

RESTORATION PLAN - SUNDARA SE LEVEE

2201777

GRADING PERMIT #2500131

RESTORATION PLAN NOTES

- The Sundara SE Levee Restoration Plan consists of Native Plant Inventory, Restoration Planting Plan and Details, and Conceptual Irrigation Plan.
- No disturbance associated with the SE Levee shall take place outside of the Grading Limits as depicted on this plan. The levee is being constructed within Environmentally Sensitive Open Space (ESOS).
- The area of levee as shown on Plans is 1.67 Acres (72,546 SF).
- The area to be graded is 1.67 Acres (72,546 SF).
- Assurances for landscaping and re-vegetation bonds must be posted prior to issuance of grading permits. A landscape bond in the amount of 10% of the original landscape bond shall remain in place for a period of one year from the complete installation of landscape materials and any replacement materials.
- All plants planted on site shall be as specified on Restoration Planting Plan. No hybrid or non-native species shall be used.
- All plants to be irrigated with an automatic drip irrigation system. Property owner is responsible for maintaining the temporary irrigation system for a minimum of five years in order to transition plants over to natural sources. Any plant materials that die in transition, for any reasons, shall be replaced in accordance with TOV Zoning Code Section 27.6.e.4, Maintenance.
- Upon completion of five year irrigation period, all irrigation equipment including mainline, laterals, emitters, backflow, etc shall be removed from the site.
- Property owners, lessees, and occupants shall maintain required landscape, irrigation, buffering, screening and rainwater harvesting system improvements per the approved plans.
- In the event of abandonment of the site after grading/disturbance of natural areas, disturbed areas shall be re-vegetated with a non-irrigated hydro seed mix from OVZCR Addendum D: Approved re-vegetation seed mix.
- All plant material shall meet the minimum standards contained in the current editions of the Arizona Nursery Association's Growers Committee Recommended Tree Specifications and the American Association of Nurserymen as to size, condition and appearance.
- Any spaded or boxed tree transplanted on site that dies due to neglect or lack of maintenance shall be replaced with the same size and species of the original salvaged tree, as required by the approved salvage and mitigation plan.
- The limits of grading shall be staked in the field, in accordance with Section 27.6.B.7.c.ii of the Zoning Code. Disturbance outside the approved grading limits shall not be permitted.
- Protection of plants to be Preserved-in-Place: All areas designated to remain undisturbed shall be fenced prior to the start of site disturbance with a highly visible fence (refer to Fencing Detail). Fencing shall remain in place for the duration of construction.
- No salvage of plants regulated by the Endangered Species Act and/or the Arizona Native Plant Law may occur without the issuance of the appropriate permit by the State Department of Agriculture.
- The Contractor shall obtain all necessary and or required permits required to install the work on the approved Plans.
- Work shall be in accordance with the requirements of the Town of Oro Valley Code.
- The Contractor shall be appropriately licensed as required by the State of Arizona.
- Existing Utilities: Utilities may exist which are not known and not shown on Plans. The Contractor shall take precautionary measures to protect all utilities on site. Prior to excavating, the Contractor shall verify the location of underground utilities. A minimum of two days prior to excavating, the Contractor shall request identification of underground utilities by calling Blue Stake at 811.
- All landscaped areas to be finished with seed mix. Restoration Seed Mix shall be as specified on Restoration Planting Plan, and shall contain no invasive species. Certificates of Analysis for seeds will be provided. Certificates will contain the following information for each seed sample: the test results of the Fifty States Noxious Weed list, all seeds including weed seeds listed, purity and germination. Any seed containing species listed as noxious, restricted or invasive, will be rejected. Weed content of the contract-specified seed mix shall not exceed 0.5 percent.
- Refer to Notes on Native Plant Preservation Plans, Restoration Landscape Plan, and Irrigation Concept for additional requirements.
- Deep rooted vegetation and trees shall not be planted closer than 7.5' from a public water line. Exceptions for alternative design solutions such as root barriers shall be considered on a case-by-case basis.

NATIVE PLANT INVENTORY & SALVAGE NOTES

- The Native Plant Inventory and Plan was prepared in accordance with the Town of Oro Valley (TOV) Native Plant Preservation, Salvage and Mitigation Plan requirements (Zoning Code Section 27.6.B) as well as per direction provided by TOV Planning and Zoning Administrator.
- Protected native plants as designated in Table C-1, Addendum C of the TOV Zoning Code Section 27.6.B have been inventoried (tagged and flagged). The Viability and Transplantability Status has been provided for each inventoried plant (refer to criteria, below).
- Tagging and Flagging: All inventoried plants adhered to the following standards:
 - Tagging: Plants were tagged with a metal tag embossed with an inventory number that cross references the Native Plant Inventory List and Native Plant Inventory Plan.
 - Flagging: Color-coded flagging has been affixed to each inventoried plant:
 - White: Plants proposed for preservation in place (PIP)
 - Blue: Plants proposed for transplant on site (TOS)
 - Red: Plants proposed for removal from site (RFS)
- All salvaged cacti shall be planted with the same sun orientation as their original location.
- Any spaded or boxed tree transplanted on site that dies due to neglect or lack of maintenance shall be replaced with the same size and species of the original salvaged tree, as required by the salvage plan.
- No salvage of plants regulated by the Endangered Species Act and/or the Arizona Native Plant Law may occur without the issuance of the appropriate permit by the State Department of Agriculture.
- Salvage operations shall not commence until the Zoning inspector has performed an inspection and given approval to be salvaged.
- Temporary nursery shall be in conformance with Section 27.6.B.4. Refer to Sheet 1 for Nursery location.
- Mitigation of Significant Vegetation shall be in accordance with Table 27-1 Mitigation of Significant Vegetation.
- Any plant that meets the salvage criteria in Section 27.6.B.4 shall be preserved in place or transplanted on-site. Any plants that meet the salvage criteria that are destroyed shall be replaced on a one-to-one ratio of the same species and size as that destroyed. Five site-native understory plants from Table C2, Oro Valley Supplemental Protected Native Plant List (understory) will be planted for every mitigated tree.
- The limits of grading shall be staked in the field, in accordance with Section 27.6.B.7.c.ii. Disturbance outside the approved grading limits shall not be permitted.
- Protection of plants to be Preserved-in-Place: All protected native plants to be preserved in place and all areas designated to remain undisturbed shall be fenced prior to the start of site disturbance with a highly visible fence (refer to Fencing Details 1 - 3, Sheet 4). Fencing shall remain in place for the duration of construction.
- All Preserve-in-Place plants shall be retained at their existing grade throughout and after construction.
- Additional plants may be deemed salvageable by the zoning inspector, and shall be salvaged.
- Non-compliance with the approved native plant preservation plan or destruction of protected plants shall result in fines in accordance with section 27.6.B.6, compliance, of the zoning code.
- Plant locations were determined with the assistance of a global positioning system accurate to within approximately one foot.

INVASIVE SPECIES MONITORING AND MANAGEMENT

The most effective, efficient, and low-cost invasive species control strategies prevent invasions from occurring and quickly detect invasions that do occur so that invasive species can be eradicated or contained before they spread (Bossard et al. 2000).

Monitoring and Management of Invasive Plant Species within the Restoration Area

- Invasive Species monitoring should be conducted by a qualified vegetation ecologist or personnel familiar with the identification of non-native invasive plant species.
- Non-native invasive species that may appear in the disturbed project area include: Stinknet (*Oncosiphon piluliferum*), Buffelgrass (*Pennisetum ciliare*), bird of paradise (*Caesalpinia spp.*), fountain grass (*Pennisetum setaceum*), and Russian thistle (*Salsola tragus*). However, other invasive plants may also germinate.
- Pedestrian monitoring / survey for non-native invasive plants within the disturbance area should be conducted at least three times per year during the 5-year vegetation restoration establishment period: (1) February or March; (2) April, May or June; (3) July or August.
- If non-native invasive plant species are detected during monitoring / surveys, appropriate eradication methods should be employed, mechanical or chemical control, based on the species (most appropriate method and time of year for control).
- The Town of Oro Valley Planning staff should be notified in writing of monitoring / survey results, location of any non-native invasive species found, and eradication conducted by Arizona certified pesticide applicators if chemical treatment is deemed appropriate.

RESTORATION OVERVIEW



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1" = 80'-0"



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PLANT TRANSPLANTABILITY CRITERIA

Determination of Plant Transplantability is based upon the criteria listed in Section 27.6.B.c.iii of the TOV Zoning Code. All plants that meet the following criteria shall be preserved in place or salvaged. Plants rated Low for transplantability should not be considered for salvage and transplant.

- A. **HEALTH:** Plant health is good to excellent with no major infestations or apparent diseases. "Plant health" is defined as a plant in a sound state, free from disease and expected to survive for five (5) or more years.
- B. **SIZE & AGE:** The plant is of a size and age to suggest a likely chance of transplant survival.
- C. **BOXABILITY/SPADEABILITY:** Plant is undamaged and is conducive to box or spade transplanting (upright branching).
- D. **SOILS:** Soils can be excavated, are cohesive, and appear capable of supporting a boxed or spaded root ball.
- E. **TOPOGRAPHY:** Surrounding topography permits access with the appropriate equipment needed to box or spade and remove the plant.
- F. **ADJACENT PLANTS:** Adjacent plants do not pose a likely interference with root systems or interfere with plant removal.
- G. **FORM:** The overall form and character is representative of the species and is a valuable specimen for landscape or habitat purposes.

NATIVE PLANT MITIGATION REQUIREMENTS

1. Any tree, shrub, or cactus that meets the salvage criteria shall be salvaged and relocated on site. Any tree, shrub, or cactus that meets the salvage criteria as salvageable but is destroyed shall be replaced on a one-to-one (1:1) ratio of the same species and size as that destroyed. Five site-native understory plants from the supplemental Arizona Department of Water Quality native plant list will be planted for every mitigated (destroyed) tree.
2. Mitigation for native trees that qualify as significant vegetation (equal to or greater than 12" caliper and 12' height) shall be at a 2:1 ratio. One each 36 gallon tree and one each 48 gallon tree shall be planted for every significant tree removed from site. Five site-native understory plants from Table C2, Oro Valley Supplemental Protected Native Plant List (understory) will be planted for every mitigated tree.
3. Refer to Tables, this Sheet, for required quantity and size of mitigation plants.

BOXING / SPADEING FOR TREES TO BE TRANSPLANTED

1. Boxing, rather than spading, may be required for trees. Large desert trees are often not conducive to spading - the amount of limbs that must be trimmed destroys the natural form of the tree, and in the case of palo verde, exposes the tree to scalding.
2. The Salvage Contractor shall identify each tree to be transplanted and the corresponding method of transplant (box or spade) with the selected box / spade size for approval by the Town of Oro Valley Planning Division prior to start of salvage. Written approval from the Town must be obtained prior to transplant of any tree.
3. When boxing is used, all tree boxing materials and construction details, including minimum box sizes, shall be in accordance with PAG Standard Specifications for Public Improvements, Section 809, Native Plant Salvage. Contractor may use larger box sizes, but not smaller, than those listed in the Specification.

DETAIL OF TOS / RFS PLANTS AND CORRESPONDING MITIGATION

Succulents						
SPECIES	HEIGHT (FEET)	SIGNIFICANT	QTY TOS (SALVAGE - BLUE FLAG)	QTY RFS (REMOVE FROM SITE - RED FLAG)	RFS MITIGATION PLANTS (1:1)	TOTAL NUMBER OF TRANSPLANTS + NEW NURSERY PLANTS
Carnegiea gigantea Saguaro	≤ 1		3			3
	5	1				1
	12	1				1
	14	1				1
	15	Y	3	1	1	4
	16	Y	1			1
	Total		10	1	1	11
	≤ 1		5			5
	1.5 to 2		5	1	1	6
	2.5 to 3		6	6	6	12
Ferocactus wislizeni Fishhook Barrel	5			1	1	1
	Total		16	8	8	24
Peniocereus greggii Queen of the Night	2		1			1
	Total		1	0	0	1
	1		2			2
	4		2			2
	5		1			1
	Total		5	0	0	5
Trees + Shrubs						
SPECIES	CALIPER (INCHES)	SIGNIFICANT	QTY TOS (SALVAGE - BLUE FLAG)	QTY RFS (REMOVE FROM SITE - RED FLAG)	RFS MITIGATION PLANTS (1:1 UNDER 12" CALIPER 2:1 OVER 12" CALIPER)	TOTAL NUMBER OF TRANSPLANTS + NEW NURSERY PLANTS
Celtis pallida Desert Hackberry	3		4			4
	4			3	3	3
	6		1			1
	Total		5	3	3	8
Parkinsonia florida Blue Palo Verde	4		1			1
	10			1	1	1
	Total		1	1	1	2
	3		2	1	1	3
	4		2			2
	5		1			1
	6		1			1
	7		1			1
	8		1			1
	9		1			1
Parkinsonia microphylla Foothill Palo Verde	10			1	1	2
	12		1			1
	13		2			2
	14		1			1
	22	Y		1	2	2
	Total		12	7	12	24
Prosopis velutina Velvet Mesquite	5		2			2
	8		1			1
	9		1			1
	10			2	2	2
	12	Y	1			1
	13	N		1	1	1
	14	Y		1	2	2
	24	Y		1	2	2
	Total		5	5	7	12
	3		6	12	12	18
Senegalia greggii Catclaw Acacia	4		1	4	4	5
	5			1	1	1
	6		2	2	2	2
	7			2	2	2
	12	Y	1			1
	Total		8	21	21	29
Vachellia constricta Whitetorn Acacia	3		10	11	11	21
	4		5	11	11	16
	5		2	2	2	4
	6		1	4	4	5
	7		1	1	1	2
	8			1	1	1
	9			1	1	1
	10			1	1	1
	12	N		1	1	1
	Total		20	32	32	52

NATIVE PLANT SUMMARY

Botanical Name	Common Name	Preserve in Place (White Flagging)	Transplant (Blue Flagging)	Remove from Site (Red Flagging)	Remove from Site (Health - Red Flagging)	Total per Species
Carnegiea gigantea	Saguaro	2	10	1		13
Celtis pallida	Desert Hackberry		5	3		8
Ferocactus wislizeni	Fishhook Barrel	2	16	8	1	27
Parkinsonia florida	Blue Palo Verde	1	1	1		3
Parkinsonia microphylla	Foothill Palo Verde	6	12	7		25
Peniocereus greggii	Queen of the Night		1			1
Prosopis velutina	Velvet Mesquite	3	5	5		13
Senegalia greggii	Catclaw Acacia	3	8	21		32
Vachellia constricta	Whitetorn Acacia	2	20	32		54
Yucca elata	Soaptree Yucca		5			5
TOTAL ALL SPECIES		19	83	78	1	181

NATIVE PLANT REMOVAL MITIGATION SUMMARY - REPLACEMENT PLANTS REQUIRED

Required mitigation is per Table 27-1, Mitigation of Significant Vegetation, and Section 27.6.B.4.d. Mitigation of Protected Native Plants. 17 significant trees (all viable) and 4 significant saguaros were inventoried. 9 significant viable trees are designated for removal. Percentage of viable Significant Vegetation to be removed from site (measured as the square footage of the ground cover area) is 72%.

Botanical Name	Common Name	QTY of Viable Plants to be Removed	Mitigation Ratio	Replacement Trees Saguaros Shrubs Other Cacti (same size)1	Replacement Trees (36" Box)	Replacement Trees (48" Box)	Understory Plants Required
Carnegiea gigantea	Saguaro	1	1:1	1			
Celtis pallida	Desert Hackberry	3	1:1	3			
Ferocactus wislizeni	Fishhook Barrel	8	1:1	8			
Parkinsonia florida	Blue Palo Verde	1	1:1	1			5
Parkinsonia microphylla	Foothill Palo Verde	2	1:1	2			10
Parkinsonia microphylla - Significant		5	2:1		5	5	50
Peniocereus greggii	Queen of the Night						
Prosopis velutina	Velvet Mesquite	3	1:1	3			15
Prosopis velutina - Significant		2	2:1		2	2	20
Senegalia greggii	Catclaw Acacia	21	1:1	21			105
Vachellia constricta	Whitetorn Acacia	32	1:1	32			160
Yucca elata	Soaptree Yucca						
TOTAL MITIGATION REQUIRED		78		71	7	7	365

Mitigation planting shall be shown on the Landscape Plan. Under-story plants shall be selected from the Supplemental Native Plant List, Addendum C, and shall either be transplanted from on-site or nursery plants.

