HAWAII DEPARTMENT OF TRANPORTATION, HIGHWAYS DIVISION (HDOT-HWY)
SUBSURFACE UTILITY ENGINEERING (SUE) PROCEDURES

General

HDOT-HWY shall follow the Quality Level (QL) guidelines in the Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data (CI/ASCE 38-02) and FHWA guidance (Attachment 1).

I. Project Scoping/Pre-Design Phase

1) Determine preliminary scope of project by work type/construction activity (i.e. Hot Mix Asphalt Resurfacing Mill and Fill, Hot Mix Asphalt Base Course Reconstruction of Weakened Pavement Areas, Signing, Guardrail, Drainage Improvements, Bridge Structures, etc.). Check Project Work Type SUE Levels Chart (See Attachment 2). Note: Quality Levels do not need to be carried out throughout the entire project limits. For example, for a resurfacing project with drainage and bridge endpost upgrade work, QL-A or QL-B may be implemented only in the vicinity of the drainage work/bridge endpost upgrades etc., while QL-C may be used throughout the rest of the project limits.

2) Conduct topographic survey for QL-C or higher to verify the locations of manholes, valve boxes, etc.

3) For Consultant designed PS&E or Design-Build (DB) contract projects, include SUE consultant designed scope of work in contract. Consultants/DB Contractor shall perform subsurface utility engineering to determine the locations of the existing utilities within the project limits during the design phase. Refer to Attachment 1 for details on the Quality Levels for SUE. Refer to Attachment 3 for SUE scope of work. The Consultant shall follow the SUE level requirements by work type listed as described in Item I.1).

II. Pre-Design Phase/60% Design Phase

1) Finalize scope of project by work type/construction activity.

2) For PS&E and DB Contract projects, at minimum perform SUE QL-D by contacting the various utility companies (including the military) to determine if they have utilities that will be affected by the subject project (See PDM Section 5.8). When required by work type, use the information obtained from the utility companies and existing roadway base plans to perform QL-C and plot on project base plans.

3) For In-House designed projects requiring QL-B or QL-A, use IDIQ SUE contract to perform the necessary investigation. Refer to Attachment 2 Scope of Work for SUE. Generally, QL-B information is initially required. QL-A may be required depending on what is found.

4) For maintenance projects conducted by the District offices, consider the work type and use engineering judgement to determine the appropriate SUE level required.

III. 60% Design Phase/90% Design Phase

1) Include the results of the QL-D/QL-C/QL-B in the project base plans. In-house designers will examine design conflicts and determine if redesign or utility relocation are required. Consultant designers will examine design conflicts and consult with HDOT project manager if redesign or utility relocation are feasible.

2) If more information is required for design or utility relocation, request IDIQ SUE contract QL-A for in-house designed projects. For Consultant designed projects, perform QL-A per Consultant design scope of work.

3) Redesign to avoid or relocate utility as necessary.

IV. 90/100% Design Phase

1) Include the results of the QL-A in the project base plans. Include QL-A testing information (test hole locations and depths, etc.) on the construction plans and in the bid package.

V. Construction Phase

1) Designer may provide QL-B and QL-A information to Construction staff (Electronic format or hard copy).

Attachment 1

FHWA guidance identifies four quality levels for SUE. Each of the four quality levels is described as follows:

- Quality Level D. QL-D is the most basic level of information for utility locations. It comes solely from existing utility records or verbal recollections, both typically unreliable sources. It may provide an overall "feel" for the congestion of utilities, but is often highly limited in terms of comprehensiveness and accuracy. QL-D is useful primarily for project planning and route selection activities.

- Quality Level C. QL-C is probably the most commonly used level of information. It involves surveying visible utility facilities (e.g., manholes, valve boxes, etc.) and correlating this information with existing utility records (QL-D information). When using this information, it is not unusual to find that many underground utilities have been either omitted or erroneously plotted. Its usefulness, therefore, is primarily on rural projects where utilities are not prevalent or are not too expensive to repair or relocate.

