

LANDSCAPE DOCUMENTATION PACKAGE

for

THE PEARL

**561 South Sierra Avenue
City of Solana Beach, California**



Developer:

**THE PEARL SOLANA BEACH, LP
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Prepared By:

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Date: Revised June 04, 2018



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SOIL MANAGEMENT REPORT

Prepared by:

**Soil and Plant Laboratory, Inc.
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Anaheim office
Lab No: 16-116-0010
May 3, 2016

Mzaki Design, Inc.
4670 Saratoga Ave. #3
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Attn: Mohammed Zaki

THE PEARL – SOLANA BEACH JOB # 11-0003

Attached are the results of the analysis performed on a soil sample that was collected from the above mentioned project site by the client and received by our laboratory on April 25, 2016. This sample was analyzed for nutrient levels and soil suitability in preparation for a new landscape installation.

Analytical Results:

All of the major and minor nutrients are sufficient for plant nutrition. Iron is high at 460 parts per million (ppm), which could potentially inhibit plant uptake of other nutrients, most notably zinc and possibly potassium. An upward pH adjustment would result in a favorable decrease in iron availability. The organic content of the soil is moderate at 2.8% by total sample dry weight.

The reaction of the soil is moderately acidic at 5.8 on the pH scale, which is at the low end of the suitable range for most plants. As noted above, adjusting the pH upward towards the slightly acidic range would decrease iron availability. This can be accomplished with calcium carbonate lime, as described below.

Salinity (ECe) is elevated at 5.4 dS/m, which could cause a broad range of plants to show tip and edge burning of older foliage. Several thorough leaching irrigations should be applied to flush excess salts out of the root zone and adjust the salinity level to less than 3.0 dS/m. We estimate that approximately 2 ½ inches of water would need to move through the soil profile to accomplish this. Be sure to allow the soil to dry slightly between irrigations to avoid creating anaerobic soil conditions. Nitrogen may be slightly below optimum after leaching.

Boron is safely low, yet sufficient for plant nutrition. The favorably low sodium adsorption ratio (SAR) indicates that soluble sodium is properly balanced by calcium and magnesium in regards to its effect on soil structure and water infiltration.

The texture of the soil is 'sandy loam' with an estimated water infiltration rate of 0.35 inches per hour. The actual rate of water infiltration may vary with the degree of soil compaction.

Comments

An inquiry was made by the client regarding soil that would be appropriate in an overstructure planter. Suggested import soil specifications are provided below. Rates of amendments and fertilizer may require adjustment based on analyses of the chosen sand and organic material.

SOIL MIX FOR OVERSTRUCTURE PLANTERS

1. If structure permits, utilize 100% fine sand to surface 8". The selected sand should meet the following gradation.

<u>Sieve No. (US Standard)</u>	<u>Weight Percent Passing</u>
10	100
18	95-100
35	65-100
60	0-50
140	0-10
270	0-5

Estimated dry bulk density 2500 lbs. / cu. yd.

Estimated wet bulk density 3000 lbs. / cu. yd.

2. The surface 8 inch layer should consist of a blend of 65% approved sand and 35% 0 - 1/4" raw fir or pine bark*. The following should be added and uniformly blended prior to placing in the planter.

AMOUNT/CU. YD.

2 lbs.	6-24-24XB® commercial fertilizer
2 lbs.	Nitroform
3 lbs.	calcium carbonate limestone
2 lbs.	dolomite lime
1 lb.	iron sulfate

Estimated dry bulk density 1900 lbs. / cu. yd.

Estimated wet bulk density 2400 lbs. / cu. yd.

* Bark Specification

1. Particle Size Distribution

<u>Sieve Size</u>	<u>Percent Passing</u>
9.51 mm (3/8 inches)	100
6.35 mm (1/4 inches)	95
500 micron (.02 inches)	0 - 30

2. Minimum 90% organic by dry weight as determined by ash method
3. pH shall be in the range of 4.0 – 5.5 as determined in saturation paste.
4. Salinity shall not exceed 2.0 dS/m as determined in saturation extract.

