

## Appendix G – Limited Subsurface Exploration

13 August 2021

Mr. Jeremy Lui  
Boca Lake Office, Inc.  
433 California Street, 7<sup>th</sup> Floor  
San Francisco, California 94104

**SUBJECT: Limited Subsurface Exploration  
620 Airport Boulevard  
Burlingame, California  
Langan Project No. 731757301**

Dear Mr. Lui:

This letter presents the results of our limited subsurface exploration to (1) obtain groundwater level measurements at the project site, (2) perform environmental testing of the near-surface soil for soil characterization and disposal, and (3) evaluate soil corrosion potential for the proposed development at 620 Airport Boulevard in Burlingame, California. Our services were performed in general accordance with our proposal for limited geotechnical and environmental services dated 22 June 2021. This letter presents the results of our field exploration (including monitoring well logs), shallow subsurface conditions, groundwater levels measured to date, and the results of corrosion testing. The results of the environmental testing will be presented in a separate letter.

## PROJECT AND SITE DESCRIPTION

The proposed 620 Airport Boulevard development is in the northern part of Burlingame. The approximately 4-acre site is bordered by a levee and lagoon to the north and west, a Hilton Hotel complex to the east, and Airport Boulevard to the south. The levee is typically about 8 feet high and separates the site from the man-made Anza Lagoon, which opens into San Francisco Bay. The levee is generally outside the property; however, the toe of the levee crosses the property line near the center of the north property line. A closed 50-acre municipal landfill owned by the City of Burlingame is about ½ mile west of the site. The landfill was operated between 1957 and 1987, and was redeveloped into a sports field complex. The site is generally level and is occupied by an asphalt parking lot accessed from Airport Boulevard, and landscape areas. The parking lot is generally at about Elevation 4.5 to 5.5 feet<sup>1</sup>. Based on our review of historical aerial images, the parking lot was constructed in 2005.

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<sup>1</sup> Elevations from an survey by BKF titled "A.L.T.A./N.S.P.S. Land Title Survey of The Lands of Kelly McLoughlin ET AL." dated 4/2/2021, and reference the North American Vertical Datum of 1999 (NAVD88).

The proposed development includes constructing two 9-story towers above a single-level podium with a maximum building height of 163 feet. The podium will occupy the majority of the site, with a footprint of about 138,000 square feet. The podium and lower three levels of the towers will include parking areas with a limited amount of flexible space. We understand project team is evaluating the feasibility of adding a below-grade level to the podium. The upper six levels will include lab and/or office space. The at-grade area above the podium will support parking, vehicle access roads, pedestrian walkways, hardscape areas, landscape areas, outdoor amenity areas, and a service yard. Foundation loads are not available for the proposed structure; we anticipate they will be moderate. Other improvements associated with the development include new sidewalks, vehicular access to Airport Boulevard, and utilities.

## **SITE CONDITIONS**

The site is on the western shore of San Francisco Bay. The area was reclaimed by placing fill in the early 1960s and is currently being used as an at-grade parking area. The site is generally level except along the south perimeter where grades slope up about 5 to 6 feet to meet Airport Boulevard, and along the north and west perimeters, where grades rise by about 5 to 8 feet to the crest of the levee along Anza Lagoon. The top of the levee is about 10 feet wide and the base varies from about 40 to 60 feet wide. Inboard slope inclinations are typically about 3H:1V (horizontal to vertical). The outboard slopes appear to be steeper, however, the available information does not provide details about the outboard embankment. The levee was constructed in the early 1970s.

The State of California Seismic Hazard Zones, San Mateo Quadrangle Official Map, dated 11 January 2018, indicates the site is within a mapped liquefaction hazard zone. Specifically, the map shows the site is in an area "where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693 (c) would be required." The site is also in a flood zone, designated Zone AE, with a flood elevation of 10 feet<sup>2</sup>.

## **LIMITED SUBSURFACE EXPLORATION**

To explore subsurface conditions, install groundwater monitoring wells and obtain soil samples for geotechnical, environmental and corrosion testing our drilling subcontractor advanced four shallow borings within the proposed building footprint. Upon completion, the borings were converted to groundwater monitoring wells to measure the groundwater levels at the site. Before starting our field exploration, we obtained the required permits from the San Mateo County

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<sup>2</sup> Flood Insurance Rate Map (FIRM) Panel 06081C0153F with effective date of 5 April 2019; elevation references the NAVD88 datum.

Environmental Health Services (SMCEHS). To check that the boring locations were clear of existing utilities, we contacted Underground Service Alert (USA) and retained a private utility locator.

We performed laboratory tests on soil samples obtained during drilling. Details about the limited field investigation and laboratory testing program are summarized in the following subsections.