- Quality Level B. QL-B involves the application of appropriate surface geophysical methods to determine the existence and horizontal position of virtually all utilities within the project limits. This activity is called "designating". The information obtained in this manner is surveyed to project control. It addresses problems caused by inaccurate utility records, abandoned or unrecorded facilities, and lost references. The proper selection and application of surface geophysical techniques for achieving QL-B data is critical. Information provided by QL-B can enable the accomplishment of preliminary engineering goals. Decisions regarding location of storm drainage systems, footers, foundations and other design features can be made to successfully avoid conflicts with existing utilities. Slight adjustments in design can produce substantial cost savings by eliminating utility relocations.

- Quality Level A. QL-A, also known as "locating", is the highest level of accuracy presently available and involves the full use of the subsurface utility engineering services. It provides information for the precise plan and profile mapping of underground utilities through the nondestructive exposure of underground utilities, and also provides the type, size, condition, material and other characteristics of underground features.

Attachment 2

Type of Work	Quality Level Required			
	D	C	B	A
HMA Overlay Only	X	*		
Guardrail Installation		X	*	
Pipe/Drainage Structures		X	*	*
Ditch/Pond Excavation		X	*	*
Roadway Excavation/Widening		X	*	*
Clearing and Grubbing Operations	X	*		
Removal of Structures and Obstructions	X	*		
Surfacing	X	*		
HMA or PCCP	X	*		
Advanced Geotechnical Work			X	*
Bridge Structures			X	*
Retaining Walls			X	*
Piling			X	*
Signal Systems			X	*
Illumination Systems			X	*
Signing		X		
ITS Systems			X	*
Railroad Crossings			X	*
Roadside Planting		X	*	
Fencing		X	*	
Striping	X			
Mailboxes		X		
Sidewalks	X	*		
Guideposts	X	*		
Monuments	X	*		
Irrigation Systems		X	*	
Curbing	X			
Temporary Erosion Control		X	*	
Sanitary Sewers		X	*	
Water Mains			X	*
Concrete Barrier	X			
Pit Site Production	X	*		

X – Minimum level required

* – Depending on known data discovered, may need to complete further study to identify conflict areas

Attachment 3

Scope of Work for Subsurface Utility Engineering (SUE)

1.0 General

1.0.1 Definitions:

A. Subsurface Utility Engineering (SUE): Engineering practice that involves managing certain risks associated with utility mapping at appropriate quality levels, utility coordination, utility relocation design and coordination, utility condition assessment, communication of utility data to concerned parties, utility relocation cost estimates, implementation of utility accommodation policies, and utility design.

B. SUE Contractor: Or, “Contractor” for the purpose of this scope of work, is the individual or firm directly, or indirectly through its specialty subconsultants and subcontractors, providing SUE utilities investigations, utilities engineering and as-needed utilities design-related services.

C. Project Manager: For the purpose of this scope of work is the entity that is in responsible charge of the utility design.

D. QL A: Utility Quality Level A as further described herein. Generally, QL A indicates the precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of subsurface utilities, usually at a specific point.

E. QL B: Utility Quality Level B as further described herein. Generally, QL B indicates information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities.

F. QL C: Utility Quality Level C as further described herein. Generally, QL C indicates information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating such information to QL D information.

G. QL D: Utility Quality Level D as further described herein. Generally, QL D indicates information derived from existing records and oral recollections.

H. Additional definitions are found in the referenced practice guidelines described herein. Where conflicts occur, Contractor shall seek written clarification from HDOT.

1.02 Objectives and Criteria:

A. The primary services anticipated to be rendered hereunder are QL A and QL B mapping of existing utilities within the specified project limits. The general scope of work includes geophysical locating of buried and observational surveying of above ground utilities within the specified project limits identified by HDOT.

B. Contractor shall comply with all applicable statutes, regulations, ordinances, and rules pertaining to this Scope of Work.

C. Contractor shall perform this Scope of Work in accordance with generally accepted engineering principles and practices as described in ASCE 38-02, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data".

1. For the purpose of this Task Order, the role of the "Engineer" as defined in ASCE 38-02 shall be understood as divided between HDOT's Project Manager and the Contractor as described herein. In ASCE 38-02, Section 4.0, "Engineer and Owner Collection and Depiction Tasks", the Contractor shall participate in all the tasks depicted for the Engineer and shall consult with HDOT's Project Manager accordingly on design intent and basis for design requirements. However, the Contractor's primary scope emphasis in this Task Order shall be as described in paragraphs 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.7, and 4.1.9 that are associated with the determination of suitable utility investigations approach corresponding to utility quality levels QL B or QL A, and the implementation and data recordation of such utility investigations.

