Collaboration. Commitment. Confidence.℠

Ms. Lisa Petersen
Town Engineer
Town of Los Gatos
Engineering Services
41 Miles Avenue
Los Gatos, CA 95030

February 24, 2020
Proposal No: 58.16.55

RE: Proposal to Provide Professional Engineering Services for the Shannon Road Embankment Stabilization Project

Dear Ms. Petersen,

NCE is pleased to present this proposal to the first phase of professional engineering services to complete a geotechnical investigation and develop preliminary repair alternatives fo the Shannon Road Embankment Stabilization Project. Following this first phase of work and upon the selection of a preferred alternative by the Town, NCE will prepare a proposal for the second phase of work to provide civil and geotechnical engineering design services to develop road embankment stabilization construction documents.

BACKGROUND

Based on our site meeting with Town staff on January 9, 2019, we understand that there have been long-term pavement cracking and settlement issues for approximately 1,300 linear feet of the paved road along Shannon Road between Santa Rosa Drive and Diduca Way. The pavement cracking and settlement appeared to be mostly contained within the outer travel lane on the downslope side, although some limited portions of the roadway exhibited pavement distresses extending into the inner travel lane. The section of the road was recently annexed into the Town of Los Gatos from unincorporated Santa Clara County. We understand from the Town that the County had been addressing settlement and pavement cracking for several decades. Routine maintenance undertaken by the County had apparently typically consisted of sealing of asphalt pavement cracks and placement of additional asphalt concrete along the settling portions of the roadway to relevel the driving surface.

The Town has therefore requested a scope of work from NCE and it's subconsultant Cal Engineering and Geology (CE&G) to complete a geotechnical investigation and develop repair alternatives with approximate costs.

SCOPE OF WORK AND FEE ESTIMATE

NCE has retained our subconsultat CE&G to complete the geotechnical investigation and develop repair alternatives in accordance with their attached detailed proposal. NCE will review and discuss repair alternatives, support the Town with any interim roadway maintenance measures (e.g. cracking sealing or filling cracks/depressions) that may need to be completed and providing project coordination, updates to the Town, and invoicing.

This work can be completed on a time and materials basis for a not to exceed fee of $79,950 (which includes a 10% mark-up of CE&G fees of $67,225 and $6,000 for NCE labor).

SCHEDULE

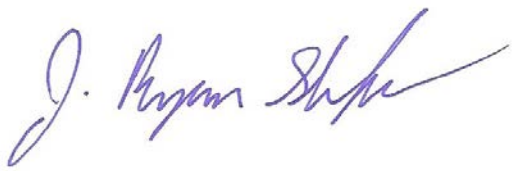
Once we have a notice to proceed and kick-off meeting we will provide the Town a schedule for completion of this work, understanding that the Town will need to have an estimate of construction costs as part of the yearly Town budgeting cycle.

Richmond, CA
501 Canal Blvd., Suite I
Richmond, CA 94804
(510) 215-3620

NCE is appreciatiave of our working relationship with the Town and for the opportunity to assist the Town with this project. We trust that this provides the information required at this time. If you have any questions or would like to discuss this request, please contact the undersigned at (510) 215-3620.

Sincerely,

NCE



J. Ryan Shafer, PE GE
Principal

CE&G
CAL ENGINEERING & GEOLOGY
Pragmatic Expertise™

CAL ENGINEERING & GEOLOGY
785 Ygnacio Valley Rd. | Walnut Creek | CA 94596
6455 Almaden Expwy., Suite 100| San José | CA 95120
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24 January 2020
Ryan Shafer, PE, GE
NCE
501 Canal Boulevard, Suite I
Richmond, California 94804

RE: Proposal to Provide Geotechnical Engineering and Design Services
Shannon Road Embankment Stabilization
Los Gatos, California

Mr. Shafer:

At your request, we have prepared this proposal to provide geotechnical investigation and design services related to the slope instability issues impacting the road embankment along Shannon Road in Los Gatos, California. We understand that NCE Consultants will be the prime consultant to the Town of Los Gatos for the project and Cal Engineering & Geology will be a subconsultant to NCE.