### Borings

The borings, designated MW-1, MW-1A, MW-2 and MW-2A, were performed by Exploration Geoservices, Inc. (EGI) of San Jose, California on 14 July 2021. The borings were advanced to depths of about 10 to 36½ feet below the existing site grades using a truck-mounted drill rig with hollow-stem augers. Borings MW-1 and MW-1A were drilled near the northeastern corner of the site. Borings MW-2 and MW-2A were drilled near the southwestern corner of the site, near Airport Boulevard. The approximate locations and depths of the borings are shown on attached Figure 1, Site Plan.

Our field engineer logged the borings and obtained representative samples of the soil encountered for visual classification and laboratory testing from borings MW-1 and MW-2; no samples were taken from borings MW-1A and MW-2A. Upon retrieval from the borings, the soil samples were in sealed Sprague & Henwood<sup>3</sup> (S&H) liners to retain field moisture content. Selected soil samples were submitted for environmental testing; the test results will be presented in a separate letter.

After completion of drilling, all borings were converted to groundwater monitoring wells. Borings MW-1 and MW-2 were screened at depths of about 21½ to 36½ feet in the native soil below the fill. Borings MW-1A and MW-2A were screened in and slightly below the shallow fill at depths of about 5 to 10 feet below the ground surface (bgs).

Logs of the borings and monitoring wells are presented in Appendix A as Figures A-1 through A-4. The soil encountered was classified according to the soil classification system described on Figure A-5.

### Geotechnical Laboratory Testing

Soil samples obtained from the borings were examined in the office to confirm the field classifications and representative soil samples were selected for geotechnical laboratory testing. Laboratory tests were selected to measure index properties of the soil including in-situ moisture content, fines content, and Atterberg Limits. The laboratory test results are shown on the boring logs and are included in Appendix B.

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<sup>3</sup> Sprague & Henwood is a driven sampler, with a 3.0-inch outside diameter and 2.5-inch inside diameter, lined with 2.43-inch inside diameter brass tubes, and typically used for cohesive (i.e. clayey) soil

### Soil Corrosivity Testing

Because corrosive soil can adversely affect underground utilities and foundation elements, we submitted four soil samples to a specialty analytical laboratory for corrosion testing. The corrosivity tests were performed on the following samples:

- Boring MW-1 at about 3¼ to 4¼ feet bgs
- Boring MW-1 at about 11½ to 12½ feet bgs
- Boring MW-2 at about 6½ to 7½ feet bgs
- Boring MW-2 at about 21 to 21½ feet bgs

The corrosivity of the soil sample was evaluated by CERCO Analytical, Inc. (CERCO), of Concord, California, using the following ASTM Test Methods:

- Redox – ASTM D1498
- pH – ASTM D4972
- Resistivity (100% Saturation) – ASTM G57
- Chloride – ASTM D4327
- Sulfate – ASTM D4327

The corrosion test results are discussed later in this letter. The laboratory corrosion test results and a brief corrosivity evaluation by CERCO are presented in Appendix C.

### **SUBSURFACE CONDITIONS**

Where explored, the site is blanketed by an about 6½- to 8-foot-thick layer of fill that consists of stiff to hard clay and medium dense to dense sand and gravel. The bottom of the fill corresponds to about Elevation -1½ to -3 feet. Based on our understanding of the site, we expect that the fill was placed in the 1960s as part of the land reclamation effort.

The fill is underlain by natural deposits that generally consist of stiff to hard clays with varying amounts of sand and gravel to the maximum depth explored of approximately 36½ feet bgs. Interbedded about 1- to 4-foot-thick layers of loose to medium dense sand and gravel with varying amounts of fines were encountered within the clay. An about 5-foot-thick layer of soft and highly compressible Bay Mud was encountered at a depth of about 8½ feet bgs in boring MW-1, corresponding to about Elevation -3½ feet.

During drilling, the groundwater level was measured about 7 and 27 feet bgs in borings MW-1 and MW-2, respectively, corresponding to approximately Elevation -1.9 feet and -22.1 feet,

respectively. As confirmed by the subsequent measurement, the initial groundwater level at Elevation -22.1 feet in MW-1 is not representative of the groundwater level at the project site. Groundwater was not encountered during drilling for MW-1A and MW-2A. After drilling, the four borings were converted to standpipe piezometers to obtain stabilized groundwater levels. See the well construction information included on the boring logs in Appendix A for additional details about the monitoring wells.

Stabilized groundwater level measurements, taken approximately 2 weeks after the well installation and summarized in Table 1, indicate the groundwater level at the site varies from about Elevation 0 to 1 foot. We anticipate the groundwater level at the site will fluctuate with tidal and seasonal changes. Additional measurements should be taken to document fluctuations in the groundwater level.

