



## AMERICAN SAMOA POWER AUTHORITY



### SCOPE OF WORK

## UPPER PAVAI AI TO AOLOAU WW COLLECTION SYSTEM - DESIGN

### I. BACKGROUND

This design project will capture the area from Upper Pavaiai, Mapusagafou, Tafeta and Aoloau. The Mapusagafou and Pavaiai village area is in one of the best watersheds on Tutuila. Relatively large amounts of rainwater recharge occur here. Keeping this abundant source of fresh clean water free of contaminants is a high priority for ASPA, ASG and all the residents of the island of Tutuila.

Over the years ASPA had installed Water Wells within the vicinity of the area and there is a need to protect the underground water from wastewater (WW) contamination. Furthermore, ASPA plans to install more Water Wells in the villages of Mapusagafou and Pavaiai.

The project will focus on the design of a proper and efficient WW collection system to address water quality issues within the area demarcated on the location map below.

### II. PROJECT LOCATION

The project is located within the Central Wastewater Collection System. The project shall capture the upper portion of the village of Pavaiai, the village of Mapusagafou, the Tafeta area and the village of Aoloau shown within the blue boundary in the map below. The map below also shows the existing sewer collection system manholes as red circles located in the lower portion of the village of Pavaiai.



### III. SCOPE OF WORK (SOW)

#### A. GENERAL

1. ASPA has issued this RFP for A/E services from a professional consultant firm with experience in designing sewage pump/lift stations, sewage force mains and gravity flow sewage collection systems. The design shall include all process control, mechanical, electrical, and structural components and related appurtenances to allow the facilities to be functional and operable according to ASPA maintenance and operation capabilities and requirements. Appurtenances shall include but will not necessarily be limited to access facilities, fencing, lighting, water connections and power supply including emergency power. The design shall be in accordance with the Ten State Standards, Wastewater Pollution Control Federation, USEPA or other comparable standards. The proposal shall include all personnel, travel, equipment, supplies, overhead and related costs necessary to complete this SOW.
2. In general the selected firm shall accomplish and connect as many homes in the project area as feasible to a WW collection system by the following: **1)** The WW collection system "Conceptual Drawings" and **2)** The WW collection system "Construction Design, Plans and Specifications".
3. The amount and length of collection system, gravity mains, service laterals, homes to connect, pump/lift stations and sewage force mains are unknown at this time.

- i. The amount and length of the collection system facilities shall be determined by and after the Conceptual Drawings are finalized and approved of by ASPA and EPA.
  4. Once the Conceptual Drawings are complete, the selected firm shall know more precisely the amount, length and approved route of the collection system and its facilities, which the firm shall then take this information, and produce the Land Survey and the Construction Design, Plans and Specifications as explained in section D and E.
  5. For Offerors to bid a cost to produce the Land Survey (section D) and the Construction Design, Plans and Specifications (section E), ASPA understands that the amount and length of collection system and facilities must be given by ASPA.
    - i. Therefore, For Bidding Section D - Land Survey and E – Construction Design, Plans and Specifications, ASPA provides the following amounts and lengths:
      - One lift station similar to the latest constructed lift stations in the village of Aua, with corresponding sewage force main 1000 feet long and with a diameter of 8 inches.
        - The design shall also include measures and components to allow the pumping stations under this RFP to be connected to and monitored by the existing ASPA SCADA System. The design shall be coordinated with the ASPA SCADA technician.
        - If an additional lift station and force main design is required, the firm shall be compensated by using this line item’s interpolated cost. For example, if two lift stations are later required, the selected firm shall use a cost double the bid amount. ASPA will provide this additional cost amount through a Change Order.
      - One mile of 8 inch gravity sewer main within the ASG paved roadway and one mile of 4 inch sewer service laterals connecting to 100 homes.
        - If additional gravity sewer main, service laterals and home connections are required, the firm shall be compensated using this bid line item’s interpolated cost.
    - ii. To cover the costs of additional WW collection system and facilities ASPA will provide a Change Order at that time corresponding to the interpolated bid item costs.
6. ASPA shall provide selected firm with the following:

- i. Schematic maps of the existing central area WW collection system and the Water Distribution system. Accuracy of maps vary. Some maps are accurate to within one foot, and other maps are accurate to within 5 feet. Some of the WW and Water utilities have been surveyed and others not. Selected firm shall verify accuracy of the maps provided.
- ii. If there is any other underground utility, ASPA can assist with obtaining contact information.
- iii. The Utilities Master Plan 2003” (Attached to this RFP). Note, many figures in the 2003 plan are not shown and have been deleted from the 2003 Plan.
- iv. An ASPA staff and contact person, the ASPA Project Engineer, to work closely with the selected firm.
- v. ASPA Wastewater Department documents related to our design standard details and specifications.
- vi. Water consumption information.
- vii. Note, The WW Utility Plan is currently ongoing by JUB Engineers out of Utah. ASPA will provide their contact information. The WW Utility Plan will include WW loading and flow calculations from this collection system project. Therefore, selected firm shall collaborate with JUB and agree on these WW related calculations.
- viii. Right of way (ROW) services.
  - ASPA ROW will be required throughout the conceptual drawings, land survey and design process.
  - ASPA ROW work is critical, because for one, the project covers a relatively large area. There are many different landowners and village councils to deal with. Approximately ninety percent of the land here is communal owned land. The rest is privately owned and government owned land.
  - Once the Conceptual Design/Drawing is complete, the ASPA ROW staff will assist selected firm in gaining access to landowner’s properties to conduct land survey and other necessary field work related to the project design.
  - ROW shall provide the easements signed by landowner to proceed with land survey/design work.

- Any assistance from the ASPA ROW staff throughout the project must be requested at least two days ahead of time.
  - Note, if there are any landowner issues the ASPA ROW must be contacted to handle the situation.
- ix. ASPA Archaeology services.
- After the Conceptual Design is complete the ASPA Archaeology staff can verify which routes are cleared archaeologically and which routes remain to be cleared.
7. At the beginning of the project, the selected firm shall submit a well thought out timeline/schedule of critical task completion milestones with summary descriptions approved by ASPA.
  8. The selected firm shall familiarize itself with the American Samoa Government (ASG), ASPA, the project area (terrain, the villages) and the public wastewater system, the public water system, other nearby utilities and other elements that may have an impact on this project.
  9. The selected firm shall meet regularly with ASPA and the ASPA Project Engineer, at least once a month to discuss project schedule, progress, proposed design and any issues that may arise.
  10. Bid submission indicates familiarity with and acceptance of existing conditions in American Samoa, the project site and at ASPA. No claim for additional compensation will be allowed which is based upon a misunderstanding or lack of knowledge by the Offeror.
  11. The selected firm will develop, as lead by and recommended by their professional Engineer of Record (EOR) conceptual drawings, detailed designs for construction, specifications, cost estimates, SOWs for the Owner for the purpose of Materials Request for Quotes (RFQ), and Construction Bidding documents.

## B. MOBILIZATION AND DEMOBILIZATION

1. The work consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under this design contract. It does not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract.
2. Mobilization shall include all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies and expenses to the site;

permits, premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable; and other items specified in the contract documents.

3. Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.
4. Measurement for payment shall be made as a lump sum (LS). Payment will be made as the work proceeds, after presentation of paid invoices or documentation of direct costs by the contractor showing specific mobilization and demobilization costs and supporting evidence of the charges of suppliers, subcontractors, and others. When the total of such payments is less than the lump sum contract price, the balance remaining will be included in the final contract payment. Payment of the lump sum contract price for mobilization and demobilization will constitute full compensation for completion of the work. Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated in the project, or the purchase costs of operating supplies.

#### C. CONCEPTUAL DRAWINGS

1. The selected firm shall produce Conceptual Drawings (CD) of the recommended collection system route approved by ASPA.
  - i. Selected firm shall prepare CD using digital elevation modeling and our contour T-Maps of the area.
  - ii. The CD preparation will probably go through three reviews (back and forth) between firm and ASPA before selecting the final CD.
  - iii. The CD shall minimize use of pump/lift stations with force mains and maximize the use of gravity flow sewer mains with manholes.
  - iv. The CD shall include: 1) A map – a clear aerial imagery view of the proposed collection system route, 2) rough/conceptual-level, plan and profile sheets, 3) approximate materials and construction cost, and 4) the approximate operations and maintenance cost.
  - v. Note, the main vehicle roadway is the government ASG property therefore right of way issues are minimized.

- vi. The CD shall assess two collection system route alternatives and from these two select the recommended route. This process of selecting the recommended route shall be explained in a 3 page report. The key assumptions and reasoning behind the recommended report shall include but it is not limited to the following:
  - demographic data
  - Buildings and homes location
  - approximate land ownership locations and village boundaries
  - physical, biological, economic and social environments
  - existing WW collection system and their locations
  - wastewater characteristics
  - regulatory requirements
  - cost estimates
  - environmental impacts and recommended mitigation
2. The ASPA ROW staff will use the CD to obtain village and landowner access approval to the recommended approximate location of the collection system route.
  - i. Note, it will take about three weeks for ASPA ROW to collect the first large batch of landowner access approvals.
  - ii. After this, the selected firm can begin their land survey for design purposes.
3. The ASPA Archaeology staff want to be kept informed of any proposed collection system routes and they will use the CD to verify which routes are cleared archaeologically and which routes remain to be cleared.
  - i. This work by ASPA Archaeology staff will take about two weeks to complete.
4. Note, ASPA ROW and Archaeology may recommend CD re-routing in some areas, which the selected firm shall take into consideration and then determine alternate routes.

