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1.0 INTRODUCTION

Hoque & Associates, Inc. (HA) is a local consulting engineering firm specializing in geotechnical exploration and construction materials testing. The firm was established with three personnel in 1997 to provide high quality, innovative, cost effective, and responsive services to its clients. Since inception, HA has grown to a 14 person company that employs a diversified staff of qualified and experienced professional and technical personnel including engineers, geologists, scientists, and engineering technicians and specializes in a wide range of geotechnical engineering and material testing and inspection services.

Mission Statement

Hoque & Associates strives to build lasting client relationships through commitment, communication, innovation, and quality responsive service to establish and maintain our standing as a premier consultant in our fields of expertise.



Hoque & Associates, Inc. facility
at 4325 S. 34th Street in Phoenix, Arizona

HA's mission is put into practice with every project we are assigned. When a client awards HA a project, we commit company personnel and resources, communicate closely with the client throughout the project duration regarding project status, look for innovative ways to serve the project and reduce costs, and serve the project in a quality and responsive manner. In doing so, HA has developed and maintained a dedicated group of clients in both the public and private sector.

Because of the firm's reputation, HA spends very little time and resources on marketing. Our clients continually come back to us and we obtain the vast majority of our work through their direct referrals and word-of-mouth.

HA is a Disadvantaged Business Enterprise certified with the Arizona Department of Transportation (DBE No. 1876) and the City of Phoenix/Maricopa County. HA is also certified as a Small Business by the U.S. Small Business Administration. As such, we can assist our clients in meeting DBE goals associated with their project work.

Hoque & Associates and especially Enamul has been so important to this Project (Rio Salado Restoration), his involvement has helped us to really think beyond the box".

- Walt Kinsler
Project Manager
City of Phoenix

2.0 FIRM CAPABILITIES

HA is highly experienced and capable of performing the following services:

- Geotechnical Engineering and Field Exploration;
- Restoration of Old Landfills for Commercial, Residential and Industrial Developments;

- Ground Improvements and Geotechnical Analysis of Soft Soil and Liquefaction Analysis;
- Geotechnical Analysis for River Restoration and Dam and Embankment Analysis and Design
- Construction Materials Field, Laboratory, and Specialty Testing and Inspection
- Solid Waste Engineering
- Environmental Site Assessment (ESA)
- Civil Engineering and Grading and Drainage Plans

HA operates from a company owned stand-alone facility conveniently located at 4325 South 34th Street (the northeast corner of South 34th Street and Broadway Road) in Phoenix, Arizona and provides the above services in-house with the exception of drilling. Our in-house resources include a fully equipped geotechnical testing laboratory and offices for professional and support personnel who provide engineering, management, and administrative services.

Managers and administrative personnel have state-of-the-art computer equipment dedicated to their exclusive use. Software proven effective in project management is utilized to assist our project managers with efficient budget development and tracking, schedule development and tracking, database development and maintenance, and documentation and report generation.

Our laboratory is accredited by appropriate state and federal agencies. All of HA's laboratory and field testing equipment is calibrated on a routine basis per our accreditation criteria and calibration documentation is kept on file in our offices. All equipment is routinely inspected and repaired or replaced as appropriate. Nuclear gauges used for field density testing of soil and asphalt are licensed by the Arizona Radiation Regulatory Agency (License number 7-431).

HA has been in business for more than 11 years. To become a premier geotechnical and construction materials testing engineering firm, HA follows a strict quality control process. Our project management and schedule control philosophy are based on the following elements:

- The most qualified, trained and experienced personnel are assigned to each project to assure that the project work is completed on time and project deliverables meet the client's requirements.
- Daily communication between the project manager and the key project personnel.
- Periodic project meetings (monthly, weekly, or daily as appropriate) to discuss the project status, accomplishments, budget, and any problems foreseen. Meeting minutes and project status reports can be provided to the client if necessary or requested.

- To assure that an individual with authority to commit resources of the company is involved, firm principals serve as project director and oversee the project. The project director works closely with the project manager and serves as the key contact person to the client.
- Project reports form the basis of our billing and include: work and tasks completed; work and tasks to be completed with an updated schedule; and, actual man-hours that have been completed.

Project managers inform all project personnel of tasks to be completed and budgetary constraints. All project personnel are required to record their hours on time sheets and prepare daily reports that summarize work completed each day.

HA's field and laboratory technicians are experienced in construction materials sampling, testing, and monitoring. Their experience includes QA/QC testing and monitoring of soils, Portland cement concrete, and asphaltic concrete. All HA personnel are highly experienced and qualified, and properly registered and/or trained (Professional Registration, OSHA training), and/or certified by national organizations (including NICET, AWS, and ATTI).

2.1 Geotechnical Engineering

HA's geotechnical program consists of planning, site reconnaissance, determination of subsurface conditions, sampling and in-situ testing, classification of earthen materials, development of subsurface profiles, interpretation of results, engineering analysis, and report preparation.

The planning stage consists of review of existing information on geology, soil, rock, environmental, and groundwater conditions of the site and available information on relevant structural and architectural details of the project. The review may include information available from the Natural Resource Conservation Service (formally the Soil Conservation Service), United States Geological Survey (USGS), reports from local and state agencies, and geotechnical reports available for the site. During the planning stage, HA prepares a data repository for the project, which is used in combination with the exploration program.

Qualified personnel trained and experienced in the area perform field reconnaissance of the project site. The purpose of the field reconnaissance is to: verify site surface conditions; identify site drainage and hydrological conditions; prepare a preliminary geological map, verify site accessibility for a drill rig; locate above and below ground utilities; and identify any surface anomaly that can affect site work or development. Field reconnaissance may be performed at the time of and in conjunction with the field exploration program depending on the size and complexity of the project.

Hoque's report is very well prepared and very informative. It covered all possible scenarios and recommended the preferred method of foundation construction. Challenging soil conditions made this project unique".

