

| ESTIMATE OF LEVEL OF EFFORT | | | | | | HARRIS & ASSOCIATES | | |
|-----------------------------------------------------------------------------------------|---------------------|----------|----------|----------|----------|------------------------------|-------------------------|--|
| CITY OF ALBANY | | | | | | Date: 7-Jul-11 | | |
| 2012 Sanitary Sewer Project | | | | | | file name: LevelofEffort.xls | | |
| PHASE, ACTIVITY, TASK | HARRIS & ASSOCIATES | | | | | SUBCONSULTANTS W/O MARKUP | | |
| | PD & QC | PM | PE | Asst PE | Clerical | NAME | \$ | |
| 0.0 PROJECT ADMINISTRATION | HOURS | HOURS | HOURS | HOURS | HOURS | | | |
| 1 Progress Meetings, 2 assumed, | | 4 | 4 | | 2 | | | |
| 2 Monthly Progress Reports, 10 months | | 10 | | | 4 | | | |
| 3 Public Meetings, 2 meetings assumed | | 4 | 4 | 4 | 2 | | | |
| SUBTOTAL HOURS | 0 | 18 | 8 | 4 | 8 | | | |
| SUBTOTAL COSTS | \$0 | \$3,330 | \$1,120 | \$400 | \$600 | | \$0 | |
| SUBTOTAL COST- HARRIS PERSONNEL | | | | | \$5,450 | | | |
| 1.0 INVESTIGATION PHASE | | | | | | | | |
| 1 Kickoff Meeting | 2 | 2 | 4 | | | | | |
| 2 Information Gathering & Evaluation | | 8 | 16 | 24 | | | | |
| 3 Photo Inventory of Existing Conditions | | | 16 | 16 | | | | |
| 4 Utility Coordination | | 2 | 12 | 8 | | | | |
| SUBTOTAL HOURS | 2 | 12 | 48 | 48 | 0 | | | |
| SUBTOTAL COSTS | \$420 | \$2,220 | \$6,720 | \$4,800 | \$0 | | \$0 | |
| SUBTOTAL COST- HARRIS PERSONNEL | | | | | \$14,160 | | | |
| 2.0 PRELIMINARY DESIGN PHASE | | | | | | | | |
| 1 Preliminary Design, 35% Phase | | 60 | 90 | 120 | | | | |
| 2 Outline Specifications | | 2 | 2 | | | | | |
| 3 Preliminary Estimate of Probable Construction Cost | | 2 | 8 | 4 | | | | |
| 4 Basis of Design Report | 2 | 8 | 16 | 2 | | | | |
| 5 Surveying, sewer and all utilities | | 2 | 4 | 24 | 3 | Chaudhary | \$38,843 | |
| 6 Geotechnical | | 1 | 2 | | | GeoEngineers | \$17,262 | |
| 7 Quality Review | 8 | | | | | | | |
| 8 Review Meeting | 2 | 2 | 4 | | 1 | | | |
| 9 Regulatory Permits, assumed none are required | | | | | | | | |
| SUBTOTAL HOURS | 12 | 77 | 126 | 150 | 4 | | | |
| SUBTOTAL COSTS | \$2,520 | \$14,245 | \$17,640 | \$15,000 | \$300 | | \$56,105 | |
| SUBTOTAL COST- HARRIS PERSONNEL | | | | | \$49,705 | | | |
| 3.0 FINAL DESIGN PHASE | | | | | | | | |
| 1 Final Design Development, 65% and 95% phases | | 110 | 160 | 220 | | | | |
| 2 Specifications and Contract Documents | | 12 | 24 | | 4 | | | |
| 3 Estimate of Probable Construction Cost | | 6 | 12 | 2 | | | | |
| 4 Traffic Control and Erosion Control Plans | | 1 | 6 | 8 | 4 | | | |
| 5 Quality Review | 12 | | | | | | | |
| 6 Review Meetings, 2 meetings assumed | 4 | 4 | 6 | | 2 | | | |
| 7 Final Contract Documents (PS&E) | 2 | 12 | 36 | 48 | 2 | | | |
| SUBTOTAL HOURS | 18 | 145 | 244 | 278 | 12 | | | |
| SUBTOTAL COSTS | \$3,780 | \$26,825 | \$34,160 | \$27,800 | \$900 | | | |
| SUBTOTAL COST- HARRIS PERSONNEL | | | | | \$93,465 | | | |
| | | | | | Harris | \$162,780 | Subconsultants \$56,105 | |
| SUBTOTAL COSTS FOR DESIGN - TASKS 1-3 (including subconsultant costs and markup) | | | | | | | \$224,496 | |