2. In its determination of suitable utility investigation approach, including any proposed utilization of specialized equipment and technology, the Contractor shall demonstrate economic viability and budgetary justification of such approach based on ASCE 38-02, Section 7.0, "Relative Costs and Benefits of Quality Levels", taking into account the technical efficacy, and data usefulness and reliability, given local site conditions.

D. In addition to the guidelines contained in ASCE 38-02, the Contractor in preparing its work plan for SUE-related Scope of Work shall take into account applicable guidelines in the following contemporaneous industry practice references:

1. "Subsurface Utility Engineering Information Management for Airports", ACRP Synthesis 34, Transportation Research Board, 2012.

2. “Identification of Utility Conflict and Solutions”, Strategic Highway Research Program 2, Transportation Research Board, 2012.

3. “Practices for Utility Coordination in Transit Projects”, TCRP Synthesis 118, Transportation Research Board, 2015.

4. Where the above-referenced guidelines conflict or are ambiguous, Contractor shall seek written clarification from HDOT.

E. Contractor’s work planning to conduct SUE-related Scope of Work shall encompass the following goals and objectives of the Task Order:

1. Improve certainty of utility design data for strategizing utilities relocation decisions,

2. Improve the quality of and reliability of utility plans issued for bid,

3. Reduce risk of damage to utilities and disruption to utility operations,

4. Reduce risk of unknown utility conditions,

5. Reduce risk of delays to utility construction and to overall project and program,

6. Base utility investigations on uniformly accepted industry practices that are rational and cost-efficient,

7. Build upon previously developed utility information and data into a reportable and query-capable database model that can be utilized by HDOT, utility owners, contractors and consultants for construction, monitoring and inspection, and operational maintenance;

8. Enhance quality of, and reduce the time for, utility decisions and consensus between HDOT, utility owners, and contractors and consultants;

9. Identify in advance issues related to scheduling, utility access, environmental clearance, and jurisdictional reviews and permitting;

10. Avoid unnecessary utility relocations and other project delivery efficiencies, and;

11. Formulate basis of utility coordination and finalizing utility agreements.

2.0 Scope of Work

2.0.1 Project Limits

The Contractor's scope of work shall be to perform SUE for (insert project title and description)

2.0.2 The Contractor's detailed work plan for the (insert project title and description) Subsurface Utility Engineering scope of work shall consist of the following activities:

A. Quality Level B, Data Acquisition and Support of the Conflict Analysis performed by HDOT's Design Engineer including:

1. Collect all current existing Utility data and information from records obtained from HDOT, including drawings, records and reconnaissance related records with observable surface features and physical observations through potholing previously performed.

2. Produce a target list of utility-related infrastructure objects with ownership and facility attributes to be checked and validated against actual data acquired.

3. Supplement HDOT's Project Manager's existing utility data. Accessible utility facilities and related structures shall be documented including invert depth, pipe data, and connectivity.

4. QL B 2D profiling using the latest Surface Geophysical Methods for Utility Imaging as outlined in ASCE 38-02 (may also coincide with QL A 3D data acquisition per 2.02.B.1 below).

5. Processing of acquired utility data and merging into secure data repository acceptable to HDOT and data users and stakeholders.

6. Support ongoing efforts of the HDOT Project Manager to track, recognize and define conflicts, and coordinate integration of SUE data into the design.

B. Quality Level A (QL A), Data Acquisition, 3D Modeling, Design Conflict Mitigation Support including:

1. QL A data acquisition performed for completing designs and conflict resolution engineering. QL A 3D profiling using the latest Surface Geophysical Methods for Utility Imaging as outlined in ASCE 38-02. Additional Data and Quality Control verification acquired by visual means through the opening of discrete test holes (e.g., potholing). This set of activities also includes supplemental aerial clearance observations and QL B mapping using electromagnetic induction probes, ground penetrating radar and electromagnetic sweeps, and 3D profiles to further evaluate the accuracy of the existing utility imaging.