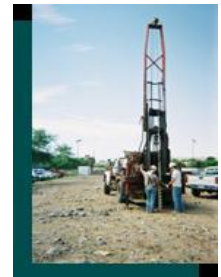
-- Khaled Salahuddin, P.E., Bridge Section, ADOT

Determination of subsurface conditions is completed by invasive and/or non-invasive methods. Invasive methods include drilling of test borings, excavation of test pits, and sampling. Drilling is completed utilizing rotary drilling systems such as auger rigs and percussion type drilling equipment such as ODEX, roto sonic rig, or reverse circulation AP-1000 Becker Hammer rigs. Drilling services are acquired through subcontractor agreements HA has with various local drilling companies. Drilling activities are monitored by field personnel who log and record subsurface conditions. Non-invasive methods include geophysical evaluation utilizing seismic refraction, electrical resistivity, and geologic survey.

Subsurface logs are developed to concisely and objectively illustrate subsurface geologic and hydrologic conditions that are important in proper planning and design of foundation, structural, and pavement systems. Hydrogeologic features presented in the logs include: soil and rock unit descriptions; thickness and extent of each unit and their physical properties; geologic and geomorphic features indicative of any subtle concern for the type of structures to be built; depth to groundwater if encountered; and, other features important to project design. Boring logs, test pit logs, and core logs are developed in the field, completed and refined in the office based on laboratory testing results, and are always reviewed by a registered professional.

HA's geotechnical exploration and testing services typically consist of the following.

- Test borings for evaluation of subsurface soil for foundations and structures.
- Rock coring and sampling to evaluate lithologic characteristics of the rock formation.
- Field testing including standard penetration tests, percolation tests, rock quality designation tests and others as appropriate.
- Soil and rock sample collection and laboratory testing.
- Development of concise and detailed soil and rock boring logs.
- Specialized field tests including static cone penetrometer, pressure meter, borehole shear, and dynamic penetrometer tests if necessary and/or requested by the client.



HA's professional engineers utilize data collected during field exploration and laboratory testing for foundation analysis. The analysis for foundation design includes:

- Recommendations for the allowable and safe bearing pressures for shallow foundations including spread footings, slabs-on-grade, and mat and raft foundations.
- Settlement analysis including compression-settlement of collapsible soil, consolidation settlement, and instantaneous compression of sand and moisture deficient soils. The analysis is completed using conventional and site-specific data and methods.
- Analysis of and recommendations for deep foundations including bored and/or driven piles, drilled shafts or caissons, pressure-injected footings, stone columns and other foundation systems. Analysis also includes lateral pile or shaft capacity due to seismic or other loads and construction requirements including inspection of

piles and drilled shafts. Analysis of deep foundations also includes use of latest techniques such as the Deformation Limit State Method recommended by AASHTO. In this analysis the foundations are assumed to undergo a predetermined settlement or deformation of the pier shaft and the capacity is corrected accordingly. This method is based on the load-transfer mechanism in which the structural elements, such as a shaft, undergo compression due to applied load. Some or part of the load is transferred to the soil as soils adjacent to shaft also compress to maintain compatibility.

- Seismic analysis for shallow and deep foundations including lateral analysis of piles and piers and development of deflection versus load curves. For foundations and structures, the seismic evaluation also includes recommendations for dynamic bearing pressures, foundation response to transient loads transmitted through soil, and predominant period and maximum amplitude of acceleration.
- Slope stability, seepage, and erosion analysis.

The results of our foundation analysis are presented in graphical form using relationships between width of footing versus bearing pressure, depth and diameter of drilled shaft versus depth of embedment, and length of piles versus pile diameter and spacing. The graphical presentation of foundation analysis can be utilized directly by the engineer as a nomograph to finalize their design saving time and costs of the project. The professional personnel at HA are also available to discuss specific needs of the clients as a continuation of our service.

Some examples of the geotechnical exploration projects completed by HA within the past several years are provided below.

Project Name and Location	Client
Ground Stabilization and Building Pad Evaluation Including Geotechnical Analysis for Tempe Marketplace	Foursite Development 2809 E. Camelback Road, Suite 300 Phoenix, Arizona 85016
Ground Improvement, Stabilization, Building Pad Evaluation, Roadway and Utilities Infrastructure Installation at Airport I-10 Business Park, Phoenix, Arizona	Wentworth Property Company, LLC. 2701 East Camelback Road #185 Phoenix, Arizona 85016
Ground Improvement and Stabilization of a Debris Fill Site at 28th Street and Elwood Street, Phoenix, Arizona	Absolute Steel LLC. Tempe, Arizona Phone number 18778333237 Attention: Dean Thomas
Ground Stabilization and Improvements at Tempe Landfill and Maricopa Landfill for Hospitality, High Density Residential and Commercial Development, 2100 East Rio Salado Parkway, Tempe	Tellurian Development 2200 East Camelback Road, #602 Phoenix, Arizona 85016
Ground Stabilization and Improvement for Utilities and Roadway Infrastructure at Riverview Rio Salado #33 Landfill at 12th	Reliance Development 2122 East Highland Avenue #400 Phoenix, Arizona 85016

Street and Riverview Drive, Phoenix, Arizona	
Rio Salado Environmental Restoration Project, Phoenix Reach, 24th Street to 19th Avenue. Development of Trails, Stabilization of landfills, Construction of Wetlands and Other Features	City of Phoenix Engineering Walt Kinsler and Karen Williams
New Traffic Control Tower Sky Harbor International Airport Phoenix, Arizona	Jacobs Facilities, Inc. 1300 Wilson Boulevard Arlington, Virginia 22209
Automated People Mover Geotechnical Exploration, Sky Harbor International Airport Phoenix, Arizona	City of Phoenix, Street Transportation Dept., 1034 East Madison Street, Phoenix, Arizona 85034
Maricopa County Sheriff's Office Training Academy Facility Phoenix, Arizona	Dick & Fritsche Design Group 4545 E. McKinley Street Phoenix, Arizona 85008
Sprint Switch Building Geotechnical Exploration and Construction Quality Assurance Testing Phoenix, Arizona	Sprint 6100 Sprint Parkway Overland Park, Kansas 66251