**TABLE 1**  
**Groundwater Level Measurements**

Monitoring Well Designation	Approximate Ground Surface Elevation (feet <sup>1</sup> )	Depth to Groundwater (feet)	Approximate groundwater Elevation <sup>1</sup> (feet)	Date of Measurement	Time of Measurement
MW-1	4.9	27.0 <sup>2</sup>	-22.1	7/14/2021	1:05 p.m.
		4.0	0.9	7/29/2021	12:28 p.m.
MW-1A	4.9	D.N.O.	N/A	7/14/2021	N/A
		4.2	0.7	7/29/2021	12:05 p.m.
MW-2	5.1	7.0 <sup>2</sup>	-1.9	7/14/2021	8:41 a.m.
		4.0	1.1	7/29/2021	12:22 p.m.
MW-2A	5.1	D.N.O.	N/A	7/14/2021	N/A
		5.0	0.1	7/29/2021	12:25 p.m.

Notes:

1. Elevations reference NAVD88 vertical datum.
2. Groundwater level measurements obtained during the field exploration may not represent stabilized groundwater levels at the site.
3. D.N.O. = did not observe; N/A = not applicable.

## SOIL CORROSIVITY

Because corrosive soil can adversely affect underground utilities and foundation elements, laboratory testing was performed on four soil samples to evaluate the corrosivity of the on-site soil.

CERCO performed the corrosivity testing on four soil samples. The results of the tests are summarized in Table 2 and are presented in Appendix C.

**TABLE 2**  
**Summary of Corrosivity Test Results**

Test Boring	Sample Depth (feet)	pH	Sulfates (mg/kg)	Resistivity (ohms-cm)	Redox (mV)	Chlorides (mg/kg)
MW-1	3¼ to 4¼	8.15	520	200	260	1,100
MW-1	11½ to 12½	8.42	190	200	280	1,300
MW-2	6½ to 7½	8.34	120	890	240	260
MW-2	21 to 21½	7.37	35	550	360	230

Based on the resistivity measurements, CERCO determined that the soil samples tested from boring MW-2 are classified as "corrosive" and the samples from MW-1 are "severely corrosive" to buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron. Test results and a brief evaluation describing the corrosion characteristics and corrosion protection recommendations, are included in Appendix C. A corrosion expert should be consulted regarding corrosion protection for below-grade elements, including foundations and utilities. If requested, we can retain or recommend a corrosion consultant to assist with addressing the corrosivity issues and/or use of special materials.

We appreciate the opportunity to provide geotechnical services on this challenging project. If you have any questions, please call.

## LIMITATIONS

This letter presents the results of our limited subsurface exploration program to (1) obtain groundwater level measurements at the project site, (2) perform environmental testing of the near-surface soil for soil disposal, and (3) evaluate soil corrosion potential. The results of the environmental testing will be presented in a separate letter. A design-level geotechnical investigation should be performed to address the geotechnical aspects of the proposed development.

Sincerely,

**Langan Engineering and Environmental Services, Inc.**



Timothy J. Light, PE  
Project Engineer



Maria G. Flessas, GE  
Principal



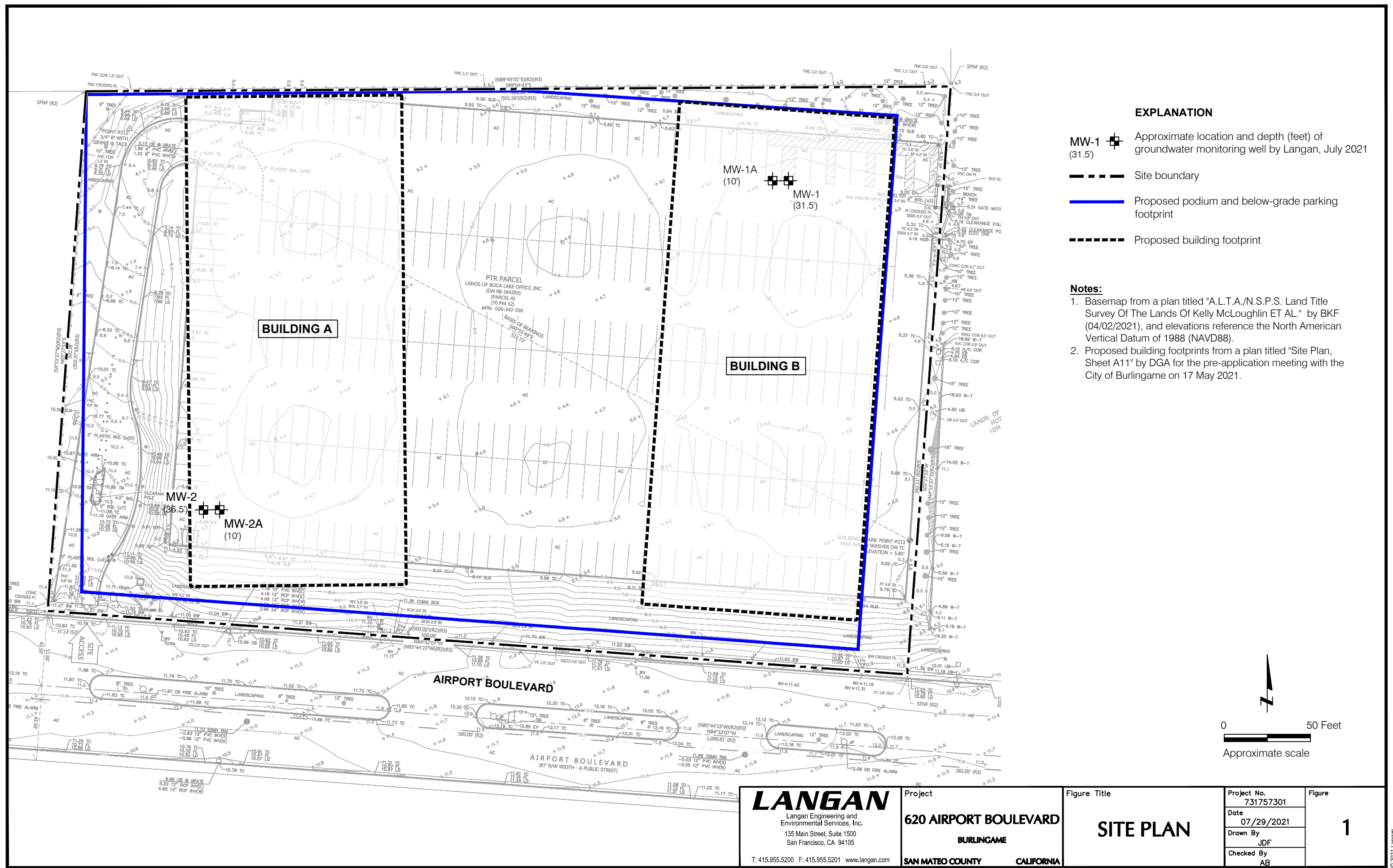
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### Attachments:





- Figure 1 Site Plan
- Appendix A Logs of Borings MW-1 through MW-2A
- Appendix B Laboratory Test Results
- Appendix C Corrosivity Test Results



**FIGURE**



EXPLANATION

- MW-1  Approximate location and depth (feet) of groundwater monitoring well by Langan, July 2021 (31.5')
-  Site boundary
-  Proposed podium and below-grade parking footprint
-  Proposed building footprint

Notes:

- Basemap from a plan titled "A.L.T.A./N.S.P.S. Land Title Survey Of The Lands Of Kelly McLoughlin ET AL." by BKF (04/02/2021), and elevations reference the North American Vertical Datum of 1988 (NAVD88).
- Proposed building footprints from a plan titled "Site Plan, Sheet A11" by DGA for the pre-application meeting with the City of Burlingame on 17 May 2021.

**LANGAN**

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Environmental Services, Inc.  
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Project

**620 AIRPORT BOULEVARD**

**BURLINGAME**

**SAN MATEO COUNTY**

**CALIFORNIA**

Figure Title

**SITE PLAN**

Project No.

731757301

Date

07/29/2021

Drawn By

JDF

Checked By

AB

Figure

**1**

**APPENDIX A**  
**LOGS OF BORINGS MW-1 THROUGH MW-2A**

GEOTECH WELL LOG W BLOWCOUNTS 731757301 620 AIRPORT GPJ TEMPLATE CA-MODIFIED - COPY.GDT 7/30/21

<b>PROJECT:</b> <b>620 AIRPORT BOULEVARD</b> <b>Burlingame, California</b>						<b>Log of Boring MW-1</b> <div style="text-align: right;">PAGE 1 OF 2</div>							
<b>Boring location:</b> See Site Plan, Figure 1						<b>Logged by:</b> A. Barakat <b>Drilled By:</b> Exploration Geoservices Inc.							
<b>Date started:</b> 7/14/21 <b>Date finished:</b> 7/14/21													
<b>Drilling method:</b> Hollow Stem Auger													
<b>Hammer weight/drop:</b> 140 lbs./30 inches <b>Hammer type:</b> Downhole Wire													
<b>Sampler:</b> Sprague & Henwood (S&H)													
DEPTH (feet)	SAMPLES			SPT N-value <sup>1</sup>	LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content %	Dry Density Lbs/Cu Ft	Monitoring Well Detail
	Sampler Type	Sample	Blows/ 6"										
Ground Surface Elevation: 4.9 feet <sup>2</sup>													
1	S&H		12	28	SC	2 inches Asphalt Concrete (AC)							
2			24			7 inches Aggregate Base (AB)							
3	S&H		8	12		CLAYEY SAND (SC) dark olive-gray, medium dense, moist, fine-grained [FILL]							
4		12											
5	S&H		6	12	CL	SANDY CLAY (CL) dark olive-gray, stiff, moist, fine sand, trace coarse angular gravel [FILL]							
6		11											
7	S&H		5	11	CH	CLAY (CH) olive-gray, stiff, moist LL = 56, PI = 28, see Figure B-1	PP		2,000				
8		10											
9	S&H		3	3		CLAY (CH) olive-gray, soft, moist, trace shells [BAY MUD]	PP		500				
10			3										
11	S&H		4	9	CH								
12			9										
13													
14						CLAY (CL) yellow-brown with orange mottling, stiff, moist, trace fine sand							
15													
16	S&H		8	13			PP		2,000		24.6	102	
17		12											
18	S&H		8	15	CL	stiff to very stiff	PP		1,750				
19			15										
20													

