GEO-ENGINEERING SOLUTIONS, INC.
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February 21, 2018

Attention: Mr. Ridge Green

Subject: ***Proposal for Geotechnical Engineering and Geologic Hazards Study Report***
Garfield Elementary School New Classroom Buildings
13050 Aurora Drive, San Leandro CA
Geo-Eng Proposal No. 1059

Dear Mr. Green:

Geo-Engineering Solutions Inc. (Geo-Eng) has prepared this proposal to provide geotechnical services to the San Leandro Unified School District for the proposed new classroom buildings at Garfield Elementary School. This proposal is based on a review of published geotechnical data, discussions with you, a review of preliminary site plans and our experience in the area.

Based on our review of the schematic plans, it is our understanding that a approximately 15,000 square foot school building will be constructed in the center of the campus as well as a replacement building of the child day care center

We are aware that the following geologic concerns that will need to be addressed by this investigation and report:

- Expansive Soils – In general, the soils of the young alluvial plain adjacent to San Francisco Bay are typically moderately to highly plastic at the surface and have a moderate potential for expansion.
- Liquefiable Soils – The project is located within a California Geologic Survey zone for high liquefaction potential.
- Compressible Soils – due to the proximity to the bay and the young age of the underlying sediments, there is a higher potential for soft to medium stiff soils at the site which may be of concern.

Based on Division of the State Architect (DSA) IR A-4.13 as dictated by California Code of Regulations, Title 24, it is our opinion that a Geologic Hazards Study report and California Geologic Survey (CGS) review will be required due to the construction of a new building that would both satisfy the annual 2,000 person-hour occupancy requirement for a permanent structure and exceed 4,000 square feet in covered area. Therefore, we have included the preparation of a Geologic Hazard Study and Report for this project. Based on a review of the California Geologic Survey (CGS) the project site is mapped within either a state identified earthquake fault zone or a seismic liquefaction hazard zone.

Additionally, per CGS Note 48, Section 16, it is required that regardless of school building type, site-specific ground motion analyses be performed for all sites where seismic parameter S_1 is 0.2 g or greater, which essentially occurs where sites are within the vicinity of major earthquake faults such the Hayward and San Andreas faults, and analyzed using the most recent California Building Code (CBC) procedures. The computed S_1 value for Garfield Elementary School is 0.653g based on the 2015 NEHRP Provisions, which is referenced by ASCE 7-16. Therefore, to comply with CGS requirements a site-specific seismic ground motion analysis will need to be completed for the project.

We have assumed that all the boring locations are accessible to a drill rig without any restrictions. In addition, we have assumed that the work will be performed on a weekday and that excess drill cuttings can be disposed of onsite in unpaved/undeveloped areas to be designated by the District. If requested excess drill cuttings can be removed and off-hauled from the site at an additional cost.

A - Geotechnical Engineering & Geologic Hazards Study

The geotechnical field study will meet Title 24/DSA/CGS requirements. These include drilling a total of 5 borings throughout the planned structures to satisfy the CGS requirement for one boring for every 5,000 sf of structure footprint or two per structure. The services to be provided for our Geotechnical Engineering Study include the following:

Preliminary Field Activities

1) Review available geotechnical and geologic literature for the site.
2) Mark the locations of the subsurface explorations at the site and contact Underground Service Alert.
3) Utilize an underground utility locating subcontractor to better define the location of existing buried utilities.
4) Obtain an Alameda County drilling permit.

Field Exploration

1) The field exploration program will consist of drilling 5 borings at the site. The borings will range in total depth between 10 and 30 feet deep. At least one boring will extend to 50 feet to comply with CGS requirements.
2) Sampling will occur in up to five-foot intervals in the borings. The soil will be sampled with a Modified California sampler fitted with six-inch long inner brass liners and a Standard Penetration Test (SPT) split spoon sampler. The relatively undisturbed liner samples will be sealed and the SPT samples will be placed in plastic bags. The samplers will be driven 18 inches with a 140-pound hammer with an approximate 30-inch drop. Blow counts for the last foot will be logged as the penetration resistance. The blow counts from the SPT sampler will be utilized to determine subsurface soil characteristics for correlation with USCS soil types. Bulk soil samples will be obtained from the upper few feet of auger cuttings in select borings.
3) The borings will be backfilled with cement grout under the supervision of a Alameda County Environmental Health Inspector. Excess drill cuttings will be spread in landscape areas which will not impact the play yard or play fields.
4) As an added option, at the District's decision, excess drill cuttings will be removed and off hauled from the site by the driller at an additional cost.

