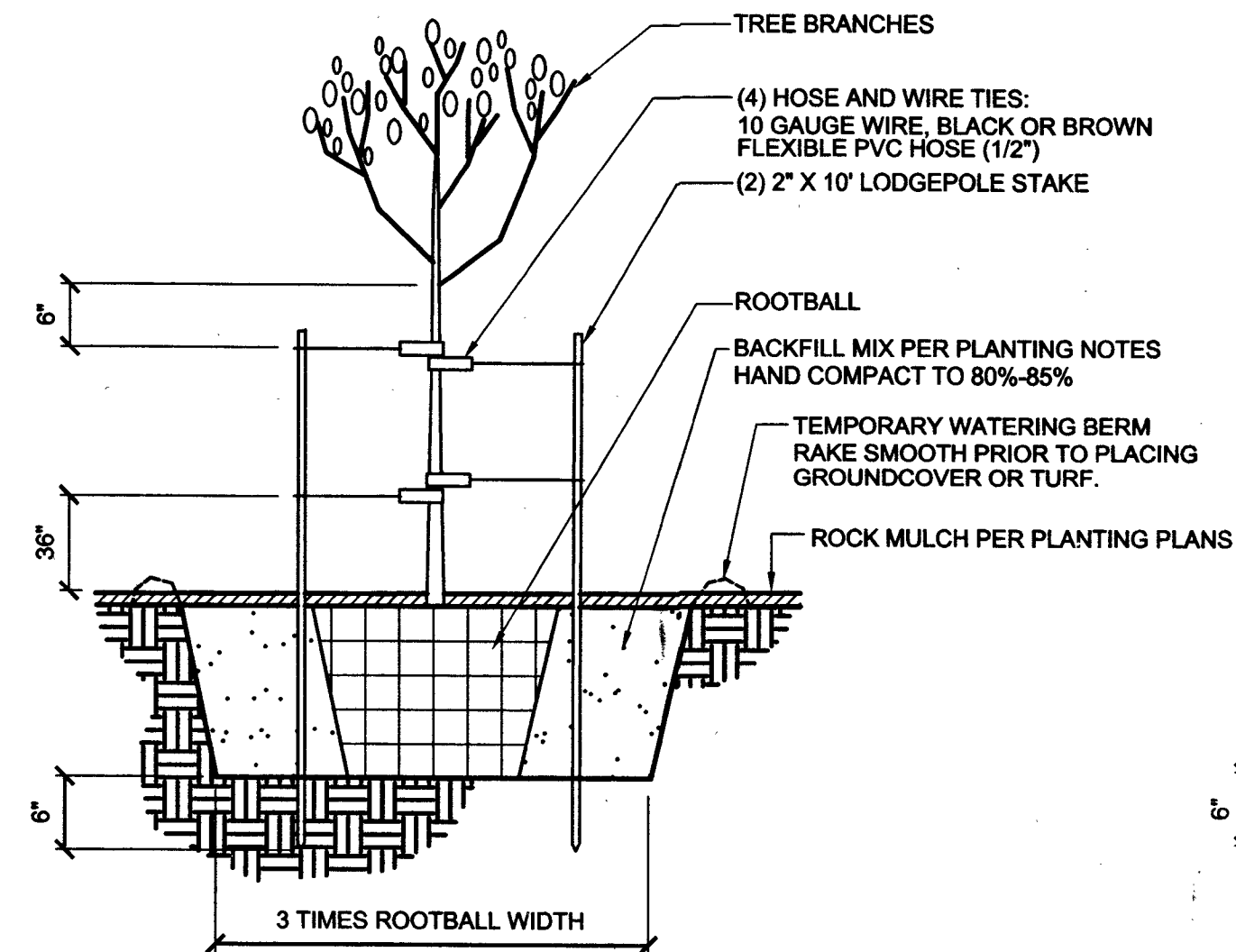
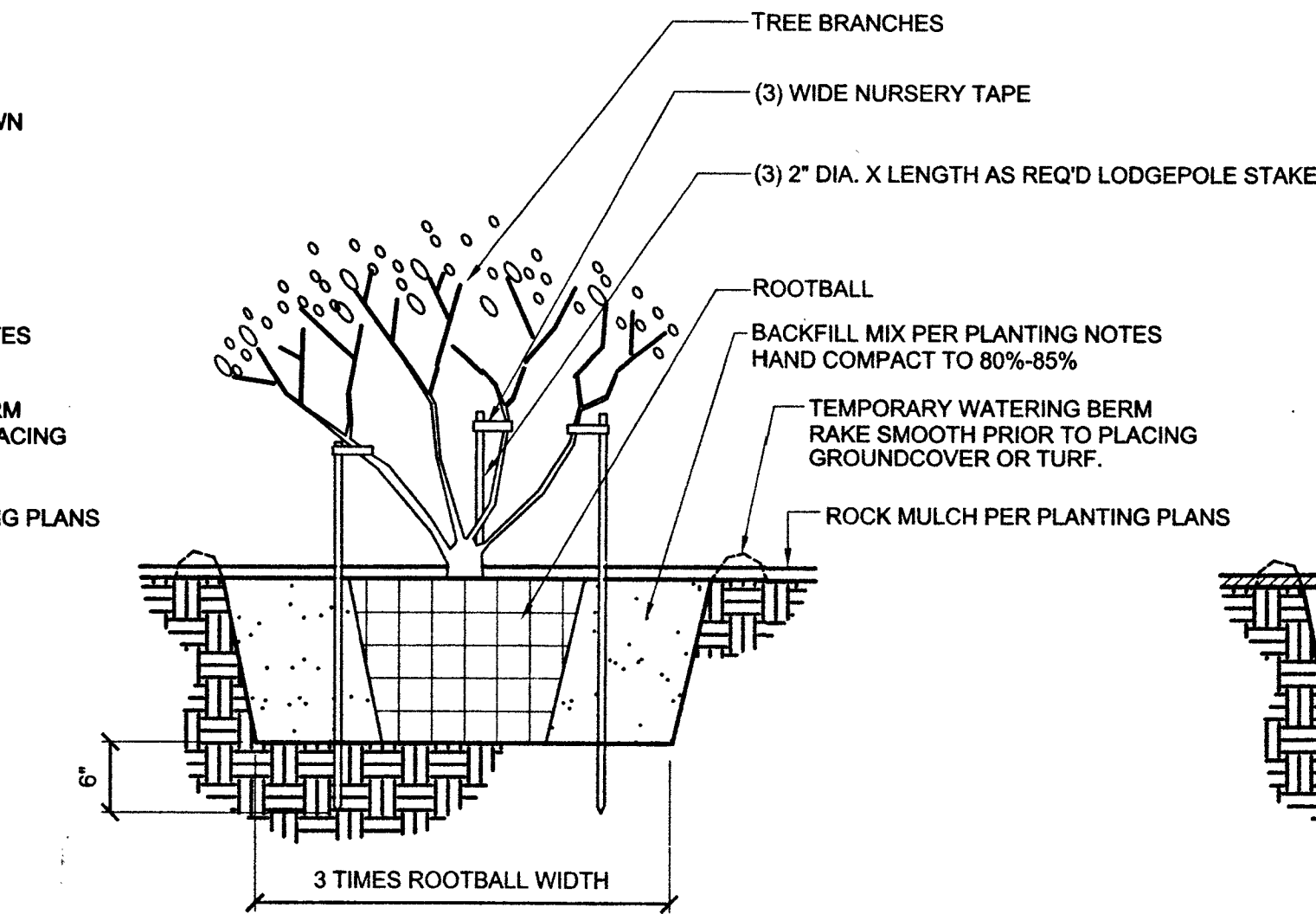
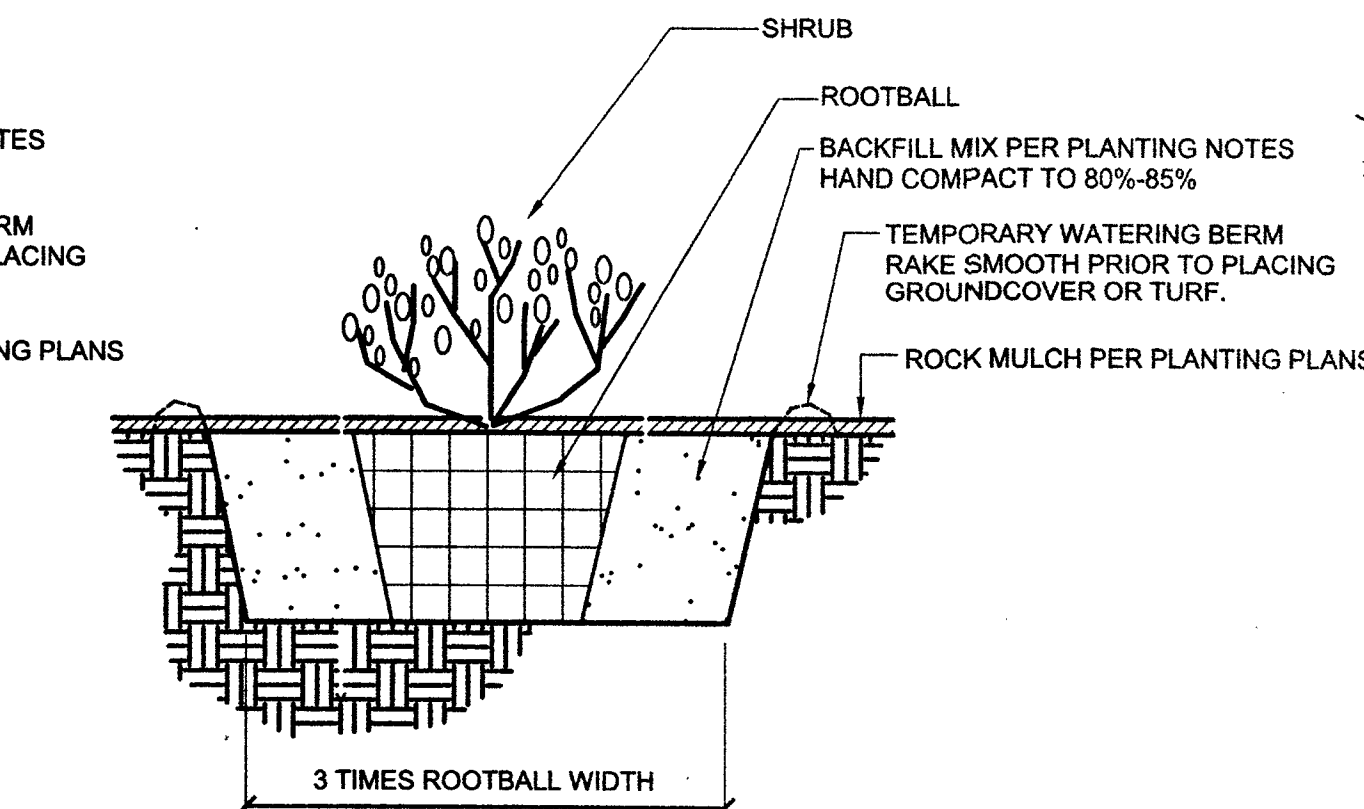




