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NUUULI AC PIPE REPLACEMENT PROJECT – DESIGN PHASE

SCOPE OF WORK

This project will insure these AC pipes in Nuuuli which are brittle and leaking a lot of water, and pose a safety and health threat, are replaced. The Project will also improve the water pressure in Nuuuli and other areas in the Central Water System and assure protection of drinking water from contaminant intrusion into the system and sustain safe, quality drinking water for the community as well as staying in compliance with requirements by EPA.

June 2021

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Section 1: General

1. The American Samoa Power Authority issues this Request for Proposal for A/E services from a professional consultant with experience in designing Water Distribution systems. The design shall include all components and related appurtenances to allow the new mainlines to be functional and operable according to ASPA maintenance and operation capabilities and requirements. Appurtenances shall include but will not necessarily be limited to gate valves, ARVs, blow-off valves, PRVs, fire hydrants, flow meters and flow control valves. The design shall be in accordance with Ten States Standards, Wastewater Pollution Control Federation, USEPA, or other comparable standards.
2. The selected A&E firm will be doing detailed topographic survey, raster imaging, civil 3d database and GIS shapefiles for existing utility lines, fittings, appurtenances, structures and other features that will affect the generation of hydraulic model and construction design, that was missed by the ASPA Survey.
3. The selected A&E firm will develop detailed designs, specifications, drawings, cost estimate and the Scope of Work for the Owner for the purpose of Materials Request for Quotes, Construction Bidding and for USEPA approval.
4. The selected A&E firm will provide designs and work methods that ensures minimum disruption to the daily operation of the water system during the construction phase
5. The selected A&E firm will provide cost estimates for design, materials and construction, taking into account available funding for the project.
6. The selected A&E firm shall secure all necessary permits (Local & Federal) required during bidding, construction and operation.
7. The selected A&E firm will provide services needed during the planning, executing, monitoring and controlling and closing of the construction phase.
8. The selected A&E firm shall conduct a series of meetings with ASPA during the scope definition phase of the project to fully understand the specific project elements and to define the basic requirements for each of the project scope elements.
9. Whether or not it is expressly stated, the A&E firm shall be responsible for the performance of any work that is either incidental to, or a prerequisite for, any of the tasks or services identified herein. Furthermore, the A&E firm shall be responsible for performing tasks and services that may not be specifically identified herein, but are clearly included in the intent of this SOW. Wherever in this SOW a task is described, without specifically stating who is responsible for performing said task, it shall be implicit that the responsibility for the completion of the work is that of the A&E engineer.
10. Offeror's due diligence shall include an understanding of what data and services ASPA will provide. For this design phase ASPA ESD, ROW, Archaeology and Survey Divisions will provide the following:
    - The Section 106 permit related documents
    - Archeological services to assist with obtaining Section 106 permit requirements
    - Right of Way (ROW) services to assist with obtaining engineers and surveyors access to project site and their services to obtain Land Use Permit (LUP)

- ROW services to advertise project to the public and to conduct a public hearing if desired by the village
- ESD will provide the LUP permit related documents
- Survey Division will provide the 90% complete land survey of project site
- Existing water system drawings as available
- Hydraulic analysis data as available
- ASPA Water System Requirements and Specifications as minimum
- Other available data and materials as requested by Design Contractor if available

Section 2: Project Location

The project is located in the Nuuuli area along the main road between Manumalo Baptist School and the Coconut Point intersection as shown below.

Project Area Map: (pipe to replace is highlighted)

Section 3: Inspection of Work Site

1. The selected A&E firm is expected to visit and thoroughly inspect the Project Site and become familiar with field conditions including accessibility and physical obstructions.
2. Familiarize itself with the survey, including the location of all existing buildings, utilities, conditions, street, equipment, components and other attributes having or likely to have an impact on the Project;
3. Bid submission indicates familiarity with, and acceptance of, field conditions.

No claim for additional compensation will be allowed which is based upon a misunderstanding or lack of knowledge, examination, inspection and/or testing of any of the above items by the Offeror.

Section 4: Mobilization and Demobilization.

The work consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. It does not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract.

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.

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.

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.

