



OPEN MEETING

REGULAR MEETING OF THE THIRD LAGUNA HILLS MUTUAL MAINTENANCE AND CONSTRUCTION COMMITTEE

**Monday, November 1, 2021 at 1:30 PM
24351 El Toro Road – Board Room & Virtual with Zoom**

Laguna Woods Village owners/residents are welcome to participate in all open committee meetings in-person and virtually. To submit comments or questions virtually for Committee meetings, please use one of the following three options:

1. Join by Zoom by clicking this link: <https://us06web.zoom.us/j/81435641900>
2. Via email to meeting@vmsinc.org any time before the meeting is scheduled to begin or during the meeting. Please use the name of the committee in the subject line of the email. Name and unit number must be included.
3. By calling (949) 268-2020 beginning one half hour before the meeting begins and throughout the remainder of the meeting. You must provide your name and unit number.

NOTICE AND AGENDA

This Meeting May be Recorded

1. Call to Order
2. Acknowledgement of Media
3. Approval of Agenda
4. Approval of Meeting Report from September 13, 2021
5. Chair's Remarks
6. Member Comments – *(Items Not on the Agenda)*
7. Department Head Update

Consent:

All matters listed under the Consent Calendar are considered routine and will be enacted by the Committee by one motion. In the event that an item is removed from the Consent Calendar by members of the Committee, such item(s) shall be the subject of further discussion and action by the Committee.

8. Project Log
9. Solar Production Report

Recommended Action: Receive and File the consent item reports.

For Discussion and Consideration:

10. Alternatives to Mitigate Nuisance Seepage at Brazo and Calzado in Gate 11

Recommended Action: Direct staff to issue an RFP for the design of a French Drain System to mitigate the water seepage in Gate 11.

Items for Future Agendas:

- TBD

Concluding Business:

11. Committee Member Comments
12. Date of Next Meeting – January 3, 2022
13. Adjournment



OPEN MEETING

**REPORT OF REGULAR MEETING OF THE THIRD LAGUNA HILLS MUTUAL
MAINTENANCE AND CONSTRUCTION COMMITTEE**

Monday, September 13, 2021 – 1:30 PM

24351 El Toro Road, Board Room & Zoom

MEMBERS PRESENT: Robert Mutchnick – Chair, John Frankel, Ralph Engdahl,
Craig Wayne

MEMBERS ABSENT: Reza Karimi

OTHERS PRESENT: Annie McCary

STAFF PRESENT: Manuel Gomez – Staff Officer, Laurie Chavarria, Baltazar
Mejia, Koh Shida, Ian Barnette, Chris Laugenour, Guy
West

1. Call to Order/Establish a Quorum

Chair Mutchnick called the meeting to order at 1:31 PM and stated that the meeting is being held pursuant to notice duly given and established that a quorum of the Committee was present.

2. Acknowledgement of Media

The media was not present.

3. Approval of the Agenda

The meeting agenda was approved as written.

4. Approval of Meeting Report for July 7, 2021

The meeting report for July 7, 2021 was approved as written.

5. Chair's Remarks

Chair Mutchnick introduced the new Maintenance & Construction Director, Manuel Gomez to the Committee and welcomed him to the Village.

6. Member Comments (Items Not on the Agenda)

- Nancy Brown – commented in person on the damage by worker claim she submitted in May.
- Jay Laessi – commented via email on the removal of architectural details from buildings, during the Prior-to-Paint Program.

Staff Officer Manuel Gomez and Chair Mutchnick responded to all member comments. Staff will follow up with Risk Management regarding Ms. Brown's submitted claim for restitution.

7. Department Head Update

Staff Officer Manuel Gomez introduced two new M&C Department Managers, Facilities Manager Baltazar (Bart) Mejia & Maintenance Operations Manager Koh Shida to the Committee and provided a brief overview of their responsibilities.

Consent:

All matters listed under the Consent Calendar are considered routine and will be enacted by the Committee by one motion. In the event that an item is removed from the Consent Calendar by members of the Committee, such item(s) shall be the subject of further discussion and action by the Committee.

The Consent Calendar was approved unanimously.

8. Project Log

9. Solar Production Report

For Discussion and Consideration:

10. Mission Statement/Charter for Parking and Golf Cart Subcommittee (Draft & Final Resolution)

Chair Mutchnick read the mission statement of the Parking and Golf Cart Subcommittee, which reviews parking, golf cart and electric vehicle information and forwards recommendations to the M&C Committee for review and action.

A motion was made and unanimously carried to recommend the Board approve proposed Resolution 03-21-XX to establish a Mission Statement and Charter for the Parking and Golf Cart Subcommittee.

11. Fumigation for Manor 5247

Chair Mutchnick summarized the request from the seller/owner of unit 5247 for them to be able to fumigate their single unit building, by whole structure tenting, at their own cost prior to the close of escrow.

Discussion ensued regarding preparation by staff; recording the fumigation in the database; and the savings to the Mutual.

Chair Mutchnick proposed that a resolution be written to allow fumigation at member expense for free-standing single unit buildings with several conditions that he read aloud and had also sent in an email to staff.

Director Frankel suggested that a condition be included that the owner requesting the unscheduled whole structure fumigation also be responsible for costs associated with lodging for any occupants residing in the unit at the time of fumigation.

A motion was made and unanimously carried to recommend the Board authorize the owner of 5247 Duenas to fumigate the building at their expense.

A motion was made and unanimously carried to recommend the Board approve the proposed resolution to revise the Fumigation Policy to allow single-unit buildings that are not scheduled for the current year's fumigation, be allowed to schedule whole structure fumigation/tenting with the Mutual's fumigation contractor, at their own expense.

12. Handrail Installation Request for 3083-C

Staff Officer Manuel Gomez summarized the request for a handrail be installed along the walkway from Unit 3083-C to the carport, at Mutual expense. The Member has a visual impairment and has stated that it is difficult to navigate the walkway to and from the carport area.

The Committee viewed pictures of the site provided by the owner and discussed the conditions of the walkway. Discussion ensued regarding the different elevations/slopes of the walkway; the area of uneven concrete that was ground flat earlier this year; and the restrictions of the Common Area Use Policy.

By consensus, staff was directed to send this request to the Architectural Control and Standards Committee for review to see if the installation of a handrail along the walkway from Unit 3083-C Via Serena South would violate the Common Area Policy.

13. Charge Ready 2 Program & Suggested EV Charging Station Locations (Bart Mejia)

Facilities Manager Baltazar Mejia summarized the applications submitted to SCE and the proposed costs to the Mutual for the Charge Ready 2 Program.

One member from the audience, one virtual member and eleven emailed member comments were heard in support of electric vehicle charging stations. Most comments mentioned that they were in support of charging stations at GRF clubhouses.

Discussion ensued regarding Level III DC fast charging stations versus Level II charging stations; what is the solution for residents in Gate 14 who are not near a clubhouse; and the amount of parking spaces needed for the proposed EV charging stations;

A motion was made and unanimously carried to recommend that the Board cancel 12 of the 14 applications submitted to SCE for the Charge Ready 2 Program. The two locations at 4008 Calle Sonora Oeste and 4019 Calle Sonora Este, inside Gate 14, should remain under review by SCE.

14. Hard Flooring Surfaces in Multi-story Buildings (Chair Mutchnick)

Chair Mutchnick summarized the complaints he has heard from residents who live below units with interior hard-surface flooring.

Manor Alterations Manager, Robbi Doncost reviewed the current Mutual's standard for the FIIC sound rating.

The Committee will refer this to the ACSC for review at a future meeting.

15. Placement of Shepherd's Crook for the 2021 Program (Guy West)

Staff Officer Manuel Gomez and Projects Division Manager Guy West summarized the reason why Shepherd's Crook could not be installed on the fence along the Dog Park at this time. Staff suggests that the Shepherd's Crook installation take place in Gate 11 at the corner of Santa Vittoria at Santa Maria.

By consensus the Committee accepted staff's recommendation to change the location of the planned installation of Shepherd's Crook from the City Dog Park to Gate 11.

Items for Future Agendas:

- TBD

Concluding Business:

16. Committee Member Comments

- None

17. Date of Next Meeting – November 1, 2021

18. Adjournment - This meeting was adjourned at 2:55pm.

DRAFT

Robert Mutchnick, Chair

Third Mutual Project Log (September 2021)

#	Type	Name	Description	Status	Estimated Completion/On-going Programs	Budget
1	920 Projects	Illuminated Building Numbers	This program is intended to upgrade building signage to improve their visibility. The M&C Committee is focused on replacement of the existing building address signs with larger, more visible signs. Staff is using larger, traffic-rated, high reflectivity materials to improve their visibility at night.	Building signs are completed in conjunction with the paint program. Cul-de-sacs 226 is scheduled to receive new building signs. Building sign installations are completed at cul-de-sacs 219, 203, 212, and 213. Invoices are pending.	December 2021	Budget: \$30,000 Exp: \$3,561 Balance: \$26,439
2	920 Projects	Senate Bill 326 Load Bearing Component Inspections	This program is funded to conduct an assessment for inspection and testing of exterior elevated elements, defined as the load-bearing components and associated waterproofing systems in all buildings and facilities within the community.	Staff is developing the special provisions for an RFP to be advertised to licensed engineers. Staff will continue the planning and budgeting process to complete the necessary inspection submittal requirements due January 2025, as outlined in Senate Bill 326.	December 2021	Budget: \$50,000 Exp: \$0 Balance: \$50,000
3	920 Projects	Building Structures	This program is funded to repair or replace building structural components that are not performing as designed. This funding also includes roofing repairs related to dry rot work.	As building structural issues are reported and inspection requests are received, staff schedules an engineer to field inspect and if required, provide a recommendation for repairs. In addition, roofing repairs are performed after prior-to-paint crews replace fascia due to dry rot. As part of this budget, staff will proactively inspect buildings for drainage issues and provide repairs as needed. Building 3129 has recommended column footing repairs. The contract is in process. Building 5125 has recommended garage wall footing repairs. Construction bids are scheduled to be received in mid-September. Building 5510 has stair case damage and a structural observation was performed. A request has been submitted to remove the stucco at the stair case connection to the landing so the condition can be observed.	Annual Program - December 2021	Budget: \$500,000 Exp: \$85,651 Balance: \$414,349

4	920 Projects	Dry Rot Program	This program is funded to develop and implement a systematic approach to eradicating wood rot throughout Third Mutual.	The Dry Rot Program will take place in coordination with the Prior to Paint Program with a primary focus on Garden Villa Buildings. Buildings 2390, 2392 and 2393 are complete. Construction for 2369 in progress. Construction is scheduled to be completed at buildings 2381, 2399, 3241 and 3243 by November. Structural repair documents for buildings 3242, 3244, 3499, 4006, 4008, 4010 and 4011 are scheduled to be received by the end of September.	Annual Program - December 2021	Budget: \$1,025,000 Exp: \$318,400 Balance: \$706,600
5	920 Projects	Foundations Program	This program is funded to replace foundations showing signs of distress or impending failure. These repairs or replacements are performed on an as-needed basis. Staff performs field observations when a foundation inspection request is received. If needed, a structural engineer is then scheduled to inspect the foundation and provide a recommendation.	Staff performs field inspections to evaluate building foundations and schedules any needed upgrades as they are identified. Buildings 2387, 2394, 2395 and 2397 have concrete spalling and structural repair plans have been submitted to the city. Construction Bids are scheduled to be received by the end of September.	Annual Program - December 2021	Budget: \$75,000 Exp: \$19,142 Balance: \$55,858
6	904 Maint Svc	Electrical Systems	These funds are allocated to repair or replace electrical equipment failures as needed.	Code compliance has been completed at the 3 story buildings. The allocation of funding will continue to make improvements when and where it is necessary.	Annual Program - December 2021	Budget \$50,000 Exp: \$0 Balance: \$50,000
7	910 Bldg. Maint	Gutters - Replacement and Repair	Gutter replacement is performed on original construction building rain gutters and downspout systems that are exhibiting deterioration. The Board authorized installation of new gutters using a "seamless" gutter system in conjunction with the Mutual's exterior painting of the building to address drainage issues and to prevent foundation problems. This program also addresses gutter repairs performed by VMS staff.	Funds have been budgeted for repairs by in-house staff on an as-needed basis throughout the year. Buildings on the exterior paint program will be selected based on drainage issues and will be scheduled for installation of seamless gutter systems by an outside vendor. The installation of gutters is completed in conjunction with the paint program.	Annual Program - December 2021	Budget: \$76,206 Exp: \$22,846 Balance: \$53,360