BACKGROUND

Based on our site meeting with Town staff on January 9, 2019, we understand that there have been long-term pavement cracking and settlement issues related to the downslope portion of approximately 1,300 linear feet of the paved road along Shannon Road between Santa Rosa Drive and Diduca Way. The pavement cracking and settlement appeared to be mostly contained within the outer travel lane on the downslope side, although some limited portions of the roadway exhibited pavement distresses extending into the inner travel lane. The section of the road was recently annexed into the Town of Los Gatos from unincorporated Santa Clara County. The downslope limit of right-of-way approximates the edge of pavement.

We understand from the Town that the County had been addressing settlement and pavement cracking for several decades. Routine maintenance undertaken by the County had apparently typically consisted of sealing of asphalt pavement cracks and placement of additional asphalt concrete along the settling portions of the roadway to relevel the driving surface. There is reportedly up to 12 feet of asphalt along the outer edge of the road in some locations. Approximately two years ago, measures were undertaken by the County to stabilize the problematic areas of the roadway by injecting polyurethane foam below the outer half of the road embankment within the areas of historic settlement and cracking.

After the foam injection was completed, the outer half of the road was received a 2.5- to 3-inchpavement inlay; details of the exact foam injecting methods are not well known at this time. The road was then annexed to the Town from the County shortly after the completion of this repair. Despite the foam injection work, the road embankment has continued to move downslope and significant pavement distress has re-developed. The settlement has caused some of the injection pipes that were left following injection to protrude up through the pavement surface.

PROPOSED SCOPE OF WORK

General Description

The Town of Los Gatos has indicated that they wish to develop a long-term, cost effective strategy to address the embankment stability issues along this stretch of Shannon Road, providing the repair cost is feasible from a cost perspective. In order to develop stabilization alternative(s), it will be necessary to complete a geotechnical investigation of the site and develop alternatives for both the short-term mitigation of the currently manifested distress and the long-term stabilization of the affected roadway embankment. The scope of geotechnical investigation and design work proposed herein represents a phased approach to the project.

Phase 1:

- evaluate the cause(s) of the ongoing problems
- identify interim short-term measures to extend roadway usability while long-term measures are developed
- identify and evaluate potential repairs and provide recommendations for design of a preferred long-term stabilization alternative

Phase 2:

- prepare construction documents for preferred stabilization alternative selected by the Town (not included in this scope of work).

Phase 1 work will be completed primarily by Cal Engineering & Geology as a subconsultant to NCE Consultants. Phase 2 will be completed primarily by NCE with CE&G providing technical details and technical specifications.

Phase 1 – Geotechnical Investigation and Development of Repair Alternatives

Task 1A. Evaluate the Cause(s) of the Ongoing Problems

The initial phase of work will focus on review of the known and inferred subsurface conditions at the site. Observations made during reconnaissance of the site suggests that stable bedrock materials are locally exposed on the upslope side of the road. The outer half of the road appears to have been placed as side-cast fill and the ongoing movement is likely a result primarily of creep of embankment materials that were placed directly on steep colluvial soil when the road was originally developed pre-1950. We did note at least two areas along the stretch of roadway where bedrock is not exposed on the upslope side of the road and where embankment movement may be somewhat deeper than in the bedrock cut areas. Based on our experience with similar vintage hillside roads in the greater Bay Area, there is a good chance that no keying or benching was used when the fill was placed and that no subsurface drainage was placed.

To investigate the subsurface conditions we will complete the following:

- Prepare a base map for the project by collecting digital photographs using an UAS (drone)and using photogrammetry to create a geo-referenced orthophoto topographic base.
- Complete geologic mapping and mapping of related significant features using the UAS-derived orthophoto topo base map.
- Plot and evaluate foam injection records from the injection work completed two years ago.
- Layout, drill, and sample up to 15 borings along the roadway over three days at key locations to be determined based on the mapping and evaluation of previous work.
- Evaluate the efficacy, cost, and advantages of completing additional subsurface characterization using geophysical methods.
- Complete laboratory testing of samples collected from the exploratory drilling.
- Develop a subsurface model of the embankment for use in developing and evaluating potential short-term and permanent repair alternatives.
- Prepare a geotechnical design report that presents the findings of the investigative work and provides recommendations for temporary measures and geotechnical bases for alternatives development and repair design.