Section 5: Temporary Facilities and Controls

The work shall consist of Temporary facilities and the necessary controls for the project including utilities, telephone, sanitary facilities, field office conducive to site meetings, storage sheds and building, safety requirements, first aid equipment, fire protection, security measures, protection of the Work and property, access roads and parking, environmental controls, disposal of trash, debris, and excavated material, pest and rodent control, water runoff and erosion control.

Measurement for payment shall be made as a lump sum (LS). Full compensation includes a lump sum cost for all equipment, labor, and materials. Payment will be made as the work proceeds, after presentation of paid invoices or documentation of direct costs by the contractor showing specific 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 will constitute full compensation for completion of the work

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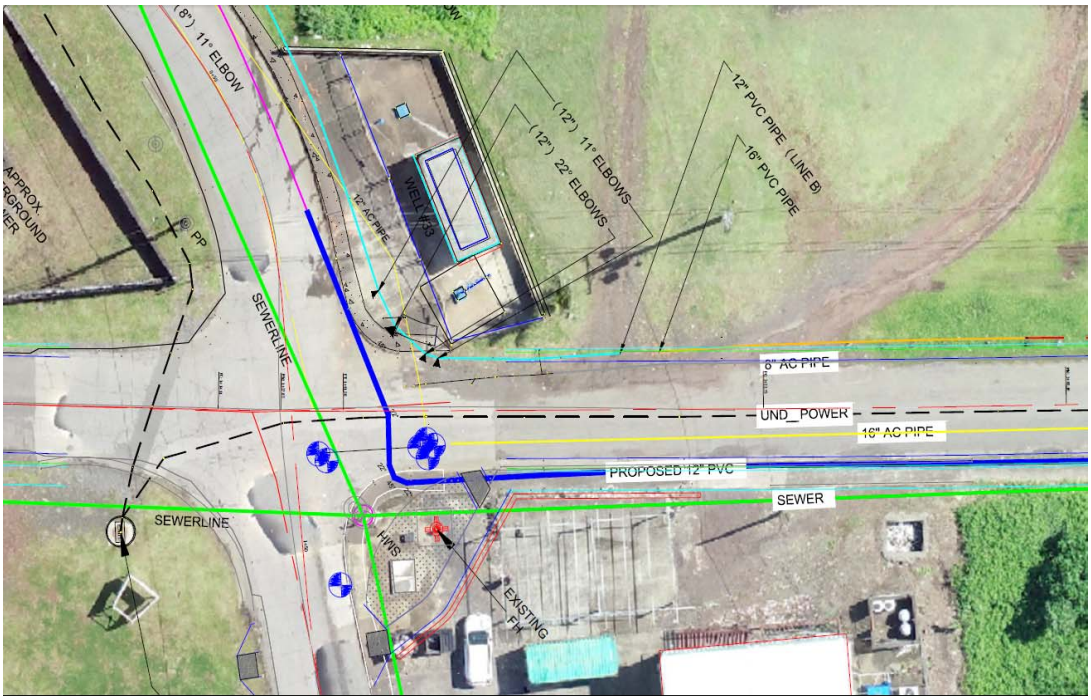
Section 6: Survey

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 A&E 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. As mentioned above, ASPA Survey Department has completed approximately 90% of the land topographic survey of the project area.

1. **Potholing**. The selected A&E firm shall perform exploratory excavations as required to collect 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 as required by DPS/DPW. The A&E 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 A&E firm.
2. **Existing Utilities**. Data needed for the design and analysis of the water distribution system shall not be limited to survey of all existing water Pipes (transmission, distribution & service lines) in the project site area, and knowledge of all Water Sources (Wells & Booster pumps), Water Storage (Tanks), Demand (all water meters, fire hydrants), appurtenances (valves, PRVS/PSV, etc.) connected to the waterline within the same water system as this project.
3. **Other utilities and structures**. The survey shall also include but not limited to all existing storm drains, bridge/stream crossings, sewer, 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 water mains and service lines.
4. **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..
5. **Basemap:** The survey shall also include basemap images (see sample raster image below) clear enough to identify existing water meters on the ground. It shall be properly projected to the same coordinates used in the development of the design. It must be submitted in CAD and GIS format.

Measurement for payment shall be made as a lump sum (LS). Full compensation includes a lump sum cost for all equipment, labor, and materials. Payment will be made as the work proceeds, after presentation of paid invoices or documentation of direct costs by the contractor showing specific 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 will constitute full compensation for completion of the work. Poor data gathering required under this section resulting in additional cost during the construction phase will be charged to the selected A&E firm.