8	910 Bldg. Maint	Exterior Paint Program	The Mutual has a 15-year full cycle exterior paint program. All exterior components of each building are to be painted every 15 years. The painted components include the body (stucco/siding) as well as the following list in regards to the trim: fascia boards; beams; overhangs; doors; closed soffits; structural and ornamental metal surfaces. Decks are top coated and damaged building address signs are replaced. Lead abatement activities are also performed in conjunction with this program.	The following cul-de-sacs/buildings are scheduled for painting during the 2021 Exterior Paint Program: CDS 213, 212, 219 and 226. Staff has completed work in CDS 213 and has moved onto CDS 212 which consists of 24 buildings, 18 carports and 5 laundry rooms.	Annual Program - December 2021	Budget: \$1,506,039 Exp: \$814,919 Balance: \$691,120
9	910 Bldg. Maint	Prior to Paint Program (PTP)	The Mutual has a 15-year full cycle exterior paint program. Prior to paint dry rot and decking repairs will be performed every 10 years to prepare building surfaces for painting.	The following cul-de-sacs are scheduled for inspection and repair during the 2021 Prior to Paint Program: CDS 212, 213, 219 and 226. Staff has completed work in CDS 213 and has moved onto CDS 212 which consists of 24 buildings, 18 carports and 5 laundry rooms.	Annual Program - December 2021	Budget: \$1,071,350 Exp: \$514,062 Balance: \$557,288
10	910 Bldg. Maint	Balcony & Breezeway Resurfacing	This mid-cycle program provides for the waterproof topcoat sealing of balcony and breezeway deck surfaces every 7.5 years. This waterproofing process protects the deck substructure against future dry rot and improves the aesthetics of the deck surface. Prior to applying topcoat, crews conduct an inspection of the deck structure to locate any dry rot or potential safety hazards.	The buildings scheduled for resurfacing in 2021 are located in the following cul-de-sacs: 340, 341, 344, 340-B and buildings 5368, 5369, 5370, 5371 and 5372. Staff has completed CDS 340, buildings 3367, 3335, 3336, 3337, 3338, and 5368.	Annual Program - December 2021	Budget: \$101,168 Exp: \$34,461 Balance: \$66,707
11	920 Projects	Emergency Roof Repair Program	This Program funding is allocated as a contingency to preserve the serviceable life of roofs by performing emergent requests for roof repairs as they are received.	During inclement weather when emergency roof leak requests are received, staff schedules the roofing contractor to investigate roof related issues. If required, the roofing contractor will provide the necessary repairs.	Annual Program - December 2021	Budget: \$110,000 Exp: \$40,169 Balance: \$69,831
12	920 Projects	Roof Replacement - BUR to PVC Cool Roofing	This program is dedicated to replacing and maintaining Mutual roofs. Built-up roofs are inspected 15 years after installation. Roofs determined to have reached the end of their serviceable life are scheduled to be replaced with a new PVC cool roof system.	28 buildings totaling 145,535 SF are scheduled for roof replacement with a PVC cool roof system. This program commenced in April and is scheduled to be completed by the end of November. As of August 31, 2021, 13 out of 28 buildings have been completed and invoicing is pending.	Annual Program - November 2021	Budget: \$1,123,317 Exp: \$523,205 Balance: \$600,112

13	920 Projects	Shepherd's Crook	As a part of the Conditional Use Permit 1135 with the City of Laguna Woods, the Mutual will remove and replace barbed wire on all perimeter block walls with Shepherd's Crook on a phased approach.	The installation of a minimum 300 lineal feet of Shepherd's Crook fencing is planned for 2021. Shepherd's Crook will be installed in Gate 11 on Santa Vittoria at the corner of Santa Maria. To date a total of 6,402 linear feet out of 33,525 LF of Shepherd's Crook has been installed.	Annual Program - December 2021	Budget: \$35,000 Exp: \$0 Balance: \$35,000
14	904 Maint Svc	Epoxy Wasteline Remediation	The Waste Line Remediation Program's objective is to install seamless liners within the existing waste pipes to mitigate future root intrusion as well as to resolve and prevent future back up problems related to compromised pipes. If there are consistent internal issues, these are also investigated and addressed during the program execution. The program addresses interior as well as exterior waste lines. The program to line pipes commenced in 2011 but did not include interior pipes. Starting in 2017, both, interior and exterior lines are receiving an epoxy liner.	While the primary focus is on three-story buildings this year, other buildings with a high risk for stoppages will also be evaluated for epoxy lining. The three-story buildings take an average of 10-12 weeks to complete. Total number of buildings in Third Mutual: 1407 Number of buildings left to complete: 1098 There are 6 three-story buildings scheduled for epoxy line remediation this year.	Annual Program - November 2021	Budget: \$1,000,000 Exp: \$269,655.09 Balance: \$730,344.92 Cumulative Expenditures from 2011 through 2019: \$3,708,372
15	920 Projects	Water Lines - Copper Pipe Remediation	This program started in 2008 as a pilot program, and epoxy lining of buildings as-needed, was approved by the Board in 2010. Epoxy lining is intended to extend the life of copper pipe water lines in all buildings which experience a high frequency of copper pipe leaks.	Buildings 2279, 2323, and 5387 are scheduled for the 2021 epoxy lining program to be completed by end of September. Building 2302, 3026, 3039, 2271, 2282 and 4004 have been completed to date.	Annual Program - September 2021	Budget: \$500,000 Exp: \$181,788 Balance: \$318,212
16	910 Bldg. Maint	Pest Control for Termites	This program is dedicated to eradicating dry wood termites from inaccessible areas by tenting buildings for fumigation. The budget also includes funding for local termite treatments and the removal of bees/wasps on an as-needed basis and hotel accommodations during whole structure fumigation.	Local termite treatments and the removal of bees/wasps are performed as-needed throughout the year. The fumigation program commences in May and is typically completed in November.	Annual Program - November 2021	Budget: \$645,800 Exp: \$113,761 Balance: \$532,039
Completed Projects/Programs						
	920 Projects	Preventive Roof Maintenance	This program is funded to preserve the serviceable life of the roofs through a 5 and 10-year inspection cycle. Roofs are inspected and maintained accordingly. 5 year inspections: 36 bldgs. = 202,877 SF 10 year inspections: 72 bldgs. = 170,732 SF	COMPLETED	Annual Program - March 2021	Budget: \$66,585 Exp: \$66,585 Balance: \$0

920 Projects	Roof Replacement - Light weight tile to Comp Shingle Roofs	Beginning with the 2020 Business Plan, the Board elected to initiate the Light Weight Tile Replacement program to address premature failure of existing tile roofs. Light weight tile roofs will be replaced with composition shingle roof systems.	COMPLETED	Annual Program - December 2021	Budget: \$109,392 Exp: \$109,133 Balance: \$259
910 Bldg. Maint	Garden Villa (GV) Laundry Room Flooring Renovations	This program is funded to replace the laundry room floors of the GV and LH-21 style buildings with epoxy flooring when the existing vinyl flooring is damaged.	COMPLETED Invoices are pending.	Annual Program - December 2021	Budget: \$46,565 Exp: \$20,523 Balance: \$26,042
920 Projects	Parapet & Stucco Wall Repairs	This program funding is to address the Villa Paraisa and Casa Grande style homes in the Gate 11 area that have had parapet wall leaks causing wood rot and wall damage. A phased program to remove these parapet walls was adopted by the Board to remove five walls per year. A total of five buildings are scheduled for 2021: 5028, 5294, 5298, 5413 and 5423.	COMPLETED 27 out of 40 buildings have been completed through May 2021. Buildings 5019, 5298, 5294, 5413 and 5423 are complete.	Annual Program - 2021 August	Budget \$300,000 Exp: \$253,820 Balance: \$46,180
920 Projects	Golf Cart Parking and Striping	This program is funded to add golf cart & vehicle parking spaces where there is adequate spacing. In 2021, Cul de sac 216 will receive 18 new golf cart spaces and 7 new vehicle parking spaces and Cul de sac 212 will receive 4 golf cart stalls this year.	COMPLETED The Golf Cart Parking Committee recommended a scope reduction. All the spaces in Cds 216 were eliminated and only the golf cart stalls in Cds 212 will be completed. The balance of the funding for this project will be slated for use on potential EV stations. The work in Cds 212 was completed in June.	Annual Program - July 2021	Budget: \$50,000 Exp: \$7,925 Balance: \$42,075
910 Bldg. Maint	Garden Villa (GV) Lobby Renovations	This program addresses the replacement of the existing acoustic ceiling, wallpaper and carpet in GV lobbies. All walls, ceilings and doors are patched and painted and the carpet is replaced. A total of 9 lobbies are scheduled for 2021: 2381, 2401, 5518, 4011, 3244, 4010, 5511, 5510, and 2402	COMPLETED Invoices are pending.	Annual Program - December 2021	Budget: \$112,500 Exp: \$73,748 Balance: \$38,752
920 Projects	Elevator Replacement Program	This Elevator Replacement Program is funded to replace mechanical equipment. In addition, a specified number of elevator cars are scheduled for interior renovations. In 2021 the elevators at buildings 3363, 3366, 4026, 5369 and 5371 are scheduled for equipment replacement & interior renovation this year.	COMPLETED	Annual Program - September 2021	Budget: \$255,000 Exp: \$146,169 Balance: \$108,831

	920 Projects	Asphalt Paving Program	<p>This program is dedicated to preserving the integrity of cul-de-sac street paving. As part of this program, asphalt paving is inspected and rated for wear annually. The 2021 program will consist of 158,441 square feet of paving replacement.</p>	<p>COMPLETED Invoices are pending.</p>	Annual Program - August 2021	Budget: \$467,763 Exp: \$0 Balance: \$467,763
	920 Projects	Seal Coat Program	<p>This program is funded to extend the life of the asphalt paving by sealing asphalt cracks and applying a bituminous slurry seal to the asphalt surface preventing water intrusion and protecting the asphalt from deterioration.</p> <p>The 2021 program consists of 28 cul-de-sacs.</p>	COMPLETED	Annual Program - August 2021	Budget: \$51,386 Exp: \$45,956 Balance: \$5,430
	920 Projects	Parkway Concrete Program	<p>This program is funded to repair or replace damaged concrete parkways in conjunction with the asphalt paving program. Parkways are inspected for damage and other deficiencies are repaired or replaced accordingly.</p>	COMPLETED	Annual Program - July 2021	Budget: \$125,000 Exp: \$106,831 Balance: \$18,169

Third Mutual Solar Production Report

2021 Production													
Third Mutual Project	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Total
2353 Via Mariposa	6,440	7,700	10,750	11,550	12,880	13,770	13,870	12,020	10,130				99,110
2381 Via Mariposa	4,560	5,330	9,090	10,740	11,950	13,370	12,560	11,020	9,290				87,910
2393 Via Mariposa West	4,130	5,230	7,640	8,390	9,520	10,580	9,820	8,480	8,550				72,340
2394 Via Mariposa West	6,050	7,150	11,110	12,700	14,090	15,800	14,910	13,050	10,960				105,820
2397 Via Mariposa West	6,050	7,220	1,080	10,720	11,980	13,460	12,700	11,070	9,340				83,620
2399 Via Mariposa West	5,310	6,410	8,870	9,590	10,710	12,070	11,510	10,030	8,420				82,920
2400 Via Mariposa West	6,110	7,360	10,390	11,230	12,540	14,130	13,260	11,540	9,700				96,260
3242 San Amadeo	4,510	5,650	8,570	9,670	10,930	12,450	11,840	10,140	8,400				82,160
3243 San Amadeo	5,000	5,800	9,267	8,651	9,125	10,202	5,534	1,695	15,365				70,639
3420 Calle Azul	3,616	4,339	6,164	6,565	7,201	7,819	7,479	6,525	3,051				52,759
5372 Punta Alta	4,750	5,688	8,116	8,395	8,837	10,242	9,860	8,624	7,357				71,869
5510 Paseo Del Lago West	3,447	4,188	6,094	6,595	7,307	8,018	7,564	6,667	5,589				55,469
Total Production of kWh =	59,973	72,065	97,141	114,796	127,070	141,911	130,907	110,861	106,152	0	0	0	960,876

(3243 - Jul/Aug/Sept 2021): Modem Failure - all solar panels and inverters are operational. Modem worked for a short time in Sept. and the reported value includes stored data.

(3420 - Sept 2021): Low production due to SCE power outage and repairs from 9/16 to 10/1

2020 Production													
Third Mutual Project	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Total
2353 Via Mariposa	3,378	8,145	9,186	10,730	13,940	12,100	14,310	13,210	9,590	7,860	6,700	5,560	114,709
2381 Via Mariposa	5,150	6,493	6,816	8,450	12,980	11,260	13,380	12,350	8,820	6,640	5,480	4,050	101,869
2393 Via Mariposa West	5,067	6,794	8,166	9,830	11,690	7,540	8,940	7,120	4,950	5,560	3,560	3,160	82,377
2394 Via Mariposa West	7,064	8,883	10,050	11,760	15,260	13,210	15,690	14,600	10,570	8,620	7,350	5,350	128,407
2397 Via Mariposa West	6,068	7,604	8,603	10,080	13,080	11,370	13,440	12,490	9,080	7,360	6,250	5,230	110,655
2399 Via Mariposa West	5,356	6,763	7,630	8,970	11,690	10,220	12,020	11,160	8,150	6,560	5,510	4,580	98,609
2400 Via Mariposa West	6,159	7,797	8,910	10,490	13,680	11,940	14,070	12,950	9,350	7,500	5,130	3,450	111,426
3242 San Amadeo	4,642	6,160	7,423	8,700	11,380	9,850	11,700	10,700	7,350	5,790	3,270	1,790	88,755
3243 San Amadeo	4,876	5,804	6,880	7,832	9,912	8,431	10,115	10,296	7,362	6,044	5,128	4,383	87,063
3420 Calle Azul	3,805	4,863	5,637	6,500	8,460	7,327	8,861	8,361	5,890	4,794	4,046	3,212	71,756
5372 Punta Alta	4,782	6,646	8,045	8,284	10,751	5,673	8,414	11,525	8,666	7,034	5,402	4,322	89,544
5510 Paseo Del Lago West	3,508	4,514	5,308	4,646	5,995	6,933	7,551	7,754	5,236	4,509	3,625	2,967	62,546
Total Production of kWh =	59,855	80,466	92,654	106,272	138,818	115,854	138,491	132,516	95,014	78,271	61,451	48,054	1,147,716

(2353 - Jan 2020): This was due to 1 out of 3 inverter's wiring harnesses malfunctioning and needing replacement through the manufacturer. Production data was not recorded but estimated based on 2/3 of the production of an identical setup.