#### D. LAND SURVEY

1. The selected firm will be doing detailed topographic survey, civil 3d database and GIS shape files for the project sites that will affect the generation of the hydraulic calculations and construction designs.
2. This section shall cover the complete costs of providing all labor, equipment and materials required to complete all survey work needed for the design required under this SOW. It shall be the selected firm's responsibility to have a Registered Surveyor and to coordinate and work with ASPA's Survey Department to make sure all survey output is in conformance to ASPA's survey standards, standard datum and coordinates and compatible with ASPA Survey's software, Traverse PC.
3. Limited Potholing: The selected firm shall perform five (5) exploratory excavations as required to collect schematic map and as-built information to verify the depth, location, alignment, size, and material of existing underground utilities or structures. Locate the existing utility, verify the required information, backfill the excavation, and restore the surfacing equal or better condition, suitable for traffic (if along roadway) as required by DPS/DPW. The firm shall waive ASPA from any liabilities resulting from inaccuracy and poor data gathering required under this section. Any damages to existing utilities during potholing is paid by the firm. The selected firm shall secure the DPW/DPS Permit to Perform potholing work in ASG roadway ROW.
4. Other utilities and structures: The survey shall also include but not limited to all existing underground utilities, storm drains, bridge/stream crossings, existing asphalt/concrete pavement, sidewalk, curb & gutter, gravel driveway, fences, rock wall, plants/grass, trees, power/communication line and pole and all structures that may be affected during installation of WW mains and service lines. Survey includes survey of potholing locations.
5. Database: The survey shall also include raw data in Excel format containing survey descriptions such as but not limited to; UniqueID, X-coordinate, Y-coordinate, Z-coordinate, Description and Size, etc.
6. The firm shall provide a comprehensive land survey to fully describe the physical environment and each business, building, home, septic tank, and cesspools.

#### E. CONSTRUCTION DESIGN, PLANS AND SPECIFICATIONS

1. Based on the thorough land survey and using ancillary data available for water use patterns and quantities, a water use and wastewater flow estimate shall be developed in collaboration with JUB Engineers who are currently preparing the WW Utility Plan. The current and future water use and wastewater flow estimate shall be projected out to 20 years in the future.



2. Construction Design and Plans: Detailed design engineering/architectural drawings for construction will be prepared for all facilities under this RFP. All drawings shall be prepared in accordance with Standard US Industry Practices for civil, structural, electrical, mechanical, highway, and environmental engineering design. The drawings shall include but not necessarily be limited to plan and profile sheets, site layouts, engineering data, material takeoff lists, observed geotechnical findings, hydraulic and energy profiles, hydraulic model, schematics, process diagrams and descriptions, standard details, and electrical schematics and one-line diagrams. Design drawing shall include connection to existing mains, tie-in scheme, relevant specific details and the tie-in steps/methods.
3. Specifications: Technical Specifications shall be prepared for all items to be designed and/or included in the Invitation for Bid for Design Contracts for the facilities and/or infrastructures developed under this SOW. The construction specifications shall be prepared according to the most recent Construction Standards Institute (CSI) format. In addition, any special conditions that must be addressed or followed in order to construct the facilities shall be identified in specifications
4. Construction Bid Form/Schedule: Once the Construction Design Plan is substantially completed, a draft Construction Bid Form/Schedule shall be prepared that includes all pertinent items included in the construction plans and specifications. The Construction Bid Form/Schedule shall be prepared for a unit cost, firm fixed-price contract and allow ASPA to utilize it as the basis for a construction contract for the facilities designed under this RFP.
5. Schedule: Design work activities/tasks, as provided by the A&E Firm in their proposal, shall be appropriately highlighted in the schedule.
6. Erosion Control and Drainage: Erosion control and drainage measures and facilities shall be included in the design including drainage structures, retaining walls, pipe dams, stream bed protection and other elements that will ensure erosion control and drainage is accomplished according to best management practices applied for similar projects or infrastructure.
7. General Surface Observational and Historical Geotechnical Analysis: The selected Firm shall conduct a general surface observational and historical geotechnical analysis of selected areas along the proposed collection system (along with service lines) route to allow general determination of soil conditions, including presence of rock, and the impact of findings on design, construction and maintenance, presence of groundwater. Based on the findings, the analysis will briefly explain in two pages, and firm shall incorporate the general geotechnical considerations into the construction cost estimate.
8. Restoration and Repair: The design shall include all necessary restoration and/or repair for existing paved roads, utilities, driveways, curbs, sidewalks, walls, fences and other

infrastructure that may need to be removed and/or replaced and conduct the work as set forth in the project scope of work. Lawns, gardens and other items that may pose an obstruction will be included in restoration. For reference on specifications, test protocols, and guidelines, refer to the latest and most current edition of the American Association of State Highway and Transportation Officials (AASHTO) Manual– A Policy on Geometric Designs of Highway and Streets – also known as the “Green Book”.