Sample Overlay Raster Image

Section 7: Hydraulic Analysis and System of Operation

This section shall cover the complete costs of providing all labor, equipment, software and materials required under this SOW.

A. Objective: The Hydraulic Model required under this SOW aims to provide ASPA a relevant information needed in Planning, System Design, Operations and Water Quality (refer to table summary below).

Planning	System Design	Operations	Water Quality
Capital Projects	Fire Flows	Training	Tracing
Mains Rehabilitation	Control Valve	Troubleshooting	Water Age
Conservation	Tank Sizing	Water Loss	Chlorine
Tank Siting	Pump Stations	Emergency	Control

		Planning	
	Design Flow / Pressure	Supply/Storage Management	Monitoring
	Pressure Zones	Calibration	
		Flushing	
		Energy Use	

B. Software: ASPA's only license modelling software is Infowater Pro hence it is ASPA's recommendation to utilize the same software to complete the requirement under this SOW. The selected A&E must have EOR with a minimum of 1 year experience using the Infowater software knowledgeable enough for the successful water model.

C. Code/Standard: The model must conform to AWWA Manual of Water Supply Practices "M32" Computer Modeling of Water Distribution System. Water Model Report must discuss the following required data but not limited to; Introduction of the System Model, Described the process of Building and Preparing the Model, Hydraulic Tests and Measurement, Hydraulic Calibration, Steady-State Simulation, Extended Period Simulation, Water Quality Modeling, Storage Tank Mixing and Water Age, Model maintenance, Transient Analysis and Advance Modeling Applications such as Asset Management, Energy and Optimization.

D. Model Scenarios: Several scenarios must be created for this project to simulate system performance with different system demands and operational settings.

- ➢ SCENARIO #1: Existing System and Operation base on ADD
- ➢ SCENARIO #2: Existing System and Operation base on MDD
- ➢ SCENARIO #3: Existing System and Operation base on MDD plus Fire Flow Demand
- ➢ SCENARIO #4: Proposed System and Operation base on ADD
- ➢ SCENARIO #5: Proposed System and Operation base on MDD
- ➢ SCENARIO #6: Proposed System and Operation base on MDD plus Fire Flow Demand

E. Water Demand: This section includes a description of how the water demands were developed for use in evaluating the water system and includes a description for existing and future development. A description of how these demands were allocated in the computer model and to be used in planning the needed upgrade to the system. A proper allocation and accounting of consumer water system demands is crucial to the development of an accurate hydraulic model.

F. Fire Flow: This section includes a description of how the fire flow demands were used in evaluating the water system and includes a description for existing and future development. All fire flow criteria must be based on this document and/or must conform to ASG fire department

Fire Flow Demand Criteria	
Customer Class/Land use	Required fire demand*
1 - Single family residential	1,000 gpm, 1-hour duration
2 - Multi-family residential	2,500 gpm, 2-hour duration
3 - Commercial/industrial/institutional	3,500 gpm, 3-hour duration
*required fire demand while maintaining 20 psi residual pressure.	

G. Supply Criteria

Supply Criteria			
Criterion		**Value/description**	**Reference, if applicable**
Capacity	Flow rate	Equal to average of MDD	WSC, 2012
Reliability	Power Supply	At least two independent power sources or a standby/auxiliary source should be provided (e.g. generator)	WSC, 2012

H. Piping Criteria: Identify existing pipes that are inadequately sized, determine the appropriate size for future piping improvements and identify pipes that should be relocated or extended for reliability purposes.