2019 Production													
Third Mutual Project	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Total
2353 Via Mariposa	3,368	5,552	8,329	11,520	11,880	10,870	14,370	13,230	10,120	9,850	5,920	2,720	107,729
2381 Via Mariposa	4,951	5,431	8,366	9,418	9,650	8,761	11,590	10,590	8,100	7,920	4,950	3,940	93,667
2393 Via Mariposa West	4,762	5,917	9,176	10,480	11,170	10,230	13,470	12,000	7,267	8,380	5,070	4,080	102,002
2394 Via Mariposa West	6,393	789	8,618	12,420	13,060	11,910	15,680	14,370	10,910	10,800	6,790	5,580	117,320
2397 Via Mariposa West	5,506	6,497	9,682	10,880	11,210	10,250	13,500	12,440	9,480	9,250	5,840	4,770	109,305
2399 Via Mariposa West	4,889	5,796	1,841	X	4,692	7,812	12,100	11,170	8,540	8,240	5,210	4,220	74,510
2400 Via Mariposa West	3,778	5,036	8,142	9,948	11,760	10,790	14,170	12,930	9,830	9,500	5,940	4,860	106,684
3242 San Amadeo	3,856	3,756	8,158	9,671	10,250	9,200	12,000	10,860	8,180	7,510	4,660	3,670	91,771
3243 San Amadeo	4,509	4,952	7,669	8,607	8,162	7,510	8,447	8,849	7,359	7,161	4,706	3,832	81,763
3420 Calle Azul	3,547	4,197	6,116	7,037	7,019	6,540	7,120	7,838	5,803	5,617	3,799	3,016	67,649
5372 Punta Alta	5,133	6,126	9,022	10,380	10,391	9,551	10,742	10,739	7,271	7,731	5,010	4,184	96,280
5510 Paseo Del Lago West	3,287	3,939	5,822	6,766	6,759	6,167	7,837	7,520	5,404	5,424	3,520	2,786	65,231
Total Production of kWh =	53,979	57,988	90,941	107,127	116,003	109,591	141,026	132,536	98,264	97,383	61,415	47,658	1,113,911

(2394 - Feb 2019): Replaced power supply due to the power to communication comes on once communication enclosure is opened.

(2399 - Apr 2019): This was due to a conduit becoming damaged after heavy rains.

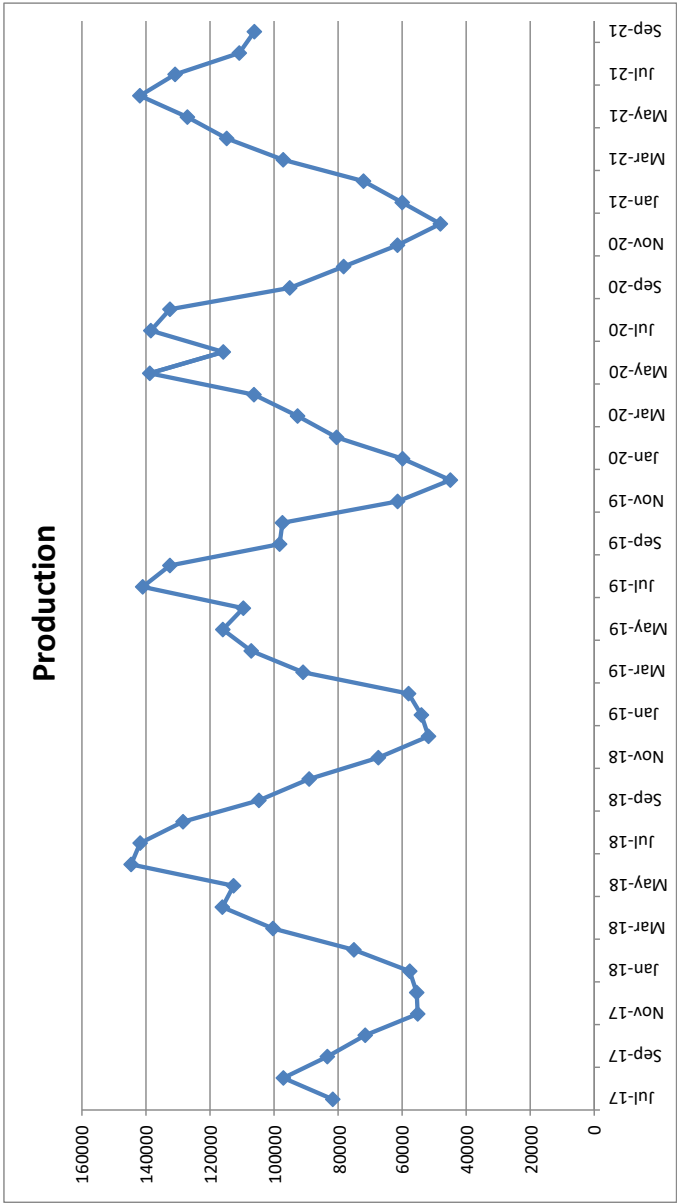
(2353 - Dec 2019): This was due to 1 out of 3 inverter's wiring harnesses malfunctioning and needing replacement through the manufacturer. Production data was not recorded but estimated based on 2/3 of the production of an identical setup.

2018 Production														
	Third Mutual Project	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Total
	2353 Via Mariposa	5,860	7,790	10,400	12,370	10,730	14,030	13,573	12,057	9,830	8,750	6,630	3,390	115,410
	2381 Via Mariposa	4,730	3,340	6,210	8,130	8,260	10,360	9,905	10,918	9,090	8,040	6,120	4,000	89,103
	2393 Via Mariposa West	5,166	6,867	7,876	2,799	10,380	13,260	12,820	11,288	8,970	7,480	5,440	4,440	96,786
	2394 Via Mariposa West	5,450	8,840	11,420	13,590	12,130	15,450	14,888	13,236	10,770	9,530	7,260	6,100	128,664
	2397 Via Mariposa West	5,590	7,560	9,400	11,660	10,420	13,510	13,295	11,817	9,610	8,350	6,280	5,250	112,742
	2399 Via Mariposa West	5,240	6,780	8,680	10,380	9,340	12,030	11,993	10,669	8,680	7,450	5,580	4,640	101,462
	2400 Via Mariposa West	5,990	7,730	10,130	12,060	10,870	14,150	13,794	12,137	9,850	8,540	6,380	4,580	116,211
	3242 San Amadeo	4,960	6,340	8,600	10,480	9,570	12,220	12,005	10,177	8,290	6,790	5,090	4,160	98,682
	3243 San Amadeo	4,192	5,428	7,896	8,896	7,932	9,953	10,144	9,481	8,054	6,514	5,035	4,278	87,803
	3420 Calle Azul	2,016	2,705	5,128	7,581	6,910	8,744	8,736	7,770	6,221	5,212	4,008	3,334	68,365
	5372 Punta Alta	5,296	7,220	8,918	11,074	10,012	12,649	12,412	11,369	9,215	7,392	5,853	4,621	106,031
	5510 Paseo Del Lago West	3,138	4,451	5,679	7,130	6,098	8,283	8,253	7,509	6,151	4,990	3,747	2,965	68,394
	Total Production of kWh =	57,628	75,051	100,337	116,150	112,652	144,639	141,818	128,428	104,731	89,038	67,423	51,758	1,189,653

2017 Production													
Third Mutual Project													
	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Total
2353 Via Mariposa							7,336	11,749	9,151	8,125	5,756	5,807	47,924
2381 Via Mariposa							X	8,566	5,922	6,211	4,410	5,622	30,731
2393 Via Mariposa West							6,283	8,423	7,967	6,712	4,671	4,157	38,213
2394 Via Mariposa West							1,789	X	2,203	1,029	5,542	5,826	16,389
2397 Via Mariposa West							12,437	11,011	8,431	7,446	5,330	3,627	48,282
2399 Via Mariposa West							6,206	10,194	7,617	6,703	4,770	4,678	40,168
2400 Via Mariposa West							7,282	5,400	8,697	7,668	5,468	5,514	40,029
3242 San Amadeo							11,193	9,736	7,256	6,312	4,341	4,433	43,271
3243 San Amadeo							10,351	9,449	6,901	4,708	3,409	4,397	39,215
3420 Calle Azul							8,381	7,141	5,666	4,971	3,325	3,288	32,772
5372 Punta Alta							2,439	8,332	8,216	7,016	5,004	5,081	36,088
5510 Paseo Del Lago West							7,962	7,090	5,329	4,628	3,110	3,015	31,134
Total Production of kWh =							81,659	97,091	83,356	71,529	55,136	55,445	444,216

(2381 - Jul 2017): Unknown Outage
(2394 - Aug 2017): Unknown Outage

Lifetime Production	4,856,372
Total 2021 Repair Costs	\$12,208
Recent Panel Cleanings	5/22/21, 9/23/21





STAFF REPORT

DATE: November 1, 2021
FOR: Maintenance and Construction Committee
SUBJECT: Alternatives to Mitigate Nuisance Seepage – Gate 11, at Brazo and Calzado

RECOMMENDATION

Staff recommends that *Alternative One: Direct Staff to Issue an RFP for the Design of a French Drain System* be approved, to mitigate the water seepage in Gate 11.

BACKGROUND

Residents in the vicinity of Brazo and Calzado streets inside Gate 11 have shared their concerns regarding the excessive amount of ground water in the common area near their homes. A recent site visit from staff confirmed that the landscaped area on the side and rear of many manors are completely saturated and, in some areas, ponding water was observed.

Over the years, staff has taken interim actions in an attempt to mitigate or reduce the accumulation of water by installing underground drainage pipes. These actions have helped somewhat, but have not cured the underlying problem.

DISCUSSION

Due to the wide area affected by the seepage of water, and the level of expertise required to properly analyze the problem, a geotechnical engineering firm, Petra Geosciences (Petra), was retained to conduct field exploration, gather pertinent data and to provide a technical report with recommendations (Attachment 1).

Petra conducted field observations, performed subsurface investigation and researched available records. The results of their findings concluded that the more likely source of the ground water seepage, comes from the underground springs that flow between layers of soil.

The underground springs were present in the early 1970's when the original grading was taking place and required the installation of drainage pipes at that time. These pipes are believed to still be active and functional.

The geotechnical engineer concludes that the most effective way to address the water seepage condition in the vicinity of Brazo and Calzado is to design and construct a supplemental subdrain system (French drain) that will drain into the existing drain pipes.

Staff has provided three alternatives for review and consideration by the Committee:

Alternative One - Direct staff to issue an RFP for the Design of a French Drain System

Under this alternative, the services of a qualified engineering firm would be retained to provide a design for a French drain system to mitigate the flow of underground natural springs into residential properties in the vicinity of Brazo and Calzado streets. The scope of work will include conducting a topographic survey, utility investigation and evaluation, and the preparation of engineering drawings, details, specifications and a construction cost estimate.

Alternative Two – Install Bubble-up Drains at Key Locations

Under this alternative bubble-up drains would be installed at key locations that will allow water to flow up from underground by hydrostatic pressure. Vegetated swales or concrete “V” gutters would be constructed to direct the water to inlets that will drain into existing storm drains. Even though this is a feasible option, its implementation may reduce the available, useable, level open space in the common area.

Alternative Three – Status Quo

Under this alternative any corrective action will be deferred to a future year when the design and installation can be properly funded. Even though this condition has existed for many years, further deferrals will continue to pose a number of challenges due to the saturated soil. The heavy equipment used for tree trimming and lawn care will continue to create ruts with the potential for water ponding. This may even create the inability to grow certain plants and ground cover.

FINANCIAL ANALYSIS

There is no fiscal impact for the recommended action. However, if Alternative One or Two is approved, a supplemental appropriation will be required to fund the design and construction.

Prepared By: Bart Mejia, Facilities Manager

Reviewed By: Laurie Chavarria, Sr. Management Analyst
Manuel Gomez, Maintenance and Construction Director

ATTACHMENT(S)

Attachment 1 – Petra Geotech Report

*GEO TECHNICAL EVALUATION
OF NUISANCE SEEPAGE AT TOE-OF-SLOPE
CUL-DE-SAC AT SOUTH END OF BRAZO AND
TOE-OF-SLOPE ALONG EAST SIDE OF CALZADO
LAGUNA WOODS VILLAGE, CALIFORNIA*

LAGUNA WOODS VILLAGE

*SEPTEMBER 7, 2021
J.N. 20-307*

ENGINEERS + GEOLOGISTS + ENVIRONMENTAL SCIENTISTS

September 7, 2021
J.N. 20-307

LAGUNA WOODS VILLAGE

24351 El Toro Road
Laguna Wood, California 92637

Attention: Mr. Kurt Wiemann

Subject: Geotechnical Evaluation of Nuisance Seepage at Toe-of-Slope, Cul-de-sac at South End of Brazo, and Toe-of-Slope along East Side of Calzado Laguna Woods Village, California

Dear Mr. Wiemann:

Petra Geosciences, Inc. (Petra) is submitting herewith our geotechnical evaluation report regarding the water seepage conditions that have been noted at the toe-of-slope at the south end of Brazo and on the east side of Calzado within the Laguna Woods Village community. Our services were performed in accordance with the scope of services outlined in our Proposal No. 20-307P and our amendment No. 1, dated August 19, 2020 and March 5, 2021, respectively. This report presents the results of Petra's field investigation and laboratory testing, and provides our findings, conclusions and recommendations with respect to the nuisance seepage conditions with the subject site areas.

We appreciate the opportunity to be of service to you on this project. If you have any questions regarding the contents of this report or require additional information, please contact us.

Respectfully submitted,

PETRA GEOSCIENCES, INC.



Darrel Roberts
Principal Geologist

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FIGURE 1 – SITE LOCATION MAP

FIGURE 2 – TRACT DRAINAGE MAP

FIGURE 3 – BORING LOCATION MAP – BRAZO (SITE 1)

FIGURE 4 – BORING LOCATION MAP – CALZADO (SITE 2)

FIGURE 5 – PROPOSED SUBDRAIN LOCATION MAP – BRAZO (SITE 1)

FIGURE 6 – PROPOSED SUBDRAIN LOCATION MAP – CALZADO (SITE 2)

FIGURE 7 – SUBDRAIN DETAIL

APPENDIX A – EXPLORATION LOGS

APPENDIX B – LABORATORY TEST PROCEDURES / LABORATORY DATA SUMMARY

**GEOTECHNICAL EVALUATION
OF NUISANCE SEEPAGE AT TOE-OF-SLOPE
CUL-DE-SAC AT SOUTH END OF BRAZO AND
TOE-OF-SLOPE ALONG EAST SIDE OF CALZADO
LAGUNA WOODS VILLAGE, CALIFORNIA**

INTRODUCTION

Petra Geosciences, Inc. (Petra) is submitting herein the results of our geotechnical evaluation regarding the water seepage conditions that have been noted at the toe-of-slope within the subject site areas. The results of our evaluation, as well as geotechnical recommendations to address the observed seepage conditions are provided in the subsequent sections of this report.