Recommendations

Surface Soil Preparation for Turf, Groundcover and Mass Planting

If feasible, prior to amending the areas where severe compaction exists, the surface soil should be ripped or tilled to a 9-inch depth. Uniformly broadcast and blend the following with existing soil to a 6-inch depth.

Materials	Amount per 1000 sq.ft.
Nitrogen fortified organic amendment (compost* or redwood or fir sawdust)	2 cu. yards
Calcium carbonate lime	45 lbs.
Calcium nitrate (15.5-0-0)	5 lbs.

* Rates may have to be adjusted depending on analysis of selected compost.

Tree and Shrub Planting Guidelines

1. Excavate planting pits at least twice the diameter of the rootball.
2. Uniformly blend 2 ½ lbs. of calcium carbonate lime with each cu. yd. of backfill soil.
3. The top of the rootball should be at or slightly above final grade.
4. Organic material is not required in the backfill; however if you wish, the amended surface soil or a soil blend consisting of no more than 20% by volume organic matter can be placed in the upper 12 inches of backfill only. Soil below this depth should not contain any added organic matter because of the threat of plant disease and/or anaerobic soil conditions developing.
5. Do not cover the original rootball with other soil. Ideally, a temporary soil berm is often constructed around the outer edge of the rootball to help channel water into the rootball and then into surrounding soil until roots are established in the backfill and the rootball is no longer the sole source of water for the plant.
6. Ideally, a weed and turf free zone, preferably 2-3 ft. in diameter, should be maintained just beyond the diameter of the planting hole. A 2-4 inch deep layer of coarse mulch can be placed around the tree or shrub; mulch should be kept a minimum 4-6 inches from the trunk.

Maintenance Fertilization

For turf, groundcover and mass planting areas, uniformly calcium nitrate (15.5-0-0) at the rate of 6 lbs. per 1000 sq. ft. The first application should occur approximately 45 to 60 days after planting, with repeat applications every 30-90 days or as growth and color dictate. In early fall and spring, substitute a complete fertilizer such as 16-6-8, or equal, for the sulfur coated urea at the rate of 6 lbs. per 1000 sq. ft. to ensure continuing supplies of phosphorus and potassium. Tree and shrub plantings can be maintained with the above fertilizers; however, the frequency between applications should be every 90-120 days, with the first application 90 days after planting. Follow each fertilization with a thorough irrigation. When plants have become well established, fertilizer applications can be less frequent.



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Mzaki Design, Inc.
May 3, 2016

If we can be of any further assistance, please feel free to contact us.

A handwritten signature in black ink, appearing to read "Jason Gihring". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Jason Gihring

Emailed: mo@mzakidesign.com

Project : The Pearl - Solana Beach, Ca
Job: #11-003

Report No : **16-116-0010**
Purchase Order :
Date Recd : 04/25/2016
Date Printed : 04/29/2016
Page : 1 of 1

