Appendix 6 Soils Report

Anaheim Office
Lab No: 23-223-0020
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Architerra Design Group, Inc.
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Attn: Peter Dalman

Project: Wildomar 20 Acre Park – Wildomar Job #: 2329

Attached are the results of the analysis performed on two soil samples that were collected from the above mentioned project site from a 12-inch depth by the client and received by our laboratory on August 11, 2023. These samples were analyzed for nutrient levels, agricultural suitability, and physical characteristics in preparation for a new landscape installation.

Analytical Results and Comments

The reaction of sample 1 is neutral and sample 2 is near neutral with readings in the range of 7.0-7.1 on the pH scale with free lime favorably low. These levels are within the range preferred for most plants and no pH adjustment is suggested.

Salinity (ECe) and sodium are favorably low. The safely low sodium adsorption ratios (SAR) indicate that sodium is properly balanced by calcium and magnesium in regards to its effect on soil structure and water infiltration.

Boron is safely low for general ornamental plants and may be below optimum for plant nutritional purposes. Irrigation water in Southern California often supplies sufficient boron to meet plant nutritional requirements for that nutrient. However, if boron is low in the irrigation water and/or plants show symptoms of boron deficiency after they are well established, consider an application of a product containing boron at the manufacturer's label rate. Boron deficiency symptoms often include stunted or deformed younger growth and "tight" internodes.

In terms of soil fertility, nitrogen is low in sample 1 and low optimum in sample 2. Phosphorus is low in both. For the minor elements, zinc and iron are moderately low. The remaining nutrients are well supplied.

The texture of the samples is 'gravelly sandy loam' with 20.4% of the samples being comprised of gravel in the 2-12 mm range on average. This, along with a relatively wide distribution of particle sizes in the fraction of the sample passing the 2.0 mm sieve, indicates that these soils may have some tendency to compact. The estimated water infiltration rates, which may vary with the degree of soil compaction, are in the range of 0.26-0.27 inches per hour. Organic content is low at 0.5% on a dry weight basis.

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 in *both* locations.

Materials	Amount per 1000 sq.ft.
Nitrogen fortified organic amendment (compost* or redwood or fir sawdust)	4 cu. yards
16-20-0 Ammonium Phosphate	9 lbs.

*Rates and fertilizers 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. The top of the rootball should be at or slightly above final grade.
3. 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.
4. Place slow release fertilizer tablets in the upper 12 inches of backfill at manufacturer's recommended rates. If fertilizer amended soil per the mass planting recommendation is used as a backfill the addition of slow release fertilizer tablets is not necessary.
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 broadcast sulfur coated urea at the rate of 5 lbs. per 1000 sq. ft. The first application should occur approximately 45 days after planting or at the first mowing in turf areas, with repeat applications every 60-90 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 120 days, with the first application 60-90 days after planting. Follow each fertilization with a thorough irrigation. When plants have become well established, fertilizer applications can be less frequent.

As noted above, zinc and iron are below optimum. When micronutrients are low, deficiencies can sometimes show in the plants. If deficiencies show once plants have become established, they may be addressed upon the first sign of deficiency. Iron and zinc deficiency symptoms are often characterized by yellow, almost white, interveinal chlorosis on the youngest growth. If these symptoms are apparent once plants are established, then application of iron and/or zinc chelate at the manufacturer's label rate may improve appearance. Chelates are generally more effective than some of the other forms of trace elements. These can be either foliar or soil applied at manufacturer's rates if deficiencies begin to show.

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

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Project : Wildomar 20 Acre Park - Wildomar
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COMPREHENSIVE SOIL ANALYSIS

Report No : **23-223-0020**
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Page : 1 of 1

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		Sufficiency Factors											
Wildomar 1	11	7.0	0.2	6	7	8	143	703	114	1.0	1.0	7	13	0.58	00501
	48	Low		0.6		0.6	2.0	0.9	1.1	1.7	0.4	1.4	0.6		
Wildomar 2	12	7.1	0.3	10	10	9	212	656	95	1.1	1.1	8	12	0.56	00502
	46	Low		0.8		0.6	2.7	0.9	0.9	1.8	0.5	1.6	0.5		

Saturation Extract Values						SAR	Gravel %		Percent of Sample Passing 2 mm Screen					USDA Soil Classification	Lab No.
									Sand			Silt	Clay		
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO_4 meq/L		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		
1.4	0.9	0.9	0	0.09	0.2	0.8	5.8	16.6	11.6	14.0	43.9	18.2	12.2	Gravelly Sandy Loam	00501
1.7	1.2	0.7	0.2	0.09	0.2	0.6	4.2	14.2	12.6	18.0	40.9	18.2	10.2	Gravelly Sandy Loam	00502

Sufficiency factor (1.0=sufficient for average crop) below each nutrient value. N factor based on 200 ppm constant feed. SAR = Sodium adsorption ratio. Half Saturation %=approx field moisture capacity. Nitrogen(N), Potassium(K), Calcium(Ca) and Magnesium(Mg) by sodium chloride extraction. Phosphorus(P) by sodium bicarbonate extraction. Copper(Cu), Zinc(Zn), Manganese(Mn) & Iron(Fe) by DTPA extraction. Sat. ext. method for salinity (ECe as dS/m),Boron (B), Sulfate(SO_4), Sodium(Na). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm(1/2 inch) sieve. Particle sizes in millimeters. Organic percentage determined by Walkley-Black or Loss on Ignition.

* LOW , SUFFICIENT , HIGH

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