1Refer to table 'Detail of TOS / RFS Plants and Corresponding Mitigation' for size requirements for mitigation plants.

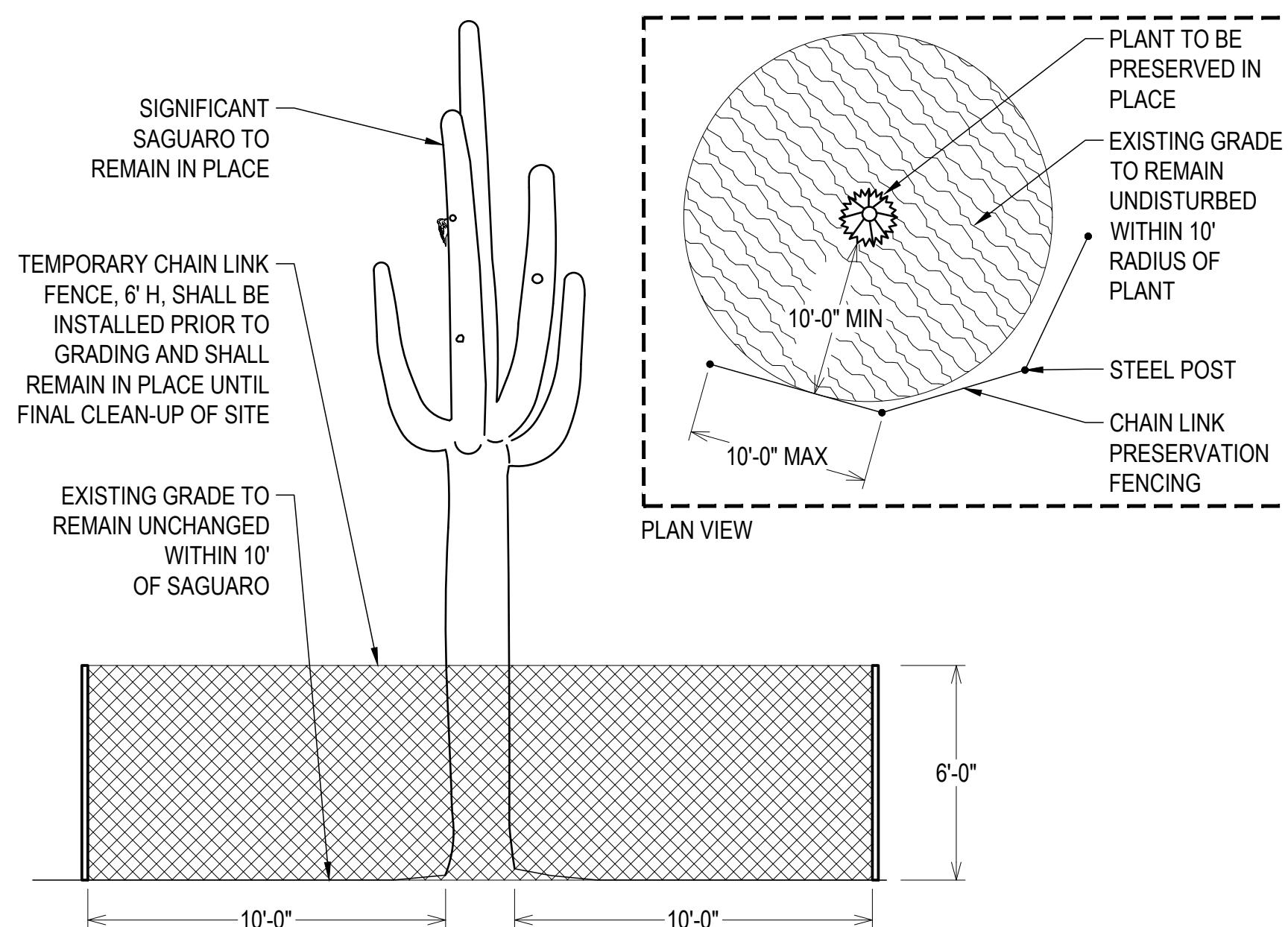
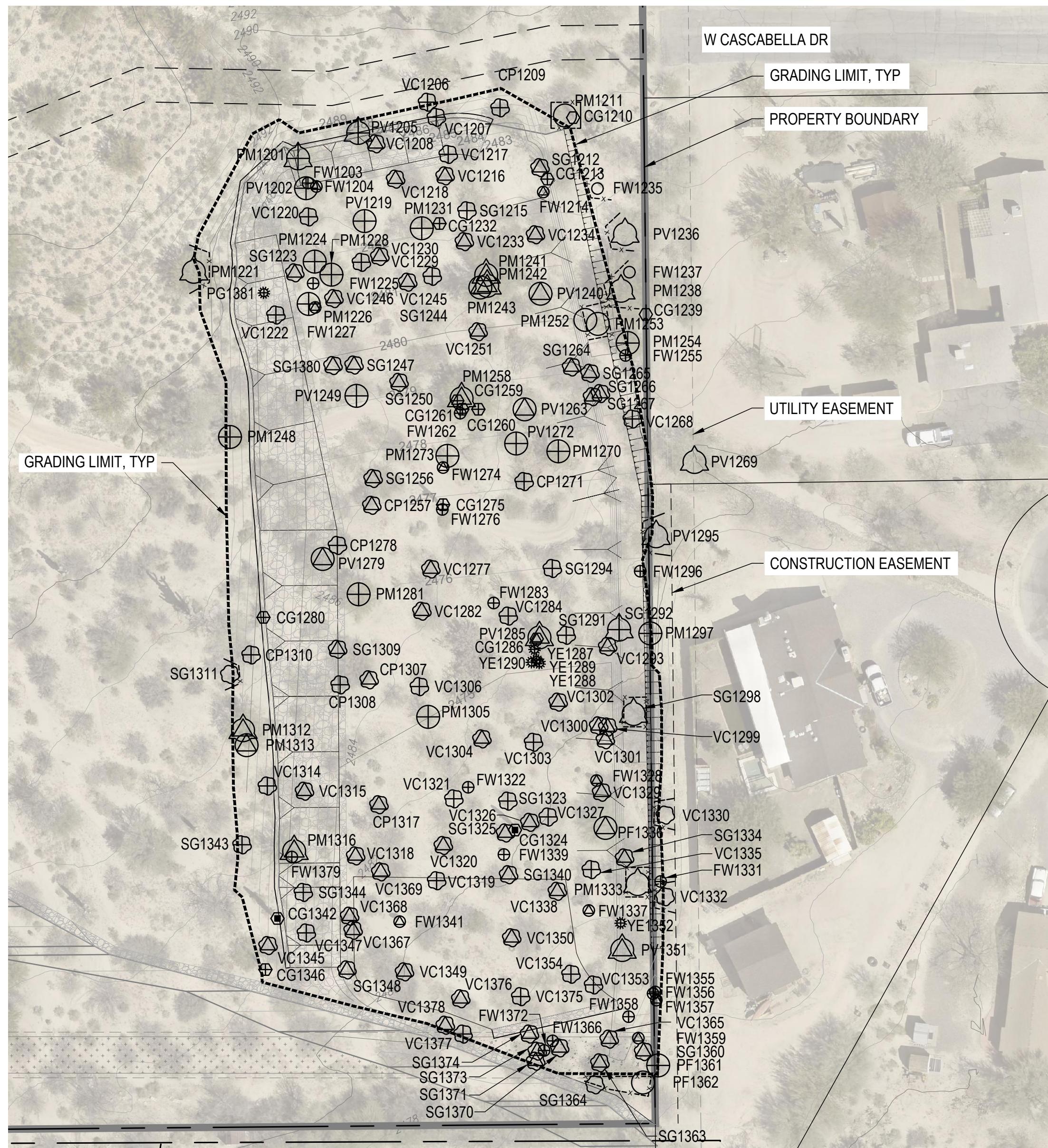
RELEVE RESULTS

Botanical Name	Common Name	R1	R2	R3	Average Density
Trees					
Parkinsonia microphylla	Foothill Palo Verde	1		2	1

INVENTORIED VEGETATION

ID	Sig Veg	Caliper (Inches)	Height (Feet)	Trans-plantable	Criteria	Disposition	Notes
<i>Carnegiea gigantea</i> , Saguaro (CG)							
1210		12	Yes		PIP		
1213		14	Yes		TOS	4 arms	
1232		5	Yes		TOS		
1239		8	Yes		PIP		
1259		12	Yes		TOS		
1260		1	Yes		TOS		
1261		0.25	Yes		TOS		
1275	Yes	15	Yes		TOS	4 arms	
1280		0.5	Yes		TOS		
1286	Yes	15	No	F: Adjacent Plants	RFS	3 arms	
1324	Yes	15	Yes		TOS	5 arms	
1342	Yes	16	Yes		TOS	5 arms	
1346		15	Yes		TOS		
<i>Celtis pallida</i> , Desert Hackberry (CP)							
1209		6	9	Yes		TOS	
1257		4	8	No	F: Adjacent Plants	RFS	
1271		3	8	Yes		TOS	
1278		3	6	Yes		TOS	
1307		4	8	No	G: Form	RFS	
1308		3	7	Yes		TOS	
1310		3	6	Yes		TOS	
1317		4	7	No	C: Spadeability	RFS	
<i>Ferocactus wislizeni</i> , Fishhook Barrel (FW)							
1203		3	Yes		TOS		
1204		3	No	B: Size and Age	RFS		
1214		2.5	No	B: Size and Age	RFS	2 stems	
1225		3	Yes		TOS		
1227		3	No	B: Size and Age	RFS	2 stems	
1235		2	Yes		PIP		
1237		2	Yes		PIP		
1255		1	Yes		TOS		
1262		0.5	Yes		TOS		
1274		5	No	B: Size and Age	RFS		
1276		2	Yes		TOS		
1283		3	Yes		TOS		
1296		3	Yes		TOS		
1322		1.5	Yes		TOS		
1328		2	No	G: Form	RFS		
1331		2	Yes		TOS		
1337		3	No	B: Size and Age	RFS		
1339		3	Yes		TOS		
1341		3	No	B: Size and Age	RFS		
1355		1	Yes		TOS		
1356		2	Yes		TOS		
1357		2.5	No	B: Size and Age	RFS		
1358		2.5	Yes		TOS		
1359		2.5	No	A: Health	RFS	scald	
1366		2	Yes		TOS		
1372		0.5	Yes		TOS		
1379		0.5	Yes		TOS		
<i>Parkinsonia florida</i> , Blue Palo Verde (PF)							
1336		10	12	No	B: Size and Age	RFS	
1361		4	7	Yes		TOS	
1362		3	8	Yes		PIP	
<i>Parkinsonia microphylla</i> , Foothill Palo Verde (PM)							
1201	Yes	13	13	Yes		TOS	
1211		5	13	No	F: Adjacent Plants	PIP	
1221	Yes	15	15	No	E: Topography	PIP	
1224		6	10	Yes		TOS	
1226		3	7	Yes		TOS	
1228		8	8	Yes		TOS	
1231		4	8	Yes		TOS	
1238	Yes	24	16	No	B: Size and Age	PIP	
1241	Yes	12	14	No	G: Form	RFS	
1242	Yes	14	14	No	F: Adjacent Plants	RFS	dieback, scald
1243		10	16	No	G: Form	RFS	
1248		10	11	Yes		TOS	
1252		3	7	Yes		PIP	
1253		5	9	Yes		PIP	
1254		9	11	Yes		TOS	
1258	Yes	22	15	No	B: Size and Age	RFS	Nurse Tree
1270		5	10	Yes		TOS	

ID	Sig Veg	Caliper (Inches)	Height (Feet)	Trans-plantable	Criteria	Disposition	Notes
<i>Parkinsonia microphylla</i> , Foothill Palo Verde (PM) Continued							
1273		4	7	Yes		TOS	
1281		10	11	Yes		TOS	
1297		3	8	Yes		TOS	
1305		7	9	Yes		TOS	
1312	Yes	12	13	No	B: Size and Age	RFS	
1313		3	9	No	G: Form	RFS	
1316	Yes	13	13	No	B: Size and Age	RFS	
1333	Yes	13	15	No	B: Size and Age	PIP	
<i>Peniocereus greggii</i> , Queen of the Night (PG)							
1381		2	Yes			TOS	
<i>Prosopis velutina</i> , Velvet Mesquite (PV)							
1202		8	10	Yes		TOS	
1205	Yes	12	12	Yes		TOS	
1219		5	10	Yes		TOS	
1236	Yes	18	13	No	B: Size and Age	PIP	
1240		10	14	No	B: Size and Age	RFS	
1249		5	7	Yes		TOS	
1263		13	10	No	B: Size and Age	RFS	
1269	Yes	24	16	No	B: Size and Age	PIP	
1272		9	9	Yes		TOS	
1279		10	12	No	B: Size and Age	RFS	
1285	Yes	14	15	No	B: Size and Age	RFS	
1295	Yes	28	15	No	B: Size and Age	PIP	
1351	Yes	24	14	No	B: Size and Age	RFS	
<i>Sengalia greggii</i> , Catclaw Acacia (SG)							
1212		4	8	No	F: Adjacent Plants	RFS	
1215		4	6	Yes		TOS	
1223		3	7	No	G: Form	RFS	
1244		3	8	Yes		TOS	
1247		3	7	No	G: Form	RFS	
1250		3	6	No	G: Form	RFS	
1256		3	7	No	G: Form	RFS	
1264		3	8	No	F: Adjacent Plants	RFS	
1265		3	7	No	F: Adjacent Plants	RFS	
1266		3	7	No	G: Form	RFS	
1267		3	7	No	G: Form	RFS	
1291		3	7	Yes		TOS	
1292	Yes	12	12	Yes		TOS	Specimen, Box only
1294		3	5	Yes		TOS	
1298	Yes	30	14	No	B: Size and Age	PIP	Specimen
1309		7	7	No	B: Size and Age	RFS	
1311		3	6	No	C: Spadeability	PIP	
1323		3	8	Yes		TOS	
1325		4	8	No	F: Adjacent Plants	RFS	
1334		4	9	No	G: Form	RFS	
1340		3	6	No	C: Spadeability	RFS	
1343		3	8	Yes		TOS	
1344		3	6	Yes		TOS	
1348		4	7	No	C: Spadeability	RFS	
1360		3	6	No	F: Adjacent Plants	RFS	
1363		6	9	No	G: Form	RFS	
1364		8	12	No	B: Size and Age	PIP	
1370		3	5	No	G: Form	RFS	
1371		7	8	No	C: Spadeability	RFS	
1373		5	9	No	C: Spadeability	RFS	
1374		6	7	No	F: Adjacent Plants	RFS	
1380		3					



NOTES:

1. Protective fencing for trees to remain in place shall be installed prior to the start of construction, and shall remain in place until final site clean up is complete.
2. The existing grade within a 10' radius of plants to be preserved in place shall remain in place - there will be no disturbance within this zone.