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| 2012 Sanitary Sewer Project | | | | | | file name: LevelofEffort.xls | | |
| PHASE, ACTIVITY, TASK | | HARRIS & ASSOCIATES | | | | | SUBCONSULTANTS W/O MARKUP | |
| | | PD & QC | PM | PE | Asst PE | Clerical | | |
| 4.0 BID PERIOD SERVICES | | | | | | | | |
| 1 Attend pre-bid meeting | | | 2 | 4 | | 2 | | |
| 2 Respond to bidding questions | | | 4 | 4 | | | | |
| 3 Addendum preparation (1 addendum budgeted) | | | 2 | 4 | 4 | 2 | | |
| 4 Attend bid opening and review bids | | | 2 | | | | | |
| SUBTOTAL HOURS | | 0 | 8 | 12 | 4 | 4 | | |
| SUBTOTAL COSTS | | \$0 | \$1,480 | \$1,680 | \$400 | \$300 | | \$0 |
| SUBTOTAL COST- HARRIS PERSONNEL | | | | | | | \$3,860 | |
| 5.0 DESIGN SERVICES DURING CONSTRUCTION | | | | | | | | |
| 1 Attend preconstruction meeting | | | 2 | 2 | | | | |
| 2 Review submittals (10 submittals budgeted) | | | 4 | 10 | | 4 | | |
| 3 Construction observation, (assume 4 site visits) | | | 4 | 4 | | | | |
| 4 Respond to RFIs | | | 12 | 6 | | 4 | | |
| 5 Change Order preparation (1 budgeted) | | | 4 | 4 | 8 | | | |
| 6 Assist City staff with final punchlist | | | 4 | 4 | | | | |
| 7 Prepare as-built drawings | | | 4 | 6 | 34 | | | |
| SUBTOTAL HOURS | | 0 | 26 | 26 | 8 | 8 | | |
| SUBTOTAL COSTS | | \$0 | \$4,810 | \$3,640 | \$800 | \$600 | | \$0 |
| SUBTOTAL COST- HARRIS PERSONNEL | | | | | | | \$9,850 | |
| TOTAL COST - TASKS 1-5 | | | | | | | | |
| HOURS PER POSITION | | 32 | 286 | 464 | 492 | 36 | | |
| 2011 HOURLY RATES | | \$210 | \$185 | \$140 | \$100 | \$75 | | |
| COST PER POSITION | | \$6,720 | \$52,910 | \$64,960 | \$49,200 | \$2,700 | | |
| TOTAL COST- HARRIS PERSONNEL | | | | | | | \$176,490 | |
| TOTAL COST- SUBCONSULTANTS | | | | | | | \$56,105 | \$56,105 |
| SUBCONSULTANT MARKUP (10%) | | | | | | | \$5,611 | |
| HARRIS DIRECT COSTS | | | | | | | \$1,088 | |
| TOTAL COST DESIGN, BID AND SERVICES DURING CONSTRUCTION -TASKS 1-5 | | | | | | | | \$239,294 |
| 6.0 OPTIONAL SERVICES | | | | | | | | |
| 1 Perform utility locating | | | 2 | 8 | 60 | | Subtronic Corp. | \$26,160 |
| 2 Mapping and Aerial Photo | | | | | | | Chaudhary | \$12,744 |
| 3 Geotechnical Consultation | | | | | | | GeoEngineers | \$3,592 |
| SUBTOTAL HOURS | | 0 | 2 | 8 | 60 | 0 | | |
| SUBTOTAL COSTS | | \$0 | \$370 | \$1,120 | \$6,000 | \$0 | | \$42,496 |
| SUBCONSULTANT MARKUP (10%) | | | | | | | | \$4,250 |
| SUBTOTAL COST- HARRIS PERSONNEL | | | | | | | \$7,490 | \$46,746 |
| TOTAL COST FOR TEAM : | | | | | | | | \$54,236 |

Description of Tasks

The following table includes a detailed scope of the services that describes the tasks required to develop final PS&E and bid documents for the 2012 Sanitary Sewer Project.

| SCOPE OF SERVICES | | | |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Task | Our Approach | Your Benefit | Deliverable |
| 00 Project Administration | | | |
| <i>0.1 Progress Meetings</i> | Monthly meetings with City staff and others as appropriate throughout design process. | Forces all parties to keep in touch; to address and resolve issues promptly. | Notes of each meeting highlighting agreed-upon action items |
| <i>0.2 Progress Report</i> | A brief progress report will accompany each monthly Harris invoice. It will discuss budget and schedule status, issues resolved and unresolved, and "next steps". | You will have a continuous written record of our progress and documentation of issues. | Monthly status report |
| <i>0.3 Public Meetings</i> | We will attend and make presentations at two public meetings for homeowners. It is anticipated that the City will invite all appropriate parties. | We act as the technical experts to help staff present sometimes difficult concepts | PowerPoint presentations and handouts |
| 1.0 Investigation Phase | | | |
| <i>1.1 Kick-off Meeting</i> | We will meet with staff to confirm the scope of work, schedule, budget, and availability of project documents; review project goals and conceptual designs; discuss format of deliverables; and clarify responsibilities of each party. | This meeting will ensure that all parties understand all aspects of the work before any work begins. | Meeting notes with lists, as appropriate |
| <i>1.2 Information Gathering and Evaluation</i> | We will gather existing background information about the project including: Assessor's Maps Preliminary design data Mapping and aerial photographs Utility locations Soils reports Design standards, details, and specifications City and utility contacts CCTV videos Funding and permit information City contract documents This activity will require assistance from City staff in researching documents and resolving design parameters and project issues. | We attempt to collect all data at project inception to facilitate preliminary design and avoid costly redesign due to unknown circumstances. CCTV information will help locate service laterals for redirection if necessary to get them into the public ROW | List of requested documents |
| <i>1.3 Photo Inventory of Existing Conditions</i> | We will document existing conditions in areas where it is anticipated we will be on private property with photographs and videos. | By documenting existing conditions the City is better protected from unreasonable claims from homeowners. | Photo and video library |