PURPOSE AND SCOPE OF SERVICES

The purpose of our evaluation was to perform a geotechnical investigation regarding the nature and possible cause(s) of the nuisance water conditions at the site. The scope of evaluation included the following:

1. Performance of a reconnaissance at the Brazo and Calzado sites with representatives of Laguna Woods Village Landscape Department to observe existing conditions within areas of reported nuisance water.
2. Collection and review of readily available literature and maps pertaining to soil and geologic conditions within and adjacent to the site at the County of Orange.
3. Review of available published and unpublished geologic and geotechnical maps.
4. Coordination with the local underground utilities locating service (Underground Service Alert) to obtain an underground utilities clearance prior to commencement of the subsurface investigation.
5. Drilling a total of three exploratory borings using a hollow-stem auger drilling rig to a maximum depth of approximately 15.5 feet, along the toe-of-slope at the southerly end of Bravo and along the toe of slope on the east side of Calzado, to evaluate subsurface soil, geologic and groundwater conditions. Upon completion of sampling and logging the borings were converted to ground water monitoring wells.
6. Drilling a total of five exploratory hand auger borings (at the rear of the residence at 5128 Brazo, the side yard of the residence at 5127 Brazo, the rear of the residence at 5184 Calzado, the front of the residence at 5173 Calzado and the rear of the residence at 5182 Duenas) to depths of approximately 3 to 5 feet below the existing ground surface to evaluate subsurface soil, geologic and groundwater conditions.
7. Collection of representative bulk and/or relatively undisturbed soil samples for laboratory analysis.
8. Performance of laboratory analyses on soil samples, which included the following: in-situ unit weight and moisture content; laboratory maximum dry density determination and optimum moisture content; and grain size distribution.
9. Performance of geologic and engineering analysis on the data collected.
10. Preparation of a geotechnical report presenting our findings, conclusions, and recommendations regarding the subject nuisance water.

SITE LOCATION AND DESCRIPTION

The nuisance water areas of concern consist of two sites located within the Laguna Woods Village community. The Brazo site (Site 1) is located at the toe of an ascending 1.5:1 (horizontal to vertical) slope adjacent to the southerly Brazo cul-de-sac. Single family residences and the street of Avenida Del Sol are located at the top of the slope. Landscape and paved surfaces adjacent to the toe of slope drain by sheet flow in a generally northerly direction. The closest residences to the toe of slope area are 5128 and 5127 Brazo, located on the northwest and southeast sides of Brazo, respectively (See Figure 1). Landscaping consists of grass, shrubs, and trees. Several utility boxes are located along the toe of the slope.

The Calzado site (Site 2) is also located at the toe of an ascending 1.5:1 (horizontal to vertical) slope that runs along the easterly side of Calzado. The street of Santa Vittoria Dr. and San Joaquin Elementary School are located east of the top of slope. Drainage is generally by sheet flow in an easterly direction until reaching the paved surface of Calzado where the gradient is to the north between the two turn-arounds and then to the west to Duenas. A shallow retention basin is located at the toe of slope adjacent to northerly turnaround. The closest residences to the toe of slope area are 5173 and 5184 Calzado, located south of the terminus of Calzado and north of the northerly turnaround, respectively (See Figure 1). An approximate 6 foot high retaining wall is located along the toe of slope on the east side yard of the residence at 5173 Calzado. Also located within the Site 2 area are residences located at 5181 and 5182 Duenas (See Figure 1). There is an approximate 5 to 10 feet drop in elevation from Calzado to the back yard areas of 5181 and 5182 Duenas. An approximate 7 feet high retaining wall runs along the backyard property line of these properties. Landscaping consists of grass, shrubs and trees.

BACKGROUND INFORMATION

Based on our review of the geologic map of the San Juan Capistrano Quadrangle, (Morton, 1972), springs or seeps were mapped in the previous drainage channel upstream (south) of the southerly cul-de-sac of Brazo within the area that is presently Avenida del Sol.

Review of records at the County of Orange found many of the available map documents for the subject tract grading un-readable at the detail necessary for review. However, based on our interpretation of these documents it is our understanding that F. Beach Leighton & Associates (Leighton) performed observation and testing during rough grading of Tract 7388 from 1971 through 1973 (Leighton, 1973). Grading operations generally consisted of cutting the ridge areas and filling the canyon areas to design grades for development of single family residences. Groundwater seeps were encountered during grading within the canyons underlying the subject site areas (see Figure 2) . Prior to placement of compacted fill, the report

indicates that unsuitable surficial soils were removed and installation of subdrains were placed on bedrock within the axes of canyons. An existing subdrain from Tract 7371 (to the east) was also connected into the subdrain system installed beneath Calzado (Site 2). Several separate subdrain systems within the subject tract join into one subdrain near the intersection of Miembro and Avenida Del Sol where it was shown to eventually outlet within the natural drainage channel to the north (See Figure 2).

Following rough grading of the subject tract Leighton (Leighton, 1973), reported the site was underlain by compacted fill that was in turn underlain by interbedded siltstone and sandstone bedrock of the Sespe Formation and alluvium where it was tested and approved if it was left in place. All cut slopes were excavated at a slope ratio of 1.5:1 (horizontal to vertical) and found to be geologically stable with the exception of the slope located at the rear (south) of the residence at 5127 Brazo (see Figure 3, Section C-C'). This slope was removed and replaced with a stability fill.

SITE RECONNAISSANCE

Representatives of this firm performed reconnaissance of subject site areas 1 and 2 on August 6, 2020 and on May 14, 2021 with representatives of the landscape department for Laguna Woods Village. Our site visits included observation of existing surface conditions along both Brazo and Calzado where seepage had been reported, as well as general observation of the surrounding areas. During our reconnaissance the following conditions were observed:

Site 1 – Brazo

1. A portion of the front patio area of the residence located at 5127 Brazo had been removed due to seepage and a shallow subdrain system had been installed within this area. The subdrain was outletted to an existing subdrain system at the rear of the residence. It was reported that this subdrain system continued to the north at the rear of the residences before outletting into a storm drain system on Miembro.
2. The rear yard area of 5127 Brazo was wet within localized areas.
3. The grassy landscape area to the south of 5128 Brazo was observed to have soggy ground. A shallow subdrain system (approximately 18 inches deep) had been installed within this area.
4. The toe of slope south of Brazo cul-de-sac was observed to have wet soil conditions.
5. Seepage was not observed out of the slope face.

Site 2 – Calzado

1. Water was observed in the small, shallow retention basin located at the toe of slope, southeast of the northerly turnaround. It was reported that a shallow subdrain system is located beneath this area.

2. Damp to saturated conditions were observed within various other portions of the landscape area at the toe of slope on the east side of Calzado.
3. Seepage was not observed out of the slope face.
4. Moist conditions were noted with the yard area adjacent to the retaining wall at the rear of 5182 Calzado

SUBSURFACE INVESTIGATION

On May 25 & 27, 2021, a subsurface investigation was performed within the subject site areas of Brazo (Site 1) and Calzado (Site 2) to evaluate subsurface soil and groundwater conditions. Our subsurface investigation included the drilling of three exploratory hollow stem borings to a depth of approximately 15 feet below the ground surface utilizing a standard truck-mounted hollow-stem auger drilling rig. A temporary monitoring well was placed within the borings (identified herein as B-1 through B-3) for further monitoring. Additionally, five hand auger borings were also advanced within the areas not accessible by large equipment. The hand auger borings (identified herein as HA-1 through HA-5) were advanced to depths ranging from 2 to 5 feet in depth. Boring locations are shown on the attached Boring Locations Maps (Figures 4 & 5).

Earth materials encountered in each of the exploratory borings were field classified and logged in accordance with Unified Soil Classification System procedures. In addition, our subsurface exploration included the collection of bulk samples and relatively undisturbed samples of the subsurface soils for laboratory testing purposes. Bulk samples consisted of selected earth materials obtained at various depth intervals from selected borings. The relatively undisturbed samples were obtained using a 3-inch, outside diameter, modified California split-spoon soil sampler lined with 1-inch high brass ring liners that for the hollow-stem auger boring was driven into the ground by repetitive 30-inch drops of a 140-pound auto-hammer attached to the drill rig. The relatively undisturbed samples collected from the hand auger borings were driven into the ground by repetitive drops of a hand operated drop hammer. The central portions of the driven core samples were placed in sealed containers and transported to our laboratory for testing. Logs of the borings are presented in Appendix A.

LABORATORY TESTING

To evaluate the engineering properties of site soils, several laboratory tests were performed on selected samples considered representative of the near surface soils encountered during our investigation. Laboratory tests included the determination of maximum dry density and optimum moisture content, and grain size distribution. In-place moisture content and unit dry density were also determined for select samples of the soil samples retrieved. A description of laboratory test procedures and summaries of the test data are presented in Appendix

B and in our exploration logs (Appendix A). An evaluation of the test data is reflected throughout the “Conclusions and Recommendations” section of this report.

FINDINGS

Artificial fill was observed within all of the exploratory borings to depths ranging from 1.5 feet to 7 feet below the existing ground surface. The fill materials consisted of Sandy Clay, Silty Clay, Clayey Sand, Silty Sand, and Sand that were found to be moist to wet, soft or loose to firm or medium dense and fine to coarse grained. Bedrock belonging to the Sespe Formation was encountered underlying the fill within all of the exploratory borings with the exception of HA-1 (fill encountered to total depth explored, 4.5 feet). The bedrock was found to consist of yellowish-brown to reddish-brown, moist, hard to very hard sandstone and siltstone.

After drilling was complete and the drill augers were removed from the borings, water was immediately observed seeping into boring B-1. Immediately after drilling B-1, water was measured 14 feet below the ground surface. After one hour had elapsed, water had reached the surface and was running off into the street. Borings B-2 and B-3 both encountered heavy seepage during drilling. After drilling had been completed and the augers were removed from both borings B-2 and B-3, water had already risen to the surface and was running off into the surrounding landscaping. Within borings B-1 & B-2, it was observed that the water appeared to be infiltrating into the borings along the fill/bedrock contact. Water infiltration within B-3 was so vigorous and immediate that determining where the water was coming from was deemed inconclusive. Water was also encountered within HA-1 and HA-5. All the other hand auger borings were relatively dry at the time the borings were advanced to their total depths. See Appendix A for detailed boring logs.

GEOTECHNICAL EVALUATION

Based on our review of the final grading report by Leighton (Leighton, 1973), our observations made during our reconnaissance and recent subsurface investigation, and our previous experience with similar conditions at other sites, it is our opinion that the water seepage conditions described above are primarily a result of underground springs that predate the housing development. As previously noted, these springs (or seeps as they are referred) were identified during regional geologic mapping of the site (Morton, 1972). As mapped, they were shown to be located in the previously existing drainage channel located directly to the south (upstream of the area that is now the southerly cul-de-sac of Brazo. Shallow ground water was not mapped within the area except within the main canyon (now buried, that traversed the subject tract from southeast to northwest) that indicated groundwater at a depth of 10 feet.

As reported in the Final Geologic Report (Leighton, 1973), groundwater seeps were encountered during grading within the canyons underlying both Brazo and Calzado site areas (see Figure 2). Canyon subdrains were installed within these drainages and other drainages within the subject tract (see Figure 2). In addition, a subdrain from Tract 7371 (to the east) was also connected into the subdrain system installed beneath Calzado (Site 2). As reported, several separate subdrain systems within the subject tract were connected into one subdrain near the intersection of Miembro and Avenida Del Sol where it was shown to eventually outlet within the natural drainage channel to the north (see Figure 2).

Nuisance water has been an ongoing problem within the Brazo (Site 1) and Calzado (Site 2) areas. The Laguna Woods Village landscape department has utilized a shallow retention basin and subdrain systems in the past to try to help alleviate the nuisance water problem with varying results.

It appears that the nuisance water is primarily associated with the toe of slope areas south of the Brazo cul-de-sac (Site 1) and east of Calzado (Site 2). Both of these areas were within design cut areas to reach finish grade and both were directly adjacent to natural drainages where seepage was encountered, subdrains were installed and fill was placed to obtain finish grade. As observed within our subsurface investigation at the toe of these slopes, only minor amounts of fill were encountered to overlie the bedrock within our exploratory borings. Within several of these borings, seepage was observed to be entering the sides of the boring along the fill/bedrock contact.

Therefore, it is our opinion that water is continuing to move in the subsurface in the same general direction from south to north within the previous (now buried) drainage channels (See Figure 2). The canyon subdrains installed during grading were meant to collect this water and outlet it to an approved drainage source. The outlet (as mapped) was the natural drainage course to the north of the intersection of Avenida Del Sol and Miembro (See Figure 2). However, subsurface water flowing along the fill/bedrock contact adjacent to the drainage channels is daylighting out the toe of slope areas where the fill is shallowest and very near the surface. This is likely a “nick point” where the water is able to rise under hydrostatic pressure, through the shallow fill, resulting in nuisance seepage along the toe of slope.

While we believe natural water sources (springs or seeps) to be the primary source of the nuisance water other conditions may be exacerbating the condition. Excessive irrigation, broken irrigation lines, poor drainage and possibly breaks in water or sewage lines regulated by the local water district can all lead to nuisance water seepage and saturated conditions and should be evaluated appropriately.

In addition, as indicated on Figure 2, all of the canyon subdrain systems underlying the tract connect into one subdrain near the intersection of Miembro and Avenida Del Sol where it was shown to eventually outlet within the natural drainage channel to the north. It would be prudent to locate the end of this outlet to confirm that it is free and clear of obstruction or possibly tied into a storm drain system and not backing up water within the system.

GEOTECHNICAL RECOMMENDATIONS

It is recommended that you confirm with the local water agency that the nuisance seepage is not originating from a leak or break in their lines located above and adjacent to the subject streets.

However, in our opinion, the most effective means to address the subject water seepage conditions would be to install a subdrain system (french drain) within the subject seepage areas to intercept and redirect nuisance water to the nearby storm drain systems. The recommended layout of the subdrain system is shown in plain view on Figures 6 & 7. The recommended method of subdrain construction is graphically depicted in cross-sectional view on Figure 8 and is summarized below.

