December 21, 2011

Honorable Antonio R. Villaraigosa
Mayor
Room 303, City Hall

Dear Mayor Villaraigosa:

**White Point Landslide – December 2011 Status Report**

The Bureau of Engineering is overseeing the geotechnical investigation and monitoring of the White Point Landslide in the San Pedro Area. The attached White Point Landslide Geotechnical Investigation December 2011 Status Report provides a summary of the initial progress of our investigation and monitoring.

The field work for the geotechnical investigation, conducted by the geotechnical consultant Shannon & Wilson, Inc., is nearing completion. Additionally, monitoring of the area is ongoing, and consists of detailed survey measurements and regular geotechnical observations made by the Bureau of Engineering. No additional ground cracks have been observed in the area outside of the fence around the landslide. This suggests that, at this time, the area outside of the fence is safe from the impacts of the landslide. The existing ground cracks adjacent to the landslide, within the fenced area have widened, since the initial landslide, by up to 2 inches. However, these observations are preliminary, and additional data is being collected and analyzed, therefore, this assumption may be subject to revision.

If you have any questions, please contact me.

Sincerely,

Gary Lee Moore, P.E.
City Engineer

J:\WJ\Geotech\Word\White Point Landslide Status Report 12-21-2011.doc

CC: Gaye Williams, Chief of Staff, Mayor’s Office
Doane Liu, Chief of Staff, Council District Fifteen
Andrea Alarcon, President, Board of Public Works
Jerilyn Lopez-Mendoza, Commissioner, Board of Public Works
Valerie Lynn Shaw, Commissioner, Board of Public Works
Jon Kirk Mukri, General Manager, Department of Recreation and Parks
Andrew Nocas, Deputy City Attorney, City Attorney’s Office
Vince Jones, Deputy City Engineer, Bureau of Engineering
Gerry Miller, Chief Legislative Analyst
WHITE POINT LANDSLIDE
GEOTECHNICAL INVESTIGATION
December 2011 Status Report
TABLE OF CONTENTS

1.0 Background

2.0 Site Observations and Activities Prior to November 20, 2011

3.0 Site Observations and Activities After November 20, 2011

4.0 Geotechnical Investigation

5.0 Survey Monitoring

Attachment 1– Status Report Prepared by Shannon and Wilson, Inc. dated December 19, 2011

Attachment 2– Summary of Survey Monitoring Points at Weymouth Avenue and Paseo Del Mar, December 21, 2011, prepared by the Bureau of Engineering
1.0 Background

The White Point Landslide is located in the San Pedro area of the City of Los Angeles. The area consists of a broad flat mesa above a steep, 120 foot high, coastal bluff. The recent landslide includes the bluff and part of the mesa. To date, the landslide has destroyed approximately 420 feet of Paseo Del Mar, taking with it the inactive utilities that were within the roadway. The mesa is underlain by sedimentary bedrock that includes shale and sandstone that is included within the Miocene (approximately 20 million years old) Altamira Shale of the Monterey Formation. The Altamira Shale that underlies this area of coastal bluff is susceptible to landslides. Other notable landsides in the area include Point Fermin, Ocean Trails, Abalone Cove and Portuguese Bend.

2.0 Site Observations and Activities Prior to November 20, 2011

In July of 2011, the Bureau of Engineering investigated tension cracks that had formed in Paseo Del Mar. A crack adjacent to a bicycle path, along the north side of the street, was 25 feet long and up to 3 inches in width. Other cracks ranging between 6 and 13 feet long and up to 2 inches in width were observed in the roadway.

Also in July of 2011, distress was noticed to the pavement on Paseo Del Mar just west of the retaining wall. After further investigations, additional monitoring points were recommended to be set to determine how fast the ground was moving.

In October of 2011, Bureau of Engineering personnel continued to investigate the pavement damage on Paseo del Mar. The investigation revealed that the cracks had grown larger in the recent months, and were of the size and type that indicated landslide activity. Based on the location of the cracking and other investigations, the landslide was estimated to be about 420 feet long and extended beyond Paseo Del Mar into the White Point Park to the north. Due to the threat to the street and its utilities, street access was closed, and utility relocation began. A portion of the bluff around the top of the landslide may topple and to protect the public, a perimeter fence was constructed.

Survey monitoring records showed progressive movement in the southerly direction on the portion of Paseo del Mar just west of the bulkhead. In the days before the eventual collapse of Paseo Del Mar, monitoring records revealed movements of almost a foot a day.

3.0 Site Observations and Activities After November 20, 2011

On November 20, 2011 approximately 420 feet of Paseo Del Mar slid southward toward the ocean. The landslide moved approximately 53 feet. A large part of the landslide moved as a relatively intact block. A palm tree that was part of the parkway along the bluff has been shifted toward the ocean and is still upright. The utilities that were within the street had been realigned or abandoned.
4.0 Geotechnical Investigation

On November 21, 2011, the Bureau of Engineering authorized the private geotechnical firm, Shannon and Wilson, Inc. to immediately begin a geotechnical study of the landslide area. This study is directed toward an evaluation of the landslide and in particular an assessment of the stability of the area around the existing landslide. This study involves subsurface exploration using several different drilling methods. The subsurface exploration will allow direct observation of the subsurface geologic conditions. Instruments will be placed within the exploratory borings so that ground water levels and ground movement of the area around the landslide can be measured.