Project No.:  
**731757301**

Figure:  
**A-1a**

PROJECT:

620 AIRPORT BOULEVARD  
Burlingame, California

## Log of Boring MW-1

PAGE 2 OF 2

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA						Monitoring Well Detail
	Sampler Type	Sample	Blows/ 6"	SPT N-Value <sup>1</sup>			Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft	
21	S&H		14	17	CL	CLAY (CL) (continued) very stiff							<p>2 inch 0.10 Slotted Screen, PVC Sch 40 (20 to 30 feet bgs)</p> <p>#3 Sand (19 feet to 30 feet bgs)</p> <p>End Cap From 31.25 To 31.5 Feet</p>
22			12		SP	SAND with CLAY and GRAVEL (SP) red-brown, medium dense, moist, fine-grained, fine to coarse rounded to subrounded gravel				10.8	17.6		
23			16		CL	SANDY CLAY (CL) yellow-brown, very stiff, moist, fine sand							
24													
25						CLAY (CL) yellow-brown and gray-brown with orange mottling, very stiff, moist							
26	S&H		10	14			PP	3,250			26.0	100	
27						(7/14/21, 1:05PM)							
28					CL								
29						hard, wet, trace fine sand							
30													
31	S&H		8	19			PP	>4500					
32													
33													
34													
35													
36													
37													
38													
39													
40													

Bottom of well at 31.5 feet below ground surface (bgs).  
Groundwater encountered at a depth of 27 feet bgs on 7/14/21 at 1:05 p.m.  
and was measured at a depth of 4 feet bgs at 12:28 p.m. on 7/29/2021.  
PP = Pocket Penetrometer.  
bgs = below ground surface.

<sup>1</sup> S&H blow counts for the last two increments were converted to SPT  
N-Values using factor of 0.6 to account for sampler type and hammer  
energy.

<sup>2</sup> Elevations based on topographic survey by BKF titled "A.L.T.A./N.S.P.S.  
Land Title Survey of The Lands of Kelly McLoughlin ET AL." dated 4/2/2021,  
and reference the North American Vertical Datum of 1988 (NAVD88).

**LANGAN**Project No.:  
731757301Figure:  
A-1b

GEOTECH WELL LOG W BLOWCOUNTS 731757301 620 AIRPORT GPJ TEMPLATE CA-MODIFIED - COPY.GDT 7/30/21

GEOTECH WELL LOG W BLOWCOUNTS 731757301 620 AIRPORT GPJ TEMPLATE CA-MODIFIED - COPY.GDT 7/30/21

PROJECT: 620 AIRPORT BOULEVARD Burlingame, California						Log of Boring MW-1A PAGE 1 OF 1							
Boring location: See Site Plan, Figure 1						Logged by: A. Barakat Drilled By: Exploration Geoservices Inc.							
Date started: 7/14/21      Date finished: 7/14/21													
Drilling method: Hollow Stem Auger													
Hammer weight/drop: 140 lbs./30 inches      Hammer type: Downhole Wire													
Sampler: N/A													
DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft	Monitoring Well Detail
	Sampler Type	Sample	Blows/ 6"	SPT N-value									
Ground Surface Elevation: 4.9 feet <sup>1</sup> See log from Boring MW-1													
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Bottom of well at 10 feet below ground surface (bgs).  
Groundwater not encountered during drilling, and was  
measured at a depth of 4.2 feet bgs at 12:05 p.m. on 7/29/2021.  
bgs = below ground surface.

<sup>1</sup> Elevations based on topographic survey by BKF titled "A.L.T.A./N.S.P.S.  
Land Title Survey of The Lands of Kelly McLoughlin ET AL." dated 4/2/2021,  
and reference the North American Vertical Datum of 1988 (NAVD88).