Assumptions:

- Roadway work requiring traffic control is permitted only between 9AM and 4PM.

- Traffic control will be required due to lack of roadway shoulder and narrow lanes. CE&G will endeavor to preserve an open lane of traffic, however safety concerns may preclude this. The Town may wish to provide advance notice to area residents.
- This project is a prevailing wage project for qualifying job classifications.

Task 1B. Identify and Evaluate Interim Measures

In consultation with NCE and the Town, we will identify interim measures intended to slow the progress of roadway distress while long-term measures are developed and plans prepared.

Task 1C. Identify and Evaluate Potential Repairs

Based on the findings of Task 1A, we will proceed with identifying and evaluating three potential alternatives for permanent repair of the problem areas along the road. The alternatives will be conceptually developed to facilitate cost estimating and assessing the impacts of construction. Alternatives will be developed for the base condition of side-cast fill over shallow stable bedrock and the secondary condition of deeper soils underlying the entire width of the road. The alternatives will focus on constructability of the repairs, containment within the right-of-way, duration of work, costs, performance, and maintenance requirements. It is anticipated that the alternatives will include primarily retaining wall options with reconstruction of the retained portion of the road embankment and the pavement structural section for the full width of road in the affected areas.

The results of the alternatives evaluation will be presented in an Alternatives Memorandum. The memorandum will be prepared first in a draft format for discussion with the NCE team and Town staff. Based on discussions regarding the draft report, a preferred alternative will be selected. The Final Alternatives Memorandum will reflect the discussions with the Town and present the preferred alternative.

Phase 2 – Development of Plans, Specifications, and Estimates

As part of a separated scope and fee, following selection of the preferred alternative CE&G will work with NCE to develop plans, specifications, and engineer's estimates (PS&E) for bidding and construction of the selected repairs. It is anticipated that the PS&E will be prepared at 65%, 90%, 100%, and Final for Bidding and Construction levels. CE&G will complete necessary geotechnical and structural design calculations, develop and prepare sections, profiles, and details for the repair measures. CE&G will also prepare technical specifications for the geotechnical-related work. NCE will prepare all other aspects of the PS&E and will incorporate CE&G's work into the overall PS&E.

The exact scope of work and projected level of effort and cost to complete the work will be developed jointly with NCE after completion of Phase 1.

PROPOSED SCHEDULE

We will begin Phase 1 upon written authorization from NCE. Tasks 1A and 1B will be undertaken concurrently to the extent possible. We anticipate that Task 1A can be completed within about eight weeks dependent on weather conditions and availability of a drilling subcontractor. Accounting for weather and driller availability, we suggest that 10 weeks be assumed for the completion of Task 1A plus an additional three weeks to complete the Task 1B Draft Alternatives Memorandum.

EXECUTION

We will complete the proposed scope of work as a Task Order under the Master Services Agreement between CE&G and NCE. The work will be completed on a time and expenses basis for a fee not-to-exceed $67,225 unless authorized by NCE's project manager. Our work will be completed in accordance with generally accepted geologic and geotechnical engineering practices and procedures. This standard is in lieu of all warranties either expressed or implied.

If the above scope of services and terms and conditions are acceptable to you, please sign the attached service agreement and return one copy of the entire proposal to our office together with the requested retainer. We look forward to working with you.

Sincerely,
CAL ENGINEERING & GEOLOGY, INC.

