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December 4, 2008

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SOUTH PASADENA
CITY CLERKS OFFICE

The Honorable Philip C. Putnam
Mayor, City of South Pasadena
1414 Mission Street
South Pasadena, CA 91030

Dear Mayor Putnam:

This is in response to your letter regarding comments to the material distributed at the State Route 710 (SR-710) Tunnel Geotechnical Study on August 21, 2008, at the Technical Advisory Committee (TAC) meeting.

The following are responses to the comments we received from the City of South Pasadena's (City) geotechnical consultants.

1. The scope of work for the geotechnical field exploration (Task Order #4 under Contract # 07-2433) is being finalized by our consultants and will be submitted to Caltrans shortly. The scope of work will be shared with the TAC as well as the Steering Committee once Task Order #4 is finalized.
2. We concur and have made the adjustments to the orientations of the geophysical lines, where feasible.
3. A considerable body of published and unpublished technical literature applicable to the project study area exists. The team has reviewed much of the literature and will continue to obtain additional information.
4. The Elysian Park Anticline, formed by the active Elysian Park Blind Thrust fault, is an active structure, with a rate of contraction estimated to be 0.8-2.2 mm/yr. This contraction is distributed over a wide area, with the bulk of the deformation below tunnel depth. We will evaluate based on the data collected. The evaluation will be more of a qualitative nature in order to assist with the screening process. Since we are not designing a tunnel, a detailed evaluation will not be performed.

We believe the Elysian Park fault (not to be confused with the Elysian Park Blind Thrust fault) to be an inactive fault. For the purpose of tunneling, both active and inactive fault zones can present challenges—poor rock quality, mixed face conditions, changed groundwater conditions, to name a few. We have planned for a 525-ft deep inclined

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boring, Z1-B1, to intersect the Elysian Park fault.

5. The geophysical lines are suggested to supplement data collected from the borings and to provide one- and two-dimensional subsurface data. The geophysical lines were chosen to intersect known faults and major features such as the known active faults, some of the potentially active or inactive faults, depth of alluvium, geologic contact information, and variations in soil stratigraphy with depth. Our main focus is on the major geological features. We agree that not all features are targeted by this study. Further evaluation will be necessary in future studies to characterize the subsurface soil conditions in detail.

6. **Zone 1 Borings** - The Elysian Park Blind Thrust fault, which forms the Elysian Park Anticline at surface, does not extend to the surface and does not offset near-surface units. Special consideration will be needed during the design phase, if this zone is selected for a possible tunnel alignment. The impact of the anticline would be evaluated for screening purposes on a qualitative level, based on data collected during the current study. Since the tunnel design is not performed at this stage, a detailed evaluation will not be performed during this phase.

7. **Zone 2 Borings** - All the formations in Zone 2 would also be encountered in Zones 1 and 3. Therefore, since this study is only at the feasibility level, and in order to avoid redundancy, we have limited the number of borings.

8. **Zone 3 Borings** - We will investigate the depth of the alluvium/granitic contact as well as the fault crossings. Angled borings are also planned within this zone, where feasible.

9. **Zone 4 Borings** - We plan to extend the borings approximately one-diameter below the conceptual tunnel invert. We believe that the proposed boring depth of 275-ft is sufficient for this investigation. If the borings show the bedrock to be at a much deeper depth than first thought, the boring will be re-evaluated. The exploration program focuses on obtaining information to the depth of the bedrock within this zone. The information obtained from the four borings, in conjunction with the data obtained from the geophysical lines, will provide sufficient information for the purpose of the current study. We will use drill rigs, which can penetrate varying soil conditions.

10. **Zone 5 Borings** - It is unknown at this time whether the East Montebello fault extends into Zone 5. While some researchers have projected it northward into this area, it has no documented surficial expression north of the I-10 freeway. Mapping and trenching studies in the Alhambra Wash just north of State Route 60 have provided evidence that the East Montebello fault is an active fault with a slip rate of 0.2+/-0.1 mm/yr. The proposed borings along with the geophysical lines are expected to provide sufficient information at this time and as such, the numbers of borings are sufficient.

11. In choosing boring locations, length, and orientation, consideration was given to lithologies, faulting, folding, and existing information.

Geotechnical Evaluation Criteria

The proposed evaluation criteria were discussed at previous TAC and Steering Committee meetings. It was decided by the committee members to limit the criteria to those, which pertain to geological and geo-technical considerations. Zones were added to the study in order to remain route neutral.

With respect to the proposed geotechnical evaluation criteria, the responses to your comments are:

1. Geologic hazard evaluations for the potential portal areas would provide useful information. However, we are at the screening stage, alignments have not been identified. As such, portal locations have not been identified at this time.
2. Tunneling ground behavior evaluations would provide useful information. However, these evaluations will be done during future phases.
3. Potential impacts due to liquefaction will be of greatest concern at potential portal locations and/or for tunneling within alluvial zones. For the most part, the tunnel will be at such depths that it will not be impacted by liquefaction. However, if the data collected during this study indicates liquefaction to be a concern, appropriate evaluation will be performed accordingly.
4. If liquefaction is found to be a concern at the tunnel depths considered, appropriate evaluations will be performed.
5. Geophysical surveys are meant to complement the boring program with additional information and provide lower-cost, less intrusive means of obtaining subsurface information over a wider area.
6. Lab testing, in-situ testing, and field logging of rock and soil will be performed to provide information for evaluating rock quality and overburden.

Tunnel Zones

1. We concur that the location of the borehole sites and geophysical survey lines do not appear to be in conflict with the "route neutral" concept. We also concur that for the current level of feasibility studies, geotechnical data obtained from these exploration locations would be applicable to nearby route alternatives within the same formation and crossing the same fault zone.
2. In order to maintain route neutrality, we are not considering any tunnel characteristics or cost at this stage.
3. We concur that, based on sub-surface geology, zones 1 through 3 have much more variable geologic units, including multiple active and inactive faults within the zones.

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4. In order to maintain route neutrality, the purpose of this study is to collect data so that a fully informed decision can be made regarding tunneling feasibility for each zone. At this stage, we have not determined which zone represents the “best” tunneling conditions or the most challenging ones.

Regarding your request:

1. We will provide the written scope of work documents to all committee members, once it has been finalized.
2. As requested, we will add a geophysical line across the Elysian Park Anticline.
3. The previously proposed scope of work was more general in nature. Once the contract is awarded, task orders are created to direct the activities of the consultant towards the focus of the study. In the case of the SR 710 Tunnel Technical Study, two Task Orders have been created for geological and geotechnical studies. Attached, please find a copy of the original amended contract as well as Task Order #3 (with amendments). Task Order #4 is currently in draft form. Once it is finalized, we will forward you a copy.

If you need additional information regarding this matter, please contact Tad Teferi, Deputy Director, Program and Project Management, at (213) 897-0362.

Sincerely,


DOUGLAS R. FAILING
District Director

cc: Abdi Saghafi- Project Manager,

SR-710 TUNNEL TECHNICAL STUDY STEERING COMMITTEE
SR-710 TUNNEL TECHNICAL STUDY TECHNICAL ADVISORY COMMITTEE

Attachments