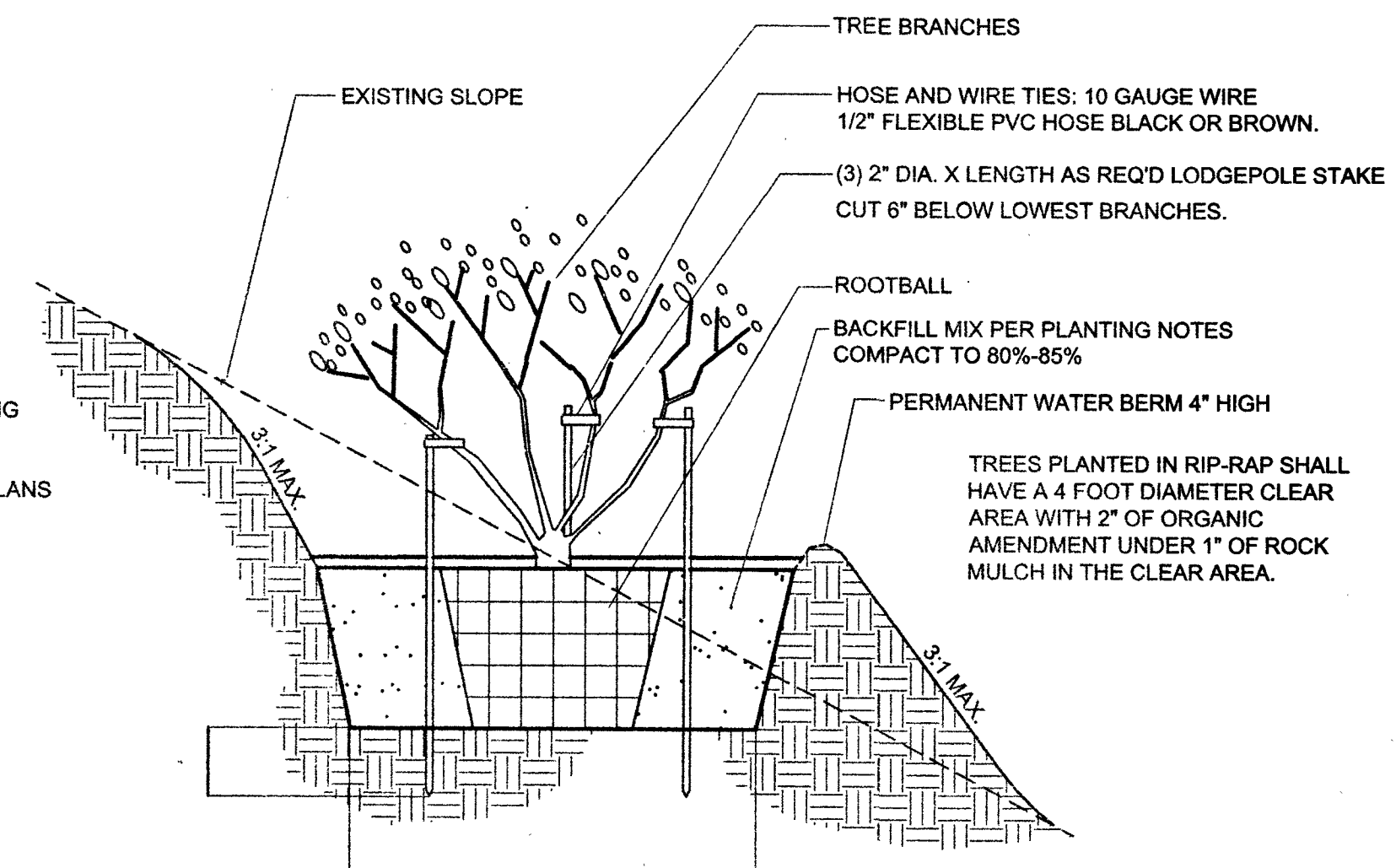
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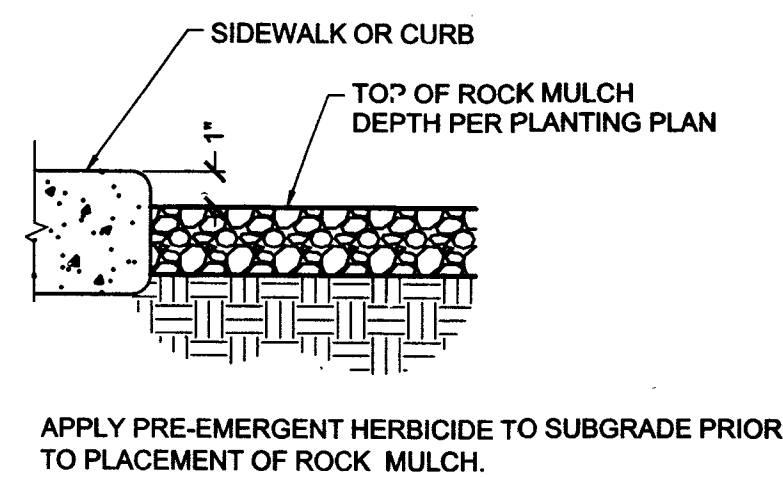
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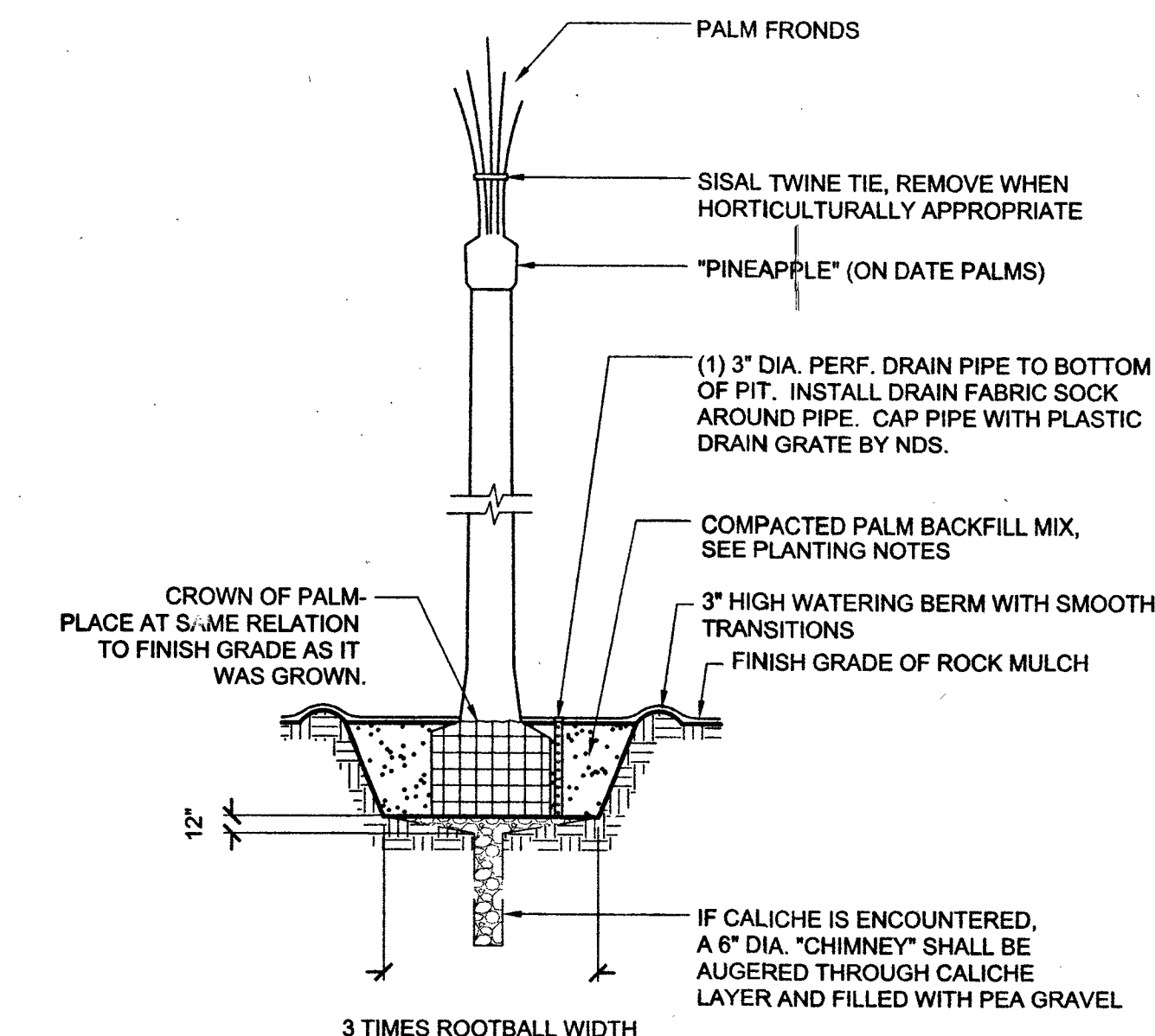
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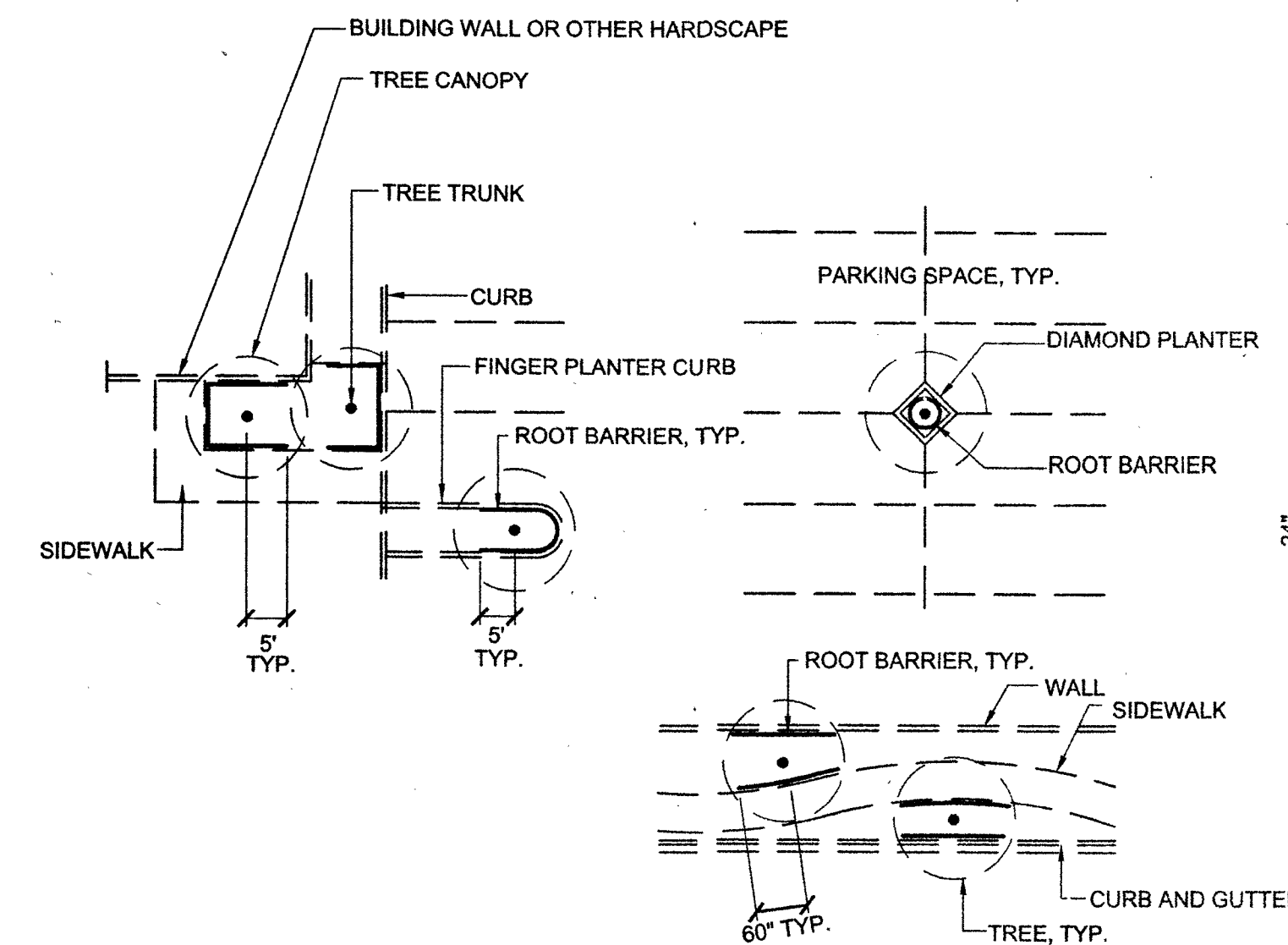
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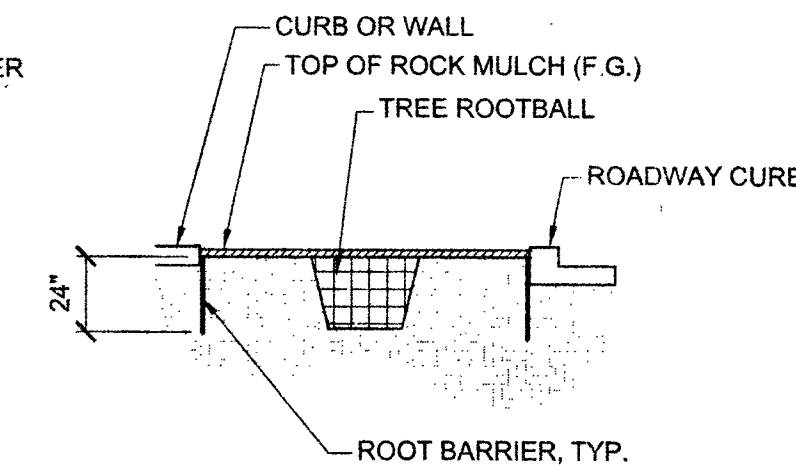
E ROCK MULCH
NTS



F PALM PLANTING
NTS



G ROOT BARRIER
NTS



- NOTES:
1. ROOTBARRIER SHALL BE BY DEEP ROOT CORP. OR CENTURY ROOT GUARD.
 2. ROOT BARRIERS SHALL BE INSTALLED WHEREVER TREE TRUNKS ARE PLANTED WITHIN 6' OF HARDSCAPE, BUILDING WALLS, ROADWAY CURBS OR ROADWAY PAVEMENT.

BACKFILL MIXES FOR PLANTING

PALMS (DATE PALMS, CALIFORNIA AND MEXICAN FAN PALMS):

100% WASHED PLASTER SAND (ANGULAR, SHARP)
15 LBS 16-16-16 PER CUBIC YARD
SUPPLEMENTAL PALM MICRONUTRIENTS AS RECOMMENDED BY MANUFACTURER.