2.03 Participate in Utility conflict brainstorming events or workshops conducted by HDOT's Project Manager with facility owners and their design engineers. Based on data gathered and factoring into account utility design and operational requirements, Contractor shall recommend any pragmatic design adjustments including:

A. Potential routing clear space for new structures and facilities;

B. Abandoned facility removal zones to accommodate new structures and facilities; and

C. Potential protections for high risk or vulnerable facilities based on current condition.

2.04 SUE Data Acquisition Quality Control

A. Contractor shall demonstrate an iterative approach for performing data acquisition operations. The intent of the SUE preliminary field operations is generally to provide designers with a comprehensive plan of existing utilities, both above ground and buried, based on records research, field investigation, and geophysical survey methods.

B. The preliminary SUE data shall be provided to HDOT's project design team for review and evaluation, and to identify locations where more detailed data is required. Utilities shall be located using geophysical methods are to be mapped in accordance with the ASCE 38-02 Standards.

C. The SUE Quality Control verification includes observation of utilities located by other geophysical detection methods in the primary SUE data acquisition utilizing visual inspection through excavation performed at discrete test hole, (pothole) locations. These locations will often be deemed where utility conflicts are a concern and more detailed QL A data, including precise three-dimensional coordinates, may be required to complete designs and mitigate/accommodate conflicts.

D. For the purposes of this work, “locate” means to establish by engineering, surveying, drafting, and excavation practices the accurate horizontal and vertical position of subsurface utilities with vertical tolerances based on referenced benchmarks.

E. A written log of each test hole shall be prepared, and derived elevations are transcribed onto CADD reference files, and “locate” points are mapped to Quality Level A on the plans.

F. Test-hole locations are identified with the designer prior to conducting field operations. Supplemental 3D QL B mapping using specialized geophysical exploratory methods may also be utilized.

G. Verifications may also include additional QL A potholing as designated by HDOT to support the accuracy of the geophysical methods for utility imaging.

2.05 Utility Coordination, Resolution Engineering and Third Party Agreements Support including:

A. Utility Coordination: Identification of conflicts with planned facilities and structures, through review of proposed designs and coordination with HDOT’s Project Manager and supporting information and consultation with utilities to assist with the resolution of such conflicts.

B. Conflict Resolution Engineering Support: Provide support to HDOT staff in determining alternatives, tasks, costs, durations, responsibilities as requested and authorized on a time and material basis.

C. Procurement Services: Provide support to HDOT with consultation on third party utility agreements, design and construction procurement options, document preparation, and other miscellaneous tasks as requested and authorized on a time and material basis.

2.06 The Contractor shall provide ongoing interpretive support to assist design engineers and utility coordinators with subsequent findings and ensure submitted data is properly understood and utilized.

2.07 If, when performing an assigned task, the Contractor detects line(s) of unknown function, status, or ownership, the Consultant shall obtain, record, and depict information on such line(s) to a quality level that is commensurate with that of the original assigned task.

2.08 Condition Assessments: As directed by HDOT, perform interior pipewall inspections and/or thickness tests of existing buried utility lines, utilizing video, ultrasonic, and/or visual techniques as appropriate. These assessments will be identified on a case by case basis during the SUE process, authorized and directed by HDOT and will be paid for under an additional task authorization.

2.09 Site Restoration:

A. Replace bedding material around exposed utility lines in accordance with owner's specifications or as otherwise directed or approved.

B. Backfill and compact the excavation in a manner acceptable to HDOT and the Authority Having Jurisdiction (AHJ). If approved, re-use excavated material with appropriate moisture/density control.

C. Install color-coded warning ribbon within the backfill area and directly above the utility line.

D. As applicable, provide permanent pavement restoration within the limits of the original cut using materials, compaction, and pavement thickness acceptable to HDOT and AHJ.

E. Repair or replace backfill or pavement that fails (i.e., subsidence and/or loss of pavement material) for the duration of the Contract.

F. For excavations in unpaved areas, restore disturbed area as nearly as practicable to pre-existing conditions.

G. Furnish and install permanent surface marker (e.g., P.K. nail, peg, steel pin, or hub) directly above the centerline of the structure and record the elevation of the marker.

2.10 Work Plan Coordination with Project Team

A. Coordinate with HDOT, its Project Manager, and utility owners to develop a work plan that includes a description of the tasks to be performed and a proposed schedule of activities. The work plan must satisfy the requirements of the project and must be approved by HDOT prior to commencing work.