Pipe Criteria			
Criterion		**Value / description**	**Reference, if applicable**
Diameter	Required size (for mains)	As calculated based on flow demand to satisfy pressure, velocity, and head loss requirements listed below. Should not be smaller than 6 inches.	(WSC, 2012)
System	Maximum	100 psi	(WSC,

Pressure	Minimum working pressure	35 psi	2012)
	Minimum under any demand condition including fire	20 psi	
	Nominal working pressure	40 to 80 psi	
Velocity	Maximum for MDD	5 fps	
	Maximum PHD or fire flow	10 fps	
Reliability	Distribution system pipe	Dead ends should be minimized by looping	(WSC, 2012)
Location	Transmission & Distribution	Water mains should be installed in public streets or other public access ways wherever possible. Existing water lines that are in easements and/or right-of- ways in alleyways or behind houses/buildings will be relocated wherever feasible.	ASPA ROW

I. **Pump Station Criteria:** Identify existing pumping stations that are inadequately sized, determine the appropriate size for future improvements base on the criteria below;

Pump Criteria			
Criterion		**Value / description**	**Reference, if applicable**
Minimum capacity	Booster	Average of MDD	(WSC, 2012)
	Closed-loop	MDD plus fire flow demand	
Reliability	Redundancy	Areas served by pumps should have a minimum of two supply pumps	(WSC, 2012)
	Redundant pump sizing	Pumps should be sized to meet the minimum capacity requirement with the largest pump out of service (redundant fire pumps are not necessary)	

	Power supply	At least two independent power sources or a standby/auxiliary source (e.g., generator) should be provided	
	Suction tanks	Wherever possible, booster pumps shall take suction from tanks and reservoirs to avoid the potential for negative pressures on the suction line which can result when the pump suction is directly connected to a distribution main	
Operations	Minimum suction pressure	Pumps that take suction from distribution mains for the purpose of serving areas of higher elevation shall be provided with a low-pressure cutoff switch on the suction side set at no less than 20 psi	ASPA
	Control settings	Adequate range shall be provided between high-/low-pressure or tank level settings to prevent excessive cycling of the pump	

J. Storage Criteria: Identify existing water storage that are inadequately sized, determine the appropriate size for future improvements base on the criteria below;

Storage Criteria			
Criterion		**Value / description**	**Reference, if applicable**
Capacity	Fire	Highest fire demand	ASEPA
	Emergency	1.5 days x ADD	

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in the final contract payment. Payment of the lump sum contract price will constitute full compensation for completion of the work

Section 8: Design, Plans & Specs and other requirements

This section shall cover the complete costs of providing all labor, equipment and materials required under this SOW. It shall be the selected A&E firm's responsibility to have a Registered Civil Engineer for civil design, Structural Engineer for structural design and/or as required.

A. **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 to install the facilities designed and to be constructed under this RFP. Lawns, gardens and other items that may pose an obstruction will be included in restoration.
B. **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.
C. **Traffic Control Plan:** A traffic control plan shall be prepared in accordance with American Samoa Department of Public Safety requirements and guidelines similar or equal to those issued by the U.S. Federal Highway Administration. The plan will minimize disruptions to traffic and identify the most suitable detours with identification of land ownership.
D. **Schedule:** The schedule shall include all tasks required to design, construct and commission the facilities. Tasks shall include but not necessarily be limited to acquisition of funding, rights-of-way and permits, procurement, design reviews and testing. The schedule shall be presented in both Gantt and PERT Chart formats. Design tasks, as provided by the Offeror in their proposal, shall be appropriately highlighted in the schedule presentation.
E. **Construction Plans:** Detailed engineering/architectural drawings for construction will be prepared for all facilities designed 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, geotechnical profile logs, hydraulic and energy profiles, hydraulic model, schematics, process diagrams and descriptions, standard details, and electrical schematics and one-line diagrams.
F. **Specifications:** Technical Specifications shall be prepared for all items to be constructed and/or or included in the Invitation for Bid for Construction Contract for the facilities designed under this RFP. The 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 will be outlined in a separate draft contract document entitled "Special Conditions"

G. Construction Plans Submittal Schedule: A&E Firm shall incorporate a construction plan submittal schedule similar to this one on their bid proposal. Preliminary 30% Construction Plans submitted no later than **40** calendar days after project Notice To Proceed (NTP) and submittal shall include the substantial completion of the Hydraulic Analysis. ASPA Review completed no later than **25** calendar days after submission of Preliminary Construction Plans.

60% Construction Plans submitted no later than **35** calendar days after ASPA's first plan review is completed and returned to Design Contractor and after the completion of the Hydraulic Analysis.

ASPA Review completed no later than **25** calendar days after submission of 60% Construction Plans.

Work on Construction Plan Documents shall continue during the review and once Construction Plan review comments are received they shall be addressed and incorporated in the Construction Documents.