SCOPE OF SERVICES

| Task | Our Approach | Your Benefit | Deliverable |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <p><i>1.4 Utility Coordination</i></p> | <p>We will contact and send project notices to each utility regarding its facilities, and identify potential conflicts. Electronic detection to verify locations and potholing would be additional services that may be recommended.</p> | <p>Getting early notice to utilities is crucial to the success of underground work. Also, utility maps are often inaccurate. Electronic and field verification is a cost-effective option to help avoid surprises during construction.</p> | <p>Copies of all correspondence with utility owners Utility locations on base layout sheets</p> |
| <p>2.0 Preliminary Design Phase</p> | | | |
| <p><i>2.1 Preliminary Design (35 Percent)</i></p> | <p>We will submit a preliminary plan and profile sheets for review and comment by City and others. Final design will not proceed until the preliminary layout is approved by the City.</p> | <p>We urge approval by the City at this stage to avoid expensive later redesign. Ultimately, the City saves money by addressing issues early in the design process.</p> | <p>Preliminary plan and profile sheets (two hard copies and PDF format)</p> |
| <p><i>2.2 Preliminary Estimate of Probable Construction Cost</i></p> | <p>A preliminary estimate of probable cost will be provided in the Basis of Design Report. We will utilize the resources of our expert design and construction management staff to provide current, realistic construction costs. We understand the funding requirements for SRF loans and will make sure all items are covered correctly for bidding.</p> | <p>We have done construction cost estimates for SRF funded projects recently in Piedmont and South San Francisco and know the requirements. We also involve our construction managers in our cost estimating due to their current knowledge.</p> | <p>Preliminary itemized cost estimate</p> |
| <p><i>2.3 Specifications and Contract Documents</i></p> | <p>We will prepare draft contract documents for review and comment by City staff. The first specification submittal will be in outline format. Specifications will be based upon standard front-end documents provided by the City and supplemented by specific technical specifications by Harris.</p> | <p>Harris is familiar with a number of standard spec formats and contract documents, including Harris' own "front-end".</p> | <p>Contract documents, including specifications, at the 35 percent stage</p> |
| <p><i>2.4 Basis of Design Report</i></p> | <p>The Basis of Design Report will accompany our preliminary design submittal. It will discuss issues (both resolved and unresolved), enumerate design parameters to be met, and discuss each conceptual alternative being considered for Area 1 and 2 projects. The purpose of the Basis of Design Report is to serve as a checkpoint in the design process. After City staff approves the report's contents, formal design will proceed.</p> | <p>We consider this a significant "check point" in the design process. All parties must agree on the various elements of the BDR in order to keep costs and schedule on target.</p> | <p>Basis of Design Report</p> |

SCOPE OF SERVICES

| Task | Our Approach | Your Benefit | Deliverable |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <i>2.5 Surveying and Mapping</i> | Our subconsultant will conduct aerial photogrammetric and “total station” field surveying, including topography and ROW of all private property areas and adjacent frontage. Base plans will be prepared in AutoCAD. Plats and exhibits will be created for permits to enter private property during construction.. | We utilize surveyors with electronic data collection capabilities. This reduces the potential for errors in our AutoCAD base mapping. | Project base maps in AutoCAD |
| <i>2.6 Geotechnical and</i> | Our subconsultant will perform soil borings, lab testing, and analysis. A report will discuss the viability of all trenchless technology options, from pipe bursting to guided boring techniques. | Geotechnical recommendations are received before design proceeds, to avoid re-design. | Geotechnical report |
| <i>2.7 Quality Review</i> | Prior to the preliminary phase submittal, all plans and documents will be reviewed by Harris’ Quality Manager. | Helps reduce City review time. | N/A |
| <i>2.8 Review Meeting</i> | At a meeting with City staff, we will discuss our preliminary design and Basis of Design Report. A preferred alternative will be selected for each element and final design will proceed after approval from the City. | The Report will clearly state the items which must be reviewed, resolved, and concurred with at this meeting. | Meeting notes |
| <i>2.9 Regulatory Permits</i> | We will identify regulatory permits required and prepare any applications for formal submittal by the City. We do not anticipate the need for any special permitting for this project. | We have done permit applications before, so we ease staff’s burden. | Permit applications and/or support documents |
| 3.0 Final Design Phase | | | |
| <i>3.1 Final Design Development</i> | We will submit plan sets for review at the 65 and 95 percent stages. Each submittal will incorporate all comments received at the previous stage. The plans will include right-of-way lines, acquisitions and easements, topographic contours, layout of paved areas and related improvements, circulation design, phasing, critical utilities, and other details needed to resolve design issues. Plans will comply with the City’s format requirements. We request one set of consolidated City comments for each submittal, returned to Harris within a pre-agreed review period. | Each subsequent submittal will include refinements and additional details and AutoCAD facilitates this design process. | Review plan sets at 65 and 95 percent completion stage (two hard copies and PDF format) |
| <i>3.2 Specifications and Contract Documents</i> | At the 100 percent stage, we will prepare draft contract documents for review and comment by City staff.. | Harris is familiar with a number of standard spec formats and contract documents, including Harris’ own “front-end”. | Contract documents, including specifications, at the 100 percent stage |