The perforated segments of the subdrain system (french drain) should be installed in an approximately 18-inch wide trench. The depth of the trench, and therefore the ultimate depth of the subdrain system, is largely controlled by the elevation of the flow line of the storm drain system in the adjacent street where the subdrain system will be outletted. However where possible, the trench should be advanced to bedrock to intercept water flowing along the fill bedrock contact. In order to maximize the capture area for the nuisance water, we recommend that the subdrain be installed at a depth of 5 feet below the ground surface while still allowing for a minimum flow gradient of 1- 2% toward the storm drain (see Figure 6 &7).

Where subdrains are proposed directly adjacent to existing structures (i.e. walls), potholing to determine the location and depth of the footings should proceed any trench excavation. In general, the bottom of the trench should not be located below a 1:1 plane projected downward from the outside bottom edge of the adjacent footing. Where this condition exists, the project geotechnical consultant should evaluate site conditions before proceeding.

The trench excavation is likely to encounter water and/or saturated conditions and should be shored/braced by the grading contractor to maintain safe temporary trench stability during subdrain installation.

Upon completion of the excavation and prior to installation of gravel and perforated pipe, the entire trench (including the top, bottom, and sides) should be lined with filter fabric consisting of Mirafi 140N (or approved equivalent) as shown in Figure 8.

The perforated pipe should consist of 4-inch-diameter, Schedule 40-PVC or ABS SDR-35. The perforated pipe assembly should be placed into the trench on a bed of 2 inches of $\frac{3}{4}$ -inch diameter, open-graded gravel with the pipe perforations facing down. Following pipe installation, the trench should be backfilled to within one foot of the ground surface with the $\frac{3}{4}$ -inch diameter, open-graded gravel.

The upper 12 inches of the trench excavation should be backfilled with on-site soils. Prior to placement of on-site soils the filter fabric should be overlapped a minimum of 12-inches so as to completely cover the gravel and prevent the on-site soils from penetrating into the gravel backfill. Compaction of on-site soil materials should be compacted to a minimum relative compaction of 90 percent (based on ASTM D 1557).

Water collected in the perforated segment of the subdrain system should be routed to the discharge point via a minimum 5-foot long segment of non-perforated Schedule 40-PVC or ABS SDR-35 pipe. The pipe should enter the storm drain system through a coring that is located a sufficient distance above the flow line elevation of the storm drain system such that backflow from the storm drain into the subdrain system is prevented. A minimum gradient of 1% to 2% percent should be maintained to the discharge point. To collect and direct water into the solid discharge pipe, concrete slurry should be used as trench backfill (headwall) from the transition from perforated pipe to non-perforated pipe, and from the bottom of the trench to within 1 foot of the existing surface. The remaining 12 inches should be backfilled with onsite soils compacted to a minimum relative compaction of 90 percent (based on ASTM D 1557).

In order to reduce the accumulation of water within the trench during construction, it is recommended that the subdrain installation be sequenced so that the non-perforated subdrain discharge pipe connection into the storm drain system be performed first. Construction should then proceed from the low end of the subdrain system to the higher elevations.

The elevation of the subdrain flow line, gradient of the proposed subdrain, and proposed subdrain tie-in with the storm drain system should be evaluated by the project civil engineer to ensure proper flow and tie in with the storm drain system.

It is recommended that a representative of the project geotechnical consultant be onsite during construction of the subdrain system to document that the recommendations presented herein have been implemented. It should be noted that the recommendations presented herein could be subject to field modification based on seepage conditions at the time of installation, trench exposures, and possible conflicts with existing underground utilities.

RECOMMENDATIONS FOR ADDITIONAL SEEPAGE MITIGATION

In addition to the proposed subdrain, it is also recommended Laguna Woods Village perform a thorough analysis of the community's water practices as well as water infrastructure. Year after year of over watering landscaping can significantly contribute to water issues within the community. The community water infrastructure (irrigation pvc pipes, water supply lines, etc.) should also be evaluated. Both the community landscaping personnel as well as the utility water supplier should coordinate their efforts to locate and identify any significant water leaks.

CLOSURE

It is anticipated that the recommendations described above, if properly implemented, will result in a significant decrease or elimination of the seepage-related concerns within the subject area. However, we suggest that the effectiveness of these recommendations be monitored after they have been implemented. If moisture-related problems persist, a re-evaluation of site conditions may be warranted.

The conclusions, opinions, and recommendations presented in this report are based on the geotechnical information obtained during the limited investigation performed by this firm. The conclusions and recommendations contained herein represent our professional judgment and no warranty is provided, either express or implied. This opportunity to be of service is greatly appreciated. Please contact us if you have any questions regarding this letter, or the project in general.

Respectfully submitted,

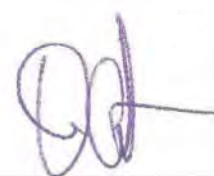
PETRA GEOSCIENCES, INC.



Kurtis Morenz
Senior Staff Geologist



Darrel Roberts
Principal Geologist
CEG 1972



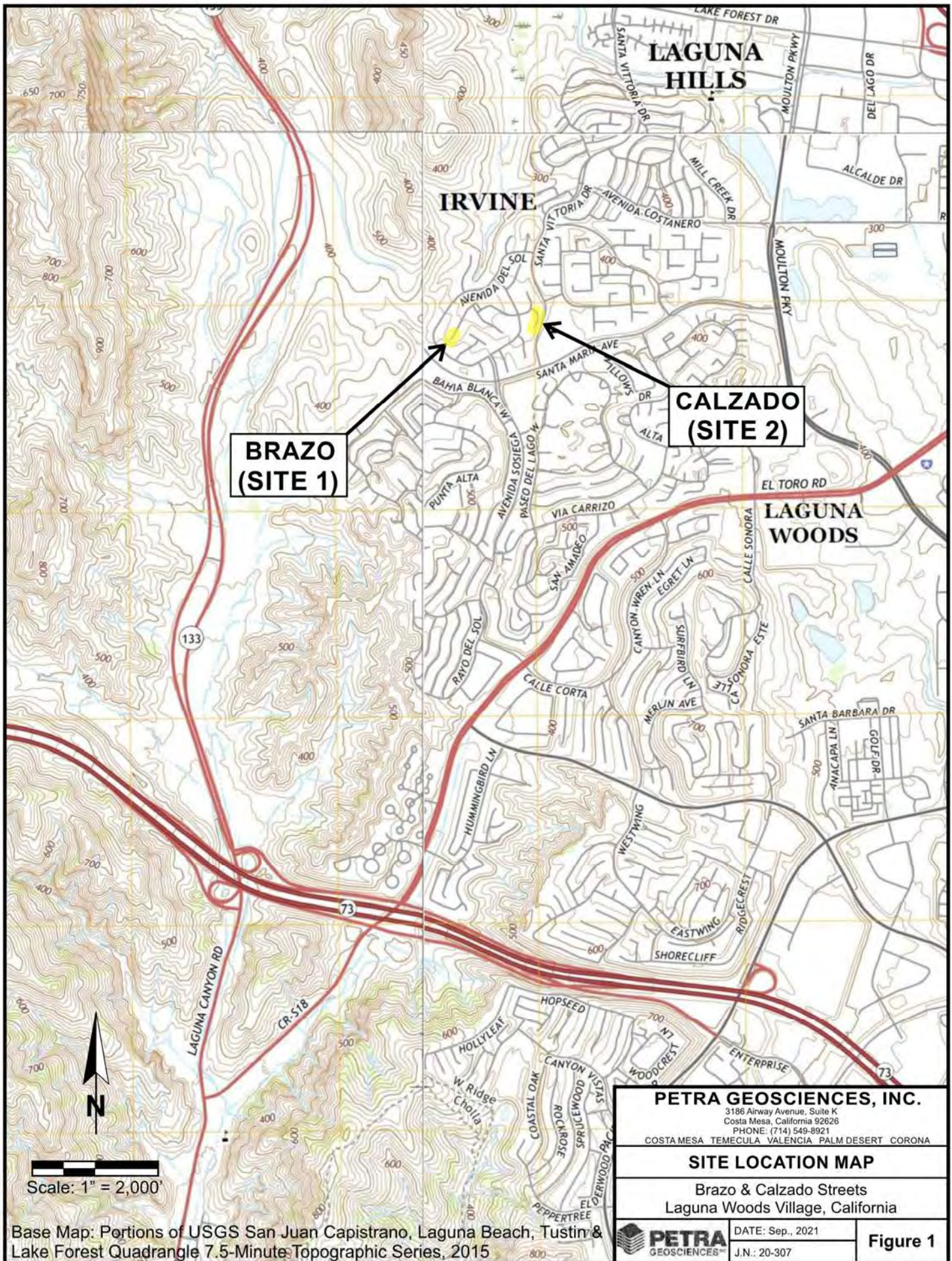
Don Obert
Associate Engineer
RGE 2872

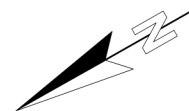





REFERENCES

- F. Beach Leighton & Associates, 1973, Final Geologic Report, Mutual 61, The North Portion of Tract 7388, Rossmoor Phase III, Laguna Hills, County of Orange, dated February 8.
- Morton, P.K., Edginton, W.J., and Fife, D.L., 1974, Geology and Engineering Geologic Aspects of the San Juan Capistrano Quadrangle, Orange County, California: California Division of Mines and Geology, Special Report 112.
- Seismic Hazard Zone Report for the San Juan Capistrano 7.5-Minute Quadrangle, Orange County, California, 2001, California Division of Mines and Geology (Depth to Historically High Ground Water).


FIGURES

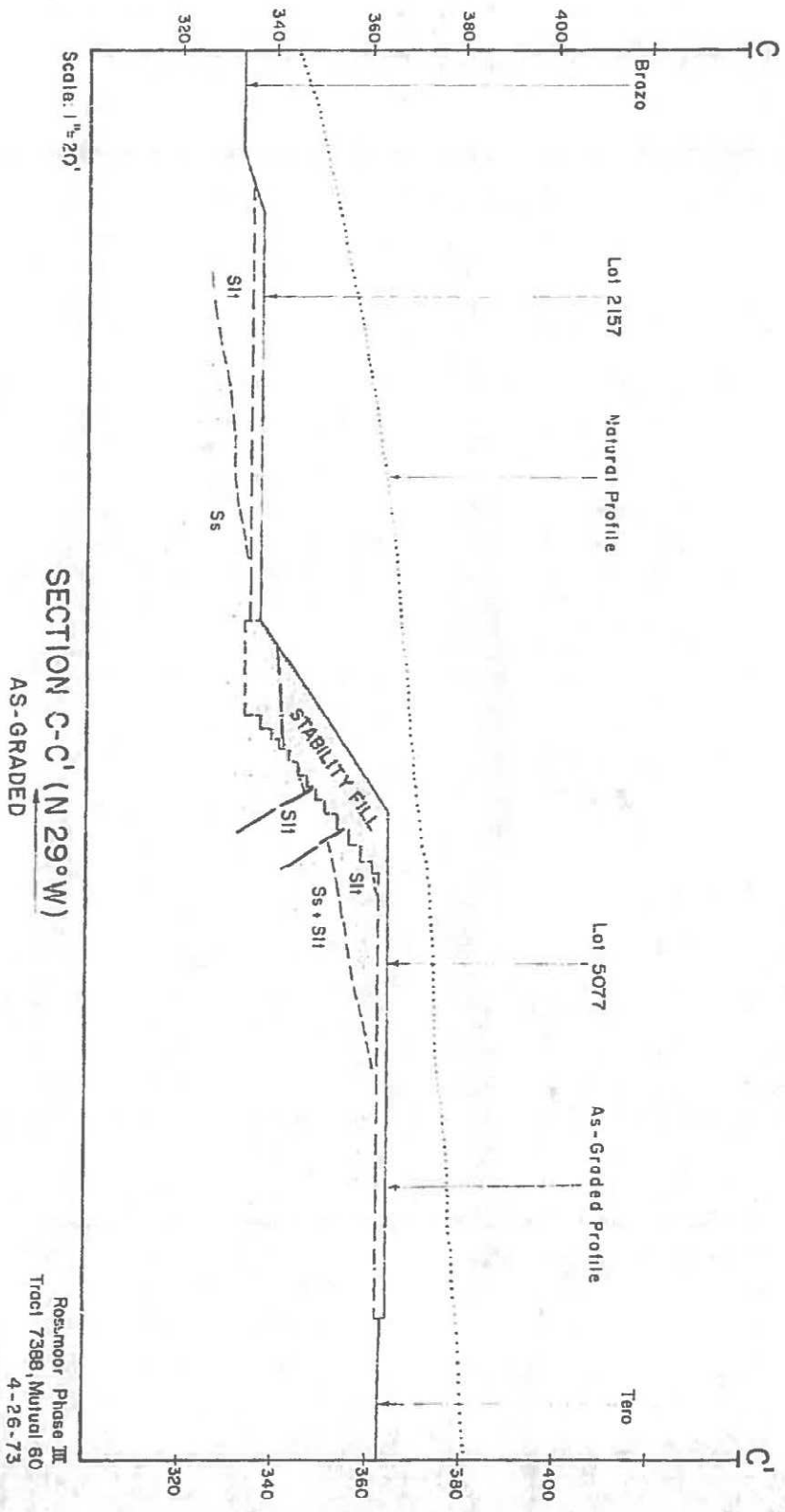




EXPLANATION	
	Location of Mapped Seep
	Location of Canyon Subdrain
	Cross Section C to C' (See Figure 3)

Base Map: Leighton "As Graded Geologic Map of Tract 7388", dated April 24, 1973.