PROTECTIVE FENCING FOR SIGNIFICANT SAGUAROS (CARNEGIA GIGANTEA) PRESERVED IN PLACE

Scale: $\frac{1}{4}$ = 1'

SYMBOL / LINETYPE LEGEND	
PROPERTY BOUNDARY	
LIMIT OF GRADING	
EXISTING CONTOUR	
PROPOSED CONTOUR	
TRAIL PER CIVIL PLAN	
EXISTING TREE	
PRESERVED IN PLACE	
PRESERVATION FENCING	

SYMBOL LEGEND Inventoried Plant Disposition

Plant Type	Preserve in Place (PIP)	Transplant on Site (TOS)	Remove from Site (RFS)
Tree, Significant	▲	▲	▲
Tree	○	⊕	○
Shrub	○	⊕	○
Saguaro, Significant	●	○	▲
Saguaro	○	⊕	○
Barrel Cactus	○	⊕	○
Succulent	○	⊕	○

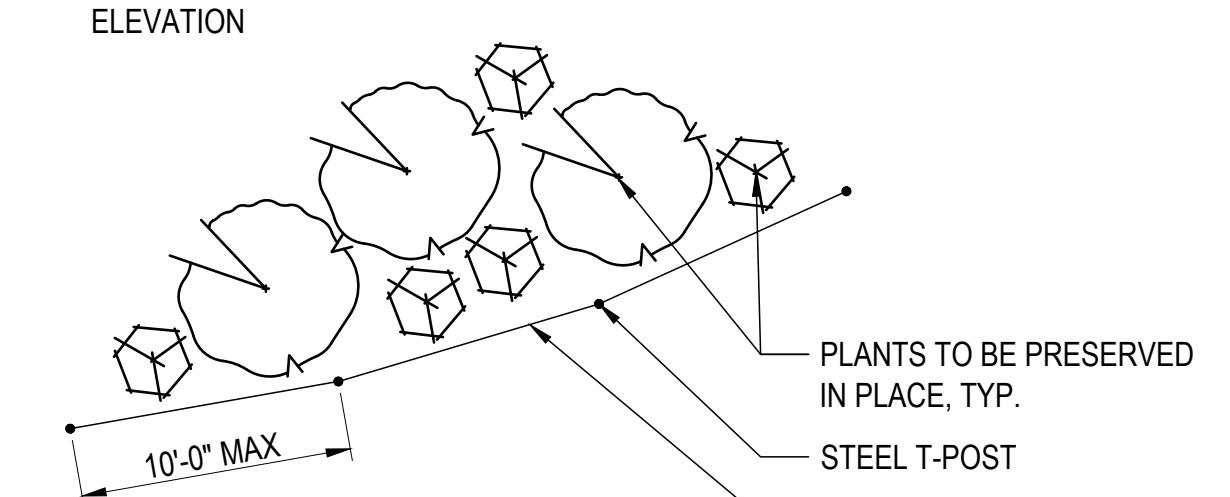
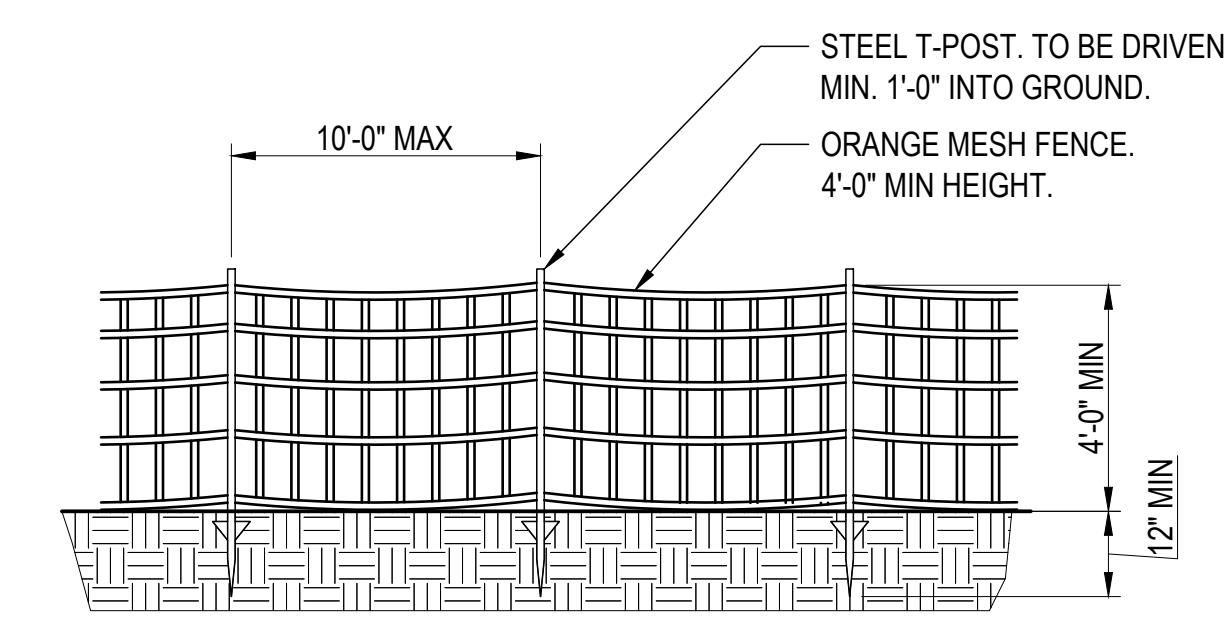
INVENTORIED PLANTS

Abbrev	BOTANICAL NAME	COMMON NAME
CG	<i>Carnegiea gigantea</i>	Saguaro
CP	<i>Celtis pallida</i>	Desert Hackberry
FW	<i>Ferocactus wislizeni</i>	Fishhook Barrel
PF	<i>Parkinsonia florida</i>	Blue Palo Verde
PM	<i>Parkinsonia microphylla</i>	Foothill Palo Verde
PG	<i>Peniocereus greggii</i>	Queen of the Night
PV	<i>Prosopis velutina</i>	Velvet Mesquite
SG	<i>Senegalia greggii</i>	Catclaw Acacia
VC	<i>Vachellia constricta</i>	Whitethorn Acacia
YE	<i>Yucca elata</i>	Soaptree Yucca

Refer to Native Plant Inventory Sheet for complete list of inventoried plants.

ID

SYMBOL	ELEMENT
PV1	Plant Identification Number. Refer to Schedule of Inventoried Plants.



NOTES:

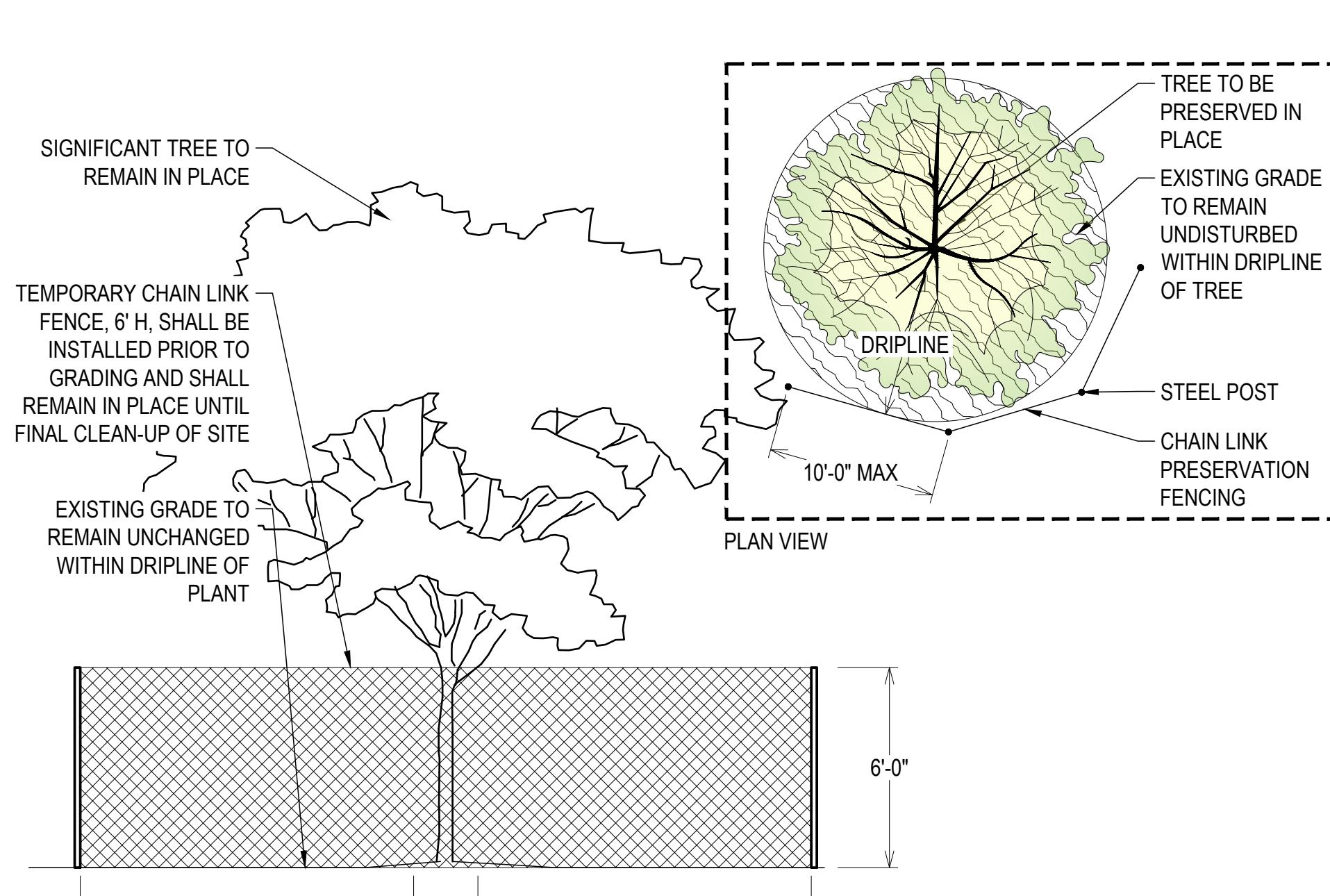
1. When excavating within 4'-0" from dripline of plants to be preserved in place, hand clear to minimize damage to root systems.
2. If roots are encountered during excavation, redirect roots into existing soil areas where possible. If redirection is not possible, cut roots cleanly with sharp pruning instruments.
3. Do not allow exposed and/or pruned roots to dry out. Provide temporary cover with peat moss, wrap with burlap, and maintain in a moist condition. Support and protect roots from further damage until they are permanently covered with soil.

PROTECTIVE FENCING - SMALL TREES

THIS DETAIL ONLY APPLICABLE TO NON-SIGNIFICANT VEGETATION

1

NTS



NOTES:

1. Protective chain link fencing is required for significant trees to remain in place and shall be installed prior to the start of construction. Fencing shall remain in place until final site clean up is complete.
2. The existing grade within the dripline of plants to be preserved in place shall remain in place - there will be no disturbance within this zone.

PROTECTIVE FENCING - SIGNIFICANT TREES TO REMAIN IN PLACE

Scale: $\frac{1}{4}$ = 1'



SIGNIFICANT SAGUARO NOTED AS RFS

Carnegiea gigantea #1286, which is a significant saguaro (15' tall, with three young arms) is marked for removal. The saguaro is growing at the base of a mesquite tree (photo above left) and the roots are entwined with the trunk (photo above right). Transplant does not appear to be feasible.

NATIVE PLANT INVENTORY

SCALE: 1" = 40'-0"

40 20 0 40



LJA Engineering, Inc.

1860 E River Rd Suite 325,
Tucson, AZ 85718
Phone 520.257.3400

NATIVE PLANT INVENTORY PLAN

SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH,
RANGE 13 EAST, G & SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

PROJECT NUMBER

2101153
JENNIFER PATTON
EXPIRES 6/30/2025

PLAN STATUS

DATE

DESCRIPTION

TEAM

TEAM

DESIGN

DRAWN

SCALE

CHKD

H:

V:

JOB No.

DATE:

9/4/2024

GRADING PERMIT #2500131

TOV CASE #
2201777
RELATED CASE #
2101153
OV914-009
OV210731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA 811
Call 811 or click Arizona811.com

SHEET

4

OF

9

RESTORATION PLANTING NOTES

- Levee Overview: The intent of the levee is to remove an existing residence (located on an adjacent parcel east of the levee) from the floodplain. The levee is designed to drain rapidly - per the Engineer, the levee area south of proposed contour 2476 may carry 4-6" of water during a 100-year storm event, but this should flow out within 10 minutes. Levee area north of contour 2476 should not pond water.
- Plants have been placed in relationship to the levee conditions described above - drought tolerant and basin intolerant plants are on the side slope and at the north end of the levee; plants that appreciate more water and can withstand temporary flooding have been placed on the levee bottom at the southern end.
- Plants shall be placed per the plan - it is not acceptable to shift placement for the reasons described in Notes 1 + 2.
- Restoration planting shall provide a natural appearance. The intent is to restore the area to pre-disturbance conditions. Plants shall be placed in random groupings as depicted in Planting Plan.
- Restoration Planting for this project consists of three elements: (1) Planting of trees, shrubs, and cacti to fulfill native plant transplant and mitigation quantified on Sheet 2; (2) Planting of understory plants in quantities and sizes as specified on the Restoration Landscape Plan; and (3) Seeding of all disturbed areas as shown on Plan with seed mix specified on the sheet.
- Prior to commencement of planting and irrigation, the soil shall be ripped per the seeding specification, this Sheet. Soil shall be left in a roughened condition after planting and irrigation. Rough soil surface is beneficial for trapping water and improving conditions for seed germination.
- All trees and shrubs shall be irrigated with a temporary drip irrigation system. Drip irrigation to be in place for a minimum of five years. Refer to the Irrigation Plan.
- Branch Mulching (refer to Detail 8, Sheet 7), will be applied after seeding.

RELEVES + SEED MIX COMPOSITION

Methodology: Three relieve plots were sampled to inform seed mix composition. Preliminary relieve locations were selected based on aerial assessment of vegetation. Final relieve locations were adjusted based upon field conditions (to ensure the relieve area was representative of the site's vegetation). Two of the plots were located in areas that were close to drainages running through the site; the other relieve was located in a more 'upland' slope area. 20' radius relieves were sampled. Refer to Sheet 1 for relieve locations.

Results: The relieves were conducted on June 6, 2024. Timing was well after winter annuals, and prior to monsoon-germinated vegetation. The relieves were sparsely populated, which was representative of the site at this time of year. Relieve results are shown on Sheet 2. To supplement survey results, the NRCS Ecological Site Description for the Sandy Loam Upland soils associated with this site was consulted.

Wilder has found this to be a great resource for understanding native plant communities associated with site soils. Wilder used the relieve data and NRCS resource, along with verification of availability of seed, to compose the restoration seed mix for this project.

SEED MIX: RESTORATION

All disturbed area to be seeding. Limits shall be field-adjusted to reflect actual disturbance.		
Scientific Name	Common Name	PLS / Acre
Shrubs		4.25
<i>Ambrosia deltoidea</i>	Triangle-leaf bursage	1.00
<i>Atriplex canescens</i>	Four wing saltbush	1.00
<i>Celtis pallida</i>	Desert Hackberry	1.00
<i>Encelia farinosa</i>	Brittlebush	1.00
<i>Larrea tridentata</i>	Creosote	0.25
Small Perennials		5.25
<i>Bahia absinthifolia</i>	Desert Bahia	0.50
<i>Baileya multiradiata</i>	Desert marigold	0.50
<i>Glandularia gooddingii</i>	Goodding's verbena	0.50
<i>Gutierrezia sarothrae</i>	Snakeweed	0.25
<i>Isocoma tenuisecta</i>	Burroweed	0.50
<i>Psilostrophe cooperi</i>	Paper Flower	0.50
<i>Sphaeralcea ambigua</i>	Globemallow	1.00
<i>Senna covesii</i>	Desert senna	1.00
<i>Zinnia acerosa</i>	Desert zinnia	0.50
Perennial Grasses		5.50
<i>Aristida purpurea</i>	Purple Three-Awn	1.00
<i>Aristida ternipes</i>	Spidergrass	0.50
<i>Bothriochloa barbinodis</i>	Cane Beardgrass	0.25
<i>Bouteloua rothrockii</i>	Rothrock grama	0.25
<i>Dasyochloa pulchella</i>	Fluffgrass	0.25
<i>Digitaria californica</i>	Arizona Cottontop	1.00
<i>Heteropogon contortus</i>	Tanglehead	0.50
<i>Hilaria rigida</i>	Big galleta	0.25
<i>Leptochloa dubia</i>	Green Sprangle Top	0.50
<i>Muhlenbergia porteri</i>	Bush Muhy	0.25
<i>Sporobolus airoides</i>	Alkali Sacaton	0.25
<i>Sporobolus contractus</i>	Spike dropseed	0.25
<i>Sporobolus cryptandrus</i>	Sand dropseed	0.25
Annual Herbs and Grasses		8.00
<i>Bouteloua aristidoides</i>	Needle Grama	0.50
<i>Bouteloua barbata</i>	Six Weeks Grama	0.20
<i>Datura discolor</i>	Sacred Datura	0.50
<i>Erigeron divergens</i>	Spreading Fleabane	0.50
<i>Kallstroemia grandiflora</i>	Arizona poppy	0.50
<i>Lesquerella gordonii</i>	Bladderpod	0.50
<i>Lupinus sparsiflorus</i>	Lupine	1.00
<i>Machaeranthera gracilis</i>	Slender Goldenweed	0.20
<i>Pectis papposa</i>	Chinchweed	0.10
<i>Penstemon parryi</i>	Penstemon, Parry	1.00
<i>Plantago insularis</i>	Indian Wheat	2.00
<i>Proboscidea parviflora</i>	Devil's Claw	0.50
<i>Salvia columbariae</i>	Chia	0.50
TOTAL		23.00

SEEDING SPECIAL PROVISIONS (SEPARATE APPLICATIONS OF SEED AND MULCH)

The work under this item shall consist of furnishing all materials, preparing the soil (tilling and nutrient enhancement), applying specified seed, and applying the final mulch cover. This seeding process separates the seed application from the mulch cover, helping to ensure that the seed has contact with the ground surface. The seeding process is adapted from ADOT seeding specifications.