SCOPE OF SERVICES

| Task | Our Approach | Your Benefit | Deliverable |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <i>3.3 Estimate of Probable Construction Cost</i> | Spreadsheets will be provided at the 100 percent stage, identifying take-off quantities, unit costs, and cost estimates for each element of the project. If appropriate, bid alternates may be incorporated. Items are double checked for SRF funding requirements. | Harris design and construction engineers will provide current cost data from personal experience and company cost estimate databases. | Cost estimates at 100 percent stage |
| <i>3.4 Traffic Control and Erosion Control Plans</i> | To save design costs, traffic control plans can be done schematically for these projects using standard lane closure requirements. Standard erosion control and BPMs will be required also. | Making Traffic and Erosion Control prescriptive in the contract documents puts the responsibility on the contractor to develop the plans and approach. | Standard traffic lane closures and erosion control details included in the plans and specifications |
| <i>3.5 Quality Review</i> | Prior to each submittal, all plans and documents are reviewed by an independent in-house team at Harris. | Quality review ensures document accuracy and completeness, and reduces necessary City review time. | N/A |
| <i>3.6 Review Meeting(s)</i> | At a meeting with City staff, we will discuss each review submittal. | Meeting to discuss City review comments ensures the City understood Harris' plans, and Harris understands the City's requested changes or comments. | Meeting notes |
| <i>3.7 Final Contract Documents (PS&E)</i> | After staff reviews and comments on the final draft documents, we will revise as needed and resubmit reproducible plans and contract documents for bidding by the City. A final, detailed engineer's estimate of probable construction cost will be provided. Plans will be prepared on standard City title block sheets. AutoCAD and Microsoft Word electronic files and project calculation sheets will be turned over to the City. | The final contract documents will incorporate all City pre-final review comments. | Reproducible plans and contract documents, plus electronic files and PDF |
| 4.0 Bid Period Services | | | |
| <i>4.1 Pre-Bid Meeting</i> | We will attend a pre-bid meeting scheduled by the City to answer questions from prospective bidders. | The designers' participation at this meeting shows the City's partnering approach, expedites answering questions, and should result in better bid results. | Meeting notes, including a list of questions asked |
| <i>4.2 Bidders' Questions</i> | We will answer questions from bidders by telephone during the advertising period. We will log questions and provide City with documentation. | Takes the burden off City staff as the "middle-man" if Harris is allowed to answer questions directly. | Log of questions received and answers given, for City to distribute if appropriate |
| <i>4.3 Prepare Addenda</i> | We will prepare any required addenda for distribution by the City. | Eliminates City staff need to issue addenda. | Addenda to bid package |

SCOPE OF SERVICES

| Task | Our Approach | Your Benefit | Deliverable |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <i>4.4 Analyze Bids</i> | We will analyze all bids and make written recommendations to the City concerning award of the construction. | Harris' contract managers are experts at reviewing Contractor submittals on behalf of the City. Protects City. | Written findings and recommendations |
| <i>4.5 Preconstruction Meeting</i> | We will attend the preconstruction meeting scheduled by the City to answer questions from the contractor awarded the project. | Harris' participation shows partnering approach, facilitates answering questions promptly, reduces staff's burden. | Meeting notes, including questions asked |
| <i>5.0 Design Services During Construction</i> | | | |
| <i>5.1 Review Shop Drawings, Contractor Submittals, and RFIs</i> | We will review all contractor submittals and Requests for Information and make recommendations to the City. | Reduces staff burden; ensures designer's input. | Written evaluation of submittals and copies of all RFIs |
| <i>5.2 Change Order Assistance</i> | We will provide the City with the necessary documentation for change order processing. | Reduces staff burden; ensures designer's input; plus provides critical review of the change order request in order to reduce change order costs. | Written response and recommendation for each change order (two hard copies and PDF of each change order) |
| <i>5.3 Prepare Punch List and Record Drawings</i> | We will prepare punch list items and record drawings from redlines made by the City's construction manager. | When the project is closed out, City will be assured of having an accurate representation of project in its files. | As-built plan sheets in AutoCAD electronic/hard copy Mylar format |

**CITY OF
ALBANY
2012
SANITARY
SEWER
PROJECT****GEOTECHNICAL
ENGINEERING
INVESTIGATION****SCOPE OF
WORK**

JULY 5, 2011**PROJECT DESCRIPTION**

The following scope of work, schedule and budget is for a geotechnical engineering investigation and report for the City of Albany's 2012 Sanitary Sewer Project (Project). The Project involves replacement and/or rehabilitation of approximately 11,900 linear feet of 6-inch to 8-inch inside diameter sanitary sewers in the following two designated areas:

- Area 1: Approximately 9,644 linear feet of sewers just east of Interstate Highway 80 on the south side of Albany Hill in the Gateview Avenue, Pierce Street, and Solano Avenue neighborhood.
- Area 2: Approximately 2,262 linear feet of sewers just east of San Pablo Avenue and east of Albany Hill in the Brighton Avenue neighborhood.