PETRA GEOSCIENCES, INC. 3180 Airway Avenue, Suite K Costa Mesa, California 92626 PHONE: (714) 549-8921 COSTA MESA TEJECOLA VALENCIA PALM DESERT CORONA		
CANYON SUBDRAIN & SEEP LOCATION MAP		
Brazo and Calzado Streets Laguna Woods Village, California		
 PETRA GEOSCIENCES	DATE: Sep., 2021	Figure 2
	J.N.: 20-307	



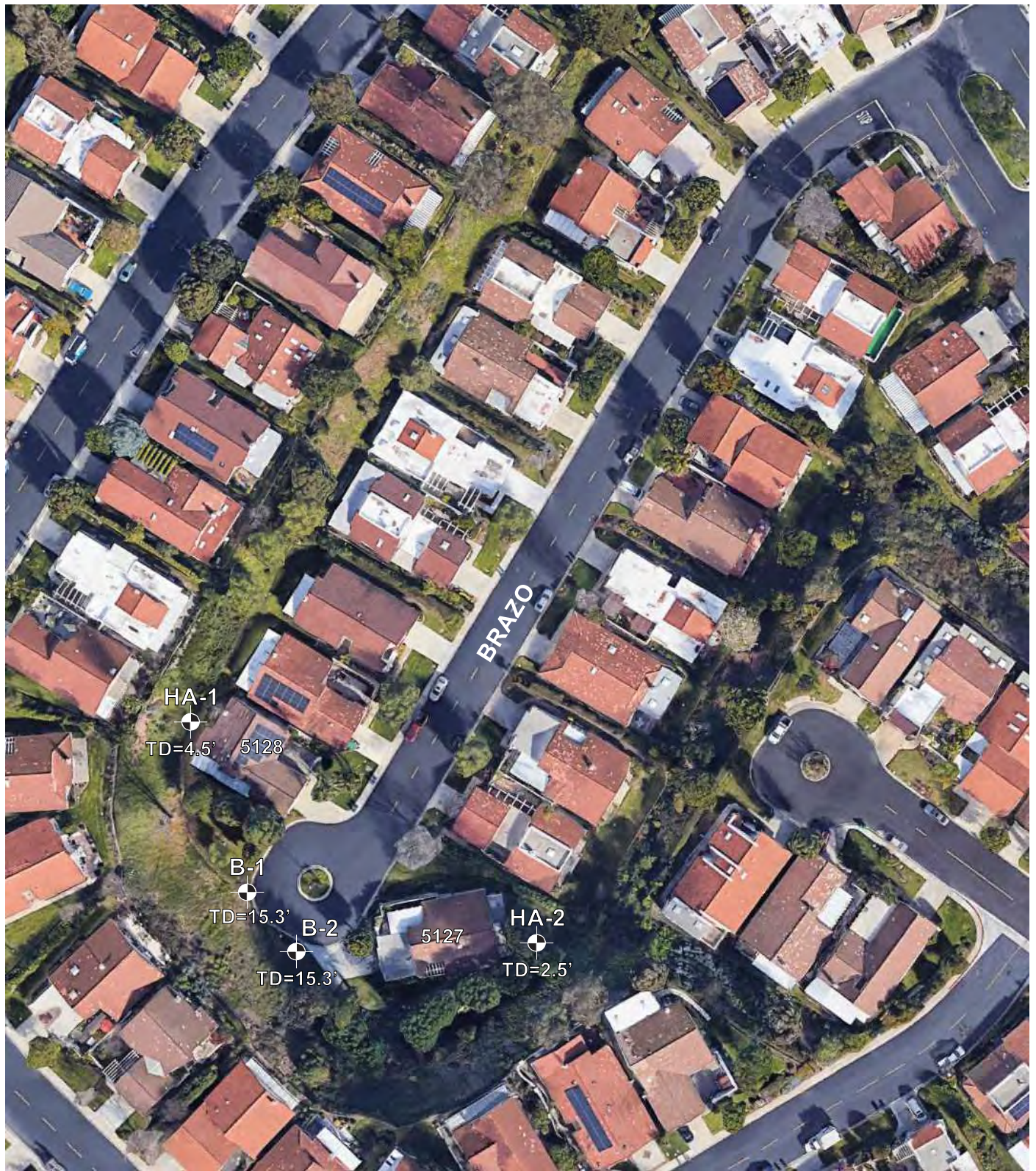
Rossmore Phase III
Tract 7388, Mutual 80
4-26-73
Project 1900
LEIGHTON

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CROSS SECTION C-C'
Brazo Street
Laguna Woods Village, California

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DATE: Sep., 2021
J.N.: 20-307
Figure 3

Reference: Leighton "Rossmore Phase III, Tract 7388, Project 1900", Dated 4/26/1973.



EXPLANATION

- B-2**

 TD=15.3' Approximate Location of Exploratory Hollow Stem Boring
 TD= Total Depth
- HA-2**

 TD=2.5' Approximate Location of Exploratory Hand Auger Boring
 TD= Total Depth

Base Map: Google Earth 2021

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BORING LOCATION MAP- SITE 1

Tract 7388 (Brazo)
 Laguna Woods Village, California

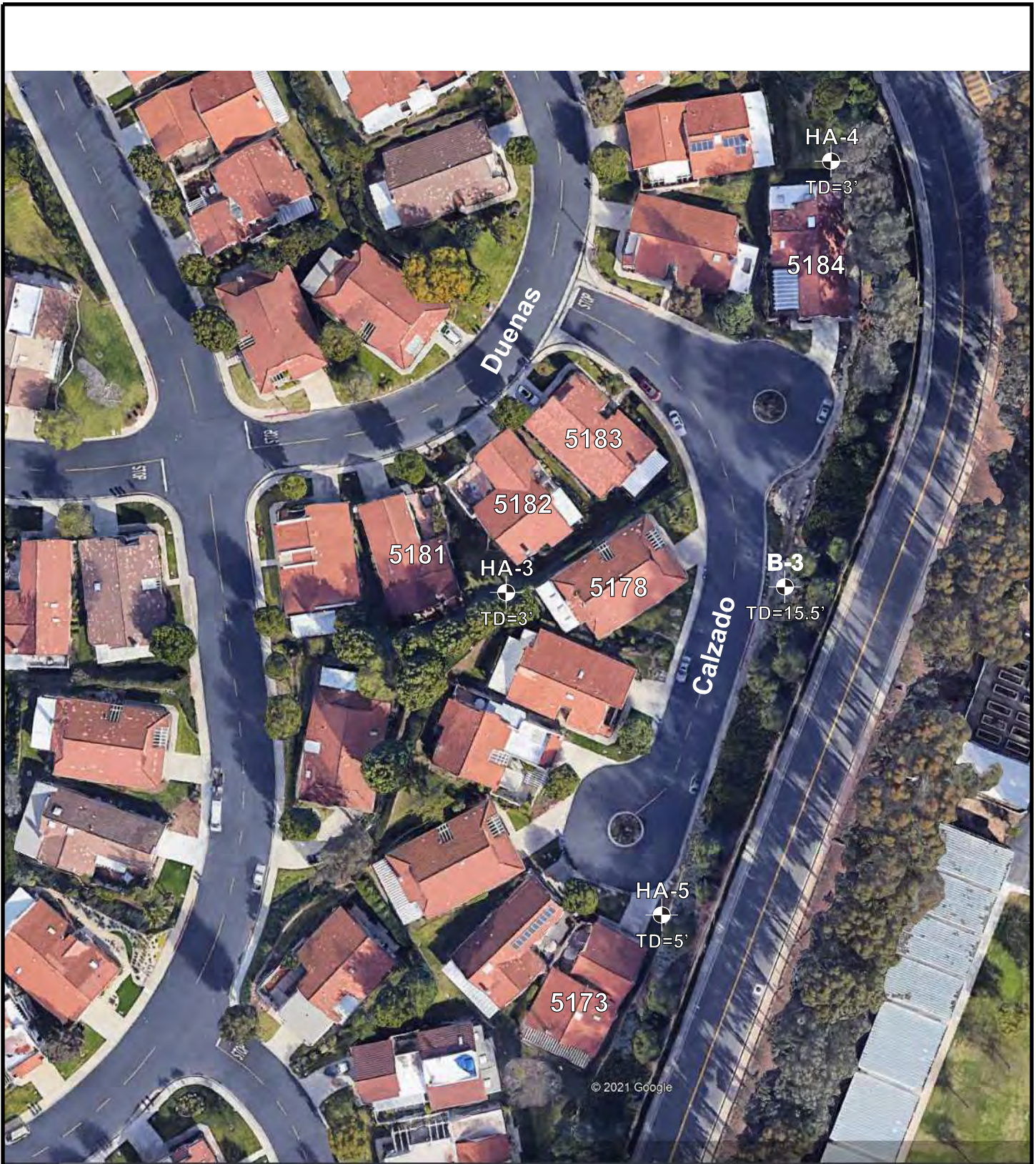


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Figure 4



EXPLANATION

- B-3**

 TD=15.5'
HA-5

 TD=5'
- Approximate Location of Exploratory Hollow Stem Boring
 TD= Total Depth
- Approximate Location of Exploratory Hand Auger Boring
 TD= Total Depth

Base Map: Google Earth 2021

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BORING LOCATION MAP- Site 2

Tract 7388 (Calzado)
 Laguna Woods Village, California



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DATE: Sep., 2021

J.N.: 20-307

Figure 5



EXPLANATION



Proposed Subdrain Location
(Showing Direction of Flow)

338 Elevation in Feet (Google Earth 2021)



Elevation of Storm Drain Flow Line (Measured from Manhole)

Base Map: Google Earth 2021

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COSTA MESA TEMECULA VALENCIA PALM DESERT CORONA

PROPOSED SUBDRAIN LOCATION- Site 1

Brazo
Laguna Woods Village, California

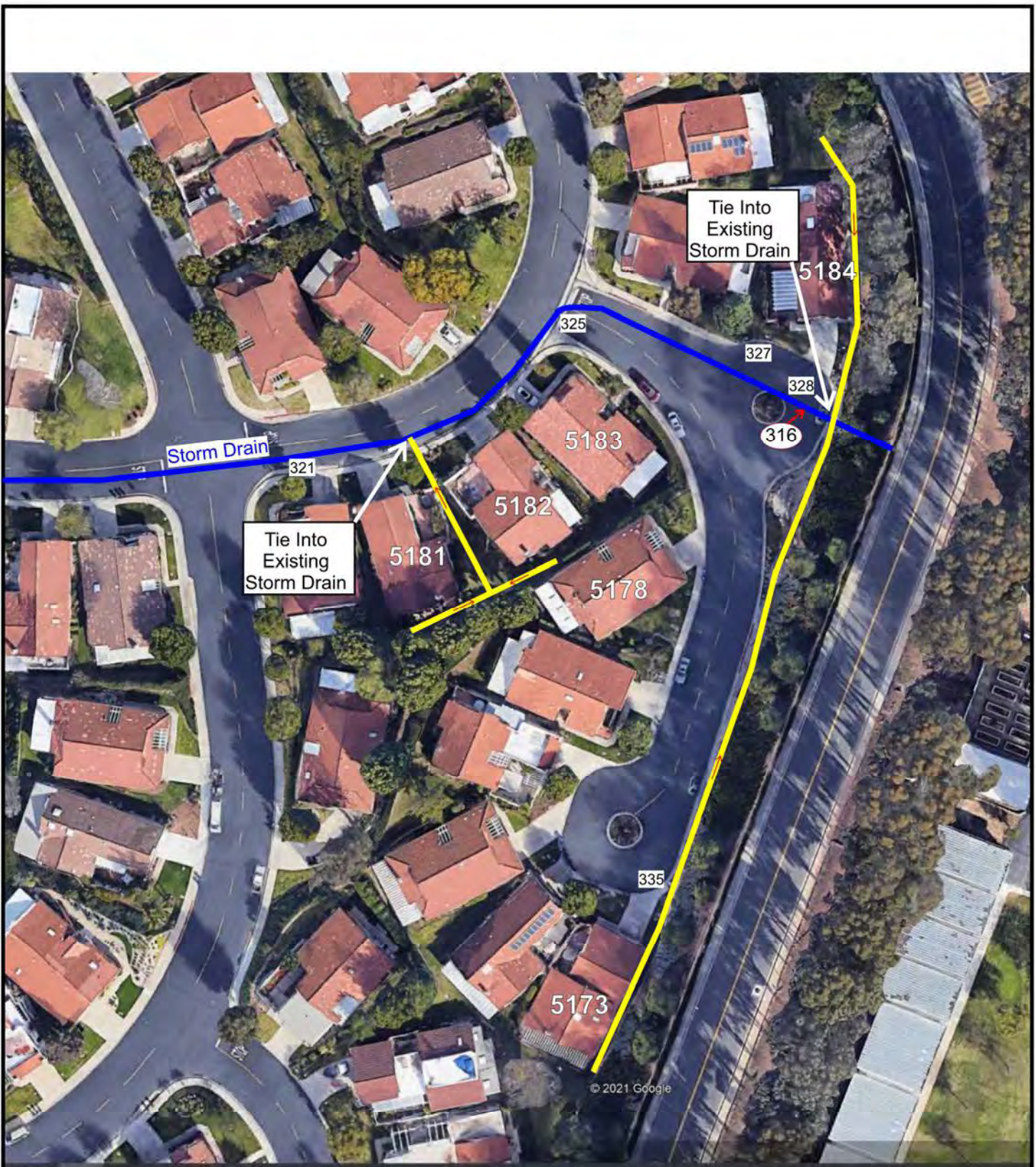


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Figure 6



EXPLANATION



Proposed Subdrain Location
(Showing Direction of Flow)

335 Elevation in Feet (Google Earth 2021)

316 Elevation of Storm Drain Flow Line (Measured from Manhole)

Base Map: Google Earth 2021

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PROPOSED SUBDRAIN LOCATION-Site 2

Calzado
Laguna Woods Village, California



DATE: Sep., 2021

J.N.: 20-307

Figure 7

EXISTING GROUND

TRENCH WIDTH
12 - 18"

APPROXIMATELY 5'

FILTER FABRIC
(Mirafi 140N
or Equivalent)

12"
COMPACTED FILL CAP
with On-Site Soil or Aggregate

3/4-INCH, OPEN GRADED GRAVEL

4" PERFORATED PIPE
Sched. 40, or ABS-SDR
35, Perforations Down

2" MIN.