100% Draft Construction Plans and written responses to the ASPA Review Comments submitted no later than **35** calendar days after submission of ASPA's second review to A&E Firm.

ASPA Review completed no later than **20** calendar days after receipt of 100% Draft Construction Plans.

Complete Stamped and Signed Design Construction Plan Documents and written responses to the ASPA 100% Draft Construction Plan review comments submitted no later than **20** calendar days after receipt of ASPA 100% Draft Design Construction Plan review comments.

H. Construction Bid Form/Schedule: Once the Construction 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.

I. Engineer's Cost Estimates: Once the Construction 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).

J. Value Engineering: In accordance with USEPA Federal Funding requirements, a Value Engineering Analysis (VEA) will 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.

K. **Design Calculations:** Provide structural analysis and design calculations for all and every structures necessary to complete the requirement of this SOW 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 needed and requested by ASPA.

Measurement for payment shall be made as a lump sum (LS). Full compensation includes a lump sum cost for all equipment, labor and materials. Payment will be made as the work proceeds, after presentation of paid invoices or documentation of direct costs by the contractor showing specific 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 will constitute full compensation for completion of the work.

Section 9: Project Management Support

This section shall cover the complete costs of providing all labor, equipment and materials required under this scope of work;

A. **Bidding and Negotiation (ASPA Procurement Rules limit these activities):** Assist with the Materials Request for Quotes (RFQ) preparation for the construction phase. Review the construction Request for Proposals (RFP) bid provided by ASPA. Attend construction pre-bid meetings, bid clarification meetings (as necessary) and pre-award meetings.

B. Construction Administration: Provide construction administration services including, but not limited to review and respond to Request for Information (RFI's), bulletins, change orders, submittal and shop drawing review, punch lists, etc. Provide additional design drawings as needed. Perform job site visits at regular intervals, but no less than twice a month, to evaluate adherence to project plans and specifications. Assist in resolving field problems and disputes in the most economical and expeditious manner possible. Review as-built drawings from the General Contractor once 50% of construction is complete. Review and approve of the final as-built drawing information from the General Contractor at the end of the project verifying accuracy.

Measurement for payment shall be made as a lump sum (LS). Full compensation includes a lump sum cost for all equipment, labor and materials. Payment will be made as the work proceeds, after presentation of paid invoices or documentation of direct costs by the contractor showing specific 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 will constitute full compensation for completion of the work

Section 10: Permits

This section shall cover the complete costs of providing all labor, equipment and materials required to assist with answering technical questions from Federal and Local authorities including ASPA. If required the A&E architect /engineer shall attend and participate in approximately 3 meetings necessary to satisfy Federal, Local and ASPA requirements, such as the Land Use Permit hearing meeting and site visit meeting.

Measurement for payment shall be made as a lump sum (LS). Full compensation includes a lump sum cost for all equipment, labor and materials. Payment will be made as the work proceeds, after presentation of paid invoices or documentation of direct costs by the contractor showing specific 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 will constitute full compensation for completion of the work.

Section 11: DELIVERABLES

This section shall cover the complete costs of providing all labor, equipment and materials required to under this SOW;

1. Hydraulic analysis and system operation report duly stamped by the Engineer of record (EOR).
2. Design calculations duly stamped by the Engineer of record (EOR).
3. Detailed Architectural and Engineering Construction Plans on 24" x 36" Bond Paper stamped by a U.S. Registered Professional Engineer (EOR) for all pertinent items within the SOW.
4. Detailed technical specifications, stamped by EOR for all items included in the Bid Schedule, in the Construction Standards Institute (CSI) 2000 format.
5. A Value Engineering Analysis for the completed design stamped by EOR
6. A Bid Schedule for finite components of the system and facility upgrades, and significant tasks within the SOW.
7. A detailed cost estimate for all items in the Bid Schedule including direct cost, overhead, contingencies, profit and bonding.
8. A schedule for provision of the deliverables by the Consultant to ASPA in Gantt and PERT Chart formats.
9. Copy of approved Permits per federal and local agency requirements.
10. Traffic Control Plan
11. Provide five (5) hard bound copies and electronic copies (autocad, pdf, spreadsheet) of all deliverables

No measurement of payment is to be made for this section hence it is incidental to the project.