One of the principal objectives of the project is to remove existing sewers from easements to public right-of-way wherever possible. Present plans are to install new 6-inch to 8-inch sewers by conventional open-cut trenching or trenchless construction (e.g., pipe bursting, directional drilling or guided boring) by removing and replacing existing pipelines within existing alignments or by creating new alignments within public right-of-way.

SCOPE OF WORK**Task No. 1 – Permits, Boring Locations and Utility Notifications**

Obtain encroachment permit and drilling permit from the City of Albany and Alameda County, respectively. This scope of work assumes that the City of Albany will waive any encroachment permit fee. This scope of work further assumes that all borings will be drilled in City streets. GeoEngineers will field mark 5 to 7 test boring locations, 3 to 4 in Area 1 and 2 to 3 in Area 2, and notify Underground Service Alert (USA) prior to beginning field work so that public and private underground utilities can be identified and proposed boring locations cleared. GeoEngineers is not responsible for damage to any USA member utilities not identified and/or not properly marked by USA at the ground surface.

Task No. 2 – Subsurface Investigation

Drill a total of 5 to 7 test borings, 3 to 4 in Area 1 and 2 to 3 in Area 2 to depths of 15 to 20 feet below present ground surface. A continuous log of soil, bedrock, and groundwater conditions will be maintained by GeoEngineers' field engineer. Disturbed and "undisturbed" soil and bedrock samples will be taken at maximum 5-foot vertical intervals. Test borings will be backfilled with grout in accordance with County drilling permit requirements and capped with a minimum of 6 inches of cold-patch asphalt. Soil cuttings will be disposed of off-



site. This scope of work and budget assumes that contaminated soil and/or contaminated groundwater will not be encountered. If any unusual vapors, odors or visual contamination are noticed during drilling of any test boring, the boring will be stopped, backfilled with grout and the suspected drill cuttings will be bagged, labeled for future source reference and provided to the City of Albany for disposal.

Task No. 3 – Laboratory Testing

Complete the following laboratory tests on representative disturbed and “undisturbed” soil and bedrock samples: Moisture Content, Unit Weight, Atterberg Limits, Grain Size Distribution, Unconfined Compression, and Direct Shear.

Task No. 4 – Geotechnical Analysis and Geotechnical Investigation Report

Geotechnical engineering analysis of the data gathered in Task Nos. 1 through 3 with specific conclusions and recommendations for design and construction of the following:

1. General: Describe geologic and seismic setting, and engineering properties (i.e., composition and consistency) of soils and bedrock sampled along the pipeline alignments. Describe groundwater conditions. Describe geologic hazards such as liquefaction, landsliding, fault rupture, ground shaking, and provide 2010 CBC seismic design parameters.
2. Open-Cut Trenching/Excavation: Provide conclusions and recommendations for trenching excavation, anticipated ground behavior, preliminary Cal-OSHA soil classification, clearance from existing utilities and protection of existing utilities, shoring guidelines including preliminary shoring pressure and surcharge pressure diagrams, construction design groundwater level and construction dewatering criteria, pipe bedding and trench backfill materials and compaction specifications, trench dams, suitability of native soil as trench backfill, backfill at existing utility crossings and the use of CLSM as pipe embedment and trench backfill, flexible and rigid pipeline external loading, and E'_c for flexible pipe design.
3. Pipeline Rehabilitation: Provide conclusions and recommendations applicable to insertion pit excavation, shoring and dewatering, as summarized above for open-cut trenching/excavation. Provide conclusions and recommendations and geotechnical engineering analysis for pipe bursting and pipe reaming including the feasibility and advantages/disadvantages of each, evaluation of pneumatic pipe bursting with flexible fused HDPE or PVC vs. static pipe bursting with segmented clay pipe, E'_c values for design of flexible pipe (E'_c values are different for the two construction methods), estimated cavity expansion



and ground heave estimates for pipe bursting, pipe bursting ground deformation and vibration impacts (for pneumatic hammers) on overlying pavement and adjacent utilities, countermeasures for protection of overlying pavement and adjacent utilities and mitigation of ground heave, drilling fluids composition and borehole stability for pipe reaming, and systemic ground settlement from pipe reaming.

Submit a geotechnical report including a scaled alignment drawing for Area 1 and Area 2 with boring locations, geotechnical data (boring logs, lab tests) and geotechnical design summary (conclusions and recommendations as summarized above).

Optional Task A – Meetings and Miscellaneous Consultations

A total of 2 project meetings with Harris Associates and the City of Albany are budgeted for this optional task to review the findings of the geotechnical investigation, review construction options, review constructability issues, assist with preparation of specifications and assist in project cost estimating. In addition, a total of 10 hours of engineering time are budgeted, as needed, for miscellaneous consultations regarding geotechnical issues not specifically addressed in Task No. 4.

Optional Task B – New Installation by Trenchless Methods

New installation of pipelines 6 to 8 inches in inside diameter by trenchless methods will be limited to horizontal directional drilling (HDD) and guided boring. For gravity pipelines with slopes of less than 2 percent, guided boring is preferable. For Optional Task B, provide geotechnical recommendations for directional drilling and guided boring including: feasibility of HDD and guided boring under site specific soil, bedrock and groundwater conditions; anticipated ground type and ground behavior within the tunnel (pipe) zone; shaft construction criteria for guided boring; minimum existing utility clearances; hydrofracture analysis for HDD and systemic settlement calculations for HDD and guided boring.