Phil Gregory, P.E, G.E.
Senior Principal Engineer

Attachments: Level of Effort and Cost Projection

CE&G
CAL ENGINEERING & GEOLOGY

2020 CE&G Rates	STAFFING							REIMBURSABLES (INCLUDES 10% MARKUP)									Total Cost
	Principal	Associate	Project	Senior GIS/CADD Specialist	Project Assistant	Subtotal Hours	Subtotal Cost	Permits	Drilling Sub./ Equipment	Traffic Control	Utility Locator	Laboratory Testing	Mileage	UAS Equipment Fee	Surveyor	Subtotal Cost	
DESCRIPTION	**$240**	**$215**	**$160**	**$125**	**$90**												
Phase 1 – Geotechnical Investigation and Development of Repair Alternatives																	
Task 1A : Evaluate the Cause(s) of the Ongoing Problems:																	
Meetings and PM		4			4	8	$ 1,220						$ 20			$ 20	$ 1,240
Site Reconnnaissance and Develop Base Map		2	12	8		22	$ 3,350						$ 20	$ 200	$ 5,000	$ 5,220	$ 8,570
Geologic Mapping			8	4		12	$ 1,780						$ 20			$ 20	$ 1,800
Evaluate Past Performance		4		4		8	$ 1,360									$ -	$ 1,360
Subsurface Exploration (3 days, USA, & traffic control plan)		2	32		4	38	$ 5,910		$ 13,600	$ 5,400			$ 60			$ 19,060	$ 24,970
Laboratory Testing		2	4			6	$ 1,070					$ 1,800				$ 1,800	$ 2,870
Subsurface Model Development		4	4	4		12	$ 2,000									$ -	$ 2,000
Geotechnical Design Report	4	8	16	12		40	$ 6,740									$ -	$ 6,740
Subtotal Hours	*4*	*26*	*76*	*32*	*8*	*146*	-	-	-	-	-	-	-	-	-	-	-
Subtotal Cost	*$ 960*	*$ 5,590*	*$ 12,160*	*$ 4,000*	*$ 720*	-	*$ 23,430*	*$ -*	*$ 13,600*	*$ 5,400*	*$ -*	*$ 1,800*	*$ 120*	*$ 200*	*$ 5,000*	*$ 26,120*	*$ 49,550*
Task 1B: Identify and Evaluate Interim Measures																	
Site Ground Truth	2	2				4	$ 910									$ -	$ 910
Meeting Regarding Short-term Alternatives	2	2				4	$ 910						$ 20			$ 20	$ 930
Prepare Memorandum	2	4		4		10	$ 1,840									$ -	$ 1,840
Subtotal Hours	*6*	*8*		*4*		*18*	-	-	-	-	-	-	-	-	-	-	-
Subtotal Cost	*$ 1,440*	*$ 1,720*	*$ -*	*$ 500*	*$ -*	-	*$ 3,660*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 20*	*$ -*	*$ -*	*$ 20*	*$ 3,680*
Task 1C: Identify and Evaluate Potential Repairs (15% Design)																	
Develop Alternatives	4	4	4			12	$ 2,460									$ -	$ 2,460
Prepare Conceptual Plans and Sections		8	8	12		28	$ 4,500									$ -	$ 4,500
Prepare Conceptual Cost Estimates		4	4			8	$ 1,500									$ -	$ 1,500
Draft Alternatives Memorandum	2	6	4	4		16	$ 2,910									$ -	$ 2,910
Meeting with Town	3	3				6	$ 1,365						$ 20			$ 20	$ 1,385
Final Alternatives Memorandum	1	2	2	2		7	$ 1,240									$ -	$ 1,240
Subtotal Hours	*10*	*27*	*22*	*18*		*77*	-	-	-	-	-	-	-	-	-	-	-
Subtotal Cost	*$ 2,400*	*$ 5,805*	*$ 3,520*	*$ 2,250*	*$ -*	-	*$ 13,975*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ 20*	*$ -*	*$ -*	*$ 20*	*$ 13,995*
Phase 1 Total Hours	**20**	**61**	**98**	**54**	**8**	**241**	-	-	-	-	-	-	-	-	-	-	-
Phase 1 Total Cost	**$ 4,800**	**$ 13,115**	**$ 15,680**	**$ 6,750**	**$ 720**	-	**$ 41,065**	**$ -**	**$ 13,600**	**$ 5,400**	**$ -**	**$ 1,800**	**$ 160**	**$ 200**	**$ 5,000**	**$ 26,160**	**$ 67,225**