APPENDIX 15.0

GEOTECHNICAL REPORT

AND

PERCOLATION TEST

RESULTS

A Universal Engineering Sciences Company
Construction Testing & Engineering, Inc.
Inspection | Testing | Geotechnical | Environmental & Construction Engineering | Civil Engineering | Surveying

January 22, 2022 CTE Project No. 40-3779G

Somar Land Group, Inc.
c/o: Mr. Stephen Macie
302 Hollister Street
San Diego, CA 92154

Subject: Geotechnical Update Report
Report of Geotechnical Investigation
Proposed Commercial Development
Clinton Keith Marketplace (Formerly the Commons at Hidden Springs)
NWC of Clinton Keith Road & Hidden Springs Road
Wildomar, California
APN 380-110-004, -009, -010, -014, &-016

Reference: Report of Geotechnical Investigation
Propose Commercial Development
The Commons at Hidden Springs
NWC of Clinton Keith Road & Hidden Springs Road
Wildomar, California
APN 380-110-004, -009, -010, -014, &-016
Prepared By: CTE, South, Inc. dated: November 12, 2019

Percolation Test Results
Wildomar Commons
NWC of Clinton Keith Road & Hidden Springs Road
Wildomar, California
Prepared by: CTE, South, Inc dated: November 24, 2020

Dear Mr. Macie:

As requested, Construction Testing & Engineering, Inc. (CTE) has prepared this update letter for the referenced reports. The purpose of this letter report is to present additional recommendations, as appropriate, to the findings presented in the above-referenced report. This update has been prepared in accordance with the 2019 CBC.

SITE AND PROPOSED CONSTRUCTION

The site is on the NWC of Clinton Keith Road & Hidden Valley in the City Wildomar, California. The site development consists of a proposed commercial development which includes 7 buildings with a revised building square footage of 66,173 sq feet. The project name has been changed from The Commons at Hidden Springs to Clinton Keith Market Place

SCOPE OF SERVICES

Our scope of services was to perform a review of the existing geotechnical report and provide updated recommendations and seismic design parameters, based on 2019 CBC (effective January 2020). No additional subsurface investigation for the buildings were performed. Our services consisted of the following tasks:

- Review the existing (referenced) geotechnical report.
- Review revised detention basin location plan relative to infiltration testing performed
- Prepare this update letter report for the proposed construction.

Our update comments are as follow:

SEISMIC DESIGN CRITERIA

The seismic ground motion values listed in the table below were derived in accordance with the ASCE 7-16 Standard that is incorporated into the 2019 California Building Code (effective January 1, 2020). This was accomplished by establishing the Site Class based on the soil properties at the site, and then calculating the site coefficients and parameters using the United States Geological Survey Seismic Design Maps application for the 2019 CBC values. These values are intended for the design of structures to resist the effects of earthquake ground motions. The site coordinates used in the application were 33.59478°N and 117.24824°W. Site Class C was used for the analysis.

SEISMIC GROUND MOTION VALUES	
PARAMETER	VALUE
Site Class	C
Mapped Spectral Response Acceleration Parameter, S_S	1.654
Mapped Spectral Response Acceleration Parameter, S_1	0.618
Seismic Coefficient, F_a	1.2
Seismic Coefficient, F_v	1.4
MCE Spectral Response Acceleration Parameter, S_{MS}	1.984
MCE Spectral Response Acceleration Parameter, S_{M1}	0.865
Design Spectral Response Acceleration Parameter, S_{DS}	1.323
Design Spectral Response Acceleration Parameter, S_{D1}	0.576
Mapped MCE Geometric Peak Ground Acceleration, PGA_m	0.872
Seismic Design Category	D

SEISMIC EARTH PRESSURE FOR RETAINING WALLS

For cantilever retaining walls (yielding walls) 6 feet or more in height, lateral pressures due to earthquake motions may be calculated based on work by Seed and Whitman (1970). The total lateral thrust against a properly drained and backfilled cantilever retaining wall above the groundwater level can be expressed as:

$$P_{AE} = P_A + \Delta P_{AE}$$

For non-yielding (or "restrained") walls, the total lateral thrust may be similarly calculated based on work by Wood (1973):

$$P_{KE} = P_K + \Delta P_{KE}$$

Where:

P_A = Static Active Thrust

P_K = Static Restrained Wall Thrust

ΔP_{AE} = Dynamic Active Thrust Increment = $(3/8)\ k_h\ \gamma H^2$

ΔP_{KE} = Dynamic Restrained Thrust Increment = $k_h\ \gamma H^2$

k_h = 2/3 Peak Ground Acceleration =2/3 (PGA_M) = 0.49g

H = Total Height of the Wall

γ = Total Unit Weight of Soil ≈ 130 pounds per cubic foot

The increment of dynamic thrust in both cases should be distributed as an inverted triangle, with a resultant located at 0.6H above the bottom of the wall.