STAFF

The Principal Engineer for this project will be David Mathy, the Senior Geologist will be Dru Nielson, and the Staff Engineer (Engineer 3) will be Mark Pinske. Resumes will be furnished upon request.

DELIVERABLES

Four (4) copies of the Final Geotechnical Investigation Report and a color, signed and stamped electronic copy in Adobe Acrobat PDF format.



PROJECT SCHEDULE

Proposed boring locations will be submitted by GeoEngineers to Harris Associates for approval within one week of receiving notice to proceed and preliminary plans and profiles of the project pipeline alignments for incorporation into the drilling and soil sampling program. GeoEngineers will submit encroachment and drilling permit applications required for the field work upon approval of boring locations. All work up to and including Task No. 4 - Geotechnical Analysis and Geotechnical Investigation Report will be completed within 4 to 6 weeks of receiving all required permits from the City of Albany and Alameda County.



BUDGET

**CITY OF
ALBANY
2012
SANITARY
SEWER
PROJECT**

| TASK NO. 1 – PERMITS, BORING LOCATIONS AND UTILITY NOTIFICATIONS | | |
|-------------------------------------------------------------------------|---------------------|--------------------|
| Senior Geologist | 4 hrs. @ \$210/hr. | \$ 840.00 |
| Staff Engineer 3 | 8 hrs. @ \$160/hr. | \$ 1,280.00 |
| Permit Fees | L.S. | \$ 300.00 |
| Mileage | 40 mi. @ \$0.65/mi. | \$ 26.00 |
| SUBTOTAL FOR TASK NO. 1 | | \$ 2,446.00 |

**GEOTECHNICAL
ENGINEERING
INVESTIGATION**

BUDGET

| TASK NO. 2 – SUBSURFACE INVESTIGATION | | |
|-----------------------------------------------|---------------------|--------------------|
| Senior Geologist | 4 hrs. @ \$210/hr. | \$ 840.00 |
| Staff Engineer 3 | 10 hrs. @ \$160/hr. | \$ 1,600.00 |
| Drill Rig & Crew | 12 hrs. @ \$160/hr. | \$ 1,920.00 |
| Misc. Field Cost (grout, asphalt patch, etc.) | L.S. | \$ 250.00 |
| Mileage | 40 mi. @ \$0.65/mi. | \$ 26.00 |
| SUBTOTAL FOR TASK NO. 2 | | \$ 4,636.00 |

JULY 5, 2011



| TASK NO. 3 – LABORATORY TESTING | | |
|---------------------------------------------------------|----------------|--------------------|
| Moisture Content | 24 @ \$ 15/ea. | \$ 360.00 |
| Unit Weight | 24 @ \$ 20/ea. | \$ 480.00 |
| Atterberg Limits | 3 @ \$190/ea. | \$ 570.00 |
| Grain Size Distribution/ Hydrometer w/sieve analysis | 6 @ \$180/ea | \$ 1,080.00 |
| Unconfined Compression | 6 @ \$100/ea. | \$ 600.00 |
| Direct Shear | 2 @ \$280/ea. | \$ 560.00 |
| | | |
| SUBTOTAL FOR TASK NO. 3 | | \$ 3,650.00 |

| TASK NO. 4 – GEOTECHNICAL ANALYSIS AND GEOTECHNICAL INVESTIGATION REPORT | | |
|---------------------------------------------------------------------------------|---------------------|--------------------|
| Principal Engineer | 2 hrs. @ \$225/hr. | \$ 450.00 |
| Senior Geologist | 8 hrs. @ \$210/hr. | \$ 1,680.00 |
| Staff Engineer 3 | 20 hrs. @ \$160/hr. | \$ 3,200.00 |
| Drafting | 6 hrs. @ \$110/hr. | \$ 660.00 |
| Clerical | 6 hrs. @ \$ 90/hr. | \$ 540.00 |
| | | |
| SUBTOTAL FOR TASK NO. 4 | | \$ 6,530.00 |

TOTAL PROJECT BUDGET \$17,262.00

GeoEngineers will not exceed a total project budget of \$17,262.00 without changes to the scope of work described herein and prior written authorization by Harris Associates. Any out-of-scope work specifically requested in writing by Harris Associates will be billed separately from this total project budget in accordance with the rates shown on the attached fee schedule. The total project budget is valid for a period of 90 days following the date of this scope of work.