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SUBDRAIN DETAIL

Brazo & Calzado Streets
Laguna Woods Village, California



DATE: Sep., 2021

J.N.: 20-307

Figure 8

APPENDIX A

EXPLORATION LOGS

Soil Classification

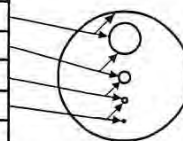


4 Moisture Content
Dry
Slightly Moist
Moist
Very Moist
Wet (Saturated)

Modifiers	
Trace	< 1 %
Few	1 - 5 %
Some	5 - 12 %
Numerous	12 - 20 %

Soil Classification Should Include:
<u>PREFERRED ORDER</u>
1. Group Name
2. Group Symbol
3. Color
4. Moisture Content
5. Relative Density / Consistency
6. Grain Size Range
7. Structure
8. Odor
9. Additional comments indicating soil characteristics which might affect engineering properties

6 Grain Size				
Description		Sieve Size	Grain Size	Approximate Size
Boulders		>12"	>12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.079 - 0.19"	Rock salt-sized to pea-sized
	medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock salt-sized
	fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized to
Fines		Passing #200	<0.0029"	Flour-sized and smaller



1 2 Unified Soil Classification System					
Coarse-grained Soils > 1/2 of materials is larger than #200 sieve	The No. 200 U.S. Standard Sieve is about the smallest particle visible to the naked eye	GRAVELS more than half of coarse fraction is larger than #4 sieve		Clean Gravels (less than 5% fines)	GW Well-graded gravels, gravel-sand mixtures, little or no fines
				Gravels with fines	GP Poorly-graded gravels, gravel-sand mixtures, little or no fines
		SANDS more than half of coarse fraction is smaller than #4 sieve		Clean Sands (less than 5% fines)	GM Silty Gravels, poorly-graded gravel-sand-silt mixtures
				Sands with fines	GC Clayey Gravels, poorly-graded gravel-sand-clay mixtures
					SW Well-graded sands, gravelly sands, little or no fines
					SP Poorly-graded sands, gravelly sands, little or no fines
					SM Silty Sands, poorly-graded sand-gravel-silt mixtures
					SC Clayey Sands, poorly-graded sand-gravel-clay mixtures
					ML Inorganic silts & very fine sands, silty or clayey fine sands, clayey silts with slight plasticity
					CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
Fine-grained Soils > 1/2 of materials is smaller than #200 sieve		SILTS & CLAYS Liquid Limit Less Than 50			OL Organic silty s & clays of low plasticity
					MH Inorganic silts, micaceous or diatomaceous fine sand or silt
					CH Inorganic clays of high plasticity, fat clays
					OH Organic silts and clays of medium-to-high plasticity
		Highly Organic Soils			PT Peat, humus swamp soils with high organic content

5 Consistency - Fine Grained Soils			
Apparent Density	SPT (# blows/foot)	Modified CA Sampler (# blows/foot)	Field Test
Very Soft	<2	<3	Easily penetrated by thumb; exudes between thumb and fingers when squeezed in hand
Soft	2-4	3-6	Easily penetrated one inch by thumb; molded by light finger pressure
Firm	5-8	7-12	Penetrated over 1/2 inch by thumb with moderate effort; molded by strong finger pressure
Stiff	9-15	13-25	Indented about 1/2 inch by thumb but penetrated only with great effort
Very Stiff	16-30	26-50	Readily indented by thumbnail
Hard	>30	>50	Indented with difficulty by thumbnail

5 Relative Density - Coarse Grained Soils			
Apparent Density	SPT (# blows/foot)	Modified CA Sampler (# blows/foot)	Field Test
Very Loose	<4	<5	Easily penetrated with 1/2-inch reinforcing rod pushed by hand
Loose	4-10	5-12	Easily penetrated with 1/2-inch reinforcing rod pushed by hand
Medium Dense	11-30	13-35	Easily penetrated 1-foot with 1/2-inch reinforcing rod driven with a 5-lb hammer
Dense	31-50	36-60	Difficult to penetrated 1-foot with 1/2-inch reinforcing rod driven with a 5-lb hammer
Very Dense	>50	>60	Penetrated only a few inches with 1/2-inch reinforcing rod driven with a 5-lb hammer

EXPLORATION LOG

Project: Brazo & Calzado Seepage				Boring No.: B-1				
Location: Laguna Woods				Elevation: ±340'				
Job No.: 20-307		Client: Laguna Woods Village		Date: 5/25/2021				
Drill Method: 8" Hollow Stem Auger		Driving Weight: 140lbs/30"		Logged By: KTM				
Depth (Feet)	Lith- ology	Material Description	W A T E R	Samples		Laboratory Tests		
				Blows per 6 in.	C o r e B u l k	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests
0		ARTIFICIAL FILL (af) <u>Sandy Clay (CL):</u> Dark brown, moist, firm, fine-grained.						
		Becomes reddish-brown, stiff.						MAX
5		Becomes dark brown.						
		BEDROCK - Sespe Formation (Ts) <u>Sandstone:</u> Yellowish-brown to brown, moist, fine- to medium-grained, hard, trace gravel.						
								HYD
10		Becomes reddish-brown, moist, very hard, fine-grained.						
15		No recovery.						
		Total Depth= 15'3"						
		Moderate to heavy seepage during drilling Water measured at 14' after drilling had completed 1 hour later the water had risen to 1 foot from the ground surface Temporary monitoring well installed within boring.						
20								
25								
30								

PLATE A-1

EXPLORATION LOG

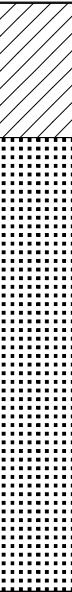




Project: Brazo & Calzado Seepage			Boring No.: B-2							
Location: Laguna Woods			Elevation: ±340'							
Job No.: 20-307		Client: Laguna Woods Village	Date: 5/25/2021							
Drill Method: 8" Hollow Stem Auger		Driving Weight: 140lbs/30"	Logged By: KTM							
Depth (Feet)	Lith- ology	Material Description	W A T E R	Samples			Laboratory Tests			
				Blows per 6 in.	C o r e	B u l k	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests	
0		ARTIFICIAL FILL (af) <u>Sandy Clay (CL):</u> Dark brown, wet, soft, fine-grained, few gravel and cobbles up to 5" in diameter.								
		BEDROCK - Sespe Formation (Ts) <u>Sandstone:</u> Yellowish-brown, moist, fine-grained, hard, highly weathered. Becomes orangish-brown, very hard, trace 3/4" gravel. Becomes yellowish-gray, slightly weathered. Same as above with no gravel. Total Depth= 15'4" Heavy Seepage during drilling Groundwater was measured at 0" from the ground surface after the completion of the boring A temporary monitoring well was placed within the boring.		25 50/5"			9.6	135.2	HYD	
5				50/5"			21.4	143.2		
10					37 50/3"					
15					50/4"					HYD

PLATE A-2

Petra Geosciences, Inc.

EXPLORATION LOG

Project: Brazo & Calzado Seepage				Boring No.: B-3					
Location: Laguna Woods				Elevation: ±333'					
Job No.: 20-307		Client: Laguna Woods Village		Date: 5/25/2021					
Drill Method: 8" Hollow Stem Auger		Driving Weight: 140lbs/30"		Logged By: KTM					
Depth (Feet)	Lith- ology	Material Description	W A T E R	Samples			Laboratory Tests		
				Blows per 6 in.	C o r e	B u l k	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests
0		ARTIFICIAL FILL (af) Gravel (GP): 3/4" to 1" in diameter. Filter Cloth encountered. @ 3" becomes saturated, observed incoming water pressure.					9.6	130.0	HYD
		Clayey Sand (SC): Brown, wet, medium-dense, fine- to coarse-grained, few gravel up to 3/4" in diameter.		6 24 38					
5		BEDROCK - Sespe Formation (Ts) <u>Sandstone:</u> Olive gray, moist, fine- to medium-grained, hard, highly weahtered.		11 19 50/2"					
10		<u>Siltstone:</u> Reddish-brown, moist, very hard, slightly weathered.		50/5"					
15		Same as above.		50/5"					
		Total Depth= 15'5" Heavy seepage during drilling Water measured @ 0" from ground surface A temporary monitoring well was installed within the boring.							
20									
25									
30									

PLATE A-3

Petra Geosciences, Inc.

EXPLORATION LOG

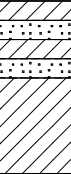
Project: Brazo & Calzado Seepage				Boring No.: HA-1				
Location: Laguna Woods				Elevation: ±344'				
Job No.: 20-307		Client: Laguna Woods Village		Date: 5/27/2021				
Drill Method: Hand Auger		Driving Weight: Hand Driven		Logged By: KTM				
Depth (Feet)	Lith- ology	Material Description	W A T E R	Samples		Laboratory Tests		
				Blows per 6 in.	C o r e	B u l k	Moisture Content (%)	Dry Density (pcf)
0		ARTIFICIAL FILL (af)						
		Sandy Clay (CL): Brown, moist, firm, fine-grained sand.						
		Sand (SP): Gray, moist, medium-dense, fine- to medium-grained.						
		Sandy Clay (CL): Brown, moist, firm.						
		Sand (SP): Gray, moist, medium-dense, fine- to medium-grained.						
		Sandy Clay (CL): Brown and gray, moist, firm, fine-grained.						
		@3' Water begins seeping into boring.						
5		Total Depth= 4.5'						
		Refusal due to rock						
		Water measured @ 3' below ground surface after broing was completed						
		Boring backfilled with cuttings.						
10								
15								
20								
25								
30								

PLATE A-4

EXPLORATION LOG

[illegible]

PLATE A-5

EXPLORATION LOG




Project: Brazo & Calzado Seepage				Boring No.: HA-3				
Location: Laguna Woods				Elevation: ±331'				
Job No.: 20-307		Client: Laguna Woods Village		Date: 5/27/2021				
Drill Method: Hand Auger		Driving Weight: Hand Driven		Logged By: KTM				
Depth (Feet)	Lith- ology	Material Description	W A T E R	Samples		Laboratory Tests		
				Blows per 6 in.	C o r e	B u l k	Moisture Content (%)	Dry Density (pcf)
0		ARTIFICIAL FILL (af) Sandy Clay (CL): Dark brown, moist, firm, medium-dense.						
		Sand (SP): Gray, moist, medium-dense, fine- to medium-grained.						
		BEDROCK - Sespe Formation (Ts) Sandstone: Reddish-brown, moist, fine-grained sand, moderately hard.						
5		Total Depth= 3' No groundwater encountered Boring backfilled with cuttings.						
6								
7								
8								
9								
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11								
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40								

PLATE A-6

EXPLORATION LOG

Project: Brazo & Calzado Seepage				Boring No.: HA-4					
Location: Laguna Woods				Elevation: ±338'					
Job No.: 20-307		Client: Laguna Woods Village		Date: 5/27/2021					
Drill Method: Hand Auger		Driving Weight: Hand Driven		Logged By: KTM					
Depth (Feet)	Lith- ology	Material Description	W A T E R	Samples			Laboratory Tests		
				Blows per 6 in.	C o r e	B u l k	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests
0	ARTIFICIAL FILL (af)	<u>Silty Sand (SM)</u> : Dark brown, moist, medium-dense, fine-grained.							
	BEDROCK - Sespe Formation (Ts)	<u>Sandstone</u> : Reddish-brown, moist, moderately hard, moderately weathered. Becomes olive gray.							
5		Total Depth=3' No groundwater encountered Boring backfilled with cuttings.							
6									
7									
8									
9									
10									
11									
12									
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39									
40									

PLATE A-7

EXPLORATION LOG

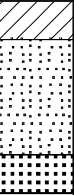

Project: Brazo & Calzado Seepage				Boring No.: HA-5					
Location: Laguna Woods				Elevation: ±343'					
Job No.: 20-307		Client: Laguna Woods Village		Date: 5/27/2021					
Drill Method: Hand Auger		Driving Weight: Hand Driven		Logged By: KTM					
Depth (Feet)	Lith- ology	Material Description	W A T E R	Samples			Laboratory Tests		
				Blows per 6 in.	C o r e	B u l k	Moisture Content (%)	Dry Density (pcf)	Other Lab Tests
0		ARTIFICIAL FILL (af) Silty Clay (CL): Dark brown, moist, firm.							
		Sand (SP): Olive gray, moist, fine-grained.							
		@3' Water encountered.							
5		BEDROCK - Sespe Formation (Ts) Sandstone: Olive gray, wet, fine-grained, hard.							
		Total Depth=5' Heavy seepage during drilling Excavation stopped due to caving from saturated conditions A temporary monitoring well was placed in boring.							
10									
15									
20									
25									
30									

PLATE A-8

APPENDIX B

LABORATORY TEST PROCEDURES

LABORATORY DATA SUMMARY

LABORATORY TEST PROCEDURES

Soil Classification

Soil materials encountered within the property were classified and described in accordance with the Unified Soil Classification System and in general accordance with the current version of Test Method ASTM

D 2488. The assigned group symbols are presented in the exploration logs, Appendix A.

In Situ Moisture Content and Dry Unit Weight

In-place moisture content and dry unit weight of selected, relatively undisturbed soil samples were determined in accordance with the current version of the Test Method ASTM D 2435 and Test Method ASTM D 2216, respectively. Test data are presented on the exploration logs, Appendix A.

Laboratory Maximum Dry Unit Weight and Optimum Moisture Content

The maximum dry unit weight and optimum moisture content of the on-site soils were determined for a selected bulk sample in accordance with current version of ASTM D 1557. The results of these tests are presented on Plate B-1.

Grain Size Distribution

Grain size analysis was performed on selected bulk samples of onsite soils in accordance with the current versions of Test Method ASTM D 136 and/or ASTM C 117, or Test Method ASTM D 422 and/or ASTM D 6913. The test result is graphically presented on Plates B-2 through B-5.