PERCOLATION TESTING

A review of the referenced percolation test report with respect to the revised basin location plan, (Conceptual Grading Plan, C1.00 attached) indicates that the approximate bottom of basin elevations of 1293 and 1279 will encounter sandstone of a similar density to what was tested in the referenced percolation test report. The percolation test results presented in the report, test numbers P-1A and P-1B have a rate of 2.1 and 2.0 inches per hour respectively. We recommend that percolation rates be verified after rough grading has been completed and prior to construction of the subsurface detention structure.

If not explicitly modified herein recommendations presented the original report remain valid.

We appreciate the opportunity to be of service on this project. If you have questions regarding the content of this update report, please do not hesitate to contact the undersigned.

Respectfully submitted,
CONSTRUCTION TESTING & ENGINEERING, SOUTH, INC.

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November 24, 2020 CTE Job No. 40-3779G

Somar Land Group, Inc.
c/o: Mr. Stephen Macie
302 Hollister Street
San Diego, CA 92154

Subject: Percolation Test Results
Wildomar Commons
NWC of Clinton Keith Road & Hidden Springs Road
Wildomar, California

Dear Mr. Macie:

On November 17 and 18, 2020, a geotechnical representative of Construction Testing & Engineering, South, Inc. (CTE) was on-site to conduct percolation tests for the subject project. The tests were conducted at approximate basin floor elevations in the proposed detention basin areas. The basin locations and elevations were provided by the project civil designer, Challman Engineering, Inc., via email and phone correspondence.

The test holes were excavated using a hollow-stem auger drill rig. The test holes were pre-soaked on day one, followed by the percolation testing on day two. The test locations are shown on the attached figure. The tests were conducted in accordance with the referenced BMP design handbook (RCFCWCD, 2018). The field percolation rates were converted to tested infiltration rates using the "Porchet method." The test results are presented in the table below.

PERCOLATION TEST RESULTS			
Test No.	Test Elevation (feet)	Soil Description	Tested Infiltration Rate (inch/hour)
P-1A	1288	Sandstone	2.1
P-1B	1288	Sandstone	2.0
P-2A	1255	Silty Sand	1.3
P-2B	1255	Silty Clayey Sand	0.8
P-2C	1255	Clayey Sand	0.1

Infiltration Rate Factor of Safety

Infiltration rates can be affected by such factors as build-up of silt, debris, degree of soil saturation, and compaction of soil from grading. Accordingly, an appropriate factor of safety should be applied to accommodate subsurface inconsistencies, potential compaction from grading, and potential silting of the soils.

In accordance with the referenced design handbook, a minimum factor of safety of 3 shall be applied to the tested infiltration rates. We recommend that the safety factor be applied to the slowest (or averaged) tested infiltration rate to provide the design infiltration rate.

Groundwater Evaluation

In the referenced geotechnical investigation report (CTE, 2019), groundwater was encountered in boring B-4 at a depth of 19½ feet below ground surface (bgs). Groundwater levels will fluctuate during periods of high precipitation, and water should be anticipated during these times in the existing natural drainage course area. Based on review of online water data library (DWR) for wells in close proximity to the subject site, historically high groundwater is approximately 15 feet bgs.

If there are questions, please contact the undersigned.

Sincerely,
CONSTRUCTION TESTING & ENGINEERING, SOUTH, INC.