Alexan Belleview Luxury Condominiums Geotechnical Exploration and Construction Quality Assurance Testing	Trammel Crow Residential Southwest 7373 N. Scottsdale Rd., Ste C228 Scottsdale, Arizona 85253
City of Phoenix New Landfill Facility Buckeye, Arizona	URS Corporation 7720 North 16 th Street, Suite 100 Phoenix, Arizona 85020
City of Prescott Water Distribution System Paulden – Chino Valley Pipeline and Booster Station, Prescott, Arizona	Black & Veatch Engineers 2850 East Camelback Road, Suite 240 Phoenix, Arizona 85016
Pinnacle Peak Road, 40 th Street to Tatum Blvd. 36-Inch High Pressure Waterline Phoenix, Arizona	Kirkham Michael Consulting Engineers 9201 North 25 th Avenue, Suite 150 Phoenix, Arizona 85029
City of Avondale Water Distribution Line El Mirage Road to 115 th Avenue Avondale, Arizona	CH2M HILL 2625 South Plaza drive, Suite 300 Tempe, Arizona 85285
Proposed Administration Building Geotechnical, Skunk Creek Landfill, City of Phoenix North Service Center, Phoenix, Arizona	City of Phoenix, Engineering & Architectural Services Dept., 200 W. Washington Street, Phoenix, Arizona 85003
Visitor Complex Geotechnical, City of Phoenix 23 rd Avenue Waste Water Treatment Plant Phoenix, Arizona	City of Phoenix, Engineering & Architectural Services Dept., 200 W. Washington Street, Phoenix, Arizona 85003
12 Story Hotel Building, Geotechnical Exploration, 44 th Street & McDowell Road Phoenix, Arizona	Columbia Sussex Corporation 207 Grandview Drive Fort Mitchell, Kentucky
10-story, 6-story, and 3-story Multi-use Structures at Rio Salado Project, Geotechnical Exploration Tempe, Arizona	Smith Group Project Management, Inc./Arizona State Board of Regents
WalMart Retail Center at Lindsay & McKellips Geotechnical Exploration Mesa, Arizona	Kimley-Horn & Associates. 7600 North 15 th Street, # 250 Phoenix, Arizona 85020
Geotechnical Exploration, WalMart Retail Center at Raintree & Pima Road Scottsdale, Arizona	Kimley-Horn & Associates. 7600 North 15 th Street, # 250 Phoenix, Arizona 85020
I-17 Bridges, and Barrier Walls, Thomas Rd. to Peoria Ave., Geotechnical Exploration and Foundation Report, Phoenix, Arizona	Parsons Brinkerhoff- Meadow Valley Joint Venture, 1501 West Fountainhead Parkway, Suite 400, Tempe, Arizona 85282

2.2 Construction Materials Testing and Inspection

HA has extensive experience providing laboratory and field construction materials testing and inspection services. Our laboratory is equipped with up-to-date properly calibrated equipment and is staffed with highly qualified engineers and technicians. HA furnishes all materials and equipment necessary to perform all sampling and testing and provides sufficient trained personnel to adequately and completely perform the client's requirements. This includes all vehicles for transport of personnel and equipment, laboratory and field sampling and testing equipment, a field laboratory if required for remote projects, office equipment including computers and supplies, and all other devices required to determine the quality and acceptability of materials and workmanship which will be incorporated into the project.

HA's laboratory and field testing and inspection capabilities are discussed below.

Construction Materials Laboratory Testing

HA's construction materials testing laboratory is certified/accredited by the American Association of State Highway and Transportation Officials (AASHTO) and the Arizona Department of Transportation (ADOT). Our laboratory is currently set up and certified to provide soil, aggregate, asphalt, and concrete/masonry testing. HA's laboratory also participates in CCRL and AMRL reference testing and certification.



HA Laboratory

Our accreditations and certifications are included in Appendix A.

HA currently provides the construction materials laboratory testing services listed below. Testing provided through sub-contracted laboratory tests are indicated with an asterisk.

A. Soil/Aggregate:

- Particle Size Analysis (ASTM D422)
- Atterberg Limits (ASTM D4318)
- Permeability (ASTM D5084)
- Compression (ASTM D2435)
- Unconfined Compression (ASTM)
- Sand Equivalent (ASTM D2419)
- Aggregate Sample Reduction (ASTM C702)
- pH
- Sieve Anal. Fine & Coarse Agg. (ASTM C136)
- Fines Content (ASTM D1140/C117)
- Specific Gravity (AASHTO)
- Triaxial (ASTM D2850/D4767)
- Swell (ASTM D4546)
- Proctor (ASTM D698/D1557)
- Moisture Content in Soil (ASTM D2216)
- Agg. Moisture by Drying (ASTM C566)
- Resistivity
- Dry Prep. Of Disturbed Soil (ASTM D421)

B. Concrete/Masonry:

- Manufacturing and Curing of Concrete Test Cylinders (ASTM C39)
- Concrete Compressive Strength Including High Strength Concrete (ASTM C31)

- Grout and Mortar Compressive Strength (ASTM C31)
- Unit Weight (ASTM C138)
- Capping Cylinders (ASTM C617)
- Mix Design (ASTM C192)
- Flexural Strength (ASTM C78)
- Sampling Freshly Mixed Concrete (ASTM C172)
- Slump (ASTM C143)

C. Asphalt:

- Mech. Analysis Ext. Aggregate (ASTM D5444)
- Bulk Specific Gravity (ASTM D2726)
- Asphalt Content by Ignition (ASTM D6307)
- Percent Air Voids (ASTM D2303)
- Marshall Flow & Stability (ASTM D1559))
- Specific Gravity (Rice/Fan Dried) (ASTM D2041)
- Un-compacted Void Content (ASTM C1252)
- Fractured Faces (ASTM D5821)

Construction Materials Field Testing and Inspection

HA provides complete construction materials field testing and inspection services. Field testing and inspection services provided by HA include:

- Sand cone and nuclear gauge soil density testing
- Soil moisture content testing
- Asphalt nuclear gauge density tests
- Crusher control sampling/testing
- Concrete air-voids, slump, temperature, air content, and cylinder preparation
- 1-pt. Proctor tests on soils
- Asphalt hot-plate and core sampling
- Asphaltic concrete cold feed testing

HA utilizes experienced technicians that are Trench Safety/Competent Person, ATI, ACI, and/or Nuclear Gauge Use/Radiation Safety certified to provide the above field testing and inspection services.