SUBTROPICAL TYPE SHRUB AND TREE BACKFILL:

60% NATIVE SOIL
40% GRO-MULCH BY KELLOGGS, SOUTHERN CALIFORNIA OR ECO-GRO BY TERRA FIRMA
15 LBS 16-16-16 PER CUBIC YARD
15 LBS IRON SULPHATE PER CUBIC YARD
SUPPLEMENTAL MICRONUTRIENTS

DESERT ADAPTED TYPE TREE AND SHRUB BACKFILL:

100% NATIVE SOIL SCREENED OF ROCKS LARGER THAN 1/2\"/>

CACTUS, OCOTILLO, JOSHUA TREE BACKFILL:

100% NATIVE SOIL

ANNUAL COLOR SOIL MIX- 8\"/>

TURF MIX TOP 6\"/>

6\"/>

H PLANT BACKFILL NOTES
NTS

32 90 00 LANDSCAPE PLANTING

PART 1 _ GENERAL

1.1 SUMMARY

A. Section Includes:

1. Trees.
2. Shrubs.
3. Plants.
4. Ground cover.
5. Turf.
6. Topsoil for planting.
7. Soil amendments.
8. Rock Mulch.
9. Initial maintenance of landscape materials.
10. Accessories required for a complete installation.

B. Related Work:

1. Section 32 80 00 - Irrigation Systems.

1.2 REFERENCES

A. American Standard for Nursery Stock, ANSI Z60.1, latest edition.

B. Arizona Nursery Association Committee Recommended Tree Specifications.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements, Codes, and Standards:

1. Comply with appropriate regulatory agencies for fertilizer, herbicide, insecticide and disease control agents in regards to composition, storage and handling, disposal and cleaning of equipment.

B. Source Quality Control:

1. Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.
 2. Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability to Owner's Representative, together with proposal for use of equivalent material.
 3. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.
 4. Trees, Shrubs and Plants: Provide trees, shrubs, and plants of quantity, size, genus, species, and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 *American Standard for Nursery Stock*. Provide healthy, vigorous stock, grown in recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, or disfigurement.
 4. Label at least ten percent of the trees and ten percent of the shrubs of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name. Any patented or trademarked plant varieties must all be identified with the appropriate identification tag.
 - a. Where formal arrangements or consecutive order of trees or shrubs are shown, select stock for uniform height and spread, and label with number to assure symmetry in planting.
 5. Inspection:
 - a. Trees and Shrubs: The Owner's Representative may inspect trees and shrubs either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size, and quality. Owner's Representative retains right to further inspect trees and shrubs for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from project site.
- C. Sole Source Responsibility: Subcontract landscape work to a single firm specializing in landscape work.
1. Nursery: Firm specializing in growing and cultivating plants with minimum 3 years documented experience.
 2. Tree, Plant, Ground Cover Installer: Firm specializing in installing and planting the plants with minimum 3 years documented experience.

1.4 SUBMITTALS

A. List of unavailable plants with proof of non-availability (list of nurseries contacted), and list of proposed equivalent substitutions.

B. Organic Amendment Analysis: A "Compost Evaluation" showing at minimum pH, Ecn, Boron parts per million, Sodium levels, Organic percentage based on dry weight, Percent passing a 1/4" screen, and Carbon/Nitrogen Ratio.

C. Imported Topsoil, Organic Amendment and Rock Mulch samples and supplier names.

1.5 DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

B. Trees and Shrubs: Do not prune prior to delivery unless otherwise approved by Owner's Representative. Do not bend or bind, tie trees or shrubs in such manner as to damage bark, break branches, or destroy natural shape. Provide wind and heat protective covering during delivery. Do not drop plant materials during delivery.

1. Protect all trees and shrubs from wind, drying and high temperatures by taking the following actions prior to, and during shipping:
 - a. Water all plant rootballs prior to shipping.
 - b. Wrap and completely cover all plant material exposed to air with 80%-90% shade or saran cloth.
 - c. If transport time is greater than 6 hours, the truck driver shall syringe the rootball and spray leaves with water at 4 hour intervals.
 - d. Anti-desiccants may be used at the Contractor's option.

C. Deliver trees and shrubs after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture.

D. Do not remove container grown stock from containers until planting time.

1.6 PROJECT CONDITIONS

A. Utilities: Call Underground Service Alert to determine location of existing underground utilities, refer to plans and as-built information for location of new utilities. Perform work in a manner, which will avoid possible damage. Hand excavates, as required. Do not plant over utility lines. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned. Repair all damage to structures, utilities and completed work of the Project caused by the prosecution of the work in this section.

B. Excavation: When conditions detrimental to plant growth are encountered, such as caliche, hardpan, rubble fill, adverse drainage conditions, or obstructions, halt planting in affected area and notify Owner's Representative for resolution.

C. Weather Conditions:

1. Do not install plant life when ambient temperatures may drop below 35 degrees F or exceed 105 degrees F.
2. Do not install plants when wind velocity exceeds 25 mph.

1.7 SEQUENCING AND SCHEDULING

A. Planting Time: Proceed with, and complete landscape work as rapidly as portions of site become available, working within weather limitations for each kind of landscape work required.

1. Plant or install materials during normal planting seasons for each type of plant material required.

B. Coordinate with installation of underground sprinkler system piping and watering heads.

D. Coordinate with other trades.

PART 2 PRODUCTS

2.1 TOPSOIL FOR PLANTING

A. Imported Topsoil for landscape work shall be reject sand or silt from local pits, and meet the following requirements:

1. U.S.D.A. Textural Classification of Sandy Loam or Loamy Sand with no particle size over 1/4" diameter.
2. Free from refuse, roots, heavy clay, stones larger than one-quarter inch in largest direction, gravel, sticks, brush, litter and other deleterious substances.
3. Less than ten percent clay content and more than 75 percent sand content.
4. Salinity - EcE no greater than four mmhos/cm.
5. Boron - Less than one ppm.
6. pH - 6.5 to 8.5
7. Sodium - Less than 8%.

B. On-Site Soil for use in Plant Backfill Mixes shall meet the following requirements:

1. No particle size over 1-inch diameter.
2. Free from refuse, roots, heavy clay, stones larger than one-quarter inch in largest direction, gravel, sticks, brush, litter and other deleterious substances.
3. Less than ten percent clay content and more than 75 percent sand content.
4. Salinity - EcE no greater than four mmhos/cm.
5. Boron - Less than one ppm.
6. pH - Less than 8.5
7. Sodium - Less than 8%.

2.2 SOIL AMENDMENTS

A. Fertilizer: Granular, Synthetic, with micronutrients.

B. Organic Amendment: composed of 1/4" minus ground fir bark or pine bark and no animal waste or biosolids. PH: less than 8.5. EcE: less than 3 parts per million. Boron: less than 1 part per million. Dry Matter: 400 pounds per cubic yard. Percent Organic Matter: 70% or greater. Sodium: 1/5 of a percent or less, Carbon: Nitrogen Ratio of 20:1 or less. A potential source is AG Organics, 1/4" Nutri-Pine, Norco, California, (909) 734-5735.

C. Ammonium Phosphate: 16-20-0

D. Slow-release fertilizer: Inorganic type containing a minimum of 10% by weight of slow release nitrogen.

E. Turf Fertilizer: Best Products Turf Supreme 16-6-8 or equal.

F. Soil Sulphur: In quantities necessary to eliminate any deficiencies of topsoil as indicated in the soil analysis.

G. Iron Sulfate: In quantities necessary to eliminate any deficiencies of topsoil as indicated in the soil analysis.

H. Miscellaneous Amendments: Types and quantities necessary for proper plant growth as determined and recommended in the agricultural soil analysis.

2.3 PLANT MATERIALS

A. Size: Meet or exceed minimum specification noted in Contract Drawings.

B. Quality: Provide trees, shrubs, and other plants of size, genus, species, and variety shown and scheduled for landscape work, grown in climatic conditions similar to those in locality of the work.

C. Ground Covers: Provide plants established and well rooted in removable containers or integral peat pots.

2.4 MISCELLANEOUS LANDSCAPE MATERIALS

A. Rock Mulch: Hard, durable rock, washed free of loam, sand, clay, and other foreign substances. Size, color and type as specified on the drawings.

B. Stakes and Guys: Provide stakes of lodgepole pine 2" dia. x 10' minimum. Deadmen of sound new hardwood, treated softwood, or redwood, free of knot holes and other defects. Provide wire ties and guys as shown on the planting details.

C. Boulders: Monolithic, hard, durable, non-fragmenting rock of color and type specified on plans.

D. Concrete Mow Curbs:

1. Type V Portland Cement, 6 sack concrete mix.
2. Expansion joint at 20'-0" on center.
3. Control joints at 5'-0" on center.

E. Stabilizer: Organic soil stabilizer, available through Stabilizer, Inc., (800) 336-2468, or equal.

F. Water: Clean, fresh and free of substances or matter, which could inhibit vigorous growth of plants.

G. Contact Herbicides: As required. Must meet all requirements of laws, codes and ordinances.

H. Systemic Herbicide: Round-up or equal.

I. Pesticide: As required. Must meet all requirements of laws, codes and ordinances.

J. Disease Control Agents: As required. Must meet all requirements of laws, codes and ordinances.

K. Pre-emergent Herbicide: Surflan or equal.

PART 3 _ EXECUTION

3.1 PREPARATION

A. Verify all necessary grading and layout staking is complete before beginning installation of plant materials. Establish correct horizontal and vertical control for all trees and shrubs scheduled for installation prior to hardscape installation. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas and secure Owner's Representative's approval before start of planting work. Make minor adjustments as may be required.

3.2 WEED CONTOL

A. Apply systemic herbicide to perennial weeds such as Bermuda Grass and Johnson Grass. After weed roots are thoroughly dead, remove the weeds. Annual weeds shall be removed by hand or mechanical methods.

3.3 LANDSCAPE MOUNDING

A. Material for mounding shall consist of topsoil.

B. Topsoil shall be placed in 6" lifts, compacted to 85% and each layer thoroughly watered.

C. Rough and finish grade to achieve smooth transitions and curves where shown on plans.

3.4 FINE GRADING

A. Remove and dispose of any soil in planting areas that contains any deleterious substances, such as oil, plaster, concrete, gasoline, paint, solvents, etc., removing the soil to a minimum depth of 6" or to the level or dryness in the affected areas. The Contractor shall be responsible for any damage caused to installed plants by such substances. Replace removed soil with soil from other areas of the Project, to be determined by the Landscape Architect.

B. Where no grades are shown, grade smoothly and evenly between existing or fixed controls such as walks, curbs, catch basins. Slopes shall have a rounded smooth transition at top and bottom. Roll, scarify and rake as necessary to obtain smooth even surfaces.

C. If, for any reason, the moisture content of the soil reaches a level that working it would destroy soil structure, spreading and grading operations shall be suspended until, in the opinion of the Owner's Representative, moisture content is reduced to workable levels.

3.5 PERCOLATION TEST

A. Percolation Test: Fill 20 of the largest size tree pits and all Phoenix spp. pits with water prior to planting and record drop in water levels over 24 hour period. Provide written report to the Landscape Architect for review. Do not proceed with any planting until the Landscape Architect gives written approval. If drainage problems are encountered, the Contractor shall bore one 6" diameter hole through any caliche layer 36" or less in thickness for trees at no additional cost to the Owner. Also, the Contractor shall bore one 2" diameter hole through any caliche layer 36" or less in thickness for shrubs at no additional cost to the Owner. Aforementioned holes shall be filled with uniformly graded pea gravel and covered before plant backfill is placed with a 24" x 24" piece of soil separator fabric. If the caliche/hardpan layer is greater than 36" in thickness, notify the Landscape Architect and Owner's Representative for resolution.

3.6 EXCAVATION FOR TREES AND SHRUBS

A. Excavate pits, beds, and trenches with sloped sides.

B. Dispose of excess subsoil removed from planting excavations.

3.7 PREPARATION OF BACKFILL MIXES FOR PLANTS.

A. Before mixing, clean On-Site Soil of roots, plants, sod, stones, clay lumps, and other extraneous materials over 1 inch diameter, and other materials harmful or toxic to plant growth.

B. Mix specified soil amendments and fertilizers with On-Site Soil at rates specified. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days.

C. Plant Backfill Mix for all trees, shrubs, and vines shall be thoroughly mixed with the excavated On-Site Soil in the following proportions per Cubic Yard(may be amended by the Landscape Architect based on the soils report at no additional cost to the Owner):

As indicated on Plans.

D. Palm Backfill Mix for all bareroot palms shall consist of the following per Cubic Yard(may be amended by the Landscape Architect based on the soils report at no additional cost to the Owner):

As indicated on Plans.