LABORATORY DATA SUMMARY				
Boring Number	Sample Depth (ft)	Soil/Bedrock Description	Max. Dry Density ¹ (pcf)	Optimum Moisture ¹ (%)
B-1	0-5	Clayey Sand w/Gravel (SC)	130.7*	7.1*

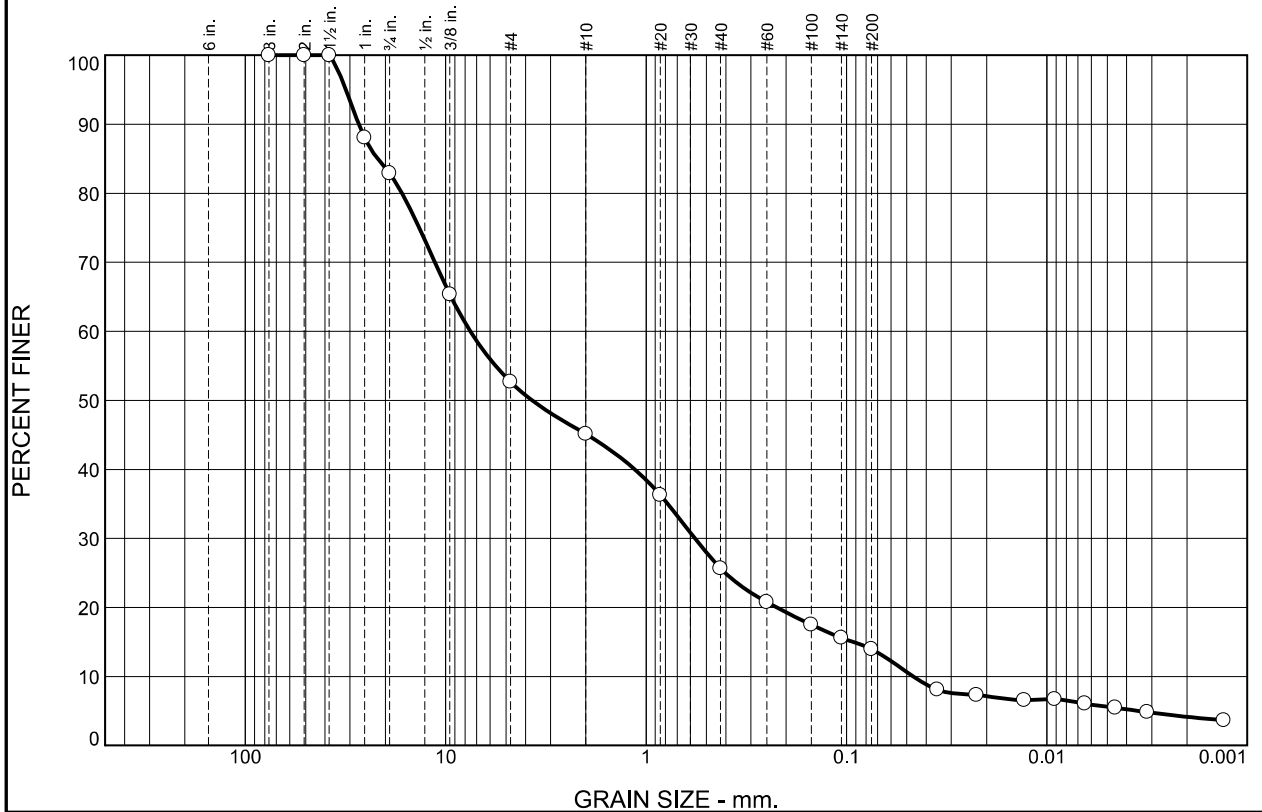
* Rock Corrected

Test Procedures: ¹ Per ASTM Test Method D1557

Laboratory:

1251 West Pomona Road, Unit #103, Corona, Ca 92882 Phone #: 714.549.8921

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.1	30.2	7.6	19.5	11.7	8.3	5.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	88.0		
.75	82.9		
.375	65.4		
#4	52.7		
#10	45.1		
#20	36.3		
#40	25.6		
#60	20.8		
#100	17.5		
#140	15.6		
#200	13.9		

* (no specification provided)

Material Description
 Dark Brown, Silty fine to coarse Sand with Clay

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 27.1615 D₈₅= 21.8027 D₆₀= 7.5176
 D₅₀= 3.7067 D₃₀= 0.5716 D₁₅= 0.0926
 D₁₀= 0.0466 C_u= 161.26 C_c= 0.93

Classification
 USCS= AASHTO=

Remarks

Source of Sample: Phase 110
Sample Number: B-1

Depth: 6'

Date: 6/14/2021



Client: Laguna Woods
Project: Laguna Woods

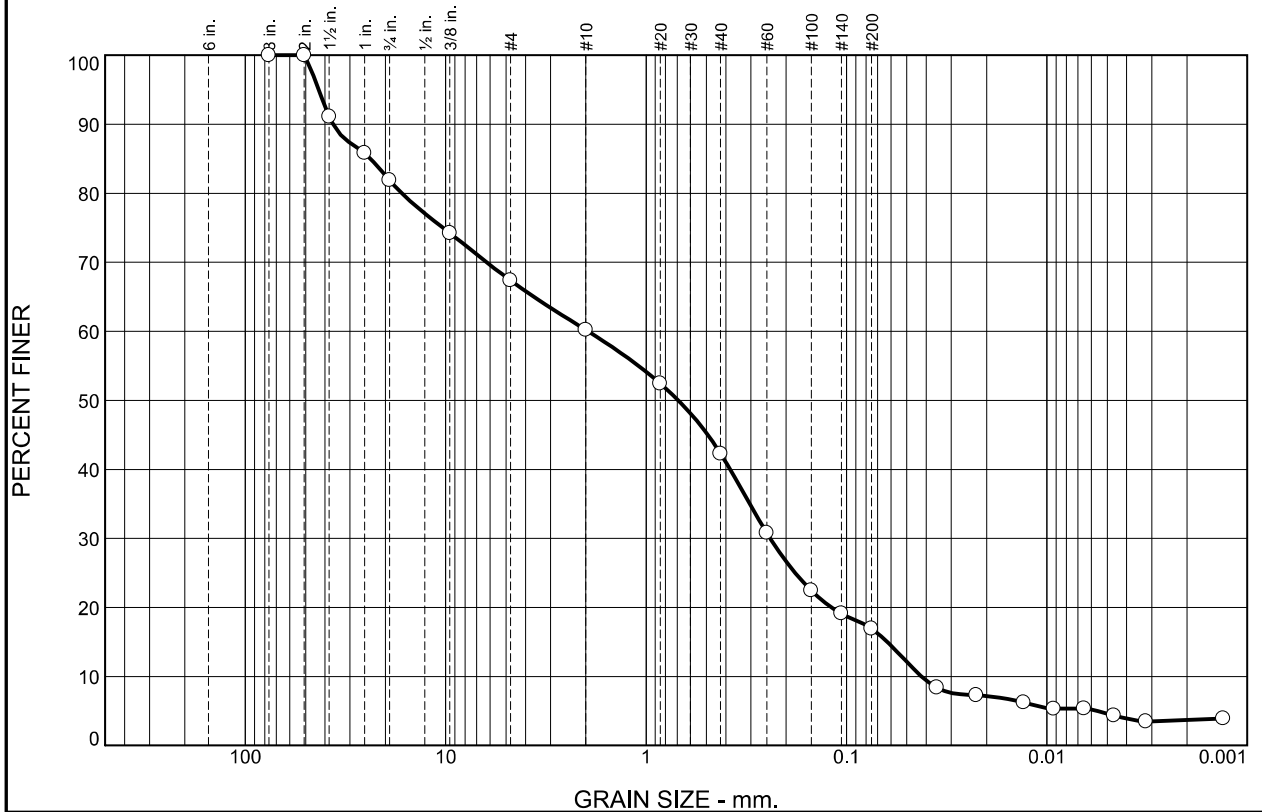
Project No: 20-307

PLATE B-2

Laboratory:

1251 West Pomona Road, Unit #103, Corona, Ca 92882 Phone #: 714.549.8921

Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.1	14.5	7.2	17.9	25.4	12.3	4.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	91.1		
1	85.8		
.75	81.9		
.375	74.2		
#4	67.4		
#10	60.2		
#20	52.4		
#40	42.3		
#60	30.8		
#100	22.4		
#140	19.1		
#200	16.9		

* (no specification provided)

Material Description

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 36.4105 D₈₅= 23.6824 D₆₀= 1.9482
 D₅₀= 0.6918 D₃₀= 0.2403 D₁₅= 0.0625
 D₁₀= 0.0422 C_u= 46.17 C_c= 0.70

Classification
 USCS= AASHTO=

Remarks

Source of Sample: Phase 110
Sample Number: B-3

Depth: 3

Date: 6/14/2021

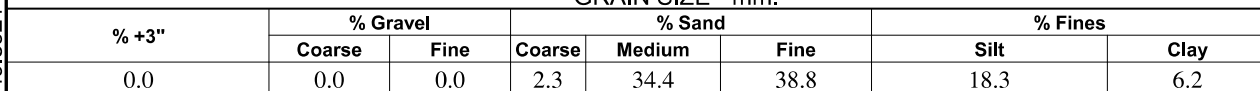


Client: Laguna Woods
Project: Laguna Woods

Project No: 20-307

PLATE B-3

Laboratory:
1251 West Pomona Road Unit #103 Corona, Ca 92882 Phone # 714 549.8921



<u>Material Description</u>		
Brown, Silty fine to medium Sand with Clay		
<u>Atterberg Limits</u>		
PL=	LL=	PI=
<u>Coefficients</u>		
D ₉₀ = 0.8743	D ₈₅ = 0.7338	D ₆₀ = 0.3922
D ₅₀ = 0.3030	D ₃₀ = 0.1302	D ₁₅ = 0.0452
D ₁₀ = 0.0269	C _u = 14.58	C _c = 1.61
<u>Classification</u>		
USCS=	AASHTO=	
<u>Remarks</u>		

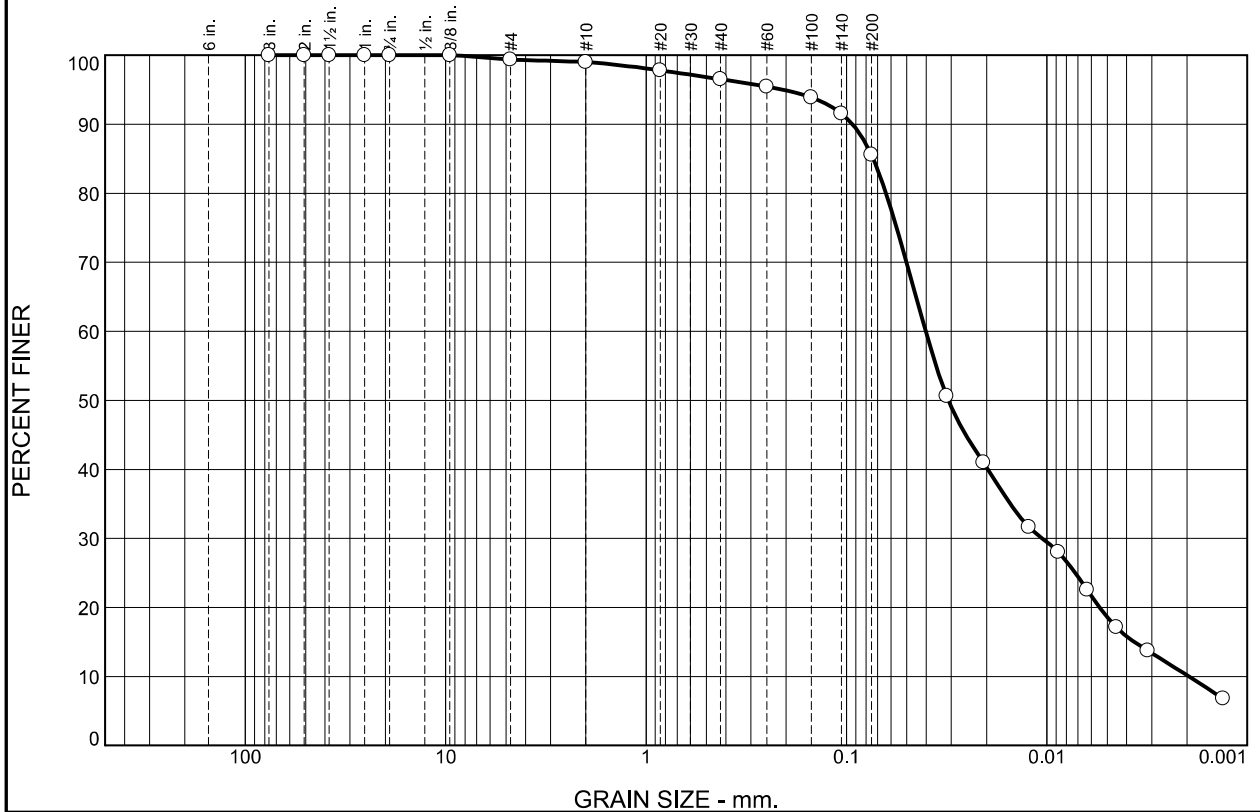
Date: 6/12/2021



Laboratory:

1251 West Pomona Road, Unit #103, Corona, Ca 92882 Phone #: 714.549.8921

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.4	2.5	10.9	67.0	18.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
.75	100.0		
.375	100.0		
#4	99.4		
#10	99.0		
#20	97.8		
#40	96.5		
#60	95.4		
#100	93.9		
#140	91.5		
#200	85.6		

* (no specification provided)

Material Description
 Reddish Brown, Clayey Silt with fine Sand

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 0.0932 D₈₅= 0.0735 D₆₀= 0.0403
 D₅₀= 0.0310 D₃₀= 0.0106 D₁₅= 0.0037
 D₁₀= 0.0020 C_u= 20.55 C_c= 1.42

Classification
 USCS= AASHTO=

Remarks

Source of Sample: Phase 110
Sample Number: B-2

Depth: 15

Date: 6/12/2021



Client: Laguna Woods
Project: Laguna Woods

Project No: 20-307

PLATE B-5