B. Meet with HDOT and its Project Manager on a regular basis and as needed to coordinate the work effort, discuss progress, and resolve problems.

C. Upon request, provide HDOT with copies of logs and correspondence that document work-related communications between the Contractor, utility owners, outside agencies, and/or private landowners.

D. Contractor shall prepare and review pre-activity safety plans with the field crews prior to each work day and manage the field activities in accordance with the safety plan. The Contractor shall provide pre-activity safety plans to HDOT prior to any field work for the project.

E. Contractor is the Engineer of Record for its assigned SUE-related work, which must be executed under the direction or supervision by a Professional Engineer in accordance with applicable Hawaii statutes.

F. Provide all necessary equipment, supplies, and support personnel, including surveying capability, to secure data outlined in this scope of work.

G. Provide utility design and constructability recommendations based on SUE best practices.

2.11 Deliverables.

2.11.1 All work by the Contractor shall build upon previous efforts performed by HDOT and its consultants, and shall indicate updated data collected, noting deviations or validation checks whichever the case may be.

2.11.2 SUE Utility Designating and Locating deliverables will include digital submittal of the following:

A. Utility reference file compliant with required CADD standards, (file of current data to be updated by Contractor will be provided to Contractor by HDOT as described in Section 3.0), which depicts existing utilities based on investigative results and professional judgment from this work effort. The CADD file will provide obtained 2D and 3D data for the designated utility alignments. The 2D alignment elevations will have ground surface elevations except for those locations where the utility is exposed (i.e. outfall at manhole, inlet structure, etc.). QL B 3D coordinate alignment data will be gathered using the latest surface geophysical methods to carefully profile utilities within immediate vicinity of identified utility conflicts. QL A 3D coordinate data will be gathered at discrete locations along targeted utility alignments where utilities are physically exposed.

B. QA/QC summary report.

C. Manhole log sheets with pipe data, invert depth and elevation data.

D. Secure Utility Infrastructure Management (UIM) database with utility attribute data including, but not limited to utility ownership, utility specifications, quality level designation, invert elevations (where accessible) at both pipe ends (outfalls), discrepancies, digital photographs, connectivity diagrams, scanned log sheets.

E. UIM conflict matrix with identified preliminary identified conflicts with known proposed design elements as coordinated and provided by the Project Manager.

F. Final existing utility 3D model for clash analysis to be utilized by the Project Manager as described in 2.11.2-H.

G. A submittal report summarizing this investigation with highlights of unusual findings, and instructions for the UIM database system.

H. 2D and 3D electronic files.

i. Civil 3D: At a minimum, utility data shall be provided in Civil 3D file format including, but not limited to the inclusion of 3D pipe network line strings identifying location, elevation, size, and utility type. A point data file may be requested, but shall not substitute for a Civil 3D pipe network file. Conform to Civil 3D 2011 format.

ii. CADD: Per HDOT CADD Standards and convertible to Microstation V8.

iii. Secure Utility Infrastructure Management Database: Non-proprietary and transferrable for unconditional use by HDOT and its contractors. The database shall be exportable and reportable, comprehensive and able to easily store, retrieve, search, and filter by utility:

a) Owner
b) Type
c) Size
d) Material
e) Estimated age
f) Condition
g) Disposition (protect, relocate, etc.)
h) Geographic location
i) QL D Data Source
j) Schedule data

2.12 Post Design Services. When requested by HDOT provide post design services. Said services, if required shall proceed only after the parties have executed an amendment to this contract agreeing to the revised scope of work, increase of open-ended authorization limit and term of the contract.

If required, new labor rates shall be negotiated for the anticipated term of the post design services provided under the contract amendment. The amended term and open-ended authorization limit shall be used to provide post design services only for work already assigned to the CONTRACTOR by Project Assignments. No new work for purposes other than post easing services shall be assigned to the CONTRACTOR. Post design services shall commence upon issuance of a new Project Assignment describing said services.

2.13 Training. When requested by HDOT provide training and orientation sessions for interested parties. A training session shall cover items such as available services, detection and excavation technology, project deliverables, and work task development.

3.0 HDOT will provide to the Contractor:

A. Project corridor information showing the project limits, alignment, profile, survey control points, benchmark data, coordinate data, available CADD files, CADD standards and associated digital aerial photos, and other applicable information in HDOT's possession.