GENERAL

Within 30 days of award of contract, the Contractor shall provide the Project Manager /Engineer with written notification of the selected seed supplier, as well as confirmation from the seed supplier that the contract-specified seed has been secured and will be available in the quantity required for the project.

Spec Sheets / Certificates of Compliance will be provided for all materials including tacking agent, wood fiber, mulch, and compost.

The Contractor shall provide all seed tag labels to the Engineer. No payment will be made for seed unless tag labels from all seed to be used on the project have been submitted as specified.

SEEDING PROCESS

1. Soil Ripping / Tilling

Proper soil preparation is essential for seeding success and is required prior to nutrient and seed application. Tillage (typically requiring ripping) improves infiltration of stormwater and can improve capacity for water storage / absorption. Soil shall not be tilled or ripped when the soils are wet and the moisture content would cause compaction. Soil may be prepared with a ripper bar, chisel plow, or other methods (including hand tillage) to produce the prescribed results. Equipment for soil tillage shall be provided by the Contractor as part of the seeding cost.

Prior to soil ripping / tilling, the contractor is responsible for:

- Determining buried utility depths to ensure that there is no conflict with soil work.
- Removal of invasive and non-native plant species.

All areas to be seeded shall be tilled to a minimum depth of 6" excluding the following areas:

- Within 3' of edge of mortared rip rap / concrete curb: Tillage at a depth between 4" - 6" will be provided.
- Within drip line of existing plant material: no tillage shall occur within the drip line of existing plant material. For trees and shrubs, this is the outer edge of canopy. For cacti tillage will occur no closer than 5' to plant. For saguaros over 8' in height no deep tillage will occur within 10' of trunk.

2. Amendment of Soil with Compost and Chemical Fertilizer

Compost and chemical fertilizer are installed after tilling and prior to planting and irrigation. The goal is for all amendments to be worked into the top 4-6" of the soil prior to the seeding application.

The following amendments will be applied:

- Chemical fertilizer and sulfur shall be applied at the rate of 200 pounds each per acre.
- Compost shall be applied at the rate of 15 cubic yards per acre for broadcast, or 3,000 pounds per acre for hydraulic application.

Refer to the Materials section for additional information and requirements.

3. Irrigation and Planting Installation

Irrigation and planting are now installed (post tilling and nutrient application). These items are done prior to seeding in order to minimize soil compaction after seeding, and to prevent seed from getting buried. Contractor shall leave the soil in a roughened condition and create furrows (minimum 3" deep, 12" minimum spacing between furrows) in areas where there are no conflicts with irrigation lines.

4. Seeding

Seed shall be applied by either hydroseeding or manual broadcast. Seeding shall not begin until all areas have been tilled and approved by the Engineer. Refer to the Materials section of this Special for requirements for all materials listed here.

The seeding process is accomplished with separate applications of (1) seed and (2) straw mulch cover. It is NOT acceptable to combine the seed and mulch in a single slurry. Regardless of the seeding method, the contractor shall obtain seed to soil contact. Seed application on top of straw mulch cover or hydraulically applied straw mulch cover shall be rejected.

Seeding shall not be performed when wind exceeds 10mph or if there are other conditions that prevent the uniform application of materials.

Seeding Application - Hydroseed: The specified seed shall be applied in a slurry containing 200 pounds of thermally-refined wood fiber and a minimum of 40 pounds tacking agent per acre. Seed shall not be in the slurry for more than 30 minutes. Hydroseeded areas shall have 100% coverage. Hydroseeded areas shall be mulched within 24 hours of seed application.

Seeding Application - Manual: The specified seed shall be broadcast manually to produce uniform distribution of seed. Seeded areas shall be mulched within 24 hours of seed application.

Straw Mulch Application (required for either method of seeding): Within 24 hours of seeding, hydraulically applied straw mulch with tacking agent and wood fiber shall be applied to all areas that were seeded.

The straw mulch slurry shall consist of:

- Hydraulically applied straw mulch (pounds per acre - dry weight): 2,500
- Tacking Agent (pounds pure mulilage per acre - dry weight): 150
- Thermally-refined Wood Fiber (pounds per acre - dry weight): 500

MATERIALS

Seed

Provide seed as specified on Plans. No substitution of species will be allowed unless evidence, showing that the specified materials are not reasonably available during the contract period, is submitted, in writing, by the contractor to the Engineer. The substitution of species shall be made only with the written approval of the Engineer, prior to making said substitution.

The seed shall be delivered to the project site in standard, sealed, undamaged containers. Each container shall be labeled in conformance with Arizona Revised Statutes and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the variety of strain of seed, the percentage of germination, purity and weed content, and the date of analysis which shall not be more than nine months prior to the delivery date.

Weed content of the seed mix shall not exceed 0.5%. If the sample contains any amount of a plant species listed as noxious, restricted or invasive, the seed mix will be rejected.

Tacking Agent: Tacking agent shall be a naturally occurring organic compound and shall be non-toxic. The tacking agent shall be a product typically used for binding soil and mulch in seeding or erosion control operations. Active ingredient shall consist of mulilage or gum obtained from guar or plantago. The tacking agent shall be labeled indicating the type and mulilage purity.

Thermally-Refined Wood Fiber: Wood cellulose fiber mulch shall be from thermo-mechanically processed wood, processed to contain no growth germination inhibiting factors. The mulch shall be from virgin wood manufactured and processed so the fibers will remain in uniform suspension in water under agitation to form homogenous slurry. Paper products will not be considered as virgin wood. The thermally-refined wood fiber mulch shall have the properties shown in Table 1 below:

TABLE 1: Thermally-Refined Wood Fiber

Virgin Wood Cellulose Fiber:	90% min.
Recycled Cellulose Fiber:	10% max.
Ash Content:	0.8% +/-0.3%
pH:	4.5 +/-1.0
Water Holding Capacity:	10 : 1 (water : fiber) Min.

Water: Water shall be free of oil, acid, salts or other substances which are harmful to plants. All non-potable water shall be tested for its suitability for seeding/planting with the water quality-related concerns of salinity, pathogens and contaminants.

Weed Free Straw Mulch for Hydraulic Application: Hydraulically applied straw mulch shall be wheat, barley, or rice straw (rye straw and oat straw are not acceptable) processed to various particle sizes. A minimum of 70 percent (70%) of the wheat, barley, or rice straw in the mix shall be not less than 1/2 inch ± 1/4 inch in length. Straw particles may be longer provided that the particles can be used with the selected hydroseeder without clogging. Hydraulically applied straw mulch, as furnished by the manufacturer, may contain up to ten (10) percent paper or cotton materials in dry weight.

Straw shall be free from noxious weeds in compliance with the standards and procedures of the North American Weed Management Association (NAWMA) or the Arizona Crop Improvement Association (ACIA). The contractor shall provide documentation, including a transit certificate, and appropriate labels and/or marking twine, from the ACIA or NAWMA that straw materials to be used for mulch are free of noxious weeds. The straw shall be accompanied by the certification, labels and/or marking twine at the time of delivery to the project site. Straw delivered to the project without such information will be rejected, and promptly removed from the project.

The date of installation of hydraulically applied straw mulch cover shall be less than twelve (12) months from the date of production. The date of production of hydraulically applied straw mulch material shall be presented for verification by the Engineer.

Chemical Fertilizer and Sulfur: Chemical fertilizer shall be composed of a mixture of one part sulfur-coated urea 25-4-8, one part monammonium phosphate 11-52-0, and one part methylene urea 38-0-0. The sulfur-coated urea, a blended fertilizer 25-4-8, shall have approximately 80 percent of the nitrogen defined as slow release, and contain 5 percent Iron, 10 percent sulfur and trace amounts of zinc and manganese. The result shall be a 24-18-2 chemical blended fertilizer, as specified herein. Application rate is 200 pounds per acre.

In addition to the fertilizer mixture, agricultural sulfur compounds, comprised of between 80 percent and 96 percent sulfur, shall be applied at the rate of 200 pounds per acre.

Compost: Compost may be applied manually or hydraulically. Compost shall consist of composted organic vegetative materials and may contain worm castings. No animal manures or biosolids shall be used in the compost or added to the compost. Compost shall be dark brown in color with the parent material composted and no longer visible. The structure shall be a mixture of fine and medium size particles and humus crumbs. The odor shall be that of rich humus with no ammonia or anaerobic odors.

Application Rate (Manual application): 15 cubic yards per acre, to be applied prior to final tilling so that compost can be incorporated into the soil.

Application Rate (Hydraulic application): 3,000 pounds per acre, to be applied after final tilling. Hydraulically applied compost may be combined with soil amendments and fertilizer in the same slurry. Seeding will be applied separately, after the application of compost and amendments - these will NOT be combined in a slurry.

ROUTINE CARE

- All machines used for hydroseeding shall be capable of continuous agitation of the slurry mixture during the seeding operation. Pump pressure shall maintain a continuous non-fluctuating spray. The sprayer shall deliver a uniform application of hydroseed.
- Hydroseed deposited on adjacent trees and shrubs, walkways, on structures and on any areas where seeding is not specified shall be removed.
- Care shall be taken during the seeding operations to prevent damage to existing trees and shrubs in the seeding area.
- Preservation of Seeded Areas. The contractor shall protect seeded areas from damage by traffic or construction equipment. Surfaces eroded or otherwise damaged following seeding shall be repaired by re-grading and reseeding as directed by the Owner.

LJA Engineering, Inc.

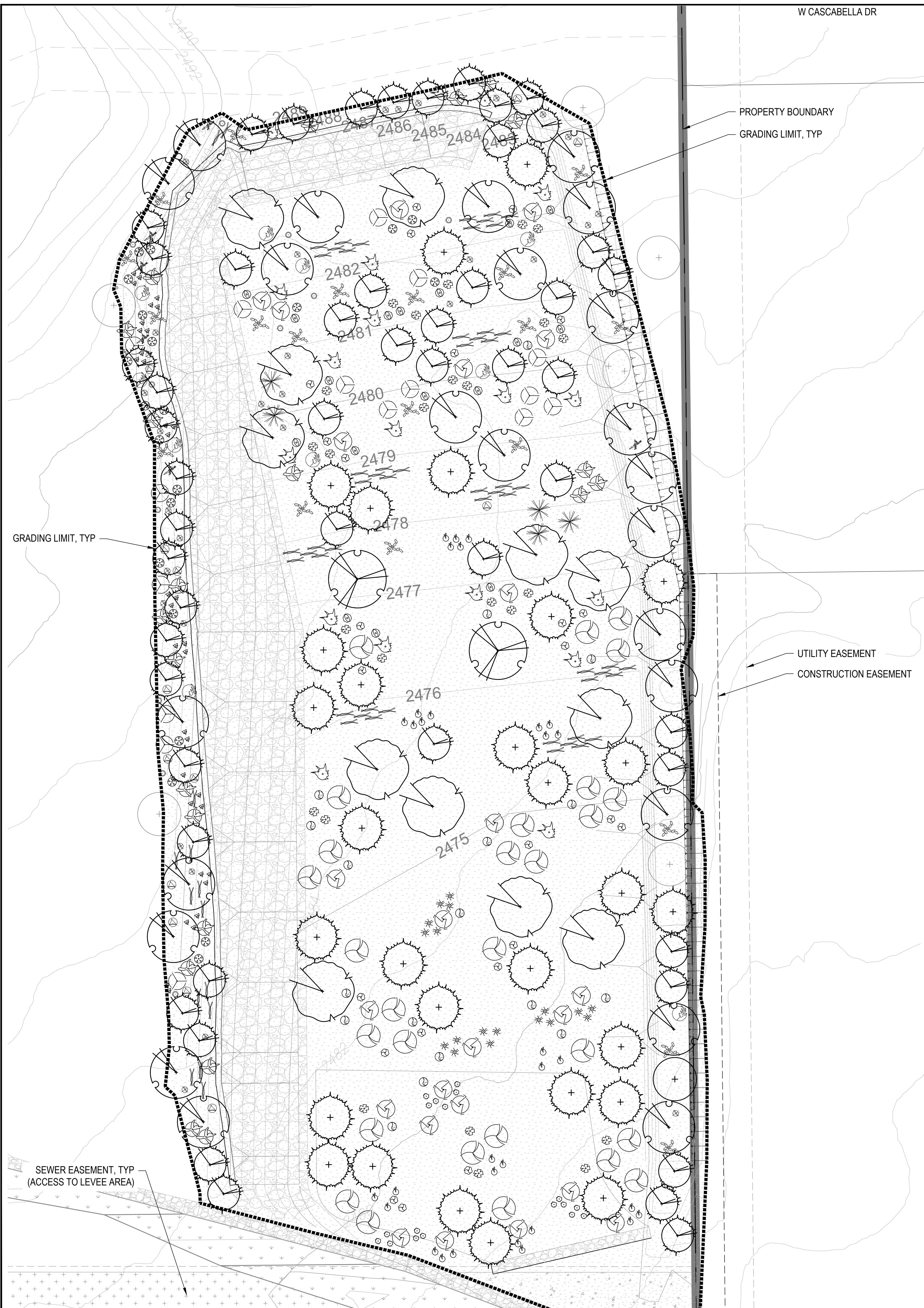
1880 E River Rd Suite 325
Tucson, AZ 85718
Phone 520.257.3400

LANDSCAPE PLAN NOTES + SEEDMIX

SUNDARA RIDGE - SE LEVEE RESTORATION

PROJECT NUMBER

10



SCHEDULE: TREES (REQUIRED TRANSPLANTS AND MITIGATION)

SYMBOL	BOTANICAL NAME COMMON NAME	TRANSPLANT FROM SITE (SIZE PER SHEET 2)	NURSERY PLANTS (MITIGATION FOR PLANTS DESTROYED - RFS) (SIZE PER SHEET 2)	NURSERY PLANTS (MITIGATION FOR SIGNIFICANT PLANTS DESTROYED - RFS)	TOTAL TRANSPLANT + NEW NURSERY PLANTING
○	Celtis pallida Desert Hackberry	5 EA	3 EA	0	8
○	Parkinsonia florida Blue Palo Verde	1 EA	1 EA	0	2
○	Parkinsonia microphylla Foothill Palo Verde	12 EA	2 EA	5 EA @ 36" Box 5 EA @ 48" Box	24
○	Prosopis velutina Velvet Mesquite	5 EA	3 EA	2 EA @ 36" Box 2 EA @ 48" Box	12
+	Senegalia greggii Catclaw Acacia	8 EA	21 EA	0	29
○	Vachellia constricta Whitetorn Acacia	20 EA	32 EA		52

LANDSCAPE PLAN

SCALE: 1" = 20'-0"

SYMBOL / LINETYPE LEGEND

- PROPERTY BOUNDARY
- LIMIT OF GRADING
- EXISTING CONTOUR
- PROPOSED CONTOUR
- TRAIL PER CIVIL PLAN
- EXISTING TREE PRESERVED IN PLACE

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1880 E River Rd Suite 325,
Tucson, AZ 85718
Phone 520.257.3400



2738 Adams Street
Tucson, Arizona 85716
Phone: (520) 320-3936
www.wilder.com
© Wilder Landscape Architects LLC

LANDSCAPE PLAN

SUNDARA RIDGE - SE LEVEE RESTORATION

SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH,
RANGE 13 EAST, G & SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

PROJECT NUMBER



PLAN STATUS

DATE

DESCRIPTION

TEAM

DESIGN

TEAM

DRAWN

JP

CHKD

SCALE

H:

V:

JOB No.

DATE:

9/4/2024

SHEET

6

OF

9

GRADING PERMIT #2500131

SCHEDULE: SUCCULENTS (REQUIRED TRANSPLANTS AND MITIGATION)

SYMBOL	BOTANICAL NAME COMMON NAME	TRANSPLANT FROM SITE (SIZE PER SHEET 2)	NURSERY PLANTS (MITIGATION FOR PLANTS DESTROYED - RFS) (SIZE PER SHEET 2)	NURSERY PLANTS (MITIGATION FOR SIGNIFICANT PLANTS DESTROYED - RFS)	TOTAL TRANSPLANT + NEW NURSERY PLANTING
○	Carnegiea gigantea Saguaro	10 EA	0	1 EA	11
○	Ferocactus wislizeni Fishhook Barrel	16 EA	8 EA	0	24
○	Peniocereus greggii Queen of the Night	1 EA	0	0	1
★	Yucca elata Soapree Yucca	5 EA	0	0	5

SCHEDULE: REQUIRED UNDERSTORY PLANTINGS

5 each understory plants are required for every viable tree that is mitigated. 395 understory plants are required for this project. Refer to the Native Plant Mitigation Summary, Sheet L2. Under-story plants were selected from the Supplemental Native Plant List, Addendum C (for significant trees) and the supplemental Arizona Department of Water Quality native plant list. Plants shall either be nursery plants or transplanted from on-site. Species substitutions are not allowed without prior written authorization from the Town of Oro Valley. All understory plants were either observed on site and / or are included in the NRCS Ecological Site Description for the Sandy Loam Upland soils associated with this site.