E. Cactus Backfill Mix for all bareroot and container Ocotillo, Joshua Trees, Saguaros and other cacti and succulents, shall consist of the following (may be amended by the Landscape Architect based on the soils report at no additional cost to the Owner):

100% On-Site Topsoil
1/4 pound 16-20-0 per Cubic Yard of Backfill Mix.

F. Annual Color Backfill Mix shall consist of the following per Cubic Yard(may be amended by the Landscape Architect based on the soils report at no additional cost to the Owner):

1 Part Imported Topsoil
1 Part Organic Amendment
1 pound 16-6-8 per Cubic Yard
2 pounds Soil Sulfur

G. For pit and trench type backfill, mix; planting soil prior to backfilling, and stockpile at site.

H. For planting beds, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.

3.8 PLANTING TREES AND SHRUBS

A. Coordination with Turf areas: Plant trees and shrubs after final grades are established, and prior to planting of turf, unless otherwise acceptable to the Landscape Architect. If planting of trees and shrubs occurs after turf installation, protect turf areas from damage and repair all resultant damage. Trees shall have sod or seed removed from a 4' diameter around the trunk of the tree.

B. Place bareroot palm and cactus in same orientation to north as they were grown, orient other plants for best appearance.

C. Set top of existing rootball flush with or slightly higher than, finish grade.

D. Set plants vertical unless otherwise specified.

E. Remove non-biodegradable root containers. For boxed materials remove sides only, bottom may be left under rootball.

F. Set plants in pits or beds in manner shown on planting details. For balled and burlapped material, remove burlap, ropes, and wires from the top 1/3 of root ball.

G. For all plants, except cacti and succulents, saturate soil with water when the pit or bed is half full of backfill mix and again when full.

E. Guy and stake trees immediately after planting. Install stakes in pits prior to backfilling.

F. Install a 3" layer of organic wood chips around the base of all trees in turf areas.

3.9 RAISED PLANTERS

A. For raised planters that have native earth at the bottom:

1. Excavate, if necessary, to provide 24" of Planter Backfill Mix.
2. Scarify 6" of subgrade.
3. Remove rocks greater than 2" diameter from top 3" of subgrade.
4. Waterproof interior of planters with two coats of asphaltic emulsion.
5. Install Planter Backfill Mix to within 3" of top of planter.

B. For raised planters that have an impervious bottom:

1. Verify drainage system is in place and operational.
2. Waterproof interior of planters with two coats of asphaltic emulsion.
3. Install 6" depth of 3/4" drainage gravel with no fines.
4. Install Soil Separator Fabric over all drainage gravel and 6" up interior sides of planter walls.
5. Install Planter Backfill Mix to within 3" of top of planter.

3.10 CALICHE/HARDPAN LAYERS

A. Tree, Shrub, Palm and Cactus Pits: If pits detailed in drawings sit on or encroach into caliche layers less than two feet deep, the caliche layers shall be removed under the plant pit. In this case, if plant backfill does not achieve the required grade, On-Site Topsoil shall be added under the plant pit and compacted to 85%. If tree and/or shrub pits detailed in drawings sit on or encroach into caliche layers greater than two feet deep, the tree or shrub rootball shall be placed on top of the caliche layer and the backfill shall be mounded around the rootball.

3.11 FINAL GRADING AND ROCK MULCH INSTALLATION

A. After planting operations are complete, final grade all planting areas. Level out all temporary watering basins. Place rock mulch as specified under all trees and shrubs. Do not allow rock mulch to pile against trunks of plants.

C. After rock mulch is in place, water thoroughly to wash down small particles, compact rock mulch and activate pre-emergent herbicide (if specified).

3.12 MAINTENANCE PERIOD

A. Maintain the landscaping immediately after installation. Maintenance Period begins at Substantial Completion. The duration of the maintenance period shall be 90 calendar days.

B. Maintain all landscaping until Final Acceptance.

3.13 MAINTENANCE SERVICE

A. Maintenance shall include (but not be limited to):

1. Weeding all landscape areas.
2. Fertilizing trees and shrubs every 90 days.
3. Applying herbicides for weed control in accordance with manufacturer's instructions, and all applicable laws. Remedy all damage resulting from use of herbicides.
4. Apply insecticides as necessary in accordance with manufacturer's instructions, and all applicable laws. Remedy all damage from use of insecticides.
5. Irrigating sufficient to maintain healthy thriving plant materials.
6. Flushing of filters and Strainers as necessary to alleviate clogging.
7. Flushing and replacement of sprinkler heads and drip emitters when necessary.
8. Repair and replacement of irrigation system components as necessary to maintain a 100% automatically operational system providing 100% coverage to plant materials.
9. Adjusting controllers for seasonal changes and watering requirements, on a monthly schedule.
10. Pruning, including removal of dead or broken branches, and treatment of pruned areas or other wounds.
11. Pruning for seasonal winds and top-heavy growth of trees. This pruning shall be completed under the direction of a Certified Arborist and requires prior approval of Owner.
12. Rodent and Pest Control, in accordance with all applicable laws.
13. Disease control.
14. Maintain tree wrapping, guys, and stakes. Repair or replace accessories when required.
15. Litter pick-up on a weekly basis.

3.14 WARRANTY

A. Warranty all plant material and related landscape work until Final Acceptance against all defects including death, disease, unsatisfactory growth, abuse, and damage. The Contractor shall replace all trees and other plants significantly damaged by wind before or during the warranty period. Significant wind damage justifying replacement shall be in the sole determination of the Owner's Representative and may include one or more of the following: broken trunks or branches, serious bark abrasions, defoliation, and toppled or badly leaning plants.

B. Remove and replace trees, shrubs, or other plants found to be dead or in unhealthy condition during warranty period at one (1) month intervals. Replace trees and shrubs, which are in non-thriving condition, as determined by the Owner's Representative, at end of warranty period

D. An "Act of God" may become an acceptable reason for the warranty to become void, but only after Substantial Completion is granted. The Contractor shall make every reasonable attempt to prevent potential damage. An "Act of God" may include unseasonable freezes, winds above 60 mph, and flooding from excessive rain.

3.15 CLEANUP AND PROTECTION

A. During landscape work, keep pavements clean and work area in an orderly condition.

B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.16 SUBSTANTIAL COMPLETION

A. When all landscape and irrigation work is completed, notify the Owner's Representative in writing to request a walk-through. Give 72 hours advance notice.

A. If the work is complete and acceptable, as determined in writing by the Owner's Representative, he/she will grant Substantial Completion and the Maintenance Period will begin.

B. If portions of the work are unacceptable or incomplete, as determined by the Owner's Representative, he/she will develop a Punchlist of items to be corrected and/or completed. When all items are complete, notify the Owner's Representative prior to scheduling a walk-through. Repeat the aforementioned process until all work is acceptable and complete. The Owner's Representative shall then grant, in writing, Substantial Completion and the Maintenance Period will begin.

3.17 FINAL ACCEPTANCE

A. When the landscape Maintenance Period is three weeks from completion, notify the Owner's Representative to request of walk-through. Give 72 hours advance notice.

B. If the work is complete and acceptable, as determined in writing by the Owner's Representative, he/she will grant Final Acceptance at the end of the Maintenance Period.

C. If portions of the work are unacceptable or incomplete, as determined by the Owner's Representative, he/she will develop a Punchlist of items to be corrected and/or completed. When all items are complete, notify the Owner's Representative prior to scheduling a walk-through. Repeat the aforementioned process until all work is acceptable and complete. The Owner's Representative shall then grant, in writing, Final Acceptance.

END OF SECTION

Key Plan

Issued For: Date:
Planchcheck 06.29.2016
Planchcheck 08.10.2016

Drawn JAJ
Checked JAJ
Approved JAJ

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Project Title

MLK / Mount Mariah Drive
Las Vegas, NV 89106

Sheet Title

Planting Specifications

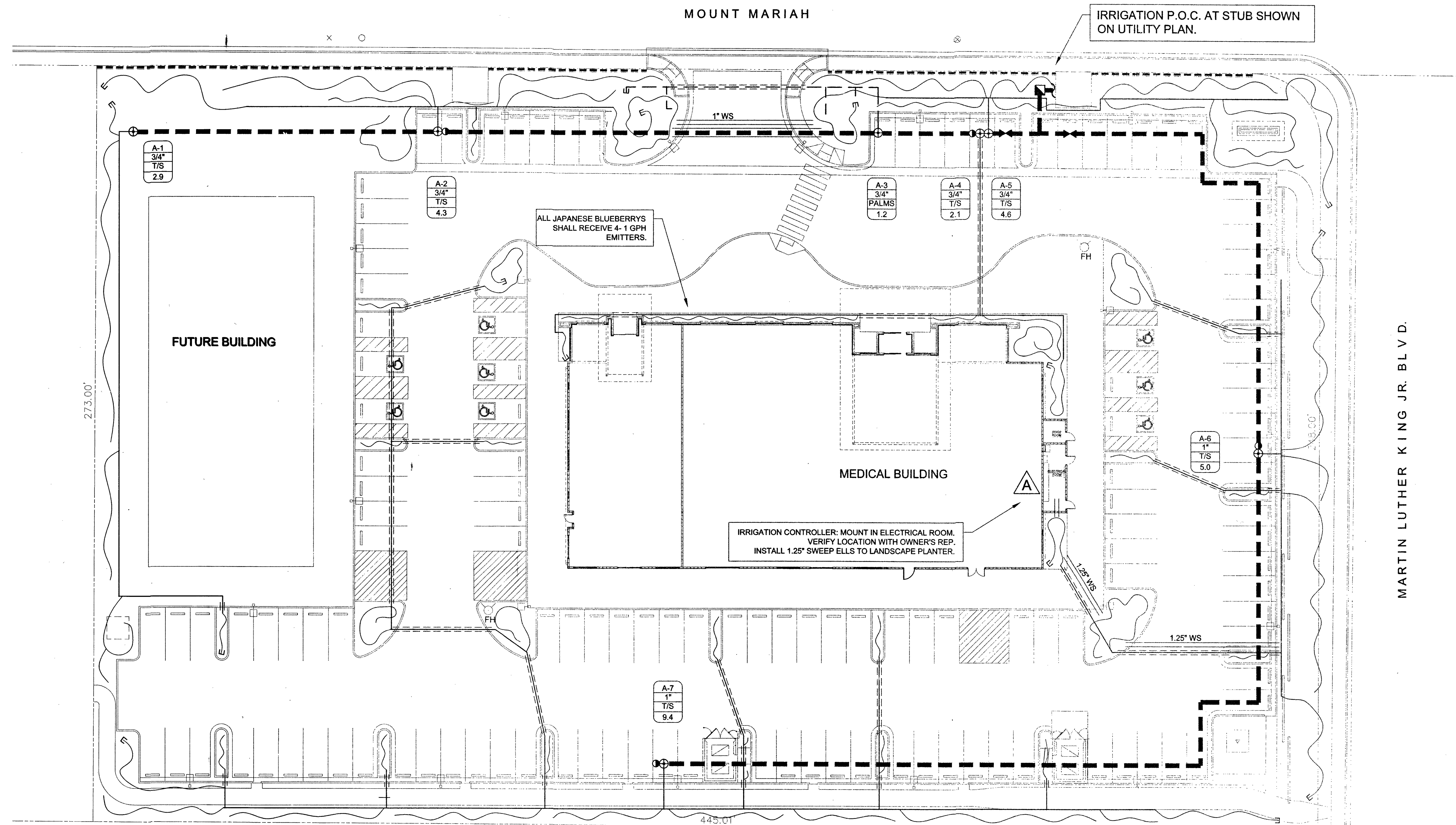
Project Number

215088

John Jones
Landscape
Architect
PLLC
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8275 S. Eastern Avenue
#200
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Sheet Number
H#66665 1076760

L1.3



IRRIGATION LEGEND (DEPICTING AN AUTOMATIC DRIP IRRIGATION SYSTEM)