Special Testing and Inspection

HA has a subcontract agreement with Inland Inspection & Testing, Inc. of Arizona, to perform the following services: Nondestructive Testing (UT, PT, MT), Visual Welding Inspections (AWS, ICBO), Welder Qualification, Fireproofing Inspection and Testing, Field and Laboratory Load Testing, and other Special Testing and Inspection.

Experienced technicians that are ATI, NICET, ACI, and/or Nuclear Gauge Use/Radiation Safety certified provide the above field testing and inspection services.

Some examples of materials testing and inspection projects completed by HA during the past several years are provided below.

Project Name and Location	Client
Sky Harbor International Airport Center Runway and Taxiway Construction Phoenix, Arizona	City of Phoenix, Street Transportation Dept., 1034 East Madison Street, Phoenix, Arizona 85034

Sky Harbor International Airport, North Runway and Taxiway Construction QA Testing Phoenix, Arizona	City of Phoenix, Street Transportation Dept., 1034 East Madison Street, Phoenix, Arizona 85034
Executive Terminal Foundations Testing/Inspection, Goodyear Airport Goodyear, Arizona	City of Phoenix, Street Transportation Dept., 1034 East Madison Street, Phoenix, Arizona 85034
Terminal 4 East Parking Structure Testing/Inspection (soil, concrete, asphalt), Sky Harbor International Airport, Phoenix, Arizona	City of Phoenix, Street Transportation Dept., 1034 East Madison Street, Phoenix, Arizona 85034
Runway 3 Testing/Inspection (soil, concrete, asphalt), Sky Harbor International Airport Phoenix, Arizona	City of Phoenix, Street Transportation Dept., 1034 East Madison Street, Phoenix, Arizona 85034
Taxiway, Apron, Hangar Buildings Testing/Inspection, Deer Valley Airport Phoenix, Arizona	City of Phoenix, Street Transportation Dept., 1034 East Madison Street, Phoenix, Arizona 85034
San Tan Regional Park Roadways Quality Assurance Testing Florence, Arizona	Pinal County Public Works P.O. Box 1408 Florence, Arizona 85232
Hertz Car Sale Facility Construction Management/Testing, Baseline & Arizona Avenue, Gilbert, Arizona	Turner / On-site 1018 East Guadalupe Road Tempe, Arizona 85283
Evaluation of Existing Pavement Mocking Bird Lane from Invergordon to 56 th Street, Town of Paradise Valley, AZ	Kimley-Horn and Associates 7600 North 15 th Street, Suite 250 Phoenix, Arizona 85020
SR-85 Gila River Bridge Quality Control and Material Testing Buckeye, Arizona	CS Construction, Inc. 22023 N. 20 th Avenue Phoenix, Arizona 85027
I-40 at Ash Fork Quality Control Testing Ash Fork, Arizona	FNF Construction 115 South 48 th Street Tempe, Arizona 85281
US-93, Lava Rock Section Quality Control Testing, Mojave County, Arizona	Ames Construction 3410 E. University Drive Phoenix, Arizona 85034
San Tan Regional Park Roadways Quality Assurance Testing Florence, Arizona	Pinal County Public Works P.O. Box 1408 Florence, Arizona 85232
Gateway and Glendale Community Colleges Parking Lot CQA Testing Maricopa County, Arizona	Maricopa County Community College District, 2411 W. 14 th Street Tempe, Arizona 85281

Arrowhead Wastewater Treatment Plant Expansion Project, Quality Control Testing Glendale, Arizona	PCL Civil Constructors, Inc. 1729 W. Greentree Drive, Suite 105 Tempe, AZ 85284
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2.3 Environmental Assessment

Goal oriented and focused toward problem solving, HA works with their clients to devise and implement environmental compliance strategies to provide expeditious and cost-effective solutions to environmental issues.

HA provides complete Phase I and Phase II (soil and/or groundwater) assessment services and underground storage tank (UST) assessment services. HA personnel have extensive experience providing these services for private and public sector clients.

HA also provides limited Phase III (remediation) and biological survey services. Remediation services provided by HA include site characterization required for determination of appropriate remedial approach and design, remedial design review, construction management, and remediation system operation and maintenance. Biological survey services provided by HA include initial identification of threatened or endangered species (flora and/or fauna) listed for the geographical area of the project site(s) and evaluation of the habitat documented for any listed species to determine if a full biological survey is warranted.

HA's Environmental Assessment capabilities as referenced above are presented separately below.

Phase I ESA

Our environmental professionals have performed hundreds of ESAs of properties including vacant undeveloped land, commercial/retail properties, UST/gasoline stations, and industrial properties. The purpose of the Phase I ESA is to characterize a parcel of commercial real-estate and adjacent property conditions to identify obvious and potential environmental concerns related to current and/or past uses, evaluate potential liability associated with the designated property, and determine if the site warrants further study. The ESA is intended to serve as appropriate, commercially prudent, reasonable inquiry with regard to the potential for "recognized environmental conditions" at a site as defined by the American Society for Testing and Materials (ASTM).

According to the ASTM definition "recognized environmental condition" means: "The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with the laws."