| OPTIONAL TASK A – MEETINGS AND MISCELLANEOUS CONSULTATIONS | | |
|-------------------------------------------------------------------|---------------------|--------------------|
| Principal Engineer | 4 hrs. @ \$225/hr. | \$ 900.00 |
| Senior Geologist | 8 hrs. @ \$210/hr. | \$ 1,680.00 |
| Staff Engineer 3 | 6 hrs. @ \$160/hr. | \$ 960.00 |
| Mileage | 80 mi. @ \$0.65/mi. | \$ 52.00 |
| | | |
| TOTAL FOR OPTIONAL TASK A | | \$ 3,592.00 |

| OPTIONAL TASK B – NEW INSTALLATION BY TRENCHLESS METHODS | | |
|-----------------------------------------------------------------|---------------------|--------------------|
| Principal Engineer | 4 hrs. @ \$225/hr. | \$ 900.00 |
| Senior Geologist | 8 hrs. @ \$210/hr. | \$ 1,680.00 |
| Staff Engineer 3 | 10 hrs. @ \$160/hr. | \$ 1,600.00 |
| Drafting | 4 hrs. @ \$110/hr. | \$ 440.00 |
| Clerical | 4 hrs. @ \$ 90/hr. | \$ 360.00 |
| | | |
| TOTAL FOR OPTIONAL TASK B | | \$ 4,980.00 |



Schedule of Charges – 2011

COMPENSATION

Our compensation will be determined on the basis of time and expenses in accordance with the following schedule unless a lump sum amount is so indicated in the proposal or services agreement. Current rates are:

Professional Staff

| | | |
|----------------------------|----|----------|
| Staff 1 Engineer Scientist | \$ | 135/hour |
| Staff 2 Engineer Scientist | \$ | 145/hour |
| Staff 3 Engineer Scientist | \$ | 160/hour |
| Engineer Scientist 1 | \$ | 170/hour |
| Engineer Scientist 2 | \$ | 180/hour |
| Senior Engineer Scientist | \$ | 210/hour |
| Associate | \$ | 215/hour |
| Principal | \$ | 225/hour |

Software Development Staff

| | | |
|-------------------------------------|----|----------|
| Database Architect/Analyst | \$ | 160/hour |
| Senior Database Architect/Analyst | \$ | 180/hour |
| Business Analyst | \$ | 160/hour |
| Senior Business Analyst | \$ | 180/hour |
| Software Architect/Developer | \$ | 180/hour |
| Senior Software Architect Developer | \$ | 200/hour |
| IT Project Manager | \$ | 200/hour |
| Senior IT Project Manager | \$ | 225/hour |

Technical Support Staff

| | | |
|---------------------------|----|----------|
| Clerical / Word Processor | \$ | 90/hour |
| Drafting | \$ | 110/hour |
| Engineering Technician | \$ | 120/hour |

Laboratory Testing

| | | |
|----------------------------------------------------------|----|--------|
| Moisture Content | \$ | 15 ea |
| Unit Weight | \$ | 20 ea |
| Atterberg Limits | \$ | 190 ea |
| No. 200 Screen Wash | \$ | 75 ea |
| Sieve Analysis (with No. 200 screen wash) | \$ | 125 ea |
| Hydrometer (with sieve analysis) | \$ | 180 ea |
| Modified Proctor Compaction Test (4-inch mold) | \$ | 250 ea |
| Modified Proctor Compaction Test (6-inch mold) | \$ | 300 ea |
| Expansion Index Test (UBC 29-2) | \$ | 360 ea |
| Swell Tests (ASTM D 4546- Method A) | \$ | 300 ea |
| Unconfined Compression Test | \$ | 100 ea |
| Triaxial Compression Test (UU per point) | \$ | 150/pt |
| Direct Shear Test (three points) | \$ | 280 ea |
| One-Dimensional Consolidation Test (with two time rates) | \$ | 350 ea |
| Permeability | \$ | 350 ea |
| Resistance “R” Value Test | \$ | 275 ea |
| Soil Corrosivity (pH, resistivity, sulfate, chloride) | \$ | 250 ea |

Miscellaneous

| | | |
|--------------------------------------------|----|------------|
| Slope Inclinometer System – 4 hour minimum | \$ | 50/hr |
| Vehicle Mileage | \$ | .65/mi |
| Outside Services | \$ | Cost + 10% |

The above items are the most commonly requested professional services offered by GeoEngineers. Fees for special services not listed herein will be furnished upon request.

Expert witness testimony and depositions: \$700.00 lump sum plus \$350.00 per hour for each hour in excess of two (2) hours. Professional consultations and preparation for expert witness testimony and depositions will be charged at the standard personnel rates given above. As all observations and findings of GeoEngineers are based on work performed, educational background, and experience as civil and geotechnical engineers, all testimony by GeoEngineers is to be considered given on the basis of said special knowledge, skill, experience, training and/or education for which compensation will be requested pursuant to California Code.

All rates are subject to change upon notification.



CHAUDHARY & ASSOCIATES, INC.