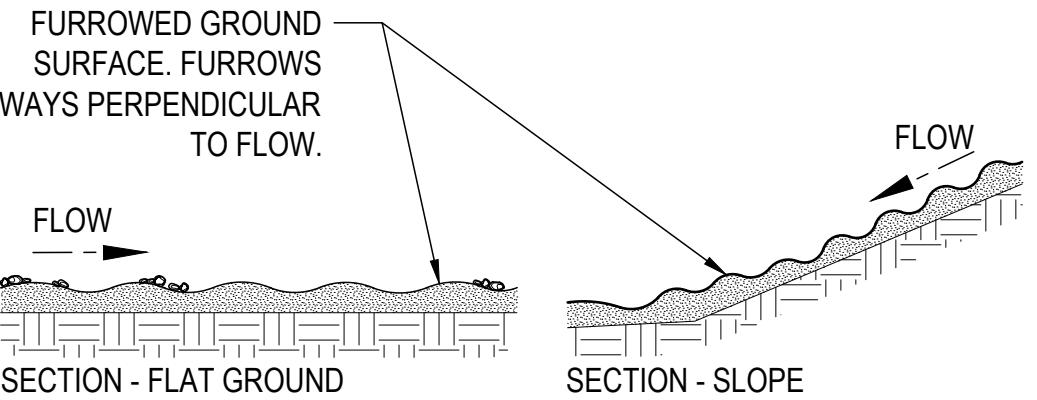
SYMBOL	BOTANICAL NAME COMMON NAME	CONT. SIZE	QTY	SYMBOL	BOTANICAL NAME COMMON NAME	CONT. SIZE	QTY
▲	Ambrosia deltoidea Triangle-leaf Bursage	1 Gal	35	▲	Cylindropuntia arbuscula Arizona Pencil Cholla	5 Gal	6
○	Atriplex canescens Fourwing Saltbush	5 Gal	21	○	Cylindropuntia fulgida Chainfruit Cholla	5 Gal	20
○	Celtis pallida Desert Hackberry	5 Gal	20	○	Cylindropuntia leptocaulis Christmas Cactus	5 Gal	13
○	Digitaria californica Arizona Cottontop	1 Gal	32	○	Cylindropuntia versicolor Staghorn Cholla	5 Gal	10
○	Encelia farinosa Brittlebush	5 Gal	21	○	Ferocactus wislizeni Fishhook Barrel	5 Gal	8
○	Heteropogon contortus Tanglehead	1 Gal	18				
*	Hilaria Rigida Big Galleta	1 Gal	18				
○	Isocoma tenuisecta Burrow Goldenweed	1 Gal	17				
○	Larrea tridentata Creosote	5 Gal	16				
○	Lycium berlandieri Berlandier's Wolfberry	5 Gal	19				
○	Sphaeralcea ambigua Globemallow	1 Gal	24				
○	Trixis californica Trixis	1 Gal	18				
○	Viguiera parishii Goldeneye	1 Gal	25				
○	Ziziphus obtusifolia Graythorn	5 Gal	24				

GROUNDCOVER

SYMBOL	ITEM	QTY	SUPPLIER / REQS	NOTES / DETAIL
	Seeding (Hydroseed followed by a separate application of Straw Mulch)	1.67 AC (72,546 SF)	Seeding includes ground preparation and fertilizer, seed mix application, and final mulch cover. Seeding shall be applied to all disturbed site area. Seed Supplier: Wildlands Restoration, Gary Maskarinec, garyberni@aol.com 520-882-0969 Hydroseed Applicator: Grasslands Reclamation & Seeding, Jim Lochner, 520-869-1697, jimgrasslands@hotmail.com	Refer to Seed Mix, Sheet 4; Detail 1, Sheet 7 & Seeding Specifications, Sheet 4, for additional requirements.
	Ground Surface Branch Mulching	Per Plan	Trees designated as remove from site are to be cut and stockpiled for placement at end of project. After seeding has been completed, branches will be placed on contour. In areas of existing / new planting, branches shall be placed around, but not on top of, plants. Placement will be done by hand, with care taken to limit soil compaction.	Refer to Detail 8, Sheet 7.

NOTE: Quantities are provided for reference only. Contractor is responsible for calculating amount of material required to construct the project as depicted on the plan. Seeding quantity will vary based on actual limit of disturbance.



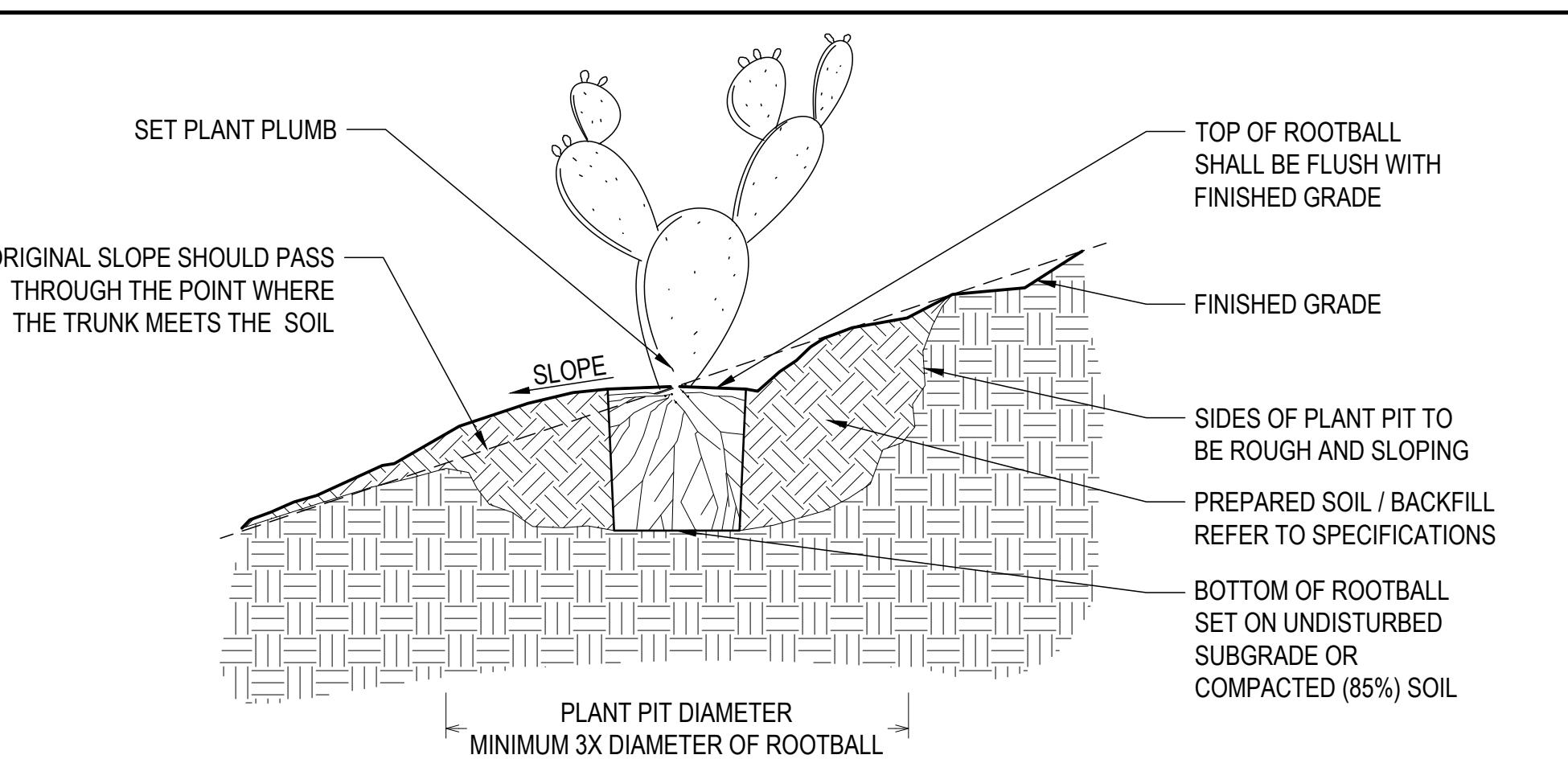


NOTES:

1. Ground surface to be furrowed along contour prior to seeding and after completion of all work in the area.
2. Depth and spacing of furrows per Specifications.
3. Intent of furrows is to slow stormwater runoff, and aid in seed germination.
4. Seeding to be applied after planting and irrigation is complete.

1 SOIL FURROWING (TO BE USED WITH SEEDING)

NTS

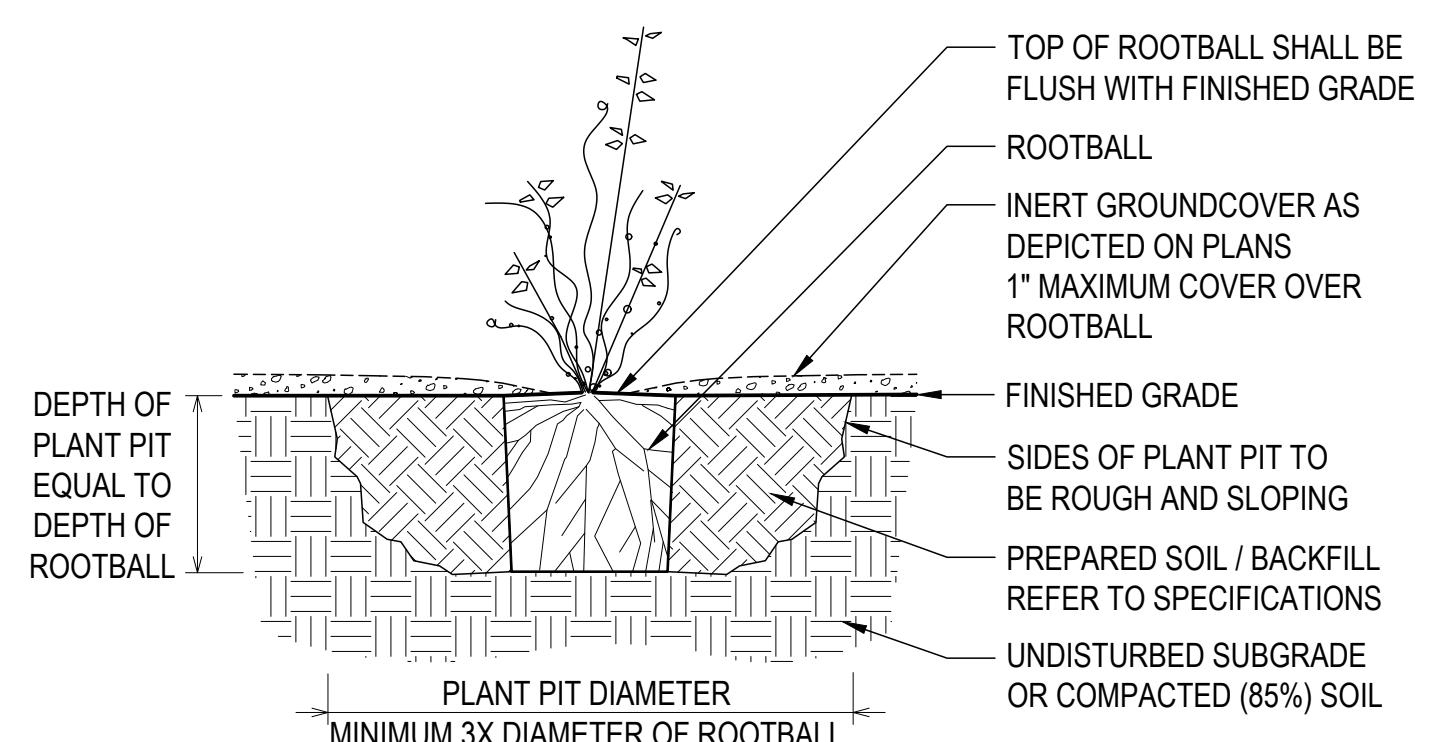


NOTES:

1. No plants shall be staked except at direction of Owner's Representative.
2. Test drainage of planting pit prior to planting. Provide drainage chimneys / overexcavation as required by specifications.
3. Do not berm soil on down slope side of cacti. Water should not be held around plant stem.
4. Remove any trash / debris prior to placing prepared soil / backfill in planting pit.

2 CACTI PLANTING ON SLOPE

NTS

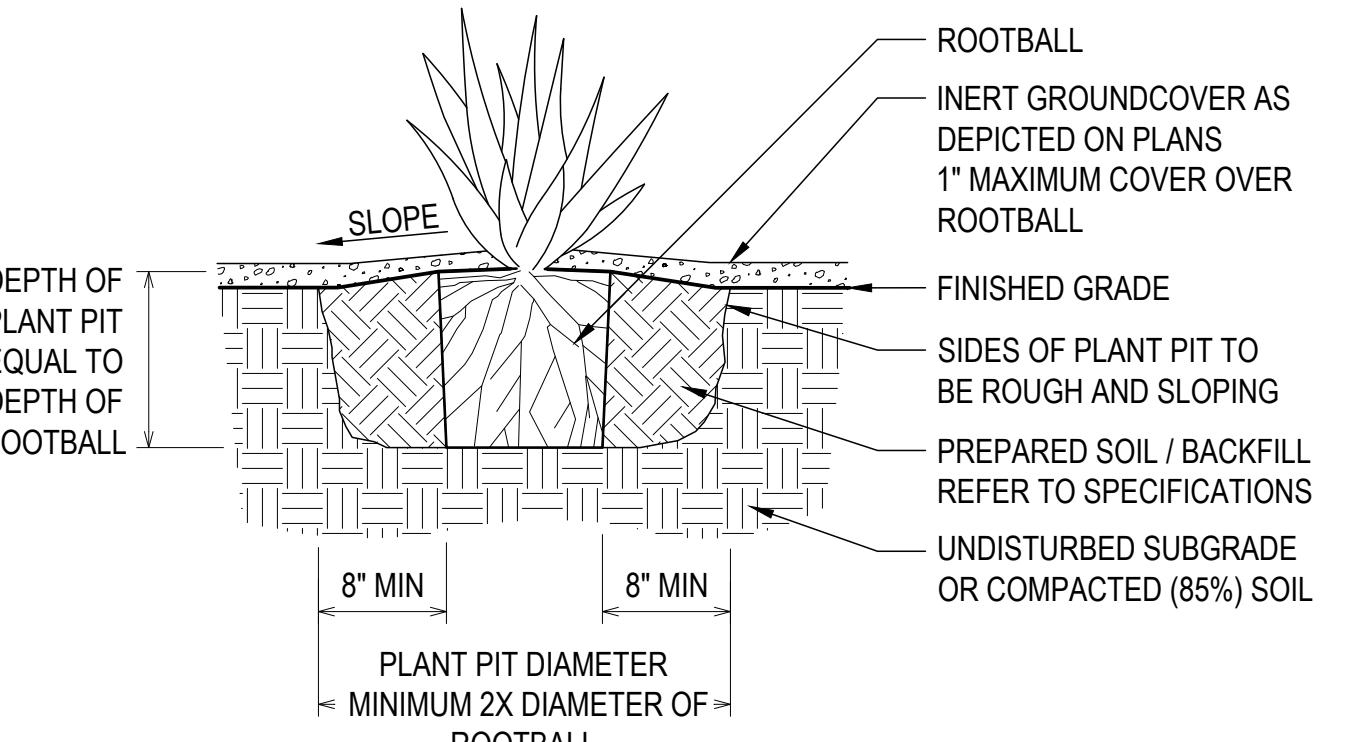


NOTES:

1. No plants shall be pruned except at direction of Owner's Representative.
2. Test drainage of planting pit prior to planting. Provide drainage chimneys / overexcavation as required by specifications.
3. Remove any trash / debris prior to placing prepared soil / backfill in planting pit.