COMPREHENSIVE SOIL ANALYSIS

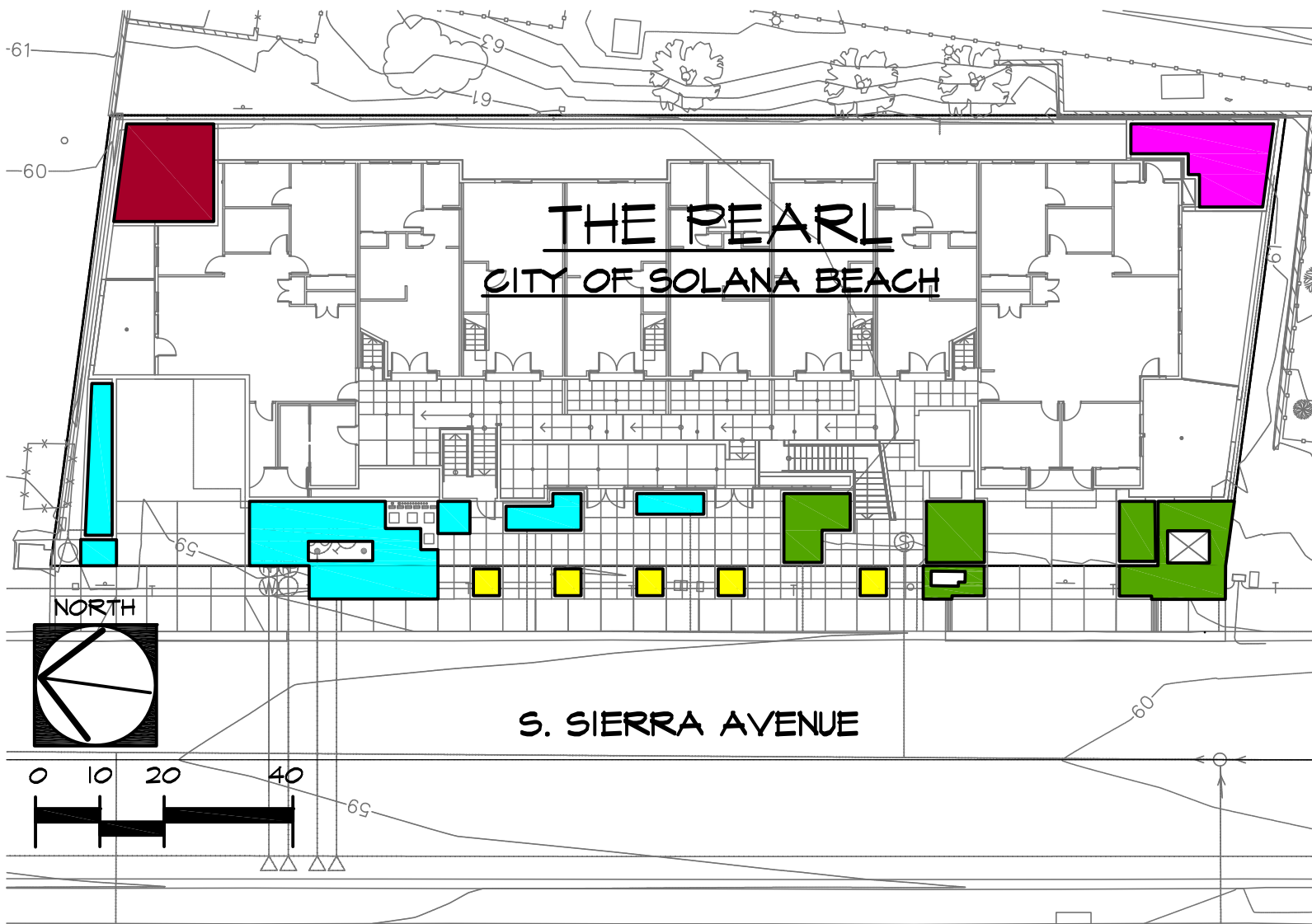
Sample Description - Sample ID				Half Sat %	pH	ECe dS/m	NO ₃ -N ppm	NH ₄ -N ppm	PO ₄ -P ppm	K ppm	Ca ppm	Mg ppm	Cu ppm	Zn ppm	Mn ppm	Fe ppm	Organic % dry wt.	Lab No.
				TEC	Qual Lime													
Site Soil - 12"				17	5.8	5.4	138	25	75	161	1109	204	1.6	10.7	13	460	2.8	32452
				66	None			4.8	3.7	1.7	1.0	1.4	1.9	3.2	1.8	14.2		
Saturation Extract Values						Percent of Sample Passing 2 mm Screen										USDA Soil Classification		Lab No.
Ca meq/L	Mg meq/L	K meq/L	Na meq/L	B ppm	SO ₄ meq/L	SAR	Gravel %		Sand		Silt		Clay					
							Coarse 5 - 12	Fine 2 - 5	Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5	.002-.05	0-.002					
34.3	12.7	2.5	17.8	0.47	6.7	3.7	0.1	0.2	1.0	28.4	50.2	9.4	10.9	Sandy Loam			32452	

WATER EFFICIENT LANDSCAPE **WORKSHEET**

**City of Solana Beach ESTIMATED TOTAL WATER USE (ETWU)
WORKSHEET including:**

- **Hydrozone Information Table and chart**
- **Estimated Total Water Use (ETWU)**
- **Maximum Allowed water Allowance (MAWA)**