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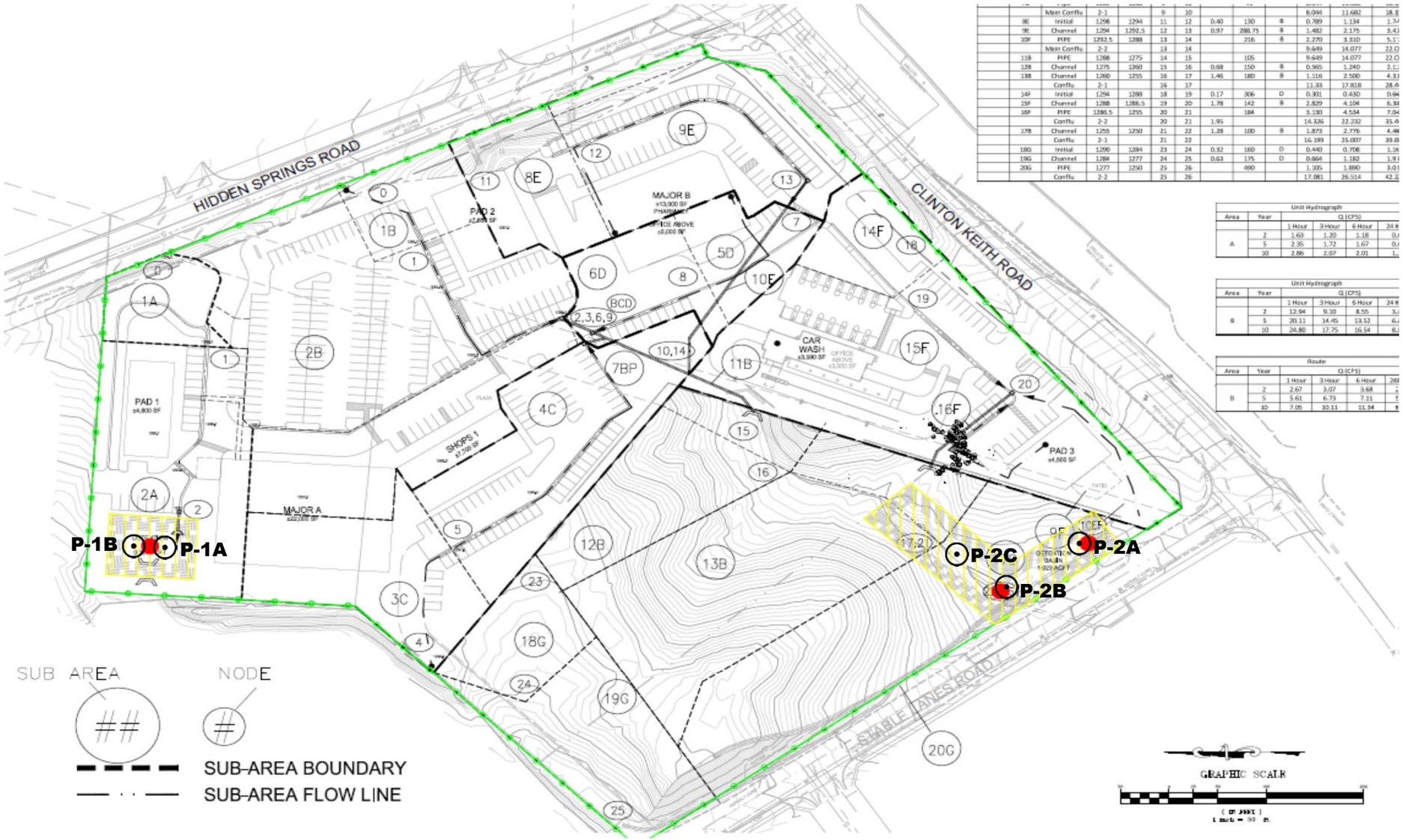
REFERENCES

1. California Department of Water Resources (DWR), Water Data Library, http://www.water.ca.gov/waterdatalibrary/.

2. Construction Testing & Engineering, South, Inc., 2019, Report of Geotechnical Investigation, Proposed Commercial Development, The Commons at Hidden Springs, NWC of Clinton Keith Road & Hidden Springs Road, Wildomar, California, November 12.

3. Riverside County Flood Control Water Conservation District (RCFCWCD), 2018, Riverside County Santa Margarita River Watershed Region Design Handbook for Low Impact Development Best Management Practices, revised June.