An additional objective of the Phase I ESA is to document readily apparent activities pertaining to hazardous substances on adjacent properties. The Phase I ESA is not performed to determine the actual presence or extent of any contamination or environmental impacts.

Phase I ESAs are completed by HA in compliance with ASTM E 1527-00, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. Any deviations from the ASTM 1527-00 standards of practice and/or any services conducted in addition to this practice are clearly identified. Phase I ESAs performed by HA include the following general tasks:

- Site review including visual and physical site reconnaissance to observe, document, and photograph the current site conditions, site usage, and site features. The surrounding neighboring properties are also reviewed by entering these properties in areas open to the public or viewing them from the subject site.
- Review of regulatory records pertaining to the subject site and adjacent and nearby properties. An environmental database search is performed for the subject site and surrounding area within the recommended search radius provided in ASTM E 1527-00.
- cursory literature review to document and identify the hydrologic and geologic conditions of the vicinity of the subject site. Regional groundwater quality, gradient, and depth data are documented including available physical properties of the aquifers. Literature review also includes regional surface water drainage conditions.
- Historical land use research consisting of review of available aerial photographs and USGS Topographic Maps. If required by the client, information available through archeological and historic preservation resources is included.
- Personal interviews of the current property owner and/or occupant and previous occupants to the extent that they are readily available. HA uses the interview questionnaire format contained in ASTM E 1528-00 to conduct interviews.
- Title search for the subject site to cover the past 50 years and used to identify historic owners of the property.

Following performance of the above tasks, the information obtained is documented and presented in a Phase I ESA report with references identifying sources relied upon in preparing the report. The report will include conclusions that describe any environmental concerns identified associated with the site or surrounding area and will state whether or not any recognized environmental conditions were identified for the site.

Recommendations related to environmental concerns and/or recognized environmental conditions are outside the scope of ASTM E 1527-00 (a non-scope consideration) and therefore are not automatically included in the report. However, many clients want or need recommendations for various reasons including requirements placed on them by lending institutions. HA will provide recommendations in the report or under separate cover at the request of the client.

Other non-scope considerations that may be environmental issues but that are outside the scope of ASTM E 1527-00 include: asbestos containing building materials, radon gas, lead-based paint, lead in drinking water, wetlands, regulatory compliance, cultural and historical resources, archeological resources, health and safety, industrial hygiene, ecological resources, endangered species, and indoor air quality. HA is experienced and capable in these non-scope areas and will include any or all in an ESA at the request of the client.

Phase II Assessment

HA personnel have performed numerous Phase II assessments of properties including vacant undeveloped land, commercial/retail properties, UST/gasoline stations, and industrial properties. The purpose of the Phase II Assessment is to characterize the presence and/or lateral and vertical extent of suspected environmental contamination identified during a Phase I ESA or



through other means and to estimate potential remediation costs. The Phase II assessment is performed in compliance with ASTM E 1903-97, Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process and any other applicable state and/or federal rules or regulations. Any deviations from the ASTM 1903-97 standards of practice or any additional services conducted are clearly identified.

HA's Phase II assessment typically includes the following general tasks:

- Development of an appropriate scope of work Based on information obtained during the Phase I ESA or through other means.
- Performance of all necessary field work including drilling, excavating, and sampling associated with soil investigation and installation/sampling of monitoring wells associated with groundwater investigation.
- Procurement of laboratory analytical services for collected soil and/or groundwater samples and report results as they relate to recommended levels allowed by Federal and/or State regulations.
- Preparation and submittal of a detailed report to define the extent of known contamination and provide recommendations and estimated costs of remediation.
- Assisting the client with necessary permitting and agency notifications as needed.

All drilling services necessary for performance of the Phase II assessment are subcontracted to a properly licensed drilling firm. All laboratory analytical services are subcontracted to a properly licensed analytical laboratory.

Phase III ESA (Remediation)

HA is highly experienced and qualified to provide support services for Phase III remediation activities including providing site characterization data required for remedial design, remedial design review, construction administration, and remediation system operation and maintenance. Remedial design services are subcontracted to experienced remediation firms as appropriate.

Remedial design for any project is site specific and highly dependent on the types and concentrations of contaminants involved, media involved (soil and/or groundwater), required time-frames for remediation, physical constraints, and cost. Various approaches to a specific contamination problem may work but at differing time-frames and costs.

HA's Phase III remediation services typically include the following:

- Provision of site characterization data necessary for remedial design and consultation with various remediation service providers to evaluate the feasibility and cost effectiveness of different methods of remediation.
- Evaluation of various remedial alternatives, including natural attenuation, to assist the client in determining the desired approach.
- Review and evaluation of the final remedial design.
- Construction administration and quality assurance observation to ensure that construction of the chosen remedial alternative(s) is in accordance with the client's and manufacturers specifications.
- Operation and maintenance of the chosen remedial alternative(s).

Some examples of environmental assessment projects completed by HA during the past several years are provided below.

Project Name and Location	Client
Numerous Phase I ESAs City of Phoenix Properties Phoenix, Arizona	City of Phoenix Engineering and Architectural Services Dept., 200 W. Washington, 7 th Floor, Phoenix, Arizona
Beardsley Landfill Phase I Environmental Site Assessment Phoenix, Arizona	Dames & Moore Group 7500 N Dreamy Draw Dr., #145 Phoenix, Arizona 85020
Phase I/II ESA 11-Acre Property Surprise, Arizona	Brookstone Ventures, L.L.C. 3303 North Manor Dr. East Phoenix, Arizona 85014
Confidential Facility, Leaking UST Groundwater Monitoring & Remediation Tempe, Arizona	Renaissance Environmental Management 3026 E. Verbena Drive Phoenix, Arizona 85048

Phase I/II ESA Industrial Facility, 4545 E. University Drive Phoenix, Arizona	AAA Transportation Services 4525 E. University Drive Phoenix, Arizona 85040
Phase I/Phase II ESA Iron King Smelter/Mill Site Humboldt, Arizona	Kuhles Services, Inc./KSERV, LLC 219 E. Navajo Drive Prescott Arizona



Ground Improvement with Deep Dynamic Compaction at 24th Street and Riverview Drive, Phoenix, Arizona

2.4 Solid Waste Engineering

HA provides a wide range of Solid Waste (Landfill) Engineering services. A summary of the various services that HA is experienced in providing is presented below.