A status report prepared by Shannon and Wilson and dated December 19, 2011 is presented in Attachment 1. This report summarizes the progress of the Geotechnical investigation through December 16, 2011.

5.0 Survey Monitoring

Near the intersection of Weymouth Avenue and Paseo Del Mar, three survey monitoring points have been established. These points are along the concrete curb.

Figure 1 in Attachment 2 shows the location of the monitoring points. These points were established on November 3, 2011.

Survey measurements are reported in hundredths of a foot. Therefore, a reading of 0.02 represents approximately !/₄ of an inch. Figure 2 indicates the horizontal and vertical movement of each of the points.

The standard deviation for the measurements listed above are within the expected errors generated by the instrumentation and techniques employed to obtain the values. The survey monitoring data therefore indicates that no movement has occurred at these three points.
Attachment 1

Status Report Prepared By Shannon & Wilson, Inc.
December 19, 2011

Bureau of Engineering
1149 South Broadway Street, Suite 120
Los Angeles, California 90015

Attn: Mr. Robert Hancock

RE:  STATUS REPORT 12/16/11
WHITE POINT LANDSLIDE INVESTIGATION
CITY OF LOS ANGELES W.O. E1907483, TOS 11-087
SHANNON & WILSON PROJECT NO. 51-1-10052-012

We are providing this letter outlining the subtask status for the period ending December 16, 2011. Shannon & Wilson is performing a subsurface investigation of the White Point Landslide following significant movement of the landslide on November 20, 2011. During the course of our services, we have not observed new surface cracks outside of the fenced perimeter of the landslide. We observed groundwater in the borings we are drilling along the landslide perimeter at depths greater than 50 feet. We believe the projected landslide failure plane is about 100 feet deep in the area of the active landslide. These initial conclusions are preliminary and are subject to change as our studies develop.

The status of each subtask is listed below:

<table>
<thead>
<tr>
<th>Subtask</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Health and Safety Plan</td>
<td>Complete</td>
</tr>
<tr>
<td>2. Geologic Mapping</td>
<td>Ongoing - 70% Complete</td>
</tr>
<tr>
<td>3. Preliminary Report</td>
<td>Ongoing - 50% Complete</td>
</tr>
<tr>
<td>4. Subsurface Exploration</td>
<td>Ongoing - 60% Complete</td>
</tr>
<tr>
<td>5. Waste Handling and Management</td>
<td>Ongoing - 20% Complete</td>
</tr>
<tr>
<td>6. Geophysical Downhole Logging</td>
<td>Ongoing - 33% Complete</td>
</tr>
<tr>
<td>7. Laboratory Testing of Samples</td>
<td>Ongoing - 5% Complete</td>
</tr>
<tr>
<td>8. Geologic Cross Sections</td>
<td>Ongoing - 10% Complete</td>
</tr>
<tr>
<td>9. Stability Analysis</td>
<td>Not started</td>
</tr>
<tr>
<td>10. Meetings</td>
<td>Ongoing – 28% Complete</td>
</tr>
<tr>
<td>11. Geotechnical Report</td>
<td>Not started</td>
</tr>
</tbody>
</table>
TASKS COMPLETED FOR THIS PERIOD

For this work period, tasks completed include:

- Completion of the Health and Safety Plan and transmitted to the City.
- Geologic mapping was completed along the toe of the existing landslide and of exposures in the surf zone as shown in Figure 1 on 11/29/11. Access routes for boring exploration were cleared by our biologist and a representative of Palos Verdes Land Conservancy on 12/1/11.
- Preliminary report tasks include the completion of a proposed boring map incorporating the City’s survey data and Navigate LA 2006 topographic contours.
- Aerial survey flown on 12/13/11.
- Subsurface exploration includes completion of borings B-1 through B-4 as shown in Table 1.
- Instrumentation installation and readings shown in Table 1. Instrumentation will be read on weekly basis for the first month following installation to monitor the landslide area for groundwater elevations and possible subsurface movement.
- Waste Handling techniques have consisted of stockpiling the existing soils on-site either next to the existing borings, using it for backfill in the bucket borings, or stockpiling within the Paseo Del Mar R/W. Additional cuttings and waste water from B-1 are stored in barrels on site.
- Geophysical logging has been completed on B-1, consisting of both optical televiewer and acoustic televiewer logging as shown in Table 1.
- Laboratory testing to date consists of limited environmental sampling of completed surface soil samples from the bucket auger borings.
- Construction of geologic cross sections has been started.
- Site observations for landslide movement following rainfall on 12/13/11 and 12/15/11. Based on visual observations, no ground fractures have appeared at the fenced perimeter of the landslide area.
- Project Team Meetings with the City of Los Angeles BOE at the downtown office, and daily field meetings on site.
TASKS IN PROGRESS

The following tasks are currently in progress:

- Completion of exploratory borings B-5, B-6, and B-7.
- Well construction in boring B-6.
- Instrumentation installation in borings B-5 and B-7.
- Geophysical logging of boring B-7.
- Geologic Mapping of the site.
- Review of cores and samples from borings B-1 through B-4.
- Topographic map survey, with completed base map on January 3, 2012.
- Laboratory Testing.

