan to compensate for impacts to waters of the U.S.
- Application to Texas Commission on Environmental Quality for individual 401 Water Quality Certification above normal coordination through the USACE.
- Application for General Land Office easements.
- Application for Texas Parks & Wildlife Department Sand, Gravel, and Marl Permit.
- Additional field investigations or analysis required to respond to public or regulatory agency comments.
- Consultation with the U. S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.
- Cultural resource survey on and adjacent to the project site.
- Expert representation at legal proceedings or at contested hearings.
- Mitigation monitoring if required by permit conditions.
- Monitoring for compliance with permit conditions.
- Assist with the payment of an EID processing fee if levied by the USACE.
- Phase I/II Environmental Site Assessment.
- Stormwater Pollution Prevention Plan.
- Spill Prevention Control and Countermeasures Plan.
- Preparation of an Essential Fish Habitat assessment.

3.6 Final Design

The final detailed design stage of the project will commence as permitting constraints which may affect the design become apparent. A basis of design document will be prepared and reviewed with the City to document and control the key requirements, data, and assumptions underpinning the project. The final design outputs will include a set of plans and specifications which the City can use to bid the construction of the selected shoreline restoration. The plans and specifications will be produced at 60% and 95% design levels for review by the City.

The final design will be based on analyses of the coastal and civil engineering aspects of the project, likely including armor design, dredging and filling, and sediment transport. The final design stage will also include design work and coordination as needed for utilities modifications or relocations, temporary construction facilities and staging areas, and any other ancillary project features – such as potential modifications to the existing fishing pier or boat ramp. All analyses and design work will be documented in a final design memorandum.

During this project stage a design review will be conducted with the City to make sure that all requirements are being met and to keep the City informed as to design issues. This process will be conducted sufficiently in advance of the completion of the design such that input can be incorporated. Internal constructability and permit-ability reviews will be conducted with Arup and FNI personnel to ensure that the design can be permitted with the minimum possible issues and fastest schedule and that it can ultimately be constructed safely and economically.

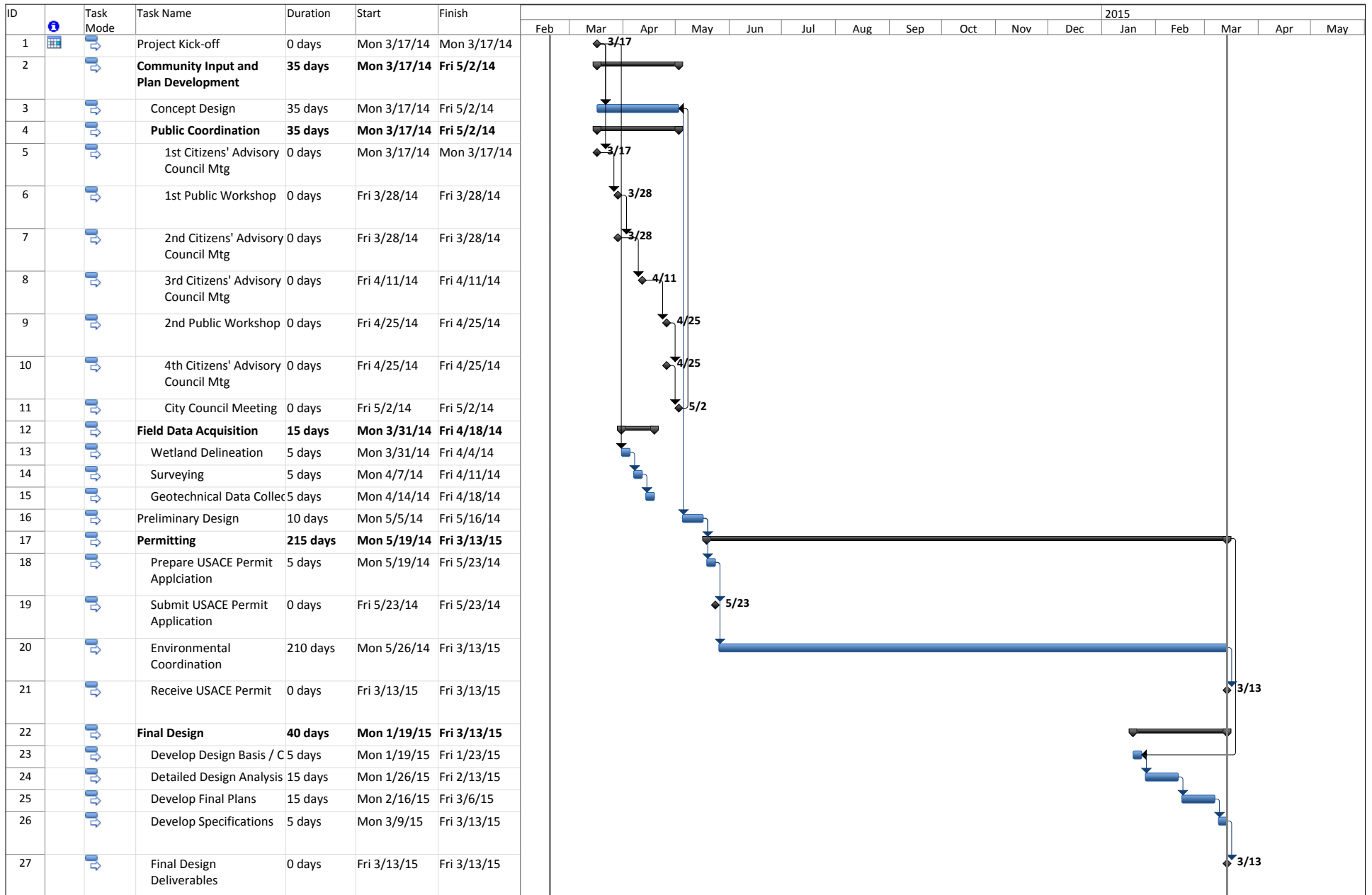
The deliverables from the final design will be a set of design plans and specifications suitable for bidding and construction of the project. Due to the possibility of changes such as storm effects and as the project funding is not immediately clear, it is recommended that the design deliverables remain as 95% complete set to be revised as required after project funding and prior to bidding and construction.

3.7 Coordination Management Systems

Throughout the project, coordination with the City, implementation of Arup's quality control, and maintaining project controls are the keys to a successful project. Arup will maintain coordination with the City through regular meetings, bi-weekly progress reports, and formal coordination at key points during the project. As part of its ISO 9001 quality management, ISO 14001 environmental management, and ISO 18001 health and safety certifications, Arup applies stringent quality, environmental, and health and safety control requirements to all projects, regardless of the size. These controls are part of the fundamental operation of the firm and will be fully applied to the Shoreacres project.

4 Schedule

A proposed project schedule is included in Appendix B. The schedule is based on prompt scheduling of all coordination meeting and decision making by the City and citizens' advisory council. The schedule for the USACE permitting can be highly variable. While the project team will meet USACE deadlines for information requests and coordinate regularly with USACE regulatory personnel, the process is highly dependent upon the experience, timeliness, and workload of USACE staff. The schedule presented is based on the USACE providing a LOP1 for the project rather than an IP. An NWP would require approximately 3 fewer months while an IP may take an additional 3 to 6 months.



Project: Schedule
Date: Tue 2/18/14

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			