Integrated Waste Management Plans

Including: Waste Reduction; Recycling and Resource Recovery Facilities; Transfer Stations Including Economic Analysis; Material Recovery Facilities; Material Collection Facilities; and, Land Disposal and Alternate Treatment of Solid Waste.

Landfill Planning & Permitting

Including: Land Use Planning; Document Preparation Based on Arizona Department of Environmental Quality (ADEQ) & Other Agency Requirements; Document Preparation to Receive Archaeological, Wild Life, and Other Clearances; and, Coordination with Regulatory Agencies to Obtain and Assist in Negotiation of Permits.



SR85 Landfill

Landfill Siting

Including: Site Identification; Site Screening Based on Technical, Economic, Environmental & Political Criteria; Preparation of Technical and Non-technical Documents; and, Waste Management Plans.

Landfill Design

Including: Conceptual and Final Designs for Site Plans and Grading Plans; On-site Disposal Roadways & Traffic Plans for Efficient Operations; Off-site and On-site Runoff & Run-on Control; Facilities Design; Liner Design & Slope Stability Including Alternate Liner Systems; Design of Leachate Collection and Removal Systems Including Leachate Pipes, Sumps, Pumps & Evaporation Ponds; Design and Construction Observation for Installation of Landfill Gas Monitoring Systems; Site Operations Plans; Excavation Management Plans; Specifications and Contract Document Preparation; Cost Estimating; and, Bid Review and Recommendations.



SR85 Landfill

Landfill Construction Management

Administration; On Site Activities Coordination; Field Inspection and QA/QC Testing; Regulatory Reporting; Progress Monitoring and Payment Recommendations; and, Final Certifications.

Closure and Post Closure System Design

Including: Final Cover Design; Final Grading & Drainage Plans; Final Closure Plans; Erosion

Control Plans; Landfill Settlement and Slope Stability Analysis to Evaluate Their Effect on Final Cover System; Environmental Control Plans; Closure Cost Estimating & Scheduling; and, Design & Planning for Alternate Cover Systems.

Post Closure Monitoring and Maintenance

Including: General Site and Environmental Maintenance; Emergency Response Plans; Health and Safety Plans; Quarterly Landfill Gas and Groundwater Monitoring; and, Monitoring, Maintenance, and Management of Cover Systems, Landfill Settlement & Subsidence, and Drainage Systems.

Some examples of solid waste engineering projects completed by HA during the past several years are provided below.

Project Name and Location	Client
Silver Bar Mine Regional Landfill, Siting, Permitting, and Preliminary Design Pinal County, Arizona	HighGround Communication, Inc. 830 North 4 th Avenue Phoenix, Arizona 85007
Iron King C&D Landfill and Waste Reduction Facility, Design, Permitting, and Monitoring Prescott, Arizona	Kuhles Services, Inc./KSERV, LLC 219 E. Navajo Drive Prescott Arizona
City of Phoenix New Landfill Facility (SR85) Siting and Design Buckeye, Arizona	URS Corporation 7720 North 16 th Street, Suite 100 Phoenix, Arizona 85020
27 th Avenue Landfill Closure - Phase I, Final Cover and Gas Monitoring System CM and QA Testing Phoenix, Arizona	City of Phoenix, Engineering & Architectural Services Dept., 200 W. Washington Street, Phoenix, Arizona 85003
27 th Avenue Landfill Closure - Phase II, Storm Water Management System CM & QA Testing Phoenix, Arizona	City of Phoenix, Engineering & Architectural Services Dept., 200 W. Washington Street, Phoenix, Arizona 85003
Skunk Creek Landfill Cell 5, Design Engineering, Construction Administration, and Construction Quality Assurance, Phoenix, Arizona	City of Phoenix, Engineering & Architectural Services Dept., 200 W. Washington Street, Phoenix, Arizona 85003
Salt River Landfill Phase IIIB & IVA, Liner System QA/QC Testing, Pima Maricopa Indian Community, Scottsdale, Arizona	Pima Maricopa Indian Community 13602 E. Beeline Highway Scottsdale, Arizona 85256
Cave Creek MSW Landfill	Maricopa County Solid Waste

Closure Design and CQA Testing and Inspection Maricopa County, Arizona	Division 2801 West Durango Street Phoenix, Arizona 85009
CQA Testing and Inspection Three Rural MSW Landfills Maricopa County, Arizona	Maricopa County Solid Waste Division 2801 West Durango Street Phoenix, Arizona 85009
Abitibi Consolidated New Landfill Design and CQA Testing and Inspection Snowflake, Arizona	Abitibi Consolidated P.O. Box 128 Snow Flake, Arizona 85937
Cochise County Eastern Regional Landfill Landfill Gas Control System Design Elfrida, Arizona	Cochise County Facilities and Solid Waste Management Department, 1415 W. Melody Lane, Building C, Bisbee, Arizona 85603

2.5 Civil Engineering

HA provides civil engineering services related to subdivision design and drainage and grading requirements for site development. HA has provided subdivision design and/or grading and drainage plans for a variety of different projects including single residential properties, multiple lot residential subdivisions, and commercial developments. We also provide permitting and permitting liaison services if requested. Our services include: site visits to evaluate the property visually and compare with survey drawings provided; design of building lots, roadways, pedestrian ways, underground utilities, easements, and setbacks; engineering drainage calculations for a 100-year storm event; design of drainage and retention features; preparation of related CADD plans based on survey drawings; and, preparation of a drainage reports and site plans for submittal to the permitting authority. HA also provides permitting and permitting liaison services if requested.