Project No.: 731757301

Figure: A-3

GEOTECH WELL LOG W BLOWCOUNTS 731757301 620 AIRPORT GPJ TEMPLATE CA-MODIFIED - COPY.GDT 7/30/21

<b>PROJECT:</b> 620 AIRPORT BOULEVARD Burlingame, California						<b>Log of Boring MW-2</b> PAGE 1 OF 2							
Boring location: See Site Plan, Figure 1						Logged by: A. Barakat Drilled By: Exploration Geoservices Inc.							
Date started: 7/14/21      Date finished: 7/14/21													
Drilling method: Hollow Stem Auger													
Hammer weight/drop: 140 lbs./30 inches      Hammer type: Downhole Wire													
Sampler: Sprague & Henwood (S&H)						<b>LABORATORY TEST DATA</b>							
Sampler: Sprague & Henwood (S&H)						<b>Monitoring Well Detail</b>							
DEPTH (feet)	SAMPLES			SPT N-value <sup>1</sup>	LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft	
	Sampler Type	Sample	Blows/ 6"										
Ground Surface Elevation: 5.1 feet <sup>2</sup>													
1	S&H		36	36	SP	2 inches Asphalt Concrete (AC) 7 inches Aggregate Base (AB)							
2			32			SAND (SP) dark brown and olive-gray, dense, moist, fine- to medium-grained, some fine angular gravel, trace clay [FILL]							
3	S&H		9	34	CL	SANDY CLAY (CL) gray-brown, hard, moist, fine sand, trace coarse angular gravel [FILL]				0.9	4.8		
4			18										
5	S&H		20	47		GRAVEL with SAND (GP) black, dense, moist, fine- to coarse-grained, angular, medium sand, trace clay [FILL]							
6			40		GP								
7	S&H		18	14		▽ (7/14/21, 8:10AM) medium dense, wet							
8			15										
9			8										
10	S&H		32	10	SP-SM	SAND with SILT and GRAVEL (SP-SM) white and gray, loose to medium dense, wet, fine- to coarse-grained, subangular gravel				5.4	9.9		
11			9										
12	S&H		7	13	GC	CLAYEY GRAVEL with SAND (GC) gray-brown to red brown, medium dense, wet, fine-grained angular, medium to coarse sand				17.3	16.3		
13			9			CLAY with SAND (CL) red-brown with black mottling, stiff, wet, fine sand							
14			12										
15													
16	S&H		8	14	CL		PP	1,750					
17			8										
18			11			very stiff							
19	S&H		14	18		LL = 40, PI = 19, see Figure B-1	PP	2,000					
20			16										

Project No.: 731757301

Figure: A-2a

PROJECT:

620 AIRPORT BOULEVARD  
Burlingame, California

## Log of Boring MW-2

PAGE 2 OF 2

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA						Monitoring Well Detail
	Sampler Type	Sample	Blows/ 6"	SPT N-Value <sup>1</sup>			Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft	
21	S&H		20 24 28	31		CLAY with SAND (CL) (continued) hard	PP		4,500				<p>Hydrated Bentonite Seal (19 feet to 21 feet bgs)</p> <p>2 inch 0.10 Slotted Screen, PVC Sch 40 (25 to 35 feet bgs)</p> <p>#3 Sand (21 feet to 35 feet bgs)</p> <p>End Cap From 36.25 To 36.5 Feet</p>
22													
23													
24													
25						very stiff							
26	S&H		16 18 21	23			PP		2,500				
27													
28					CL								
29													
30													
31	S&H		18 28 42	42			PP		3,500		27.3	99	<p>Hydrated Bentonite Seal (19 feet to 21 feet bgs)</p> <p>2 inch 0.10 Slotted Screen, PVC Sch 40 (25 to 35 feet bgs)</p> <p>#3 Sand (21 feet to 35 feet bgs)</p> <p>End Cap From 36.25 To 36.5 Feet</p>
32													
33													
34													
35						stiff							
36	S&H		7 8 9	10			PP		1,750				
37													
38													
39													
40													

Bottom of well at 36.5 feet below ground surface (bgs).  
Groundwater encountered at a depth of 7 feet bgs on 7/14/21 at 8:10 a.m.  
and was measured at a depth of 4 feet bgs at 12:22 p.m. on 7/29/2021.  
PP = Pocket Penetrometer.  
bgs = below ground surface.

<sup>1</sup> S&H blow counts for the last two increments were converted to SPT  
N-Values using factor of 0.6 to account for sampler type and hammer  
energy.

<sup>2</sup> Elevations based on topographic survey by BKF titled "A.L.T.A./N.S.P.S.  
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**LANGAN**Project No.:  
731757301Figure:  
A-2b

GEOTECH WELL LOG W BLOWCOUNTS 731757301 620 AIRPORT GPJ TEMPLATE CA-MODIFIED - COPY.GDT 7/30/21



GEOTECH WELL LOG W BLOWCOUNTS 731757301 620 AIRPORT GPJ TEMPLATE CA-MODIFIED - COPY.GDT 7/30/21

PROJECT: 620 AIRPORT BOULEVARD Burlingame, California										Log of Boring MW-2A PAGE 1 OF 1									
Boring location: See Site Plan, Figure 1										Logged by: A. Barakat Drilled By: Exploration Geoservices Inc.									
Date started: 7/14/21					Date finished: 7/14/21														
Drilling method: Hollow Stem Auger																			
Hammer weight/drop: 140 lbs./30 inches					Hammer type: Downhole Wire					LABORATORY TEST DATA									
Sampler: N/A										Monitoring Well Detail									
DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft							
	Sampler Type	Sample	Blows/ 6"	SPT N-value															
						Ground Surface Elevation: 5.1 feet <sup>1</sup> See log from Boring MW-2													
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			

Bottom of well at 10 feet below ground surface (bgs).  
Groundwater not encountered during drilling, and was  
measured at a depth of 5 feet bgs at 12:25 p.m. on 7/29/2021.  
bgs = below ground surface.