SYMBOL	DESCRIPTION	REFERENCE
NOT SHOWN	TREE DRIP EMITTERS: RAINBIRD XERI-BUG XB - 20 PC (2.0 GPH) WITH 1/4" DRIP TUBING.	G/H/L2.2
NOT SHOWN	SHRUB DRIP EMITTERS: RAINBIRD XERI-BUG XB - 10PC (1.0 GPH) WITH 1/4" DRIP TUBING.	H/L2.2
NOT SHOWN	PALM DRIP EMITTERS: RAINBIRD XERI-BUG XB - 20PC (2.0 GPH) WITH 1/4" DRIP TUBING.	G/H/L2.2
⊕	VALVE ASSEMBLY: RAINBIRD XCZ-100-PRF. FOR VALVES WITH FLOWS OVER 5 GPM VALVE ASSEMBLY: RAINBIRD XCZ-075-PRF. FOR VALVES WITH FLOWS UNDER 5 GPM	C/L2.2
●	QUICK COUPLER ASSEMBLY: RAINBIRD 33 DNP	D/L2.2
△	AUTOMATIC CONTROLLER: RAINBIRD ESP - RZX81 - 120V INDOOR CONTROLLER	I/L2.2
■	BACKFLOW PREVENTER: FEBCO 825 YA - 1" WITH STAINLESS STEEL INSULATED ENCLOSURE	A/L2.2
✂	GATE VALVE ASSEMBLY: NI3CO T-113, LINE SIZE.	B/L2.2
↖	END CAP ASSEMBLY: ADAPT TO VERTICAL SCHEDULE 80 NIPPLE WITH END CAP FITTING IN 6" DIA. TAN VALVE BOX WITH COVER.	F/L2.2
—	TREE AND SHRUB DRIP HOSE: POLYETHYLENE DRIP HOSE: 3/4" MIN., MAX. LENGTH 120'. SHRUB LATERAL LINE: 3/4" MIN. SCHEDULE 40 PVC PIPE. SIZED BY CONTRACTOR PER PIPE SIZING CHART.	E/L2.2
---	PALM LATERAL: 3/4" MIN. SCH. 40 PVC PIPE TO 3/4" MIN. POLYETHYLENE HOSE. SIZED BY CONTRACTOR PER PIPE SIZING CHART.	E/L2.2
---	MAINLINE: 1.25" SCHEDULE 40 PVC PIPE	E/L2.2
---	SLEEVE: SCHEDULE 40 NON-POTABLE PVC, 2 TIMES DIAMETER OF PIPE INSIDE, OR AS NOTED ON PLAN. SEE NOTE BELOW REGARDING SLEEVE INSTALLATION. WS = WIRE SLEEVE	E/L2.2

EMITTER CHART

SYMBOL SEE PLANTING PLAN	BOTANICAL NAME	NUMBER OF EMITTERS AND GPH
✿	WASHINGTON FILIFERA	6 - 2 GPH
✿	PROSOPIS 'PHOENIX'	6 - 2 GPH
✿	VITEX AGNUS CASTUS	4 - 2 GPH
✿	PARKINSONIA 'DESERT MUSEUM'	6 - 2 GPH
✿	ACACIA STENOPHYLLA	6 - 2 GPH
✿	ACACIA ANEURA	6 - 2 GPH
✿	LAGERSTROEMIA 'PURPLE'	8 - 2 GPH

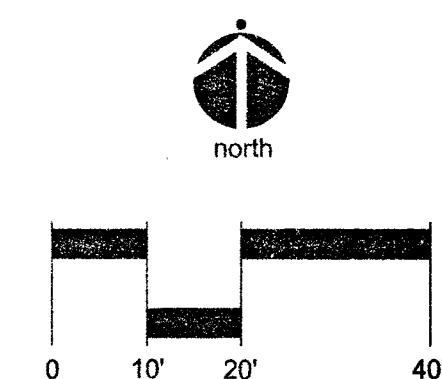
ALL SHRUBS, GROUNDCOVERS, GRASSES AND VINES SHALL RECEIVE 1 - 1 GPH EMITTERS.

A-1	STATION DESIGNATION
1"	VALVE SIZE
TREE	PLANT MATERIAL IRRIGATED - T/S = TREES AND SHRUBS
00.0	GALLON PER MINUTE

LATERAL PIPE SIZING CHART - SCH. 40 PVC	
GALLONS PER MINUTE	PIPE SIZE
0-8	3/4"
8-12	1"
12-22	1.25"
22-35	1.50"
35-50	2"

NOTES:

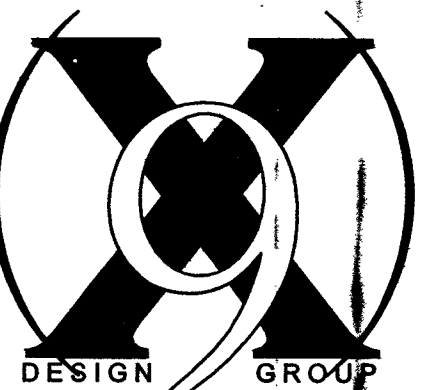
- CONTRACTOR SHALL CALL APPROPRIATE UTILITY COMPANIES (CALL BEFORE YOU DIG) TO MARK UTILITIES.
- VERIFY STATIC WATER PRESSURE OF 50 PSI MINIMUM PRIOR TO INSTALLATION OF IRRIGATION SYSTEM. IF PRESSURE IS LESS THAN 50 PSI, CONTACT OWNER'S REP. AND LANDSCAPE ARCHITECT FOR RESOLUTION.
- INSTALL SLEEVING UNDER ROADWAYS, WALLS AND SIDEWALKS PRIOR TO PLACEMENT AND COMPACTION OF TYPE II BASE, OR OTHER BASE MATERIAL. SLEEVES SHALL BE 18" BELOW TOP OF PAVEMENT OR FOOTING.
- INSTALL ALL IRRIGATION PIPING, WIRING AND COMPONENTS IN PLANTER AREAS WHEREVER POSSIBLE
- FINAL LOCATIONS OF ALL BACKFLOW PREVENTERS AND IRRIGATION CONTROLLERS SHALL BE APPROVED BY OWNER'S REP. PRIOR TO INSTALLATION.
- INTENT OF PLAN IS TO PROVIDE IRRIGATION TO ALL PLANT MATERIAL SHOWN ON PLANTING PLAN.



Key Plan

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Plancheck	07.01.2016
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Drawn	JAJ
Checked	JAJ
Approved	JAJ