4 SHRUB PLANTING

NTS

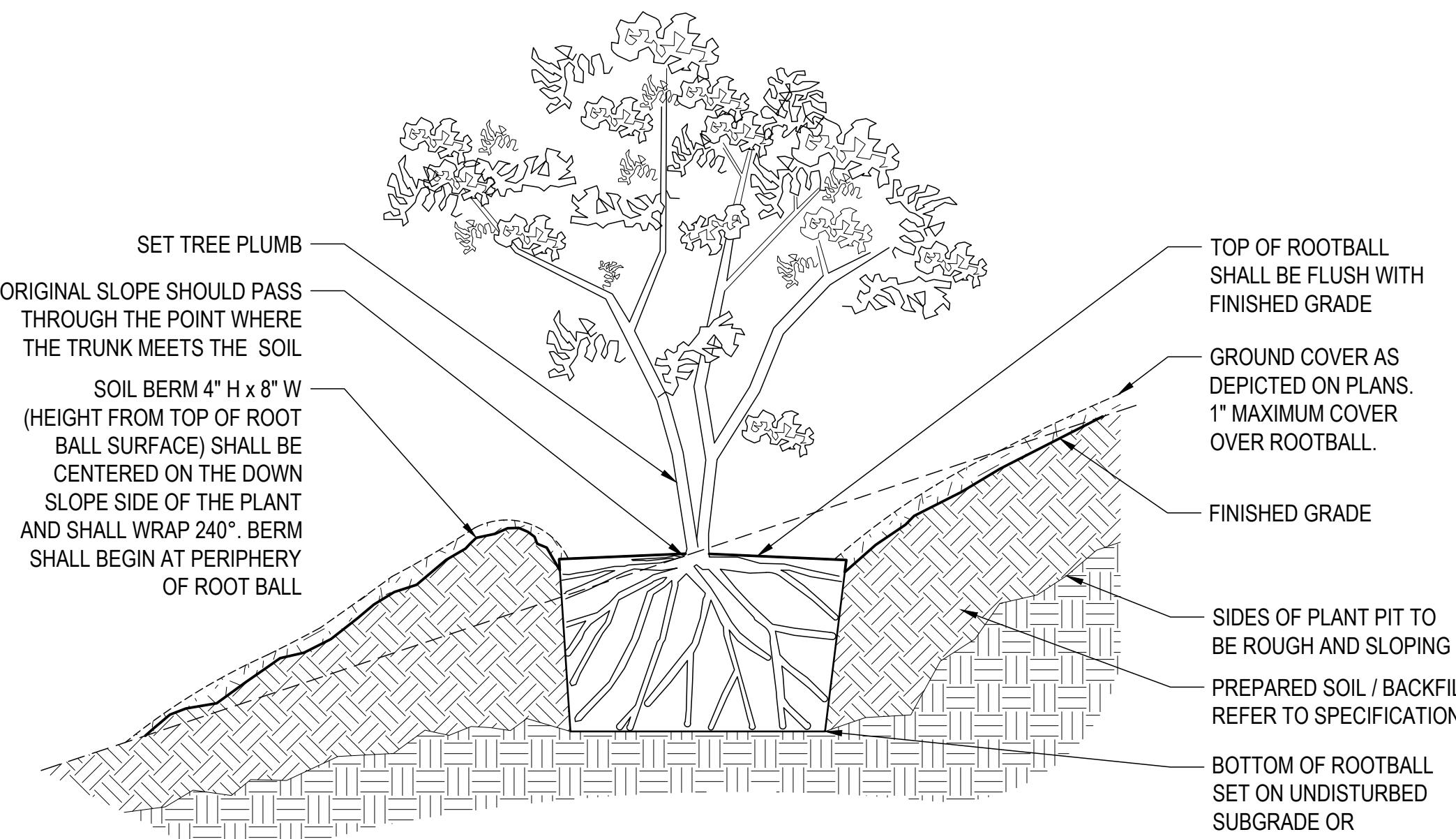


NOTES:

1. Slope backfill away from succulent. Do not create a berm at base of plant.
2. Test drainage of planting pit prior to planting. Provide drainage chimneys / overexcavation as required by specifications.
3. Remove any trash / debris prior to placing prepared soil / backfill in planting pit.

5 SUCCULENT PLANTING - CONTAINER GROWN

NTS

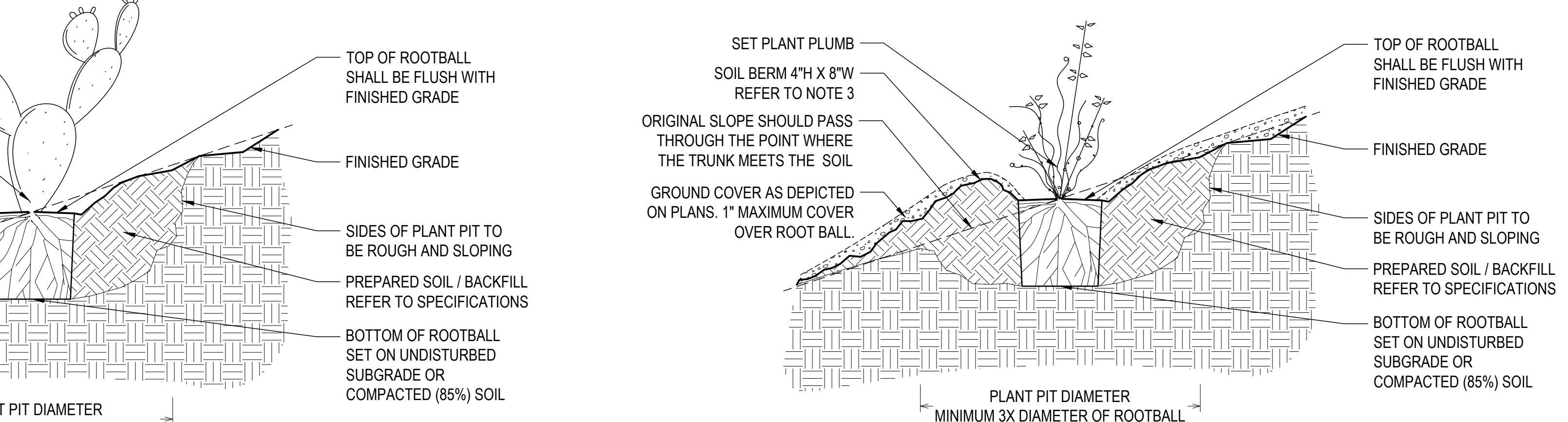


NOTES:

1. No plants shall be staked except at direction of Owner's Representative.
2. Test drainage of planting pit prior to planting. Provide drainage chimneys / overexcavation as required by specifications.
3. Remove any trash / debris prior to placing prepared soil / backfill in planting pit.

7 TREE PLANTING ON SLOPE

NTS

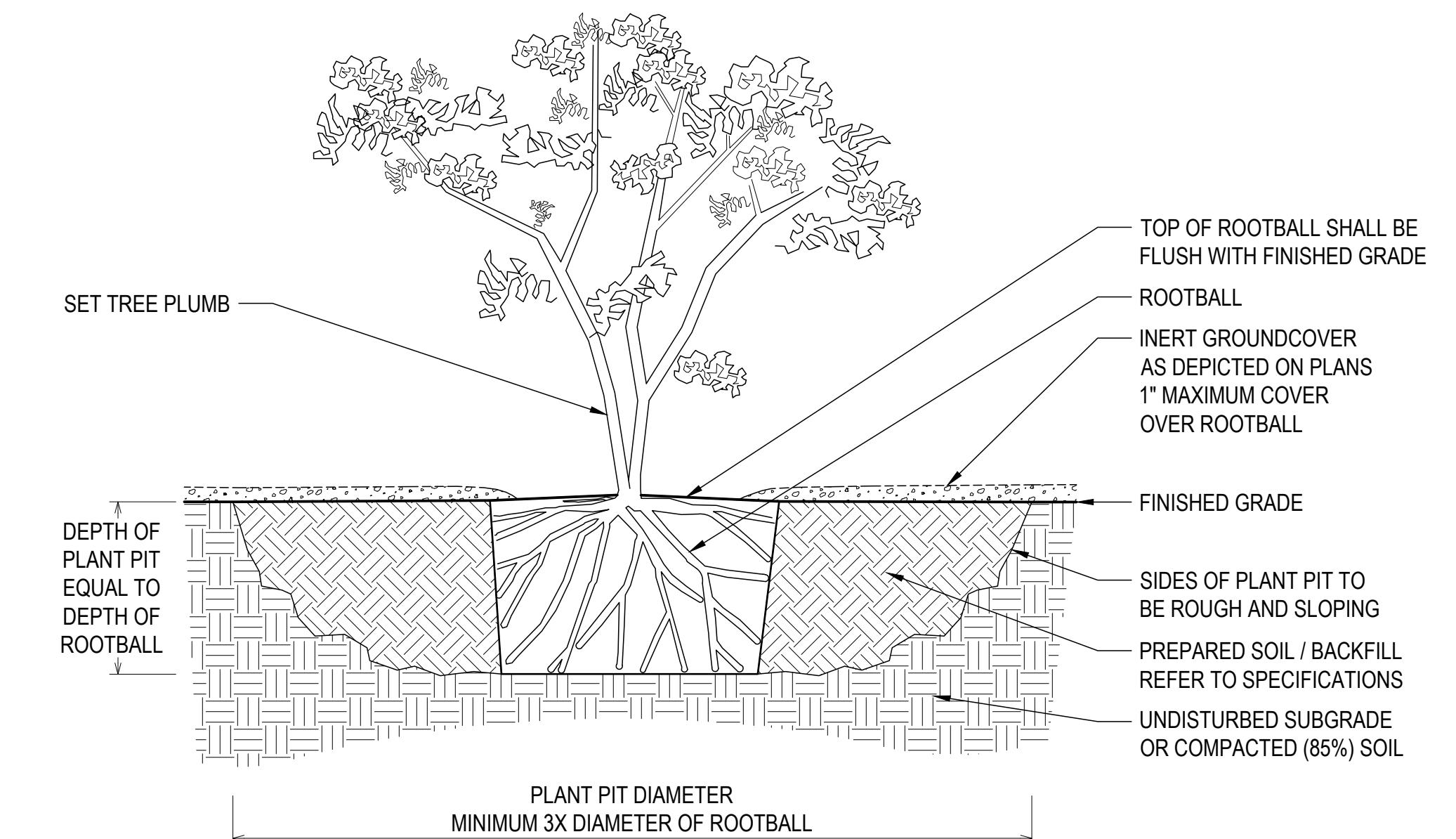


NOTES:

1. No plants shall be pruned except at direction of Owner's Representative.
2. Test drainage of planting pit prior to planting. Provide drainage chimneys / overexcavation as required by specifications.
3. Berm height measured from top of rootball surface. Center berm on down slope side of plant and wrap 240°. Begin berm at periphery of rootball.
4. Remove any trash / debris prior to placing prepared soil / backfill in planting pit.

3 SHRUB PLANTING ON SLOPE

NTS



NOTES:

1. No plants shall be staked except at direction of Owner's Representative.
2. Test drainage of planting pit prior to planting. Provide drainage chimneys / overexcavation as required by specifications.
3. Remove any trash / debris prior to placing prepared soil / backfill in planting pit.

6 TREE PLANTING

NTS



NOTES:

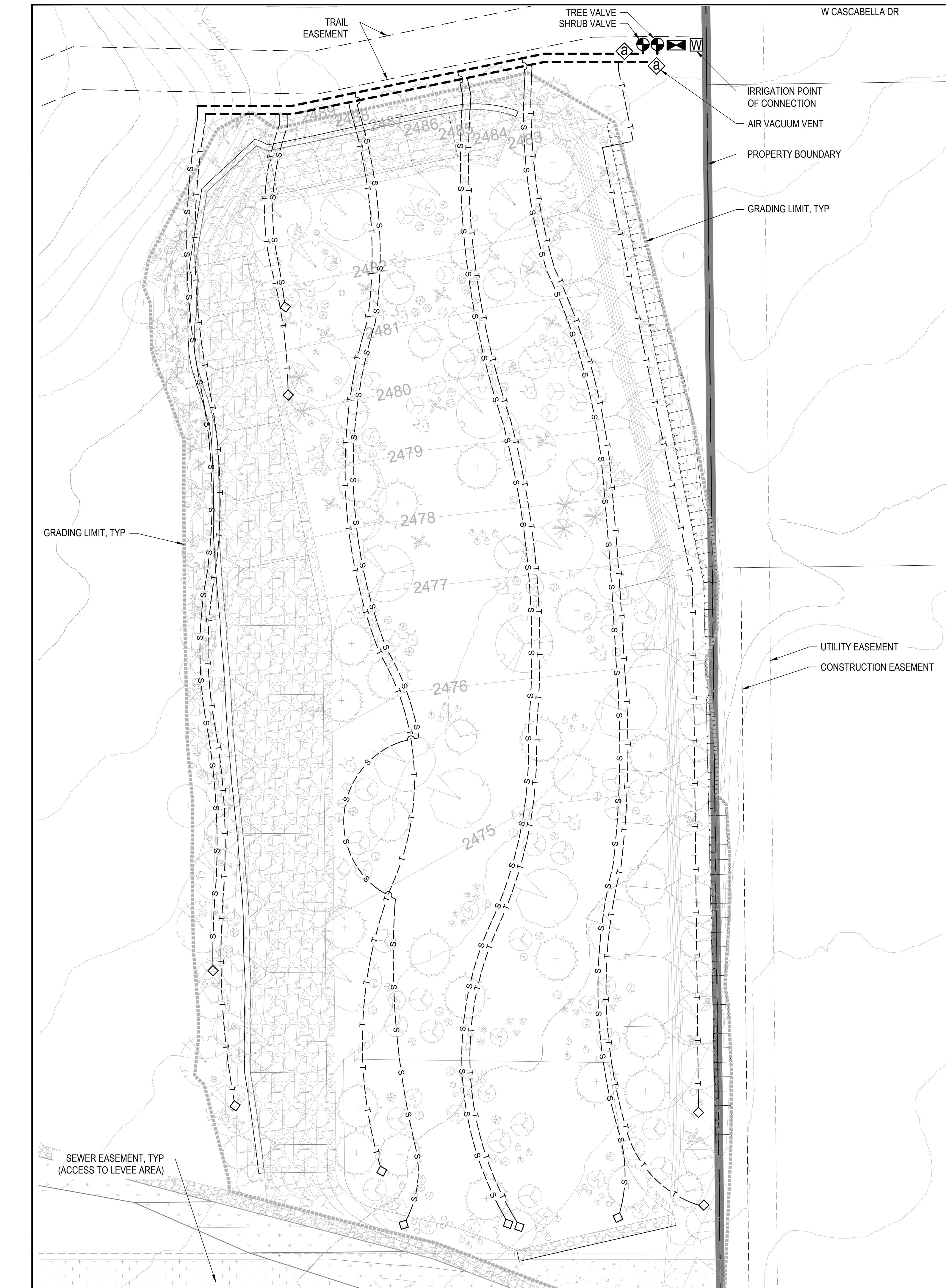
1. The goal of branch mulching is to use the valuable green 'waste' on site rather than trucking it to a landfill / recycling plant. Branch mulch reduces erosion, shades the soil allowing for better seed germination, provides refuge for small critters and improves the soil as it is consumed by insects and soil organisms.
2. Branches and limbs shall be cut into pieces no longer than 5', and stockpiled on site until finish grading, irrigation, planting, and seeding have occurred. Upon completion of seeding, contractor shall arrange the branches along contour (perpendicular to slope) in the areas shown on the Landscape Plan. Arrange the branches 6 - 8" high maximum. There should be ample visible soil.
3. Branches may be placed around new / existing plants. Care will be taken not to damage plant material, and no branches shall be placed on top of plants.

8 BRANCH MULCHING

NTS

TOV CASE #
 2201777
 RELATED CASE #
 2101153
 OV914-009
 OV2100731
 OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA 811
 Call 811 or click Arizona811.com



IRRIGATION SYSTEM DESCRIPTION

A temporary above-ground irrigation system will be installed to irrigate all plant material installed as part of the levee restoration planting. The system shall be maintained for a minimum of five years to establish plant material. After establishment, all irrigation system components will be removed from site.

The design is based on a 1" water meter (Metro Water) with 68 PSI after the backflow preventer. The system is designed to operate with 25 GPM flow through the tree valve and a 5 GPM flow through the shrub valve.