TASKS REMAINING

The following are the anticipated tasks remaining on the project as outlined in our proposal:

- Complete Borings B-8 and B-9.
- Construct Instrumentation Plots.
- Submit next status report.
- Slope Stability Analyses.
- Geotechnical Report Preparation.
- Weekly Meetings.

Respectfully,

SHANNON & WILSON, INC.

[Signature]

Dean G. Fráncuch, P.G., C.E.G.
Associate

Enc:  Table 1 – Summary of Explorations and Instrumentation
Figure 1 – Site and Exploration Plan

Cc: Mr. Christopher Johnson, City of Los Angeles (electronic copy only)
    Mr. Mark Oborne, City of Los Angeles (electronic copy only)
<table>
<thead>
<tr>
<th>Planned Location</th>
<th>Boring Name</th>
<th>Drill Type</th>
<th>Status</th>
<th>Depth (feet)</th>
<th>Completion (2)</th>
<th>Type (3)</th>
<th>Install (2)</th>
<th>Read 1 (4)</th>
<th>Read 1 Depth (ft.)</th>
<th>Installed (2)</th>
<th>Baseline</th>
<th>Read 1</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>B-2</td>
<td>Bucket Auger</td>
<td>Complete</td>
<td>120</td>
<td>12/2/11</td>
<td>-</td>
<td>12/2/11</td>
<td>12/8/11</td>
<td>88</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>F</td>
<td>B-3</td>
<td>Bucket Auger</td>
<td>Complete</td>
<td>120</td>
<td>12/6/11</td>
<td>Well (5)</td>
<td>12/20/11</td>
<td>12/8/11</td>
<td>98</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>G</td>
<td>B-4</td>
<td>Bucket Auger</td>
<td>Complete</td>
<td>100</td>
<td>12/8/11</td>
<td>-</td>
<td>12/8/11</td>
<td>12/8/11</td>
<td>55</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C</td>
<td>B-5</td>
<td>Bucket Auger</td>
<td>In progress</td>
<td>121</td>
<td>12/16/11</td>
<td>VWP</td>
<td>12/16/11</td>
<td>12/16/11</td>
<td>68</td>
<td>12/16/11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>H</td>
<td>B-6</td>
<td>Sonic Core</td>
<td>In progress</td>
<td>110</td>
<td>12/16/11</td>
<td>Well</td>
<td>12/16/11</td>
<td>12/16/11</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>B</td>
<td>B-7</td>
<td>Rotary Core</td>
<td>In progress</td>
<td>118</td>
<td>12/16/11</td>
<td>VWP</td>
<td>12/16/11</td>
<td>12/16/11</td>
<td>-</td>
<td>12/16/11</td>
<td>12/14/11</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>I</td>
<td>B-8 (2)</td>
<td>Sonic Core</td>
<td>Not started</td>
<td>110</td>
<td>12/20/11</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E</td>
<td>B-9 (2)</td>
<td>Rotary Core</td>
<td>Not started</td>
<td>120</td>
<td>12/20/11</td>
<td>VWP</td>
<td>12/20/11</td>
<td>12/20/11</td>
<td>-</td>
<td>12/20/11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes:
(1) DAT = Downhole Acoustic (and/or Optical) Teviewer
(2) Updated as of 12/16/11 - dates posted in future are planned
(3) VWP = Vibrating Wire Piezometer
(4) If VWP or well not installed, measurement taken after drilling
(5) 8-inch diameter well installed
Attachment 2

Summary of Survey Monitoring Points
### White Point Landslide

#### FIGURE 2

<table>
<thead>
<tr>
<th>PT #1</th>
<th>Date</th>
<th>Horiz Change</th>
<th>Vert Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11/3/2011</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>11/7/2011</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>11/14/2011</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>11/21/2011</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>11/25/2011</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>11/26/2011</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Standard Deviation** 0.015 0.005

<table>
<thead>
<tr>
<th>PT #2</th>
<th>Date</th>
<th>Horiz Change</th>
<th>Vert Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11/3/2011</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>11/7/2011</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>11/14/2011</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>11/21/2011</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>11/25/2011</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>11/26/2011</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>0.02</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**Standard Deviation** 0.007 0.005

<table>
<thead>
<tr>
<th>PT #3</th>
<th>Date</th>
<th>Horiz Change</th>
<th>Vert Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11/3/2011</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>11/7/2011</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>11/14/2011</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>11/21/2011</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>11/25/2011</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>11/26/2011</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>12/21/2011</td>
<td>0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**Standard Deviation** 0.010 0.006

The standard deviation for the measurements listed above are within the expected errors generated by the instrumentation and techniques employed to obtain the values.

These results indicate that there is no observable ground movement.