**ETWU, MAWA Calculations and Hydrozone are included on
the Landscape Construction Documents Drawing No. LI-5.**



- HYDRO-ZONE (1): (MED PF, DRIP IRRIGATION)
IRRIGATION CONTROL VALVE # A-1
- HYDRO-ZONE (2): (LOW PF, TREE BUBBLERS)
IRRIGATION CONTROL VALVE # A-2
- HYDRO-ZONE (3): (LOW PF, DRIP IRRIGATION)
IRRIGATION CONTROL VALVE # A-3
- HYDRO-ZONE (4): (LOW PF, DRIP IRRIGATION)
IRRIGATION CONTROL VALVE # A-4
- HYDRO-ZONE (5): (MED PF, DRIP IRRIGATION)
IRRIGATION CONTROL VALVE # A-5

HYDRO-ZONE CHART



ESTIMATED TOTAL WATER USE (ETWU) WORKSHEET

The project's Estimated Total Water Use is calculated using the following formula:

$$0.62 \left(\frac{PF \times HA}{IE} + SLA \right)$$

ETWU = Estimated total water use per year (gallons per year)

ETo = Evapotranspiration rate (inches per year)

PF = Plant Factor from WUCOLS (see Definitions)

HA = Hydro-zone Area (square feet): Define hydro-zones by water use: very low, low, moderate and high

SLA = Special Landscape Area: Edible plants, irrigated with recycled water, & turf used for active play

0.62 = Conversion Factor (to gallons per square foot)

IE = Irrigation Efficiency

CITY OF SOLANA BEACH ESTIMATED TOTAL WATER USE (ETWU) WORKSHEET							
	Line	Hydro-zone Number (1 - 5 Below – use as many tables as necessary to complete all hydrozones)					
		1	2	3	4	5	SLA
Evapotranspiration Rate (ETo) See "A" below	1	Use 41 (west of I-5) / 47 (east of I-5)					
Conversion Factor - .62	2	0.62					
(Line 1 x Line 2)	3	25.42 (west of I-5) / 29.14 (east of I-5)					
Plant Factor (PF) See "B" below	4	0.60	0.30	0.30	0.30	0.60	
Hydrozone Area (HA) - in square feet	5	220	144	578	386	202	0
(Line 4 x Line 5)	6	132.00	43.2	173.40	115.80	121.20	
Irrigation Efficiency (IE) See "C" below	7	0.81	0.75	0.81	0.81	0.81	
(Line 6 ÷ Line 7)	8	162.96	57.60	214.08	142.96	149.63	
TOTAL of all Line 8 boxes + SLA	9	727.23					
Line 3 x Line 9 Estimated Total Water Use - ETWU (gallons per year) Total shall not exceed MAWA below	10	727.23 x 25.42 = 18,486.19 Gallons / 748 = 24.72 CCF					
A <i>ETo - Evapotranspiration rate =</i> 41 (west of I-5) 47 (east of I-5)		B <i>PF - Plant Factor – Use WUCOLS values to determine the category for each species used. The highest water use PF must be used when more than one PF is shown in a hydro-zone.</i> 0.1 = VLW - Very Low Water Use Plants 0.3 = LW - Low Water Use Plants 0.6 = MW - Moderate Water Use Plants 1.0 = HW - High Water Use Plants		C <i>IE – Irrigation Efficiency</i> Spray = .55 Rotor = .70 Bubbler = .75 MP rotator = .75 Drip & Micro-spray = .81 A different IE may be used if supported by documentation subject to approval by the City Planner			

MAXIMUM APPLIED WATER APPLICATION (MAWA) calculation:

25.42 x [(0.55 x 1,530) + (1-0.55 x 0)] =
 25.42 or 29.14 Total Landscape Area Total SLA
 Evapotranspiration adjustment factor (ETAF) use .55 residential .45 non- residential

MAWA =
21,390.00 Gallons / 748 = 28.60 CCF

MATURITY RECOMMENDED IRRIGATION **SCHEDULE**

(Recommended Irrigation Schedule, Additional Notes and Requirements are Included on the Landscape Construction Documents Sheet LI-4).