ENGINEERS
SURVEYORS
INSPECTORS

851 NAPA VALLEY CORPORATE WAY ■ SUITE G ■ NAPA, CALIFORNIA 94558-7551
PHONE: 707.255.2729 ■ FAX: 707.255.5021 ■ WWW.CHAUDHARY.COM

Revised July 6, 2011
June 30, 2011
#11-12-990 (001)

CHAUDHARY & ASSOCIATES, INC. COST PROPOSAL

UTILITY SURVEY

To: Vernon Phillips, Harris & Associates
From: Edward Krumrei, P.E., Chaudhary & Associates, Inc.
Subject: Albany 2012 Sanitary Sewer Project
Re: Albany, California

DIRECT LABOR

OFFICE PERSONNEL

| | | | | | | |
|-----------------|------------------|------------|---|--------------|----|--------|
| Edward Krumrei | Project Manager | 4.0 hours | @ | \$ 77.86 /hr | \$ | 311.44 |
| Helmut Korstick | Project Surveyor | 16.0 hours | @ | \$ 53.83 /hr | \$ | 861.28 |
| Svetlana Luis | CADD Technician | 32.0 hours | @ | \$ 25.75 /hr | \$ | 824.00 |

Total Hours 52.0

SUBTOTAL DIRECT LABOR (OFFICE) \$ 1,996.72

FIELD PERSONNEL

| | | | | | | |
|-------|---------------|-------------|---|--------------|----|----------|
| Staff | Party Chief | 136.0 hours | @ | \$ 37.19 /hr | \$ | 5,057.84 |
| Staff | Instrumentman | 0.0 hours | @ | \$ 34.10 /hr | \$ | 0.00 |
| Staff | Rodman | 136.0 hours | @ | \$ 31.22 /hr | \$ | 4,245.92 |

Total Hours 272.0

SUBTOTAL LABOR (FIELD) \$ 9,303.76

TOTAL LABOR OFFICE / FIELD \$ 11,300.48

INDIRECT COST

Overhead & Fringe Benefits:

| | | | |
|-------------------|-------------|----|-----------|
| Office: 188.78% x | \$ 1,996.72 | \$ | 3,769.41 |
| Field: 217.57% x | \$ 9,303.76 | \$ | 20,242.19 |

SUBTOTAL BEFORE FEE \$ 35,312.08

FEE 10%x \$ 35,312.08 \$ 3,531.21

OTHER DIRECT COST \$ 0.00

TOTAL COST \$ 38,843.29

* Prevailing Wage Rates for Field Surveyors pursuant to California Labor Code Part 7, Chapter 1, Article 2, Sections 1770, 1773 and 1773.1.





July 6, 2011
#11-12-990(001)

SCOPE

Topographic Mapping:

Map the street areas/lengths listed under limits

Scale: 1" = 20'

Contour: 1 foot

Width: Street area to 15' behind sidewalk both sides

Photography:

Digitized rectified black and white aerial photography of entire areas 1 & 2

Scale: Suitable scale compatible with mapping

Deliverables:

- Mapping control listing
- Aerial topographic mapping file in AutoCADD format
- Scanned black & white photography

Utility Surveys:

- Locate all surface utility features within street areas (back of sidewalk to back of sidewalk) listed under limits.
- Open & dip all sanitary sewer manholes & storm drain structures within survey limits.

Deliverables:

- Field notes
- Text files
- Utility features line work in AutoCADD format compatible with topographic mapping
- Schematic – one per dipped structure showing pipe sizes, directions & depth to invert



CHAUDHARY & ASSOCIATES, INC.

ENGINEERS
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PHONE: 707.255.2729 ■ FAX: 707.255.5021 ■ WWW.CHAUDHARY.COM

June 30, 2011
#11-12-990 (001)

CHAUDHARY & ASSOCIATES, INC. COST PROPOSAL

MAPPING

To: Vernon Phillips, Harris & Associates
From: Edward Krumrei, P.E., Chaudhary & Associates, Inc.
Subject: Albany 2012 Sanitary Sewer Project
Re: Albany, California

DIRECT LABOR

OFFICE PERSONNEL

| | | | | | |
|-----------------|------------------|-----------|---|--------------|-----------|
| Edward Krumrei | Project Manager | 2.0 hours | @ | \$ 77.86 /hr | \$ 155.72 |
| Helmut Korstick | Project Surveyor | 4.0 hours | @ | \$ 53.83 /hr | \$ 215.32 |
| Svetlana Luis | CADD Technician | 0.0 hours | @ | \$ 25.75 /hr | \$ 0.00 |

Total Hours 6.0

SUBTOTAL DIRECT LABOR (OFFICE) \$ 371.04

FIELD PERSONNEL

| | | | | | |
|-------|---------------|------------|---|--------------|-----------|
| Staff | Party Chief | 24.0 hours | @ | \$ 37.19 /hr | \$ 892.56 |
| Staff | Instrumentman | 0.0 hours | @ | \$ 34.10 /hr | \$ 0.00 |
| Staff | Rodman | 24.0 hours | @ | \$ 31.22 /hr | \$ 749.28 |

Total Hours 48.0

SUBTOTAL LABOR (FIELD) \$ 1,641.84

TOTAL LABOR OFFICE / FIELD \$ 2,012.88

INDIRECT COST

Overhead & Fringe Benefits:

| | | |
|-------------------|-------------|-------------|
| Office: 188.78% x | \$ 371.04 | \$ 700.45 |
| Field: 217.57% x | \$ 1,641.84 | \$ 3,572.15 |

SUBTOTAL BEFORE FEE \$ 6,285.48

FEE

10%x \$ 6,285.48 \$ 628.55

OTHER DIRECT COST

Photogrammetrist \$ 5,830.00

TOTAL COST \$ 12,744.03

* Prevailing Wage Rates for Field Surveyors pursuant to California Labor Code Part 7, Chapter 1, Article 2, Sections 1770, 1773 and 1773.1.