<sup>1</sup> Elevations based on topographic survey by BKF titled "A.L.T.A./N.S.P.S.  
Land Title Survey of The Lands of Kelly McLoughlin ET AL." dated 4/2/2021,  
and reference the North American Vertical Datum of 1988 (NAVD88).

Project No.: 731757301

Figure: A-4

Sch 40  
PVC Blank  
Casing,  
2-inch-  
diameter  
(0 to 5 feet  
bgs)

Portland  
Cement  
Grout (0 to  
3 feet bgs)

Hydrated  
Bentonite  
Seal (3  
feet to 4  
feet bgs)

2 inch 0.10  
Slotted  
Screen,  
PVC Sch  
40 (5 to 10  
feet bgs)

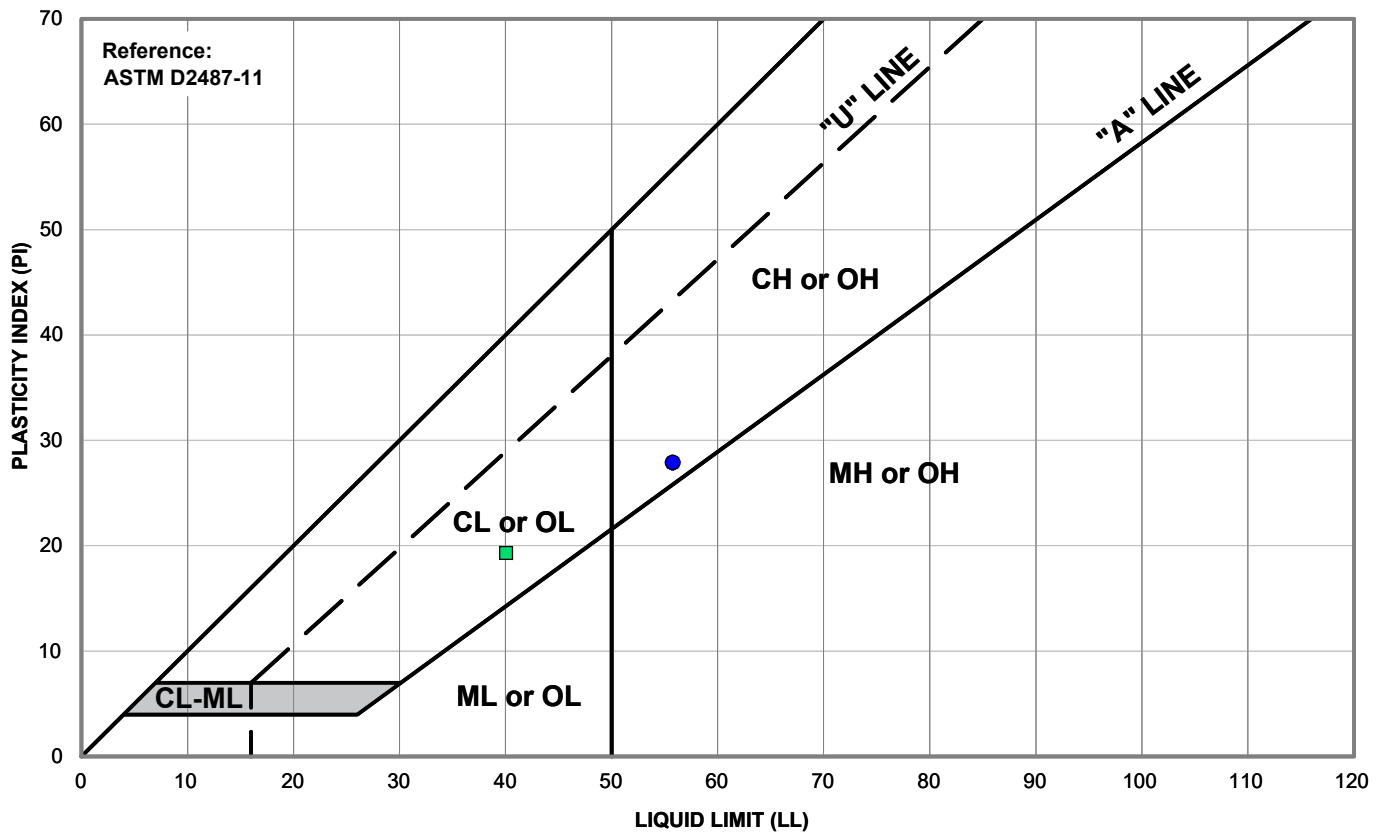
#3 Sand (4  
feet to 10  
feet bgs)