IRRIGATION NOTES

- The Irrigation Plan is conceptual. The Contractor shall furnish a system that provides complete coverage to all intended areas. System adjustments shall be made to maximize coverage and efficiency.
- The short mainline will be buried, all other laterals and sub-laterals will be above ground. The remote control valves shall be installed in valve boxes.
- Contractor assumes responsibility for damage or theft that may occur with above-ground components.
- All irrigation lines / components are to be located within the Project Site.
- The Owner reserves the right to reject any materials or workmanship.
- Prior to the supply and installation of any irrigation equipment. The Contractor shall submit for approval manufacturer's "cut sheet" / technical information for each type of pipe, controller, valves, valve boxes, wire, conduit, fittings and all other types of fixtures and equipment which he/she proposes to install on the job.
- Staking of laterals and sub-laterals is suggested to prevent pipe movement.

EMITTER SCHEDULE

PLANT CONTAINER SIZE	EMITTER QTY	EMITTER OUTPUT
Trees:		
15 Gal	3	1 GPH
25 Gal / 24" Box	4	
36" Box	6	
48" Box	10	
60" Box or greater	12	
Shrubs: 5 gallon		
	1	1 GPH

NOTE: No irrigation to cacti. Thoroughly soak at planting.

IRRIGATION EQUIPMENT SCHEDULE

ITEM	MANUFACTURER / MODEL	SIZE	QTY	NOTES
Water Meter				1" minimum. Refer to Civil Plans.
Reduced Pressure Backflow Prevention Assembly	Febco 825Y	1"	1 EA	
Irrigation Controller 'A'	Hunter Node 200 (2-valve battery operated controller)		1 EA	Install with Remote Control Valve. Refer to Detail 1, Sheet 9.
Zone Control Valve (Tree) Filter Pressure Regulator	Hunter ICV-151G-FS-DC Rain Bird LCRBY150S Senninger PR40HF5F5FV	1 1/2", 1 1/2", 1 1/4"	1 EA 1 EA 1 EA	Install in Jumbo Valve Box. Refer to Detail 1, Sheet 9.
Zone Control Valve (Shrub) Combo Filter + Pressure Regulator	Hunter ICV-101G-FS-DC Rain Bird PRB-QKCHK-100	1", 1"	1 EA 1 EA	Install in Jumbo Valve Box. Refer to Detail 1, Sheet 9.
Air Vacuum Vent	Netafim Guardian / 65ARIA100	3/4"	2 EA	
Mainline Pipe, Sch 40 PVC		1 1/2"	25 LF	Bury pipe
Lateral Line (Tree) HDPE	HDPE 4710, ASTM D 2239, SDR 15, 125 PSI	1 1/2"	165 LF	Run pipe above ground
Lateral Line (Shrub) HDPE	HDPE 4710, ASTM D 2239, SDR 15, 125 PSI	1"	160 LF	Run pipe above ground
Sub-lateral Line (Tree + Shrub) Poly	PE (.82" ID)	3/4"	3650 LF	Run pipe above ground
Lateral End Cap Assembly		N/A	11 EA	
Unconnected Pipe Crossing				
Pressure Compensating Emitters	Rain Bird XB or Multi-outlet XB	1 GPH	1790 EA	Refer to Details 2 - 8, Sheet 9

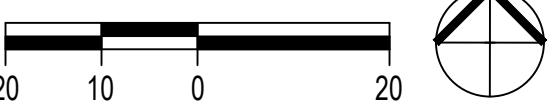
NOTE: Quantities shown are for reference only. Contractor is responsible for calculating actual quantities as depicted on plan, adjusting quantities as required to provide irrigation to all plant material.

SYMBOL / LINETYPE LEGEND

	PROPERTY BOUNDARY
	LIMIT OF GRADING
	EXISTING CONTOUR
	PROPOSED CONTOUR
	TRAIL PER CIVIL PLAN
	EXISTING TREE PRESERVED IN PLACE

IRRIGATION PLAN

SCALE: 1" = 20'-0"



LJA Engineering, Inc.

1880 E River Rd Suite 325,
Tucson, AZ 85718
Phone 520.257.3400



2738 E Adams Street
Tucson, Arizona 85716
Phone: (520) 320-3936
www.wildera.com
© Wilder Landscape Architects LLC

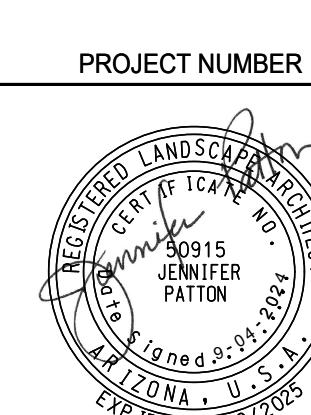
IRRIGATION PLAN

SUNDARA RIDGE - SE LEVEE RESTORATION

A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA

2101153

2/10/2024

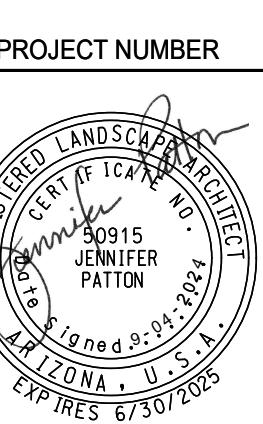


PLAN STATUS

NOT DRAWN

NOT CHECKED

NOT DRAWN



PLAN STATUS

PROJECT NUMBER

DATE 201777

TEAM DESIGN

TEAM DRAWN

JP CHKD

SCALE H: V:

JOB No.