		Main Confl'n	2-1			9	10				8.044	11.682
	8E	Initial	1298	1294	11	12	0.40	130	B	0.789	1.134	1.7
	9E	Channel	1294	1292.5	12	13	0.97	288.75	B	1.482	2.175	3.4
	10F	PIPE	1292.5	1288	13	14		216	B	2.270	3.310	5.1
		Main Confl'n	2-2		13	14				9.649	14.077	22.0
	11B	PIPE	1288	1275	14	15		105		9.649	14.077	22.0
	12B	Channel	1275	1260	15	16	0.68	150	B	0.965	1.240	2.1
	13B	Channel	1260	1255	16	17	1.46	180	B	1.116	2.500	4.1
		Confl'n	2-1		16	17				11.33	17.818	28.6
	14F	Initial	1294	1288	18	19	0.17	306	D	0.301	0.430	0.6
	15F	Channel	1288	1286.5	19	20	1.78	142	B	2.829	4.104	6.3
	16F	PIPE	1286.5	1255	20	21		184		3.130	4.534	7.0
		Confl'n	2-2		20	21	1.95			14.326	22.232	35.6
	17B	Channel	1255	1250	21	22	1.28	100	B	1.873	2.776	4.4
		Confl'n	2-1		21	22				16.199	25.007	39.8
	18G	Initial	1290	1284	23	24	0.32	160	D	0.440	0.708	1.1
	19G	Channel	1284	1277	24	25	0.63	175	D	0.664	1.182	1.9
	20G	PIPE	1277	1250	25	26		490		1.105	1.890	3.0
		Confl'n	2-2		25	26				17.081	26.514	42.2

Unit Hydrograph					
Area	Year	Q (CFS)			
		1 Hour	3 Hour	6 Hour	24 H
A	2	1.63	1.20	1.18	0.6
	5	2.36	1.72	1.67	0.9
	10	2.86	2.07	2.01	1.1

Unit Hydrograph					
Area	Year	Q (CFS)			
		1 Hour	3 Hour	6 Hour	24 H
B	2	12.94	9.10	8.55	3.3
	5	20.11	14.45	13.52	6.4
	10	24.80	17.75	16.54	8.1

Route					
Area	Year	Q (CFS)			
		1 Hour	3 Hour	6 Hour	24H
B	2	2.67	3.07	3.68	4
	5	5.61	6.73	7.11	9
	10	7.05	10.11	11.34	13

GEOTECHNICAL LEGEND

⊙ **P-1 Approximate Percolation Test Location**

CTE SOUTH Construction Testing & Engineering, South, Inc.
Inspection | Testing | Geotechnical | Environmental & Construction Engineering | Civil Engineering | Surveying

PERCOLATION TEST LOCATION MAP
WILDOMAR COMMONS
HIDDEN SPRINGS ROAD & CLINTON KEITH ROAD
WILDOMAR, CALIFORNIA

Job No.	Date	Figure
40-3779G	NOV 2020	1

SUMMARY OF EARTHWORK QUANTITIES

ITEM	A CUT/CUBIC YDS..	B FILL/CUBIC YDS.
1. LAND DEVELOPMENT PROGRAM FOR PURE VOLUME (RAW)	54,542	90,570
2. SUBSIDENCE LOSS – 0.1'		1,153
3. OVEREXCAVATION – PAD 63,490 x 4 / 27	7,104	7,104
4. OVEREXCAVATION – ROAD 204,773 x 1 / 27	8,537	8,537
5. SUBTOTALS	70,183	107,364
6. SHRINKAGE @ 10%		11,929
7. TOTALS	70,183	119,293
8. IMPORT		49,110

Proposed Underground Detention Basin

See Hydrology Report- Appendix E - PDF Page 475 for Basin Details. Basin provides both infiltration as well as pass thru capability.

Proposed Surface level Detention Basin. Bottom of Basin approximately 1,293'.

CONSTRUCTION NOTES:

1. CONSTRUCT 4' WIDE RIBBON GUTTER PER DETAIL 'B' ON SHEET C1.02
2. CONSTRUCT 6" PCC CURB PER SPPWC 120-2, A1-6 (150). SEE DETAIL 'A' ON SHEET C1.02
3. CONSTRUCT ADA SIGNAGE AND STRIPING
4. CONSTRUCT 6" PCC CURB AND GUTTER PER SPPWC 120-2, A1-6 (150) SEE DETAIL 'D' ON SHEET C1.02
5. INSTALL 36"X36" JENSEN (OR EQUAL) DROP INLET CATCH BASIN
6. INSTALL ADS UNDERGROUND STORAGE SYSTEM PER MANF. RECOMMENDATION AND DETAILS

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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REVISIONS

No.	Revisions	By	Date

PROJECT
CLINTON KEITH MARKETPLACE
380-110-004,009,010,014,016
WILDOMAR, CA

ENGINEER OF RECORD
PROFESSIONAL ENGINEER RYAN DUKE 17919 CIVIL STATE OF CALIFORNIA

SHEET TITLE
CONCEPTUAL GRADING PLAN

SHEET
C1.00
PROJECT: 19067

SHEET NO.
3
OF 10 SHEETS