Some examples of the grading and drainage projects accomplished by HA within the past three years are summarized below.

Project Name and Location	Client
Villas Montanas Phoenix, Arizona	S & S Paving and Construction 3401 E Illini St. Phoenix, AZ 85040
Beverly Subdivision Civil Engineering and Design Phoenix, Arizona	Acorn Housing Corporation Arizona 1018 West Roosevelt Street Phoenix, Arizona 85007
Site Plan and Construction Development 5 th Street & Mountain View Phoenix, Arizona	Sunny Slope Village Revitalization, Inc. 9108 North 3 rd Street Phoenix, Arizona 85020

Engineering Evaluation for 320 Acres Land, 243 rd Avenue & Deer Valley Road Surprise, Arizona	Mr. Imtiaz Waris 11260 North 92 nd Street, Suite 2085 Scottsdale, Arizona 85260
Salt River Landfill, Hydrologic Analysis, On-Site Storm Water Runoff Management System Scottsdale, Arizona	Salt River Pima Maricopa Indian Community, 13602 East Beeline Highway Scottsdale, Arizona 85256
Islamic Center of the East Valley Drainage, Grading, and Hydraulic Analysis Phoenix, Arizona	Islamic Center of the East Valley Mesa, Arizona
Dhangel Residence Drainage, Grading, and Hydraulic Analysis Scottsdale, Arizona	Architecture All & Associates, Inc. 7740 E. Evans Rd. Scottsdale, Arizona 85260
Express Lube Drainage, Grading, and Hydraulic Analysis Phoenix, Arizona	Environmental Professional Services 3038 E. Leland Street Mesa, Arizona 85213
Engineered Fill Plan for 24 th St. Landfill Phoenix, Arizona	Jacor Partners, L.C. 2730 East Camelback Rd., Ste. 220 Phoenix, Arizona 85016

3.0 KEY PERSONNEL

The team of professional and technical personnel presented in this SOQ consists of a diverse group of individuals with extensive expertise and knowledge in their field. Our team includes qualified engineers, scientists, CADD operators, and field and laboratory technicians. These personnel combine technical skill, professional reputation, and project management skills including project budget and schedule control to provide efficient, effective, and responsive services. Our team members are thorough in their knowledge with regard to: geotechnical engineering; construction materials testing and monitoring; foundation analysis; pavement design; construction management; record search and regulatory review; building inspection; environmental assessment; and, landfill siting, design, and liner system construction quality assurance (CQA).

HA project teams consist of a Project Director/Principal-in-Charge, Project Manager, and Task Leaders. The Project Director/Principal-in-Charge serves as HA's point of contact to the client and is responsible for project technical issues, scheduling, and budget control. The Project Manager provides general project oversight and reports to the Project Director. All task leaders report to the Project Manager with regard to project issues.

Brief descriptions of key HA personnel including their relevant experience are provided below.

**Enamul Hoque, P.E., President
Project Director/Principal-in-Charge**

Mr. Enamul Hoque holds a M.S. Degree in Civil Engineering and is a Registered Professional Engineer. Mr. Hoque is an ASCE Fellow and has more than 34 years of experience in geotechnical engineering and construction materials testing in the southwestern U.S.A, Asia, and North Africa. He has successfully managed, permitted, designed, and/or provided CQA and construction administration services for hundreds of geotechnical and materials testing projects. He has completed numerous geotechnical projects involving: field exploration; field logging and classification of soils; field and laboratory testing; foundation analysis; mitigation of special problems including collapsible/soils and soft soils; seismic and earthquake foundation design; retaining wall and embankment slope design and analysis; and, design and analysis of embankment dams. Mr. Hoque has completed several dozen liner, earthwork, and dam projects in the arid southwestern United States. He has provided innovative solutions for construction and maintenance of landfill soil liners and infiltration layers and developed and utilized index properties as an indicator test for permeability. He has been an instructor for last five years teaching a continuing education short course on Design and Construction of Waste Containment Systems and Final Cover for Waste Impoundments for ASCE, ADEQ, and ASU.

Tracie Riggs, Project Manager

Ms. Riggs has more than 5 years of experience in the field of geotechnical engineering including instrumentation, monitoring, material testing, and field exploration. Ms. Riggs has extensive experience in managing projects for construction materials testing. Major projects in his geotechnical experience include highways, highway bridges, residential subdivisions, parking garages, commercial buildings, high-rise buildings, industrial facilities, wastewater treatment plants, landfills, solid waste transfer stations, and military bases.

**Karl Johnson and Arvin Collinwood
CAD Designers/Drafters**

Mr. Johnson and Mr. Collinwood have combined over 37 years of experience as designers/drafters providing services to public and private sector clients. Their experience includes subdivision design including design of lot configurations, roadways, grading and drainage including retention basins, underground utilities, and setbacks and easements and grading and drainage plans for numerous custom home sites, schools, and churches. They also have experience providing cut and fill calculations and design and cost estimating for earthworks. Specialty work experience includes landfill design, volume calculations, and disposal cell phasing plans and maps and plans associated with contamination assessment and remediation projects. HA commits the above referenced personnel to provide its clients with quality and responsive services. HA has

additional personnel to commit to projects and will do so as needed with approval from the client. Detailed resumes for all HA personnel are available upon request.

Tom Hoover, Jr.
Senior Engineering Technician

Mr. Hoover has been providing engineering testing and inspection services for 14 years. He has extensive experience providing construction quality assurance (CQA) and construction quality control (CQC) field materials testing and inspection services and laboratory materials testing services. His experience includes: geotechnical and materials testing explorations for foundations, structures, and pavement; and CQA/CQC construction specification and drawing interpretation and enforcement. The types of projects he has worked on include roadways, bridges, pipelines, building structures, and airport runways and infrastructure. Tom is an ATI Field, ACI Field, ACI Concrete Strength Testing, and City of Phoenix qualified field technician.