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Project Title

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Sheet Title

Irrigation Plan

Project Number

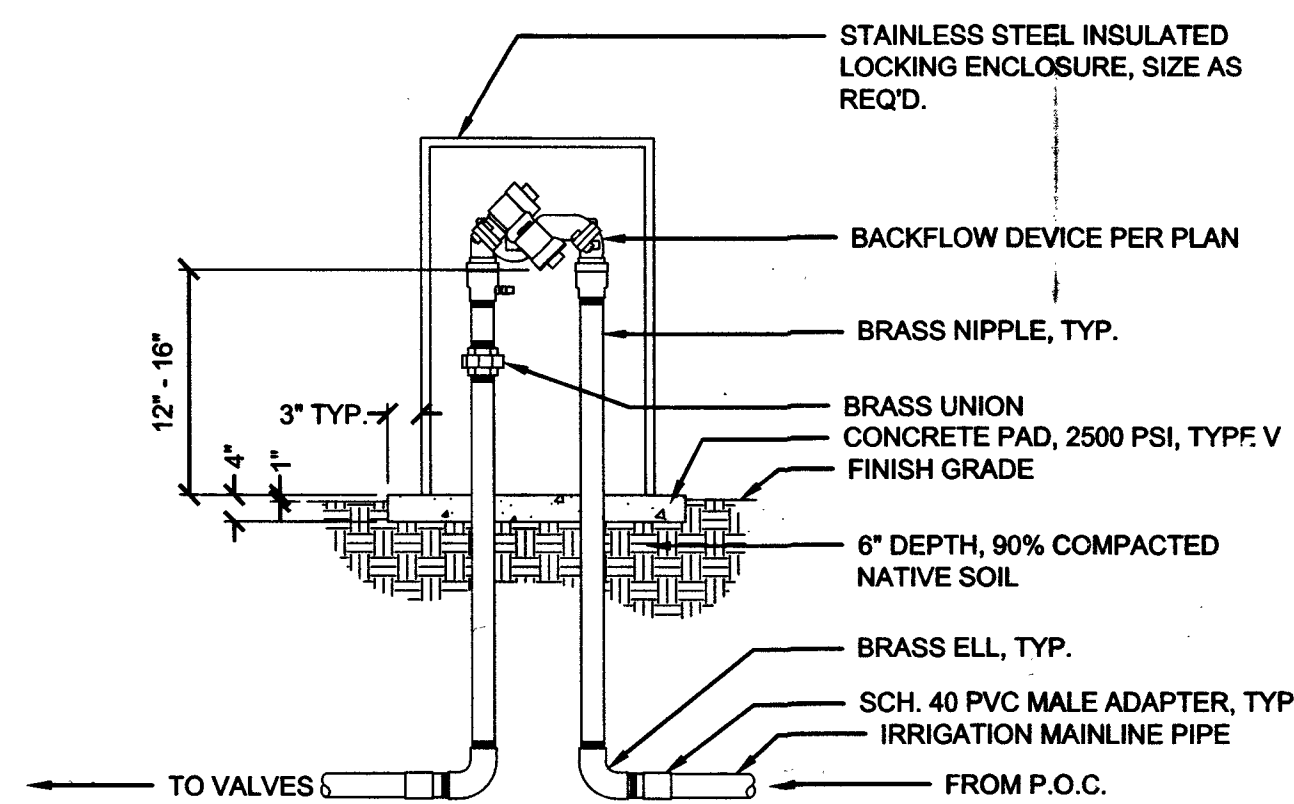
215088

Sheet Number

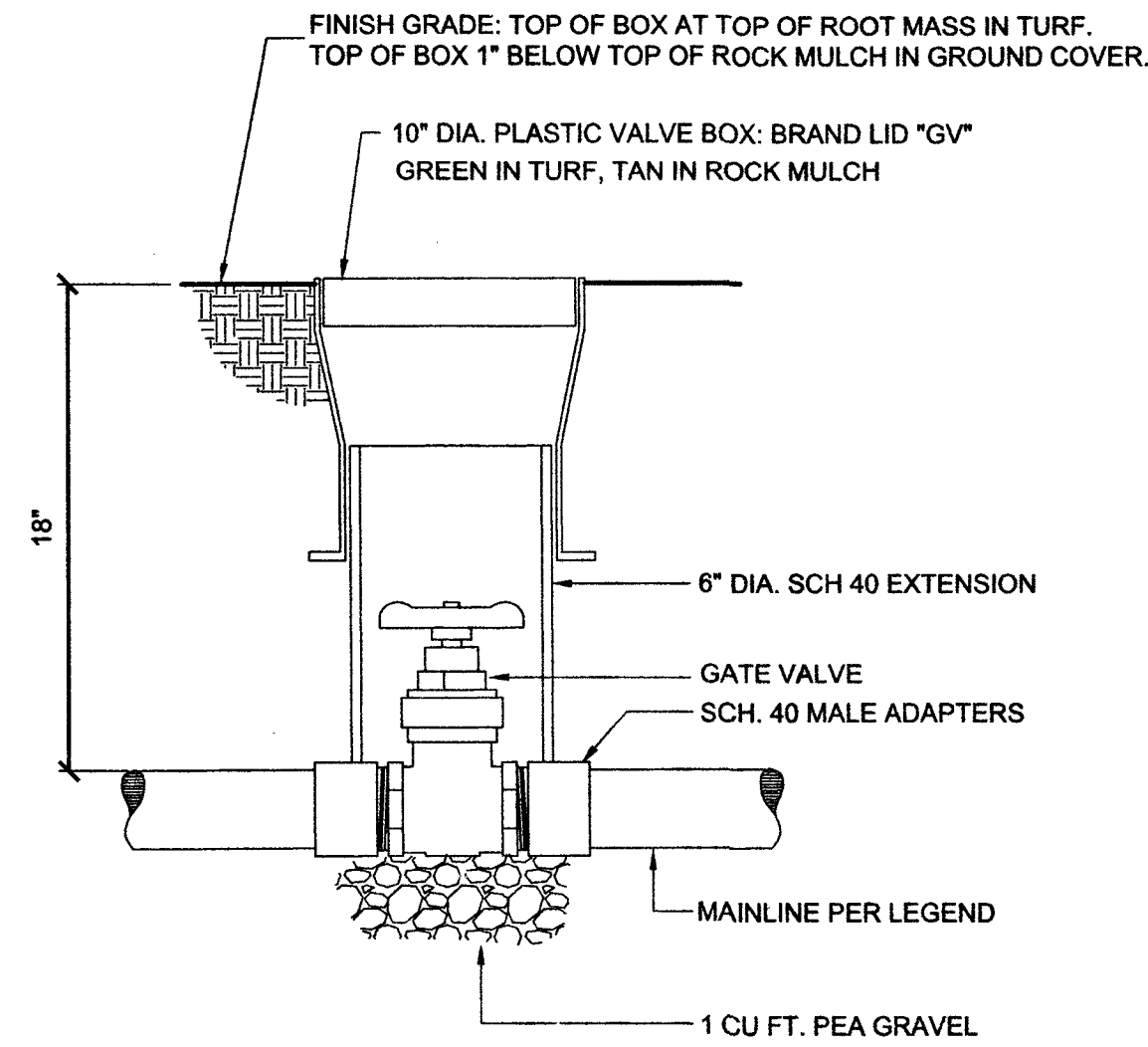
H# 66665 107V6760

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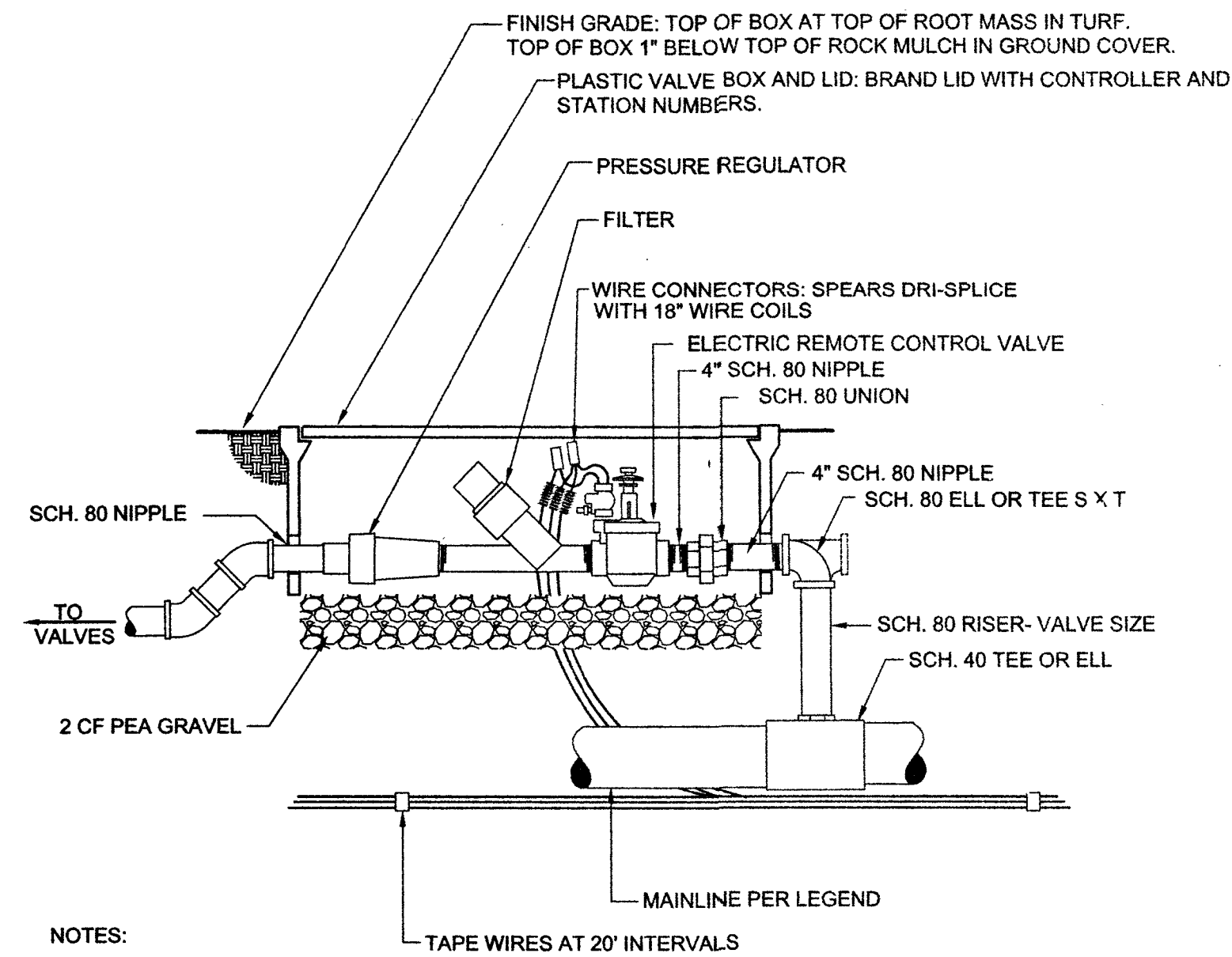
L2.1