Laboratory Testing

1) Several in-situ moisture and density tests will be performed on selected brass tube liner samples.
2) Up to two Sieve Analysis tests will be performed to determine subsurface soil characteristics of granular subsurface soils as needed for engineering analysis.
3) One to two direct shears or undrained triaxial tests may be performed to obtain soil strength parameters.
4) One to two Atterberg Limits tests will be performed to determine the expansive potential of the near surface soil.
5) One Corrosion test will be performed as required by the 2016 CBC to help evaluate the corrosive potential of onsite soil on buried structures.

Report Preparation

1) A Geotechnical Engineering Study report will be prepared and will contain a site plan showing boring location, boring logs, geologic cross-sections, and a summary of the site soil and groundwater conditions.
2) We will perform the required computer analyses and generate the required site-specific seismic ground motion parameters based on applicable procedures of the 2016 CBC and ASCE 7-16
3) Recommendations will be provided for:
   - Site clearing, preparation, grading (cut and fill, backfilling) and drainage,
   - Allowable fill material requirements,
   - Underground utility backfilling,
   - Subgrade preparation for building pads and paved areas
   - Foundation design for buildings and structures
   - Retaining wall design,
   - Exterior concrete hardscape,
   - Temporary cut slope excavation and trench slope stability,
   - Flexible asphalt and rigid concrete pavement section designs (vehicular and non-vehicular).

Geology and Geologic Hazards Study

In accordance with the requirements of Title 24, DSA Interpretation of Regulations A-4.13, and the 2016 CBC, a Geologic Hazards Study report is also generally required for new structures exceeding 4,000 square feet in size. Required information to be included in the study is dictated by Note 48 of the California Geologic Survey. The Geology and Geologic Hazards Study report would be integrated into the Geotechnical Study Report and will include site plans, geology maps, soil series maps, geologic cross-sections, and fault map. Geologic maps, literature, and historic aerial photographs will be reviewed. The local and regional geology and geologic hazards will be discussed.

Consultation During Design

Consultation during design may be required to provide information to other engineers or architects on the design team. This consultation is typically minor and consists of letter preparation and plan review services by a Senior Engineer or Geologist, and may also include value engineering and attendance at design team meetings if requested. For budgeting purposes, we suggest you establish a budget of $2,000 to $2,500 for such services.

Summary of Fees

We will perform our proposed base scope of work for Phase A services presented herein for a Lump Sum fee of **$**. The following table provides a breakdown of our proposed fees for this project:

Scope Item	Amount	Fee Basis
Phase A - Geotechnical Engineering Study and Geologic Hazards Report		
Planning and Coordination	$ 500.00	Lump Sum
Alameda County Environmental Permit	$ 800.00	Lump Sum
Utility Location-USA (Staff) and Private Locating Contractor	$ 800.00	Lump Sum
Drilling, including Geo-Eng Staff Engineer/Geologist	$ 5,100.00	Lump Sum
Lab Testing	$ 1,200.00	Lump Sum
Engineering and Geologic Analysis	$ 1,200.00	Lump Sum
Site-Specific Seismic Ground Motion Analysis	$ 3,500.00	Lump Sum
Report Preparation	$ 1,500.00	Lump Sum
Total – Required Geologic Report and Geotechnical Report	**$14,600.00**	Lump Sum
Optional Off-haul and Disposal of Excess Soil Cuttings	$ 1,200.00	Lump Sum

Schedule

The field exploration program has been scheduled for the week of February 26th, 2018 an is anticipated to take a total of up to one day of drilling and the estimate above is based on the assumption that the drilling will take place on a weekday to avoid overtime charges. Laboratory testing will take approximately two weeks to complete following the fieldwork. The reports can be issued within about three to four weeks after the drilling is completed. Specific design recommendations if needed by the project architect prior to submittal of our report can be provided in the form of e-mail correspondence or a project progress memorandum as the needed information is developed.

We anticipate that the services will be provided in accordance with our master services agreement with the district and a task order will be issued in accordance with the terms of our agreement. If you have any questions regarding this proposal, please contact the undersigned at eswenson@geo-eng.net or (925) 433-0450. We greatly appreciate the opportunity to provide this proposal to the San Leandro Unified School District.

Sincerely,
GEO-ENGINEERING SOLUTIONS, INC.



Eric J. Swenson, G.E., C.E.G.
Principal Engineer/ Engineering Geologist

Distribution: Mr. Ridge Greene, RGM and Associates (Ridge@rgmassociates.com)