Abdur Rashid
Senior Engineering Technician

Mr. Rashid has been providing engineering, testing, and inspection services for 33 years. He has extensive experience providing construction quality assurance (CQA) and construction quality control (CQC) field materials testing and inspection services and laboratory materials testing services. His experience includes: geotechnical and materials testing explorations for foundations, structures, and pavement. The types of projects he has worked on include roadways, bridges, pipelines, and building structures. Mr Rashid's certifications include: ATI Field, ACI Field, OSHA 29 CFR Part 1926.650-652 Subpart P "Competent Person," Nuclear Gauge Use/Radiation Safety, and Army Corps of Engineers Contractor's Construction Management Certification.

Corey McElprang, EIT, Project Manager

Corey McElprang has worked over eight years as an Engineering Technician and a Project manager overseeing construction Project and geotechnical exploration. He also performs the inspection of DDC, manages foundation analysis and design both in the field and in the laboratory. His experience includes geotechnical exploration and sampling, construction materials testing, and shaft integrity testing using CSL & GDL for drilled shafts. He has worked on various types of projects including roadways, coring, landfills, bridges, and both commercial and residential developments. Mr. McElprang is ACI and ATTI certified, and is a Certified Nuclear Gauge Operator.

Arash Cyrus, EIT, Assistant Project Manager

Arash Cyrus is a civil engineering degree holder and working with HA for more than two years starting as an intern. He is inspector for DDC, construction of utilities and

analysis of foundations and retaining walls. He is an ATTI, ACI certified personnel and has OSHA training as trench safety.

4.0 PROJECT REFERENCES

As a direct result of the quality, responsive, innovative, and cost effective services that HA provides, the firm has developed and maintained a dedicated and consistent client base that includes both public and private sector clients. Our public sector clients include Maricopa County, Pinal County, Cochise County, Mojave County, the City of Phoenix, the City of Chandler, the Gila River Indian Community, and the Salt River Pima-Maricopa Indian Community. Some of our notable private sector clients include Black & Veatch, CH2M HILL, URS Corp, Kiewit-Western, Abitibi Consolidated, PCL Civil Contractors, West Consultants, Kimley-Horn, Parsons-Brinkerhoff, and Huitt-Zollars.

Because of the firm's reputation over the past three-plus years, HA spends very little time and resources on marketing. Our clients continually come back to us and we obtain the vast majority of our work through their direct referrals and word-of-mouth. HA is very proud of this fact. The following project references are provided for verification of the level of quality and responsiveness provided by HA.

Mr. Fred Mollenhauer

Abitibi Consolidated
P.O. Box 128
Snow Flake, Arizona 85937
Phone: (520) 536-4314

Work Performed: construction quality assurance including field and laboratory soil testing, landfill liner design, earthen dam repair design and quality assurance monitoring, landfill gas monitoring.

Mr. Dave Allard, P.E.

CH2M HILL
2625 South Plaza Drive, Ste. 300
Tempe, AZ 85285-8440
Phone: (480) 966-8188

Work Performed: landfill regulatory review, geotechnical field exploration and materials testing in support of the Rio Salado Environmental Restoration Phoenix Reach project and other projects including pipeline and roadway designs.

Mr. Mike Bornhoeft

City of Phoenix, Engineering and Architectural Services
200 West Washington Street
Phoenix, Arizona 85003
Phone: 602-262-6653

Work Performed: geotechnical engineering, laboratory testing and QA/QC testing various City of Phoenix projects.

Mr. Sam Hashem, P.E.

Jacobs Facilities, Inc.

1300 Wilson Boulevard

Arlington, Virginia 22209

Phone: 571-218-1332

Work Performed: geotechnical engineering and laboratory testing services for the new Phoenix Sky Harbor International Airport Traffic Control Tower design/build project.

Mr. Pascal P. Hinnen, P.E.

URS Corporation

7720 North 16th Street, Suite 100

Phoenix, Arizona 85020

Phone: 602-648-2455

Work Performed: geotechnical engineering, slope stability analysis, landfill location restriction demonstration, and laboratory testing services for a new City of Phoenix landfill.

Dr. Equbal Charania, P.E.

City of Phoenix Street Transportation Department

1034 East Madison St.

Phoenix, Arizona 85034

Phone: (602) – 495 -2050

Work Performed: geotechnical exploration and material laboratory testing for numerous City of Phoenix construction projects including roadways, utilities, and retaining walls.

Ms. Linda Palumbo, Environmental Quality Specialist

City of Phoenix Engineering and Architectural Services Department

200 W. Washington Street, 7th Floor

Phoenix, Arizona 85003

Phone: (602) 495-0975

Work Performed: numerous phase I ESAs for City of Phoenix project sites including vacant lots, housing developments, right-of-ways, and commercial and industrial properties.

Mr. Chris Shaw

City of Phoenix, Street Transportation Dept.

1034 East Madison Street, Phoenix, Arizona 85034

Phone: (480) 529-1477

Work Performed: quality assurance construction materials testing and inspection for projects at Sky Harbor Airport including the North Runway and Taxiway, Terminal 4 East Parking Structure, Runway 3, Taxiway C3E, and Salt River North Bank.

Mr. Ronald J. Serio, P.E.

City of Phoenix
3060 South 27th Avenue
Phoenix, Arizona 85009
Phone: (602) 534-1420

Work Performed: geotechnical engineering, construction materials testing and inspection, and/or design services for several landfill construction and/or closure projects

5.0 INSURANCE CAPABILITIES

HA maintains professional liability, general liability, worker's compensation, and automobile liability insurance. The coverage we maintain is as follows:

- Professional Liability \$1,000,000 per claim
- General Liability \$1,000,000 per claim
- Automobile \$1,000,000 per claim

Our liability coverage can be increased to \$5,000,000 to meet project specific requirements if required.