MATURITY RECOMMENDED IRRIGATION SCHEDULE

PROJECT INFORMATION

Project: The Pearl
Location: City of Solana Beach, California
Proj. #: 11-003
Date: Revised 8/03/2016
By: M Zaki Design, Inc.

Controller No.: A
Controller Description: Hunter I-CORE 12-Station with Hunter SOLAR.SYNC ET Sensor & Module
Irrigation Schedule Description: 7-Day Water Window
Landscape irrigation is porhibited between the hours of 6:00 a.m. and 9:00 p.m.
Landscape irrigation shall be limited to the hours of 9:00 p.m. and 6:00 a.m.
Source of (Eto) data indicated below: CA Model Water Efficient Ordinance Dec. 2015

AREA EVAPO/TRANSPIRATION DATA

Rooting Depth = 7"

Normal Year Average ETto (Inches Per Month)
Normal Year Average ETto (Inches Per Day)

IRRIGATION SCHEDULE

Total Eto = 39.80 (Station 173 Torrey Pines)											
JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
2.20	2.30	3.40	3.90	4.00	4.10	4.60	4.70	3.80	2.80	2.00	2.00
0.07	0.08	0.11	0.13	0.13	0.14	0.15	0.16	0.13	0.09	0.07	0.07

VALVE	VALVE DESCRIPTION- MICRO CLIMATE	VALVE GPM	PRECIP. RATE (PR)	Micro Adj FACTOR	CROP COEF. (Kc)	SPKLR EFFIC.	Irrig Adj PCT	AVERAGE MINUTES PER DAY OF IRRIGATION - 7 DAYS PER WEEK											
								JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
A-1	Shrub & G.C Drip-Partial S/S	1.7	0.39	80%	0.6	81%	113%	10	12	16	19	19	20	22	23	19	13	10	10
A-2	Tree Bubbler-Partial S/S	10.0	0.96	80%	0.3	75%	100%	2	3	4	4	4	4	5	5	4	3	2	2
A-3	Shrub & G.C. Drip-Partial S/S	4.0	0.39	80%	0.3	81%	113%	5	6	8	9	9	10	11	12	9	5	5	5
A-4	Shrub & G.C. Drip-Partial S/S	3.3	0.39	80%	0.3	81%	113%	5	6	8	9	9	10	11	12	9	7	5	5
A-5	Shrub Drip-Full Sun	1.5	0.39	100%	0.6	81%	111%	13	15	20	24	24	26	27	29	24	16	13	13
TOTAL MINUTES PER DAY								35	42	56	65	65	70	76	81	65	46	35	35
TOTAL HOURS PER DAY								0.6	0.7	0.9	1.1	1.1	1.2	1.3	1.4	1.1	0.8	0.6	0.6

MAINTENANCE SCHEDULE

(Refer to landscape construction documents for additional notes and requirements on Sheet LT-2).

RECOMMENDED MAINTENANCE SCHEDULE

WEEKLY TASKS

- Check all irrigation equipment and adjust/align as required.
- Inspect all landscape areas for pests/pathogens.
- Weed all shrub/groundcover areas as needed.
- Remove landscape debris.
- Repair planting wells and /or grade around plants to eliminate runoff.
- Perform corrective pruning to eliminate hazards and damage to plant.
- Repair irrigation equipment with originally specified materials.

MINIMUM RECOMMENDED YEARLY MAINTENANCE SCHEDULE

Month	Adjust Irrigation Schedule	Inspect Tree Staking	Flush Drip Valves	Add Mulch	Prune Trees & Shrubs	Fertilize As Needed	Irrigation Winterization Flush
January	X	X					
February	X	X			X		
March	X	X	X	X		X	
April	X	X					
May	X	X			X		
June	X	X	X	X			
July	X	X					
August	X	X					
September	X	X	X	X			
October	X	X			X	X	
November	X	X					
December	X	X	X	X			X

NOTE:

ADDITIONAL MAINTENANCE REQUIREMENTS ARE INCLUDED ON THE LANDSCAPE CONSTRUCTION DOCUMENTS PLAN SHEET LT-2 UNDER MAINTENANCE BY THE CONTRACTOR AND FUTURE MAINTENANCE BY THE DEVELOPER.