B. Preliminary list of utilities or agency contact persons within the project limits.

C. Any Quality Level D and C information and QL A potholing data that others have previously obtained.

D. Any existing permits, right-of-entries, etc. (including private land access) that may allow field personnel to work in those areas that are outside the existing right-of-way limits.

E. HDOT will monitor the Contractor's progress to verify compliance with these requirements and standards referenced herein.

4.0 Contractor Organization

4.0.1 The Contractor shall submit an organizational plan that demonstrates its ability to provide the core resources necessary to accomplish the complete Subsurface Utility Engineering scope specified herein. Table 1 represents a sample of Contractor's Organizational elements required and their corresponding duties. Provide all traffic control necessary to complete their work. Contractor will coordinate survey work with HDOT staff.

Table 1. Project Key Personnel and Duties

Project Role	Duties
Principal-In-Charge	Scoping, contract negotiations, oversight of project effort; project coordination and staffing; progress reporting, innovative conflict resolutions and contracting strategies.
On-Site Project Manager / Project Engineer	Project coordination, project submittals preparation. Records research, utility company coordination, field data review, identifying, resolving and documenting utility discrepancies, review of proposed construction and recommendations for additional SUE investigations. Traffic control measures and plans; health and safety plans. HDOT's primary contact.
Quality Assurance Engineer	Quality Assurance review of field data, CADD files, reports, submittal information.
Utility Coordination	Utility conflict workshops, term sheet preparation, initial utility conflict report
Computer Aided Drafting and Engineering Support	CADD plan and utility database preparation; utility conflict identification and SharePoint database maintenance.
Database Development	Utility data management including utility data repository development and populating, conflict matrix database development, custom query and report generation.
Field Operations Superintendent	Subsurface utility engineering Phase I designating field operations, field crew coordination, scheduling and management, field sketch preparation, field log sheet completion and review, documentation and communication of field designating issues, coordination with engineering survey operations, CADD plan review, plan sheet annotation of discrepancies encountered during field operations.

4.0.2 The on-site project manager serves as the primary liaison with HDOT for project duration. He/she will communicate regularly with HDOT to discuss operations, field results, scheduled activities, health and safety plans, traffic control plans, project schedule and resolve issues. The principal-in-charge is in overall charge of all activities, schedule and budget.

4.0.3 The Contractor's project management team will prepare and submit monthly progress reports to HDOT to document the SUE investigation. During the project time frame, project management staff members shall be available to meet in person with HDOT immediately upon notice for any urgent issues.

5.0 Submittals

A. Contractor's SUE work plan and as outlined in Section 2.0.

B. Contractor's Schedule as outlined in Section 6.0.

C. Final SUE Report as outlined in 2.11.

6.0 Schedule

6.0.1 Based on conditions identified in this scope of work, the Contractor shall submit a project schedule to meet the milestone criteria set forth herein:

A. Preliminary Schedule - utility designating field operations will be detailed in the Contractor's schedule by operation and logical geographic area.

B. Final Schedule - utility designating submittals will be included in the Contractor's schedule after the field work has been completed to include CADD drawing and utility database preparation, along with completion of QA and discrepancy resolution efforts.

6.0.2 Contractor will provide monthly updates to the project schedule. Additionally, Contractor will provide weekly updates to a three week Look Ahead Schedule (LAS) for work activities and resources.

6.0.3 The following initial schedule lists the major milestones with submittal dates required for this project, provided in the number of calendar days relative to the issuance of Notice to Proceed (NTP).

A.	Preliminary SUE Utility CADD File and Utility Database	NTP+120
B.	Utility Plans, Summary Report, Utility Database	NTP+150
C.	Final SUE Report Submittal	NTP+180

7.0 Measurement & Payment

7.0.1 The Contract scope identified herein will be measured and paid by the following:

Item	Description	Unit	Quantity	Unit Price	Extended Price
1	Mobilization		[1]		
2	General Conditions / Management	MO	[6]		
3	QL B Utility Data Acquisition	LF	[250,000]		
4	QL A Utility Data Acquisition	LF	[125,000]		
5	Quality / Accuracy Verification	EA	[150]		
6	Final SUE Report and Files	LS	[1]		
7	Optional Engineering Support – post survey	MO	4		