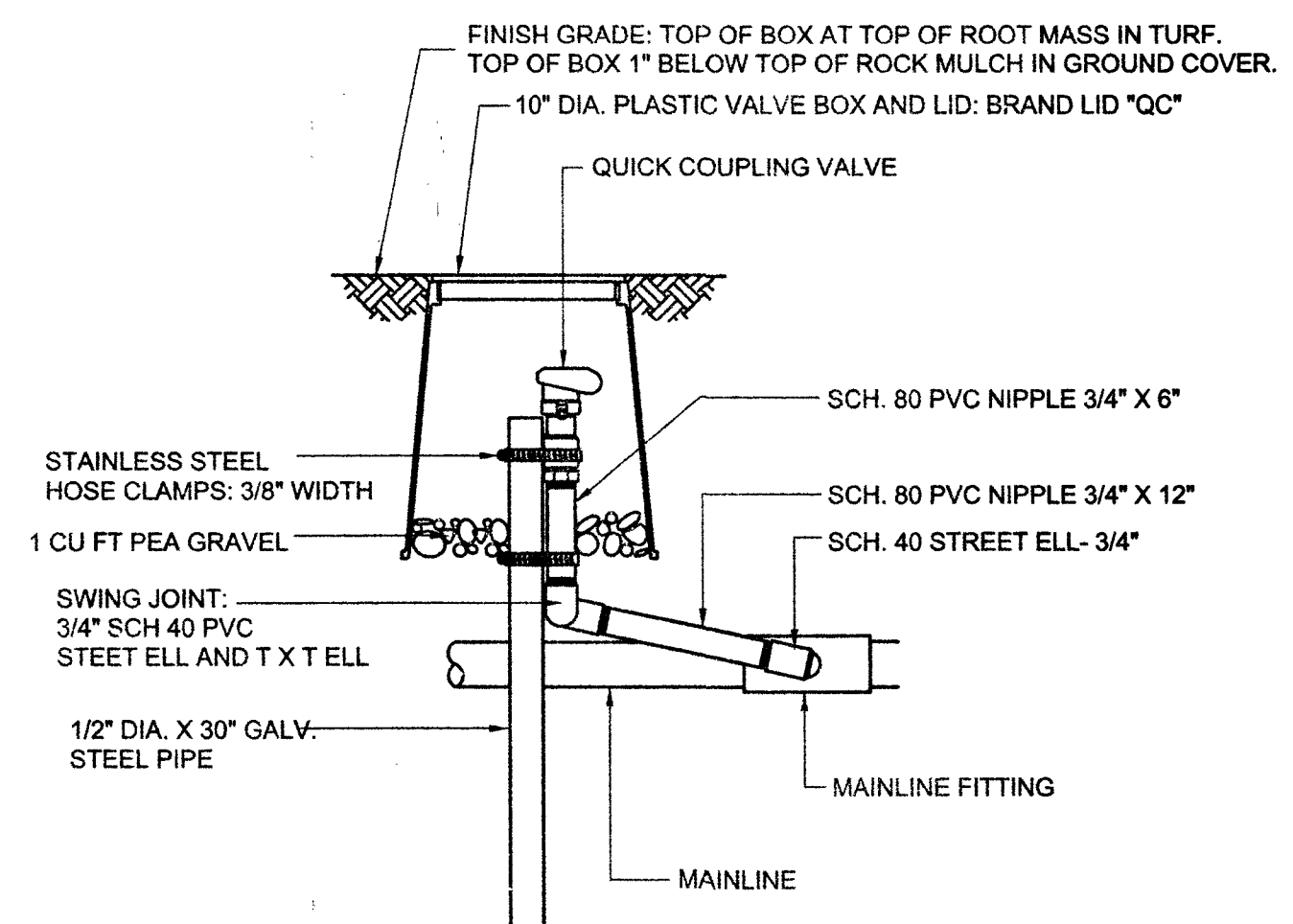
A BACKFLOW PREVENTER NTS



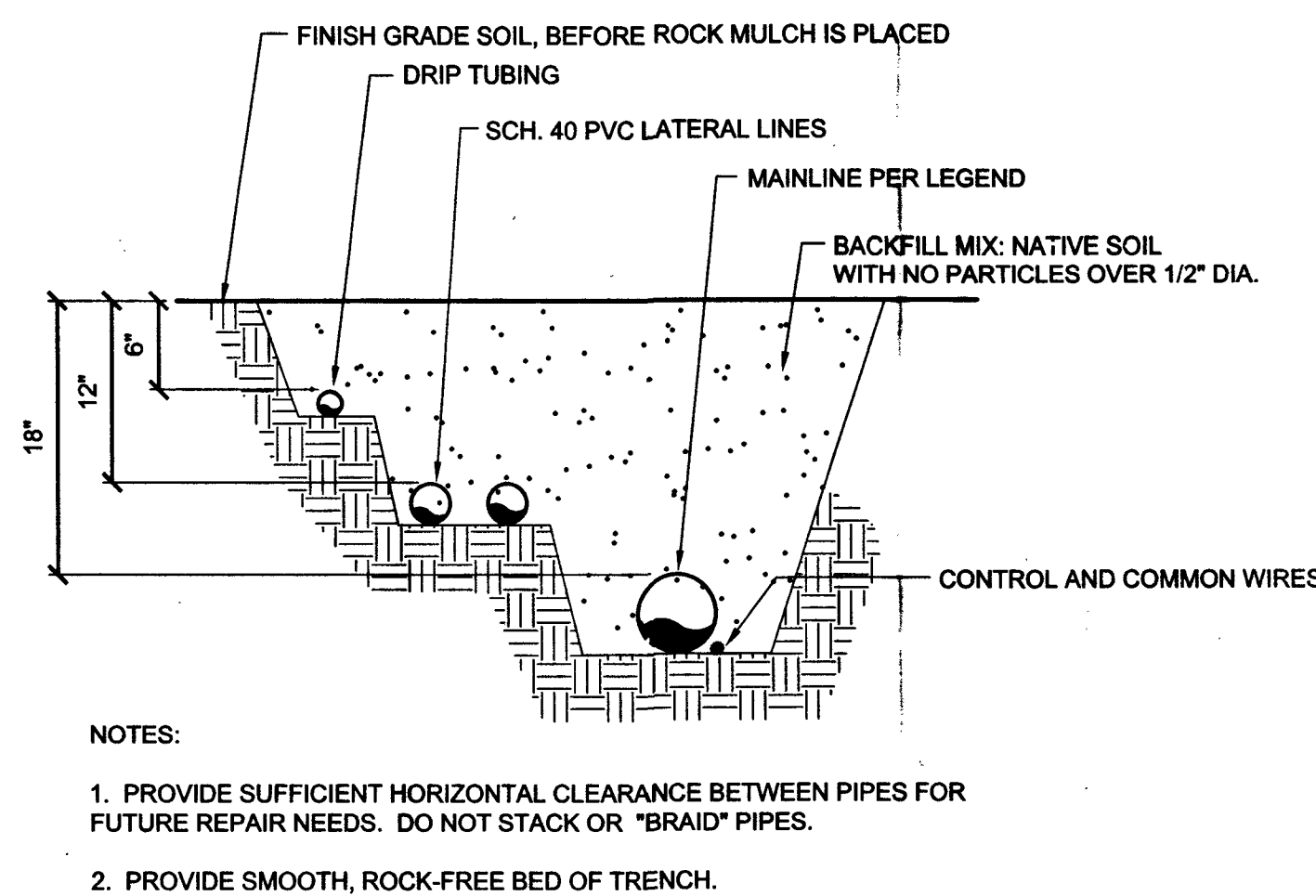
B GATE VALVE NTS



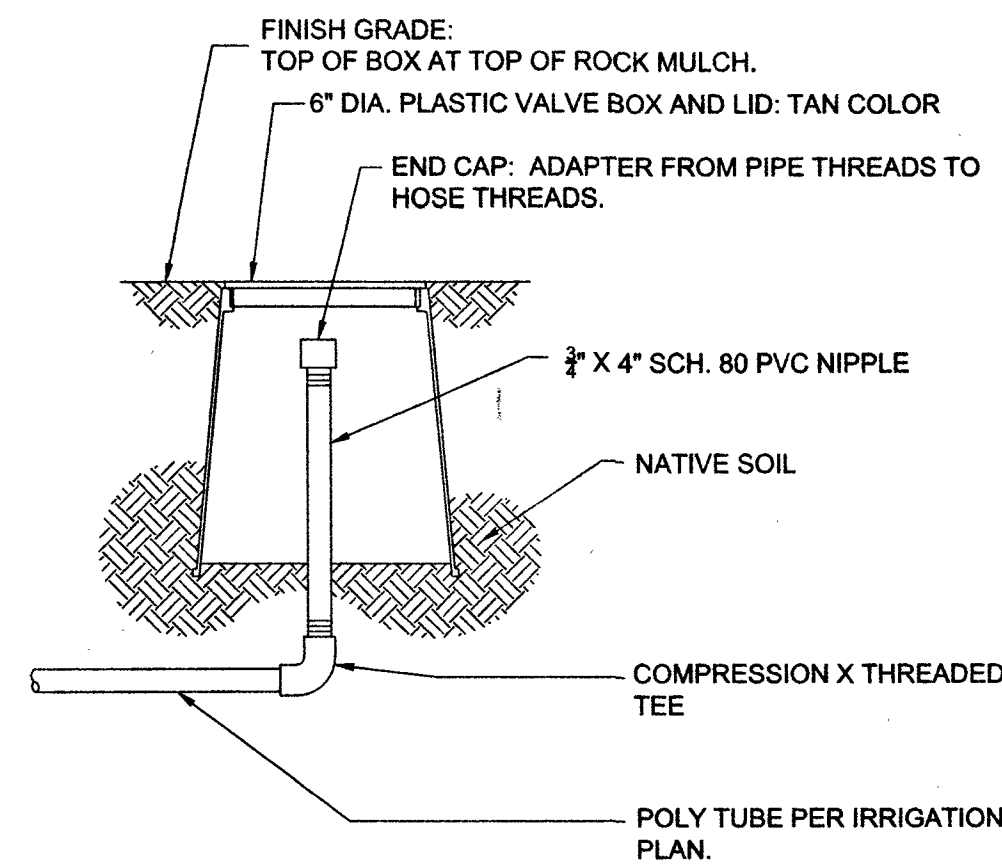
C DRIP VALVE ASSEMBLY NTS



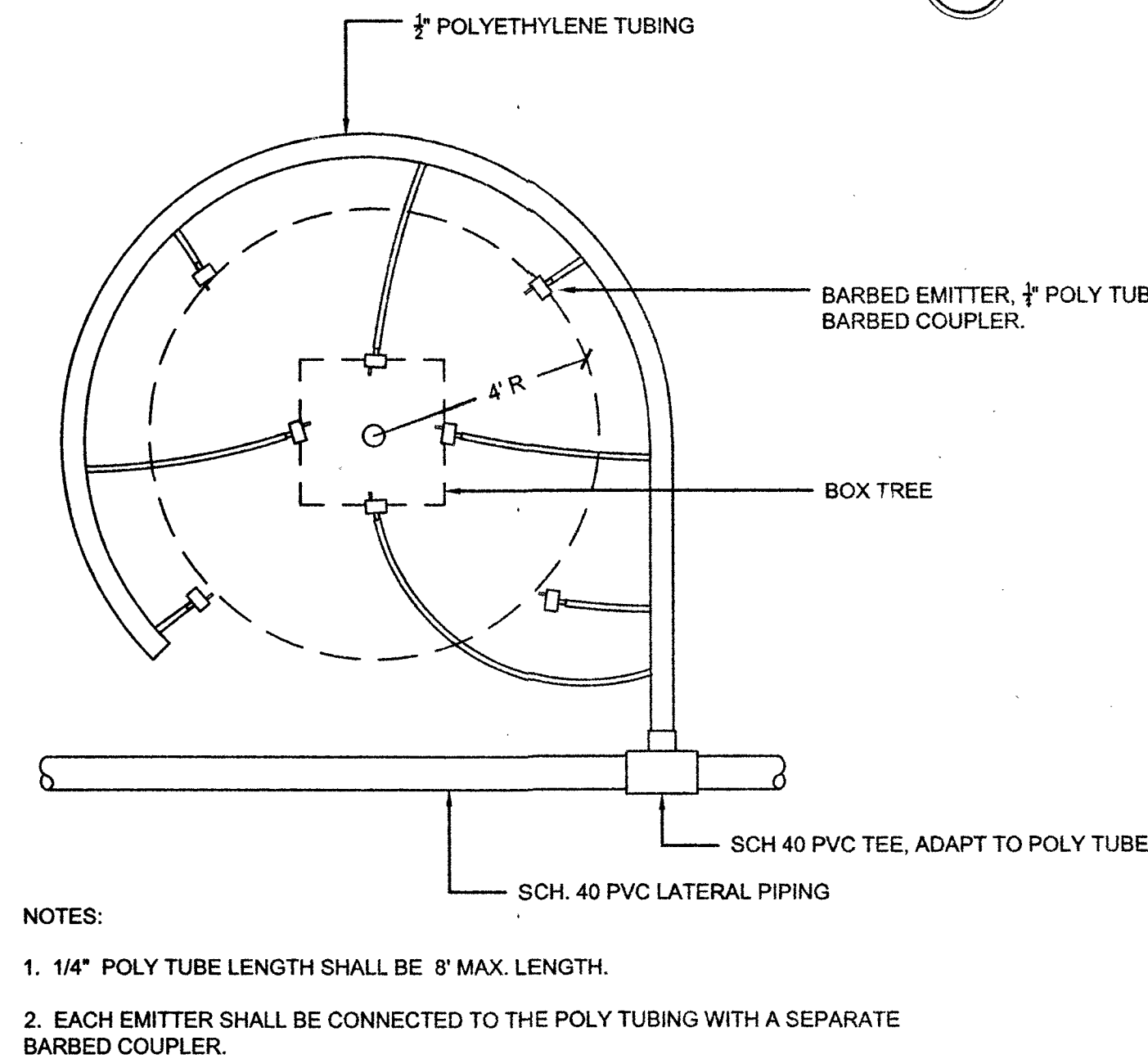
D QUICK COUPLER NTS



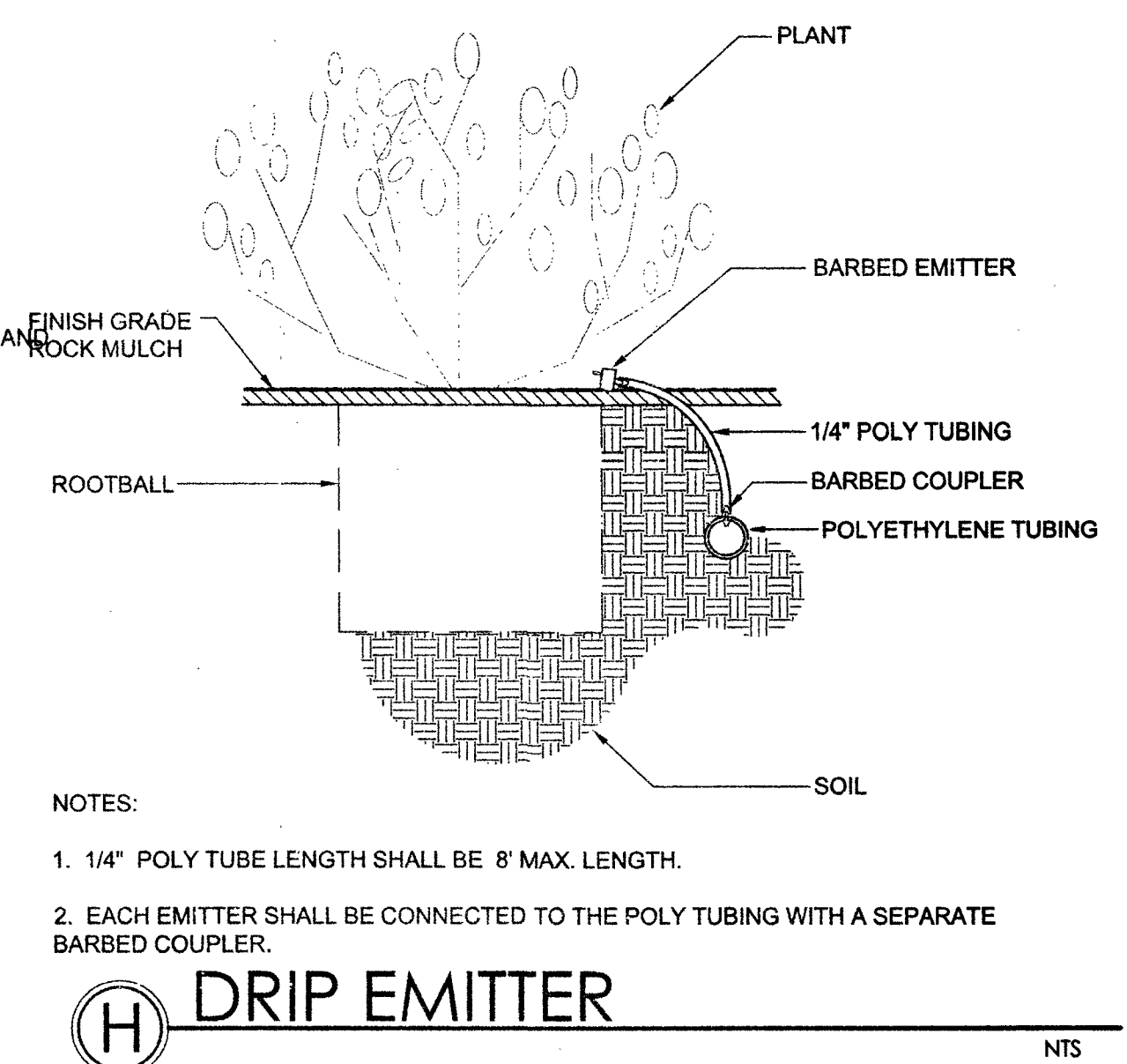
E TRENCHING NTS



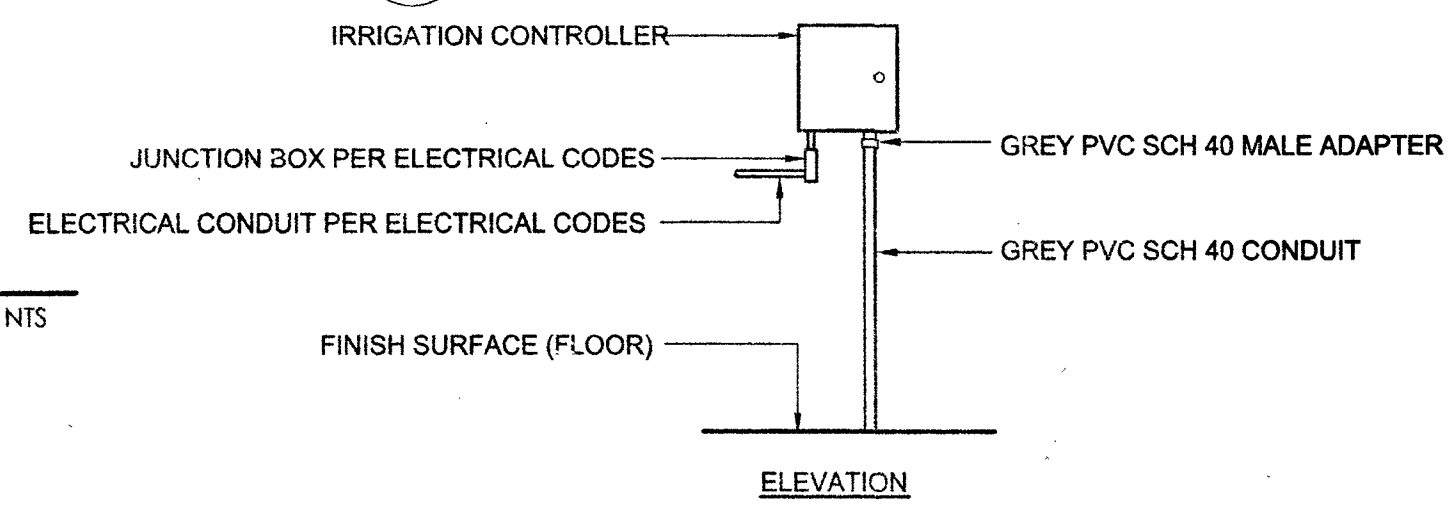
F END CAP NTS



G TREE EMITTER LAYOUT NTS



H DRIP EMITTER NTS



- NOTES:
1. GAIN APPROVAL OF OWNER'S REP. FOR FINAL LOCATION OF IRRIGATION CONTROLLER.
 2. SECURELY FASTEN CONTROLLER TO INTERIOR WALL.
 3. ELECTRICAL CONTRACTOR SHALL MAKE FINAL POWER HARDWARE CONNECTION.
 4. INSTALL WIRE SWEEP ELLS PRIOR TO FOUNDATION AND FLOOR POURS.
 5. SIZE CONDUIT AS NECESSARY FOR VALVE WIRES.

I AUTOMATIC CONTROLLER NTS

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Key Plan	
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Approved	IAJ

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Sheet Title
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Project Number
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L2.2

32 80 00 IRRIGATION SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Valves, piping, emitters, specialties, accessories, controls, and wiring for an automatic irrigation system.
 2. Accessories required for a complete installation.

- B. Related Sections:
1. Section 32 90 00 - Landscaping.
 2. Landscape Drawings.
 3. Electrical Drawings.
 4. Civil Drawings.

- C. System Description:
1. Electric solenoid controlled underground irrigation system.
 2. Source Power: 120 volt.
 3. Low Voltage Controls: 24 volt.

1.2 REGULATORY REQUIREMENTS

- A. Conform to applicable codes for piping, wiring and component requirements.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Intent of Irrigation Plan is to provide irrigation to all plant materials unless otherwise indicated.

- B. Location of Sprinklers and Devices: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs, light standards, utilities, etc..