DATE: 9/4/2024

TOV CASE #

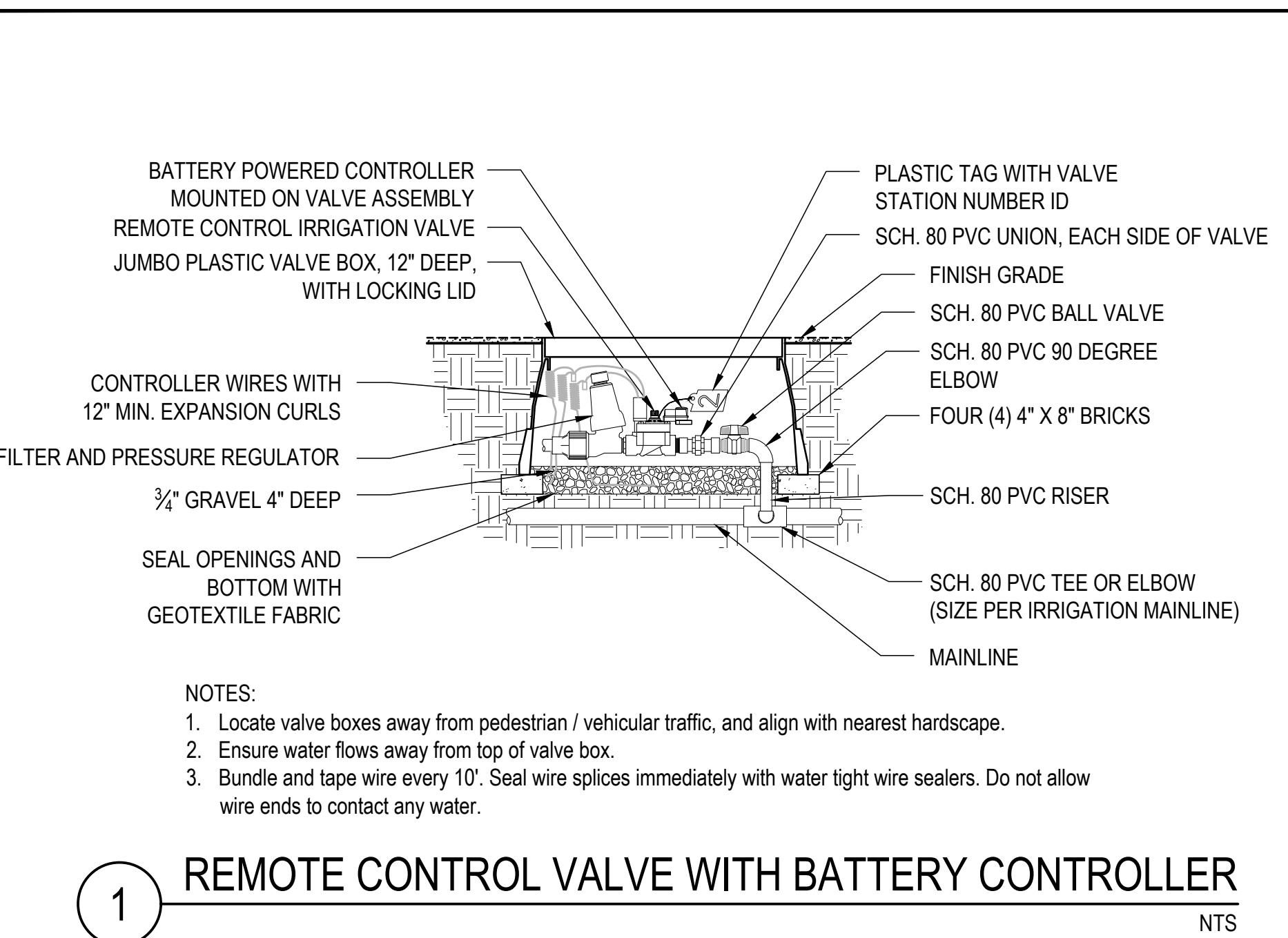
RELATED CASE #

CONTACT ARIZONA 811 AT LEAST TWO FULL WORKING DAYS BEFORE YOU BEGIN EXCAVATION

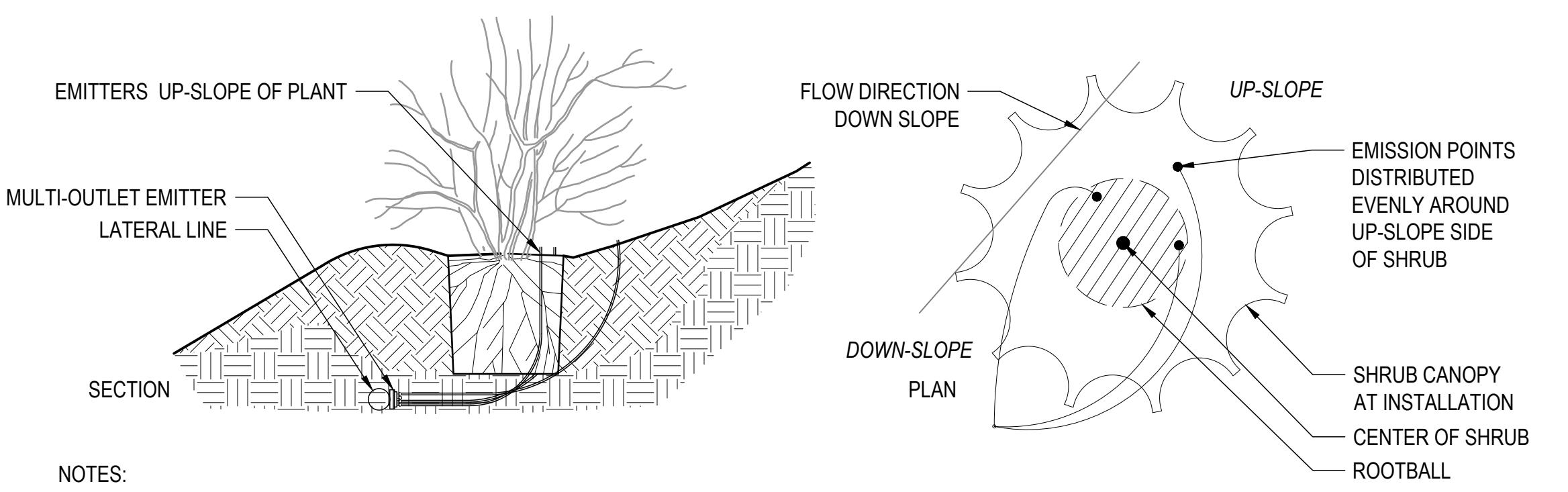


Call 811 or click Arizona811.com

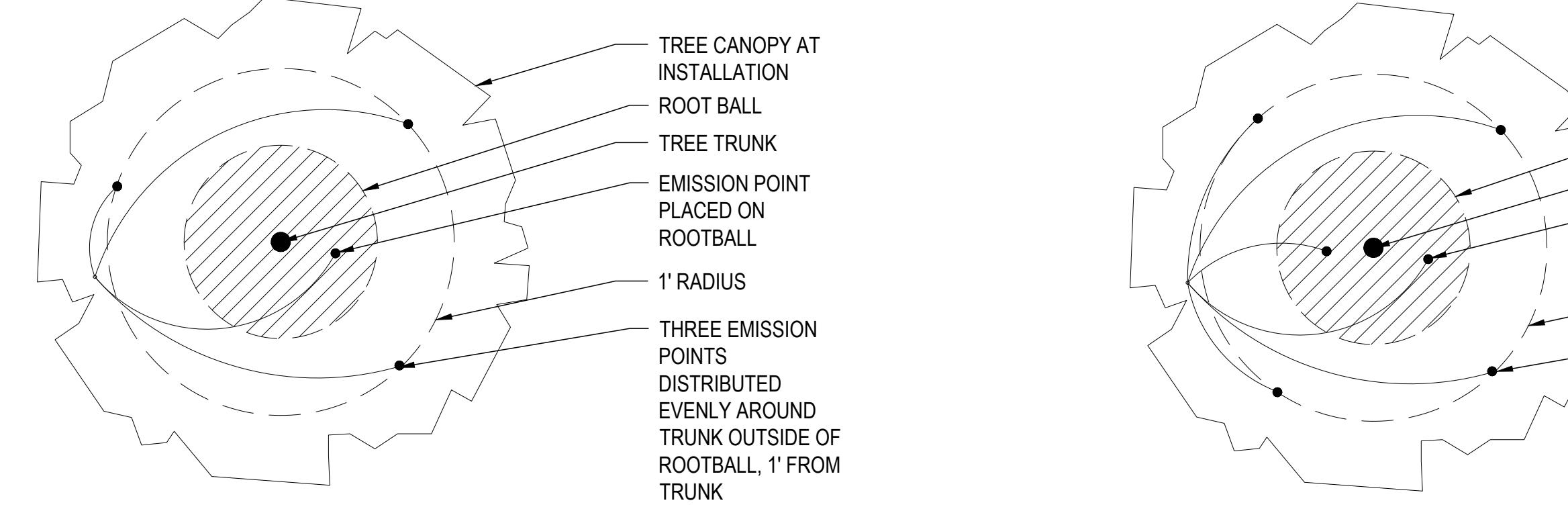
GRADING PERMIT #2500131



1 REMOTE CONTROL VALVE WITH BATTERY CONTROLLER

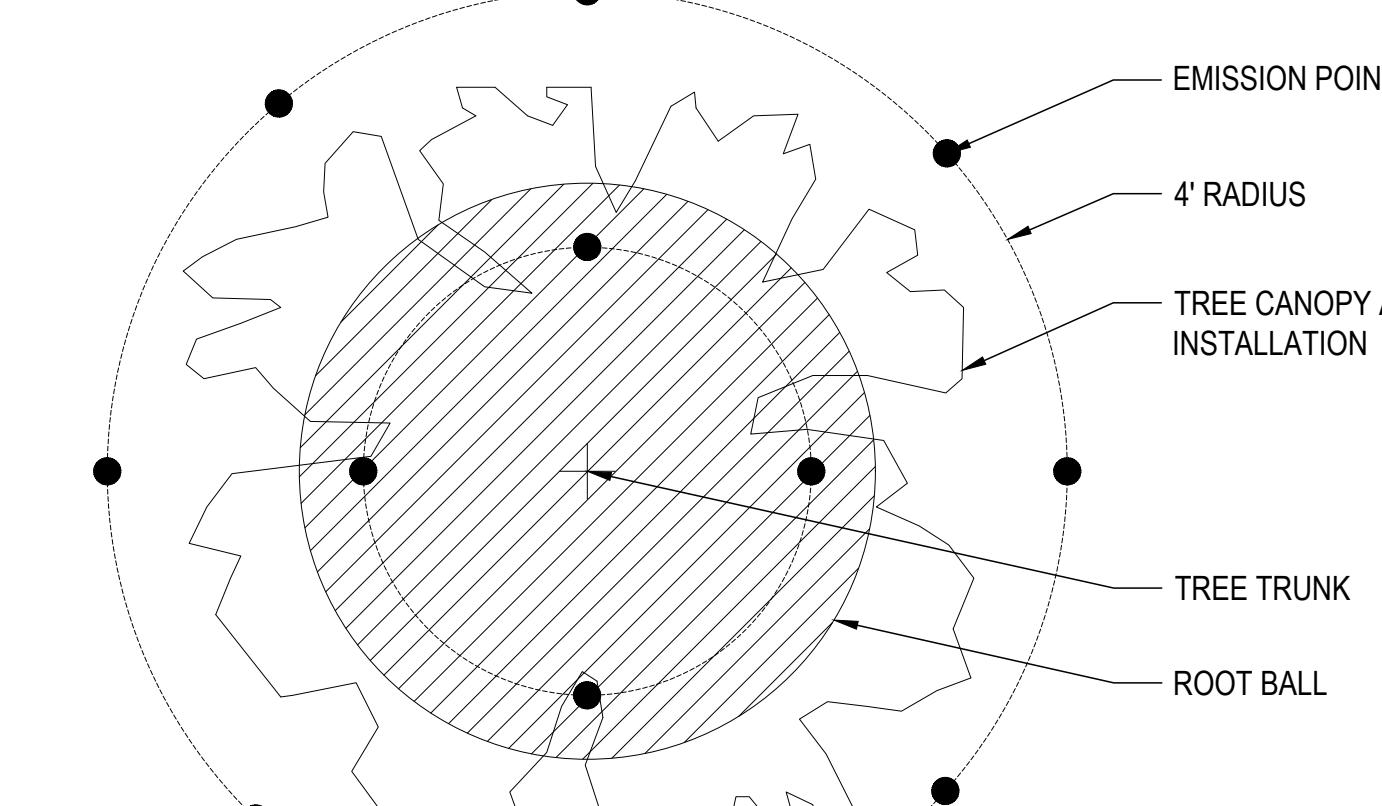


2 Emitter Placement - Slopes



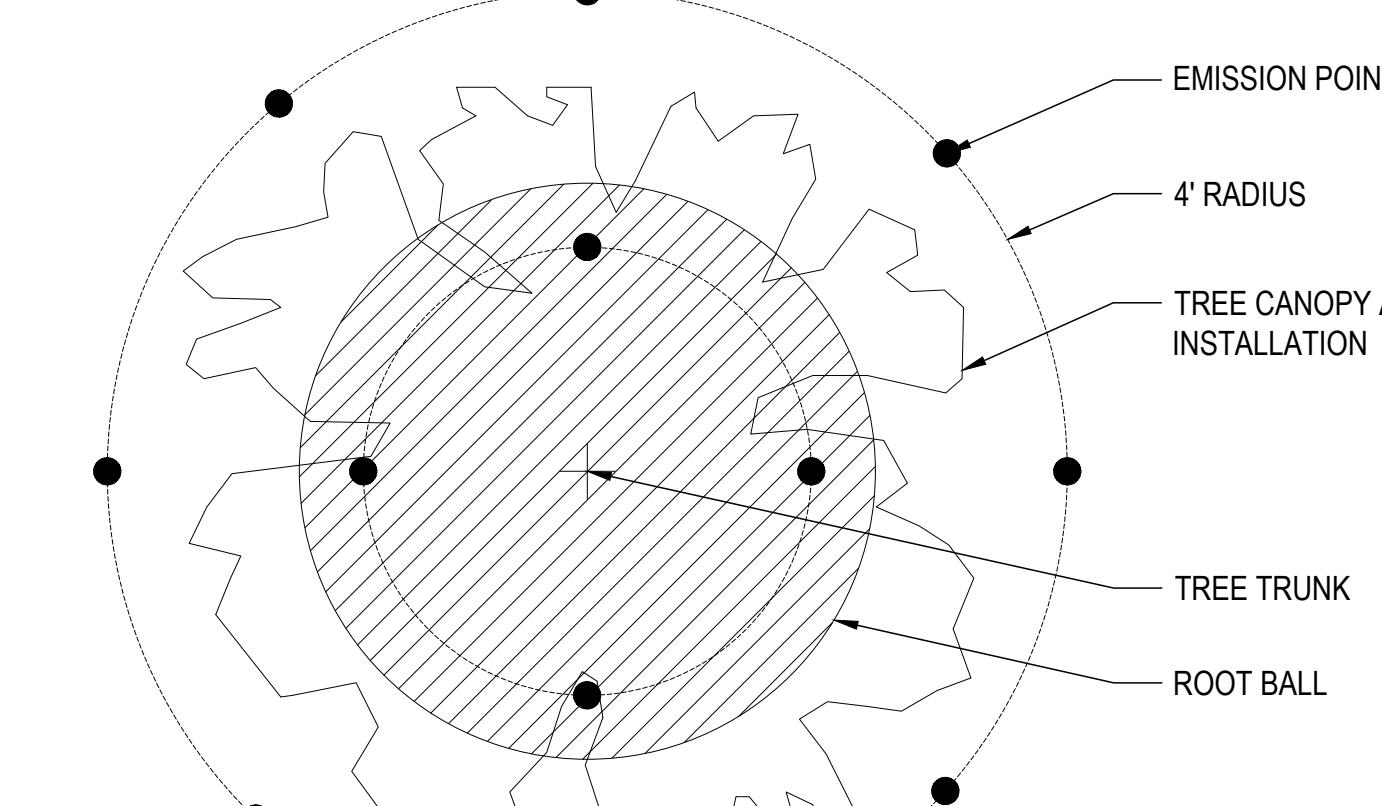
3 MULTI-OUTLET Emitter Placement Layout - TREES, 3-EMITTER

NTS



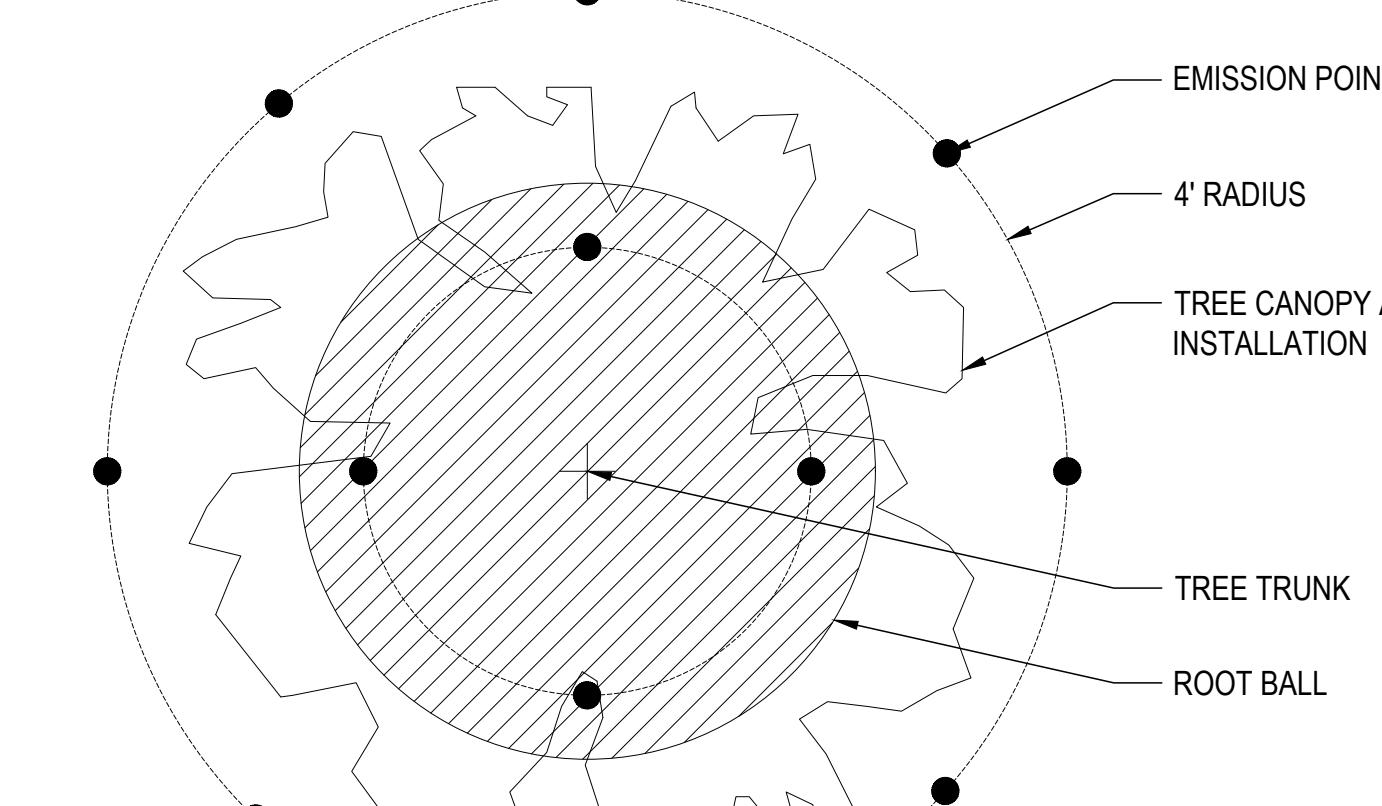
4 MULTI-OUTLET Emitter Placement Layout - TREES, 4-EMITTER

NTS



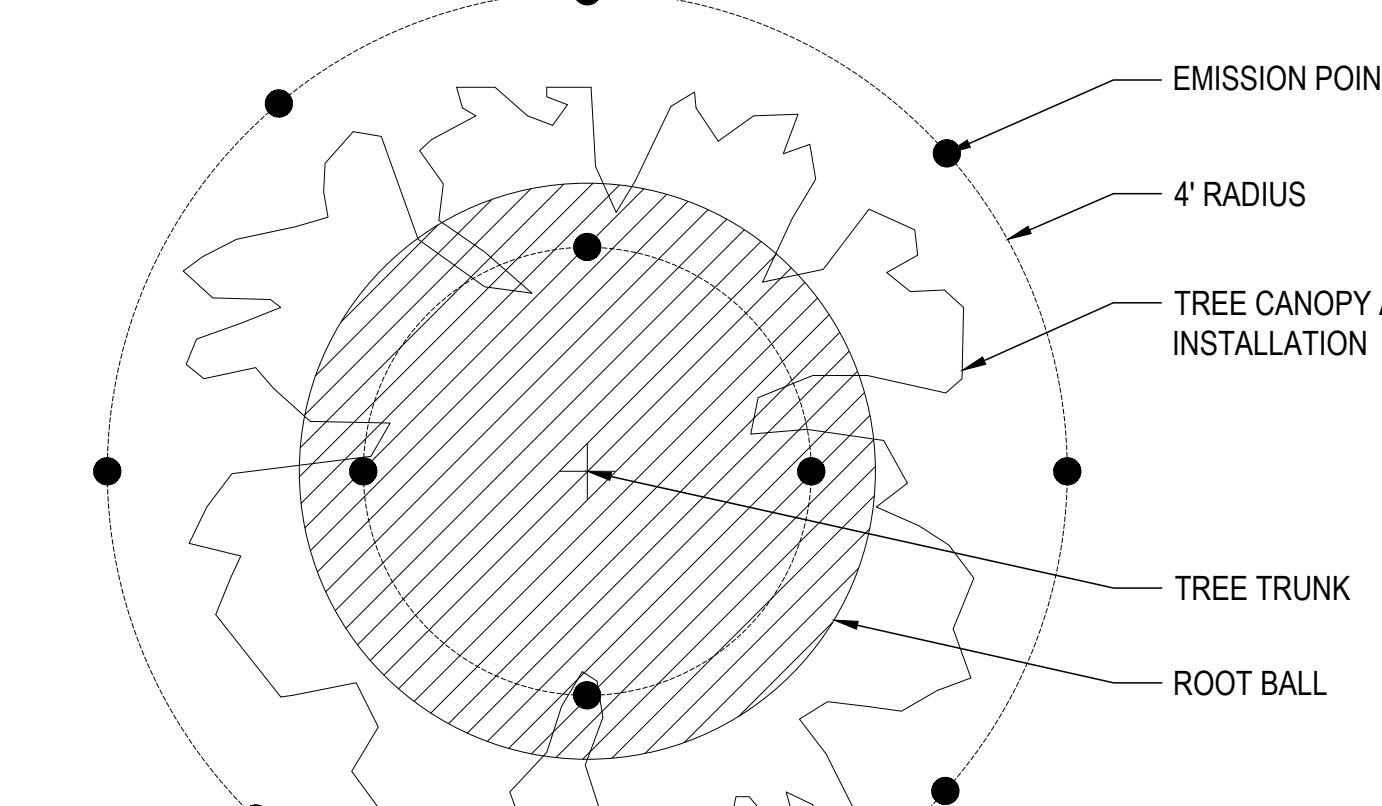
5 MULTI-OUTLET Emitter Placement Layout - TREES, 6-EMITTER

NTS



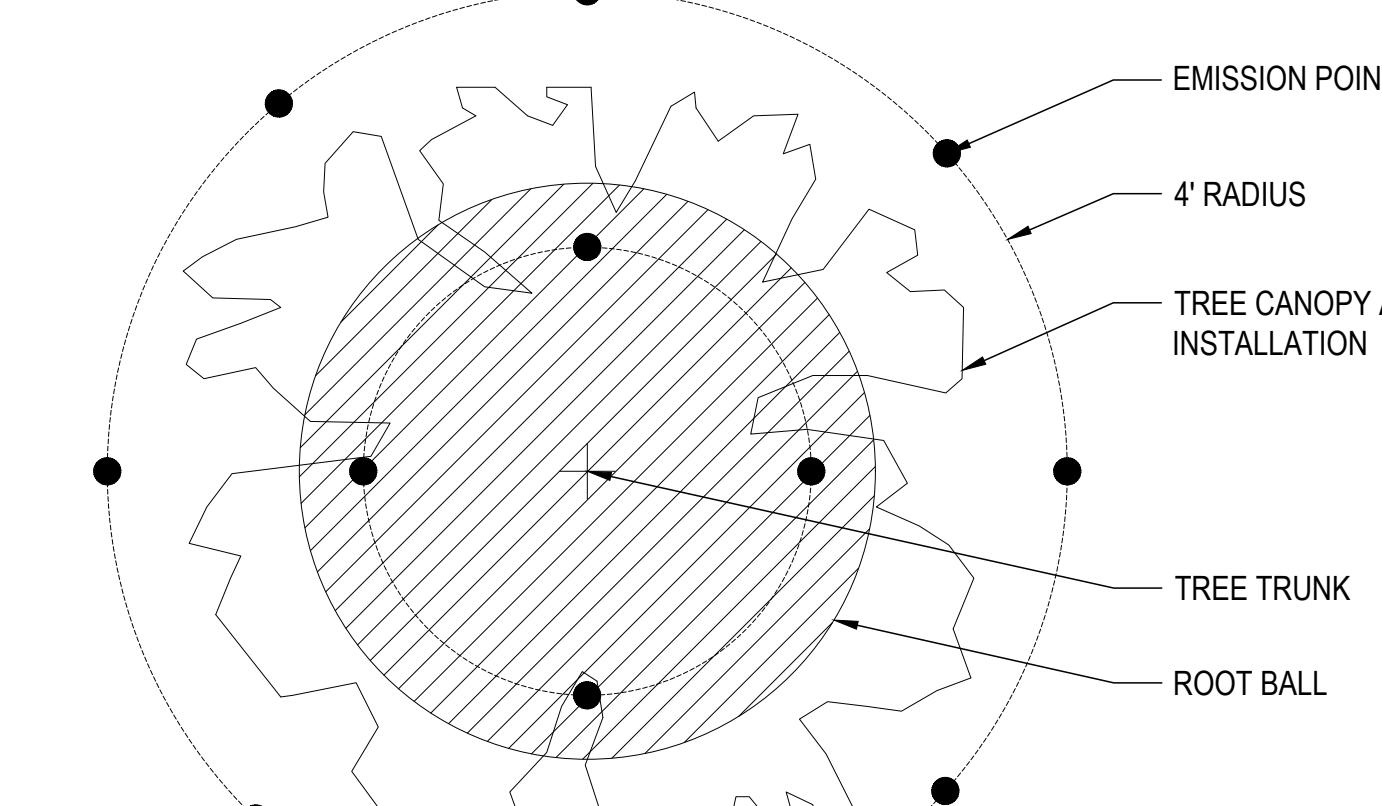
6 MULTI-OUTLET Emitter Placement Layout - TREES, 8-EMITTER

NTS



7 MULTI-OUTLET Emitter Placement Layout - 12-EMITTER

NTS



8 MULTI-OUTLET Emitter Placement Layout - SHRUBS

NTS