End Cap  
From 9.75  
To 10 Feet

Christy Box  
(with bolt down  
lid flush with  
Asphalt Concrete)

**APPENDIX B**  
**LABORATORY TEST RESULTS**

# PLASTICITY CHART



Symbol	Source	Description and Classification	Natural M.C. (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
●	MW-1 at 7 feet	CLAY (CH), olive-gray	--	56	28	--
■	MW-2 at 18.5 feet	CLAY with SAND (CL), red-brown with black mottling	--	40	19	--

**LANGAN**

Langan Engineering and  
Environmental Services, Inc.  
135 Main Street, Suite 1500  
San Francisco, CA 94105

T: 415.955.5200 F: 415.955.5201 www.langan.com

Project

620 AIRPORT BOULEVARD

BURGLINGAME

SAN MATEO COUNTY CALIFORNIA

Figure Title

**PLASTICITY  
CHART**

Project No.

731757301

Date

07/30/2021

Drawn By

AG

Checked By

TL

Figure

**B-1**

**APPENDIX C**  
**CORROSIVITY TEST RESULTS**



1100 Willow Pass Court, Suite A  
Concord, CA 94520-1006  
925 462 2771 Fax. 925 462 2775  
www.cercoanalytical.com

3 August, 2021

Job No. 2107031  
Cust. No. 12242

Mr. Tim Light  
Langan  
1 Almaden Blvd., Suite 590  
San Jose, CA 95113

Subject: Project No.: 731757301.700.006.0  
Project Name: 620 Airport Boulevard  
Corrosivity Analysis – ASTM Test Methods

Dear Mr. Light:

Pursuant to your request, CERCO Analytical has analyzed the soil samples submitted on July 26, 2021. Based on the analytical results, a brief evaluation is enclosed for your consideration.

Based upon the resistivity measurements, Sample No.001 & No.002 are classified as "severely corrosive" and Samples No.003 & No.004 are classified as "corrosive". All buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion.

The chloride ion concentrations ranged from 230 to 1,300 mg/kg and are determined to be sufficient to attack steel embedded in a concrete mortar coating. Chloride ion concentrations greater than 300 mg/kg are considered corrosive to embedded reinforcing steel; and, as such, the concrete mix design shall be adjusted accordingly by a qualified corrosion engineer.

The sulfate ion concentrations ranged from 35 to 520 mg/kg and are determined to be sufficient to potentially be detrimental to reinforced concrete structures and cement mortar-coated steel at these locations. Therefore, concrete that comes into contact with this soil should use sulfate resistant cement such as Type II, with a maximum water-to-cement ratio of 0.55.

The pH of the soils ranged from 7.37 to 8.45, which does not present corrosion problems for buried iron, steel, mortar-coated steel and reinforced concrete structures.

The redox potentials ranged from 240 to 360-mV. All samples are indicative of potentially "slightly corrosive" soils resulting from anaerobic soil conditions.

This corrosivity evaluation is based on general corrosion engineering standards and is non-specific in nature. For specific long-term corrosion control design recommendations or consultation, please call *JDH Corrosion Consultants, Inc.* at (925) 927-6630.

We appreciate the opportunity of working with you on this project. If you have any questions, or if you require further information, please do not hesitate to contact us.

Very truly yours,  
CERCO ANALYTICAL, INC.

A handwritten signature in dark ink, appearing to read 'J. Darby Howard, Jr.', is written over the typed name.  
J. Darby Howard, Jr., P.E.  
President

JDH/jdl  
Enclosure



1100 Willow Pass Court, Suite A  
Concord, CA 94520-1006  
925 462 2771 Fax. 925 462 2775  
www.cercoanalytical.com

Client: Langan  
Client's Project No.: 731757301.700.006.0  
Client's Project Name: 620 Airport Boulevard  
Date Sampled: 14-Jul-21  
Date Received: 26-Jul-21  
Matrix: Soil  
Authorization: Chain of Custody

Date of Report: 3-Aug-2021

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Conductivity (umhos/cm)*	Resistivity (100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
2107031-001	MW-1, S-3 & S-4 (3.25' - 4.25')	260	8.15	-	200	-	1,100	520
2107031-002	MW-1, S-10 & S-11 (11.5'-12.5')	280	8.42	-	200	-	1,300	190
2107031-003	MW-2, S-7 & S-8 (6.5' - 7.5')	240	8.34	-	890		260	120
2107031-004	MW-2, S15 (21' - 21.5')	360	7.37	-	550		230	35

Method:	ASTM D1498	ASTM D4972	ASTM D1125M	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Reporting Limit:	-	-	10	-	50	15	15
Date Analyzed:	2-Aug-2021	2-Aug-2021	-	30-Jul-2021	-	30-Jul-2021	30-Jul-2021

\* Results Reported on "As Received" Basis

N.D. - None Detected

Cheryl McMillen  
Laboratory Director