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements, Codes, and Standards:
1. Comply with requirements of utility supplying water for prevention of backflow and back siphonage.
 2. Installer Qualifications: Installer having minimum 2 years documented experience in irrigation systems similar in material, design, and extent to work indicated and having a successful service record.
 3. Listing/Approval Stamp, Label, or Other Marking: On equipment, specialties, and accessories made to specified standards.

1.5 SUBMITTALS

- A. Record Drawings: Record actual locations of all mainline, wires, sleeves, valves, quick couplers, gate valves, controllers, pumps and flow sensors. Provide two dimensions from permanent objects.
- B. Controller Charts:
1. Provide a colored, plastic laminated chart up to a maximum size of 11" x 17" for each sheet. Provide unique color coding of lateral line and associated valve for each valve operated by each controller. Minimum of one controller chart is required for each controller.

1.6 PROJECT CONDITIONS

- A. Visually inspect and measure site for discrepancies with plans. If discrepancies exist, immediately notify the Owner's Representative.

- B. Verify irrigation system piping may be installed in compliance with original design and referenced standards. If conflicts exist, immediately notify the Owner's Representative.

- C. Arrange for utility markings by Underground Service Alert. Verify that marking is completed prior to commencing work. If conflicts exist, immediately notify the Owner's Representative.

1.7 SEQUENCING AND SCHEDULING

- A. Maintain uninterrupted water service.

- B. Coordinate work with site backfilling, landscape grading and delivery of plant material.

1.8 WARRANTY

- A. Warranty all parts and labor for a period of one year from date of substantial completion as specified in and concurrent with section 32 90 00.
1. Repair damage to landscape due to settling of trenches.
 2. Fill and repair depressions.
 3. Repair damage to premises caused by defective components.
 4. Make non-hazard causing, non-water wasting repairs within seven days of notification.
 5. Make hazard causing, water wasting repair immediately upon notification.
 6. The contract documents govern replacement materials, labor, and workmanship identically as with new work.
 7. Make replacements at no additional cost to owner.

PART 2 PRODUCTS

2.1 PIPE MATERIALS

- A. Manufacturers: Firm specializing in the manufacture of specific types of pipe.

- B. Mainline (from pump station to remote control valves)
1. 1"-3": Solvent Weld Schedule 40 PVC Pipe conforming to ASTM D2411; Schedule 40.
 2. 1"-3" Fittings: Schedule 40 PVC fittings.
 3. Solvent Cement: ANSI/ASTM D2564 for PVC pipe and fittings.

- E. Lateral Line (downstream of valves)
1. Piping: Solvent Weld Schedule 40 PVC Pipe conforming to ASTM D2411; Schedule 40 minimum 3/4" nominal.
 2. Fittings: Schedule 40 PVC fittings..

- F. Drip Hose/Tubing
1. Polyethylene Tubing: Hardie Blue Stripe or equivalent, 1/2" nominal minimum.
 2. Fittings: Polyethylene or Schedule 40 PVC fittings- 1/2" minimum. Suitable for use with the Polyethylene Tubing used. Rated at 50 psi minimum.

- G. Sleeve Material: Solvent Weld Schedule 40 PVC Pipe conforming to ASTM D2411; Schedule 40.

- H. Galvanized Steel Pipe: Schedule 40 galvanized steel pipe.

- I. Copper Pipe: Type K.

- J. Brass Pipe: Red Brass

2.2 VALVES

- A. Gate Valves: as indicated on drawings.

- B. Jumbo Valve Box: Plastic Body and Lid, 12" height; sized to fit complete valve assembly inside.

- C. Valve Box: Plastic Body, 12" x 17" x 12" minimum inside dimensions with plastic lid.

- D. 10" Round Valve Box: Plastic Body, 10" diameter minimum inside dimension 12" deep. With plastic lid.

- E. Remote Control Valves: Electric solenoid, normally closed, including required fittings and accessories, as indicated on drawings.

- F. Quick Coupling Valve: as indicated on drawings.

2.3 CONTROLS

- A. Exterior Controller Housing: Weatherproof, watertight, stainless steel with lockable access door.

- B. Wire Conductors: Color coded, 12 gauge common, 14 gauge pilot, solid copper, UF listed, direct burial. Unique color combinations for each pilot wire.

- C. Controller Unit: as indicated on Drawings.

2.7 SPRINKLERS AND EMITTERS

- A. Emitters: As indicated on plans

- B. Sprinklers: As indicated on plans. Rubber covers required for all rotary heads in turf areas.

2.8 MISCELLANEOUS MATERIALS

- A. Solvent Weld Cement for PVC pipe and fittings: medium setting gray or blue, Weld-On 711, or equal.

- B. Solvent Weld Cement for PVC pipe to Flexible PVC hose: Weld-On 795, or equal.

- C. Concrete for Thrustblocks: Shall be 3000 psi at 28 days, Type V.

- D. Concrete for Controller and Equipment Pads: Shall be 3000 psi at 28 days, Type V.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify location of existing utilities.

- B. Verify required utilities are available, in proper location, and ready for use.

- C. Verify available water supply water pressure. Notify the Landscape Architect if static pressure measured is less than that indicated in the drawings.

3.2 PREPARATION

- A. Set stakes to identify proposed mainline locations. Obtain Owner's Representative's approval before excavation.

- B. Piping layout indicated is diagrammatic only. Route piping to avoid plants, ground cover, and structures.

- C. Review layout requirements with other affected work. Locate and coordinate with existing sleeves.

3.3 TRENCHING

- A. Excavate, trench, and backfill as specified in the drawings.

- B. Bottom of trenches shall be level to uniformly support pipe.

- C. Compact backfill to 85% in planting areas and 95% under all pavements and/or structures.

- D. Repair settling of trenches.

- E. Minimum Soil Cover Over Pipes:
1. Minimum Cover Over Sleeves under roadways and parking lots: 36 inches.
 2. Minimum Cover Over Sleeves under sidewalks, walls: same as mainline or lateral inside.
 3. Minimum Cover Over Installed Mainline Piping:
 - a. 1'-3", 18 inches.
 - b. 4" -12", 36 inches
 4. Minimum Cover Over Installed Lateral Piping:
 - a. 3/4" - 2", 12 inches.
 - b. 2.5" - 4", 18 inches
 5. Minimum Cover Over Installed Drip Tubing: 6 inches.

- F. Horizontal Separation of Pipes:
1. Between Mainlines: 18" Clear.
 2. Between Mainlines and Laterals: 12" Clear
 3. Between Laterals: 6" Clear.

- G. Trench to accommodate grade changes.

- H. Maintain trenches free of debris, material, or obstructions that may damage pipe.

3.4 JOINT CONSTRUCTION

- A. Threaded Joints: Thread pipes with tapered pipe threads, apply tape or joint compound, and apply wrench to valve ends into which pipes are being threaded.

- B. Polyvinyl Chloride (PVC) Piping Solvent Cemented Joints: Construct joints free of burrs.
1. Handle Solvent Cements, Primers, and Cleaners in a safe and legal manner.
 2. Apply primer to outside of pipe and inside of fitting, apply solvent cement to outside of pipe and inside of fitting taking care not to use an excessive amount. Insert pipe into fitting and rotate one-quarter turn to evenly spread cement around entire contact surface. Wipe away excess glue, do not allow excess glue to restrict flow through inside of pipe or fitting.

- C. Dissimilar Materials Piping Joints: Construct joints using adapters compatible with both piping materials to avoid corrosion, outside diameters, and system working pressure. Install dielectric fittings where dissimilar metals, such as steel and brass or steel and copper join.

3.5 PIPING SYSTEMS _ COMMON REQUIREMENTS

- A. General Locations and Arrangements: Drawings indicate general location and arrangement of piping systems.

- B. Indicated locations and arrangements were used to size pipe and calculate friction loss, and in other design considerations. Install piping as indicated, except where deviations to layout are approved by owner's representative.

- C. Install components having pressure rating equal to or greater than system operating pressure.

- D. Install piping free of sags and bends.

- E. Locate groups of pipes parallel to each other, spaced to permit valve servicing.

- F. Install fittings for changes in direction and branch connections.

3.6 PIPING AND WIRING INSTALLATION

- A. Install pipe, valves, controls, and outlets in accordance with manufacturer's instructions.

- B. Connect to utilities.

- C. Set outlets and box covers as indicated on irrigation details.

- D. Provide for thermal movement of components in system. Snake pipe in trench.

- E. Use threaded nipples for risers to each outlet.

- F. Install 24 V control wiring in accordance with Uniform Electrical Code. Provide 10 inch expansion coil at each valve to which controls are connected, at 100 ft intervals and at changes of direction.

- G. Coordinate pipe installation with electrical work and conduit installation.

- H. Lay piping on sand bedding, uniformly sloped without humps or depressions.

- I. Install piping and wire under sidewalks, walls and paving in sleeves.

- J. After mainline piping is installed, centerload only and perform pressure testing prior to completing backfilling.

- K. Flush all piping prior to installing nozzles and emitters.

3.7 VALVE INSTALLATION

- A. Valves: Install underground valves in valve boxes. Only one valve per valve box.

- B. Control Valves: Install in valve boxes, arranged for easy adjustment and removal. Only one valve per valve box.

- C. Install control wiring in same trench with mainline piping, wherever possible. Install an extra pilot and common wire from controller along all legs of mainline and stub up into valve boxes for potential future use.

- D. Common wire shall be white in color, pilot wire shall be black or red in color.

- E. Label all wires within the controller enclosure with the valve number using permanent adhesive labels.

3.8 EMITTER INSTALLATION

- A. Emitters: After hydrostatic test and flush of mainline, flush lateral piping with full head of water and install emitters.

- B. Place and install emitters as indicated on drawings.

3.9 SPRINKLER HEAD INSTALLATION

- A. Layout sprinkler locations with string lines and measuring tape. Accurate placement of heads is required.

- B. Sprinkler heads shall be set flush with finish grade in seeded areas. Sprinkler heads shall be set flush with the top of sod soil in sod areas.

- C. Adjustments to the layout of sprinklers shall be approved by the Owner's Representative prior to installation.

3.10 CONNECTIONS

- A. Connect piping to sprinklers, devices, valves, control valves, specialties, and accessories.

- B. Connect water supplies to irrigation systems. include backflow preventers on potable water supplies.

- C. Electrical Connections: Connect to power source, controllers, and automatic control valves.

- D. Minimum requirements for electrical installations are specified in Electrical Drawings.

- E. Ground systems according to details in Drawings.

3.11 FIELD QUALITY CONTROL

- A. Testing: Perform hydrostatic test of piping and valves in the presence of the Owner's Representative after center loading pipe. Keep all joints visible. Piping may be tested in sections to expedite work. All valves are to be installed prior to the test. Perform test in the presence of the Owner's Representative.

- B. Cap and subject the piping system to a static water pressure of 150 psi static. Isolate test source and allow to stand for 2 hours. Leaks or loss in test pressure of more than 3 psi constitute defects that must be repaired.

- C. Repair leaks and defects with new materials and retest system or portion thereof until satisfactory results are obtained.

3.17 BACKFILLING

- A. Protect pipe from rocks as necessary. Trench backfill for 2" around pipe shall be free from rocks 1/2" diameter and larger.

- B. Center load pipe prior to Hydrostatic Test. Backfill trench and compact to subgrade elevation. Compact trenches under paving to 95%. Compact trenches in landscape areas to 85%. Protect piping from displacement.

3.18 CLEANING AND ADJUSTING

- A. Flush dirt and debris from piping before installing emitters and other devices.

- B. Adjust automatic control valves to provide flow rate and pressure required for each irrigation circuit.

- C. Adjust settings of controllers, pressure regulators and automatic control valves.

3.19 DEMONSTRATION

- A. Demonstrate to Owner's Representative that system meets coverage requirements and that automatic controls function automatically.

- B. Demonstrate to Owner's maintenance personnel operation of equipment, emitters, specialties, and accessories.

- C. Review operating and maintenance information.

- D. Provide 7 days' written notice in advance of demonstration.

3.20 SUBSTANTIAL COMPLETION, MAINTENANCE PERIOD AND FINAL ACCEPTANCE

- A. Substantial Completion, Maintenance Period and Final Acceptance of this Work shall be concurrent with and follow the procedure prescribed in Section 32 90 00.

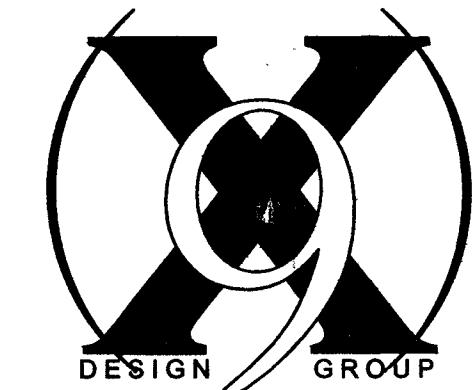
- B. Perform all maintenance of irrigation system set forth in Section 32 90 00.

END OF SECTION

Key Plan

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Project Title

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Sheet Title

Irrigation Specifications

Project Number

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L2.3

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