9. Engineer’s Cost Estimates: Once the Design Plan is substantially completed, a detailed engineer’s cost estimates shall be prepared in accordance with the items included in the draft construction bid form/schedule that conforms to applicable industry standards such as RS Means Estimating Manuals and Guidelines. Appropriate indexes that account for inflation and other factors that are pertinent to American Samoa including special logistical constraints are to be included. A&E firm shall also provide a Material List of all materials required to complete construction to allow ASPA to utilize it for a Request for Quotes (RFQ). Cost estimates shall include capital costs, annual O&M costs, annual O&M costs per 1000 gallons WW.
10. Value Engineering: In accordance with USEPA Federal Funding Requirements, a Value Engineering Analysis (VEA) shall be completed for the facilities to be designed and upgraded. The VEA will strive to ensure the design results in maximum cost efficiency for operation and maintenance of the facilities.
11. Design Calculations: Provide engineering analysis (structural, geotechnical, hydrological and hydraulic (H&H), etc.) and design calculations for all and every infrastructure necessary to complete the requirement of this scope of work such as but not limited to: concrete encasement, reinforce concrete jacket, pavement design, thrust block, pipe support/hangers, box culvert, concrete vault, gratings, pipe bedding, pipe buoyancy protection and as requested by ASPA.
12. Design Presentations: Selected firm shall provide five presentations, one of the 30% CD, the second on the final CD, the third on the 30% design, the fourth on the 60% design, the fifth on the 90% design. After each presentation firm shall incorporate review comments from ASPA into the next updated design draft.
13. Septic Tank and Cess Pool Decommissioning: Design shall include a detail showing septic tank and cess pool decommissioning.
14. Offeror shall provide one Post Design presentation of the final ASPA approved Design.
  - i. The presentation is for the ASPA Executive Director, and engineering staff for up to 15 people.
  - ii. The presentation shall last up to 2 hours, first half to provide a clear explanation of the design and its highlights and the second half to include a question and

answer period. Presentation/workshop can be “in person” or by video conference including an agenda and hands on use of the report.

- iii. Presentation shall be conducted by the Firm’s main contributors to the design as well as the professional licensed staff who approved the report. The goal is for the audience to thoroughly understand the design, the design’s analysis of the ASPA WW System, recommended routes and it’s facilities and associated implementation impacts and related topics.

15. Minimum Deliverables:

- i. Note, the selected firm shall keep design, project documents, and report sections sized 20MB or less to make emailing sections of the report easier.
- ii. Detailed Architectural and Engineering Construction Plans on 24” x 36” Bond Paper stamped by a U.S. Registered Professional Engineer (EOR) or Registered Architect (RA) for all pertinent items within the SOW as required.
- iii. A 3 to 5 page summary of Design with schematics.
- iv. A Value Engineering Analysis for the completed design stamped by EOR as required.
- v. A Bid Schedule for finite components of the system and facility upgrades, and significant tasks within the SOW.
- vi. A detailed cost estimate for all items in the Bid Schedule including direct cost, overhead, contingencies, profit, bonding and shipping;
- vii. A schedule for provision of the deliverables by the Consultant to ASPA in Gantt and PERT Chart formats.
- viii. Conceptual drawings, engineered and EOR stamped documents related to the design such as hydraulic modeling report, value-engineering analysis, calculations, technical specifications and standards.
- ix. Detailed technical specifications, stamped by a registered US Registered Professional Engineer as mentioned above.
- x. An Operations Plan outlining methods and means by which the facilities will be operated and maintained within the resources and/or capabilities of ASPA.
- xi. Operation and Maintenance manuals addressing all mechanical, process and control components for the pump/lift stations.
- xii. Milestone schedule and timeline to completion with summary descriptions. Updated at least every couple months.

- xiii. Post report presentation on PowerPoint slides, summary and agenda.
- xiv. Three (3) hard bound copies and electronic copies (i.e. AutoCAD, pdf, Excel spreadsheet, ArcGIS) of report, summary, maps, tables, figures and all deliverables.
- xv. Other items as necessary/required.

16. The design shall be submitted in logical increments similar to the following:

- i. Milestone schedule and timeline
- ii. 30% submittal
- iii. 60% submittal
- iv. 90% submittal
- v. Final draft submittal. Final report is complete once ASPA and USEPA approves of and signs Final submittal.
- vi. Each submittal will be followed by an ASPA review with comments within 20 calendar days. These comments shall be addressed and incorporated into the next submittal if recommended. Also, an ASPA comment and selected firm response list shall be maintained and shared with ASPA.